

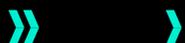
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MORE FUN.



800 MT-X

Service Manual



Edition Date: 20240330

Edition Item: CF800-11 CF800-11A(6WW9-00WX01-11) SM -20260119

FOREWORD

This manual introduces CF800-11、CF800-11A maintenance information, including disassembly procedure checking & adjustment methods, troubleshooting and technical specifications. There are some illustrations, drawing to guide your operation.

The first three chapters mainly introduce general operation information, special tool, vehicle structure, basic specification, inspection&maintenance methods etc.,

The rest chapters introduce vehicle part removal, installation, adjustment, service, fault diagnosis and etc.,

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Any transmission or recording is prohibited.

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

CFMOTO/CKM 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/CKM 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.

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Zhejiang CFMOTO Power Co.,Ltd/
Zhejiang CFMOTO-KTMR2R Motorcycles
Co., Ltd
March, 2024

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 service manual is not only specially designed for professional machinist, but also it is used to instruct the vehicle's user how to do maintenance work. It is necessary to know mechanical knowledge, tools proper usage and have a well understanding of service procedure conversion before you perfectly solve all service problems. If no, you should get the service support by professional machinist. Please read this service manual and understand it before operation for high efficiency work. Work in clean area for vehicle mechanical performance and safety works. No tools replaced or use temporary tools since that we have been appointed the special service tools and equipments. All service and scheduled maintenance should be executed base on the instructions of service manual. Any consequences are responsible by the vehicle's owner resulted from any rule-breaking operations.

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 operate 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 shows up in the contents. That will help you to lock the chapter. And each chapter has its own contents. For example, if you want to find ignition coil information, lock the electrical system chapter by using the contents, and then find the ignition coil in electrical system chapter.

Whenever you see the warning or warning symbol, you must keep attention and comply with the safety operation and maintenance method.

 **DANGER:** This symbol means it will cause serious injuries even death if you don't follow the procedure.

 **WARNING:** This symbol means the special steps. It may cause the vehicle damage if you don't follow the procedure.

 **CAUTION:** This symbol means the special steps for higher efficiency and easier working.

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

NOTE:

The disassemble steps exclude the electrical parts, police implements and engine, etc. Electrical parts and engine are shown in the separate chapters.

All connectors are unplugged by default during removal.

The guide line without serial number in the picture indicates the direction of removal.

01 General Information

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1.1 Operation Cautions

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



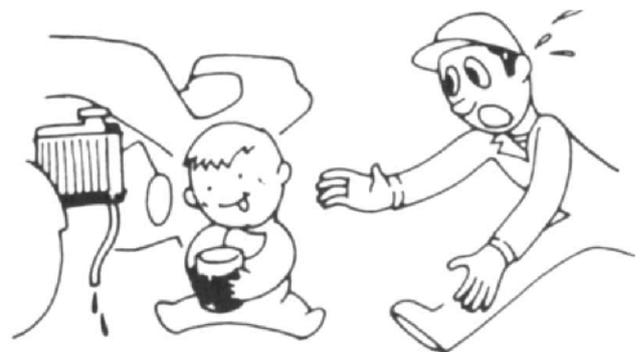
⚠ WARNING: Don't touch the engine or muffler with bare hands when the engine has just stopped to avoid hurt. Wear long-sleeve work clothes.



⚠ WARNING: 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.



⚠ WARNING: 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 touches eyes. If drinking the coolant, induce vomiting and consult doctors. Keep coolant away from reach of children.



01 General Information

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



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



⚠️ DANGER: 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.

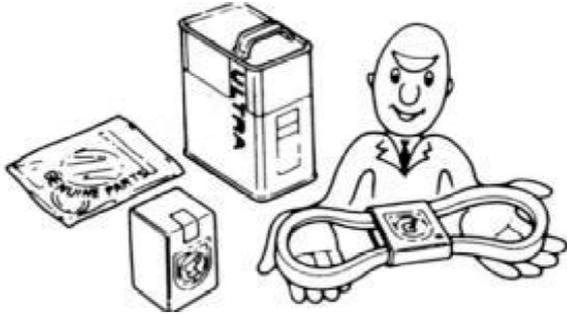


⚠️ DANGER: Be careful to get clamped by the turning parts like wheels and clutch.

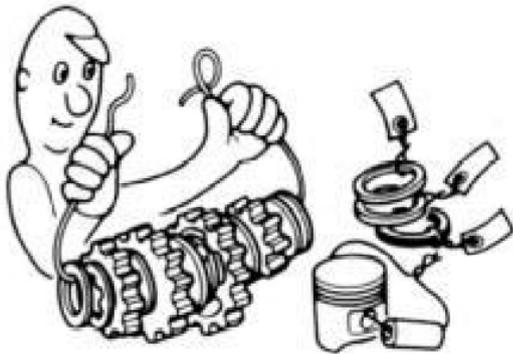


1.2 Disassembly and Assembly Cautions

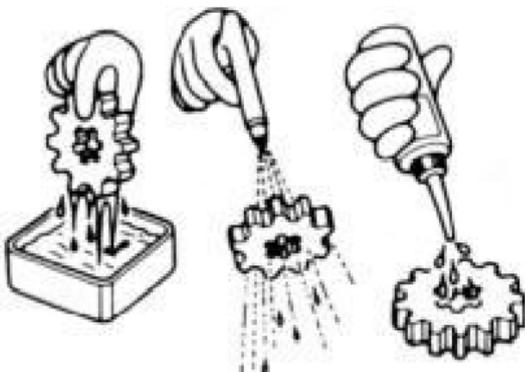
■ Use genuine CFMOTO Parts, lubricants and grease.



■ 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.



■ 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.

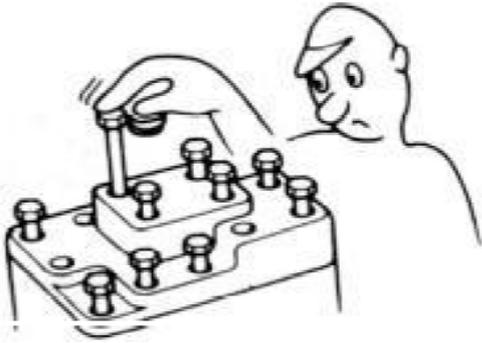


■ Measure the data during disassembly for correct assembly.

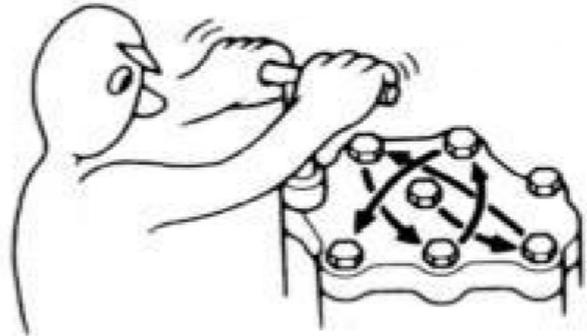


01 General Information

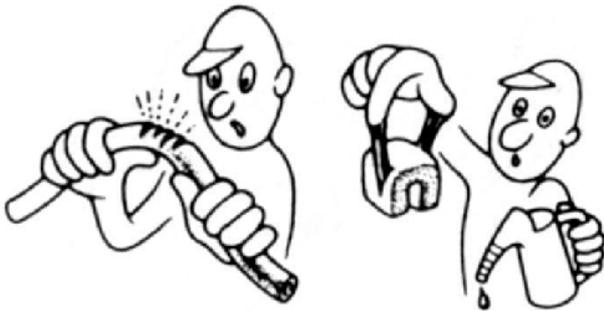
■ If not know the length of screws, install the screws one by one and tighten with same torque.



■ 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.



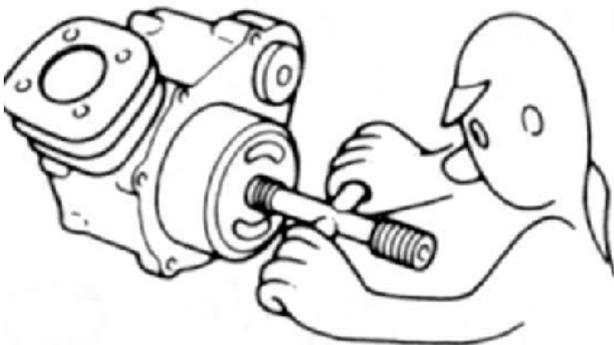
■ Check if the disassembled rubber parts are aged and replace it if necessary. Keep the rubber parts away from grease.



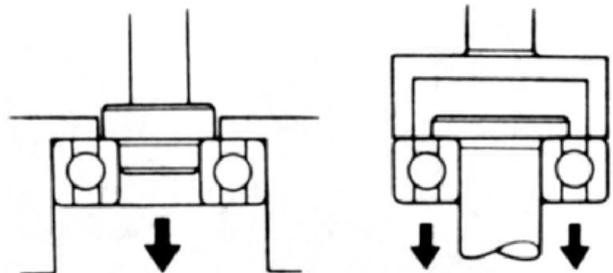
■ Apply or inject recommended lubricant to the specified parts.



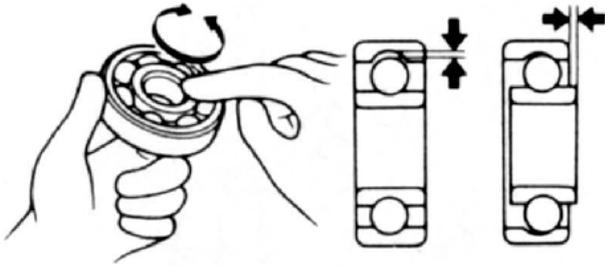
■ Use special tools wherever necessary.



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



■ 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 and replace. If the cleaning does not help. When pressing the bearing into the machine or to the shaft, replace the bearing if it could not be pressed tight.



■ Keep the bearing block still when blowing dry the bearing after washing clean. Apply oil or lubricant before assembling.

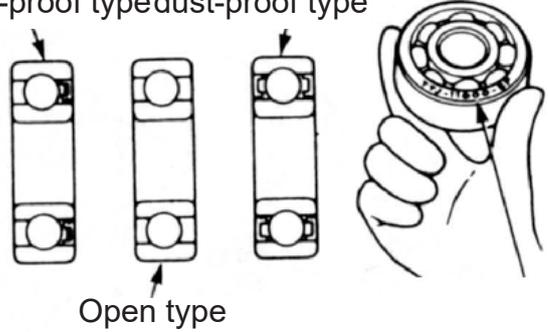


■ After assembling, check if all the tightened parts are properly tightened and can move smoothly.

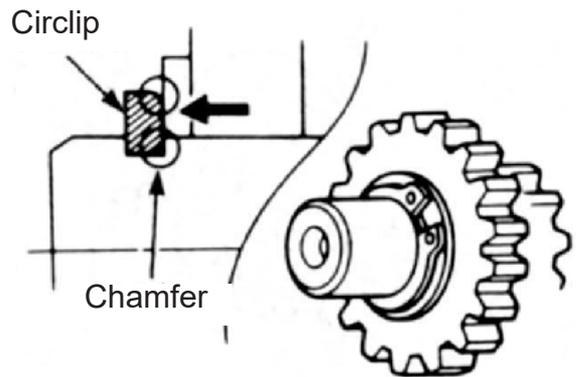


■ Install the one-side dust-proof bearing in the right direction. When assembling the open type or double-side dust-proof bearing, install with manufacturer's mark outward.

Single side dust-proof type Double side dust-proof type



■ Install the elastic circlip after assembling to make sure it has been installed into the slot.

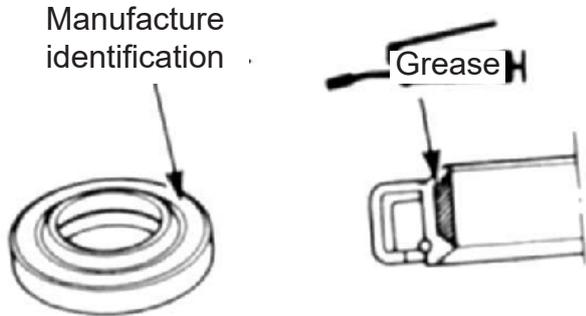


■ Brake fluid and coolant may damage coating, plastic and rubber parts. Flush these parts with water if splashed.

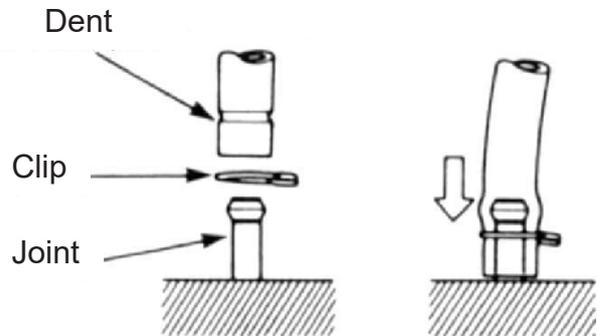


01 General Information

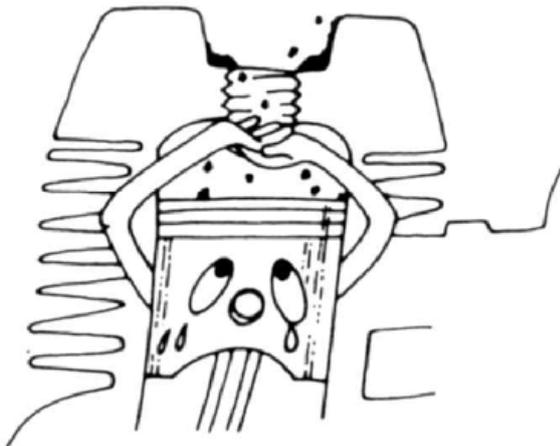
■ Install oil seal with the side of manufacturer's mark outward.
Do not fold or scratch the oil seal lip.
Apply grease to the oil seal lip before assembling.



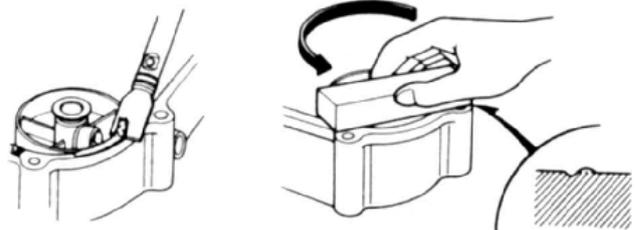
■ When installing pipes, insert the pipe till the end. Fit the pipe clip, if any, into the rove. Replace the pipes or hoses that cannot be tightened.



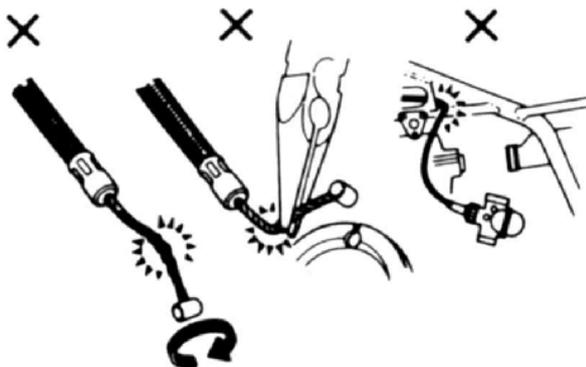
■ Do not mix mud or dust into engine or the hydraulic brake system.



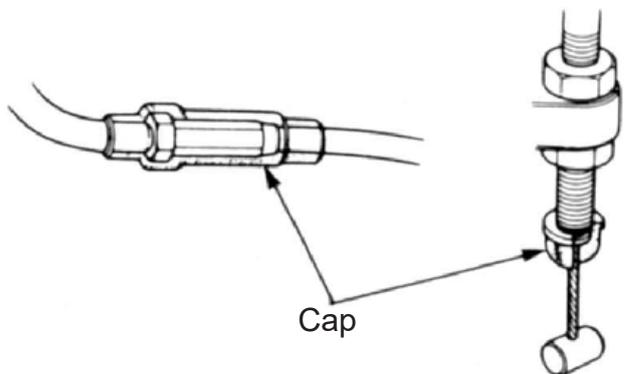
■ Clean the gaskets and washers of the engine cases before assembling. Remove the scratches on the contact surfaces by polishing evenly with an oil stone.



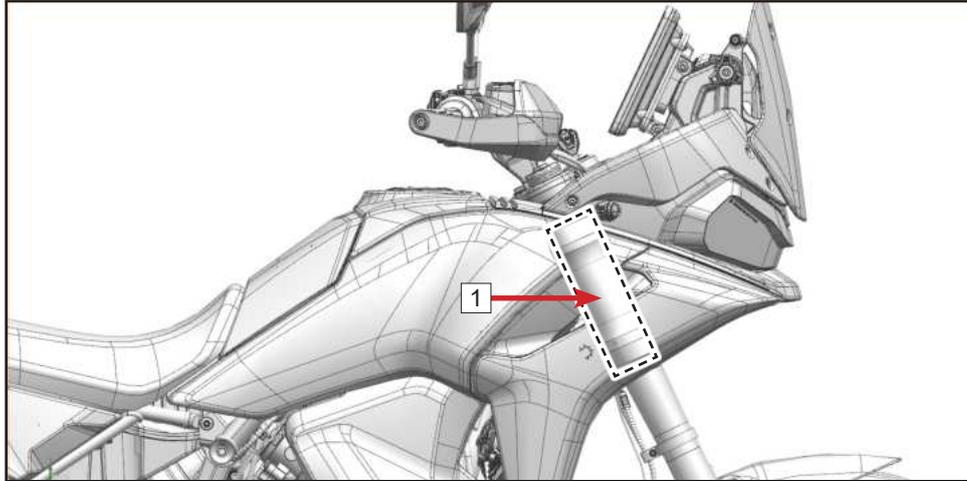
■ Do not twist or bend the cables too distorted or damaged cables may cause poor operation.



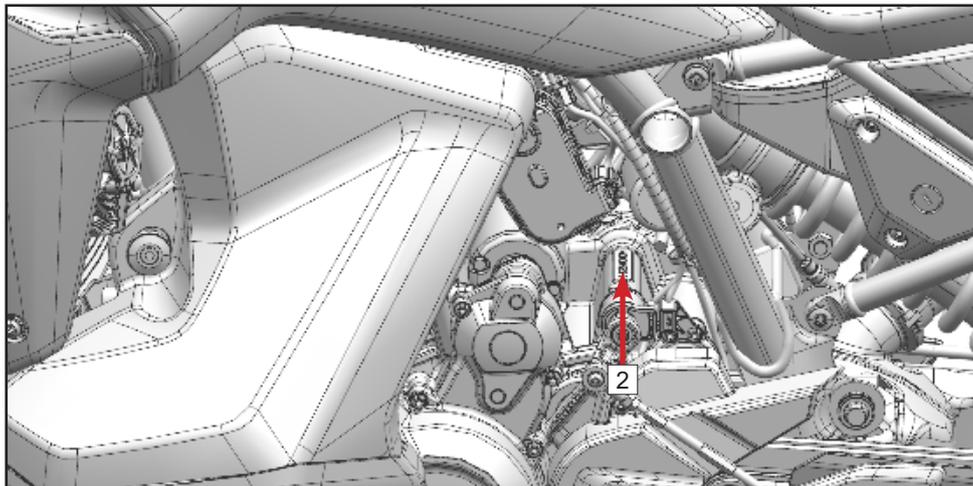
■ When assembling the parts of protection caps, insert the caps to the grooves, if any.



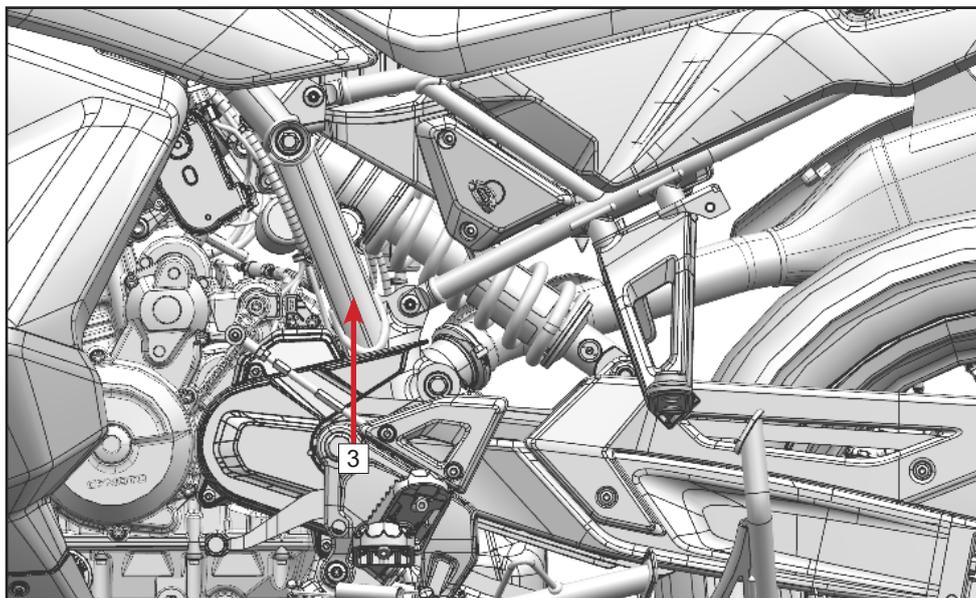
1.3 Number Engrave Place



1 | VIN



2 | Engine number



3 | Vehicle nameplate position

02 Maintenance Information

2.1 Daily Maintenance Schedule	2-2
2.2 Break-in Maintenance Schedule	2-3
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⚠ 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.

Clean Maintenance Mileage

After the regular maintenance, the maintenance information mileage in the dashboard should be manually cleared.

Press the SET key in short time to enter the Menu.

Press △ or ▽ key in long time, until vehicle information is entered.

Press △ or ▽ key in long time, until maintenance information is entered.

Press SET key and △ key in long time (> 10 seconds) to clean maintenance mileage.

2.1 D a i l y M a i n t e n a n c e S c h e d u l e

Item	Maintenance before riding				
	Hour	Calendar	km	Remarks	
Fuel system					
Fuel tank and hose	-	Daily	-	Inspect for aging	
Electrical system					
Switches	-	Daily	-	Inspect	
Lights and horns	-	Daily	-		

02 Maintenance Information

2.2 Break-in Maintenance Schedule

Item		Break-in Maintenance Interval (Service whichever interval comes first)			
		Hour	Calendar	km	Remarks
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 line	-	-	1000	Inspect for damage and sealing
	Brake pedal	-	-	1000	Inspect for free play
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 and use purpose)
Cooling system					
	Coolant fluid level	-	-	1000	Inspect
■	Coolant	-	-	1000	
■	Radiator fan function	-	-	1000	
	Cooling hose	-	-	1000	
Steering system					
■	Steering bearings	-	-	1000	Inspect
Other parts					
■	Diagnosis connector	-	-	1000	Read with PDA
■	All mobile parts	-	-	1000	Lubricate, inspect for flexibility
■	Bolts and nuts	-	-	1000	Inspect for fastness
■	Cables	-	-	1000	Inspect for damage, stuck and flexibility

2.3 Periodic Maintenance Schedule

Item		Periodic Maintenance Interval (Service whichever interval comes first)			
		Hour	Calendar	km	Remarks
Engine					
	Oil and oil filter	-	12M	15000	Replace
	Oil strainer	-	12M	15000	Clean
■	Clutch	-	-	15000	Inspect, repair or replace if necessary.
	Idle	-	-	15000	Inspect, adjust if necessary
■	Coolant	-	12M	15000	Inspect, replace if necessary
		-	48M	-	Replace
	Throttle system	-	-	10000	Inspect, adjust if necessary
■	Throttle valve body	-	-	15000	Clean
▶ ■	Air filter element	-	12M	15000	Replace
■	Spark plug	-	-	30000	Replace
■	Valve clearance	-	-	30000	Inspect, adjust if necessary
Electrical system					
■	junctions of electrical parts	-	12M	10000	Inspect, repair or replace if necessary
	Battery	-	6M	5000	Inspect, charge if necessary
	Fuses or overload protector	-	6M	5000	Inspect, replace if necessary
■	Wires	-	12M	10000	Inspect for damage and bending during layout
Brake system					
	Front and rear brake system	-	12M	10000	Inspect, repair or replace if necessary
	Brake discs	-	12M	10000	
▶	Brake pads	-	12M	10000	
	Brake fluid level	-	12M	10000	Inspect, add if necessary
		-	12M	10000	Check for damage and sealing
		-	12M	10000	Inspect for free play.
■	Brake fluid	-	24M	-	Replace
Wheels					
	Tire condition	-	12M	10000	Inspect, repair or replace if necessary.
	Tire pressure	-	12M	10000	Inspect, replenish air pressure if necessary.

02 Maintenance Information

■	Wheel bearings	-	-	10000	Inspect, repair or replace if necessary.
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Item		Periodic Maintenance Interval (Service whichever interval comes first)			
		Hour	Calendar	km	Remarks
Suspension system					
■	Suspension system	-	-	5000	Inspect, repair or replace if necessary.
■	Rear shock absorber and front shock absorber	-	12M	10000	Inspect for leaking (maintain front fork and rear shock absorber according to the requirement and use purpose)
Cooling system					
	Coolant fluid level	-	12M	10000	Inspect, add if necessary.
■	Radiator fan function	-	12M	10000	Inspect, repair or replace if necessary.
■	Cooling hose	-	12M	10000	
Frame system					
	Frame	-	-	30000	Inspect, repair or replace if necessary.
Steering system					
■	Steering bearing	-	12M	10000	Inspect, repair or replace if necessary.
Chain					
▶	Chain lubrication	-	-	600	Inspect immediately after riding in rainy weather.
	Chain tightness	-	-	1000	Inspect, adjust if necessary.
	Chain, rear sprocket and engine sprocket	-	12M	10000	Inspect, replace if necessary.
	Chain guard	-	12M	10000	
Other parts					
■	Diagnosis connector	-	12M	10000	Read with PDA
■	All mobile parts	-	12M	10000	Lubricate; inspect for flexibility
■	Bolts and nuts	-	12M	10000	Inspect for fastness
■	Cables	-	12M	5000	Inspect for damage, bending and routing
■	All pipes and sleeves	-	12M	10000	Inspect for cracks, sealing and routing

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3.1 General Specification

Item		Specifications			
Model		800MT-X			
		CF800-11		CF800-11A	
Length		2288mm		2330mm	
Width		945 mm			
Height		1355mm	1390mm	1360mm	1395mm
Wheel Base		1530 mm			
Engine Model		288MW-D			
Displacement		799mL			
Fuel grade		RQ-95 or above			
Gross weight		231kg		248kg	
Passengers		2 passengers (including driver)			
Tire specification	Front	90/90-21			
	Rear	150/70 R18			
Rim specification	Front	21xMT2.5			
	Rear	18xMT4.25			
Min. ground clearance		225 mm			
Turning circle diameter		5400 mm			
Dry weight		198kg			
Steering	Steering Angle	Right	36°		
		Left	36°		
Brake system		Front	Hydraulic Disc		
		Rear	Hydraulic Disc		
Shock absorber	Suspension	Front Wheel	Telescopic		
		Rear Wheel	Cantilever type		
Frame		Steel tube			

3.2 Engine Specification

Item		Type/Specification		
Model		800MT-X		
		CF800-11	CF800-11A	
Type		Line engine, twin-cylinder, 4-stroke, water-cooled, DOHC		
Bore×Stroke		88mm ×65.7mm		
Displacement		799mL		
Compression Ratio		12.8(±0.3): 1		
Engine idle rpm		1400r/min±140r/min		
Starting System		Electric		
Max Net Power		70Kw/8500rpm		
Max torque		87N•m/6750rpm		
Electrical system	Ignition type	ECU ignition		
	Spark plug/Electrode gap	BN8RT1/0.8mm ~ 1.0 mm		
	Magneto type	PM three phase AC		
Combustion system	Air filter type	Pape filter		
	Gasoline	RQ-95 and above		
Valves system	Valves type	DOHC/chain drive		
Lubrication system	Lubrication type	Pressure and splash, semi-dry oil pan		
	Oil pump type	Rotor drive		
	Oil filter type	Paper type, replaceable+paprt cartridge		
	Engine oil type	SAE 10W-50 JASO T903 MA2		
Cooling system	Cooling type	Closed coolant circulation cooling		
	Coolant type	-35°C Antirust and antifreeze solution		
D r i v e t r a i n s y s t e m	Cooling type		Wet and m ultiplate manual clutch	
	Transmission type		Six-speed international standard	
	Reducer gear		6 gears	
	Gearshift methods/orders		Mechanical reciprocating/1-0-2-3-4-5-6-5-4-3-2-0-1	
	Transmission ratio	Primary ratio		1.923
		Final ratio		2.813
		Secondary ratio	1st	2.846
			2nd	2.000
			3rd	1.550
			4th	1.273
5th	1.083			
6th	0.957			
Dry weight		47.3kg		
Output type		Chain		
Rotation of engine output		When moving forward, counter clockwise(left view).		

3.3 Maintenance Specification

3.3.1 Front Wheel

Item		Standard	Service Limit	
Front Wheel	Front wheel shaft bending		-	0.2 mm
	Rim Run-out	Longitudinal	0.8 mm	2.0 mm
		Horizontal	0.8 mm	2.0 mm
	Tire	Remaining Groove	-	1.6 mm
		Tire Pressure	240 kPa	-

3.3.2 Rear Wheel

Item		Standard	Service Limit	
Rear Wheel	Rim run-out	Longitudinal	0.8 mm	2.0 mm
		Horizontal	0.8 mm	2.0 mm
	Tire	Remaining Groove	-	1.6 mm
		Tire Pressure	240 kPa	-

3.3.3 Brake System

Item		Standard	Service Limit
Front Brake	Front (hand) Brake Free Travel	5mm~10mm	-
	Brake Disc Abrasion	4.5 mm	4 mm
Rear Brake	Rear (foot) Brake Free Travel	10mm~20mm	-
	Brake Disc Abrasion	5 mm	4 mm

3.3.4 Lights, Dashboard and Switches

Item		Standard
Fuse	Main fuse	30 A
	Secondary fuse	1×25A 3×10A 3×15A 2×5A
Lights	Headlight	LED
	Position light	LED
	Tail light	LED
	Turn light	LED
	License light	LED

3.4 Service Specification

3.4.1 Valve Train+Cylinder Head

Item	Standard		Limit	Remark
Valve clearance (cold engine)	IN	0.10mm~0.15mm	-	
	EX	0.15mm~0.20mm	-	
Clearance, valve guide and valve stem	IN	0.01mm~0.037mm	-	
	EX	0.03mm~0.057mm	-	
I.D of valve guide	IN&EX	4.5mm~4.512mm	-	
O.D of valve stem	IN	4.475mm~4.490mm	-	
	EX	4.455mm~4.470mm	-	
Free length, valve spring	41.6mm		-	
Valve spring force	When compressed to 38.4mm, 103N~121N		-	
	When compressed to 30.5mm, 422N~466N		-	
	When compressed to 29.8mm, 455N~503N		-	
Camshaft lift	IN	36.543mm~36.657mm	-	
	EX	35.843mm~35.957mm	-	
Camshaft to hole clearance	0.028mm~0.071mm		-	
O.D of camshaft	23.950mm~23.972mm		-	
I.D of camshaft mating hole	24mm~24.021mm		-	
Camshaft runout	0.02mm		-	
Cylinder head junction surface flatness	0.05mm		-	

3.4.2 Lubrication System

Item	Standard		Service Limit	Remark
Outer rotor to inner rotor clearance	≤0.20mm		-	
Outer rotor to pump body clearance	≤0.15mm		-	
Oil pressure	1.4bar @ 1500r/min 2.4bar @ 6000r/min		-	
Oil type	10W-50/SJ, JASOMA2 certified engine oil		-	
Oil capacity	Change oil and filter	2800 mL	-	
	At overhaul	2900 mL	-	

3.4.3 Cylinder, Piston, Piston Ring and Connecting Rod

Item	Standard		Service Limit	Remark
Clearance between piston and cylinder	0.035mm~0.070mm		-	
Dia. of piston skirt	82.920mm~87.980mm		-	
I.D of cylinder	88.000mm~88.012m m		-	
Cylinder junction surface flatness	0.03mm		-	
Piston ring closed clearance	1 Ring	0.25mm~0.40mm	-	
	2 Ring	0.40mm~0.55mm	-	
Clearance between piston ring and groove	1 Ring	0.03mm~0.07mm	-	
	2 Ring	0.02mm~0.06mm	-	
Thickness of piston ring	1 Ring	0.87mm~0.89mm	-	
	2 Ring	0.97mm~0.99mm	-	
Width of piston ring groove	1 Ring	0.92mm~0.94mm	-	
	2 Ring	1.01mm~1.03mm	-	
	Oil Ring	1.510mm~1.525mm	-	
O.D of piston pin	18.996mm~19mm		-	
I.D of connecting rod small end	19.01mm~19.02mm		-	
Connecting rod big end side clearance	41mm~41.015mm		-	
Connecting rod big end thickness	22.85mm~22.9mm		-	
Crankshaft run-out	0.02mm		-	

3.4.4 Clutch and Transmission

Item	Standard	Service Limit	Remark
Friction disc A		-	
Quantity	3	-	
Friction disc B		-	
Quantity	4	-	
Steel disc A		-	
Quantity	5	-	
Steel disc B		-	
Quantity	1	-	
Clutch driven pad deformation	0.15mm	0.30mm	
Free length of clutch spring	46.6mm	≥ 43.0 mm	
Quantity	3	-	
Shift fork thickness	4.8mm~5.0mm	-	

3.4.5 Cooling System

Item	Standard/Specification	Service Limit	Remark
Start temp. of thermostat	72°C~85°C	-	
Lift range of thermostat valve	≥8 mm at 85°C	-	
Open pressure of radiator cap	135kPa~160kPa(standard:140kPa)	-	
The relationship between the resistance of water temp. sensor and temperature	Temperature (°C)	-	
	-20	-	
	20	-	
	80	-	
Coolant type	120	-	
	-35°C anti-rust and anti-freeze fluid with high boiling point	-	

3.4.6 Air Inlet System

Item	Specification	Remark
Port size (mm)	φ42 mm	
Idle speed (r/min)	1450 r/min ± 145 r/min	

3.4.7 Electrical System

Item	Specification		Remark
Spark plug	Model	NGK LMAR9AI-10	
	Gap	1 mm	
Spark	> 8 mm, 1 MPa		
Ignition coil resistance	Primary	1.23 Ω	
	Secondary	6kΩ~13kΩ	
Magneto coil resistance	Trigger	400Ω	
Magneto max output power	350W		
Stabilized voltage	13.5V~15.0V		
Primary peak voltage, ignition coil	≥27kV		
Peak voltage, trigger coil	≥17V		

3.5 Tighten Torque

Tighten Torque Table for Vehicle

Item	Torque N•m(kgf•m)	Item	Torque N•m(kgf•m)
M5 bolt, nut	5±1(0.5±0.1)	M5 screw	4±1(0.4±0.1)
M6 bolt, nut	10±1(1.0±0.1)	M6 screw	9±1(0.9±0.1)
M8 bolt, nut	20~30(2.0~3.0)	M6 flange bolt and nut	12±1(1.2±0.1)
M10 bolt, nut	30~40(3.0~4.0)	M8 flange bolt and nut	20~30(2.0~3.0)
M12 bolt, nut	40~50(4.0~5.0)	M10 flange bolt and nut	30~40(3.0~4.0)

3.5.1 Tighten Torque Table for Vehicle

Please use standard torque if without torque value mentioned below table.

**NOTE: 1. Thread locker should be applied on screw thread and contact surface.
2. Replace with new ones if self-locking bolts are removed.**

Mounting place	Item	Torque N•m & Thread locker
Oxygen sensor	Oxygen sensor	50N•m
Nut, front exhaust pipe	Muffler nut	Inside 20N•m (1) Outside 12N•m (2) Inside 20N•m (1)
Bolts, front muffler body	Bolt M8*30	25N•m (Loctite®243)
Side stand switch	Bolt M5	4N•m (Loctite®243)
Lock nut, rear brake lever	Nut M8	25N•m (Loctite®243)
Lock nut, gearshift lever pedal	Nut M8	25N•m (Loctite®243)
Rear brake fluid inlet pipe	Banjo Bolt II	25N•m
Front brake fluid outlet pipe	Banjo Bolt II	25N•m
	Screw M10*45	48N•m (Loctite®243)
Tighten front LH footrest assembly front bolt	Bolt M10*87	45N•m (Loctite®243)
Tighten front LH footrest assembly lower bolt	Bolt M10*40	45N•m (Loctite®243)
Tighten front RH footrest assembly front bolt	Bolt M10*22	45N•m
Tighten front RH footrest assembly lower bolt	Bolt M10*40	45N•m (Loctite®243)
Tighten engine hanger and engine connecting bolt	Bolt M10*60	45N•m (Loctite®243)
Tighten center strut LH and RH mounting seat	Bolt M10*45 Bolt M10*30	45N•m (Loctite®243)
Tighten engine hanger and frame connecting bolt	Bolt M8*50	28N•m (Loctite®243)
Tighten front LH&RH footrest assembly upper bolt	Bolt M12*60	100N•m
Tighten rear shock absorber bolt	Shock absorber upper and lower mounting bolt M12*60	80N•m (Loctite®243)
Tighten output shaft nut	Small sprocket output shaft nut	120N•m (Loctite®243)
Tighten subframe bolt	Frame upper tighten bolt M10*22	60N•m (Loctite®2701)
Tighten subframe bolt	Frame lower tighten bolt M10*37	60N•m (Loctite®2701)

03 Technical Information

Handlebar bracket	Hexagon socket cap screw M10*1.25*60	45N•m (Loctite®243)
Front brake pump assembly	Brig your own	2N•m
RH handlebar switch	Brig your own	2N•m
E-throttle	Brig your own	2N•m

Clutch lever assembly	Brig your own	2N•m
LH handlebar switch	Brig your own	2N•m
LH grip assembly	Brig your own	2N•m
Tighten column	Upper triple clamp tighten screw M25*1.5	21N•m
Tighten front brake master cylinder brake pipe	Banjo Bolt II	25N•m
Lower triple clamp mounting front shock absorber	Screw M8*30	Upper 20N•m (Loctite®243) Lower 16N•m (Loctite®243)
Tighten upper triple clamp screw	Hexagon socket cap screw M8*30	20N•m (Loctite®243)
	Hexagon socket cap screw M8*25	20N•m (Loctite®243)
Rear wheel shaft tighten nut	Nut M25*1.5	90N•m
Fuel pump	Bolt M6*16	5N•m
Front wheel shaft tighten screw	Front wheel shaft tighten screw M25*1.5	45N•m
Tighten front brake caliper	Bolt M10*1.25*60	45N•m (Loctite®243)
Tighten brake hose	Banjo Bolt	25N•m
Rear pedal assembly mouting frame	Screw M8*20	25N•m (Loctite®243)
Rear muffler	Inner hex screw M8*52	25N•m (Loctite®243)
Small sprocket guard	Assembly stepped screws M5	5N•m (Loctite®243)
Shift connecting rod and shift connecting seat	GB70.2 M6*16	6N•m (Loctite®243)
Front LH&RH bumper assembly	Bolt M8*20	25N•m (Loctite®243)
Bumper connecting tube welding assembly	Bolt M8*20	25N•m (Loctite®243)
Rear seat	Bolt M8*35	25N•m (Loctite®243)
Rear armrest deco cover plate	Assembly stepped screws M5	6N•m (Loctite®243)
Side box LH&RH bracket welding assembly	Screw M8	25N•m (Loctite®243)
Side box bracket connecting rod	Flange bolt M8	25N•m (Loctite®243)
Strut	Screw M8	30N•m (Loctite®243)
Front brake disc screw	Screw M8*25	25N•m (Loctite®243)
Rear brake disc screw	Screw M8	25N•m (Loctite®243)
Rear sprocket	Flower shaped semi- countersunk head screw M8*28	38N•m (Loctite®2701)

3.6 Lubrication Requirements

The control cable, bearing and rotating parts shall be lubricated according to the following table.

Parts	Notes	Type
Side bracket rotating part Column bearing Rear fork needle roller bearing Front wheel LH/RH oil seal Rear brake pedal rotating part Rear wheel RH oil seal Sprocket seat oil seal Cable Windshield bracket rotating part Front footrest rotating part Rear footrest rotating part Shift lever rotating part	Lubrication	Lithium grease GB/T5671

3.7 Engine Consumption Materials&Assembling Materials

Item	Specification	Using parts	Remark
Lubricant oil/oil	SAE10W-50 SJ, JASOMA2	Rotation and moving section in cylinder, crankcase and cylinder head.	Oil Capacity: 2800mL
Lubricant oil with molybdenum		Piston pin, valve stem, valve oil seal, camshaft	
Lubricant grease/grease	#3 MoS2 lithium grease	Oil seal, o-ring and rubber seal face, bearing with sealant	
Coolant	-35°C anti-rust and anti-freeze fluid with high boiling point	Cooling system, water seal installation	Capacity depends on radiator water pipes
Flange sealant		Crankcase faying face , crankcase and cylinder joint cylinder head and cylinder head cover joint	
Tread locker		Parts of thread	

4.1 Seat Removal..... 4-2

4.2 Seat Installation 4-2

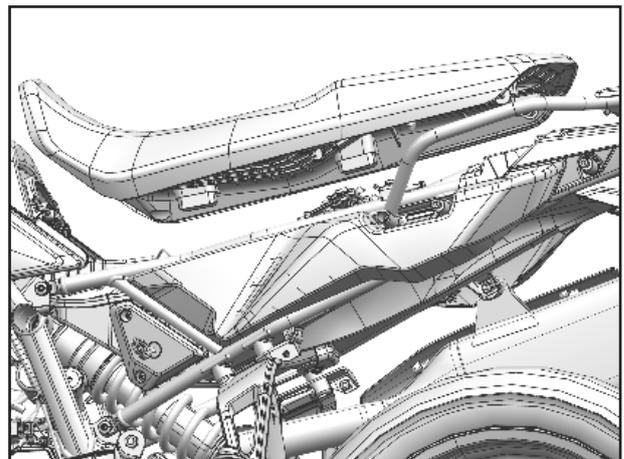
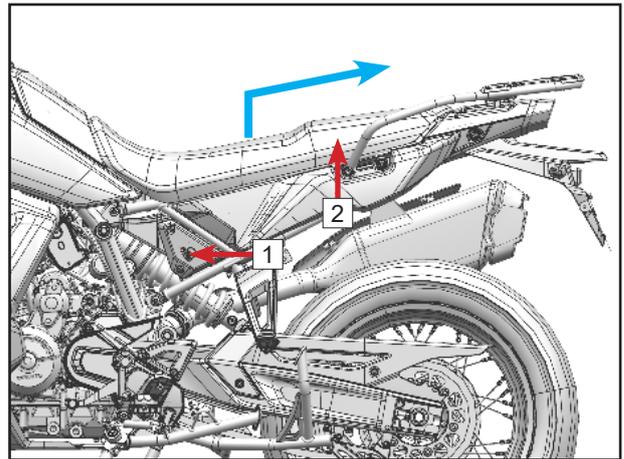
4.1 Seat Removal

Place the vehicle on the level surface and park.

Insert the key **1** into the seat lock, turn the key clockwise and release the seat.

Lift the front part of rear seat **2**.

Remove the seat from synclinal rear.



4.2 Seat Installation

Reverse the removal procedures for installation.

05 Body Covering Parts

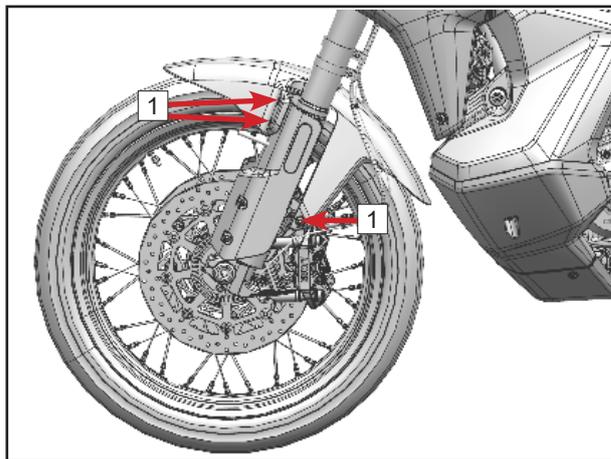
5.1 Front Fender Assembly	5-2
5.1.1 Front Fender Deco Plate.....	5-3
5.2 Handle Guard	5-3
5.3 Front Fender	5-4
5.4 Upper Panel of Battery Housing	5-4
5.5 Fuel Tank LH Panel Assembly	5-5
5.6 LH Fuel Tank Panel Mounting Bracket	5-6
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5.14 LH Side Lock Cover.....	5-13
5.15 Small Sprocket Guard	5-13
5.16 Fuel Tank LH Lower Panel.....	5-13
5.17 Fuel Tank RH Lower Panel.....	5-14
5.18 Engine Lower Panel	5-14

5.1 Front Fender Assembly

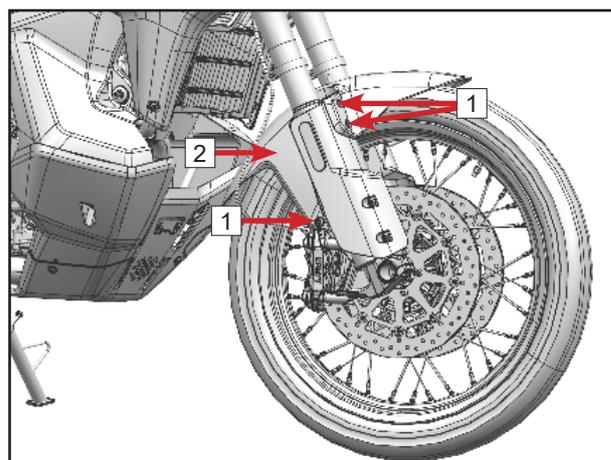
Low Fender

Removal

Remove three bolts **1** on both sides.



Remove front fender **2**.



Installation

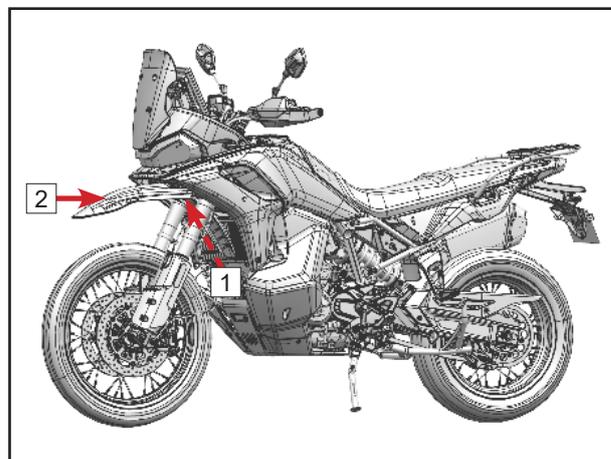
Reverse the removal procedures for installation.

Fender

Removal

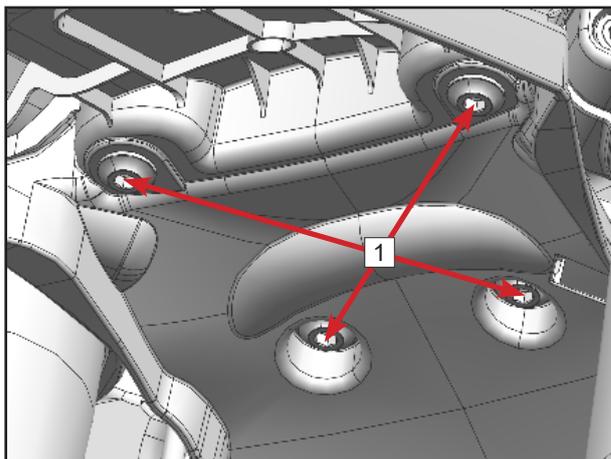
Remove four bolts **1**.

Remove front fender **2**.



Installation

Reverse the removal procedures for installation.



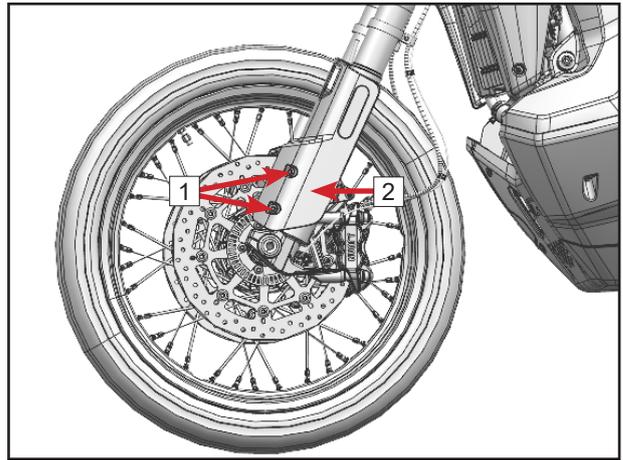
05 Body Covering Parts

5.1.1 Front Fender Deco Plate

Removal

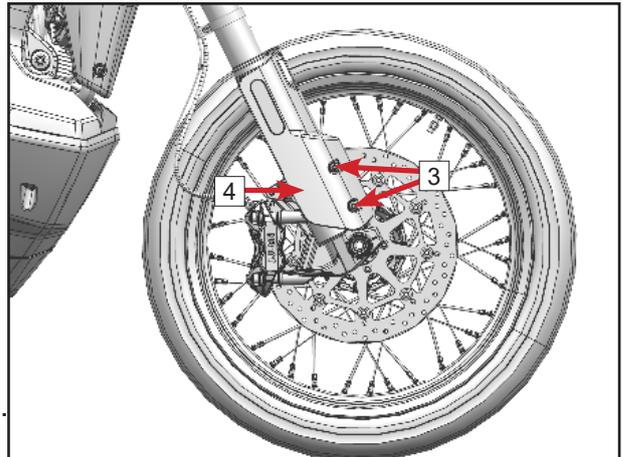
Remove two screws [1].

Remove front fender LH deco plate [2].



Remove two screws [3].

Remove front fender RH deco plate [4].



Installation

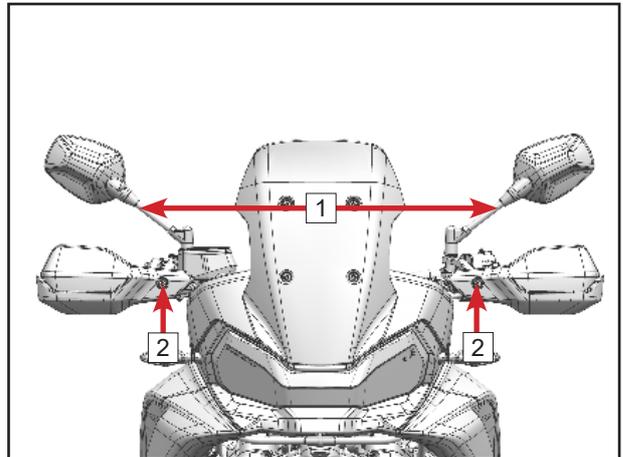
Reverse the removal procedures for installation.

5.2 Handle Guard

Removal

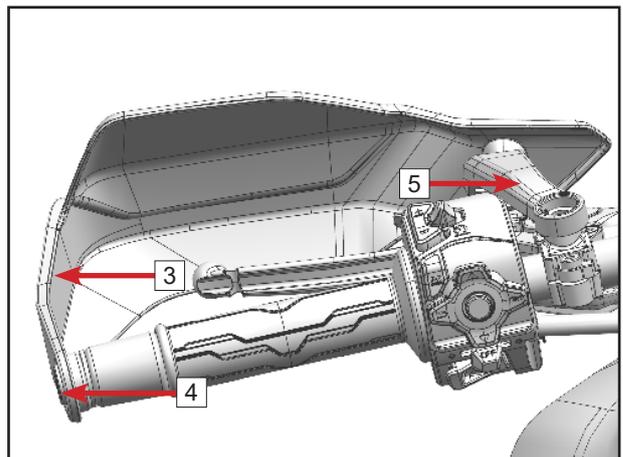
Rotate to remove two rear view mirrors [1].

