NOTE

SOME IMAGES IN THIS MANUAL MAY COME FROM DIFFERENT MODEL/VARIANT THAN THE ONE COVERED BY THIS MANUAL. NEVERTHELESS, THE IMAGES REMAIN ACCURATE AND APPLICABLE FOR THE SPECIFIC TASK OR INFORMATION PRESENT IN THE ACCOMPANYING TEXT. WHILE CERTAIN COMPONENTS IN THE IMAGES MAY APPEAR DIFFERENT, THEY DON'T AFFECT THE STEPS, TOOLS, OR SAFETY PRECAUTIONS FOR THE TASKS DESCRIBED.

A FEW WORDS ABOUT SAFETY

SERVICE INFORMATION

The service and repair information contained in this manual is intended for use by qualified, professional technicians.

Attempting service or repairs without the proper training, tools, and equipment could cause injury to you or others. It could also damage the vehicle or create an unsafe condition.

This manual describes the proper methods and procedures for performing service, maintenance, and repairs. Some procedures require the use of specially designed tools and dedicated equipment. Any person who intends to use a replacement part, service procedure or a tool that is not recommended by HERO MOTOCORP, must determine the risks to their personal safety and the safe operation of the vehicle.

If you need to replace a part, use genuine parts with the correct part number or an equivalent part. We strongly recommend that you do not use replacement part of inferior quality.

FOR YOUR CUSTOMER'S SAFETY

Proper service and maintenance are essential to the customer's safety and the reliability of the vehicle. Any error or oversight while servicing a vehicle can result in faulty operation, damage to the vehicle, or injury to others.

⚠ WARNING

Improper service or repairs can create an unsafe condition that can cause your customer or others to be seriously hurt or killed. Follow the procedures and precautions in this manual and other service materials carefully.

FOR YOUR SAFETY

Because this manual is intended for the professional service technician, we do not provide warnings about many basic shop safety practices (e.g., Hot parts- wear gloves). Some of the most important general service safety precautions are given below. However, we cannot warn you of every conceivable hazard that can arise in performing service and repair procedures. Only you can decide whether or not you should perform a given task.

⚠ WARNING

Failure to properly follow instructions and precautions can cause you to be seriously hurt or killed.
Follow the procedures and precautions in this manual carefully.

IMPORTANT SAFETY PRECAUTION

Make sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and using safety equipment. When performing any service task, be especially careful of the following:

- Read all of the instructions before you begin and make sure you have the tools, the replacement or repair parts and the skills required to perform the tasks safely and completely.
- Protect your eyes by using proper safety glasses, goggles or face shields any time you hammer, drill, grind, pry or work around pressurized air or liquids and springs or other stored- energy components. If there is any doubt, put on eye protection.
- Use other protective wear when necessary, for example gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts. Before you grab something that looks like it can hurt you, stop and put on gloves.
- Protect yourself and others whenever you have the vehicle up in the air. Any time you lift the vehicle, either with a hoist or a jack, make sure that it is always securely supported. Use jack stands.

Make sure the engine is off before you begin any servicing procedures, unless the instruction tells you to do otherwise.

This will help eliminate several potential hazards:

- Carbon monoxide poisoning from engine exhaust. Be sure there is adequate ventilation whenever you run the engine.
- Burns from hot parts. Let the engine and exhaust system cool before working in those areas.
- Injury from moving parts. If the instruction tells you to run the engine, be sure your hands, fingers and clothing are out of the way.

Gasoline vapors and hydrogen gases from batteries are explosive. To reduce the possibility of a fire of explosion, be careful when working around gasoline or batteries.

- Use only a nonflammable solvent, not gasoline, to clean parts.
- Never drain or store gasoline in an open container.
- Keep all cigarettes, sparks and flames away from the battery and all fuel- related parts.

HOW TO USE THIS MANUAL

This shop manual describes the service procedures for **HUNK 440** by Hero MotoCorp.

Follow the Maintenance Schedule **(Section 3)** recommendations to ensure that the vehicle is in peak operating condition.

Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.

Sections 1 and 3 apply to the whole vehicle.

Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections.

Section 4 through **23 of base manual** describe parts of the vehicle, grouped according to location.

Section 22 describes the troubleshooting of the vehicle.

You will find important safety information in a variety of forms including:

- Safety Labels- on the vehicle
- Safety Messages- preceded by a safety alert symbol and one of three signal words, **DANGER, WARNING** or **CAUTION**.

These signal words mean:

⚠ DANGER You WILL be SERIOUSLY HURT if you don't follow instructions.

⚠ WARNING You CAN be SERIOUSLY HURT if you don't follow instructions.

⚠ CAUTION You CAN be HURT if you don't follow instructions.

- Instructions- how to service this vehicle correctly and safely.

As you read this manual, will find information that is preceded by a **NOTE** symbol. The purpose of this message is to help prevent damage to your vehicle, other property or the environment.

CONTENTS

Hero

SYMBOLS

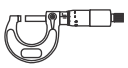
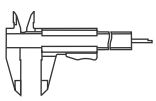
SYMBOLS

Listed in the table below are the symbols indicating instructions and other information necessary for servicing and meaning associated with them respectively.

SYMBOLS	DESCRIPTION
	Replace the part(s) with new one(s) before assembly.
	Apply oil. Use engine oil unless otherwise specified.
	Use Molybdenum oil solution (Mixture of the engine oil and molybdenum grease in a ratio of 1:1).
	Apply Grease.
	Apply Silicone Grease.
	Apply Moly Paste.
	Apply Sealant.
	Use fork oil.
	Apply a Locking agent.
	Apply or use brake fluid.
	Measure in voltage range.
	Measure in resistance range.
	Measure in current range.
	Check for continuity.
	Use special tool.
	Torque control required. Data beside it indicates specified torque.

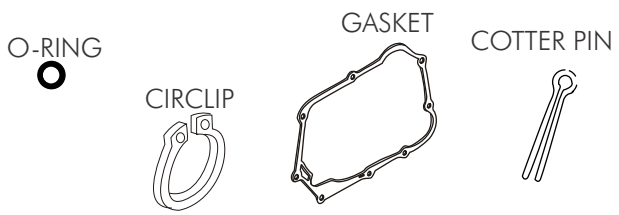
SYMBOLS

Listed in the table below are the symbols indicating instructions and other information necessary for servicing and meaning associated with them respectively.

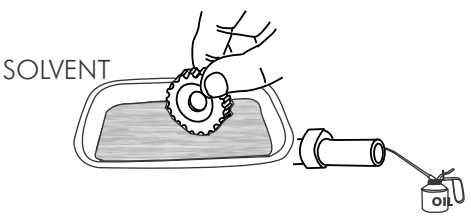
SYMBOLS	DESCRIPTION
	Feeler gauge
	Micrometer
	Cylinder bore gauge
	Dial gauge
	Degreasing
	Vernier Caliper

GENERAL SERVICE PRECAUTIONS

Always replace gaskets, O-rings, circlips and cotter pins with new ones.

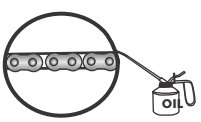


When engine and final drive components are disassembled and inspected, coat the mating surface with a lubricant to prevent corrosion.

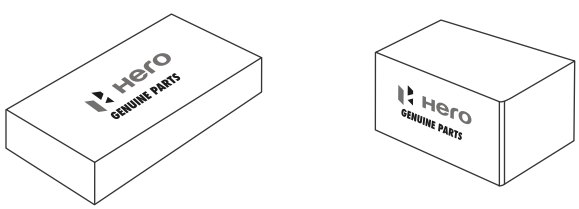


When tightening nuts and bolts, start first with the larger or centre ones. Tighten these to the specified torque using a criss- cross pattern.

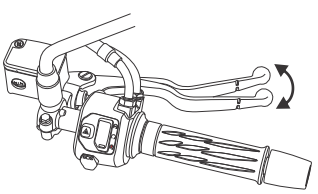
After assembling components, use proper assembly lubricants.



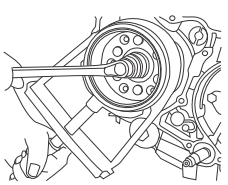
Use only genuine Hero MotoCorp parts and recommended lubricants.



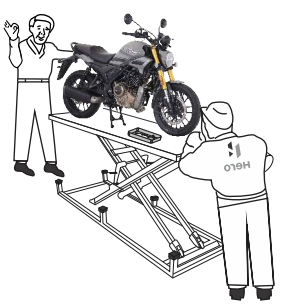
After assembling, check every part for proper installation, movement and operation.



Use specified special and common tools only.



Always ensure mutual safety when working with a partner.



GENERAL SAFETY

CARBON MONOXIDE

If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area.

⚠ WARNING

The exhaust contains poisonous carbon monoxide gas that can cause loss of consciousness and may lead to death.

Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

GASOLINE

⚠ WARNING

Work in a well ventilated area. Keep cigarettes, flames or sparks away from the area or where gasoline is stored.

⚠ WARNING

Gasoline is extremely flammable and is explosive under certain conditions.

KEEP OUT OF REACH OF CHILDREN.

HOT COMPONENTS

⚠ WARNING

- Engine and exhaust system parts become very hot and remain hot for some time after the engine is run.
- Wear insulated gloves or wait the engine and exhaust system have cooled before handling these parts.

BATTERY

⚠ WARNING

The battery gives of explosive gases: keep sparks, flame and cigarettes away. Provide adequate ventilation for charging.

ELECTRICAL WIRES

⚠ WARNING

Route all electrical wire/harness and cables. Keep them away from sharp edges and area where they might be pinched between moving parts.

USED ENGINE/TRANSMISSION OIL

⚠ WARNING

- Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods.
- Although this is unlikely unless you handle used oil on daily bases, it is still advisable to thoroughly wash hands with soap and water as soon as possible after handling used oil.

KEEP OUT OF REACH OF CHILDREN

BRAKE DUST

Never use an air hose or dry brush to clean brake assemblies.

⚠ WARNING

Inhaled fibers have been found to cause respiratory disease and cancer.

BRAKE FLUID

CAUTION

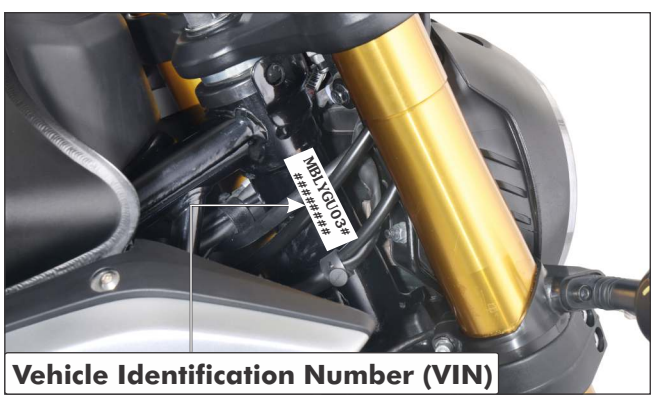
Spilling fluid on painted, plastic or rubber parts will damage them. Place a clean shop towel over these parts whenever the system is serviced.

KEEP OUT OF REACH OF CHILDREN

SERVICE RULES

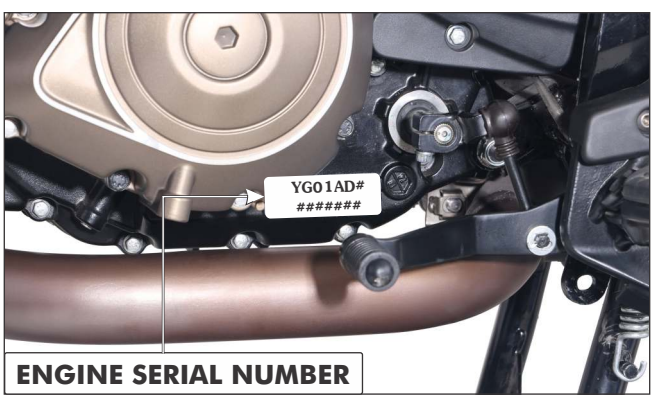
1. Use genuine Hero MotoCorp recommended parts, lubricants and sealants.
   Parts that do not meet Hero MotoCorp's design specifications may damage the vehicle.
2. Use the special tools designed for this product.
3. Install new gaskets, O-rings, Cotter pins, Lock plates etc. when reassembling.
4. When tightening a series bolts or nuts, begin with the larger diameter of inner bolts first, and tighten to specified torque diagonally, in incremental steps unless a particular sequence is specified.
5. Clean parts in cleaning solvent on disassembly. Lubricate any sliding surfaces before reassembly.
6. After assembly, check all parts for proper installation and operation.
7. Route all electrical wires, Cable/Wiring Harness/Tubes/Hoses as shown from (page 1-34 through 1-80).

MODEL IDENTIFICATION - HUNK 440



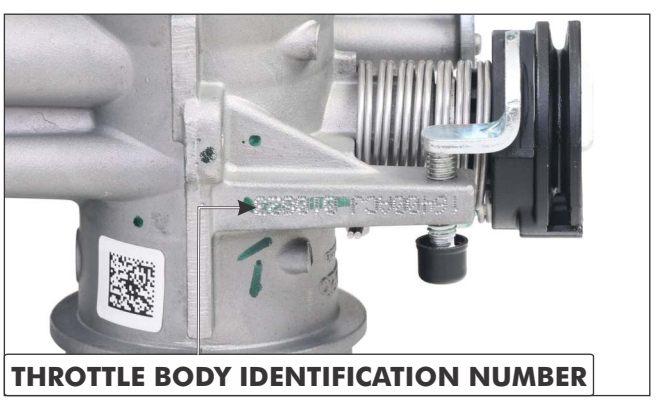
Vehicle Identification Number (VIN)

The VIN is stamped on the right side of the steering head.



ENGINE SERIAL NUMBER

The engine serial number is stamped on the lower left side of the crankcase.



THROTTLE BODY IDENTIFICATION NUMBER

SPECIFICATIONS

GENERAL

ITEM				SPECIFICATIONS
Dimensions	Overall length			2100 mm
	Overall width			868 mm
	Overall height			1112 mm
	Wheelbase			1388 mm
	Saddle height			803 mm
	Kerb weight			188 kg
	Ground clearance			175 mm
Frame	Frame type			Trellis frame body
	Front suspension			USD front forks
	Front cushion stroke			130 mm
	Rear suspension			Hydraulic rear twin shock swingarm mount
	Rear cushion stroke			130 mm (Wheel stroke)
	Front tyre size			110/70-17 54H TL
	Rear tyre size			150/60 ZR-17 66W TL
	Cold tyre pressure	Rider only	Front	27 psi
			Rear	29 psi
		Rider & Pillion	Front	27 psi
			Rear	29 psi
	Brakes	Front brake		Dia. 320 mm
		Rear brake		Dia. 240 mm
	Fuel tank capacity			13.5 litres
	Caster angle			23.9°
	Trail length			91.4 mm
	Fork oil capacity			430 cc (Per leg)
Engine	Type			Full Vertical, Oil cooled 2V
	Cylinder arrangement			Single cylinder
	Maximum power			20.13 kW/27 bhp @ 6000 r/min
	Maximum torque			36 N-m @ 4000 r/min
	Bore and stroke			79.6 X 88.4 mm
	Displacement			440 cc
	Compression ratio			9.65:1
	Valve train			2V SOHC
	Engine oil capacity			2.6 litres at disassembly and 2.25 litres at oil draining
	Lubrication system			Forced lubrication
	Oil pump type			Gerotor
	Air filtration			Wet paper pleated type
	Cylinder compression	Without De-comp		12±2 kgf/cm^2
		With De-comp		6±2 kgf/cm^2
	Intake valve	Open		3.8° (BTDC)
		Close		37.5° (ABDC)
	Exhaust valve	Open		42.4° (BBDC)
		Close		0° (ATDC)

SPECIFICATIONS

GENERAL

ITEM				SPECIFICATIONS
Engine	Valve clearance (in cold condition)		Intake	0.10±0.02 mm
			Exhaust	0.22±0.02 mm
	Idle speed		Cold condition	1600±100 r/min
			Hot condition	1300±100 r/min
Drive train	Clutch			Multi plate, Wet type, Assist & Slipper
	Transmission			Manual 6 speed
	Primary reduction			2.308
	Gear ratio	1st		2.833
		2nd		1.875
		3rd		1.4
		4th		1.136
		5th		0.958
		6th		0.818
	Final reduction			2.53
	Gearshift pattern			Toe shift 1(Down)-N-2-3-4-5-6(Up)
Electrical system	Alternator			325 W @ 5000 r/min
	Battery capacity			*MF Battery 12V- 8 Ah/ ETZ-9
	Spark plug			Federal Mogul REK6YC
	Spark plug gap			0.8-0.9 mm
	Fuse	Starter magnetic switch		25A (Main fuse)
		Fuse box		15Ax3, 10Ax3 (Main fuse) & 25A, 15A, 10A (Spare fuse)
Lamps/ Indicators	Headlamp		Driving beam	29V, 25.6W (LED)
			Passing beam	19V, 17.5W (LED)
			DRL	13.5V, 11.5W (LED)
	Position lamp			13.5V, 2.5W (LED)
	Tail/stop lamp			7.0V, 2.1W/ 7.0V, 0.7W (LED)
	Turn signal lamp			LED
	Turn signal indicator (RH/LH)			LEDx2 nos.
	High beam indicator			LED
	ABS indicator			LED
	Service reminder indicator			LCD
	Side stand indicator			LED
	Licence plate lamp			LED
	Malfunction indicator lamp (MIL)			LED
	Low fuel indicator			LED
	Neutral indicator			LED
	Low oil pressure indicator			LED
	Fog lamp indicator (Optional)			LED

***MF stands for Maintenance Free**

SERVICE LIMITS

MAINTENANCE

ITEM			SPECIFICATIONS
Throttle grip free play			1-3 mm
Spark plug			Federal Mogul REK6YC
Spark plug gap			0.8-0.9 mm
Valve clearance	Intake		0.10 mm ± 0.02
	Exhaust		0.22 mm ± 0.02
Engine oil capacity	At draining		2.25 litres
	At disassembly		2.6 litres
Recommended engine oil			BRAND: Hero Xotic+ GRADE: 100% Synthetic SAE 15W 50 Manufactured by : Indian Oil Corporation Limited. Savita Oil Technologies Limited.
Engine idle speed		Cold condition	1600±100 r/min
		Hot condition	1300±100 r/min
Cylinder compression		Without decomp	12±2 kgf/cm^2
		With decomp	6±2 kgf/cm^2
Drive chain slack			20-25 mm
Recommended brake fluid			DoT 4
Clutch lever free play			10-15 mm
Tyre size		Front	110/70-17 54H TL
		Rear	150/60 ZR-17 66W TL
Cold tyre pressure	Rider only	Front	27 psi
		Rear	29 psi
	Rider & Pillion	Front	27 psi
		Rear	29 psi
Recommended tyre tread depth		Front	0.8 mm
		Rear	0.8 mm

LUBRICATION SYSTEM

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	2.25 litres	-
	At disassembly	2.6 litres	-
Recommended engine oil		BRAND: Hero Xotic+ GRADE: 100% Synthetic SAE 15W 50 Manufactured by : Indian Oil Corporation Limited. Savita Oil Technologies Limited.	-
Oil pump	Outer rotor-body clearance	0.085-0.185 mm	0.25 mm
	Rotor tip clearance	0.05-0.17 mm	0.20 mm
	Pump end clearance	0.03-0.10 mm	0.15 mm
Oil Pressure at Oil Pressure Switch (measured by Oil Pressure Gauge)		@ Idle speed:1700±100mbar (30±5°C) @ 4000 r/min :1750±100mbar (30±5°C)	
		@ Idle speed:750±100mbar (60±5°C) @ 4000 r/min :1200±100mbar (60±5°C)	

FUEL INJECTION SYSTEM

ITEM		SPECIFICATIONS
Engine oil temperature (EOT) sensor resistance		2.645 KΩ±5% @20°C
Engine oil temperature (EOT) sensor voltage		5V ± 0.1V
TP sensor	Fully closed throttle	0.484V ± 0.05V
	Wide open throttle	4.422V ± 0.2V
IAT sensor resistance		2KΩ ± 20Ω (at 25°C)
Fuel injector resistance		12Ω±5%
Fuel pressure at idle		282-324 kPa
Map sensor voltage		0.3V-4.7V
IAT sensor voltage		0.19V-4.76V
Bank angle sensor voltage	Output voltage high (Vertical position)	4±0.4V
	Output voltage low (65±5°)	1±0.3V

ENGINE REMOVAL/INSTALLATION

ITEM		SPECIFICATIONS
Engine oil capacity	At draining	2.25 litres
	At disassembly	2.6 litres

CYLINDER HEAD/VALVES

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression		Without De-comp	12±2 kgf/cm^2	12±2 kgf/cm^2
		With De-comp		6±2 kgf/cm^2
Valve clearance (in cold condition)		Intake	0.10 ± 0.02 mm	-
		Exhaust	0.22 ± 0.02 mm	-
Camshaft cam lobe height		Intake	35.396-35.576	35.366 mm
		Exhaust	35.401-35.631 mm	35.371 mm
Cylinder head warpage			-	0.1 mm
Rocker arm	I.D		10.000-10.015 mm	10.025 mm
	Shaft O.D		9.972-9.987 mm	9.962 mm
Valve	Stem O.D	Intake	6.95-6.965 mm	6.93 mm
		Exhaust	6.93-6.945 mm	6.91 mm
	Guide I.D	Intake	7-7.015 mm	7.035 mm
		Exhaust	7-7.016 mm	7.035 mm
	Stem-to-guide clearance	Intake	0.035-0.065 mm	0.085 mm
		Exhaust	0.055-0.085 mm	0.115 mm
	Spring free length	Inner	39.5 mm	38.5 mm
Valve seat width			1.3±0.1mm	1.6 mm
Specified height of inlet valve guide			19.9±0.1 mm	-
Specified height of exhaust valve guide			19.9±0.1 mm	-

CYLINDER/PISTON

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D		79.6-79.61 mm	79.64 mm
	Ovality		-	0.10 mm
	Taper		-	0.10 mm
	Warpage		-	0.10 mm
Piston	Piston O.D		78.855-79.555 mm	78.825 mm
	Piston pin hole I.D		19.007-19.013 mm	19.023 mm
	Piston pin O.D		18.995-19.000 mm	18.993 mm
	Piston-to-piston pin clearance		-	0.02 mm
	Connecting rod small end I.D		19.006-19.017 mm	19.047 mm
	Cylinder-to-piston clearance		-	0.8 mm
	Connecting rod-to-piston pin clearance		-	0.03 mm
	Piston ring-to-groove clearance	Top	0.015-0.035 mm	0.05 mm
		Second	0.02-0.06 mm	0.07 mm
	Piston ring end gap	Top	0.12-0.22 mm	0.27 mm
		Second	0.5-0.65 mm	0.7 mm
		Oil (side rail)	0.2-0.5 mm	0.53 mm

CLUTCH/GEARSHIFT LINKAGE

ITEM			STANDARD	SERVICE LIMIT
Clutch	Lever free play		10-15 mm	-
	Spring free length		51.7 mm	50.7 mm
	Disc thickness	Disc-A (4Nos.)	2.92-3.08 mm	2.82 mm
		Disc-B (2 Nos.)	2.92-3.08 mm	2.82 mm
		Disc-C (1 No.)	2.92-3.08 mm	2.82 mm
	Plate warpage-A		1.9-2.1	1.8 mm
	Plate warpage-B		1.88-2.12	1.78 mm
	Clutch outer guide I.D		20.991-21.009	21.039 mm
	Clutch outer guide O.D		27.959-27.980 mm	27.929 mm
	Clutch outer I.D		-	33.055 mm

ALTERNATOR/STARTER CLUTCH

ITEM		STANDARD	SERVICE LIMIT
Gear reduction	I.D	10.0-10.022 mm	10.052 mm
	Shaft O.D	9.987-9.978 mm	9.948 mm
Starter driven gear	I.D	10.013-10.028 mm	10.058 mm
	O.D	9.987-9.978 mm	9.948 mm

CRANKCASE/CRANKSHAFT/TRANSMISSION

ITEM			STANDARD	SERVICE LIMIT
Shift fork	I.D		10-10.018 mm	10.048 mm
	Claw thickness		4.63-4.7 mm	4.6 mm
	Shaft O.D		9.976-9.994 mm	9.946 mm
Shift drum	O.D	Left	21.959-21.98 mm	21.929 mm
		Right	20.959-20.98 mm	20.929 mm
	Journal I.D	Left	27.976-27.989 mm	28.019 mm
		Right	27.951-27.972 mm	27.981 mm
Transmission	Gear I.D	M5, M6	25.0-25.021 mm	25.051 mm
		C3, C4	29.0-29.021 mm	29.051 mm
		C2	28.4-28.421 mm	28.451 mm
		C1	23.0 - 23.021 mm	23.051 mm
	Bushing O.D	M5, M6	24.967-24.98 mm	24.937 mm
		C3, C4	28.967-28.98 mm	28.937 mm
		C2	28.359-28.39 mm	28.329 mm
		C1	22.959-22.98 mm	22.929 mm
	Bushing I.D	M5, M6	21.00-21.021 mm	21.051 mm
		C2	25.4-25.421 mm	25.421 mm
		C1	19.00-19.021 mm	19.051 mm
	Gear to bushing clearance	M5, M6	-	0.09 mm
		C3, C4	-	0.09 mm
		C2	-	0.10 mm
		C1	-	0.10 mm
	Mainshaft/Countershaft O.D	At M5, M6	20.959-20.98 mm	20.929 mm
		C2	25.359-25.38 mm	25.329 mm
		C1	18.959-18.98 mm	18.929 mm
	Bushing-to-shaft clearance	M5, M6	-	0.098 mm
		C2	-	0.098 mm
		C1	-	0.098 mm
Crankshaft	Connecting rod side clearance		0.28-0.54 mm	0.70 mm
	Connecting rod side clearance		0.1-0.35 mm	0.70 mm
	Runout		0.03 mm	0.05 mm
	Big end side clearance		0.10-0.35 mm	0.36 mm
	Big end radial clearance		0.028-0.054 mm	0.069 mm

FRONT WHEEL/SUSPENSION/STEERING

ITEM		STANDARD	SERVICE LIMIT
Minimum tyre tread depth		4.2 mm	0.8 mm
Cold tyre pressure	Rider only	27 psi	-
	Rider & Pillion	27 psi	-
Front axle straightness		Dia 0.2 mm	-
Front wheel rim runout	Axial (Tyre fitment area)	0.4 mm	2.0 mm
Wheel balance weight		60 g max	-
Fork spring free length		355.8 mm	346.7 mm
Fork tube runout		-	0.2 mm
Fork oil grade		OIL NO-00M01	
Fork oil capacity		430 cc (Per leg)	
Fork oil level		118 mm	
ABS sensor AIR GAP		0.8	Min 0.3 / Max 1.2

REAR WHEEL/SUSPENSION

ITEM		STANDARD	SERVICE LIMIT
Minimum tyre tread depth		5 mm	0.8 mm
Cold tyre pressure	Rider only	29 psi	-
	Rider & Pillion	29 psi	-
Rear axle straightness		Dia 0.35	-
Rear wheel rim runout	Axial (Tyre fitment area)	0.4mm	2.0 mm
Wheel balance weight (Cast wheel)		60g max	-

TUBELESS TYRES

ITEM			STANDARD	SERVICE LIMIT
Minimum tyre tread depth	Front		4.2 mm	0.8 mm
	Rear		5 mm	0.8 mm
Cold tyre pressure	Front	Rider only	27 psi	-
		Rider & Pillion	27 psi	-
	Rear	Rider only	29 psi	-
		Rider & Pillion	29 psi	-
Wheel rim runout	Front	Axial (Tyre fitment area)	0.4 mm	2.0 mm
	Rear	Axial (Tyre fitment area)	0.4 mm	2.0 mm
Wheel balance weight			60g max	-

ANTI-LOCK BRAKING SYSTEM

ITEM	SPECIFICATIONS
Wheel speed sensor resistance	50 Ω±2% - 115 Ω±2%
Wheel speed sensor air gap	1.2 mm Maximum
Operating temperature	-20°C to 50°C
Operating voltage	10 to 16V
ABS unit inclination angle	± 10° (about longitudinal direction) ± 5° (about later direction)

HYDRAULIC BRAKE SYSTEM

ITEM		STANDARD	SERVICE LIMIT
Specified brake fluid		DoT- 4	
Brake Disc thickness	Front Brake	5 mm	4.5 mm
	Rear Brake	4.5 mm	4.0 mm
Brake Disc runout	Front Brake	0.15 mm	0.25 mm
	Rear Brake	0.1 mm	0.25 mm
Master cylinder I.D	Front Brake	13 mm	-
	Rear Brake	12 mm	-
Master cylinder piston O.D	Front Brake	13 mm	-
	Rear Brake	12 mm	-
Brake caliper cylinder I.D	Front Brake	28x2 mm	-
	Rear Brake	32 mm	-
Brake caliper piston O.D	Front Brake	28x2 mm	-
	Rear Brake	32	-

BATTERY/CHARGING SYSTEM

ITEM		SPECIFICATIONS
Battery	Capacity	*MF Battery 12V-8Ah/ETZ-9
	Current leakage	1.0 mA (Maximum)
	Voltage @ 20°C/68°F	12.4 V (Minimum)
Alternator	Capacity	325 W @ 5000 r/min
	Charging coil resistance	0.560±10% Ω
Lamp coil regulated voltage (with battery)		14.5±0.2 V
Lamp coil regulated current (with battery)		19 A minimum @ 2500 rpm
		20.2 A minimum @ 6000 rpm

***MF stands for Maintenance Free**

IGNITION SYSTEM

ITEM			SPECIFICATIONS
Spark plug	Standard		Federal Mogul REK6YC
	Spark plug gap		0.8-0.9 mm
Peak voltage	CKP sensor		1.5 V (Minimum) @ 300 r/min @ 1.1 mm gap
Ignition coil	Primary coil resistance		1.98 Ω±12%
	Secondary coil resistance	With noise suppressor cap	13.50 kΩ±16%
		Without noise suppressor cap	11.9-15.1 kΩ±12%
Ignition pulse generator resistance			109-164 Ohms

ELECTRIC STARTER

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	7.2 mm	3.5 mm

LAMPS/METERS/SWITCHES

ITEM			SPECIFICATIONS
LED	Headlamp	Driving beam	29V, 25.6W (LED)
		Passing beam	19V, 17.5W (LED)
		DRL	13.5V, 11.5W (LED)
	Position lamp		13.5V, 2.5W (LED)
	Tail/Stop lamp		7.0V, 2.1W/ 7.0V, 0.7W (LED)
	Turn signal lamp		LED
	Licence plate lamp		LED
	Neutral indicator		LED
	Malfunction indicator lamp (MIL)		LED
	Low fuel indicator		LED
	Low oil pressure indicator		LED
	Service reminder indicator		LCD
	Turn signal indicator (RH/LH)		LED x 2 nos.
	High beam indicator		LED
	ABS indicator		LED
	Side stand indicator		LED
	Fog lamp indicator (Optional)		LED
Fuse	Starter magnetic switch		25A (Main fuse) & 25A (Spare fuse)
	Fuse box		15Ax3 nos., 10Ax3 nos. (Main fuse) & 15A, 10A (Spare fuse)
Float resistance		Full (top position)	8±1.3 Ω
		Empty (bottom position)	282±2.8 Ω

ENGINE TORQUE VALUES

SR. NO.	ITEM	THREAD SIZE & TYPE	TORQUE		PR VALUES N-m	REMARKS
			N-m	kgf-m		
1	Oil drain bolt	M12x1.5 Plug drain	25~34	2.5~3.5	30	Apply engine oil
2	Left crankcase cover	M14x1.5 Cap, 14mm	4~8	0.4~0.8	6	
		M32x1.5 Cap, 32mm	10~20	1.0~2.0	15	
		M6x1 Bolt flange	8~12	0.8~1.2	10	
3	Crankcase left	M6x1 Bolt flange	8~12	0.8~1.2	10	
		M8x1 Bolt flange	18~25	1.8~2.5	22	
4	Cam holder cap	M6x1 Hex bolt	12~14	1.2~1.4	13	
5	Cylinder head component	M10x1.25 Bolt cylinder head	Stage1- 25~30	Stage1-2.8	28	Apply engine oil
			Stage2= 53~55	Stage2=5.4	54	
		M6x1 Bolt cylinder head	8~12	0.8~1.2	10	Apply engine oil
6	Cam sprocket	M6x1 Bolt flange	8~12	0.8~1.2	10	Apply engine oil
7	Tappet adjusting nut	M6x0.75 Nut	12~16	1.2~1.6	14	Apply engine oil
8	Gear position sensor	M6x1 Bolt flange	6~8	0.6~0.8	7	
9	Spark plug	M10x1 Spark plug	10~15	1.0~1.5	12	
10	Pipe comp inlet	M6x1Bolt flange SH.	8~12	0.8~1.2	10	
11	Oil pump	M6x1Bolt flange SH.	8~12	0.8~1.2	10	
12	Crankshaft	M16x1.5 Nut special (GPD)	130~140	13~14	110	Apply engine oil
		M14x1.5 Nut special (ACG)	90~110	9~11	100	Apply engine oil
13	Balancer shaft	M14x1 Nut special	60~70	6.0~7.0	65	Apply engine oil
14	Clutch	M16x1.5 Lock nut	100~120	10~12	110	Apply engine oil
15	Counter shaft	16 mm lock nut	70~80	7.0~8.0	75	Apply engine oil
16	Cam gear shift	6 mm hex bolt	10~14	1.0~1.4	12	
17	R crankcase cover	M6x1 Bolt flange	8~12	0.8~1.2	10	
18	Sensor assembly	M10x 1.25	13~16	1.3~1.6	14	
19	Oil cooler hose mtg (Cylinder head & crankcase)	M6x1 Bolt flange	10~14	1.0~1.4	12	
20	Pivot shift drum stopper	M6x1 Bolt flange	8~12	0.8~1.2	10	
21	Piston cooling jet left	M5x1 Socket bolt	4~6	0.4~0.6	5	
22	Plate chain support	M3x0.5	1~2	0.1~0.2	1.5	
23	Oil pressure switch	M10x1	7~10	0.7~1.0	8.5	

ENGINE TORQUE VALUES

SR. NO.	ITEM	THREAD SIZE & TYPE	TORQUE		PR VALUES N-m	REMARKS
			N-m	kgf-m		
24	Oil jet 1.5 mm	M6x1	1.5~2.5	0.15~0.25	2	

NOTE

1. Factor for conversion of torque value SI unit (N-m) from customary unit (kgf-m) shall be 9.81 in this table.
2. Center Values in PR value. (Those shall be entered in shop/service manual)
3. Engine Oil for applying shall be MC-4 Stroke gasoline Engine oil which do not contain Molybdenum.

FRAME TORQUE VALUES

SR. NO.	ITEM	THREAD SIZE & TYPE	TORQUE		PR VALUES N-m	REMARKS
			N-m	kgf-m		
1	Steering					
	Steering stem nut	M24x1.0	88~118	9.0~12.0	100	-
	Thread component hd top	M26x1.0	12~16	1.2~1.6	14	-
	Front fork socket bolt	M8x1.25	17~24	1.7~2.4	20	-
	Front fork bolt	M39x1.0	24~30	2.4~3.0	27	-
	Fork top bridge bolt	M8x1.25	18~22	1.8~2.2	20	-
	Fork bottom bridge bolt	M10x1.25	29~34	2.9~3.4	32	-
	Handle holder under bolt	M10x1.25	45~50	4.5~5.0	47.5	-
	Thread component ch nut	M26x1.0	6~10	0.6~1.0	8	-
2	Wheel					
	Front axle nut	M14x1.5	59~78	6.0~8.0	68	Front axle
	Rear axle nut	M16x1.5	100~120	10.0~12.0	110	PT nut
	Driven sprocket nut	M8x1.25	29~35	3.0~3.6	32	PT nut
	FR/RR speed sensor bolt	M6x1.0	8~10	0.8~1.0	9	Bolt flange
	Sensor ring bolt	M5x0.8	3.5~6.0	0.35~0.6	4.5	Bolt socket
	Front/Rear disc bolt	M8x1.25	39~44	4.0~4.5	42	Disc bolt
	HECU mounting bolt	M6x1.0	8~10	0.8~1.0	9	Bolt washer 6x16 Bolt flange 6x18
3	Engine hanger					
	Engine hanger top	M10x1.25	49~59	5~6	54	
	Engine hanger bottom	M10x1.25	49~59	5~6	54	
	Rear engine mounting top	M10x1.25	49~59	5~6	54	
	Rear engine hanger bottom	M10x1.25	49~59	5~6	54	
	5th engine mounting	M10x1.25	49~59	5~6	54	
	Engine hanger front top mounting	M8x1.25	18~25	1.8~2.5	2.2	
4	Brake					
	Front caliper (front fork fitting use)	M8x1.25	23~25	2.3~2.5	24	BF
	Front stop switch	M4x 0.7	0.8~1.5	0.08~0.15	1.2	Screw
	Front M/C cap	M4x 0.7	1.0~2.0	0.1~0.2	1.5	Screw
	R handle lever pivot (bolt)	M6x1.0	0.5~1.5	0.05~0.15	1	
	R handle lever pivot (nut)	M6x1.0	5~7	0.5~0.7	6	
	Frame M/C holder	M6x1.0	8~10	0.8~1.0	9	BF
	Oil bolt (M cylinder & caliper)	M10x1.25	24~27	2.4~2.7	25.5	BF
	Front caliper bleeder	M10x1.25	12~16	1.2~1.6	14	
	Front caliper secondary pin	M10x1.25	12~16	1.2~1.6	14	Apply adhesive
	Rear caliper bleeder	M8x1.25	7~10	0.7~1.0	8.5	
	Rear M/C reservoir mounting (6x14)	M6x1.0	3~5	0.3~0.5	4	Bolt special
	Rear M/C reservoir cap	-	1.0~2.0	0.1~0.2	1.5	

FRAME TORQUE VALUES

SR. NO.	ITEM	THREAD SIZE & TYPE	TORQUE		PR VALUES N-m	REMARKS
			N-m	kgf-m		
	Rear M/C lock nut	M8x 1.25	6.5~8.5	0.65~0.85	7.5	
	Rear M/C (step holder fitting use)	M6x 1.0	8~12	0.8~1.2	10	BF
	Banjo/oil bolt (on HECU)	M10x1.0	21~24	2.1~2.4	24 Max	-
	Rear brake arm nut	M6x1.0	7.8~12	0.8~1.2	10	BF
	Clamper a RR brake	M6x1.0	8~10	0.8~1.0	9	BF
	2 way clip RR brake	M6x1.0	5~6	0.5~0.6	9	BF
	Clamper FR brake	M6x1.0	8~10	0.8~1.0	9	Socket bolt
	Brake pedal adjust lock nut	M6x1.0	8~10	0.8~1.0	9	
	Reservoir stay MTG bolt 6x10	M6x1.0	8~10	0.8~1.0	-	
	Stay brake line bolt flange 6x12	M6x1.0	8~10	0.8~1.0	-	
	Pressure switch rear brake	M10x1.25	24~27	2.4~2.7	-	
5	Suspension					
	RR cushion upper nut	M14x1.5	45~55	4.5~6.5	50	
	RR cushion under bolt	M12x1.25	49~59	5.0~6.0	55	
6	Swingarm					
	Swingarm pivot nut	M14x1.5	55~65	5.5~6.5	60	
	Chain slider	M6x1	8~12	0.8~1.2	10	
	Adjuster bolt swingarm pivot	M20x1.5	6~8	0.6~0.8	7	
7	Handle bar					
	Handle holder upper bolt	M8x1.25	18~25	1.8~2.5	21	
8	Fuel tank					
	Plate setting	M6x1	10~14	1.0~1.4	12	
	Tank MTG bolt rear	M8x1.25	24~29	2.4~3.0	26.5	
	Purge valve MTG nut	M6x1	8~10	0.8~1.0	9	
	Bolt socket 4x25	M4x0.7	1.5~2.0	0.15~0.2	-	
9	Step					
	Main step assembly	M8x1.25	18~25	1.8~2.5	21	
	L step pillion assembly	M8x1.25	18~25	1.8~2.5	21	
	R step pillion assembly	M8x1.25	18~25	1.8~2.5	21	
10	Gear change pedal					
	Gear change pivot bolt	M6x1	8~12	0.8~1.2	10	
11	Muffler					
	Screw muffler protector	M6x1.0	7~11	0.7~1.1	9.0	
	Bolt special 6x14	M6x1.0	8~12	0.8~1.2	10.0	
	Bolt flange 8x40	M8x1.25	24~29	2.4~3.0	26.5	
	Nut 8 mm EXP	M8x1.25	24~29	2.4~3.0	26.5	
	Bolt flange 8x33	M8x1.25	24~29	2.4~3.0	26.5	
	Bolt flange 8x45	M8x1.25	24~29	2.4~3.0	26.5	

FRAME TORQUE VALUES

SR. NO.	ITEM	THREAD SIZE & TYPE	TORQUE		PR VALUES N-m	REMARKS
			N-m	kgf-m		
12	Air cleaner					
	Screw pan	M5x0.8	1.3~1.7	0.13~0.17	1.5	A/C cover mount
	Grommet bolt flange	M6x1.0	8~12	0.8~1.2	10	A/C mount with frame
	Bolt recessed 5x30	M6x0.8	3.4~5 max	0.35~0.50	-	
13	Side stand					
	Side stand nut	M10x1.25	39~49	4.0~5.0	44	
	Side stand bolt	M10x1.25	29~39	3.0~4.0	34	
14	Cables					
	Clutch cable	M8x1.25	18~25	1.8~2.5	21	
15	Electricals					
	Speedometer mounting nut	M5x0.8	3.4~5 max	0.35~0.50	-	
	Ignition coil	M6x1.0	7.8~11.8	0.79~1.2	-	
	Horn	M6x1.0	7.6~11	0.7~1.1	9	
	Switch side stand	M6x1.0	8~12	0.8~1.2	-	
	SM: Top nut tightening torque to secure wiring harness LA terminal @ SM positive terminal	M6 Nut	3.5~4	-	-	
	USB screw pan 4x16	M4x0.7	1	0.1	-	
	Winker nut flange 10 mm	M10x1.25	10~12	1~1.2	-	
	Headlamp top mounting bolt	M6x1.0	8~12	0.8~1.2	-	
	Headlamp lower mounting bolt	M4x0.7	2~3	0.2~0.3	-	
	Front turn signal nut hex cap 6 mm	M6x1	8~10	0.8~1.0	-	
	Tail/stop lamp nut flange 6 mm	M6x1	8~12	0.8~1.2	-	
	Oxygen sensor heated	M12x1.25	15~20	1.5~2	-	
16	Body					
	Eye brow	M6x1	8~12	0.8~1.2	10	
	Back cover meter	M6x1	8~12	0.8~1.2	10	
	Wire cover rear fender	M6x1	8~12	0.8~1.2	10	
	Cover under seat	M6x1	8~12	0.8~1.2	10	
	Stay seat rear	M6x1	8~12	0.8~1.2	10	
	Seat stay bolt SP flange	M6x1	8~12	0.8~1.2	10	
	Mirror bolt adaptor 10 mm	M10x1.25	30~40	3~4		
	Socket bolt 8x85	M8x1.25	16~20	1.6~2	18	
	Socket bolt 8x45	M8x1.25	16~20	1.6~2	18	
	Screw pan 6x10	M6x1	7~11	0.7~1.1	9	

FRAME TORQUE VALUES

SR. NO.	ITEM	THREAD SIZE & TYPE	TORQUE		PR VALUES N-m	REMARKS
			N-m	kgf-m		
17	Other					
	Leg guard	M8x1.25	18~25	1.8~2.5	21	
	Saree guard	M10x1.25	49~59	05~06	54	
	Battery box	M6x1	08~12	0.8~1.2	10	
	Bash plate	M8x1.25	18~25	1.8~2.5	21	
	Guard step pillion	M5x0.8	4.4~6	0.45~0.6	-	
	Upper chain case	M6x1	08~12	0.8~1.2	10	
	Pannier rack	M10x1.25	49~59	5~8	54	
	Women step	M8x1.25	18~25	1.8~2.5	21	
	Headlamp bracket top	M6x1	08~12	0.8~1.2	10	
	Headlamp bracket bottom	M6x1	08~12	0.8~1.2	10	
	Oil cooler bolt (Oil cooler side)	M6x1.0	7~11	0.7~1.1	9	
	Oil cooler bolt (Engine side)	M6x1.0	10~15	1.0~1.5	13	
18	Main stand					
	Nut flange 6 mm	M6x1.0	8~12	0.8~1.2	-	

GENERAL TORQUE VALUES

STANDARD

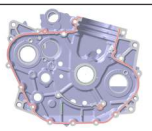
FASTENER TYPE	TORQUE (N-m)	TORQUE (kgf-m)
5 mm bolt and nut	4.4~6.0	0.45~0.6
6 mm bolt and nut (include SH flange bolt)	8~12	0.8~1.2
8 mm bolt and nut	18~25	1.8~2.5
10 mm bolt and nut	29~39	3.0~4.0
12 mm bolt and nut	49~59	5.0~6.0
5 mm screw	3.4~5	0.35~0.5
6 mm screw	7~11	0.7~1.1
6 mm flange bolt (include NSHF) and nut	9.8~14	1.0~1.4
8 mm flange bolt and nut	24~29	2.4~3.0
8 mm flange bolt and nut	34~44	3.5~4.5

NOTE

- Torque specifications listed above and on the following pages are for important fasteners.
- Others should be tightened to standard torque values listed above.

LUBRICATION & SEAL POINTS

ENGINE

BLOCK NAME OR PARTS NAME	APPLIED AREA	MATERIAL	METHOD AND AMOUNT	PURPOSE	REMARKS
Left crankcase	Mating surface	Three-bond #1215 or # 1207G	Spreading	2	
Needle bearing (left & right crankcase)	Whole surface	Engine oil	Pouring from oiler	1	
Ball bearings (left & right crankcase)	Sliding surface	Engine oil	Pouring from oiler	1	
Bush (left & right crankcase)	Sliding surface	Engine oil	Pouring from oiler	1	
ACG grommet	Sealing surface	Three-bond # 1215 or 1207G	Spreading	2	
Piston cooling jet bolt (left & right crankcase)	Threaded portion	Engine oil	Oil bath or spreading	4	
Oil pressure switch assembly (crankcase right cover)	Threaded portion	Engine oil	Spreading	5	
Cylinder	Inner surface of cylinder sleeve	Engine oil	Spreading or dripping	1	
M10 special bolt (cylinder head mounting)	Threaded portion oil	Engine oil	Oil bath or spreading	4	
Crankshaft component	Journal bearing of connecting rod big end.	Engine oil	Spreading or dripping	1	
	Inner surface of connecting rod small end.	Engine oil	Spreading or dripping	1	
Piston	Pin hole, ring groove & sliding area.	Engine oil	Oil bath or spreading	1	
Piston pin	Outer surface	Engine oil	Oil bath or spreading	1	
Piston ring	Whole surface	Engine oil	Oil bath or spreading	1	
ACG & crankshaft	Tapered surface	Engine oil	Degreasing	5	
M14 & M16 flange nut (flywheel & GPD)	Threaded portion	Engine oil	Oil bath or spreading	4	
Valve IN/EX	Outer surface of stem, stem end	Engine oil	Spreading or dripping	1	
Camshaft component	Whole camshaft surface	Engine oil	Spreading or dripping	1	
Camshaft chain	Whole surface	Engine oil	Oil bath or spreading	1	
Rocker arm shaft	Whole surface	Engine oil	Oil bath or spreading	1	
Rocker arm IN/EX	Pivot point & contact surface	Engine oil	Spreading or dripping	1	

LUBRICATION & SEAL POINTS

ENGINE

BLOCK NAME OR PARTS NAME	APPLIED AREA	MATERIAL	METHOD AND AMOUNT	PUR-POSE	REMARKS
Oil pump assembly	Rotor & shaft	Engine oil	Pouring from oiler	1	
Oil pump idler gear shaft	Whole surface	Engine oil	Spreading	1	
Clutch outer guide	Ø28 outer surface	Engine oil	Oil bath or spreading	1	
Clutch disc	Whole surface	Engine oil	Oil bath	1	
Clutch outer component	Sliding surface	Engine oil	Spreading	1	
Needle bearing	Whole surface	Engine oil	Oil bath	1	
Clutch lever component	Rotating area			5	
M-16 flange nut (clutch center)	Threaded portion	Engine oil	Oil bath or spreading	4	
Ball bearing	Sliding surface	Engine oil	Pouring from oiler	1	
M-2, 3, 4, 5, 6 gear	Inner surface	Engine oil	Spreading	1	
M-5, 6 gear inner bush	Whole surface	Engine oil	Oil bath or spreading	1	
C-1, 2, 3, 4, 5, 6 gear	Inner surface	Engine oil	Spreading	1	
C-1, 2 gear inner bush	Whole surface	Engine Oil	Oil bath or spreading	1	
M-3, M-4 & C-5, C-6 gear	Shift fork groove surface	Engine Oil	Spreading	1	
Shift fork shaft	Whole surface	Engine Oil	Oil bath or spreading	1	
Shift drum journal	Outer surface sliding area	Engine Oil	Oil bath or spreading	1	
Change spindle journal	Outer surface sliding area	Engine Oil	Spreading or dripping	1	
Camshaft gear stopper	Threaded portion		Precoating	3	
Shift drum stopper	Threaded portion		Precoating	3	
Starter driven gear	Inner surface	Engine Oil	Spreading	1	
Needle bearing	Whole surface	Engine Oil	Oil bath	1	
Starter clutch	Rolling surface	Engine Oil	Oil bath or spreading	1	
Starter reduction gear shaft 1& 2	Whole surface	Engine Oil	Spreading	1	
Starter reduction gear 1& 2	Whole surface	Engine Oil	Spreading	1	
Bolt flange SH 8X95, 8X50 & 8X65mm (for crankcase sealing)	Threaded portion	Engine Oil	Oil bath or spreading	4	
Screw flat head 6X12 (for PLT bearing hold)	Threaded portion	Loctite 243	Spreading	3	

LUBRICATION & SEAL POINTS

ENGINE

BLOCK NAME OR PARTS NAME	APPLIED AREA	MATERIAL	METHOD AND AMOUNT	PUR-POSE	REMARKS
Bolt flange 5X14 (for breather plate)	Threaded portion	Engine oil	Spreading	3	
Bolt flange SH 6X30 (for oil pump)	Threaded portion	Engine oil	Spreading	4	
Bolt flange SH 6X12 (for clamper ACG cord)	Threaded portion	Loctite 243	Spreading	3	
Screw flat 6X16 (for tensioner camchain)	Threaded portion	Engine oil	Spreading	4	
Bolt socket 6X20 (for ACG roter with oneway clutch HSG.)	Threaded portion		Precoating	3	
Bolt socket 6X40 (for ACG coil)	Threaded portion	Loctite 243	Spreading	3	
Bolt flange 6X25 (for camshaft gear shift)	Threaded portion	Loctite 243	Spreading	3	
Pivot shift drum stopper	Threaded portion	Loctite 243	Spreading	3	
Engine oil (for plant)	Inside of crankcase	MC 4-stroke gasoline engine oil	2700cc (First fill) 2250cc (Upper level) 1700cc (Lower level)	1	SAE 15W/50
Engine oil (for service only)	Inside of crankcase	MC 4-stroke gasoline engine oil	2250cc (Upper level) 1700cc (Lower level) 550cc (Exchange)	1	SAE 15W/50 (Fully synthetic)

NOTE

1. Engine oil for spreading shall be 4 stroke vehicle gasoline engine oil which does not contain molybdenite.
2. Molybdenum disulfide paste content in Molybdenum disulfide oil shall be 50% in volume percent.

PURPOSE

1. Lubrication
2. Seal
3. Lock (Sealant)
4. Apply for torque stabilizing
5. Others

LUBRICATION & SEAL POINTS

FRAME

SR. NO.	BLOCK NAME OF PARTS NAME	APPLIED AREA	MATERIAL	METHOD OF AMOUNT	PUR-POSE	REMARKS
1	Steering					
	Steering cone race	Rolling contact surface	Shell alvania EP2 or excelite EP2 (kyodo yushi co.ltd.) or equivalent	Filling 3~5 gm	1	
	Steering ball race					
	Steering dust seal	Lip surface		Spreading	1	
2	Suspension					
	Front fork	Inside	Oil type : KLH15	Inject	5	
	Front fork oil seal	Lip surface	(Berutox centroplex GLP-100-000BH)	Spreading	1	
	Swingarm bearing needle	Inside	JIS K2220 heavy load grease, grade-1, No. 2	Filling	1	
	Swingarm pivot dust seal	Inside	JIS K2220 heavy load grease, grade-1, No. 2	Spreading	1	
	Swingarm pivot nut	Threaded portion	JIS K2220 heavy load grease, grade-1, No. 2	Spreading	4	
3	Brake					
	Front brake caliper primary pin	Inside insulator & Sliding portion	Brake grease special	Spreading 0.5 gm min	1	No grease on lining surface allowed
		Threaded portion	Apply adhesive	Spreading	3	
	Front brake caliper secondary pin	Inside insulator	Brake grease special	Spreading 0.5 gm min	1	
	Front brake lever pivot	Sliding portion	Brake grease special	Spreading 0.1 gm min	1	
	Front brake master cylinder	Inside of master cylinder cup	DoT 4	Inject to upper level	5	To up level after complete air bleeding
	Front brake master cylinder push rod	Both resting end	Brake grease special	Spreading 0.1 gm min	1	
	Rear brake caliper primary pin	Inside insulator & Sliding portion	Brake grease special	Spreading 0.5 gm max	1	No grease on lining surface allowed
		Threaded portion	Apply adhesive	Spreading	3	
	Rear brake caliper secondary pin	Inside insulator	Brake grease special	Spreading 0.5 gm max	1	
	Rear brake master cylinder push rod comp	Sliding area	Brake grease special	Spreading 0.1 gm each	1	
	Rear brake master cylinder	Inside of master cylinder cup	DoT 4	Inject to upper level	5	To up level after complete air bleeding
	Rear brake pedal	Sliding portion	1205769 servo grease MP-3	Spreading		

LUBRICATION & SEAL POINTS

FRAME

SR. NO.	BLOCK NAME OF PARTS NAME	APPLIED AREA	MATERIAL	METHOD OF AMOUNT	PUR-POSE	REMARKS
4	Wheel					
	Front and rear tyre	Bead seat area	Vegetable soap solution	Spreading	5	
	FR/RR wheel oil seal	Lip surface	Class 2, grade B as per HMCS-D-0063	Spreading	1	
	Driven flange dust seal	Lip surface		Spreading	1	
5	Control cable					
	Throttle cable	Inside of boot	Silicon grease (TSG3251) or equivalent	Filling	2	
		Inside of casing	TSG 3203 or molybdenum ally oil M-A0 or equivalent	Filling	1	
	Clutch cable	Inside of boot	Silicon grease (TSG3251) or equivalent	Filling	1	
		Inside of casing	TSG 3203 or molybdenum ally oil M-A0 or equivalent	Filling	1	
6	Handle					
	Grip L handle	Matching surface	# 540 (cemedine) or equivalent	Spreading	3	
	Grip component Throttle	Contact area of throttle cable eng	JIS K2220 general purpose grease, grade-1, No. 2	Spreading	1	
	Clutch lever pivot bolt	Sliding portion	Class 3 grade B, as per HMCS-D-0063	Spreading	1	
7	Change					
	Change pedal pivot	Sliding portion	HES D 2012-2-1-2	Spreading	1	
	Tie rod	Sliding portion	HES D 2012-2-1-2	Spreading	1	
8	Air cleaner					
	Air cleaner case, Connecting tube duct	Case connecting area	#540 (cemedine) or equivalent	Spreading	2	Adhesive shall not over flow to clean side
9	Speed sensor assy					
	Dust seal	Lip	Shell alvania grease	Spreading	1	
	Magnet	Inner dia	Shell alvania grease	Spreading	1	

LUBRICATION & SEAL POINTS

FRAME

SR. NO.	BLOCK NAME OF PARTS NAME	APPLIED AREA	MATERIAL	METHOD OF AMOUNT	PUR-POSE	REMARKS
10	Others					
	Side stand pivot	Sliding portion	JIS K2220 general purpose grease, grade-1, No. 2	Spreading	1	
	Main stand pivot	Sliding portion		Spreading	1	
	Main step	Sliding portion		Spreading	1	
	Pillion step	Sliding portion		Spreading	1	
	Pillion step (SPG)	Sliding portion		Filling	1	
	Footrest pin	Sliding portion		Filling	1	
	Change pedal pivot	Sliding portion		Filling	1	
	Change pedal tie rod	Sliding portion		Filling	1	
	Brkt elctrical part MTG grommet	Sliding portion	Silicon grease (TSG 3251) or equivalent	Spreading	1	
	Gear shift pedal	Sliding portion	JIS K2220 general purpose grease, grade-1, No. 2	Spreading	1	
	Comb. and Lock switch bolt	Threaded portion	Threebond TB-1342N or loctite 262 or equivalent	Spreading	1	

PURPOSE

1. **Lubrication**
2. **Seal**
3. **Lock**
4. **Apply for torque stabilizing**
5. **Others**

SPECIAL TOOLS

COMMON TOOLS

SL. NO.	DESCRIPTION	APPLICATION	PART NUMBER
1	GPD holder	To provide gear locking between GPD and clutch outer.	070HH198017
2	Piston slide base	To secure piston while assembling cylinder.	HMCL0423ACRD03
3	Valve spring compressor	To compress the valve spring and remove the cotters and valve.	070HH198005
4	Pilot driver, 17mm	To seat in the inner race and drive out/in the bearing.	070HH198033
5	Pierer's plier	To remove snap ring from master cylinder and driven face bearing.	070HHKFN003
6	Crankcase bearing remover shaft	To remove bearing from crankcase.	070HHKFN006
7	Crankcase bearing remover weight	To remove bearing from crankcase.	070HHKFN007
8	Handle bearing driver	To hold pilot and driver outer to remove/insert bearing.	070HHKFN008
9	Driver outer, 42x47	To seat on outer race surface and drive out/in the bearing.	070HHKFN011
10	Pilot driver, 15 mm	To seat in the inner race and drive out/in the bearing.	070HHKFN013
11	Pilot driver, 21mm	To seat in the inner race and drive out/in the bearing.	070HHKFN014
12	Driver, 24x27 mm	To seat on outer race surface and drive out/in the bearing.	070HHKFN021
13	Flywheel puller holder	To hold the flywheel puller.	070HHKRYH002
14	Magnet holder (Clamp type)	To hold magnet while removing the lock nut.	070HHKRYH004
15	Tester (MF-battery)	To test the condition of a MF-battery.	HMCLCBT062101S
16	T-stem cone puller	To remove T-stem bottom cone.	070HHKST001
17	Bottom cone race driver	To install T-stem bottom cone.	070HHKST002
18	Upper and bottom cone installer	To install upper and bottom cone race to steering head pipe.	070HHKST003
19	Steering bearing adjusting nut	To adjust the steering bearings. socket, 41mm	070HHKST004
20	Driver outer, 32x35	To remove/install wheel bearing.	070HHKFN010
21	Flywheel puller	To remove the flywheel from crankshaft.	070HHKTC004
22	Collet, 17 mm	To remove bearing from crankcase.	070HHKTN002
23	Bottom cone race driver	To remove top and bottom cone races from the steering head pipe.	070HHKTN005

SL. NO.	DESCRIPTION	APPLICATION	PART NUMBER
24	Pilot driver, 20mm	To seat in the inner race and drive out/in the bearing.	070HHKTN006
25	Fuel pressure gauge	To check the fuel pressure in fuel delivery system.	070HHKTRF003
26	Multimeter probe	To check the wiring in Programmed-FI connectors.	070HHKTRF004
27	Fuel pressure gauge adaptor	To check the fuel pressure in fuel delivery system.	070HHKTRF005
28	Wheel bearing remover shaft	To remove the wheel bearing.	070HHKZJ009
29	Collet, 20 mm	To remove bearing from crankcase.	070HHKZN003
30	Oxygen sensor socket	To remove/install the oxygen sensor socket.	HMCL0519ABW01
31	Hero vehicle communication interface	To diagnose the FI system.	HMCL0419HVCI01
32	OBD 2 cable	To connect the DLC connector with HVCI OBD cable.	HMCL0522HVCI05
33	Wheel bearing remover head, 15mm	To remove wheel bearing from wheel hub.	070HHKVN001
34	Brake pad hanger pin remover	To remove brake pad hanger pin from caliper assembly.	070HH198036
35	Front fork dismantling shaft	To hold fork tube seat while opening the bottom allen key bolt.	HMCL0418AABM002
36	Pilot driver, 25 mm	To seat in the inner race and drive out/in the bearing.	HMCL0423ACRD01
37	Collet, 22 mm	To remove bearing from crankcase.	HMCL0623RAAA01
38	Driver, 50x55 mm	To remove/install bearing.	HMCL0623RAAA02
39	Clutch center holder	To hold the centre clutch while removing the lock nut.	HMCL0623RAAA03
40	Valve spring compressor adaptor-28	To compress the valve spring and remove the cotters and valve	HMCL0623RAAA04
41	Valve Guide Remover	To remove valve guide from cylinder head	HMCL0623RAAA05
42	Start driven gear bearing remover, 26x34	To seat in the outer race surface and drive out the starter driven gear bearing.	HMCL0623RAAA06
43	Swingarm bearing remover/installer	To remove/install the swingarm bearing.	HMCL0623RAAA09
44	Muffler plug	To restrict water entry during washing.	HMCL0623RAAA10
45	Swingarm pivot adjuster bolt	To adjust the swingarm pivot	HMCL0623RAAA11
46	Timing chain sprocket remover	To remove the timing sprocket from the crankshaft.	HMCL0623RAAA12
47	Timing Chain Sprocket Installer	To install the timing sprocket on the crankshaft.	HMCL0623RAAA13
48	Gear shift shaft bearing driver, 19x21 mm	To seat on outer race surface and drive in/out the gear shift shaft bearing.	HMCL0423ACAA08
49	Pilot driver, 14 mm	To seat in the inner race and drive out/in the bearing.	HMCL0423ACAA05
50	Balancer drive gear puller	To remove the crankshaft balancer drive gear.	HMCL0423ACAA02
51	Oil pressure gauge	To check the engine oil pressure	HMCL0423ACAA09

SL. NO.	DESCRIPTION	APPLICATION	PART NUMBER
52	Gear Shift Drum Bearing - Driver	To seat on outer race surface and drive in the gear shift drum bearing.	HMCL0423ACAA06
53	Driver, 40x46 mm	To seat on outer race surface and drive out/in the bearing.	070HH198031
54	Wheel bearing remover head, 17mm	To remove wheel bearing from wheel hub.	070HHKZJ008
55	Front fork oil seal installer (43mm)	To drive in new oil seal & anti friction bush.	HMCL0623RAAA07
56	Front fork oil seal inserter (43mm)	To install in new oil seal.	HMCL0623RAAA08
57	Front fork wrench (22 mm)	-	HMCL0423ACRD07
58	Front fork spring compressor	-	HMCL0423ACRD08
59	Front fork spring lock	-	HMCL0423ACRD09
60	Front fork cartridge removal tool	-	HMCL0423ACRD11
61	Front fork piston rod extension	-	HMCL0423ACRD12

EMISSION CONTROL SYSTEM

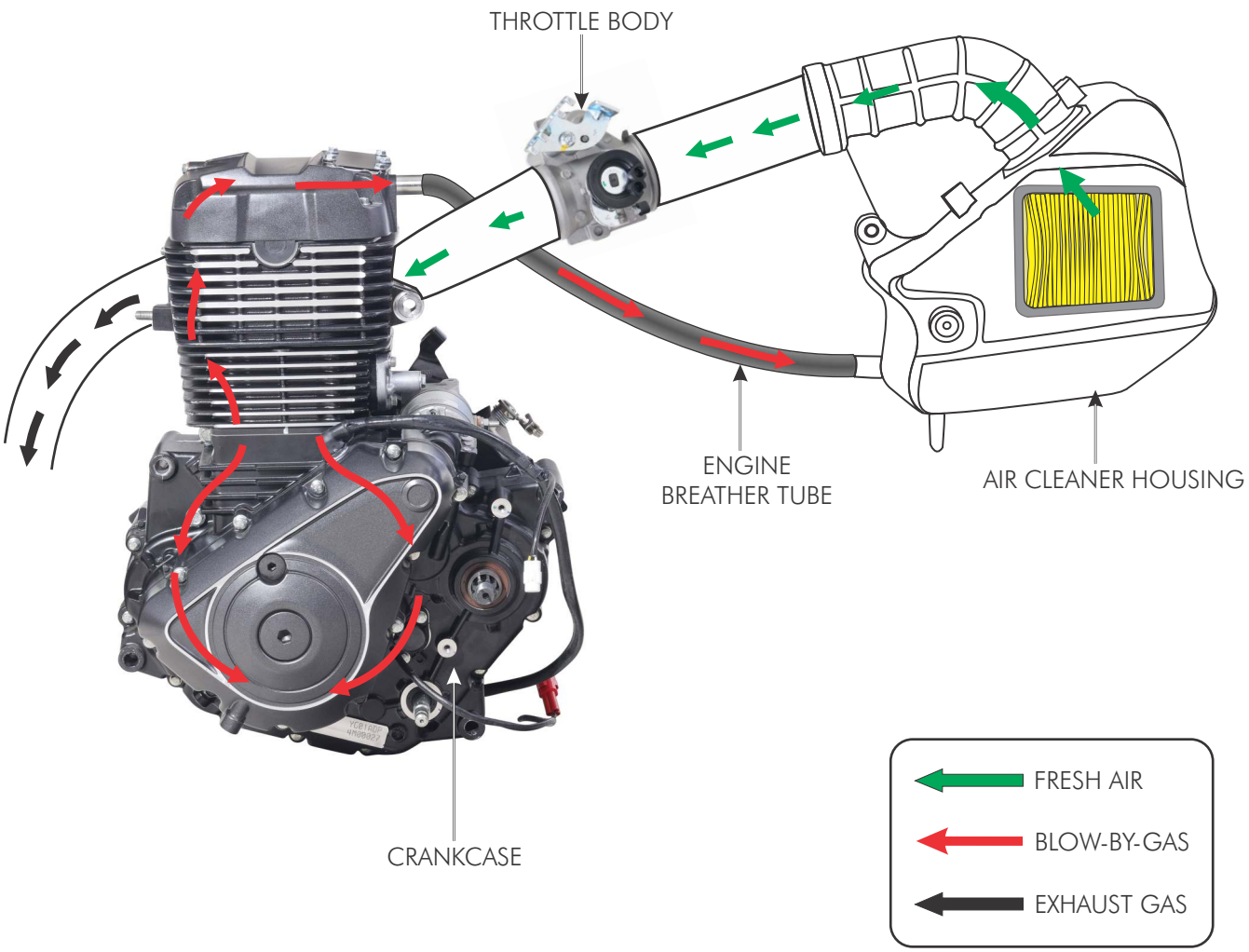
SOURCE OF EMISSIONS

The combustion process produces carbon monoxide (CO), oxides of nitrogen (NOx) and hydrocarbons (HC). Control of carbon monoxide, oxides of nitrogen and hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but is toxic.

Hero MotoCorp Ltd. utilizes appropriate systems, to reduce carbon monoxide and hydrocarbons.

CRANKCASE EMISSION CONTROL SYSTEM

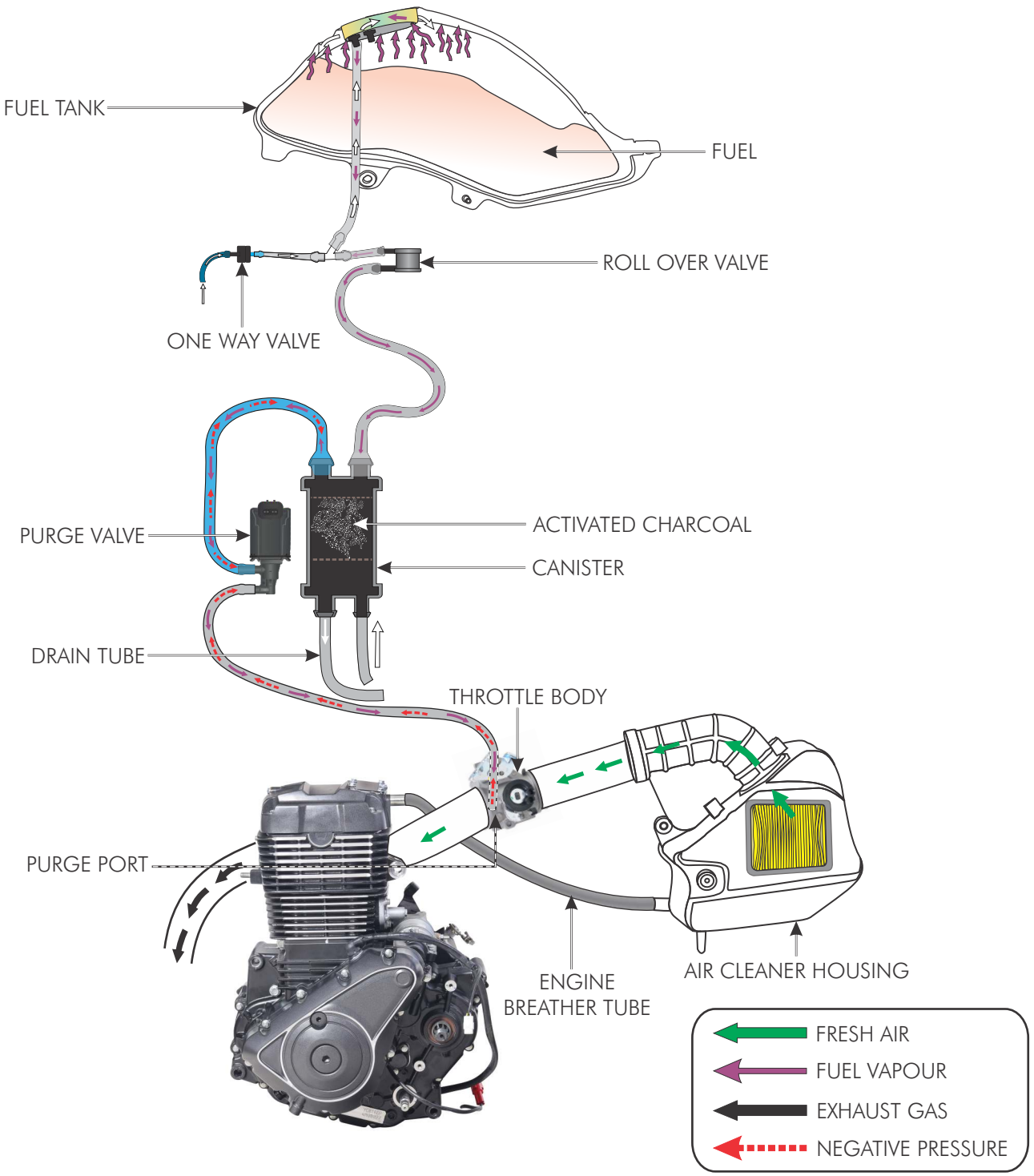
The engine is equipped with a closed crankcase system to prevent discharging crankcase emission into the atmosphere. Blow-by gas is returned to the combustion chamber through the air cleaner and throttle body.



Note: *Images may depict a different model/variant, but procedures and information remain same.*

EVAPORATIVE EMISSION CONTROL SYSTEM

This motorcycle is equipped with an evaporative emission control system to meet emission standards. During warm weather, the petrol vapours which contain HC evaporates easily into the atmosphere from the fuel tank, if the fuel system is unsealed or open. The evaporative emission control system is used to prevent petrol vapours from escaping into the atmosphere from fuel tank. Fuel vapor from the fuel tank is routed into the evaporative emission (EVAP) canister where it is adsorbed and stored while the engine is stopped. When the engine is running and the evaporative emission (EVAP) purge control valve is open, fuel vapor in the EVAP canister is drawn into the engine through the throttle body for re-burning to avoid pollution caused by the fuel vapour diffused into the air.



Note: *Images may depict a different model/variant, but procedures and information remain same.*

NOTE

SOME IMAGES IN THIS MANUAL MAY COME FROM DIFFERENT MODEL/VARIANT THAN THE ONE COVERED BY THIS MANUAL. NEVERTHELESS, THE IMAGES REMAIN ACCURATE AND APPLICABLE FOR THE SPECIFIC TASK OR INFORMATION PRESENT IN THE ACCOMPANYING TEXT. WHILE CERTAIN COMPONENTS IN THE IMAGES MAY APPEAR DIFFERENT, THEY DON'T AFFECT THE STEPS, TOOLS, OR SAFETY PRECAUTIONS FOR THE TASKS DESCRIBED.

COMPONENT LOCATION

BODY PANELS/EXHAUST SYSTEM

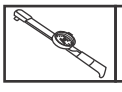
SERVICE INFORMATION

⚠ WARNING

Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.

GENERAL

- This section covers removal and installation of the body panels and exhaust system. The body panels installation is in the reverse order of removal, unless noted other wise.
- Always replace the exhaust pipe gaskets with new ones after loosening or removing the exhaust pipe joint nuts.
- When installing the exhaust system, loosely install all the exhaust pipe fasteners. Always tighten the exhaust mounting nuts from the cylinder head side first, then tighten the other mounting fasteners. If you tighten the mounting bolt and nut first, the exhaust pipe may not seat properly.
- Always inspect the exhaust system for leak after installation.



TORQUE VALUES

FUEL TANK REAR MOUNTING BOLT	: 2.6 kgf-m
RIGHT PILLION STEP MOUNTING BOLT	: 2.1 kgf-m
LEFT PILLION STEP MOUNTING BOLT	: 2.1 kgf-m
EXHAUST PIPE MOUNTING BOLT	: 2.6 kgf-m
EXHAUST MUFFLER MOUNTING BOLT	: 2.6 kgf-m
EXHAUST MUFFLER PINCH BOLT	: 2.6 kgf-m
EXHAUST MUFFLER JOINT NUT	: 2.6 kgf-m
EXHAUST MUFFLER PROTECTOR SCREW	: 0.9 kgf-m
UPPER CHAIN CASE MOUNTING BOLT	: 1.0 kgf-m
AIR CLEANER GROMMET BOLT	: 1.0 kgf-m
SAREE GUARD SOCKET BOLT	: 5.4 kgf-m
WOMEN STEP MOUNTING BOLT	: 2.1 kgf-m
SECONDARY O_2 SENSOR COVER BOLT	: 1.0 kgf-m

For other nuts, bolts, fasteners etc. refer to standard torque values **(SECTION-1)**.

TROUBLESHOOTING

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

REAR VIEW MIRROR

REMOVAL

Slide the lock nut boot.

Loosen the bolt and remove the left side rear view mirror.
Follow the same procedure for the right side rear view mirror.

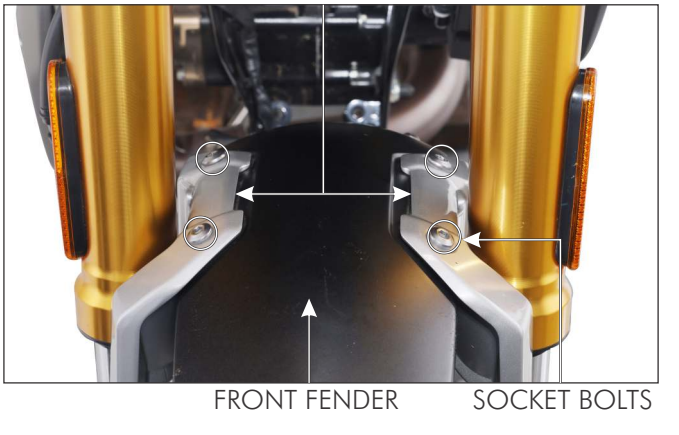
INSTALLATION

Installation is in the reverse order of removal.

FRONT FENDER

REMOVAL

Remove the front fender upper mounting socket bolts (Nos.: 4, Size: 5 mm) from the right and left front fender brackets.



Remove the front fender by sliding it towards front.

FRONT FENDER

DISASSEMBLY

Remove the front fender-B by removing the allen key bolts/nuts (Nos.: 3, Size: 5 mm).

ASSEMBLY

Assembly is in the reverse order of removal.

INSTALLATION

Installation is in the reverse order of removal.

ALLEN KEY BOLTS/NUTS

FRONT FENDER-B

FRONT FENDER BRACKETS

REMOVAL

Remove the front fender (page 2-3).

Remove the right front fender bracket by removing its allen key bolts (Nos.: 2, Size: 5 mm).

Remove the left front fender bracket by removing its allen key bolts (Nos.: 2, Size: 5 mm).

Remove the front fender left and right sides stay.

INSTALLATION

Installation is in the reverse order of removal.

RIGHT FRONT FENDER BRACKET

LEFT FRONT FENDER BRACKET

ALLEN KEY BOLTS

ALLEN KEY BOLTS

SEAT

REMOVAL

Insert the ignition key into the seat lock and turn is clockwise to unlock the seat.

Remove the seat while releasing the tabs from the hooks.

INSTALLATION

To install the seat, align the tabs with the hooks and press the seat from the rear side until the seat gets locked.

Note: *Images may depict a different model/variant, but procedures and information remain same.*

BATTERY COVER

REMOVAL

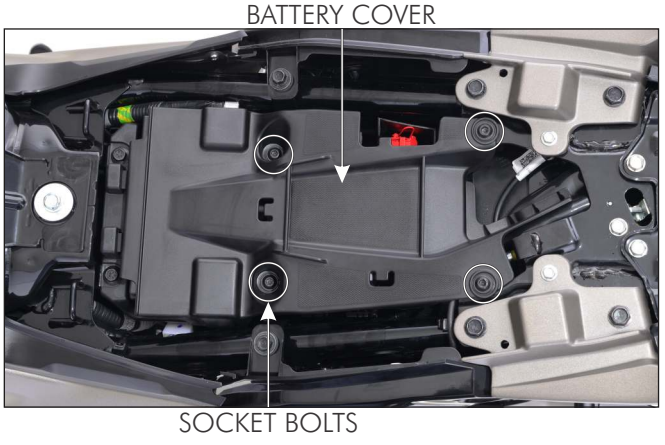
Remove the seat (page 2-5).

Remove the battery cover socket bolts (Nos.: 4, Size: 6 mm).

Remove the battery cover.

INSTALLATION

Installation is in reverse order of removal.



TANK COVERS

RIGHT SIDE

REMOVAL

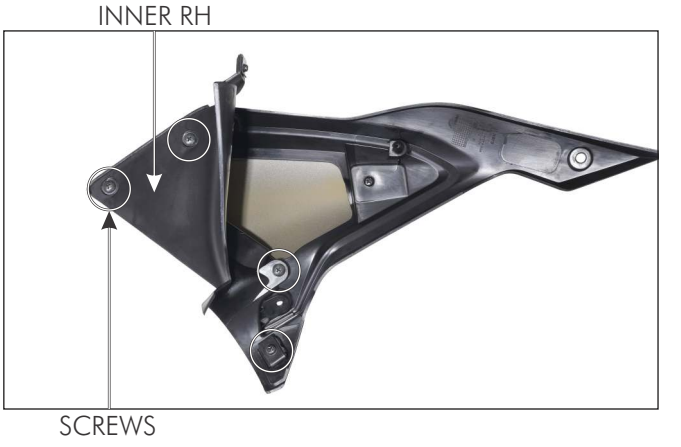
Remove the right side tank cover special bolts (Nos.: 3, Size: 5 mm) and screw (No.: 1) as shown.

Remove the right side tank cover by dislodging the lug from the fuel tank grommet.

Note: *Images may depict a different model/variant, but procedures and information remain same.*

DISASSEMBLY

Remove the inner RH tank cover screws (Nos.: 4).



Remove the inner RH tank cover by dislodge the lug from the grommet.

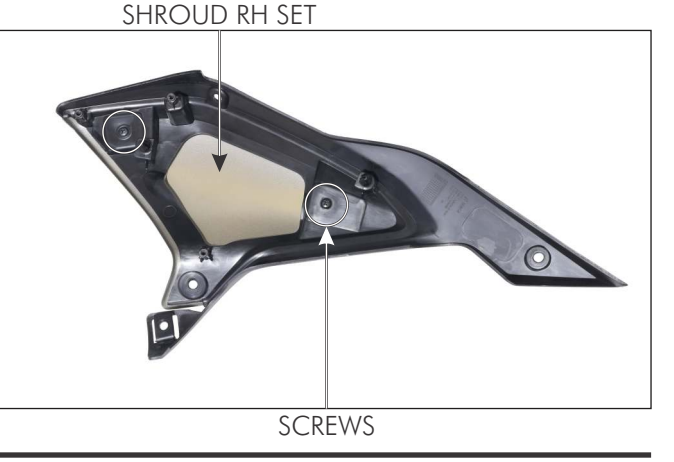
Remove the shroud RH set by removing the (Nos.: 2).

ASSEMBLY

Assembly is in the reverse order of removal parts.

NOTE

While assembly align the lug to the grommet.



INSTALLATION

Install the right side tank cover by aligning the lug from the fuel tank grommet.

Install and tighten the right side tank cover special bolts (Nos.: 3, Size: 5 mm) and screw (No.: 1).

LEFT SIDE

REMOVAL

Remove the left side tank cover special bolts (Nos.: 3, Size: 5 mm) and screw (No.: 1) as shown.

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Remove the left side tank cover by dislodging the lug from the fuel tank grommet.

DISASSEMBLY

Remove the inner LH tank cover screws (Nos.: 3).

Remove the inner RH tank cover by dislodge the lug from the grommet.

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Remove the shroud LH set by removing the (Nos.: 2).

ASSEMBLY

Assembly is in the reverse order of removal parts.

NOTE

While assembly align the lug to the grommet.

INSTALLATION

Install the left side tank cover by aligning the lug from the fuel tank grommet.

Install and tighten the left side tank cover special bolts (Nos.: 3, Size: 5 mm) and screw (No.: 1).

Note: *Images may depict a different model/variant, but procedures and information remain same.*

FRONT SUB ASSEMBLY REMOVAL

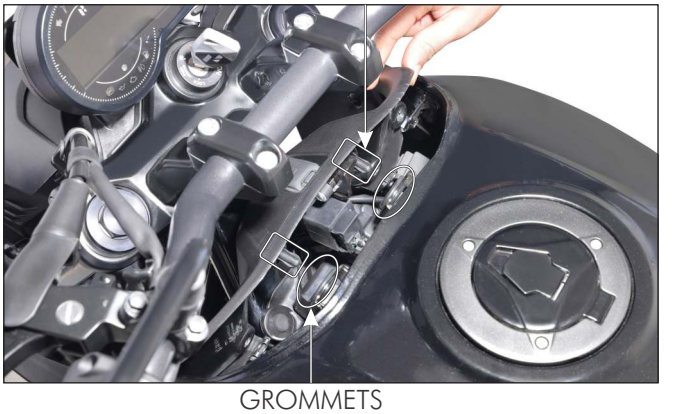
Remove the tank cover front sub assembly screws (Nos.: 4) as shown.

FRONT SUB ASSEMBLY

SCREWS

Dislodge the lugs (Nos.: 2) from the fuel tank grommets

LUGS



GROMMETS

Disconnect the USB charger connector.

USB CONNECTOR

Note: *Images may depict a different model/variant, but procedures and information remain same.*

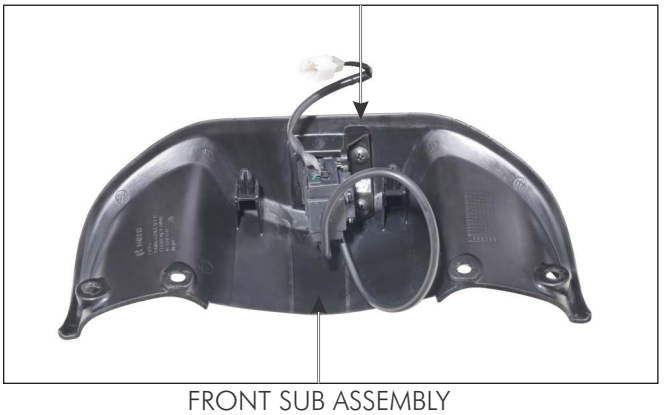
Remove the tank cover front sub assembly with USB charger with controller.

Dismount the USB charger controller (page 20-24).

Remove the USB charger (page 20-25).

Assembly is in the reverse order of removal parts.

USB CHARGER WITH STAY



FRONT SUB ASSEMBLY

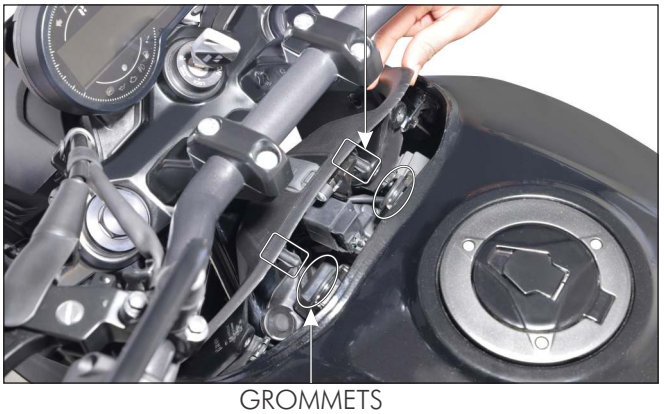
INSTALLATION

Installation is in the reverse order of removal.

NOTE

While installation align the lugs into the grommets.

LUGS



GROMMETS

FUEL TANK

REMOVAL

Keep the vehicle idle to cool the engine for 10-20 minutes.

Remove the seat (page 2-5).

Remove the tank covers (page 2-6).

Remove the fuel tank mounting bolt, washer and collar.

MOUNTING BOLT/WASHER/COLLAR

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Remove the fuel feed hose from the fuel pump (page 5-64).
Lift the fuel tank from the rear side, disconnect the fuel pump 5P connector.

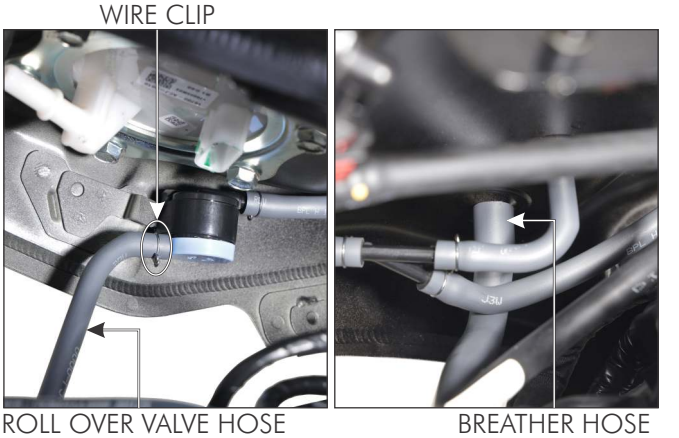
NOTE

- To avoid fuel spillage on engine, beaker can be used to collect extra fuel present in tube.
- Whenever fuel feed hose is disconnected ensure to plug the hose and cover injector joint to prevent dust entry.
- Take extra care while lifting the fuel tank to avoid any damage to fuel pump hose connection or injector joint.

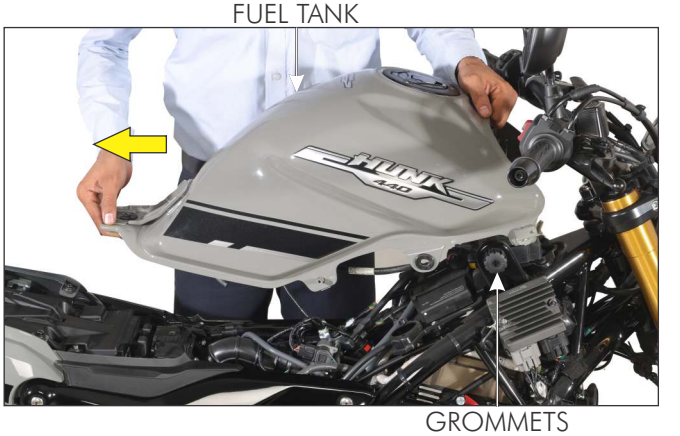
⚠ WARNING

- Keep petrol away from flames or sparks.
- Wipe up spilled petrol at once.

Disconnect the roll over valve hose by removing the wire clip from roll over valve.
Disconnect the fuel tank breather hose from fuel tank.



Remove the fuel tank by lifting and sliding it towards rear while dismounting from the grommets.



Note: *Images may depict a different model/variant, but procedures and information remain same.*

INSTALLATION

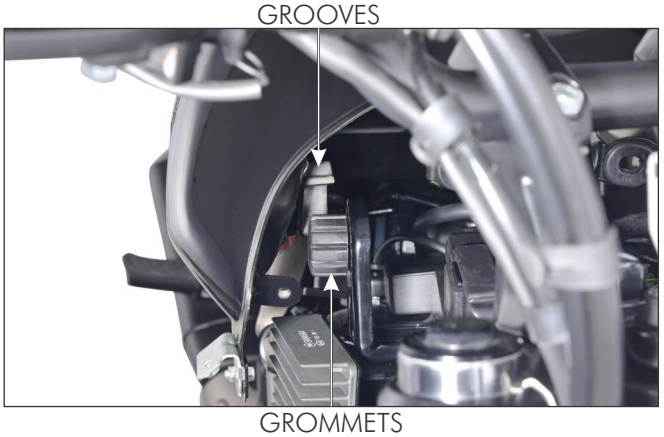
Installation is in the reverse order of removal.

NOTE

- Align the grommets in the frame with the grooves in the fuel tank.
- Route the hoses properly. Ensure the hoses are not pinched or kinked during assembly.

Install and tighten the fuel tank rear mounting bolt to the specified torque.

FUEL TANK REAR MOUNTING BOLT: 2.6 kgf-m



SIDE COVERS

LEFT SIDE COVER

REMOVAL

Remove the special bolts (Nos.: 2, Size: 5 mm) from the left side cover.

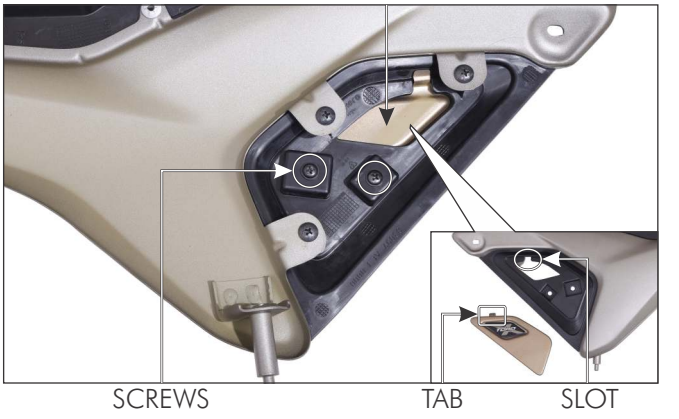
Remove the left side cover while removing the lug from the frame grommet.

Note: *Images may depict a different model/variant, but procedures and information remain same.*

DISASSEMBLY

Remove the left side sub assembly garnish screws (Nos.: 2).

Remove the left side sub assembly garnish by dislodging the tab from the slot.



Remove the left side cover sub assembly by removing its screws (Nos.: 3) as shown.

ASSEMBLY

Assembly is in the reverse order of removal.

NOTE

While installing align the tab to the slot.

INSTALLATION

Install the left side cover while installing align the lug into the grommet.

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Install the special bolts (Nos.: 2, Size: 5 mm) to the left side cover.

SPECIAL BOLTS

LEFT SIDE COVER

RIGHT SIDE COVER

REMOVAL

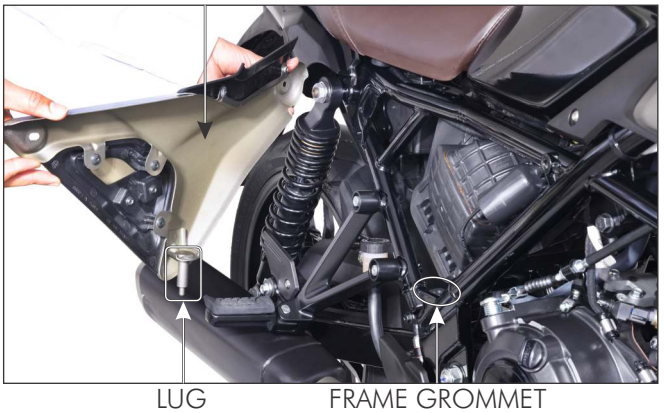
Remove the special bolts (Nos.: 2, Size: 5 mm) from the right side cover.

SPECIAL BOLTS

RIGHT SIDE COVER

Remove the right side cover while removing the lug from the frame grommet.

RIGHT SIDE COVER



LUG FRAME GROMMET

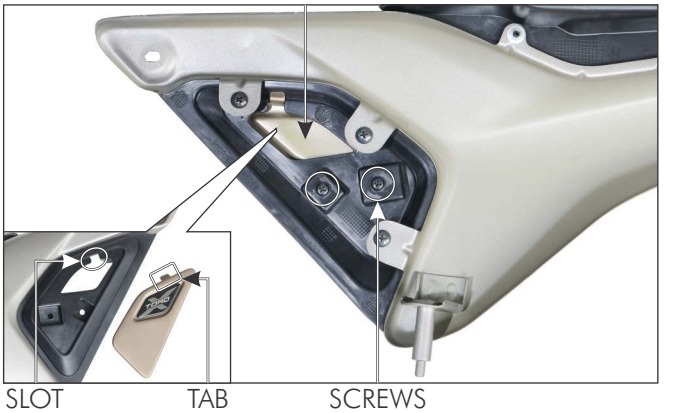
Note: *Images may depict a different model/variant, but procedures and information remain same.*

DISASSEMBLY

Remove the right side sub assembly garnish screws (Nos.: 2).

Remove the right side sub assembly garnish by dislodging the tab from the slot.

RIGHT SIDE SUB ASSEMBLY GARNISH



Remove the right side cover sub assembly by removing its screws (Nos.: 3) as shown.

SCREWS

RIGHT SIDE COVER SUB ASSEMBLY

ASSEMBLY

Assembly is in the reverse order of removal.

NOTE

While installing align the tab to the slot.

INSTALLATION

Install the right side cover while installing align the lug into the frame grommet.

RIGHT SIDE COVER

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Install the special bolts (Nos.: 2, Size: 5 mm) to the right side cover.

RIGHT SIDE COVER

STEP HOLDER

RIGHT SIDE

REMOVAL

Park the vehicle on main stand.

Remove the rear brake reservoir by removing the mounting bolt mounted on the right side step holder (page 16-5).

Remove the right side step holder allen key bolts (Nos.: 2, Size: 6 mm).

Remove the exhaust muffler mounting bolt (No.: 1, Size: 12 mm), nut (No.: 1, Size: 8 mm) collars (Nos.: 2) and rubber (No.: 1).

Remove the right side step holder.

MOUNTING BOLT/NUT/COLLARS/RUBBER

INSTALLATION

Install the right side step holder.

Install the exhaust muffler rubber (No.: 1), collars (Nos.: 2), mounting bolt (No.: 1, Size: 12 mm) and nut (No.: 1, Size: 8 mm).

Install and tighten the right side step holder allen key bolts (Nos.: 2, Size: 6 mm) to the specified torque.

TORQUE

RIGHT SIDE STEP HOLDER

MOUNTING BOLT: 2.1 kgf-m

EXHAUST MUFFLER MOUNTING BOLT: 2.6 kgf-m

Install the rear brake reservoir by installing the mounting bolt mounted on the right side step holder (page 16-5).

MOUNTING BOLT/NUT/COLLARS/RUBBER

Note: *Images may depict a different model/variant, but procedures and information remain same.*

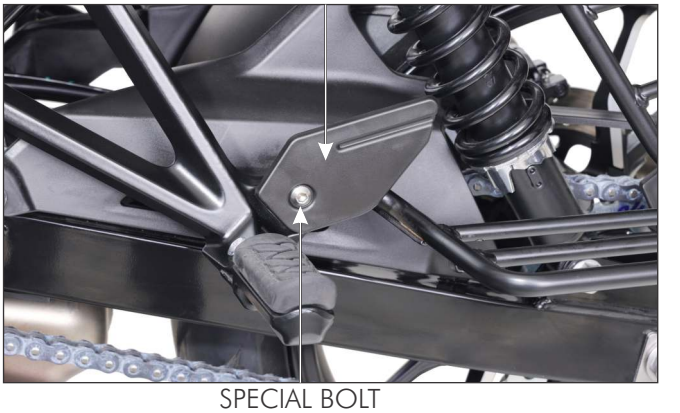
LEFT SIDE

REMOVAL

Park the vehicle on main stand.

Remove the left pillion stem guard by removing the special bolt (No.: 1).

LEFT PILLION STEM GUARD



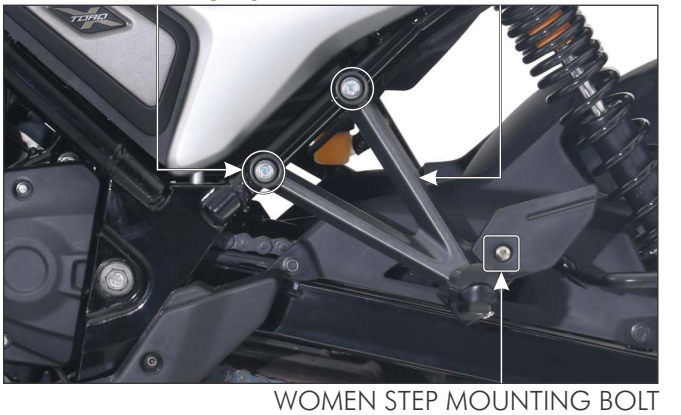
SPECIAL BOLT

Remove the left side step holder allen key bolts (Nos.: 2, Size: 6 mm).

Remove the women step mounting bolt (No.: 1, Size: 12 mm) as shown.

Remove the left side step holder.

ALLEN KEY BOLTS LEFT SIDE STEP HOLDER



WOMEN STEP MOUNTING BOLT

INSTALLATION

Install the left side step holder.

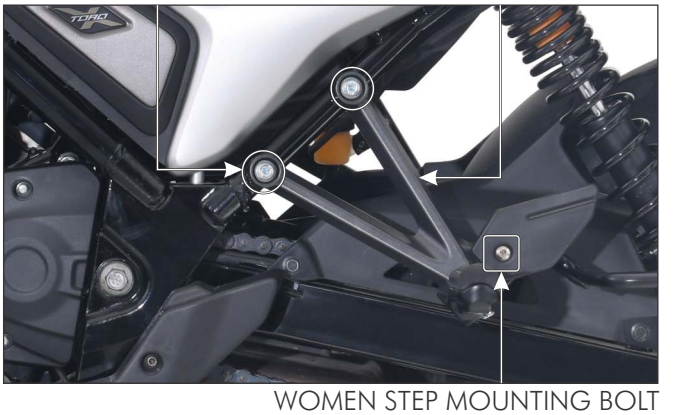
Install the women step mounting bolt (No.: 1, Size: 12 mm) and left side step holder allen key bolts (Nos.: 2, Size: 6 mm) to the specified torque.

TORQUE

LEFT SIDE STEP HOLDER MOUNTING BOLT: 2.1 kgf-m

WOMEN STEP MOUNTING BOLT: 2-1 kgf-m

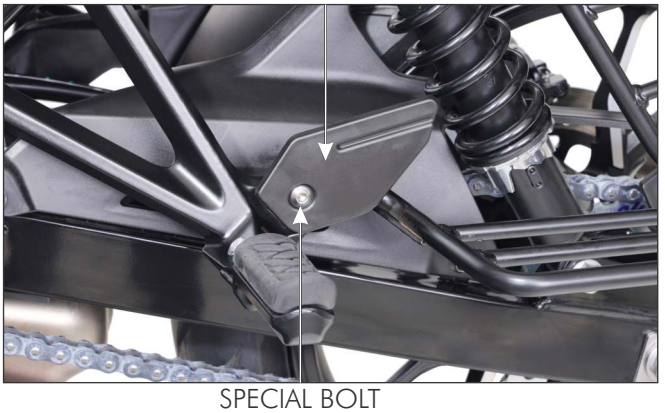
ALLEN KEY BOLTS LEFT SIDE STEP HOLDER



WOMEN STEP MOUNTING BOLT

Install the left pillion stem guard by installing the special bolt (No.: 1).

LEFT PILLION STEM GUARD



SPECIAL BOLT

SAREE GUARD WITH WOMEN PILLION STEP

REMOVAL

Remove the left pillion stem guard (page 2-19).

Remove the saree guard with women step allen key socket bolts (Nos.: 2) from under the rear fender as shown.

Remove the saree guard with women step mounting bolt (No.: 1) as shown.

Remove the saree guard with women step.

INSTALLATION

Installation is in the reverse order of removal.

TORQUE

SAREE GUARD SOCKET BOLT: 5.4 kgf-m
WOMEN STEP MOUNTING BOLT: 2.1 kgf-m

Install the left pillion stem guard (page 2-20).

ALLEN KEY SOCKET BOLTS

SAREE GUARD WITH WOMEN STEP

MOUNTING BOLTS

EXHAUST MUFFLER

REMOVAL

Park the vehicle on the main stand.

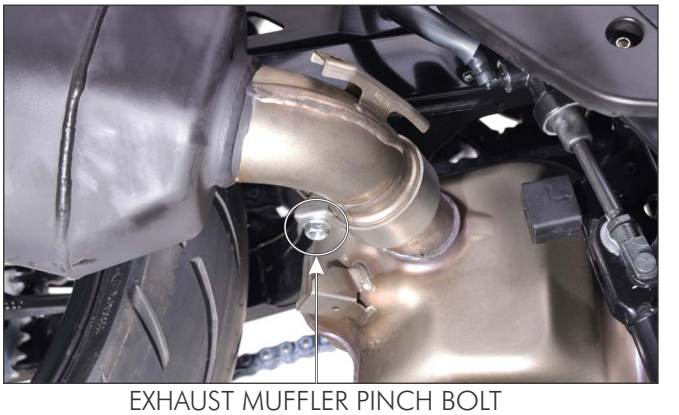
Remove the exhaust muffler cover (page 2-24).

Remove the exhaust muffler mounting bolt (No.: 1, Size: 12 mm), nut (No.: 1, Size: 8 mm) collars (Nos.: 2) and rubber (No.: 1).

MOUNTING BOLT/NUT/COLLARS/RUBBER

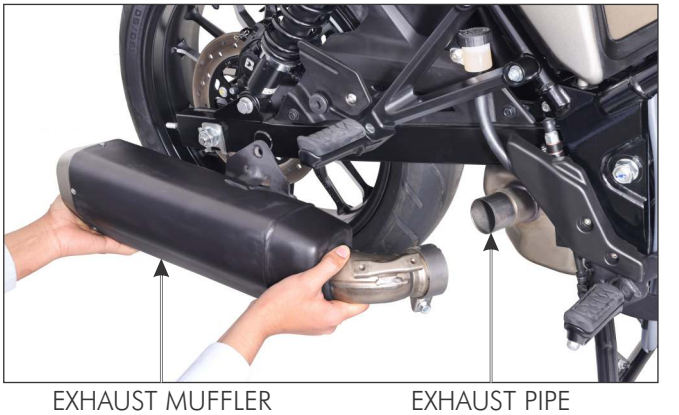
Note: *Images may depict a different model/variant, but procedures and information remain same.*

Remove the exhaust muffler pinch bolt (No.: 1, Size: 12 mm) from the bottom side as shown.



EXHAUST MUFFLER PINCH BOLT

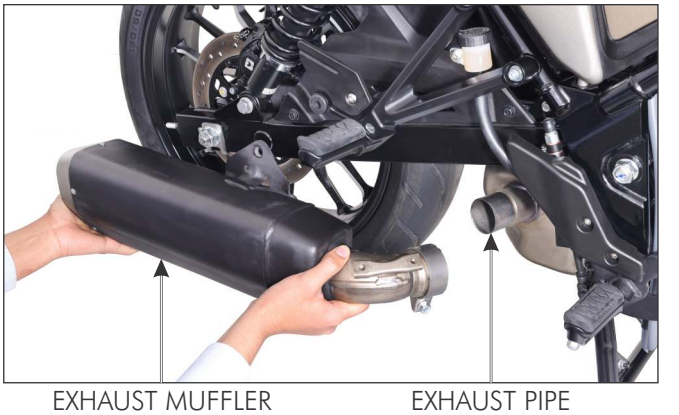
Remove the exhaust muffler from the exhaust pipe.



EXHAUST MUFFLER EXHAUST PIPE

INSTALLATION

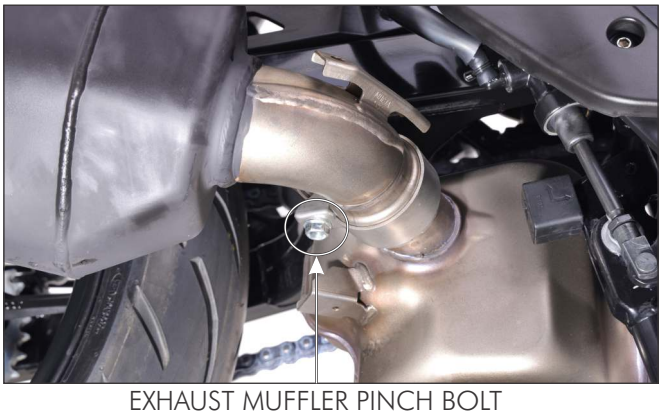
Install the exhaust muffler in a exhaust pipe.



EXHAUST MUFFLER EXHAUST PIPE

Install and tighten the exhaust muffler pinch bolt (No.: 1, Size: 12 mm) to the specified torque.

EXHAUST MUFFLER PINCH BOLT: 2.6 kgf-m



EXHAUST MUFFLER PINCH BOLT

Install and tighten the exhaust muffler mounting bolt (No.: 1, Size: 12 mm) to the specified torque.

EXHAUST MUFFLER MOUNTING BOLT: 2.6 kgf-m

Install the exhaust muffler cover (page 2-24).

MOUNTING BOLT/WASHER/COLLAR/RUBBER

EXHAUST PIPE

REMOVAL

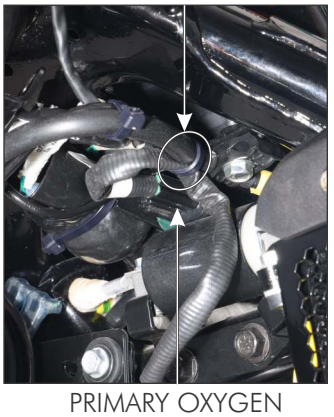
Park the vehicle on the main stand.

Remove the exhaust muffler (page 2-20).

Remove the primary oxygen sensor cord by removing the tie-wrap.

Disconnect the primary and secondary oxygen sensor 2P connectors.

TIE-WRAP



PRIMARY OXYGEN SENSOR 2P CONNECTOR

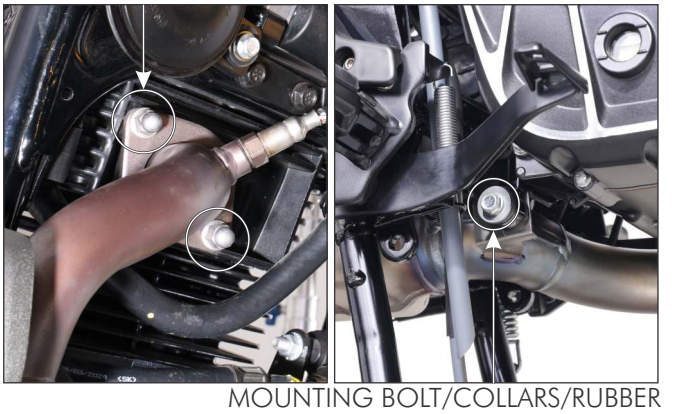
SECONDARY OXYGEN SENSOR 2P CONNECTOR

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Remove the exhaust muffler joint nuts (Nos.: 2, Size. 8 mm) from the exhaust pipe.

Remove the exhaust pipe mounting bolt (No.: 1, Size: 12 mm), collars (Nos.: 2) and rubber (No.: 1).

EXHAUST MUFFLER JOINT NUTS



MOUNTING BOLT/COLLARS/RUBBER

Remove the exhaust pipe and gasket.

CAUTION

Avoid keeping any cloth or flammable object between hot parts (muffler, oil cooler, engine).

EXHAUST PIPE

GASKET

INSTALLATION

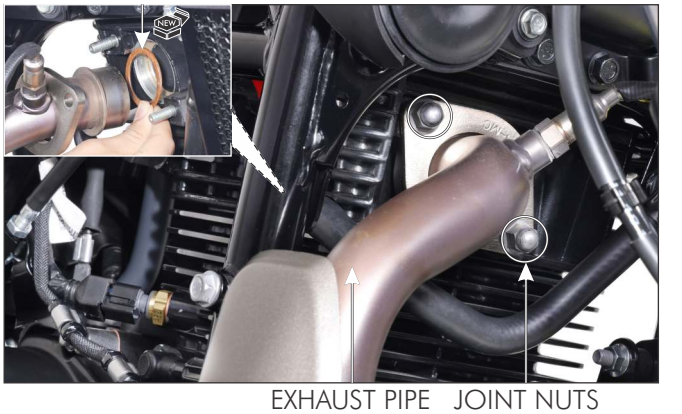
Install a new exhaust pipe gasket.

Align the exhaust pipe and install the exhaust muffler joint nuts.

NOTE

Always replace the exhaust muffler gasket with a new one whenever the muffler is removed from the engine.

GASKET

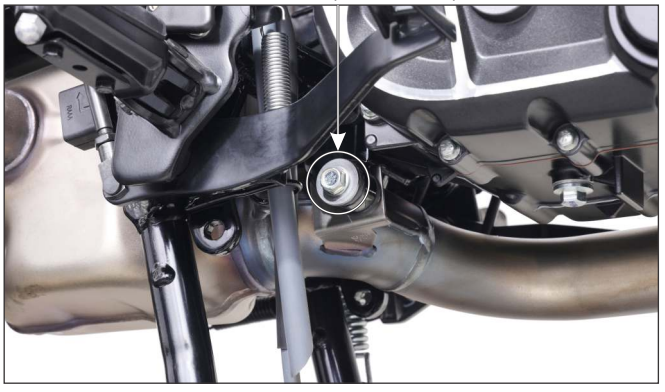


EXHAUST PIPE JOINT NUTS

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Install the exhaust pipe mounting bolt (No.: 1, Size: 12 mm), collars (Nos.: 2) and rubber (No.: 1).

MOUNTING BOLT/COLLARS/RUBBER



Tighten the exhaust pipe joint nuts and muffler mounting bolt to the specified torque.

TORQUE

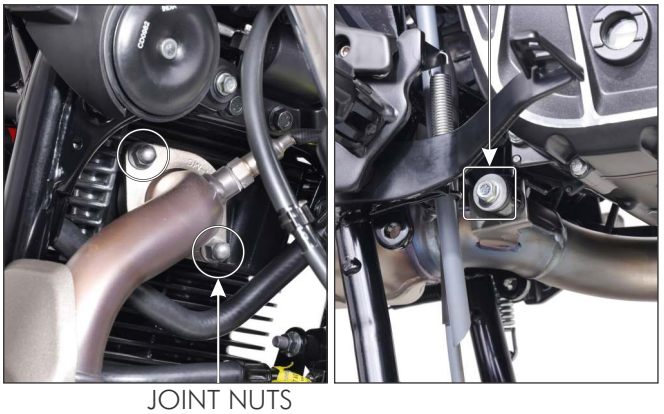
EXHAUST MUFFLER JOINT NUT: 2.6 kgf-m

EXHAUST PIPE MOUNTING BOLT: 2.6 kgf-m

NOTE

While loosening and tightening always tighten the muffler joint nuts at the cylinder head first and then the muffler mounting bolt.

MOUNTING BOLT



JOINT NUTS

Connect the primary and secondary oxygen sensor 2P connectors.

Tie the primary oxygen sensor cord with the front caliper hose by using a tie-wrap.

Install the exhaust muffler (page 2-20).

TIE-WRAP

PRIMARY OXYGEN SENSOR 2P CONNECTOR

SECONDARY OXYGEN SENSOR 2P CONNECTOR

Note: *Images may depict a different model/variant, but procedures and information remain same.*

EXHAUST MUFFLER COVERS

REMOVAL

Remove the exhaust muffler cover by removing allen key screws (Nos.: 2).

Remove the exhaust muffler catcon cover by removing allen key screws (2 nos.) along with protector washer.

INSTALLATION

Installation is in the reverse order of removal to the specified torque.

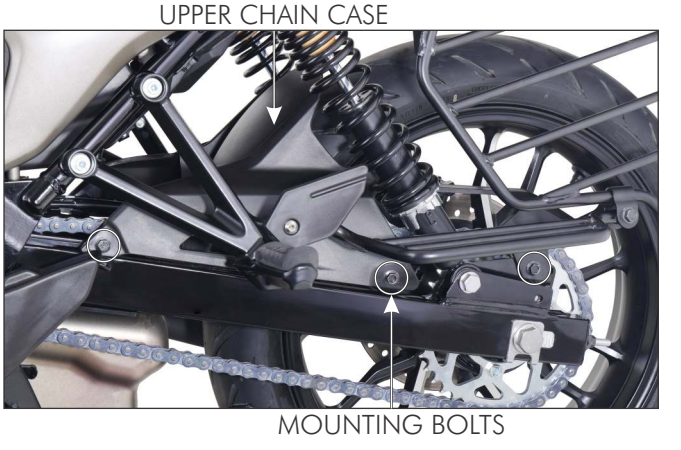
TORQUE

EXHAUST MUFFLER PROTECTOR SCREW : 0.9 kgf-m

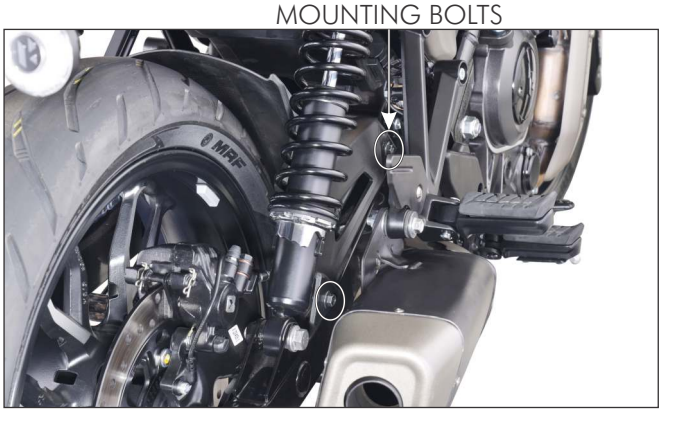
UPPER CHAIN CASE

REMOVAL

Remove the upper chain case mounting bolts (Nos.: 3, Size: 10 mm) from the right side as shown.



Remove the upper chain case mounting bolts (Nos.: 2, Size: 10 mm) from the left side as shown.



Note: *Images may depict a different model/variant, but procedures and information remain same.*

Remove the upper chain case towards rear side.

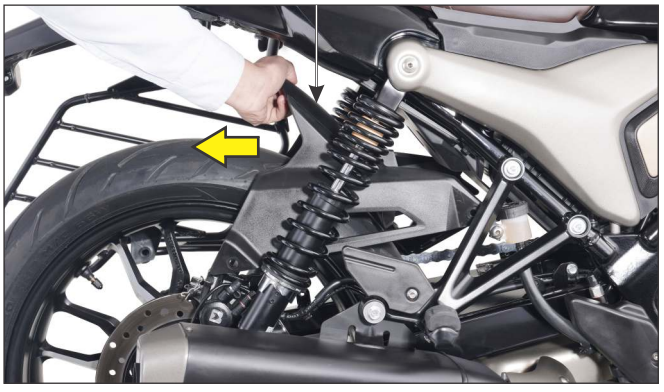
INSTALLATION

Installation is in the reverse order of removal to the specified torque.

TORQUE

UPPER CHAIN CASE MOUNTING BOLT: 1.0 kgf-m

UPPER CHAIN CASE



REAR FENDER ASSEMBLY

REMOVAL

Remove the seat (page 2-5).

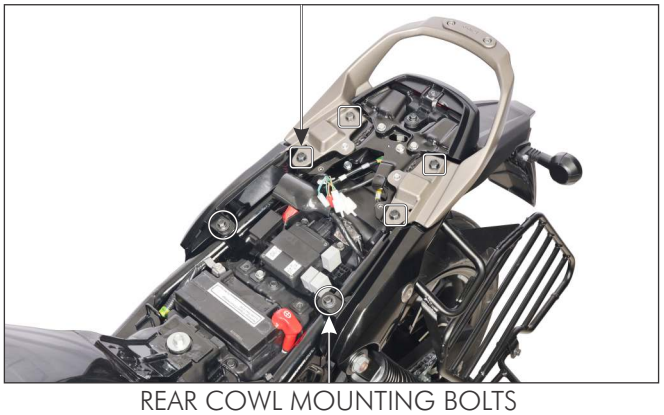
Remove the battery cover (page 2-6).

Slide the boot and disconnect the tail/stop lamp, turn signal lamp, position lamp connectors.

CONNECTORS

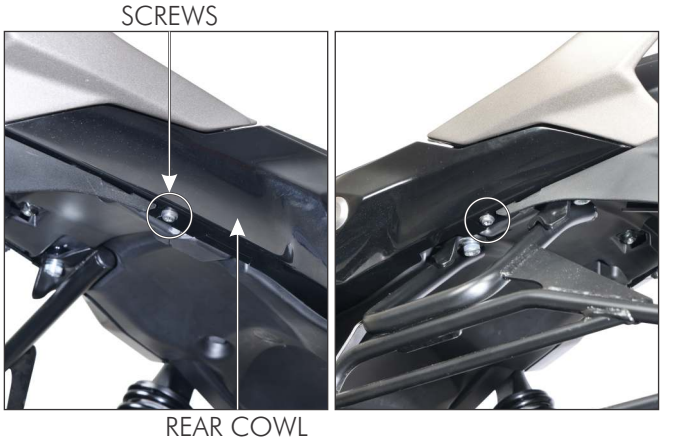
Remove the rear grip mounting bolts (Nos.: 4, Size: 10 mm) and rear cowl mounting bolts (Nos.: 2, Size: 12 mm).

REAR GRIP MOUNTING BOLTS



REAR COWL MOUNTING BOLTS

Remove the rear cowl screws (Nos.: 2).



REAR COWL

Dislodging the rear cowl lugs (Nos.: 2) from the frame grommets (Nos.: 2).

GROMMETS

Remove the rear fender assembly with rear cowl, rear grip, tail/stop lamp and turn signal indicators.

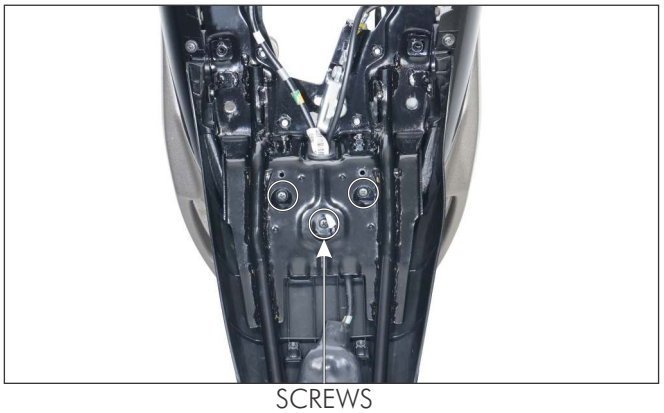

REAR FENDER ASSEMBLY

Remove the rear fender inner cover by removing the screws (Nos.: 4).

REAR FENDER INNER COVER

SCREWS

Remove the tail/stop lamp screws (Nos.: 3).



SCREWS

Remove the tail/stop lamp mounting bolt (No.: 1).

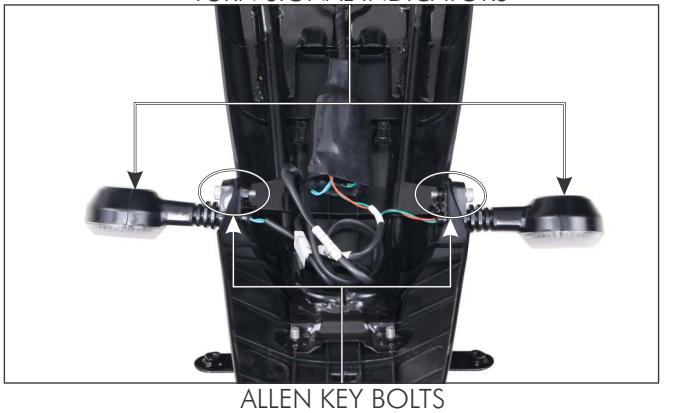
MOUNTING BOLT

Remove the tail/stop lamp assembly.
Remove the rear grip (page 2-31).
Remove the rear cowl (page 2-32).

TAIL/STOP LAMP ASSEMBLY

Remove the turn signal indicators by removing the allen key bolts (Nos.: 2, Size: 5 mm) from the rear fender assembly.

TURN SIGNAL INDICATORS



ALLEN KEY BOLTS

Remove the licence plate stay by removing the mounting bolts (Nos.: 2, Size: 10 mm) from the rear fender.

REAR FENDER LICENCE PLATE STAY

LICENCE PLATE STAY MOUNTING BOLTS

Remove the rear fender assembly side bolts (Nos.: 2, Size: 8 mm and mounting bolts (Nos.: 2, Size: 10 mm).

REAR FENDER ASSEMBLY SIDE BOLTS

REAR FENDER ASSEMBLY MOUNTING BOLTS

Remove the rear fender stay from the rear fender.

INSTALLATION

Installation is in the reverse order of removal.

NOTE

Route the wire properly **(Section 1)**.

REAR FENDER ASSEMBLY STAY

REAR FENDER ASSEMBLY

REAR FENDER-A

REMOVAL

Remove the seat (page 2-5).

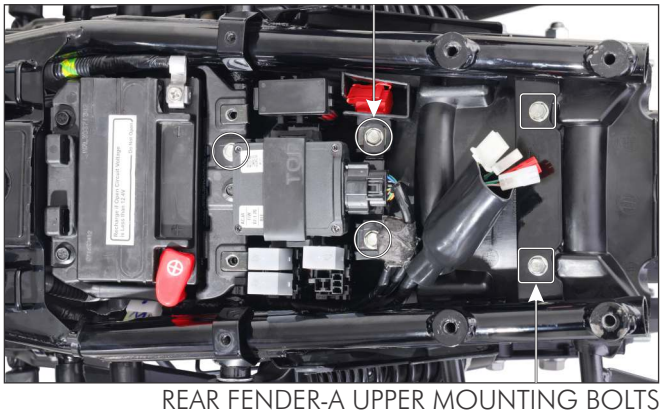
Remove the saree guard mounting bolts (page 2-20).

Remove the battery cover (page 2-6).

Remove the rear fender assembly (page 2-26).

Remove the TCU stay mounting bolts (Nos.: 3, Size: 12 mm) and rear fender-A upper mounting bolts (Nos.: 2).

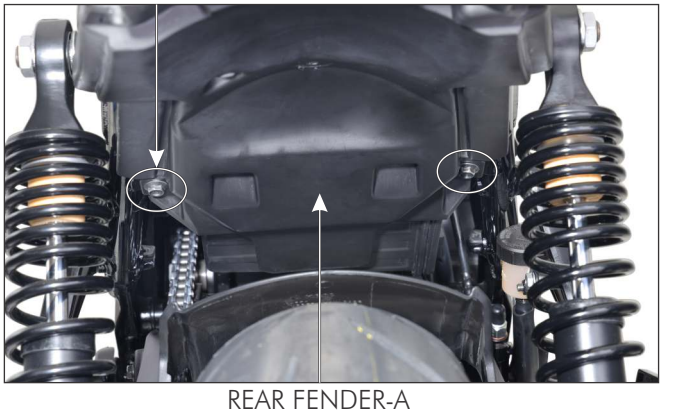
TCU STAY MOUNTING BOLTS



REAR FENDER-A UPPER MOUNTING BOLTS

Remove the rear fender-A under mounting bolts (Nos.: 2).

REAR FENDER-A UNDER MOUNTING BOLTS



REAR FENDER-A

Dislodging the rear fender-A lugs (Nos.: 2) from the battery box grooves.

BATTERY BOX GROOVES

REAR FENDER-A LUGS

Remove the rear fender-A towards the rear side.

REAR FENDER-A

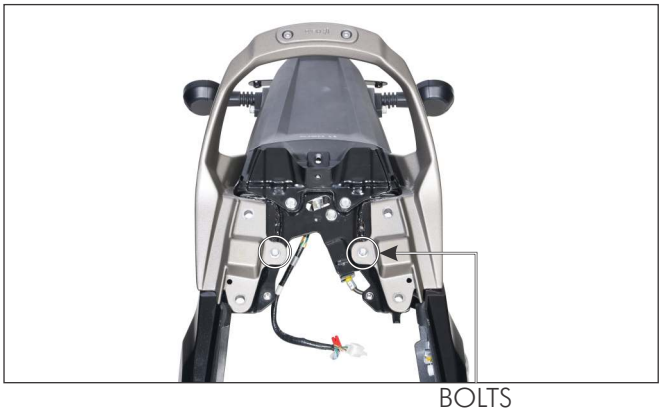
INSTALLATION

Installation is in the reverse order of removal.

REAR GRIP

REMOVAL

Remove the rear fender assembly (page 2-26).
Remove the tail/stop lamp from the rear fender (page 2-26).
Remove the rear grip mounting bolts (Nos.: 2, Size: 8 mm).



Remove the rear grip from the rear fender assembly stay.

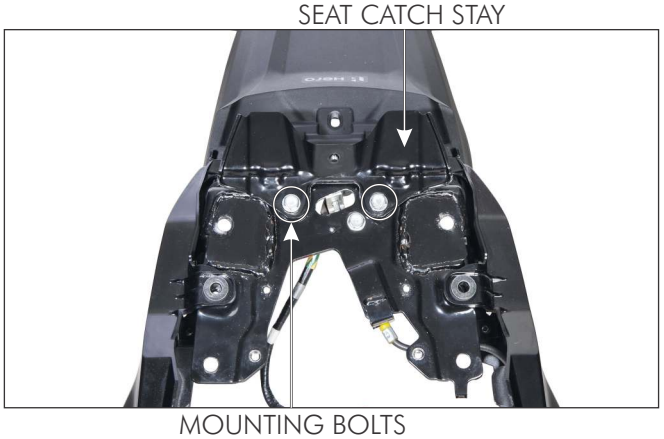
INSTALLATION

Installation is in the reverse order of removal.

REAR COWL

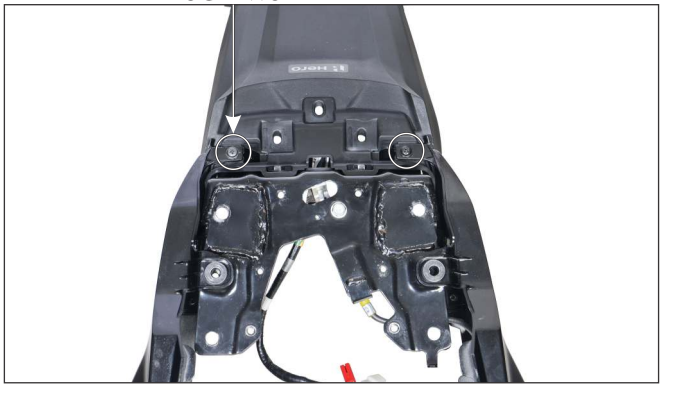
REMOVAL

Remove the rear fender assembly (page 2-26).
Remove the tail/stop lamp assembly ([age 2-26).
Remove the rear grip (page 2-31).
Remove the seat catch stay by removing the mounting bolts (Nos.: 2, Size: 8 mm).



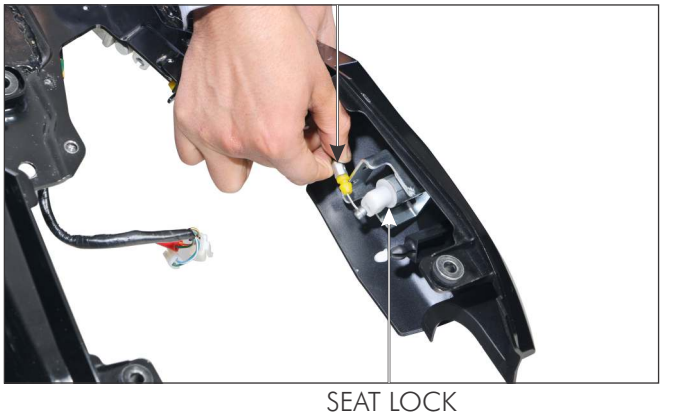
Remove the left and right side rear cowl screws (Nos.: 2) .

SCREWS



Release the seat catch cable from the seat lock.

SEAT CATCH CABLE



SEAT LOCK

Remove the left and right side rear cowl.

INSTALLATION

Installation is in the reverse order of removal.

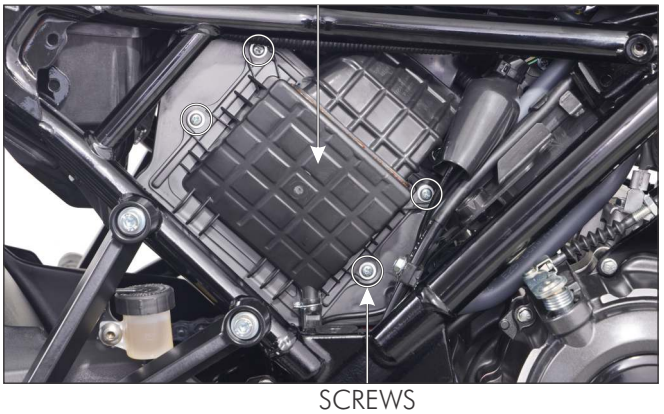
LEFT SIDE REAR COWL

RIGHT SIDE REAR COWL

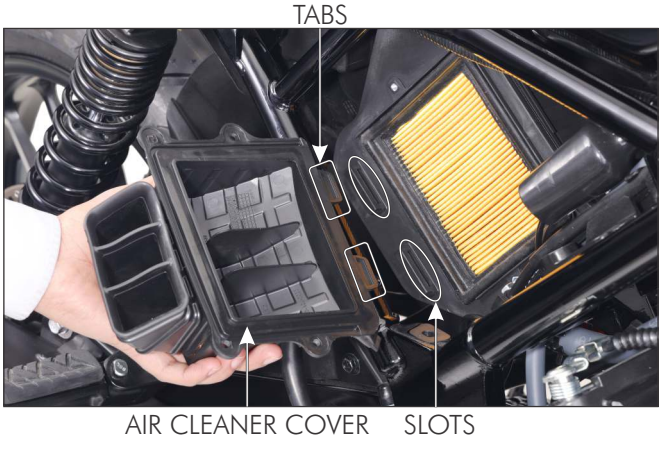
AIR CLEANER HOUSING

REMOVAL

Remove the seat (page 2-5).
Remove the left & right side covers (page 2-14).
Remove the fuel tank (page 2-14).
Remove the battery box (page 19-5).
Remove the rear fender-A (page 2-30).
Remove the rear wheel (page 13-3).
Remove the air cleaner cover screws (Nos.: 4).



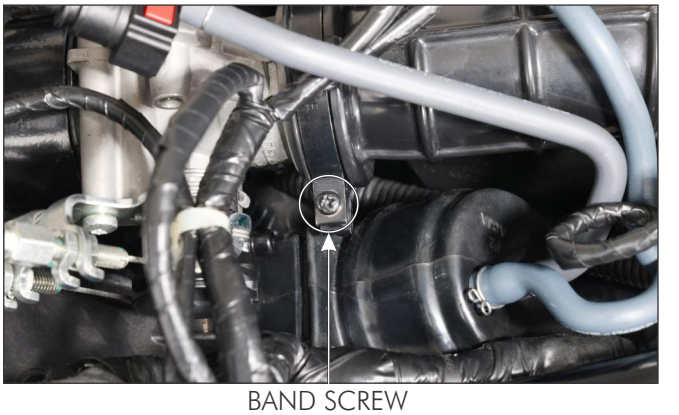
Remove the air cleaner cover by dislodging the tabs from the slots.



Disconnect the crankcase breather tube from air cleaner side.

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Remove the air cleaner connecting hose band screw.



BAND SCREW

Remove the air cleaner assembly socket bolt (No.: 1, Size: 5 mm) from the frame top side as shown.

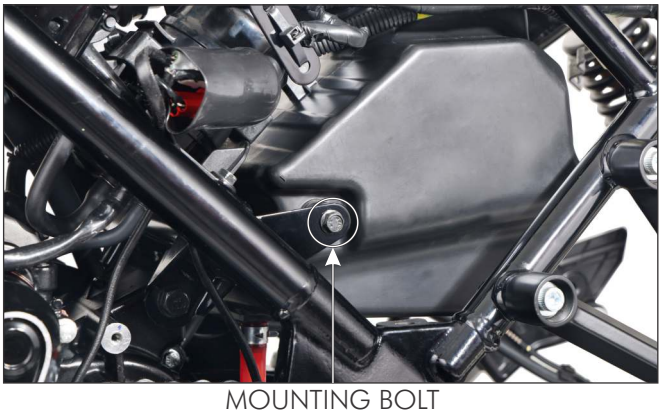
ALLEN KEY SOCKET BOLT

Remove the air cleaner assembly mounting bolt (No.: 1, Size: 10 mm) from the right side.

MOUNTING BOLT

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Remove the air cleaner assembly mounting bolt (No.: 1, Size: 10 mm) from the left side.



MOUNTING BOLT

Remove the air cleaner housing towards the rear side.

INSTALLATION

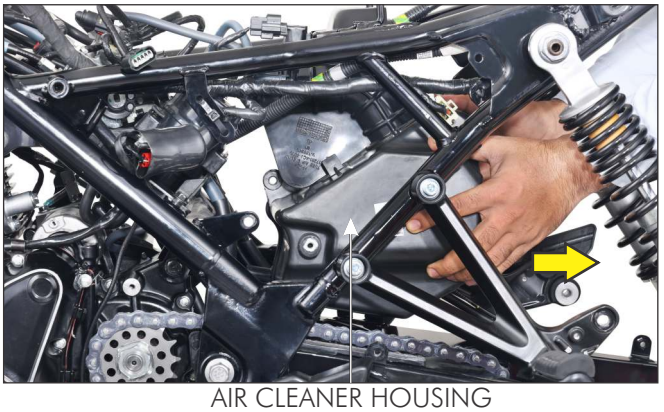
Installation is in the reverse order of removal.

TORQUE

AIR CLEANER GROMMET BOLT: 1.0 kgf-m

NOTE

- Route the wire properly **(Section 1)**.
- Adjust the drive chain slack (page 3-16).



AIR CLEANER HOUSING

Note: *Images may depict a different model/variant, but procedures and information remain same.*

SERVICE INFORMATION

GENERAL

⚠ WARNING

- If the engine is running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area The exhaust contains poisonous carbon monoxide gas that can cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.
- Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.
- Petrol is extremely inflammable and is explosive under certain condition. Work in a well ventilated area with the engine in stop condition. Do not smoke, allow flames, sparks in the work area where petrol is stored.

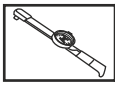
- Park the vehicle on ramp before starting any work.
- The oil filter screen, oil filter rotor cleaning and oil pump servicing can be done with engine in the frame.
- Some maintenance jobs requires removal of body panels. (**Refer section-2**) for the removal/installation of required body panels.

SPECIFICATIONS

MAINTENANCE

ITEM		SPECIFICATIONS
Throttle grip free play		1-3 mm
Spark plug		Federal Mogul REK6YC
Spark plug gap		0.8-0.9 mm
Valve clearance	Intake	0.10 mm ± 0.02
	Exhaust	0.22 mm ± 0.02
Engine oil capacity	At draining	2.25 litres
	At disassembly	2.6 litres

Recommended engine oil			BRAND: Hero Xotic+ GRADE: 100% Synthetic SAE 15W 50 Manufactured by : Indian Oil Corporation Limited. Savita Oil Technologies Limited.
Engine idle speed		Cold condition	1600±100 r/min
		Hot condition	1300±100 r/min
Cylinder compression		Without decomp	12±2 kgf/cm^2
		With decomp	6±2 kgf/cm^2
Drive chain slack			20-25 mm
Recommended brake fluid			DoT 4
Clutch lever free play			10-15 mm
Tyre size		Front	110/70-17 54H TL
		Rear	150/60 ZR- 17 66W TL
Cold tyre pressure	Rider only	Front	27 psi
		Rear	29 psi
	Rider & Pillion	Front	27 psi
		Rear	29 psi
Recommended tyre tread depth		Front	0.8 mm
		Rear	0.8 mm

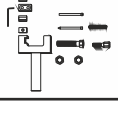


TORQUE VALUES

SPARK PLUG	**: 1.0-1.5 kgf-m**
TAPPET ADJUSTING SCREW LOCK NUT	**: 1.2-1.6 kgf-m**
OIL DRAIN BOLT	**: 2.5-3.5 kgf-m**
REAR AXLE NUT	**: 10.0-12.0 kgf-m**
CRANKSHAFT HOLE CAP	**: 1.0-2.0 kgf-m**
PRESS BOLT	**: 1.2-1.5 kgf-m**

For other nuts, bolts, fasteners etc. refer to standard torque values (**SECTION-1**).

SPECIAL TOOLS

	**TESTER (MF-BATTERY)** **PART NO: HMCLCBT062101S**
	**DRIVE CHAIN RIVETING TOOL** **PART NO: HMCL0423ACRD04**

MAINTENANCE SCHEDULE

	ITEMS	SERVICE	1st	2nd	3rd	4th	5th	6th
		DAYS	1st 60	Next 180	Next 180	Next 180	Next 180	Next 180
		KM Note- 1	500-750	6000-6500	12000-12500	18000-18500	24000-24500	30000-30500
	Fuel Line		I	I	I	I	I	I
✎	Throttle Operation		I, A	I, A	I, A	I, A	I, A	I, A
✎	Air Cleaner Element	Note-2	I	I	I	I	R	R
	Spark Plug		I, C, A	I, C, A	I, C, A	I, C, A	R	R
✂	Valve Clearance		I, A	I, A	I, A	I, A	I, A	I, A
	Engine Oil	Note-3	R	I, T	R	I,T	R	I,T
✂	Engine Oil Strainer Screen	Note-4	C		C		C	
✂	Engine Oil Filter		R		R	R	R	R
✎	Engine Oil Cooler		I	I	I	I	I	I
	Electric Starter		I	I	I	I	I	I
✂	Drive Chain	Note-5						
	Drive Chain Slider		I, C, L, A at every 1000 km or early as required					
	Battery Voltage		I	I	I	I	I	I
	Brake Pad Wear		I	I	I	I	I	I
✂	Brake System & Brake Pedal Pivot		I, C, L	I, C, L	I, C, L	I, C, L	I, C, L	I, C, L
	Brake Fluid	Note-6	I	I	I	I	I	R
✂	Stop Lamp Switch		I	I	I	I	I	I
✂	Headlamp Focus		I, A	I, A	I, A	I, A	I, A	I, A
	Clutch Free Play		I, A	I, A	I, A	I, A	I, A	I, A
	Side Stand/Main Stand (Optional)		L	L	L	L	L	L
	Side Stand Switch		I, C	I, C	I, C	I, C	I, C	I, C
✎	Nut, Bolts & Fasteners (Grommets and Dampers)	Note-7	I	I	I, R (If required)	I	I, R (If required)	I
✂	Wheels & Flange Bearings	Note-8	I	I	I	I	I	I
✂	Wheels/Tyres	Note-9	I	I, A	I, L, A	I, L, A	I, L, A	I, L, A
✂	Steering Head Bearing	Note-10	I	I, A	I, L, A	I, L, A	I, L, A	I, L, A
✂	Front Suspension/Oil	Note-11	I	I	I	I	I	I
✎	Rear Suspension	Note-12	I	I	I	I	I	I
✂	Muffler (Catalytic Converter)	Note-13		I, E	I, E	I, E	I, E	I, E
✎	Evaporative Emission Control System	Note-14	I	I	I	I	I	I
✂	Magnetic Drain Plug Bolt Tip	Note-15	C		C	C	C	C
	Fuel Filter (External)						R	R

✎ To be serviced by your Authorized dealer unless the owner has the relevant tools, technical information and is technically qualified.
✂ In the interest of safety, we recommend that these jobs are carried out only by your Authorized dealer.

Note-1: At higher odometer readings, repeat the frequency interval established here. **Note-2:** Service more frequently if the vehicle is ridden in unusually wet or dusty areas. **Note-3:** Replace engine oil once in every 10000 km. Top up if the oil level is at or near the lower level mark. **Note-4:** Strainer cleaning has to be ensured at defined frequency at 1st Service and all service at10000 km frequency. Engine oil filter to replaced at 1st Service and in every 10000 km. **Note-5:** Visit Authorized dealer for inspection, cleaning, lubrication and adjustment of drive chain at every 1000 km or as required. **Note-6:** Replace brake fluid once in every two years or 30000 km, whichever is earlier. **Note-7:** Inspect & maintain specified torque. **Note-8:** Inspect the bearings free play, replace if necessary. **Note-9:** Inspect, replace if necessary/damaged. Replace the tyre as per tread wear indicator (TWI). **Note-10:** Replace rubber washer once in every 2 years or 10000 km. **Note-11:** Replace front fork oil once in a every 2 years or 30000 km, whichever is earlier. **Note-12:** Inspect rear suspension mounting bushes play, replace rear shock absorber if necessary. **Note-13:** Check CO emission at idle, to be followed Govt. regulation (PUC). **Note-14:** Inspect the canister hoses for deterioration, damage or loose connections and canister for cracks or other damages. **Note-15:** Clean the Magnetic Drain Plug bolt tip in every 10000 km/during oil change/oil replace if any damages.

Note

- **Service more frequently if the vehicle is ridden in wet or dusty areas.**
- **Service more frequently if the vehicle is ridden in rain or at full throttle.**
- **Always wipe the water from the vehicle after washing. Use clean soft cloth or pressurized air for completely drying the water.**
- **Always replace gaskets, O-rings, circlips, rubber washers and cotter pins with new one once removed.**

 # Replacement of parts (e.g filters, etc.) and consumables (e.g engine oil, etc.) during paid or free service are at customer's expenses.

Ensure that each paid service is availed within 12 months or 10000 km from the date of previous service, whichever is earlier.

I: INSPECT C: CLEAN R: REPLACE A: ADJUST L: LUBRICATE T: TOP UP E: EMISSION CHECK

FUEL LINES

FUEL HOSE INSPECTION

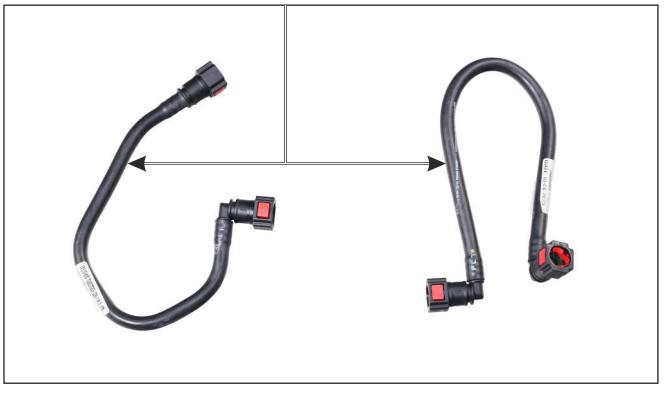
Check the fuel line for any leakage, deterioration, damage, cracks or any other damage.

Replace the fuel hose if necessary. For quick connect fitting removal and installation (page 5-64).

NOTE

- Always ensure to clean any dust or dirt around the quick connect fitting area before removal.
- Use a shop towel to prevent the remaining fuel in the fuel feed hose from falling out.
- Be careful not to damage the hose or other parts.
- Do not use any tool to press the retainer tabs.
- If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
- Do not bend or twist the fuel feed hose.

FUEL HOSES



FUEL PUMP FILTER

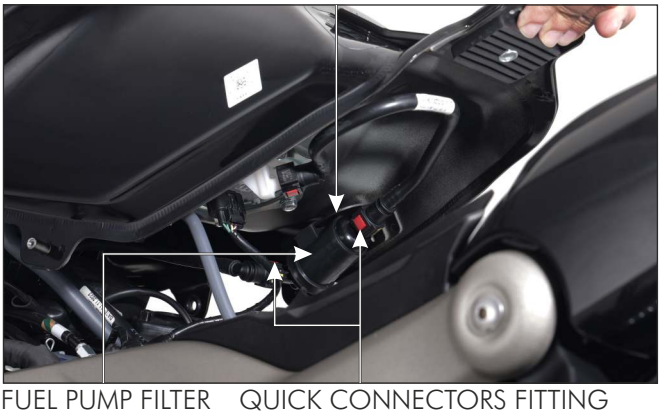
REMOVAL

Remove the fuel tank mounting bolt and lift the fuel tank from the rear side (page 2-12).

Disconnect the quick connectors fitting from fuel pump filter both sides (page 5-64).

Dismount the fuel pump filter from the fuel pump filter mounting stay on the fuel tank.

FUEL PUMP FILTER MOUNTING STAY



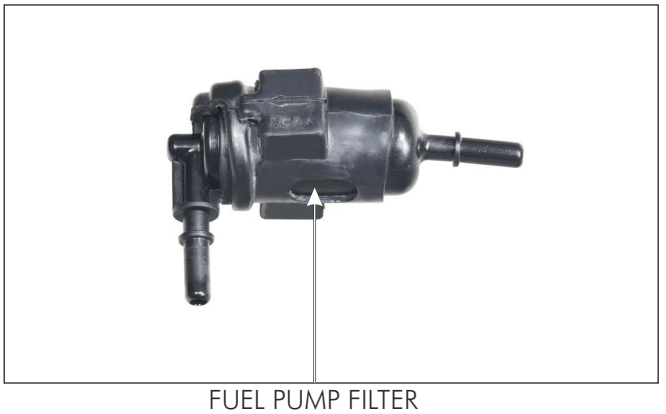
FUEL PUMP FILTER QUICK CONNECTORS FITTING

INSTALLATION

Installation is in the reverse order of removal.

NOTE

- Replace the fuel filter at every 10000 km.
- Fuel filter replacement should be done in dust free environment.



FUEL PUMP FILTER

THROTTLE OPERATION

Check for any deterioration or damage to the throttle cables.

Check the throttle grip for smooth operation. Check that the throttle grip returns from the full open to the full closed position smoothly and automatically in all steering positions.

If the throttle grip does not return properly, lubricate the throttle grip housing.

For cable lubrication: Disconnect the throttle cable at their upper end. Throughly lubricate the cable and its pivot points with silicon grease (TSG 3251) or equivalent.

If the throttle grip still does not return properly, replace the throttle cable.

⚠ WARNING

Reusing a damaged or abnormally bent or kinked throttle cable can prevent proper throttle operation and may lead to a loss of throttle control while riding.

With the engine idling, turn the handlebar all the way to the left and right to ensure that the idle speed does not change. If idle speed increases, check the throttle grip free play and throttle cable connection.

Check for throttle cable routing.

Measure the throttle grip free play at the throttle grip flange.

FREE PLAY: 1-3 mm

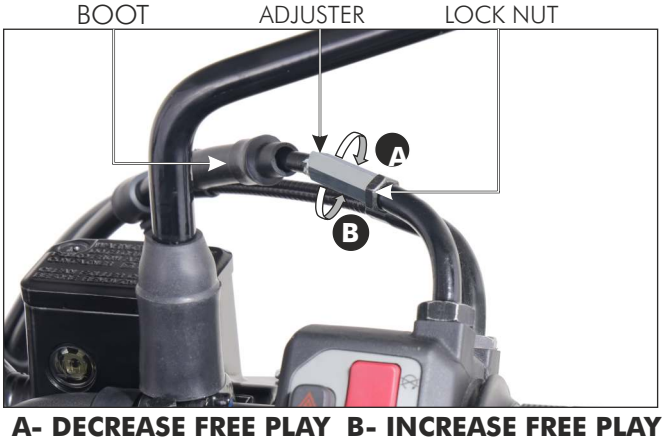
If the throttle grip free play is not correct, adjust as follows:

Slide the boot off the adjuster.

Loosen the lock nut and turn the adjuster as required.

NOTE

Replace the throttle cable if the above procedure is no longer effective.



A- DECREASE FREE PLAY B- INCREASE FREE PLAY

After adjustment, tighten the lock nut and reposition the boot.

Recheck the throttle operation in all steering positions.

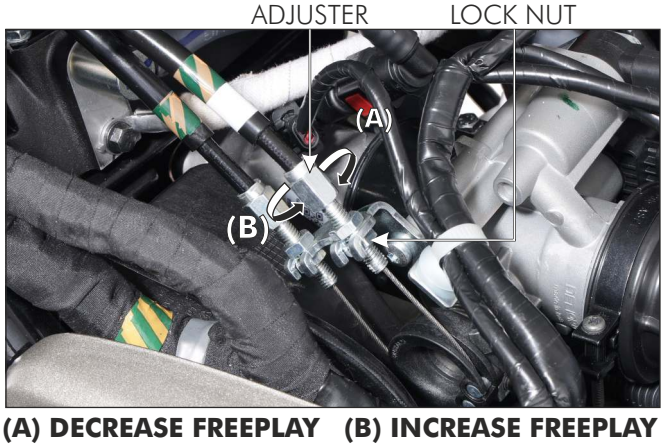
If the specified free play is not achieved, adjust the free play on throttle body side.

Remove the fuel tank (page 2-12).

Loosen the lock nut and turn the adjuster as required. (Replace the throttle cable if the above procedure is no longer effective).

After adjustment, tighten the lock nut.

Recheck the throttle operation in all steering position.



(A) DECREASE FREEPLAY (B) INCREASE FREEPLAY

Note: *Images may depict a different model/variant, but procedures and information remain same.*

AIR CLEANER ELEMENT

The air cleaner is a wet paper pleated filter which has enhanced filtering efficiency.

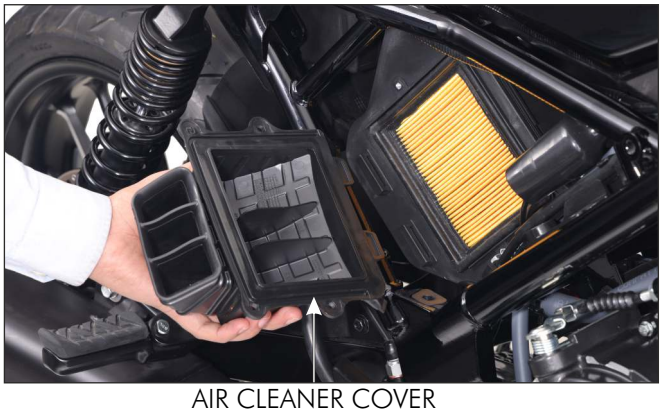
The air cleaner should be replaced at regular intervals (page 3-3).

NOTE

When riding in dusty areas, more frequent replacement may be necessary.

Remove the right side cover (page 2-16).

Remove the air cleaner cover (page 2-33).



AIR CLEANER COVER

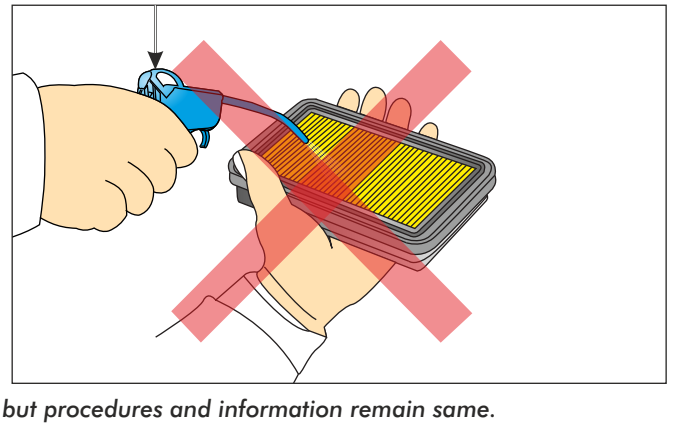
Remove the air cleaner element from air cleaner housing.

AIR CLEANER ELEMENT

AIR CLEANER HOUSING

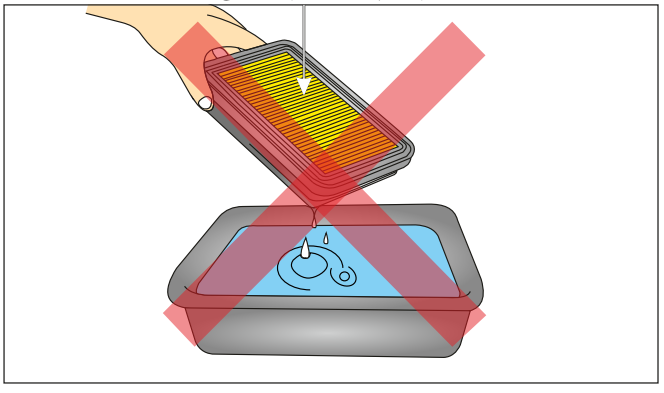
Do not clean with solvent to remove dust and also do not use forced air on it. The viscous oil will be lost and filter becomes dry. As the base filter paper is coarse, it cannot block fine dust when it becomes dry.

NOZZLE



Note: *Images may depict a different model/variant, but procedures and information remain same.*

Do not place air cleaner element horizontally on any surface as dust can stick to the filter due to presence of oil. If necessary place it vertically. Install immediately after inspection.



Clean the air cleaner housing using a shop towel.

Install the new air cleaner element inside the air cleaner housing.

Install the air cleaner cover (page 2-34).

Install the right side cover (page 2-17).

OIL COOLER

Check the oil cooler air passages for clogging or damage.

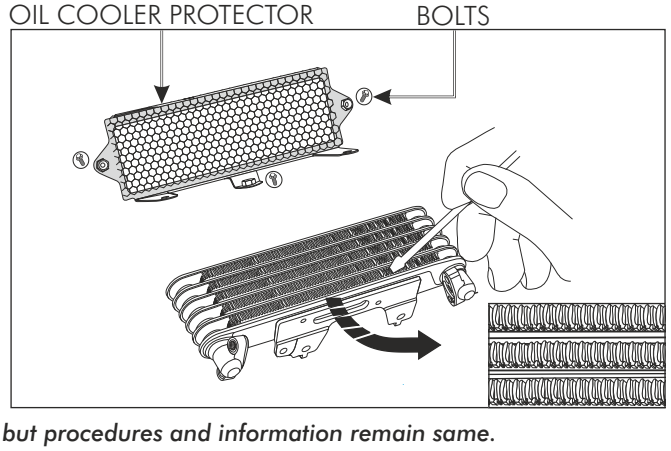
Remove the oil cooler fins cover bolts and cover.

Straighten the bent or collapsed fins with a suitable small, blade type screw driver if necessary.

Blow out dirt, mud or other obstructions from between core fins with compressed air or wash it off with low pressure water.

NOTE

Make sure not to damage the fins while cleaning.



Note: *Images may depict a different model/variant, but procedures and information remain same.*

CAUTION

- Do not use high pressure washing spray directly on the oil cooler as it may damage the fins and any physical contact with fins has to be avoided.
- Avoid keeping any cloth or flammable object between hot parts (muffler, oil cooler and engine).

OIL COOLER

OIL COOLER PROTECTOR

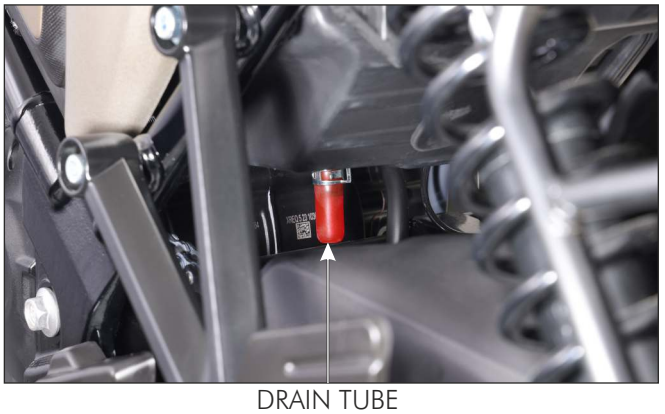
DRAIN TUBE

Remove the drain tube from the air cleaner assembly and drain the deposit into a suitable container. Reinstall the drain tube.

Follow the above process more frequently when riding in rain or at full throttle.

NOTE

Always ensure to reinstall the drain tube after draining the deposit.



DRAIN TUBE

SPARK PLUG

Disconnect the noise suppressor cap and clean any dirt around the spark plug area.

NOTE

Clean around the spark plug area with compressed air before removing, and be sure that no debris is allowed to enter the combustion chamber.

Remove the spark plug using the spark plug wrench.

Inspect, clean or replace as described in the maintenance schedule (page 3-3).

NOISE SUPPRESSOR CAP

Note: *Images may depict a different model/variant, but procedures and information remain same.*

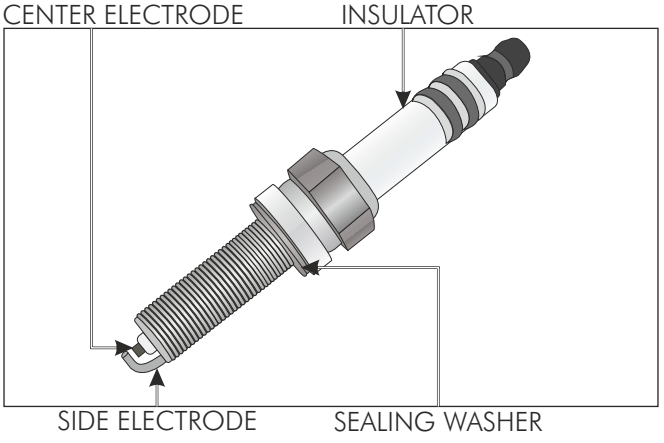
INSPECTION

Check the following and replace, if necessary.

- Insulator for cracks or damage
- Electrodes for fouling, damage, discoloration or wear
- Burning condition, colorations;

NOTE

If carbon deposits are accumulated on to the spark plug electrode, clean the spark plug in spark plug cleaner by rotating and sand blasting alternatively.



REUSING A SPARK PLUG

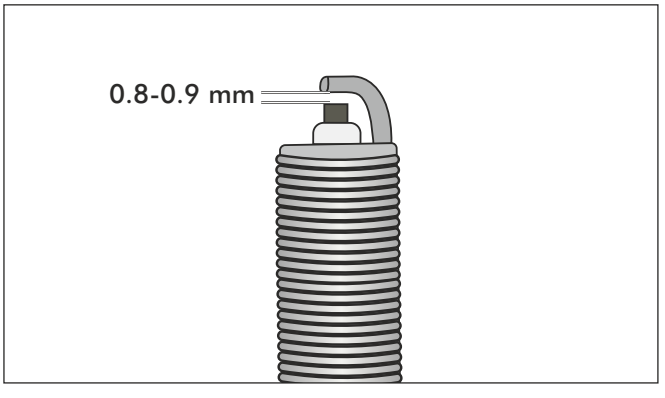
Clean the spark plug electrodes in a spark plug cleaner.

Check the gap between the center and side electrodes with a wire-type feeler gauge. If necessary, adjust the gap by bending the side electrodes carefully.

SPARK PLUG GAP: 0.8-0.9 mm

CAUTION

To prevent damage to the cylinder head, hand-tighten the spark plug before using a wrench to-tighten to the specified torque.



TORQUE

SPARK PLUG: 1.0-1.5 kgf-m

RECOMMENDED SPARK PLUG

Federal Mogul REK6YC

REPLACING A SPARK PLUG

Set the plug gap to specification with a wire-type feeler gauge.

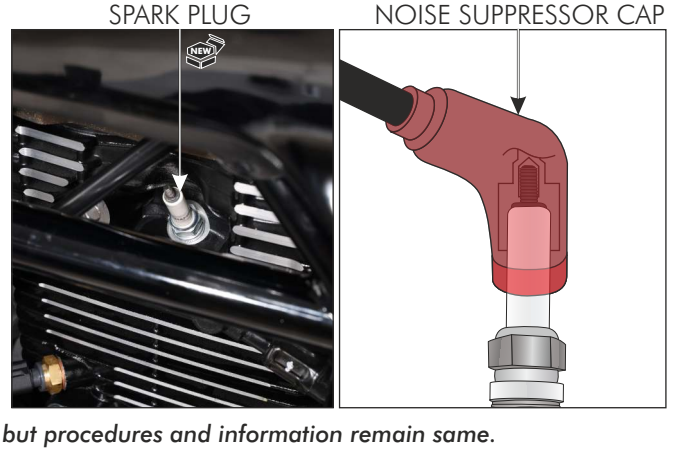
CAUTION

Do not over tighten the spark plug.

Install and hand tighten the new spark plug, then tighten it about 1/2 of turn after sealing washer contacts the seat of the plug hole.

Incase of reusing the spark plug, it should only take 1/8-1/4 turn after the plug seats.

Connect the noise suppressor cap.



***Note:** Images may depict a different model/variant, but procedures and information remain same.*

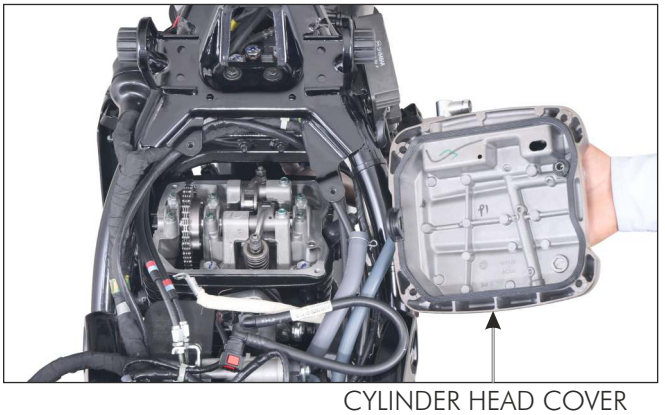
VALVE CLEARANCE

NOTE

Inspect and adjust the valve clearance when the engine is cold (below 35°C/95°F).

Remove the fuel tank (page 2-12).

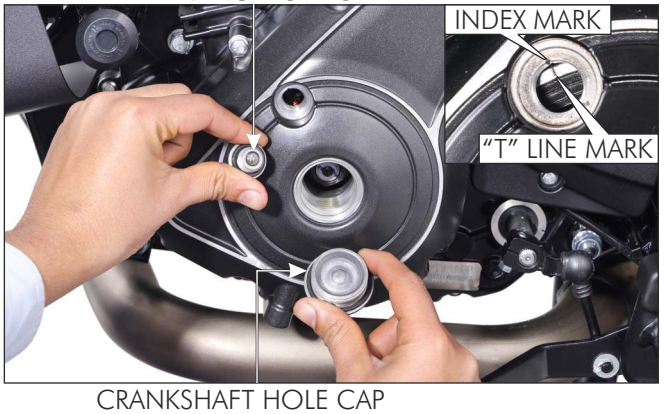
Remove the cylinder head cover (page 7-4).



CYLINDER HEAD COVER

Remove the crankshaft hole cap and timing hole cap.

TIMING HOLE CAP



CRANKSHAFT HOLE CAP

Rotate the crankshaft counterclockwise and align the "T" line mark on the flywheel with the index mark on the left crankcase cover.

Make sure that the piston is at TDC (Top Dead Centre) on the compression stroke. (The rocker arms should be free in this condition).

If the rocker arms are not free, it is because the piston is moving through the exhaust stroke to TDC. Rotate the crankshaft one full turn and the match then "T" line mark again.

CAM SPROCKET

INDEX LINE

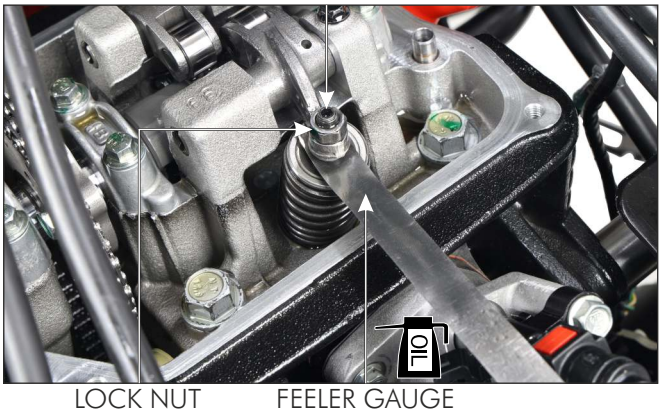
Note: *Images may depict a different model/variant, but procedures and information remain same.*

Apply clean engine oil on the feeler gauge.

Check the valve clearance by inserting a feeler gauge between the valve adjusting allen key screw and the valve stem.

VALVE CLEARANCE (Cold condition)
INTAKE: 0.10 mm ± 0.02
EXHAUST: 0.22 mm ± 0.02

ADJUSTING ALLEN KEY SCREW



LOCK NUT FEELER GAUGE

Adjust the valve clearance by loosening the lock nut and turning the adjusting allen key screw until there is slight drag on the feeler gauge.

Hold the adjusting allen key screw and tighten the lock nut.

Recheck the valve clearance.

TORQUE

TAPPET ADJUSTING ALLEN KEY SCREW LOCK NUT: 1.2-1.6 kgf-m

NOTE

An improperly tightened lock nut may cause damage to the engine.

ALLEN KEY

FEELER GAUGE

Install the cylinder head cover (page 7-6).

Install the fuel tank (page 2-14).

Install new O-rings to the crankshaft hole cap and timing hole cap.

Apply clean engine oil to the O-rings.

O-RING

O-RING

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Install and tighten the timing hole cap.

Install and tighten the crankshaft hole cap to the specified torque.

TORQUE

CRANKSHAFT HOLE CAP: 1.0-2.0 kgf-m

TIMING HOLE CAP

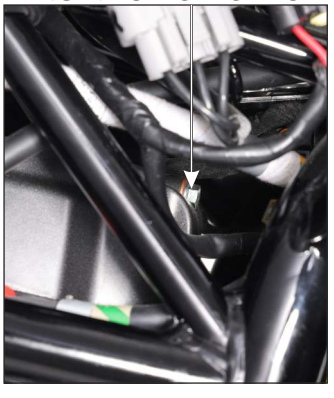
CRANKSHAFT HOLE CAP

ENGINE OIL

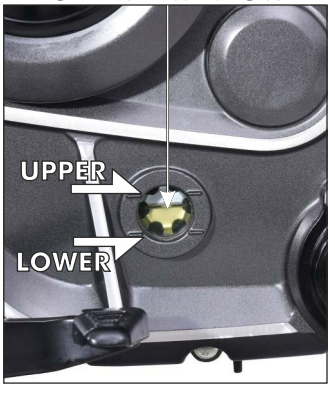
Oil level inspection

- Park the vehicle on its main stand (Optional).
- Start the engine and let it idle for 3-5 minutes.
- Slightly loosen the engine oil check bolt and check the engine oil entry into the cylinder head cover.
- After checking the oil circulation, tighten the engine oil check bolt.
- Stop the engine and wait for 2-3 minutes.
- Check the oil level in the oil level window. It must be between upper and lower level marks.
- If required add the specified oil upto the upper level mark. Do not overfill.
- Quantity of the oil to be filled is approximately 2.25 litres during oil change when right crankcase cover is not removed.

ENGINE OIL CHECK BOLT

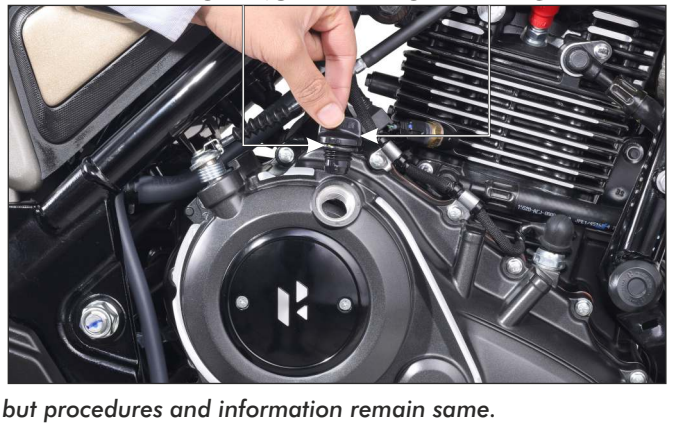


OIL LEVEL WINDOW



Reinstall oil filler cap with new O-ring and check for oil leaks.

O-RING OIL FILLER CAP



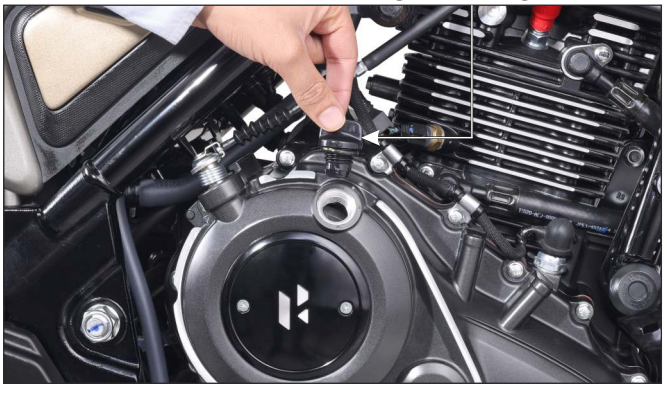
Note: *Images may depict a different model/variant, but procedures and information remain same.*

OIL CHANGE

NOTE

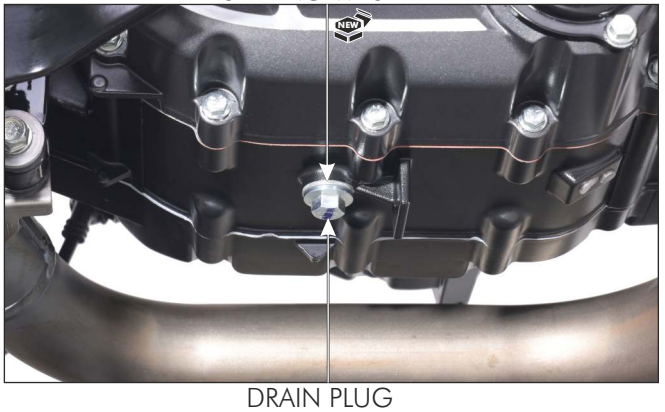
- Clean around the filler cap area with compressed air before removing, and be sure that no debris is allowed to enter inside the engine.
- Drain engine oil while engine is warm and the vehicle is on the main stand or held upright. This ensures complete and rapid draining.

OIL FILLER CAP



- To drain the oil, start the engine, warm it up for several minutes and then turn it off.
- Wait a few minutes until the oil settles down.
- Remove the oil filler cap, drain bolt and sealing washer.
- After the oil has completely drained, reinstall the drain plug with new sealing washer and tighten it to the specified torque.

SEALING WASHER



DRAIN PLUG

TORQUE

OIL DRAIN BOLT: 2.5-3.5 kgf-m

- Fill the crankcase with recommended engine oil (Approx. 2.25 litres when right crankcase cover is not removed).

Engine Oil Capacity : 2.25 litres at oil change

2.6 litres at disassembly of right crankcase cover

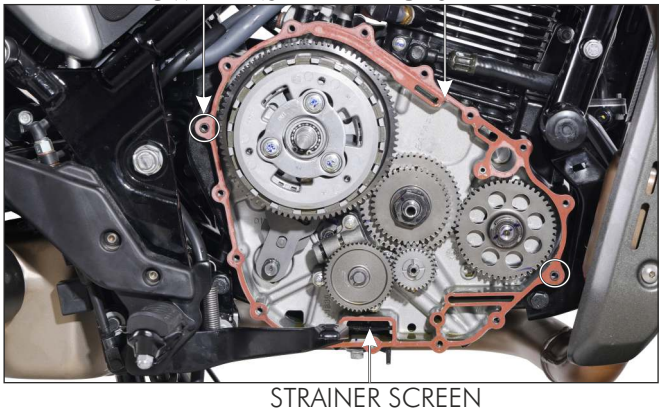
- Re-install the oil filler cap with a new O-ring.
- Make sure that the oil level is till the upper level mark and there are no oil leaks.

OIL STRAINER SCREEN CLEANING

Remove the right crankcase cover (page 9-3).

Remove the gasket and dowel pins.

DOWEL PINS GASKET



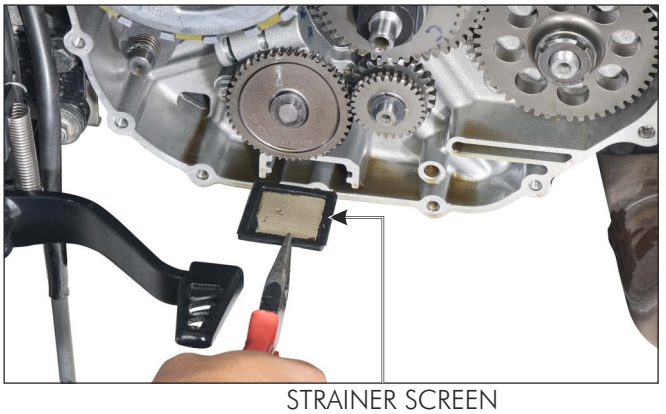
STRAINER SCREEN

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Pull the strainer screen out of the crankcase.

NOTE

Be careful not to damage the oil strainer screen.



STRAINER SCREEN

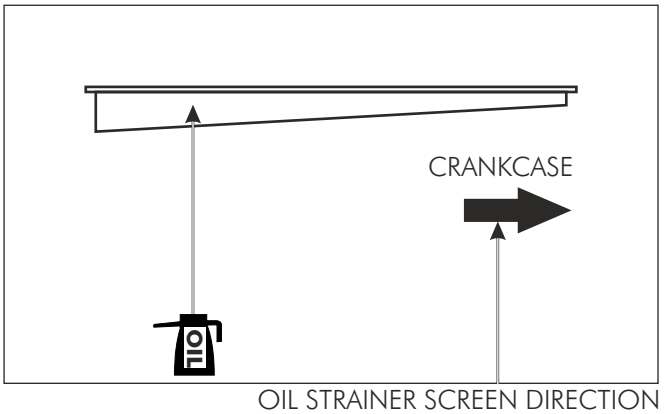
Wash the oil strainer screen thoroughly in nonflammable or high flash point solvent until all accumulated dirt has been removed.

Check the screen and the sealing rubber for damage/ deterioration and replace if necessary.

Blow dry it with compressed air to clean completely.

Coat the oil strainer screen rubber with engine oil.

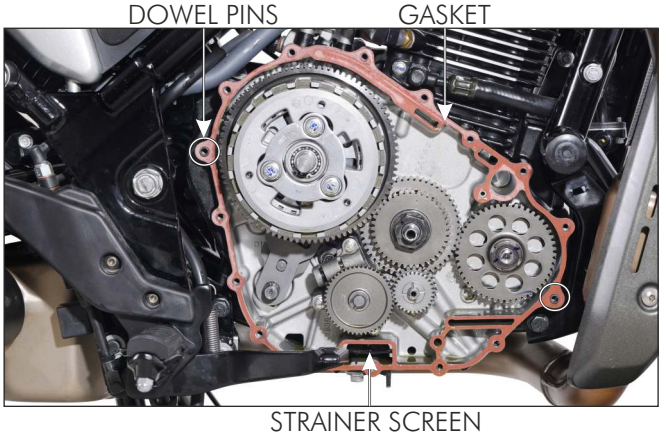
Install the oil strainer screen with the thin sharp edge facing inwards towards the crankcase.



OIL STRAINER SCREEN DIRECTION

Install the dowel pins and new gasket.

Install the right crankcase cover (page 9-7).



Note: *Images may depict a different model/variant, but procedures and information remain same.*

ENGINE OIL FILTER ELEMENT

REMOVAL

NOTE

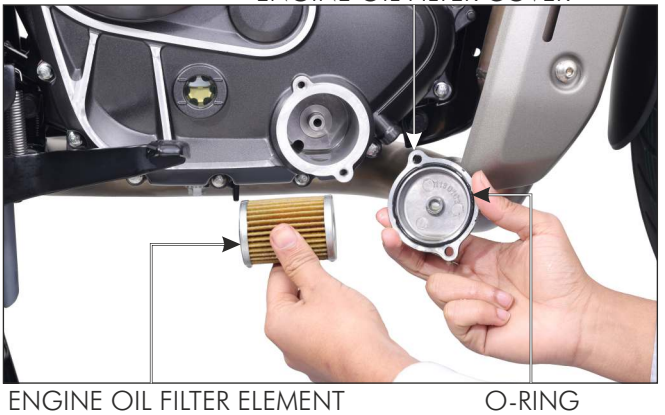
Drain the engine oil thoroughly in case of engine oil filter element replacement.

Remove the mounting bolts (Nos.: 2).

MOUNTING BOLTS

Remove the engine oil filter element cover with O-ring.
Remove the engine oil filter element from the cover.

ENGINE OIL FILTER COVER



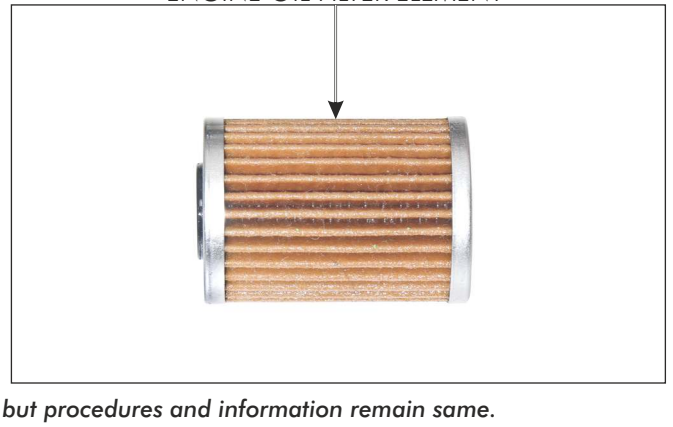
ENGINE OIL FILTER ELEMENT O-RING

Replace the engine oil filter element.

NOTE

- When the engine oil filter element replaced always replace the O-ring with the new one.
- Make sure that gasket is properly seated.
- Apply engine oil on engine oil filter element before installation.
- Inspect and replace engine oil filter element as specified in the maintenance schedule (page 3-3).

ENGINE OIL FILTER ELEMENT



INSTALLATION

Installation is in the reverse order of removal.

Note: *Images may depict a different model/variant, but procedures and information remain same.*

DRIVE CHAIN

⚠ WARNING

Never inspect and adjust the drive chain while the engine is running.

DRIVE CHAIN SLACK INSPECTION

NOTE

Excessive chain slack may damage the frame.

Park the vehicle on its main stand.

Turn "OFF" the ignition switch, shift the transmission into neutral.

Check the slack in the drive chain lower run midway between the sprockets.

Move the drive chain up and down by hand and chain slack should be adjusted to 20-25 mm vertical movement by hand.

Drive Chain Slack: 20-25 mm

Rotate the wheel in reverse direction by hand and check drive chain slack as the wheel rotates. Drive chain slack should remain constant as the wheel rotates. If the chain is loose in one section and tight in another, this could be due to some links getting kinked or binding. Binding can frequently be eliminated by lubrication.

DRIVE CHAIN SLACK

Rotate the rear wheel slowly, inspect the drive chain and sprockets for any of the following conditions.

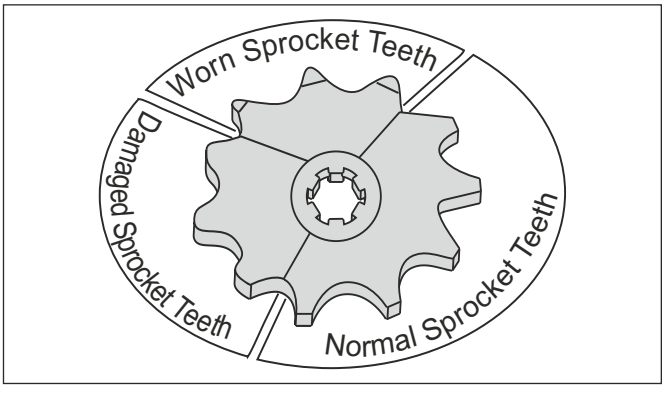
Drive chain

- Damaged rollers
- Loose pins
- Dry or rusted links
- Kinked or binding links
- Excessive wear
- Improper adjustment
- Damaged or missing O-rings

Sprockets

- Excessively worn teeth
- Broken or damaged teeth

If the drive chain has damaged rollers, loose links or missing O-rings, replace it. If the chain is dry or rusted, it should be lubricated.



NOTE

Always replace drive chain (page 3-19), drive sprocket (page 3-24) & driven sprocket (page 14-9) as set, even when a single component is damaged/worn.

ADJUSTMENT

CAUTION

If the adjustment is at the same, the wheel is out of alignment and can cause excessive tyre, sprocket and chain wear.

Park the vehicle on its main stand with the transmission is in neutral and the ignition switch in "OFF" position.

Loosen the rear axle nut.

REAR AXLE

REAR AXLE NUT

Loosen the both adjuster lock nuts.

Turn both adjusting nuts until the correct drive chain slack is obtained. Turn the adjusting nut clockwise to decrease the slack or anticlockwise to increase the slack of the chain.

Make sure the index mark on both adjusters are aligned with the rear edges of the axle slots in the swingarm.

If after adjustment of drive chain slack, axle touches to the rear edge of adjustment slot. Chain kit has to be replaced.

Tighten the rear axle nut to the specified torque.

ADJUSTING NUT

INDEX MARKS LOCK NUT

TORQUE

REAR AXLE NUT: 10.0-12.0 kgf-m

Tighten the both adjusting nuts and lock nuts.

Recheck the drive chain slack and free wheel rotation.

DRIVE CHAIN REMOVAL PROCEDURE

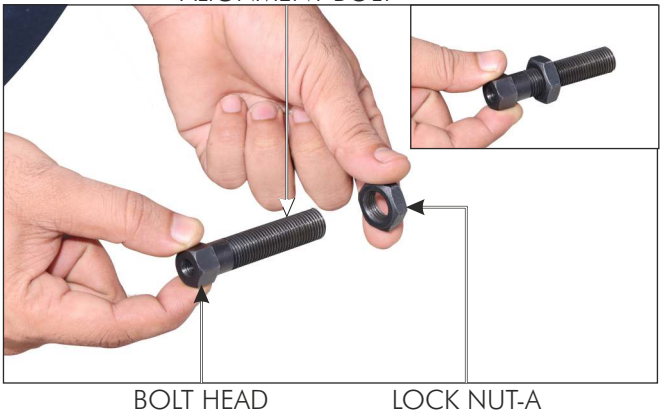
TOOL

DRIVE CHAIN RIVETING TOOL
PART NO: HMCL0423ACRD04

Lubricate alignment bolt threads.

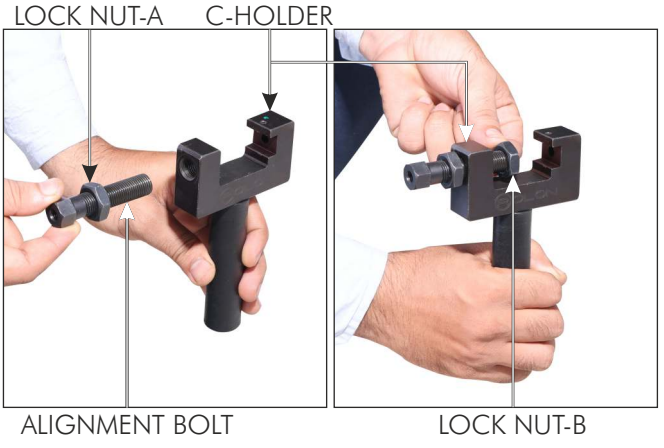
Install lock nut-A on the alignment bolt and bring the nut close to the bolt head.

ALIGNMENT BOLT

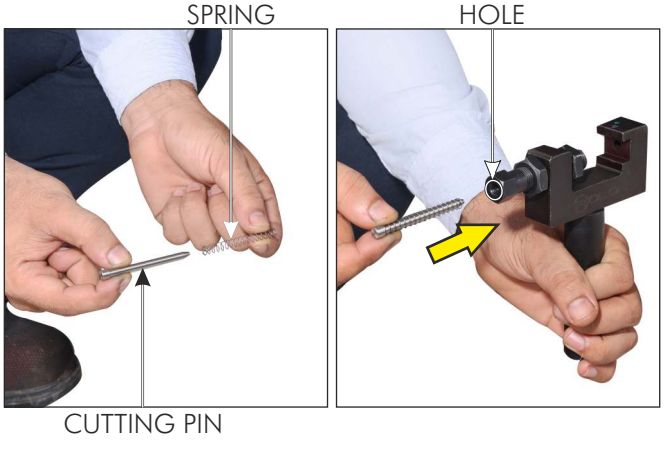


BOLT HEAD LOCK NUT-A

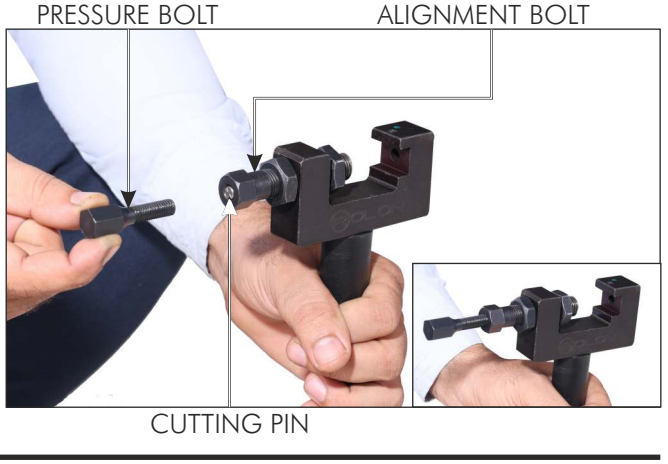
Install alignment bolt into the C-holder keeping lock nut-A outside the C-holder.
Install lock nut-B on the alignment bolt from inside the C-holder.



Install spring on the cutting pin and insert the cutting pin into the hole on the alignment bolt.

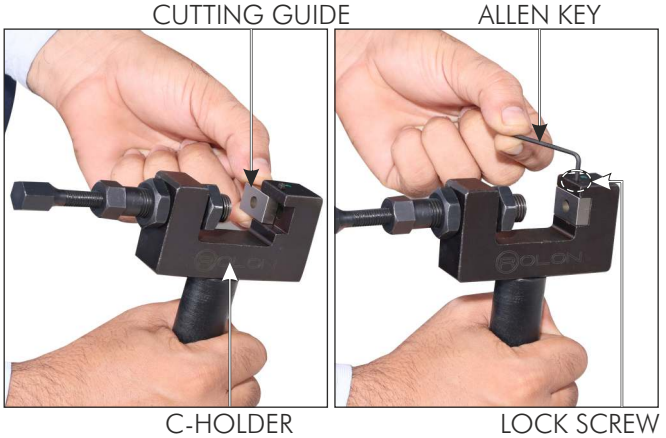


Lubricate pressure bolt threads.
Install the pressure bolt on the alignment bolt to secure the cutting pin.



Install the cutting guide into the C-holder groove by sliding it in from either side.

Tighten the lock screw on top of the groove using the allen key (included in tool kit).



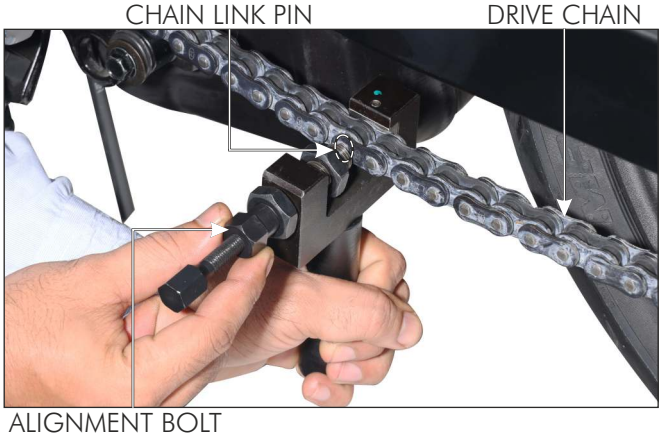
Park vehicle on its main stand, if available, otherwise use a paddock stand.

Loosen the drive chain (page 3-19) to make installation easier.

Position the chain link which is to be removed where chain slack is highest. Ensure sufficient clearance is present on both sides of the chain for using chain riveting tool.

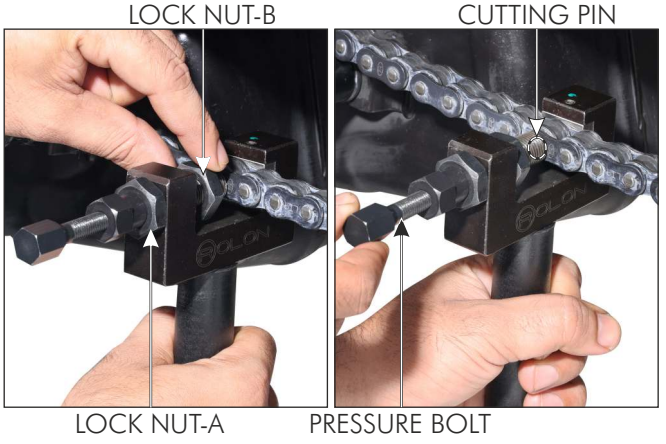
Place the C-holder carefully on the chain link to be removed, keeping the alignment bolt side on the exterior side of vehicle.

Tighten alignment bolt clockwise with hand until it seats itself properly on the pin of chain link.



Tighten lock nut-A and then tighten lock nut-B.

Hand tighten pressure bolt until the cutting pin (inside the alignment bolt) touches the pin on chain link.



Note: *Images may depict a different model/variant, but procedures and information remain same.*

Tighten the pressure bolt to specified torque, then push out the pin link from chain.

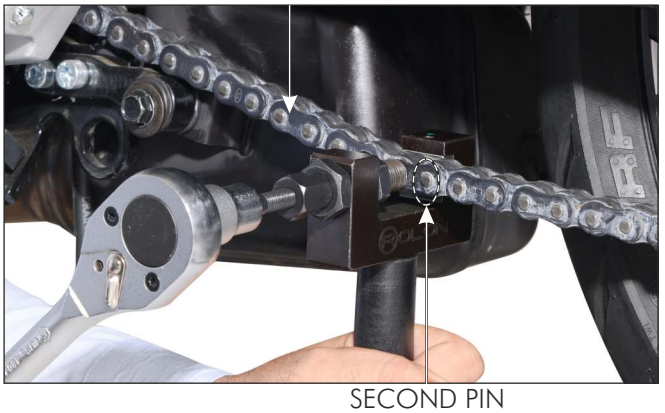
TORQUE

PRESSURE BOLT: 1.5 kgf-m max

Repeat the same process on the second pin of the same chain link and remove it.

Derail the drive chain from vehicle by rotating the rear wheel in reverse direction.

DRIVE CHAIN



SECOND PIN

DRIVE CHAIN INSTALLATION PROCEDURE

Remove the left crankcase rear cover (page 3-24A).

Route one open end of drive chain from the lower side of chain slider, towards the lower end of front sprocket.

Mesh the teeth of front sprocket with chain and bring the chain out from upper side of sprocket.

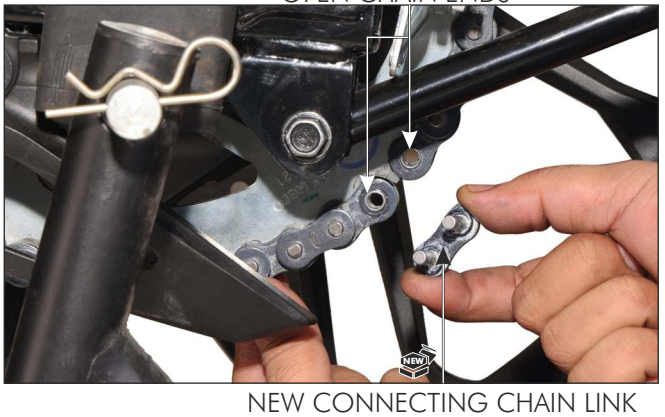
Pull the drive chain and route it over the upper side of chain slider, going towards rear sprocket.

Mesh the teeth of rear sprocket with drive chain, then rotate the rear wheel in reverse direction to bring the open end of drive chain to the position shown below.

Manually mesh the other open end on the lower end of rear sprocket in a way that both open ends are exactly one teeth apart.

Insert new connecting chain link into the two open ends from the inner side of sprocket.

OPEN CHAIN ENDS



NEW CONNECTING CHAIN LINK

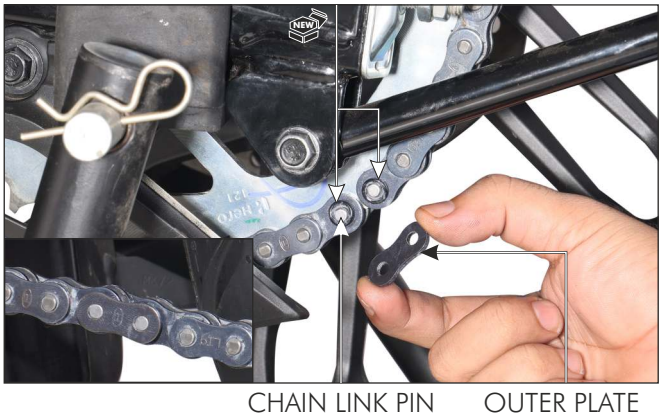
Note: *Images may depict a different model/variant, but procedures and information remain same.*

CAUTION

- Insert the chain link from the back side first as shown in figure.
- Ensure both the pins have new O-rings.
- Ensure that new O-rings are correctly positioned between the plates, and that the plates are adequately lubricated.

Install O-rings on the protruding pins, and then place the outer plate with R mark facing outwards.

O-RINGS



CHAIN LINK PIN OUTER PLATE

Assemble the chain riveting tool using the same steps performed in removal, with gauging pin in place of cutting pin, and bottom guide in place of cutting guide.

Tighten the lock screw on top of the groove using the allen key (included in tool kit).

ALLEN KEY

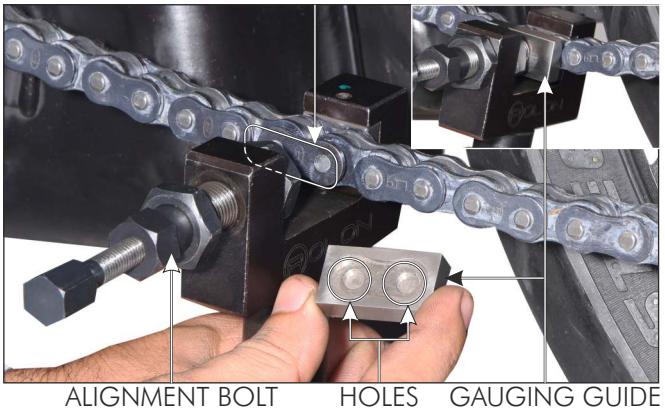
GAUGING PIN

Bring the new chain link to the position where chain slack is highest. Ensure sufficient clearance is present on both sides of the chain for using chain riveting tool.

Place C-holder on new chain link and insert gauging guide between alignment bolt and chain link.

Align holes on the gauging guide with chain link properly.

CHAIN LINK



ALIGNMENT BOLT HOLES GAUGING GUIDE

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Turn alignment bolt clockwise until it touches the gauging guide.

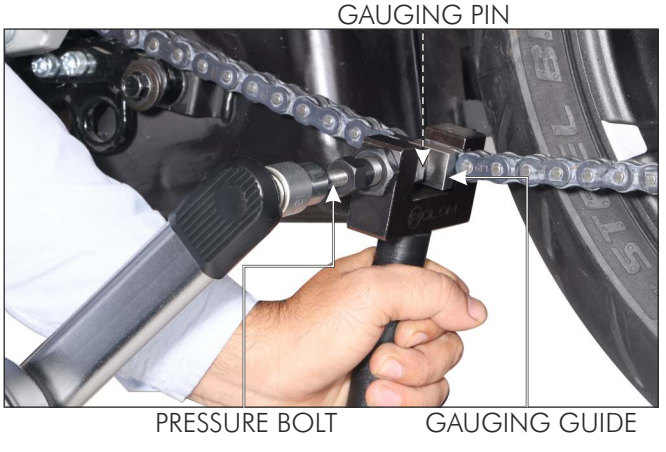
Tighten lock nut-A and then lock nut-B.

Hand tighten pressure bolt until gauging pin (inside the alignment bolt) touches the gauging guide.

Tighten pressure bolt to specified torque.

TORQUE

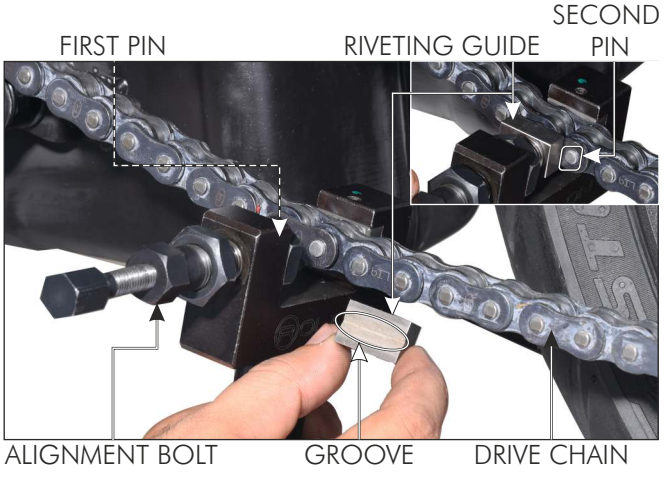
PRESSURE BOLT: 1.5 kgf-m max



Remove the C-holder and gauging guide.

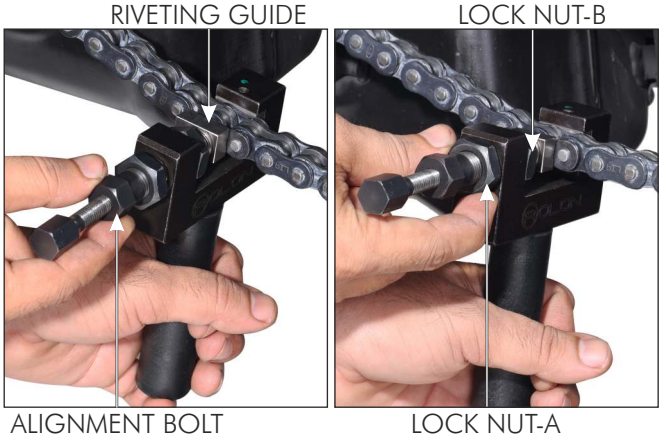
Place C-holder back on the drive chain with sufficient clearance between drive chain and alignment bolt and place the riveting guide in the space.

Align groove on riveting guide with first pin of chain link properly. The guide should not be covering the second pin of the same chain link.



Note: *Images may depict a different model/variant, but procedures and information remain same.*

Tighten alignment bolt clockwise until it touches the riveting guide, then tighten lock nut-A and lock nut-B.



Hand tighten pressure bolt until the gauging pin (inside the alignment bolt) touches the riveting guide.

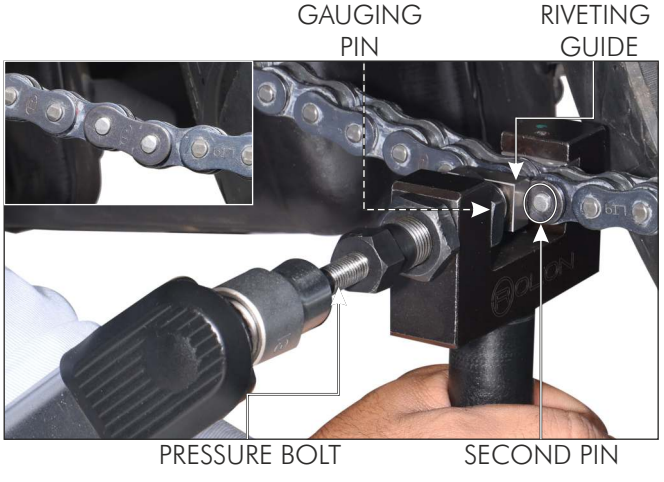
Tighten pressure bolt to specified torque.

TORQUE

PRESSURE BOLT: 2.5 kgf-m max

Remove the C-holder.

Repeat the same process for the second pin of the same chain link.



Rotate rear wheel to bring the newly riveted pins to the shown location on the rear sprocket.

Measure the diameter of riveted pins with vernier as shown. The diameter should be more than 5.25 mm.

NOTE

Always replace drive chain, drive sprocket (page 3-24) & driven sprocket (page 14-9) as set, even when a single component is damaged/worn.

Note: *Images may depict a different model/variant, but procedures and information remain same.*

CHAIN CLEANING AND LUBRICATION PROCEDURE

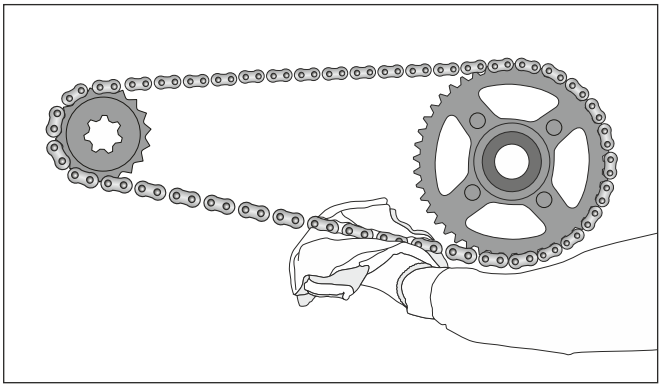
NOTE

Use rubber coated hand gloves while cleaning and lubricating the chain.

CAUTION

Do not use coarse stiff brushes and/or thinner or caustic solvents.

1. Turn the ignition switch "OFF" and park vehicle on its main stand, if available, otherwise use a paddock stand.
2. Wipe the chain with a soft cloth/brush to remove any accumulated dirt.



NOTE

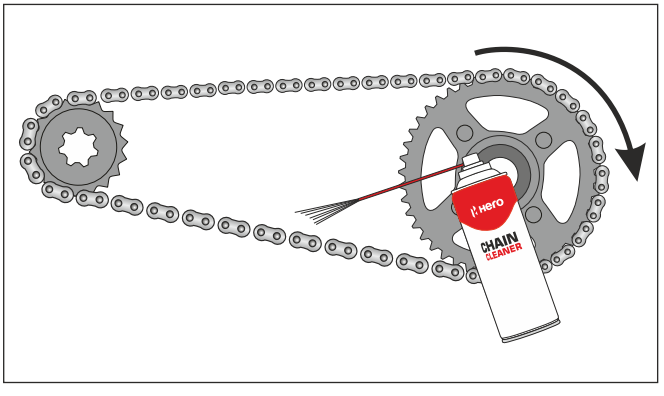
Shake the chain cleaner can well before use.

3. Connect extender tube to the nozzle of chain cleaner can.

⚠ WARNING

Do not direct the spray towards any brake parts. Keep hands away from the sprocket's teeth at all times.

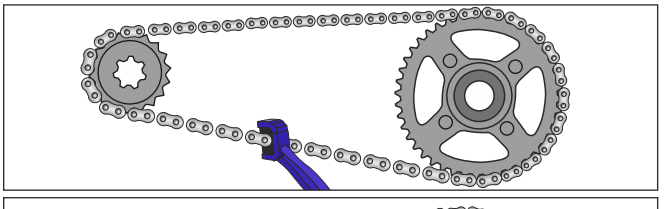
4. While rotating the rear wheel in reverse direction, spray chain cleaner from approximately 6 inches away onto the inner side of the entire chain (slack side), targeting the mid-span area. Wait 2-3 minutes after spraying.

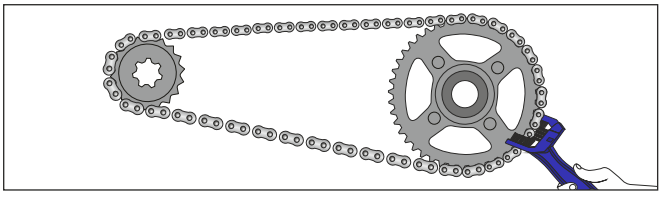


NOTE

Ensure the cleaner reaches all the rollers of the chain.

5. Scrub the chain from all sides with a chain cleaning brush to remove all dirt and grease deposited on the chain.
6. Wipe the chain with a clean and dry cloth to remove any traces of oil and chain cleaner fluid.





NOTE

Shake the chain lube can well before use.

7. Connect extender tube to the nozzle of chain lube can.

⚠ WARNING

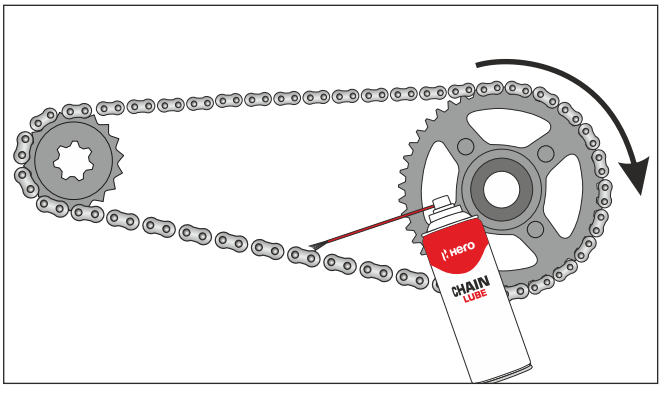
Do not direct the spray towards any brake parts. Keep hands away from the sprocket's teeth at all times.

8. While rotating the rear wheel in reverse direction, spray chain lube onto the inner side of the entire chain (slack side), targeting the mid-span area.

NOTE

Ensure after chain cleaning completely wipe and dry the chain before applying the chain lube.

9. Wait 5-10 minutes after spraying to allow lubricant to penetrate.
10. Wipe off any excess lube using a clean soft cloth, if needed.

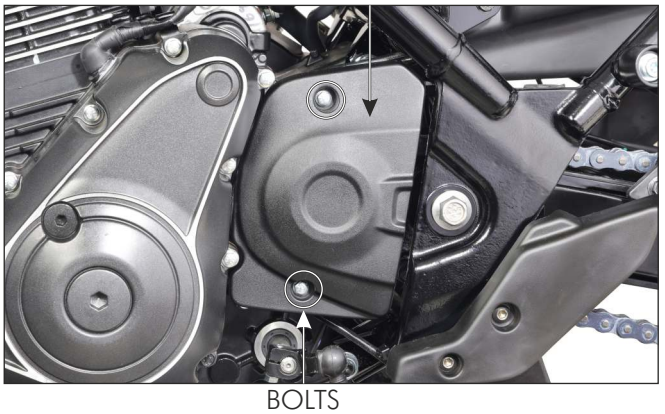


DRIVE CHAIN SLIDER

REMOVAL

Remove the bolts (2 nos.) and the left crankcase rear cover.

LEFT CRANKCASE REAR COVER



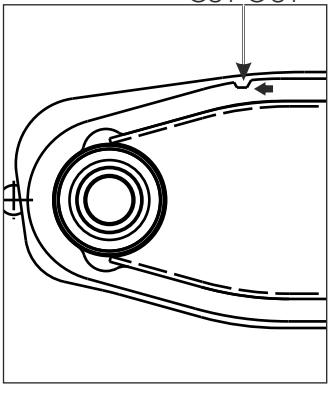
BOLTS

Clean the drive chain slider. Check the chain slider for wear or damage.

The chain slider must be replaced if it is worn till the wear limit cut-out (page 13-22).

CHAIN SLIDER

CUT OUT



INSTALLATION

Installation is in the reverse order of removal.

BATTERY VOLTAGE

It is not necessary to check the battery electrolyte level or add distilled water as the battery is a Maintenance- Free (sealed) type.

Remove the battery cover (page 2-6).

Measure the battery voltage using an MF-Battery Tester.

STANDARD VOLTAGE: 12.4V (Minimum)

For battery charging procedure (page 17-6).

⚠ WARNING

This vehicle is equipped with a Maintenance-Free Battery and can be permanently damaged if the cap sealing strip is removed.

TOOL

TESTER (MF-BATTERY)

PART NO: HMCLCBT062101S

MF BATTERY TESTER

Note: *Images may depict a different model/variant, but procedures and information remain same.*

INTEGRATED START-KILL SWITCH

ELECTRIC STARTER OPERATION

Press the electric starter (⊛) of integrated start-kill switch downwards to start the vehicle.

Check for the operation of electric starter switch for sticky moment.

NOTE

Do not operate electric starter (⊛) of integrated start-kill switch continuously more than 5 seconds as continuous cranking of engine will discharge the battery.

