

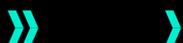
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MORE FUN.



125 NK

Service Manual



CFMOTO

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FOREWORD

This manual introduces CF125-11H maintenance information, removal & installation procedures, Inspection & adjustment methods, troubleshooting and technical specifications.

Chapter 1 mainly introduces general operation information, service tools, vehicle structure and basic specifications.

Chapter 2 mainly introduces inspection & adjustment methods and how to do vehicle maintenance.

Chapter 3 mainly introduces disassembly, installation, adjustment, maintenance and troubleshooting information.

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This manual has been improved by using many ways to make it accuracy. But we are no response for any difference and missing.

CFMOTO reserves right to make improvements and modifications to the products without prior notice. Overhaul and maintenance should be done according to actual condition of vehicle. And CFMOTO is not responsible for production improvements and modifications. This manual is only for reference. If any objections, please ask the nearest dealer to get the latest information.

The information in this manual are the latest depends on latest productions on coming out. The images in this manual may not stand for real model assembly and parts.

This Model CF125-11H is subject to standard: Q/CFD 193-2024. This manual is in accordance with standard: GB9969-2008 and GB/T19678-2005.

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Zhejiang CFMOTO Power Co.,Ltd

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Conversion Table			
A	Ampere	lb	Pound
ABDC	After bottom dead center	m	Meter
AC	Alternating current	min	Minute
ATDC	After top dead center	N	Newton
BBDC	Before bottom dead center	Pa	Pascal
BDC	Bottom dead center	PS	Metric horse power
BTDC	Before top dead center	psi	Pound/Square Inch
°C	Centigrade	r	Revolutions
DC	Direct current	rpm	Revolutions per minute
F	Farad	TDC	Top dead center
°F	Fahrenheit	TIR	Total indicator reading
ft	Feet	V	Volt
g	Gram	W	Watt
h	Hour	Ω	Ohm
L	Litre	in	Inch
US gal	Gallon(US)	US qt	Quart(US)
oz	Ounce	HP	British horsepower
cm Hg	Centimeter of mercury	pint	Pint
cu in	Cubic inch	mL	Milliliter

Forward

This manual is intended for use by experienced technicians in a fully equipped workshop. However, the detailed details and basic information contained in this manual are sufficient to enable the owner to carry out the basic maintenance and repair work of the motorcycle himself. In order to obtain more comprehensive maintenance and repair results, the basic knowledge of mechanics, the correct use of tools and the understanding of maintenance procedures are necessary. If you lack practical experience or are unsure of maintenance and repair work, all adjustment, maintenance and repair work must be done by a qualified mechanic. In order to improve work efficiency and avoid major errors, before operation, read this manual to make yourself thoroughly understand the repair procedure, and then work carefully in a clean area. Once you specify that special tools or equipment are required, do not use temporary tools or equipment instead. Only the use of appropriate tools or equipment can guarantee the mechanical properties of the vehicle, and the use of alternative tools can seriously affect the safety of operation. During the warranty period, we recommend that all repairs and regular maintenance be carried out in accordance with this repair manual. If the owner maintains or repairs by himself or does not follow the procedures of this maintenance manual, we will not be responsible for the consequences.

How To Get Long Service Life

- Follow scheduled maintenance and service operations based on service manual.
- Non-periodical maintenance in special situations.
- Use tools properly and use CFMOTO genuine parts.

Special tools, dashboard and tester have been listed into this service manual for necessary genuine parts.

- Strictly operated based on the correct service procedures.
- Keep fully service records and specify the date of new parts replacement.

How to use this manual:

In this manual, the production will be separated as several systems. All the systems are shown up in the contents. That will help you to locate the chapter. And each chapter has its own contents. For example, if you want to find ignition coil information, locate the electrical system chapter by using the contents, and then find the ignition coil in electrical system chapter.

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Please read below explanations carefully. Always follow these safe operation and maintenance practices.

⚠ DANGER: The Danger alert and icon indicates a potential hazard that may cause serious injuries or death.

⚠ WARNING: The Warning alert and icon indicates a potential hazard that may cause light or medium injury.

⚠ CAUTION: The Caution alert and icon indicates a potential hazard that requires you to pay attention.

NOTE: It makes operation process easier or offers clearer information. It has no symbol.

The other three symbols below are to distinguish the different levels of warning information in service manual.

● Procedure or operation should be acted.

○ One step of whole procedures or how to operate after acted procedures. Probably it is the guidance before attention matters.

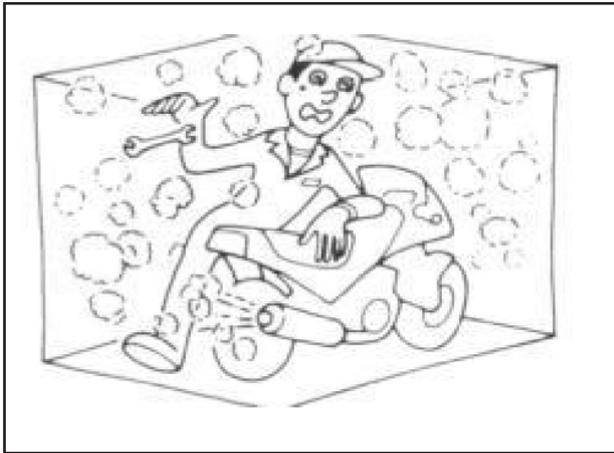
★ To take actions based on the front steps or test results from the front procedures. It shows detail illustration including torque, lubrication oil, lubrication grease and tighten glue during assembling.

01 Maintenance Information

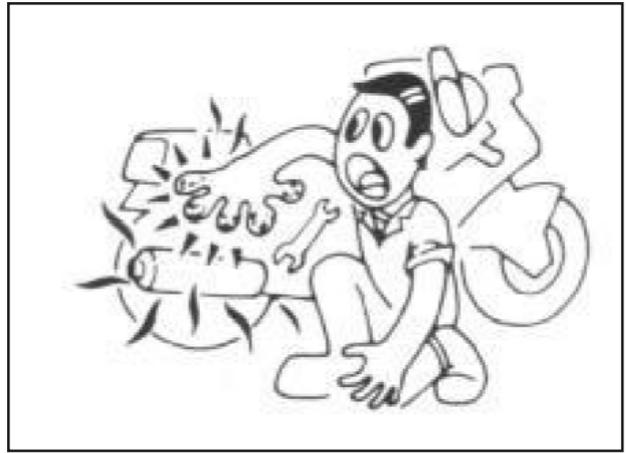
1.1 Operation Cautions	01-1	1.5 Specifications for Maintenance	01-8
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1.1 Operation Cautions

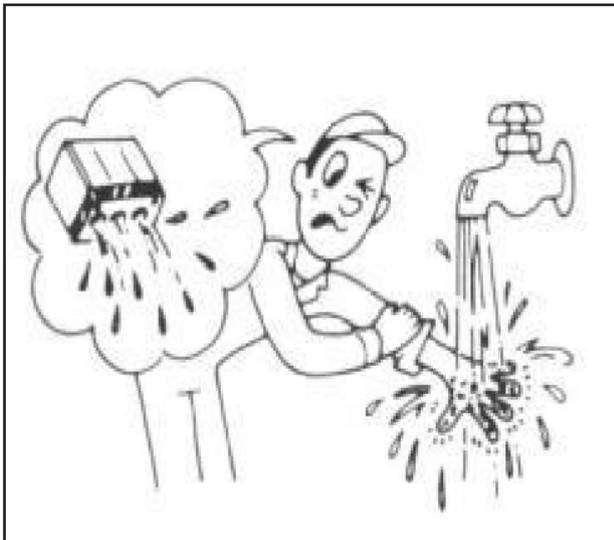
⚠ CAUTION: Hazardous compents in exhaust. Do not run the engine in a enclosed or poor ventilated place for a long time.



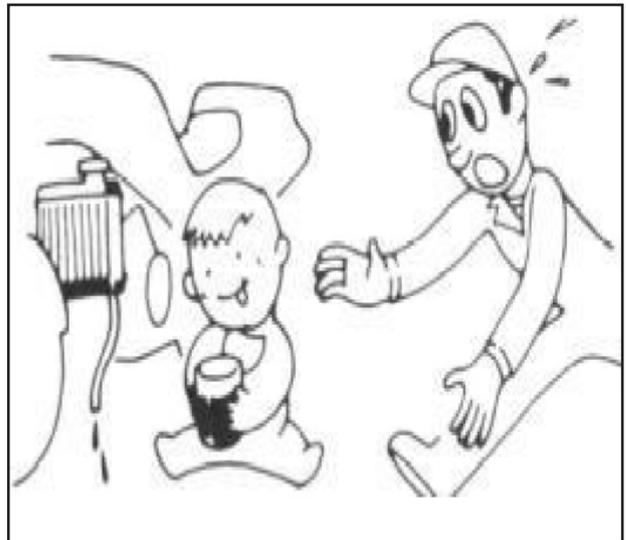
⚠ CAUTION: Don't touch the engine or muffler with bare hands when the engine has just stopped to avoid hurt. Wear long-sleeve work clothes.



⚠ CAUTION: Battery liquid (dilute sulfuric acid) is highly caustic and may cause burns to skin and eyes. Flush with water if splashed to skin and get immediate medical attention. Flush with water if splashed to clothes to avoid burns. Keep battery and liquid away from reach of children.

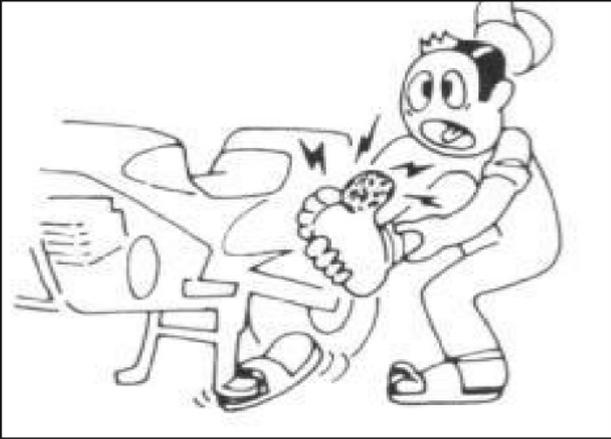


⚠ CAUTION: Coolant is poisonous. Do not drink or splash to skin, eyes or clothes. Flush with plenty of soap water if splashed to skin. Flush with water and consult doctors. If drinking the coolant, induce vomiting and consult doctors. Keep coolant away from reach of children.



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⚠ CAUTION: Wear proper work clothes, cap and boots. Wear dust-glass, gloves and mask if necessary.



⚠ CAUTION: Coolant Gasoline is highly flammable. No smoking or fire. Also keep against sparks. Vaporized gasoline is also explosive. Operate in a well-ventilated place.



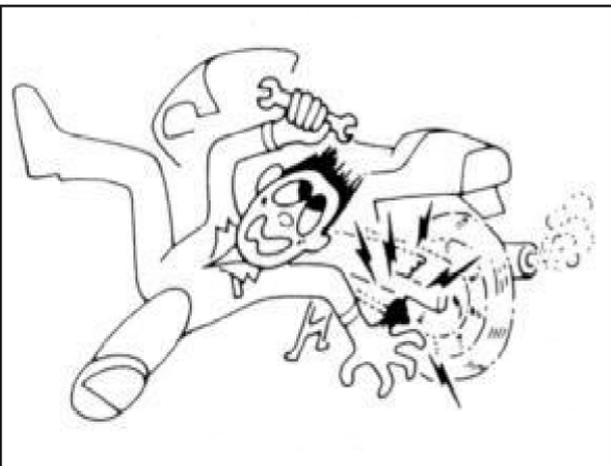
⚠ CAUTION: When charged, Battery may generate hydrogen which is explosive. Charge the battery in a well-ventilated place.



⚠ Warning: When more than two people are operating, keep reminding each other for safety purpose.



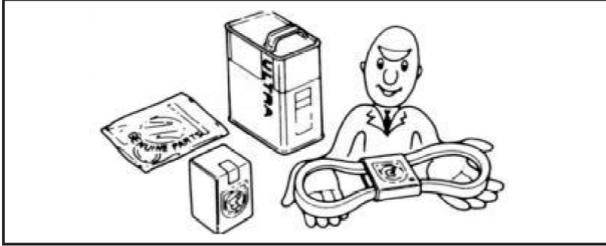
⚠ CAUTION: Be careful to get clamped by the turning parts like wheels and clutch.



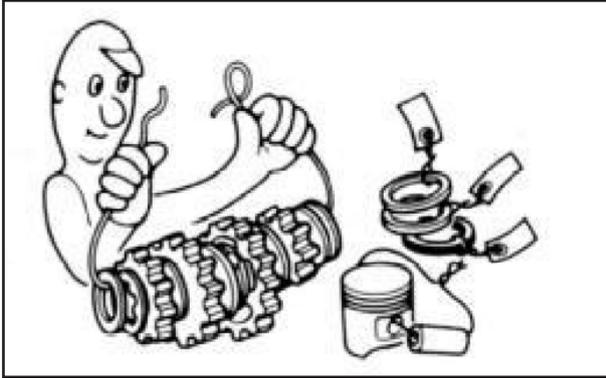
01 Maintenance Information

1.2 Disassembly and Assembly Cautions

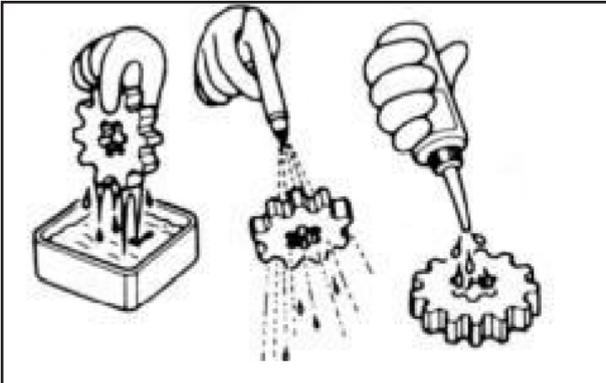
- Use genuine CFMOTO Parts, lubricants and grease.



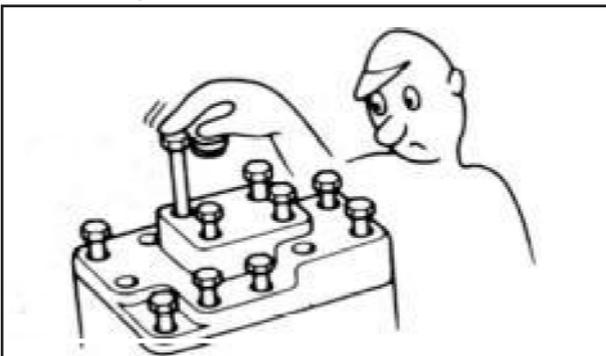
- Place and store the disassembled parts separately in order for correct assemble.



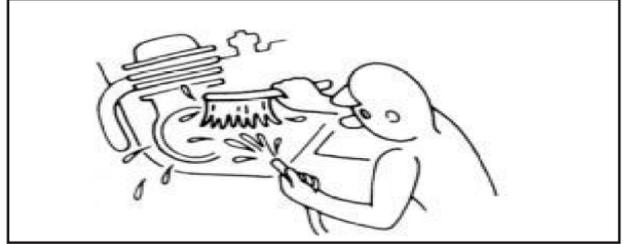
- Clean and blow off the detergent after disassembling the parts. Apply lubricants on the surface of moving parts.



- If not know the length of screws, install the screws one by one and tighten with same torque.



- Clean the mud, dust before overhauling.



- Replace the disassembled washers, O-rings, piston pin circlip and cotter pin with new ones.

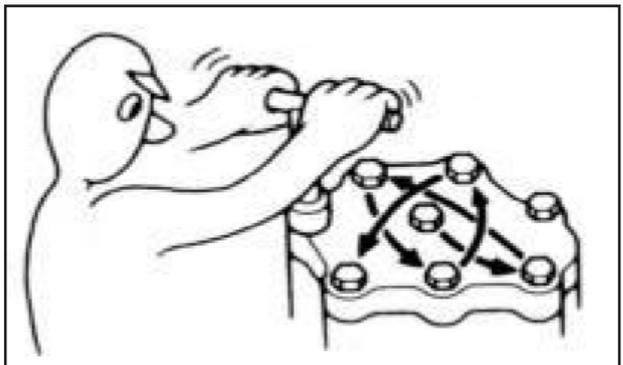
- Elastic circlips might get distorted after disassembled. Do not use the loosed circlips.



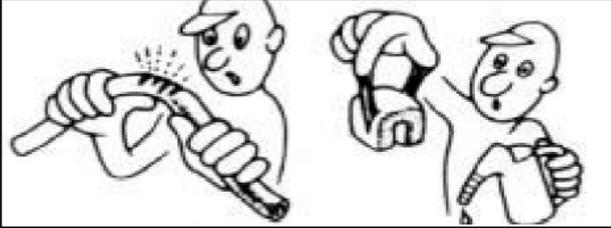
- Measure the data during disassembly for correct assembly.



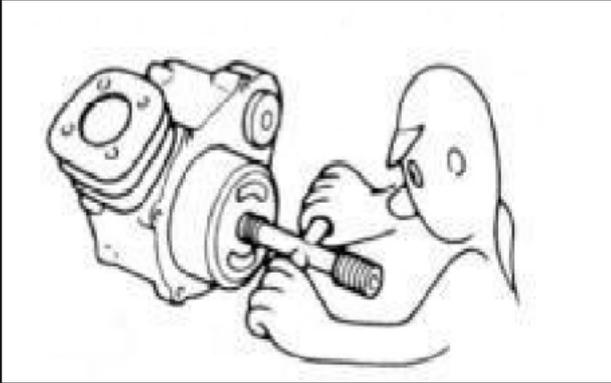
- Pre-tighten the bolts, nuts and screws, then tighten them according to the specified torque, from big to small and from inner side to outer side.



■ Check if the disassembled rubber parts are aged and replace it if necessary. Since rubber parts are not resistant to gasoline/ kerosene, etc. Do not allow volatile oils/greases to attach to them.

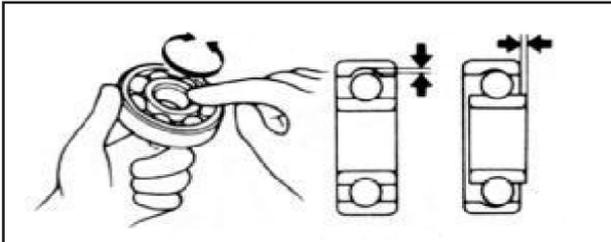


■ Use special tools wherever necessary.



■ Turn the ball bearing with hands to make sure the bearing will turn smoothly. Replace if the axial or radial play is too big. If the surface is uneven, clean with oil, replace if the cleaning does not help. (Double side dust-proof type can not be cleaned).

When pressing the bearing into the machine or to the shaft, replace the bearing if it could not be pressed tight.



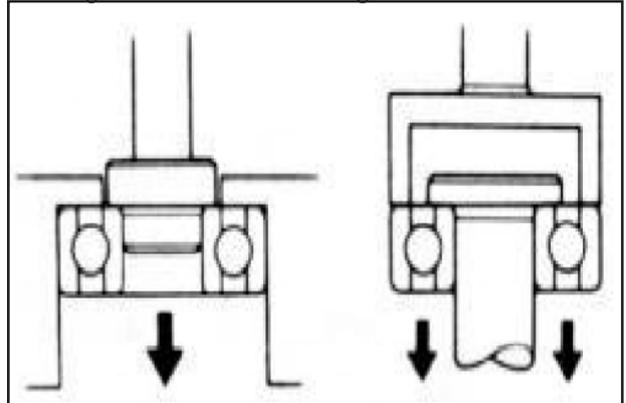
■ When the ball bearing is washed and blown with compressed air, do not turn the bearing ring. If the bearing ring is rotated, its high-speed rotation speed will exceed the limit, which may damage the bearing. Apply oil or grease to the bearing before assembly.



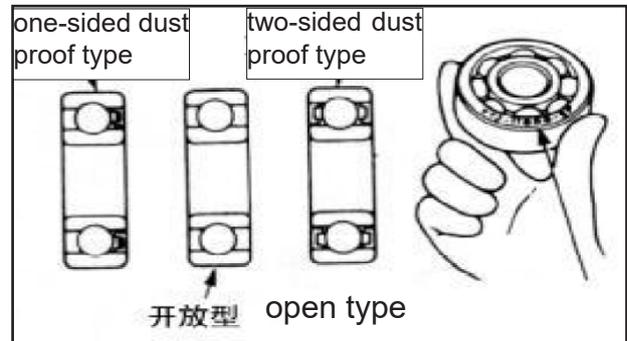
■ Apply or inject recommended lubricant to the specified parts.



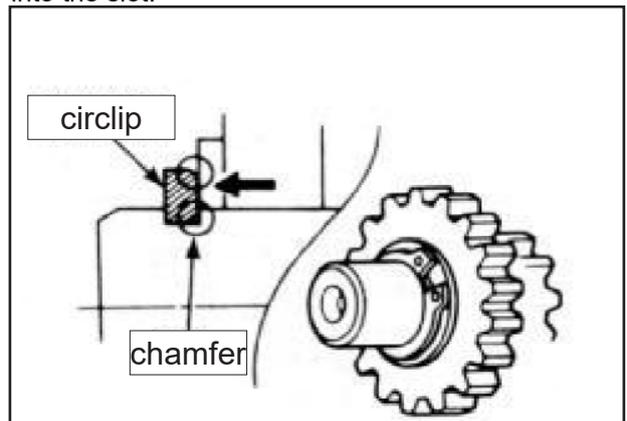
■ If the disassembling of pressed ball bearing is done by pressing the balls, the disassembled bearing should not be used again.



■ Install the one-side dust-proof bearing in the right direction. When assembling the open type or double-side dust-proof bearing, install with manufacturer's mark outward.

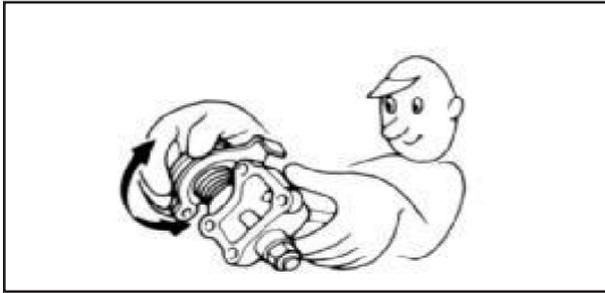


■ Install the elastic circlip with the chamfered side facing the direction of force. Do not use the circlip that has lost its elasticity. Install the elastic circlip after assembling to make sure it has been installed into the slot.

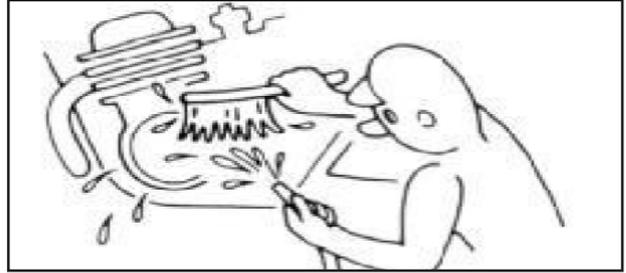


01 Maintenance Information

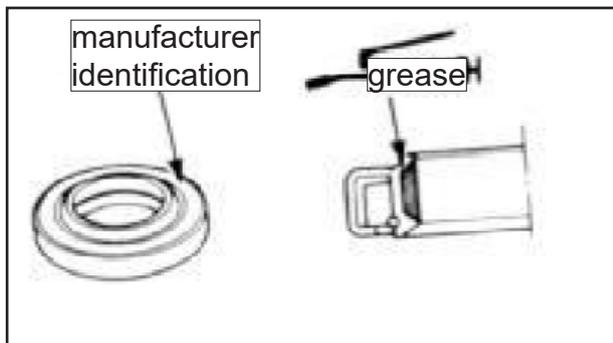
■After assembling, check if all the tightened parts are properly tightened and can move smoothly.



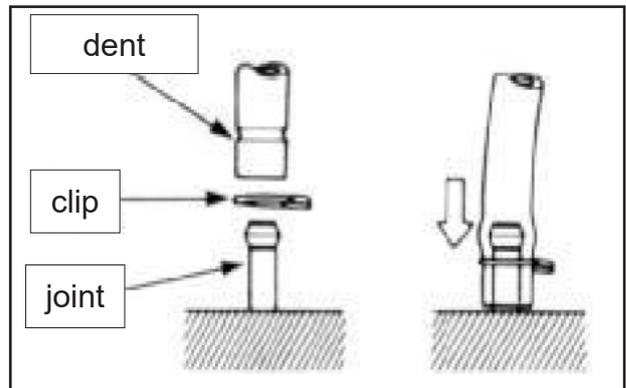
■Brake fluid and coolant may damage coating, plastic and rubber parts. Flush these parts with water if splashed.



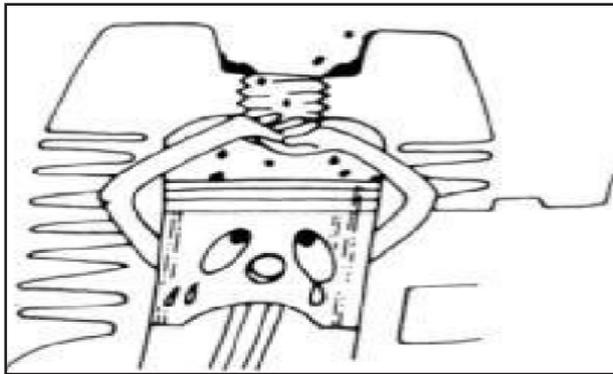
■Install oil seal with the side of manufacturer's mark outward. (Direction without oil)
Do not fold or scratch the oil seal lip.
Apply grease to the oil seal lip before assembling.



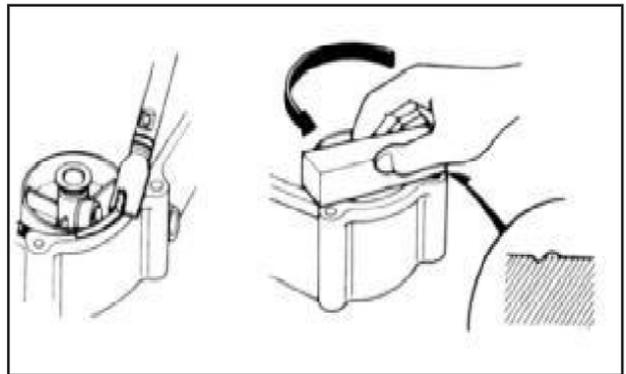
■When installing pipes, insert the pipe till the end. Fit the pipe clip, if any, into the rove. Replace the pipes or hoses that cannot be tightened.



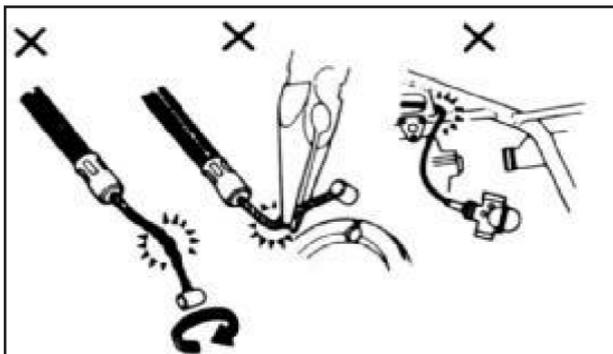
■Do not mix mud or dust into engine or the hydraulic brake system.



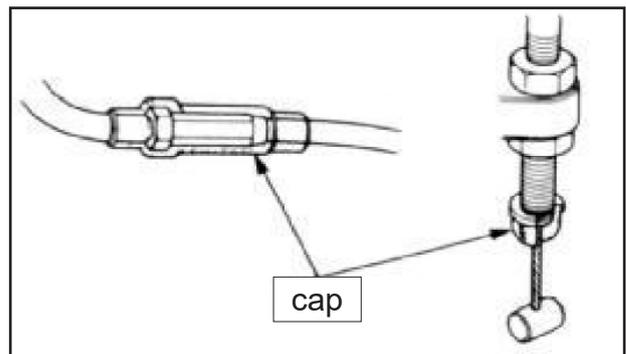
■Clean the gaskets and washers of the engine cases before assembling. Remove the scratches on the contact surfaces by polishing evenly with an oil stone.



■Do not twist or bend the cables too distorted or damaged cables may cause poor operation.



■When assembling the parts of protection caps, insert the caps to the grooves, if any.



1.4 Main Specifications

Item		Specifications	
125NK			
Length		1990mm	
Width		800mm	
Height		1065mm	
Wheel Base		1360mm	
Maximum net power		10.6Kw / 10500 rpm	
Maximum torque		10.2N•m / 8500 rpm	
Displacement		124mL	
Fuel type		95# or above	
Curb weight		142kg	
Fuel type		2 people (including driver)	
Tire	Front	110/70 R17 M/C 54H	
	Rear	140/60 R17 M/C 63H	
Min. Ground Clearance		150mm	
Turning Circle Diameter		5000mm	
Steering	S t e e r i n g Angle	Left	35°
		Right	35°
Brake System		Front	Hydraulic Disc
		Rear	Hydraulic Disc
Shock Absorber	Suspension	Front Wheel	Telescopic
		Rear Wheel	Cantilever Type
Frame Type		Steel Tube	
Item		Standard	
Fuel System	Fuel Capacity		12.5L
	Injector		Type: F01R00MG11
	Fuel Pump	Voltage: DC13.5V±0.3V	
		Pressure: 0.27MPa±0.01MPa	
		Flow: ≥40L/h	
Idle Speed		1500r/min±150r/min	
		Current: ≤2.3A	

1.5 Specifications for Maintenance

Front Wheel

Item		Standard	Service Limit	
Front Wheel	Front Wheel Shaft Bending	-	0.2mm	
	Rim Run-Out	Longitudinal	0.6mm	0.8mm
		Horizontal	0.6mm	0.8mm
	Tire	Remaining Groove	-	0.8mm
		Tire Pressure	225kPa	-

Rear Wheel

Item		Standard	Service Limit	
Rear Wheel	Rear Wheel Shaft Bending	-	0.2mm	
	Rim Run-Out	Longitudinal	0.6mm	0.8mm
		Horizontal	0.6mm	0.8mm
	Tire	Remaining Groove	-	0.8mm
		Tire Pressure	225kPa	-

Brake System

Item		Standard	Service Limit
Front Brake	Front (Hand Brake) Free Travel	5mm ~ 10mm	-
	Brake Disc Wear	4mm	3mm
Rear Brake	Rear (Foot Brake) Free Travel	10mm ~ 20mm	-
	Brake Disc Wear	4mm	3mm

Fuse, Lights and Indicators on Dashboard

Item		Standard
Fuse	Main	30A
	Auxiliary	5A×3, 7.5A×2, 10A×3, 15A×1
Lights and Indicators	Front Headlight (Hi /Lo)	LED 12V 22.5W/9.5W/4.7W
	Front& Rear Turning Light	LED 13.5V 1.5W
	Brake Light/Tail Light	LED 12V 4W/0.5W
	License Light	LED 12V 0.2W
	Left Turning Indicator	LED
	Neutral Indicator	LED
	EFI Fault Indicator	LED
	ABS Fault Indicator	LED
	Right Turning Indicator	LED
	Engine Water Temperature Indicator	LED
	High Beam Indicator	LED
	Position Indicator	LED

1.6 Tighten Torque

Type	Torque N·m	Type	Torque N·m
5mm bolt, nut	5	5mm screw	4
6mm bolt, nut	10	6mm screw	9
8mm bolt, nut	20~30	6mm flange bolt and nut	12
10mm bolt, nut	30~40	8mm flange bolt and nut	20~30
12mm bolt, nut	40~50	10mm flange bolt and nut	30~40

Tighten to standard torque where not recorded in the table below.

NOTE 1. Apply engine oil on the joint surface of thread part.

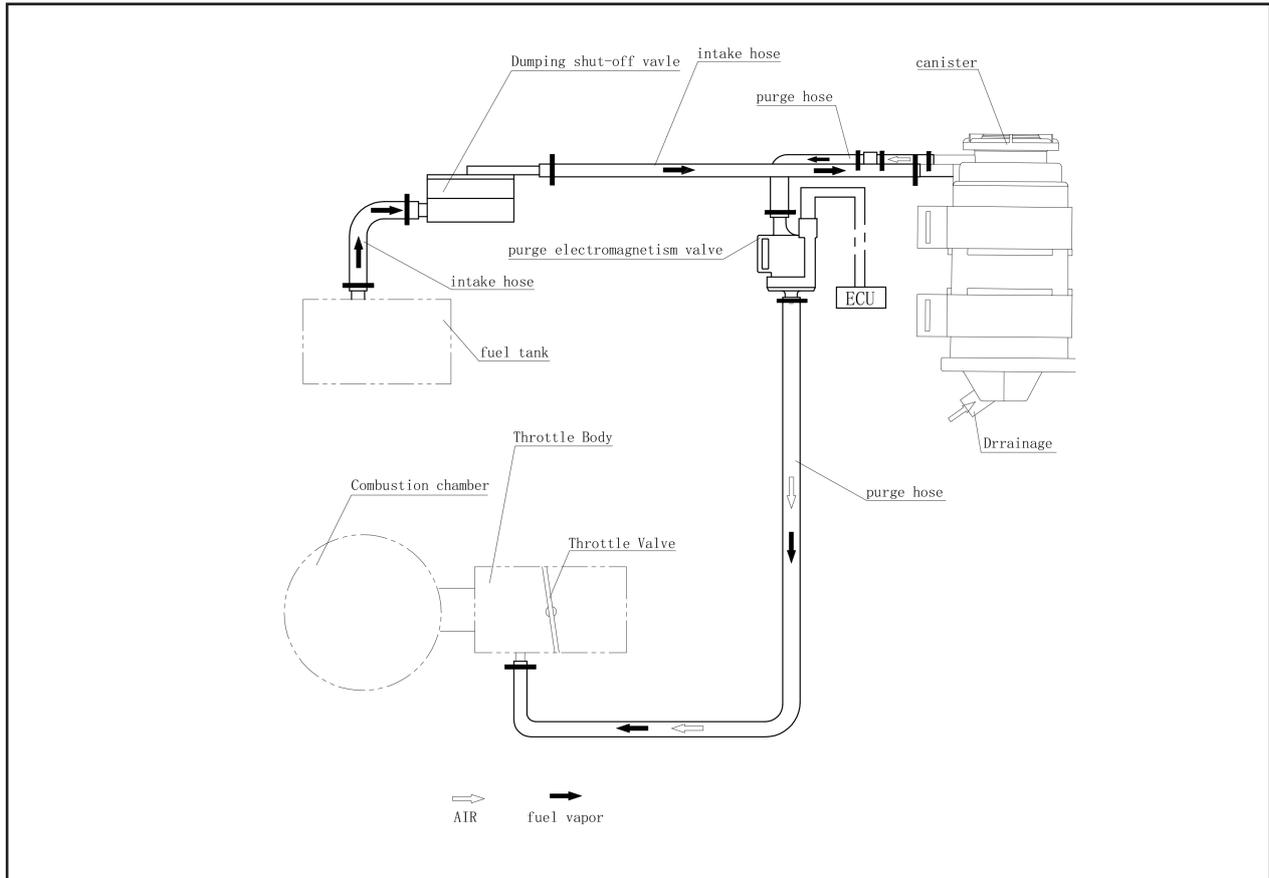
2. The self-locking bolt should be replaced when disassembling.

Position	Specification	Number	Tighten N·m	Thread locker
Engine LH mounting bracket bolt	M8×35	2	25~28	NO
Engine RH mounting bracket bolt	M8×35	2	25~28	NO
Engine front suspension shaft	M10×95	1	58~62	YES
Engine upper mounting bolt	M10×1.5×60	2	40~50	YES
Front wheel shaft	M12×1.25×192	1	60~70	NO
Front shock absorber lock front wheel shaft	M8×40	2	25	NO
Rear wheel shaft nut	M14×1.5	1	105~110	NO
Rear fork shaft nut	M14×1.5	1	95~105	NO
Steering column lock nut	A000-050006	1	First tighten A000-050006 50N·m, then rotate the front suspension assembly three times each, lock the nut back to 120-150 °, and then tighten 25N·m, tighten A000-050007 20N·m.	NO
	A000-050007	1		
Upper triple clamp lock screw	M26×1	1	85.5~94.5	NO
Upper triple clamp shock absorber lock screw	M8×25	2	18~22	NO
Lower triple clamp shock absorber lock screw	M8×25	4	18~22	NO
Rear shock absorber upper mounting bolt	M10×1.25	1	58~62	YES
Rear shock absorber lower mounting nut	M10×1.25	1	52.5~57.5	NO
Starter relay nut	M6	2	3	NO

1.7 Lubricating Grease

Areas	Notes	Type
Steering column bearing Throttle cable joint Throttle grip part Front/rear footrest rotating part Side bracket rotating part Front/rear shaft sleeves and oil seals Sprocket seat shaft sleeve and oil seal Seat lock seat Rear fork bearing and oil seal Rear brake pedal shaft sleeve Rear fork RH bushing Shift lever pedal shaft sleeve	Lubricate	Lithium grease No. 2 GB/T5671

Fuel Evaporation System Schematic Diagram



⚠ Caution: Fixed the anti roll-over valve as horizontal position. Don't modify fuel evaporation system. Tubes should be well connected after maintenance, disassembling without air leakage, blocking, squeezing, broken and damage etc. Fuel steam will be released into carbon tank by absorption tube from fuel tank. Absorbing fuel steam by active carbon when engine stop; Fuel steam of carbon tank will follow into combustor for burning when engine working in order to avoid environment pollution if fuel stem released into air directly. Meanwhile, Air pressure of fuel tank should be balanced by absorption tube. If inner pressure of fuel tank is lower than outside, it is available to replenish air pressure by air tube of carbon tank or absorption tube. All tube system should be smooth running without blocking and squeezing, otherwise fuel pump will be damaged, fuel tank will be deformed or broken.

02 Inspection and Adjustment

2.1 Overhaul Information	02-1	2.7 Brake Fluid	02-6
2.2 Periodic Maintenance Schedule.....	02-1	2.8 Suspension	02-7
2.3 Throttle cable	02-5	2.9 Bolt and Nut	02-7
2.4 Chain.....	02-5	2.10 Front&Rear Wheel Shaft, Handlebar.....	02-7
2.5 Clutch Cable.....	02-5	2.11 Cooling System Inspection	02-8
2.6 Front Brake and Rear Brake	02-6		

2.1 Overhaul Information

CAUTION:

- Do not run engine for a long time in a closed place, because exhaust gas contains poisonous elements such as carbon monoxide (CO).
- When engine is just stops, the temperature of muffler and engine is still high. Uniform with long sleeves and gloves must be worn during operation. Overhaul is necessary while engine just stops.
- Gasoline is easily combustible, smoking or naked fire is not allowed at the operation site. Not only flames, but also electric sparks shall be avoided. Besides, the vaporized gasoline is explosive, please operate it in a place with well ventilation.
- Please be cautions that do not let the turning pieces and movable pieces clip your hands or clothes.
- The vehicle must be placed in an even and stable place, raise vehicle properly with the main support of the vehicle or maintenance bracket.

2.2 Periodic Maintenance Schedule

This motorcycle must do periodic maintenance regularly. Keep motorcycle clean before doing maintenance.

Cautions:

- ▶ = Severe Use Item. Reduce interval by 50% on vehicles subjected to severe use.
- = Have an authorized dealer perform repairs that involve this component or system.

Maintenance Schedule

Item	Maintenance before operation			
	Hour	Calendar	km	Remarks
Fuel system				
Fuel hose	-	Daily	-	Inspect for aging
Electrical system				
Switches	-	Daily	-	Inspection
Lights, horn	-	Daily	-	

Break-in Maintenance Schedule

Item		Break-in Maintenance Interval (Service whichever interval comes first)			
		Hour	Calendar	km	Remarks
Engine					
■	Engine oil and oil filter	-	-	1000	Replace
■	Oil strainer	-	-	1000	Clean
	Idle	-	-	1000	Inspect
■	Coolant	-	-	1000	
	Throttle system	-	-	1000	
Electrical system					
■	Functions of electrical parts	-	-	1000	Inspect
	Battery	-	-	1000	
	Fuses or circuit breakers	-	-	1000	
Brake system					
	Brake discs	-	-	1000	Inspect
	Brake pads	-	-	1000	
	Brake fluid level	-	-	1000	
	Brake lever	-	-	1000	Inspect for free play
■	Brake hoses	-	-	1000	Inspect for damage and sealing
Wheels					
	Tire condition	-	-	1000	Inspect
	Tire pressure	-	-	1000	
Suspension system					
■	Rear shock absorber and front forks	-	-	1000	Inspect for leaking (maintain front fork and rear shock absorber according to the requirement)
Cooling system					
	Coolant level	-	-	1000	Inspect
■	Coolant	-	-	1000	
■	Radiator fan function	-	-	1000	
	Coolant hoses	-	-	1000	
Steering system					
■	Steering bearings	-	-	1000	Inspect
Other parts					
■	Diagnosis connector	-	-	1000	Read with PDA
■	Mobile parts	-	-	1000	Lubricate; inspect for flexibility
■	Bolts and nuts	-	-	1000	Inspect for fastness
■	Cables and wires	-	-	1000	Inspect for damage, bending and routing

02 Inspection and Adjustment

Periodic Maintenance Schedule

Item	Periodic Maintenance Interval (Service whichever interval comes first)				
	Hour	Calendar	km	Remarks	
Engine					
	Engine oil and oil filter	-	6M	5000	Replace
	Oil strainer	-	6M	5000	Clean
■	Clutch	-	-	5000	Inspect
	Idle	-	-	10000	
■	Coolant	-	24M	35000	Replace
	Throttle system	-	-	5000	Inspect
■	Throttle valve	-	-	6000	Clean
▶ ■	Air filter element	-	-	5000	Clean
		-	24M	20000	Replace
■	Spark plug	-	-	5000	Inspect
		-	-	10000	Replace
■	Valve clearance	-	-	40000	Inspect
Electrical system					
■	Functions of electrical parts	-	12M	10000	Inspect
	Battery	-	6M	5000	
	Fuses or circuit breakers	-	6M	5000	
■	Wires	-	12M	10000	Inspect for damage, bending and routing
Brake system					
	Front and rear brake system	-	12M	10000	Inspect
		-	24M	20000	
	Brake discs	-	12M	10000	
		-	24M	20000	
▶	Brake pads	-	12M	10000	
		-	24M	20000	
	Brake fluid level	-	12M	10000	
		-	-	20000	
	Brake lever	-	24M	20000	Inspect for free play
		-	12M	10000	
■	Brake hoses	-	24M	20000	Inspect for damage and sealing
		-	12M	10000	
■	Brake fluid		24M	-	Replace
Wheels					
	Tire condition	-	12M	10000	Inspect
		-	24M	20000	
	Tire pressure	-	12M	10000	
		-	24M	20000	
■	Wheel bearings	-	-	10000	
		-	-	30000	

CFMOTO

Item	Periodic Maintenance Interval (Service whichever interval comes first)				
	Hour	Calendar	km	Remarks	
Suspension system					
■	Suspension system	-	-	10000	Inspect
■	Rear shock absorber and front forks	-	12M	10000	Inspect for leaking (maintain front fork and rear shock absorber according to the requirement)
		-	24M	20000	
■	Swing arms	-	-	10000	Inspect
		-	-	30000	
Cooling system					
	Coolant level	-	12M	10000	Inspect
		-	24M	20000	
■	Coolant	-	12M	10000	
		-	24M	20000	
■	Radiator fan function	-	12M	10000	
		-	24M	20000	
■	Coolant hoses	-	12M	10000	
		-	48M	30000	
Frame system					
	Frame	-	-	30000	Inspect
Steering system					
■	Steering bearings	-	12M	10000	Inspect
		-	24M	20000	
Chain					
▶	Chain, rear sprocket and engine sprocket	-	12M	10000	Inspect
		-	24M	20000	
Other parts					
■	Diagnosis connector	-	12M	10000	Read with PDA
		-	24M	20000	
■	Mobile parts	-	12M	10000	Lubricate; inspect for flexibility
		-	48M	30000	
■	Bolts and nuts	-	12M	10000	Inspect for fastness
		-	48M	30000	
■	Cables and wires	-	12M	5000	Inspect for damage, bending and routing
		-	24M	15000	
■	Pipes, ducts, hoses and sleeves	-	12M	10000	Inspect for cracks, sealing and routing
		-	48M	30000	

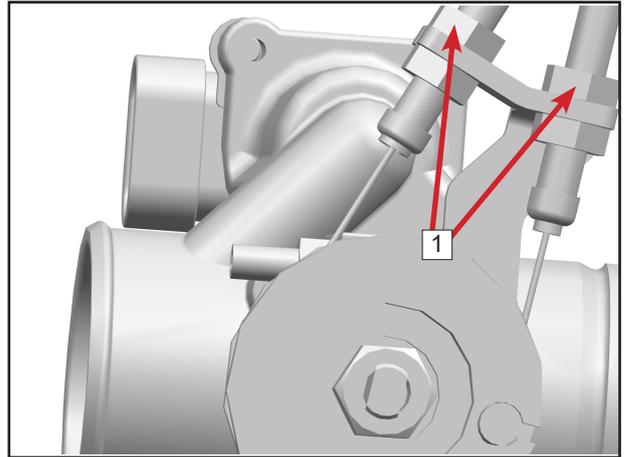
2.3 Throttle cable

Turn the throttle grip, and check if it can turn smoothly.

Check free play of throttle cable: 2mm ~ 3mm;

Fine tuning of throttle cable free play: adjust the position of the adjusting screw on the throttle valve body.

Rough adjust throttle cable free play: lose nut **1**, turn the adjuster properly, and then tighten lock nut.



2.4 Chain

Inspect transmission chain slackness.

Standard slackness: 20mm ~ 30mm

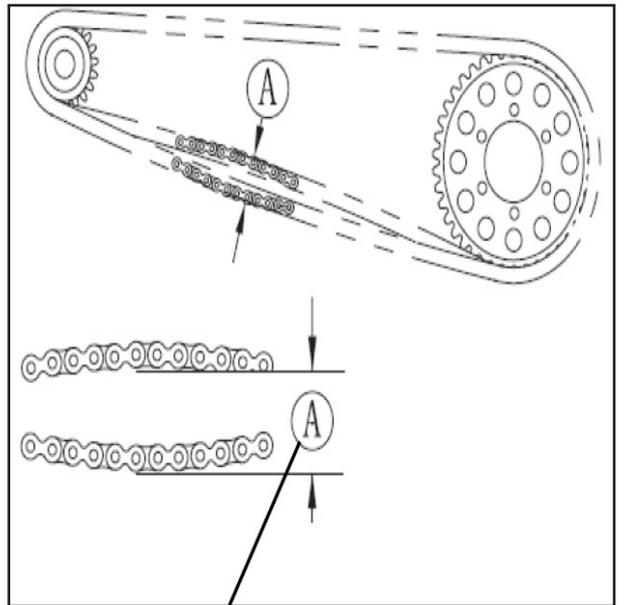
Chain adjustment:

Loose rear wheel shaft nut.

Loose the nut of chain adjuster, adjust left and right chain adjusters to same scale.

Turn rear wheel, and check chain slackness.

Fasten adjuster nut, and then fasten rear wheel shaft nut.



Standard slackness: 20mm ~ 30mm

2.5 Clutch Cable

Clutch is controlled by cable.

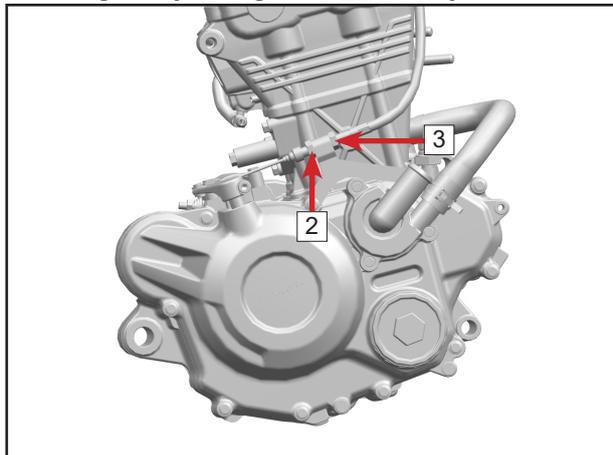
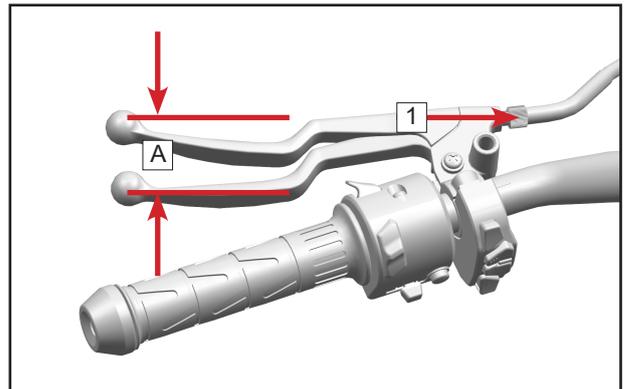
Install clutch lever on the left handlebar.

Clutch free play

Check clutch free play A: 10mm ~ 20mm

Slight adjustment: loose lock nut **1**, turn the small adjusting nut to adjust.

Large adjustment: loose lock nut **2**, turn the large adjusting nut **3** to adjust.



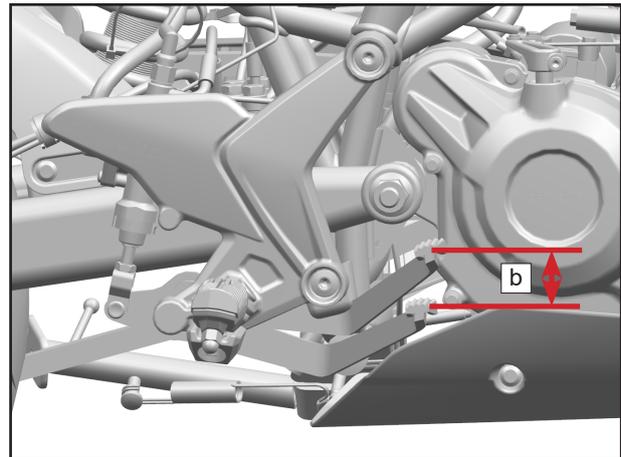
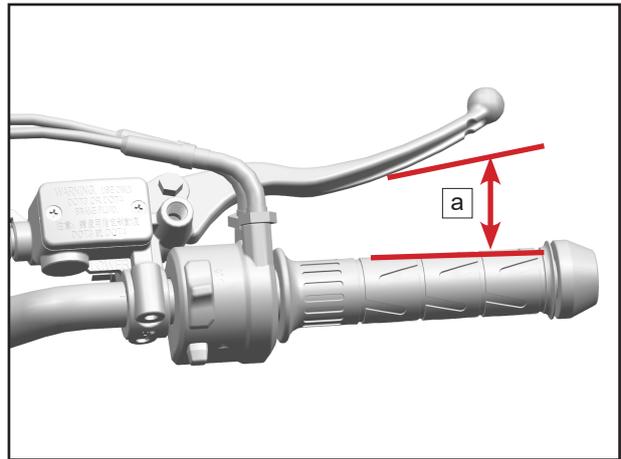
2.6 Front Brake and Rear Brake

Check brake pad, brake disc wear, if they wear to the limit mark, replace it timely.

Brake free play:

a Front (hand) brake free play:
5mm ~ 10mm

b Rear (hand) brake free play:
10mm ~ 20mm

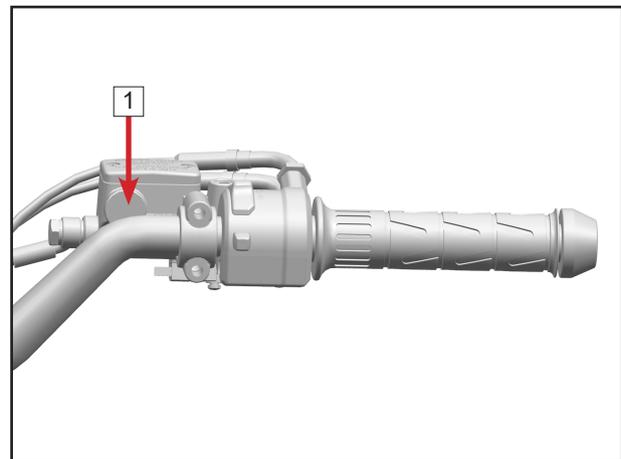


2.7 Brake Fluid

Front brake fluid inspection

Keep steering handlebar straight, inspect brake fluid level ① of upper brake pump and ensure the level is between upper limit and lower limit.

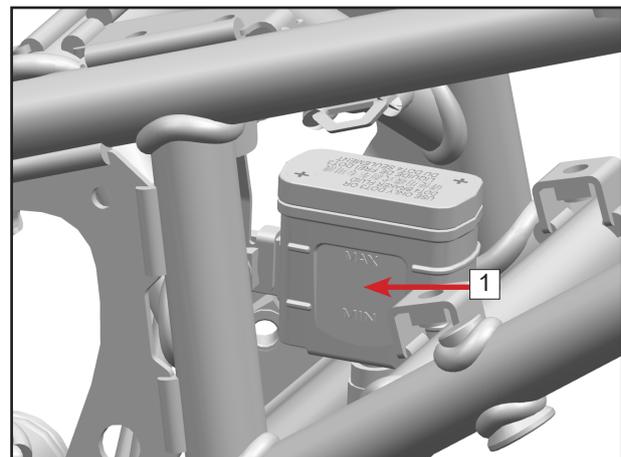
Appointed brake fluid: DOT4 non-petroleum base brake fluid.



Rear brake fluid inspection

Keep steering handlebar straight, inspect brake fluid level ① of lower brake pump and ensure the level is between upper limit and lower limit.

Appointed brake fluid: DOT3 or DOT4 non-petroleum base brake fluid.



2.8 Suspension

Front suspension

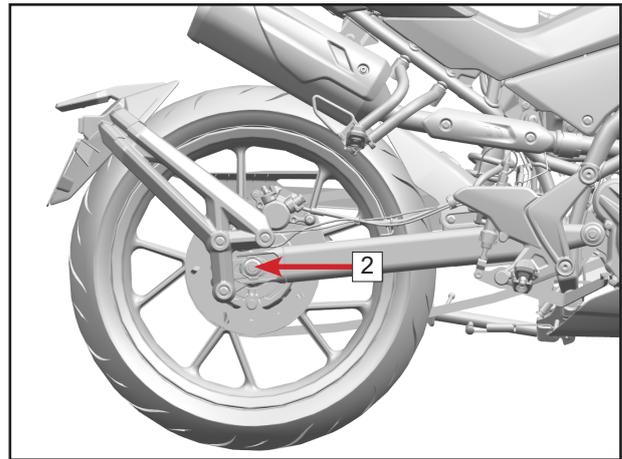
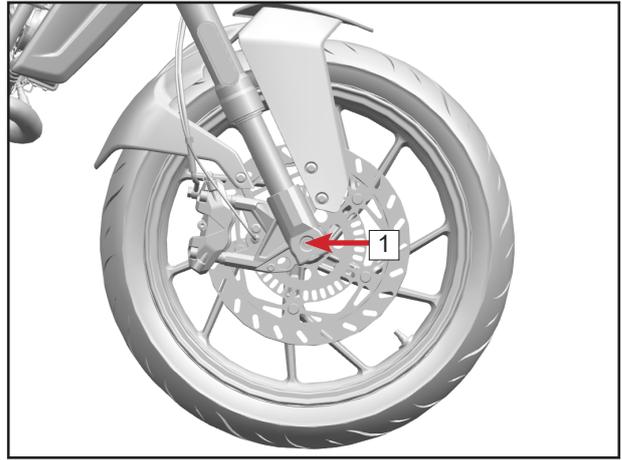
Hold front brake, press the front suspension down for several times to check front suspension performance.

Check if front shock absorber has oil leakage, looseness or abnormal noise.

Rear suspension

Press rear suspension up and down for several times to check if rear shock absorber works smoothly, or part has abnormal noise and looseness.

Put up main support, press rear wheel and move it side to side. Check if rear suspension pivot has abnormal noise or looseness



2.9 Bolt and Nut

Check if bolts or nuts have looseness. If loose, tighten it as appointed torque.

2.10 Front&Rear Wheel Shaft, Handlebar

Front&Rear Wheel Shaft

Check if front wheel shaft **1** is loosen. If loose, tighten it as appointed torque.

Front wheel shaft torque:
60N·m ~ 70N·m

Check if rear wheel shaft **2** is loosen. If loose, tighten it as appointed torque.

Rear wheel shaft torque:
105N·m ~ 110N·m

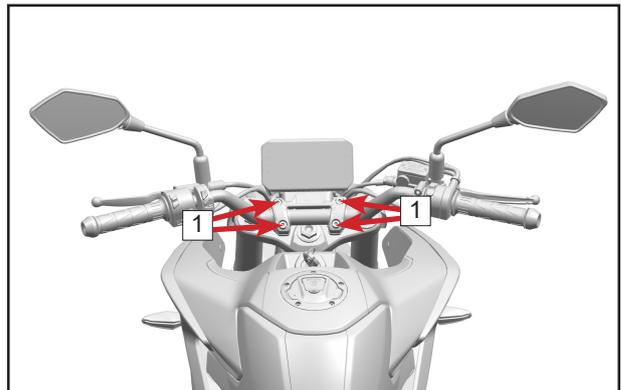
Handlebar

Move handlebar side to side. And check if wires have interference.

Turn front wheel, check if it has interference. If it does not move smoothly, check if steering bearing nut is tighten or not

Adjust handlebar angle to proper position, tighten four screws **1** of handlebar.

Handlebar bolt torque:20N·m ~ 30N·m



Note: The clearance between handlebar upper cover plate and lower seat is even. Four bolts are tightend in criss-cross way. Cover palte and knurl should try to overlap.

2.11 Cooling System Inspection

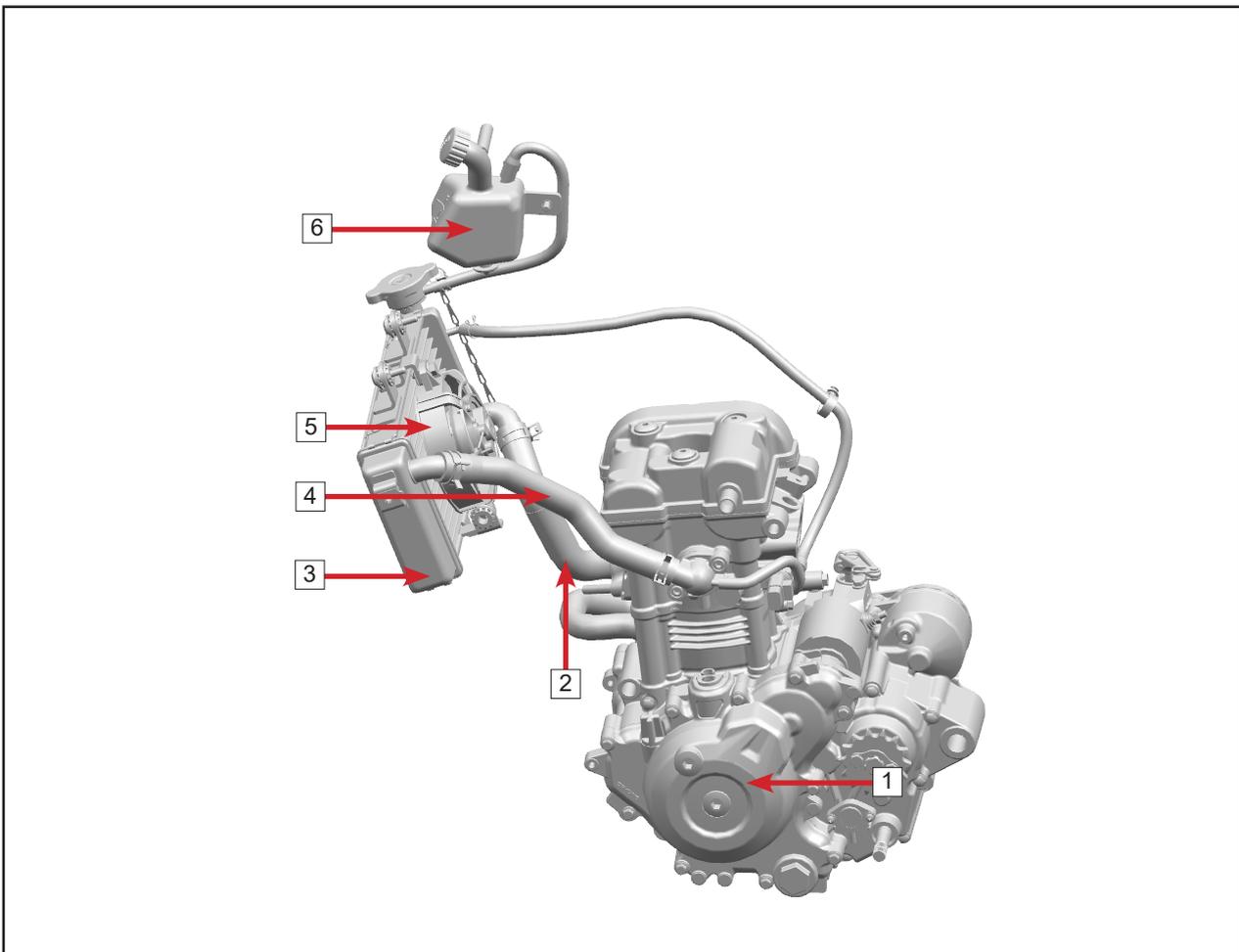
Check radiator, reservoir tank and clamp for damage, and check the engine coolant for leakage. Replace with new parts if it does.

Coolant inspection: Observe the level of coolant and up & down level line. If below it, fill coolant to the up line. Meanwhile, open the radiator cap, and fill coolant into the radiator.

⚠ Danger: Do not open radiator cap, when engine is hot. Otherwise you will be hurt by water vapor or boiling coolant.

⚠ Warning: Coolant is poisonous. Do not drink it. Do not adhere to skin and eyes. Wash it with water at once, or go to hospital if adhere to skin accidentally.

⚠ Warning: Store coolant well. Keep it away from children.



1	Engine assembly	3	Radiator outlet assembly	5	Fan motor assembly
2	Radiator outlet pipe	4	Radiator inlet pipe	6	Water reservoir assembly

3.1 Service Information	03-2
3.2 Front Fender, Seat and Rear Armrest.....	03-3
3.3 Rear Fender Bracket, LH and RH Panel, License Light	03-4
3.4 Tail Cover, Tail Light, Rear Base Plate and Steering Tail Guard .	03-5
3.5 Fuel Tank Guard	03-6
3.6 Engine Guard.....	03-9
3.7 Headlight and Dashboard.....	03-10
3.8 Muffler Guard	03-12
3.9 Canister Deco Cover	03-12
3.10 LH Rear Cover Assembly.....	03-12
3.11 Rear Inner Fender.....	03-12

3.1 Service Information

Operation Precautions

NOTE

Gasoline is very flammable, so fireworks are prohibited in the workplace. Not only open flames, but also electrical sparks should be avoided. In addition, due to the risk of explosion after gasoline evaporation (gasification), work should be carried out in a well-ventilated area. Fuel tank must be disassembled according to the method in the manual. The muffler must be disassembled after the muffler has cooled down completely.

This chapter describes the operation of the body covering parts, exhaust pipe, muffler, and fuel tank.

Pipes and cables should be routed in the correct position according to the pipe and cable wiring diagram.

Replace gaskets when removing and installing muffler.

After the muffler is installed, check for air leakage.

Troubleshooting

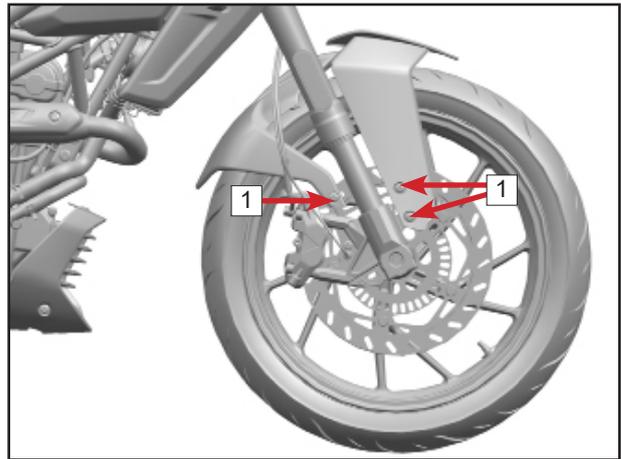
Loud exhaust

- Muffler broken
- Leakage
- Insufficient strength
- Muffler deformation
- Leakage
- Muffler blocked

3.2 Front Fender, Seat and Rear Armrest

Front Fender Installation

The front fender is installed by three bolts **1** on the left and right sides.

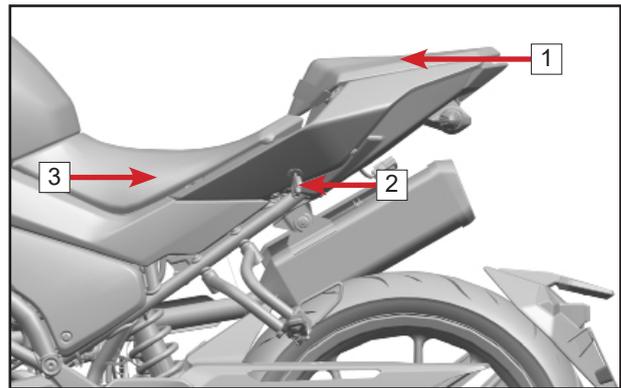


Seat Removal

Insert the key into the seat lock **2** and open the seat lock.

Remove the rear seat **1**.

Turn the rear part of front seat **3** up on each side.



Remove the two bolts **1**.

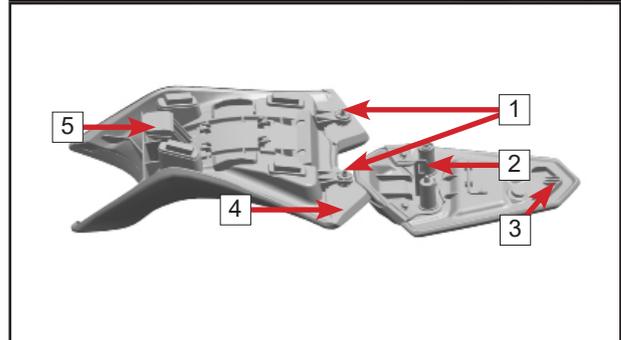
Pull back the front seat.

Installation

Insert the front seat hooks **5** into the vehicle seat clips **7**.

Push the seat forward, align the bolt mounting hole, and then fasten with bolts.

Insert the rear seat hook **3** into the retainer slot **6**, and press down on the front part of rear seat until you hear the hook on the seat. Lock the seat.



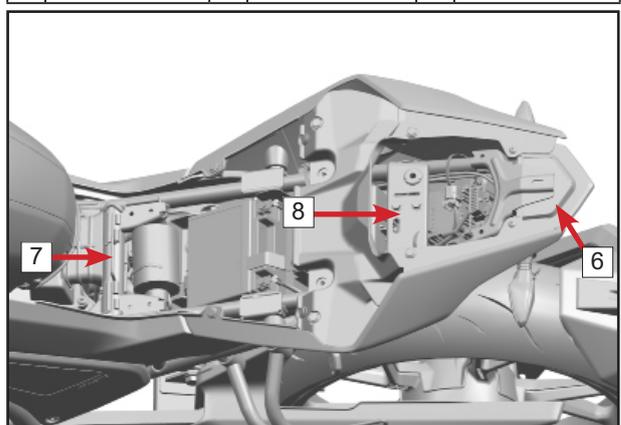
1	Inner hex bolt	3	Rear seat clip	5	Front seat clip
2	Seat lock hook	4	Rear part of seat		

NOTE

Align the five dowel pins first when installing.

NOTE

When installing the front seat, make sure it is in place before tightening the screws. The rear seat should also be installed in place, and finally the rear seat should be pressed into place, and the seat should be shaken up and down after installation until the seat latch is buckled into seat lock, which confirms whether it is installed in place.



6	Rear seat limit slot	7	Front seat clip
8	Rear seat lock mechanism		

3.3 Rear Fender Bracket, LH and RH Panel, License Light

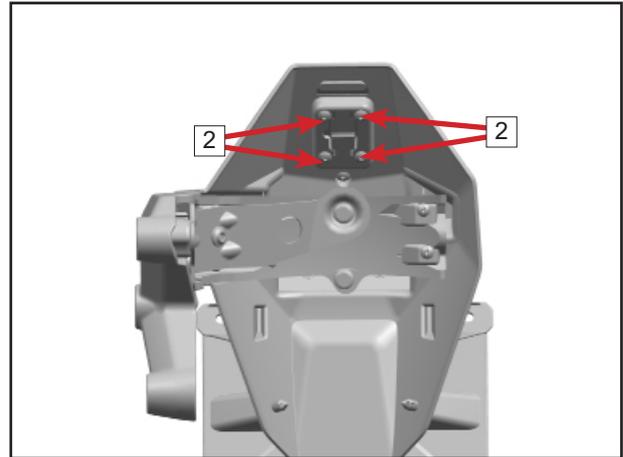
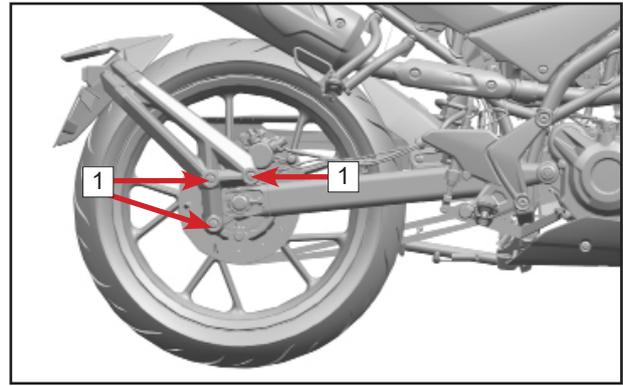
Removal

Pull out the rear cable and remove the three mounting bolts [1] of rear fender.

The rear license light is fixed to the rear fender by four ST4.2×13 screws [2]. After unscrewing four self-tapping screws, pull out the license light cable.

Installation

Reverse the removal procedures for installation.



LH Lower Deco Strip

Removal

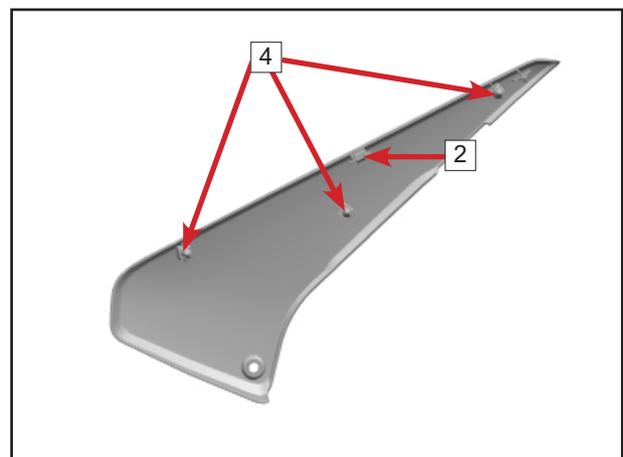
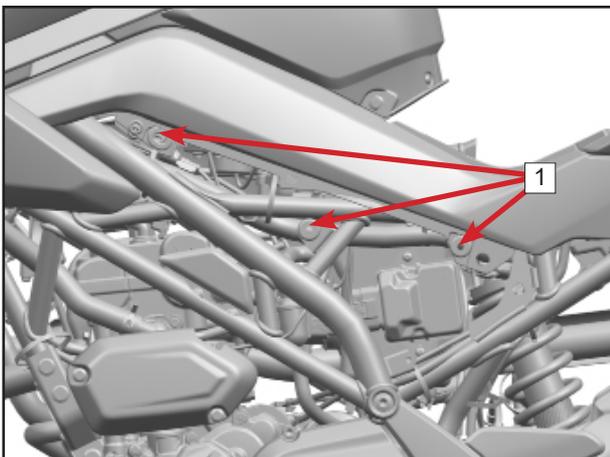
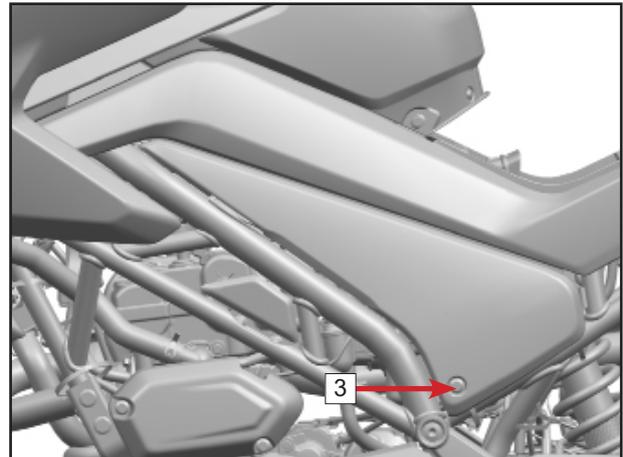
Remove the screws [3].

Gently pull out the LH lower deco strip, and pull the LH lower deco strip fastener [4] out of the rubber buffer [1].

When the plastic buckle [2] snaps out, it can be removed.

Installation

Reverse the removal procedures for installation.



3.4 Tail Cover, Tail Light, Rear Base Plate and Steering Tail Guard

Tail Guard

Removal

Remove the seat.

Remove eight plastic expansion clips [1].

Remove two ST4.2 self-tapping screws [2].

Remove four lower plastic expansion clips [5].

Remove the rear LH and RH deco parts, and release the rear seat lock.

Remove the two lower plastic expansion clips [6], and remove the seat support plate [3].

Installation

Reverse the removal procedures for installation.

Rear Base Plate

Removal

Remove the battery [4], and unplug the connector.

Remove two bolts [1], one bolt and [3] two screws [2].

Remove rear base plate assembly.

Taillights, Rear Turn Lights Removal and Installation

Removal

Open front and rear seats.

Remove seat support plate, rear LH and RH deco plates and base plate.

Disconnect the connectors of taillight and rear turn light harness from the main cable.

Remove seven self-tapping screws [1].

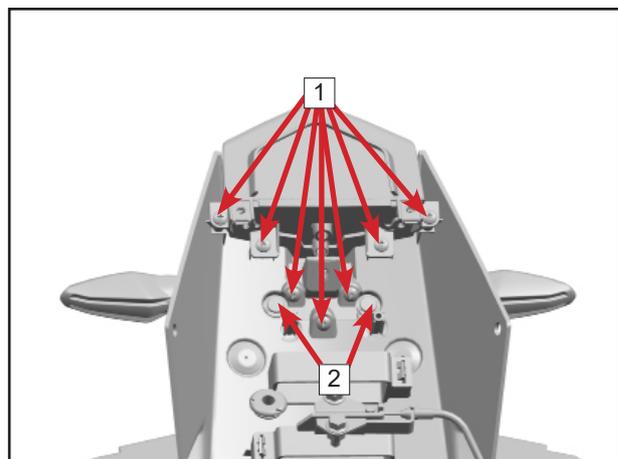
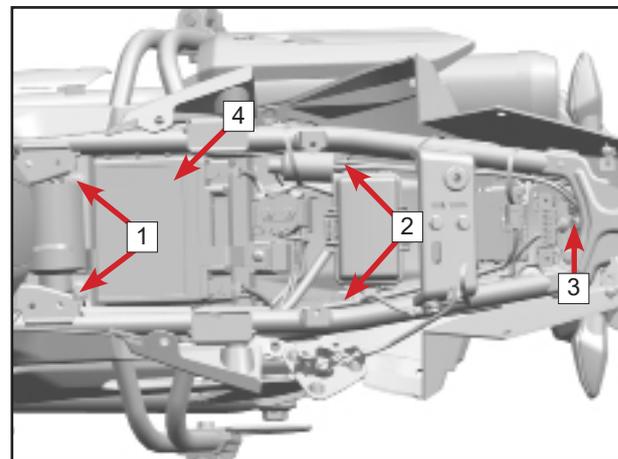
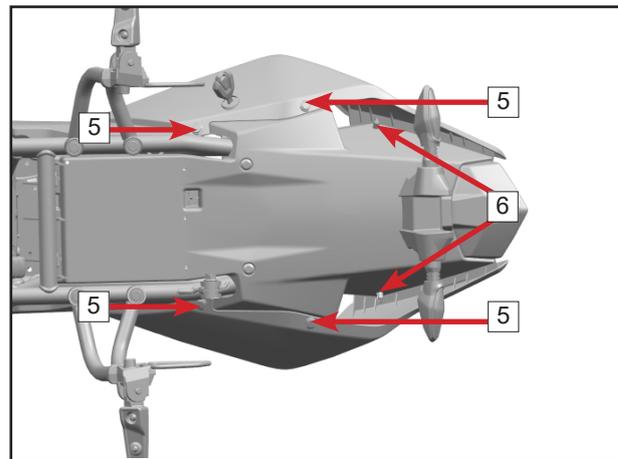
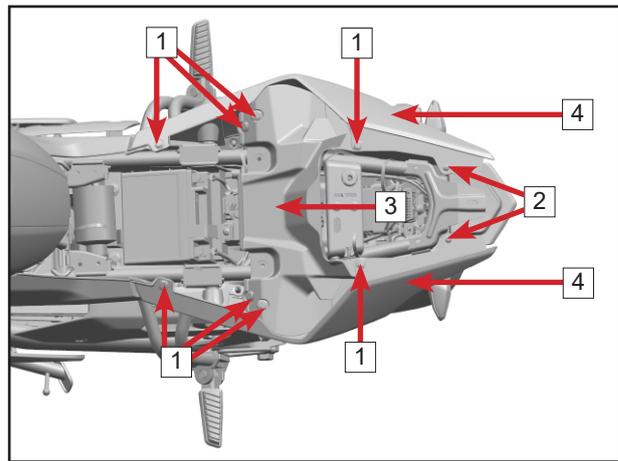
Remove two plastic expansion clips [2].

Lift the tail light out.

Remove the rear turn light downwards.

Installation

Reverse the removal procedures for installation.



3.5 Fuel Tank Guard

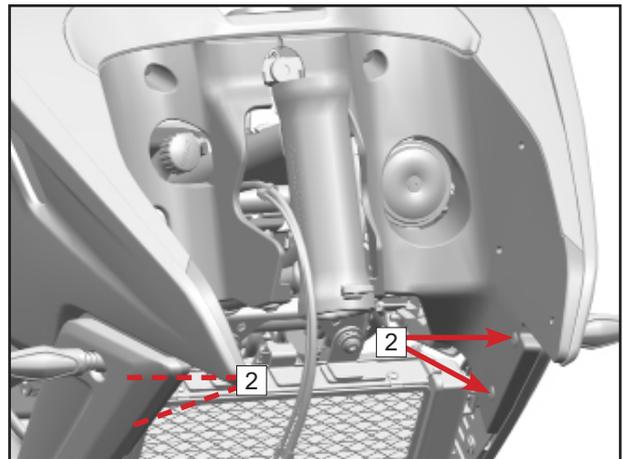
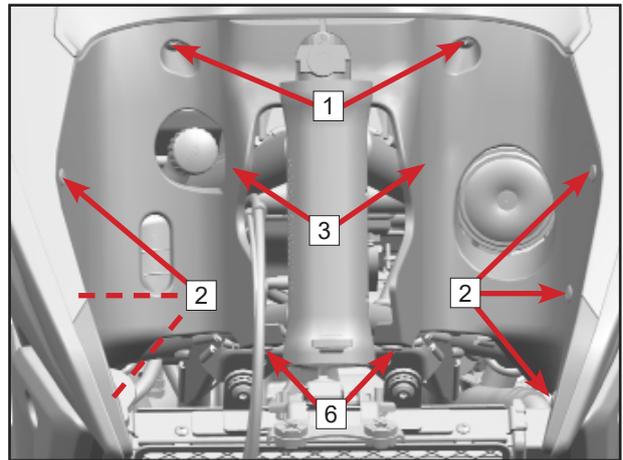
Removal

Remove the screws **1**.

Remove the plastic clip **2**.

Remove the screws **6**.

Remove front LH and RH inner panels **3**.

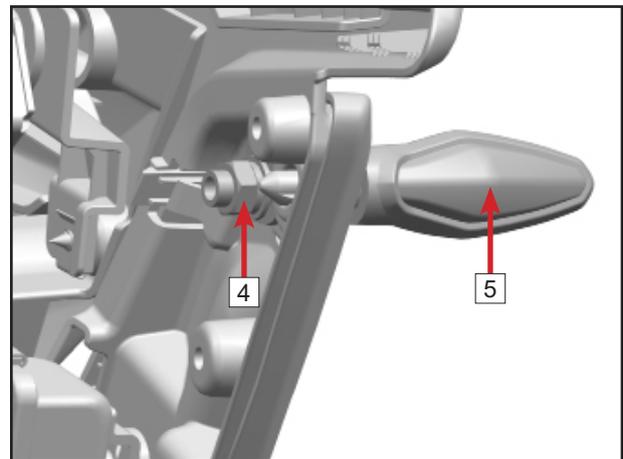


Disconnect the harness .

Remove the LH panel assembly of water tank.

Remove bolt **4**.

Remove front LH turn light **5**.

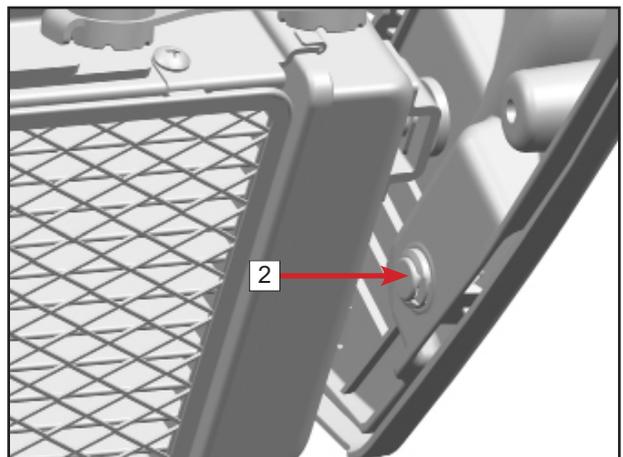


The front RH turn light is removed in the same way as the front LH turn light.

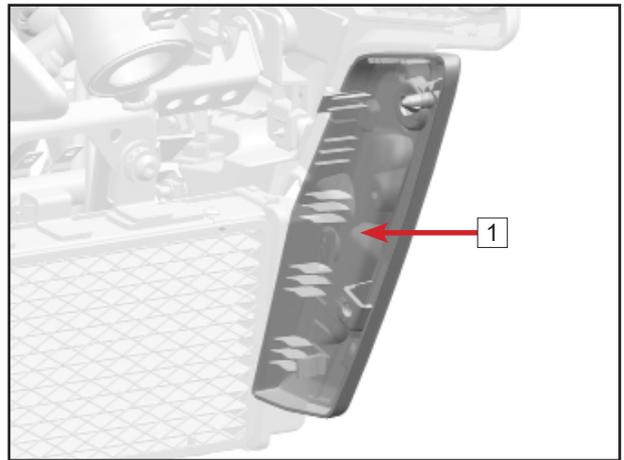
Water Tank LH Outer Panel

Removal

Remove one expansion screw **2**.



Remove the LH outer panel of water tank **1**.



Installation

Reverse the removal procedures for installation.

The water tank RH outer panel is removed in the same way as the LH outer panel.

Water Tank Panel Assembly

Removal

Remove two screws **3** (left and right symmetrical).

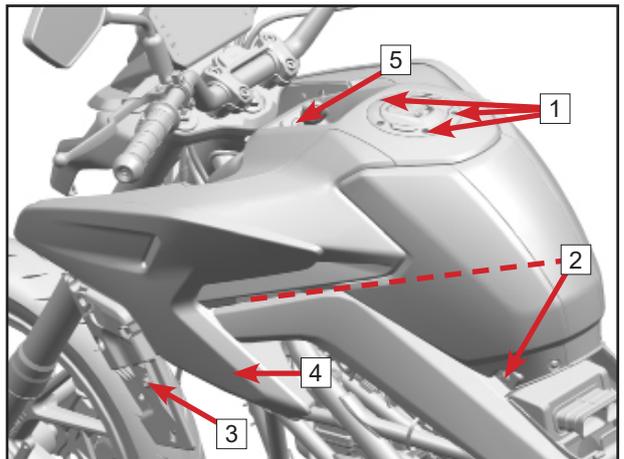
Remove four plastic expansion clips (left and right symmetrical) **2**.

Remove the three screws, unlock and remove the oil filler **1**.

Pull the fastener out of the rubber ring **4** (left and right symmetrical).

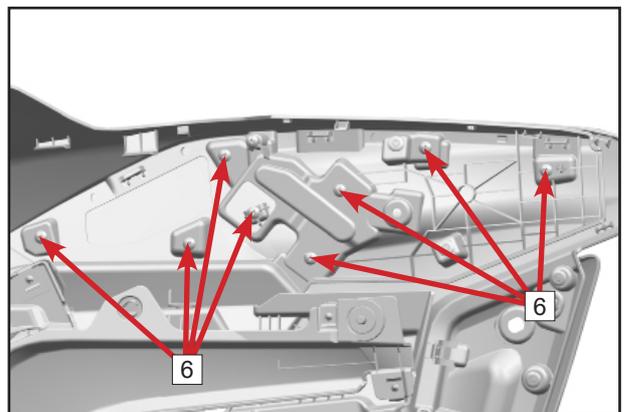
Open the water tank panel assembly at the fastener **4** position.

Remove fuel tank panel assembly **5** in direction of power lock.



Remove eight self-tapping screws **6**.

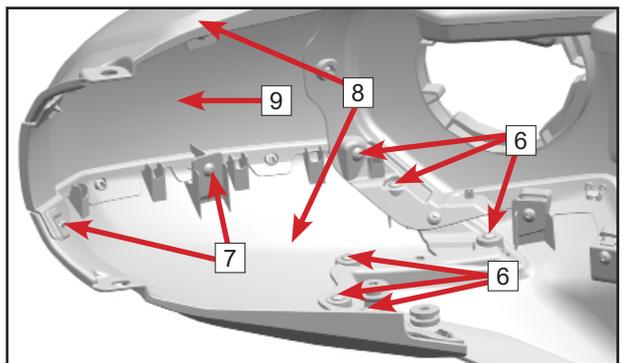
Remove the front LH panel deco part of fuel tank.



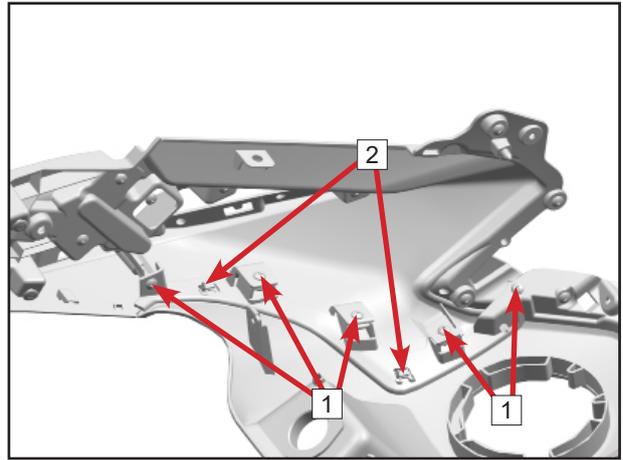
Remove sixteen screws **7** (left and right symmetrical).

Remove the fuel tank LH and RH panels **8**.

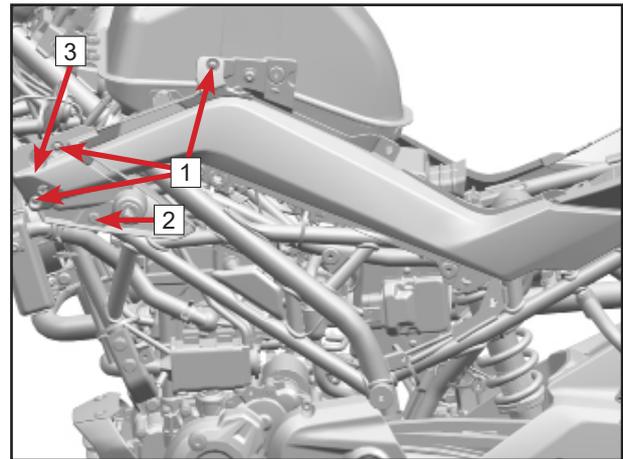
Remove the rear part of fuel tank upper panel **9**.



Remove five screws [1].
Loosen two clasps [2].
Remove fuel tank front LH panel.
The front RH panel is removed in the same way as the front LH panel.

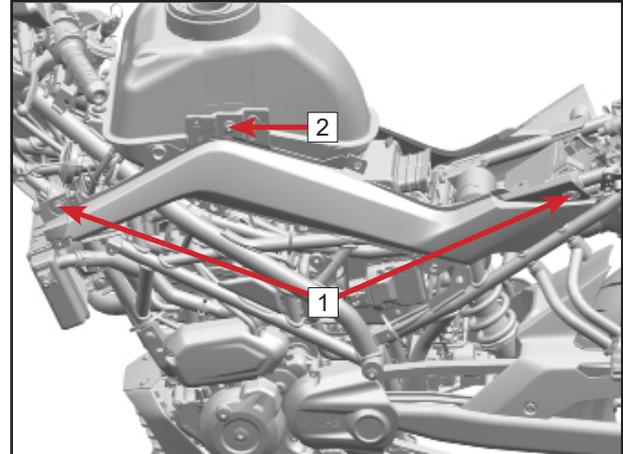


Remove three screws [1].
Remove one bolt [2].
Remove the LH inner panel of water tank [3].



The water tank RH inner panel is removed as on the LH side.

Remove two bolts [1].
Remove one screw [2].
Remove the LH panel.

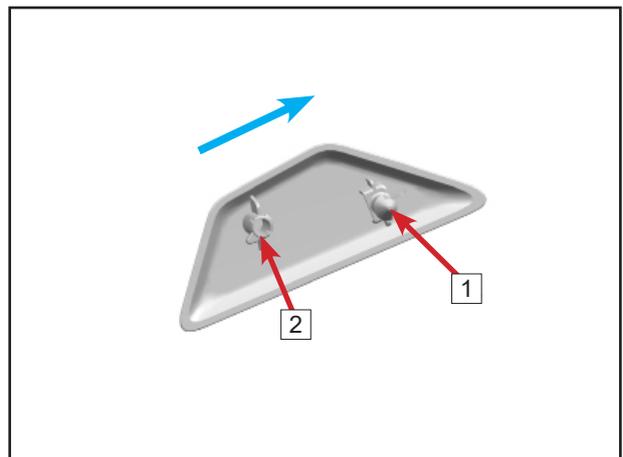


The RH panel is removed in the same way as the LH panel.

Frame LH Deco Cover

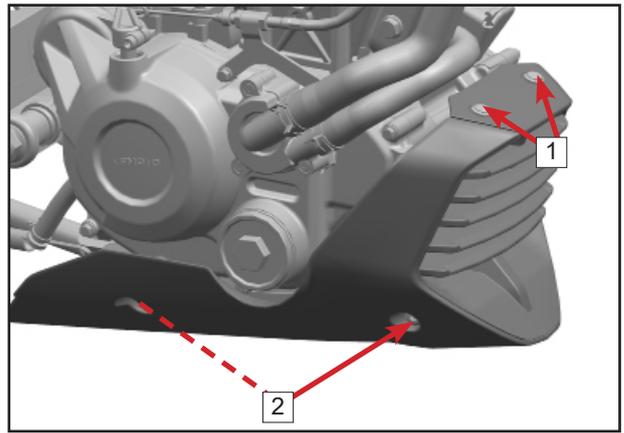
Removal

Pull out the fastener [1].
Unhook the clasp [2] in the direction of the arrow.
Remove the frame LH deco cover.

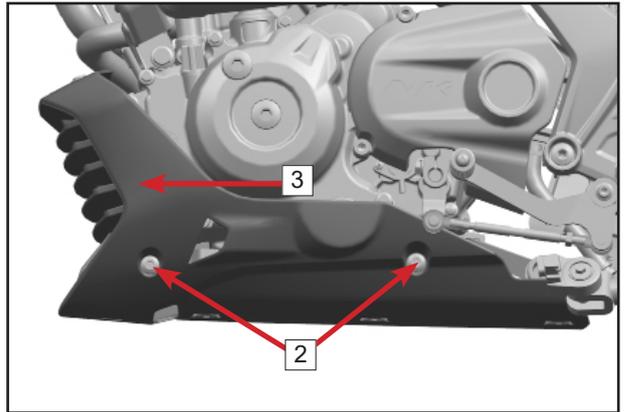


The frame RH deco cover is removed in the same way as the LH deco cover.