Remove two stepped screws [2].

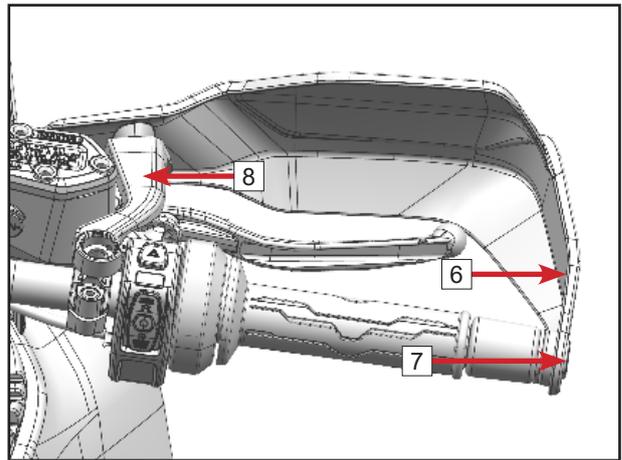


Remove stepped screw [4].

Remove LH hand guard [3] and [5] assembly.



Remove stepped screw [7].
Remove RH hand guard [6] and [8] assembly.



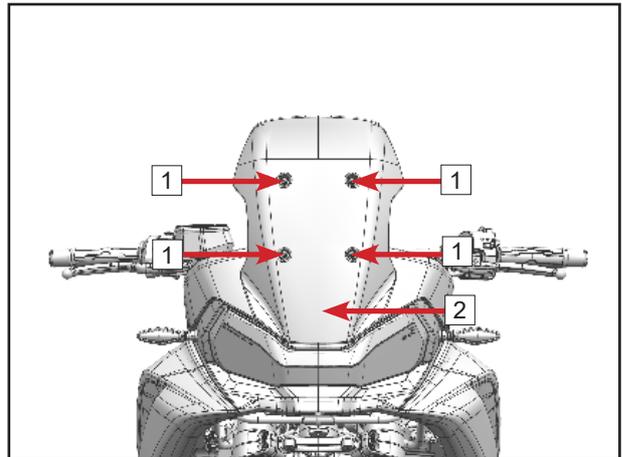
Installation

Reverse the removal procedures for installation.

5.3 Front Fender

Removal

Remove four inner hex stepped screws [1].
Remove front fender [2].



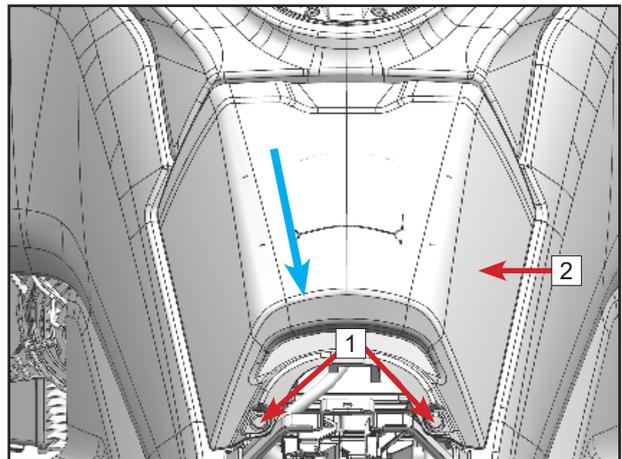
Installation

Reverse the removal procedures for installation.

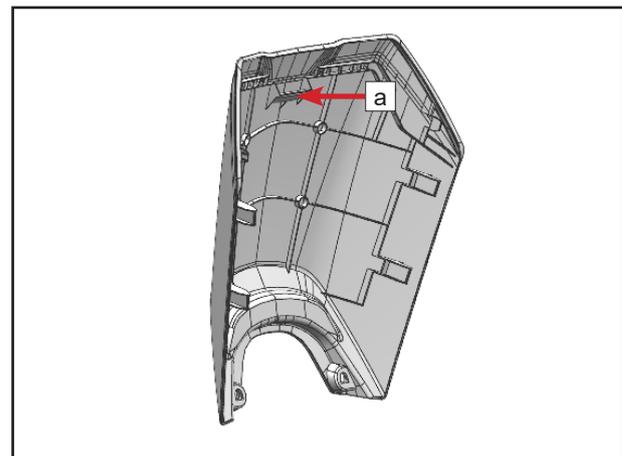
5.4 Upper Panel of Battery Housing

Removal

Remove plastic clip assembly [1].
Remove the upper panel of battery housing [2] in the direction shown.



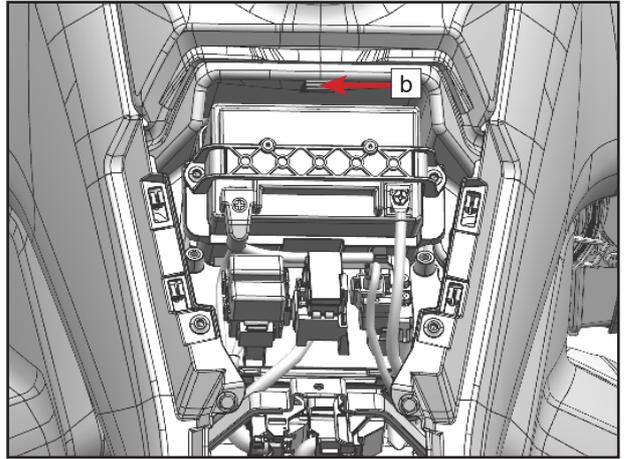
Prevent the buckle [a] from breaking during disassembly.



05 Body Covering Parts

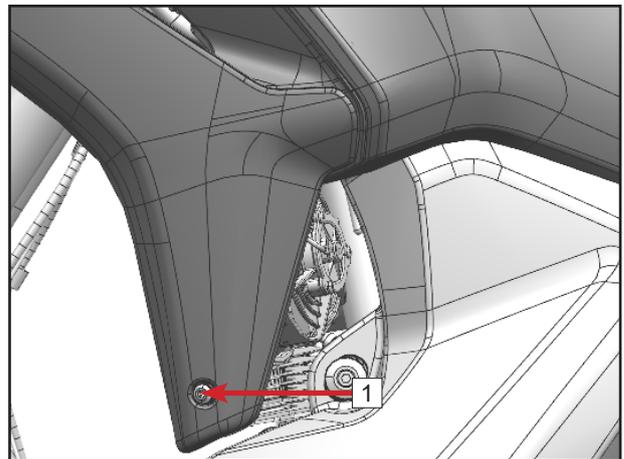
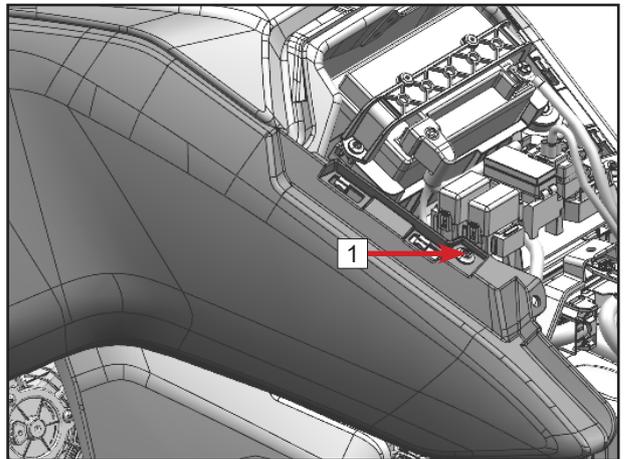
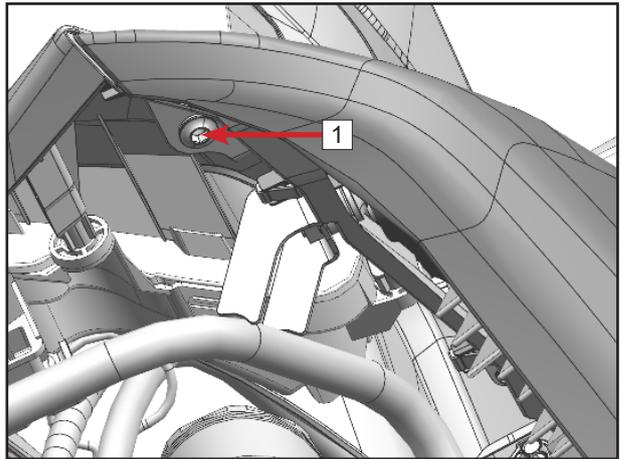
Installation

Reverse the removal procedures for installation. Clip the buckle **a** into **b** when installation.



5.5 Fuel Tank LH Panel Assembly Removal

Remove three screws **1**.



Remove LH panel assembly **2**.

Installation

Reverse the removal procedures for installation.

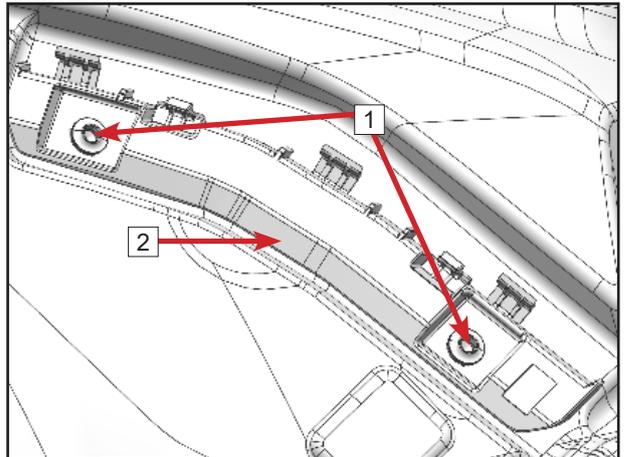
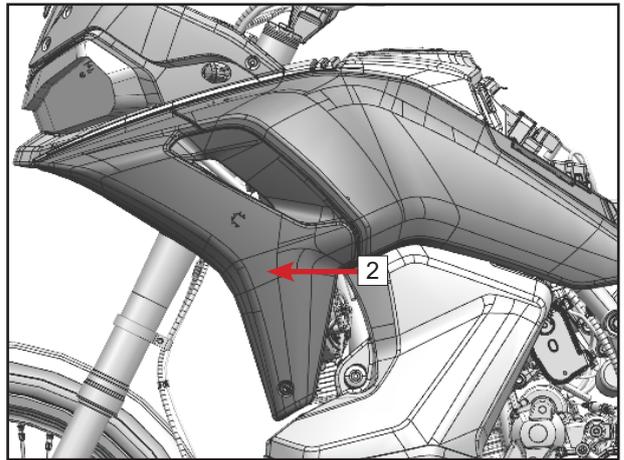
The method of removing and assembling the RH panel assembly of fuel tank is the same as that of removing and assembling the RH panel assembly of fuel tank.

5.6 LH Fuel Tank Panel Mounting Bracket

Removal

Remove two screws **1**.

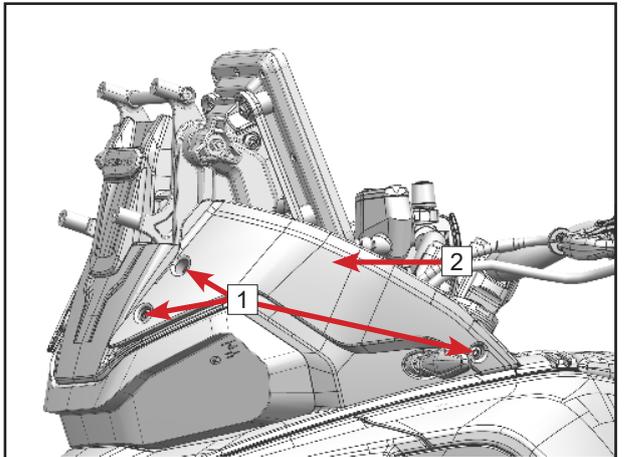
Remove LH fuel tank panel mounting bracket **2**.



Installation

Reverse the removal procedures for installation.

The method of removing and assembling the RH fuel tank panel mounting bracket is the same as that of removing and assembling the LH fuel tank panel mounting bracket .



5.7 Headlight

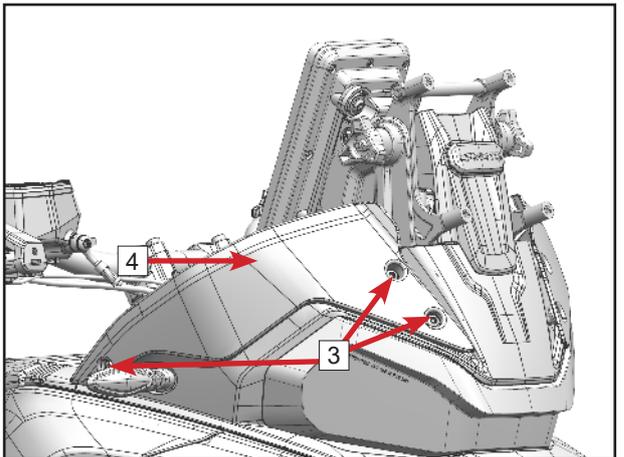
Removal

Remove three screws **1**.

Remove LH deflector **2**.

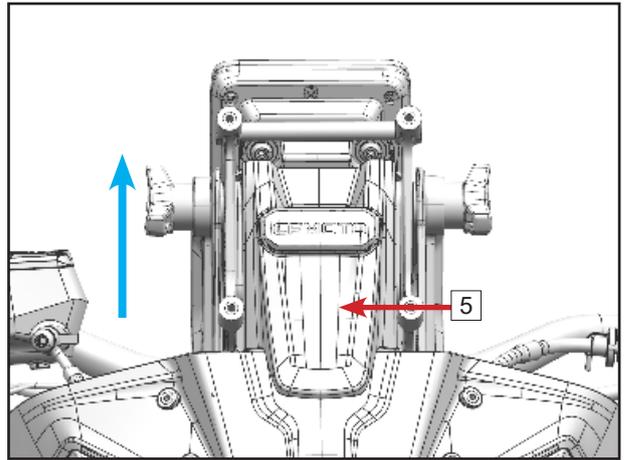
Remove three screws **3**.

Remove RH deflector **4**.

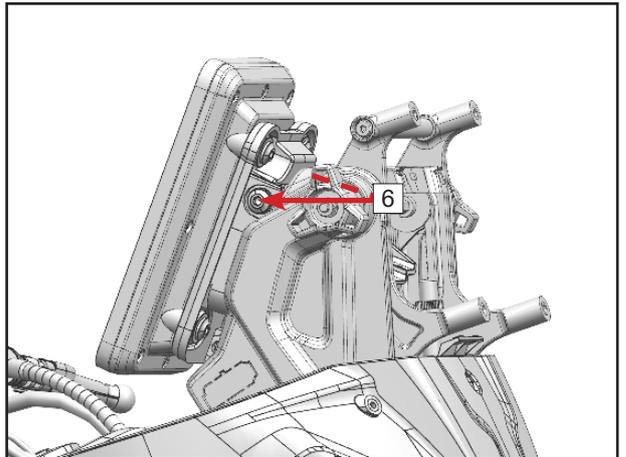


05 Body Covering Parts

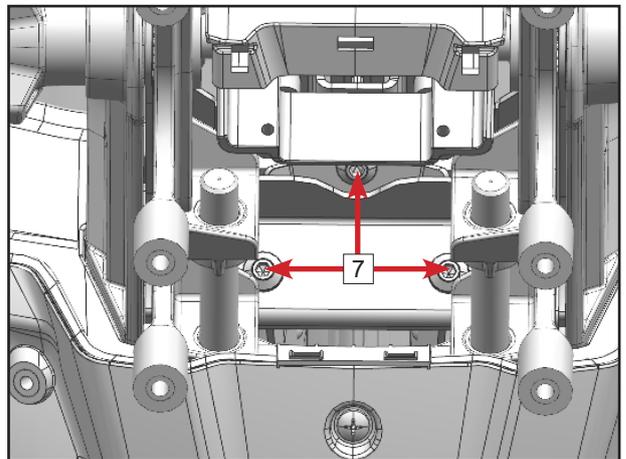
Remove dashboard front guard [5].



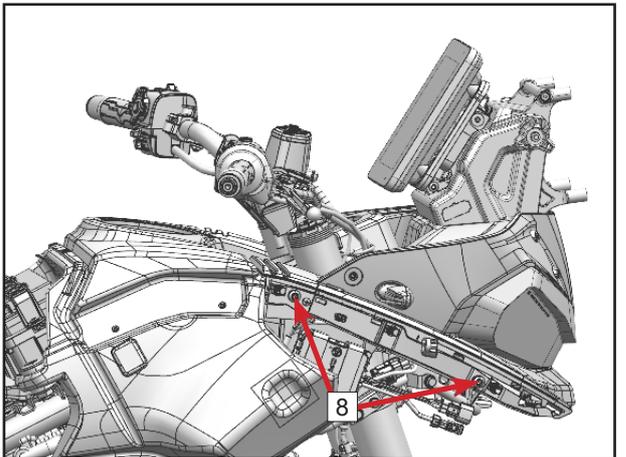
Remove two screws [6].



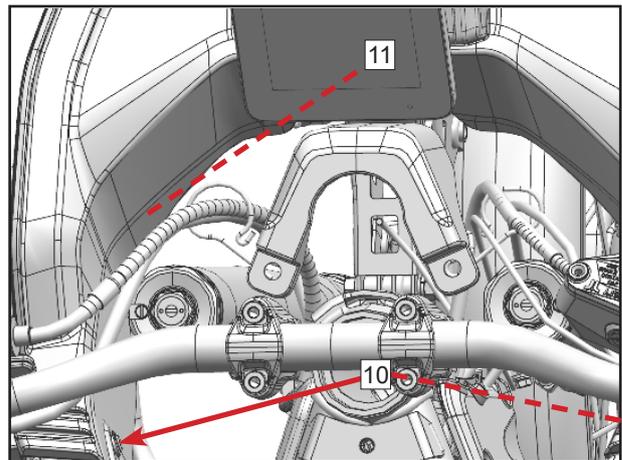
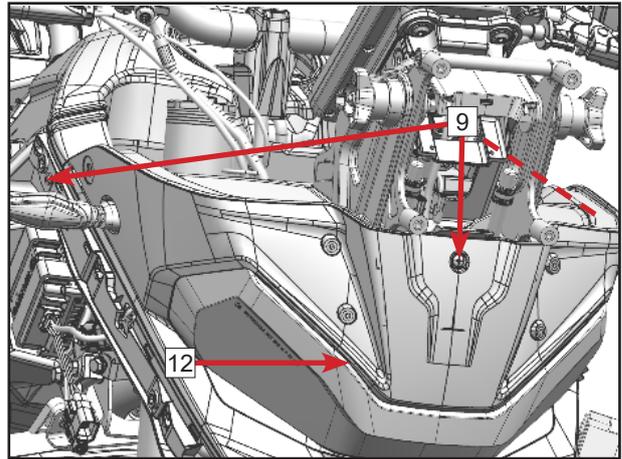
Remove three screws [7].



Remove two screws [8] on each side.



- Remove three self-tapping screws **9**.
- Remove two expansion screws **10**.
- Remove one screw **11**.
- Remove headlight **12**.



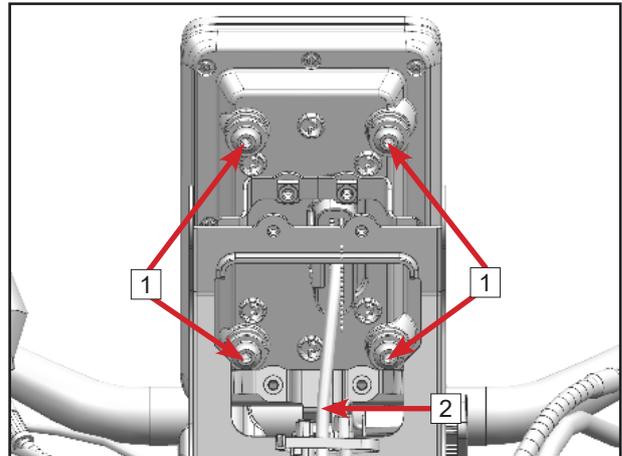
Installation

Reverse the removal procedures for installation.

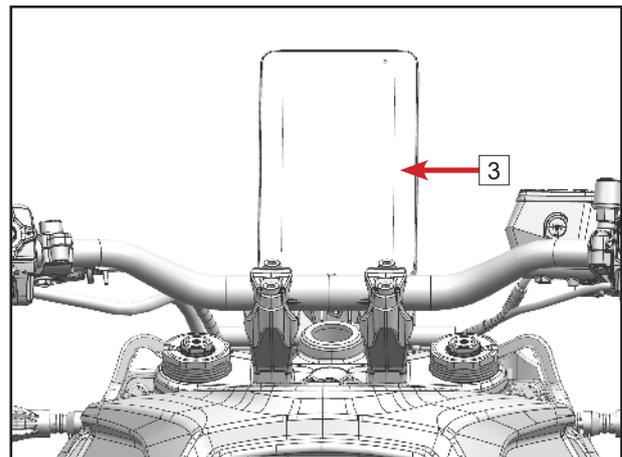
5.8 Dashboard

Removal

- Remove four screws **1**.
- Disconnect main cable **2**.



- Remove dashboard **3**.



Installation

Reverse the removal procedures for installation.

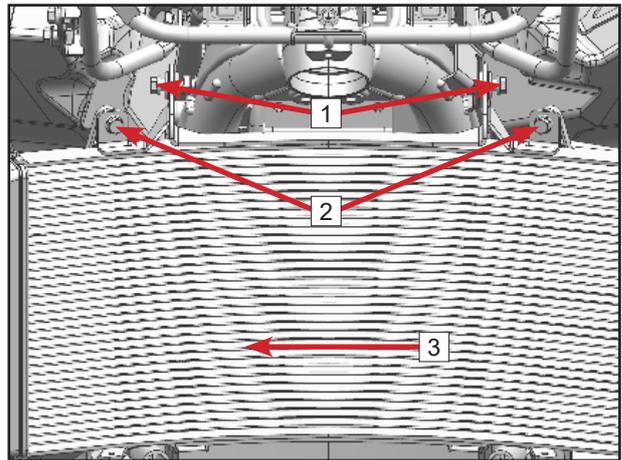
5.9 Radiator Front Panel

Removal

- Remove two bolts **1**.
- Remove two bolts **2**.
- Remove radiator front panel **3**.

Installation

Reverse the removal procedures for installation.



5.10 Rear Armrest

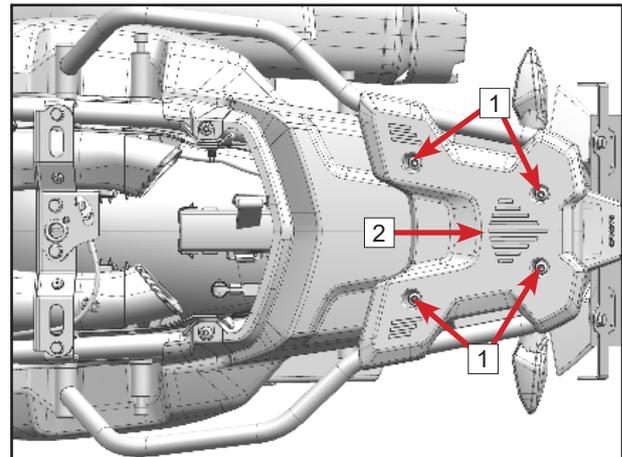
5.10.1 Rear Armrest Cover

Removal

- Remove four screws **1**.
- Remove rear armrest cover **2**.

Installation

Reverse the removal procedures for installation.



5.10.2 Rear Armrest Assembly

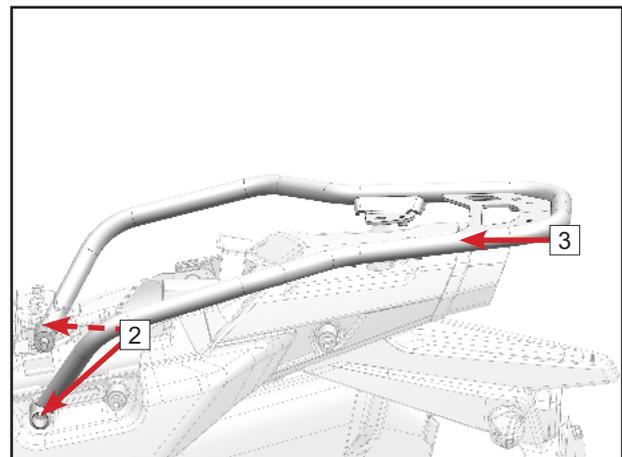
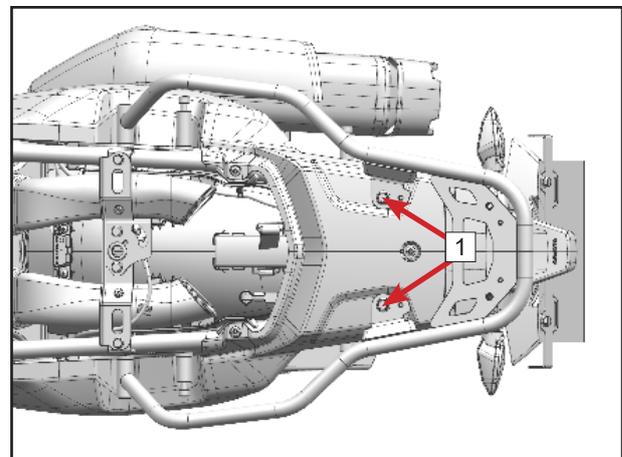
Removal

- Remove two bolts **1**.

- Remove two screws **2**.
- Remove rear armrest assembly **3**.

Installation

Reverse the removal procedures for installation.



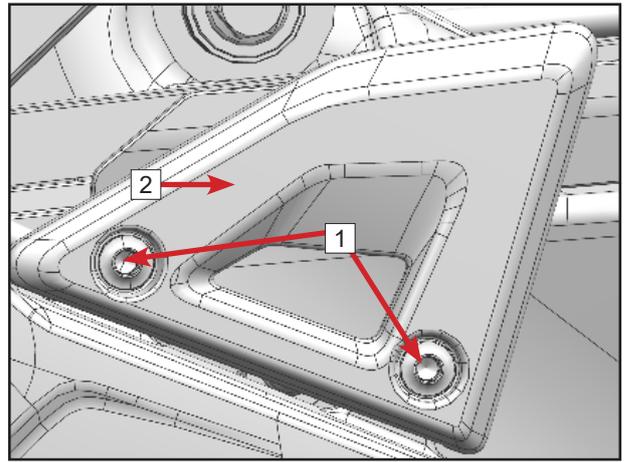
5.11 Footrest

5.11.1 LH Footrest Deco Guard Removal

Remove two screws **1**.
Remove LH footrest deco guard **2**.

Installation

Reverse the removal procedures for installation.

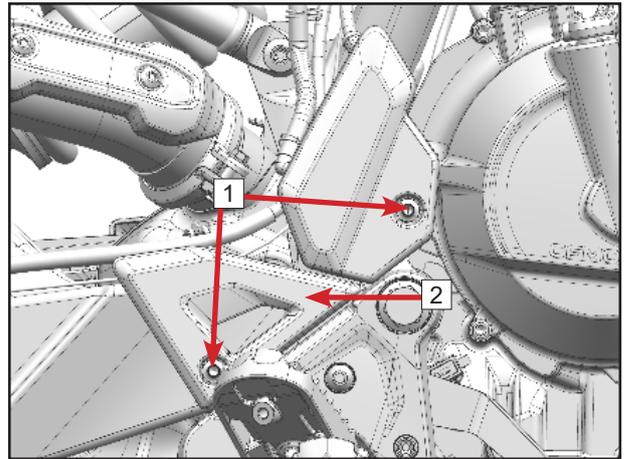


5.11.2 RH Footrest Deco Guard Removal

Remove two screws **1**.
Remove RH footrest deco guard **2**.

Installation

Reverse the removal procedures for installation.

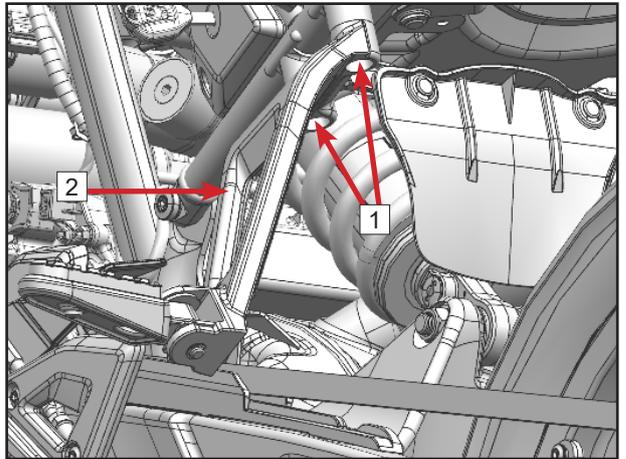


5.11.3 LH Pedal Removal

Remove two screws **1**.
Remove LH pedal **2**.

Installation

Reverse the removal procedures for installation.



5.11.4 RH Pedal Pre-work

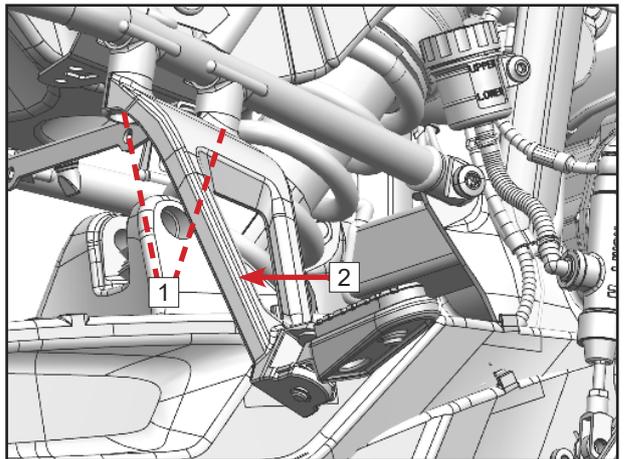
Remove the muffler. (see chapter 10)

Removal

Remove two screws **1**.
Remove RH pedal **2**.

Installation

Reverse the removal procedures for installation.



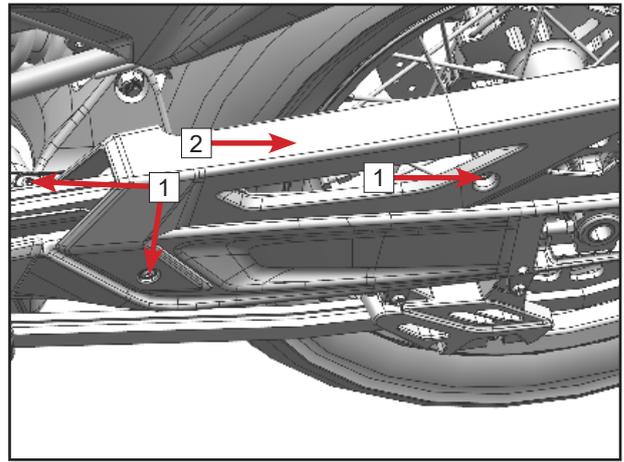
5.12 Chain Guard

Removal

Remove three bolts [1].
Remove chain guard [2].

Installation

Reverse the removal procedures for installation.



5.13 Rear Panel

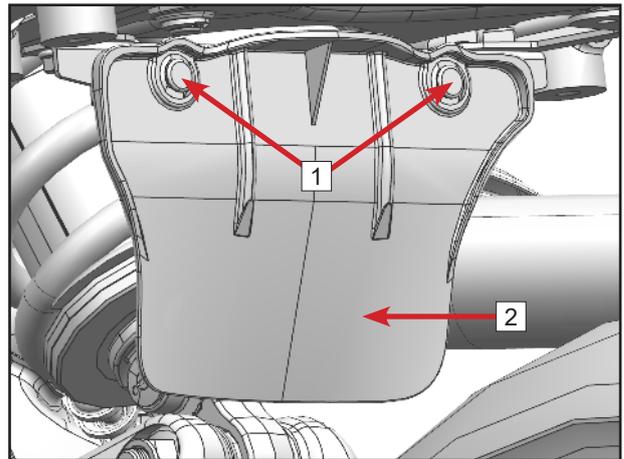
5.13.1 Rear Shock Absorber Fender

Removal

Remove two plastic clip assembly [1].
Remove rear shock absorber fender [2].

Installation

Reverse the removal procedures for installation.



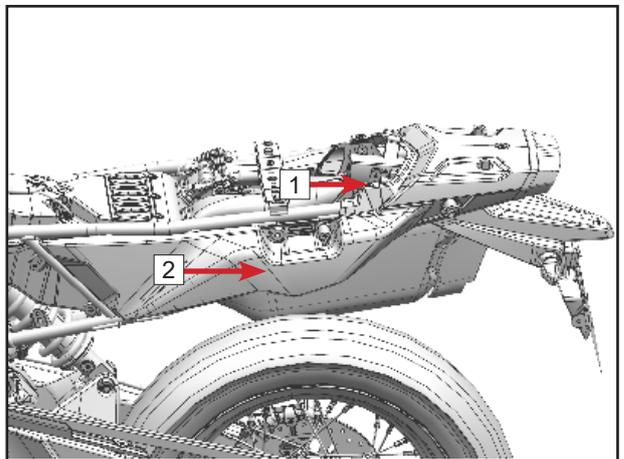
5.13.2 Tail Light LH Panel

Removal

Remove screw [1].
Remove tail light LH panel [2].

Installation

Reverse the removal procedures for installation.



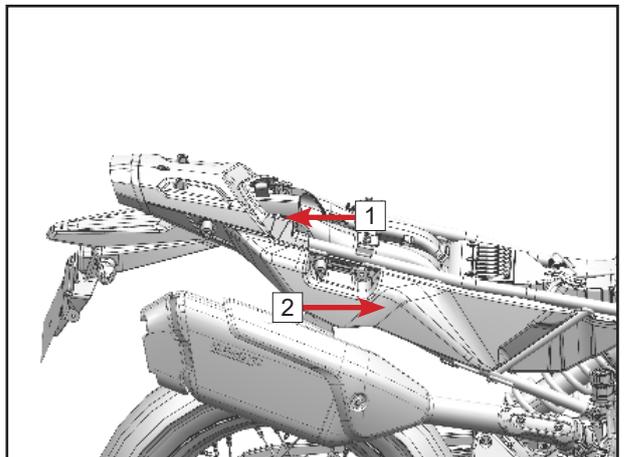
5.13.3 Tail Light RH Panel

Removal

Remove screw [1].
Remove tail light RH panel [2].

Installation

Reverse the removal procedures for installation.



5.13.4 Tail Light Upper Guard

Removal

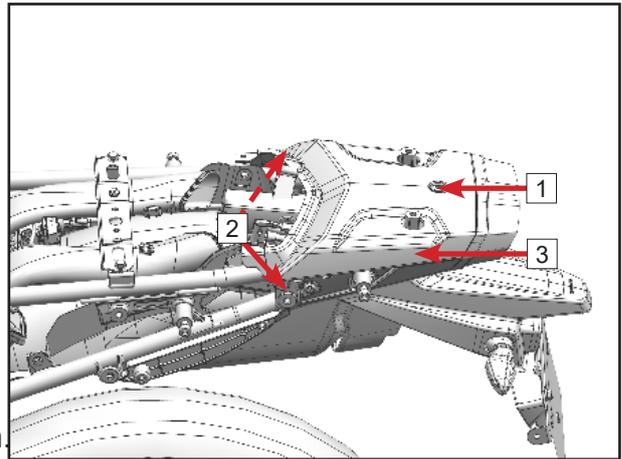
Remove stepped screw [1].

Remove two self-tapping screws [2].

Remove tail light upper guard [3].

Installation

Reverse the removal procedures for installation.



5.13.5 Rear Fender Assembly

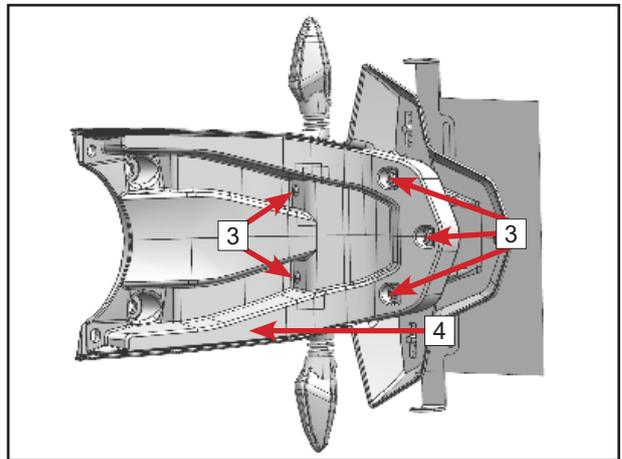
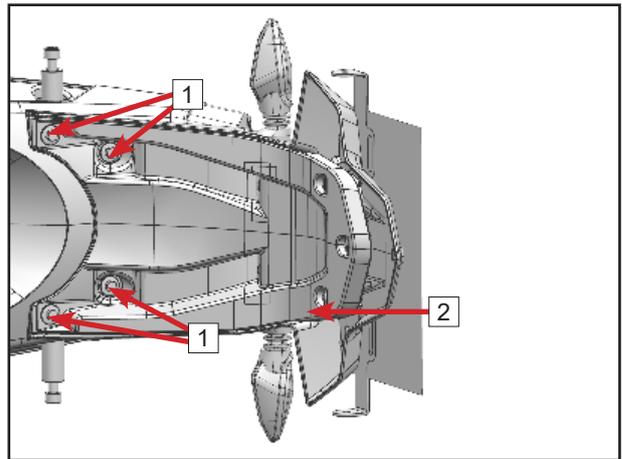
Removal

Remove Rear Fender Assembly [1].

Remove rear fender assembly [2].

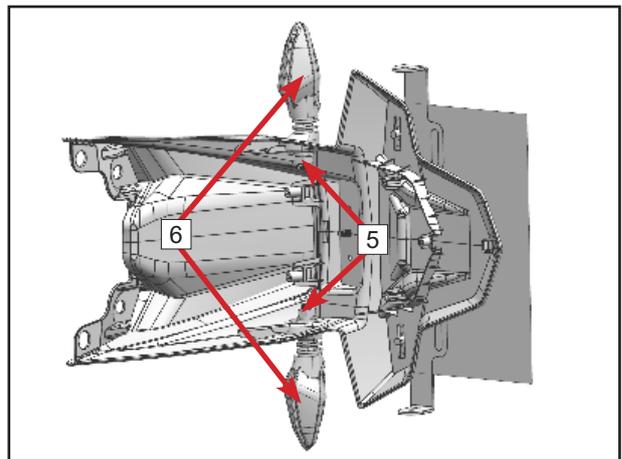
Remove five screws [3].

Remove plastic part [4].



Remove two bolts [5].

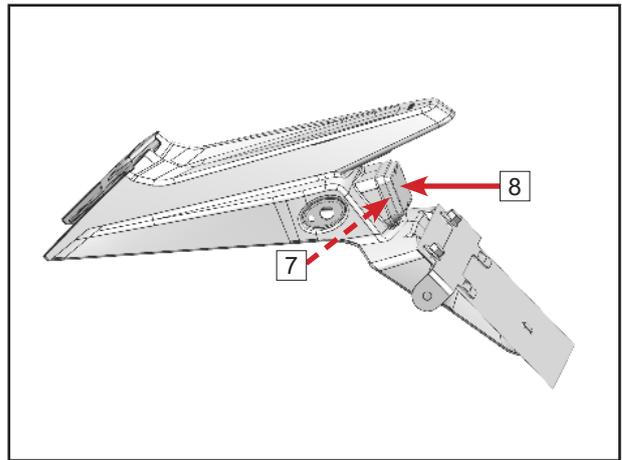
Remove turn lights [6].



Remove bolt [7].
Remove the rear reflector [8].

Installation

Reverse the removal procedures for installation.

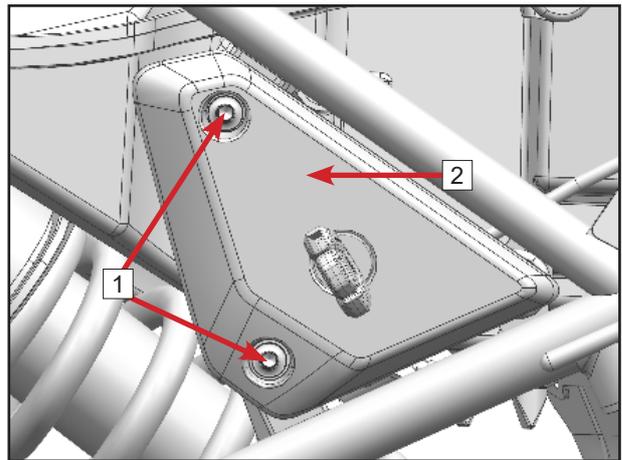


5.14 LH Side Lock Cover Removal

Remove two screws [1].
Remove LH side lock cover [2].

Installation

Reverse the removal procedures for installation.

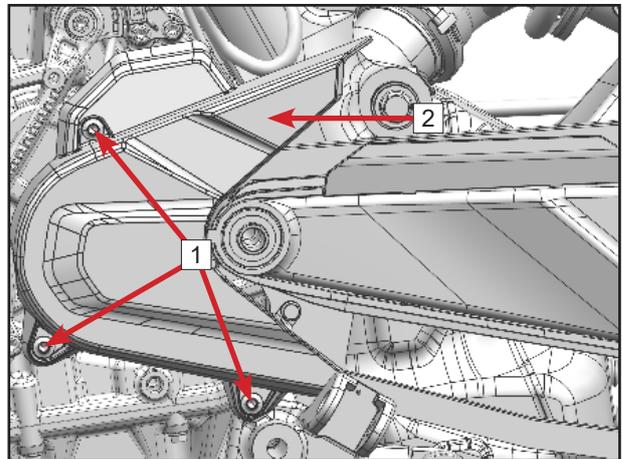


5.15 Small Sprocket Guard Removal

Remove three screws [1].
Remove small sprocket guard [2].

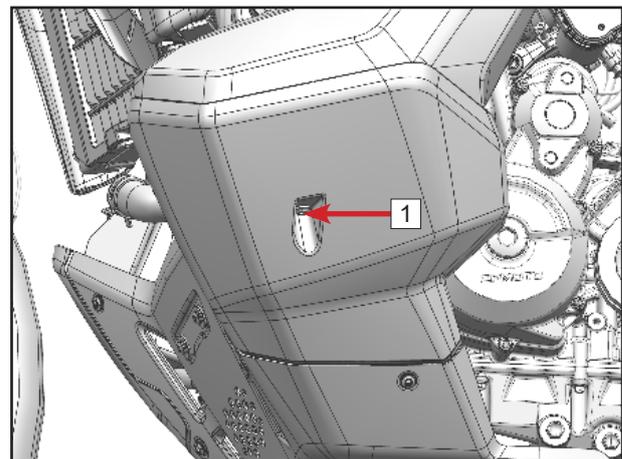
Installation

Reverse the removal procedures for installation.



5.16 Fuel Tank LH Lower Panel Removal

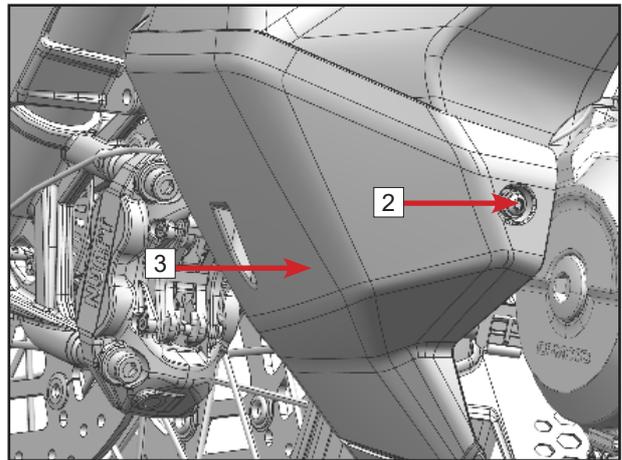
Remove one inner hex screw [1].



Remove one inner hex screw **2**.
Remove fuel tank LH lower panel **3**.

Installation

Reverse the removal procedures for installation.

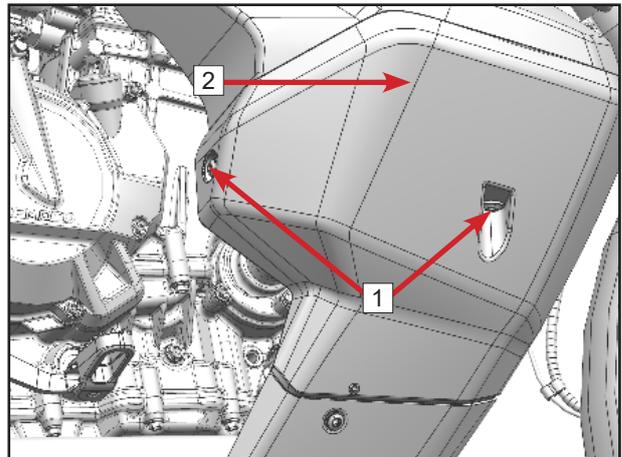


5.17 Fuel Tank RH Lower Panel Removal

Remove two inner hex screws **1**.
Remove fuel tank RH lower panel **2**.

Installation

Reverse the removal procedures for installation.

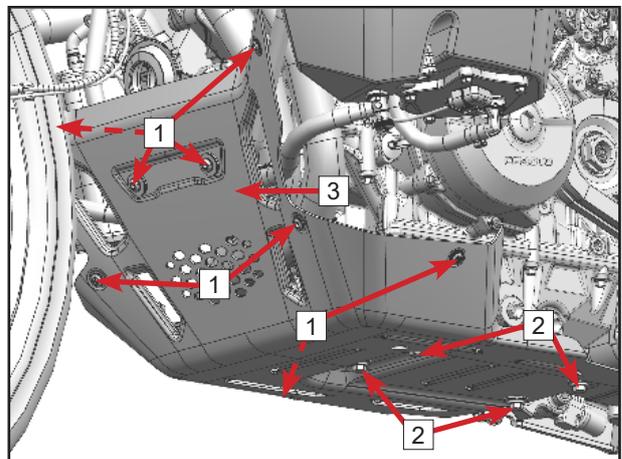


5.18 Engine Lower Panel Removal

Remove eight screws **1**.
Remove four nuts **2**.
Remove engine lower panel **3**.

Installation

Reverse the removal procedures for installation.



6.1 Fuel System	6-3
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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 400kPa) 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.

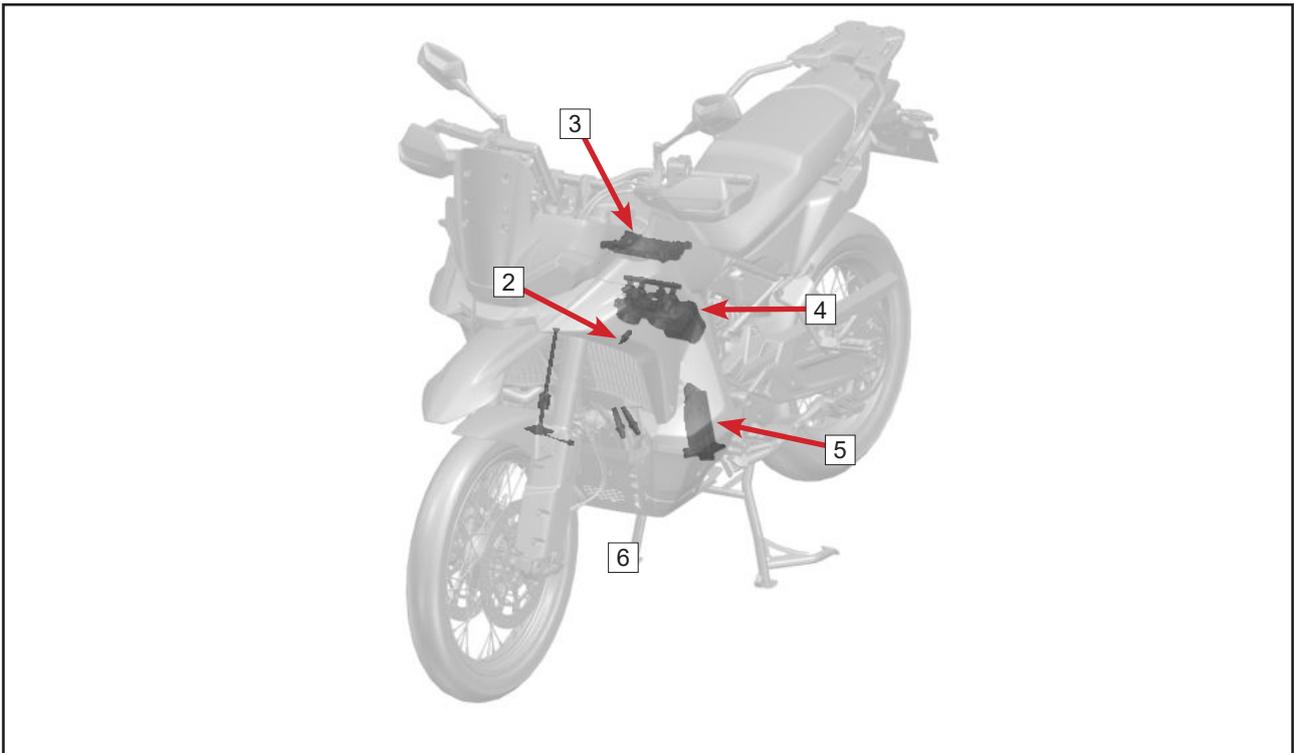
Battery positive/negative wires and electrical control units have to be removed before welding on the vehicle.

It is forbidden to puncture the wire to test the input/output electrical signals.

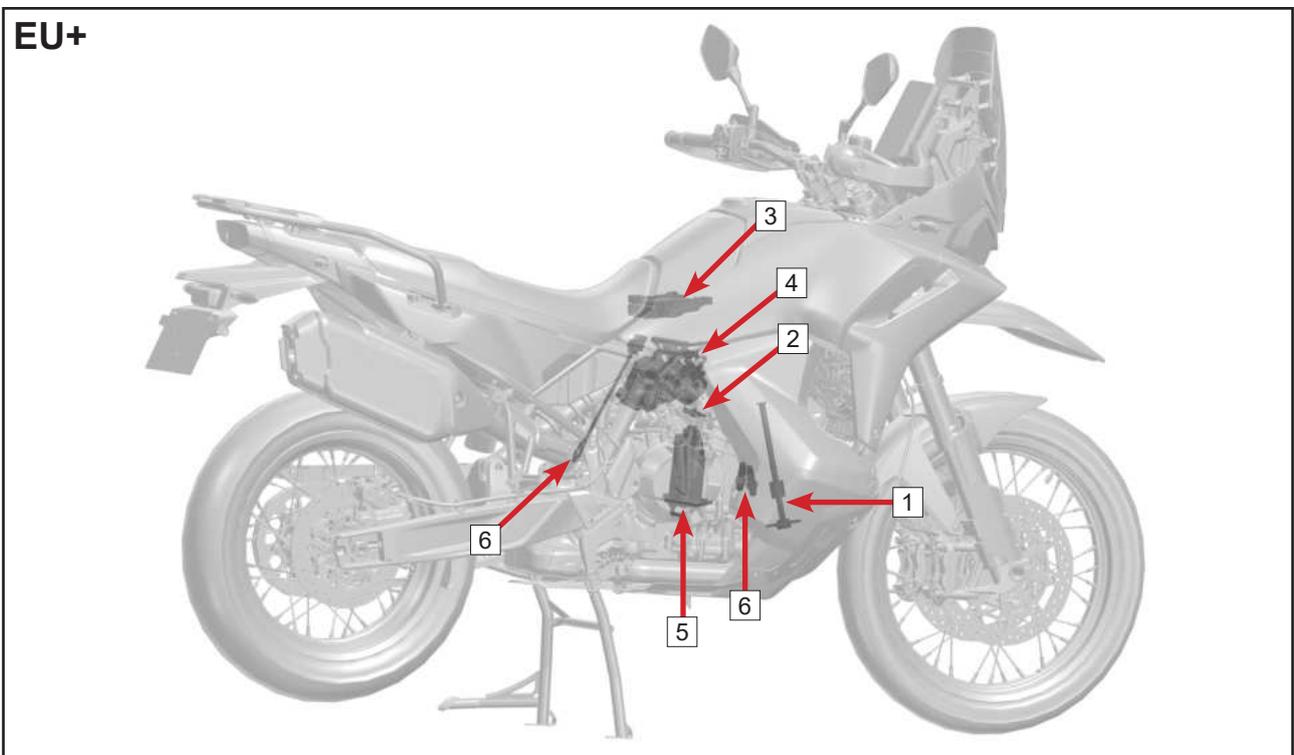
Establish the awareness of environmental protection and effective disposal of waste generated during maintenance.