INTEGRATED START-KILL SWITCH

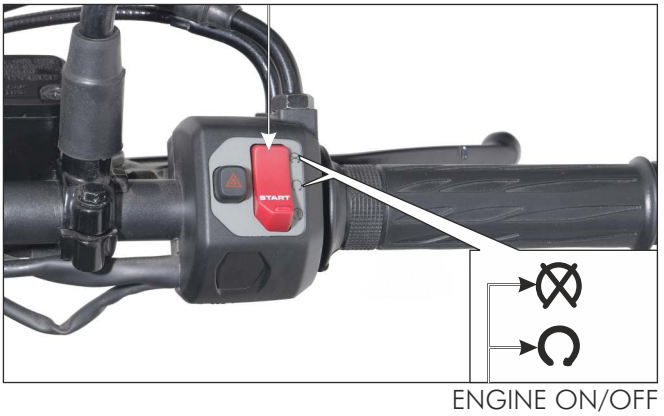
ELECTRIC STARTER

ENGINE STOP SWITCH OPERATION

For engine stop operation integrated start-kill switch has two positions. In "ON" (⊙) position, engine will operate and in "OFF" (⊗) position, engine will not operate. The prime function of it is to stop the engine during emergency (Vehicle tip over, throttle cable stuck etc.). The switch should normally remain in "ON" (⊙) position. During emergency, put the switch to "OFF" (⊗) position.

If the vehicle is stopped with the ignition switch "ON" (⊙) and the engine stop switch "OFF" (⊗), the headlamp, position lamp, tail/stop lamp and licence lamp will still be on, resulting in battery discharge.

INTEGRATED START-KILL SWITCH



ENGINE ON/OFF

BRAKE FLUID

Recommended brake fluid: **DoT 4**

CAUTION

- Do not remove the cover or cap unless the reservoir is in level or else fluid may spill out.
- Do not mix DoT 4 as they are not compatible.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling of fluid on painted, plastic or rubber parts. Place a rug over these parts whenever the system is serviced.

MASTER CYLINDER RESERVOIR

Note: *Images may depict a different model/variant, but procedures and information remain same.*

When the fluid level is low, check the brake pads for wear (page 3-26).

A low fluid level may be due to wear of the brake pads.

If brake pads are worn, the caliper piston is pushed out, and this accounts for low reservoir level. If the brake pads are not worn and the fluid level is low, check the entire system for leaks.

FRONT BRAKE

Turn the handlebar so that the reservoir is in level and check the front brake reservoir level through the sight glass. If the level is near mark, check the brake pad wear (page 3-26).

To top up the brake fluid, remove the cover, set plate and diaphragm and fill the reservoir to the casting edge with DoT 4 brake fluid from a sealed container.

NOTE

Replace brake fluid once in every 2 years or 30000 km, whichever is earlier.

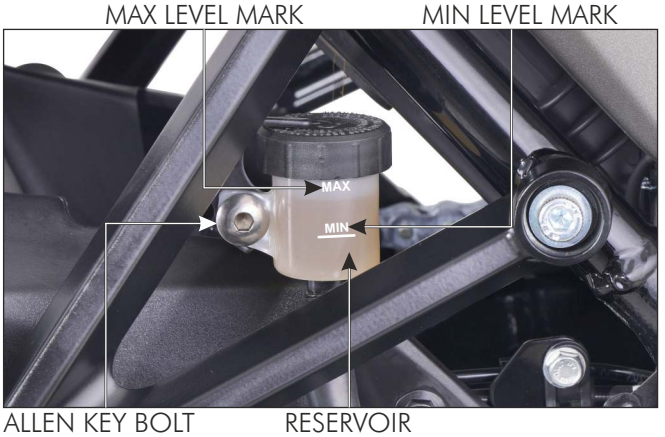
REAR BRAKE

Park the vehicle on a level surface and support it an upright position.

Check the rear brake fluid level.

If the level is near the lower level line, check the brake pad wear.

To top up the brake fluid, remove the bolt and unmount the rear brake reservoir.



Note: *Images may depict a different model/variant, but procedures and information remain same.*

Remove the cover, set plate and diaphragm and fill the reservoir with DoT 4 brake fluid from a sealed container.

BRAKE PAD WEAR

FRONT BRAKE PADS

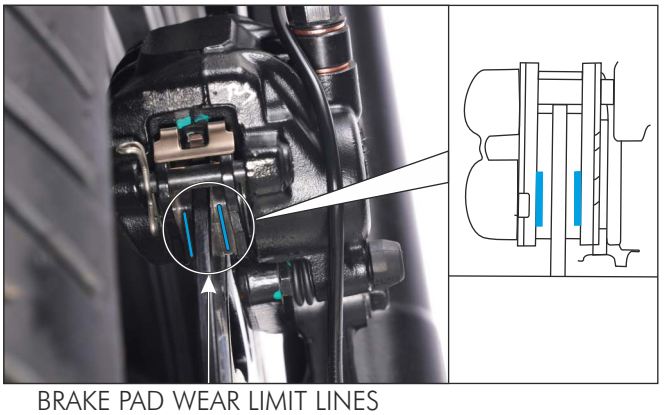
Check the brake pads for wear.

Replace the brake pads if either pad is worn to the bottom of wear limit line.

Brake pad replacement (page 16-10).

CAUTION

Always replace the brake pads in pairs to assure even pressure is applied on disc.



BRAKE PAD WEAR LIMIT LINES

REAR BRAKE PADS

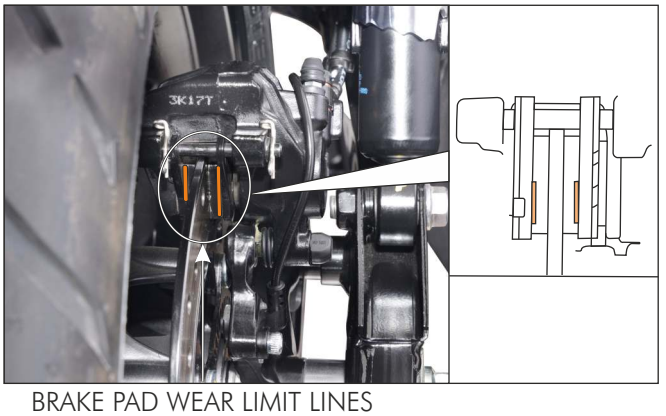
Check the brake pads for wear.

Replace the brake pads if either pad is worn to the bottom of wear limit line.

Brake pad replacement (page 16-10).

CAUTION

Always replace the brake pads in pairs to assure even pressure is applied on disc.



BRAKE PAD WEAR LIMIT LINES

Note: *Images may depict a different model/variant, but procedures and information remain same.*

BRAKE SYSTEM

INSPECTION

FRONT BRAKE HOSE

Firmly apply the brake lever and check that no air has entered the system.

If the brake lever feels soft or spongy when operated, bleed the air from the system (page 16-4).

Inspect the brake hose and fittings for deterioration, cracks and signs of leakage.

Tighten any loose fittings.

Replace hoses and fittings as required.

For brake air bleeding (page 16-4).

FRONT BRAKE HOSE

REAR BRAKE HOSE

Firmly apply the brake pedal and check that no air has entered the system.

If the brake pedal feels soft or spongy when operated, bleed the air from the system (page 16-5).

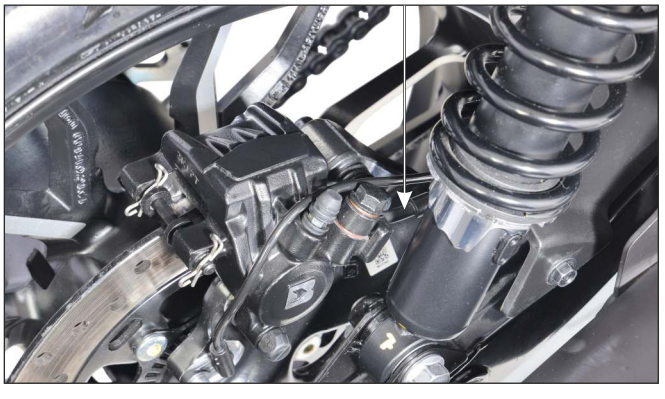
Inspect the brake hose and fittings for deterioration, cracks and signs of leakage.

Tighten any loose fittings.

Replace hoses and fittings as required.

For brake air bleeding (page 16-5).

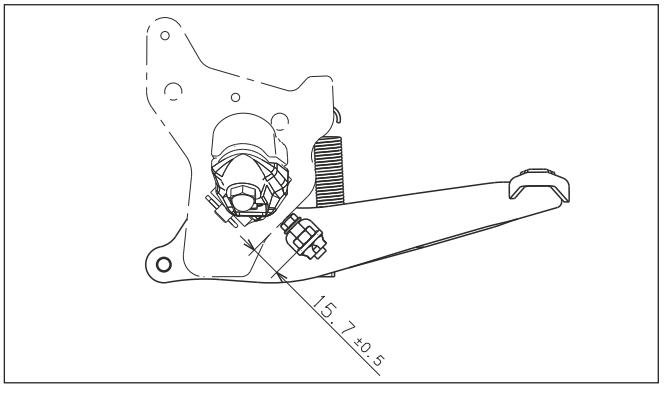
REAR BRAKE HOSE



BRAKE PEDAL HEIGHT ADJUSTMENT

Loosen the lock nut and turn the push rod until the correct pedal height is obtained.

Adjust the push rod length so that the distance between the center of the master cylinder lower mounting bolt hole and joint pin hole is 15.7±0.5 mm. After adjustment, tighten the lock nut.

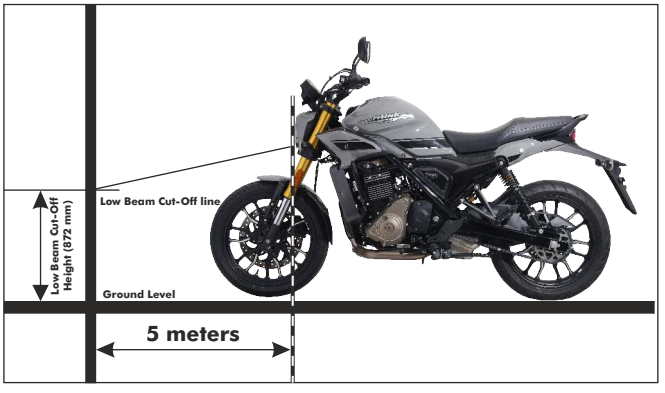


HEADLAMP FOCUS

⚠ WARNING

An improperly adjusted headlamp may blind oncoming drivers, or it may fail to illuminate the road to a safe distance.

1. Line up the vehicle on a level ground perpendicular to a wall or any screen with rider sitting on the vehicle.
2. The distance of the wall should be 5 meters from the vehicle's headlamp.
3. A dark environment is preferred to make the headlamp focus adjustment.
4. Remove any luggage or additional weight from the vehicle and also ensure that the pressure in all the tyres is as per the specification.
5. Make a mark on the wall using a masking tape at a height of 872 mm from the ground.



6. Turn on the headlamp low beam and align its top edge (or low beam cut off line) with a marking done on the wall.
7. To adjust the low beam cut-off height, adjust the headlamp beam by loosening or tightening the bolt located behind the headlamp assembly for correct focus adjustment.

ADJUSTING BOLT

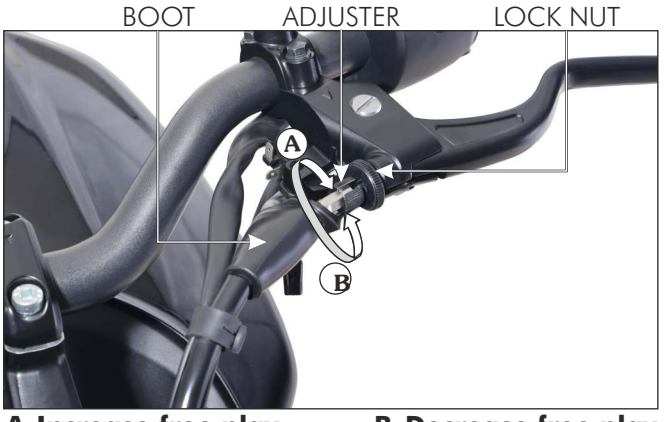
CLUTCH SYSTEM

Measure the clutch lever free play at the end of the lever.

FREE PLAY: 10-15mm

Adjustments are made by adjusting the nut of the clutch cable mounted at the clutch lever end or engine end.

To adjust the free play at the clutch lever end, slide the boot backwards and then loosen the lock nut. Turn the adjuster towards direction "A" or "B" to adjust free play. After adjustment, tighten the lock nut and slide the boot on the adjuster and lock nut securely.

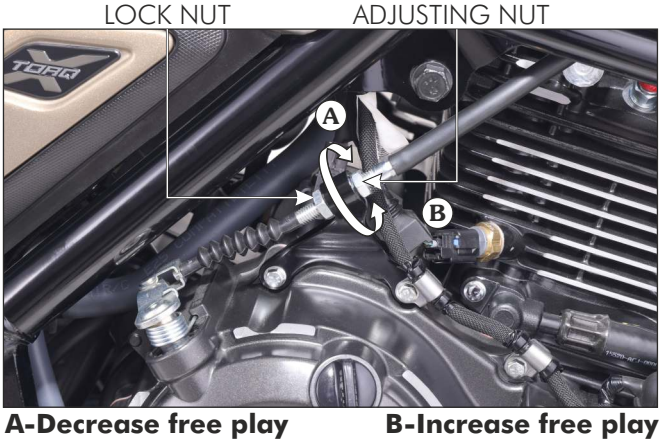


A-Increase free play **B-Decrease free play**

To adjust the free play at engine end, loosen the lock nut. Turn the adjusting nut towards direction "A" or "B" to obtain the specified free play. After the adjustment is complete, tighten the lock nut and check the adjustment. If the proper free play cannot be obtained, or the clutch slips during the drive, disassemble and inspect the clutch.

NOTE

- Check the cable routing and any signs of cable damage that could cause improper clutch operation.
- Perform clutch lever free play adjustment at engine end, if the specified clutch lever play is not obtained at lever end.



A-Decrease free play **B-Increase free play**

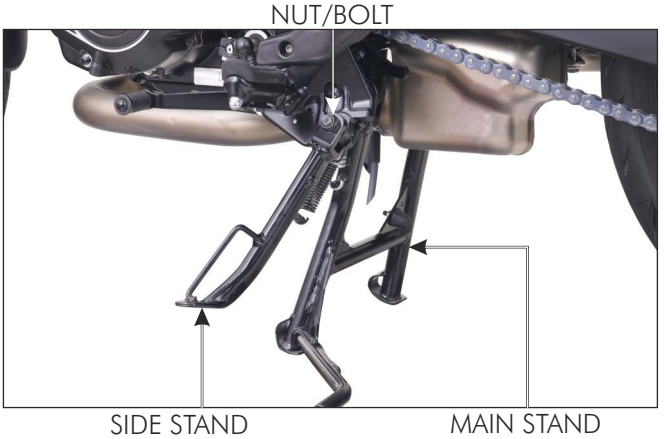
SIDE STAND/MAIN STAND

Support the vehicle on the level surface.

Check the side/main stand return spring for damage or loss of tension.

Check the side/main stand for freedom of movement. Lubricate the side stand pivot with grease if necessary.

Make sure the side stand is not bend.



Note: *Images may depict a different model/variant, but procedures and information remain same.*

SIDE STAND SWITCH

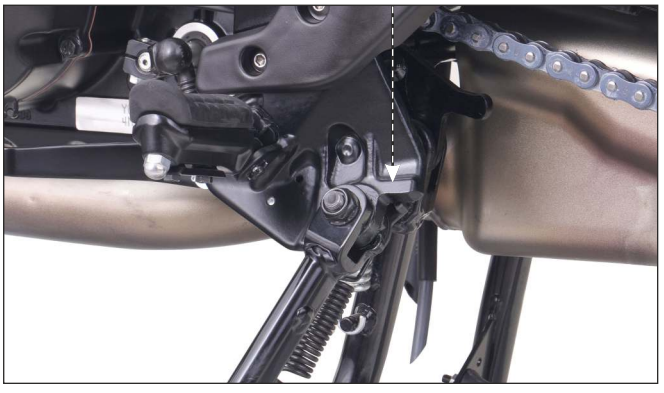
A side stand switch is provided on the side stand, if the side stand is put down (ignition switch "ON"), the side stand indicator on the speedometer console glows.

Inspect the side stand switch for any wear or physical damage. Clean the side stand switch periodically as per the maintenance schedule.

CAUTION

Never remove the side stand switch from its mounting for cleaning.

SIDE STAND SWITCH



SUSPENSION

⚠ WARNING

Loose, worn, or damaged suspension parts impair vehicle stability and control. Repair or replace any damaged components before riding. Riding a vehicle with faulty suspension increases your risk of an accident and possible injury.

FRONT

Check the action of the forks by applying the front brakes and compressing the front suspension several times.

Check the entire fork assembly for signs of leaks, scratches, damage or loose fasteners.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

REAR

Support the vehicle securely and raise the rear wheel off the ground.

Check for worn swingarm needle bearing by grabbing the rear wheel and attempting to move the wheel side to side.

Replace the bearing, if found defective.

Check the action of the shock absorbers by compressing them several times.

Check the entire shock absorber assembly for signs of leaks, damage or loose fasteners.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

NOTE

Rear suspension adjustment should be done as per maintenance schedule.

NUTS, BOLTS, FASTENERS

Tighten bolts and nuts at regular interval shown in the maintenance schedule.

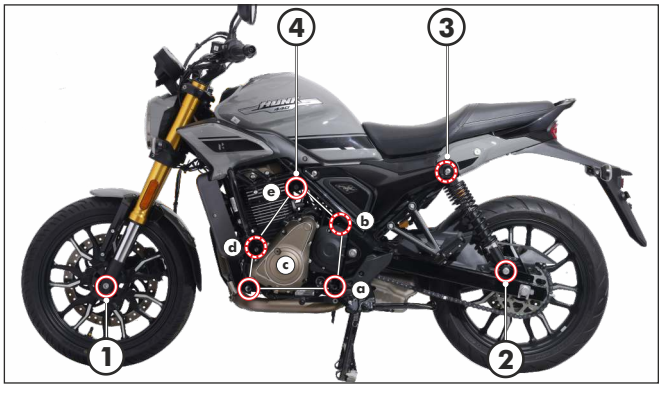
Check that all chassis nuts and bolts are tightened to correct torque values:

1. Front axle- 6.8 kgf-m
2. Lower shock absorber mounting bolt- 5.5 kgf-m
3. Upper shock absorber mounting bolt- 5.0 kgf-m
4. Engine mounting bolts - 5.4 kgf-m (Sequence from a to f)
5. Steering stem nut- 10.0 kgf-m
6. Swingarm pivot nut- 6.0 kgf-m
7. Rear axle nut- 11.0 kgf-m

Other critical nut & bolts.

For all torque values refer (page 1-18 to 1-21).

Check that all cotter pins, slip pins, hose clamps and cable stays are in place.



WHEELS/TYRES

Make sure the fork is not allowed to move, raise the front wheel and check for play. Turn the wheel and check that it rotates smoothly with no unusual noise.

If faults are found, inspect the wheel bearings.

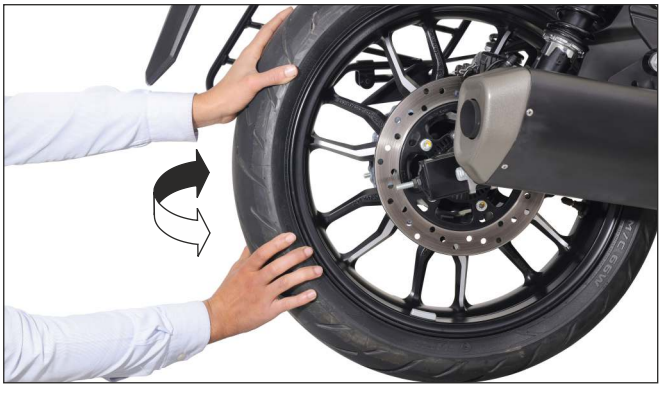
Support the vehicle securely and raise the rear wheel off the ground.

Check for play in either the wheel or the swing arm pivot. Turn the wheel and check that it rotates smoothly with no unusual noise.

If abnormal conditions are suspected, check the rear wheel bearings.

NOTE

As the swing arm pivot is included in this check, be sure to confirm the location of the play; i.e. from the wheel bearings or the swing arm pivot.



Check and adjust the tyre pressure

NOTE

The tyre pressure should be checked when the tyres are **"COLD"**.

Cold tyre pressure kgf/cm²	Front	Rear
Rider only	(27 psi)	(29 psi)
Rider & pilliion	(27 psi)	(29 psi)

AIR PRESSURE GAUGE

Check the tyre treads and side wall for cuts, imbedded nails, or other damage.

Measure the tread depth at the centre of tyre. Replace the tyre when the tread depth reaches the following limits:

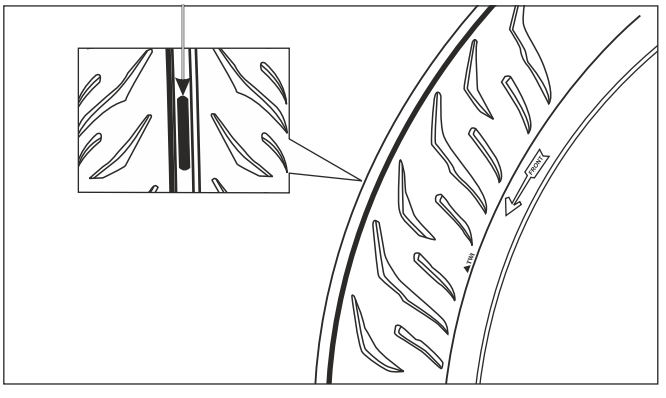
RECOMMENDED MINIMUM CENTER TYRE TREAD DEPTH

FRONT: 0.8 mm

REAR: 0.8 mm

Tyre wear indicators are distributed at several locations around the tyre for easy inspection. Replace tyres immediately when the tyre wear indicator contacts the road.

TYRE WEAR INDICATOR



STEERING HEAD BEARINGS

NOTE

Check that the control cables do not interfere with the handlebar rotation.

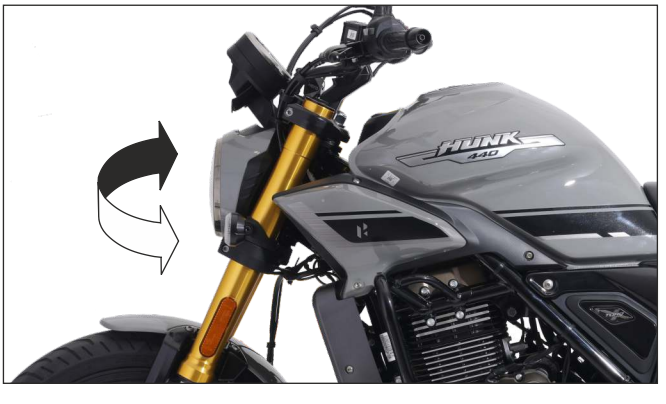
For lubrication process refer (**Section-1**)

Raise the front wheel off the ground by placing a jack or other support under the engine.

Check that the handlebar rotates freely from side to side. If the handlebar moves unevenly, binds, or has play, inspect and adjust the steering head bearings.

If the operation is not smooth check for any interference of cable or wiring harness.

Check for misalignment of front wheel with respect to handlebar.



EXHAUST EMISSION

MEASUREMENT AT IDLE

1. Check the following items before inspection;
   - Air cleaner
   - Spark plug
   - Engine breather hose
2. Warm up the engine to the normal operating temperature (Engine oil temperature: Approx 80°C).
3. Park the vehicle on the main stand on a level surface.
4. Seal the muffler drain hole using the sealing tape.
5. Connect an appropriate pipe or hose (heat resistant, chemical resistant) to the muffler so that the probe can be inserted by more than 30 cm (12 inch).
6. Measure the CO% and RPM with exhaust gas analyzer.
7. Check the engine idle speed.

Idle speed: 1600±100/min (cold condition) & 1300±100 r/min (hot condition)

8. Insert the probe into the muffler and measure the carbon monoxide (CO%) concentration.

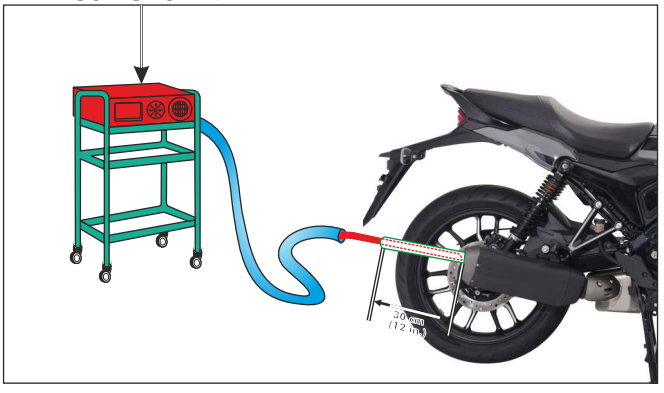
CO Measurement at idle: 0.5%

HC Measurment at idle: 500 ppm

NOTE

Sealing tape for drain hole must be removed after idle check.

EXHAUST GAS ANALYZER



EVAPORATIVE EMISSION CONTROL SYSTEM

Remove the side covers (page 2-14 & 2-16).

Remove the fuel tank (page 2-12).

Inspect the hoses for deterioration, damage or loose connections and canister for cracks or other damages.

Inspect the system as described in the maintenance schedule (page 3-3).

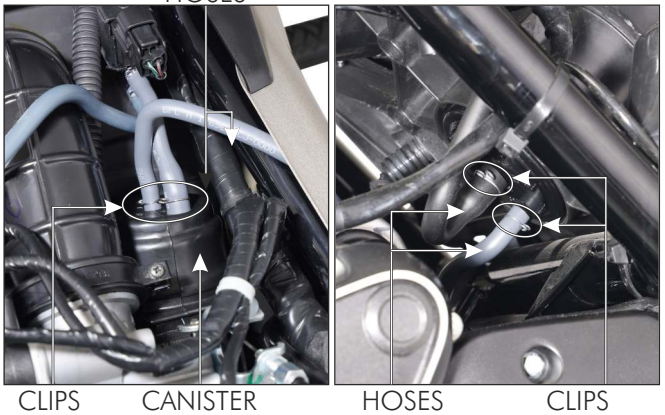
NOTE

- Reinstall the clips or hoses properly.
- Route the hose pipes and ensure the hose pipes are not pinched/kincked.

Install the fuel tank (page 2-14).

Install the side covers (page 2-15 & 2-17).

HOSES



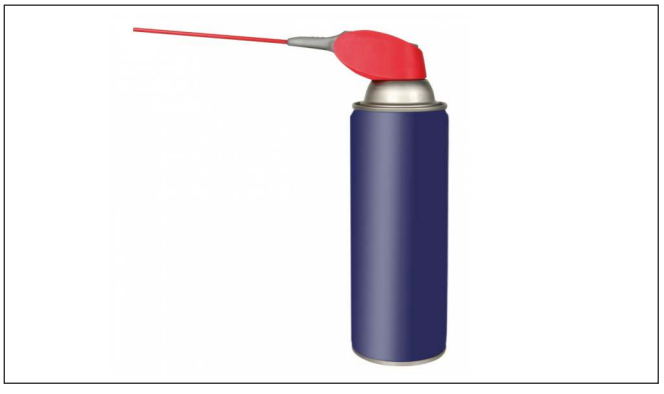
CLIPS CANISTER HOSES CLIPS

SERVICING AND CLEANING PROCESS

In some conditions, key insertion & removal and fuel tank cap lid operation might get slightly hard due to entry of dust particles and water. In such cases, servicing and cleaning is required with anti-rust spray. Servicing and cleaning procedures are given as:

Guidelines:

- Hard or sticky insertion or withdrawl of key.
- Anti-rust should be used as per requirement not on regular interval.



IGNITION SWITCH / FUEL TANK CAP LID

Nozzle pipe of the Anti-rust spray bottle should be fitted into the chamber properly.

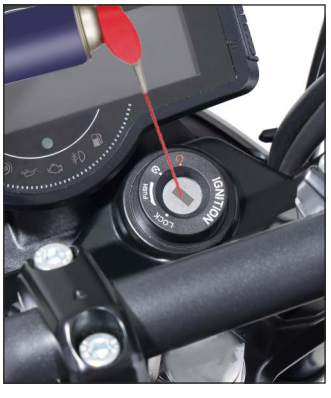
Insert the nozzle pipe into the ignition switch or fuel tank cap lid as shown in image.

Spray the anti-rust (2-3 ml or 4-5 drops approx.).

Insert the ignition key or open the fuel tank cap lid at least five times after the spray to check the operation.

NOTE

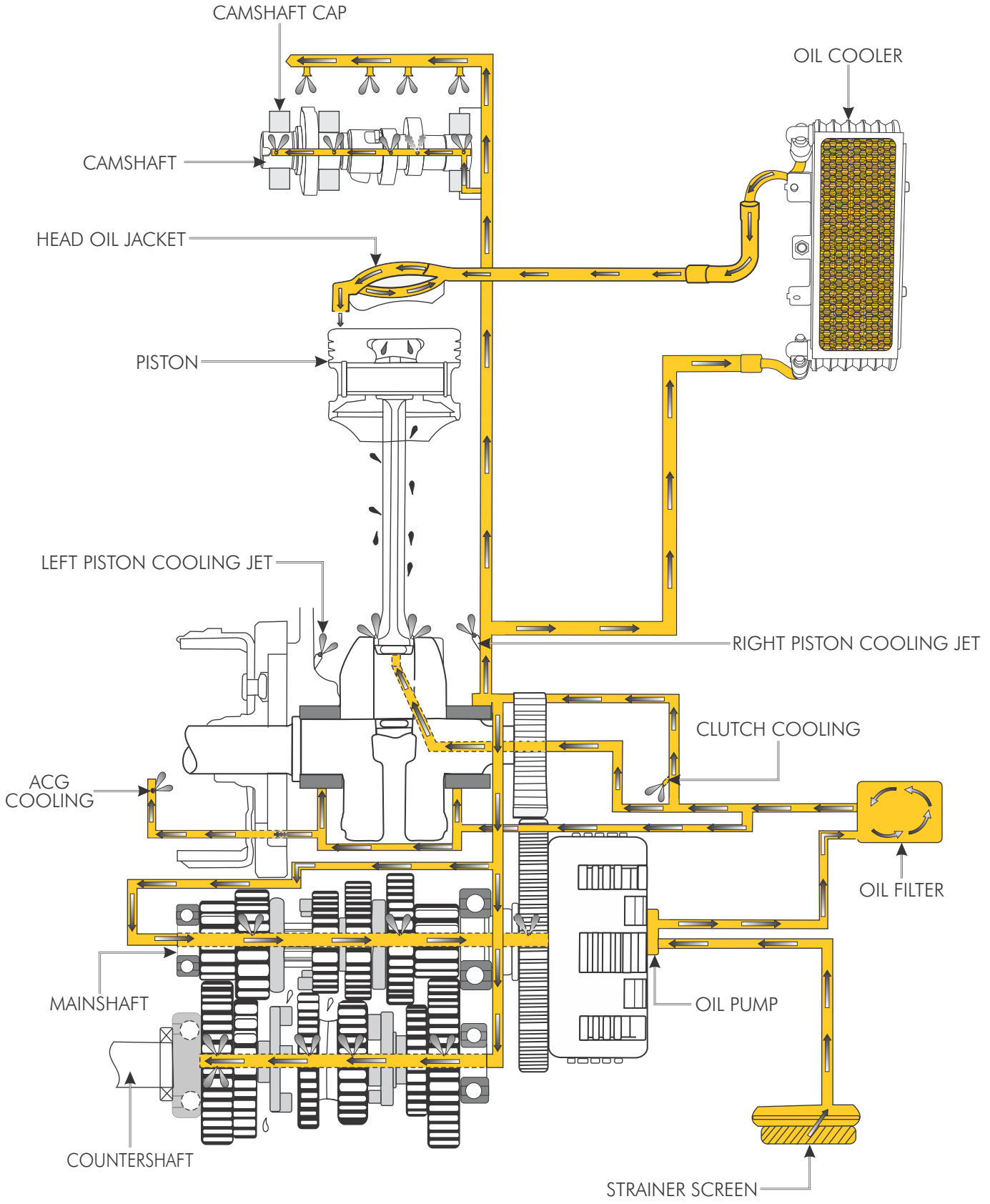
Do not over flow the anti-rust spray.



NOTE

SOME IMAGES IN THIS MANUAL MAY COME FROM DIFFERENT MODEL/VARIANT THAN THE ONE COVERED BY THIS MANUAL. NEVERTHELESS, THE IMAGES REMAIN ACCURATE AND APPLICABLE FOR THE SPECIFIC TASK OR INFORMATION PRESENT IN THE ACCOMPANYING TEXT. WHILE CERTAIN COMPONENTS IN THE IMAGES MAY APPEAR DIFFERENT, THEY DON'T AFFECT THE STEPS, TOOLS, OR SAFETY PRECAUTIONS FOR THE TASKS DESCRIBED.

SYSTEM DIAGRAM



LUBRICATION SYSTEM

SERVICE INFORMATION

GENERAL

⚠ WARNING

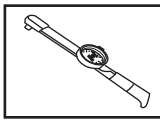
- Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged period. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.
- If the engine is running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that can cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

- This section covers service of the oil pump.
- The oil pump can be serviced with the engine installed on the frame.
- The service procedure in the section must be performed with the engine oil drained.
- Always lubricate the oil pump components with clean engine oil before assembling the oil pump.
- When removing and installing the oil pump, care to be taken to avoid dust or dirt entry into the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.

SPECIFICATIONS

LUBRICATION SYSTEM

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	2.25 litres	-
	At disassembly	2.6 litres	-
Recommended engine oil		BRAND: Hero Xotic+ GRADE: 100% Synthetic SAE 15W 50 Manufactured by : Indian Oil Corporation Limited. Savita Oil Technologies Limited.	-
Oil pump	Outer rotor-body clearance	0.085-0.185 mm	0.25 mm
	Rotor tip clearance	0.05-0.17 mm	0.20 mm
	Pump end clearance	0.03-0.10 mm	0.15 mm
Oil Pressure at Oil Pressure Switch (measured by Oil Pressure Gauge)		@ Idle speed:1700±100mbar (30±5°C) @ 4000 r/min :1750±100mbar (30±5°C)	
		@ Idle speed:750±100mbar (60±5°C) @ 4000 r/min :1200±100mbar (60±5°C)	



TORQUE VALUES

OIL PUMP BOLT	**: 0.8-1.2 kgf-m**
OIL COOLER HOSES BOLTS BOLT (OIL COOLER SIDE)	**: 1.0-1.4 kgf-m**

For other nuts, bolts, fasteners etc. refer the standard torque values (SECTION-1).

TOOL	SPECIAL TOOLS
	**OIL PRESSURE GAUGE** **HMCL0423ACAA09**

TROUBLESHOOTING

Oil level too low
- External oil leaks
- Worn valve guide or seal
- Worn piston rings or cylinder

Oil contamination
- Oil not changed periodically
- Faulty cylinder head gasket
- Worn piston rings
- Air cleaner element not cleaned periodically

Low oil pressure
- Oil level low
- Clogged oil strainer
- Internal oil leak
- Incorrect engine oil grade being used

No oil pressure
- Oil level too low
- Internal oil leaks
- Damaged oil pump

OIL PUMP

REMOVAL

NOTE

Oil pump can be removed with engine on frame.

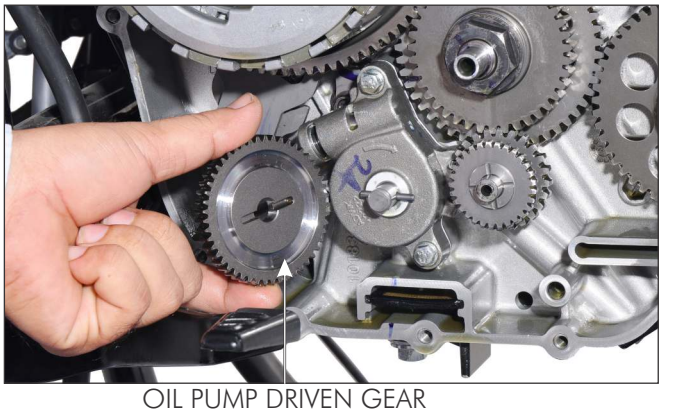
Remove the right crankcase cover (page 9-3).

Remove the oil pump driven gear circlip and washer.

CIRCLIP

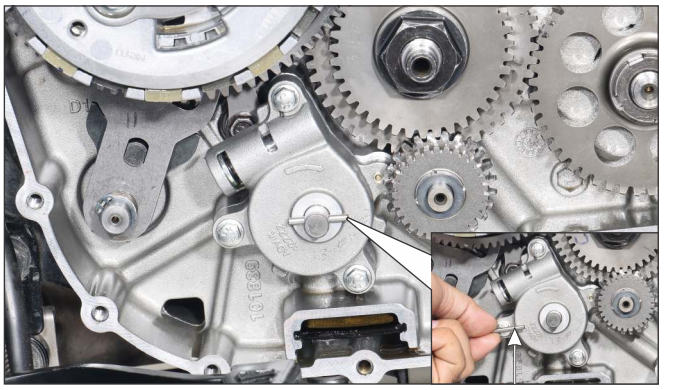
WASHER

Remove the oil pump driven gear.



OIL PUMP DRIVEN GEAR

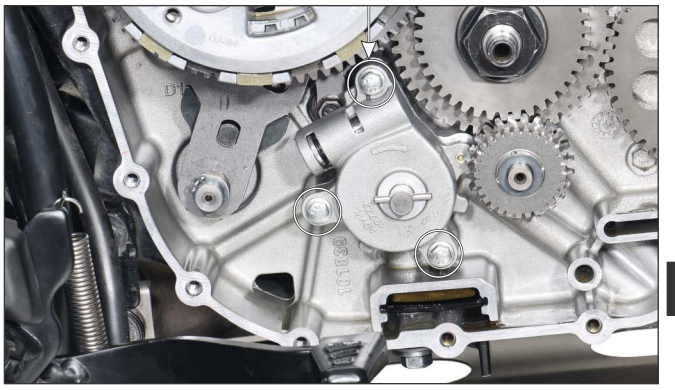
Remove the oil pump roller pin.



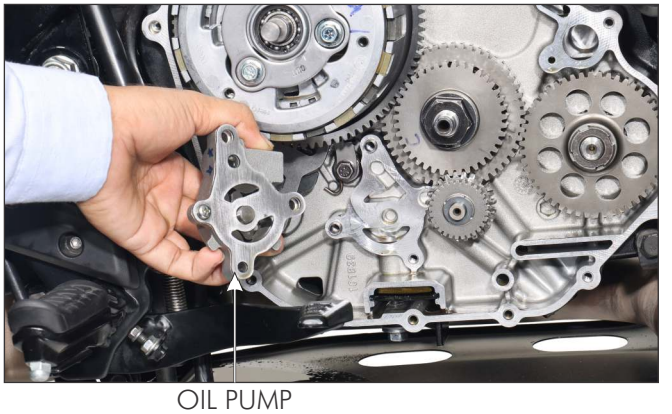
ROLLER PIN

Remove the oil pump mounting bolts (Nos.: 3, Size: 8 mm).

OIL PUMP MOUNTING BOLTS



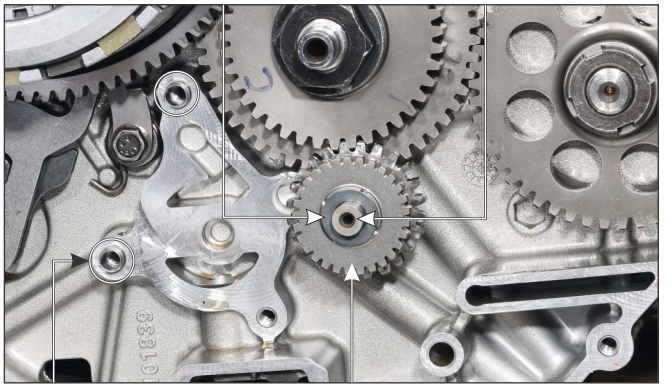
Remove the oil pump.



OIL PUMP

Remove the dowel pins.
Remove the oil pump idler gear washer.
Remove the oil pump idler gear.
Remove the oil pump idler gear shaft.

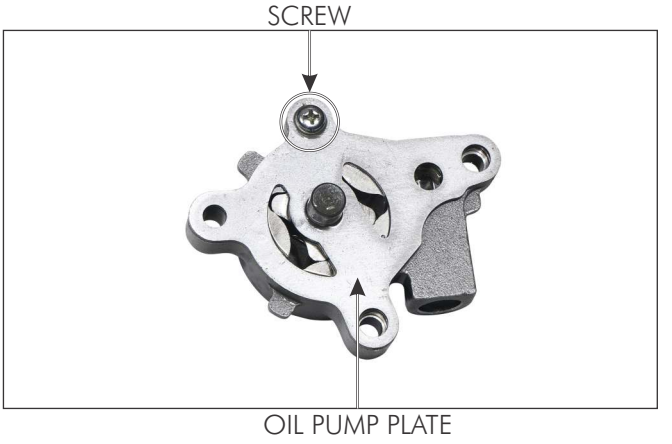
WASHER OIL PUMP IDLER GEAR SHAFT



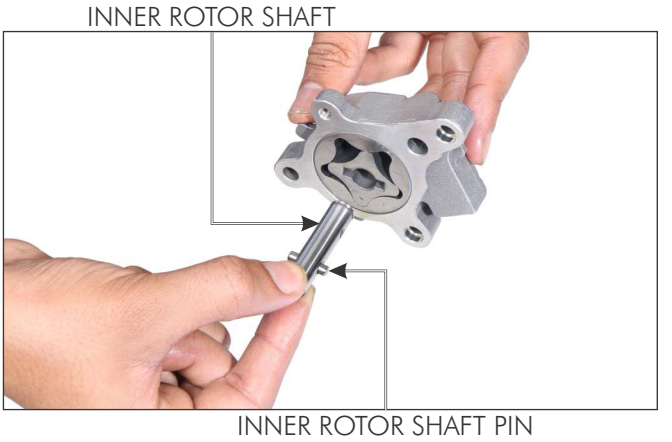
DOWEL PINS OIL PUMP IDLER GEAR

DISASSEMBLY

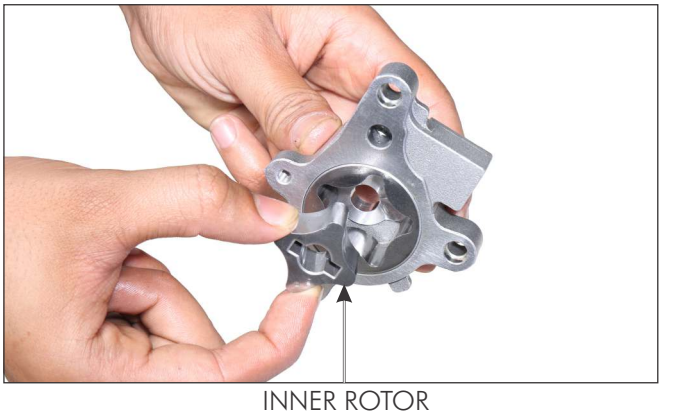
Remove the oil pump plate by removing the screw.



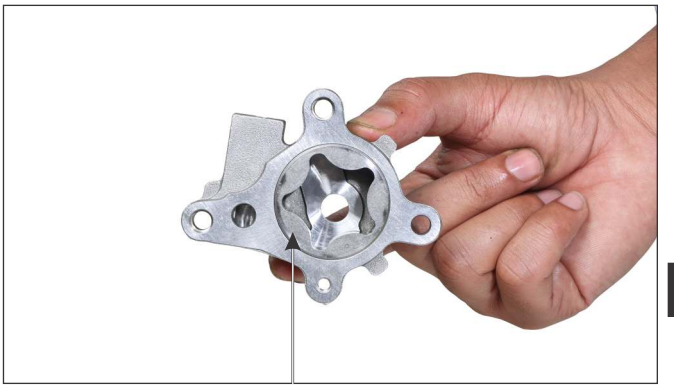
Remove the oil pump inner rotor shaft with rotor shaft pin.
Remove the rotor shaft pin from the rotor shaft.



Remove the oil pump inner rotor.



Remove the oil pump outer rotor.

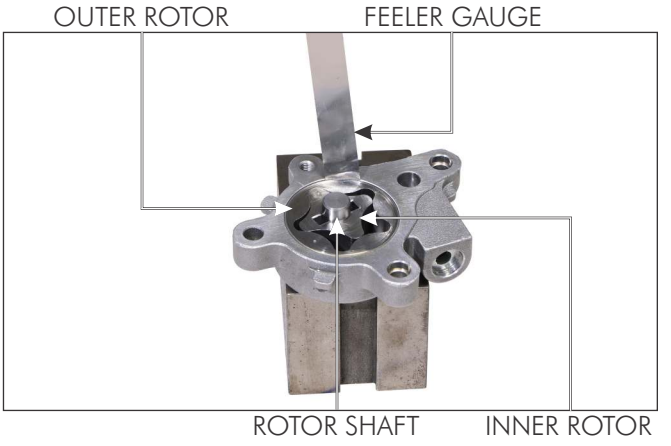


INSPECTION

Install the outer rotor, rotor shaft and inner rotor into the oil pump body and measure the clearance between outer rotor and oil pump body.

SERVICE LIMIT

OIL PUMP BODY CLEARANCE: 0.25 mm



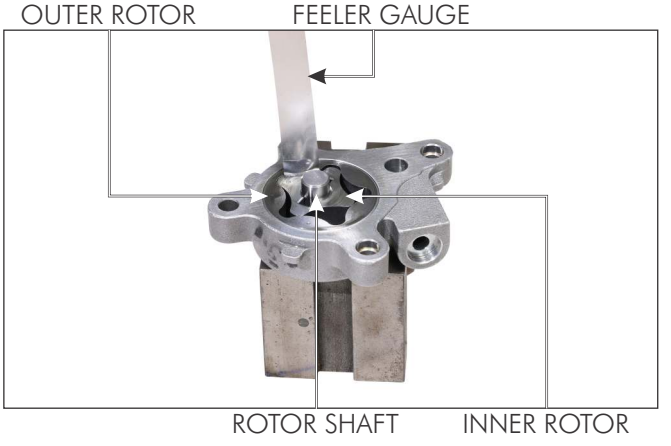
Measure the rotor tip clearance between the inner and outer rotors.

SERVICE LIMIT

ROTOR TIP CLEARANCE: 0.20 mm

NOTE

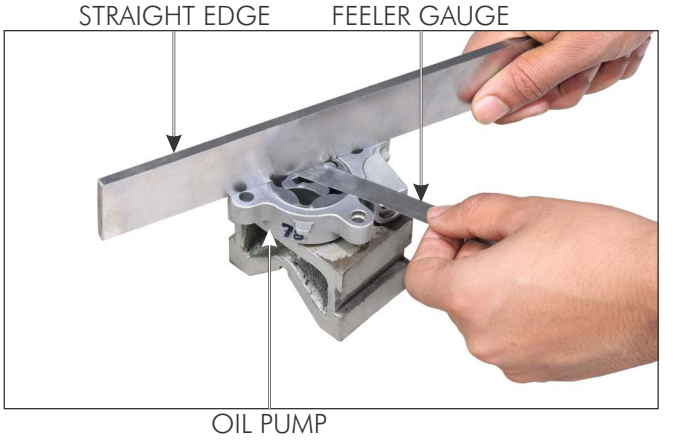
- Measure the clearance at several places and use the largest reading to compare with the service limit.
- If any portion of the oil pump is worn beyond the specified service limit, replace the oil pump and pump cover as an assembly.



Remove the rotor shaft.
Measure the pump end clearance using a straight edge and feeler gauge.

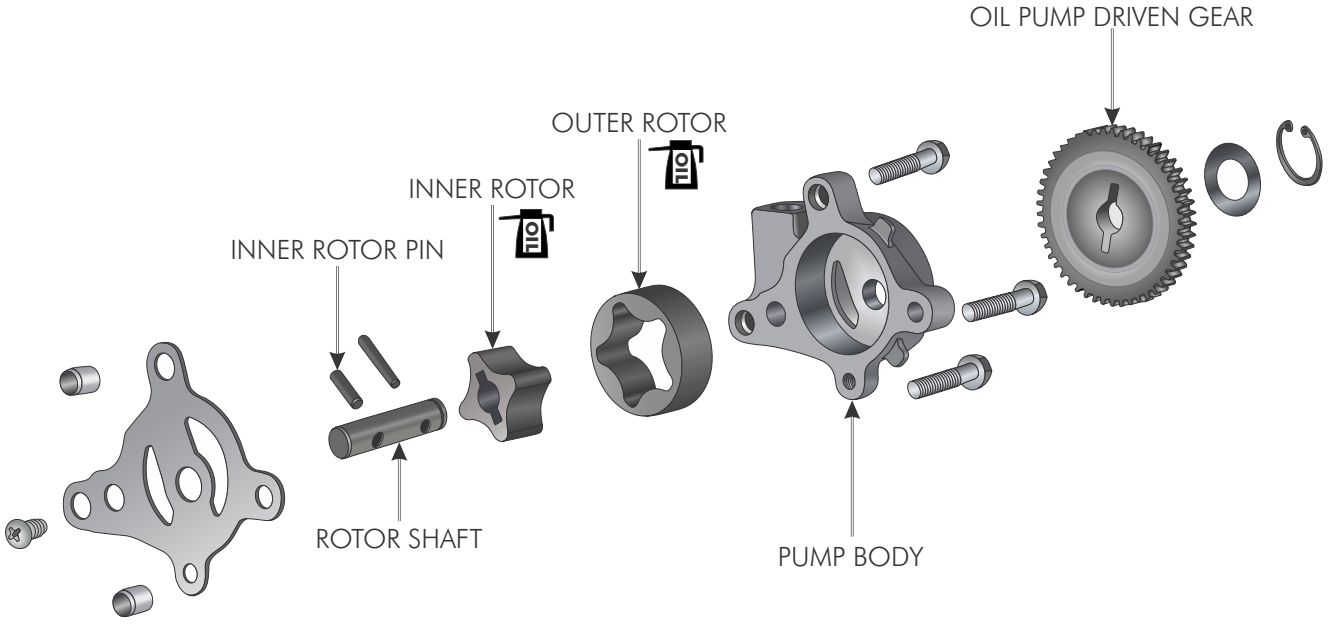
SERVICE LIMIT

PUMP SIDE CLEARANCE: 0.15 mm



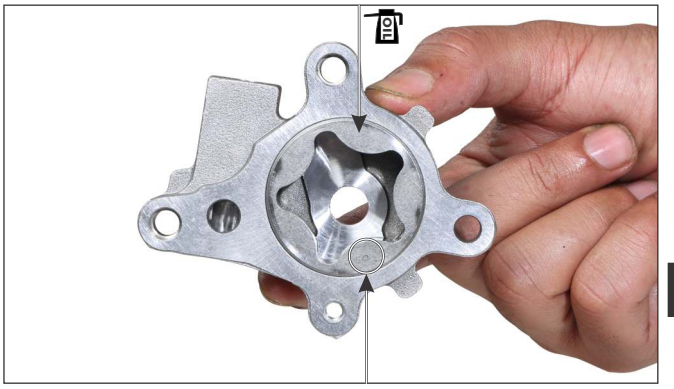
ASSEMBLY

Clean all disassembled parts in high flash point nonflammable solvent and check for damage or abnormal wear.



Apply clean engine oil to the outer rotor and install it into the oil pump body with its punch mark facing up.

OUTER ROTOR



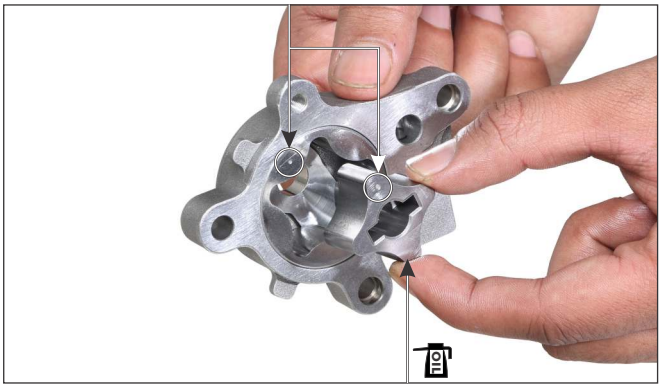
PUNCH MARK

Apply clean engine oil to the inner rotor and install them by aligning the flat end of the rotor shaft and inner rotor.

NOTE

While assembling the oil pump make sure that the punch marks on the inner and outer rotor are facing outwards.

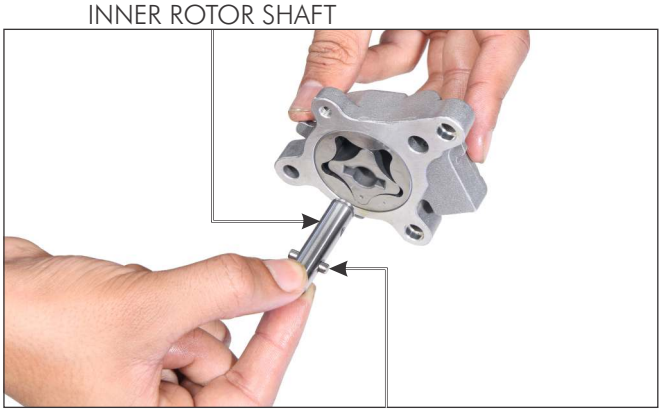
PUNCH MARKS



INNER ROTOR

Install the rotor shaft into the inner rotor.
Install the rotor shaft pin into the rotor shaft.

INNER ROTOR SHAFT

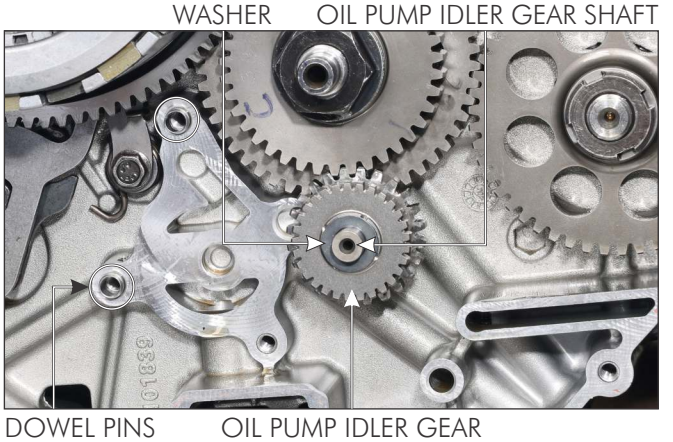


INNER ROTOR SHAFT PIN

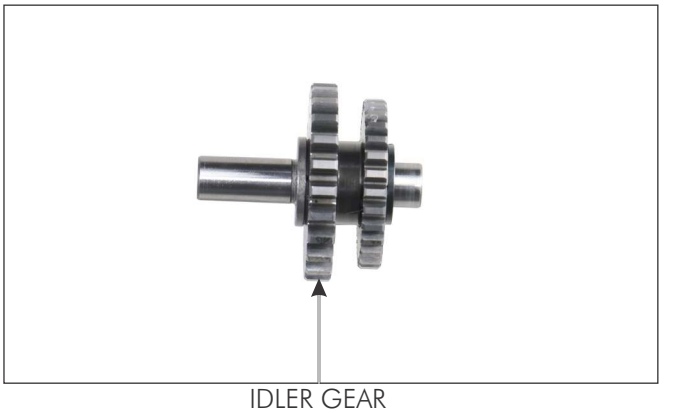
Install the oil pump plate by installing the screw.

INSTALLATION

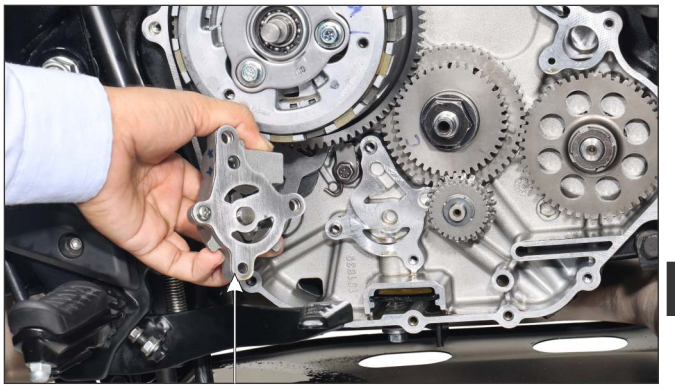
Install the oil pump idler gear shaft.
Install the oil pump idler gear.
Install the oil pump idler gear washer.
Install the dowel pins.



Check the idler gear for excessive wear or damage.



Install the oil pump on the right crankcase.



OIL PUMP

Install and tighten the oil pump mounting bolts (Nos.: 3, Size: 8 mm) to the specified torque.

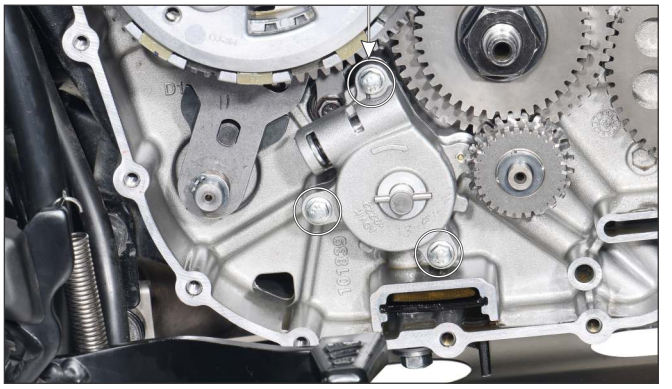
TORQUE

OIL PUMP MOUNTING BOLT: 0.8-1.2 kgf-m

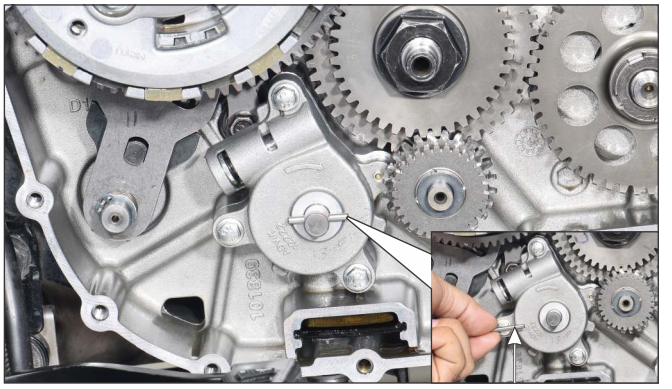
NOTE

- Oil pump assembly should be free from burns, foreign particles and other defects.
- After tightening the oil pump assembly, pump should rotate smoothly.

OIL PUMP MOUNTING BOLTS

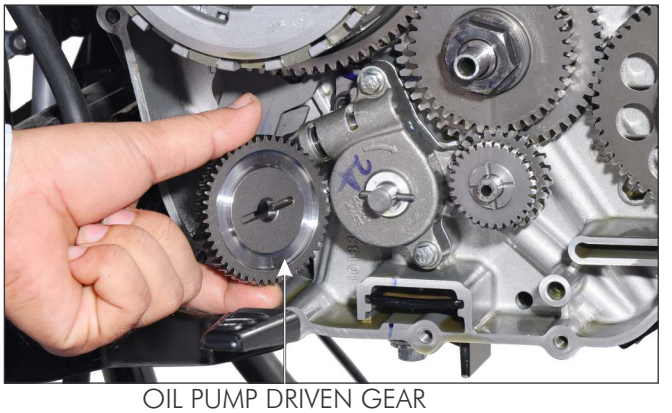


Install the oil pump roller pin.



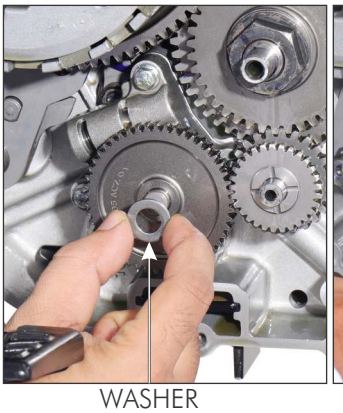
ROLLER PIN

Install the oil pump driven gear.

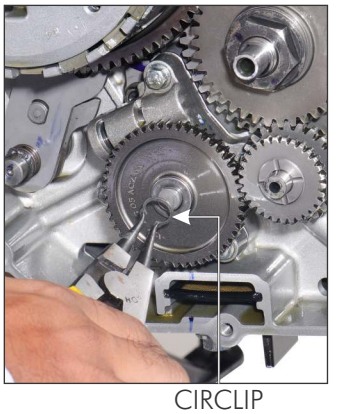


OIL PUMP DRIVEN GEAR

Install the oil pump driven gear washer and circlip.
Install the right crankcase cover (page 9-5).



WASHER



CIRCLIP

OIL COOLER

REMOVAL

Remove the oil cooler protector cover allen key screws (Nos.: 3).

Remove the oil cooler protector cover from the oil cooler.

OIL COOLER PROTECTOR COVER

ALLEN KEY SCREWS

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Remove the oil cooler hoses bolts and O-rings from the cylinder head (page 7-7) and right crankcase cover (page 9-3).

Remove the oil cooler mounting bolts/washers/rubbers (Nos.: 2) and oil cooler from frame.

NOTE

- Handle the oil cooler carefully to avoid damage to fins during removal or installation.
- Do not hang the oil cooler on the frame fitted with hose pipes.

CAUTION

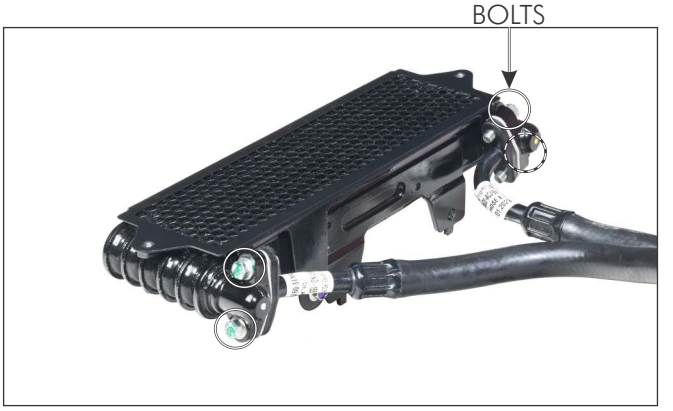
Avoid keeping any cloth or flammable object between hot parts (muffler, oil cooler, engine).

OIL COOLER

MOUNTING BOLTS/WASHERS/RUBBERS

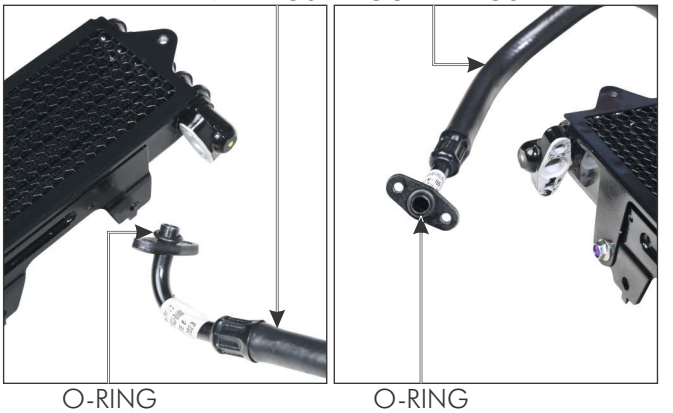
Remove the inlet and outlet hose mounting bolts from oil cooler (4 nos.).

BOLTS



Remove the O-rings from the inlet and outlet hose joints.

INLET HOSE OUTLET HOSE



O-RING O-RING

Note: *Images may depict a different model/variant, but procedures and information remain same.*

INSPECTION

Remove the oil cooler protector by removing the mounting bolts.

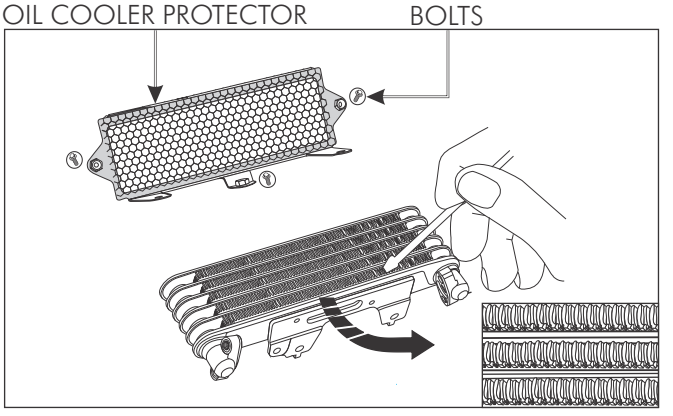
Check the oil cooler for bent or collapsed fins.

Straighten the bent or collapsed pins with a suitable small, blade type screw driver if necessary.

Check for air passages for clogging or restriction. Blow dirt out from between core fins with compressed air or wash it off with low pressure water.

NOTE

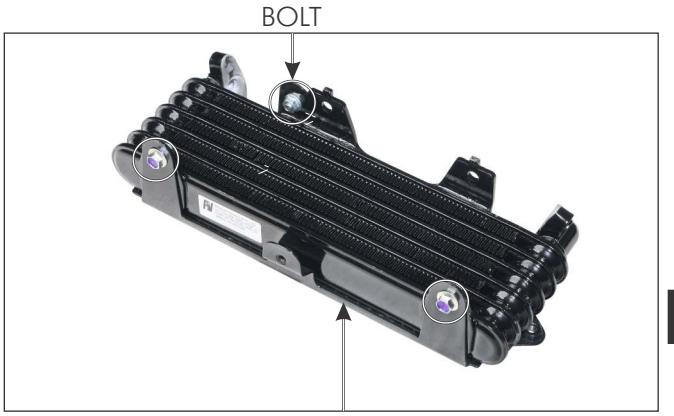
Make sure not to damage the fins while cleaning.



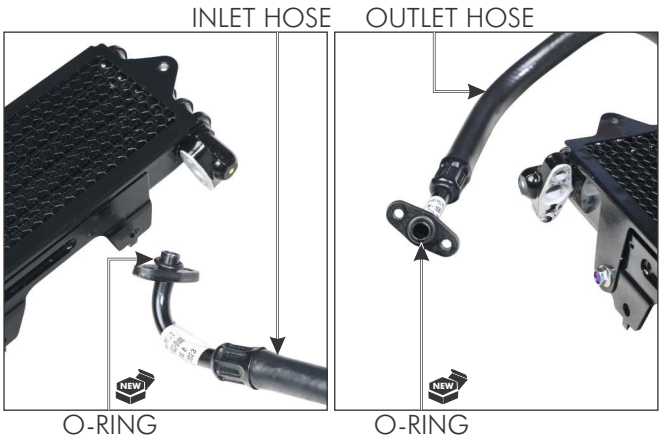
Check the oil line connections at crimped area for leaks.

INSTALLATION

Install the oil cooler protector by installing the mounting bolts.



Apply clean engine oil to new O-rings and install it to the inlet and outlet oil cooler hoses.

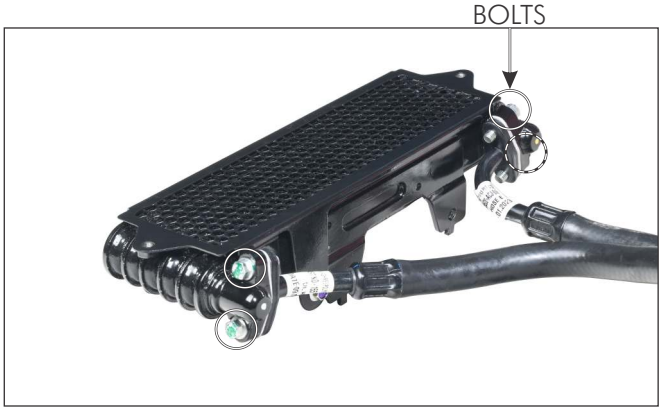


Install and tighten the oil cooler inlet and outlet hose mounting bolts to the specified torque.

TORQUE

OIL COOLER PIPES BOLTS (OIL COOLER SIDE):

1.0-1.4 kgf-m



Install the oil cooler to the frame and install the rubbers/washers/mounting bolts (Nos.: 2).

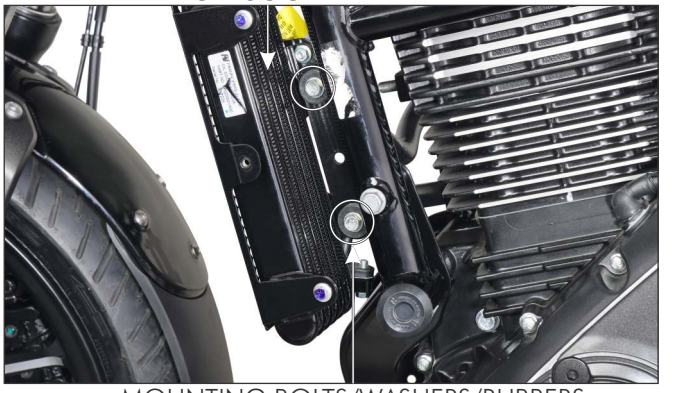
Tighten the mounting bolts securely to its specified torque.

Install the oil cooler hoses bolts with new O-rings to the cylinder head (page 7-34) and right crankcase cover (page 9-5).

NOTE

Handle the oil cooler carefully to avoid damage to fins during removal or installation.

OIL COOLER

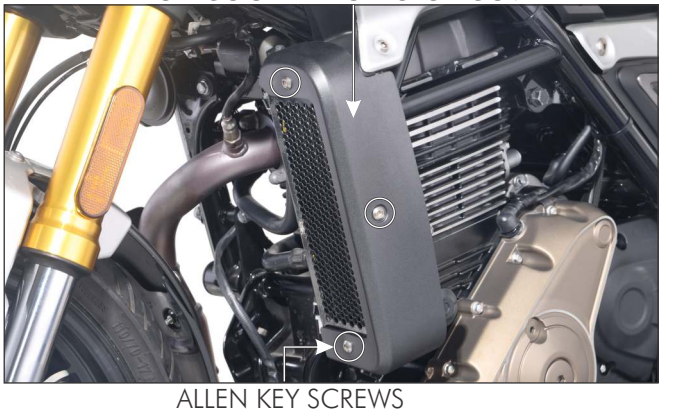


MOUNTING BOLTS/WASHERS/RUBBERS

Install the oil cooler protector cover.

Install and tighten the oil cooler protector cover allen key screws (Nos.: 3).

OIL COOLER PROTECTOR COVER



ALLEN KEY SCREWS

OIL PRESSURE TEST

Start the engine, warm it up for several minutes, and then turn it off.

Check engine oil level in the oil level window.

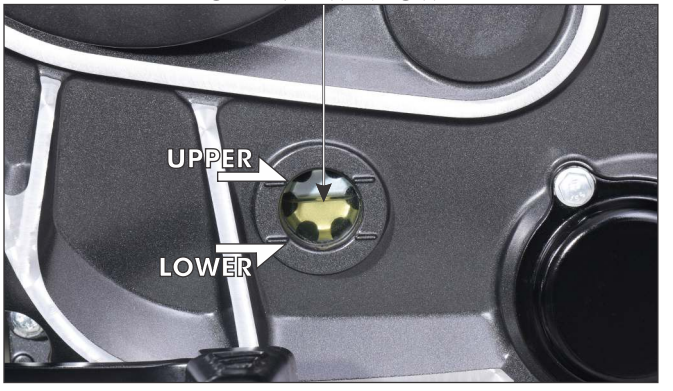
Oil level should be between upper and lower level mark.

Fill the crankcase with recommended engine oil if the engine oil level is upto/below lower level mark.

CAUTION

When the engine oil is cold, the engine oil will have a higher viscosity, causing the engine oil pressure to increase. Therefore, be sure to measure the engine oil pressure after warming up the engine.

OIL LEVEL WINDOW



***Note:** Images may depict a different model/variant, but procedures and information remain same.*

Remove the oil pressure switch (page 20-48).

OIL PRESSURE SWITCH

Thread in the pressure gauge into the hole given in the oil pressure switch.

OIL PRESSURE GAUGE

TOOL

OIL PRESSURE GAUGE
HMCL0423ACAA09

Turn the ignition switch "ON" .

Start the engine and allow it to run in idle.

Read the oil pressure.

OIL PRESSURE AT ENGINE OIL PRESSURE SWITCH
@ Idle:1700±100mbar (30±5°)
@ 4000 r/min :1750±100mbar (30±5°C)
@ Idle:750±100mbar (60±5°)
@ 4000 r/min :1200±100mbar (60±5°C)

NOTE

The temperature should be checked only at the places shown in the image.)

If the oil pressure is higher than specified this can be because of following possibility:

- Leaking oil passage
- Oil viscosity too high

If the oil pressure is lower than specified this can be because of following possibility:

- Faulty oil pump
- Clogged oil filter
- Leaking oil passage
- Broken or damaged seal

After inspection, stop the engine, wait for few minutes till the engine cools down.

Remove the oil pressure gauge and install the oil pressure switch (page 20-49).

Check for correct oil level (page 3-12).

TEMPERATURE MEASUREMENT LOCATION

***Note:** Images may depict a different model/variant, but procedures and information remain same.*

LUBRICATION POINTS

Use general purpose grease wherever specification is not given.
Apply oil or grease to all other sliding surfaces and cables not shown here

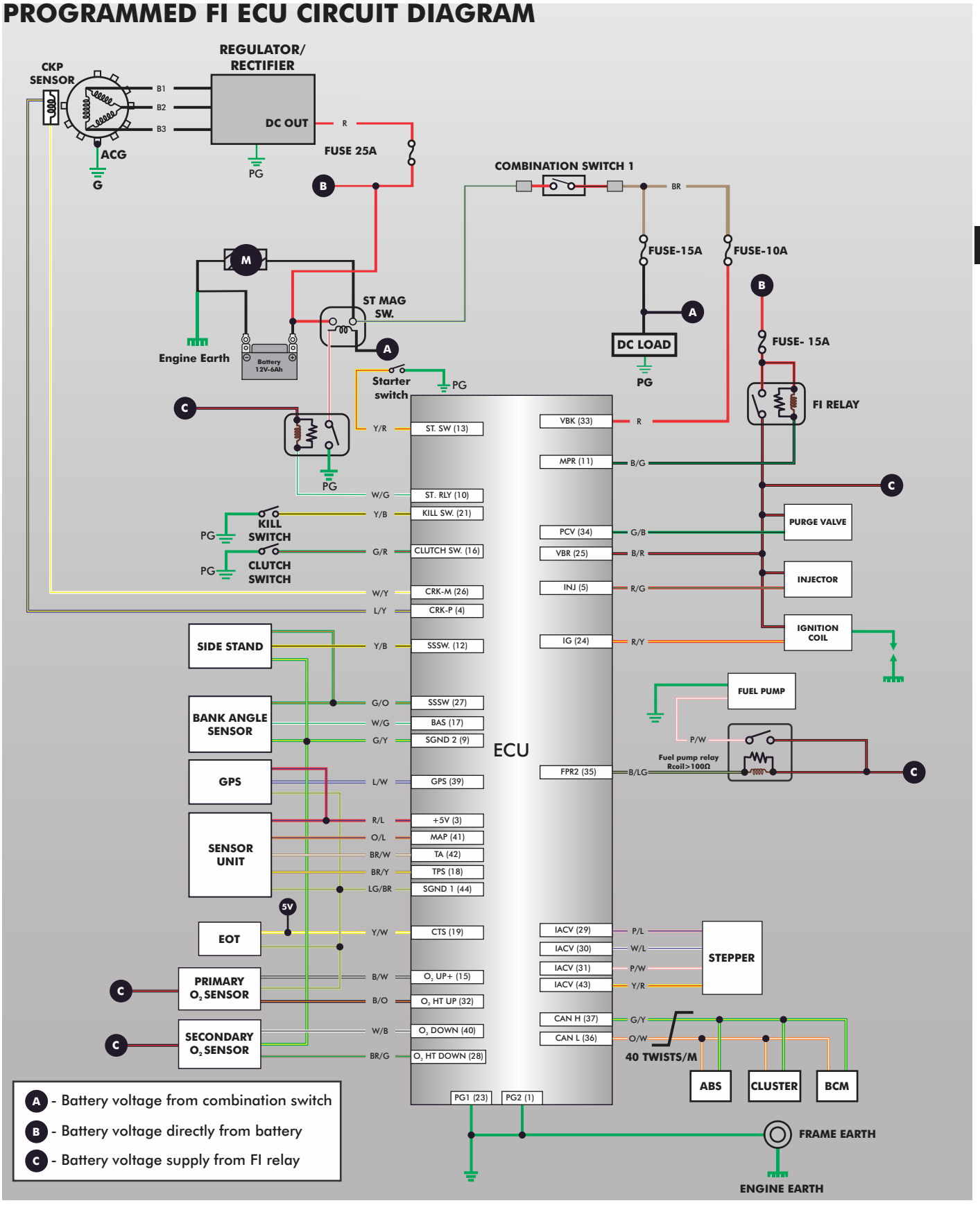
CONTROL CABLES

Periodically disconnect the throttle cable at its upper end. Throughly lubricate the cable and its pivot points with commercially available recommended cable lubricant or low viscosity oil.

NOTE

SOME IMAGES IN THIS MANUAL MAY COME FROM DIFFERENT MODEL/VARIANT THAN THE ONE COVERED BY THIS MANUAL. NEVERTHELESS, THE IMAGES REMAIN ACCURATE AND APPLICABLE FOR THE SPECIFIC TASK OR INFORMATION PRESENT IN THE ACCOMPANYING TEXT. WHILE CERTAIN COMPONENTS IN THE IMAGES MAY APPEAR DIFFERENT, THEY DON'T AFFECT THE STEPS, TOOLS, OR SAFETY PRECAUTIONS FOR THE TASKS DESCRIBED.

PROGRAMMED FI ECU CIRCUIT DIAGRAM



SERVICE INFORMATION

GENERAL

⚠ WARNING

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where petrol is stored can cause a fire or explosion.
- Before disconnecting fuel feed hose, vehicle can be kept idle to cool the engine for 10-20 minutes.
- Inspection of high tension output voltage on the vehicle should be carried out by clamping timing light to high tension coil cord.

- Whenever fuel feed hose is disconnected ensure to plug the hose and cover injector joint to prevent dust entry.
- Always ensure to keep the fuel tank lid closed whenever working on the fuel system to avoid dust entry.
- During PDI always ensure that there are no malfunction codes stored in the ECU memory.
- Do not accelerate while cranking the engine.
- Ensure ECU and harness connectors are fastened securely. A poor or loose connection can cause high voltage surge and result in damaging the integrated circuits in ECU.
- Bending or twisting the control cable will impair smooth operation and could cause the cable to stick or bend, resulting in loss of control on the vehicle.
- Do not snap the throttle valve from full open to full close after the throttle cable has been removed. It may cause incorrect idle operation.
- Seal the cylinder head intake port with a tape or a clean cloth to keep dirt and debris from entering the intake port after the throttle body has been removed. Do not damage the throttle body. It may cause incorrect throttle valve calibration.
- Prevent dirt and debris from entering the throttle bore and fuel feed hose, clean them using compressed air.
- The throttle body with sensor unit is factory pre-set. Do not disassemble in a way other than shown in this manual.
- Do not loosen or tighten the white painted nut of the throttle body. Loosening or tightening them can cause throttle body malfunction.
- Do not disassemble the fuel pump in case of any malfunction. It has to be replaced as a single unit.
- Do not damage the throttle body. It may cause incorrect throttle valve operation.
- The bank angle sensor is factory pre-set and does not require BAS initialization.
- If the Malfunction Indicator Lamp (MIL) glows continuously after the vehicle starts, follow the Malfunction Diagnosis procedures to remedy the problem.
- When checking the Programmed- FI, always follow the steps in the troubleshooting (page 5-24).

- A faulty Programmed FI system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- The Programmed-FI system is provided with fail-safe function to secure a minimum running capability even when there is any trouble in the system. When any abnormality is detected by the Programmed- FI Malfunction Diagnosis function, running capability is secured by making use of the numerical values of a situation preset in advance in the simulated program map.
- When disassembling the programmed fuel injection parts, note the location of the O-rings. Replace them with new ones upon reassembly.
- Use a Hero vehicle communication interface (Hero VCI) (part no. HMCL0419HVCI01 for Programmed FI system inspection.
- For troubleshooting Programmed-FI system remove the body panels **(Section-2)**.

SPECIFICATIONS

FUEL INJECTION SYSTEM

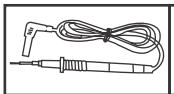
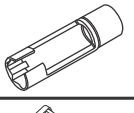
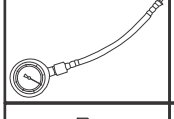
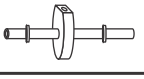
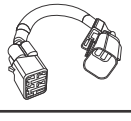
ITEM		SPECIFICATIONS
Engine oil temperature (EOT) sensor resistance		2.645 KΩ±5% @20°C
Engine oil temperature (EOT) sensor voltage		5V ± 0.1V
TP sensor	Fully closed throttle	0.484V ± 0.05V
	Wide open throttle	4.422V ± 0.2V
IAT sensor resistance		2KΩ ± 20Ω (at 25°C)
Fuel injector resistance		12Ω±5%
Fuel pressure at idle		282-324 kPa
Map sensor voltage		0.3V-4.7V
IAT sensor voltage		0.19V-4.76V
Bank angle sensor voltage	Output voltage high (Vertical position)	4±0.4V
	Output voltage low (65±5°)	1±0.3V

TORQUE VALUES

FUEL PUMP MOUNTING BOLTS	**: 1.2 kgf-m**
OXYGEN SENSOR	**: 1.75 kgf-m**
EOT SENSOR	**: 1.45 kgf-m**
INJECTOR MOUNTING BOLTS	**: 0.51± 0.7 kgf-m**
TORX SCREWS	**: 0.3 kgf-m**

For other nuts, bolts, fasteners etc. refer to standard torque values **(SECTION-1)**.

SPECIAL TOOLS

	**MULTIMETER PROBE** **PART NO: 070 HH KTRF 004**
	**OXYGEN SENSOR SOCKET** **PART NO: HMCL0519ABW01**
	**HERO VEHICLE COMMUNICATION INTERFACE (HERO VCI)** **PART NO: HMCL0419HVCI01**
	**FUEL PRESSURE GAUGE** **PART NO: 070 HH KTRF 003**
	**FUEL PRESSURE GAUGE ADAPTOR** **PART NO: 070 HH KTRF 005**
	**OBD2 CABLE** **PART NO: HMCL0523HVCI05**

MALFUNCTION INDICATION

Park the vehicle on its main stand.

Turn the ignition switch to "ON".

If the malfunction indicator lamp (MIL) glows continuously until the vehicle starts, it indicates that programmed FI system is OK.

If MIL remains "ON" even if the vehicle is started, there is an abnormality in the programmed FI system.

If you wish to read the Programmed FI memory for malfunction data, perform the following:

MALFUNCTION INDICATOR LAMP (MIL)

MALFUNCTION CODE READING PROCEDURE

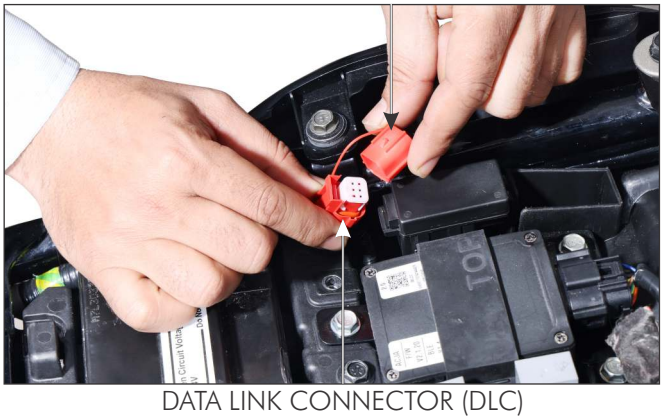
Turn the ignition switch to “OFF”.

Remove the seat (page 2-5).

Remove the battery cover (page 2-6).

Disconnect the connector cover from the data link connector (DLC).

CONNECTOR COVER



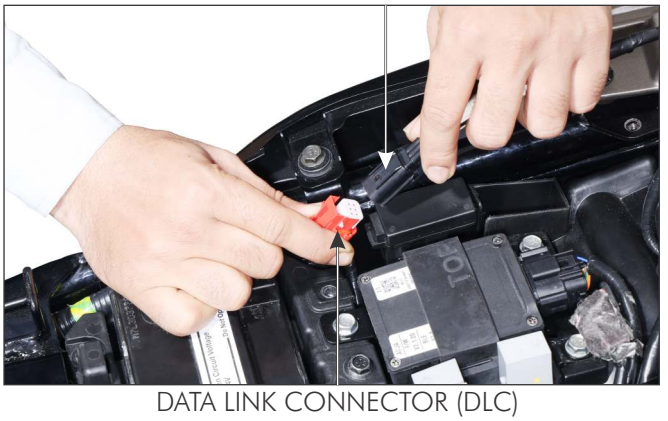
DATA LINK CONNECTOR (DLC)

Connect the VCI OBD2 cable to the data link connector (DLC).

TOOL

OBD2 CABLE
PART NO: HMCL0523HVCI05

OBD2 CABLE



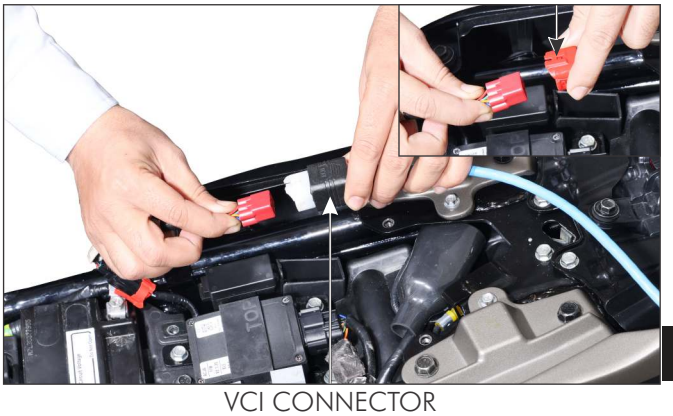
DATA LINK CONNECTOR (DLC)

Disconnect the connector cover from the OBD2 cable.
Connect the VCI wire harness connector to OBD2 cable.

TOOL

HERO VEHICLE COMMUNICATION INTERFACE
PART NO: HMCL0419HVCI01

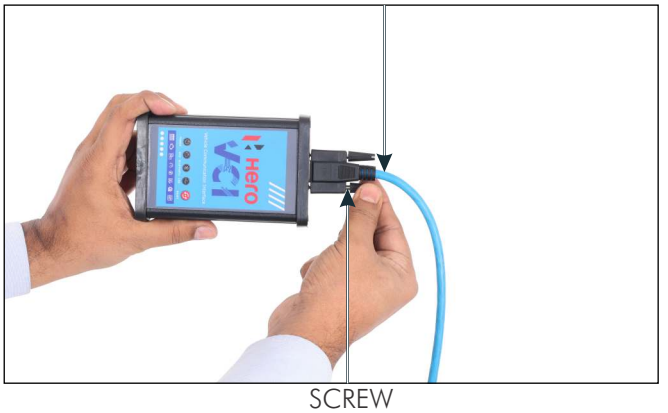
CONNECTOR COVER



VCI CONNECTOR

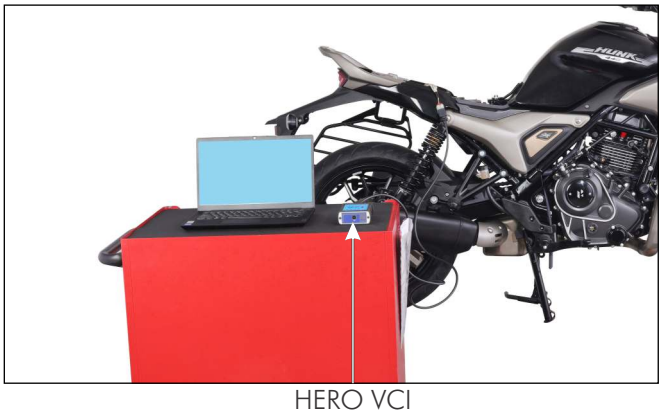
Connect the VCI connector to the Hero VCI and tighten it by rotating its screw.

VCI CABLE



SCREW

Connect HERO VCI and Laptop/Desktop either with USB cable or using the Bluetooth connectivity (page 23-14).



HERO VCI

Note: *Images may depict a different model/variant, but procedures and information remain same.*

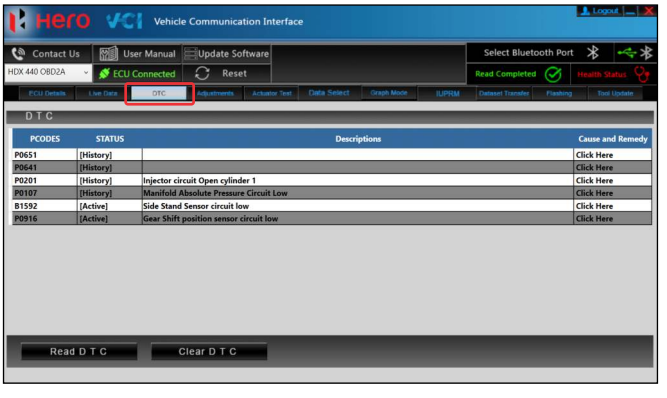
- Turn "ON" the ignition switch.

NOTE

Engine should not to be cranked during the process.

- Open HERO VCI application and login with username and password credentials.

- Click on to "DTC" tab to view the diagnostics trouble codes stored in the ECU memory.



DIAGNOSTIC TROUBLE CODE CHART

To identify the programmed FI System malfunction, connect the Hero VCI & check the malfunction as per the malfunction code and repair or replace the defective component. After replacing a defective component, again check for any malfunction.

DTC CODE	DESCRIPTION	MIL	CAUSES	REMEDIES	REFER TO
P0030	Primary O_2 sensor-heater	ON	Heater line is disconnected	• Check the wiring harness for any loss of connectivity between battery, O2 sensor heater and ECU. • Change the O2 sensor to check any line or pin damage within the part. • Change the ECU to see if there is any loss of connectivity internally.	Page 5-24
P0031			Heater line is short to ground line	• Check the wiring harness for a short between heater signal line and vehicle ground. • Change the O2 sensor to see if there is an internal short within the part. • Change the ECU to see if there is an internal short within the ECU.	
P0032			Heater line is short to 12V supply line	• Check the wiring harness for a short between the pins to the O2 sensor heater. • Change the O2 sensor to see if there is an internal short within the part. • Change the ECU to see if there is an internal short within the ECU.	
P0036	Secondary O_2 heater (B1,S2)	ON	Downstream oxygen sensor heater line is disconnected	• Check the harness for any signs of open circuit condition and rectify it. • Check the sensor for any damage in internal circuit and rectify it. • Replace the sensor if required.	Page 5-25A
P0037			Downstream oxygen sensor heater line is short to ground line	• Check the harness for any signs of shorting and rectify it. • Check the sensor for any damage in internal circuit and rectify it. • Replace the sensor if required.	
P0038			Downstream oxygen sensor heater line is short to 12V supply line	• Check the harness for any signs of shorting and rectify it. • Check the sensor for any damage in internal circuit and rectify it. • Replace the sensor if required.	
P0053	Primary O_2 sensor-heater	ON	Lambda sensor heater performance not acceptable	• Check the harness for any added resistance between the ECU and the sensor. • Change the sensor to see if there is an issue with the sensor. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-24

DTC CODE	DESCRIPTION	MIL	CAUSES	REMEDIES	REFER TO
P0054	Secondary O_2 heater (B1,S2)	ON	Performance deterioration of the heater	• Check the sensor for any kind of external damage and rectify it • Replace the sensor if required	Page 5-25A
P0105	Manifold absolute pressure (MAP) sensor PM1	ON	MAP sensor value readout stuck	• Check the wiring harness for continuity to the ECU from the signal pin or any added resistance in the line. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-26
P0106			MAP sensor value readout physical value high/low	• Check the wiring harness for continuity to the ECU from the signal pin or short to ground or any added resistance in the line. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	
P0107	Manifold absolute pressure (MAP) sensor	ON	Sensor signal line is shorted to the ground line	• Check the wiring harness for a short between the signal and ground lines. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-26
P0108			Sensor signal line is either open or short to supply	• Check the wiring harness for continuity to the ECU from the signal pin or short to supply • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	
P0110	Intake air temperature sensor (IAT)	ON	Intake temperature sensor value stuck	• Check the wiring harness for continuity to the ECU from the signal pin or any added resistance in the line. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-29
P0111			Intake temperature sensor value above/ lower physical limits	• Check the wiring harness for continuity to the ECU from the signal pin or short to ground or any added resistance in the line. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	

DTC CODE	DESCRIPTION	MIL	CAUSES	REMEDIES	REFER TO
P0112	Intake air temperature sensor (IAT)	ON	Sensor signal line is shorted to the ground line	• Check the wiring harness for a short between the signal and ground lines. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-29
P0113			Sensor signal line is either open or short to supply	• Check the wiring harness for continuity to the ECU from the signal pin or short to supply. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	
P0115	Engine coolant temperature	ON	Engine temperature sensor value is stuck	• Check the wiring harness for continuity to the ECU from the signal pin or any added resistance in the line. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-31
P0116			Sensor signal line is shorted to the ground line	• Check the wiring harness for continuity to the ECU from the signal pin or short to ground or any added resistance in the line. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	
P0117	Engine oil temperature sensor (EOT)	ON	Sensor signal line is shorted to the ground line	• Check the wiring harness for a short between the signal and ground lines. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-31
P0118			Sensor signal line is either open or short to supply	• Check the wiring harness for continuity to the ECU from the signal pin or short to supply. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	
P0122	Throttle position sensor (TPS)	ON	Short to ground	• Check the harness for any signs of shorting and rectify it. • Check the sensor for any damage in internal circuit and rectify it • Replace the sensor if required.	Page 5-33

DTC CODE	DESCRIPTION	MIL	CAUSES	REMEDIES	REFER TO
P0123	Throttle position sensor (TPS)	ON	Short to battery/Open load	• Check the harness for any signs of shorting or open condition and rectify it. • Check the sensor for any damage in internal circuit and rectify it. • Replace the sensor if required.	Page 5-33
P0130	Primary O2 sensor (binary)	ON	Signal line is disconnected	• Check the wiring harness for continuity to the ECU from the signal pin. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-24
P0131			Signal line is short to ground line	• Check the wiring harness for a short between the signal and ground lines. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	
P0132			Signal line is short to supply line	• Check the wiring harness for a short between the signal and supply lines . • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	
P0133	Primary O2 sensor	ON	Lambda sensor performance not adequate - slow response	• Change the lambda sensor to check if there is an issue with the part. • Change the ECU to see if there is an issue with the part.	Page 5-24
P0134			Sensor signals not switching	• Check the wiring harness for any added resistance between the ECU and the signal pin. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU. • Check the system for any intake or exhaust leaks.	
P0136	Secondary O2 sensor (B1, S2)	ON	Downstream oxygen sensor signal line is disconnected	• Check the harness for any signs of open condition and rectify it • Check the sensor for any damage in internal circuit and rectify it • Replace the sensor if required	Page 5-25A
P0137			Downstream oxygen sensor signal line is short to ground line	• Check the harness for any signs of shorting and rectify it • Check the sensor for any damage in internal circuit and rectify it • Replace the sensor if required	

DTC CODE	DESCRIPTION	MIL	CAUSES	REMEDIES	REFER TO
P0138	Secondary O2 sensor (B1, S2)	ON	Downstream oxygen sensor signal line is short to supply line	• Check the harness for any signs of shorting and rectify it • Check the sensor for any damage in internal circuit and rectify it • Replace the sensor if required	Page 5-25A
P0139			Downstream oxygen Sensor signal stuck or sensor response is slow from rich to lean	• Check the sensor for any abnormalities and rectify it • Replace the sensor if required	
P0201	Injector (INJ)	ON	Injector line is disconnected	• Check the wiring harness for any loss of connectivity between battery, injector and ECU. • Change the injector to check any line or pin damage within the part. • Change the ECU to see if there is any loss of connectivity internally.	Page 5-35
P0261	Injector (INJ)	ON	Injector line is short to ground line	• Check the wiring harness for a short between injector signal line and vehicle ground. • Change the injector to see if there is an internal short within the part. • Change the ECU to see if there is an internal short within the ECU.	Page 5-35
P0262			Injector-short to 12V supply line	• Check the wiring harness for a short between the pins to the injector. • Change the injector to see if there is an internal short within the part. • Change the ECU to see if there is an internal short within the ECU.	
P0301	Engine catcon damage misfire	ON	Catalyst damaging misfire detected	Catalyst damaging misfire detected	Page 5-37
	Engine emission misfire		Emission exceeding misfire detected in the current drive cycle	Emission exceeding misfire detected	
P0335	Crankshaft position sensor (CKP)	ON	Vehicle cranking but no engine position detected	• Check the wiring harness for continuity between EPM sensor and ECU. • Change the sensor to see if there is an internal issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-38
P0351	Ignition coil (IG)	ON	Ignition driver pin is shorted to ground	• Check the wiring harness for a short between the pin to the coil and the ground line. • Change the ignition coil to see if there is an internal short within the part. • Change the ECU to see if there is an internal short within the ECU.	Page 5-39

DTC CODE	DESCRIPTION	MIL	CAUSES	REMEDIES	REFER TO
P0420	Catalytic convertor	ON	Catalyst has deteriorated due to ageing/ damage	Replace the catalyst/muffler.	Page 5-40
P0444	Purge control valve (PCV)	ON	No connectivity between purge valve and ECU	• Check the wiring harness for any loss of connectivity between battery, purge valve and ECU. • Change the purge valve to check any line or pin damage within the injector. • Change the ECU to see if there is any loss of connectivity internally.	Page 5-41
P0458			Purge valve ECU pin is short to ground line	• Check the wiring harness for a short between purge valve signal line and vehicle ground. • Change the purge valve to see if there is an internal short within the part. • Change the ECU to see if there is an internal short within the ECU.	
P0459			Purge valve ECU pin is short to 12V supply line	• Check the wiring harness for a short between the pins to the purge valve. • Change the purge valve to see if there is an internal short within the part. • Change the ECU to see if there is an internal short within the ECU.	
P0501	Vehicle speed sensor	ON	Vehicle speed is lower than a threshold or vehicle speed error reported by ABS module	• Check for any reported faults by the ABS unit. • Check the connections of the wheel speed sensor to the ABS unit. • Change the ABS unit to see if there is an issue with the unit.	Page 5-43
P0506	Idle air system	ON	Actual engine speed is lower than desired engine speed in idle	• Check the wiring harness for any abnormal electrical load/Noise on the stepper coil line. • Check the stepper coil for any physical abnormality in the coil and its immediate environment. • Change the stepper coil to see if the symptom is gone. • Change the ECU to see if the symptom is gone.	Page 5-44
P0507			Actual engine speed is higher than desired engine speed in idle		
P0508	Idle speed control stepper motor (IACV)	ON	Stepper ECU pins for coil 1 is short to ground	• Check the wiring harness for a short between stepper coil signal line and vehicle ground. • Change the stepper coil to see if there is an internal short within the part. • Change the ECU to see if there is an internal short within the ECU.	Page 5-44
P0509			Stepper ECU pins for coil 1 is short to battery		

DTC CODE	DESCRIPTION	MIL	CAUSES	REMEDIES	REFER TO
P0511	Idle speed control stepper motor (IACV)	ON	Stepper ECU pins for coil 1 is open	• Check the wiring harness for any loss of connectivity between battery, stepper coil and ECU. • Change the stepper coil to check any line or pin damage within the injector. • Change the ECU to see if there is any loss of connectivity internally.	Page 5-44
P0560	Battery voltage	OFF	Battery voltage measured has a non plausible value	• Check the battery to see if the voltage is outside permissible limits. • Check the battery and the charging circuit for any abnormal behavior. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-47
P0562			Battery voltage measured is below limits		
P0563			Battery voltage measured exceeds limits		
P0615	Starter relay circuit (STR)	OFF	No connectivity between starter relay and ECU	• Check the wiring harness for any loss of connectivity between battery, starter motor relay and ECU. • Change the starter motor relay to check any line or pin damage within the part. • Change the ECU to see if there is any loss of connectivity internally.	Page 5-48
P0616			Starter relay ECU pin is short to ground line	• Check the wiring harness for a short between starter motor relay line and vehicle ground. • Change the starter motor relay to see if there is an internal short within the part. • Change the ECU to see if there is an internal short within the ECU.	
P0617	Starter relay circuit (STR)	OFF	Starter relay ECU pin is short to 12V supply line	• Check the wiring harness for a short between the pins to the starter motor relay. • Change the starter motor relay to see if there is an internal short within the part. • Change the ECU to see if there is an internal short within the ECU.	Page 5-48
P0627	Fuel pump relay (FLR)	ON	Relay line is disconnected	• Check the wiring harness for any loss of connectivity between battery, fuel pump relay and ECU. • Change the fuel pump to check any line or pin damage within the part. • Change the ECU to see if there is any loss of connectivity internally	Page 5-49

DTC CODE	DESCRIPTION	MIL	CAUSES	REMEDIES	REFER TO
P0628	Fuel pump relay (FLR)	ON	Relay line is short to ground line	• Check the wiring harness for a short between pump relay line and vehicle ground. • Change the fuel pump relay to see if there is an internal short within the part. • Change the ECU to see if there is an internal short within the ECU.	Page 5-49
P0629			Fuel pump relay - short to 12 V supply line	• Check the wiring harness for a short between the pins to the fuel pump relay. • Change the fuel pump relay to see if there is an internal short within the part. • Change the ECU to see if there is an internal short within the ECU.	
P0642	Sensor supply 1	ON	Sensor supply 1 module under voltage/short to ground	• Check the wiring harness for a short between the sensor supply 1 line and ground line. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-51
P0643			Sensor supply 1 module over voltage	• Check the wiring harness for a short between the sensor supply 1 line and battery line. • Change the ECU to see if there is an internal issue within the ECU.	
P0652	Sensor supply 2	ON	Sensor supply 2 module under voltage/short to ground	• Check the wiring harness for a short between the sensor supply 2 line and ground line. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-53
P0653			Sensor supply 2 module over voltage	• Check the wiring harness for a short between the sensor supply 2 line and battery line. • Change the ECU to see if there is an internal issue within the ECU.	
P0914	Gear position sensor	ON	Gearbox position sensor value stuck	• Check the wiring harness for any added resistance of lack of continuity. • Change the gearbox position sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-57
P0915			Gearbox position sensor value not plausible-shift pattern not consistent	• Check the sensor mounting to ensure there is no physical disturbance. • Change the sensor to see if there is an issue with the part. • Change the ECU to see if there is an internal issue within the ECU.	

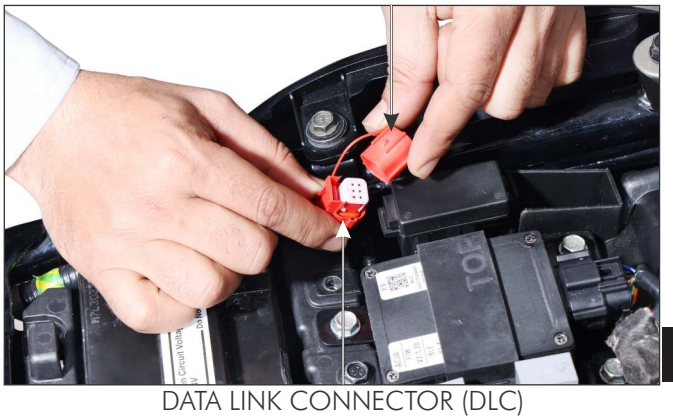
DTC CODE	DESCRIPTION	MIL	CAUSES	REMEDIES	REFER TO
P0916	Gear position sensor	ON	Sensor signal line is shorted to the ground line	• Check the wiring harness for a short between the signal and ground lines. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-57
P0917			Sensor signal line is either open or short to supply	• Check the wiring harness for continuity to the ECU from the signal pin or short to supply. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	
P1001	Level 2 errors	ON	Voltage at ADC is greater than NTP voltage calibrated threshold	• Check for TPS sensor & wiring related problems. • Replace TPS sensor. • Investigate ECU.	Page 5-59
P1002			Voltage at ADC is greater or less than test Voltage calibrated threshold		
P1006			If the difference between the engine speed from level 1 and level 2 is greater than the specified limit.	• Check whether any DFC set in L1 w.r.t. engine speed sensor. • Check wiring harness w.r.t. engine speed sensor. • Replace engine speed sensor. • Investigate ECU.	
P1009			If level 1 and level 2 side stand signal status are not same.	Check & ensure that side stand sensor pins are not shorted (battery, ground) & sensor is not in open condition.	
P1013			If the power stage are shut-of due to an active WDA with root cause erroneous query/response communication	• Check all wiring harness related connections and check for wiring harness continuity and damage. • Check battery and vehicle grounding and confirm. Ensure no current is passing through ECU HW. • Check vehicle with multiple resets. • Replace ECU.	
P1531	Rollover sensor (RO)	OFF	Sensor signal line is shorted to the ground line	• Check the wiring harness for a short between the signal and ground lines. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-59
P1532			Sensor signal line is shorted to supply	• Check the wiring harness for a short between the signal and supply lines. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	

DTC CODE	DESCRIPTION	MIL	CAUSES	REMEDIES	REFER TO
P1534	Rollover sensor (RO)	OFF	Non plausible signal from the sensor	• Check the wiring harness for added resistance on the signal line to the ECU. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-59
B1591	Side stand error	ON	Sensor signal line is shorted to the ground line	• Check the wiring harness for a short between the signal and ground lines. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-61
B1592			Sensor signal line is shorted to supply	• Check the wiring harness for a short between the signal and supply lines. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	
B1593			Non Plausible Signal from the sensor	• Check the wiring harness for added resistance on the signal line to the ECU. • Change the sensor to see if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	
P2187	Fuel system	OFF	System is running in to lean at idle condition	• Check the fuel pump its working fine or not, and check the injector condition. • Check the ignition coil and oxygen sensor connection. • Change the ECU to see if there is an internal short in the ECU.	Page 5-63
P2188			System is running in to rich at idle condition		
P2191			System is running in to lean at higher load		
P2192			System is running in to rich at higher load		
P2232	Secondary O2 sensor (B1, S2)	ON	Downstream oxygen Sensor signal short to heater	• Check the harness for any signs of shorting and rectify it • Check the sensor for any damage in internal circuit and rectify it • Replace the sensor if required	Page 5-25A
U0121	ABS	ON	No data received from ABS unit.	• Re-flash latest SW on the ABS module and check if the error comes back. • Re-flash the latest SW on the EMS controller and check if the error comes back. • Change the ABS unit to check if there is an issue within the part. • Change the ECU to see if there is an internal issue within the ECU.	Page 5-64
U0415			• Alive counter mismatch from ABS. • CRC mismatch from ABS. • Invalid data length received from ABS unit.		

MALFUNCTION CODE READING PROCEDURE

Park the vehicle on a level surface.
Turn the ignition switch to "OFF".
Remove the seat (page 2-5).
Remove the battery cover (page 2-6).
Slide the boot and disconnect the connector cover from the data link connector (DLC).

CONNECTOR COVER



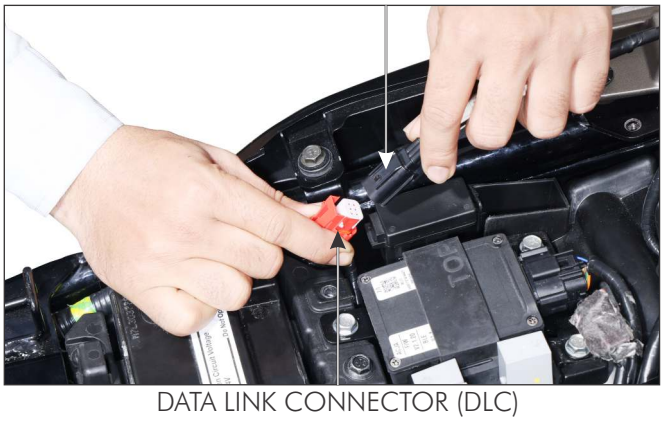
DATA LINK CONNECTOR (DLC)

Connect the VCI OBD2 cable to the data link connector (DLC).

TOOL

OBD2 CABLE
PART NO: HMCL0523HVCI05

OBD2 CABLE



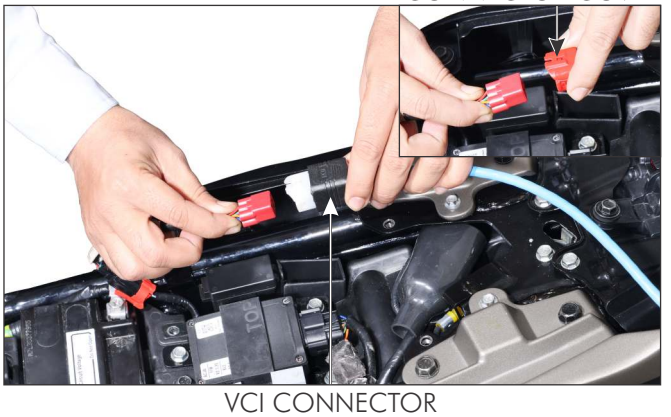
DATA LINK CONNECTOR (DLC)

Disconnect the connector cover from the OBD2 cable.
Connect the VCI wire harness connector to OBD2 cable.

TOOL

HERO VEHICLE COMMUNICATION INTERFACE
PART NO: HMCL0419HVCI01

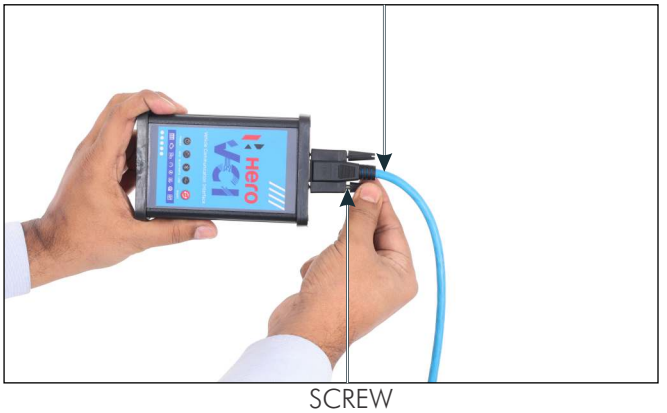
CONNECTOR COVER



VCI CONNECTOR

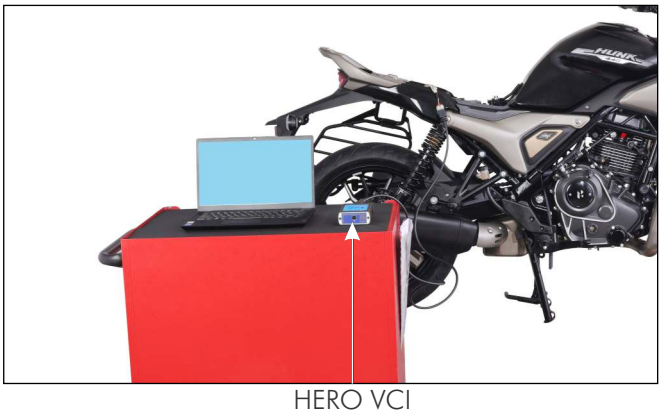
VCI CABLE

Connect the VCI connector to the Hero VCI and tighten it by rotating its screw.



SCREW

- Connect HERO VCI and Laptop/Desktop either with USB cable or using the Bluetooth connectivity (page 23-10).



HERO VCI

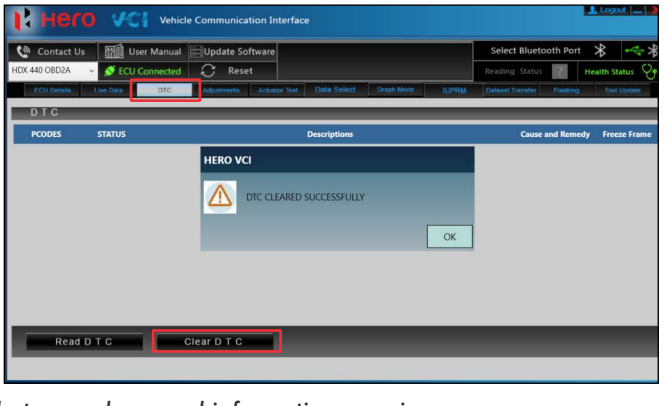
- Turn "ON" the ignition switch.

NOTE

Engine should not to be cranked during the process.

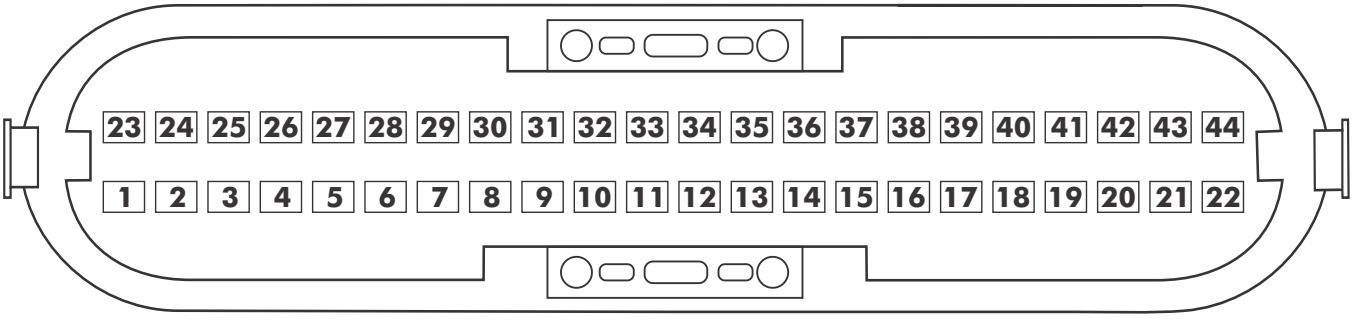
- Open HERO VCI application and login with username and password credentials.

- To clear the DTC codes, go to DTC tab and click on "Clear DTC" button to clear the existing error codes.



Note: *Images may depict a different model/variant, but procedures and information remain same.*

ELECTRONIC CONTROL UNIT (ECU)- INPUTS AND OUTPUTS



Pin No.	COLOUR	SIGNAL NAME	FUNCTION
1	G	PG1	Power ground 1
2	Blank	-	-
3	R/L	VSENS 1	Sensor supply 1
4	L/Y	CRK+	Crankshaft input +
5	R/G	INJ	Injector
6	Blank	-	-
7	Blank	-	-
8	Blank	-	-
9	G/Y	SGND 2	Sensor GND 2
10	W/G	ST. RELAY	Intermediate starter relay
11	B/G	MPR	Main relay driver
12	Y/B	SSW	Side stand sensor
13	Y/R	ST. SW	Start switch
14	Blank	-	-
15	B/W	O_2 UP+	Lambda sensor (LSF) 1
16	G/R	CLS	Clutch switch
17	W/G	BAS	Roll over sensor
18	BR/Y	TPS	Throttle position sensor
19	Y/W	ETS	Engine temperature sensor
20	Blank	-	-
21	Y/B	KILL SW.	Kill switch
22	Blank	-	-
23	G	PG2	Power ground 2

COLOUR CODE	
Black	B
Yellow	Y
Blue	L
Green	G
Red	R
White	W
Brown	BR
Orange	O
Sky Blue	SB
Light Green	LG
Pink	P
Gray	GR

COMBINATION
Base colour/marking colour

Example
BR/W: Brown/White

Pin No.	COLOUR	SIGNAL NAME	FUNCTION
24	R/Y	IG	Ignition coil
25	B/R	VBR	Power supply after main relay
26	W/Y	CRK-	Crankshaft input -
27	G/O	VSENS 2	Sensor supply 2
28	BR/G	O_2 DOWN	Lambda sensor (LSF) 2
29	P/L	STEP A	Stepper A
30	W/L	STEP B	Stepper B
31	P/W	STEP C	Stepper C
32	B/O	O_2 HT UP	Lambda upstream heater
33	R	VBK	Ignition key
34	G/B	PCV	Canister purge valve
35	B/LG	FPR	Fuel pump relay
36	O/W	CAN L	CAN low
37	G/Y	CAN H	CAN high
38	Blank	-	-
39	L/W	GPS	Gear position sensor
40	W/B	O_2 HT DOWN	Lambda sensor (LSF) 2
41	O/L	MAP	Manifold air pressure sensor
42	BR/W	TA	Intake air temperature sensor
43	Y/R	STEP D	Stepper D
44	LG/BR	SGND 1	Sensor GND 1

NOTE

Frequent/Unwanted disconnection of ECU connector is not recommended. Hence, ECU connector to be disconnected when electrical check is must.

VCI NOT RESPONDING/ DLC CHECKING

Disconnect the meter 18P connector (page 20-11).

Check for loose or poor connection at meter 18P connector and DLC connector.

Check the VCI tool connection with laptop/computer.

If VCI tool is not connected then turn the ignition switch to "OFF" and remove VCI connection from the laptop/ computer.

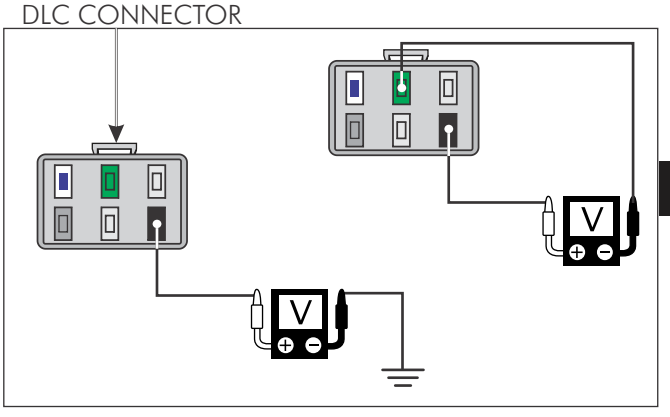
Check the VCI cable connection on DLC.

1. Turn the ignition switch to "ON" and measure the voltage between the DLC connector.

CONNECTION
Black- Green
STANDARD: Battery Voltage

If voltage does not exist, measure the voltage between the black and body ground.

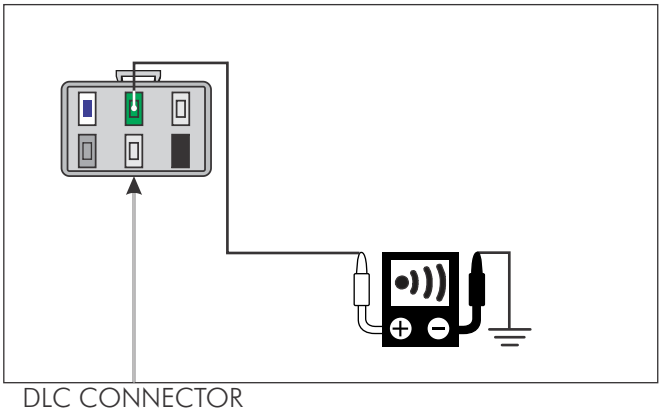
CONNECTION
Black- Body Ground
STANDARD: Battery Voltage



If voltage does not exist, check the continuity of green wire of DLC connector and body ground

CONNECTION
Green- Body Ground
STANDARD: Continuity

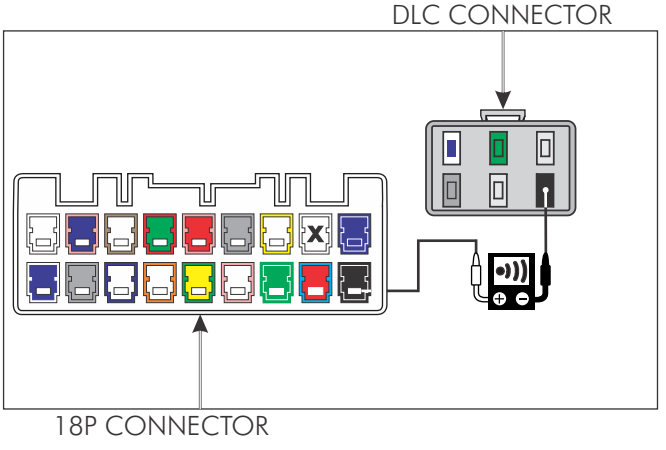
If continuity does not exist, then replace the wiring harness and inspect again.



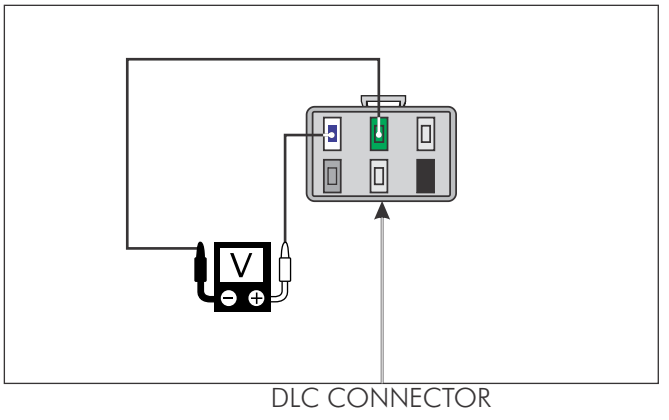
If the voltage does not exist in black and body ground then turn the ignition switch to "OFF", disconnect the meter 18P connector and check the continuity between DLC connector and meter 18P connector.

CONNECTION
Black (Meter Pin- 10)-Black
STANDARD: Continuity

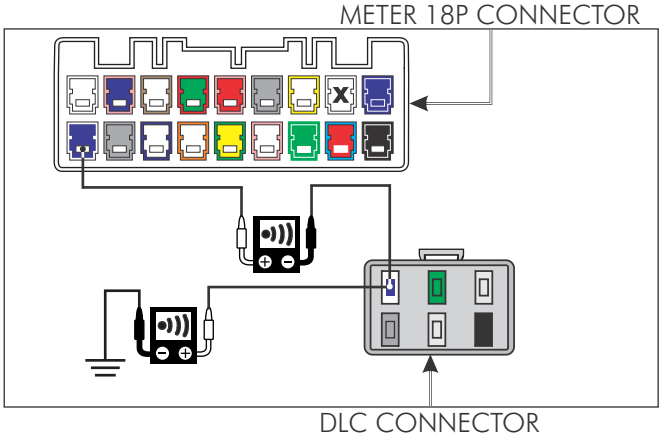
If continuity does not exist, then replace the wiring harness and inspect again.



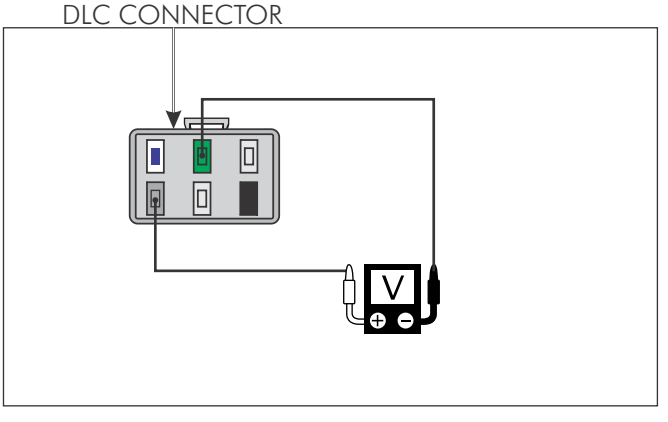
2. Check the DLC harness input voltage at DLC connector.
CONNECTION
White/Blue-Green
STANDARD: 2.52 V



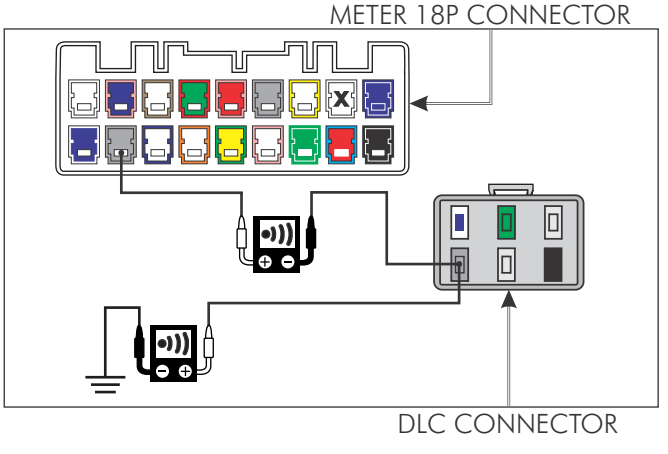
If voltage does not exist, disconnect the meter 18P connector and check the continuity between the DLC connector and meter 18P connector.
CONNECTION
White/Blue (Meter Pin-18)-White/Blue
STANDARD: Continuity
CONNECTION
White/Blue-Body Ground
STANDARD: No Continuity
If any abnormality is found, replace the wiring harness and inspect again.



3. Check the DLC harness input voltage at DLC connector.
CONNECTION
Gray- Green
STANDARD: 2.49 V



If voltage does not exist, disconnect the meter 18P connector and check the continuity between the DLC connector and meter 18P connector.
CONNECTION
Gray (Meter Pin-17)-Gray
STANDARD: Continuity
CONNECTION
Gray-Body Ground
STANDARD: No Continuity
If any abnormality is found, replace the wiring harness and inspect again.
If all above connections are normal then check the known good hero VCI tool and inspect again.



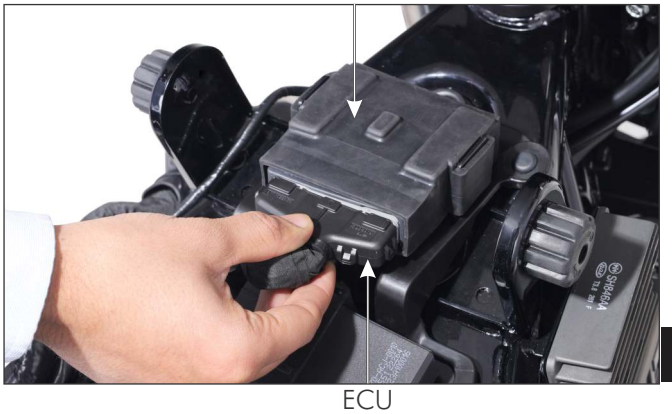
ELECTRONIC CONTROL UNIT (ECU)

REMOVAL

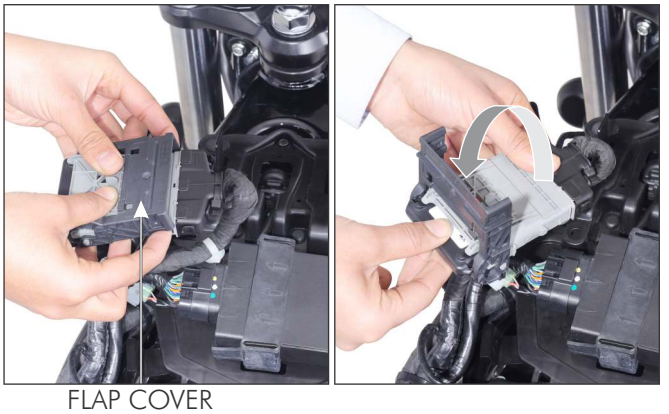
Remove the fuel tank (page 2-12).

Dismount the ECU from the electrical part mount bracket.

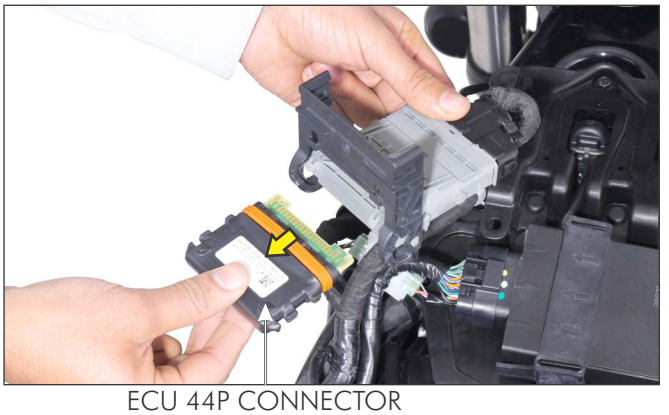
Remove the ECU from the boot cover.



Lift and unlock the flap cover upward.



Remove the ECU from the ECU 44P connector.



To inspect the harness on the ECU side, connect the multimeter probes from the inside of the ECU as shown in the image.

INSTALLATION

Installation is in the reverse order of removal.

NOTE

Exercise due care while connecting the ECU 44P connector to avoid damages to ECU pins.

Note: *Images may depict a different model/variant, but procedures and information remain same.*

ECU INSPECTION

- This vehicle has two types of power supply to operate the ECU.
- If the battery is in proper-working condition, it is used as the first power supply. Else it uses the ACG power supply.
- If the engine does not start with the electric starter, inspect the ECU power/ground first, then inspect the alternator and regulator/rectifier as the secondary power supply.
- Before inspecting the ECU power/ground inspection, be sure that battery is fully charged.

NOTE

Before starting the inspection, check the battery voltage, it should be more then 12V.

ECU GROUND CIRCUIT INSPECTION

Turn ignition switch to "OFF".

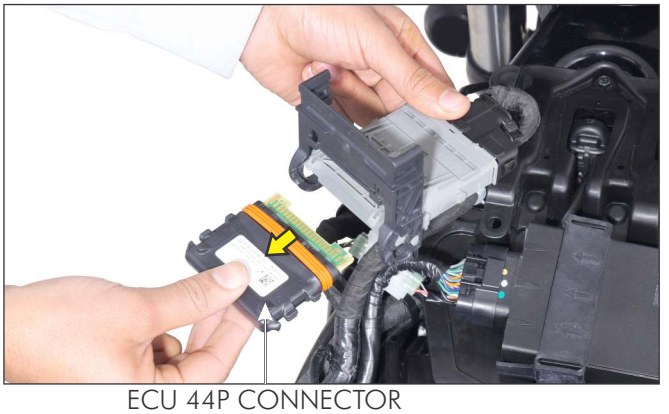
Disconnect the ECU 44P connector (page 5-22).

Check for loose or poor connection on the ECU 44P connector.

Connect ECU 44P connector. Start the engine. If the engine starts there has been a loose or poor contact on the ECU 44P connector.

NOTE

Exercise due care while connecting the ECU 44P connector to avoid damages to ECU pins.



ECU 44P CONNECTOR

Disconnect the ECU 44P connector. Check for the continuity between ECU 44P connector of the wiring harness side and body ground.

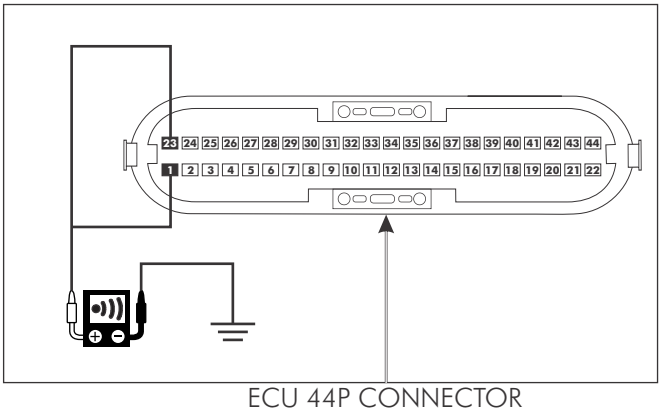
CONNECTION

Green (ECU Pin-1)- Body Ground
Green (ECU Pin- 23)- Body Ground
STANDARD: Continuity

If there is no continuity, check for open circuit.

If all connections are connected properly but continuity does not exist then replace the wiring harness and inspect again.

If the connections are normal, replace the ECU and inspect again.



ECU 44P CONNECTOR

***Note:** Images may depict a different model/variant, but procedures and information remain same.*

ECU POWER SUPPLY CIRCUIT INSPECTION

Turn the ignition switch to "ON" and measure the battery voltage between the ECU 44P connector of the wire harness side and body ground.

CONNECTION

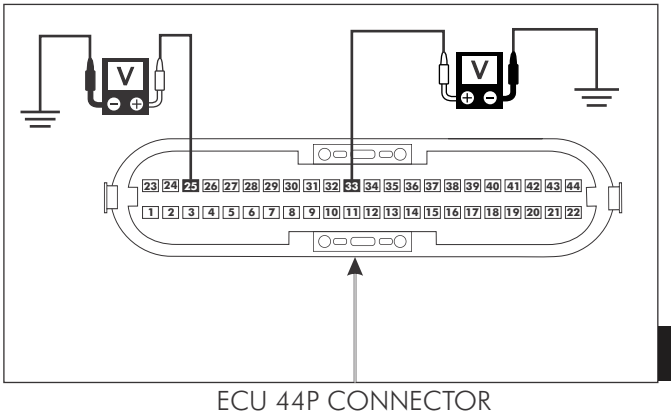
Black/Red (ECU Pin- 25)- Body Ground
STANDARD: Battery Voltage
Red (ECU Pin- 33)- Body Ground
STANDARD: Battery Voltage

If the battery voltage is out of range check for the following.

- Loose or poor connector contact
- Inspect the ignition switch.
- Blown fuse: 15Ax3 &10Ax3
- Open or short circuit in black/red or red wire between the battery and ignition switch

If voltage does not exists then replace wire harness.

If voltage exists then replace the ECU (page 5-22) with a new one and inspect it again.



ECU 44P CONNECTOR

5

TROUBLESHOOTING

PRIMARY OXYGEN SENSOR (DTC: P0030, P0031, P0032, P0053, P0130, P0131, P0132, P0133, P0134, P2231)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

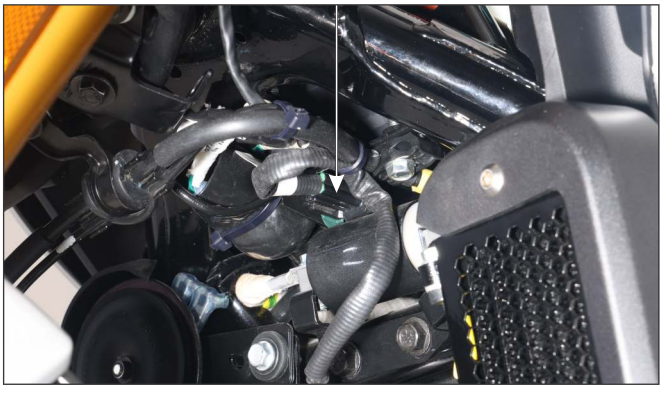
If active P0030, P0031, P0032, P0053, P0130, P0131, P0132, P0133, P0134, P2231 codes appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P0030, P0031, P0032, P0053, P0130, P0131, P0132, P0133, P0134, P2231 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Check for loose or poor contact on the oxygen sensor 4P connector.
3. If active code doesn't appear then there had been loose or poor contact on the oxygen sensor 4P connector. Clear the history DTC (page 5-16).

PRIMARY OXYGEN SENSOR CONNECTOR

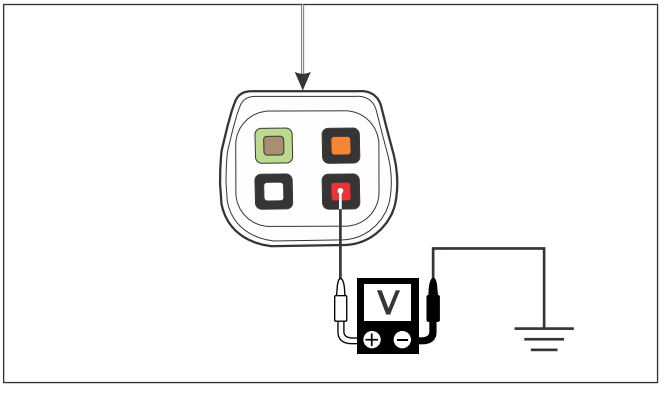


4. If active DTC code still appear, turn the ignition switch to "OFF" and disconnect the primary O_2 sensor 4P connector.
5. Turn the ignition switch to "ON" and check the battery voltage between the primary O_2 sensor 4P connector and body ground at the wire harness side.

CONNECTION

Black/Red-Body ground
STANDARD: Battery voltage

PRIMARY OXYGEN SENSOR 4P CONNECTOR



6. **If voltage does not exist**, then turn the ignition switch to "OFF".
   Check for continuity between the primary O_2 sensor 4P connector and relay 8P connector at the wire harness side.

CONNECTION

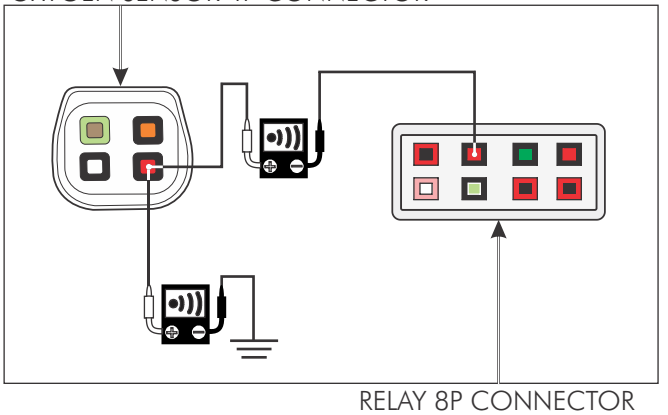
Black/Red-Black/Red (Relay 8P Connector)
STANDARD: Continuity
Black/Red-Body Ground
STANDARD: No Continuity (Ignition switch "ON")

If the above connection are abnormal replace the harness, clear the history DTC (page 5-16) and inspect again.

If the above connection are normal then inspect the following:

- Ignition switch (page 20-17).
- Fuses
- RR unit (page 17-12).
- Relay box (page 20-22).

OXYGEN SENSOR 4P CONNECTOR



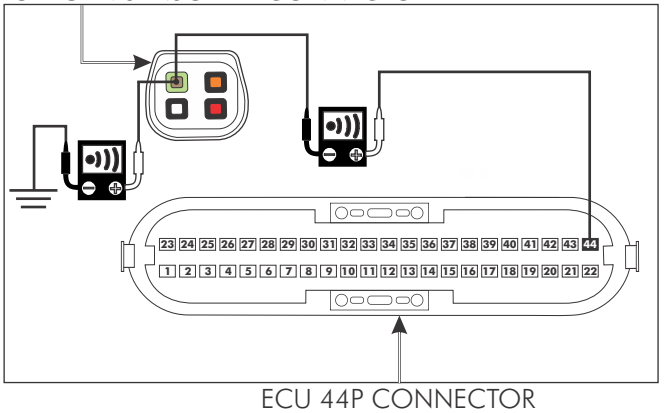
RELAY 8P CONNECTOR

7. **If voltage exist**, then turn the ignition switch to "OFF".
   Disconnect the ECU 44P connector and check the continuity and no continuity of following harness between the primary O_2 sensor 4P connector and ECU 44P connector at the wire harness side.

CONNECTION

Light Green/Brown (ECU Pin-44) - Light Green/Brown
STANDARD: Continuity
Light Green/Brown-Body Ground
STANDARD: No Continuity

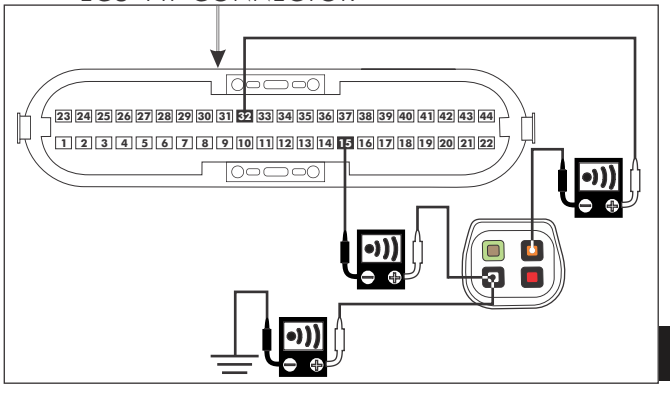
OXYGEN SENSOR 4P CONNECTOR



ECU 44P CONNECTOR

Black/White (ECU Pin-15) - Black/White
STANDARD: Continuity
Black/Orange (ECU Pin-32) - Black/Orange
STANDARD: Continuity
Black/White-Body Ground
STANDARD: No Continuity
If the above connection are abnormal replace the harness, clear the history DTC (page 5-16) and inspect again.

ECU 44P CONNECTOR

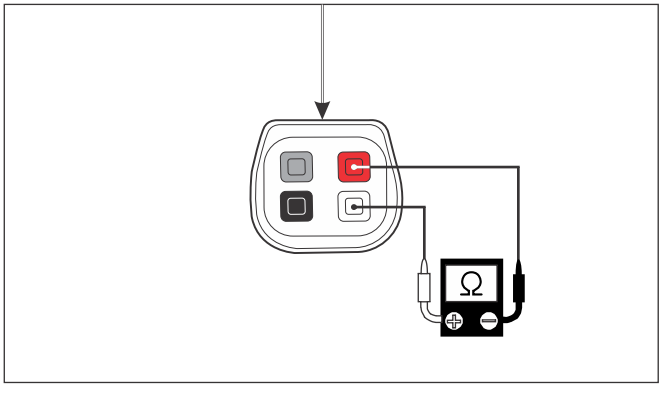


8. If the connections are normal then connect the ECU 44P connector and check for resistance between the primary O_2 sensor 4P connector at the component side.

CONNECTION

Red-White
STANDARD: 8.2 Ω
If resistance is abnormal, replace the primary O_2 sensor (page 5-93), clear the history DTC (page 5-16) and inspect again.
If the error still persist then replace the ECU (page 5-22) and inspect again.
If problem still persists then check for any intake or exhaust leaks.

OXYGEN SENSOR 4P CONNECTOR



SECONDARY OXYGEN SENSOR (DTC: P0036, P0037, P0038, P0054, P0136, P0137, P0138, P0139, P2232)

Read the DTC code in Hero VCI (page 5-3).
If any history code appears, then clear them from ECU memory (page 5-16).

If active P0036, P0037, P0038, P0054, P0136, P0137, P0138, P0139, P2232 codes appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P0036, P0037, P0038, P0054, P0136, P0137, P0138, P0139, P2232 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Check for loose or poor contact on the secondary oxygen sensor 4P connector.
3. If active code doesn't appear then there had been loose or poor contact on the secondary oxygen sensor 4P connector. Clear the history DTC (page 5-16).

SECONDARY OXYGEN SENSOR CONNECTOR

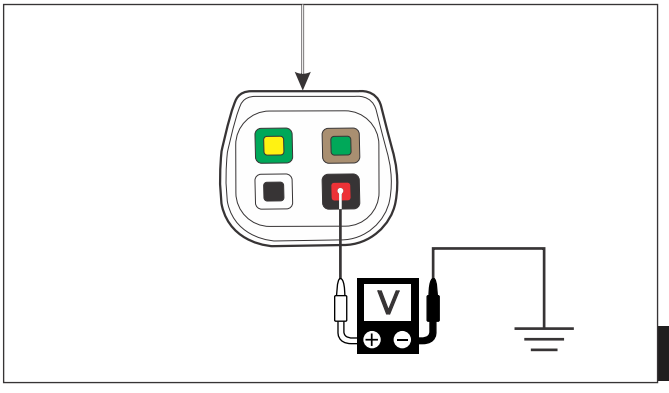
4. If active DTC code still appear, turn the ignition switch to "OFF" and disconnect the secondary O_2 sensor 4P connector.
5. Turn the ignition switch to "ON" and check the battery voltage between the secondary O_2 sensor 4P connector and body ground at the wire harness side.

CONNECTION

Black/Red-Body ground

STANDARD: Battery voltage

SECONDARY OXYGEN SENSOR 4P CONNECTOR



6. **If voltage does not exist**, then turn the ignition switch to "OFF".

   Check for continuity between the secondary O_2 sensor 4P connector and relay 8P connector at the wire harness side.

CONNECTION

Black/Red-Black/Red (Relay 8P Connector)

STANDARD: Continuity

Black/Red-Body Ground

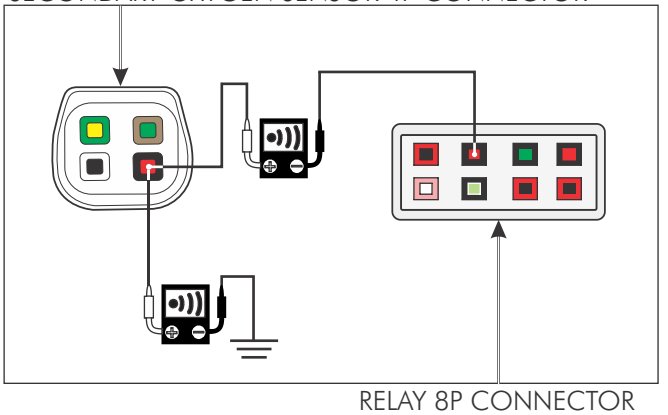
STANDARD: No Continuity (Ignition switch "ON")

If the above connection are abnormal replace the harness, clear the history DTC (page 5-16) and inspect again.

If the above connection are normal then inspect the following:

- Ignition switch (page 20-17).
- Fuses
- RR unit (page 17-12).
- Relay box (page 20-22).

SECONDARY OXYGEN SENSOR 4P CONNECTOR



RELAY 8P CONNECTOR

7. **If voltage exists**, then turn the ignition switch to "OFF".

   Disconnect the ECU 44P connector and check the continuity and no continuity of following harness between the secondary O_2 sensor 4P connector and ECU 44P connector at the wire harness side.

CONNECTION

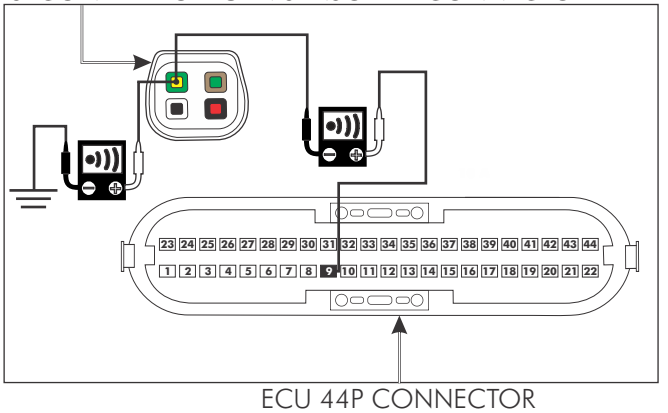
Green/Yellow (ECU Pin-9)-Green/Yellow

STANDARD: Continuity

Green/Yellow-Body Ground

STANDARD: No Continuity

SECONDARY OXYGEN SENSOR 4P CONNECTOR

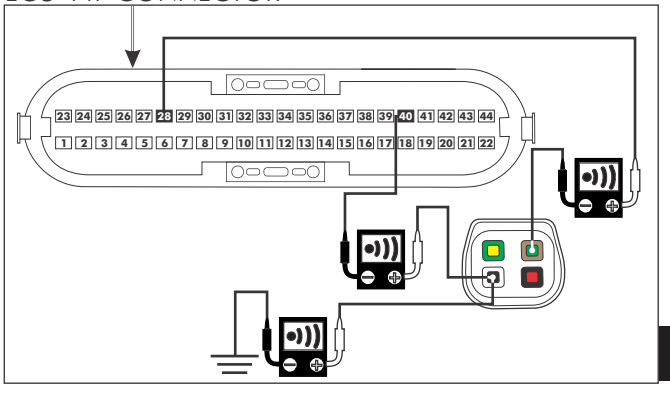


ECU 44P CONNECTOR

White/Black (ECU Pin-40) - White/Black
STANDARD: Continuity
Brown/Green (ECU Pin-28) - Brown/Green
STANDARD: Continuity
White/Black-Body Ground
STANDARD: No Continuity

If the above connection are abnormal replace the harness, clear the history DTC (page 5-16) and inspect again.

ECU 44P CONNECTOR



8. If the connections are normal then connect the ECU 44P connector and check for resistance between the secondary O_2 sensor 4P connector at the component side.

CONNECTION

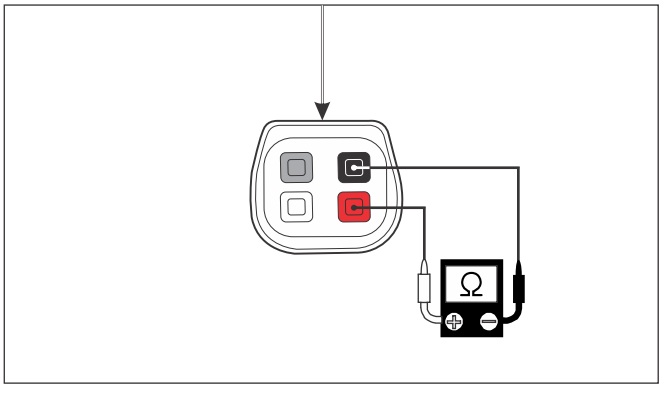
Black-Red
STANDARD: 8.2 Ω

If resistance is abnormal, replace the secondary O_2 sensor (page 5-93), clear the history DTC (page 5-16) and inspect again.

If the error still persist then replace the ECU (page 5-22) and inspect again.

If problem still persists then check for any intake or exhaust leaks.

SECONDARY OXYGEN SENSOR 4P CONNECTOR



MAP SENSOR (DTC: P0105, P0106, P0107, P0108)

Read the DTC code in Hero VCI (page 5-3).

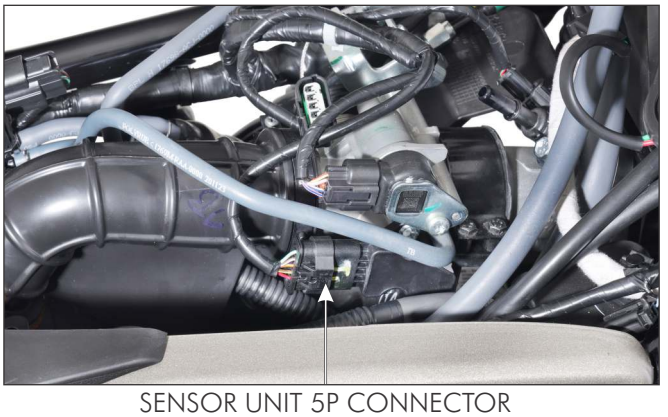
If any history code appears, then clear them from ECU memory (page 5-16).

If active P0105, P0106, P0107, P0108 codes appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P0105, P0106, P0107, P0108 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the fuel tank (page 2-12).
3. Check for loose or poor contact on the sensor unit 5P connector.
4. If active code doesn't appear then there had been loose or poor contact on the sensor unit 5P connector. Clear the history DTC (page 5-16).

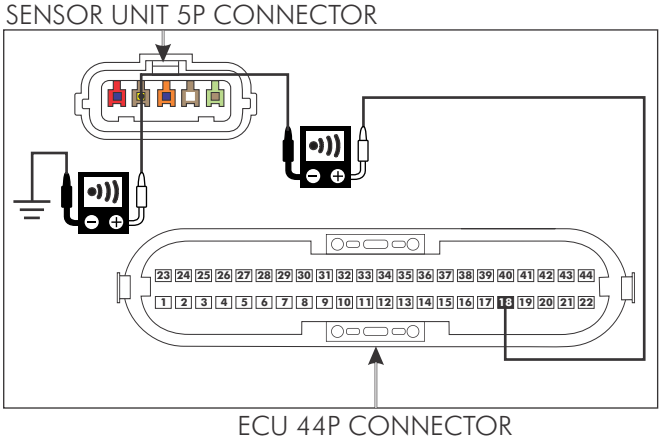


SENSOR UNIT 5P CONNECTOR

5. If active DTC code still appear, turn the ignition switch to "OFF" and disconnect the sensor unit 5P connector.
6. Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and sensor unit 5P connector at the wire harness side.

CONNECTION :
Brown/Yellow (ECU Pin-18)-Brown/Yellow
STANDARD : Continuity
Brown/Yellow-Body Ground
STANDARD: No continuity

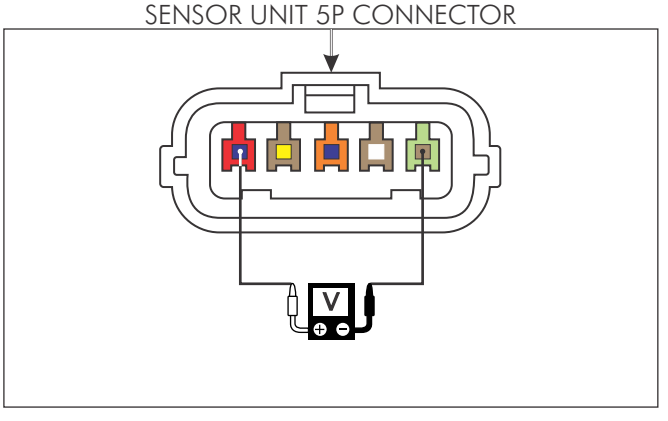
If the above connection is abnormal, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.



7. If the above connection are normal connect the ECU 44P connector.
   Turn the ignition switch to "ON" and measure the voltage between the sensor unit 5P connector at wire harness side.

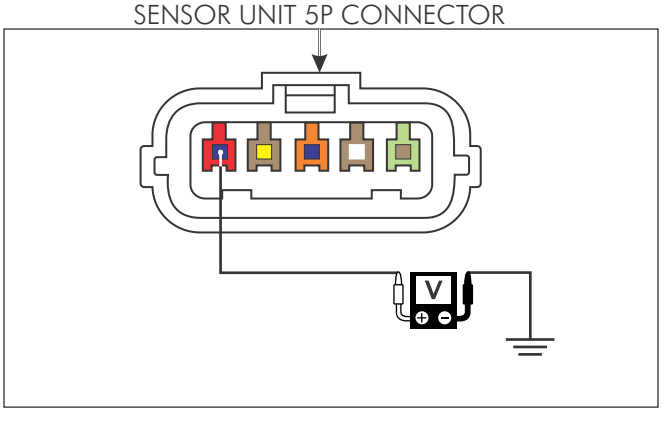
CONNECTION :
Red/Blue-Light green/Brown
STANDARD: 4.75-5.25 V

If voltage is in the range, then replace the sensor unit (page 5-80), clear the history DTC (page 5-16) and inspect again.



8. If voltage is out of range, then measure the voltage between the sensor unit 5P connector and body ground.

CONNECTION :
Red/Blue-Body Ground
STANDARD: 4.75-5.25 V

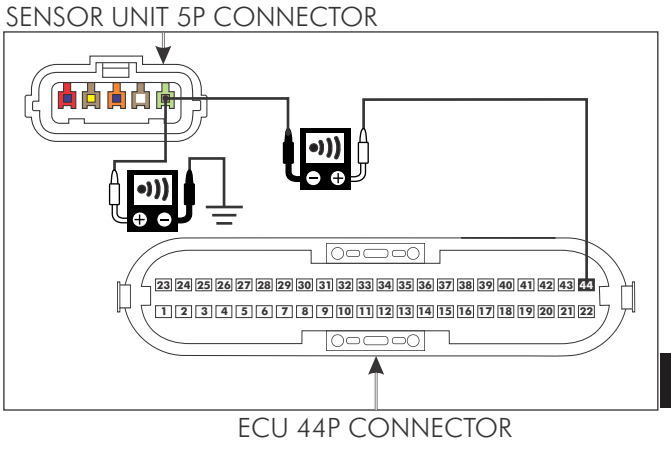


If voltage exists between R/L and body ground:

9. Turn the ignition switch to "OFF". Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and sensor unit 5P connector at the wire harness side.

CONNECTION :
Light green/Brown (ECU Pin-44)-
Light green/Brown
STANDARD : Continuity
Light green/Brown -Body Ground
STANDARD : No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.



5

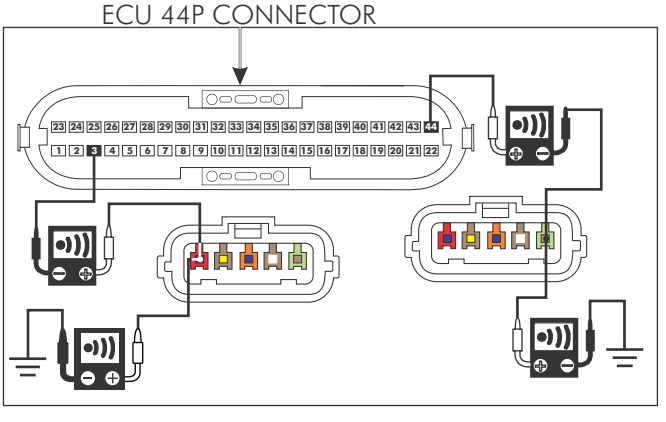
If voltage does not exist between R/L and body ground:

10. Turn the ignition switch to "OFF". Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and sensor unit 5P connector at the wire harness side.

CONNECTION :
Red/Blue (ECU Pin-3)- Red/Blue
STANDARD: Continuity
Light green/Brown (ECU Pin-44)-
Light green/Brown
STANDARD : Continuity
Light green/Brown-Body Ground
STANDARD : No Continuity
Red/Blue -Body Ground
STANDARD: No continuity

If any abnormality is found, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

If connections are normal, then replace the ECU (page 5-22) with a new one and inspect again.



IAT SENSOR (DTC: P0110, P0111, P0112, P0113)

Read the DTC code in Hero VCI (page 5-3).

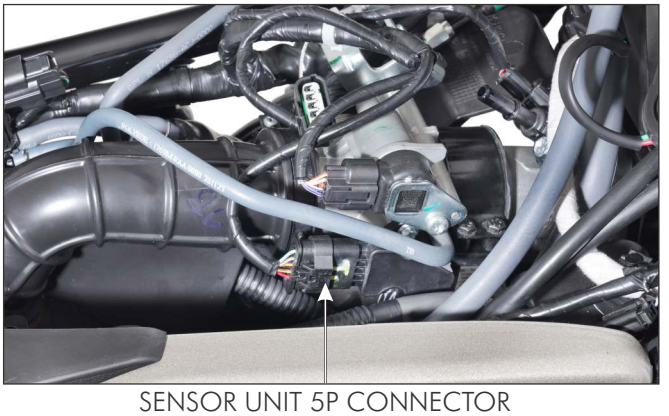
If any history code appears, then clear them from ECU memory (page 5-16).

If active P0110, P0111, P0112, P0113 codes appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P0110, P0111, P0112, P0113 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the fuel tank (page 2-12).
3. Check for loose or poor contact on the sensor unit 5P connector.
4. If active code doesn't appear then there had been loose or poor contact on the sensor unit 5P connector. Clear the history DTC (page 5-16).



SENSOR UNIT 5P CONNECTOR

5. If active DTC code still appear, turn the ignition switch to "OFF" and disconnect the sensor unit 5P connector.
6. Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and sensor unit 5P connector at the wire harness side.

CONNECTION :

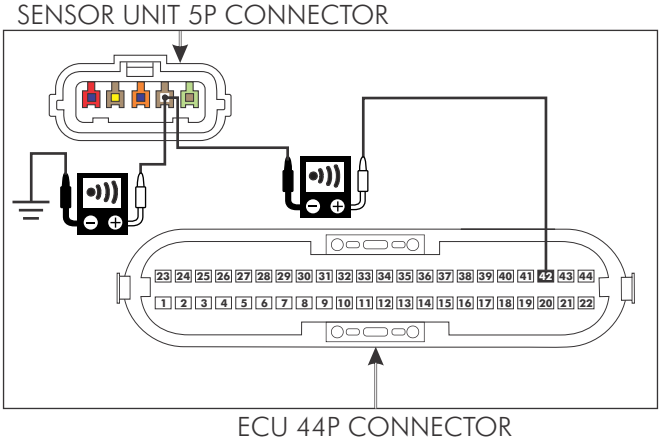
Brown/White (ECU Pin-42)-Brown/White

STANDARD : Continuity

Brown/White-Body Ground

STANDARD: No continuity

If the above connection is abnormal, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.



7. If the above connection are normal connect the ECU 44P connector.

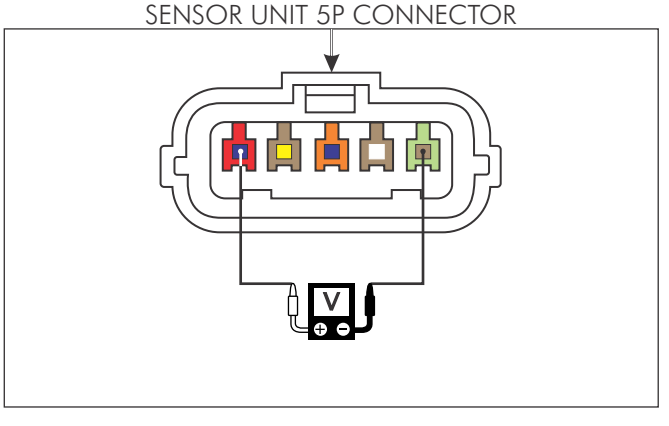
   Turn the ignition switch to "ON" and measure the voltage between the sensor unit 5P connector at wire harness side.

CONNECTION :

Red/Blue-Light green/Brown

STANDARD: 4.75-5.25 V

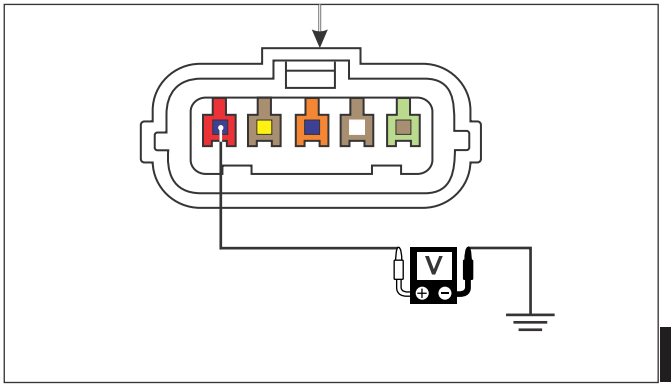
If voltage is in the range, then replace the throttle body with sensor unit (page 5-79), clear the history DTC (page 5-22) and inspect again.



8. If voltage is out of range, then measure the voltage between the sensor unit 5P connector and body ground.

CONNECTION :
Red/Blue-Body Ground
STANDARD: 4.75-5.25 V

SENSOR UNIT 5P CONNECTOR



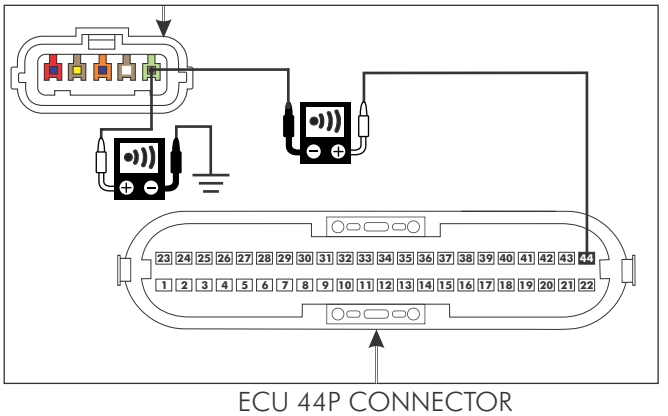
If voltage exists between R/L and body ground:

9. Turn the ignition switch to "OFF". Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and sensor unit 5P connector at the wire harness side.

CONNECTION :
Light green/Brown (ECU Pin-44)-
Light green/Brown
STANDARD : Continuity
Light green/Brown -Body Ground
STANDARD : No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

SENSOR UNIT 5P CONNECTOR



ECU 44P CONNECTOR

If voltage does not exist between R/L and body ground:

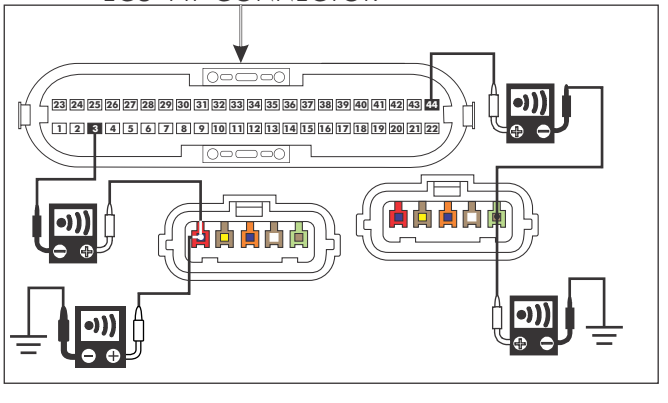
10. Turn the ignition switch to "OFF". Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and sensor unit 5P connector at the wire harness side.

CONNECTION :
Red/Blue (ECU Pin-3)- Red/Blue
STANDARD: Continuity
Light green/Brown (ECU Pin-44)-
Light green/Brown
STANDARD : Continuity
Light green/Brown-Body Ground
STANDARD : No Continuity
Red/Blue -Body Ground
STANDARD: No continuity

If any abnormality is found, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

If connections are normal, then replace the ECU (page 5-22) with a new one and inspect again.

ECU 44P CONNECTOR



ENGINE OIL TEMPERATURE SENSOR (EOT)
(DTC: P0115, P0116, P0117, P0118)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

If active P0115, P0116, P0117, P0118 codes appear in VCI then perform following steps:

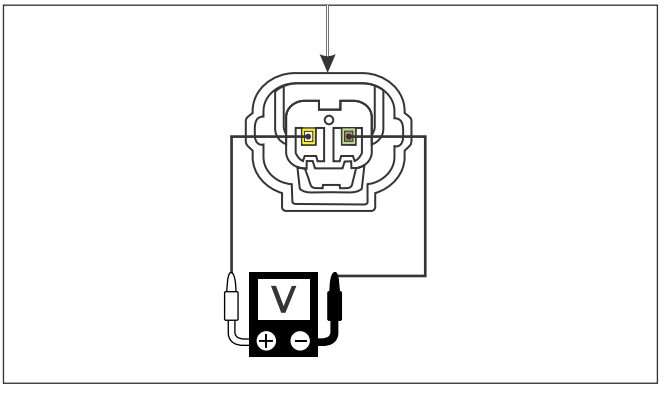
NOTE

To know about the causes and remedies of P0115, P0116, P0117, P0118 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

EOT SENSOR 2P CONNECTOR

1. Turn the ignition switch to "OFF".
2. Remove the fuel tank (page 2-12).
3. Check for loose or poor contact on the EOT sensor 2P connector.
4. If active code doesn't appear then there had been loose or poor contact on the EOT sensor 2P connector. Clear the history DTC (page 5-16).

EOT SENSOR 2P CONNECTOR



5. If active DTC code still appear, turn the ignition switch to "OFF" and disconnect the EOT sensor 2P connector.
6. Turn the ignition switch to "ON" and measure the voltage between the EOT sensor 2P connector at wire harness side.

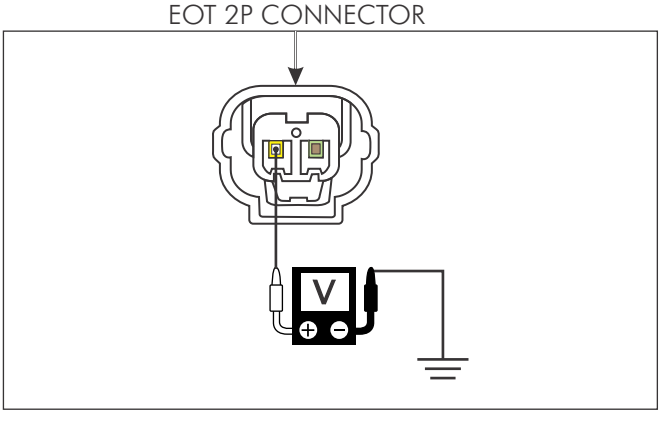
CONNECTION

Yellow/White- Light green/Brown

STANDARD: 4.9-5.1 V

If voltage is in the range, then inspect the EOT (page 5-89) and replace if required, clear the history DTC (page 5-16) and inspect again.

EOT 2P CONNECTOR



7. If voltage is out of range, then measure the voltage between the EOT 2P connector at wire harness side and body ground.

CONNECTION

Yellow/White-Body Ground

STANDARD: 4.9-5.1 V

If voltage exists between Y/W and body ground:

8. Turn the ignition switch to "OFF".
9. Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and EOT 2P connector at the wire harness side.

CONNECTION

Light green/Brown (ECU Pin-44)-

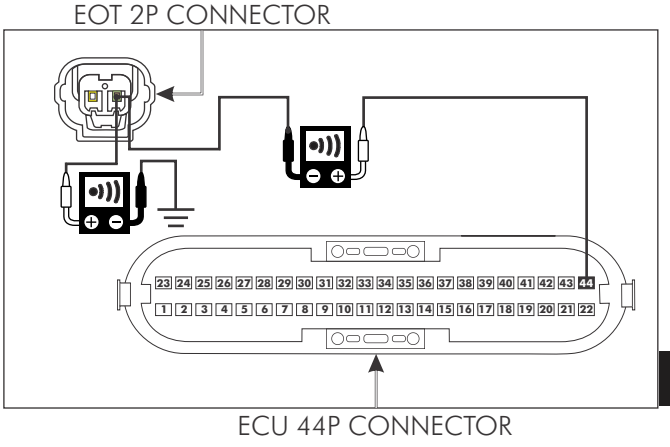
Light green/Brown

STANDARD : Continuity

Light green/Brown-Body Ground

STANDARD : No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.



5

If voltage does not exist between Y/W and body ground:

10. Check the continuity between the ECU 48P connector and EOT sensor 2P connector at the wire harness side.

CONNECTION

Light green/Brown (ECU Pin-44)-

Light green/Brown

STANDARD : Continuity

Yellow/White (ECU Pin- 19)- Yellow/White

STANDARD: Continuity

Light green/Brown-Body Ground

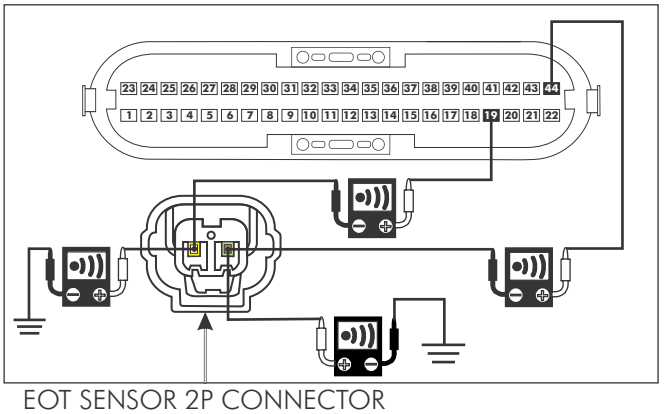
STANDARD: No Continuity

Yellow/White-Body Ground

STANDARD: No continuity

If any abnormality is found, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

If connections are normal, then replace the ECU (page 5-22) with a new one and inspect again.



TP SENSOR (DTC: P0122, P0123)

Read the DTC code in Hero VCI (page 5-3).

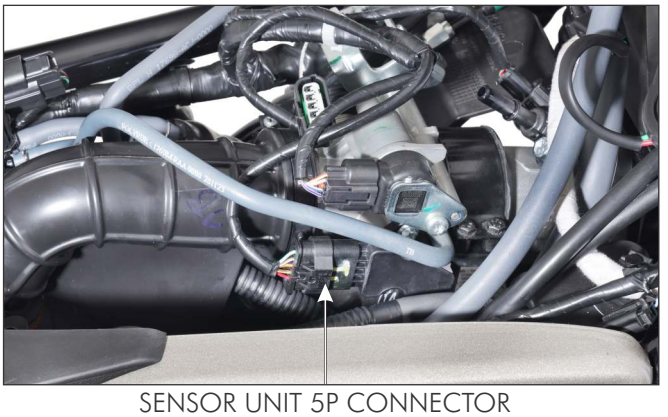
If any history code appears, then clear them from ECU memory (page 5-16).

If active P0122, P0123 codes appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P0122, P0123 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the fuel tank (page 2-12).
3. Check for loose or poor contact on the sensor unit 5P connector.
4. If active code doesn't appear then there had been loose or poor contact on the sensor unit 5P connector. Clear the history DTC (page 5-16).



SENSOR UNIT 5P CONNECTOR

5. If active DTC code still appear, turn the ignition switch to "OFF" and disconnect the sensor unit 5P connector.
6. Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and sensor unit 5P connector at the wire harness side.

CONNECTION :

Brown/Yellow (ECU Pin-18)-Brown/Yellow

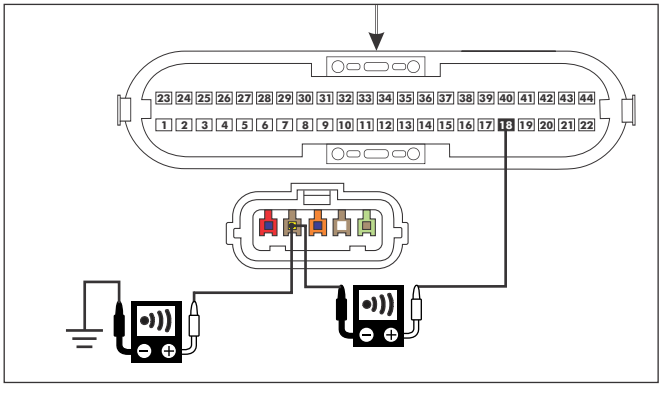
STANDARD : Continuity

Brown/Yellow-Body Ground

STANDARD: No continuity

If the above connection is abnormal, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

ECU 44P CONNECTOR



7. If the above connection are normal connect the ECU 44P connector.

   Turn the ignition switch to "ON" and measure the voltage between the sensor unit 5P connector at wire harness side.

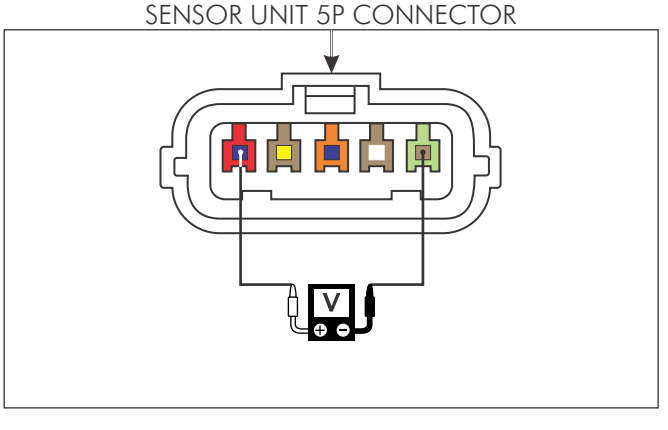
CONNECTION :

Blue-Light green/Brown

STANDARD: 4.75-5.25 V

If voltage is in the range, then replace the throttle body with sensor unit (page 5-79), clear the history DTC (page 5-16) and inspect again.

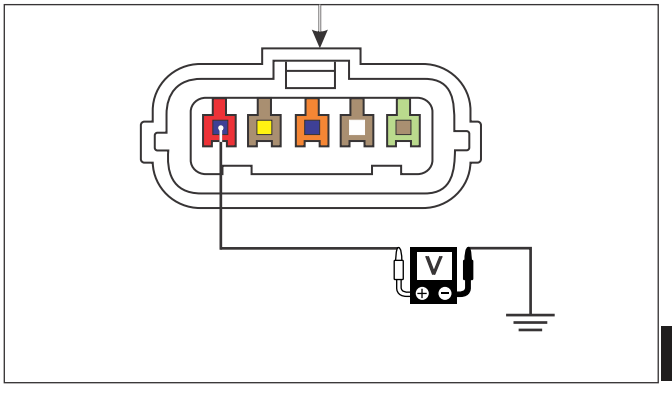
SENSOR UNIT 5P CONNECTOR



8. If voltage is out of range, then measure the voltage between the sensor unit 5P connector and body ground.

CONNECTION :
Red/Blue-Body Ground
STANDARD: 4.75-5.25 V

SENSOR UNIT 5P CONNECTOR



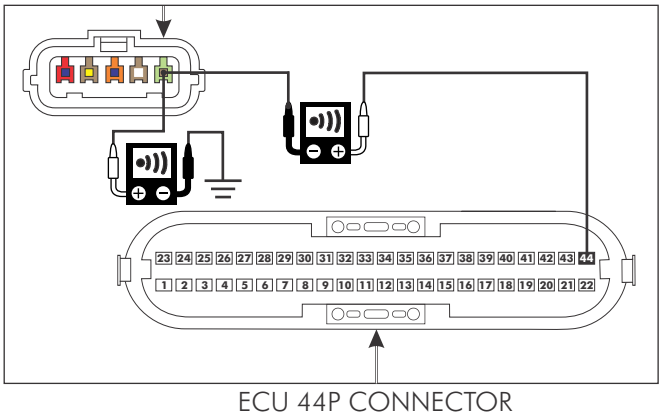
If voltage exists between R/L and body ground:

9. Turn the ignition switch to "OFF". Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and sensor unit 5P connector at the wire harness side.

CONNECTION :
Light green/Brown (ECU Pin-44)-
Light green/Brown
STANDARD : Continuity
Light green/Brown -Body Ground
STANDARD : No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

SENSOR UNIT 5P CONNECTOR



ECU 44P CONNECTOR

If voltage does not exist between R/L and body ground:

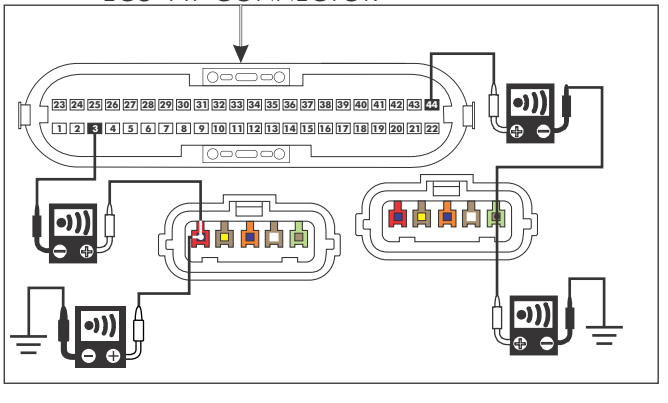
10. Turn the ignition switch to "OFF". Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and sensor unit 5P connector at the wire harness side.

CONNECTION :
Red/Blue (ECU Pin-3)- Red/Blue
STANDARD: Continuity
Light green/Brown (ECU Pin-44)-
Light green/Brown
STANDARD : Continuity
Light green/Brown-Body Ground
STANDARD : No Continuity
Red/Blue -Body Ground
STANDARD: No continuity

If any abnormality is found, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

If connections are normal, then replace the ECU (page 5-22) with a new one and inspect again.

ECU 44P CONNECTOR



INJECTOR (DTC: P0201, P0261, P0262)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

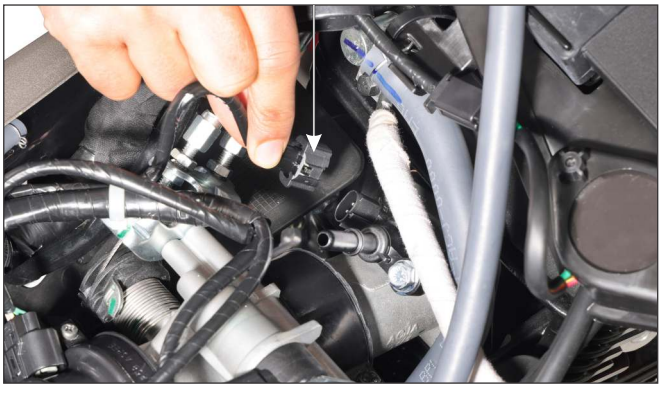
If active P0201, P0261, P0262 codes appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P0201, P0261, P0262 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the fuel tank (page 2-12).
3. Check for loose or poor contact on the injector 2P connector.
4. If active code doesn't appear then there had been loose or poor contact on the injector 2P connector. Clear the history DTC (page 5-16).

INJECTOR 2P CONNECTOR



5. If active DTC code still appear, turn the ignition switch to "OFF" disconnect the injector 2P connector.

   Disconnect the ECU 44P connector and check for continuity between the ECU 44P connector and injector 2P connector at the wire harness side.

CONNECTION

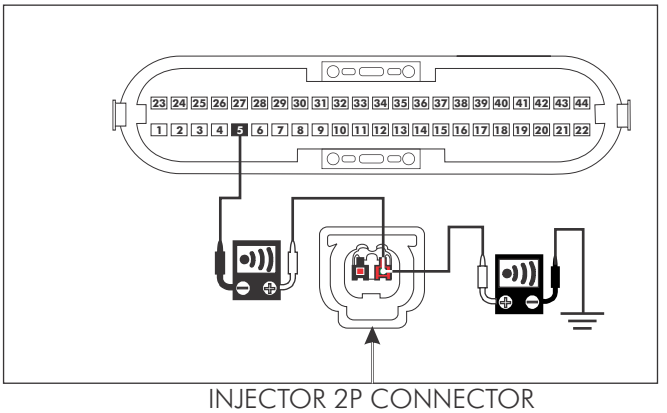
Red/Green (ECU Pin- 5)- Red/Green

STANDARD: Continuity

Red/Green- Body Ground

STANDARD: No Continuity

If the above connection is abnormal, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

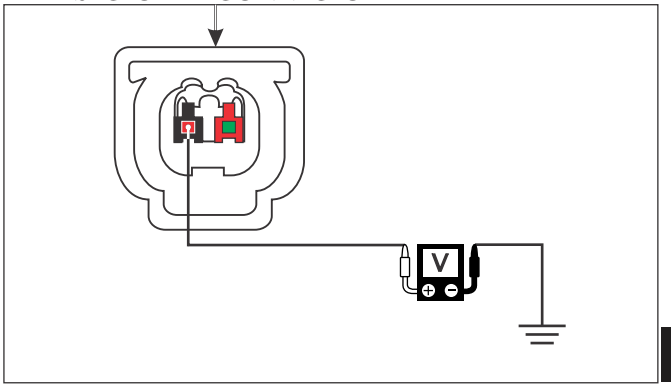


INJECTOR 2P CONNECTOR

6. If the above connection are normal connect the ECU 48P connector.
   Turn the ignition switch to "ON", and measure the voltage between the injector 2P connector and body ground.

CONNECTION
Black/Red-Body Ground
STANDARD: Battery Voltage

INJECTOR 2P CONNECTOR



7. **If voltage does not exist**, then turn the ignition switch to "OFF".
   Check for continuity between the injector 2P connector and relay 8P connector at the wire harness side.

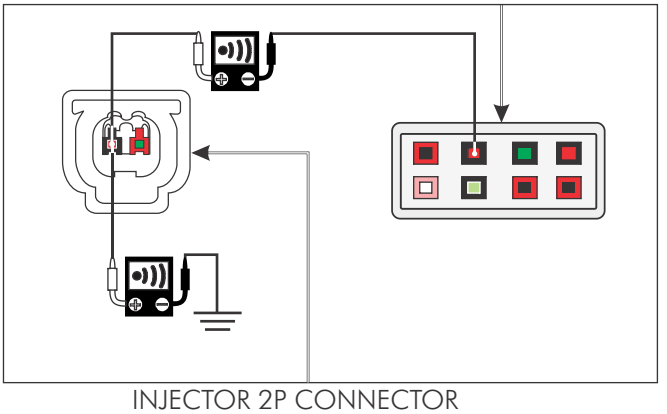
CONNECTION
Black/Red (Injector 2P Connector)– Black/Red-(Relay 8P Connector)
STANDARD: Continuity
Black/Red--Body Ground
STANDARD: No Continuity (Ignition switch "ON")

If the above connection are abnormal replace the harness, clear the history DTC (page 5-16) and inspect again.

If the above connection are normal then inspect the following:

- Ignition switch (page 20-16).
- Fuses
- RR unit (page 17-11).
- Relay box (page 20-22).

RELAY 8P CONNECTOR



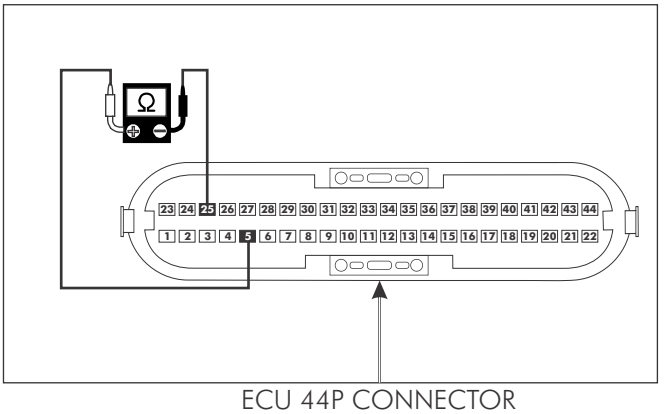
INJECTOR 2P CONNECTOR

8. **If voltage exist**, then turn the ignition switch to "OFF".
   Connect the injector 2P connector and disconnect the ECU 44P connector, then measure the resistance between ECU 44P connector at wire harness side.

CONNECTION
Red/Green (ECU Pin- 5)-Black/Red (ECU Pin- 25)
STANDARD: 12 Ω ± 5% at 22°C

If resistance is abnormal, replace the injector (page 5-84), clear the history DTC (page 5-16) and inspect again.

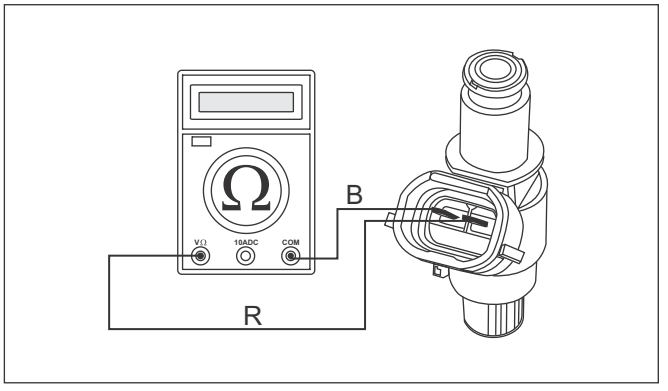
if error still exist replace the ECU (page 5-16) and inspect again.



ECU 44P CONNECTOR

NOTE

Incase the injector is removed from the throttle body then the resistance can be checked directly on the injector pins.



MISSFIRE DETECTION (DTC:P0301)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

If active P0301 code appear in VCI then perform following steps:

NOTE

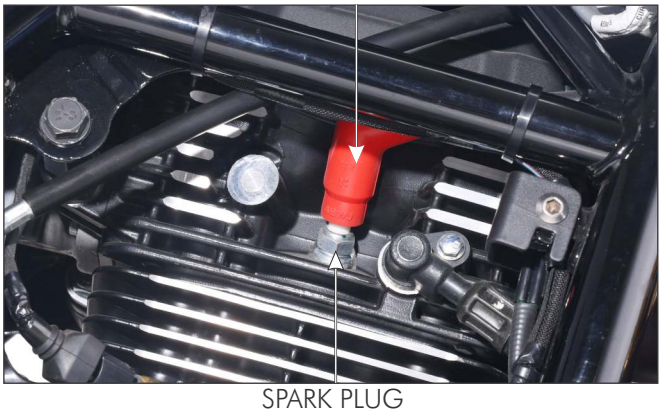
To know about the causes and remedies of P0301 code, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

Check whether any other active DTC code is appearing, if yes, then perform troubleshooting steps of respective DTC codes.

Now, if P0301 code is still appearing, then perform following inspection:

1. Inspect for defective spark plug and noise suppressor cap (page 3-8) and replace if required.
2. Inspect for Intake and exhaust lines for leakage.
3. Inspect for clogged or defective injector.
4. Inspect for air filter clogging.
5. Inspect valve clearance (page 3-10).
6. Inspect fuel pressure (page 5-69).
7. If all above are normal, then replace the ECU (page 5-22) with new one and inspect again.

NOISE SUPPRESSOR CAP



SPARK PLUG

CKP SENSOR (DTC:P0335)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

If active P0335 code appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P0335 code, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the left side cover (page 2-14) and slide the boot.
3. Check for loose or poor contact on the CKP sensor 2P connector.
4. If active code doesn't appear then there had been loose or poor contact on the CKP sensor 2P connector. Clear the history DTC (page 5-16).

CKP SENSOR 2P CONNECTOR

5. Disconnect ECU 48P connector. Check the continuity between ECU 48P connector and CKP sensor 2P connector at wiring harness side.

CONNECTION

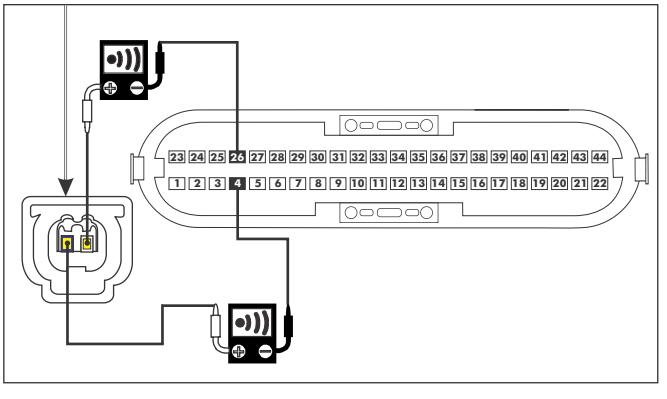
White/Yellow (ECU Pin-26)-White/Yellow

Blue/Yellow (ECU Pin-4)- Blue/Yellow

STANDARD - Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

CKP SENSOR 2P CONNECTOR



6. If continuity exist, connect the ECU 44P connector and check the CKP sensor resistance value at 2P connector.

CONNECTION

Sky blue-White

Standard: 109-164 Ω

If resistance are abnormal, then replace the CKP sensor, clear the history DTC (page 5-16) and inspect again.

If resistance is normal replace the ACG, clear the history DTC (page 5-16) and inspect again.

If error still persist, then replace the ECU (page 5-22) and inspect again.

(-)VE PROBE (+)VE PROBE

Note: *Images may depict a different model/variant, but procedures and information remain same.*

IGNITION COIL (DTC: P0351)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

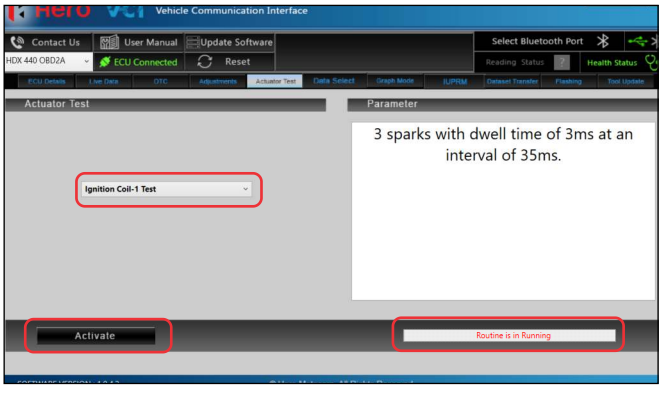
If active P0351 code appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P0351 code, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

IGNITION COIL 2P CONNECTOR

1. Turn the ignition switch to "OFF".
2. Remove the left side fuel tank shroud (page 2-14).
3. Check for loose or poor contact on ignition coil connector.
4. If active code doesn't appear then there had been loose or poor contact on the ignition coil connector. Clear the history DTC (page 5-16).



5. If DTC code appear then run the actuator test in Hero VCI (page 23-15).
6. Select the "IGNITION COMMAND", click on to "ACTIVATE" to start the testing.
7. In the status bar, if the status displayed as "ROUTINE SUCCESS" this means that ECU is OK
8. If the status displayed as "TEST NOT COMPLETED" then replace the ECU (page 5-22).

9. If test is successful, then turn the ignition switch to "OFF" disconnect the ignition coil 2P connector.

   Disconnect the ECU 44P connector and check for continuity between the ECU 44P connector and ignition coil 2P connector at the wire harness side.

CONNECTION

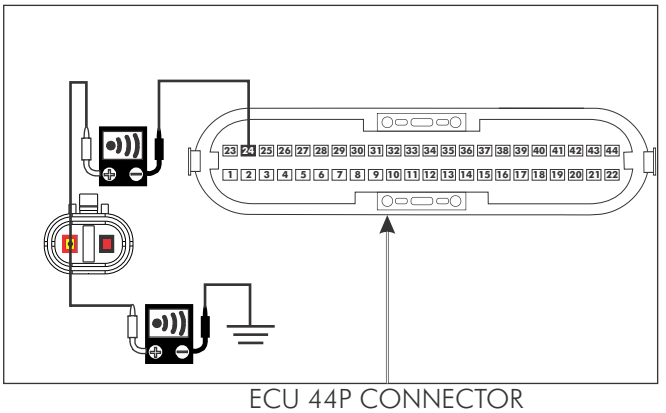
Red/Yellow (ECU Pin-24)- Red/Yellow

STANDARD: Continuity

Red/Yellow-Body Ground

STANDARD: No Continuity

If the above connection are abnormal replace the harness, clear the history DTC (page 5-16) and inspect again.



ECU 44P CONNECTOR

***Note:** Images may depict a different model/variant, but procedures and information remain same.*

10. If the above connection are normal connect the ECU 44P connector.

    Turn the ignition switch to "ON", and measure the voltage between the ignition coil 2P connector and body ground.

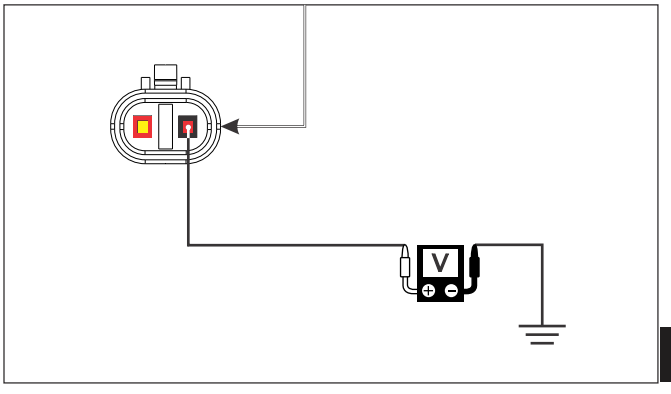
CONNECTION

Black/Red-Body Ground

STANDARD: Battery Voltage

If voltage is ok, inspect the ignition coil (page 18-4), replace if required, clear the history DTC (page 5-16) and inspect again.

IGNITION COIL 2P CONNECTOR



11. If voltage does not exist, then turn the ignition switch to "OFF".

    Check for continuity between the ignition coil 2P connector and relay 8P connector at the wire harness side.

CONNECTION

Black/Red- Black/Red

STANDARD: Continuity

Black/Red-Body Ground (Ignition switch "ON")

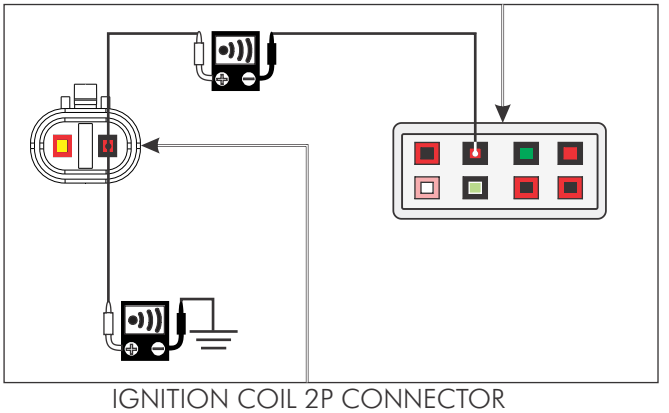
STANDARD: No Continuity

If the above connection are abnormal replace the harness, clear the history DTC (page 5-16) and inspect again.

If the above connection are normal then inspect the following:

- Ignition switch (page 20-16).
- Fuses
- RR unit (page 17-11).
- Relay box (page 20-22).

RELAY 8P CONNECTOR



IGNITION COIL 2P CONNECTOR

CATALYTIC CONVERTOR (DTC:P0420)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

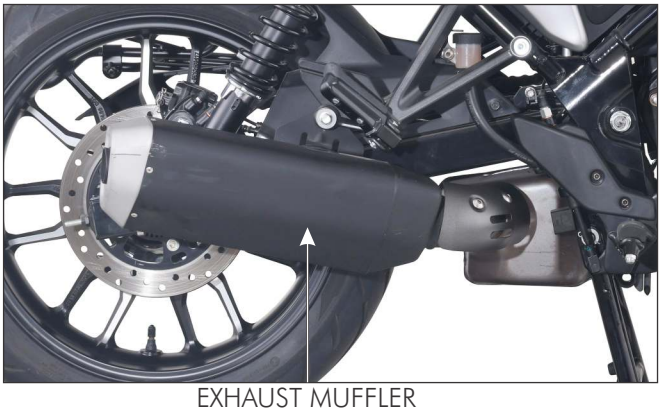
If active P0420 code appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P0420 code, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

Check whether any other active DTC code is appearing, if yes, then perform troubleshooting steps of respective DTC codes.

Now, if P0420 code is still appearing, then replace the exhaust muffler (page 2-14) with new one and inspect again.



EXHAUST MUFFLER

PURGE VALVE (DTC: P0444, P0458, P0459)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

If active P0444, P0458, P0459 codes appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P0444, P0458, P0459 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the fuel tank (page 2-12).
3. Check for loose or poor contact on the purge valve 2P connector.
4. If active code doesn't appear then there had been loose or poor contact on the purge valve 2P connector. Clear the history DTC (page 5-16).
5. If active DTC code still appear, turn the ignition switch to "OFF" and run the actuator test in Hero VCI (page 23-15).
6. Select the "CANISTER/PURGE VALVE COMMAND", click on to "ACTIVATE" to start the testing.
7. In the status bar, if the status displayed as "ROUTINE SUCCESS" this means that ECU is OK.
8. If the status displayed as "TEST NOT COMPLETED" then replace the ECU (page 5-22).
9. If test is successful, then turn the ignition switch to "OFF" disconnect the purge valve 2P connector.

   Disconnect the ECU 44P connector and check for continuity between the ECU 44P connector and purge valve 2P connector at the wire harness side.

CONNECTION

Green/Black (ECU Pin-34)-Green/Black

STANDARD: Continuity

Green/Black-Body Ground

STANDARD: No Continuity

If the above connection are abnormal replace the harness, clear the history DTC (page 5-16) and inspect again.

10. If the above connection are normal connect the ECU 44P connector.

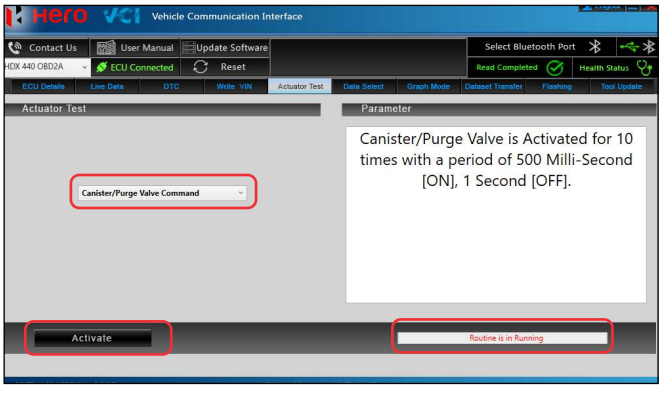
    Turn the ignition switch to "ON", and measure the voltage between the purge valve 2P connector and body ground.

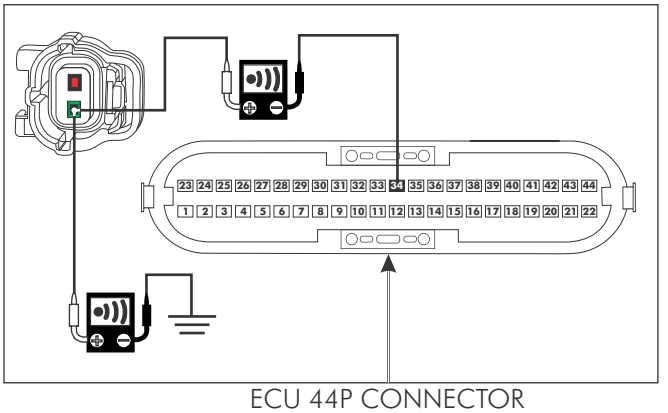
CONNECTION

Black/Red-Body Ground

STANDARD: Battery Voltage

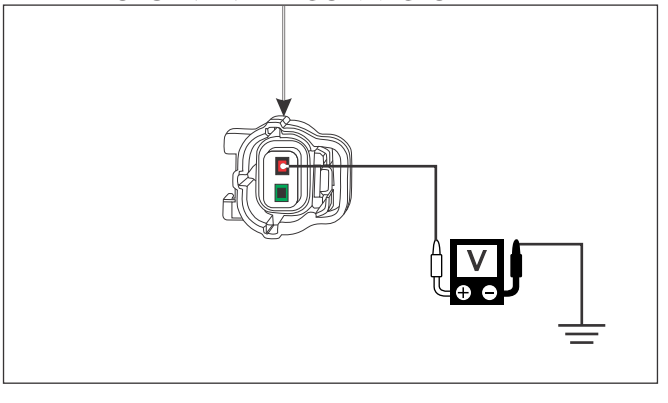
PURGE VALVE 2P CONNECTOR





ECU 44P CONNECTOR

PURGE VALVE 2P CONNECTOR



11. **If voltage does not exist**, then turn the ignition switch to "OFF".

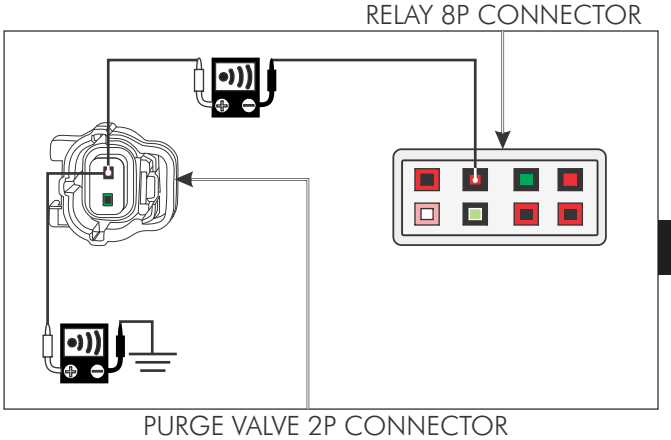
    Check for continuity between the purge valve 2P connector and relay 8P connector at the wire harness side.

CONNECTION
Black/Red- Black/Red
STANDARD: Continuity
Black/Red-Body Ground (Ignition switch "ON")
STANDARD: No Continuity

If the above connection are abnormal replace the harness, clear the history DTC (page 5-16) and inspect again.

If the above connection are normal then inspect the following:

- Ignition switch (page 20-16).
- Fuses
- RR unit (page 17-11).
- Relay box (page 20-22).

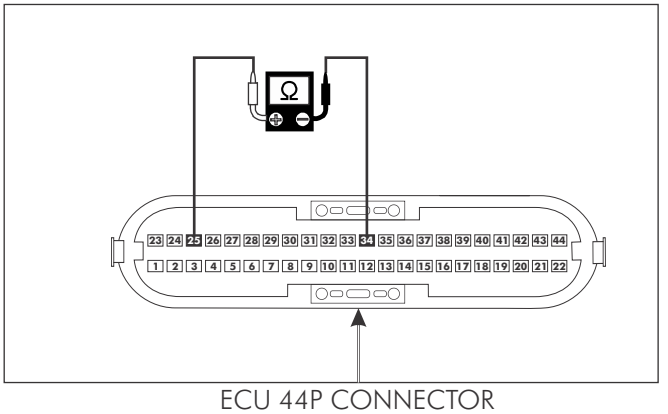


12. **If voltage exist**, then turn the ignition switch to "OFF".

    Connect the purge valve 2P connector and disconnect the ECU 44P connector, then measure the resistance between ECU 44P connector at wire harness side.

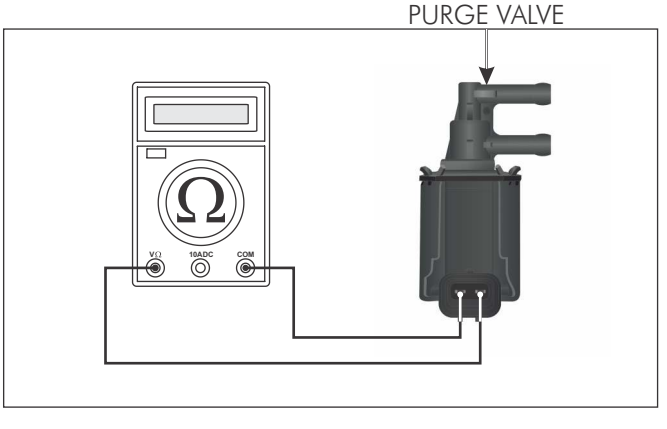
CONNECTION
Green/Black (ECU Pin-34)-
Black/Red (ECU Pin- 25)
STANDARD: 32±3Ω

If resistance is abnormal, replace the purge valve (page 5-92), clear the history DTC (page 5-16) and inspect again.



NOTE

Incase the purge valve is removed from the frame then the resistance can be checked directly on the purge valve pins.



WHEEL SPEED SENSOR (DTC:P0501)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

If active P0501 code appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P0501 code, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the left side tank cover (page 2-8).
3. Check for loose or poor contact on HECU 16P connector, ECU 44P connector and front speed sensor (WSS) 2P connector.
4. If active code doesn't appear then there was loose or poor contact on the HECU 16P connector, ECU 44P connector and front WSS 2P connector. Clear the history DTC (page 5-16).

FRONT WSS 2P CONNECTOR

5. If DTC code appear, disconnect the front WSS 2P connector then turn the ignition switch to "ON".
6. Measure the voltage between front WSS 2P connector at wire harness side.

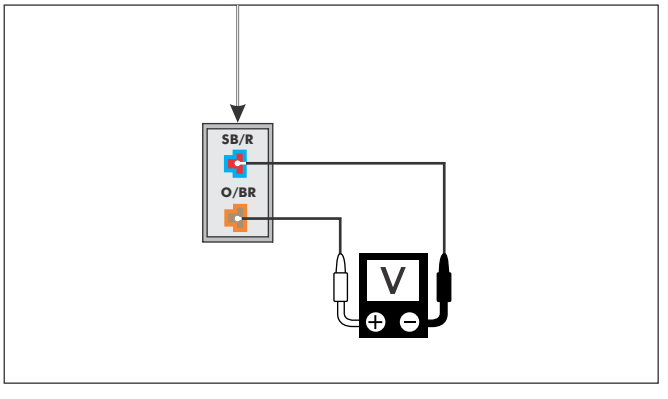
CONNECTION

Sky Blue/Red-Orange/Brown

STANDARD: Battery voltage

If voltage is in the range, then inspect the front WSS (page 20-47) and replace if required.

FRONT WSS 2P CONNECTOR



7. If battery voltage is out of range, then measure the battery voltage between the front WSS 2P connector at wire harness side and body ground.

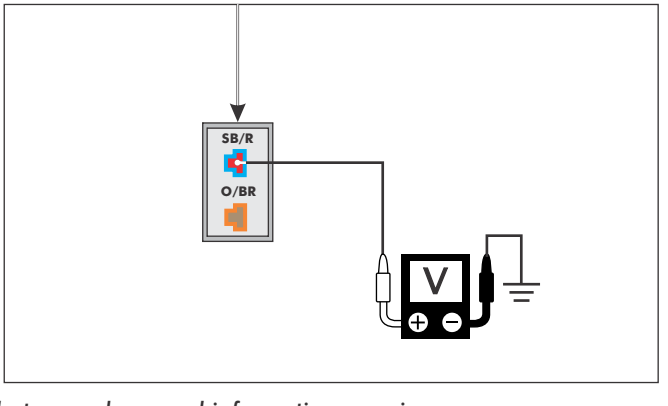
CONNECTION

Sky Blue/Red-Body Ground

STANDARD: Battery voltage

If voltage is in the range, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

FRONT WSS 2P CONNECTOR



Note: *Images may depict a different model/variant, but procedures and information remain same.*

8. If voltage does not exist, turn the ignition switch to "OFF". Disconnect HECU 16P connector and check for continuity between the HECU 16P connector and front WSS 2P connector at the wire harness side.

CONNECTION :
Sky Blue/Red (HECU Pin-2)- Sky Blue/Red
STANDARD: Continuity
Orange/Brown (HECU Pin-11)-Orange/Brown
STANDARD : Continuity
Sky Blue/Red-Body Ground
STANDARD : No Continuity
Orange/Brown-Body Ground
STANDARD: No continuity

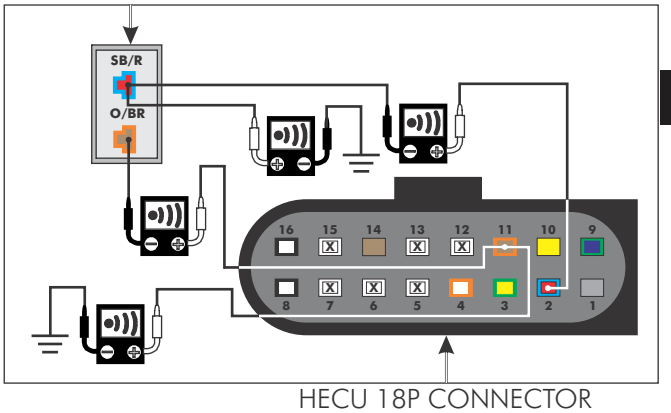
If any abnormality is found, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

If connections are normal, then inspect the HECU (page 15-18), replace if required, clear the history DTC (page 5-16) and inspect again.