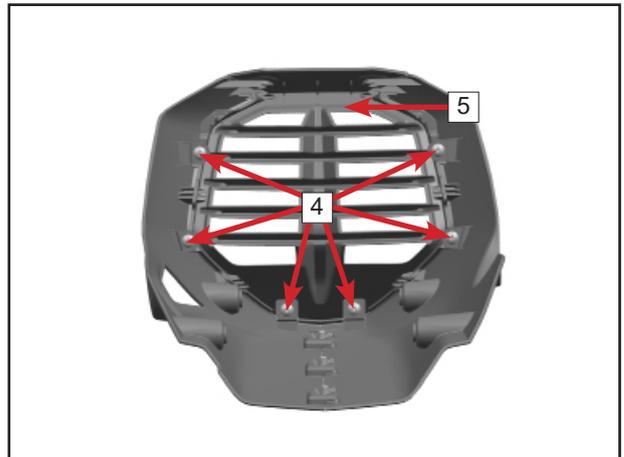
3.6 Engine Guard Removal



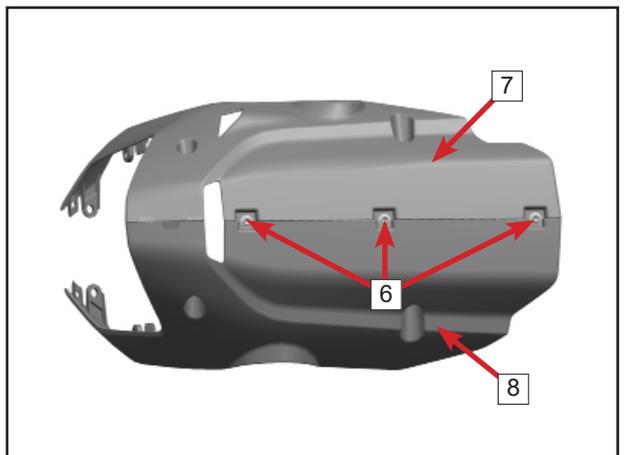
Remove four screws [2].
Remove engine guard assembly [3].



Remove plastic clip assembly [1].
Remove six self-tapping screws [4].
Remove engine middle panel [5].



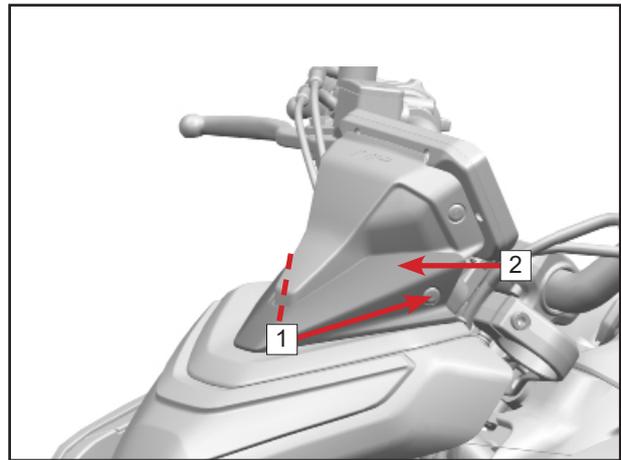
Remove 3 screws [6].
Remove engine LH panel [7].
Remove engine RH panel [8].



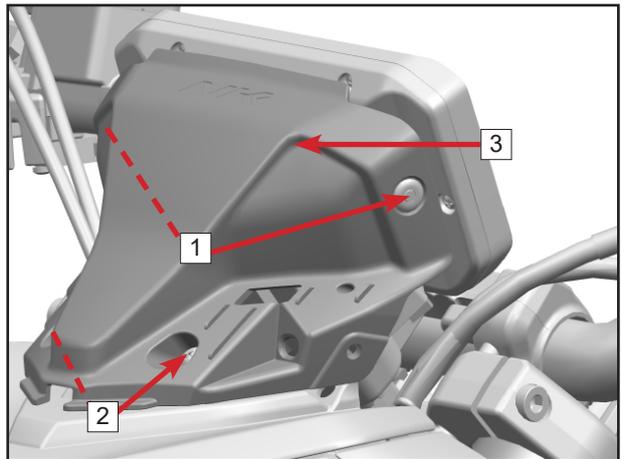
3.7 Headlight and Dashboard

Removal

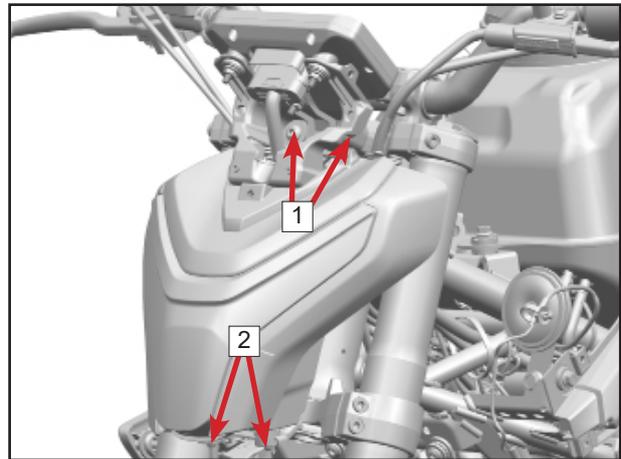
Remove two plastic expansion screws [1].
Remove dashboard deco guard [2].



Remove two plastic expansion screws [1].
Remove two self-tapping screws [2].
Remove dashboard lower deco guard [3].



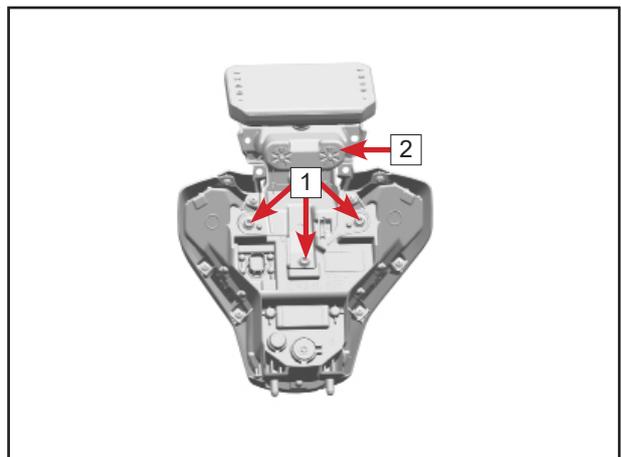
Remove two inner hex bolts [1] at the upper end of headlight assembly.
Pull out the two fastener in the lower rubber ring [2].
Disconnect the headlight combination harness and the plug connection of the instrument combination to the main cable.
Remove headlight strip dashboard assembly.



Installation

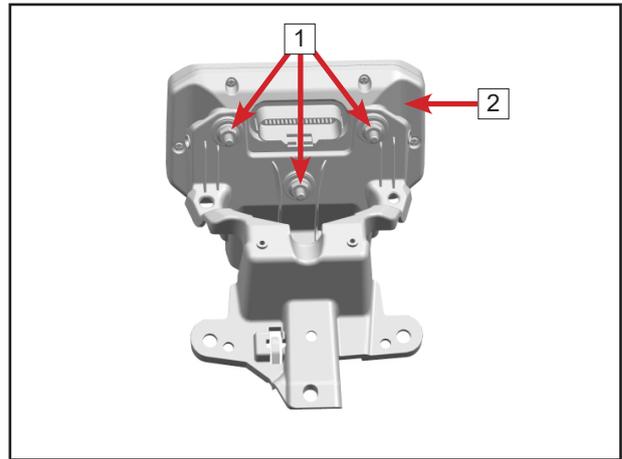
Reverse the removal procedures for installation.

Remove three bolts [1].
Remove the dashboard and bracket assembly [2].

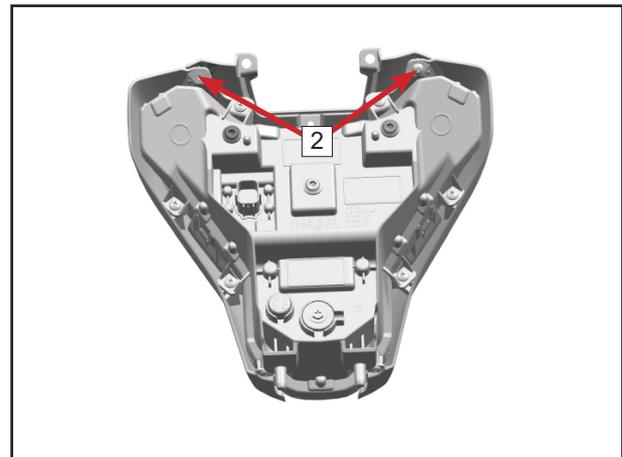


03 Vehicle Body

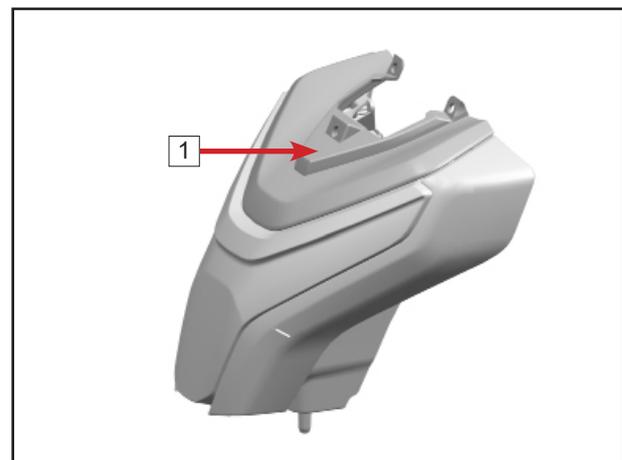
Remove three bolts **1**.
Remove dashboard **2**.



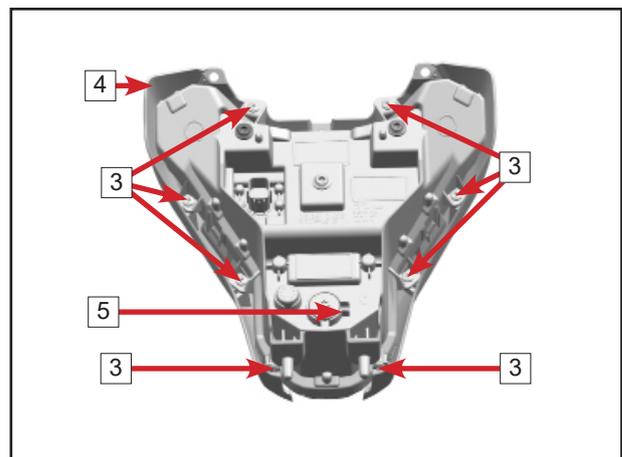
Remove two self-tapping screws **2**.



Remove front headlight upper deco guard **1**.



Remove eight self-tapping screws **3**.
Remove headlight deco guard **4**.
Remove headlights **5**.



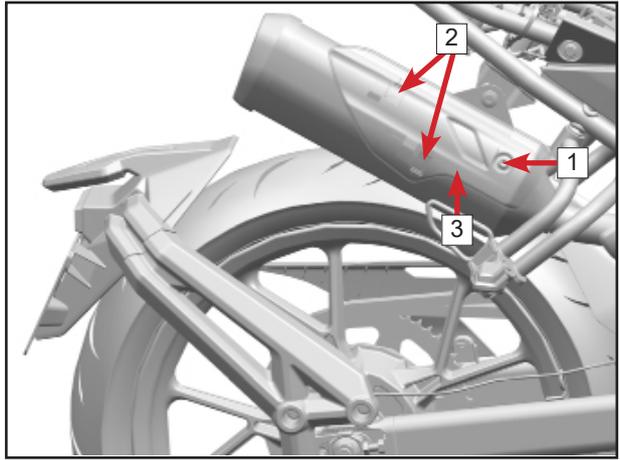
Installation

Reverse the removal procedures for installation.

3.8 Muffler Guard

Removal

- Remove bolt **1**.
- Along the axis of the exhaust pipe.
- Unplug the rubber sleeve **2**.
- Remove the muffler guard **3**.



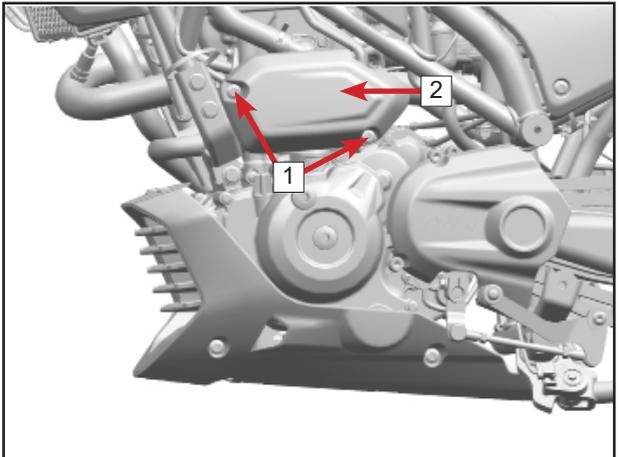
Installation

Reverse the removal procedures for installation.

3.9 Canister Deco Cover

Removal

- Remove two screws **1**.
- Remove the canister deco cover **2**.



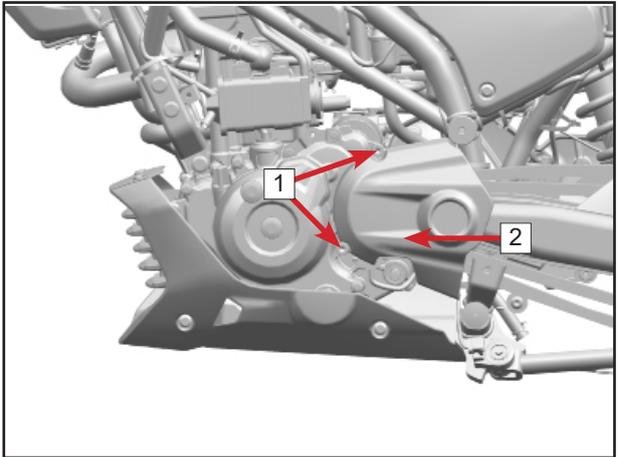
Installation

Reverse the removal procedures for installation.

3.10 LH Rear Cover Assembly

Removal

- Remove two screws **1**.
- Remove LH rear cover assembly **2**.



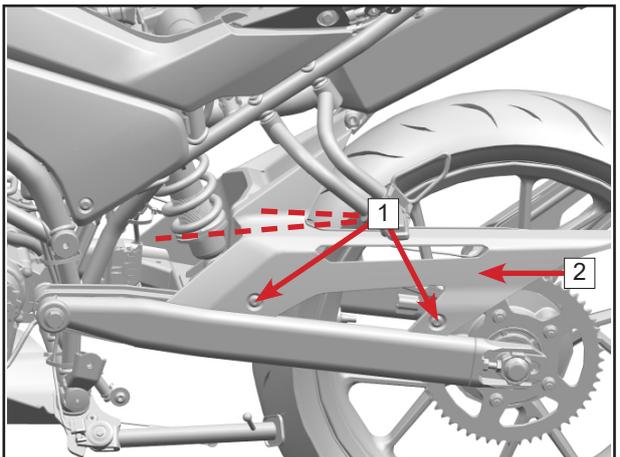
Installation

Reverse the removal procedures for installation.

3.11 Rear Inner Fender

Removal

- Remove four screws **1**.
- Remove rear inner fender **2**.



Installation

Reverse the removal procedures for installation.

04 Cooling System

4.1 Coolant Specification.....	4-2
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4.4 Cooling Cycle Tightness Inspection.....	4-7
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4.9 Coolant Replacement.....	4-10

4.1 Coolant Specification

The coolant used in the cooling system is a mixture of 51.5% water, 46% ethylene glycol, and 2.5% additives. This mixture has good anti-corrosion and heat absorption functions. Its freezing point is -35 °C. If the engine works under -35 °C, the coolant with freezing points of -40 °C and -50 °C is selected.

CAUTION

**The mixture made of high-quality distilled water and ethylene glycol antifreeze shall not be mixed with ethanol mixture or other brands of antifreeze.
The mixing ratio shall not exceed 60% or be less than 50%.
Do not use leak proof additives.**

DANGER

**Coolant is toxic and harmful to health.
Don't drink nor spill on skin, eyes, clothing.
If coolant is swallowed, induce vomit and seek for medical attention.
In case of contact with skin, wash the contact part with plenty of water immediately.
Once the coolant comes into contact with the eyes, immediately flush the eyes thoroughly with water and then seek medical advice.
If you spill coolant on your clothing, change your clothing.
Rust and corrosion residues in the engine and radiator must be treated according to regulations. The chemical inside can do harm to humans.**

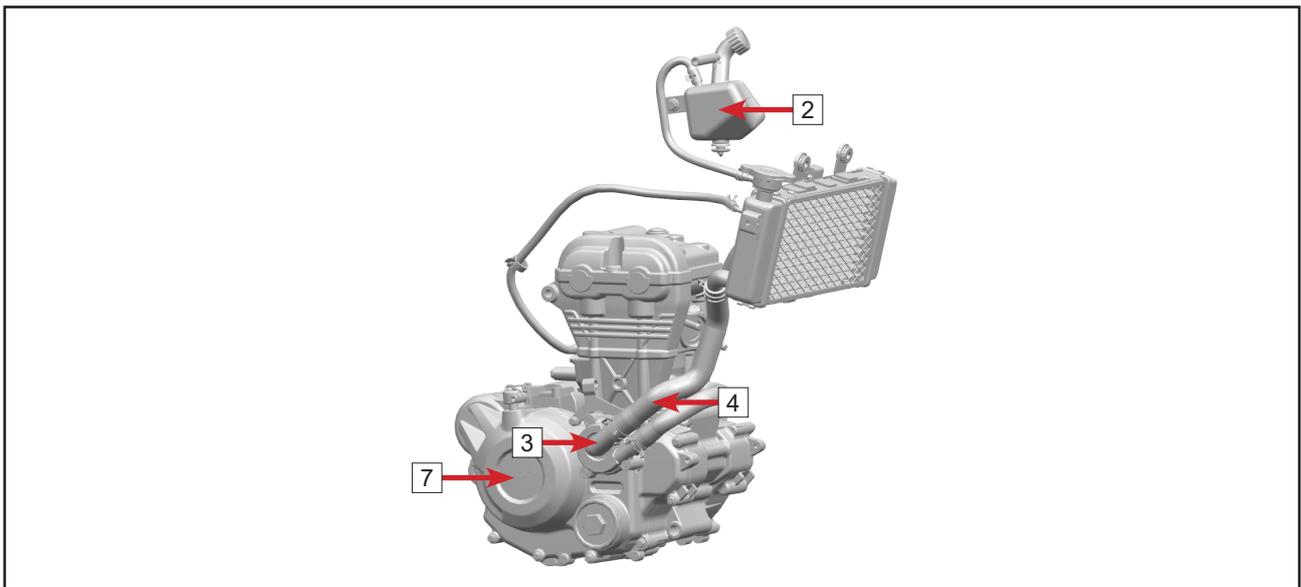
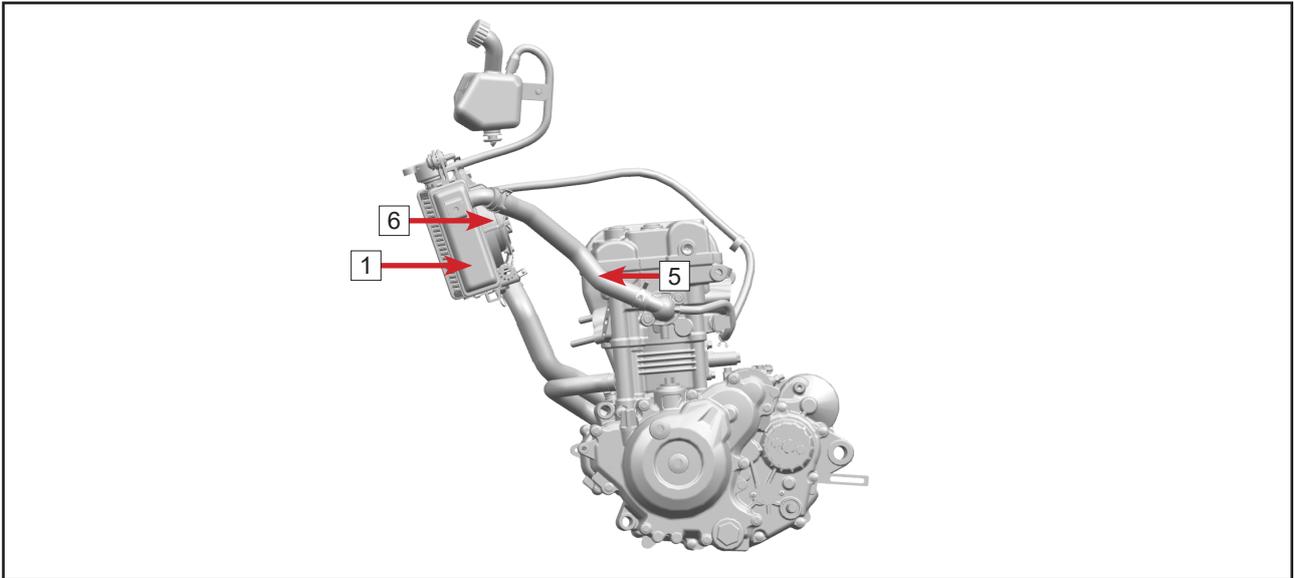
CAUTION

**If tap water is added to the cooling system, scale deposit will accumulate inside the cooling system. When the temperature is below zero, ice will be generated, which will seriously affect the operation of the cooling system.
Antifreeze is added anti-rust agent and antiseptic. When it is diluted, it will lose resistance of rust and corrosion. The dilution concentration of antifreeze must be consistent with the manufacturer's instructions.
The coolant added into the cooling system is green and contains ethylene glycol. When the ambient temperature is at -35°C, please choose the coolant whose freezing point is lower than -35°C.**

WARNING

**The coolant will be very hot and under pressure when the vehicle is running.
Do not open the radiator, radiator hose, auxiliary water tank and other parts of the cooling system before the engine or cooling system is completely cooled.
If get scalded, rinse the wound with flowing cold water for more than 10 minutes until the wound is no longer painful and seek medical advice immediately.**

4.2 Cooling System View



1	R a d i a t o r a s s e m b l y	2	Reservoir tank a s s e m b l y	3	W a t e r p u m p a s s e m b l y	4	Radiator water outlet p i p e
5	Radiator water i n l e t p i p e	6	F a n m o t o r a s s e m b l y	7	E n g i n e a s s e m b l y		

Inlet Pipe and Outlet Pipe Inspection

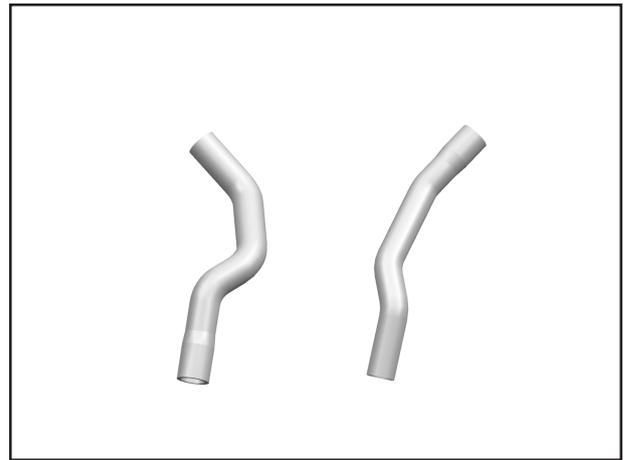
Check whether the radiator inlet and outlet pipes are damaged or broken.

The rubber hose will naturally age due to heat and long use time, and the cooling system will cause the pipe to break when heated.

Pinch the water pipe with fingers to check whether there are cracks. Replace it if there is damage and rupture.

Check the tightness of coolant pipe ring. Replace or tighten if loosen.

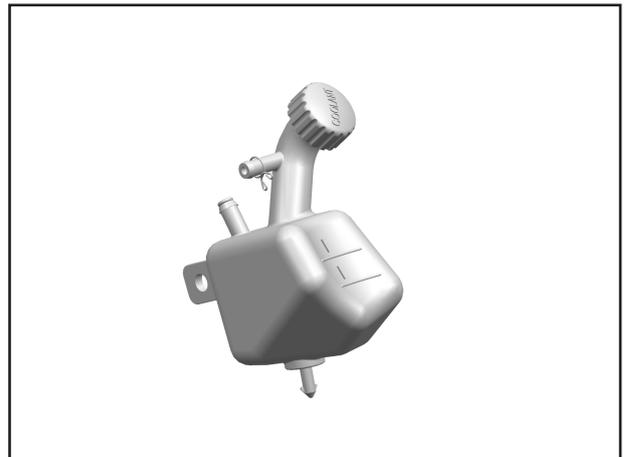
Check water pump, water pipe and all connecting parts for leakage. Replace if it does.



Reservoir Tank

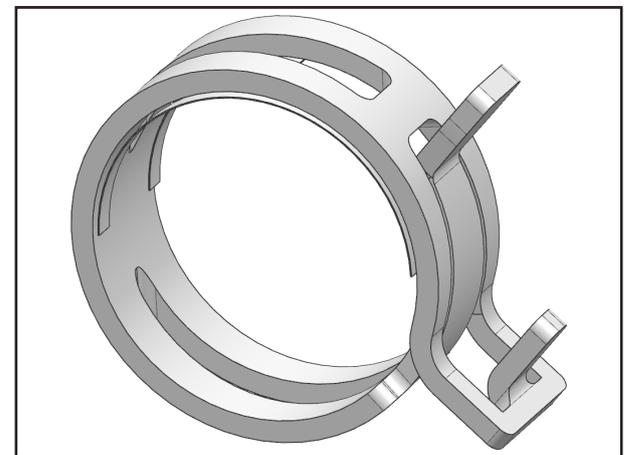
Check the reservoir tank for damage or cracks. Replace in time if it does.

Check the water pipe of reservoir tank for damage or cracks. Replace in time if it does.



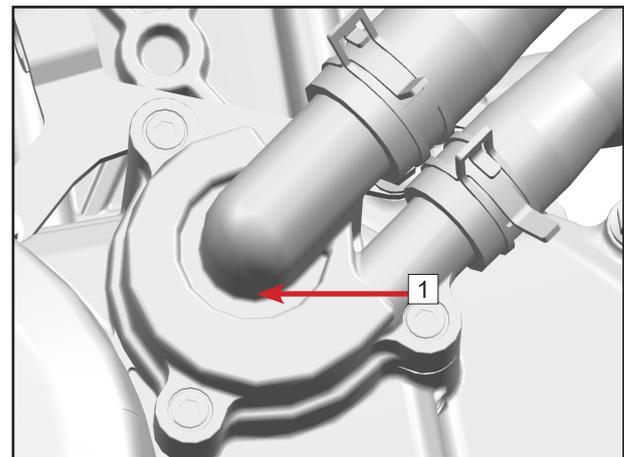
Clamp

Check whether the clamp is worn, deformed or cracked. If it does, replace it with a new one in time.



Water Pump Cover

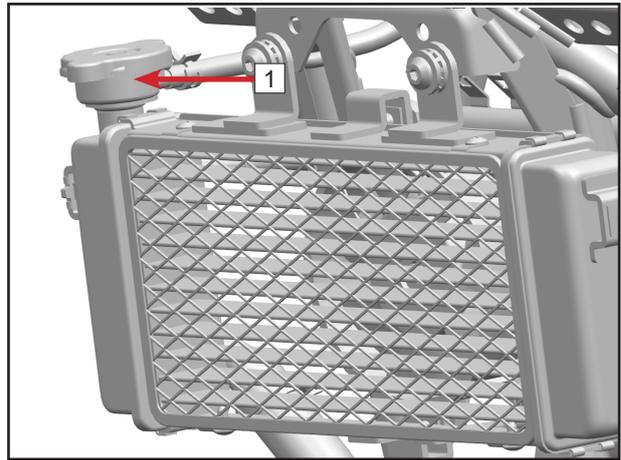
Check the water pump cover 1 for cracks, sealing surface for pits or protrusions. Replace if it does.



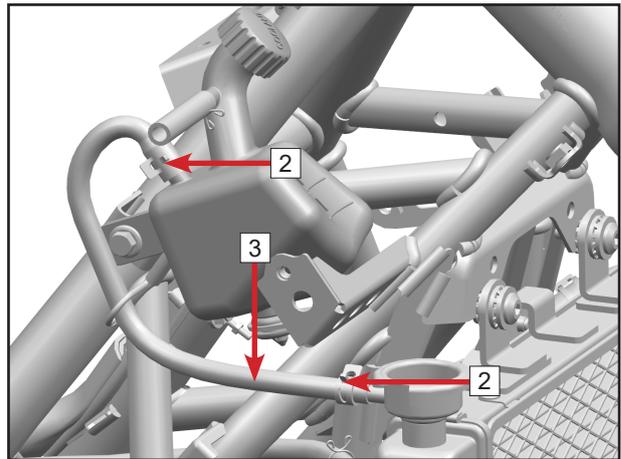
4.3 Cooling System Assembly Removal

Removal

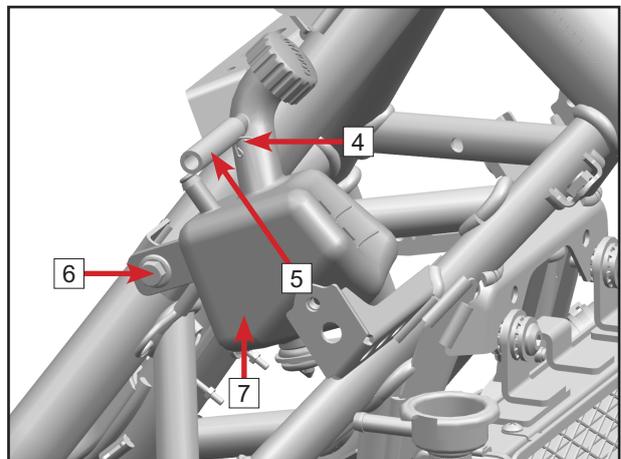
Open the radiator cap **1**.



Loosen the clamp **2**.
Disconnect reservoir tank connecting pipe **3**.

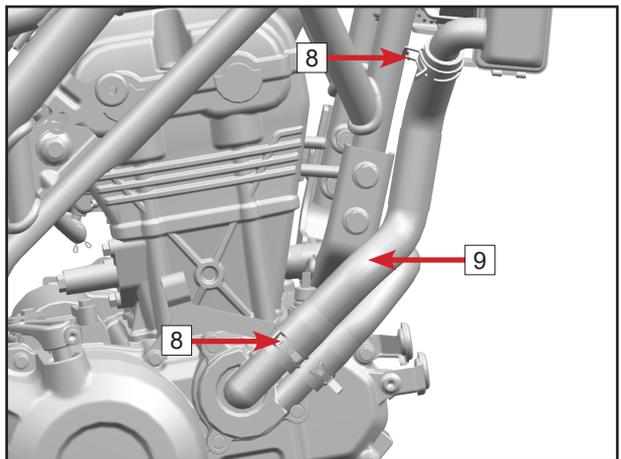


Loosen the clamp **4**.
Remove reservoir tank siphon pipe **5**.
Remove bolt **6**.
Remove reservoir tank **7**.



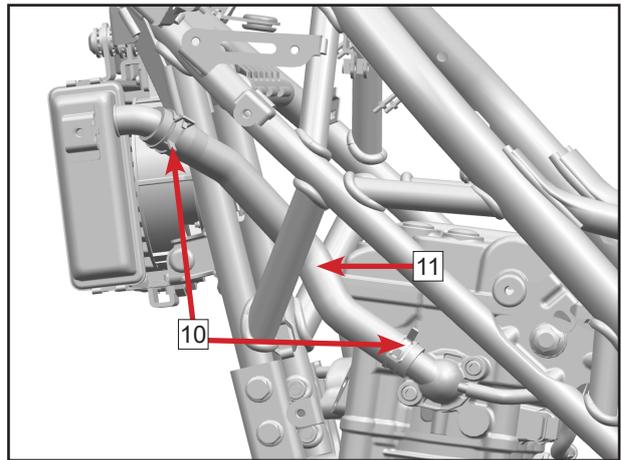
Place a basin under the water pump.
Loosen the clamp **8**.
Remove the outlet pipe **9**.
Drain the coolant.

NOTE
After water outlet pipe removal, there is still some coolant spilling out.

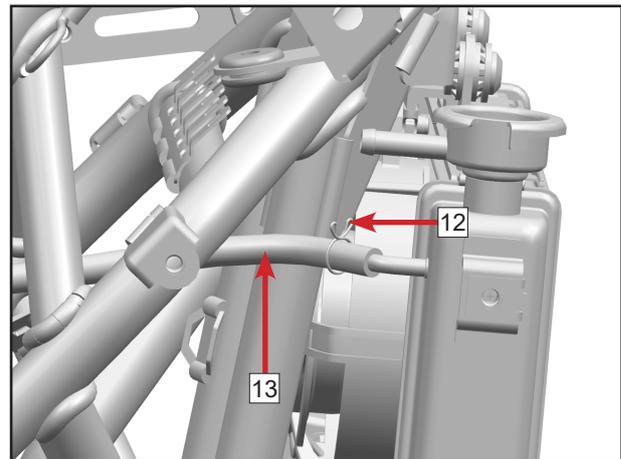


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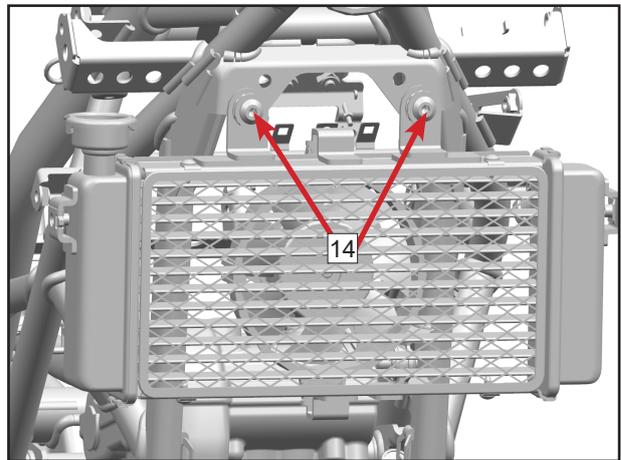
Loosen the clamp **10**.
Remove the inlet pipe **11**.



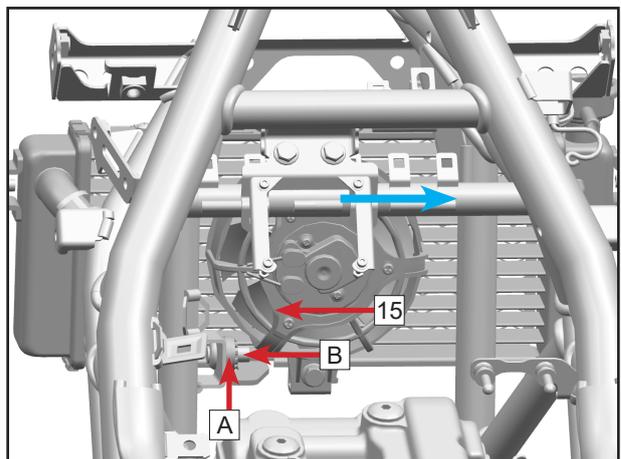
Loosen the clamp **12**.
Remove thermostat connecting pipe **13**.



Remove two screws **14**.



Remove the radiator **15** in the direction shown.



Installation

Reverse the removal procedures for installation. When installing the radiator, the LH side **A** is suspended from the frame **B**.

4.4 Cooling Cycle Tightness Inspection

Radiator Cap Inspection

Remove the radiator cap.

Use a barometer to test the opening pressure of the radiator cap.

If the radiator cap cannot meet the pressure requirements, replace it with a new one.

Opening pressure of radiator cap

135kPa~160kPa

1.35kgf/cm²~1.6kgf/cm²

19.58psi~23.2psi

Standard value:

140kPa

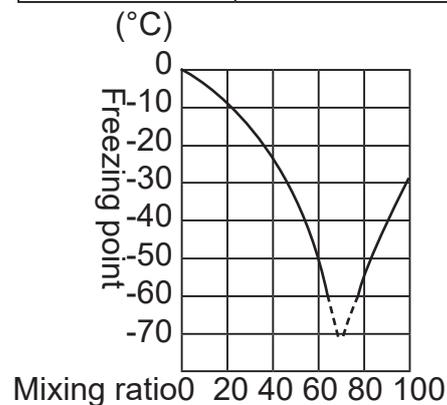
1.4kgf/cm²

20.3psi

Tightness Inspection

Connect the tester to the connection port of the reservoir tank.

Mixing ratio	Freezing point
50%	-30°C
55%	-40°C
60%	-55°C



⚠ WARNING

Do not open the radiator cap before the engine is cooled to avoid high temperature steam burns.

Pressurize 135 kPa and hold for 10 seconds.

If the pressure drops within 10 seconds, it indicates there is leakage in the cooling cycle. At this time, inspect the whole cooling cycle, and replace with new parts in case of leakage.

NOTE

When taking out the tester, cover the radiator cap with a piece of rag to prevent the coolant from splashing out.

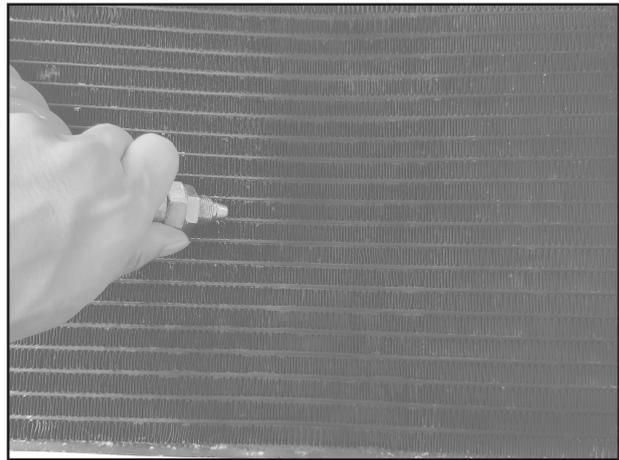
NOTE

The test pressure should not exceed the opening pressure of the radiator cap.

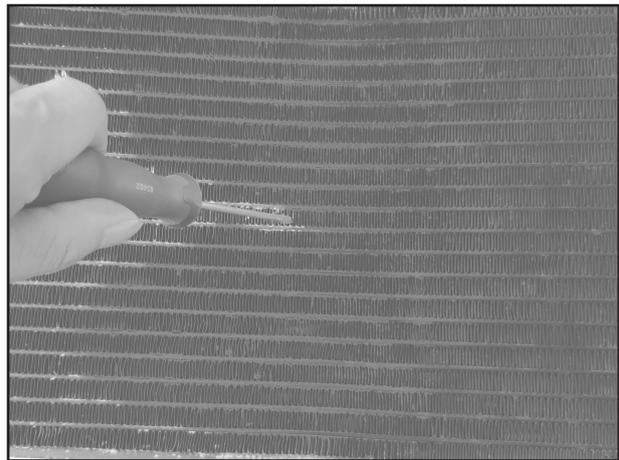
4.5 Radiator and Water Pipe Inspection and Cleaning

Radiator Inspection and Cleaning

Remove sediment and dirt from the radiator surface with high-pressure air.



Repair the radiator fin with a small screwdriver.



Radiator Water Pipe Inspection

Check the water leakage and damage of radiator hose, and replace with a new one in case of water leakage and damage.

Check the radiator hose clamp and replace it with a new one in case of failure in fastening.

Check the coolant after checking the radiator and hose, and add coolant if necessary.

4.6 Fan Motor Inspection

Remove bolts [1].

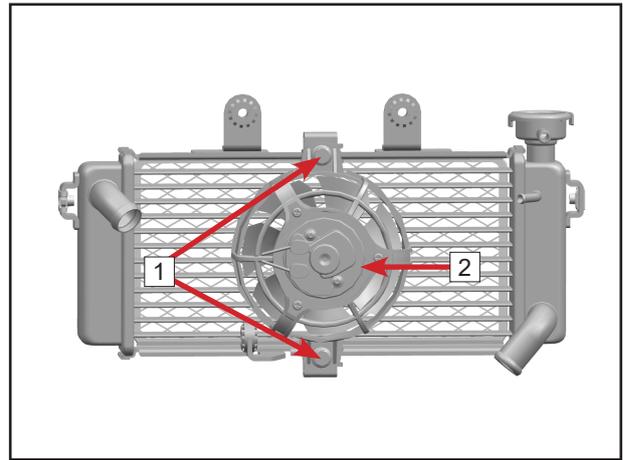
Remove the fan motor assembly [2].

Rotate the blade by hand and check its rotation flexibility and completeness.

If the blade is jammed or damaged, replace with a new fan motor assembly [2].

The battery voltage is 12V, the motor operates at full speed, and the ammeter current does not exceed 5A. If the motor does not rotate or the current exceeds the specified value, replace with a new fan motor assembly [2].

Fan Relay Test (See chapter 12 Electrical System for details).



Installation

Reverse the removal procedures for installation.

4.7 Coolant Inspection

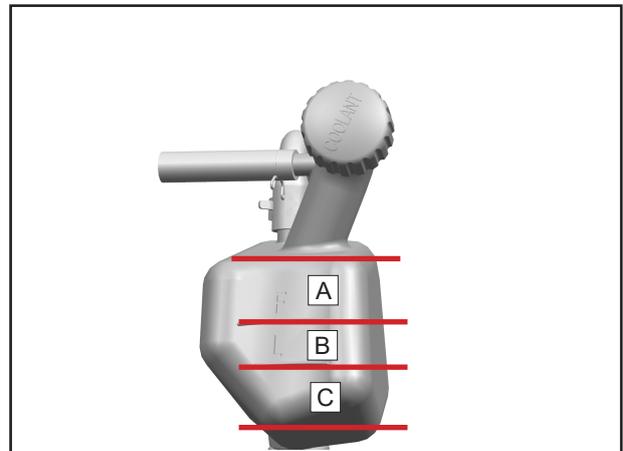
Lift the vehicle on level ground with the side brace.

Check the reservoir coolant level after coolant has cooled down.

If coolant level is in level A: drain excess coolant to level B.

If coolant level is in level B: the level is right.

If coolant level is in level C or not visible: Refill the same coolant to level B.



⚠️ WARNING

The coolant will be very hot and under pressure while the vehicle is running. Do not open the radiator cap, radiator hose, reservoir tank and other parts of the cooling system before the engine or cooling system is completely cooled. In the event of a burn, rinse the wound with running cold water for 10 minutes or more until the wound is no longer painful and then seek medical attention.

4.8 Coolant Addition

Open the reservoir cap and add the same coolant to area B.

⚠ CAUTION

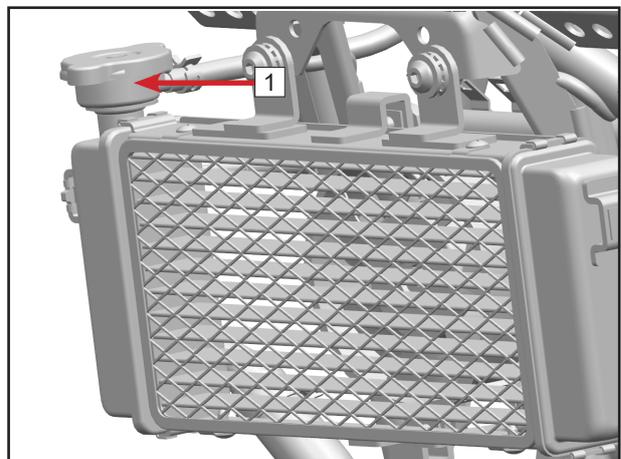
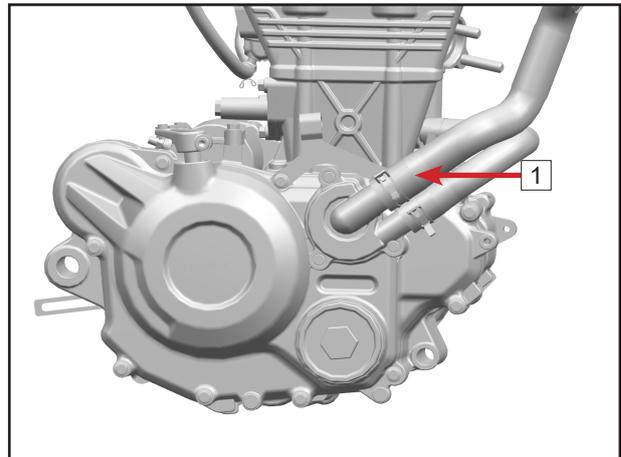
If the coolant needs to be replenished frequently, or if the coolant in the reservoir is frequently backed up and drained, there may be leakage in the cooling system, contact the engineer to have the cooling system checked.

Only the original CFMOTO coolant is recommended. Mixing different coolants may cause engine damage, contact the engineer to replace the coolant.

4.9 Coolant Replacement

Preconditions: Prop up the vehicle on the level ground or fix the vehicle on the level control console, so that the vehicle is perpendicular to the ground.

1. Place a container under the water pump.
2. Remove outlet pipe **1**.
3. Release the radiator pressure cap **2**.
4. Drain the coolant (Make sure that the coolant in the reservoir is cleared).
5. Install outlet pipe.
6. Open radiator pressure cap **2**.
7. Use a funnel to fill the coolant from the radiator mouth to the radiator neck.
8. Start the vehicle to heat engine for 2 to 3 minutes (do not close the radiator pressure cover during vehicle starting).
9. After heating the engine, add coolant from radiator mouth to radiator neck.
10. Close the radiator pressure cap **2**.
11. Start the vehicle until the fan runs, and observe the reservoir at the same time to check whether the coolant in the radiator is flowing into the reservoir through the reservoir connecting pipe.
12. If no coolant flows out, repeat steps 6 to 11 above (make sure the engine is cooled).
13. If any coolant flows out, fill the reservoir tank with coolant between the UPPER and LOWER limit line.
14. After the engine is cooled, check the level of reservoir. If the level is lower than the Lower limit line, add the coolant between the Upper and Lower limits. If the level is higher than the Upper limit line,



drain out the excess coolant to restore the level to the Upper and Lower limits.

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5.1 Special Tool

(The following special tools are available for dealers' reference)

Camshaft Locking Pin

SH-JC7DM409/0379



Tool For Supporting The Piston

SH-JC865261



Camshaft Sprocket Locking Tool

SH-JC865259



Clutch Housing Extraction Tool

SH-JC00H05300041



Magneto Flywheel Extractor Tool

SH-JC864868



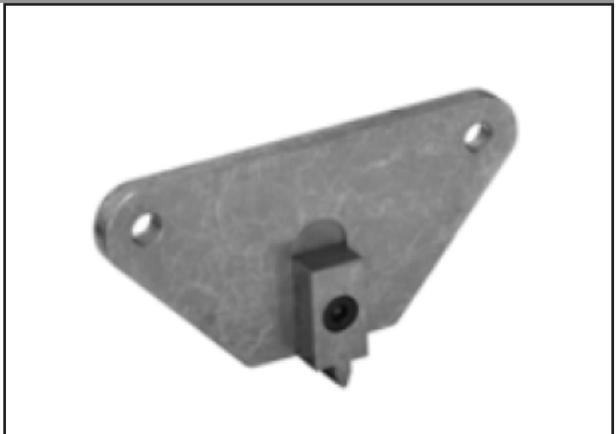
Balance Shaft Locking Tool

SH-JC864486



Crankshaft Sprocket Locking Tool

SH-JC864487



Magneto Flywheel Locking Tool

SH-JCFZ409/0284



5.2 Engine Removal

Engine Removal

Remove seat.

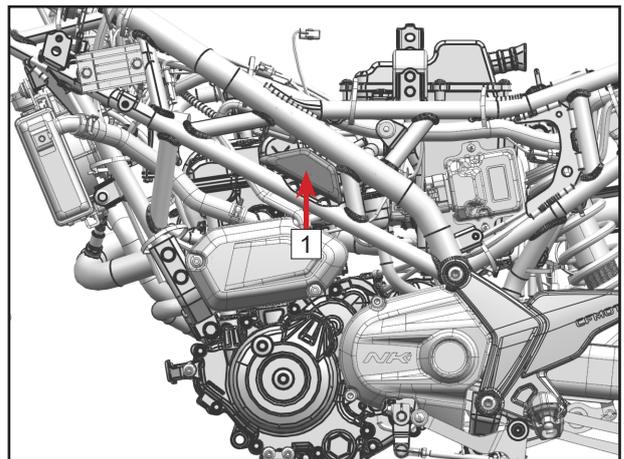
Refer to Chapter 03 to remove:

- Frame LH panel
- Frame RH panel
- Front LH inner plate
- Front RH inner plate
- Water tank LH outer panel
- Water tank RH outer panel
- Fuel tank panel assembly
- Rear LH deco plate
- Rear RH deco plate
- LH panel/water tank LH inner panel assembly
- RH panel/water tank RH inner panel assembly
- Engine panel assembly

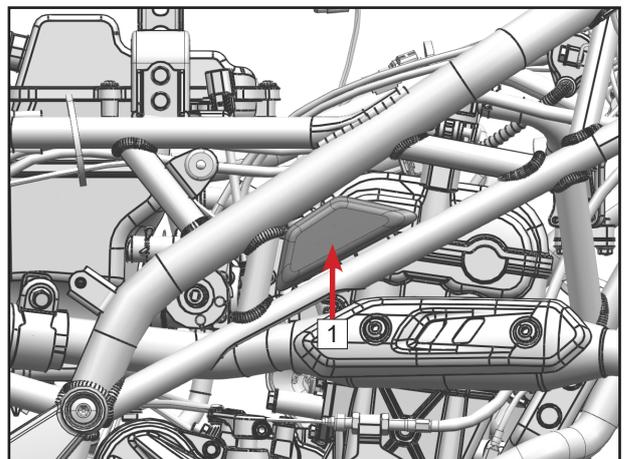
Drain out the coolant.

Remove the fuel tank.

Remove frame LH deco cover 1.

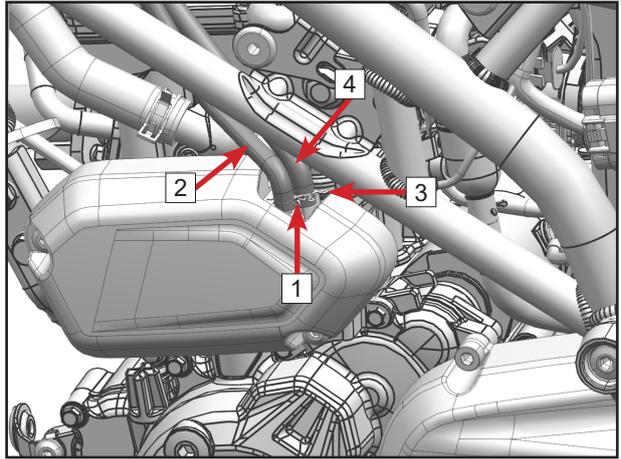


Remove frame RH deco cover 1.

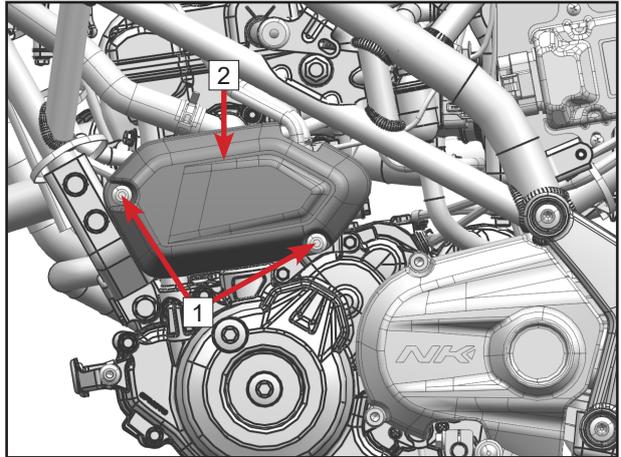


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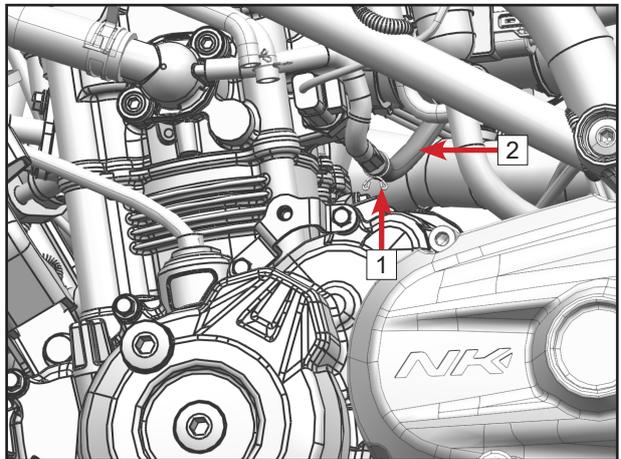
Loosen the clamp **1**, remove the pipe **2** from the canister.
Loosen the clamp **3**, remove the pipe **4** from the canister.



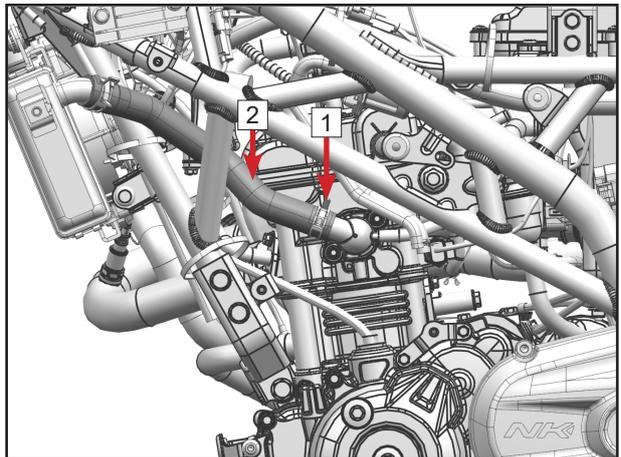
Remove screws **1**.
Remove canister deco cover **2** and canister.



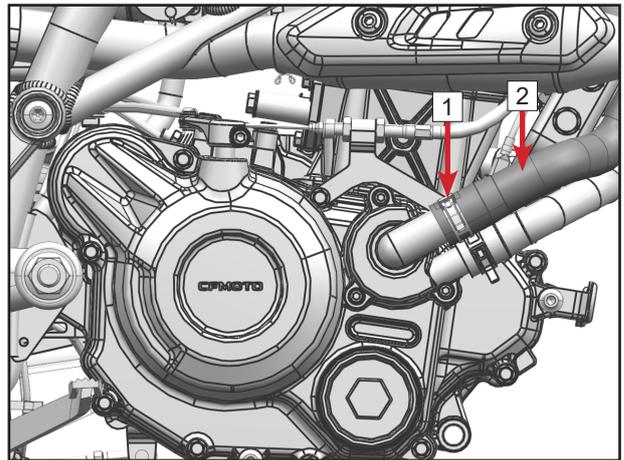
Loosen the clamp **1**.
Remove the thermostat connecting water pipe **2**.



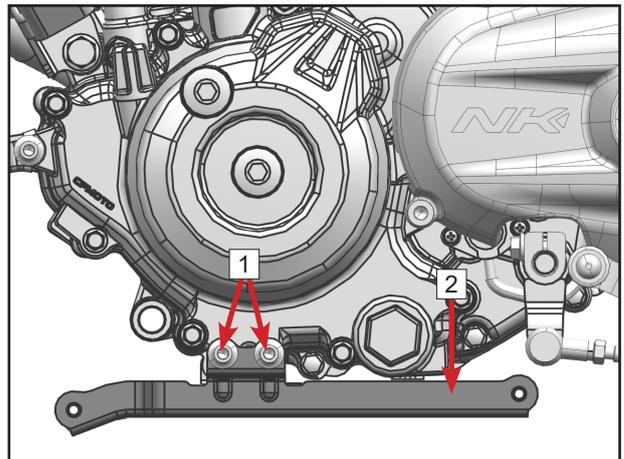
Loosen the clamp **1**, and remove the radiator inlet pipe **2** from the thermostat cover.



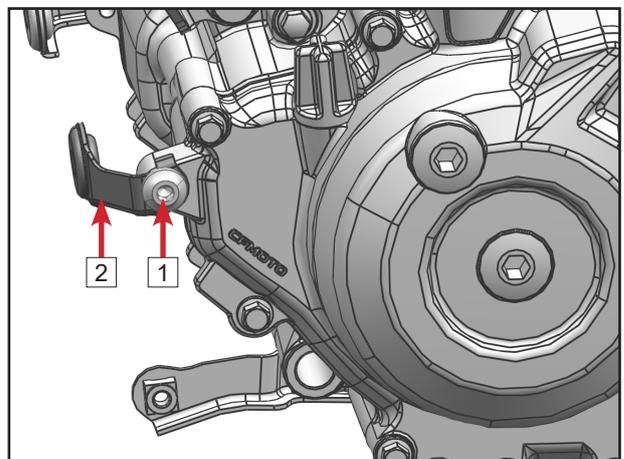
Loosen the clamp **1**, remove the radiator outlet pipe **2** from the pump cover.



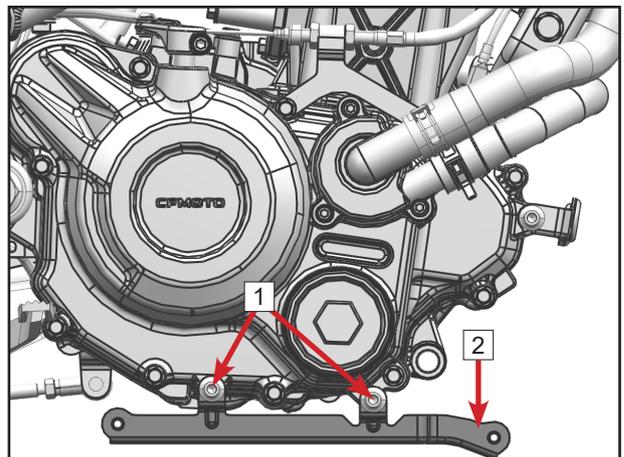
Remove screws **1**.
Remove lower deflector LH mounting bracket assembly **2**.



Remove screws **1**.
Remove lower deflector LH upper mounting bracket assembly **2**.

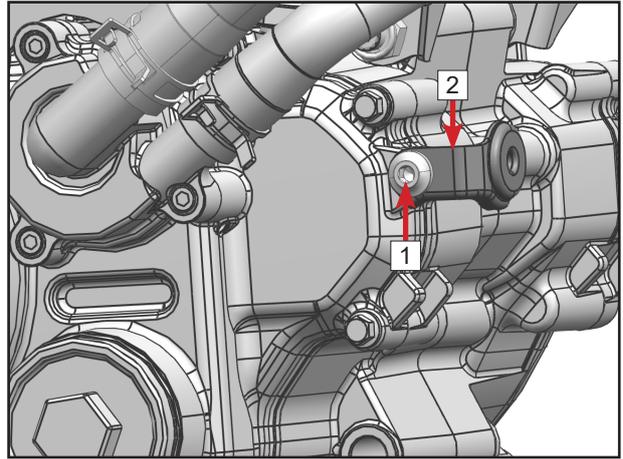


Remove screws **1**.
Remove lower deflector RH mounting bracket assembly **2**.

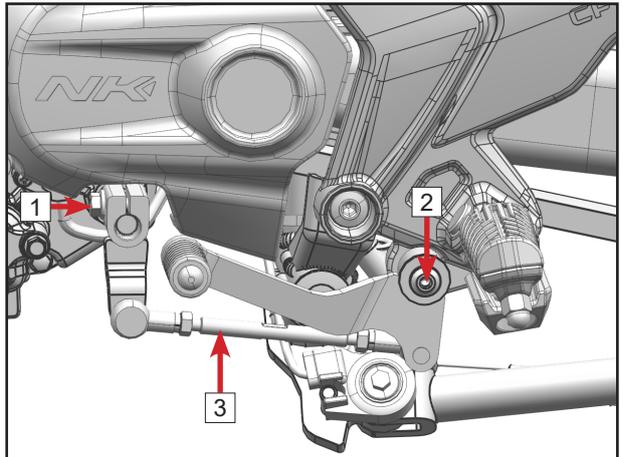


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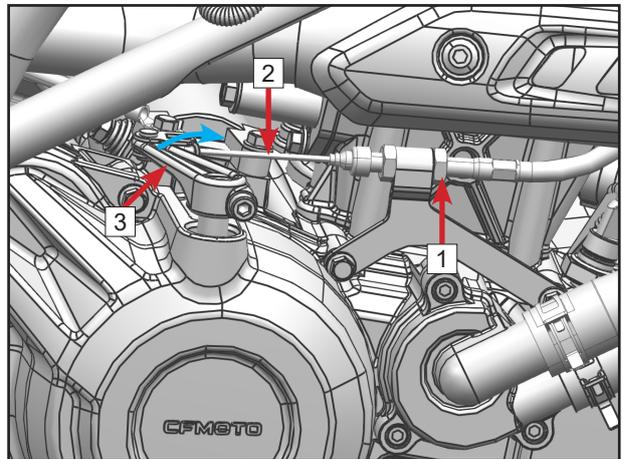
Remove screw **1**.
Remove lower deflector RH upper mounting bracket assembly **2**.



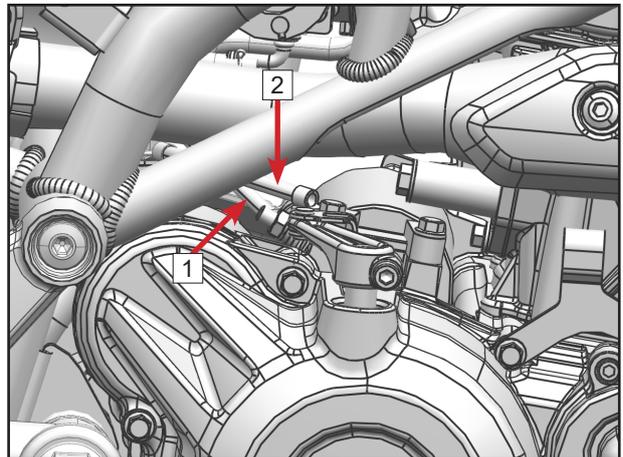
Remove bolt **1**.
Remove screw **2** and washer.
Remove shift lever assembly **3**.



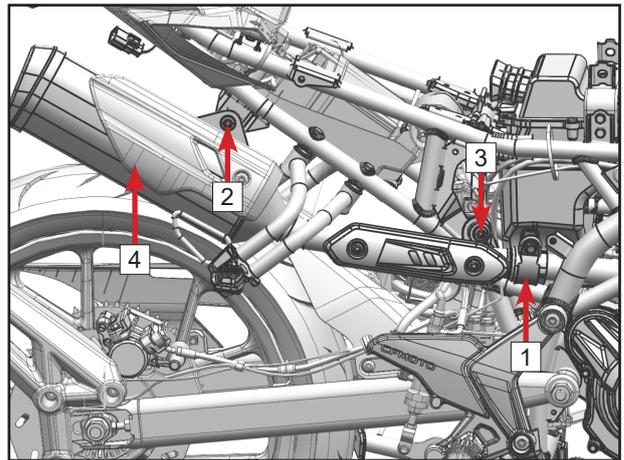
Loosen nut **1**.
Turn the clutch release lever **3** clockwise and separate the clutch cable **2**.
Hang the clutch cable to the side.



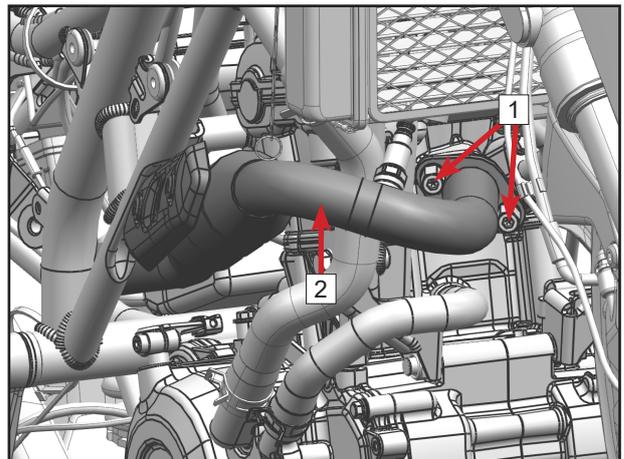
Remove the positive cable fastening nut and hang the positive cable **1** aside.
Remove the negative cable fastening bolt and hang the negative cable **2** aside.



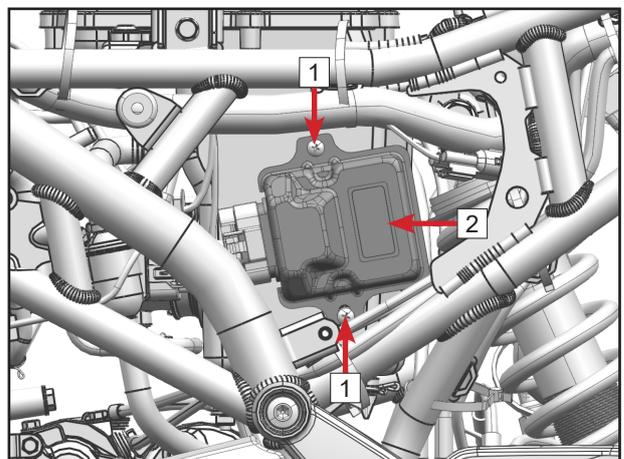
Disconnect the oxygen sensor connector.
Loosen the clamp **1**.
Remove screw **2** and screw **3**.
Remove muffler body assembly **4**.



Remove the exhaust pipe nuts **1**.
Remove the exhaust pipe assembly **2** and
exhaust seal gasket.

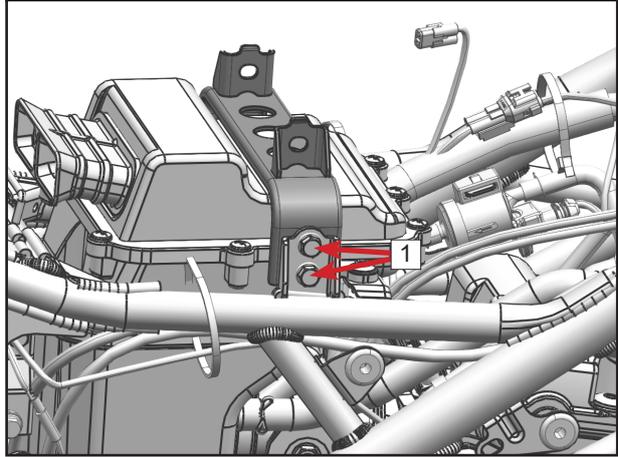
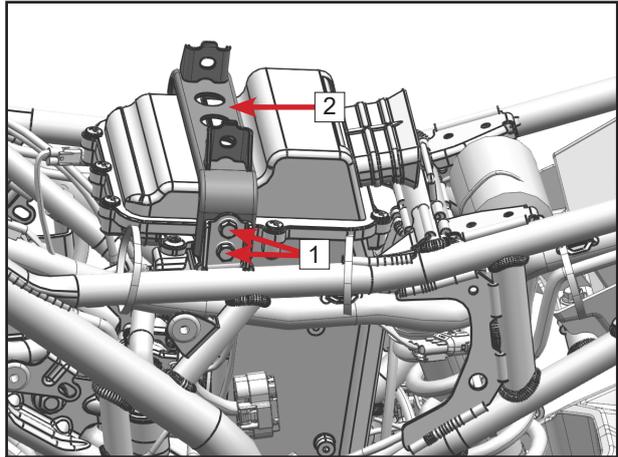


Remove self-tapping screw **1**.
Remove ECU **2**.

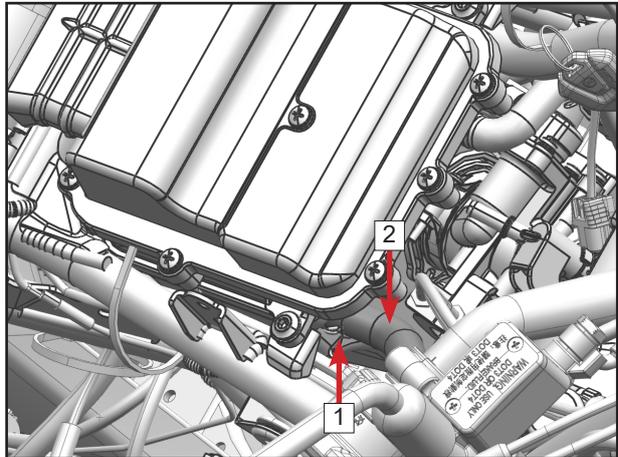


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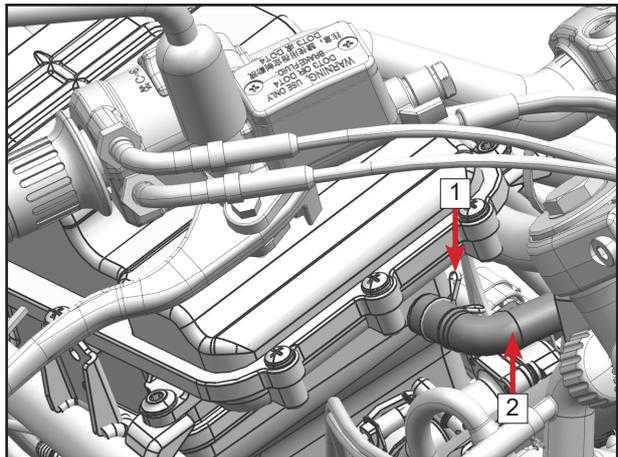
Remove bolts **1**.
Remove fuel tank rear mounting bracket assembly **2**.



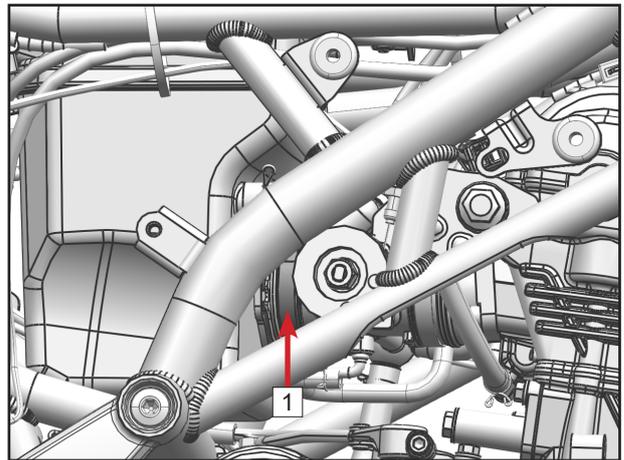
Loosen the clamp **1**, and unplug the air filter outlet pipe of secondary gulp valve **2** from the air filter lower housing.



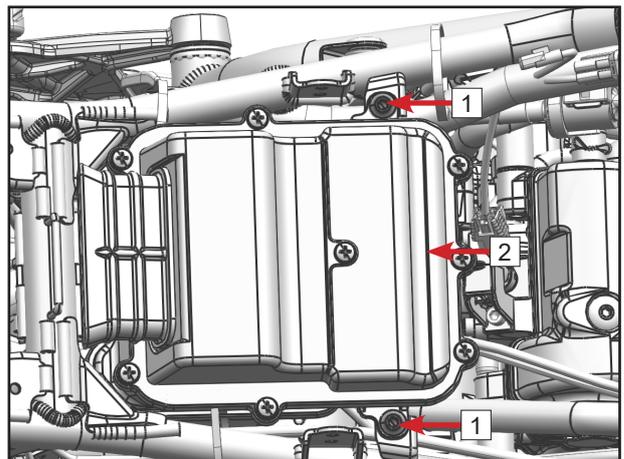
Loosen the clamp **1**, unplug the oil gas separator outlet pipe **2** from the air filter lower housing.



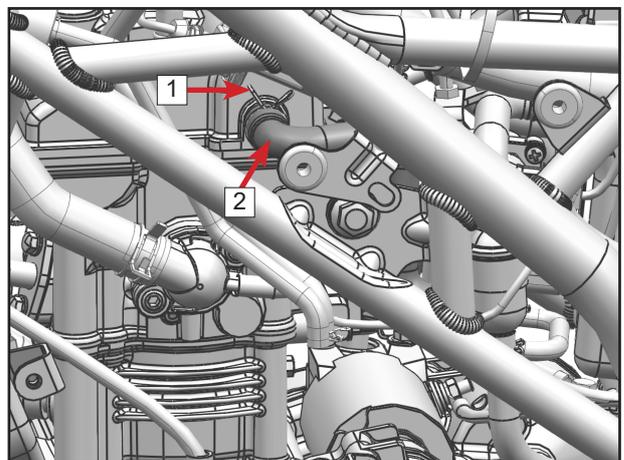
Loosen the clamp **1**.



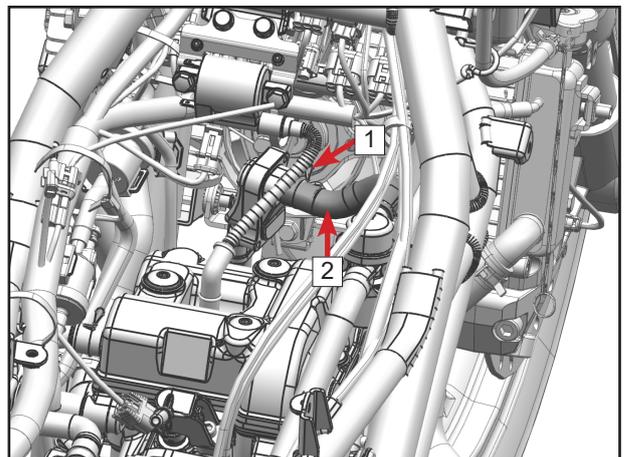
Remove screw **1**.
Remove air filter housing assembly **2**.



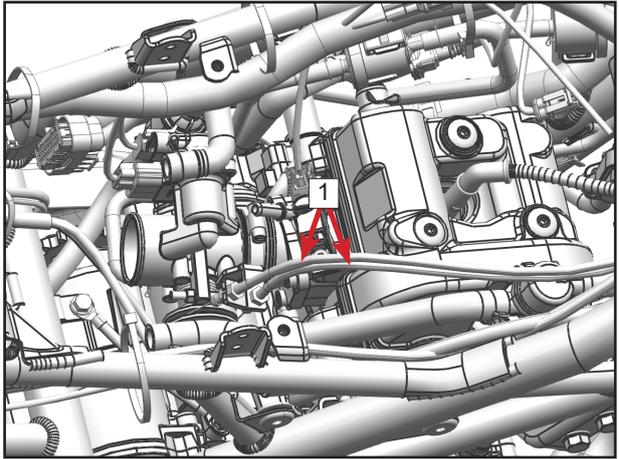
Loosen the clamp **1**, unplug the oil gas separator intake pipe **2** from the engine.



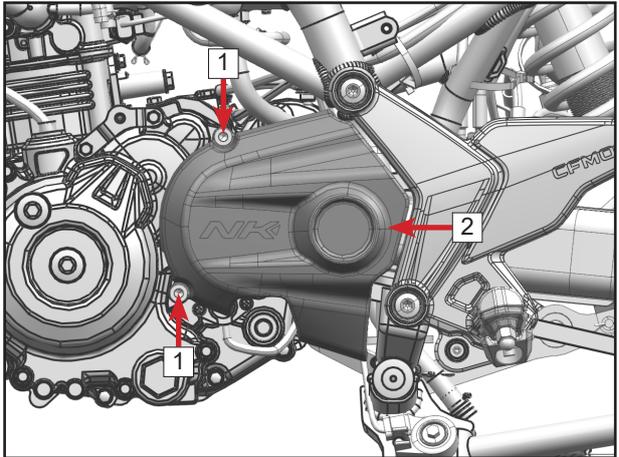
Loosen the clamp **1**, unplug the engine intake pipe of secondary gulp valve **2** from the SAS one-way valve.



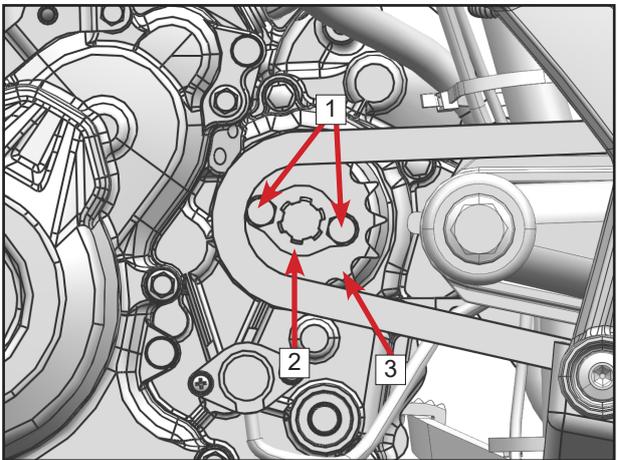
Remove throttle cable **1** from throttle body assembly .



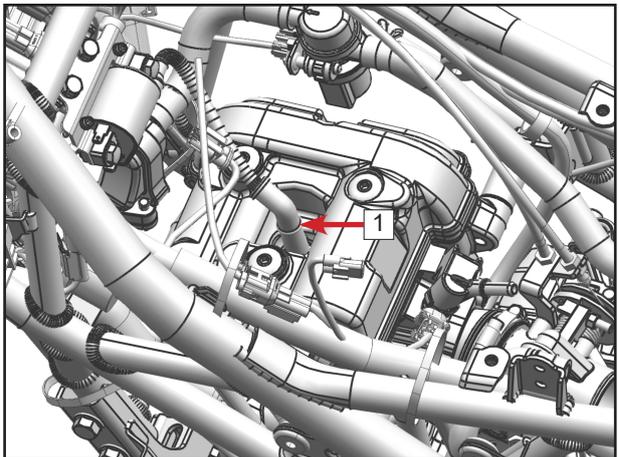
Remove screws **1**.
Remove rear LH cover assembly **2**.



Remove bolts **1**.
Remove sprocket panel **2**.
Remove sprocket **3** (with chain).

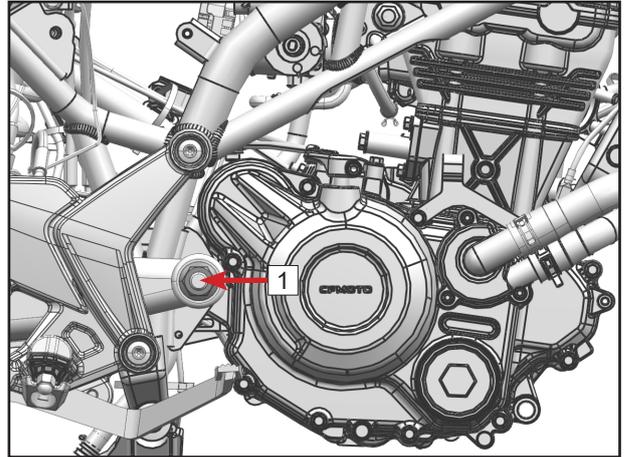


Remove ignition coil **1**.

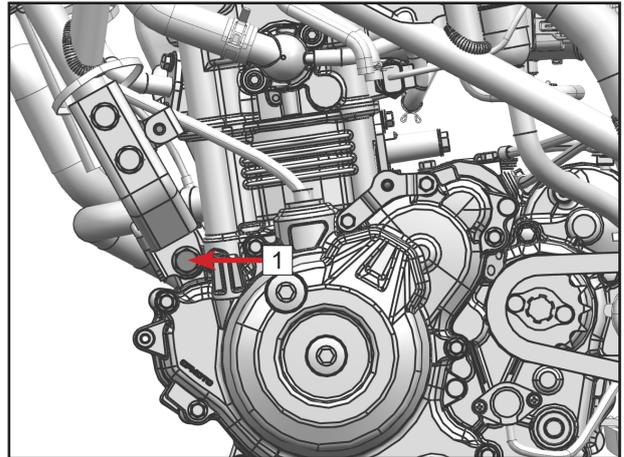


Disconnect the coolant temperature sensor connector.
Disconnect the magneto stator connector.
Disconnect the gear sensor connector.
Disconnect the idle air control valve (IACV) connector.
Disconnect the TPS connector.
Disconnect the injector connector.

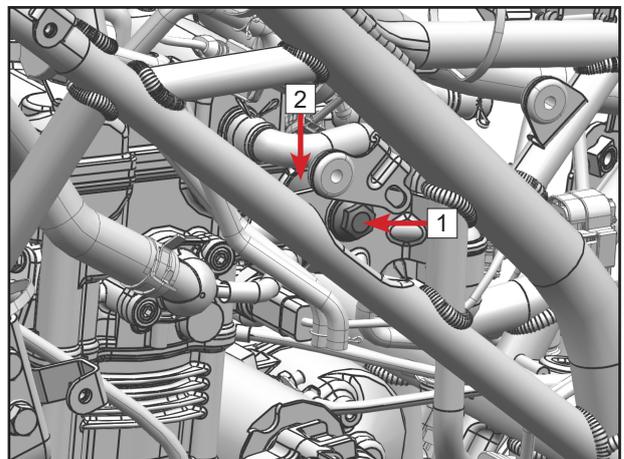
Support the engine.
Remove rear fork shaft/nut **1**.



Remove engine front suspension shaft **1**.



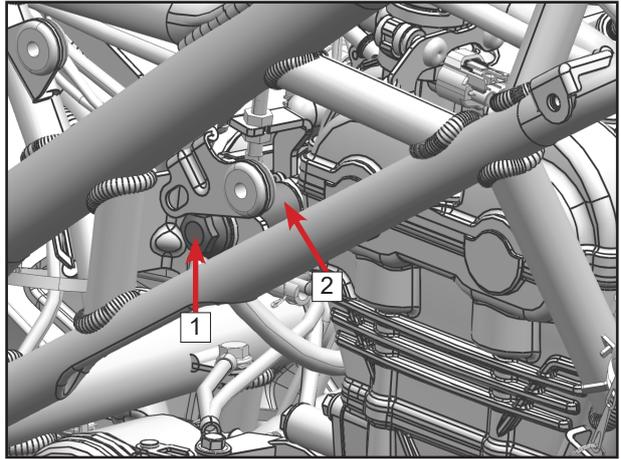
On the left side of vehicle:
Remove engine upper mounting bolt **1**
and engine upper mounting bushing **2**.



On the right side of vehicle:

Remove engine upper mounting bolt [1]
and engine upper mounting bushing [2].

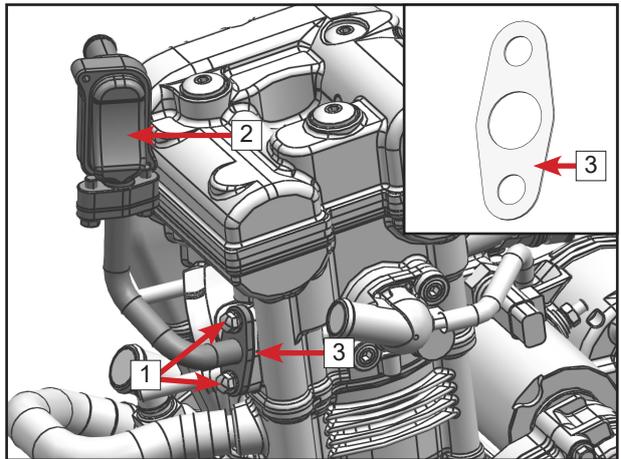
Remove the engine.



SAS One-way Valve Assembly Removal

Remove bolts [1].

Remove SAS one-way valve assembly [2]
and secondary gulp pipe seal gasket [3].



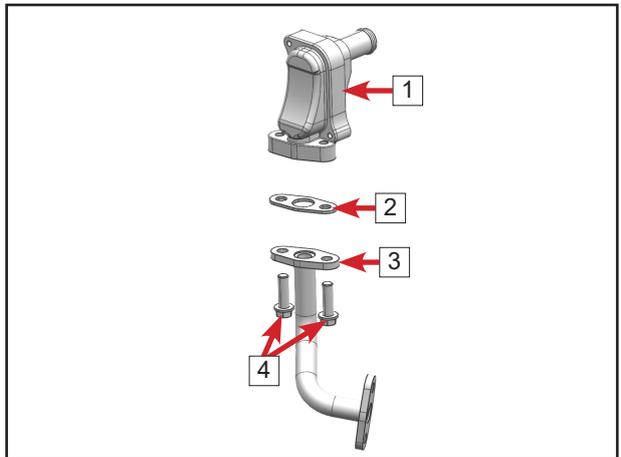
Check the SAS one-way valve assembly for
cracks, flange warping or other damage.
Replace abnormal parts if necessary.

[1]: SAS one-way valve

[2]: one-way valve seal gasket

[3]: secondary gulp metal pipe

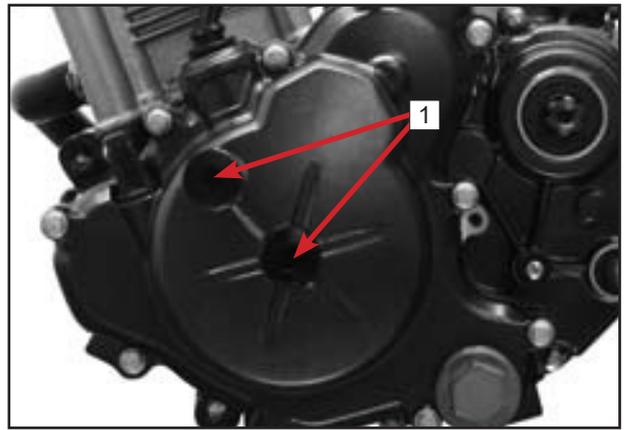
[4]: bolt



5.3 Engine Disassembly

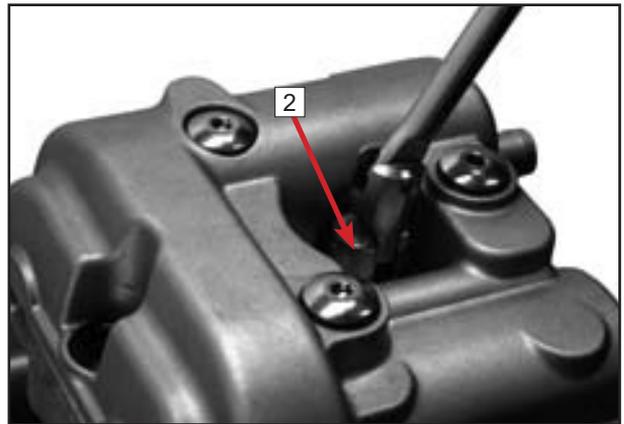
1.Remove:

- The inspection plugs **1** from the flywheel cover.



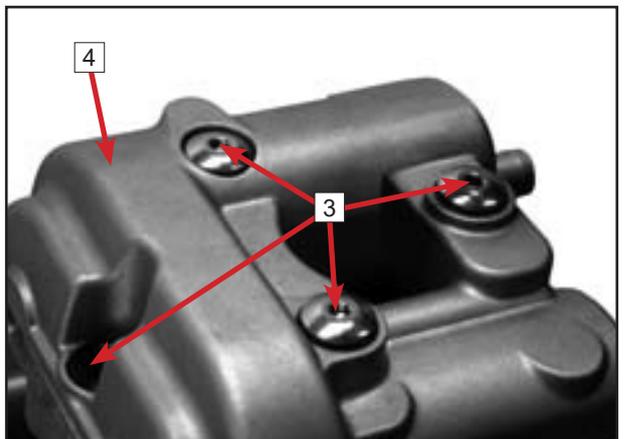
2.Remove:

- The spark plug **2**.



3.Remove:

- The 4 rocker cover bolts **3**.
- The rocker cover **4**.



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4. Position:

- The piston at top dead centre (TDC) on the compression stroke. To do so, turn the crankshaft in an **anticlockwise direction** with an Allen key until the mark [5] is lined up with the mark to be found on the flywheel [6].

⚠ CAUTION: Turn the crankshaft in an anticlockwise direction. Attempting to turn it in the opposite direction may cause serious damage to the engine.

Detail showing the alignment of the mark [5] with that existing on the flywheel [6].

NOTE: Up to engine number 7015, the mark [6] (a circle) does not exist. On these engines (from 0001 to 7015), the mark [6] is a line [7] which has to be aligned with the end of the orifice.

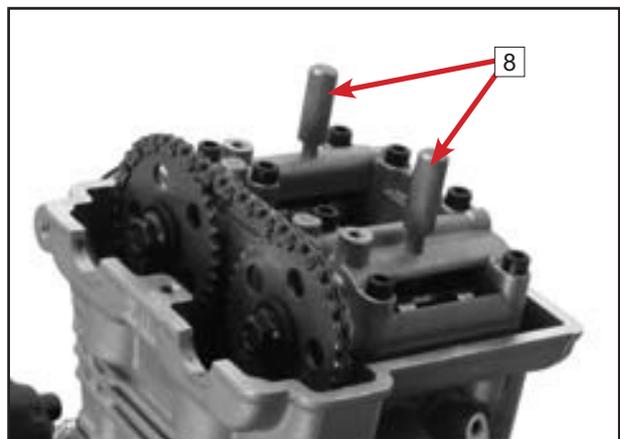
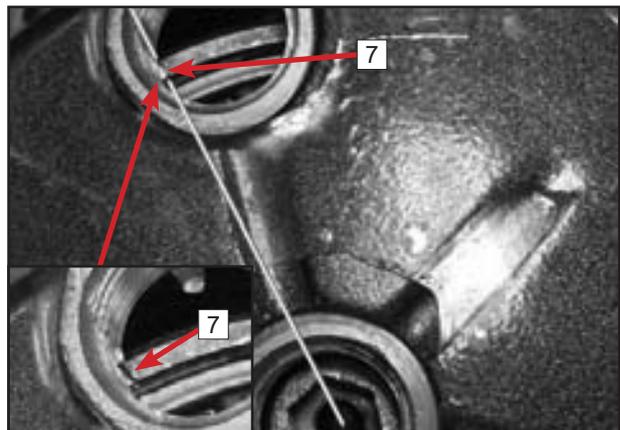
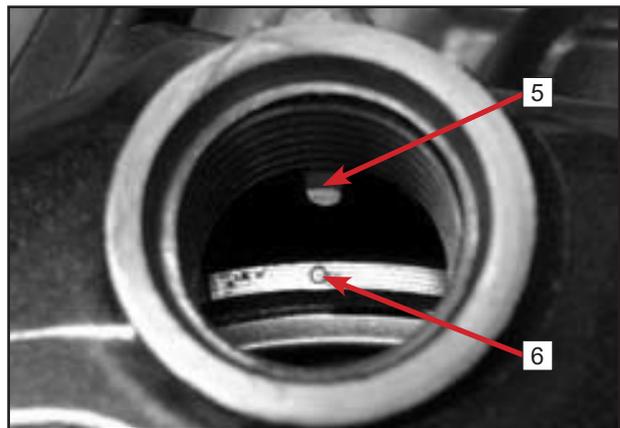
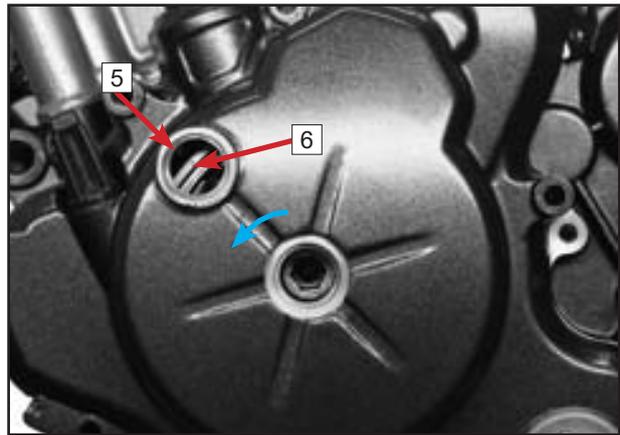
Detail of alignment of the line [7] with the end of the inspection the orifice (from engine NOS. 0001 to 7015).

5. Position:

- The locking pins [8] to ensure the alignment. In this situation, the cams should be positioned outwards.