6.1 Fuel System

6.2 Fuel System Location



1	Fuel Level Sensor	2	Water Temperature Sensor	3	ECU
4	Throttle Body Assembly	5	Fuel Pump	6	Oxygen Sensor



1	Fuel Level Sensor	2	Water Temperature Sensor	3	ECU
4	Throttle Body Assembly	5	Fuel Pump	6	Oxygen Sensor

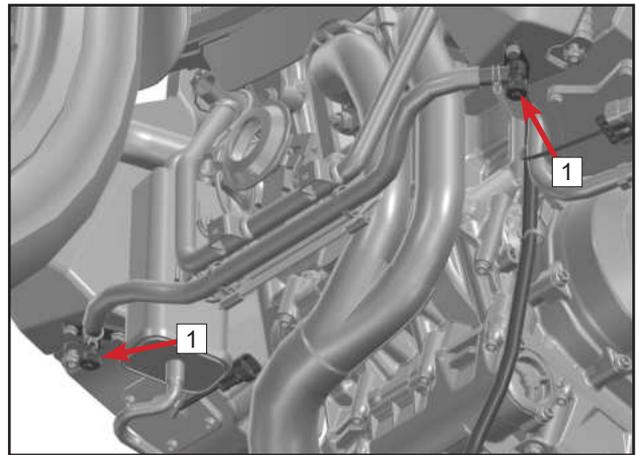
6.3 Fuel Tank

Removal

Remove T-BOX.

Remove ECU.

Turn off the fuel valve **1**.



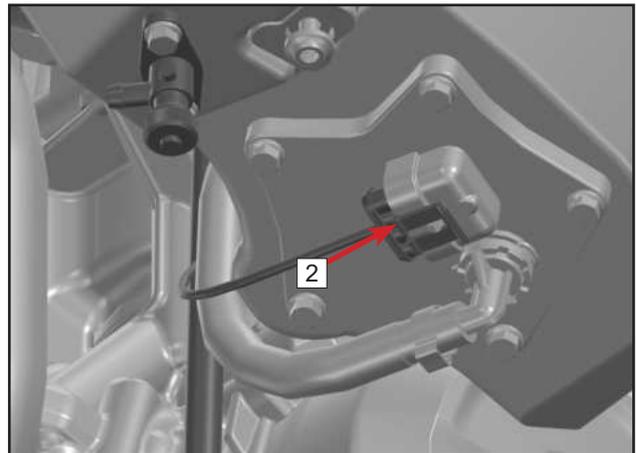
Tip: The following steps are for fuel line pressure relief.

Remove the fuel pump connector **2**.

Unlock the vehicle and press the ignition switch.

Start the vehicle and idle the engine to stop.

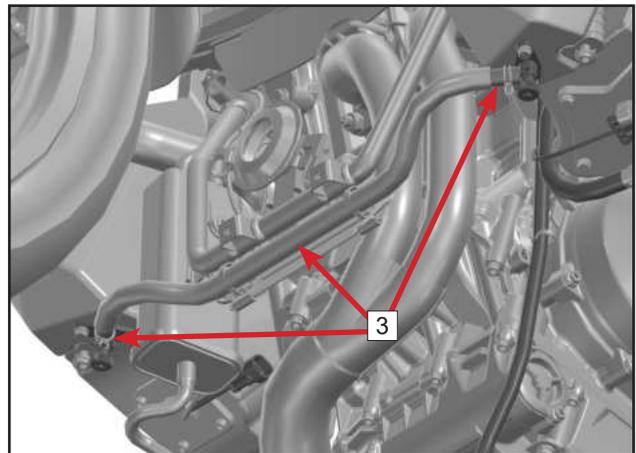
Turn off the vehicle power and disconnect the positive and negative terminals of battery.



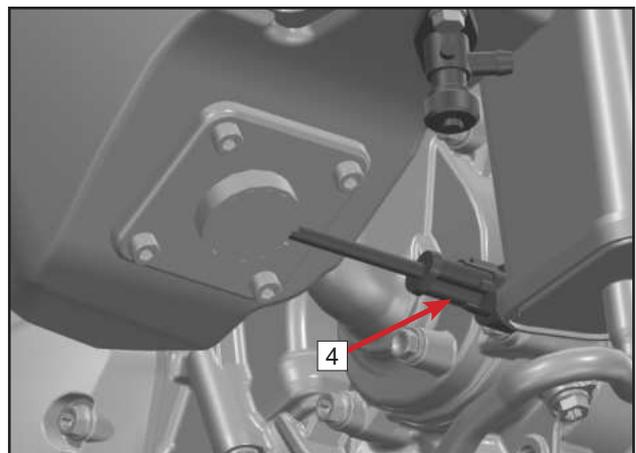
⚠ CAUTION

Before disassembly, please relieve the fuel pressure. Prevent a large amount of fuel overflow when disassembling the tubing, resulting in safety hazards.

Disconnect fuel tank connecting pipe assembly **3**.

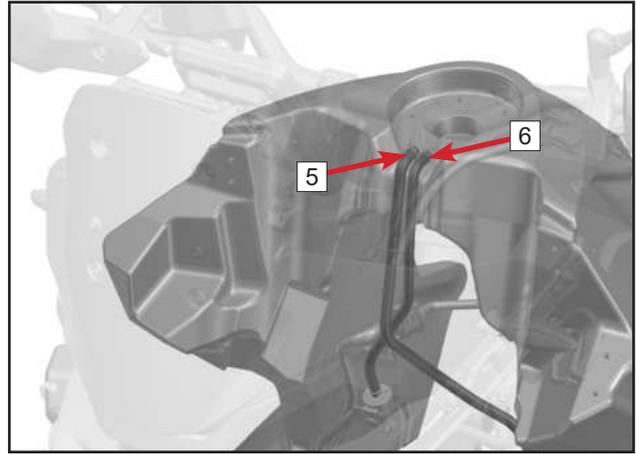


Disconnect fuel level sensor connector **4**.

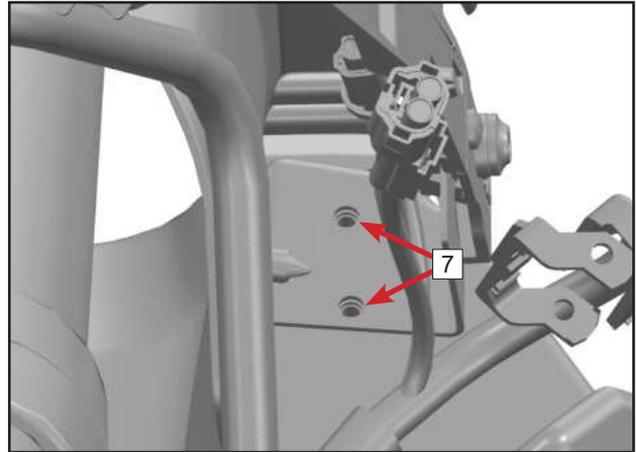


06 Fuel System

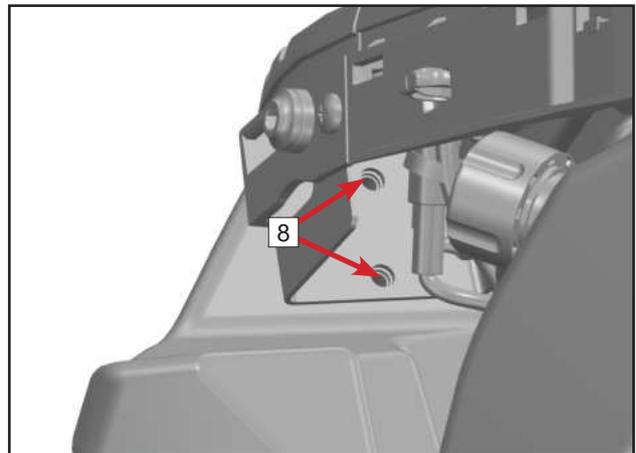
Disconnect the overflow pipe [5].
Disconnect the fuel evaporator line [6].



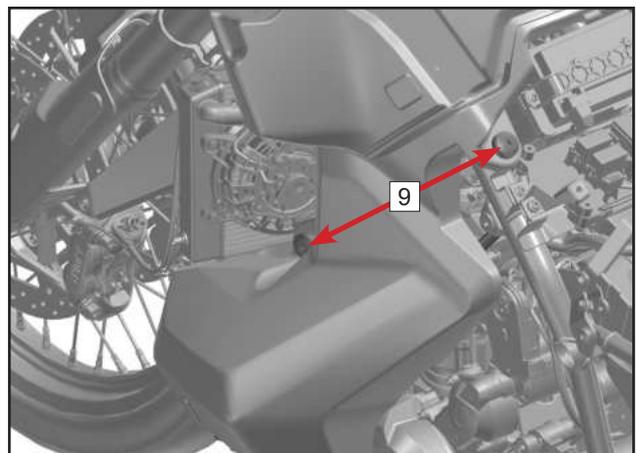
Remove bolts [7].



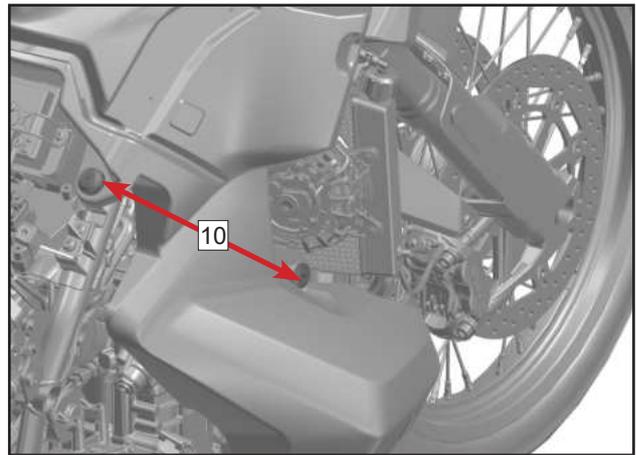
Remove bolts [8].



Remove bolt bushing assembly [9].



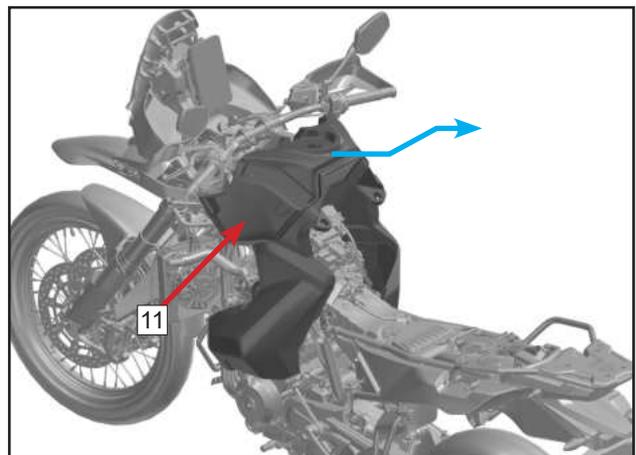
Remove bolt bushing assembly 10.



Lift the fuel tank backwards and upwards 11.

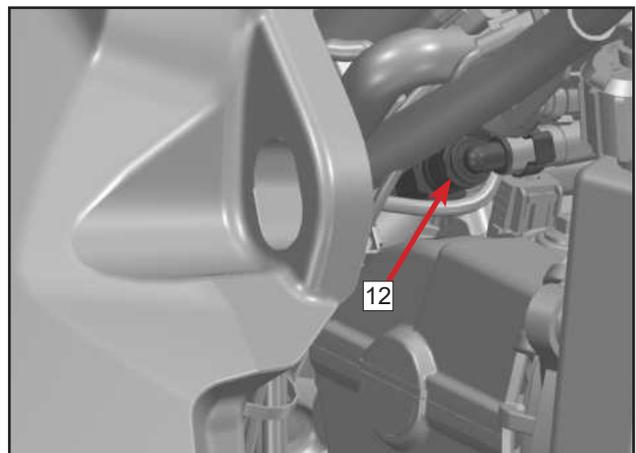
Disconnect the fuel line 12.

Remove fuel tank 11.



 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.

6.4 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.

Clean the bottom of fuel tank and fuel pump after removing all the connecting lines and joints under the fuel pump to prevent foreign matter from entering the 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 [4] 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.

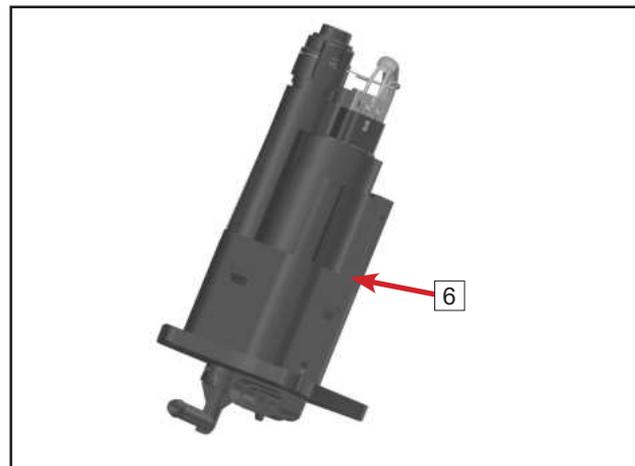
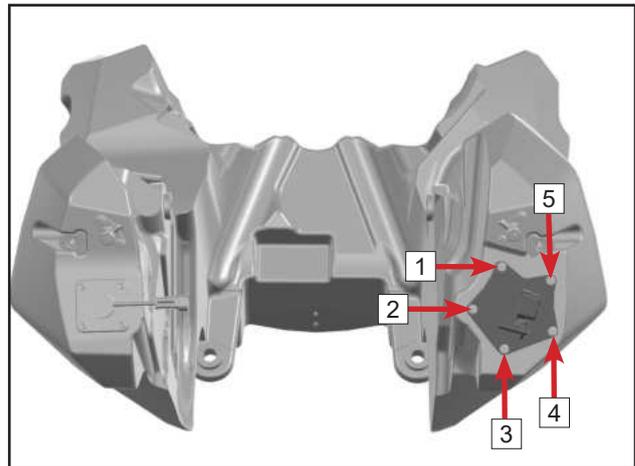
NOTE

The arrow on fuel pump aligns to fuel tank mark all the way.

Place the screw cap of fuel pump at the joint of fuel pump assembly and fuel tank assembly.

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.



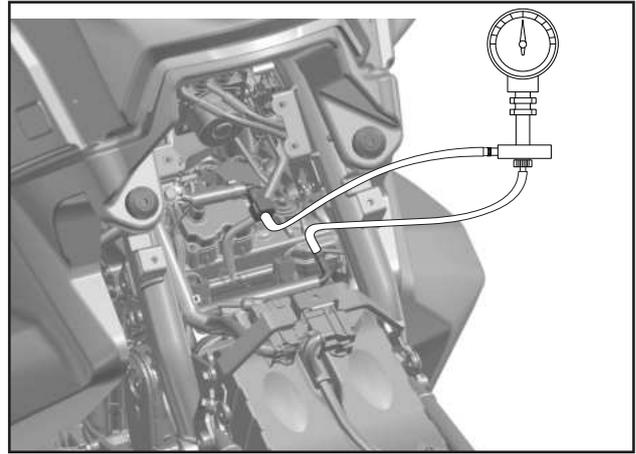
6.4.1 Fuel Pump Pressure Test

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 400kpa.

If the fuel pump is lower than 400kpa, the fuel pump assembly is damaged and replace it with a new one.



6.4.2 Fuel Level Sensor Detection

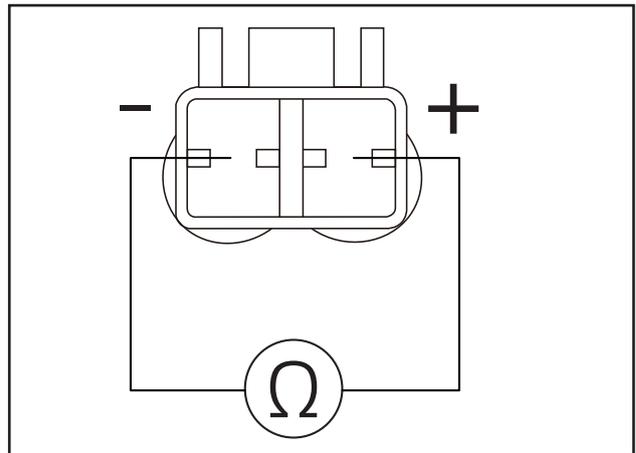
1.The detection method is shown in the figure.

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
5	10	± 1
4	130	± 2
3	212	± 3
2	294	± 3
1	376	± 4
0	458	± 5

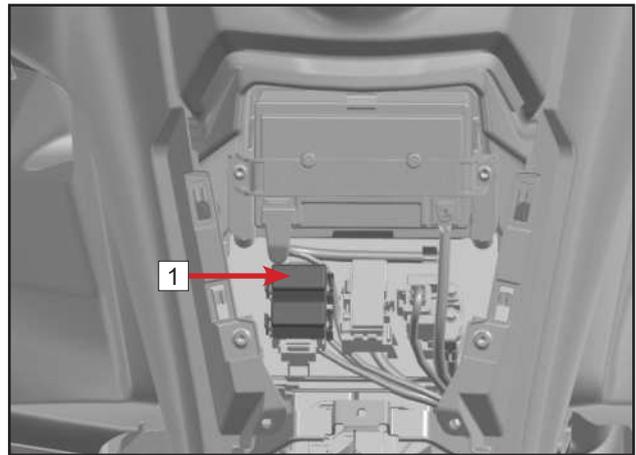
If the resistance value is not within the preceding range, the fuel level sensor is damaged. Replace it with a new one.



6.4.3 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.

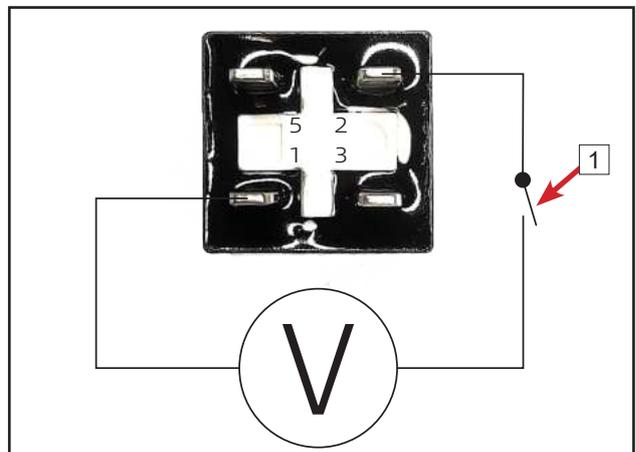
Installation

Reverse the removal procedures for installation.



6.4.3.1 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.



6.5 ECM

Removal

Remove the upper panel of battery case.
(see chapter 05).

Remove the vehicle power supply.

Remove the positive and negative terminals
of battery.

Remove main relay.

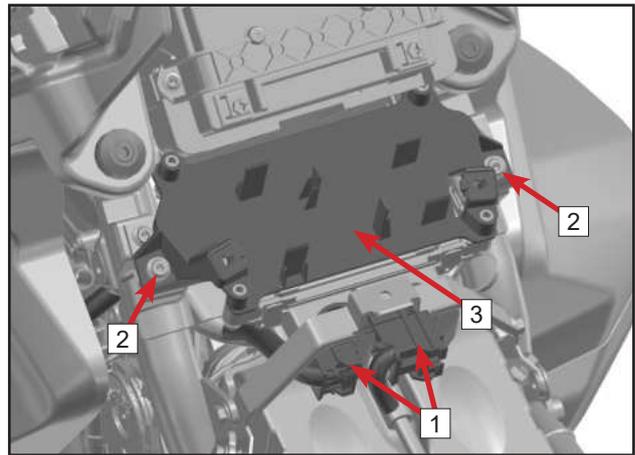
Remove fuse box.

Remove relay box.

Disconnect the connector **1**.

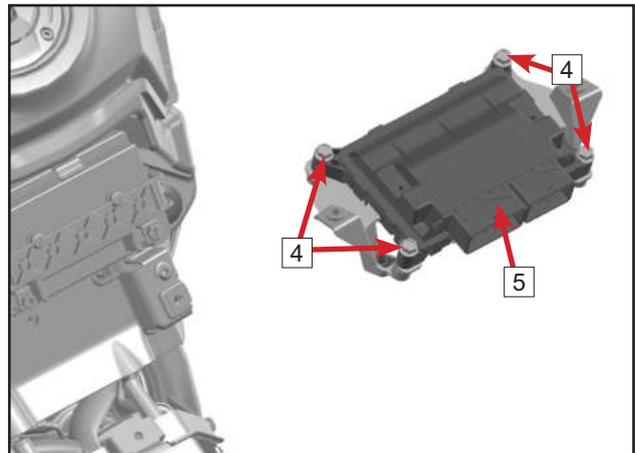
Remove bolts **2**.

Remove ECU retainer **3**.



Remove bolts **4**.

Remove ECU **5**.



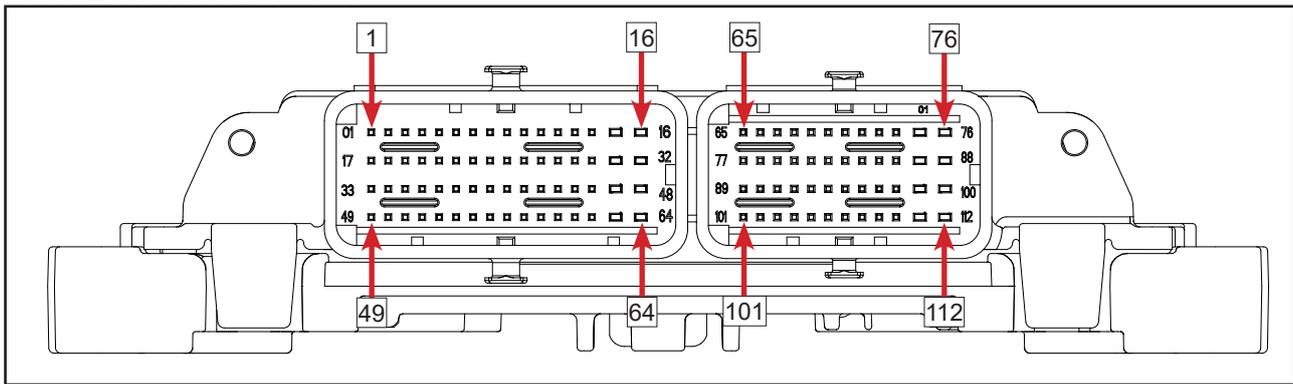
CAUTION

Before disassembly, power off the vehicle and disconnect the positive and negative terminals of battery. Prevent damage to ECM caused by thermal short circuit. After installing the ECM, wait five minutes before installing battery to prevent ECM self-learning faults.

Installation

Reverse the removal procedures for installation.

6.5.1 ECM Pin Function



Pin	Function	Pin	Function	Pin	Function
1	CAN H	38	/	75	Throttle actuator A
2	/	39	/	76	/
3	/	40	/	77	TPS 1
4	/	41	Fuel pump relay	78	TPS 2
5	Main relay	42	Headlight relay	79	Shift shaft sensor 2
6	/	43	Oxygen sensor 2 GND	80	Sensor 1 GND
7	Pedal 1 GND	44	Clutch switch	81	/
8	/	45	Accelerator pedal sensor 1	82	/
9	Cruise control	46	/	83	Sensor GND 6
10	/	47	Simulation GND	84	Sensor GND
11	/	48	Oxygen sensor heating 2	85	Manifold sensor GND
12	Air intake pressure sensor 2	49	/	87	Throttle actuator B
13	Rain mode switch	50	/	88	/
14	/	51	/	89	/
15	Non-sustained power 1	52	/	90	/
16	Non-sustained power 2	53	/	91	Air intake pressure sensor 1
17	CAN L	54	/	92	/
18	Diagnose K line	55	/	93	/
19	5V power	56	Fan control 1	94	Canister control valve
20	Sustained power	57	/	95	Null
21	Oxygen sensor 2	58	Starter motor control relay	96	Engine RPM sensor A
22	/	59	Pedal 2 GND	97	Engine RPM sensor B
23	Brake switch	60	/	98	/
24	/	61	/	99	Ignition coil 2
25	Brake light switch	62	/	100	Ignition coil 1
26	/	63	ECU GND 2	101	Engine temp. sensor
27	/	64	ECU GND 1	102	Air intake temp. sensor
28	/	65	/	103	Gear sensor signal
29	Side stand switch	66	/	104	Oxygen sensor 1

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30	Accelerator pedal sensor 2	67	/	105	/
31	/	68	Injector (cylinder 1)	106	/
32	/	69	/	107	TPS 5V power
33	/	70	/	108	5V Power
34	Engine RPM output	71	/	109	Intake manifold sensor
35	Ignition switch	72	Injector (cylinder 2)	110	/
36	Pedal 2 5V power	73	Oxygen sensor heating 1	111	ECU GND 4
37	Pedal 1 5V power	74	/	112	ECU GND 3

6.5.2 EFI Fault Code Table

No.	Code	Description
1	P0108	Manifold Abs.Pressure or Bar.Pressure High Input
2	P0107	Manifold Abs.Pressure or Bar.Pressure Low Input
3	P0113	Air Intake Temperature Sensor Circuit High
4	P0112	Air Intake Temperature Sensor Circuit Low
5	P0118	Engine Coolant Temp.Circ. High Input
6	P0117	Engine Coolant Temp.Circ. Low Input
7	P0688	Main Relay Output Circuit No Activity Detected
8	P0688	Main Relay Output Circuit Malfunction
9	P0650	MIL Control Circ. High Voltage
10	P0650	MIL Control Circ. Low Voltage
11	P0650	MIL Control Circ. Open
12	P0692	Fan Control Circ. High Voltage (Low Speed)
13	P0691	Fan Control Circ. Low Voltage (Low Speed)
14	P0480	Fan Control Circ. Open (Low Speed)
15	P0629	Fuel Pump "A" Control Circuit High
16	P0628	Fuel Pump "A" Control Circuit Low
17	P0627	Fuel Pump "A" Control Circuit /Open
18	P0459	Canister purge valve Circuit high
19	P0458	Canister purge valve Circuit low
20	P0444	Canister purge valve Circuit open
21	P0262	Cylinder 1- Injector Circuit High
22	P0261	Cylinder 1- Injector Circuit Low
23	P0201	Cylinder 1- Injector Circuit open
24	P0265	Cylinder 2- Injector Circuit High
25	P0264	Cylinder 2- Injector Circuit Low
26	P0202	Cylinder 2- Injector Circuit open
27	P0563	System Voltage High Voltage
28	P0562	System Voltage Low Voltage
29	P0560	System Voltage Malfunction
30	P0501	Speed Signal Malfunction
31	P2301	Cylinder 1- Ignition Coil Circuit High
32	P2307	Cylinder 3- Ignition Coil Circuit High
33	P2310	Cylinder 4- Ignition Coil Circuit High
34	P2304	Cylinder 2- Ignition Coil Circuit High
35	P2300	Cylinder 1- Ignition Coil Circuit Low
36	P2306	Cylinder 3- Ignition Coil Circuit Low
37	P2309	Cylinder 4- Ignition Coil Circuit Low
38	P2303	Cylinder 2- Ignition Coil Circuit Low
39	P0123	Throttle/Pedal Pos.Sensor Circ. High Input
40	P0122	Throttle/Pedal Pos.Sensor Circ. Low Input
41	P0223	E-TPS 2 Signal Circuir High
42	P0222	E-TPS 2 Signal Circuir Low
43	P2123	E-throttle Pedal Position Sensor 1 Circuit High
44	P2122	E-throttle Pedal Position Sensor 1 Circuit Low
45	P2128	E-throttle Pedal Position Sensor 2 Circuit High
46	P2127	E-throttle Pedal Position Sensor 2 Circuit Low
47	P0032	O2 Sensor Heater Contr. Circ.(Bank(1)Sensor 1) High

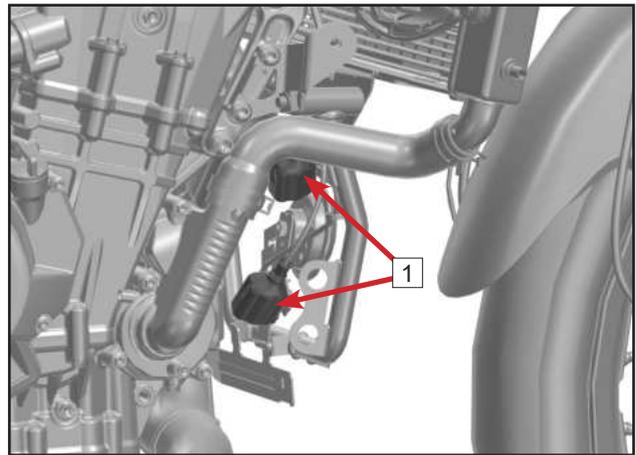
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48	P0031	O2 Sensor Heater Contr. Circ.(Bank(1)Sensor 1) Low
49	P0030	O2 Sensor Heater Contr. Circ.(Bank(1)Sensor 1)open
50	P0132	O2 Sensor Circ.,Bank1-Sensor1 High Voltage
51	P0131	O2 Sensor Circ.,Bank1-Sensor1 Low Voltage
52	P0130	O2 Sensor Circ.,Bank1-Sensor1 Malfunction
53	P0134	O2 Sensor Circ.,Bank1-Sensor1 No Activity Detected
54	P0052	O2 Sensor Heater Contr. Circ.(Bank(2)Sensor 2) High
55	P0051	O2 Sensor Heater Contr. Circ.(Bank(2)Sensor 2) Low
56	P0050	O2 Sensor Heater Contr. Circ.(Bank(2)Sensor 2)open
57	P0152	O2 Sensor Heater Contr. Circ.(Bank(2)Sensor 2) High
58	P0151	O2 Sensor Circ.,Bank1-Sensor2 Low Voltage
59	P0150	O2 Sensor Circ.,Bank1-Sensor2 Malfunction
60	P0154	O2 Sensor Circ.,Bank1-Sensor2 No Activity Detected
61	U3502	CAN Module Input Circ. High
62	U3501	CAN Module Input Circ. Low
63	U0073	Control Module Communication Bus Off
64	U0140	Lost Communication With ECU and ABS Control Module
65	U0155	Lost Communication With Instrument Panel Cluster (IPC) Control Module
66	P0322	Eng.Speed Inp.Circ. No Signal
67	P0412	Second Air System Valve Circuit High
68	P0414	Second Air System Valve Circuit Low
69	P0413	Secondary Air Injection System Incorrect Flow Detected
70	P082B	Gearshaft Signal Circuit High
71	P1002	Gearshaft Signal Circuit Low
72	P0917	Gear Sensor Circuit High
73	P0916	Gear Sensor Circuit Low

6.6 Oxygen Sensor

Removal

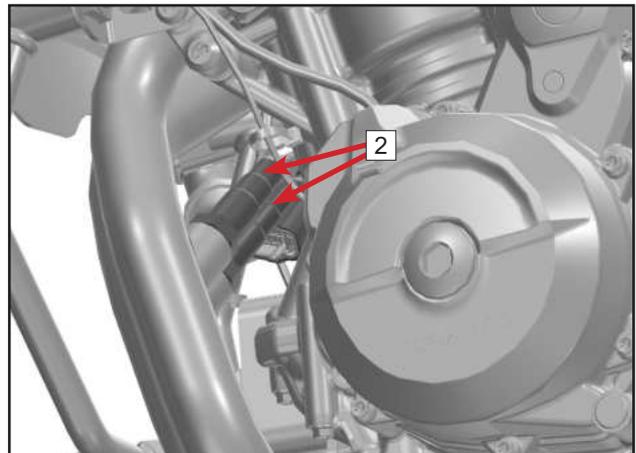
Remove the connector **1**.



Remove oxygen sensor **2**.

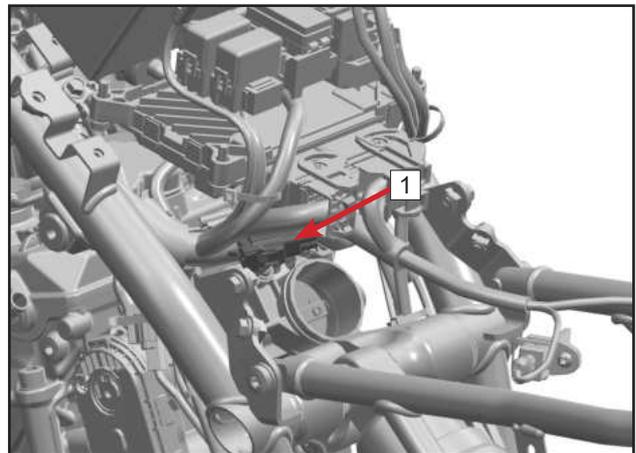
Installation

Reverse the removal procedures for installation.



6.6.1 Oxygen Sensor(EU+)

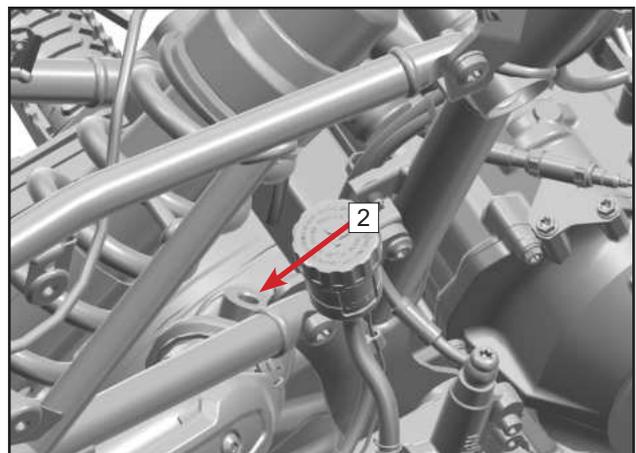
Remove the connector **1**.



Remove oxygen sensor **2**.

Installation

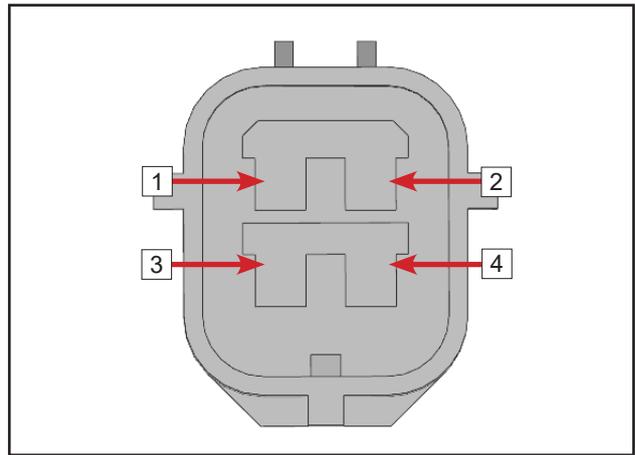
Reverse the removal procedures for installation.



CFMOTO

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 ECM.

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:

- 1. Sensor GND
- 2. 12V+
- 3. Sensor signal
- 4. Heating

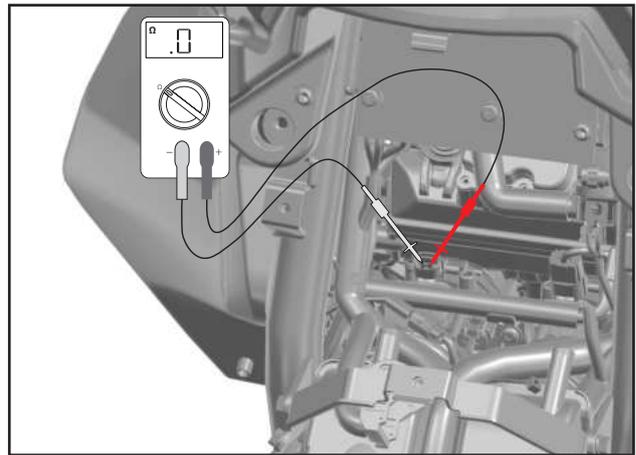
6.7 Injector

6.7.1 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.



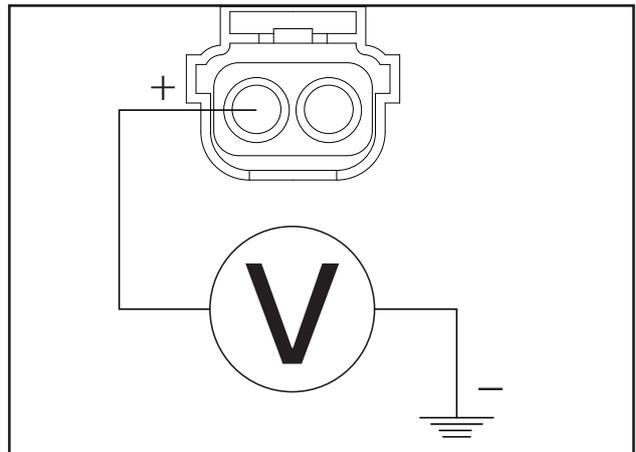
6.7.2 Injector Input Voltage Detection

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.



6.8 Throttle Body Assembly

Removal

Turn off the vehicle power.

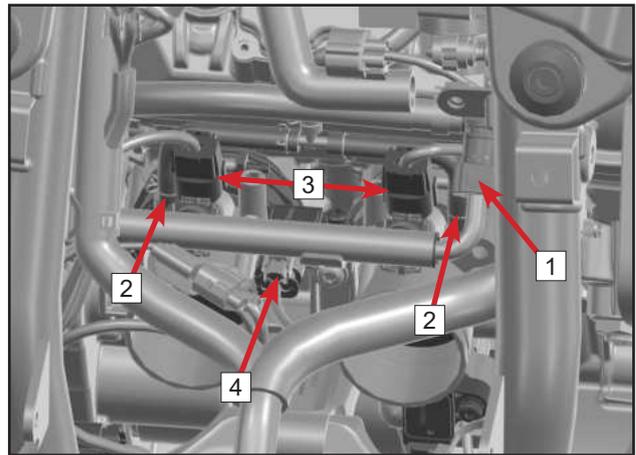
Disconnect the positive and negative terminals of battery.

Disconnect the fuel line **1**.

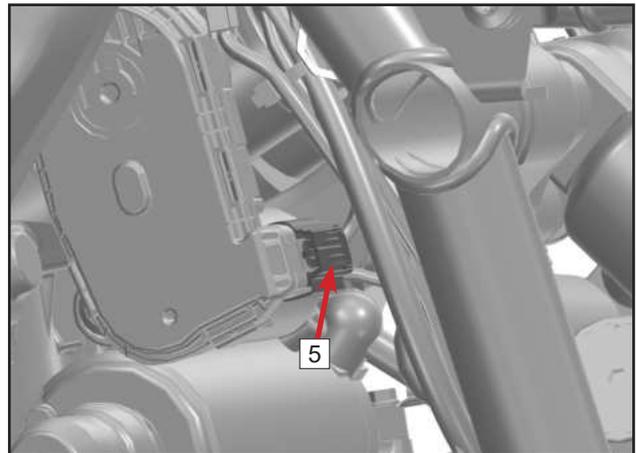
Disconnect the fuel evaporator line **2**.

Disconnect the nozzle connector **3**.

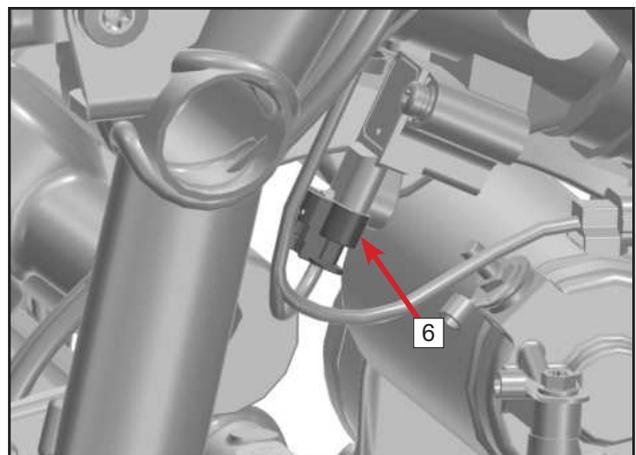
Disconnect the air intake pressure sensor 1 connector **4**.



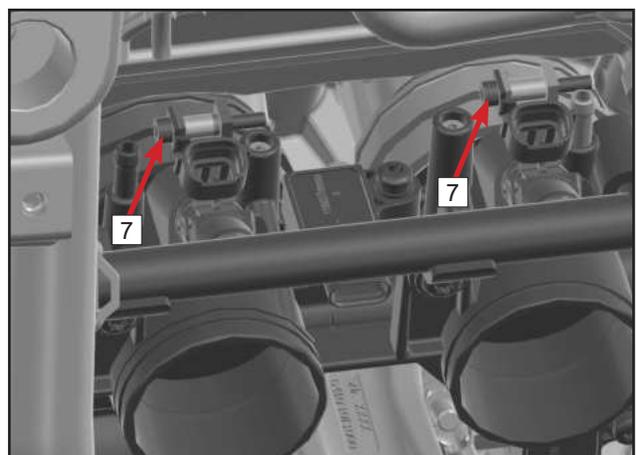
Disconnect the Angle sensor connector **5**.



Disconnect the air intake pressure sensor 2 connector **6**.



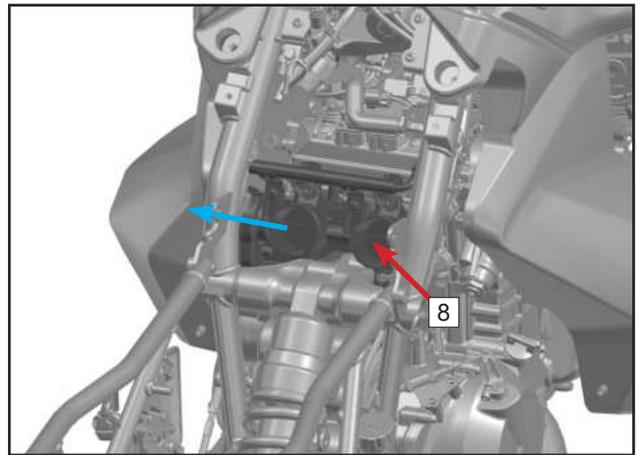
Loosen the bolt **7**.



Remove throttle body assembly [8].

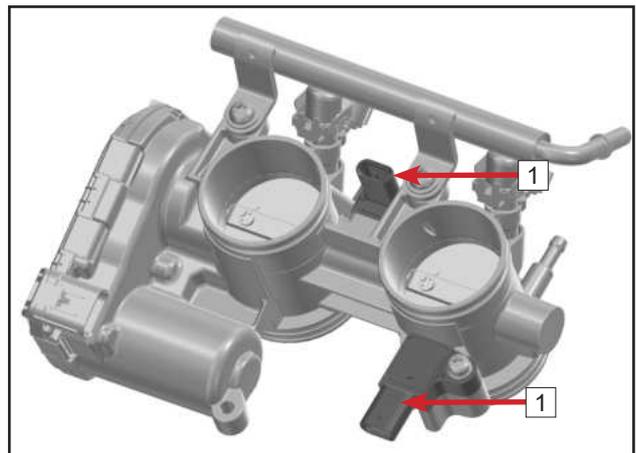
Installation

Reverse the removal procedures for installation.



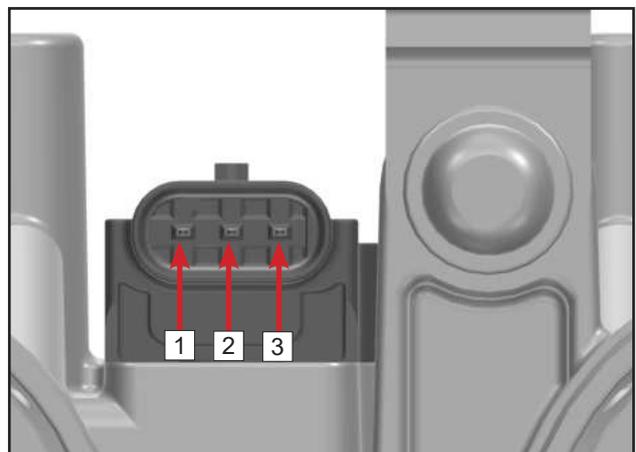
6.8.1 Air Intake Pressure Sensor

The intake pressure/temperature sensor [1] monitors the pressure in the intake pipe and provides the ECU with information about the load of engine.

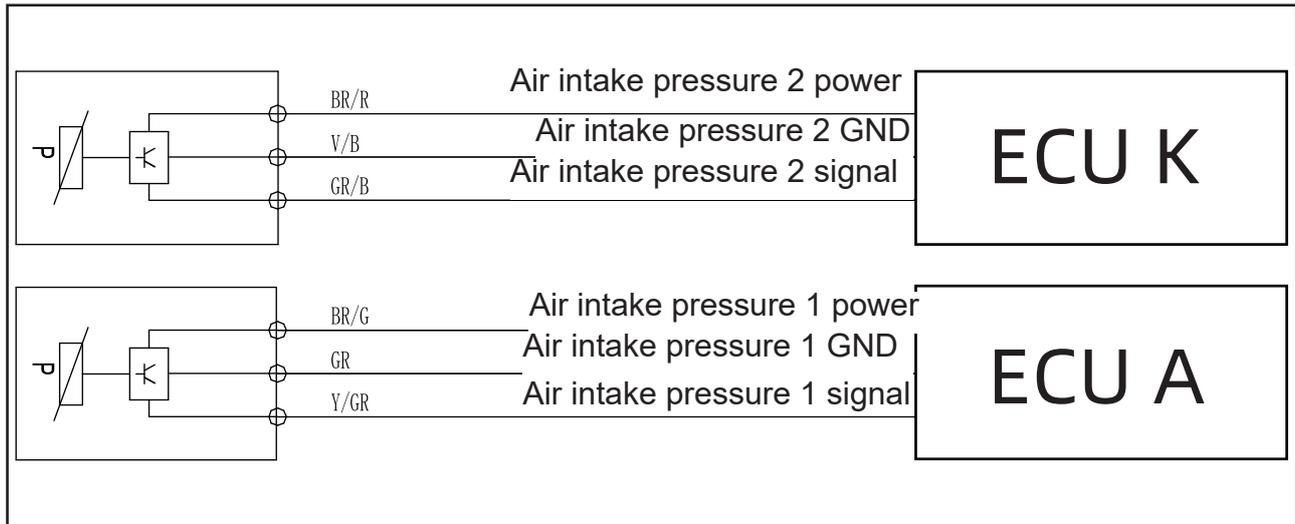


Air Intake Pressure Sensor Pin Function

- [1]: Air intake pressure sensor power
- [2]: GND
- [3]: Air intake pressure sensor signal



6.8.1.1 Air Intake Pressure/Temperature Sensor 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

Use a multimeter to connect the BR/B and V/B harness, whether the voltage is about 5-5.25V. Use a multimeter to connect the BR/G and GR harness, whether the voltage is about 5-5.25V.

NO →

Check whether BR/R and V/B are short-circuited or disconnected. If no short circuit or open circuit exists, replace the ECU and check it again. Check whether BR/G and GR are short-circuited or disconnected. If no short circuit or open circuit exists, replace the ECU and check it again.

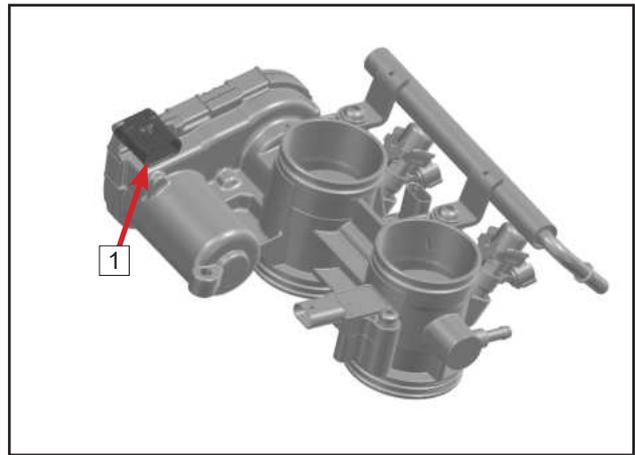
YES

Replace it with a new one and then check it again.

6.8.2 Angle Sensor

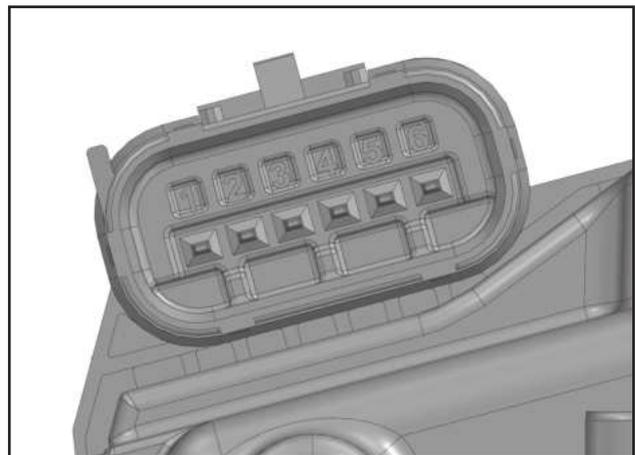
The intake pressure/temperature sensor 1 monitors the pressure in the intake pipe and provides the ECU with information about the load of engine.

The temperature sensor is a negative temperature coefficient (NTC) thermistor whose resistance value decreases as the coolant temperature rises, but the relationship is not linear.

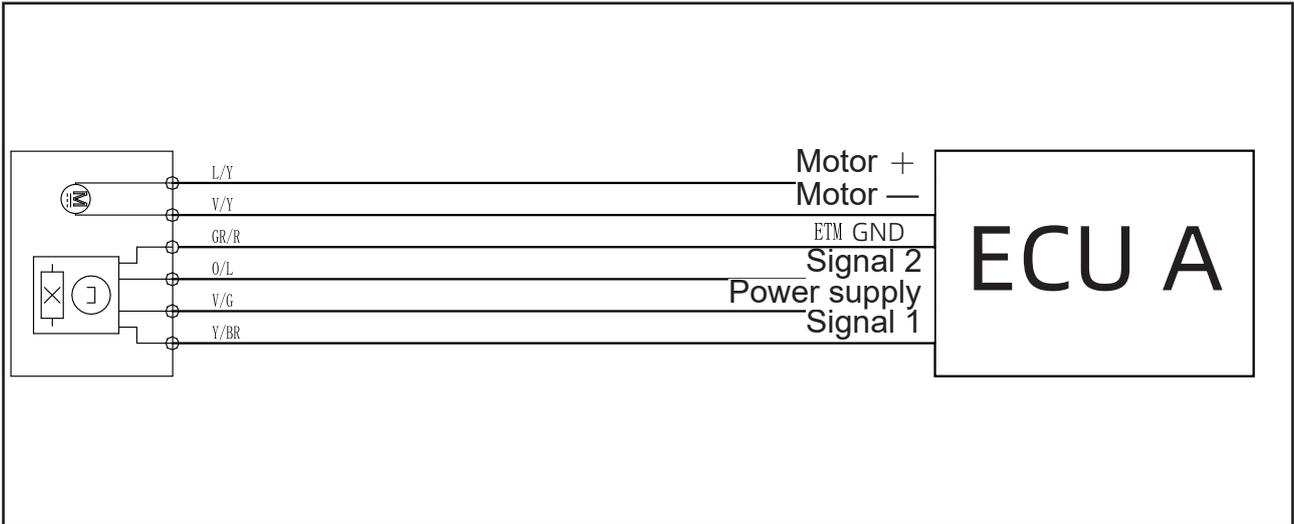


Angle Sensor Pin Functions

- 1: Motor +
- 2: Motor—
- 3: Sensor GND
- 4: Signal 2
- 5: Sensor power supply
- 6: Signal 1



6.8.2.1 Angle Sensor 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

Use a multimeter to connect the O/L and V/G harness, whether the voltage is about 5-5.25V. Use a multimeter to connect the L/Y and V/Y harness, whether the voltage is about 12V.