If error still persist then inspect the encoder for any damage (page 15-17).

If error still persist then inspect speedometer and ECU, replace if required.

FRONT WSS 2P CONNECTOR



HECU 18P CONNECTOR

IDLE SPEED CONTROL (IACV)

(DTC: P0506, P0507, P0508, P0509 P0511)

Read the DTC code in Hero VCI (page 5-3).

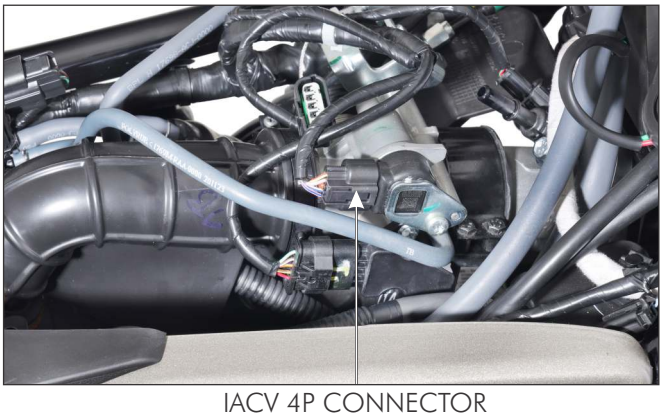
If any history code appears, then clear them from ECU memory (page 5-16).

If active P0506, P0507, P0508, P0509, P0511 codes appear in VCI then perform following steps:

NOTE

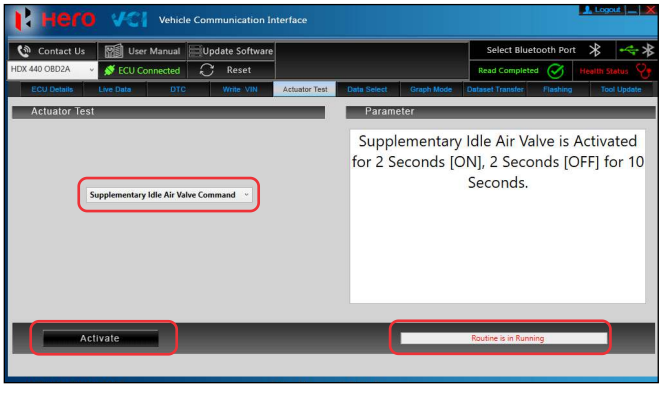
To know about the causes and remedies of P0506, P0507, P0508, P0511 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the fuel tank (page 2-12).
3. Check for loose or poor contact on IACV 4P connector.
4. If active code doesn't appear then there had been loose or poor contact on the IACV 4P connector. Clear the history DTC (page 5-16).



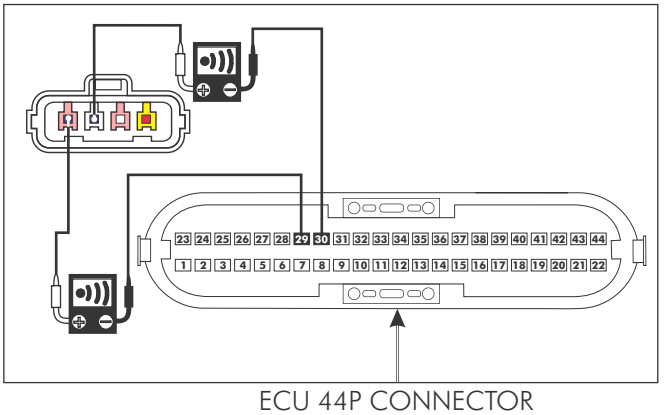
IACV 4P CONNECTOR

5. If active DTC code still appear, turn the ignition switch to "OFF" and run the actuator test in Hero VCI (page 23-15).
6. Select the "SUPPLEMENTARY IDLE AIR VALVE COMMAND", click on to "ACTIVATE" to start the testing.
7. In the status bar, if the status displayed as "ROUTINE SUCCESS" this means that ECU is OK.
8. If the status displayed as "TEST NOT COMPLETED" then replace the ECU (page 5-22).



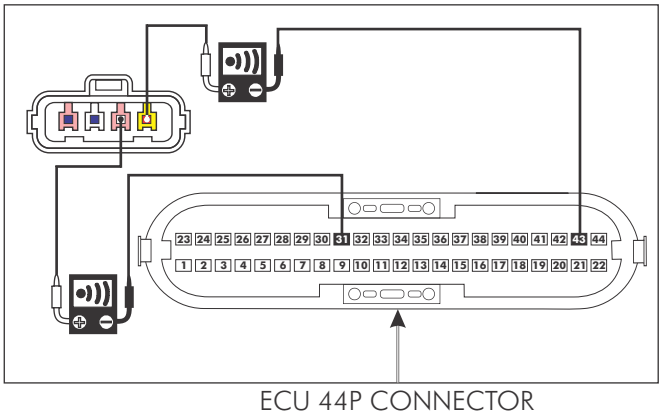
9. If test is successful, turn the ignition switch to "OFF", disconnect the IACV 4P connector.
10. Disconnect the ECU 44P connector and check for continuity between the IACV 4P connector and ECU 44P connector at the wire harness side.

CONNECTION
Pink/Blue (ECU Pin-29)-Pink/Blue
STANDARD : Continuity
White/Blue (ECU Pin-30)-White/Blue
STANDARD : Continuity



ECU 44P CONNECTOR

CONNECTION
Pink/White (ECU Pin-31)-Pink/White
STANDARD : Continuity
Yellow/Red (ECU Pin-43)-Yellow/Red
STANDARD : Continuity

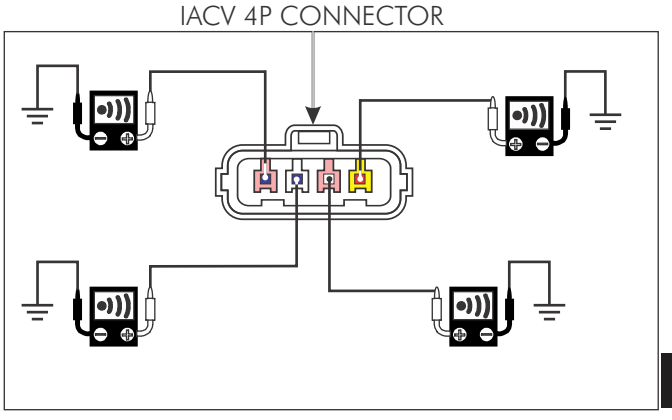


ECU 44P CONNECTOR

11. Simultaneously also check for no continuity between the IACV 4P connector at the wire harness side and body ground.

CONNECTION
Pink/Blue -Body Ground
STANDARD: No Continuity
White/Blue-Body Ground
STANDARD: No Continuity
Pink/White-Body Ground
STANDARD: No Continuity
Yellow/Red-Body Ground
STANDARD: No Continuity

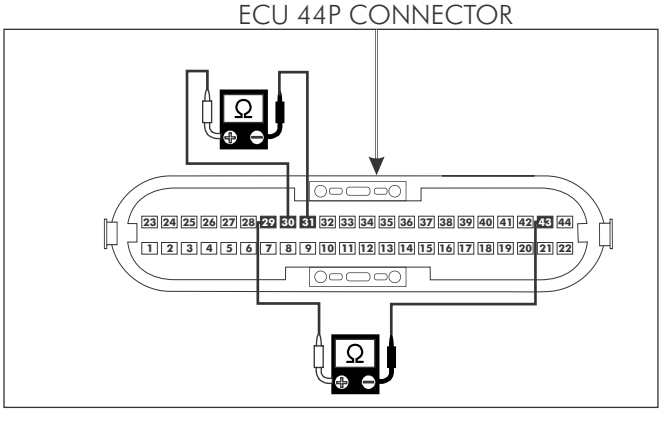
If the above connection are abnormal replace the respective harness, clear the history DTC (page 5-16) and inspect again.



12. If all above connections are normal, connect the IACV 4P connector and disconnect the ECU 44P connector, then measure the resistance between ECU 44P connector at wire harness side.

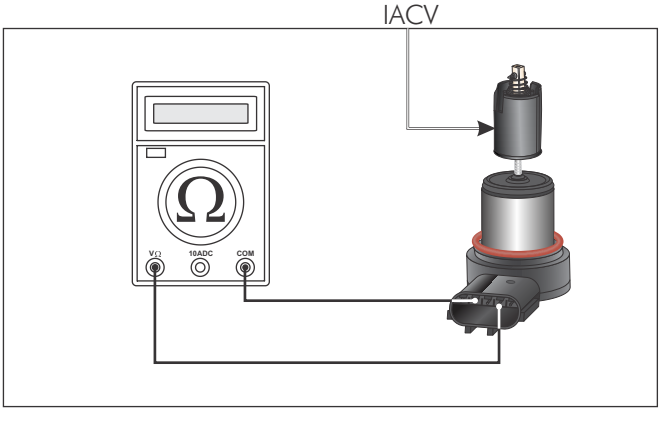
CONNECTION
Pink/Blue (ECU Pin-29)-
Yellow/Red (ECU Pin-43)
STANDARD: 100-110 Ω
White/Blue (ECU Pin-30)-
Pink/White (ECU Pin-31)
STANDARD: 100-110 Ω

If resistance is abnormal, replace the IACV (page 5-79), clear the history DTC (page 5-16) and inspect again.



NOTE

Incase the IACV is removed from the throttle body then the resistance can be checked directly on the IACV pins (between 2 outer or 2 inner pins).



BATTERY VOLTAGE (DTC: P0560, P0562, P0563)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

If active P0560, P0562, P0563 code appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P0560, P0562, P0563 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the fuel tank (page 2-12).
3. Check for loose or poor contact on ECU 44P connector, battery, fuse, ignition switch, starter magnetic switch and regulator/rectifier.
4. If active code doesn't appear then there was loose or poor contact on the ECU 44P connector, battery, fuse, ignition switch, starter magnetic switch and regulator/rectifier. Clear the history DTC (page 5-16).
5. If the DTC code still appears, turn the ignition switch to "ON" and measure the battery voltage between the ECU 44P connector of the wire harness side and body ground.

CONNECTION

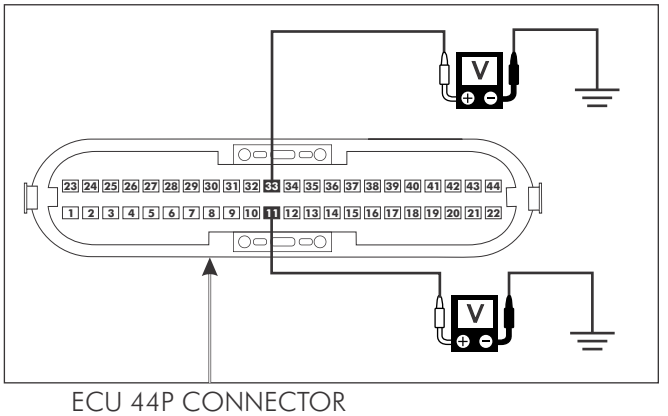
Black/Green (ECU Pin-11)- Body Ground

STANDARD: Battery Voltage

Red (ECU Pin- 33)- Body Ground

STANDARD: Battery Voltage

If the battery voltage exists then replace the ECU (page 5-22) with new one and inspect again.



ECU 44P CONNECTOR

6. If the battery voltage does not exist, turn the ignition switch to "OFF" check the continuity between the ECU 44P connector and fuse 10A at the wire harness side.

CONNECTION

Red (ECU Pin-33)-Red (Fuse 10A)

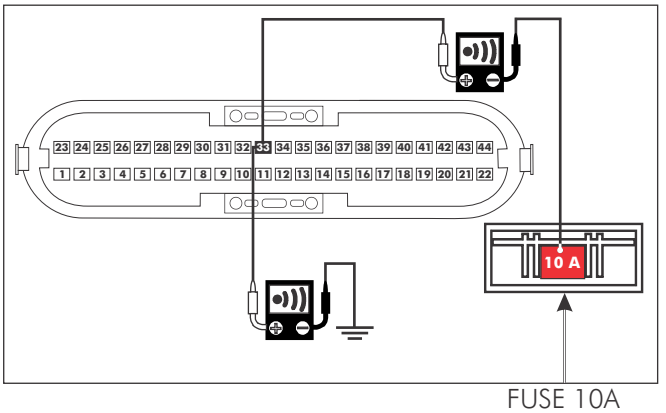
STANDARD: Continuity

Red (ECU Pin-33)-Body ground

STANDARD: No Continuity (Ignition switch "ON")

If the above connection are abnormal replace the harness, clear the history DTC (page 5-16) and inspect again.

If continuity exists then inspect battery voltage (page 3-23), clear the history DTC (page 5-16) and inspect again.



FUSE 10A

7. Also check the continuity between the ECU 44P connector and relay 8P connector at the wire harness side.

CONNECTION

Black/Green (ECU Pin- 11)- Black/Green

STANDARD: Continuity

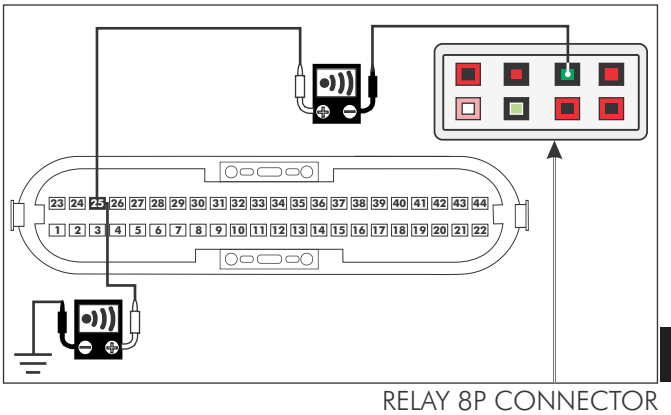
Black/Green-Body Ground (Ignition switch "ON")

STANDARD: No Continuity

If the above connection are abnormal replace the harness, clear the history DTC (page 5-16) and inspect again.

8. If error still persist, then inspect the following:

- Ignition switch (page 20-16).
- Fuses
- RR unit (page 17-11).
- Relay box (page 20-22).



RELAY 8P CONNECTOR

5

STARTER RELAY (DTC:P0615, P0616, P0617)

Read the DTC code in Hero VCI (page 5-3).

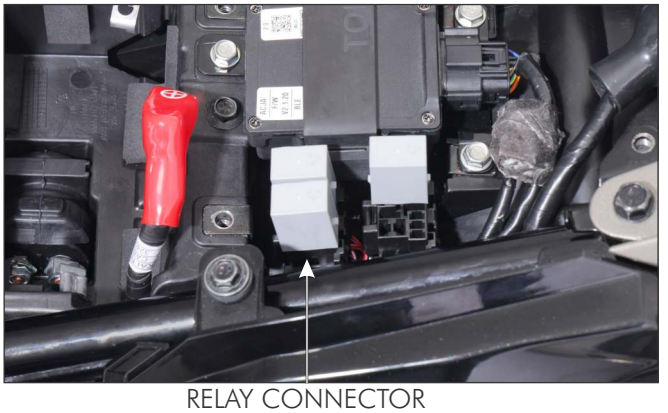
If any history code appears, then clear them from ECU memory (page 5-16).

If active P0615, P0616, P0617 codes appear in VCI then perform following steps:

NOTE

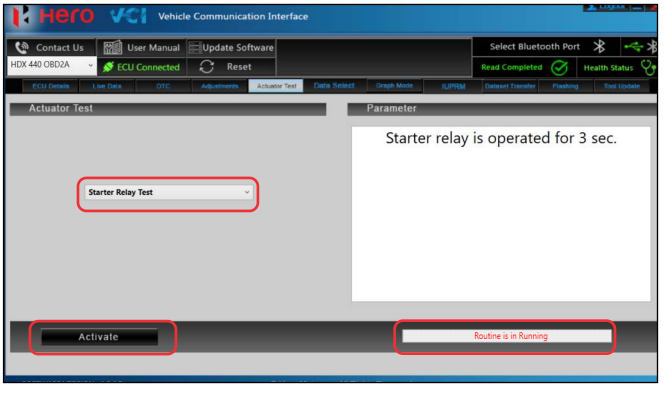
To know about the causes and remedies of P0615, P0616, P0617 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the battery cover (page 2-6).
3. Check for loose or poor contact on the relay connector.
4. If active code doesn't appear then there had been loose or poor contact on the relay 8P connector. Clear the history DTC (page 5-16).



RELAY CONNECTOR

5. If active DTC code still appear, turn the ignition switch to "OFF" and run the actuator test in Hero VCI (page 23-15).
6. Select the "STARTER RELAY COMMAND", click on to "ACTIVATE" to start the testing.
7. In the status bar, if the status displayed as "ROUTINE SUCCESS" this means that ECU is OK.
8. If the status displayed as "TEST NOT COMPLETED" then replace the ECU (page 5-22).



9. If test is successful, turn the ignition switch to "OFF", disconnect the ECU 44P connector and relay 8P connector.

   Check the continuity between the ECU 44P connector and relay 8P connector at wire harness side.

CONNECTION

White/Green (ECU pin-10) - White/Green

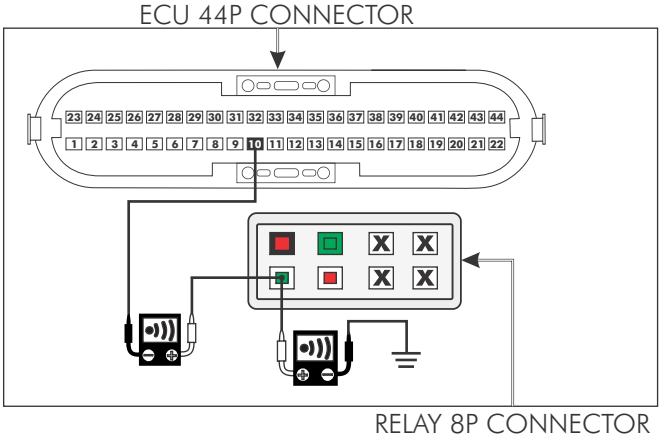
STANDARD: Continuity

White/Green-Body Ground

STANDARD: Continuity (Ignition switch "ON" and ECU 44P connector connected)

If above connection are abnormal, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

ECU 44P CONNECTOR



RELAY 8P CONNECTOR

10. If connection are normal, then connect the ECU 44P connector. Turn the ignition switch to "ON" measure the battery voltage between relay 8P connector at wire harness side and body ground.

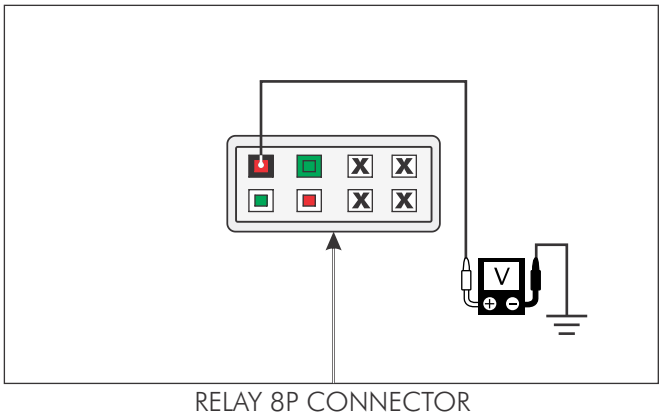
CONNECTION

Black/Red-Body Ground

STANDARD: Battery voltage

If battery voltage exists, then inspect the relay box 1 (page 20-22) and replace if required, clear the history DTC (page 5-16) and inspect again.

If battery voltage does not exist, then inspect the relay box (page 20-22) and replace if required, clear the history DTC (page 5-16) and inspect again.



RELAY 8P CONNECTOR

FUEL PUMP (DTC: P0627, P0628, P0629)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

If active P0627, P0628, P0629 codes appear in VCI then perform following steps:

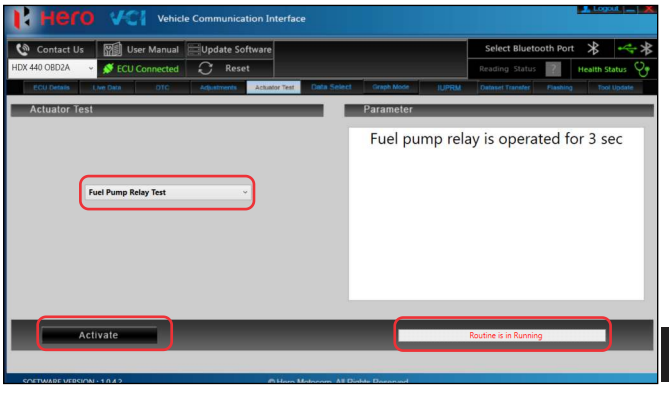
NOTE

To know about the causes and remedies of P0627, P0628, P0629 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the fuel tank mounting bolt and lift the fuel tank from the rear side.
3. Check for loose or poor contact on fuel pump 5P connector.
4. If active code doesn't appear then there had been loose or poor contact on the fuel pump 5P connector. Clear the history DTC (page 5-16).

FUEL PUMP 5P CONNECTOR

5. If DTC code appear then run the actuator test in Hero VCI (page 23-15).
6. Select the "FUEL PUMP COMMAND", click on to "ACTIVATE" to start the testing.
7. In the status bar, if the status displayed as "ROUTINE SUCCESS" this means that ECU is OK
8. If the status displayed as "TEST NOT COMPLETED" then replace the ECU (page 5-22).



9 If test is successful, then turn the ignition switch to "OFF" disconnect the relay 8P connector.

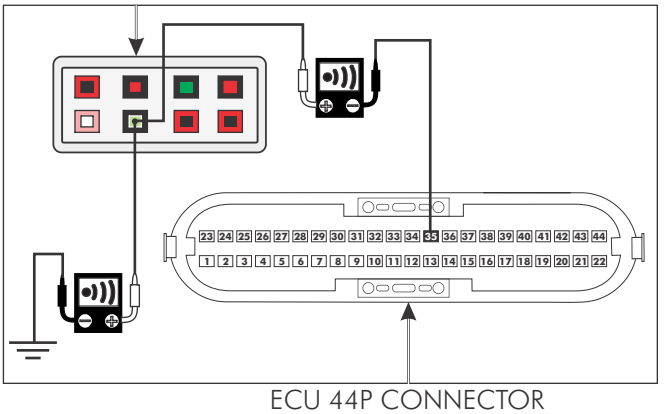
Disconnect the ECU 44P connector and check for continuity between the ECU 44P connector and relay 8P connector at the wire harness side.

CONNECTION
Black/Light green (ECU Pin-35)-
Black/Light green
STANDARD: Continuity
Black/Light green-Body Ground
STANDARD: No Continuity

If the above connection are abnormal replace the harness, clear the history DTC (page 5-16) and inspect again.

If the above connection are normal then inspect the relay box (page 20-22) and replace if required, clear the history DTC (page 5-16) and inspect again.

RELAY 8P CONNECTOR



ECU 44P CONNECTOR

10 If DTC code still appear, connect the relay 8P connector and ECU 44P connector.

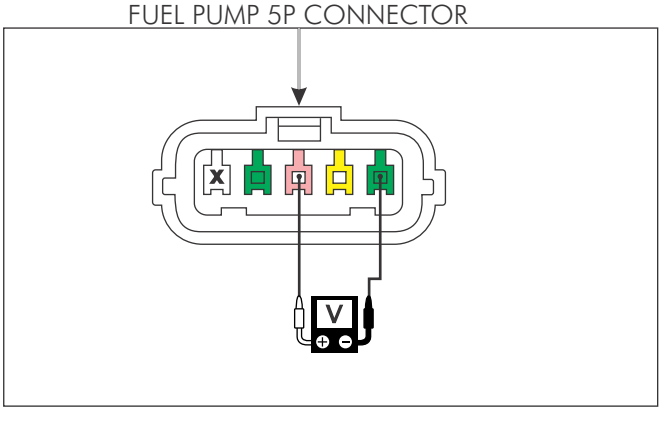
Turn the ignition switch to "ON", and measure the voltage between the fuel pump 5P connector.

CONNECTION
Pink/White-Green
STANDARD: Battery Voltage
NOTE

After turning the ignition to "ON" the voltage can be measured only for a few seconds.

If voltage is ok, replace the fuel pump (page 5-73), clear the history DTC (page 5-16) and inspect again.

FUEL PUMP 5P CONNECTOR



11. If voltage does not exist, measure the voltage between the fuel pump 5P connector and body ground.

CONNECTION
Pink/White-Body Ground
STANDARD: Battery Voltage
NOTE

After turning the ignition to "ON" the voltage can be measured only for a few seconds.

If voltage is ok, replace the harness, clear the history DTC (page 5-16) and inspect again.

12. If voltage does not exist, then turn the ignition switch to "OFF" and disconnect the relay and relay-1 8P connector .

    Check for continuity between the fuel pump 5P connector and relay 8P connector at the wire harness side.

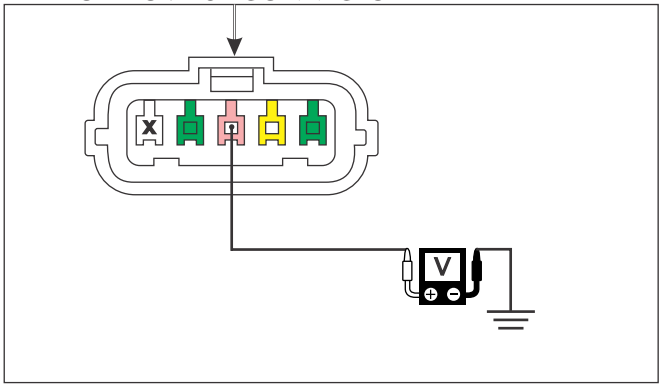
CONNECTION
Pink/White- Pink/White
STANDARD: Continuity
Green-Green
STANDARD: Continuity
Green-Body ground
STANDARD: No Continuity

If the above connection are abnormal replace the harness, clear the history DTC (page 5-16) and inspect again.

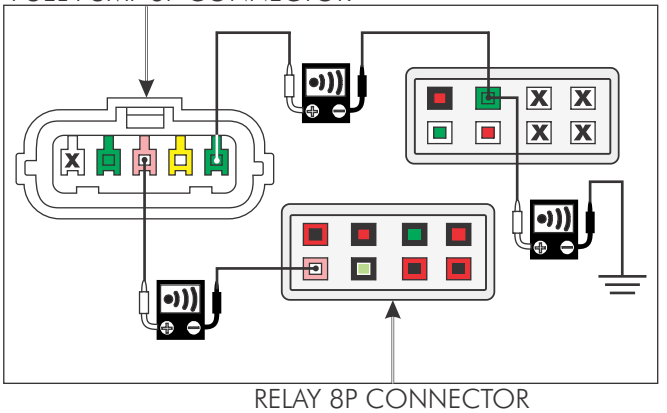
If the above connection are normal then inspect the following:

- Ignition switch (page 20-16).
- Fuses
- RR unit (page 17-11).

FUEL PUMP 5P CONNECTOR



FUEL PUMP 5P CONNECTOR



RELAY 8P CONNECTOR

SENSOR SUPPLY 1 (DTC: P0642, P0643)

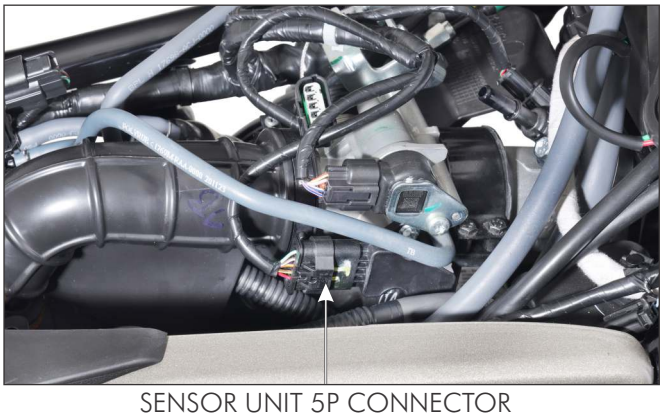
Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

If active P0642, P0643 codes appear in VCI then perform following steps:
NOTE

To know about the causes and remedies of P0642, P0643 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the fuel tank (page 2-12).
3. Check for loose or poor contact on sensor unit 5P connector.
4. If active code doesn't appear then there had been loose or poor contact on the sensor unit 5P connector. Clear the history DTC (page 5-16).



SENSOR UNIT 5P CONNECTOR

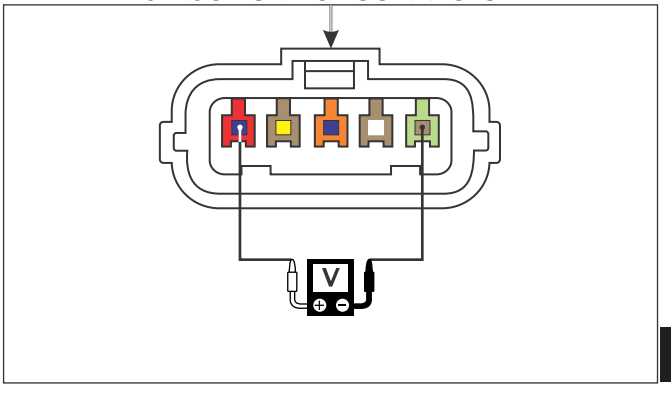
5. If the above connection are normal connect the ECU 44P connector.

   Turn the ignition switch to "ON" and measure the voltage between the sensor unit 5P connector at wire harness side.

CONNECTION :
Red/Blue-Light green/Brown
STANDARD: 4.75-5.25 V

If voltage is in the range, then replace the sensor unit (page 5-80), clear the history DTC (page 5-16) and inspect again.

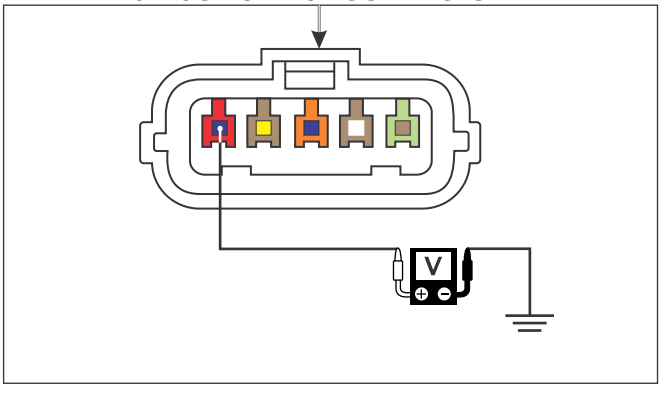
SENSOR UNIT 5P CONNECTOR



6. If voltage is out of range, then measure the voltage between the sensor unit 5P connector and body ground.

CONNECTION :
Red/Blue-Body Ground
STANDARD: 4.75-5.25 V

SENSOR UNIT 5P CONNECTOR



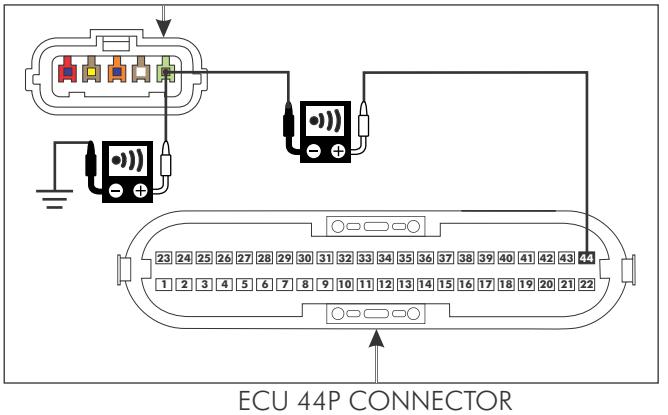
If voltage exists between R/L and body ground:

7. Turn the ignition switch to "OFF". Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and sensor unit 5P connector at the wire harness side.

CONNECTION :
Light green/Brown (ECU Pin-44)-
Light green/Brown
STANDARD : Continuity
Light green/Brown -Body Ground
STANDARD : No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

SENSOR UNIT 5P CONNECTOR



ECU 44P CONNECTOR

If voltage does not exist between R/L and body ground:

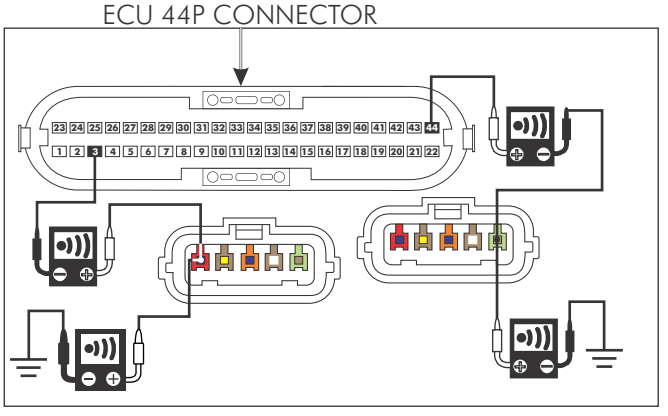
8. Turn the ignition switch to "OFF". Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and sensor unit 5P connector at the wire harness side.

CONNECTION :
Red/Blue (ECU Pin-3)- Red/Blue
STANDARD: Continuity
Light green/Brown (ECU Pin-44)-
Light green/Brown
STANDARD : Continuity
Light green/Brown-Body Ground
STANDARD : No Continuity
Red/Blue -Body Ground
STANDARD: No continuity

If any abnormality is found, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

If connections are normal, then replace the ECU (page 5-22) with a new one and inspect again.

ECU 44P CONNECTOR



SENSOR SUPPLY 2 (DTC: P0652, P0653)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

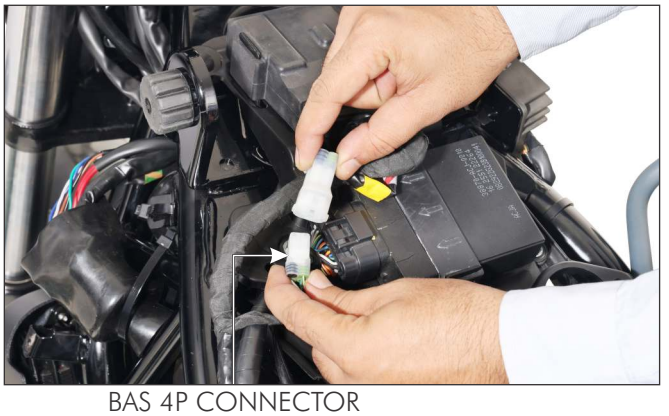
If active P0652, P0653 codes appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P0652, P0653 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

AT BANK ANGLE SENSOR SIDE

1. Turn the ignition switch to "OFF".
2. Remove the fuel tank (page 2-12).
3. Check for loose or poor contact on bank angle sensor (BAS) 4P connector.
4. If active code doesn't appear then there had been loose or poor contact on the bank angle sensor 4P connector. Clear the history DTC (page 5-16).



BAS 4P CONNECTOR

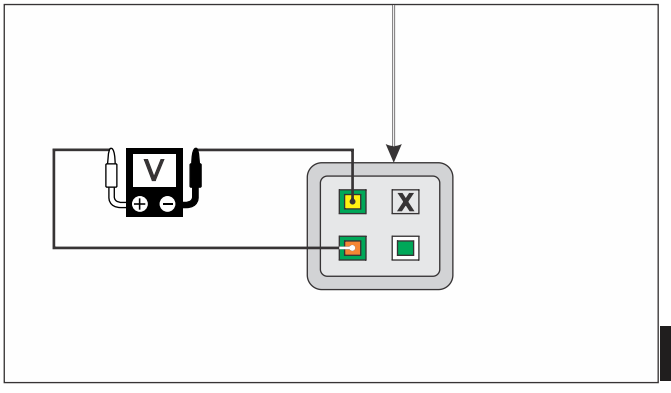
Note: *Images may depict a different model/variant, but procedures and information remain same.*

5. If active DTC code still appear, turn the ignition switch to "OFF" and disconnect the bank angle sensor 4P connector.
6. Turn the ignition switch to "ON" and measure the voltage between the bank angle sensor 4P connector at wire harness side.

CONNECTION
Green/Oragne-Green/Yellow
STANDARD: 4-5 V

If voltage exist, then replace the bank angle sensor (page 5-90), clear the history DTC (page 5-16) and inspect again.

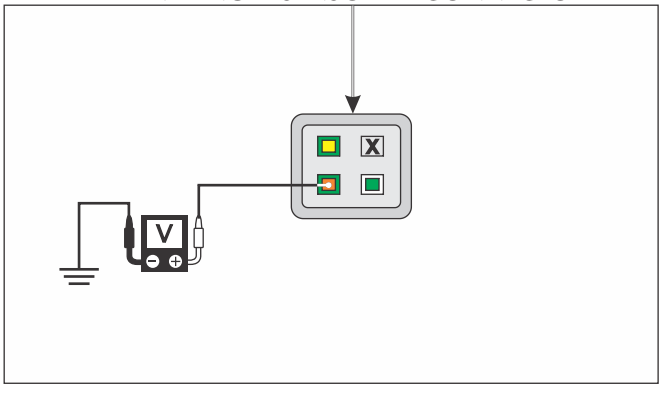
BANK ANGLE SENSOR 4P CONNECTOR



7. If voltage does not exist then check the voltage at bank angle sensor 4P connector and body ground.

CONNECTION
Green/Oragne-Body Ground
STANDARD: 4-5 V

BANK ANGLE SENSOR 4P CONNECTOR



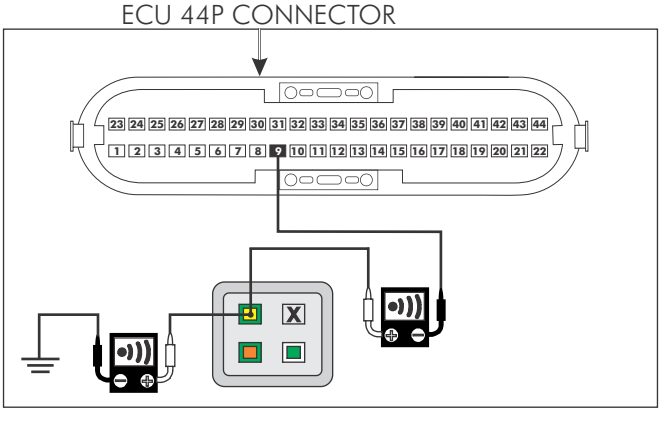
If voltage exists between G/O and body ground:

8. Turn the ignition switch to "OFF", disconnect the ECU 44P connector and check the continuity between BAS 4P connector and ECU 44P connector.

CONNECTION :
Green/Yellow (ECU pin-9)-Green/Yellow
STANDARD: Continuity
Green/Yellow-Body Ground
STANDARD : No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

ECU 44P CONNECTOR



If voltage does not exists between R/L and body ground:

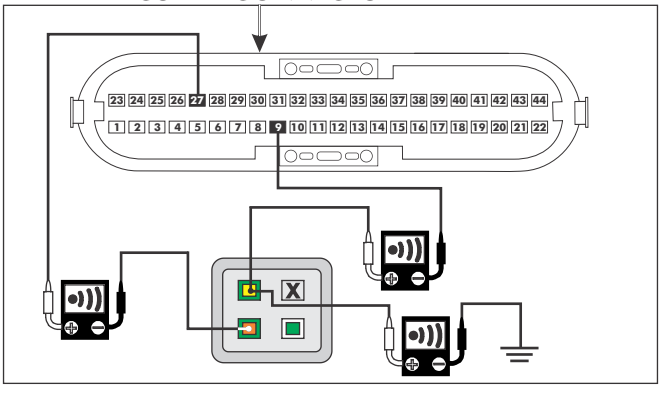
9. Turn the ignition switch to "OFF", disconnect the ECU 44P connector and check the continuity between BAS 4P connector and ECU 44P connector.

CONNECTION :
Green/Orange (ECU pin-27)-Green/Orange
STANDARD: Continuity
Green/Yellow (ECU pin-9)-Green/Yellow
STANDARD: Continuity
Green/Yellow-Body Ground
STANDARD : No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

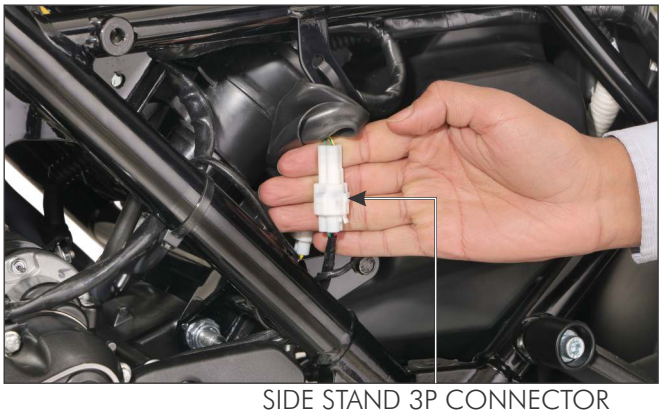
If above connections are normal, then replace the ECU (page 5-22) with a new one and inspect again.

ECU 44P CONNECTOR



AT SIDE STAND SENSOR SIDE

1. Turn the ignition switch to "OFF".
2. Remove the left side cover (page 2-14) and slide the boot.
3. Check for loose or poor contact on side stand 3P connector.
4. If active code doesn't appear then there had been loose or poor contact on the side stand 3P connector. Clear the history DTC (page 5-16).



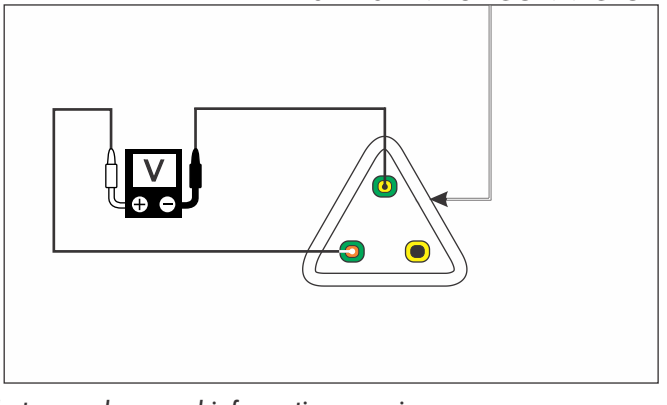
SIDE STAND 3P CONNECTOR

5. If active DTC code still appear, turn the ignition switch to "OFF" and disconnect the side stand 3P connector.
6. Turn the ignition switch to "ON" and measure the voltage between the side stand 3P connector at wire harness side.

CONNECTION
Green/Orange-Green/Yellow
STANDARD: 4-5 V

If voltage exist, inspect the side stand switch (page 20-55) and replace if required. Clear the history DTC (page 5-16) and inspect again.

SIDE STAND 3P CONNECTOR

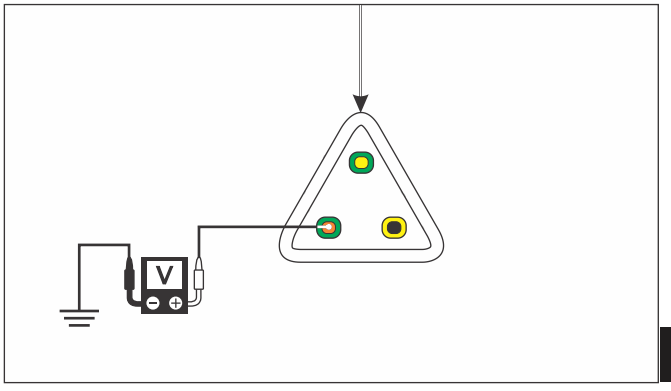


Note: *Images may depict a different model/variant, but procedures and information remain same.*

7. If voltage does not exist then check the voltage at side stand 3P connector and body ground.

CONNECTION
Green/Orange-Body Ground
STANDARD: 4-5 V

SIDE STAND 3P CONNECTOR



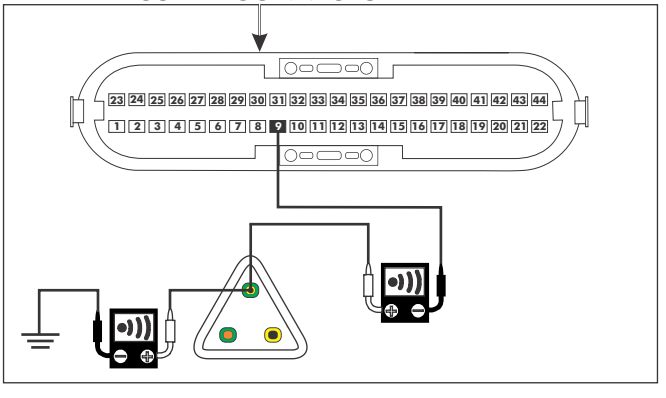
If voltage exists between G/O and body ground:

8. Turn the ignition switch to "OFF", disconnect the ECU 44P connector and check the continuity between side stand 3P connector and ECU 44P connector.

CONNECTION :
Green/Yellow (ECU pin-9)-Green/Yellow
STANDARD: Continuity
Green/Yellow-Body Ground
STANDARD : No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

ECU 44P CONNECTOR



If voltage does not exists between G/O and body ground:

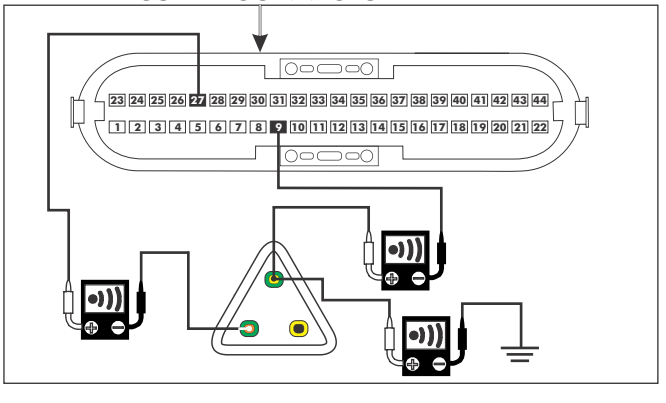
9. Turn the ignition switch to "OFF", disconnect the ECU 44P connector and check the continuity between side stand 3P connector and ECU 44P connector.

CONNECTION :
Green/Orange (ECU pin-27)-Green/Orange
STANDARD: Continuity
Green/Yellow (ECU pin-9)-Green/Yellow
STANDARD: Continuity
Green/Yellow-Body Ground
STANDARD : No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

If above connections are normal, then replace the ECU (page 5-22) with a new one and inspect again.

ECU 44P CONNECTOR



GEAR POSITION SENSOR (DTC: P0914, P0915, P0916, P0917)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

If active P0914, P0915, P0916, P0917 codes appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P0914, P0915, P0916, P0917 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the left side cover (page 2-14) and slide the boot.
3. Check for loose or poor contact on gear position sensor 3P connector.
4. If active code doesn't appear then there was loose or poor contact on the gear position sensor 3P connector. Clear the history DTC (page 5-16).

GEAR POSITION SENSOR 3P CONNECTOR

5. If active DTC code still appear, turn the ignition switch to "OFF" and disconnect the gear position sensor 3P connector.
6. Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and gear position sensor 3P connector at the wire harness side.

CONNECTION :

Blue/White (ECU Pin-39)-Blue/White

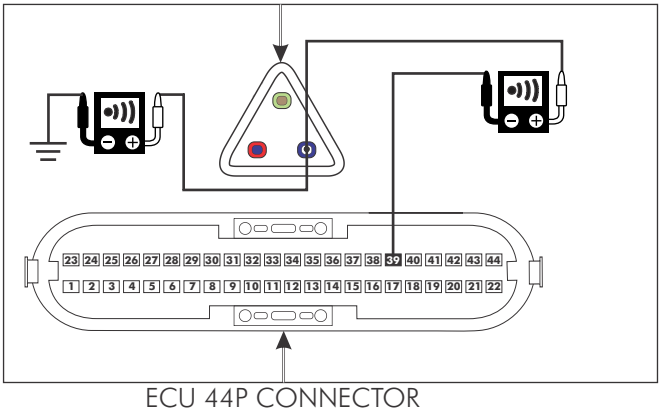
STANDARD : Continuity

Blue/White-Body Ground

STANDARD: No continuity

If the above connection is abnormal, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

GEAR POSITION SENSOR 3P CONNECTOR



ECU 44P CONNECTOR

7. If the above connection are normal connect the ECU 44P connector.

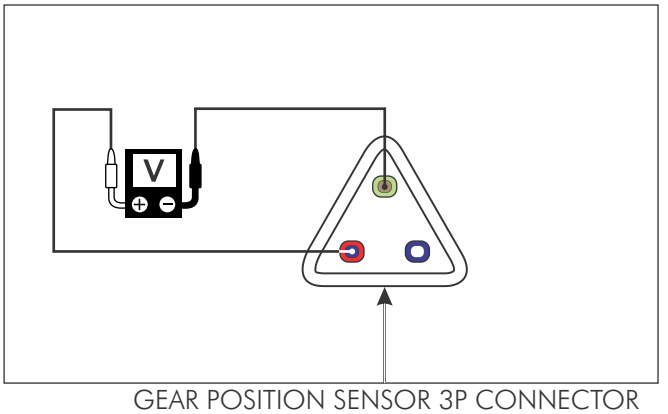
   Turn the ignition switch to "ON" and measure the voltage between the gear position sensor 3P connector at wire harness side.

CONNECTION :

Red/Blue-Light green/Brown

STANDARD: 5±0.1 V

If voltage is in the range, then replace the gear position sensor (page 20-13), clear the history DTC (page 5-16) and inspect again.



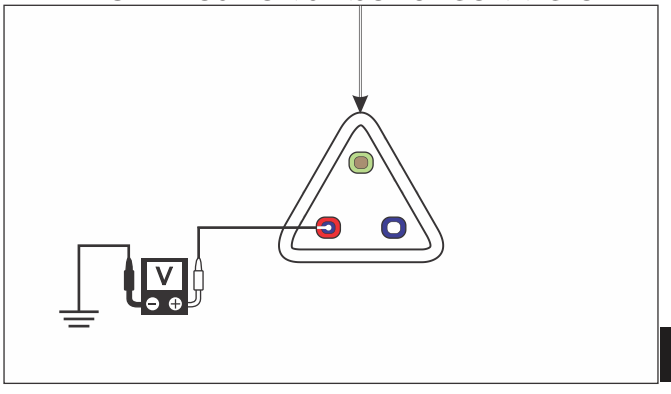
GEAR POSITION SENSOR 3P CONNECTOR

Note: *Images may depict a different model/variant, but procedures and information remain same.*

8. If voltage is out of range, then measure the voltage between the gear position sensor 3P connector and body ground.

CONNECTION :
Red/Blue-Body Ground
STANDARD: 5±0.1 V

GEAR POSITION SENSOR 3P CONNECTOR



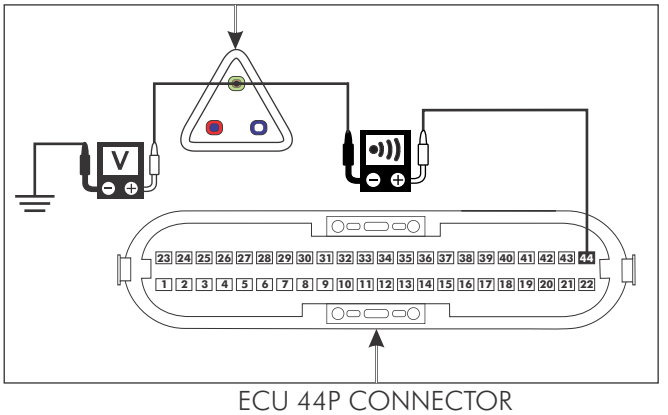
If voltage exists between R/L and body ground:

9. Turn the ignition switch to "OFF". Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and gear position sensor 3P connector at the wire harness side.

CONNECTION :
Light green/Brown (ECU Pin-44)-
Light green/Brown
STANDARD : Continuity
Light green/Brown -Body Ground
STANDARD : No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

GEAR POSITION SENSOR 3P CONNECTOR



ECU 44P CONNECTOR

If voltage does not exist between R/L and body ground:

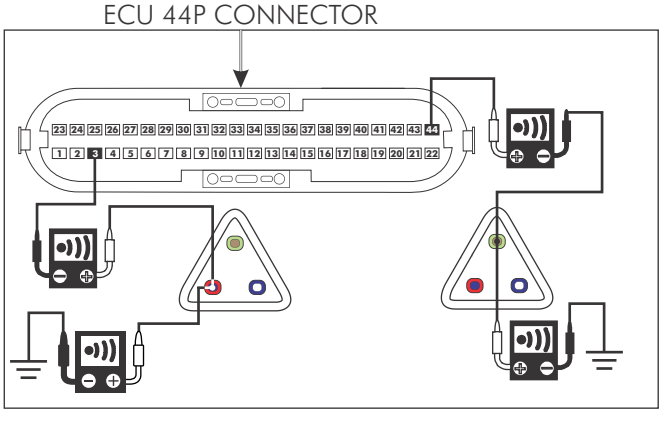
10. Turn the ignition switch to "OFF". Disconnect ECU 44P connector and check for continuity between the ECU 44P connector and gear position sensor 3P connector at the wire harness side.

CONNECTION :
Red/Blue (ECU Pin-3)- Red/Blue
STANDARD: Continuity
Light green/Brown (ECU Pin-44)-
Light green/Brown
STANDARD : Continuity
Light green/Brown-Body Ground
STANDARD : No Continuity
Red/Blue -Body Ground
STANDARD: No continuity

If any abnormality is found, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

If connections are normal, then replace the ECU (page 5-22) with a new one and inspect again.

ECU 44P CONNECTOR



LEVEL 2 ERRORS (DTC: P1001, P1002, P1006, P1009, P1013)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

If active P1001, P1002, P1006, P1009, P1013 codes appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P1001, P1002, P1006, P1009, P1013 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the fuel tank (page 2-12).
3. Check for loose or poor contact on ECU 44P connector.
4. If active code doesn't appear then there had been loose or poor contact on the ECU 44P connector. Clear the history DTC (page 5-16).
5. If DTC code still appear then replace the ECU (page 5-22) with new one and inspect again.

ECU 44P CONNECTOR

ROLL OVER SENSOR/BANK ANGLE SENSOR (BAS) (DTC:P1531, P1532, P1534)

Read the DTC code in Hero VCI (page 5-3).

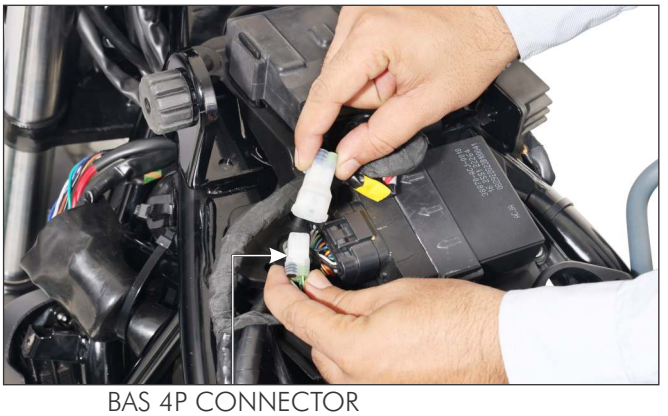
If any history code appears, then clear them from ECU memory (page 5-16).

If active P1531, P1532, P1534 codes appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P1531, P1532, P1534 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the fuel tank (page 2-12).
3. Check for loose or poor contact on bank angle sensor (BAS) 4P connector.
4. If active code doesn't appear then there had been loose or poor contact on the bank angle sensor 4P connector. Clear the history DTC (page 5-16).



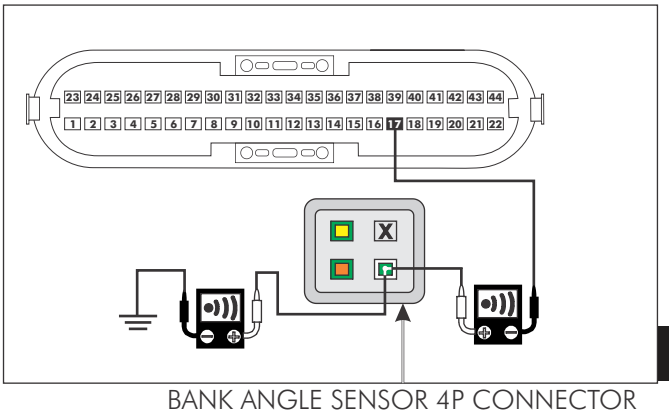
BAS 4P CONNECTOR

Note: *Images may depict a different model/variant, but procedures and information remain same.*

5. If DTC codes still appears, turn the ignition switch to "OFF" and disconnect the bank angle sensor 4P connector .
6. Disconnect the ECU 44P connector and check for continuity between the ECU 44P connector and bank angle sensor 4P connector.

White/Green (ECU pin-17)-White/Green
STANDARD : Continuity
White/Green-Body Ground
STANDARD : No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.



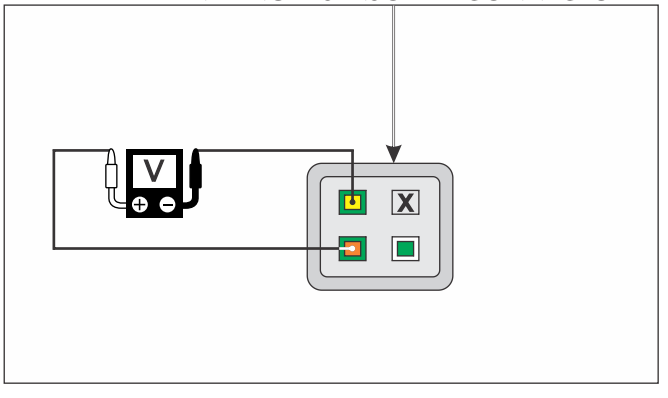
BANK ANGLE SENSOR 4P CONNECTOR

7. If continuity does not exist then connect the ECU 44P connector, turn the ignition switch to "OFF" and disconnect the bank angle sensor 4P connector.
8. Turn the ignition switch to “ON” and measure the voltage between the bank angle sensor 4P connector at wire harness side.

CONNECTION
Green/Orange-Green/Yellow
STANDARD: 4-5 V

If voltage exist, then replace the bank angle sensor (page 5-90), clear the history DTC (page 5-16) and inspect again.

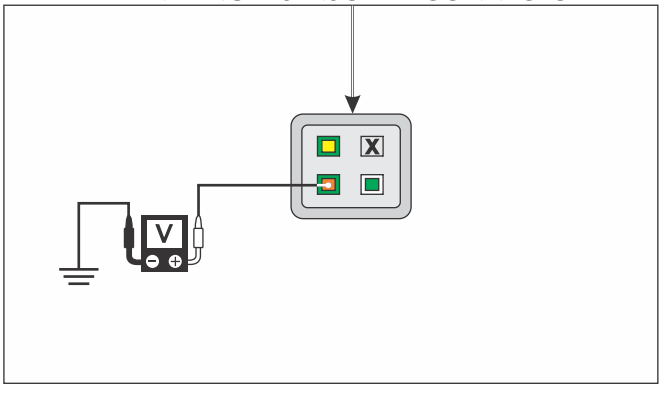
BANK ANGLE SENSOR 4P CONNECTOR



9. If voltage does not exist then check the voltage at bank angle sensor 4P connector and body ground.

CONNECTION
Green/Orange-Body Ground
STANDARD: 4-5 V

BANK ANGLE SENSOR 4P CONNECTOR



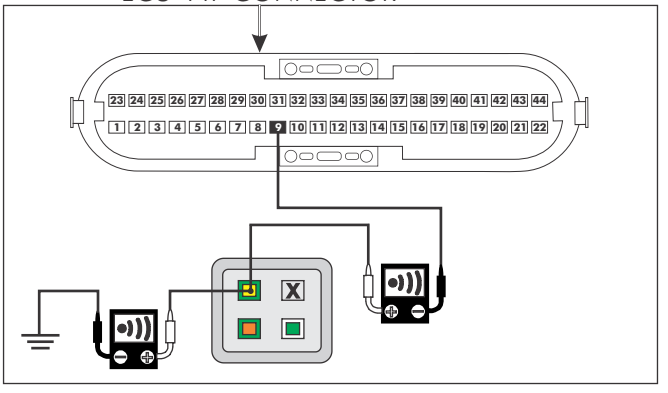
If voltage exists between G/O and body ground:

10. Turn the ignition switch to "OFF", disconnect the ECU 44P connector and check the continuity between BAS 4P connector and ECU 44P connector.

CONNECTION :
Green/Yellow (ECU pin-9)-Green/Yellow
STANDARD: Continuity
Green/Yellow-Body Ground
STANDARD : No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

ECU 44P CONNECTOR



If voltage does not exists between G/O and body ground:

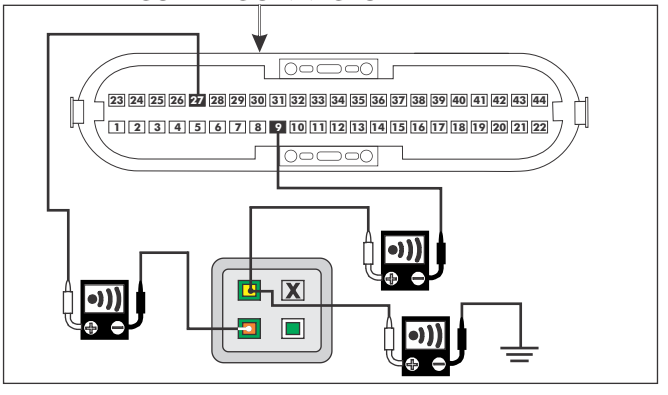
11. Turn the ignition switch to "OFF", disconnect the ECU 44P connector and check the continuity between BAS 4P connector and ECU 44P connector.

CONNECTION :
Green/Orange (ECU pin-27)-Green/Orange
STANDARD: Continuity
Green/Yellow (ECU pin-9)-Green/Yellow
STANDARD: Continuity
Green/Yellow-Body Ground
STANDARD : No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

If above connections are normal, then replace the ECU (page 5-22) with a new one and inspect again.

ECU 44P CONNECTOR



SIDE STAND SWITCH (DTC: B1591, B1592, B1593)

Read the DTC code in Hero VCI (page 5-3).

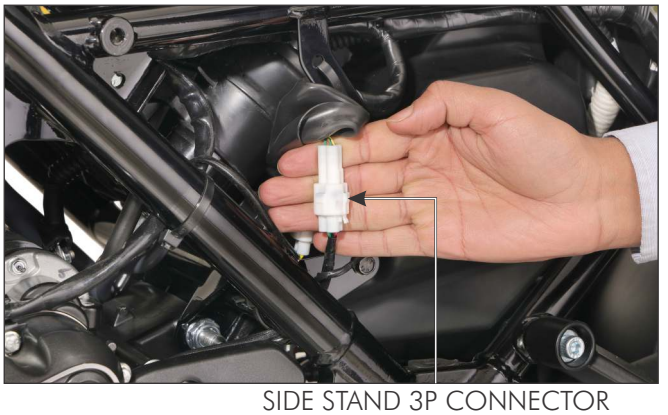
If any history code appears, then clear them from ECU memory (page 5-16).

If active B1591, B1592 & B1593 codes appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of B1591, B1592, B1593 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the left side cover (page 2-14) and slide the boot.
3. Check for loose or poor contact on side stand 3P connector.
4. If active code doesn't appear then there had been loose or poor contact on the side stand 3P connector. Clear the history DTC (page 5-16).



SIDE STAND 3P CONNECTOR

***Note:** Images may depict a different model/variant, but procedures and information remain same.*

5. If DTC codes still appears, disconnect the side stand 3P connector.
6. Disconnect the ECU 44P connector and check the continuity between the ECU 44P connector and side stand 3P connector at the wire harness side.

CONNECTION

Yellow/Black (ECU pin 12) - Yellow/Black

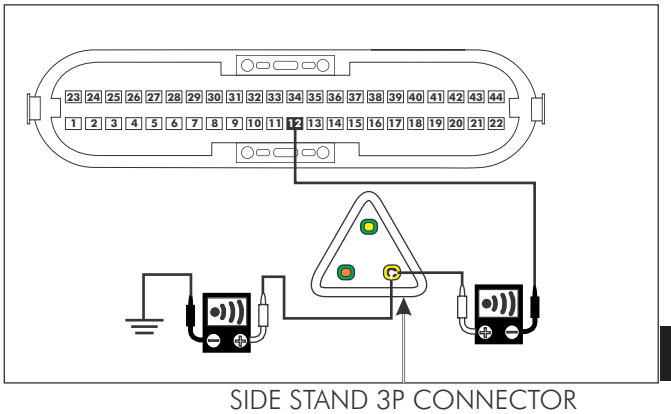
STANDARD: Continuity

CONNECTION

Yellow/Black - Body Ground

STANDARD: No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.



SIDE STAND 3P CONNECTOR

7. If continuity exists then connect the ECU 48P connector, turn the ignition switch to "ON" and measure the voltage between the side stand 3P connector at wire harness side.

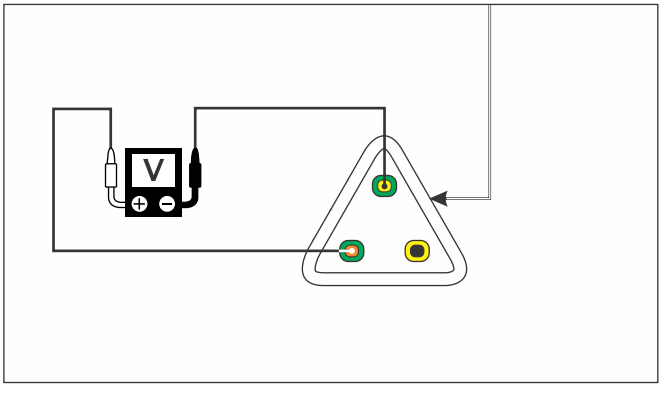
CONNECTION

Green/Orange-Green/Yellow

STANDARD: 4-5 V

If voltage exist, inspect the side stand switch (page 20-55) and replace if required. Clear the history DTC (page 5-16) and inspect again.

SIDE STAND 3P CONNECTOR



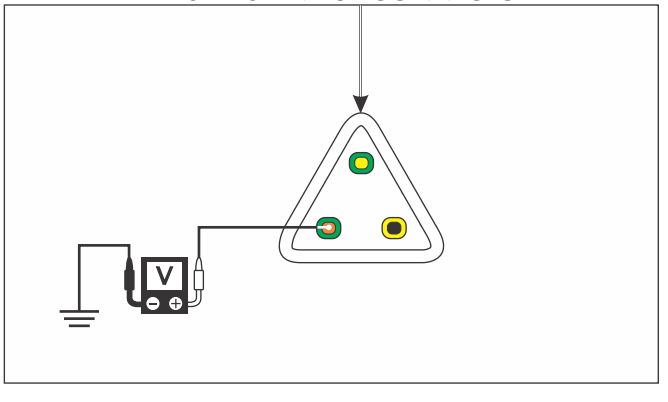
8. If voltage does not exist then check the voltage at side stand 3P connector and body ground.

CONNECTION

Green/Orange-Body Ground

STANDARD: 4-5 V

SIDE STAND 3P CONNECTOR



If voltage exists between G/O and body ground:

9. Turn the ignition switch to "OFF", disconnect the ECU 44P connector and check the continuity between side stand 3P connector and ECU 44P connector.

CONNECTION :
Green/Yellow (ECU pin-9)-Green/Yellow
STANDARD: Continuity
Green/Yellow-Body Ground
STANDARD : No Continuity

If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

If voltage does not exists between R/L and body ground:

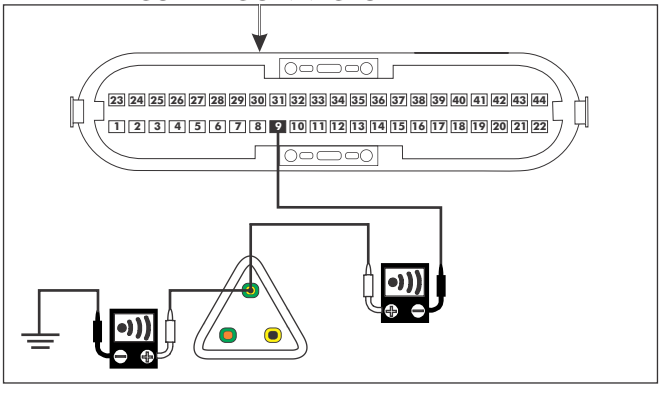
10. Turn the ignition switch to "OFF", disconnect the ECU 44P connector and check the continuity between side stand 3P connector and ECU 44P connector.

CONNECTION :
Green/Orange (ECU pin-27)-Green/Orange
STANDARD: Continuity
Green/Yellow (ECU pin-9)-Green/Yellow
STANDARD: Continuity
Green/Yellow-Body Ground
STANDARD : No Continuity

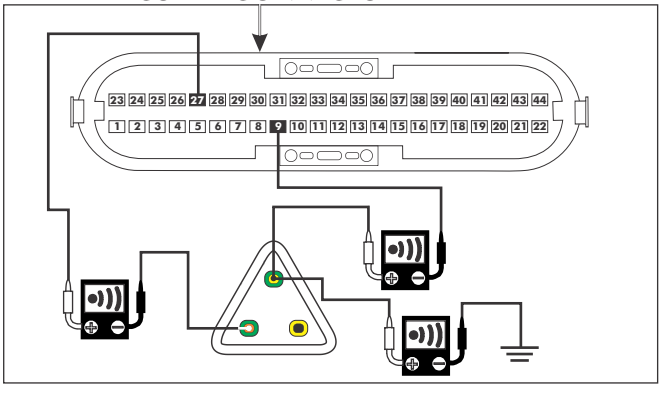
If continuity does not exists, then replace the wiring harness, clear the history DTC (page 5-16) and inspect again.

If above connections are normal, then replace the ECU (page 5-22) with a new one and inspect again.

ECU 44P CONNECTOR



ECU 44P CONNECTOR



FUEL SYSTEM (DTC: P2187, P2188, P2191, P2192)

Read the DTC code in Hero VCI (page 5-3).

If any history code appears, then clear them from ECU memory (page 5-16).

If active P2187, P2188, P2191 & P2192 codes appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of P2187, P2188, P2191 & P2192 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Check for any intake or exhaust leaks and correct the same, if found.
3. If active DTC code doesn't appear, then there was leak in intake or exhaust.
4. If active DTC code still appear change the oxygen sensor (page 5-91) with a new one, clear the history DTC (page 5-16) and inspect again.
5. If active DTC code still appear, replace the throttle ECU (page 5-16) with new one and inspect again.

OXYGEN SENSOR

ABS (DTC: U0121, U0415)

Read the DTC code in Hero VCI (page 5-3).

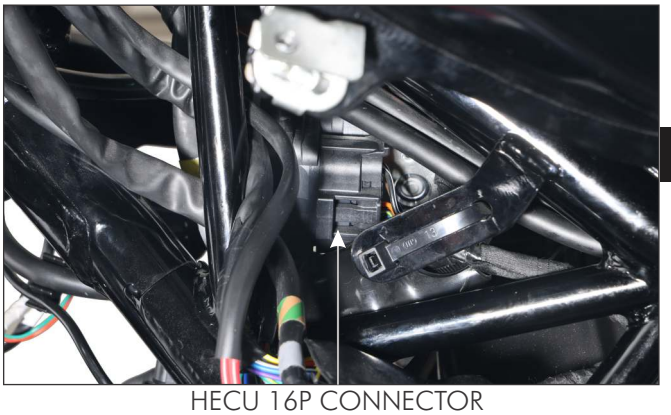
If any history code appears, then clear them from ECU memory (page 5-16).

If active U0121, U0415 codes appear in VCI then perform following steps:

NOTE

To know about the causes and remedies of U0121, U0415 codes, click on to "CAUSE AND REMEDY" button on VCI application, a popup will appear with related information (page 23-14).

1. Turn the ignition switch to "OFF".
2. Remove the left side tank cover (page 2-6).
3. Check for loose or poor contact on HECU 18P connector.
4. If active code doesn't appear then there had been loose or poor contact on the HECU 16P connector. Clear the history DTC (page 15-4).
5. If DTC code still appear then replace the HECU (page 15-12) with new one and inspect again.



HECU 16P CONNECTOR

QUICK CONNECT FITTING

REMOVAL

FUEL PUMP SIDE

Turn the ignition switch to "OFF".

Keep the vehicle idle to cool the engine for 10-20 minutes.

Remove the fuel tank mounting bolt (page 2-12).

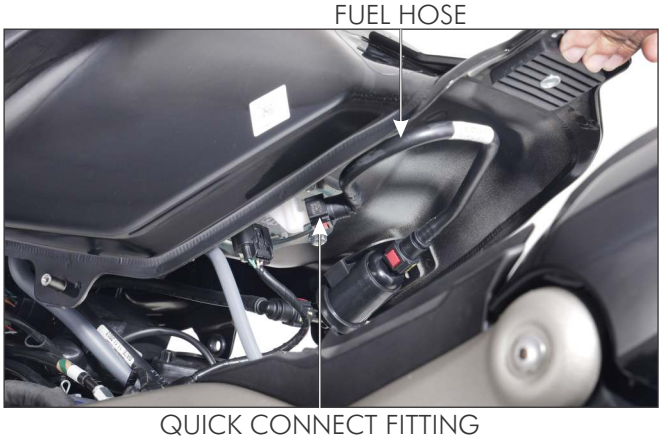
Place a shop towel over the quick connect fitting.

Hold the connector with one hand and press the retainer tabs with the other hand (from both the sides) and release them from the locking pawls.

Pull out the fuel feed hose.

NOTE

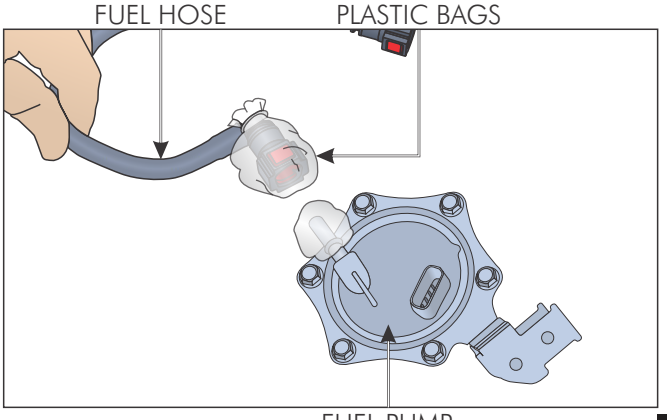
Take extra care while lifting the fuel tank to avoid any damage to fuel pump hose connection or injector joint.



QUICK CONNECT FITTING

CAUTION

To prevent dust entry into the fuel delivery system always ensure to plug the fuel hose and cover the fuel hose joints with a plastic bag/cover.



EXTERNAL FUEL FILTER-FUEL PUMP SIDE

Turn the ignition switch to "OFF".

Keep the vehicle idle to cool the engine for 10-20 minutes.

Remove the fuel tank mounting bolt (page 2-12).

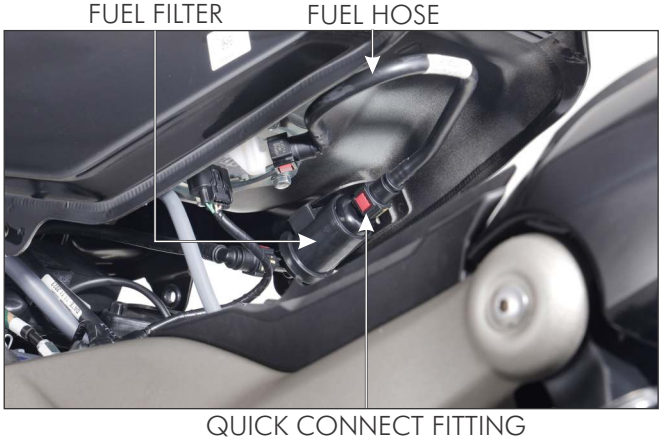
Place a shop towel over the quick connect fitting.

Hold the connector with one hand and press the retainer tabs with the other hand (from both the sides) and release them from the locking pawls.

Pull out the fuel feed hose.

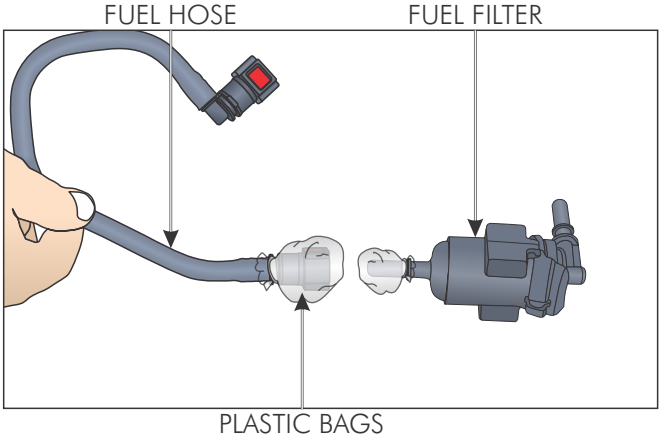
NOTE

Take extra care while lifting the fuel tank to avoid any damage to fuel pump hose connection or injector joint.



CAUTION

To prevent dust entry into the fuel delivery system always ensure to plug the fuel hose and cover the fuel hose joints with a plastic bag/cover.



EXTERNAL FUEL FILTER-INJECTOR SIDE

Turn the ignition switch to "OFF".

Keep the vehicle idle to cool the engine for 10-20 minutes.

Remove the fuel tank mounting bolt (page 2-12).

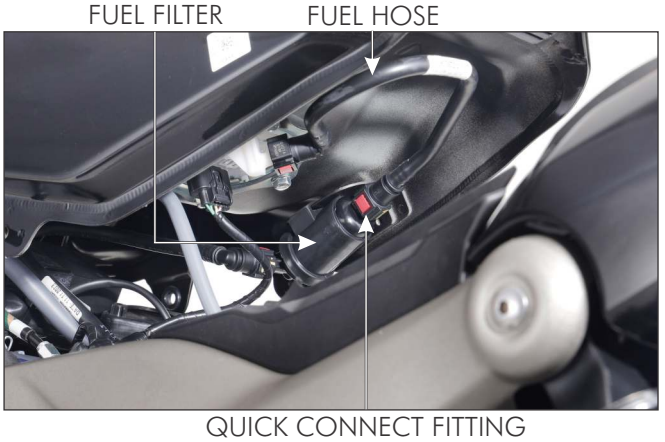
Place a shop towel over the quick connect fitting.

Hold the connector with one hand and press the retainer tabs with the other hand (from both the sides) and release them from the locking pawls.

Pull out the fuel feed hose.

NOTE

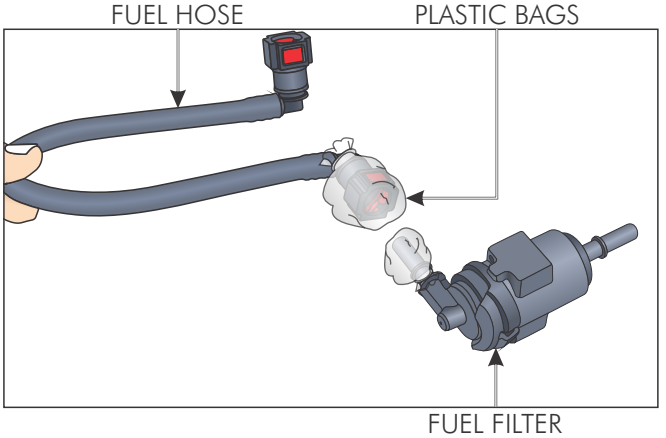
Take extra care while lifting the fuel tank to avoid any damage to fuel pump hose connection or injector joint.



QUICK CONNECT FITTING

CAUTION

To prevent dust entry into the fuel delivery system always ensure to plug the fuel hose and cover the fuel hose joints with a plastic bag/cover.



FUEL FILTER

INJECTOR SIDE

Remove the fuel tank (page 2-12).

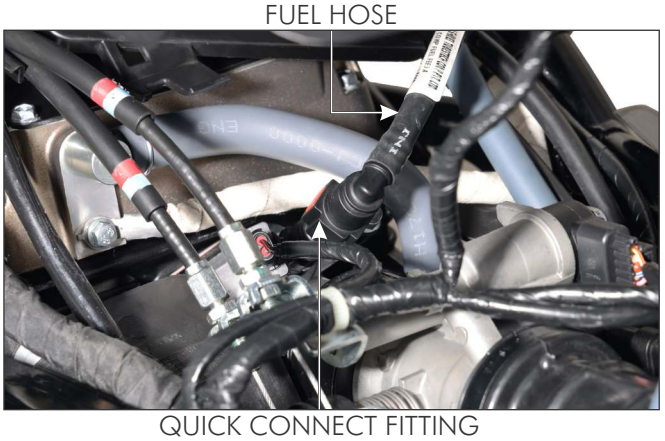
Place a shop towel over the quick connect fitting.

Hold the connector with one hand and press the retainer tabs with the other hand (from both the sides) and release them from the locking pawls.

Pull out the fuel feed hose.

NOTE

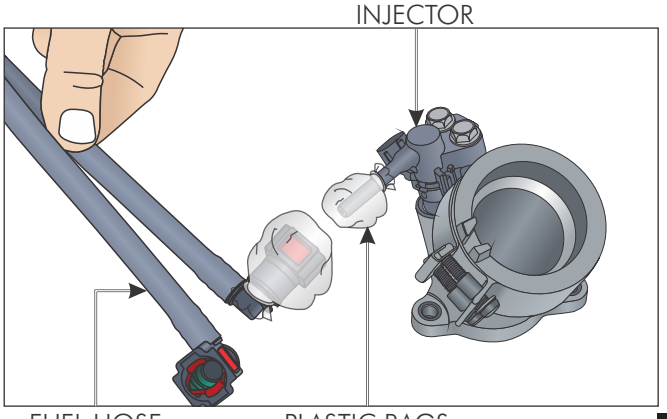
- To avoid fuel spillage on engine, beaker can be used to collect extra fuel present in tube.
- Whenever fuel feed hose is disconnected ensure to plug the hose and cover injector joint to prevent dust entry.
- Always ensure to clean any dust or dirt around the quick connect fitting area before removal.
- Use a shop towel to prevent the remaining fuel in the fuel feed hose from falling out.
- Be careful not to damage the hose or other parts.
- Do not use any tool to press the retainer tabs.
- If the connector does not move, keep the retainer tabs out, and alternately pull and push the connector until it comes off easily.
- Take extra care while lifting the fuel tank to avoid any damage to fuel pump hose connection or injector joint.



QUICK CONNECT FITTING

CAUTION

To prevent dust entry into the fuel delivery system always ensure to plug the fuel hose and cover the fuel hose joints with a plastic bag/cover.



FUEL HOSE INSPECTION

Remove fuel tank (page 2-12).

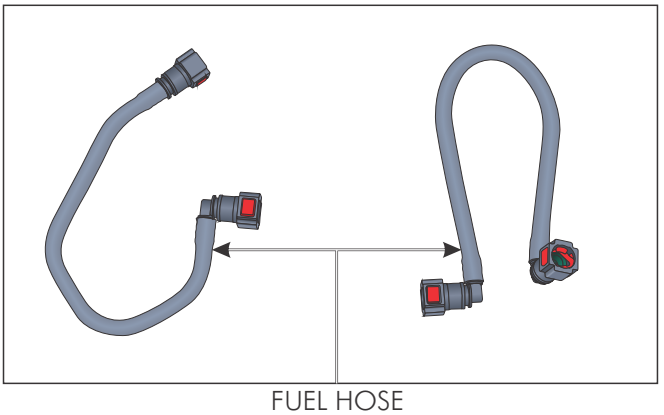
Remove quick fitting connectors from pump side, external fuel filter side and injector side (page 5-64).

Inspect the fuel hose for any deterioration, damage or leakage.

Replace the fuel hose if necessary.

CAUTION

To prevent dust entry into the fuel delivery system always ensure to plug the fuel hose and cover the fuel hose joints with a plastic bag/cover.



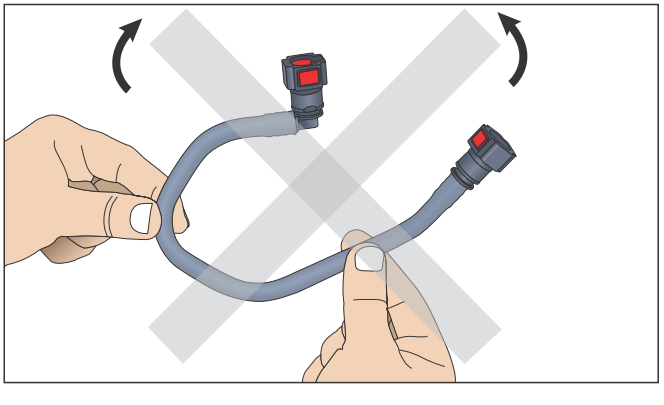
QUICK CONNECT FITTING INSTALLATION

NOTE

- Do not bend or twist the fuel feed hose.
- Always ensure to clean any dust or dirt around the quick connect fitting area before installation.

Inspect fuel hose for any signs of leakage/cracks.

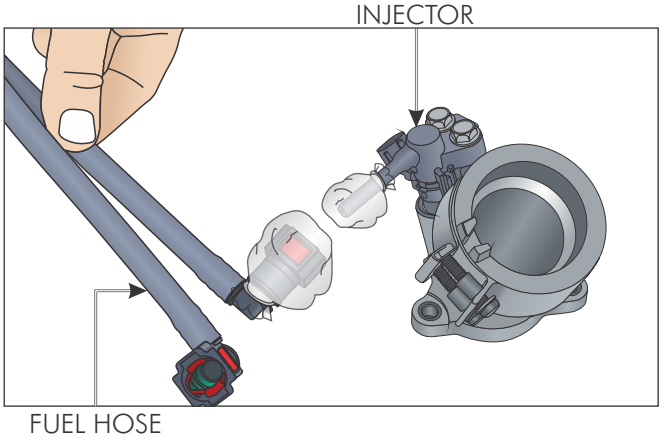
Clean around the fuel hose joint.



INJECTOR SIDE

Align the quick connect fitting with the injector joint then press the quick connect fitting until both the retainer pawls lock with a "CLICK".

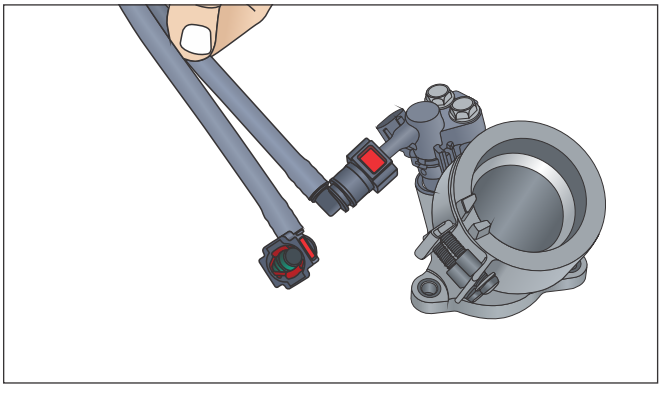
If it is hard to connect, put a small amount of engine oil on the pipe end.



NOTE

Make sure the connection is secure and that the pawls are firmly locked into place, check visually and also by pulling the connector.

Install the removed parts in the reverse order of the removal.



EXTERNAL FUEL FILTER-INJECTOR SIDE

Clean around the fuel hose joint.

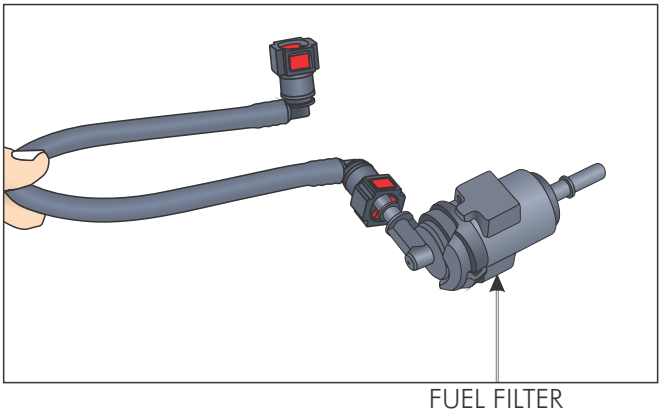
Align the quick fitting connector with the fuel pump then press the quick fitting connector until both the retainer pawls lock with a "CLICK".

If it is hard to connect, put a small amount of engine oil on the pipe end.

NOTE

Make sure the connection is secure and that the pawls are firmly locked into place, check visually and also by pulling the connector.

Installation is in the reverse order of the removal.



EXTERNAL FUEL FILTER-FUEL PUMP SIDE

Clean around the fuel hose joint.

Align the quick fitting connector with the fuel pump then press the quick fitting connector until both the retainer pawls lock with a "CLICK".

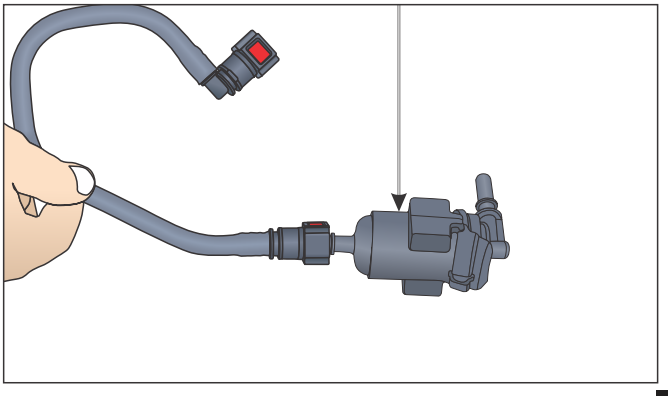
If it is hard to connect, put a small amount of engine oil on the pipe end.

NOTE

Make sure the connection is secure and that the pawls are firmly locked into place, check visually and also by pulling the connector.

Installation is in the reverse order of the removal.

FUEL FILTER



FUEL PUMP SIDE

Clean around the fuel hose joint.

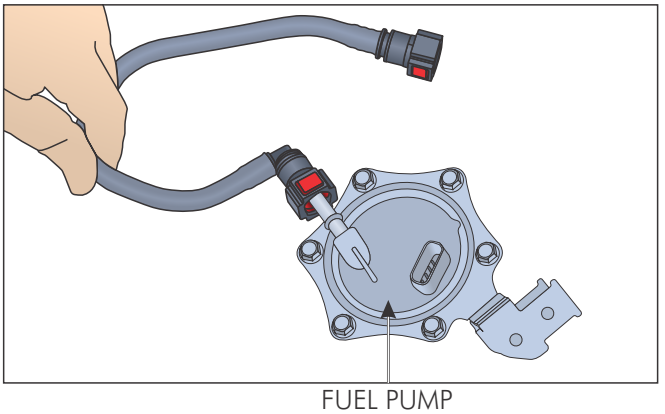
Align the quick fitting connector with the fuel pump then press the quick fitting connector until both the retainer pawls lock with a "CLICK".

If it is hard to connect, put a small amount of engine oil on the pipe end.

NOTE

Make sure the connection is secure and that the pawls are firmly locked into place, check visually and also by pulling the connector.

Installation is in the reverse order of the removal.



FUEL PUMP

FUEL PRESSURE TEST

Remove the side covers (page 2-14 & 2-16).

Remove the fuel tank mounting bolt (page 2-12).

To drop the fuel pressure, disconnect the fuel pump connector (page 2-13) and start the vehicle.

Engine will stop once the pressure is dropped.

Disconnect the fuel hose from the tank side.

Attach one side of pressure gauge adaptor to the fuel feed hose and the other side to the fuel attachment hose.

Attach the other side of fuel attachment hose to the injector.

Thread in the fuel hose of pressure gauge into the hole given in the adaptor.

TOOL

FUEL PRESSURE GAUGE
PART NO: 070 HH KTRF 003
FUEL PRESSURE GAUGE ADAPTOR
PART NO: 070 HH KTRF 005

FUEL FEED HOSE FUEL ATTACHMENT HOSE

PRESSURE GAUGE ADAPTOR

Connect the fuel pump connector back to its position (page 2-13).

Turn the ignition switch "ON" and inspect for any leakage.

Start the engine and keep it in idling r/min.

Read the fuel pressure.

IDLE SPEED: 1600±100 r/min (cold condition) & 1300±100 r/min (hot condition)

FUEL PRESSURE: 282-324 kPa

If the fuel pressure is higher than specified, replace the fuel pump assembly.

If the fuel pressure is lower than specified, inspect the following:

- Fuel line leaking
- Fuel pump (page 5-70)

After inspection, to drop the fuel pressure, disconnect the fuel pump 5P connector (page 2-13) and start the vehicle.

Engine will stop once the pressure is dropped.

Disconnect the fuel hose from the adaptor.

Remove the fuel pressure gauge and pressure gauge adaptor from the fuel hose.

Connect fuel hose onto the injector.

Connect the fuel pump 5P connector back to its position (page 2-13).

NOTE

Take extra care while lifting the fuel tank to avoid any damage to fuel pump hose connection or injector joint.

FUEL PUMP

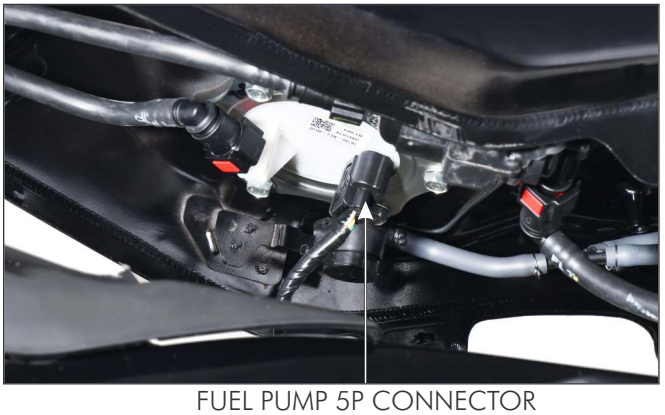
INSPECTION

NOTE

Perform the fuel pump inspection process when engine stops running or not starting, even if no DTC code related to the fuel pump is generated.

Turn the ignition switch to “ON” and confirm that the fuel pump operates for a few seconds.

If pump is priming but still vehicle is not starting then check the fuel pressure (page 5-69).



Note: *Images may depict a different model/variant, but procedures and information remain same.*

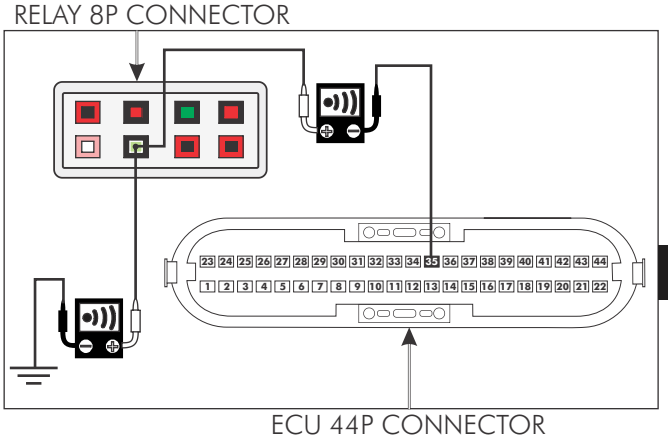
If fuel pressure is not as per standard specification, then turn the ignition switch to "OFF" disconnect the relay 8P connector.

Disconnect the ECU 44P connector and check for continuity between the ECU 44P connector and relay 8P connector at the wire harness side.

CONNECTION
Black/Light green (ECU Pin-35)-
Black/Light green
STANDARD: Continuity
Black/Light green-Body Ground
STANDARD: No Continuity

If the above connection are abnormal replace the harness, and inspect again.

If the above connection are normal then inspect the relay box (page 20-22), replace if required and inspect again.



5

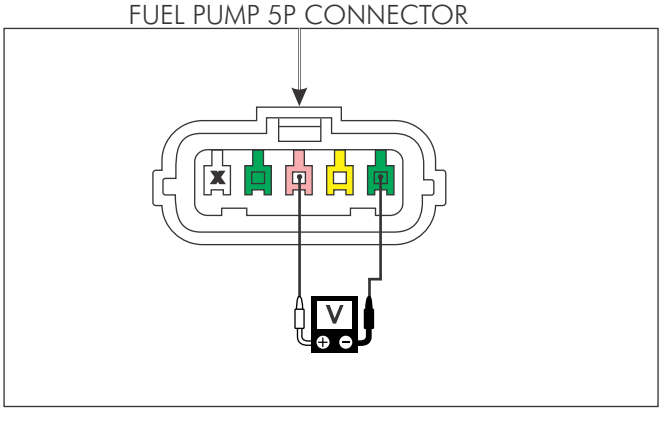
Connect the relay 8P connector and ECU 44P connector.

Turn the ignition switch to "ON", and measure the voltage between the fuel pump 5P connector.

CONNECTION
Pink/White-Green
STANDARD: Battery Voltage

NOTE

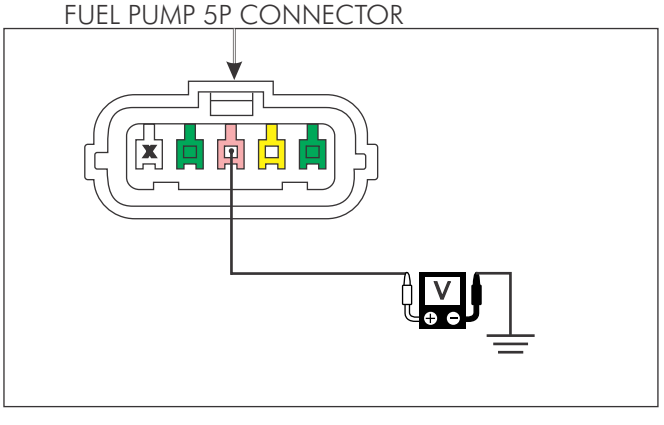
After turning the ignition to "ON" the voltage can be measured only for a few seconds.



If voltage does not exist, measure the voltage between the fuel pump 5P connector and body ground.

CONNECTION
Pink/White-Body Ground
STANDARD: Battery Voltage

If voltage is ok, replace the harness, and inspect again.



If voltage does not exist, then turn the ignition switch to "OFF" and disconnect the relay and relay-1 8P connector .

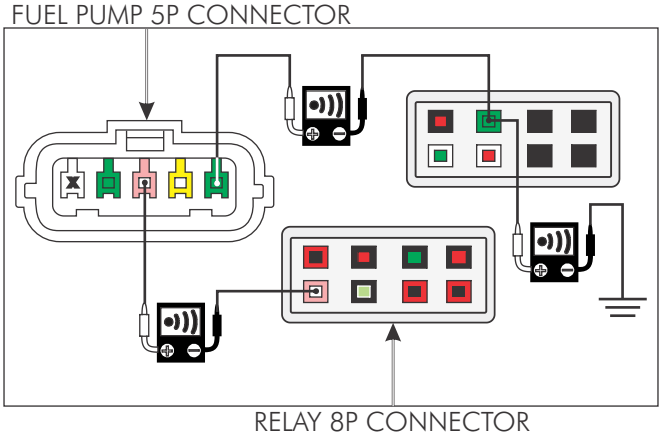
Check for continuity between the fuel pump 5P connector and relay 8P connector at the wire harness side.

CONNECTION
Pink/White- Pink/White
STANDARD: Continuity
Green-Green
STANDARD: Continuity
Green-Body ground
STANDARD: No Continuity

If the above connection are abnormal replace the harness, and inspect again.

If the above connection are normal then inspect the following:

- Ignition switch (page 20-16).
- Fuses
- RR unit (page 17-11).



If voltage with body ground is ok then perform current leakage test (page 17-11), if current leakage is in range, then perform following steps to check current consumption by fuel pump:

1. Connect fuel pump 5P connector.
2. Disconnect battery negative terminal.
3. Insert multimeter red probe to 10 ADC point and black probe to COM point as shown.
4. Connect multimeter black probe to battery (-)ve terminal and red probe to (-)ve wire and check current consumption.

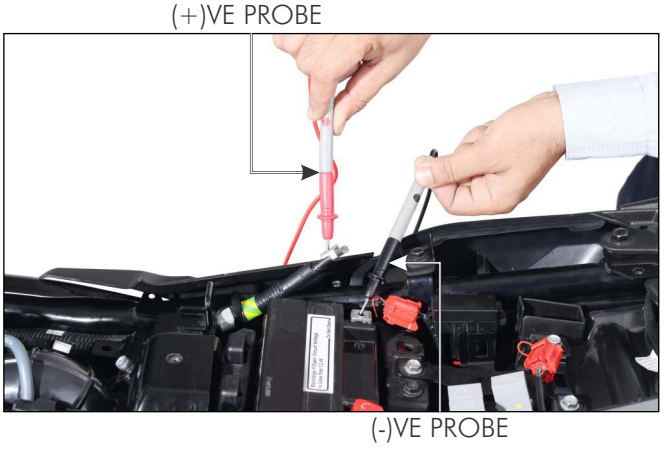
Current consumption≤1.6A

NOTE

Current consumption value can be calculated by subtracting initial (highest) current value with the lowest value.

If current consumption by fuel pump is in range then fuel pump is ok.

If current consumption by fuel pump is out of range then fuel pump is faulty and must be replaced.



REMOVAL

Remove the following :

- Fuel tank (page 2-12).

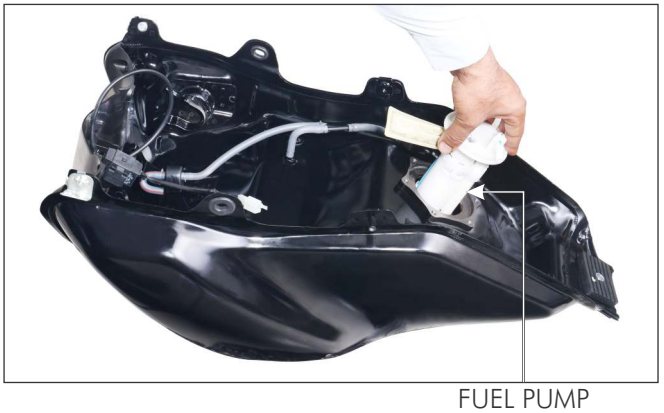
NOTE

- Always ensure to clean any dust or dirt around the fuel pump before removal.
- Take extra care while removing the fuel pump to avoid any damaged to the fuel pump unit.

Remove the fuel pump mounting bolts.

Remove the pressure plate.

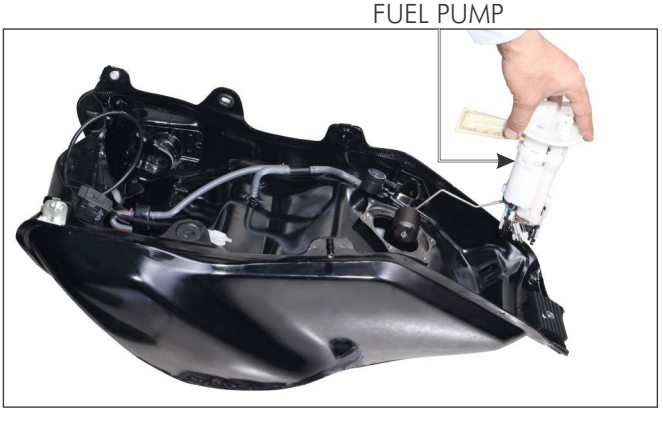
Carefully remove the fuel level sensor portion of fuel pump from the tank.



Tilt the fuel pump so that floater arm come out from the tubes (inside the fuel tank) without colliding with the tubes.

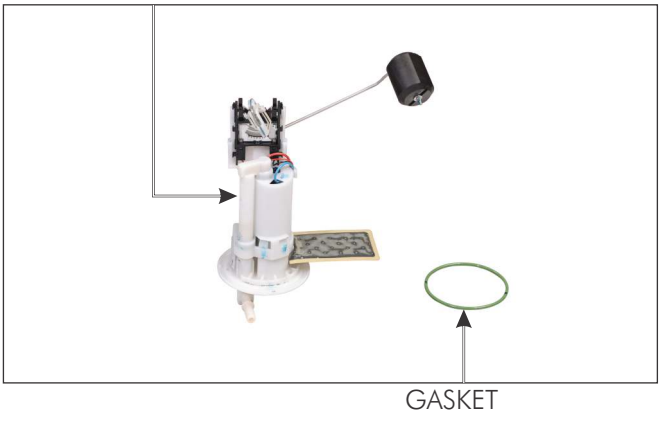
Remove the floater arm from the fuel tank partially.

Rotate the fuel pump so that float can be removed.

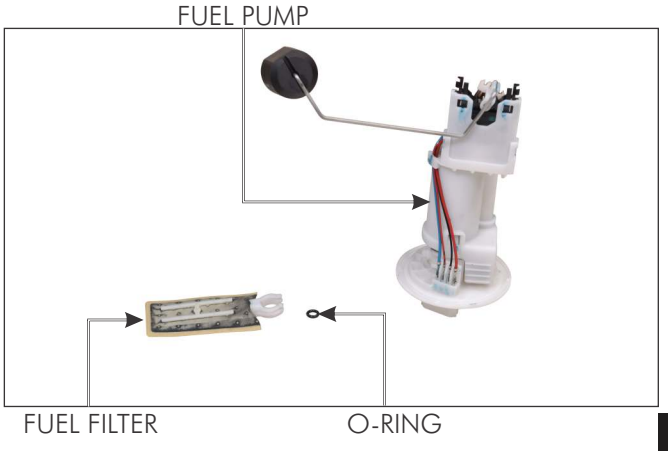


DISASSEMBLY

Remove the gasket from the fuel pump assembly.



Remove fuel filter and O-ring from the fuel pump assembly.

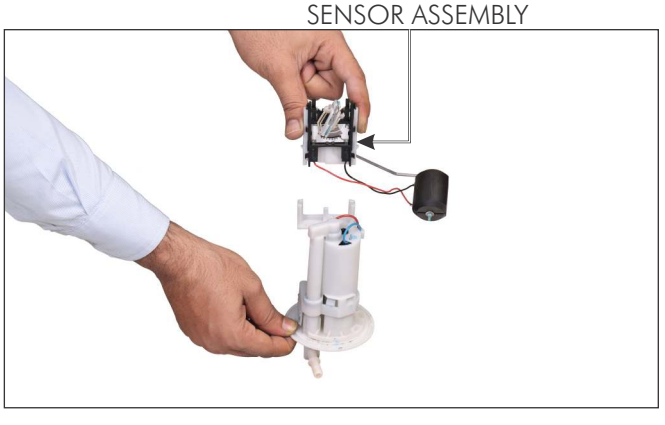


Disconnect the FLS and it's wire connection.

NOTE

FLS terminal once removed, it cannot be re-used.

Remove the sensor assembly.

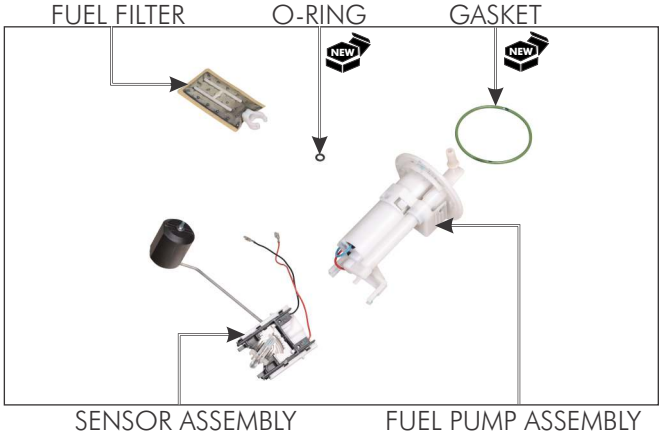


ASSEMBLY

Assembly is in the reverse order of disassembly.

NOTE

- Replace the gasket and O-ring with the new ones.
- Install the new FLS.



INSTALLATION

Move the fuel pump towards right side till a extent where float can be inserted into the tank.

FUEL PUMP

Rotate the fuel pump so that float can be inserted.

Insert floater arm inside the tank partially.

FUEL PUMP

Tilt the fuel pump so that floater arm goes between the tubes inside without colliding with the tubes.

FUEL PUMP

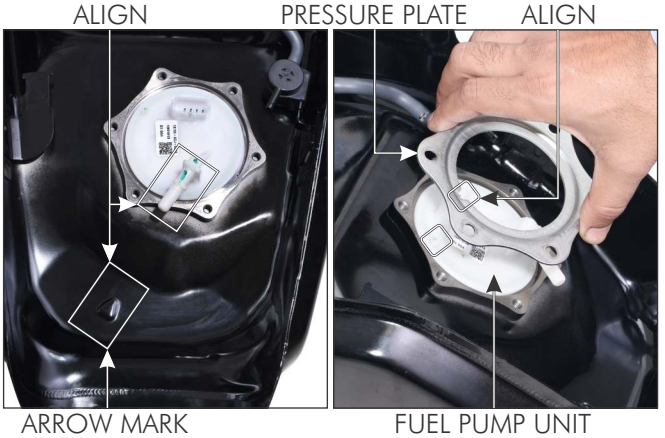
Carefully insert the fuel level sensor portion of the fuel pump inside the tank with same orientation.

Once after fuel level sensor portion is inside the tank, tilt the fuel pump so that pump holder portion gets inside the tank also bend the pre-filter while assembling.

FUEL PUMP

While installing the fuel pump align the fuel pump with the arrow mark on the fuel tank.

Install the pressure plate on the fuel pump while aligning the notch on the pressure plate with the tab on the fuel pump.

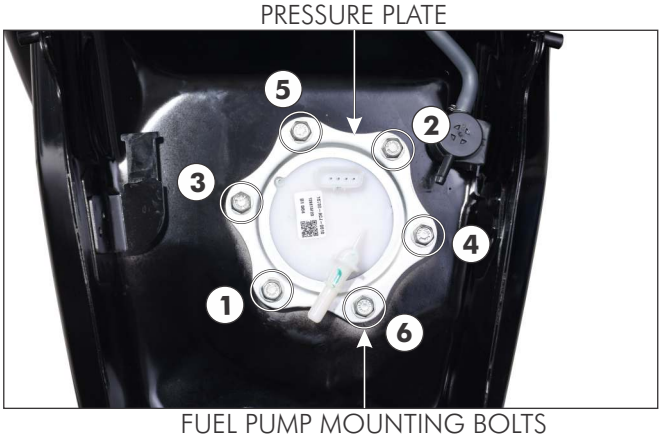


Install the fuel pump mounting bolts.

Tighten the fuel pump mounting bolts in the sequence shown.

TORQUE

FUEL PUMP MOUNTING BOLTS: 1.2 kgf-m

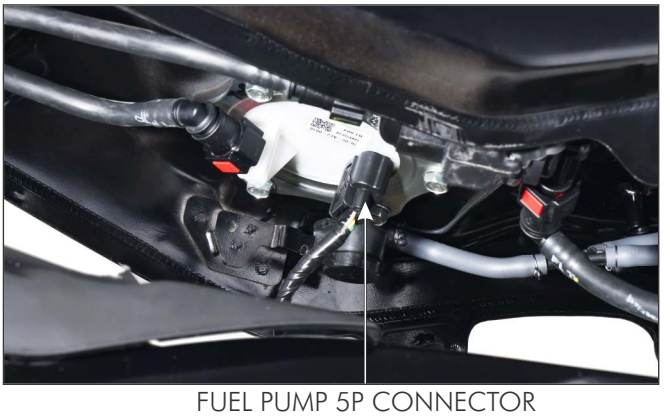


FUEL PUMP MOUNTING BOLTS

Connect the fuel pump 5P connector.

Install the following :

- Fuel tank (page 2-14).


FUEL PUMP 5P CONNECTOR

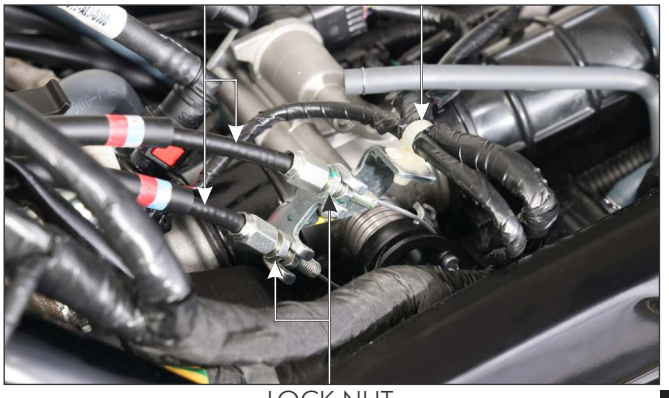
THROTTLE BODY WITH SENSOR UNIT/ IACV

REMOVAL

Remove the fuel tank (page 2-12).

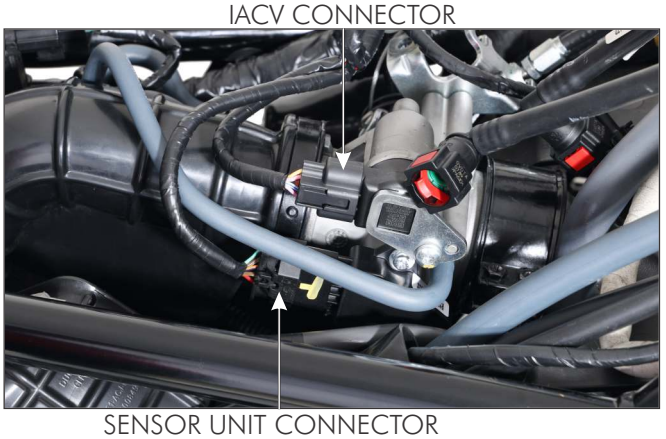
Dismount the tree clip with cables from the throttle drum.

Loosen the both throttle cable lock nut and disconnect both the throttle cable from the throttle drum.

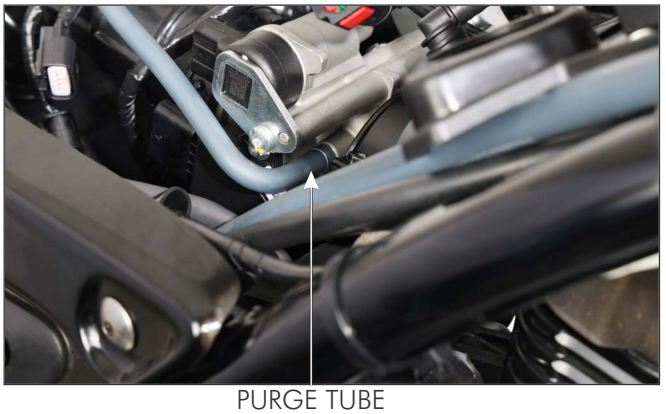


Disconnect the sensor unit connector from the throttle body.

Disconnect the IACV connector from the throttle body.



Disconnect the purge tube from the throttle body.



Loosen the air cleaner connecting hose band screw.
Loosen the intake manifold connecting hose band screw.
Remove the throttle body.

DISASSEMBLY

NOTE

- The throttle body/sensor unit is factory pre-set. Do not disassemble in a way other than shown in this manual.
- Do not snap the throttle valve from full open to full close after the throttle cable has been removed. It may cause incorrect idle operation.
- Do not damage the throttle body. It may cause incorrect throttle valve operation.
- Do not loosen or tighten the white painted nuts of the throttle body with sensor unit. Loosening or tightening can cause throttle body malfunction.

CAUTION

The throttle body with sensor unit is factory pre-set. Do not disturb the white painted allen key bolts of the sensor unit it may cause throttle body malfunction.

INTAKE AIR CONTROL VALVE (IACV)

INSPECTION

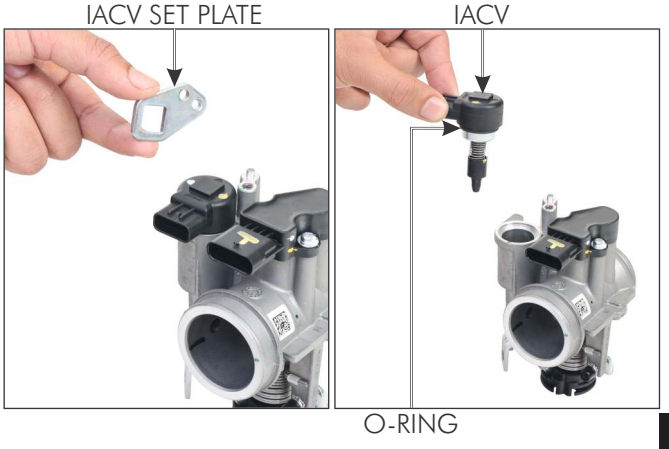
The IACV is installed on the throttle body and is operated by the step motor. When the ignition switch is turned "ON", the IACV operates for a few seconds.

NOTE

The IACV operation can be checked visually as follows:

Remove the torx screw from the IACV set plate.

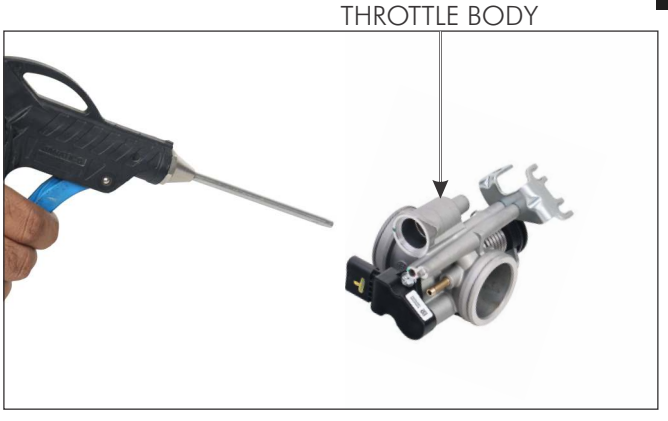
Remove the IACV set plate.
Remove the IACV with O-ring from the throttle body.



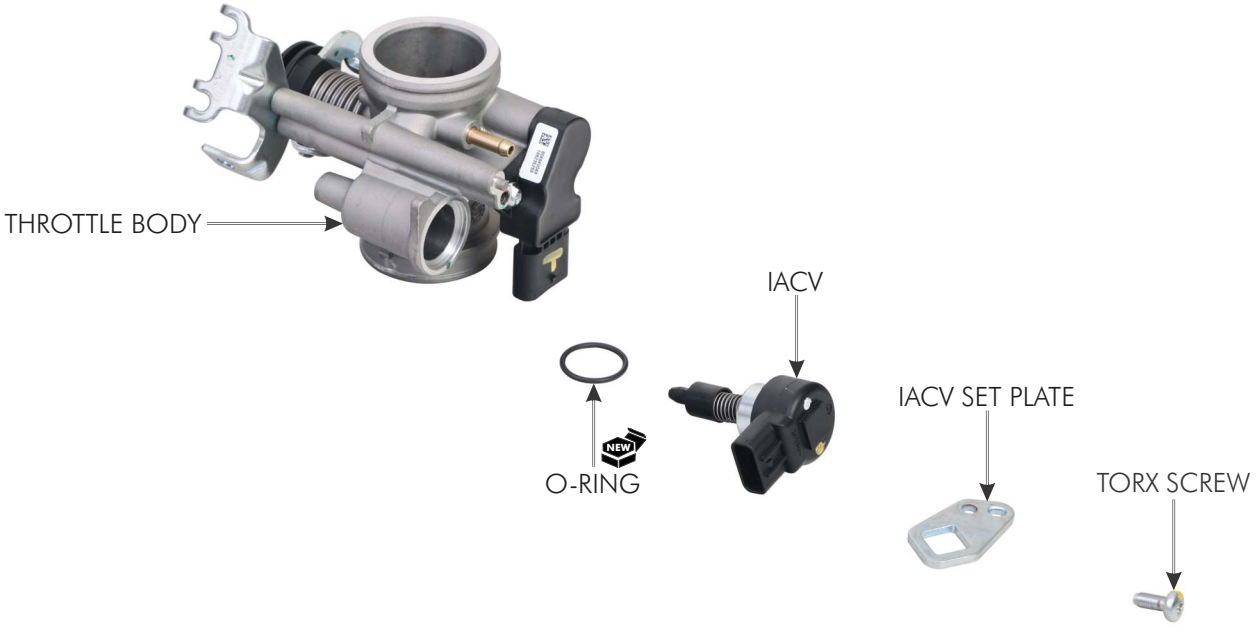
Blow open each air passage in the throttle body with the compressed air.

NOTE

Do not use high pressure air or bring the nozzle too close to the throttle body.

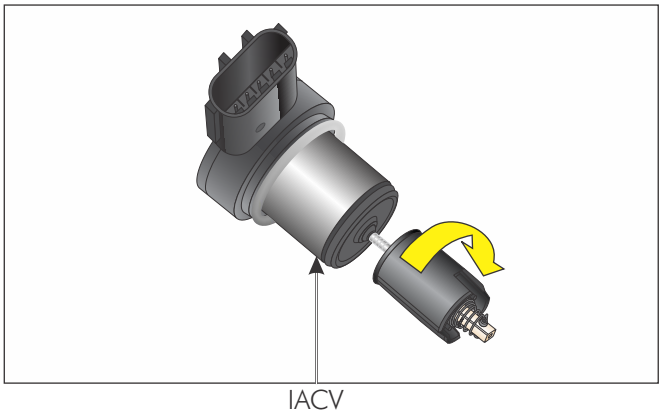


ASSEMBLY

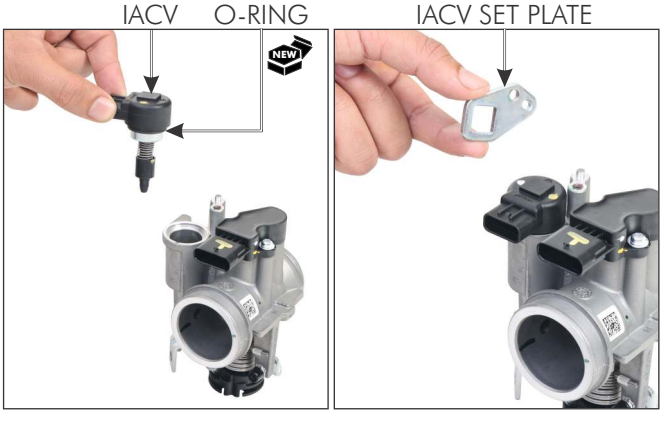


INSTALLATION

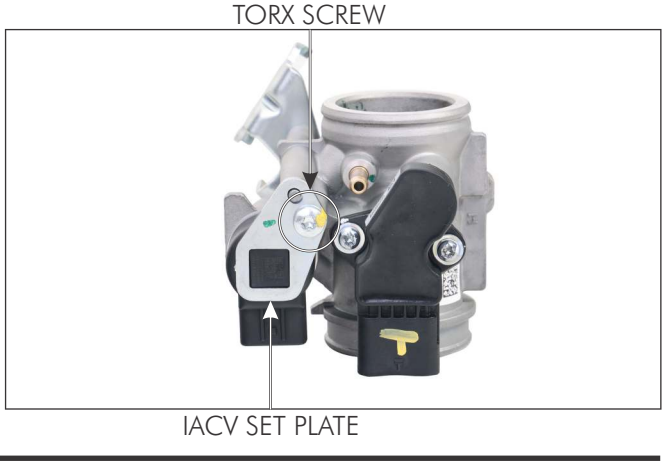
Turn the slide valve clockwise until lightly seated on IACV body.



Install the IACV with new O-ring to the throttle body.
Install the IACV set plate.



Install the torx screw to the IACV set plate.



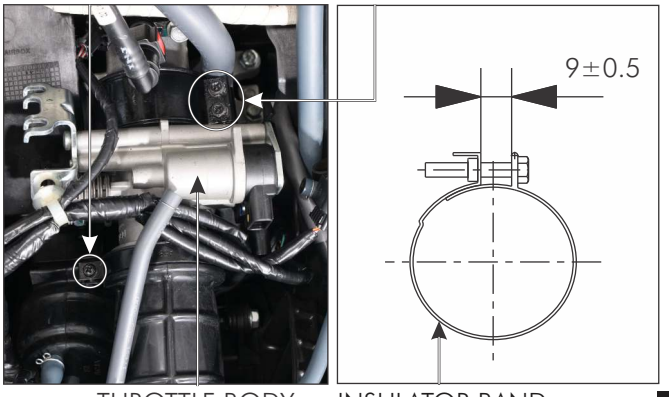
Install the throttle body.

NOTE

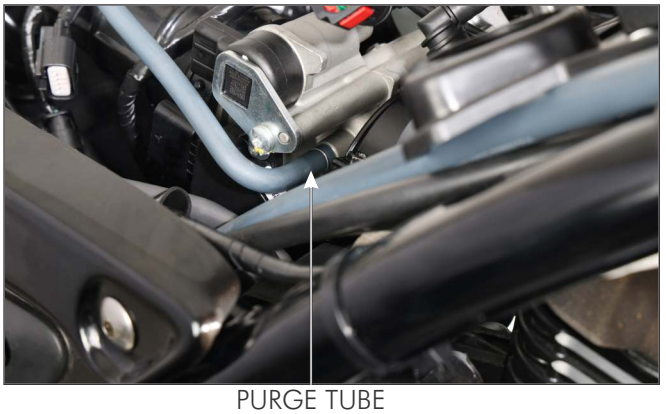
Be careful not to damage the insulator.

Tighten the air cleaner connecting hose band screw and insulator band screw.

Tighten the insulator band screw so that the band ends clearance is 9±0.5 mm.

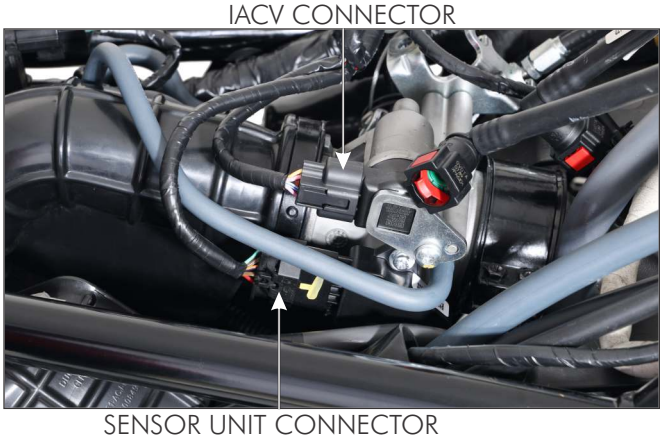


Connect the purge tube into the throttle body.



Connect the IACV connector to the throttle body.

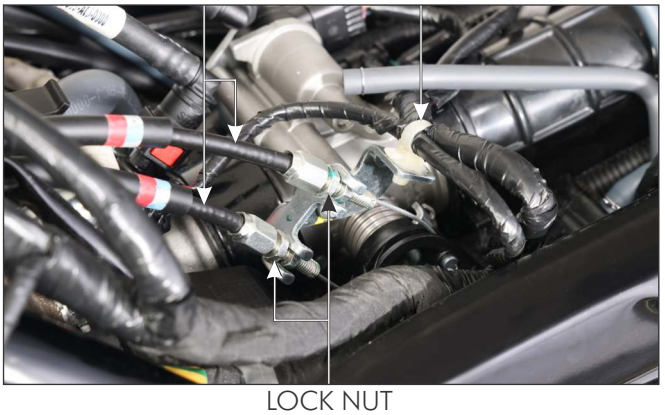
Connect the sensor unit connector to the throttle body.



Connect the both throttle cable to the throttle drum then adjust the throttle grip free play (page 3-5).

Mount the tree clip with cables on to the throttle drum.

Install the fuel tank (page 2-14).



INJECTOR

REMOVAL

Remove the fuel tank (page 2-12).

Disconnect the injector 2P connector.

Disconnect the quick connector fitting from injector side (page 5-66).

Remove the injector mounting bolt (Size: 10 mm).

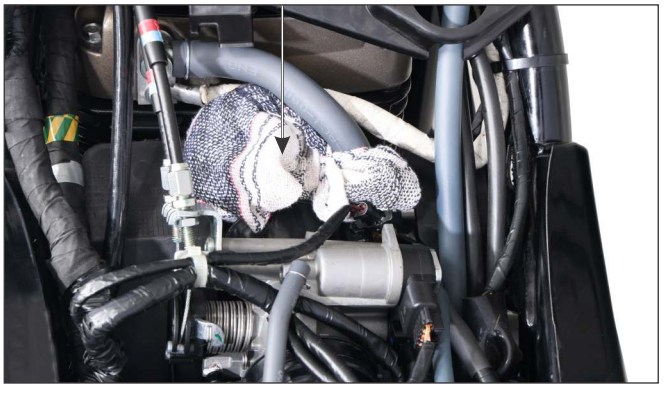
Remove the injector assembly with O-rings.

INJECTOR ASSEMBLY

NOTE

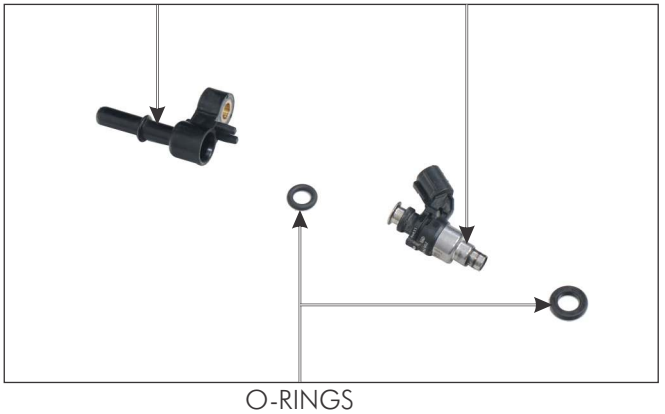
Seal the injector port with a shop towel or cover it with a piece of tape to prevent any foreign material from dropping into the engine.

SHOP TOWEL



Remove O-rings from the injector.

Check the removed parts for wear or damage and replace them if necessary.



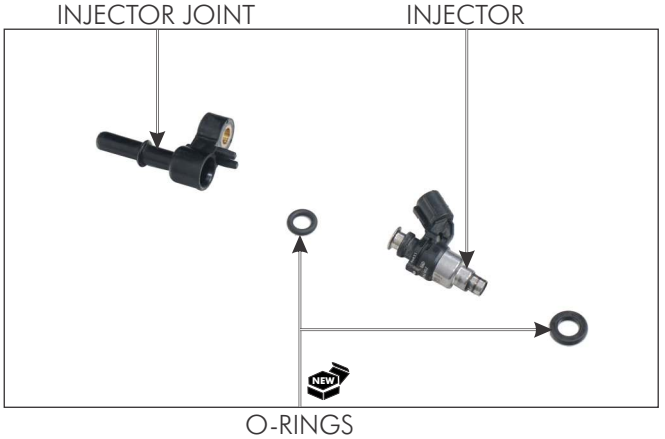
INSTALLATION

Coat new O-rings with engine oil.

NOTE

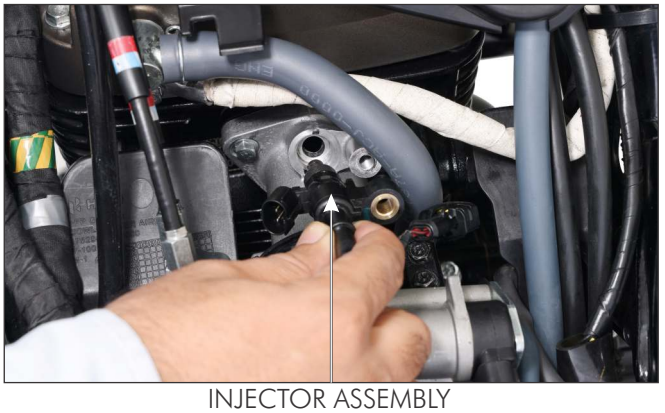
- Replace the O-rings with new ones.
- Be careful not to damage the O-rings.

Install new O-rings to the injector.
Install the injector to the fuel injector joint.



O-RINGS

Install the injector assembly.


INJECTOR ASSEMBLY

Install the injector mounting bolt to the specified torque.

TORQUE

INJECTOR MOUNTING BOLTS: 0.51±0.7 kgf-m.


INJECTOR MOUNTING BOLT

Connect the injector 2P connector.
Connect the quick connector fitting to injector side (page 5-68).
Install the fuel tank (page 2-13).

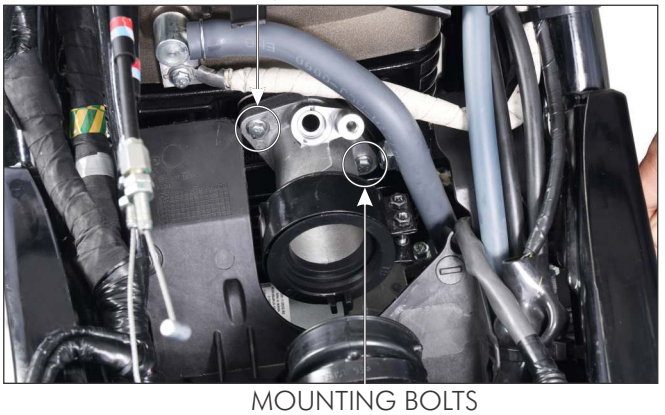
INJECTOR 2P CONNECTOR

PIPE INLET

REMOVAL

Remove the throttle body (page 5-79).
Remove the injector (page 5-84).
Remove the pipe inlet mounting bolts (Nos.: 2, Size: 8 mm).
Remove the pipe inlet from the cylinder head.

PIPE INLET



MOUNTING BOLTS

Remove the insulator with O-ring.

O-RING

INSULATOR

INSTALLATION

NOTE

Be careful not to damage the insulator/pipe inlet.

Install a new O-ring to the insulator.

Install the pipe inlet to the cylinder head.

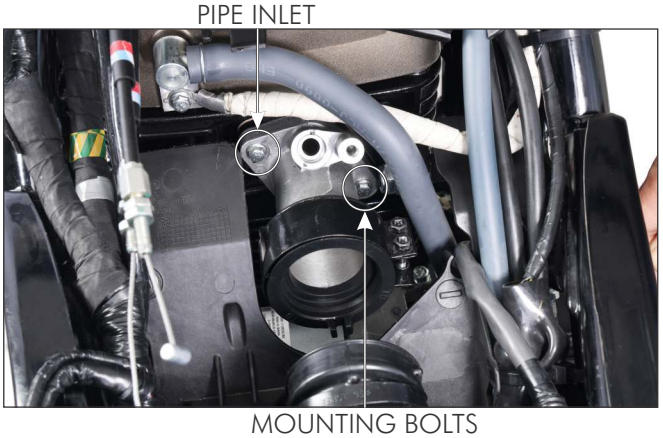
Tighten the pipe inlet mounting bolts (Nos.: 2, Size: 8 mm) to specified torque.

TORQUE

PIPE INLET BOLTS: 1.0 kgf-m

Install the injector (page 6-86).

Install the throttle body (page 6-82).



ENGINE OIL TEMPERATURE SENSOR (EOT)

REMOVAL

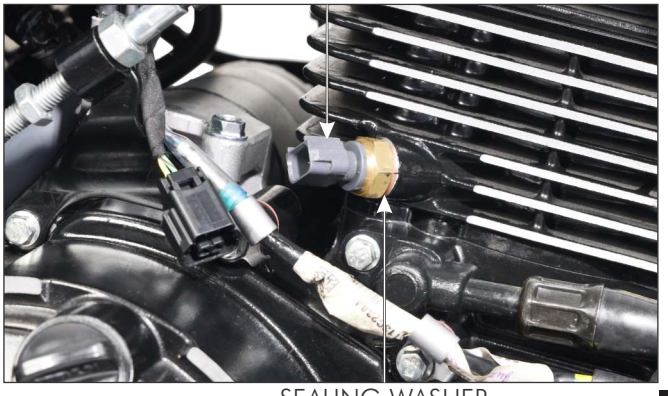
Disconnect the EOT 2P connector from the sensor.

***Note:** Images may depict a different model/variant, but procedures and information remain same.*

Remove the EOT sensor and sealing washer.

NOTE

Replace the EOT sensor when the engine is cold.



INSPECTION

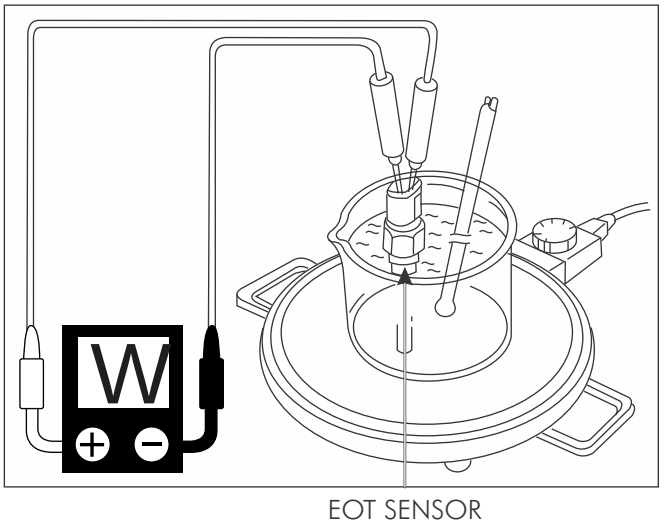
NOTE

Keep all flammable materials away from the electric heating element.

Suspend the EOT sensor in a pan of pure coolant and distilled water (50-50 mixture) on an electric heating element and measure the resistance at the EOT sensor terminals as the coolant heats up.

NOTE

- Soak the EOT sensor in coolant up to its threads with at least 40 mm (1.57 in) from the bottom of the pan to the bottom of the sensor.
- Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect reading. Do not let the thermometer or EOT sensor touch the pan.
- Measure the resistance at the EOT sensor terminals as shown.



TEMPERATURE	20°C (68°F)	100°C (212°F)
RESISTANCE	2.645 ± 5% kΩ	0.2156 ± 2.5% kΩ

If the resistance is out of specification at any temperature listed, replace the EOT sensor.

INSTALLATION

NOTE

Always replace a sealing washer with a new one.

Install the new sealing washer and EOT sensor. Tighten the EOT sensor to the specified torque.

TORQUE

EOT SENSOR: 1.45 kgf-m

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Connect the EOT sensor 2P connector.

ROLL OVER SENSOR/BANK ANGLE SENSOR (BAS)

NOTE

This is a safety related control provided to minimize the damage in case of an accident by shutting down all engine operations.

REMOVAL

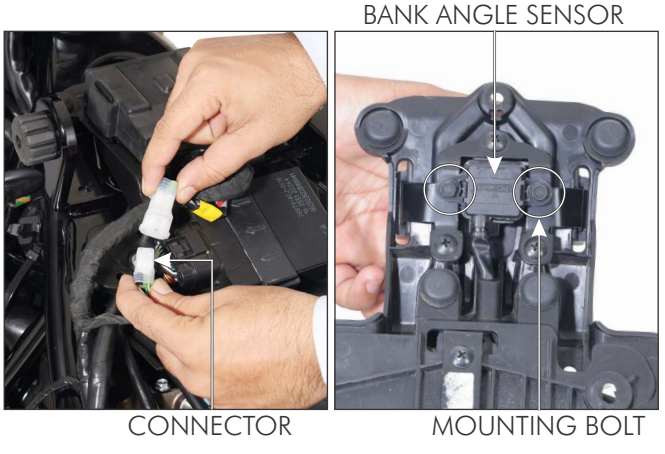
Remove the fuel tank (page 2-12).

Disconnect the bank angle sensor 4P connector.

Remove the electrical part mount bracket (page 7-4).

Remove the bank angle sensor mounting bolts.

Remove bank angle sensor.



INSPECTION

Connect the 4P connector to bank angle sensor and place the bank angle sensor horizontal as shown and turn the ignition switch "ON" and start the engine.

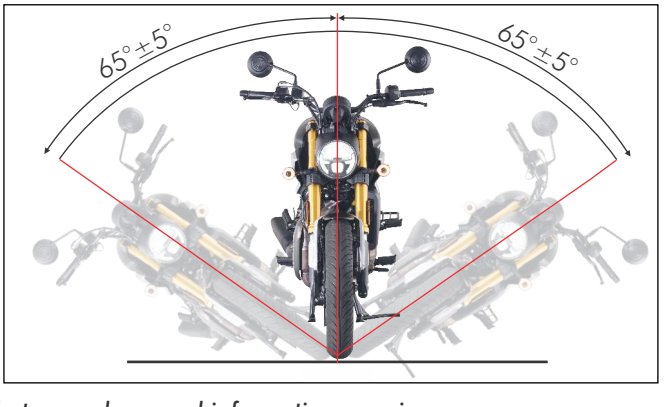
Incline the bank angle sensor approximately 65°±5° to the left or right.

The bank angle sensor is normal if the engine stalls.

If the engine does not stall then check the BAS troubleshooting process.

NOTE

To restart the engine bring the bank angle sensor to up-right position (align arrow mark in right position). Turn the ignition switch to "OFF" and then "ON".



Note: *Images may depict a different model/variant, but procedures and information remain same.*

INSTALLATION

Install the bank angle sensor.

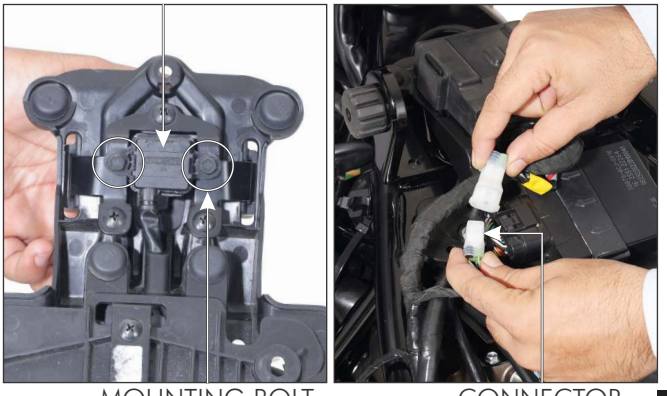
Install the stay bank angle sensor and tighten the mounting bolts.

Install the electrical part mount bracket (page 7-7).

Connect bank angle sensor 4P connector.

Install the fuel tank (page 2-13).

BANK ANGLE SENSOR



MOUNTING BOLT CONNECTOR

PRIMARY OXYGEN SENSOR

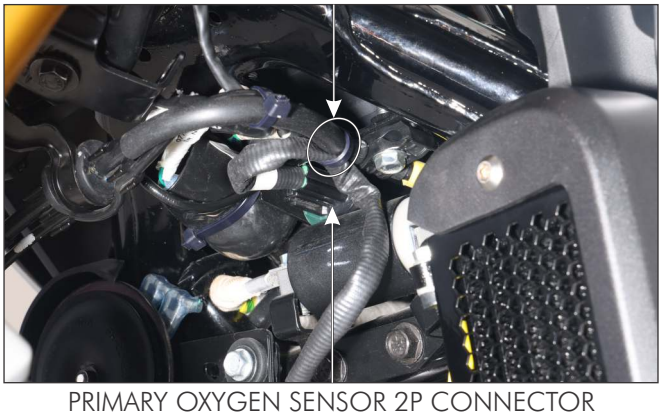
REMOVAL

NOTE

- Do not apply grease, oil or other materials in the oxygen sensor air hole.
- The oxygen sensor may be damaged if dropped. Replace it with a new one, if dropped.
- If the oxygen sensor cap is disconnected, replace the oxygen sensor cord with a new one, do not reuse oxygen sensor cord.
- Handle the oxygen sensor with care.
- Do not service the oxygen sensor while it is hot.

Remove the primary oxygen sensor cord by removing the tie-wrap and disconnect the primary oxygen sensor 2P connector.

TIE-WRAP



PRIMARY OXYGEN SENSOR 2P CONNECTOR

Remove the primary oxygen sensor by using the special tool.

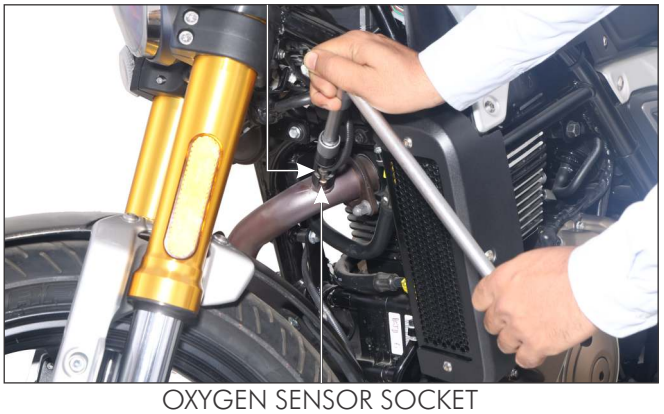
TOOL

OXYGEN SENSOR SOCKET
PART NO: HMCL0519ABW01

CAUTION

- Be careful not to damage the sensor wire.
- Do not use a impact wrench while removing or installing the oxygen sensor, or it may be damaged.

PRIMARY OXYGEN SENSOR



OXYGEN SENSOR SOCKET

INSTALLATION

Install and tighten the primary oxygen sensor to the specified torque.

TOOL

OXYGEN SENSOR SOCKET
PART NO: HMCL0519ABW01

TORQUE

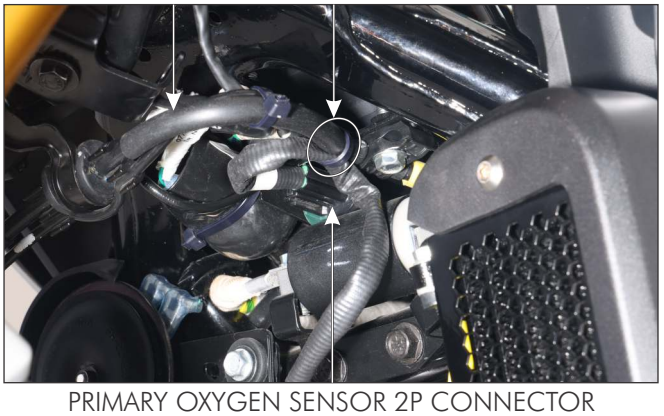
OXYGEN SENSOR: 1.75 kgf-m

NOTE

Anti-seize coating applied on thread from supplier end. Do not apply grease or oil, when assembling.

OXYGEN SENSOR SOCKET

Tie the primary oxygen sensor cord with the front caliper hose by using a tie-wrap and connect the primary oxygen sensor 2P connector.



PRIMARY OXYGEN SENSOR 2P CONNECTOR

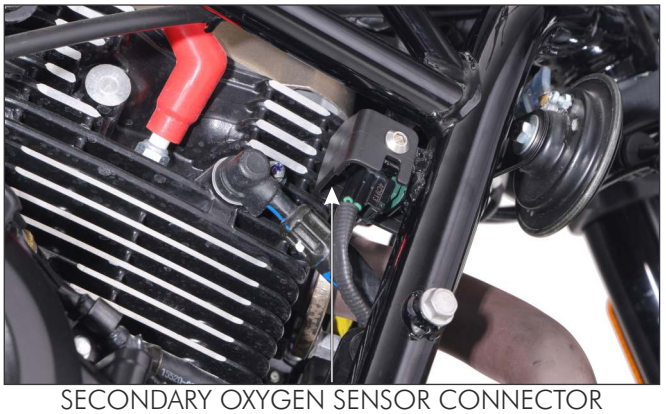
SECONDARY OXYGEN SENSOR

REMOVAL

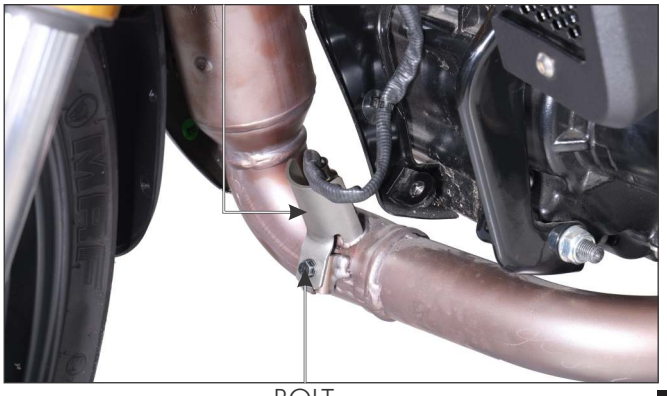
NOTE

- Do not apply grease, oil or other materials in the oxygen sensor air hole.
- The oxygen sensor may be damaged if dropped. Replace it with a new one, if dropped.
- If the oxygen sensor cap is disconnected, replace the oxygen sensor cord with a new one, do not reuse oxygen sensor cord.
- Handle the oxygen sensor with care.
- Do not service the oxygen sensor while it is hot.

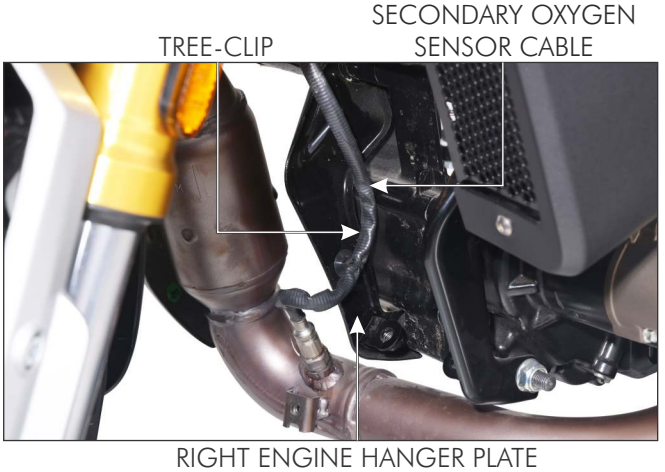
Disconnect the secondary oxygen sensor connector.


SECONDARY OXYGEN SENSOR CONNECTOR

Remove the secondary oxygen sensor cover by removing the bolt (Nos.: 1, Size: 8 mm).



Dismount the secondary oxygen sensor cable tree clip from the right engine hanger plate.



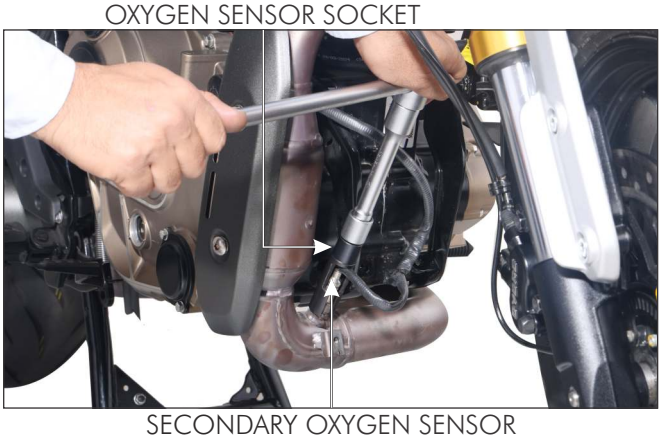
Remove the secondary oxygen sensor by using the special tool.

TOOL

OXYGEN SENSOR SOCKET, 16mm
PART NO: HMCL0724ACYB12

CAUTION

- Be careful not to damage the sensor wire.
- Do not use an impact wrench while removing or installing the oxygen sensor, or it may be damaged.



INSTALLATION

Install and tighten the secondary oxygen sensor to the specified torque.

TOOL

OXYGEN SENSOR SOCKET, 16mm
PART NO: HMCL0724ACYB12

TORQUE

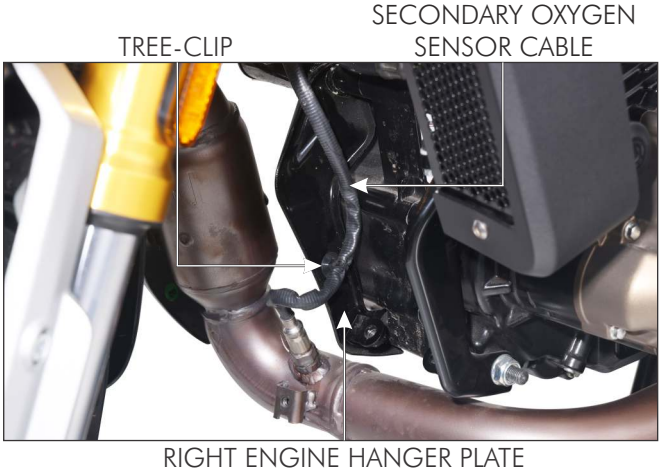
OXYGEN SENSOR: 1.75 kgf-m

NOTE

Anti-seize coating applied on thread from supplier end. Do not apply grease or oil, when assembling.

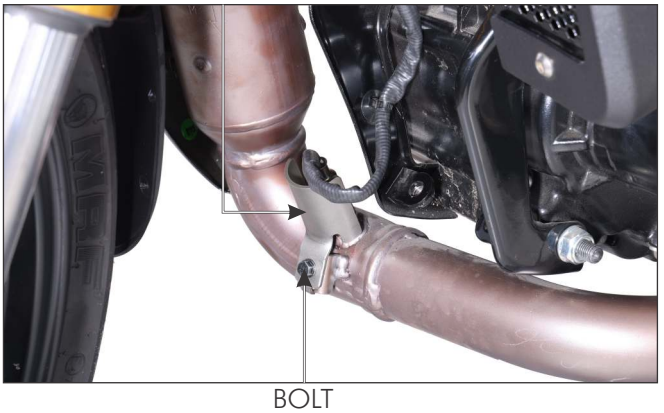
SECONDARY OXYGEN SENSOR

Mount the secondary oxygen sensor cable tree clip to the right engine hanger plate.



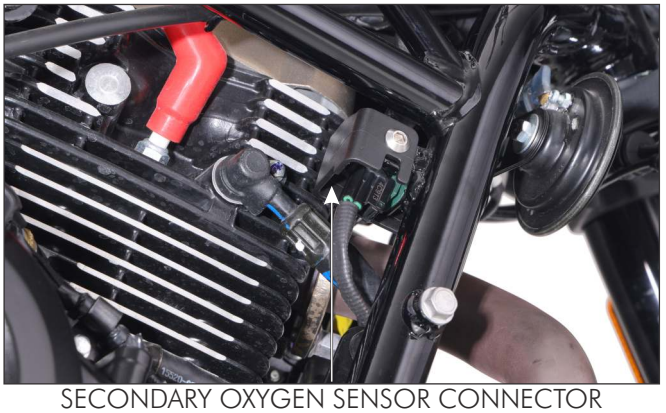
RIGHT ENGINE HANGER PLATE

Install and tighten the secondary oxygen sensor cover by installing the bolt (Nos.: 1, Size: 8 mm).



BOLT

Connect the secondary oxygen sensor connector.



SECONDARY OXYGEN SENSOR CONNECTOR

PURGE VALVE

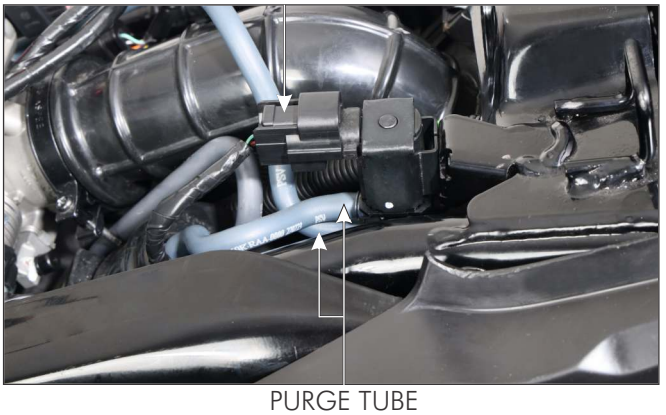
REMOVAL

Remove the fuel tank (page 2-12).
Remove the battery box (page 19-5).
Remove the air cleaner allen key mounting bolt.

ALLEN KEY MOUNTING BOLT

PURGE VALVE 2P CONNECTOR

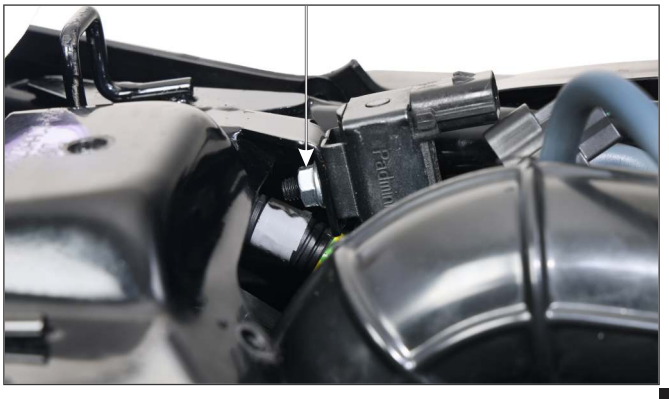
Disconnect the purge valve 2P connector.
Remove the purge hoses from purge valve.



PURGE TUBE

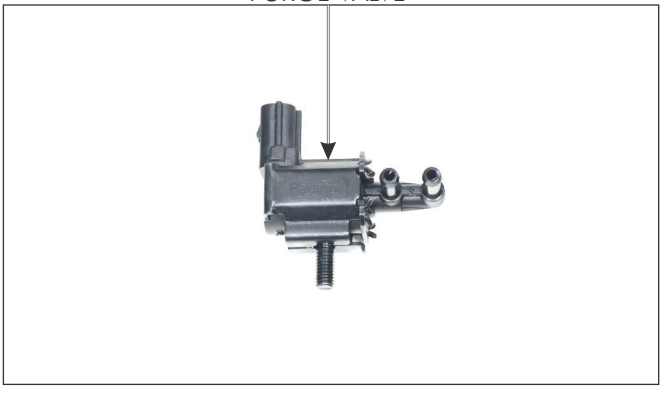
Remove the mounting nut.

MOUNTING NUT



Remove the purge valve.

PURGE VALVE



INSTALLATION

Installation is in the reverse order of the removal.

INSPECTION

Disconnect the purge valve 2P connector (page 5-92).

CONNECTION

Green/Black-Ground

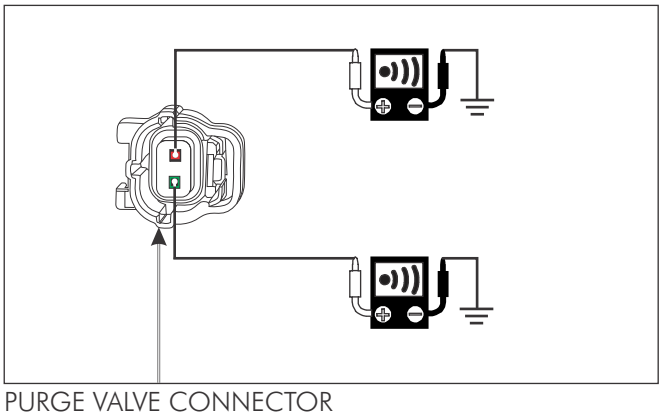
STANDARD: No continuity

Black/Red-Ground

STANDARD: No continuity (Ignition switch "ON")

If the no continuity exists, inspect for continuity in black/red from purge valve connector to ECU connector.

If there is continuity, then replace the purge valve.

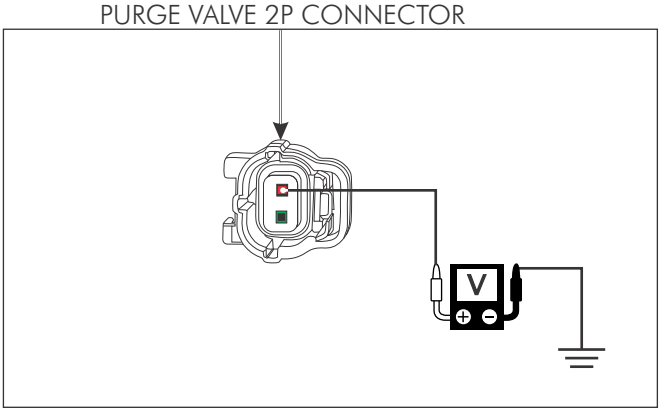


PURGE VALVE CONNECTOR

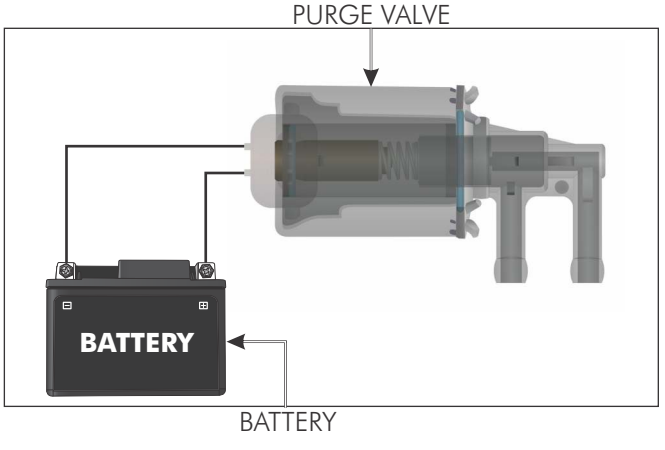
If there is no continuity, then inspect the following:
- Main fuse (10A)
- Open circuit in Green/Black or Black/Red wire
- ECU

CONNECTION
Black/Red-Ground
STANDARD: Battery voltage

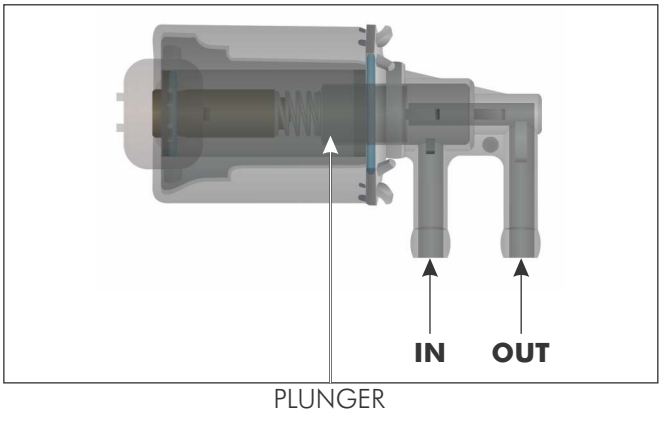
If the voltage exists, then replace the purge valve.
If there is no voltage, then inspect the following:
- Main fuse (10A)
- Open circuit in Green/Black or Black/Red wire
- ECU



Connect the external battery supply (-)ve and (+)ve to purge valve pins.



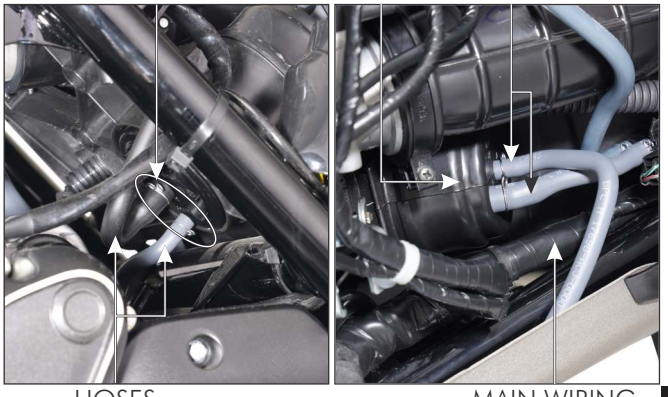
If a clicking sound is observed, the plunger is operating.
Now, blow air from one end of the tube, the air should flow and it should block when connection are removed.
If the plunger doesn't operate or opens the passage when "ON" or block when "OFF" replace with a new one and check again. If the problem still persists go to the next step.



CANISTER

REMOVAL

Remove the fuel tank (page 2-12).
Remove the purge valve (page 5-92).
Disconnect the hoses by removing the clips.
Step aside the main wiring harness.
Pull out the canister from the mounting stay.

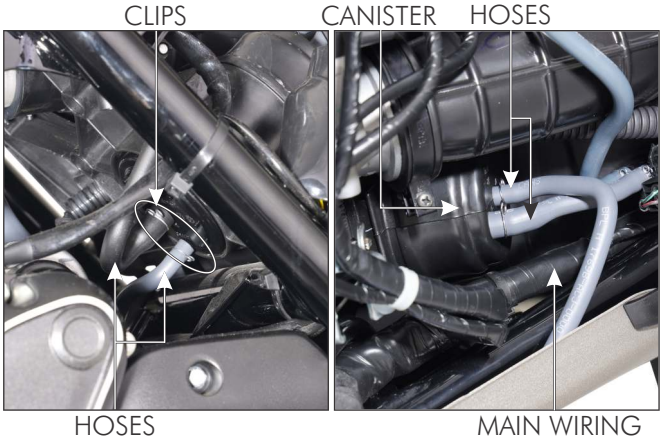


INSPECTION

Inspect the hoses for deterioration, damage or loose connections and canister for cracks or other damages.
Check the weight of canister after running the vehicle for certain km, the weight should be reduced to some grams.
Check the weight of canister after parking the vehicle in hot summer day, the weight should be increased to some grams.

INSTALLATION

Installation is in the reverse order of the removal.



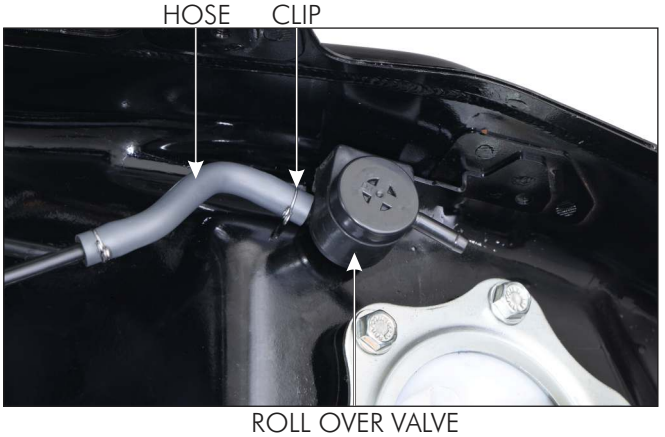
ROLL OVER VALVE

REMOVAL

Remove the fuel tank (page 2-12).
Disconnect the hose by removing the clip.
Remove the roll over valve from the stay.

INSTALLATION

Installation is in the reverse order of the removal.



Note: *Images may depict a different model/variant, but procedures and information remain same.*

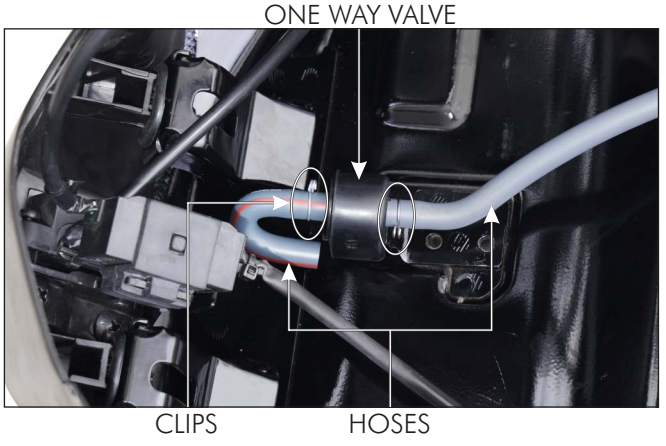
ONE WAY VALVE

REMOVAL

Remove the fuel tank (page 2-12).
Disconnect the hoses by removing the clips.
Remove the one way valve from the stay.

INSTALLATION

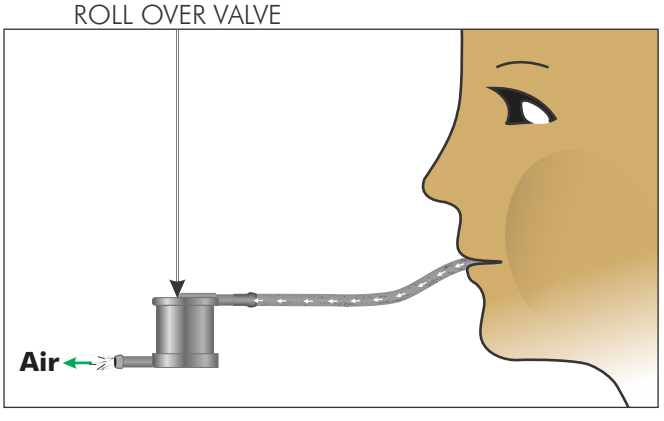
Installation is in the reverse order of the removal.



INSPECTION

(A) ROLL OVER VALVE

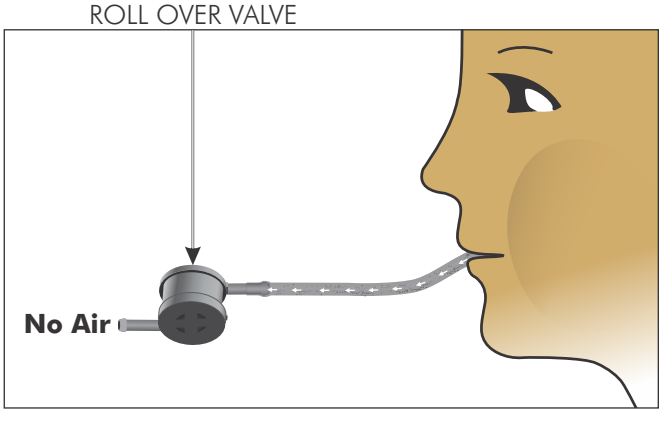
Blow air from one side in upright position and observe if air is coming out from other end or not.



Try the same by turning the roll over valve in 90°, the air should not pass.

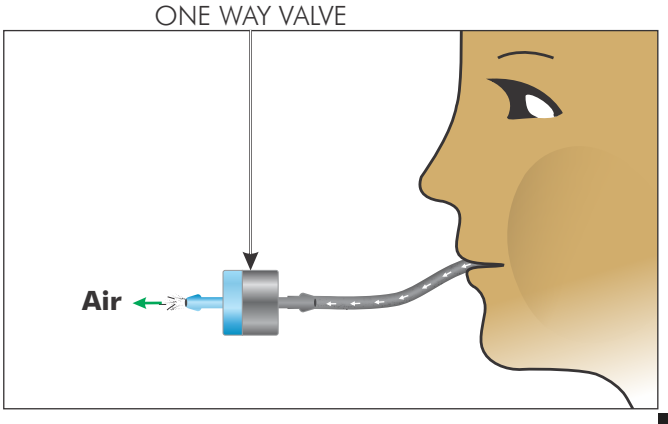
INSTALLATION

Installation is in the reverse order of the removal.



(B) ONE WAY VALVE

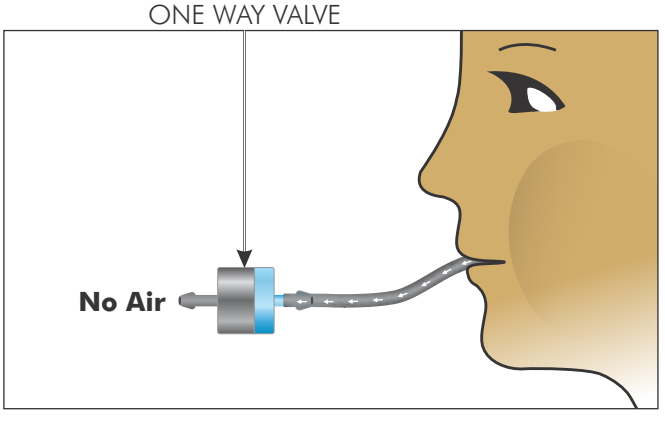
Blow air from one side and observe if air is coming out from other end or not. Air should pass in this condition.



Try the same from other side as well-in this case the air should not pass.

INSTALLATION

Installation is in the reverse order of the removal.



SYSTEM LOCATION

ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

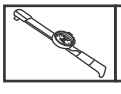
GENERAL

- A floor jack or other adjustable support is required to support the engine.
- The following components require engine removal for service:
  - Crankshaft/transmission
- The following component can be serviced with the engine installed in the frame:
  - Cylinder head
  - Cylinder piston
  - Alternator/starter clutch
  - Electric start motor
  - Clutch
  - Oil strainer
  - Oil filter rotor
  - Oil pump
  - Gearshift linkage
- When installing the engine, be sure to tighten the engine mounting fasteners to the specified torque.

SPECIFICATIONS

ENGINE REMOVAL/INSTALLATION

ITEM		SPECIFICATIONS
Engine oil capacity	At draining	2.25 litres
	At disassembly	2.6 litres



TORQUE VALUES

FRONT ENGINE MOUNTING BOLT/NUT	**: 6.0-6.5 kgf-m**
REAR ENGINE MOUNTING BOLT/NUT	**: 6.0-6.5 kgf-m**
5TH ENGINE MOUNTING BOLT	**: 5.4-6.0 kgf-m**
GEAR SHIFT PEDAL PINCH BOLT	**: 0.8-1.2 kgf-m**
DRIVE SPROCKET NUT	**: 7.0-8.0 kgf-m**

For other nuts, bolts, fasteners etc. refer to standard torque values **(SECTION-1)**.

ENGINE

REMOVAL

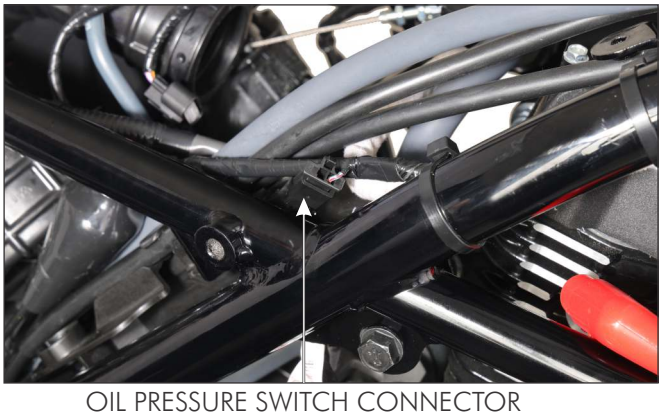
Park the vehicle on its main stand.
Drain the engine oil (page 3-13).
Remove the following:
- Side covers (page 2-14 & 2-16).
- Fuel tank (page 2-12).
- Electrical part mount bracket (page 7-4).
- Clutch cable (page 9-3).
- Noise suppressor cap (page 3-8).
- Throttle body (page 5-79).
- Pipe inlet (page 5-87).
- Oil cooler protector cover (page 4-11)

Remove the oil cooler mounting bolts (page 4-12).

OIL COOLER

MOUNTING BOLTS/WASHERS/RUBBERS

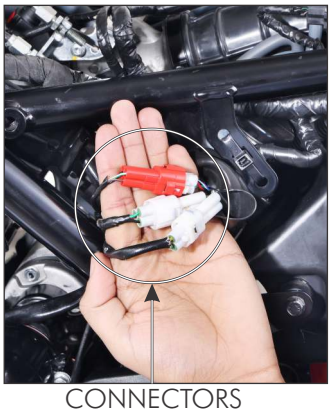
Disconnect the oil pressure switch connector.



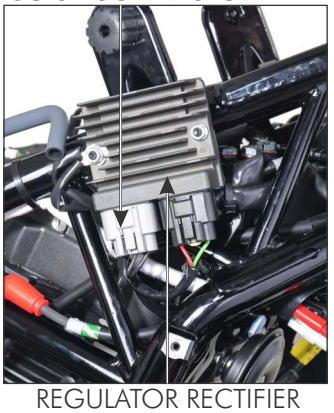
OIL PRESSURE SWITCH CONNECTOR

Disconnect the CKP sensor, side stand switch and gear position sensor (GPS) wire connectors.
Disconnect the ACG 3P connector from the regulator/ rectifier.

ACG 3P CONNECTOR

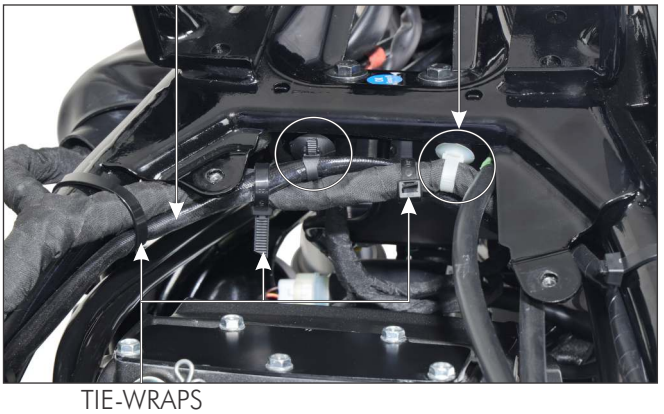


CONNECTORS

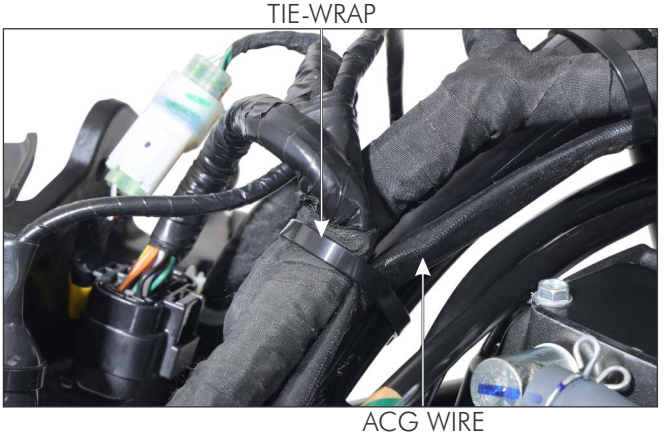


REGULATOR RECTIFIER

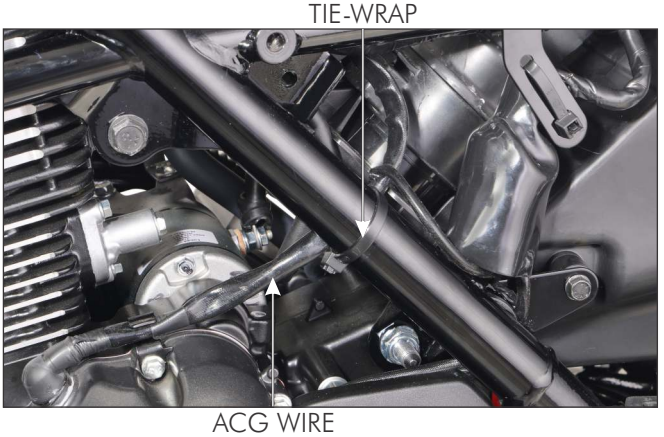
Dismount the ACG wire harness from tree clips (Nos.: 2) mounted on the frame.
Disconnect the ACG wire from the tie-wraps.



Disconnect the ACG wire from the tie-wrap mounted on the frame.

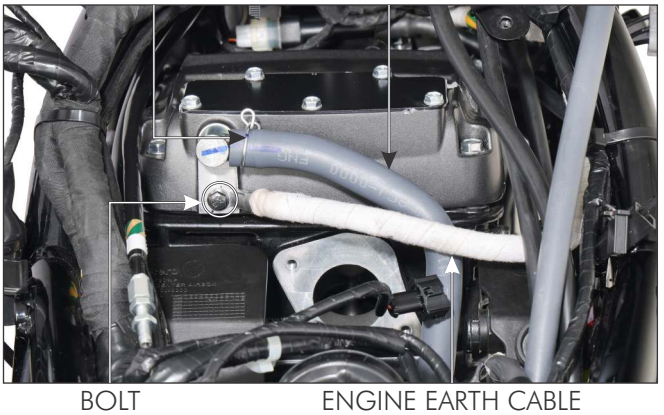


Disconnect the ACG wire from the tie-wrap mounted on the frame.



Disconnect the engine breather tube by removing its wire clip from the cylinder head cover.

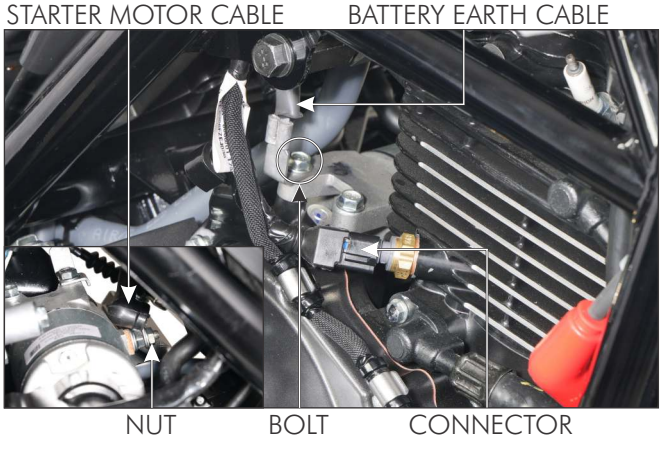
Disconnect the engine earth cable by removing its bolt from cylinder head cover.



Disconnect the starter motor cable by removing the its nut (page 19-3).

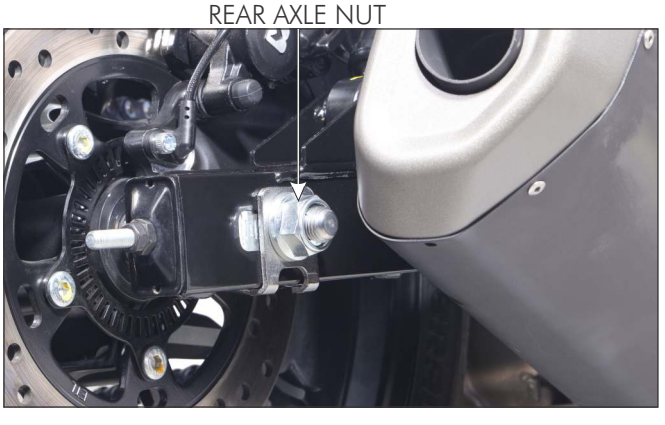
Disconnect the battery earth cable by removing its bolt (page 19-3).

Disconnect the EOT sensor connector.



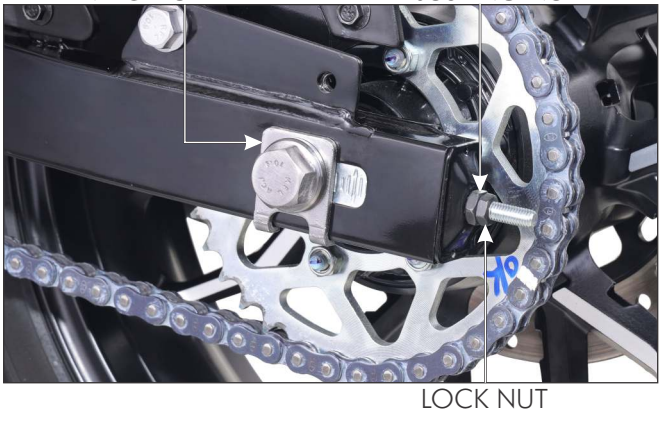
Loosen the rear axle nut.

Remove the exhaust muffler (page 2-20).



Loosen the indicator plate, both side drive chain adjusting lock nuts and adjusting nuts.

Push the rear wheel forward and slacken the drive chain fully.

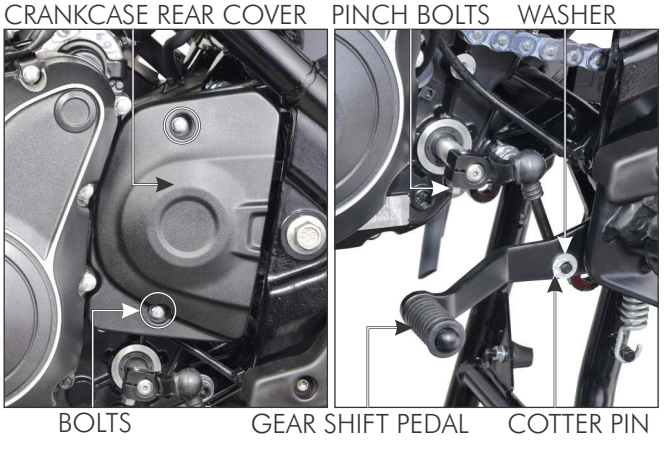


Remove the left crankcase rear cover bolts (Nos.: 2) and left crankcase rear cover.

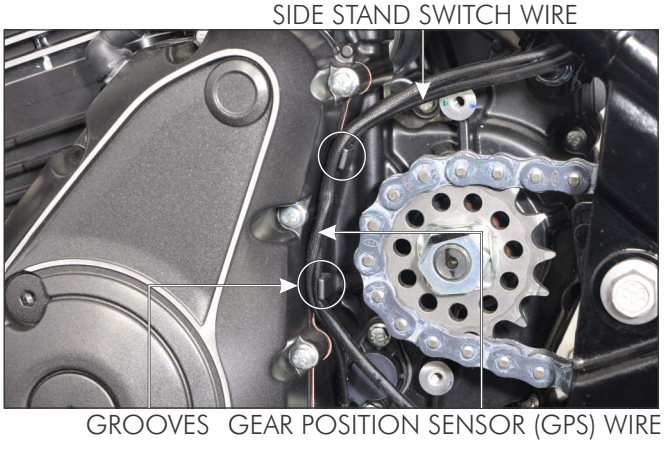
Remove the cotter pin, washer.

Push the gear shift pedal rod and release the gear shift pedal rod from the gear pedal.

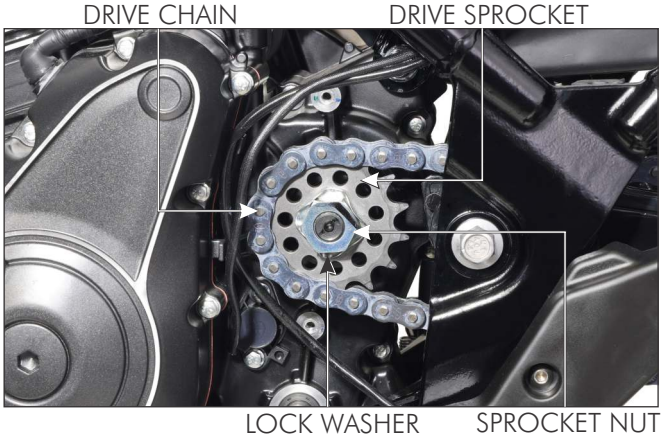
Remove the pinch bolt and gear shift pedal.



Remove the side stand switch and gear position sensor (GPS) wires from the grooves.

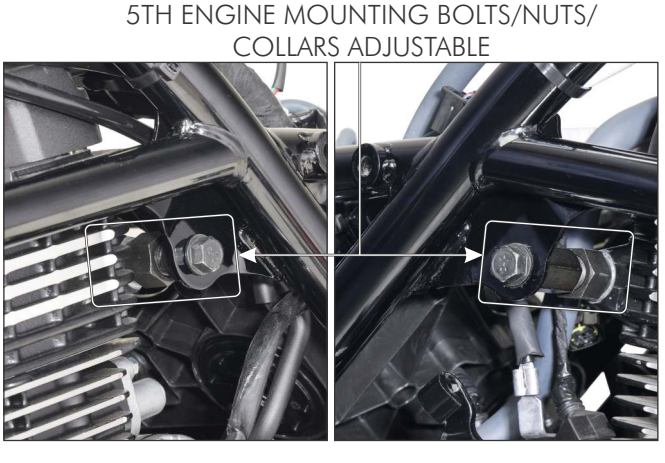


Straighten the lock washer.
Remove the drive sprocket nut .
Remove the lock washer.
Remove the drive sprocket with chain.



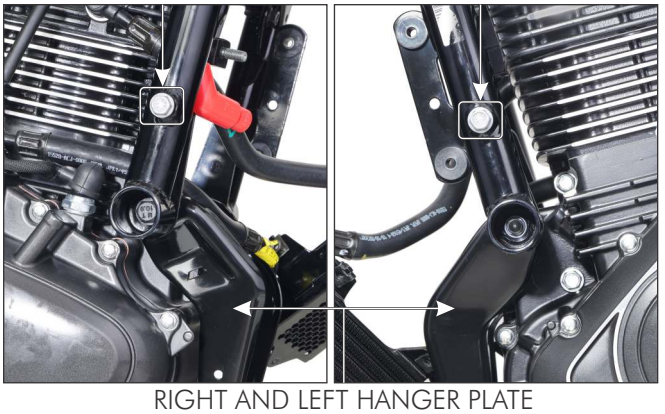
Remove the plastic cap from the both sides.

Remove the 5th engine mounting bolts/nuts/collars adjustable (page 7-7).



Remove the right and left engine hanger plate mounting nuts (Nos.: 2, Size: 8 mm), bolts (Nos.: 2, Size: 12 mm) with collars (Nos.: 2) from the both side.

HANGER PLATE MOUNTING NUTS/BOLTS/COLLARS

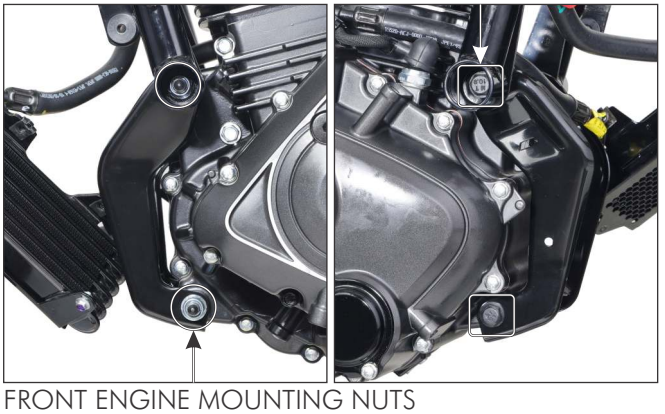


RIGHT AND LEFT HANGER PLATE

Remove the front engine mounting nuts (Nos.: 2, Size: 17 mm) from the left side of the vehicle.

Remove the front engine mounting bolts (No.: 2, Size: 14 mm) from the right side of the vehicle.

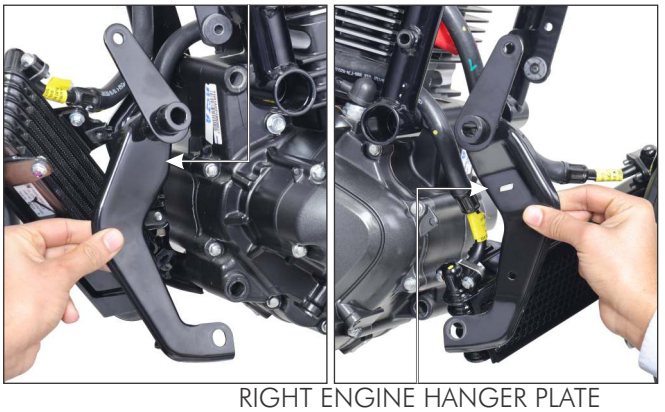
FRONT ENGINE MOUNTING BOLTS



FRONT ENGINE MOUNTING NUTS

Remove the left and right engine hanger plates from the both side.

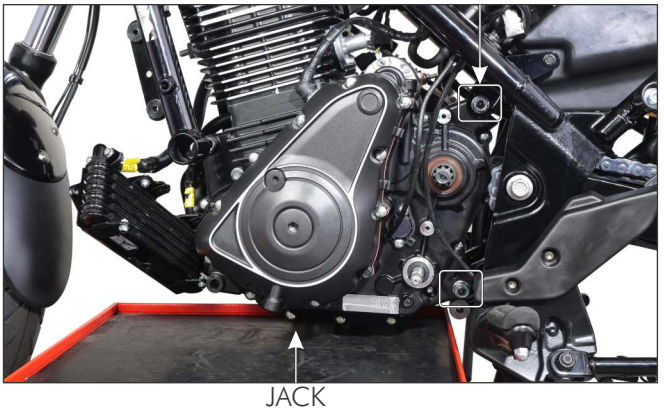
LEFT ENGINE HANGER PLATE



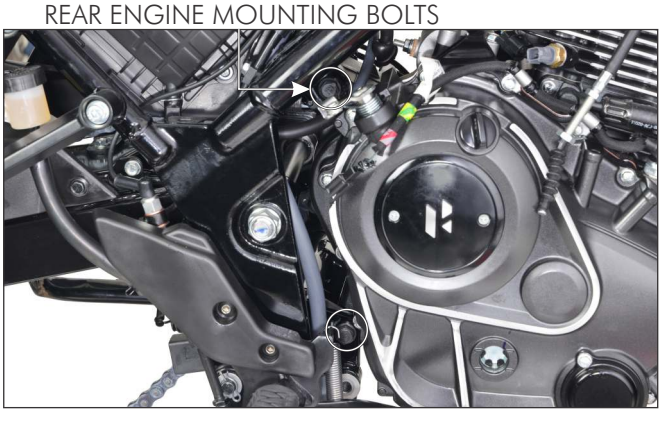
RIGHT ENGINE HANGER PLATE

Place the jack under the engine.

Remove the rear engine mounting nuts (Nos.:2, Size: 17 mm) from the left side.



Remove the rear engine mounting bolts (Nos.:2, Size: 14 mm) from the right side.



NOTE

- A floor jack or other adjustable support is required to support the engine.
- During engine removal, hold the engine securely and be careful not to damage the frame and engine.

ENGINE INSTALLATION

CAUTION

Carefully align the mounting points with the jack to prevent damage to engine, frame, wires and cables.

NOTE

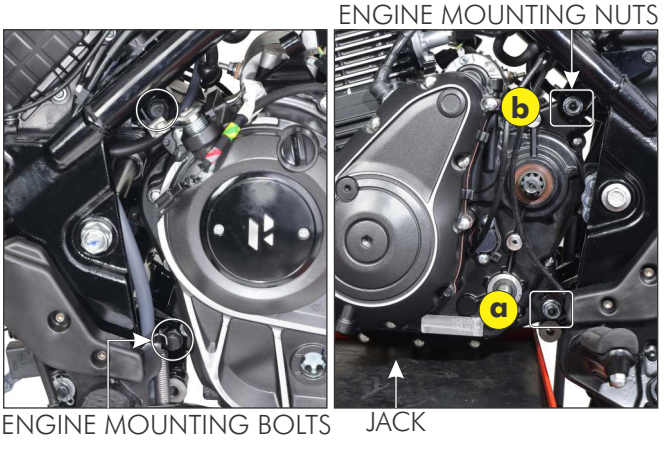
- Install and hand tighten the engine mounting bolts then tighten them to the specified torque.
- During engine installation, hold the engine securely and be careful not to damage the frame and engine.

Place the engine on the frame and carefully align the bolt holes in the frame and engine.

Install the rear engine mounting bolts (Nos.:2, Size: 14 mm).

Remove the jack under the engine.

Tighten the rear engine mounting nuts (Nos.:2, Size: 17 mm) to the specified torque.

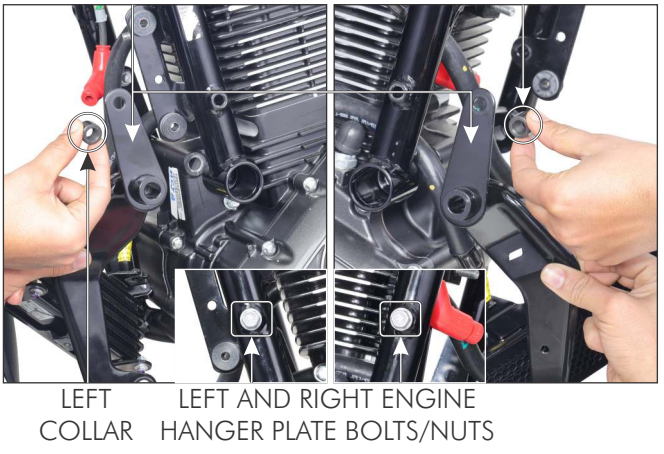


TORQUE

REAR ENGINE MOUNTING

BOLT/NUT: 6.0-6.5 kgf-m

Install the left and right engine hanger plates by installing the bolts (Nos.: 2, Size: 12 mm) with collars (Nos.: 2) and nuts (Nos.: 2, Size: 8 mm) from the both side.

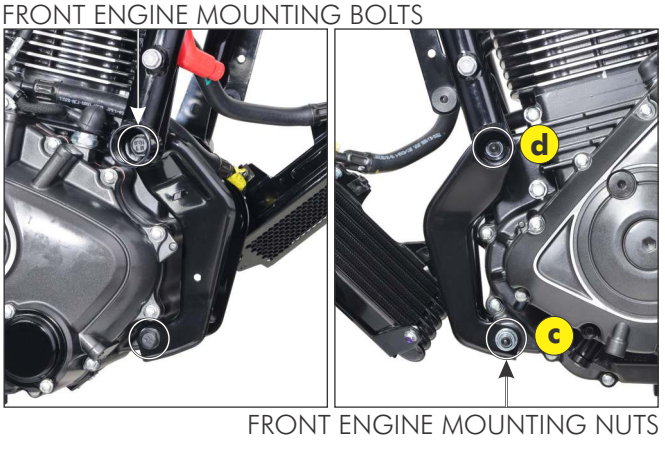


Install the front engine mounting bolts (Nos.: 2, Size: 14 mm) from the right side of the vehicle.

Install and tighten the front engine mounting nuts (Nos.: 2, Size: 17 mm) to the specified torque from the left side of the vehicle.

TORQUE

FRONT ENGINE MOUNTING BOLT/NUT: 6.0-6.5 kgf-m



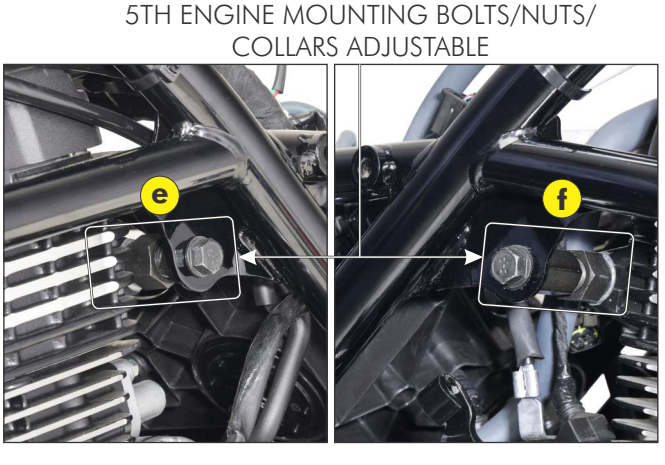
Install the 5th engine mounting bolts/nuts/collars adjustable to the specified torque (page 7-32).

TORQUE

5TH ENGINE MOUNTING BOLT: 5.4-6.0 kgf-m

NOTE

Tighten the engine mounting bolts/nuts in the given sequence from a to f.



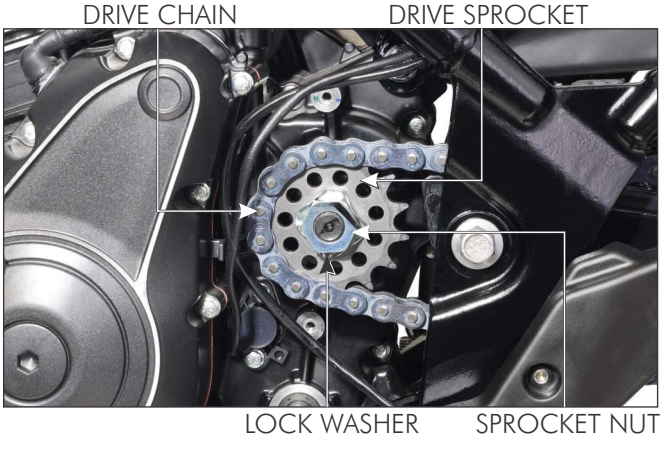
Install the plastic cap from the both sides.

Install the drive sprocket with chain.
Install the lock washer.
Install the drive sprocket nut to the specified torque.

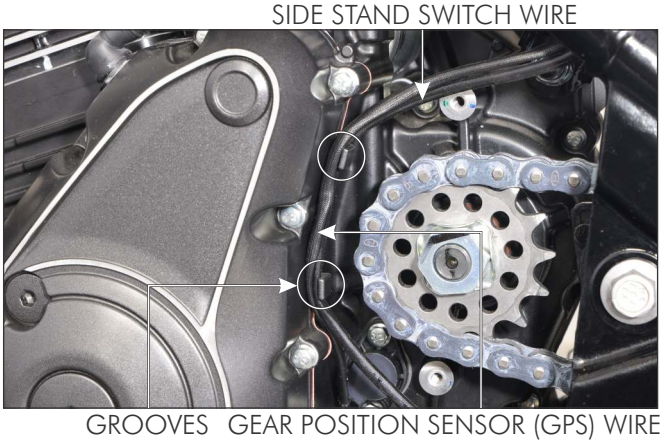
TORQUE

DRIVE SPROCKET NUT: 7.0-8.0 kgf-m

Bend the lock washer as shown.



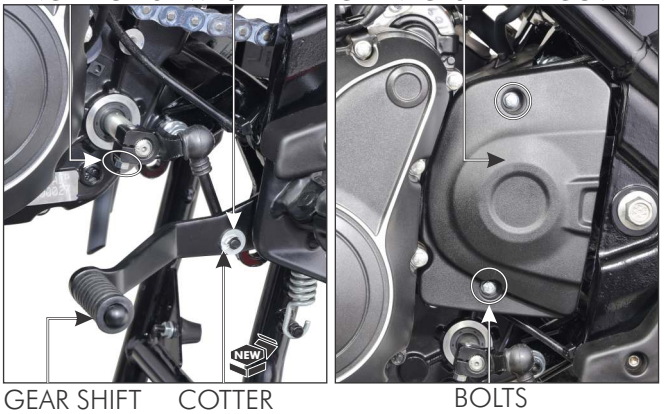
Route the side stand switch and gear position sensor (GPS) wires into the grooves.



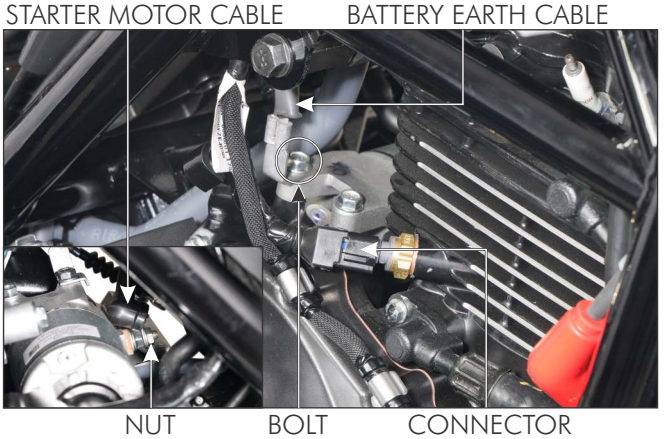
Insert the gear shift pedal rod into the gear shift pedal.
Install the washer and new cotter pin.
Install the gear shift pedal.
Tighten the pinch bolt to the specified torque.

TORQUE
GEAR SHIFT PEDAL PINCH BOLT: 0.8-1.2 kgf-m

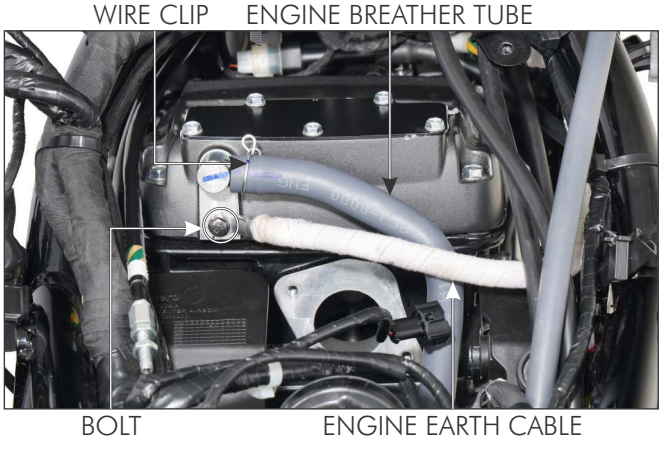
Install the left crankcase rear cover by installing its bolts (Nos.: 2).
Inspect and adjust the drive chain slack (page 3-16).



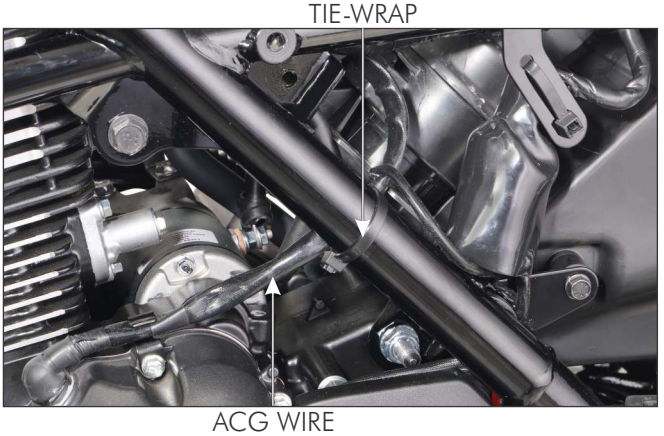
Connect the EOT sensor connector.
Connect the battery earth cable by installing its bolt (page 19-3).
Connect the starter motor cable by installing its nut (page 19-3).



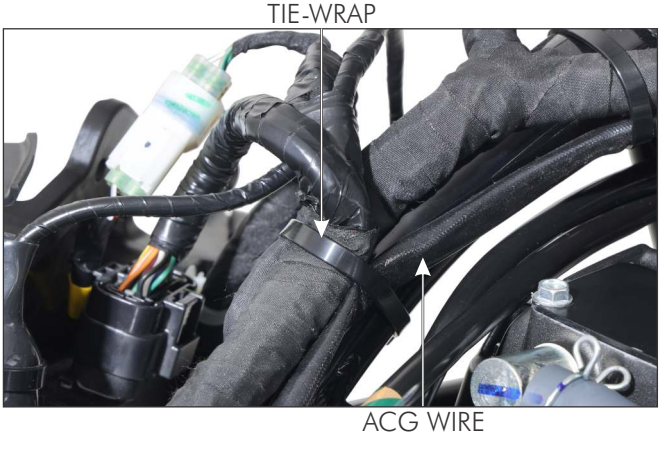
Connect the engine earth cable by installing its bolt to the cylinder head cover.
Connect the crankcase breather tube by wire clip to the cylinder head cover.



Mount the ACG wire through the tie-wrap on the frame.

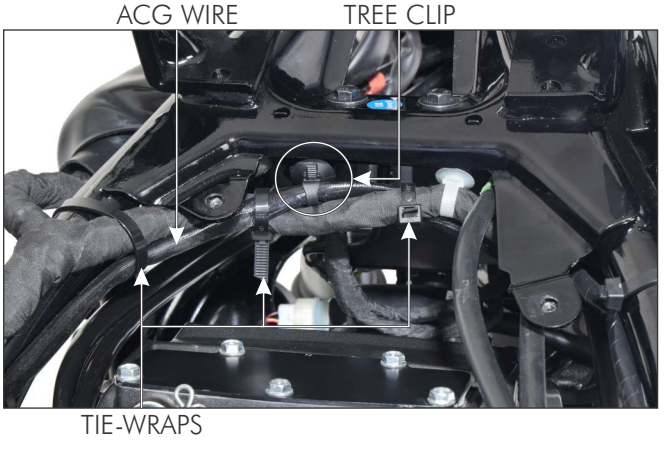


Mount the ACG wire with main wiring harness through the tie-wrap on the frame.

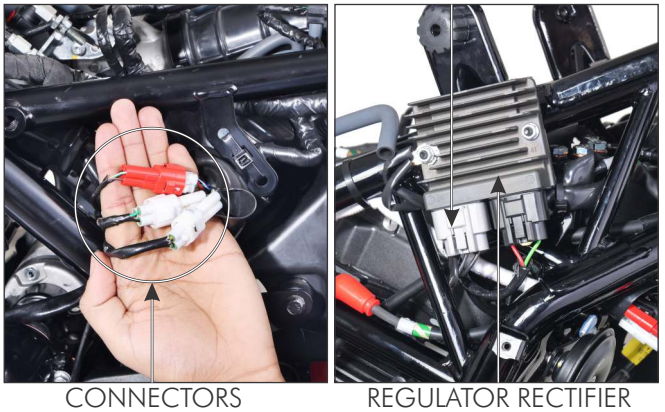


Mount the ACG wire with main wiring harness through the tie-wraps on the frame as shown.

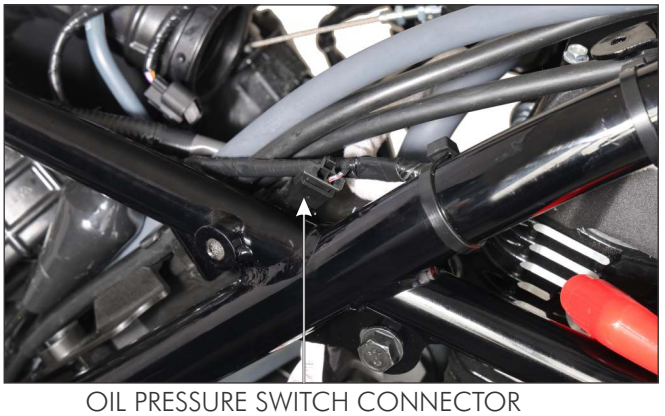
Mount the ACG wire harness from tree clip (No.: 1) mounted on the frame.



Connect the ACG 3P connector to the regulator/rectifier.
Connect the CKP sensor, side stand switch and gear position sensor (GPS) wire connectors.