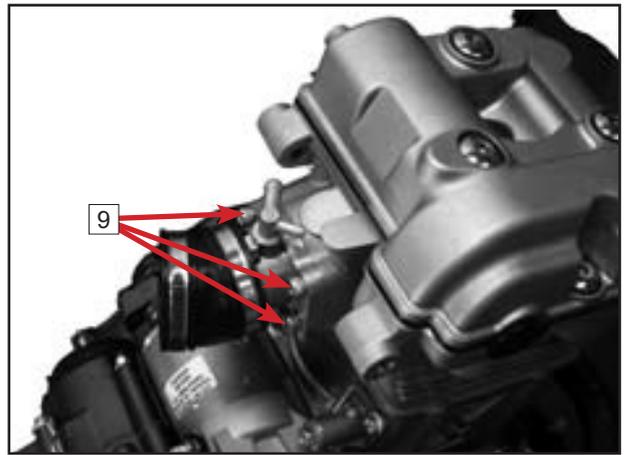
NOTE: At TDC on the compression stroke, the bridge orifices should coincide with the those of the camshafts.

Camshaft Locking Pin
SH-JC7DM409/0379



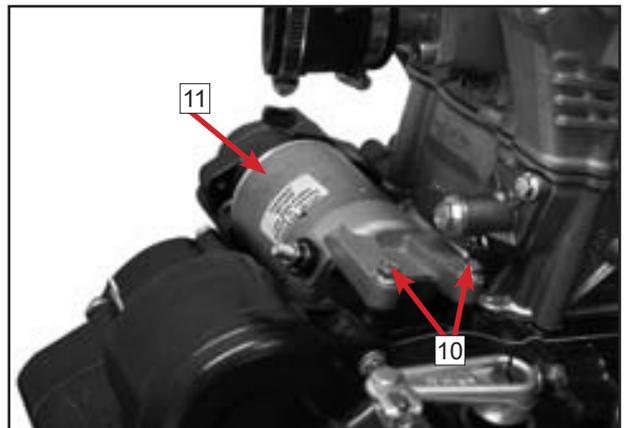
6. Remove:

- The inlet manifold, using the 3 bolts 9.



7. Remove:

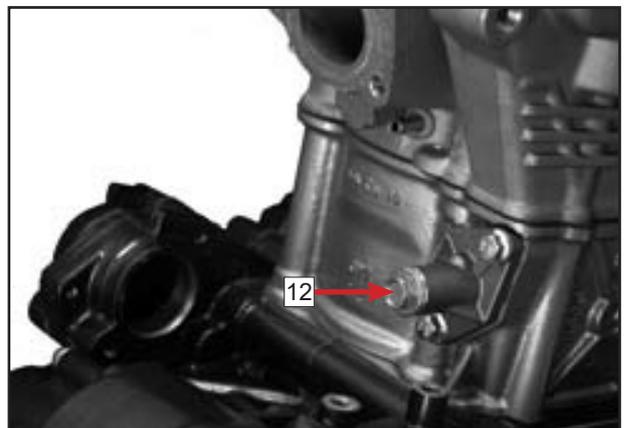
- The starter motor connector.
- The 2 bolts 10 securing the starter motor.
- The starter motor 11.



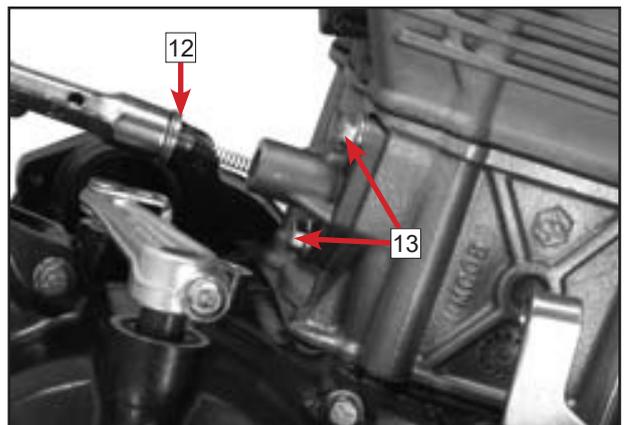
8. Remove:

- First of all the central timing chain tensioner bolt 12.

- The 2 bolts (13) securing the timing chain tensioner.



⚠ CAUTION: On dismantling the timing, always remove the central timing chain bolt first of all. Failure to do so may lead to severe damage to the timing chain.



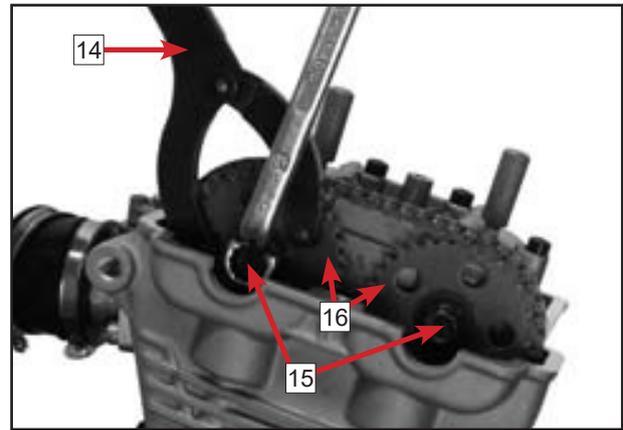
9. Fit:

- The camshaft sprocket locking tool [14](#).

**Camshaft Sprocket Locking Tool
SH-JC865259**

10. Remove:

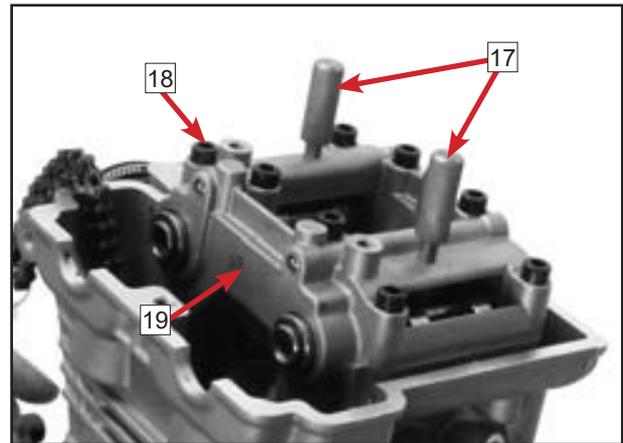
- The 2 bolts [15](#) from the camshaft sprockets.
- The camshaft sprockets [16](#).



NOTE: Tie a piece of wire to the timing chain to prevent it from dropping into the engine.

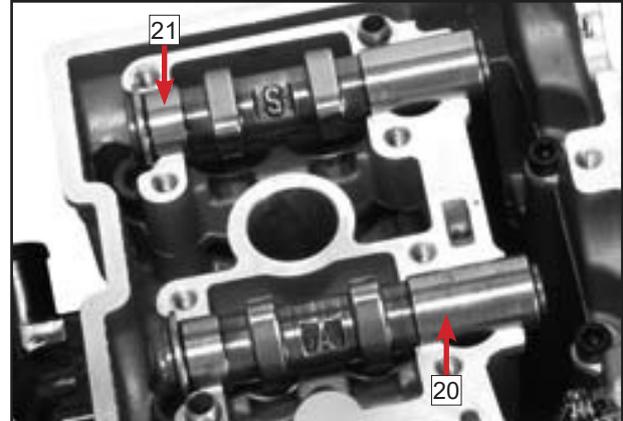
11. Remove:

- The 2 locking pins [17](#).
- The 8 bolts [18](#) from the camshaft bridge (loosen them by following a cross pattern).
- The camshaft bridge [19](#).



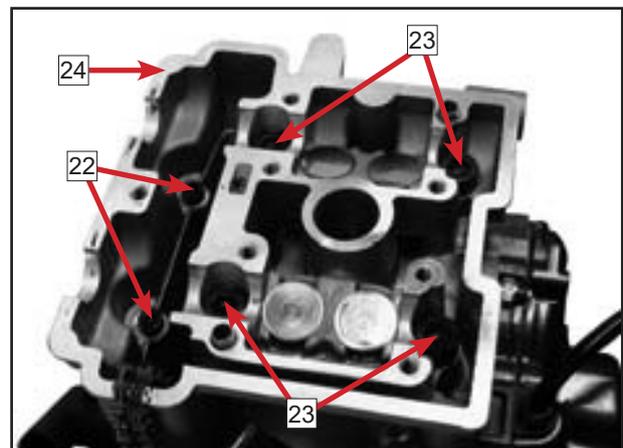
- The inlet camshaft [20](#).
- The exhaust camshaft [21](#).

NOTE: The inlet camshaft bears the inscription "A". The exhaust camshaft bears the inscription "S".



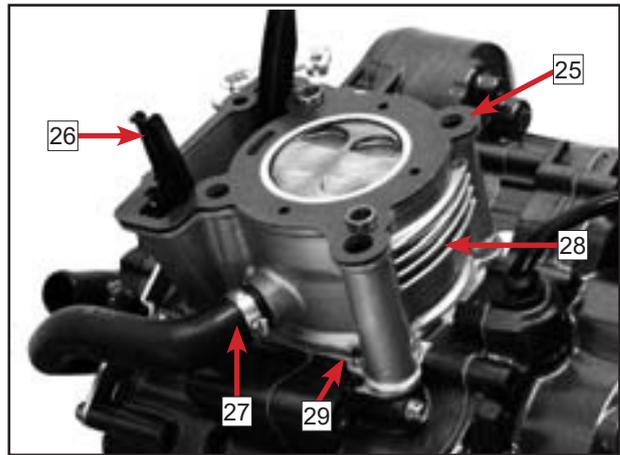
12. Remove:

- The 2 M6 bolts [22](#) securing the cylinder head to the cylinder.
- The 4 M8 bolts [23](#) securing the cylinder head to the cylinder.
- The cylinder head [24](#).



13. Remove:

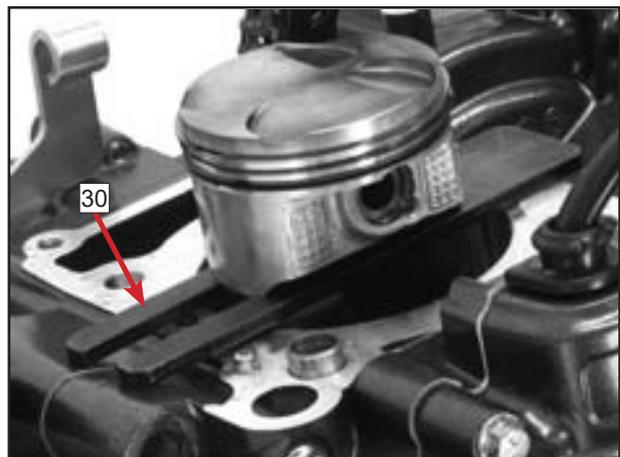
- The cylinder head gasket **25**. (Renew on refitting).
- The mobile timing chain roller **26**.
- The coolant pipe **27**.
- The cylinder **28**.
- The cylinder bottom gasket **29**. (Renew on refitting).



14. Fit:

- The tool for supporting the piston **30**.

**Tool For Supporting The Piston
SH-JC865261**



NOTE: Before removing the circlip from the gudgeon pin, cover the base of the cylinder with a cloth to prevent objects from falling into the engine.

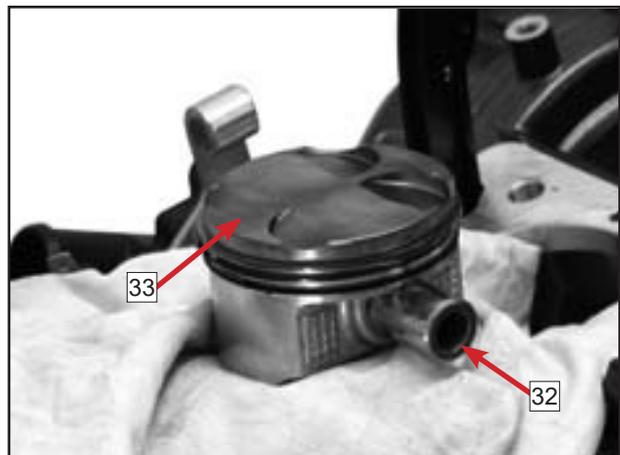
15. Remove:

- The circlip **31** (extracting one is enough) securing the piston gudgeon pin. (Renew on refitting).



16. Remove:

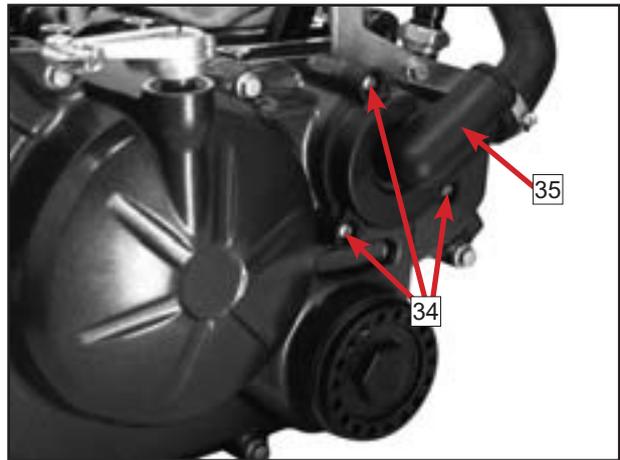
- The gudgeon pin **32** from the piston.
- The piston **33**



17. Remove:

- The 3 bolts **34** from the water pump cover **35**.

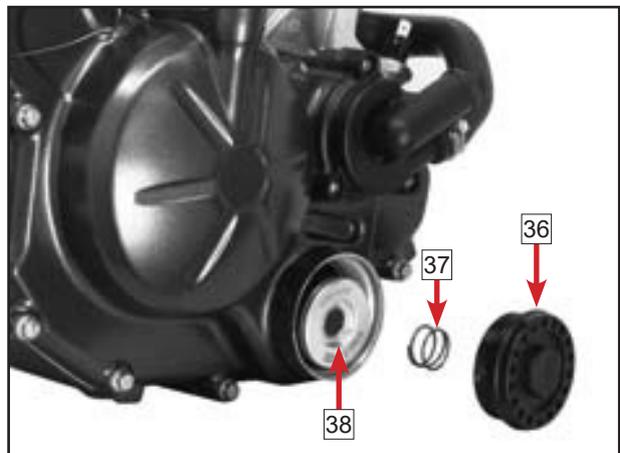
NOTE: There is no need to remove the water pump cover, but it is recommend to do so as this aids in fitting the clutch cover.



NOTE: If the engine oil has not been previously drained, place a recipient under the engine and drain the oil.

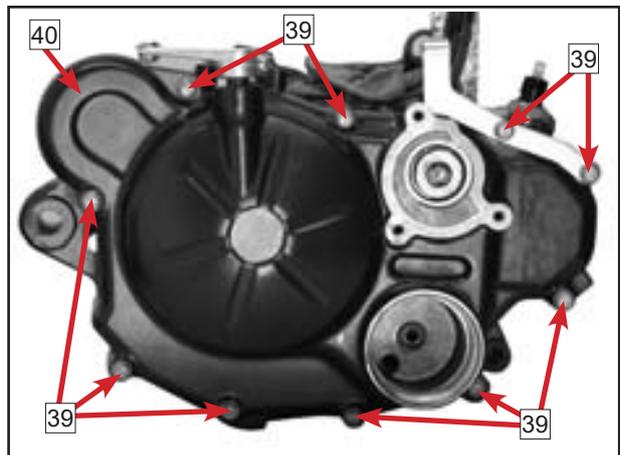
18. Remove:

- El tapón del filtro de aceite **36**.
- El muelle **37**.
- El filtro de aceite **38**.



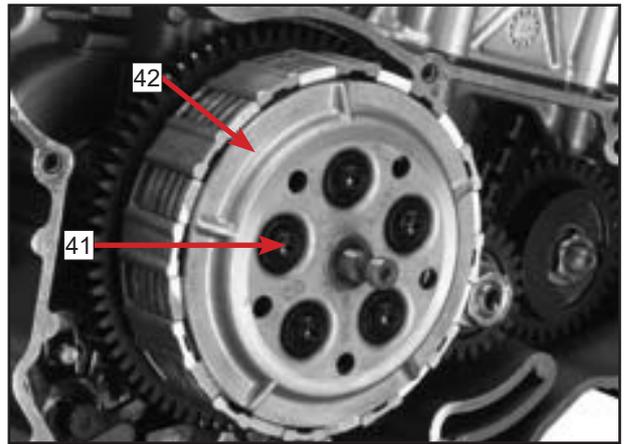
19. Remove:

- The 10 bolts **39** from the clutch cover.
- The clutch cover **40**.
- The clutch cover gasket. (Renew when refitting).



20. Remove:

- The 5 bolts [41](#) with washer and spring from the clutch closing cover.
- The clutch closing cover [42](#).



21. Remove:

- The driving disks [43](#) and driven disks.



22. Abrir:

- The seal tab [44](#).

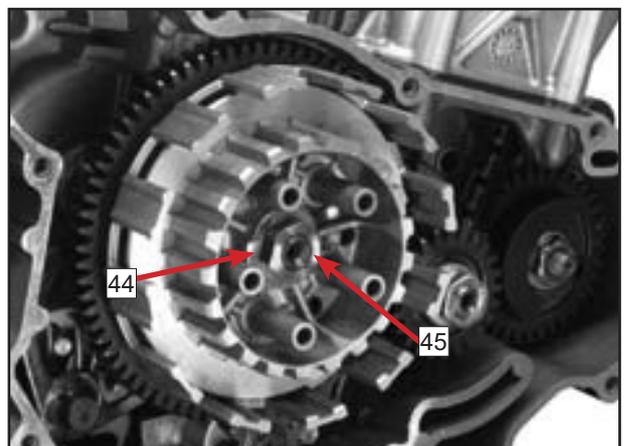
23. Remove:

- The nut [45](#).
- The seal [44](#).

24. Fit:

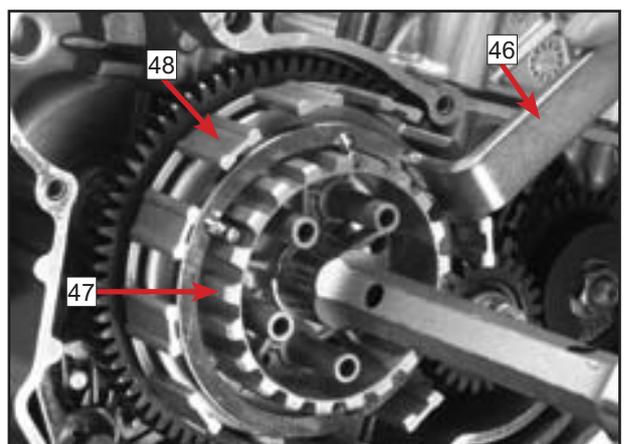
- Use the clutch housing extraction tool [46](#) to remove it.

**Clutch Housing Extraction Tool
SH-JC00H05300041**



25. Remove:

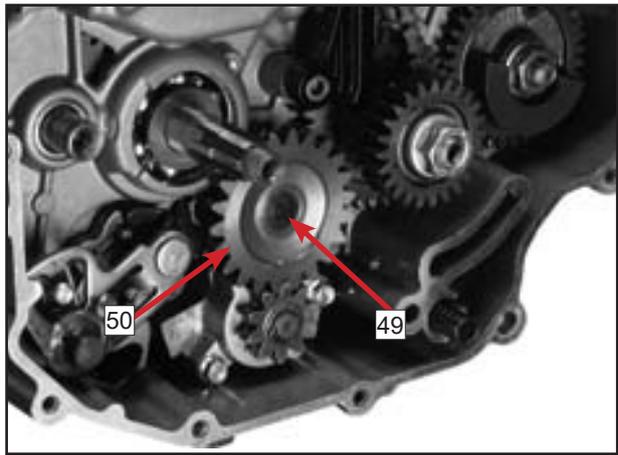
- The clutch box [47](#) (clutch ram).
- The clutch bell housing [48](#).



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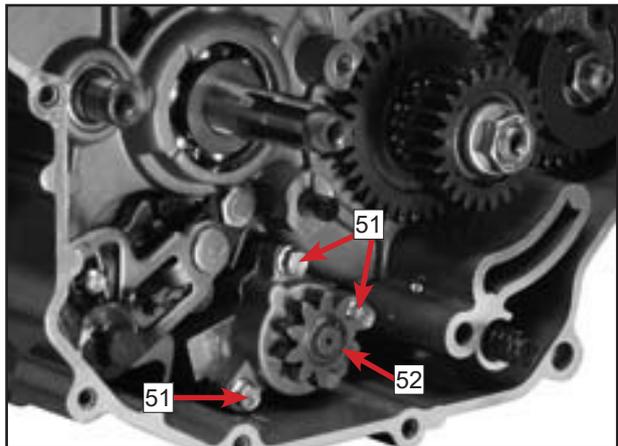
26. Remove:

- The circlip and washer [49] from the pump driving gear [50].
- The pump driving gear [50].



27. Remove:

- The 3 oil pump bolts [51].
- The oil pump [52].



28. Remove:

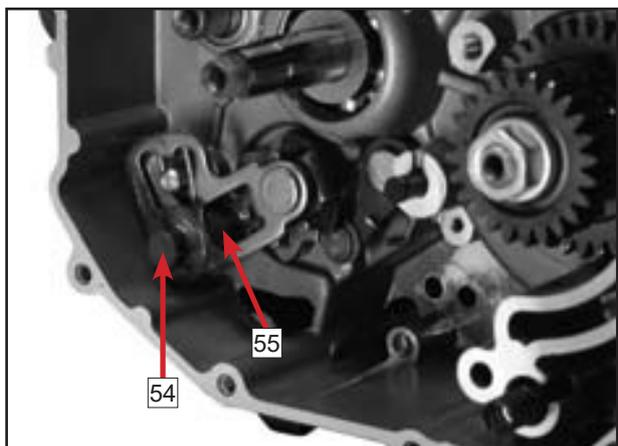
The oil pump gasket [53]. (Renew on refitting).



29. Remove:

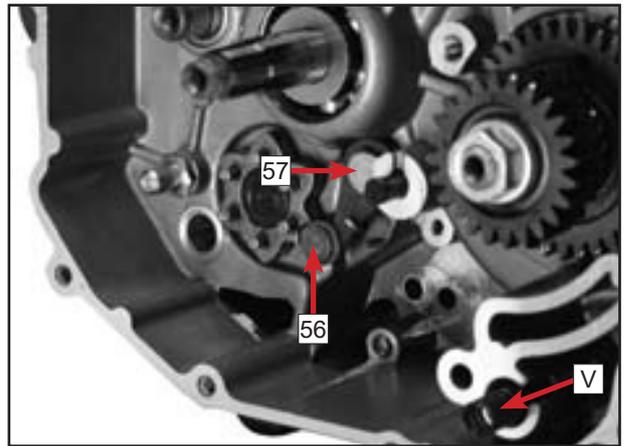
- The gear selector shaft [54] by pulling it out.

NOTE: When refitting the shaft, remember to fit the washer [55].



30. Remove:

- The gear change spring bolt [56].
- The gear lever [57].
- The lubrication circuit by-pass valve [V].



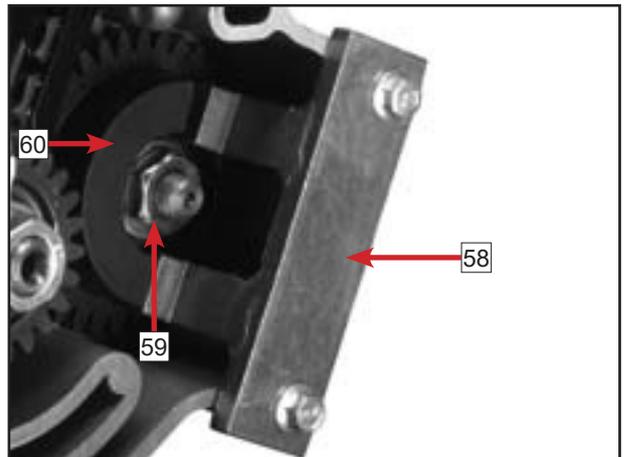
31. Fit:

- The balance shaft locking tool [58].

Balance Shaft Locking Tool
SH-JC864486

32. Remove:

- The nut balance shaft nut [59].
- The balance gear [60].



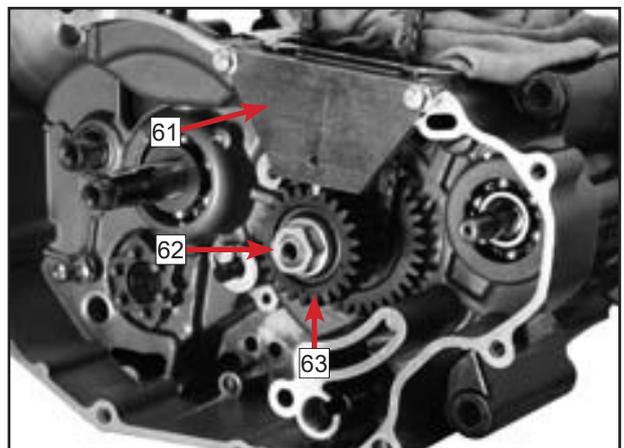
33. Fit:

- Fit the crankshaft sprocket using the locking tool [61].

Crankshaft Sprocket Locking Tool
SH-JC864487

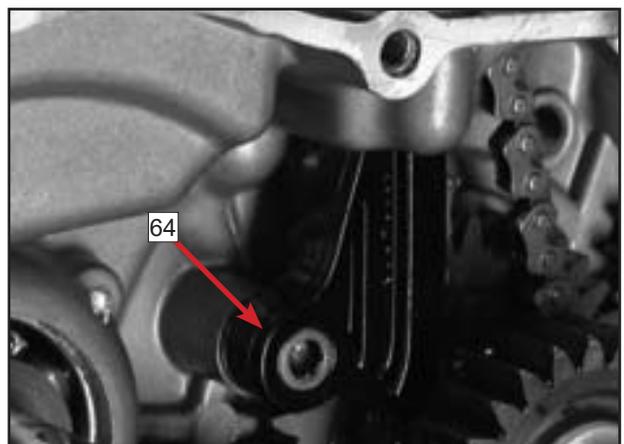
34. Remove:

- The nut [62].
- The fitting tool [61].
- The crankshaft sprocket [63].



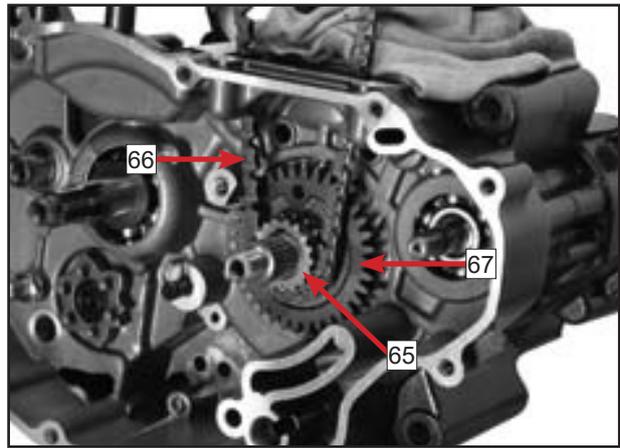
35. Remove:

- The fixed timing chain roller [64].



36. Remove:

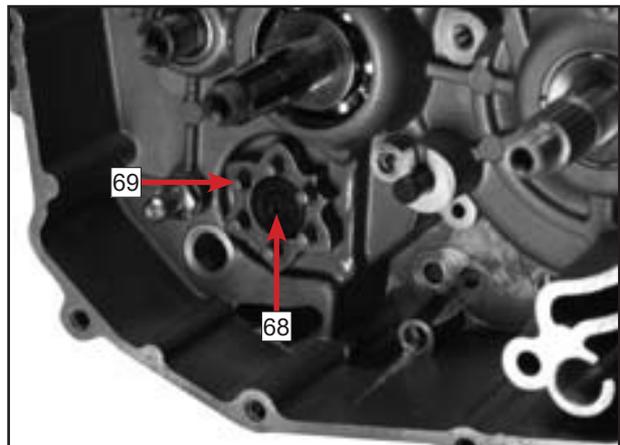
- The timing chain gear **65**.
- The timing chain **66** from the top.
- The intermediate balance shaft gear **67**.



NOTE: Tap the allen key with a nylon mallet to unlock it (bolt **68**).

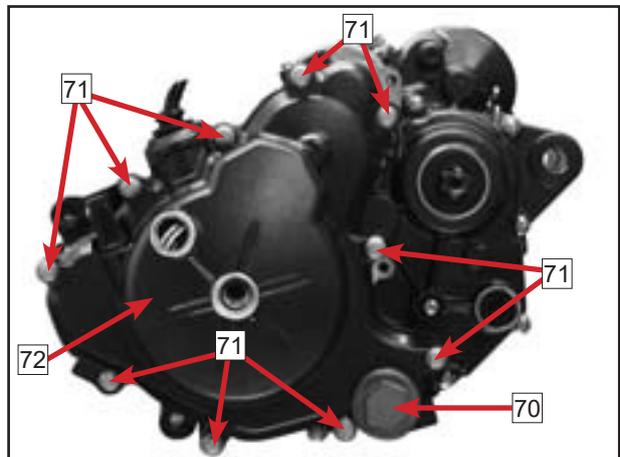
37. Remove:

- The bolt **68** from the gear selector distributor.
- Gear change shaft assembly **69**.



38. Remove:

- The engine oil pre-filter cap **70**.
- The engine oil pre-filter.
- The 10 bolts **71** from the magneto flywheel cover.
- The magneto flywheel cover **72**.
- The cover gasket. (Renew when refitting).



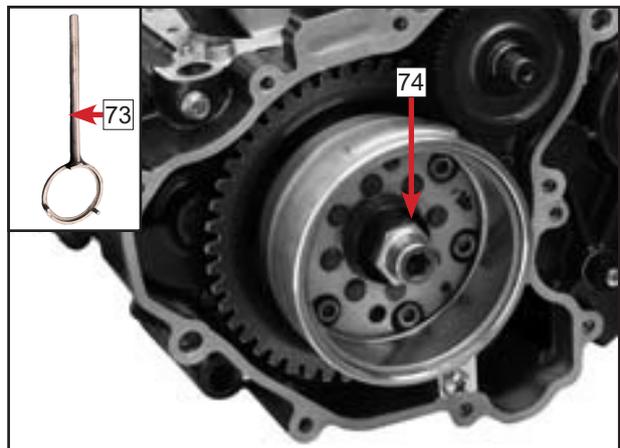
39. Fit:

- The magneto flywheel locking tool **73** to fix the magneto flywheel rotor.

Magneto Flywheel Locking Tool
SH-JCFZ409/0284

40. Remove:

- The nut **74** and the washer from the magneto flywheel.



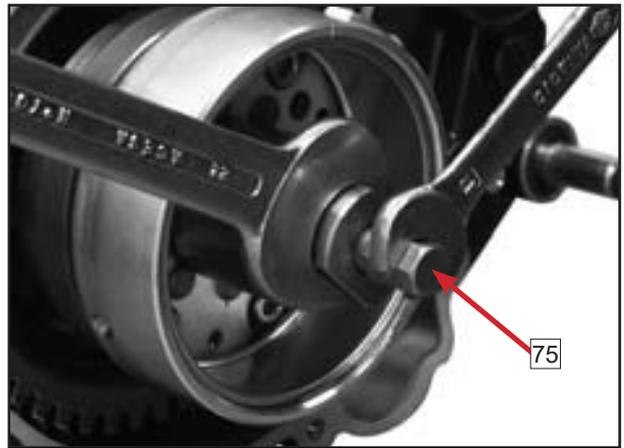
41. Fit:

- The magneto flywheel extractor 75.

**Magneto flywheel extractor tool
SH-JC864868**

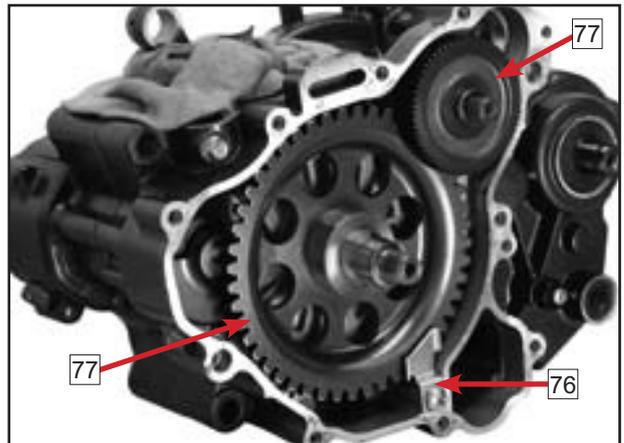
42. Remove:

- The magneto flywheel.
- The magneto flywheel extractor.



43. Remove:

- The starter crown wheel retaining plate 76.
- The 2 starter system sprockets 77.



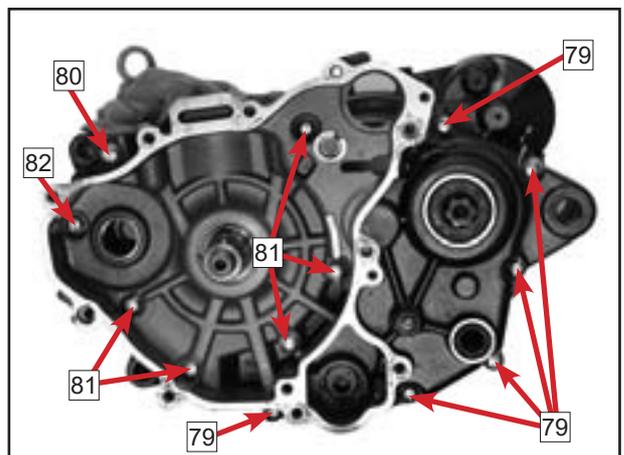
44. Remove:

- The balance shaft 78.



45. Remove:

- The 6 outer bolts 79 on the left-hand crankcase.
- The (longer) outer bolt 80 on the left-hand crankcase.
- The 5 inner bolts 81 on the left-hand crankcase.
- The (shorter) inner bolt 82.

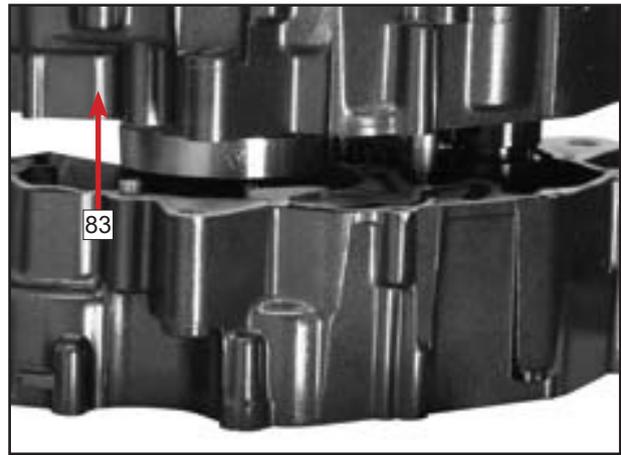


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45. Remove:

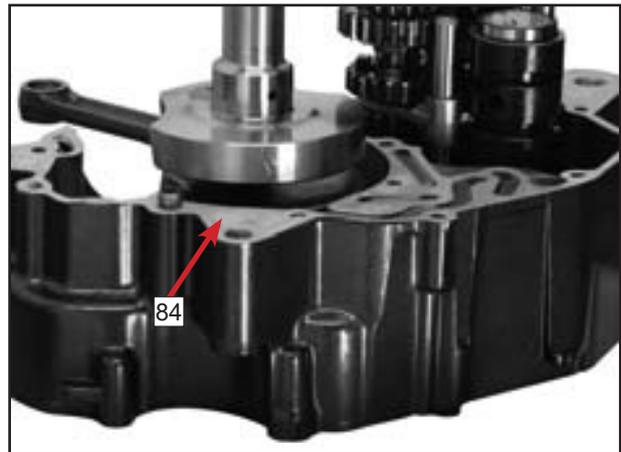
- The left-hand crankcase **83** upwards.

NOTE: To aid the task, set the engine down on a wooden box.



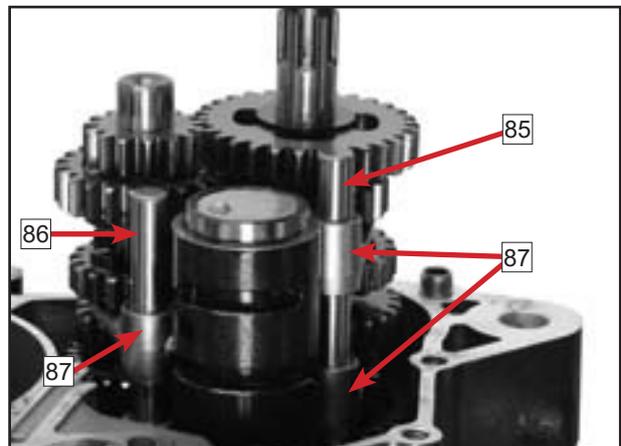
46. Remove:

- The gasket from the crankcases **84**.



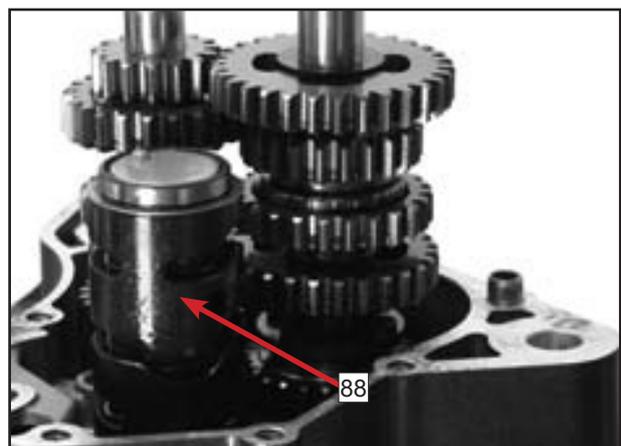
47. Remove:

- The 2 gear selector fork shafts.
 - Long shaft **85**.
 - Short shaft **86**.
- The 3 selector forks **87**.



48. Remove:

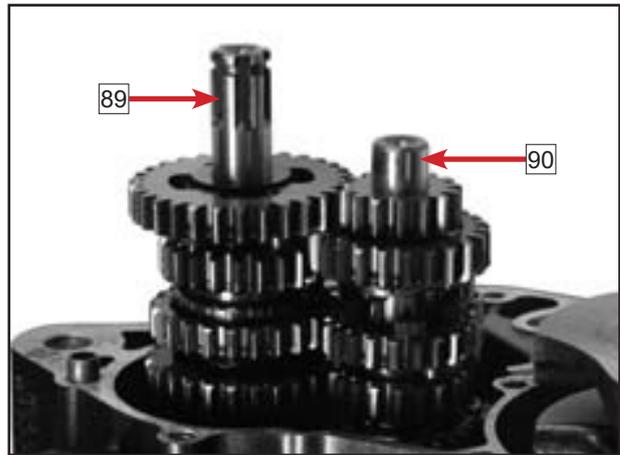
- The selector drum **87** by pulling it upwards.



49. Remove:

- The secondary shaft 89.
- The primary shaft 90.

NOTE: Total length of secondary shaf:
92.15±0.07 mm



5.4 Engine Parts Inspection

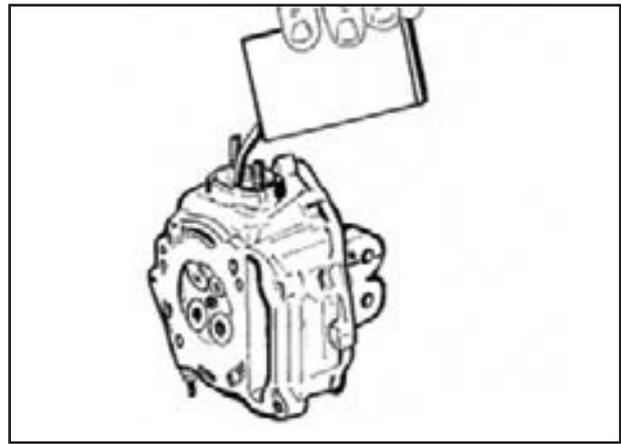
5.4.1 Cylinder Head

Checking For Tight Valve Seating

- Test both the inlet and the exhaust valves.
- The test should be carried out by filling the manifold with petrol and checking that petrol does not ooze excessively past the valves.

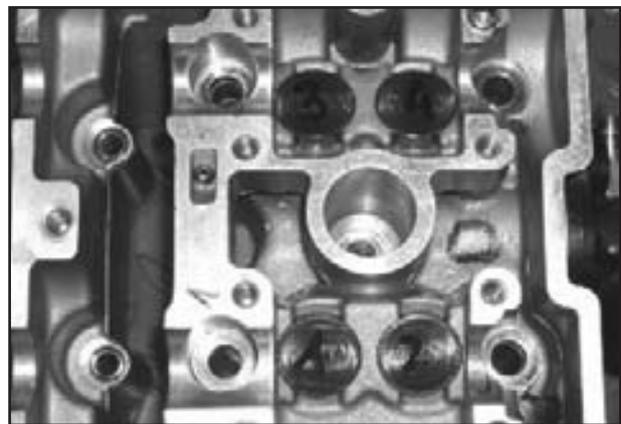
Tight valve seating => Refit cylinder head.

Leaking valve seating => Dismantle and grind the valves.



Steps To Follow To Dismantle The Valves

- Position the cylinder head on a supporting surface.
- Number the valves and the shims to ensure they are refitted in the correct positions.



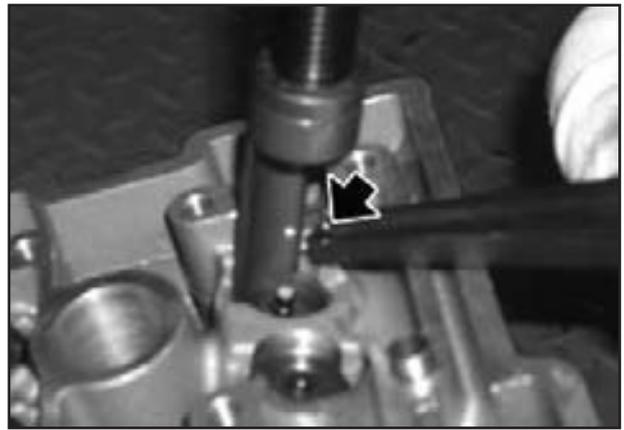
- Extract the shims from the valves.



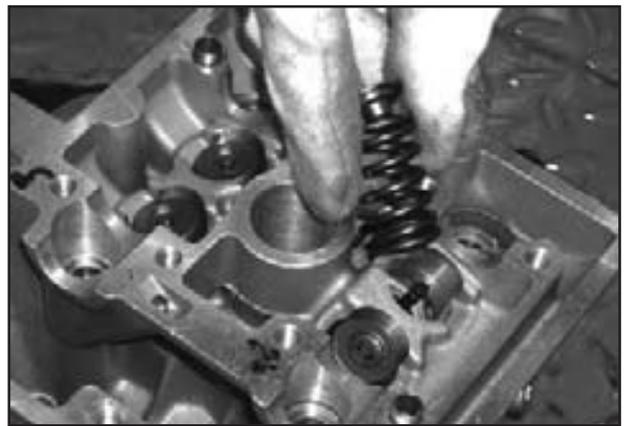
- Use a suitable tool to compress the valve springs.



- From each of the valves:
 - Extract the 2 semi-cones.
 - Release the springs.



- Remove the plates and the springs.



- Extract the valves.

NOTE: Make a note of the position of the valves for their subsequent refitting.



- Extract the valve guide oil seals with the aid of pliers.

NOTE: To refit the valves, carry out the process in reverse order.

⚠ CAUTION: Fit new valve guide retainers when refitting.



CFMOTO

Valve Grinding

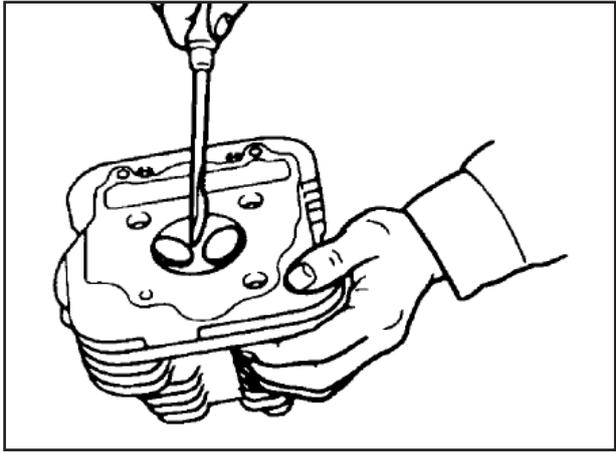
1. Eliminate:

- Carbon sediments (of the surface of the valve seat).

2. Inspeccione:

- Valve seats.

Grooves/wear => Grind the valve.



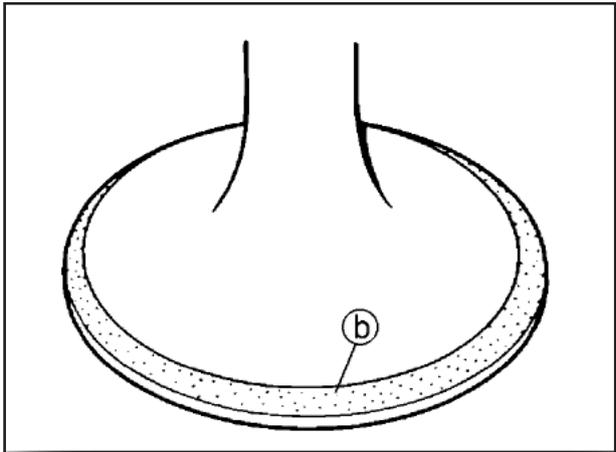
- Apply blue mechanical dye (Prussian blue) to the valve face.

- Fit the valve into the cylinder head.

- Press the valve against the guide and against the seat to make a visible mark.

- Measure the width of the valve seat. Where there is contact between the seat and the valve face, the dye will indicate this.

- If the valve seat width is large or small, or if the seat is not centred, it has to be redone

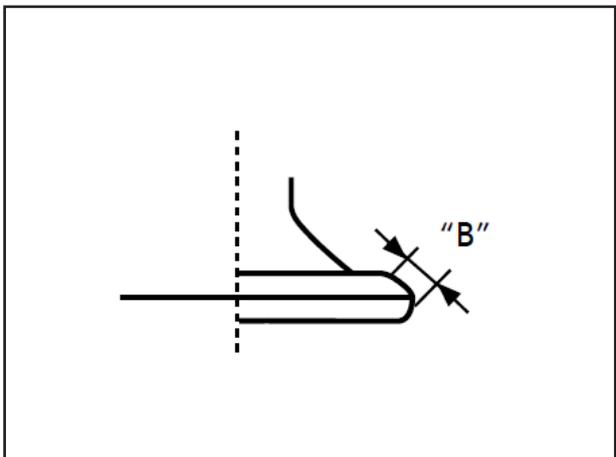


Width of Valve Seats (B)

Inlet: 2.33~2.63mm

Exhaust: 2.82~3.12mm

Outside that specified => Grind the valve.



3. Grind:

- Valve face.

- Valve seat (Cylinder head).

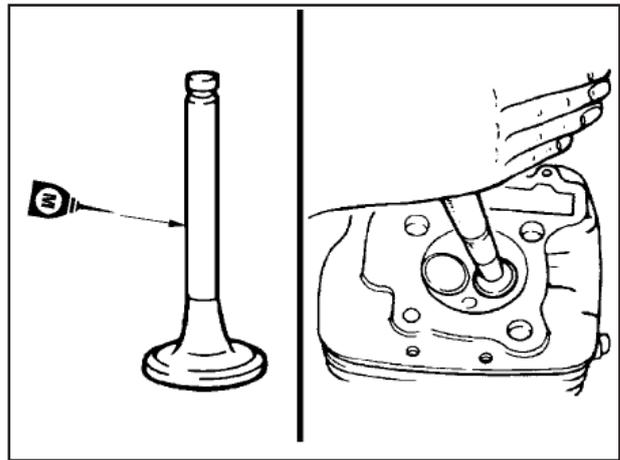
NOTE: After rectifying the valve seat or replacing the valve and its guide, the seat and face must be ground.

Steps for seating valves:

- Apply a fine abrasive paste (grinding paste) to the valve seat.

⚠ CAUTION: Do not allow the paste to penetrate in the space between the valve stem and the valve guide.

- Apply acid with molybdenum disulphate to the valve stem.
- Fit the valve into the cylinder head.
- Rotate the valve until its face and its seat are uniformly ground, then remove all the paste immediately.



NOTE: To obtain the best results from grinding the valves, rotate the valve gently in the valve seat while rotating it backwards and forwards with the hands.

- Apply a coarse abrasive paste to the valve face and repeat the above steps.

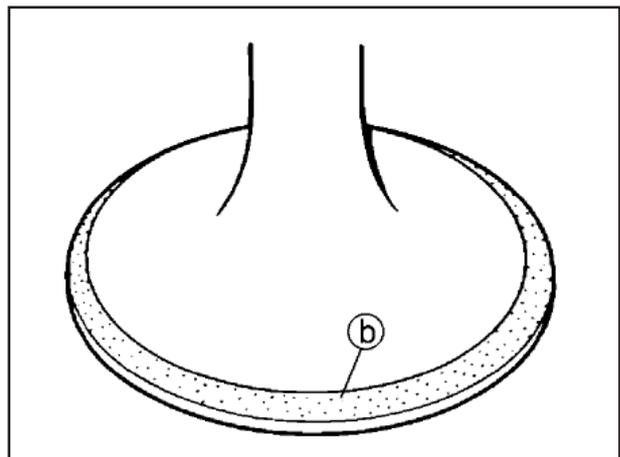
NOTE: Ensure that the abrasive paste is completely cleaned from the valve face and seat after each valve grinding operation.

- Re-apply blue mechanical dye (Prussian blue) to the valve seat (b).
- Fit the valve into the cylinder head.
- Press the valve through the valve guide and against its seat to obtain a good contact.
- Measure the width of the valve seating (c) once again.

Grinding correct => Refit valves.

Check tightness of valve seating.

Tight valve seating => Refit cylinder head.



⚠ CAUTION: If the valves have been ground, when the cylinder head is refitted onto the engine, adjust the valve seatings.

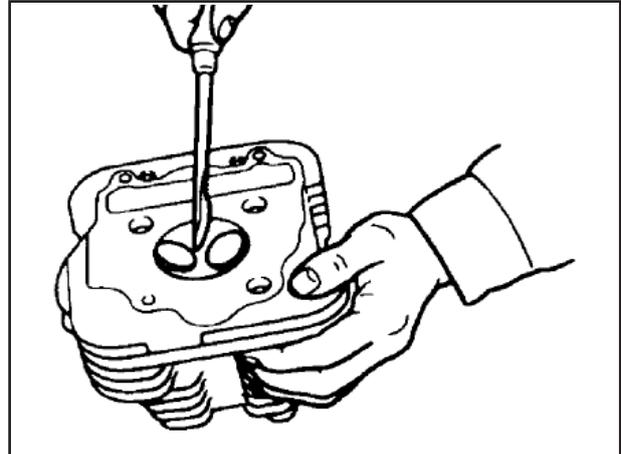
CULATA

1. Eliminate:

- Carbon sediments (from the combustion chamber) Use a rounded spatula.

NOTE: Avoid using any sharp edged instrument that can cause damage and scratching.

- IN THE SPARK PLUG THREADS
- ON THE VALVE SEATS



2. Inspect:

- Cylinder head
Wear/damage => **Renew.**

Steps for measuring distortion and for rectification:

Place a ruler **1** and a thickness calliper **2** on the head cylinder surface, as in the figure to the side.

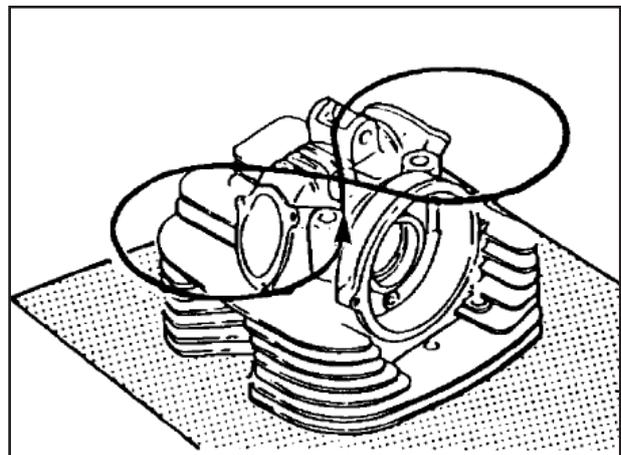
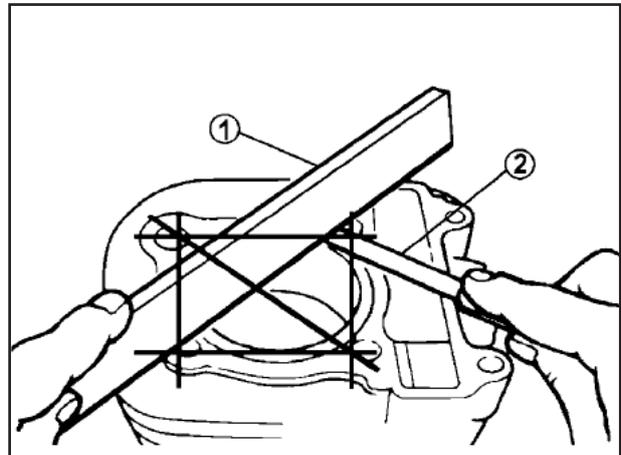
Cylinder Head Warp: 0.05 mm.

Incorrect warp => **Rectificate.**

- Lay a 400 – 600 file on a flat (and skimmed) surface and skim the cylinder head surface by filing with a figure eight movement.

NOTE: Turn the cylinder head several times to prevent too much material being taken from a single side.

⚠ CAUTION: Skimming and planing a cylinder head requires expert hands. If you do not consider yourself an expert, it is recommended to leave the task to a head - skimming workshop.



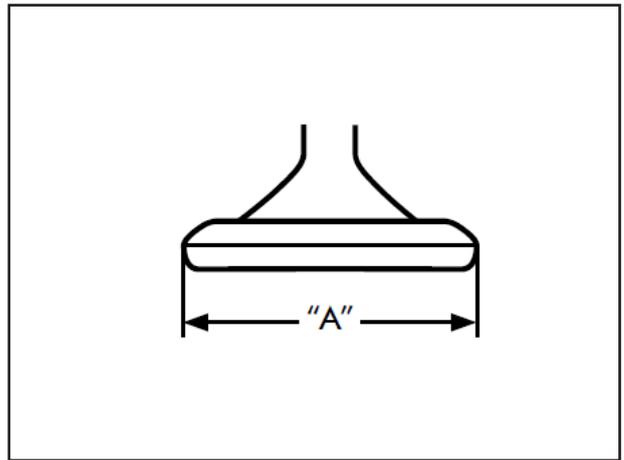
5.4.2 Valves, Valve Guides and Valve Springs

Standard values

Valve Diameters (A)

Inlet: 21.90 ~ 22.05 mm

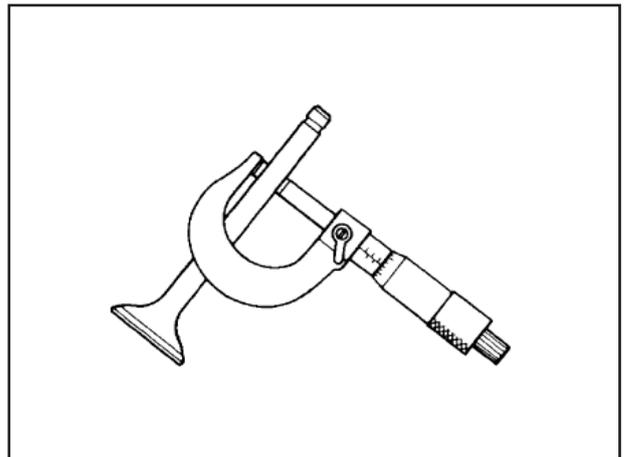
Exhaust : 18.70 ~ 18.85 mm



Valve Stem Diameter

Inlet: 3.97 ~ 3.98 mm

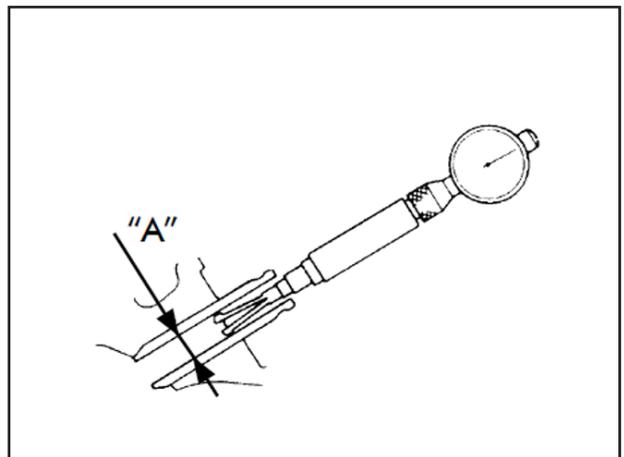
Exhaust : 3.96 ~ 3.97 mm



Valve Guide Internal Diameter (A)

Inlet: 4 ~ 4.012 mm

Exhaust : 4 ~ 4.012 mm



Valve Guide-Stem Service Limit Clearance

Inlet: 0.02 ~ 0.042 mm

Exhaust : 0.03 ~ 0.052 mm

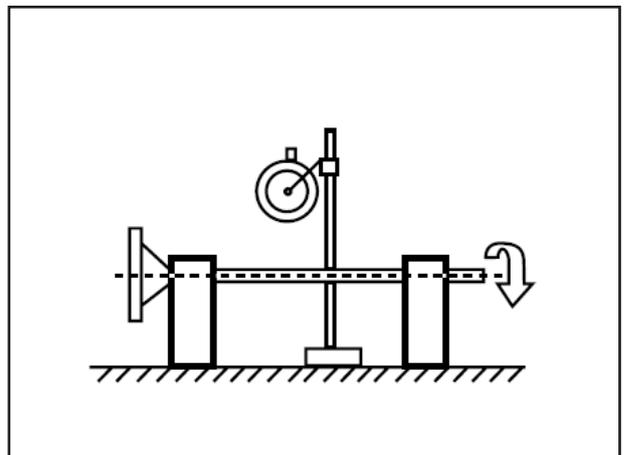
Outside that specified => **Renew.**

Valve Warp

Inlet: 0.01 mm

Exhaust : 0.01 mm

Outside that specified => **Renew.**



VALVE SPRINGS (a)

Inlet, free length: 33,24 mm

Exhaust, free length: 33,24 mm

Inlet, working length (valve closed):
26 mm

Exhaust, working length (valve closed):
26 mm

Inlet, work load:

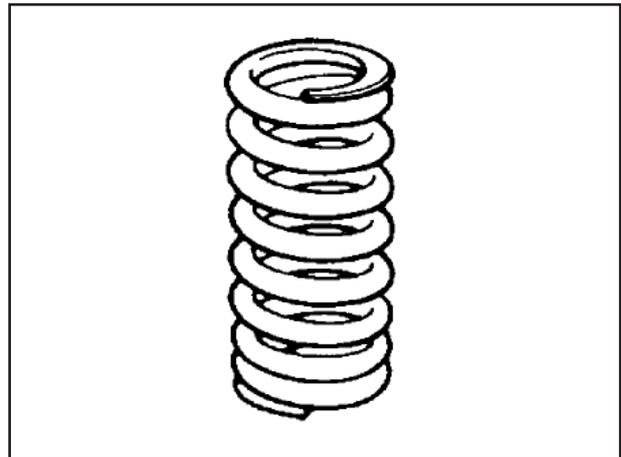
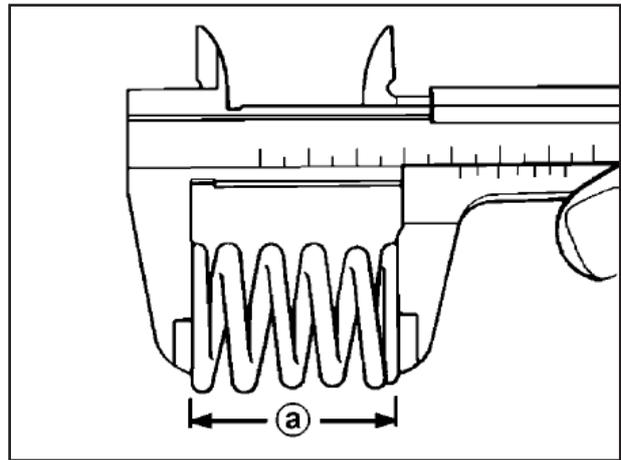
101.87~116.13 N (10.19~11.61 Kgf)

Exhaust, work load:

101.87~116.13 N (10.19~11.61 Kgf)

- Spring contact face.

Wear/damage/scratches => **Renew.**



5.4.3 Camshaft

1. Check:

- Geometry of the cams (standard values).

CAM SIZE

Inlet "A": 31.44~31.54 mm

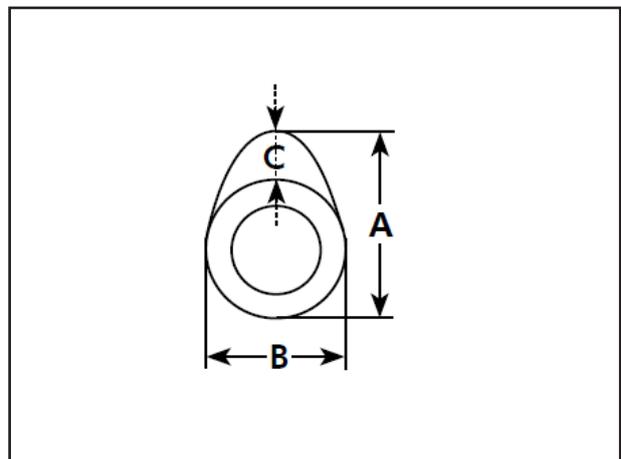
Inlet "B": 23.95~24.05 mm

Inlet (lifted) "C": 7.49 mm

Exhaust "A": 30.81~30.91 mm

Exhaust "B": 23.95~24.05 mm

Exhaust (lifted) "C": 6.86 mm



Grooves/scratches/blue colouring =>
Renew.

2. Inspect:

Maximum Camshaft Warp

Inlet: 0.008 mm

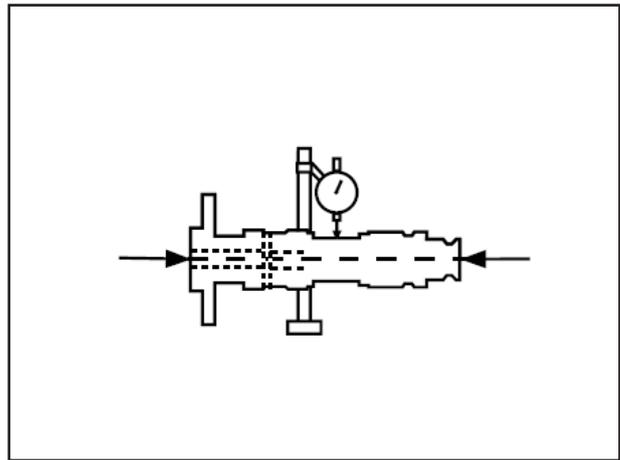
Exhaust: 0.008 mm

Maximum Camshaft Axial Play

Inlet: 0.4 mm

Exhaust: 0.4 mm

Outside that specified => **Renew.**



5.4.4 Timing Chain, Sprockets and Rollers

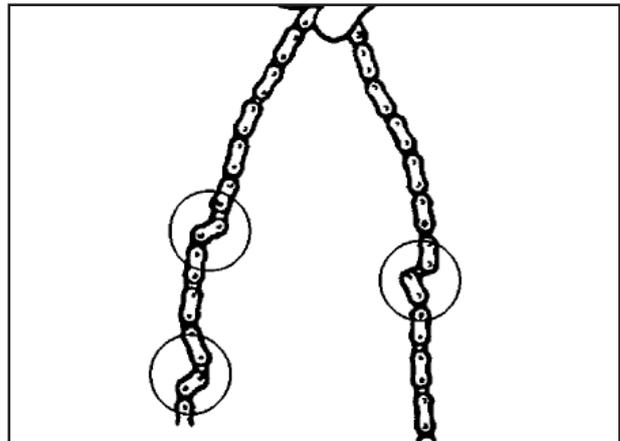
Check the condition of the chain, control sprockets and rollers.

NOTE: The condition of the timing chain tensioner can help to indicate whether the chain is out of service.

1. Inspect:

- Timing chain.

Stiff/damaged => Renew chain.



2. Inspect:

- Control sprockets.

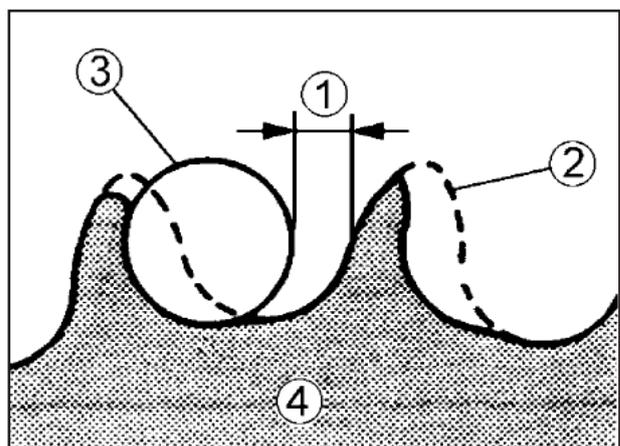
Damage/wear => Replace the sprockets and the timing chain.

(1) 1/4 of the tooth

(2) Correct

(3) Roller

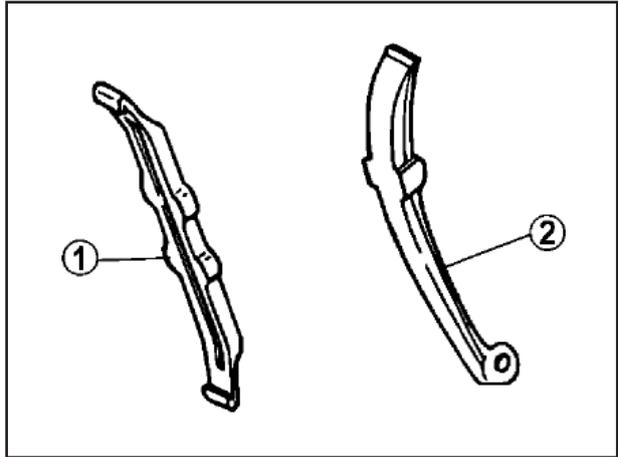
(4) Sprocket



3. Inspect:

- Timing chain rollers (exhaust) (1).
- Timing chain rollers (inlet) (2).

Damage/wear => **Renew.**

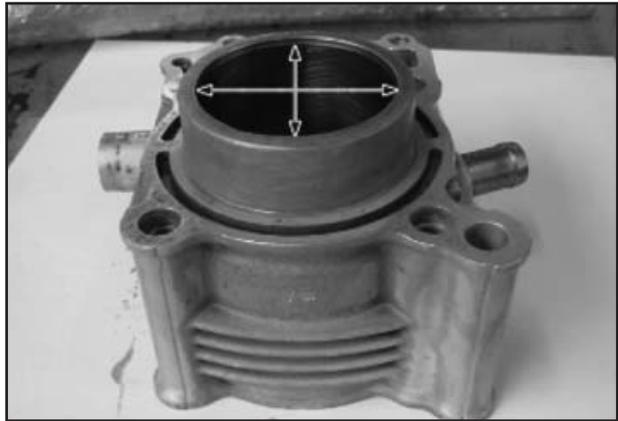


5.4.5 Cylinder and Piston

DIÁMETRO CILINDRO (standard values)

- CAT M: 58.010~58.017 mm
- CAT N: 58.017~58.024 mm
- CAT O: 58.024~58.031 mm
- CAT P: 58.031~58.038 mm

Cylinder Base Warp: 0.05 mm
Incorrect warp => **Renew.**

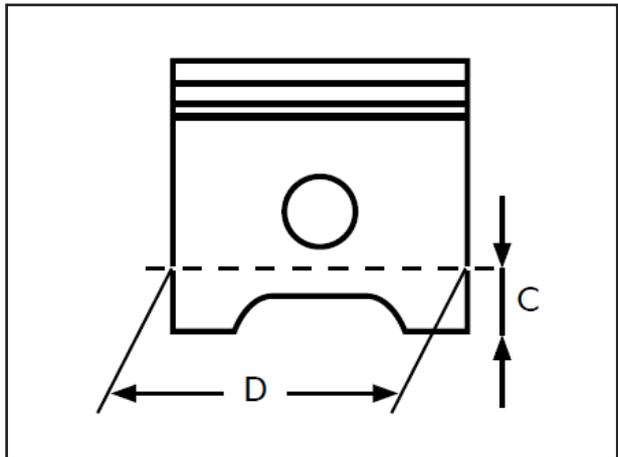


Piston Diameter (D)

- CAT M: 57.968~57.975 mm
- CAT N: 57.975~57.982 mm
- CAT O: 57.982~57.989 mm
- CAT P: 57.989~57.996 mm

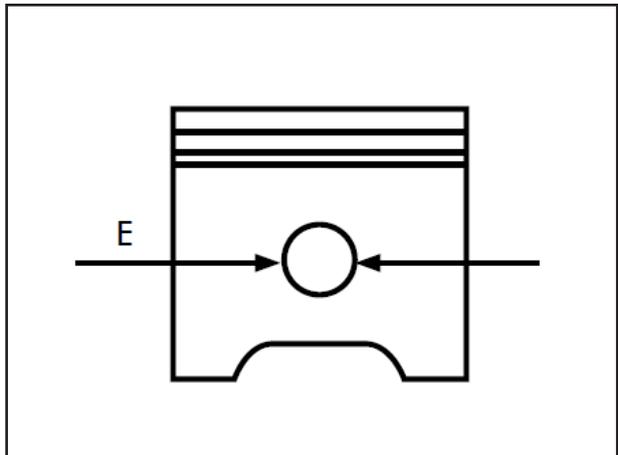
EXT. Diameter Measurement Point Piston (C):

7.5mm

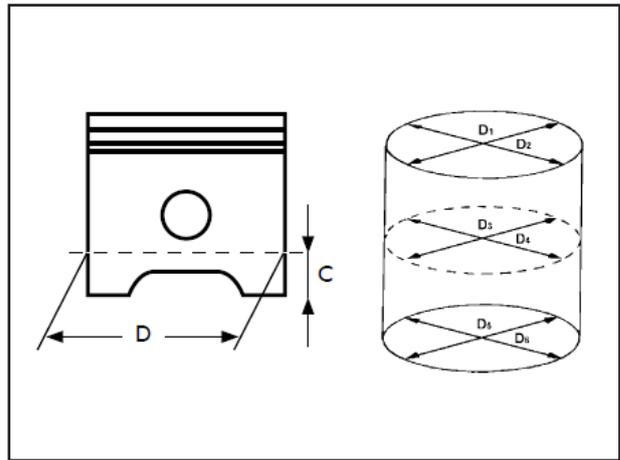


Diameter of Piston Gudgeon Pin Orifice (E):

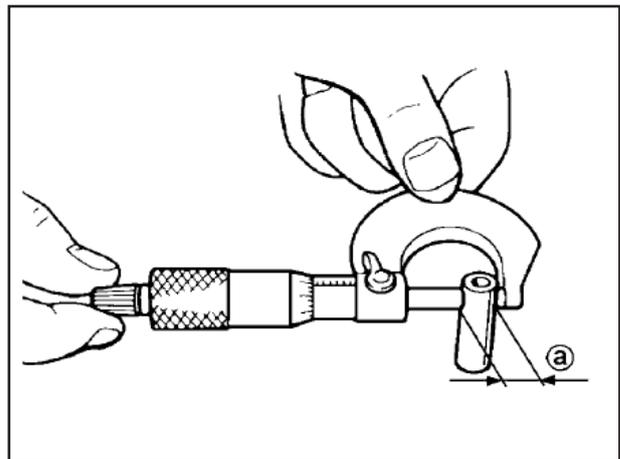
15.003~15.008 mm



Cylinder-Piston Assembly Play:
 0.035~0.049 mm (standard value)

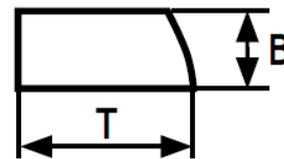


Diameter of Piston Gudgeon Pin (a):
 Standard 14.997~15.00 mm
 Service limit 14.995 mm

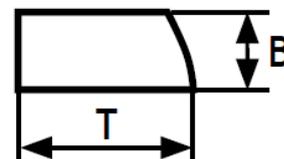


Piston Ring Type

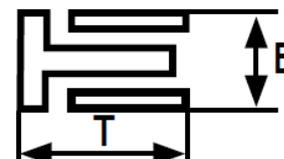
1st compression ring
 Type Cónico
 Dimension (BxT) 1 x 2.5 mm



2nd compression ring
 Type Cónico
 Dimension (BxT) 1.2 x 2.5 mm



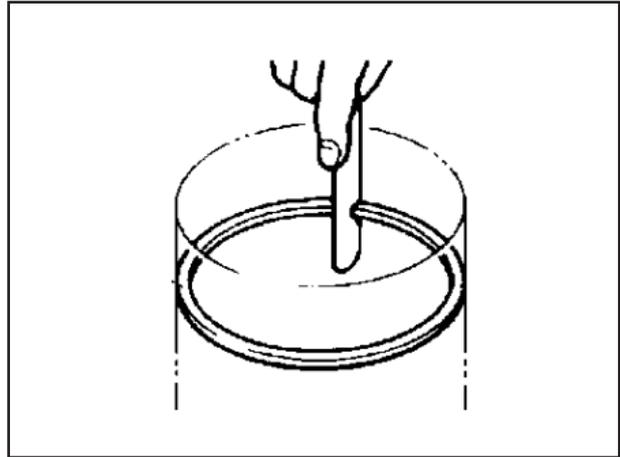
3rd oil scraper ring
 Dimension (BxT) 2 x 2.5 mm



Piston Ring Gap

(standard values)

1st compression ring	0.2~0.35 mm
2nd compression ring	0.2~0.35 mm
3rd oil scraper ring	0.2~0.7 mm



5.4.6 Crankshaft and Connecting Rod

Crankshaft

(standard values)

Crankshaft thickness (A):

46.87~47.05 mm

Diameter of crankshaft supports

CLASS 1 32.480~32.485 mm

CLASS 2 32.485~32.490 mm

Crankshaft warp between points (C):

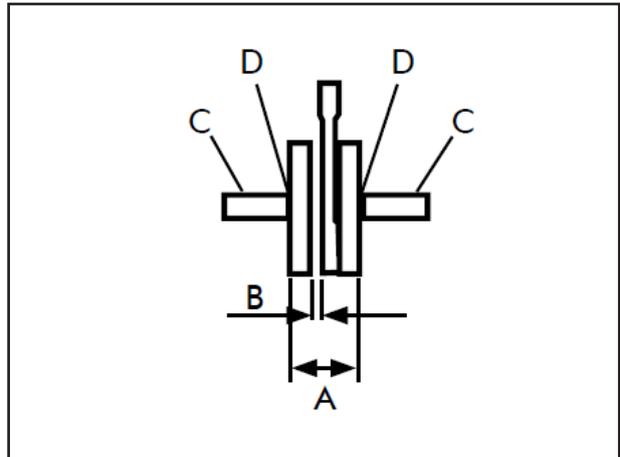
0.1 mm

Crankshaft warp at the supports (D):

0.01 mm

Axial play of crankshaft in the crankcase:

0.15~0.43 mm



Connecting Rod

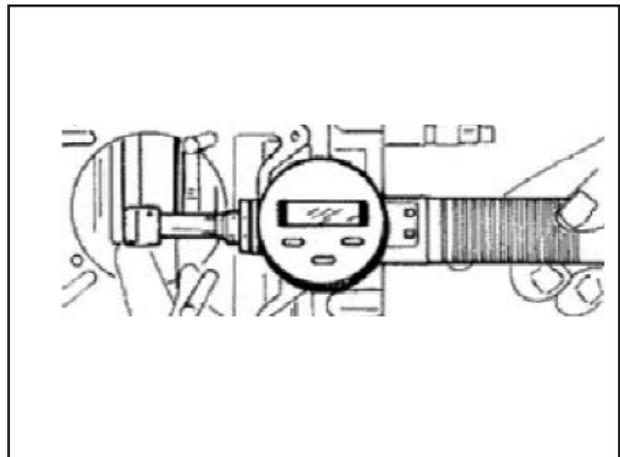
Connecting rod side play (B):

0.39~0.83 mm

Diameter of the connecting rod:

Standard 15.010~15.018 mm

Limit 15.023 mm



5.4.7 Clutch Standard values

Thickness of driving disks: 2.85~2.95 mm
Number of driving disks: 5

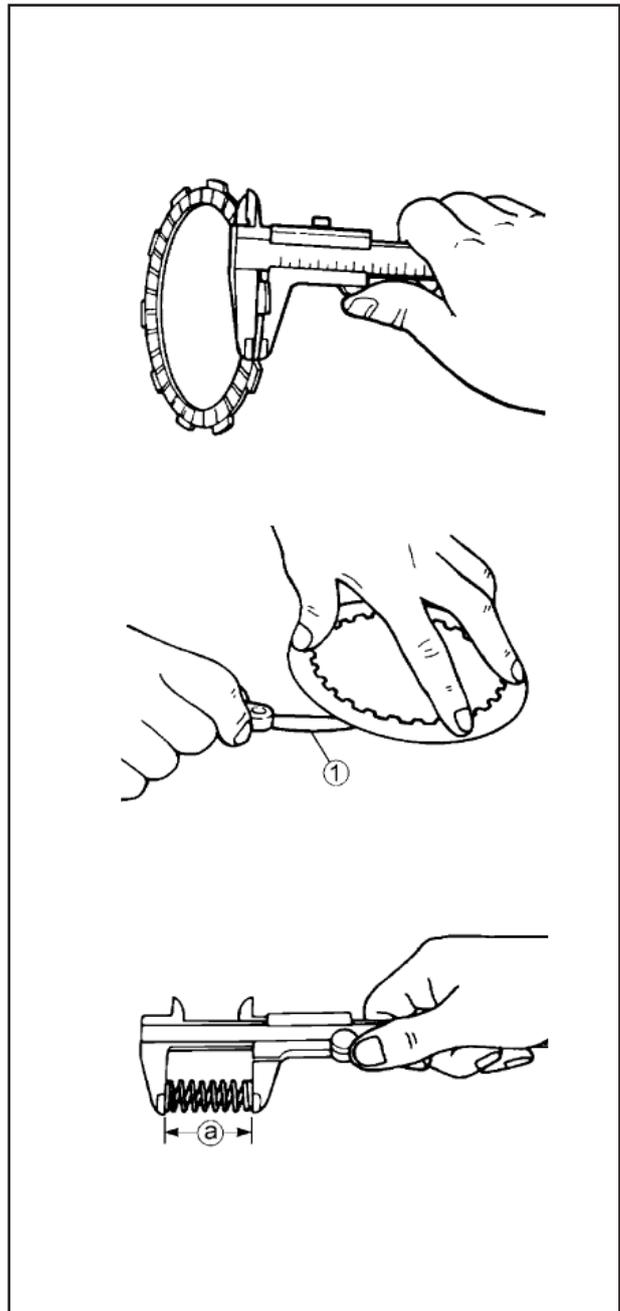
Damage => **Renew.**

Thickness of driven disks: 1.46~1.53 mm
Number of driven disks: 4
Driven disk flatness service limit:
> 0.05 mm

Damage => **Renew.**

Free length of clutch springs (a): 31.6 mm
Number of springs: 5

Damage => **Renew.**



Inspecting the clutch bell housing

1. Inspect:

- Primary sprocket teeth (1).
- Clutch housing splines (2).

Wear/damage => **Renew both sprockets.**

Excessive noise when functioning => **Renew both sprockets.**

- Claws (of the bell housing) (1).

Rough edges/wear/damage => **Eliminate the rough edges or renew the bell housing.**

- Clutch housing spline grooves (2).

Edgings/wear/damage => **Replace the clutch housing.**

NOTE: Edgings on the bell housing claws and clutch housing spline grooves result in irregular operation.

5.4.8 Forks and Gear Selector

1. Inspect:

- Fork follower (1).
- Ends of the gear change forks (2).

Scoring/warping/wear/damage => **Renew.**

2. Inspect:

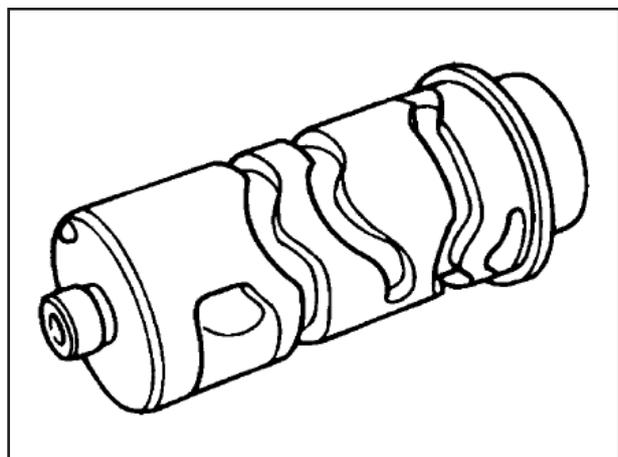
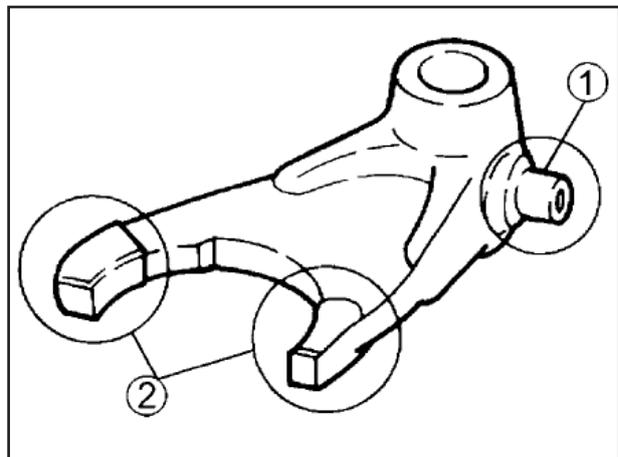
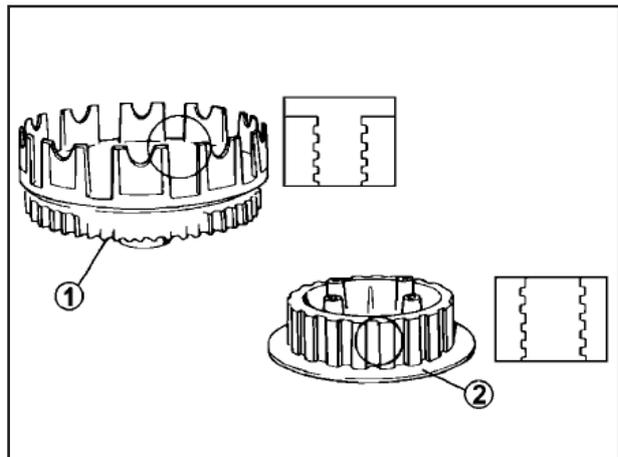
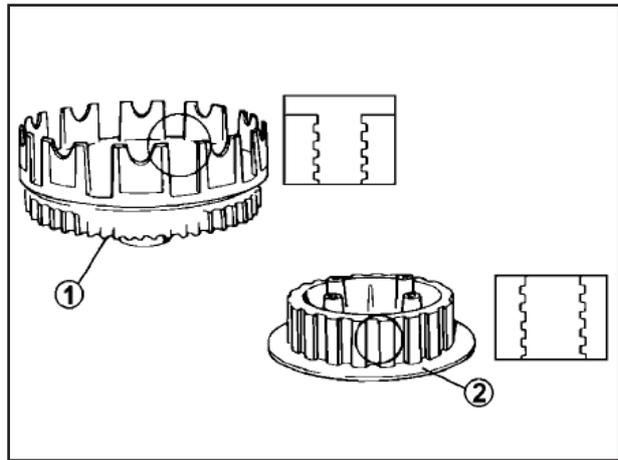
Wear/damage/scratches => **Renew.**

- Gear change selector follower.

Wear/damage => **Renew.**

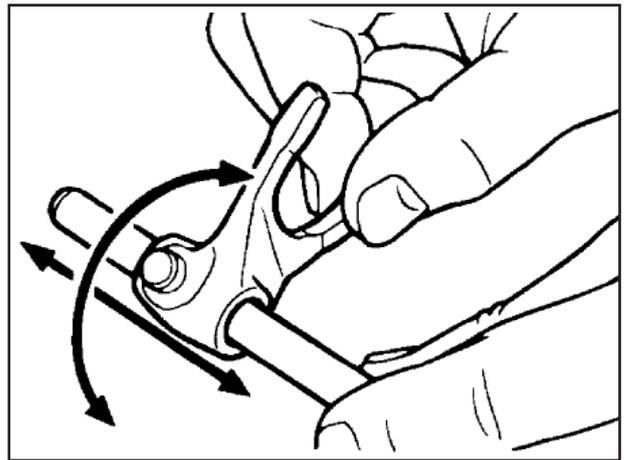
3. Inspect:

- Gear change fork 1 centre right.
- Gear change fork 2 top left.
- Gear change fork 3 bottom left.
- Guide bar.
- Gear change selector.
- Guide pin.



Roll the guide bar on a flat surface.
Warping => **Renew.**

⚠ CAUTION: Do not try and straighten a warped bar.



4. Check:

- Movement of the gear change forks (in the guide bar)

Uneven movement => **Renew the fork and the bar.**

NOTE: If the gear change fork and the drive sprockets are damaged, renew the sprockets to either side all together.

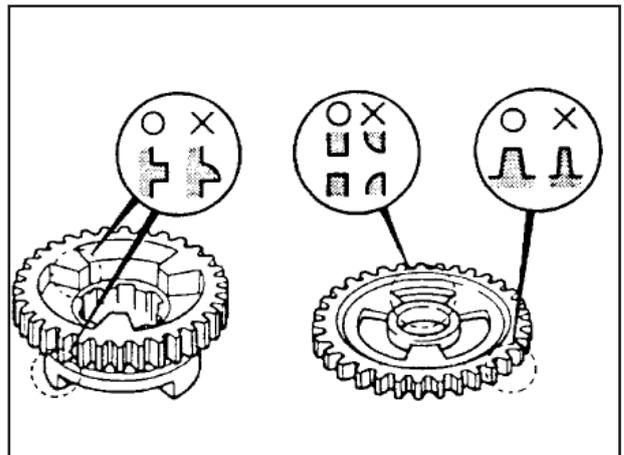
5. Inspect:

- Gear teeth.

Blue colouring/grooves/wear => **Renew.**

- Gear claws

Rounded edges/cracks/pieces missing => **Renew.**

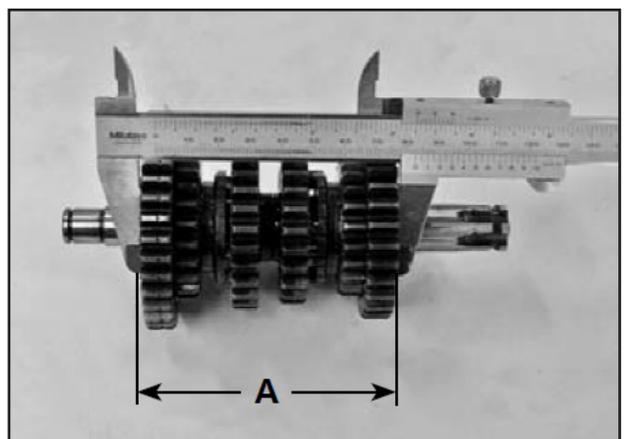


6. Check:

- Length of the secondary shaft pack

(A):

92.2mm (+0.10 / +0.18 mm).



Gear Transmission Ratio

$$1^{\text{st}} \text{ TR} = 73/24$$

$$1^{\text{st}} = 33/11$$

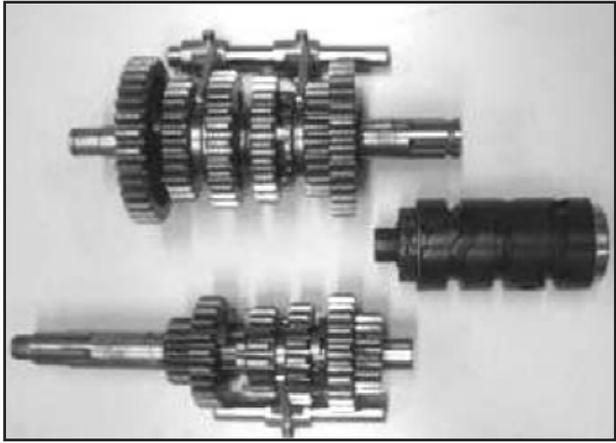
$$2^{\text{nd}} = 30/15$$

$$3^{\text{rd}} = 27/18$$

$$4^{\text{th}} = 24/20$$

$$5^{\text{th}} = 27/25$$

$$6^{\text{th}} = 22/23$$



7. Inspect:

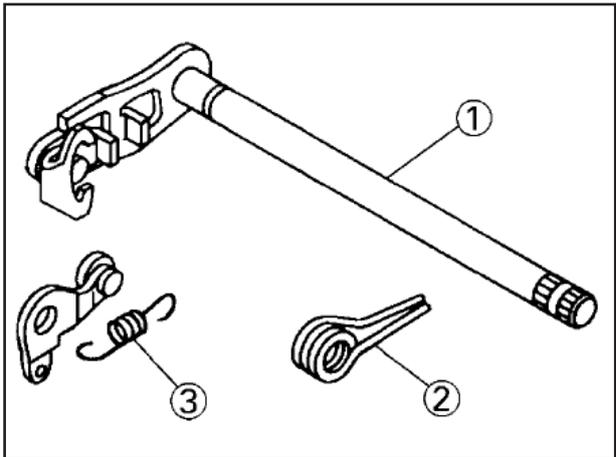
- Gear change shaft (1).

Damage/warping/wear => **Renew.**

- Return spring (gear change shaft) (2).

- Return spring (limiter rod) (3).

Wear/damage => **Renew.**



5.4.9 Oil Pump

Oil pressure (manometer connected to sensor): 4.2 Bars

Pump with 2 rotors:

Oil suction rotor

Thickness: 13.5 mm

Oil pumping rotor

Thickness: 8.5 mm

(standard values)

Radial clearance (1) between rotor points:

0.04 mm

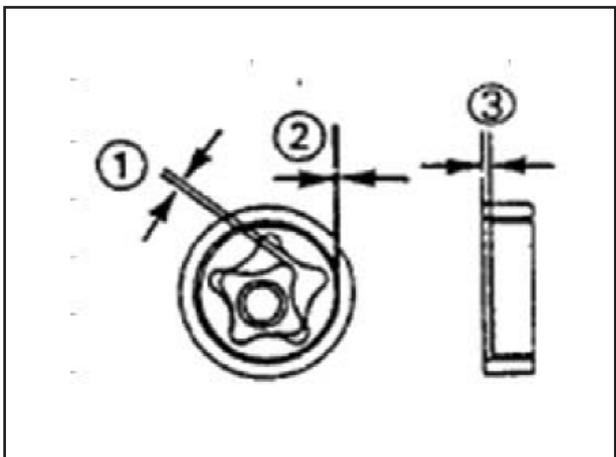
Radial clearance (2) between rotor points:

0.08 mm

Axial clearance (3) between Rotor 1 and pump body: 0.04 mm

Axial clearance (3) between Rotor 2 and pump body: 0.05 mm

Cracking/damage => **Renew.**



5.4.10 Oil Passages (Right Hand Side Casing Cover)

1. Inspect:

- Oil passage

Obstructions => **Blow through with compressed air.**

Casing

1. Wash the casings well with petrol.

2. Clean the seal-bearing surfaces and the casing contact surfaces well.

3. Inspect:

- Casings

Cracks/damage => **Renew.**

- Oil passages

Obstructions => **Blow through the passages with compressed air.**

Bearings and Retaining Rings

1. Inspect:

- **Bearings**

Clean and lubricate, then turn the inner ring by hand.

Roughness => **Renew.**

2. Inspect:

- Retaining rings.