NO

Check whether O/L and V/G are short-circuited or disconnected. If no short circuit or open circuit exists, replace the ECU and check it again.

Check whether L/Y and V/Y are short-circuited or disconnected. If no short circuit or open circuit exists, replace the ECU and check it again.

YES

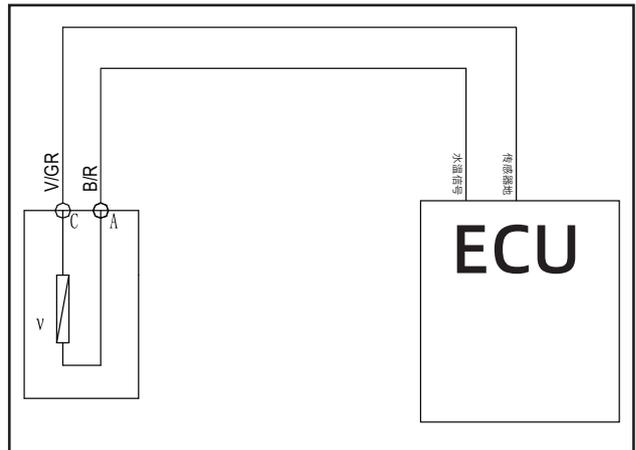
Replace it with a new one and then check it again.

6.9 Water 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 dashboard for display.

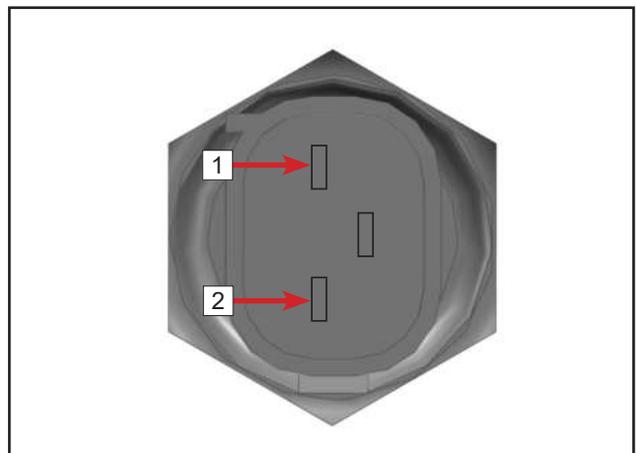


The circuit of connection between the sensor and ECU.



Water Temperature Sensor Pin Function:

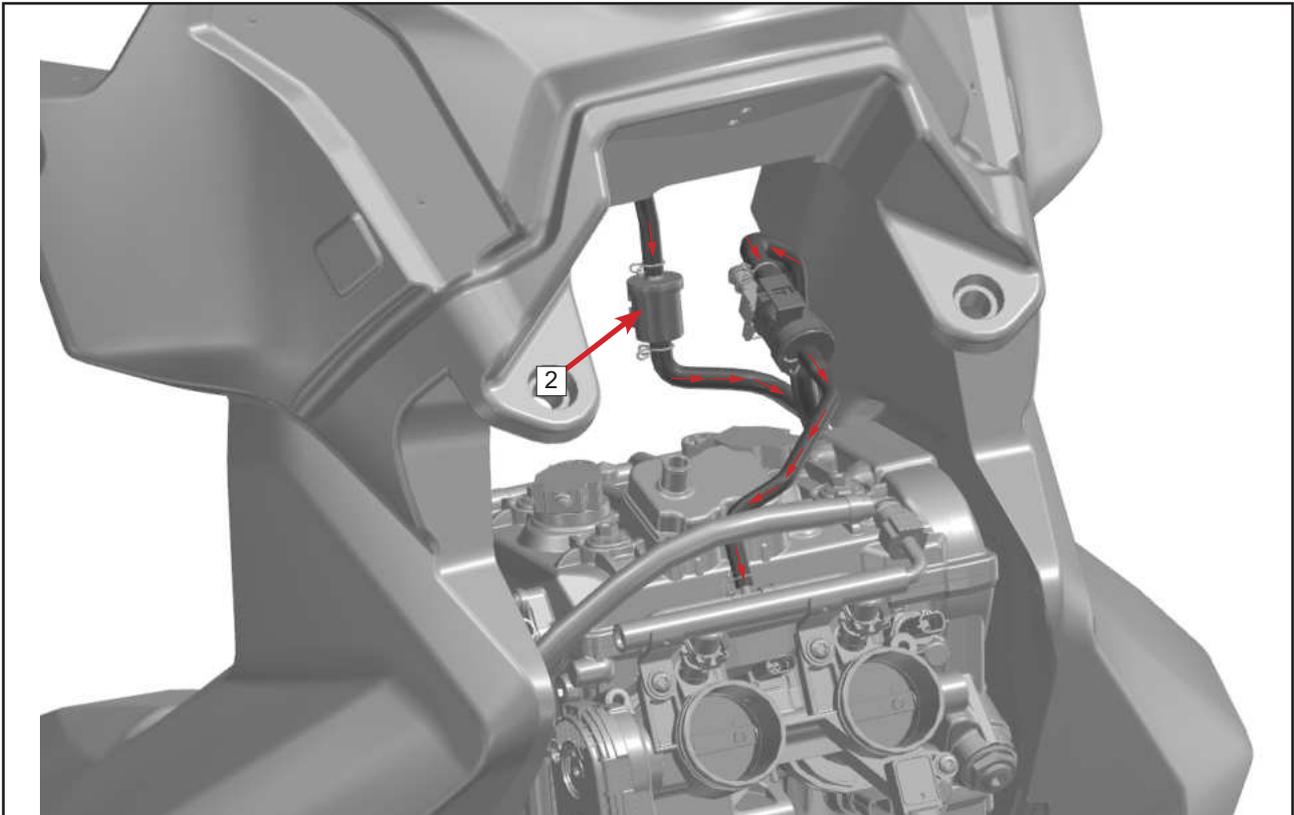
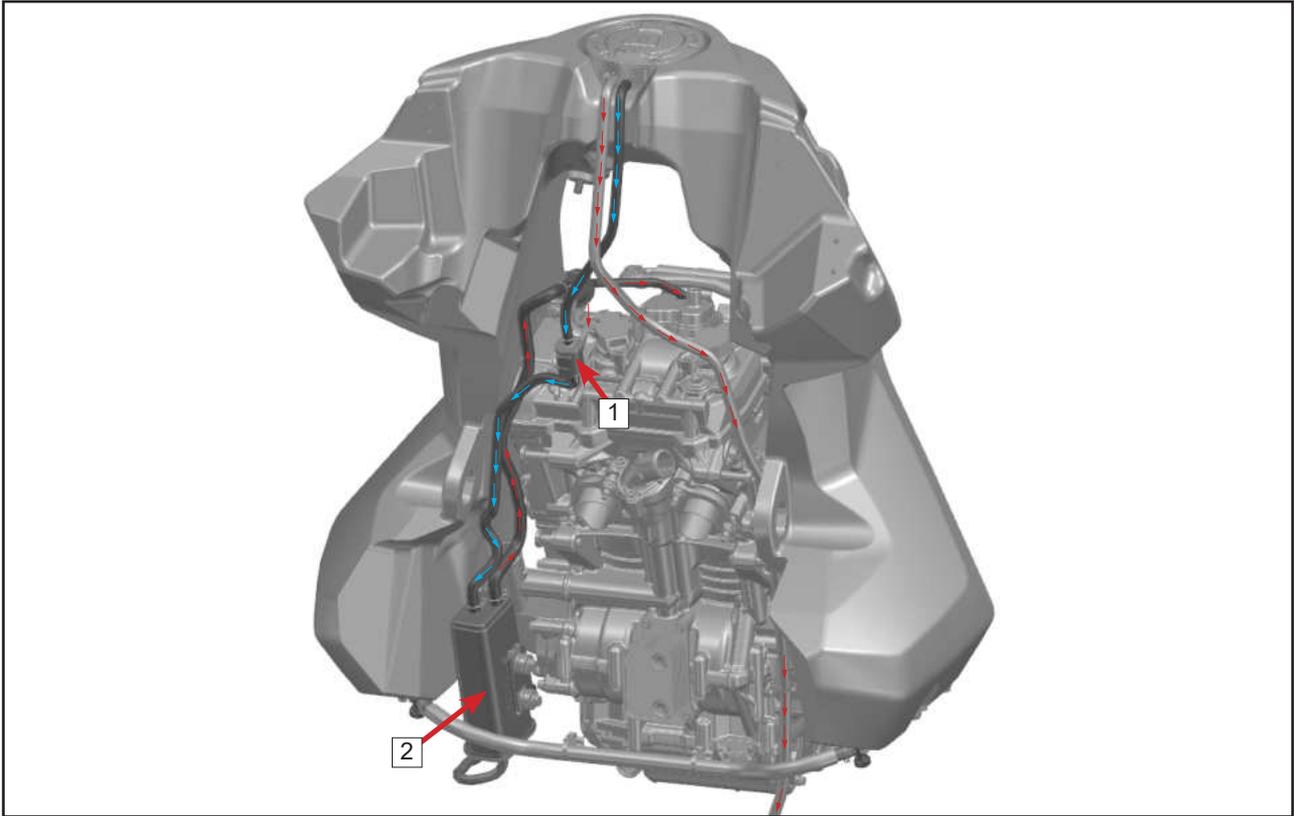
- 1: GND
- 2: Coolant temperature signal sensor



Temperature°C	Resistance(Ω)
-20±0.1	13.71~16.94
25±0.1	1.825~2.155
80±0.1	0.303~0.326
110±0.1	0.1383~0.1451

The right table shows the resistance value of the sensor at different temperatures.

6.10 EVAP System Work Guide



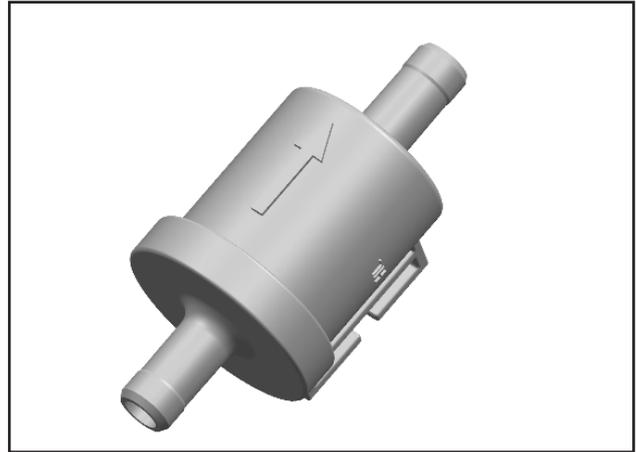
Due to the volatile characteristics of fuel, in order to adapt to the current environmental protection laws and regulations, a set of fuel evaporation system is designed.

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.

6.10.1 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.

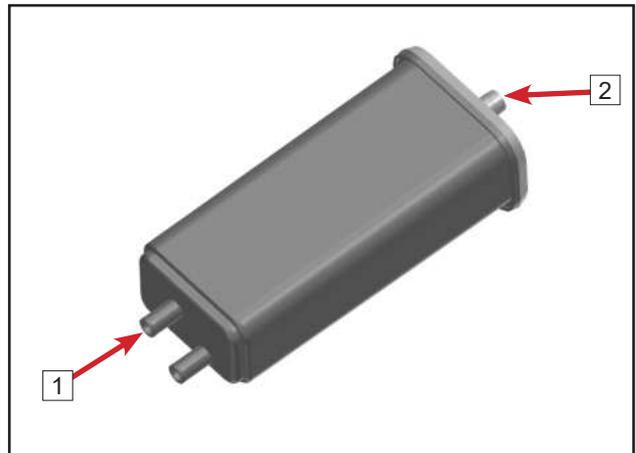


6.10.2 Canister Test

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.

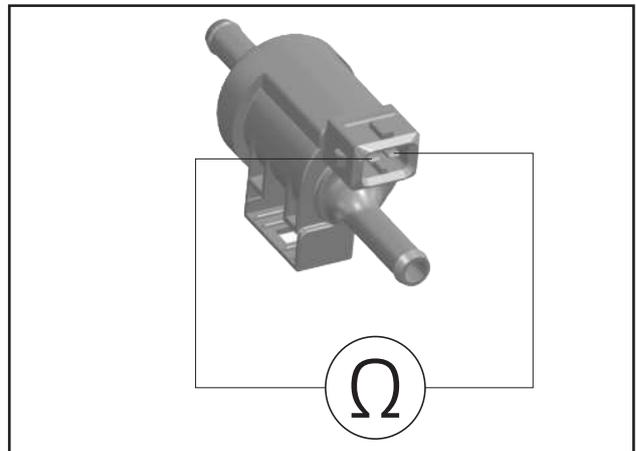
If there is air leakage or body damage during the test, please replace it with a new part.



6.10.3 Canister Magnetic Valve Test

The resistance value of canister magnetic valve is measured as shown in the figure.

If the resistance value in the test is greater than or less than the normal value, please replace the new part.

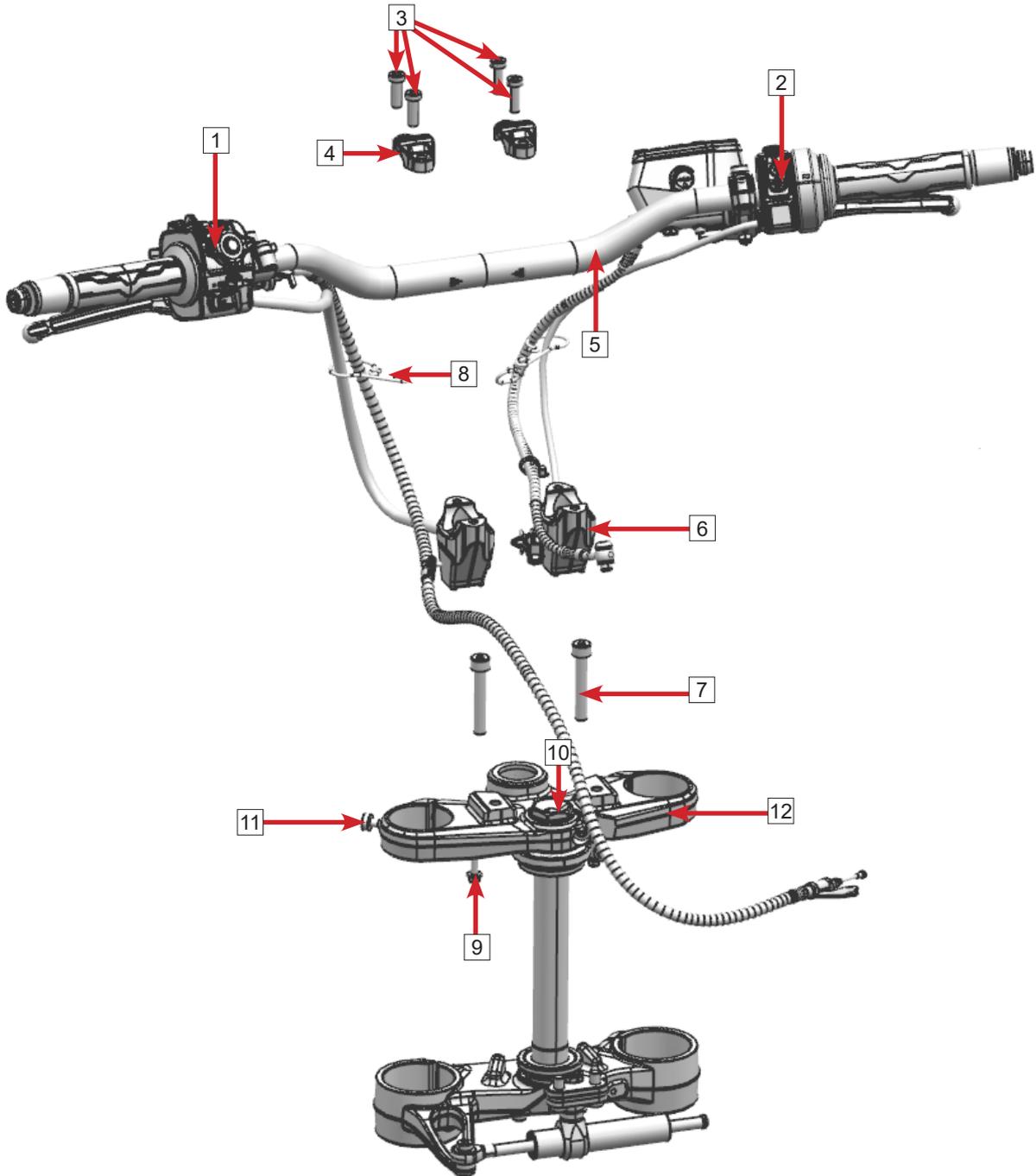


Canister magnetic valve resistance value: $17 \pm 2 \Omega$

07 Steering System

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7.1 Exploded View



1	LH handlebar switch assembly	2	RH handlebar switch assembly	3	Inner hex bolt	4	Handlebar upper press cover
5	Handlebar	6	Handlebar mounting seat	7	Bolt	8	Cable hook
9	Bolt	10	Upper triple clamp tighten screw	11	Hexagon socket head cap screw	12	Upper triple clamp assembly

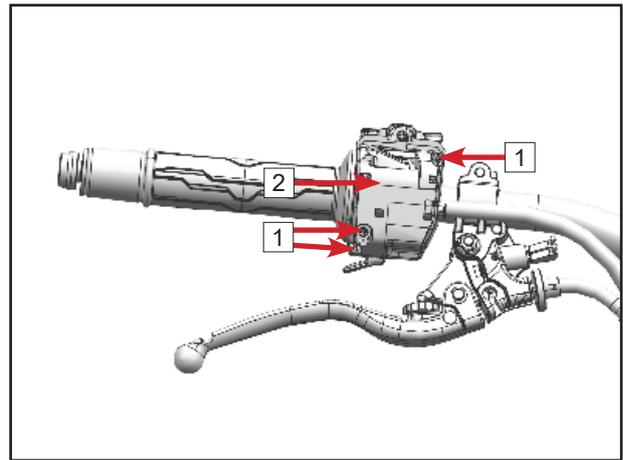
7.2 Handlebar Switch

7.2.1 LH Handlebar Switch Assembly

Removal

Remove screws **1**.

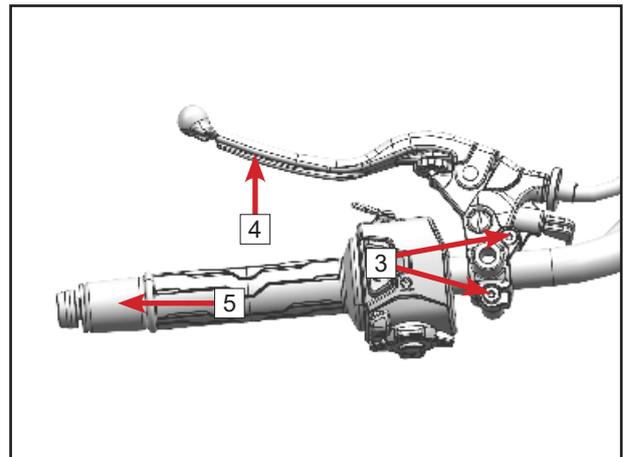
Remove switch **2**.



Remove inner hex bolt **3**.

Remove clutch lever **4**.

Remove LH grip **5**.

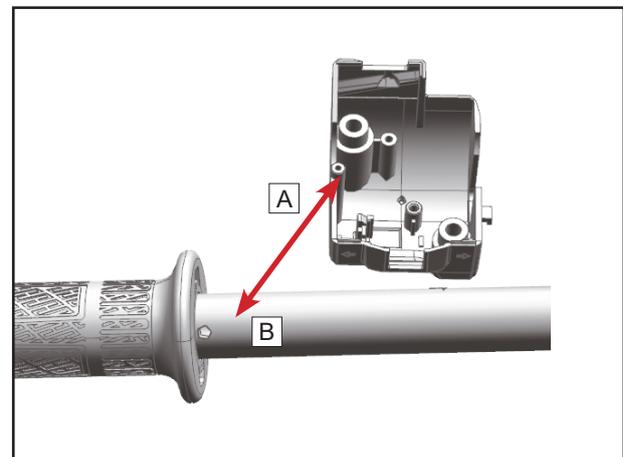


Installation

Reverse the removal procedures for installation.

NOTE:

When the switch is installed on the handlebar tube, there is a positioning structure inside the switch. Connect device A to the fixing point B of the steering tube and then tighten the bolt.

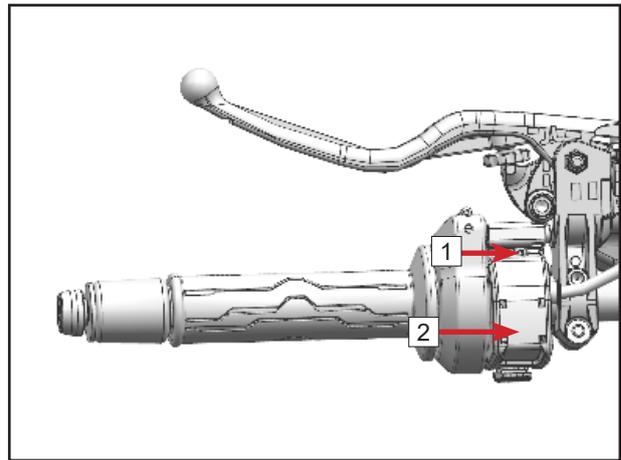


7.2.2 RH Handlebar Switch Assembly

Removal

Remove bolt **1**.

Remove RH handlebar switch **2**.



Installation

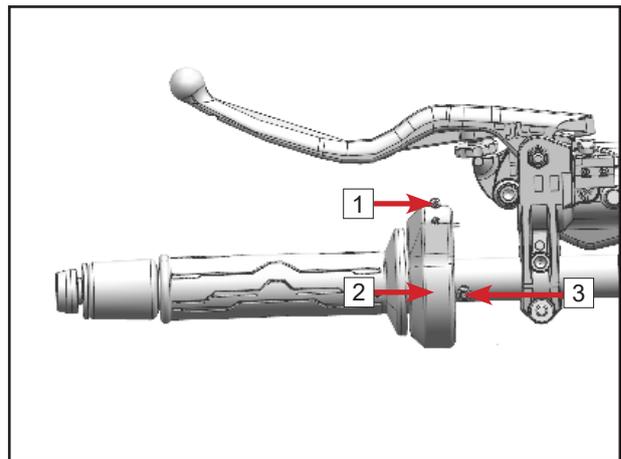
Reverse the removal procedures for installation.

7.2.3 Throttle Handle

Remove bolt **1**.

Separate throttle seat upper seat **2**.

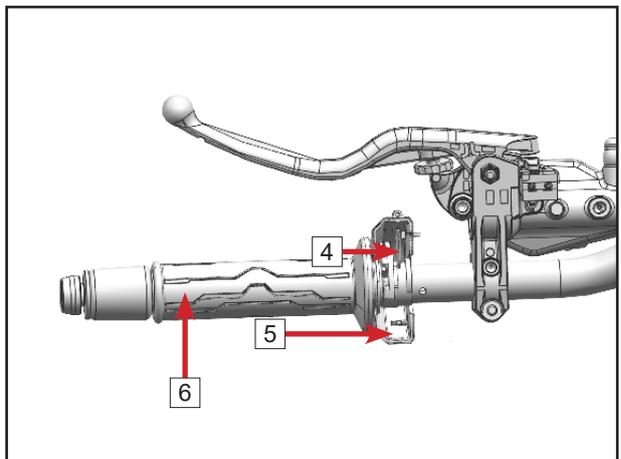
Remove self-tapping screw **3**.



Separate throttle cable and throttle seat **4**.

Remove throttle seat lower seat **5**.

Remove RH grip **6**.

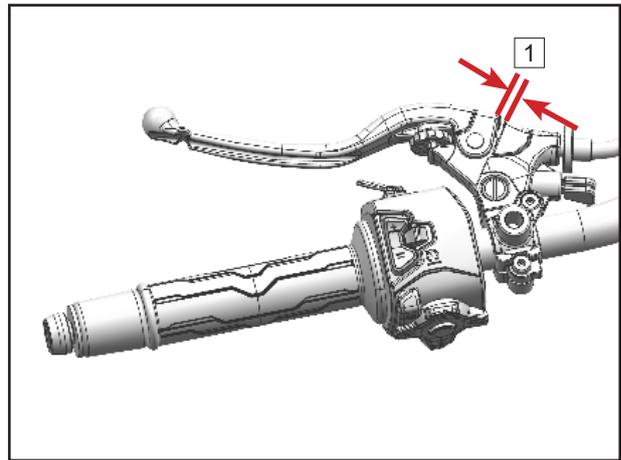


7.3 Handlebar Service

7.3.1 Clutch Lever Clearance Inspection

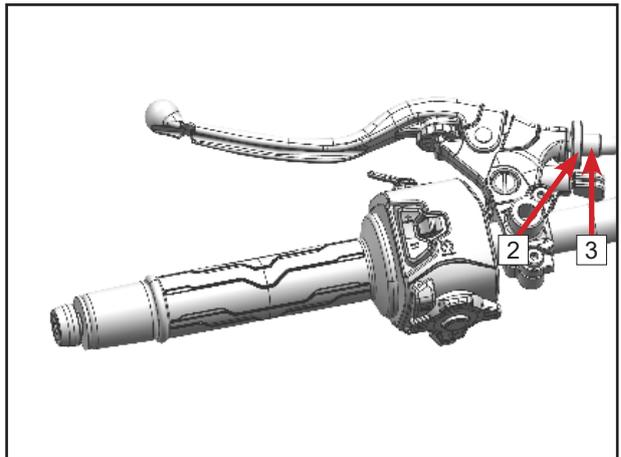
Check if the clutch lever returns smoothly.
Check the free play **1** of clutch lever.

Free play: 2mm

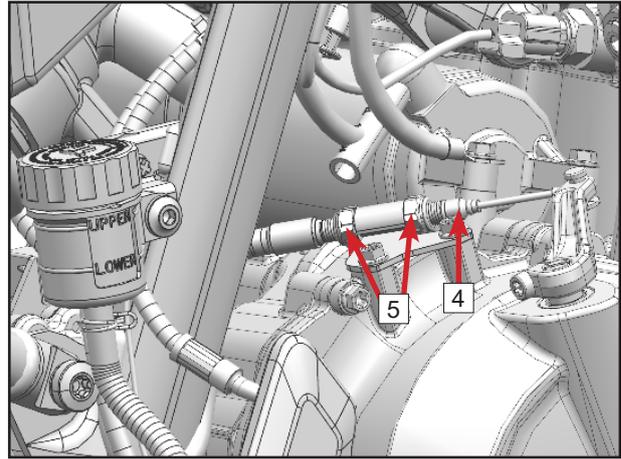


7.3.2 Clutch Cable Free Play Adjustment

When the hand lever end is slightly adjusted, loosen the lock nut **2**, turn the adjusting nut **3** for adjustment, and tighten the lock nut **2**.



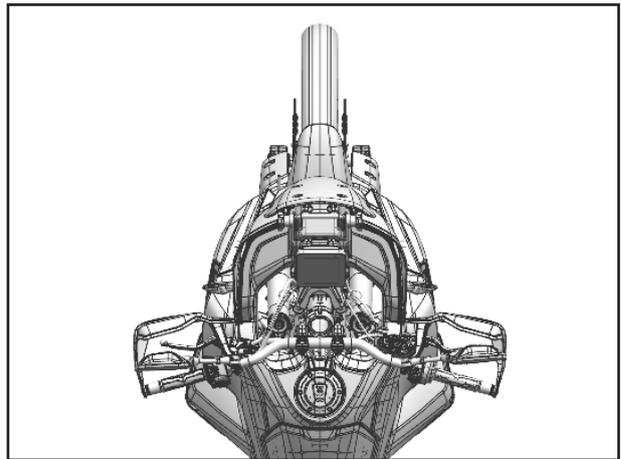
When the engine end is heavily adjusted: loosen the two lock nuts **5** and adjust the position of cable threaded pipe **4**. Then tighten the lock nut **5**.



7.3.3 Handlebar Interference Inspection

Swing the handlebar to the left and right to check if all kinds of wires interfere with the front wheel.

Check if the fuel tank, windshield and dashboard are interfered by the maximum steering of the handlebar.



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8.1 Service Tool

CFMOTO DSCAN

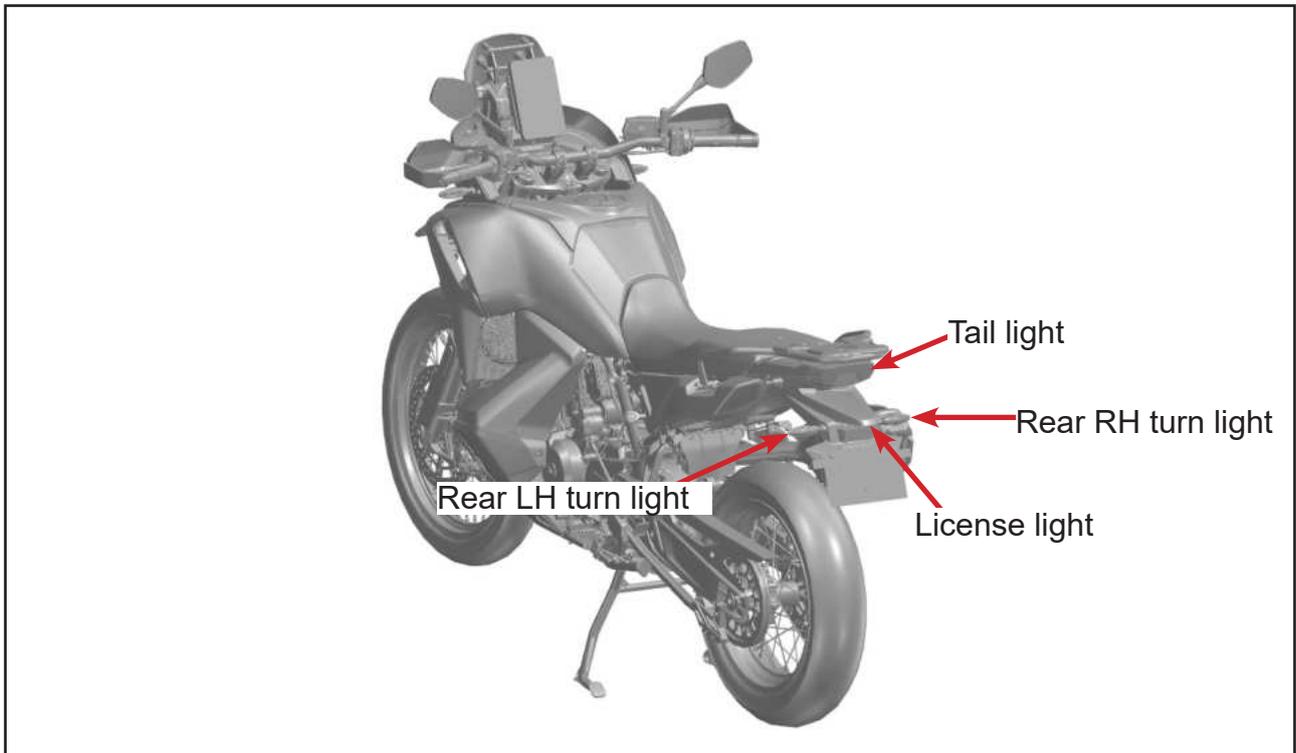
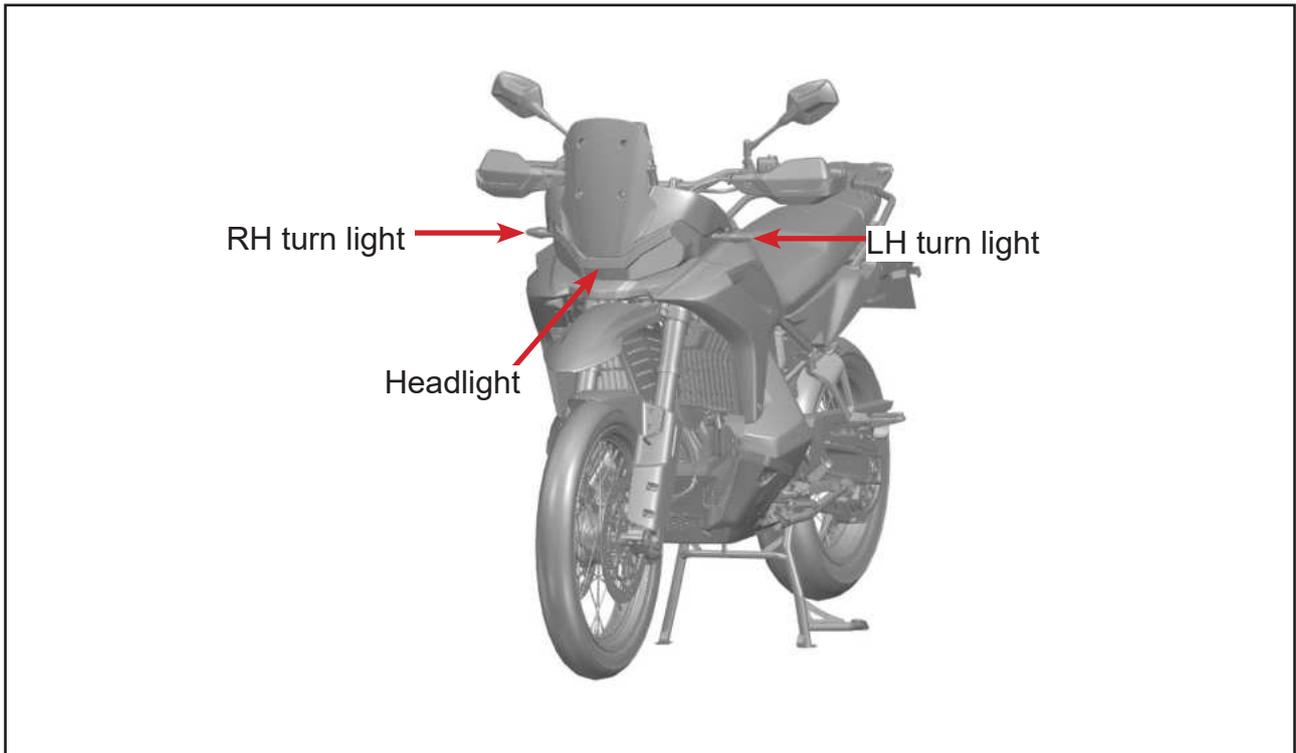
Function :

Read/clear the EFI system fault code, observe the data flow, update and scrub the ECU program, etc.

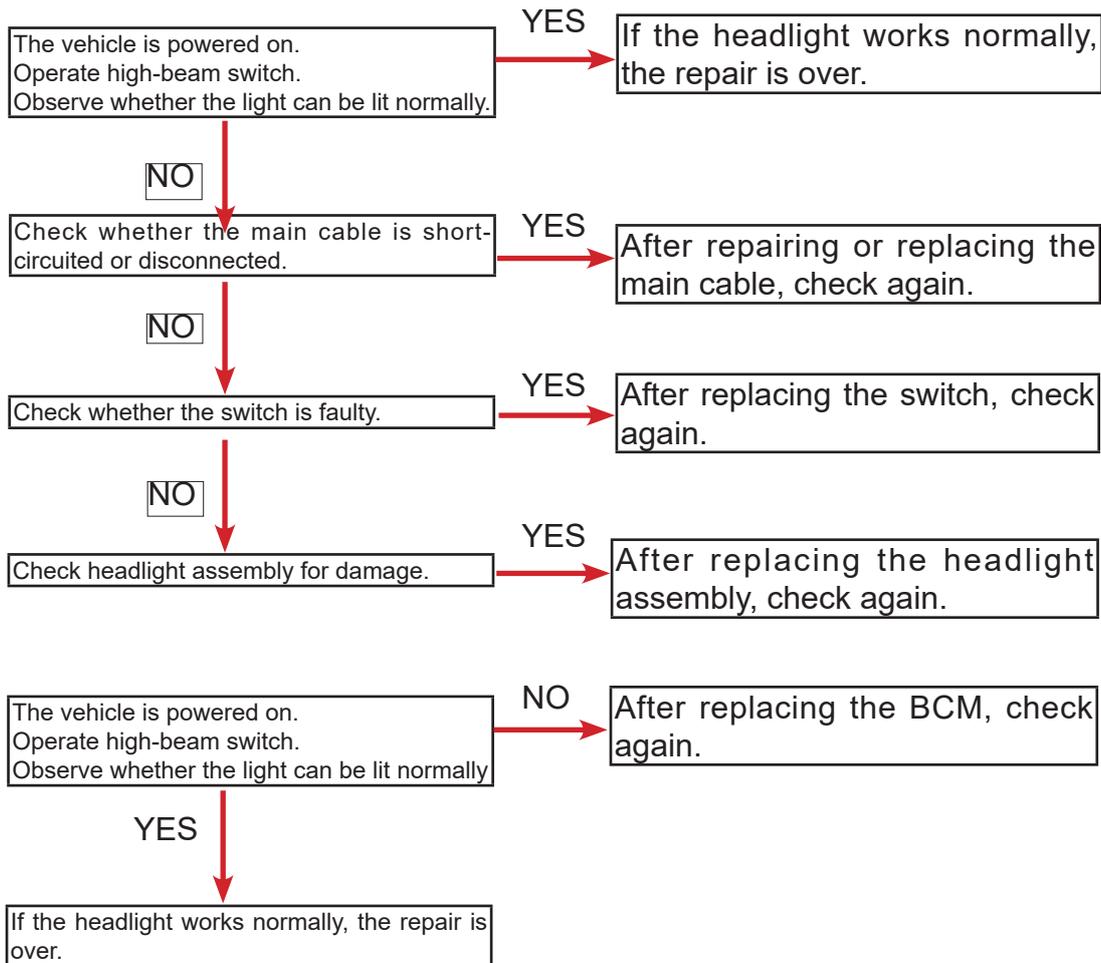


8.2 Lights

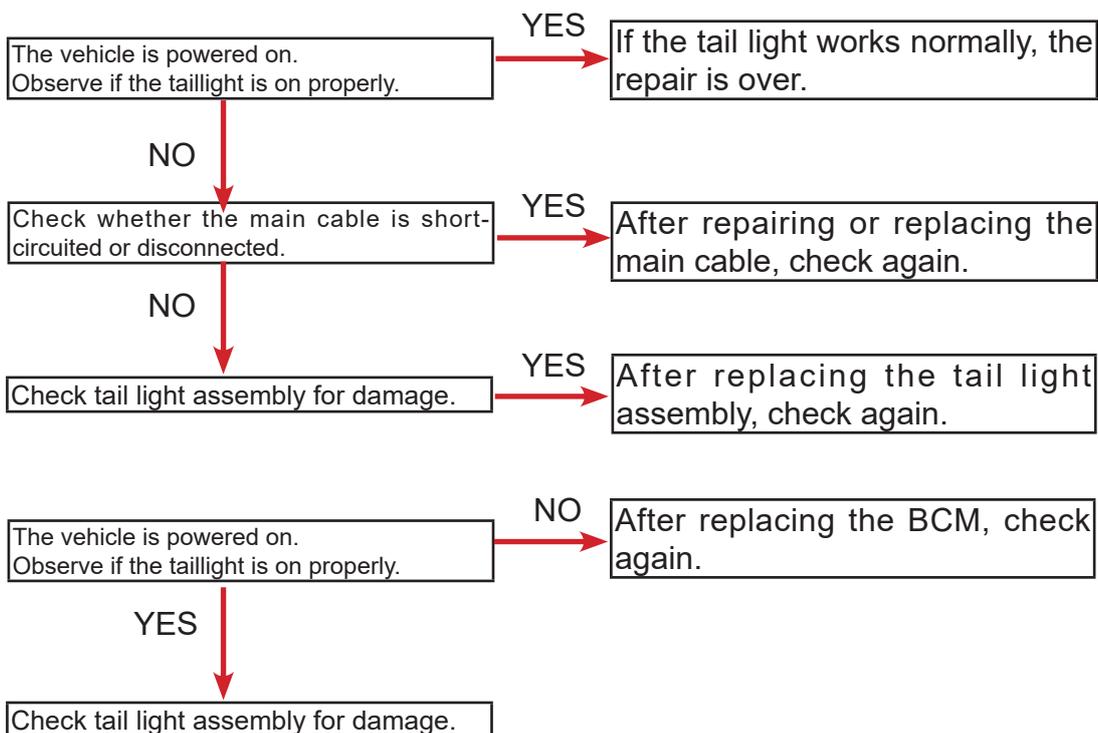
8.2.1 Light Position



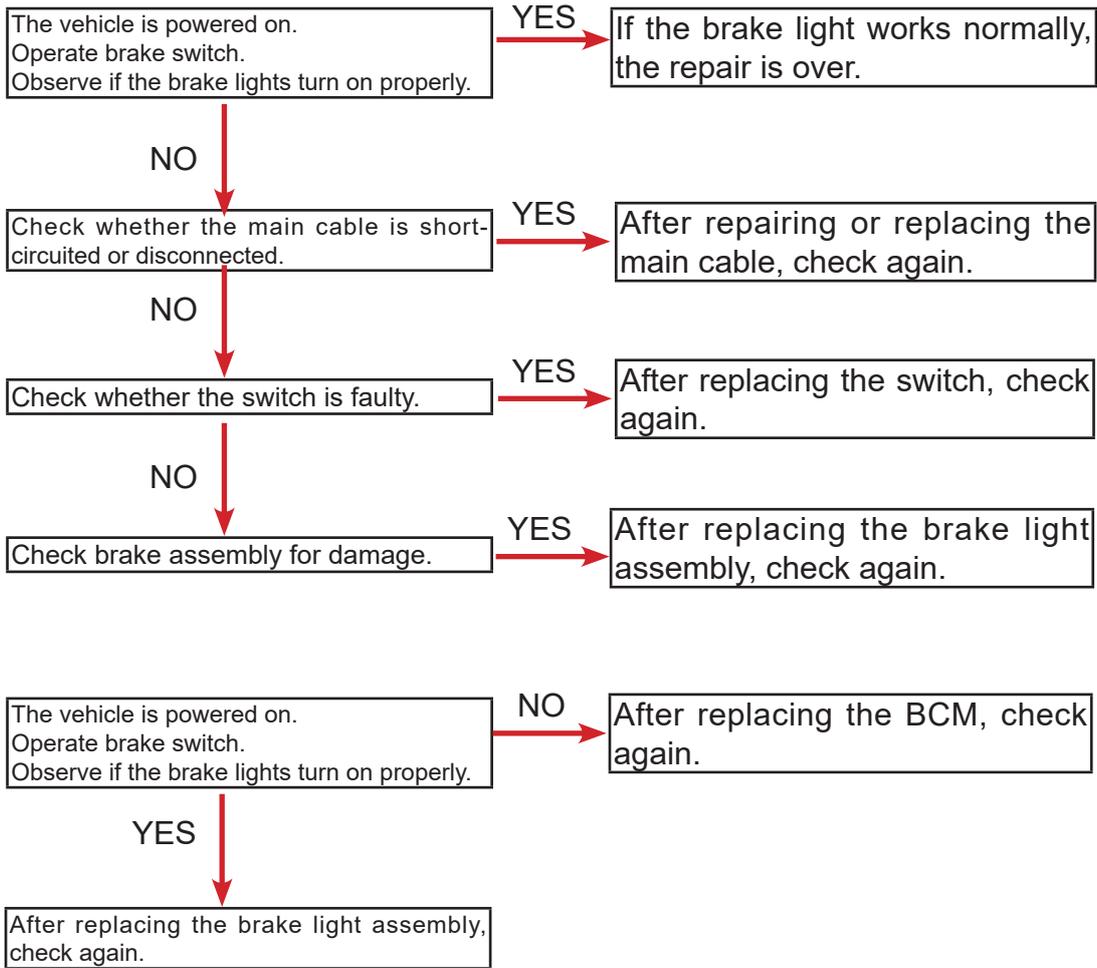
8.2.2 Headlight Inspection



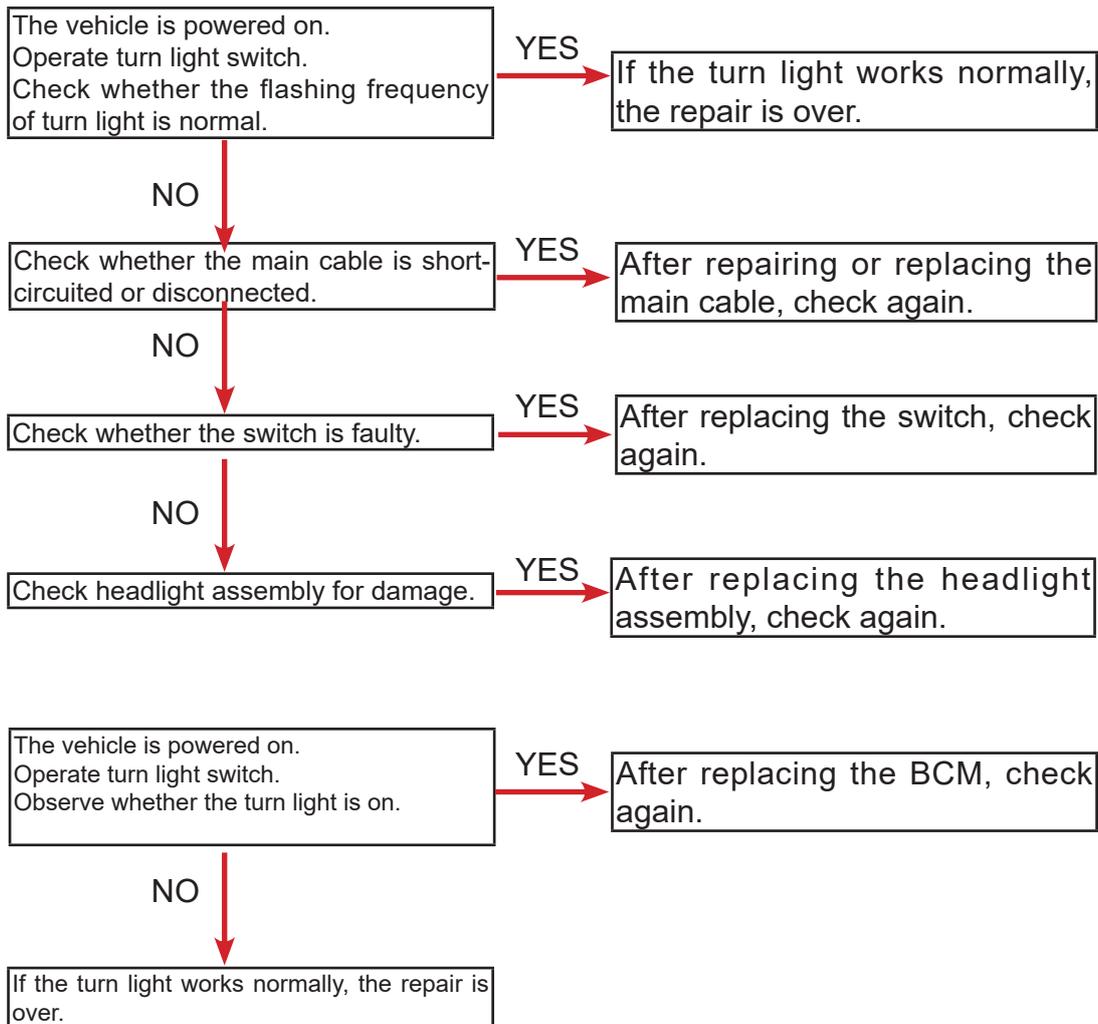
8.2.3 Tail Light Inspection



8.2.4 Brake Light Inspection

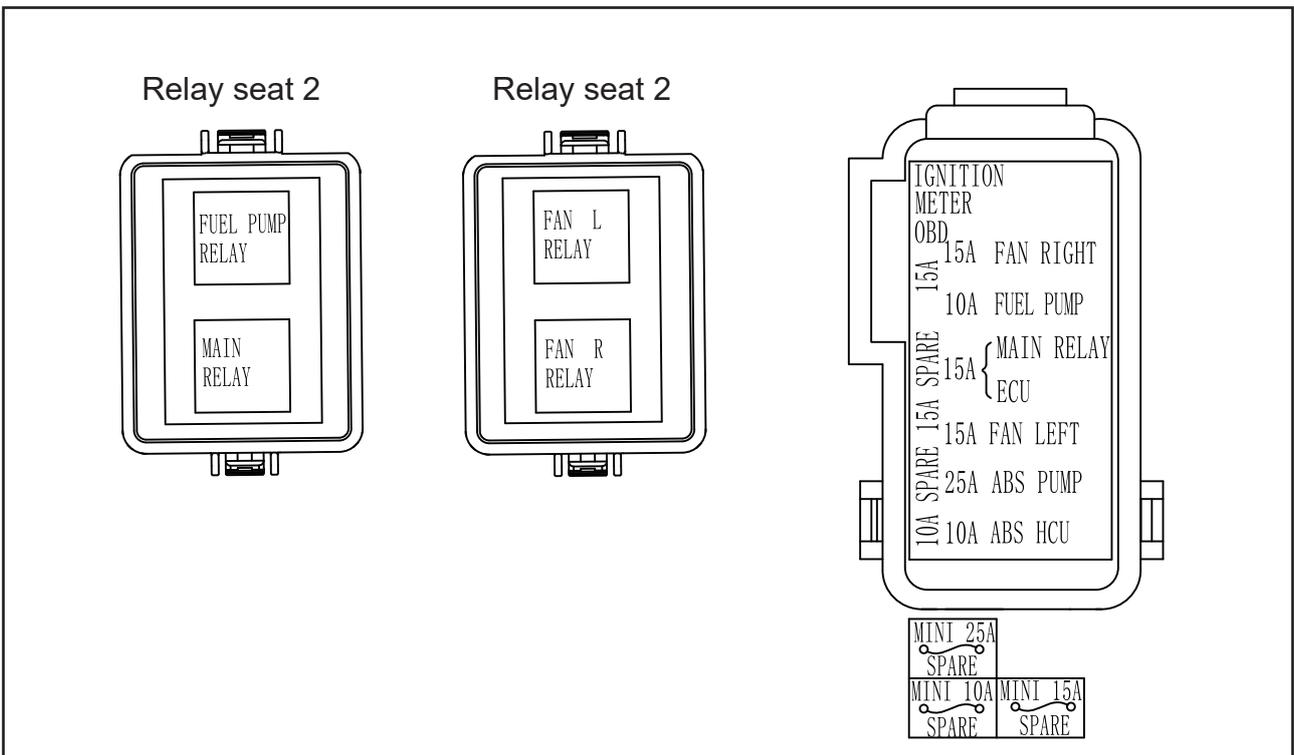
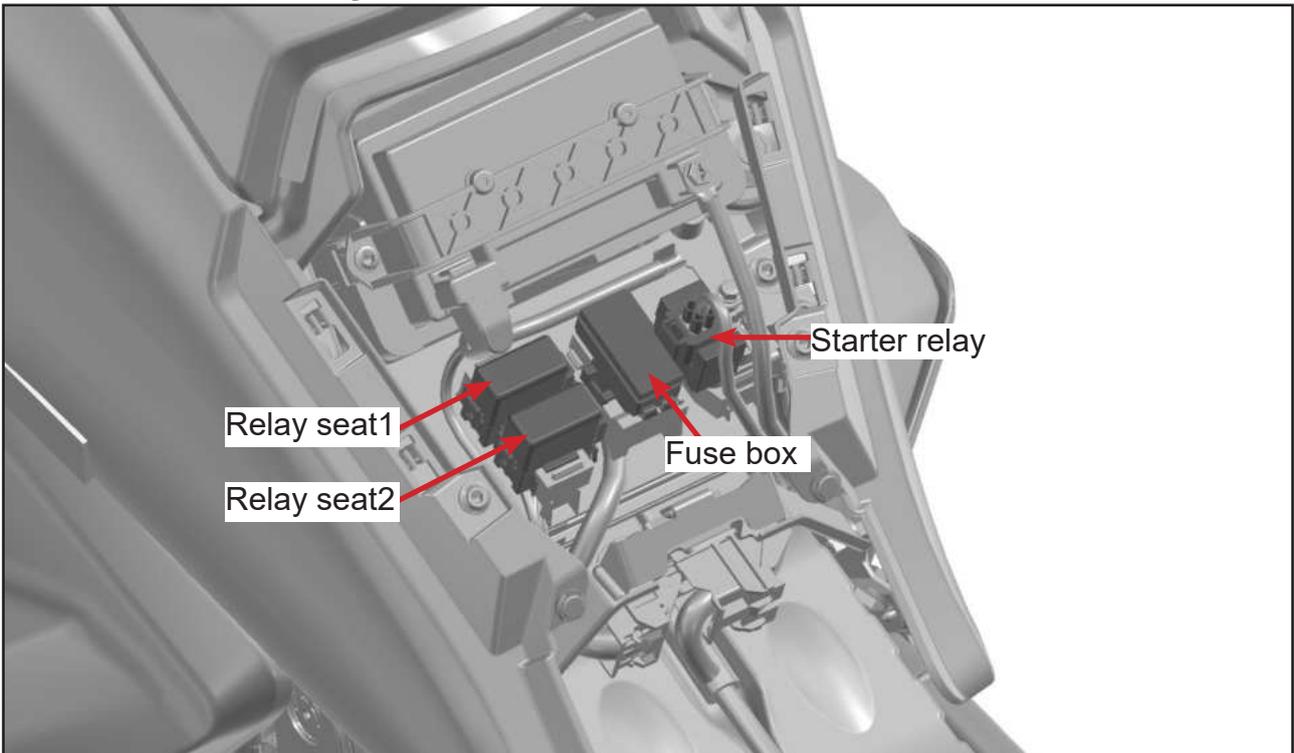