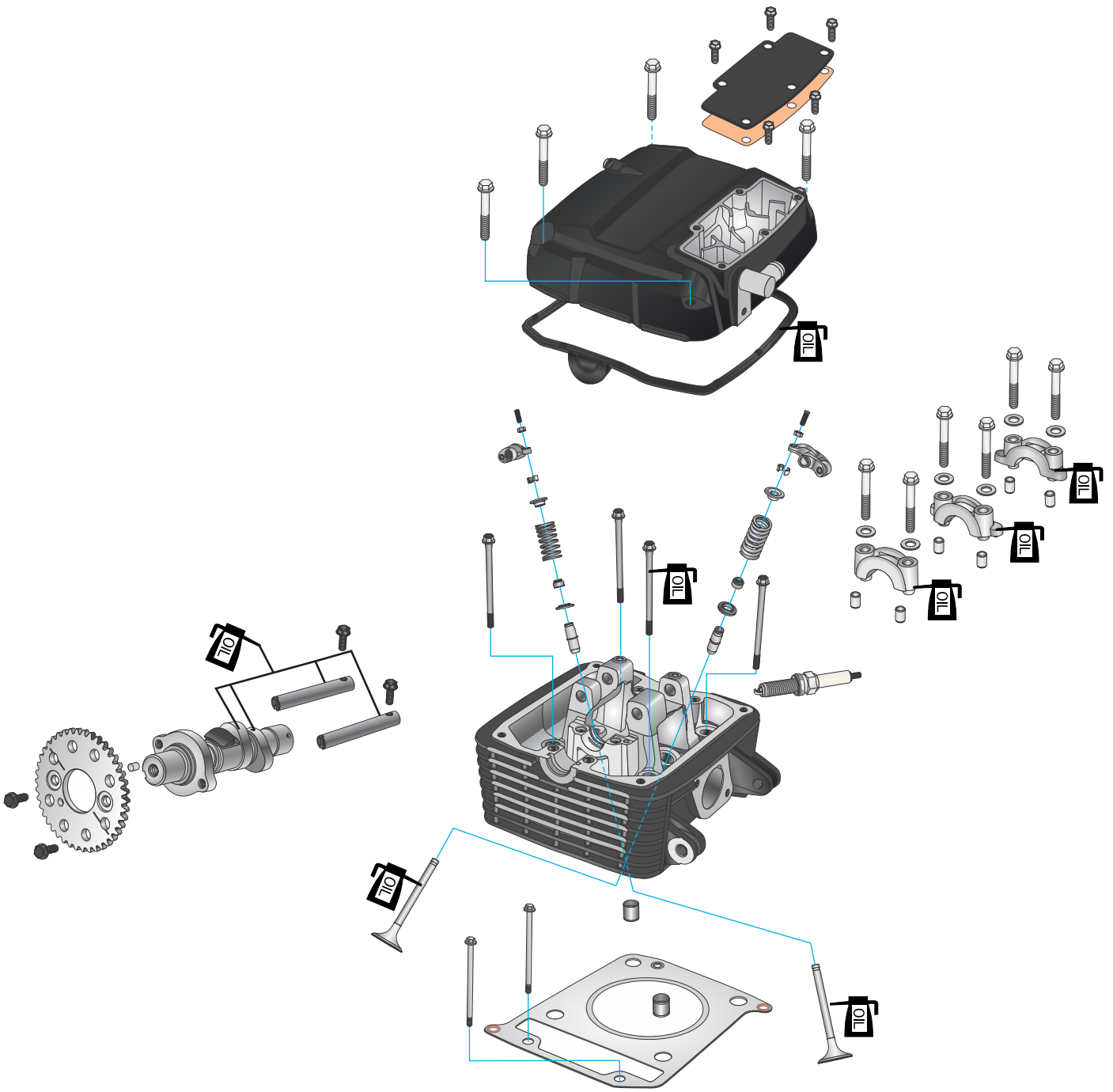


Connect the oil pressure switch connector.



Install the oil cooler mounting bolts to the specified torque (page 4-15).
Install the following:
Pipe inlet (page 5-88).
Throttle body (page 5-82).
Exhaust muffler (page 2-21).
Noise suppressor cap (page 3-9).
Clutch cable (page 9-7).
Electrical part mount bracket (page 7-7).
Fuel tank (page 2-14).
Side covers (page 2-15 & 2-17).
Fill the crankcase with recommended engine oil to the proper level (page 3-13).

SYSTEM DIAGRAM



CYLINDER HEAD/VALVES

SERVICE INFORMATION

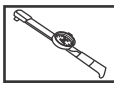
GENERAL

- The cylinder head can be serviced with the engine installed in the fame.
- The camshaft can be serviced with the engine installed on the fame.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with clean solvent and dry them using compressed air before inspection.
- When installing camshaft, apply molybdenum disulfide oil to the cam lobes and journals.
- Camshaft lubricating oil is fed through oil passages in the cylinder head cover and cylinder head. Clean the oil passages before assembling the cylinder head and cylinder head cover.

SPECIFICATIONS

CYLINDER HEAD/VALVES

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression	Without De-comp		12±2 kgf/cm^2	12±2 kgf/cm^2
	With De-comp			6±2 kgf/cm^2
Valve clearance (in cold condition)		Intake	0.10 ± 0.02 mm	-
		Exhaust	0.22 ± 0.02 mm	-
Camshaft cam lobe height		Intake	35.396-35.576	35.366 mm
		Exhaust	35.401-34.17	35.371 mm
Cylinder head warpage			-	0.1 mm
Rocker arm	I.D		10.000-10.015 mm	10.025 mm
	Shaft O.D		9.972-9.987 mm	9.962 mm
Valve	Stem O.D	Intake	6.95-6.965 mm	6.93 mm
		Exhaust	6.93-6.945 mm	6.91 mm
	Guide I.D	Intake	7-7.015 mm	7.035 mm
		Exhaust	7-7.016 mm	7.035 mm
	Stem-to-guide clearance	Intake	0.035-0.065 mm	0.085 mm
		Exhaust	0.055-0.085 mm	0.115 mm
	Spring free length	Inner	39.5 mm	38.5 mm
Valve seat width			1.3±0.1mm	1.6 mm
Specified height of inlet valve guide			19.9±0.1 mm	-
Specified height of exhaust valve guide			19.9±0.1 mm	-

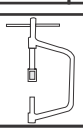
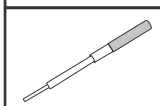


TORQUE VALUES

CYLINDER HEAD COVER BOLT	**: 0.8-1.2 kgf-m**
CAM SPROCKET BOLT	**: 0.8-1.2 kgf-m**
TENSIONER LIFTER BOLT	**: 0.8-1.2 kgf-m**
CYLINDER HEAD SPECIAL BOLT	**: 5.4 kgf-m**
CYLINDER HEAD SIDE BOLT	**: 0.8-1.2 kgf-m**
ENGINE MOUNTING BOLT	**: 5.4-6.0 kgf-m**
OIL COOLER MOUNTING BOLT	**: 1.0-1.4 kgf-m**
ROCKER ARM SHAFT BOLT	**: 0.6-0.8 kgf-m**

For other nuts, bolts, fasteners etc. refer to standard torque values (**SECTION-1**).

SPECIAL TOOLS

	**VALVE SPRING COMPRESSOR** **PART NO: 070 HH 198 005**
	**VALVE SPRING COMPRESSOR ADAPTOR-28** **PART NO: HMCL0623RAAA04**
	**VALVE GUIDE REMOVER** **PART NO: HMCL0623RAAA05**

TROUBLESHOOTING

- Engine top- end problems usually affect engine performance. These can be diagnosed by a compression test or leak down test or by tracing noises at the top- end with a sounding rod or stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather tube. If the tube is smoky check for a seized piston ring.

Compression too low, hard starting or poor performance at low speed

- Valves
  - Incorrect valve clearance
  - Burned or bent valve
  - Incorrect valve timing
  - Broken valve spring
  - Uneven valve seating
- Cylinder head
  - Leaking or damaged cylinder head gasket
  - Warped or cracked cylinder head
  - Loose spark plug
- Faulty cylinder or piston (**SECTION-8**)

Compression too high

- Excessive carbon built- up on piston or combustion chamber

Rough idle

- Low cylinder compression

Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Faulty cylinder or piston (**SECTION-8**)

Excessive noise

- Incorrect valve clearance
- Sticking valve or broken valve spring
- Worn or damaged camshaft
- Worn or damaged rocker arm and/or shaft
- Worn or damaged cam sprocket teeth
- Loose or worn cam chain
- Worn or damaged cam chain tensioner
- Loose spark plug
- Faulty cylinder or piston (**SECTION-8**)
- Faulty connecting rod, crankshaft or transmission (**SECTION-11**)

CYLINDER COMPRESSION

⚠ WARNING

- If the engine must be running to do some work, make sure that the area is well-ventilated. Never run the engine in an enclosed area.
- The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death.

Warm up the engine to normal operating temperature.

Ten minutes of stop-and-go riding is sufficient.

Stop the engine, disconnect the noise suppressor cap.

Remove the spark plug.

Install the compression gauge in the spark plug hole.

Shift the transmission in neutral.

Open the throttle all the way and crank the engine with the integrated start-kill switch until the gauge reading stops rising.

Repeat the same procedure 5-6 times.

Take average of three readings.

COMPRESSION PRESSURE:

12±2 kgf/cm² (without decomp)

6±2 kgf/cm²(with decomp)

If compression is high, it indicates that carbon deposits have accumulated on the combustion chamber and/or the piston crown. Usage of improper head gasket of less thickness or cylinder head facing also leads to high compression.

If compression is low, pour 3-5 ml of clean engine oil into the cylinder through the spark plug hole and recheck the compression.

If the compression increases from the previous value, check the cylinder, piston and piston rings.

- Leaking cylinder head gasket/warped cylinder head
- Worn piston ring
- Worn cylinder and piston

If the compression is the same as the previous value, check the valves for leakage. Other reasons may be:

- Improper valve adjustment
- Air filter blockage
- Damage spark plug seat
- Pressure leakage at valve seats
- In correct valve timing/valve stem sticky movement
- Faulty spring of spring
- Non functional compression assemble.
- Wear out flange of compression.
- Rocker arm wear out (compression pad).

NOISE SUPPRESSOR CAP

SPARK PLUG

COMPRESSION GAUGE

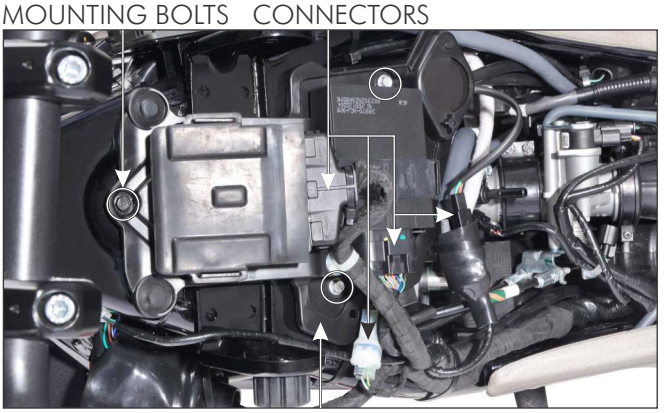
CYLINDER HEAD COVER REMOVAL

Remove the fuel tank (page 2-12).

Disconnect the ECU, BCM, buzzer and bank angle sensor connectors.

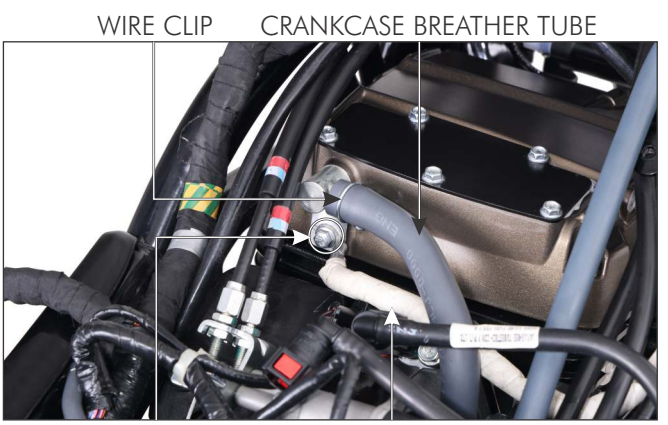
Remove the electrical part mount bracket mounting bolts (Nos.: 3, Size: 8 mm).

Remove the electrical part mount bracket with ECU, BCM, buzzer and bank angle sensor from the vehicle.

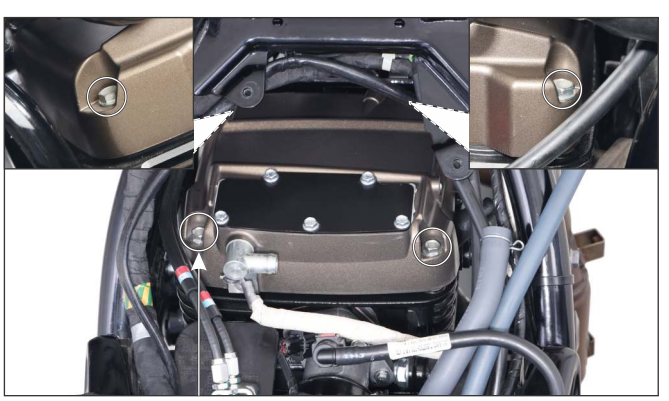


ELECTRICAL PART MOUNT BRACKET

Disconnect the crankcase breather tube by removing its wire clip from the cylinder head cover.



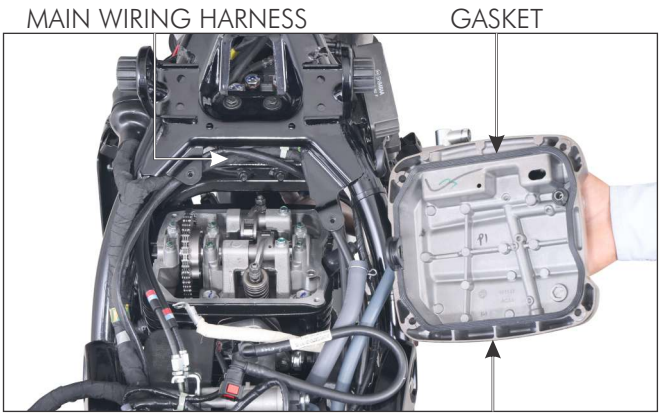
Remove the cylinder head cover mounting bolts (Nos.: 4, Size 10 mm).


MOUNTING BOLTS

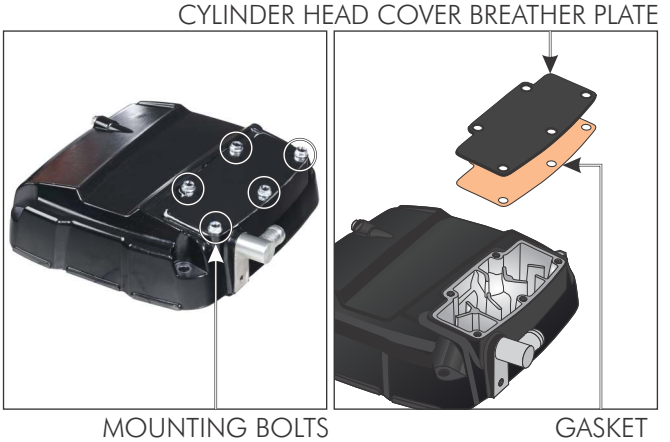
Remove the cylinder head cover and cover gasket.

NOTE

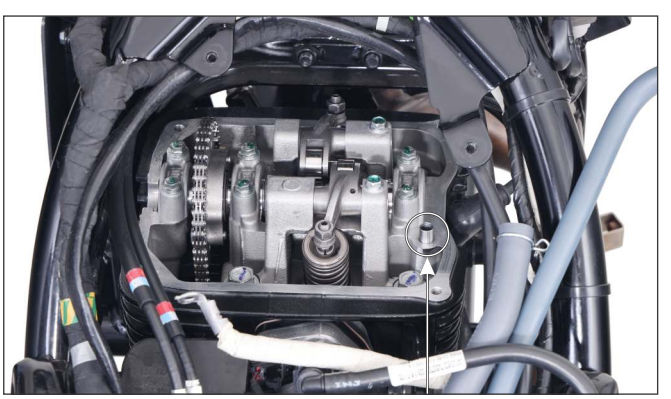
While removing the cylinder head cover side the main wiring harness and carefully pull the cylinder head cover.



Remove the cylinder head cover breather plate by removing its mounting bolts (Nos.: 5, Size: 8 mm) and its gasket.

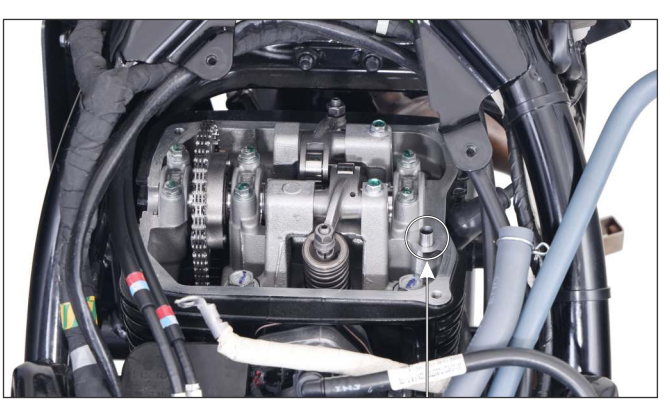


Remove the dowel pin (No.: 1) from cylinder head .



INSTALLATION

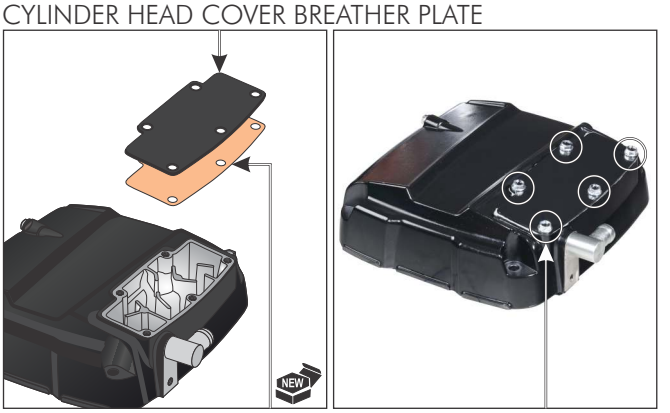
Install the dowel pin (No.: 1) from cylinder head .



Install the breather plate with new gasket.

Install and tighten the cylinder head cover breather plate mounting bolts (Nos.: 5, Size: 8 mm).

CYLINDER HEAD COVER BREATHER PLATE



GASKET MOUNTING BOLTS

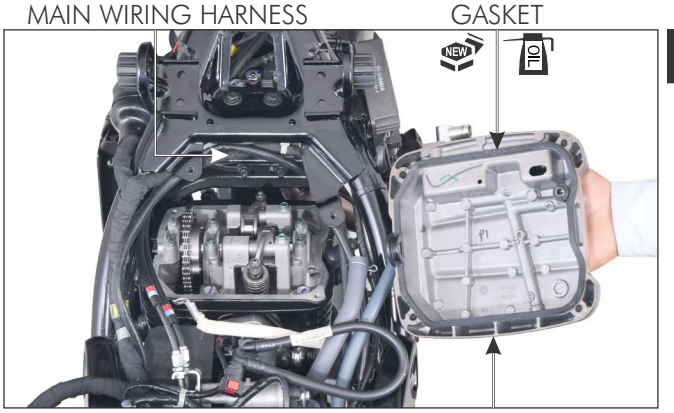
Install a new cylinder head cover gasket into the cylinder head cover groove.

Install the cylinder head cover onto the cylinder head.

NOTE

While installing the cylinder head cover side the main wiring harness and carefully install the cylinder head cover.

MAIN WIRING HARNESS GASKET



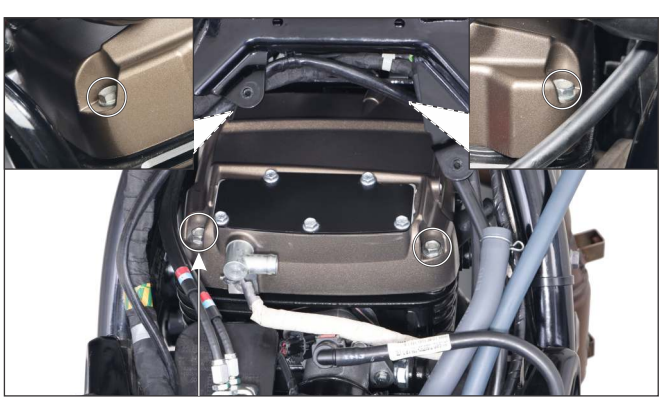
CYLINDER HEAD COVER

Install the cylinder head cover mounting bolts (Nos.: 4, Size 10 mm).

Tighten the cylinder head cover mounting bolts to the specified torque.

TORQUE

CYLINDER HEAD COVER BOLT: 0.8-1.2 kgf-m

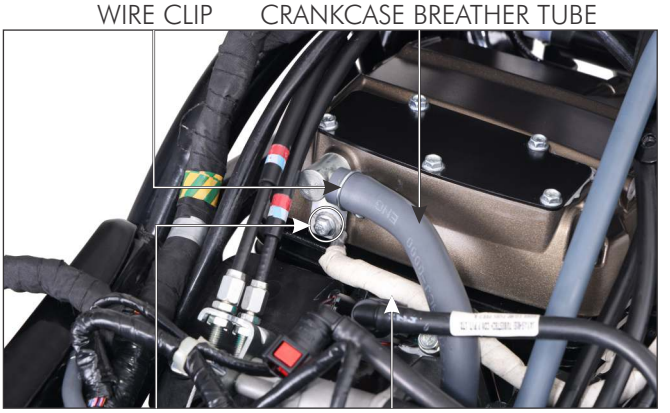


MOUNTING BOLTS

WIRE CLIP CRANKCASE BREATHER TUBE

Connect the engine earth cable by installing its bolt to the cylinder head cover.

Connect the crankcase breather tube by wire clip to the cylinder head cover.



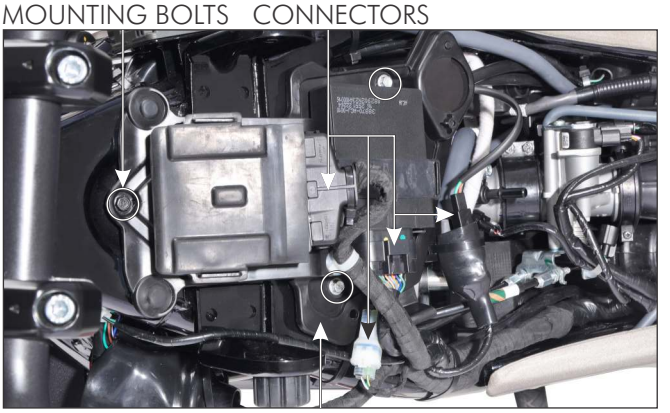
BOLT ENGINE EARTH CABLE

Install the electrical part mount bracket with ECU, BCM, buzzer and bank angle sensor onto the vehicle.

Install the electrical part mount bracket mounting bolts (Nos.: 3, Size: 8 mm).

Connect the ECU, BCM, buzzer and bank angle sensor connectors properly.

Install the fuel tank (page 2-14).



ELECTRICAL PART MOUNT BRACKET

CYLINDER HEAD

REMOVAL

Remove the cylinder head cover (page 7-4).

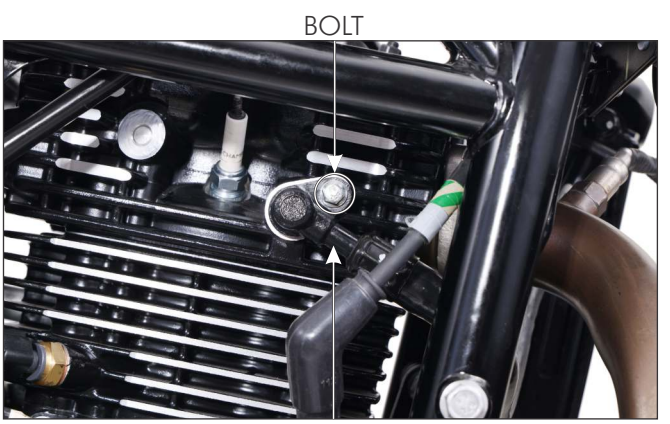
Remove the noise suppressor cap (page 3-7).

Remove the exhaust pipe (page 2-16).

Remove the throttle body (page 5-79).

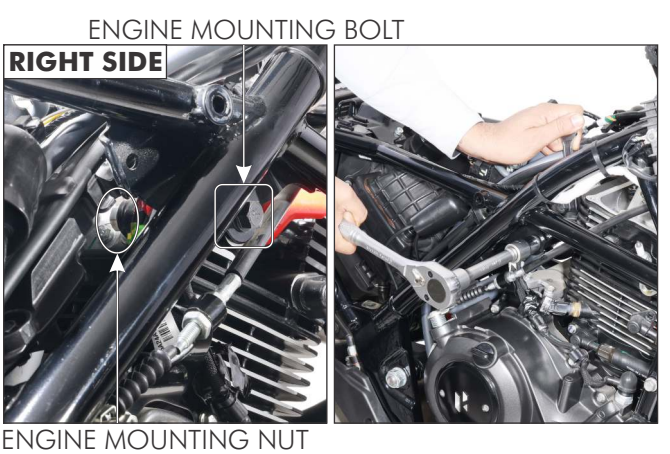
Remove the pipe inlet mounting bolts and O-rings (page 5-88).

Remove the oil cooler outlet hose by removing its bolt from the cylinder head.



OIL COOLER OUTLET HOSE

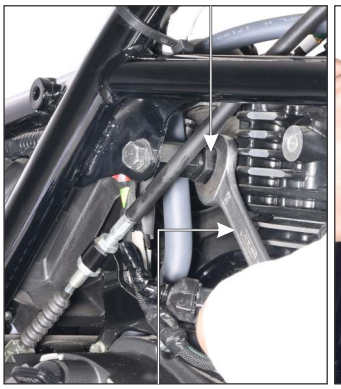
Hold the right side engine mounting nut from engine side and loosen the engine mounting bolt.



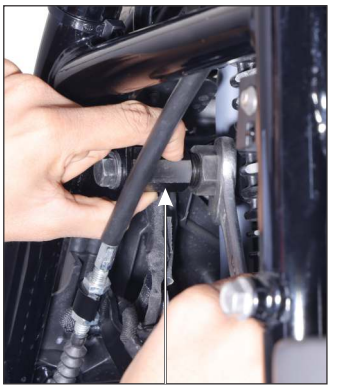
ENGINE MOUNTING NUT

Hold the rear side collar with a spanner and rotate the adjuster collar (near frame side) by hand in the clockwise direction to loosen it.

REAR SIDE COLLAR



SPANNER



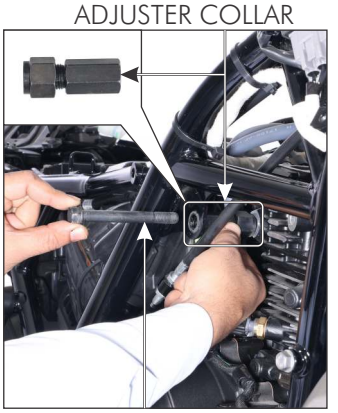
ADJUSTER COLLAR

Remove the right side engine mounting nut.

Remove the right side engine mounting bolt (Nos.: 1, Size: 20 mm) and rear side collar with adjuster collar.

REAR SIDE COLLAR WITH ADJUSTER COLLAR

ENGINE MOUNTING NUT

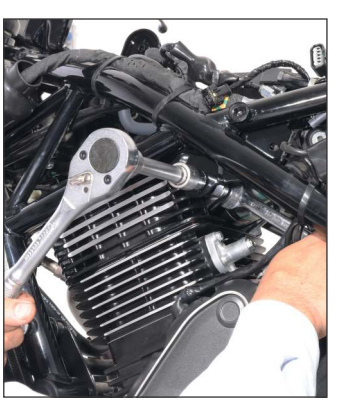


ENGINE MOUNTING BOLT

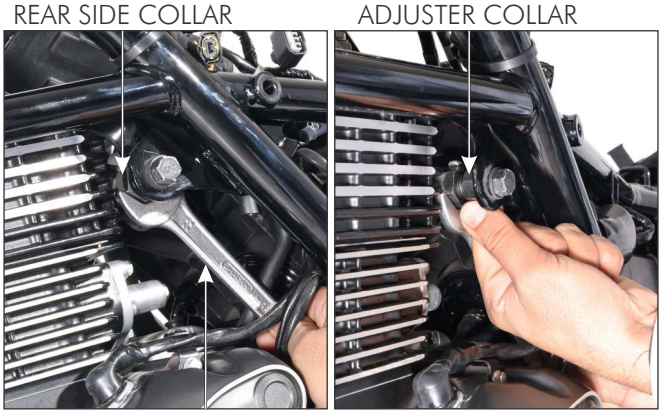
Hold the left side engine mounting nut from engine side and loosen the engine mounting bolt.

ENGINE MOUNTING BOLT

ENGINE MOUNTING NUT

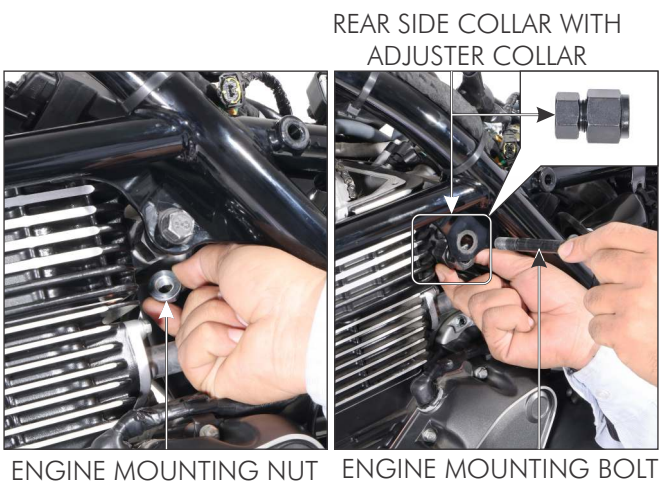


Hold the rear side collar with a spanner and rotate the adjuster collar (near frame side) by hand in the clockwise direction to loosen it.



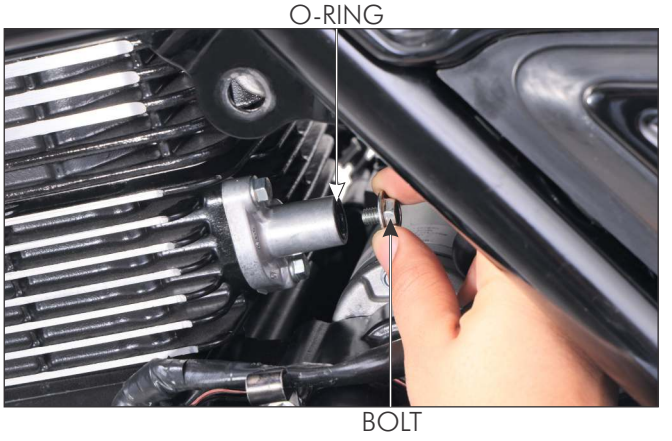
Remove the left side engine mounting nut.

Remove the left side engine mounting bolt (Nos.: 1, Size: 20 mm) and rear side collar with adjuster collar.

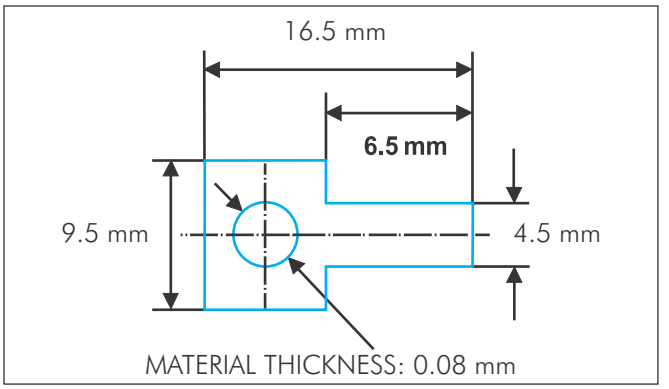


Loosen the spark plug (page 3-7).

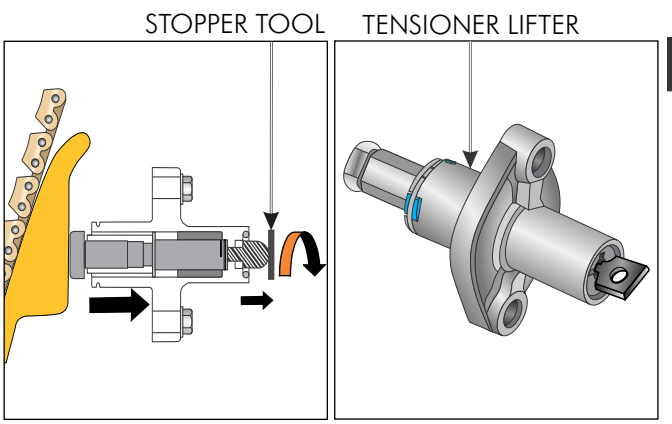
Remove the tensioner lifter bolt (Nos.: 10 mm) and O-ring.



Make a tensioner shaft stopper tool out of a thin piece of steel (0.8 mm thickness) using the diagram.



Turn the tensioner shaft clockwise with the stopper tool to retract the tensioner, then insert the stopper fully to hold the tensioner in the fully retracted position.

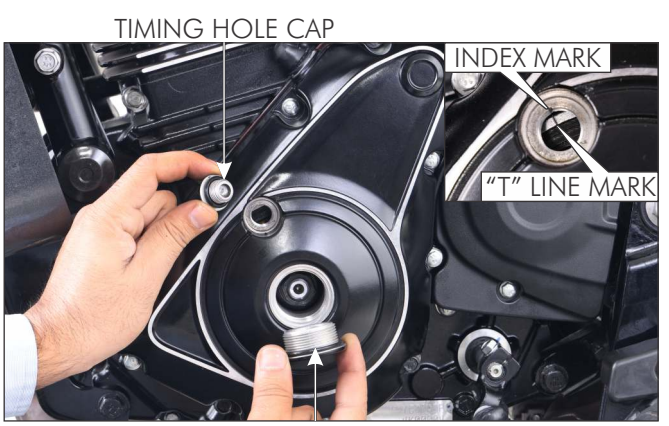


Remove the crankshaft hole cap and timing hole cap.

Rotate the crankshaft counterclockwise and align the"T" line mark on the flywheel with the index mark on the left crankcase cover.

Make sure that the piston is at TDC (Top Dead Centre) on the compression stroke. (Both inlet and exhaust rocker arms should be free in this condition.)

If the rocker arms are not free, it is because the piston is moving through the exhaust stroke to TDC. Rotate the crankshaft one full turn and the match the "T" line mark again.

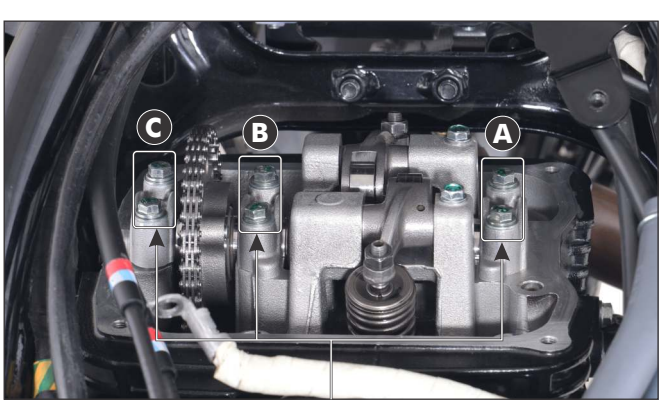


CRANKSHAFT HOLE CAP

Remove the camshaft cap-A, B & C each mounting bolts (Nos.: 2, Size: 8 mm) and washers.

NOTE

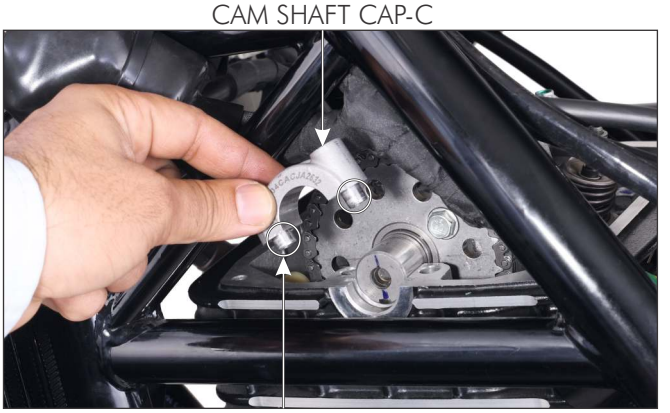
Make sure to remove camshaft cap-A, B & C mounting bolts with washers, there is a very high chance of it falling in engine.



MOUNTING BOLTS/WASHERS

Remove the cam shaft cap-C with dowel pins.

CAM SHAFT CAP-C



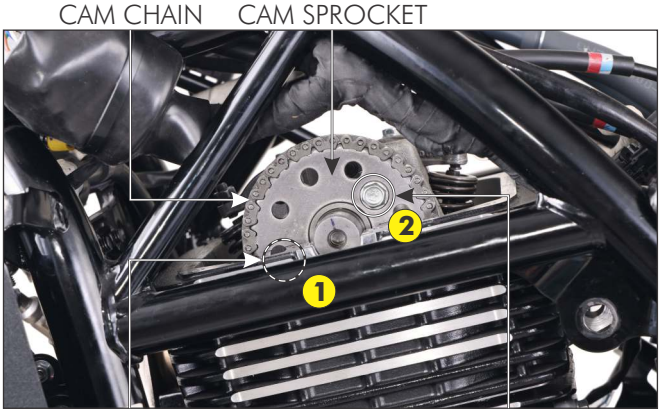
DOWEL PINS

Remove the cam sprocket bolt 1st (Nos.: 1, Size: 10 mm) then realign the TDC.

Remove the cam sprocket bolt 2nd (Nos.: 1, Size: 10 mm).

Derail the cam chain from the cam sprocket.

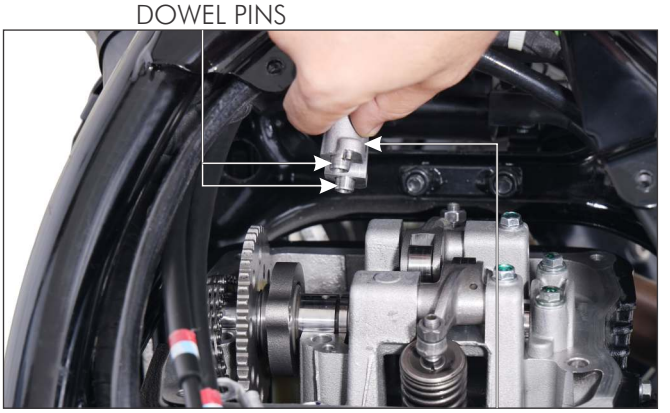
CAM CHAIN CAM SPROCKET



CAM SPROCKET BOLT (1st) CAM SPROCKET BOLT (2nd)

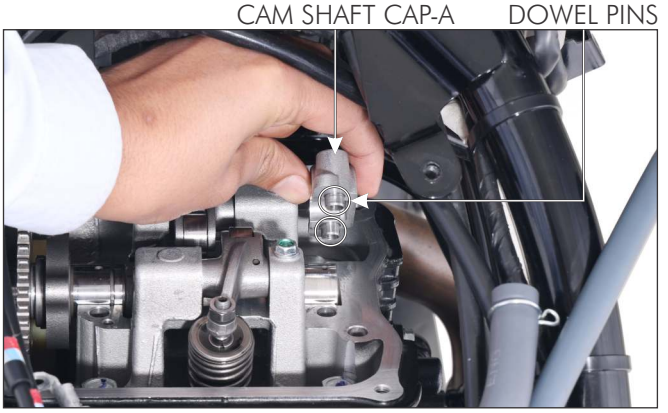
Remove the cam shaft cap-B with dowel pins.

DOWEL PINS



CAM SHAFT CAP-B

Remove the cam shaft cap-A with dowel pins.



Remove the intake rocker arm shaft bolt (No.: 1 , Size: 8 mm).

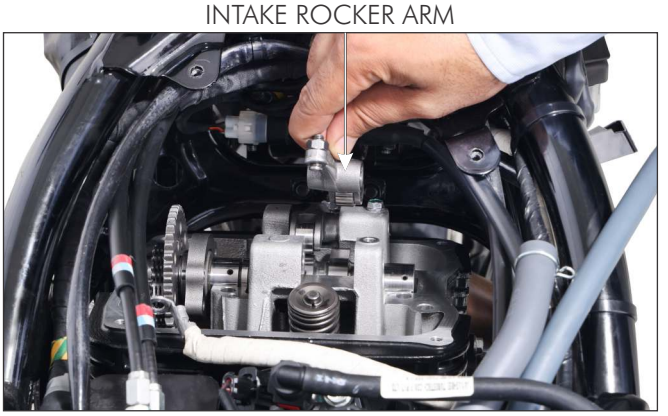
NOTE

Mark all parts during disassembly so that they can be placed back in their original locations during installation.

CAUTION

Take extra care while removing the rocker arm to avoid bend or damage.

Remove the intake rocker arm.



Remove the exhaust rocker arm shaft bolt (No.: 1, Size: 8 mm).

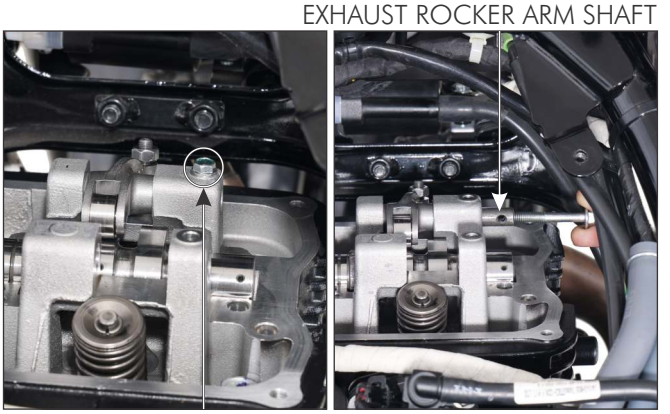
NOTE

Mark all parts during disassembly so that they can be placed back in their original locations during installation.

CAUTION

Take extra care while removing the rocker arm to avoid bend or damage.

EXHAUST ROCKER ARM SHAFT



EXHAUST ROCKER ARM SHAFT BOLT

Remove the exhaust rocker arm.

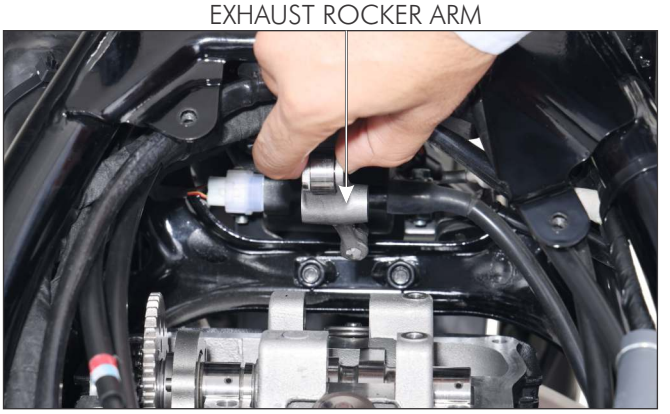
NOTE

Mark all parts during disassembly so that they can be placed back in their original locations during installation.

CAUTION

Take extra care while removing the rocker arm to avoid bend or damage.

EXHAUST ROCKER ARM

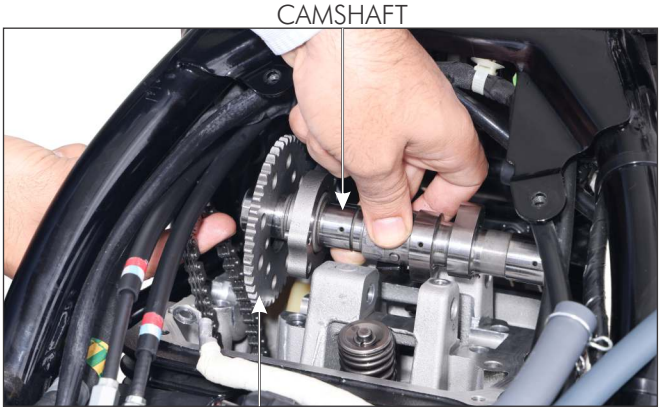


Remove the camshaft with cam sprocket from the cylinder head.

NOTE

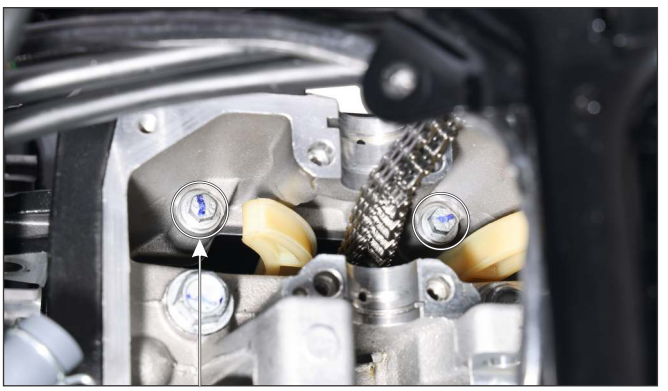
Attach a piece of wire to the cam chain to prevent it from falling into the crankcase

CAMSHAFT



CAM SPROCKET

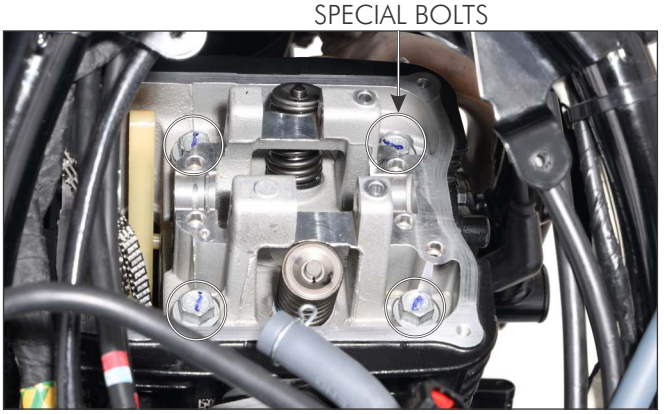
Remove the cylinder head side bolts (Nos.: 2).



SIDE BOLTS

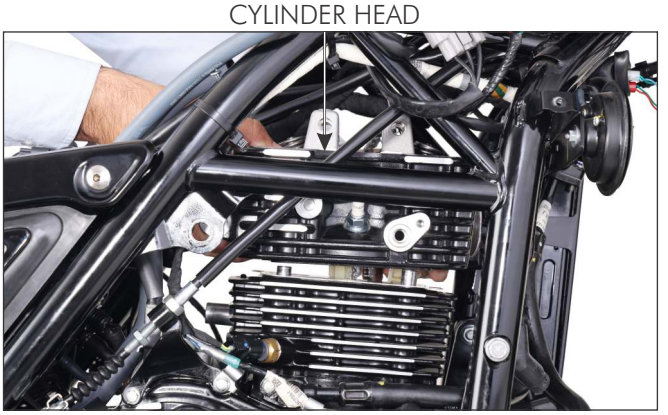
Remove the special bolts (Nos.: 4) from the cylinder head.

SPECIAL BOLTS

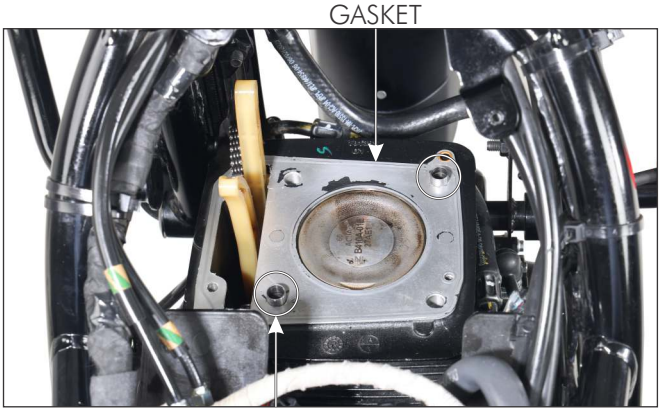


Remove the cylinder head from the up side.

CYLINDER HEAD



Remove the gasket and dowel pins.



CYLINDER HEAD

DISASSEMBLY

Remove the spark plug.

Compress the valve spring with the valve spring compressor and remove the valve cotters.

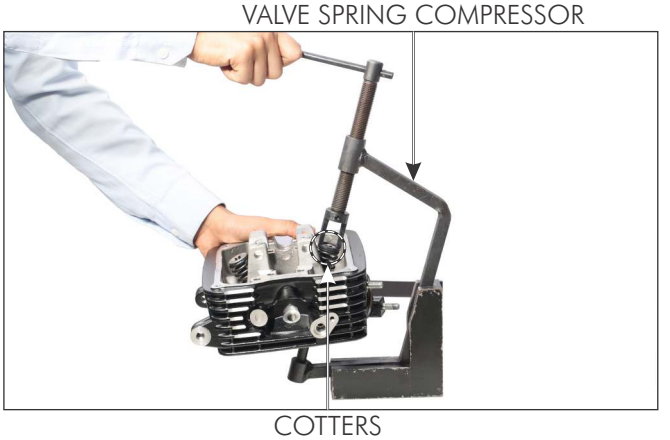
TOOL

VALVE SPRING COMPRESSOR
PART NO: 070 HH 198 005

VALVE SPRING COMPRESSOR ADAPTOR-28
PART NO: HMCL0623RAAA04

CAUTION

To prevent loss of tension do not compress the valve spring more than necessary to remove the cotters.

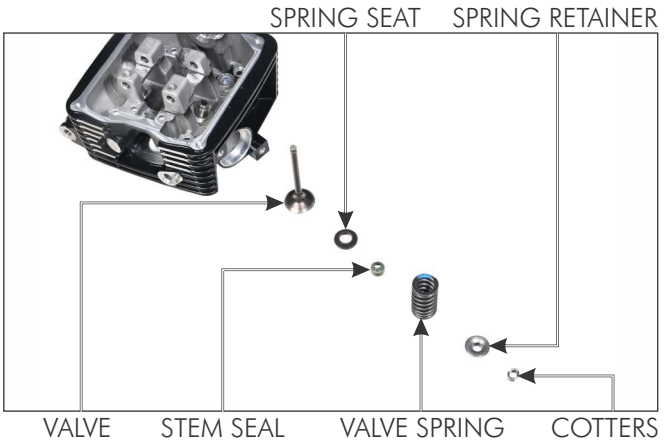


Loosen the valve spring compressor and remove the following:

- Cotters
- Spring retainer
- Valve springs
- Inlet/exhaust valve
- Stem seals
- Spring seats

NOTE

Mark all parts during disassembly so that they can be placed back in their original location during installation.

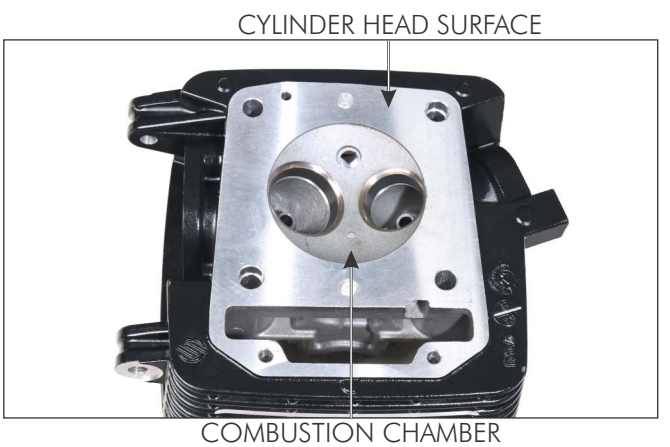


Remove the carbon deposits from the combustion chamber.

Clean off any gasket materials from the cylinder head surface.

NOTE

Avoid damaging the cylinder head surface.



INSPECTION

Replace the camshaft assembly if the outer race does not turn smoothly and quietly, or if it is loose on the camshaft. check cam lobe height.

CAM LOBE

Measure the height of each cam lobe.

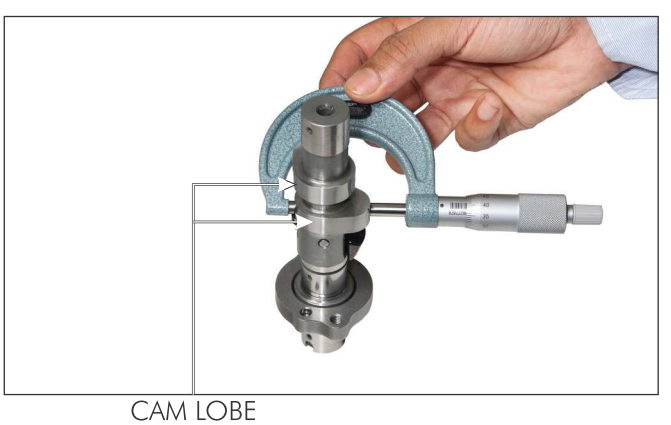
SERVICE LIMIT

INTAKE: 35.366 mm

EXHAUST: 35.371 mm

Inspect the cam lobe for damage or excessively worn.

Inspect the oil passages and rocker arms for wear or damage.



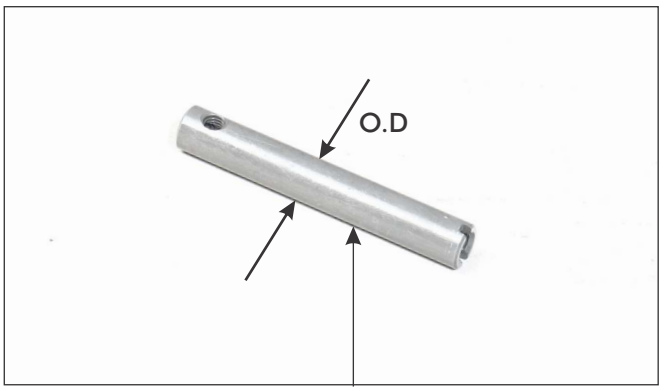
ROCKER ARM SHAFT

Measure the rocker arm shaft O.D.

SERVICE LIMIT

ROCKER ARM SHAFT O.D: 9.962 mm

Inspect the rocker arm shaft for wear or damage.



ROCKER ARM

Turn the rocker arm roller with your finger.
The roller should turn smoothly and quietly.

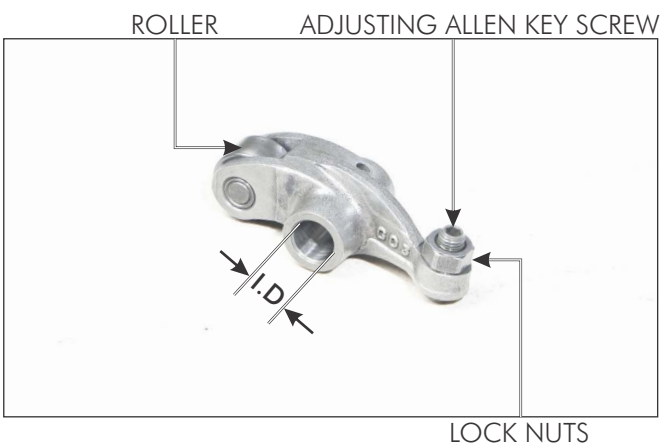
NOTE

If either of the rocker arm rollers require service or replacement, inspect the cam lobes for scoring, chipping or flat spot.

Measure the rocker arm I.D.

SERVICE LIMIT

ROCKER ARM I.D: 10.025 mm

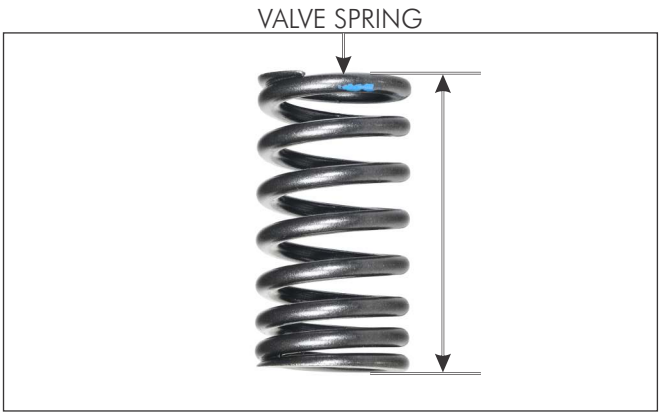


VALVE SPRING

Measure the valve springs free length.

SERVICE LIMIT

FREE LENGTH (INNER): 38.5 mm



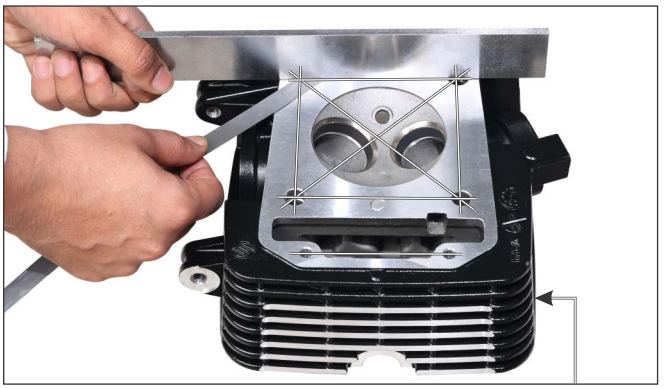
CYLINDER HEAD

Check the spark plug hole and valve area for cracks.

Check the cylinder head for warpage with a straight edge and a feeler gauge.

SERVICE LIMIT

WARPAGE: 0.1 mm



CYLINDER HEAD

VALVE

Inspect the valve for trueness, burning, scoring or abnormal stem wear.

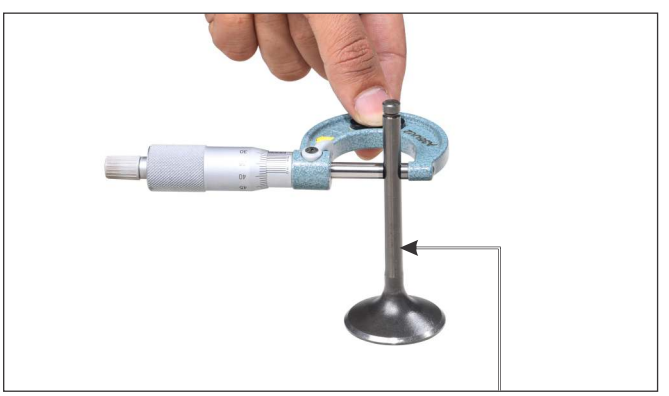
Measure the valve stem O.D.

SERVICE LIMIT

INTAKE: 6.93 mm

EXHAUST: 6.91 mm

Insert each valve into the valve guide and check the valve movement in the guide.



VALVE

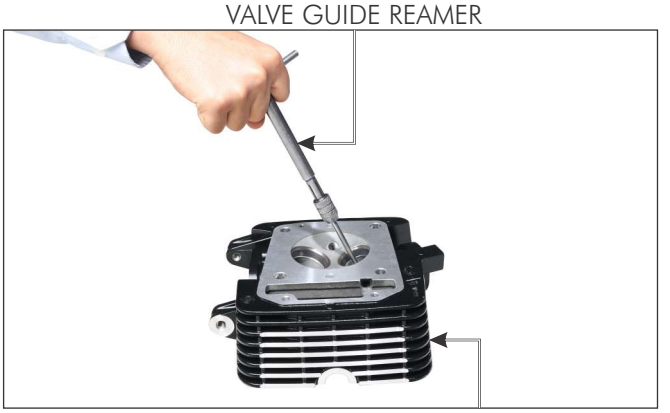
VALVE GUIDE

Ream the valve guide to remove the carbon buildup before checking the valve guide.

TOOL

VALVE GUIDE REAMER

VALVE GUIDE REAMER



CYLINDER HEAD

NOTE

- Always insert the reamer from the combustion chamber side.
- Use cutting oil on reamer during this operation.
- Always rotate the reamer clockwise, never rotate counter-clockwise even while inserting or removing the reamer.
- Take care not to tilt or lean the reamer in the guide while reaming.
- If reaming is irregular, oil will leak past the valve stem seal. it could cause improper seat contact that cannot be corrected by refacing

Measure and record each valve guide I.D with a ball gauge.

SERVICE LIMIT

INTAKE/EXHAUST: 7.035 mm

Calculate the stem-to-guide clearance.

SERVICE LIMIT

INTAKE: 0.085 mm

EXHAUST: 0.115 mm

If the stem-to-guide clearance is out of the service limit, determine if a new guide with standard dimensions would bring the clearance within tolerance. If so replace the guides as necessary and ream to fit.

If the stem-to-guide clearance still exceeds the service limit with new guides, replace the valve.

NOTE

Inspect and reface the valve seat whenever new valve guides are installed.

VALVE GUIDE

VALVE GUIDE

REPLACEMENT

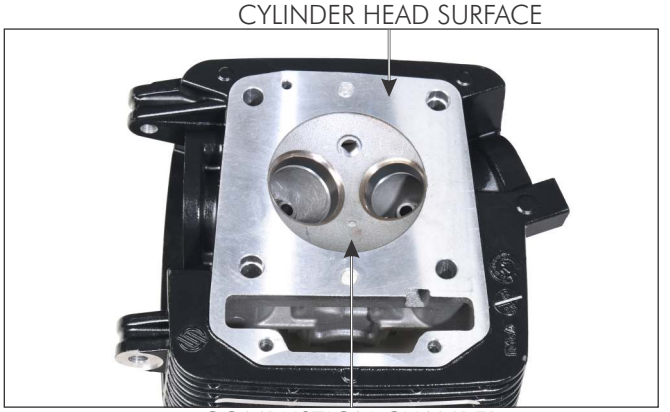
Chill the replacement valve guides in the freezer section of a refrigerator for about an hour.

Heat the cylinder head to 130°C-140°C (275°F-290°F) with a hot plate or oven. Do not heat the cylinder head beyond 150°C (300°F). Use temperature indicator sticks available at welding supply stores, to be sure the cylinder head is heated to the proper temperature.

CAUTION

- Using a torch to heat the cylinder head may cause warpage.
- Be careful not to damage the mating surface.

CYLINDER HEAD SURFACE


COMBUSTION CHAMBER

Support the cylinder head and drive the valve guides out of the cylinder head from the combustion chamber side.

TOOL

VALVE GUIDE REMOVER
PART NO: HMCL0623RAAA05

VALVE GUIDE REMOVER

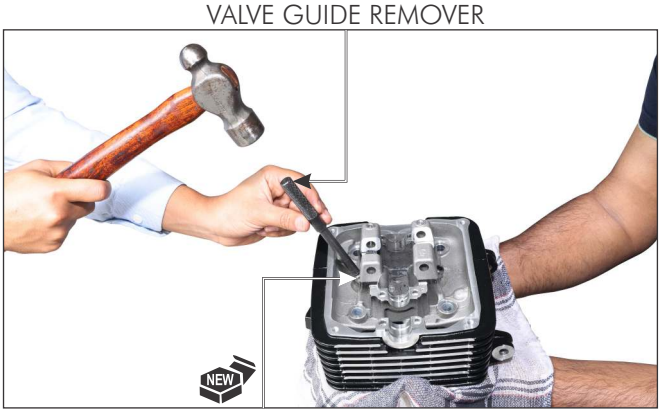
Take out the new valve guides from the freezer.

Install and drive in the new valve guides from the camshaft side of the cylinder head while cylinder head is still heated.

TOOL

VALVE GUIDE REMOVER
PART NO: HMCL0623RAAA05

VALVE GUIDE REMOVER

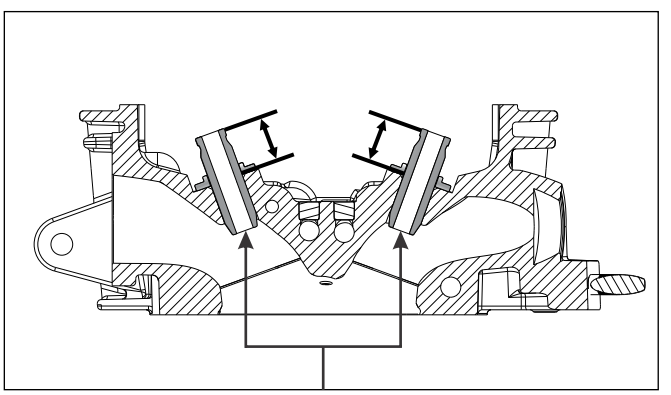


VALVE GUIDE

After installing the valve guides, measure the valve guides height from the cylinder head.

SPECIFIED HEIGHT:
Inlet valve guide :19.9±0.1 mm
Exhaust valve guide:19.9±0.1 mm

Let the cylinder head cool to room temperature.



VALVE GUIDES

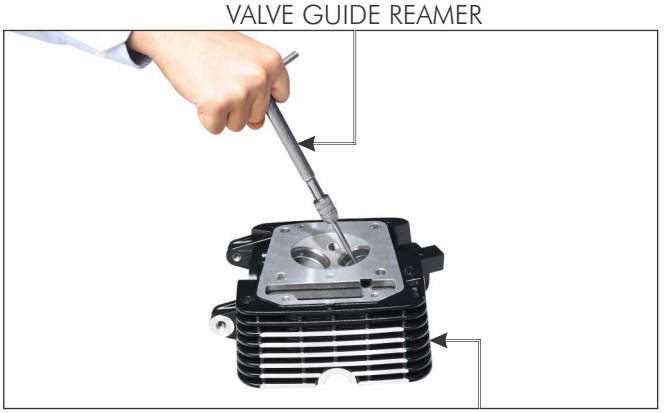
Ream the new valve guides.

TOOL

VALVE GUIDE REAMER

- Take care not to tilt or lean the reamer in the guide while reaming. Otherwise, the valve is reamed slanted, that causes oil leaks from the stem seal and improper valve set contact and result in the valve seat refacing not able to be performed.
- Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise, while inserting or pulling out the reamer from the guide.
- Use cutting oil on the reamer during this operation.
- Clean the cylinder thoroughly to remove any metal particles after reaming and reface the valve seat.

VALVE GUIDE REAMER

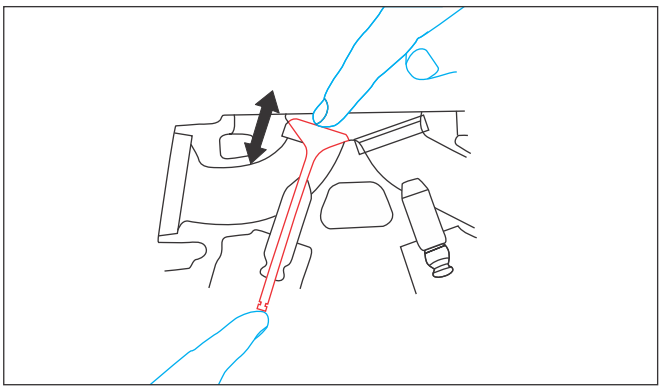


CYLINDER HEAD

VALVE SEAT INSPECTION

Clean the intake and exhaust valves thoroughly to remove the carbon deposits.

Apply light coating of Prussian Blue to the valve seats.

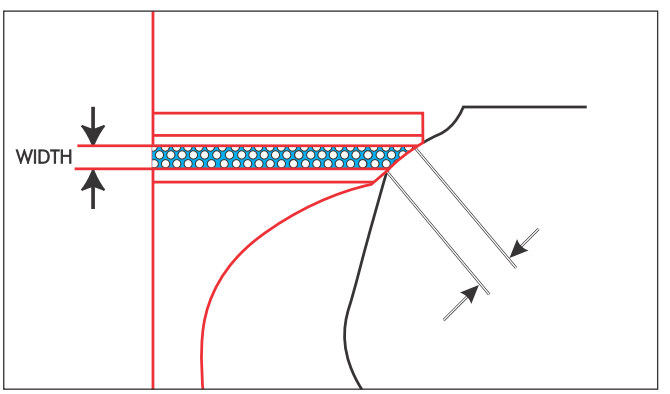


NOTE

Tap the valve against the valve seat several times with your finger, without rotating the valve, to check for proper valve seat contact.

Remove the valve and inspect the width of each valve seat.

The valve seat contact should be within the specified width and even all around the circumference.



SERVICE LIMIT

VALVE SEAT WIDTH: 1.6 mm

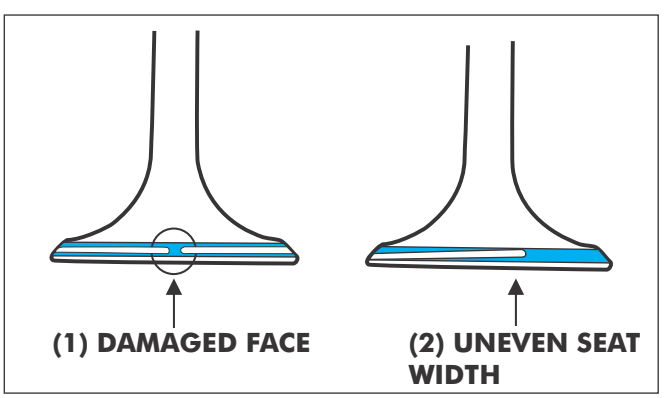
Valve seat width is not within specification, reface the valve seat (page 7-21).

CAUTION

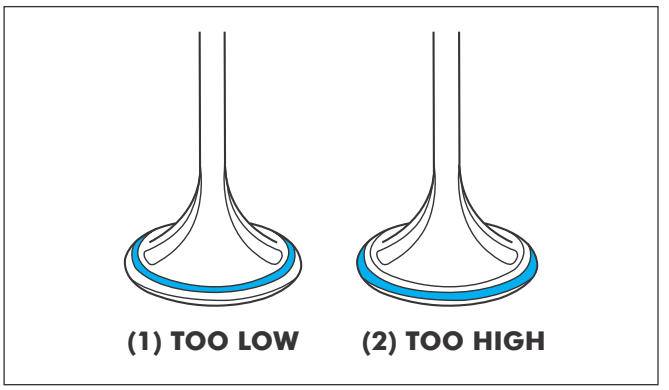
The valve cannot be ground. If a valve face is burnt or badly worn or if it contacts the seat unevenly, replace the valve.

Inspect the valve seat face for:

- Damaged face:
  - Replace the valve and reface the valve seat.
- Uneven seat width:
  - Bent or collapsed valve stem;
  - Replace the valve and reface the valve seat.

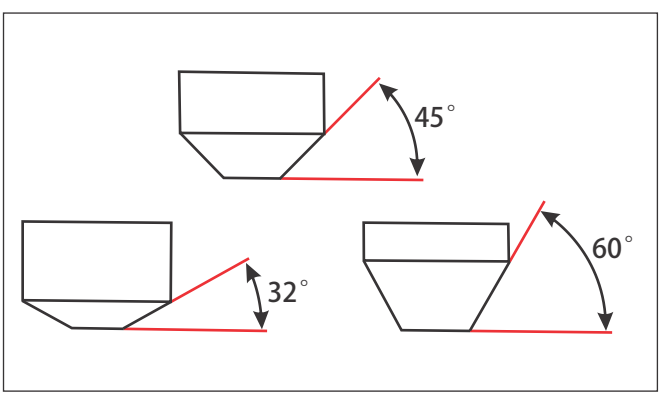


- Contact area (too high or too low area)
  - Reface the valve seat.



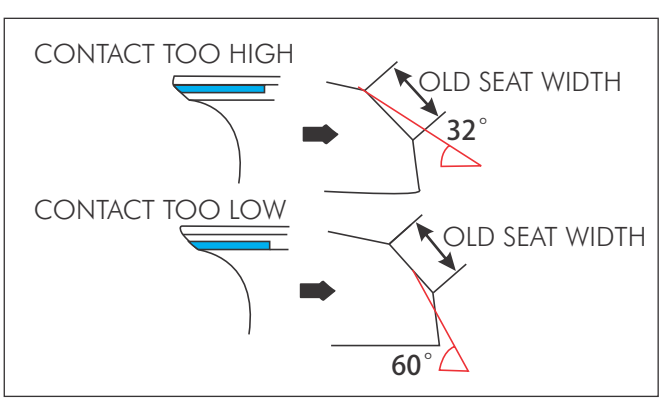
VALVE SEAT REFACING

Valve Seat Cutters, a grinder or equivalent valve seat refacing equipment are recommended to correct worn valve seat.



If the contact area is too high on the valve, the seat must be lowered using a 32° flat cutter.

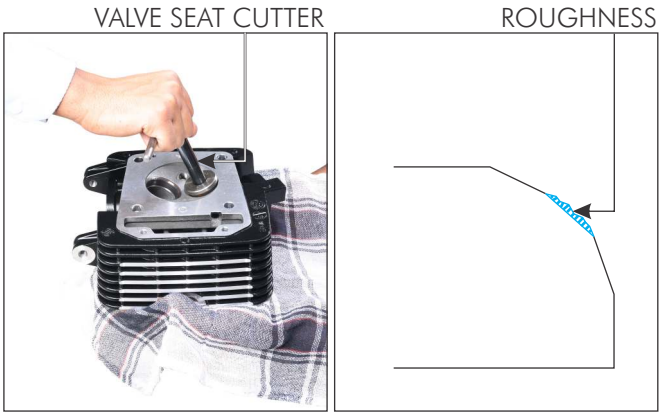
If the contact area is too low on the valve, the seat must be raised using a 60° inner cutter.



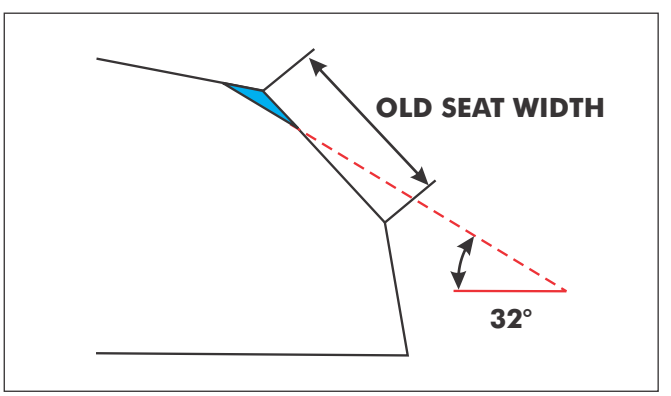
NOTE

Reface the valve seat with a 45° cutter when a valve guide is replaced.

Use a 45° cutter to remove the roughness or irregularities from the seat.

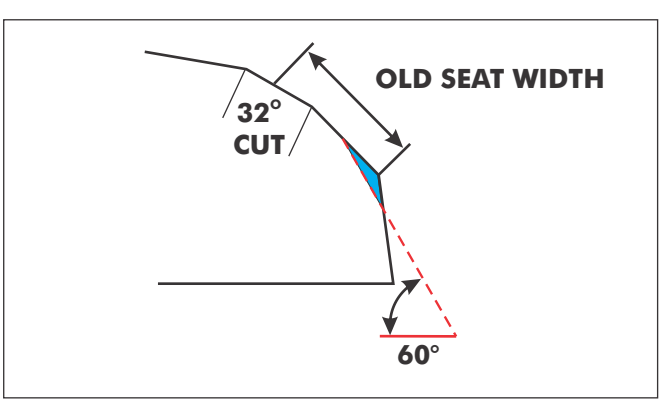


Using 32° cutter, remove top ¼ of the existing valve seat material.



Using 60° cutter, remove the bottom ¼ of the old seat.

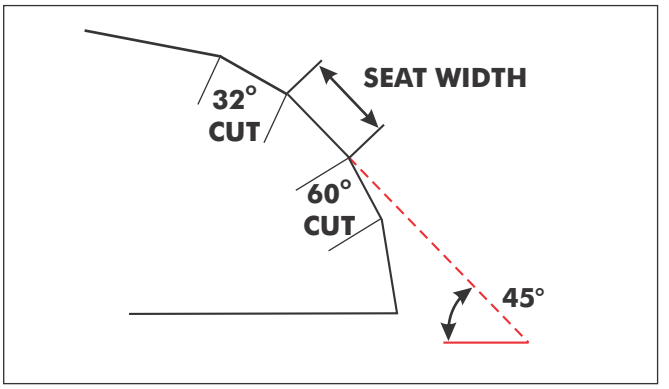
Remove the cutter and inspect the area you have just removed.



Install a 45° finish cutter and cut the seat to proper width.
Make sure that all pitting and irregularities are removed.
Refinish if necessary.

STANDARD SEAT WIDTH: 1.3±0.1 mm

After cutting the seat, apply lapping compound to the valve face and lap the valve using light pressure.



NOTE

- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool frequently to prevent uneven seat wear.
- Lapping compound can cause damage if it enters between the valve stem and guide.

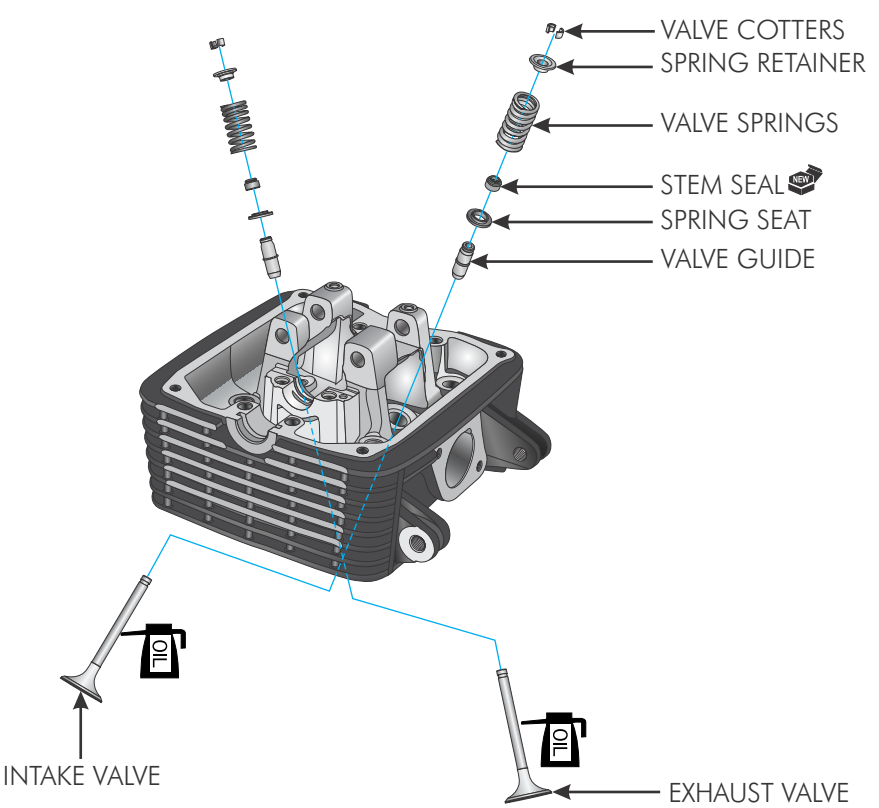
After lapping, wash any residual compound off the cylinder head and valve.

Recheck the seat contact after lapping.

HAND LAPPING TOOL

7

ASSEMBLY



Clean the cylinder head assembly with high flash point nonflammable solvent and blow through all oil passages with compressed air.

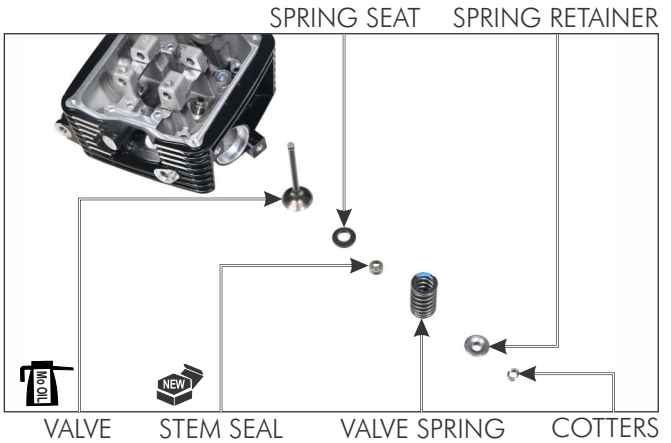
Install the valve spring seats and new valve stem seals.

Lubricate each valve stem with molybdenum oil solution.

Insert the intake and exhaust valve into the valve guides.

NOTE

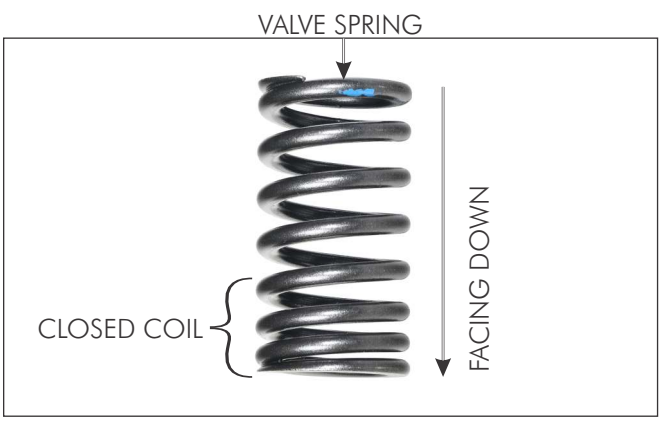
To avoid the damage of stem seal turn the valve slowly while inserting.



Install the valve springs.

NOTE

Install the valve spring with the closed coil end facing downwards.



Compress the valve springs and install the valve cotters.

TOOL

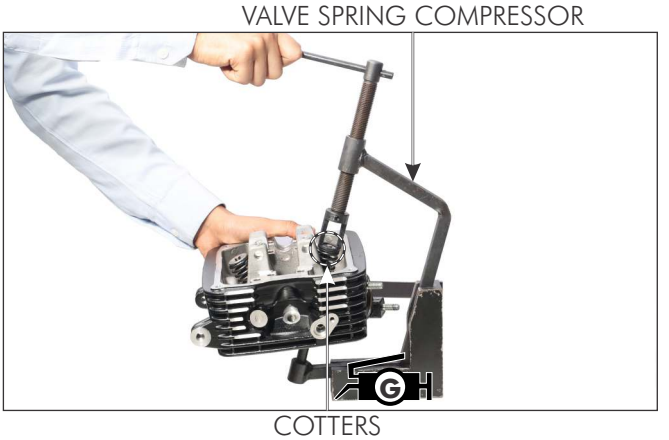
VALVE SPRING COMPRESSOR
PART NO: 070 HH 198 005
VALVE SPRING COMPRESSOR ADAPTOR-28
PART NO: HMCL0623RAAA04

CAUTION

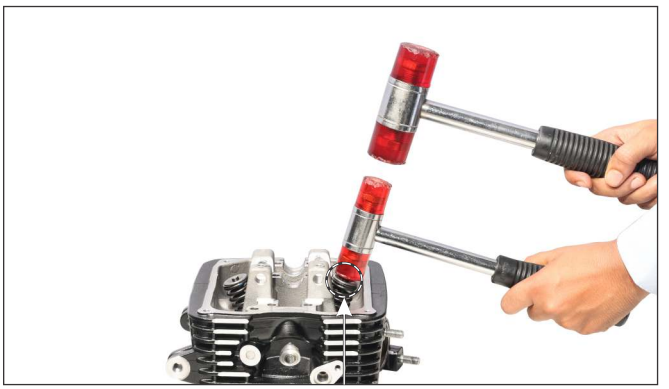
To prevent the loss of tension, do not compress the valve springs more than necessary

NOTE

To ease installation of the cotters, grease them first.



Tap the stem gently with two plastic mallet to firmly seat the cotters.



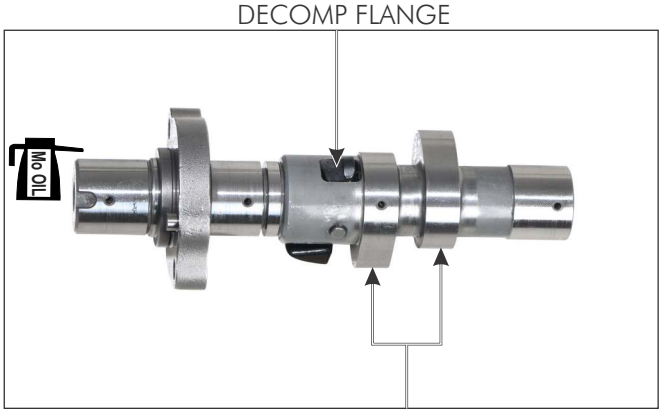
COTTERS

Apply clean engine oil with MOS_2 to whole surface of camshaft.

NOTE

- Check decomp functionality as well before assembly.
- Check with finger for the decomp flange retraction movement.

DECOMP FLANGE



CAM LOBES

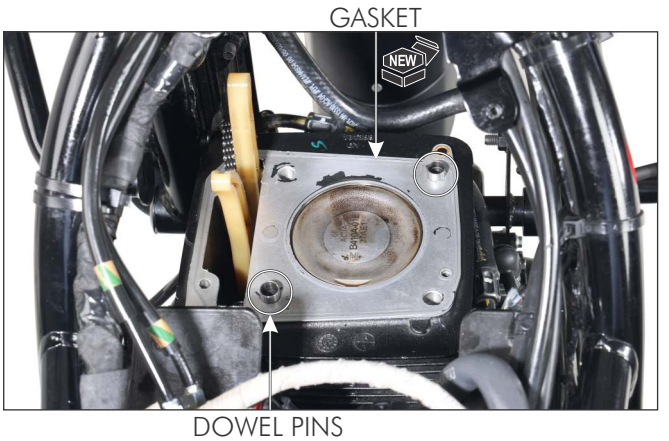
Install the spark plug.

SPARK PLUG

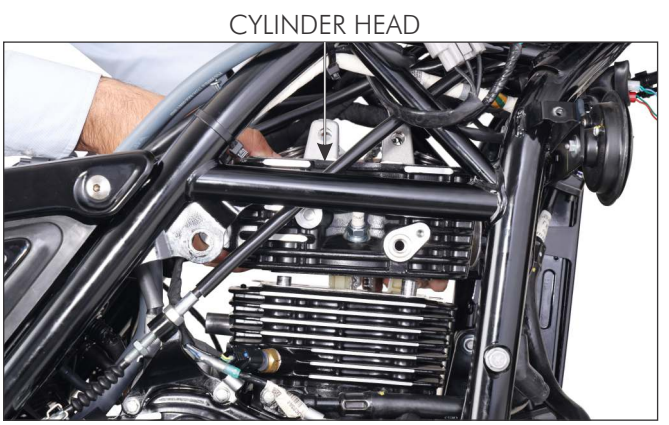
CYLINDER HEAD

INSTALLATION

Clean the gasket material from the cylinder mating surface.
Install the dowel pins and new gasket.

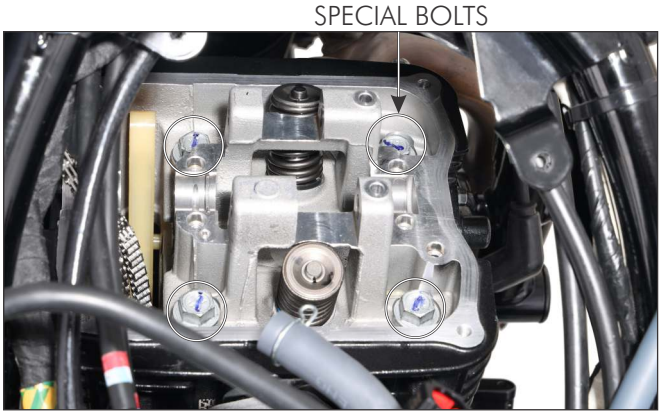


Install the cylinder head onto the cylinder.



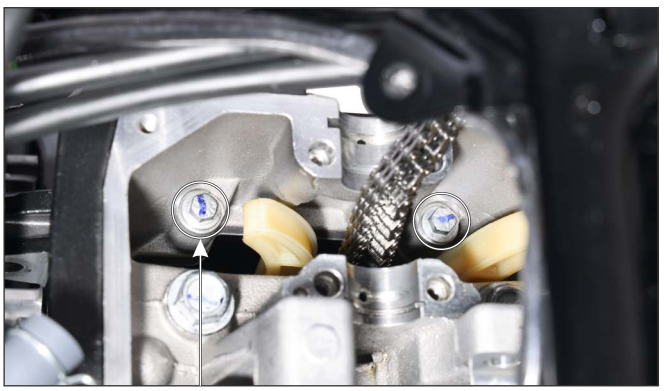
Apply clean engine oil to the threads and seating surfaces of the cylinder head special bolts.
Install and hand tighten the special bolts.
Tighten the camshaft holder special bolts to the specified torque.

TORQUE
CYLINDER HEAD SPECIAL BOLT: 5.4 kgf-m



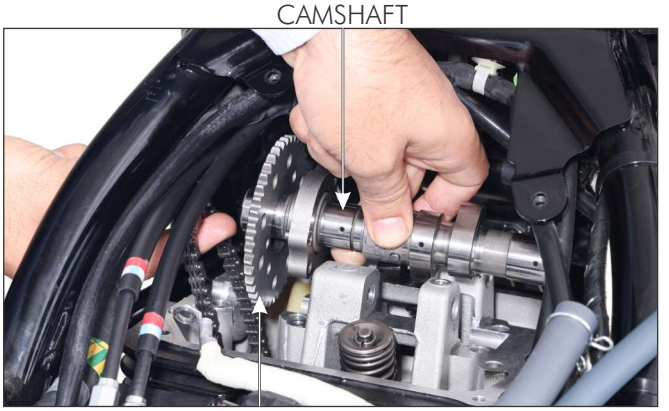
Apply clean engine oil to the cylinder head side bolts.
Install and tighten the cylinder head side bolts to the specified torque.

TORQUE
CYLINDER HEAD SIDE BOLT: 0.8-1.2 kgf-m

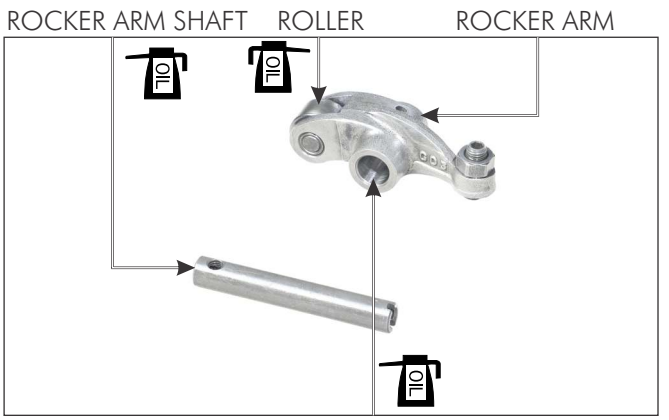


SIDE BOLTS

Install the camshaft with cam sprocket onto the cylinder head.
Temporarily install the cam chain onto the camshaft.

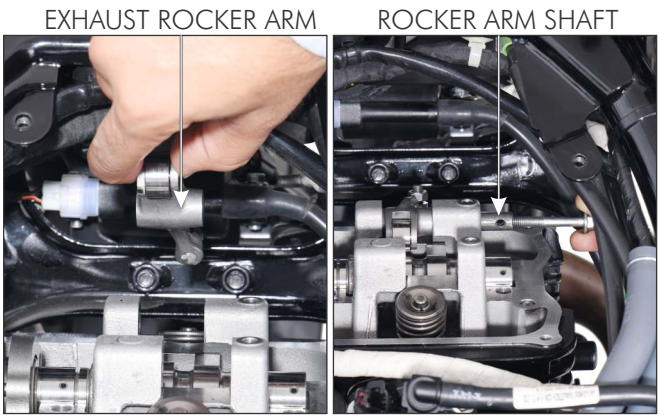


Clean the threads of each rocker arm shaft thoroughly.
Apply clean engine oil to the rocker arm's inner surface and rocker arm shaft whole surface.



ROCKER ARM INNER SURFACE

Set the exhaust rocker arm in the cylinder head, then install the rocker arm shaft into the cylinder head through the rocker arm.

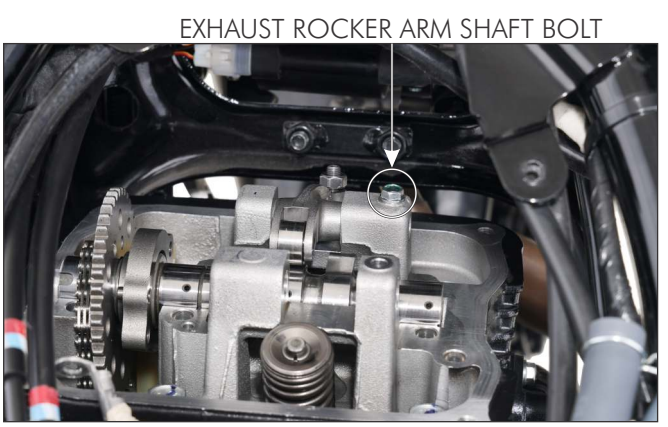


Align the hole of the exhaust rocker arm shaft with the hole of the cylinder head.

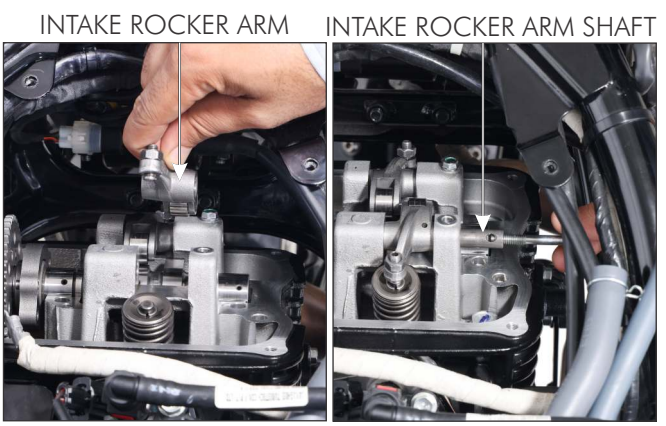
Install the exhaust rocker arm shaft bolt to the specified torque.

TORQUE

ROCKER ARM SHAFT BOLT: 0.6-0.8 kgf-m



Set the intake rocker arm in the cylinder head, then install the rocker arm shaft into the cylinder head through the rocker arm.



Align the hole of the intake rocker arm shaft with the hole of the cylinder head.

Install the intake rocker arm shaft bolt to the specified torque.

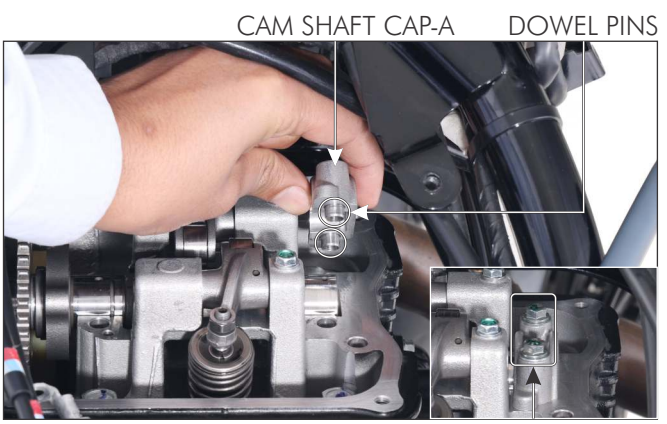
TORQUE

ROCKER ARM SHAFT BOLT: 0.6-0.8 kgf-m

INTAKE ROCKER ARM SHAFT BOLT

Install the dowel pins and camshaft cap-A.

Install the camshaft cap-A washers/bolts.

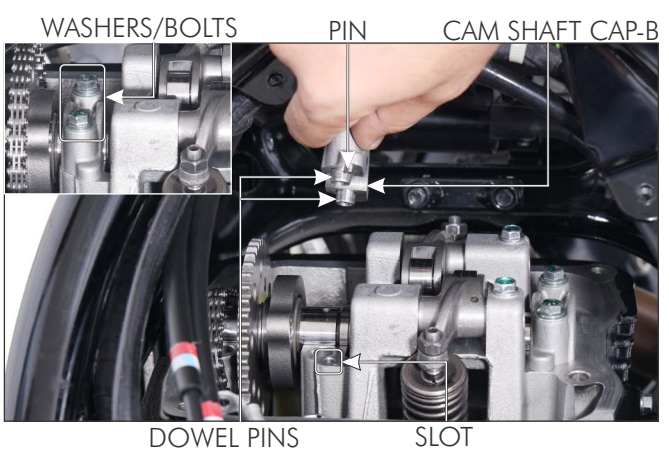


Install the dowel pins and camshaft cap-B.

Install the camshaft cap-B washers/bolts.

NOTE

Align the camshaft cap-B pin into the cylinder head slot as shown.



Install the cam chain onto the cam sprocket.

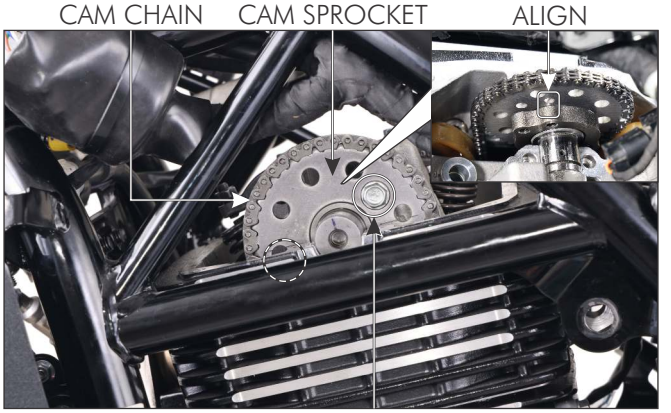
NOTE

- While installing align the camshaft pin into the cam sprocket hole.
- Ensure the line mark should be straight while assembly & key way should be in upper straight position.

Install and tighten the cam sprocket bolts to the specified torque.

TORQUE

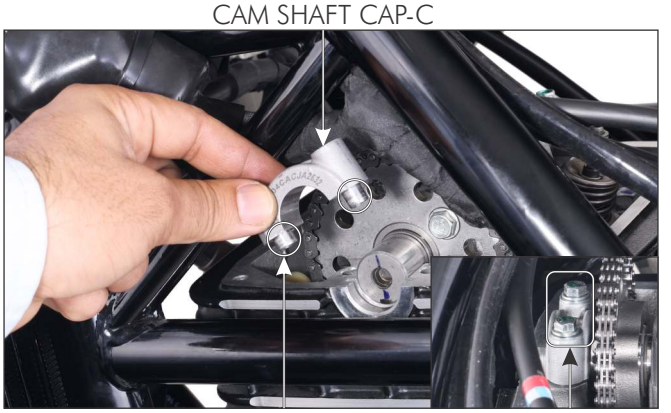
CAM SPROCKET BOLT: 0.8-1.2 kgf-m



CAM SPROCKET BOLTS

Install the dowel pins and camshaft cap-C.

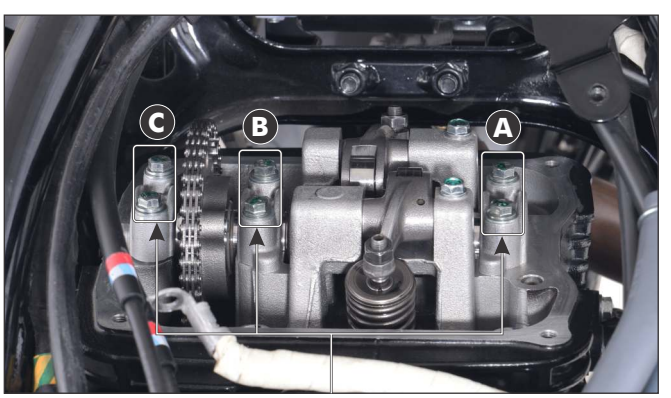
Install the camshaft cap-C washers/bolts.



Tighten the camshaft cap-A, B & C each mounting bolts.

NOTE

Ensure the valve clearance are as per spec after assembly (page 3-10).



MOUNTING BOLTS

Holding the cam chain rotate the crankshaft counter-clockwise and align the "T" line mark on the flywheel with the index notch on the left crankcase cover.

Make sure the piston is at the TDC (Top Dead Center).

TIMING HOLE CAP

CRANKSHAFT HOLE CAP

Tighten the spark plug to the specified torque (page 3-9).

Remove the stopper tool from the cam chain tensioner lifter.

STOPPER TOOL

TENSIONER LIFTER

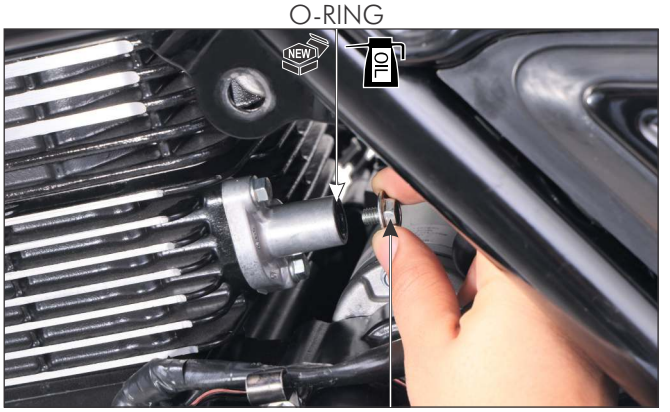
Apply clean engine oil to a new O-ring and install it on the lifter.

Install the bolt and tighten it.

TORQUE

TENSIONER LIFTER BOLT: 0.8-1.2 kgf-m

O-RING



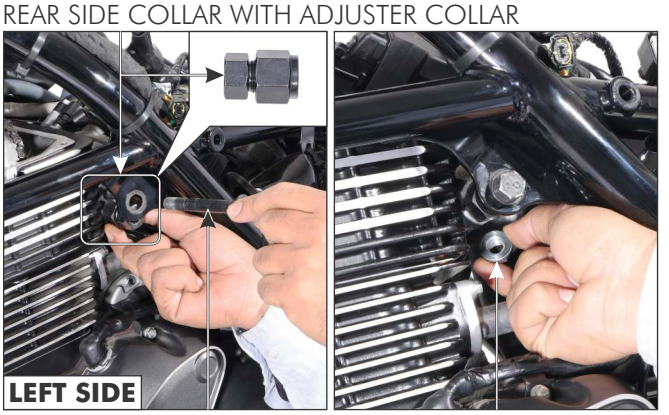
BOLT

Insert the rear side collar with adjuster collar between the engine and frame as shown.

Insert the left side engine mounting bolt (Nos.: 1, Size: 20 mm) through the rear side collar with adjuster collar as shown.

Install the left side engine mounting nut.

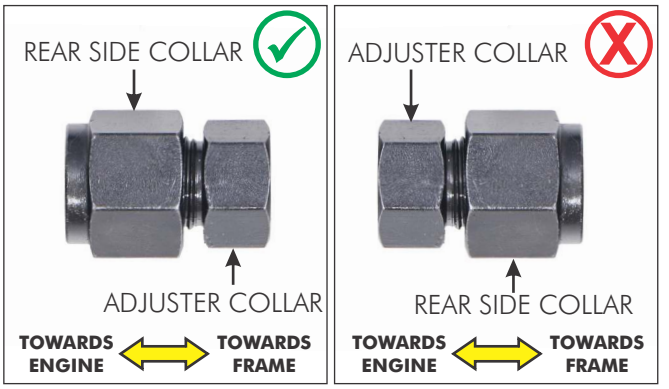
REAR SIDE COLLAR WITH ADJUSTER COLLAR



ENGINE MOUNTING BOLT ENGINE MOUNTING NUT

NOTE

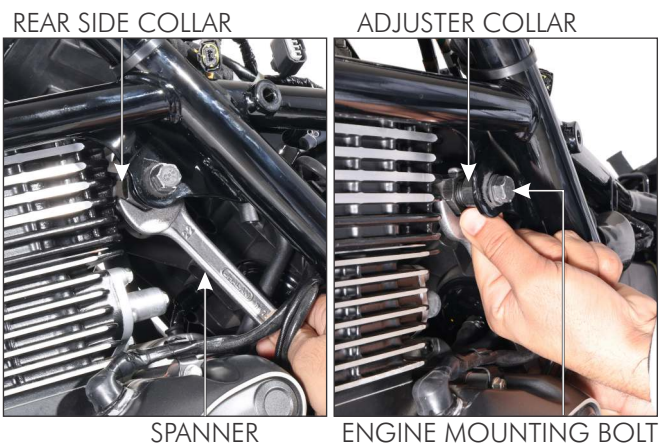
Make sure the rear side collar should face towards engine side during installation.



Hold the rear side collar with a spanner and hand tighten the adjuster collar (near frame side) to adjust the gap between the frame and the adjuster collar.

NOTE

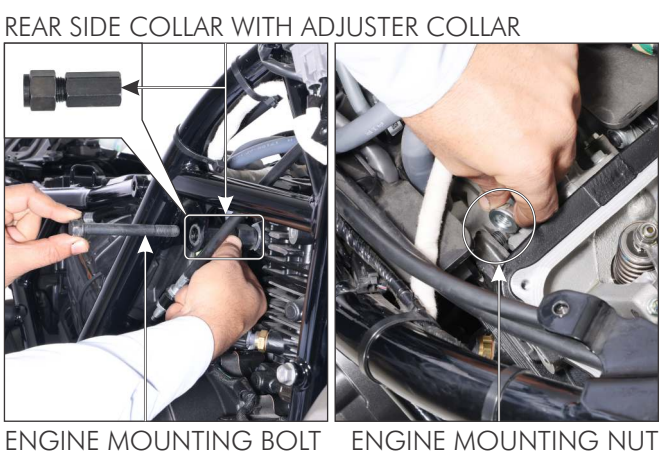
- Ensure the rear side collar and adjuster collar should properly contact between engine and frame surface before torquing engine mounting bolt.
- Do not use a spanner for adjusting the adjuster collar.



Insert the rear side collar with adjuster collar between the engine and frame as shown.

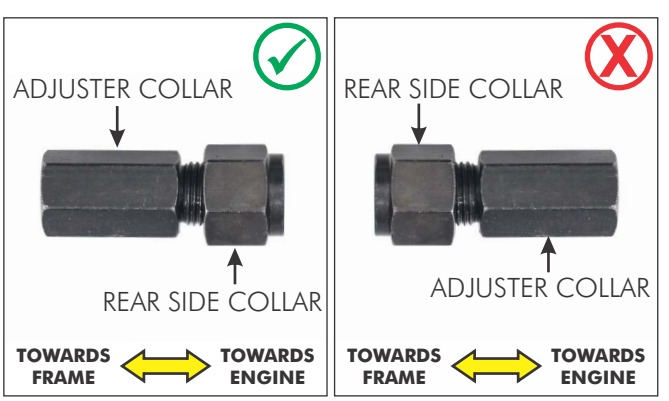
Insert the right side engine mounting bolt (Nos.: 1, Size: 20 mm) through the rear side collar with adjuster collar as shown.

Install the right side engine mounting nut.



NOTE

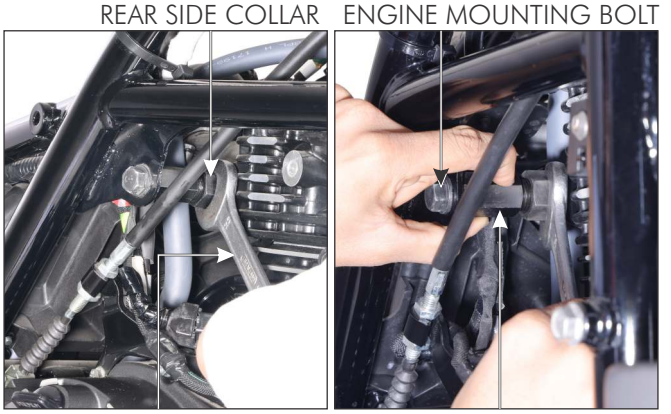
Make sure the rear side collar should face towards engine side during installation.



Hold the rear side collar with a spanner and hand tighten the adjuster collar (near frame side) to adjust the gap between the frame and the adjuster collar.

NOTE

- Ensure the rear side collar and adjuster collar should properly contact between engine and frame surface before torquing engine mounting bolt.
- Do not use a spanner for adjusting the adjuster collar.

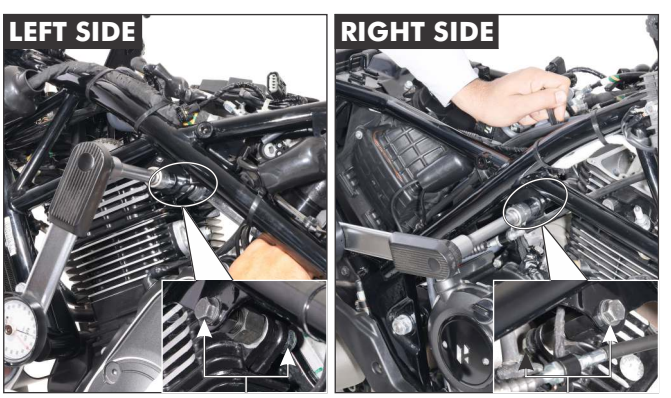


Hold the engine mounting nut from rear side and tighten the engine mounting bolt to the specified torque as per the below sequence.

Tighten the bolt to the specified torque in two steps:

TORQUE

STEP-1 (Initial torque)
ENGINE MOUNTING BOLT (LH & RH):
2.5-3.0 kgf-m
STEP-2 (Final torque)
ENGINE MOUNTING BOLT (LH & RH):
5.4-6.0 kgf-m



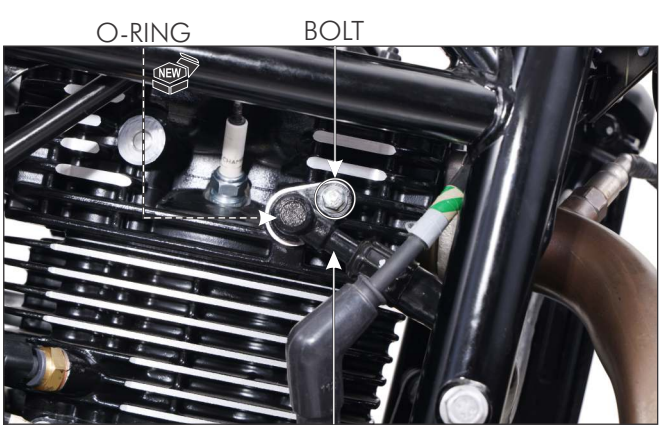
Install the oil cooler outlet hose by installing its bolt along with new O-ring to the cylinder head.

Tighten the oil cooler bolt with specified torque.

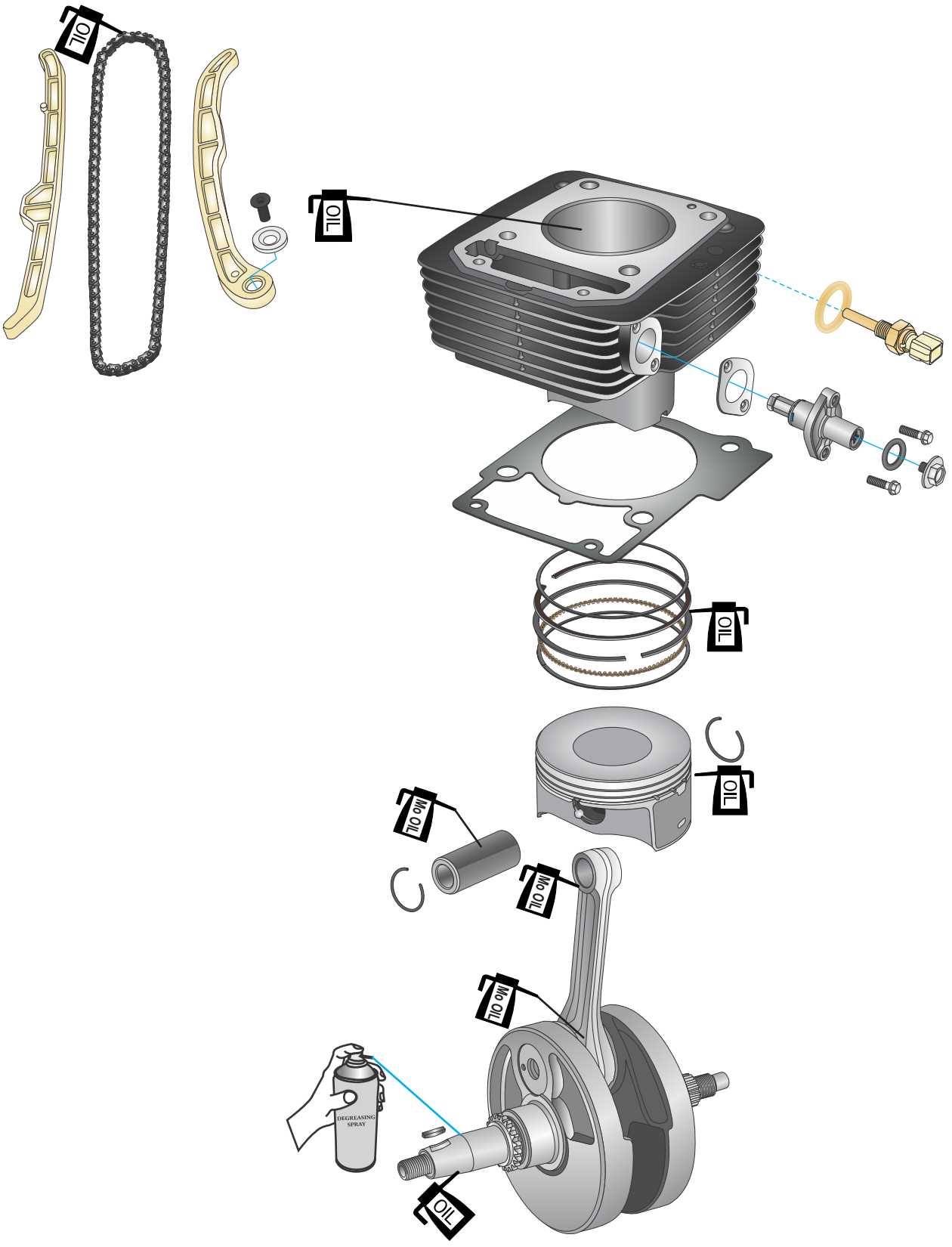
TORQUE

OIL COOLER MOUNTING BOLT: 1.0-1.4 kgf-m

Install the O-ring and pipe inlet mounting bolts (page 5-88).
Install the throttle body (page 5-83).
Install the exhaust pipe (page 2-24).
Install the noise suppressor cap (page 3-9).
Install the cylinder head cover (page 7-6).



SYSTEM DIAGRAM



CYLINDER/PISTON

SERVICE INFORMATION

GENERAL

- Cylinder and piston can be serviced with the engine installed in the frame.
- Be careful not to damage the mating surfaces by using a screwdriver when removing the cylinder. Do not strike the cylinder too hard during removal, even with a rubber or plastic hammer, to prevent the possibility of damage to the fins.
- When installing piston pin apply molybdenum disulfide oil to its whole surface.
- Take care not to damage the cylinder wall and piston.

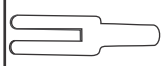
SPECIFICATIONS

CYLINDER/PISTON

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D		79.6-79.61 mm	79.64 mm
	Ovality		-	0.10 mm
	Taper		-	0.10 mm
	Warpage		-	0.10 mm
Piston	Piston O.D		78.855-79.555 mm	78.825 mm
	Piston pin hole I.D		19.007-19.013 mm	19.023 mm
	Piston pin O.D		18.995-19.000 mm	18.993 mm
	Piston-to-piston pin clearance		-	0.02 mm
	Connecting rod small end I.D		19.006-19.017 mm	19.047 mm
	Cylinder-to-piston clearance		-	0.8 mm
	Connecting rod-to-piston pin clearance		-	0.03 mm
	Piston ring-to-groove clearance	Top	0.015-0.035 mm	0.05 mm
		Second	0.02-0.06 mm	0.07 mm
	Piston ring end gap	Top	0.12-0.22 mm	0.27 mm
		Second	0.5-0.65 mm	0.7 mm
		Oil (side rail)	0.2-0.5 mm	0.53 mm

For other nuts, bolts, fasteners etc. refer to standard torque values **(SECTION-1)**.

TOOL	SPECIAL TOOLS

	**PISTON SLIDE BASE** **PART NO: HMCL0423ACRD03**

TROUBLESHOOTING

Compression too low, hard to start or poor performance at low speed

- Worn, stuck or broken piston rings
- Worn or damaged cylinder or piston
- Leaking cylinder head gasket

Excessive smoke

- Worn cylinder or piston rings
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

Excessive noise (piston)

- Worn cylinder and piston
- Worn piston pin and piston pin hole
- Worn connecting rod small end

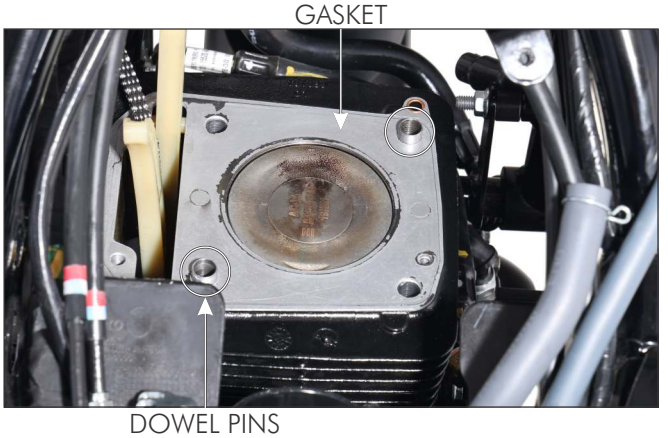
Overheating, knocking/compression too high

- Excessive carbon deposit on piston or combustion chamber

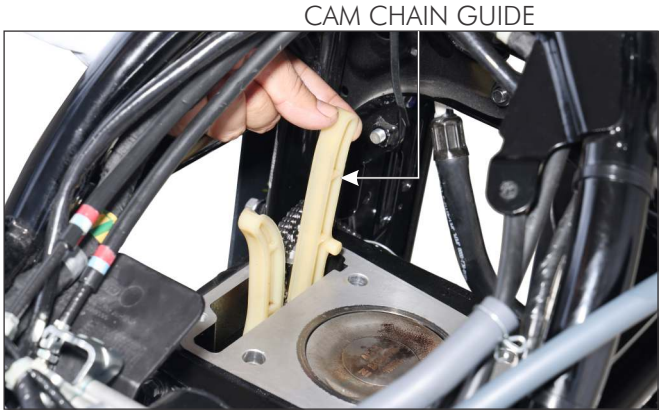
CYLINDER

REMOVAL

Remove the cylinder head (page 7-7).
Remove the dowel pins and gasket (page 7-15).



Remove the cam chain guide.



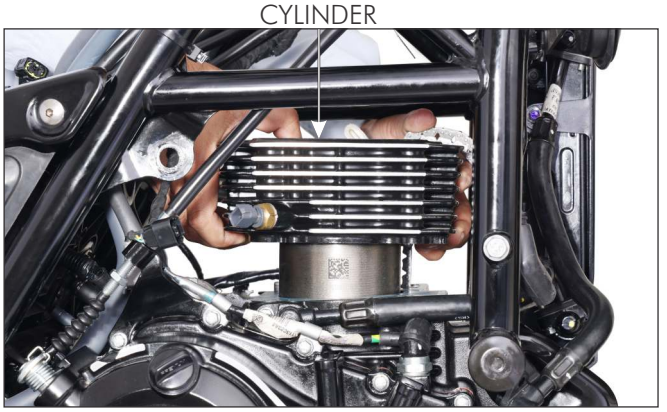
Disconnect the EOT sensor connector (page 5-88).
Loosen the EOT sensor.

Lift the cylinder and remove it, being careful not to damage the piston with the studs.

Clean the top of the cylinder throughly.

NOTE

Be careful not to damage the mating surfaces by using a screwdriver when splitting the cylinder from the crankcase.



Remove the dowel pins and gasket.

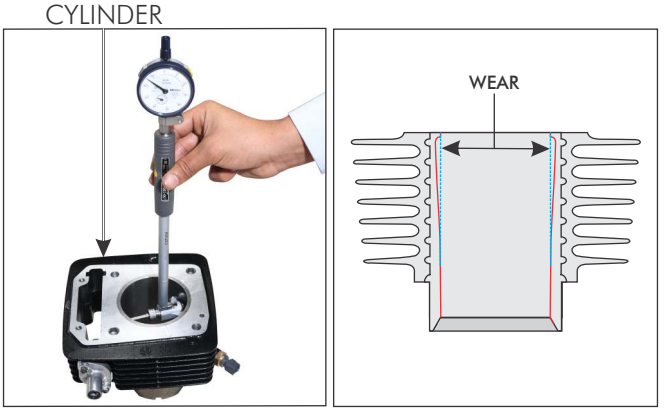
CYLINDER INSPECTION

Inspect the cylinder wall for scoring and wear.

Measure and record the cylinder I.D at three levels in both the X and Y axis. Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT

CYLINDER I.D: 79.64 mm

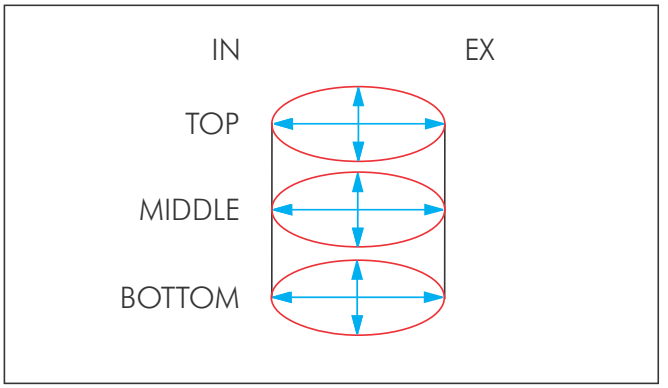


Calculate the cylinder for taper and ovality at three levels in an X and Y axis. Take the maximum reading to determine the ovality.

SERVICE LIMIT

TAPER: 0.10 mm

OVALITY: 0.10 mm



Check the cylinder for warpage by placing a straight edge and a feeler gauge across the studs and bolt holes as shown.

SERVICE LIMIT

CYLINDER WARPAGE: 0.10 mm

PISTON

REMOVAL

Remove the piston pin clip using nose plier.

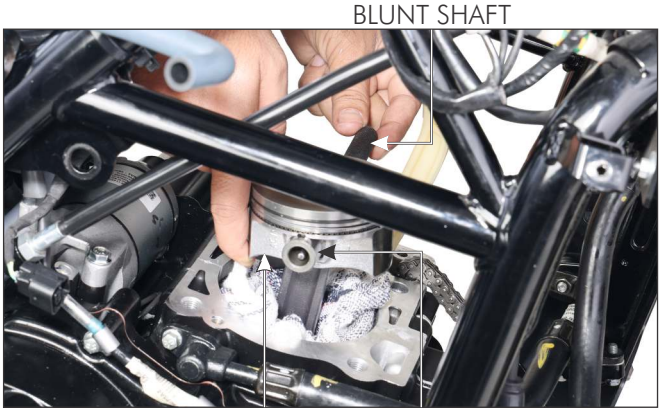
NOTE

Place a clean shop towel over the crankcase to prevent the possibility of the piston pin clip falling into the crankcase.

Remove the piston pin out by driving it with a blunt shaft.

CAUTION

- Do not damage or scratch the piston
- Do not apply side force to the connecting rod.

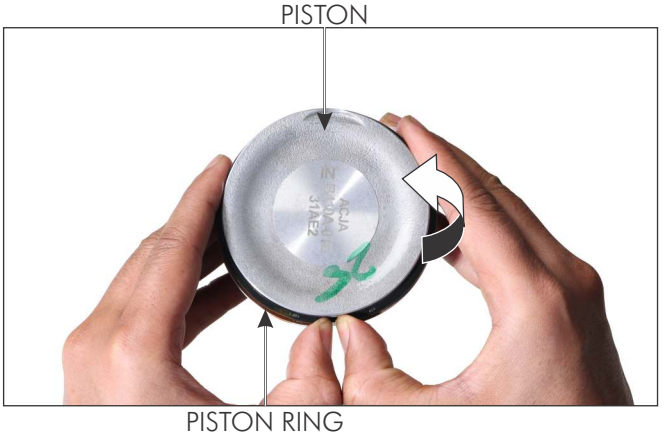


Inspect the piston rings for movement by pressing the rings. The rings should be able to move in its groove without catching.

Spread each piston ring and remove it by lifting it up at a point opposite the gap.

CAUTION

- Do not damage the piston ring by spreading the ends too far.
- Be careful not to damage the piston during the piston ring removal.



PISTON/PISTON RING

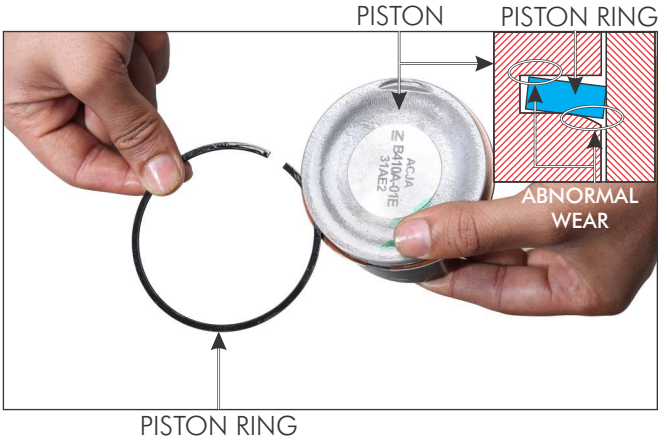
INSPECTION

NOTE

- Clean carbon deposits from the piston.
- Clean carbon deposits from the piston ring grooves with a ring that will be discarded. Never use a wire brush; it will damage the grooves.

Inspect the piston for cracks or other damage.

Inspect the ring grooves for excessive wear and carbon build-up.



Measure piston O.D at 10 mm from the bottom, and 90° to the piston pin hole.

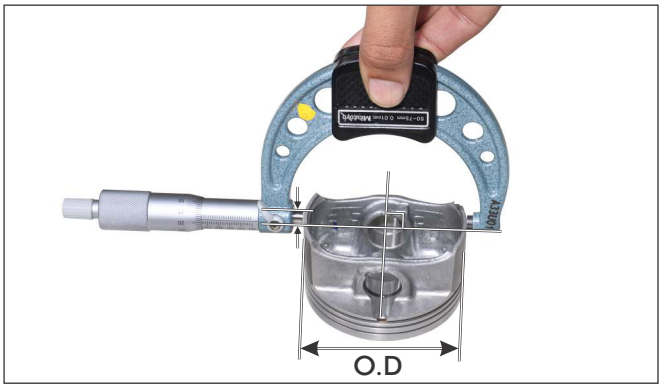
SERVICE LIMIT

PISTON O.D: 78.825 mm

Calculate the cylinder- to- piston clearance. Take the maximum calculate the cylinder-to-piston clearance reading to determine the clearance.

SERVICE LIMIT

CYLINDER- TO- PISTON CLEARANCE: 0.8 mm

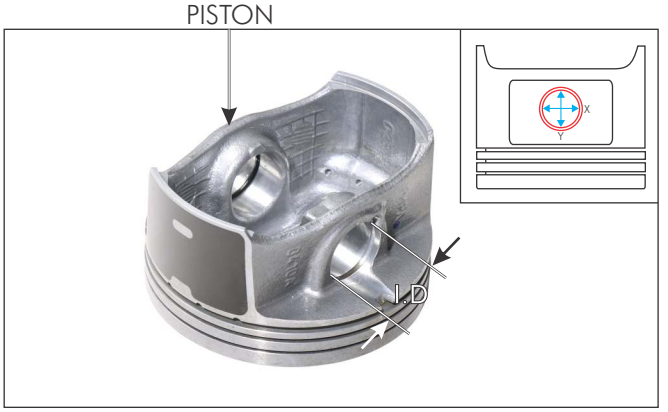


Measure each piston pin hole I.D. in an X and Y axis.

Take the maximum reading to determine I.D.

SERVICE LIMIT

PISTON PIN HOLE I.D: 19.023 mm



Measure the piston pin O.D. at three points.

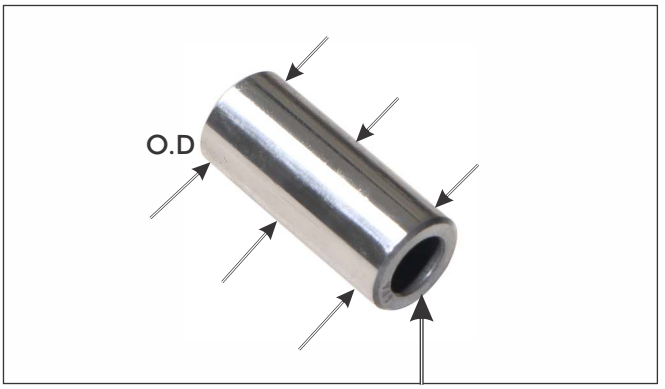
SERVICE LIMIT

PISTON PIN O.D: 18.993 mm

Calculate the piston-to-piston pin clearance.

SERVICE LIMIT

PISTON-TO-PISTON PIN CLEARANCE: 0.02 mm



PISTON PIN

CONNECTING ROD

Measure the connecting rod small end I.D.

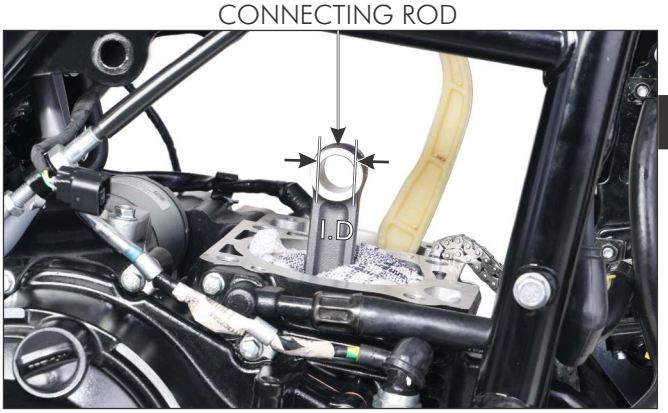
SERVICE LIMIT

CONNECTING ROD SMALL END I.D: 19.047 mm

Calculate the connecting rod small end-to-piston pin clearance.

SERVICE LIMIT

CONNECTING ROD SMALL END-PISTON PIN CLEARANCE: 0.03 mm



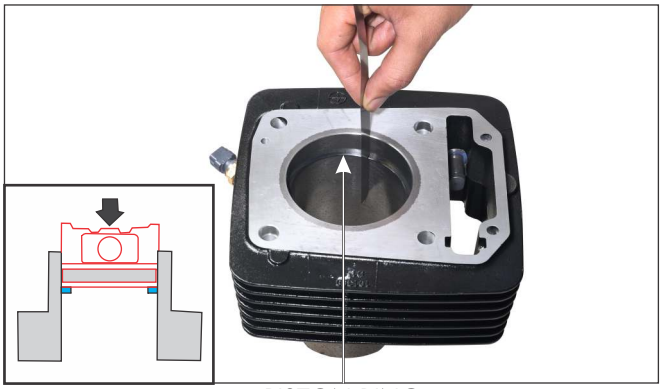
Using a piston, push the ring securely into the cylinder and measure the piston ring end gap using a feeler gauge.

SERVICE LIMIT

TOP RING END GAP: 0.27 mm

SECOND RING END GAP: 0.7 mm

OIL RING END GAP: 0.53 mm



PISTON RING

Inspect the piston rings and replace them if they are worn.

NOTE

Always replace the piston rings as a set.

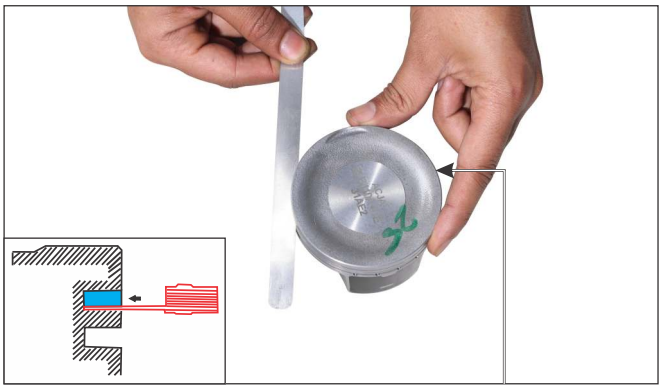
Reinstall the piston rings into the piston grooves.

Push in until the outer surface of the piston ring is nearly flushed with the piston and measure the clearance using a feeler gauge.

SERVICE LIMIT

TOP: 0.05 mm

SECOND: 0.07 mm



PISTON RING

PISTON RING INSTALLATION

Clean the piston heads, ring land and skirt.

Carefully install the piston rings onto the piston with their marking facing up.

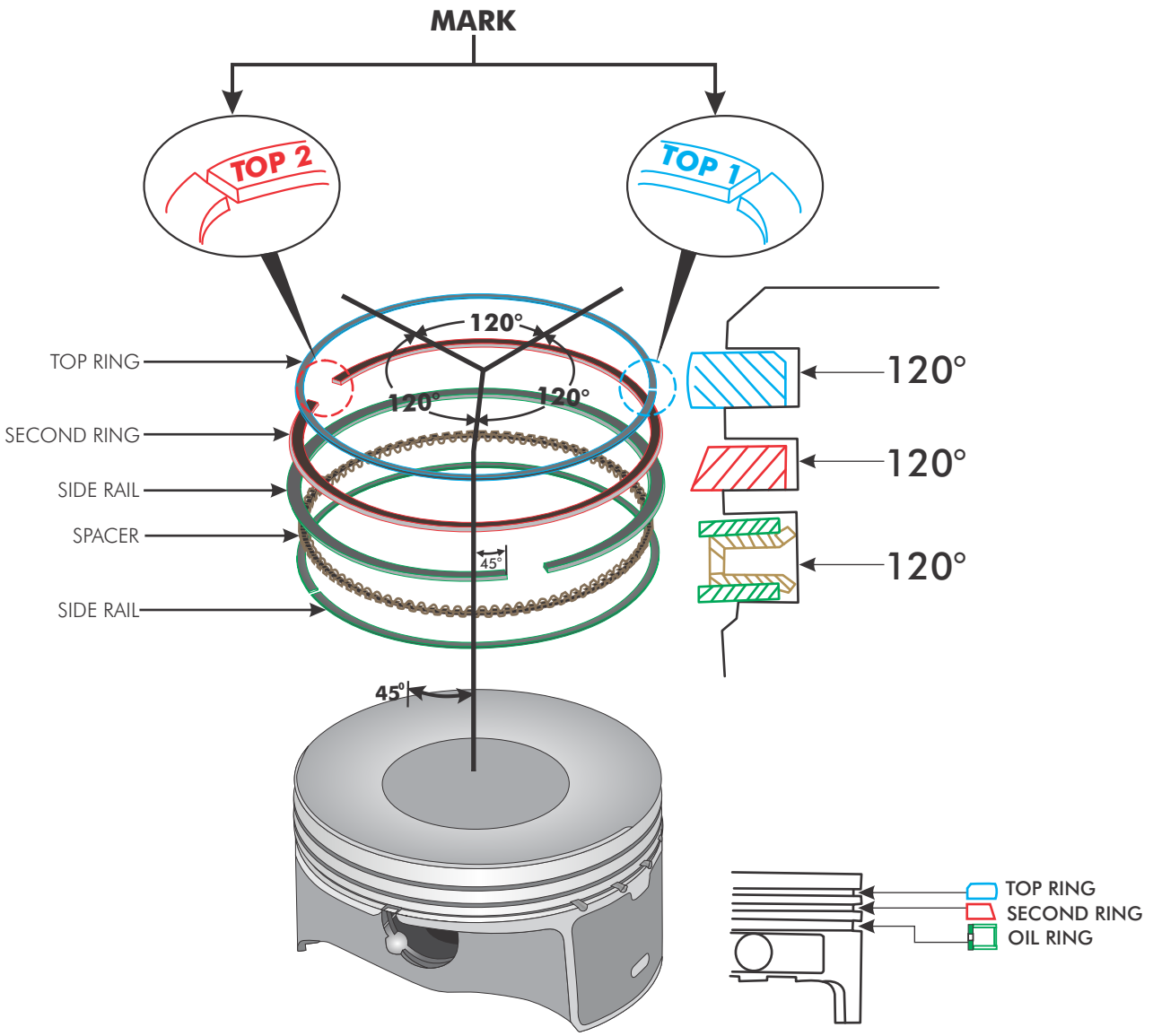
CAUTION

- Do not damage the piston ring by spreading the ends too far.
- Be careful not to damage the piston when the piston ring installation.

NOTE

- Do not confuse the top and second rings.
- After installing the rings they should rotate freely, without sticking.
- Space the ring end gaps 120° apart.

PISTON RING



PISTON

INSTALLATION

NOTE

When cleaning the cylinder mating surface, place a shop towel over the crankcase opening to prevent dirt entry into the engine.

Clean any gasket material from the cylinder mating surface of the crankcase.

MATING SURFACE

Apply molybdenum oil solution to the piston pin outer surfaces.

Install the piston.

Install the piston pin.

PISTON

PISTON PIN

Install new piston pin clips.

CAUTION

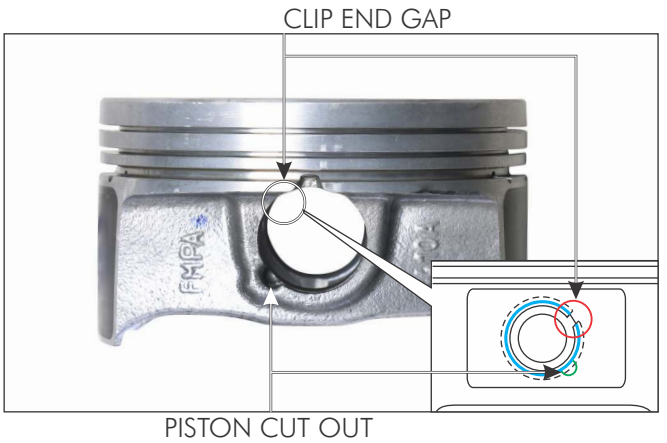
Always use new piston pin clips . Reinstalling used piston pin clips may lead to serious engine damage.

PISTON PIN CLIP

NOSE PLIER

NOTE

- Place a shop towel over the crankcase opening to prevent piston pin clips from the falling into the crankcase.
- Set the piston pin clip in the groove properly.
- Do not align the clip's end gap with the piston cut-out.



CYLINDER

INSTALLATION

Install the dowel pins and a new gasket.

NOTE

- When cleaning the cylinder mating surface, place a shop towel over the crankcase opening to prevent dirt entry into the engine.
- Do not reuse the gasket, replace with new one.

CAUTION

- Be careful not to damage the piston rings and cylinder wall.
- Be careful not to jam the piston rings to the cutaway of the cylinder sleeve.

Apply clean engine oil to the cylinder wall, piston outer surface and piston rings.

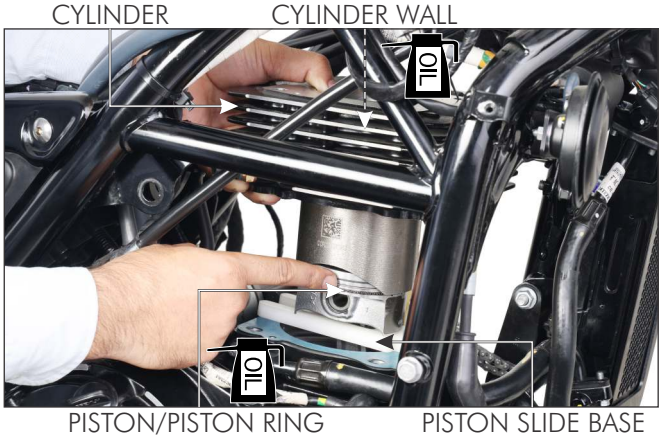
Place piston slide base under the piston.

Install the cylinder over the piston compressing the piston rings with your fingers.

Route the cam chain through the cylinder.

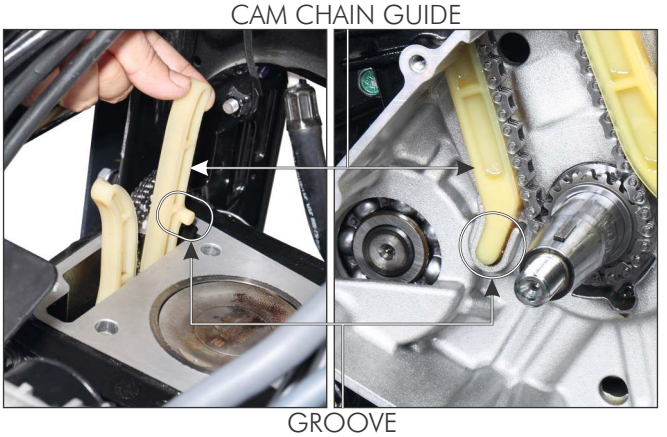
TOOL

PISTON SLIDE BASE
PART NO: HMCL0423ACRD03



Insert the cam chain guide into the cylinder and crankcase groove.

CAM CHAIN GUIDE



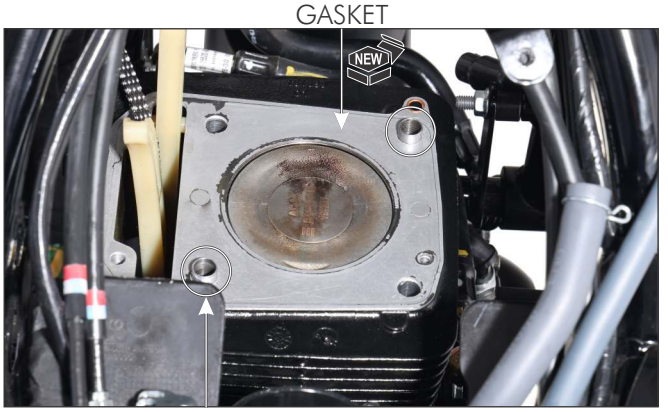
GROOVE

Tighten the EOT sensor.
Connect the EOT sensor connector (page 5-89).

EOT SENSOR

Install a new gasket and dowel pins.
Install the cylinder head (page 7-27).

GASKET

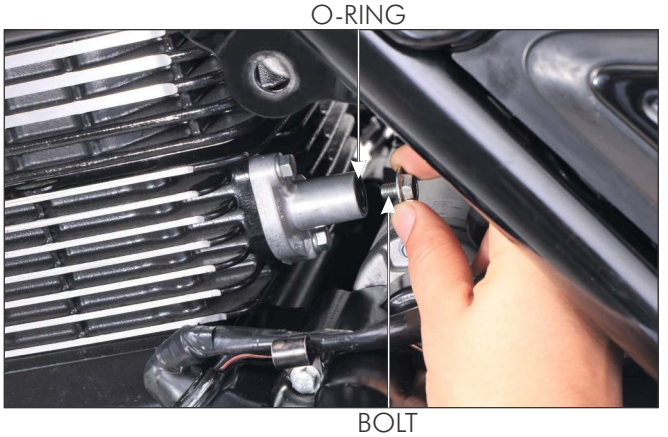


DOWEL PINS

CAM CHAIN TENSIONER LIFTER

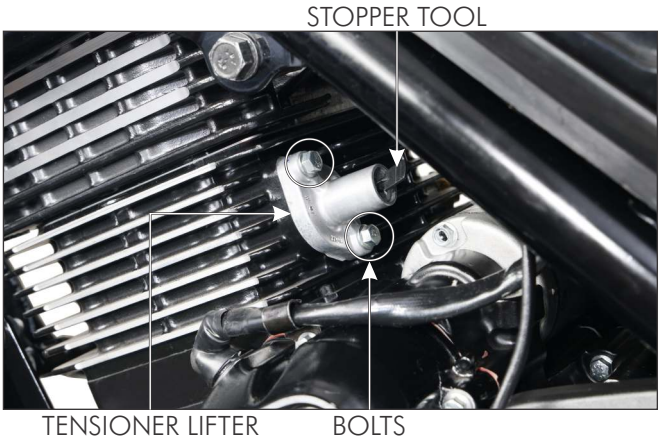
REMOVAL

Remove the tensioner bolt and O-ring.



Turn the tensioner shaft clockwise with the stopper tool to retract the tensioner, then insert the stopper fully to hold the tensioner in the fully retracted position.

Remove the two mounting bolts.

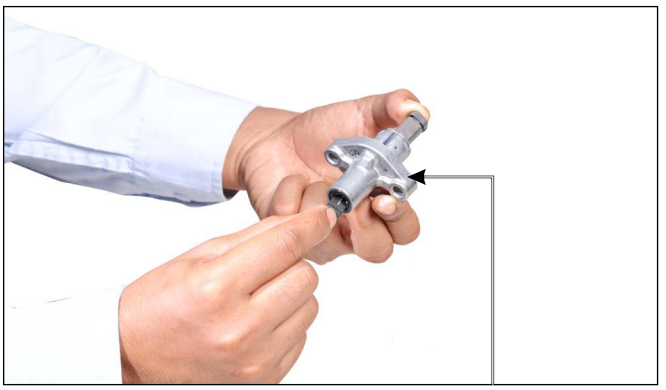


Remove the cam chain tensioner lifter and gasket.

INSPECTION

Check the lifter operation:

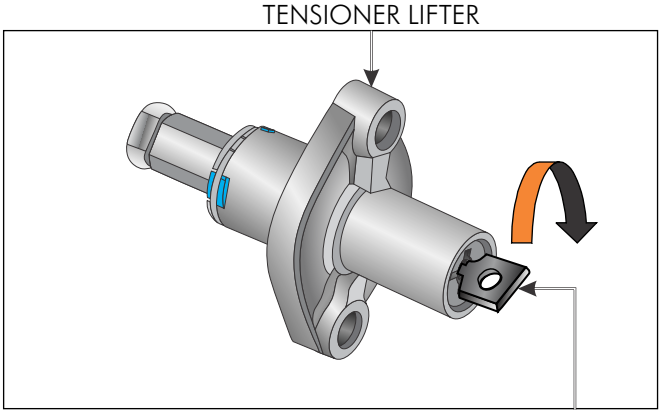
- The tensioner shaft should not go into the body when it is pushed.
- When it is turned clockwise with a stopper tool the tensioner lifter shaft should be pulled into the body .
- The shaft should spring out of the body as soon as the stopper tool is released.



TENSIONER LIFTER

INSTALLATION

Turn the tensioner lifter shaft clockwise with the stopper tool to retract the tensioner lifter, then insert the stopper fully to hold the tensioner lifter in the retracted position.



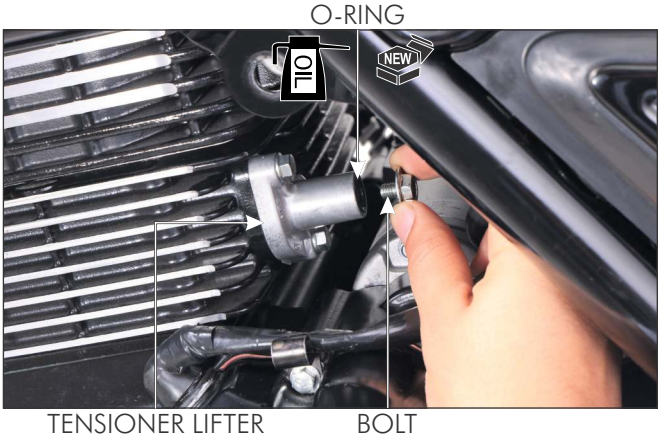
Install the cam chain tensioner lifter along with a new gasket.

NOTE

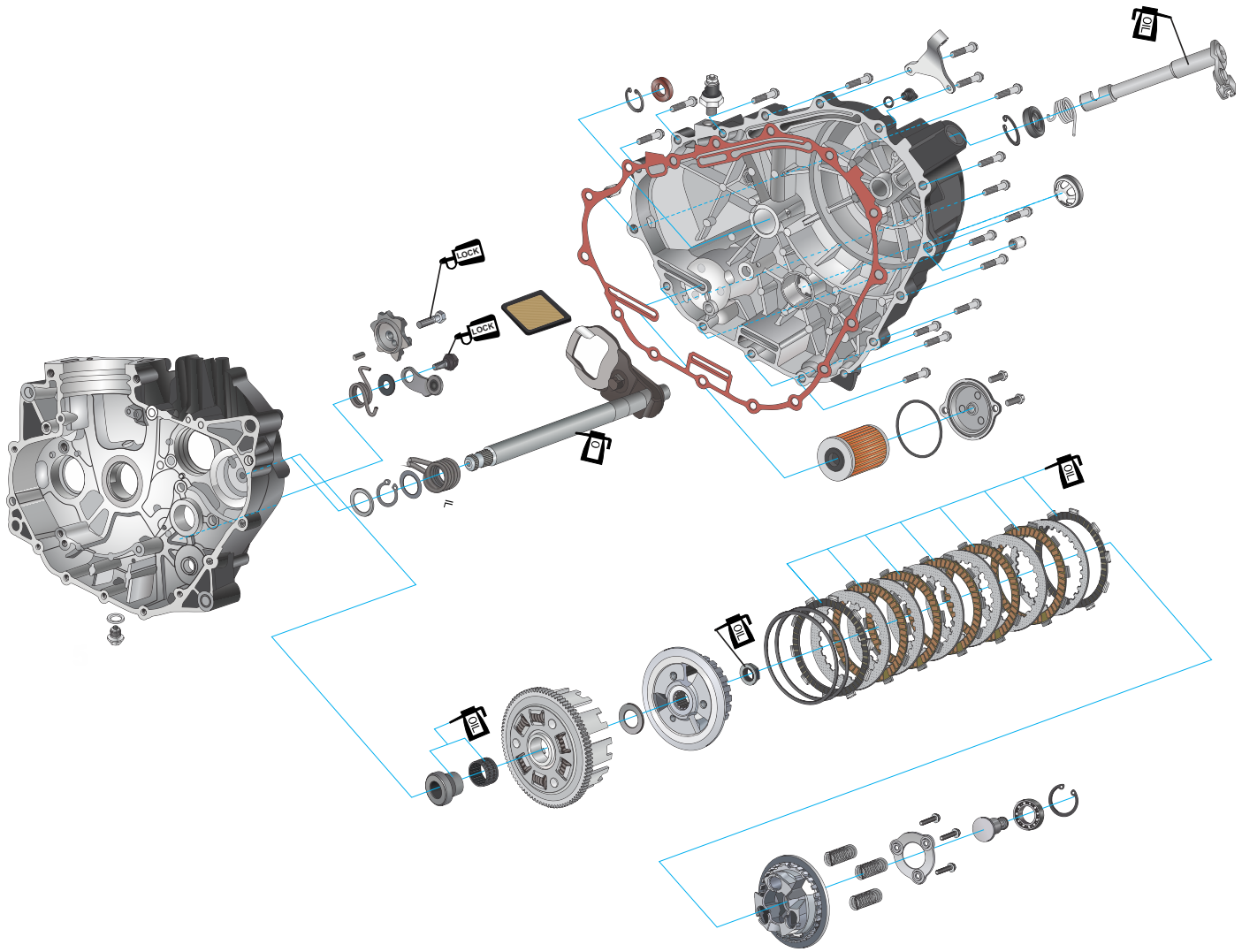
Never assemble the tensioner lifter to the engine with the tension condition, as it may cause cam chain noise/wear.

Install the mounting bolts and tighten them.
Remove the stopper tool from the tensioner lifter.

Apply clean engine oil to a new O-ring and install it to the lifter.
Install the tensioner lifter bolt and tighten it.



SYSTEM DIAGRAM



CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION

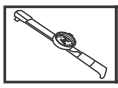
GENERAL

- The clutch and the gearshift linkage can be serviced with the engine installed on the frame.
- Engine oil viscosity and level have an effect on clutch operation. When the clutch does not disengage or the vehicle creeps with the clutch disengaged, inspect the engine oil and oil level before servicing the clutch system.
- When removing and installing the oil pump, care to be taken to avoid oil or dirt entry into the engine.

SPECIFICATIONS

CLUTCH/GEARSHIFT LINKAGE

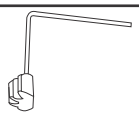
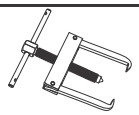
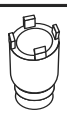
ITEM			STANDARD	SERVICE LIMIT
Clutch	Lever free play		10-15 mm	-
	Spring free length		51.7 mm	50.7 mm
	Disc thickness	Disc-A (4Nos.)	2.92-3.08 mm	2.82 mm
		Disc-B (2 Nos.)	2.92-3.08 mm	2.82 mm
		Disc-C (1 No.)	2.92-3.08 mm	2.82 mm
	Plate warpage-A		1.9-2.1	1.8 mm
	Plate warpage-B		1.88-2.12	1.78 mm
	Clutch outer guide I.D		20.991-21.009	21.039 mm
	Clutch outer guide O.D		27.959-27.980 mm	27.929 mm
	Clutch outer I.D		-	33.055 mm



TORQUE VALUES

OIL PRESSURE SWITCH NUT	**: 0.7-1.0 kgf-m**
CLUTCH CENTER LOCK NUT	**: 10.0-12.0 kgf-m**
CLUTCH LIFTER PLATE BOLT	**: 1.0-1.4 kgf-m**
SHIFT DRUM STOPPER PLATE BOLT	**: 0.8-1.2 kgf-m**
SHIFT DRUM STOPPER PLATE ARM BOLT	**: 1.0-1.4 kgf-m**
BALANCER DRIVEN GEAR LOCK NUT	**: 6.0-7.0 kgf-m**
PRIMARY DRIVE GEAR LOCK NUT	**: 13.0-14.0 kgf-m**
RIGHT CRANKCASE COVER BOLT	**: 0.8-1.2 kgf-m**

For other nuts, bolts, fasteners etc. refer to standard torque values **(SECTION-1)**.

TOOL	SPECIAL TOOLS
	**GPD HOLDER** **PART NO: 070 HH 198 017**
	**CLUTCH CENTER HOLDER** **PART NO: HMCL0623RAAA03**
	**BALANCER DRIVE GEAR PULLER** **PART NO: HMCL0423ACAA02**
	**SOCKET ROTOR FILTER** **NUT (Pneumatic 24mm)** **PART NO: 070 HH 198 029**

TROUBLESHOOTING

Faulty clutch operation can usually be corrected by adjusting the free play.

Clutch lever too hard
- Damaged, kinked or dirty clutch cable
- Improperly routed clutch cable
- Damaged clutch lifter mechanism
- Faulty clutch lifter plate bearing

Clutch will not disengage or motorcycle creeps with clutch disengaged
- Excessive clutch lever free play
- Clutch plate warped
- Oil level too high, improper oil viscosity, or additive used.
- Check for oil additive

Clutch slips
- Clutch lifter sticking
- Worn clutch discs
- No clutch lever free play
- Check for oil additive
- Weak clutch springs

Clutch operation feels rough
- Rough clutch outer slots

Hard to shift
- Misadjusted clutch cable
- Damaged or bent shift fork
- Bent shift fork shaft
- Incorrect engine oil viscosity
- Incorrect gearshift spindle assembly
- Damaged shift drum guide grooves

Transmission jumps out of gear
- Worn shift drum stopper arm
- Worn or broken gearshift spindle return spring
- Bent shift fork shaft
- Damaged shift drum guide grooves
- Worn gear dogs or dog holes

Gearshift pedal will not return
- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

RIGHT CRANKCASE COVER

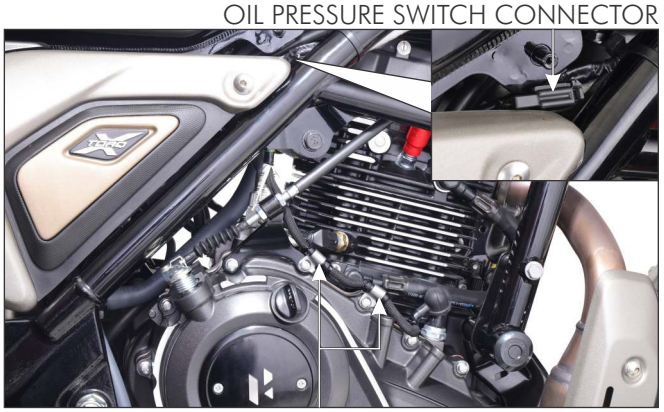
REMOVAL

Drain the engine oil (page 3-13).

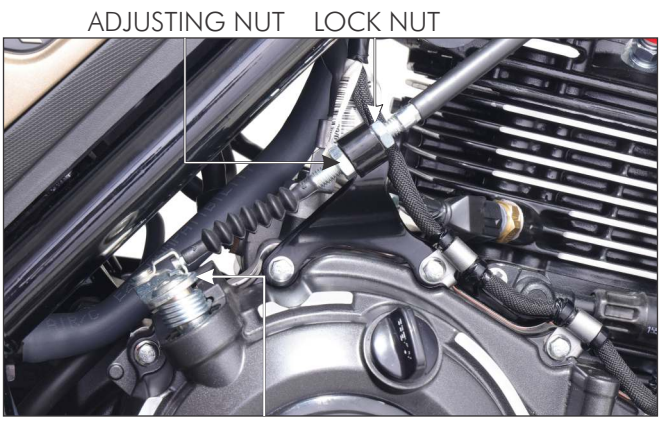
Remove the right side tank cover (page 2-6).

Disconnect the oil pressure switch connector.

Release the oil pressure switch wire from the clamp bolted on the right crankcase cover.



Loosen the lock nut and adjusting nut, then disconnect the clutch cable from the clutch lever.



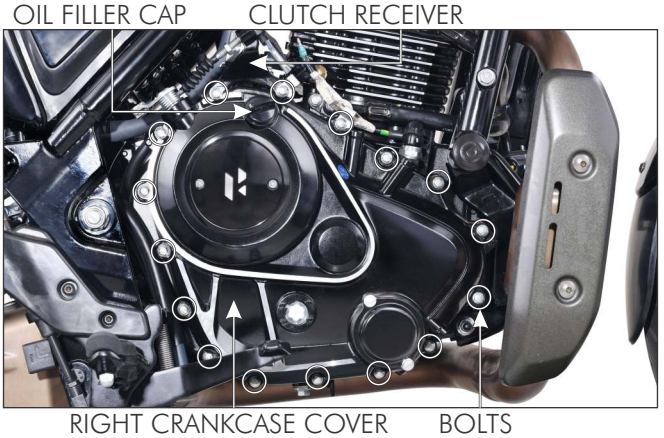
NOTE

- The right crankcase cover can be serviced with the engine installed in the frame.
- Clean around the oil filler cap with compressed air before removing and be sure that no debris are allowed to enter inside the engine.

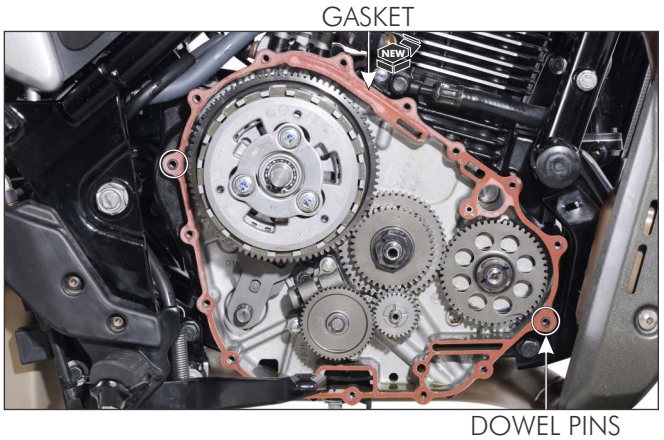
Remove the oil filler cap.

Loosen and remove the right crankcase cover bolts (Nos.:16, Size: 8 mm) in a crisscross pattern in 2 or 3 steps.

Remove the clutch receiver and the right crankcase cover.



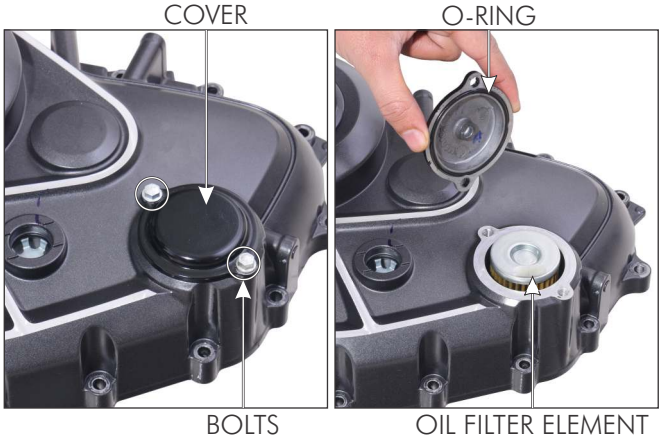
Remove the gasket and dowel pins.



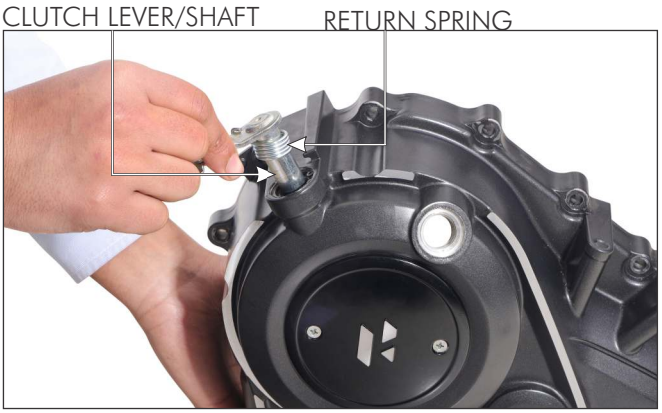
DISASSEMBLY

Remove the oil pressure switch by removing the nut.

Remove the engine oil filter element bolts (Nos.: 2, Size: 8 mm).
Remove the engine oil filter cover with O-ring.
Remove the engine oil filter element.



Unhook the return spring from the right crankcase cover.
Remove the clutch lever/shaft.
Check the clutch lever/shaft for wear or damage.
Check the return spring for fatigue or damage.



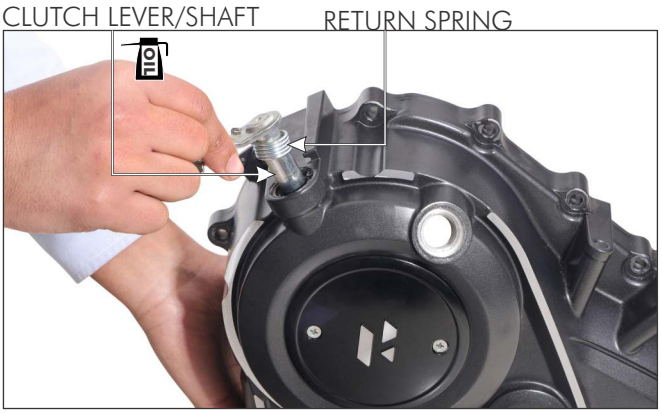
Remove the circlip and clutch lever/shaft oil seal.

ASSEMBLY

Apply grease to a new clutch lever shaft oil seal lip and install it into the right crankcase cover.
Install the new circlip.

Apply clean engine oil to the clutch lever shaft sliding surface and install it into the right crankcase cover.

Hook the return spring end to the right crankcase cover.



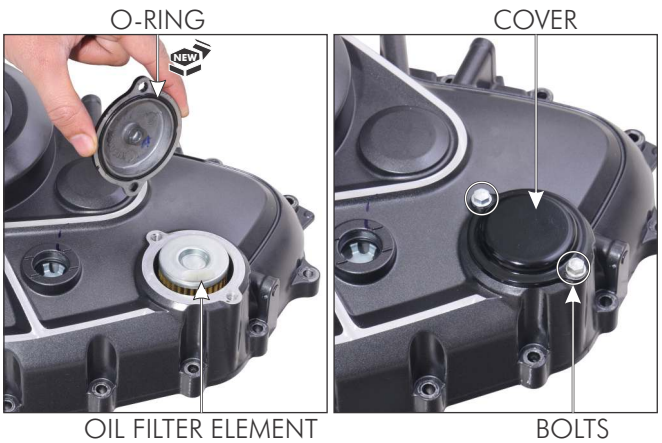
Install the engine oil filter element.

Install the engine oil filter cover with new O-ring.

Install the engine oil filter element bolts (Nos.: 2, Size: 8 mm).

NOTE

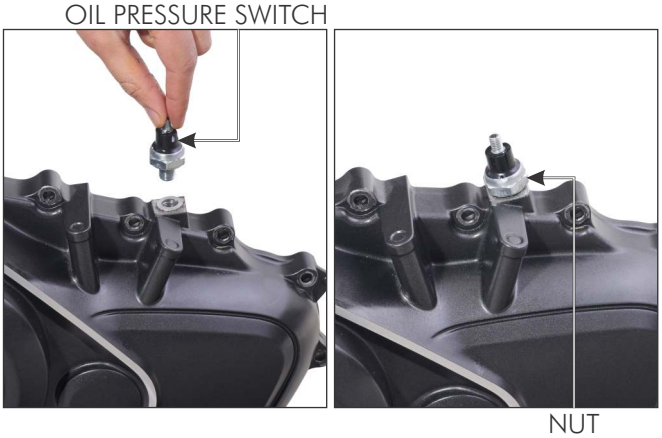
Change the oil filter element as per maintenance schedule (page3-3).



Install the oil pressure switch by installing the nut to the specified torque.

TORQUE

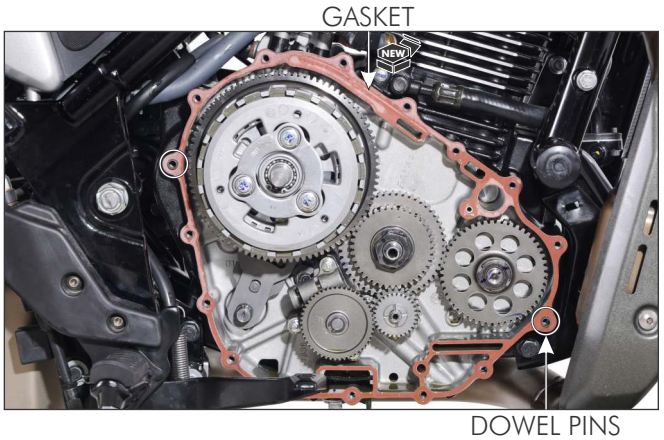
OIL PRESSURE SWITCH NUT: 0.7-1.0 kgf-m



INSTALLATION

Clean off any gasket material from the mating surfaces of the right crankcase and cover.

Install the dowel pins and new gasket.



NOTE

Apply multipurpose grease to the kick starter serrated area.

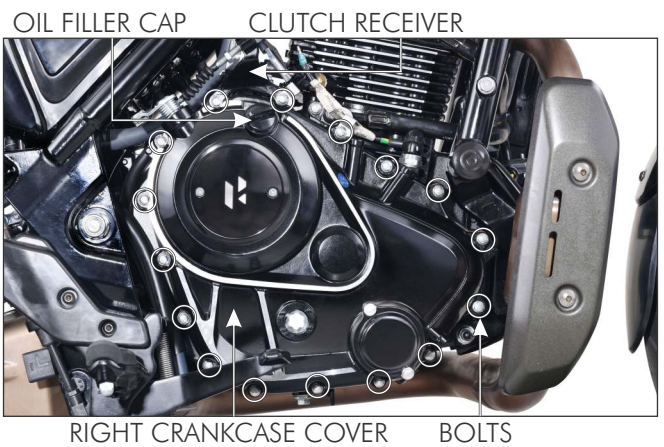
Install the right crankcase cover, clutch receiver and cover bolts.

Tighten the bolts in a criss-cross pattern in 2 or 3 steps.

Install the oil filler cap.

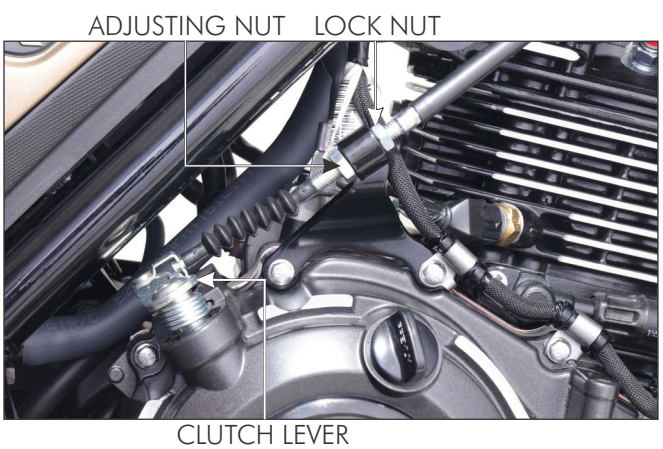
TORQUE

RIGHT CRANKCASE COVER BOLT: 0.8-1.2 kgf-m



Connect the clutch cable to the clutch lever.

Adjust the clutch lever free play (page 3-28).



Route the oil pressure switch wire through the clamp bolted on the right crankcase cover

Connect the oil pressure switch connector.

Install the right side tank cover (page 2-8).

Fill the crankcase with the recommended engine oil (page 3-13).

OIL PRESSURE SWITCH CONNECTOR

CLAMPS

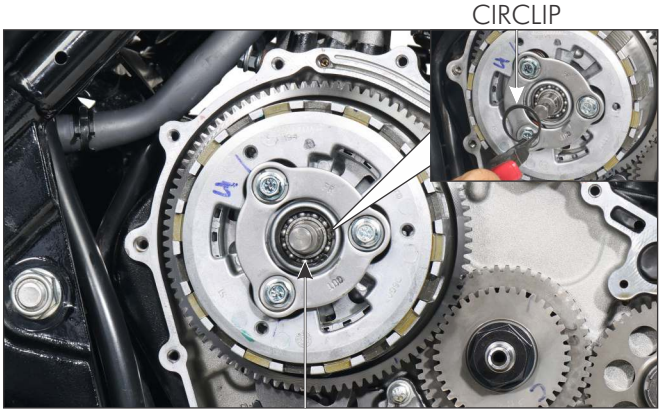
CLUTCH

DISASSEMBLY

Remove the right crankcase cover (page 9-3).

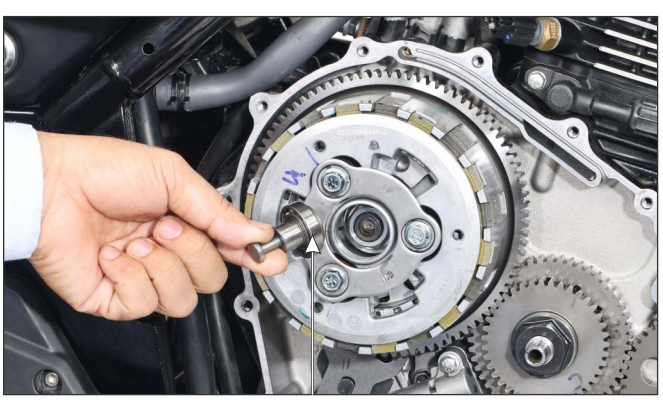
Remove the circlip from the clutch lifter bearing assembly.

CIRCLIP



CLUTCH LIFTER BEARING ASSEMBLY

Remove the clutch lifter bearing assembly.



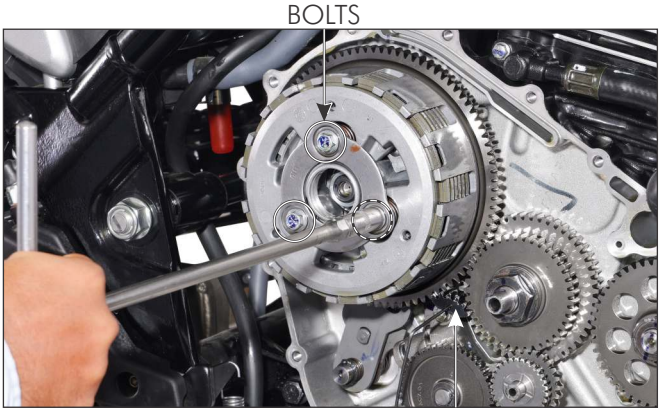
CLUTCH LIFTER BEARING ASSEMBLY

Loosen the clutch lifter plate bolts (Nos.: 3, Size: 10 mm) in a criss-cross pattern in several steps using GPD holder.
Remove the lifter plate bolts.

TOOL

GPD HOLDER
PART NO: 070 HH 198 017

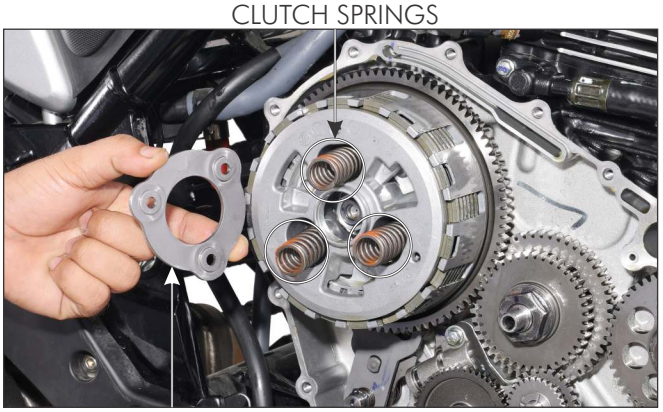
BOLTS



GPD HOLDER

Remove the lifter plate and clutch springs.

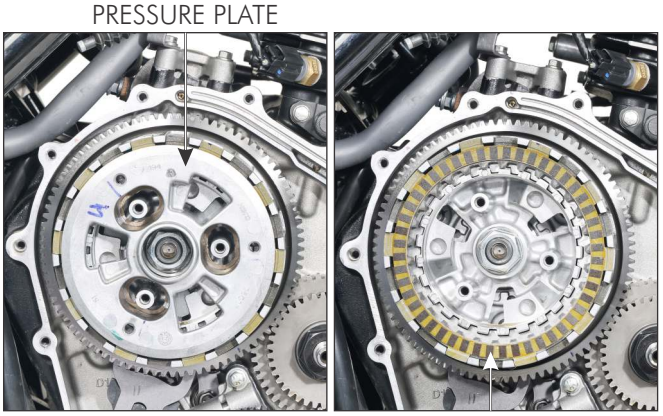
CLUTCH SPRINGS



LIFTER PLATE

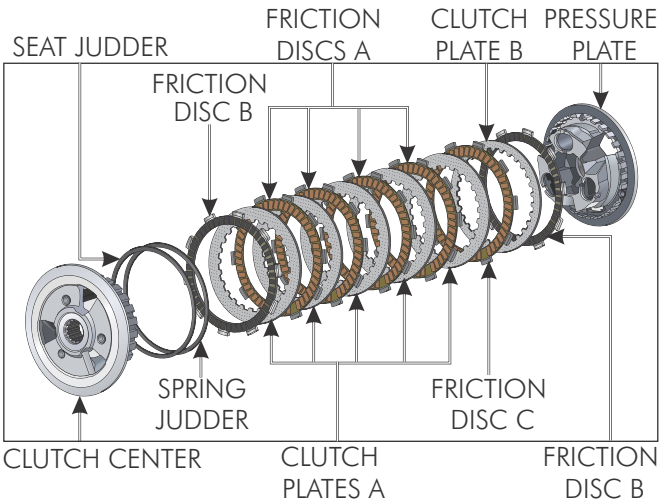
Remove the pressure plate.
Remove the friction disc.

PRESSURE PLATE



FRICTION DISC

Remove the following:
- Pressure plate
- Friction disc B
- Clutch plate B
- Friction disc C
- Clutch plates A and friction discs A.
- Friction disc B
- Spring seat judder and spring judder
- Clutch center



Hold the clutch center with clutch center holder and loosen the clutch center lock nut.

TOOL

CLUTCH CENTER HOLDER
PART NO: HMCL0623RAAA03

Remove the clutch center lock nut and washer.

Remove the thrust washer.

THRUST WASHER

Remove the clutch outer.

CLUTCH OUTER

Remove the needle bearing.

NEEDLE BEARING

Remove the clutch outer guide.

CLUTCH OUTER GUIDE

INSPECTION

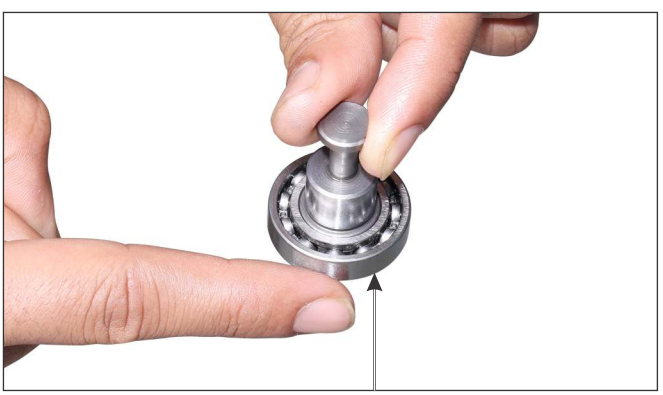
CLUTCH LIFTER PLATE BEARING

Turn the inner race of the lifter bearing with your finger.

The bearing should turn smoothly and quietly.

Also check that the outer race of the bearing fits tightly in the lifter plate.

Replace the bearing if the inner race does not turn smoothly, quietly, or if the outer race fits loosely in the lifter plate.



CLUTCH LIFTER BEARING

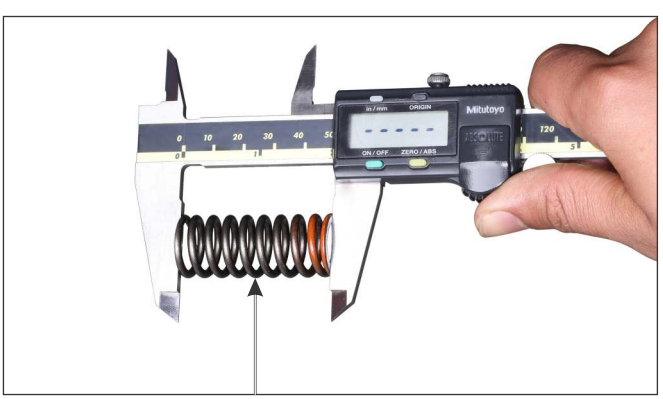
CLUTCH SPRING

Check the clutch spring for fatigue or damage.

Measure the clutch spring free length.

SERVICE LIMIT

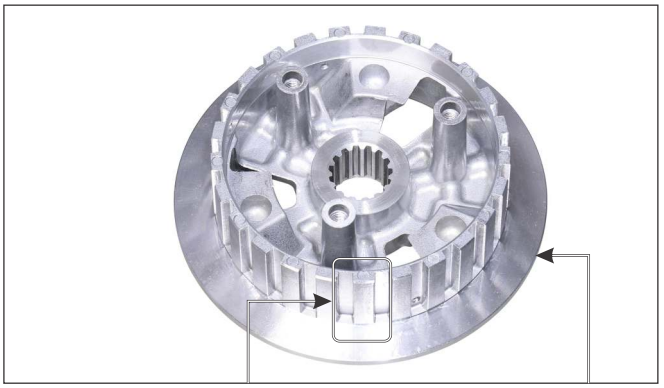
CLUTCH SPRING FREE LENGTH: 50.7 mm



CLUTCH SPRING

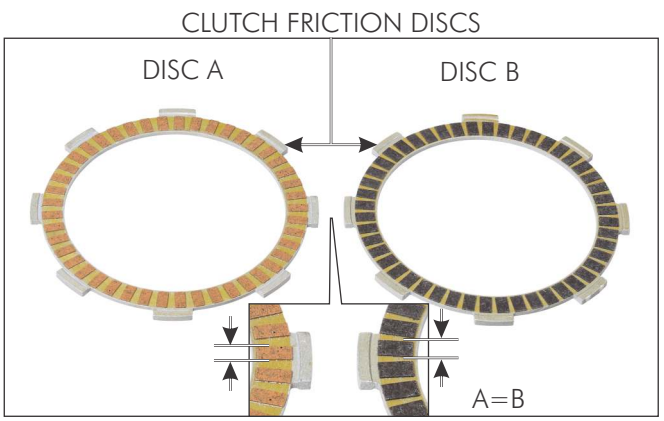
CLUTCH CENTER

Check the grooves of the clutch center for damage or wear caused by the clutch plates.



CLUTCH FRICTION DISC

Check the clutch friction discs for signs of scoring or discoloration.



Measure the thickness of each disc.

SERVICE LIMIT

Disc A: 2.82 mm
Disc B: 2.82 mm
Disc C: 2.82 mm

CLUTCH PLATE

Check the clutch plates for discoloration.

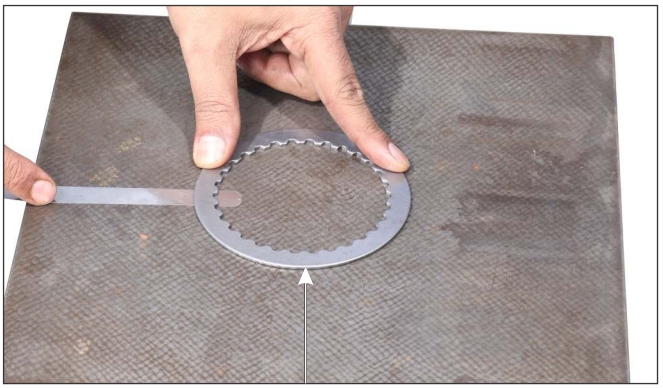
Check the clutch plates for warpage on a surface plate using a feeler gauge.

SERVICE LIMIT

PLATE WARPAGE A: 1.8 mm

PLATE WARPAGE B: 1.78 mm

Warped clutch plates prevent the clutch from disengaging properly.



CLUTCH PLATE

CLUTCH OUTER/OUTER GUIDE

Check the slots in the clutch outer for nicks, cuts or indentations made by the clutch discs.

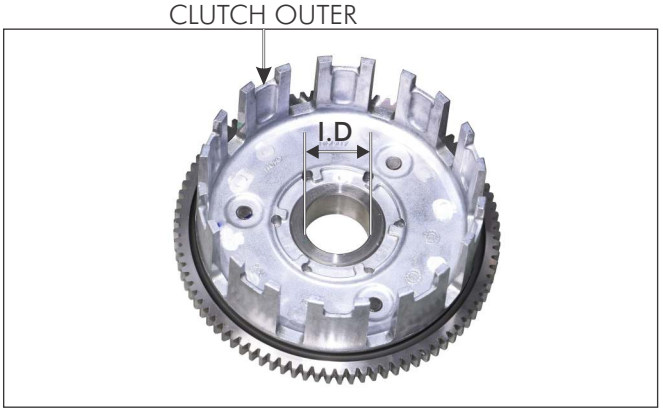
Check the primary driven gear teeth for wear or damage.

Measure the clutch outer I.D.

SERVICE LIMIT

I.D: 33.055 mm

CLUTCH OUTER



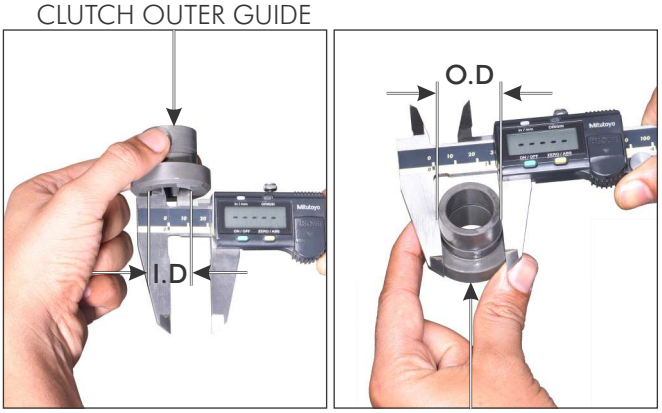
Measure the clutch outer guide I.D and O.D.

SERVICE LIMIT

I.D: 21.039 mm

O.D: 27.929 mm

CLUTCH OUTER GUIDE



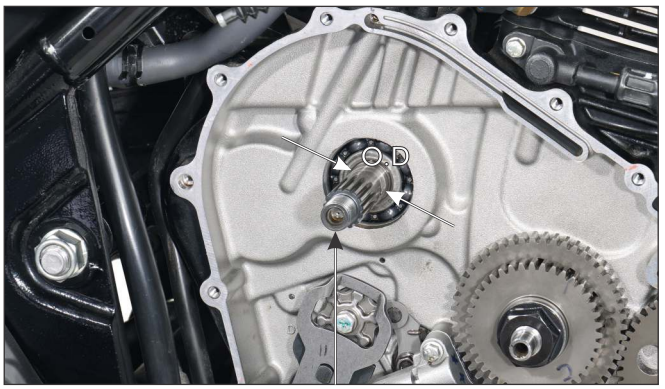
CLUTCH OUTER GUIDE

MAINSHAFT

Measure the mainshaft O.D. at the clutch outer guide.

SERVICE LIMIT

O.D: 27.929 mm



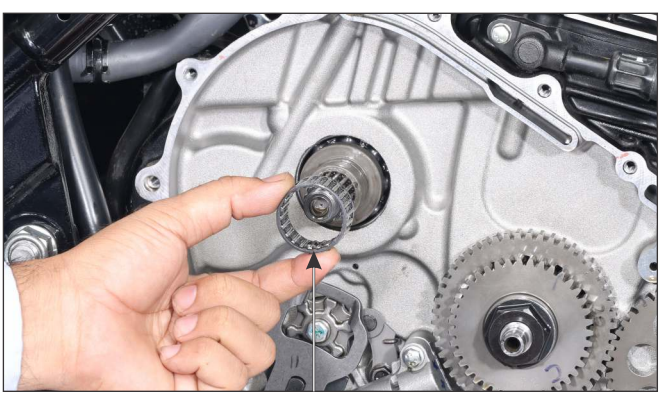
MAINSHAFT

CLUTCH OUTER GUIDE

ASSEMBLY

Apply molybdenum oil solution to the entire surface of the clutch outer guide and install it into the mainshaft.

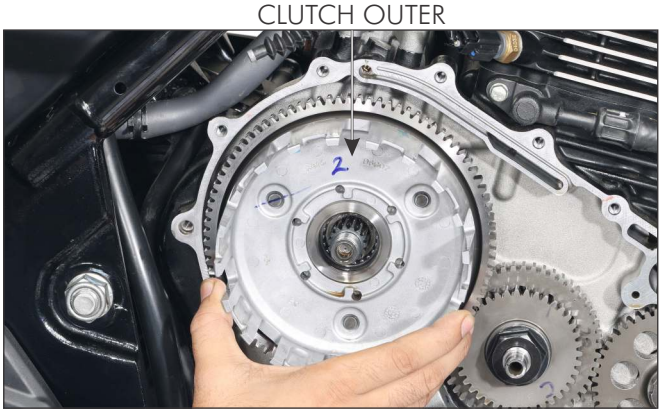
Install the needle bearing.



NEEDLE BEARING

Install the clutch outer.

CLUTCH OUTER

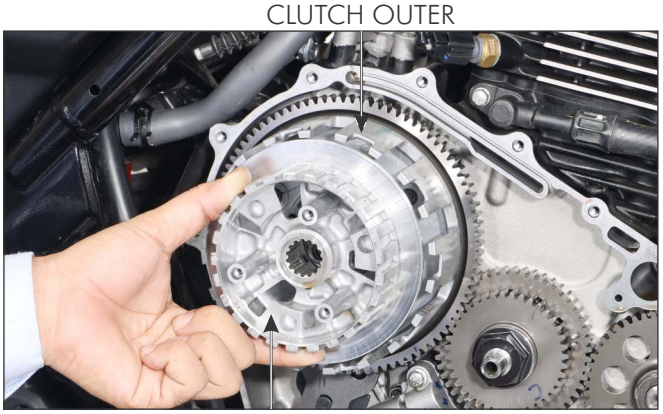


Install the thrust washer.

THRUST WASHER

Install the clutch center into the clutch outer.

CLUTCH OUTER



CLUTCH CENTER

Install the washer and lock nut.

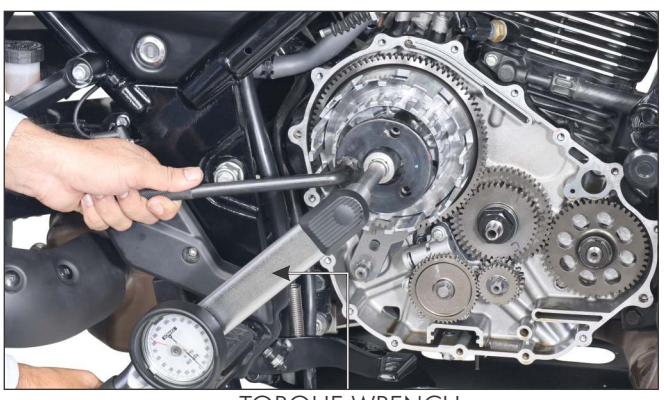
Hold the clutch center with the clutch center holder.
Tighten the clutch center lock nut using the special tool.

TOOL

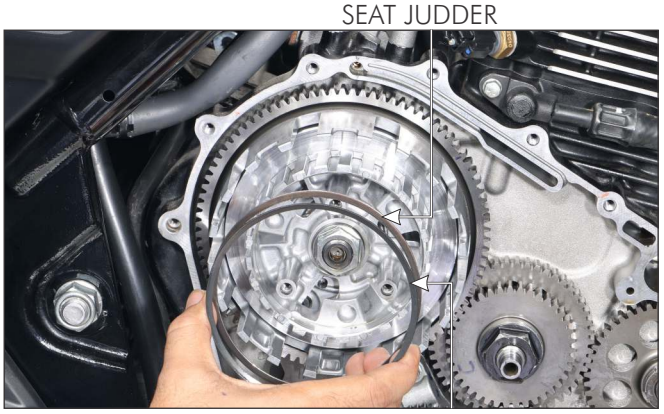
CLUTCH CENTER HOLDER
PART NO: HMCL0623RAAA03

Tighten the clutch center lock nut to the specified torque using torque wrench.

TORQUE
CLUTCH CENTER LOCK NUT: 10.0-12.0 kgf-m



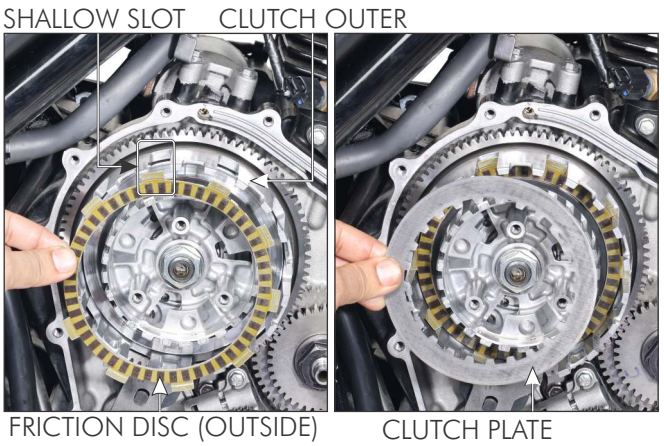
Install the seat judder and spring judder



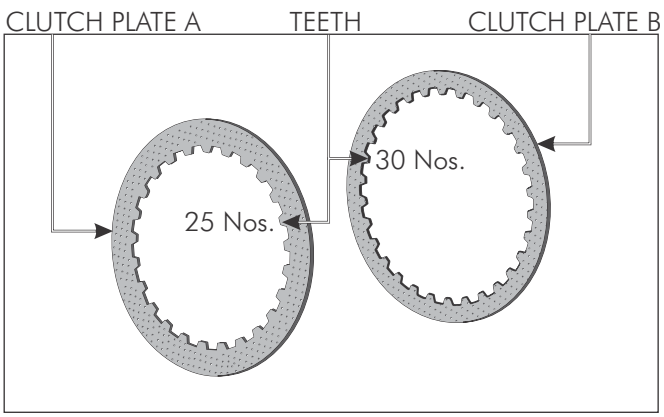
Install the friction discs and clutch plates (please refer the exploded view as shown below).

NOTE

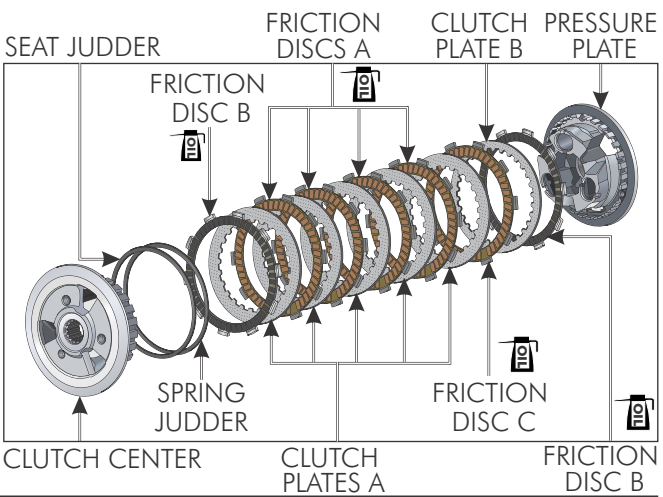
- Install the tabs of clutch friction disc (outside) into the shallow slots in the clutch outer.
- Coat the clutch friction discs with clean engine oil.



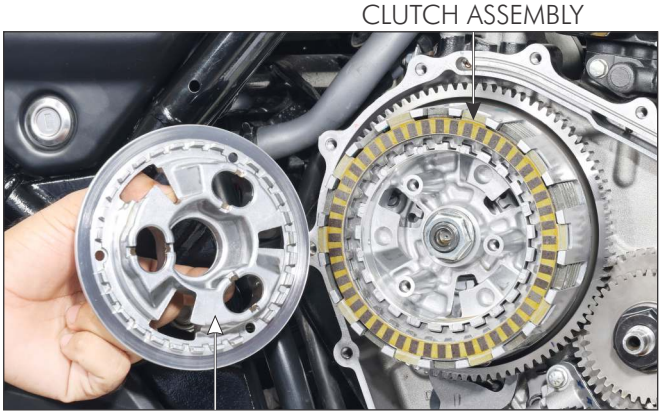
Identification of clutch plates
Number of teeth's :
-Clutch plate A - 25 Nos
-Clutch plate B - 30 Nos



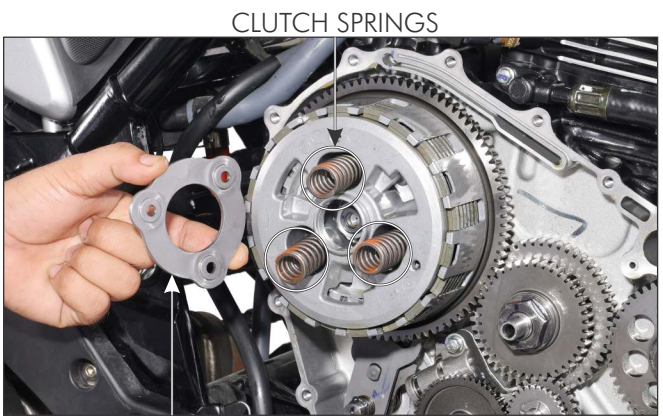
Assemble seat judder, spring judder, friction disc B, clutch plates A and friction discs A, friction disc C, clutch plate B, friction disc B and pressure plate onto the clutch center.



Install the pressure plate into the clutch assembly.



Install the clutch springs and lifter plate.



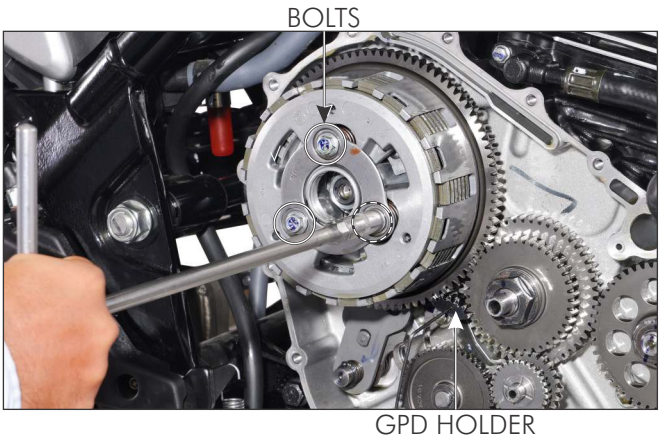
Install and tighten the lifter plate bolts (Nos.: 3, Size: 10 mm) in a criss-cross pattern in several steps, using GPD holder.

TOOL

GPD HOLDER
PART NO: 070 HH 198 017

TORQUE

CLUTCH LIFTER PLATE BOLT: 1.0-1.4 kgf-m

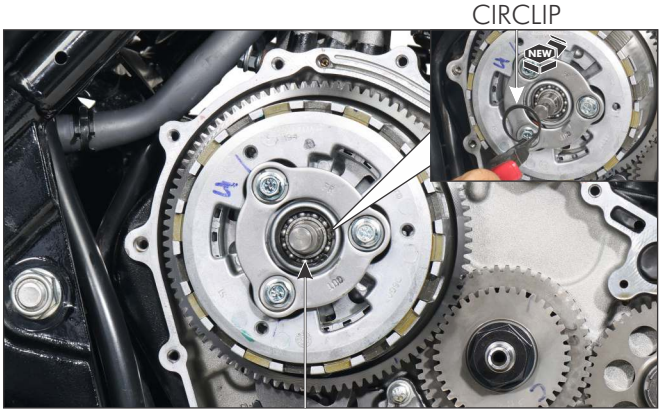


Install the clutch lifter plate bearing assembly.

CLUTCH LIFTER BEARING ASSEMBLY

Install the new circlip.
Install the right crankcase cover (page 9-7).

CIRCLIP



CLUTCH LIFTER BEARING ASSEMBLY

PRIMARY DRIVE GEAR

REMOVAL

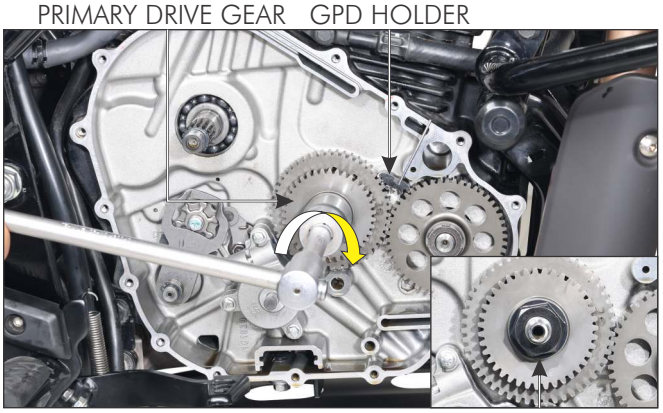
Remove the clutch assembly (page 9-8).
Remove the oil pump driven gear (page 4-3).
Install the GPD holder between the balancer drive and driven gear as shown, and loosen the primary drive gear lock nut by rotating it in clockwise direction.

TOOL

GPD HOLDER
PART NO: 070 HH 198 017

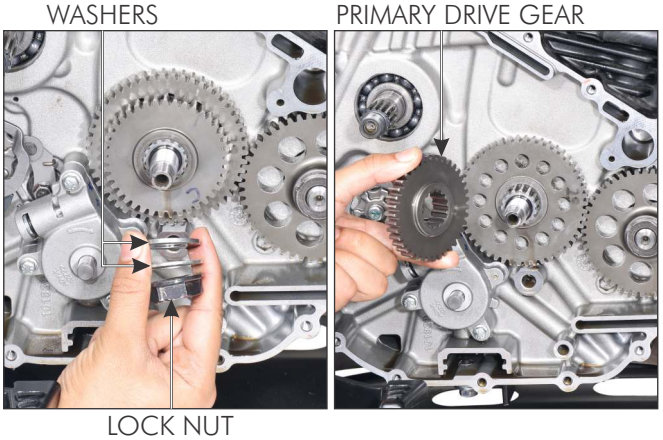
Remove the GPD holder.

PRIMARY DRIVE GEAR GPD HOLDER



LOCK NUT

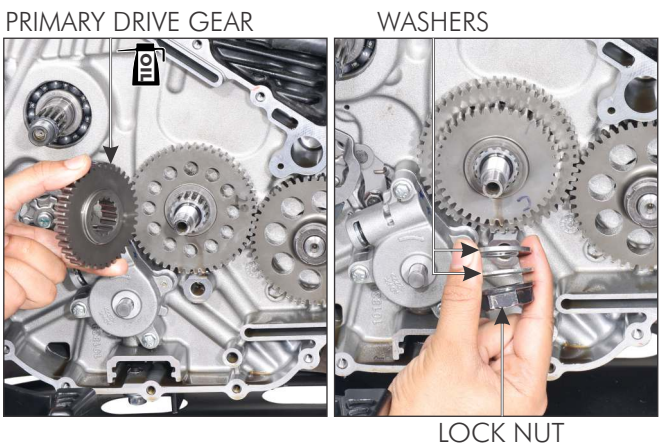
Remove the primary drive gear lock nut and washers.



INSTALLATION

Apply clean engine oil to the primary drive gear.

Install the primary drive gear.



Install the GPD holder between the balancer drive and driven gear as shown.

TOOL

GPD HOLDER

PART NO: 070 HH 198 017

Tighten the primary drive gear lock nut by rotating it in anticlockwise direction to the specified torque.

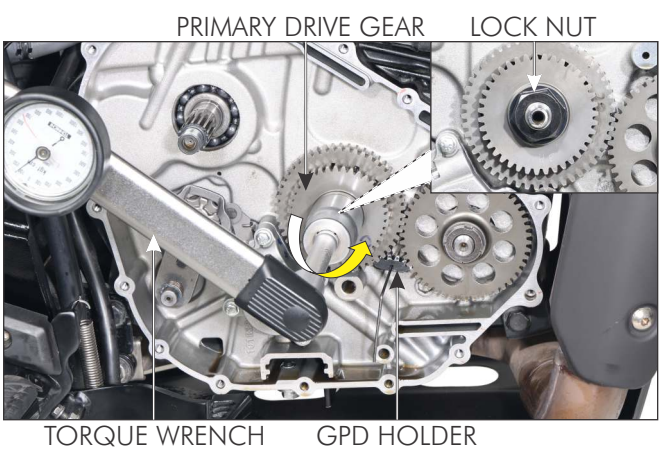
TORQUE

PRIMARY DRIVE GEAR LOCK NUT: 13.0-14.0 kgf-m

Remove the GPD holder.

Install the oil pump drive gear (page 4-11).

Install the clutch assembly (page 9-15).



BALANCER DRIVE GEAR/ BALANCER DRIVEN GEAR

REMOVAL

Remove the oil pump assembly (page 4-3).

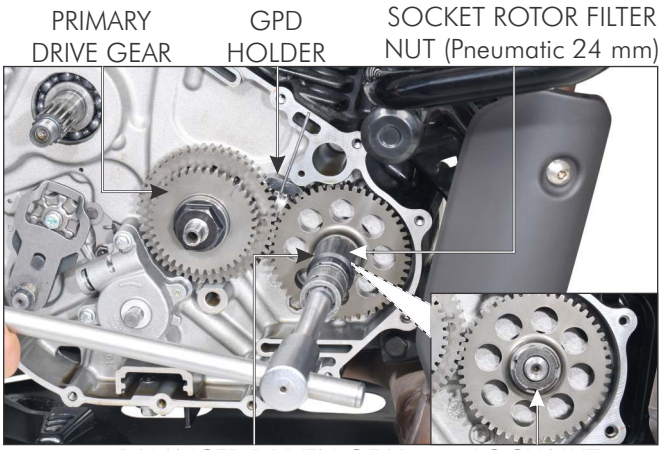
Remove the primary drive gear (page 9-20).

Install the GPD holder between the balancer drive gear and balancer driven gear as shown, and loosen the driven gear lock nut.

TOOL

SOCKET ROTOR FILTER NUT (Pneumatic 24mm)
PART NO: 070 HH 198 029
GPD HOLDER
PART NO: 070 HH 198 017

Remove the GPD holder.



Remove the balancer drive gear by using the special tool as shown.

TOOL

BALANCER DRIVE GEAR PULLER
PART NO: HMCL0423ACAA02

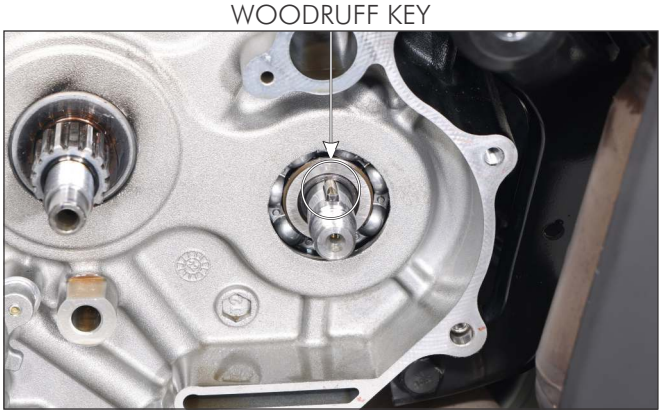
Remove the balancer driven gear by removing the lock nut.

Remove the woodruff key

NOTE

When remove the woodruff key, be careful not to damage the key groove and balancer shaft.

WOODRUFF KEY



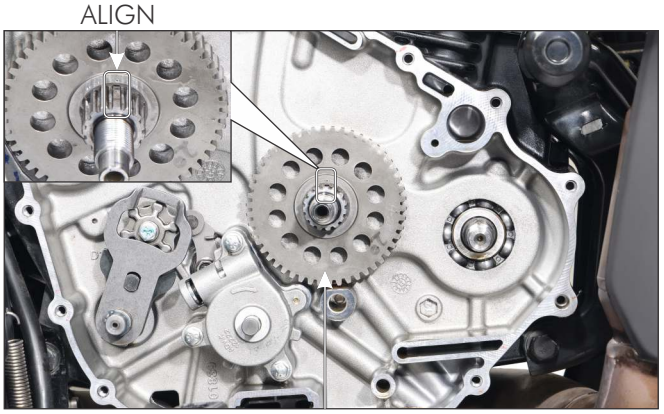
INSTALLATION

Install the balancer drive gear.

NOTE

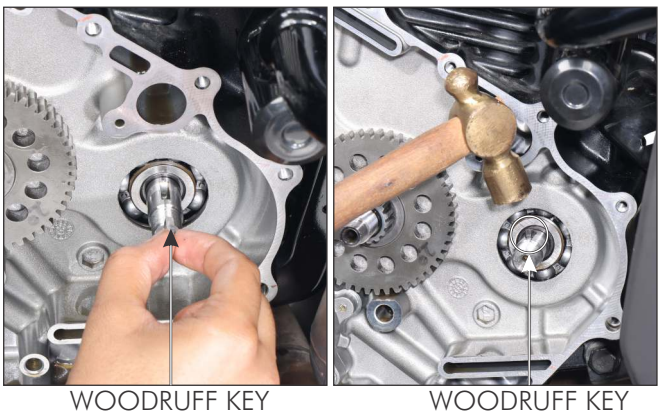
While installing the balancer drive gear align the balancer drive gear punch mark with crankshaft flat teeth as shown.

ALIGN



BALANCER DRIVE GEAR

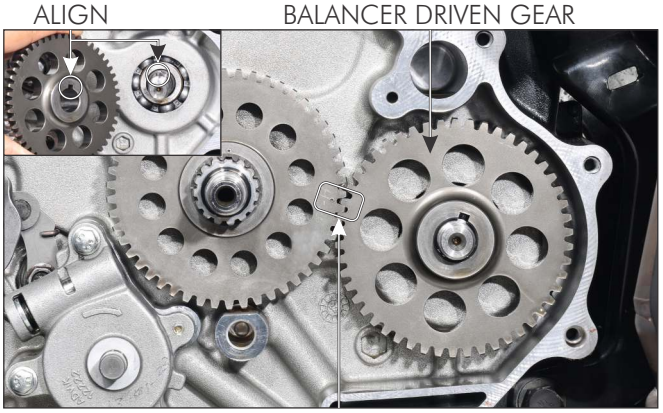
Install the woodruff key onto the balancer gear shaft.



WOODRUFF KEY WOODRUFF KEY

Install the balancer driven gear, aligning the groove with the woodruff key and punch mark on balancer shaft.

Aligning the punch marks of balancer drive gear and balancer driven gear.



Install and hand tighten the driven gear lock nut.

Install the GPD holder between the balancer drive and balancer driven gear, and tighten the driven gear lock nut to the specified torque.

TOOL

SOCKET ROTOR FILTER NUT (Pneumatic 24mm)
PART NO: 070 HH 198 029
GPD HOLDER
PART NO: 070 HH 198 017

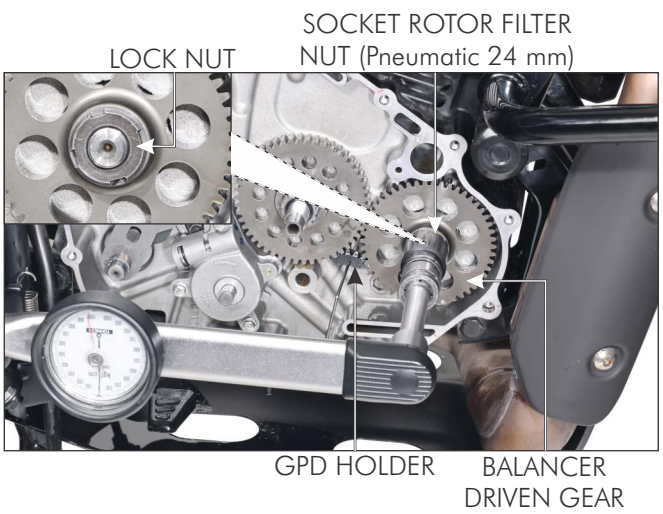
TORQUE

BALANCER DRIVEN GEAR LOCK NUT: 6.0-7.0 kgf-m

Remove the GPD holder.

Install the oil pump assembly (page 4-9).