Damage/wear => **Renew.**

Locking Rings and Washers

1. Inspect:

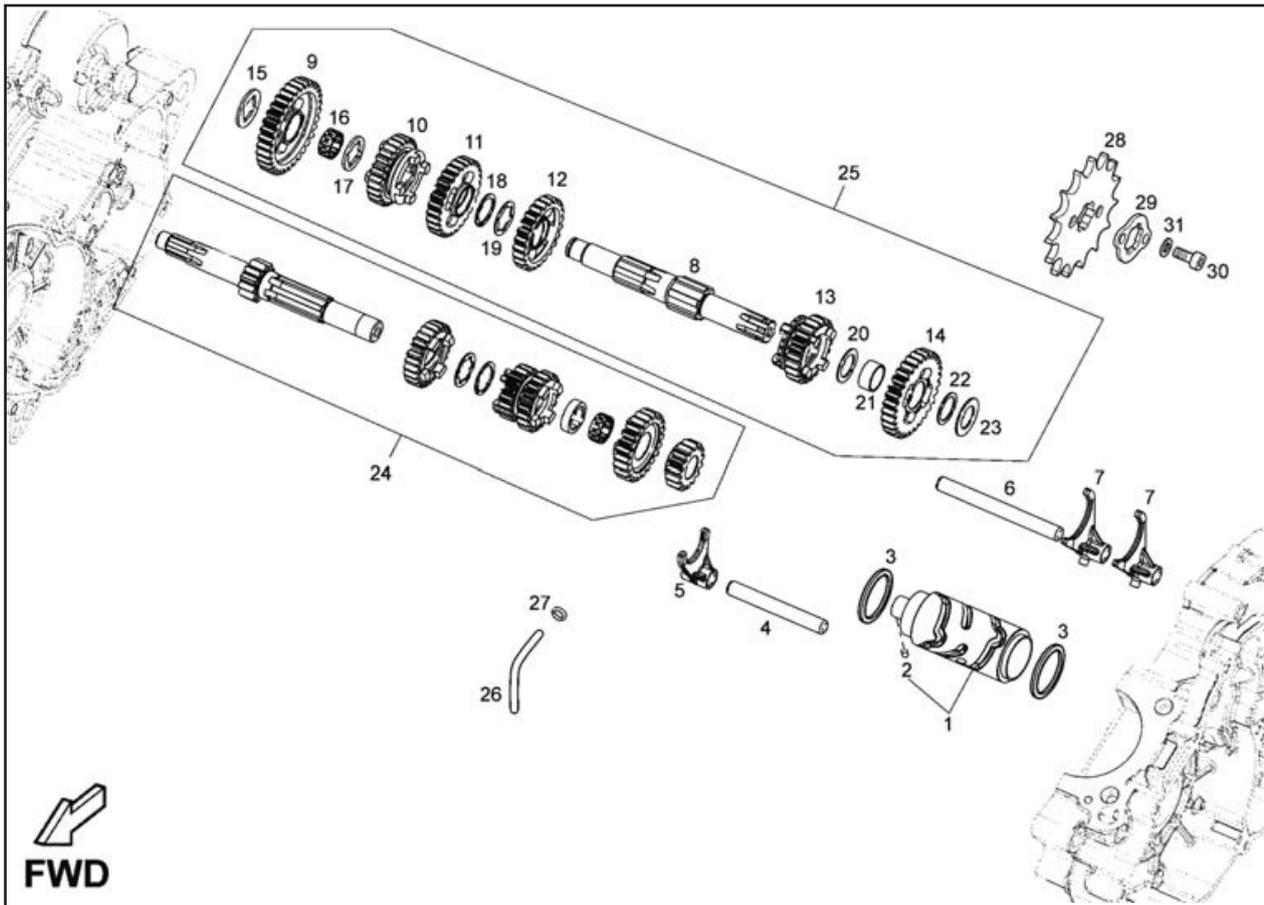
- Circlips

- Washers

Damage/loose/distorted => **Renew.**

Daños/sueltos/deformados => **Reemplace.**

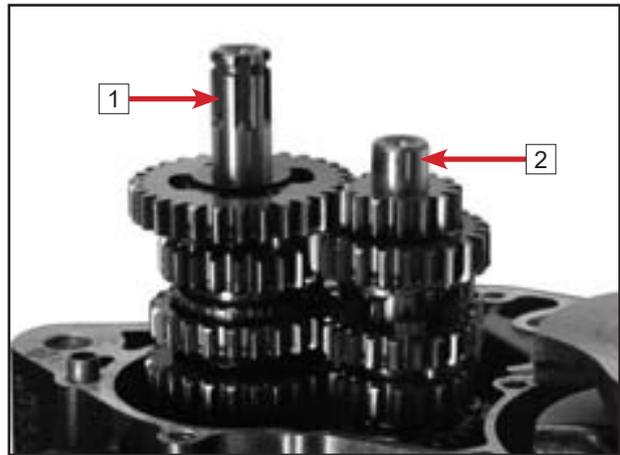
5.5 Engine Assembly Drive Shaft Spare Parts



NO.	Part Name	NO.	Part Name
1	Distributor drum	17	Adjustment washer
2	Roller	18	Safety ring
3	Washer	19	Adjustment washer
4	Primary fork shaft	20	Washer
5	Cat. 1 gear change fork.	21	Bush
6	Secondary fork shaft	22	Washer
7	Cat. 2 gear change fork	23	Washer
8	Secondary shaft	24	Primary shaft assy.
9	1st secondary gear 1 ^o	25	Secondary shaft assembly
10	5th secondary gear 5 ^a	26	Gear change greasing tube
11	3rd secondary gear 3 ^a	27	O-ring
12	4th secondary gear 4 ^a	28	Z13 gear change output gear
13	6th secondary gear 6 ^a	29	Lock gasket
14	2nd secondary gear 2 ^a	30	M5X12 bolt
15	Adjustment washer	31	Output gear seal
16	Needle bearing assy.		

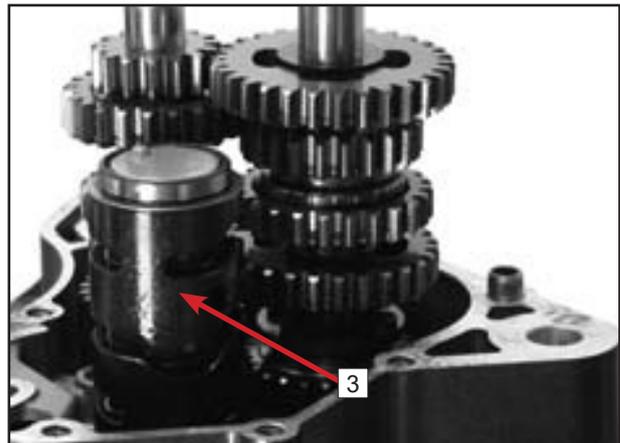
1. Fit:

- The secondary shaft [1].
- The primary shaft [2].



2. Fit:

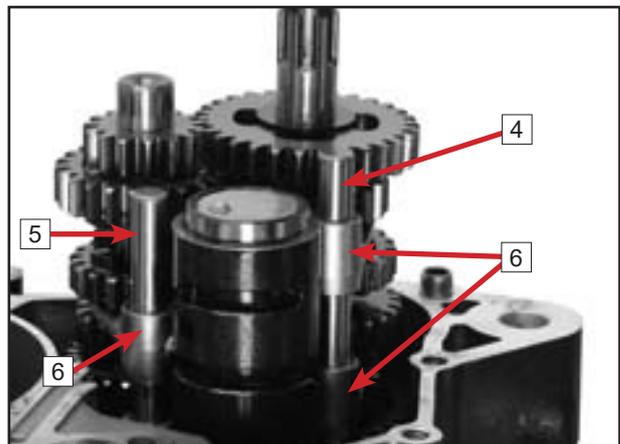
- The gear selector drum [3].



3. Fit:

- The 2 gear selector fork shafts.
 - Long shaft [4].
 - Short shaft [5].
- The 3 gear selector forks [6].

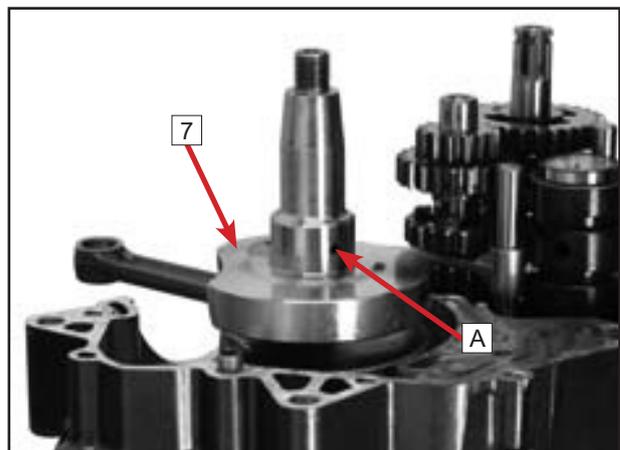
NOTE: Apply engine oil to the gearbox parts as a whole before closing the semi-crankcases.



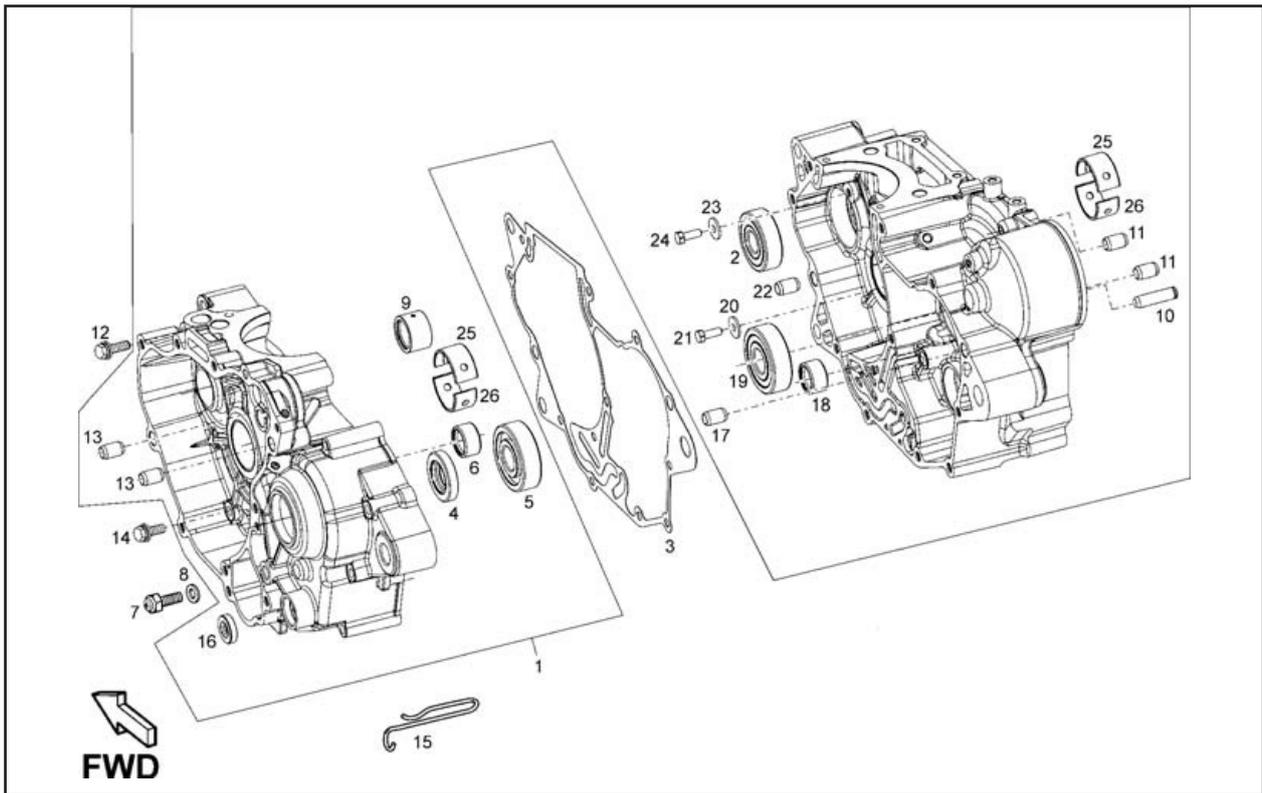
4. Fit:

- Crankshaft [7].

NOTE: To avoid scratching the crankshaft and to aid fitting, apply grease to the edges of the oil seal, and engine oil to the bearings. Apply engine oil to the crankshaft through the greasing orifice (A).



Crankcase Parts

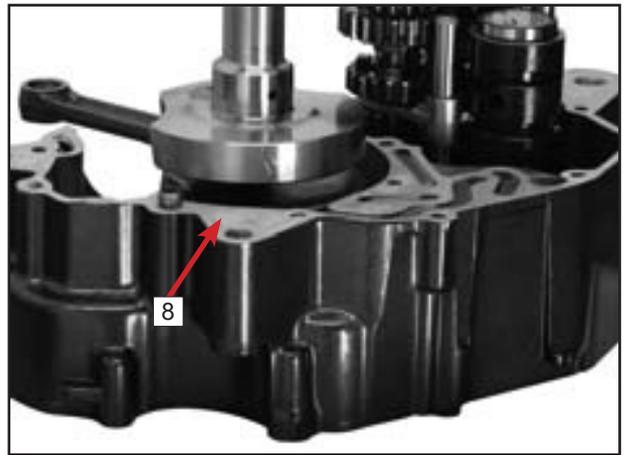


NO.	Part Name	NO.	Part Name
1	Crankcases assy.	15	Clamp
2	Counterweight bearing	16	Selector lever shaft oil seal
3	Crankcase gasket	17	Centring stud
4	Crankshaft oil seal	18	Secondary shaft needle bearing assy.
5	Secondary shaft bearing	19	Primary shaft bearing
6	Primary shaft needle bearing assy.	20	5.2x15x1.5 washer
7	Neutral switch	21	M5x14 bolt
8	Gasket	22	Centring stud
9	Counterweight shaft needle bearing assy.	23	5.2x15x1.5 washer
10	Bolt	24	M5x14 bolt
11	Key	25	Top mounting blue semi-bearing
12	M6x75 hex. bolt	26	Bottom mounting blue semi-bearing
13	Key		
14	M6x60 bolt		

5. Fit:

- The engine crankcase gasket **8** (new gasket).

NOTE: To aid the task, rest the engine on a wooden box.

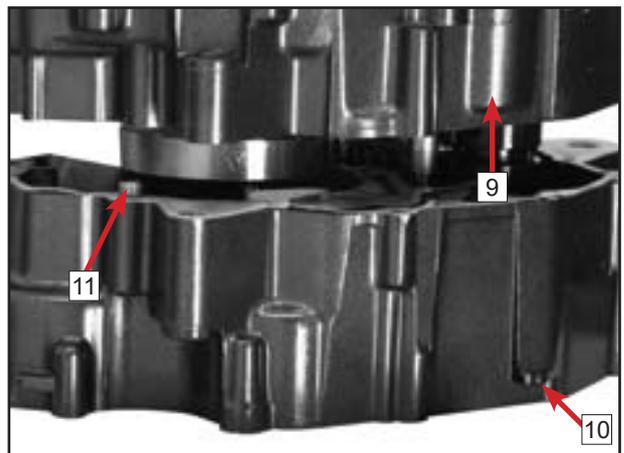


6. Fit:

- The left-hand crankcase **9** onto the right-hand crankcase **10**, being guided by the centring studs **11**.

⚠ CAUTION: Make sure that the gasket remains in the correct position.

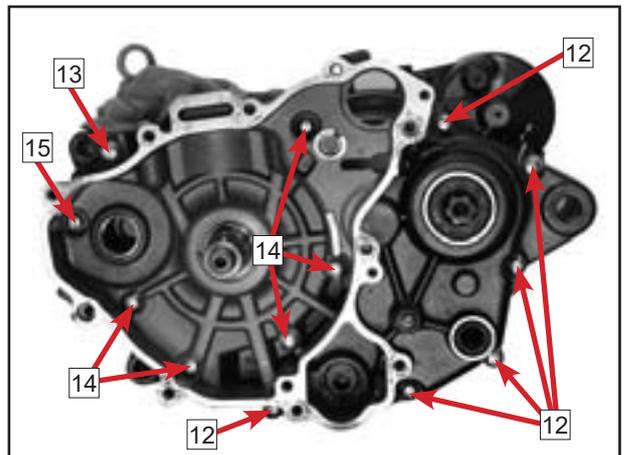
NOTE: Tap the crankcase cover lightly with a nylon mallet.



⚠ CAUTION: Tighten the crankcase bolts in succession crosswise, going from one to another two or three times.

7. Fit:

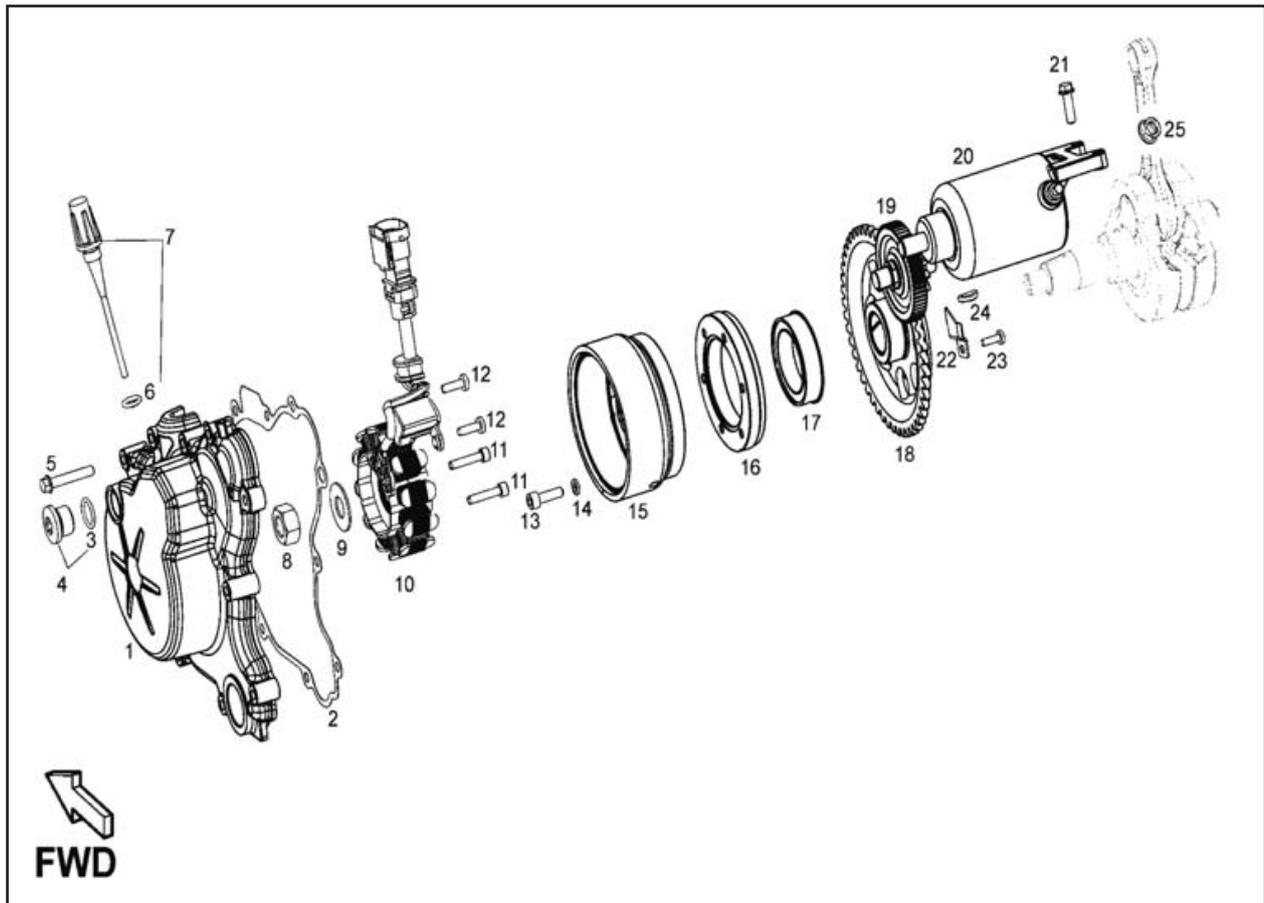
- The 6 outer bolts **12** on the left-hand crankcase.
- The (longer) outer bolt **13** on the left-hand crankcase.
- The 5 inner bolts **14** on the left-hand crankcase.
- The (shorter) inner bolt **15**.



Bolts (crankcases):

11~13 N·m (8.1~9.6 ft-lb.)

Magneto Parts



NO.	Part Name	NO.	Part Name
1	Magneto side cover	15	Rotor
2	Magneto cover-crankcase gasket	16	Free wheel inner ring
3	O-ring	17	Free wheel
4	Ignition cover	18	Electric start crown wheel
5	M6x35 bolt	19	Starter motor takeoff gear
6	O-ring	20	Starter motor
7	Oil dipstick	21	M6x25 bolt
8	Nut	22	Starter crown wheel retaining plate
9	Flat washer	23	M6x14 bolt
10	Stator	24	Key
11	M5x25 bolt	25	6M100 hexagonal nut with clamp
12	M5x16 bolt		
13	Bolt		
14	Washer		

8. Fit:

- The balance shaft 16.

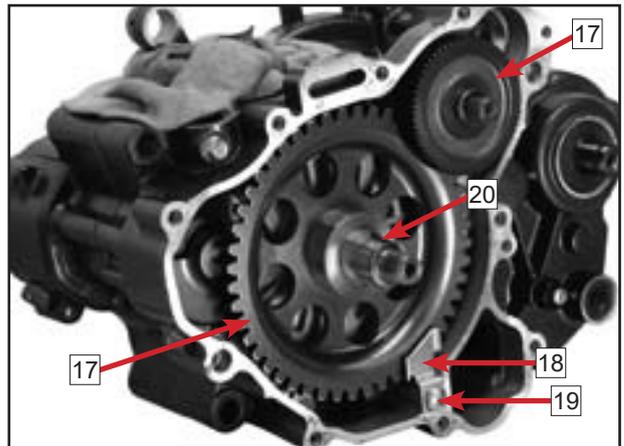


9. Fit:

- The 2 starter system sprockets 17.
- The starter crown wheel retaining plate 18.
- Bolt 19 retaining plate.
- The magneto flywheel key 20.

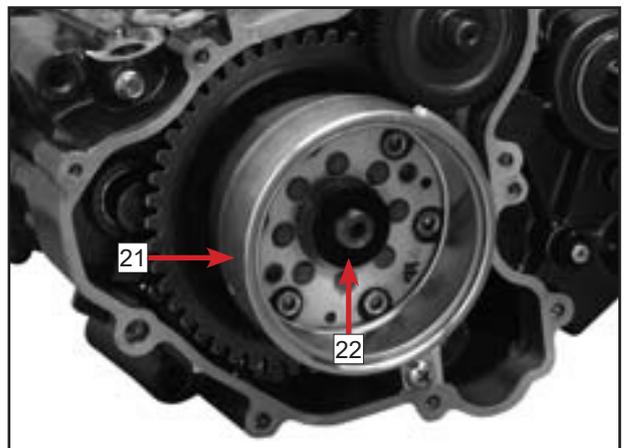
Bolt 19:

5~6 N·m (3.7~4.4 ft-lb.)



10. Fit:

- The rotor 21.
- The washer 22.



11. Fit:

- The rotor nut 23.



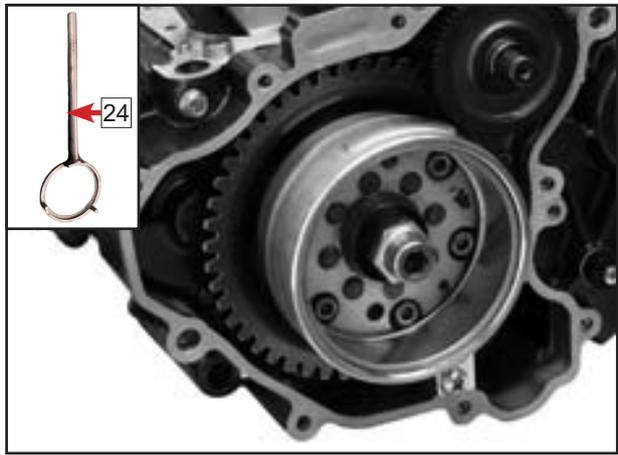
12. Fix:

- The magneto flywheel rotor, using the magneto flywheel locking tool [24].

Magneto Flywheel Locking Tool
SH-JCFZ409/0284

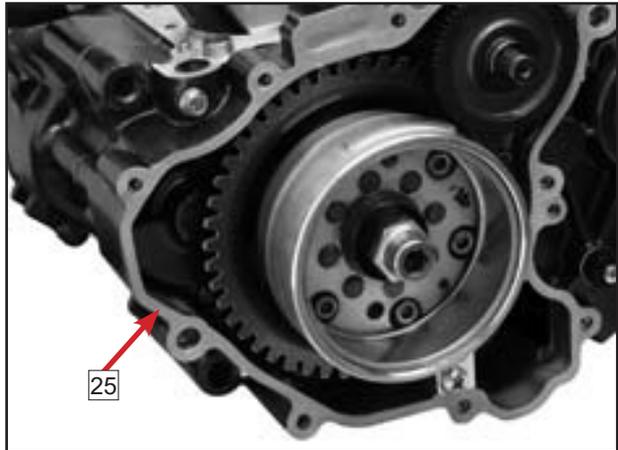
Magneto flywheel rotor nut:

83~90 N·m (61.2~66.4 ft-lb.)



13. Fit:

- The cover gasket [25] (new gasket).



14. Fit:

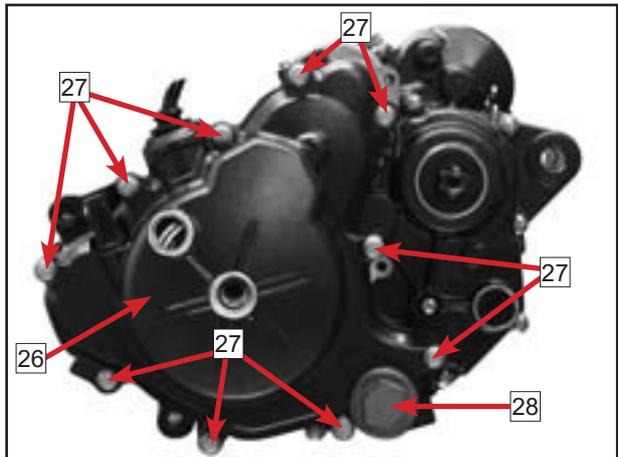
- The magneto flywheel cover [26].
- The 10 bolts [27] on the magneto flywheel cover.

Magneto flywheel cover bolts:

11~13 N·m (8.1~9.6 ft-lb.)

IMPORTANT

Tighten the bolts on the magneto flywheel cover in succession crosswise, going from one to another two or three times.



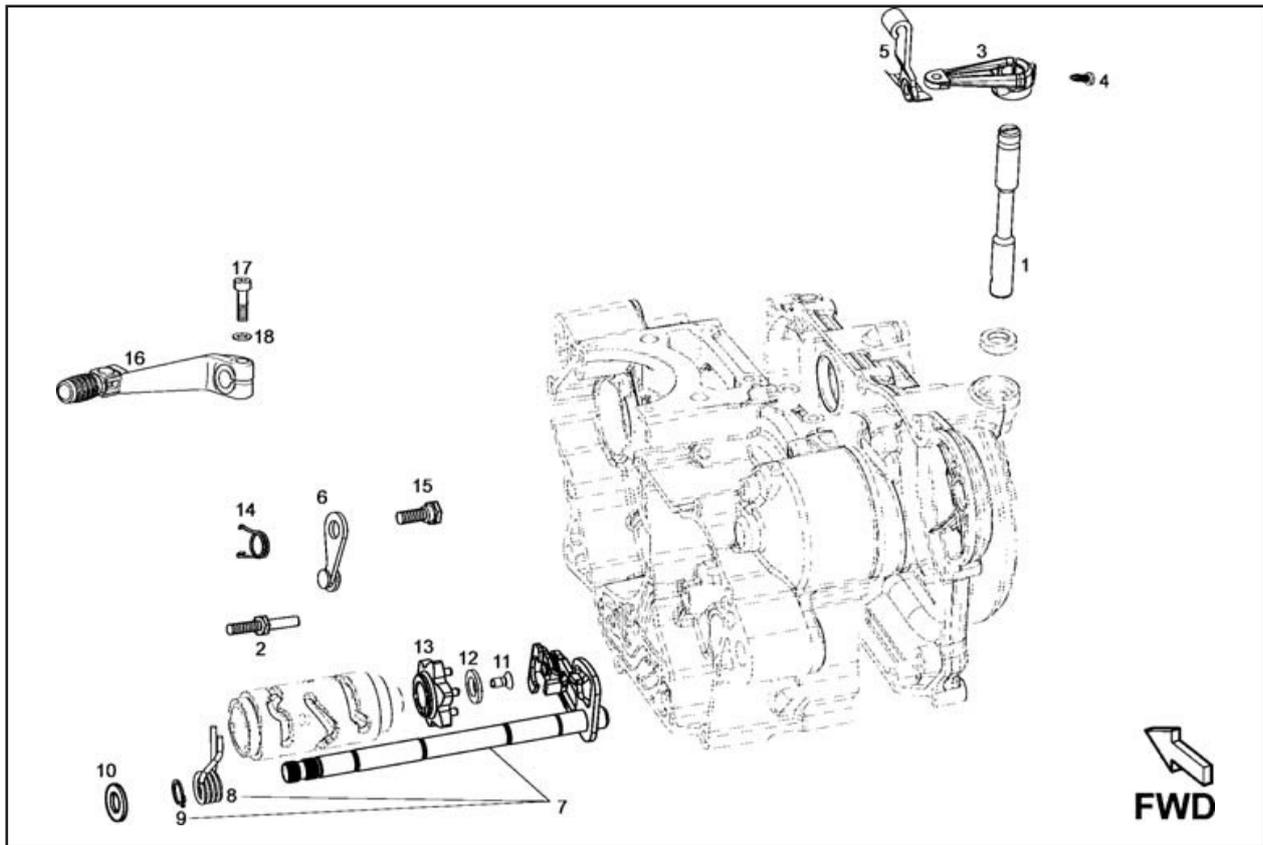
15. Fit:

- The engine oil pre-filter.
- The pre-filter plug [28].

The pre-filter plug:

24~30 N·m (17.7~22.1 ft-lb.)

Gear Change Selector Parts



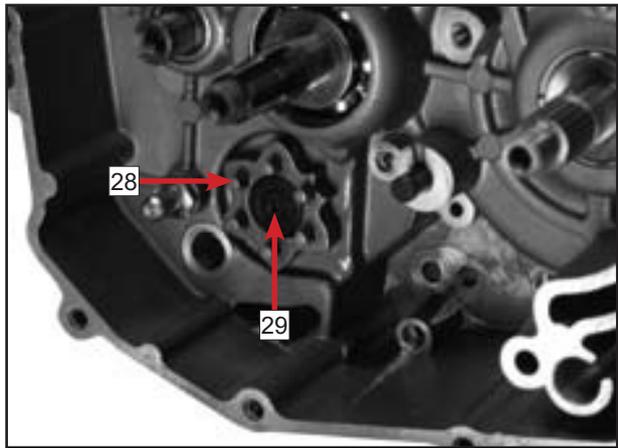
NO.	Part Name	NO.	Part Name
1	Clutch push rod	10	Washer
2	Selector spring stud	11	Bolt
3	Clutch lever	12	Washer
4	Bolt	13	Drum control head
5	Clutch cable securing plate	14	Gear selection spring
6	Gear selection lever	15	Special bolt
7	Selector shaft assembly	16	Gear lever assy.
8	Spring	17	6M100x25 bolt
9	D12 safety ring	18	D6 washer

16. Fit:

- Gear change shaft assembly [28](#).
- The bolt [29](#) on the gear selector distributor.

Gear selector distributor bolt:

5~6 N·m (3.7~4.4 ft-lb.)

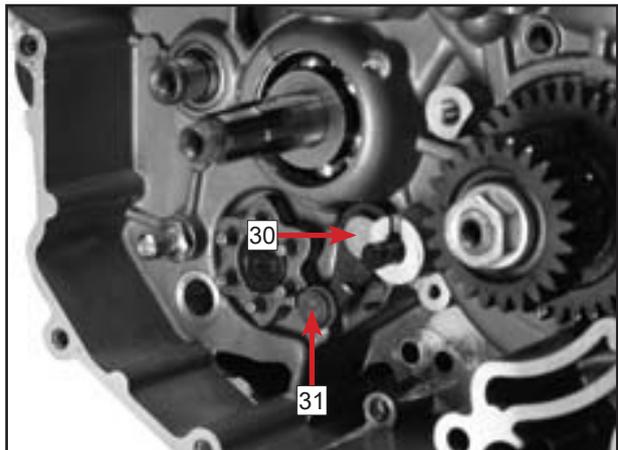


17. Fit:

- The gear selector lever [30](#) and the spring, using the bolt (31).

Gear lever bolt:

8~10 N·m (5.9~7.3 ft-lb.)



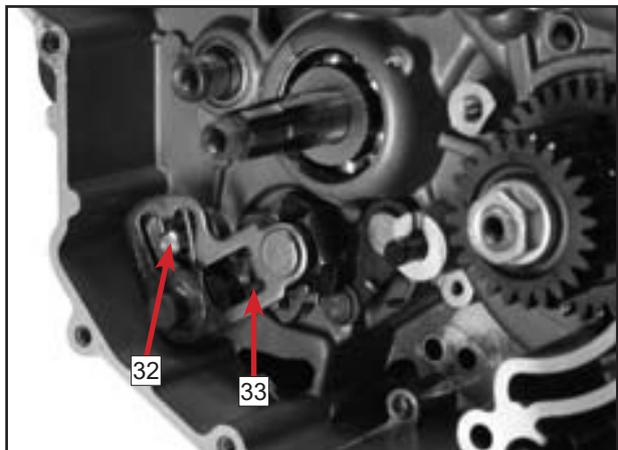
18. Fit:

- The gear change selector shaft [33](#).

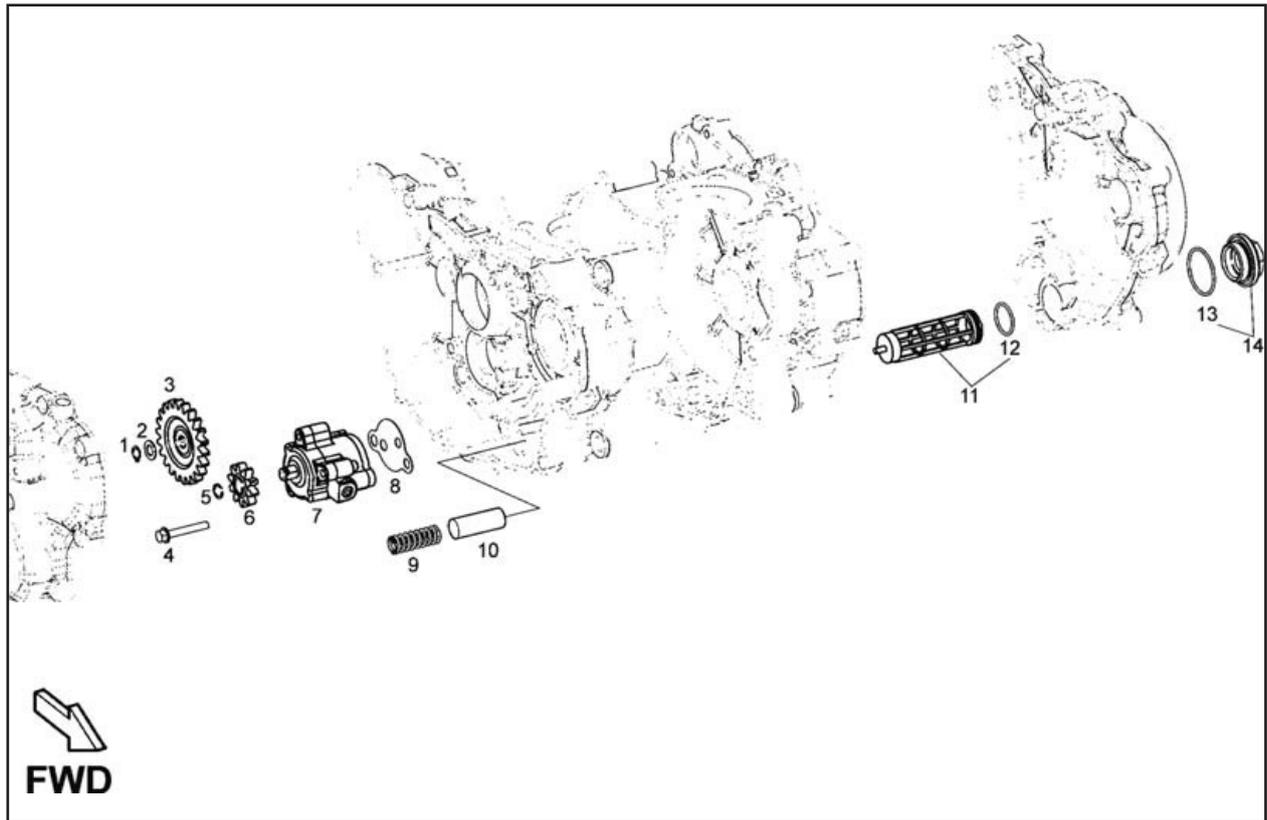
NOTE: Apply engine oil to the selector shaft before fitting it.

Fit the gear selector shaft, aligning the ends of the return spring with the positioning bracket [32](#) on the crankcase.

Fit the gear selector shaft, aligning the yoke [33](#) with the nipples of the gear selector distributor.



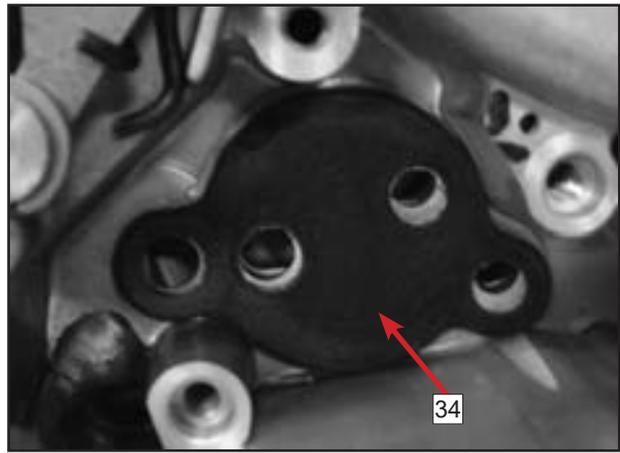
Oil Pump Assembly Parts



NO.	Part Name	NO.	Part Name
1	Rubber ring	8	Crankcase / oil pump gasket
2	Flat washer	9	Oil pressure valve spring
3	Intermediate oil pump gear	10	Oil by-pass valve
4	Bolt	11	Oil filter
5	Circlip	12	Oil filter gasket
6	Oil pump gear	13	Plug gasket
7	Oil pump	14	Oil filter plug

19. Fit:

- The oil pump gasket **34** (new gasket).



20. Fit:

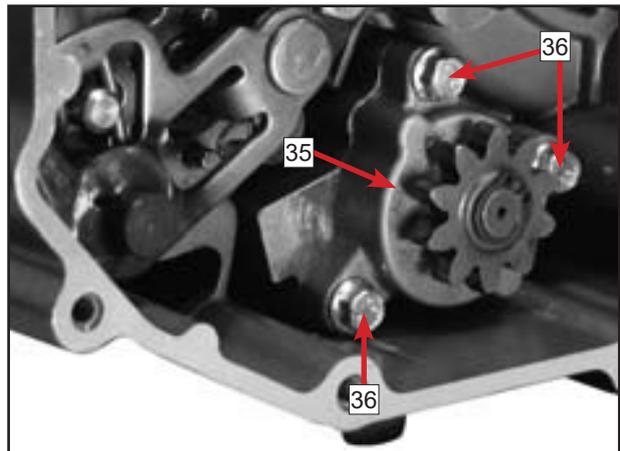
- The oil pump **35**.
- The 3 oil pump bolts **36**.

The oil pump bolts:

5~6 N·m (3.7~4.4 ft-lb.)

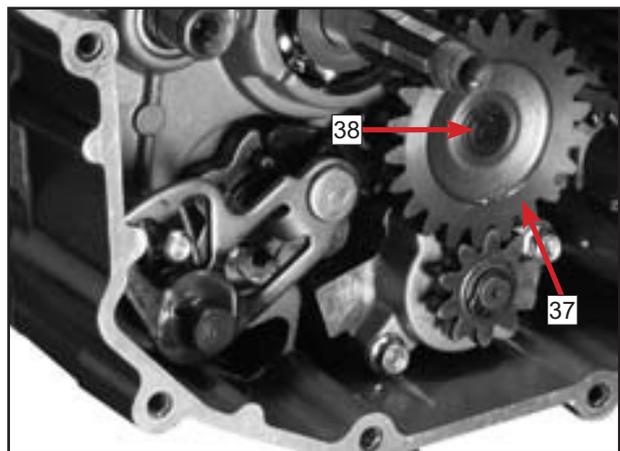
NOTE: Once the pump bolts have been tightened to their torque settings, check that the pump turns properly.

NOTE: The oil pump is a double rotor pump, with each rotor pumping separately.

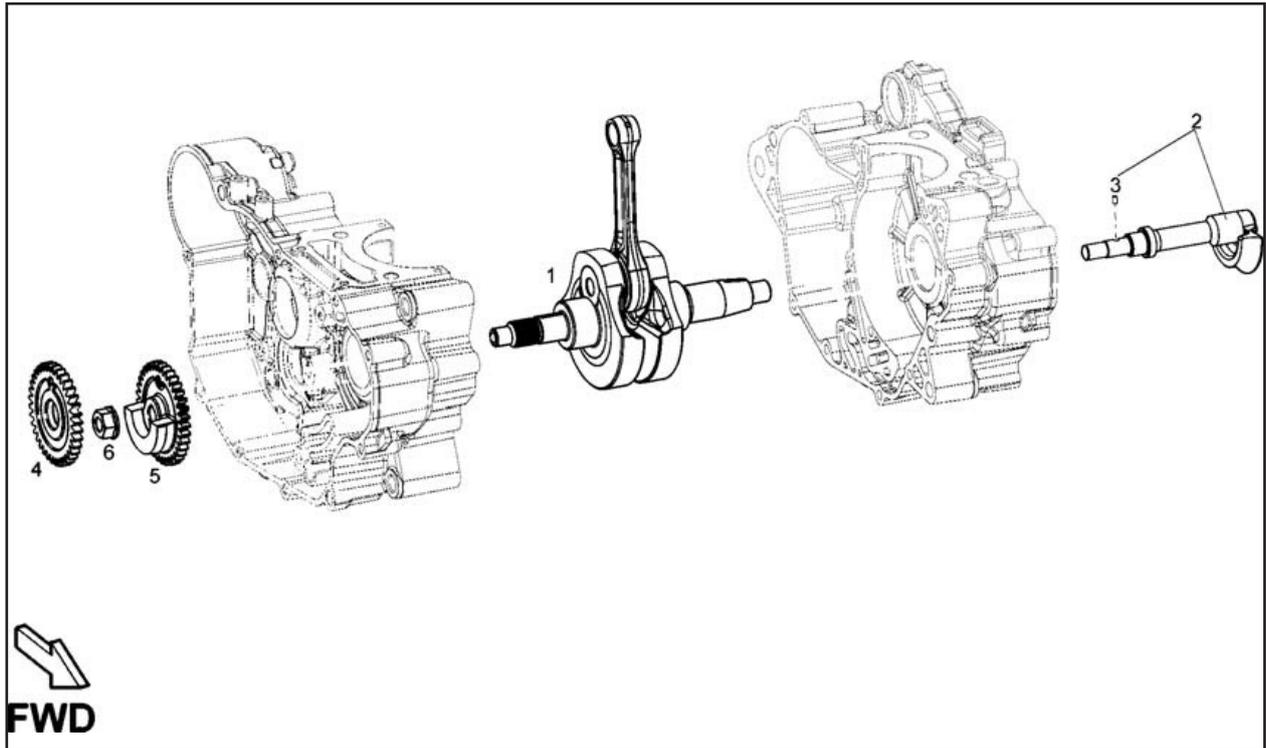


21. Fit:

- The pump driving gear **37**.
- The NEW circlip and washer **38** on the pump driving gear **37**.



Crankshaft Parts



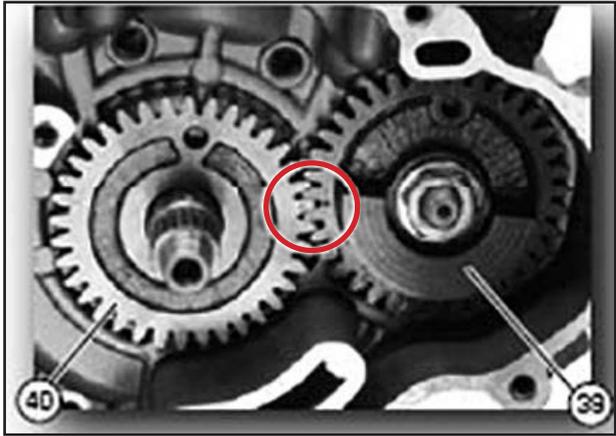
NO.	Part Name
1	Crankshaft-connecting rod assy.
2	Counterweight shaft
3	Key
4	Intermediate gear counterweight
5	Counterweight gear
6	Nut

CFMOTO

22. Fit:

- The balance shaft gear 39.
- The intermediate balance shaft gear 40.

⚠ CAUTION: Align the crankshaft and balancer gears using the guide points.



23. Fit:

- The Balance shaft locking tool 24.

**Balance Shaft Locking Tool
SH-JC864486**

- The balance shaft nut 42.

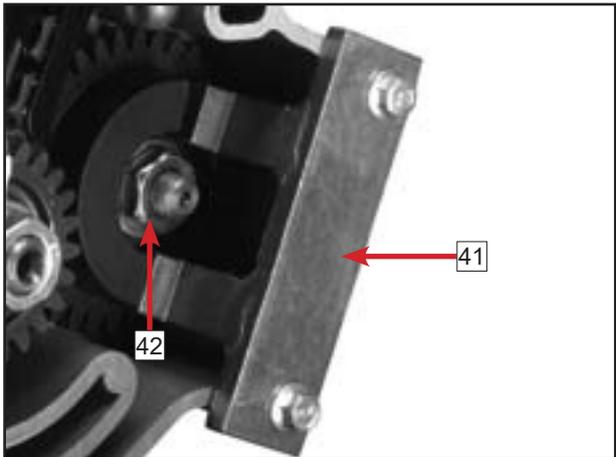
Balance shaft nut:

35~45 N·m (25.8~33.2 ft-lb.)

24. Remove:

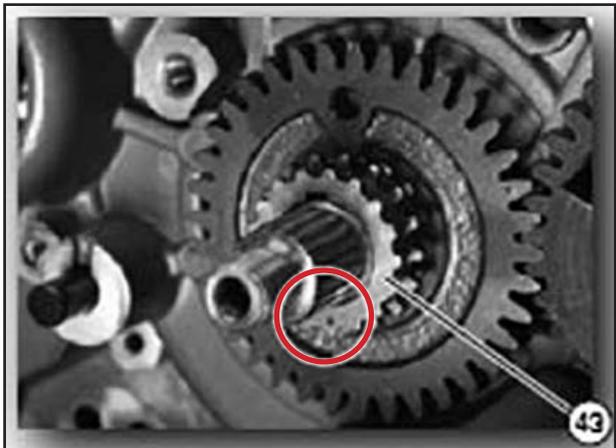
- The Balance shaft locking tool.

⚠ CAUTION: Fit the timing chain sprocket with the guide point facing forwards.



25. Fit:

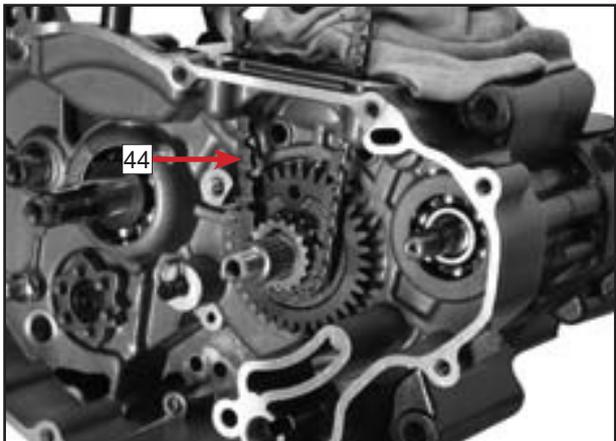
- The timing chain sprocket 43.



26. Fit:

- The timing chain 44.

NOTE: Fit it on the central teeth.

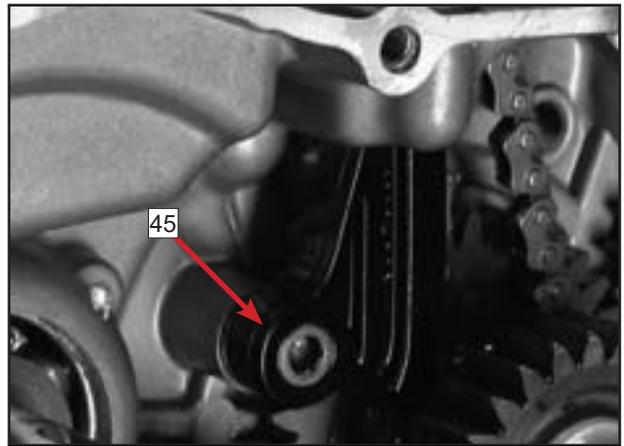


27. Fit:

- The fixed timing chain roller [45](#).

Fixed timing bolt:

10~12 N·m (7.3~8.8 ft-lb.)



28. Fit:

- The crankshaft gear [46](#).
- The fitting tool [47](#).

**Crankshaft Sprocket Locking Tool
SH-JC864487**

29. Fit:

- The crankshaft gear nut [48](#).

Crankshaft gear nut:

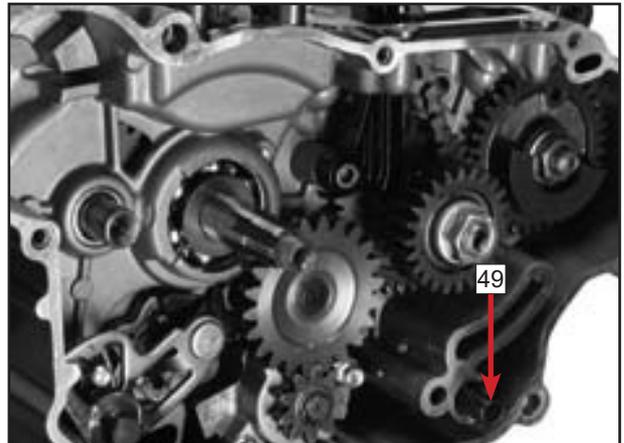
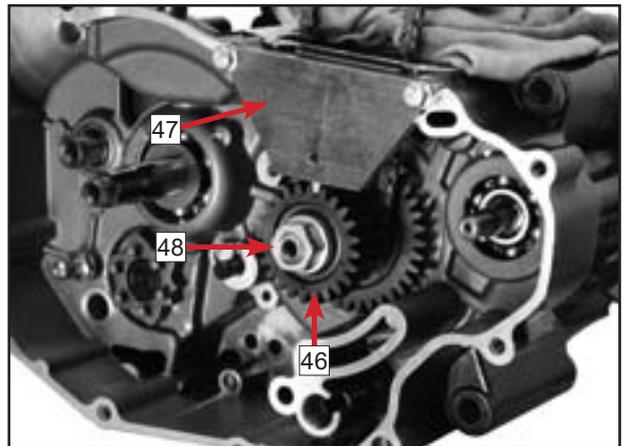
75~83 N·m (55.3~61.2 ft-lb.)

30. Remove:

- The fitting tool [47](#).

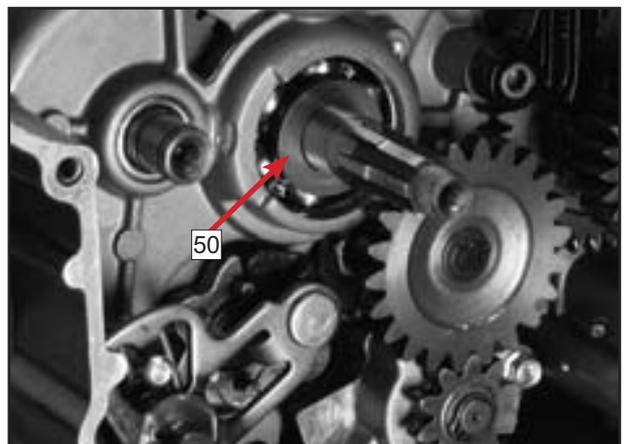
31. Fit:

- The lubrication circuit by-pass valve [49](#).

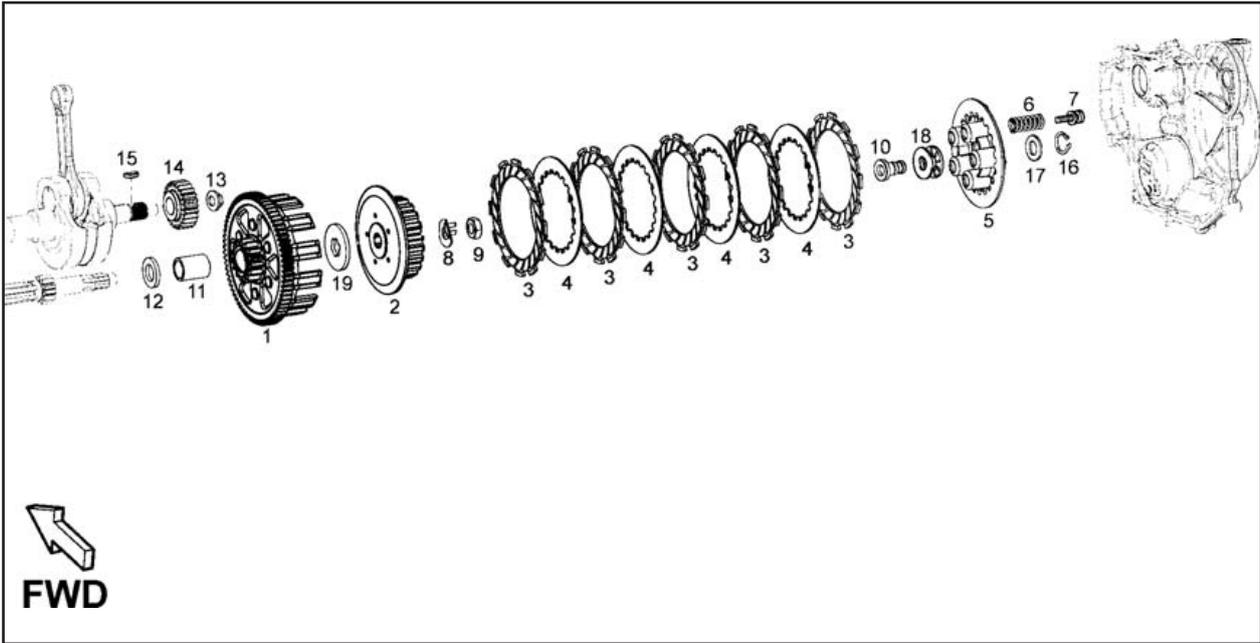


32. Fit:

- The clutch bell housing washer [50](#).



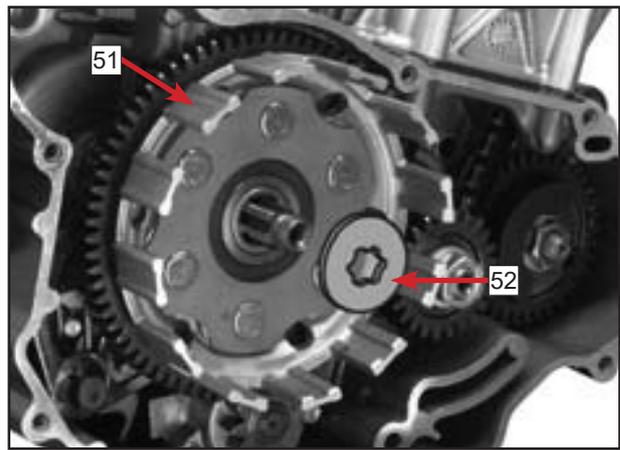
Clutch Bell Housing Parts



NO.	Part Name	NO.	Part Name
1	Clutch bell housing	11	Separator
2	Clutch casing	12	Washer
3	Driving disk (5u.)	13	Nut with tapered spring
4	Driven disk (4u.)	14	Engine gear
5	Clutch closing cover	15	Key
6	Clutch spring	16	Seeger ring
7	Bolt with washer	17	Washer
8	Washer	18	Needle bearing assy.
9	M6 hexagonal nut	19	Separator bush
10	Clutch bolt		

33. Fit:

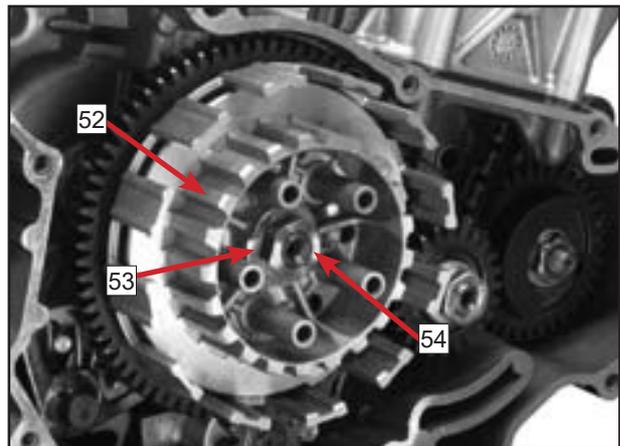
- The clutch bell housing [51](#) with the central bush.
- The separating washer [52](#).



34. Fit:

- The clutch bell housing [52](#).
- The seal [53](#).
- The nut [54](#).
- The tool for fitting the clutch bell housing [55](#) onto the clutch housing [52](#).

Bell Housing Fitting Tool
Ref. 00H05300041



35. Tighten:

- The nut [54](#) to the indicated torque.

The clutch housing nut:

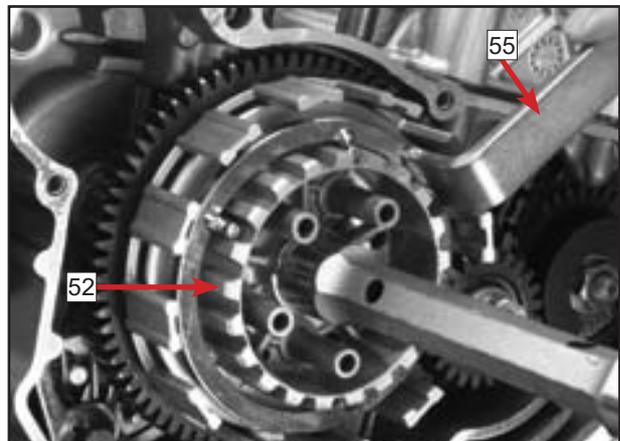
35~45 N·m (25.8~33.2 ft-lb.)

36. Closing:

- The seal tab [53](#) .

37. Remove:

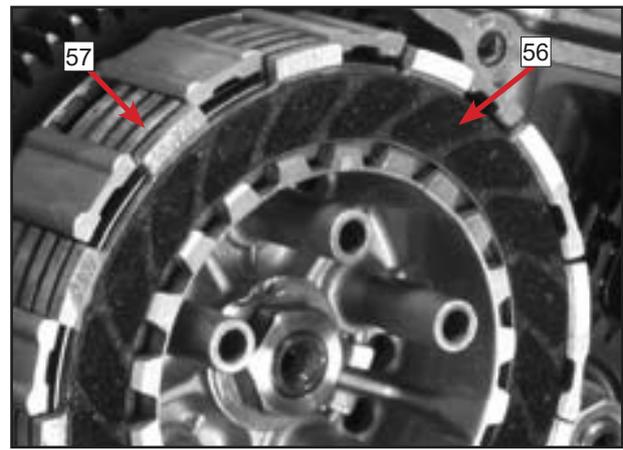
- The clutch bell housing fitting tool [55](#) .



38. Fit:

- The driving disks **56** and the driven disks **57**.

NOTE: Fit the driving disks (blades to the right) and driven disks (rounded profile inwards) alternately onto the clutch hub, beginning with a driving disk and ending with a driving disk as well.
Lubricate all the disks with engine oil before fitting.

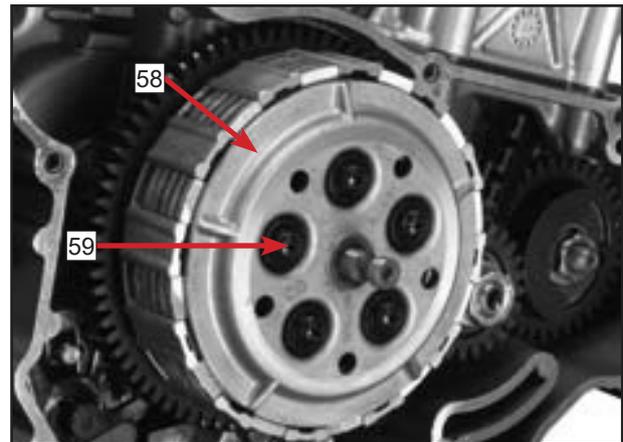


39. Fit:

- The clutch closing cover **58**.

⚠ CAUTION: The clutch closing cover can only be fitted in one position.

NOTE: In the correct fitting position, the pack of disks is completely compressed.



40. Fit:

- The 5 clutch closing cover springs.
- The 5 bolts **59** with washers.

41. Tighten:

- The 5 bolts **59**.

The clutch closing cover bolts:
3.5~4.5 N·m (2.6~3.3 ft-lb.)

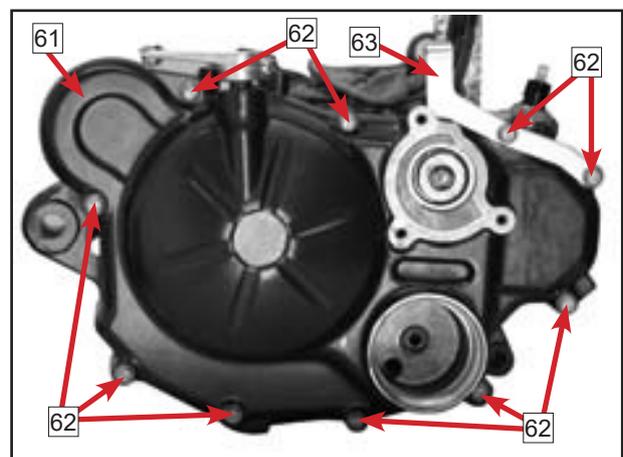
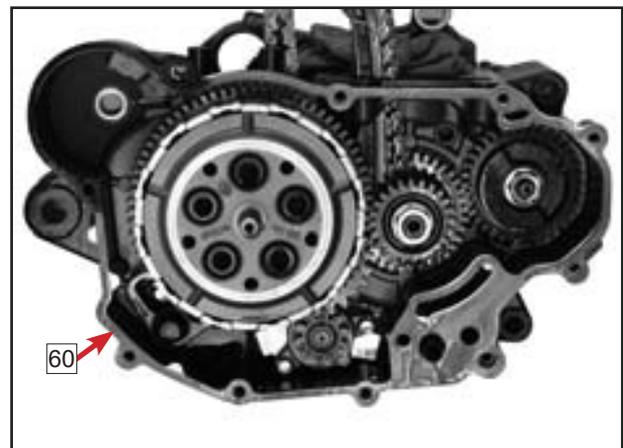
42. Fit:

- The cover gasket **62** (new gasket).
- The clutch cover **61**.
- The 10 clutch cover bolts **62**.
- The clutch cable support **63**.

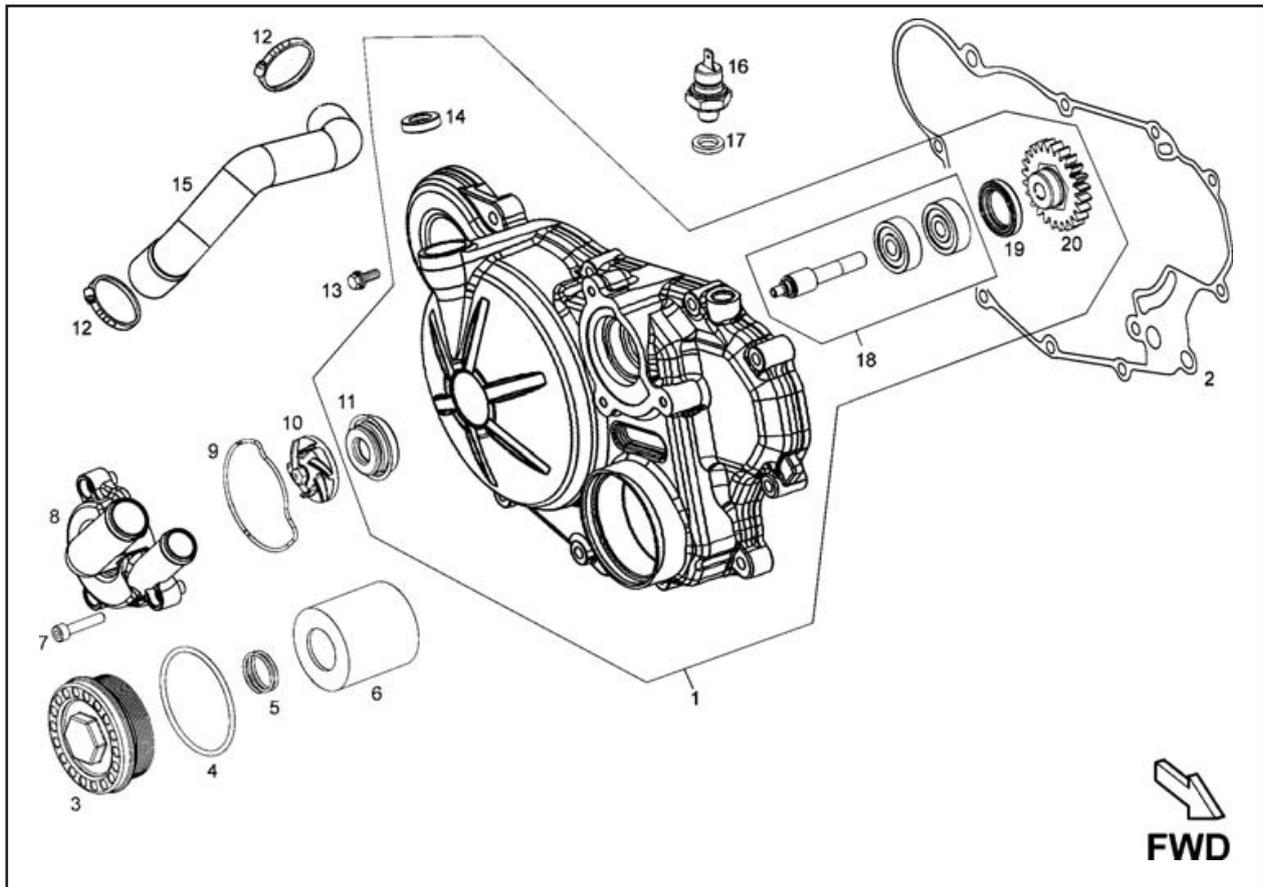
The clutch cover bolts:
11~13 N·m (8.1~9.6 ft-lb.)

NOTE: To help the cover to fit, the water pump turbine should be turned until the 2 gears coincide.

⚠ CAUTION: Tighten the bolts on the cover in succession crosswise, going from one to the other two or three times.



Clutch Cover Parts



NO.	Part Name	NO.	Part Name
1	Clutch cover assy.	11	Water pump oil seal
2	Clutch cover – crankcase gasket	12	Clamp
3	Oil filter cover	13	M6x35 bolt
4	O-ring	14	Oil seal
5	Oil filter cartridge spring	15	Pump-cylinder head pipe
6	Oil filter cartridge	16	Oil pressure sensor
7	M5x14 bolt	17	Washer
8	Water pump cover	18	Water pump shaft assy.
9	O-ring	19	20x30x5 oil seal
10	Complete drive shaft	20	Water pump gear

43. Fit:

- The oil filter **64**.
- The spring **65**.
- The oil filter plug **66**.

The oil filter plug:

24~26 N·m (17.7~19.2 ft-lb.)



44. Fit:

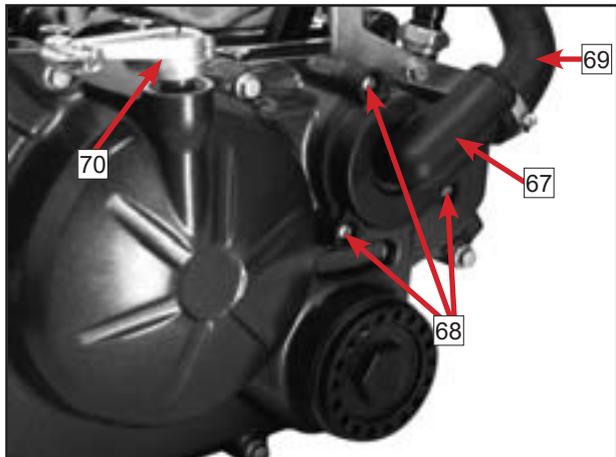
- The water pump cover **67** and the 3 bolts **68**.
- The coolant pipe **69**.
- The clutch cam **70**

45. Tighten:

- The 3 water pump cover bolts **68**.

The water pump cover bolts:

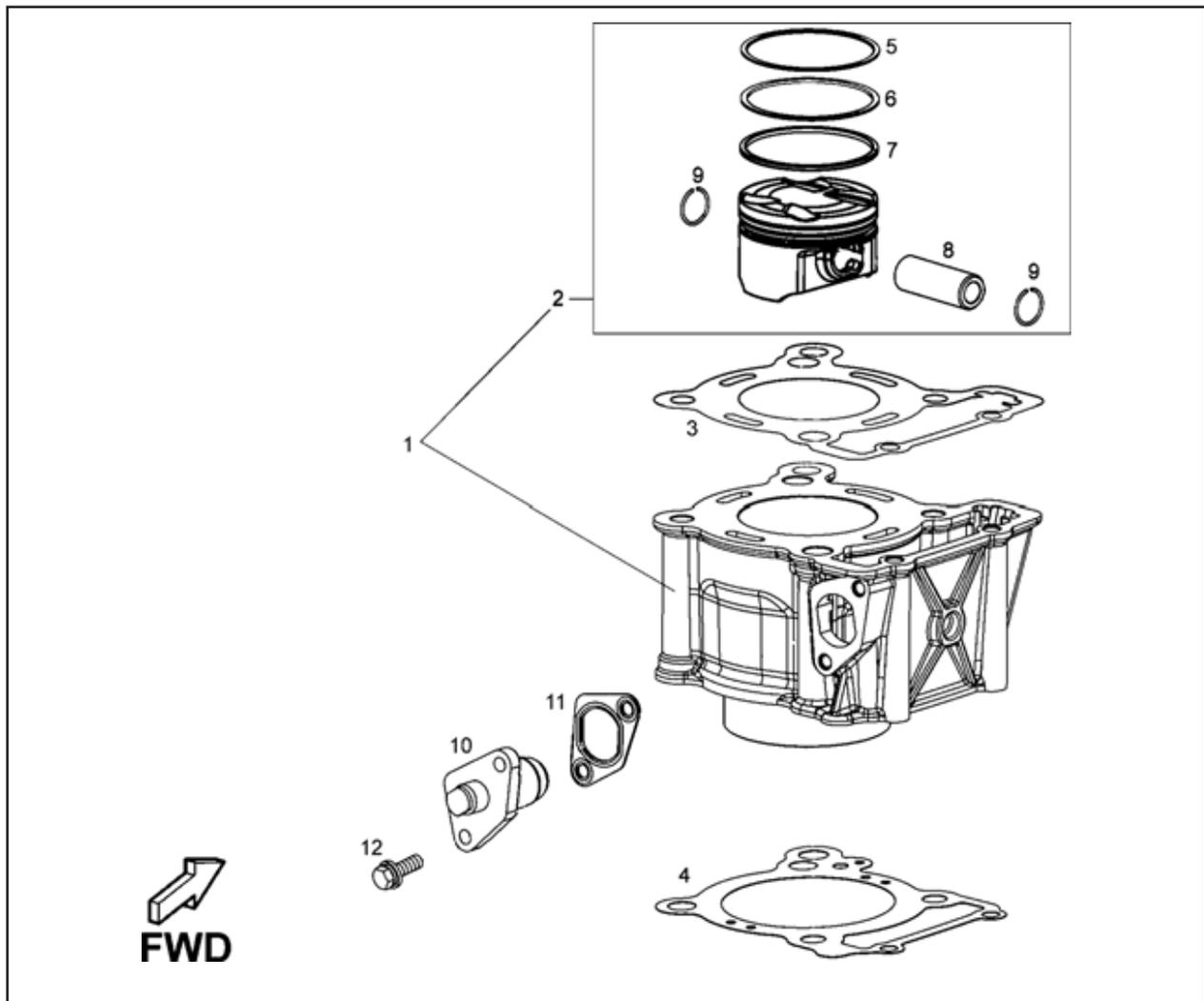
5~6 N·m (3.7~4.4 ft-lb.)



NOTE: Fit a new gasket to the pump cover.

⚠ CAUTION: The clutch cam can only be fitted in one position.

Cylinder Head and Cylinder Parts



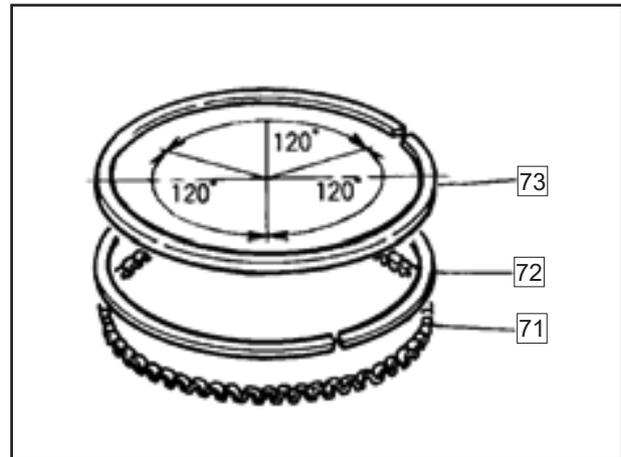
NO.	Part Name
1	Piston-cylinder assy.
2	1st cat. piston assy.
3	Cylinder – cylinder head gasket
4	Cylinder - crankshaft gasket
5	First piston ring
6	Second piston ring
7	Scraper ring
8	Piston gudgeon pin
9	Piston gudgeon pin circlip
10	Chain tensioner
11	Gasket
12	M6x16 bolt

CFMOTO

46. Fit the rings onto the piston in the following order:

- Bottom ring (oil ring) 71.
- Central ring (scraper) 72.
- Top ring (compression) 73.

NOTE: Fit the rings in such a way that the manufacturer's mark is towards the top. Lubricate the piston and the rings well with engine oil.



47. Position:

- The ends of the rings must be staggered 120°.

⚠ CAUTION: Position the ends of the rings at 120° from each other, as shown in the figure.

48. Lubricate:

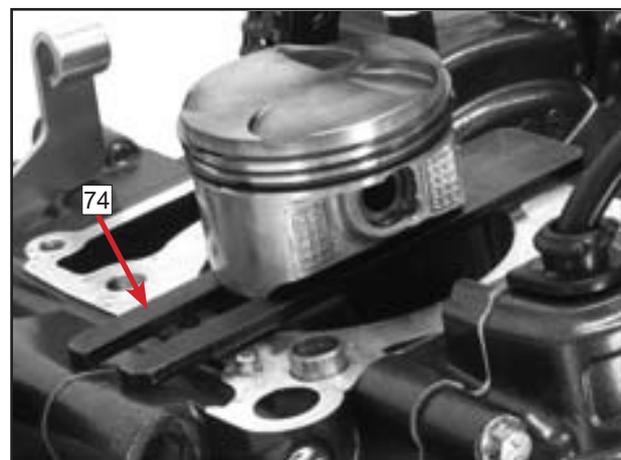
- External surface of the piston
- Rings

49. Fit:

- The tool for supporting the piston 74.

Tool For Supporting The Piston
SH-JC865261

NOTE: Before fitting the piston gudgeon pin securing circlip, cover the base of the cylinder with a cloth to prevent objects from falling into the engine. Apply engine oil to the gudgeon pin.



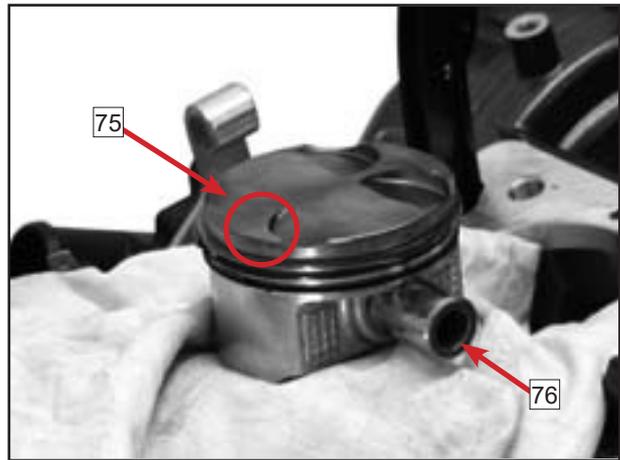
⚠ CAUTION: The piston has a fitting position. Position the (◀) mark pointing towards the exhaust side.

NOTE: The piston and cylinder are paired according to the table below.

Piston Mark	Cylinder Mark
M	M
N	N
O	O
P	P

50. Fit:

- The piston **75**.
- The piston gudgeon pin **76**.



51. Fit:

- The piston gudgeon pin securing circlips **77**.

⚠ CAUTION: Do not re-use the piston gudgeon pin circlips. Always fit new ones.



52. Fit:

- The cylinder bottom gasket **78** (new gasket).

53. Lubricate:

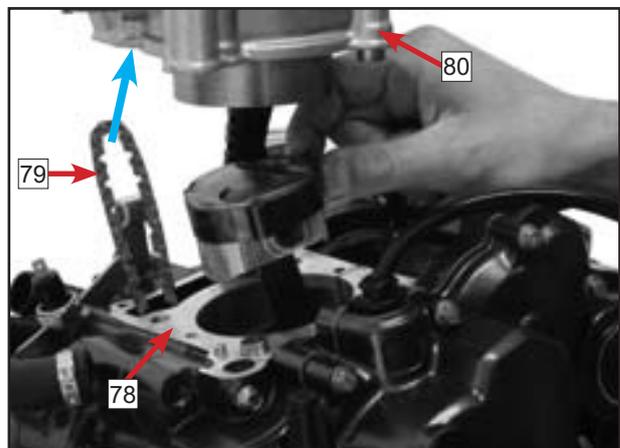
- The internal surface of the cylinder with engine oil.

54. Pass:

- The timing chain **79** through the cylinder slot.

55. Fit:

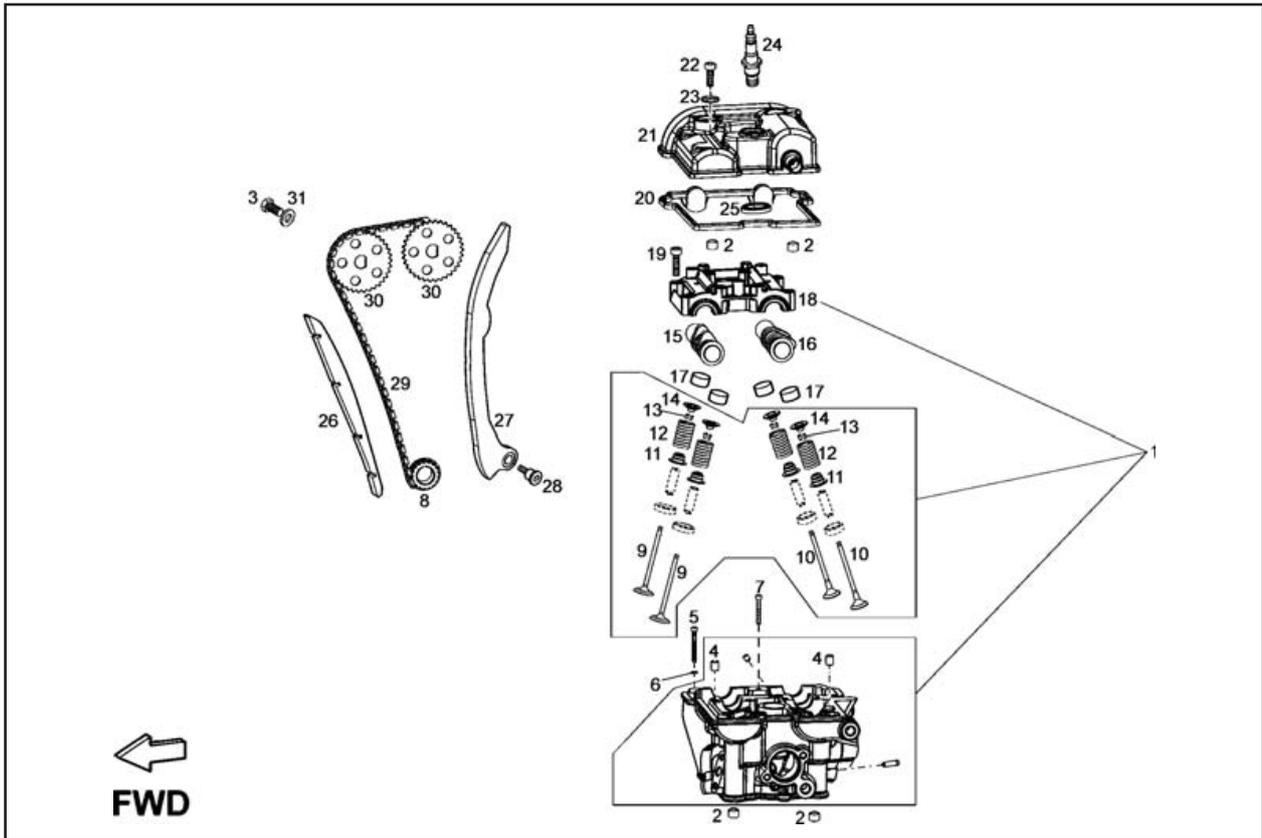
- The cylinder **80**.



NOTE: Do not re-use the cylinder bottom gasket. Always fit a new one. To aid in inserting the piston in the cylinder, use a piston ring compressor.

⚠ CAUTION: Lubricate the internal surface of the cylinder with engine oil.

Valves and Camshaft Parts



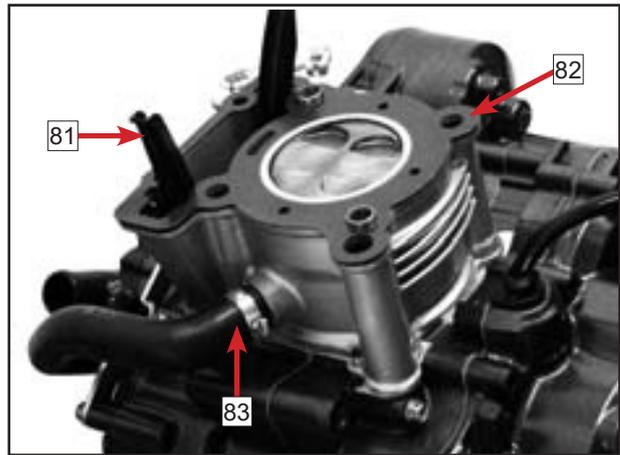
NO.	Part Name	NO.	Part Name
1	Cylinder head assy.	17	Seal washer
2	12x13 centring bush	18	Camshaft cover
3	M8x20x1 bolt	19	M6x40 bolt
4	8x13 centring bush	20	Rocker cover gasket
5	M8x166 bolt	21	Rocker cover
6	8.5x16x1.5 washer	22	Rocker cover bolt
7	M6x130 bolt	23	Valve cover rubber washer
8	Distribution gear	24	NGK CR8EB spark plug
9	125cc exhaust valve	25	Gasket
10	125cc inlet valve	26	Chain guide fixed roller
11	Oil seal	27	Chain tensioner mobile roller
12	Valve spring	28	M6 bolt
13	Valve semi-cone	29	Timing chain
14	Valve top casing	30	Crown wheel
15	Exhaust camshaft	31	8.25x23x4 washer
16	Intake camshaft		

(Continues from point 55)

56. Fit:

- The front timing chain roller **81**.
- The cylinder head gasket **82** (new gasket).
- The coolant pipe **83**.

NOTE: Remember to fit the front chain roller before fitting the cylinder head.

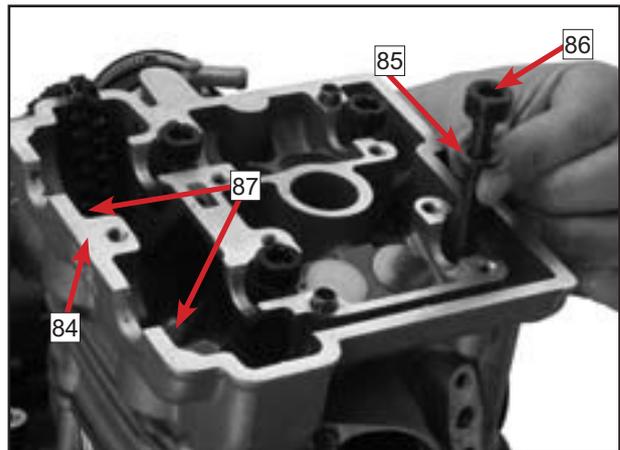


57. Fit:

- The cylinder head (84).

NOTE: Tie a piece of wire to the timing chain to prevent it from dropping into the engine.

⚠ CAUTION: Apply oil to the washers of the 4 bolts joining the cylinder head to the crankcase.



58. Fit:

- The washers **85** impregnated with engine oil onto the M8 bolts **86**.
- The 4 M8 bolts **86** securing the cylinder head to the crankcase.
- The 2 M6 bolts **87** securing the cylinder head to the crankcase.

Bolts securing the cylinder head to the crankcase.

Bolts M8: 27 N·m + 90° (19.9 ft-lb. + 90°)

Bolts M6: 11~13 N·m (8.1~ 9.6 ft-lb.)

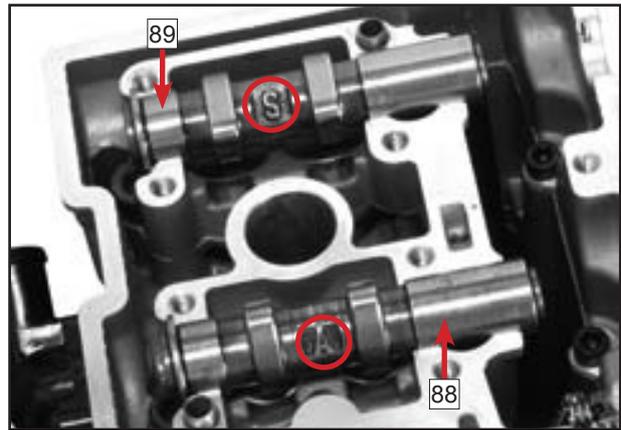
⚠ CAUTION: Tighten the M8 bolts first. Tighten the cylinder head bolts in succession crosswise, going from one to the other two or three times.

NOTE: After tightening the M8 bolts to their indicated torque, they should be turned another 90° (1/4 of a turn).

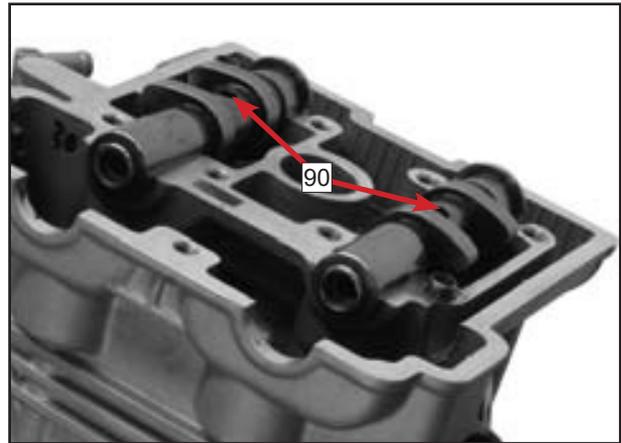
59. Fit:

- A little engine oil to the camshaft supports.
- The camshafts onto their housings:
 - The inlet camshaft 88.
 - The exhaust camshaft 89

NOTE: The inlet camshaft bears the inscription "A". The exhaust camshaft bears the inscription "S".



NOTE: Position the camshaft locking orifices 90 facing upwards.



60. Fit:

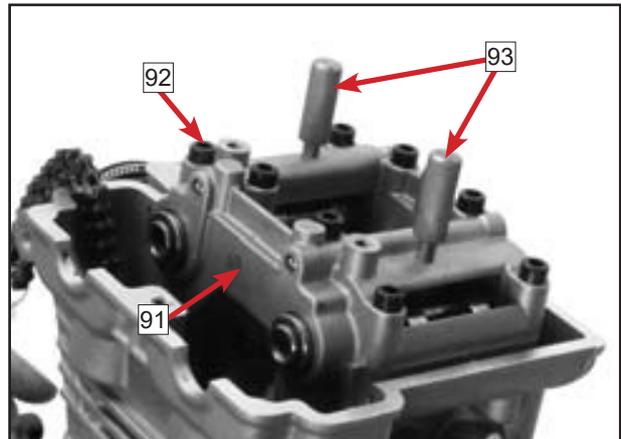
- The camshaft bridge 91.
- The 8 bolts 92 into the camshaft bridge (tighten them by following a cross pattern).

The bolts (camshaft bridge):

10~12 N·m (7.3~ 8.8 ft-lb.)

- The locking pins 93.

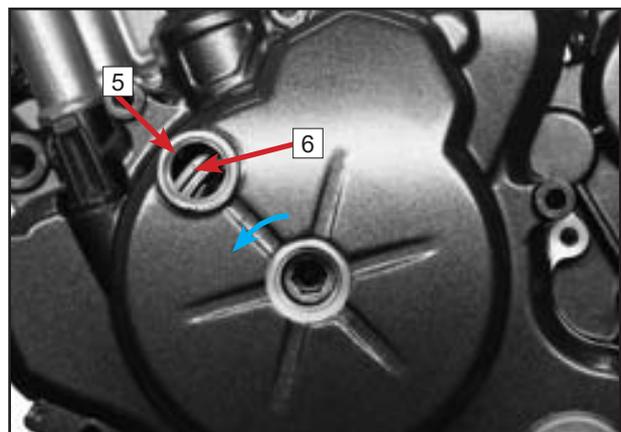
Camshaft Locking Pin
SH-JC7DM409/0379



61. Position:

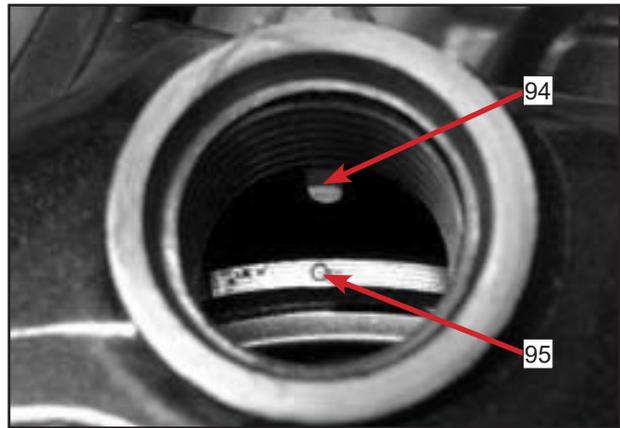
- The piston at top dead centre (TDC) on the compression stroke. To do so, turn the crankshaft in an **anticlockwise direction** with an Allen key until the mark 5 is lined up with the mark to be found on the flywheel 6.

⚠ CAUTION: Turn the crankshaft in an anticlockwise direction. Attempting to turn it in the opposite direction may cause serious damage to the engine.