8.2.5 Turn Light Inspection



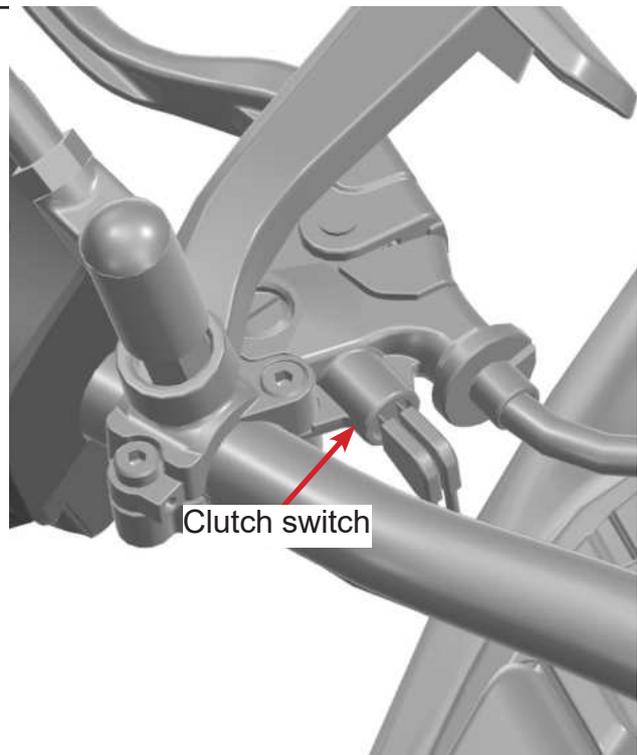
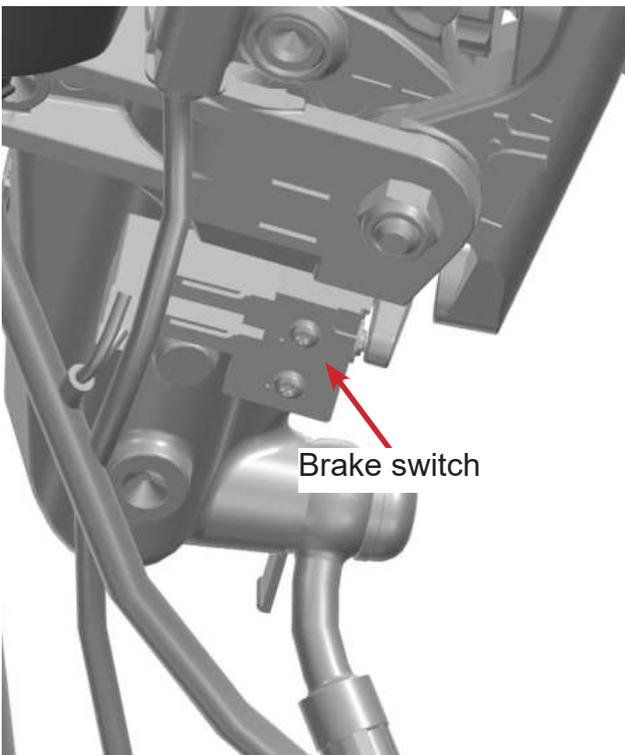
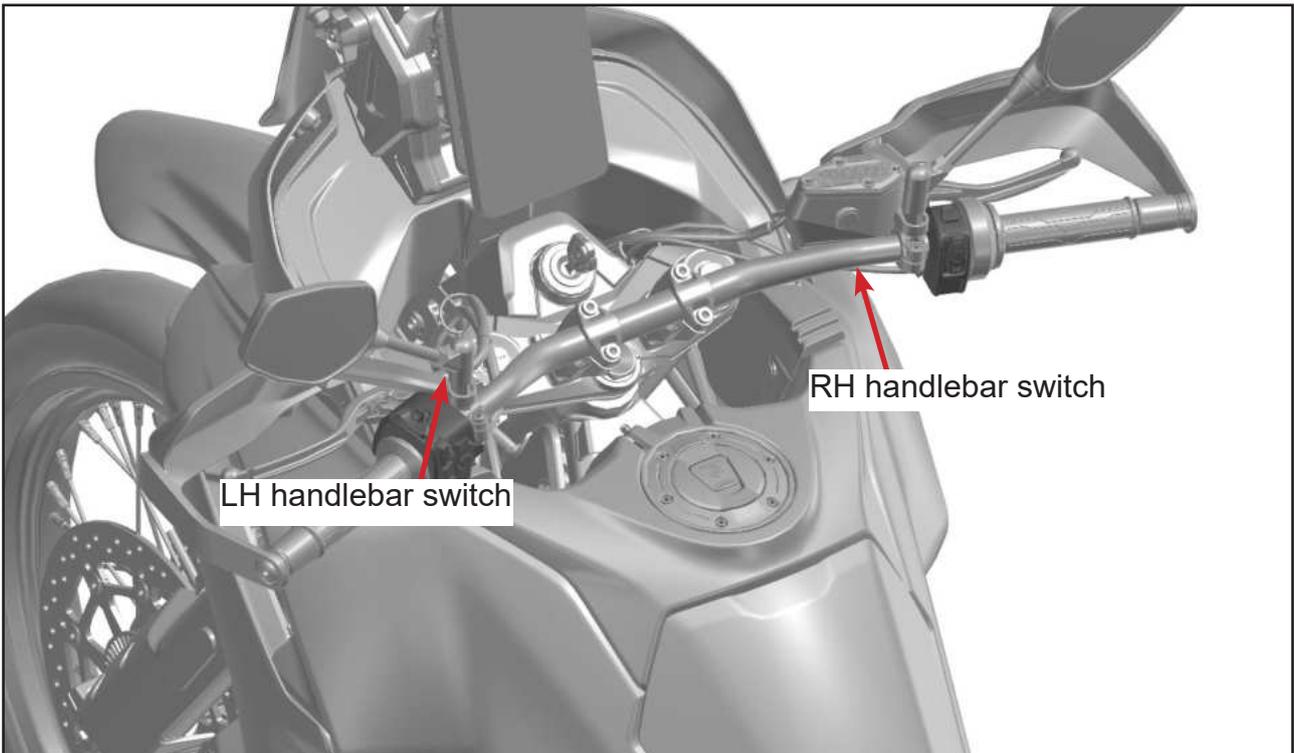
8.3 Fuse and Relay

8.3.1 Fuse and Relay Position



8.4 Switch

8.4.1 Switch Position

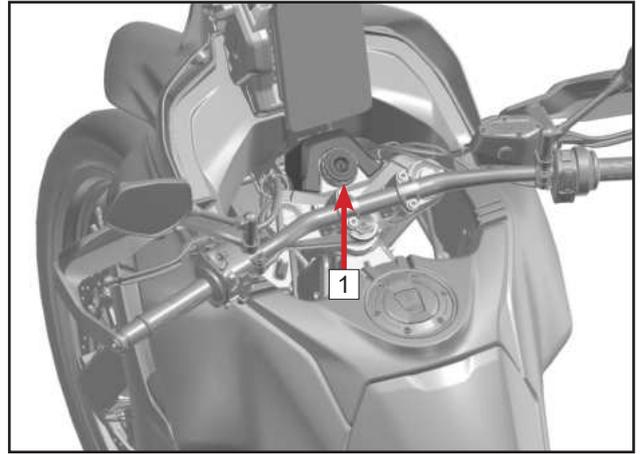


8.4.2 Ignition Lock

Inspection

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

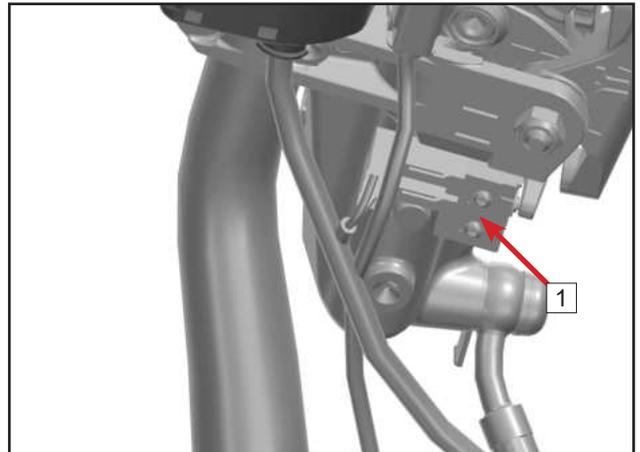
Ignition Switch			
Gear/Color	R	BL	Can key pull out
			NO
			YES
			YES



8.4.3 Front Brake Light Switch

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

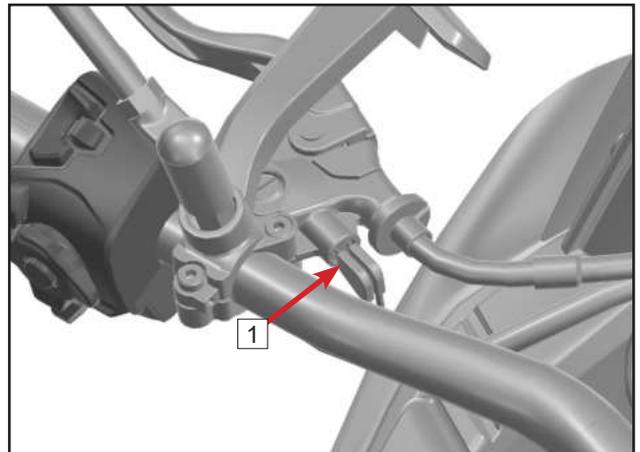
1. When the front brake handle is kneaded: the brake light on.
2. When the front brake handle is released: the brake light off.



8.4.4 Clutch Switch

Pull out the plug **1** of front brake light wiring switch to check whether the wiring harness 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.



8.4.5 Handlebar Switch

8.4.5.1 LH Handlebar Switch

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

Dimmer switch1			
Function	Color	L	G
		●	●
		●	●

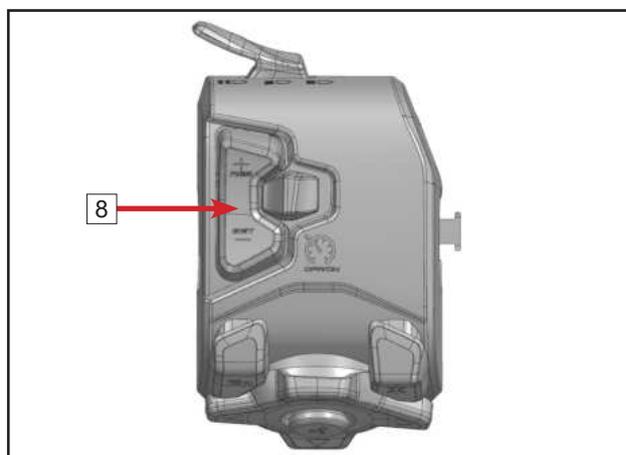
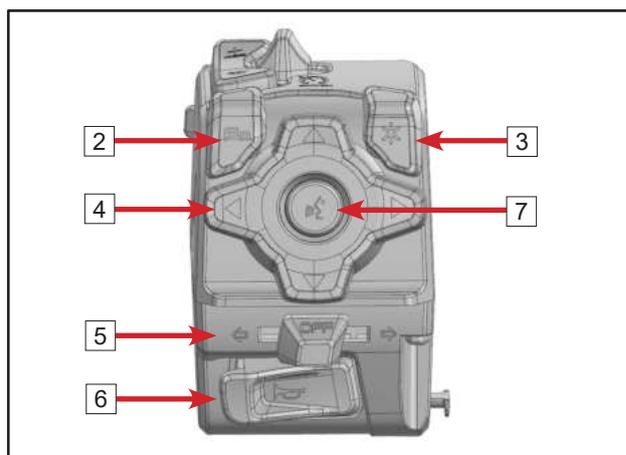
FAN switch2				
Function	Color	Y/G	G	BR
FN		●	●	●

Custom switch3				
Function	Color	Y/G	G	BR
		●	●	●

Menu switch4							
Function	Color	G	B/W	B/L	V	L/W	BR
		●	●				●
		●		●			●
		●			●		●
		●				●	●

Turn switch5					
Function	Color	O	G	GR	SB
		●	●		
OFF			●	●	
			●		●

Horn switch6				
Function	Color	LG	G	BR
		●	●	●



Voice switch7				
Function	Color	Y	G	BR
		●	●	●

Cruise control switch8			
Function	Color	BR	G
RES+		●	●
RES-		●	●

8.4.5.2 RH Handlebar Switch

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

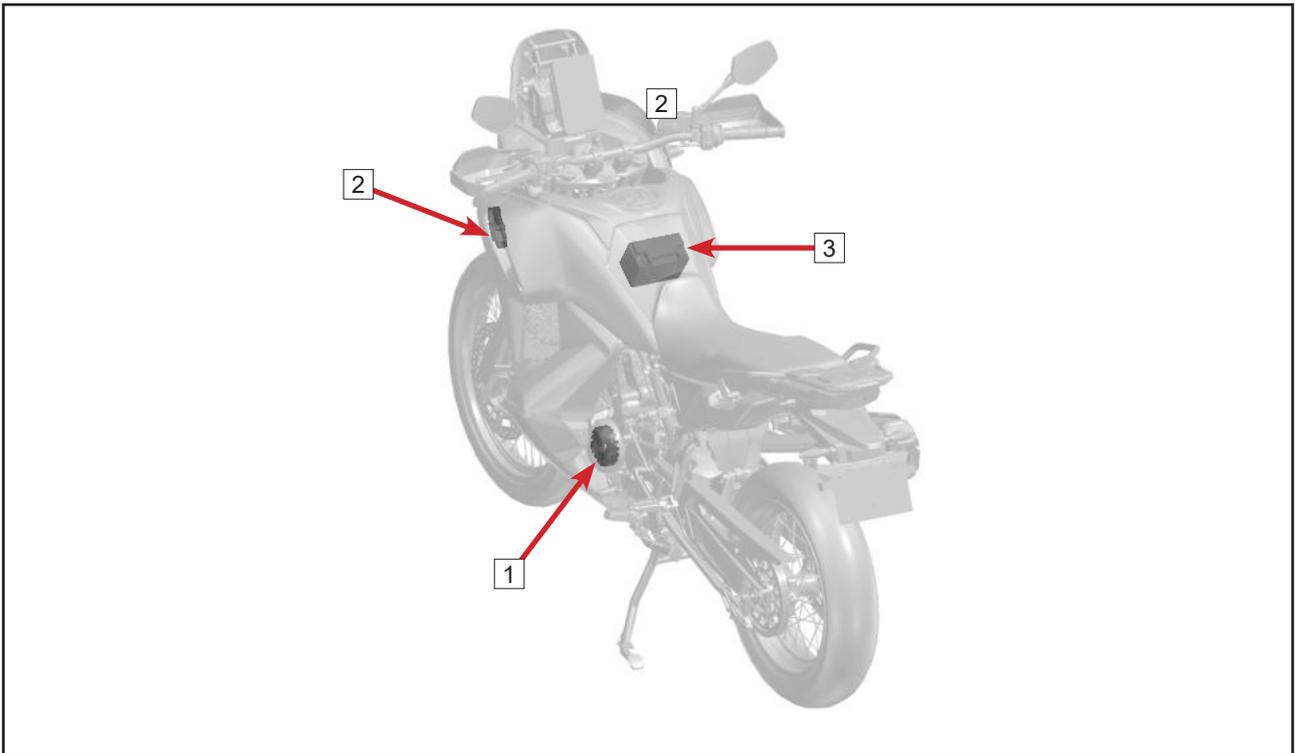
Warning switch1				
Function	Color	P	G	W/G
▲		●	●	●

Start/stop switch2					
Function	Color	B/BR	BR/B	G	Y/W
⊗					
↻		●	●		
Ⓢ		●	●	●	●



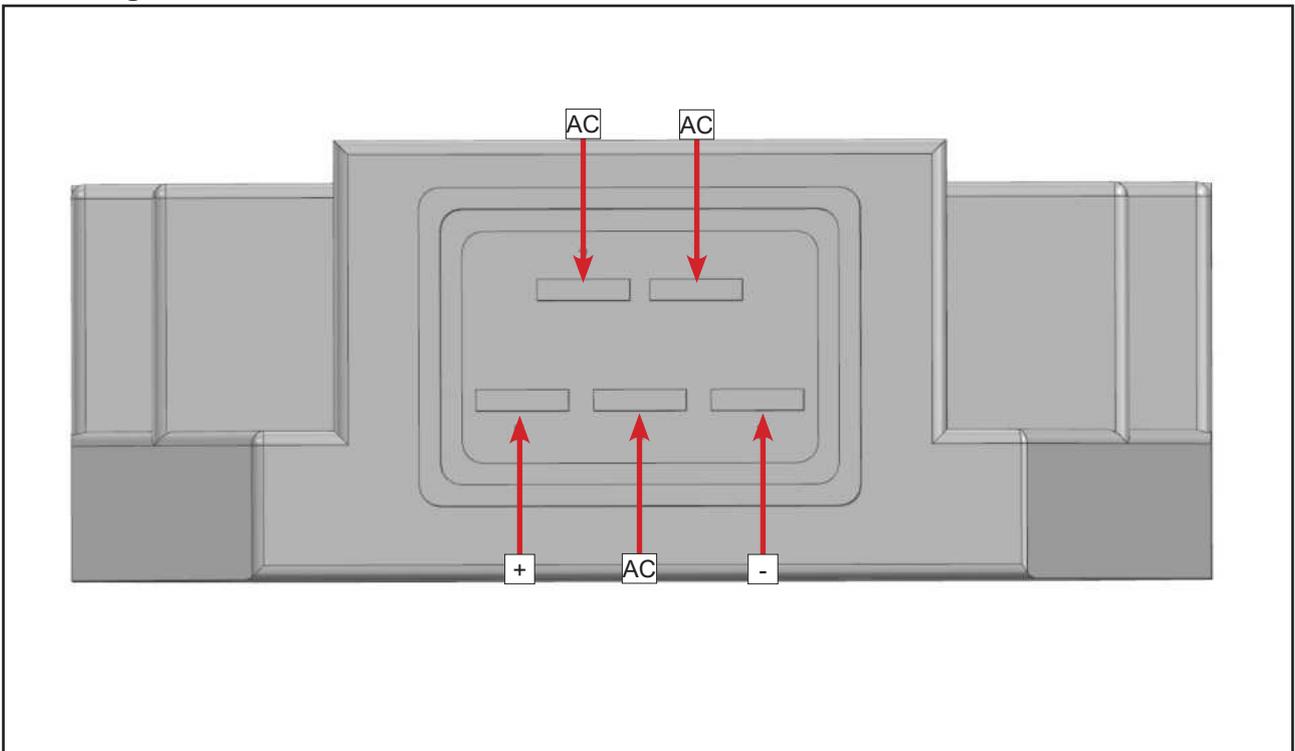
8.5 Charging System/Battery

8.5.1 Charging System Position



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

8.5.2 Regulator



8.5.3 Charging Voltage Inspection

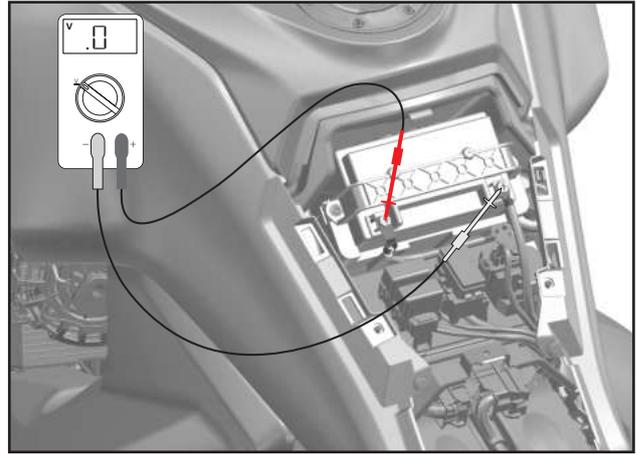
The battery must function properly and be fully charged.

Start the vehicle for voltage measurement.

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

Charging Voltage	
5000rpm	13.5V~15.0V

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

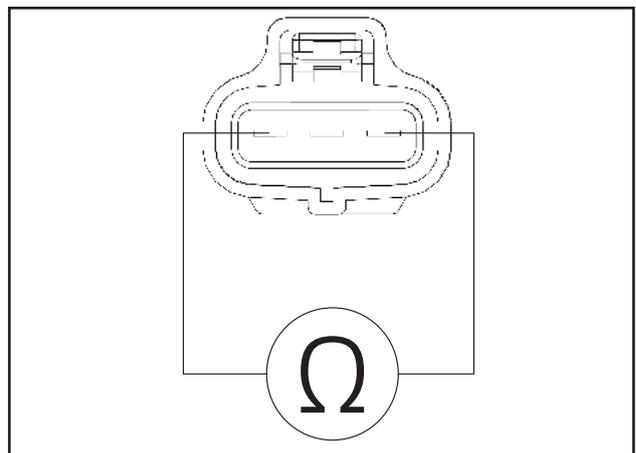
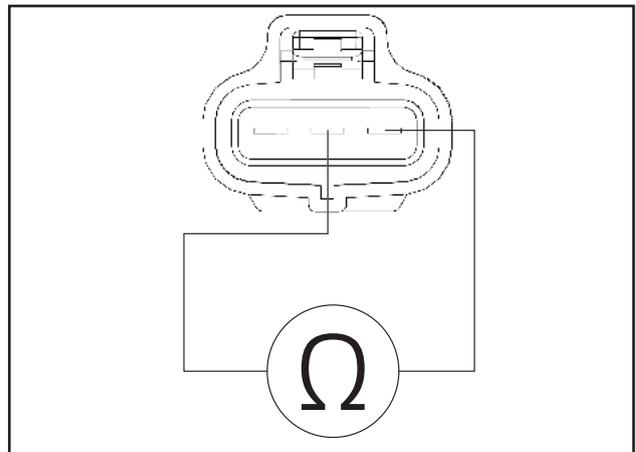
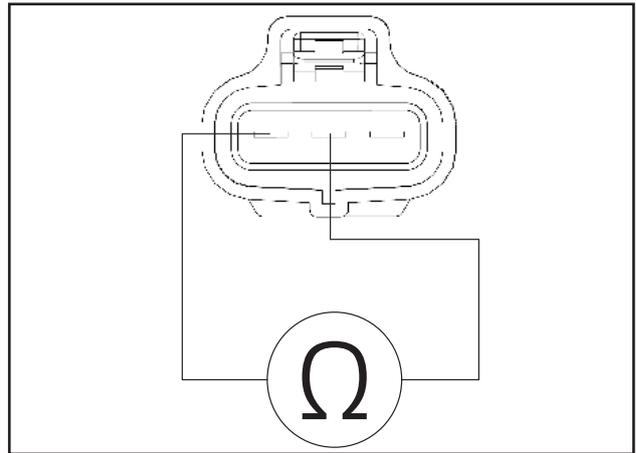


8.5.4 Stator Path Inspection

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.

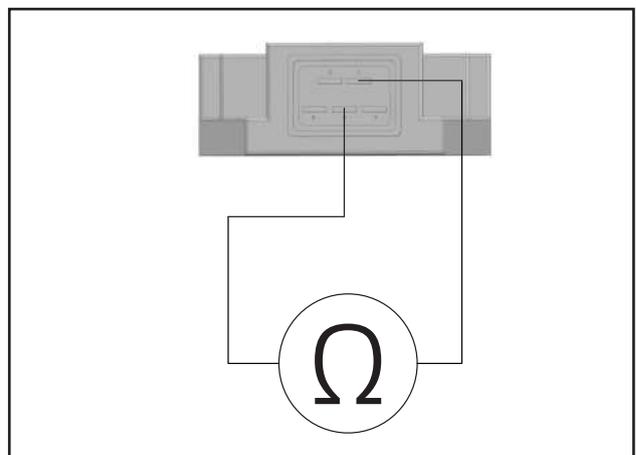
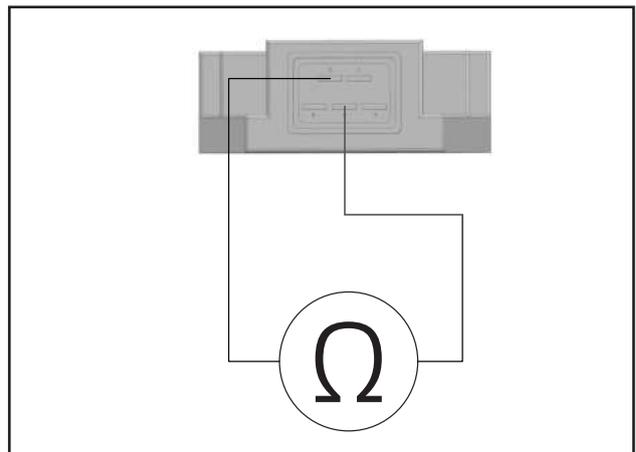
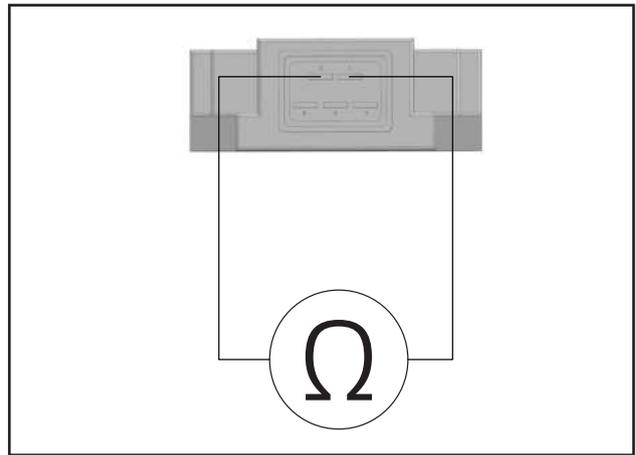


8.5.5 Regulator Path Inspection

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.



8.5.6 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.

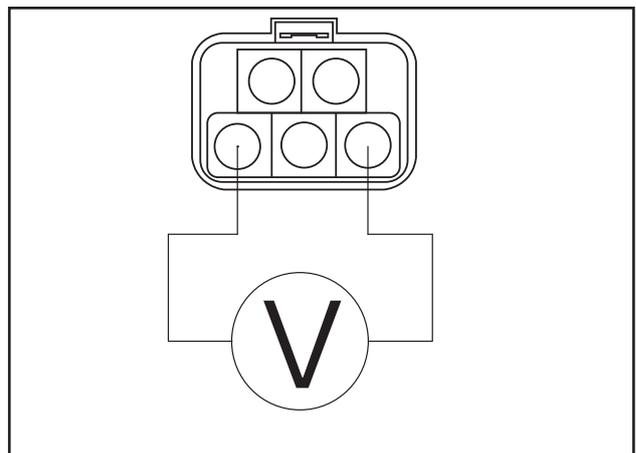
Measure point positive (+), and measure point GND (-).

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.



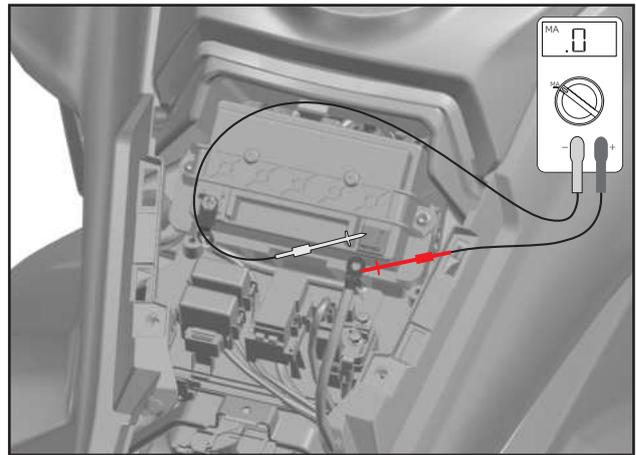
8.5.7 Battery Leakage Inspection

Battery Current Leakage Inspection

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.



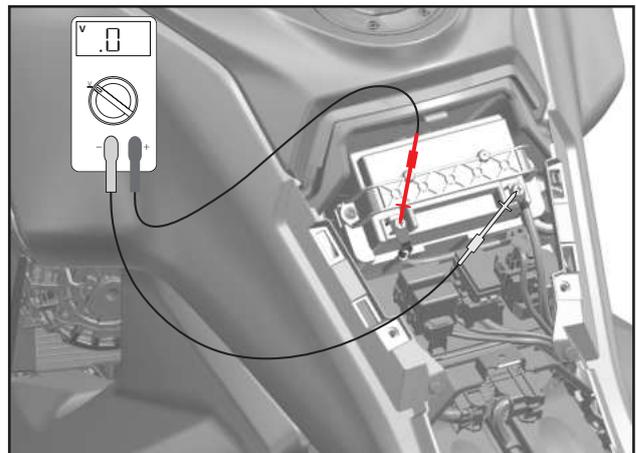
8.5.8 Battery Inspection

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.



8.6 Horn

Removal

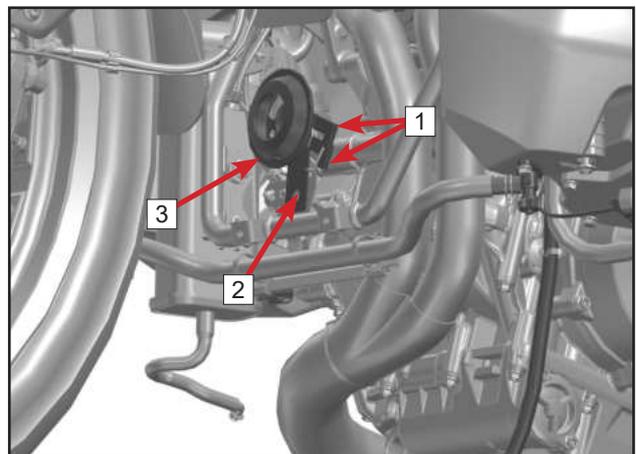
Disconnect the connectors **1**.

Remove bolt **2**.

Remove horn **3**.

Installation

Reverse the removal procedures for installation.



Inspection

Turn on the vehicle power supply.

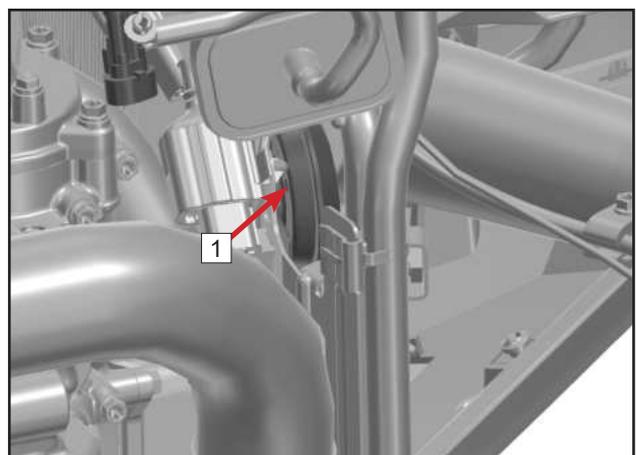
Operate horn switch.

Check whether the horn works.

If the speaker has no sound or the sound is muted.

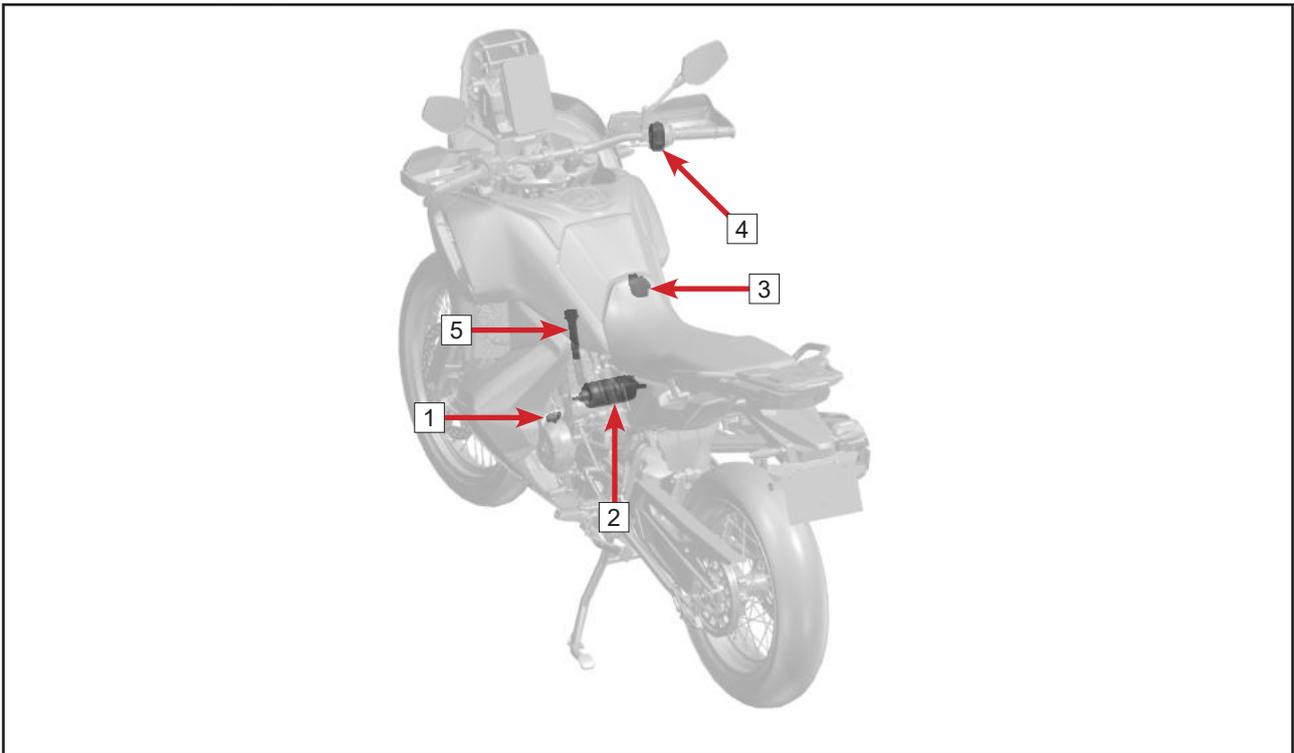
Adjust the bolt **1**.

If the horn fails after adjusting the bolt **1**, replace it with a new part.



8.7 Starting System

8.7.1 Starting System Position



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

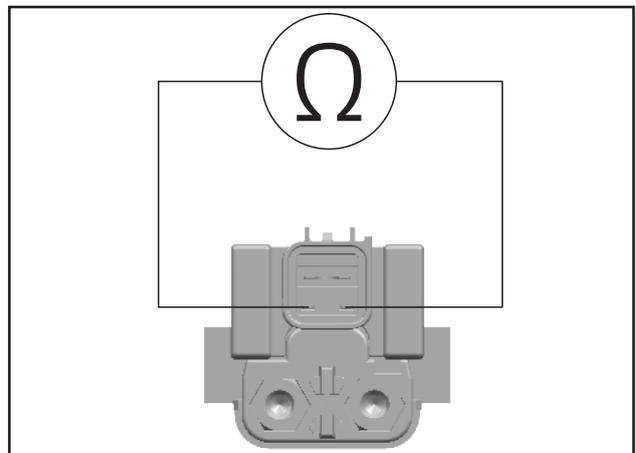
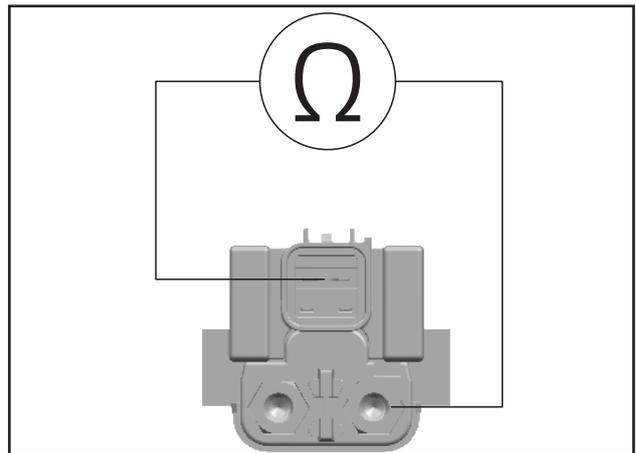
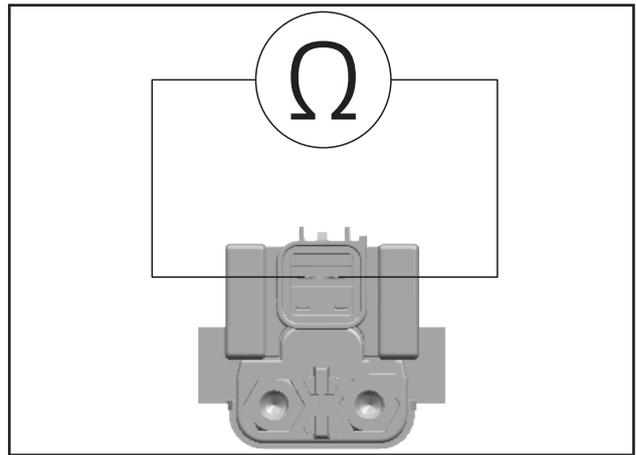
8.7.2 Starter Relay

8.7.2.1 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.

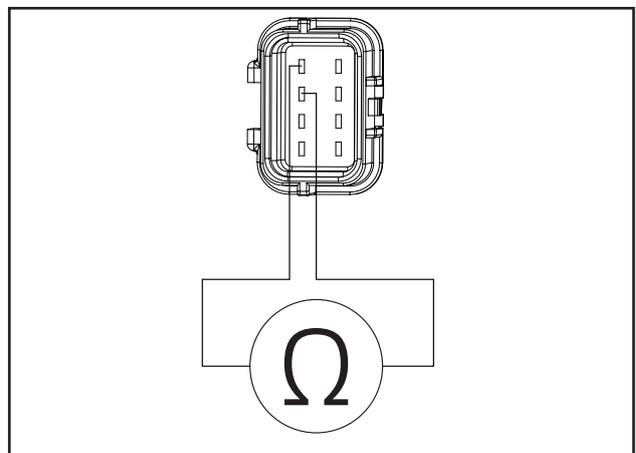
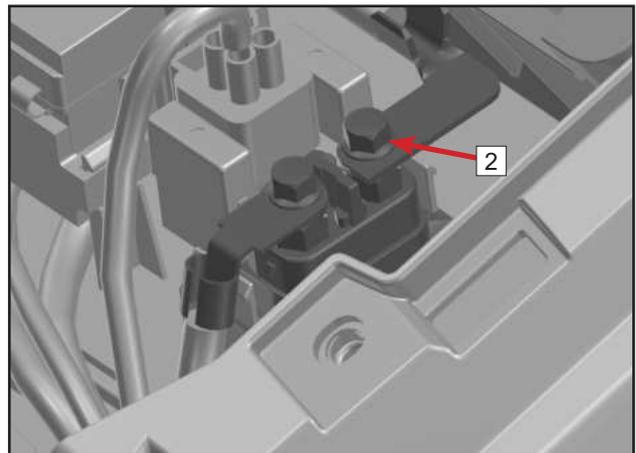
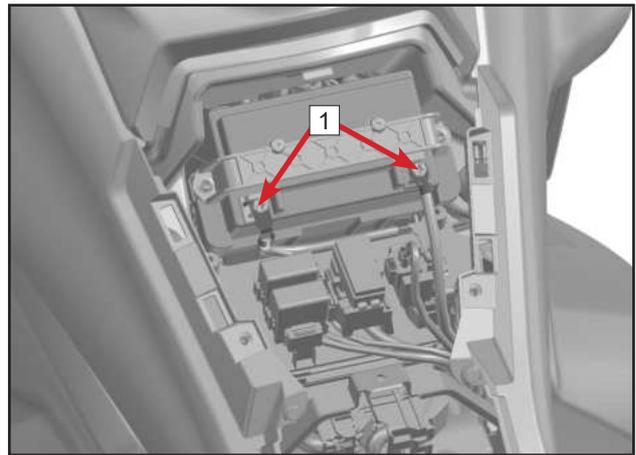


8.7.2 Starter Relay Operation Inspection

1. Disconnect the positive and negative terminals of battery [1].
 2. Disconnect the starter relay starter motor power cord [2]. And do the insulation between the power supply terminals of the starting relay.
 3. Connect the positive and negative terminals of battery [1].
 4. Operate the ignition switch for about 5 seconds, at this time you will hear the starter relay ticking, indicating that the starter relay works normally.
- If there is no ticking sound, the start switch or starter relay may be in poor contact or damaged. Check the start switch or starter relay and replace the damaged part.

CAUTION

The voltage time applied to the relay coil should not exceed two minutes, otherwise it will cause the coil to overheat and cause the coil to burn.

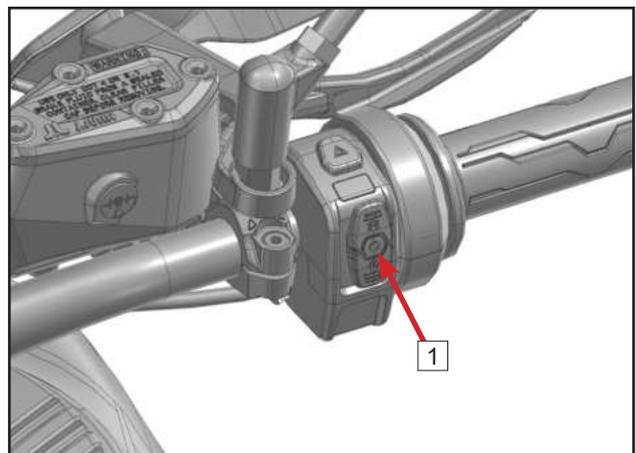


8.7.3 Starting Switch

8.7.3.1 Starting Switch Path Inspection

Turn off the vehicle power off.

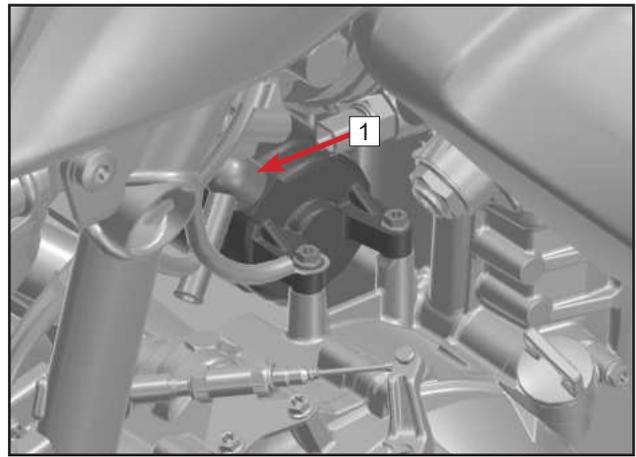
1. Disconnect the connector of RH handlebar starting switch.
 2. Set the multimeter to buzzer, as shown in the picture.
 3. Turn on the ignition switch [1].
 4. Use the multimeter to check whether there is a beep between pins.
- If there is no beep, the starting switch may be in poor contact or damaged. Please replace it with a new one.



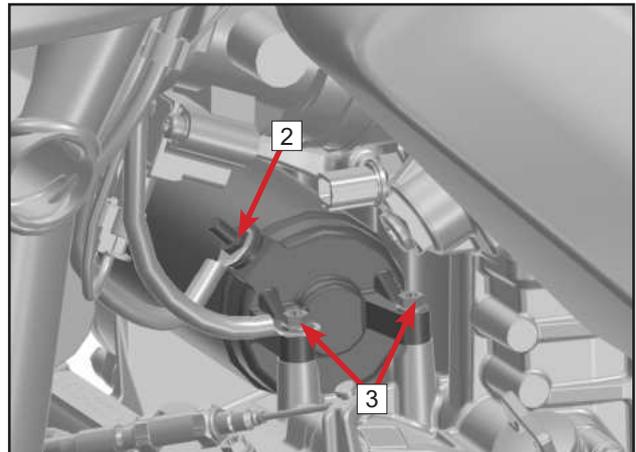
8.7.4 Starter Motor

Removal

Remove protective sleeve **1**.



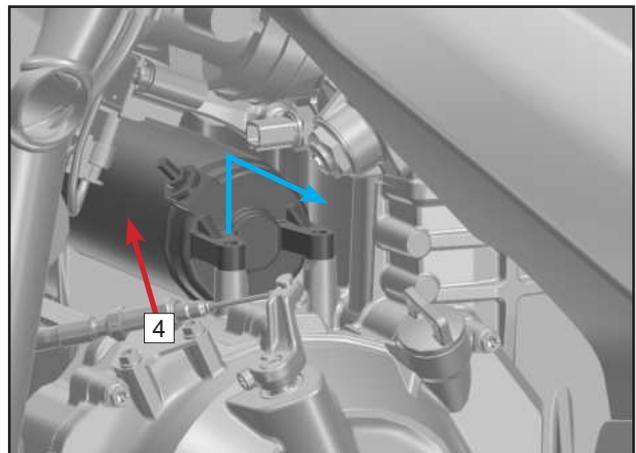
Remove nut **2**.
Remove bolt **3**.



Remove starter motor **4**.

Installation

Reverse the removal procedures for installation.



8.7.4.1 Starter Motor Appearance Inspection

Check the position 1 for ablative marks. If any ablative marks appear, replace them with new parts.



8.7.4.2 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 harness, 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.

8.7.5 Trigger

8.7.5.1 Trigger Peak Voltage Inspection

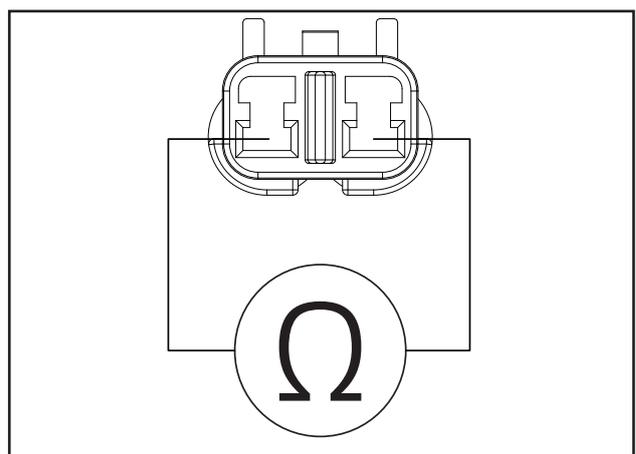
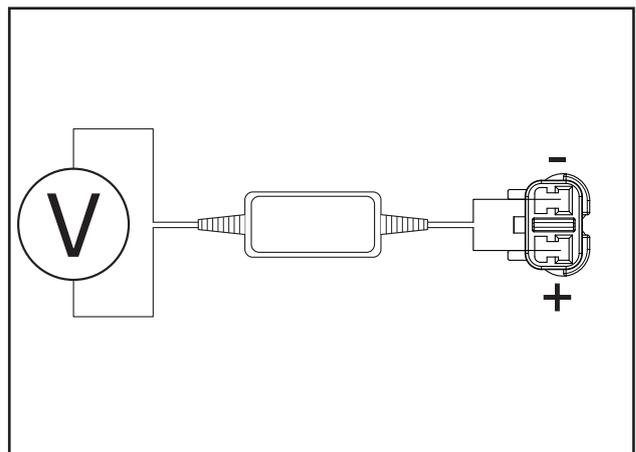
The detection connection of peak voltage is shown in the figure.

Turn on the vehicle power supply.

Start the ignition switch for about 4-5 seconds.

The standard value (AC) of peak voltage: above 3V.

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



8.7.5.2 Trigger Resistance Inspection

Remove the trigger connector.

The detection connection of peak voltage is shown in the figure.

Trigger resistance value: 100Ω~160Ω(20°C)

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

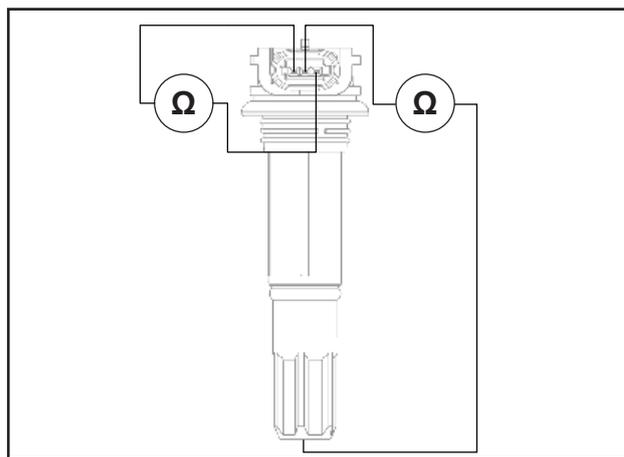
8.7.5.3 Ignition Coil Resistance Inspection

Remove ignition coil.