Install the primary drive gear (page 9-21).



GEARSHIFT LINKAGE

REMOVAL

Remove the following:

- Gearshift pedal (page 6-5).
- Oil pump assembly (page 4-3).
- Clutch assembly (page 9-8).

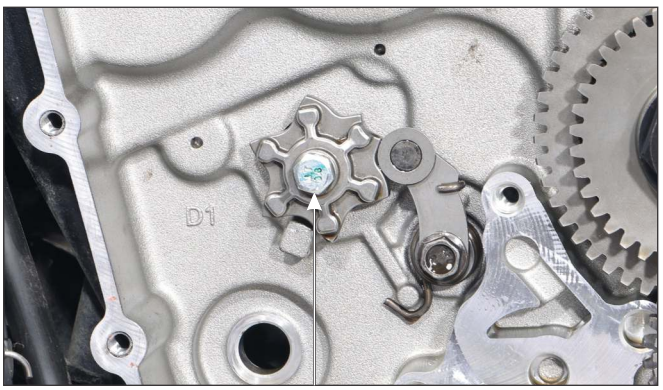
NOTE

Apply multipurpose grease to the gearshift spindle serrated area.

Pull the gearshift spindle out of the crankcase.

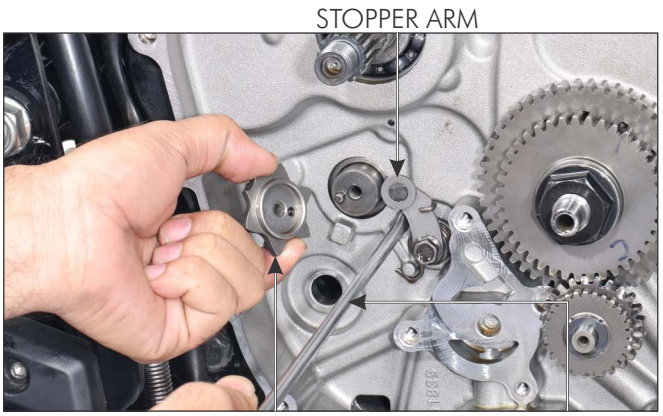
Remove the thrust washer.

Remove the shift drum stopper plate bolt.

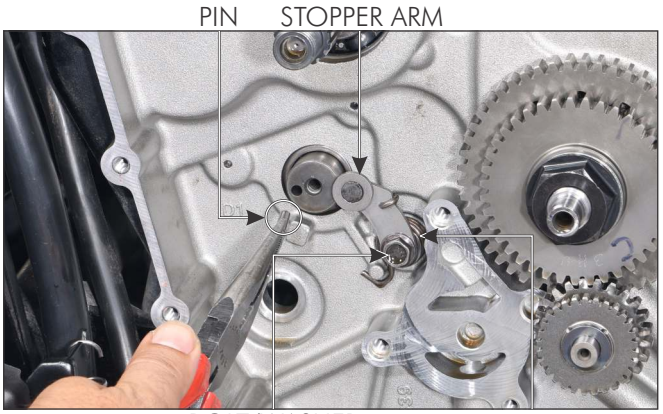


SHIFT DRUM STOPPER PLATE BOLT

Hold the stopper arm with a screw driver and remove the shift drum stopper plate.

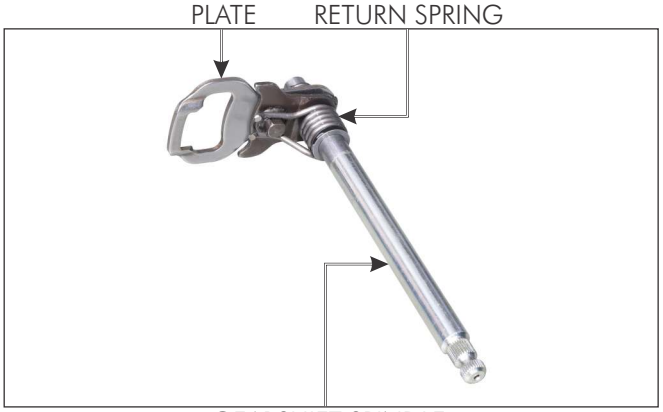


Remove the following:
- Pin from the shift drum
- Stopper arm bolt
- Stopper arm
- Washer
- Return spring



INSPECTION

Check the gearshift spindle for wear or bend.
Check the spindle plate for wear, damage or deformation.
Check the return spring for fatigue or damage.

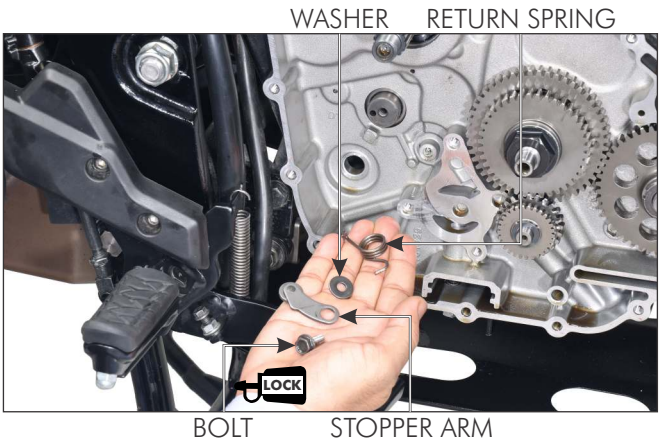


INSTALLATION

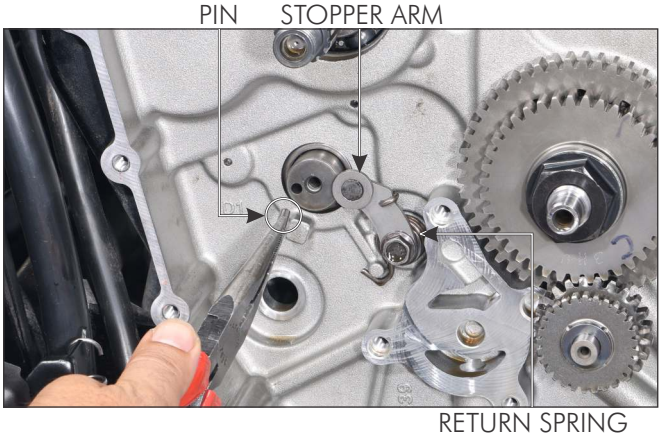
Apply locking agent to the stopper arm bolt threads.
Install the return spring, washer, stopper arm and bolt, and tighten the bolt to the specified torque.

TORQUE

SHIFT DRUM STOPPER PLATE ARM BOLT: 0.8-1.2 kgf-m



Hook the return spring to the stopper arm groove.
Install the pin into the shift drum hole.



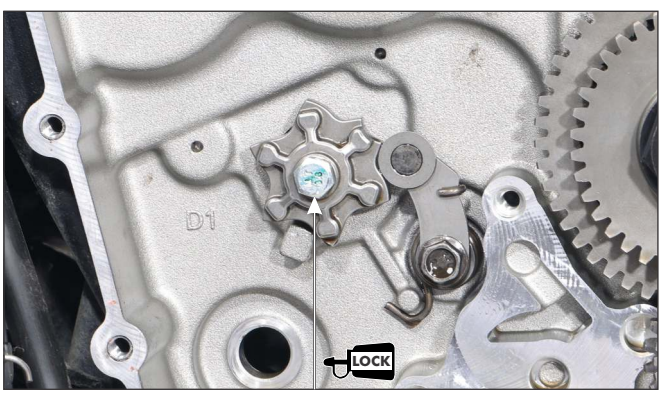
Hold the stopper arm with a screw driver and install the shift drum stopper plate, aligning the pin hole with the pin.

Apply locking agent to the shift drum stopper plate bolt threads.

Install the shift drum stopper plate bolt and tighten it.

TORQUE

SHIFT DRUM STOPPER PLATE BOLT: 1.0-1.4 kgf-m



Apply clean engine oil to the gearshift spindle journal rotating area.

Install the thrust washer onto the gearshift spindle and insert the spindle into the crankcase.

NOTE

Apply multipurpose grease to the gearshift spindle serrated area.

Install the spindle, while aligning the return spring ends with the stopper pin.

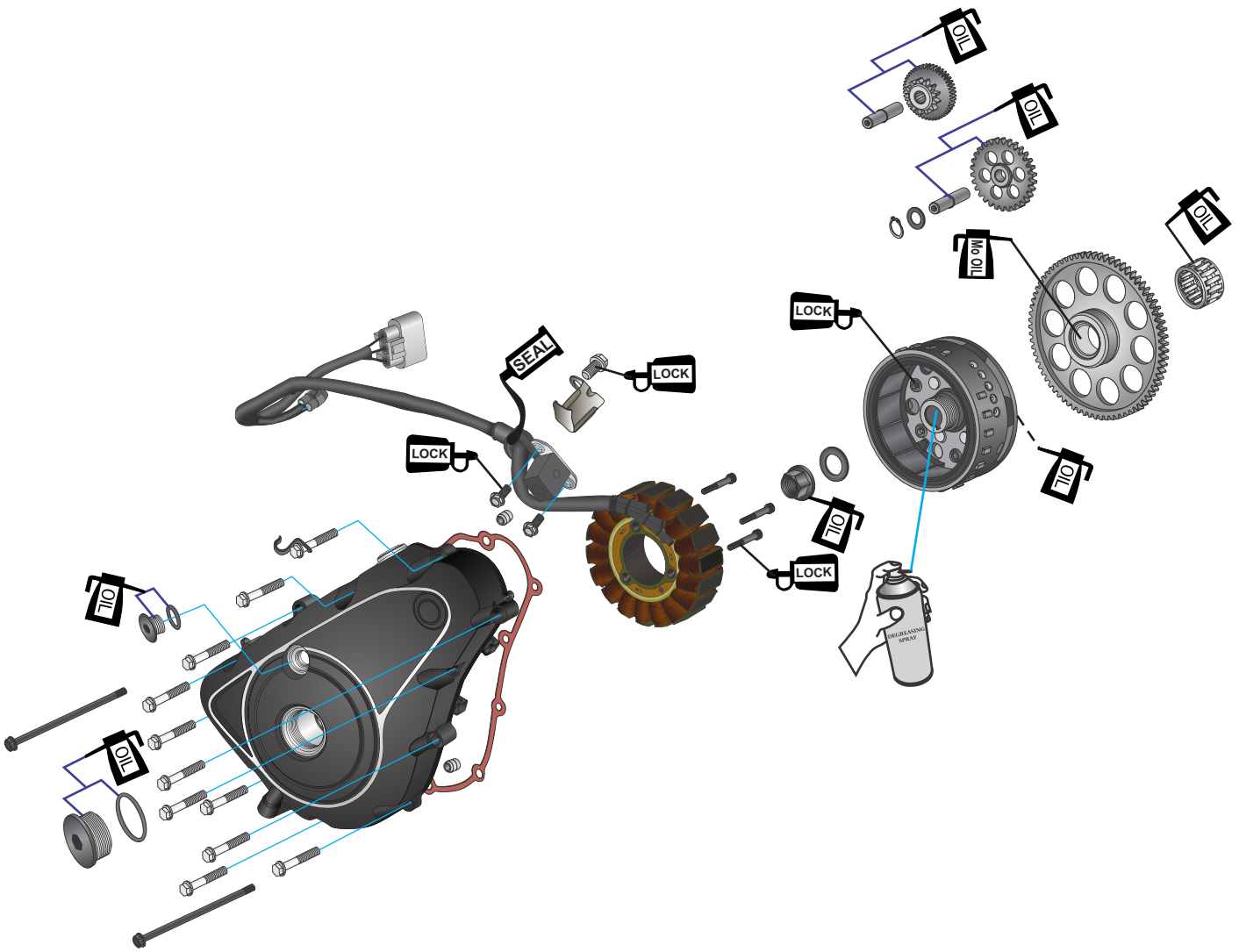
Install the following:

- Clutch assembly (page 9-15).
- Oil pump assembly (page 4-9).
- Gearshift pedal (page 6-9).

ALIGN

GEARSHIFT SPINDLE

SYSTEM DIAGRAM



ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION

GENERAL

- This section covers the removal and installation of the starter reduction gear, alternator stator, flywheel and starter clutch.
- These services can be done with the engine installed in the frame.
- See page 17-14 for alternator stator inspection.

SPECIFICATIONS

ALTERNATOR/STARTER CLUTCH

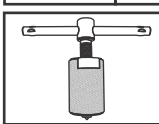
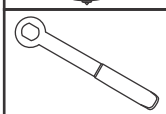
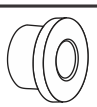
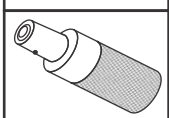
ITEM		STANDARD	SERVICE LIMIT
Gear reduction	I.D	10.0-10.022 mm	10.052 mm
	Shaft O.D	9.987-9.978 mm	9.948 mm
Starter driven gear	I.D	10.013-10.028 mm	10.058 mm
	O.D	9.987-9.978 mm	9.948 mm

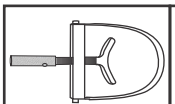
TORQUE VALUES

FLYWHEEL LOCK NUT	**: 9.0-11.0 kgf-m**
LEFT CRANKCASE COVER BOLT	**: 0.8-1.0 kgf-m**
WIRE GUIDE BOLT	**: 0.8-1.2 kgf-m**
CKP SENSOR BOLT	**: 0.8-1.2 kgf-m**
STARTER ONE WAY CLUTCH BOLT	**: 1.0-1.2 kgf-m**
STATOR ALLEN KEY BOLT	**: 0.8-1.2 kgf-m**

For other nuts, bolts, fasteners etc. refer to standard torque values **(SECTION-1)**.

SPECIAL TOOLS

	**FLYWHEEL PULLER PART NO: 070 HH KTC 004**
	**FLYWHEEL PULLER HOLDER PART NO: 070 HH KRYH 002**
	**DRIVER OUTER (32X35) PART NO : 070 HH KFN 010**
	**HANDLE BEARING DRIVER PART NO: 070 HH KFN 008**

	**MAGNET HOLDER (CLAMP TYPE) PART NO: 070 HH KRYH 004**
	**STARTER DRIVEN GEAR BEARING REMOVER (26X34) PART NO : HMCL0623RAAA06**
	**PILOT DRIVER, 25 mm PART NO: HMCL0423ACRD01**

TROUBLESHOOTING

Engine does not turn

- Faulty starter clutch
- Faulty starter reduction, idle, driven gears
- Electric starter system malfunction

LEFT CRANKCASE COVER REMOVAL

Remove the right side tank cover (page 2-6).

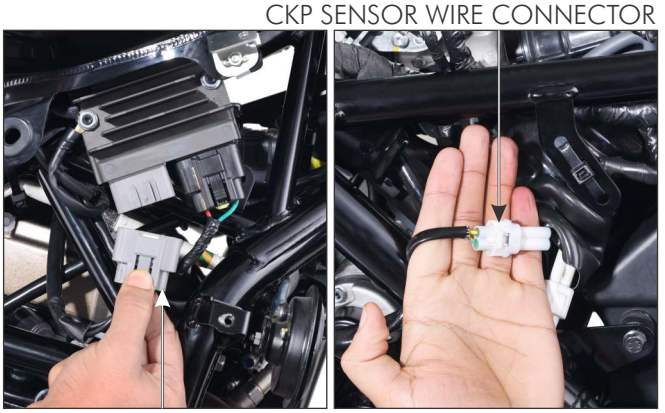
Disconnect the alternator 3P connector from the regulator/rectifier.

Remove the fuel tank (page 2-12).

Remove the electrical part mount bracket (page 7-4).

Slide the boot and disconnect the CKP sensor wire connector.

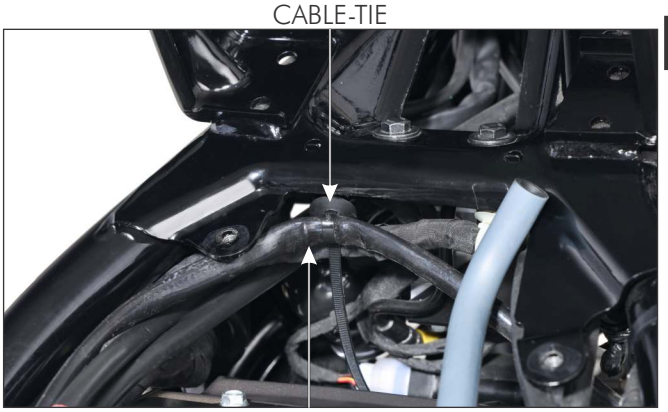
CKP SENSOR WIRE CONNECTOR



ALTERNATOR CONNECTOR

Dismount the ACG wire from the cable tie mounted on the frame.

CABLE-TIE

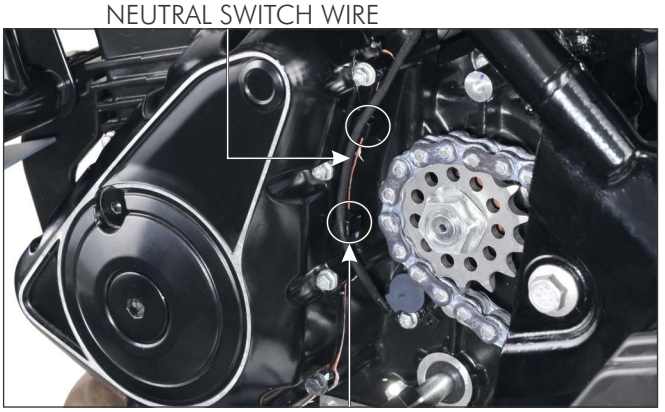


ACG WIRE

Remove the left crankcase rear cover (page 6-4).

Remove the neutral switch wire from the left crankcase cover grooves.

NEUTRAL SWITCH WIRE



GROOVES

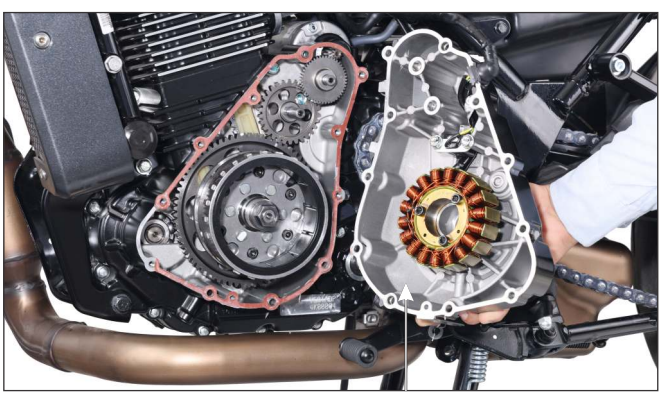
Loosen the left crankcase cover bolts in a criss-cross pattern in several steps.

Remove the left crankcase cover bolts (Nos.: 11).

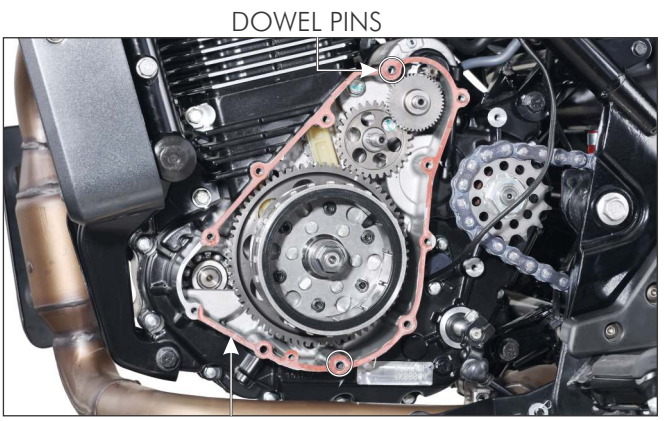
NOTE

- Loosen the left crankcase cover bolts in a criss-cross pattern.
- The left crankcase cover (stator) is magnetically attached to the flywheel, be careful during removal.

Remove the left crankcase cover.

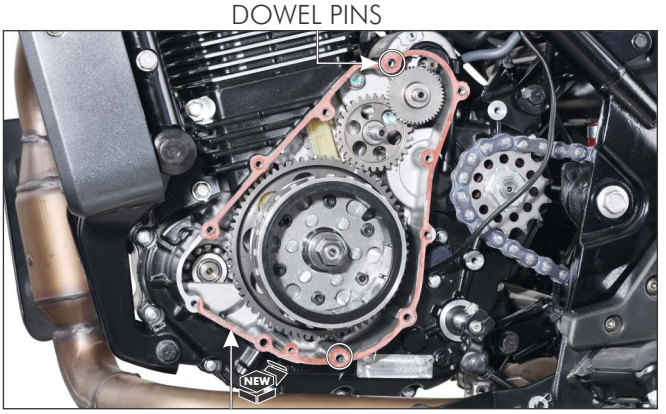


Remove the dowel pins and gasket.

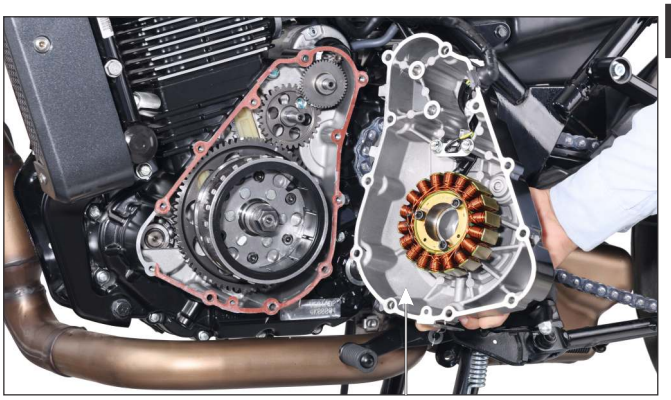


INSTALLATION

Install the dowel pins and new gasket.



Install the left crankcase cover.



Install the left crankcase cover being careful not to pinch the neutral switch and side stand switch wires. Tighten the bolts (Nos.:11) in a criss-cross pattern in several steps.

NOTE

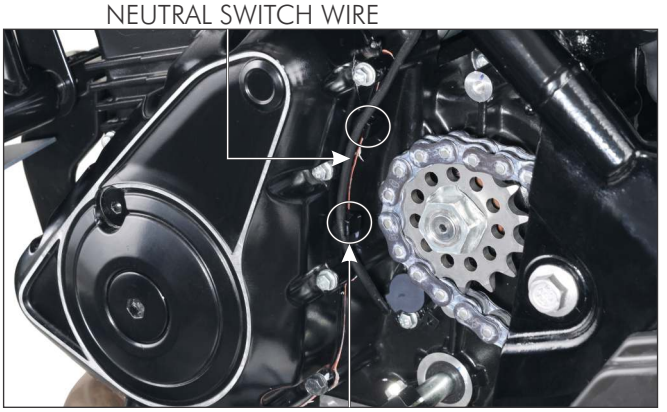
- The left crankcase cover (stator) is magnetically attached to the flywheel, be careful during installation.
- Tighten the left crankcase cover bolts in a criss-cross pattern.

TORQUE

LEFT CRANKCASE COVER BOLT: 0.8-1.0 kgf-m

Route the neutral switch wire to the left crankcase grooves.
Install the left crankcase rear cover (page 6-5).

NEUTRAL SWITCH WIRE



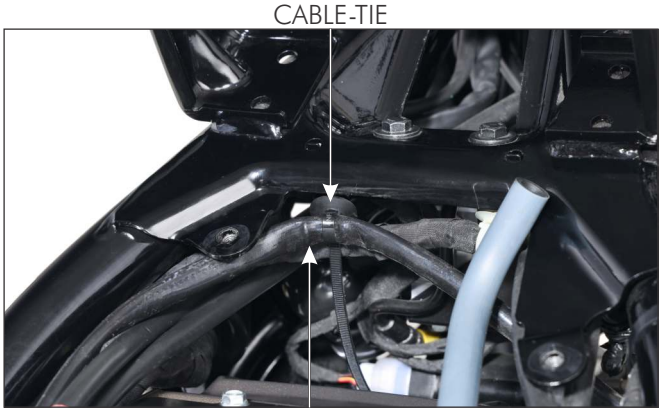
GROOVES

Mount the ACG wire with cable tie mounted on the frame.

NOTE

Route the alternator wire properly.

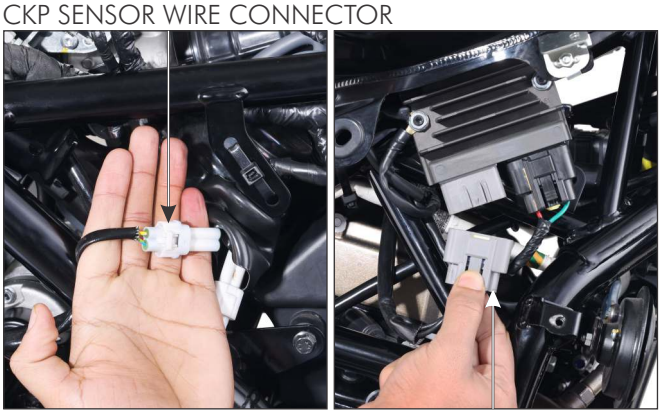
CABLE-TIE



ACG WIRE

Connect the CKP sensor wire connector and slide the boot on the connectors properly.
Install the electrical part mount bracket (page 7-4).
Install the fuel tank (page 2-14).
Connect the alternator 3P connector to the regulator/rectifier.
Install the right side tank cover (page 2-6).
Fill the crankcase with recommended engine oil to the proper level (page 3-13).

CKP SENSOR WIRE CONNECTOR



ALTERNATOR CONNECTOR

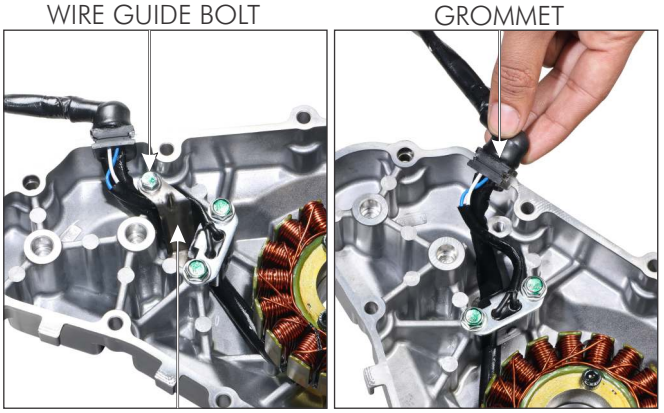
STATOR/CKP SENSOR

REMOVAL

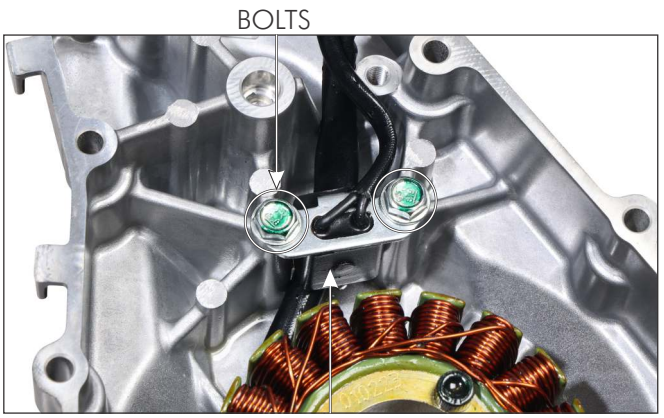
Remove the left crankcase cover (page 10-2).

Remove the wire guide by removing the bolt (No.: 1).

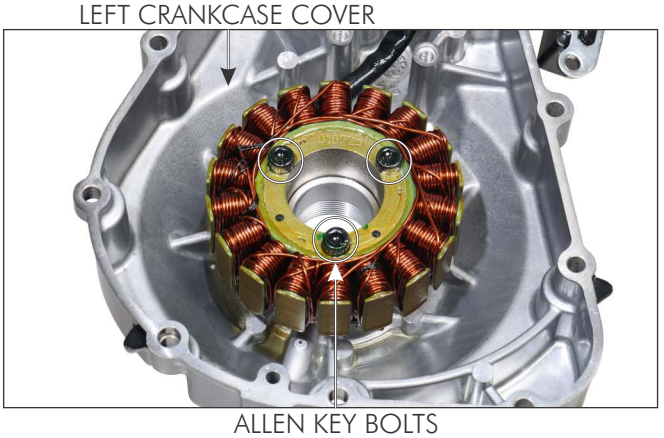
Remove the grommet from the left crankcase cover.



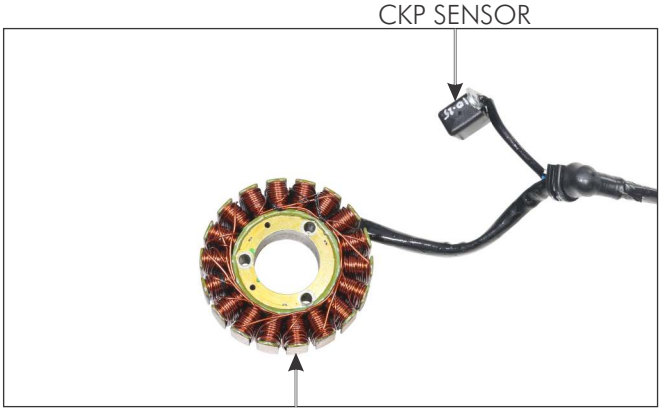
Remove the CKP sensor by removing the bolts (Nos.: 2).



Remove the stator allen key bolts (Nos.: 3) from the left crankcase cover.



Remove the stator assembly. Replace if necessary.



INSTALLATION

Install the stator to left crankcase cover.

Clean and apply locking agent to the stator mounting allen key bolts threads.

Install and tighten the stator allen key bolts to the specified torque.

TORQUE

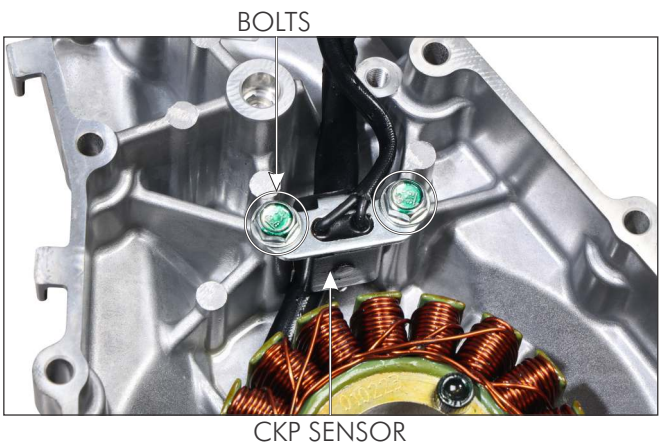
STATOR ALLEN KEY BOLT: 0.8-1.2 kgf-m

Install the CKP sensor.

Install and tighten the CKP sensor bolts (Nos.: 2) to the specified torque.

TORQUE

CKP SENSOR BOLT: 0.8-1.2 kgf-m



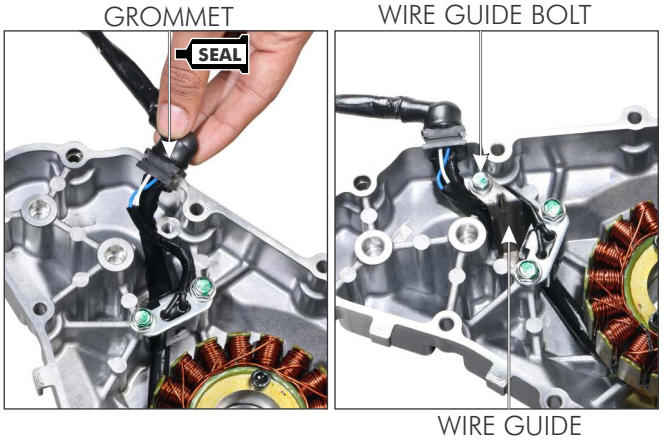
Apply liquid sealant to the wire grommet seating surface and install the grommet into the groove.

Install the wire guide bolt (No.: 1) to the specified torque.

TORQUE

WIRE GUIDE BOLT: 0.8-1.2 kgf-m

Install the left crankcase cover (page 10-3).

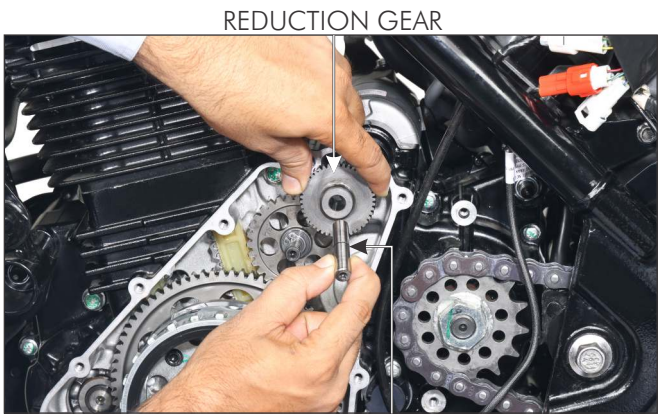


FLYWHEEL/STARTER DRIVEN GEAR

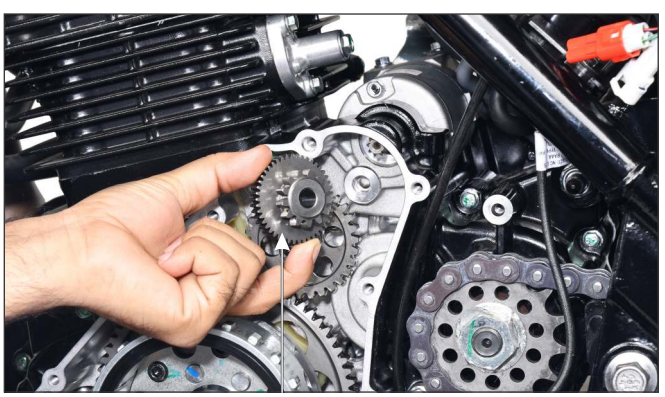
REMOVAL

Remove the left crankcase cover (page 10-2).

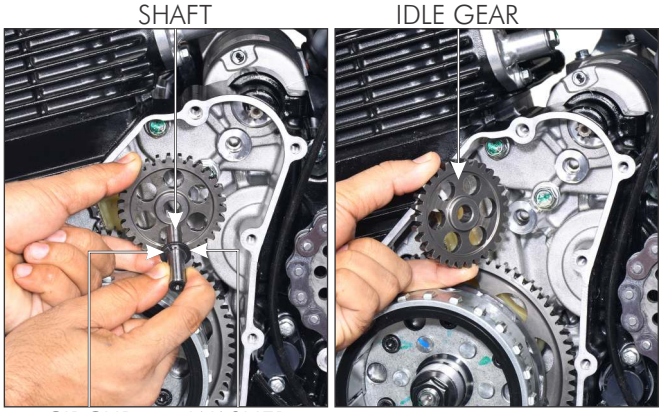
Remove the starter reduction gear shaft.



Remove the starter reduction gear.



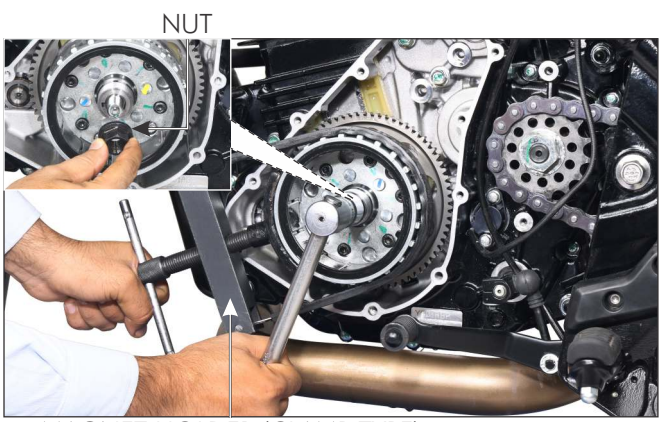
Remove the idle gear shaft, circlip, washer and idler gear.



Hold the flywheel with the magnet holder clamp type and remove the flywheel lock nut.

TOOL

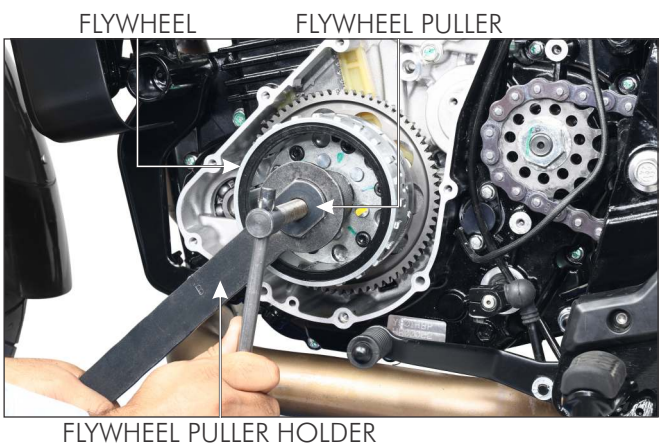
MAGNET HOLDER (CLAMP TYPE)
PART NO: 070 HH KRYH 004



Remove the flywheel using the flywheel puller.

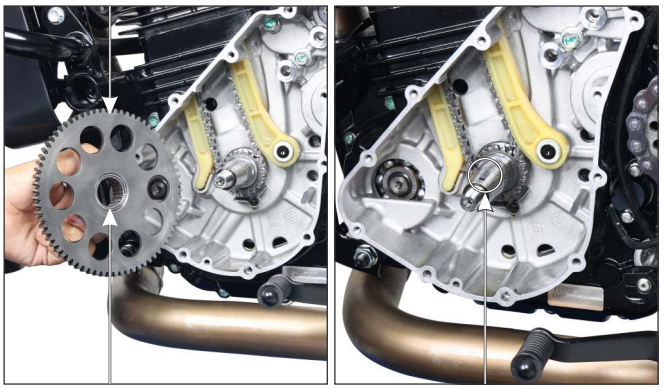
TOOL

FLYWHEEL PULLER
PART NO: 070 HH KTC 004
FLYWHEEL PULLER HOLDER
PART NO: 070 HH KRYH 002



Remove the starter driven gear with needle bearing.
Remove the woodruff key.

STARTER DRIVEN GEAR



NEEDLE BEARING WOODRUFF KEY

STARTER DRIVEN GEAR/STARTER CLUTCH

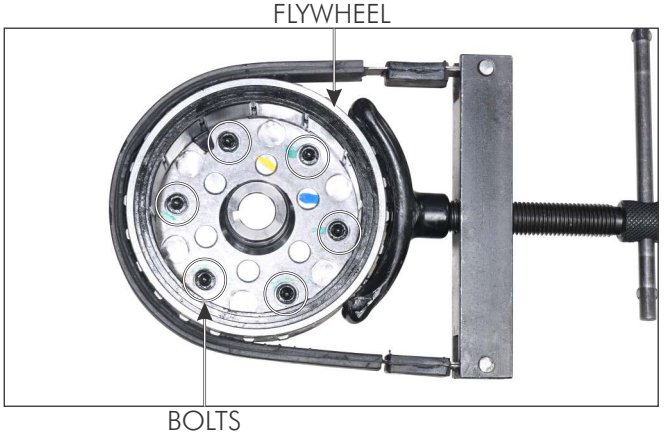
DISASSEMBLY

Remove the starter one way clutch socket bolts while holding the flywheel.

NOTE

Use flywheel holder (clamp type) for holding the flywheel.

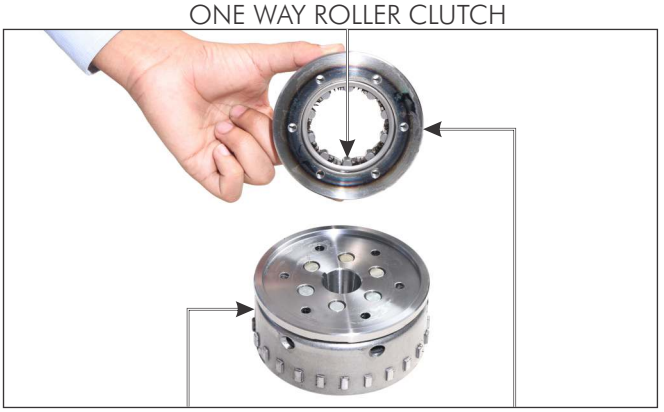
FLYWHEEL



BOLTS

Remove the starter clutch outer assembly.

ONE WAY ROLLER CLUTCH



FLYWHEEL CLUTCH OUTER ASSEMBLY

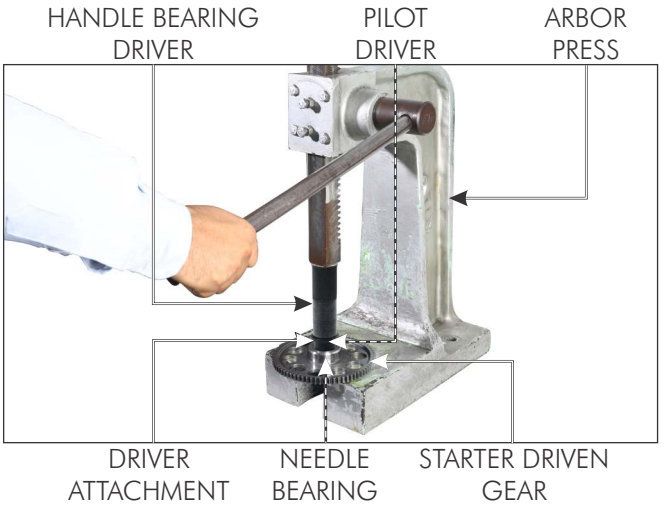
Remove the needle bearing from starter driven gear by using the arbor press and special tools as shown in the image.

TOOL

STARTER DRIVEN GEAR BEARING REMOVER (26X34)
PART NO : HMCL0623RAAA06

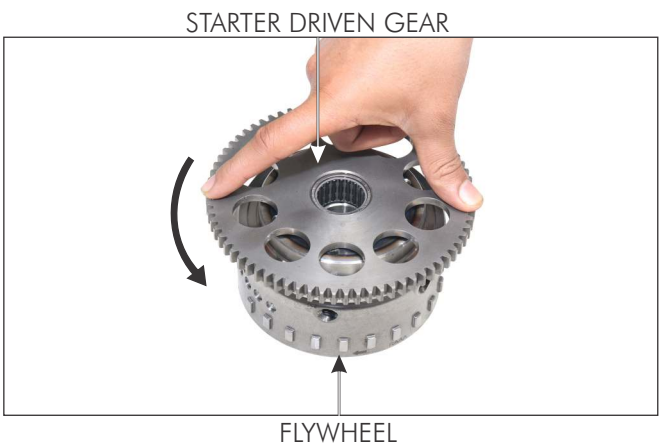
PILOT DRIVER, 25 mm
PART NO: HMCL0423ACRD01

HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008

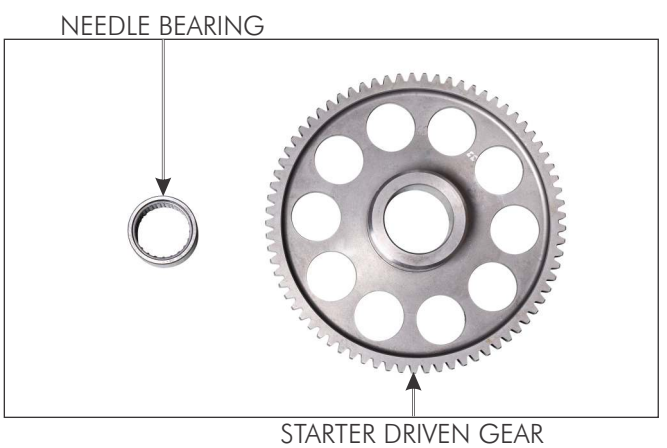


INSPECTION

Check that the starter driven gear turns freely in counter clockwise direction and locks up in clockwise direction.



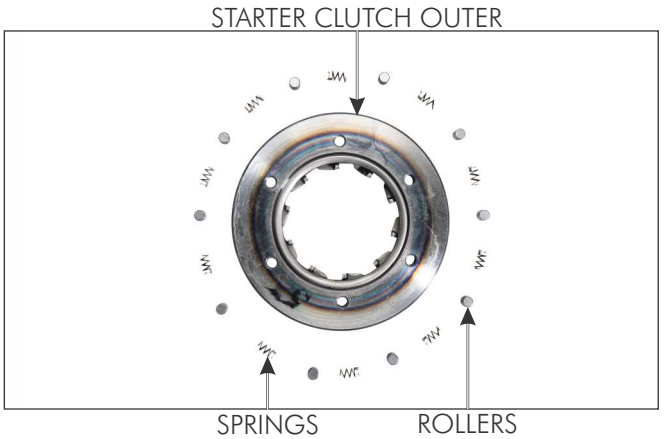
Check the roller contact surface for wear or damage.
Check the needle bearing for abnormal wear or damage.



Remove the one-way clutch rollers, springs and starter clutch outer.

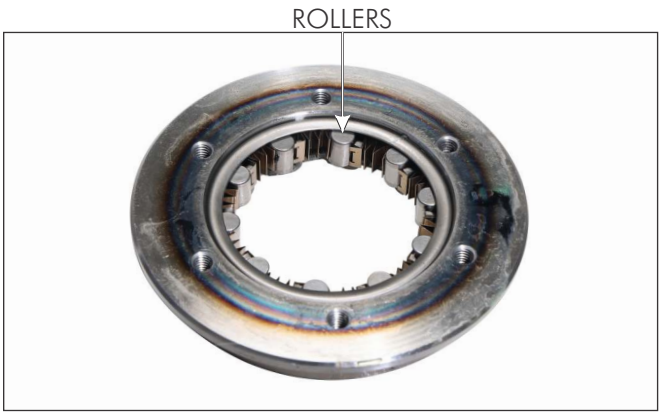
Check the one-way clutch rollers, springs, starter clutch outer for wear or damage.

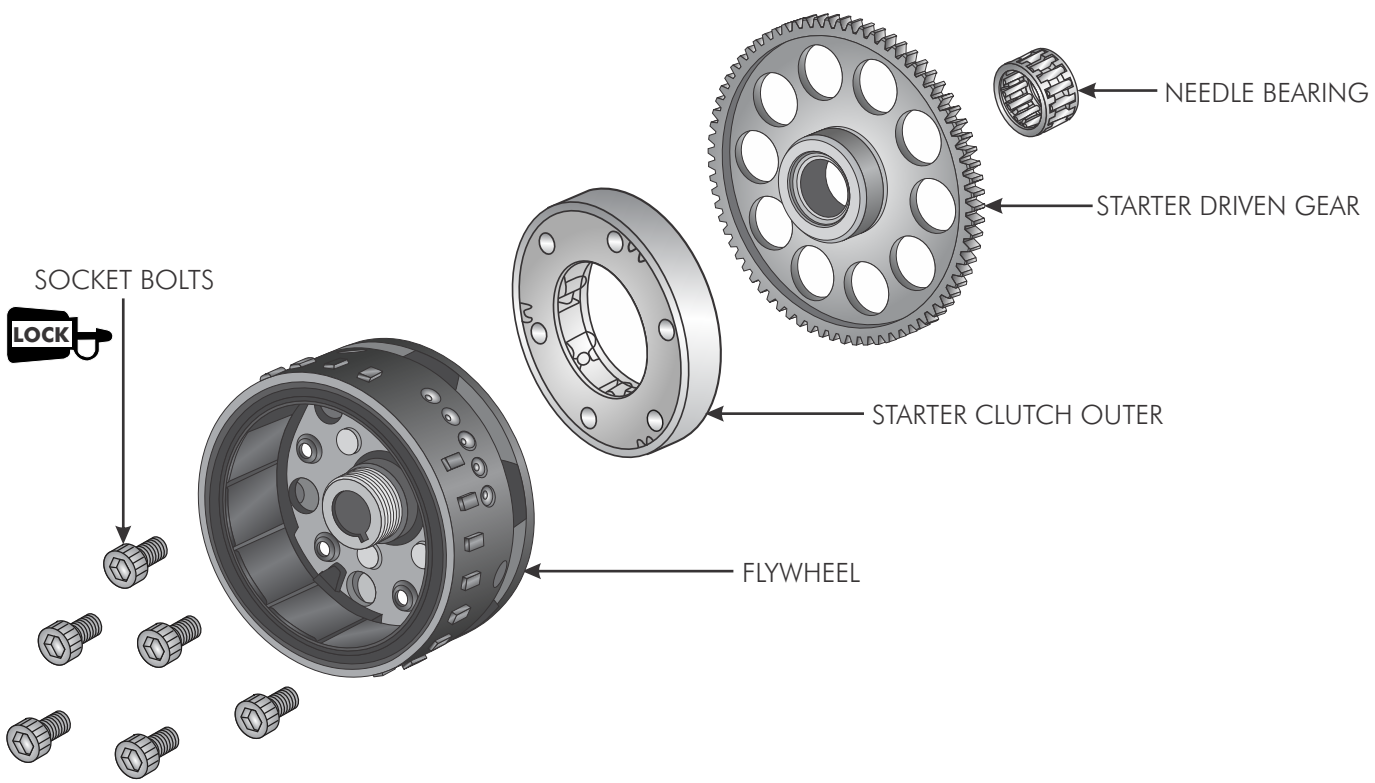
If damaged replace the starter clutch outer as an assembly.



ASSEMBLY

Install the springs and one-way clutch rollers to the starter clutch outer as shown.





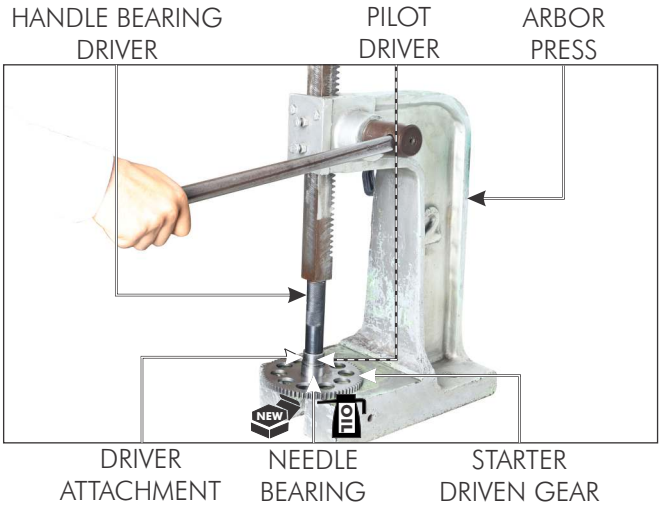
Apply clean engine oil to the new needle bearing.
Install the needle bearing into the starter driven gear by using the arbor press and special tools as shown in the image.

TOOL

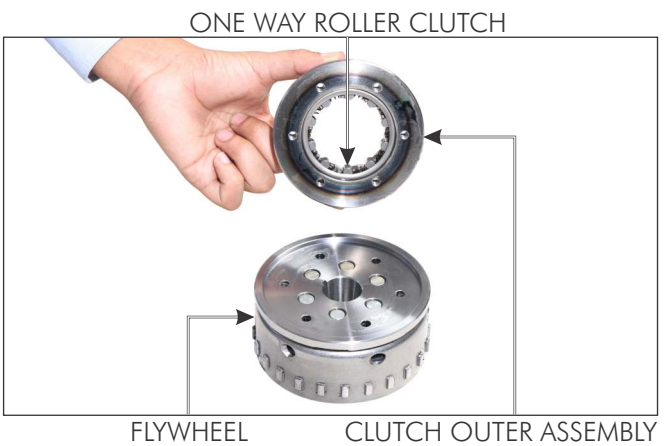
DRIVER OUTER (32X35)
PART NO : 070 HH KFN 010

PILOT DRIVER, 25 mm
PART NO: HMCL0423ACRD01

HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008



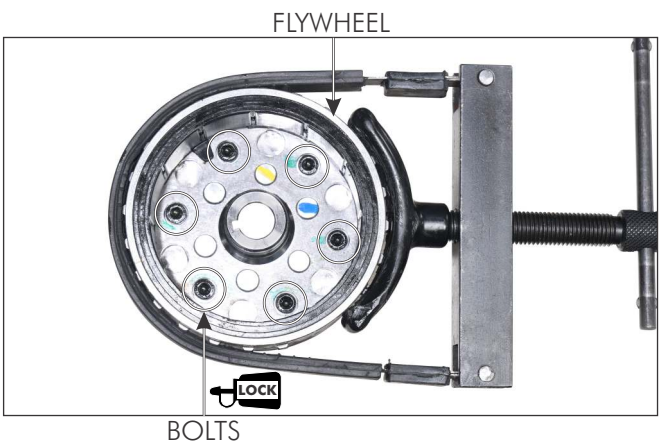
Clean one-way roller clutch.
Install the starter clutch outer assembly on to the flywheel.



Hold the flywheel by using the magnet holder clamp type.
Clean and apply locking agent to the starter one way roller clutch bolt threads.
Install and tighten the starter one way clutch socket bolts to the specified torque.

TORQUE

STARTER ONE WAY CLUTCH BOLT: 1.0-1.2 kgf-m



FLYWHEEL/STARTER DRIVEN GEAR

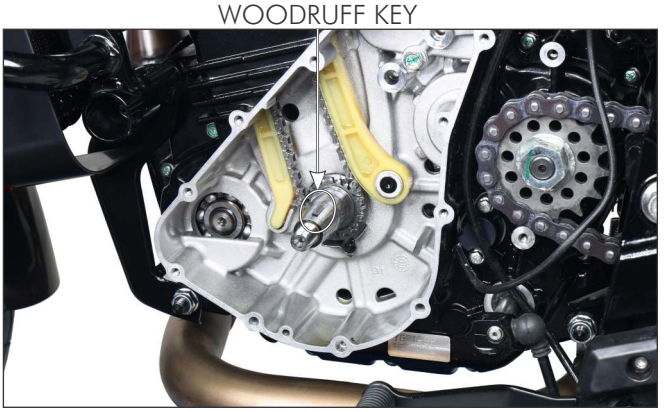
INSTALLATION

NOTE

- When woodruff key installation, be careful not to damage the key groove or crankshaft.
- Degrease the crankshaft taper area before installing the flywheel.

Install the woodruff key to the key groove of crankshaft.

WOODRUFF KEY



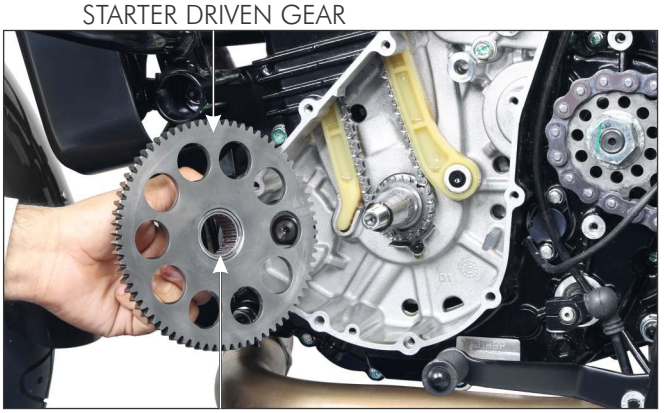
Install starter driven gear with needle bearing on the crankshaft.

Install flywheel to the crankshaft aligning the key groove of the flywheel with the woodruff key on the crankshaft.

NOTE

- Check that there is no debris inside the flywheel before installation. The magnets attract steel filings and other ferrous material.
- Degrease the mating surface of the flywheel and crankshaft tapered area before installation.

STARTER DRIVEN GEAR



NEEDLE BEARING

Hold the flywheel using magnet holder clamp type.

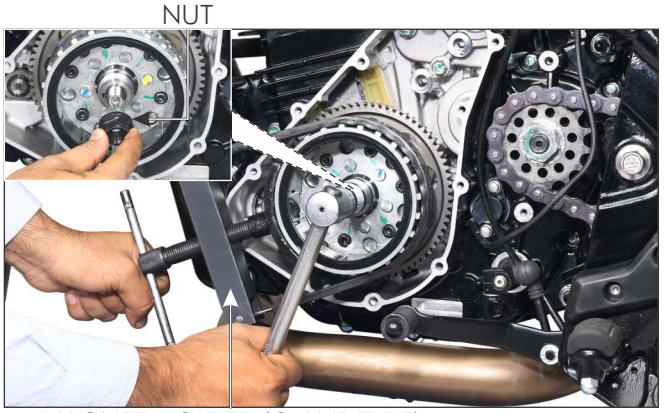
TOOL

MAGNET HOLDER (CLAMP TYPE)
PART NO: 070 HH KRYH 004

Instal the washer and lock nut .

Tighten the flywheel nut.

NUT

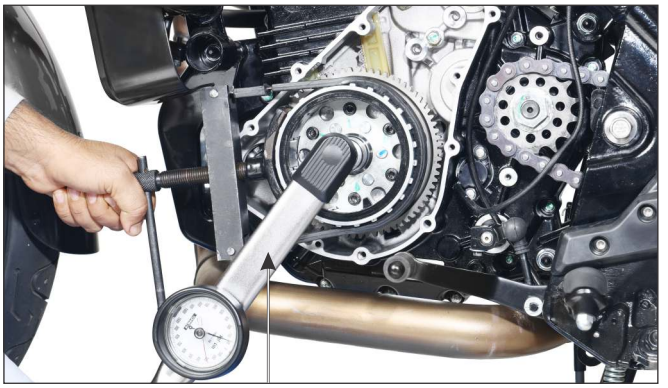


MAGNET HOLDER (CLAMP TYPE)

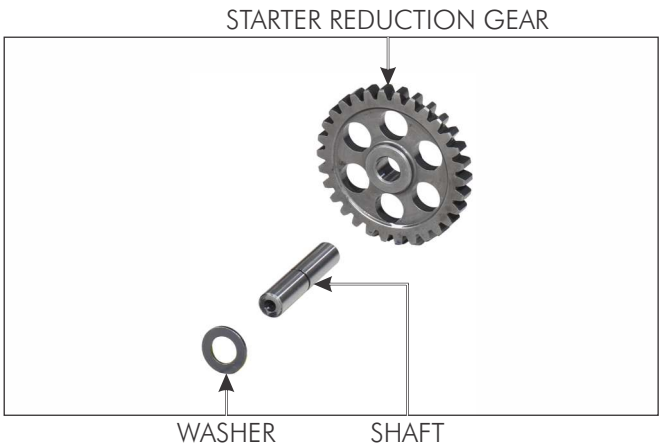
Tighten the flywheel nut to the specified torque with torque wrench.

TORQUE

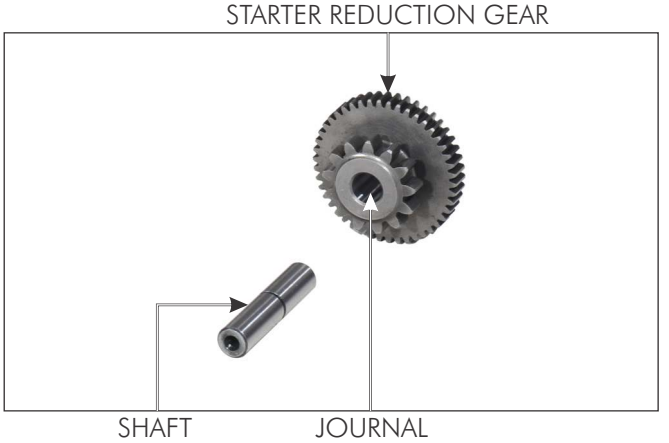
FLYWHEEL LOCK NUT: 9.0-11.0 kgf-m



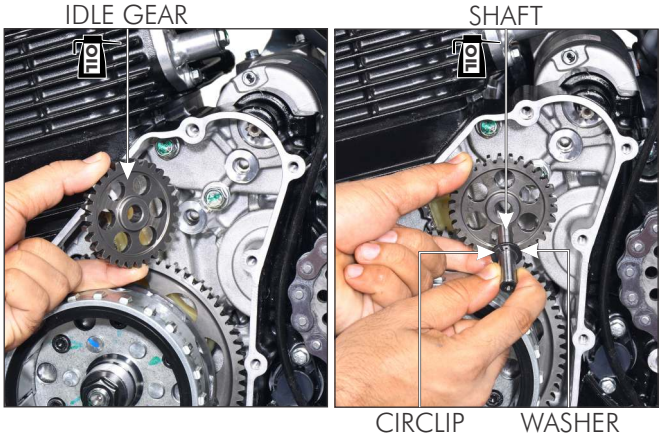
Check the idler gear, shaft and washer for wear or damage.



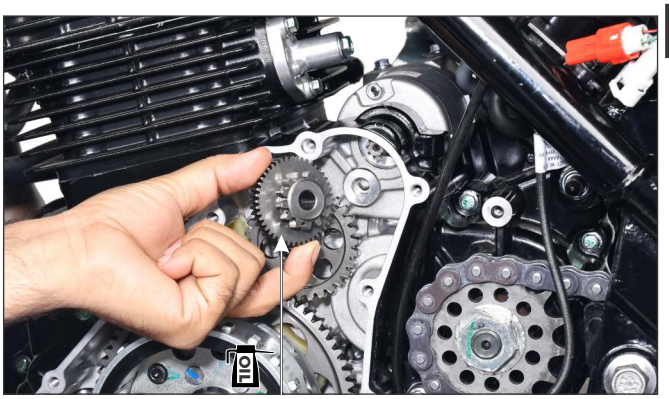
Check the starter reduction gear, journal and shaft for wear or damage.



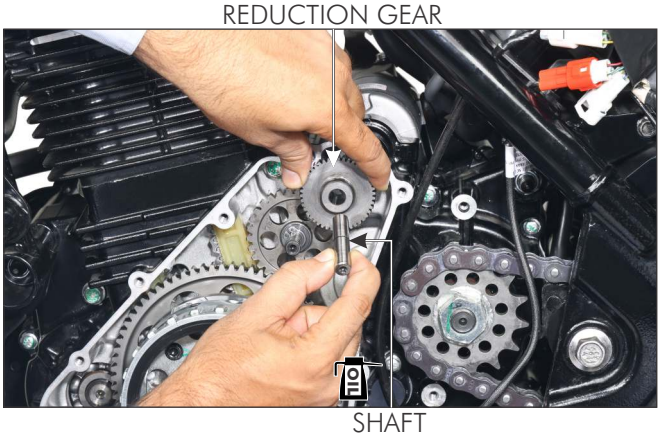
Apply clean engine oil to starter idler gear journal.
Install the starter idler gear.
Install the washer and circlip onto the starter idle gear shaft.
Apply clean engine oil to starter idler gear shaft and install it.



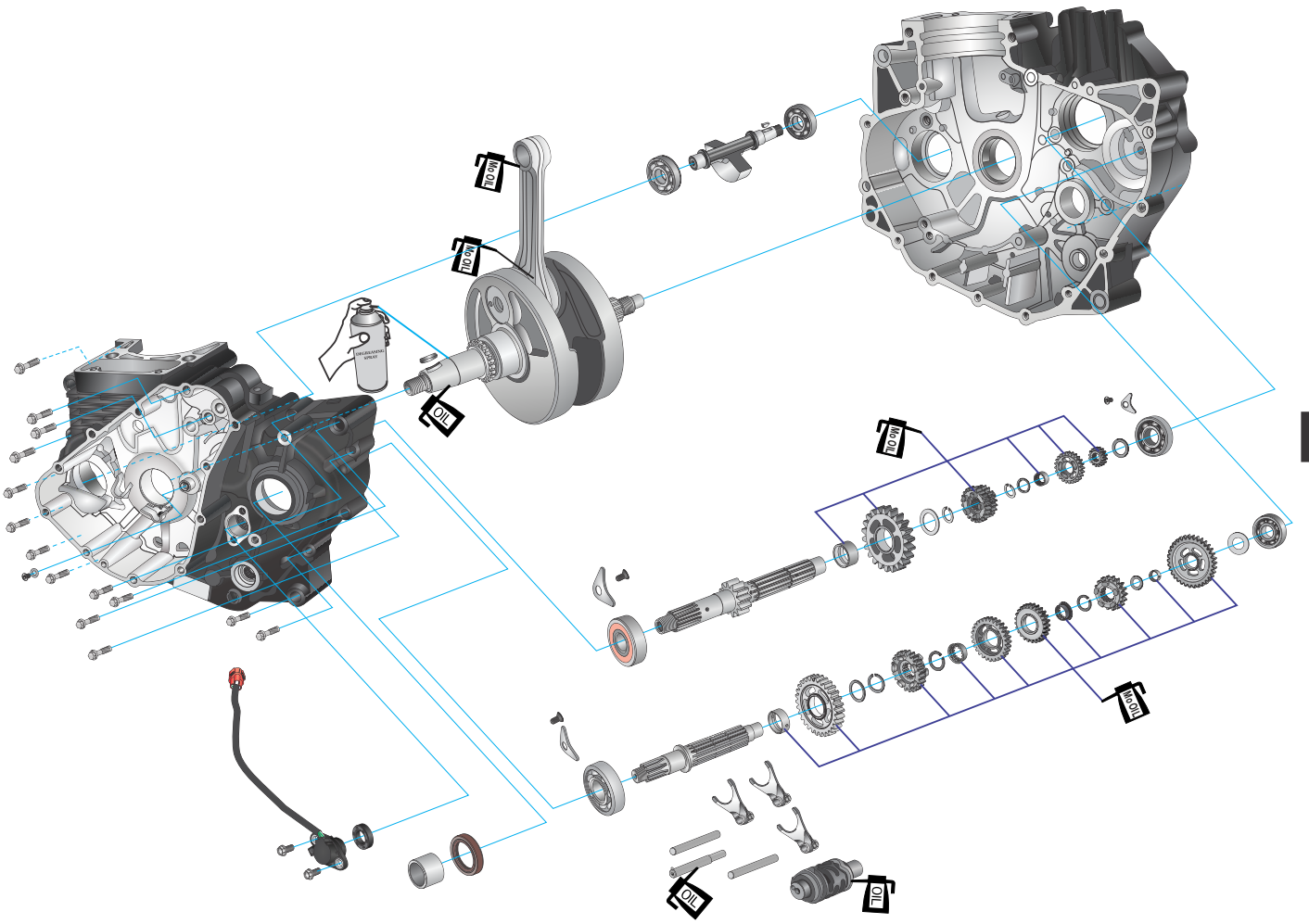
Apply clean engine oil to starter reduction gear journal.
Install the starter reduction gear.



Apply clean engine oil to the starter reduction gear shaft and install it.
Install the left crankcase cover (page 10-4).



SYSTEM DIAGRAM



SERVICE INFORMATION

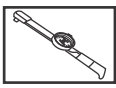
GENERAL

- The engine needs to be dismounted from the frame to separate the crankcase.
- The following components must be removed before separating the crankcase:
- Flywheel
- Cylinder head (page 7-7).
- Cylinder/piston (page 8-3/8-5).
- Oil pump (page 4-3).
- Clutch (page 9-8).
- Gearshift linkage (page 9-24).
- Primary drive gear (page 9-20).
- Balancer drive gear/Balancer driven gear (page 9-22).
- Neutral switch (page 20-13).
- Be careful not to damage the crankcase mating surfaces when servicing.
- Clean the oil passage before assembling the crankcase halves.

SPECIFICATIONS

CRANKCASE/CRANKSHAFT/TRANSMISSION

ITEM			STANDARD	SERVICE LIMIT
Shift fork	I.D		10-10.018 mm	10.048 mm
	Claw thickness		4.63-4.7 mm	4.6 mm
	Shaft O.D		9.976-9.994 mm	9.946 mm
Shift drum	O.D	Left	21.959-21.98 mm	21.929 mm
		Right	20.959-20.98 mm	20.929 mm
	Journal I.D	Left	27.976-27.989 mm	28.019 mm
		Right	27.951-27.972 mm	27.981 mm
Transmission	Gear I.D	M5, M6	25.0-25.021 mm	25.051 mm
		C3, C4	29.0-29.021 mm	29.051 mm
		C2	28.4-28.421 mm	28.451 mm
		C1	23.0 - 23.021 mm	23.051 mm
	Bushing O.D	M5, M6	24.967-24.98 mm	24.937 mm
		C3, C4	28.967-28.98 mm	28.937 mm
		C2	28.359-28.39 mm	28.329 mm
		C1	22.959-22.98 mm	22.929 mm
	Bushing I.D	M5, M6	21.00-21.021 mm	21.051 mm
		C2	25.4-25.421 mm	25.421 mm
		C1	19.00-19.021 mm	19.051 mm
	Gear to bushing clearance	M5, M6	-	0.09 mm
		C3, C4	-	0.09 mm
		C2	-	0.10 mm
		C1	-	0.10 mm
	Mainshaft/Countershaft O.D	At M5, M6	20.959-20.98 mm	20.929 mm
		C2	25.359-25.38 mm	25.329 mm
		C1	18.959-18.98 mm	18.929 mm
	Bushing-to-shaft clearance	M5, M6	-	0.098 mm
		C2	-	0.098 mm
		C1	-	0.098 mm
Crankshaft	Connecting rod side clearance		0.28-0.54 mm	0.70 mm
	Connecting rod side clearance		0.1-0.35 mm	0.70 mm
	Runout		0.03 mm	0.05 mm
	Big end side clearance		0.10-0.35 mm	0.36 mm
	Big end radial clearance		0.028-0.054 mm	0.069 mm

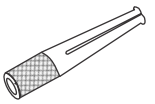
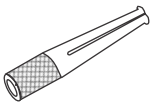
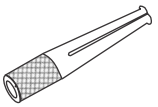
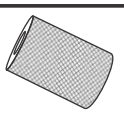
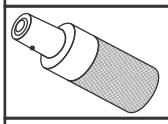
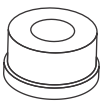
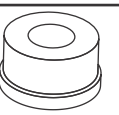
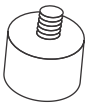
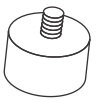
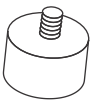
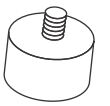
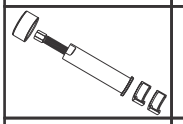
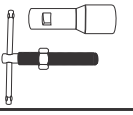


TORQUE VALUES

SCREW FLAT HEAD : 0.7-1.1 kgf-m

For other nuts, bolts, fasteners etc. refer to standard torque values **(SECTION-1)**.

SPECIAL TOOLS

	CRANKCASE BEARING REMOVER COLLET 17 mm PART: 070 HH KTN 002
	COLLET BEARING REMOVER, 20 mm PART NO: 070 HH KZN 003
	CRANKCASE BEARING REMOVER COLLET 22 mm PART: HMCL0623RAAA01
	CRANKCASE BEARING REMOVER SHAFT PART NO: 070 HH KFN 006
	CRANKCASE BEARING REMOVER WEIGHT PART NO: 070 HH KFN 007
	HANDLE BEARING DRIVER PART NO: 070 HH KFN 008
	DRIVER ATTACHMENT, 19x21 mm PART NO: HMCL0423ACAA08
	DRIVER ATTACHMENT, 24x 27 mm PART NO: 070 HH KFN 021
	DRIVER ATTACHMENT, 32x35 mm PART NO: 070 HH KFN 010
	DRIVER ATTACHMENT, 42x47 mm PART NO: 070 HH KFN 011
	DRIVER ATTACHMENT, 50x55 mm PART NO: HMCL0623RAAA02
	PILOT DRIVER, 14 mm PART NO: HMCL0423ACAA05
	PILOT DRIVER, 17 mm PART NO: 070 HH 198 033
	PILOT DRIVER, 20 mm PART NO: 070 HH KTN 006
	PILOT DRIVER, 21 mm PART NO: 070 HH KFN 014
	TIMING CHAIN SPROCKET REMOVER PART NO: HMCL0623RAAA12
	TIMING CHAIN SPROCKET INSTALLER PART NO: HMCL0623RAAA13
	CRANKSHAFT BEARING (LHS) INSERTER PART NO: 070 HH KTN 007
	GEAR SHIFT DRUM BEARING DRIVER PART NO: HMCL0423ACAA06
	CRANKSHAFT BEARING INSTALLER EXTN. PART NO: HMCL0423ACRD02

TROUBLESHOOTING

Excessive noise

- Worn or chipped transmission gear
- Worn or damaged transmission bearing
- Worn or damaged connecting rod big end bearing
- Worn crankshaft bearing
- Worn connecting rod small end

Hard to shift

- Bent shift fork
- Bent shift fork shaft
- Damaged shift drum guide groove
- Damaged shift fork guide pin
- Improper clutch operation

Gear slippage

- Worn gear dogs or slots
- Worn shift drum guide groove
- Worn shift fork guide pin
- Worn shift fork groove in gear
- Worn shift fork shaft
- Bent fork shaft
- Worn cylinder or piston rings

CRANKCASE SEPARATION

Refer to service information (page 11-1) for removal of necessary parts before disassembling the crankcase.

CAUTION

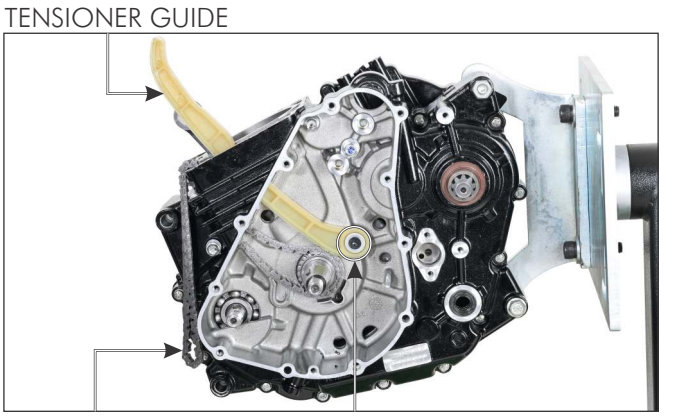
Place a shop towel to close the lower open portion to prevent any bolt etc. from falling inside the engine.

Remove the starter motor (page 19-4).

Remove the neutral switch (page 20-13).

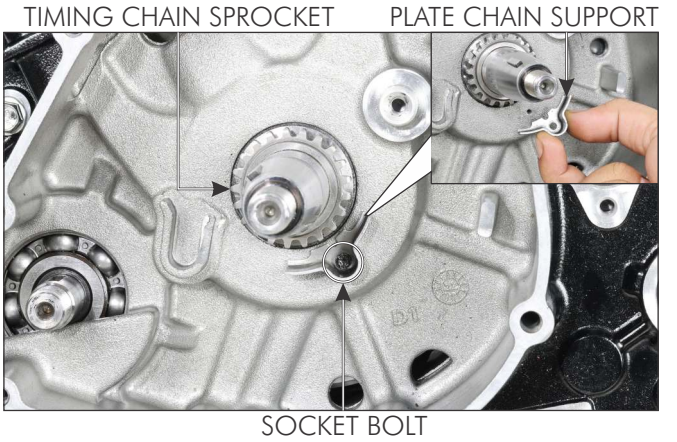
Remove the tensioner guide allen key bolts/washer and tensioner guide.

Remove the cam chain.

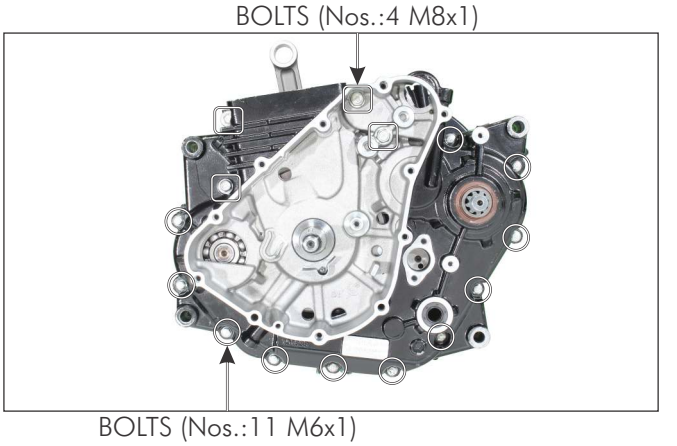


Inspect the plate chain support and remove by its socket bolt (Nos.: 1), if required.

Remove the timing chain sprocket from the crankshaft (page 11-11).



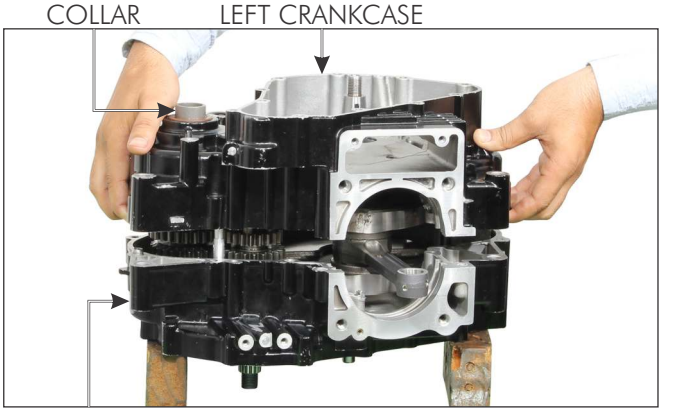
Loosen the left crankcase bolts (M6x1 Nos. 11) & (M8x1 Nos.: 4) in crisscross pattern in 2 or 3 steps and remove the bolts.



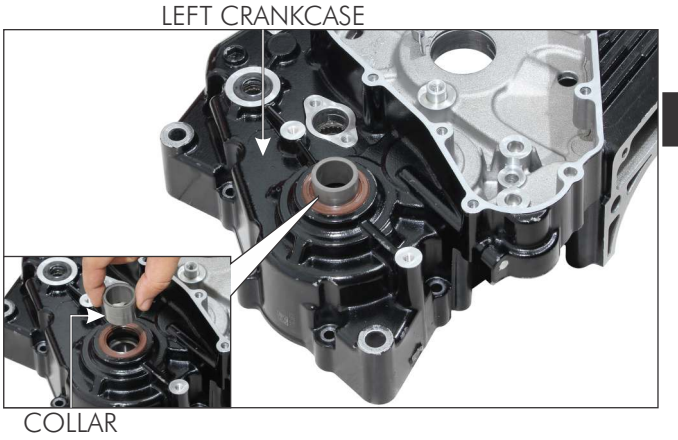
Carefully separate the left crankcase with collar from the right crankcase while tapping them at several locations with a mallet.

NOTE

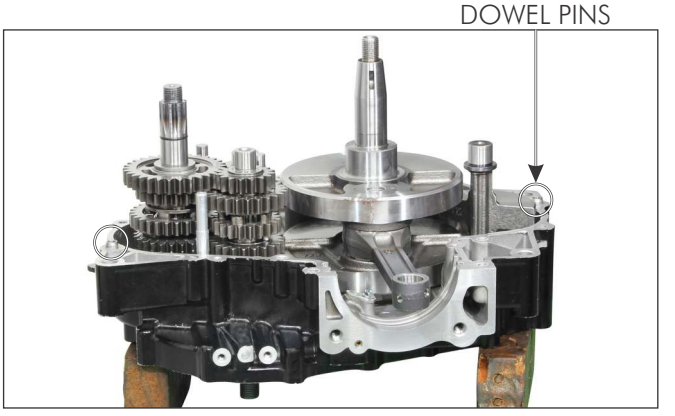
- Do not split crankcase using sharp tool.
- If engine is dismantled on the engine jig, then remove the left crankcase.
- Install counter shaft oil seal guide before spreading the crankcase.



Remove the collar from the left crankcase.



Remove the dowel pins.



CRANKCASE

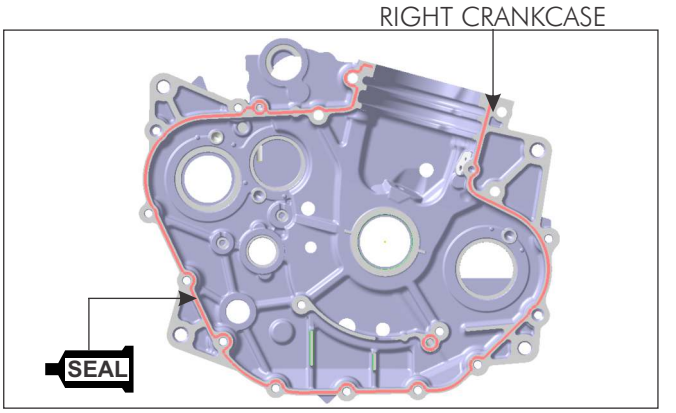
ASSEMBLY

Clean the left and right crankcase mating surfaces thoroughly, and ensure not to damage to mating surfaces.

Check for any damage.

NOTE

- Dress the surfaces with an oil stone if necessary to correct any minor roughness or irregularities.
- After cleaning, lubricate the crankshaft bearings and other contacting surfaces with clean engine oil.



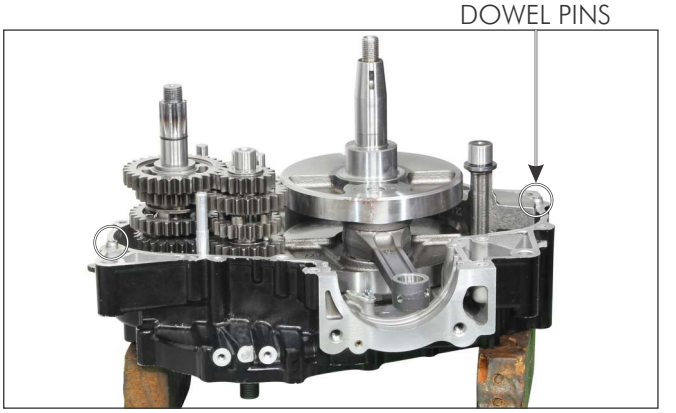
Install the balancer shaft, crankshaft and transmission.

NOTE

Apply "Three- bond 1215" or equivalent.

Apply a light but thorough coating of sealant to all crankcase mating surface except the oil passage area.

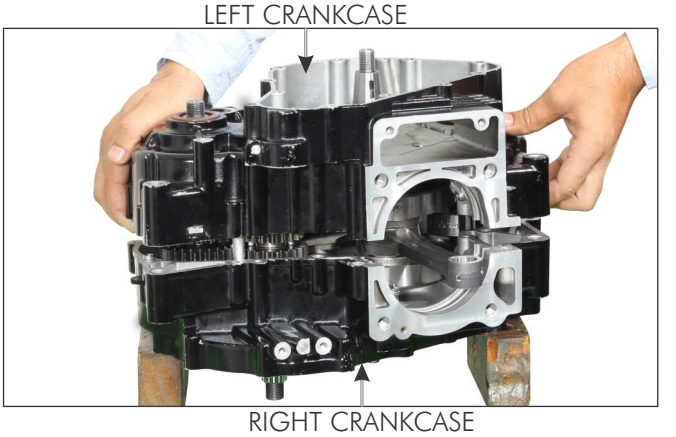
Install the dowel pins.



Install the left crankcase over the right crankcase.

CAUTION

Do not force crankcase halves together. If there is excessive force required, something is wrong. Remove the left crankcase and check for misaligned parts.

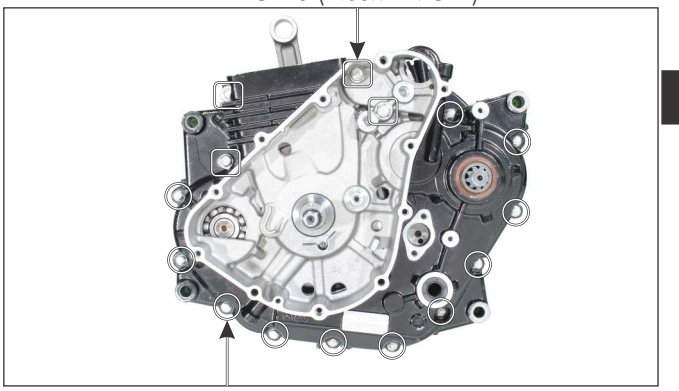


Install the collar.

COLLAR

Install the left crankcase bolts (M6x1 Nos. 11) & (M8x1 Nos.: 4), and tighten the bolts in a crisscross pattern in 2-3 steps.

BOLTS (Nos.:4 M8x1)



BOLTS (Nos.:11 M6x1)

Install the timing chain sprocket from the crankshaft (page 11-12).

TIMING CHAIN SPROCKET

Install the cam chain to the sprocket through the crankcase.

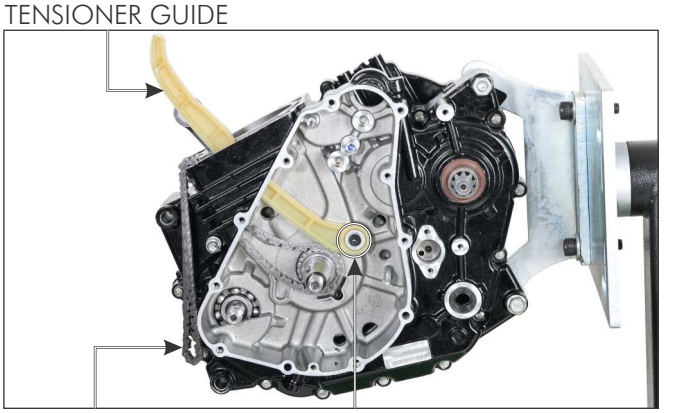
Install the cam chain tensioner guide and allen key bolt with washer (No.: 1).

CAUTION

Place a shop towel to close the lower open portion, to prevent any bolt etc. from falling inside the engine.

Install the neutral switch (page 20-13).

Install the starter motor (page 19-4).



BALANCER SHAFT/CRANKSHAFT

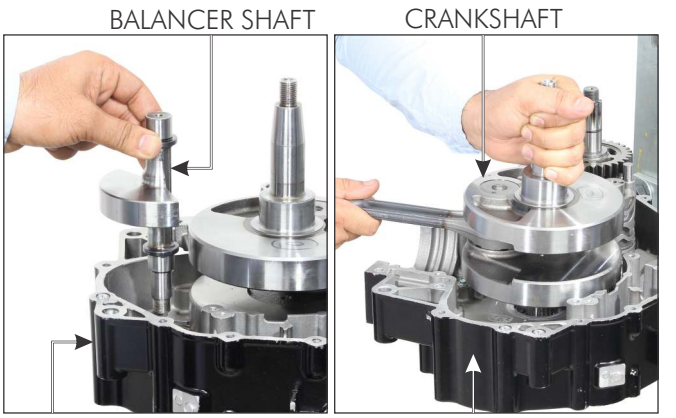
REMOVAL

Remove the crankcase assembly (page 11-5).

Remove the balancer shaft and crankshaft from the right crankcase.

CAUTION

When removing, installing and inspecting the crankshaft, be careful not to damage or kink crank web.



CRANKSHAFT INSPECTION

CRANKSHAFT RUNOUT

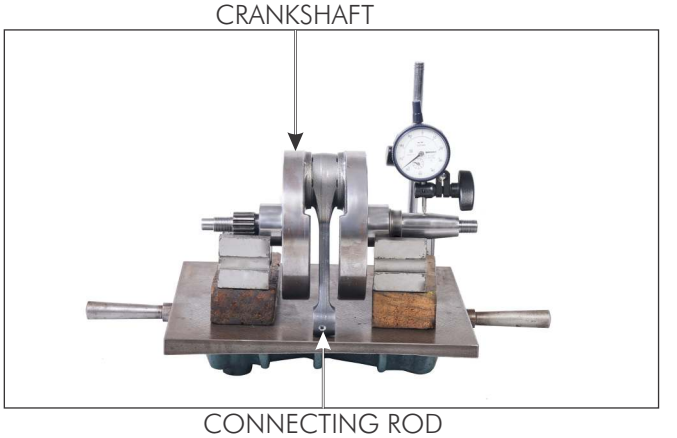
Place the crankshaft on a stand or V-blocks.

Set the dial indicator on the shafts.

Rotate the crankshaft two revolutions and read the runout.

SERVICE LIMIT

CRANKSHAFT RUNOUT: 0.05 mm



BIG END SIDE CLEARANCE

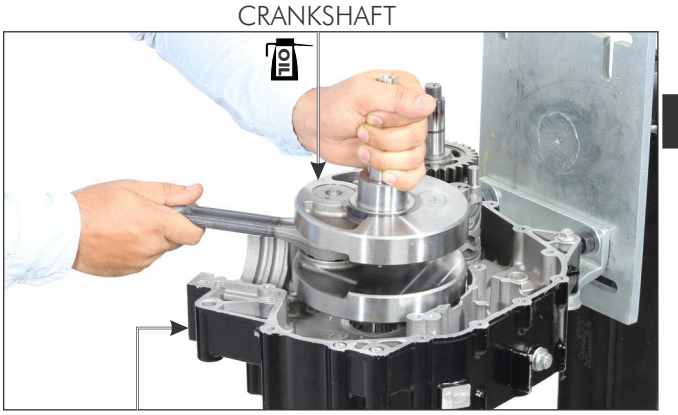
Measure the side clearance of the connecting rod big end with feeler gauge.

SERVICE LIMIT

CONNECTING ROD BIG END: 0.36 mm

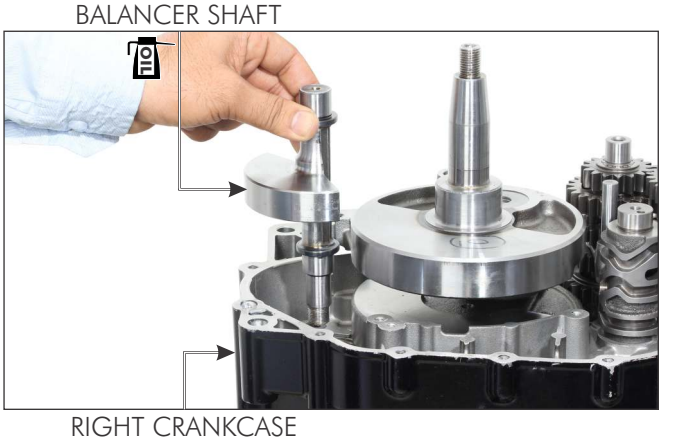
INSTALLATION

Apply the engine oil to main bearing sliding surface and install the crankshaft into the right crankcase.



Install the balancer shaft into the right crankcase.

Assemble the crankcase (page 11-7).



TIMING CHAIN SPROCKET REMOVAL

Remove the tensioner guide and cam chain (page 11-5).

Install the timing chain sprocket remover onto the crankshaft as shown.

TOOL

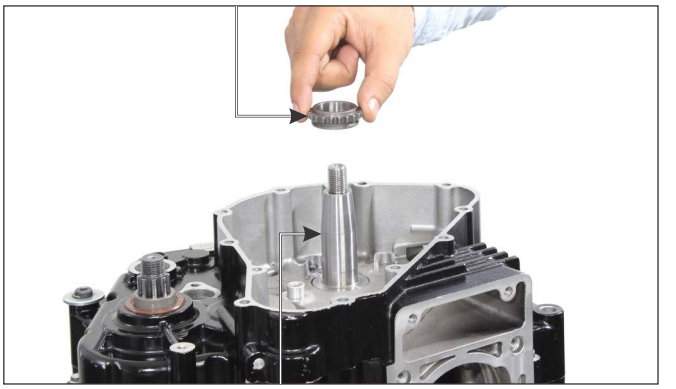
TIMING CHAIN SPROCKET REMOVER
PART NO: HMCL0623RAAA12

TIMING CHAIN SPROCKET REMOVER

TIMING CHAIN SPROCKET

Remove the timing chain sprocket from the crankshaft.

TIMING CHAIN SPROCKET



CRANKSHAFT

TIMING SPROCKET

Check the timing sprocket teeth for wear or damage.

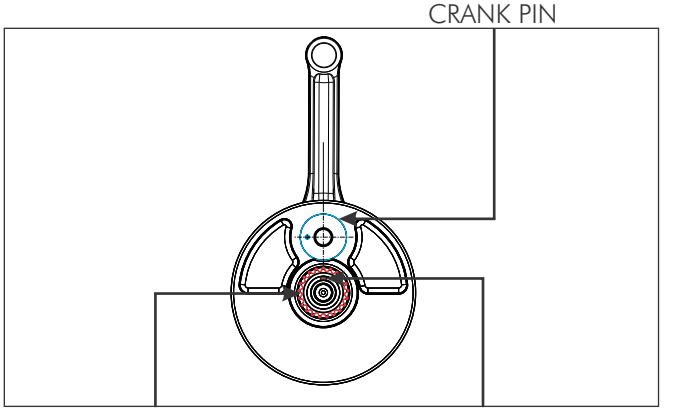
Remove the timing sprocket if necessary.

When installing the timing sprocket, align the center of the timing sprocket teeth with the center of the woodruff key.

NOTE

If the timing sprocket teeth are worn or damaged, check the cam chain, tensioner and cam sprocket.

CRANK PIN

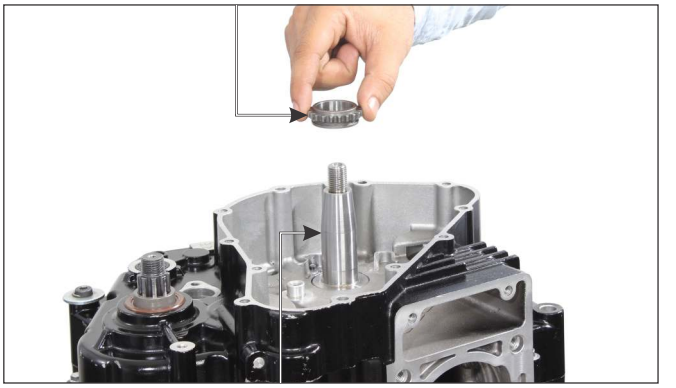


TIMING SPROCKET WOODRUFF KEY

INSTALLATION

Install the timing chain sprocket onto the crankshaft.

TIMING CHAIN SPROCKET



CRANKSHAFT

Apply clean engine oil to the timing chain sprocket.

Install the timing chain sprocket onto the crankshaft.

Install the crankshaft bearing installer extension onto the crankshaft.

Install the timing chain sprocket installer tool with using crankshaft bearing (LHS) inserter T-handle only as shown.

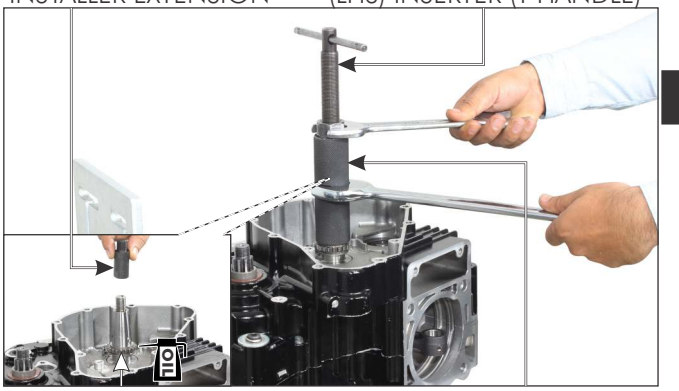
TOOL

CRANKSHAFT BEARING INSTALLER EXTN.
PART NO: HMCL0423ACRD02
TIMING CHAIN SPROCKET INSTALLER
PART NO: HMCL0623RAAA13
CRANKSHAFT BEARING (LHS) INSERTER
PART NO: 070 HH KTN 007

Install the cam chain and tensioner guide (page 11-9).

CRANKSHAFT BEARING INSTALLER EXTENSION

CRANKSHAFT BEARING (LHS) INSERTER (T-HANDLE)



TIMING CHAIN SPROCKET

TIMING CHAIN SPROCKET INSTALLER

11

TRANSMISSION

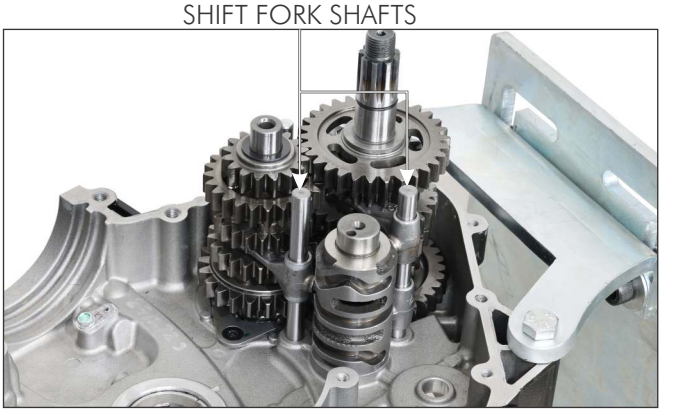
REMOVAL

Separate the crankcase halves (page 11-5).

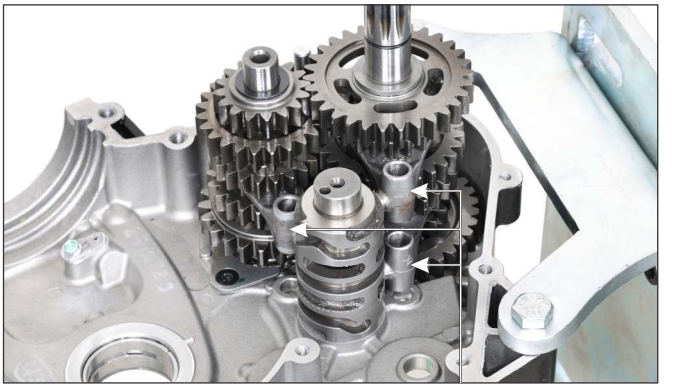
Remove the crankshaft and balancer shaft (page 11-9).

Pull the shift fork shafts and remove it from the shift forks.

SHIFT FORK SHAFTS



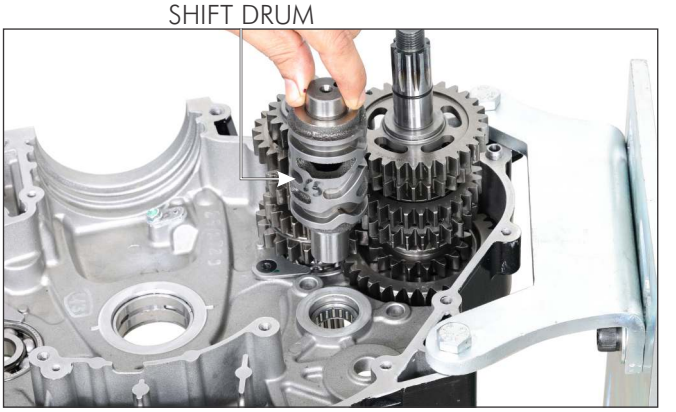
Remove the shift forks.



SHIFT FORKS

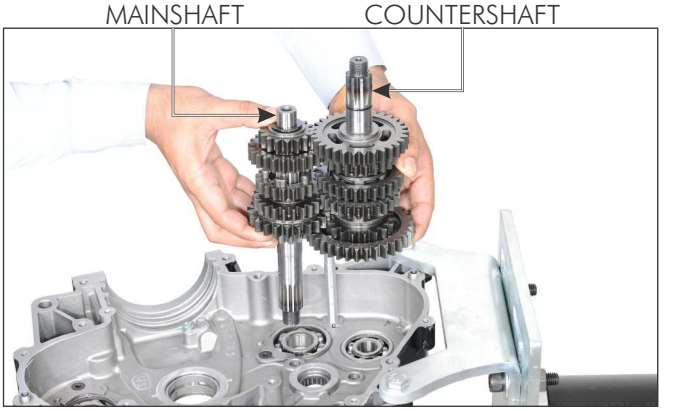
Remove the shift drum.

SHIFT DRUM

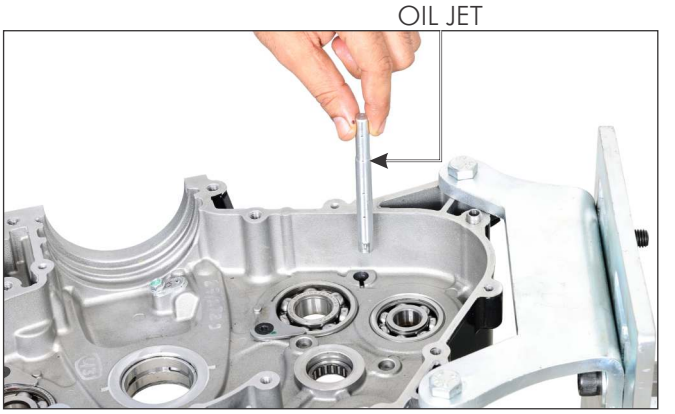


Remove the mainshaft and countershaft together.

MAINSHAFT COUNTERSHAFT



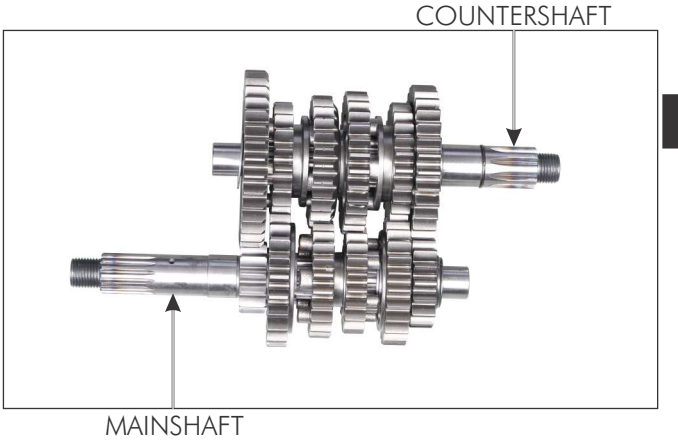
Remove the oil jet from crankcase.



Disassemble the mainshaft and countershaft.

NOTE

- Keep track of the disassembled parts (gears, bushes, washers and snap rings) by stacking them on a tool or slipping them onto a piece of wire.
- Do not expand the snap ring more than necessary for removal. To remove snap ring, expand the snap ring and pull it off using the gear behind it.



INSPECTION

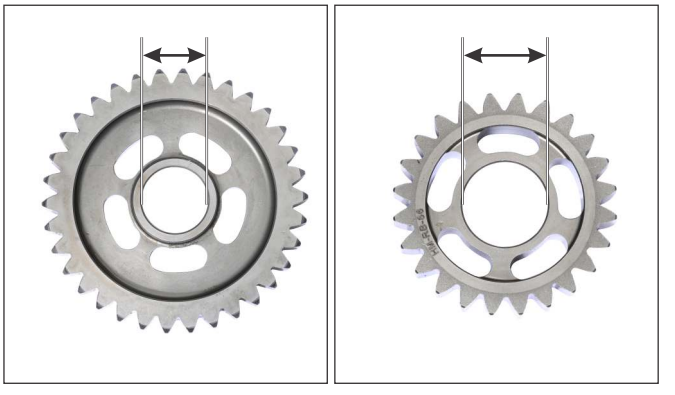
GEARS

Check the gear dogs, dog holes and teeth for damage or excessive wear.

Measure the I.D of each gear.

SERVICE LIMIT

M5, M6: 25.051 mm
C1: 23.051 mm
C2: 28.451 mm
C3, C4: 29.051 mm



BUSHES

Check the bushes for wear or damage.
Measure the O.D of each bush.

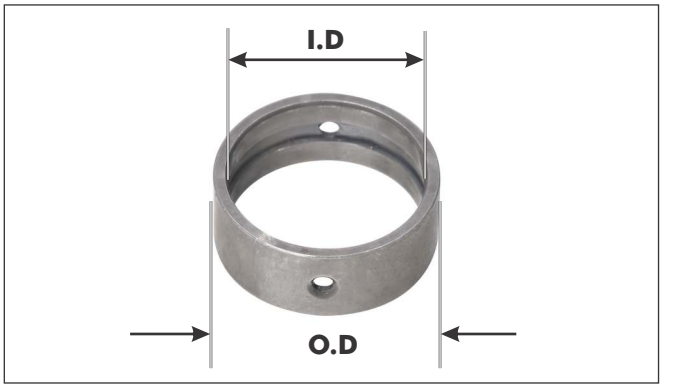
SERVICE LIMIT
M5, M6: 24.937 mm
C1: 22.929 mm
C2: 28.329 mm
C3, C4: 28.937 mm

Measure I.D of each bush.

SERVICE LIMIT
M5, M6: 21.051 mm
C1: 19.051 mm
C2: 25.421 mm

Calculate the gear-to-bush clearance.

SERVICE LIMIT
M5, M6: 0.09 mm
C3, C4: 0.09 mm
C2: 0.10 mm
C1: 0.10 mm



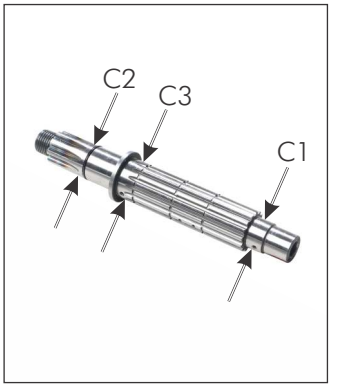
MAINSHAFT/COUNTERSHAFT

Check the spline grooves and sliding surfaces for abnormal wear or damage.
Measure the O.D of the mainshaft and countershaft at the gear and bush sliding areas.

SERVICE LIMIT
Mainshaft (at M5, M6 gear bush): 20.929 mm
Countershaft (at C1 gear bush): 18.929 mm
(at C2 gear bush): 25.329 mm

Calculate the bush- to- shaft clearance.

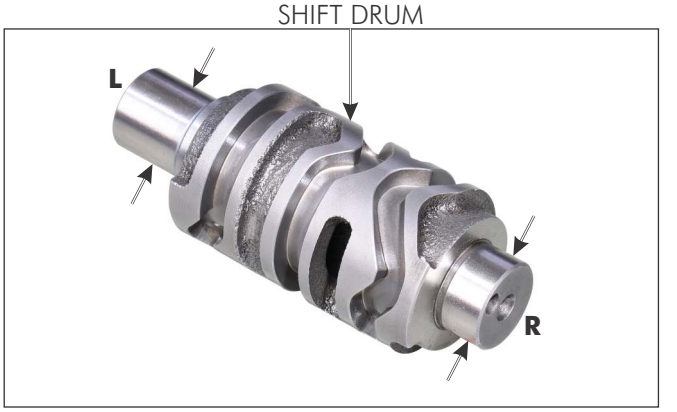
SERVICE LIMIT
M5, M6: 0.098 mm
C2, C1: 0.098 mm



SHIFT DRUM

Inspect the shift drum end for scoring or evidence of insufficient lubrication.
Check the shift drum grooves for abnormal wear or damage.
Measure the shift drum O.D at each end.

SERVICE LIMIT
LEFT SIDE: 21.929 mm
RIGHT SIDE: 20.929 mm



Check the shift drum journals on the left crankcase for excessive wear or damage.

Measure the shift drum journal I.D.

SERVICE LIMIT

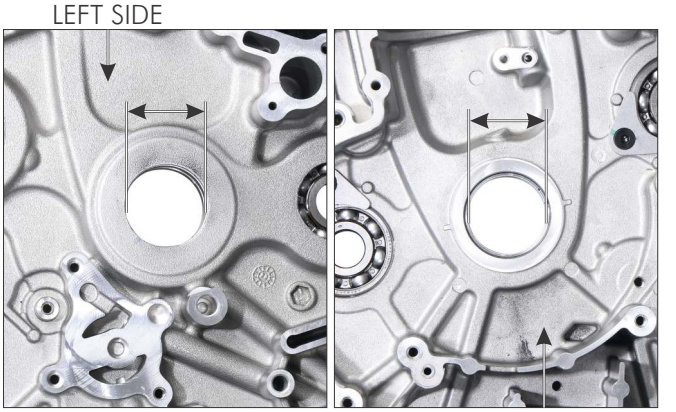
LEFT SIDE: 28.019 mm

Check the shift drum journals on the right crankcase for excessive wear or damage.

Measure the shift drum journal I.D.

SERVICE LIMIT

RIGHT SIDE: 27.981 mm



SHIFT FORK

Check the shift forks for deformation or abnormal wear.

Measure each shift fork claw thickness

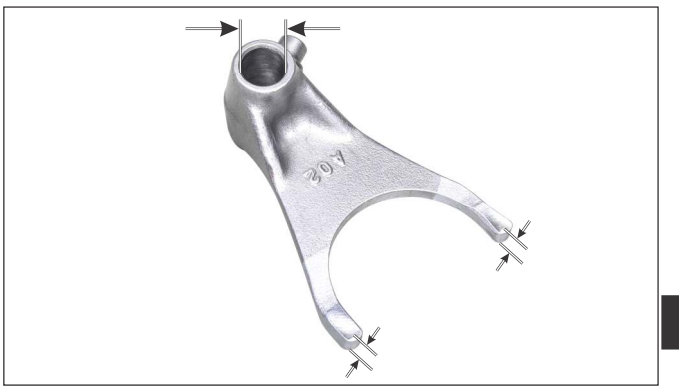
SERVICE LIMIT

SHIFT FORK CLAW THICKNESS: 4.6 mm

Measure the I.D of each fork.

SERVICE LIMIT

FORK: 10.048 mm



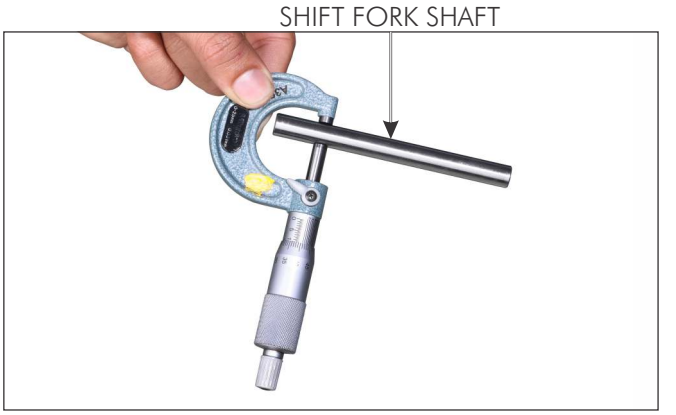
SHIFT FORK SHAFT

Check the shift fork shafts for damage and straightness.

Measure the shift fork shaft O.D

SERVICE LIMIT

SHIFT FORK SHAFT O.D: 9.946 mm



INSTALLATION

Clean all parts in high flash point nonflammable solvent.

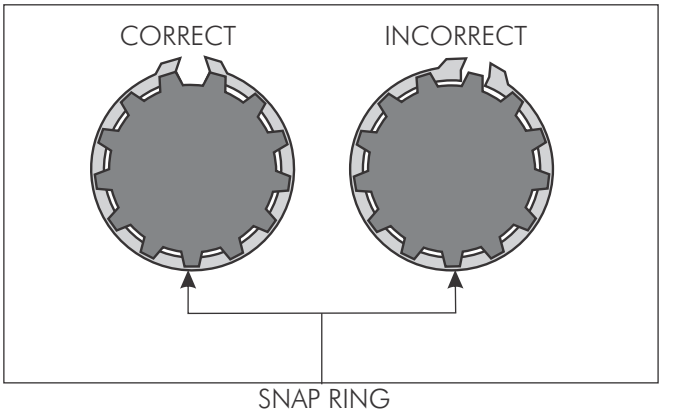
Apply clean engine oil to each gear teeth.

Apply molybdenum oil solution to the bush sliding surface to ensure initial lubrication.

Assemble all parts into their original positions.

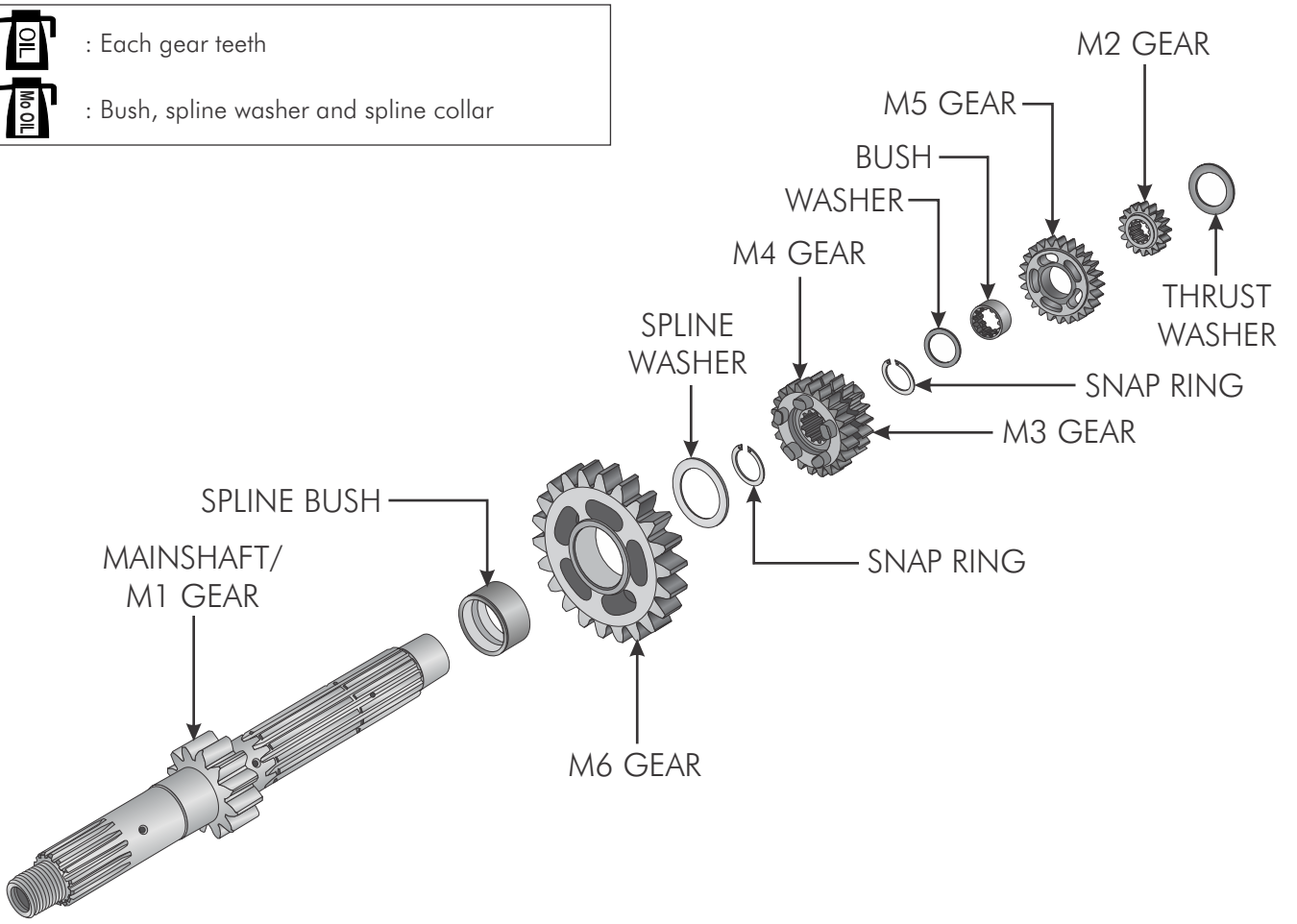
NOTE

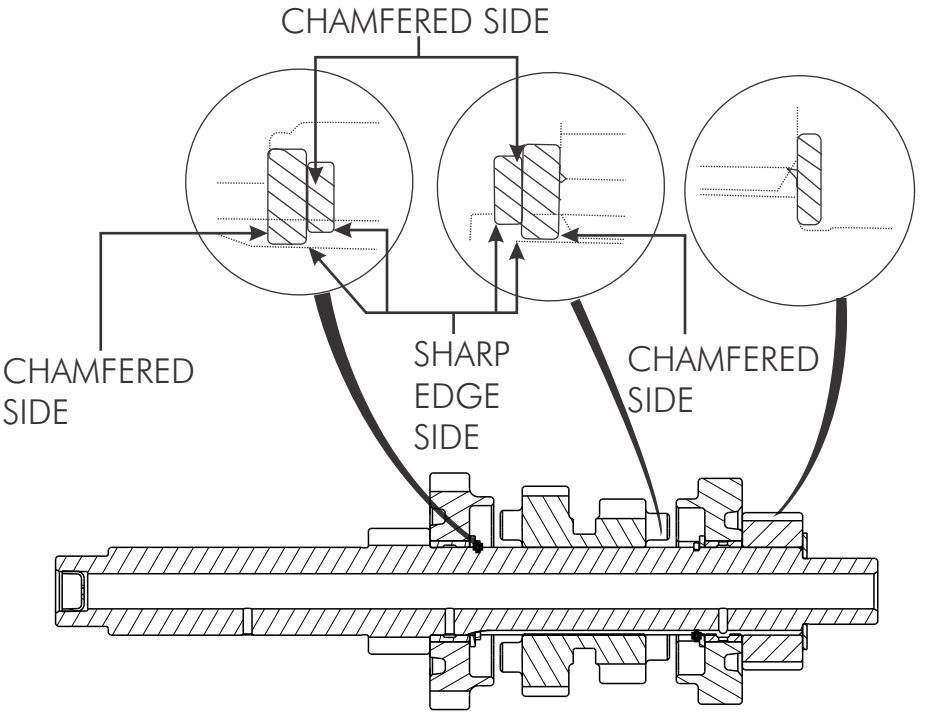
- Check the gears for freedom of movement or rotation on the shaft.
- Install the washers and snap rings with the chamfered side facing of the thrust load side. Confirm the inner side of snap rings and washer when you detect the chamfered side.
- Do not reuse worn snap ring which could easily spin in the groove.
- Check that the snap rings are seated in the grooves and align their end gaps with the grooves of the spline.
- Align the splined bush with the oil hole on the shaft.



MAINSHAFT

OIL	: Each gear teeth
Mo OIL	: Bush, spline washer and spline collar

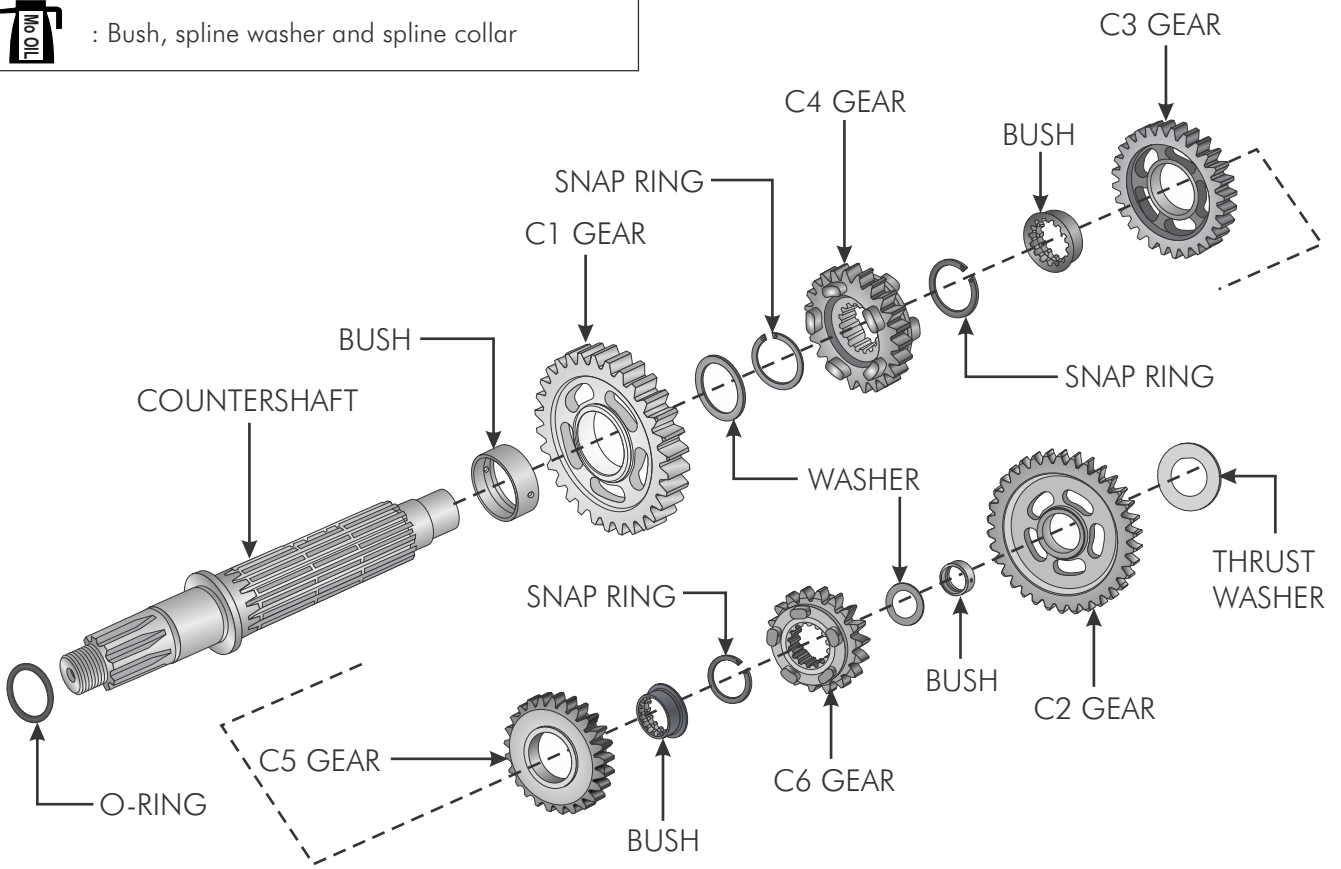


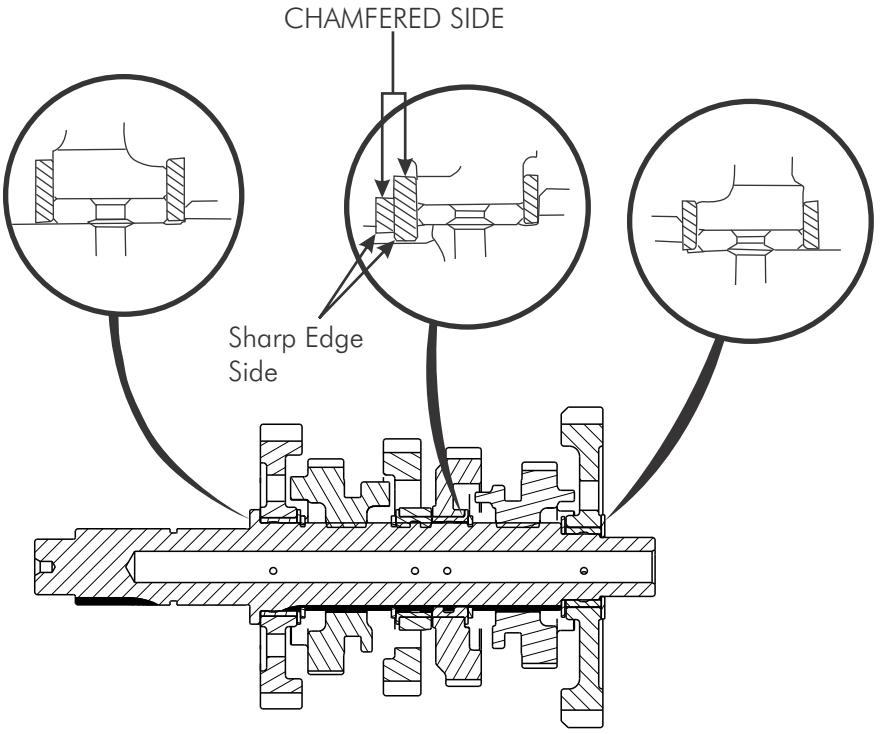


COUNTERSHAFT

OIL : Each gear teeth

Mo OIL : Bush, spline washer and spline collar





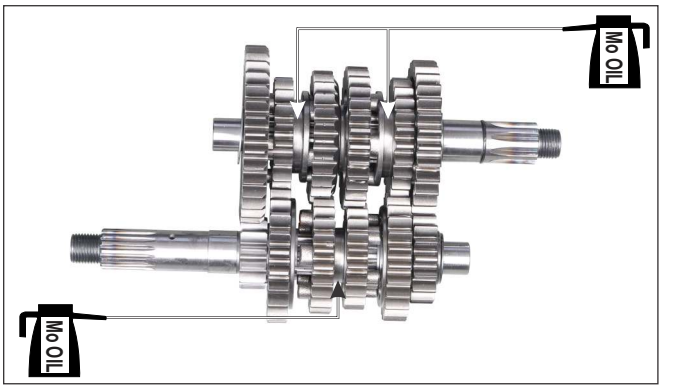
NOTE

Please ensure that during assembly, the following items should be applied to the components:

- Apply molybdenum oil solution to the shift fork grooves.
- Apply clean engine oil to the transmission gear teeth.

Check the transmission gear for free rotation and sliding on the shaft.

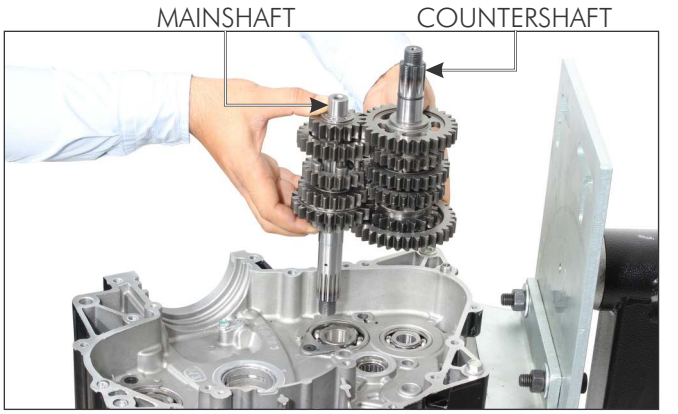
Engage the mainshaft and countershaft.



Install the mainshaft and countershaft together into the right crankcase. Be sure to install the three end washers (mainshaft; left only/countershaft; both ends).

NOTE

- Do not forget to install the transmission end washer.
- During mainshaft and countershaft installation, be careful not to damage the countershaft oil seal.



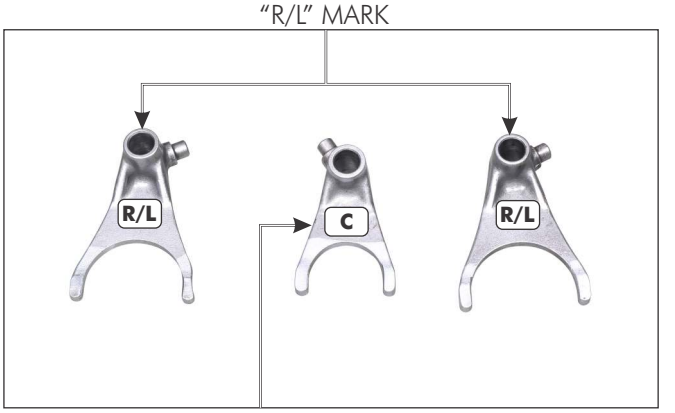
Install the oil jet.

NOTE

Each shift fork has an identification mark; "R/ L" (right and left, "C" (Center).

Install the shift forks into the shifter gear grooves with the marks facing up (left crankcase side).

"R/L" MARK

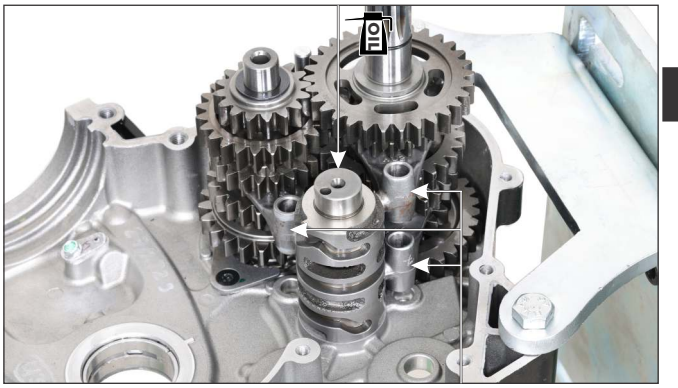


"C" MARK

Apply clean engine oil to the guide grooves and install the shift drum into the right crankcase.

Align the shift fork guide pins with the guide grooves.

SHIFT DRUM



SHIFT FORKS

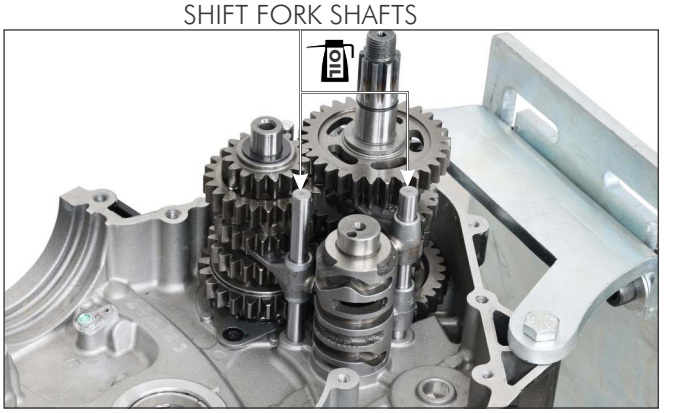
Apply clean engine oil to the shift fork shaft and insert it through the shift forks into the right crankcase.

Rotate the mainshaft by hand to see if the gears rotate freely.

Install the crankshaft and balancer shaft (page 11-10).

Assemble the crankcase (page 11-7).

SHIFT FORK SHAFTS



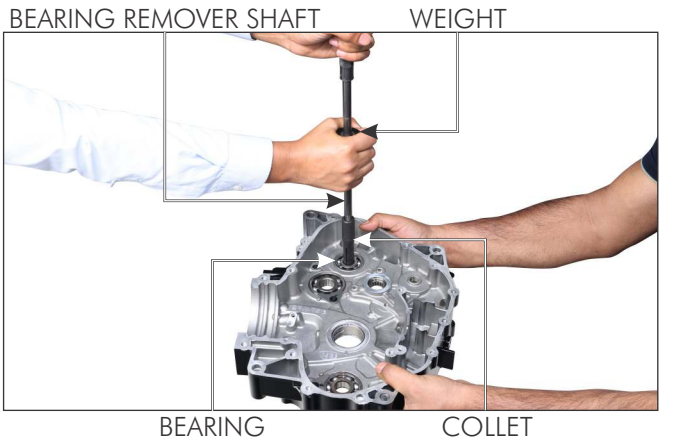
RIGHT CRANKCASE COUNTERSHAFT BEARING

REMOVAL

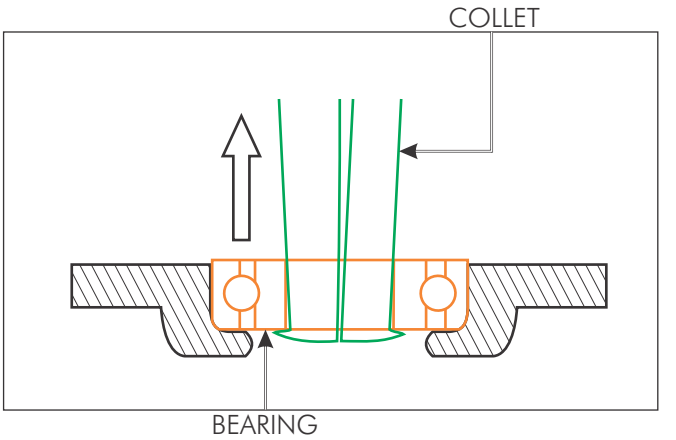
Separate the crankcase (page 11-5).
Remove the crankshaft and balancer shaft (page 11-9).
Remove the transmission (page 11-12).
Drive out the countershaft bearing from the right crankcase with following tools.

TOOL

CRANKCASE BEARING REMOVER SHAFT
PART NO: 070 HH KFN 006
CRANKCASE BEARING REMOVER WEIGHT
PART NO: 070 HH KFN 007
CRANKCASE BEARING REMOVER COLLET, 17 mm
PART NO: 070 HH KTN 002



To remove the bearings from the crankcase, install the collet in to the bearing and then drive in the bearing remover shaft along with the bearing remover weight in to the collet, then remove the bearing out by sliding the bearing remover weight on the shaft.



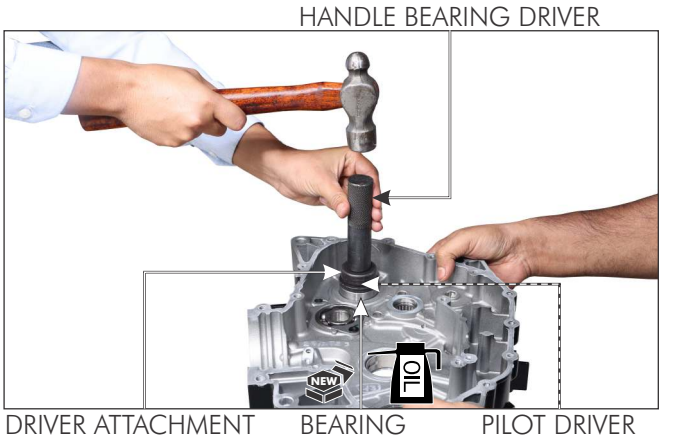
INSTALLATION

Lubricate all the bearing with clean engine oil.
Drive new countershaft bearing into the right crankcase.

TOOL

PILOT DRIVER, 17 mm
PART NO: 070 HH 198 033
DRIVER ATTACHMENT, 42x47 mm
PART NO: 070 HH KFN 011
HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008

Install the transmission (page 11-16).
Install the crankshaft and balancer shaft (page 11-10).
Install the crankcase (page 11-7).



RIGHT CRANKCASE MAINSHAFT BEARING

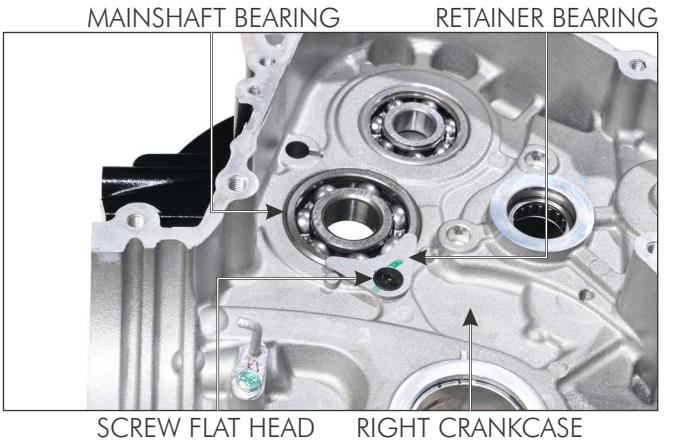
REMOVAL

Separate the crankcase (page 11-5).

Remove the crankshaft and balancer shaft (page 11-9).

Remove the transmission (page 11-12).

Remove the retainer bearing by removing the screw flat head from the right crankcase.



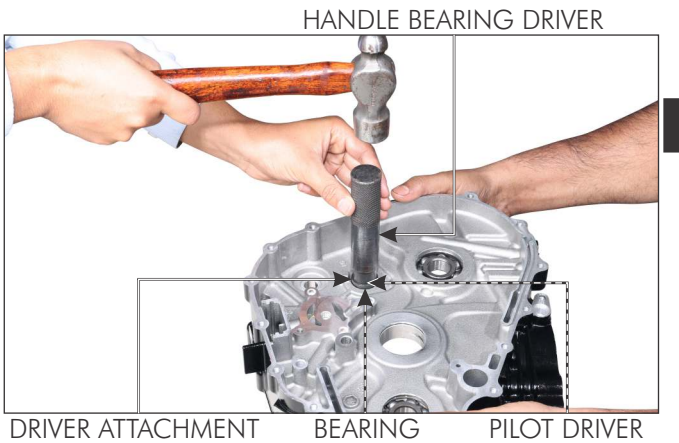
Drive out the mainshaft bearing from the right crankcase.

TOOL

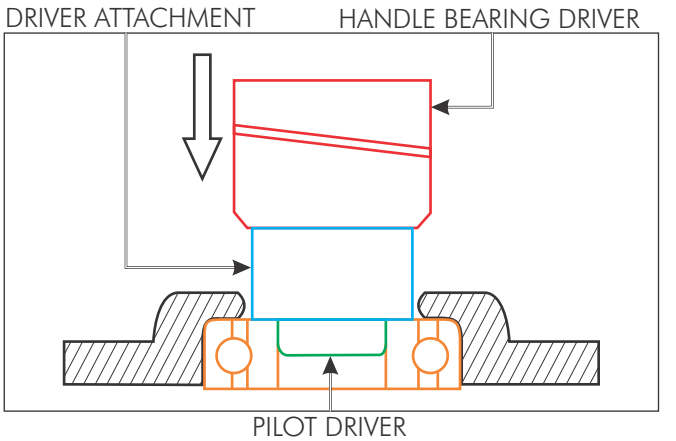
PILOT DRIVER, 21 mm
PART NO: 070 HH KFN 014

DRIVER ATTACHMENT, 32x35 mm
PART NO: 070 HH KFN 010

HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008



To remove the bearing from the crankcase, set the required driver attachment and pilot to the driver handle as shown and drive out the bearings.

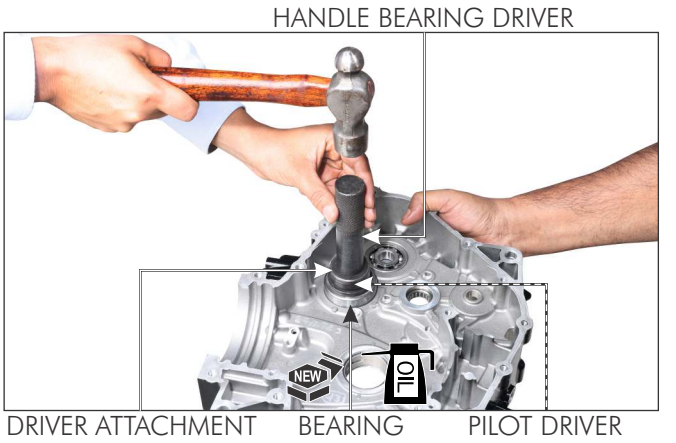


INSTALLATION

Lubricate all the bearing with clean engine oil.
Drive new mainshaft bearing into the right crankcase.

TOOL

PILOT DRIVER, 21 mm
PART NO: 070 HH KFN 014
DRIVER ATTACHMENT, 50x55 mm
PART NO: HMCL0623RAAA02
HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008

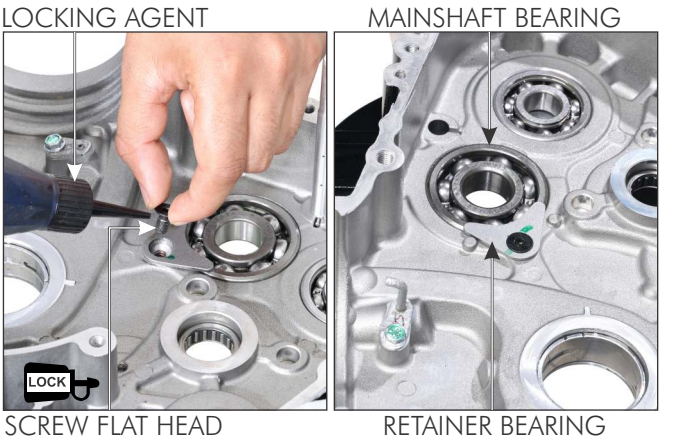


Install the retainer bearing.
Apply locking agent to the threads of the screw flat head.
Install the screw flat head.
Tighten the screw flat head to the specified torque.

TORQUE

SCREW FLAT HEAD: 1.1 kgf-m

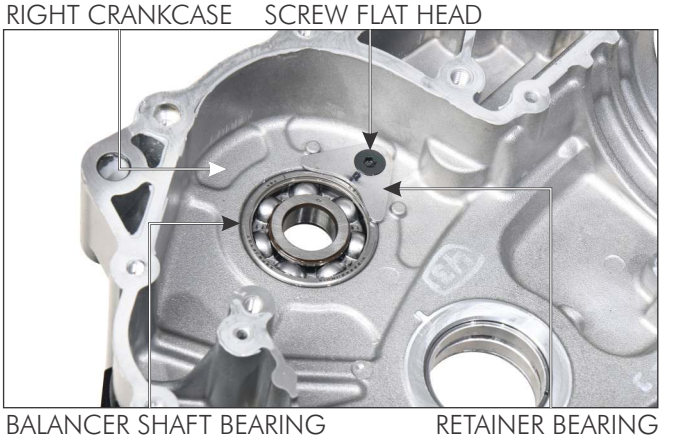
Install the transmission (page 11-16).
Install the crankshaft and balancer shaft (page 11-10).
Install the crankcase (page 11-7).



RIGHT CRANKCASE BALANCER SHAFT BEARING

REMOVAL

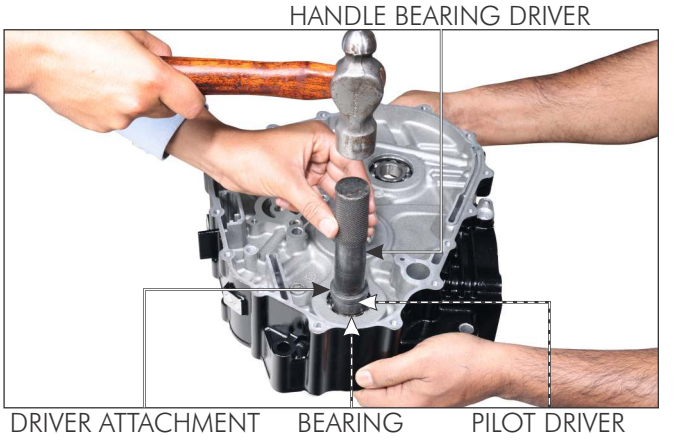
Separate the crankcase (page 11-5).
Remove the crankshaft and balancer shaft (page 11-9).
Remove the transmission (page 11-12).
Remove the retainer bearing by removing the screw flat head from the right crankcase.



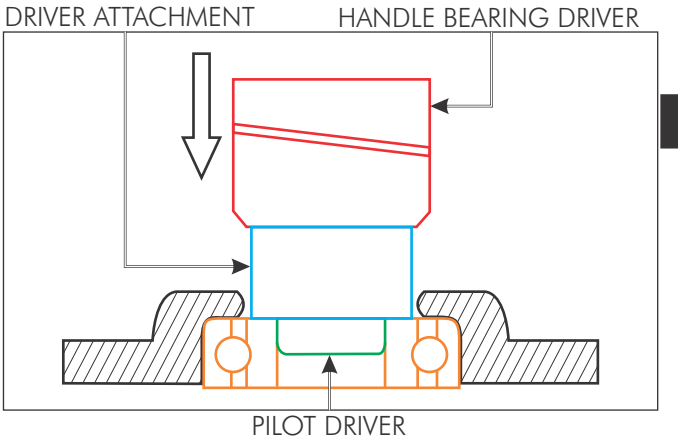
Drive out the balancer shaft bearing from the right crankcase.

TOOL

PILOT DRIVER, 20 mm
PART NO: 070 HH KTN 006
DRIVER ATTACHMENT, 32x35 mm
PART NO: 070 HH KFN 010
HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008



To remove the bearings from the crankcase, set the required driver attachment and pilot to the driver handle as shown and drive out the bearings.



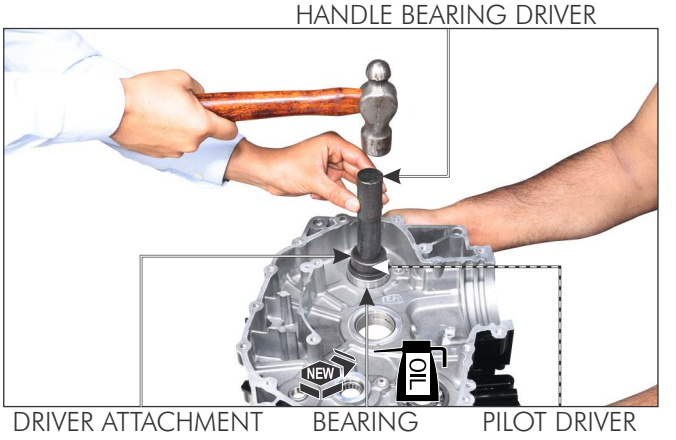
11

INSTALLATION

Lubricate all the bearing with clean engine oil.
Drive new balancer shaft bearing into the right crankcase.

TOOL

PILOT DRIVER, 20 mm
PART NO: 070 HH KTN 006
DRIVER ATTACHMENT, 50x55 mm
PART NO: HMCL0623RAAA02
HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008

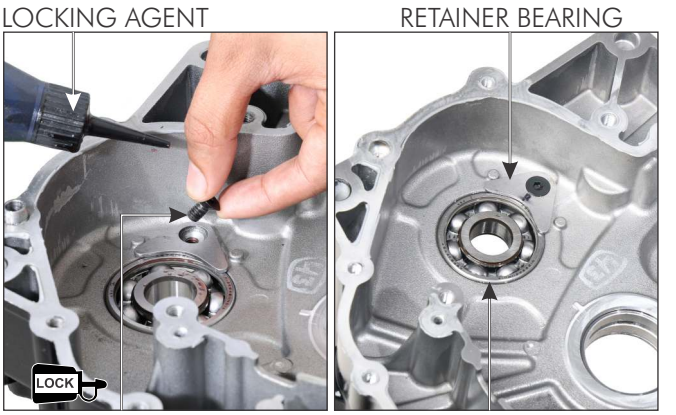


Install the retainer bearing.
Apply locking agent to the threads of the screw flat head.
Install the screw flat head.
Tighten the screw flat head to the specified torque.

TORQUE

SCREW FLAT HEAD: 1.1 kgf-m

Install the transmission (page 11-16).
Install the crankshaft and balancer shaft (page 11-10).
Install the crankcase (page 11-7).



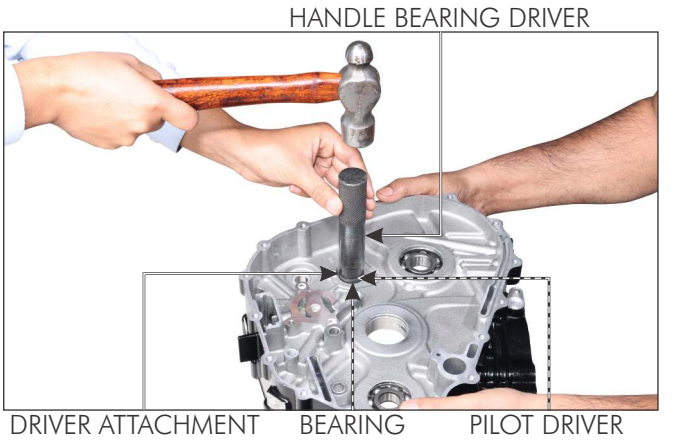
RIGHT CRANKCASE SHIFT DRUM BEARING

REMOVAL

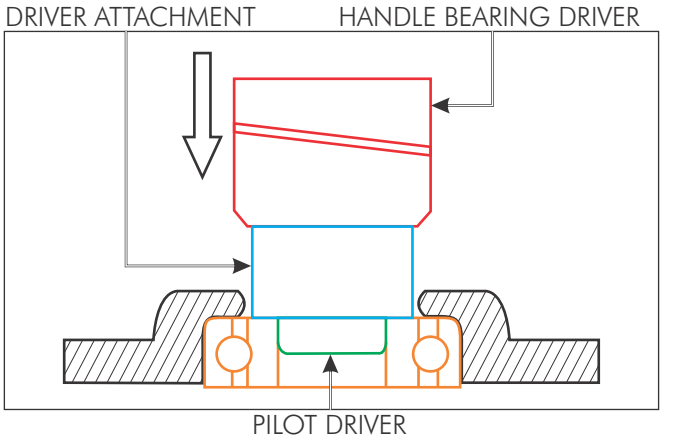
Separate the crankcase (page 11-5).
Remove the crankshaft and balancer shaft (page 11-9).
Remove the transmission (page 11-12).
Drive out the gear shift drum needle bearing from the right crankcase with following tools.

TOOL

PILOT DRIVER, 21 mm
PART NO: 070 HH KFN 014
DRIVER ATTACHMENT, 24x27 mm
PART NO: 070 HH KFN 021
HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008



To remove the bearings from the crankcase, set the required driver attachment and pilot to the driver handle as shown and drive out the bearings.



INSTALLATION

Lubricate all the bearing with clean engine oil.

Drive new balancer bearing into the right crankcase.

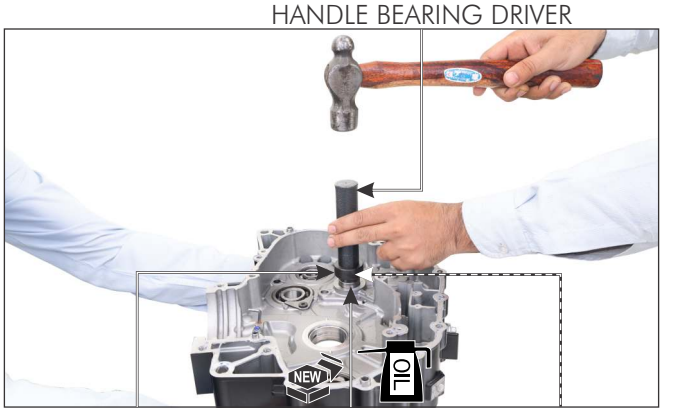
TOOL

PILOT DRIVER, 21 mm
PART NO: 070 HH KFN 014
GEAR SHIFT DRUM BEARING DRIVER
PART NO: HMCL0423ACAA06
HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008

Install the transmission (page 11-16).

Install the crankshaft and balancer shaft (page 11-10).

Install the crankcase (page 11-7).



LEFT CRANKCASE OIL SEAL

REMOVAL

Separate the crankcase (page 11-5).

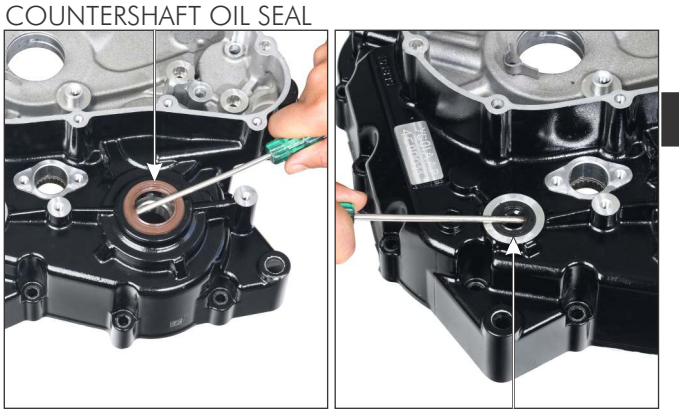
Remove the crankshaft and balancer shaft (page 11-9).

Remove the transmission (page 11-12).

Remove the countershaft oil seal and gear shift shaft dust seal from the left crankcase.

INSTALLATION

Installation is in the reverse order of removal.



LEFT CRANKCASE COUNTERSHAFT BEARING

REMOVAL

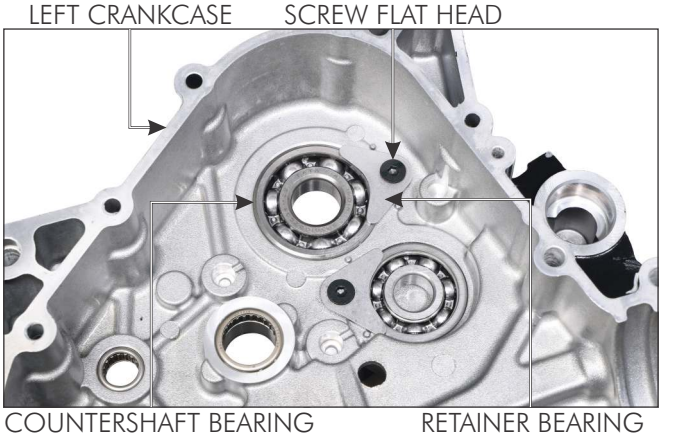
Separate the crankcase (page 11-5).

Remove the crankshaft and balancer shaft (page 11-9).

Remove the transmission (page 11-12).

Remove the countershaft oil seal (page 11-26).

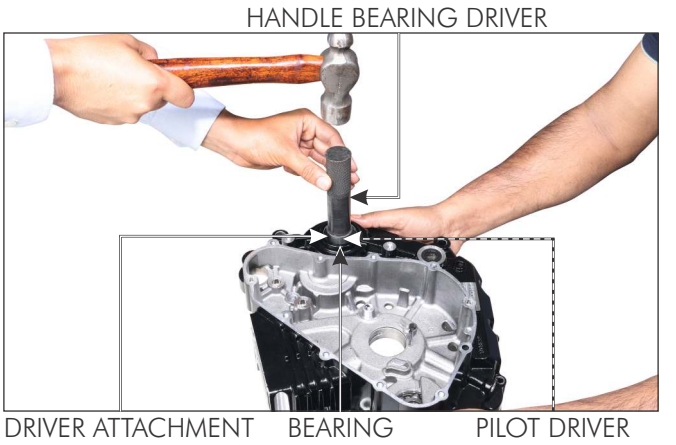
Remove the retainer bearing by removing the screw flat head from the left crankcase.



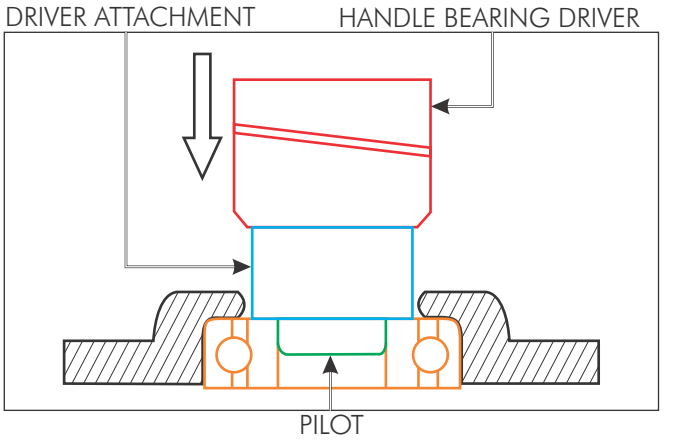
Drive out the countershaft bearing from the left crankcase with following tools.

TOOL

PILOT DRIVER, 21 mm
PART NO: 070 HH KFN 014
DRIVER ATTACHMENT, 32x35 mm
PART NO: 070 HH KFN 010
HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008



To remove the bearings from the crankcase, set the required driver attachment and pilot to the driver handle as shown and drive out the bearings.

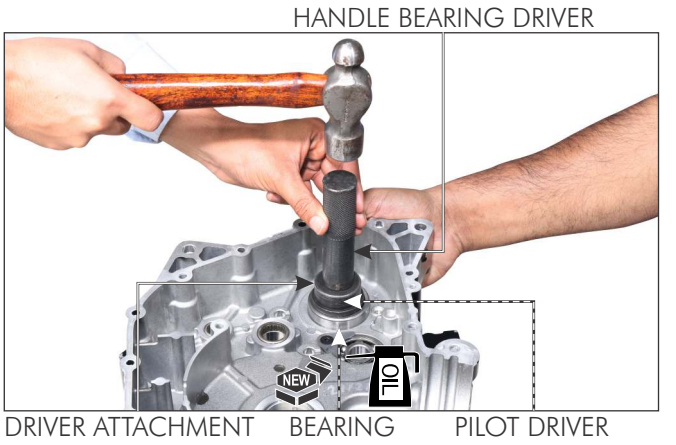


INSTALLATION

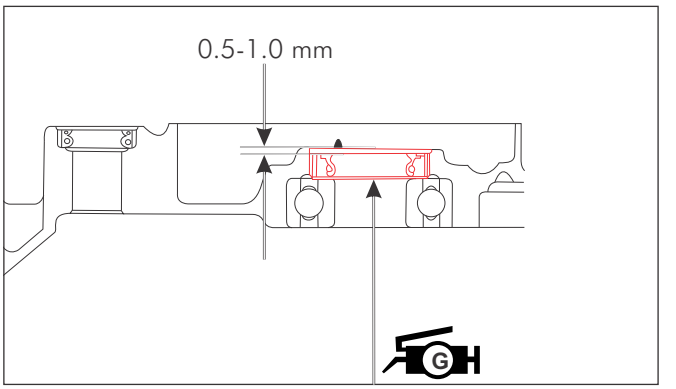
Lubricate all the bearing with clean engine oil.
Drive new countershaft bearing into the left crankcase.

TOOL

PILOT DRIVER, 21 mm
PART NO: 070 HH KFN 014
DRIVER ATTACHMENT, 50x55 mm
PART NO: HMCL0623RAAA02
HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008



Apply grease to new oil seal lips.
Install countershaft oil seals.



COUNTERSHAFT OIL SEAL

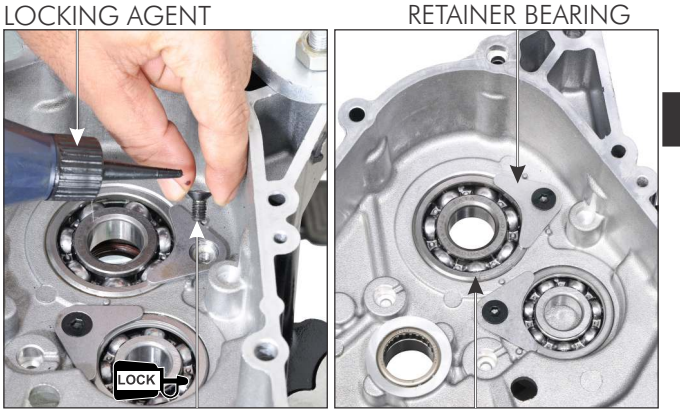
Install the retainer bearing.
Apply locking agent to the threads of the screw flat head.
Install the screw flat head.
Tighten the screw flat head to the specified torque.

TORQUE

SCREW FLAT HEAD: 1.1 kgf-m

Install the transmission (page 11-16).
Install the crankshaft and balancer shaft (page 11-10).
Install the crankcase (page 11-7).

LOCKING AGENT RETAINER BEARING



SCREW FLAT HEAD COUNTERSHAFT BEARING

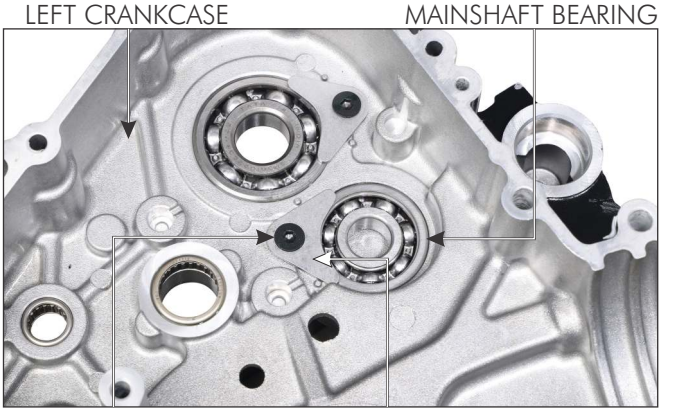
11

LEFT CRANKCASE MAINSHAFT BEARING

REMOVAL

Separate the crankcase (page 11-5).
Remove the crankshaft and balancer shaft (page 11-9).
Remove the transmission (page 11-12).
Remove the retainer bearing by removing the screw flat head from the left crankcase.

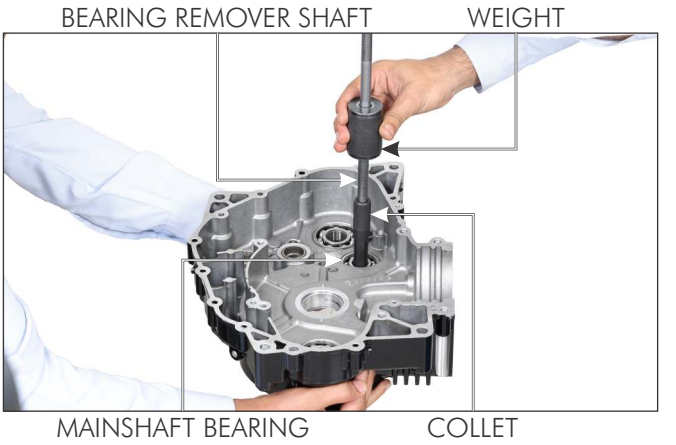
LEFT CRANKCASE MAINSHAFT BEARING


SCREW FLAT HEAD RETAINER BEARING

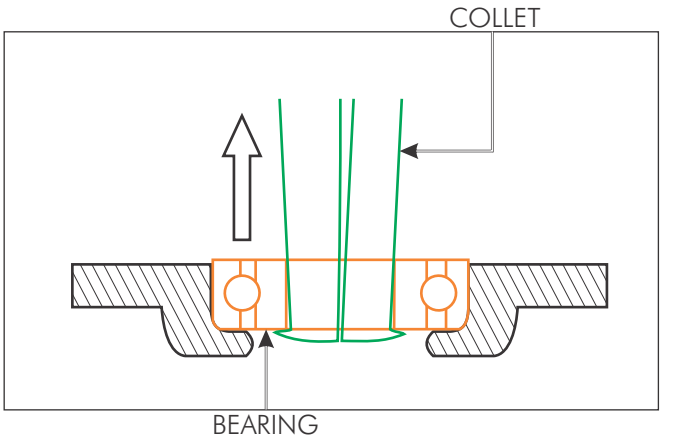
Drive out the main shaft bearing from the left crankcase with following tools.

TOOL

CRANKCASE BEARING REMOVER SHAFT
PART NO: 070 HH KFN 006
CRANKCASE BEARING REMOVER WEIGHT
PART NO: 070 HH KFN 007
COLLET BEARING REMOVER, 17 mm
PART NO: 070 HH KTN 002



To remove the bearings from the crankcase, install the collet in to the bearing and then drive in the bearing remover shaft along with the bearing remover weight in to the collet, then remove the bearing out by sliding the bearing remover weight on the shaft.

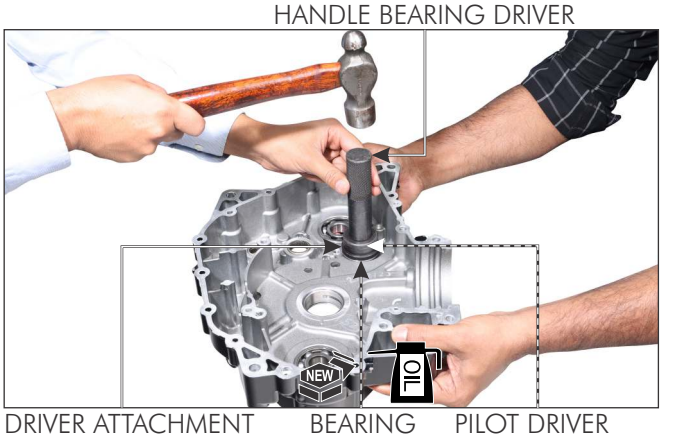


INSTALLATION

Lubricate all the bearing with clean engine oil.
Drive new mainshaft bearing into the left crankcase.

TOOL

PILOT DRIVER, 17 mm
PART NO: 070 HH 198 033
DRIVER ATTACHMENT, 42x47 mm
PART NO: 070 HH KFN 011
HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008

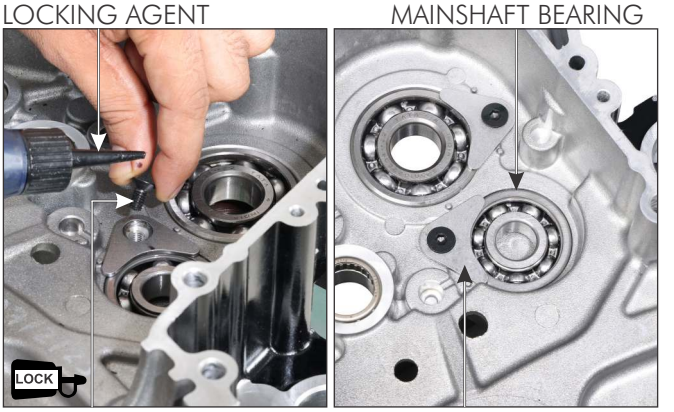


Install the retainer bearing.
Apply locking agent to the threads of the screw flat head.
Install the screw flat head.
Tighten the screw flat head to the specified torque.

TORQUE

SCREW FLAT HEAD: 1.1 kgf-m

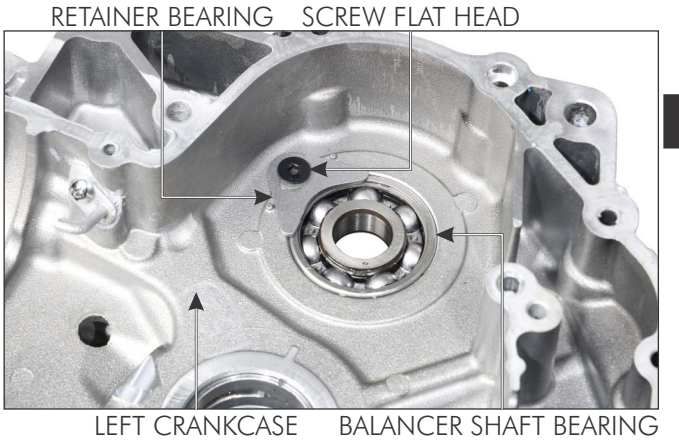
Install the transmission (page 11-16).
Install the crankshaft and balancer shaft (page 11-10).
Install the crankcase (page 11-7).



LEFT CRANKCASE BALANCER SHAFT BEARING

REMOVAL

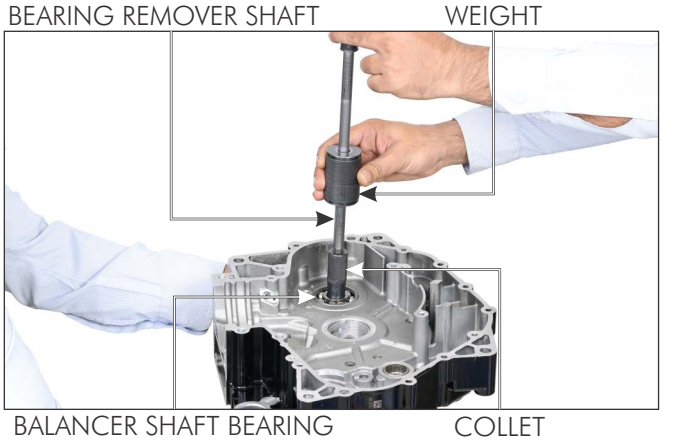
Separate the crankcase (page 11-4).
Remove the crankshaft and balancer shaft (page 11-9).
Remove the transmission (page 11-12).
Remove the retainer bearing by removing the screw flat head from the left crankcase.



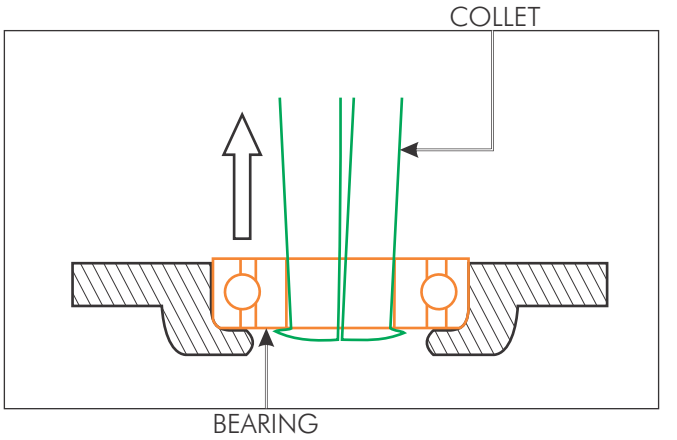
Drive out the balancer bearing from the left crankcase with following tools.

TOOL

CRANKCASE BEARING REMOVER SHAFT
PART NO: 070 HH KFN 006
CRANKCASE BEARING REMOVER WEIGHT
PART NO: 070 HH KFN 007
COLLET BEARING REMOVER, 20 mm
PART NO: 070 HH KZN 003



To remove the bearings from the crankcase, install the collet in to the bearing and then drive in the bearing remover shaft along with the bearing remover weight in to the collet, then remove the bearing out by sliding the bearing remover weight on the shaft.

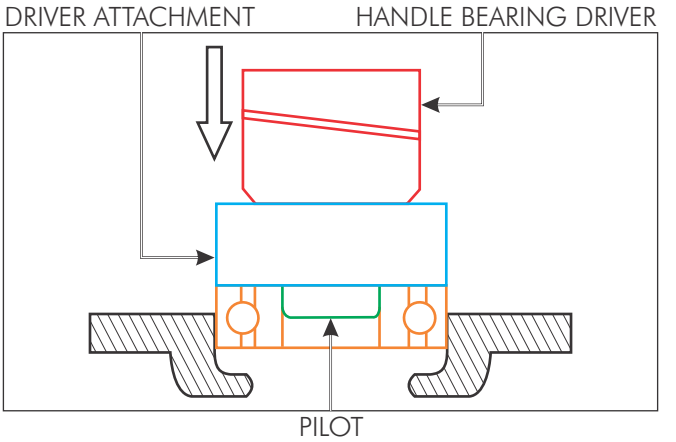


INSTALLATION

To install the bearings onto the crankcase, set the required driver attachment and pilot to the driver handle as shown and drive in the bearings.

NOTE

Make sure not to push the ball or the inner race of the bearing. Make sure not to damage the rolling surface of the bearing at this time.

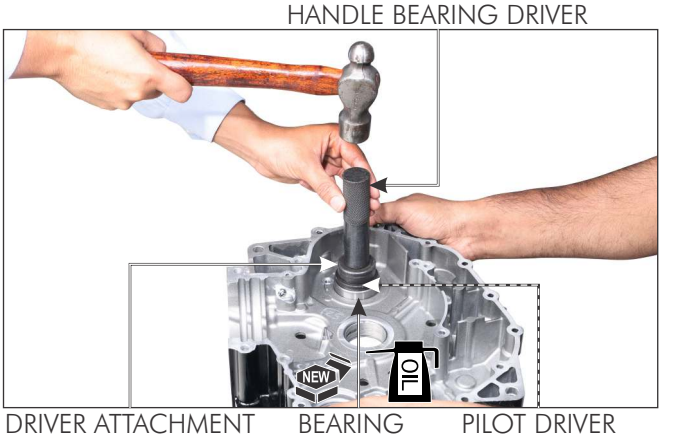


Lubricate all the bearing with clean engine oil.

Drive new balancer bearing into the left crankcase.

TOOL

PILOT DRIVER, 20 mm
PART NO: 070 HH KFN 006
DRIVER ATTACHMENT, 50x55 mm
PART NO: HMCL0623RAAA02
HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008

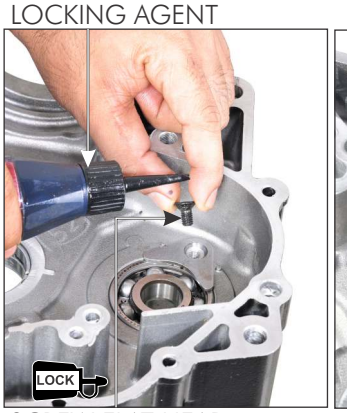


Install the retainer bearing.
Apply locking agent to the threads of the screw flat head.
Install the screw flat head.
Tighten the screw flat head to the specified torque.

TORQUE

SCREW FLAT HEAD: 1.1 kgf-m

Install the transmission (page 11-16).
Install the crankshaft and balancer shaft (page 11-10).
Install the crankcase (page 11-7).



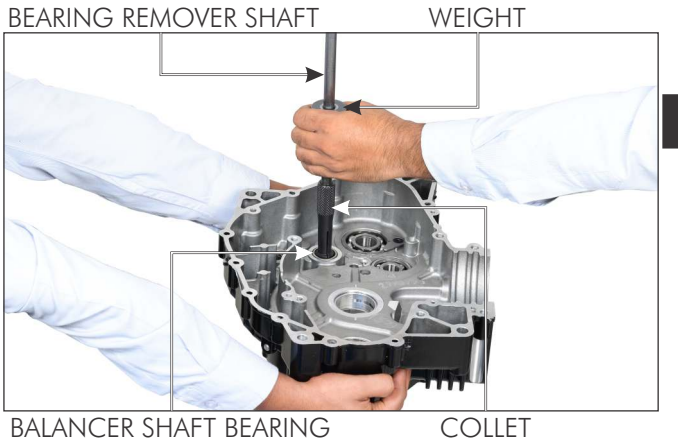
LEFT CRANKCASE GEAR SHIFT DRUM NEEDLE BEARING

REMOVAL

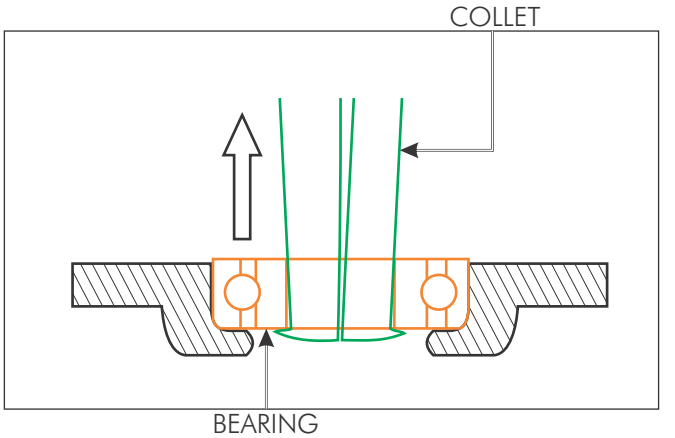
Separate the crankcase (page 11-4).
Remove the crankshaft and balancer shaft (page 11-9).
Remove the transmission (page 11-12).
Drive out the gear shift drum needle bearing from the left crankcase with following tools.

TOOL

CRANKCASE BEARING REMOVER SHAFT
PART NO: 070 HH KFN 006
CRANKCASE BEARING REMOVER WEIGHT
PART NO: 070 HH KFN 007
COLLET BEARING REMOVER, 22 mm
PART NO: HMCL0623RAAA01



To remove the bearings from the crankcase, install the collet in to the bearing and then drive in the bearing remover shaft along with the bearing remover weight in to the collet, then remove the bearing out by sliding the bearing remover weight on the shaft.

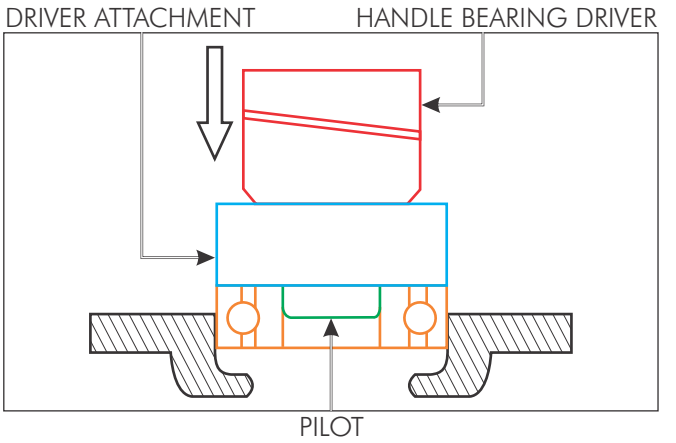


INSTALLATION

To install the bearing onto the crankcase, set the required driver attachment and pilot to the driver handle as shown and drive in the bearings.

NOTE

Make sure not to push the ball or the inner race of the bearing. Make sure not to damage the rolling surface of the bearing at this time.



Lubricate all the bearing with clean engine oil.

Drive new gear shift drum needle bearing into the left crankcase.

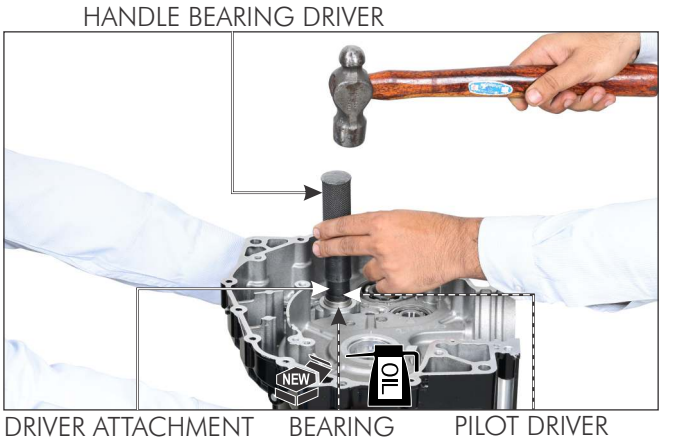
TOOL

PILOT DRIVER, 21 mm
PART NO: 070 HH KFN 014
DRIVER ATTACHMENT, 24x27 mm
PART NO: 070 HH KFN 021
HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008

Install the transmission (page 11-16).

Install the crankshaft and balancer shaft (page 11-10).

Install the crankcase (page 11-7).



LEFT CRANKCASE GEAR SHAFT SHIFT NEEDLE BEARING

REMOVAL

Separate the crankcase (page 11-4).

Remove the crankshaft and balancer shaft (page 11-9).

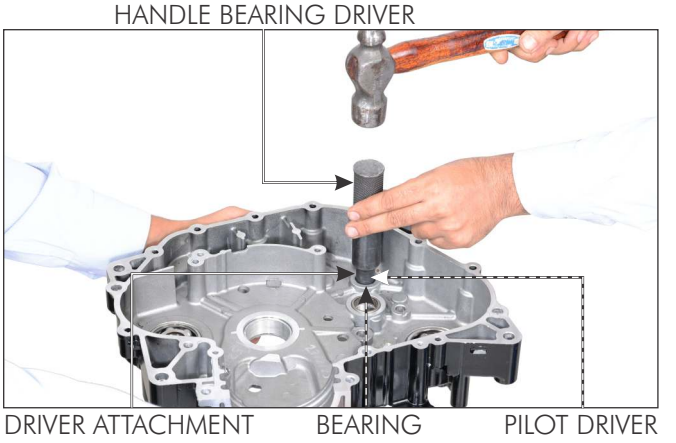
Remove the transmission (page 11-12).

Remove the gear shaft shift needle bearing oil seal (page 11-12).

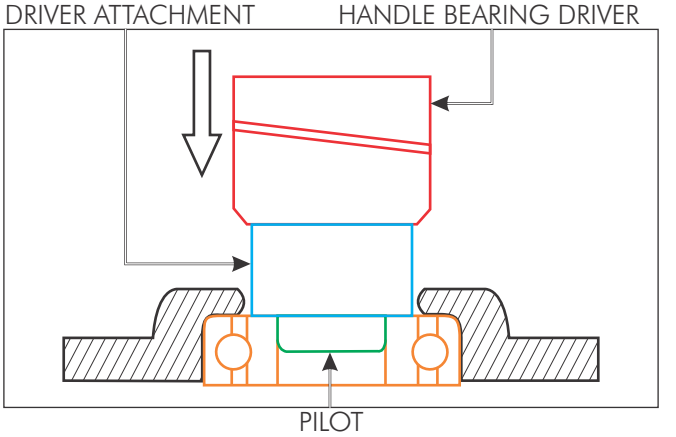
Drive out the gear shaft shift needle bearing from the left crankcase.

TOOL

PILOT DRIVER, 14 mm
PART NO: HMCL0423ACAA05
DRIVER ATTACHMENT, 19x21 mm
PART NO: HMCL0423ACAA08
HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008



To remove the bearings from the crankcase, set the required driver attachment and pilot to the driver handle as shown and drive out the bearings.

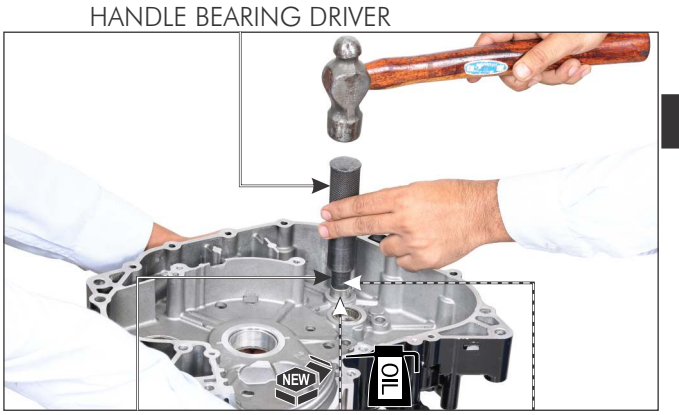


Lubricate all the bearing with clean engine oil.

Drive new gear shaft shift needle bearing into the left crankcase.

TOOL

PILOT DRIVER, 14 mm
PART NO: HMCL0423ACAA05
DRIVER ATTACHMENT, 19x21 mm
PART NO: HMCL0423ACAA08
HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008

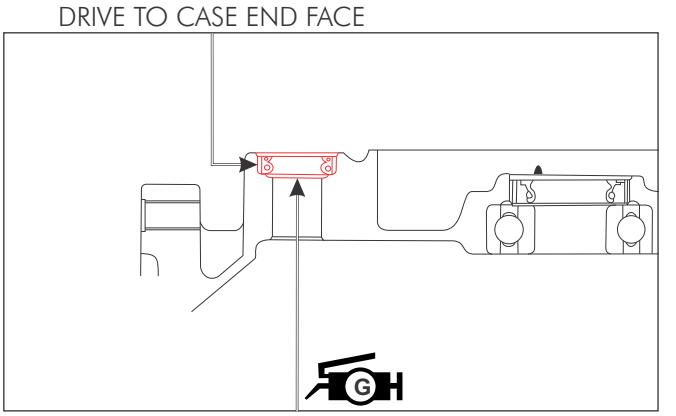


Install the gear shaft shift needle bearing oil seal (page 11-26).

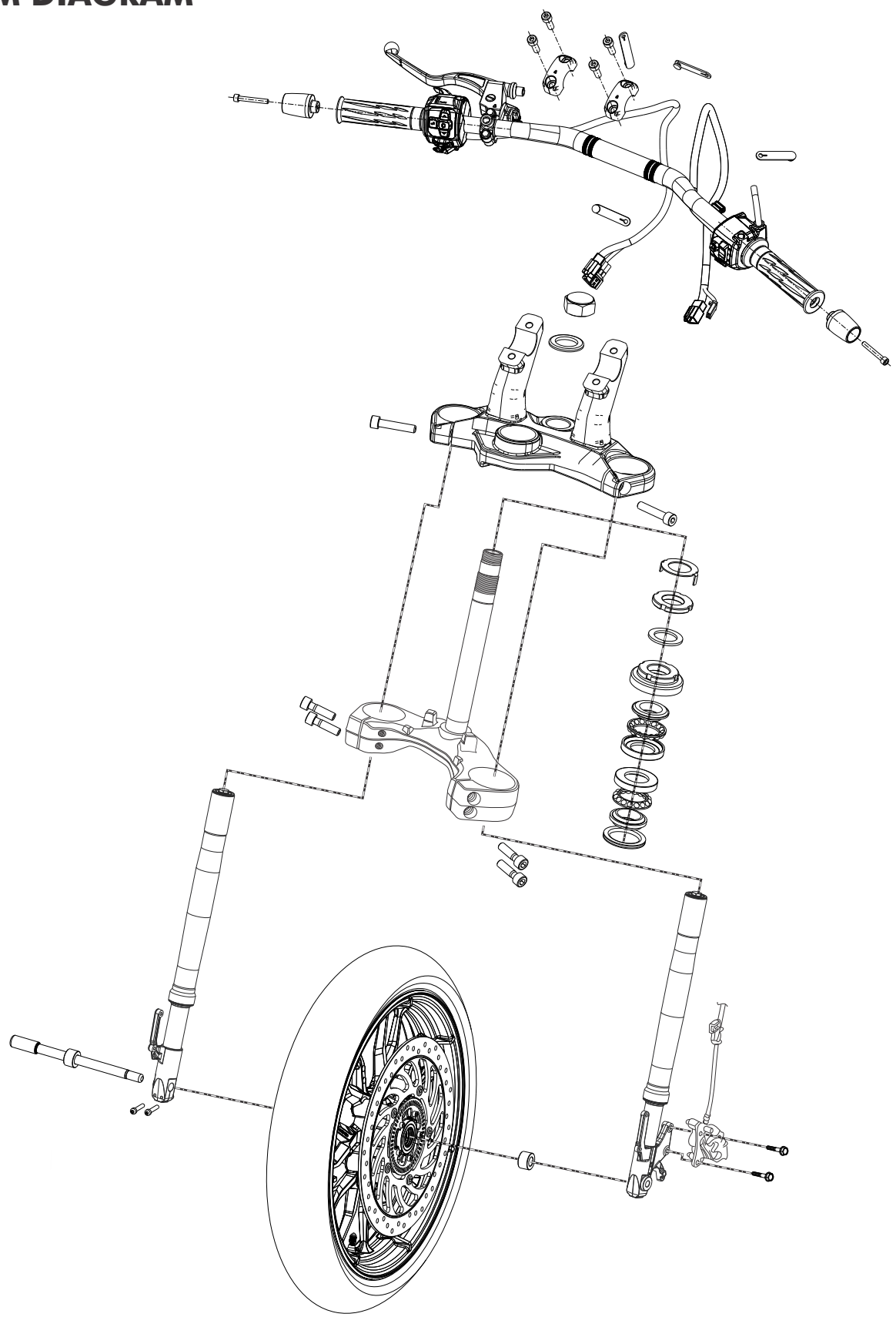
Install the transmission (page 11-16).

Install the crankshaft and balancer shaft (page 11-10).

Install the crankcase (page 11-7).



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

⚠ WARNING

- Riding on damaged wheels impairs safe operation of the vehicle.
- A contaminated brake disc or pad increases stopping distance. Discard contaminated pad and clean a contaminated disc with a high quality brake degreasing agent.

- This section covers maintenance of the front wheel, forks and steering stem.
- Raise the front wheel off the ground by supporting the vehicle securely with a jack or other support under the engine.
- After the front wheel installation, check the brake operation by applying the brake lever.
- Use only tyres marked "TUBELESS" and tubeless valves on wheels marked "TUBELESS TYRE APPLICABLE".
- Brake system information (page16-1).
- Lamps, meters and switches information (page 20-1).
- Take extra care while removing and installing the wheel bearing to avoid any damage to the encoder.

SPECIFICATIONS

FRONT WHEEL/SUSPENSION/STEERING

ITEM		STANDARD	SERVICE LIMIT
Minimum tyre tread depth		4.2 mm	0.8 mm
Cold tyre pressure	Rider only	27 psi	-
	Rider & Pillion	27 psi	-
Front axle straightness		Dia 0.2 mm	-
Front wheel rim runout	Axial (Tyre fitment area)	0.4 mm	2.0 mm
Wheel balance weight		60 g max	-
Fork spring free length		355.8 mm	346.7 mm
Fork tube runout		-	0.2 mm
Fork oil grade		OIL NO-00M01	
Fork oil capacity		430 cc (Per leg)	
Fork oil level		118 mm	
ABS sensor AIR GAP		0.8	Min 0.3 / Max 1.2

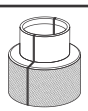
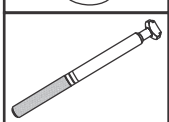
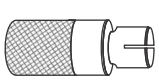
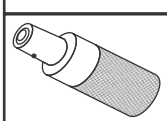
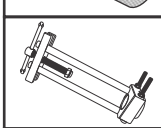
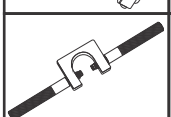
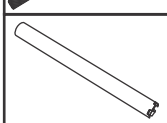
TORQUE VALUES

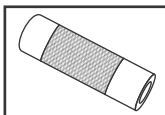
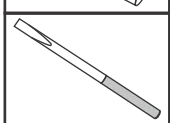
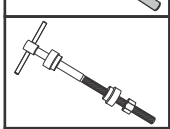
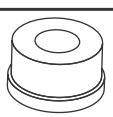
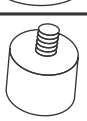
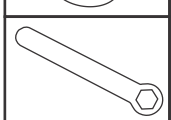
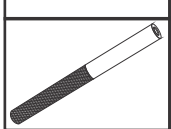
FORK TOP BRIDGE BOLT	: 2.0 kgf-m
FORK BOTTOM BRIDGE BOLT	: 1.8 kgf-m
FRONT AXLE NUT	: 6.8 kgf-m
FORK CAP BOLT	: 2.3 kgf-m
CLUTCH LEVER HOLDER BOLT	: 0.9 kgf-m
MASTER CYLINDER HOLDER BOLT	: 0.9 kgf-m
FRONT BRAKE LEVER PIVOT NUT	: 0.6 kgf-m
CLUTCH LEVER PIVOT NUT	: 0.6 kgf-m

HANDLE UPPER HOLDER BOLTS	: 2.1 kgf-m
STEERING STEM NUT	: 10.0 kgf-m
STEERING TOP THREAD COMPONENT (Initial)	: 5.0-5.5 kgf-m
STEERING TOP THREAD COMPONENT (Final)	: 1.4 kgf-m

For other nuts, bolts, fasteners etc. refer to standard torque values **(SECTION-1)**.

SPECIAL TOOLS

	FRONT FORK OIL SEAL INSTALLER (43 mm) PART NO: HMCL0623RAAA07
	FRONT FORK OIL SEAL INSERTER (43 mm) PART NO: HMCL0623RAAA08
	BALL RACE DRIVER PART NO: 070 HH KTN 005
	BEARING REMOVER HEAD, 15 mm PART NO: 070 HH KVN 001
	HANDLE BEARING DRIVER PART NO: 070 HH KFN 008
	T-STEM CONE PULLER PART NO: 070 HH KST 001
	FRONT FORK SPRING COMPRESSOR PART NO: HMCL0423ACRD08
	FRONT FORK CARTRIDGE REMOVAL TOOL PART NO: HMCL0423ACRD11
	STEERING BEARING ADJUSTING NUT SOCKET, 41 mm PART NO: 070 HH KST 004

	BOTTOM CONE RACE DRIVER PART NO: 070 HH KST 002
	WHEEL BEARING REMOVER HEAD SHAFT PART NO: 070 HH KZJ 009
	UPPER AND BOTTOM CONE INSTALLER PART NO: 070 HH KST 003
	DRIVER ATTACHMENT, 40x46 mm PART NO: 070 HH 198 031
	PILOT DRIVER, 15 mm PART NO: 070 HH KFN 013
	FRONT FORK WRENCH (22 mm) PART NO: HMCL0423ACRD07
	FRONT FORK SPRING LOCK PART NO: HMCL0423ACRD09
	FRONT FORK PISTON ROD EXTENSION PART NO: HMCL0423ACRD12

TROUBLESHOOTING

Hard steering
- Steering bearing adjustment nut too tight
- Worn or damaged steering head bearing
- Bent steering stem
- Insufficient tyre pressure
- Faulty tyre

Steers to one side or does not track straight
- Bent front tube
- Bent front axle
- Wheel installed incorrectly
- Faulty steering head bearing
- Bent frame
- Worn or damaged wheel bearings
- Worn or damaged swingarm pivot bearings
- Unevenly assembled left and right fork tubes
- Unequal oil quantity in each fork tube

Front wheel wobbling
- Bent rim
- Worm wheel bearings
- Bent or loose spoke
- Faulty tyre
- Unbalanced front tyre and wheel
- Axle not tightened properly

Wheel turns hard
- Damaged front wheel bearing
- Brake dragging
- Bent front axle
- Insufficient tyre pressure

Brake squeaks
- Worn brake lining/pad/disc
- Contaminated brake lining/pad/disc

Soft suspension
- Weak fork spring
- Insufficient fork oil
- Oil viscosity too low (wrong grade of oil)
- Insufficient tyre pressure

Hard suspension
- Bent or damaged fork tube
- Clogged fluid passage
- Incorrect fluid viscosity
- Oil volume too high
- Damaged fork slider

Front suspension noisy
- Faulty slider bushing
- Insufficient fork fluid
- Loose front suspension fasteners
- Uneven fluid quantity in fork tubes

Poor brake performance
- Contaminated brake lining/pad/disc

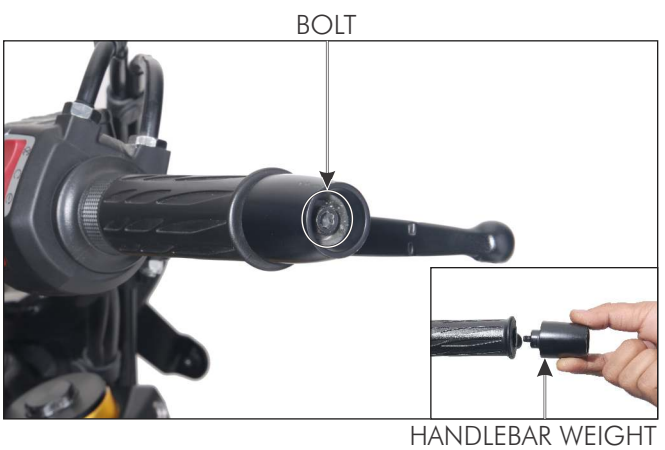
HANDLEBAR

REMOVAL

Remove the rear view mirrors (page 2-3).

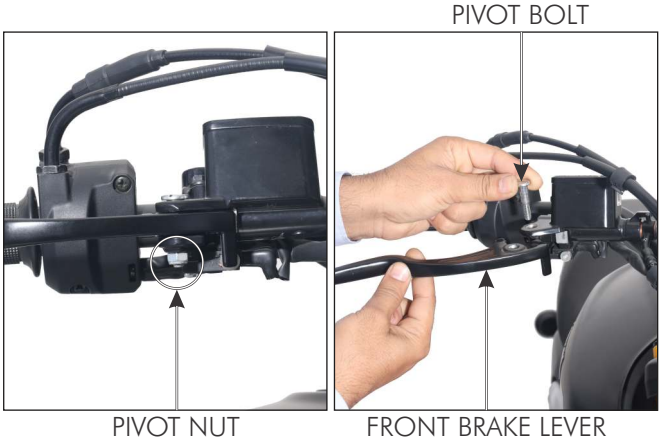
Remove the wire bands.

Remove the right side handlebar weight by removing its allen key bolt (Nos.: 1, Size: 5 mm).



Remove the front brake lever pivot nut.

Remove the front brake lever by removing its pivot bolt.



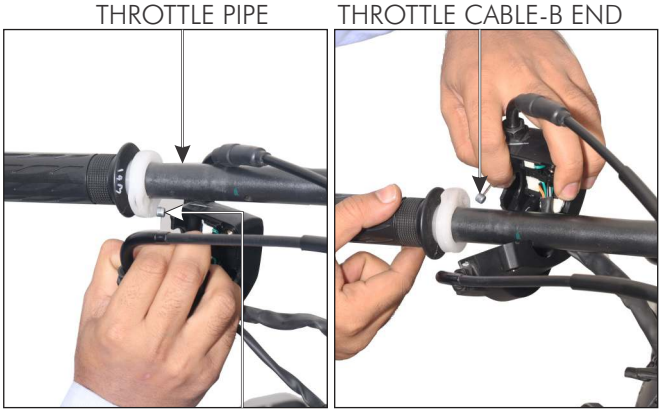
Disconnect the front brake switch connection by removing connectors.

Remove the bolts (Nos.: 2, Size: 8 mm), front brake master cylinder and holder.

Remove the right handlebar switch housing screws (Nos.: 2).

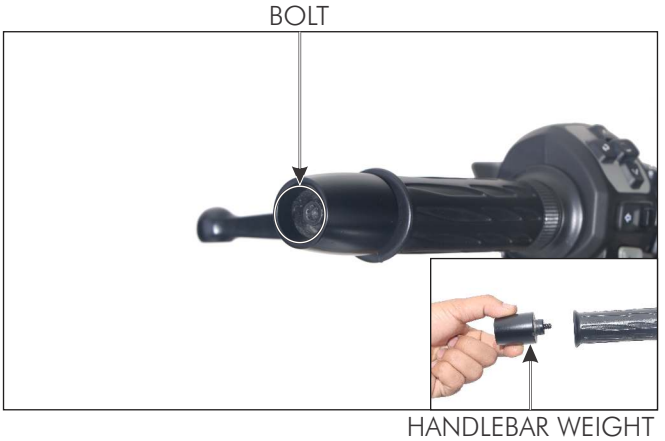
Separate the right handlebar switch housing.

Disconnect the throttle cable-A & B end from the throttle pipe.



Remove the throttle grip and throttle pipe from the handlebar.

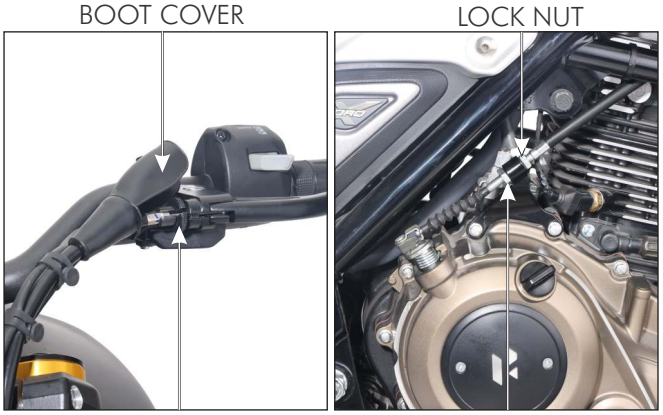
Remove the left side handlebar weight by removing its allen key bolt (Nos.: 1, Size: 5 mm).



Slide back the boot cover.

Loosen the clutch cable lock nut from handlebar side.

Loosen the clutch cable lock nut and adjusting nut from right crankcase cover side.



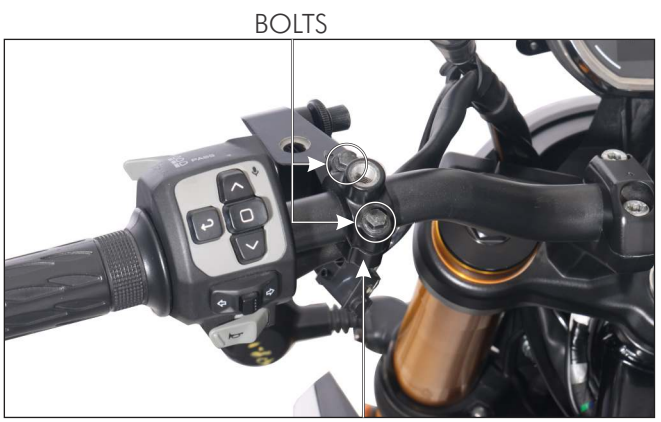
Disconnect the clutch cable from the clutch lever/yoke.

Remove the clutch switch by removing the screw (Nos.: 1).

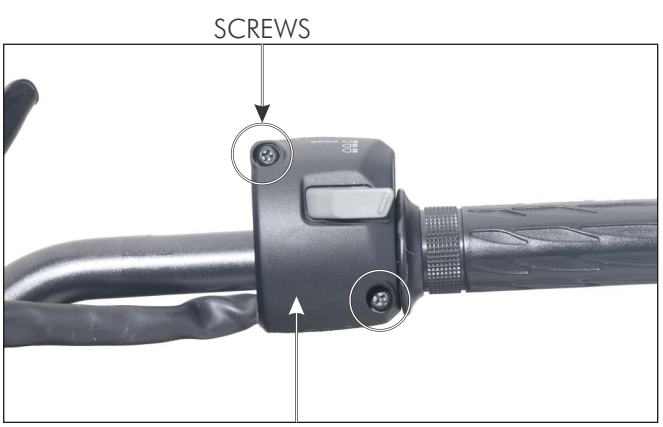
Remove the clutch lever pivot nut.

Remove the clutch lever by removing its pivot bolt.

Remove the clutch lever holder by removing its bolts (Nos.: 2, Size: 8 mm).

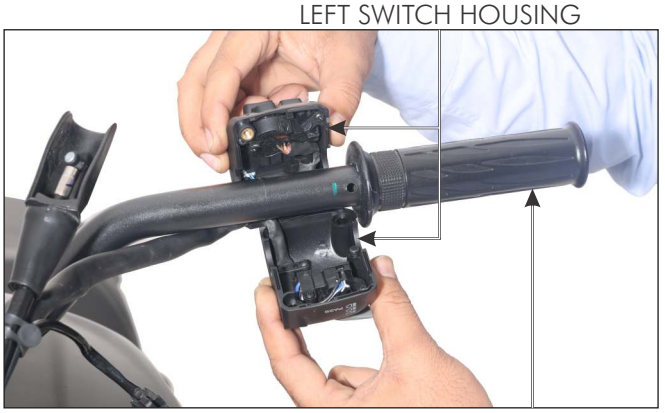


Remove the left handlebar switch housing screws (Nos.: 2) as shown.



Separate the left handlebar switch housing.
Remove the left handlebar grip.

LEFT SWITCH HOUSING



LEFT HANDLEBAR GRIP

Remove the handle upper holders allen key bolts (Nos.: 4, Size: 6 mm).

HANDLE UPPER HOLDERS

BOLTS

Remove the handlebar from the top bridge.

HANDLEBAR

TOP BRIDGE

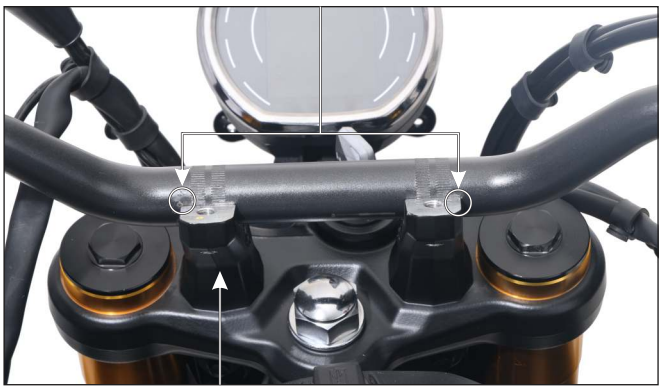
INSTALLATION

Install the handlebar onto the top bridge.

NOTE

Align the handlebar punch mark with the lower holder top edge at both sides.

PUNCH MARKS



TOP BRIDGE

Install the handle upper holder onto the handlebar and its allen key bolts (Nos.: 4, Size: 6 mm) to the specified torque.

TORQUE

HANDLE UPPER HOLDER BOLTS: 2.1 kgf-m

HANDLE UPPER HOLDERS

BOLTS

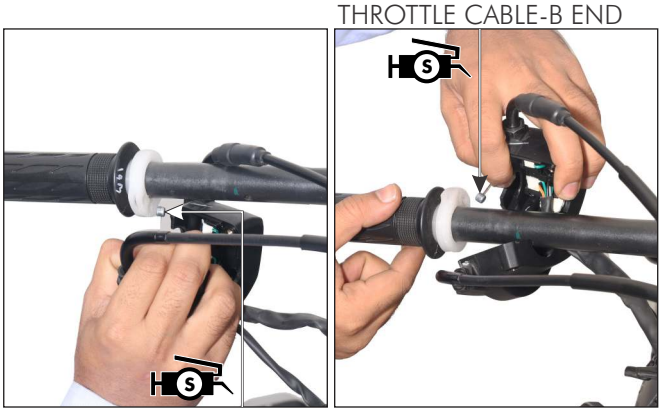
Apply grease to the throttle pipe rotating area of the handlebar.

Install the throttle grip on the handlebar.

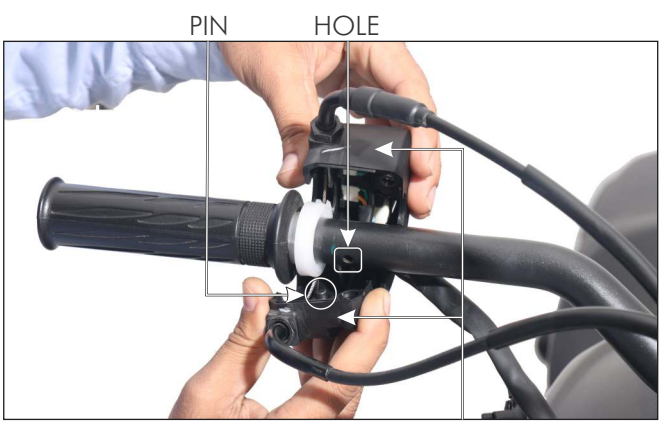
THROTTLE GRIP

THROTTLE PIPE

Apply silicon grease to the throttle cable-A & B end.
Connect the throttle cable end to the throttle pipe.



Align the locating pin with the hole on the handlebar and install the right handlebar switch housing.



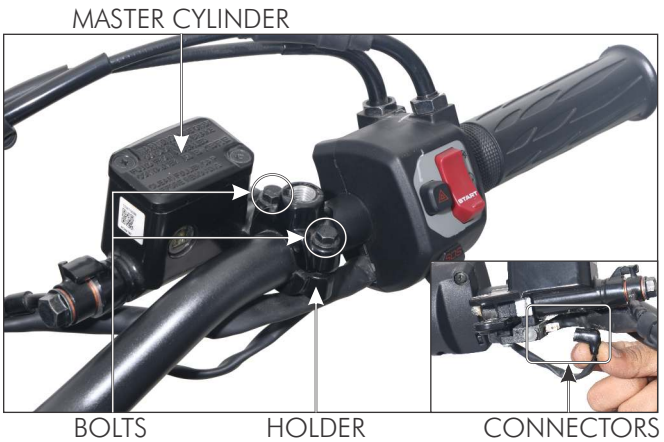
RIGHT HANDLEBAR SWITCH HOUSING

Install and tighten the right handlebar switch housing screws (Nos.: 2).

Install the front brake master cylinder and holder by installing its bolts (Nos.: 2, Size: 8 mm) to the specified torque.

TORQUE

MASTER CYLINDER HOLDER BOLTS: 0.9 kgf-m

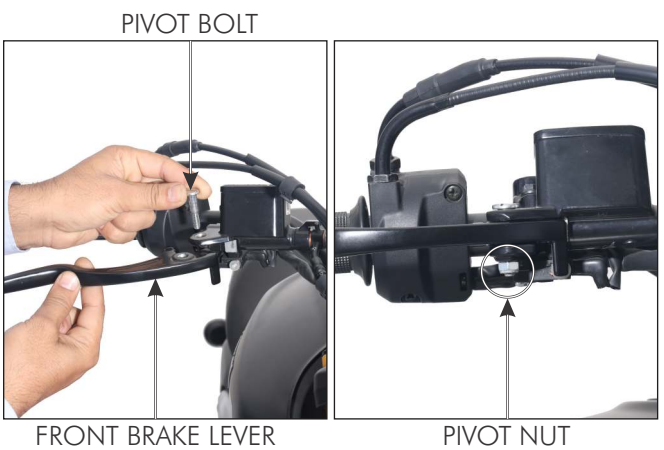


Install the front brake lever and insert the pivot bolt.

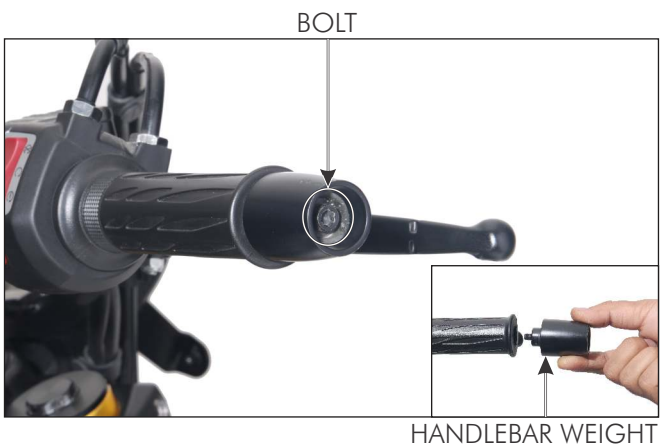
Install and tighten the front brake lever pivot nut to the specified torque.

TORQUE

FRONT BRAKE LEVER PIVOT NUT: 0.6 kgf-m



Install the right side handlebar weight by installing its allen key bolt (Nos.: 1, Size: 5 mm).

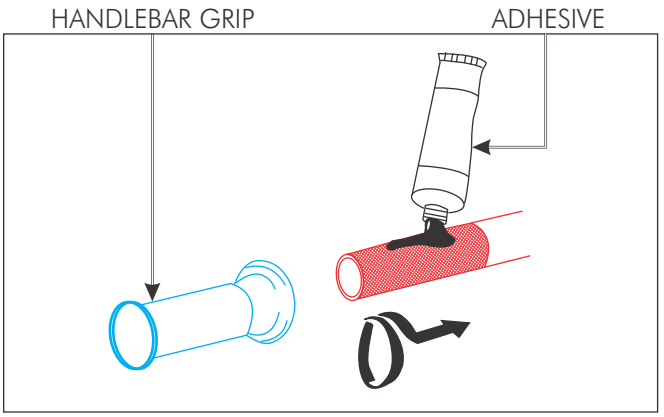


Apply Fevicol PL-10 & Hardener (5% by volume) or its equivalent to the inside surface of the grip and to the clean surface of the left handlebar.

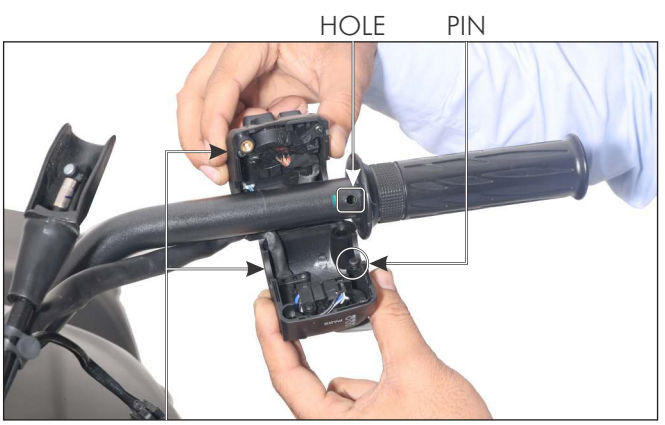
Rotate the grips for even application of the adhesive.

CAUTION

The adhesive should not leak off to the inside portion of the head pipe.