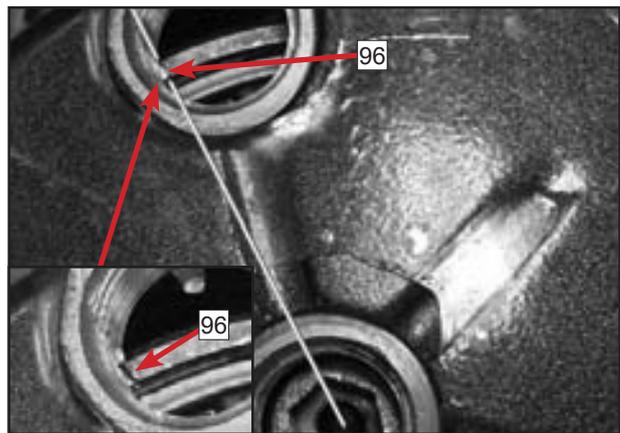


Detail showing the alignment of the mark **94** with that existing on the flywheel **95**.

NOTE: Up to engine number 7015, the mark **95 (a circle) does not exist. On these engines (from 0001 to 7015), the mark **95** is a line **96** which has to be aligned with the end of the orifice.**



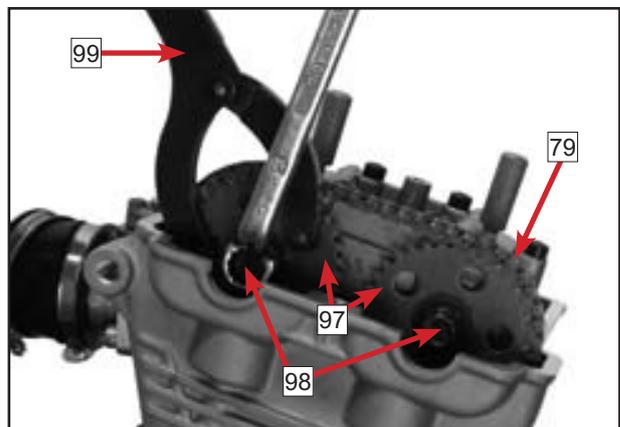
Detail of alignment of the line **96** with the end of the inspection the orifice (from engine NOS. 0001 to 7015).



62. Fit:

- The timing chain **79** over the sprockets.
- The camshaft sprockets **97**.
- Apply Loctite 270-type thread sealant to the 2 bolts **98** before fitting them.
- The camshaft sprocket washers and bolts **98**.
- The sprocket locking tool **99**.

**Camshaft Sprocket Locking Tool
SH-JC865259**

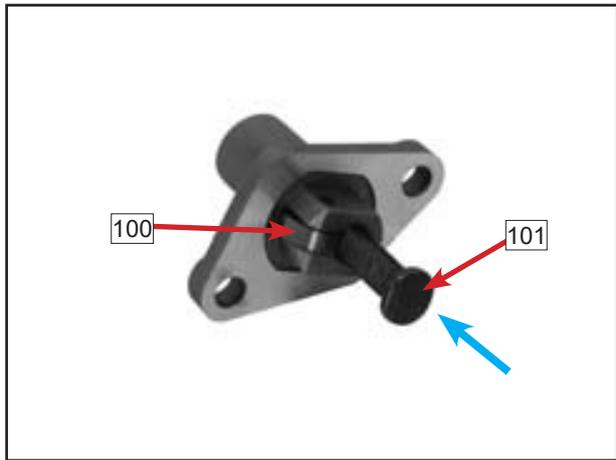


⚠ CAUTION: Make sure the TDC mark on the flywheel is correctly aligned before fitting the camshaft sprockets. Do not tighten the sprockets to their torque setting until the subsequent tensioning of the timing chain has been performed.

63. Adjusting the tensioner:

- Press the tab 100.
- Push the timing chain tensioner 101.
- Release the tab 100.

⚠ CAUTION: Do not tighten the sprockets to their torque setting until the subsequent tensioning of the timing chain has been performed.

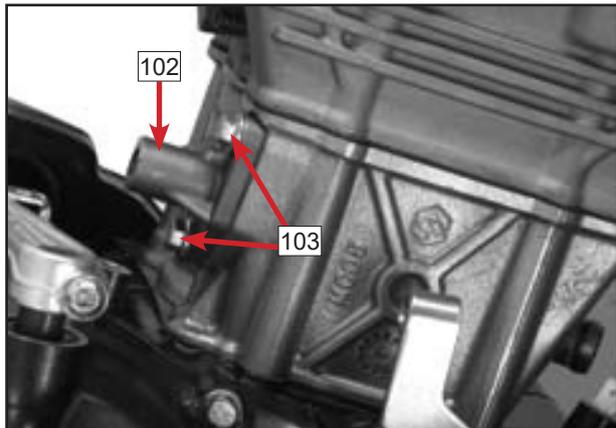


64. Fit:

- A NEW tensioner seal.
- The timing chain tensioner 102.
- The 2 tensioner bolts 103.

Timing chain tensioner bolts:

11~13 N·m (8.1~ 9.6 ft-lb.)



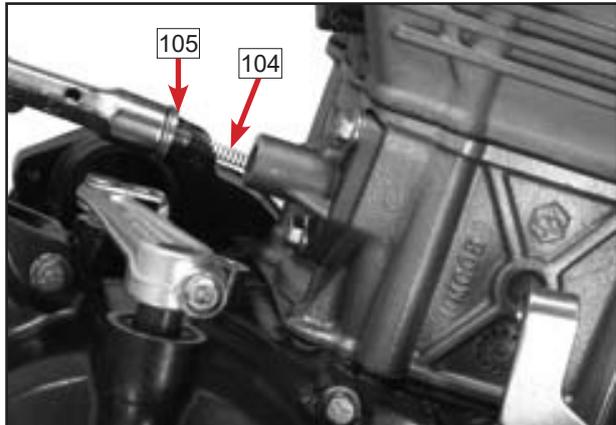
65. Fit:

- The spring 104, pressing it down until the bolt is in position.
- The tensioner central bolt 105.

Central timing chain tensioner bolt:

8~10 N·m (5.9~ 7.3 ft-lb.)

⚠ CAUTION: Make sure that 270-type thread sealant has been applied to the sprocket bolts.



66. Fit:

- The camshaft sprocket locking tool 99.

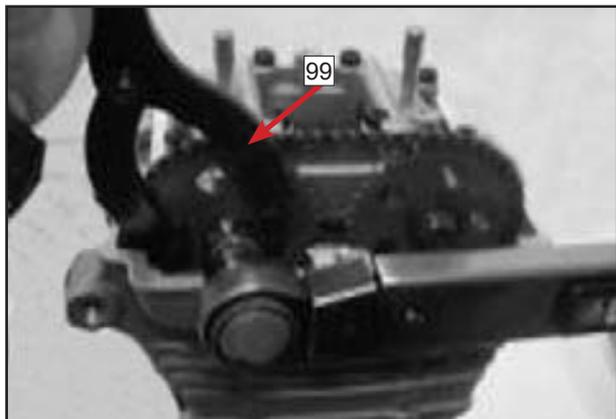
**Camshaft Sprocket Locking Tool
SH-JC865259**

67. Tighten:

- The 2 bolts on the sprockets to the nominal torque.

Sprocket bolts:

25~27 N·m (18.4~ 19.9 ft-lb.)



68. Remove:

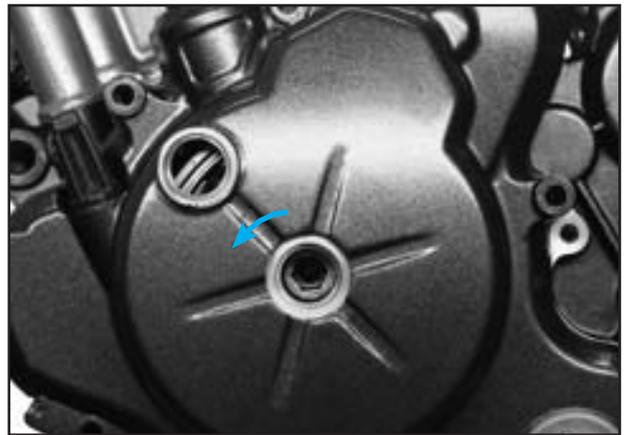
- The locking pins 93.

69. Check:

- The correct functioning of the timing by turning the crankshaft a number of times.



⚠ CAUTION: Turn the crankshaft in an anticlockwise direction. Attempting to turn it in the opposite direction may cause serious damage to the engine.



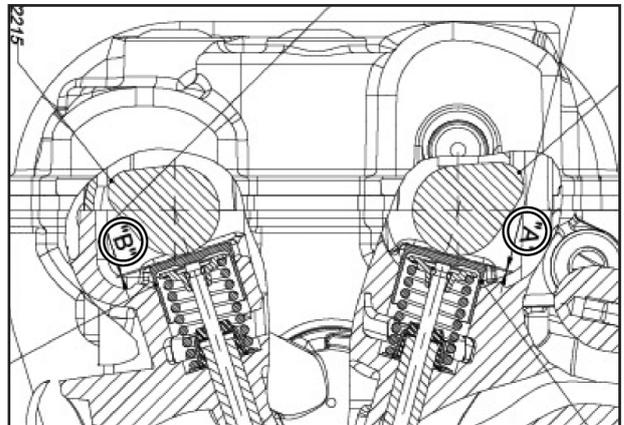
70. Check:

- Valve settings. Use a feeler gauge to check that the clearance between the cam and the valve shim corresponds to the values indicated:

Inlet Valves: 0.10~0.15 mm (Cota A)

Exhaust Valves: 0.15~0.20 mm (Cota B)

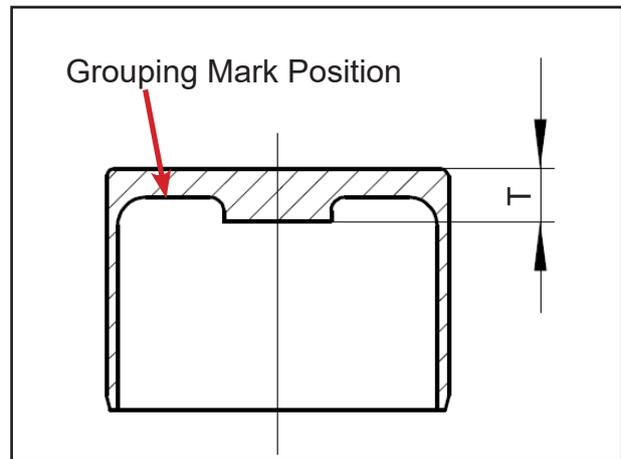
Outside that specified => Adjust setting
Within that specified => Refit the cylinder head



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Valve shims are grouped according to thickness T as follows:

Valve Shims T Size Grouping	
Mark	T(mm)
200	2.200
250	2.250
300	2.300
350	2.350
400	2.400
450	2.450
500	2.500
550	2.550
600	2.600
650	2.650
700	2.700
750	2.750



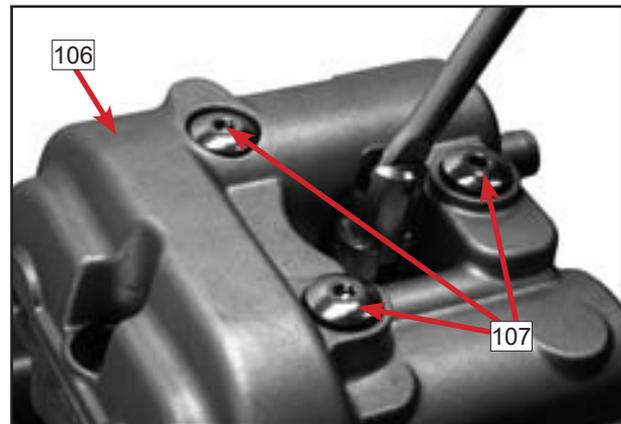
71. Fit:

- The rocker cover 106.
- The 4 rocker cover bolts 107.
- The spark plug.

Rocker cover bolts:

10~12 N·m (7.3~ 8.8 ft-lb.)

NOTE: Make sure that the rocker cover gasket is properly positioned around the spark plug housing.



Spark plug:

12~14 N·m (8.8~ 10.3 ft-lb.)

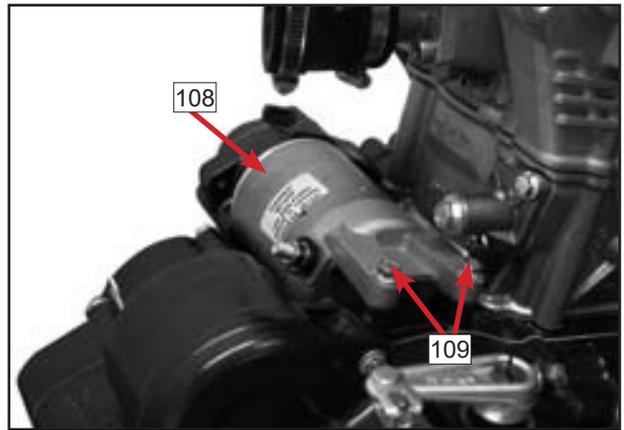
72. Fit:

- The starter motor [108].
- The 2 bolts [109] securing the starter motor.

NOTE: Apply Loctite 243-type thread sealant to the 2 bolts before fitting them.

Starter motor bolts:

11~13 N·m (8.1~ 9.6 ft-lb.)

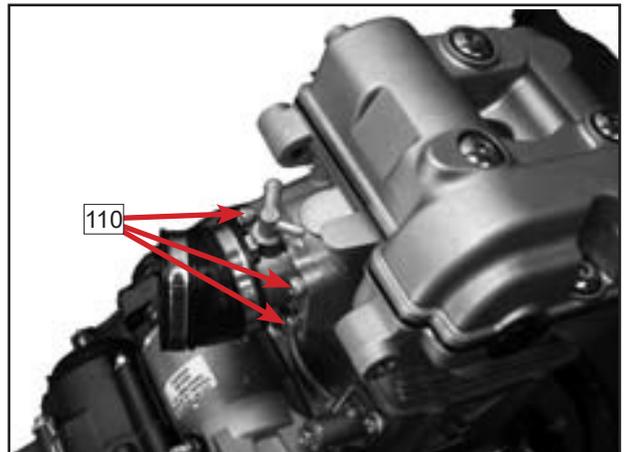


73. Fit:

- The inlet manifold, using the 3 bolts [110].

Inlet manifold bolts:

11~13 N·m (8.1~ 9.6 ft-lb.)

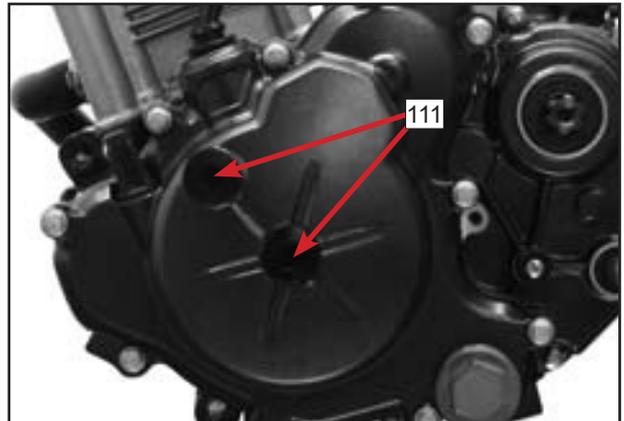


74. Fit:

- The inspection plugs [111] onto the flywheel cover.

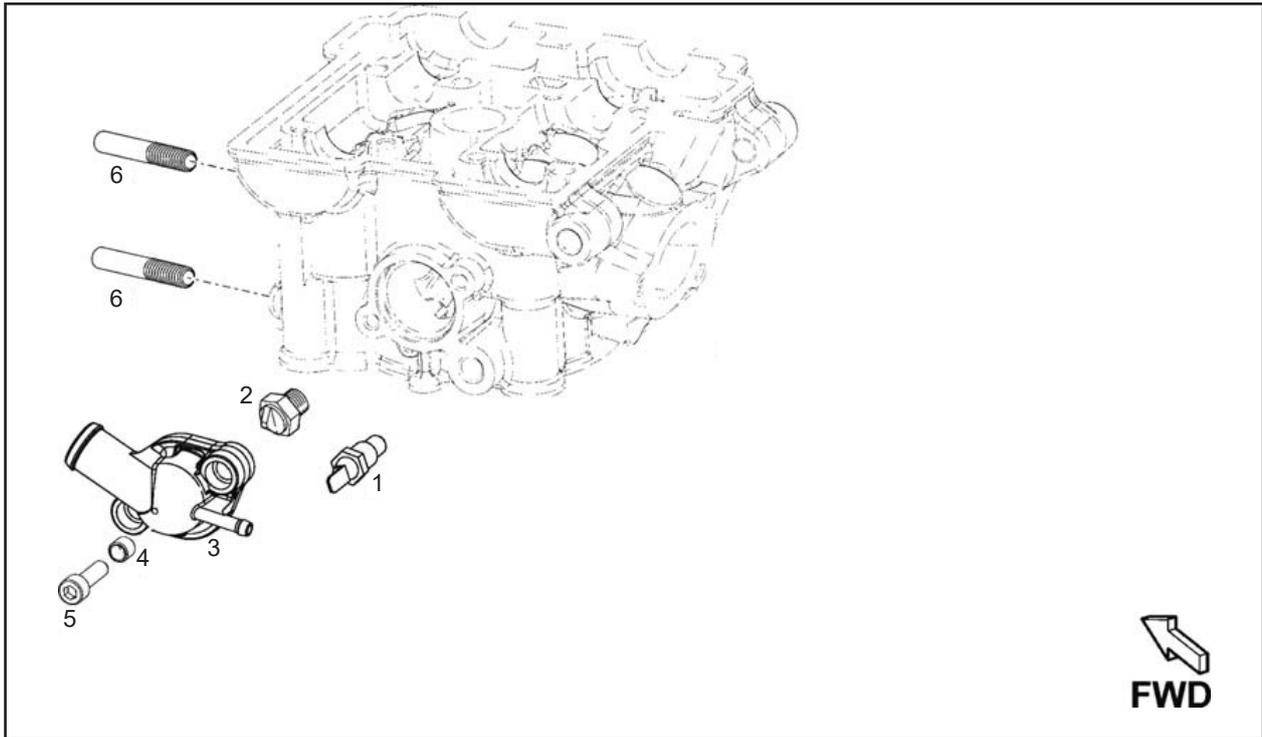
Inspection plugs:

3.5~4.5 N·m (2.6~ 3.3 ft-lb.)



⚠ CAUTION: Once the engine has been refitted onto the chassis, ensure that the oil level in the engine is correct before starting it up.

Thermostat Parts

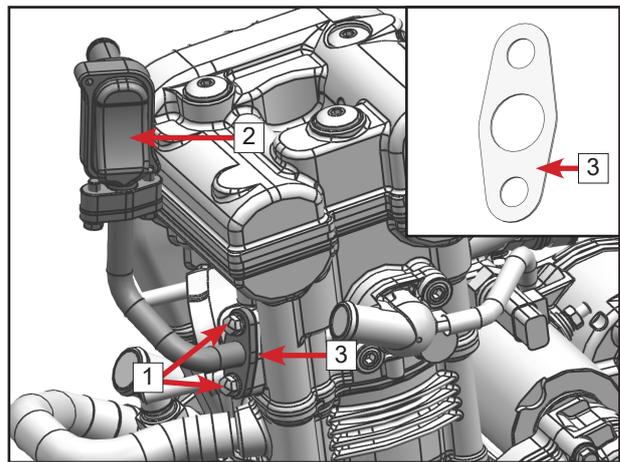


NO.	Part Name
1	Thermistor
2	Thermostat
3	Thermostat cover
4	6.3x8x6.8 bush
5	M6x20 bolt
6	Studs

5.6 Engine Installation

SAS One-way Valve Assembly Installation

Install SAS one-way valve assembly **2** and secondary gulp pipe seal gasket **3**.
Install bolts **1**.

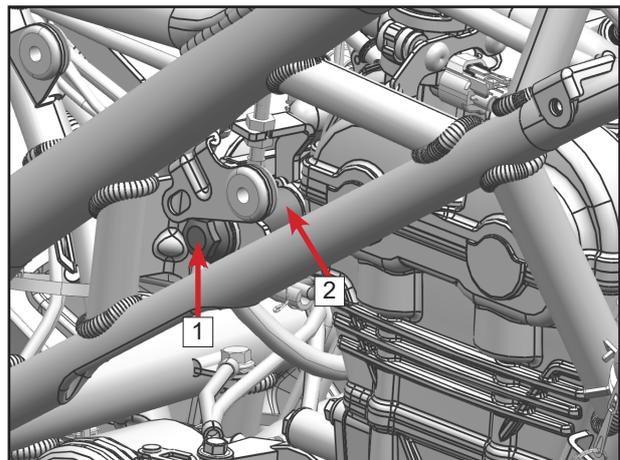


Engine Installation

Carefully place the engine in the frame and align the mounting holes.

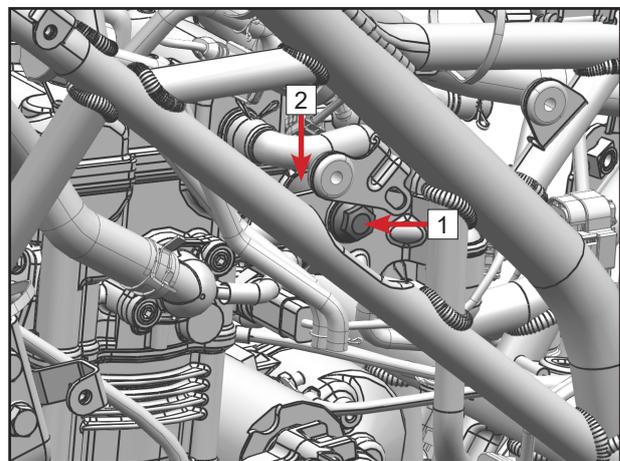
On the right side of vehicle:

Install engine upper mounting bolt **1** and engine upper mounting bushing **2**.

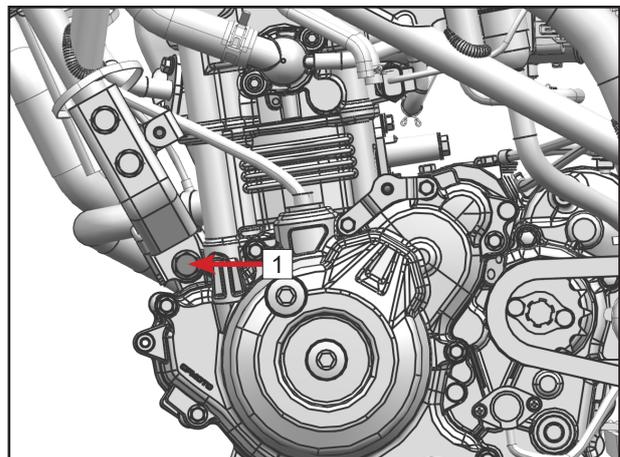


On the left side of vehicle:

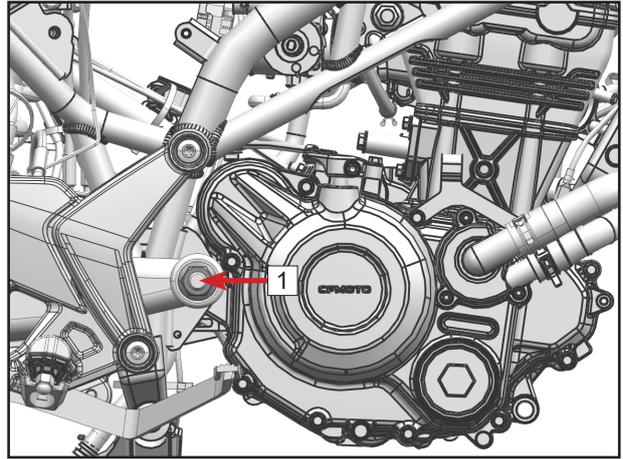
Install engine upper mounting bolt **1** and engine upper mounting bushing **2**.



Install the engine front suspension shaft **1**.

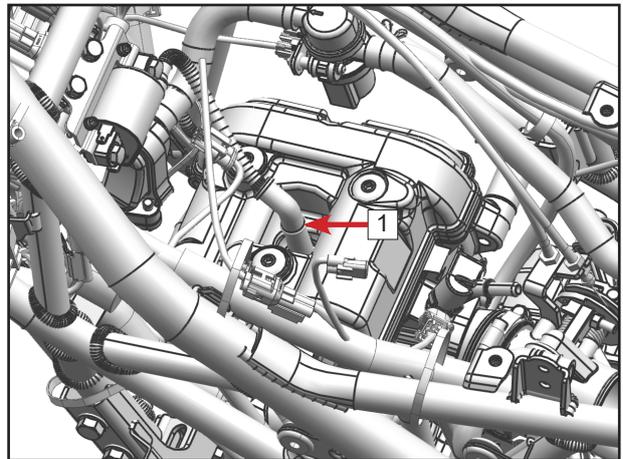


Install rear fork shaft/nut **1**.

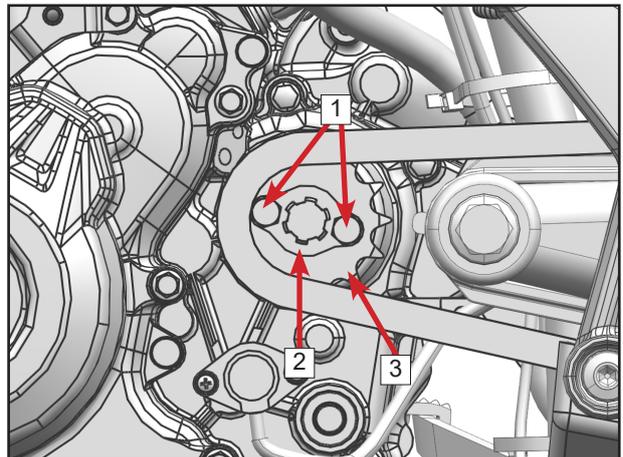


Plug in the fuel injector connector.
Plug in the TPS sensor connector.
Plug in the idle air control valve (IACV) connector.
Plug in the gear sensor connector.
Plug in the magneto stator connector.
Plug in the coolant temperature sensor connector.

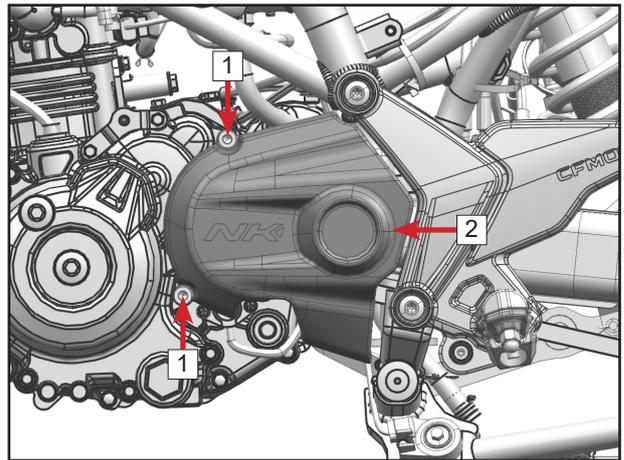
Install ignition coil **1**.



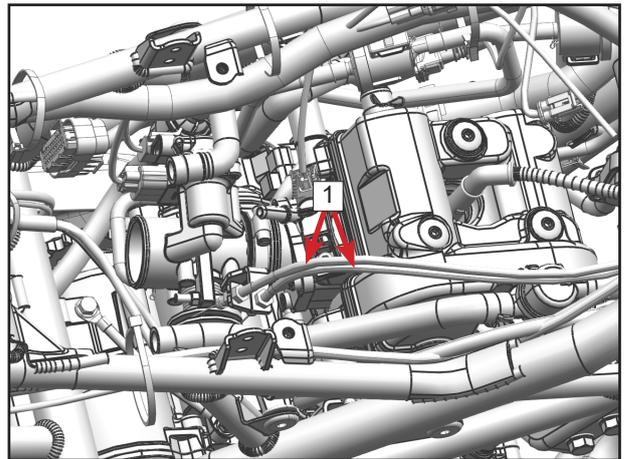
Hang the chain on the sprocket **3**.
Install sprocket **3** and chain.
Install sprocket panel **2**.
Install bolts **1**.



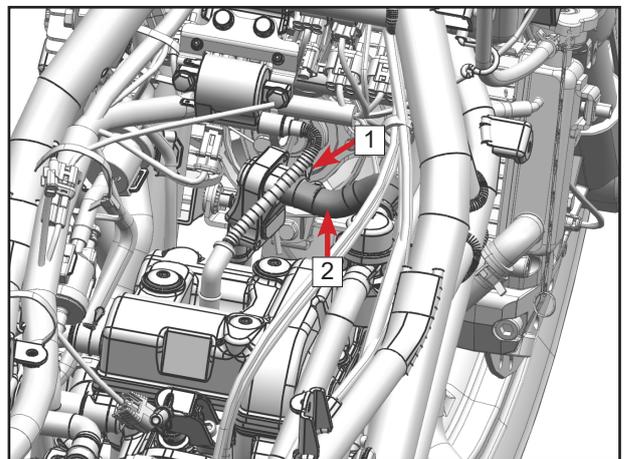
Place the rear LH cover assembly **2** in place.
Install screws **1**.



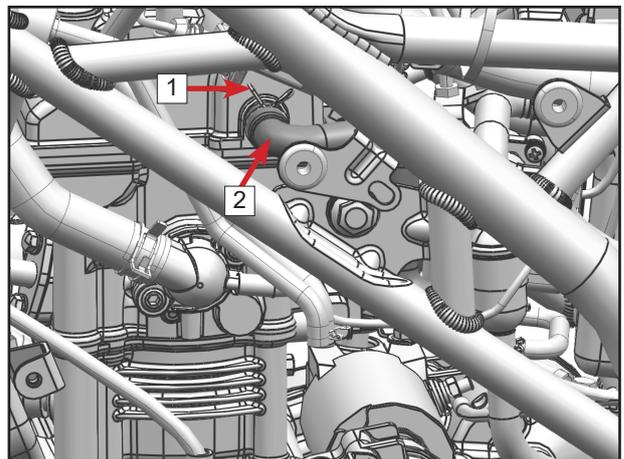
Install throttle cable **1** to throttle body assembly.



Install the engine intake pipe of secondary gulp valve **2** to the SAS one-way valve.
Tighten the clamp **1**.

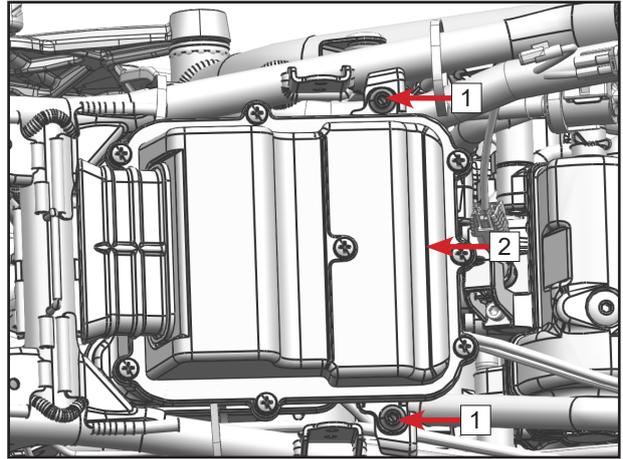


Install the oil and gas separator intake pipe **2** to the engine.
Tighten the clamp **1**.

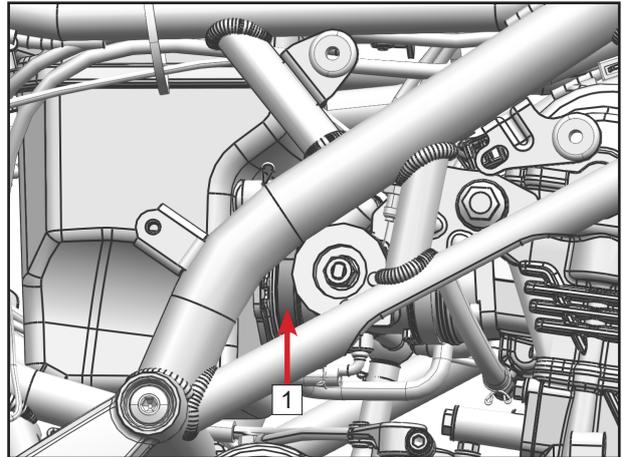


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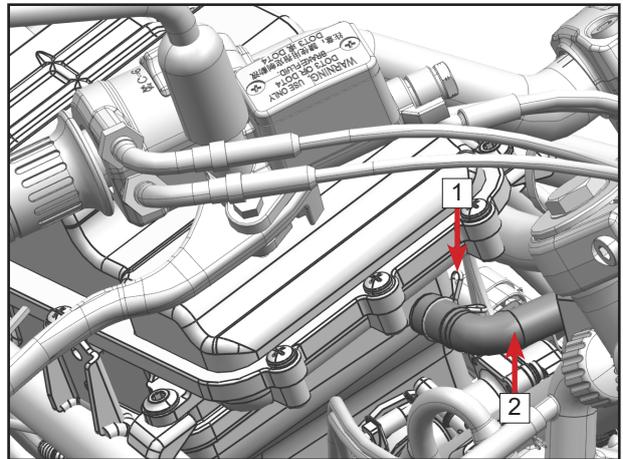
Place the air filter housing assembly **2** in place.
Install screws **1**.



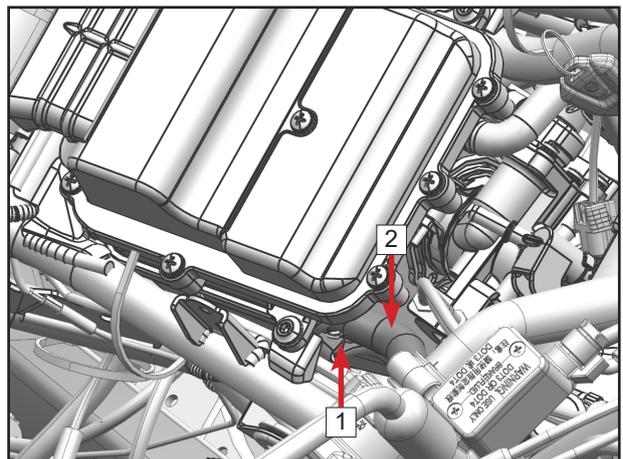
Tighten the clamp **1**.



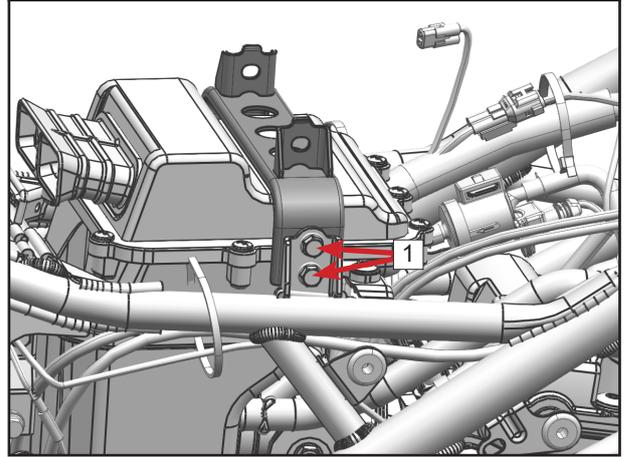
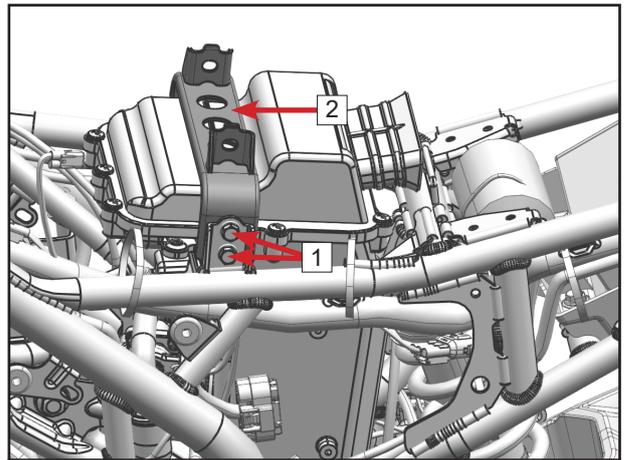
Install the oil and gas separator outlet pipe **2** to the air filter lower housing.
Tighten the clamp **1**.



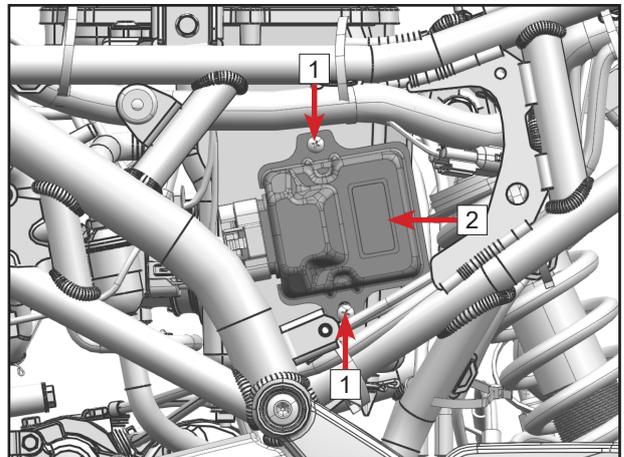
Install the air filter outlet pipe of secondary gulp valve **2** to the air filter lower housing.
Tighten the clamp **1**.



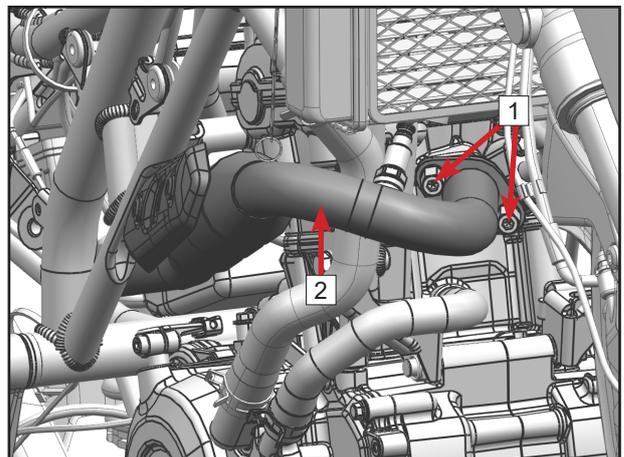
Place the fuel tank rear mounting bracket assembly **2** in place.
Install bolts **1**.



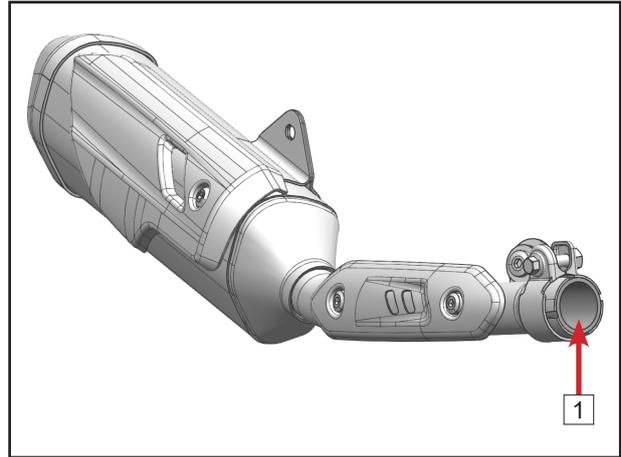
Place the ECU **2** in place.
Install self-tapping screws **1**.



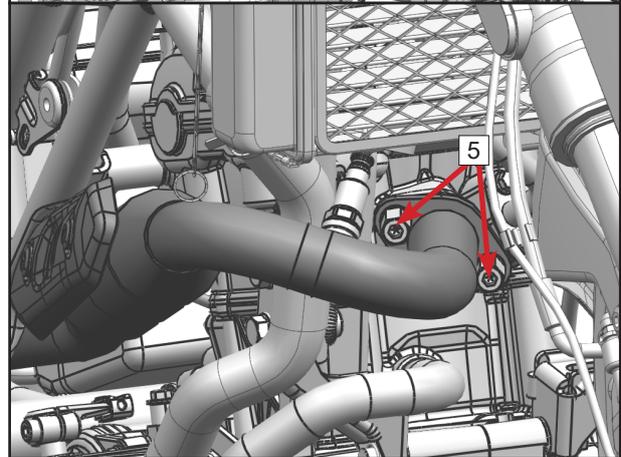
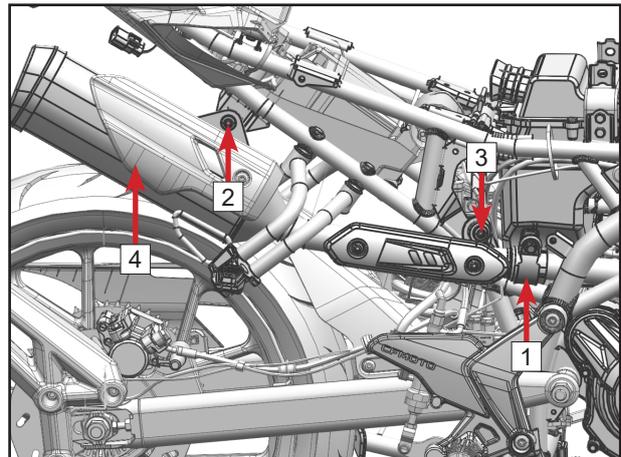
Make sure that the exhaust gasket is installed. (If the exhaust gasket is aged or damaged, it should be replaced in time)
Put the exhaust pipe assembly **2** in place.
Install exhaust pipe nuts **1**, but not tighten.



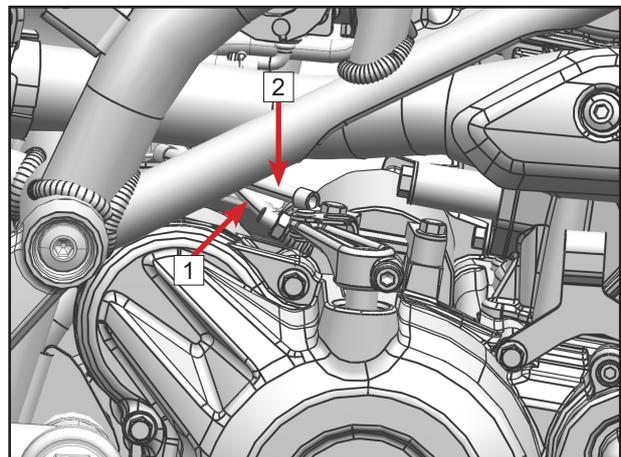
If the graphite seal ring **1** is aged or damaged, it should be replaced in time.



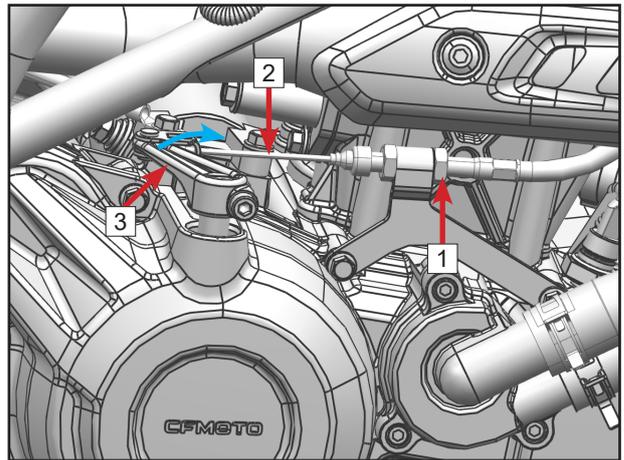
Install the muffler body assembly **4** in place.
Install and tighten screw **2** and screw **3**.
Tighten nut **5**.
Tighten the clamp **1**.
Plug in the oxygen sensor connector.



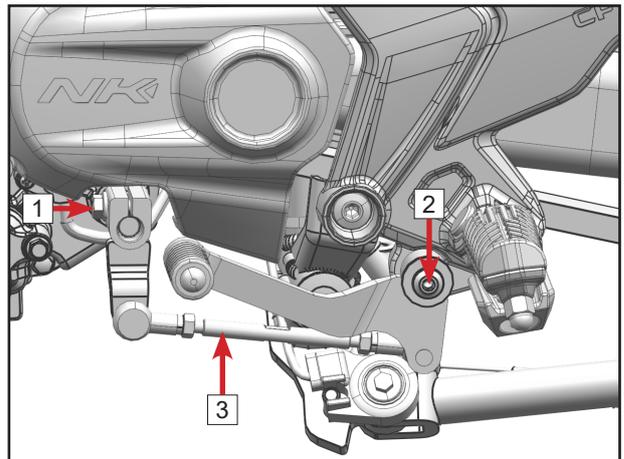
Place the positive cable **1** in place, then install the positive cable fixing nut.
Place the negative cable **2** in place, and then install the negative cable fixing bolt.



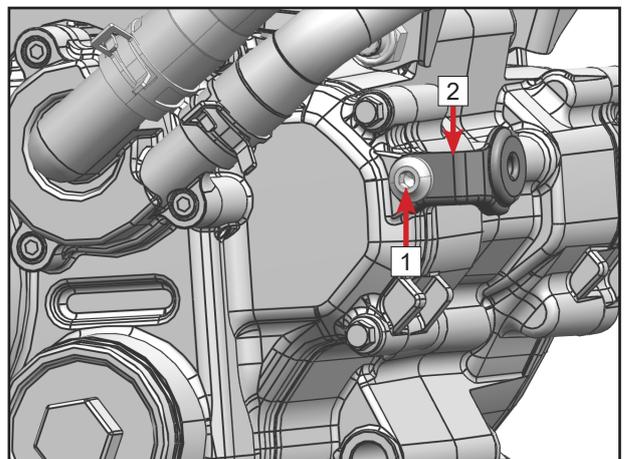
Turn the clutch release lever **3** clockwise and install the clutch cable **2**.
Tighten the nut **1**.



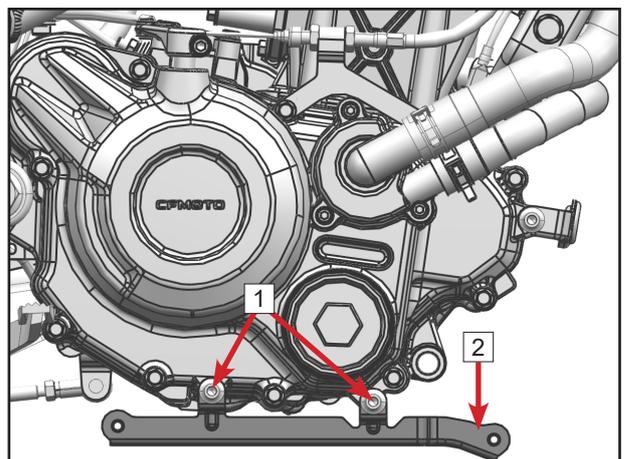
Install shift lever assembly **3**.
Install screw **2** and washer.
Install bolt **1**.



Place the RH upper mounting bracket assembly **2** of the lower deflector in place.
Install screw **1**.

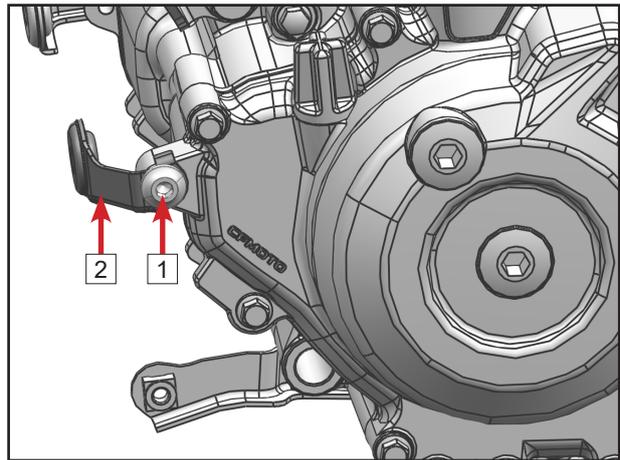


Place the RH mounting bracket assembly **2** of the lower deflector in place.
Install screws **1**.

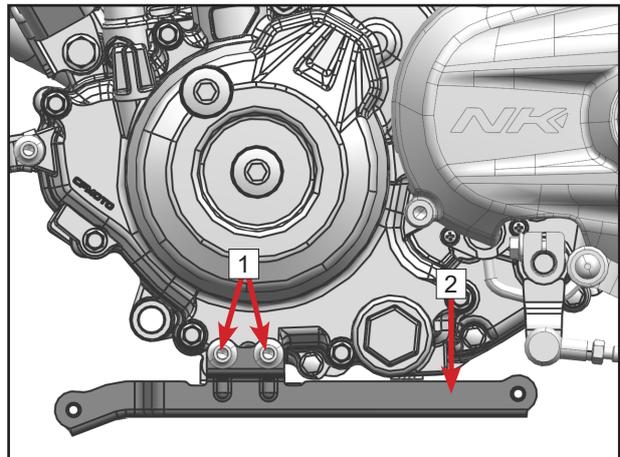


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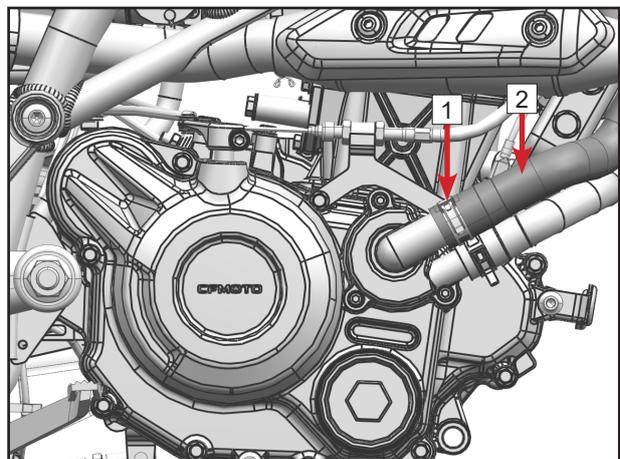
Place the LH upper mounting bracket assembly **2** of the lower deflector in place.
Install screw **1**.



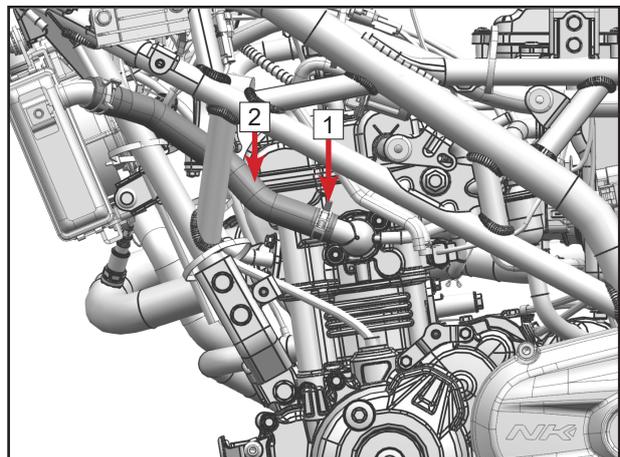
Place the LH mounting bracket assembly **2** of the lower deflector in place.
Install screws **1**.



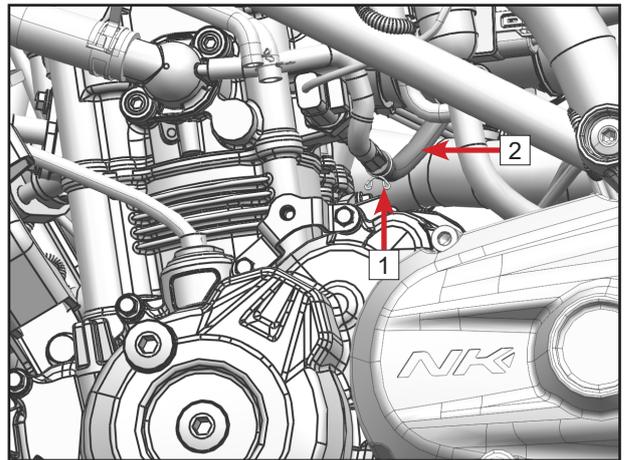
Install radiator outlet pipe **2** on the water pump cover.
Tighten clamp **1**.



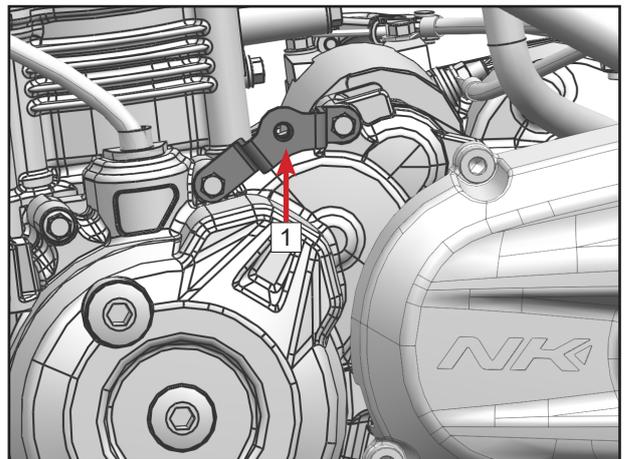
Install radiator inlet pipe **2** on the thermostat cover.
Tighten clamp **1**.



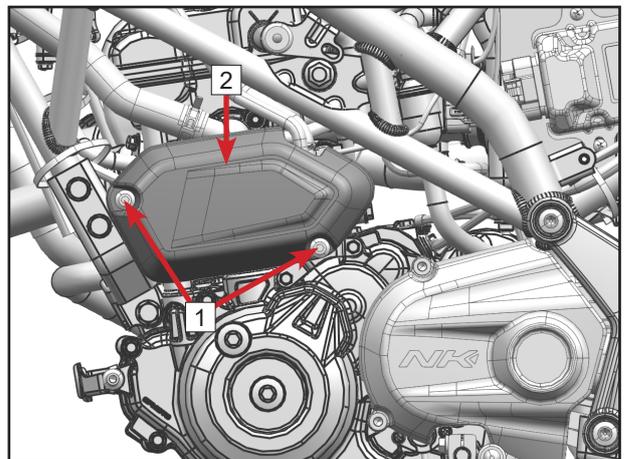
Install the thermostat connecting water pipe **2** to the pipe joint.
Tighten clamp **1**.



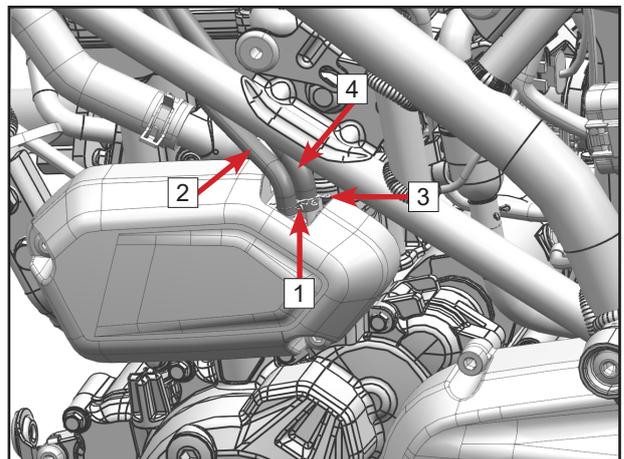
Ensure that canister brackets **1** are installed.



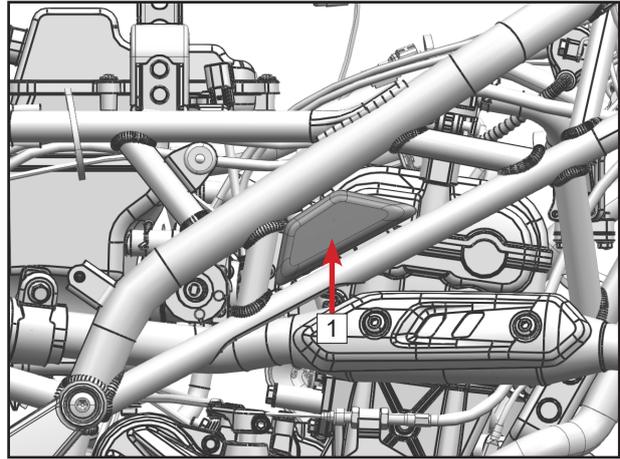
Place the canister deco cover **2** and canister in place.
Install screws **1**.



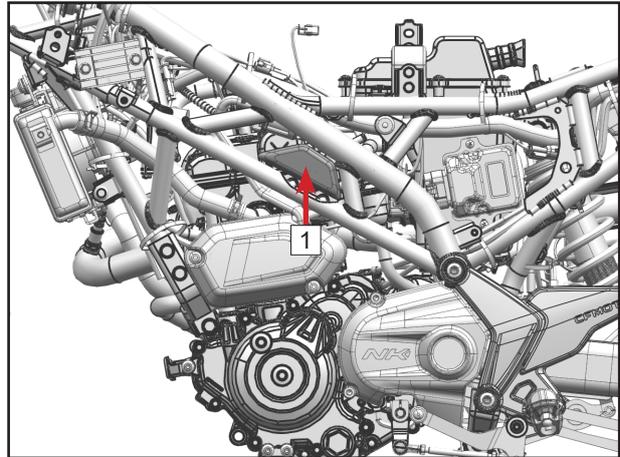
Install the pipe **4** to the canister, and tighten the clamp **3**.
Install the pipe **2** to the canister, and tighten the clamp **1**.



Install the frame RH deco cover **1**.



Install the frame LH deco cover **1**.



Install the fuel tank.
Add coolant and exhaust the cooling system.

Refer to Chapter 03 to install:

- Engine Panel Assembly
- RH Panel/ Water Tank RH Inner Panel Assembly
- LH Panel/ Water Tank LH Inner Panel Assembly
- Rear RH Deco Plate
- Rear LH Deco Plate
- Fuel Tank Panel Assembly
- Water Tank RH Outer Panel
- Water Tank LH Outer Panel
- Front RH Inner Side Plate
- Front LH Inner Side Plate
- Frame RH Panel
- Frame LH Panel

Install the seat.

5.7 Engine Lubricate System

5.7.1 Engine Oil Level Inspection

Ensure that the vehicle is on level ground. Start the engine and let the engine run at idle for a few minutes.

Turn off the engine and wait a few minutes until all the oil flows back to the crankcase. Remove the oil gauge and wipe the oil off it.

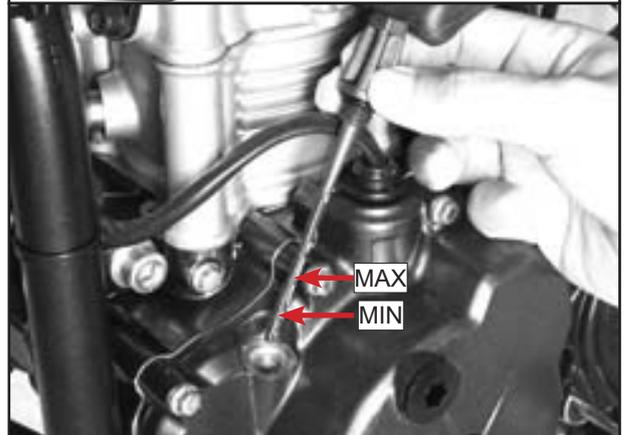
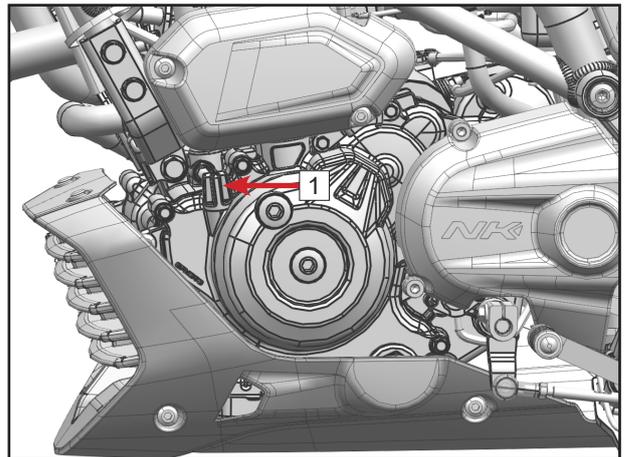
Upright the vehicle on the level surface, then screw the oil gauge into the LH crankcase cover.

Remove the oil gauge and observe the oil level.

Maintain the level between “upper” line (MAX) and “lower” line (MIN).

Add or remove engine oil until the oil level is right.

NOTE: Strictly follow the procedure to prevent a wrong oil level indication.



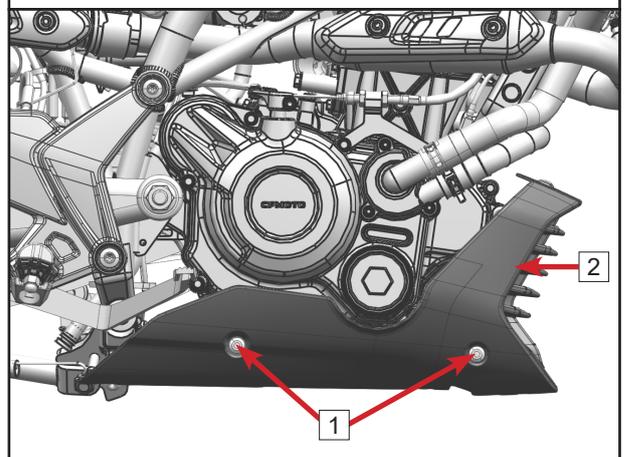
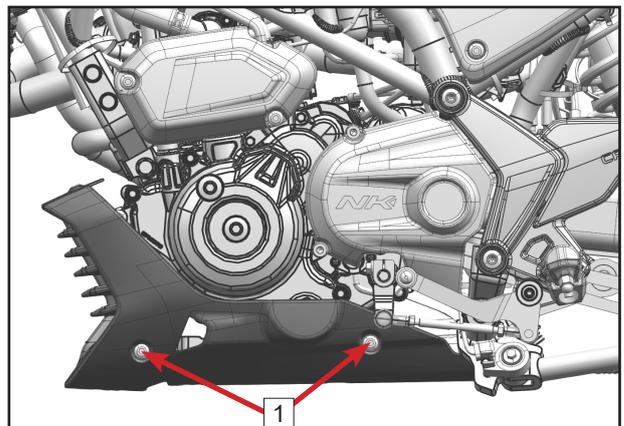
5.7.2 Engine Oil Replacement

NOTE: Wait until engine temperature is appropriate for replacement. Replace engine oil and filter at the same time when the engine is warm.

Make sure the vehicle is on level ground.

Remove screws **1**.

Remove engine panel assembly **2**.



Wipe the area of oil drain plug clean.
Place a suitable oil container at the bottom of the engine (where the oil drain plug is located).

Remove the drain plug **1**.

Wait for several minutes to drain the oil completely from the engine crankcase.

Remove the oil strainer.

NOTE: Oil condition reflects engine condition. Check the engine oil for metal shavings or heavy residue. Presence of a small amount of fine particles is considered normal wear. Presence of heavy debris indicates a potential failure inside the engine, which should be investigated.

Clean the drain plug and oil strainer.

Install the oil strainer.

Install drain plug and tighten to the specified torque.

Drain Plug	
Torque	24 ~ 30 N·m (17.7 ~ 22.1 ft-lb.)

Oil Filter Replacement

The disassembly of oil filter element see the chapter "Engine Removal" for details.

The assembly of oil filter element see the chapter "Engine Installation" for details.

Oil Filling

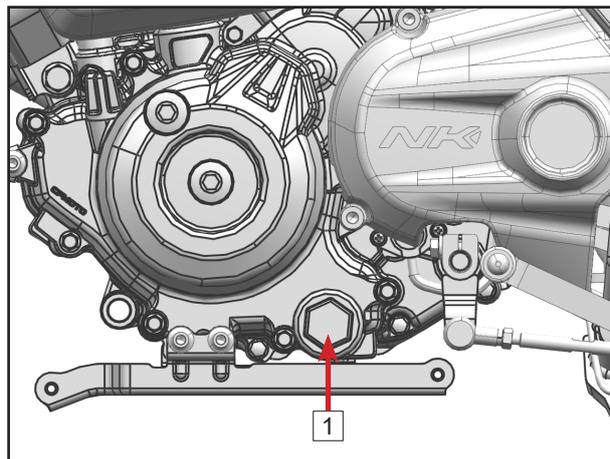
Remove the oil gauge **1**.

Fill the engine with the recommended oil through the oil gauge mounting hole.

Engine Oil Capacity (Replace oil and oil filter at the same time)	
Capacity	1.1L
Oil Type	SAE 10W-40, API SF or higher

Install the oil gauge, start the engine, and ensure that there is no leakage at the oil filter or drain plug.

After filling the oil, check the oil level (refer to the engine oil level inspection described above).



5.8 Air Intake System

5.8.1 Air Filter Element Maintenance

NOTE: If the vehicle is used in severe conditions, increase the frequency of air filter inspections and maintenance (refer to Maintenance Chart).

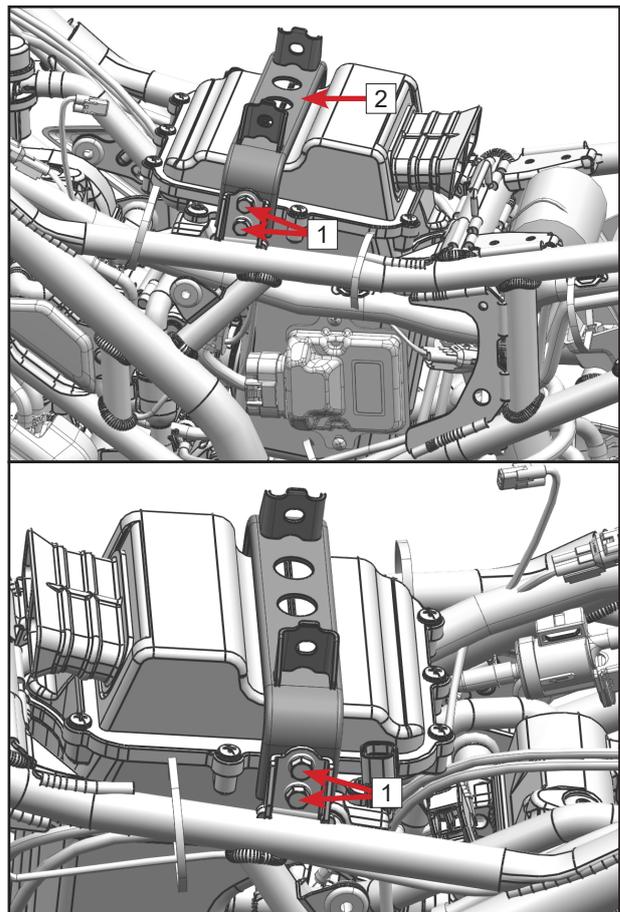
Removal

Refer to the relevant chapters to remove:

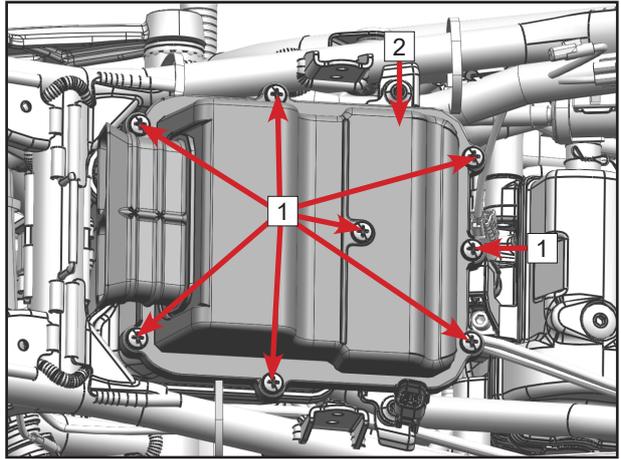
- Seat
- Frame LH panel
- Frame RH panel
- Front LH inner side plate
- Front RH inner side plate
- Reservoir LH outer panel
- Reservoir tank RH outer panel
- Fuel tank panel assembly
- Rear LH deco plate
- Rear RH deco plate
- LH panel/reservoir tank LH inner panel assembly
- RH panel/reservoir tank RH inner panel assembly
- Fuel Tank

Remove bolts **1**.

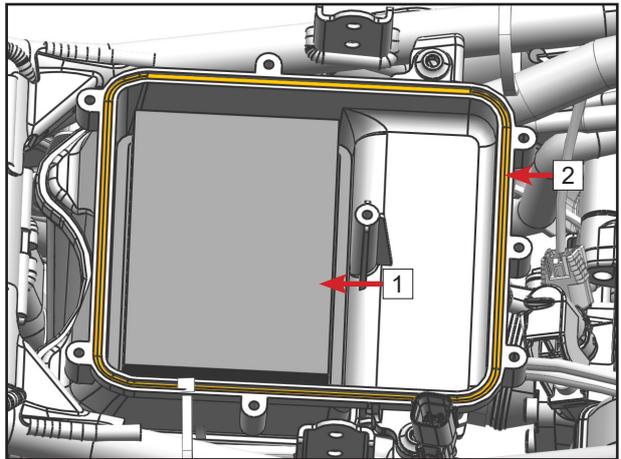
Remove fuel tank rear mounting bracket assembly **2**.



Remove self-tapping screws **1**.
Remove air filter upper housing assembly **2**.



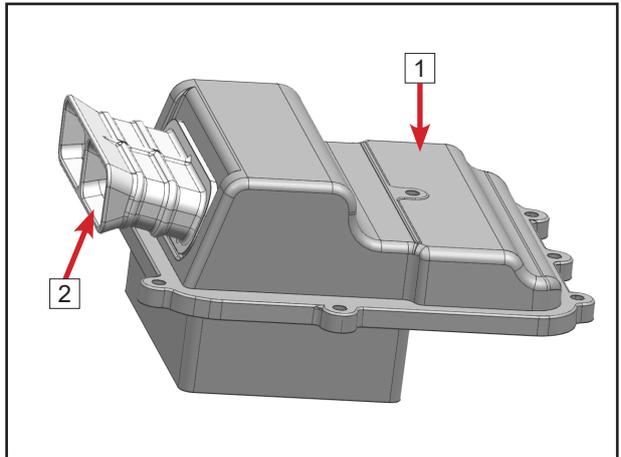
Remove the air filter element **1**.
Remove the sealing strip **2**.



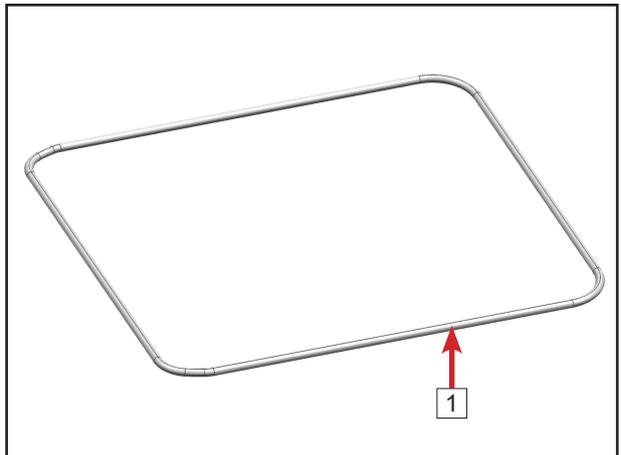
Inspection

Check whether the air filter housing **1** is cracked or otherwise damaged.
Check whether the air filter inlet pipe **2** is cracked, aged or otherwise damaged.
If any abnormality is found, replace the air filter upper housing and the air filter inlet pipe as an assembly.

Clean the air filter upper housing and air filter inlet pipe.

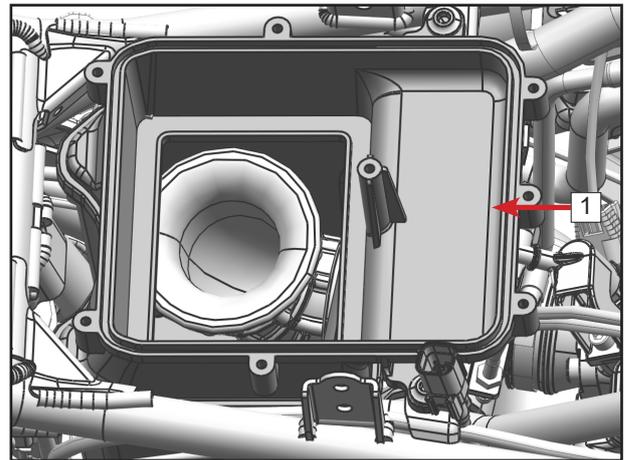


Check whether the sealing strip **1** is cracked, hardened or otherwise damaged.
If yes, replace it with a new one.



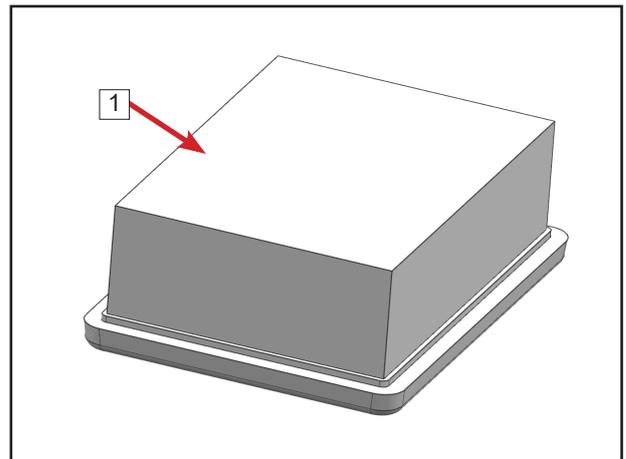
Clean air filter middle/lower housing **1**.

NOTE: If sand or other particles are found in the air filter middle/lower housing, use the vacuum cleaner to clean it.



Check the air filter element **1** to determine whether the element needs to be replaced. If the filter does not need to be replaced, clean the filter. Flick the thick dust from the paper filter.

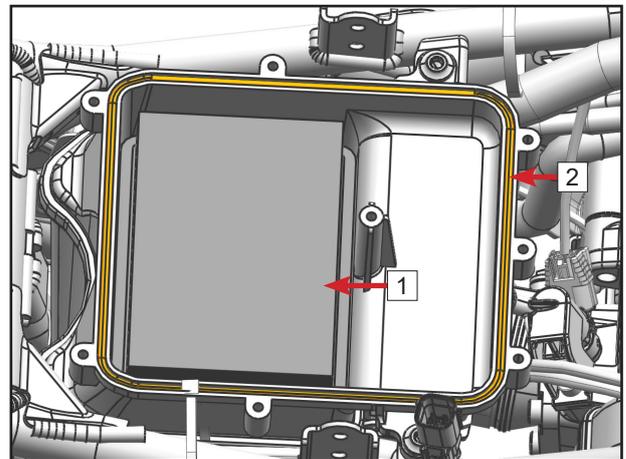
NOTE: It is not recommended to blow compressed air into the paper filter element. When used in the dusty environment, doing so may damage the paper fibers and reduce their filtration capacity. If the air filter element is too dirty, replace.



Installation

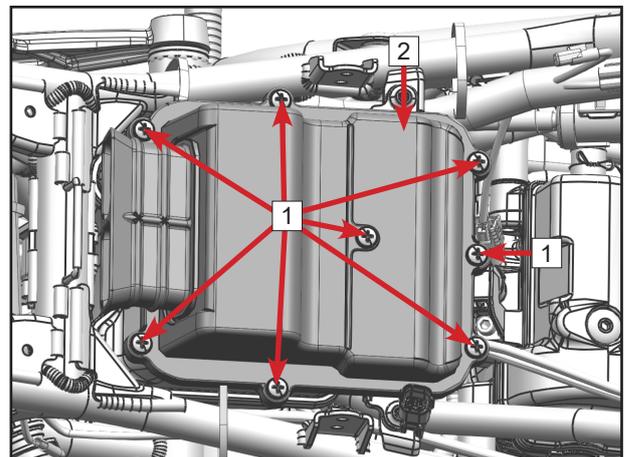
Install the sealing strip **2** on the air filter housing.

Install the air filter element **1** in place.



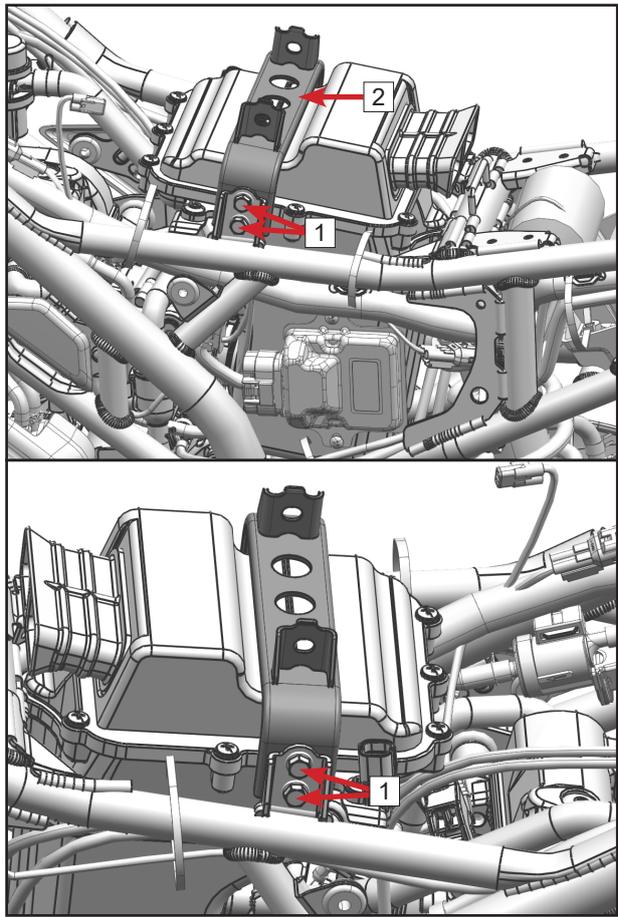
Install air filter upper housing assembly **2**.

Install self-tapping screws **1**.



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Place the fuel tank rear mounting bracket assembly **2** in place.
Install bolts **1**.



Refer to the relevant chapters to install:

- Fuel tank
- RH panel/reservoir RH inner panel assembly
- LH panel/reservoir LH inner panel assembly
- Rear RH deco plate
- Rear LH deco plate
- Fuel tank panel assembly
- Reservoir LH outer panel
- Reservoir RH outer panel
- Front RH inner side plate
- Front LH inner side plate
- Frame RH panel
- Frame LH panel
- Seat

5.8.2 Air Filter Housing Assembly

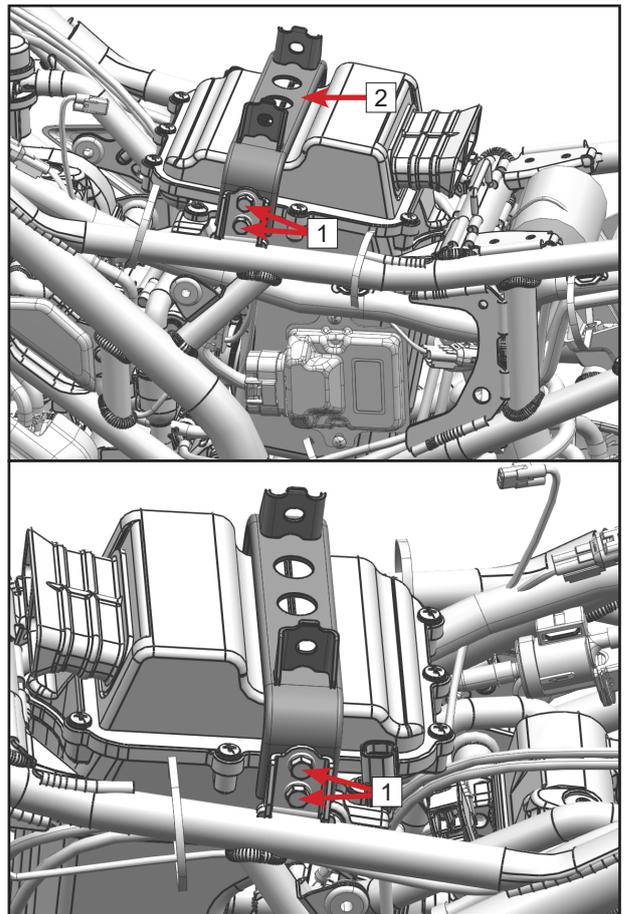
5.8.2.1 Removal

Refer to the relevant chapters to remove:

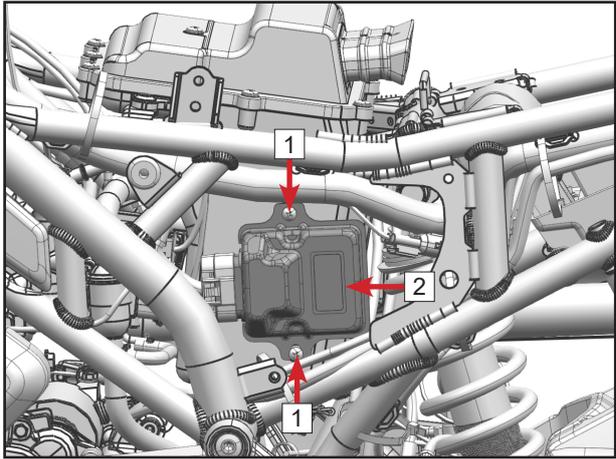
- Seat
- Frame LH panel
- Frame RH panel
- Front LH inner side plate
- Front RH inner side plate
- Reservoir LH outer panel
- Reservoir RH outer panel
- Fuel tank panel assembly
- Rear LH deco plate
- Rear RH deco plate
- LH panel /reservoir LH inner panel
- RH panel /reservoir RH inner panel
- Fuel tank

Remove bolts **1**.

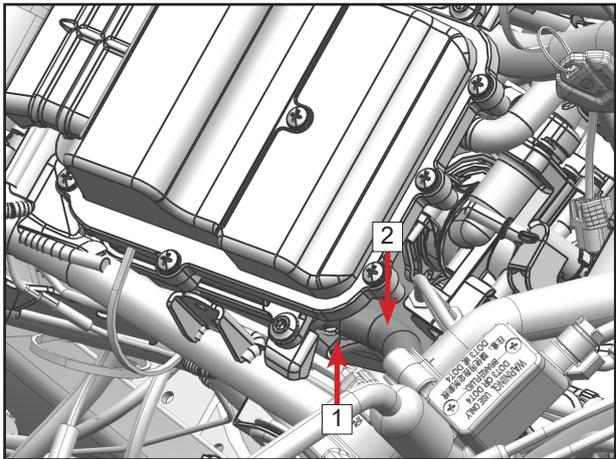
Remove fuel tank rear mounting bracket assembly **2**.



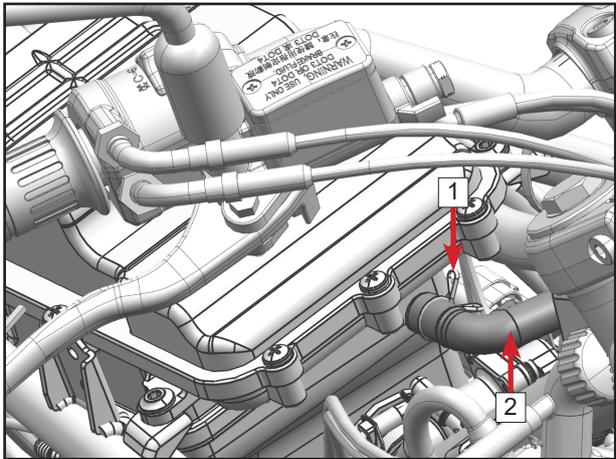
Remove self-tapping screws **1**.
Remove ECU **2**.



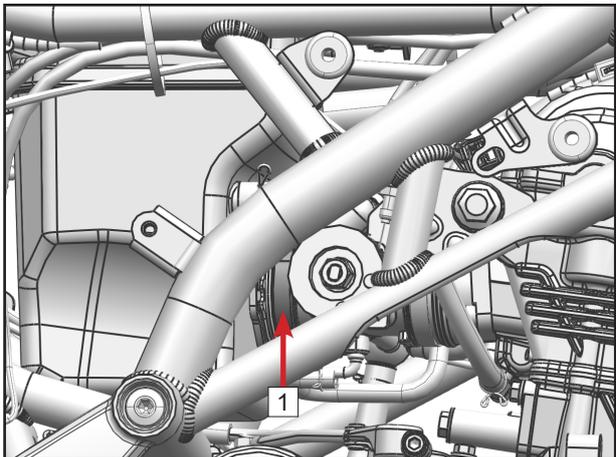
Loosen the clamp **1**, remove the air filter outlet pipe of secondary gulp valve **2** from the air filter lower housing.



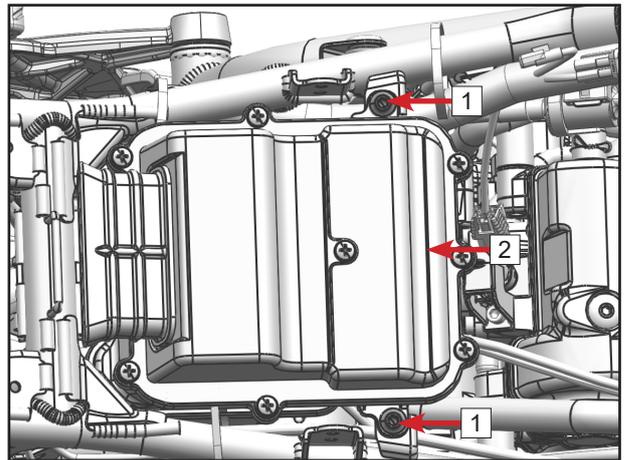
Loosen the clamp **1**, remove the oil and gas separator outlet pipe **2** from the air filter lower housing.



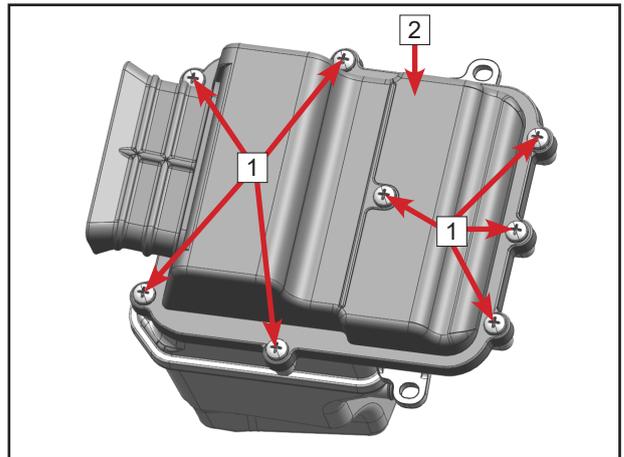
Loosen the clamp **1**.



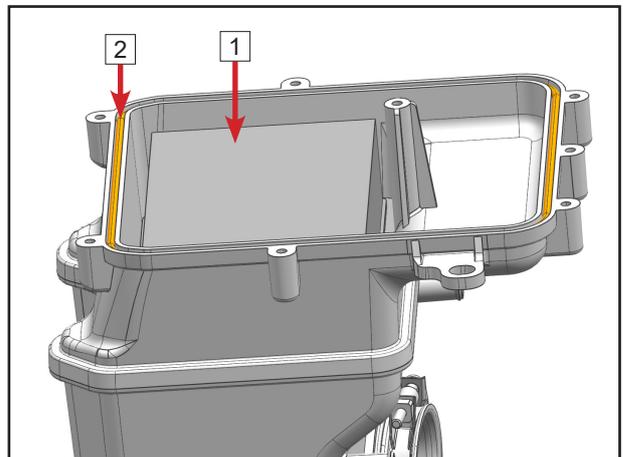
Remove screws **1**.
Remove air filter housing assembly **2**.



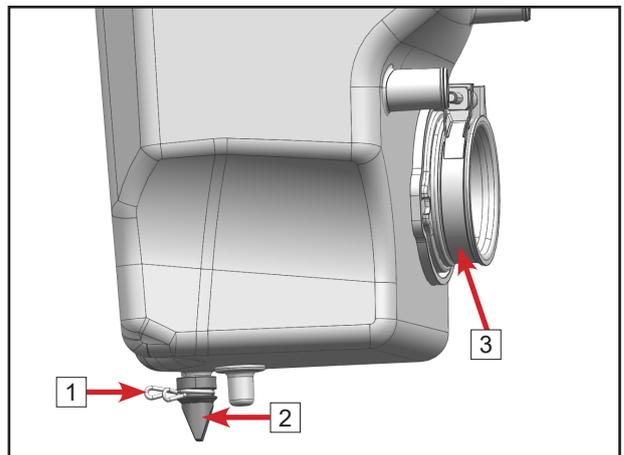
Air Filter Housing Assembly Removal
Remove self-tapping screws **1**.
Remove air filter upper housing assembly **2**.



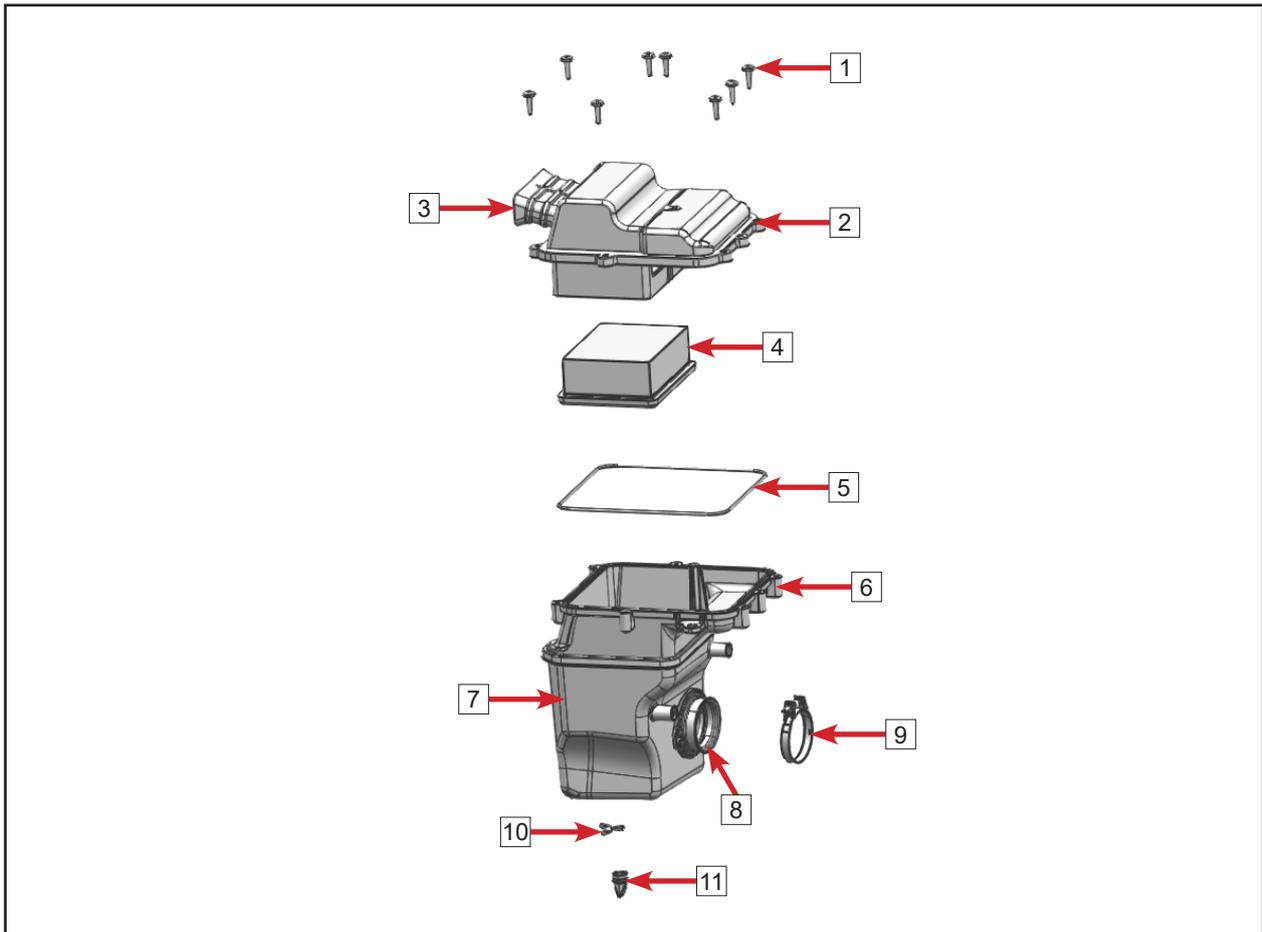
Remove the air filter element **1**.
Remove sealing strip **2**.



Loosen the clamp **1**, then remove the overflow pipe **2**.
Remove the clamp **3**.