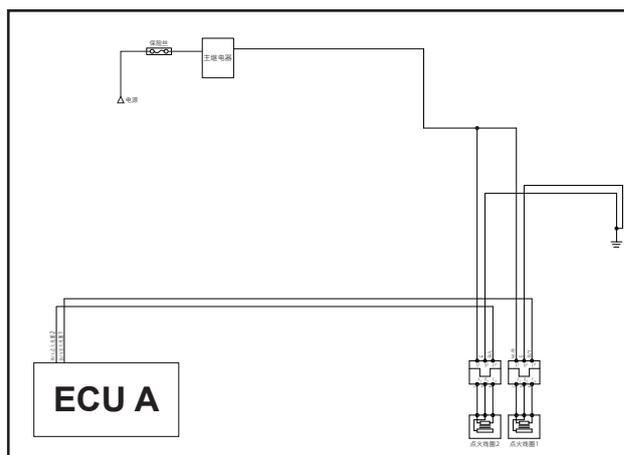
Use the multimeter to measure the ignition coil resistance, as shown in the figure.

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

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



The circuit of connection between the sensor and ECU.



8.8 T-BOX

Removal

Turn off the vehicle power supply.
Remove fuel tank RH panel assembly. (see chapter 06)

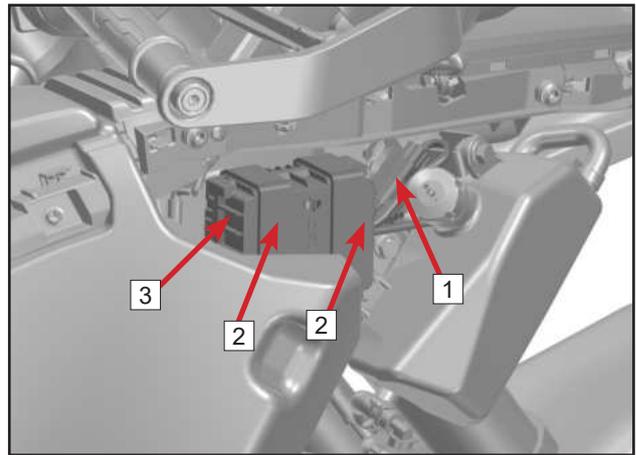
Disconnect the connector **1**.

Remove fixing band **2**.

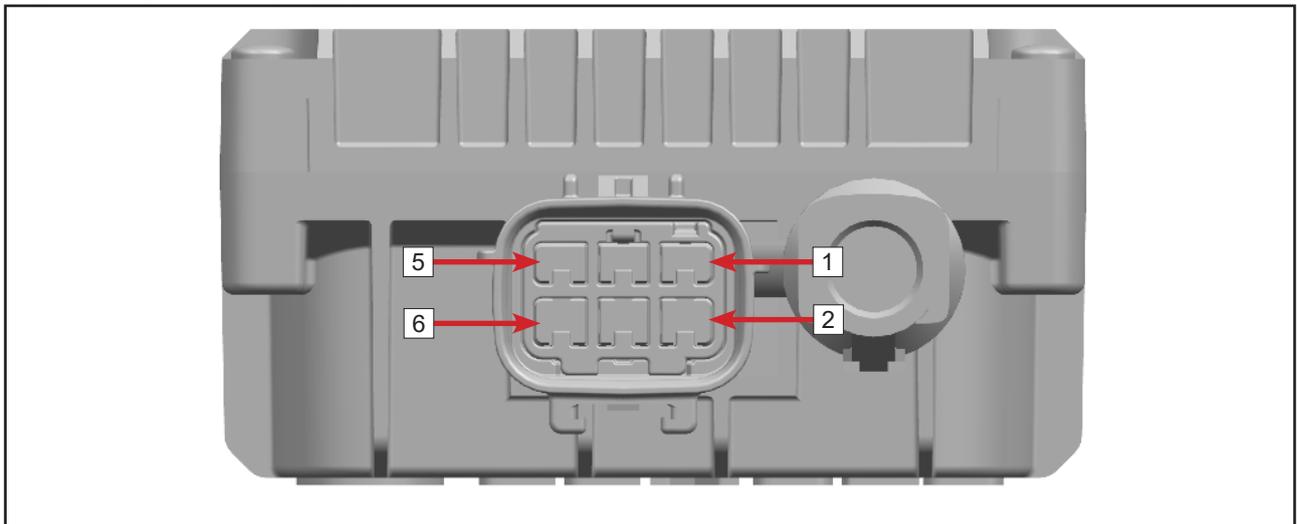
Remove T-BOX **3**.

Installation

Reverse the removal procedures for installation.



8.8.1 T-BOX Pin Function



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

8.8.2 T-BOX Fault Code

No.	Code	Information	Countermeasures
1	B111716	Vehicle power supply voltage below threshold	<p>1. Check battery.</p> <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>
2	B111717	Vehicle power supply voltage above threshold	<p>1. Check battery.</p> <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>
3	U007388	CAN bus off fault of BICAN	<p>Condition: The vehicle is powered off. Remove the battery.</p> <p>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.</p> <p>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.</p> <p>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.</p> <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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4	U118287	Lost communication of MMI	<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. Check MMI 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>
5	U11C087	Lost communication of BCM	<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. Check BCM 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>
6	B1A4087	KL30 Disconnected	<p>Condition: The vehicle is powered off. Remove the battery.</p> <ol style="list-style-type: none"> 1. Use the multimeter to measure the battery voltage. 2. Use a multimeter to measure the connectivity between the VBAT of TBOX part and the vehicle B+. If the communication does not occur, check the wiring harness. 3. Use a multimeter to measure the connectivity between the GND of TBOX part and the vehicle GND. If the communication does not occur, 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>

7	U220D00	LimpHome DTC	<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_H [PIN4] of TBOX part and the CAN_H [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>
8	U110B87	Lost FAMD communicaiton	<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. Check FAMD 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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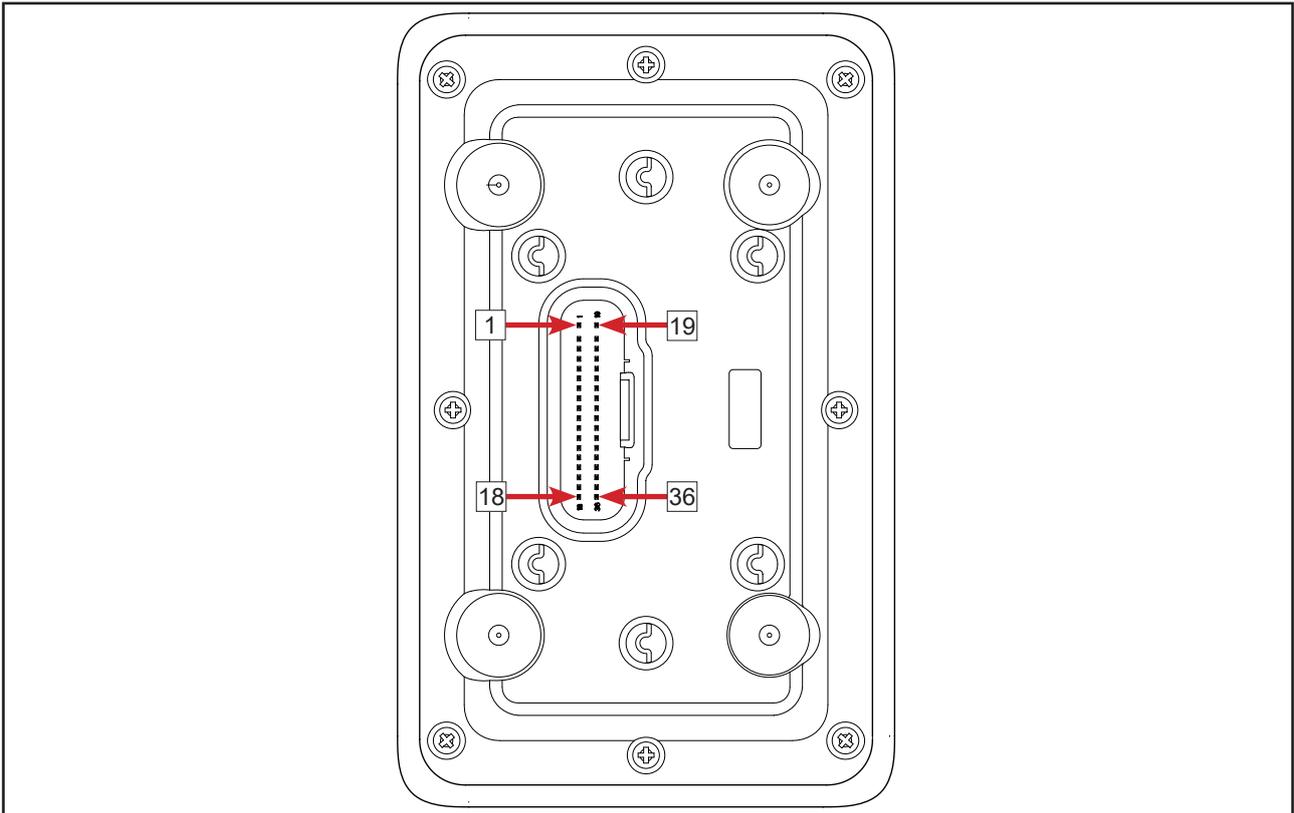
9	U110C87	Lost RAMD communicaiton	<p>Condition: The vehicle is powered off. Remove the battery.</p> <ol style="list-style-type: none"> 1. Use a multimeter to measure the resistance between CAN_H [PIN6] and CAN_L [PIN14] at the OBD port. The measured resistance should range from 54Ω to 66Ω. If the measured resistance is not within the range, check the cable harness. 2. Check RAMD 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>
10	U010587	Lost DASH communicaiton	<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. Check DASH 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>
11	U012187	Lost ABS communicaiton	<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. Check ABS 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>

12	U018087	Lost Lamp communicaiton	<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. Check Lamp 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>
13	U014087	Lost MCU communicaiton	<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. Check MCU 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>
14	U015587	Lost DASH communicaiton	<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. Check DASH 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>

15	U114087	Lost communication of ABS/MSC	<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. Check ABS/MSC 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>
16	U118187	Lost communication of DASH	<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. Check DASH 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>

8.9 Dashboard

8.9.1 Dashboard Pin Function



Pin	Function	Description	Pin	Function	Description
1	Power –	Power GND	21	Motor 2WD signal	Low level signal (reserved)
2	Brake failure signal	Low level signal (reserved)	22	Motor 4WD signal	Low level signal (reserved)
3	Key: Up	Low level signal	23	Position indicator signal	High level signal (reserved)
4	EFI indicator signal	Low level signal (reserved)	24	High-beam indicator signal	High level signal (reserved)
5	Key: Down	Low level signal	25	Oil pressure indicator signal	Low level signal (reserved)
6	Mode switching signal	Low level signal	26	Handlebar switch Fn key	Low level signal
7	Key: Return	Low level signal	27	Steering power failure indicator signal	Low level signal (reserved)
8	Key: Confirm	Low level signal	28	L gear	Low level signal (reserved)
9	LH turn indicator signal	High level signal (reserved)	29	H gear	Low level signal (reserved)
10	RH turn indicator signal	High level signal (reserved)	30	P gear	Low level signal (reserved)
11	Motor 4WD lock signal	Low level signal (reserved)	31	R gear	Low level signal (reserved)
12	Switch 2WD signal	Low level signal (reserved)	32	Buzzer +	Buzzer + (reserved)

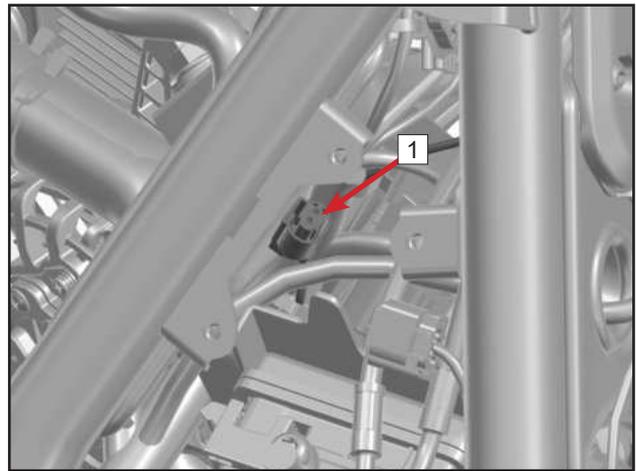
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13	N gear	Low level signal (reserved)	33	Buzzer -	Buzzer – (reserved)
14	E-door lock	High level signal	34	Parking signal (hand brake)	Low level signal (reserved)
15	CAN-H	CAN BUS	35	Speed signal	Voltage pulse signal (reserved)
16	CAN-L	CAN BUS	36	Key-less indicator signal	High level signal (reserved)
17	Switch 4WD lock signal	Low level signal (reserved)			
18	Oil level signal	Resistance signal			
19	Power +	Power +			
20	Seat sensor signal	Low level signal (reserved)			

8.10 Front/Rear Wheel Speed Sensor

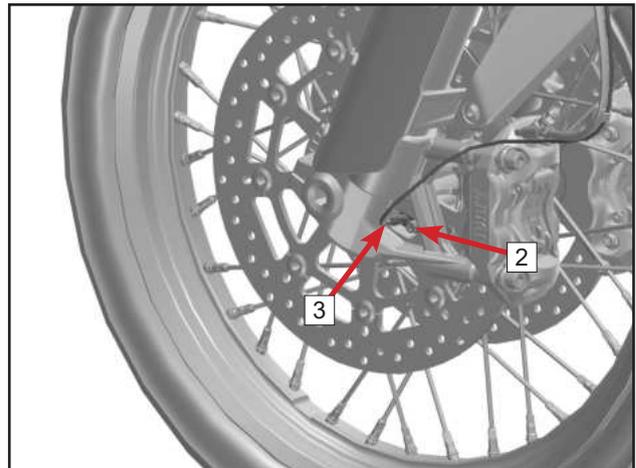
8.10.1 Front Wheel Speed Sensor Removal

Disconnect the connector **1**.



Remove bolt **2**.

Remove front wheel speed sensor **3**.

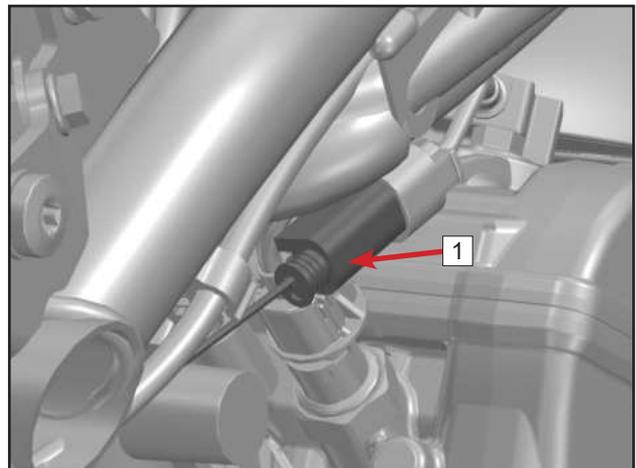


Installation

Reverse the removal procedures for installation.

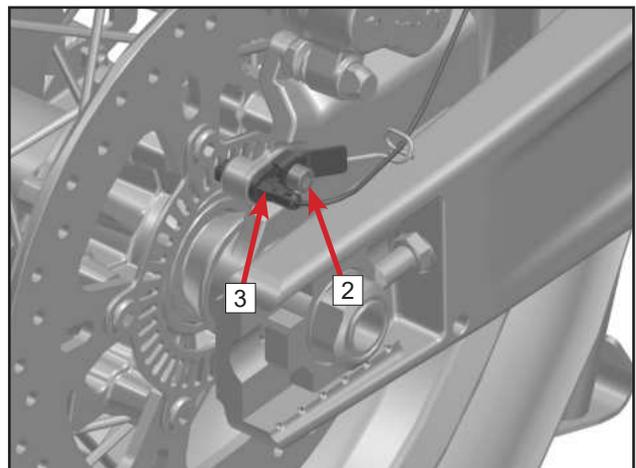
8.10.2 Rear Wheel Speed Sensor Removal

Disconnect the connector **1**.



Remove bolt **2**.

Remove rear wheel speed sensor **3**.



Installation

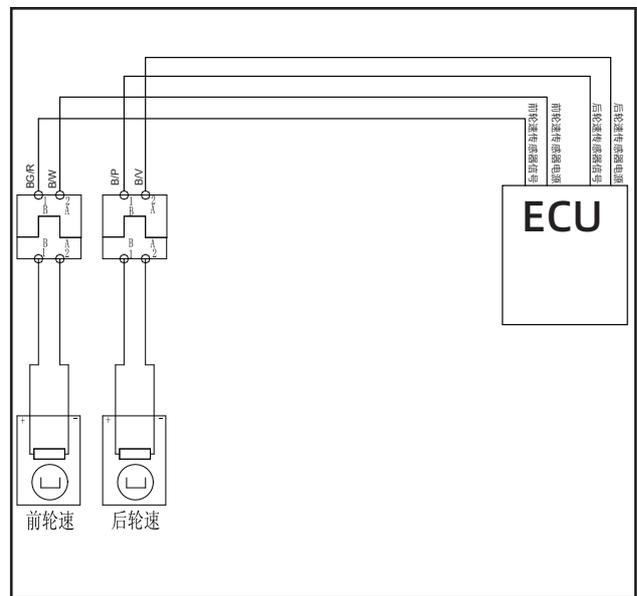
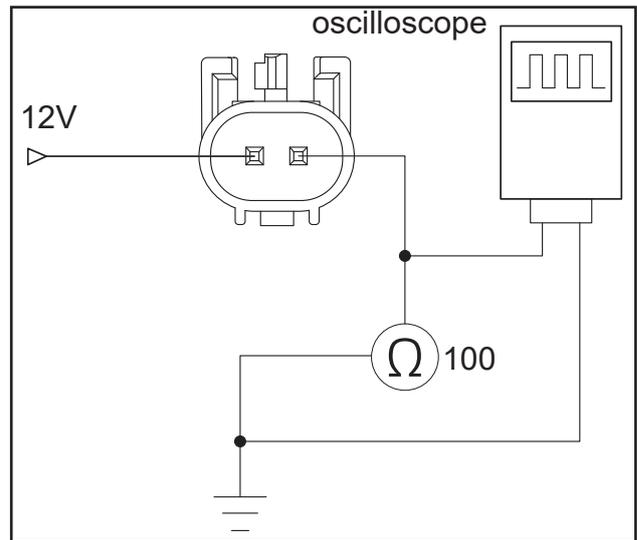
Reverse the removal procedures for installation.

8.10.3 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.

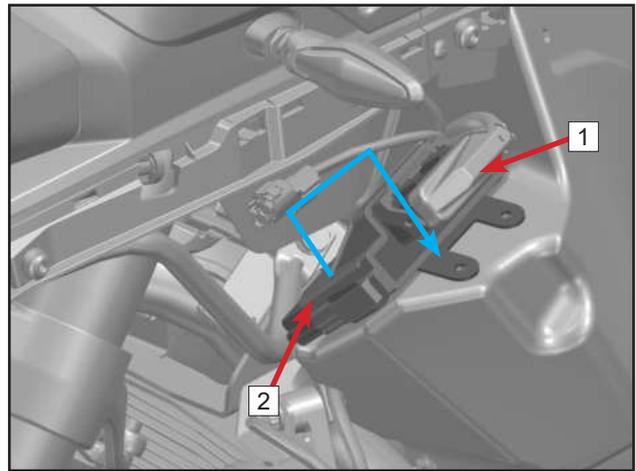
8.11 BCU

Removal

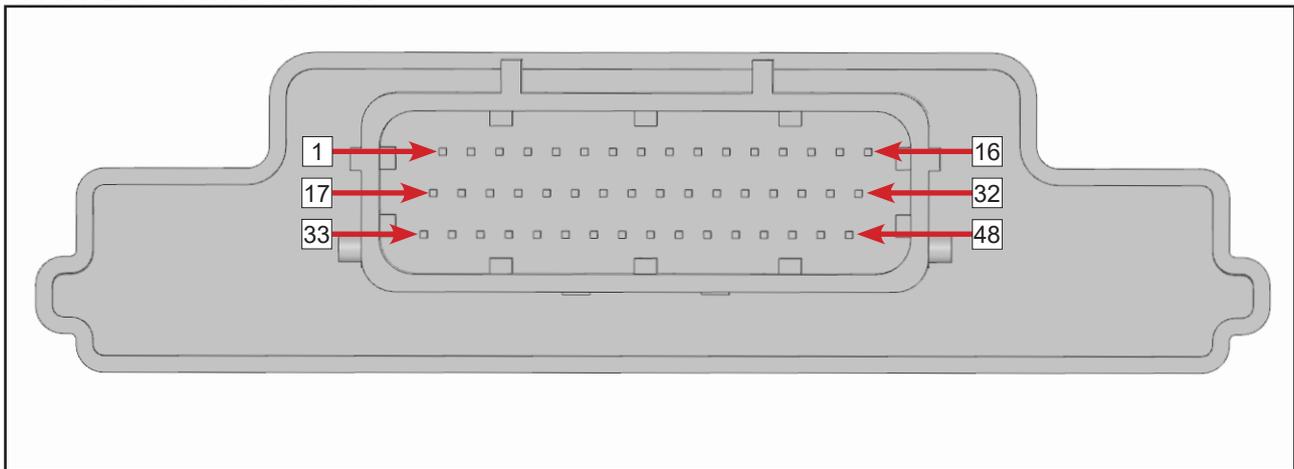
Turn off the vehicle power supply.
Remove fuel tank LH panel. (see chapter 05)
Disconnect the connector 1.
Remove BCU 2.

Installation

Reverse the removal procedures for installation.



8.11.1 BCU Pin Function



Pin	Function	Pin	Function
1	Rear RH turn light	25	Rear brake switch
2	Starter relay control +	26	/
3	Front RH turn switch	27	Warning switch
4	Low-beam light	28	Switch signal GND
5	High-beam light	29	CAN_H
6	Horn switch	30	LH fog light
7	Oil pressure signal	31	Brake light
8	Power –	32	Power +
9	RH turn switch	33	Power +
10	High-beam switch	34	/
11	Side stand lift signal	35	/
12	Grip heating PWM (reserved)	36	/
13	Front/rear position light+License light+Handlebar backlight	37	Fuel level acquisition signal
14	Seat heating PWM (reserved)	38	/
15	Horn	39	Steering reset switch
16	Power +	40	Power –
17	Supply power to ECU	41	Front brake switch
18	Rear LH turn light	42	Power –
19	Front LH turn light	43	START switch
20	Ignition switch	44	/
21	/	45	CAN_L
22	LH turn light	46	RH fog light
23	/	47	ECU enable start signal
24	Fog light switch	48	Power +

8.12 Normal Troubles

Engine Body

Troubles	Possible Cause	Countermeasure
Cannot start or difficult to start	Cylinder pressure too low 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 Spark plug cannot ignite or weak ignition 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 Insufficient fuel inside throttle body 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	Replace Replace Replace Service or replace Tighten Check electrical parts Adjust Adjust Adjust or replace Clean & dry or replace Replace Replace Replace Clean or replace Clean or replace Check or replace Check or replace Clean or replace
	1. Improper valve clearance 2. Unsuitable valve seat 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	Adjust Replace or repair Replace Replace Replace Replace or repair Replace Replace or repair Replace

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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>

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 driven 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

8.13 Trouble Diagnosis In Accordance With Engine

1. Confirm if 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.

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(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 8-12V or not when engine starts.	YES	Next step
		NO	Replace battery
2	Turn on ignition switch, stop switch 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 switches 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 lubricant
		NO	Next step
6	Check if mechanical resistance is too big inside engine.	YES	Check engine inside resistance
		NO	Repeat above procedures

(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 or start engine, check if fuel pressure is around 300kpa.	YES	Next step
		NO	Check and repair fuel supply system
2	Connect PDA, 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 and repair ignition system
4	Test cylinder pressure and check if pressure is enough.	YES	Eliminate engine mechanical failures
		NO	Next step
5	Connect EFI adapter, turn on ignition switch, check if power supply of ECU pin 32 and 33 is normal; check if ECU pin 5, 10 work normally.	YES	Use PDA to check
		NO	Repair related circuit

(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 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 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

(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

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(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

(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

CFMOTO

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:

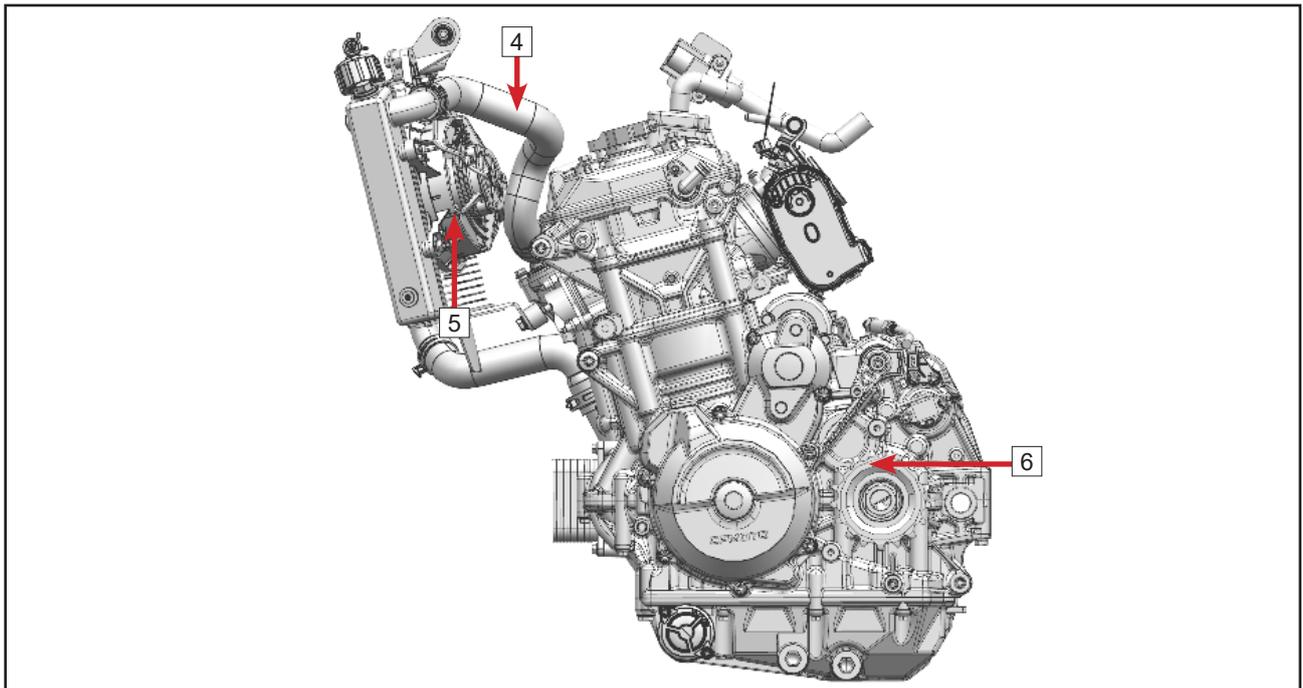
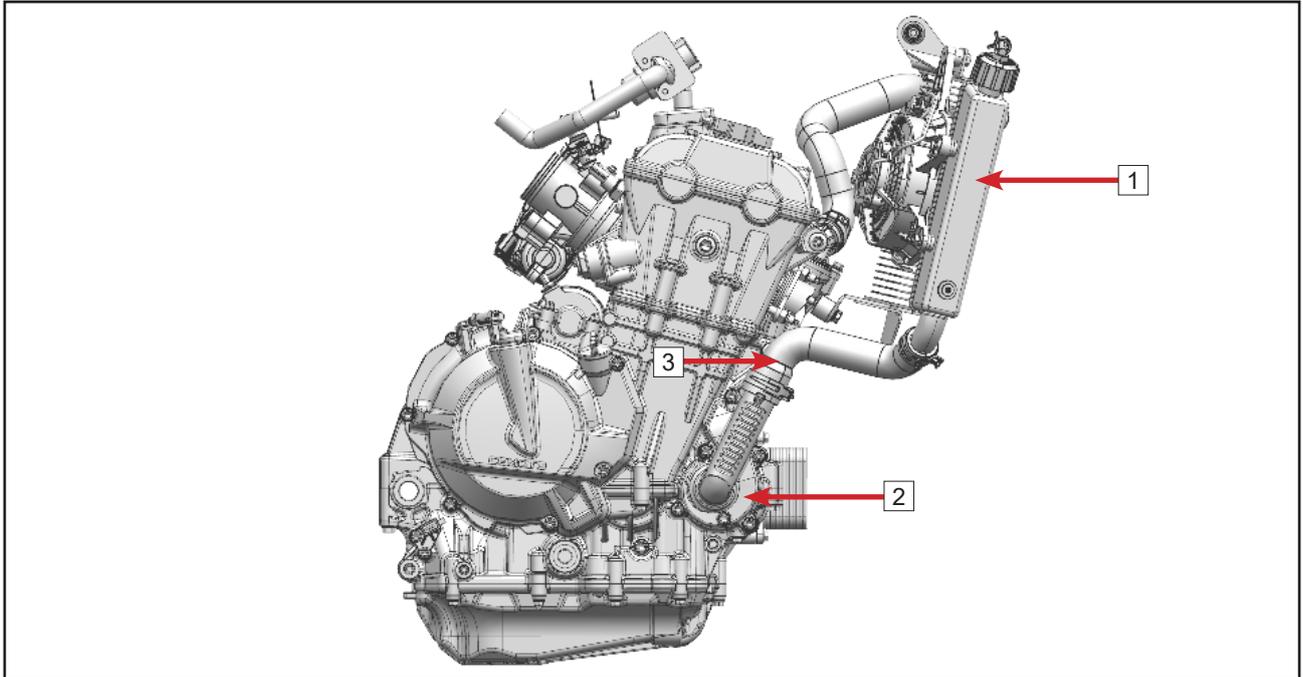
Item	Procedures	Results	Next
1	Check if clutch sliding, low tire pressure, bad brake or wrong tire size.	YES	Repair
		NO	Next step
2	Check if air filter is blocked.	YES	Check and repair air intake system
		NO	Next step
3	Connect fuel pressure gauge, turn on engine, check if fuel pressure is around 300kPa.	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

08 Electrical System

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

9.1 Cooling System Diagram	9-2
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9.4 Seal Inspection	9-4
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9.8 Coolant Addition.....	9-7
9.9 Coolant Replacement.....	9-7

9.1 Cooling System Diagram



1	R a d i a t o r a s s e m b l y	2	W a t e r p u m p a s s e m b l y	3	R a d i a t o r w a t e r o u t l e t p i p e	4	R a d i a t o r w a t e r i n l e t p i p e
5	F a n m o t o r a s s e m b l y	6	E n g i n e a s s e m b l y				

DANGER

Coolant is toxic. Don't drink nor spill on skin, eyes, clothing. If coolant is swallowed, induce vomit and seek for medical attention. If you get coolant on your skin or in your eyes, immediately wash it off before medical attention. If you spill coolant on your clothing, change your clothing.

Rusting and corroding residues in 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 .

CAUTION

The coolant will be very hot and under pressure when the vehicle is running.

Never open the radiator cap when the engine is still hot. Otherwise, the vapor or hot coolant will cause injury.

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.

9.2 Cooling System Removal

Place a container under water pump.

Remove drain bolt **1**.

Drain coolant.

Loosen clamp **2**.

Remove water outlet pipe **3**.

NOTE

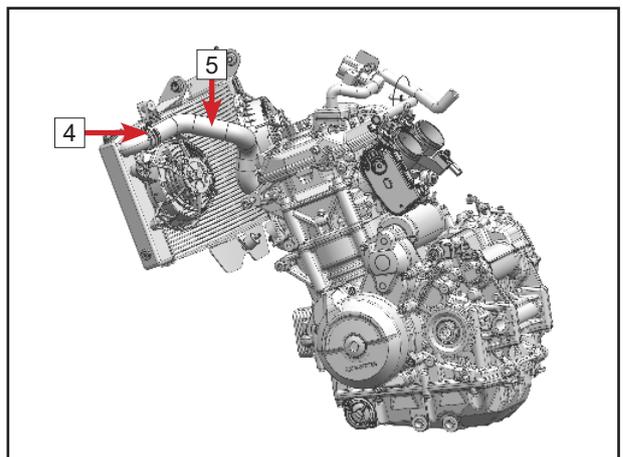
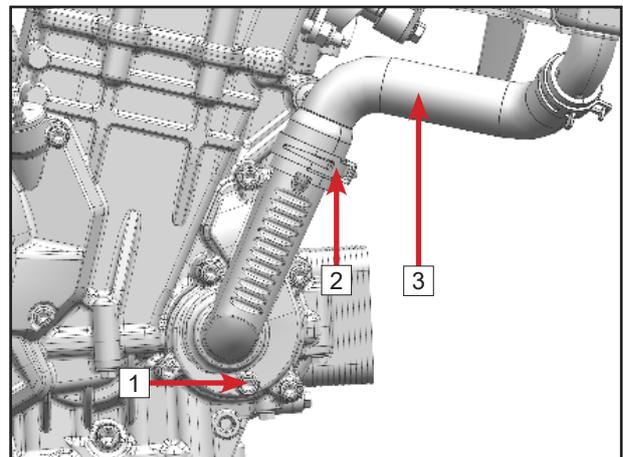
After water outlet pipe removal, there is still some coolant spilling out.

NOTE

There is pressure inside cooling system. The coolant will spill out after removing drain bolt.

Loosen clamp **4**.

Remove water inlet pipe **5**.

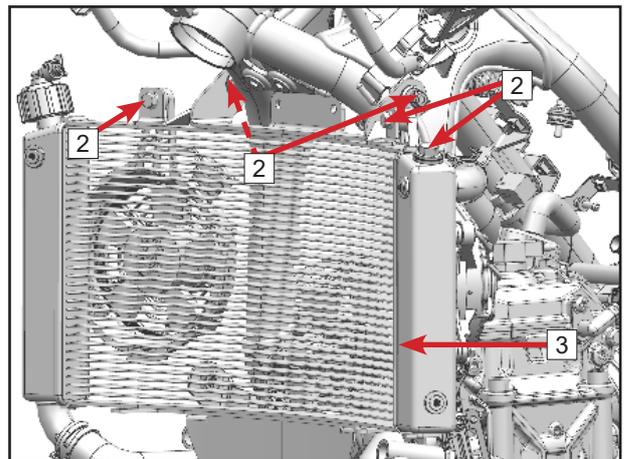
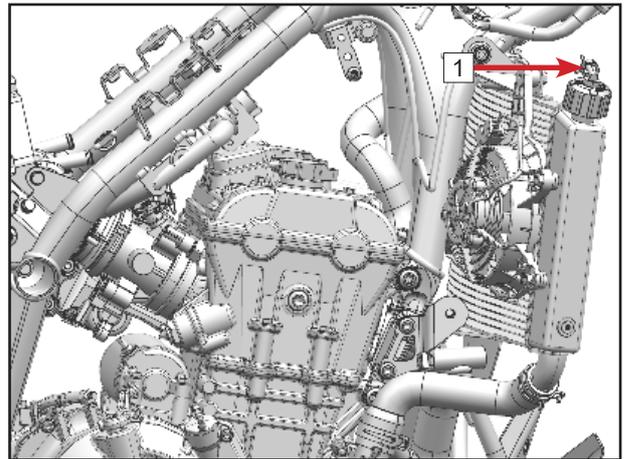


Loosen the clamp [1].
Remove reservoir tank siphon pipe [2].

Remove bolts [2] on the both sides.
Remove radiator [3].

Installation

Reverse the removal procedures for installation.



9.3 Engine Coolant

Coolant in cooling system is a mixture of 51.5% distilled water, 46% ethylene glycol antifreeze and 2.5% additive. This mixture ratio provides optimized corrosion resistance and fine heat production. The mixture has good anti-corrosion and endothermic function, and its solidification point is -35°C . If engine works under -35°C , choose coolant with freezing point of -40°C and -50°C .

⚠ CAUTION

Use high quality ethylene glycol base antifreeze mixed with distilled water. Never mix alcohol base anti-freeze or other different brands of antifreeze. The ratio of mixture should not be more than 60% or less than 50%. Do not use anti-leak additive.

9.4 Seal Inspection

Radiator Cap Inspection

Remove radiator cap.
Measure the open pressure of radiator cap with pressure gauge.
If the pressure is out of standard, replace a new part.

Radiator Cap Open Pressure:

135kPa~160kPa

1.35kgf/cm²~1.6kgf/cm²

19.58psi~23.2psi

Standard:

140kPa

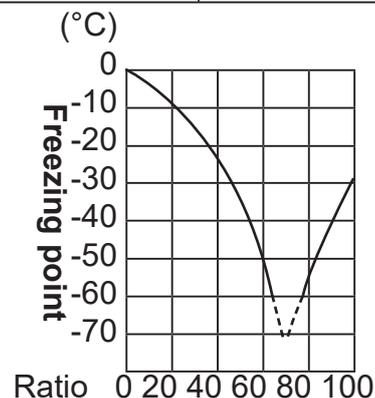
1.4kgf/cm²

20.3psi

Seal Inspection

Connect the pressure gauge with reservoir joint.

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



⚠ WARNING

Never open the radiator cap when the engine is still hot. Otherwise, the vapor or hot coolant will cause injury.

Inflate to 135 kPa, and last for 10s.

If the pressure decreases within 10s, there is leaking inside the system. Inspect the whole system and replace the broken parts.

NOTE

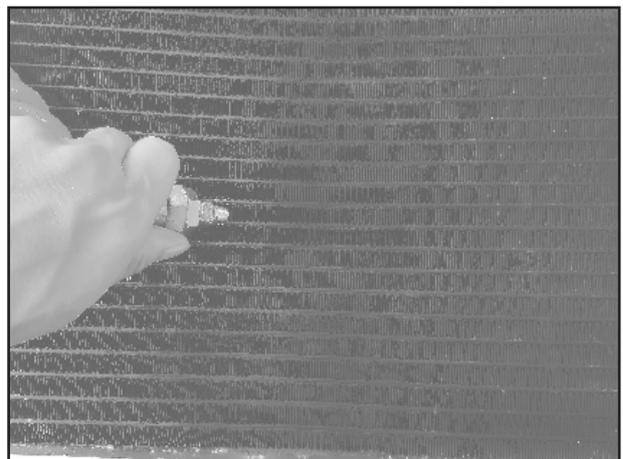
When remove the gauge, cover radiator cap with cloth, in case the coolant spills out.

NOTE

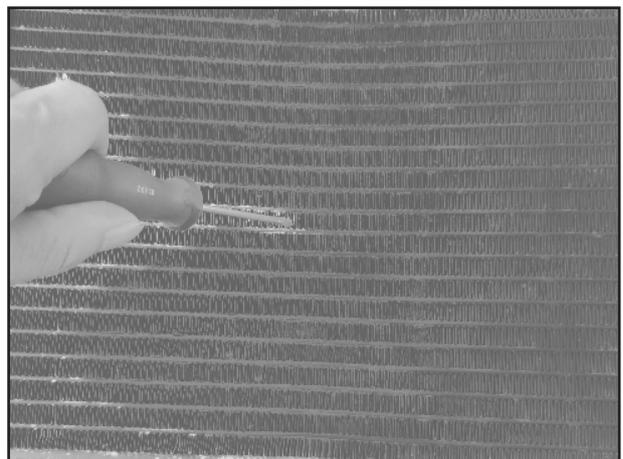
The testing pressure does not exceed the open pressure.

9.5 Radiator and Water Pipes Inspection and Clean

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



Repair radiator fins with a small screwdriver.



Radiator Water Pipes Inspection

Inspect radiator water pipes for leakage, damage. Replace if necessary.

Inspect radiator water pipe clamps. Replace if loose.

After radiator and water pipes inspection, inspect the coolant. Add coolant if necessary.

9.6 Fan Motor Inspection

Remove bolts [1].

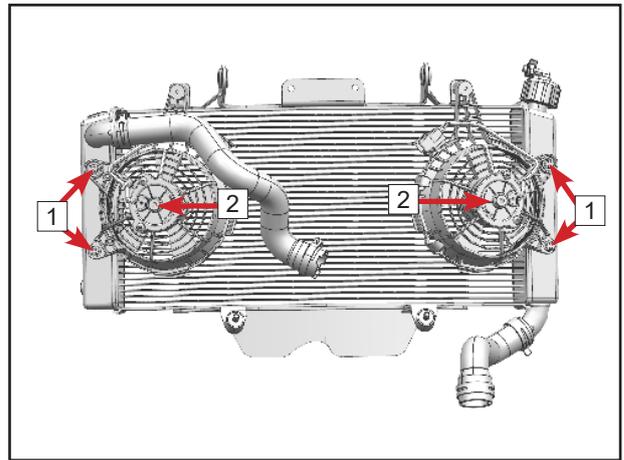
Remove fan motor assembly [2].

Rotate impeller to check performance.

Replace fan motor assembly [2] if stuck or damaged.

Battery voltage is 12V, make motor work, the electrical current is no more than 5A.

Replace fan motor assembly [2] if motor doesn't work or current exceeds.



Installation

Reverse the removal procedures for installation.

9.7 Coolant Inspection

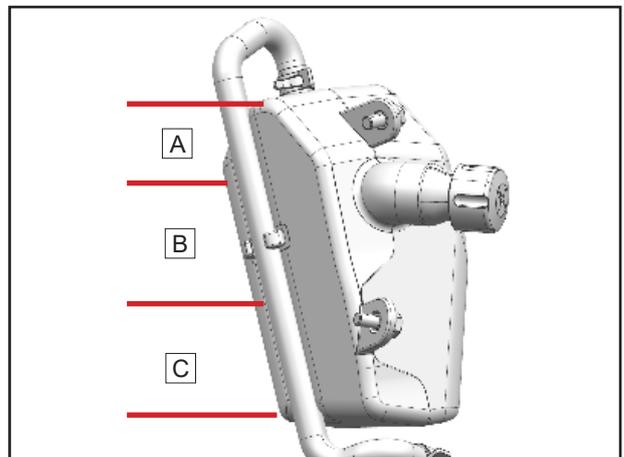
Support vehicle with side stand on level ground.

Make sure the coolant completely cools down and check coolant level.

If the level locates A area, drain coolant until the level is at B area.

If the level locates B area, it is appropriate.

If the level locates C area, add coolant until the level is at B area.



⚠ WARNING

The coolant temperature is very high and compressed as well when the vehicle is running.

Do not open radiator, radiator hose, reservoir tank or other cooling system part before engine or cooling system completely cools down.

Once scalding occurs, rinse the wound with running cold water for at least 10 minutes until the wound is no longer painful. Seek for medical treatment in time.

9.8 Coolant Addition

Open reservoir tank cap and add coolant until level is at B area.

⚠ CAUTION

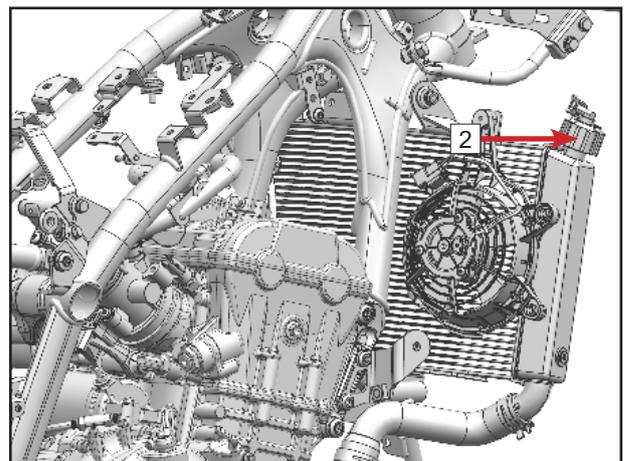
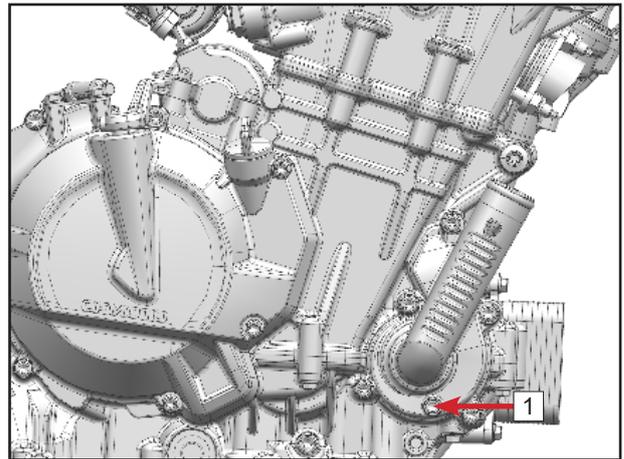
If the coolant needs to be refilled frequently, or the coolant in the secondary tank is often sucked up and drained, the cooling system may leak. Contact your dealer to check the cooling system.

It is only recommended to use the original coolant of CFMOTO. Different coolant mixing may cause engine damage. Contact your dealer to replace the coolant.

9.9 Coolant Replacement

Preconditions: Prop up the vehicle using side stand 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 the drain bolt 1.
3. Release the radiator pressure cap.
4. Drain the coolant (Make sure that the coolant in the reservoir is cleared).
5. Install the drain bolt
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.

10.1 Engine Panel, Exhaust Pipe	10-2
10.1.1 Engine Panel.....	10-2
10.1.2 Exhaust Pipe.....	10-3
10.2 Exhaust Pipe Inspection	10-4

DANGER

The temperature of muffler is very high after engine runs for a while. Do not park the vehicle near inflammable and explosive articles when removing muffler. Never operate high temperature parts like muffler when the vehicle isn't cool down, in case of burnt issue.

The muffler will emit toxic and hazardous gas. Do not operate in a closed or no effective ventilation environment. The poisonous and harmful gas emitted by the muffler may cause poisoning or even death.

10.1 Engine Panel, Exhaust Pipe

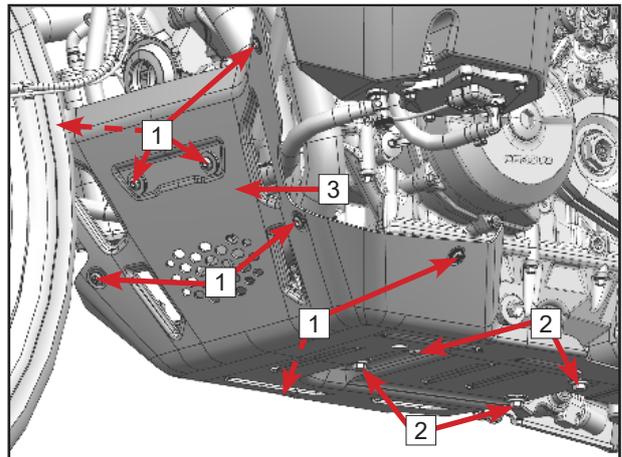
10.1.1 Engine Panel

Removal

Remove eight screws .

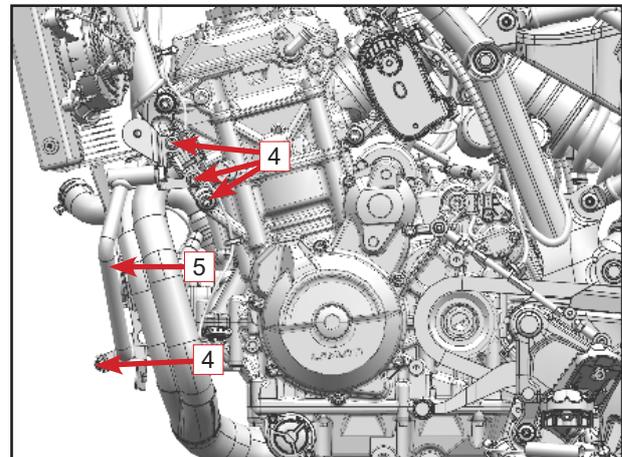
Remove four nuts .

Remove engine lower panel .



Remove the left and right four inner hex bolts .

Remove guard bar .



Installation

Reverse the removal procedures for installation.

10 Exhaust System

10.1.2 Exhaust Pipe

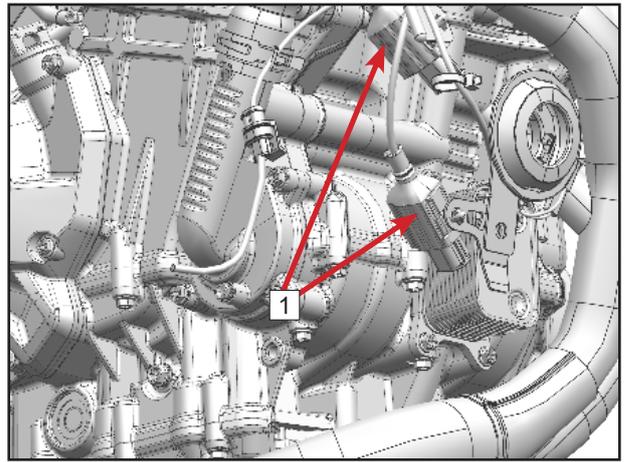
Pre-work

Remove the rear RH footrest. (see chapter 05 Body Covering Parts)

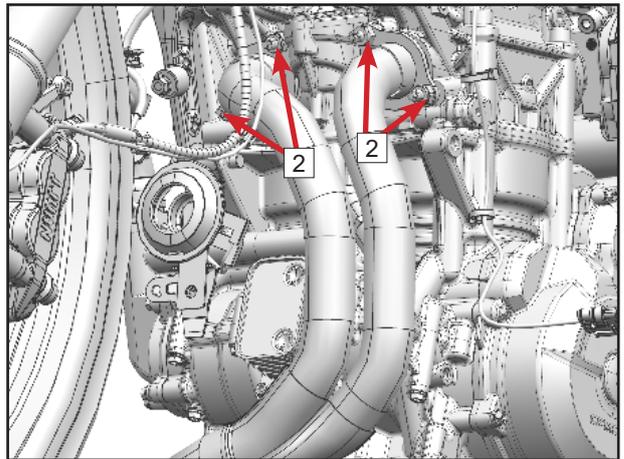
Disconnect oxygen sensor connector **1**.

NOTE

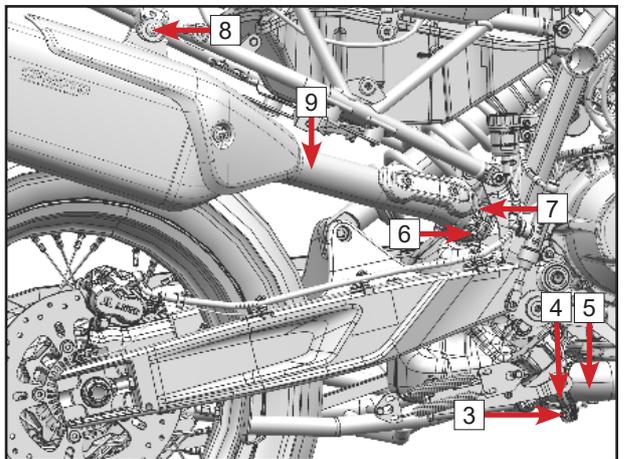
Mark the oxygen sensor terminals so that they correspond to the "L" and "R" marks of the connector.



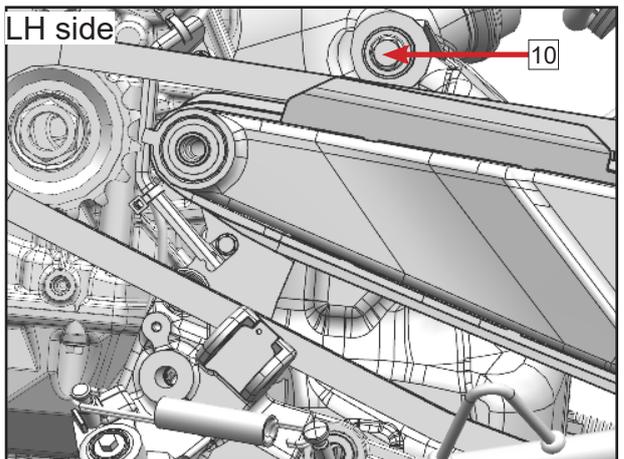
Remove four lock nuts **2**.