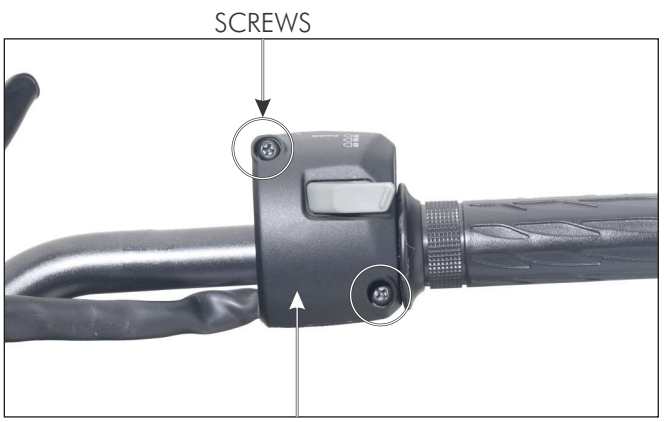


Install the left handlebar switch housing, while aligning the locating pin in the housing with the hole in the handlebar.



LEFT SWITCH HOUSING

Install the left handlebar switch housing screws (Nos.: 2) as shown.



LEFT SWITCH HOUSING

Carefully align the clutch lever holder back into its original position on the handlebar.

Insert the bolts (Nos.: 2, Size: 8 mm) through the holes in the clutch lever holder.

Tighten the bolts to the specified torque.

TORQUE

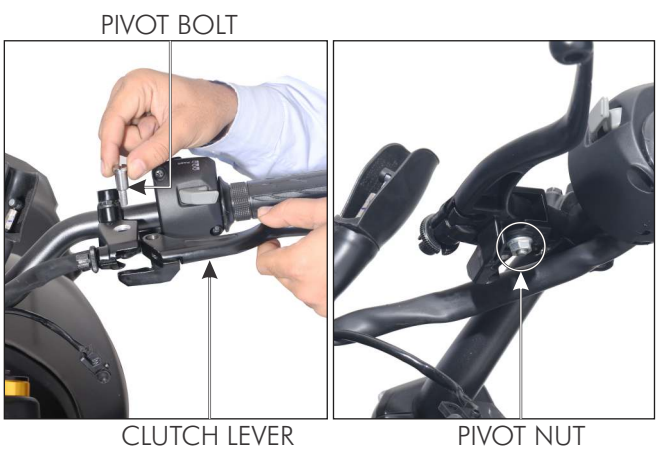
CLUTCH LEVER HOLDER BOLTS: 0.9 kgf-m

Install the clutch lever and insert the pivot bolt.

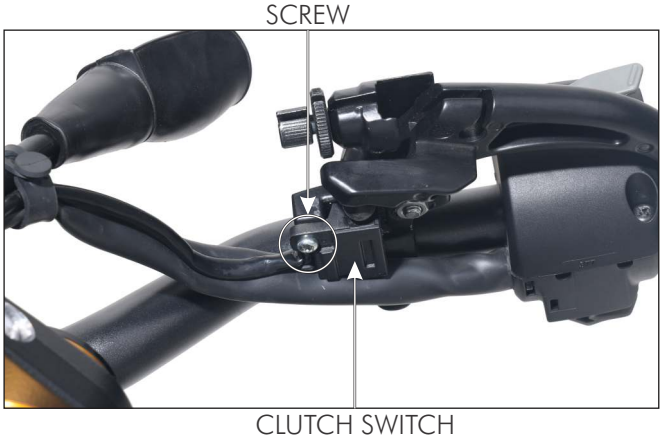
Install and tighten the clutch lever pivot nut to the specified torque.

TORQUE

CLUTCH LEVER PIVOT NUT: 0.6 kgf-m



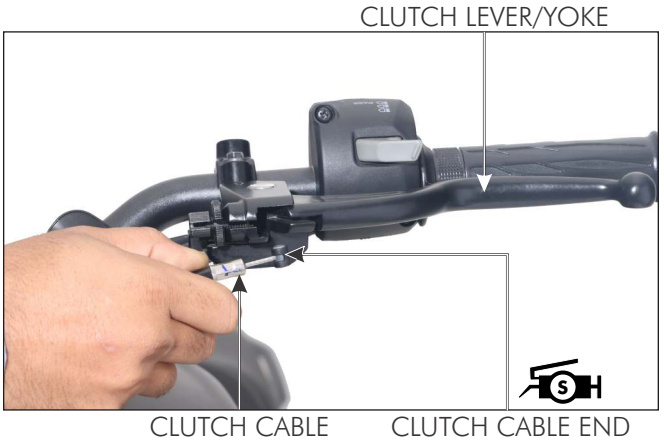
Install the clutch switch by installing the screw (Nos.: 1).



Connect the clutch cable to the clutch lever/yoke.

NOTE

Apply silicon grease to the clutch cable end.

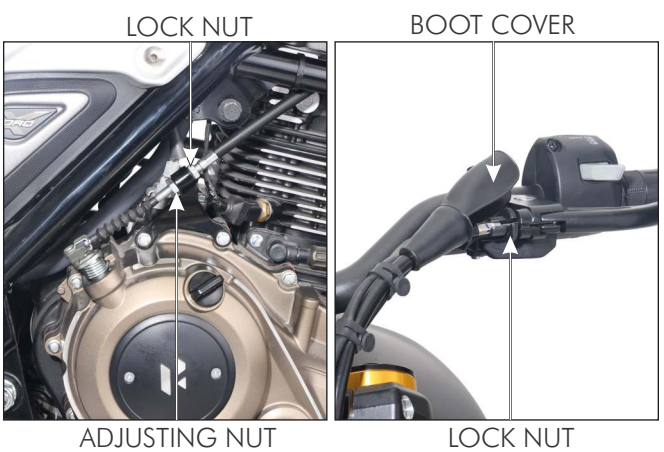


Tighten the clutch cable lock nut and adjusting nut to the right crankcase cover side.

Tighten the clutch cable lock nut from handlebar side.

Slide back the boot cover properly.

Adjust the clutch lever free play (page 3-37).

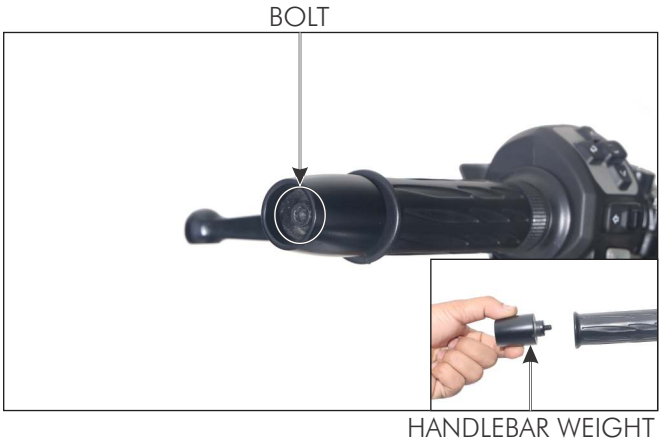


Install the left side handlebar weight by installing its allen key bolt (Nos.: 1, Size: 5 mm).

Install the rear view mirrors (page 2-3).

NOTE

Route the cables/wires/hoses properly refer (section-1)



FRONT WHEEL

⚠ WARNING

A contaminated brake disc pad increases stopping distance.
Discard contaminated pads and clean contaminated disc with a high quality brake degreasing agent.

REMOVAL

Loosen the front fork bottom pinch bolts (Nos.: 2, Size: 6 mm).

FRONT FORK BOTTOM PINCH BOLT

Loosen the front axle using the allen key.

Raise the front wheel off the ground by placing a jack or other support under the engine.

Remove the front axle and wheel.

Remove the front caliper assembly (page 17-28).

Remove the wheel speed sensor cable (page 16-14).

NOTE

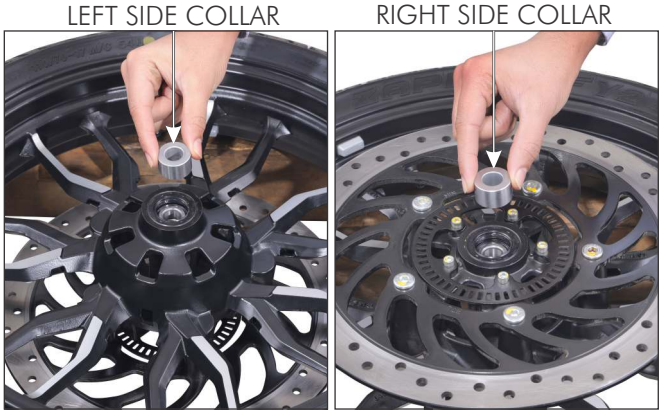
Do not operate the brake lever after removing the caliper and front wheel. If this is done, it will be difficult to fit brake disc between brake pads

ALLEN KEY

FRONT AXLE FRONT WHEEL

Remove the left side and right side collar.

LEFT SIDE COLLAR RIGHT SIDE COLLAR



INSPECTION

Place the axle in V-blocks and measure the runout with a dial indicator.

Actual runout is ½ of the total indicator reading.

SERVICE LIMIT

FRONT AXLE STRAIGHTNESS: 0.2 mm

FRONT AXLE

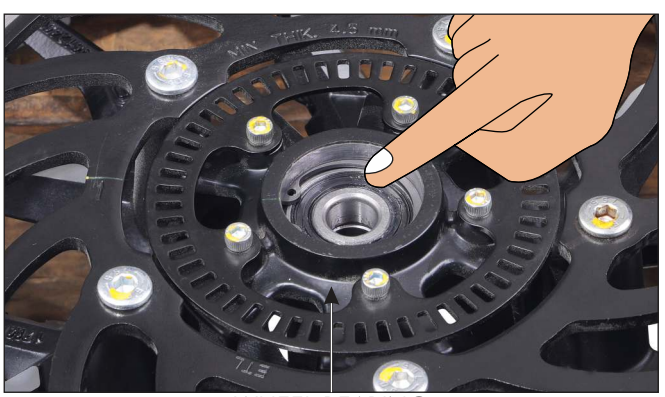
Turn the inner race of each bearing with your finger, the bearing should turn smoothly and quietly.

Also check that the bearing outer race fits tightly in the hub.

Remove and discard the bearings if the races do not turn smoothly, quietly, or of they fit loosely in the hub.

NOTE

Replace the wheel bearings in pairs.



WHEEL BEARING

Check the wheel rim runout by placing the wheel in a turning stand.

Spin the wheel by hand and read the runout using a dial indicator.

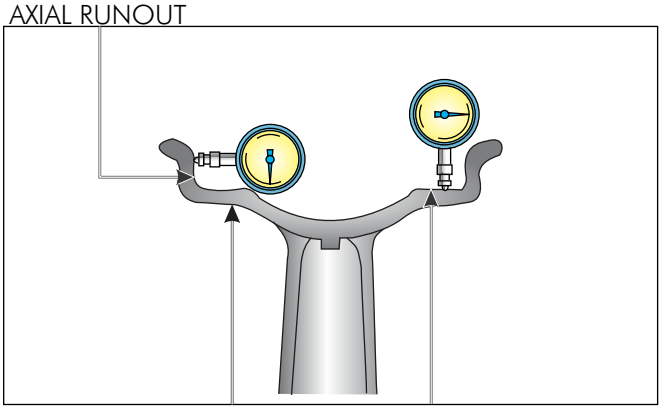
Actual runout is ½ of the total indicator reading.

SERVICE LIMIT

AXIAL: 2.0 mm

RADIAL: 2.0 mm

AXIAL RUNOUT



WHEEL RIM RADIAL RUNOUT

DISASSEMBLY

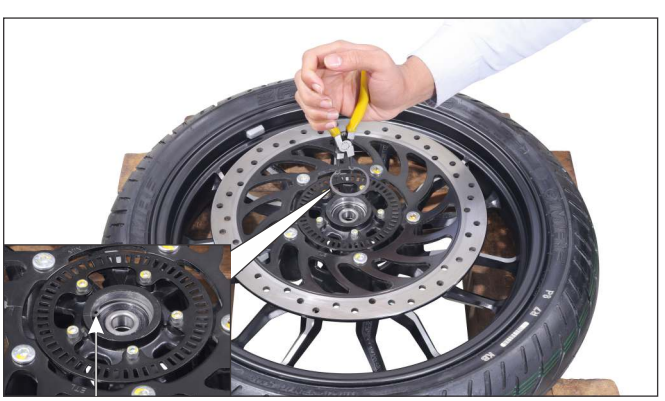
Remove the dust seal from the right side of front wheel.

DUST SEAL

Remove the dust seal from the left side of front wheel.

DUST SEAL

Remove the circlip from the right side of front wheel.



CIRCLIP

Insert the bearing remover head into the bearing.

From the opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub.

TOOL

WHEEL BEARING REMOVER HEAD, 15 mm
PART NO: 070 HH KVN 001
WHEEL BEARING REMOVER HEAD SHAFT
PART NO: 070 HH KZJ 009

BEARING REMOVER HEAD SHAFT

BEARING REMOVER HEAD

Insert the bearing remover head into the bearing.

From the opposite side, install the bearing remover shaft, remove the distance collar and drive the bearing out of the wheel hub.

TOOL

WHEEL BEARING REMOVER HEAD, 15 mm
PART NO: 070 HH KVN 001
WHEEL BEARING REMOVER HEAD SHAFT
PART NO: 070 HH KZJ 009

NOTE

Take extra care while removing the wheel bearing to avoid any damage to the encoder.

BEARING REMOVER HEAD SHAFT

DISTANCE COLLAR BEARING REMOVER HEAD

ASSEMBLY


ENCODER ALLEN KEY BOLTS
ENCODER RING
DUST SEAL
NEW
G
COLLAR
CIRCLIP
BEARING
NEW
LOCK
DISC BOLTS
BRAKE DISC
BEARING
NEW
DISTANCE COLLAR
NEW
DUST SEAL
G
COLLAR

Pack in the bearing cavities with grease. Drive in a new left wheel bearing first with the marking facing up until it is fully seated.

TOOL

HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008
PILOT DRIVER, 15 mm
PART NO: 070 HH KFN 013
DRIVER ATTACHMENT, 40x46 mm
PART NO: 070 HH 198 031

NOTE

- Never install the old bearing, once the bearing has been removed, the bearing must be replaced with new one.
- Take extra care while installing the wheel bearing to avoid any damage to the encoder.
- Disc side bearing to be pressed first and butt against the wheel.

HANDLE BEARING DRIVER

DRIVER ATTACHMENT BEARING PILOT DRIVER

Apply a thin coating of grease to the distance collar and install it.

Pack in the bearing cavities with grease. Drive in a new right wheel bearing first with the marking facing up until it is fully seated.

TOOL

HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008
PILOT DRIVER, 15 mm
PART NO: 070 HH KFN 013
DRIVER ATTACHMENT, 40x46 mm
PART NO: 070 HH 198 031

HANDLE BEARING DRIVER PILOT DRIVER

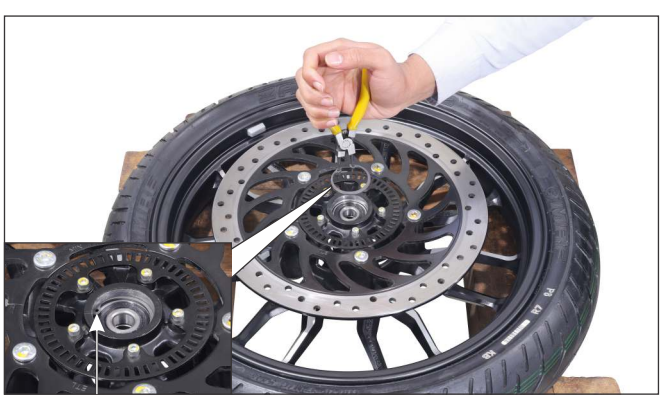
DRIVER ATTACHMENT BEARING DISTANCE COLLAR

FRONT WHEEL INSTALLATION

Install the circlip to the right wheel hub.

⚠ WARNING

Do not get grease on the brake disc or stopping distance will be increased.



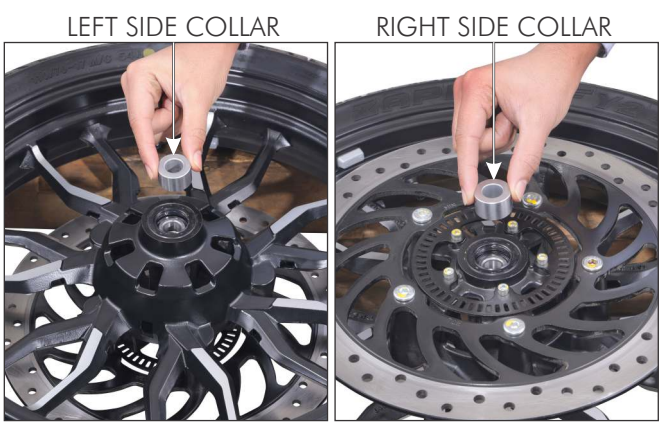
CIRCLIP

Apply grease to the new right & left dust seal lip.
Install the new dust seal to the right & left wheel hub.

NOTE

Never install the old dust seal. Once the dust seal has been removed, the dust seal must be replaced with new ones.

Install the left side and right side collar.



Clean the wheel parts and apply thin layer of grease to the axle outer surface.
Place the wheel between the fork legs while inserting the brake disc between the brake pads.
Insert the front axle from the left side of the vehicle, then tighten it to the specified torque.

TORQUE

FRONT AXLE NUT: 6.8 kgf-m

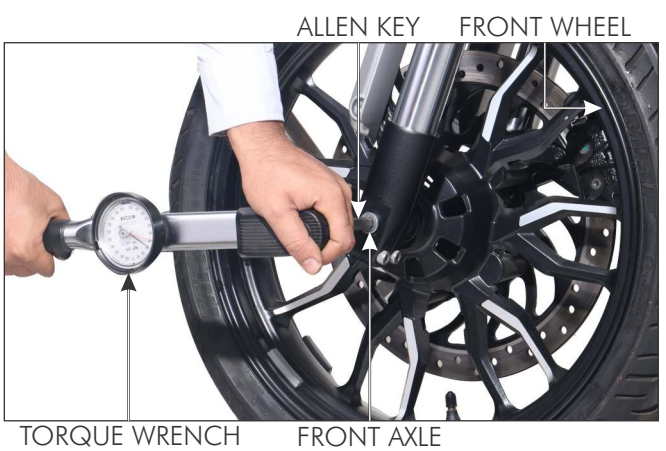
Operate the hand brake lever several times until the brake lining are seated against brake disc.

Remove the vehicle from the lift stand.

Pump the fork up and down at least 3 times to appropriately align the axle and fork.

WARNING

- Do not apply the oil or grease on the brake discs reduce braking effect.
- Always keep brake disc free from oil and grease.



Tighten the front fork bottom pinch bolts (Nos.: 2, Size 6 mm).

Tighten the right front fork axle pinch socket bolts (Nos.: 2, Size: 6 mm) to the specified torque.

TORQUE

FRONT FORK PINCH SOCKET BOLT: 3.0 kgf-m

FRONT FORK BOTTOM PINCH BOLT

FORK

REMOVAL

Remove the front caliper (page 17-28).

Remove the wheel speed sensor cable (page 15-14).

CAUTION

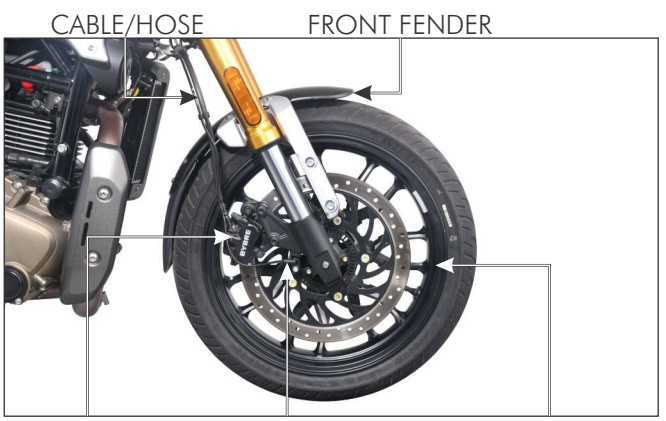
- Do not suspend the brake caliper from the brake hose.
- Do not twist the brake hose.

NOTE

Do not operate the front brake lever after removing the caliper and front wheel. If done so will cause difficulty in fitting the brake disc between the brake pads.

Remove the front fender (page 2-3).

Remove the front wheel (page12-11).

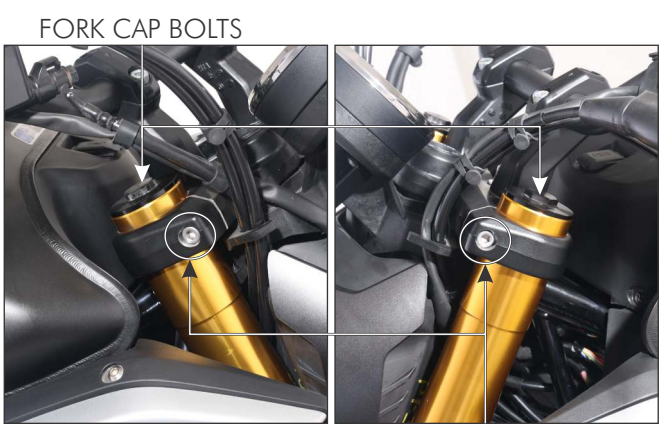


Loosen the fork cap bolts.

Loosen the fork top bridge allen key pinch bolts (Nos.: 2, Size: 6 mm).

NOTE

If the fork is to be disassembled then loosen the fork cap before loosening the top and bottom bridge allen key pinch bolts.



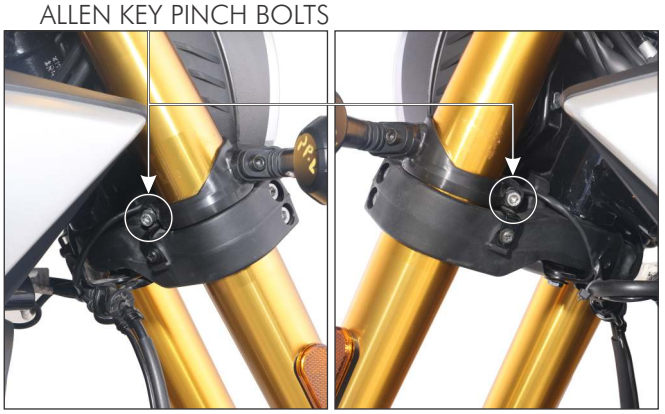
ALLEN KEY PINCH BOLTS

While holding the fork slider, loosen the fork bottom bridge allen key pinch bolts (Nos.: 2, Size: 6 mm).

ALLEN KEY PINCH BOLTS

Loosen the left and right side turn signal stay allen key bolts (Nos.: 2, Size: 5 mm).

ALLEN KEY PINCH BOLTS



Remove the fork assembly by sliding it down from top and bottom bridge while rotating with hand as shown.

FORK ASSEMBLY

FRONT FORK

DISASSEMBLY

Open the front fork cap bolt from the slider by using front fork wrench (22 mm).

TOOL

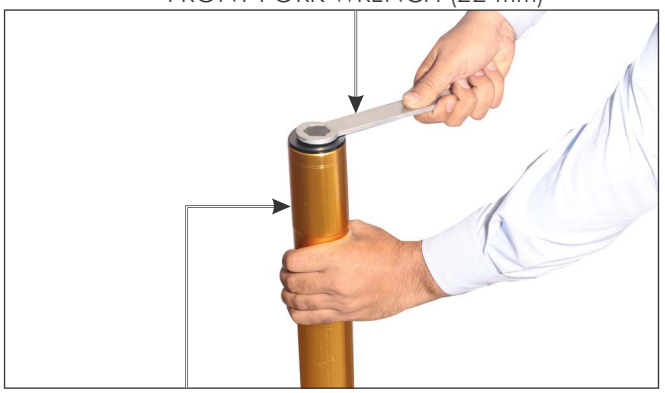
FRONT FORK WRENCH 22 mm
PART NO: HMCL0423ACRD07

⚠ WARNING

The cap is under spring pressure. Be careful when removing.

Push down the slider until contacting an axle holder.

FRONT FORK WRENCH (22 mm)



SLIDER

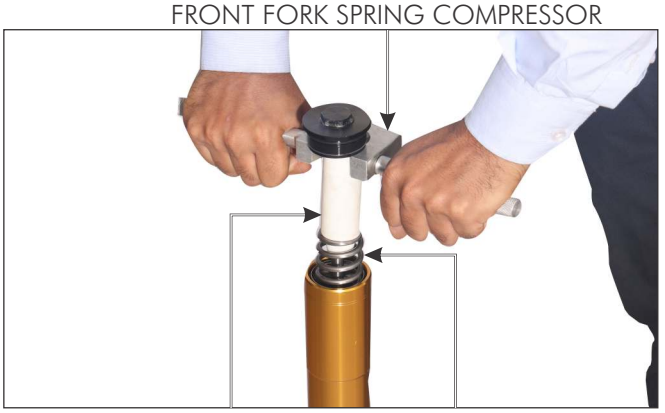
Locate front fork spring compressor in holes on pre-compression spacer.

Push down front fork spring compressor & compress the fork spring.

TOOL

FRONT FORK SPRING COMPRESSOR
PART NO: HMCL0423ACRD08

FRONT FORK SPRING COMPRESSOR



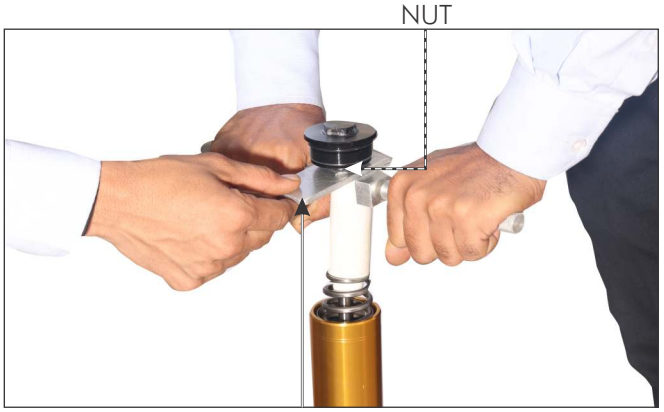
SPACER FORK SPRING

In compressed condition of fork spring, insert the front fork spring lock just below the nut.

TOOL

FRONT FORK SPRING LOCK
PART NO: HMCL0423ACRD09

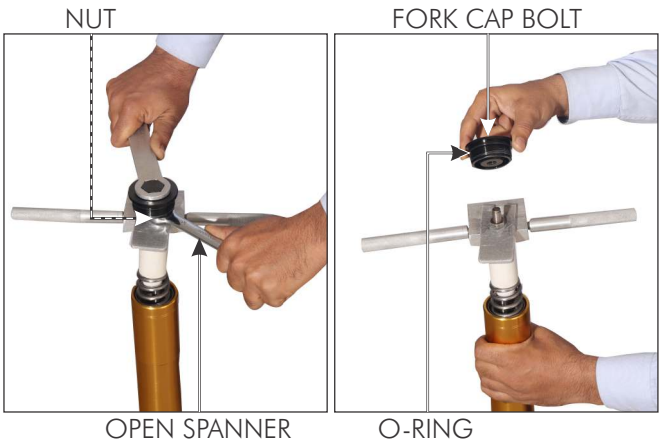
NUT



FRONT FORK SPRING LOCK

Hold the nut by using 14 mm open spanner and remove the fork cap bolt by using front fork wrench (22 mm).

Remove the O-ring from the fork cap bolt.



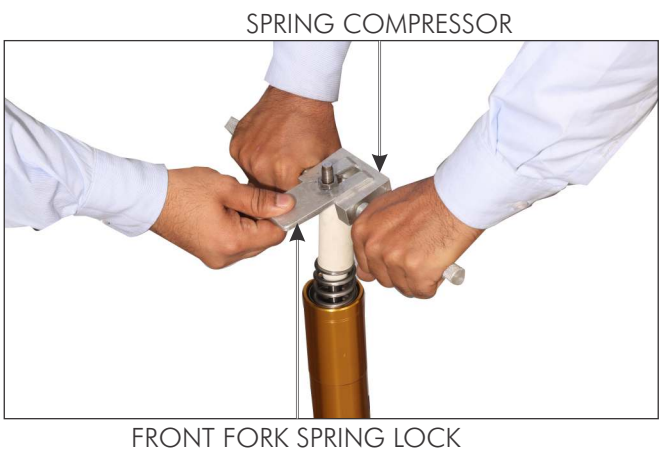
Compress the fork spring and remove the front fork spring lock.

TOOL

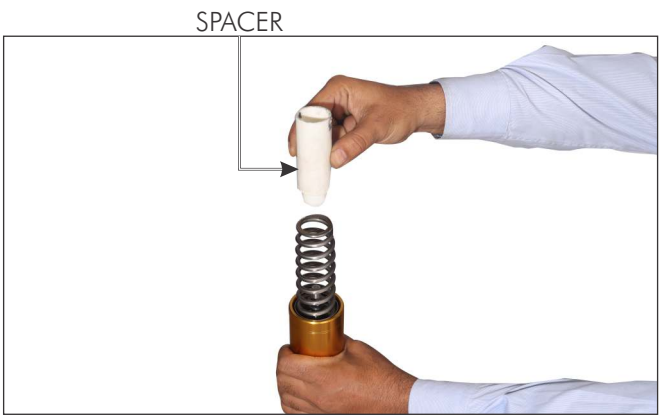
FRONT FORK SPRING LOCK
PART NO: HMCL0423ACRD09

Slowly release the load from the fork spring.

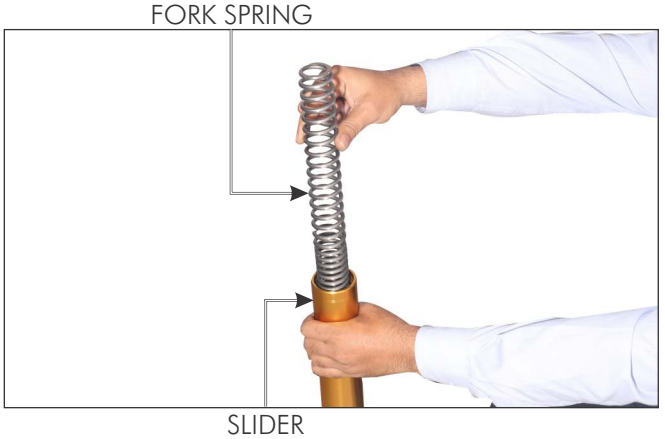
Remove the spring compressor.



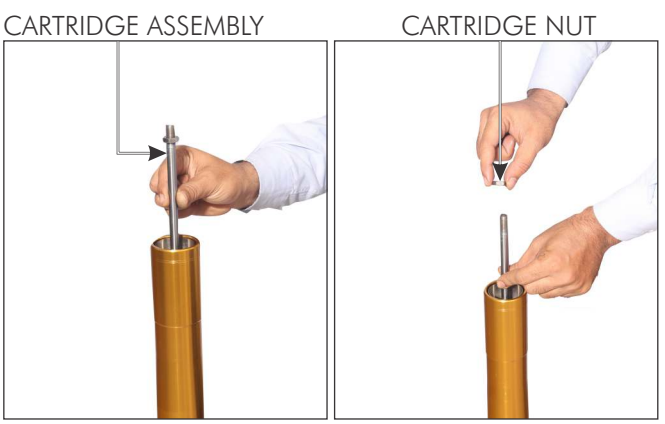
Remove the spacer.



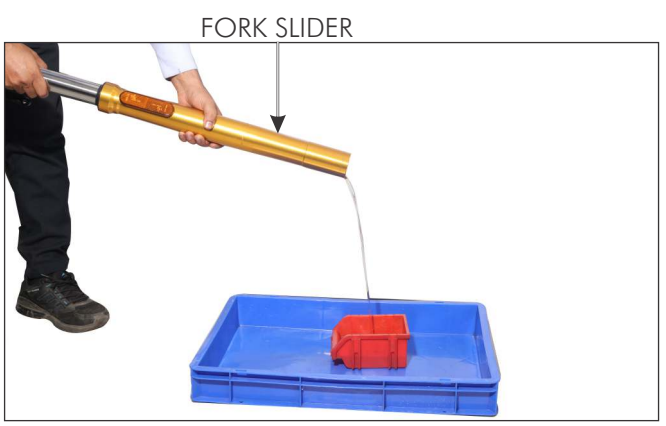
Remove the fork spring from the slider.



Hold the cartridge assembly and remove the cartridge nut.



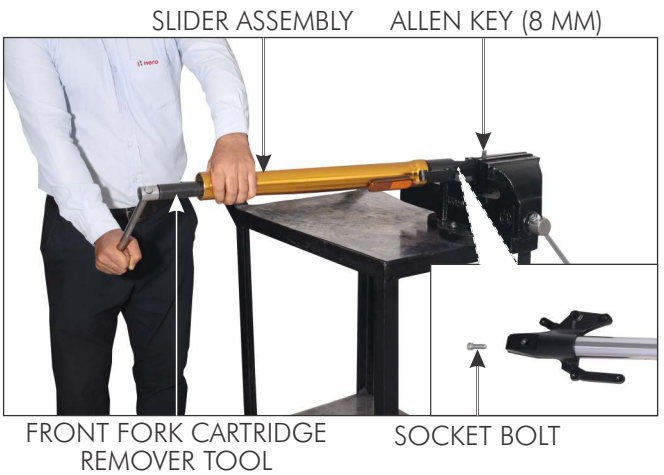
Pour out the fork oil from the fork slider by pumping the fork several times.



Clamp the 8 mm allen key in bench vice.

Place the front fork on allen key as shown in image.

Insert the front fork cartridge remover tool from top side & loosen the cartridge by loosen the socket bolt from the slider assembly bottom side.

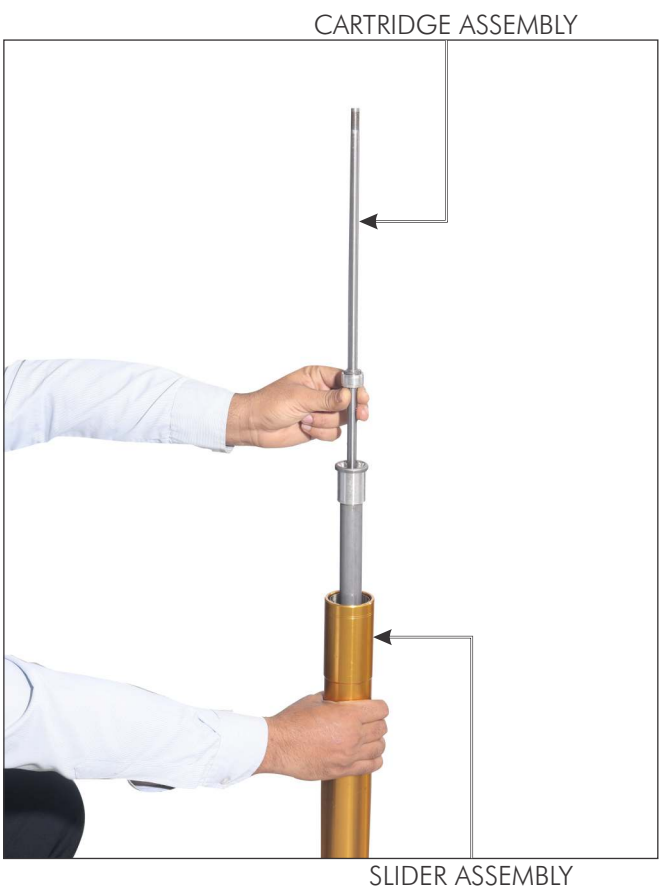


TOOL

FRONT FORK CARTRIDGE REMOVAL TOOL
PART NO: HMCL0423ACRD11

Remove the socket bolt from the slider assembly bottom side.

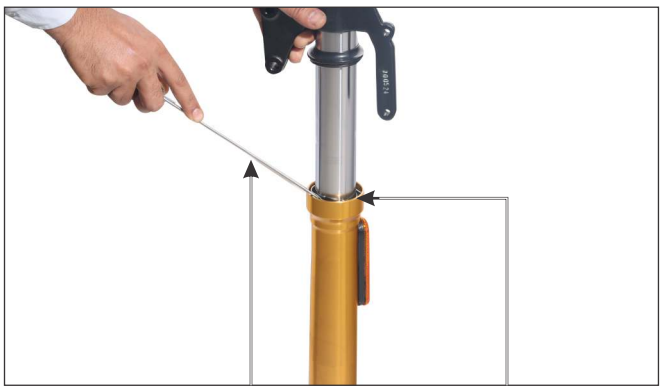
Remove the cartridge assembly from the slider assembly.



Slide the dust seal up side by using the minus screw driver as shown.

NOTE

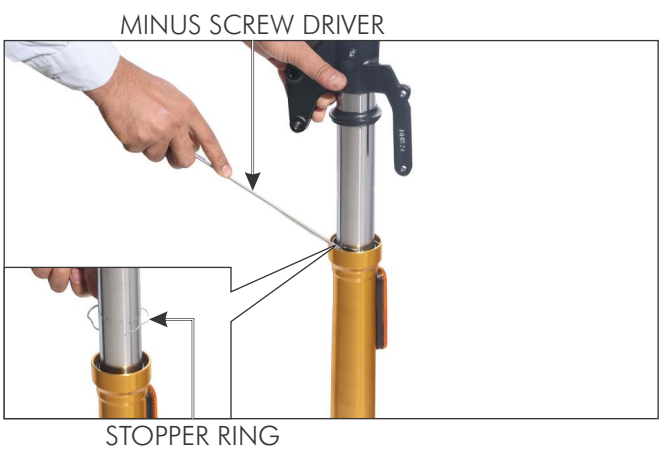
Be careful not to scratch the fork tube.



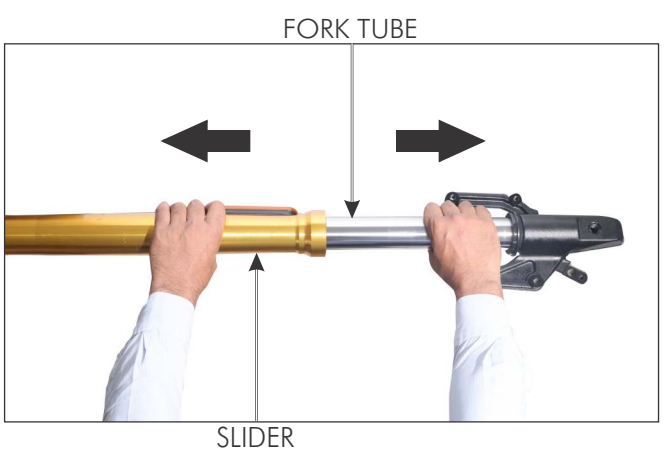
Remove the oil seal stopper ring by using smaller minus screw driver.

NOTE

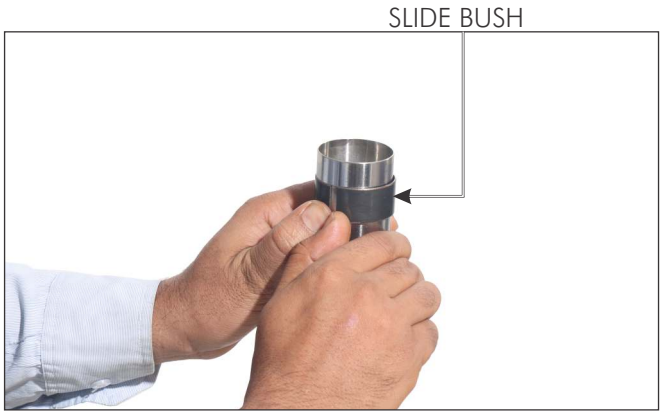
Be careful not to scratch the fork tube.



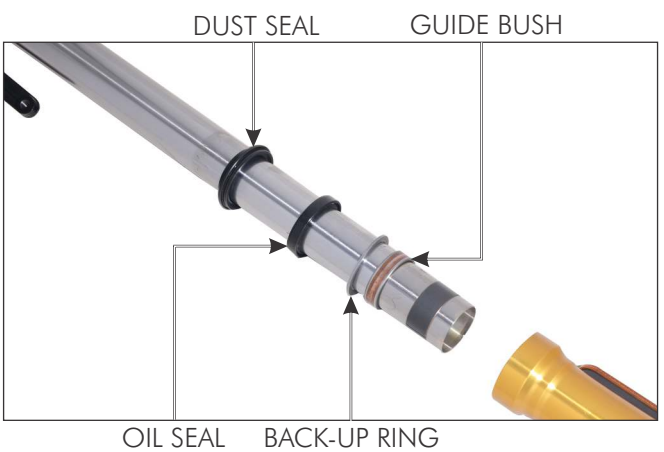
Hold the fork tube and slider with hands respectively and pull out fork tube & slider to separate.



Spread the slide bush by hand & remove the slide bush from the fork tube by lifting it upward.

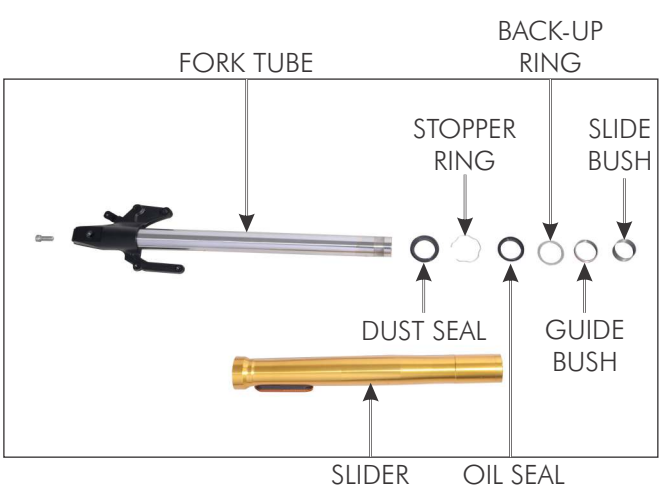


Remove the guide bush, back-up ring, oil seal and dust seal from the fork tube.



NOTE

- Do not score the inner fork tube sliding surface.
- Check that the fork tube moves smoothly in the fork slider. If it does not, check the fork tube for bend or damage.



INSPECTION

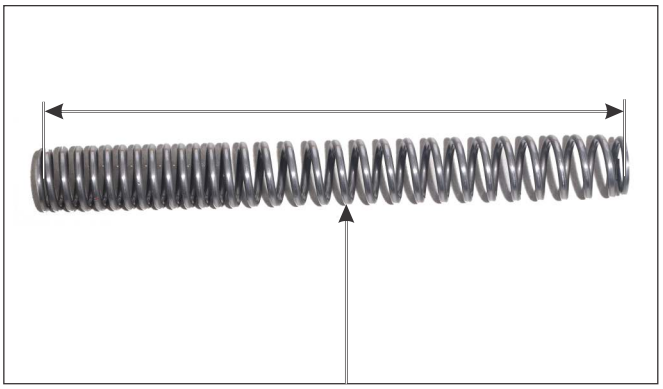
FORK SPRING

Check the fork spring for fatigue or damage.

Measure the fork spring free length by placing the spring on a flat surface.

SERVICE LIMIT

FORK SPRING: 346.7 mm



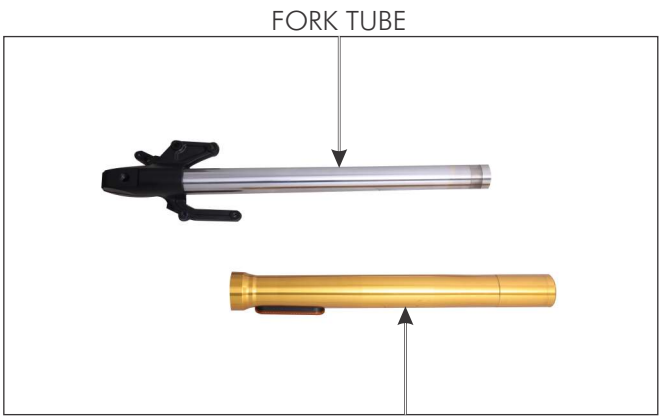
FORK SPRING

FORK TUBE/SLIDER/GUIDE BUSH/SLIDE BUSH/BACK-UP RING

Check the fork tube and slider for score marks, scratches or excessive or abnormal wear.

If there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than ¾ of the entire surface, replace the slider.

Replace the components if necessary.



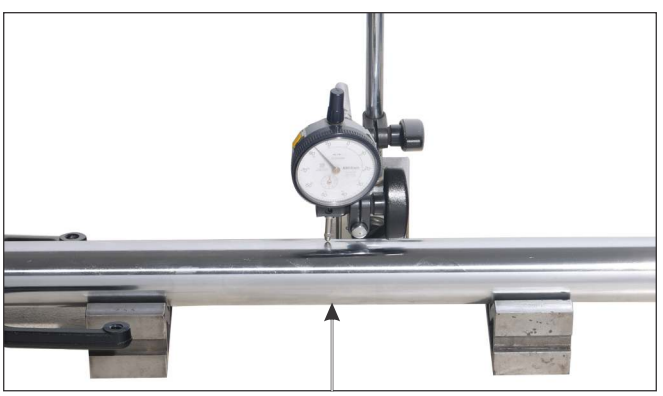
Set the fork tube in V- block and measure the fork tube runout by rotating it with a dial indicator.

The actual runout is ½ of the total indicator reading.

SERVICE LIMIT

FORK TUBE: 0.2 mm

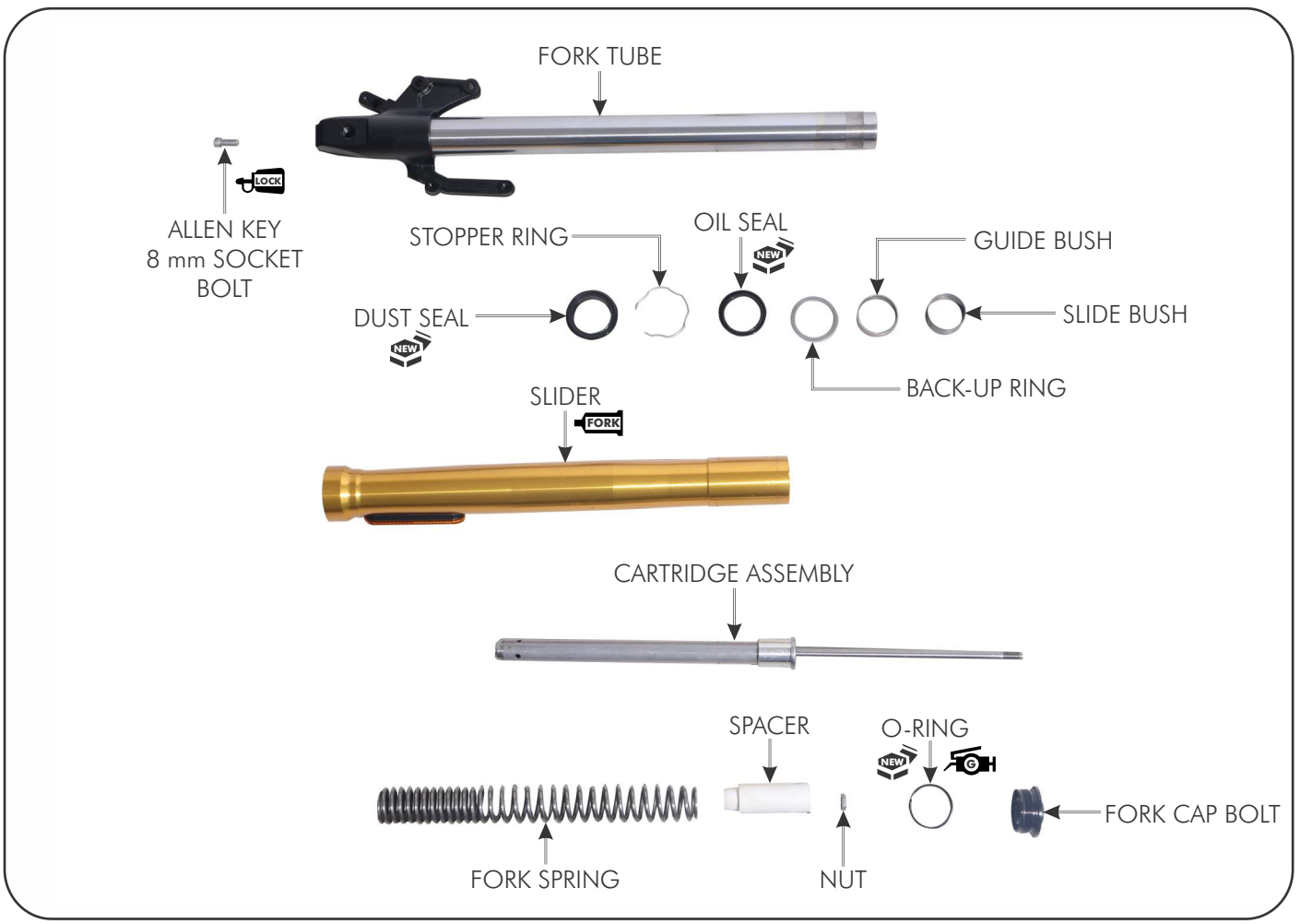
Replace if the service limit is exceeded or there are scoring or knicks that will allow fork oil to leak past the seals.



FORK TUBE

ASSEMBLY

Before assembly, wash all parts with a high flash or non- flammable solvent and wipe them dry.

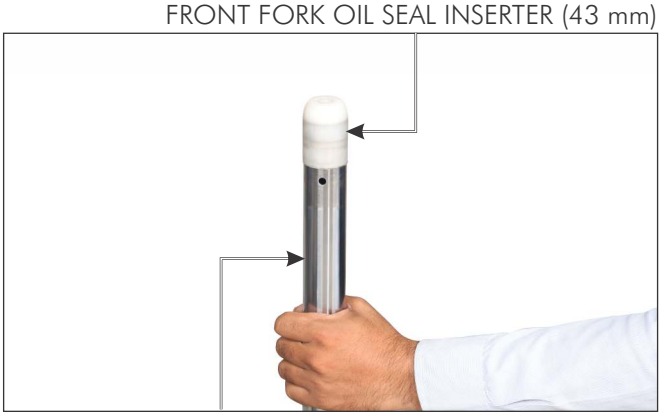


Install the special tool front fork oil seal inserter (43 mm) on the fork tube.

TOOL

FRONT FORK OIL SEAL INSERTER (43 mm)
PART NO: HMCL0623RAAA08

FRONT FORK OIL SEAL INSERTER (43 mm)



Install the new dust seal.

DUST SEAL

Apply fork fluid to a new oil seal lip and install it onto the fork tube.

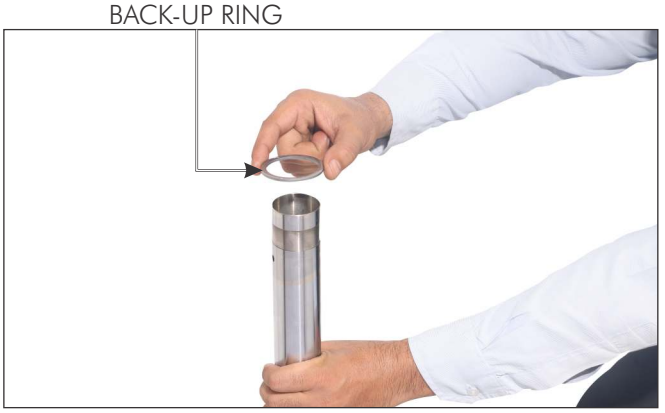
Remove the special tool front fork oil seal inserter (43 mm) from the fork tube.

FRONT FORK OIL SEAL INSERTER (43 mm)

OIL SEAL

Install the back-up ring on the fork tube.

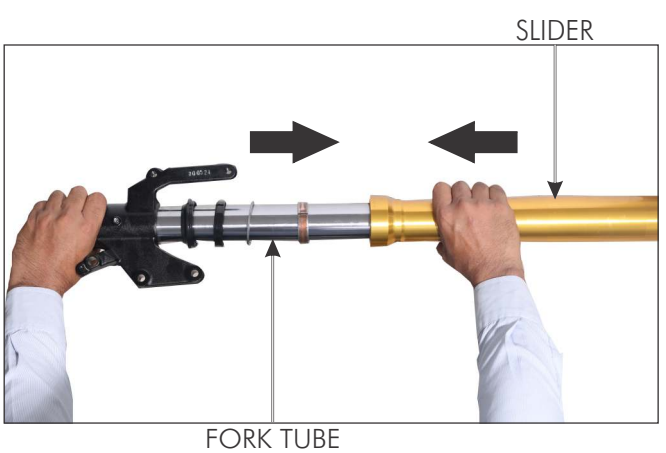
BACK-UP RING



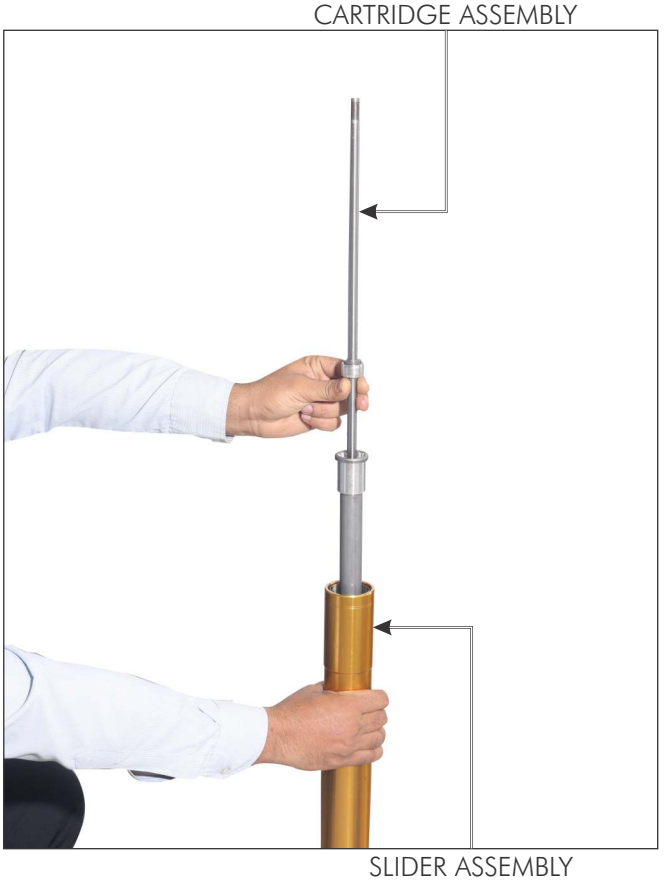
Install the new guide bush.

Install the new slide bush.

Install the fork tube into the fork slider.



Install the cartridge assembly into the slider assembly.



Clean and apply a locking agent to the fork socket bolt threads and install it with a new sealing washer into the slider assembly bottom side.

Clamp the 8 mm allen key on bench vice.

Place the fork on allen key as shown in image.

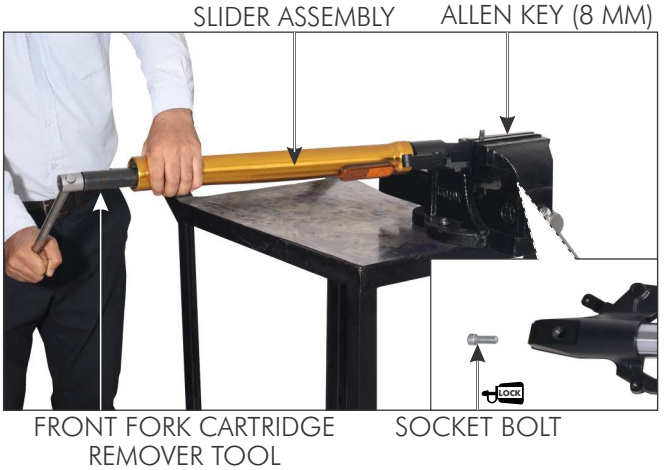
Insert the front fork cartridge remover tool and tighten the cartridge into the slider assembly to the specified torque.

TORQUE

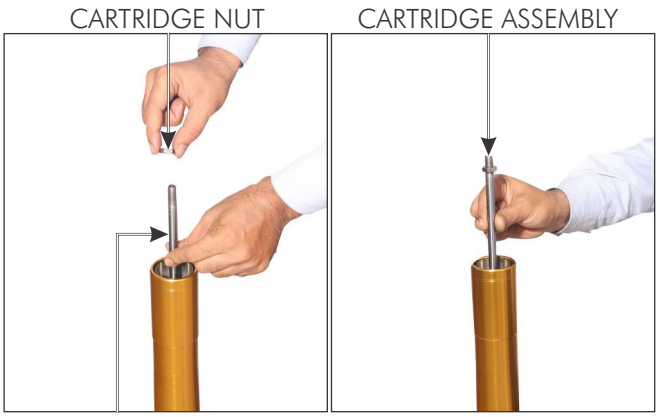
FORK SOCKET BOLT: 2.1 kgf-m

TOOL

FRONT FORK CARTRIDGE REMOVAL TOOL
PART NO: HMCL0423ACRD11



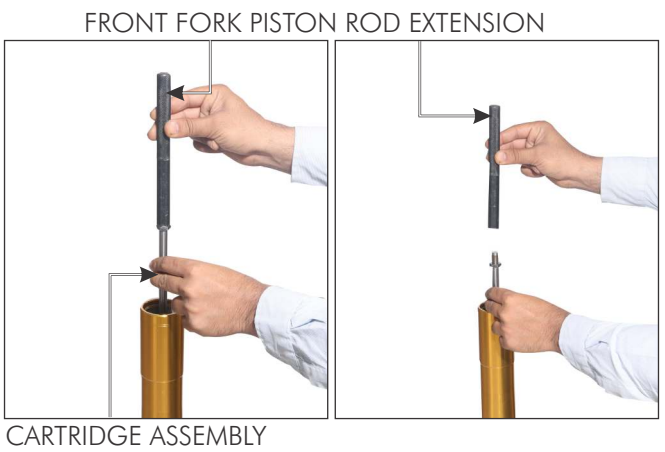
Hold the cartridge assembly and install the cartridge nut.



Hold the cartridge assembly and install the front fork piston rod extension on the cartridge assembly as shown in the image.

TOOL

FRONT FORK PISTON ROD EXTENSION
PART NO: HMCL0423ACRD12

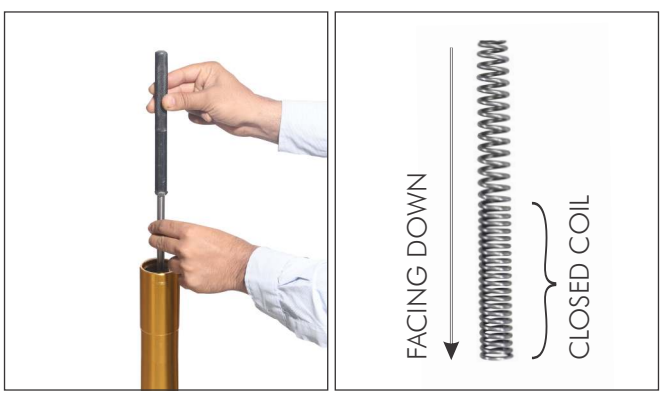


Clean the spring with petrol and allow it to dry.

NOTE

Do not wipe the spring with shop towel.

Install the fork spring with the closely wound coil side facing down into the fork tube.



Install the spacer through the front fork piston rod extension as shown in image.

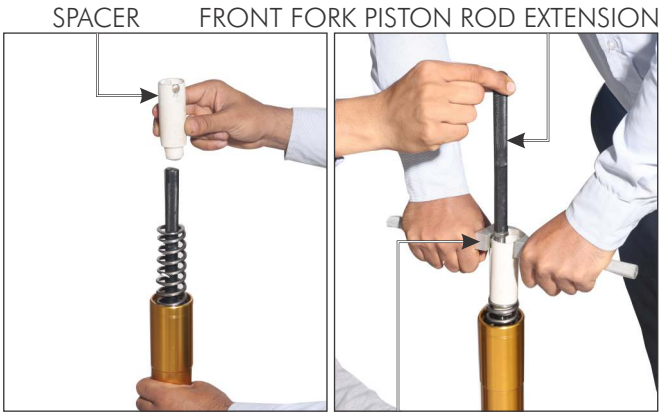
Install the front fork spring compressor in spacer hole.

Push down the front fork spring compressor and remove the front fork piston rod extension.

TOOL

FRONT FORK PISTON ROD EXTENSION
PART NO: HMCL0423ACRD12

FRONT FORK SPRING COMPRESSOR
PART NO: HMCL0423ACRD08

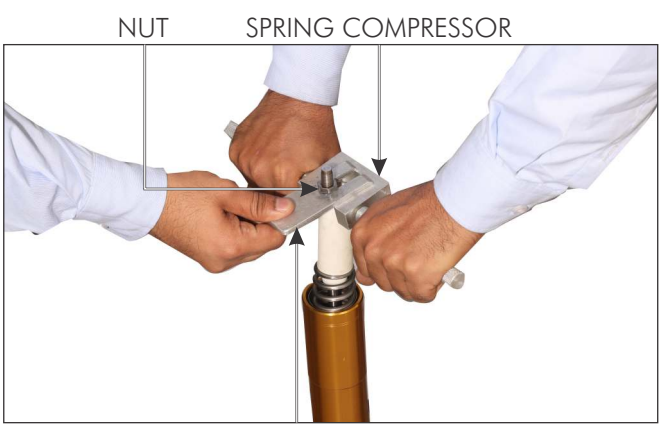


Compress the fork spring by pushing down the front fork spring compressor.

Insert the front fork spring lock below the cartridge nut.

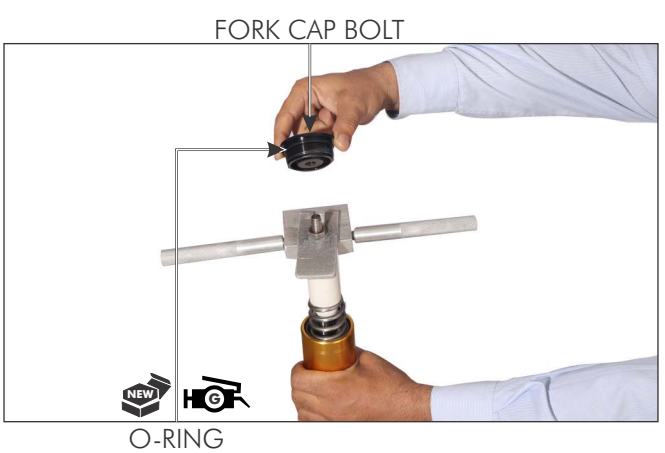
TOOL

FRONT FORK SPRING COMPRESSOR
PART NO: HMCL0423ACRD08
FRONT FORK SPRING LOCK
PART NO: HMCL0423ACRD09



Apply grease to a new O-ring and install it on the fork cap.

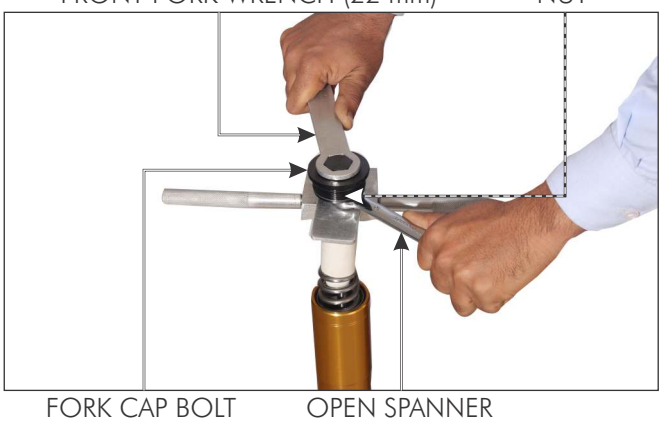
Install the fork cap bolt.



Hold the nut by using 14 mm open spanner and tighten the fork cap bolt by using front fork wrench (22 mm).

TOOL

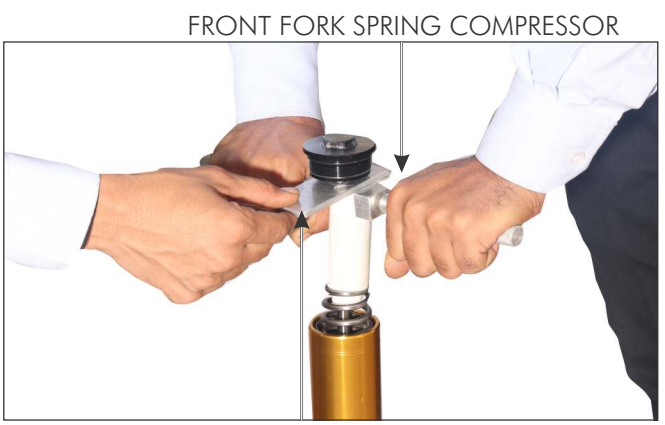
FRONT FORK WRENCH 22 mm
PART NO: HMCL0423ACRD07



Compress the fork spring by pushing down the front fork spring compressor.
Remove the front fork spring lock.
Remove the front fork spring compressor.

TOOL

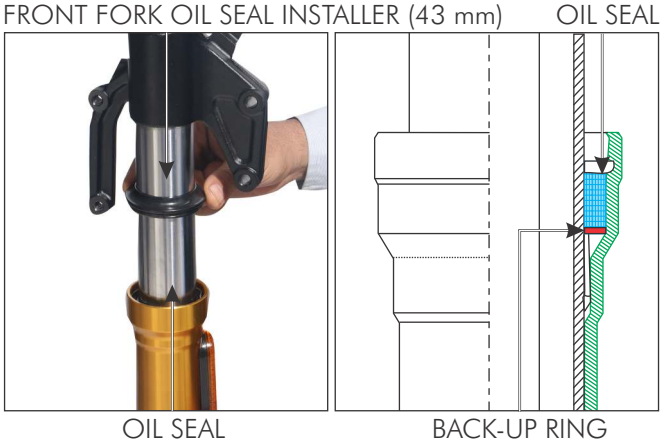
FRONT FORK SPRING COMPRESSOR
PART NO: HMCL0423ACRD08
FRONT FORK PISTON ROD HOLDER
PART NO: HMCL0423ACRD12



Drive the oil seal in the slider by using the special tool.

TOOL

FRONT FORK OIL SEAL INSTALLER (43 mm)
PART NO: HMCL0623RAAA07



Install the oil seal stopper ring into the groove of the fork slider.

Slide down the dust seal and fix it properly.

Pour the specified amount of recommended fork fluid into the fork tube.

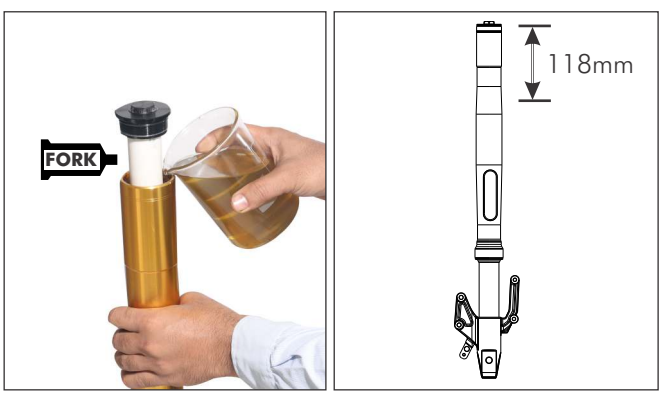
FORK FLUID CAPACITY: 430±2 ml (per leg)

FORK OIL GRADE: OIL NO-00M01

Pump the fork tube several times to remove trapped air from the lower portion of the fork tube.

Compress the fork slider fully and measure the oil level from the top of the fork tube.

FORK OIL LEVEL: 118 mm from top

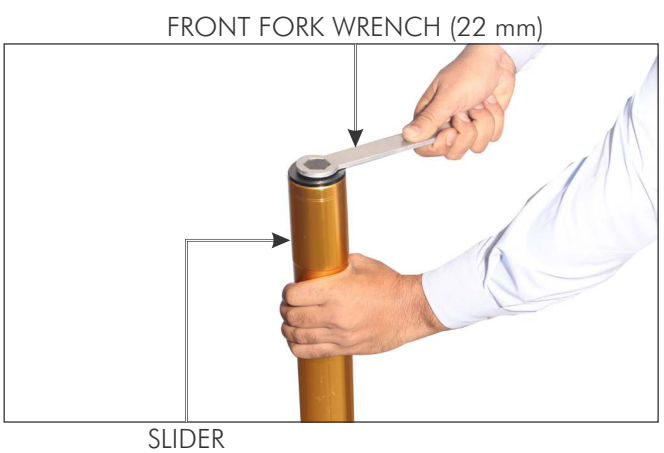


Tighten the front fork cap bolt by using the special tool.

TOOL

FRONT FORK WRENCH 22 mm

PART NO: HMCL0423ACRD07



INSTALLATION

Insert the fork assembly through the bottom bridge, turn signal stay and top bridge.

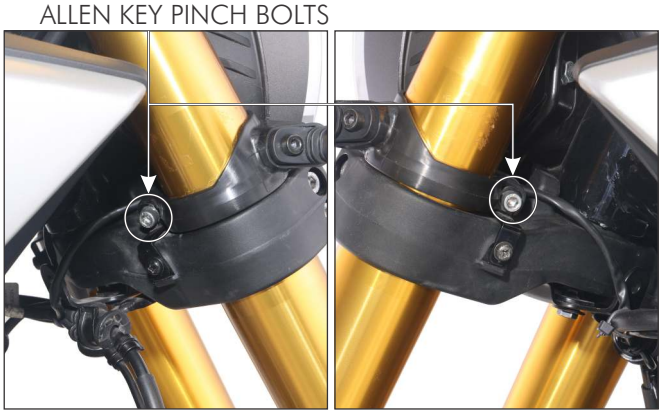
NOTE

Make sure that fork tubes and cap should be align with top bridge.

FORK ASSEMBLY

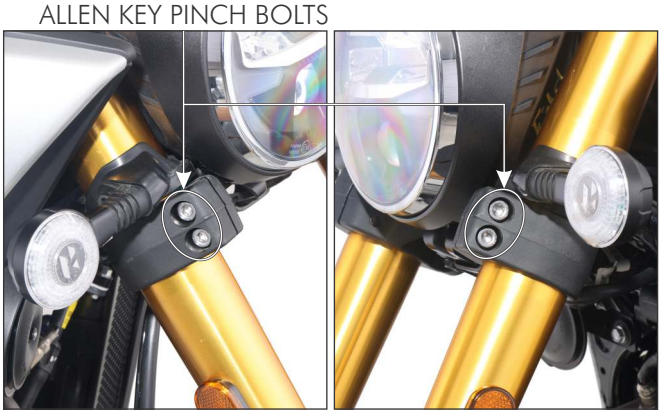
Tighten the left and right side turn signal stay allen key bolts (Nos.: 2, Size: 5 mm).

ALLEN KEY PINCH BOLTS



Tighten the fork bottom bridge bolts (Nos.: 4) to the specified torque.

ALLEN KEY PINCH BOLTS



TORQUE

FORK BOTTOM BRIDGE BOLTS: 1.8 kgf-m

Tighten the fork cap bolt to the specified torque.

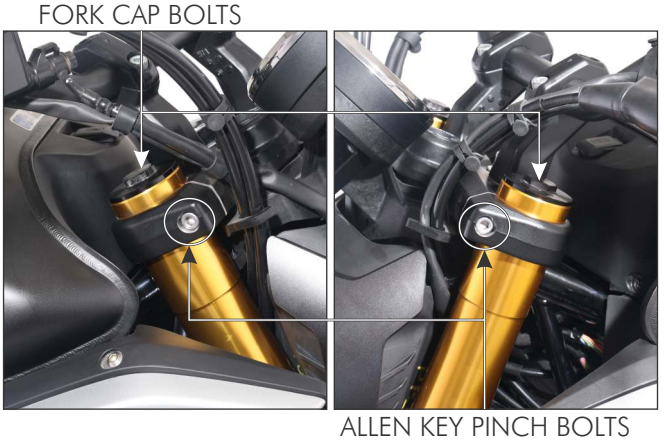
TORQUE

FORK CAP BOLT: 2.3 kgf-m

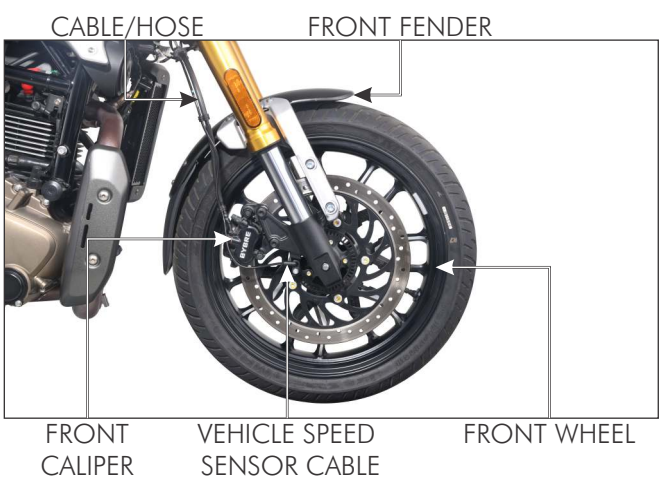
Install and tighten the fork top bridge allen key pinch bolts (Nos.: 2, Size: 6 mm) to the specified torque.

TORQUE

FORK TOP BRIDGE BOLTS: 2.0 kgf-m



Install the front wheel (page13-21).
Install the front fender (page 2-37).
Connect the wheel speed sensor cable (page 16-15).
Install the front caliper (page 17-32).

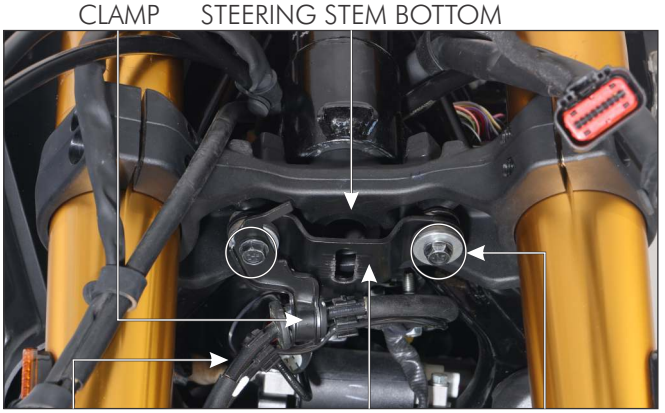


STEERING STEM

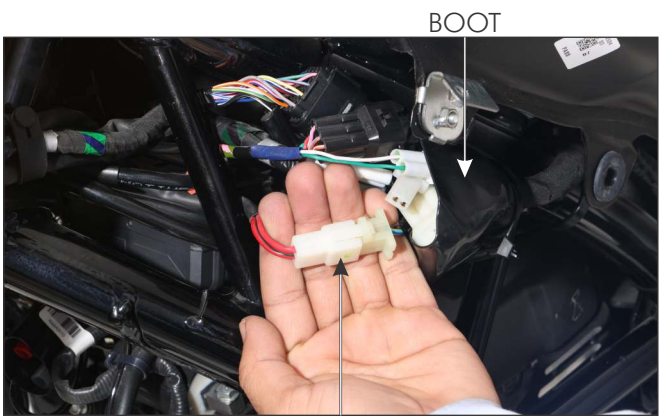
REMOVAL

Remove the handlebar (page 12-4).
Remove the headlamp/position lamp assembly (page 20-3).
Remove the combination meter with stay (page 20-11).
Remove the front fender (page 2-3).
Remove the front wheel (page 12-11).
Remove the turn signal indicator from the fork (page 20-6).

Remove the front brake hose clamp and bracket with brake hose & wheel speed sensor cable by removing its mounting bolts (Nos.: 2, Size 12 mm) from the steering stem bottom side as shown.



Slide the boot away from the connector and then carefully disconnect the ignition switch connector.



Release the ignition switch wire from the wire band.

Loosen the front fork bottom bridge allen key bolts (Nos.: 4, Size: 6 mm).

ALLEN KEY BOLTS

Loosen the steering stem nut using steering stem socket.

Remove the steering stem nut/washer.

NOTE

Ensure that the front forks are installed while loosening the steering stem nut.

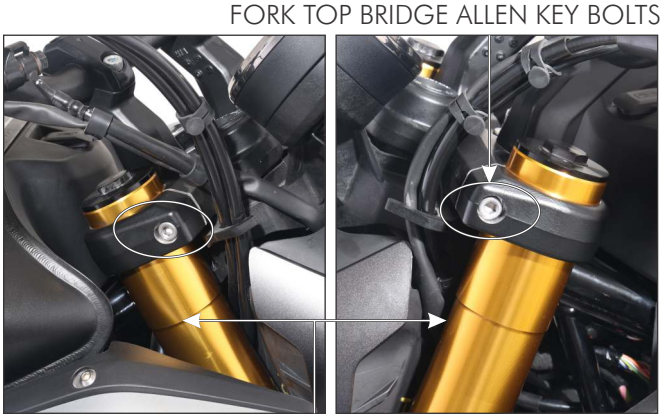
STEERING STEM SOCKET

STEERING STEM NUT/WASHER

Loosen the fork top bridge allen key bolts (Nos.: 2, Size: 6 mm).

Pull out the fork assembly from top and bottom bridge while rotating with hand.

FORK TOP BRIDGE ALLEN KEY BOLTS



FRONT FORKS

Remove the fork top bridge.

FORK TOP BRIDGE

Remove the securing washer.

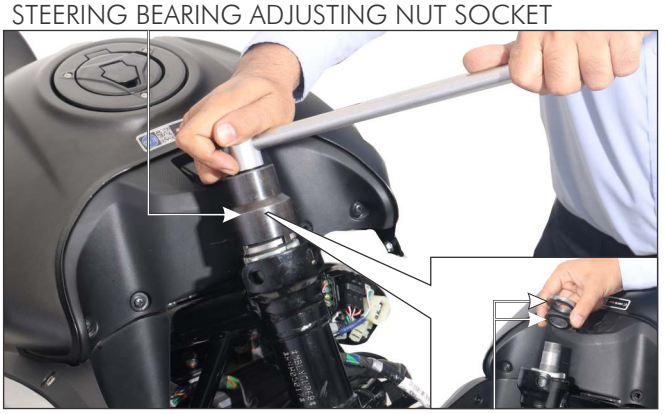
SECURING WASHER

Hold the steering stem from the bottom and remove the steering top thread/rubber washer using the special tool.

TOOL

STEERING BEARING ADJUSTING NUT SOCKET, 41 mm
PART NO: 070 HH KST 004

STEERING BEARING ADJUSTING NUT SOCKET



STEERING TOP THREAD/RUBBER WASHER

Loosen the steering top thread component by using the special tool.

TOOL

STEERING BEARING ADJUSTING NUT SOCKET, 41 mm
PART NO: 070 HH KST 004

STEERING BEARING ADJUSTING NUT SOCKET

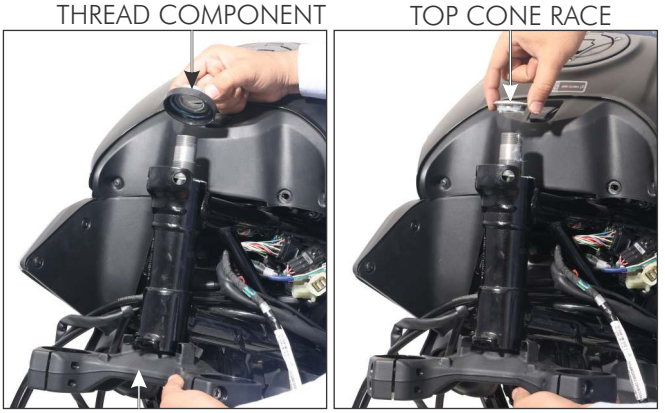
STEERING TOP THREAD COMPONENT

Hold the steering stem from the bottom side.

Remove the steering top thread component and top cone race from the steering stem.

STEERING TOP THREAD COMPONENT

TOP CONE RACE



STEERING STEM

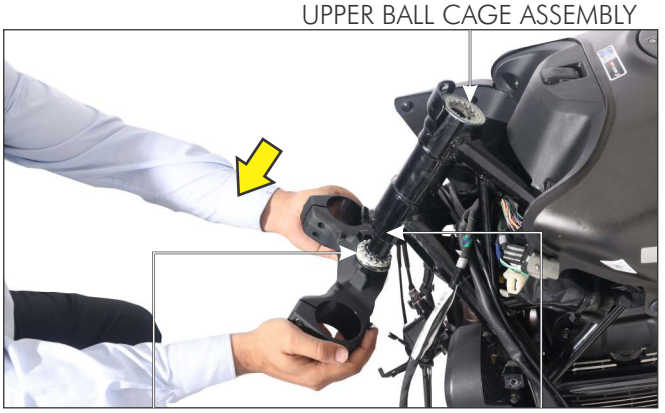
Remove the steering stem from the steering head pipe along with the lower ball cage bearing assembly.

Remove the upper ball cage from the steering head pipe.

Remove the lower ball cage from the steering stem.

Check the ball cage assembly for wear or damage.

UPPER BALL CAGE ASSEMBLY



LOWER BALL CAGE ASSEMBLY

STEERING STEM

Check the steering stem bearing races for wear or damage.

BEARING RACE

STEERING STEM BEARING RACE REPLACEMENT

NOTE

Always replace the bearings and races as a set.

Drive the top and bottom ball races out of the steering head pipe by using upper cone race remover.

TOOL

BALL RACE DRIVER
PART NO: 070 HH KTN 005

BALL RACE DRIVER

BALL RACE DRIVER

Remove the dust seal from the steering stem.

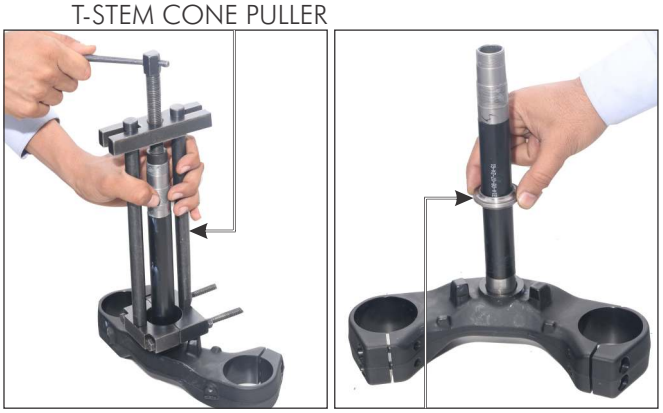
DUST SEAL

Remove the bottom cone race with special tool as shown.

TOOL

T-STEM CONE PULLER
PART NO: 070 HH KST 001

T-STEM CONE PULLER



BOTTOM CONE RACE

INSTALLATION

Apply grease to the rolling contact surface of the new bottom cone race.

Insert the new bottom cone race onto the steering stem.

Install the bottom cone race using the special tool.

TOOL

BOTTOM CONE RACE DRIVER
PART NO: 070 HH KST 002

BOTTOM CONE RACE DRIVER

BOTTOM CONE RACE BOTTOM CONE RACE

Apply grease to the new dust seal lip and install it to the steering stem.

DUST SEAL

Install a new upper and lower steering stem bearing races using the special tool.

TOOL

UPPER AND BOTTOM CONE INSTALLER
PART NO: 070 HH KST 003

NOTE

Inspect the race sitting area in frame and clean properly before fitting race cones.

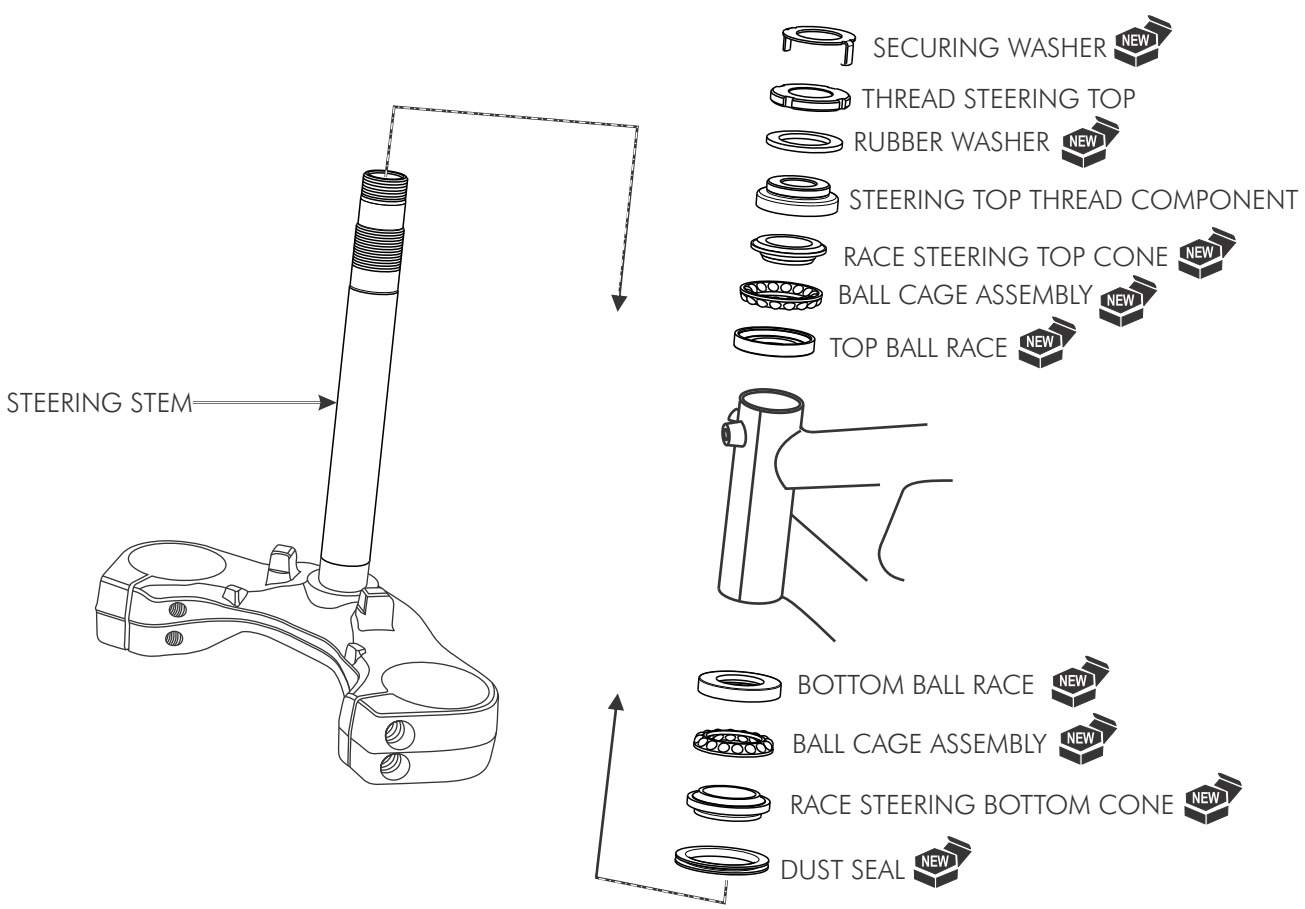
STEERING TOP CONE INSERTER ADAPTER

STEERING STEM BEARING RACES

INSTALLATION

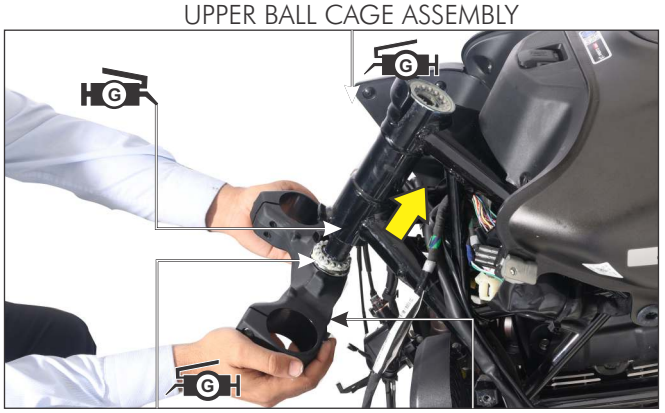
NOTE

If the motorcycle has been involved in an accident, examine the area around the steering head for cracks or deformation.



Apply Balmerol Sylton 3 grease to the new top and bottom ball and cone races.
Install the upper ball cage assembly onto the top ball race.
Install the lower ball cage assembly onto the bottom cone race.
Install the steering stem into the steering head pipe.

UPPER BALL CAGE ASSEMBLY



LOWER BALL CAGE ASSEMBLY STEERING STEM

Apply grease to the new top cone race.
Install the top cone race on the steering head pipe.

TOP CONE RACE

STEERING HEAD PIPE

Install the steering top thread component and hand tighten it.
Check that the steering stem rotates freely and that there is no vertical play.
Tighten the steering top thread component to the initial specified torque.

TORQUE (Initial torque)
STEERING TOP THREAD COMPONENT:
5.0-5.5 kgf-m

TOOL

STEERING BEARING ADJUSTING NUT SOCKET, 41 mm
PART NO: 070 HH KST 004

STEERING BEARING
TORQUE WRENCH ADJUSTING NUT SOCKET

STEERING TOP THREAD COMPONENT

Rotate the steering stem lock to lock several times to seat the steering bearing, then loosen the steering top thread component.

Retighten the steering top thread component nut to the final specified torque.

TORQUE (Final torque)

STEERING TOP THREAD COMPONENT: 1.4 kgf-m

TOOL

STEERING BEARING ADJUSTING NUT SOCKET, 41 mm
PART NO: 070 HH KST 004

STEERING TOP THREAD COMPONENT

Install a new rubber washer.

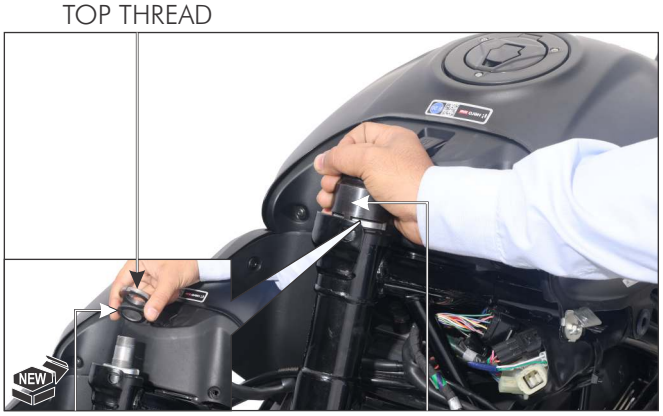
NOTE

- Always replace new rubber washer once it is removed.
- Replace rubber washer once in every 2 years or 10000 km as per maintenance schedule.

Install the steering top thread and hand tighten it.

TOOL

STEERING BEARING ADJUSTING NUT SOCKET, 41 mm
PART NO: 070 HH KST 004



Tighten the steering top thread while holding the steering stem steady to the final specified torque.

TORQUE

0.8 kgf-m

TOOL

STEERING BEARING ADJUSTING NUT SOCKET, 41 mm
PART NO: 070 HH KST 004

STEERING BEARING ADJUSTING NUT SOCKET

Install the new securing washer by aligning the matched groove slot into the thread steering upper and lower nuts.

SECURING WASHER

SLOT GROOVES

Install the fork top bridge with ignition switch.

FORK TOP BRIDGE

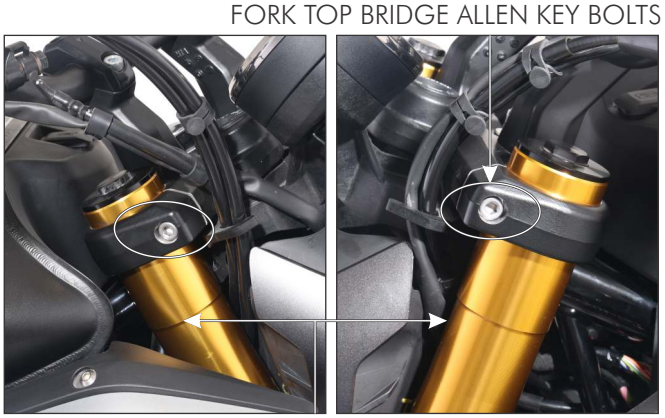
Install the front forks (page 12-17).

Tighten the fork top bridge allen key bolts (Nos.: 2) to the specified torque.

TORQUE

FORK TOP BRIDGE BOLTS: 2.0 kgf-m

FORK TOP BRIDGE ALLEN KEY BOLTS



FRONT FORKS

Install the washer and steering stem nut onto the fork top bridge as shown.

Tighten the steering stem nut to the specified torque.

TORQUE

STEERING STEM NUT: 10.0 kgf-m

Check that the steering stem rotates freely and that there is no vertical play

STEERING STEM SOCKET TORQUE WRENCH

STEERING STEM NUT/WASHER

Tighten the front fork bottom bridge allen key bolts (Nos.: 4, Size: 6 mm) to the specified torque.

TORQUE

FORK BOTTOM BRIDGE BOLT: 1.8 kgf-m

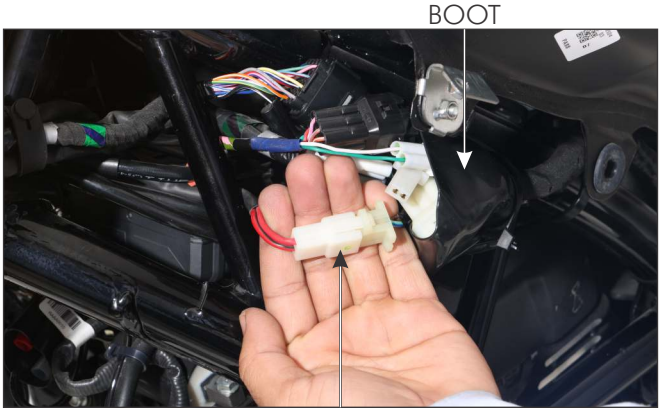
ALLEN KEY BOLTS

Tie the ignition switch wire with wire band along with combination meter and left switch housing cords.

IGNITION SWITCH WIRE

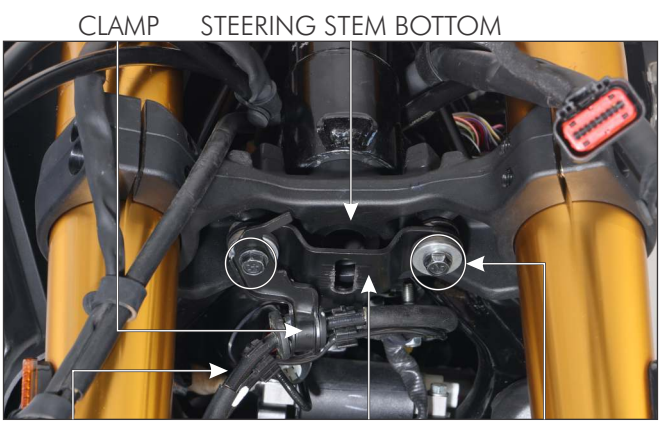
WIRE BAND

Connect the ignition switch 2P connector. Then slide the boot back onto the connector.



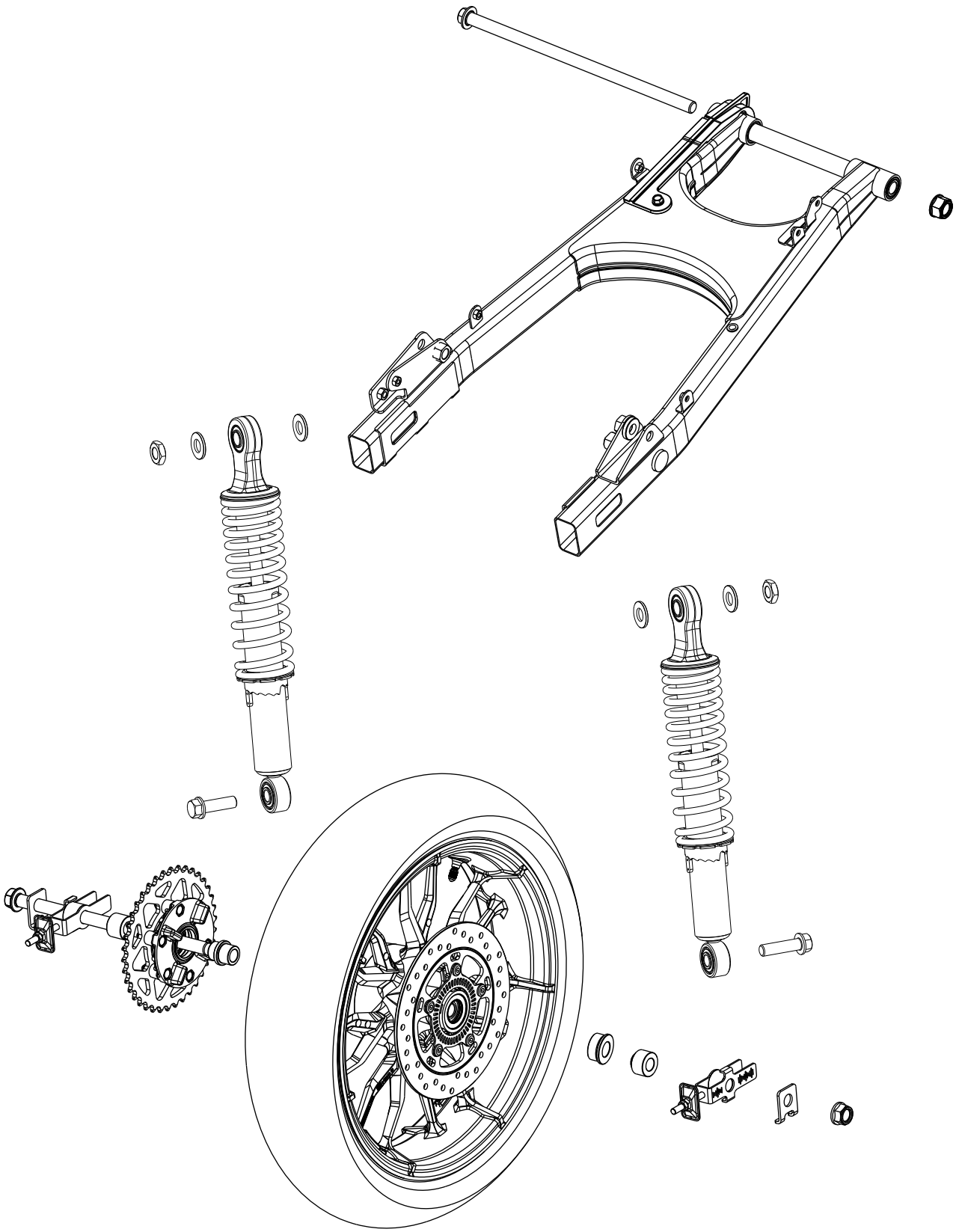
IGNITION SWITCH 2P CONNECTOR

Install the front brake hose clamp and bracket with brake hose & wheel speed sensor cable by installing its mounting bolts/washers (Nos.: 2, Size 12 mm) from the steering stem bottom side as shown.



Install the turn signal indicator from the fork (page 20-6).
Install the front wheel (page 12-11).
Install the front fender (page 2-3).
Install the combination meter with stay (page 20-11).
Install the headlamp/position lamp assembly (page 20-3).
Install the handlebar (page 12-10).

SYSTEM DIAGRAM



SERVICE INFORMATION

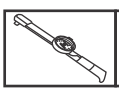
GENERAL

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- After the rear wheel installation, check the brake operation by applying the brake pedal.
- When servicing the rear wheel and suspension, support the motorcycle using a safety stand or hoist.
- Use only tyres marked "TUBELESS" and tubeless valves on rim marked "TUBELESS TYRE APPLICABLE".
- Use Hero genuine replacement bolts and nuts for all suspension pivot and mounting point.
- For brake system information refer to **(SECTION-16)**.

SPECIFICATIONS

REAR WHEEL/SUSPENSION

ITEM		STANDARD	SERVICE LIMIT
Minimum tyre tread depth		5 mm	0.8 mm
Cold tyre pressure	Rider only	29 psi	-
	Rider & Pillion	29 psi	-
Rear axle straightness		Dia 0.35	-
Rear wheel rim runout (Cast)	Axial (Tyre fitment area)	0.4mm	2.0 mm
Rear wheel rim runout (Spokes)	Radial	1.0 mm	1.2 mm
	Axial	1.0 mm	1.2 mm
Wheel balance weight (Cast wheel)		60g max	-
Wheel balance weight (Spokes wheel)		60g max	-

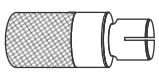
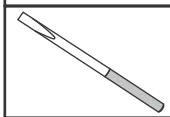
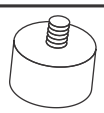
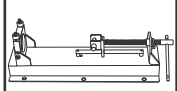
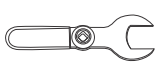
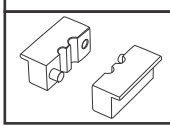


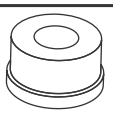
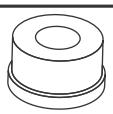
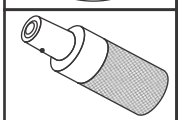
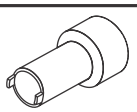
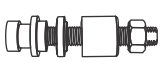
TORQUE VALUES

DRIVEN SPROCKET NUT	**: 3.0-3.6 kgf-m**
REAR AXLE NUT	**: 10.0-12.0 kgf-m**
UPPER JOINT	**: 4.9-5.9 kgf-m**
SHOCK ABSORBER UPPER MOUNTING NUT	**: 4.5-6.5 kgf-m**
SHOCK ABSORBER LOWER MOUNTING BOLT	**: 5.0-6.0 kgf-m**
SWINGARM PIVOT NUT	**: 5.5-6.5 kgf-m**
ADJUSTER BOLT SWINGARM PIVOT	**: 0.6-0.8 kgf-m**

For other nuts, bolts, fasteners etc. refer to standard torque values **(SECTION-1)**.

TOOL	SPECIAL TOOLS

	**WHEEL BEARING REMOVER HEAD, 17 mm** **PART NO: 070 HH KZJ 008**
	**WHEEL BEARING REMOVER HEAD SHAFT** **PART NO: 070 HH KZJ 009**
	**PILOT DRIVER, 25 mm** **PART NO: HMCL0423ACRD01**
	**PILOT DRIVER, 17 mm** **PART NO: 070 HH 198 033**
	**COMPRESSOR REAR SHOCK ABSORBER** **PART NO: HMCL0124ACJA04**
	**REAR CUSHION DAMPER LOCK NUT SPANNER (28 mm)** **PART NO: HMCL0124ACJA05**
	**RSU PISTON ROD HOLDER** **PART NO: HMCL0124ACJA06**

	**DRIVER OUTER, 50x55 mm** **PART NO: HMCL0623RAAA02**
	**DRIVER OUTER, 40x46 mm** **PART NO: 070 HH 198 031**
	**DRIVER OUTER, 32x35 mm** **PART NO: 070 HH KFN 010**
	**HANDLE BEARING DRIVER** **PART NO: 070 HH KFN 008**
	**SWINGARM PIVOT ADJUSTER** **PART NO: HMCL0623RAAA11**
	**SWINGARM BEARING REMOVER/ INSTALLER** **PART NO: HMCL0623RAAA09**

TROUBLESHOOTING

Rear wheel wobbles
- Bent wheel
- Worn or damaged rear wheel bearings
- Worn or damaged driven flange bearing
- Faulty rear tyre
- Unbalanced rear tyre
- Loose or broken spokes
- Worn or damaged swingarm bearings
- Bent frame or swingarm
- Axle fastener not tightened properly
- Tyre pressure too low

Wheel turns hard
- Brake drag
- Faulty wheel bearings
- Faulty driven flange bearings
- Bent axle
- Driven chain too tight

Soft suspension
- Incorrect suspension adjustment
- Weak shock absorber springs
- Oil leakage from damper unit
- Low tyre pressure

Hard suspension
- Incorrect suspension adjustment
- Bent shock absorber damper rod
- Damaged suspension or swingarm pivot bearings
- Bent swingarm pivot or frame
- High tyre pressure

Steers to one side or does not tract straight
- Drive chain adjusters not adjusted equally
- Bent axle
- Bent frame
- Worn swingarm pivot components

Rear suspension noise
- Loose suspension fasteners
- Worn or damaged suspension pivot bearings
- Faulty shock absorber

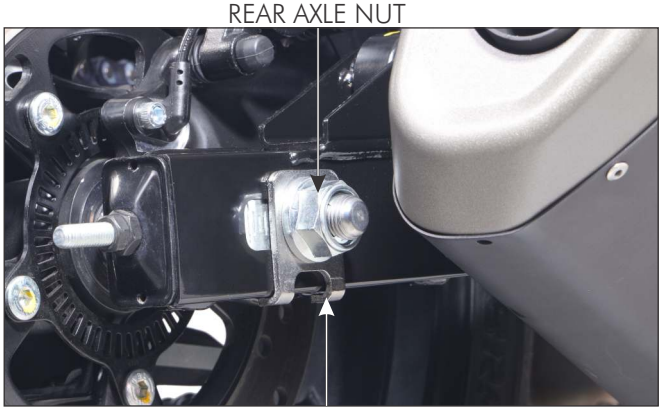
REAR WHEEL

REMOVAL

Support the vehicle securely on ramp, raise the rear wheel off the ramp.

Remove the rear axle nut and washer rear axle.

REAR AXLE NUT



WASHER REAR AXLE

Pull out the rear axle.

REAR AXLE

Remove the drive chain adjusters.

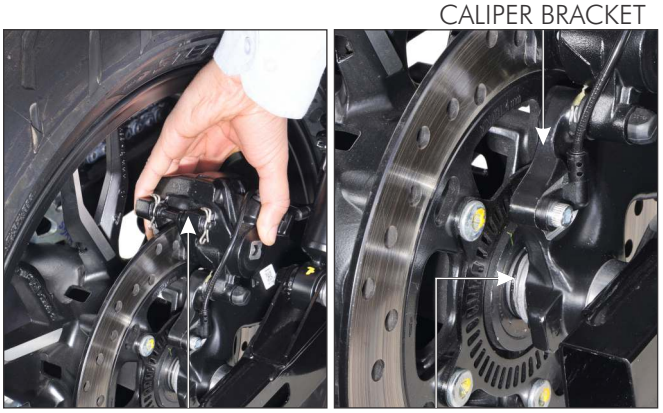
DRIVE CHAIN ADJUSTERS

Lift the rear brake caliper bracket upwards.

NOTE

Do not hang the caliper by the brake hose. Do not twist brake hose.

Remove the side collar from the right side of the wheel.



Dislodge the rear wheel flange from hub.

Remove the rear wheel.

NOTE

Do not operate the brake pedal after removing the rear wheel.

Derail the drive chain from the driven sprocket.

DAMPER RUBBER

Remove the damper rubbers.

Check the condition of the damper rubbers. Replace the damper rubbers if they are damaged or deteriorated.

NOTE

Replace the damper rubber as a set.

Install the damper rubbers to the wheel hub.

WHEEL BEARING

Check the wheel bearing play by placing the wheel in a truing stand and spinning the wheel by hand.

Replace the bearings with new ones if they are noisy or have excessive play.

NOTE

Replace the wheel bearings in pair.

WHEEL BEARING REPLACEMENT

Remove the dust seal.

Remove the circlip.

CIRCLIP

Install the bearing remover head into the bearing.
From the opposite side install the bearing remover shaft and drive the bearing out of the wheel hub.
Remove the distance collar and drive out the other bearing.

TOOL

WHEEL BEARING REMOVER HEAD SHAFT
PART NO: 070 HH KZJ 009
WHEEL BEARING REMOVER HEAD, 17 mm
PART NO: 070 HH KZJ 008

BEARING REMOVER SHAFT COLLAR

BEARING REMOVER HEAD

Similarly remove the right side bearing using special tool.

NOTE

Once the bearings are removed, they must be replaced with new ones.

TOOL

WHEEL BEARING REMOVER HEAD SHAFT
PART NO: 070 HH KZJ 009
WHEEL BEARING REMOVER HEAD, 17 mm
PART NO: 070 HH KZJ 008

BEARING REMOVER SHAFT

BEARING REMOVER HEAD

WHEEL/DRIVEN FLANGE BEARINGS

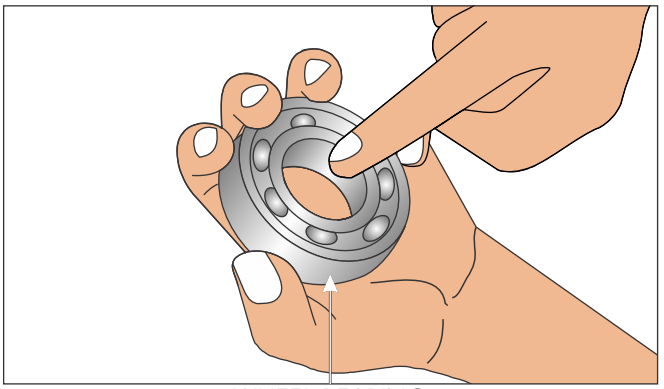
Turn the inner race of each bearing with your finger, the bearing should turn smoothly and quietly.

Also check that the bearing outer race fits tightly in the hub.

Remove and discard the bearings if the races do not turn smoothly, quietly, or of they fit loosely in the hub.

NOTE

Replace the wheel bearings in pairs.



WHEEL BEARING

INSTALLATION

Pack all the bearing cavities with grease.

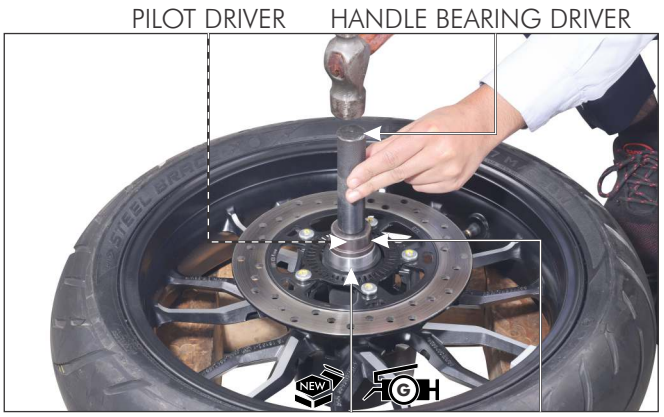
Drive in the new right bearing squarely with marked side facing up until it is fully seated.

TOOL

HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008
DRIVER OUTER, 40x46 mm
PART NO: 070 HH 198 031
PILOT DRIVER, 17 mm
PART NO: 070 HH 198 033

NOTE

Keep the grease off the brake disc.

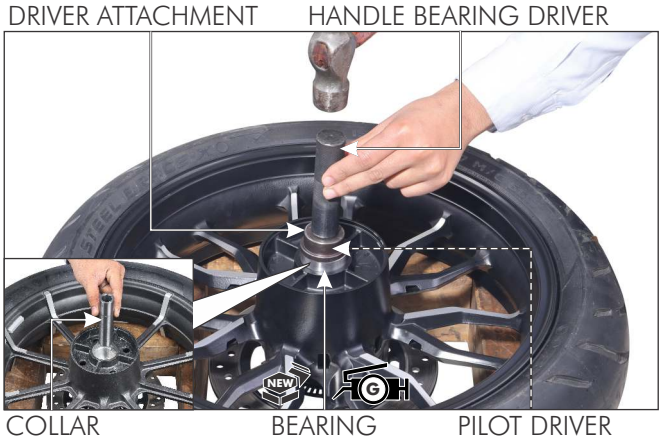


Install the distance collar.

Drive in the new left bearing first, squarely with the marked side facing up until it is fully seated.

TOOL

HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008
PILOT DRIVER, 17 mm
PART NO: 070 HH 198 033
DRIVER OUTER, 40x46 mm
PART NO: 070 HH 198 031



Install the circlip.

CIRCLIP

AXLE INSPECTION

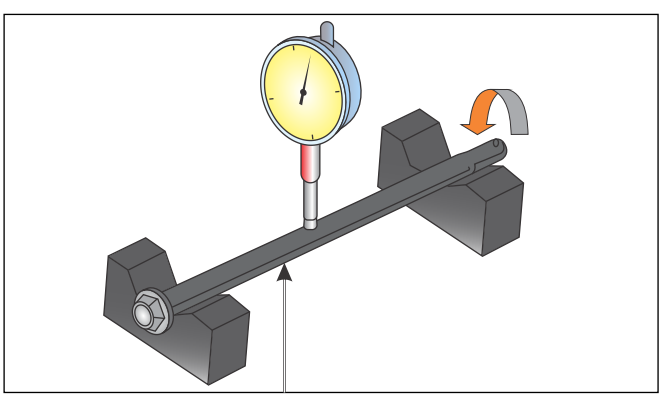
Set the rear axle in V-blocks to measure the straightness.

Turn the axle and measure the runout using a dial indicator.

Actual run-out is ½ the total indicator reading.

SERVICE LIMIT

REAR AXLE: 0.2 mm



REAR AXLE

13

Check the wheel rim run-out by placing the wheel in a turning stand.

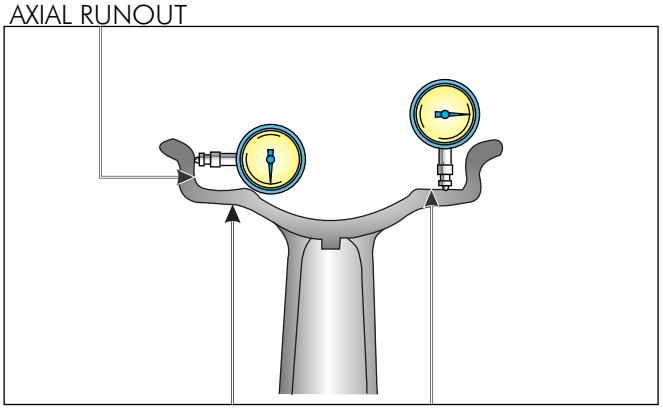
Spin the wheel by hand and read the run-out using a dial indicator.

Actual run-out is ½ of the total indicator reading.

SERVICE LIMIT

AXIAL: 2.0 mm

AXIAL RUNOUT



WHEEL RIM RADIAL RUNOUT

Install the collar to the right side of the wheel.

SIDE COLLAR

DUST SEAL

Install the damper rubbers.

DAMPER RUBBER

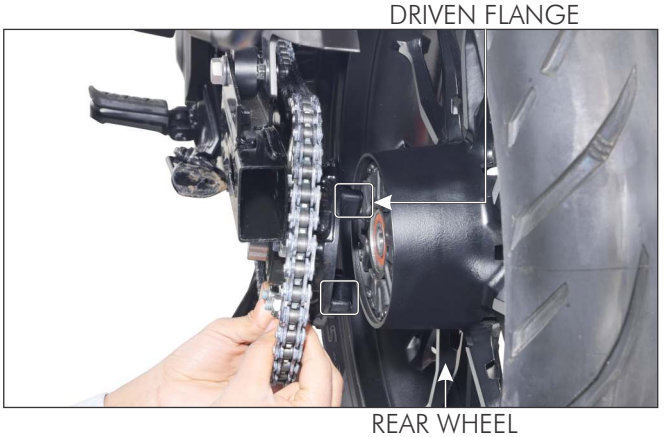
Install the drive chain on to the driven sprocket.

DRIVEN SPROCKET

DRIVE CHAIN

Place the rear wheel in the swingarm.

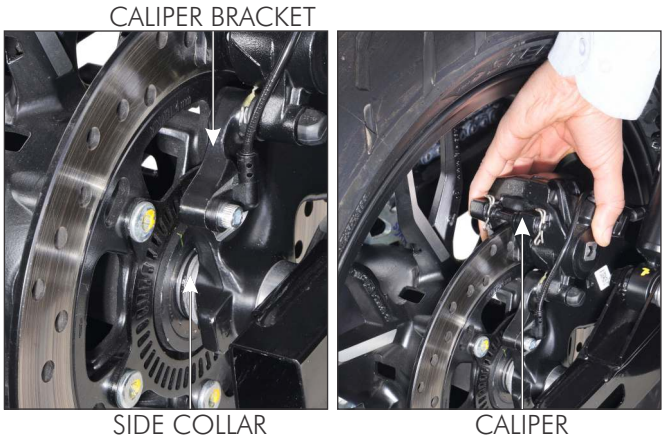
Align & engage the driven flange lugs with the slots of damper rubber.



Install the rear brake caliper bracket while placing the rear wheel into the swingarm.

NOTE

Be careful not to damage the brake pads.



Install the drive chain adjusters.

Apply a thin coat of grease to axle outer surface.

Insert the axle from the left side through the left indicator plate, left drive chain adjuster, driven flange, wheel hub, caliper bracket and right drive chain adjuster, right indicator plate.

Install the rear axle nut and washer rear axle.

Adjust the drive chain slackness (page 3-16).

Tighten the rear axle nut to the specified torque.

TORQUE

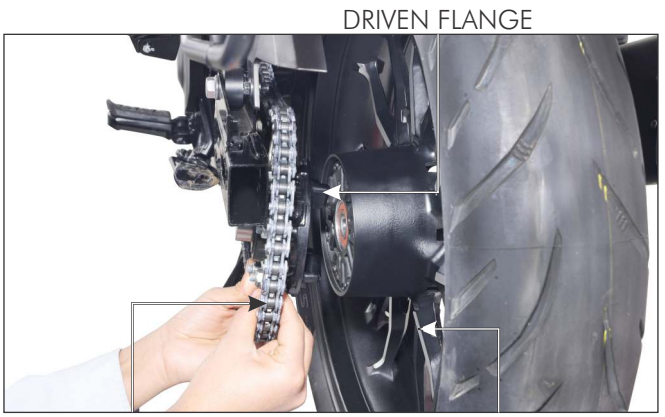
REAR AXLE NUT: 10.0~12.0 kgf-m

DRIVEN FLANGE

REMOVAL

Remove the rear wheel (page13-3).

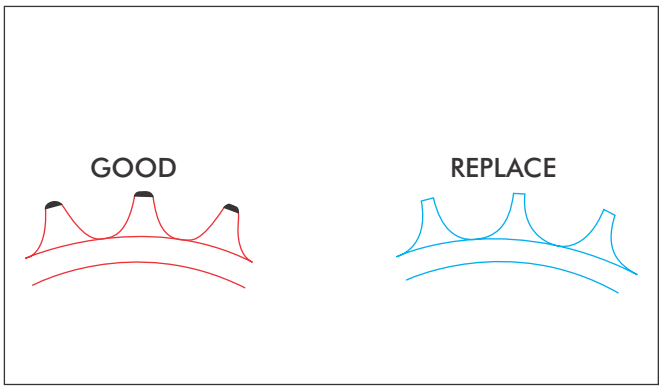
Derail the drive chain from the driven sprocket and remove the driven flange from the wheel hub .



Check the condition of final driven sprocket teeth. Replace the sprocket if it is worn out or damaged.

NOTE

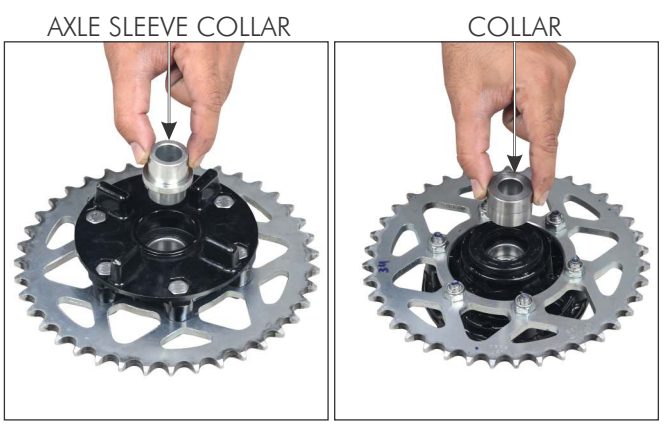
If the driven sprocket is worn out or damaged, the drive chain and the driven sprocket must be inspected and replace as a complete set.



DISASSEMBLY

DRIVEN SPROCKET

Remove the axle sleeve collar.
Remove the collar.



Remove the nuts and driven sprocket.

Remove the dust seal.

DUST SEAL

DRIVEN FLANGE BEARING

Remove the circlip.

CIRCLIP

Check the driven flange bearing by turning the inner race with your finger.

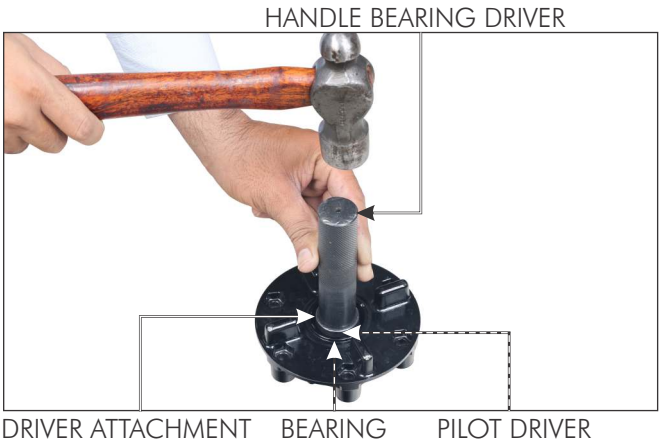
Replace the bearing with a new one if it is noisy or has excessive play.

BEARING

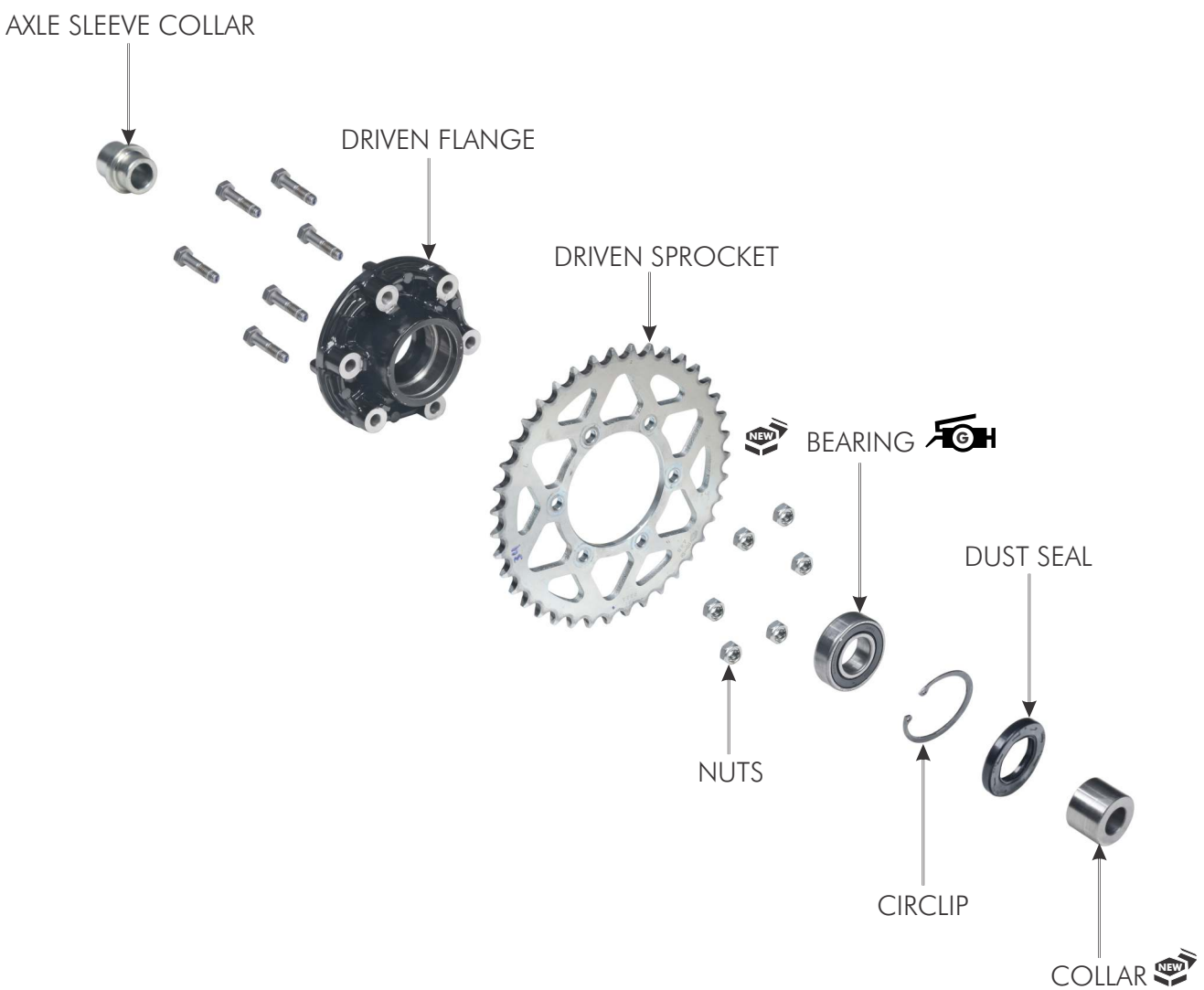
Replace the bearing with a new one if it is noisy or has excessive play.

TOOL

HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008
PILOT DRIVER, 25 mm
PART NO: HMCL0423ACRD01
DRIVER ATTACHMENT, 32x35 mm
PART NO: 070 HH KFN 010



ASSEMBLY



13

DRIVEN FLANGE BEARING

Pack new bearing cavities with grease.

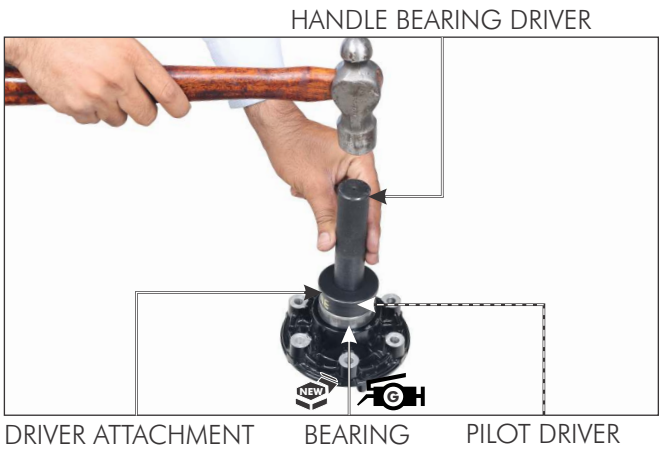
Drive in a new bearing squarely until it is fully seated.

TOOL

HANDLE BEARING DRIVER
PART NO: 070 HH KFN 008
PILOT DRIVER, 25 mm
PART NO: HMCL0423ACRD01
DRIVER ATTACHMENT, 50x55 mm
PART NO: 070 HMCL0623RAAA02

NOTE

- Drive the bearing squarely, not allowing it to tilt.
- Install the bearing with the sealed end facing outside.



DRIVEN SPROCKET

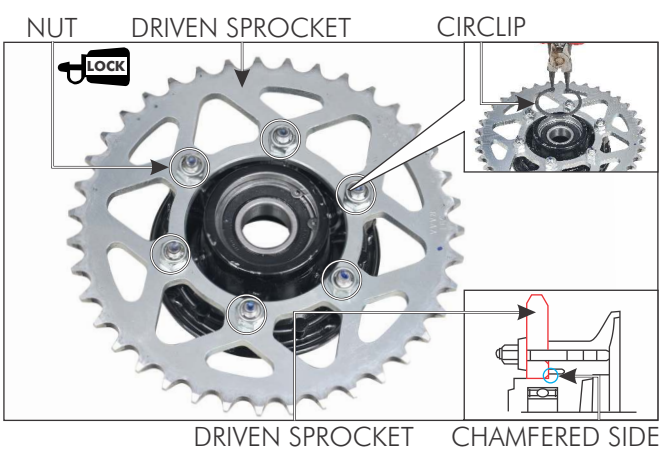
Install the driven sprocket with the numbering side facing towards the drive flange side.

Apply locking agent and install the nuts and tighten them.

TORQUE

DRIVEN SPROCKET NUT: 3.0-3.6 kgf-m

Install the circlip.



Apply grease to the lip of a new dust seal and install it.

Install the collar.

COLLAR

Install the axle sleeve collar.

AXLE SLEEVE COLLAR

INSTALLATION

Align the driven flange next to rear wheel and install chain onto the sprocket.

Install the rear wheel (page 13-7).

DRIVEN FLANGE

DRIVEN SPROCKET

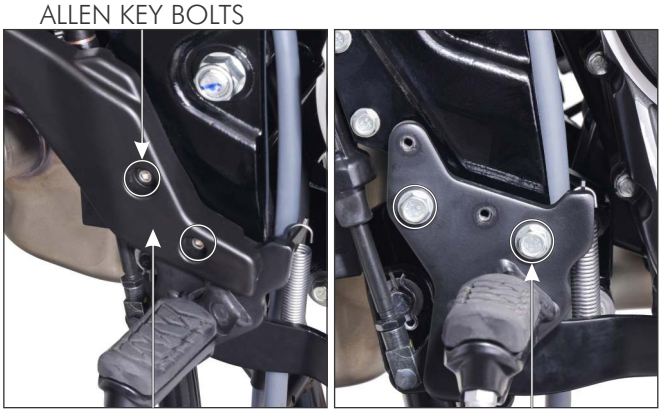
REAR WHEEL

BRAKE PEDAL

REMOVAL

Remove the right side rider holder bracket assembly cover by removing the allen key bolts (Nos.: 2, Size: 5 mm).

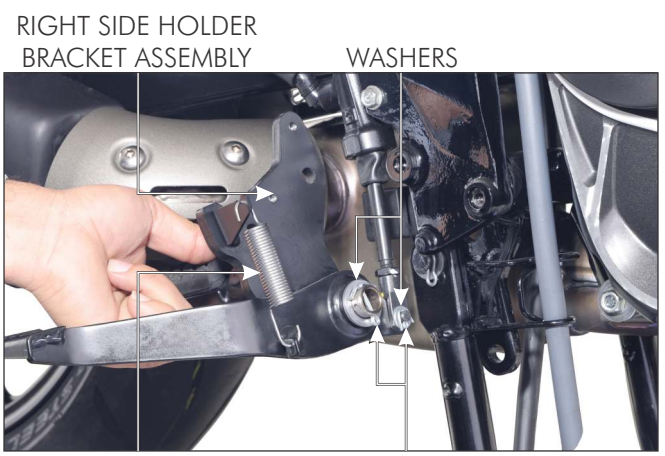
Remove the right side rider footrest bracket mounting bolts (Nos.: 2, Size: 10 mm).



Remove the right side rider footrest bracket assembly from the vehicle.

Remove the cotter pin and joint pin from the rear stop lamp switch rod.

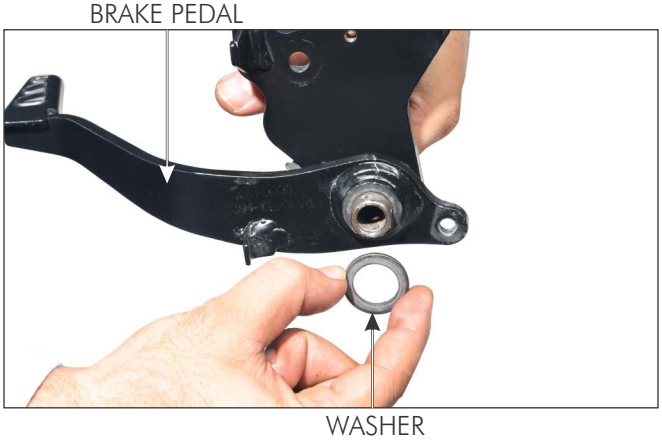
Remove the cotter pin and joint pin from the rear brake pedal.



Remove the footrest/brake pedal assembly.

Remove the brake pedal return spring from the right side rider footrest bracket.

Remove the rear brake pedal washer from the footrest bracket.

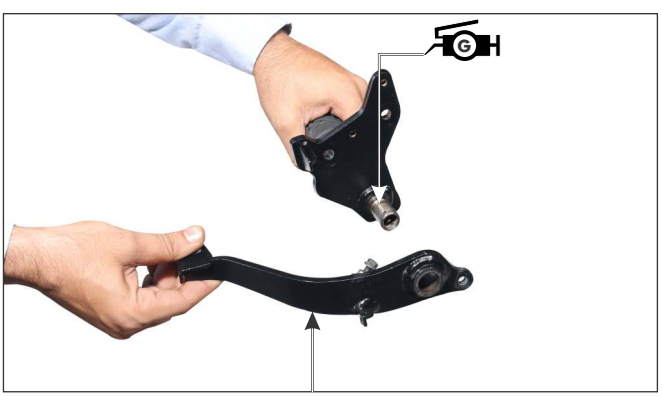


Remove the rear brake pedal from the right side rider footrest bracket.

Apply grease to the rear brake pedal pivot shaft and install it on to the right side rider footrest bracket.

INSTALLATION

Installation is in the revers order of removal.



REAR SHOCK ABSORBER

LEFT SIDE

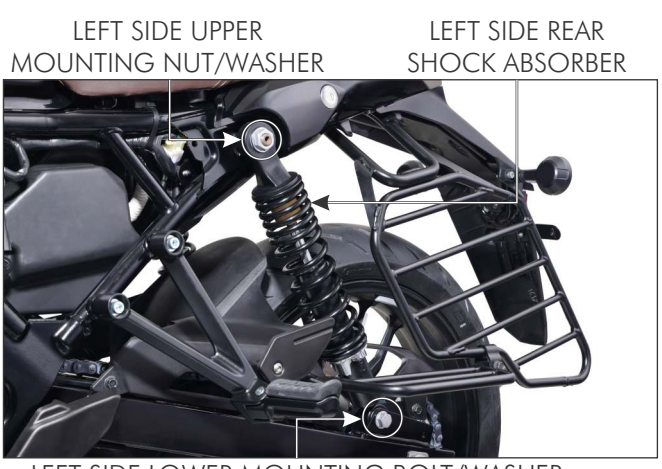
REMOVAL

Remove the left side cover (page 2-14).

Remove the left side upper mounting nut/washer from the rear shock absorber.

Remove the left side under mounting bolt/washer from the rear shock absorber.

Remove the left side rear shock absorber.



RIGHT SIDE

REMOVAL

Remove the exhaust muffler (page 2-20).

Remove the right side cover (page 2-16).

Remove the right side upper mounting nut/washer from the rear shock absorber.

Remove the right side under mounting bolt/washer from the rear shock absorber.

Remove the right side rear shock absorber.

SHOCK ABSORBER DISASSEMBLY

Compress the rear shock absorber spring with the compressor rear shock absorber.

TOOL

COMPRESSOR REAR SHOCK ABSORBER
PART NO: HMCL0124ACJA04

Remove the upper joint by holding the lock nut using rear cushion damper lock nut spanner (28 mm).

TOOL

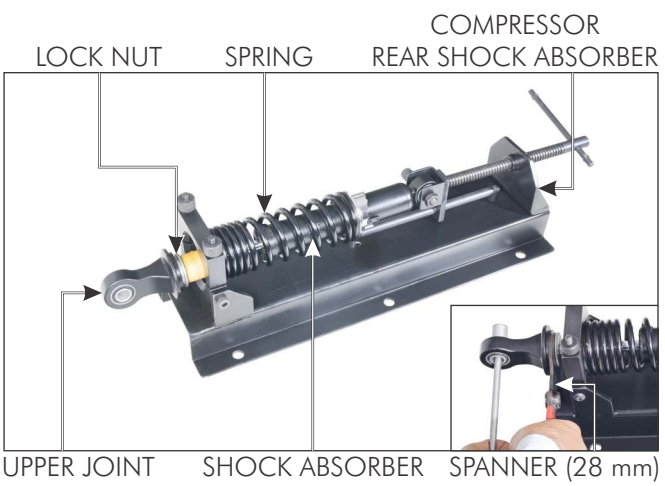
REAR CUSHION DAMPER LOCK NUT SPANNER (28 mm)
PART NO: HMCL0124ACJA05

Remove the compressor rear shock absorber to disassemble the shock absorber.

Remove the rear shock absorber spring.

CAUTION

- Compress the shock absorber only to the extent required.
- Over tightening may damage the spring.

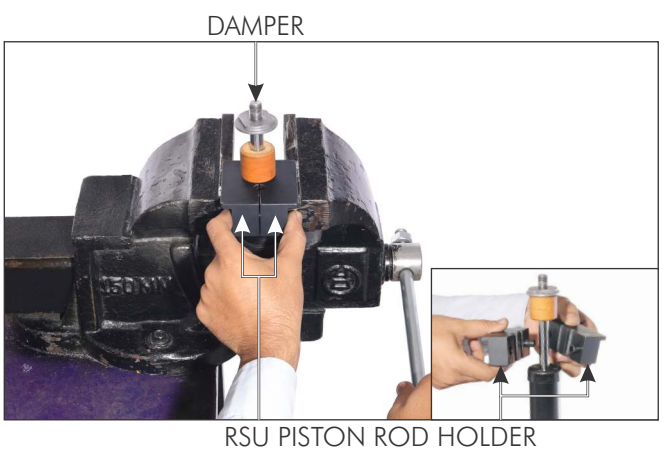


Install the RSU piston rod holder tool on the damper.

Clamp the damper with RSU piston rod holder tool in bench vice.

TOOL

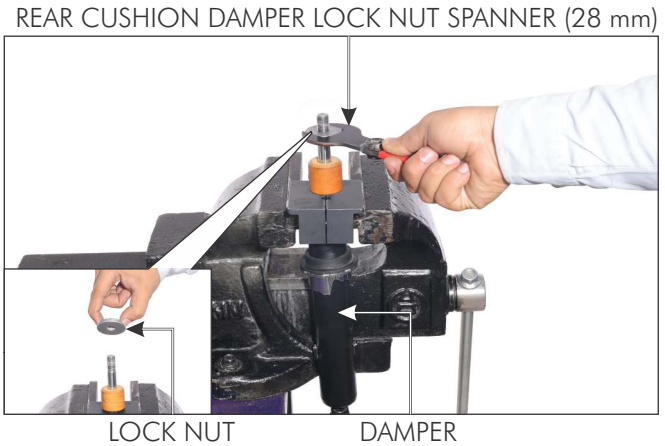
RSU PISTON ROD HOLDER
PART NO: HMCL0124ACJA06



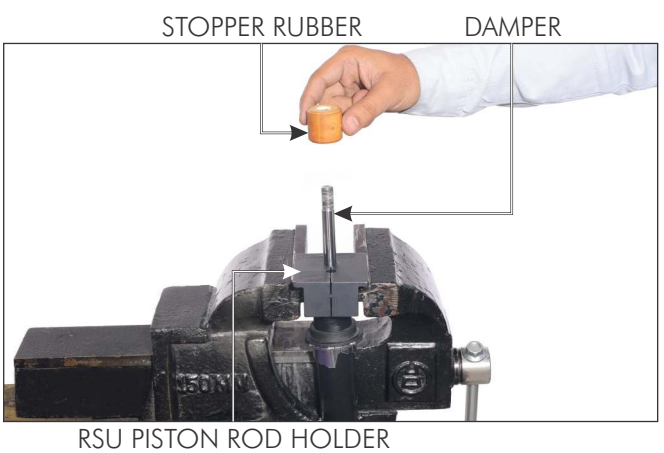
Remove the lock nut from the damper by using the rear cushion damper lock nut spanner (28 mm).

TOOL

REAR CUSHION DAMPER LOCK NUT SPANNER (28 mm)
PART NO: HMCL0124ACJA05



Remove the stopper rubber from the damper.
Remove the damper with RSU piston rod holder from the bench vice.
Separate the RSU piston rod holder from the damper.



13

PARTS INSPECTION

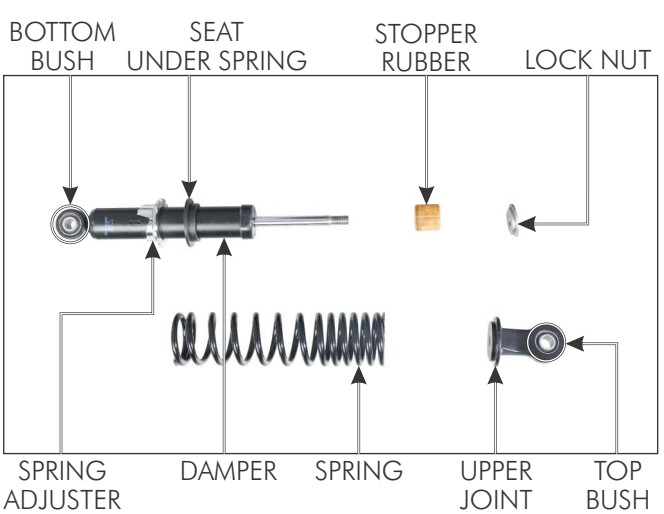
Visually inspect the shock absorber for wear or damage. Check the following:

- Damper rod for bend or damage.
- Damper unit for leakage or other damage.
- Bush for wear or damage (Top and Bottom)
- Spring adjuster, upper joint, seat under spring & lock nut wear or damage

Check for smooth damper operation.
Replace the shock absorber as an assembly, if necessary.

- Spring for wear or damage
- Stopper rubber for wear or damage

Replace the part, if necessary.



SHOCK ABSORBER ASSEMBLY

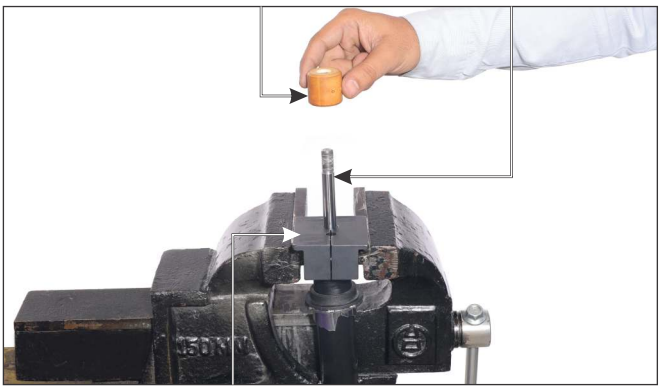
Install the RSU piston rod holder onto the damper.

Clamp the damper with RSU piston rod holder in bench vice.

TOOL

RSU PISTON ROD HOLDER
PART NO: HMCL0124ACJA06

Install the stopper rubber.



RSU PISTON ROD HOLDER

Install and tighten the lock nut onto the damper using the rear cushion damper lock nut spanner (28 mm).

TOOL

REAR CUSHION DAMPER LOCK NUT SPANNER (28 mm)
PART NO: HMCL0124ACJA05

REAR CUSHION DAMPER LOCK NUT SPANNER (28 mm)

LOCK NUT DAMPER

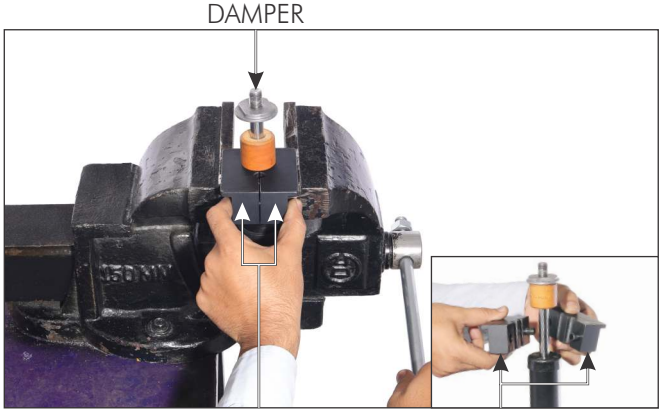
Remove the damper with RSU piston rod holder from the bench vice.

Separate the RSU piston rod holder tool from the damper.

TOOL

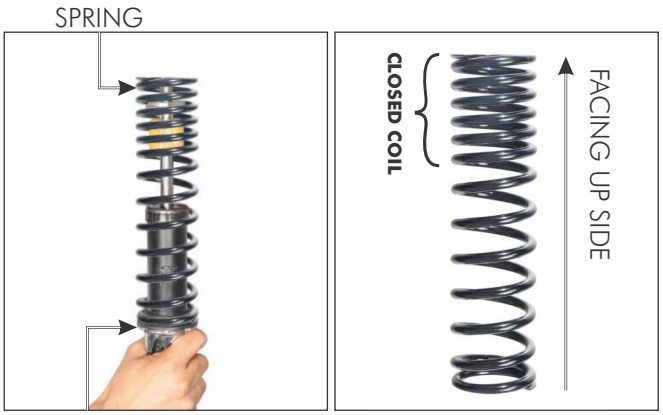
RSU PISTON ROD HOLDER
PART NO: HMCL0124ACJA06

DAMPER



RSU PISTON ROD HOLDER

Install the rear shock absorber spring with the close coils should be on piston rod side in assembly.



Compress the spring with the compressor rear shock absorber.

TOOL

COMPRESSOR REAR SHOCK ABSORBER
PART NO: HMCL0124ACJA04

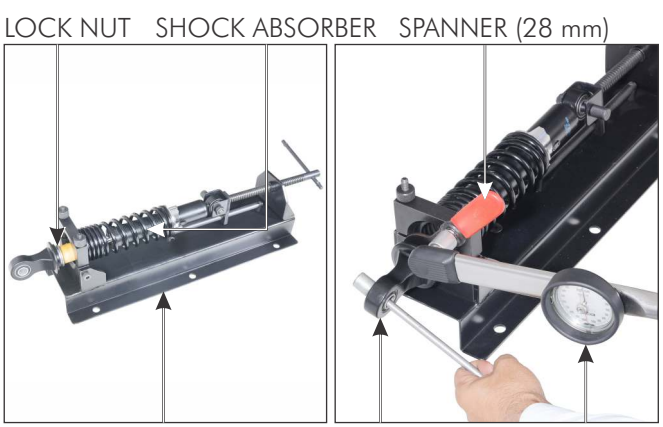
Install and tighten the upper joint by holding the lock nut using rear cushion damper lock nut spanner (28 mm) to the specified torque.

TORQUE

UPPER JOINT: 4.9-5.9 kgf-m

TOOL

REAR CUSHION DAMPER LOCK NUT SPANNER (28 mm)
PART NO: HMCL0124ACJA05



13

INSTALLATION

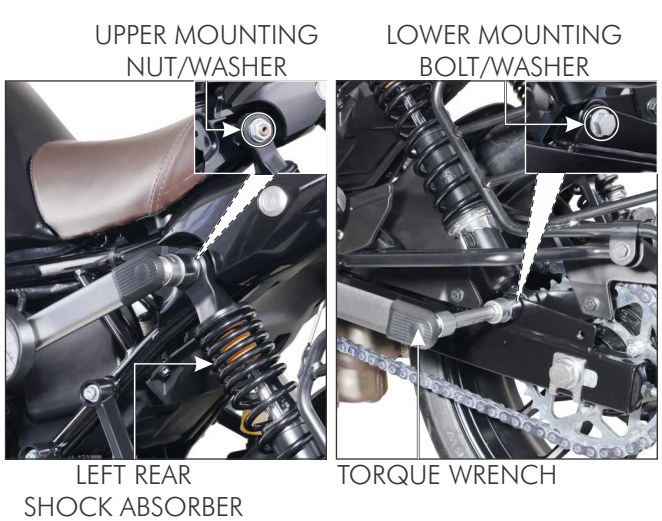
Install the left side rear shock absorber.

Install the upper mounting nut/washer (No.: 1) to the specified torque.

Install the under mounting bolt nut/washer (No.: 1) to the specified torque.

TORQUES

UPPER MOUNTING NUT: 4.5-6.5 kgf-m
UNDER MOUNTING BOLT: 5.0-6.0 kgf-m



Install the right side rear shock absorber.

Install the upper mounting nut/washer (No.: 1) to the specified torque.

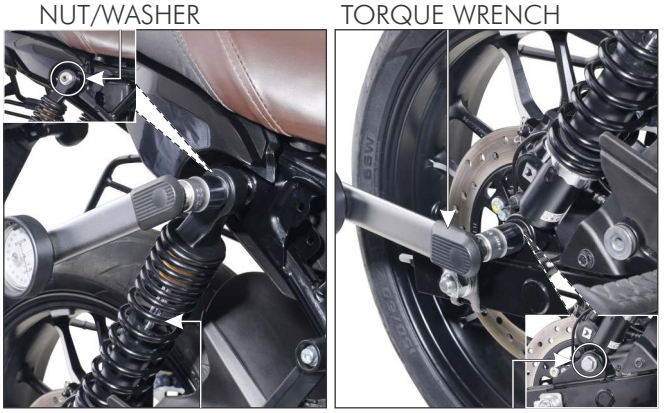
Install the under mounting bolt nut/washer (No.: 1) to the specified torque.

TORQUES

UPPER MOUNTING NUT: 4.5-6.5 kgf-m
UNDER MOUNTING BOLT: 5.0-6.0 kgf-m

Install the side covers (page 2-17).

Install the exhaust muffler (page 2-21).



SWINGARM

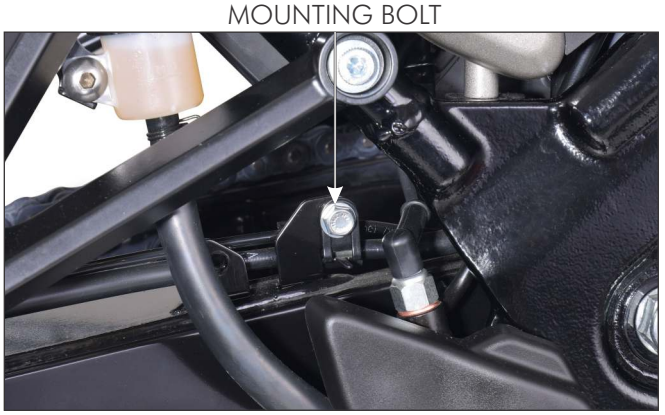
REMOVAL

Remove the side covers (page 2-14).
Remove the exhaust muffler (page 2-20).
Remove the upper chain case (page 2-25).
Remove the rear wheel (page 13-3).

Loosen the left & right side rear shock absorber upper mounting bolts.

Remove the left & right side rear shock absorber under mounting bolts.

Remove the hose mounting bolt.

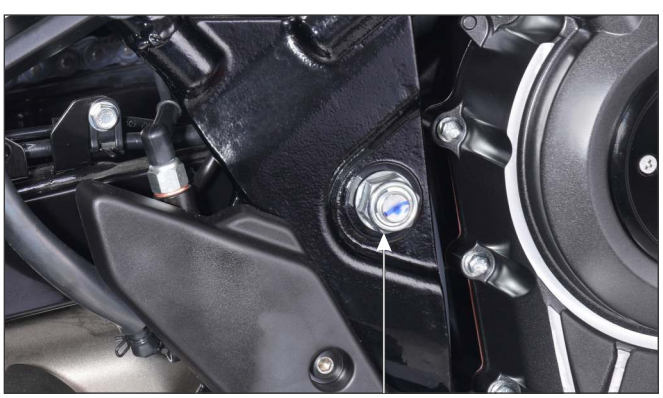


Remove the brake hose/rear wheel speed sensor cable with clamp by removing the mounting bolt.

BRAKE HOSE/REAR WHEEL SPEED SENSOR CABLE

BRAKE HOSE CLAMP MOUNTING BOLT

Remove the swingarm pivot nut.



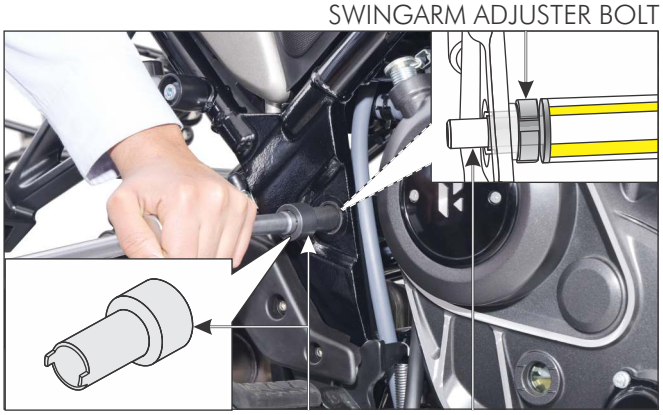
SWINGARM PIVOT NUT

Install the swingarm pivot adjuster special tool and loosen the swingarm adjuster bolt as shown.

TOOL

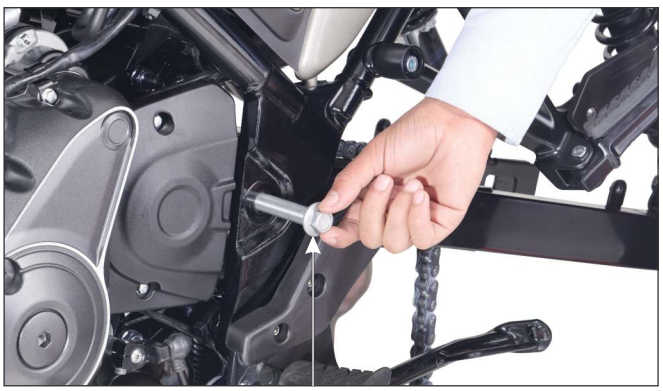
SWINGARM PIVOT ADJUSTER
PART NO: HMCL0623RAAA11

SWINGARM ADJUSTER BOLT



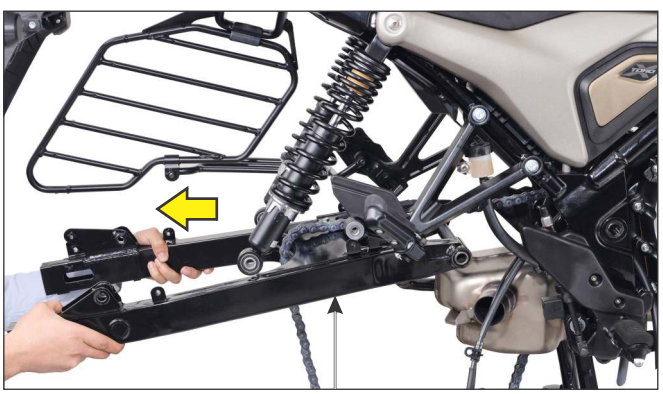
SWINGARM PIVOT ADJUSTER SWINGARM PIVOT BOLT

Remove the swingarm pivot bolt from the left side.



SWINGARM PIVOT BOLT

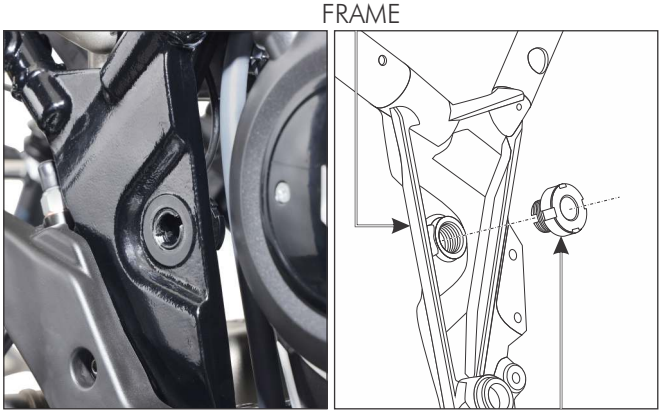
Remove the swingarm from the frame towards rear side.



SWINGARM

FRAME

Remove the swingarm adjuster bolt from the right inner side as shown (if required).



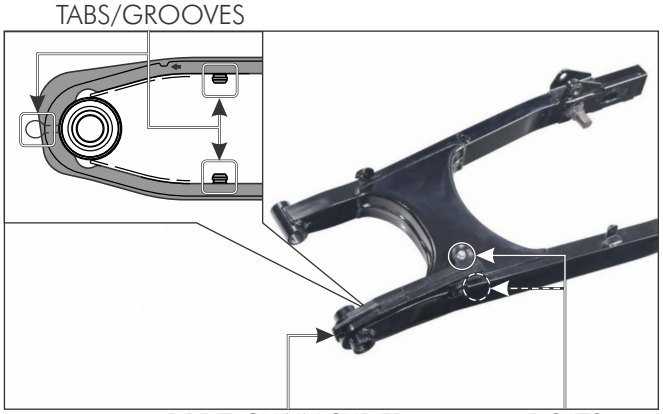
SWINGARM ADJUSTER BOLT

DISASSEMBLY

Remove the drive chain slider bolts.

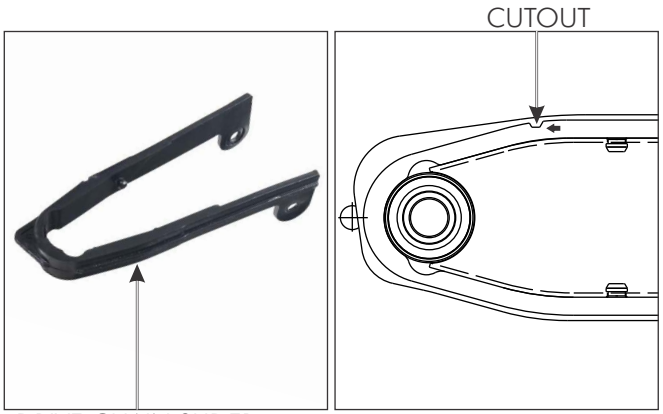
Remove the drive chain slider while releasing the tabs from the grooves.

TABS/GROOVES

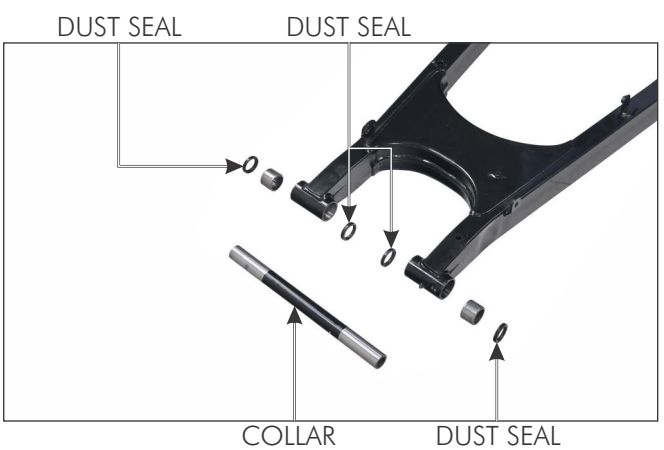


DRIVE CHAIN SLIDER BOLTS

Check the chain slider for wear or damage.
The chain slider must be replaced if it is worn to the wear limit cut-out.



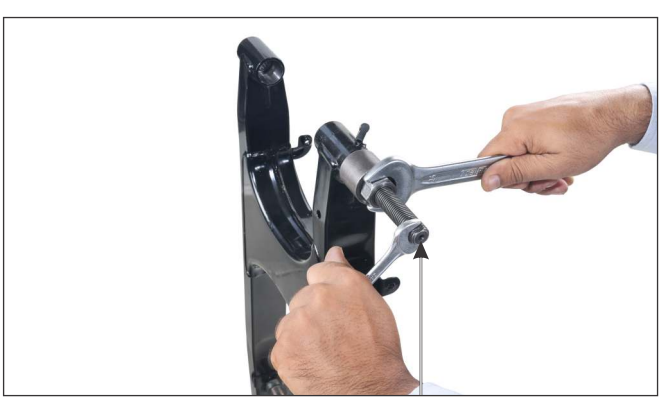
Remove the dust seals and collar.



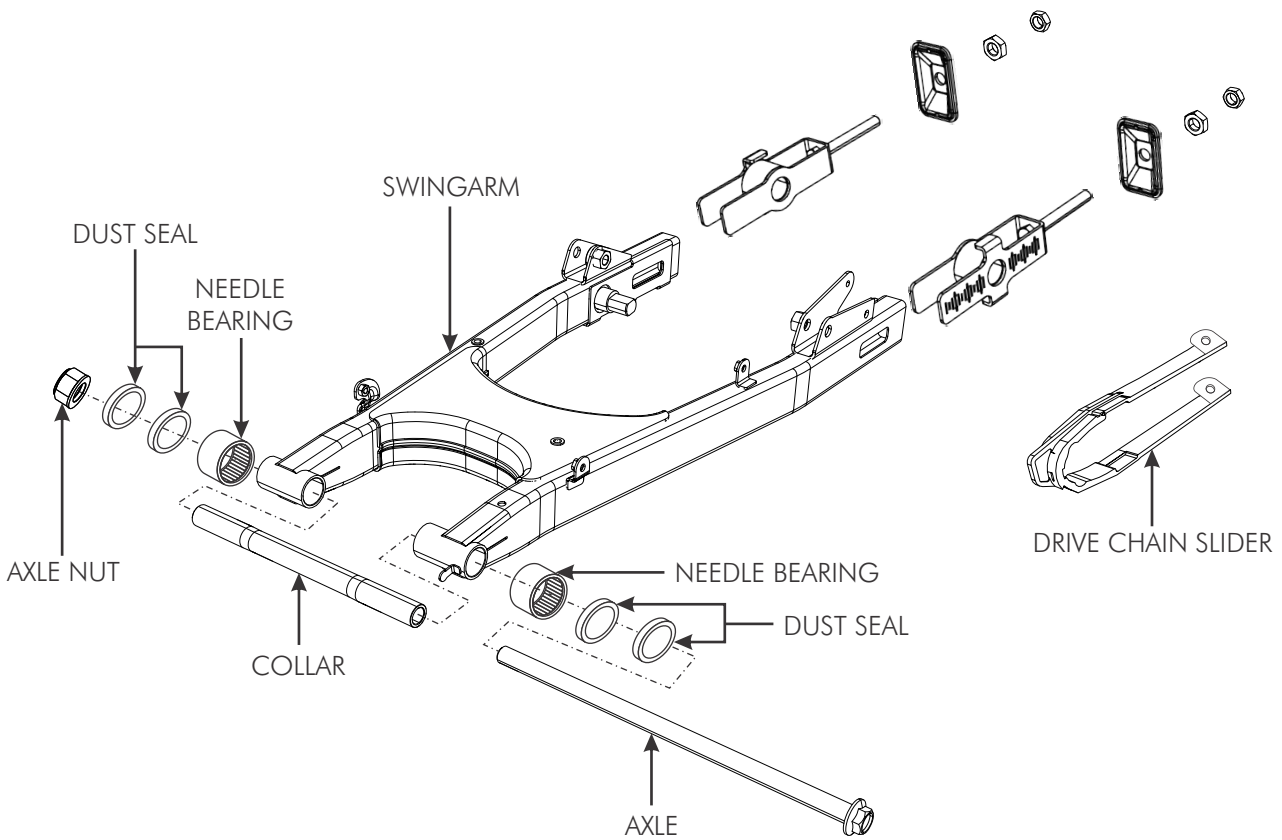
Remove the swingarm needle bearing by using the special tool.

TOOL

SWINGARM BEARING REMOVER/INSTALLER
PART NO: HMCL0623RAAA09


SWINGARM NEEDLE BEARING REMOVER/INSTALLER

ASSEMBLY



NOTE

- Please ensure seal to be installed with collar length 241.2mm
- If changing the seal it should be replaced along with the collar.

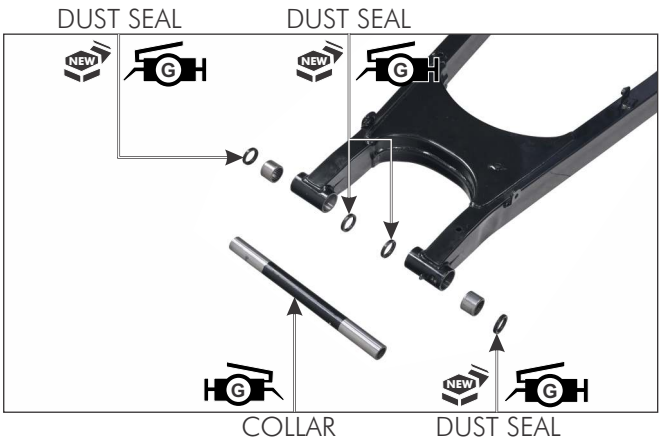
Apply grease to the needle bearing outer surface and install them into the swingarm with the help of special tool.

TOOL

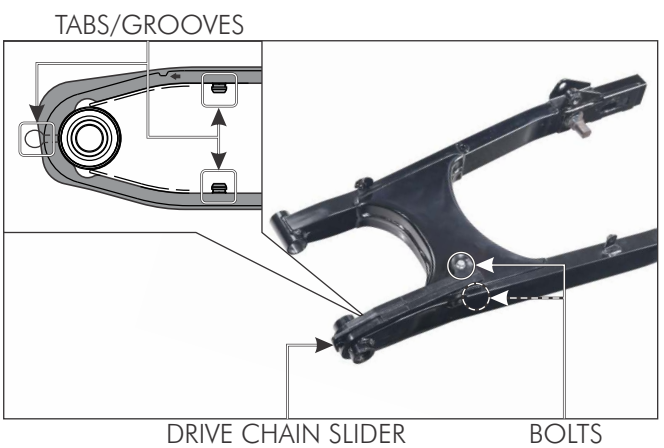
SWINGARM BEARING REMOVER/INSTALLER
PART NO: HMCL0623RAAA09

SWINGARM NEEDLE BEARING REMOVER/INSTALLER

Apply grease to the collar surfaces and install them into the swingarm pivots.
Apply grease to the dust seal lips.
Install the new dust seals on the swingarm pivot.

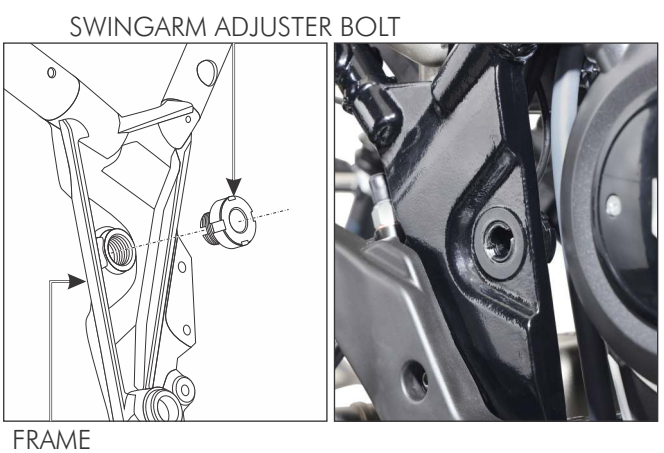


Install the chain slider while aligning tabs with grooves.
Install the drive chain slider bolts.

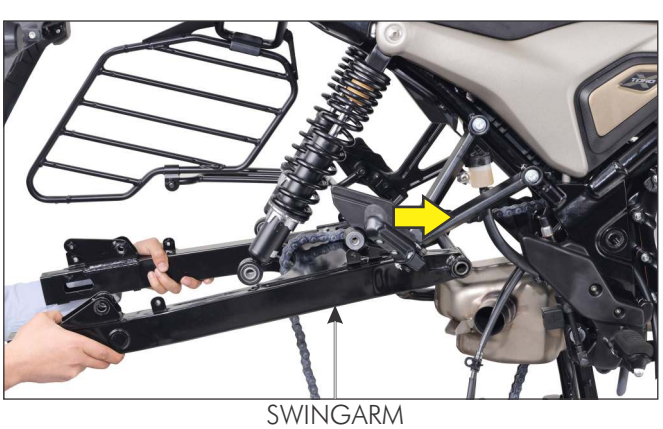


INSTALLATION

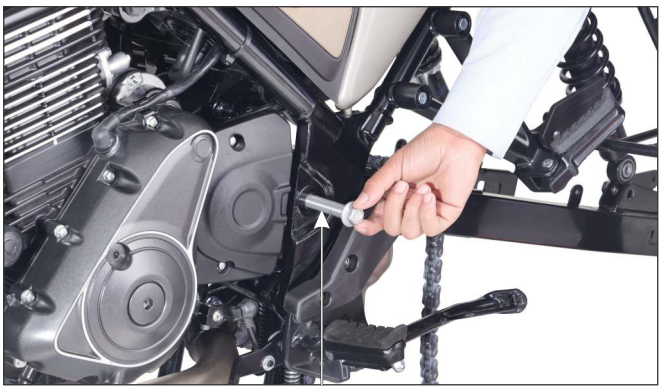
Install the swingarm adjuster bolt into the frame from the right inner side as shown (if removed).
Tighten the swingarm adjuster bolt completely by hand.



Install the swingarm to the frame towards front side.



Install the swingarm pivot bolt.



SWINGARM PIVOT BOLT

Install the swingarm pivot adjuster special tool and tighten the swingarm adjuster bolt to the specified torque.

NOTE

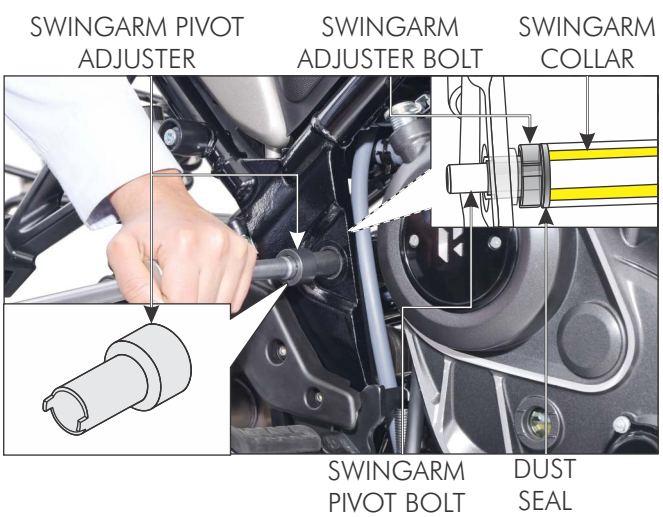
- Before torquing the swingarm adjuster bolt ensure that the bolt is in contact with the swingarm collar and there should be gap with dust seal.
- Over torquing should be avoided and hand tool is sufficient for recommended torque.

TORQUES

SWINGARM ADJUSTER BOLT: 0.6-0.8 kgf-m

TOOL

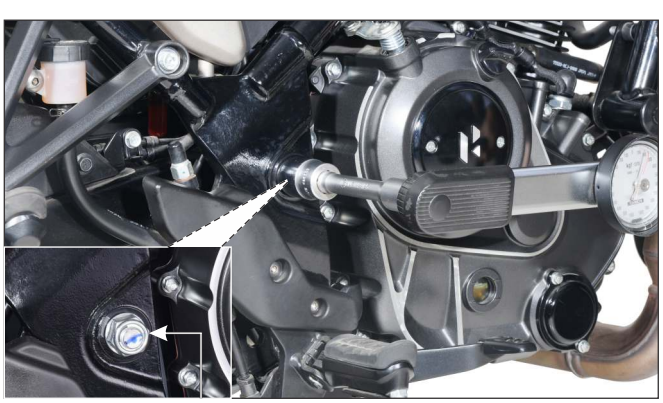
SWINGARM PIVOT ADJUSTER
PART NO: HMCL0623RAAA11



Tighten the swingarm pivot bolt /nut specified torque.

TORQUES

SWINGARM PIVOT NUT: 5.5-6.5 kgf-m



SWINGARM PIVOT NUT

Install the brake hose/rear wheel speed sensor cable with clamp by installing the mounting bolt.

NOTE

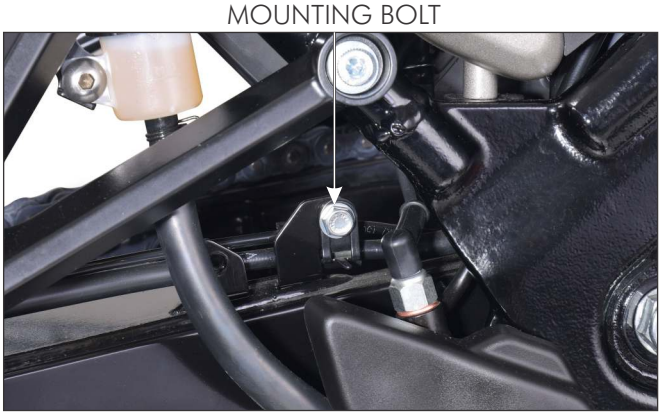
Route the brake hose/rear wheel speed sensor cable properly.

BRAKE HOSE/REAR WHEEL SPEED SENSOR CABLE

BRAKE HOSE CLAMP MOUNTING BOLT

Install the mounting bolt.

MOUNTING BOLT



Install the rear wheel (page 13-9).

Install and tighten the upper/under mounting bolt/nut washer both side specified torque.

TORQUES

SHOCK ABSORBER UPPER MOUNTING

NUT : 4.5-6.5 kgf-m

SHOCK ABSORBER LOWER MOUNTING

BOLT : 5.0-6.0 kgf-m

Install the exhaust muffler (page 2-21).

Install the upper chain case (page 2-25).

Install the side covers (2-15).

MOUNTING NUT/WASHER

MOUNTING BOLT/WASHER

SERVICE INFORMATION

GENERAL

⚠ WARNING

- Riding on damaged wheels impairs safe operation of the motorcycle.
- Installing improper tyres or using tyres that are excessively worn or improperly inflated tyres on motorcycle can affect handling and stability. This can cause a crash in which you can be seriously hurt.
- Do not try install a tube inside a TUBELESS TYRE. Excessive heat build up can cause the tube to burst. The wheels are specially designed for TUBELESS TYRES, during hard acceleration or braking a tube installed in TUBELESS TYRES could slip on the wheel and cause the tyre to rapidly deflate.

- This section covers removal and installation of TUBELESS TYRES.
- Raise the front wheel off the ground by supporting the motorcycle securely with a jack or other support under the engine.
- After the front wheel installation, check the brake operation by applying the brake lever.
- Use only tyres marked "TUBELESS" and tubeless valves on wheels marked "TUBELESS TYRE APPLICABLE".
- Brake system information (page 16-1).

SPECIFICATIONS

TUBELESS TYRES

ITEM			STANDARD	SERVICE LIMIT
Minimum tyre tread depth	Front		4.2 mm	0.8 mm
	Rear		5 mm	0.8 mm
Cold tyre pressure	Front	Rider only	27 psi	-
		Rider & Pillion	27 psi	-
	Rear	Rider only	29 psi	-
		Rider & Pillion	29 psi	-
Wheel rim runout (Cast wheel)	Front	Axial (Tyre fitment area)	0.4 mm	2.0 mm
	Rear	Axial (Tyre fitment area)	0.4 mm	2.0 mm
Wheel rim runout (Spokes wheel)	Front	Radial	1.0 mm	1.2 mm
		Axial	1.0 mm	1.2 mm
	Rear	Radial	1.0 mm	1.2 mm
		Axial	1.0 mm	1.2 mm
Wheel balance weight (Cast wheel assembly)			60g max	-
Wheel balance weight (Spokes wheel assembly)			60g max	-

TYRE

REMOVAL

Remove the front wheel (page 12-11).

Remove the rear wheel (page 13-3).

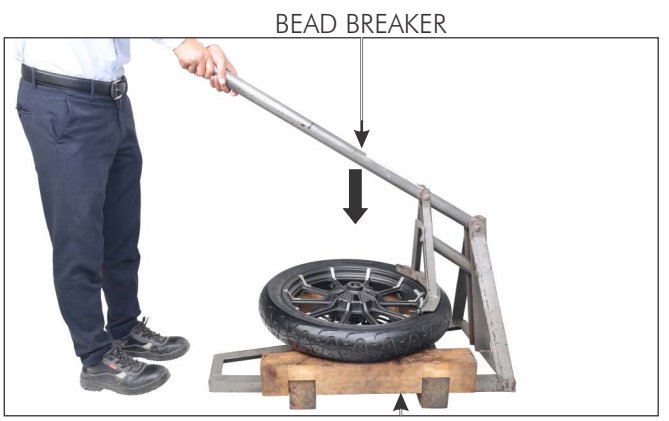
Remove the valve cap and bleed air by pressing the valve core.

RIM VALVE VALVE CAP VALVE CORE SCREWDRIVER

Collapse the bead with a tyre bead breaker.

NOTE

Be careful not to damage the rim while pressing the bead breaker.



After Loosening the bead from the rim, from opposite side of the valve push the bead to the centre of the rim so that the tyre become off-centre.

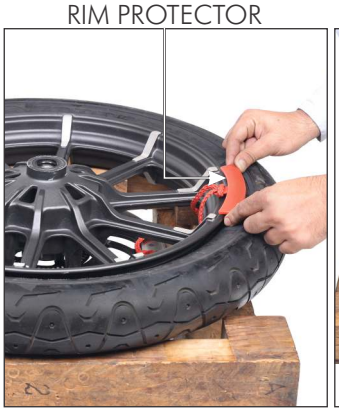
NOTE

The tyre can be removed once the beads on both sides are collapsed completely.

Apply a mild detergent solution to the rim and the mating surfaces.

Check the beads opposite to the valve are completely loosened from the rim. Install the rim protector on the section of the rim close to the valve and insert a tyre lever to pry it out.

RIM PROTECTOR



TYRE LEVER

NOTE

- Be sure to use motorcycle tyre levers.
- To avoid damaging the rim, use rim protectors.

Insert another tyre lever 30~50 mm from the first tyre lever and pry the tyre over the rim little by little.

NOTE

Do not try to remove too much of the bead at one time.

Repeat the above procedures until half of the bead is removed. Remove the remaining bead by hand.

Remove the tyre from the rim.

RIM VALVE REPLACEMENT

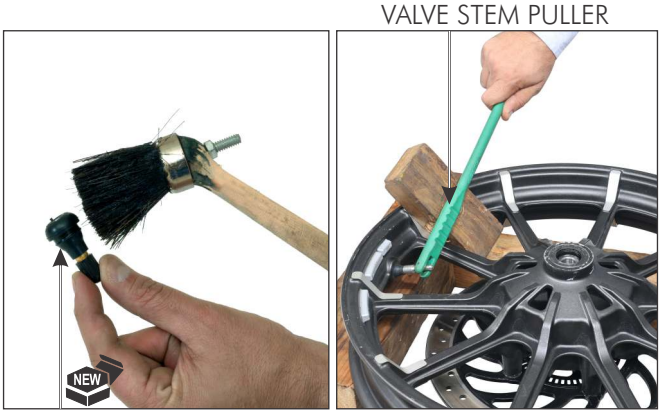
Cut off the rim valve at the base.

Apply mild detergent solution to the replacement rim valve and insert it from inside of the rim. pull it in radially towards the center of the wheel using a special tool.

NOTE

- Be sure to use the recommended rim valve.
- Take care not to damage the valve hole.
- Replace the rim valve whenever installing a new tubeless tyre.

VALVE STEM PULLER



RIM VALVE

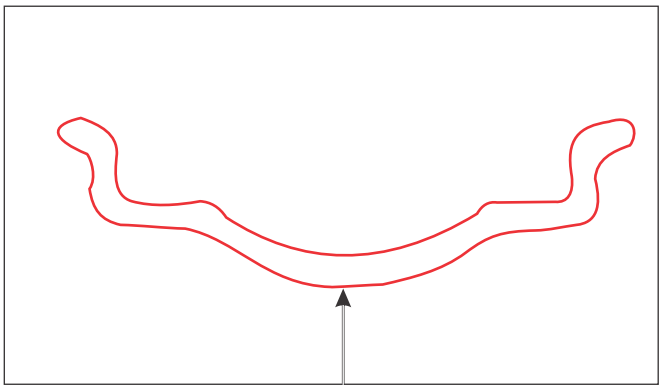
WHEEL
INSPECTION

When a tubeless tyre is incorrectly installed on a rim, it may be dislodged from the rim leading to a serious accident. Make sure to observe the following points while installing.

When an organic solvent (Brake cleaner, gasoline, paint thinner etc) is used to remove rust or dirt, be sure to clean the rim completely so that no solvent is left on the rim which may damage the rubber.

When the rim has a large deformation, distortion, crack, replace the rim as it may cause air leak.

Always change the rim if there is scratch on the surface of the rim where it (0.5 mm in depth and 1.0 mm in width) contacts the bead.



TYRE
INSTALLATION

⚠ WARNING

Any attempt to mount a passenger car tyre on a motorcycle rim may cause the tyre bead to separate from the rim with enough explosive force to cause serious injury.

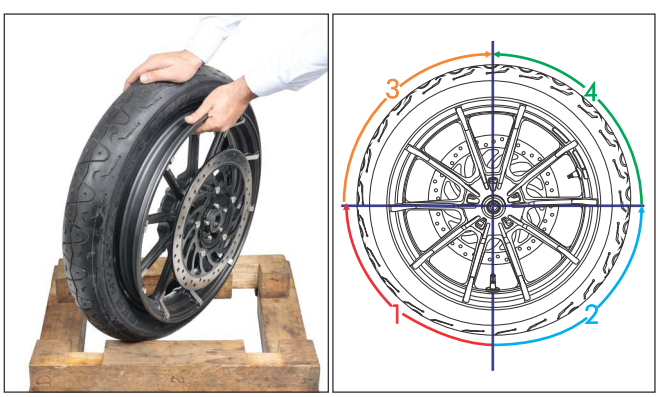
Check overall condition of the tyre and apply a mild detergent solution to the bead.

Mount the tyre with the balance mark ('O' paint mark) aligned with the valve. Install the tyre with arrow mark pointing with the direction of rotation.

⚠ WARNING

A tyre that shifts on the rim may lead to a sudden loss of air pressure while riding and an accident could occur.

Stand the tyre upright, hold it with one hand and starting from the apposite side to the valve, install one side of the tyre from the rim as much as possible by hand. Be sure to assemble in the sequence as shown.



NOTE

- Be sure to use motorcycle tyre levers.
- For easy assembly, apply a mild detergent solution to the tyre and rim mating surface.

Place the wheel on the tyre replacement base on a level surface and mount the remaining portion of the tyre using two tyre levers. At the last section, you may need to pry with the two levers simultaneously. Make sure the installed bead is loose from the rim and stays along the centre of the rim.

Install the bead by holding the bead with your knees so that the bead may not come off.

After half of the bead has been mounted, insert the two tyre levers 30-40 mm apart and pry the bead over the rim. Repeat until ¾ of the bead has been mounted.

NOTE

Before using the levers, be sure that the bead on the opposite side is positioned in the center of the rim.

NOTE

Hold one tyre lever upright to allow removal of the other tyre lever.

After installing the valve core, apply a mild detergent solution to the bead again.

Tap on the tyre tread surface with a mallet so that the tyre and rim fit evenly around the circumference. Be sure that the tyre centre and rim centre are aligned.

Inflate the tyre to 1.5 times the standard recommended pressure to seat the bead on the rim.

Use the tyre pressure specified in the Model Specific manual or on the tyre label. Overinflation may cause a tyre to burst with sufficient force to result in serious injury.

NOTE

- You may hear a loud sound as the bead seats on the rim. This is normal.
- If air leaks from between the rim and bead, stand the wheel up with the valve at the bottom and put air in while pushing down on the tyre.

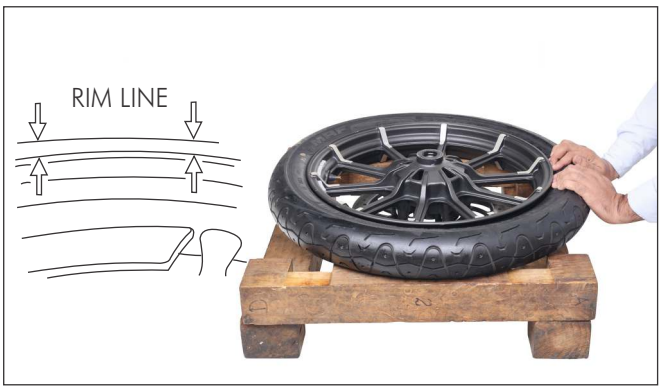
TUBELESS TYRES

Check that the tyre bead seats on the tyre rim securely and that the rim line of the tyre is concentric with the rim.

Adjust the tyre pressure as per specification.

Check the wheel balance (page 14-8).

Install the wheel.



WHEEL BALANCE

Wheel balance directly affects the stability, handling and overall safety of the motorcycle. Always check balance when the tire has been removed from the wheel.

For optimum balance, the tyre balance mark (a paint dot on the side wall) must be located next to the valve stem. Remount the tyre if necessary.

Note the rotating direction marks on the wheel and tyre.

NOTE

Install the tyre with arrow mark pointing with the direction of rotation.

Remove the dust seals from the wheel.

Mount the wheel, tyre and brake discs assembly in an inspection stand.

Spin the wheel slowly, allow it to stop, and mark the lowest (heaviest) point of the wheel with a chalk.

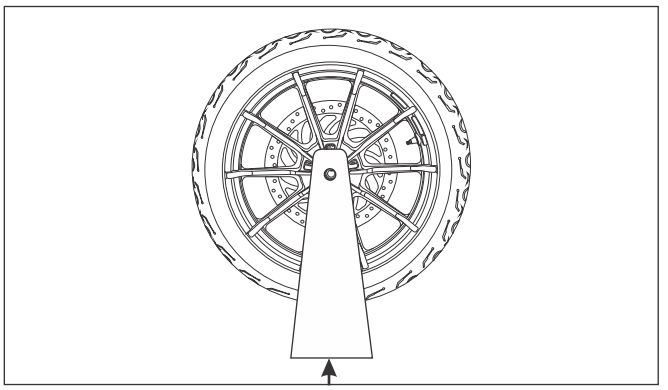
Do this two or three times to verify the heaviest area.

If the wheel is balanced, it will not stop consistently in the same position.

To balance the wheel, install the wheel weights on the highest side of the rim, the side opposite the chalk marks. Add just enough weight so that wheel will no longer stop in the same position when it is spun. Do not add more than 60 grams to the wheel.

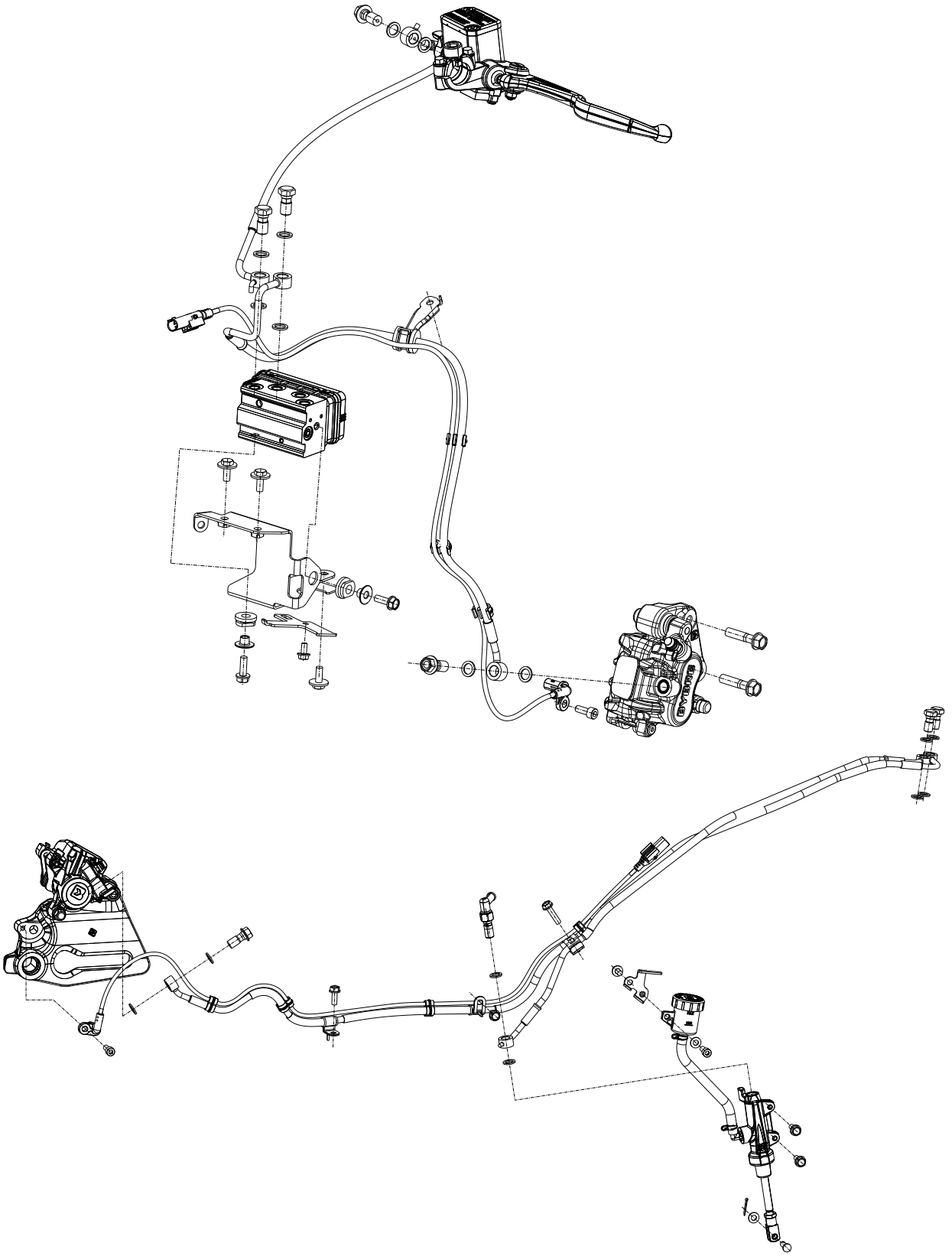
NOTE

This model is equipped with the new shape wheel weight made of zinc spelter. This wheel weight is incompatible with the conventional one in case of installation to the wheel.



INSPECTION STAND

SYSTEM DIAGRAM



SERVICE INFORMATION

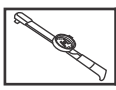
GENERAL

- The anti-lock braking system (ABS) doesn't function without battery. The normal operating voltage of ABS hydraulic electronic control unit (HECU) is 10 to 16 voltage.
- HECU is non serviceable. Do not dismantle the HECU unit in case of any malfunction.
- Do not attempt to correct the encoder teeth by bending manually or by using any other mode.
- During PDI always ensure that there are no malfunction description stored related to ABS system.
- Ensure all HECU and harness connectors are properly connected and locked. A poor or loose connection can cause high voltage surge and result in damaging the integrated circuits in HECU.
- Ensure all the brake hoses are routed properly and are not bent or kinked.
- Prevent dirt and debris from entering into the HECU unit after it has been removed or whenever hose pipe joints are removed at HECU. Seal the HECU brake hose ports with suitable caps/plugs/threaded connectors.
- HECU assemblies must not be placed on top of each other without a suitable layer placed in between.
- Do not drop the HECU as it may damage the internal components due to shock.
- Brake pipes, brake hoses or electrical lines may not be used as a handle to lift or carry an assembly. Assemblies must be held by the fixed body e.g. motor.
- Do not touch or bend the HECU connector pins.
- HECU must be installed under as little tension as possible and there must also be a certain amount of clearance to the rigid part of the suspension to dampen the vibrations. Tighten the bolts to the specified torque.
- Check the brake pads and make sure that the brake fluid is clean. ABS systems can also malfunction due to worn brake pads or air or dirt in brake fluid.
- Use the recommended brake fluid.
- Carefully remove the wheel during the puncture/tyre replacement to prevent the encoder damage/bend.
- Use only the recommended make, type and size of tyre (**Section-1**).
- During riding, speed display on speedometer can go off due to battery loose connections, battery low voltage or removing front wheel keeping ignition "ON". As a result, ABS warning lamp starts illuminating continuously. In that case, system becomes ok as soon as ignition is turned "OFF" & "ON" again.
- Do not adjust the wheel speed sensor air gap.
- Do not insert any metallic part near wheel speed sensor.
- Use only genuine spares like pads & discs.

SPECIFICATIONS

ANTI-LOCK BRAKING SYSTEM

ITEM	SPECIFICATIONS
Wheel speed sensor resistance	50 Ω±2% - 115 Ω±2%
Wheel speed sensor air gap	1.2 mm Maximum
Operating temperature	-20°C to +85°C
Operating voltage	10 to 16V
ABS unit inclination angle	± 10° (about longitudinal direction) ± 5° (about later direction)

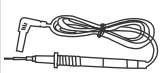
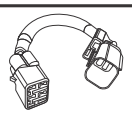


TORQUE VALUES

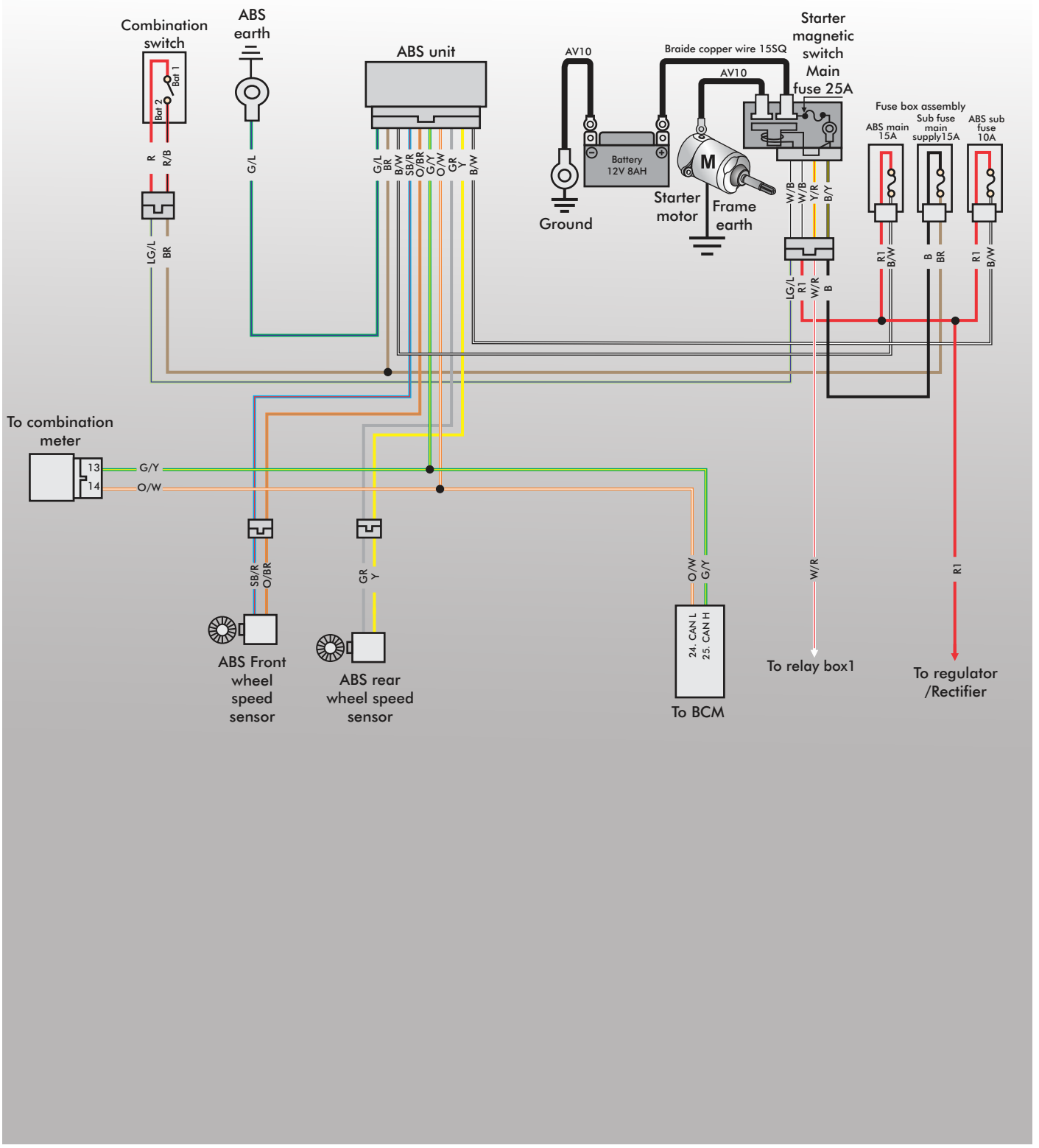
HECU BENJO BOLT	**: 2.1-2.4 kgf-m**
WHEEL SPEED SENSOR (WSS) MOUNTING BOLT	**: 0.8-1.0 kgf-m**
HYDRAULIC ELECTRONIC CONTROL UNIT MOUNTING BOLT	**: 0.8-1.0 kgf-m**

For other nuts, bolts, fasteners etc. refer to standard torque values **(SECTION-1)**.

SPECIAL TOOLS

	**MULTIMETER PROBE** **PART NO: 070 HH KTRF 004**
	**HERO VEHICLE COMMUNICATION INTERFACE (HERO VCI)** **PART NO: HMCL0419HVCI01**
	**OBD2 CABLE** **PART NO: HMCL0523HVCI05**

ABS CIRCUIT DIAGRAM



MALFUNCTION INDICATION

Park the vehicle on its main stand.

Turn the ignition switch to "ON".

ABS indicator will illuminate for 1.8 seconds and then it will start blinking until vehicle speed exceeds 5 km/h.

If it goes "OFF" after vehicle speed exceeds 5 km/h, then system is normal.

At any point, if there is a malfunction in ABS system, the ABS indicator will remain "ON" or illuminates continuously.

In case of ABS malfucntion perform the following procedure to read the Anti-lock braking system (ABS) malfunction :

ABS INDICATOR

MALFUNCTION CODE READING PROCEDURE

Turn the ignition switch to "OFF".

Remove the seat (page 2-5).

Remove the battery cover (page 2-6).

Disconnect the connector cover from the data link connector (DLC).

CONNECTOR COVER

DATA LINK CONNECTOR (DLC)

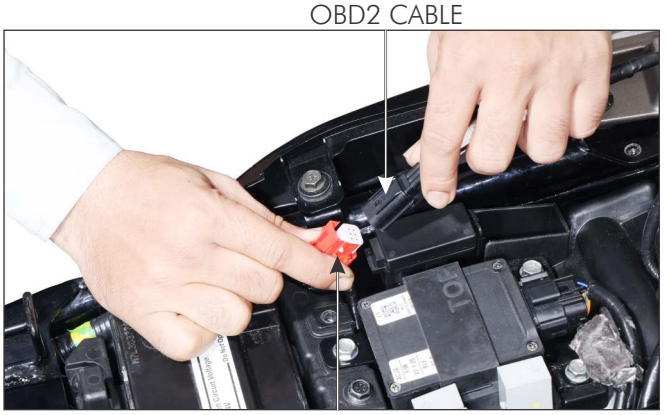
15

Connect the VCI OBD2 cable to the data link connector (DLC).

TOOL

OBD2 CABLE
PART NO: HMCL0523HVCI05

OBD2 CABLE

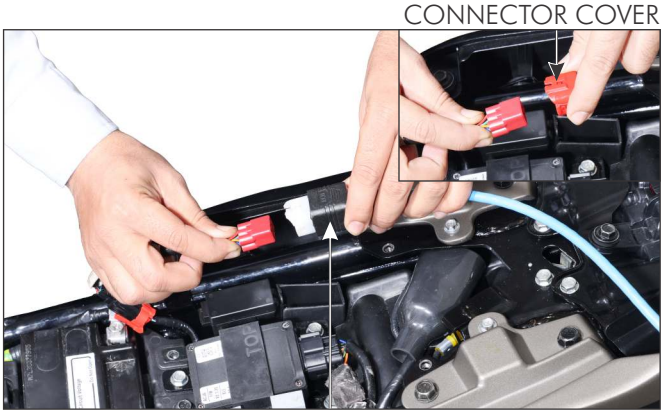


DATA LINK CONNECTOR (DLC)

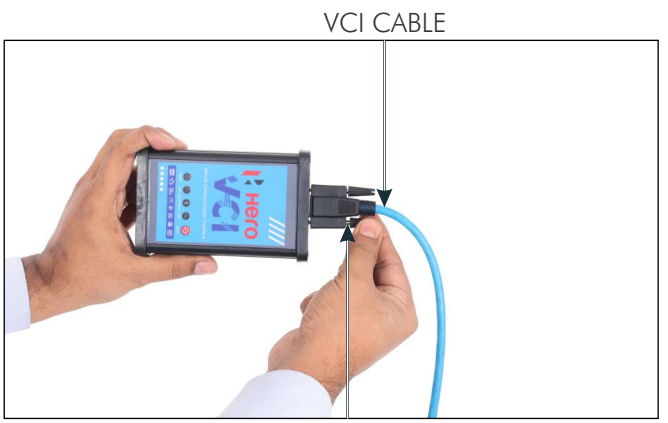
Disconnect the connector cover from the other end of OBD2 cable.
Connect the VCI wire harness connector to OBD2 cable.

TOOL

HERO VEHICLE COMMUNICATION INTERFACE
PART NO: HMCL0419HVCI01



Connect the VCI connector to the Hero VCI and tighten it by rotating its screw.



Connect HERO VCI and Laptop/Desktop either with USB cable or using the Bluetooth connectivity (page 23-14).

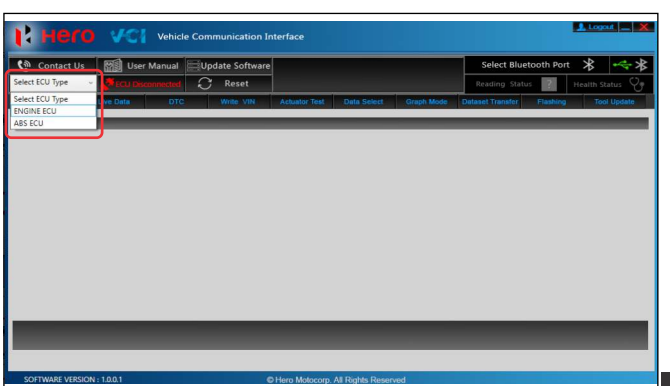
- Turn "ON" the ignition switch.

NOTE

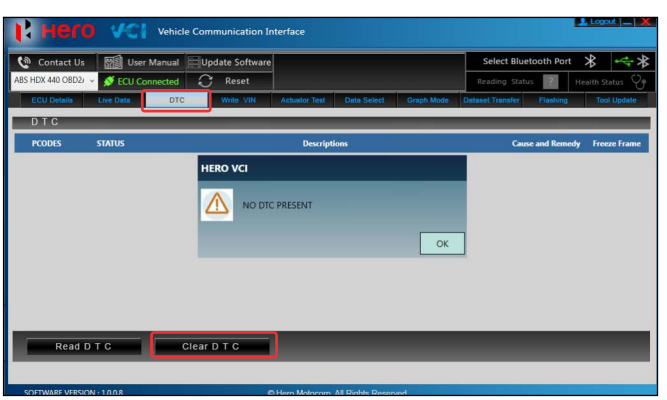
Engine should not to be cranked during the process.

- Open HERO VCI application and login with username and password credentials.

- Select ECU type by clicking on "SELECT ECU TYPE" from the drop down list.
- Select "ABS ECU" from the drop down list.



- Click on to "DTC" tab to view the diagnostics trouble codes stored in the ECU memory.
- Codes will reflect as an "ACTIVE" for current codes and "HISTORY" for rectified codes (which were not deleted after repairing the vehicle).
- To clear the DTC codes, click on "Clear DTC" button to clear the existing error codes.



DIAGNOSTIC TROUBLE DESCRIPTION CHART

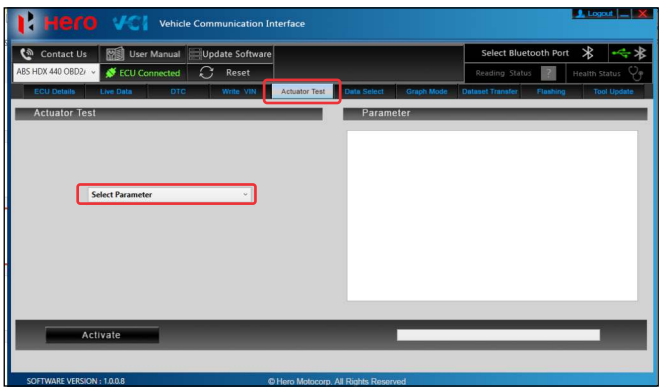
To identify the ABS malfunction, connect the VCI tool & check the malfunction as per the malfunction description and repair or replace the defective component. After replacing a defective component, again check for any malfunction.

Diagnostic code	Description	Problem	Action to be taken
C1501500	Return flow pump failure	Defective pump circuit.	Perform ignition cycle. If fault still present. Replace HECU (page 15-12).
C1501700	Return flow pump supply error	Undervoltage at UBMR due to. Defective fuse. Inline resistor in UBMR supply line.	Examine the fuse of the voltage supply (UB_MR) for correct function and exchange if defective but only when voltage supply ignition/Kl.15 (12V) is switched off (no voltage supply at the ECU. Remove line interruption. Remove voltage drop at contact points. Improve ground connection. Charge battery. If fault still exists, exchange battery. If fault still exists, replace the HECU (page 15-12).
C1501900	Valve relay failure/Over heated due to diag request	Power supply failure at UBVR pin/Valve relay failure/Over heated	Perform ignition cycle. If fault still present. Replace HECU (page 15-12).
C1502100	ECU internal error	Internal failure detected in ECU, μC and peripheral integrated circuits in the control unit are not working normally. Fluctuating power supply leading to ECU reset.	Perform ignition cycle. If fault still present. Replace HECU (page 15-12).
C1502400	WSS generic failure	Incorrect tooth count. Interference at one or more wheels. Permanent bad signal.	Replace toner wheel with using correct torque for the fasteners. Secure WSS with correct torque for the fasteners. After correction, ride the vehicle @ >60kph for 30 seconds to confirm fault doesn't exist.
C1503100	Rear WSS hardware failure	Open circuit in the WSS line. Short circuit to Uz in the WSS line. Short circuit to ground in the WSS line. Short circuit between WSS lines. Loose contact in WSS connector.	Replace WSS. Check for loose connection in WSS connector. Check for short circuit in wiring harness. Replace wiring harness.
C1503200	Rear WSS signal plausibility	Tooth wheel missing, WSS not installed, too great air gap. Worm or missing teeth. Noise. Interference between lines. Loose contact in WSS connector. WSS not securely fastened. WSS dislodging from bracket.	Replace toner wheel with using correct torque for the fasteners. Secure WSS with correct torque for the fasteners. Check for loose connection in WSS connector. After correction, ride the vehicle @ >60kph for 30 seconds to confirm fault doesn't exist.

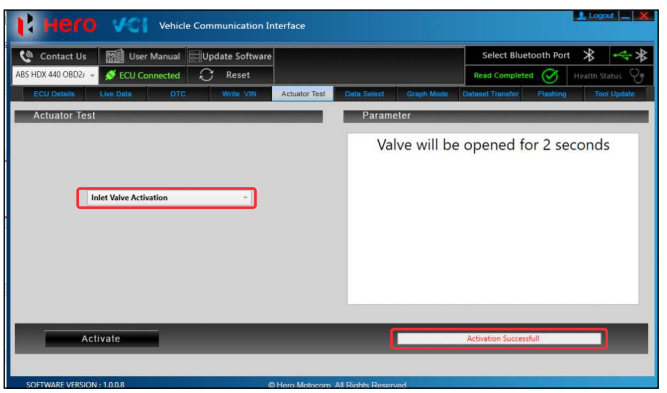
Diagnostic code	Description	Problem	Action to be taken
C1503300	Front WSS hardware failure	Open circuit in the WSS line. Short circuit to Uz in the WSS line. Short circuit to ground in the WSS line. Short circuit between WSS lines. Loose contact in WSS connector.	Replace WSS. Check for loose connection in WSS connector. Check for short circuit in wiring harness. Replace wiring harness.
C1503400	Front WSS signal is plausibility	Tooth wheel missing, WSS not installed, too great air gap. Worm or missing teeth. Noise. Interference between lines. Loose contact in WSS connector. WSS not securely fastened. WSS dislodging from bracket.	Replace toner wheel with using correct torque for the fasteners. Secure WSS with correct torque for the fasteners. Check for loose connection in WSS connector. After correction, ride the vehicle @ >60kph for 30 seconds to confirm fault doesn't exist.
C1503600	Front WSS signal is suspicious		
C1503700	Rear WSS signal is suspicious		
C1504800	Valve failure detected in rear outlet valve	ECU internal valve failure	Perform ignition cycle. If fault still present. Replace the HECU (page 15-12).
C1504900	Valve failure detected in front outlet valve		
C1505200	Valve failure detected in rear inlet valve		
C1505400	Valve failure detected in front inlet valve		
C1505800	Under voltage error	Faulty regulator/rectifier unit/weak battery.	Charge battery, Check and replace regulator/rectifier unit if faulty (page 17-11).
C1505900	Over voltage error	Faulty regulator/rectifier unit.	Check and replace regulator/rectifier unit if faulty (page 17-11).
C1E92100	CAN controller generic failure	CAN controller malfunction	Perform ignition cycle. If fault still present. Replace the HECU (page 15-12).
C1E92200	CAN Bus off failure	CAN lines short to ground, supply or mutually short or no ECU on the network to acknowledge the frame transmitted	Perform ignition cycle. If fault still present. Replace the HECU (page 15-12).
C1E93000	Under voltage error	Faulty regulator/rectifier unit/weak battery	Charge battery, Check and replace regulator/rectifier unit if faulty (page 17-11).
C1E93100	Over voltage error	Faulty regulator/rectifier unit	Check and replace regulator/rectifier unit if faulty (page 17-11).