5.8.2.2 Inspection



NO.	Name of parts	NO.	Name of parts
1	Self-tapping screw	7	Air filter lower housing
2	Air filter upper housing	8	Air filter outlet bending pipe
3	Air filter inlet pipe	9	Clamp
4	Air filter element	10	Clamp
5	Seal strip	11	Overflow pipe
6	Air filter middle housing		

For the inspection of the upper housing, air filter inlet pipe, seal strip and air filter element, please refer to the section "Air Filter Element Maintenance".

Check whether the air filter middle housing and air filter lower housing are cracked or otherwise damaged.

Check whether the outlet bending pipe of the air filter is cracked, aged or otherwise damaged.

The air filter middle housing, air filter lower housing and air filter outlet bending pipe need to be replaced as an assembly.

Clean the air filter housing.

Check the overflow pipe for aging or other damage. If yes, replace it with a new one.

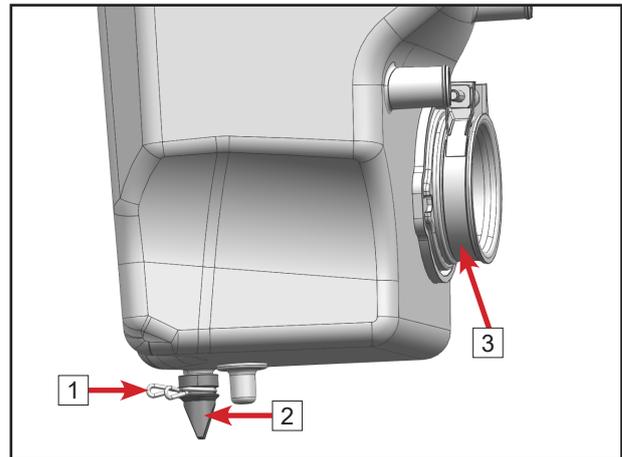
5.8.2.3 Installation

Install Air Filter Housing Assembly

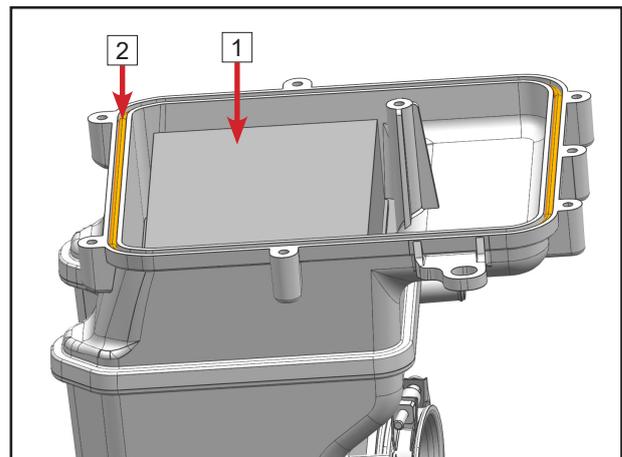
Install the clamp **3** on the air filter outlet bending pipe.

Put the clamp **1** on the overflow pipe **2**, and install the overflow pipe on the lower housing of air filter.

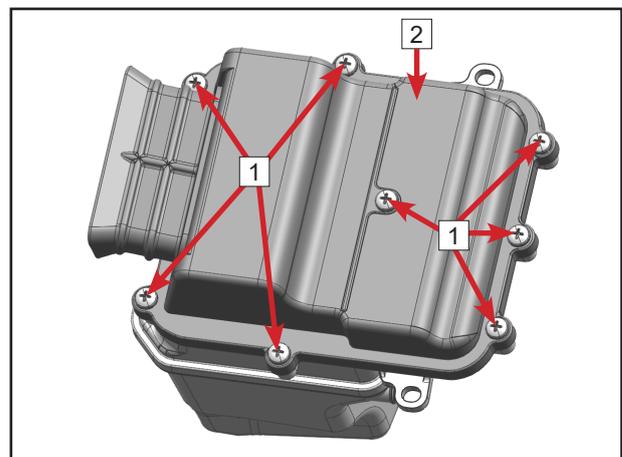
Tighten the clamp **1**.



Install the air filter element **1** in place.
Install the seal strip **2** in place.



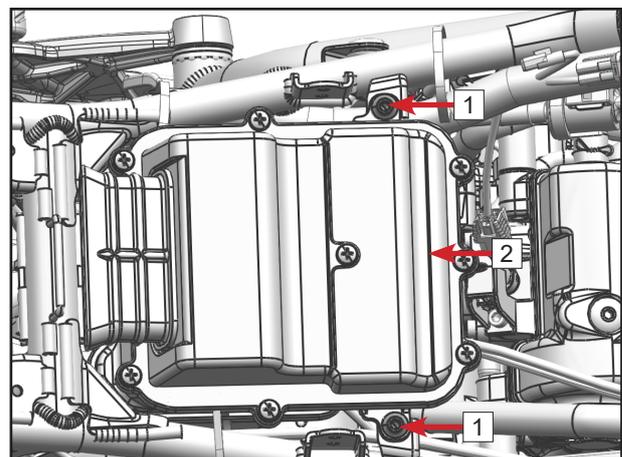
Install air filter upper housing assembly **2**.
Install self-tapping screws **1**.



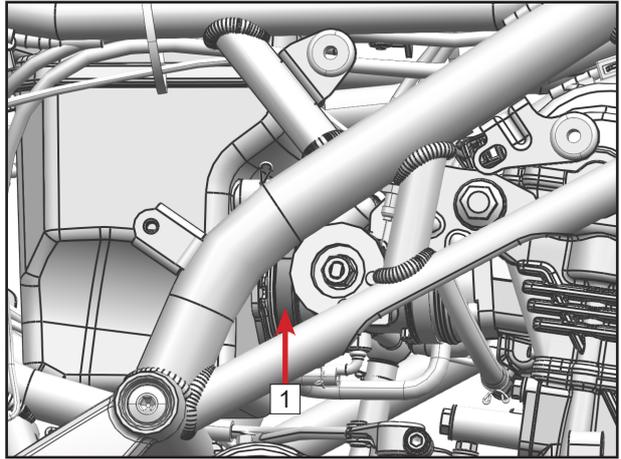
Air Filter Housing Assembly Installation

Place air filter housing assembly **2** in place.

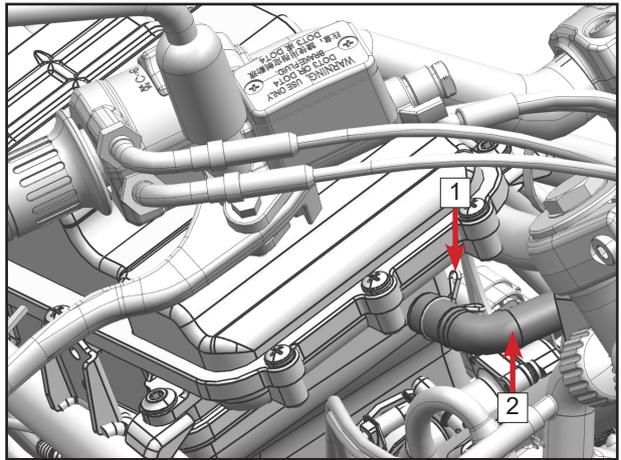
Install the screws **1**.



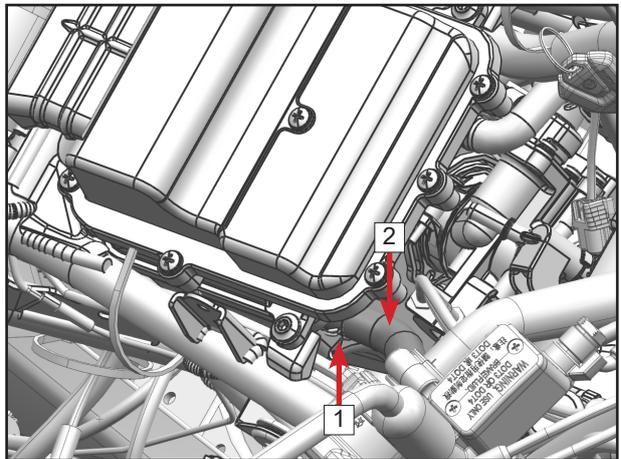
Tighten the clamp **1**.



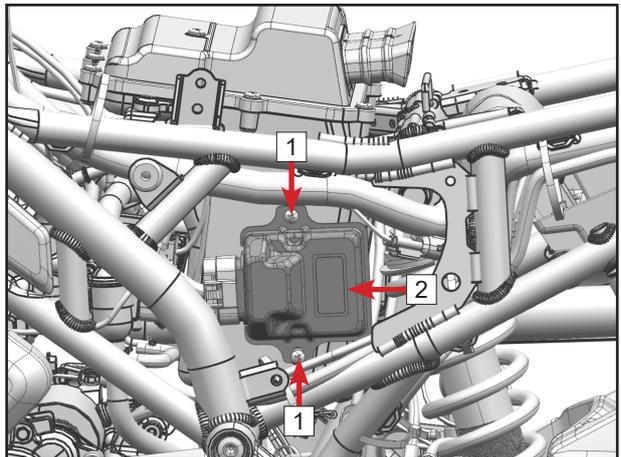
Install the outlet pipe **2** of oil and gas separator to the lower housing of air filter.
Tighten the clamp **1**.



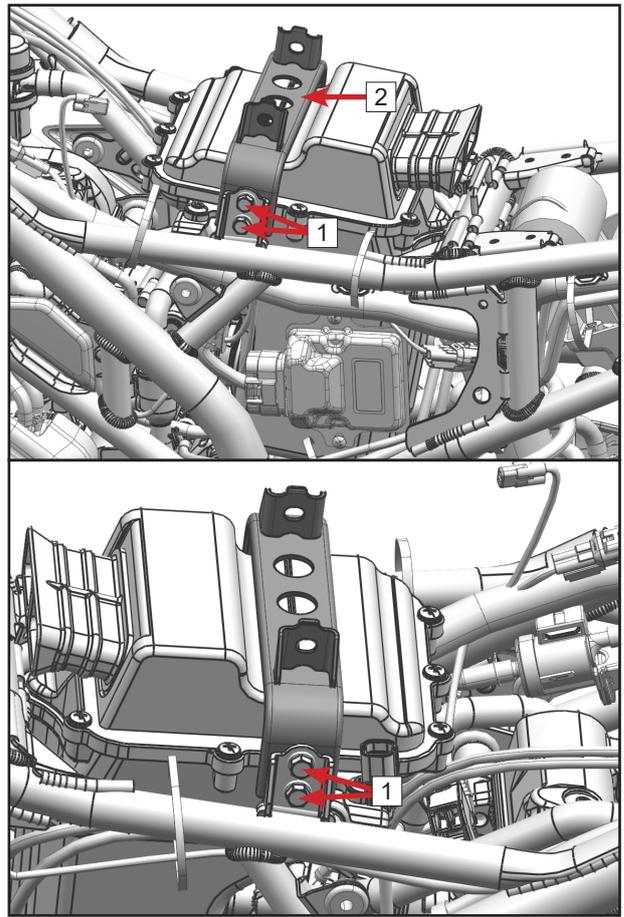
Install the outlet pipe **2** of air filter of secondary gulp valve to the lower housing of the air filter.
Tighten the clamp **1**.



Place the ECU **2** in place.
Install self-tapping screws **1**.



Place the fuel tank rear mounting bracket assembly **2** in place.
Install bolts **1**.



Refer to the relevant chapters to install:

- Fuel Tank
- RH panel/reservoir tank RH inner panel assembly
- LH panel/reservoir tank LH inner panel assembly
- Rear RH Deco Plate
- Rear LH Deco Plate
- Fuel Tank Panel Assembly
- Reservoir tank LH outer panel
- Reservoir tank RH outer panel
- Front RH inner side plate
- Front LH inner side plate
- Frame RH panel
- Frame LH panel
- Seat

5.8.3 Throttle Body Assembly

5.8.3.1 Removal

Remove the air filter housing assembly.
(see the section Air Filter Housing Assembly for details)

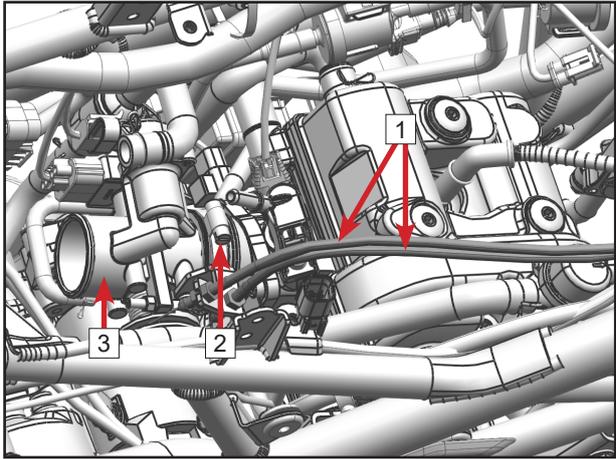
Disconnect the idle air control valve (IACV) connector.

Disconnect the TPS connector.

Remove throttle cable **1** from throttle body assembly .

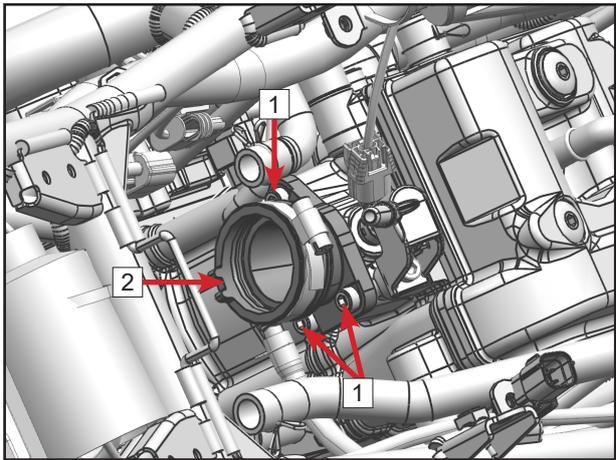
Loosen the clamp **2**.

Remove throttle body assembly **3**.



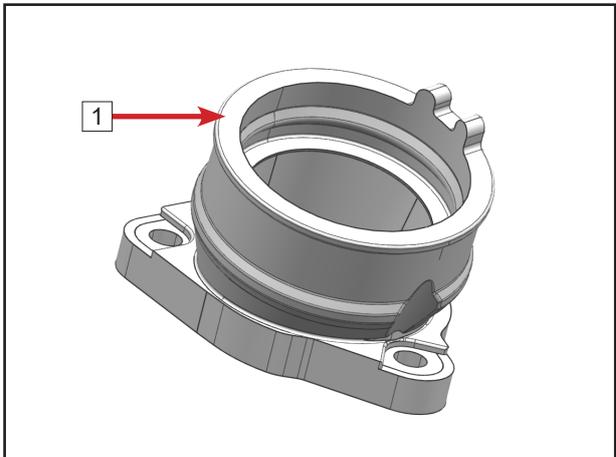
Remove screws **1**.

Remove throttle body connecting pipe **2**.



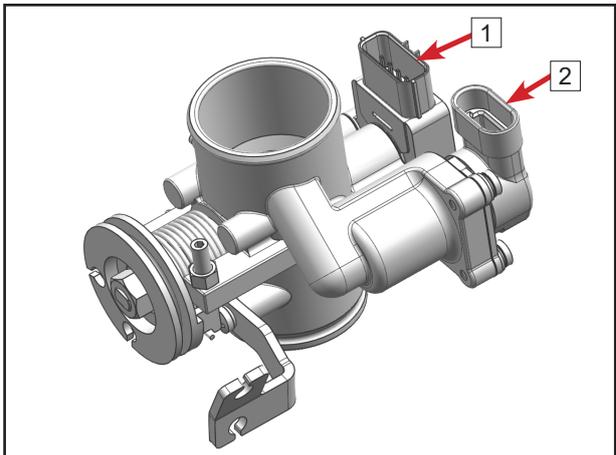
5.8.3.2 Inspection

Check the throttle body connecting pipe **1** for cracks, aging, or any other obvious damage. It should be replaced if necessary.



Check throttle body assembly for cracks or other damage. If yes, replace it with a new one.

For the maintenance of TPS **1** and idle air control valve **2**, please refer to the Electrical chapter.

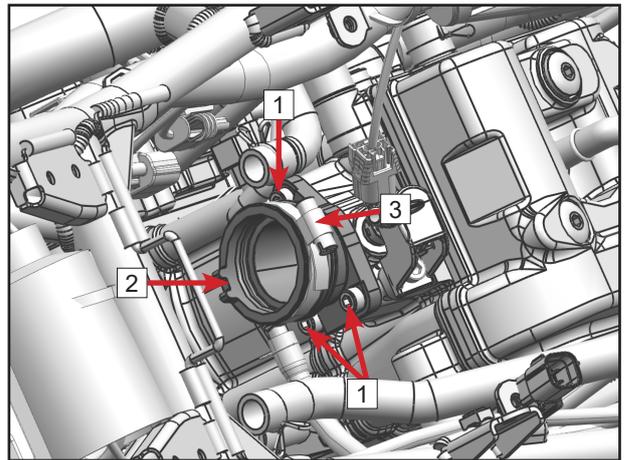


5.8.3.3 Installation

Place the throttle body connecting tube **2** in place.

Install screws **1**.

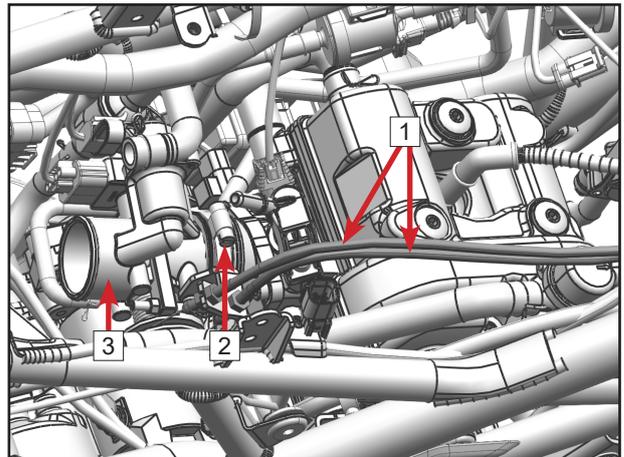
Put the clamp **3** on the tube **2**.



Install throttle body assembly **3**.

Tighten the clamp **2**.

Install throttle cable **1** to the throttle body assembly.



Plug in the TPS connector.

Plug in the idle air control valve connector.

Install the air filter housing assembly. (see the section Air Filter Housing Assembly for details)

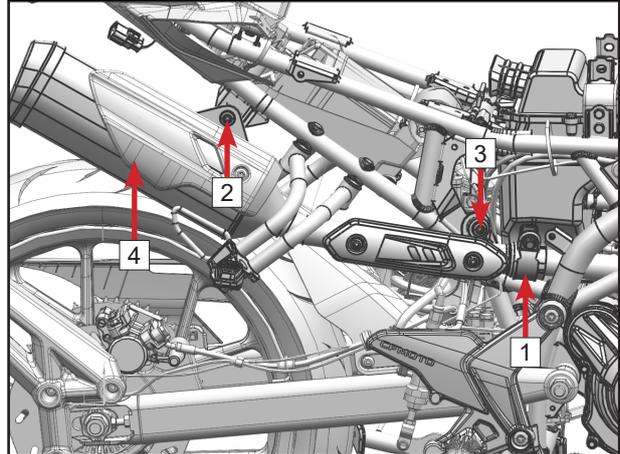
5.9 Exhaust System

5.9.1 Removal

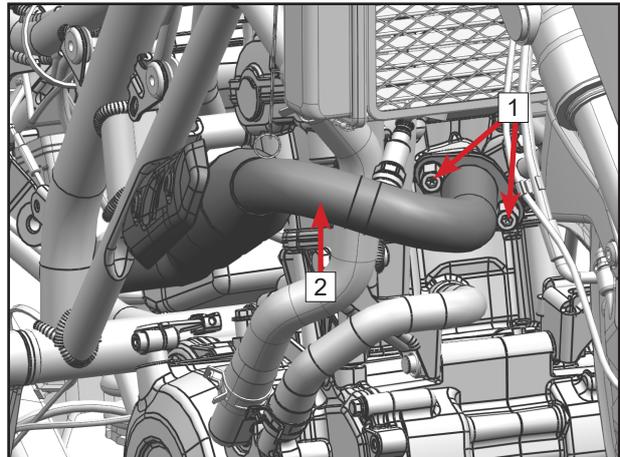
⚠ WARNING: Do not touch exhaust system parts immediately after the engine has been running.

Remove related body covering parts.
Disconnect the oxygen sensor connector.

Loosen the clamp **1**.
Remove the screw **2** and screw **3**.
Remove muffler body assembly **4**.

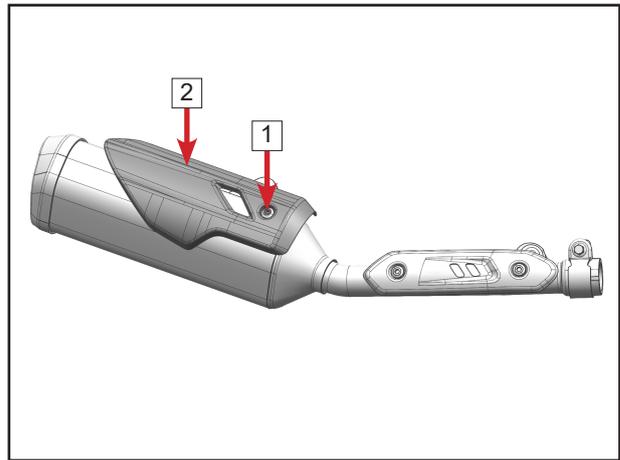


Remove the exhaust pipe nuts **1**.
Remove the exhaust pipe assembly **2** and
exhaust seal gasket.

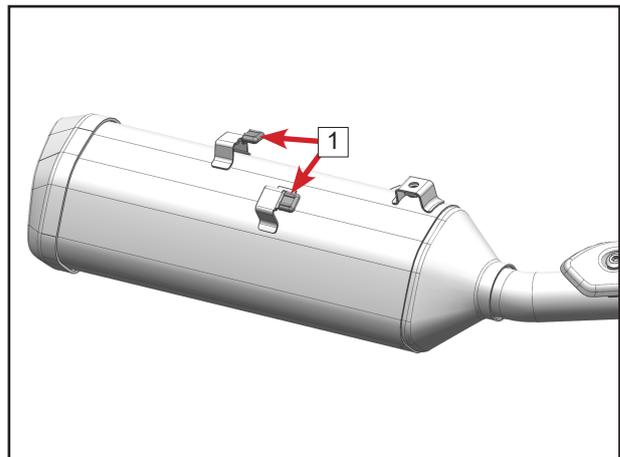


5.9.2 Inspection Muffler Body Assembly Removal

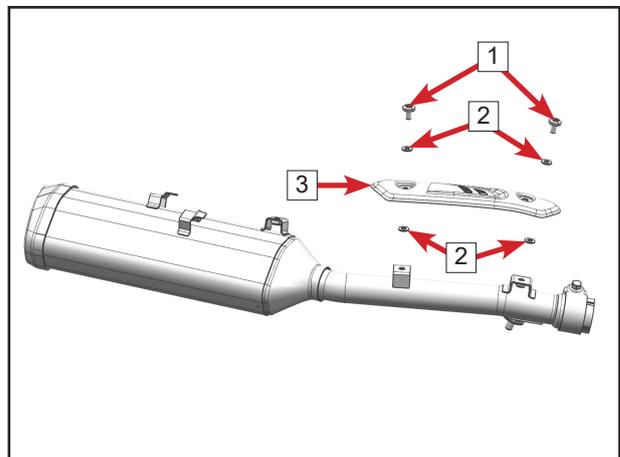
Remove screw **1**.
Remove muffler deco part **2**.



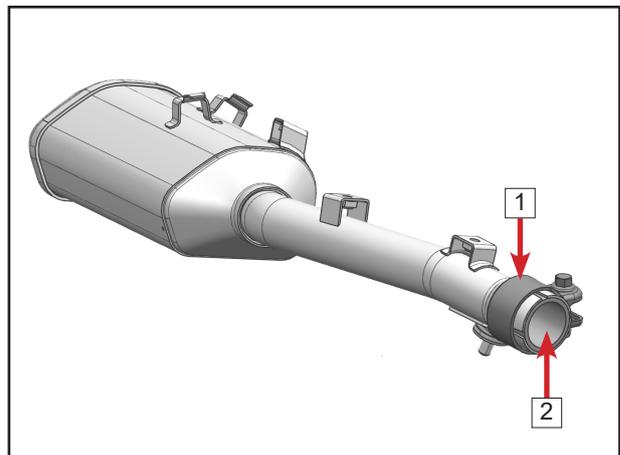
Remove guard rubber sleeve **1**.



Remove screw **1**.
Remove wire mesh pad **2**.
Remove guard **3**.
Remove wire mesh pad **2**.

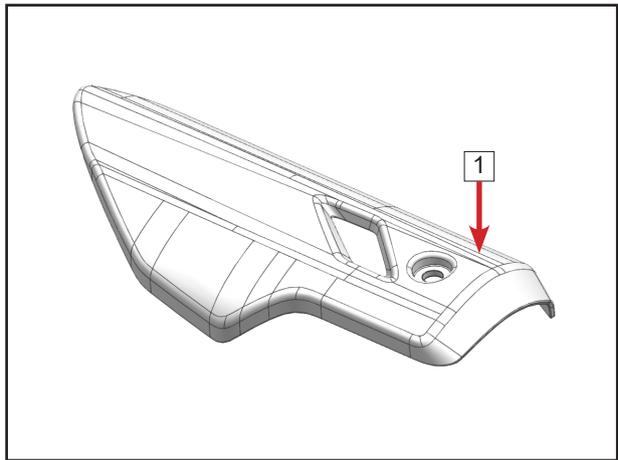


Remove the clamp **1**.
Remove graphite seal ring **2**.

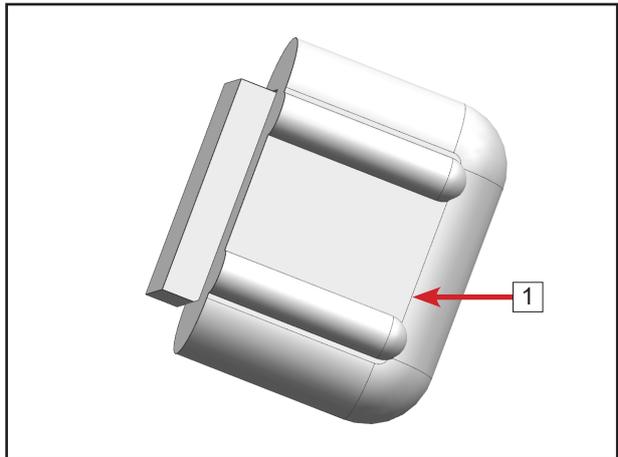


Inspection

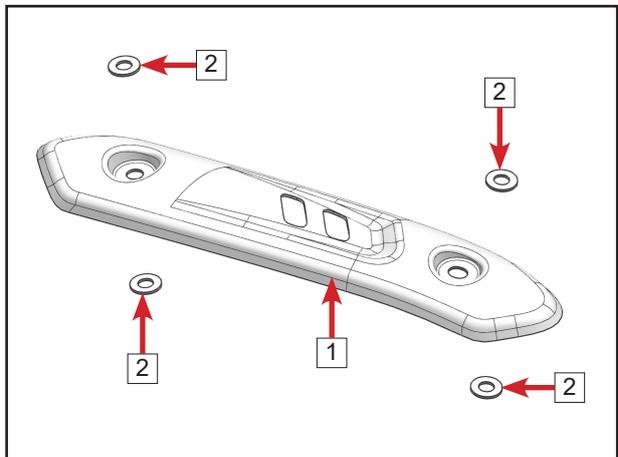
Check the muffler deco part **1** for damage. Replace if necessary.



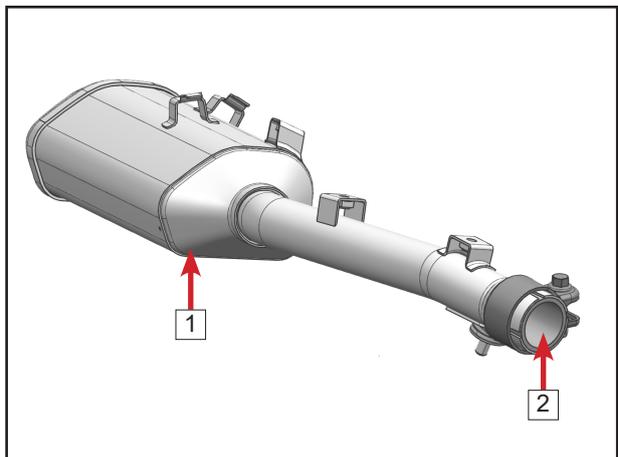
Check the rubber sleeve **1** for aging or other damage. Replace if necessary.



Check the guard **1** for damage. Replace if necessary.
Check whether the wire mesh pad **2** is aged or damaged. Replace if necessary.



Check muffler body assembly **1** for cracks or other damage. Replace if necessary.
Check whether the graphite seal ring **2** is aged or broken. Replace if necessary.



Installation

Reverse the removal procedures for installation.

Exhaust Pipe Assembly

Removal

Remove screws [1].

Remove the wire mesh pad [2].

Remove the guard [3].

Remove the wire mesh pad [2].

Inspection

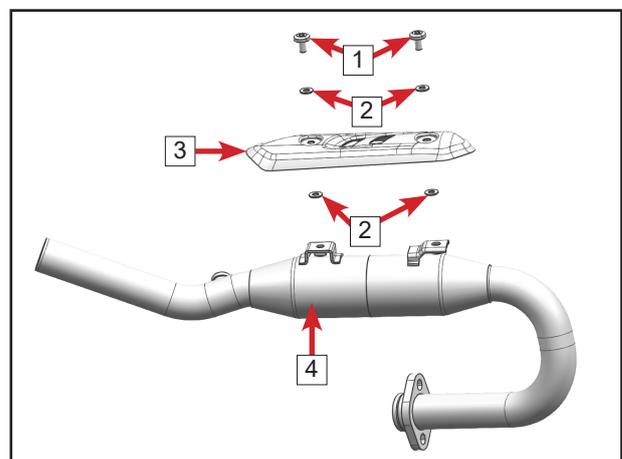
Check the guard [3] for damage. Replace if necessary.

Check whether the wire mesh pad [2] is aged or damaged. Replace if necessary.

Check the exhaust pipe assembly [4] for cracks, bends, or other damage. Replace if necessary.

Installation

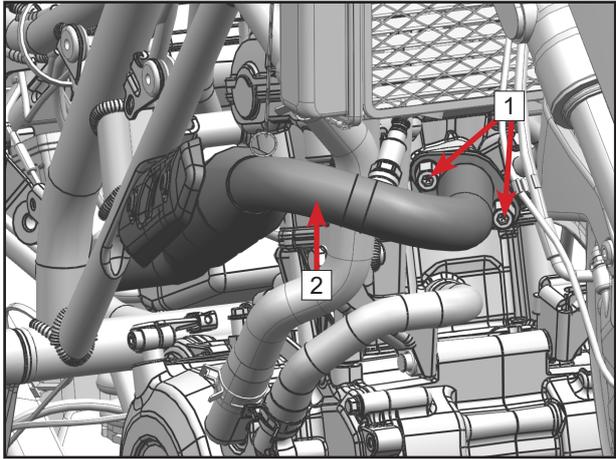
Reverse the removal procedures for installation.



5.9.3 Installation

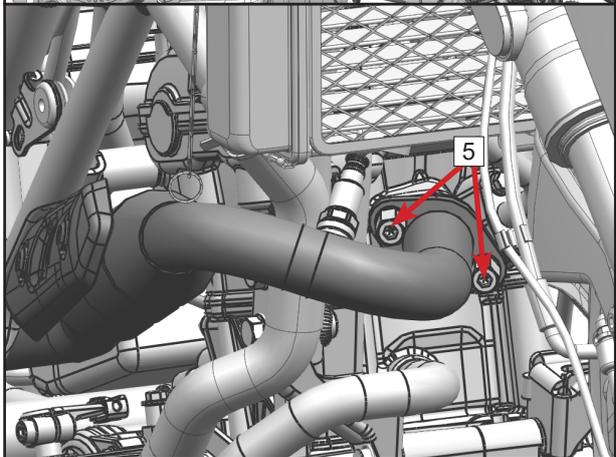
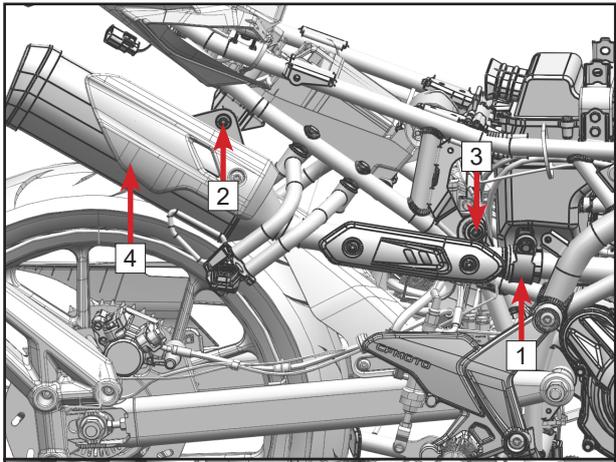
Make sure the exhaust seal gasket is installed. (If the exhaust seal gasket is aged or damaged, it should be replaced in time)

Put the exhaust pipe assembly **2** in place. Install exhaust pipe nuts **1**, but not tighten.



Install muffler body assembly **4** in place. Install and tighten screw **2** and screw **3**. Tighten nuts **5**. Tighten the clamp **1**. Plug in the oxygen sensor connector.

Install the other removed parts.



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6.1 Service Tool

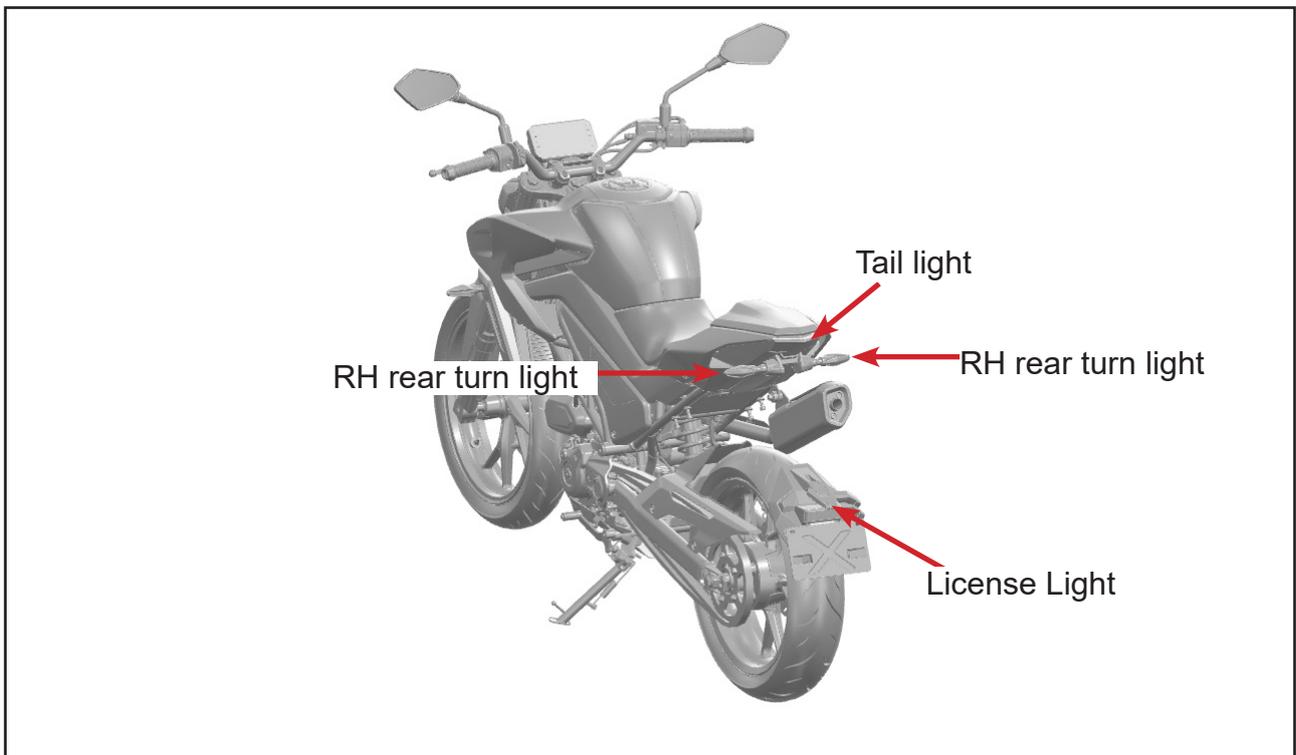
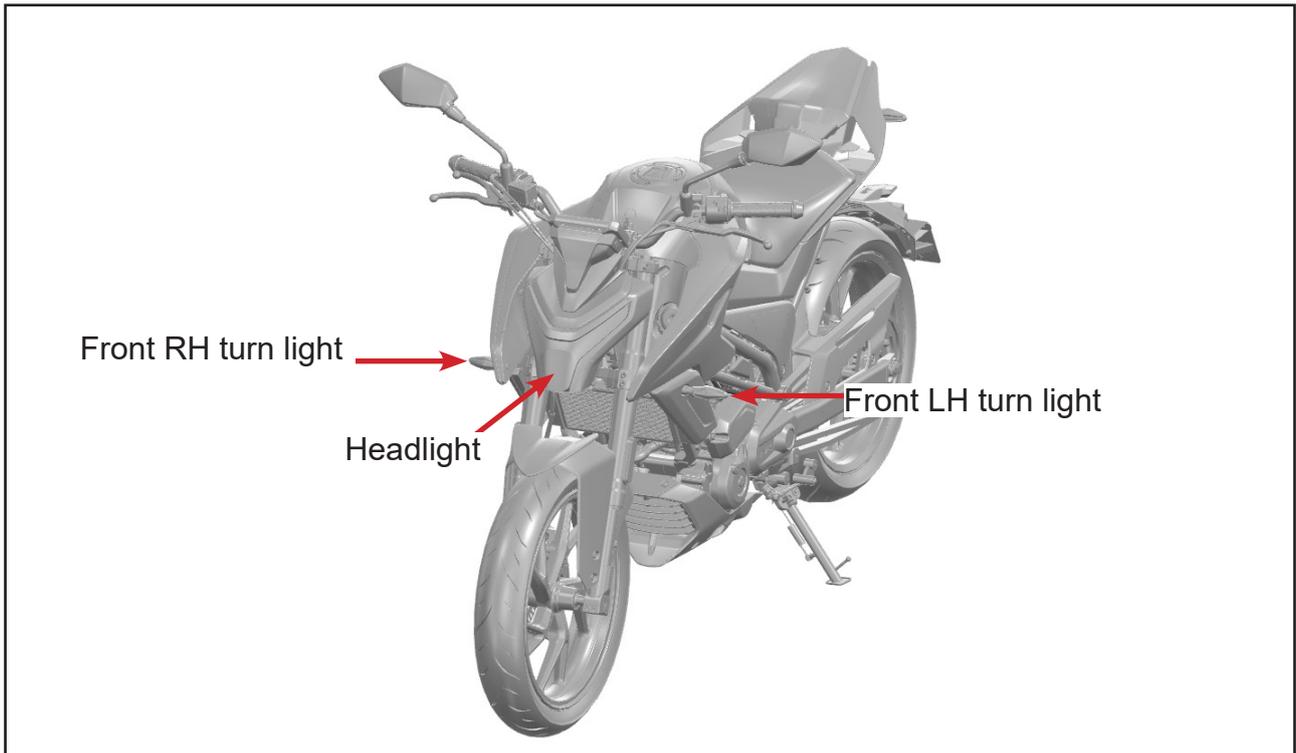
CFMOTO DSCAN

Function: Read/clear EFI system fault codes, observe data stream, update and write ECU programs.

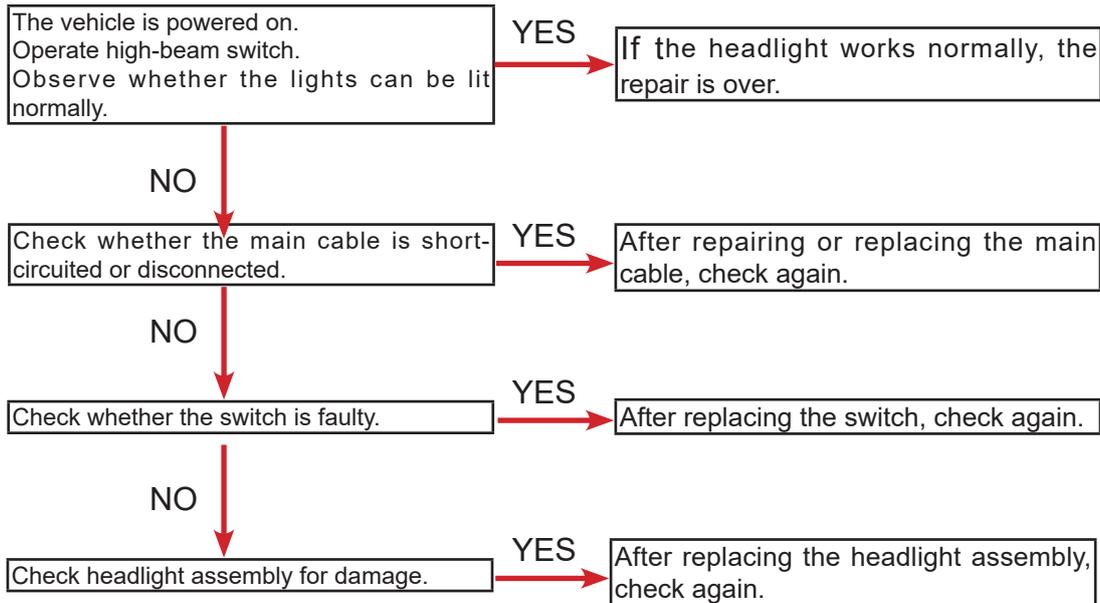


6.2 Lights

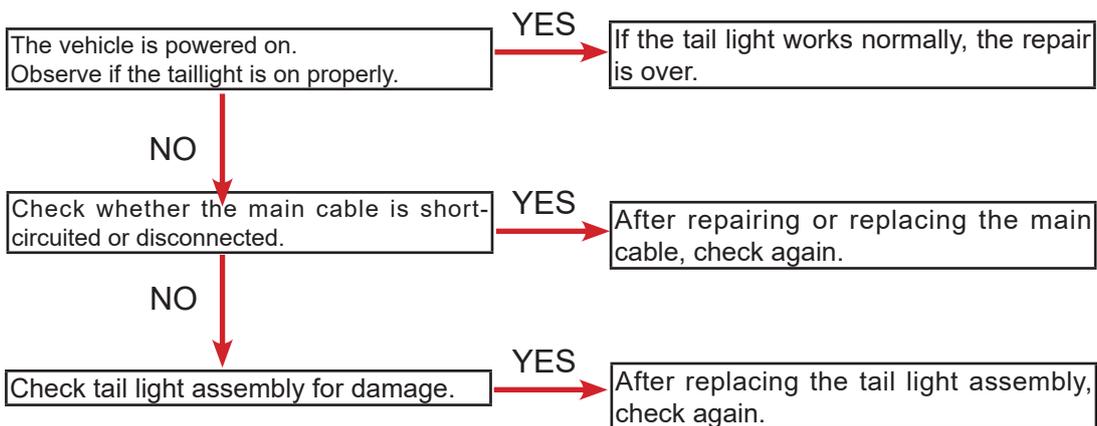
6.2.1 Lights View



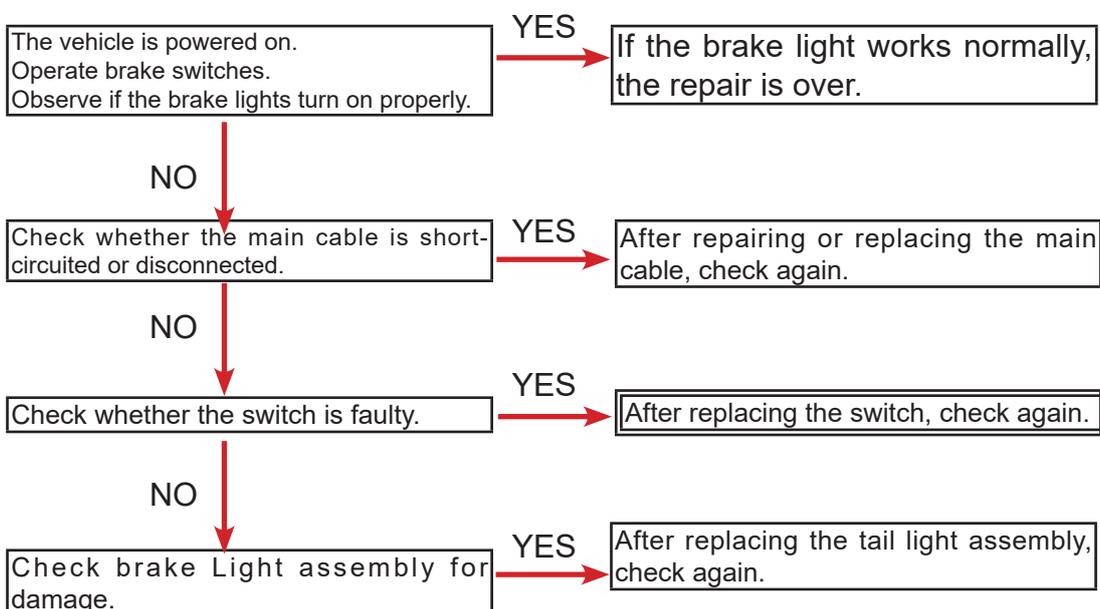
6.2.2 Headlight Inspection



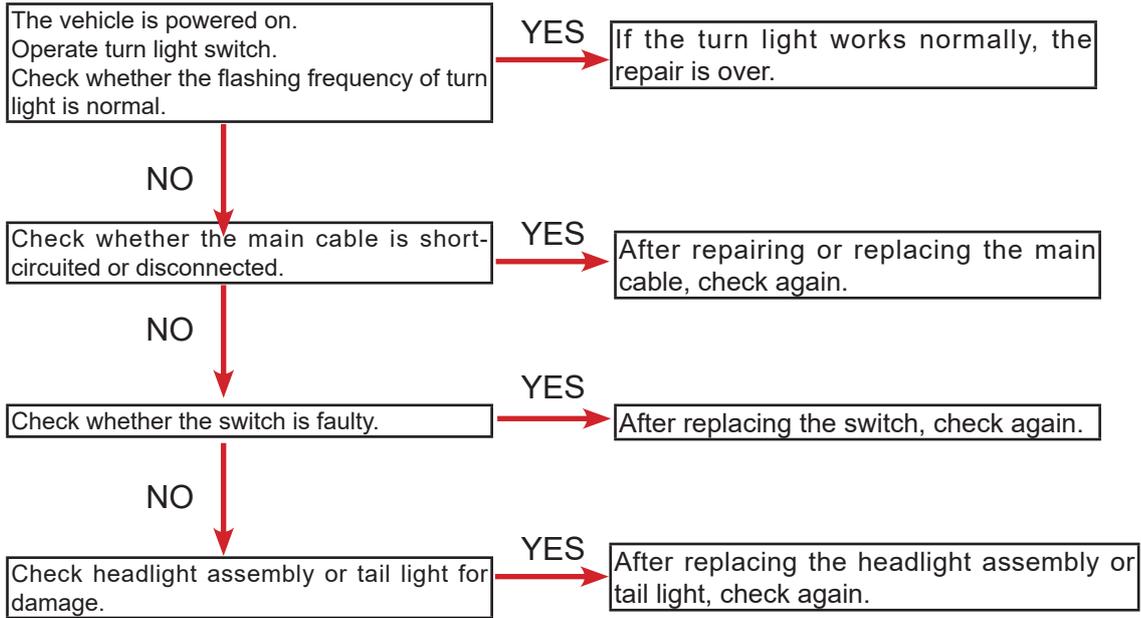
6.2.3 Tail Light Inspection



6.2.4 Brake Light Inspection

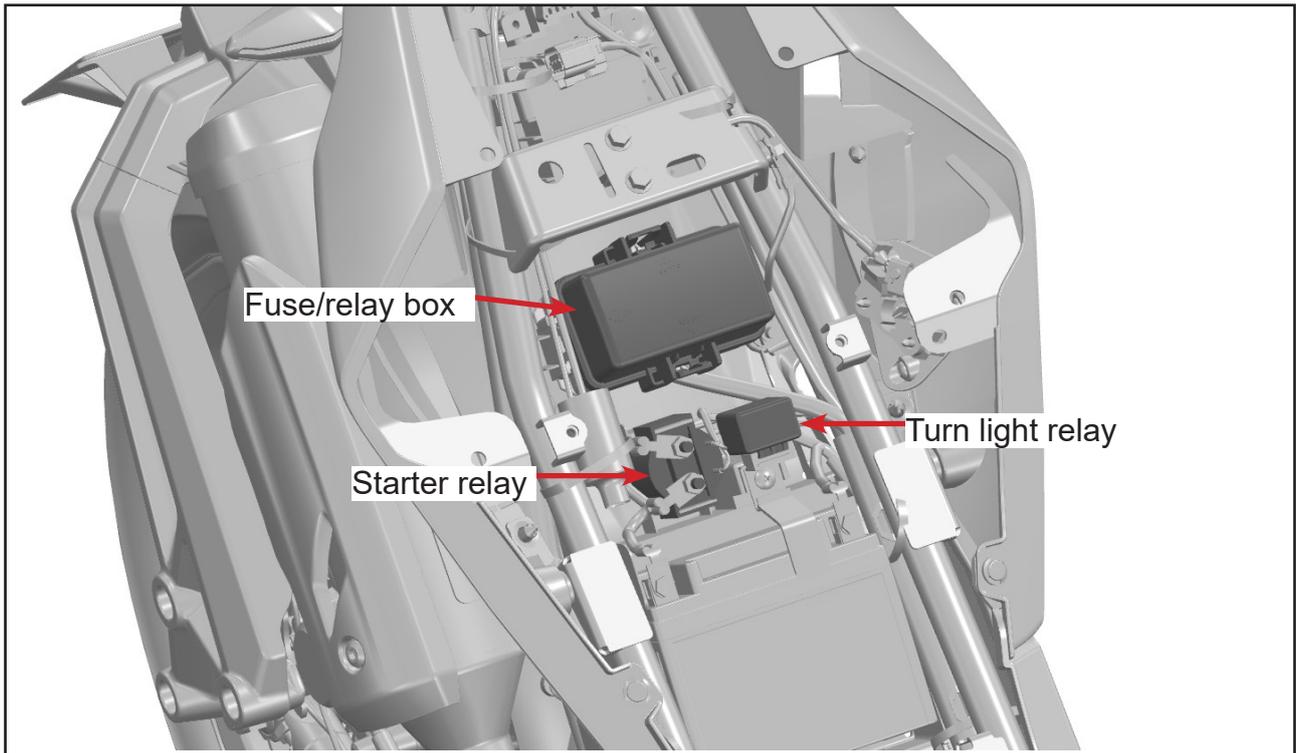


6.2.5 Turn Light Inspection

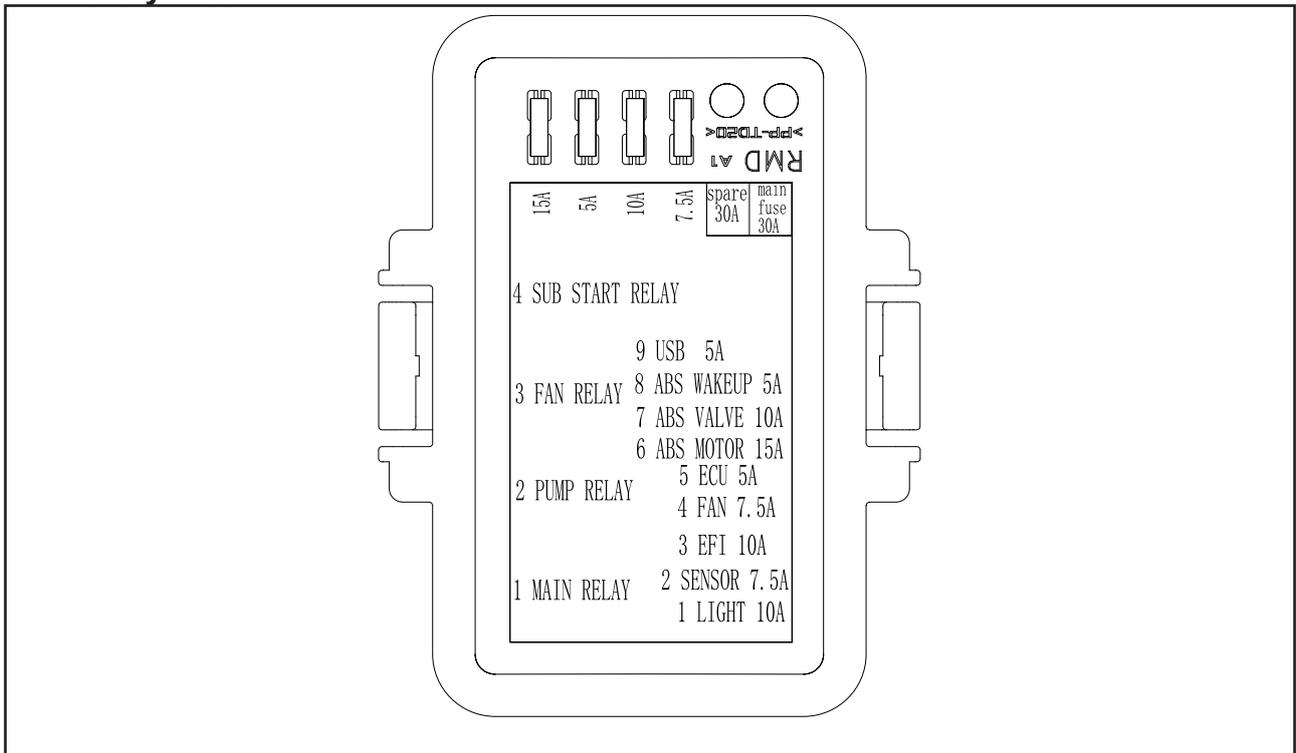


6.3 Fuse and Relay

6.3.1 Fuse and Relay Position

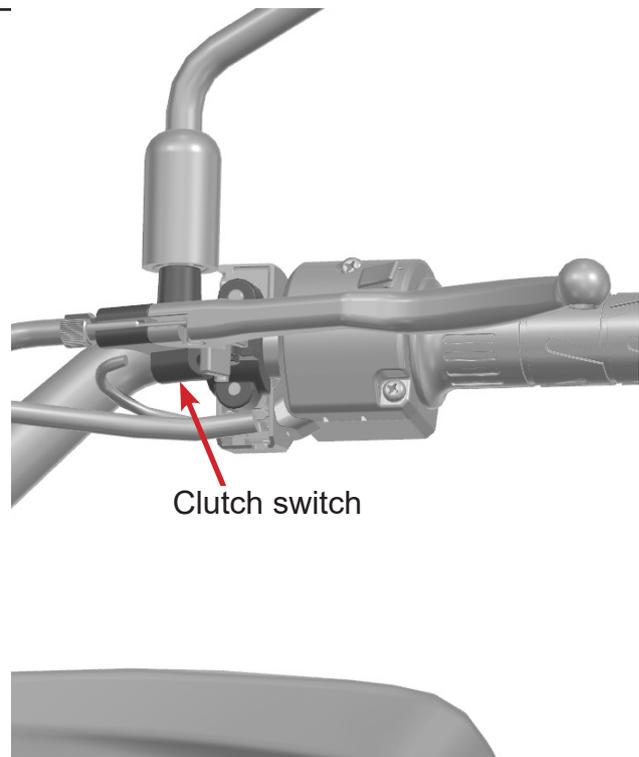
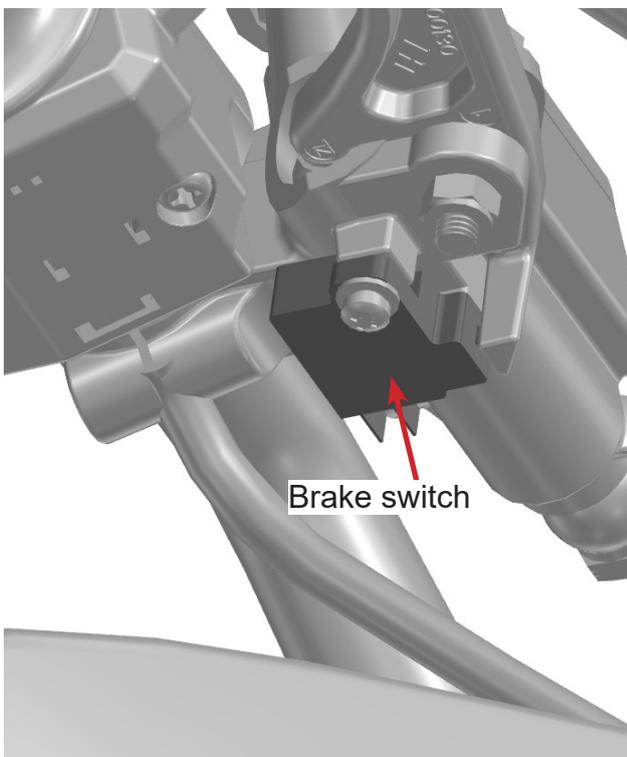
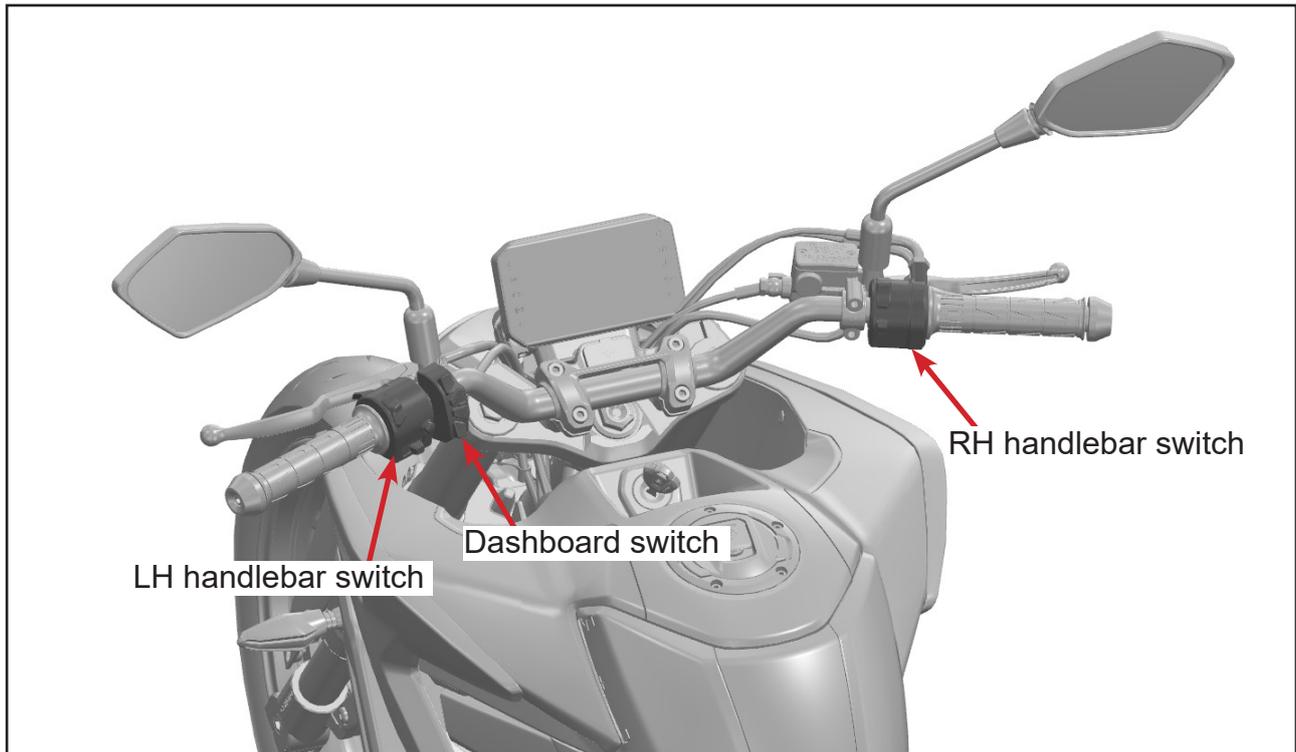


Fuse/relay box



6.4 Switch

6.4.1 Switch Position

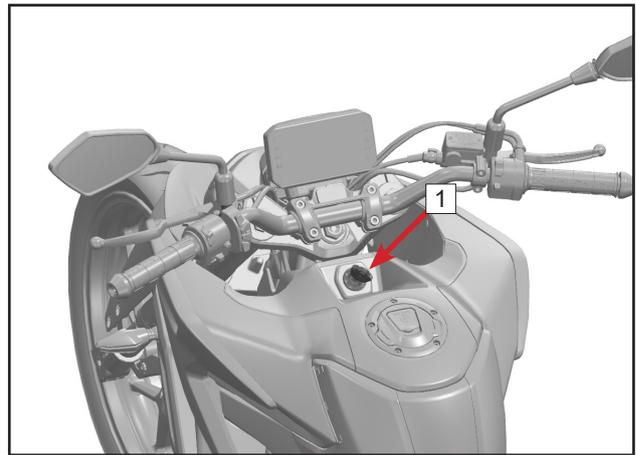


6.4.2 Ignition Lock

Inspection

Pull out the connector of ignition switch **1** and the main cable, and check the connection of ignition switch.

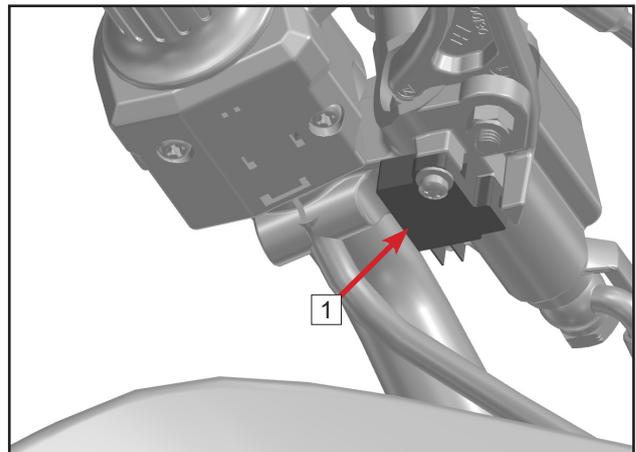
Ignition Switch			
Gear/Color	R	BL	Can key pull out
	●	●	NO
			YES
			YES



6.4.3 Front Brake Light Switch

Pull out the plug **1** of front brake light wiring switch to check whether the wiring cable end and the pin are good:

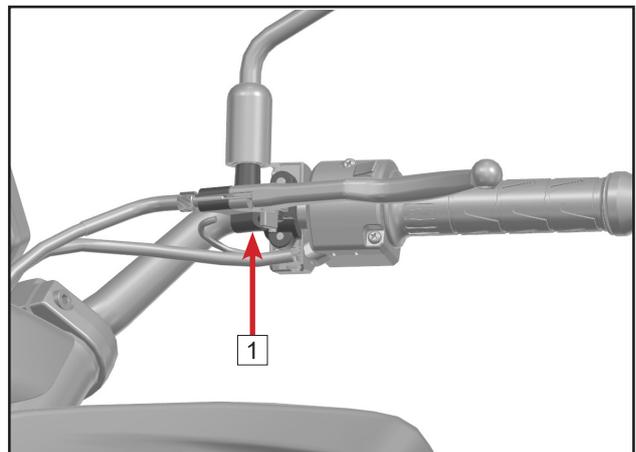
1. When the front brake handle is kneaded: the brake light on.
2. When the front brake handle is released: the brake light off.



6.4.4 Clutch Switch

Pull out the plug **1** of front brake light wiring switch to check whether the wiring cable end and the pin are good:

1. When the clutch handle is kneaded: with the side stand down:
Cut into gear and turn off normally.
2. If not, check the clutch switch.



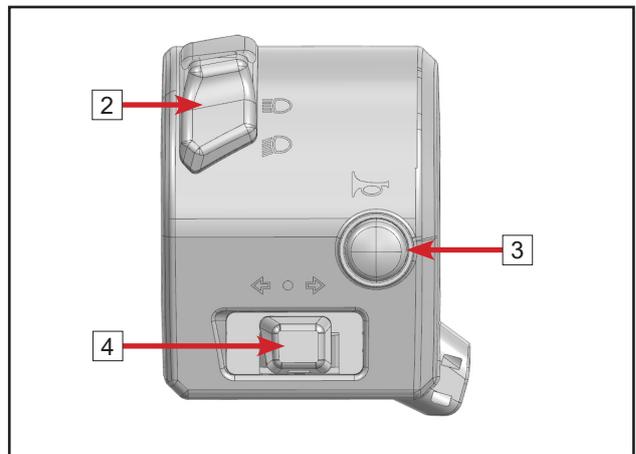
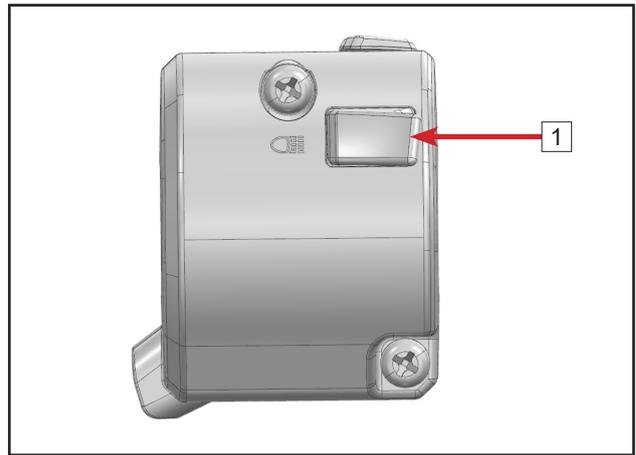
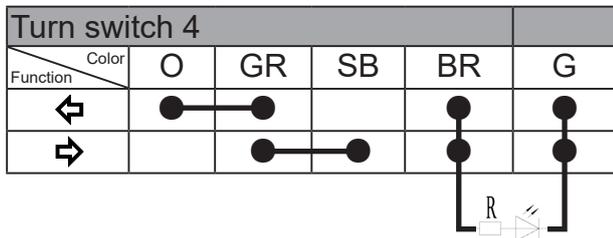
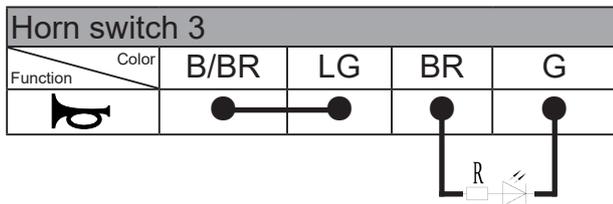
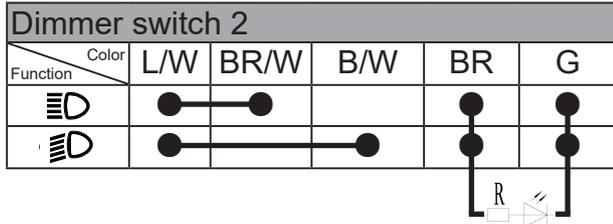
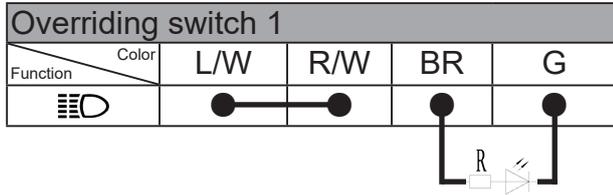
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6.4.5 Handlebar Switch

6.4.5.1 LH/RH Handlebar Switch

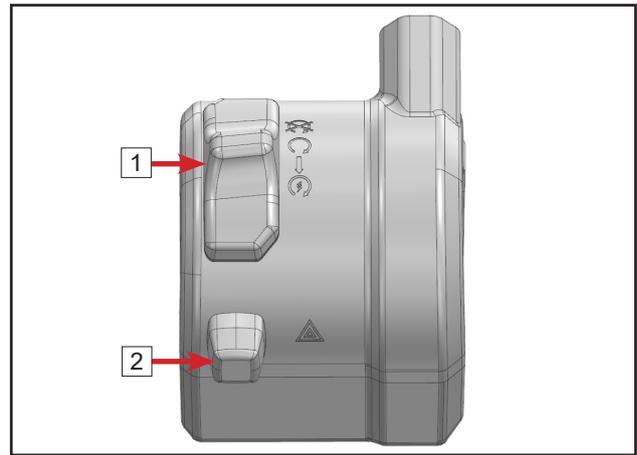
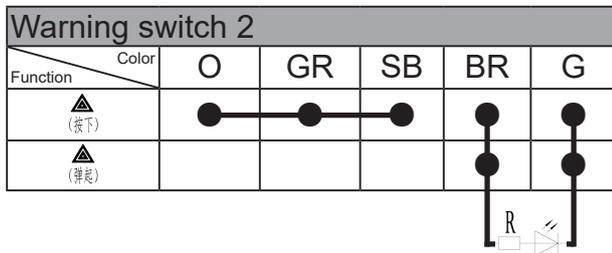
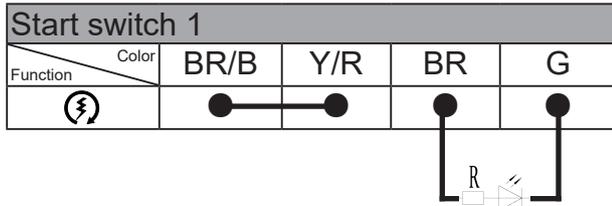
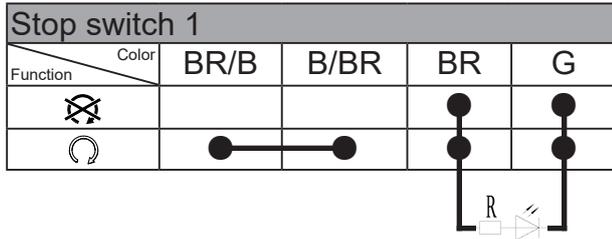
LH Handlebar Switch

Remove the connector connecting the LH handlebar switch cable with the main cable, and check whether each switch is on or off.



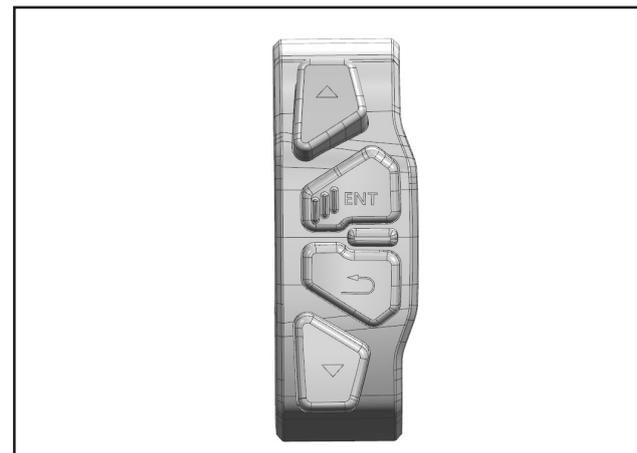
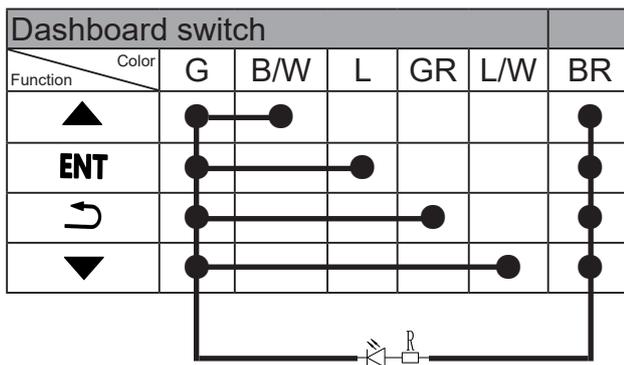
RH Handlebar Switch

Remove the connector connecting the RH handlebar switch cable with the main cable, and check whether each switch is on or off.



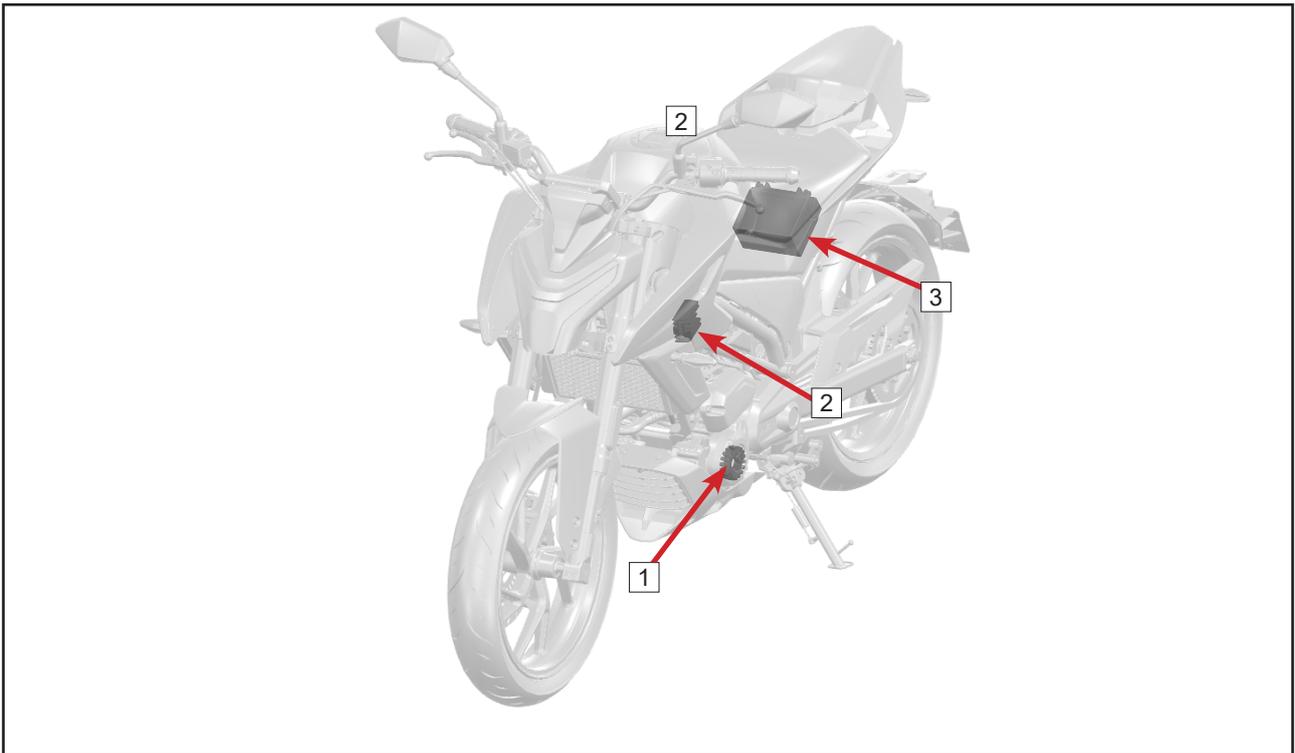
6.5 Dashboard Switch

Remove the connector connecting the dashboard switch cable with the main cable, and check whether each switch is on or off.



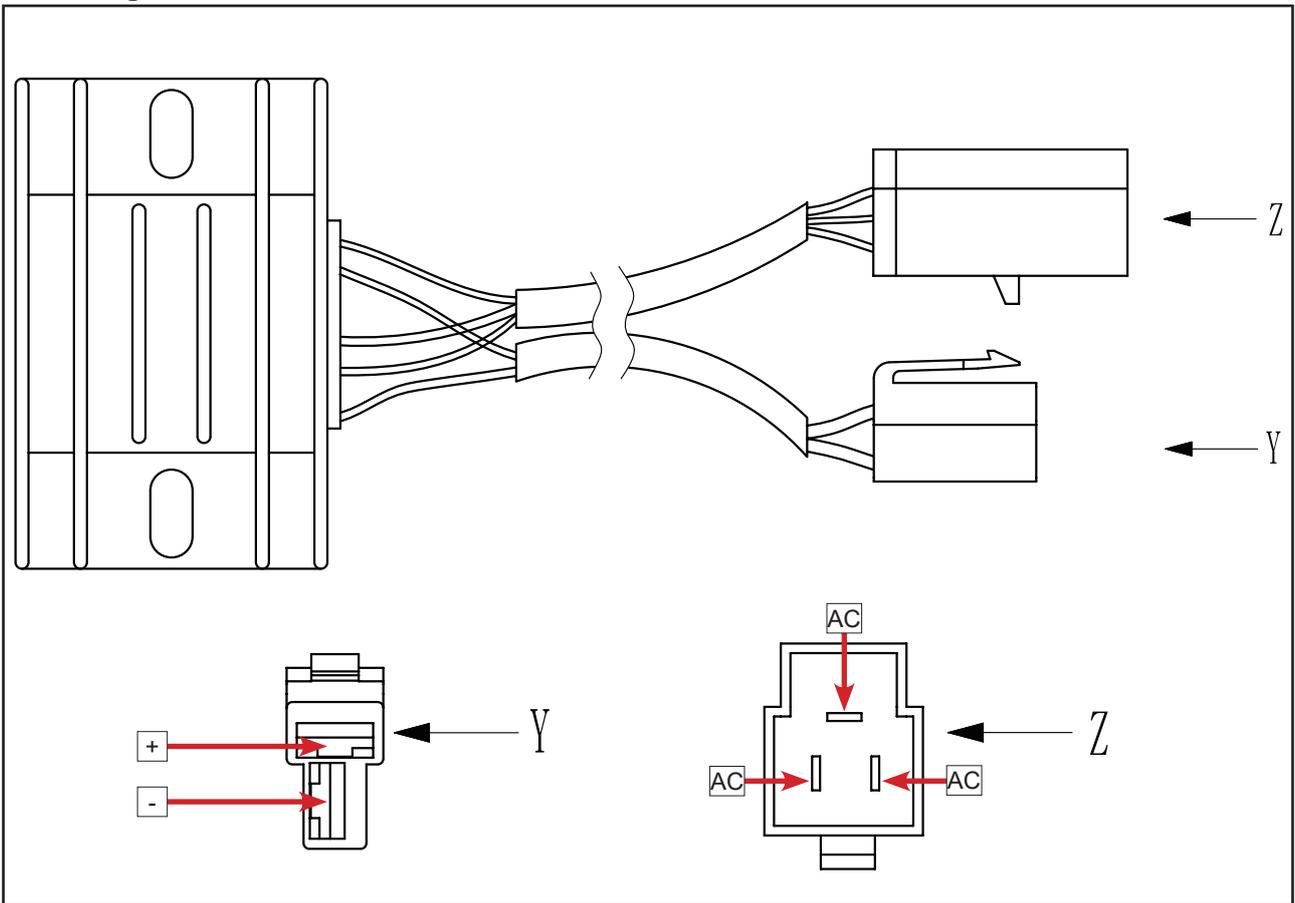
6.6 Charging System/Battery

6.6.1 Charging System Position



1	Stator	2	Regulator	3	Battery
---	--------	---	-----------	---	---------

6.6.2 Regulator



6.6.3 Charging Voltage Inspection

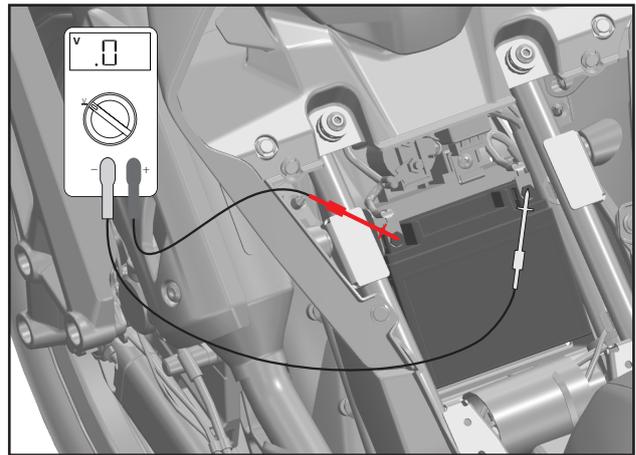
The battery must function properly and be fully charged.

Start the vehicle for voltage measurement.

Measure point positive (+), measure point GND (-).

Charging Voltage	
5000rpm	13.2V~14.8V

If the charging voltage is abnormal, check the stator or regulator.

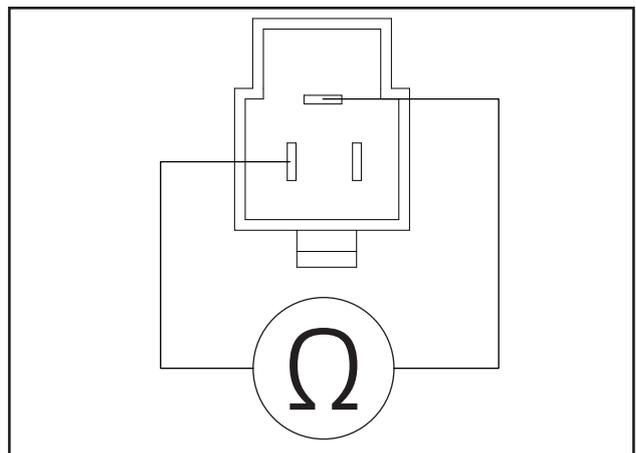
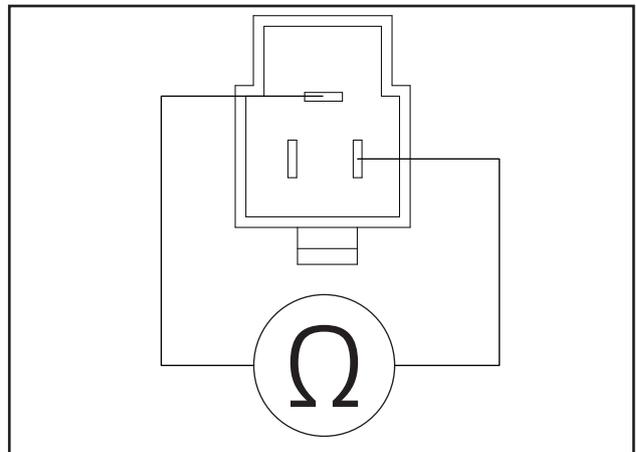
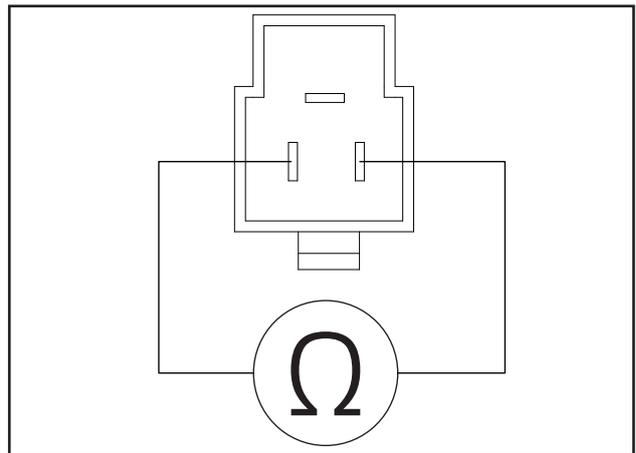


6.6.4 Stator Path Inspection

Set the multimeter to buzzer.

As shown in the figure, use the multimeter to check whether there is a beep between the stator pins.

If there is no beep, replace the new part and check the stator body and charging voltage again.



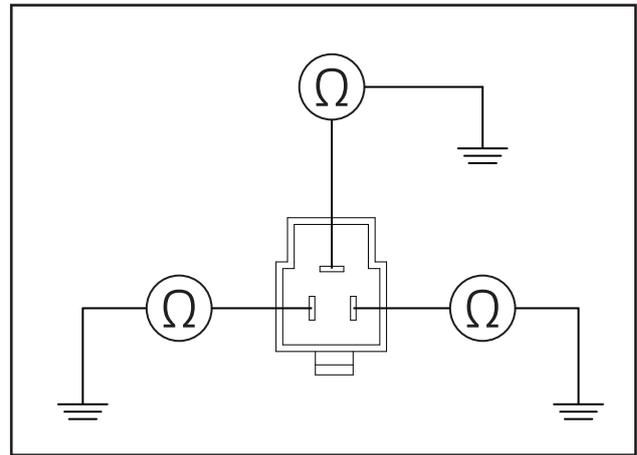
CFMOTO

6.6.5 Stator GND Inspection

Set the multimeter to buzzer.

As shown in the figure, use the multimeter to check whether there is a beep between the stator pins.

If there is no beep, replace the new part and check the stator body and charging voltage again.

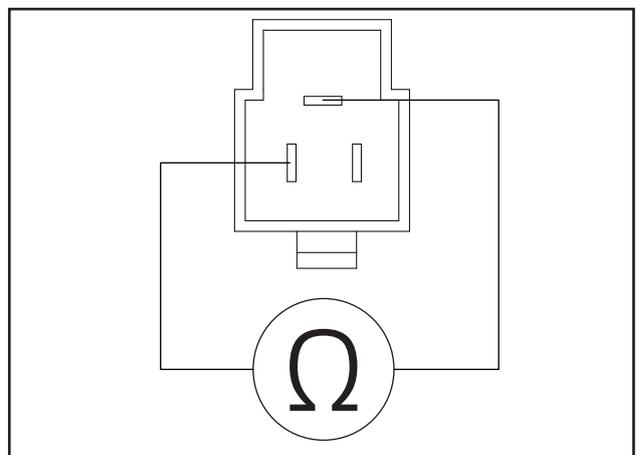
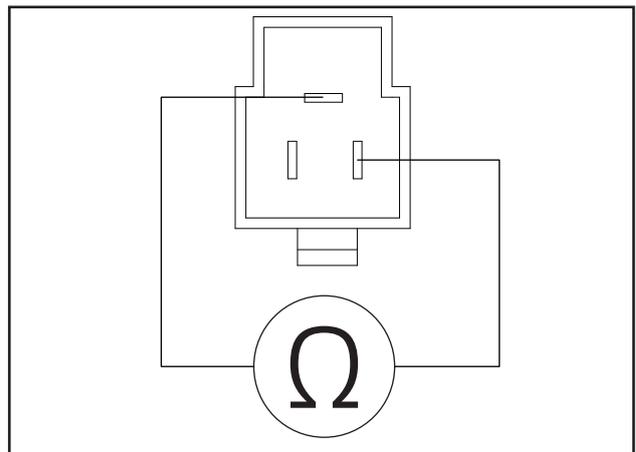
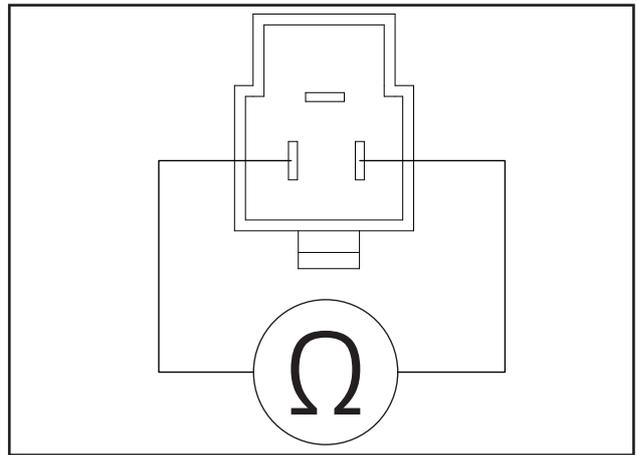


6.6.6 Regulator Path Inspection

Set the multimeter to buzzer.

As shown in the figure, use the multimeter to check whether there is a beep between the AC pins.

If there is no beep, replace the new part and check the regulator body and charging voltage again.



6.6.7 Regulator Input Voltage Test

The battery must function properly and be fully charged.

Set the multimeter to the appropriate DC gear.

Disconnect the positive and negative connectors of regulator.

Start the vehicle for voltage measurement.

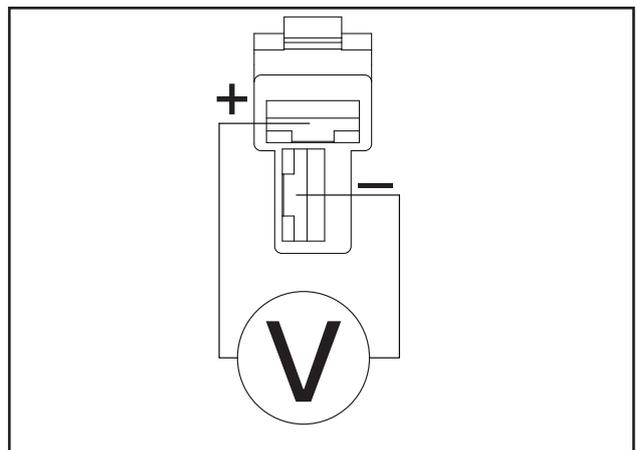
Measure point positive (+), and measure point GND (-).

Input Voltage	
5000rpm	≤14.8V

If the charging voltage is abnormal, check the stator or regulator.

Tips: It is normal to have flameout during the test.

After the test, please fully charge the battery with a special charger.

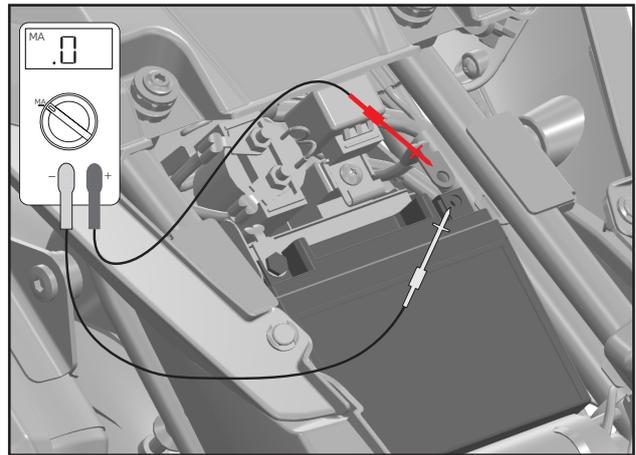


6.6.8 Battery Leakage Inspection

Turn off the vehicle power supply.
Detect the battery current leakage as shown in the figure.

Maximum current leakage does not exceed: 1.8mA.

If it exceeds the value, check the current leakage of each appliance.

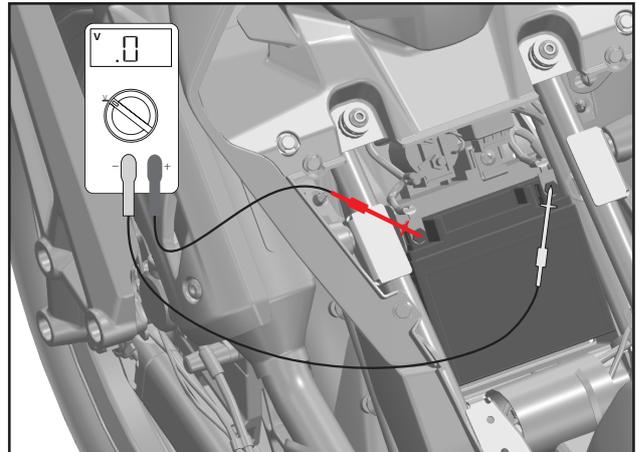


6.6.9 Battery Inspection

Turn off the vehicle power supply.
Check the battery voltage as shown in the figure.

Battery voltage: about 12.75V.

1. If the battery voltage is lower than 12V.
2. Remove the battery and charge it with a special charger.
3. If the battery cannot be charged, the battery may be damaged. Replace the battery with a new one.