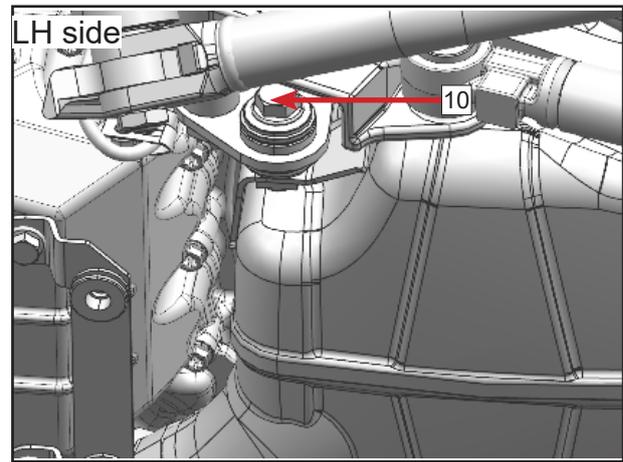
- Remove one bolt **3**.
- Remove the clamp **4**.
- Remove exhaust pipe assembly **5**.
- Remove one bolt **6**.
- Remove the clamp **7**.
- Remove one screw **8**.
- Remove muffler body assembly **9**.



Remove three bolts **10**.

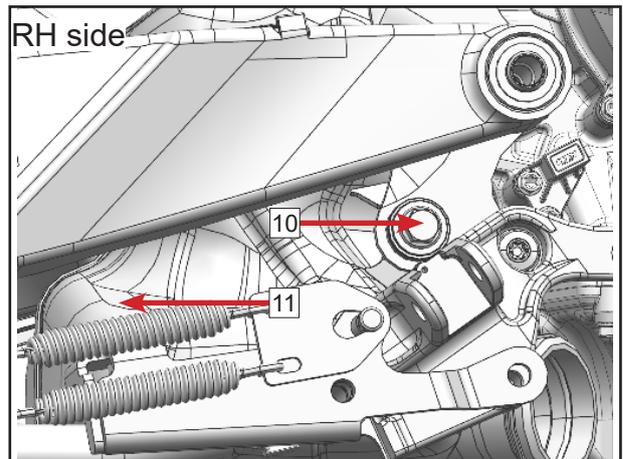


Remove front cylinder body assembly **11**.



Installation

Reverse the removal procedures for installation.



10.2 Exhaust Pipe Inspection

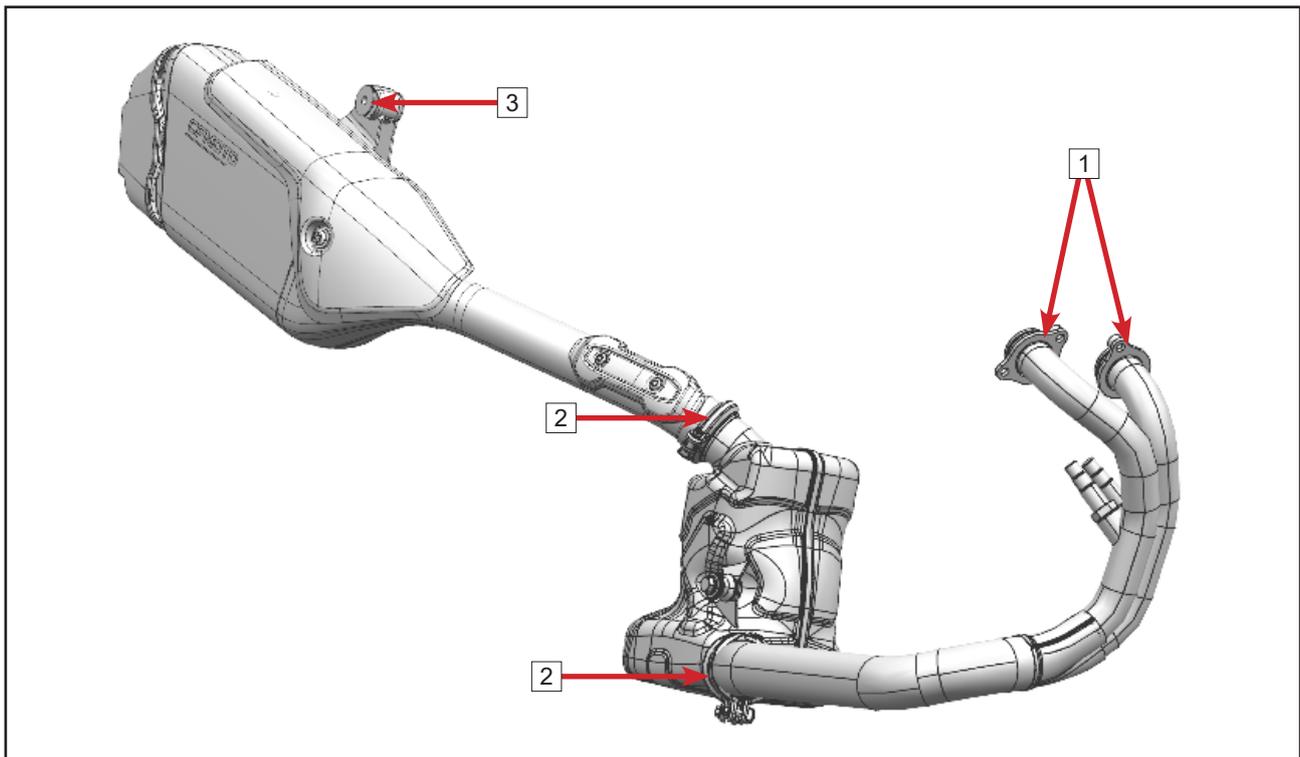
Check the appearance of exhaust pipe for damage. Replace if it does.

Check exhaust pipe graphite sealing sleeve **1** **2**.

Check exhaust pipe sealing gasket **1** for corrosion, crack or deformation.

Replace with new parts in time if it does.

Check the cushion collar **3** for crack or corrosion. Replace it in time if it does.



11 Front, Rear Wheels and Brake System

11.1 Front Brake Caliper	11-2
11.2 Front Wheel	11-2
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NOTE

Before removing wheels, support vehicle with bracket or other device to make tires off the ground.

11.1 Front Brake Caliper

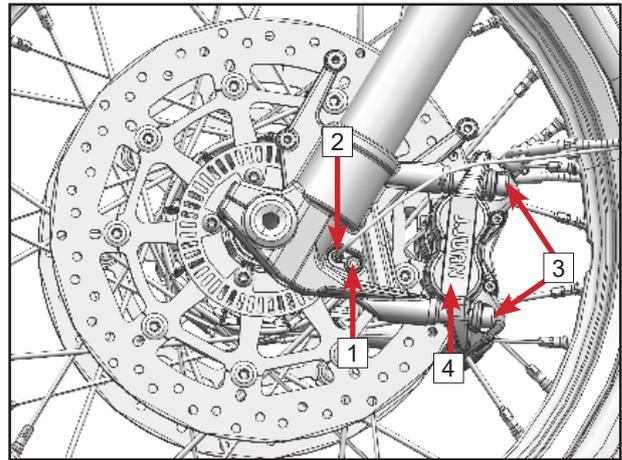
Removal

Remove inner hex bolt **1**.

Remove speed sensor **2**.

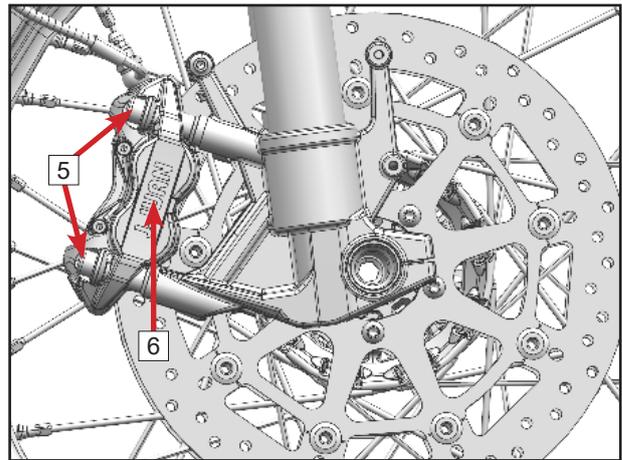
Remove inner hex bolts **3**.

Remove LH front brake caliper **4**.



Remove inner hex bolts **5**.

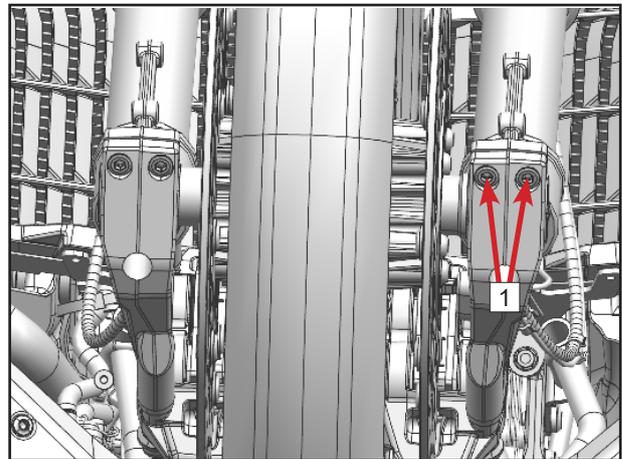
Remove RH front brake caliper **6**.



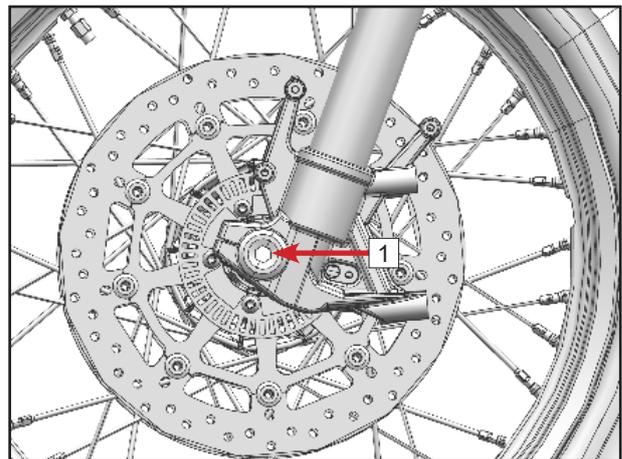
11.2 Front Wheel

Removal

Remove two screws **1**.

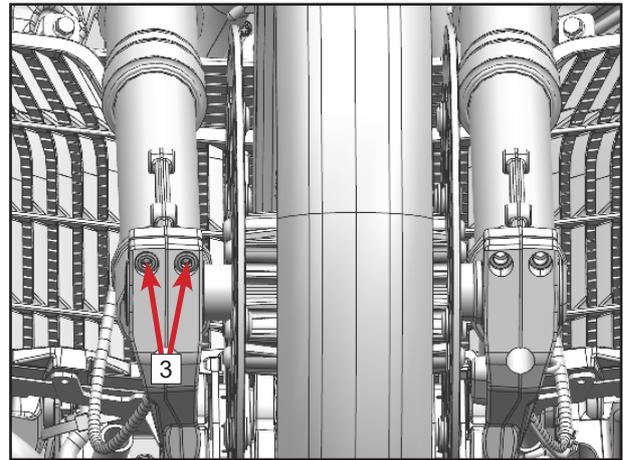


Loosen front wheel shaft tighten screw **2**.

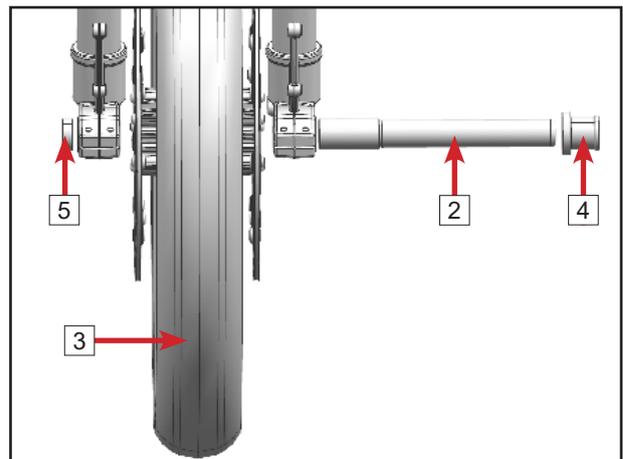


11 Front, Rear Wheels and Brake System

Remove two screws **3**.



Remove front wheel shaft **2**.
Remove front wheel **3**.



Keep front wheel LH bushing **4** and RH bushing **5** to prevent missing.

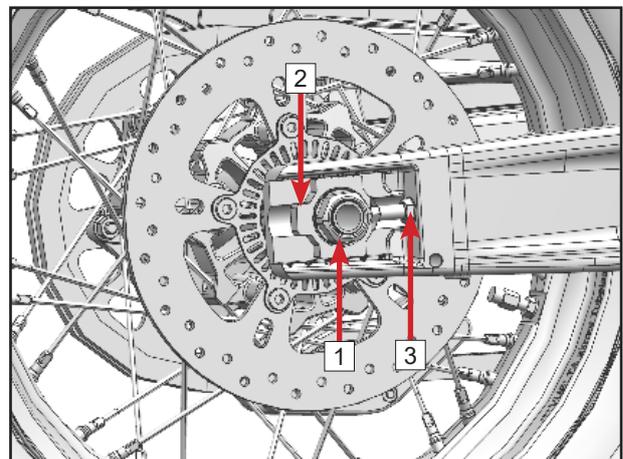
11.3 Rear Wheel

Removal

Remove rear wheel shaft tighten nut **1**.

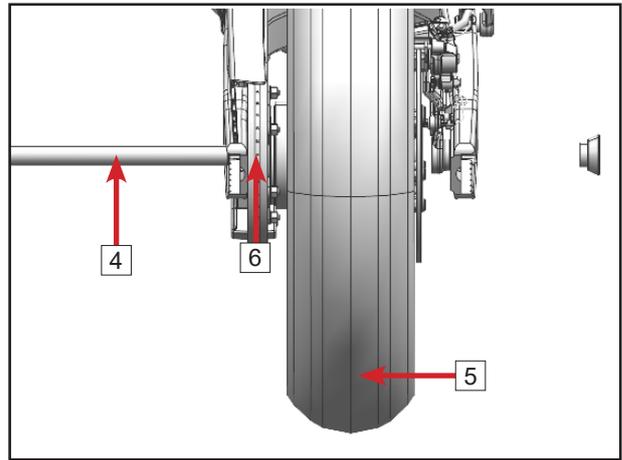
Remove chain adjusting block **2**.

Adjust lock nut **3**.



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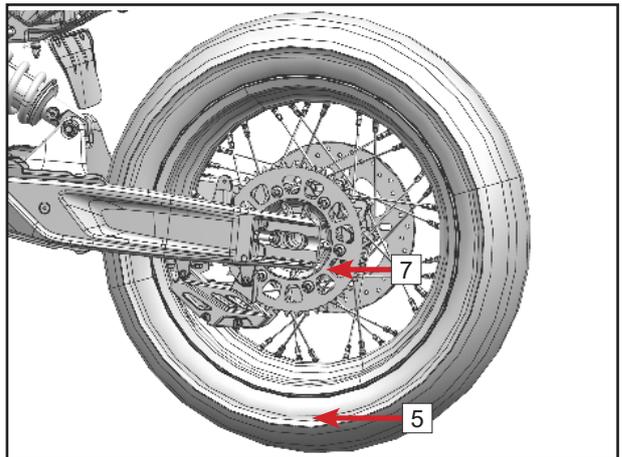
Pull out rear wheel shaft **4**.
Push rear wheel **5** forward.
Remove chain **6** from the sprocket.



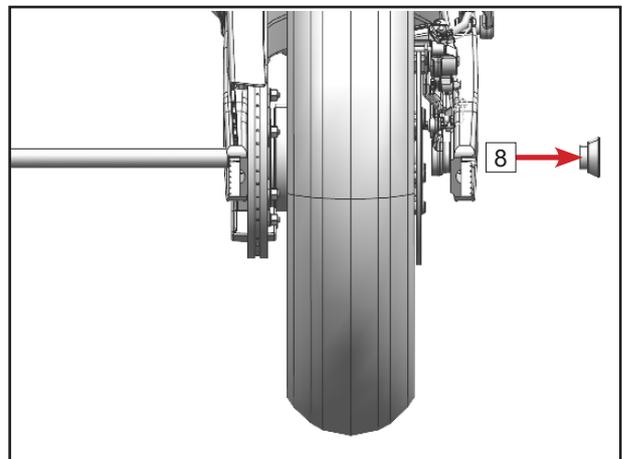
Remove rear wheel **5**.
Avoid sprocket seat **7** falling from the left side.

⚠ CAUTION

Lean rear wheel slightly to right during removal, in case of sprocket seat falling down to cause injury.



Keep rear wheel bushing **8** to prevent missing.

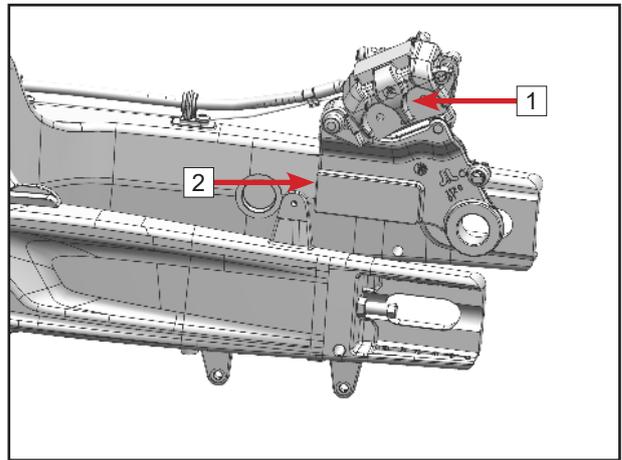


11 Front, Rear Wheels and Brake System

11.4 Rear Brake Caliper

Removal

Remove rear brake caliper **1** from limit block **2**.



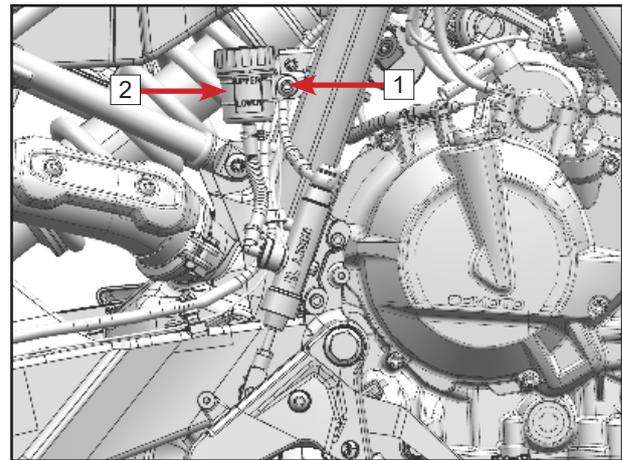
11.5 Brake Master Cylinder

11.5.1 Rear Brake Master Cylinder

Removal

Remove bolt **1**.

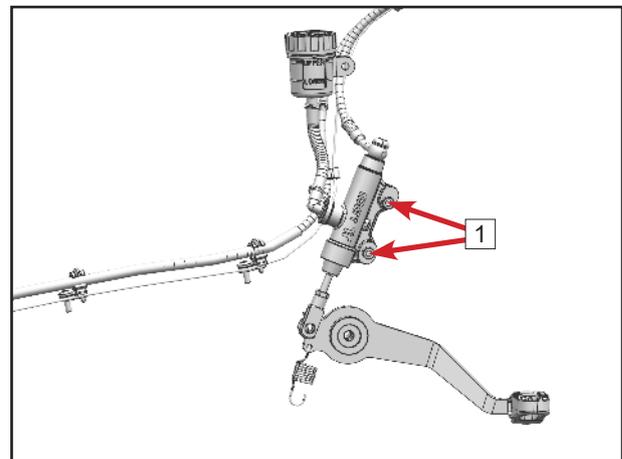
Remove rear brake reservoir **2**.



CAUTION

Never put brake fluid reservoir up side down, in case the air gets into the system, which leads to brake system failure.

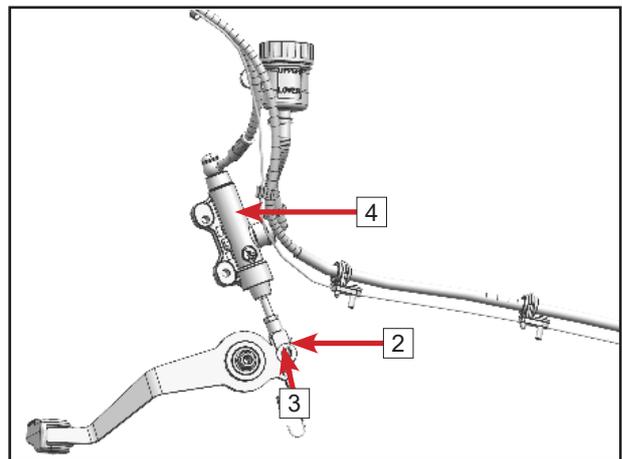
Remove bolts **1**.



Remove brake master cylinder pin **2**.

Remove brake master cylinder pin shaft **3**.

Remove brake master cylinder **4**.



11.5.2 Hand Brake Master Cylinder Assembly

Removal

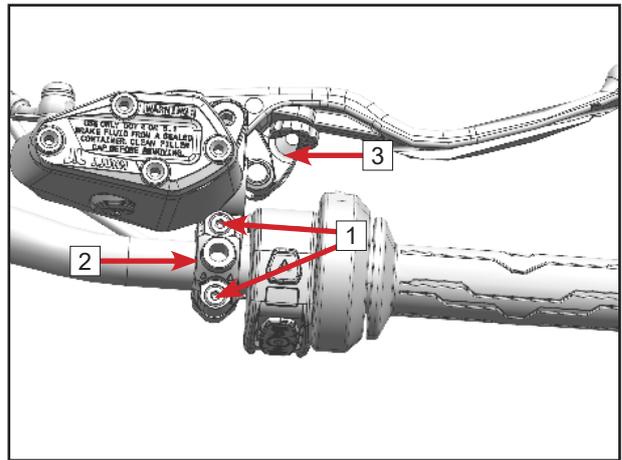
Remove bolts [1].

Remove press cover [2].

Remove hand brake master cylinder assembly [3].

CAUTION

Never put brake fluid reservoir up side down, in case the air gets into the system, which leads to brake system failure.



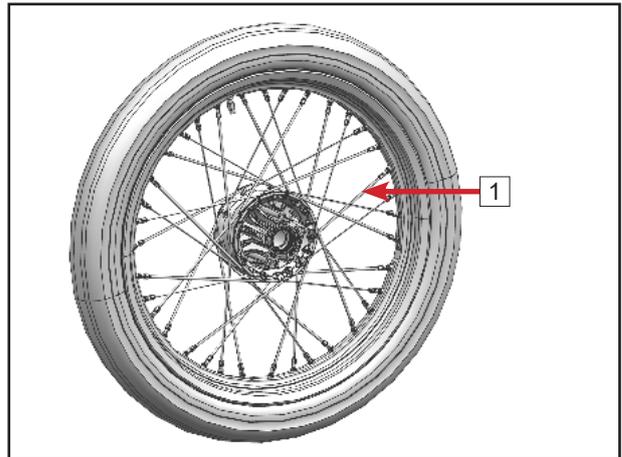
11.6 Wheel Inspection

Warning: Special tire press machine must be used to remove the tire. Avoid the vicinity of valve nozzle when picking the tire to prevent damage to the tire pressure sensor.

11.6.1 Front Wheel

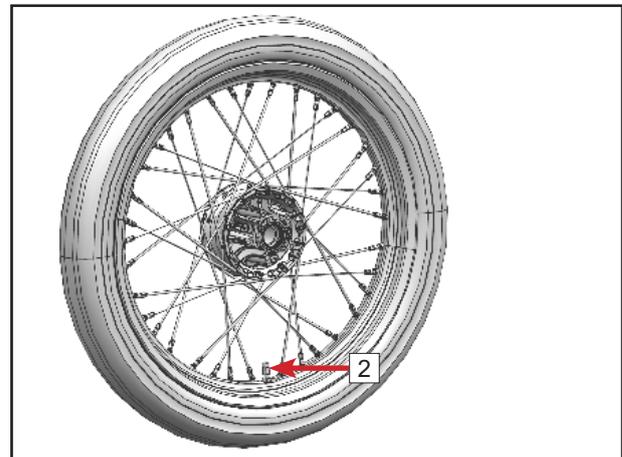
Check the spoke [1] for twist, deformation, cracks or damage. Replace if any damages are found.

Check spoke elastic ring for deformation which leads to rim leakage and damage. Replace if any damages are found.



If equipped with the tire pressure sensor:

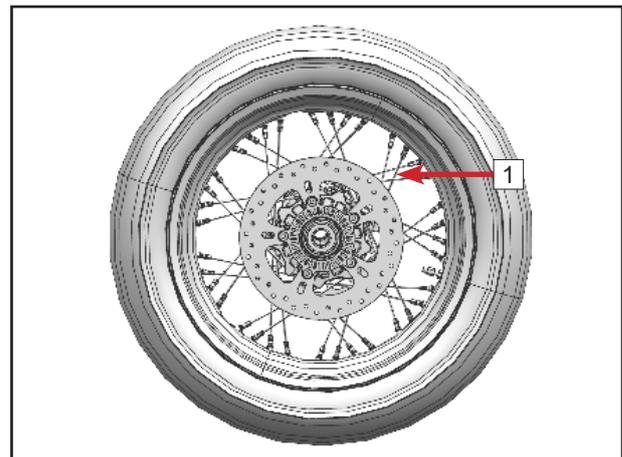
Check tire pressure sensor valve [2] for damage or leakage. The vehicle uses the tire pressure sensor. If the valve is damaged or the tire pressure display is abnormal, replace the new tire pressure sensor.



11.6.2 Rear Wheel

Check the spoke [1] for twist, deformation, cracks or damage. Replace if any damages are found.

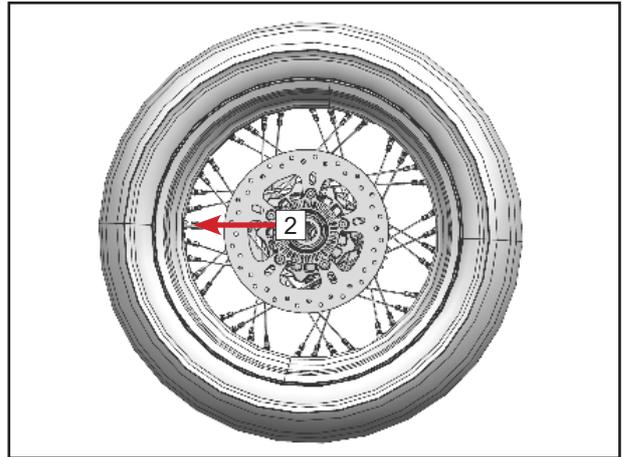
Check spoke elastic ring for deformation which leads to rim leakage and damage. Replace if any damages are found.



11 Front, Rear Wheels and Brake System

If equipped with the tire pressure sensor:

Check tire pressure sensor valve **2** for damage or leakage. The vehicle uses the tire pressure sensor. If the valve is damaged or the tire pressure display is abnormal, replace the new tire pressure sensor.

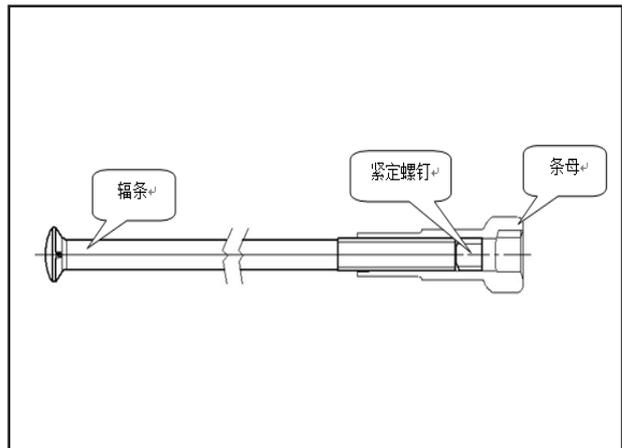


11.6.3 Spoke

Check tire jump during tire replacement. If tire jump > 1.0 , adjust spoke nut.

Check spokes for twist, deformation, cracks or damage. Replace if any defect is found.

Check spoke nut torque (torque: $4N\cdot m \sim 6N\cdot m$). If torque value is incorrect, set it to correct tighten torque and make spoke jump < 1.0 .



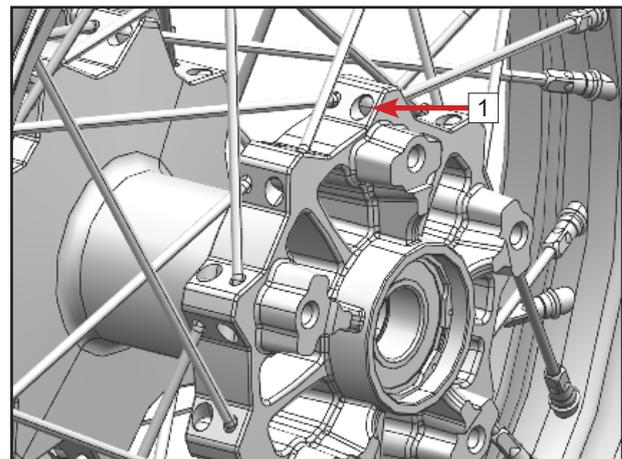
Inspection Method:

Check the torque value of each bar with torque wrench, which should be $\geq 4N\cdot m$. If there is no torque wrench, use the screwdriver and other tools to knock the spokes for inspection, the sound is clear on behalf of the spoke tension is enough, the sound is low and hoarse on behalf of the tension is insufficient, and the loosened steel wire can be felt directly by hand.



Adjustment Method:

For undertensioned spokes, use the slotted screwdriver to unscrew the setting screw **1** from the bar. Re-tighten the corresponding bar of the spoke and to check that the torque is between $4-6N\cdot m$ with torque wrench. Finally, reinstall the setting screw and tighten it.

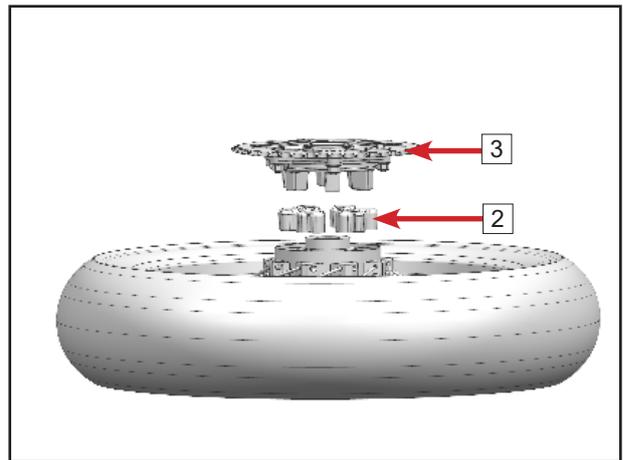


Check six cushion rubber blocks **2** for aging or damage.

If the cushion rubber block is aged or damaged, replace the cushion rubber block directly.

Check sprocket seat **3** and rear sprocket for wear or damage.

Replace sprocket seat or rear sprocket directly if the sprocket seat or rear sprocket is worn or broken.



11.6.4 Tire Pressure

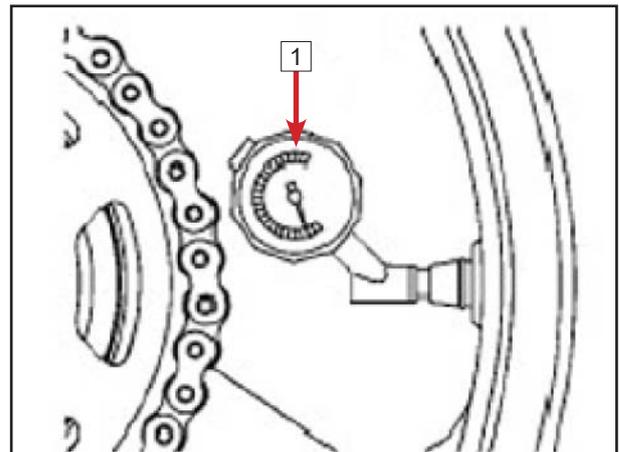
Remove tire inflation valve cap.

Measure the tire pressure with air gauge **1** when it is cool.

Pressure	
Front wheel	240kPa
Rear wheel	240kPa

Adjust the tire pressure according to the standard if necessary.

Install tire inflation valve cap.



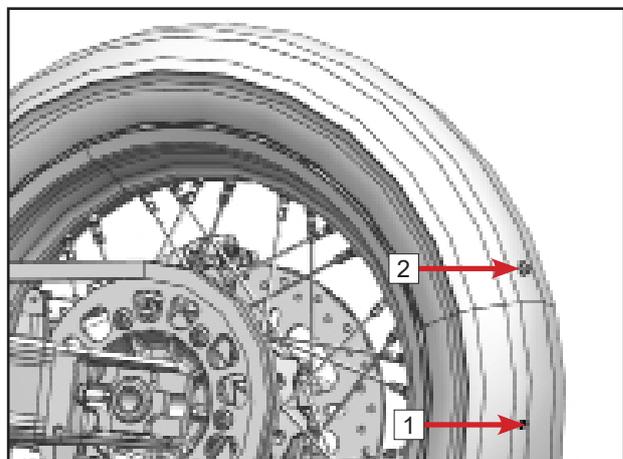
11.6.5 Tire Appearance

Clean the embedded stone **1** or other inclusions **2** on tires.

Check all parts of the tire tread for cracks, cuts, or dents.

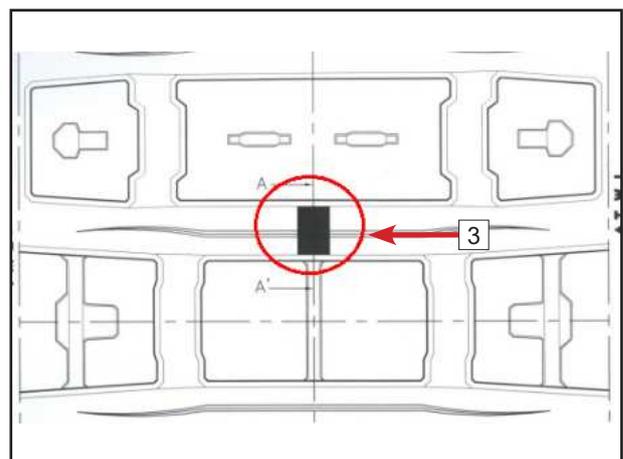
Check tire appearance for expansion or pulge. Expansion or pulge indicates damage inside the tire.

Replace it if any damages are found to avoid rapid expansion of tire damage.



Check tire for wear condition. The tire may be punctured or damaged if beyond service limit. Majority of the tire accidents happen due to exceeding service limit. Pay attention not to use the tire if the pattern is worn in case of injury.

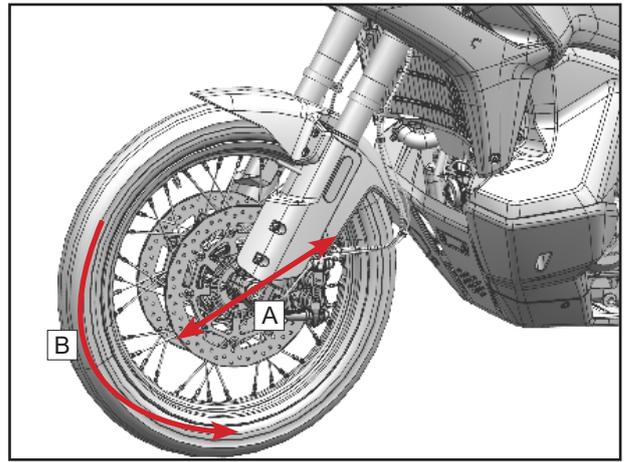
When the tire thread wears to the block **3** height, replace a new tire.



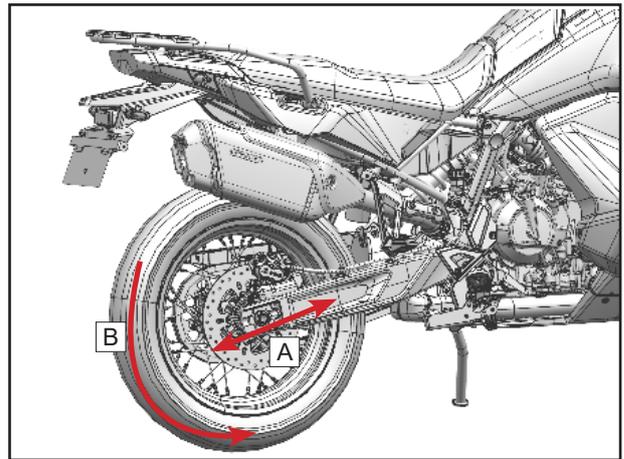
11 Front, Rear Wheels and Brake System

11.6.6 Wheel Bearing

Lift the front wheel off the ground.
Inspect the front wheel bearing for damage by pushing or pulling the wheel **A**.
Rotate the front wheel **B** to inspect for the smooth movement and noise.
Replace front wheel bearing if any damages are found.

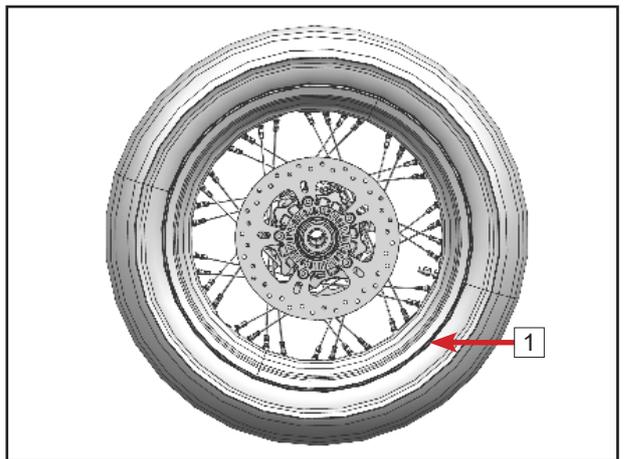
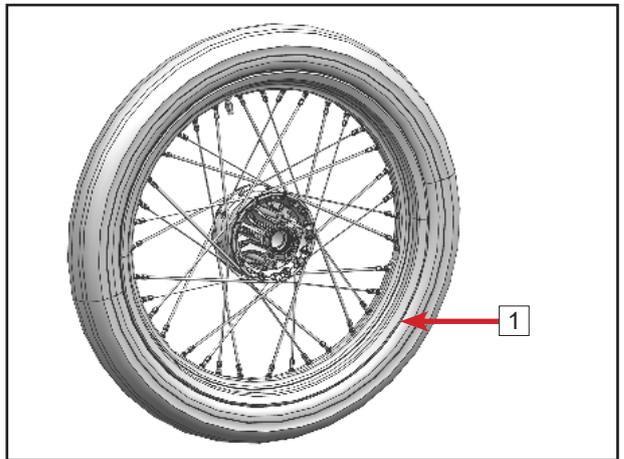


Lift the rear wheel off the ground.
Inspect the rear wheel bearing for damage by pushing or pulling the wheel **A**.
Rotate the rear wheel **B** to inspect for the smooth movement and noise.
Replace rear wheel bearing if any damages are found.



11.6.7 Rim

Inspect rim if sunk or damaged **1**.
Inspect front wheel or rear wheel completely if any damages are found. Replace if necessary.



11.7 Brake System Maintenance

WARNING

Brake fluid can stimulate the skin.

Keep the brake fluid out of reach of children.

Do not let brake fluid contact skin, eyes or clothing. Wear protective gears and goggles during operation.

If swallow brake fluid by accident, seek for medical attention immediately.

If you get brake fluid on skin, rinse contact area with clean water immediately.

If you get brake fluid in your eyes, immediately wash it off and seek for medical attention.

If you spill brake fluid on your clothing, change your clothing.

11.7.1 Hand Master Cylinder Maintenance Front Brake Fluid Level Inspection

Straighten the vehicle to make the hand brake

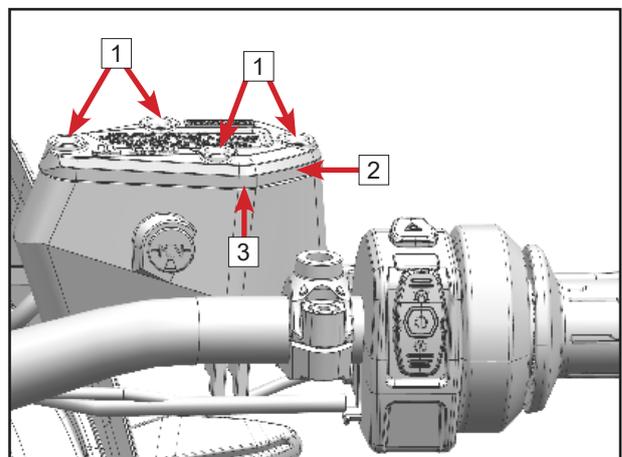
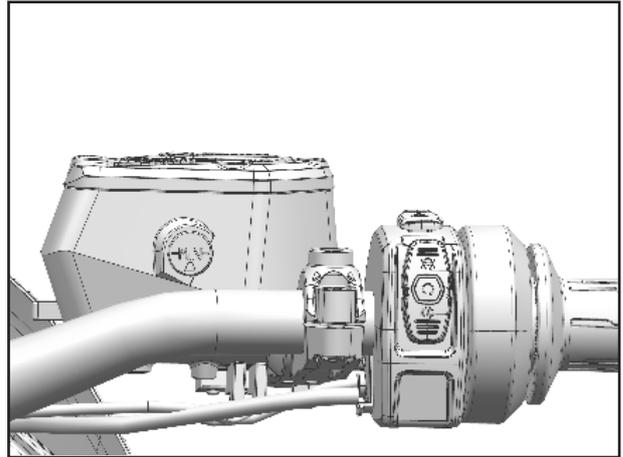
fluid reservoir parallel the ground.

Check the brake fluid level of fuel reservoir.
If the fluid level is higher than the reservoir gasket, release some brake fluid between the reservoir gasket and MIN.

If the fluid level is between the reservoir gasket and MIN, the fluid level is appropriate.

If the fluid level is lower than MIN, add brake

fluid between the reservoir gasket and MIN.



Brake Fluid Replacement

Remove four screws **1**.

Remove reservoir cap **2**.

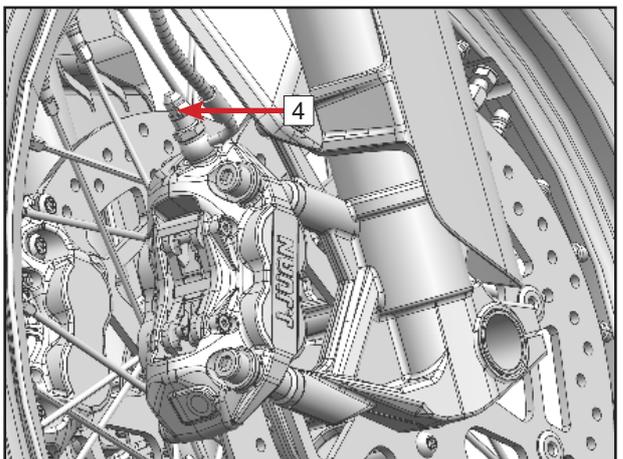
Remove reservoir gasket **3**.

NOTE

Reservoir gasket may be sunk due to negative pressure caused by brake fluid reducing. It doesn't affect normal use but needs to be restored during installation.

Open air-bleed bolt rubber sleeve.

Connect a clean plastic hose with air-bleed bolt **4**, with other side into a container.



11 Front, Rear Wheels and Brake System

Repeatedly hold and loose **A** brake lever until it feels hard.

Loose air-bleed bolt **4** a little bit.

Tighten the air-bleed bolt right after the brake fluid doesn't spray out or the lever feels soft.

Add brake fluid.

Repeat the above procedures until the new brake fluid sprays out.

⚠️ WARNING

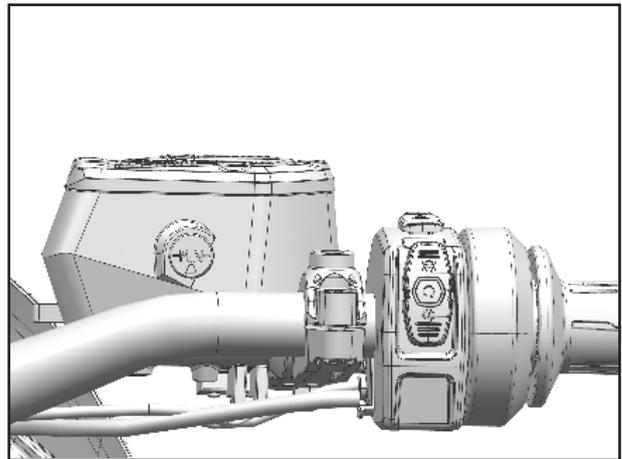
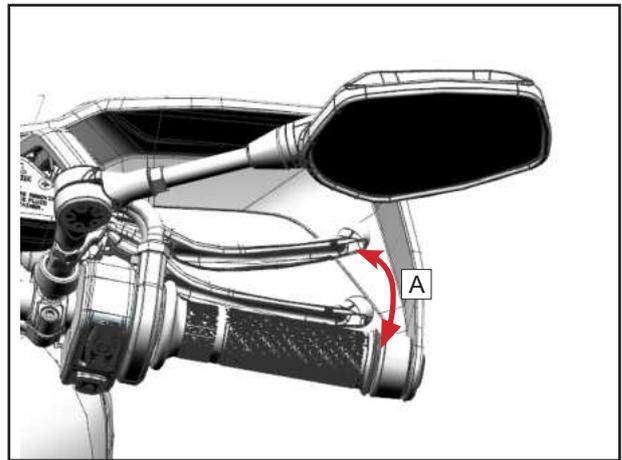
Keep brake fluid level above LOWER, in case air gets into brake system, which results in brake system failure and injury.

⚠️ WARNING

If there is air inside of brake system, replace brake fluid repeatedly until there is no air in drained brake fluid.

Brake Fluid Addition

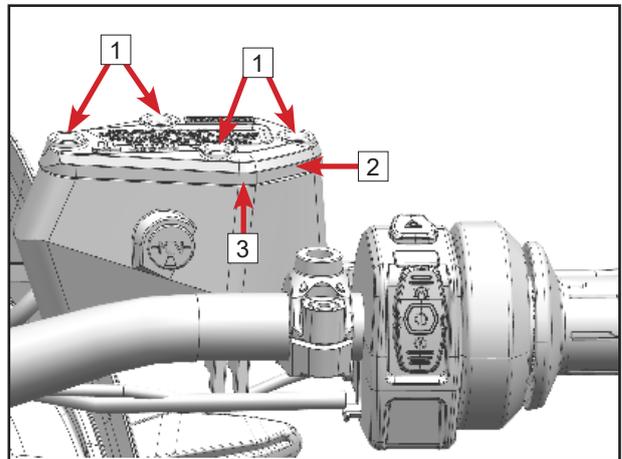
Add brake fluid between reservoir gasket and MIN.



Install reservoir gasket **3**.

Install reservoir cap **2**.

Install two screws **1**.



11.7.2 Rear Brake Master Cylinder Maintenance

Rear Brake Fluid Level Inspection

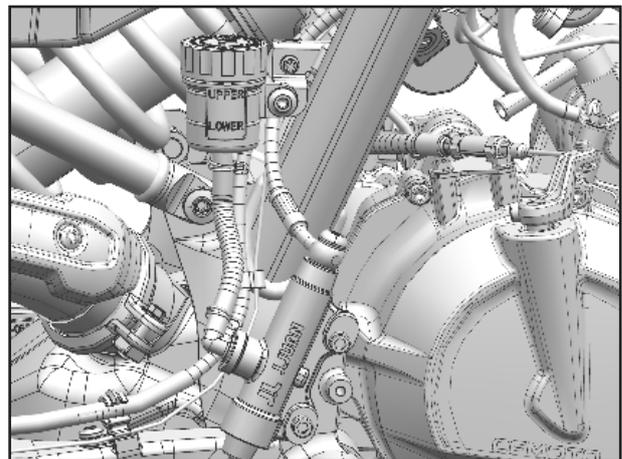
Straighten the vehicle to make the rear brake fluid reservoir parallel the ground.

Check brake fluid level of fuel reservoir.

If the fluid level is higher than UPPER line, release some brake fluid between the UPPER and LOWER.

If the fluid level is between UPPER and LOWER, the fluid level is appropriate.

If the fluid level is lower than LOWER line, add brake fluid between UPPER and LOWER.



Brake Fluid Replacement

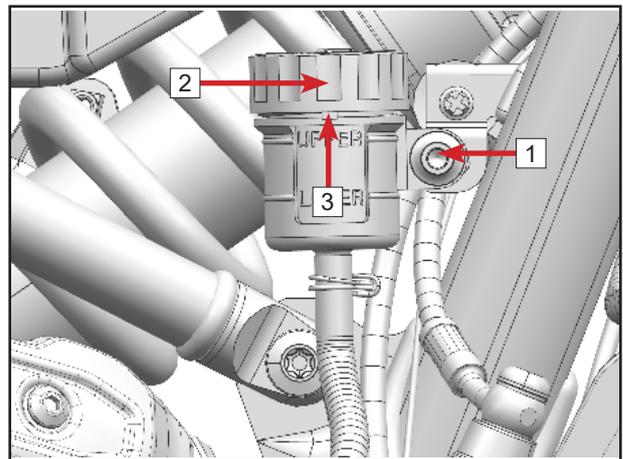
Remove screw **1**.

Rotate to remove reservoir cap **2**.

Remove reservoir gasket **3**.

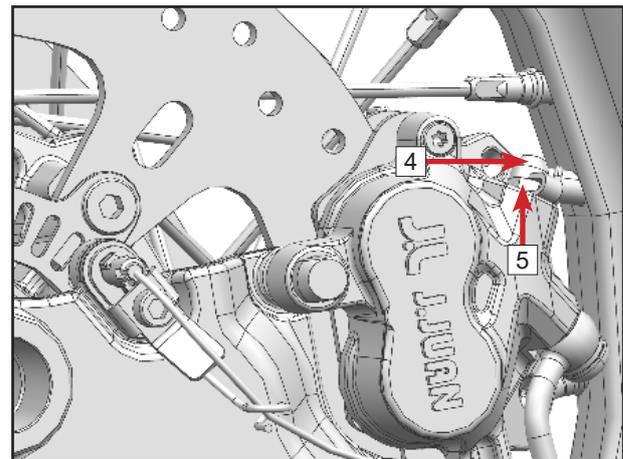
NOTE

Reservoir gasket may be sunk due to negative pressure caused by brake fluid reducing. It doesn't affect normal use but needs to be restored during installation.



Open air-bleed bolt rubber sleeve **4**.

Connect a clean plastic hose with air-bleed bolt **5**, with other side into a container.



Repeatedly hold and loose **A** brake lever until it feels hard.

Loose air-bleed bolt **5** a little bit.

Tighten the bolt right after the brake fluid doesn't spray out or the lever feels soft.

Add brake fluid until the level is between UPPER and LOWER.