ACTUATOR TESTING

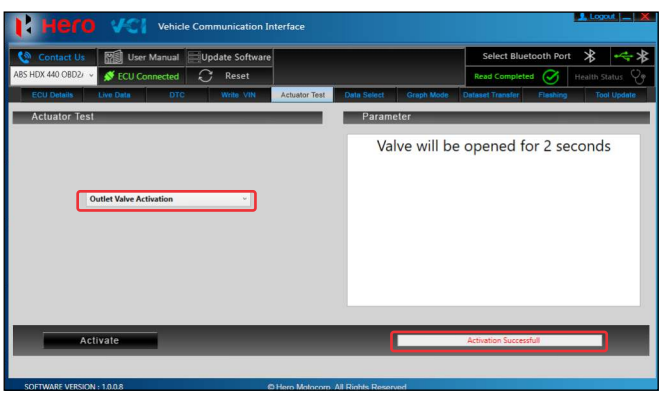
- Click on to “SELECT PARAMETER”, a dropdown list will appear for actuator selection.
- Select the desired actuator to perform the test.



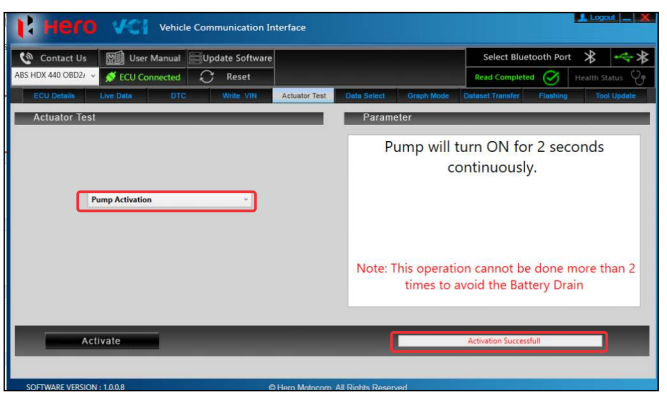
- For inlet valve testing.
- After selecting the "Inlet Valve Activation", click on to “ACTIVATE” to start the testing.
- In the status bar, if the status displayed as “ACTIVATION SUCCESSFUL” this means that inlet valve is working fine.
- If the status displayed as “NOT SUCCESSFUL” then replace the HECU (page 15-12).



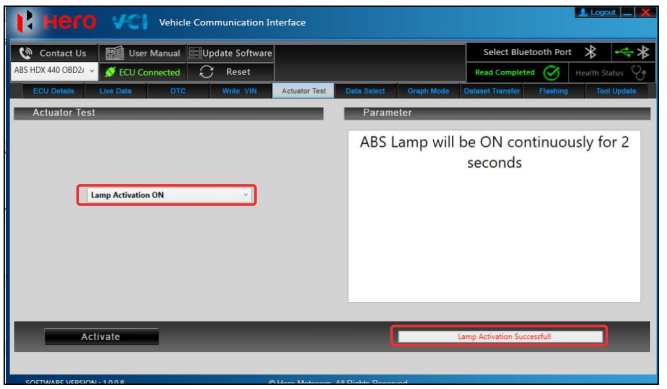
- For outlet valve testing.
- After selecting the "Outlet Valve Activation", click on to “ACTIVATE” to start the testing.
- In the status bar, if the status displayed as “ACTIVATION SUCCESSFUL” this means that outlet valve is working fine.
- If the status displayed as “NOT SUCCESSFUL” then replace the HECU (page 15-12).



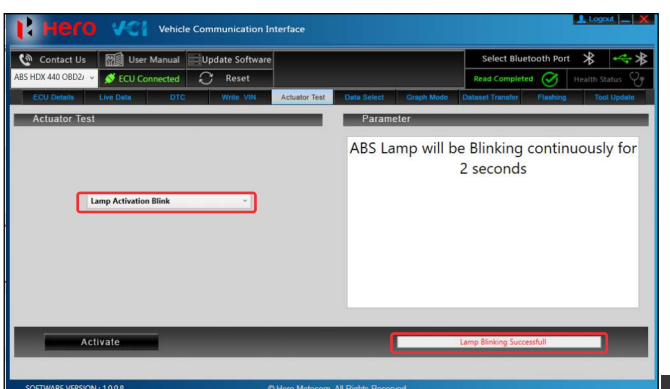
- For pump testing.
- After selecting the "Pump Activation", click on to “ACTIVATE” to start the testing.
- In the status bar, if the status displayed as “ACTIVATION SUCCESSFUL” this means that pump is working fine.
- If the status displayed as “NOT SUCCESSFUL” then replace the HECU (page 15-12).



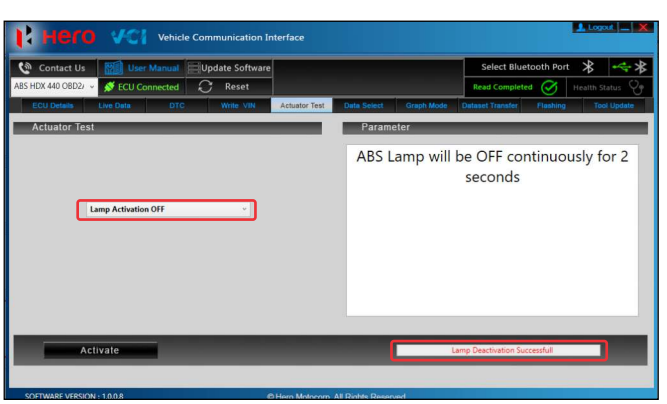
- For lamp activation “ON” testing.
- After selecting the "Lamp Activation ON", click on to “ACTIVATE” to start the testing.
- In the status bar, if the status displayed as “LAMP ACTIVATION SUCCESSFUL” this means that lamp is working fine.
- If the status displayed as “NOT SUCCESSFUL” then replace the HECU (page 15-12).



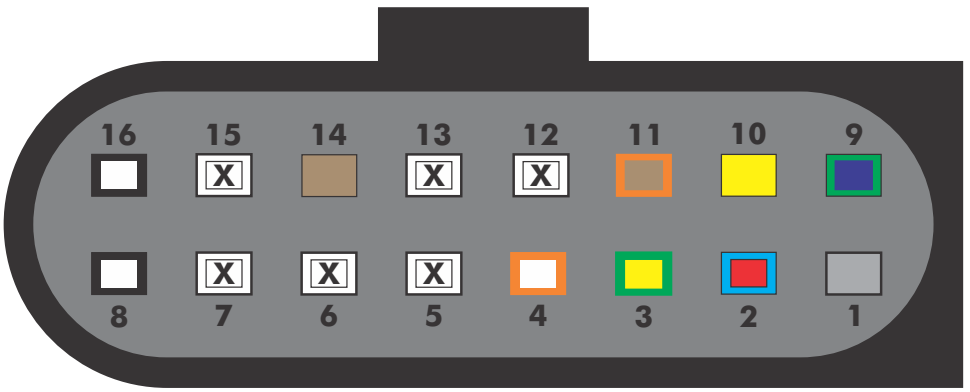
- For lamp activation blink testing.
- After selecting the "Lamp Activation Blink", click on to “ACTIVATE” to start the testing.
- In the status bar, if the status displayed as “LAMP BLINKING SUCCESSFUL” this means that lamp is working fine.
- If the status displayed as “NOT SUCCESSFUL” then replace the HECU (page 15-12).



- For lamp activation “OFF” testing.
- After selecting the "Lamp Activation OFF", click on to “ACTIVATE” to start the testing.
- In the status bar, if the status displayed as “LAMP DEACTIVATION SUCCESSFUL” this means that lamp is working fine.
- If the status displayed as “NOT SUCCESSFUL” then replace the HECU (page 15-12).



HYDRAULIC ELECTRONIC CONTROL UNIT (HECU)



HECU PIN		
PIN NO.	**COLOUR**	**DESCRIPTION**
1	GR	Rear wheel speed sensor ground
2	SB/R	Front wheel speed sensor input
3	G/Y	CANH
4	O/W	CANL
5	-	None
6	-	None
7	-	None
8	B/W	ABS Sub Fuse 10A
9	G/L	ABS Ground
10	Y	Rear wheel speed sensor input
11	O/BR	Front wheel speed sensor ground
12	-	None
13	-	None
14	BR	Ignition switch input
15	-	None
16	B/W	ABS Fuse 15A

COLOUR CODE	
Black	B
Violet	V
Yellow	Y
Blue	L
Green	G
Red	R
White	W
Brown	BR
Orange	O
Sky Blue	SB
Light Green	LG
Pink	P
Gray	GR

COMBINATION:
Base Colour / Marking Colour
e.g. Brown / White
BR / W

HYDRAULIC ELECTRONIC CONTROL UNIT

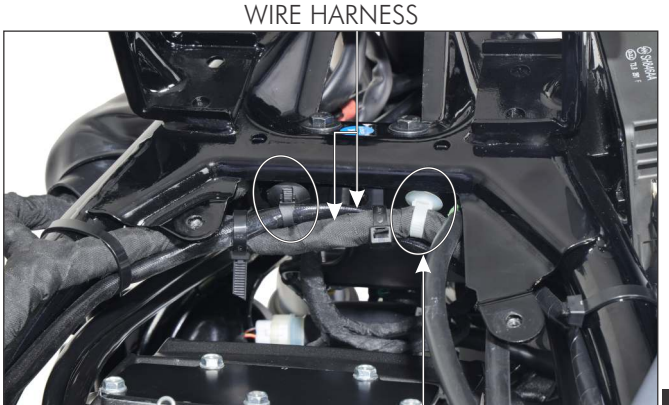
REMOVAL

Turn the ignition switch to "OFF" position.
Drain the brake fluid (page 16-4).
Remove the fuel tank (page 2-12).
Remove the electrical part mount bracket (page 7-4).

IGNITION SWITCH

Remove the main wiring harness and ACG harness from the frame by dismounting the tree clips (Nos. 2) as shown.

WIRE HARNESS


TREE CLIPS

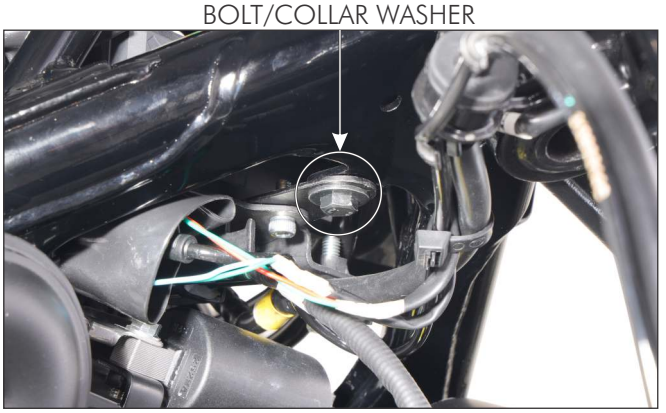
Disconnect the HECU 16P connector from the HECU.

HECU


HECU 16P CONNECTOR

Remove the HECU bolt/collar washer (No.: 1) from the bottom side as shown.

BOLT/COLLAR WASHER



Disconnect the brake hose from the tie-wrap mounted on the wire harness boot.

Remove the banjo bolts and disconnect the brake hoses from HECU unit.

NOTE

- Seal the HECU brake hose ports with suitable caps/ plugs/threaded connectors
- Do not bend and kinked the brake hoses.

TIE-WRAP BANJO BOLTS

BOOT BRAKE HOSES

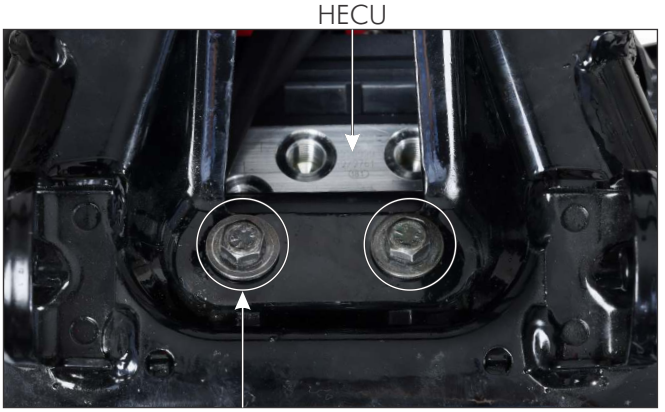
Remove the HECU bolts/collar washers (Nos. 2) from the upper side as shown.

Remove the HECU unit from the vehicle.

NOTE

Prevent dirt and debris from entering into the HECU unit after it has been removed.

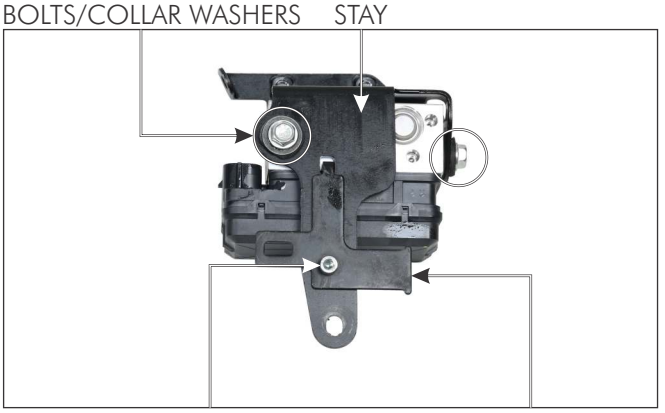
HECU



BOLTS/COLLAR WASHERS

Remove the oxygen sensor mounting bracket by removing the allen key bolt (No.: 1).

Remove the stay from the HECU by removing the allen key bolts/collar washers (Nos. 2).



INSTALLATION

Installation is in the reverse order of removal.

NOTE

- Ensure all the brake hoses are routed properly and are not bent or kinked.
- Always update the VIN number after replacing the HECU on a mandatory basis (page 15-19) .

TORQUE

HECU BANJO BOLT: 2.1-2.4 kgf-m

HYDRAULIC ELECTRONIC CONTROL UNIT MOUNTING BOLT : 0.8-1.0 kgf-m

Fill and bleed the hydraulic system (page 16-6).

15

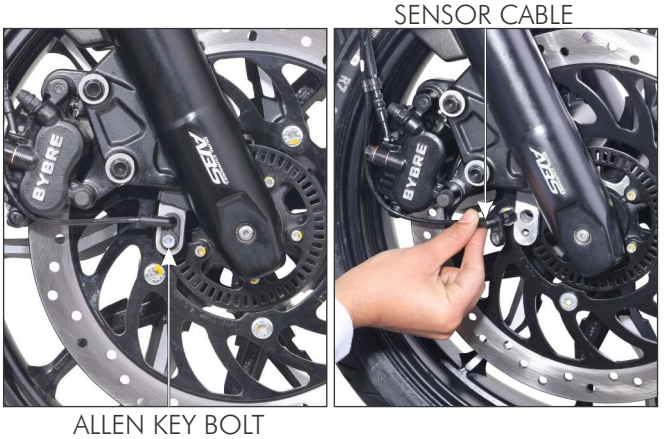
WHEEL SPEED SENSOR (WSS) CABLE

FRONT WSS

REMOVAL

Remove the bolt from front fork bracket.

Remove the sensor cable along with wheel speed sensor (WSS) from front fork bracket.



Dislodge sensor cable from the guides.

GUIDES

Remove the left side tank cover (page 2-8).

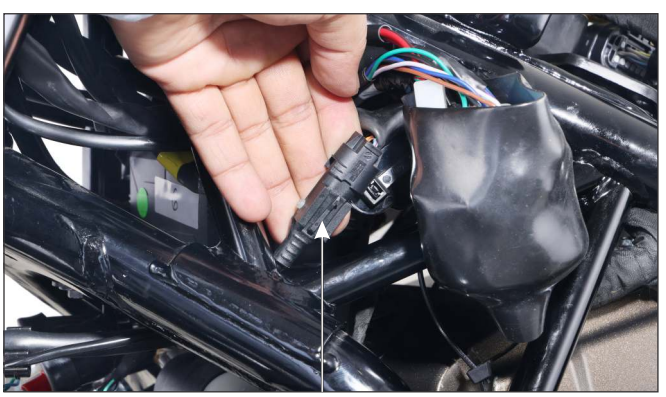
Disconnect the connector from main wire harness & remove the WSS cable.

INSTALLATION

Installation is in the reverse order of removal.

TORQUE

WHEEL SPEED SENSOR (WSS) MOUNTING BOLT: 0.8-1.0 kgf-m



CONNECTOR

REAR WSS

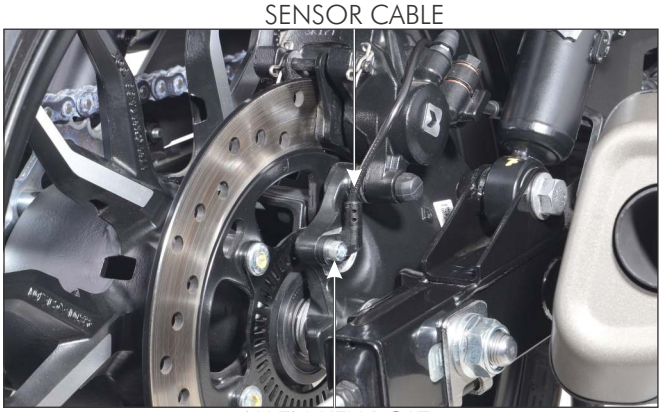
REMOVAL

Remove the right side cover (page 2-6).

Remove the sensor bolt from caliper holder.

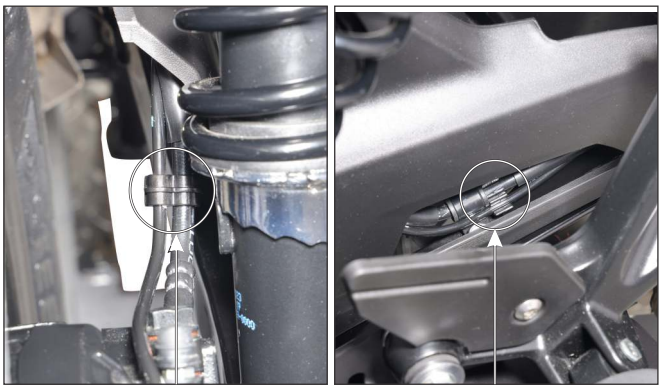
Remove the sensor cable along with wheel speed sensor (WSS) from caliper holder.

SENSOR CABLE



ALLEN KEY BOLT

Dislodge sensor cable from the guides on the swingarm.



Dislodge sensor cable from the guide .

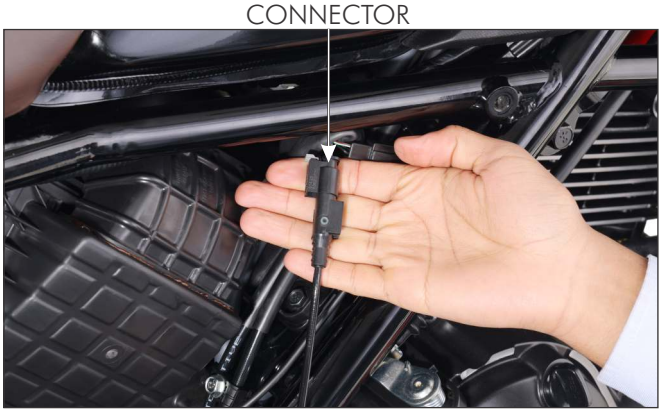
Disconnect the connector from main wire harness & remove the WSS cable.

INSTALLATION

Installation is in the reverse order of removal.

TORQUE

WHEEL SPEED SENSOR (WSS) MOUNTING BOLT: 0.8-1.0 kgf-m



FRONT WHEEL ENCODER

REMOVAL

Remove the front wheel (page 12-11).

Remove the allen key bolts (Nos.: 5) from wheel hub & remove the encoder.

INSTALLATION

Installation is in the reverse order of removal.

NOTE

- Use thread lock before installing allen key bolts.
- Inspect the encoder for bend or damage before its installation.

REAR WHEEL ENCODER

REMOVAL

Remove the rear wheel (page 13-3).

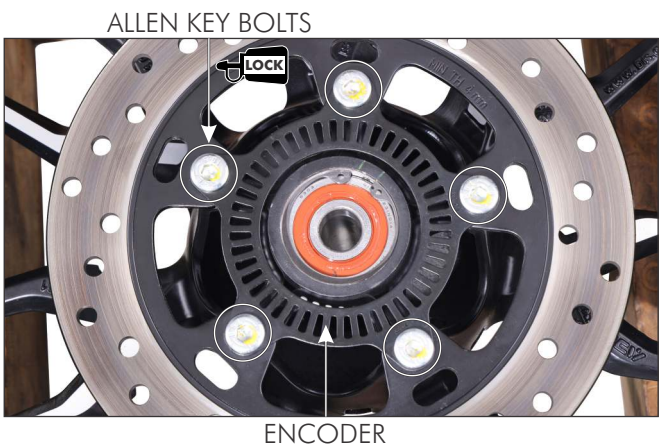
Remove the allen key bolts (Nos.: 5) from wheel hub & remove the encoder.

INSTALLATION

Installation is in the reverse order of removal.

NOTE

- Use thread lock before installing allen key bolts.
- Inspect the encoder for bend or damage before its installation.



HECU INSPECTION

NOTE

Ensure that the battery is in good condition **(Refer section-17)**. If not, then replace with a new battery and then inspect.

Read the DTC code in Hero VCI (page 15-4).

1. If DTC code appear in VCI tool, disconnect the HECU 16P connector.Check for loose or poor connection on the HECU 16P connector.
2. Connect the HECU connector. Turn the ignition switch to"ON" and recheck the DTC. If the DTC code still appears, then check the continuity of HECU wire harness:

CONNECTIONS

Gray (HECU)	**-**	**Gray (Rear wheel speed sensor)**
Sky blue/Red (HECU)	**-**	**Sky blue/Red (Front wheel speed sensor)**
Green/Yellow (HECU)	**-**	**Green/Yellow (Service connector)**
Orange/White (HECU)	**-**	**Orange/White (Service connector)**
Black/White (HECU)	**-**	**Black/White (ABS Sub Fuse 10A)**
Green/Blue (HECU)	**-**	**Green/Blue (ABS Earth)**
Yellow (HECU)	**-**	**Yellow (Rear wheel speed sensor)**
Orange/Brown (HECU)	**-**	**Orange/Brown (Front wheel speed sensor)**
Brown (HECU)	**-**	**Brown (Combination switch)**
Black/White (HECU)	**-**	**Black/White (ABS Sub Fuse 15A)**

STANDARD : CONTINUITY

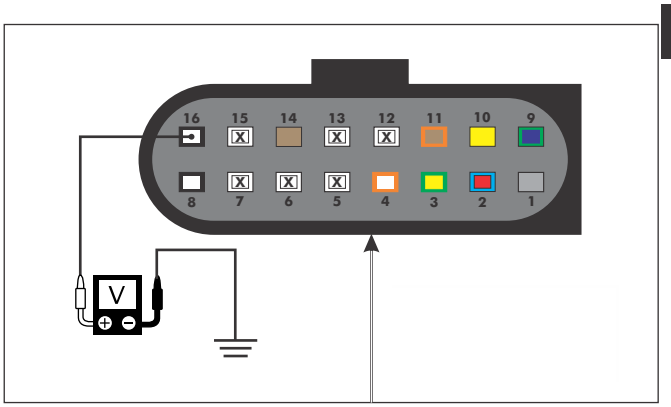
3. If no continuity is detected then replace the harness.
4. If continuity exist, then go to next step.
5. Disconnect the HECU 16P connector (page 15-12).
6. Measure the voltage at 16P HECU connector.

VOLTAGE

Connection: Black/White (+)- Ground (-)

Standard: 10-16 V

If voltage is out of range then replace the HECU.

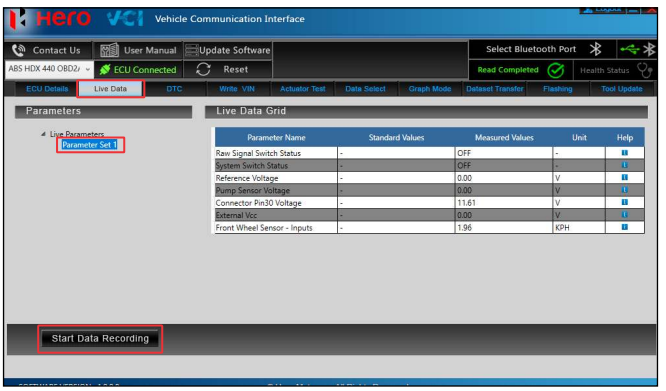


HECU 16P CONNECTOR

HECU DATA READING

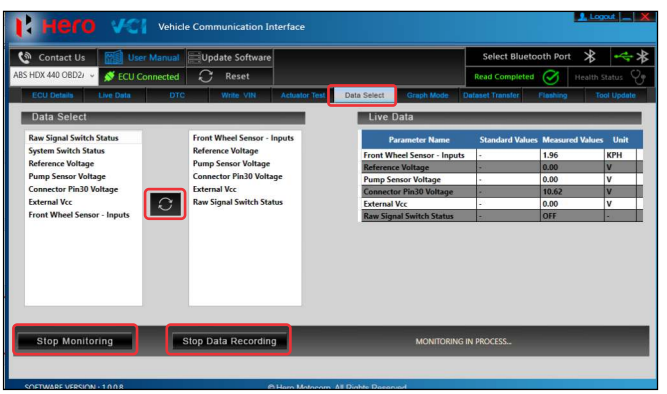
LIVE DATA

- Click on live data Parameter set 1.
- To record the live data click on to “START DATA RECORDING” a pop-up will appear on the screen.
- Select the desktop or other location to save the live data parameters.



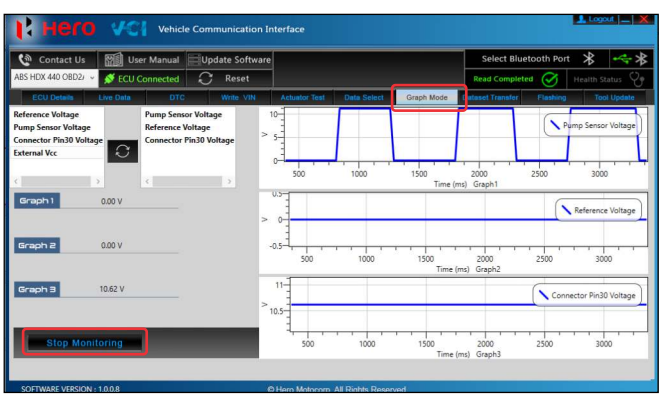
DATA SELECT

- Data select tab is used to monitor the selected parameters.
- To select the parameter, double click on the required parameter to swap into the monitor window.
- To remove the selected parameter double click on the parameter.
- To remove all selected parameter click on reset button.
- Click on to “START MONITORING” button to start the live data monitoring of selected parameters.
- To stop the monitoring click on to “STOP MONITORING” button once the monitoring is done.
- To record the data of selected parameters click on to “START DATA RECORDING” same as “LIVE DATA” recording.



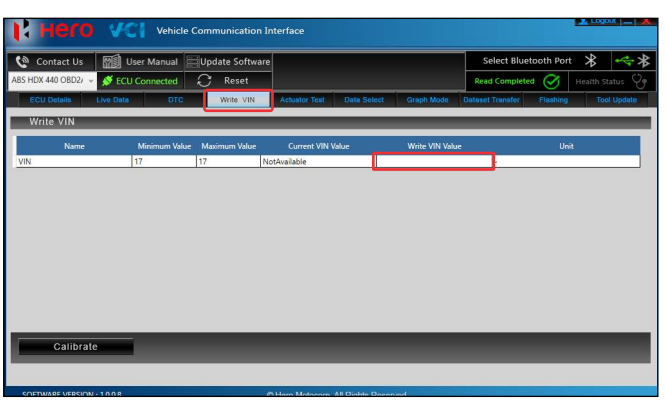
GRAPH MODE

- To select the parameter, double click on the required parameter to swap into the monitor window.
- To remove the selected parameter double click on the parameter.
- To remove all selected parameter click on reset button.
- Click on to “START MONITORING” to view the selected parameters in graph mode.
- To stop the graph click on to “STOP MONITORING”.
- Maximum three parameters can be view in graph mode.



VIN DATA WRITING

- Click on “WRITE VIN”.
- By clicking the tab below the “WRITE VIN VALUE”, write/edit the VIN Number.



16. HYDRAULIC BRAKE SYSTEM

SERVICE INFORMATION

GENERAL

⚠ WARNING

A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.

CAUTION

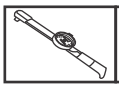
- Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an vacuum cleaner.

- Spilled brake fluid will severely damage the instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap: make sure the reservoir is horizontal first.
- Never allow contaminates when servicing the system. Do not mix different types of fluid as they may not be compatible.
- Always check brake operation before riding the motorcycle (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened or if the brake feel is spongy, the system must be bleed.
- Always use fresh DoT 4 brake fluid from a sealed container

SPECIFICATIONS

HYDRAULIC BRAKE SYSTEM

ITEM		STANDARD	SERVICE LIMIT
Specified brake fluid		DoT- 4	
Brake Disc thickness	Front Brake	5 mm	4.5 mm
	Rear Brake	4.5 mm	4.0 mm
Brake Disc runout	Front Brake	0.15 mm	0.25 mm
	Rear Brake	0.1 mm	0.25 mm
Master cylinder I.D	Front Brake	13 mm	-
	Rear Brake	12 mm	-
Master cylinder piston O.D	Front Brake	13 mm	-
	Rear Brake	12 mm	-
Brake caliper cylinder I.D	Front Brake	28x2 mm	-
	Rear Brake	32 mm	-
Brake caliper piston O.D	Front Brake	28x2 mm	-
	Rear Brake	32	-

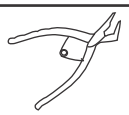
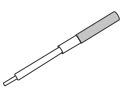


TORQUE VALUES

FRONT CALIPER BLEED VALVE	: 1.2-1.6 kgf-m
REAR CALIPER BLEED VALVE	: 0.7~1.0 kgf-m
BRAKE HOSE BANJO BOLT	: 2.4~2.7 kgf-m
FRONT CALIPER MOUNTING BOLT	: 2.3~2.5 kgf-m
BRAKE DISC BOLT	: 4.0-4.5 kgf-m
MASTER CYLINDER HOLDER BOLT	: 0.8-1.0 kgf-m
BRAKE PEDAL ADJUST LOCK NUT	: 0.8~1.0 kgf-m

For other nuts, bolts, fasteners etc. refer to standard torque values (SECTION-1).

SPECIAL TOOLS

	PIERER'S PLIER PART NO: 070 HH KFN 003
	BRAKE PAD HANGER PIN REMOVER PART NO: 070 HH 198 036

TROUBLESHOOTING

Brake lever soft or spongy.

- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Contaminated master cylinder
- Bent brake lever/pedal

Brake lever/pedal hard

- Sticking/worn caliper piston
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever/pedal
- Sticking rear brake pedal sliding surface

Brake drag

- Contaminated brake pad/disc
- Misaligned wheel
- Badly worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage .
- Sticking/worn caliper piston
- Sticking master cylinder piston
- Sticking rear brake pedal sliding surface
- For rear brake drag, chain slackness not adjusted as per specification

Poor brake performance

- Check brake discs to inspect wear
- Low brake fluid level

Brake lever hard or slow return

- Worn or broken return spring
- Check for brake hose routing (SECTION-1)
- Caliper piston rusting
- Torque more than spec on lever pivot bolt

BRAKE FLUID REPLACEMENT/ BLEEDING

NOTE

A contaminated brake disc or pad increases stopping distance. Discard contaminated pads and clean contaminated disc with a high quality brake degreasing agent.

CAUTION

- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

BRAKE FLUID DRAINING

FRONT BRAKE

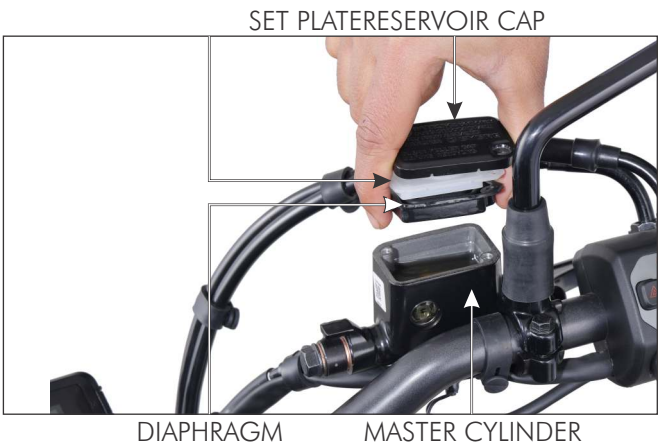
Turn the handlebar until the reservoir is parallel to the ground, before removing the reservoir cap.

Remove the screws (Nos.: 2) from reservoir cap.

Remove the reservoir cap, set plate and diaphragm.

NOTE

During the brake lever actuation, cover the reservoir to avoid splashing of fluid outside the reservoir.



Remove the bleed valve cap.

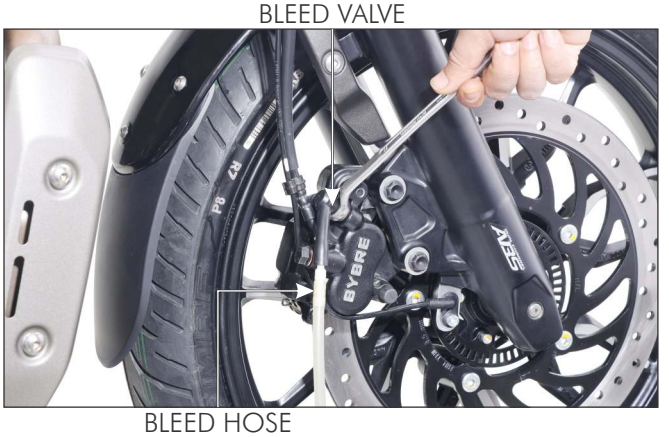
Connect a transparent bleed hose to the bleed valve.

Loosen the bleed valve and pump the brake lever until no more fluid flows out of the bleed valve.

Tighten the bleed valve to the specified torque.

TORQUE

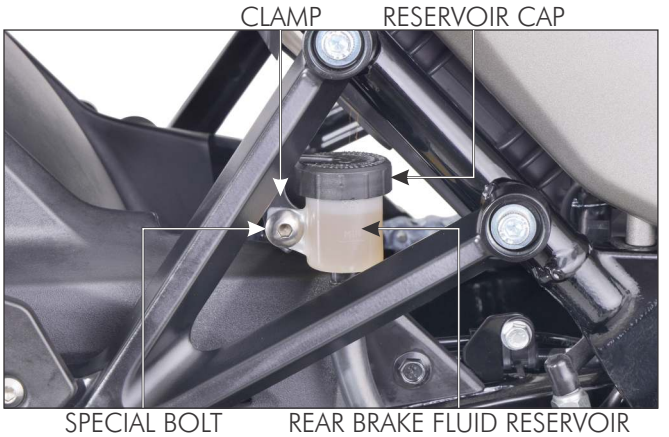
FRONT CALIPER BLEED VALVE: 1.2-1.6 kgf-m



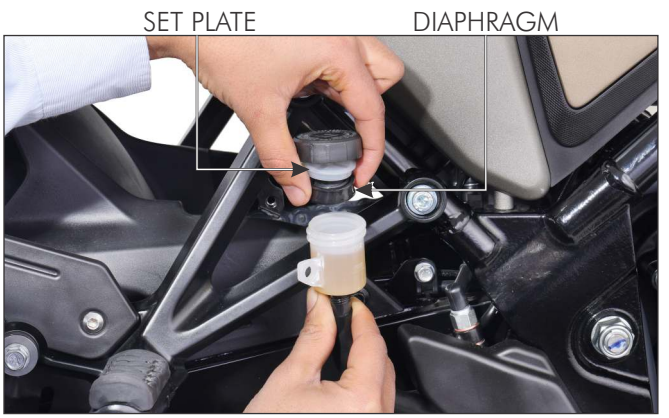
REAR BRAKE

Dismount the rear brake fluid reservoir from its clamp by removing the special bolt (No. 1).

Remove the rear brake fluid reservoir cap.



Remove the set plate, reservoir cap and diaphragm.



Remove the bleed valve cap.

Connect a bleed hose to the caliper bleed valve.

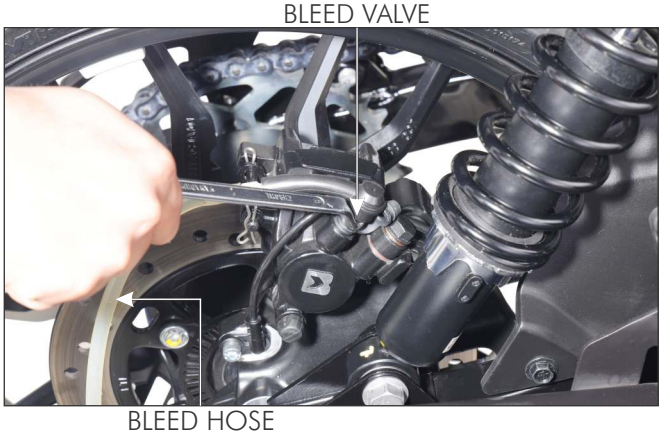
Loosen the bleed valve and pump the brake pedal.

Pump the brake pedal until no more fluid flows out of the bleeder valve.

Tighten the bleeder valve to the specified torque.

TORQUE

REAR CALIPER BLEED VALVE: 0.7-1.0 kgf-m



BRAKE FLUID FILLING/BLEEDING

Fill the reservoir with DoT-4 brake fluid from a sealed container.

CAUTION

Do not mix different types of fluid as they may not be compatible.

Connect a commercially available brake bleeder to the bleed valve.

Pump the brake bleeder and loosen the bleed valve. Add brake fluid when the fluid level in the reservoir is low.

NOTE

- Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

Repeat the above procedures until air bubbles do not appear in the plastic hose.

Close the bleed valve.

If a brake bleeder is not available, perform the following procedures.

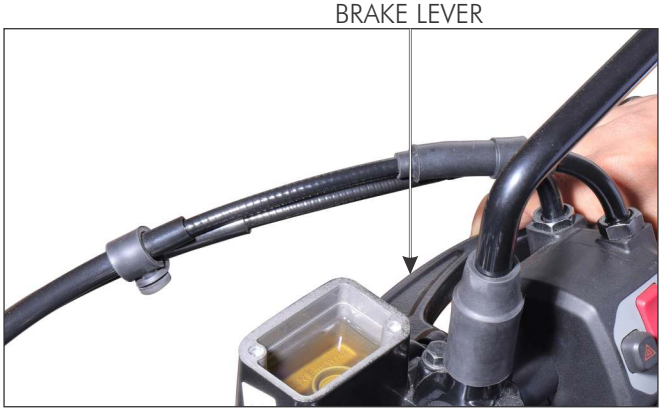
Pump up the system pressure with the brake lever or pedal until there are no air bubbles in the fluid flowing out of the reservoir small hole and lever resistance is felt.

Connect a hose to the bleed valve and bleed the system as follows:

1. Squeeze the brake lever or push the brake pedal, open the bleed valve ½ turn and then close it.

BRAKE BLEEDER

BRAKE LEVER



NOTE

Do not release the brake lever until the bleed valve has been closed.

2. Release the brake lever or pedal slowly and wait several seconds after it reaches the end of its travel.

Repeat steps 1 and 2 until air bubbles cease to appear in the fluid coming out of the bleed valve.

Tighten the bleed valve to the specified torque.

TORQUE

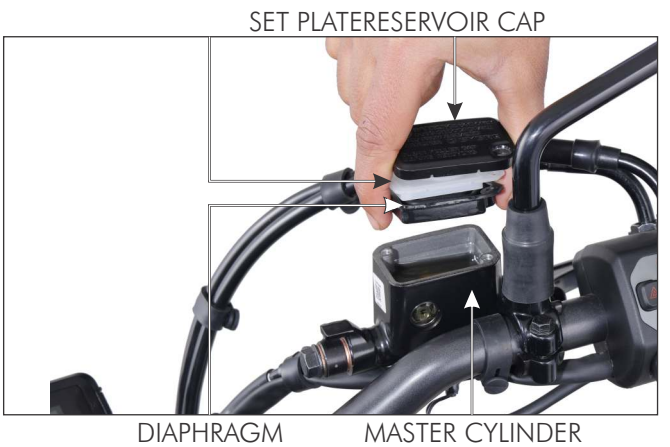
FRONT CALIPER BLEED VALVE: 1.2-1.6 kgf-m

BLEED VALVE

BLEED HOSE

Fill the reservoir to the upper level with DoT-4 brake fluid from a sealed container.

Install the diaphragm, set plate and reservoir cap.



Tighten the cap screws (Nos.: 2) with impact driver.

REVERSE BLEEDING PROCEDURE

Remove the brake pads (page 16-10).

Remove the caliper piston (page 16-29).

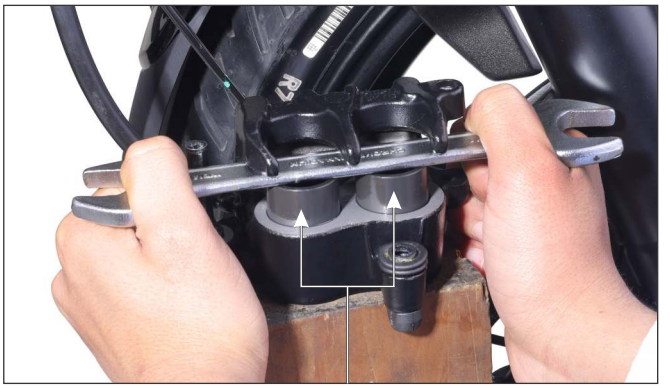
Pour brake fluid till the top seal of caliper.

NOTE

Remove piston using pressurized air protecting the piston using a soft base.

Install the caliper piston (page 16-30) and press both the pistons simultaneously and force the fluid upwards to master cylinder.

Install the brake pads (page 16-12) and install the brake caliper assembly (page 16-30).

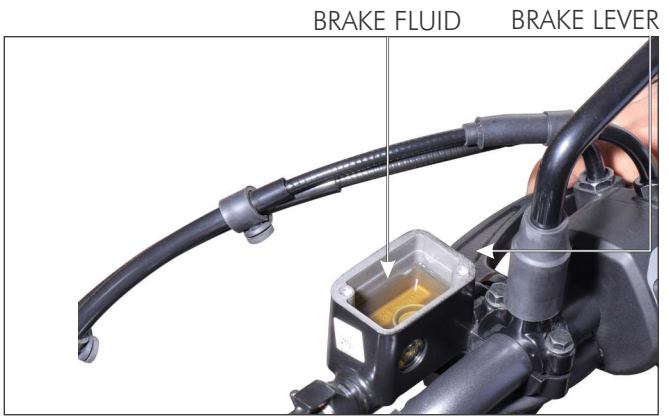


Remove the screws (Nos.: 2) from reservoir cap.

Remove the reservoir cap, set plate and diaphragm.

Press and release the brake lever until the air bubbles stops coming in master cylinder.

Top up the brake fluid from a sealed container if brake fluid level is low. Ensure that the fluid does not fall below 'MIN' mark on the master cylinder.



Install the diaphragm on the fluid filled master cylinder. Install the set plate and reservoir cap.

NOTE

Ensure that no dust enters the caliper assembly.

Tighten the screws securely.
Check the brake performance by pressing the brake lever.
Follow the same procedure for the rear brake bleeding.

SCREWS

BRAKE PAD/DISC

⚠ WARNING

A contaminated brake disc or pad increases stopping distance. Discard contaminated pads and clean contaminated disc with a high quality brake degreasing agent.

FRONT BRAKE PAD REPLACEMENT

NOTE

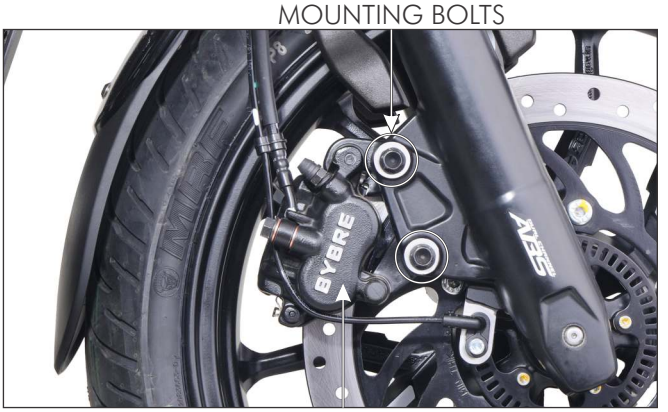
Always replace the brake pads in pairs to assure even disc pressure.

Remove the caliper mounting bolts (Nos.: 2).
Remove the caliper assembly.
Push the caliper piston all the way in by pushing the caliper body inward to allow installation of new brake pads.

NOTE

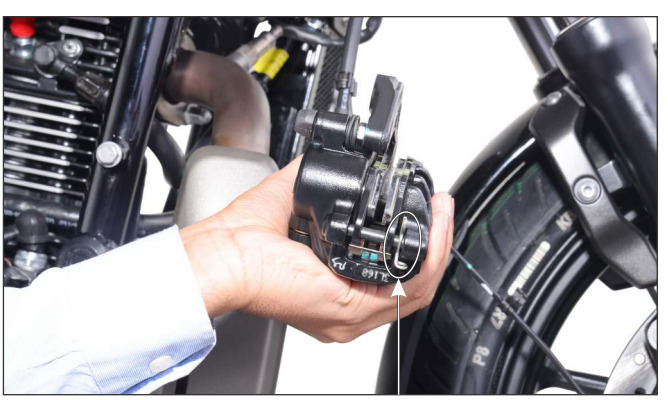
Check the brake fluid level in the master cylinder reservoir as this operation causes the brake fluid level to rise.

MOUNTING BOLTS



CALIPER

Remove the pin lock.



PIN LOCK

Remove the pad pin by using special tool.

NOTE

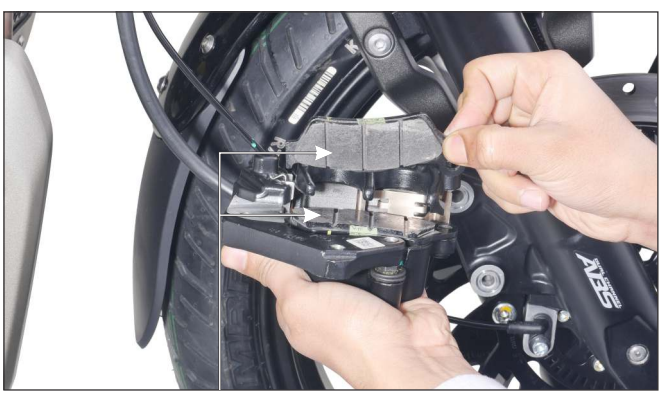
While removing the pad pin, hold the caliper assembly carefully.

TOOL

BRAKE PAD HANGER PIN REMOVER
PART NO: 070 HH 198 036

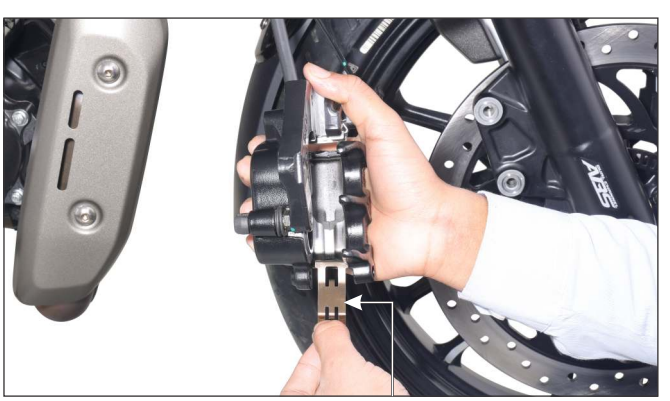
BRAKE PAD PIN REMOVER

Remove the brake pads.

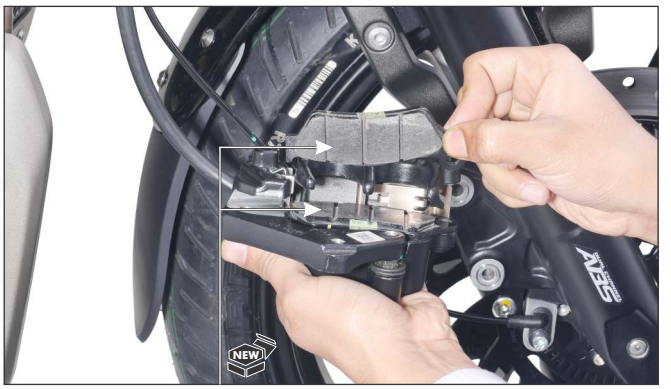

BRAKE PADS

Clean the inside of the caliper especially around the caliper piston.

Make sure that the pad spring is installed in position.


PAD SPRING

Install new pads so that their ends rest on the pad spring.



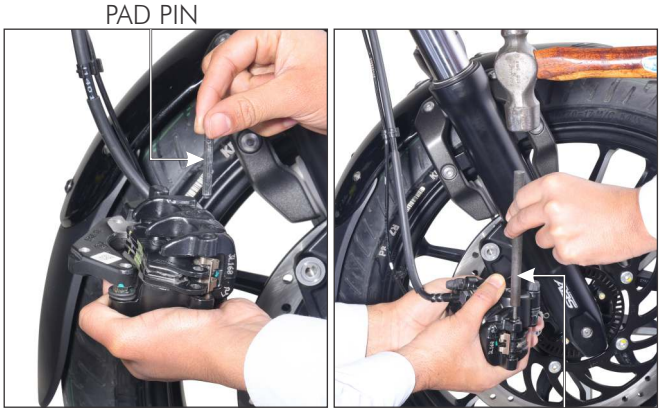
BRAKE PADS

Install the brake pad pin by using special tool.

TOOL

BRAKE PAD HANGER PIN REMOVER
PART NO: 070 HH 198 036

PAD PIN



BRAKE PAD PIN REMOVER

Install the pin lock.

PIN LOCK

Install the front brake caliper to the fork leg so that the disc is positioned between the pads.

NOTE

Be careful not to damage the brake pads.

Apply locking agent and install and tighten the front caliper mounting bolts (Nos.: 2) to the specified torque.

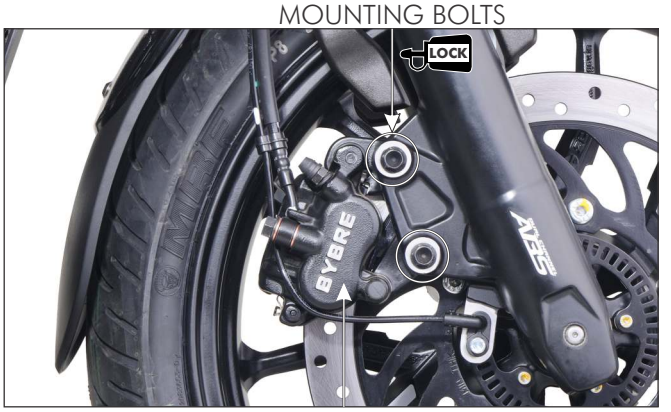
TORQUE

FRONT CALIPER MOUNTING BOLT: 2.3-2.5 kgf-m

CAUTION

After replacement, operate the brake lever to seat the caliper pistons against the pads.

MOUNTING BOLTS



CALIPER

REAR BRAKE PAD REPLACEMENT

Push the caliper piston all the way in by pushing the caliper body inward to allow installation of new brake pads.

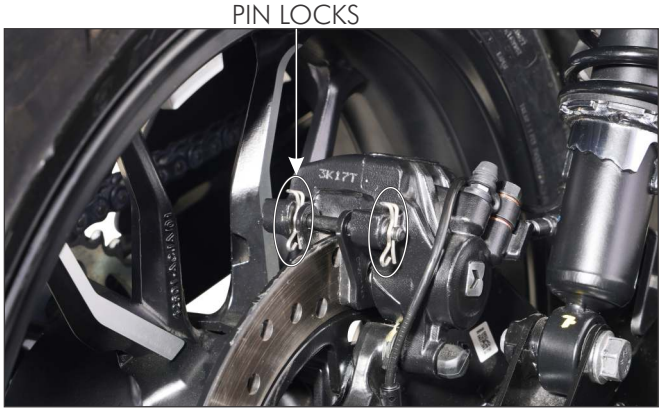
NOTE

Check the brake fluid level in the master cylinder reservoir as this operation causes the brake fluid level to rise.

16

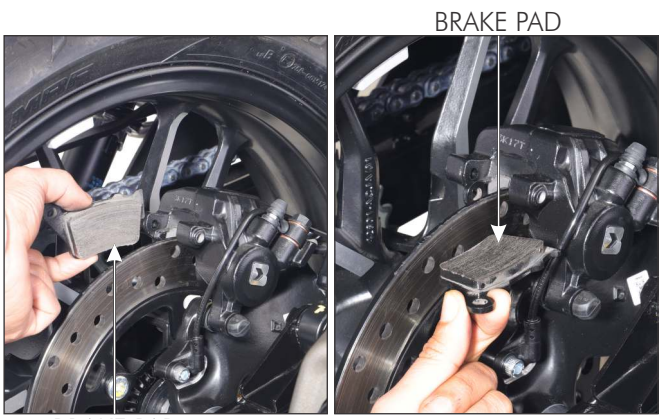
Remove the pin locks.

PIN LOCKS



Remove the pad pin.

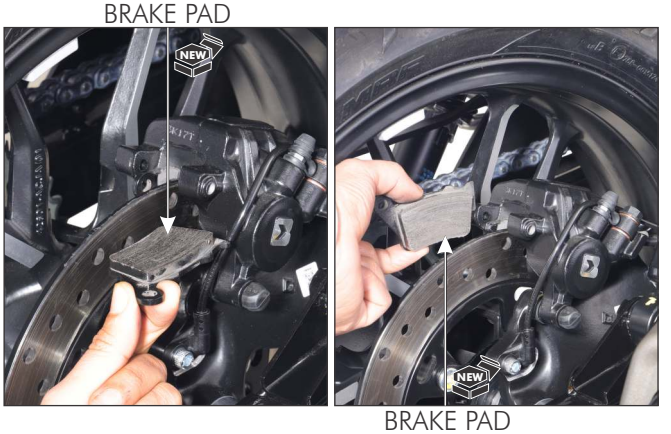
Remove the brake pads.



Install new brake pads securely.

NOTE

Always replace the brake pads in pairs to assure even disc pressure.

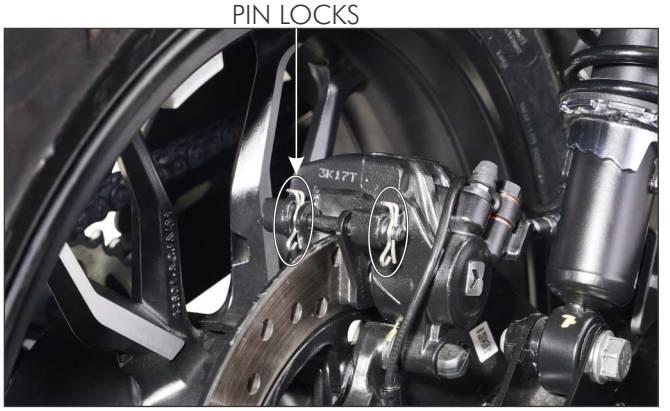


Install the pad pin by pushing the pads against the pad spring to align the pad pin hole in the pads in the caliper.

PAD PIN

Install the pin locks.

PIN LOCKS



BRAKE DISC

INSPECTION

Visually inspect the brake discs for damage or cracks.

Measure the brake disc thickness with a micrometer.

SERVICE LIMITS

FRONT: 4.5 mm

REAR: 4.0 mm

NOTE

The service unit is stamped on the brake disc.

Replace the brake disc if the smallest measurement is less than the service limit.

Measure the brake disc runout with a dial indicator.

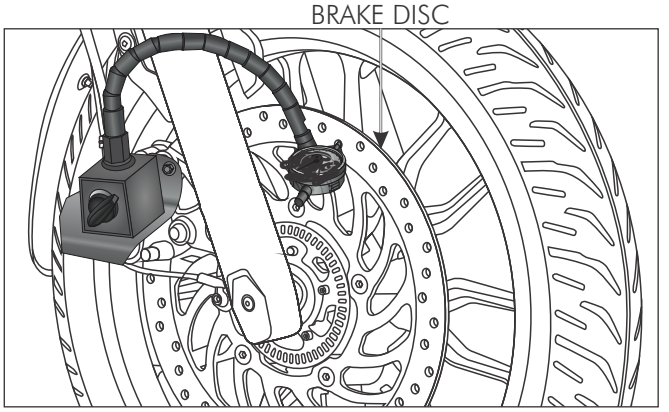
SERVICE LIMITS

FRONT: 0.25 mm

REAR: 0.25 mm

Check the wheel bearings for excessive play, if the warpage exceeds the service limit.

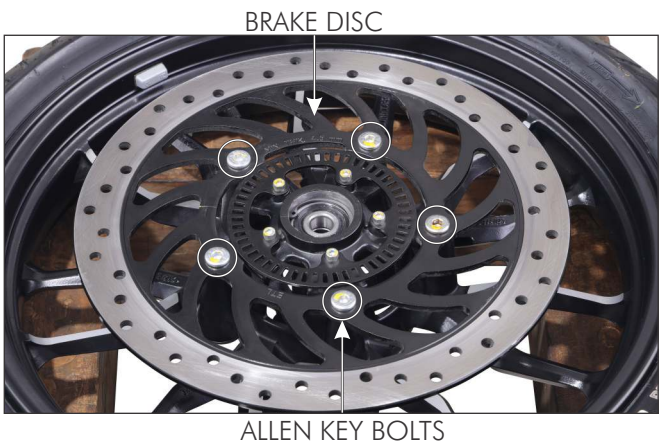
Replace the brake disc if the wheel bearings are normal.



BRAKE DISC REPLACEMENT

Remove the front wheel (page 12-11) or rear wheel (page 13-3).

Remove the brake disc allen key bolts (Nos.: 5).



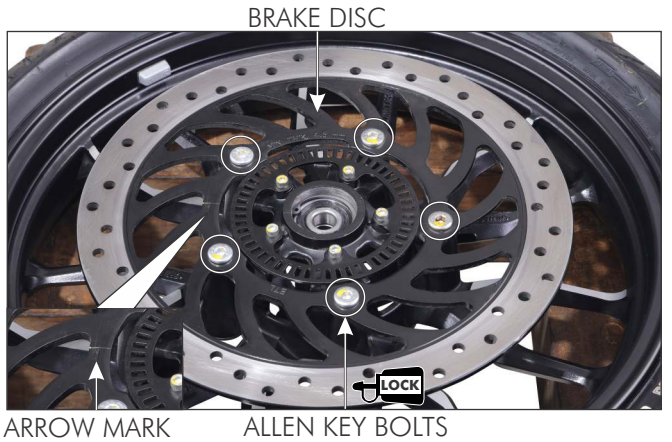
Install the brake disc with the arrow mark facing out in the direction of rotation of the wheel.

Apply locking agent and install new disc allen key bolts and tighten them in a criss-cross pattern into or three steps to the specified torque.

TORQUE

BRAKE DISC BOLT: 4.0-4.5 kgf-m

Installation is in the reverse order of removal.



FRONT MASTER CYLINDER

REMOVAL

CAUTION

- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.
- When removing the brake hose banjo bolt, cover the end of the hose. to prevent contamination.

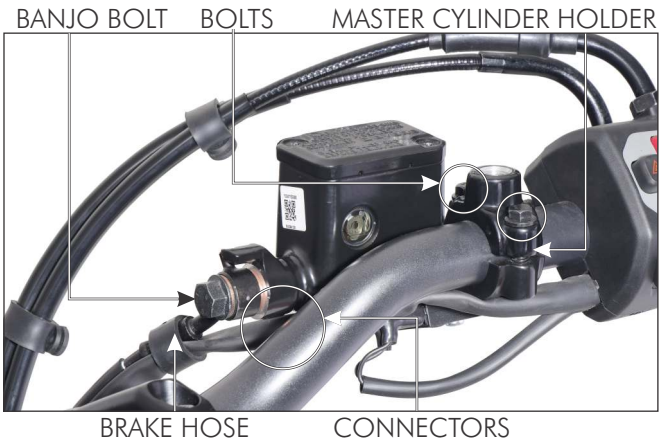
Disconnect the front stop lamp switch connectors.

Remove the right side rear view mirror (page 2-3).

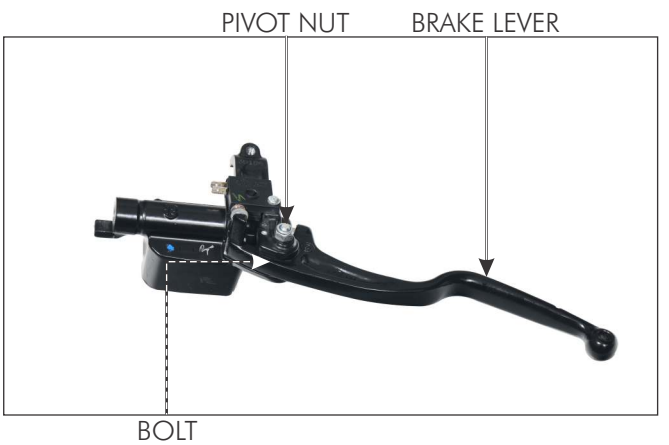
Drain the brake fluid from the hydraulic system (page 16-4).

Disconnect the brake hose by removing the brake hose banjo bolt and sealing washers.

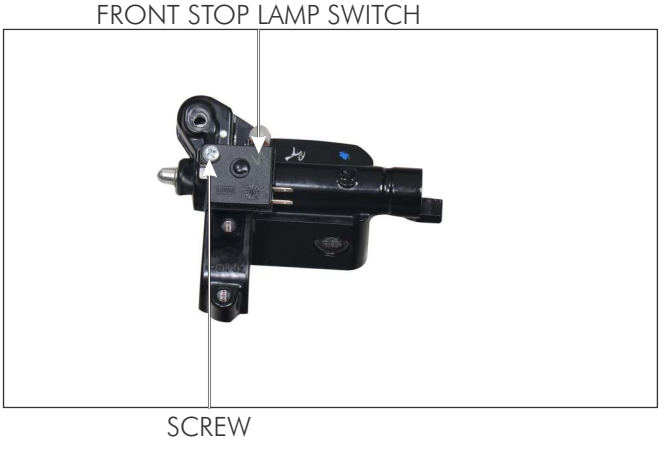
Remove the master cylinder holder bolts, holder and the master cylinder from the handlebar.



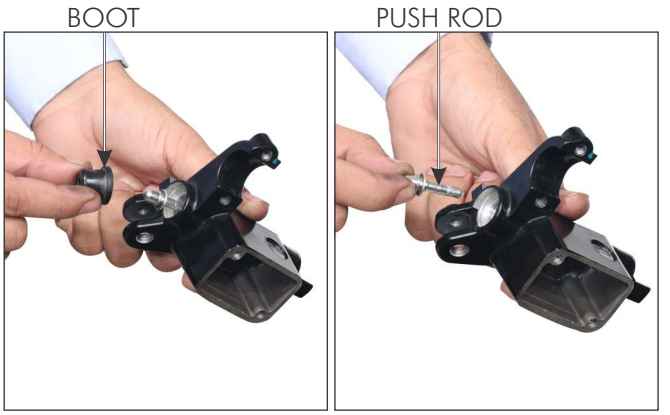
Remove the pivot nut, bolt and the brake lever assembly.



Remove the screw and stop lamp switch.



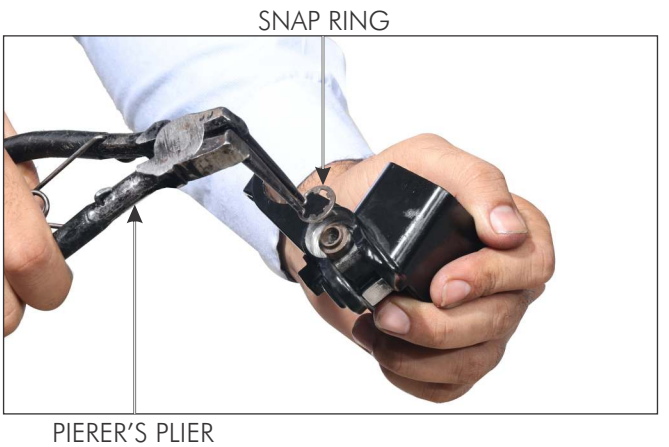
Remove the piston boot and push rod from the master cylinder.



Remove the snap ring from the master cylinder.

TOOL

PIERER'S PLIER
PART NO : 070 HH KFN 003



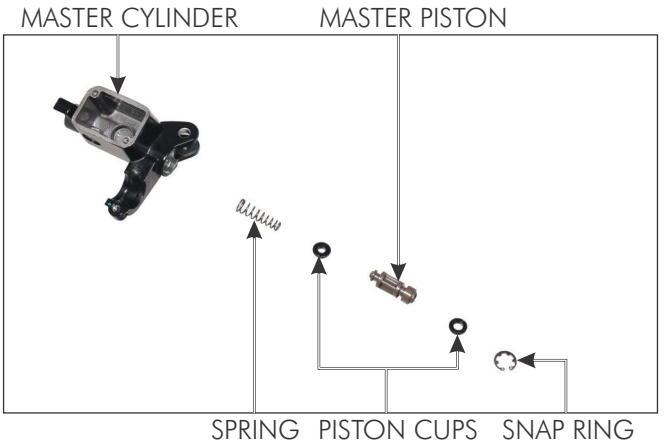
Remove the master piston from the master cylinder.

Remove the master cylinder piston and spring from the master cylinder.

Clean the master cylinder, reservoir and master cylinder piston with clean brake fluid.

NOTE

- Replace the master cylinder piston, spring, cups and snap ring as a set whenever they are disassembled.
- Be sure that each part is free from the dust or dirt before reassembly.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.

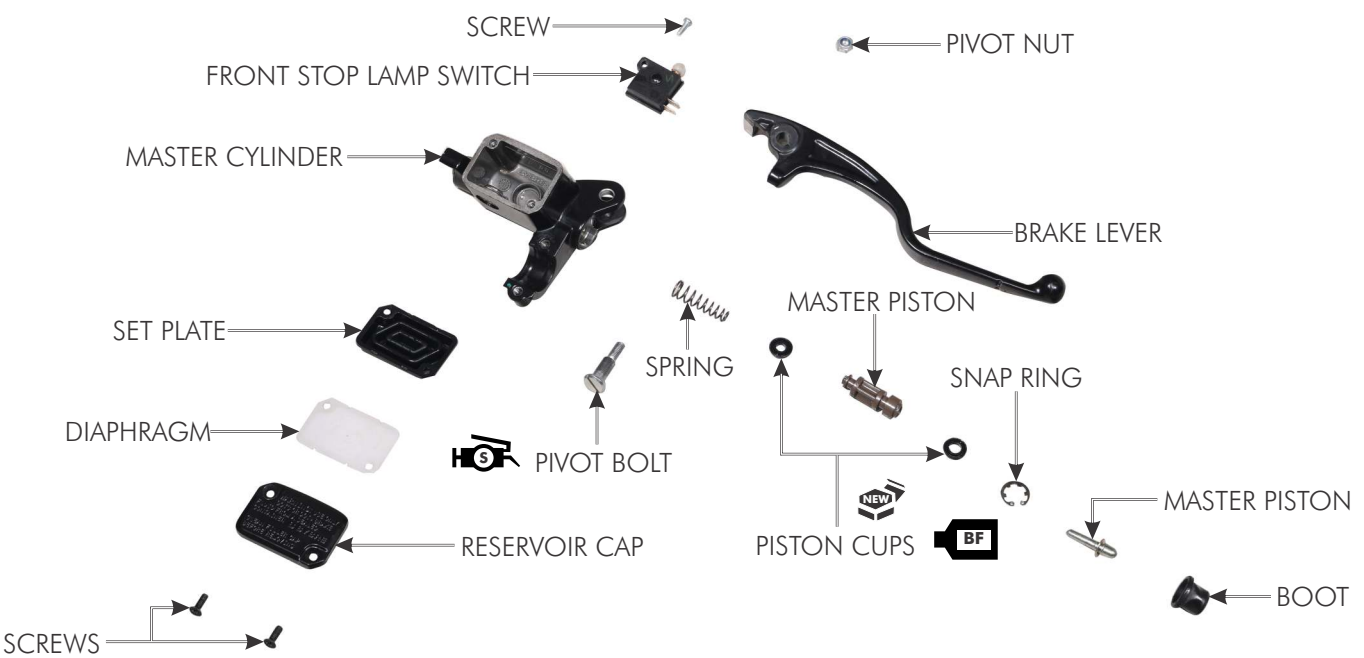


INSPECTION

Check the piston cups for damage.

Check the master cylinder and piston for scoring or other damage.

ASSEMBLY



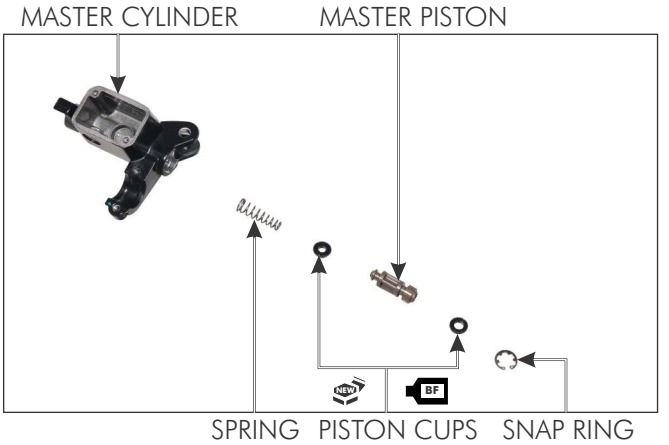
NOTE

- Replace the master piston, spring, cups and snap ring as a set.
- Replace the boot if it is worn, deteriorated or damaged.
- Apply silicone grease to the boot inner surface.
- Be sure that each part is free from dust or dirt before reassembly.

Coat the master cylinder piston and piston cups with clean brake fluid. Install spring onto the master piston end. Install master cylinder piston/spring into the master cylinder.

CAUTION

Do not allow the piston cup lips to turn inside out. Install the snap ring into the groove in the master cylinder.



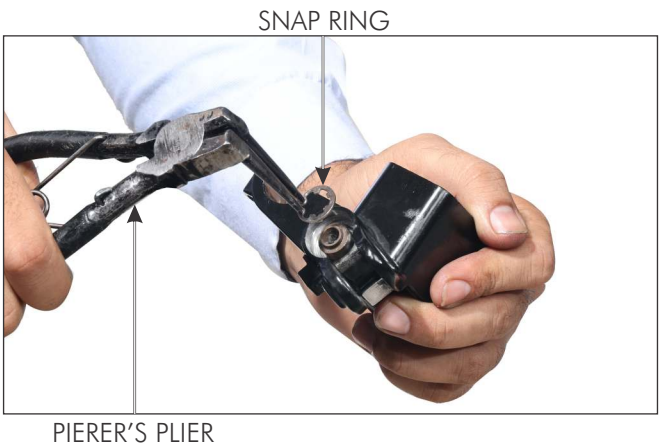
Install the snap ring into the groove in the master cylinder by using special tool.

TOOL

PIERER'S PLIER
PART NO: 070 HH KFN 003

CAUTION

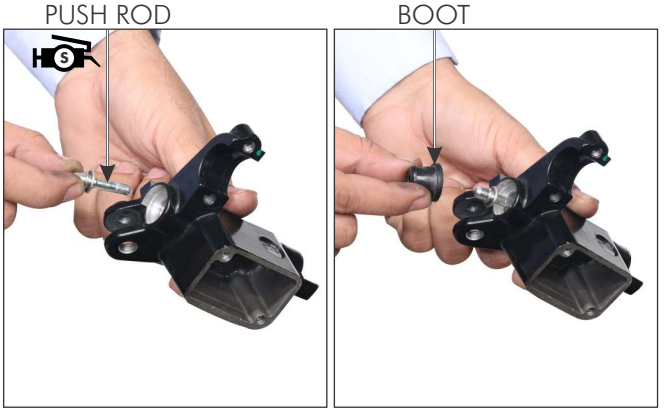
Be certain the snap ring is firmly seated in the groove.



Apply silicone grease to the contacting surface of the master piston and push rod.

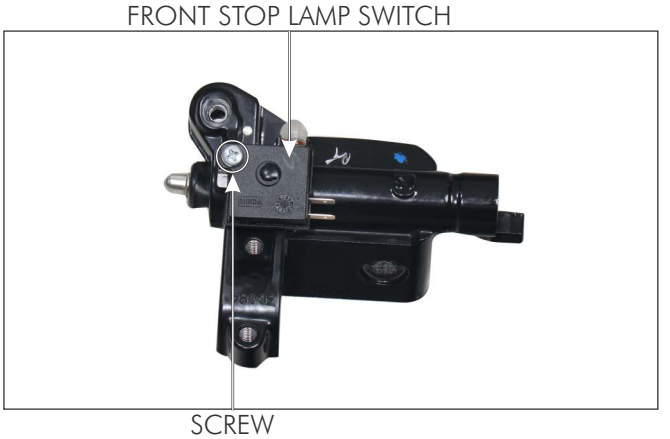
Install the boot into the master cylinder at one end and the groove in the master piston at the other.

Apply silicone grease to the push rod tip and brake lever contacting surface.



Install the front stop lamp switch to the master cylinder aligning the front stop lamp switch tab and master cylinder groove.

Install and tighten the screw securely.

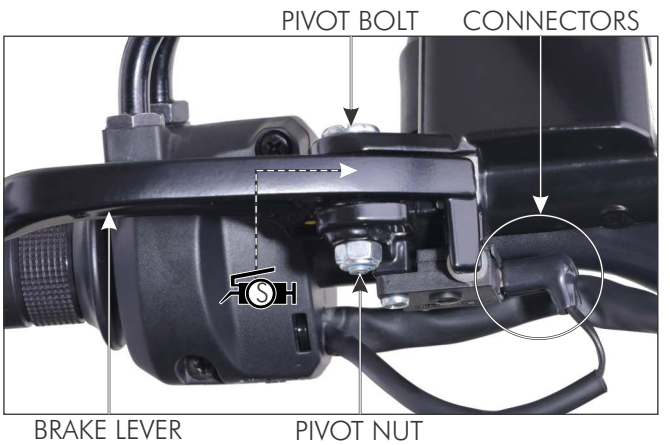


Apply silicone grease to the brake lever pivot bolt sliding surface.

Install the brake, lever and pivot bolt and tighten the bolt.

Hold the pivot bolt and install and tighten the pivot nut.

Connect the front stop lamp switch connectors.

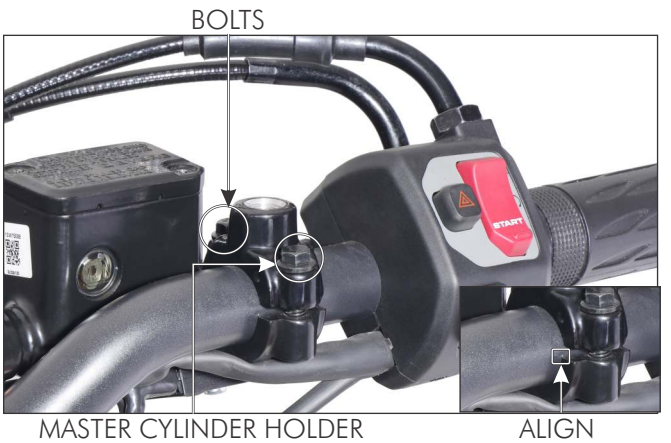


Align the end of the master cylinder with the punch mark on the handlebar.

Install the front master cylinder holder bolts and tighten to the specified torque.

TORQUE

MASTER CYLINDER HOLDER BOLT: 0.8-1.0 kgf-m



Connect the brake hose to the master cylinder with the banjo bolt and new sealing washers, and tighten the banjo bolt.

TORQUE

BRAKE HOSE BANJO BOLT: 2.4-2.7 kgf-m

Install the the right side rear view mirror (page 2-3).

Fill and bleed the hydraulic system (page 16-6).

REAR MASTER CYLINDER

REMOVAL

CAUTION

- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.
- When removing the brake hose banjo bolt, cover the end of the hose to prevent contamination.

Drain the brake fluid from the hydraulic system (page 16-4).

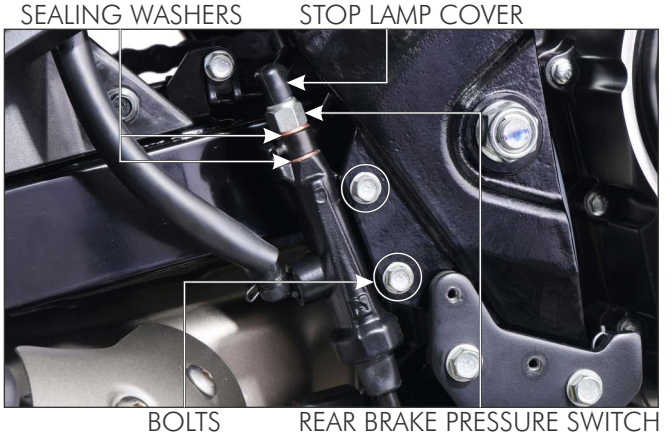
Remove the right side cover (page 2-16).

Disconnect the stop lamp connector.

Remove the right side rider footrest holder bracket by removing allen key bolts (Nos.: 2).

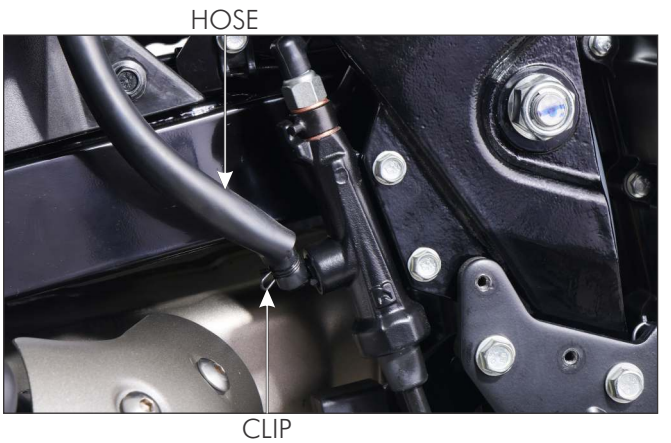
Disconnect the brake hose by removing the rear brake pressure switch and sealing washers.

Remove the rear brake master cylinder mounting bolts (Nos. 2).

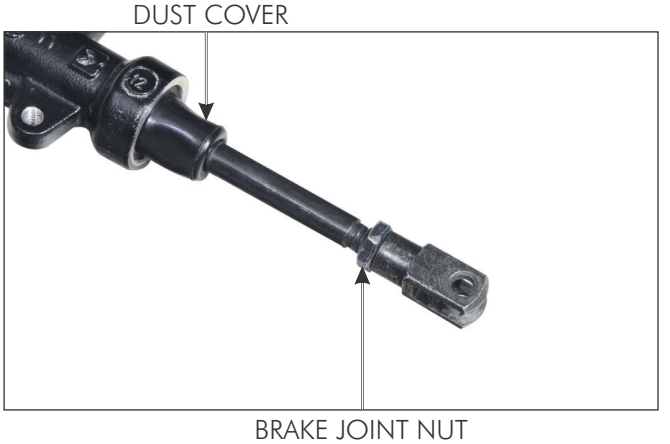


DISASSEMBLY

Remove the clip and disconnect the hose from the rear master cylinder.



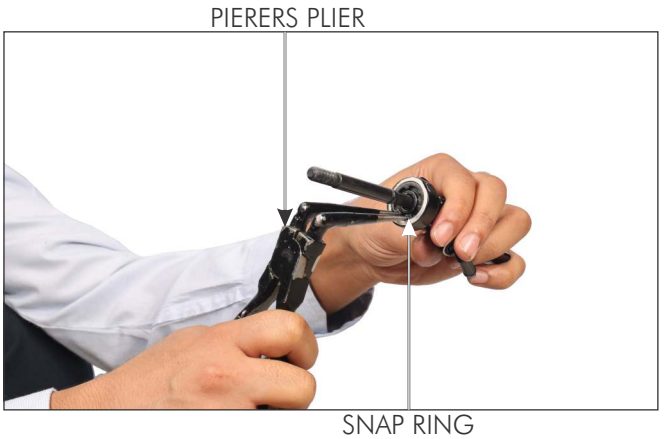
Remove the boot from the rear master cylinder body and remove the brake joint by loosening the nut.



Remove the snap ring from the rear master cylinder body using the special tool as shown.

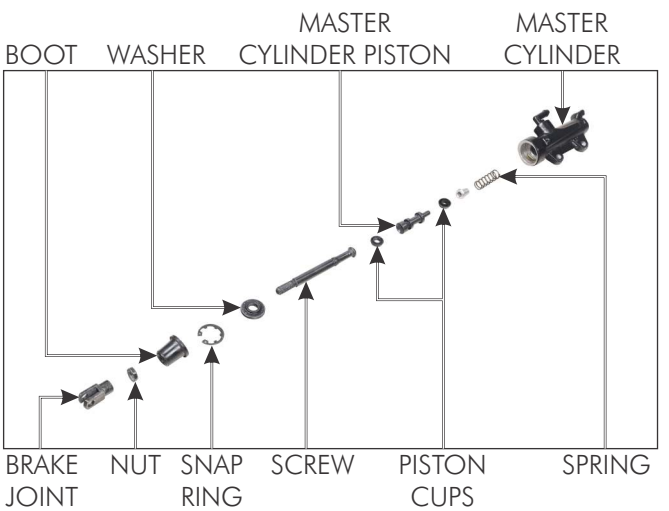
TOOL

PIERER'S PLIER
PART NO: 070 HH KFN 003



Remove the rear master cylinder piston, spring, screw, washer, boot, snap ring brake joint nut and brake joint.

Clean the inside of the master cylinder with clean brake fluid.



INSPECTION

Check the piston boot, piston cups for fatigue or damage.

Check the master cylinder and piston for scoring or other damage.

Measure the master cylinder I.D.

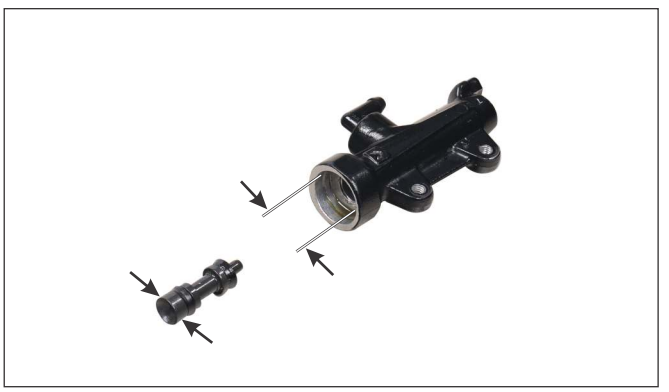
SERVICE LIMIT

MASTER CYLINDER I.D: 13.00 mm

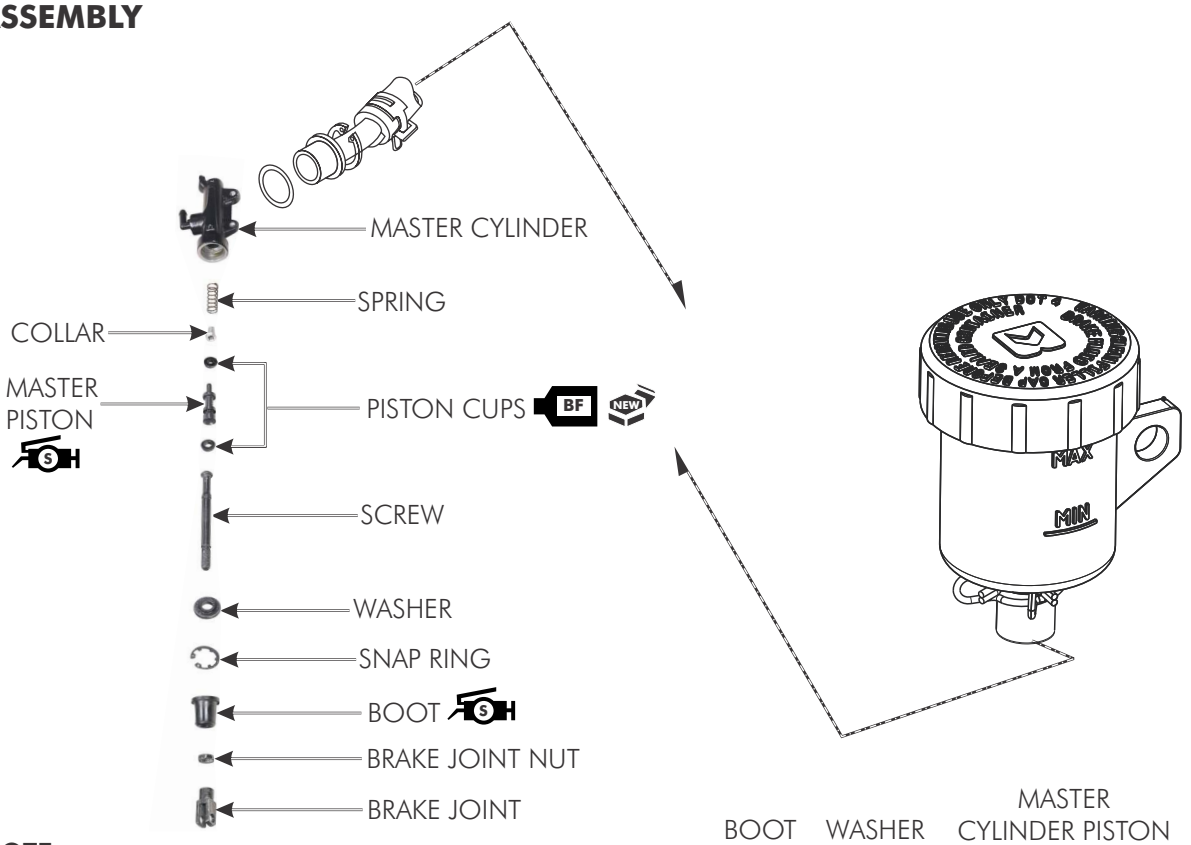
Measure the master cylinder piston O.D.

SERVICE LIMIT

MASTER CYLINDER PISTON O.D: 13.00 mm



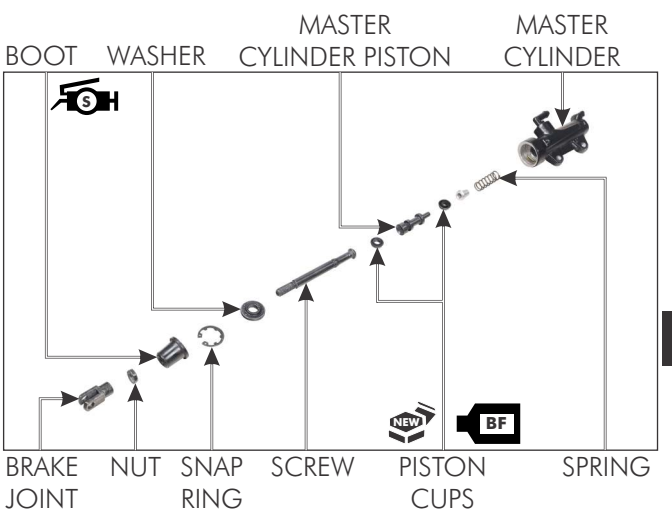
ASSEMBLY



NOTE

- Keep the piston, cups, springs, snap rings and boot as a set. Do not substitute individual parts.
- Replace the master piston, spring, cups and snap ring as a set.
- Replace the boot if it is worn, deteriorated or damaged.
- Apply silicone grease to the boot inner surface.
- Be sure that each part is free from dust or dirt before reassembly.

Coat the master cylinder piston and piston cups with clean brake fluid. Install spring onto the master piston end. Install brake joint, brake joint nut, master cylinder piston/spring into the master cylinder.



CAUTION

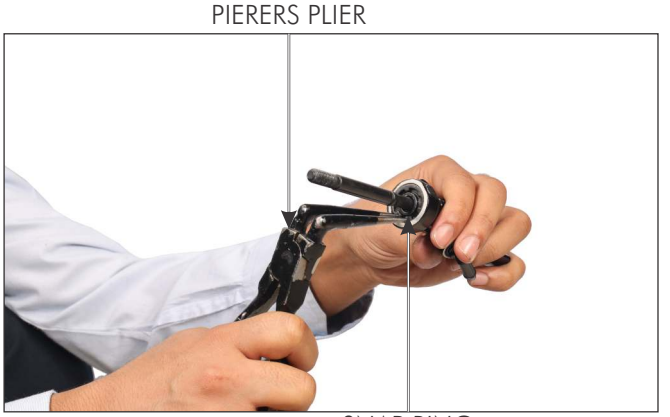
Do not allow the piston cup lips to turn inside out.

Install the snap ring into the groove in the master cylinder.

TOOL

PIERER'S PLIER
PART NO: 070 HH KFN 003

PIERERS PLIER



CAUTION

Be certain the snap ring is firmly seated in the groove.

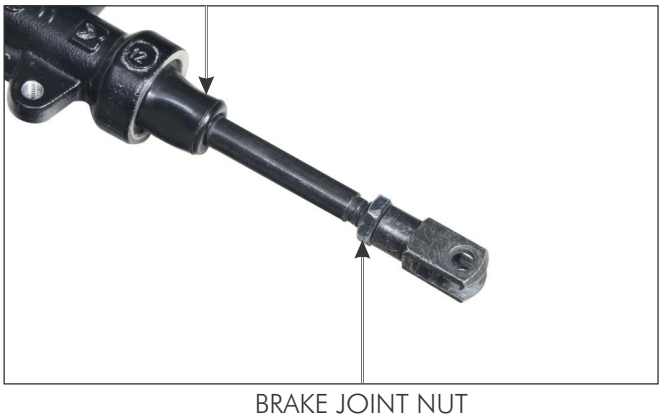
Install the brake joint and boot into the master cylinder body.
Tighten the brake joint nut to the specified torque.

TORQUE

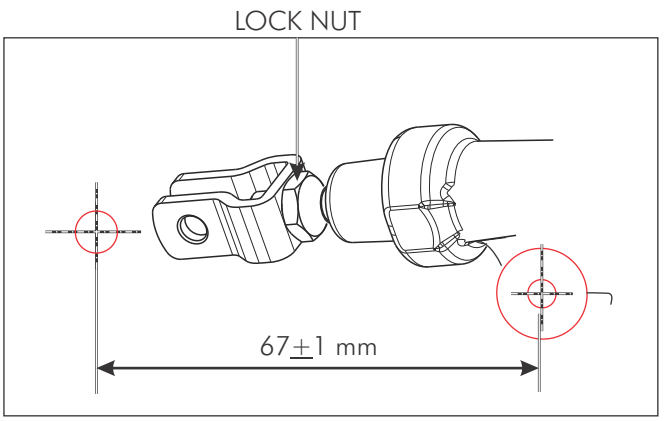
BRAKE JOINT NUT: 0.8-1.0kgf-m

NOTE

Be careful not to damage the boot.



If the push rod is disassembled, adjust the push rod length so that the distance between the center of the master cylinder lower mounting bolt hole and joint pin hole is 67±1 mm. After adjustment, tighten the lock nut.



Install the dust cover into the rear master cylinder body.
Connect the hose to the rear master cylinder and properly fit the clip.

REAR MASTER CYLINDER

INSTALLATION

Connect the brake hose to the master cylinder with the stop lamp switch, stop lamp cover and sealing washers.

Tighten the mounting bolts to the specified torque.

TORQUE

BRAKE HOSE BANJO BOLT: 2.4-2.7 kgf-m

Install and tighten the allen key bolts to the specified torque.

TORQUE

REAR MASTER CYLINDER
MOUNTING BOLT: 1.0-1.4 kgf-m

Adjust the rear brake pedal height (page 3-27).

Fill and bleed the hydraulics system (page 16-6).

Install the right side rider footrest holder bracket by removing allen key bolts (2 nos.).

Install the right side cover (page 2-17).

Connect the stop lamp connector.

Fill and bleed the hydraulic system (page 16-6).

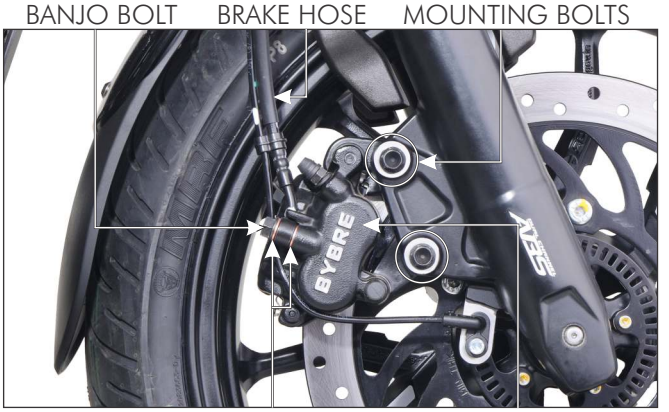
FRONT BRAKE CALIPER

REMOVAL

CAUTION.

- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced
- When removing the banjo bolt, cover the end of the hose to prevent contamination.

Drain the brake fluid from the hydraulic system (page 16-4). Disconnect the brake hose by removing the brake hose banjo bolt and sealing washers.



Remove the front brake caliper mounting bolts and front brake caliper.

Remove the pin lock and pad pin.

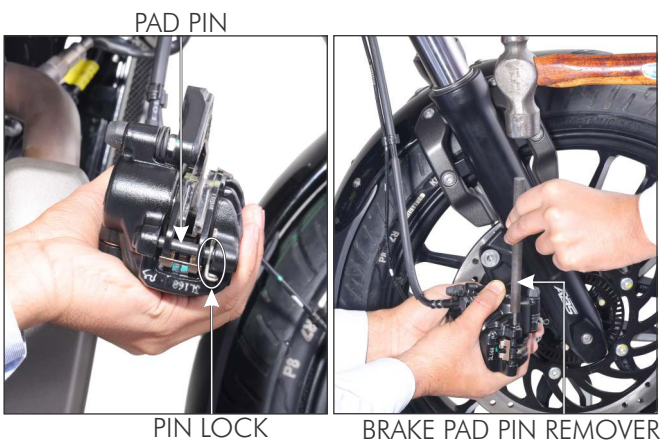
Remove the pad pin by using special tool.

NOTE

While removing the pad pin, hold the caliper assembly carefully.

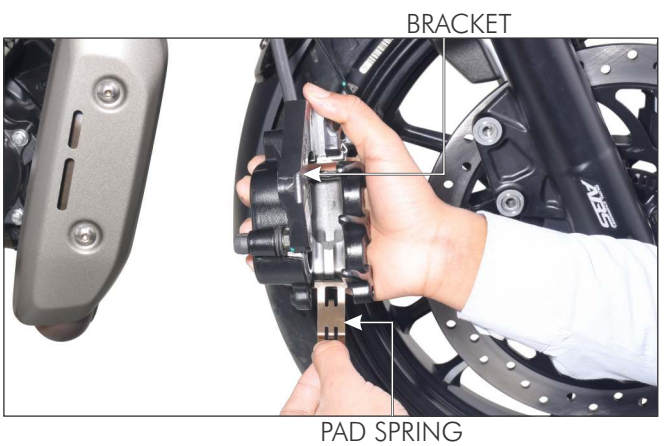
TOOL

BRAKE PAD HANGER PIN REMOVER
PART NO: 070 HH 198 036



Remove the brake pads.

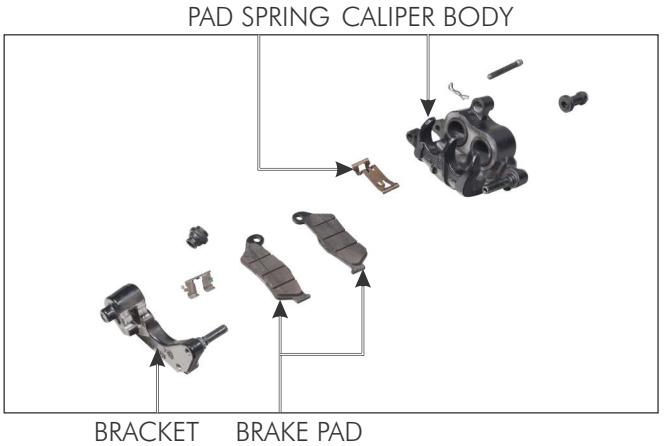
Remove the pad spring and bracket.



DISASSEMBLY

NOTE

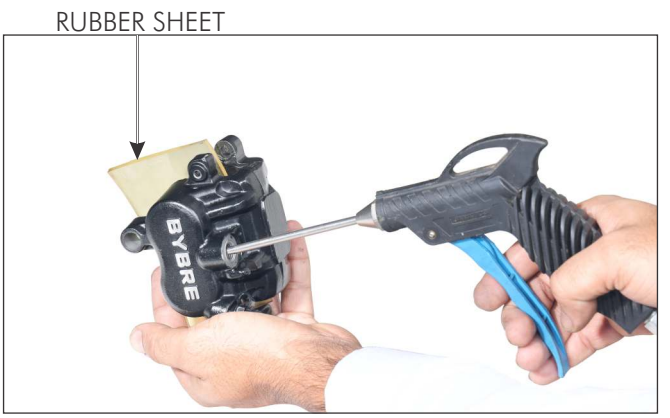
- Do not remove the caliper and bracket pins unless replacement is required.
- Remove the caliper bracket from the caliper body.
- Remove the pad spring and bracket pin boot from the cylinder body.



Place shop towel or a soft rubber sheet over the pistons. Position the caliper body with the pistons down and apply instant air pressure to the fluid inlet to remove the pistons.

NOTE

- Do not use high pressure air or bring the nozzle too close to the inlet.
- Mark the pistons to ensure correct reassembly.



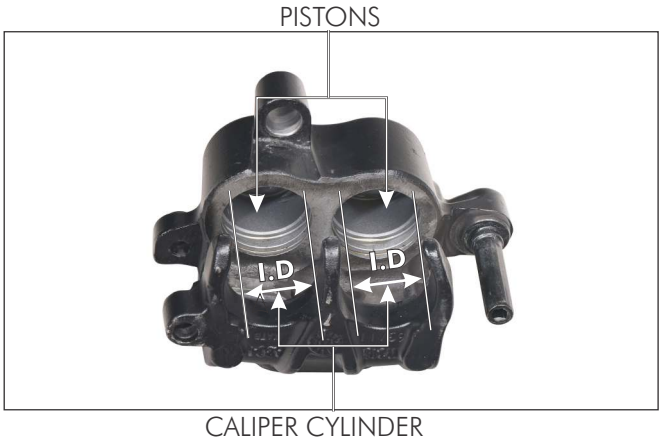
Push the dust and piston seals in and lift them out.

CAUTION

- Be careful not to damage the piston sliding surface.
- Clean the seal grooves, caliper pistons and caliper piston sliding surfaces with clean brake fluid.

INSPECTION

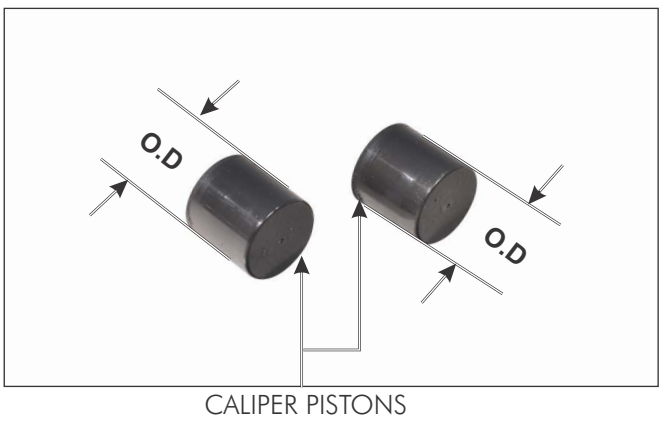
Check the caliper cylinder and pistons for scoring, scratches or damage.



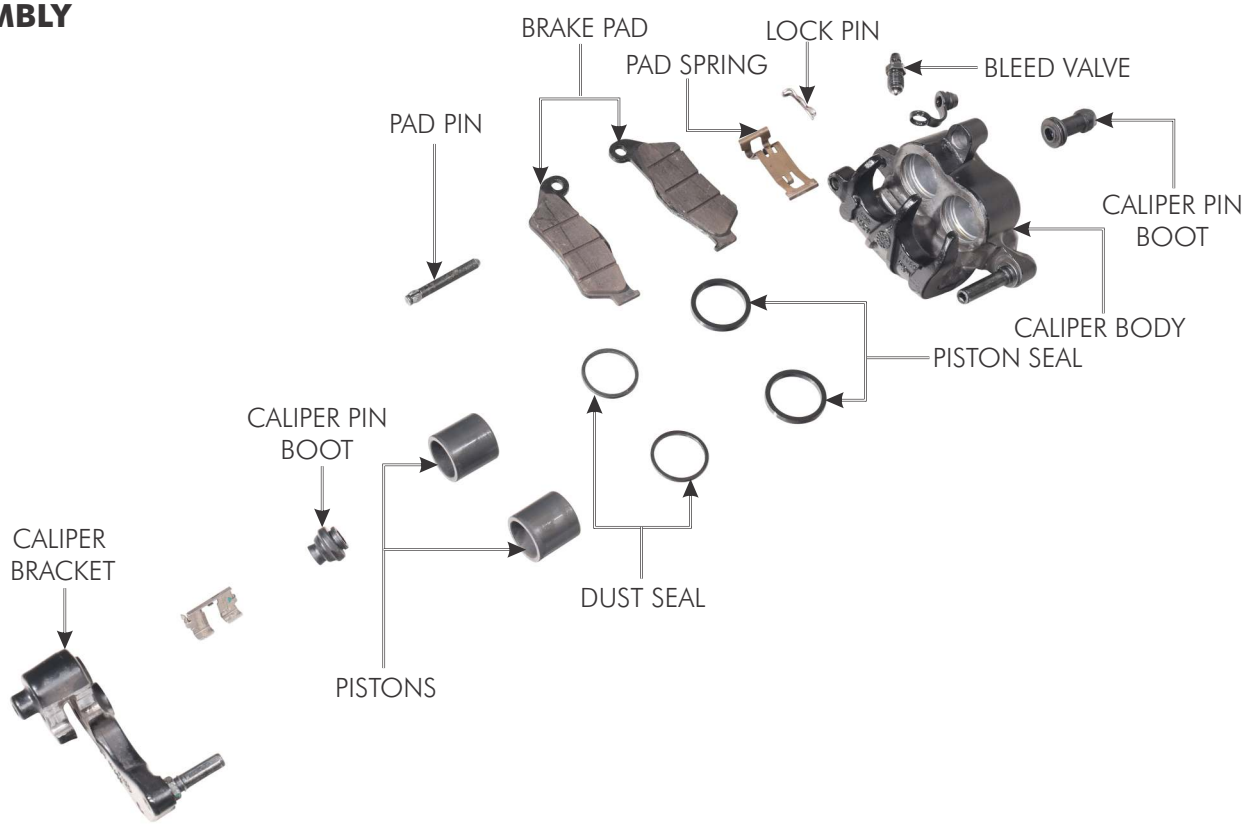
Check the caliper piston for scoring, scratches or damage.
Measure the caliper piston O.D.

SERVICE LIMIT

CALIPER PISTON O.D: 28 mm x 2

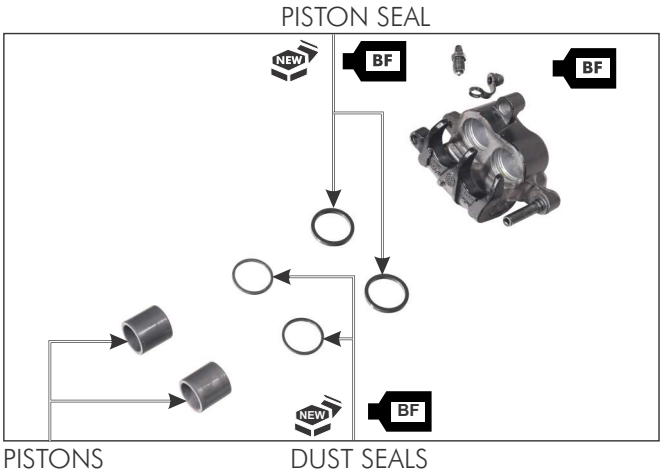


ASSEMBLY



NOTE

- Replace the dust seals and piston seals with new ones.
- Replace the caliper and bracket pin boot if it is worn, deteorated or damaged. Apply silicone grease to boot inner surface.
- Be sure that each part is free from the dust or dirt before reassembly.



Coat new piston seals with clean brake fluid and install them in the seal grooves in the caliper.

Coat new dust seals with silicone grease and install them in the seal grooves in the caliper.

Coat the caliper pistons with clean brake fluid & install it into caliper cylinder with opening towards the pads.

If the caliper pin boots are hard or deteriorated, replace them with new ones.

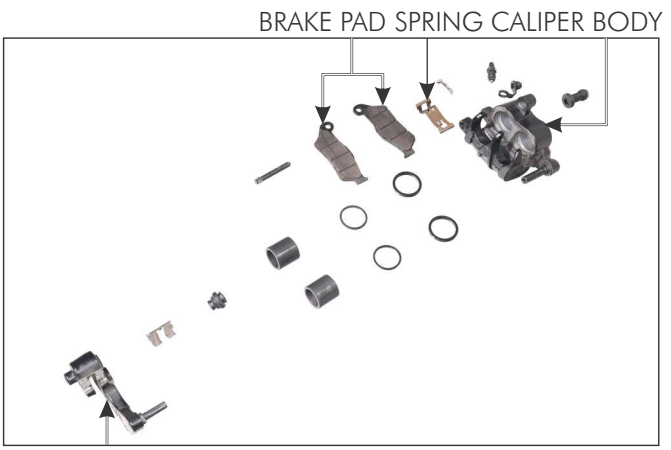
Apply silicone grease to the caliper pins and boots.

Install the caliper pin boots and caliper bracket into the caliper body.

Install the pad spring in the caliper.

Install the brake pads.

Install the pad pin.



Install the front brake caliper to the front fork.

Install and tighten the front caliper mounting bolts to the specified torque.

TORQUE

FRONT CALIPER MOUNTING BOLT: 2.3-2.5 kgf-m

Connect the brake hose to the brake caliper with new sealing washers.

Install and tighten the banjo bolt to the specified torque.

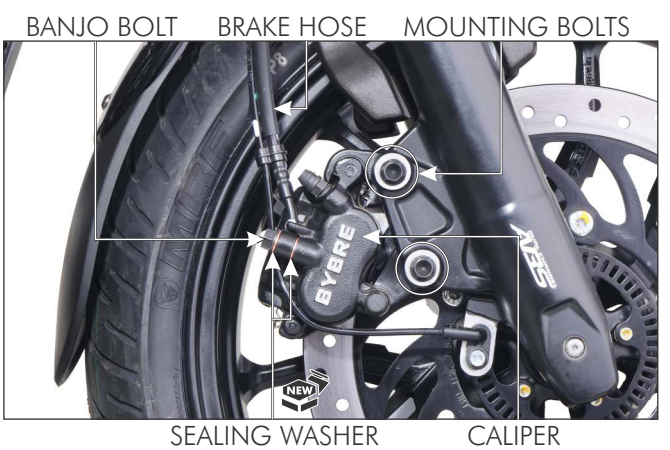
TORQUE

BRAKE HOSE BANJO BOLT : 2.4-2.7 kgf-m

NOTE

Be careful not to twist the brake hose.

Fill and bleed the hydraulic system (page 16-6).



REAR BRAKE CALIPER

REMOVAL

CAUTION

- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced
- When removing the banjo bolt, cover the end of the hose to prevent contamination.

Drain the brake fluid from the hydraulic system (page 16-4).

Remove the banjo bolt and caliper assembly.

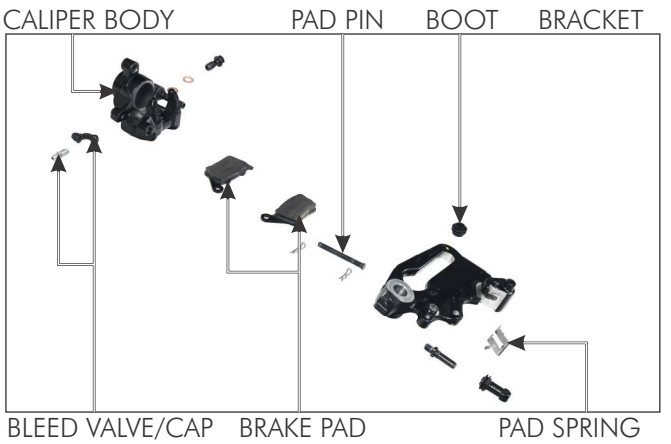
DISASSEMBLY

NOTE

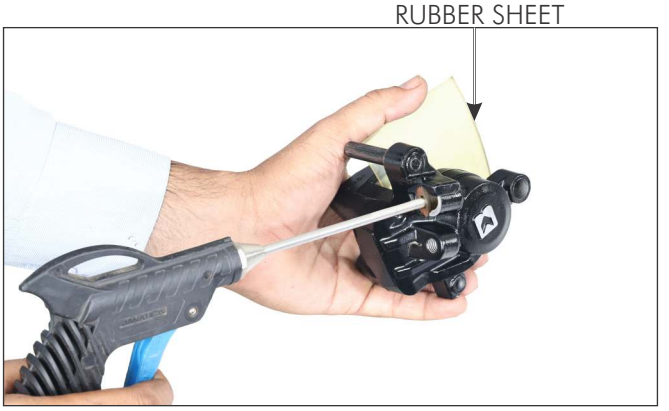
Do not remove the caliper and bracket pins unless replacement is required.

Remove the caliper bracket from the caliper body.

Remove the pad spring and bracket pin boot from the cylinder body.



Place shop towel or a soft rubber sheet over the piston. Position the caliper body with the piston down and apply instant air pressure to the fluid inlet to remove the piston.



Push the dust and piston seals in and lift them out.

CAUTION

Be careful not to damage the piston sliding surface.

Clean the seal grooves, caliper piston and caliper piston sliding surfaces with clean brake fluid.

PISTON SEAL

DUST SEAL

INSPECTION

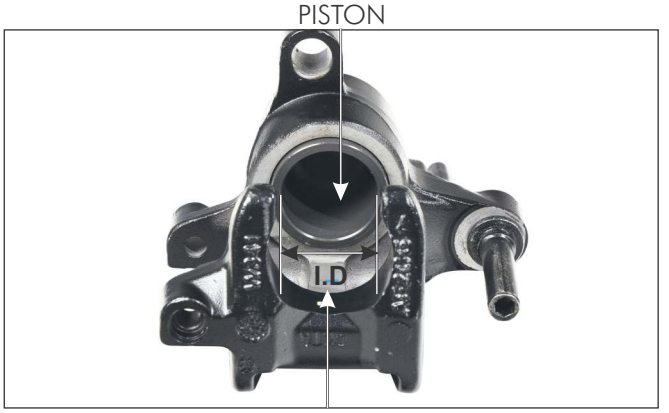
Check the caliper cylinder for scoring, scratches or damage.

Measure the caliper cylinder I.D.

SERVICE LIMIT

CALIPER CYLINDER I.D: 32 mm

PISTON



REAR CALIPER CYLINDER

16

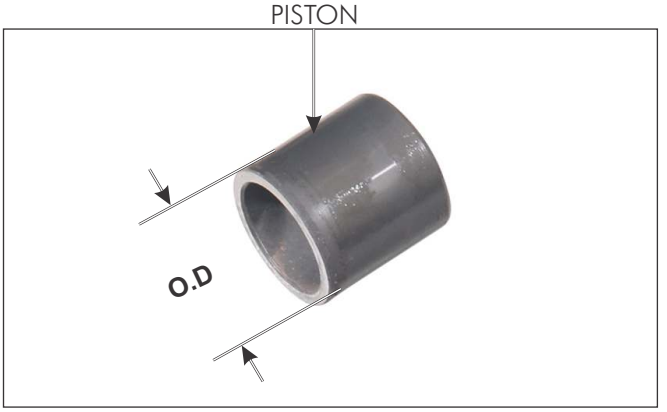
Check the caliper piston for scoring, scratches or damage.

Measure the caliper piston O.D.

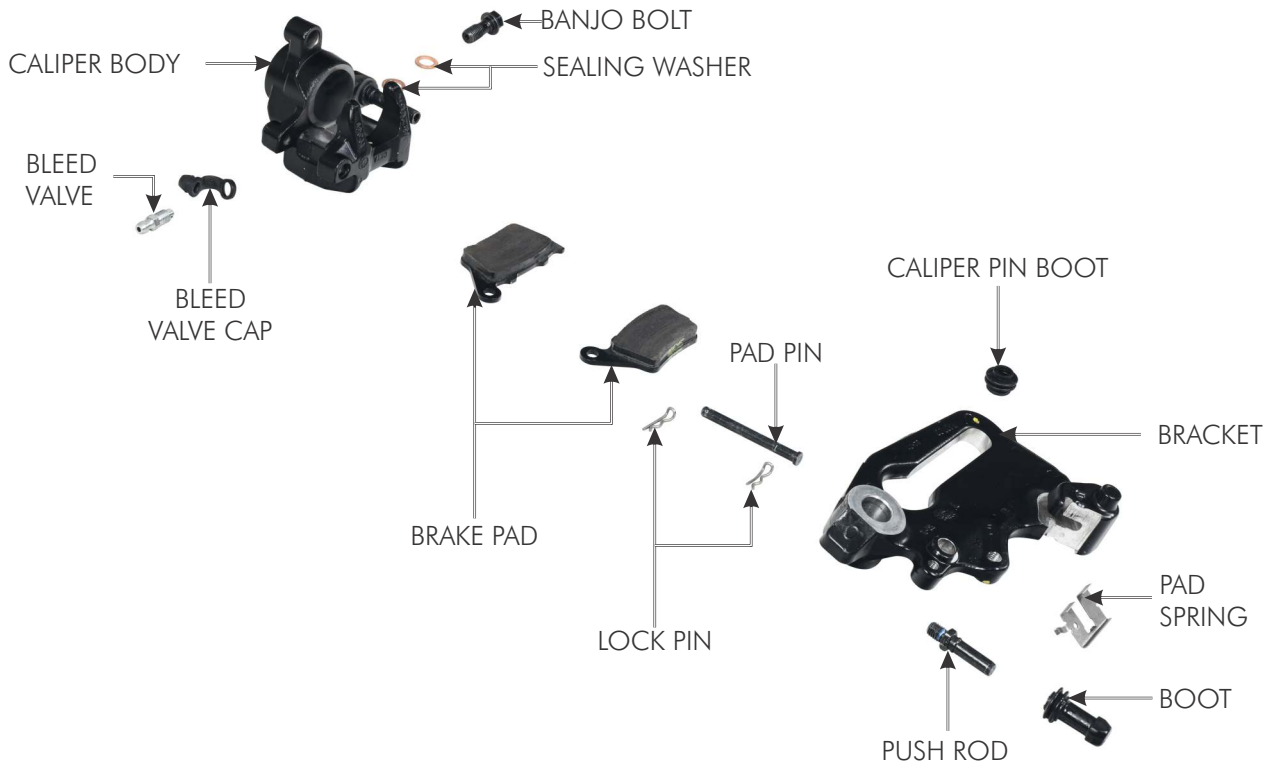
SERVICE LIMIT

CALIPER PISTON O.D: 32 mm

PISTON

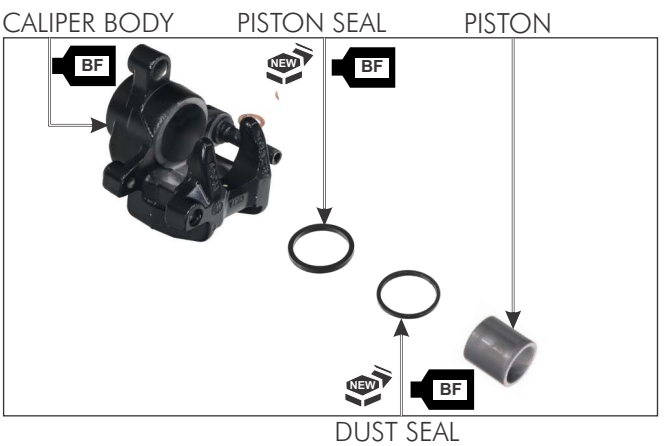


ASSEMBLY



NOTE

- Replace the dust seal and piston seal with new ones.
- Replace the caliper and bracket pin boot if it is wear, deterioration or damage. Apply silicone grease to boot inner surface.
- Be sure that each part is free from the dust or dirt before reassembly.



Coat new piston seal with clean brake fluid and install it in the seal groove in the caliper.

Coat new dust seal with silicone grease and install it in the seal groove in the caliper.

Coat the caliper piston with clean brake fluid & install it into caliper cylinder with opening towards the pads.

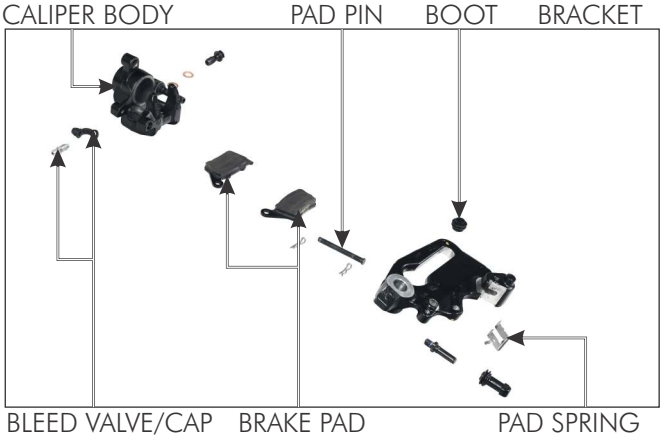
If the caliper pin boots are hard or deteriorated, replace them with new ones.

Apply silicone grease to the caliper pins and boots.

Install the caliper pin boots and caliper bracket into the caliper body.

Install the pad spring in the caliper.

Install the brake pads.



INSTALLATION

Install the rear brake caliper.

Connect the brake hose to the brake caliper with new sealing washers.

Install and tighten the banjo bolt to the specified torque.

TORQUE

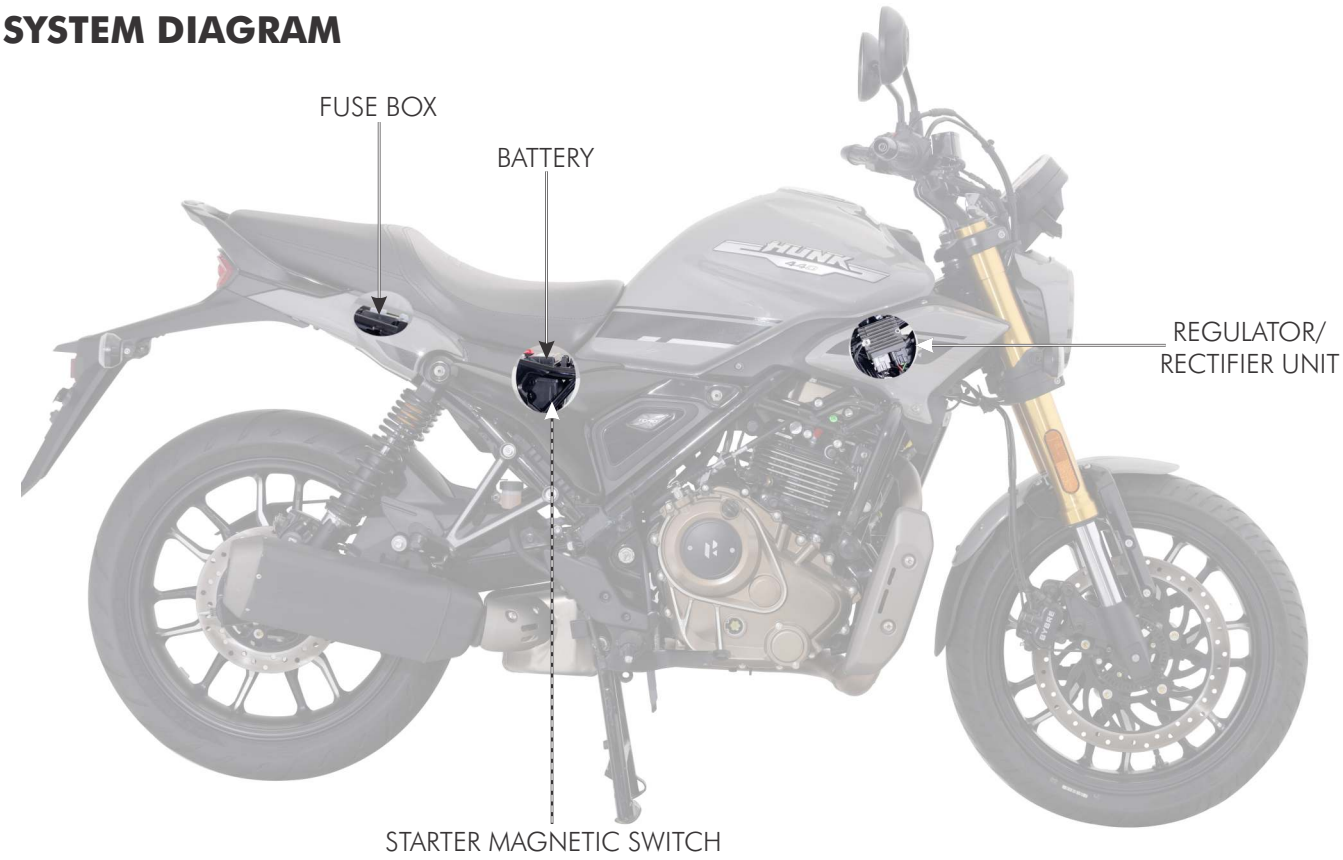
BRAKE HOSE BANJO BOLT : 2.4-2.7 kgf-m

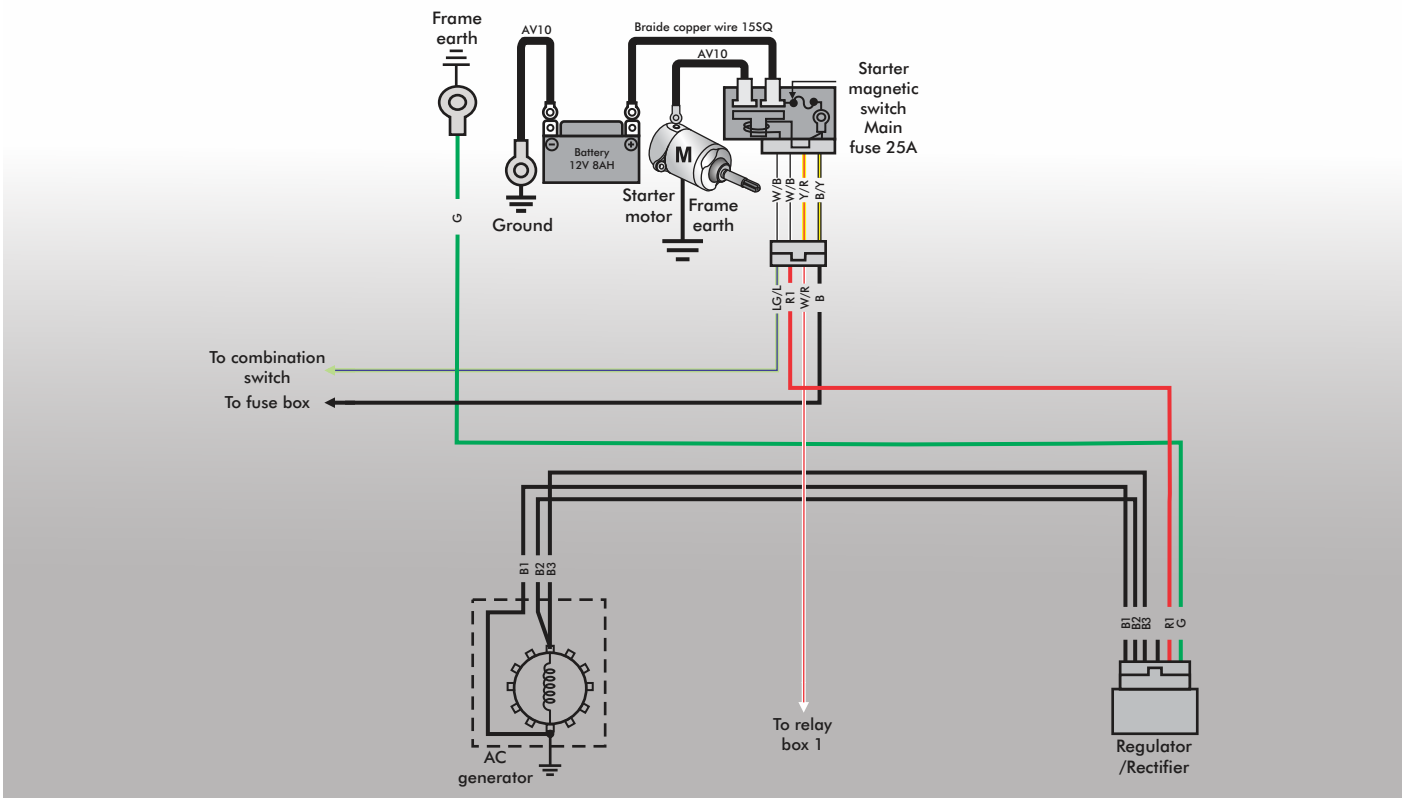
NOTE

Be careful not to twist the brake hose.

Fill and bleed the hydraulic system (page 16-6).

SYSTEM DIAGRAM





BATTERY/CHARGING SYSTEM

SERVICE INFORMATION

GENERAL

⚠ WARNING

Battery gives off explosive gases; keep spark, flames, and cigarettes away. Provide adequate ventilation when charging or using the battery in an enclosed space.

CAUTION

- Always turn "OFF" the ignition switch before disconnecting any electrical component.
- For extended storage, remove the battery, give it a full charge and store it in a cool dry place.
- For a battery remaining in a stored vehicle, disconnect the negative battery cable from the battery terminal.
- Battery can be damaged if overcharged or undercharged, or if left to discharge for long periods. These conditions contribute to shortening the "Life Span" of the battery. Even under normal use, the performance of batteries deteriorates after 2-3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die. For this reason, the charging system is often suspected to be the problem. Battery overcharge often results from problems the battery itself, which may appear to be an overcharge symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level drops down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlamp and tail lamp "ON" for a long periods of time without riding the vehicle.
- The battery will self-discharge when the vehicle is not in use for long duration. For this reason, charge the battery once in a month to prevent sulfation forming.
- When checking the charging system, always follow the steps in the troubleshooting flow chart.

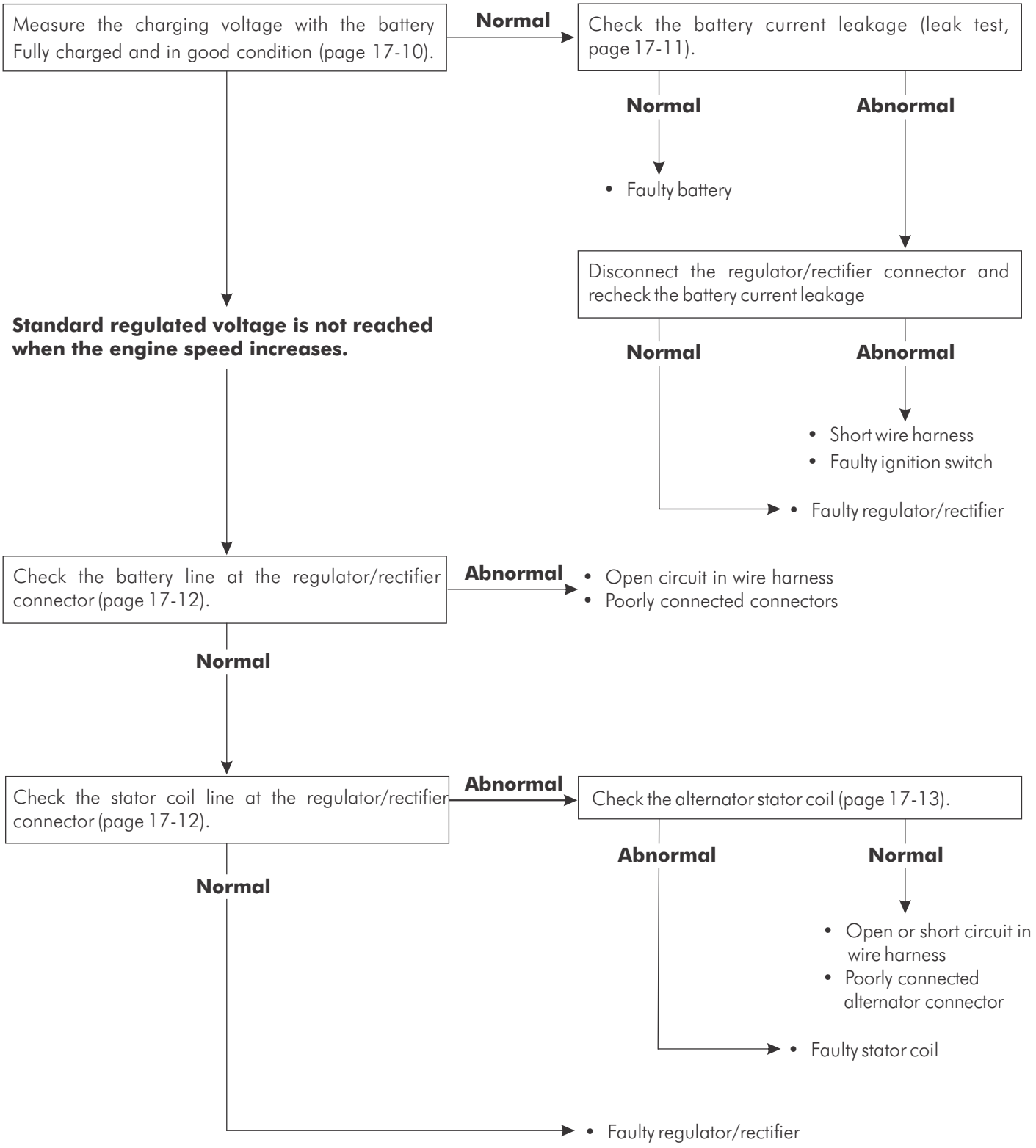
SPECIFICATIONS

BATTERY/CHARGING SYSTEM

ITEM		SPECIFICATIONS
Battery	Capacity	*MF Battery 12V-8Ah/ETZ9
	Current leakage	1.0 mA (Maximum)
	Voltage @ 20°C/68°F	12.4 V (Minimum)
Alternator	Capacity	325 W @ 5000 r/min
	Charging coil resistance	0.560±10% Ω
Lamp coil regulated voltage (with battery)		14.5±0.2 V
Lamp coil regulated current (with battery)		19 A minimum @ 2500 rpm
		20.2 A minimum @ 6000 rpm

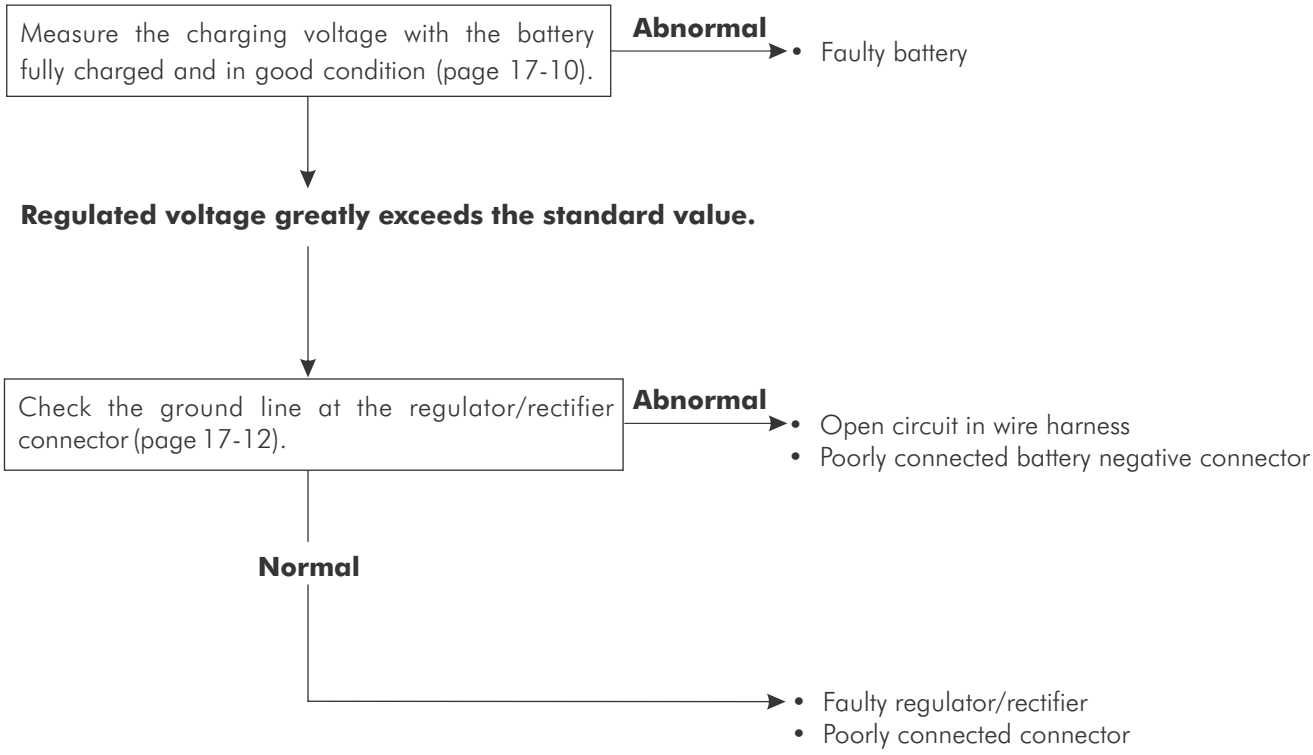
TROUBLESHOOTING

Battery undercharging (voltage not raised to regulated voltage)



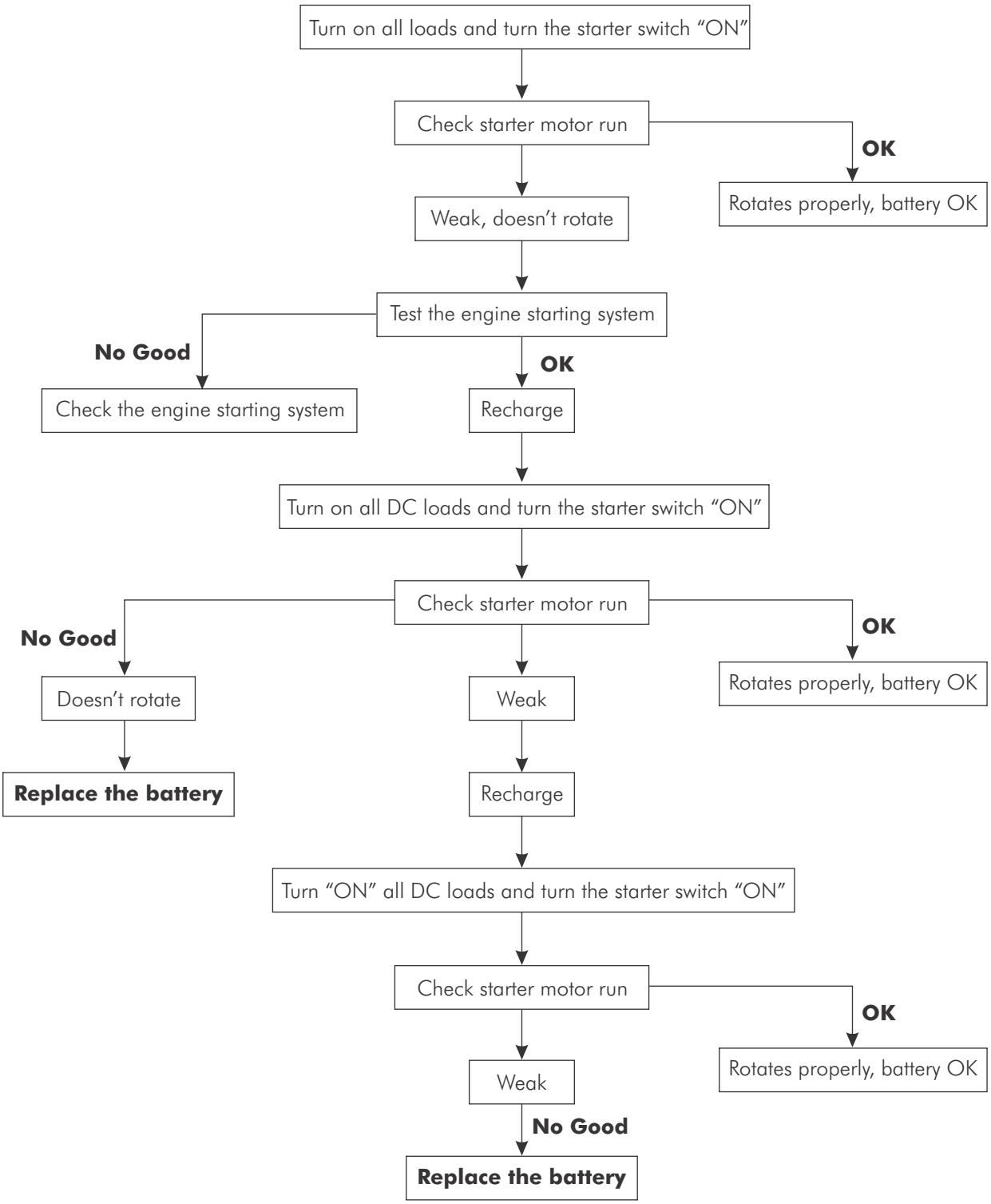
TROUBLESHOOTING

Battery overcharging (regulated voltage too high)



TROUBLESHOOTING

Battery performance check with battery installed on the vehicle.



NOTE

- "All DC loads" indicates turn signals, stop lamp and position lamp.
- Recharging should be done based on the charging capacity indicated in the battery charging procedure (page 17-8).
- Decision for battery replacement to be taken after using the MF-battery tester, after recharging the battery.

BATTERY

REMOVAL

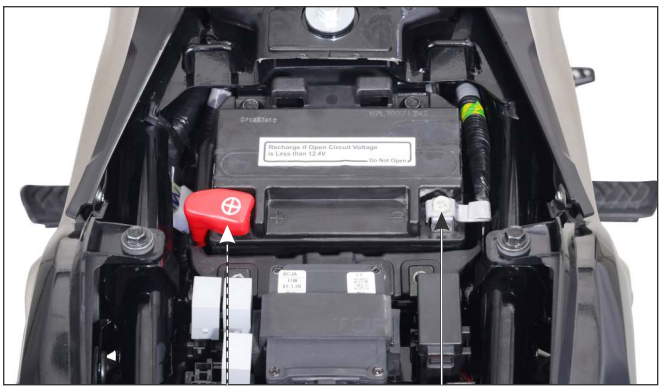
NOTE

Always turn the ignition switch "OFF" before removing or installing the battery.

Remove the seat (page 2-5).

Remove the battery cover (page 2-6).

Disconnect the negative (-)ve cable from the battery, then disconnect the positive (+)ve cable.



(+)VE CABLE (-)VE CABLE

Pullout the battery from the battery box.

INSTALLATION

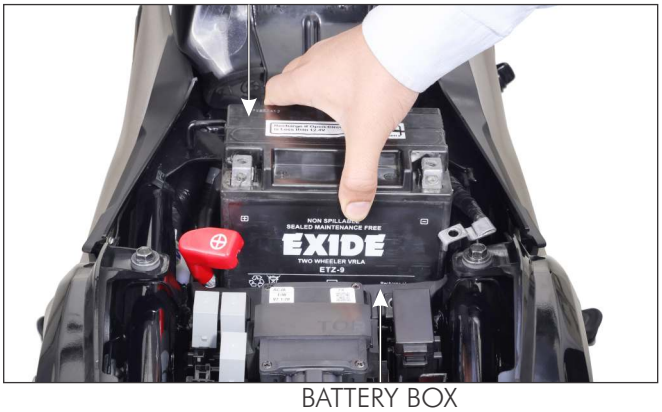
Installation is in the reverse order of removal.

NOTE

Connect the positive terminal first and then the negative cable.

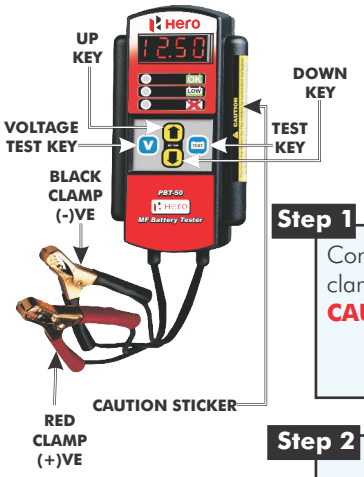
After installing the battery coat the terminal with petroleum jelly to prevent corrosion.

BATTERY



BATTERY BOX

MF-BATTERY TESTING



- MF Batteries can be tested IN vehicle and "OFF" the vehicle.

IN Vehicle Test: Turn "OFF" the vehicle and all electrical loads.

Caution : Testing with the ignition switch "ON" or vehicle electrical loads "ON" may lead to inaccurate readings.

OFF Vehicle Test : Remove the battery from the Motorcycle.

Step 1

Connect the MF-Battery tester clamps to the battery terminals: Red clamp to the (+)ve terminal and Black clamp to (-)ve terminal

CAUTION : Clean both the battery terminals before connecting with the MF-Battery Tester.
: Do not charge the battery before the test, check in "as it is" condition.
: If the battery is charged by MF- Battery Charger or on vehicle, wait for minimum 30 minutes before testing.

Step 2

"conn" display

Confirm the indication on display screen

No Display

REF. NO. Display

Loose connection of MF-Battery Tester clamps with battery

Reconnect the tester clamps to the battery properly

• Reverse connection of MF-Battery Tester clamps on battery terminals

Correct the MF-Battery tester clamps connection
Red clamp ⇨ (+)ve terminal
Black clamp ⇨ (-)ve terminal

•Battery open circuit voltage less than 8V.
• Battery internal resistance is very high

Full charge the battery with MF-Battery charger and retest after 30 minutes

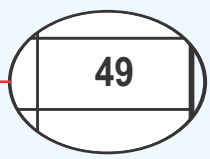
REF NO. LIST IS AT BACK PANEL

TEST INSTRUCTIONS-12V Motorcycle Battery

- Find the battery Ref Number in the table below
- Use the UP/DOWN ARROWS to scroll to the Ref Number
- Press TEST for the results

Reference number table

Vehicle	Battery		Ref. Number
	Make	Model	
HUNK 440	EXIDE	ETZ-9	49



Check and decide the battery reference number as per the battery type and vendor from reference sheet given on rear panel of the tester

Set the correct battery reference number by using up and down keys

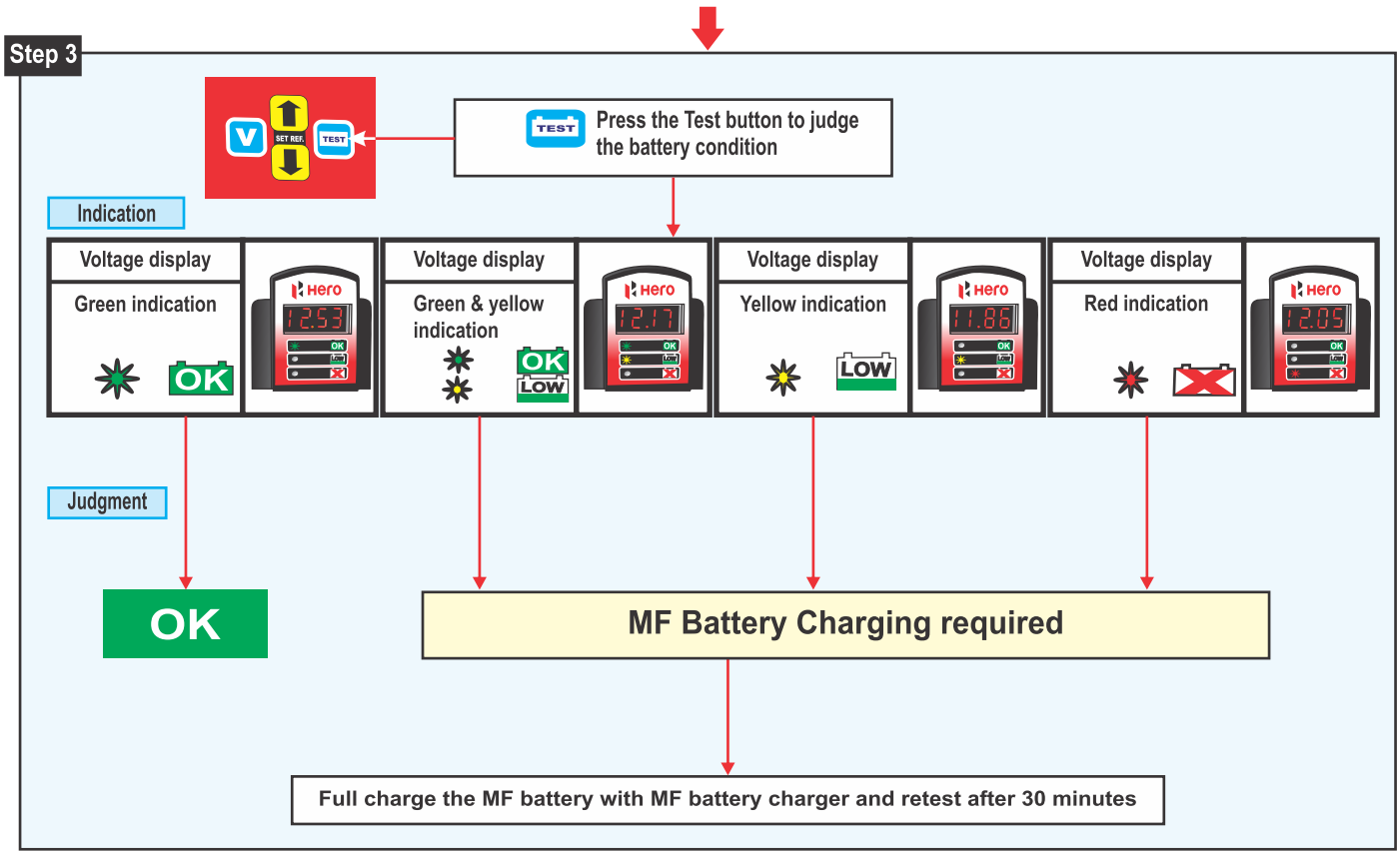
DO'S

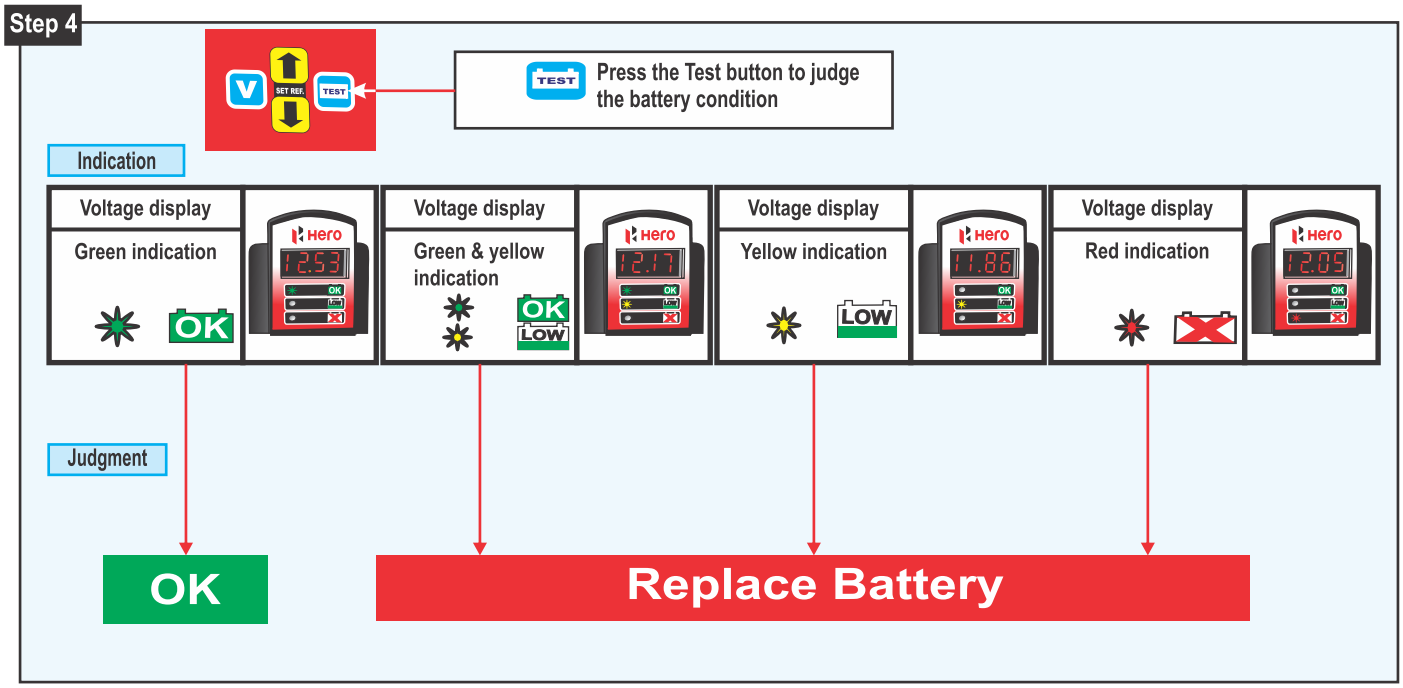
- Store MF-Batteries in a cool, dry location with minimal temperature change
- Check MF-Batteries OCV as per the maintenance schedule. If the battery open circuit voltage is less then 12.4V charge the battery with MF-battery charger only.
- Make sure the area around the MF Battery Charger is well ventilated, clear of flammable materials, and away form heat, humidity, water and dust.
- Check the MF Battery with MF Battery tester in "as it is" condition. Incase of MF Battery charged with MF Battery Charger or in vehicle, wait for minimum 30 minutes before testing.

DONT'S

- Do not store MF Batteries in a place directly exposed to sunlight or at high temperature
- Do not charge the MF battery on conventional battery charger.
- Do not squeeze a battery pack that is draining into a battery.
- Do not reopen the sealing cap from the battery for any reason.
- Do not interchange conventiona and Maintenance-Free batteries.
- Do not install a filled, but uncharged (or untested) battery.
- Do not add any type of additives to any Maintenance-Free battery.

17


Step 3
Press the Test button to judge the battery condition
Indication
Voltage display
Green indication
OK
Voltage display
Green & yellow indication
OK
LOW
Voltage display
Yellow indication
LOW
Voltage display
Red indication
Judgment
OK
MF Battery Charging required
Full charge the MF battery with MF battery charger and retest after 30 minutes


Step 4
Press the Test button to judge the battery condition
Indication
Voltage display
Green indication
OK
Voltage display
Green & yellow indication
OK
LOW
Voltage display
Yellow indication
LOW
Voltage display
Red indication
Judgment
OK
Replace Battery

HERO MOTOCORP MF-BATTERY CHARGER

Hero MotoCorp MF Battery Charger is designed for vehicles with 12V MF-Batteries only and can be used both for regular charging of service batteries and initial charging of new batteries. LED indicator glows when the battery is fully charged, and automatically switches over to a sustained charging mode.

It has a forced recovery function using maximum of 20V/200mA for a deeply discharged battery that cannot be recovered with regular charging. However, not all the deeply discharged batteries can be recovered.

This charger also has a failure inspection function which indicates if the battery cannot be charged properly due to a short-circuit, electrolyte shortage, or sulfation after 30 minutes of inspection time.

NOTE

Make sure the area around the charger is well ventilated, clear off flammable materials, away from heat, humidity, water, and dust.

MF-BATTERY CHARGER

POWER SWITCHES

CHARGING PROCEDURE

1. Connect mains lead to a 220V AC power supply and switch "ON" the main supply.
2. Connect the battery charger leads to battery terminals (Red lead to (+)ve terminal and Black lead to (-)ve terminal) .
3. Switch "ON" the battery charger main switch, a "GREEN" LED will glow on the battery charger.
   - If the battery is not connected to the charger prior to switching "ON", a open circuit "RED" LED will start blinking to indicate a open circuit.
   - Switch "OFF" the battery charger and connect the battery to the battery charger properly and then switch "ON" the battery charger.
4. Select and press the button for charging mode as "Normal".

   Normal - Wet type MF-Batteries in use in vehicles.

   - Select the maximum charging current to **2 AMP** or **4 AMP** depending upon the battery capacity. For 3Ah & 4Ah batteries select-**2 AMP** and for 5Ah, 6Ah & 8Ah batteries select-**4 AMP**.
5. MF-Battery Charger detects the battery voltage and if the voltage is less than 5V it will switch over to Step 1 (20V/200mA charging - Forced Recovery Mode).
   - In this step the MF-Battery Charger detects the battery voltage after every 3 minutes continuously. If the battery voltage is more than 5V it switches over to Step 2/Step 3 directly depending on the charging mode.
   - Charging duration in this mode is 30 minutes.
   - If the battery voltage is less than 5V after 30 minutes a "RED" LED indicating a "BAD BATTERY" will glow. This indicates that the battery is not suitable for charging.
   - If the MF-Battery Charger switches to Step 2/Step 3 the battery would undergo charge for 5~10Hrs. depending on the battery condition.
6. After Completion of the battery charging a "GREEN" LED will glow to indicate completion of charging and the MF-Battery Charger will switch over to "Sustained Charging Mode".

NOTE

- All MF-Batteries (Wet type) indicating green & yellow or yellow or red require a charging using Hero MotoCorp MF-Battery Charger. Ensure to follow the battery charging procedure.
  - **Wet type MF Batteries:** Batteries filled with electrolyte and already charged.
- During charging if the battery is disconnected an AUDIO INDICATOR will beep for 2 minutes with a "RED" LED blinking to indicate a "OPEN CIRCUIT".
- OPEN CIRCUIT "RED" LED will continue blinking until the battery is connected properly.

⚠ WARNING

- Charging a battery creates highly explosive hydrogen gas.
- You can be burned or seriously injured if it explodes.
- Do not allow smoking, flames, or sparks in the area where you are charging batteries.

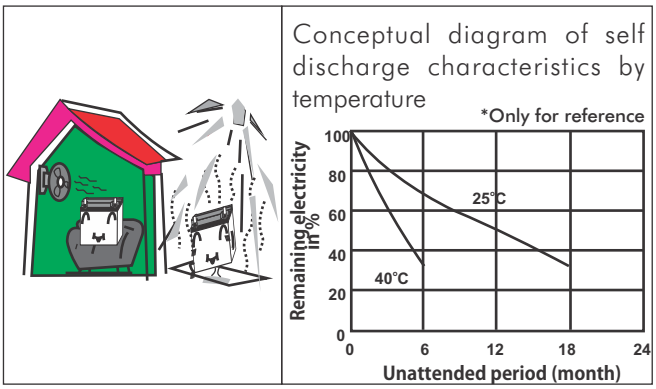
STORING BATTERIES

STORAGE PLACE

Keep batteries in a cool place.

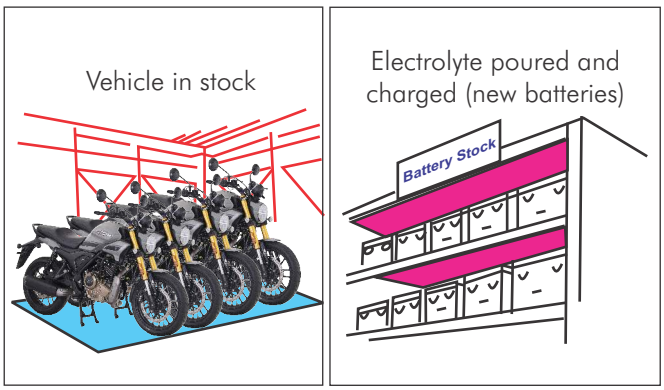
- A cool place (-5 to 15°C) is desirable.
- A dust free place which is neither exposed to rain nor direct sun.
- Self discharge.

The battery, after the electrolyte is filled, loses its electrolyte with the progress of time at a very small rate, even if the external circuit is not connected. This is called self discharge, and the rate is generally greater when the temperature is high.

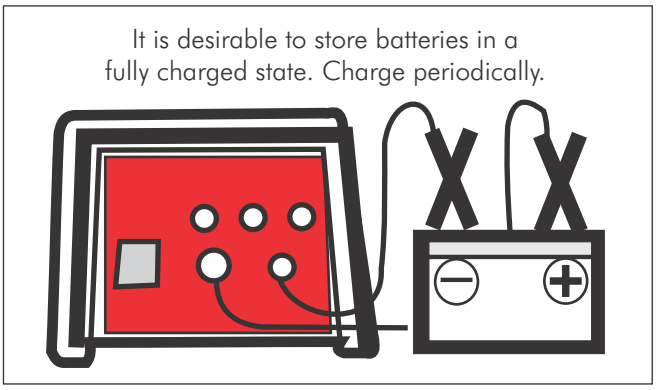


ELECTROLYTE IS POURED AND CHARGED

When new vehicles are stocked with charged batteries for which the electrolyte is filled, charge them once in every three months. This is the same for stocked batteries.

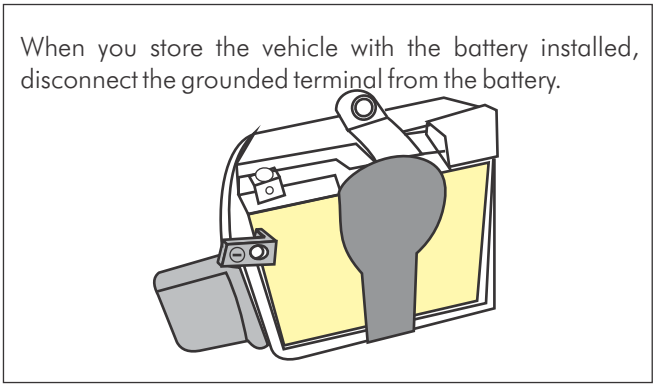


When the open voltage becomes below 12.4V even if the time is less than six months, charge the battery. This is to compensate the self discharge. Moreover, this will reduce sulfation when the batteries are stored at discharged state for a long period of time.



LONG TERM VEHICLE STORAGE

When you do not use the vehicle for a long period of time, remove and keep the battery in a safe place. When you store the vehicle with the battery installed, disconnect the grounded terminal from the battery. Charge the battery periodically to compensate for self discharge storage. The charging interval will be one month.



CHARGING SYSTEM

INSPECTION

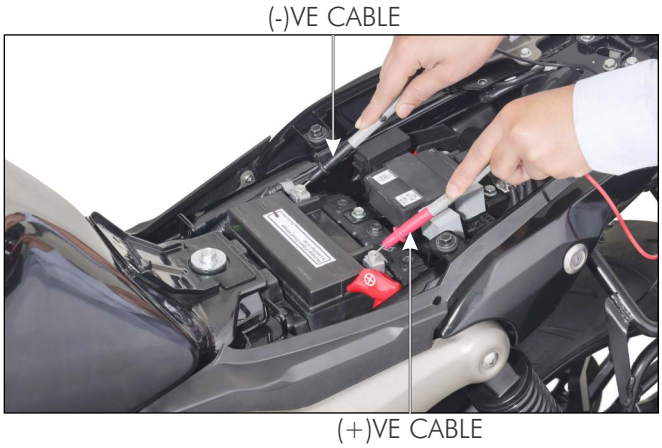
NOTE

- Measuring circuits with a large capacity that exceeds the capacity of the multimeter may cause damage to the multimeter.
- Before starting each test, set the multimeter at the high capacity range first, then gradually down to low capacity ranges in order to ensure that you have the correct range and do not damage the multimeter.

REGULATED VOLTAGE INSPECTION

If the engine is running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area.

The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death.



NOTE

Before performing this test, be sure that the battery is in good condition. Use of a battery with low charge will result in different readings. Start the engine and warm it up to normal operating temperature, then turn the ignition switch "OFF".

Remove the battery cover (page 2-6).

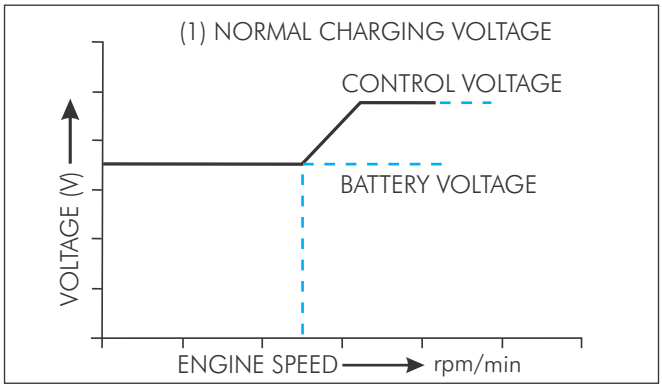
Connect the multimeter between battery terminals.

CAUTION

- To prevent short circuit, make absolutely certain which are the positive and negative terminals or cable.
- Do not disconnect the battery or any cable in the charging system without switching "OFF" the ignition switch. Failure to follow this precaution can damage the multimeter or electrical components.

Start the engine and increase the engine speed gradually.

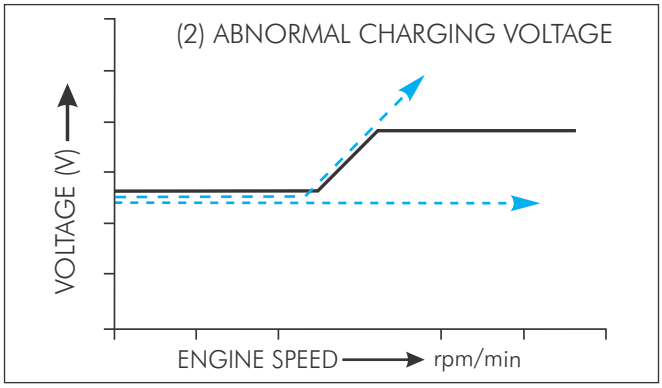
Read the multimeter.



Battery regulated voltage: 14.5±0.2 V (with the charged battery)

The speed at which voltage starts to rise cannot be checked as it varies with the temperature and loads of the generator.

A frequently discharged battery is an indication that it is deteriorated even if it proves normal in the regulated voltage inspection.



CURRENT LEAKAGE TEST

Remove the seat (page 2-5).

Remove the battery cover (page 2-6).

Turn the ignition switch "OFF" and disconnect the negative (-)ve cable from the battery.

Connect the multimeter (+)ve probe to the battery negative cable and the multimeter (-)ve probe to the battery negative terminal.

With the ignition switch "OFF", check for current leakage.

Current leakage: 1.0 mA (maximum)

If current leakage exceeds the specified value a shorted circuit is likely.

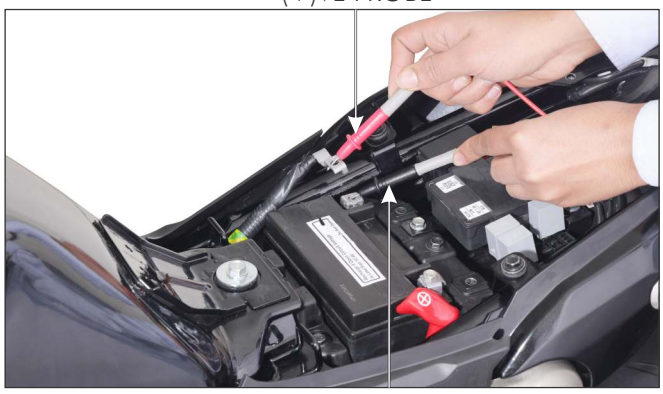
NOTE

When measuring current using a multimeter, set it to a high range and then bring the range down to an appropriate level. Current flow larger than the range selected may blowout the fuse in the multimeter.

CAUTION

While measuring current, do not turn the ignition switch "ON". A sudden surge of current may blowout the fuse in the multimeter.

(+)VE PROBE



(-)VE PROBE

REGULATOR/RECTIFIER

REMOVAL

Remove the right side tank cover (page 2-6).

Disconnect the ACG 3P connector.

Disconnect the regulator/rectifier 3P connector.

Remove the regulator/rectifier by removing nuts (Nos. 2).

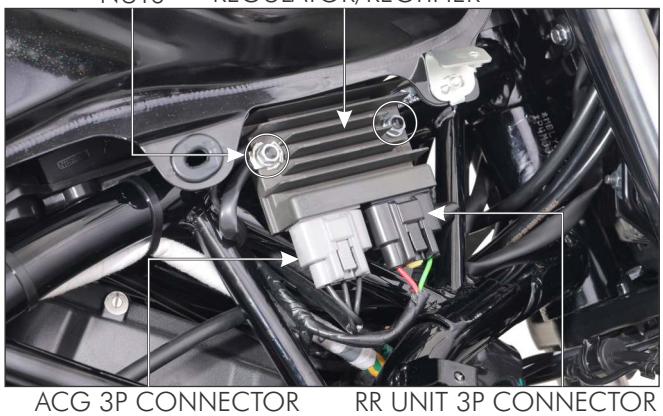
INSTALLATION

Installation is in the reverse order of removal.

NOTE

Route the wire harness properly.

NUTS REGULATOR/RECTIFIER



ACG 3P CONNECTOR RR UNIT 3P CONNECTOR

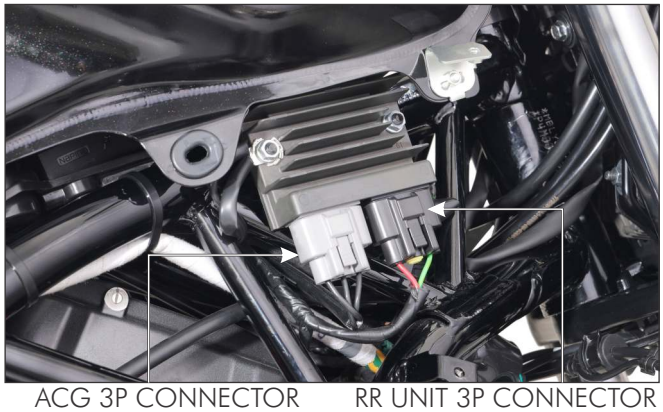
WIRE HARNESS INSPECTION

Remove the right side tank cover (page 2-6).

Disconnect the ACG 3P connector.

Disconnect the regulator/rectifier 3P connector.

Check the connectors for loose or corroded terminal.



ACG 3P CONNECTOR RR UNIT 3P CONNECTOR

INSPECTION

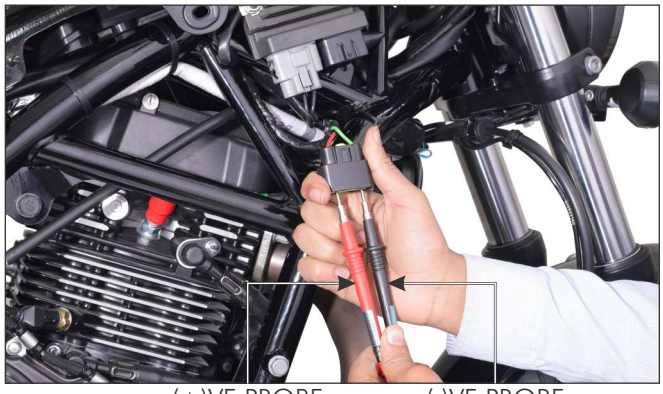
Check the voltage between red wire & green.

STANDARD: BATTERY VOLTAGE

CONNECTION

(+)VE PROBE: RED WIRE

(-)VE PROBE: GREEN



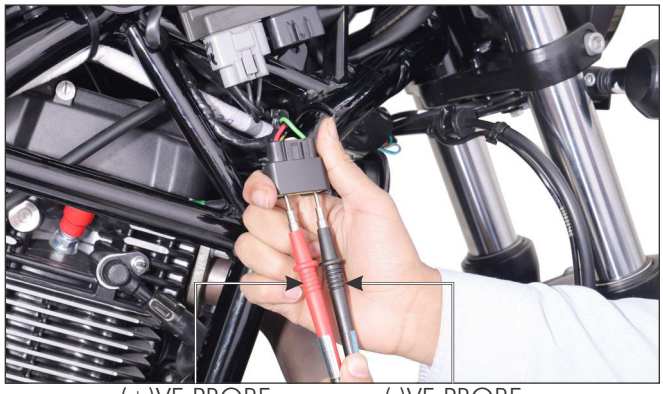
Check the resistance between red and green wire.

CONNECTION

(+)VE PROBE: RED WIRE

(-)VE PROBE: GREEN WIRE

STANDARD: 0.560±10% Ω



Check the continuity between black and black wire in ACG 3P connector.

STANDARD: CONTINUITY

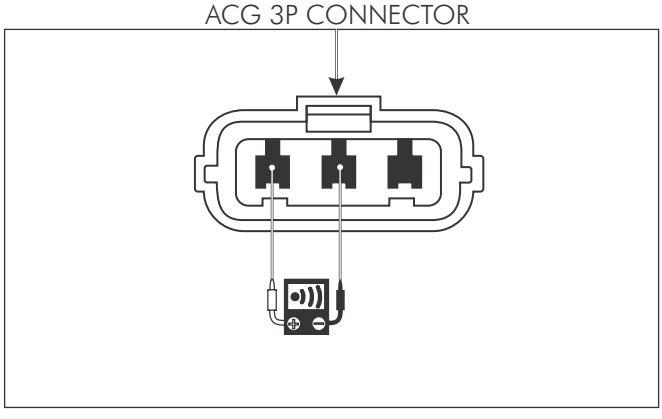
If all components of the charging system are normal and there are no loose connection at the regulator/rectifier connectors, replace the regulator/rectifier unit.

INSTALLATION

Installation is in the reverse order of removal.

NOTE

Route the wire harness properly.



CHARGING LINE

NOTE

- This inspection can be performed with the alternator stator installed.
- Disconnect the alternator connector.

Remove the right side tank cover (page 2-6).

Disconnect the ACG 3P connector.

Measure the stator coil resistance between each connector terminal.

CONNECTION

(+)VE PROBE: BLACK

(-)VE PROBE: BLACK

STANDARD: 0.560±10% Ω

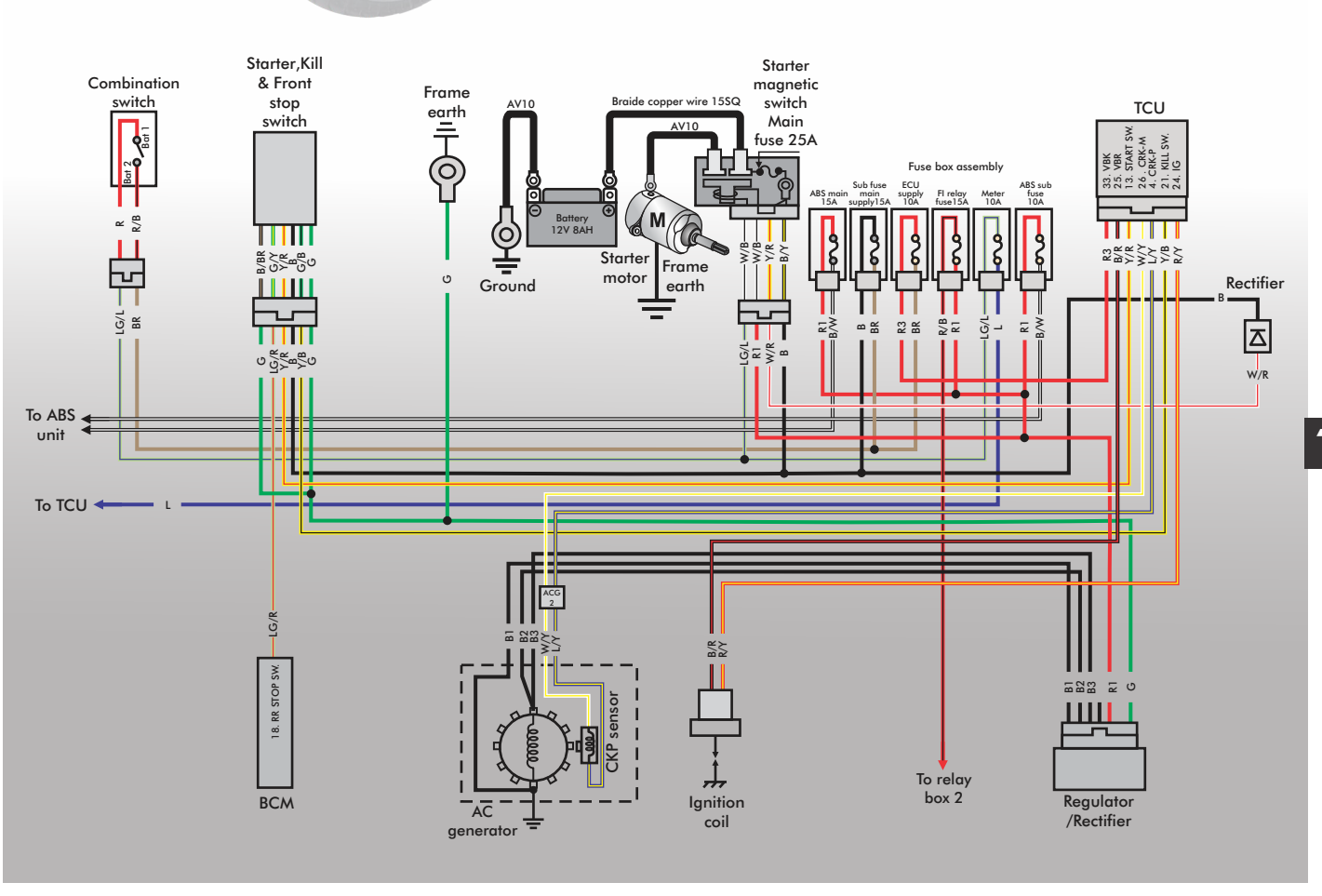
If the stator coil reading is out of specification, check the wiring harness if ok then replace the stator (page 10-6).

ACG 3P CONNECTOR

INSTALLATION

Installation is in the reverse order of removal.

SYSTEM DIAGRAM



SERVICE INFORMATION

⚠ WARNING

- If the engine is running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area.
- The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death.

CAUTION

- The ECU may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn off the ignition switch before servicing.
- Use spark plug of the correct heat range. Using spark plug with an incorrect heat range can damage the engine.

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is "ON" and current is present.
- When checking the ignition system, always follow the steps in the troubleshooting sequence (page 18-2).
- A faulty ignition system is often related to poor connections. Check those connections before proceeding. Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plug.
- For Programmed FI troubleshooting information (page 5-24).
- For alternator/starter clutch removal and installation, see **(SECTION 10).**
- The following components information

- Ignition switch (page 20-16).
- Clutch switch (page 20-23).
- Neutral switch (page 20-13).
- ECU (page 5-22).

SPECIFICATIONS

IGNITION SYSTEM

ITEM			SPECIFICATIONS
Spark plug	Standard		Federal Mogul REK6YC
	Spark plug gap		0.8-0.9 mm
Peak voltage	CKP sensor		1.5 V (Minimum) @ 300 r/min @ 1.1 mm gap
Ignition coil	Primary coil resistance		1.98 Ω±12%
	Secondary coil resistance	With noise suppressor cap	13.50 kΩ±16%
		Without noise suppressor cap	11.9-15.1 kΩ±12%
CKP sensor resistance			109-164 Ohms

TROUBLESHOOTING

Inspect the following before diagnosing the system.

- Faulty spark plug
- Loose noise suppressor cap or spark plug wire
- Water got into the noise suppressor cap (Leaking the ignition coil secondary voltage)

UNUSUAL CONDITION		PROBABLE CAUSE (CHECK IN NUMERICAL ORDER)
Ignition coil primary voltage	No primary voltage (battery voltage) with the ignition switch "ON"	1. Open circuit in primary wire (incase when "NO CONTINUITY" is observed between PIN-24 of ECU and ignition coil (+)ve terminal) (page 5-39). 2. Faulty 10A fuse. 3. Loose connections at battery terminals or open circuit in battery cables. 4. Battery undercharged or discharged. 5. Open circuit in ECU green wire. 6. Faulty ECU (incase when above 1-5 are normal and battery voltage in not observed at PIN-25 (page 5-24) of ECU).
	Primary voltage is normal, but does not spark.	1. Faulty noise suppresser cap. 2. Faulty spark plug or leaking ignition coil secondary current. 3. Faulty ignition coil. 4. Faulty ECU.
CKP sensor	Peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/ DCV. 2. Cranking speed is too slow (Battery is undercharged). 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltge is over the standard voltage at lease once). 4. Faulty ECU (In case when above No. 1-3 are normal).
	No peak voltage	1. Faulty peak voltage adaptor 2. Faulty CKP sensor

IGNITION SYSTEM INSPECTION

Inspect the ignition switch.

Remove the noise suppressor cap from the plug, install a known good spark plug to the noise suppressor cap and ground it to the engine.

Turn the ignition switch "ON" and crank the engine.

Spark should jump at the plug.

If there is no spark, check the ignition circuit.

NOTE

If no spark jumps at the plug, check all connections for loose or poor contact before measuring voltage.

SPARK PLUG

NOISE SUPPRESSOR CAP

IGNITION COIL PRIMARY VOLTAGE

NOTE

- Check the system connections before inspection. Poor connected connectors can cause incorrect readings.
- Check that the cylinder compression is normal and the spark plug is installed correctly into the cylinder head.

Remove the left side tank cover (page 2-8).

Disconnect the ignition coil 2P connector.

IGNITION COIL 2P CONNECTOR

IGNITION COIL

Connect the multimeter (+) probe and (-) probe as shown.

CONNECTION

Black/Red: (+)ve terminal

Red/Yellow: (-)ve terminal

Turn the ignition switch ON.

Check for initial voltage at this time, battery voltage should be present.

Voltage: Battery Voltage

If the initial voltage cannot be measure, check the power supply circuit.

For ignition system troubleshooting (page 18-2).

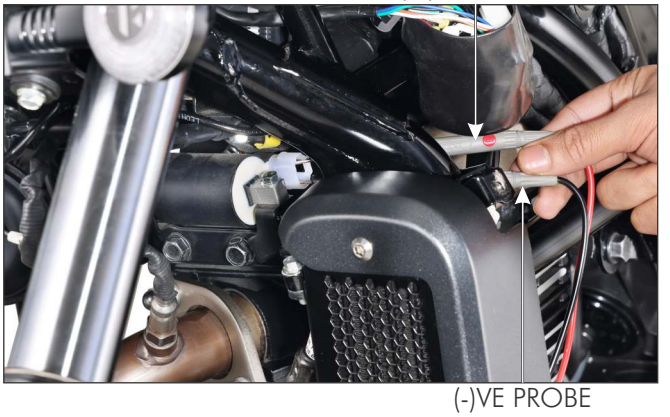
⚠ WARNING

To avoid possible electrical shock during voltage measurements, do not touch test probe metal parts.

It the voltage is abnormal, check for an open circuit or poorly connected 2P connector.

If no defects are found in the harness, refer to the troubleshooting chart (page 18-2).

(+)VE PROBE



(-)VE PROBE

IGNITION COIL

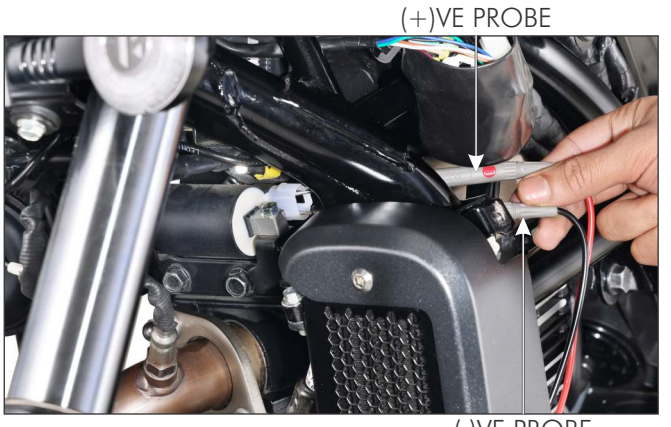
Remove the left side tank cover (page 2-8).

Disconnect the ignition coil 2P connector (page 18-3).

INSPECTION

Measure the primary coil resistance between the connector terminals.

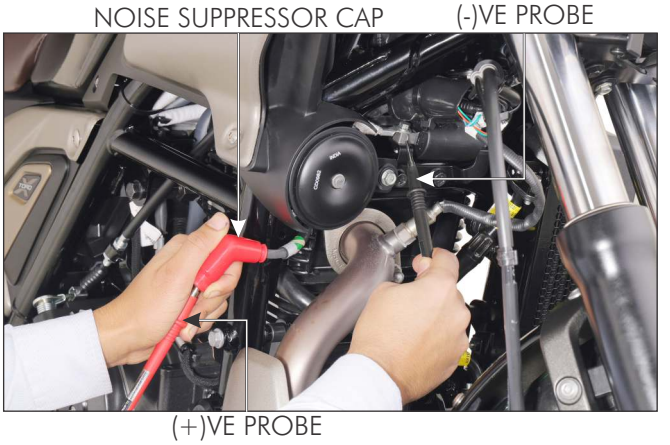
Standard: 1.98 Ω±12%



SECONDARY COIL

Remove the noise suppressor cap from the spark plug wire (HT cable) and measure the secondary coil resistance between the spark plug wire and ignition coil ground.

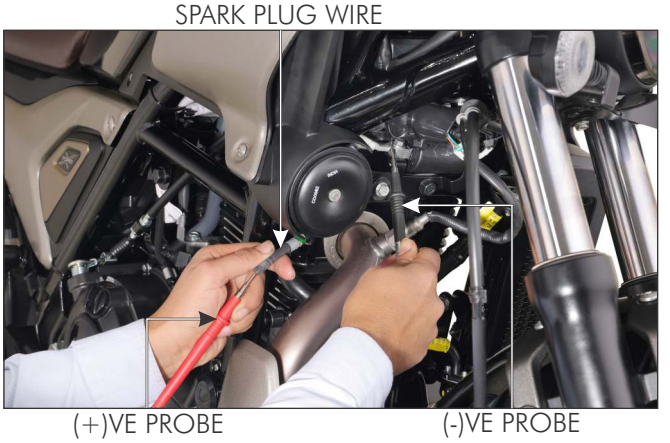
SECONDARY COIL RESISTANCE (WITH NOISE SUPPRESSOR CAP): 13.50 kΩ±12%



If the resistance is out of range, remove the noise suppressor cap from the spark plug wire (HT cable) and measure the secondary coil resistance between the spark plug wire and ignition coil primary connector terminal.

SECONDARY COIL RESISTANCE (WITHOUT NOISE SUPPRESSOR CAP): 18.50 kΩ±37%

Installation is in the reverse order of removal.



REMOVAL

Remove the left side tank cover (page 2-8).

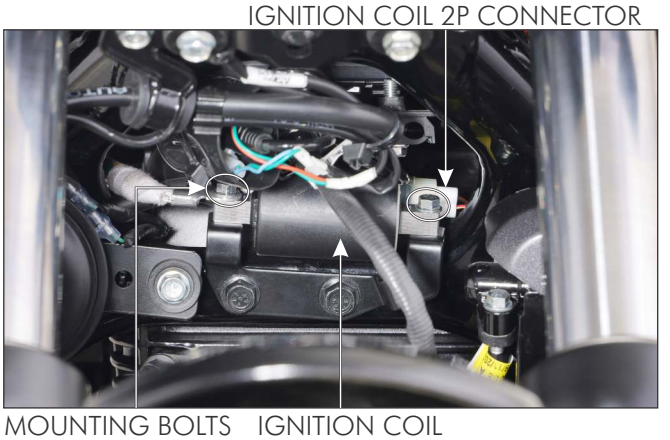
Disconnect the ignition coil 2P connector.

Remove the spark plug cap from the spark plug.

Remove the ignition coil mounting bolts (Nos. 2) and the ignition coil from the frame.

INSTALLATION

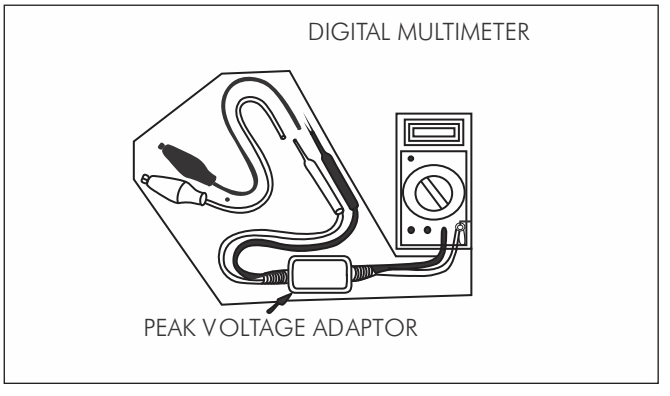
Installation is in the reverse order of removal.



CKP SENSOR PEAK VOLTAGE

NOTE

- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Install the spark plug into the cylinder head and measure the peak voltage under normal cylinder compression.
- The reading differs depending on the multimeter input impedance. Therefore, use only commercially available multimeter with the input impedance higher than 10MΩ/ DCV.



Disconnect the ECU 44P connector from the ECU (page 5-22).

Connect the peak voltage adaptor (+) probe and (-) probe as shown.

TOOL

PEAK VOLTAGE ADAPTOR
MULTIMETER

CONNECTION

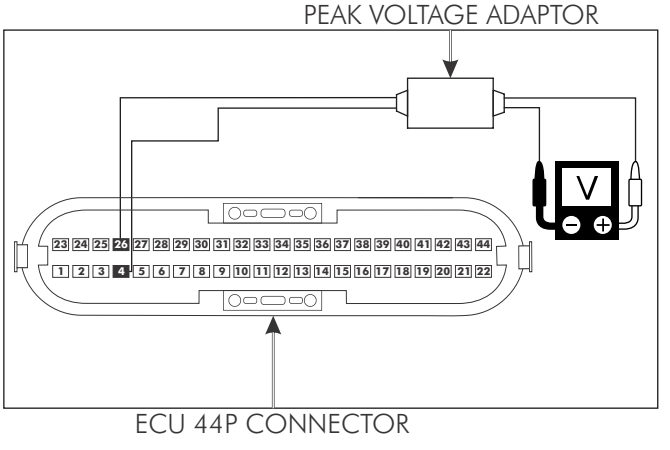
Pin- 4 and Pin- 26

Crank the engine and read the CKP sensor peak voltage.

Peak voltage: 1.5V (Minimum) @ 300 r/min @ 1.1 mm gap

If the peak voltage measured at the ECU 44P connector is abnormal, measure the peak voltage at the CKP sensor connector.

Disconnect the CKP sensor 2P connector and connect the tester probes to the terminal.



CONNECTION

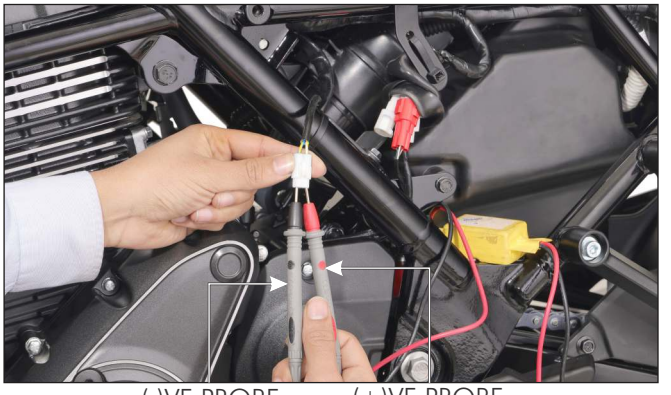
Blue and White

Connect the peak voltage adaptor (+)ve probe and (-)ve probe to the wire connector terminal.

Measure the peak voltage and compare it to the voltage measured at the ECU 44P connector.

NOTE

- If the peak voltage measured at the ECU is abnormal and the one measured at the CKP sensor is normal check the 2P connector for loose connection and the wire harness for an open circuit or loose connection.
- If both peak voltage measured are abnormal, refer to the troubleshooting chart (page 18-3).
- If all items are normal, the CKP sensor is faulty. For CKP sensor replacement.



(-)VE PROBE (+)VE PROBE

CKP SENSOR INSPECTION

NOTE

It is not necessary to remove alternator stator and CKP sensor to make this inspection.

Remove the left side cover (page 2-14).

Disconnect the CKP sensor 2P wire connector. Measure the CKP sensor resistance.

INSPECTION

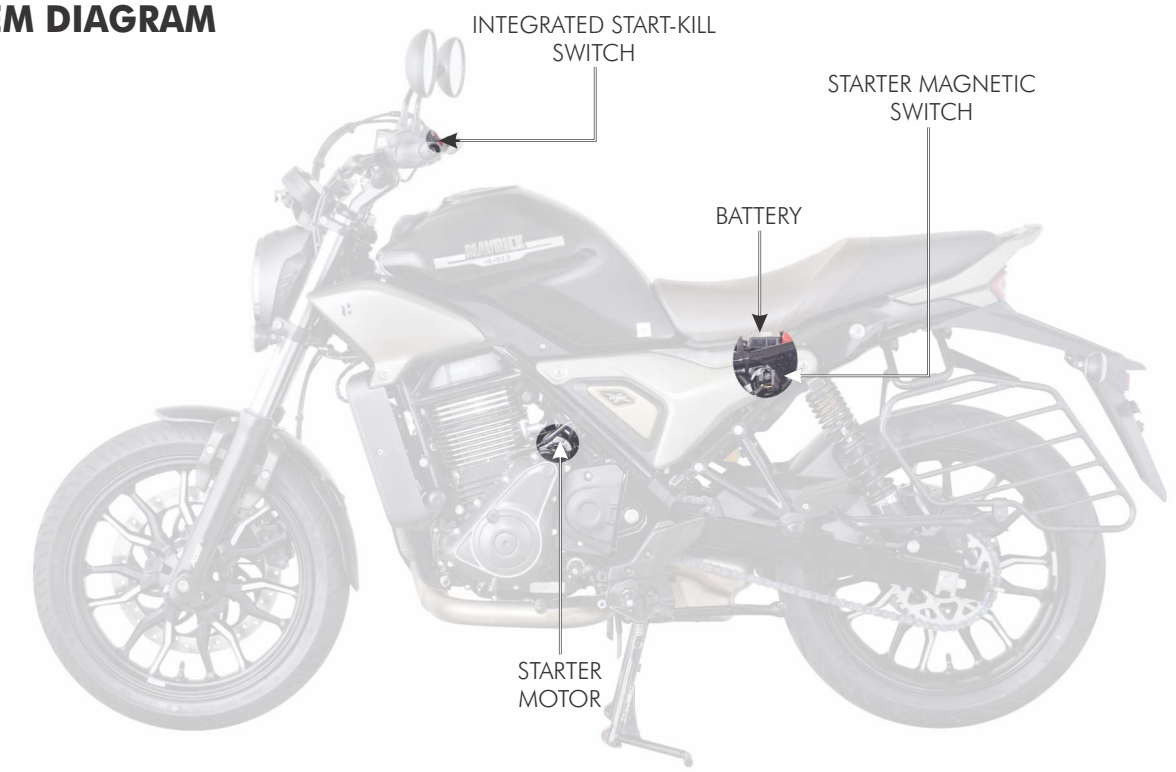
White/Yellow-Blue/Yellow

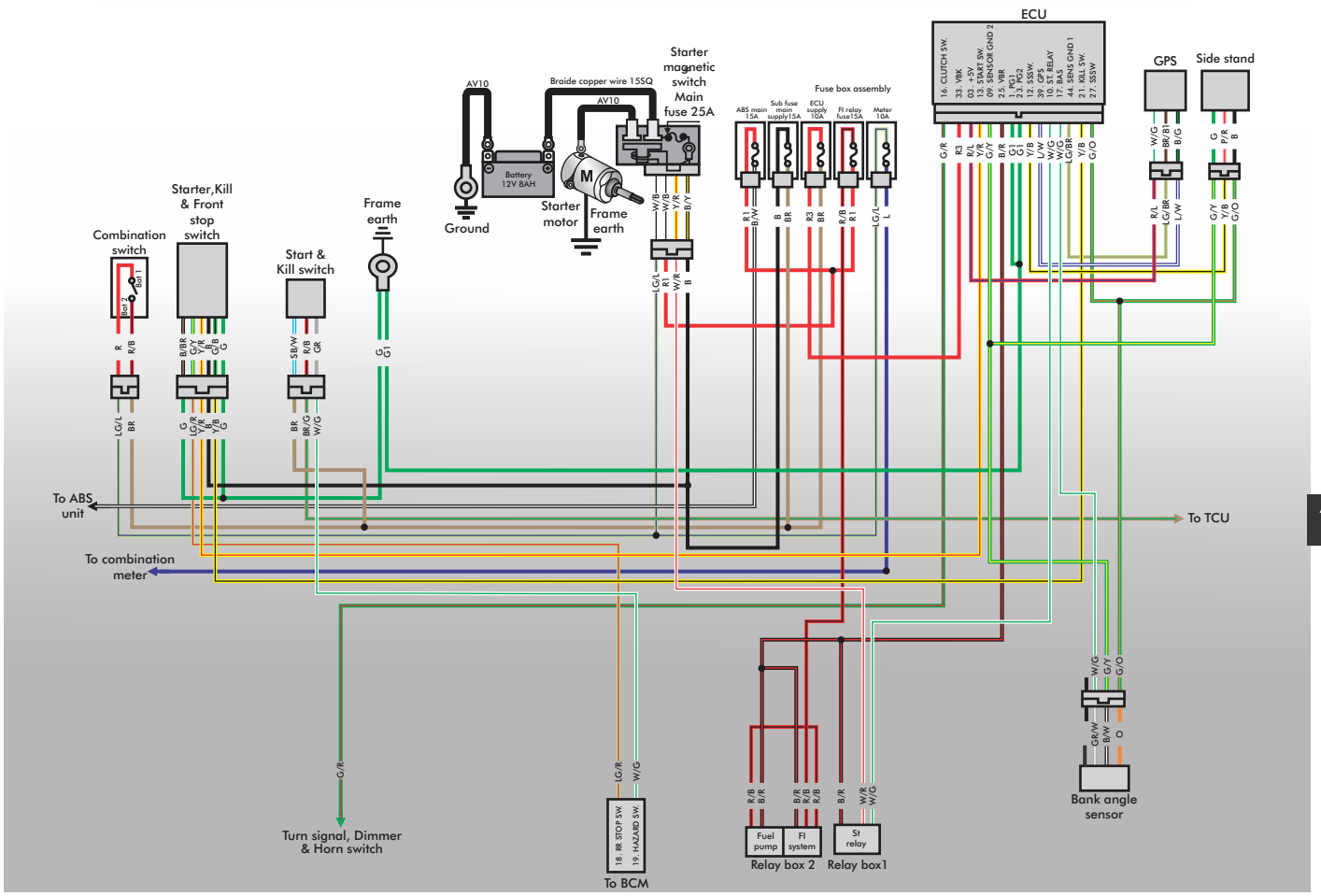
Standard: 1.98 Ω ± 12%

For ignition CKP sensor replacement (page 10-6).

(-)VE PROBE (+)VE PROBE

SYSTEM DIAGRAM





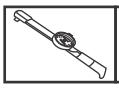
SERVICE INFORMATION

GENERAL

⚠ WARNING

- Always turn the ignition switch "OFF" before servicing the starter motor. The motor could suddenly start, causing serious injury.
- If the current keeps flowing through the starter motor to operate it while the engine is unable to crank, the starter motor may be damaged.

- The starter motor can be serviced with the engine in the frame.
- When checking the starter system, always follow the steps in the troubleshooting flow chart (page 19-2).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- For the starter clutch servicing (page 10-10).
- Refer to the following components information.
  - Ignition switch (page 20-16).
  - Starter magnetic switch (page 19-4).
  - Neutral switch (page 20-13).
  - Clutch switch (page 20-23).



TORQUE VALUES

BATTERY BOX MOUNTING BOLT	**: 0.8-1.2 kgf-m**

For other nuts, bolts, fasteners etc. refer to standard torque values **(SECTION-1)**.

TROUBLESHOOTING

Starter motor will not turn

- Dead battery,
- Blown starter-motor fuse,
- Faulty starter-motor relay,
- Side stand being down while the bike is in gear.
- Engine start-stop switch being in the "OFF" position.

The starter motor turns when the transmission is in neutral, but does not turn with the transmission in any gear position except neutral.

- Faulty clutch switch

Starter Motor turns engine slowly

- Low battery voltage
- Poorly connected battery cables
- Poorly connected starter motor cable
- Poorly connected battery ground cable
- Faulty starter motor

Starter Motor turns, but engine does not crank

- Starter motor is running backwards
  - Terminals connected improperly
- Faulty starter clutch
- Damaged or faulty starter drive gear, driven gear, idle gear and/or reduction gear

Starter Relay "CLICKS", but engine does not crank

- Crankshaft does not turn due to engine problems

STARTER MOTOR

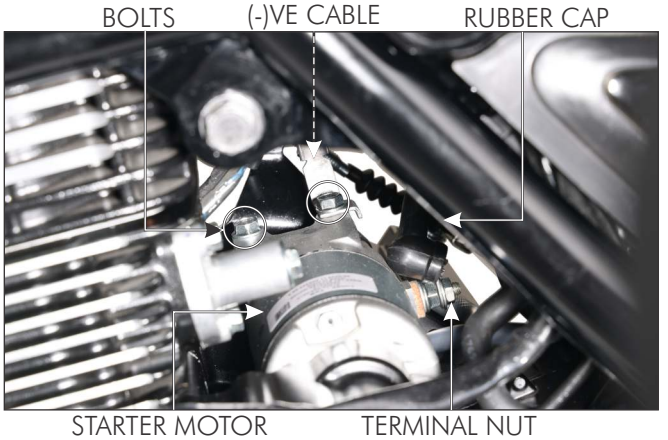
REMOVAL

⚠ WARNING

Always turn the ignition switch "OFF" before servicing the starter motor.

Remove the rubber cap and then hold the terminal nut of starter motor to remove the cable mounting nut and cable from the starter motor.

Remove the two mounting bolts, disconnect the battery negative (-)ve cable and the starter motor.



Replace the starter motor with the new one, if required.

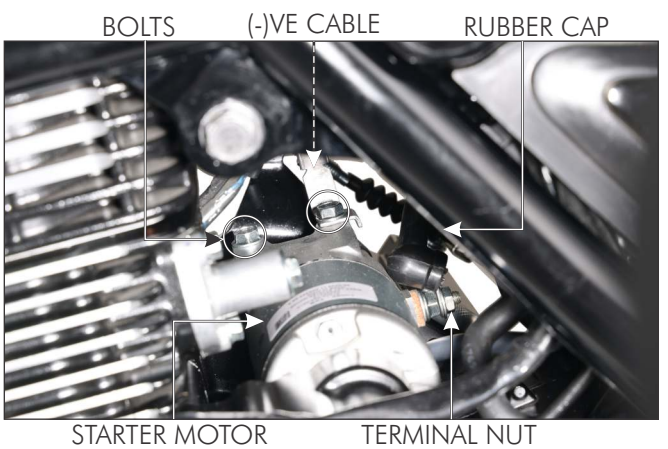
INSTALLATION

Install the starter motor in place.

Install the two mounting bolts with the ground cable and tighten the bolts securely.

Install the starter motor cable and tighten the nut securely.

Install the terminal cover over the cable terminal properly.



STARTER MAGNETIC SWITCH

INSPECTION

Shift the transmission into neutral.

Turn the ignition switch "ON" and press the starter switch. The starter magnetic switch coil is normal, if it clicks.

If it does not click, check the starter magnetic voltage and ground circuit.

STARTER MAGNETIC SWITCH VOLTAGE

Remove the left side cover (page 2-14).

Disconnect the starter magnetic switch 4P connector.

Measure the voltage between the white/red wire terminal of the start mag switch connector and body ground.

There should be battery voltage when the starter switch is pressed with the ignition switch "ON".

STARTER MAGNETIC SWITCH CONNECTOR

(+)VE PROBE (+)VE PROBE

STARTER MAGNETIC SWITCH GROUND CIRCUIT

Check for continuity between the red wire terminal of the start magnetic switch connector and body ground.

There should be no continuity when the transmission is in neutral and/or the clutch lever is pressed.

(+)VE PROBE

(-)VE PROBE

REMOVAL

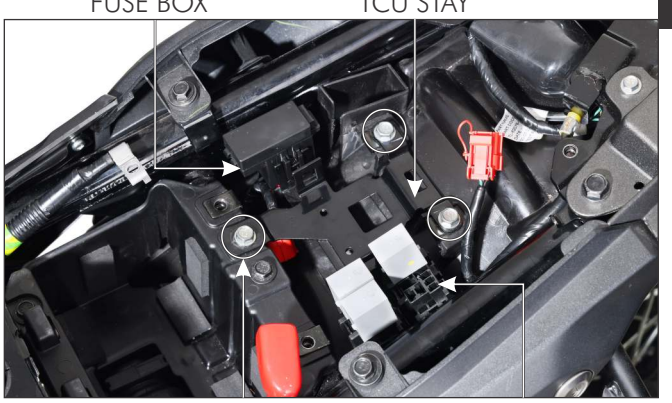
Remove the battery (page 17-5).

Disconnect the starter magnetic switch connector (page 19-4).

Dismount the relay box, TCU and fuse box.

Remove the TCU stay mounting bolts (Nos.:3, Size 10 mm).

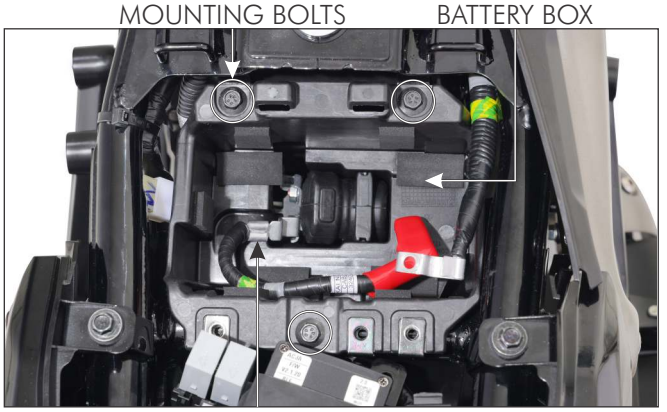
FUSE BOX TCU STAY



MOUNTING BOLTS RELAY BOX

Remove the battery (+)ve cable from the starter magnetic switch.

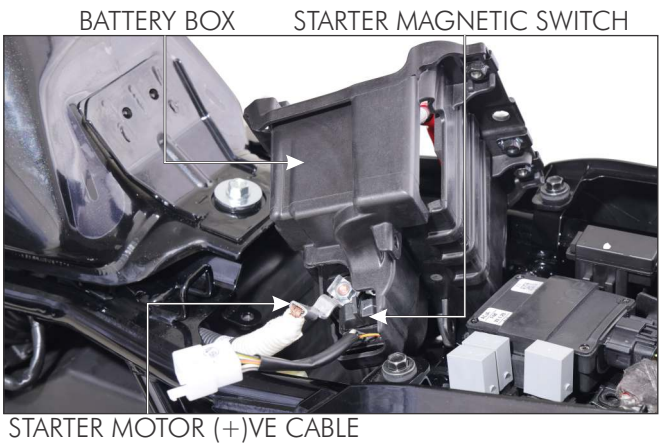
Remove the battery box mounting bolts (Nos. 3).



Pull the battery box up side.

Disconnect the starter motor (+)ve cable from the starter magnetic switch.

Remove the starter magnetic switch from the inside the battery box side.



INSTALLATION

Installation is in reverse order of removal.

TORQUE

BATTERY BOX MOUNTING BOLT: 0.8-1.2 kgf-m

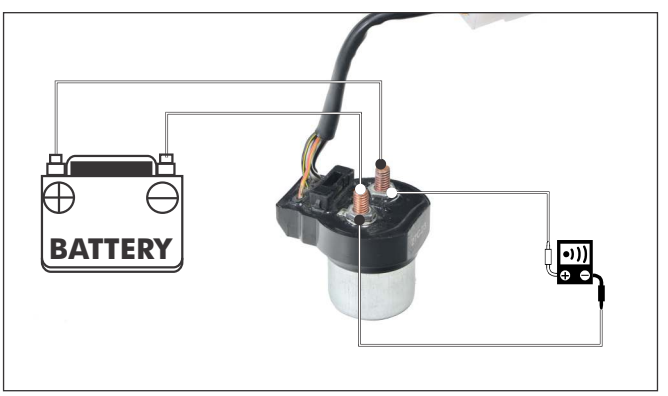
OPERATION CHECK

Remove the starter magnetic switch from the inside the battery box side (page 19-5).

Connect an multimeter to the starter cable terminals. Connect the 12V battery to the starter magnetic switch terminal as shown.

The starter magnetic switch is normal, if there is continuity between the cable terminals when the battery is connected, and no continuity when the battery is disconnected.

Installation is in the reverse order of removal.



NOTE

SOME IMAGES IN THIS MANUAL MAY COME FROM DIFFERENT MODEL/VARIANT THAN THE ONE COVERED BY THIS MANUAL. NEVERTHELESS, THE IMAGES REMAIN ACCURATE AND APPLICABLE FOR THE SPECIFIC TASK OR INFORMATION PRESENT IN THE ACCOMPANYING TEXT. WHILE CERTAIN COMPONENTS IN THE IMAGES MAY APPEAR DIFFERENT, THEY DON'T AFFECT THE STEPS, TOOLS, OR SAFETY PRECAUTIONS FOR THE TASKS DESCRIBED.

SERVICE INFORMATION

GENERAL

- All plastic connectors have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
- To isolate an electrical failure, check the continuity of the electrical path through the part. A continuity check can usually be made without removing the part from the motorcycle. Simply disconnect the connectors and connect a continuity tester to the terminals or connections.
- A continuity tester is useful when checking to find out whether or not there is an electrical connection between the two points. An ohmmeter is needed to measure the resistance of a circuit, such as when there is a specific coil resistance involved or when checking for high resistance caused by corroded connections.
- Check the battery condition before performing any inspection that requires proper battery voltage.

SPECIFICATIONS

LAMPS/METERS/SWITCHES

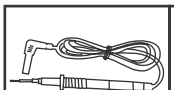
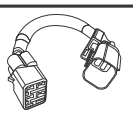
ITEM			SPECIFICATIONS
LED	Headlamp	Driving beam	29V, 25.6W (LED)
		Passing beam	19V, 17.5W (LED)
		DRL	13.5V, 11.5W (LED)
	Position lamp		13.5V, 2.5W
	Tail/Stop lamp		7.0V, 2.1W/ 7.0V, 0.7W (LED)
	Turn signal lamp		LED
	Licence plate lamp		LED
	Neutral indicator		LED
	Malfunction indicator lamp (MIL)		LED
	Low fuel indicator		LED
	Low oil pressure indicator		LED
	Service reminder indicator		LCD
	Turn signal indicator (RH/LH)		LED x 2 nos.
	High beam indicator		LED
	ABS indicator		LED
	Side stand indicator		LED
	Fog lamp indicator (Optional)		LED
Fuse	Starter magnetic switch		25A (Main fuse) & 25A (Spare fuse)
	Fuse box		15Ax3 nos., 10Ax3 nos. (Main fuse) & 15A, 10A (Spare fuse)
Float resistance		Full (top position)	8±1.3 Ω
		Empty (bottom position)	282±2.8 Ω

TORQUE VALUES

IGNITION SWITCH ALLEN KEY BOLT : 2.0 kgf-m

For other nuts, bolts, fasteners etc. refer to standard torque values **(SECTION-1)**.

SPECIAL TOOLS

	**MULTIMETER PROBE** **PART NO: 070 HH KTRF 004**
	**HERO VEHICLE COMMUNICATION INTERFACE (HERO VCI)** **PART NO: HMCL0419HVCI01**
	**OBD2 CABLE** **PART NO: HMCL0523HVCI05**

TROUBLESHOOTING

Headlamp does not come "ON" when vehicle is started.

- Faulty LED
- Open circuit in wire harness or loose connection
- Weak or dead battery

Headlamp beam does not shift when dimmer switch is operated.

- Faulty LED
- Faulty dimmer switch

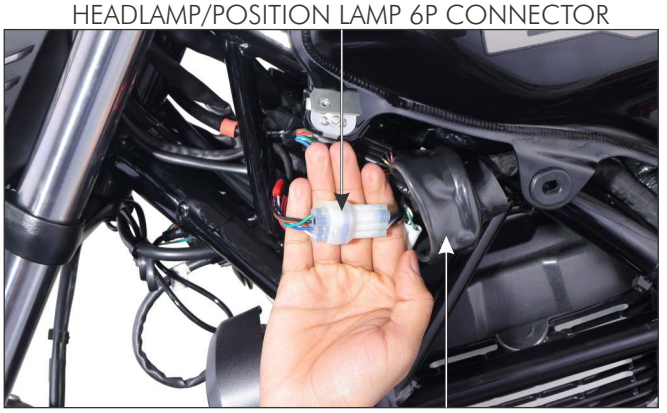
HEADLAMP/POSITION LAMP ASSEMBLY

REMOVAL

Remove the left side tank cover (page 2-8).