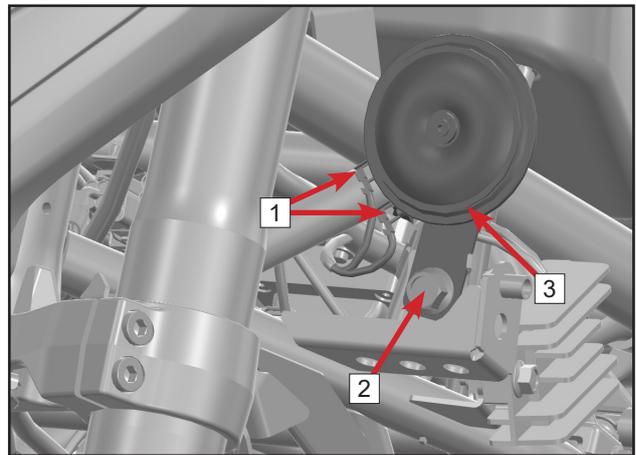
6.7 Horn

Removal

1. Disconnect the connectors.
2. Remove bolt.
3. Remove horn.

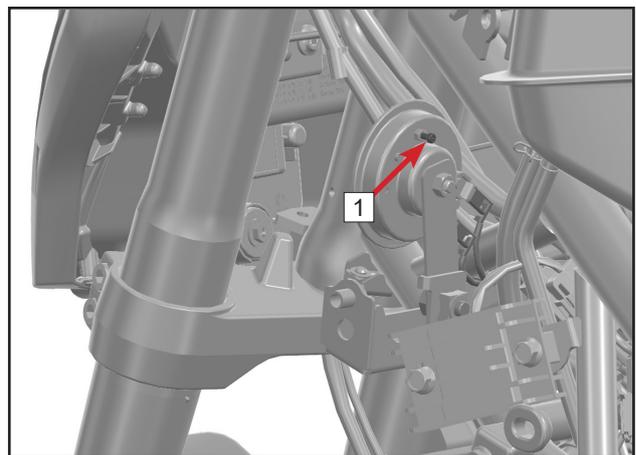
Installation

Reverse the removal procedures for installation.



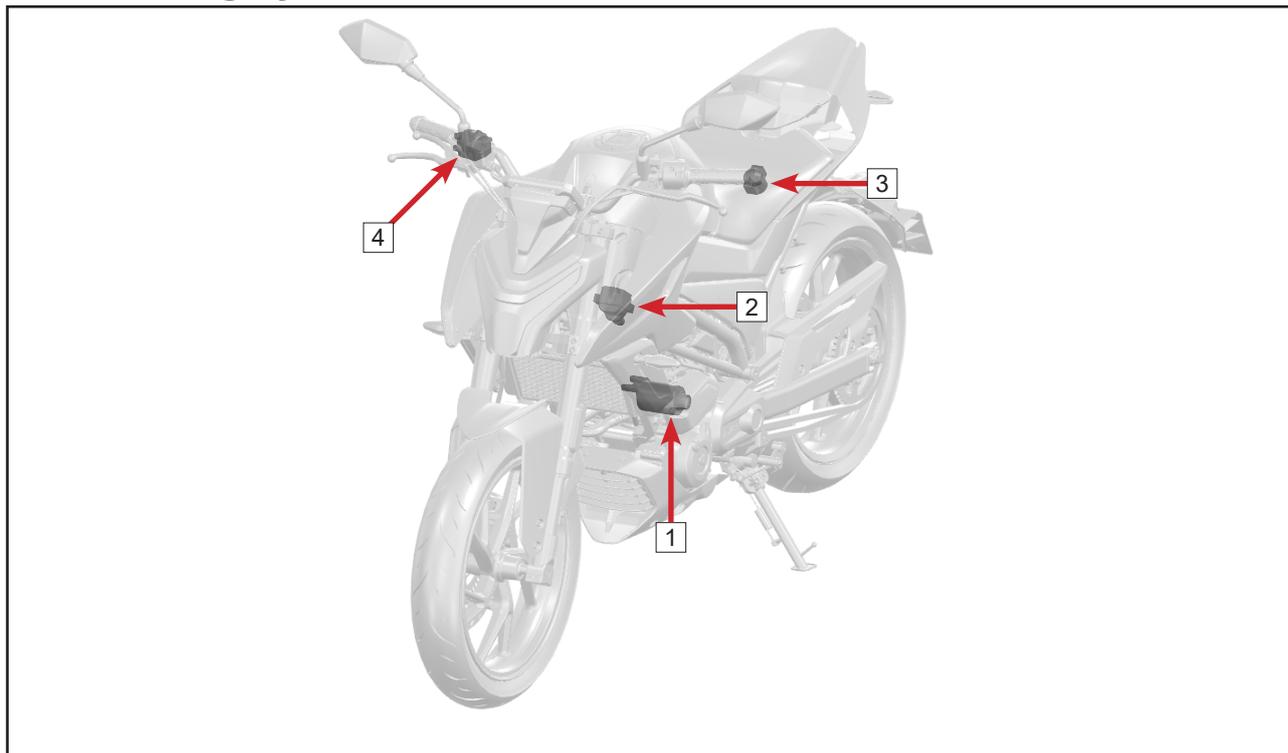
Inspection

- Turn on the vehicle power supply.
Operate horn switch.
Check whether the horn works.
If the speaker has no sound or the sound is muted.
Adjust the bolt **1**.
If the horn fails after adjusting the bolt **1** replace it with a new part.



6.8 Starting System

6.8.1 Starting System Position



1	Starter motor	2	Ignition coil	3	Starter relay
4	Starting switch	5			

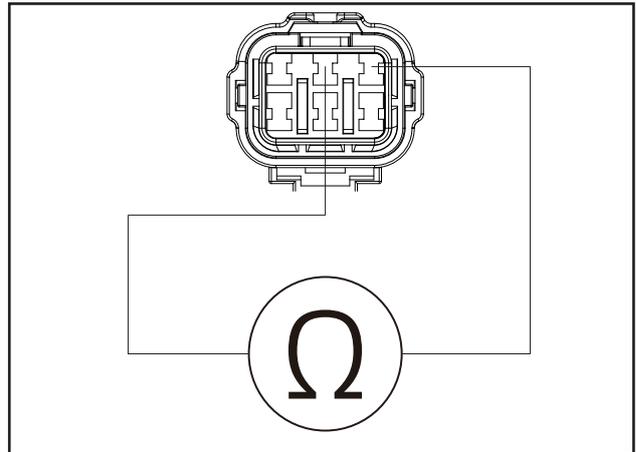
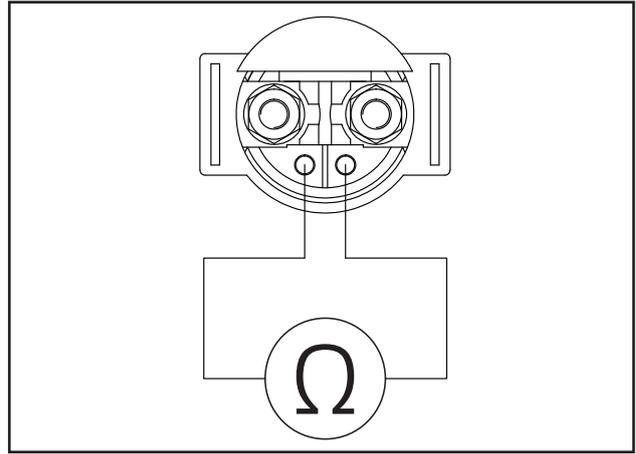
6.8.2 Starter Relay

6.8.2.1 Starter Relay Path Inspection

Set the multimeter to buzzer.

As shown in the figure, use the multimeter to check whether there is a beep between the pins.

If there is no beep, the starter relay may be damaged, please replace it with a new part.



6.8.3 Starting Switch

6.8.3.1 Starting Switch Path Inspection

Turn off the vehicle power off.

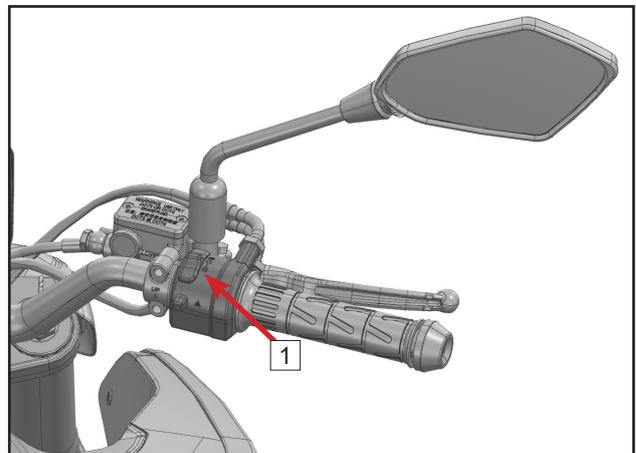
1. Disconnect the connector of RH handlebar starting switch connector.

2. Set the multimeter to buzzer, as shown in the picture.

3. Turn on the ignition switch 1.

4. Use the multimeter to check whether there is a beep between pins.

If there is no beep, the starting switch may be in poor contact or damaged. Please replace it with a new one.

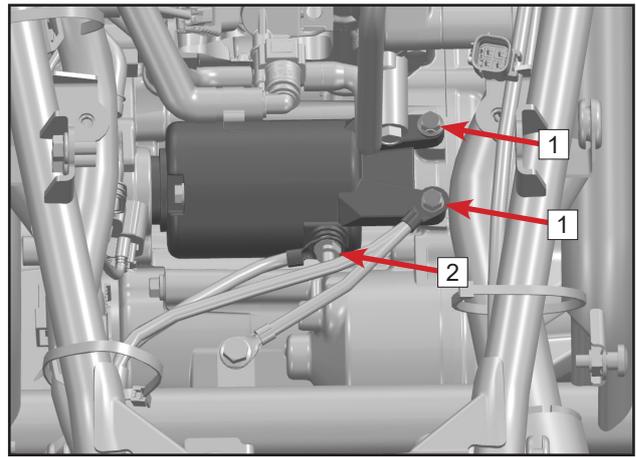


6.8.4 Starter Motor

Removal

Remove bolts [1].

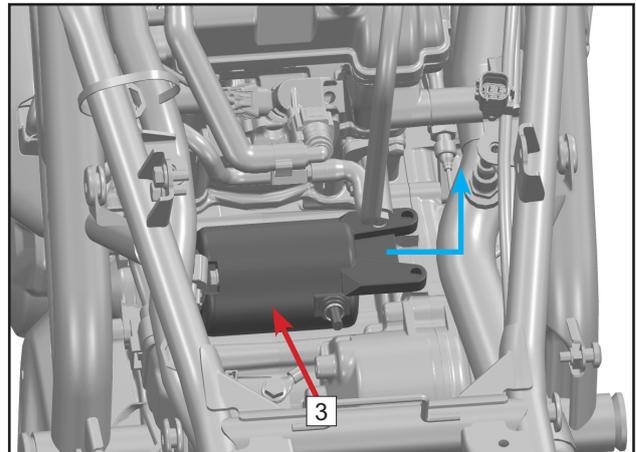
Remove nut [2].



Remove starter motor [3].

Installation

Reverse the removal procedures for installation.



6.8.4.1 Starter Motor Appearance Inspection

Check the appearance of the starter motor for ablative marks. If any ablative marks appear, replace them with new parts.

6.8.4.2 Starter Motor Working Inspection

Press the ignition switch.

1. Observe whether the starter motor has no noise.

2. Observe whether the starter motor works. In any of the above cases, check whether the wiring cable, starter relay, and ignition switch are faulty. If the above parts are not faulty, the starter motor may be faulty, please replace a new part.

6.8.5 Trigger

6.8.5.1 Trigger Peak Voltage Inspection

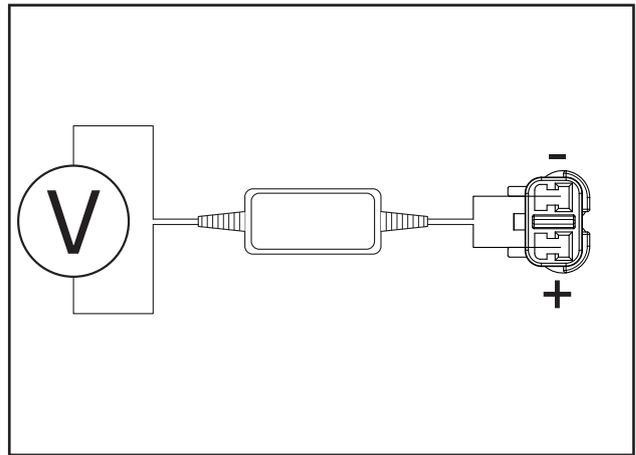
The peak voltage detection connection is shown in the figure.

Turn on the vehicle power supply.

Start the ignition switch for about 4-5 seconds

Peak voltage (AC) standard: more than 3V.

If it is lower than 3V, please replace it with a new part.



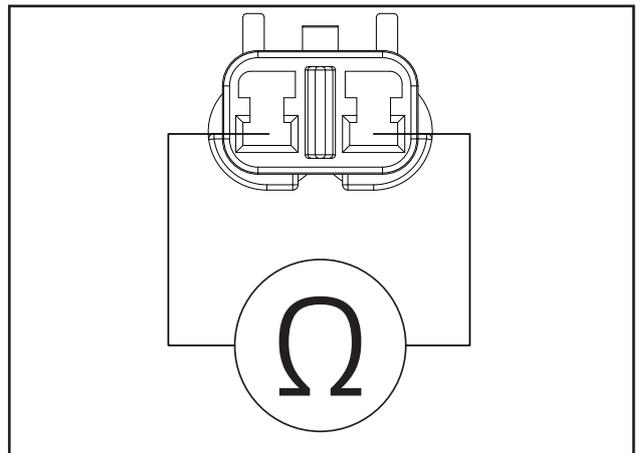
6.8.5.2 Trigger Resistance Inspection

Disconnect the trigger connector.

The peak voltage detection connection is shown in the figure.

Trigger resistance: $100\Omega \sim 120\Omega$ (room temperature)

If the resistance value is less than 100Ω or close to zero, replace it with a new part.



6.8.6 Ignition Coil

6.8.6.1 Ignition Coil Peak Voltage Detection

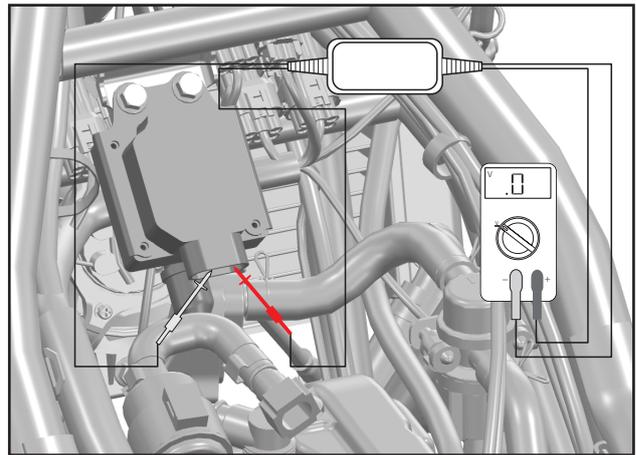
1. Connect the ignition coil to the spark plug assembly using the multimeter peak voltage detection tool.

2. Keep the ignition coil and spark plug assembly grounded.

The detection method is shown in the figure on the right.

Turn on the electric door lock, press the ignition switch

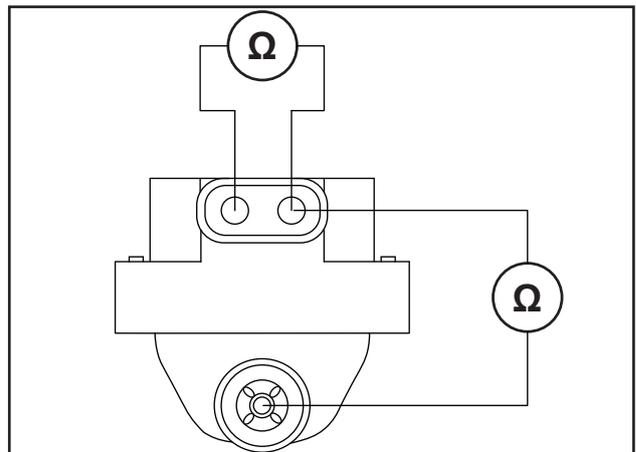
After starting, the secondary ignition voltage should be $\leq 27\text{kV}$



6.8.6.2 Ignition Coil Resistance Detection

Remove ignition coil.

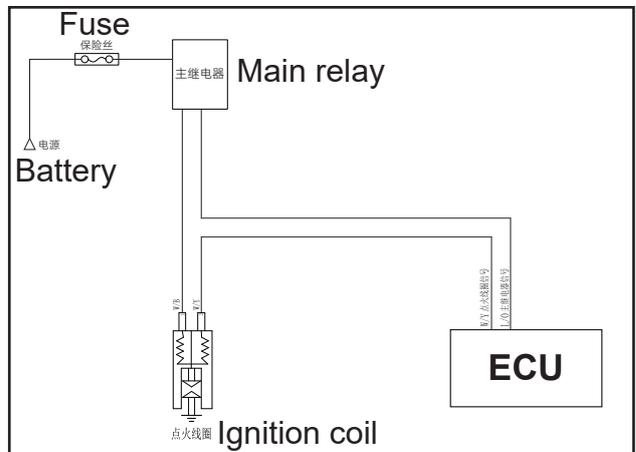
Use the multimeter to measure the ignition coil resistance, as shown in the figure.



Primary resistance value: $1.1 \pm 0.3\Omega$

Secondary resistance value: $13 \pm 0.5\text{k}\Omega$

The wiring diagram of the sensor and the ECU.



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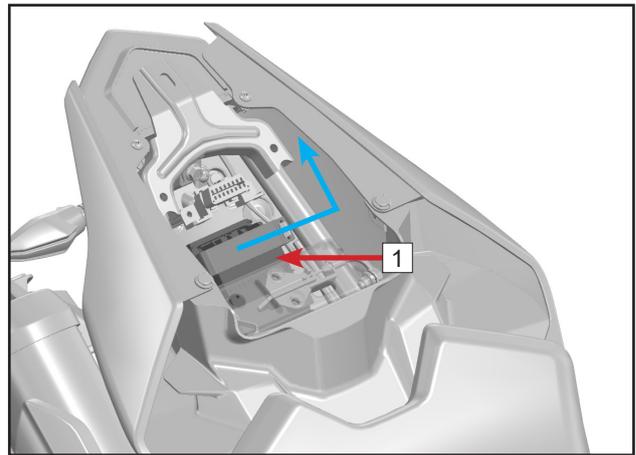
6.9 T-BOX (DELUXE)

Removal

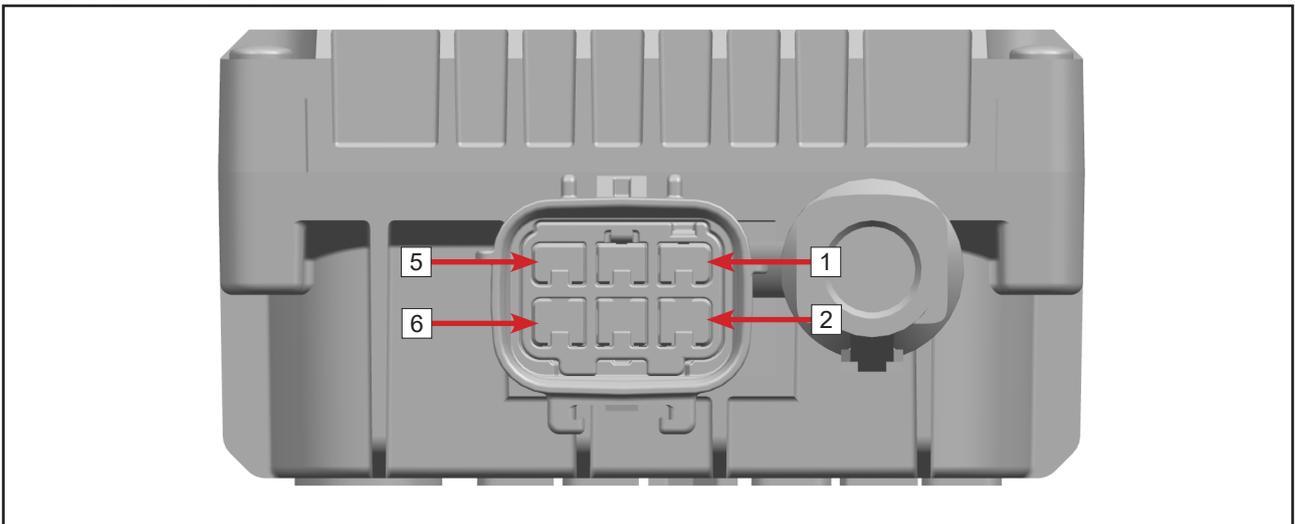
- Turn off the vehicle power supply.
- Remove seat.
- Disconnect the connector.
- Remove T-BOX **1**.

Installation

- Reverse the removal procedures for installation.



6.9.1 T-BOX Pin Function



1	VBAT	2	KL.15	3	CAN H
4	CAN L	5	NC	6	GND

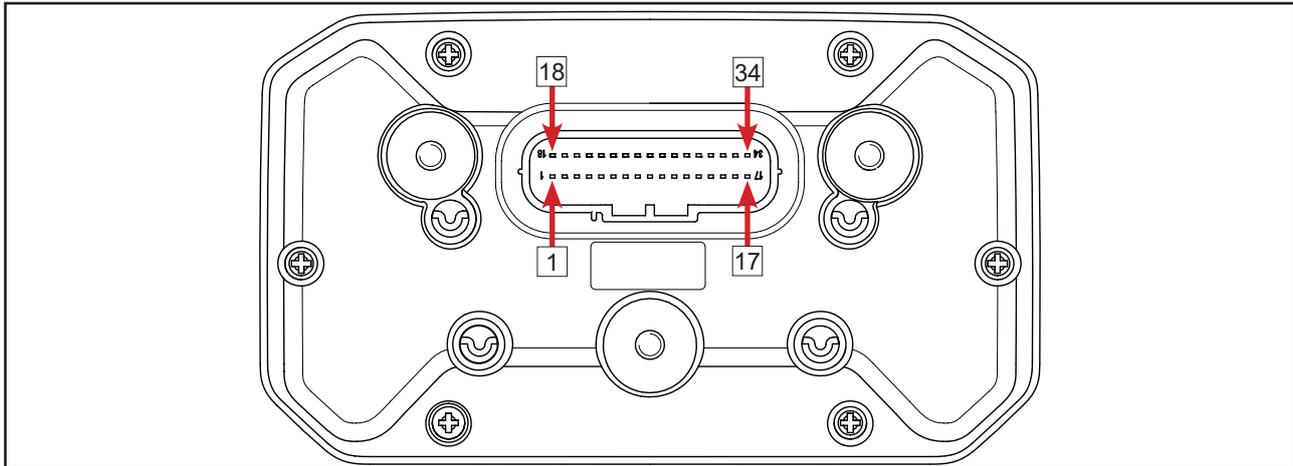
6.9.2 T-BOX Fault Code

No.	Code	Information	Countermeasures
1	B111716	Vehicle power supply voltage below threshold	1. Check battery. *NOTE: After performing the repair recommendations, clear the fault code before powering on the vehicle and starting the engine. Wait for 10s, and then read whether the fault code exists. If the fault code still exists, please contact customer service.
2	B111717	Vehicle power supply voltage above threshold	1. Check battery. *NOTE: After performing the repair recommendations, clear the fault code before powering on the vehicle and starting the engine. Wait for 10s, and then read whether the fault code exists. If the fault code still exists, please contact customer service.
3	U007388	C A N b u s o f f f a u l t o f B I C A N	Condition: The vehicle is powered off. Remove the battery. 1. Use a multimeter to measure the resistance between CAN_H [PIN6] and CAN_L [PIN14] at the OBD port. The measured resistance should range from 54Ω to 66Ω. If the measured resistance is not within the range, check the cable harness. 2. Use a multimeter to measure the connection between the CAN_H [PIN3] of TBOX part and the CAN_H [PIN6] of OBD port. If the connection is not normal, check the wiring harness. 3. Use a multimeter to measure the connection between the CAN_L [PIN4] of TBOX part and the CAN_H [PIN14] of OBD port. If the connection is not normal, check the wiring harness. *NOTE: After performing the repair recommendations, clear the fault code before powering on the vehicle and starting the engine. Wait for 10s, and then read whether the fault code exists. If the fault code still exists, please contact customer service.

4	U220D00	L i m p H o m e D T C	<p>Condition: The vehicle is powered off. Remove the battery.</p> <ol style="list-style-type: none">1. Use a multimeter to measure the resistance between CAN_H [PIN6] and CAN_L [PIN14] at the OBD port. The measured resistance should range from 54Ω to 66Ω. If the measured resistance is not within the range, check the cable harness.2. Use a multimeter to measure the connection between the CAN_H [PIN3] of TBOX part and the CAN_H [PIN6] of OBD port. If the connection is not normal, check the wiring harness.3. Use a multimeter to measure the connection between the CAN_L [PIN4] of TBOX part and the CAN_L [PIN14] of OBD port. If the connection is not normal, check the wiring harness. <p>*NOTE: After performing the repair recommendations, clear the fault code before powering on the vehicle and starting the engine. Wait for 10s, and then read whether the fault code exists. If the fault code still exists, please contact customer service.</p>
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6.10 Dashboard

6.10.1 Dashboard Pin Function



Pin	Function	Description
1	Keyless system indicator	High side control signal 12V (reserved)
2	EFI fault light	Low side control signal (reserved)
3	ABS warning light	Low side control signal (turn-off lighting, reserved)
4	Oil pressure signal	Low side control signal
5	Fuel signal (450 high resistance)	Resistance signal (reserved)
6	High-beam light signal	High side control signal 12V
7	Position light signal	High side control signal 12V
8	RH turn light signal	High side control signal 12V
9	LH turn light signal	High side control signal 12V
10	Handlebar switch: return	Low side control signal
11	Handlebar switch: confirm	Low side control signal
12	Handlebar switch: down	Low side control signal
13	Handlebar switch: up	Low side control signal
14	Power negative	Resistance signal (reserved)
15	Power negative	Power GND
16	E-door lock	High side control signal 12V
17	Power Positive	Power +
18	Fuel signal (100Ω low resistance)	Resistance signal
19	Speed signal	Square wave input signal (reserved)
20	Starting GND signal	Output suspension/GND signal (control 200mA relay) (reserved)
21	Gear signal 6	Low side control signal
22	Gear signal 5	Low side control signal
23	Gear signal 4	Low side control signal
24	Gear signal 3	Low side control signal
25	Gear signal 2	Low side control signal
26	Gear signal 1	Low side control signal
27	Gear signal N	Low side control signal
28	ABS set switch signal	Low side control signal (reserved)
29	/	Low side control signal (reserved)

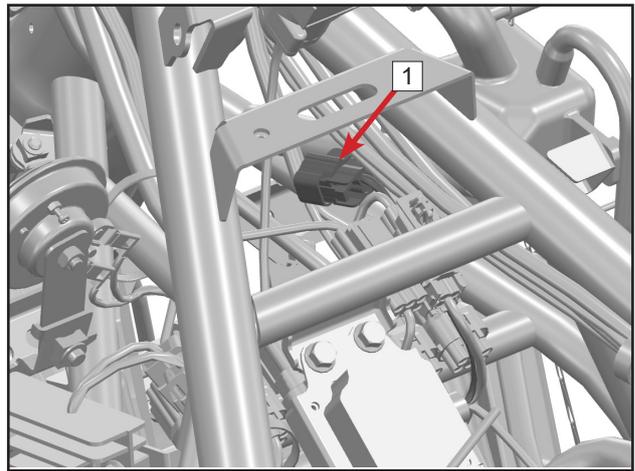
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30	K-LINE	K-line (reserved)
31	Environment temp. sensor	Resistance signal (reserved)
32	Stop switch signal	High side control signal 12V
33	CAN-L	CAN signal: coolant temperature, speed, RPM, ABS failure light, EFI failure light, TCS
34	CAN-H	

6.11 Front/Rear Wheel Speed Sensor

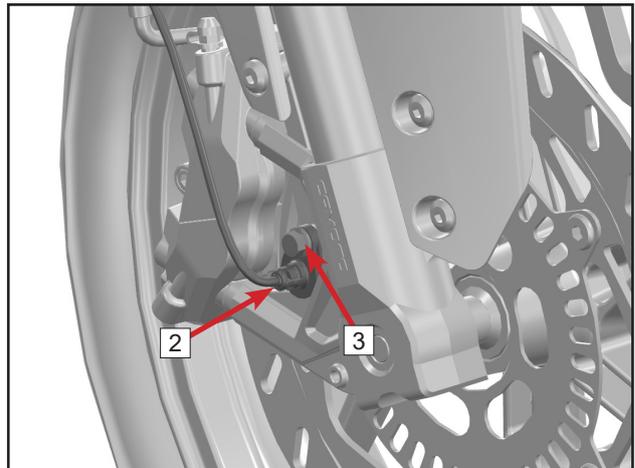
6.11.1 Front Wheel Speed Sensor Removal

Disconnect the connector **1**.



Remove bolt **2**.

Remove front wheel speed sensor **3**.

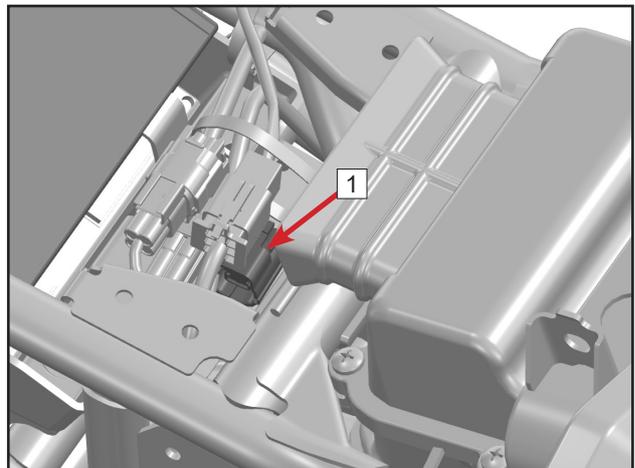


Installation

Reverse the removal procedures for installation.

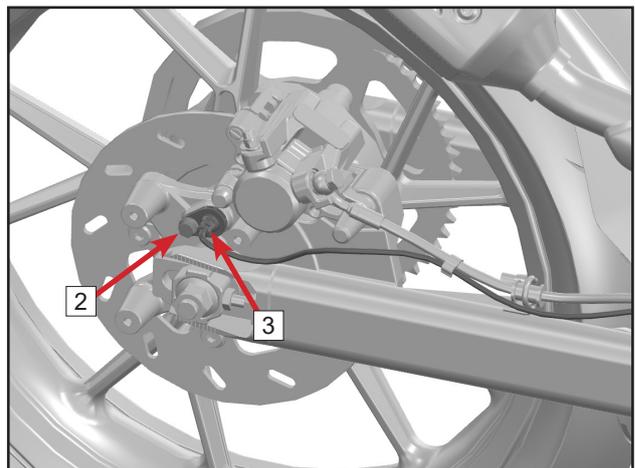
6.11.2 Rear Wheel Speed Sensor Removal

Disconnect the connector **1**.



Remove bolt **2**.

Remove rear wheel speed sensor **3**.



Installation

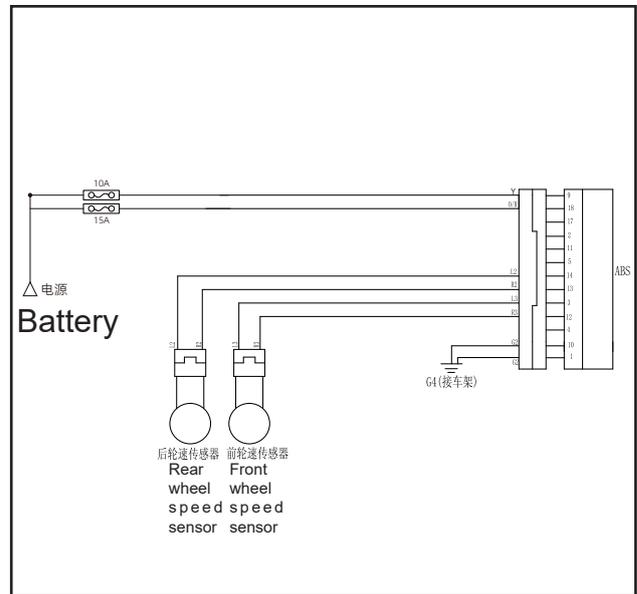
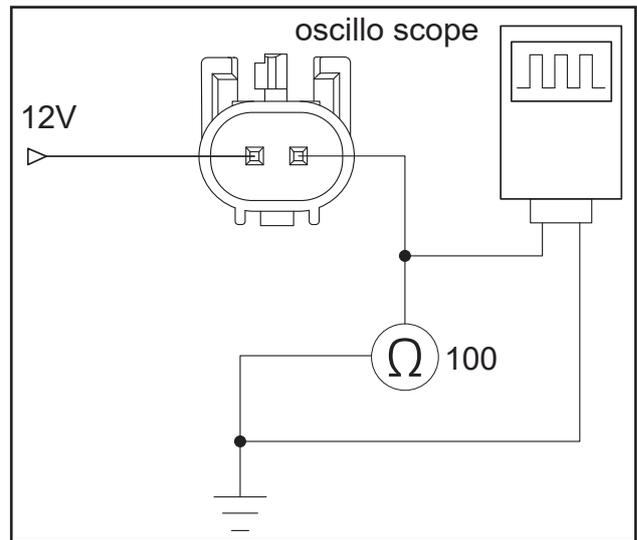
Reverse the removal procedures for installation.

6.11.3 Front/Rear Wheel Speed Sensor Inspection

The speed is calculated by ABS reading wheel speed sensor, and then sent to the dashboard for display after sending to CAN through ABS. At the same time, the work of ABS also needs to read the wheel speed sensor data.

The inspection method is shown in the figure.

1. After connecting the test electrical components, rotate the front wheel hub and observe whether the frequency displayed by the oscilloscope is linear.
2. If the frequency displayed by the oscilloscope is abnormal, check the front gear ring or replace it with a new one.



The circuit of front and rear wheel speed sensors.

6.12 Normal Troubles

Engine Body

Troubles	Possible Cause	Countermeasure
Cannot start or difficult to start	<p>Cylinder pressure too low</p> <ol style="list-style-type: none"> 1. Cylinder worn 2. Piston ring worn 3. Air leakage of cylinder gasket 4. Valve stem worn or unsuitable valve seat 5. Spark plug loosen 6. Starting motor rotate too slowly 7. Improper valve timing 8. Improper valve clearance <p>Spark plug cannot ignite or weak ignition</p> <ol style="list-style-type: none"> 1. Improper spark plug clearance 2. Spark plug dirty or wet 3. Ignition coil failure 4. Trigger short circuit or open circuit 5. Magneto malfunction <p>Insufficient fuel inside throttle body</p> <ol style="list-style-type: none"> 1. Breather hole block 2. Injector blocked or failure 3. High pressure oil pump failure 4. Low pressure, oil pump 5. Oil pump filter net blocked 	<p>Replace Replace Replace Service or replace Tighten Check electrical parts Adjust Adjust</p> <p>Adjust or replace Clean & dry or replace Replace Replace Replace</p> <p>Clean or replace Clean or replace Check or replace Check or replace Clean or replace</p>
No idle speed or unstable speed	<ol style="list-style-type: none"> 1. Improper valve clearance 2. Defective valve pipe 3. Defective valve pipe 4. Rocker or rocker arm wear 5. Dirty spark plug 6. Incorrect valve clearance 7. Ignition coil failure 8. In & Ex air hose blocked, idle valve 9. Magneto failure 	<p>Adjust Replace or repair Replace Replace Replace Replace or repair Replace Replace or repair Replace</p>

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Troubles	Possible Cause	Countermeasures
High RPM unstable	<ol style="list-style-type: none"> 1. Valve spring getting worn 2. Camshaft worn 3. Spark plug dirty 4. Spark plug gap too narrow 5. Valve timing incorrect 6. Ignition coil failure 7. Low pressure,oil pump 8. Air filter too dirty 	<p style="text-align: center;">Replace Replace Clean or replace Adjust or replace Adjust Replace Adjust or replace Clean or replace</p>
Blue or black exhaust gas	<ol style="list-style-type: none"> 1. Engine oil too much 2. Piston ring worn 3. Valve pipe worn 4. Cylinder worn or scraped 5. Valve stem worn 6. Oil seal of valve stem damaged 	<p style="text-align: center;">Check oil level and drain Replace Replace Replace Replace Replace</p>
Engine power not enough	<ol style="list-style-type: none"> 1. Valve clearance improper 2. Valve spring getting weak 3. Valve timing incorrect 4. Cylinder worn 5. Piston ring worn 6. Improper valve seat 7. Spark plug dirty 8. Improper spark plug gap 9. Injector blocked 10. Insufficient pressure,oil pump 11. Air filter too dirty 12. Rocker arm or camshaft worn 13. Air leakage of inlet pipe 14. Engine oil too much 	<p style="text-align: center;">Adjust Replace Adjust Replace Replace Replace or repair Clean or replace Clean or replace Clean or replace Adjust or replace Clean or replace Replace Tighten or replace Check oil level and change</p>
Engine overheating	<ol style="list-style-type: none"> 1. Carbon deposit on piston head 2. Engine oil too less or too much 3. Oil pump failure 4. Fuel hose blocked 5. Air leakage of inlet pipe 6. Unsuitable engine oil 7. Cooling system failure 	<p style="text-align: center;">Clean Check and add or drain Replace Clean Tighten or replace Change oil</p>

06 Electrical System

Troubles	Possible Cause	Countermeasures
Engine abnormal noise	Valve abnormal noise 1. Valve clearance too big 2. Valve spring worn or broken 3. Swing arm or camshaft worn	Adjust Replace Replace
	Piston abnormal noise 1. Piston worn 2. Cylinder worn 3. Carbon deposit inside combustion chamber 4. Piston pin or pin hole worn 5. Piston ring or groove worn	Replace Replace Clean Replace Replace
	Timing chain abnormal noise 1. Chain stretched out 2. Chain sprocket worn 3. Timing tensioner failure	Replace chain and sprocket Replace chain and sprocket Repair or replace
	Clutch abnormal noise 1. Clutch gear worn or damaged 2. Cushion rubber aging or damaged	Replace clutch gear Replace clutch gear
	Crankshaft abnormal noise 1. Bearing noise 2. Crankshaft pin bearing down 3. Clearance too big	Replace Replace Replace
	Transmission abnormal noise 1. Gear worn or damaged 2. Main shaft or counter shaft worn 3. Bearing worn 4. Bushing worn	Replace Replace Replace Replace
Clutch slippery	1. Clutch drive disc worn or damaged 2. Clutch driven disc worn or damaged 3. Clutch spring getting weak	Replace Replace Replace

Ignition System:

Troubles	Possible Cause	Countermeasures
No spark or spark too weak	1. Ignition failure 2. Spark plug ablation 3. Spark plug clearance too big or too small 4. Carbon deposit in spark plug 5. Magnetor failure 6. Battery voltage insufficient or failure 7. Ignition coil failure 8. Trigger coil failure 9. Trigger clearance too big or too small 10. Other line failure	Replace Replace Adjust Clean Replace Charge or replace Replace Replace Adjust Inspect

6.13 Trouble Diagnosis In Accordance With Engine Error

Before trouble diagnosis by engine problems, initial checking should be done as follows:

1. Confirm if engine trouble light is ok.
2. Confirm there's no trouble code record by DSCAN checking.
3. Confirm there's really trouble existing complained by end-users.

Then check the following points:

- (1) Check fuel hoses if any fuel leakage.
- (2) Check vacuum pipes if any broken, twist or improper connection.
- (3) Check intake manifold if any blocked, air leakage or damaged.
- (4) Check high-tension cable if any damaged, aging or ignition order is correct.
- (5) Check wiring close to ground if it's clean and firm.
- (6) Check connector of all sensors and actuator if any loose or improper connection.

Important NOTE: In case there are some problems as above-mentioned, then removal work should be done firstly, then go to next diagnosis.

Diagnosis helps:

1. Confirm engine without any trouble record.
2. Confirm there's really trouble existing.
3. During checking, do not neglect vehicle periodic maintenance, cylinder pressure, valve timing, fuel supply and so on.
4. Replace ECU to test.

In case trouble disappears, then it's a problem of ECU. If trouble still exists, then assemble original ECU and check other points.

Frequent troubles list:

1. When starting the engine, engine cannot rotate or rotate slowly.
2. When starting engine, starter motor can rotate but cannot start engine.
3. Difficult to start warm or hot engine.
4. Difficult to start cold engine.
5. RPM is ok, but difficult to start engine.
6. Starting is ok, but idle speed is unstable at any time.
7. Starting is ok, but idle speed is unstable during engine warm-up period.
8. Starting is ok, but idle speed is unstable after engine warm-up.
9. Starting is ok, idle speed is unstable or engine stop when switch on some lights or other electric components.
10. Starting is ok, but too high idle speed.
11. RPM cannot go up or engine stop when acceleration.
12. Slow acceleration.
13. Insufficient power and bad performance when acceleration.

(1) Starting Failure/Hard Starting

General failure part: 1. Battery, 2. Starter motor, 3. Wirings harness or ignition switch, 4. Engine mechanism part.

General diagnosis procedures:

Item	Procedures	Results	Next
1	Use multi-meter to check battery voltage if voltage is between 8V~12V or not when engine starts.	YES	Next step
		NO	Replace battery
2	Turn on ignition switch, stop switch and side stand switch, and check if voltage of ECU pin 35 is around 12V.	YES	Next step
		NO	Repair switches or change harness
3	Keep ignition switch "on", use multi-meter to check if voltage of starting motor anode is over 8V.	YES	Next step
		NO	Repair or change harness
4	Disassemble starting motor and check its working status, especially whether there was broken circuit or jammed by bad lubrication.	YES	Repair or replace starting motor
		NO	Next step
5	If error only occur in Winter, check if starting motor resistance is too big caused by improper oil used.	YES	Change to proper lubrication
		NO	Next step
6	Check if mechanical resistance is too big inside engine, which causes starter engine does not work or rotates slowly.	YES	Check and repair engine inside resistance
		NO	Repeat

(2) When starting, engine can rotate but cannot start

General failure part: 1. No fuel, 2. Fuel pump, 3. Trigger, 4. Ignition coil, 5. Mechanical parts of engine.

General diagnosis procedures:

Item	Procedures	Results	Next
1	Connect fuel pressure gauge, turn on ignition switch, repeat several times if necessary, or start engine, check if fuel pressure is around 300kPa.	YES	Next step
		NO	Check and repair fuel supply system
2	Connect DSCAN, observe the data of "RPM", check if there's signal of RPM data after starting engine.	YES	Next step
		NO	Check and repair RPM sensor circuit
3	Disconnect high-tension cable, connect spark plug and set its electrode 5mm to engine body, then start engine to check if blue and white spark appears.	YES	Next step
		NO	Check ignition system
4	Test cylinder pressure and check if pressure is enough.	YES	Eliminate engine mechanical failures
		NO	Next step
5	Use EFI system adaptor, turn on ignition switch, check if power supply of ECU pin 32# and 33# is normal, check if ECU pin 5# and 10# works normally.	YES	Use DSCAN to check
		NO	Repair related circuit

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(3)Difficult to start hot engine

General failure part: 1. Water in fuel tank, 2. Fuel pump, 3. Water temp. sensor, 4. Ignition coil.

General diagnosis procedures:

Item	Procedures	Results	Next
1	Connect fuel pressure gauge, turn on engine, check if fuel pressure is around 300kPa.	YES	Next step
		NO	Check and repair fuel supply system
2	Disconnect high-tension cable, connect spark plug and set its electrode 5mm to engine body, then start engine to check if blue and white spark appears.	YES	Next step
		NO	Check ignition system
3	Disconnect engine water temp. sensor joint, start the engine, and check whether the engine starts successfully. (Or replace the engine temp. sensor with a 300 ohm resistance in series at the engine water temp. sensor junction, and check whether the engine successfully starts at this time.)	YES	Check and repair circuit or replace sensor
		NO	Next step
4	Check whether the failure happens right after fueling.	YES	Change fuel
		NO	Next step
5	Use EFI system adaptor, turn on ignition switch, check if power supply of ECU pin 32# and 33# is normal, check if ECU pin 5# and 10# works normally.	YES	Use DSCAN to check
		NO	Repair related circuit

(4) Difficult to start cold engine

General failure part: 1. Water in fuel tank; 2. Fuel pump; 3. Engine water temp. sensor; 4. Injector; 5. Ignition coil; 6. Throttle body and by-pass; 7. Mechanical parts of engine.

General diagnosis procedures:

Item	Procedures	Results	Next
1	Connect fuel pressure gauge, turn on engine, check if fuel pressure is around 300kPa.	YES	Next step
		NO	Check and repair fuel supply system
2	Disconnect high-tension cable, connect spark plug and set its electrode 5mm to engine body, then start engine to check if blue and white spark appears.	YES	Next step
		NO	Check and repair ignition system
3	Disconnect engine water temp. sensor joint, start the engine, and check whether the engine starts successfully. (Or replace the engine temp. sensor with a 2500 ohm resistance in series at the engine water temp. sensor junction, and check whether the engine successfully starts at this time.)	YES	Check and repair circuit or replace sensor
		NO	Next step
4	Slightly draw throttle cable and check if engine could start easily.	YES	Clean throttle body and by-pass
		NO	Next step
5	Disassemble injector and use special tool to check if there is leakage or block.	YES	Replace
		NO	Next step
6	Check whether the failure happens right after filling fuel.	YES	Change fuel
		NO	Next step
7	Check if cylinder pressure is insufficient.	YES	Eliminate engine mechanical failures
		NO	Next step

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(5) Difficult to start in any conditions

General failure part: 1. Water in fuel tank; 2. Fuel pump; 3. Water temp. sensor; 4. Injector; 5. Ignition coil; 6. Throttle body and by-pass; 7. Air intake pipe; 8. Ignition timing; 9. Spark plug; 10. Mechanical part of engine.

General diagnosis procedures:

Item	Procedures	Results	Next
1	Check if air filter is blocked or air intake pipe leaks.	YES	Check and repair air intake system
		NO	Next step
2	Connect fuel pump gauge, start engine, check if pressure is around 330kPa.	YES	Next step
		NO	Check and repair fuel supply system
3	Disconnect high-tension cable, connect spark plug and set its electrode 5mm to engine body, then start engine to check if blue and white spark appears.	YES	Next step
		NO	Check and repair ignition system
4	Check if spark plug is suitable for requirement including its type and clearance.	YES	Next step
		NO	Adjust or replace
5	Disconnect engine water temp. sensor joint, start the engine, and check whether the engine starts successfully.	YES	Check and repair circuit or replace sensor
		NO	Next step
6	Slightly draw throttle cable and check if engine could start easily.	YES	Clean throttle body and by-pass
		NO	Next step
7	Disassemble injector and use special tool to check if there is leakage or block.	YES	Replace
		NO	Next step
8	Check whether the failure happens right after filling fuel.	YES	Change fuel
		NO	Next step
9	Check if cylinder pressure is insufficient.	YES	Eliminate engine mechanical failures
		NO	Next step

(6) Normal starting, but unstable idle speed during engine warming

General failure part: 1. Water in fuel tank; 2. Injector; 3. Spark plug; 4. Throttle body and by-pass; 5. Air intake pipe; 6. Air control valve; 7. Ignition timing; 8. Spark plug; 9. Mechanical part of engine.

General diagnosis procedures:

Item	Procedures	Results	Next
1	Check if air filter is blocked or air intake pipe leaks.	YES	Check and repair air intake system
		NO	Next step
2	Check if air control valve is blocked.	YES	Clean or replace
		NO	Next step
3	Check cylinder spark plug, and observe whether its type and clearance meet the specification.	YES	Next step
		NO	Adjust or replace
4	Check if there is carbon deposit inside throttle body and air control valve.	YES	Clean
		NO	Next step
5	Disassemble injector and use special tool to check if there is leakage, block or flow overshoot.	YES	Replace
		NO	Next step
6	Check whether the failure happens right after fueling.	YES	Change fuel
		NO	Next step
7	Check engine cylinder pressure, observe whether there is large difference in the engine cylinder pressure.	YES	Eliminate engine mechanical failures
		NO	Next step
8	Check if the mechanical ignition timing is beyond specification.	YES	Next step
		NO	Check ignition timing

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(7) Normal starting, but unstable idle speed after engine warming

General failure part: 1. Water in fuel tank; 2. Engine water temp. sensor; 3. Spark plug; 4. Throttle body and by-pass; 5. Air intake pipe; 6. Air control valve; 7. Mechanical part of engine.

General diagnosis procedures:

Item	Procedures	Results	Next
1	Check if air filter is blocked or air intake pipe leaks.	YES	Check and repair air intake system
		NO	Next step
2	Check if spark plug is suitable for requirement including its type and clearance.	YES	Next step
		NO	Adjust or replace
3	Disassemble air control valve and check if there is carbon deposit inside throttle body, idle adjustment and by-pass.	YES	Clean
		NO	Next step
4	Disconnect water temp. sensor connector and start engine to check idle speed is stable or not.	YES	Check circuit and replace sensor
		NO	Next step
5	Disassemble injector and use special tool to check if there is leakage, block or flow overshoot.	YES	Replce
		NO	Next step
6	Check whether the failure happens right after fueling.	YES	Change fuel
		NO	Next step
7	Check engine cylinder pressure, observe whether there is large difference in the engine cylinder pressure.	YES	Eliminate engine mechanical failures
		NO	Next step

(8) Normal starting, but unstable idle speed after engine warming

General failure part: 1. Water in fuel tank; 2. Water temp. sensor; 3. Spark plug; 4. Throttle body and by-pass; 5. Air intake pipe; 6. Air control valve; 7. Mechanical part of engine.

General diagnosis procedures:

Item	Procedures	Results	Next
1	Check if air filter is blocked or air intake pipe leaks.	YES	Check and repair air intake system
		NO	Next step
2	Check if spark plug is suitable for requirement including its type and clearance.	YES	Next step
		NO	Adjust or replace
3	Disassemble air control valve and check if there is carbon deposit inside throttle body, idle adjustment and by-pass.	YES	Clean
		NO	Next step
4	Disconnect the engine water temp. sensor joint, start engine, and observe whether engine is unsteady at idle during engine warming.	YES	Check and repair circuit or replace sensor
		NO	Next step
5	Disassemble injector and use special tool to check if there is leakage, block or flow overshoot.	YES	Replace
		NO	Next step
6	Check whether the failure happens right after fueling.	YES	Change fuel
		NO	Next step
7	Check engine cylinder pressure, observe whether there is large difference in the engine cylinder pressure.	YES	Eliminate engine mechanical failure
		NO	Next step

(9) Normal starting, unstable idle speed or engine stop when it is electronic loaded (e.g. headlight is on)

General failure part: 1. Air control valve; 2. Injector.

General diagnosis procedures:

Item	Procedures	Results	Next
1	Disassemble air control valve and check if there is carbon deposit inside throttle body, idle adjustment and by-pass.	YES	Clean
		NO	Next step
2	Check if output power increases when lighting, by using DSCAN to test if ignition advance angle, fuel spray and air intake volume is normal.	YES	To step 4
		NO	Next step
		NO	Check and repair air conditioner system
3	Disassemble injector and use special tool to check if there is leakage or blocked or wrong fuel flow.	YES	Replace
		NO	Next step
4	Use EFI system adaptor, turn on ignition switch, check if power supply of ECU pin 32# and 33# is normal, check if ECU pin 5# and 10# works normally.	YES	Use DSCAN to check
		NO	Repair related circuit

(10) Engine starts normally, but idle speed is too high

General failure part: 1. Throttle body and by-pass; 2. Injector seat; 3. Air control valve; 4. Water temp. sensor; 5. Ignition timing.

General diagnosis procedures:

Item	Procedures	Results	Next
1	Check if throttle cable is jammed or too tight.	YES	Adjust
		NO	Next step
2	Check if air filter is blocked or air intake pipe leaks.	YES	Check and repair air intake system
		NO	Next step
3	Disassemble air control valve and check if there is carbon deposit inside throttle body, idle adjustment and by-pass.	YES	Clean
		NO	Next step
4	Remove water temp. sensor connector, start engine to check if idle speed is too high.	YES	Check circuit and replace sensor
		NO	Next step
5	Check if ignition timing complies with standard regulation.	YES	Next step
		NO	Check and repair ignition timing

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(11) RPM cannot increase or engine stop when accelerating

General failure part: 1. Water in fuel tank; 2. TPS; 3. Spark plug; 4. Throttle body and by-pass; 5. Air intake pipe; 6. Air control valve; 7. Injector; 8. Ignition timing; 9. Exhaust pipe.

General diagnosis procedures:

Item	Procedures	Results	Next
1	Check if air filter is blocked.	YES	Check and repair air intake system
		NO	Next step
2	Connect fuel pressure gauge, turn on the engine, check if fuel pressure is around 300kPa.	YES	Next step
		NO	Check and repair fuel supply system
3	Check if spark plug is suitable for requirement including its type and clearance.	YES	Next step
		NO	Adjust or replace
4	Remove air control valve and check if there is carbon deposit inside throttle body, air control valve and by-pass.	YES	Clean
		NO	Next step
5	Check if intake pressure sensor, TPS and its circuit is normal.	YES	Next step
		NO	Check circuit and replace sensor
6	Disassemble injector and use special tool to check if there is leakage or block.	YES	Replace
		NO	Next step
7	Check whether the failure happens right after filling fuel.	YES	Change fuel
		NO	Next step
8	Check if ignition timing complies with standard regulation.	YES	Next step
		NO	Check and repair ignition timing
9	Check if exhaust gas exhale smoothly.	YES	Next step
		NO	Repair or replace exhaust pipe

(12) Low acceleration

General failure part: 1. Water in fuel tank; 2. TPS; 3. Spark plug; 4. Throttle body and by-pass; 5. Air intake pipe; 6. Air control valve; 7. Injector; 8. Ignition timing; 9. Exhaust pipe.

General diagnosis procedures:

Item	Procedures	Results	Next
1	Check if air filter is blocked.	YES	Check and repair air intake system
		NO	Next step
2	Connect fuel pressure gauge, turn on the engine, check if fuel pressure is around 300kPa.	YES	Next step
		NO	Check and repair fuel supply system
3	Check if spark plug is suitable for requirement including its type and clearance.	YES	Next step
		NO	Adjust or replace
4	Remove air control valve and check if there is carbon deposit inside throttle body, air control valve and by-pass.	YES	Clean
		NO	Next step

06 Electrical System

Item	Procedures	Results	Next
5	Check if TPS and its circuit is normal.	YES	Next step
		NO	Check circuit and replace sensor
6	Disassemble injector and use special tool to check if there is leakage or block.	YES	Replace
		NO	Next step
7	Check whether the failure happens right after filling fuel.	YES	Change fuel
		NO	Next step
8	Check if ignition timing complies with standard regulation.	YES	Next step
		NO	Check and repair ignition timing
9	Check if exhaust gas exhale smoothly.	YES	Next step
		NO	Repair or replace exhaust pipe

(13) Difficult to accelerate and bad performance

General failure part: 1. Water in fuel tank; 2. TPS; 3. Spark plug; 4. Ignition coil; 5. Throttle body and by-pass; 6. Air intake pipe; 7. Air control valve; 8. Injector; 9. Ignition timing; 10. Exhaust pipe.

General diagnosis procedures:

Item	Procedures	Results	Next
1	Check if clutch sliding, low tire pressure, bad brake or wrong tire size.	YES	Repair
		NO	Next step
2	Check if air filter is blocked.	YES	Check and repair air intake system
		NO	Next step
3	Connect fuel pressure gauge, turn on engine, check if fuel pressure is around 300kPa.	YES	Next step
		NO	Check and repair fuel supply system
4	Disconnect high-tension cable, connect spark plug and set its electrode 5mm to engine body, then start engine to check if spark is strong enough.	YES	Next step
		NO	Check and repair ignition system
5	Check if spark plug is suitable for requirement including its type and clearance.	YES	Next step
		NO	Adjust or replace
6	Remove air control valve and check if there is carbon deposit inside throttle body, air control valve and by-pass.	YES	Clean
		NO	Next step
7	Check if TPS and its circuit is normal.	YES	Next step
		NO	Check circuit and replace sensor
8	Disassemble injector and use special tool to check if there is leakage or block.	YES	Replace
		NO	Next step
9	Check whether the failure happens right after filling fuel.	YES	Change fuel
		NO	Next step
10	Check if ignition timing complies with standard regulation.	YES	Next step
		NO	Check and repair ignition timing
11	Check if exhaust gas exhale smoothly.	YES	Next step
		NO	Repair or replace exhaust pipe

07 Front Wheels, Brakes, Suspension and Steering

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7.1 Maintenance Information

7.1.1 Operation Precautions

NOTE

Securely support the scooter when overhauling front wheel and suspension system. Do not overexert on the wheel. Avoid any damage to the wheels. In order to avoid damage to the rim, special tire removal and installation equipment must be used.

7.1.2 Maintenance Standard

Item		Standard	Service Limit	
Front Wheel	Front wheel shaft bent	—	0.2 mm	
	Wheel runout	Vertical	0.6 mm	0.8 mm
		Horizontal	0.6 mm	0.8 mm
	Tires	Residual grooves	—	0.8 mm
		Tire pressure	225kPa (2.25 kgf/cm ²)	—
Front brake	Free play of brake lever	5mm - 20mm	—	

7.1.3 Tighten Torque

Front wheel shaft tighten screw: 60 N·m ~ 70 N·m

Upper triple clamp shock absorber lock screw: 18 N·m ~ 22 N·m

Lower triple clamp shock absorber lock screw: 18 N·m ~ 22 N·m

07 Front Wheels, Brakes, Suspension and Steering

7.2 Troubleshooting

7.2.1 Heavy Steering (Steering too Tight)

- Steering adjustment nut is too tight
- Steering bearing is damaged or worn out
- Inner & outer bearing seats are damaged, worn out or stepped
- Steering column is distorted
- Tire pressure is too low
- Worn tire

7.2.2 Lateral or Poor Steering

- Front right and left shock absorbers are not matched.
- Front shock absorbers are distorted
- Front wheel shaft is distorted, wrong assembly of front wheel

7.2.3 Front Wheel Runout

- Deformed rim
- Faulty wheel bearing
- Poor tires
- Improper tightening of wheel shaft

7.2.4 Front Suspension too Soft

- Front fork spring weakness
- Front fork oil insufficiency

7.2.5 Front Suspension too Hard

- Improper amount of front fork oil
- Front shock absorber deformed
- Front fork oil channel blocked

Spongy Brake Lever

- Air enter into brake system
- Brake oil level too low
- Oil leakage in brake system

Poor Braking Power

- Dirty brake disc
- Brake disc unparallel with wheels

Abnormal Noise with Disc Brake

- Dirty brake disc
- Eccentric disc brake disc
- Disc brake pump wrong assembly
- Brake disc unparallel with wheels

Abnormal Noise with Front Suspension

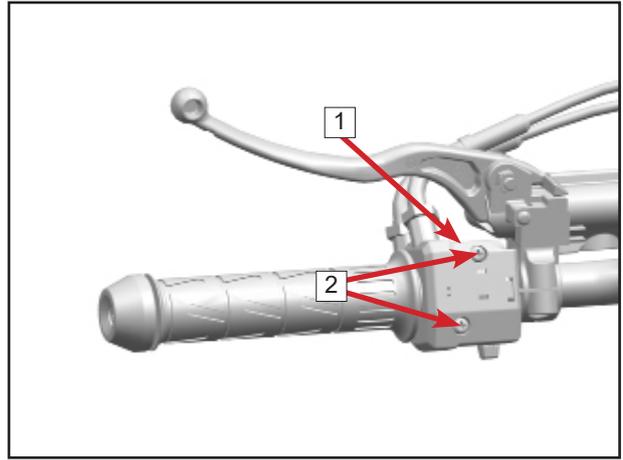
- Insufficient oil on tachometer gear
- Sliding part bent
- Front fork not not tighten enough
- Insufficient front fork oil
- Front fork bearing wear

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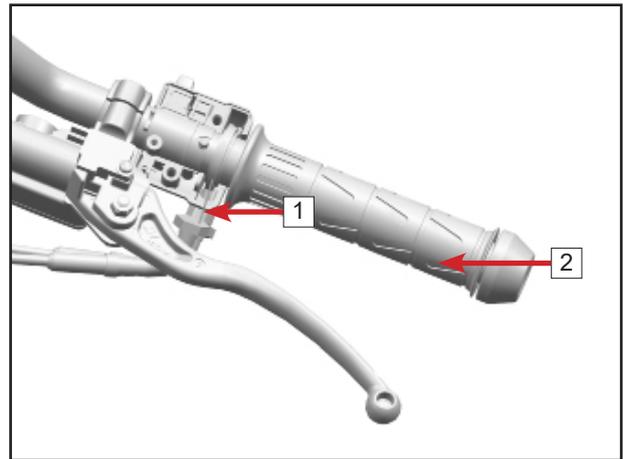
7.3 Handlebar

Removal

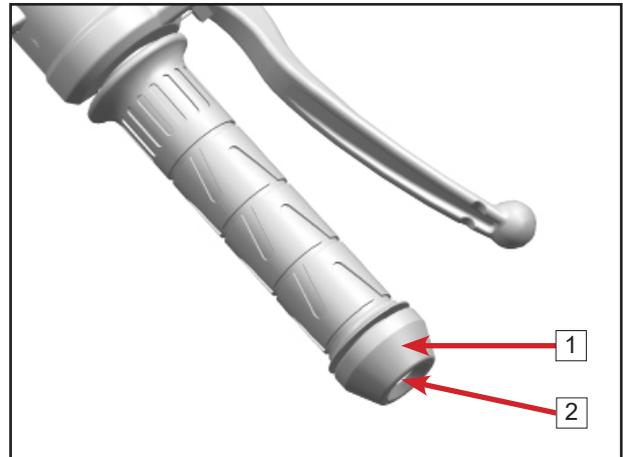
Remove two mounting screws [1] of RH handlebar switches [2].



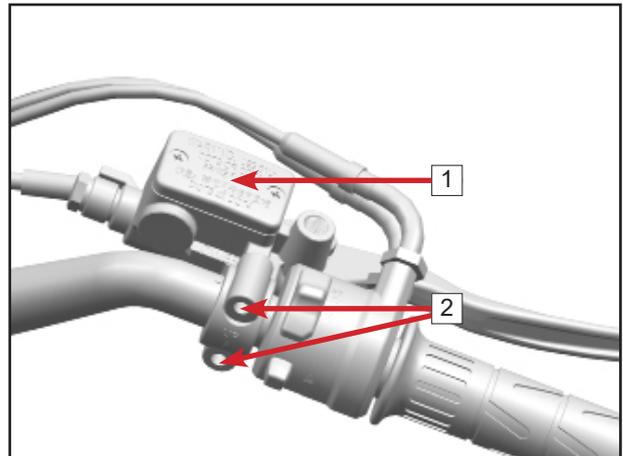
Detach the throttle cable [1] from the throttle grip [2].
Remove RH handlebar switch.



Loosen the balance block bolt [2].
Remove the balance block [1] and the throttle grip.

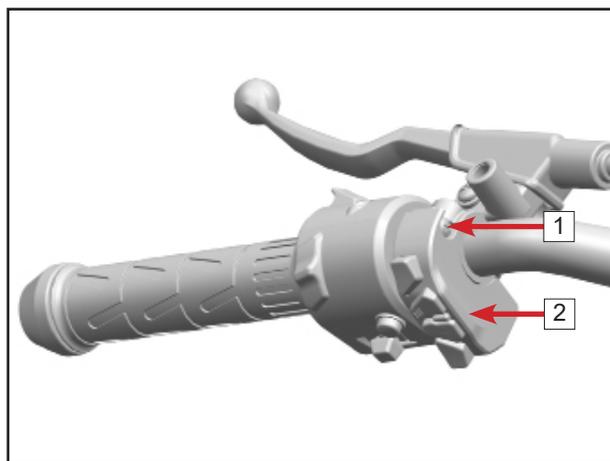


Remove two fixing seat bolts [2] of front brake main pump.
Remove front brake master pump [1].

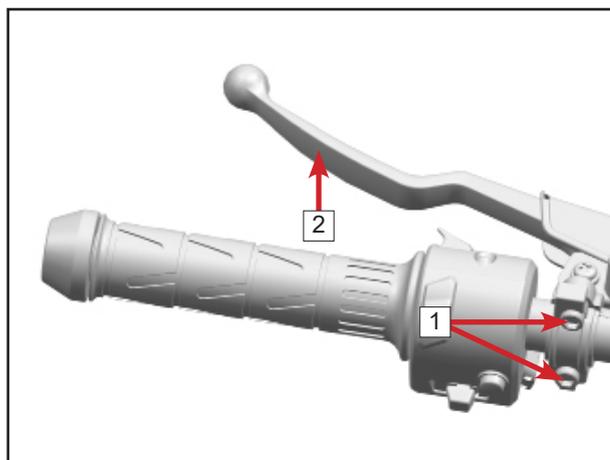


07 Front Wheels, Brakes, Suspension and Steering

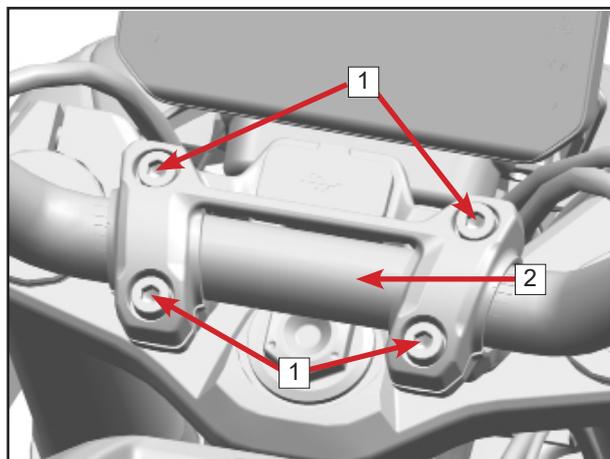
Remove self-tapping screw **1**.
Remove dashboard menu switch **2**.



Remove two clutch lever fixing screws **1**
and the clutch lever **2**.



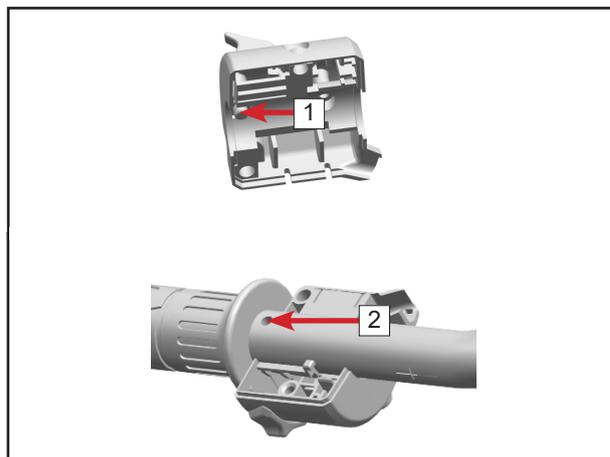
Remove four fixing screws **1** and the
handlebar **2**.



Installation

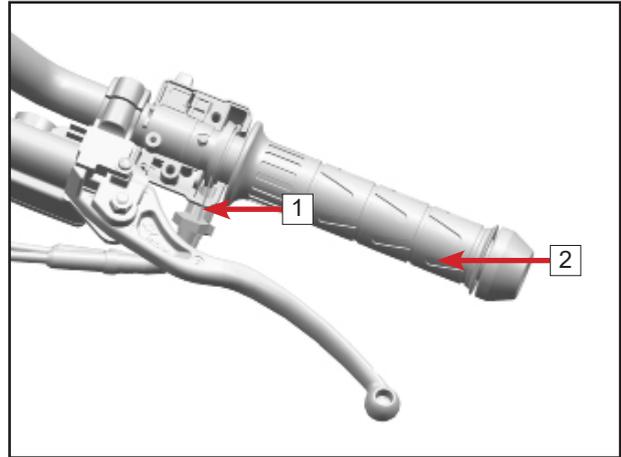
Reverse the removal procedures for
installation.

When installing LH handlebar switch **1**,
install dowel pin into the position hole.



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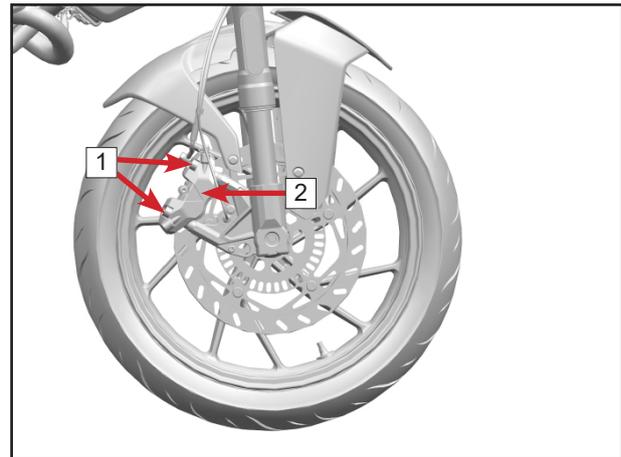
When installing RH handlebar switch, insert throttle grip **2** into right handlebar, then install throttle cable **1**.



7.4 Front Wheel

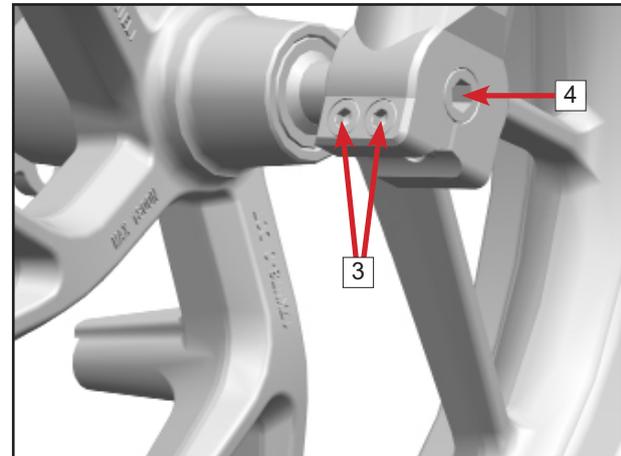
Support the vehicle to lift the front wheel off the ground.

Unscrew the caliper fixing screws **1**.
Remove the caliper **2**.



Loosen the shock absorber tighten screws **3**.

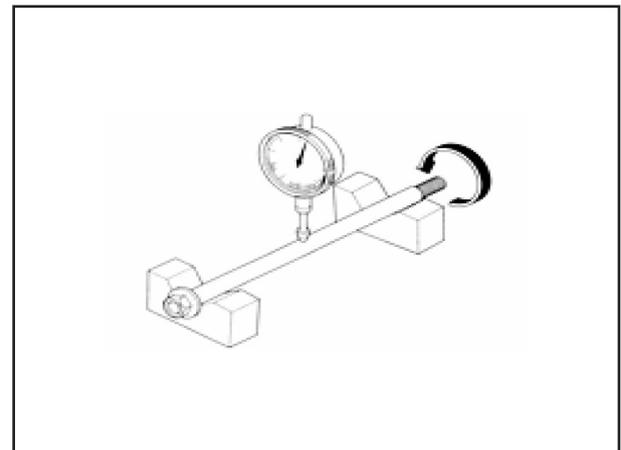
Unscrew the front wheel shaft **4**.
Remove the front wheel.



7.4.1 Front Wheel Shaft Inspection

Place the front wheel shaft and shaft core on the V-iron to check the bending of front wheel shaft.

Service limit: Replace above 0.2mm.



07 Front Wheels, Brakes, Suspension and Steering

Precautions for Protecting Vehicle Tires

When the environment temperature is below 14°F (-10°C), it is recommended to place the vehicle indoors if required to be stored for a long time.

Do not use side stand to park the vehicle for long time in winter. Use the frame to park the vehicle, to let the tires be free of the wheel weight.

Do not allow the tires to sink into snow or ice for a long time when parking the vehicle in winter.

When parking the vehicle for a long time outside in winter, it is recommended to put objects that can preserve the heat such as branches, paper or sand under the tires.

7.4.2 Front Rim Inspection

Place the front wheels on the rotary table and check the rim runout.

Measure with a dial gauge, rotate the wheel to check.

Rim runout service limit:

Axial: 0.8 mm

Radial: 0.8 mm

Check the bearing for looseness.

Rotate the inner race of bearing to check whether the bearing can swing flexibly and smoothly.

Check whether it is loose on the hub.

Replace new bearing if not free play or loosen or have abnormal noise.

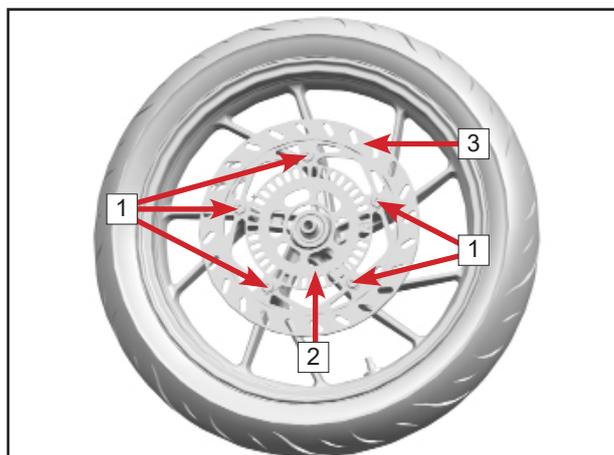
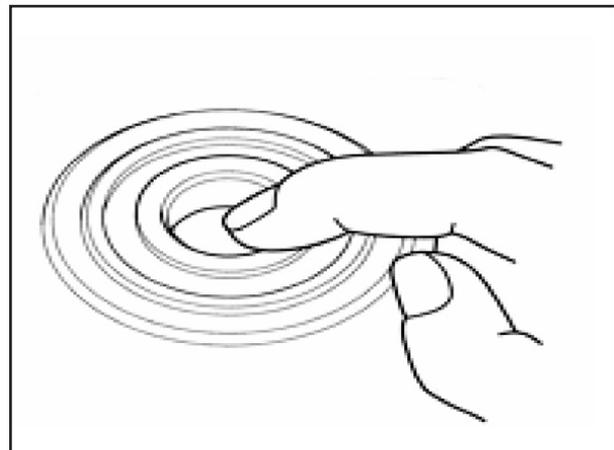
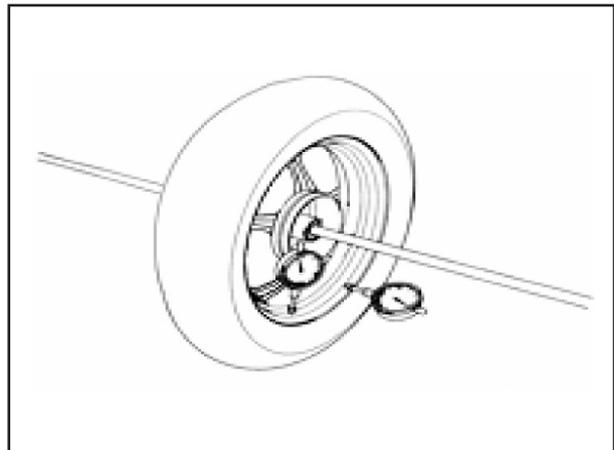
Brake Disc Removal

Remove front wheel.

Remove brake disc fastening screws [1].

Remove brake disc tighten screws [2].

Remove brake disc [3].



7.5 Front Shock Absorber

Removal

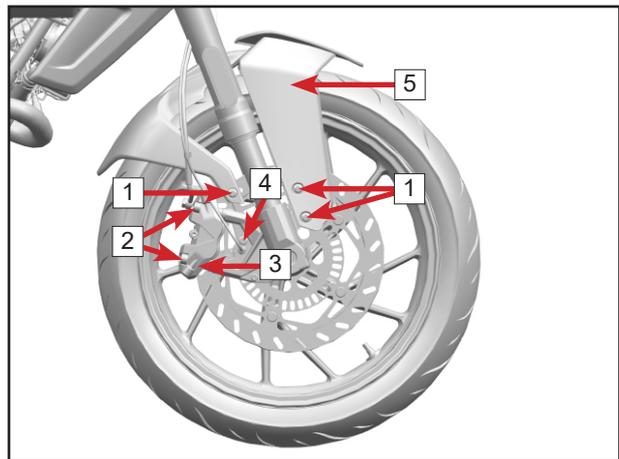
Remove six M6 inner hex bolts [1] of front fender.

Remove front fender [5].

Remove the screws [4].

Remove two inner hex bolts [2] of front brake lower pump.

Remove front brake lower pump [3].



Loosen the front wheel shaft lock bolts [4].

Remove the front wheel [5] after removing the front wheel shaft [3].

Remove the inner hex bolts [1] and LH&RH front shock absorbers [2].

Inspection

Check shock absorber for oil leakage, oil seal aging and damage. Replace if necessary.

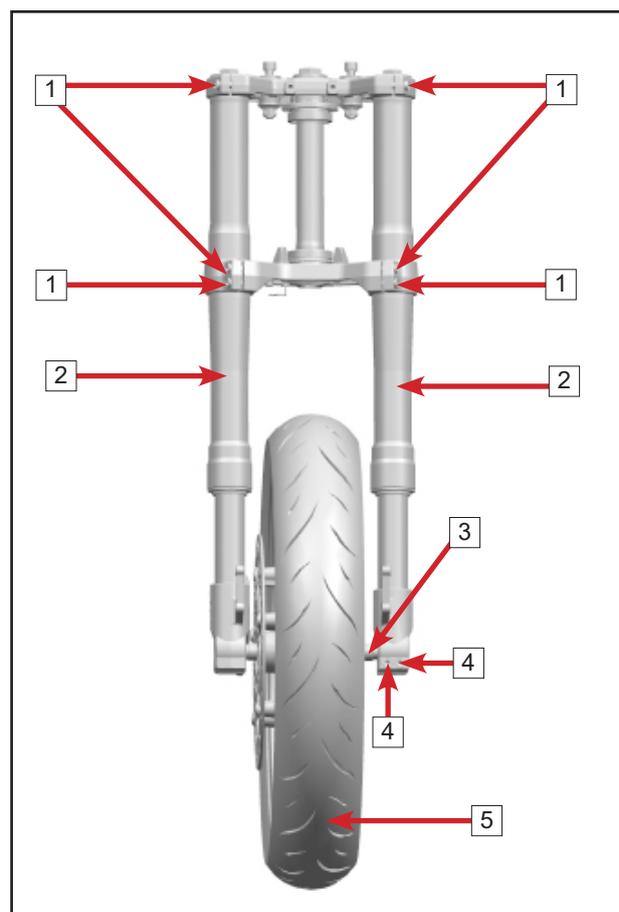
Installation

Reverse the removal procedures for installation.

Front wheel shaft tighten torque: (60-70) N·m

Brake lower pump fixing bolt tighten torque: (50-60) N·m

Upper and lower triple clamps fixing bolts [4] torque: (18-22) N·m



7.6 Steering Column

Removal

Remove front fender.

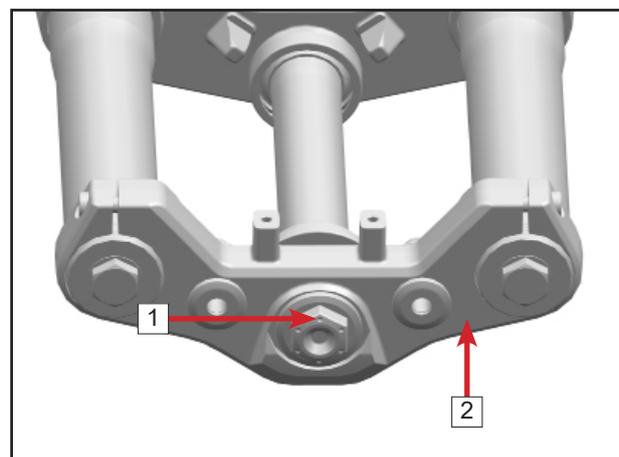
Remove front wheels and front shock absorber.

Remove handlebar.

Remove headlight guard assembly.

Remove dashboard assembly.

Remove upper triple clamp lock bolt [1] and upper triple clamp [2].

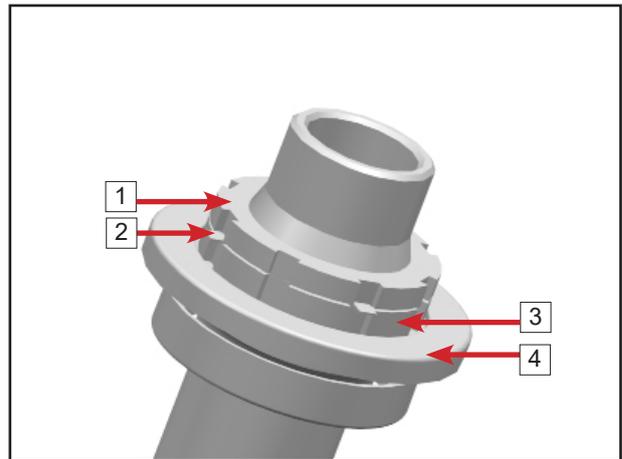


07 Front Wheels, Brakes, Suspension and Steering

Beat out thrust washer [2].

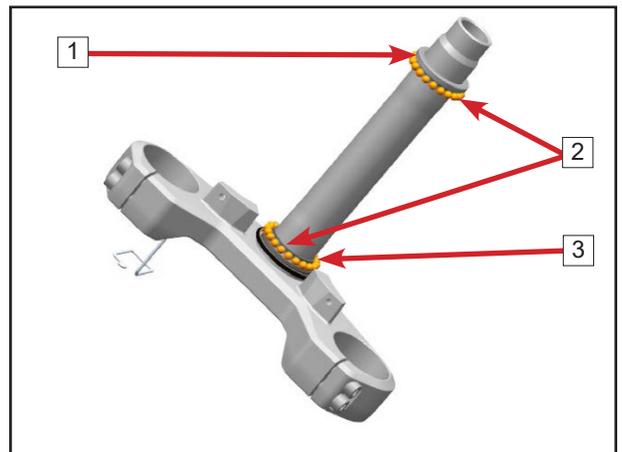
Use lock wrench to loose locking nut [1] and [3].

Remove the dust cover [4] and lower trip clamp assembly.



Remove the upper bearing retainer [1], upper steel bead assembly and lower steel bead assembly [2].

Use press tool to remove upper and lower bearing rages, and lower bearing retainer [3].



Inspection

Check upper and lower bearing rages and bearing retainer for cracks and abnormal wear, and replace them in time.

Check whether the steel ball is complete and worn, and replace it in time.

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Installation

Use press tool to install upper and lower bearing rages [1] into frame pipe, and apply enough grease.

NOTE

When pressing upper and lower bearing rages, they should be pressed to the vehicle. And keep the pipes bottoms balanced.

Place steel ball bracket [2] on upper bearing rage.

Insert dust sleeve [3] on lower triple clamp assembly pipe.

Press lower bearing retainer [4] and install it into place.

Set in the steel ball bracket assembly [2].

Bearing assembly shall be greased.

NOTE

Steel ball bracket has to be in bearing rage pathway. Do not put it up side down. The upper and lower steel ball bracket are symmetrically installed. Do not let dust in.

Place front fork lower triple clamp into frame pipe. Install bearing retainer [5] and dust cap [8].

Use lock nut [7] to lock front fork lower triple clamp, and turn front fork lower triple clamp to adjust the tightness to the suitable position. (Standard: Pre-tighten at 50 N·m first, and then rotate the lower triple clamp assembly left and right three times, check the flexibility, and rotate the lock nut 120° to 150°, and then tighten at 20 to 25 N·m)

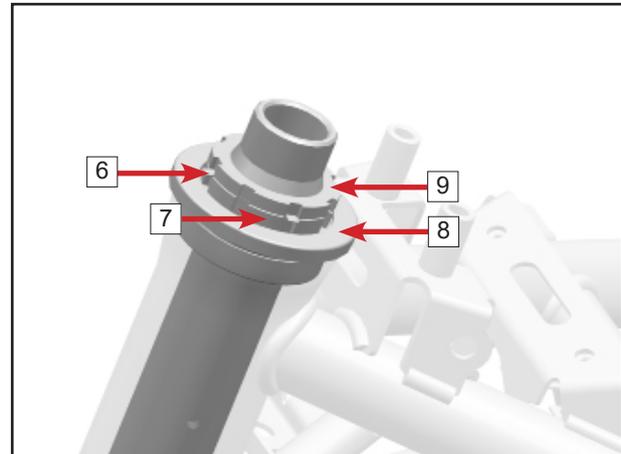
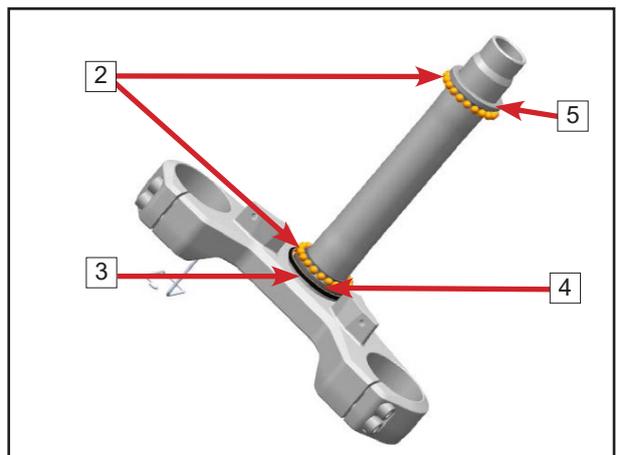
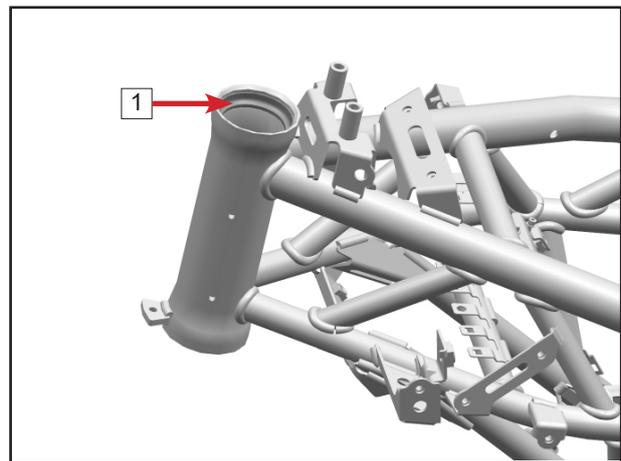
NOTE

Lock nut 1 [7] round side faces down and press upper bearing retainer.

Install thrust washer [6].

Tighten lock nut [9].

Lock thrust washer.



NOTE

The revers of thrust washer should be staggered to be locked.

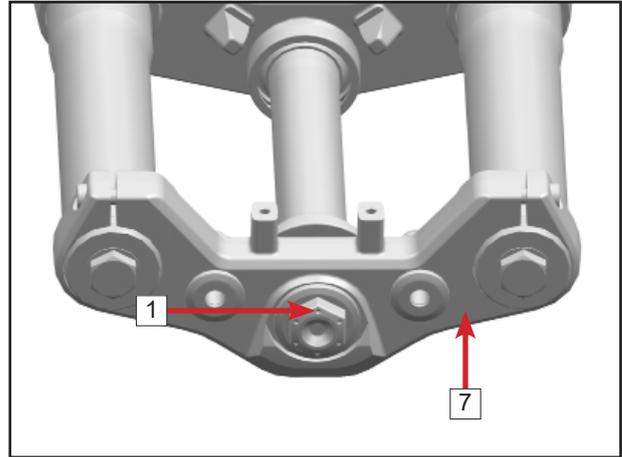
Locking nut II tighten torque: (18-22) N·m

07 Front Wheels, Brakes, Suspension and Steering

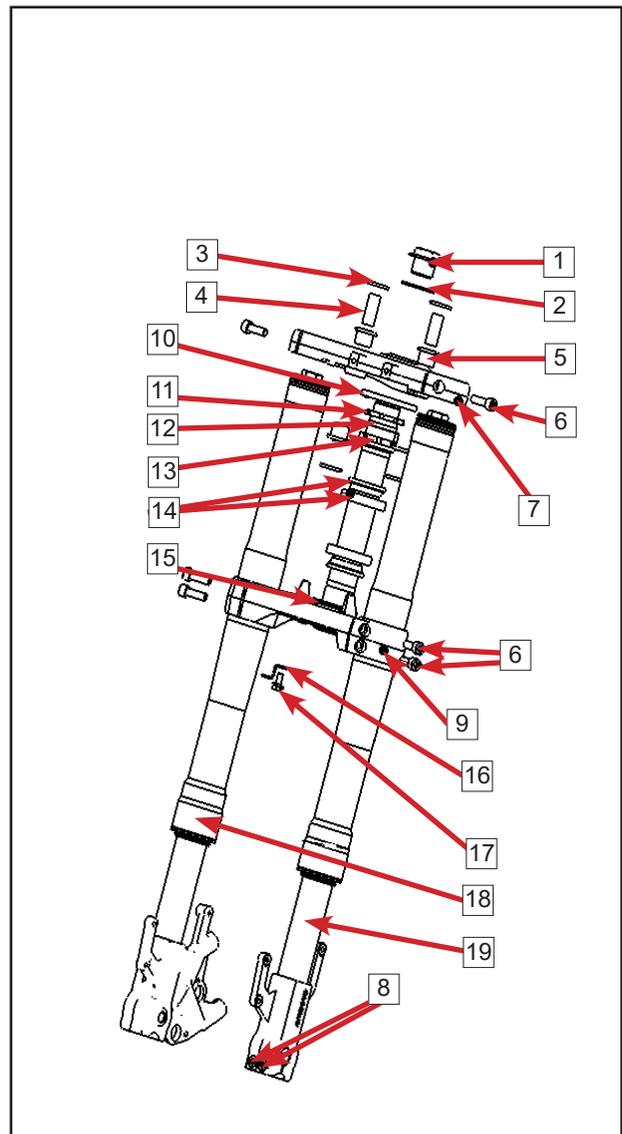
Install the upper triple clamp **7**.
Secure with the upper triple clamp tighten bolt **1**.

**Upper triple clamp tighten bolt torque:
85.5-94.5 N·m**

Install the dashboard.
Install front shock and front wheel.
Install front brake lower pump.
Install headlight guard assembly.
Install front fender.
Install the handlebar.



1	Upper triple clamp tighten screw	11	Lock nut II
2	Washer	12	Gasket
3	Washer	13	Lock nut I
4	Upper triple clamp liner	14	Steering bearing assembly
5	Upper triple clamp buffer rubber	15	Lower retainer dust cap
6	M6 screw	16	Front brake tube retaining wire
7	Upper triple clamp	17	M6 screw
8	M6 screw	18	Front RH shock absorber
9	Lower triple clamp assembly	19	Front LH shock absorber
10	Upper retainer dust cap		



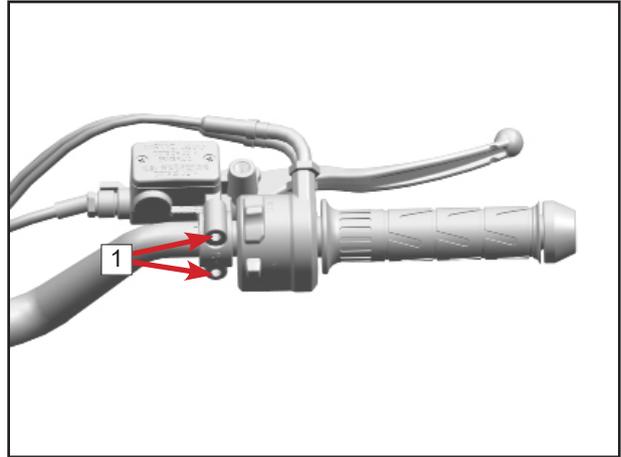
7.7 Front Brake

7.7.1 Front Brake Master Pump Removal

Remove the LH rearview mirror.
Remove two press cover bolts [1].

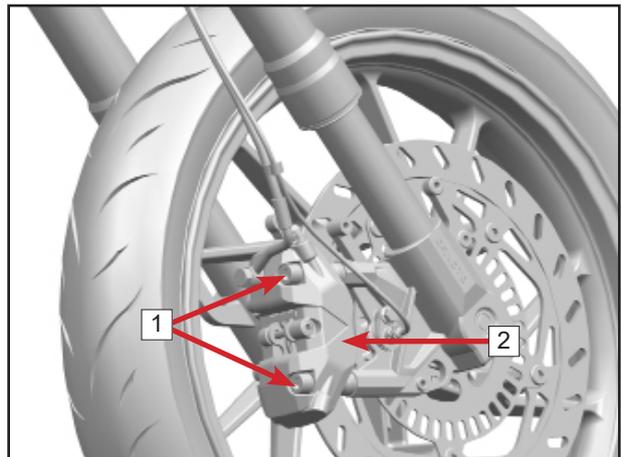
NOTE

It is not necessary to remove the brake pump assembly from the body when the front brake master pump is only separated from the handlebar without replacing the brake pump.