Slide the boot and disconnect the headlamp/position lamp 6P connector.

HEADLAMP/POSITION LAMP 6P CONNECTOR



BOOT

Remove the headlamp adjusting bolt (No.: 1, Size 8 mm) from bottom side.

HEADLAMP ADJUSTMENT BOLT

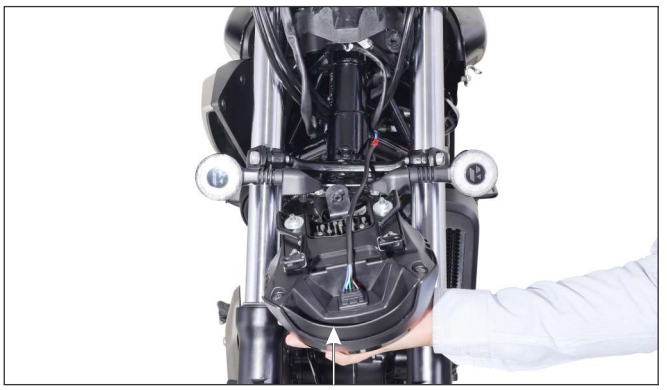
Remove the headlamp mounting bolt with collar (No.: 1, Size: 10 mm) from both side.

MOUNTING BOLT/COLLAR

MOUNTING BOLT/COLLAR

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Remove the headlamp/position lamp from the vehicle.



HEADLAMP/POSITION LAMP

Remove the headlamp/position lamp stay by removing its mounting nuts (Nos.: 4).

HEADLAMP/POSITION LAMP STAY

MOUNTING NUTS

Replace headlamp/position lamp assembly with the new one, if necessary.

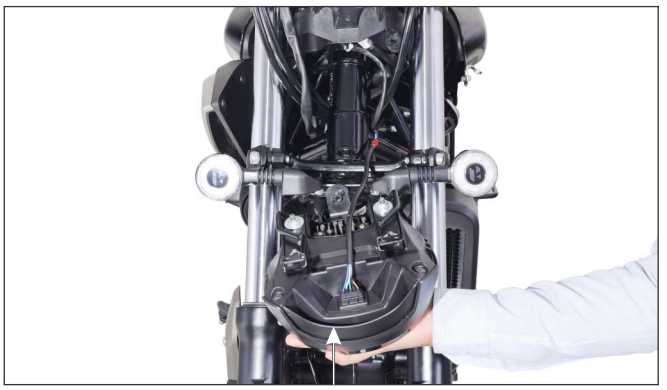
HEADLAMP/POSITION LAMP ASSEMBLY

Note: *Images may depict a different model/variant, but procedures and information remain same.*

INSTALLATION

Installation is in the reverse order of removal.

Adjust the headlamp focus (page 3-28).



HEADLAMP/POSITION LAMP

TAIL/STOP LAMP

REMOVAL

Turn the ignition switch "ON", and check the tail/stop lamp operation.

Check that all LED in the tail/stop lamp unit illuminate with the front brake lever/rear brake pedal applied.

If any LED does not turn "ON", replace the tail/stop lamp assembly.

TAIL/STOP LAMP

Remove the tail/stop lamp assembly (page 2-28).

TAIL/STOP LAMP ASSEMBLY

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Remove the tail/stop lamp assembly stay by removing its screws (Nos.:3).

Replace tail/stop lamp unit with new one, if necessary.

INSTALLATION

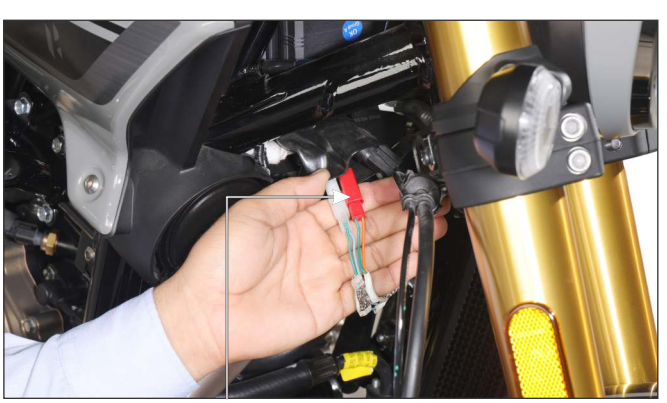
Installation is in the reverse order of removal.

NOTE

Route the cables properly.

FRONT TURN SIGNAL LED LAMP

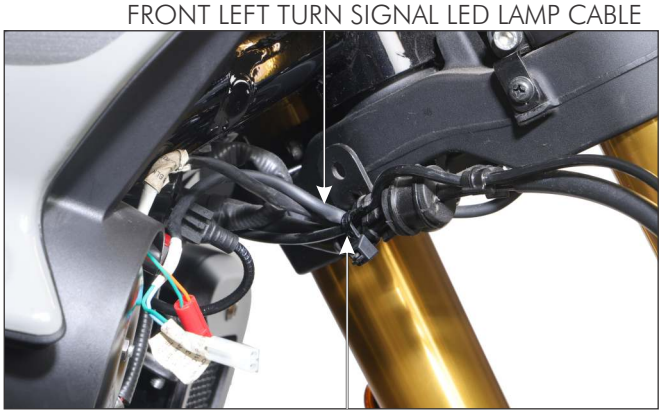
Slide the boot and disconnect the front left turn signal LED lamp 2P connector.



Note: *Images may depict a different model/variant, but procedures and information remain same.*

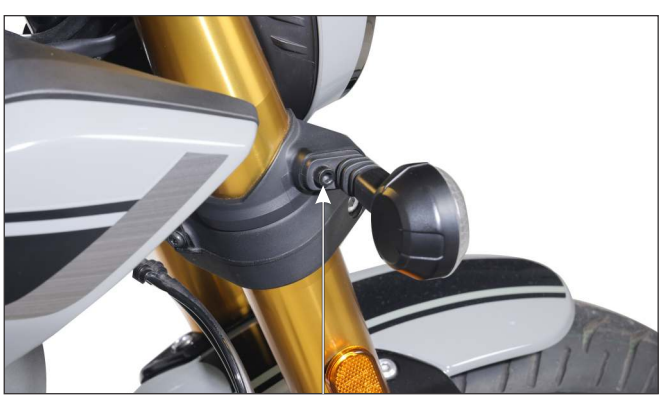
FRONT LEFT TURN SIGNAL LED LAMP CABLE

Remove the front left turn signal LED lamp cable from the tie-wrap mounted on the



TIE-WRAP

Remove the front right turn signal LED lamp allen key bolt (No.: 1, Size: 5 mm)



ALLEN KEY BOLT

Remove the right front turn signal LED lamp from the right front fork.

FRONT LEFT TURN SIGNAL LED LAMP

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Replace right front turn signal LED lamp with new one, if necessary.

Follow the same procedure for the front right turn signal LED lamp.

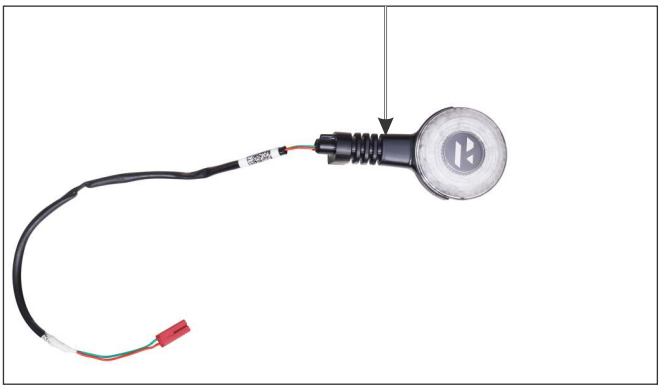
INSTALLATION

Installation is in the reverse order of removal.

NOTE

Route the cable properly (Section-1).

FRONT LEFT TURN SIGNAL LED LAMP



REAR TURN SIGNAL LED LAMP

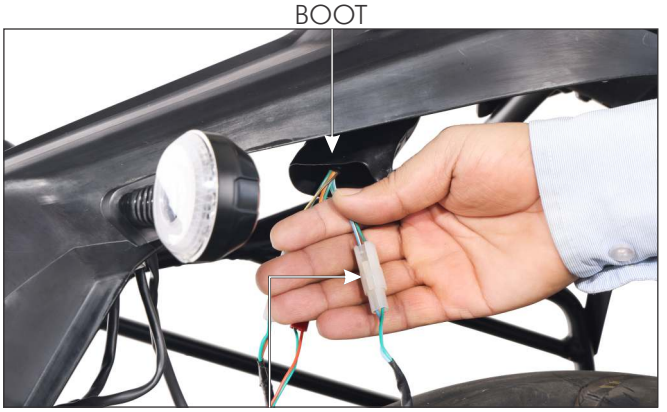
Remove the rear fender inner cover by removing the screws (Nos.: 5).

REAR FENDER INNER COVER

SCREWS

Slide the boot and disconnect the rear right turn signal LED lamp 2P connector.

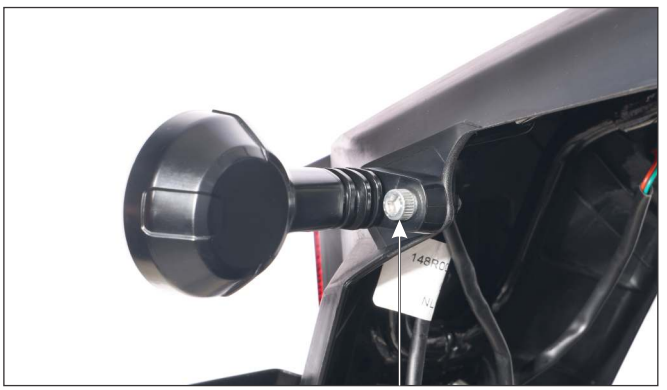
BOOT



2P CONNECTOR

Note: *Images may depict a different model/variant, but procedures and information remain same.*

Remove the rear right turn signal LED lamp allen key bolt (No.: 1, Size: 5 mm)



ALLEN KEY BOLT

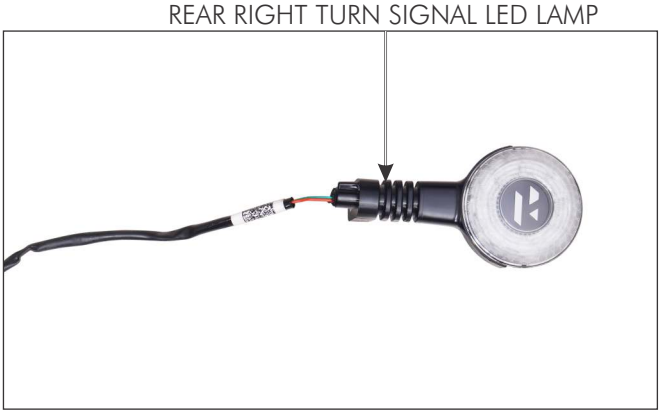
Remove the rear right turn signal LED lamp from the rear fender.

REAR RIGHT TURN SIGNAL LED LAMP

REAR RIGHT TURN SIGNAL LED LAMP

Replace rear right turn signal LED lamp with new one, if necessary.

Follow the same procedure for the rear left turn signal LED lamp.



INSTALLATION

Installation is in the reverse order of removal.

NOTE

Route the cable properly (Section-1).

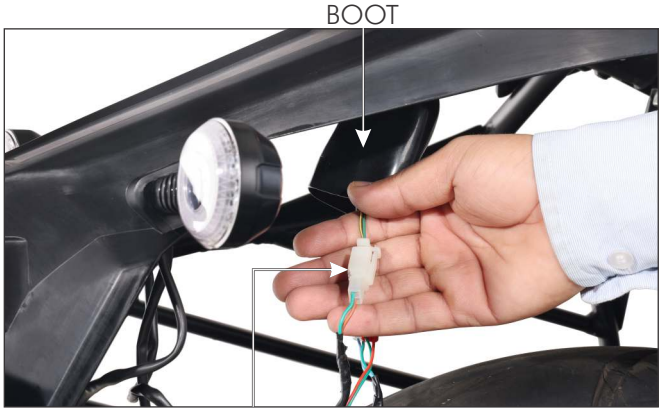
LICENCE PLATE LAMP

REMOVAL

Remove the rear fender inner cover (page 2-27).

Slide the boot and disconnect the licence plate lamp 2P connector.

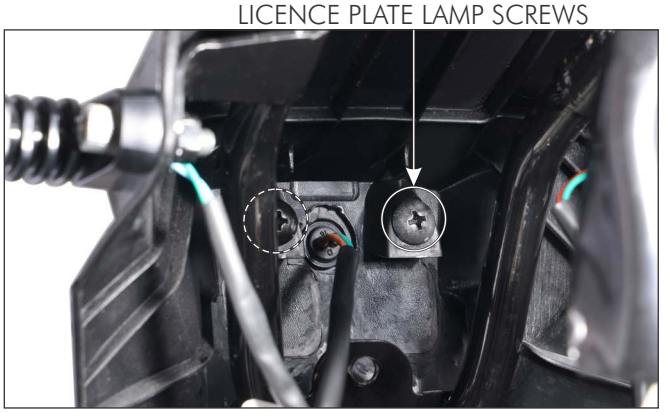
BOOT



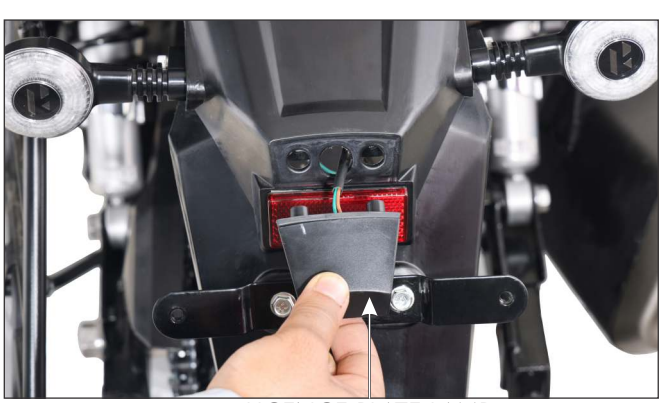
LICENCE PLATE LED LAMP 2P CONNECTOR

Remove licence plate lamp screws (Nos.: 2) from the rear fender bottom side as shown.

LICENCE PLATE LAMP SCREWS



Remove licence plate lamp from the rear fender.



LICENCE PLATE LAMP

Replace licence plate lamp with new one, if necessary.

INSTALLATION

Installation is in the reverse order of removal.

NOTE

Route the cable properly.

LICENCE PLATE LAMP

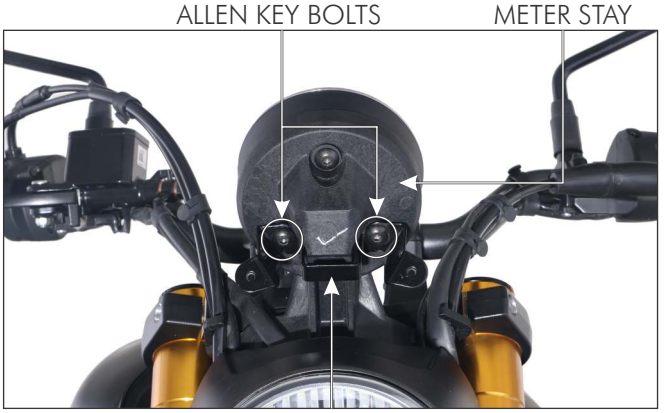
COMBINATION METER

REMOVAL

Remove the headlamp/position lamp assembly (page 20-3).

Remove the front license plate stay by removing its allen key bolts (Nos.: 2, Size: 5 mm) from the meter stay.

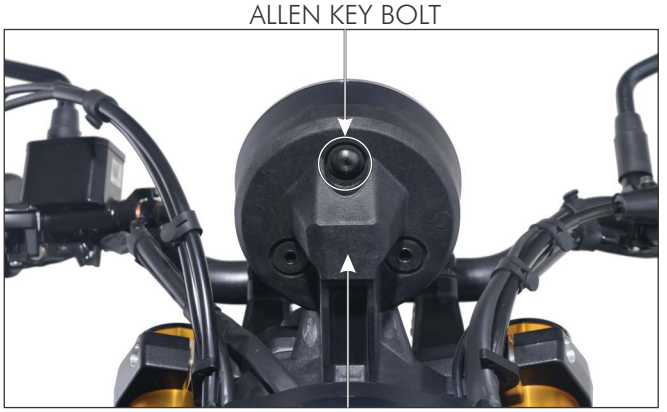
ALLEN KEY BOLTS METER STAY



FRONT LICENCE PLATE STAY

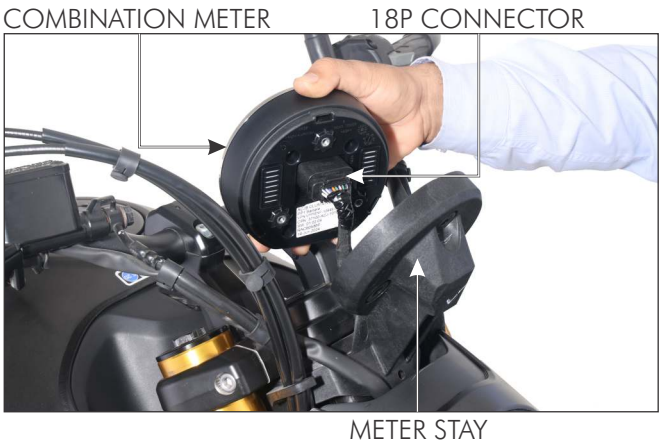
Remove the allen key bolt (Nos.: 1, Size: 5 mm) from the meter stay.

ALLEN KEY BOLT

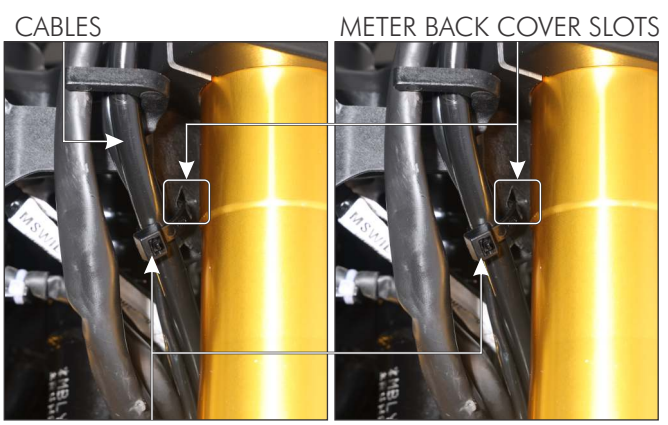


METER STAY

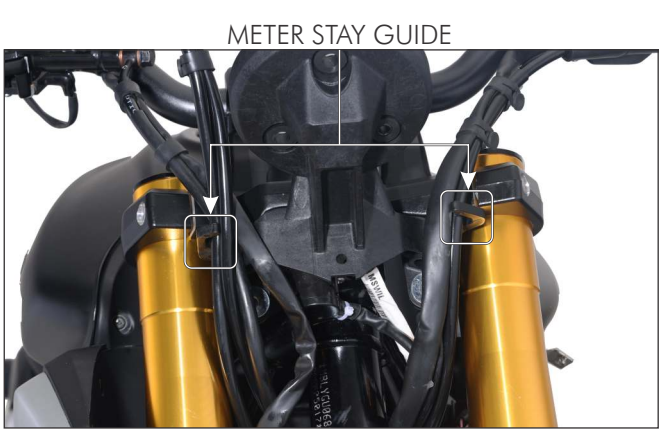
Pull the combination meter towards upper side from the meter stay and disconnect the combination meter 18P connector.



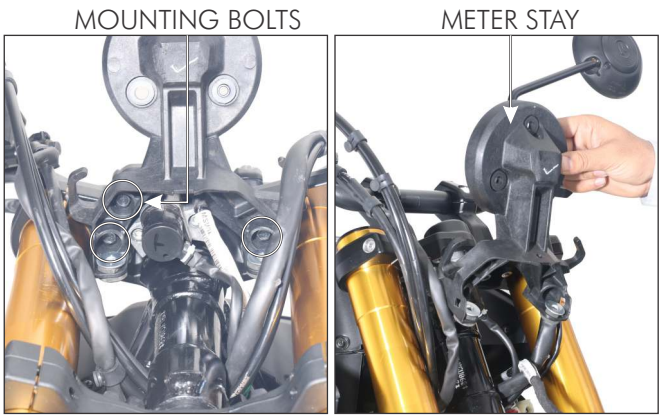
Release the cables from the meter stay slots by removing the tie-wraps.



Release the cables and hoses from the meter stay guide.



Remove the meter stay by removing its mounting bolts (Nos.: 3, Size: 10 mm) from the bottom side.

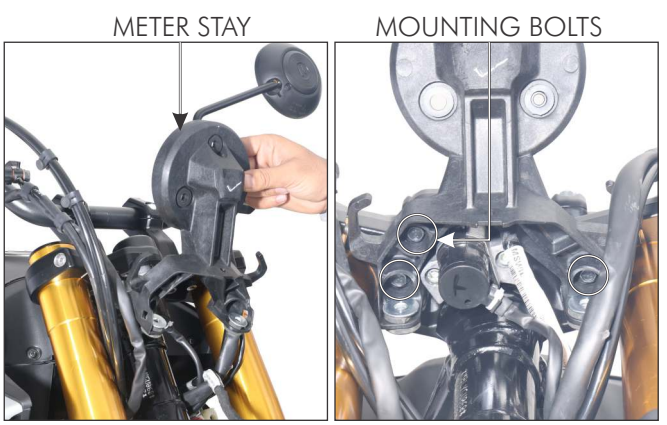


Install the meter stay by installing its mounting bolts (Nos.: 3, Size: 10 mm).

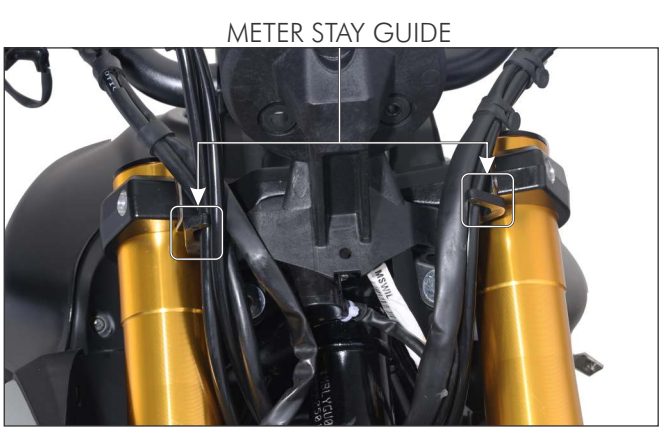
Tighten the meter stay mounting bolts to the specified torque.

TORQUE

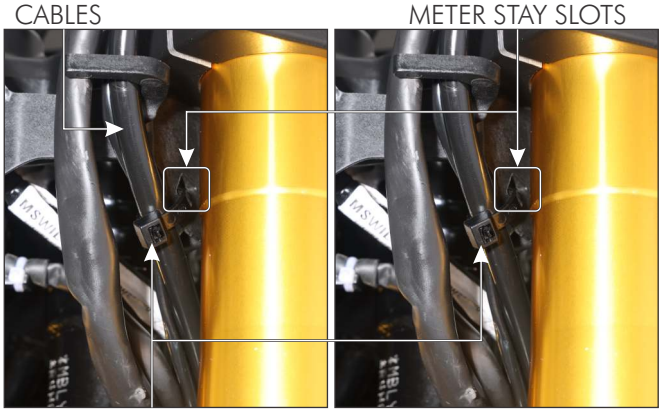
METER STAY MOUNTING BOLT 1.0 kgf-m



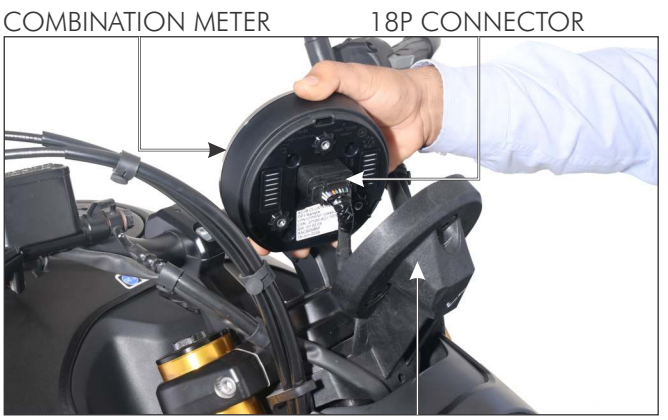
Route the cables and hoses through the meter stay guide.



Tie the cables to the meter stay slots by using a tie-wraps.



Connect the combination meter 18P connector.
Install the combination meter on to the meter stay.



Install the allen key bolt (Nos.: 1, Size: 5 mm) from the meter stay.

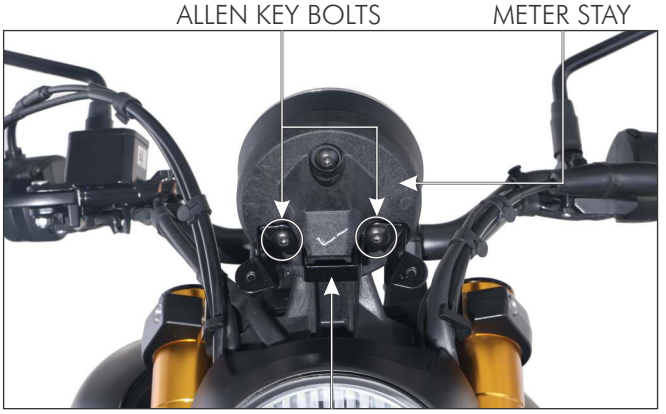
Install the front license plate stay by installing its allen key bolts (Nos.: 2, Size: 5 mm) to the meter stay.

Tighten the allen key bolts to the specified toque.

TORQUE

METER STAY MOUNTING BOLT 1.0 kgf-m

Install the headlamp/position lamp assembly (page 20-3).



NEUTRAL SWITCH

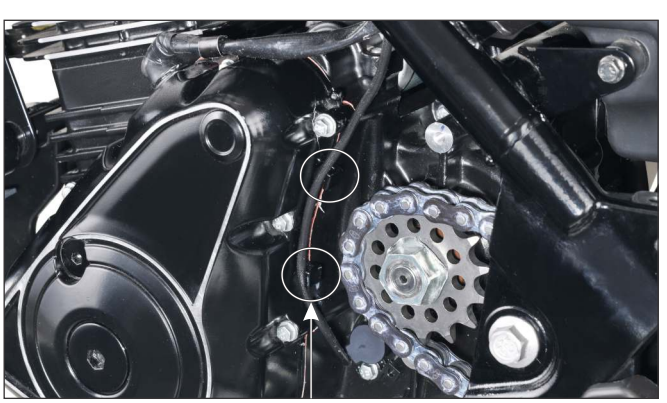
REMOVAL

Remove the left side cover (page 2-14).

Slide the boot and disconnect the neutral switch 3P connector.

Remove the left crankcase rear cover (page 3-23).

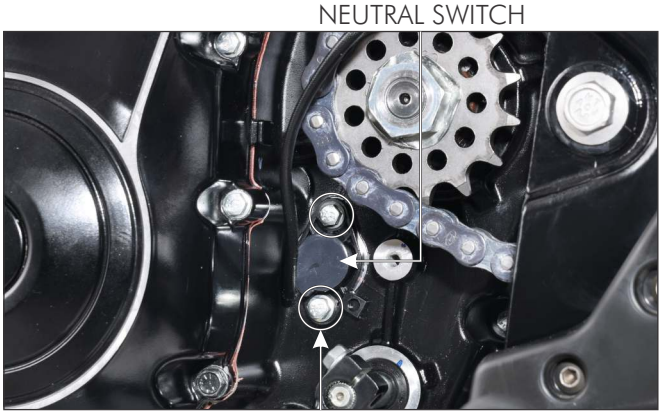
Dislodge the neutral switch wire from the grooves.



Note: *Images may depict a different model/variant, but procedures and information remain same.*

Remove the neutral switch mounting bolts (Nos.: 2).

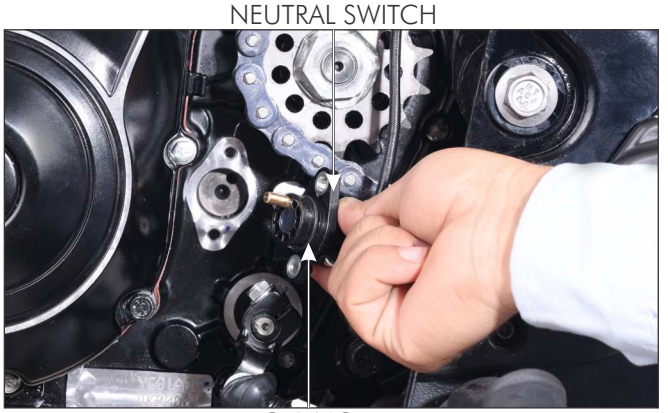
NEUTRAL SWITCH



MOUNTING BOLTS

Remove the neutral switch and O-ring.

NEUTRAL SWITCH



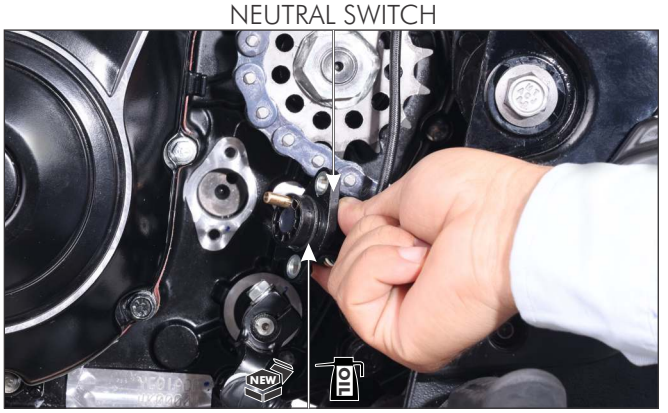
O-RING

INSTALLATION

Apply clean engine oil to a new O-ring and install it to the neutral switch.

Install the neutral switch.

NEUTRAL SWITCH



O-RING

Note: *Images may depict a different model/variant, but procedures and information remain same.*

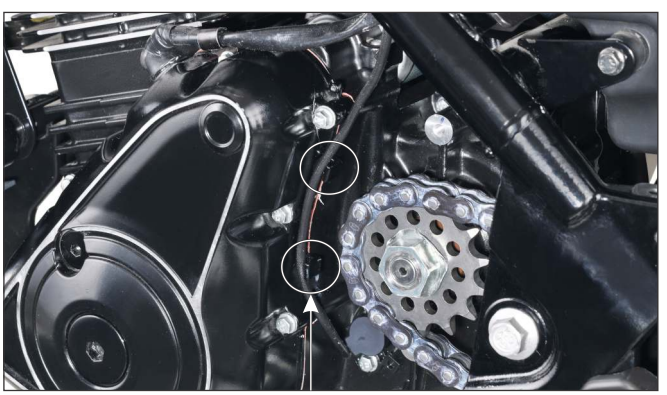
Install the neutral switch mounting bolts and tighten them.

NEUTRAL SWITCH

MOUNTING BOLTS

Route the neutral switch wire from into the left crankcase grooves as shown.

Install the left crankcase rear cover (page 3-23).



GROOVES

Connect the neutral switch 3P connector and boot the properly.

Install the left side cover (page 2-15).

BOOT

NEUTRAL SWITCH WIRE 3P CONNECTOR

Note: *Images may depict a different model/variant, but procedures and information remain same.*

STOP LAMP SWITCH

FRONT

Disconnect the front stop lamp switch connectors.

There should be continuity with the brake lever pressed and no continuity with the brake lever is released.

FRONT STOP LAMP SWITCH

REAR

Remove the right side cover (page 2-16).

Slide the boot and disconnect the rear stop lamp switch wire connector.

Check for continuity between the connector terminals of the switch side.

There should be continuity with the brake pedal depressed and no continuity with the brake pedal released.

REAR STOP LAMP SWITCH CONNECTOR

INSTALLATION

Installation is in the reverse order of the removal.

IGNITION SWITCH

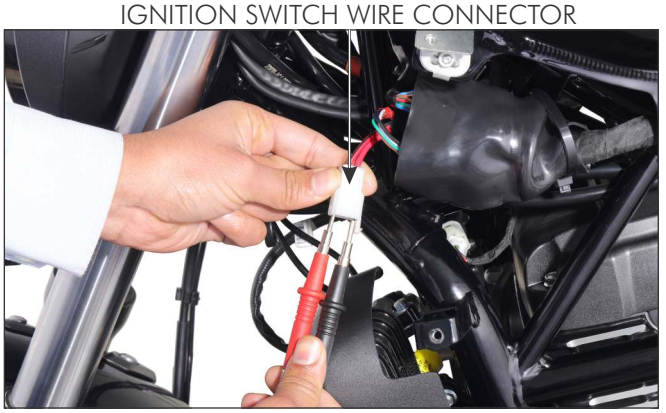
INSPECTION

Remove the left side tank cover (page 2-8).

Disconnect the ignition switch wire connector.

Check for continuity between the connector terminals in each switch position.

IGNITION SWITCH WIRE CONNECTOR



Note: *Images may depict a different model/variant, but procedures and information remain same.*

Continuity should exist between the colour coded wires in the chart.

Colour / Position	Red/Black	Red
LOCK		
OFF		
ON	●———	——●

IGNITION SWITCH

REMOVAL/INSTALLATION

Remove the fork top bridge (page 12-35).

FORK TOP BRIDGE

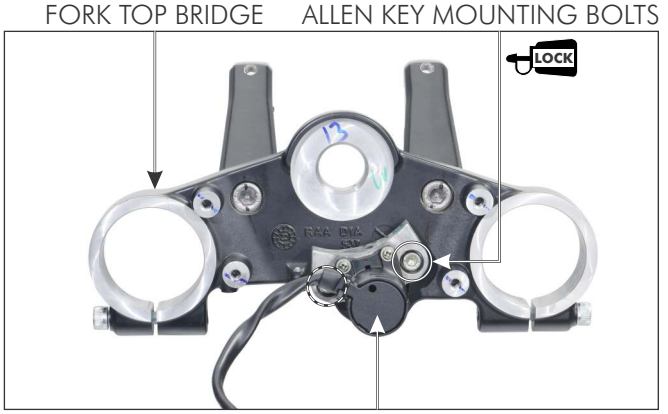
Remove the allen key mounting bolts (Nos.: 2) and the ignition switch from the top bridge.

Install the ignition switch in the reverse order of removal.

TORQUE

IGNITION SWITCH ALLEN KEY MOUNTING BOLT: 2.0 kgf-m

FORK TOP BRIDGE ALLEN KEY MOUNTING BOLTS



IGNITION SWITCH

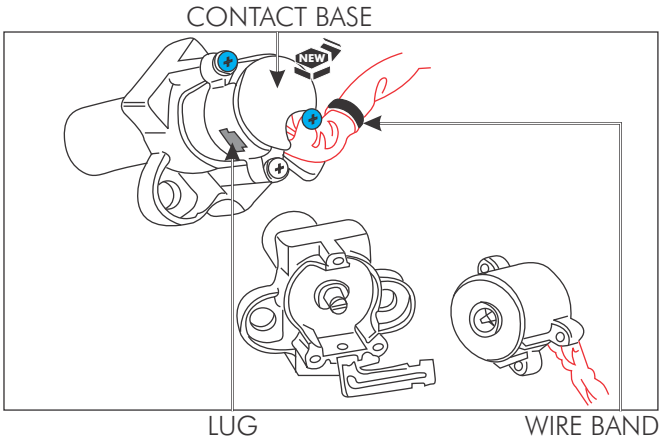
Note: *Images may depict a different model/variant, but procedures and information remain same.*

CONTACT BASE REPLACEMENT

Cut the wire band and remove the three attaching screws. Insert the ignition key into the switch cylinder and position it between the "ON" and "OFF" positions.

Push the lugs in the slots and remove the contact base from the switch cylinder.

Install a new contact base and tighten the attaching screws. Secure the switch wire with a new wire band.

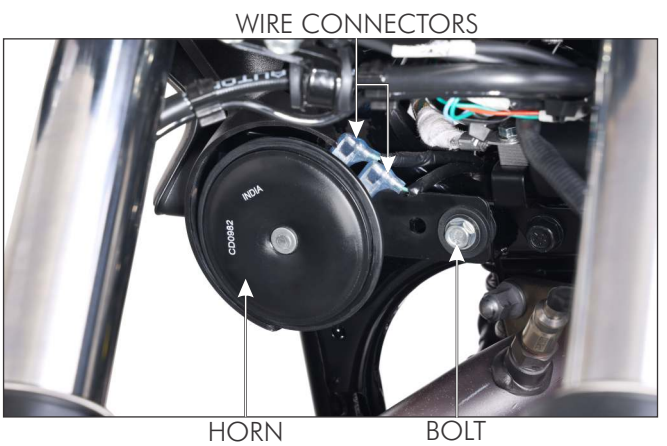


HORN

REMOVAL

Disconnect the wire connectors from the horn.

Remove the bolt and horn.



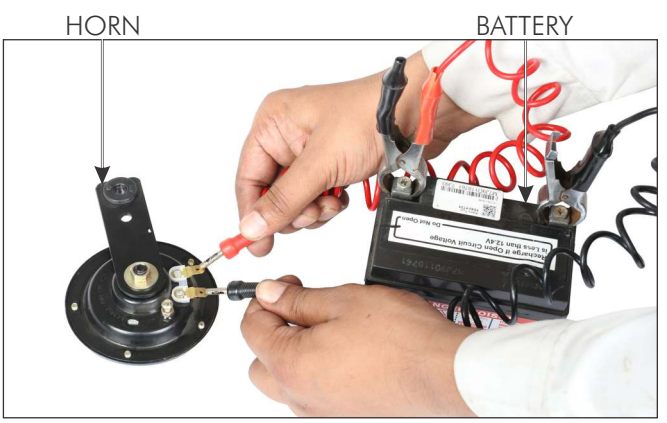
INSPECTION

Connect the battery voltage to the horn terminals.

The horn is normal if it sounds when the battery voltage is connected across the horn terminals.

INSTALLATION

Installation is in the reverse order of the removal.



Note: *Images may depict a different model/variant, but procedures and information remain same.*

HANDLEBAR SWITCH

RIGHT HANDLEBAR SWITCH

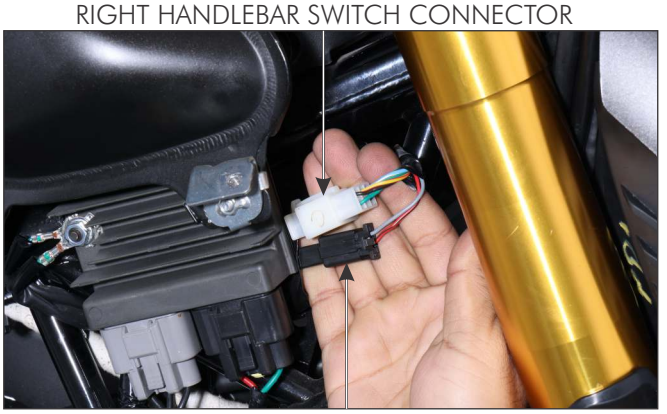
Remove the right side tank cover (page 2-6).

Slide the boot and disconnect the right handlebar switch wire connector and SOS alert/Panic switch connector.

Check each switch for continuity between the connector terminal.

There should be continuity between the colour coded wire in each chart.

RIGHT HANDLEBAR SWITCH CONNECTOR



SOS ALERT/PANIC SWITCH CONNECTOR

INTEGRATED START-KILL SWITCH

Colour / Position	Black/ Brown	Green/ Black	Green	Yellow/ Red
⊗				
∩	● — ●			
∩	● — ●		● — ●	

HAZARD SWITCH

Colour / Position	Black	Gray
ON	● — ●	
OFF		

HAZARD SWITCH

INTEGRATED START-KILL SWITCH

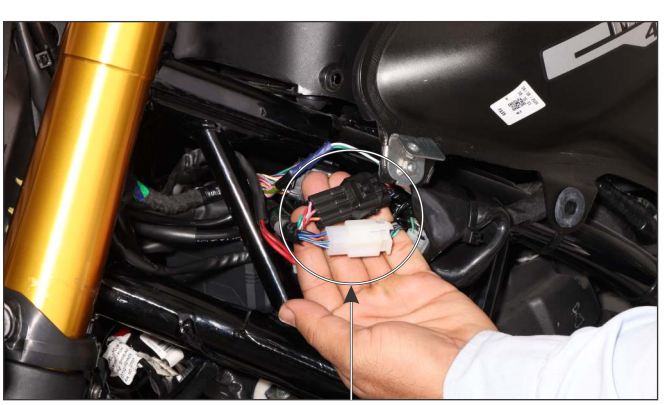
LEFT HANDLEBAR SWITCH

Remove the left side tank cover (page 2-8).

Slide the boot and disconnect the left handlebar switch wire connectors.

Check each switch for continuity between the connector terminal.

There should be continuity between the colour coded wire in each chart.



LEFT HANDLEBAR SWITCH CONNECTORS

DIMMER/PASS SWITCH

Colour / Position	Blue/White	Black	Blue
High	●	●	
Low	AHO		
Pass		●	●

DIMMER/PASS SWITCH

USER INTERFACE

Colour / Position	Green	Orange/ White	Pink/ White	Red/ Green	Brown/ White
Up	●	●			
Down	●		●		
Back	●			●	
Set	●				●

USER INTERFACE

TURN SIGNAL SWITCH

Colour / Position	Orange/ Black	Black	Sky Blue/ Black
⇦	●	●	
(N)			
⇨		●	●

TURN SIGNAL SWITCH

HORN SWITCH

HORN SWITCH

Colour / Position	Black	Light Green
Free		
Push	●	●

FUEL METER/FUEL LEVEL SENSOR

FUEL METER INSPECTION

Turn the ignition switch to "ON" and check for the fuel gauge display.

FUEL GAUGE

If the fuel meter does not indicate properly, perform the following:

Remove the fuel tank mounting bolt and lift the fuel tank from the rear side.

Disconnect the fuel pump 5P connector (page 2-13).

Turn the ignition switch "ON" and check the fuel meter.

If the fuel meter indication is continuously changes from full to empty, wire harness is normal.

If the fuel meter indication is "Full", check for short circuit in Yellow/White wire.

FUEL PUMP 5P CONNECTOR

Turn the ignition switch to "OFF".

Ground the fuel pump 5P connector terminals with a jumper wire.

CONNECTION:

Yellow/White-Green

Turn the ignition switch "ON" and check the fuel meter.

If the fuel meter indication is "Full", wire harness is normal.

If the fuel meter indication is "Empty", check for open circuit in Yellow/ White wire and green wire.

If the wires are normal, check the fuel level sensor (see below).

FUEL PUMP 5P CONNECTOR

JUMPER WIRE

FUEL LEVEL SENSOR INSPECTION

Remove the fuel pump (page 5-73).

Connect the multimeter to the fuel level sensor terminals.

Inspect the resistance of the float at the top and bottom positions.

CONNECTION:

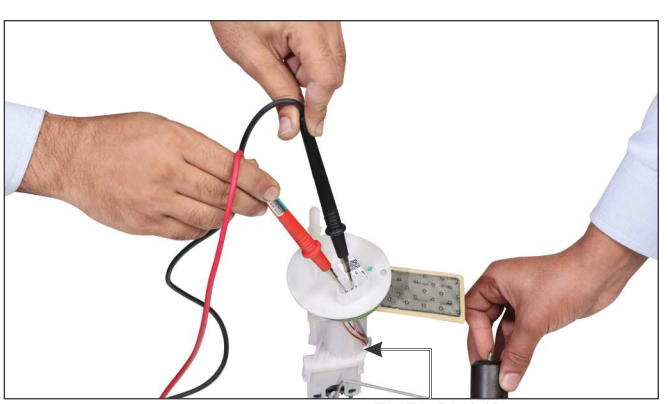
Red-Black

STANDARD

8±1.3 Ω Full (Top position)

282±2.8 Ω Empty (Bottom position)

Installation is in the reverse order of the removal.



FUEL PUMP

RELAY

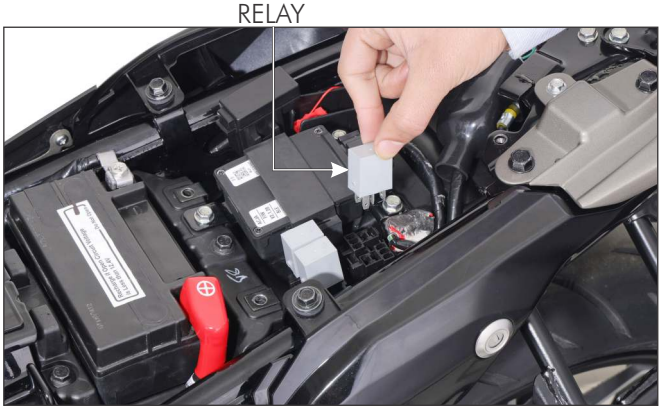
REMOVAL

Remove the battery cover (page 2-6).

RELAYS

Disconnect the relay.

RELAY



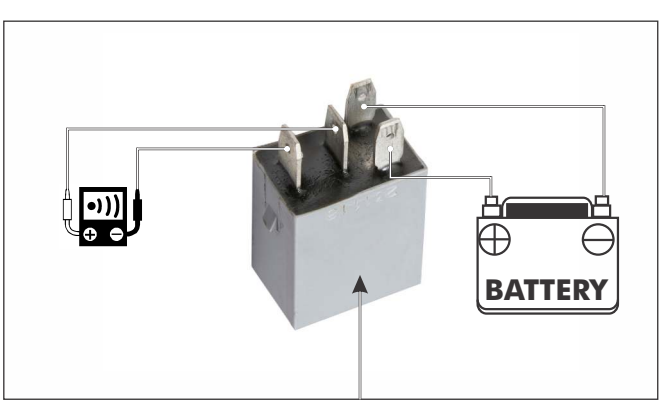
INSPECTION

Disconnect the relay.

Connect a multimeter to the relay terminals.

Connect the 12V battery to the relay terminal as shown.

The relay is normal, if there is continuity between the cable terminals when the battery is connected, and no continuity when the battery is disconnected.



RELAY

INSTALLATION

Installation is in the reverse order of removal.

Note: *Images may depict a different model/variant, but procedures and information remain same.*

CLUTCH SWITCH

Disconnect the clutch switch connectors.

CLUTCH SWITCH WIRE CONNECTORS

Check for continuity between the switch terminals.
There should be continuity with the clutch lever pressed and no continuity with the clutch lever released.

REMOVAL

Remove the clutch switch screw (No.: 1).

SCREW

CLUTCH SWITCH

Remove the clutch switch from its location in the clutch yoke.

CLUTCH SWITCH

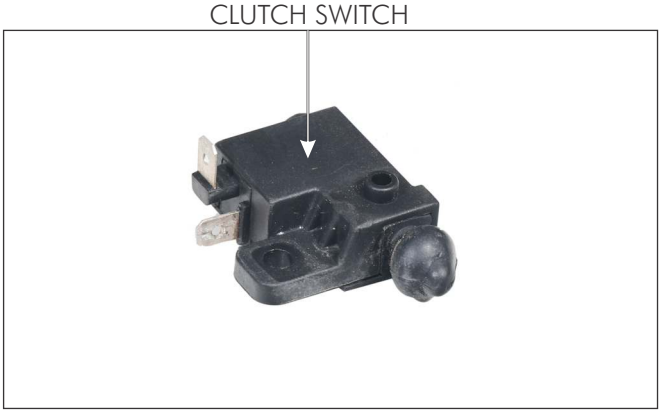
Replace the clutch switch, if required.

INSTALLATION

Installation is in the reverse order of removal.

Adjust the clutch free play (page 3-28).

CLUTCH SWITCH



USB CHARGER ASSEMBLY

REMOVAL

The USB charger assembly is located on the tank cover front sub assembly.

Remove the tank cover front sub assembly with USB charger (page 2-11).

Dismount the USB controller from the stay.

TANK COVER FRONT SUB ASSEMBLY

USB CHARGER CONTROLLER

Remove the USB charger stay screws (Nos.: 2) from the tank cover front sub assembly.

Remove the USB charger with stay from tank cover front sub assembly.

Remove the USB charger screws (Nos.:2).
Separate the USB charger from the stay.

INSTALLATION

Installation is in the reverse order of removal.

INSPECTION

Remove the tank cover front sub assembly (page 2-11).

Check for loose and poor contact on USB charger 2P connector.

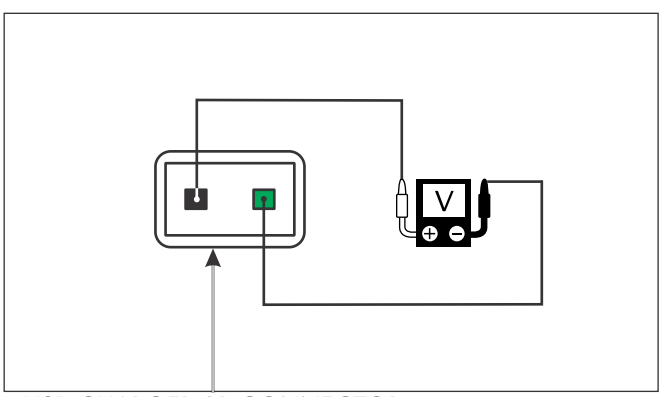
If connection is ok, disconnect the USB charger 2P connector and turn the ignition switch to "ON", check for battery voltage in USB charger 2P connector at wiring side.

CONNECTION

Black-Green

STANDARD: Battery voltage

If voltage exist, replace the USB charger.



USB CHARGER 2P CONNECTOR

In case of any abnormality, if 15A fuse and battery voltage is ok then check continuity of black wire between 15A fuse and USB charger connector.

If continuity does not exist, replace the wiring harness.

Check the continuity between green wire of USB connector and body ground.

CONNECTION

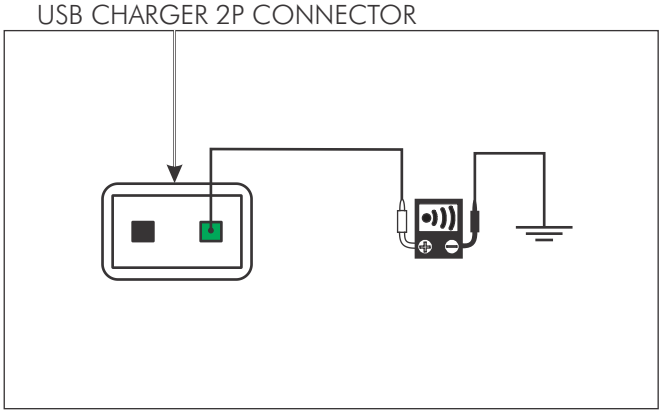
Green-Ground

STANDARD: Continuity

If continuity does not exist, replace the wiring harness.

Install the tank cover front sub assembly (page 2-6).

USB CHARGER 2P CONNECTOR



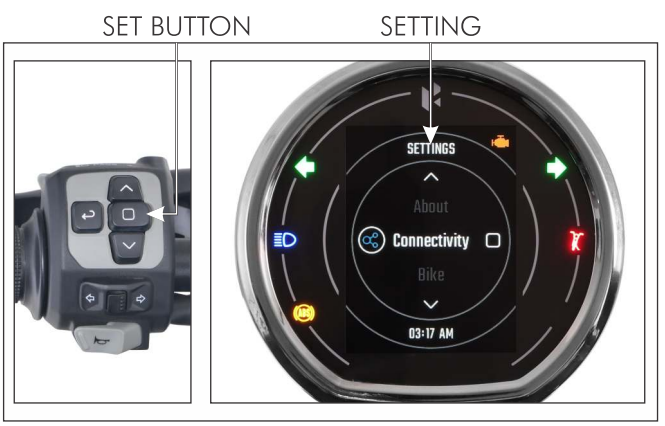
METER CONSOLE FEATURES

DIGITAL CLOCK

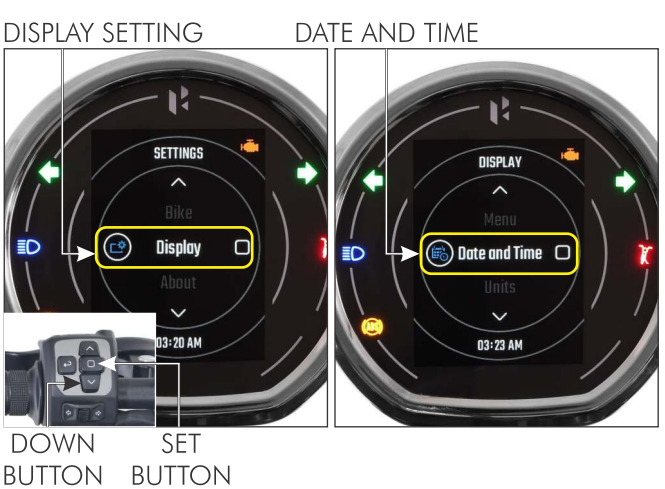
For clock setting refer below procedure:

1. Turn the ignition switch "ON" (ON).
2. Clock will be adjusted in configurable menu.

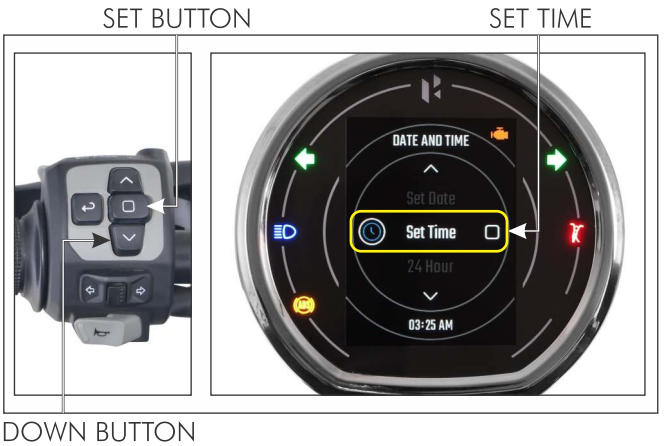
3. To open the setting on the meter console press and hold the set button.



3. Navigate to display setting on the meter console by pressing the down button and press the set button to open the display setting.
4. In display setting navigate to date and time setting by pressing the down button and press the set button to open the date and time setting.



5. In date and time setting navigate to set time on the meter console by pressing the down button and press the set button to open the time setting.



To set the hour, press up/down button until the desired hour is displayed.

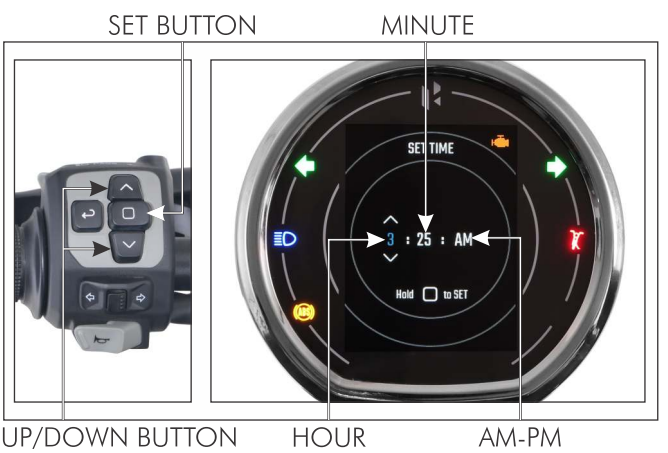
- The time is advanced by 1 hour each time the up/down button is pressed.
- The time advances fast when the up/down button is pressed and held.

To set minute, press the set button to switch from hour to minute display. Now press the press up/down button until the desired minute is displayed.

- The time is advanced by 1 minute each time the up/down button is pressed.
- The time advances fast when the up/down button is pressed and held.

To change AM-PM, press the set button to switch from minute to AM-PM display. Now press the press up/down button to select the AM-PM.

To set the clock press and hold the set button.



NOTE

The clock will reset to "1:00" if the battery is disconnected.

TRIPMETER

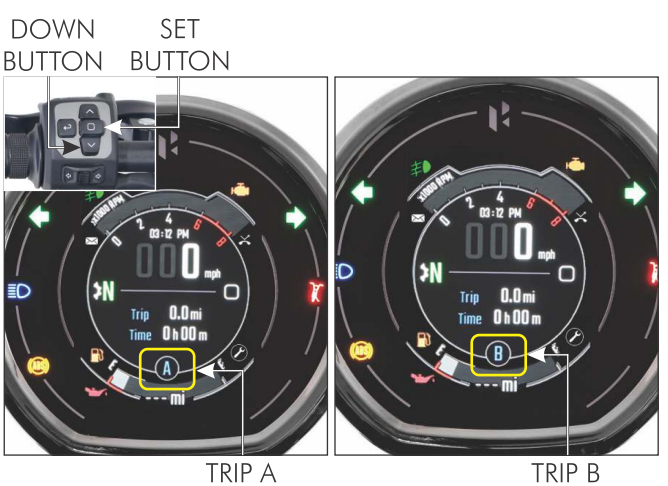
The tripmeter shows distance travelled since trip meter was reset last time. There are two tripmeters, "Trip A" and "Trip B".

Short press the set button on the handlebar to view "Trip A" display.

Press the down button to select "Trip B".

"Trip A" and "Trip B" can be displayed upto "999.9" km.

If the tripmeter exceeds "999.9" km it will return to "0.0" km automatically.

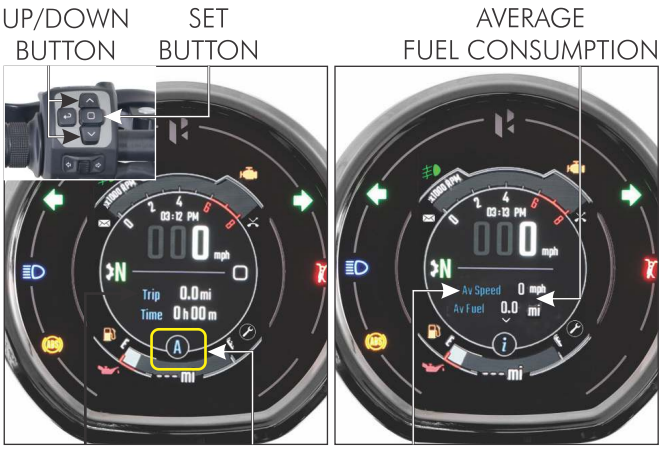


Press the set button to view the following tripmeter parameters:

- **Distance:** distance covered in a trip.
- **Trip time:** time taken to complete a trip.
- **Avg speed:** average speed at which vehicle completes a trip
- **Avg fuel consumption (FE):** average fuel consumption at which vehicle covers the trip distance.

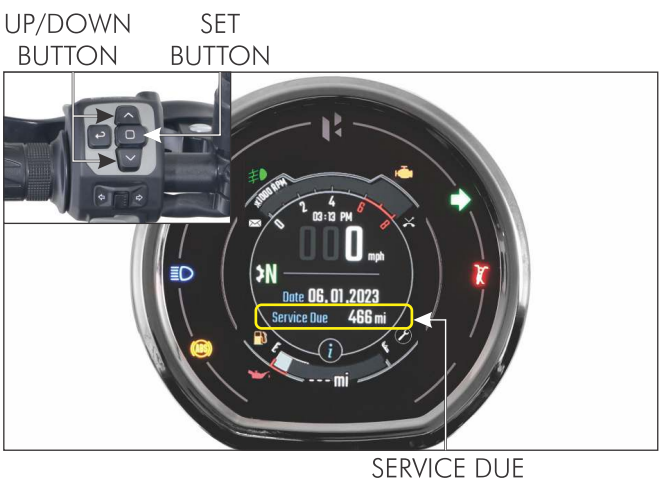
To view the above parameters press up/down button.

When tripmeter sub menu is selected, long press (more than 2 seconds) the set button to reset tripmeter to zero.



SERVICE DUE

Indicates how many kilometres are left before the next service is due. Press the set button and press the up/down button until the "Service due" is displayed.



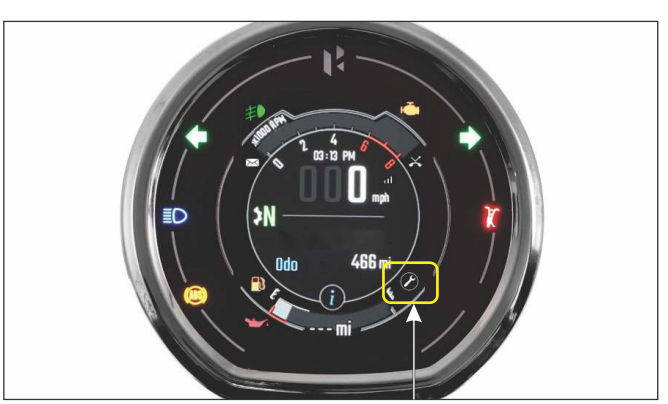
SERVICE REMINDER INDICATOR

The service reminder indicator (1) is to indicate to the user to bring the vehicle to an Authorised Hero MotoCorp workshop for service. The indicator will start blinking when the vehicle covers miles as specified in the maintenance schedule. The indicator will keep on blinking throughout the miles interval for a particular service and will stay ''ON'' thereafter.

To reset the service reminder, press and hold the set button and switch on the ignition key. The service reminder will reset after 3 seconds.

NOTE

After getting the vehicle serviced, make sure that the service reminder indicator has been reset.



DATE

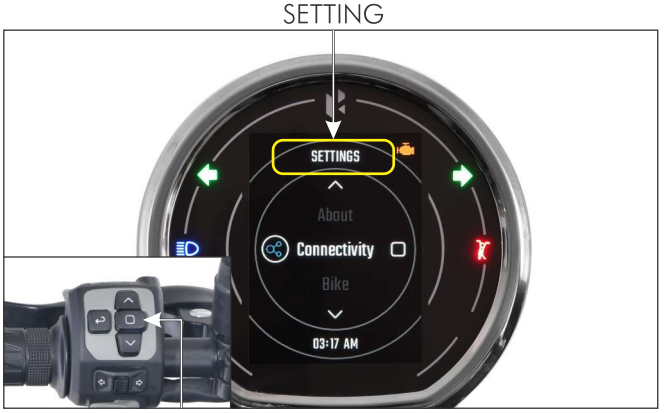
Displays the day, month and year.

DAY/MONTH/YEAR

For date setting refer below procedure:

- Turn the ignition switch "ON" ( ).
- Date will be adjusted in configurable menu.
- To open the setting on the meter console, press and hold the set button.

SETTING



SET BUTTON

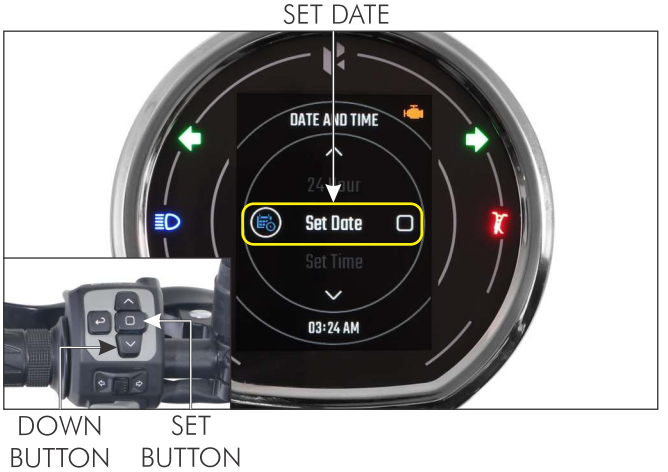
- Navigate to display setting on the meter console by pressing the down button and press the set button to open the display setting.
- In display setting navigate to date and time setting by pressing the down button and press the set button to open the date and time setting.

DOWN BUTTON SET BUTTON

DISPLAY SETTING DATE AND TIME

In date and time setting navigate to set date on the meter console by pressing the down button and press the set button to open the date setting.

SET DATE



DOWN BUTTON SET BUTTON

- To set the desired day, press up/down button until the desired day is displayed.
- To set month, press the set button to switch from day to month display. Now press the press up/down button until the desired month is displayed.
- To set year, press the set button to switch from month to year display. Now press the press up/down button until the desired year is displayed.
- To set the date press and hold the set button.

DAY MONTH YEAR

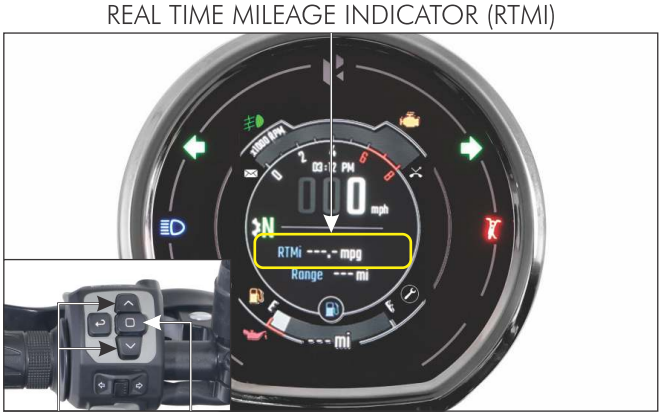
UP/DOWN BUTTON SET BUTTON

REAL TIME MILEAGE INDICATOR (RTMI)

RTMI INSPECTION

1. Turn the ignition switch "ON"
2. Press the set button and press the up/down button until the RTMI is displayed, check the RTMI display which will be "---.- km/L".
3. Put the vehicle on main stand, start the engine, shift from 1st to 6th gears, and give constant throttle (1/5th opening).
4. RTMI value will keep on refreshing after every 3 second till 120 km/litre and after that it may not change.
5. The RTMI value shall be displayed when the speed of the vehicle is more than 5±2 km/hr. If the speed is less than 5±2 km/hr "---.-" shall be displayed.

REAL TIME MILEAGE INDICATOR (RTMI)



UP/DOWN BUTTON SET BUTTON

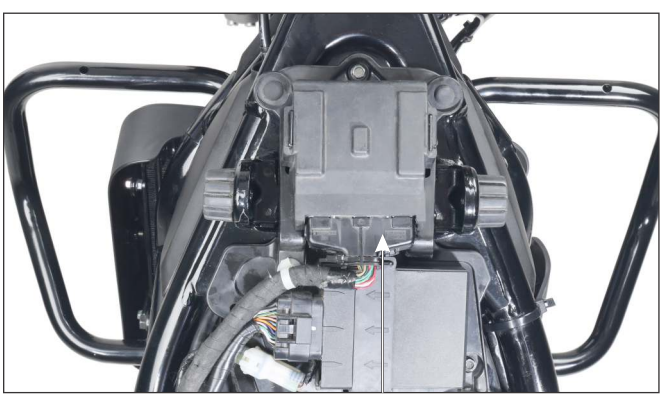
If there is no display then check the following:

6. Turn the ignition switch "OFF"
7. Remove the fuel tank (page 2-12).
8. Disconnect the combination meter 18P connector (page 20-13).

18P CONNECTOR

9. Disconnect the ECU 44P connector (page 5-16). Check for loose or poor contact in the combination meter 18P connector and ECU 44P connector.
10. Connect the combination meter 18P connector and ECU 44P connector, turn the ignition switch to "ON".

If RTMI working is normal then there was loose or poor connection between the combination meter 18P connector or ECU 44P connector.



ECU 44P CONNECTOR

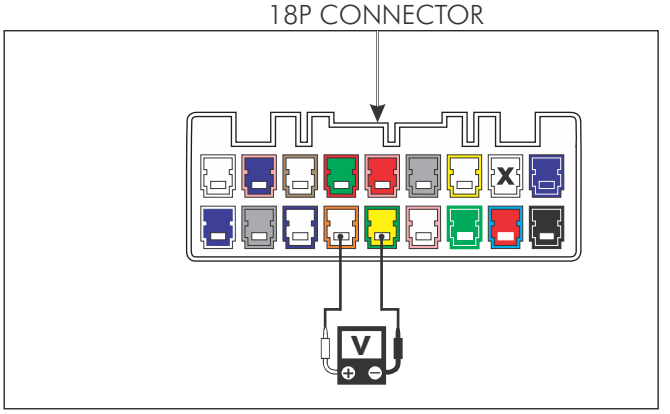
If still no display then check the following:

11. Turn the ignition switch "OFF"
12. Disconnect combination meter 18P connector, turn the ignition switch to "ON" and check the voltage between combination meter 18P connector at wire harness side.

CONNECTION:
Green/Yellow (18P Pin-14)-
Orange/White (18P Pin-15)
Standard: 5V

If voltage is ok then inspect the combination meter (page 20-51) and replace if required.

18P CONNECTOR

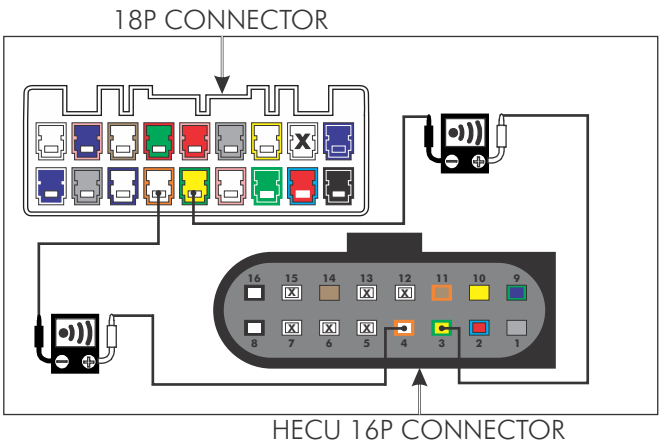


13. If voltage doesn't exist, turn the ignition switch to "OFF". disconnect the HECU 16P connector (page 15-12) and check the continuity between combination meter 18P connector and HECU 16P connector at wire harness side.

CONNECTION
Orange/White (18P Pin-15)-
Orange/White (HECU Pin-4)
STANDARD: Continuity
Green/Yellow (18P Pin-14)-
Green/Yellow (HECU Pin-3)
STANDARD: Continuity

If continuity does not exist then replace the wiring harness and inspect again.

If continuity exist then inspect the HECU unit (page 15-18) and replace if required.

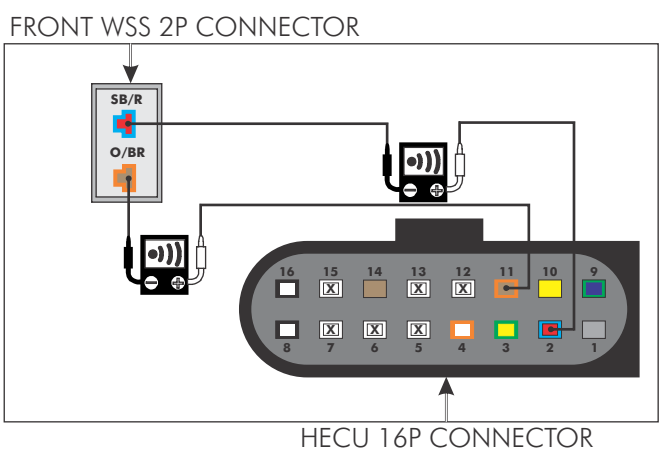


14. If HECU unit is ok, then connect the combination meter 18P connector and disconnect the WSS 2P connector (page 15-14).
15. Check the continuity between HECU unit 16P connector and WSS 2P connector at wire harness side.

CONNECTION
Sky Blue/Red (HECU Pin-2)- Sky Blue/Red
STANDARD: Continuity
Orange/Brown (HECU Pin-11)-Orange/Brown
STANDARD : Continuity

If continuity does not exist then replace the wiring harness and inspect again.

If continuity exist then inspect the encoder for any damage (page 15-17).



If still RTMI indicator is not working then check the following:

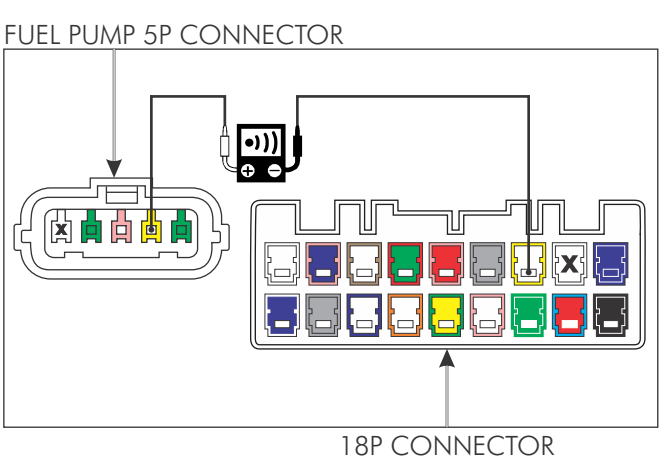
16. Connect the HECU unit 16P connector and WSS 2P connector.
17. Disconnect the combination meter 18P connector and fuel pump 5P connector. Check the continuity between combination meter 18P connector and fuel pump 5P connector at wire harness side.

CONNECTION
Yellow/ White (18P Pin-3)-Yellow/ White
STANDARD: Continuity

If continuity does not exist then replace the wiring harness and inspect again.

If continuity exist then inspect the fuel meter/fuel sensor (page 20-21).

If above connection are normal then inspect the combination meter (page 20-51) and replace if required.



WHEEL SPEED SENSOR

FRONT

INSPECTION

NOTE

Ensure that the battery is in good condition (**Section-17**). If not, then replace with a new battery and then inspect.

Disconnect the HECU 16P connector (page 15-12).

Check for loose or poor contact terminals at HECU connector and front wheel speed sensor connector.

If connections are normal, then check for continuity between the HECU connector and front wheel speed sensor connector.

CONNECTION

Sky Blue/Red (HECU Pin-2)- Sky Blue/Red

STANDARD: Continuity

Orange/Brown (HECU Pin-11)-Orange/Brown

STANDARD : Continuity

If no continuity is detected, then replace the harness.

If continuity exist, then measure the resistance of front wheel speed sensor.

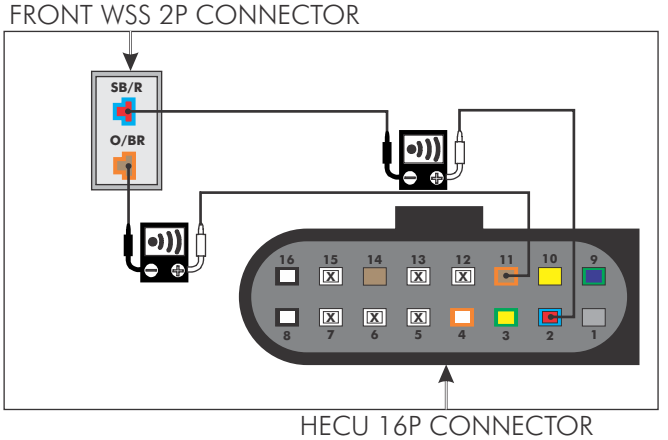
Measure the resistance of the front wheel speed sensor connector.

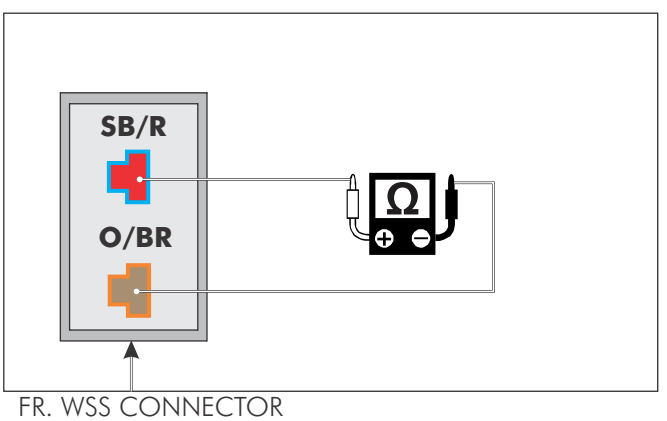
CONNECTION

Sky Blue/Red-Orange/Brown

Standard: 50 Ω±2% - 115 Ω±2%

If resistance is out of specification, then replace the front wheel speed sensor.





REAR

INSPECTION

NOTE

Ensure that the battery is in good condition (**Section-17**). If not, then replace with a new battery and then inspect.

Disconnect the HECU 16P connector (page 15-12).

Check for loose or poor contact terminals at HECU connector and rear wheel speed sensor connector.

If connections are normal, then check for continuity between the HECU connector and rear wheel speed sensor connector.

Connection:

Yellow (HECU Pin-10)- Yellow

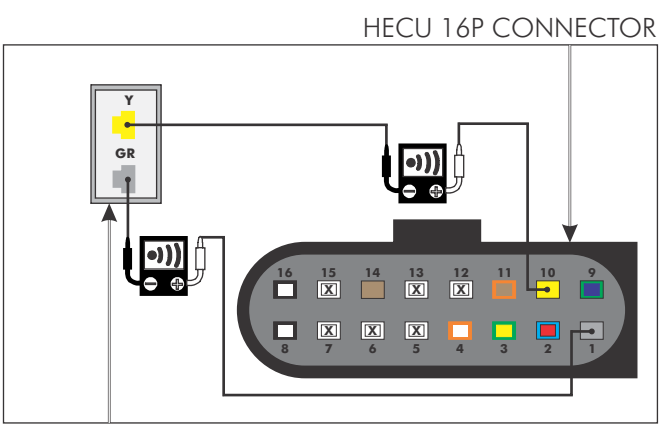
STANDARD: Continuity

Gray (HECU Pin-1)-Gray

STANDARD : Continuity

If no continuity is detected, then replace the harness.

If continuity exist, then measure the resistance of rear wheel speed sensor.



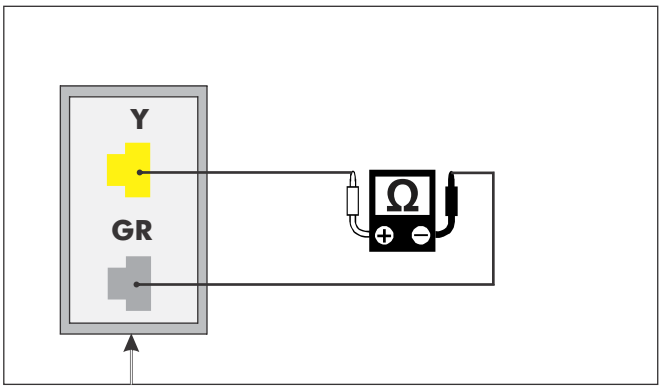
Measure the resistance of the rear wheel speed sensor connector.

CONNECTION

Yellow-Gray

Standard: 50 Ω±2% - 115 Ω±2%

If resistance is out of specification, then replace the rear wheel speed sensor.



REAR WSS 2P CONNECTOR

OIL PRESSURE SWITCH

REMOVAL

Remove the right side tank cover (page 2-6).

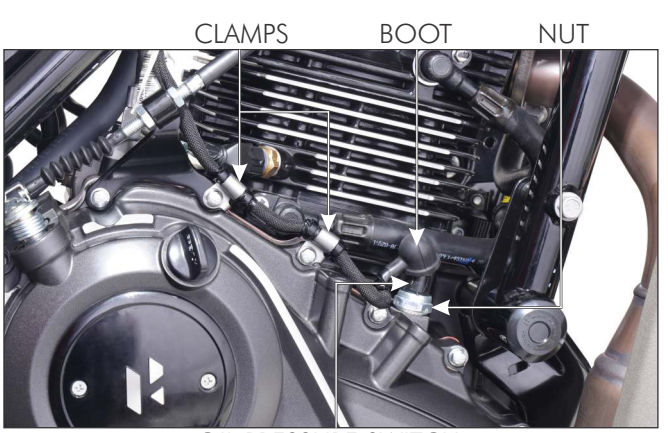
Disconnect the oil pressure switch connector.

Release the oil pressure switch wire by removing the tie-wrap from frame.

OIL PRESSURE SWITCH CONNECTOR

Remove the oil pressure switch wire from the clamps.

Slide the boot and remove the oil pressure switch by removing the nut.



OIL PRESSURE SWITCH

Replace the oil pressure switch, if required.

INSTALLATION

Installation is in the reverse order of removal.

OIL PRESSURE SWITCH

INSPECTION

Disconnect the oil pressure switch connector.

Check the continuity between oil pressure switch connector and body ground

CONNECTION

Sky blue/Red-Body ground

Standard- Continuity (Ignition switch "ON")

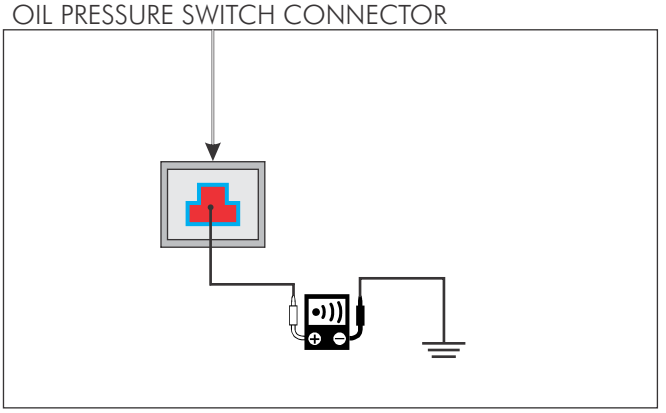
Sky blue/Red-Body ground

STANDARD- No Continuity

(Engine start condition)

If above connection are abnormal then replace wire harness.

OIL PRESSURE SWITCH CONNECTOR



Inspect the battery voltage at oil pressure switch connector and body ground.

CONNECTION

Sky blue/Red-Battery (+)ve terminal

Standard- 12V (Ignition switch "OFF")

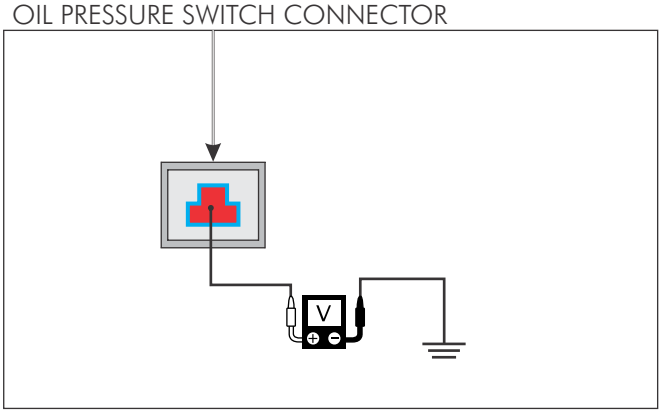
Sky blue/Red-Battery (+)ve terminal

Standard- 0V (Engine start condition)

If above connection are abnormal then replace the oil pressure switch.

Connect the oil pressure switch connector.

OIL PRESSURE SWITCH CONNECTOR



Note: *Images may depict a different model/variant, but procedures and information remain same.*

COMBINATION METER

INSPECTION

NOTE

Ensure that the battery is in good condition (**section-17**). If not, then replace with a new battery and then inspect.

Turn the ignition switch "ON".

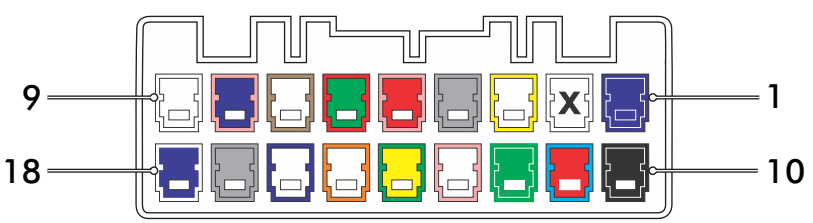
Check the following:

- All LCD segments are displayed for speedometer. A figure of '188' is visible.
- All LCD segments are displayed for clock. A figure of '88:88' is visible.
- The tachometer segment swings from MIN-MAX-MIN.
- The fuel gauge segment swings from MIN-MAX-MIN.

If no display is observed:

Disconnect the combination meter 18P connector (page 20-12).

COMBINATION METER 18P PIN



1	: Battery	- Blue	10	: Ignition input	- Black
2	: Not used	- Empty	11	: Low oil pressure	- Sky blue/Red
3	: Fuel	- Yellow/White	12	: Ground	- Green
4	: Left turn indicator	- Gray	13	: High Beam	- Pink/White
5	: Down button	- Pink/Red	14	: CAN 1 High	- Green/Yellow
6	: Set button	- Red/Green	15	: CAN 1 Low	- Orange/White
7	: Return button	- Black/White	16	: Up button	- Blue/White
8	: Right turn indicator	- Pink/blue	17	: CAN 2 High	- Gray
9	: Fog lamp indicator	- White	18	: CAN 2 Low	- White/Blue

Check pin 12 with body ground for continuity.

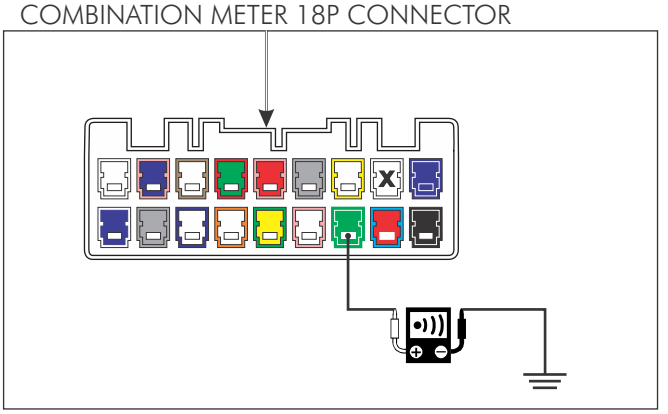
CONNECTION

Green (18P Pin-12)- Body Ground

STANDARD: Continuity

If no continuity is observed then replace harness.

COMBINATION METER 18P CONNECTOR



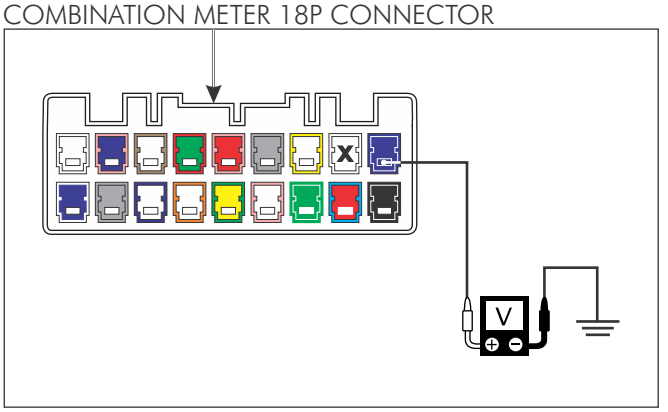
If continuity is observed then check the voltage at pin 1.

CONNECTION

Green/Orange (18P Pin-1)- Body Ground

Standard: Battery Voltage

COMBINATION METER 18P CONNECTOR



FUEL METER

Turn the ignition switch "ON".

Check the following.

- All LCD segments are displayed for fuel gauge. A figure of '8' is visible.

If the above display is OK then check the fuel unit.

If the fuel gauge needle does not function then disconnect the combination meter 18P connector.

Check the continuity between meter unit 18P connector and fuel pump 5P connector.

CONNECTION

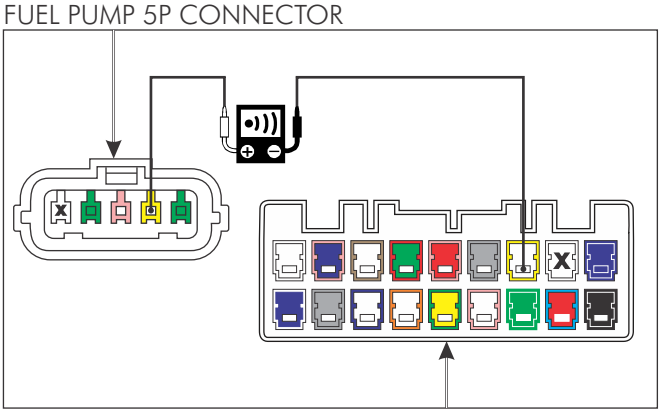
Yellow/ White (16 Pin-3)-Yellow/ White

STANDARD: Continuity

If continuity is not observed then replace harness.

If continuity is observed then replace fuel unit.

FUEL PUMP 5P CONNECTOR



18P CONNECTOR

BODY CONTROL MODULE (BCM)

BCM is provided to control the vehicle lighting system. When engine turns "ON", its send a signal to BCM to turn headlamp "ON".
Key Features:

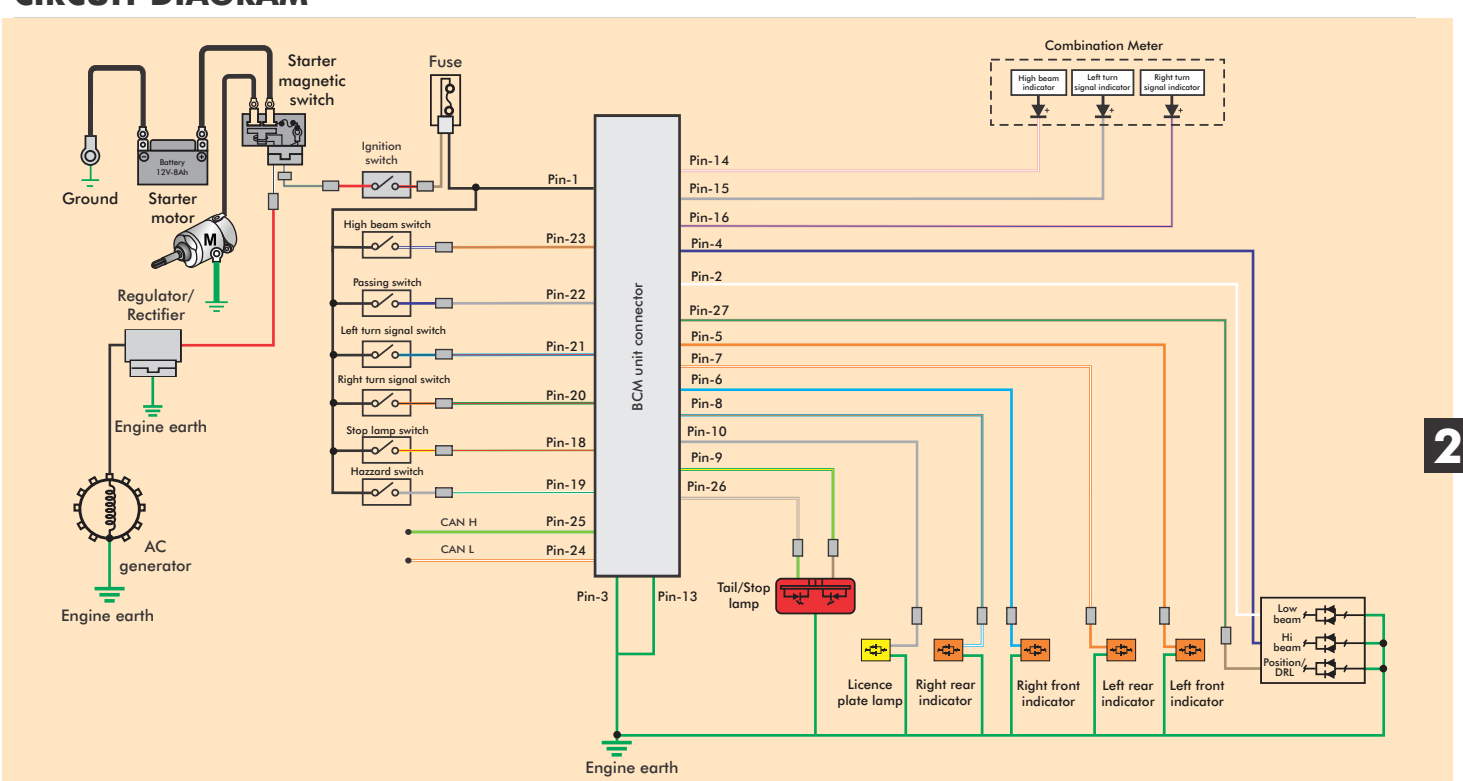
- To incorporate functioning of hazard lighting system.
- Provides integrated control of all LED lighting system.

REMOVAL

Remove the fuel tank (page 2-12).
Disconnect the BCM 33P connector.

BCM 33P CONNECTOR

CIRCUIT DIAGRAM



Note: *Images may depict a different model/variant, but procedures and information remain same.*

BODY CONTROL MODULE (BCM) INPUT AND OUTPUT COMBINATION

Output	Input							
	Ignition key ON (Apply battery voltage)	High beam switch pressed (Apply battery voltage)	Passing switch pressed (Apply battery voltage)	Left turn signal switch pressed (Apply battery voltage)	Right turn signal switch pressed (Apply battery voltage)	Stop switch pressed (Apply battery voltage)	Hazard switch pressed (Apply battery voltage)	Engine status signal coming low (Nearly 0V) to BCM unit
Tail mode ON with 50±10 mA current in tail/stop lamp load.	Yes	×	×	×	×	No	×	×
Position lamp ON with 150±15 mA current.	Yes	×	×	×	×	×	×	×
High beam ON	Yes	Yes	No	×	×	×	×	Yes
High beam ON	Yes	×	Yes	×	×	×	×	×
Low beam ON	Yes	No	No	×	×	×	×	Yes
Left front, left rear turn signal lamp and cluster indicator blink with normal frequency (85±10 flash/min.)	Yes	×	×	Yes	×	×	No	×
Left front faulty and left rear turn signal and cluster indicator blink with double frequency (170±10 flash/min.)	Yes	×	×	Yes	×	×	No	×
Left rear faulty and left front turn signal and cluster indicator blink with double frequency (170±10 flash/min.)	Yes	×	×	Yes	×	×	No	×
Right front, right rear turn signal and cluster indicator blink with normal frequency (85±10 flash/min.)	Yes	×	×	×	Yes	×	No	×
Right front faulty and right rear turn signal and cluster indicator blink with double frequency (170±10 flash/min.)	Yes	×	×	×	Yes	×	No	×
Right rear faulty and right front turn signal and cluster indicator blink with normal frequency (170 ±10 flash/min.)	Yes	×	×	×	Yes	×	No	×
Left front, rear turn signal, right front and right rear blink with normal frequency 85±10 flash/min.	Yes	×	×	×	×	×	Yes	×
Stop mode ON with 280±28 mA current in tail/stop lamp load.	Yes	×	×	×	×	Yes	×	×

Inspection

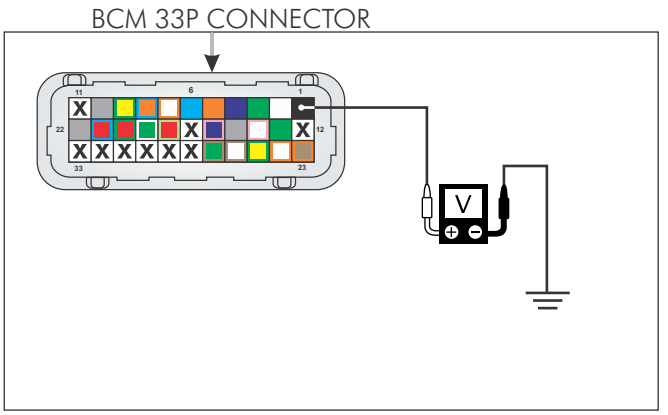
Disconnect the BCM 33P connector and turn the ignition switch to "ON" and check the voltage between BCM 33P connector and ground.

Connection

Black (BCM Pin 1)- Ground

Standard: Battery Voltage

If the voltage does not exist then replace the BCM.

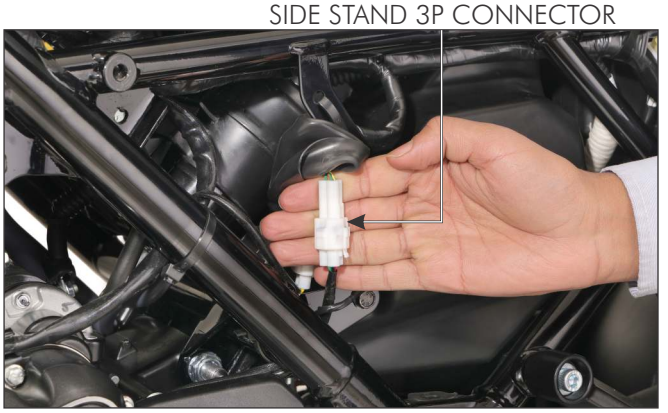


SIDE STAND SWITCH

Remove the left side cover (page 2-14).

Disconnect the side stand switch 3P connector.

SIDE STAND 3P CONNECTOR



Remove the rear left crankcase cover (page 3-23).

Remove the side stand switch wire by removing the tie-wrap from the frame.

Remove the side stand switch bolt.

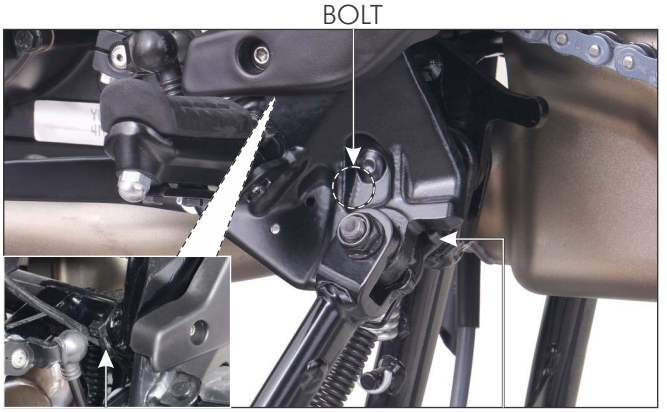
Remove the side stand switch.

Installation is in the reverse order of removal.

NOTE

Route the side stand switch cord properly.

BOLT



TIE-WRAP

SIDE STAND SWITCH

"Side stand engine kill" feature for safety purpose

This feature has following functions:

- It prevents starting the engine when transmission is in gear (irrespective of clutch lever operation) and side stand is down.
- It stops the running engine when transmission is in gear (irrespective of clutch lever operation) and side stand is moved down.

⚠ WARNING

"Side stand engine kill" system is not affected by clutch lever operation.

To inspect the functionality of this feature, park the vehicle on its main stand and check all the conditions described in the inspection flow diagram.

If vehicle doesn't operate as described in flow diagram then inspect the side stand switch.

INSPECTION FLOW DIAGRAM

1. Turn the ignition switch to "ON" (○) position and press the electric starter (ⓐ) of integrated start-kill switch (with transmission in neutral and side stand is down).

Does engine start? — NO → Inspect the side stand switch (page 20-55)

YES

2. Then shift the transmission to gear (with engine running and irrespective of clutch lever operation).

Does engine stop? — NO → Inspect the side stand switch (page 20-55)

YES

3. Now pull in the clutch lever and press the electric starter (ⓐ) of integrated start-kill switch (After engine has stopped).

Does engine start? — YES → Inspect the side stand switch (page 20-55)

NO

SYSTEM IS OK

20

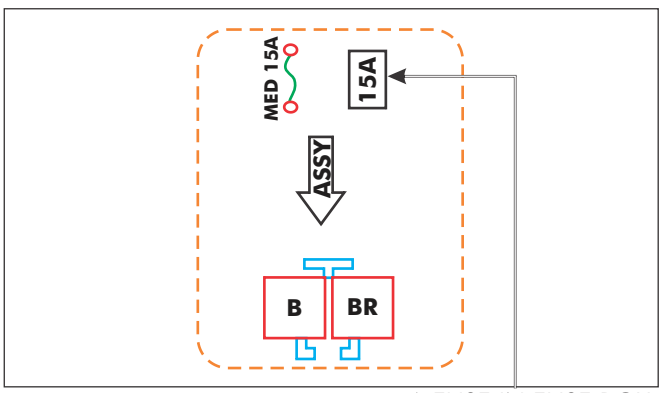
Note: *Images may depict a different model/variant, but procedures and information remain same.*

INSPECTION

- Turn the ignition of the vehicle to the "ON" position.
- Check if the side stand indicator comes on and goes off when the side stand is operated.
  The indicator must be "ON" when the side stand is "DOWN" and "OFF" when the side stand is "UP"
  If the indicator does not function as required, check the side stand switch and indicator LED.
- Check DTC code for side stand switch, if DTC code appear then do the troubleshooting for the code (page 5-61). If DTC code does not appear then inspect the side stand switch.

SIDE STAND INDICATOR

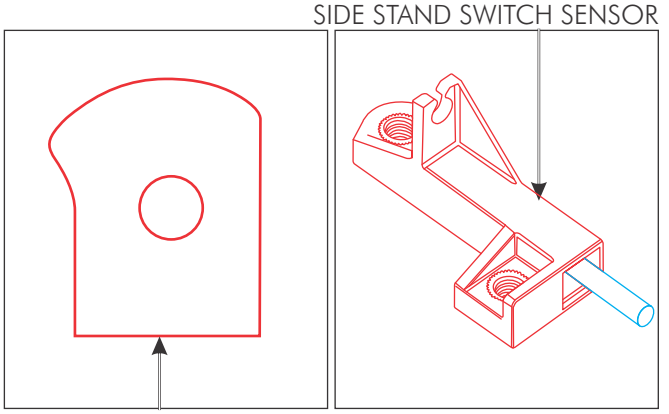
- Check the 15A fuse in the fuse box. If the fuse is damaged, replace the fuse and repeat step 2.
- Ensure that the battery voltage is normal. If battery voltage is low, battery must be recharged or replaced.
- Ensure that the side stand switch connector is properly attached to the connector on the wiring harness.
- Check that the magnet holder is installed on the side stand, and is not damaged (cracked or broken). Also ensure that there is no mud covering the magnet holder.
- Use an Iron object to check the working of the magnet.
- Check the gap between the magnet holder and the sensor when the side stand is in the "DOWN" position.
  Gap should be 2-4 mm



15A FUSE IN FUSE BOX

- If the magnet is not working or if the magnet holder is damaged, replace the magnet holder and repeat second step.
- Check that the side stand switch sensor is installed on the frame and is not damaged (cracked or broken).
- Visually inspect the wire to ensure that there is no cuts or breakages.
  If any damage is observed, replace the side stand switch sensor, and repeat second step.
- Remove the sensor and ensure that there is no debris or spatter at the sensor mounting.
  If there is debris or spatter, clean the area, remount the sensor and repeat second step.

SIDE STAND SWITCH SENSOR



MAGNET HOLDER ON THE SIDE STAND

WIRING HARNESS INSPECTION

Disconnect the 18P connector, check for loose or poor contact on the 18P connector. If side stand indicator glow then there has been a loose or poor contact in the 20P connector.

If side stand indicator does not glow then follow the below process:

1. Disconnect the 18P connector from the meter (page 20-12), turn the ignition switch to "ON" and check the continuity between 18P connector and ground with both side stand "UP" and "DOWN" condition.

CONNECTION

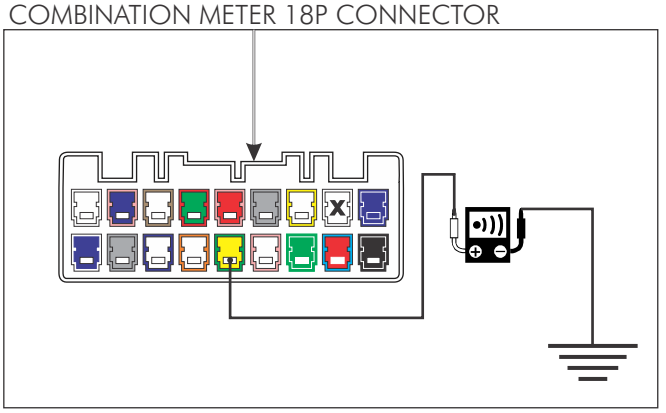
Green/Yellow (18 P connector Pin 14)- Ground

STANDARD: Continuity (Side stand is "DOWN")

STANDARD: No Continuity (Side stand is "UP")

If above conditions are ok, but side stand indicator does not glow in meter console then replace the combination meter (page 20-12).

COMBINATION METER 18P CONNECTOR



2. If step 1 conditions are not ok then disconnect the ECU 44P connector (page 5-16) and check the continuity between the ECU 44P connector and 18P connector at the wire harness side.

CONNECTION

Green/Yellow (ECU pin 37)-

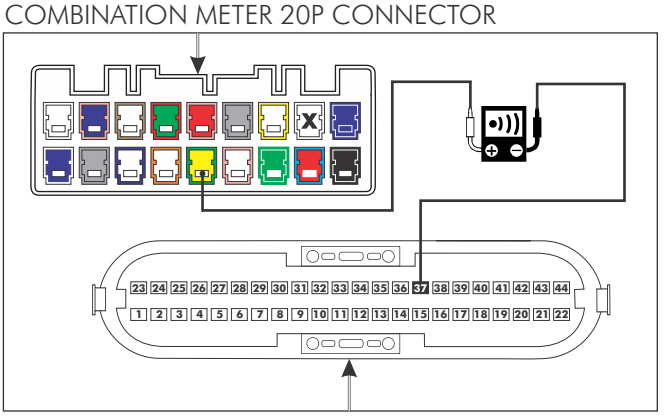
Green/Yellow (18P connector Pin 14)

STANDARD: Continuity

If continuity is not ok then replace the wiring harness.

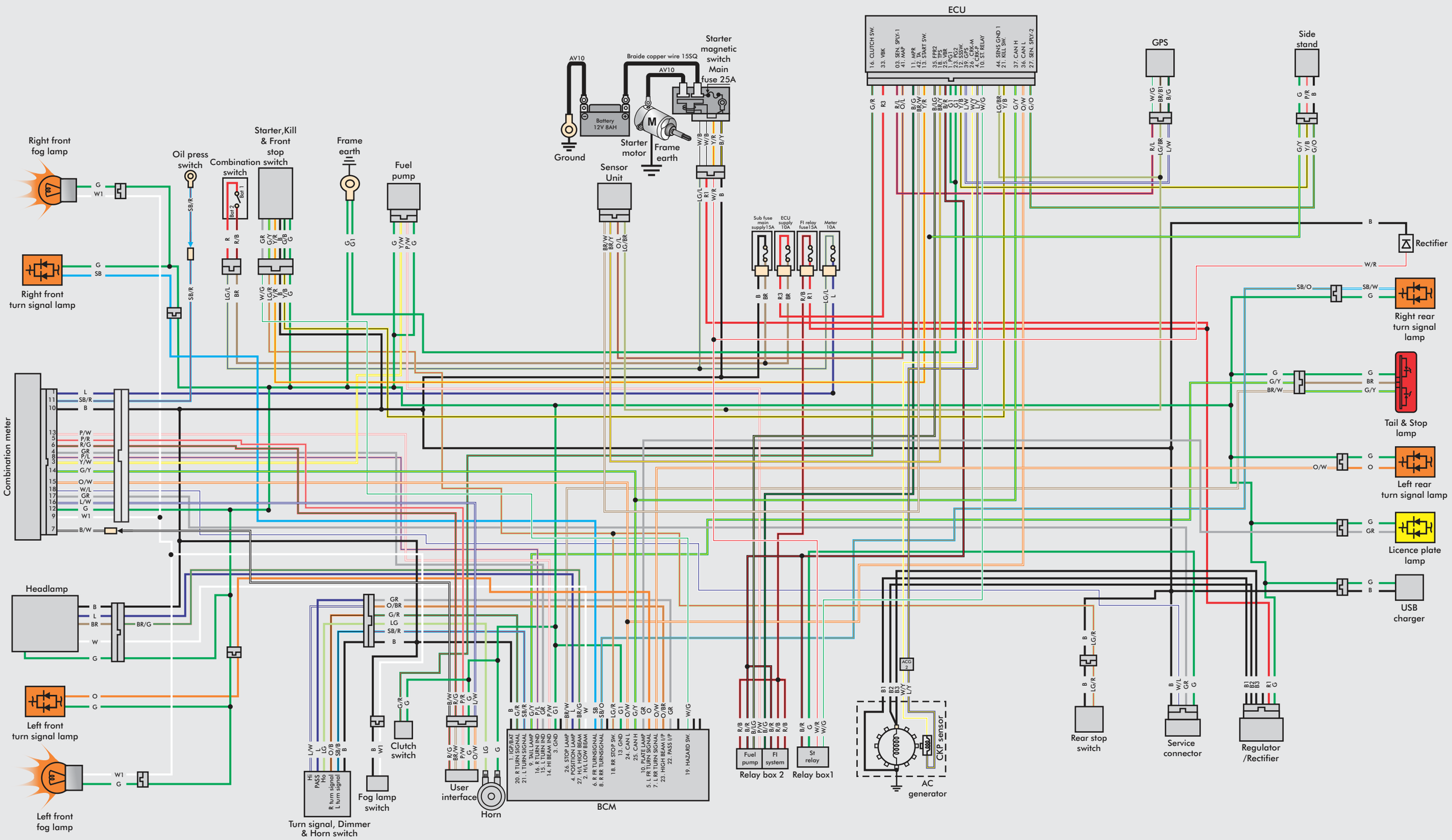
If continuity is ok then refer side stand troubleshooting (page 5-61).

COMBINATION METER 20P CONNECTOR

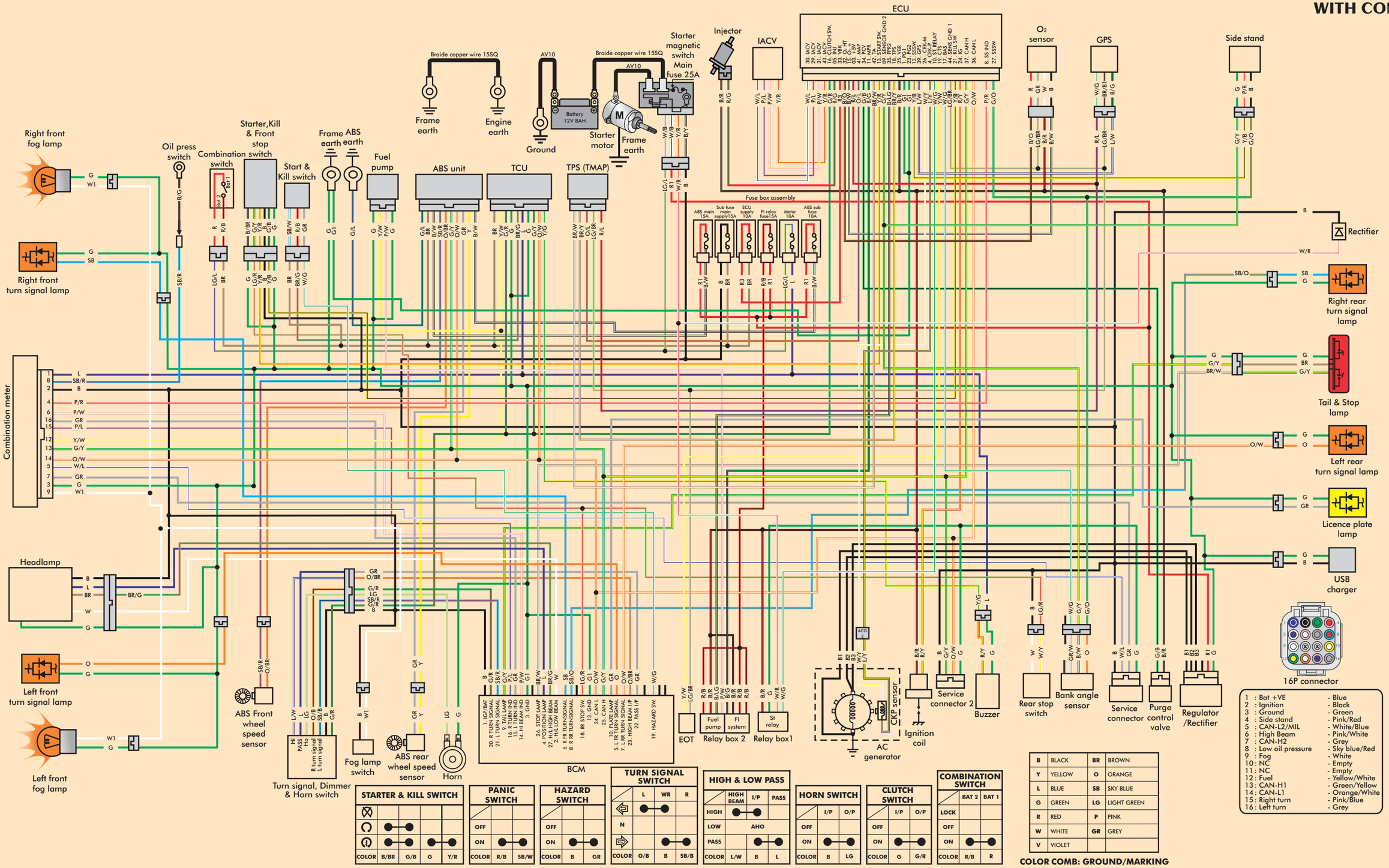


ECU 44P CONNECTOR

CIRCUIT DIAGRAM



WITH CONNECT

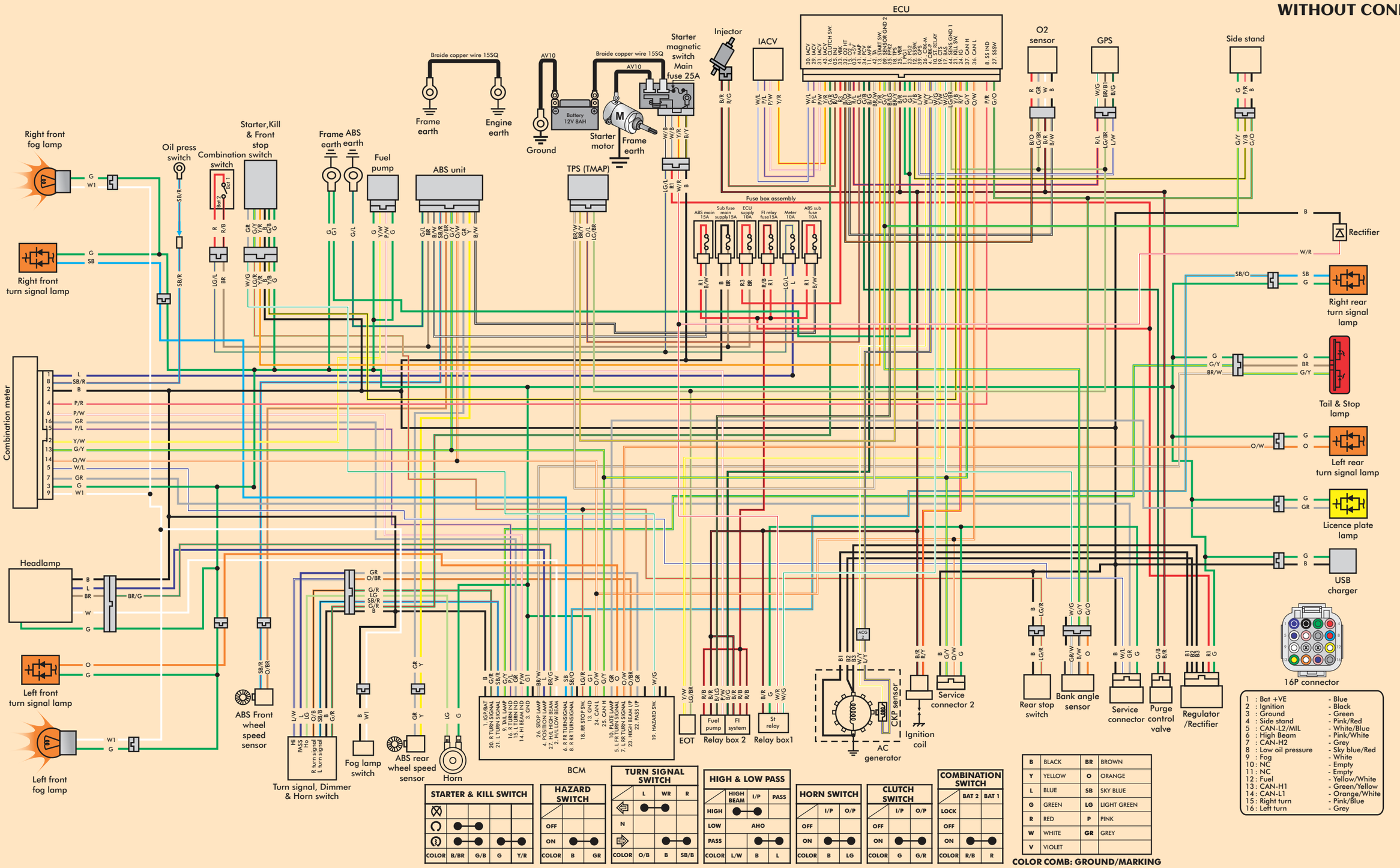


1	: Bat +VE	-	Blue
2	: Ignition	-	Black
3	: Ground	-	Green
4	: Side stand	-	Pink/Red
5	: CAN-L2/MIL	-	White/Blue
6	: High Beam	-	Pink/White
7	: CAN-H2	-	Grey
8	: Low oil pressure	-	Sky blue/Red
9	: Fog	-	White
10	: NC	-	Empty
11	: NC	-	Empty
12	: Fuel	-	Yellow/White
13	: CAN-H1	-	Green/Yellow
14	: CAN-L1	-	Orange/White
15	: Right turn	-	Pink/Blue
16	: Left turn	-	Grey

B	BLACK	BR	BROWN
Y	YELLOW	O	ORANGE
L	BLUE	SB	SKY BLUE
G	GREEN	LG	LIGHT GREEN
R	RED	P	PINK
W	WHITE	GR	GREY
V	VIOLET		

COLOR COMB: GROUND/MARKING

WITHOUT CONNECT



1	: Bat +VE	-	Blue
2	: Ignition	-	Black
3	: Ground	-	Green
4	: Side stand	-	Pink/Red
5	: CAN-L2/MIL	-	White/Blue
6	: High Beam	-	Pink/White
7	: CAN-H2	-	Grey
8	: Low oil pressure	-	Sky blue/Red
9	: Fog	-	White
10	: NC	-	Empty
11	: NC	-	Empty
12	: Fuel	-	Yellow/White
13	: CAN-H1	-	Green/Yellow
14	: CAN-L1	-	Orange/White
15	: Right turn	-	Pink/Blue
16	: Left turn	-	Grey

B	BLACK	BR	BROWN
Y	YELLOW	O	ORANGE
L	BLUE	SB	SKY BLUE
G	GREEN	LG	LIGHT GREEN
R	RED	P	PINK
W	WHITE	GR	GREY
V	VIOLET		

COLOR COMB: GROUND/MARKING

STARTER & KILL SWITCH

	●		●	
	●			●
COLOR	B/BR	G/B	G	Y/R

HAZARD SWITCH

OFF		
ON	●	
COLOR	B	GR

TURN SIGNAL SWITCH

	L	WR	R
⇦	●		
N			
⇨		●	●
COLOR	O/B	B	SB/B

HIGH & LOW PASS

	HIGH BEAM	I/P	PASS
HIGH	●	●	
LOW	AHO		
PASS		●	●
COLOR	L/W	B	L

HORN SWITCH

	I/P	O/P
OFF		
ON	●	●
COLOR	B	LG

CLUTCH SWITCH

	I/P	O/P
OFF		
ON	●	●
COLOR	G	G/R

COMBINATION SWITCH

	BAT 2	BAT 1
LOCK		
OFF		
ON	●	●
COLOR	R/B	R

TROUBLESHOOTING

ENGINE DOES NOT START OR ENGINE IS HARD TO START

		POSSIBLE CAUSE
1. Check the charging system	Abnormal	• Faulty battery • Faulty charging system
Normal ↓		
2. Check the Programmed-FI system	Abnormal	• Faulty ECU
Normal ↓		
3. Check for operating sound of the fuel pump	Sound not heard	• Loose or disconnected fuel pump • Broken or shorted fuel pump wire • Faulty fuel pump
Sound heard ↓		
4. Inspect the fuel pressure and fuel flow	Abnormal	• Faulty fuel pump • Clogged fuel filter • Faulty ECU
Normal ↓		
5. Perform a spark test	Weak or no spark	• Faulty spark plug • Incorrect spark plug heat range • Incorrect spark plug gap • Broken or shorted spark plug wire • Faulty CKP sensor • Faulty battery • Faulty bank angle sensor • Faulty ECU • Loose or disconnected ignition system wires
Good spark ↓		
6. Test cylinder compression	Low Compression	• Incorrect valve seat contact • Valve clearance too small • Valve stuck open • Worn cylinder and piston rings • Damaged cylinder head gasket • Seized valve • Improper valve timing
Normal compression ↓		
7. Starting following normal procedure	Engine starts but stops	• Intake manifold leaking • Improper ignition timing (Faulty CKP sensor) • Faulty IACV • Fuel contaminated
Engine does not start ↓		
8. Remove and inspect spark plug	Wet plug	• Clogged air cleaner • Faulty ECU
	Dry plug	• Faulty injector

ENGINE LACKS POWER

		POSSIBLE CAUSE
1. Raise wheel off the ground and spin by hand	Wheels doesn't spin freely	• Brake dragging • Worn or damaged wheel bearing
Wheel spins freely		
2. Check tyre pressure	Pressure low	• Faulty tyre valve • Punctured tyre
Pressure normal		
3. Check for clutch slipping problem, even when clutch assistance is desired.	Clutch slips	• Week clutch springs • Worn clutch disks • Wrapped clutch plates • Misadjusted clutch lever free play • Sticking clutch lifter mechanism
Clutch does not slip		
4. Lightly accelerate engine Engine speed increases	Engine speed does not increase sufficiently	• Clogged air cleaner • Restricted fuel flow • Clogged fuel tank cap breather hole • Clogged fuel filter • Clogged muffler
5. Check ignition timing	Incorrect	• Faulty ECU • Faulty CKP sensor • Improper valve timing
Correct		
6. Test cylinder compression	Low compression	• Incorrect valve seat contact • Valve clearance too small • Worn cylinder and piston rings • Damaged cylinder and piston rings • Seized valve • Improper valve timing
Normal compression		
7. Inspect fuel pressure and fuel flow	Abnormal	• Faulty fuel pump • Clogged fuel filter • Faulty ECU
Normal		
8. Remove and check spark plug	Fouled or discoloured	• Spark plug not serviced frequently • Use of spark plug with improper heat range
Good condition		

9. Check oil level and condition → Incorrect →
   - Oil level too high
   - Oil level too low
   - Contaminated oil

   Correct ↓

10. Remove cylinder head cover and inspect lubrication → Valve train not lubricated properly →
    - Clogged oil passage
    - Faulty oil pump
    - Clogged oil strainer screen

    Valve train lubricated properly ↓

11. Check if engine overheats → Engine overheats →
    - Excessive carbon build- up on combustion chamber
    - Use of improper quality of fuel
    - Wrong type of fuel

    Engine does not overheat ↓

12. Accelerate or run at high speed → Engine knocks →
    - Excessive carbon built-up on combustion chamber
    - Use of improper quality of fuel
    - Worn cylinder and piston
    - Ignition timing too advance (Faulty ECU)
    - Faulty CKP

    Engine does not knock ↓

POOR PERFORMANCE AT LOW AND IDLE SPEED

1. Check ignition timing and valve clearance → Incorret →
   - Faulty ECU unit
   - Faulty CKP
   - Improperly adjusted valve clearance
   - Improperly installed CKP

   Correct ↓

2. Inspect the fuel pressure and fuel flow → Abnormal →
   - Faulty fuel pump
   - Clogged fuel filter
   - Faulty ECU

   Normal ↓

3. Check for leaks in the intake manifold → Leaking →
   - Loose intake manifold band or mounting bolts
   - Damaged intake manifold

   Not leak ↓

4. Perform spark test → Weak or intermittent Spark →
   - Faulty spark plug
   - Faulty carbon or wet fouled spark plug
   - Faulty ECU
   - Faulty ignition coil
   - Broken or shorted spark plug wire
   - Faulty CKP sensor
   - Faulty ignition switch
   - Loose or disconnected ignition system wires.
   - Faulty injector

POOR PERFORMANCE AT HIGH SPEED

1. Check ignition timing → Incorrect →
   - Faulty ECU
   - Faulty CKP sensor
   - Improper valve timing

   Correct ↓

2. Inspect the fuel pressure and fuel flow → Abnormal →
   - Faulty fuel pump
   - Clogged fuel filter
   - Faulty ECU

   Normal ↓

4. Check valve timing → Incorret →
   - Improperly installed cam sprocket

   Correct ↓

4. Check valve spring → Weak →
   - Faulty valve spring

   Not weak ↓

   - Faulty injector

POOR HANDLING

1. If steering is heavy →
   - Steering bearing adjusting nut too tight
   - Damaged steering head bearings
   - Low tyre pressure

2. If either wheel is wobbling →
   - Excessive wheel bearing play
   - Bent rim
   - Loose swingarm pivot bolt
   - Excessively worn swingarm pivot bushing
   - Bent frame

3. If vehicle pulls to one side →
   - Front and rear wheel not aligned
   - Faulty shock absorber
   - Bent fork
   - Bent swingarm
   - Bent axle
   - Bent frame

ABS TROUBLESHOOTING

PROBLEM

During riding, ABS warning lamp starts glowing, which indicates ABS malfunction. The system becomes ok as soon as ignition is turned "OFF" & "ON" again.

In case of malfunction the DTC code will be generated which can be read through the VCI.

PROBABLE CAUSE	TROUBLESHOOTING
Battery connection loose	Check battery terminal connections & tighten them if found loose. Also, assure no loose couplers (no open loop circuit)
Wheel is taken out while keeping the ignition "ON"	Ensure that ignition key is "OFF"
Low voltage due to ignition kept on for very long duration which causes battery to drain	Recharge the battery to fully charged or replace the battery, if required.

For other ABS related troubleshooting refer anti-lock braking system **(Section-15)**.

NOTE

THIS CHAPTER COVERS GENERIC PROCEDURE TO INSTALL, FLASH AND UPDATE THE VEHICLE COMMUNICATION INTERFACE (VCI).
FOR ALL OTHER VCI RELATED DIAGNOSTIC PROCEDURES, FOLLOW FUEL SYSTEM (PROGRAMMED FI) CHAPTER OF RESPECTIVE MODELS.

23. VEHICLE COMMUNICATION INTERFACE (VCI)

REQUIREMENTS FOR THE INSTALLATION OF HERO VCI SOFTWARE IN SYSTEM

I. If user having windows 7 please follow below steps.

- If user using windows 7 operating system, user has to update windows 7 properly first then update system into windows 7.1.
- If user having windows 8 or windows 10 there is no need of update.
- User has to install dot net framework 4.6.1 in system.

NOTE

Use genuine windows operating system.

II. If user system having any antivirus at the time of installation please disable it for installation

III. User has to run the system in administrative mode at the time of installation of VCI software

IV. Once OTP is recived at the mail id or mobile use the OTP for installation with in 30 minutes.

V. System Requirement

Windows Edition

Windows 7.1 or higher version (Genuine).

System configuration

Processor- Intel®core™i3-7100U CPU @ 2.40GHZ 2.40GHZ.

Installed memory – 4.00GB.

System Type - 64-bit operating system, x64-based processor.

HERO VEHICLE COMMUNICATION INTERFACE (HERO VCI)

PART NO: HMCL0419HVCI01

DESCRIPTION

It is a computer-based system originally designed to reduce emissions by monitoring the performance of major engine components.

Vehicle's programmed fuel injection system consists of an ECU (Electronic Control Unit), which uses input from various sensors (e.g., oxygen sensors) to control the actuators (e.g., fuel injectors) to get the desired performance. Incase of any malfunction, ECU stores the respective diagnostic trouble code (DTC) that can be scanned by VCI tool. The MIL (malfunction indicator light) provides warning of malfunction to the vehicle owner.

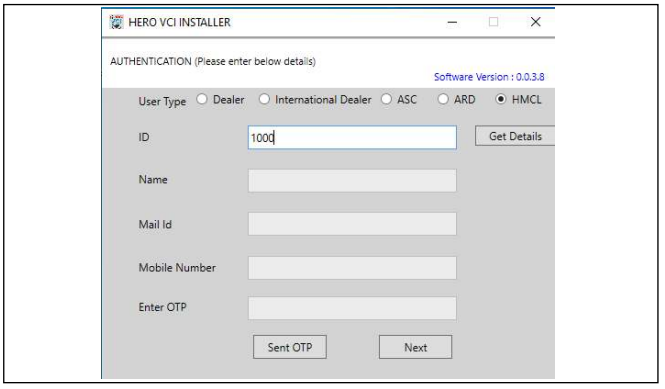
HERO VCI COMPONENTS

VCI bag consists of following components:

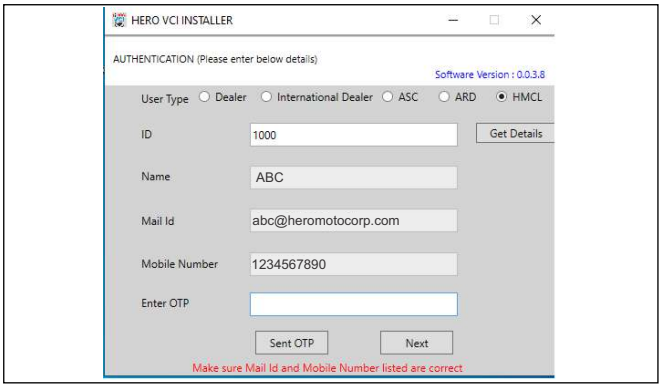
1. VCI tool
2. VCI cable
3. USB cable
4. Bluetooth dongle

SET UP INSTALLATION PROCEDURE

- Open HERO VCI Installer.EXE. A new window will open as shown.
- Select User Type and enter the Dealer/International Dealer/ASC/ARD code in "ID" field. Dealer Name, Mail ID and Mobile Number will fetch automatically from HERO Server.



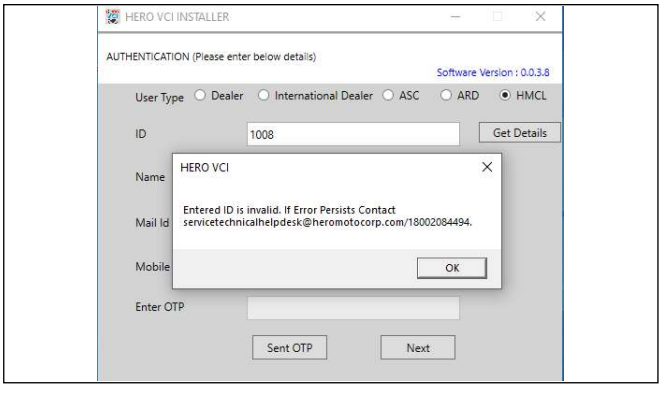
- If Dealer/International Dealer/ASC/ARD details are available on the Server, then details will be displayed.



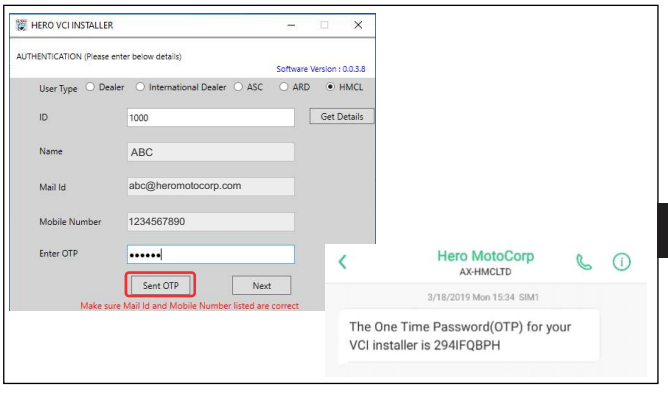
- If Details are not available on the server, a message will be displayed as "No such Dealer/International Dealer/ ASC/ ARD Code Exists".

NOTE

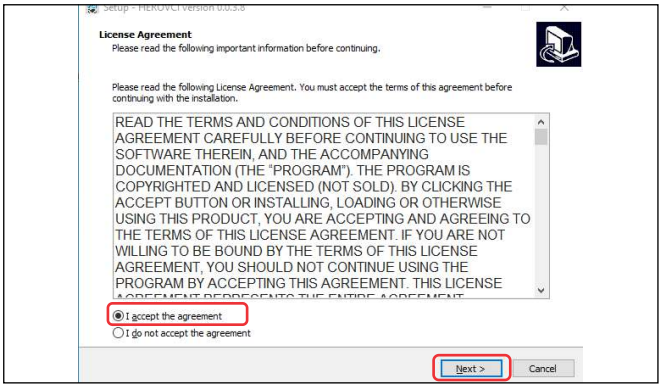
If message persists, contact "Hero Service Technical Helpdesk" for the support.



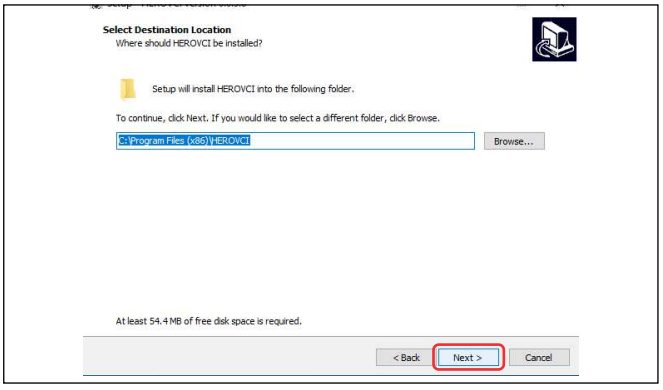
- Click on "Send OTP" tab and OTP will be shared to Mail id and Mobile Number to assigned Dealer/International Dealer/ASC/ARD.
- Enter the OTP in the enter OTP section to start the installation.



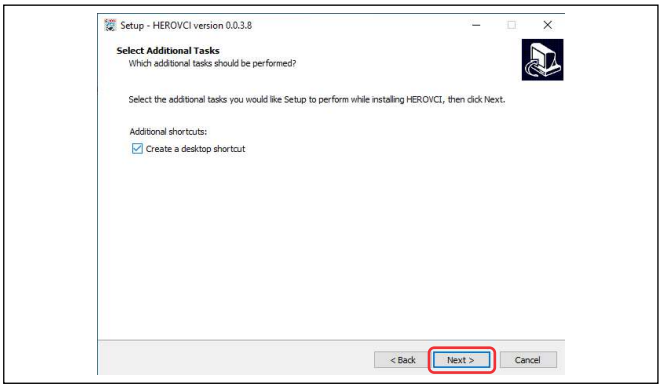
- Once OTP entered, accept the Terms and Conditions and click next to proceed.



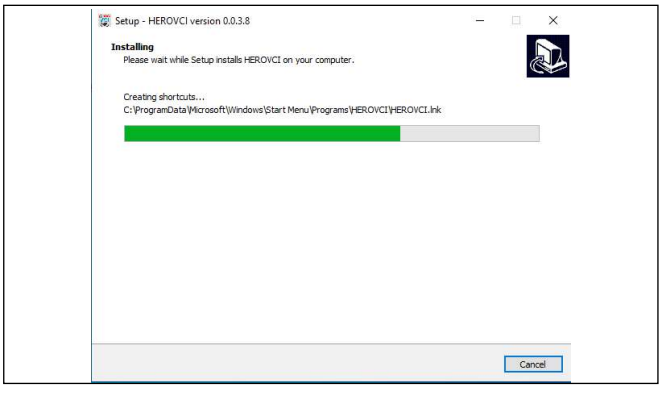
- Click on "Next" to proceed.



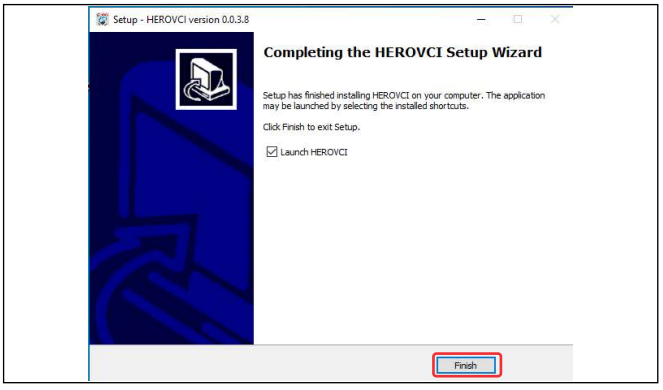
- Click on "Next" to proceed.



- Click on "Install" to start the installation process.



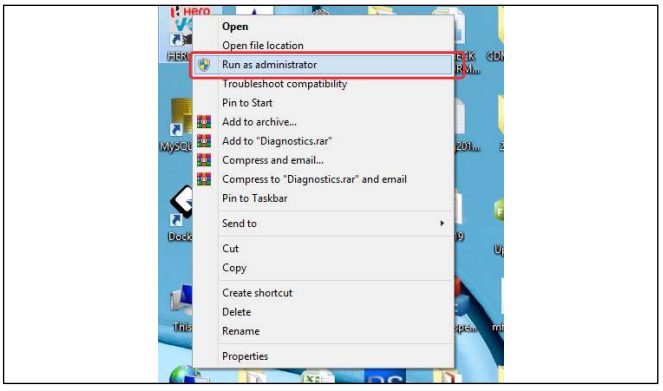
- Once installation completed, click on "Finish" tab to complete the process.



PASSWORD CREATION

- While opening HERO VCI SOFTWARE for first time runs the HERO VCI as administrator. If the software not in administrator mode it will show a popup.

- To run the software with "Administrator", select the software and right click on it. A window will open as shown.



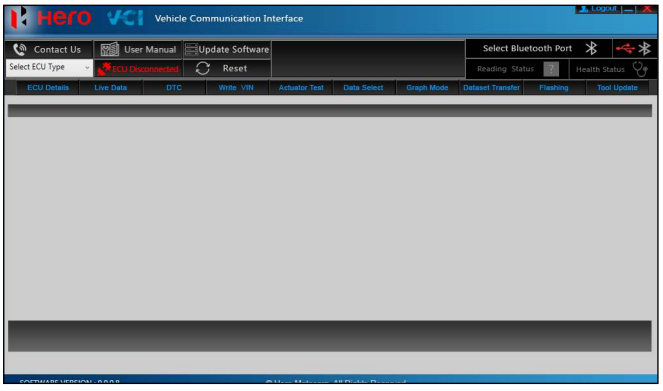
- Once software gets open, enter Dealer/International Dealer/ASC/ARD code and Enter OTP and click on login.

NOTE

If you forgot the OTP, "Double click" on "Resend OTP". OTP will be sent to registered mobile number.

- Once software is installed, at the time user has to create own password.
- User has to enter their OTP in ENTER OLD PASSWORD/ OTP box, then enter a New Password in Second box, then type same Password in confirm Password box and click on Login.

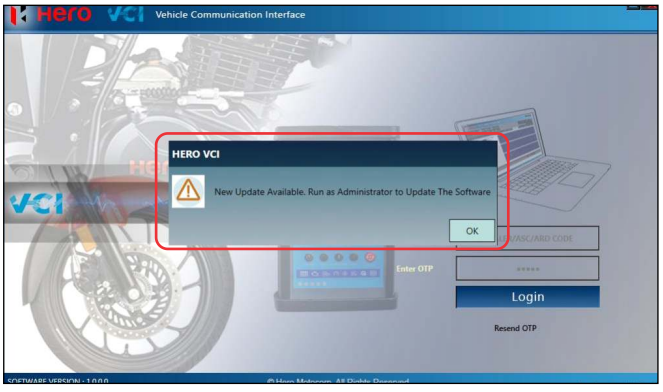
- After creating the Password for login enter the Dealer/ International Dealer/ASC/ARD code in proper box and enter the Password given by the user in proper box and click on “Login”. A window will open as shown.



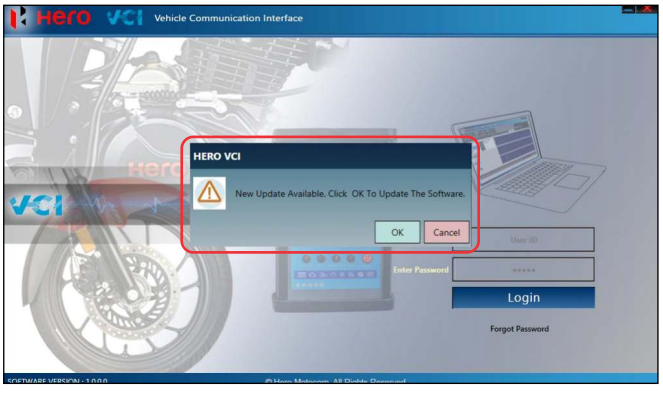
SOFTWARE UPDATE

If the user using version 1.01.2 or less than 1.0.1.2 of HERO VCI SOFTWARE it will give a popup automatically, if version is above 1.0.1.2 then automatically software update will happen after tool update.

- Press “OK” and close the application.

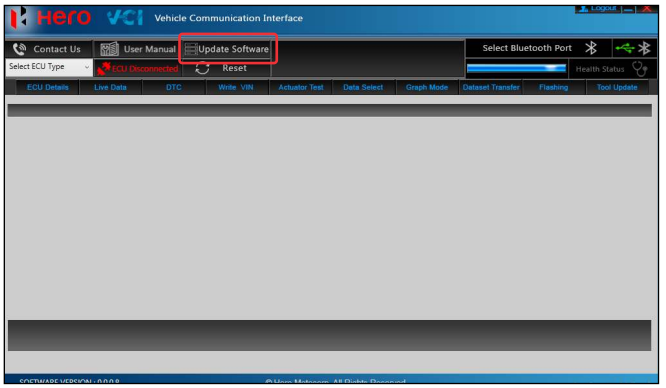


- Run VCI software as administrator then a popup will be shown.



1. If user press "Cancel"

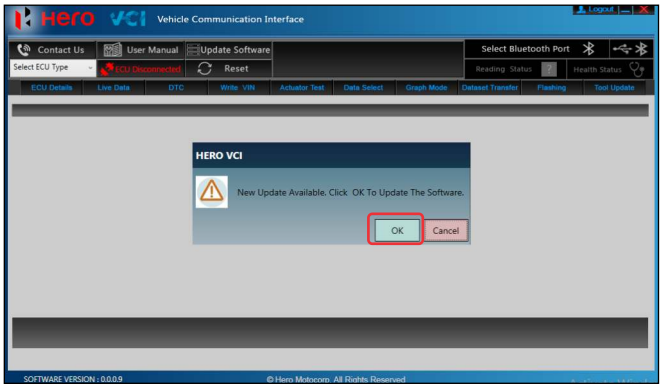
- Open the software
- For updating HERO VCI SOFTWARE manually, please click on update software button as shown.



- If latest version is available, a pop up will be shown.

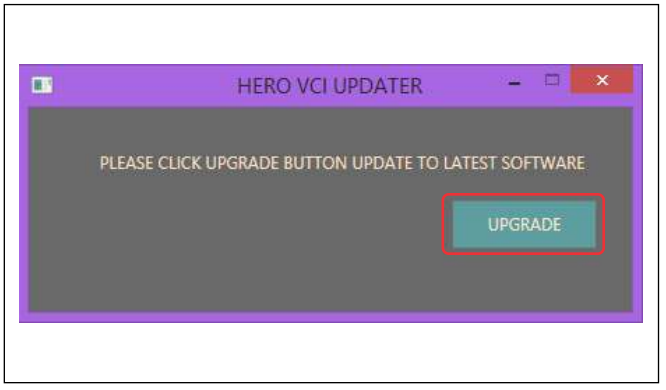
NOTE

For software update application should have to run as administrator.

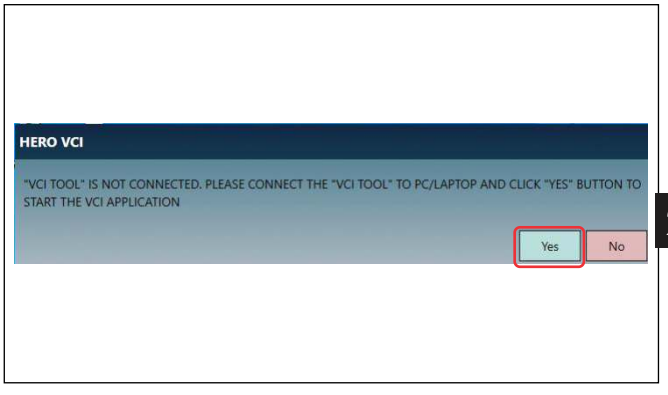


2. If user press "OK"

- Once click on "OK" HERO VCI application closed automatically and one popup will appear, "Please click on upgrade button to update into the latest software".



- After updating, software will show a pop-up. If VCI hardware (VCI Tool) is not connected with system (Laptop/Desktop) user should connect VCI hardware (VCI tool) with application and click on "Yes" button else application will not open.



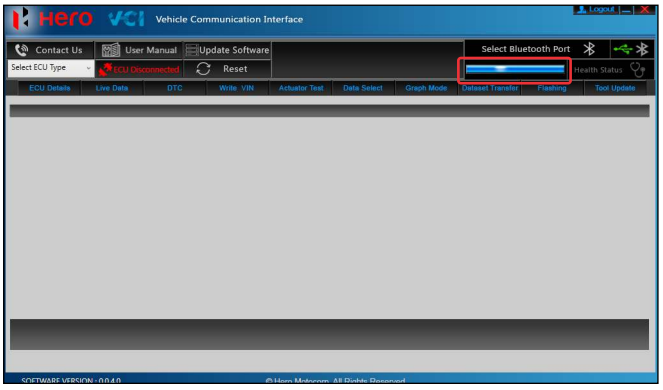
- Once clicked on "Yes" application will open.

VCI TOOL UPDATE

Key Points to Follow: -

- Connect the VCI tool with PC/Laptop and vehicle with necessary cables.
- Make sure "INTERNET CONNECTIVITY" is available while TOOL UPDATE is in process in TOOL UPDATE SECTION.
- Please ensure Antivirus/Window firewall should be in disabled mode before starting the Process.
- When tool update process is running do not reset the VCI tool/VCI application.
- Follow the steps as mentioned in the VCI chapter. Contact the hero technical help desk for any support, complaint and queries.

  Mail ID: servicetechnicalhelpdesk@heromotocorp.com
  Contact Number: 18002084494

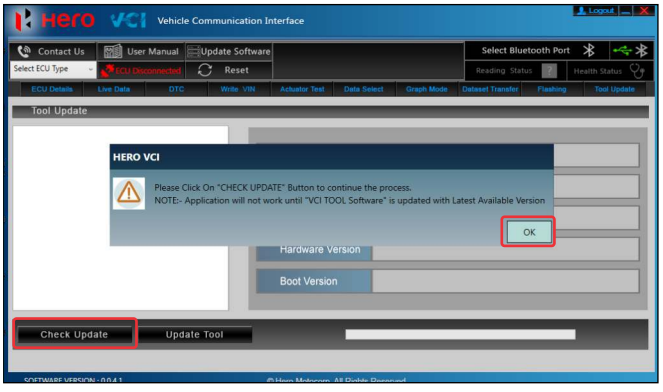


- After update of Application once user login into application, it will start to check tool firmware version and software version automatically, if it is not updated application will direct "user" automatically to tool update window.

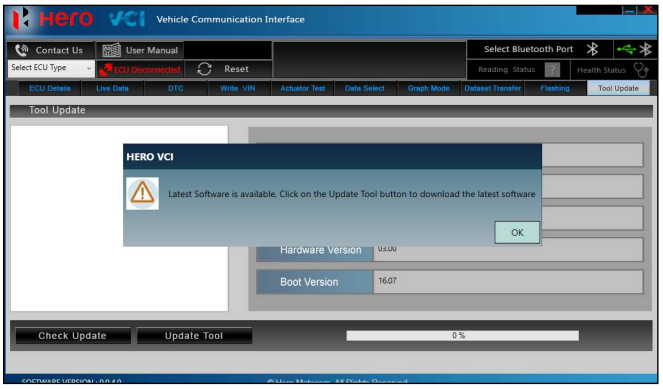
NOTE

Without updating hardware and software to latest version, software will not work.

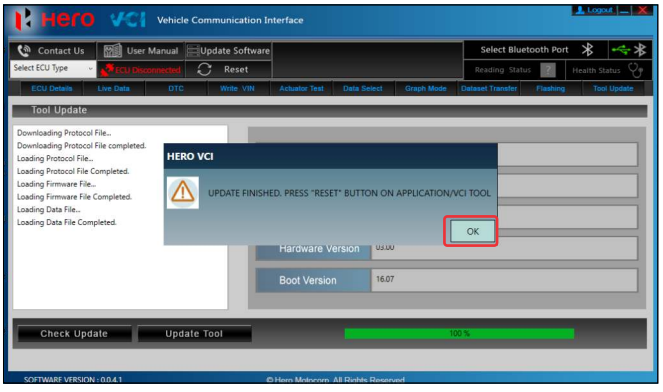
- A popup will appear, press "OK" and click on "Check Update"



- Once clicked on "Check update" a popup will appear, latest software is available please click on "OK" and click on "Update tool".



- Please wait until software update is completed.
- Once tool got successfully updated, a pop-up message will appear "Update Finished. Press Reset button on Application/VCI Tool". Now press "OK".



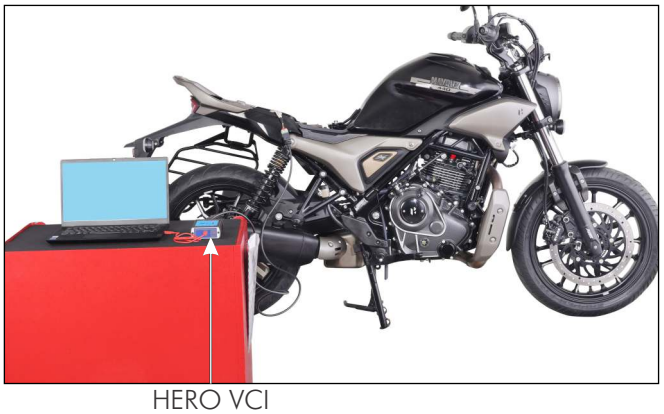
VCI TESTING PROCEDURE

NOTE

- The following steps will explain the general procedure for performing VCI testing and therefore a different model may appear in the VCI screen images.
- Make sure you have selected a correct model on which the VCI testing will be performed.

For HID (USB) Mode

- Connect the Hero VCI with the cable and other end with vehicle diagnostic link connector (DLC).
- Connect USB cable to HERO VCI and Laptop/Desktop.



HERO VCI

- Turn "ON" the ignition switch.

NOTE

Engine should not to be cranked during the process.

- Open HERO VCI application and login with username and password credentials.

For Bluetooth Mode

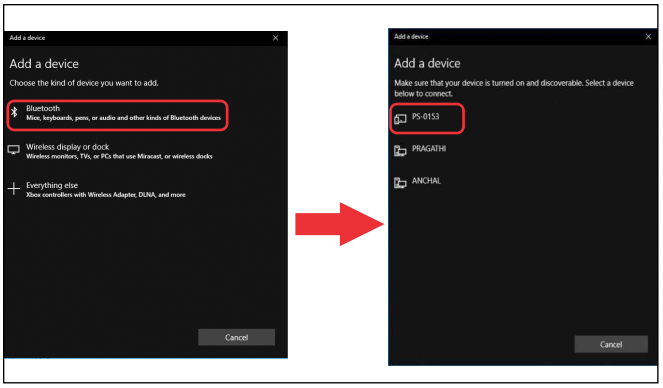
- Connect the Hero VCI with the cable and other end with vehicle diagnostic link connector (DLC).

HERO VCI

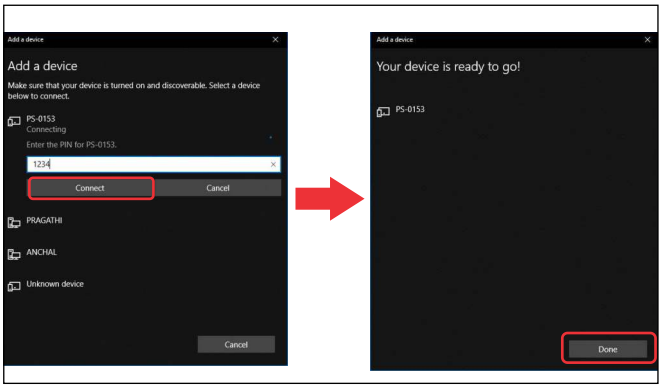
Pairing Steps

- Connect the bluetooth dongle to the desktop or in laptop, enable the bluetooth mode. Open bluetooth control settings.
- Click on add bluetooth devices.
- Click on bluetooth and select the device.

For example: If the Serial Number of the tool is HM02 190153 then the HERO VCI Bluetooth device name will appear as PS-0153



- Select the appropriate device, enter the password 1234 and click on "CONNECT" for pairing.
- Once the device is paired, it is ready to communicate with the ECU.
- Click on "DONE".



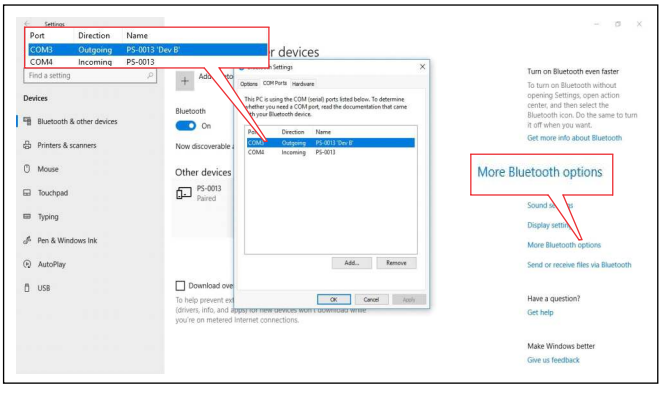
- Select the appropriate COM Port through which the system can communicate with VCI for Bluetooth connectivity.

NOTE

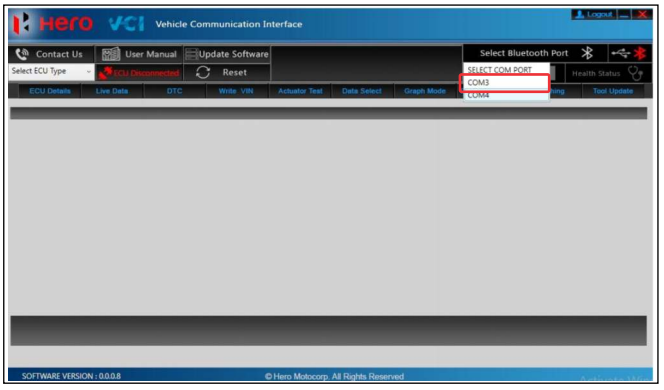
COM port related details can be seen in "More Bluetooth Options".

- Check for the outgoing COM Port. Select COM 3 in the application. Bluetooth connection status message will be displayed on the screen as connected.

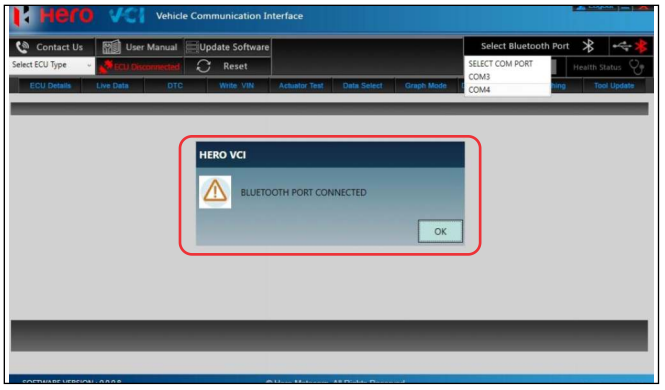
For example: COM 3 is an outgoing port for PS-0013



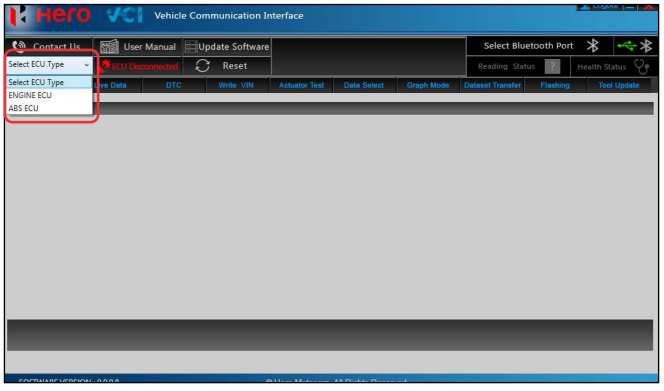
- Once system bluetooth connected with HERO VCI tool, open application and connect with proper COM port



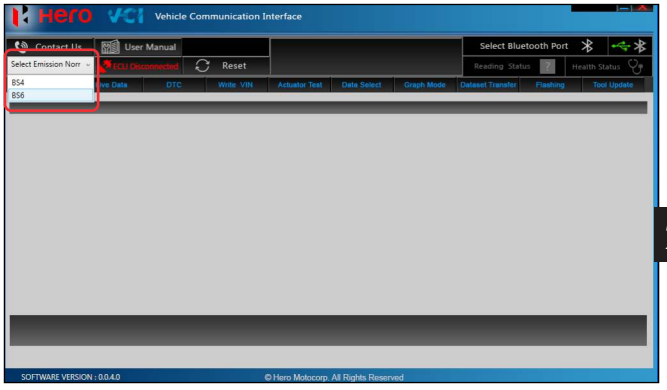
- Once COM Port is selected, a message will be displayed on the screen "BLUETOOTH PORT CONNECTED".



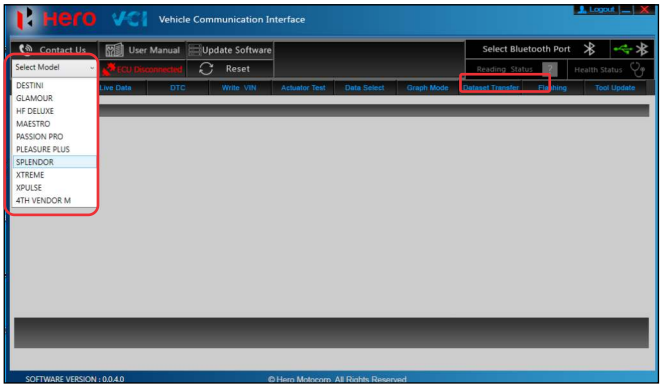
- Select ECU type by clicking on "SELECT ECU TYPE" from the drop down list.



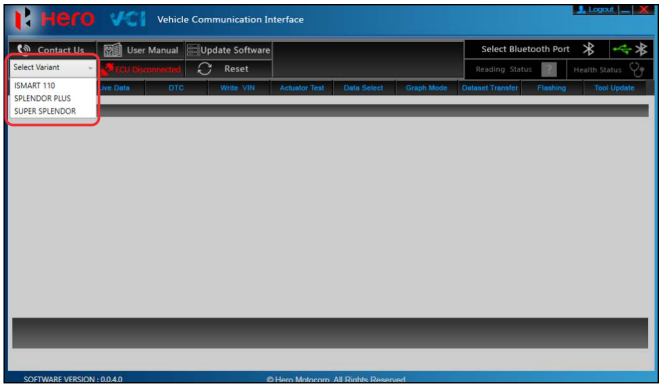
- Once ECU Type selected, "Emission Norm" menu will be displayed.



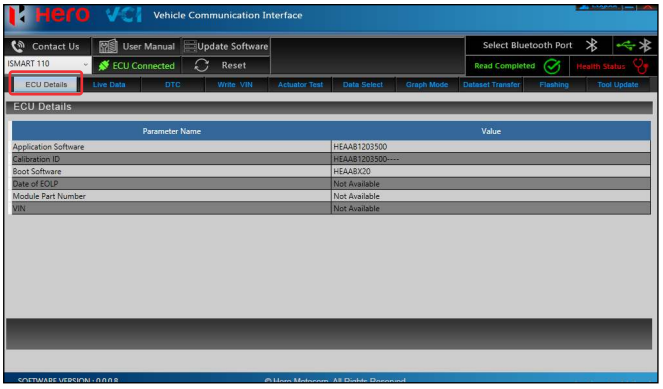
- Once emission norm selected, "MODEL" menu will be display.



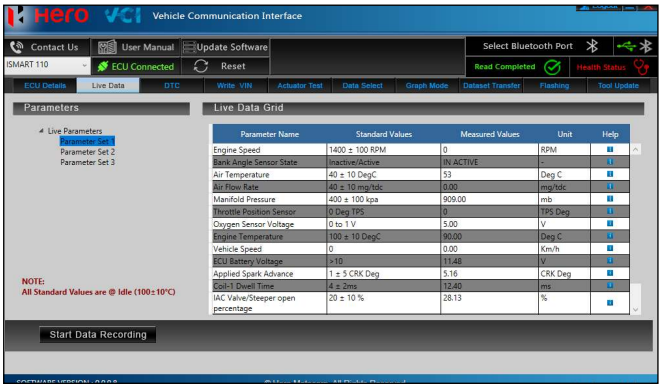
- Once variant is selected, VCI will connect with Vehicle and ECU details will be displayed and ECU connected will be displayed in green color.



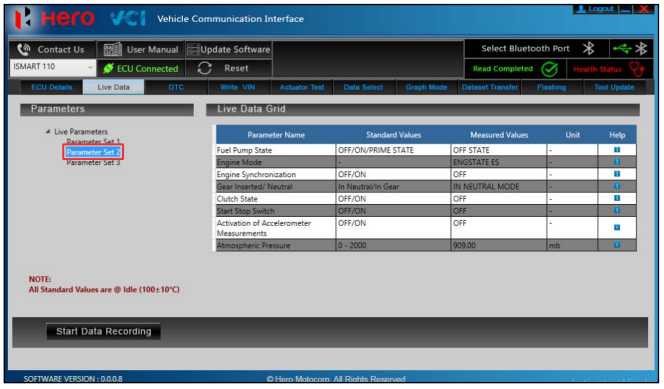
- Engine ECU connected message can be seen and ECU ID details are populated on the screen in case of successful connection.



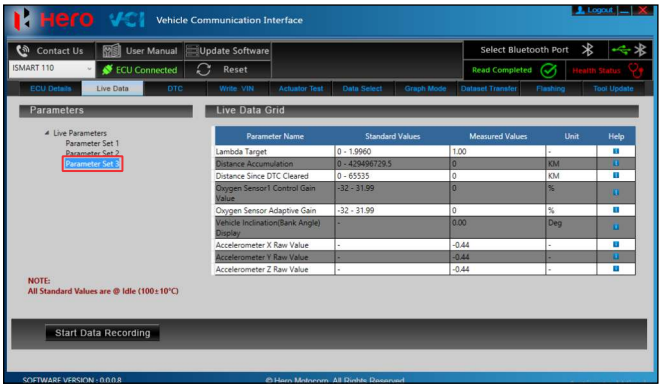
- "LIVE DATA" tab is used to view the engine ECU live data parameters.
- Click on Live Data-Parameter Set 1/Parameter Set 2/ Parameter Set 3 to view the parameters.



- LIVE DATA parameter set 2.



- LIVE DATA parameter set 3.

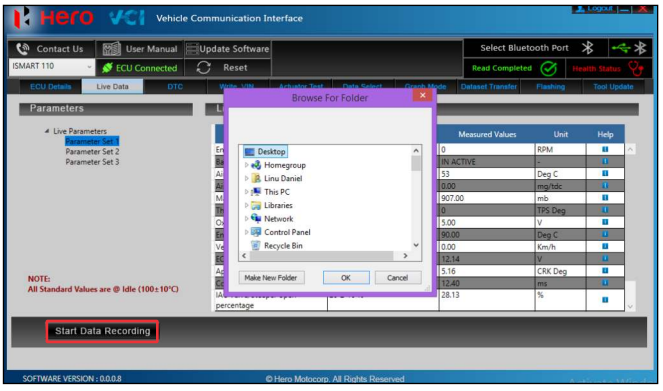


- Click on start logging to take the logs of the selected parameter set.

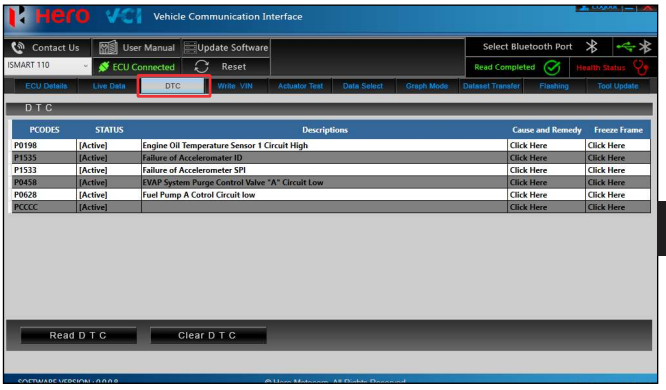
NOTE

Logging is nothing but recording the current varying data in the system.

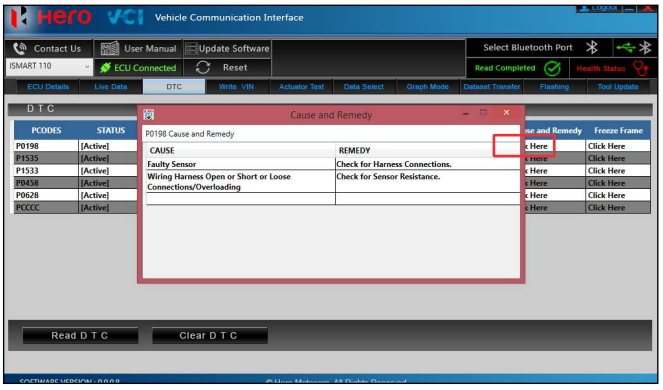
- Select the path where the log file is to be saved and click on OK to start the logging.



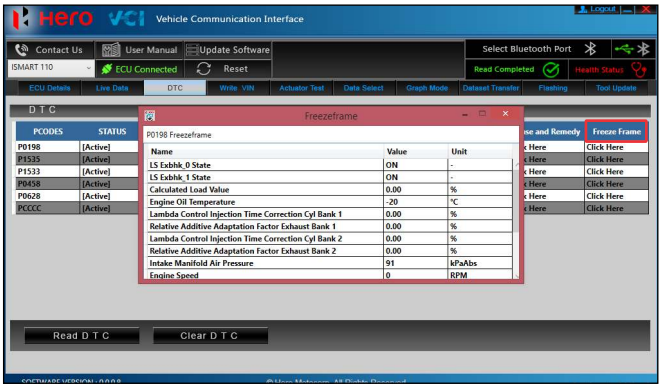
- Click on DTC tab to view the Diagnostics Trouble Codes.
- Click on Read DTC button to Read the error codes that are available in the ECU.



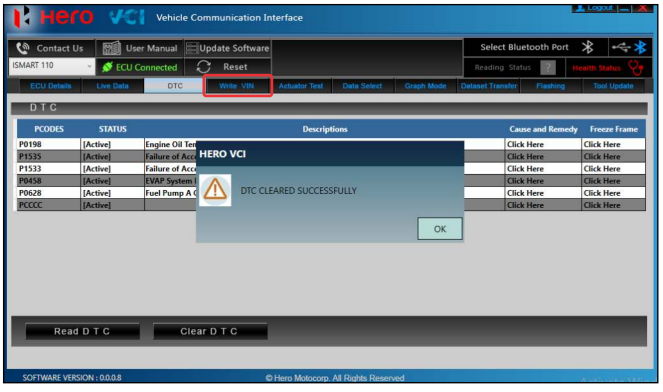
- The resolutions steps for clearing the particular error code can be viewed on the cause and remedy section.



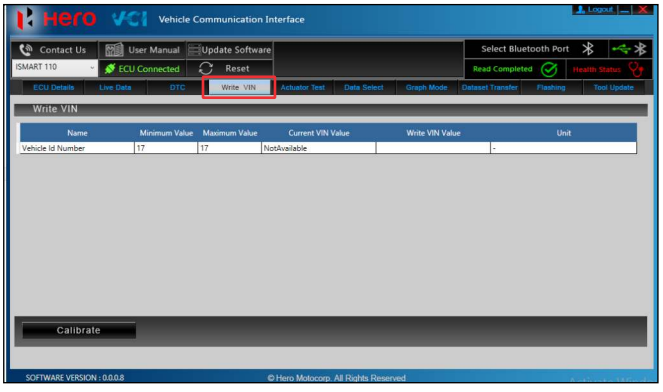
- Click on specific list of error code and view freeze frame data.



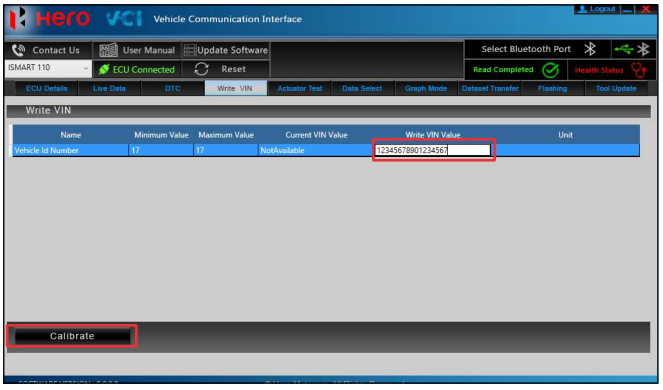
- Click on “Clear DTC” button to clear the existing error codes.



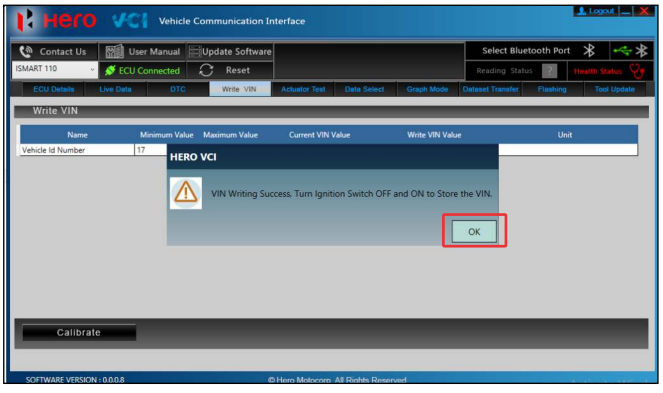
- Click on write VIN option to read current VIN value. To write/edit the VIN number, VIN number should be entered in write VIN value field and click on calibrate to set.



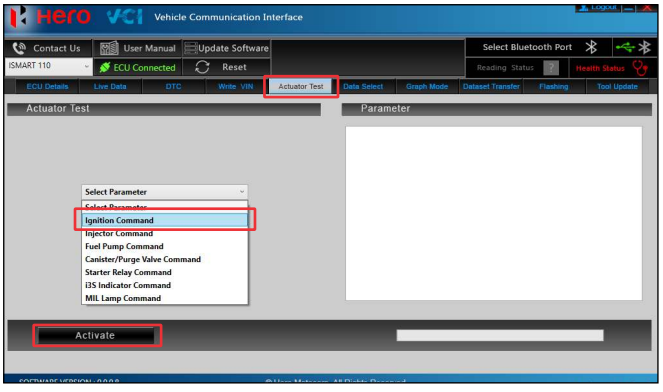
- Enter the VIN data in write VIN value field to write the VIN number.



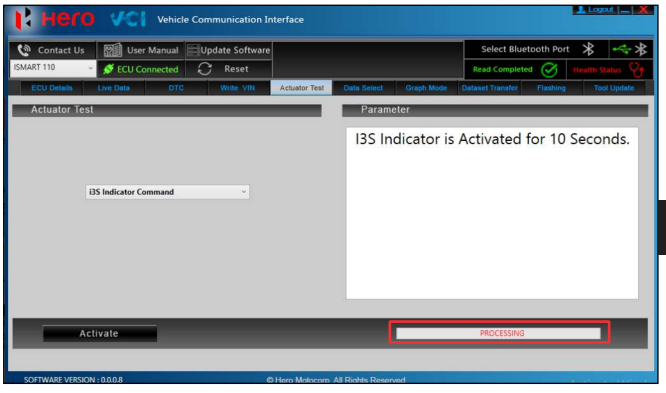
- Click on calibrate button to write the parameter in the ECU. VIN write success message is displayed after the successful writing of VIN number in to the ECU. Turn "OFF" and "ON" the ignition for the changes to reflect.



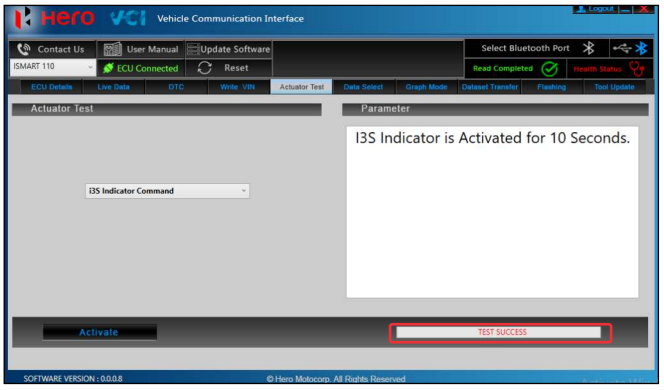
- Click on actuator test tab and select the parameter for which the test is to be performed.



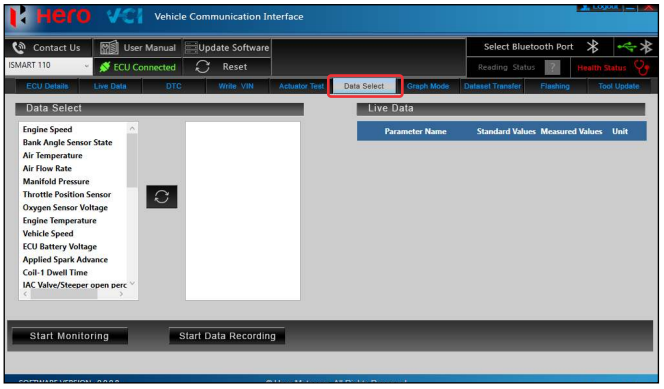
- Click on activate to start the testing and in status bar, the status will be displayed as Activated/Processing/Test Success.



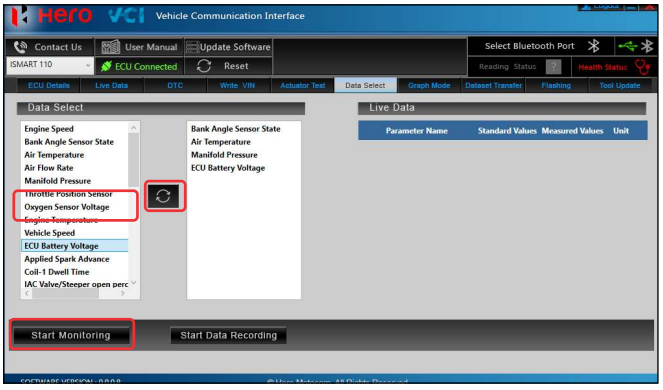
- Once “Test Success” is displayed in the status bar.



- Data Select tab is used to monitor the selected parameters useful to the user.



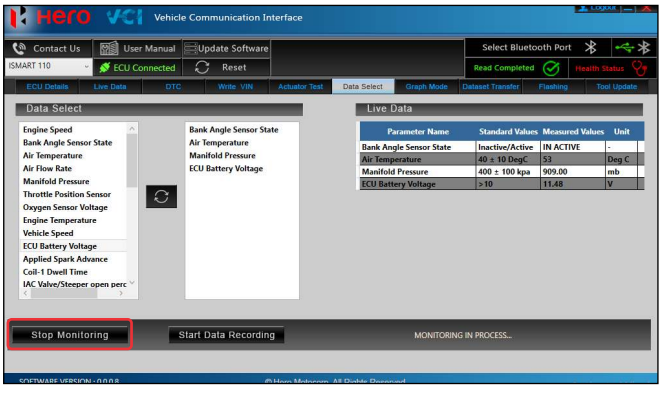
- Select the specific parameter and double click on that parameter to swap it into monitor window.
- Double click on right side parameter to remove the parameter that has been filtered out and is not required to be monitored. Click on reset button to clear the monitor window.



- Click on Start Monitor to start the live monitoring of selected parameters and Stop monitor once the monitoring is done.

NOTE

Maximum 10 parameters can be monitor only at a time.

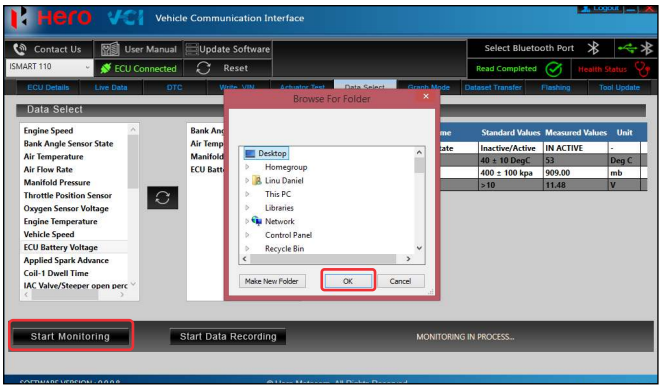


- Similarly Start Data Recording button is used to save the record logs of the parameters.
- Click on Start Data Recording to take the logs of the selected parameter set.

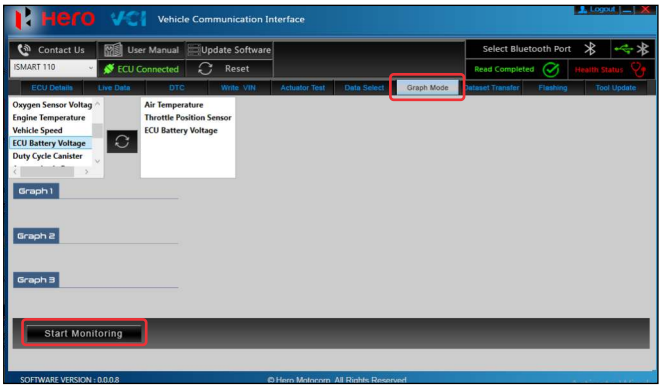
NOTE

Logging is nothing but recording the current varying data in the system.

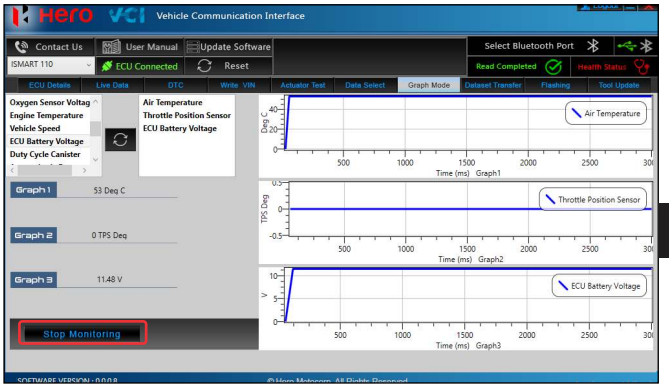
- Select the path where the log file is to be saved and click on OK to start the logging.



- Click on Graph Mode to view the specific parameter.
- Maximum three parameters can be view in graph mode.



- Select the specific parameter and double click on that parameter to swap it into monitor window.
- Double click on right side parameter to remove the parameter that has been filtered out and is not required to be monitored.
- Click on reset button to clear the monitor window.



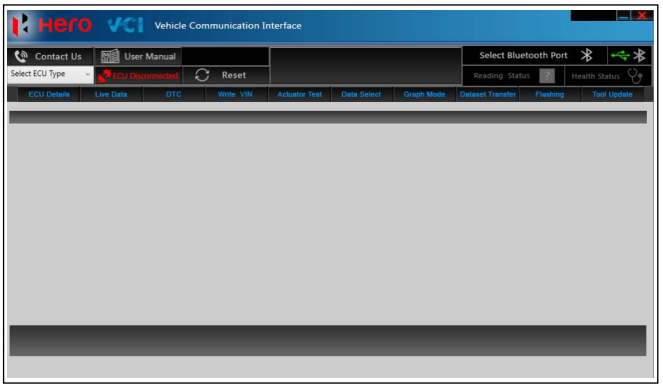
FLASHING PROCESS

NOTE

- The following steps will explain the general procedure for performing ECU flashing and therefore a different model name may appear in the VCI screen images.
- Make sure you have selected a correct model on which the ECU flashing will be performed.

OFFLINE FLASHING

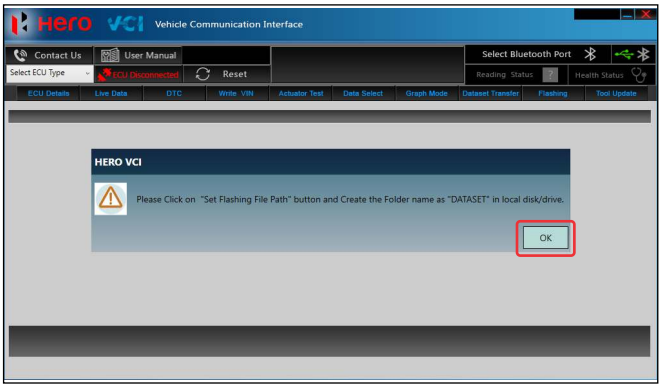
1. Dataset Transfer



- Run the application as administrator and login using user ID & password and click on the "Dataset Transfer" button to start the process.

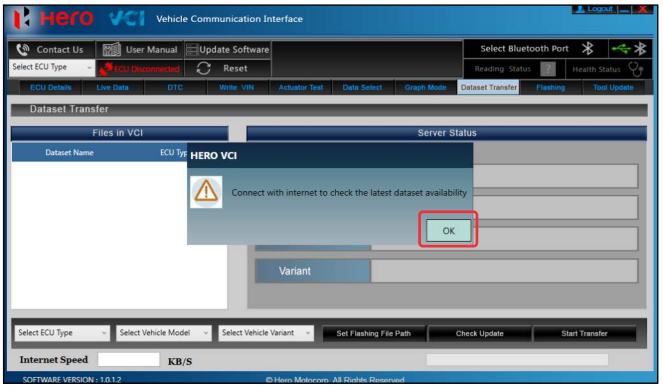
NOTE

Data set transfer is one-time process, once dataset for any model is updated in tool there is no need of transferring dataset for same model again until new update available for the particular model.

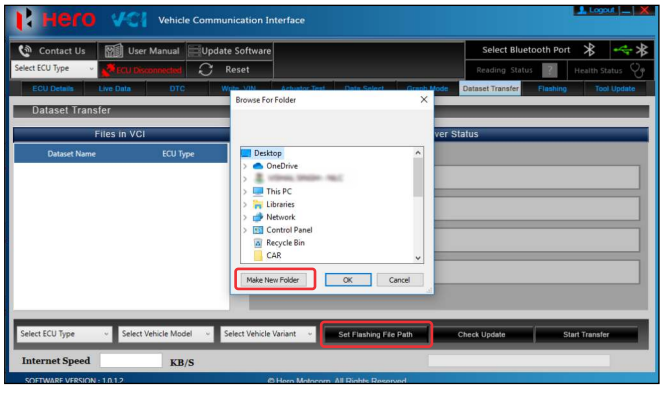


- Read the instructions carefully and click on "OK" to continue the process.

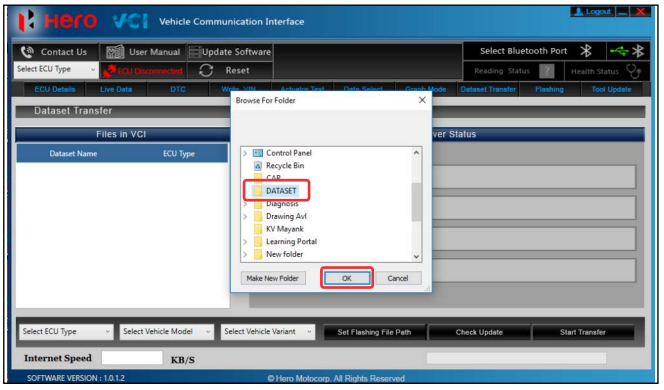
- Check the internet connection before proceeding



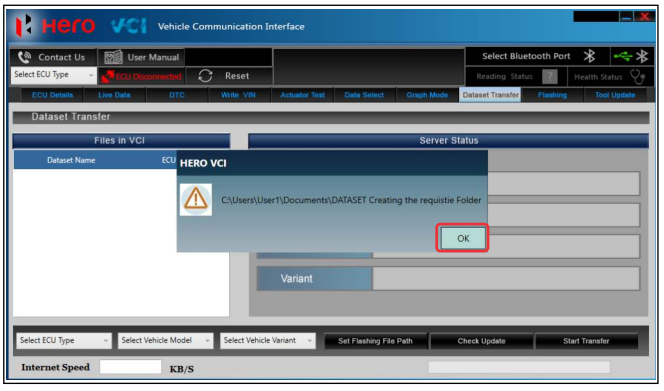
- Click on the "Set Flashing File Path" button to create a new folder.
- Click on the "Make New Folder" tab in the opened select folder window to create a new folder.



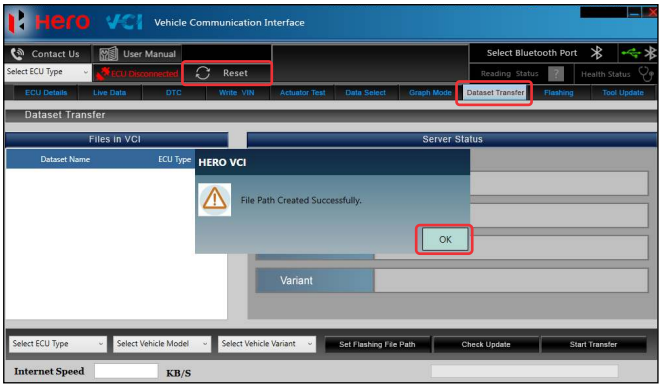
- Once "New Folder" is created then change the new folder name as "DATASET" and select the "DATASET" folder and click "OK" to save the path automatically.



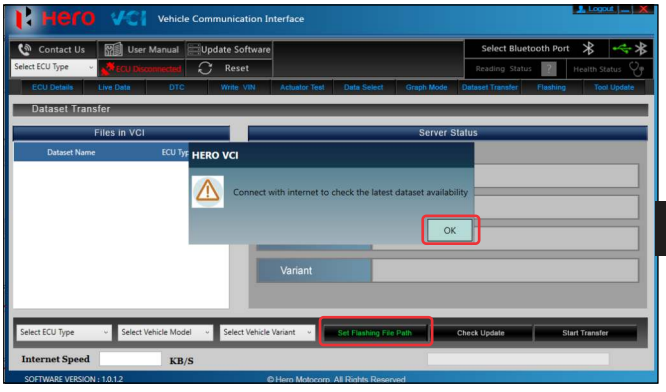
- Click "OK" to continue.



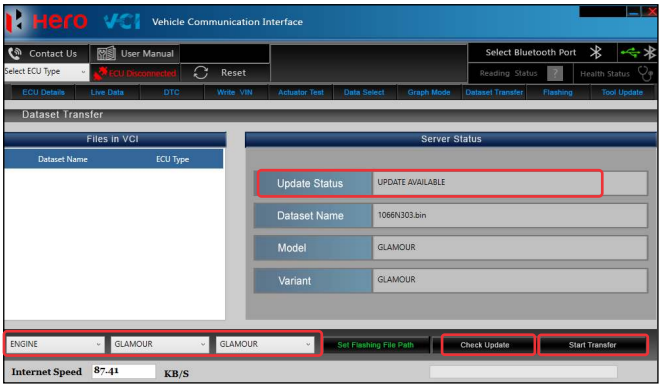
- A new window will be displayed as "File Path Created Successfully" click OK to continue.
- Now click on "Reset" tab on the application and select the "Dataset Transfer" tab again to continue the process.



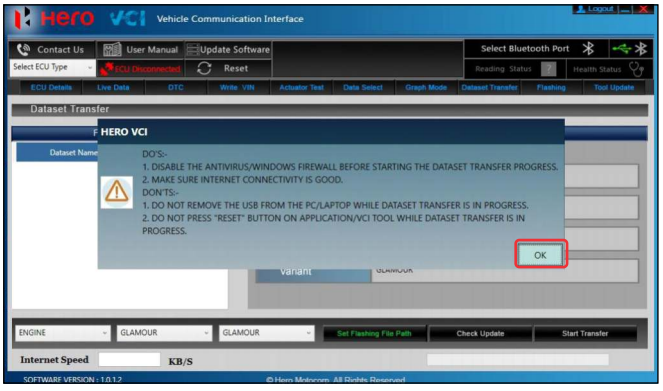
- Application will again ask to check the internet connectivity, if yes then click "OK" to proceed.
- Now "Set Flashing File Path" will display in green colour.



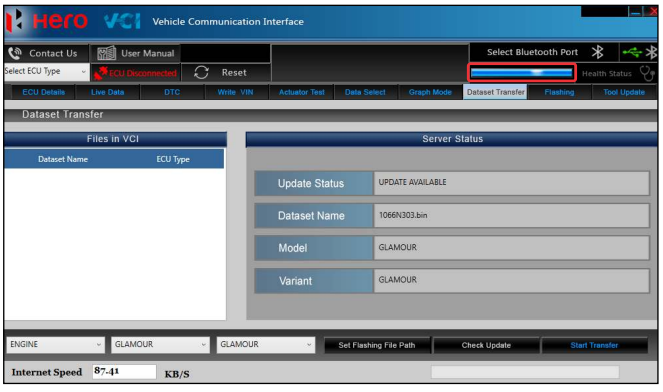
- Select the ECU type, Model & Variant in the selection box.
- Click on “Check Update” to check the new ECU dataset update availability
- If new ECU dataset update is available then it will show in the update status box as “Update Available”.
- Click on the “Start Transfer” button to start the downloading of the new ECU dataset from the server.



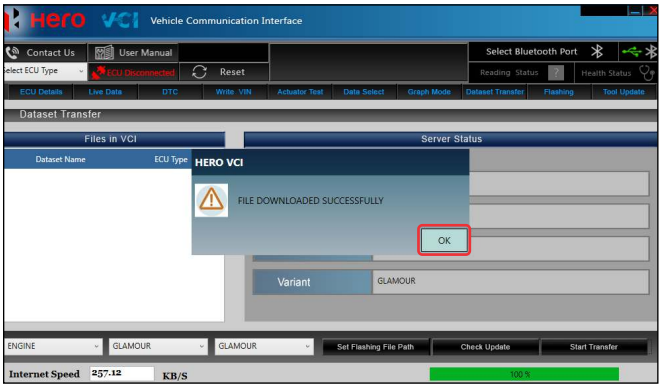
- Read the “Do and Don'ts” carefully and then click on “OK” to continue.
- Once click on “OK” button then downloading of new ECU dataset process will start automatically.



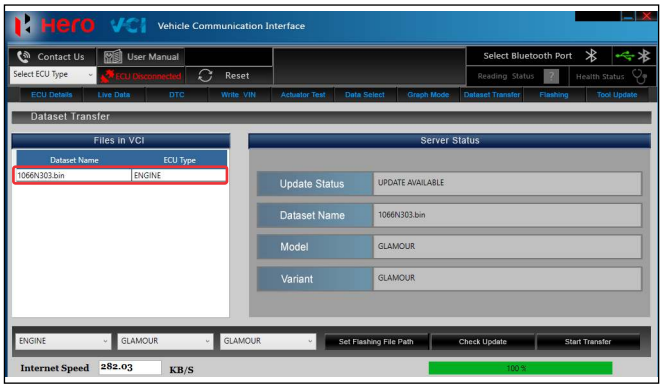
- Progress bar will appear to show the downloading is in process.



- Once the new ECU dataset file is downloaded a popup will appeared as “File Downloaded Successfully” click on “OK” button to continue for next step.

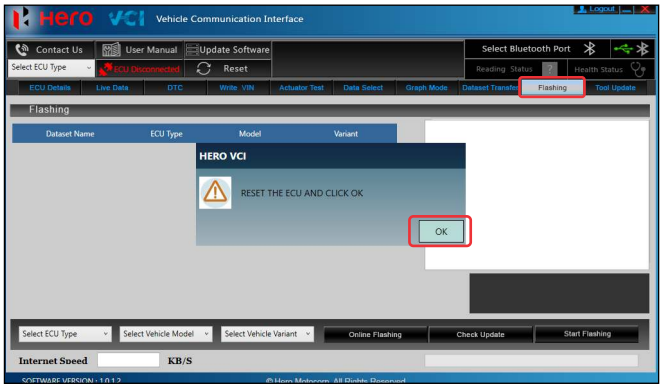


- After downloading the new ECU dataset file, file name will start displaying in the file box.
- Now, close the VCI application and restart again, also click on "RESET" button provided on the VCI tool.

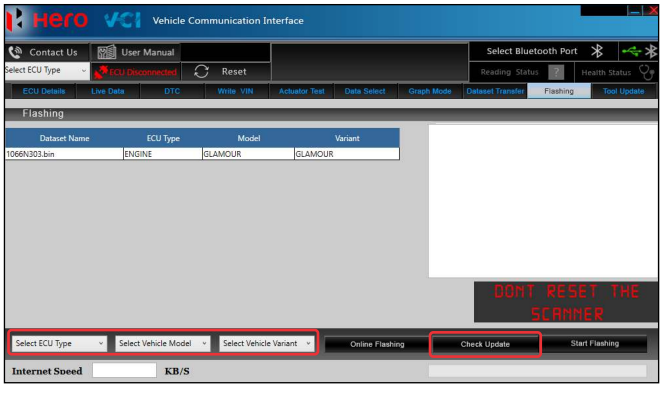


2. Flashing

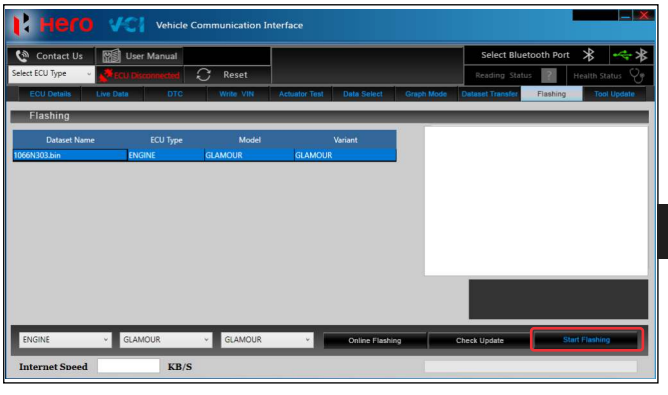
- To start the ECU flashing click on "Flashing" button.
- A popup will appear "Rest the ECU and click OK", click OK to start the process.



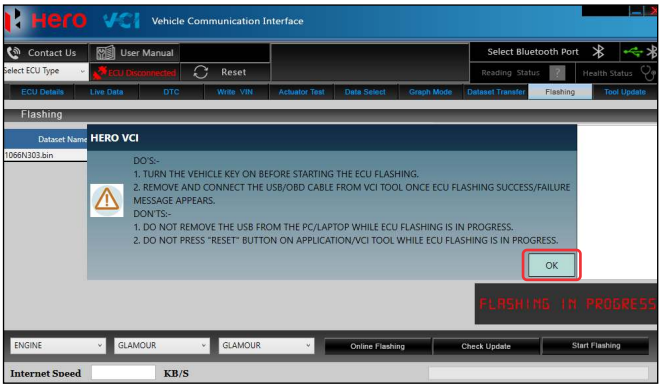
- Once flashing screen appeared, select the "appropriate ECU, model and variant".
- Click on "Check Update" button to refresh the file list.



- Select the appropriate file from the list and click on "Start Flashing" button to start the ECU flashing with new dataset.



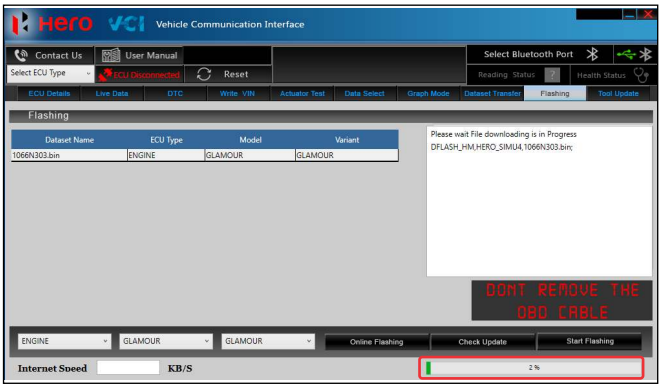
- Read the Do & Don'ts carefully and click on "OK".
- Once "OK" button is pressed ECU flashing process will start automatically.



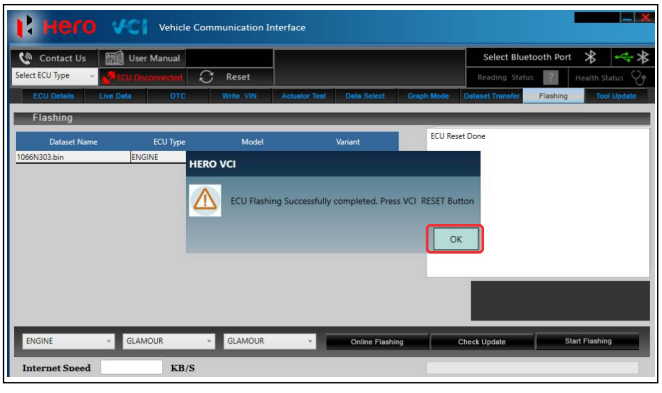
- Status bar will start reflecting the ECU flashing is in process.

NOTE

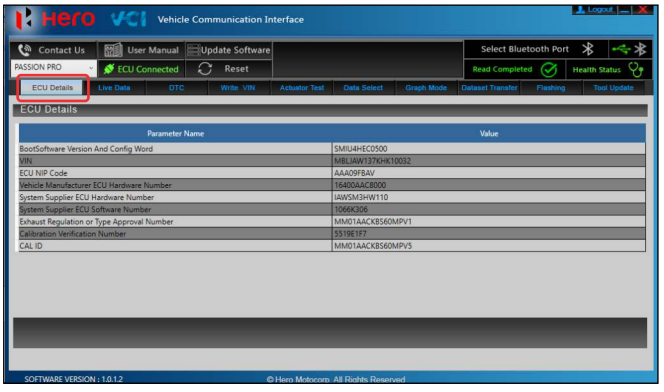
Do not "Reset" the VCI tool and application and also do not turned "OFF" the ignition switch when ECU flashing is in process.



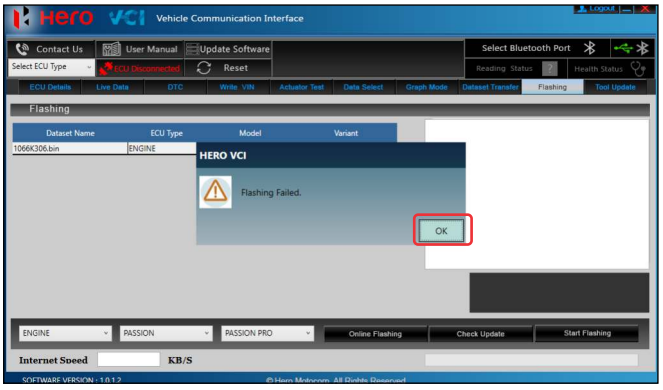
- Once ECU flashing is completed, successful message will appear on the screen.
- Now click on "OK" button and turned OFF the ignition switch and turned ON after 30 secs.
- Close and restart the application also press the reset button provided on VCI tool.



- Finally start engine and select the appropriate model to check the new ECU update details in the "ECU Details" tab.

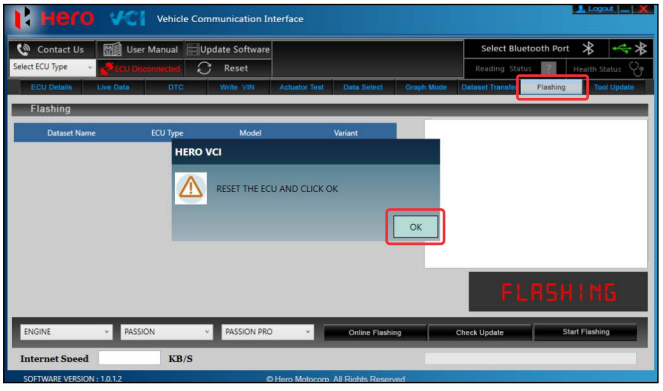


- During ECU dataset flashing if ECU connection is disconnected then "Flashing Failed" message will appear.
- Click OK and read the instruction slide once and do the process again.

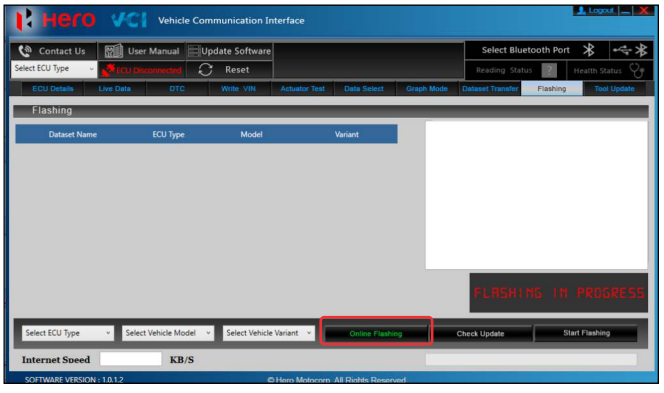


ONLINE ECU FLASHING

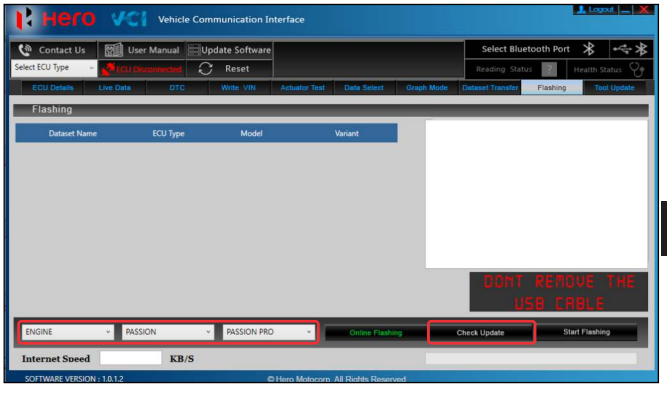
- Run the application as administrator and login using user ID & password and click on the "Flashing" button to start the online ECU dataset flashing process.
- Click on OK button to start the process.



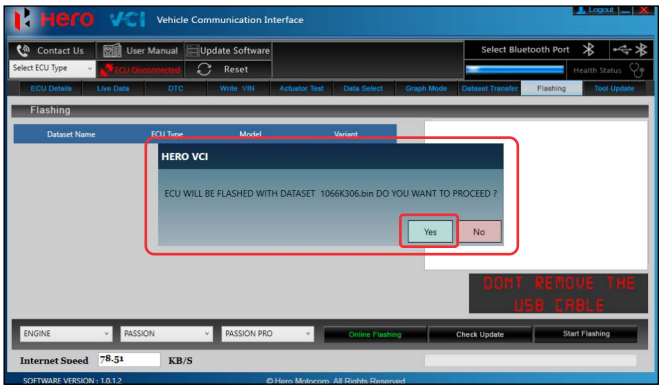
- Click on "Online Flashing" to enable the online ECU dataset flashing process.
- Once online flashing is enabled, the "Online Flashing" button colour will be converted into green.



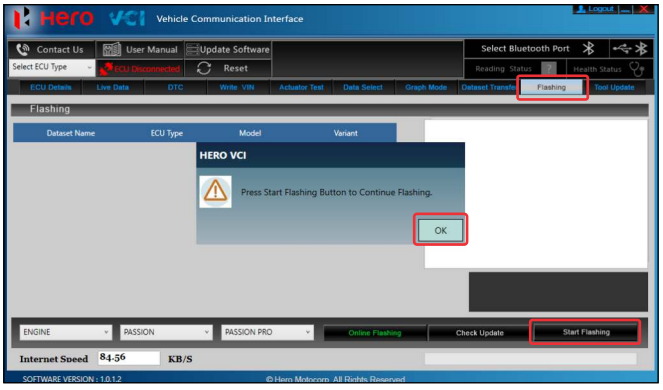
- Select the ECU type, Model & Variant in the selection box.
- Click on the "Check Update" button to check the new ECU dataset file availability.



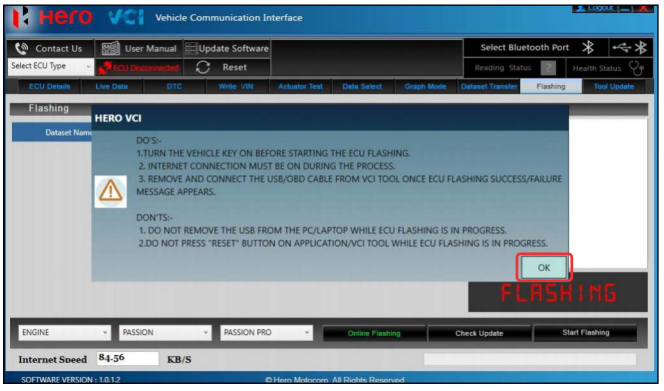
- A message will be displayed as “ECU WILL BE FLASHED WITH 1066N303.bin Do YOU WANT TO PROCEED”
- Press “YES” button to go to the next step.



- Read the instruction and click on OK.
- Now select the “Start Flashing” button to start the online ECU dataset flashing.



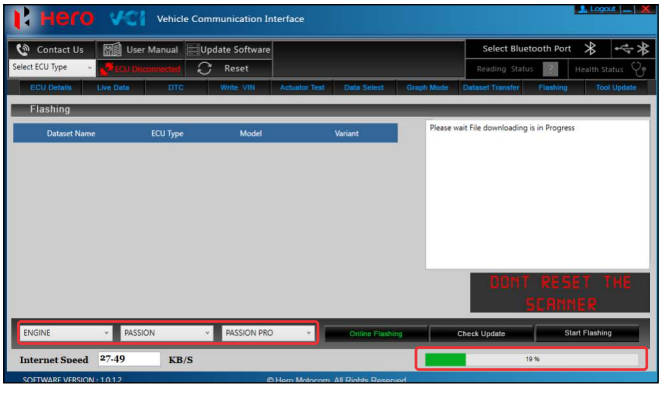
- Read the Do & Don'ts carefully and click on “OK”.
- Once “OK” button is pressed ECU flashing process will start automatically



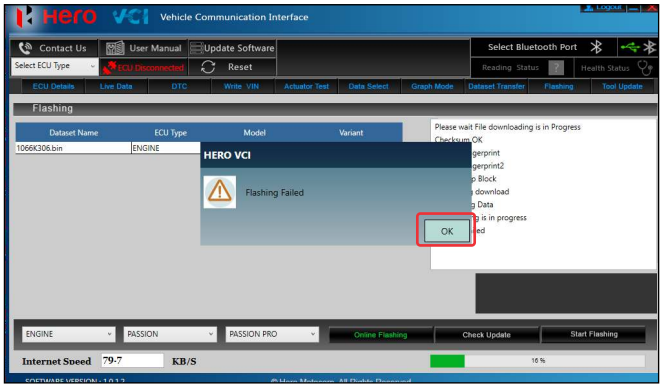
- Status bar will start reflecting the ECU flashing is in process.

NOTE

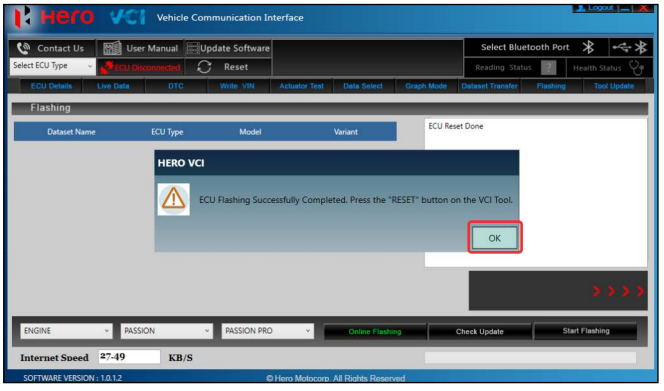
Do not “Reset” the VCI tool and application and also do not turned “OFF” the ignition switch when ECU flashing is in process.



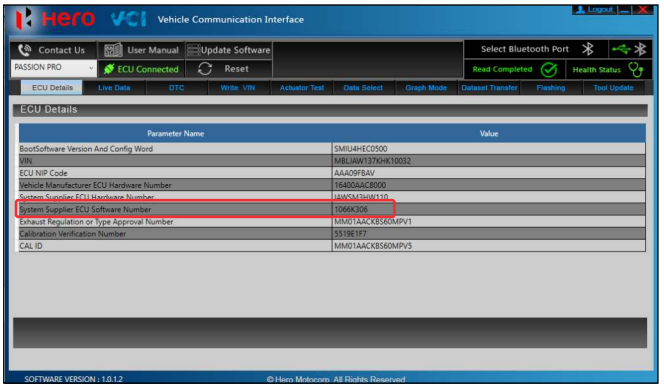
- During ECU dataset flashing if ECU connection is disconnected then "Flashing Failed" message will appear.
- Read the instruction slide once and do the process again.



- Once ECU flashing is completed, successful message will appear on the screen.
- Now click on "OK" button and turned OFF the ignition switch and turned ON after 30 secs.
- Close and restart the application also press the reset button provided on VCI tool.



- Finally start engine and select the appropriate model to check the new ECU update details in the "ECU Details" tab.



CUSTOMER SUPPORT

- For customer queries click on Contact Us. Support Mail ID and Help Desk Number is available.