NOTE

Do not suspend the brake pump with the brake hose. The front brake main pump is reversed, which will cause air to enter the hydraulic system. When installing the master brake pump on the handlebar, ensure that the upper cover of brake reservoir is level with the ground.



7.7.2 Front Brake Caliper Removal

Remove two mounting bolts [1].
Separate the front brake caliper body [2]
from the front LH shock absorber in the
direction of bolt installation.

NOTE

Do not pinch the front brake lever during
the removal of lower brake caliper.

7.7.3 Front Brake Pump Installation

Reverse the removal procedures for
installation.

07 Front Wheels, Brakes, Suspension and Steering

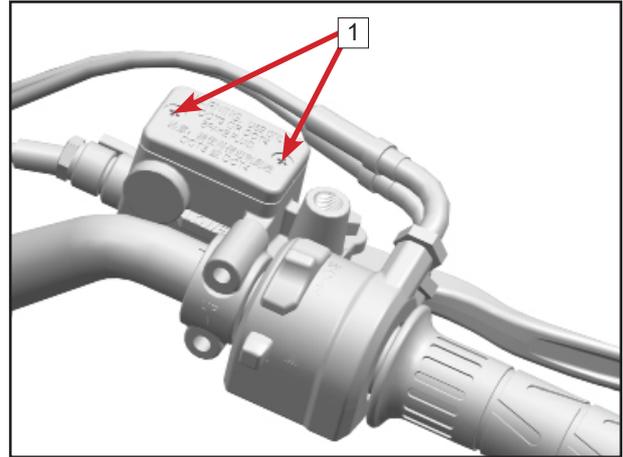
7.7.4 Brake Oil Replacement and Exhaust Air

Lift the vehicle up on the level surface and turn the steering handle, and remove two fixing screws of reservoir cover **1**.

Connect a transparent rubber hose to the brake caliper bleed bolt.

Loosen the bleed bolt.

Use the injection cylinder to suck out the brake oil. In the process of suction, be sure to ensure that the brake fluid in the oil cup is always kept between the upper and lower scale lines.



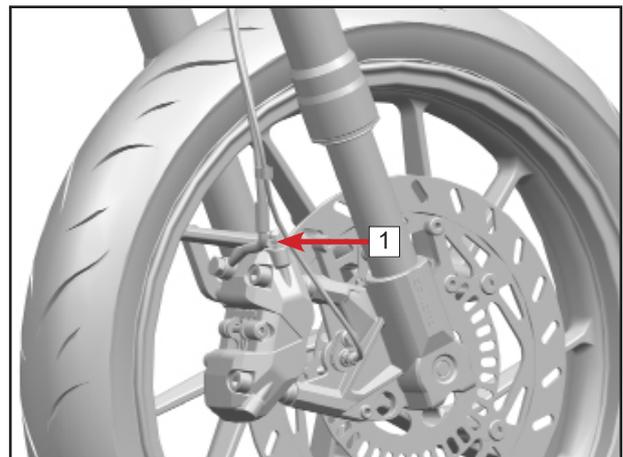
NOTE

In order to prevent brake oil from splashing onto the coating parts, plastic parts and other parts and causing corrosion to them, please use cloth to cover the coating parts, plastic parts and the other surrounding parts.

NOTE

When the injection suction cylinder is doing oil suction, pay attention to the oil level of reservoir slot should be kept between the upper and lower scale lines to prevent air from being inhaled.

Please use the specified brake fluid (DOT4's non-petroleum based brake fluid).



7.7.5 Brake System Air Emission

Pinch the front brake lever continuously. Every time you pinch the brake lever, you must pinch it to the end. When the hand lever feels heavy, do not let go.

Loosen the bleed bolt **1**, discharge the air, then tighten the bleed bolt, and repeat the above operation until no air is discharged from the bleed bolt.

NOTE

When discharging the air, pay attention to keep the oil level of oil cup between the upper and lower scale lines.

7.7.6 Brake Block / Front Disc

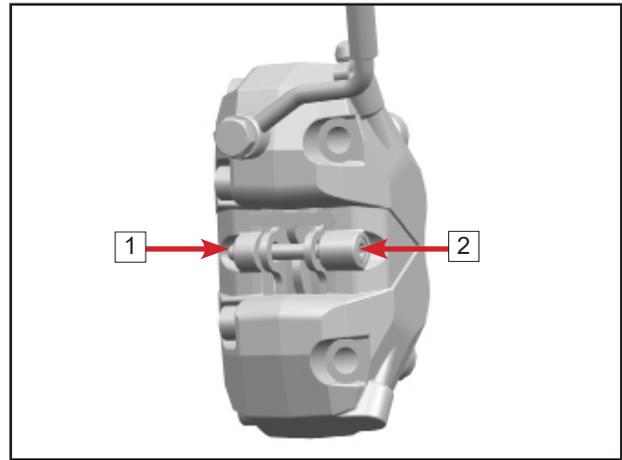
7.7.6.1 Brake Block Replacement

Remove brake lower pump.

Remove brake pads.

Remove the split washer **1**.

Remove inner hex bolt **2**.



Remove the inner and outer parts of brake from the caliper body.

Replace inner and outer brake pads **3**.

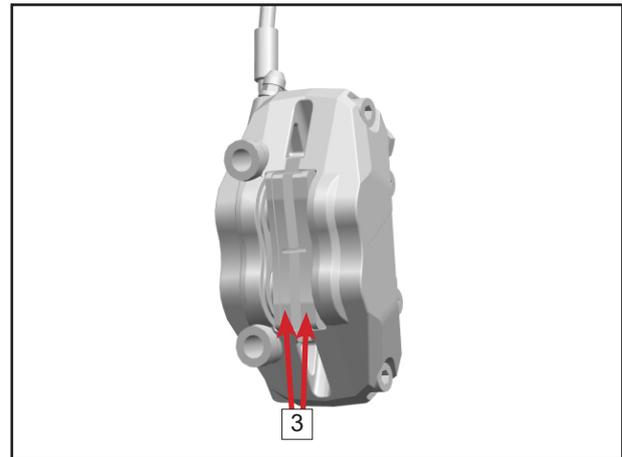
Brake Pads Installation

Place the brake pad spring washer into the corresponding position of brake.

Place inner and outer brake pads in the brake caliper body.

Insert the brake pad bolts through the brake caliper body and the inner and outer pad holes in turn.

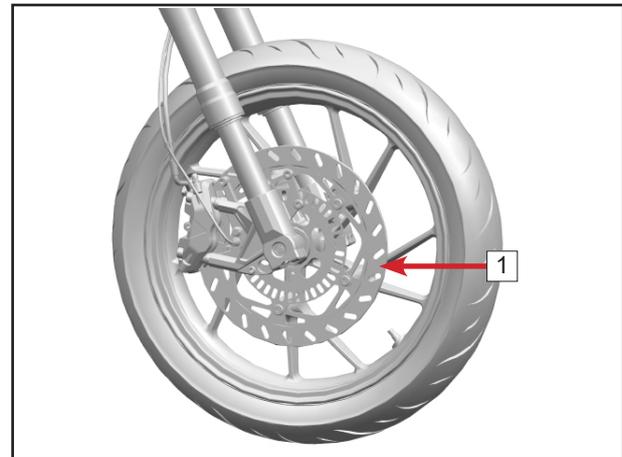
Tighten the fixing bolts.



NOTE

Brake pad spring washer must be fitted securely.

After the brake caliper assembly is assembled, the brake must be properly adjusted before use.



7.7.6.2 Disc Thickness Measurement

Use a micrometer or caliper to measure the thickness of brake disc **1**. Replace the disc if it exceeds the service limit.

Residual material thickness limit: 3 mm

08 Rear Wheel, Brake and Suspension

8.1 Maintenance Information	08-1
8.1.1 Operation Notice	08-1
8.1.2 Maintenance Standard.....	08-1
8.1.3 Tighten Torque	08-1
8.2 Rear Wheel	08-2
8.2.1 Rear Wheel Removal.....	08-2
8.3 Rear Fork	08-4
8.4 Rear Brake	08-7

8.1 Maintenance Information

8.1.1 Operation Notice

NOTE	
When installing driving chain connecting clasp, make the gap to the opposite way from the wheel.	
After adjusting the driving chain, double confirm the brake pedal play if need to do adjustment accordingly.	

8.1.2 Maintenance Standard

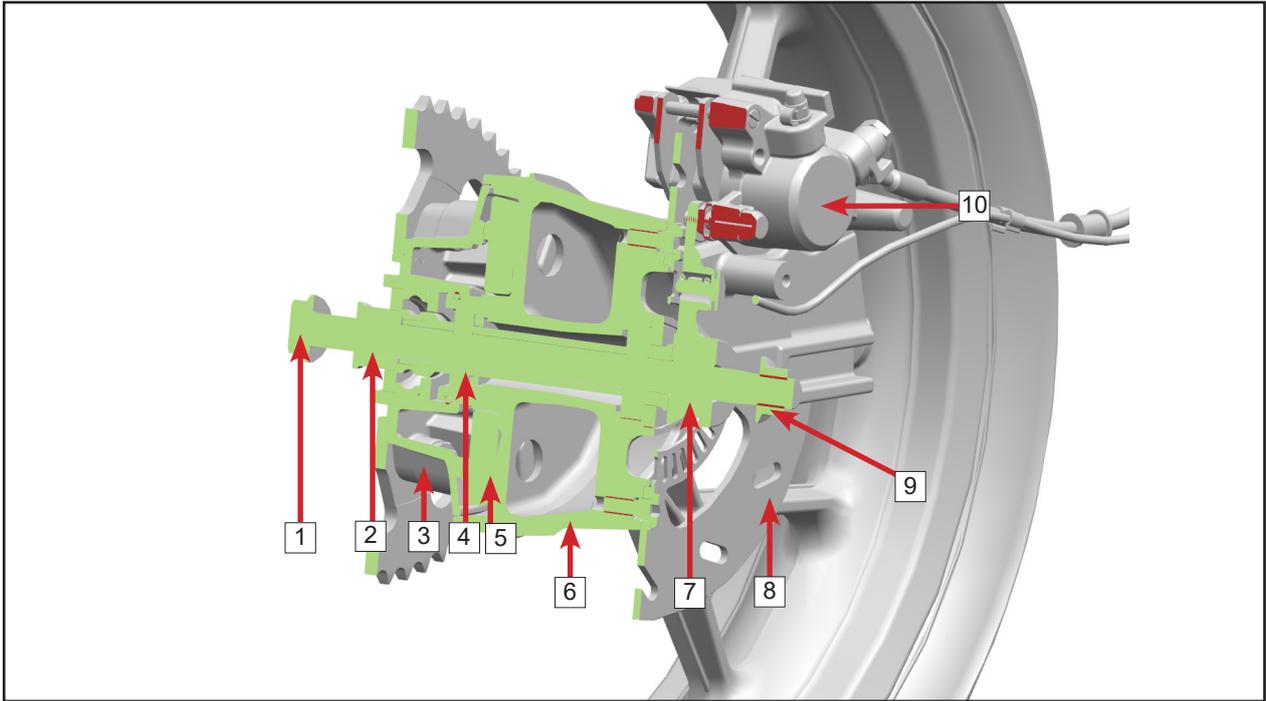
Item		Standard	Limit
R e a r Wheel	Camber of rear wheel shaft	-	0.2mm
	Rim run-out	Longitudinal	0.6mm
		Horizontal	0.6mm
	Tire	Residual groove	-
Pressure		225kPa (2.25kgf/cm ²)	—
R e a r Brake	Thickness of rear brake disc	4mm	3mm

8.1.3 Tighten Torque

Rear fork shaft tighten nut torque	95N · m ~ 105N · m
Rear shock absorber mouting bolt torque	50N · m ~ 60N · m
Rear wheel shaft nut torque	105N · m ~ 110N · m

8.2 Rear Wheel

8.2.1 Rear Wheel Removal



1	Rear wheel shaft	5	Rubber damper	9	Rear wheel shaft nut
2	Left collar	6	Rear rim assembly	10	Rear brake
3	Sprocket assembly	7	Right collar		
4	Sprocket seat bushing	8	Brake disc		

Removal

Support the vehicle with jack.

Remove three bolts **1**.

Remove rear lower fender assembly **6**.

Remove rear wheel shaft nut **5**.

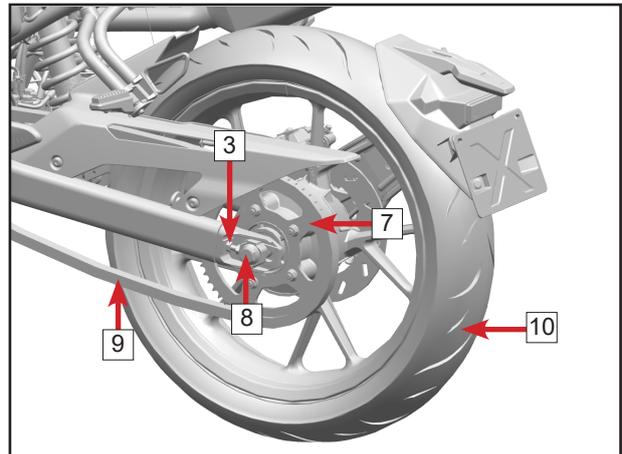
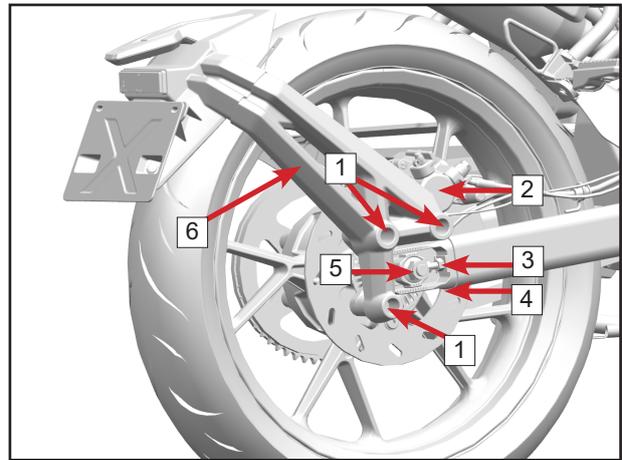
Loose chain adjusting nut **3**.

Remove the chain **9** from sprocket **7**.

Take out rear wheel shaft **8**.

Remove brake caliper **2**.

Remove rear wheel assembly **10**.



08 Rear Wheel, Brake and Suspension

Remove sprocket left collar [1].
 Remove sprocket assembly.
 Remove rear brake assembly. Inspect rear brake disc, the thickness should be no less than 3mm.
 Remove rubber damper [2]. Replace new one if aged and broken.

Inspect rear wheel bearing. Replace if the clearance is too big. Remove rear wheel shaft sleeve with special tool. Reverse the removal procedures for installation. Anti-dust oil seal has to be covered with grease when installing.

Rear wheel shaft nut tighten torque: 105N·m ~ 110N·m

Inspection

Rear Wheel Shaft

Set shaft on a V-block, measure axle vibration with dial gauge.

Service limit: 0.2mm

Place rear wheel on the rotating stage, check the rims vibration

Service limit:

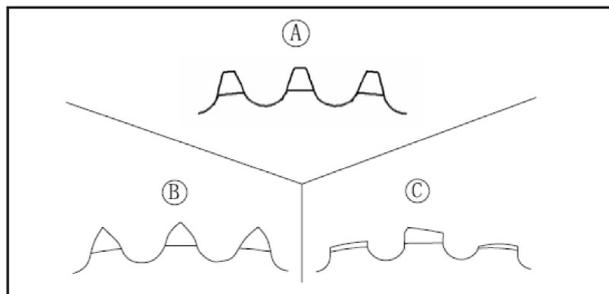
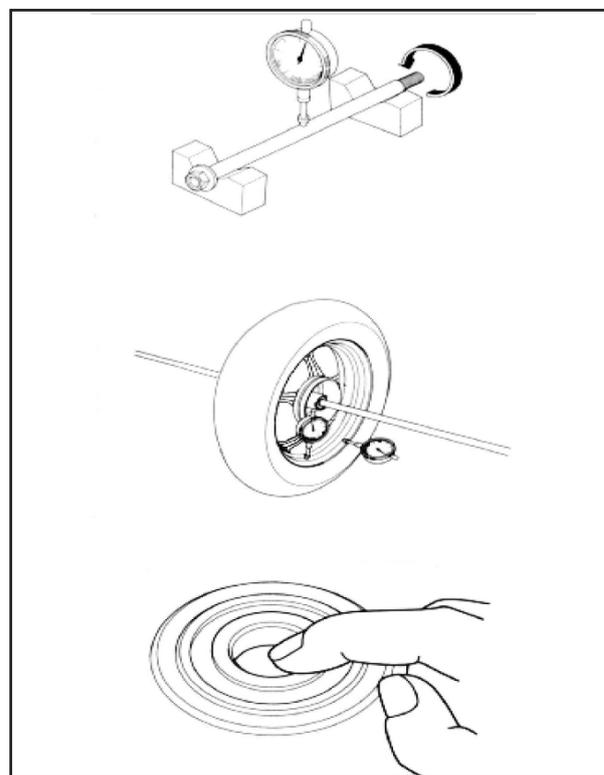
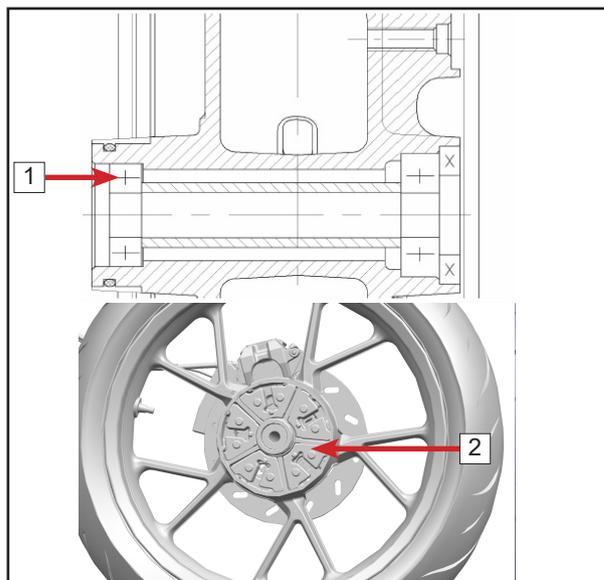
Horizontal: 0.8mm Vertical: 0.8mm

The thickness of rear brake disc should no less than 3mm

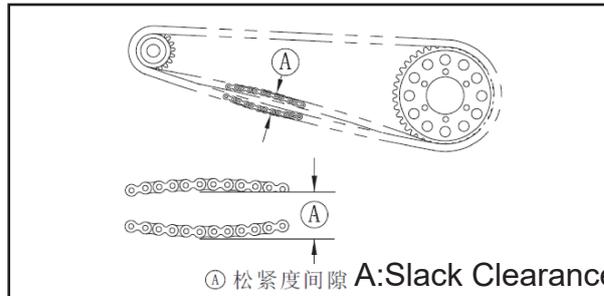
Check rear wheel shaft clearance. Replace if clearance is too big.

Check sprocket condition. If the wear is serious or damaged, replace the sprocket or chain.

Check the status and length of the transmission chain, and replace new ones if necessary.



A. Standard B. Worn C. Damaged
 Replace new chain or sprocket if B or C happens.



A: Slack Clearance
A standard: 20mm~30mm

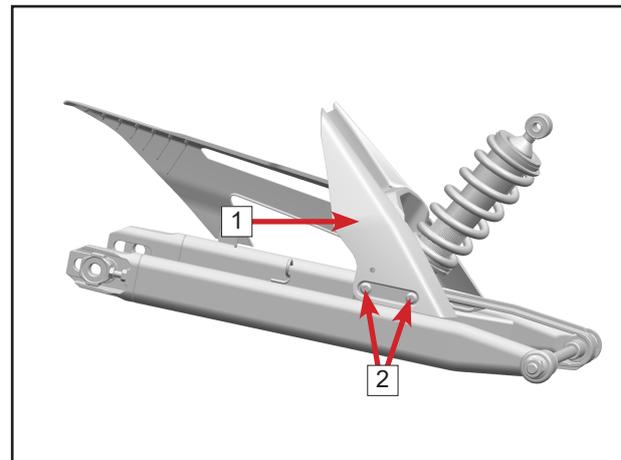
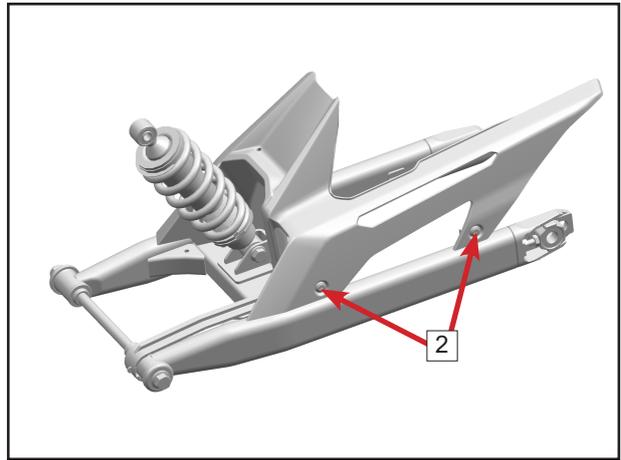
8.3 Rear Fork

Removal

Remove rear wheel.

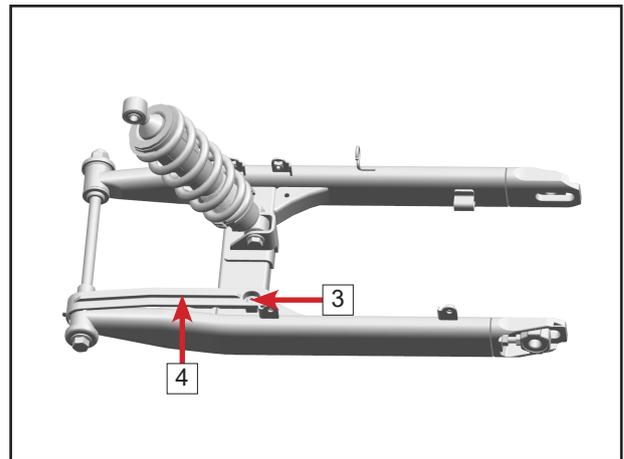
Loosen four inner hex mounting bolts **2**.

Remove rear inner fender **1**.

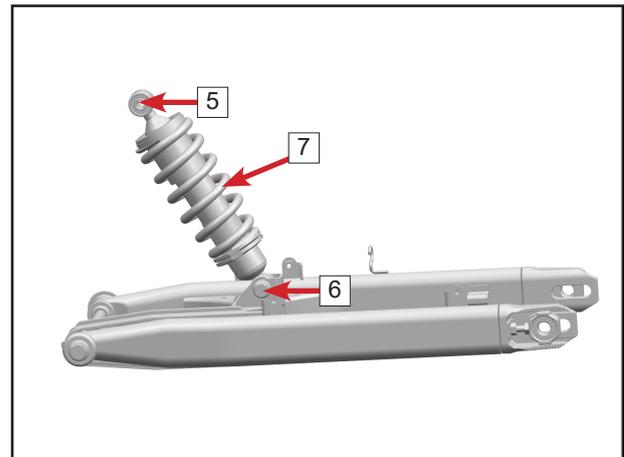


08 Rear Wheel, Brake and Suspension

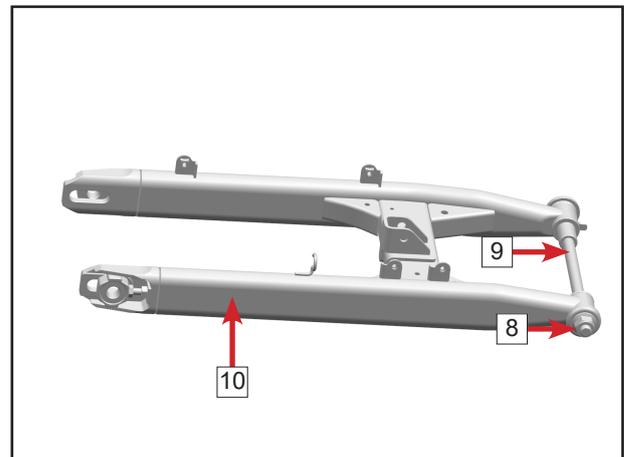
Remove the bolt **3** on the rear fork.
Remove chain guard **4**.



Remove upper mounting bolt **5** and lower mounting bolt **6** of rear shock absorber.
Remove rear shock absorber **7**.



Loosen rear fork shaft lock nut **8**.
Remove rear fork shaft **9**.
Remove rear fork **10**.

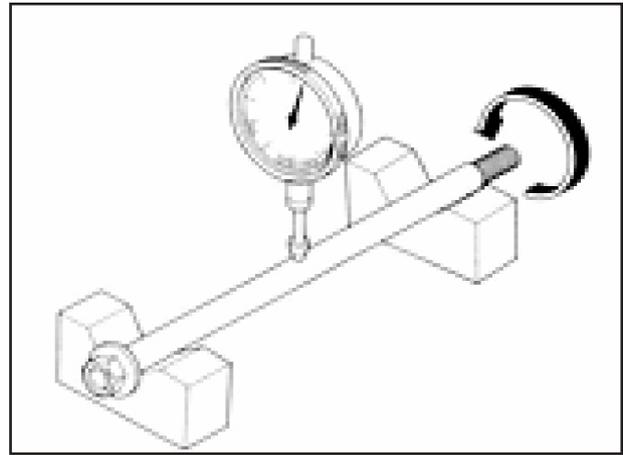


CFMOTO

Inspection

Inspect rear fork left 1 and 2 right collar for free play. The clearance between collars should not be too big. Replace oil seal if stuck or worn. Replace chain guide if damaged. Place the core of rear fork shaft on a V-block to check the curvature of front wheel shaft.

Service limit: 0.2mm above replace

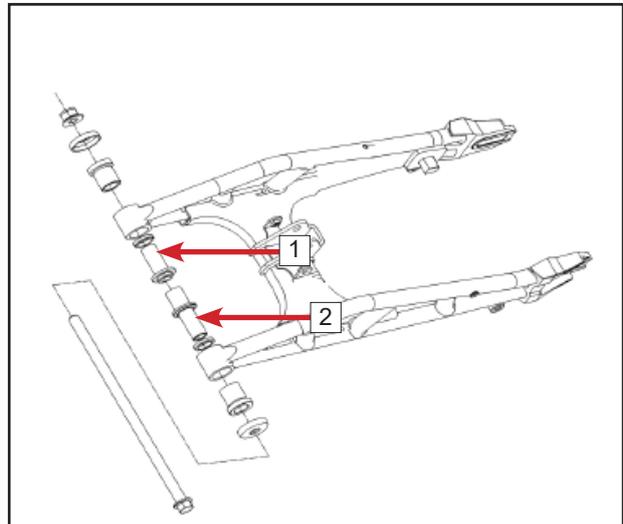


Installation

Reverse the removal procedures for installation.

NOTE

Apply grease on left inner collar 1 and right inner collar 2, to avoid dust.



Rear fork fixing nut:

Tighten torque: (95 ~ 105) N·m.

Rear shock absorber mounting nut:

Tighten torque: (50 ~ 60) N·m.

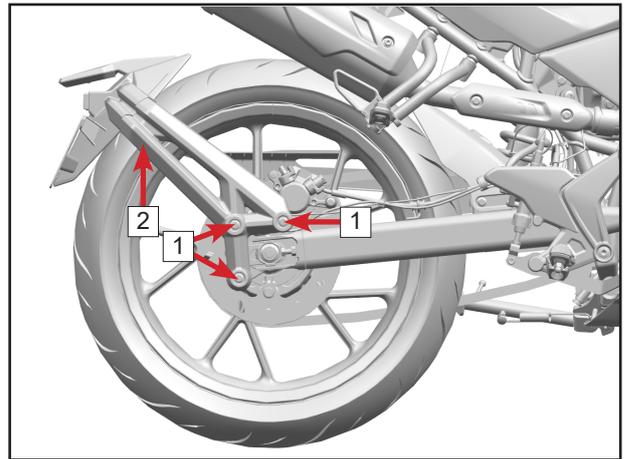
08 Rear Wheel, Brake and Suspension

8.4 Rear Brake

Removal

Remove bolts **1** .

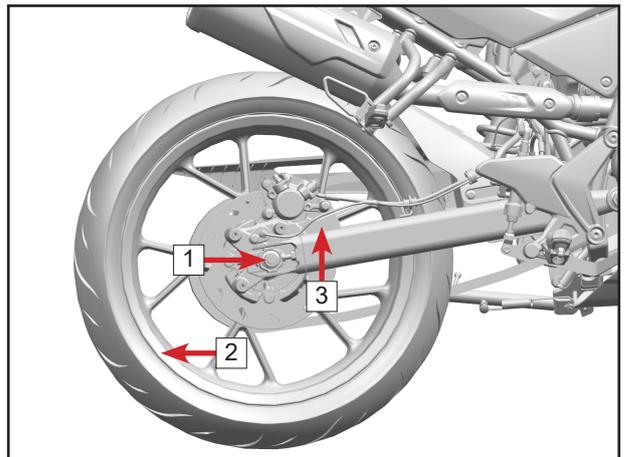
Remove rear fender assembly **2** .



Remove rear wheel shaft nut **1** .

Remove rear wheel **2** .

Remove rear brake **3** .



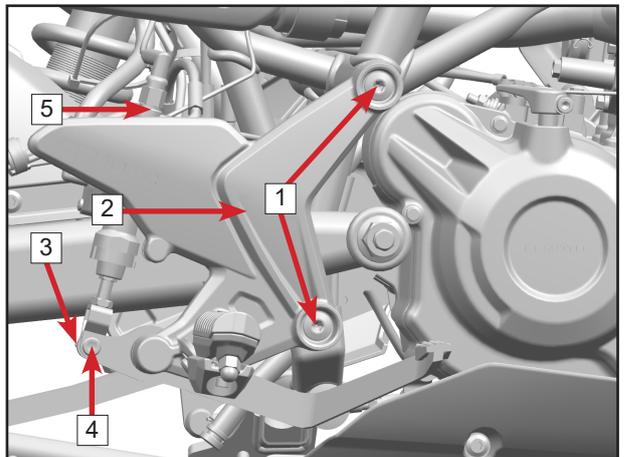
Remove bolts **1** .

Remove RH footrest bracket **2** .

Remove cotter pin **3** .

Remove bolt **4** .

Remove rear brake main pump **5** .



Inspection

Check the thickness of rear brake pad.
Replace the brake disc with a new one when it is worn to the mark.

Brake Oil Replacement and Exhaust Air

Lift the vehicle up on the level surface and turn the steering handle.

Remove oil storage cap **1**.

Attach a transparent rubber hose to the brake clamp bleed bolt.

Loosen the bleed bolt.

Use the injection cylinder to suck out the brake oil. In the process of suction, be sure to ensure that the brake fluid in the oil cup is always kept between the upper and lower scale lines.

NOTE

When the injection suction cylinder is doing oil suction, pay attention to the oil level of brake reservoir should be kept between the upper and lower scale lines to prevent air from being inhaled.

Please use the specified brake fluid (**DOT3** or **DOT4's** non-petroleum based brake fluid).

Brake System Air Emission

First continuously step on the rear brake pedal, every time you step on the brake pedal, you must step on to the end. When the foot feels very heavy, step on the brake pedal do not let go.

Loosen the bleed bolt **1**, discharge the air, then tighten the bleed bolt, and repeat the above operation until no air is discharged from the bleed bolt.

NOTE

When discharging the air, pay attention to keep the oil level of oil cup between the upper and lower scale lines.

Measure Brake Disc Thickness

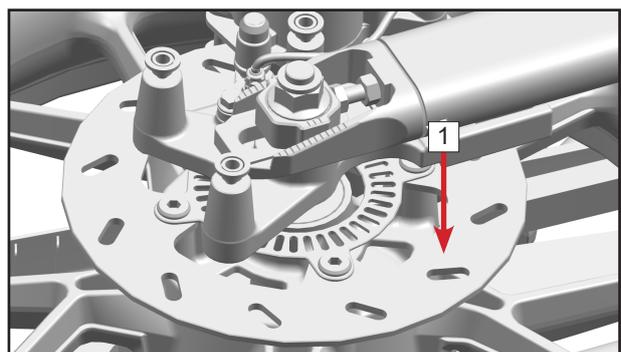
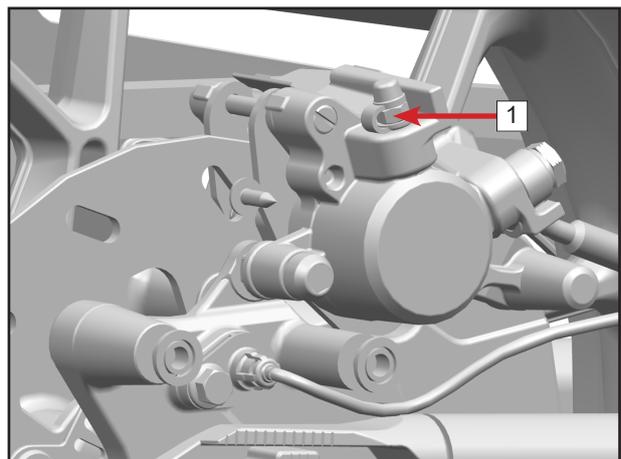
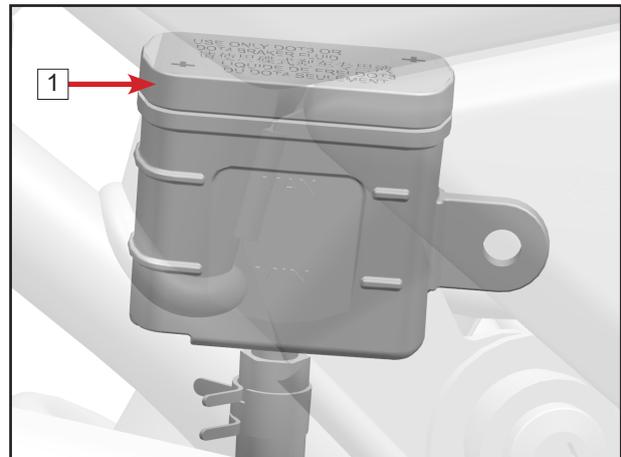
Remove brake disc **1**.

Use a micrometer or caliper to measure the thickness of brake disc **1**. Replace the disc if it exceeds the service limit.

Residual material thickness limit: 3mm

Installation

Reverse the removal procedures for installation.



9.1 Fuel System	9-3
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DANGER

Fuel is extremely flammable and can be explosive under certain conditions. Always maintain it in a well-ventilated area, turn off the engine in advance and wait for the engine and muffler to cool. No smoking or any acts that cause sparks is allowed in the fuel filling area or fuel storage area.

Never tilt or place upside down the tank. Avoid overflowing onto high temperature parts.

Fuel is toxic and harmful to health. Avoid touching with skin, eyes and clothes. Do not inhale fuel vapor.

If touched skin, wash with plenty of clean water.

If touched to eyes, wash eyes immediately with clean water and see a doctor immediately.

If touched to clothes, change the clothes immediately.

Seek medical attention immediately if accidentally contact your eyes or swallow gasoline.

Dispose of fuel properly to avoid damage to the environment.

WARNING

Please use genuine parts for maintenance. Otherwise, the normal operation of the electronic injection system cannot be guaranteed.

During maintenance, do not disassemble EFI parts.

Carefully handle EFI parts during maintenance.

Turn the ignition switch off during unplugging or plugging in connectors to prevent damaging EFI parts.

Do not electrify the oil pump during removal to prevent electric spark and fire.

The fuel pump is not allowed to run in dry condition or in water. Otherwise, its service life will be reduced. The positive and negative wires of the fuel pump can't be connected backwards.

The pressure is high (around 300kPa) in fuel system. All fuel hoses are high-pressure resistance. The fuel rail keeps high fuel pressure even the engine doesn't work. Do not remove fuel hose during maintenance.

Spark jumping test should be carried out only when necessary. The testing time should be as short as possible. The throttle valve should not be opened during the test. Otherwise, a large amount of unburned fuel will enter the exhaust pipe and damage the three-way catalytic converter.

When the fuel system needs to be repaired, the fuel system should be decompressed before the oil hoses are removed. The method of pressure relief: to remove the oil pump relay and start the engine to idle until the engine stops by itself.

Fuel hoses removal and fuel filter replacement shall be operated by professional technicians in a well-ventilated place.

Do not mis-connect the positive and negative pole of battery. Remove the negative wire first if disassembling battery, in case it damages electrical elements. The system of this vehicle uses negative earth mode.

Battery wires are not allowed to be removed while the engine is working.

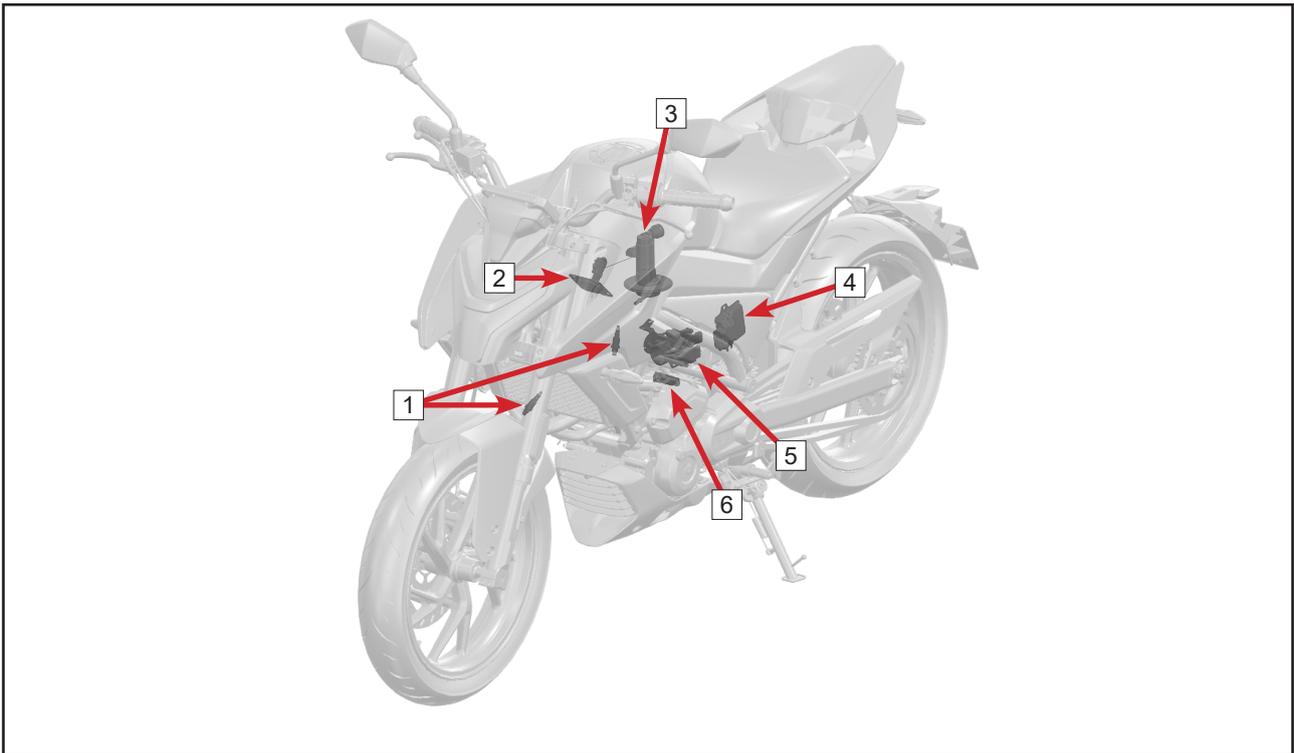
Battery positive/negative wires and electrical control units have to be removed before welding on the vehicle.

It is forbidden to puncture the wire to test the input/output electrical signals.

Establish the awareness of environmental protection and effective disposal of waste generated during maintenance.

9.1 Fuel System

9.1.1 Fuel System Location

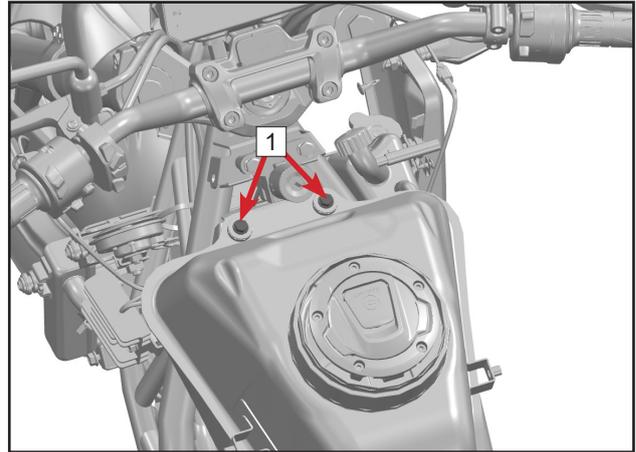


1	Oxygen Sensor	2	Fuel Level Sensor	3	Gasoline Pump
4	ECU	5	Throttle Body Assembly	6	Water Temperature Sensor

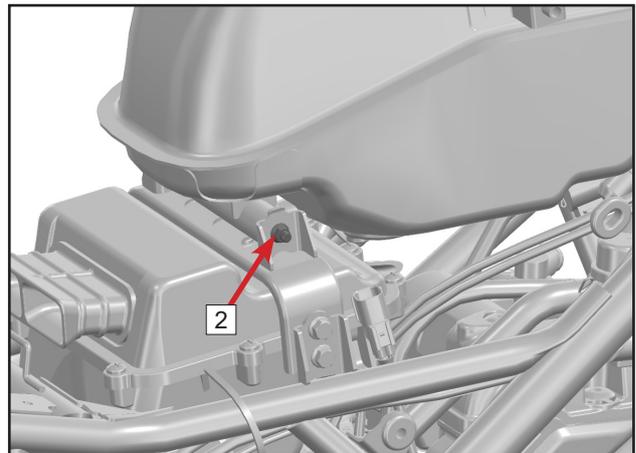
9.2 Fuel Tank

Removal

Remove bolts **1**.



Remove nut **2**.



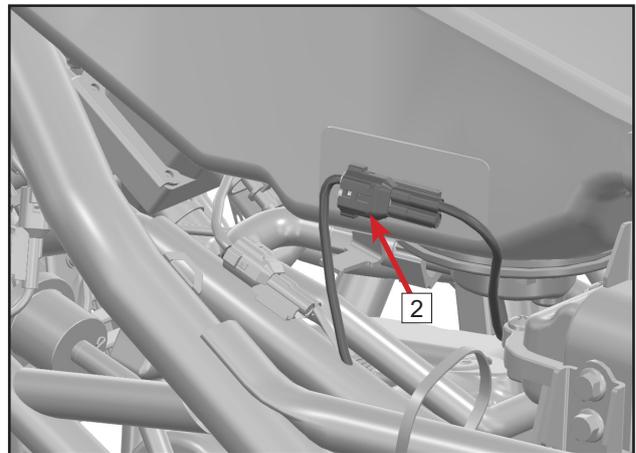
Tip: The following steps are for fuel line pressure relief.

Remove the fuel pump connector **2**.

Unlock the vehicle and press the ignition switch.

Start the vehicle and idle the engine to stop.

Turn off the vehicle power and disconnect the positive and negative terminals of battery.



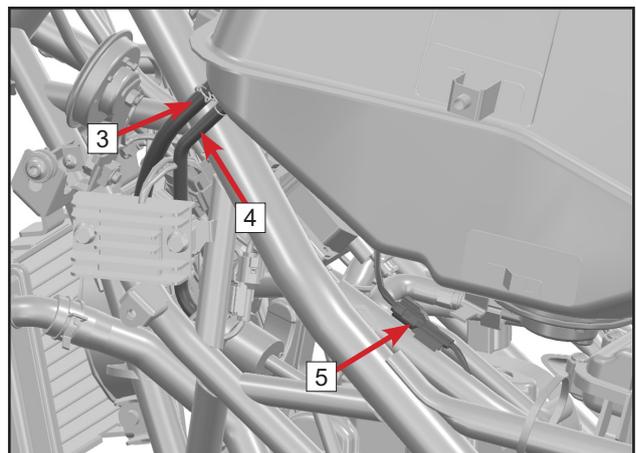
⚠ CAUTION

Before disassembly, please relieve the fuel pressure. Prevent a large amount of fuel overflow when disassembling the tubing, resulting in safety hazards.

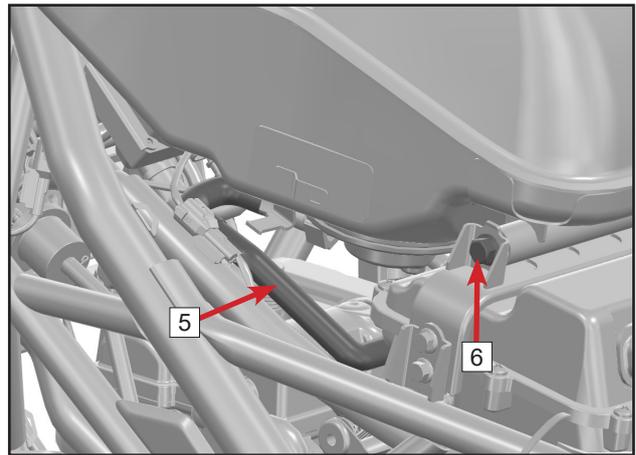
Disconnect the overflow pipe **3**.

Disconnect the fuel evaporator line **4**.

Disconnect fuel level connector **5**.



Disconnect the fuel line **5**.
Remove the screw rod **6**.



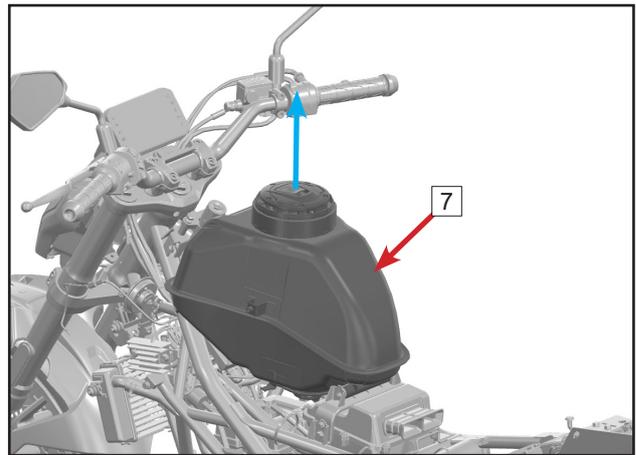
Remove fuel tank **7**.

⚠ DANGER

Do not invert the fuel tank to prevent fuel leakage.

⚠ WARNING

When installing the fuel tank, install the quick joint of high-pressure oil pipe first, and check that the pipes cannot be squeezed or damaged.



Installation

Reverse the removal procedures for installation.

9.3 Fuel Pump Assembly

Release pressure in fuel system.

Ensure that static electricity is released by grounding the vehicle.

Unplug cables related to fuel pump.

Unplug quick joint. Cover with cloth to prevent fuel leaking.

Remove fuel pump cables and connectors. Clean fuel tank and fuel pump to prevent foreign matters into fuel tank.

NOTE

Excessive foreign matter in the tank may cause the fuel pump to wear out prematurely or block fuel filter.

Remove bolt 1 ~ bolt 5 in sequence.

Remove fuel pump 6 carefully.

NOTE

There is still some fuel remained in removed fuel pump. Be careful to transfer the fuel pump into a proper container.

Check the fuel tank for impurities. Clean the tank thoroughly with clean fuel before reinstalling a new fuel pump. Do not use water or other chemicals to clean the tank.

Installation

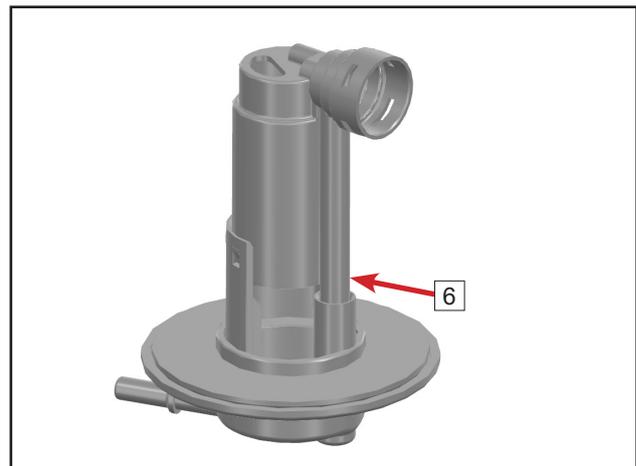
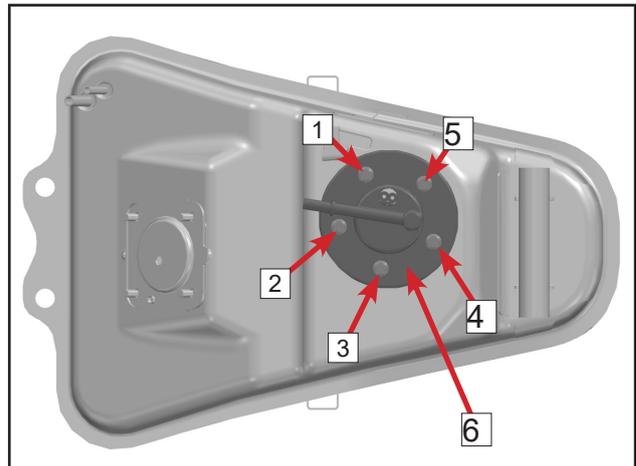
Position the fuel pump correctly into the tank assembly mounting hole.

NOTE

The arrow on fuel pump aligns to fuel tank mark all the way.

Remove bolt 1 ~ bolt 5 in sequence.

Reconnect the quick connector, cable and other parts, start the power supply to test whether the fuel pump starts normally.



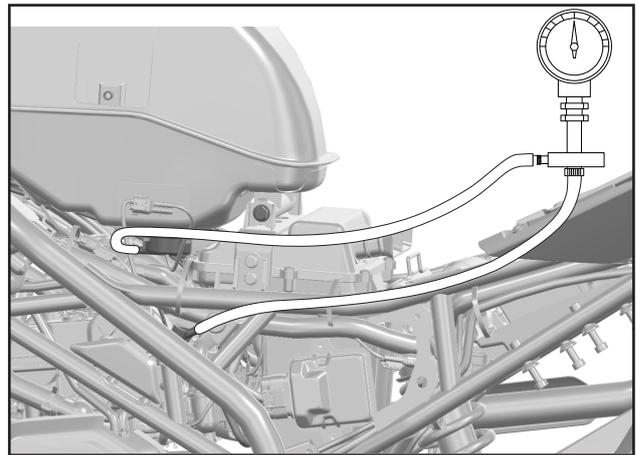
9.3.1 Fuel Pump Pressure Test

Connect the fuel pump pressure tester as shown in the figure.

Unlock the vehicle and turn on the stop switch.

At this time, the self-test of the fuel pump is carried out. The rated working pressure of fuel pump is 300kpa.

If the fuel pump is lower than 300kpa, the fuel pump assembly is damaged and replace it with a new one.



9.3.2 Fuel Level Sensor Detection

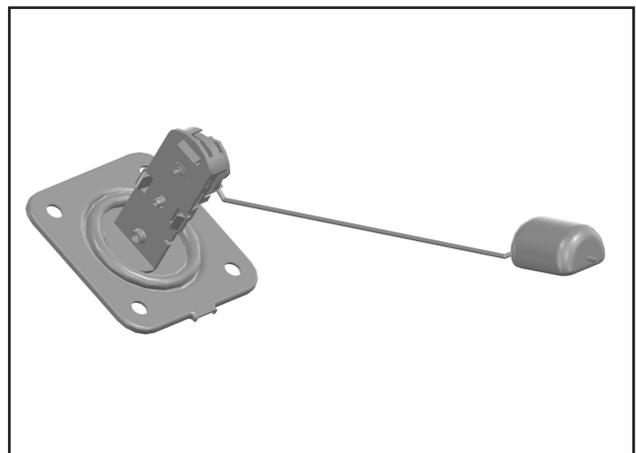
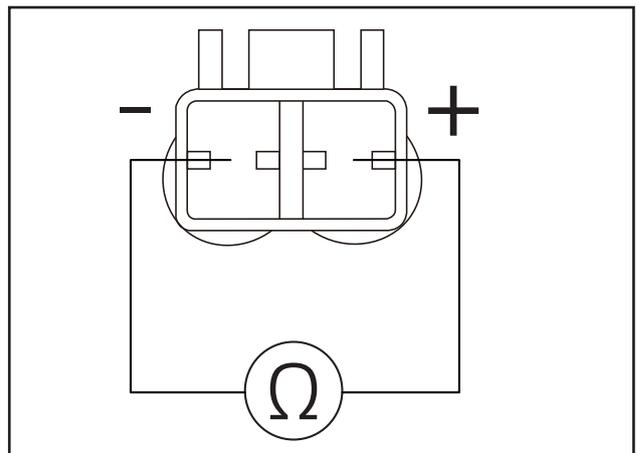
1.The detection method is shown in the figure.

2.Swing the float chamber up and down
As the Angle changes, the multimeter will display different resistance values.

3.Resistance value detection parameters are as follows:

Float position	Resistance (Ω)	Error
60°(F)	12	±2
52°	12	±2
47°	32	±2
42°	42	±1
36°	49.5	±1
30°	57	±1
25°	62.5	±1
20°	71.5	±1
15°	77.5	±1
10°	86	±1
5°	92	±1
0°(E)	100	±2

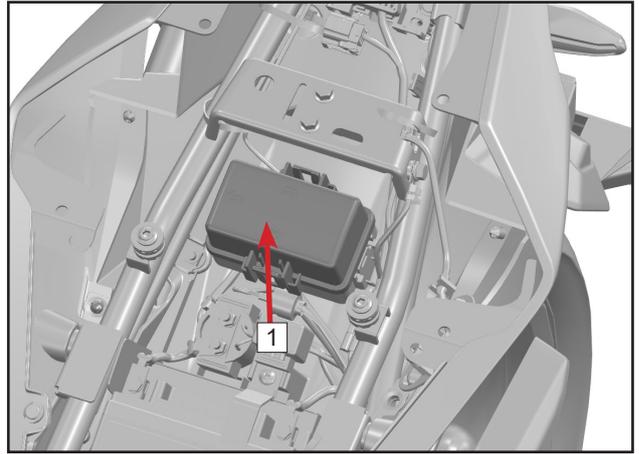
If the resistance value is not within the preceding range, the fuel level sensor is damaged. Replace it with a new one.



9.3.3 Fuel Pump Relay

Removal

Turn off the vehicle power.
Turn on fuel relay cover 1.



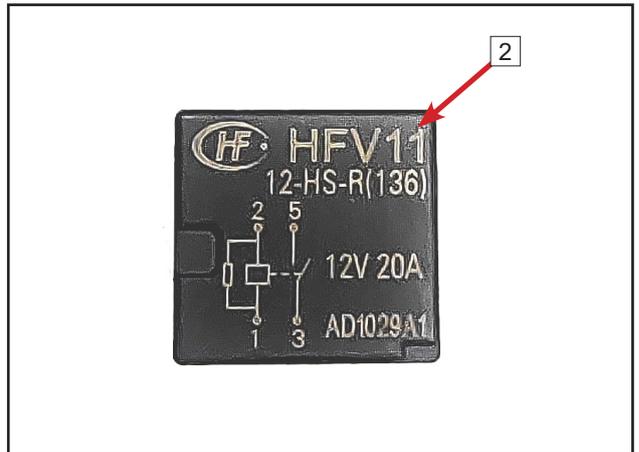
Remove fuel relay 2.
Check the fuel relay pin for breakage.

CAUTION

Avoid violent disassembly when disassembling, otherwise it may cause the relay pin to break and damage the relay.

Installation

Reverse the removal procedures for installation.



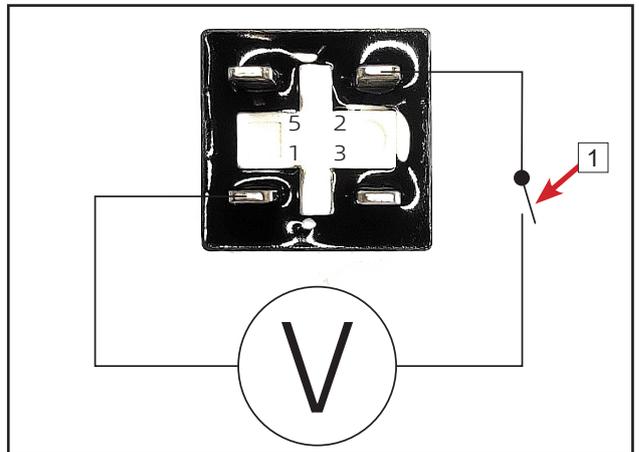
9.3.3.1 Fuel Pump Relay Operation Test

1. Connect 12V power supply as shown in the figure.

2. Operate the switch 1 intermittently.

3. Observe whether the fuel pump relay has the ticking sound.

If there is no ticking sound, the fuel pump relay may be damaged. Please replace it with a new one.



9.4 ECU

Removal

Remove frame LH panel. (see chapter 06 for details)

Remove the vehicle power supply.

Remove the positive and negative terminals of battery.

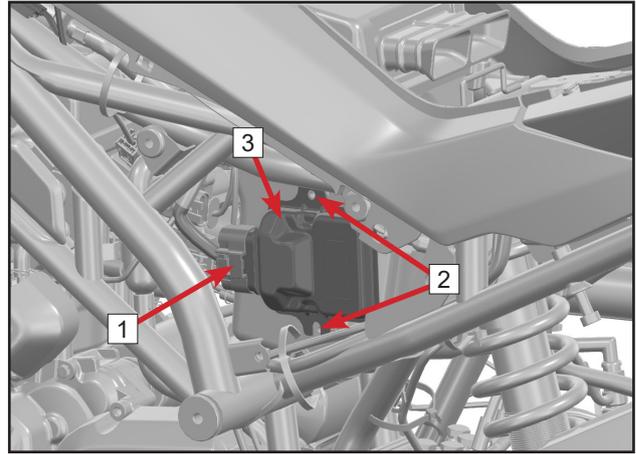
Remove the connector **1**.

Remove bolts **2**.

Remove ECU **3**.

Installation

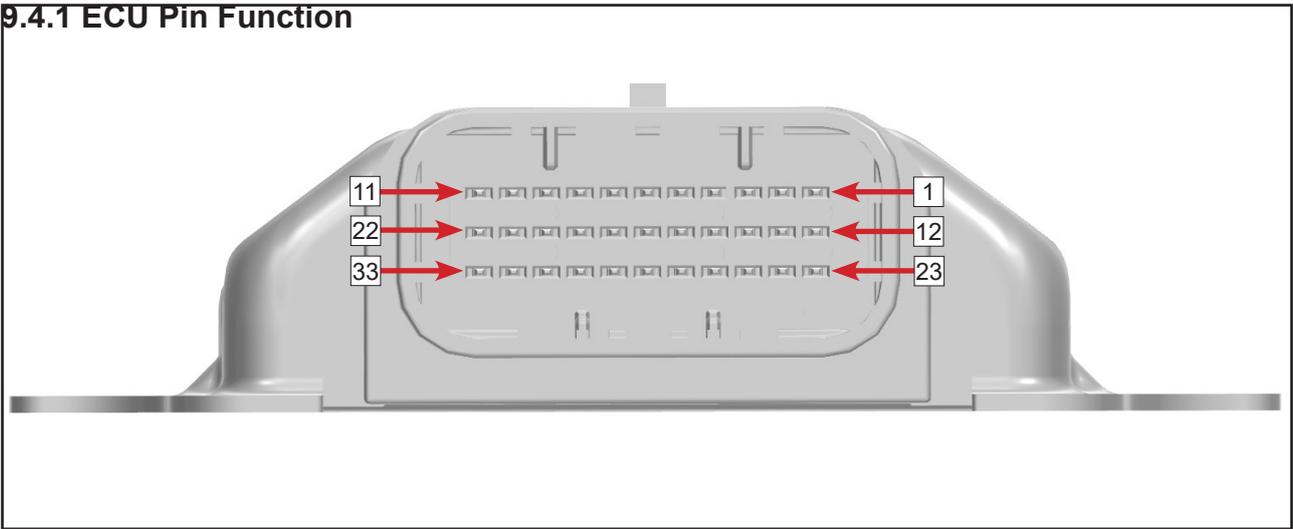
Reverse the removal procedures for installation.



CAUTION

Before disassembly, power off the vehicle and disconnect the positive and negative terminals of battery. Prevent damage to ECU caused by thermal short circuit. After installing the ECU, wait five minutes before installing battery to prevent ECU self-learning faults.

9.4.1 ECU Pin Function



Pin	Function	Pin	Function	Pin	Function
1	Front oxygen sensor 1 heating	2	Stepper motor A	3	Side stand switch
4	Sustained power	5	Engine RPM sensor A	6	Engine RPM sensor B
7	Power GND 1	8	Air intake pressure sensor	9	Engine RPM output
10	Power GND 2	11	Ignition coil 1	12	Injector 1
13	Stepper motor D	14	Clutch switch	15	5V power 1
16	CAN L	17	CAN H	18	Fan relay
19	Rear oxygen sensor 2 heating	20	Front oxygen sensor 1	21	TPS
22	Secondary gulp valve	23	Canister control valve	24	Stepper motor C
25	Stepper motor B	26	Ignition switch	27	Sensor GND
28	Fuel pump relay	29	Main relay	30	Shift shaft sensor
31	Rear oxygen sensor 2	32	Engine coolant temp. sensor	33	Air intake temperature sensor

9.4.2 EFI Fault Code Table

No.	Code	Description
1	P0262	Cylinder 1- Injector Circuit High
2	P0261	Cylinder 1- Injector Circuit Low
3	P0201	Cylinder 1- Injector Circuit open
4	P0629	Fuel Pump "A" Control Circuit High
5	P0628	Fuel Pump "A" Control Circuit Low
6	P0627	Fuel Pump "A" Control Circuit Low
7	P0511	Idle Air Control Circuit
8	P0509	Idle Air Control Circuit Low High
9	P0508	Idle Air Control Circuit Low
10	P2300	Ignition Coil "A" Primary Control Circuit low
11	P0650	Malfunction Indicator Lamp Control Circ.
12	P0108	Manifold Abs.Pressure or Bar.Pressure High Input
13	P0107	Manifold Abs.Pressure or Bar.Pressure Low Input
14	P0105	Manifold Abs.Pressure or Bar.Pressure Circuit
15	P0106	Manifold Abs.Pressure or Bar.Pressure Range/Performance
16	P0000	Crankshaft Signal Malfunction
20	P0322	Crankshaft Signal Lost
21	P0507	Idle Control System RPM Higher than Expected
22	P0506	Idle Control System RPM Lower than Expected
23	P0000	Idle Controller Signal Malfunction
24	P0113	Intake Air Temp.Circ. High Input
25	P0112	Intake Air Temp.Circ. Low Input/range
26	P0111	Intake Air Temp.Circ. struck/Performance
27	P0114	Intake Air Temp.Circ. struck
28	P0118	Engine Coolant Temp.Circ. High Input
29	P0117	Engine Coolant Temp.Circ. Low Input
30	P0116	Engine Coolant Temp.Circ. Range/Performance
31	P0126	Engine Coolant Temp.Circ. struck
32	P0563	System Voltage High Voltage
33	P0562	System Voltage Low Voltage
34	P0560	System Voltage Malfunction
35	P0501	Speed Signal Failure
36	P0123	DK Sensor Voltage High
37	P0122	DK Sensor Voltage Low
38	P2177	System Too Lean Bank1 Non-idle
39	P2178	System Too Rich Bank1 Non-idle
40	P2187	System Too Lean Bank1 Idle
41	P2188	System Too Rich Bank1 Idle
42	P0053	O2 Sensor Heater Resistance(Bank(1)Sensor 1)
43	P0032	O2 Sensor Heater Contr. Circ.(Bank(1)Sensor 1) High
44	P0031	O2 Sensor Heater Contr. Circ.(Bank(1)Sensor 1) Low
45	P0030	O2 Sensor Heater Contr. Circ.(Bank(1)Sensor 1)open
46	P0133	O2 Sensor Circ.,Bank1-Sensor1 Slow Response
47	P0132	O2 Sensor Circ.,Bank1-Sensor1 High Voltage
48	P0131	O2 Sensor Circ.,Bank1-Sensor1 Low Voltage
49	P0130	O2 Sensor Circ.,Bank1-Sensor1 Malfunction
50	P0134	O2 Sensor Circ.,Bank1-Sensor1 No Activity Detected

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51	P0301	Cyl.1 Misfire Detected
52	P0692	Fan Control Circuit High
53	P0691	Fan Control Circuit Low
54	P0480	Fan Control Circuit Open
55	P0459	Canister Purge Valve Circuit High
56	P0458	Canister Purge Valve Circuit Low
57	P0444	Canister Purge Valve Circuit Open
58	P0412	Second Air System Valve Circuit High
59	P0414	Second Air System Valve Circuit Low
60	P0413	Second Air System Valve Circuit Open
61	P0000	DUMP control Circuit Malfunction
62	P0000	DUMP control Circuit open
63	P1099	DUMP control Circuit high
64	P1098	DUMP control Circuit low
65	P0000	Side Stand Switch Signal Malfunction
66	P1508	Side Stand Switch Voltage High
67	P1507	Side Stand Switch Voltage Low
68	P0000	Side Stand Switch Voltage Open

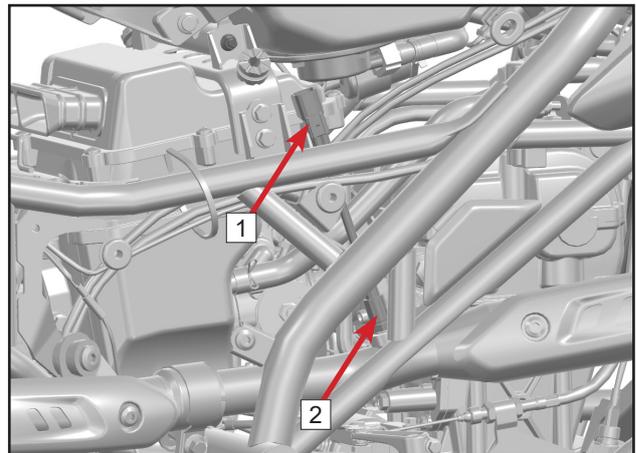
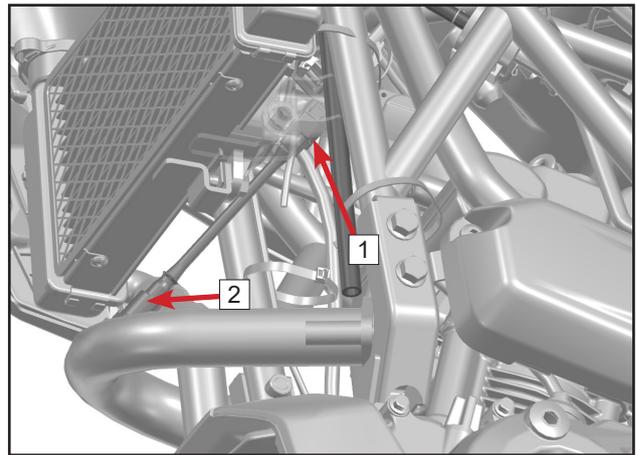
9.5 Oxygen Sensor

Removal

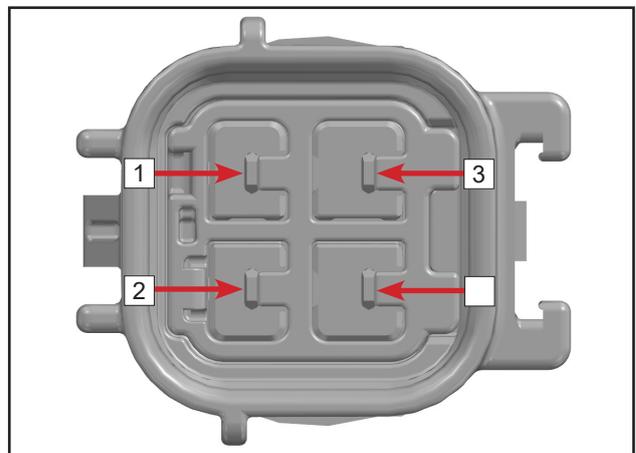
Remove the connector **1**.
Remove oxygen sensor **2**.

Installation

Reverse the removal procedures for installation.



This sensor is used in closed-loop feedback controlled fuel injection to improve the air-to-fuel ratio accuracy and control the emission, which is to improve the control accuracy of the air-fuel ratio of ECU. It's located in the exhaust stream to measure the amount of oxygen in exhaust, and determine whether the gasoline and air are completely burned so as to make catalytic converter convert HC, CO and NOX of Nitrogen efficiently.



Pin function:

PIN1: heating
PIN2: sensor GND
PIN3: heating
PIN4: oxygen sensor signal

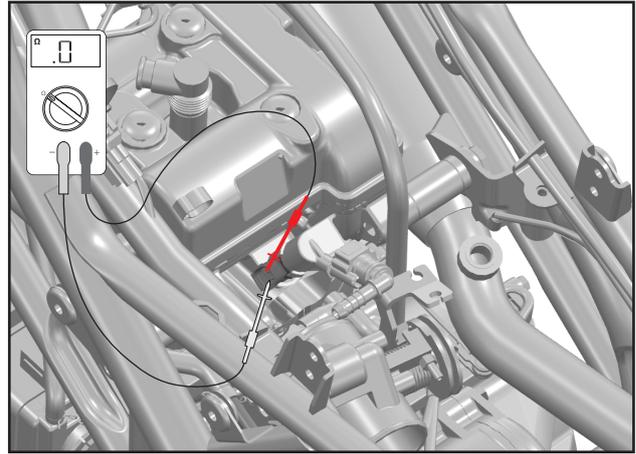
9.6 Injector

9.6.1 Injector Resistance Detection

1. The detection method is shown in the figure.

Injector resistance value: 11.5-12.5Ω.

If the resistance value is not within the above range, it indicates that the fuel injector is damaged, please replace it with a new part.



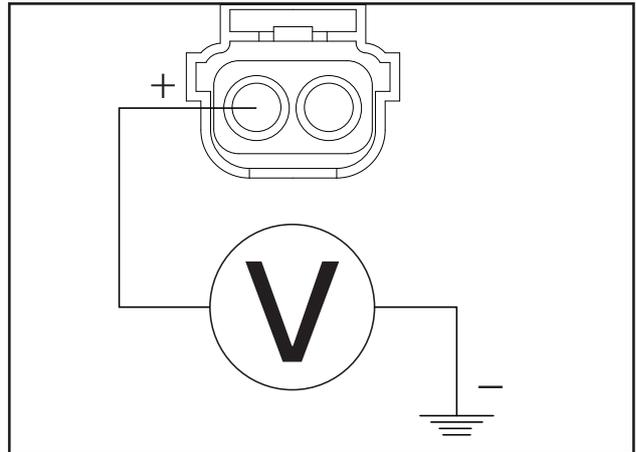
9.6.2 Injector Input Voltage Detection

1. Use a multimeter to connect the harness terminal, as shown in the figure.

2. Unlock the vehicle and turn on the ignition switch.

3. Whether the voltage is about 12V.

If no voltage is displayed or the voltage is too low, check whether the wiring harness is open or the battery is out of power.



9.7 Throttle Body Assembly

Removal

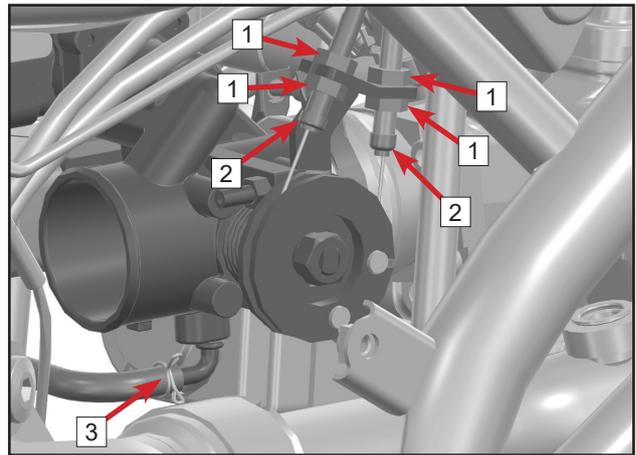
Turn off the vehicle power.

Disconnect the positive and negative terminals of battery.

Loosen nuts **1**.

Remove throttle cable **2**.

Remove hose **3**.

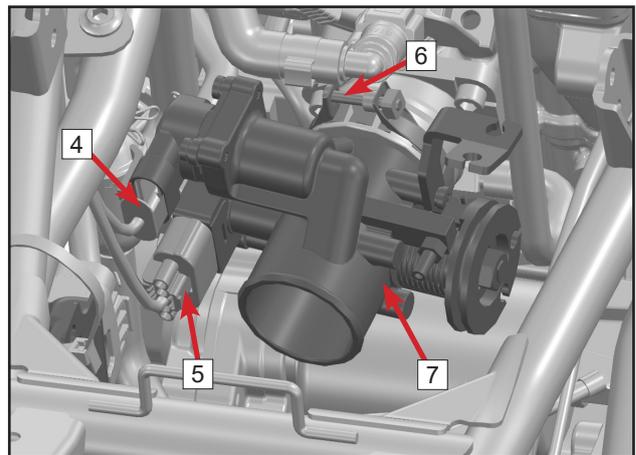


Remove idle stepper motor connector **4**.

Remove TPS three-in-one connector **5**.

Remove clamp bolt **6**.

Remove throttle body assembly **7**.



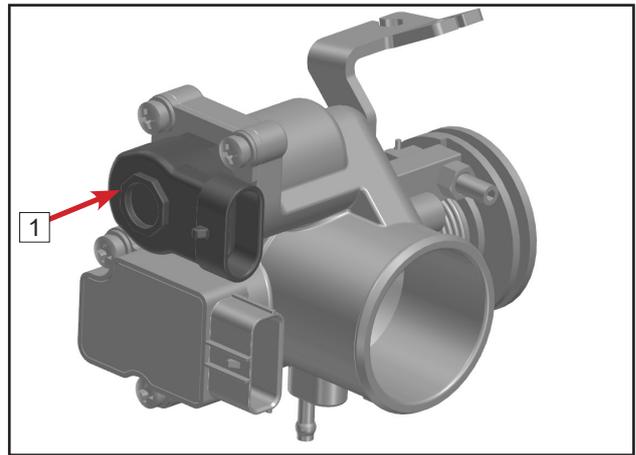
Installation

Reverse the removal procedures for installation.

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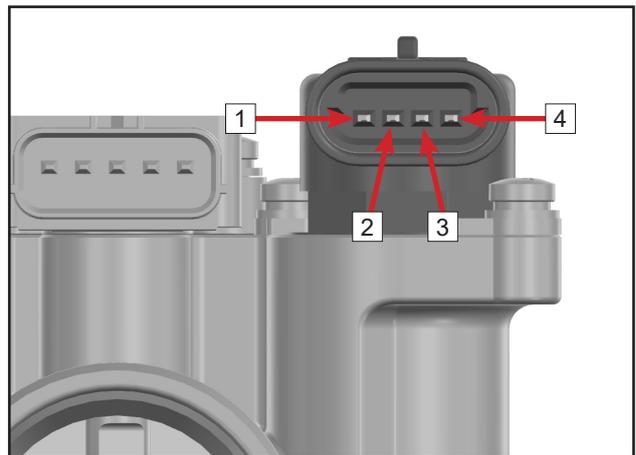
9.7.1 Idle Stepper Motor

The idle stepper motor **1** sends the signal to the ECU by controlling the intake air flow, and the ECU controls the injection amount according to the intake air flow, so as to achieve the normal idle speed of the engine.

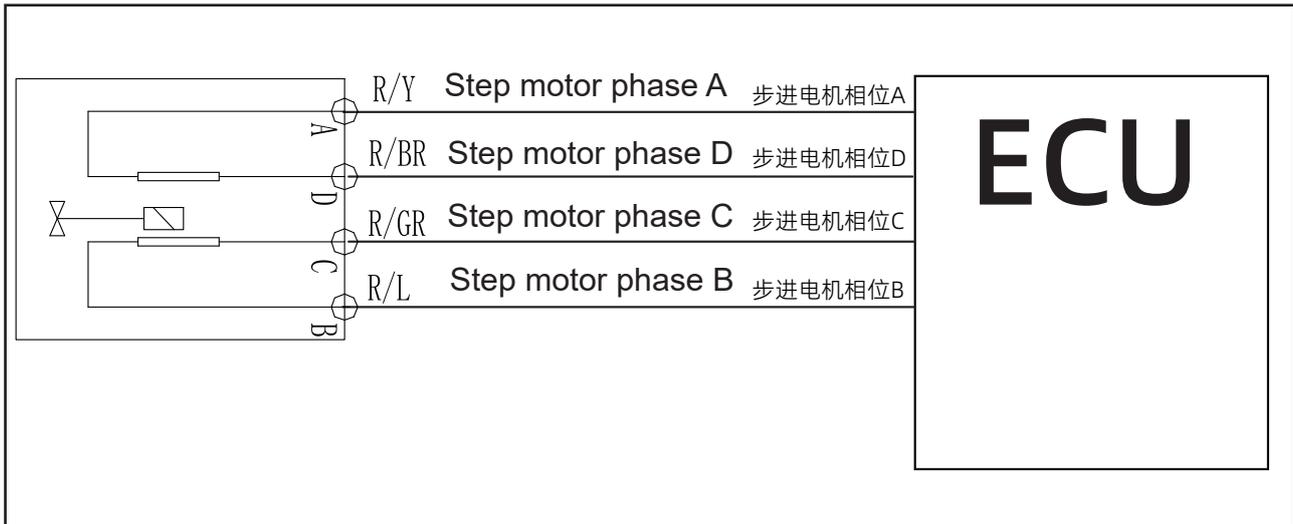


Idle Stepper Motor Pin Function

- 1**: Stepper motor phase D
- 2**: Stepper motor phase C
- 3**: Stepper motor phase B
- 4**: Stepper motor phase A



9.7.1.1 Idle Stepper Motor Troubleshooting



Harness Inspection

Use to DSCAN check the sensor voltage, whether the voltage is about 0V. **NO** → The connector is in poor contact due to intermittent fault.

Sensor Power Inspection

YES
 1. Use a multimeter to connect the R/Y and R/BR harness, whether the voltage is about 12V.
 2. Use a multimeter to connect the R/GR and R/L harness, whether the voltage is about 12V.

NO →

Check whether R/Y and R/BR are short-circuited or disconnected. If no short circuit or open circuit exists, replace the ECU and check it again.

Check whether R/GR and R/L are short-circuited or disconnected. If no short circuit or open circuit exists, replace the ECU and check it again.

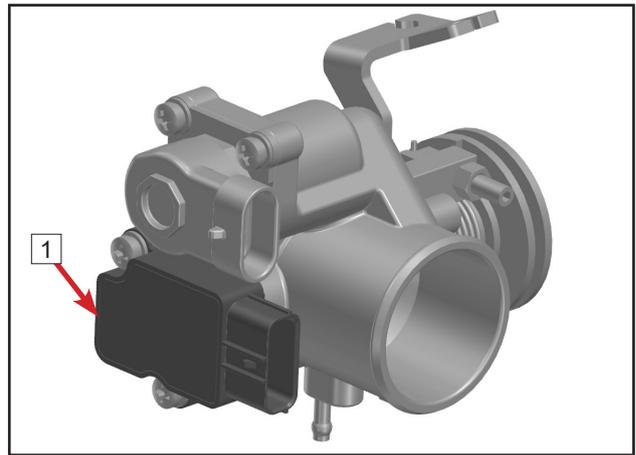
YES →

Replace it with a new one and then check it again.

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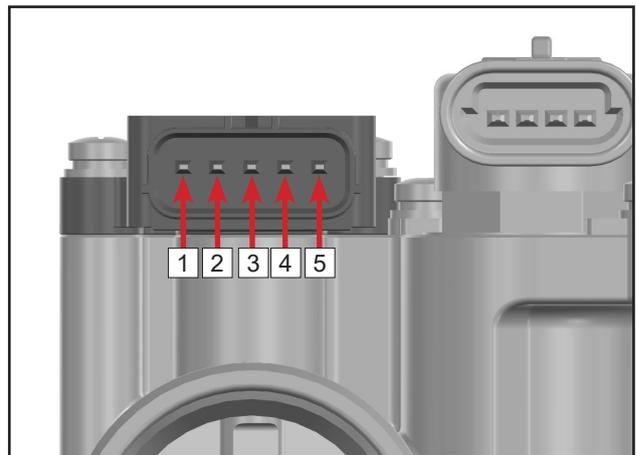
9.7.2 TPS Three In One

TPS 3-in-1 TAB 1 controls the engine intake by adjusting the throttle opening size, so that the engine can obtain the required number of revolutions and power.

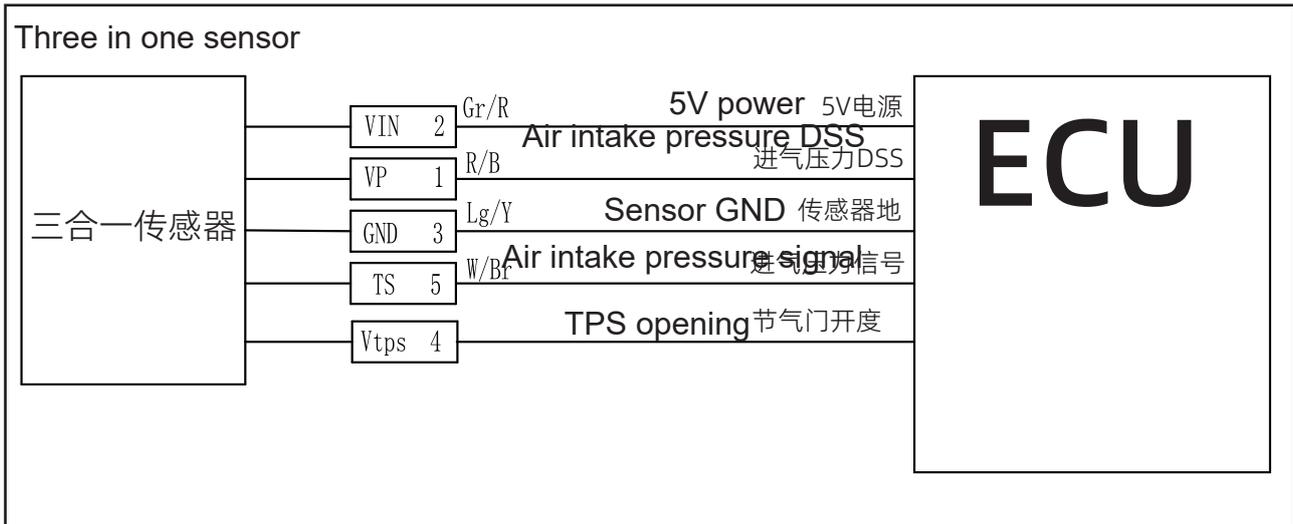


Air Intake Pressure/Temperature Sensor Pin Function

- PIN 1: air intake pressure signal
- PIN 2: throttle opening
- PIN 3: GND
- PIN 4: 5V power
- PIN 5: air intake pressure DSS



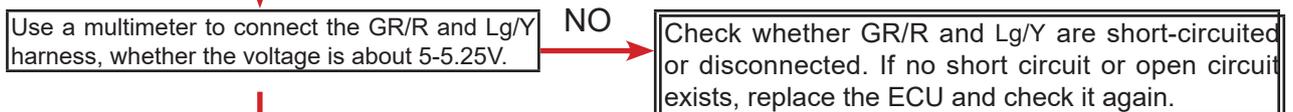
9.7.2.1 TPS Three In One Troubleshooting



Harness Inspection

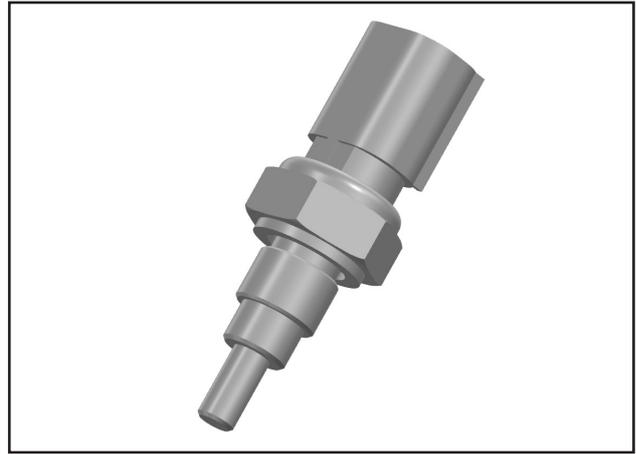


Sensor Power Inspection

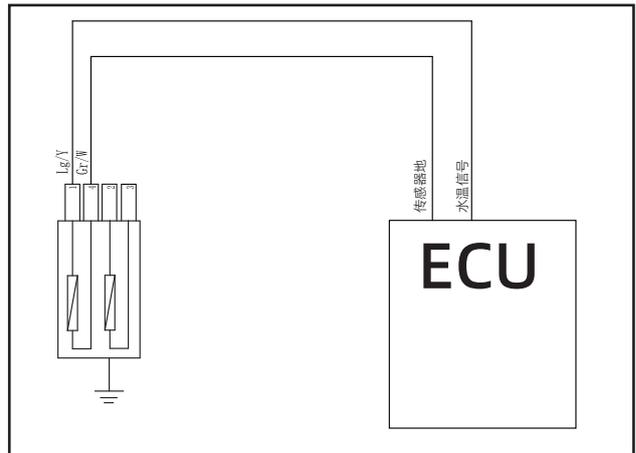


9.8 Coolant Temperature Sensor

The sensor is two groups of negative temperature coefficient (NTC) thermistors, whose resistance value decreases as the coolant temperature increases, but the relationship is not linear. The ECU reads the temperature value of sensor and provides the value to the meter for display.



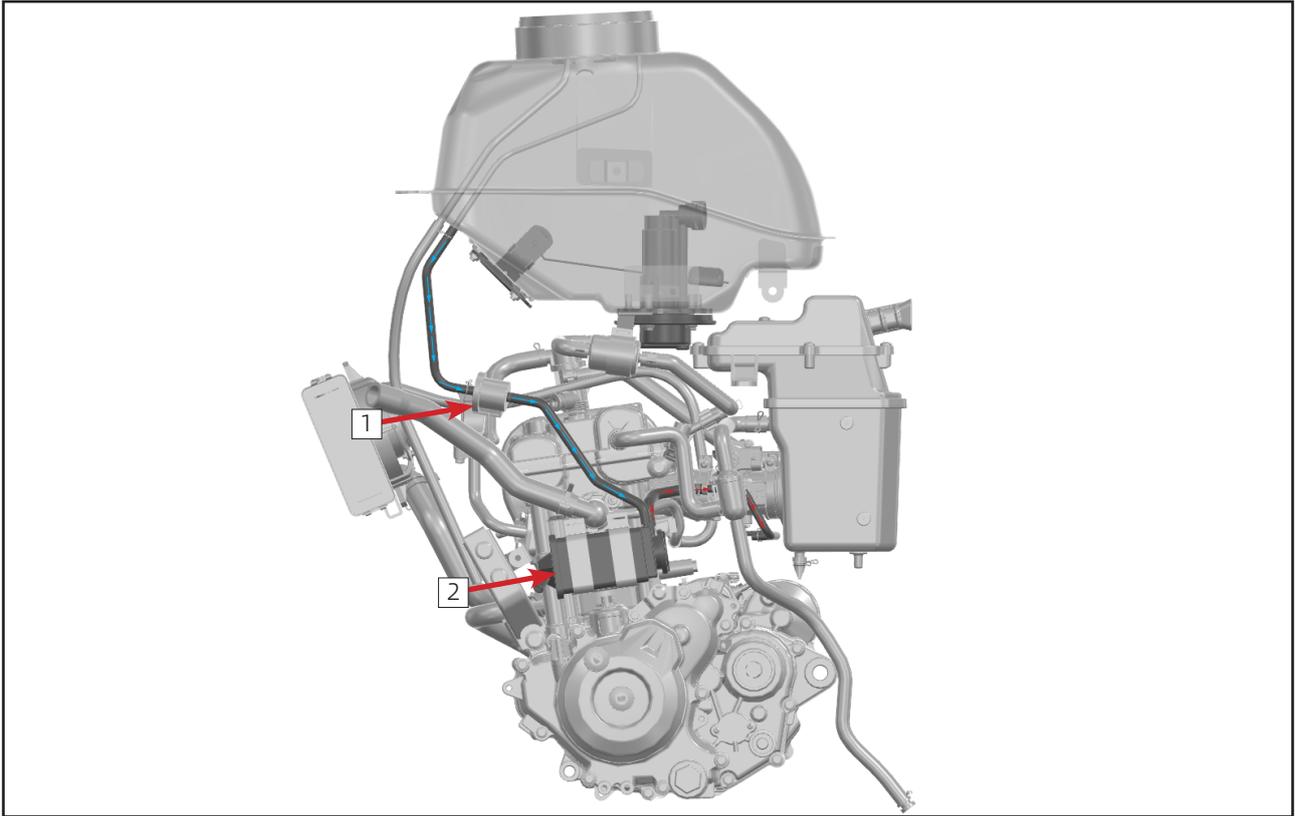
The circuit of connection between the sensor and ECU.



The right table shows the resistance value of sensor at different temperatures.

Temperature°C	Rmin(kΩ)	Rnom(kΩ)	Rmax(kΩ)
-40	42.68	45.66	48.83
-30	24.32	25.87	27.51
-20	14.34	15.18	16.05
-10	8.748	9.21	9.694
0	5.504	5.767	6.042
10	3.564	3.718	3.878
20	2.37	2.462	2.557
30	1.614	1.67	1.728
40	1.124	1.159	1.195
50	0.7984	0.8204	0.8429
60	0.5777	0.5917	0.6059
70	0.425	0.434	0.443
80	0.3175	0.3232	0.329
90	0.2405	0.2442	0.2479
100	0.1836	0.1869	0.1902
110	0.1418	0.1448	0.1477
120	0.1108	0.1134	0.116
130	0.0875	0.0897	0.0919
140	0.0697	0.0716	0.0736

9.9 EVAP System Work Guide



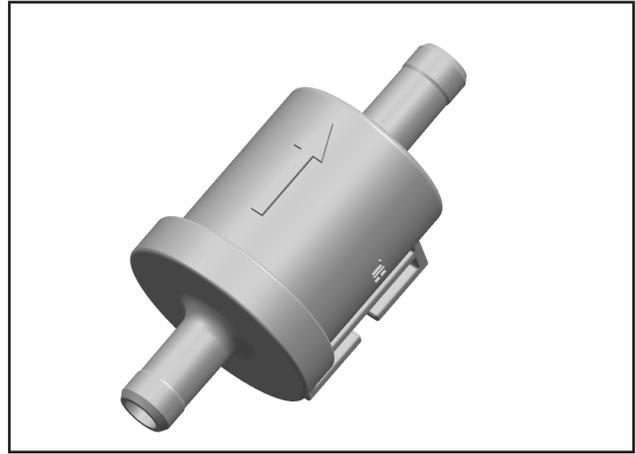
Due to the volatile characteristics of fuel, in order to adapt to the current environmental protection laws and regulations, a set of fuel evaporation system is designed.

The blue arrow shows the evaporated oil and gas, after the volatilized oil and gas passing through the two-way valve **1** enters the carbon tank **2**.

The red arrow shows that after the engine starts, the carbon tank produces negative pressure, the air enters the carbon tank from the vent of carbon tank, desorbates the fuel vapor adsorbed on the carbon tank, passes through the fuel steam desorption pipe, enters the throttle and flows into the combustion chamber for combustion.

9.9.1 Two-way Valve Test

Close one end of the two-way valve, input air from the other end and keep for 10 seconds, no leakage situation is normal. If there is air leakage or body damage during the test, please replace it with a new part.



9.9.2 Canister Test

1. Inject air on the one end ① of the adsorption port, and the vent port exits normally ②.
2. Plug other ports, and pass 14.0kpa compressed air through the adsorption port ①, and keep no leakage for 30 seconds. If there is air leakage or body damage during the test, please replace it with a new part.