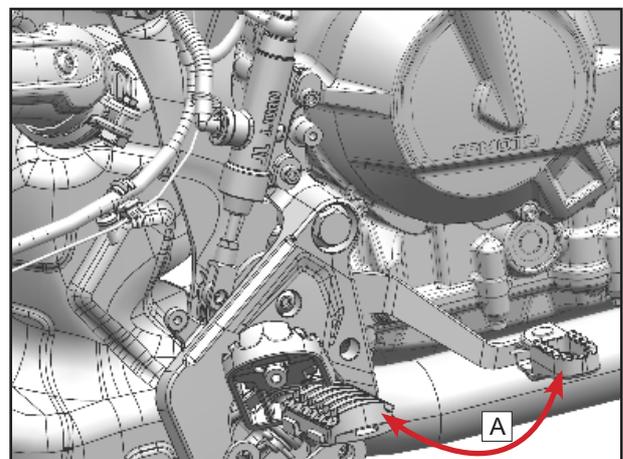
Repeat the above procedures until the new brake fluid sprays out.

⚠️ WARNING

Keep brake fluid level above **LOWER**, in case air gets into brake system, which results in brake system failure and injury.

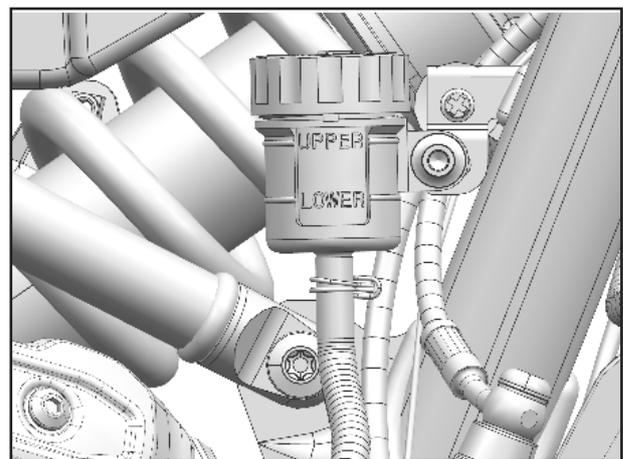
⚠️ WARNING

If there is air inside of brake system, replace brake fluid repeatedly until there is no air in drained brake fluid.



Brake Fluid Addition

Add brake fluid until the level is between UPPER and LOWER.



11 Front, Rear Wheels and Brake System

- Install reservoir gasket [3].
- Install reservoir cap [2].
- Install screw [1].

11.7.3 Brake Hose Maintenance

Check brake hose, connectors and pipes for damage, cracks or leakage.

With improper maintenance, the high pressure inside the brake hose can cause fluid leakage [A] or hose burst.

Check brake hose for bending or twist. Replace with new hoses and pipes if crack [B], bulge [C] or leakage detected.

Tighten all the brake hose connecting bolts and nuts.

Check brake hose route. Reset the hose route if not proper or correct.

11.7.4 Brake Caliper and Brake Pad Maintenance

Front Brake Caliper

Remove brake caliper.

Check the minimum thickness of each brake pad.

Minimum friction pad thickness: 1.3mm

Replace brake pads before it reaches to minimum limit. Replace brake pads in set. Check brake pads for deep scratches or other damages. Replace if any defect is found. Replace brake pads in set.

⚠️ WARNING

Replace with new brake disc or brake friction pad, do not drive immediately. The brake pad needs to be run in and the front brake handle manipulated (held) several times until the brake disc is well engaged with the brake caliper.

Front Brake Disc

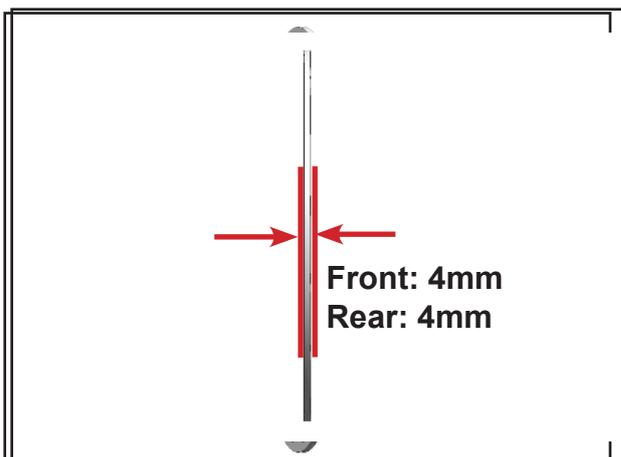
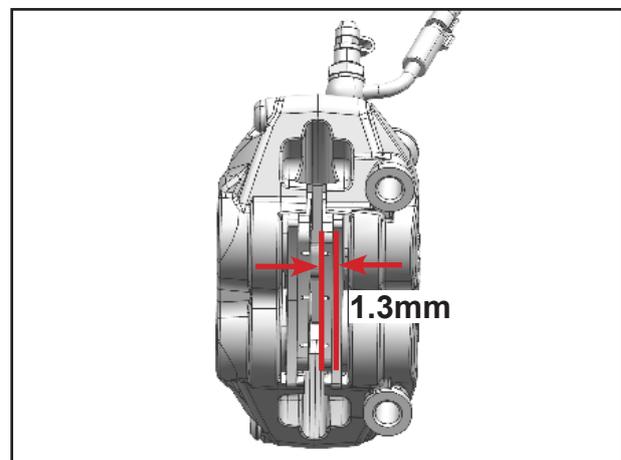
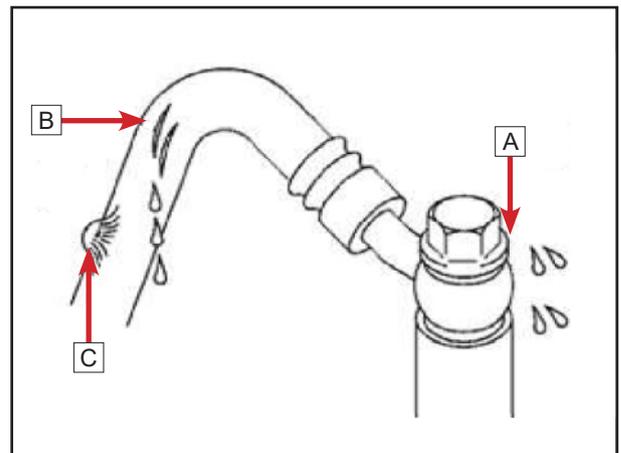
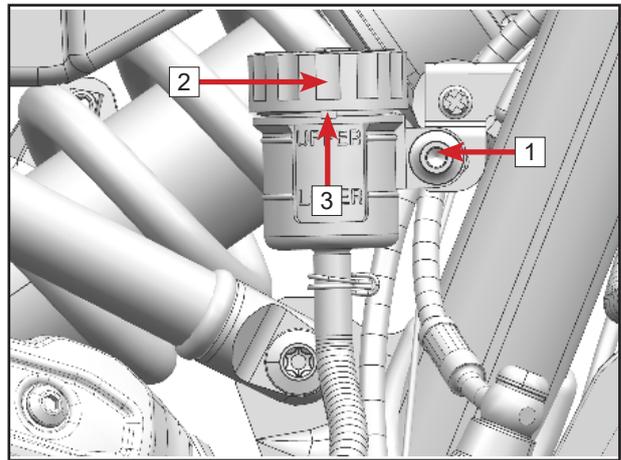
Check the minimum thickness of each brake disc.

Minimum front brake disc thickness: 4mm.

Minimum rear brake disc thickness: 4mm.

Replace brake disc before it reaches to minimum limit.

Check brake pads for deep scratches or other damages. Replace if any defect is found.

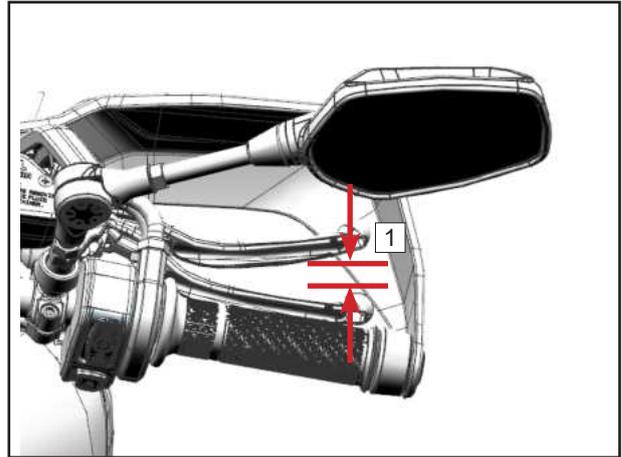


11.8 Free Play

11.8.1 Front Brake Lever Free Play

Check the free play of front brake lever 1.

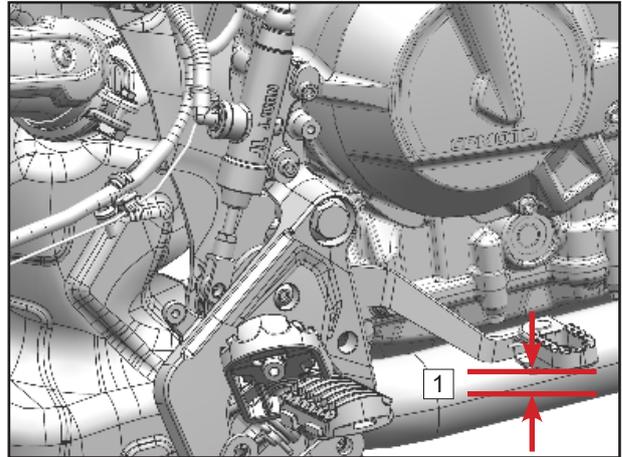
Free Play: 10mm~15mm



11.8.2 Rear Brake Pedal Free Play

Check the free play of rear brake pedal 1.

Free Play: 5mm~10mm



12 Shock Absorbers and Rear Fork

12.1 Front LH & RH Shock Absorbers	12-2
12.2 Chain.....	12-3
12.3 Rear Shock Absorber	12-4
12.4 Rear Fork.....	12-5
12.5 Chain Inspection.....	12-7

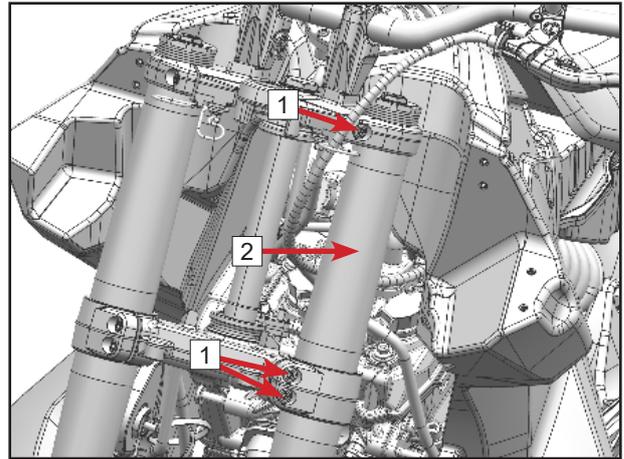
12.1 Front LH & RH Shock Absorbers

Pre-work

Remove front fender. (see chapter 05)
Remove front brake. (see chapter 11)
Remove front wheel. (see chapter 11)
Remove vehicle LH & RH panels, front plastic parts. (see chapter 05)

Removal

Remove three inner hex bolts **1** of upper & lower triple clamps.
Remove front LH shock absorber **2**.



Inspection

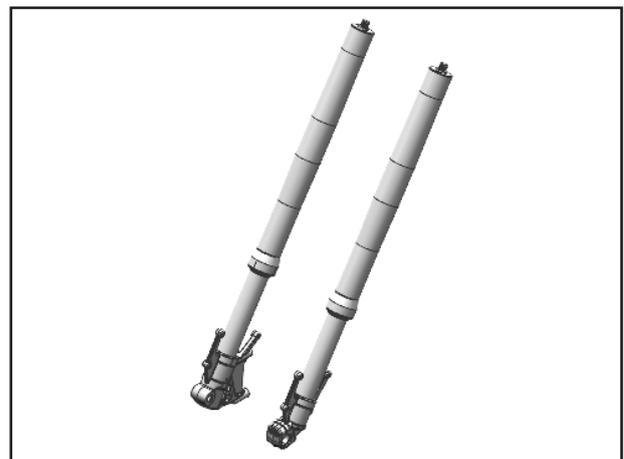
Inspect front shock absorber appearance for damage, cracks or other damage. Replace if it does.

Clean dust and mud on front shock absorber.

Press down handlebar several times to check compression/rebound function of front shock absorber.

Installation

Reverse the removal procedures for installation.

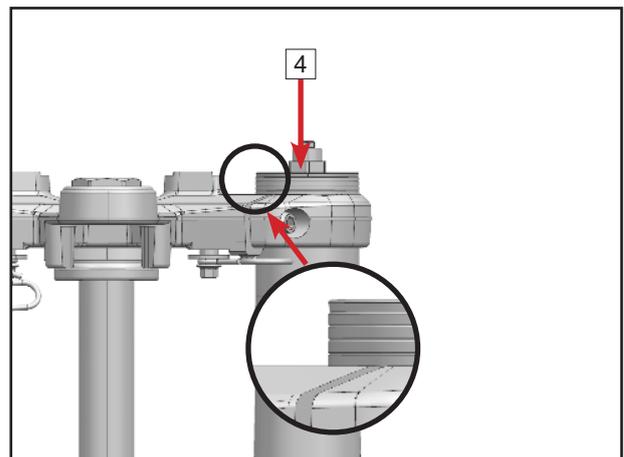


⚠ CAUTION

During installation, the upper surfaces **4** of two front shock absorbers should be in parallel.

Adjustment

The front shock absorber has been adjusted to the best condition and is suitable for most situations when the vehicle leaves the factory.

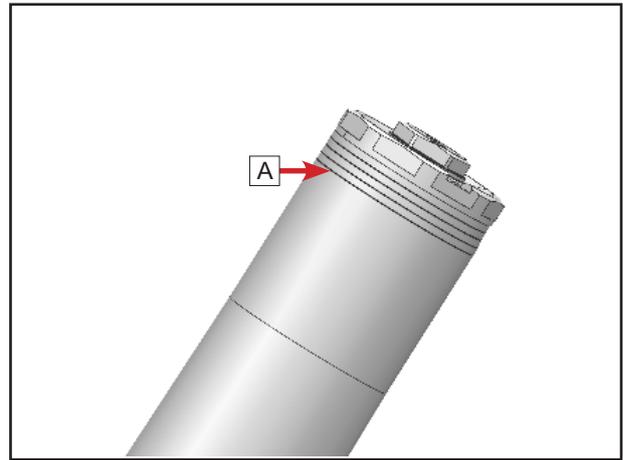


12 Shock Absorbers and Rear Fork

Installation

Reverse the removal procedures for installation. The shock absorber needs to be exposed to the 4th scale **A**.

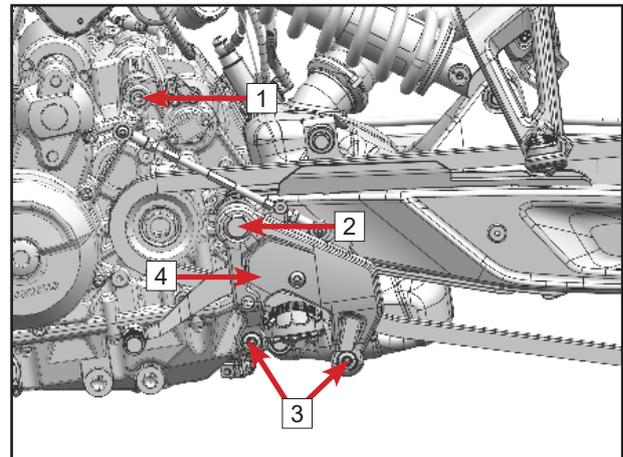
The front RH shock absorber is installed and removed in the same method as the front LH shock absorber.



12.2 Chain

Pre-work

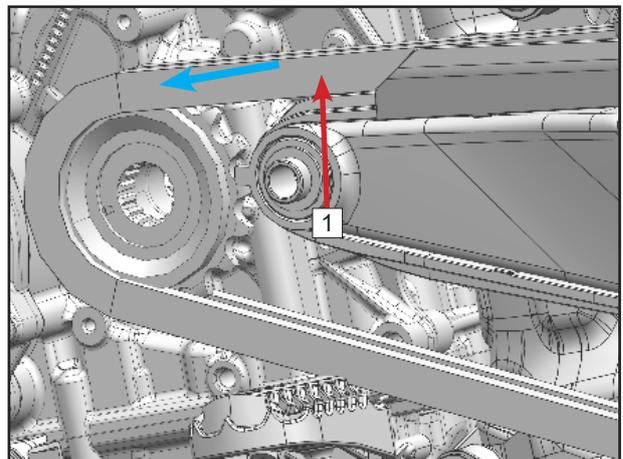
- Remove rear wheel. (see chapter 11)
- Remove gear connecting rod bolt **1**.
- Remove LH side rear fork bolt **2**.
- Remove LH side bolts **3**.
- Remove LH footrest **4**.
- Reinsert the bolt **2**.



Push the chain **1** forward.

Remove the chain **1**.

To prevent the chain from falling on the ground or coming into contact with other dirt, such as chain dirt, professional chain cleaner and chain oil must be used to clean and lubricate the chain during re-installation.



12.3 Rear Shock Absorber

Pre-work

Remove chain guard. (see chapter 05)

Removal

Remove bolt and nut assembly **1**.

Remove bolt and nut assembly **2**.

Remove rear shock absorber **3**.

Bolt torque: 80N•m

Installation

Reverse the removal procedures for installation.

Inspection

Inspect rear shock absorber appearance for damage, cracks or other damage. Replace if it does.

Clean dust and mud on rear shock absorber.

Press down handlebar several times to check compression/rebound function of rear shock absorber.

Adjustment

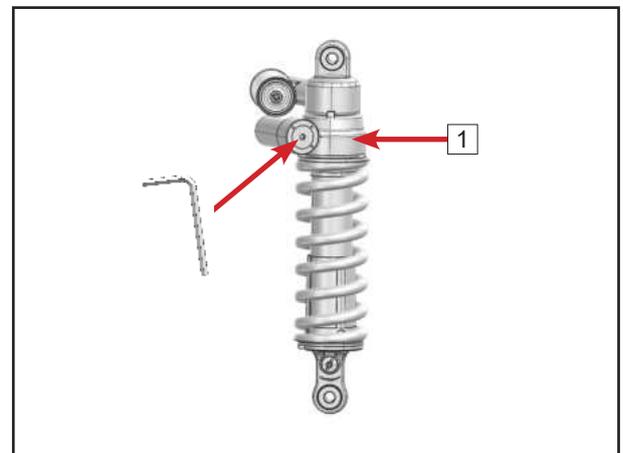
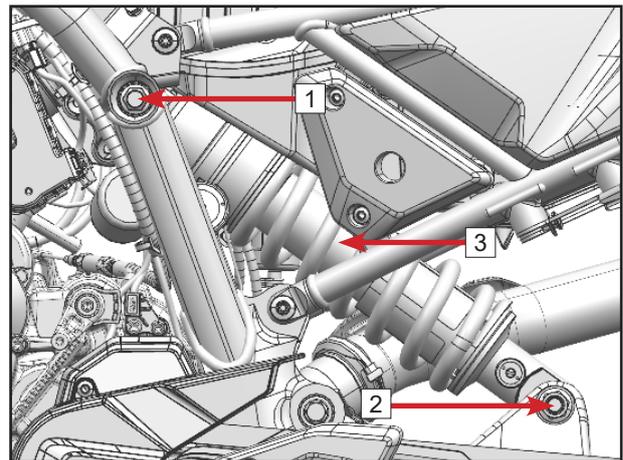
The rear shock absorber spring preload can be adjusted to suit the rider's weight and riding conditions.

Adjust the spring preload by following these steps

When driving under solid ground conditions or carrying people and cargo close to the maximum load, increase the spring preload to make the ride more stable.

Use an Allen wrench to adjust the hydraulic adjustment assembly **1**, rotating clockwise (" + "direction) to increase the spring preload and counter-clockwise (" - "direction) to reduce the spring preload.

Contact your dealer to adjust the spring preload. Do not adjust it yourself.



⚠ DANGER

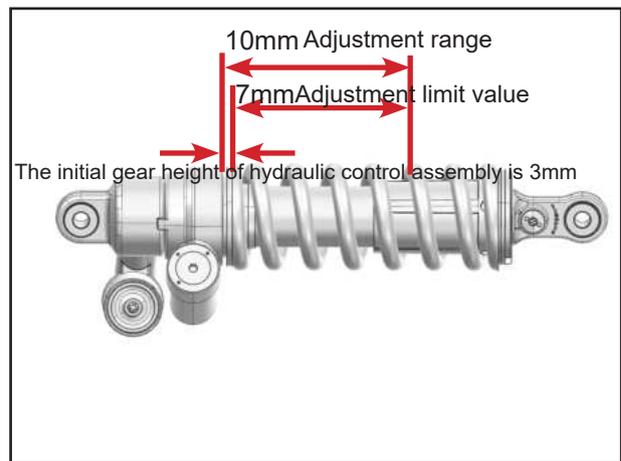
This part contains high-pressure nitrogen. Improper operation may result in explosion. Read the relevant instructions and do not put it in the fire, open the hole or open it.

NOTE

The rear shock absorber has been adjusted to the best condition and is suitable for most situations when the vehicle leaves the factory.

12 Shock Absorbers and Rear Fork

The pre-load of the factory spring is shown on the right.



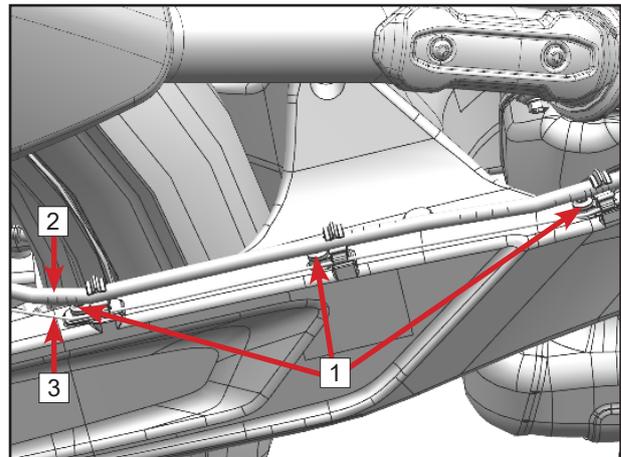
12.4 Rear Fork

Pre-work

Remove three screws **1**.

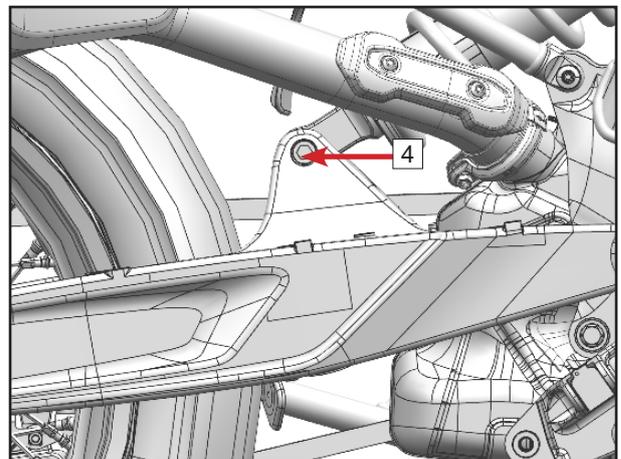
Loosen brake hose **2**, wheel speed sensor cable **3**.

Remove chain adjusting block, rear wheel shaft nut, rear wheel shaft and rear wheel.

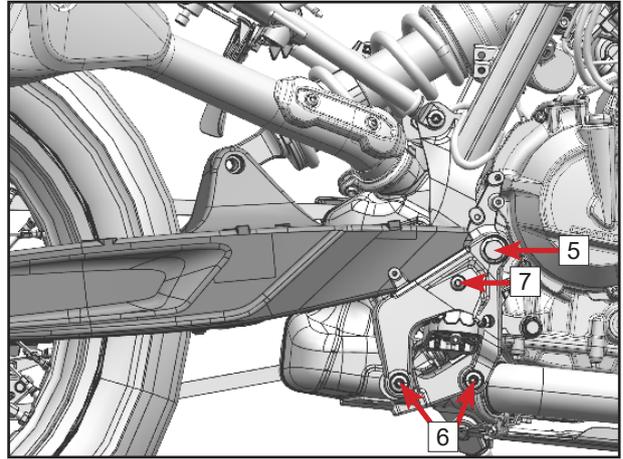


Removal

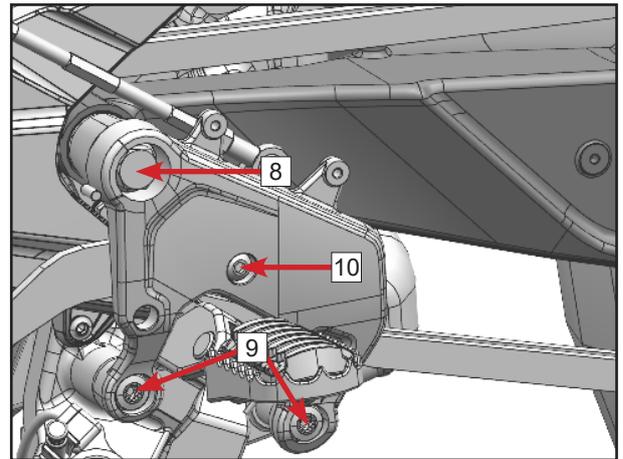
Remove bolt and nut assembly **4**.



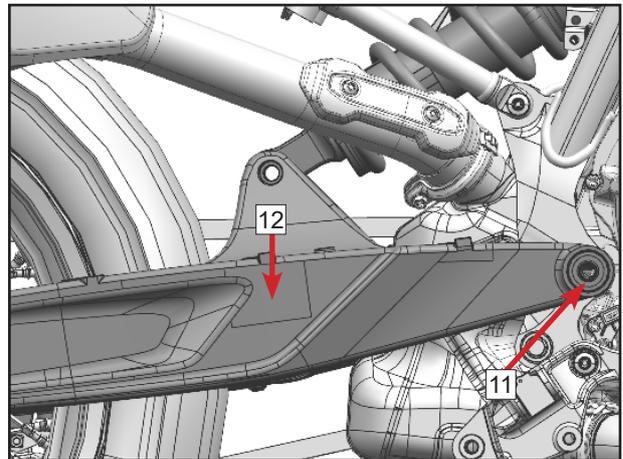
Remove RH rear fork bolt **5**.
Loosen RH side bolts **6**.
Loosen screw **7**.



Remove LH rear fork bolt **8**.
Loosen LH side bolts **9**.
Loosen screw **10**.



Remove rear fork shaft **11**.
Remove rear fork assembly **12**.



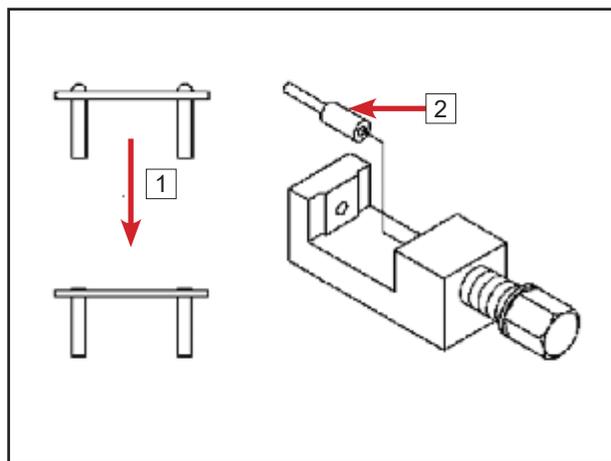
Installation

Reverse the removal procedures for installation.

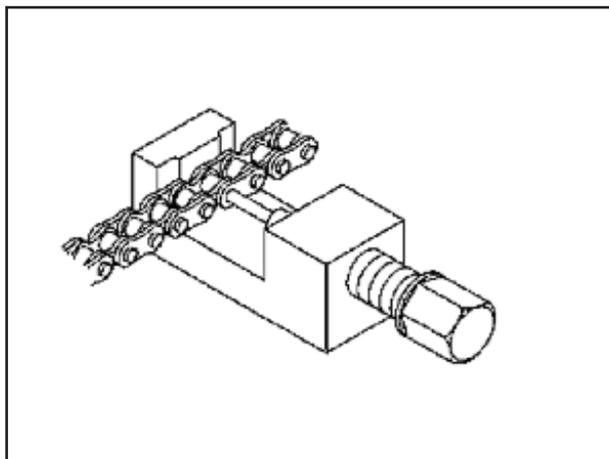
12 Shock Absorbers and Rear Fork

12.5 Chain Inspection

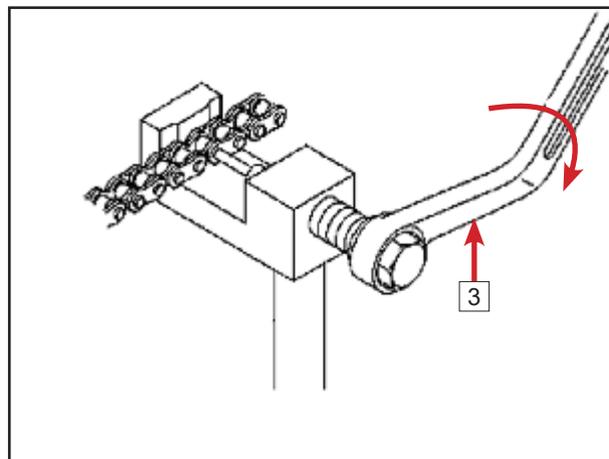
Press hard **1** to make two pin heads parallel.
Set the cutting and riveting pin **2** as picture shows.



Tighten the bolt to narrow the pin seat until it touches chain pin.
Make sure the centers of cutting and riveting pin and chain pin are aligned.



Rotate the pin seat with wrench **3** clockwise to remove the chain pin.



Drive Chain Installation

Install new chain knots on chain to replace the old ones.

Remove the chain boards of new drive chain.

Apply grease on chain pin **2** and seal rings **1**.

Engage the chain and rear chain sprocket.

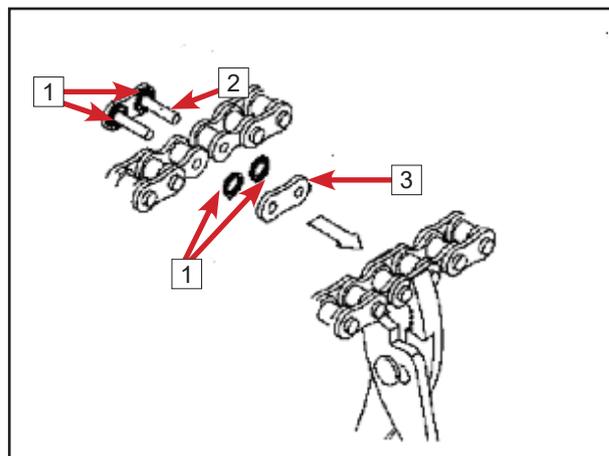
Insert chain pins into chain knots.

Install seal rings **1**.

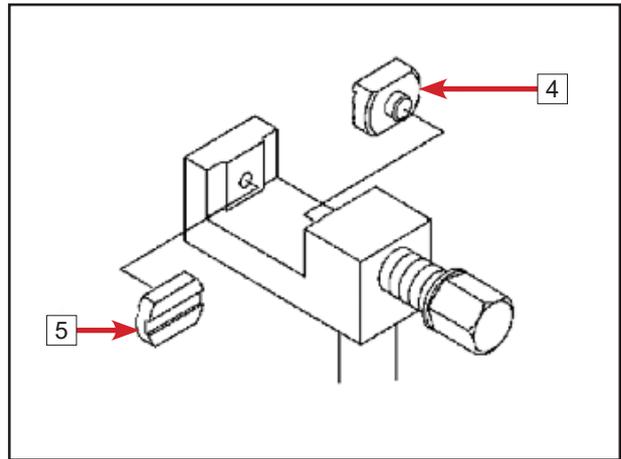
Install chain boards and make the mark **3** face outside.

Fix the chain board with hand or plier.

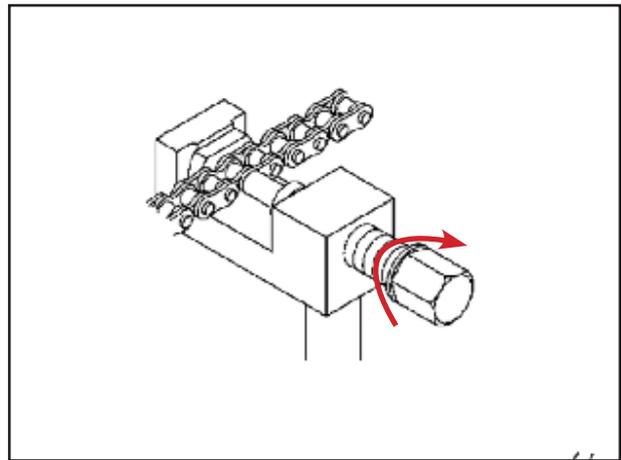
Make sure the seal ring is installed correctly in case of the chain grease leaking.



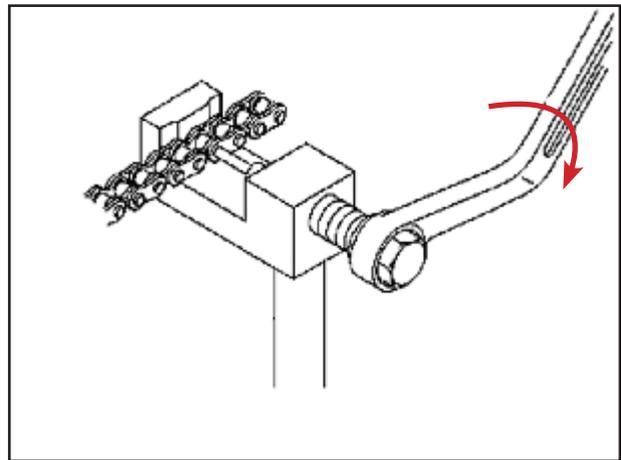
Set the holder **4** and **5**.



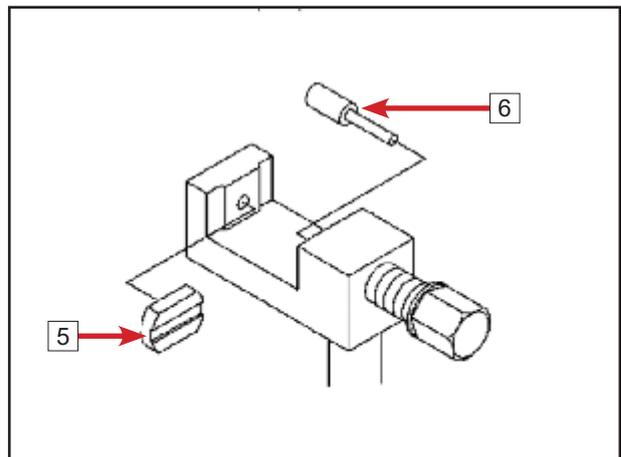
Align the holder and chain board.
Rotate the pin seat until it touches the chain board.



Rotate the pin seat with wrench clockwise until two pins get into the grooves of holder.
Remove holder **4**.

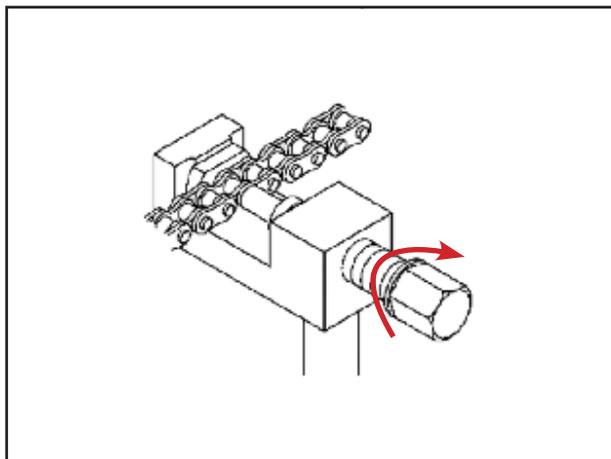


Set the holder **5** and cutting and riveting pin **6** as picture shows.



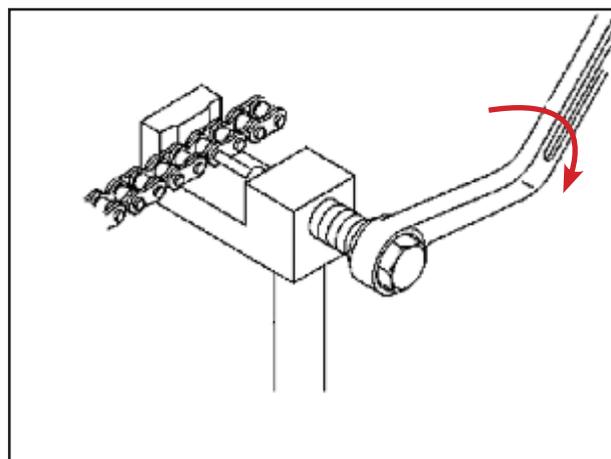
12 Shock Absorbers and Rear Fork

Rotate the pin seat until it touches chain pin.



Rotate the wrench clockwise until cutting and riveting pin head touches chain pin to rivet.

Other chain pins installation follows the same procedures.



Inspection

After installation, inspect riveting knots for cracks. Measure chain pin outer diameter [1] and chain board width [2].

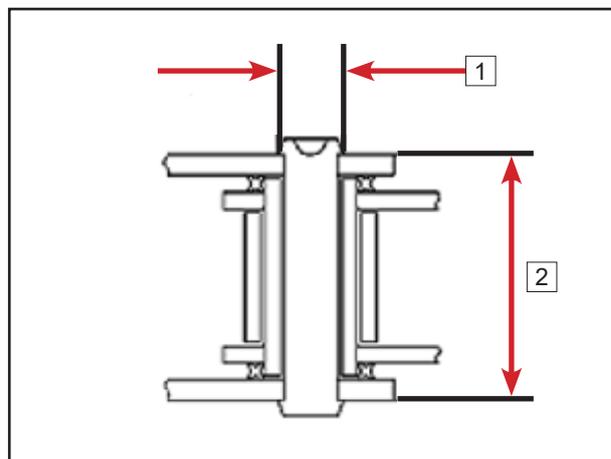
Chain pin outer diameter

Standard: 5.45mm~5.55mm

Chain board width

Standard: 17.25mm~17.45mm

Cut and re-rivet the chain knots if out of standard.



Chain Tightness Inspection

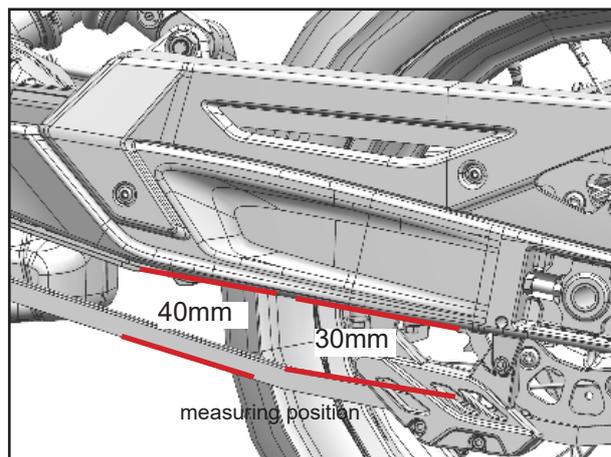
Put it in neutral gear.

Lift up the vehicle with side brace.

In the natural state, the distance between the chain and the lowest point of swing arm does not exceed 30mm.

Pull down the chain, the distance between the chain and the lowest point of swing arm does not exceed 40mm.

If the tightness of chain does not conform to the regulations, adjust to the standard value.



Note: The wear degree of chain is not always uniform, and the tightness is repeatedly measured at different positions by rotating the rear wheel several times.

Drive Chain Tightness Adjustment

Loosen rear wheel shaft nut **1**.

Loosen LH&RH lock nuts **3**.

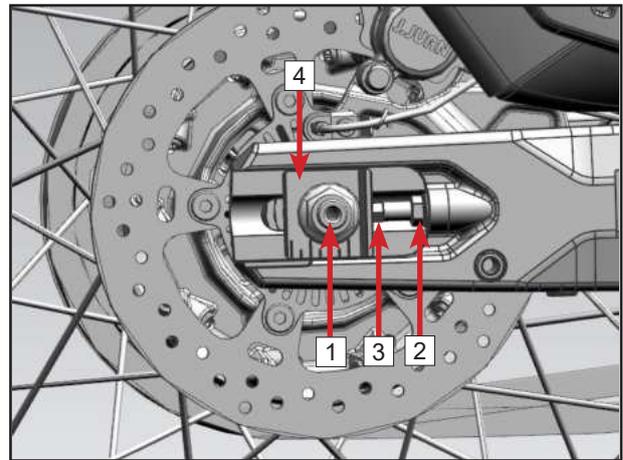
Adjust the bolt **2** left and right to adjust the chain tightness.

Ensure that the relative position between the left and right chain tensioner **4** marks and the reference marks is the same.

Make sure the tensioner is tight against the adjusting bolt.

Tighten LH&RH lock nuts **3**.

Tighten rear wheel shaft nut (90N•m).



Wear Inspection

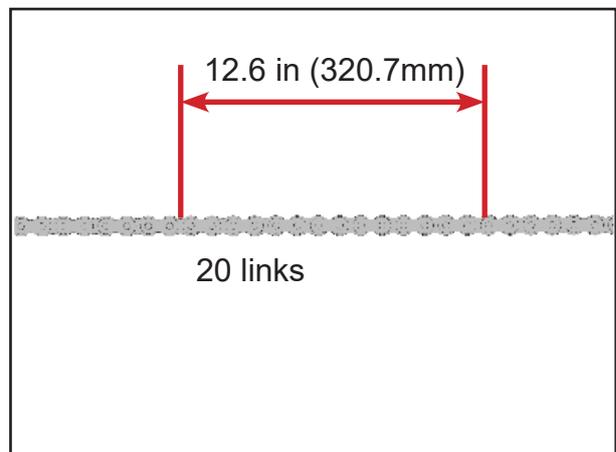
Place the transmission into Neutral.

Support the vehicle with side stand.

Apply chain tensioning or hanging a 22 lb. (10 kg) object on the chain.

Measure the length between 20 links for elongation. If the measured length exceeds the standard limit, replace the chain with a new one.

Standard limit: 12.6 in (320.7 mm)

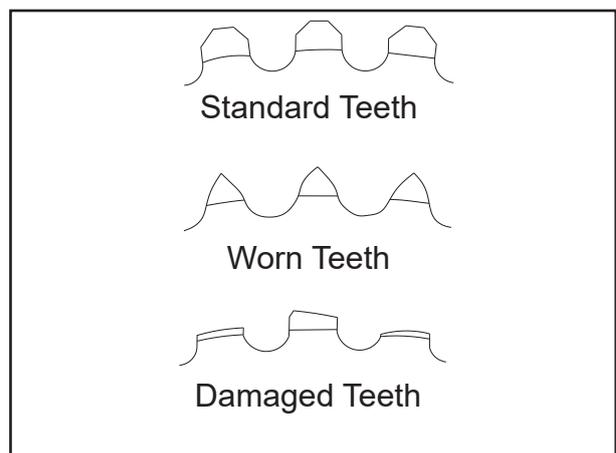


⚠ DANGER
For your safety, please use the standard chain. When chain is elongated, never cut the chain and mount back onto the vehicle. Have it replaced by an authorized CFMOTO dealer.

Inspect the rear sprocket and engine sprocket teeth for any kind of wear.

If the engine sprocket or rear sprocket is worn, then replace the both sprockets as a set.

Inspect chain guard for wear. Inspect chain tightness if chain guard is worn. Replace chain and chain guard if necessary.



12 Shock Absorbers and Rear Fork

Rebound Damping Adjustment

The rebound damping end is inscribed with TEN.

The rebound damping affects the reaction speed during the shock absorber rebound. The lower the damping gear **1** the slower the suspension rebound speed, and the higher the damping gear, the faster the suspension rebound speed.

Initial gear: 10 gear

Total gear: 20 gear \pm 2 gear

Use a flat-head screwdriver to rotate the gear counterclockwise (“-” direction) and record the number of times to reduce the rebound damping. Use a flat-head screwdriver to rotate the gear clockwise (“+” direction) and record the number of times to increase the rebound damping.

Restore Damping to Factory Settings

Reverse rotation according to the recorded rotation numbers to restore the factory settings. Or rotate clockwise (“-” direction) to the minimum, counterclockwise (“+” direction) to the shock absorber 10 gear.

Contact the engineer to adjust the damping. Do not adjust it yourself.

There is an air bleed screw **2** on the left and right front shock absorber, which is used to prevent the accumulation of air pressure inside the shock absorber and affect the damping force. Contact your dealer for venting.

Compression Damping Adjustemnt

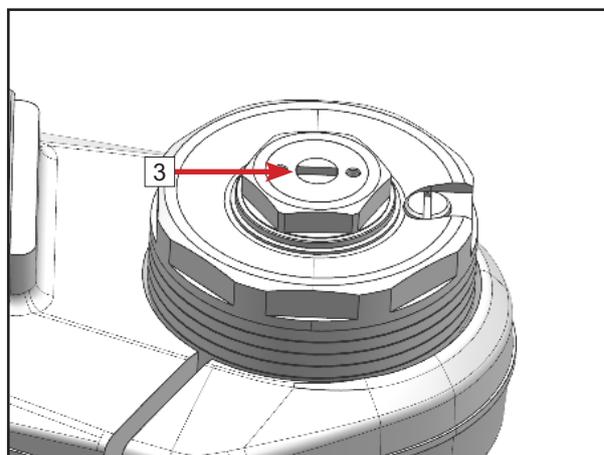
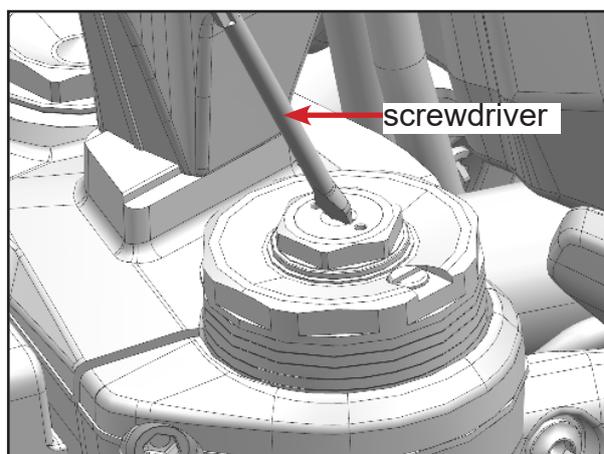
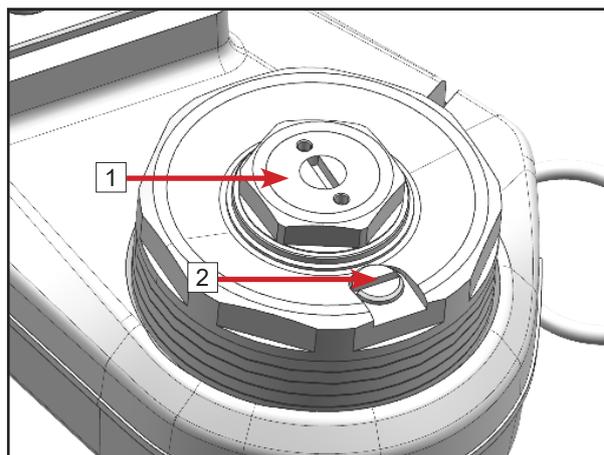
The compression damping end is inscribed with COMP.

The compression damping affects the reaction speed during the shock absorber compress. The lower the damping gear **3**, the slower the suspension compress speed, and the higher the damping gear, the faster the suspension compress speed.

Initial gear: 10 gear

Total gear: 20 gear \pm 2 gear

Use a flat-head screwdriver to rotate the gear counterclockwise (“-” direction) and

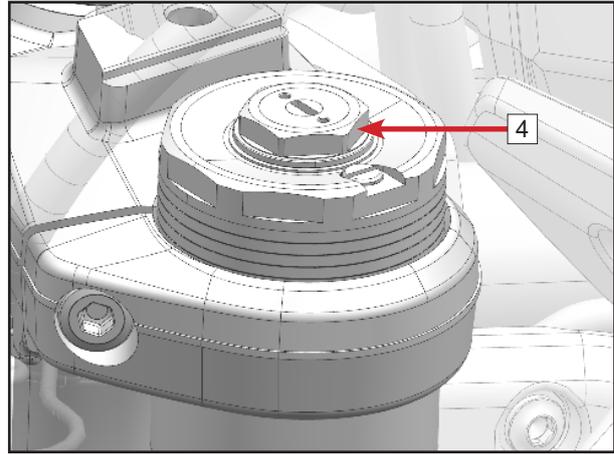


record the number of times to reduce compression damping. Use a flat-head screwdriver to turn the gear clockwise (“+” direction) and record the number of times to increase the compression damping.

Restore Damping to Factory Settings

Reverse rotation according to the recorded rotation numbers to restore the factory settings. Or rotate counter-clockwise (“-” direction) to the minimum, clockwise (“+” direction) to the shock absorber 10 gear.

Contact the engineer to adjust the damping. Do not adjust it yourself.



Shock absorber oil: Foss 5045
Shock absorber capacity: 642±3mL

Preload Adjustemnt

The preload of spring affects the force required when the spring is pressed down, the higher the preload, the greater the force required for the same distance of the spring, the lower the preload, the smaller the force required for the same distance of the spring. The most intuitive manifestation is that the higher the prepressure, the harder the spring.

Initial gear: 10 gear

Total gear: 30 gear ± 2 gear

Turn the preload adjusting nut 4 clockwise (“+” direction) to increase the spring preload, and turn the preload adjusting nut 4 counterclockwise (“-” direction) to reduce the spring preload.

When adjusting the pre-pressure, the pre-pressure gear of the front left and right shock absorbers should be consistent (please make a gear record).

Contact your dealer to adjust the front shock absorber prepressure. Do not adjust it yourself.

Recommended preload adjustment tool:
22mm wrench or socket.

12 Shock Absorbers and Rear Fork

Rebound Damping Adjustment

The rebound damping affects the reaction speed during the shock absorber rebound. The lower the damping gear **3**, the slower the suspension rebound speed, and the higher the damping gear, the faster the suspension rebound speed.

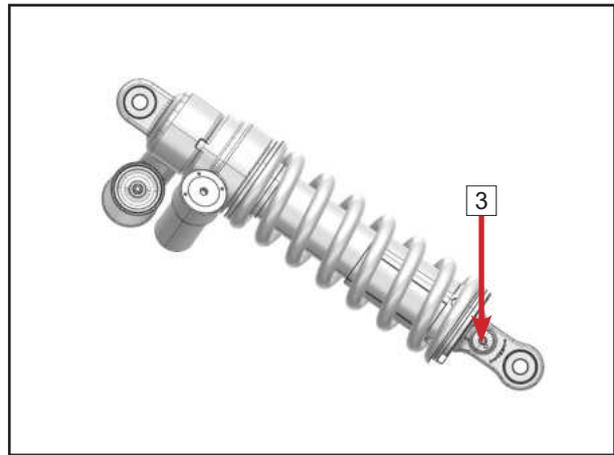
Initial gear: 12 gear

Total gear: 22 gear \pm 2 gear

Adjust according to the picture:

Use a flat-head screwdriver to rotate the gear clockwise (“+” direction) and record the number of times to increase the rebound damping.

Use a flat-head screwdriver to rotate the gear counterclockwise (“-” direction) and record the number of times to reduce the rebound damping.



Restore Damping to Factory Settings

Reverse rotation according to the recorded rotation numbers to restore the factory settings. Or rotate counter-clockwise (“-” direction) to the minimum, clockwise (“+” direction) to the shock absorber 12 gear.

Contact the engineer to adjust the damping. Do not adjust it yourself.

DANGER

This part contains high-pressure nitrogen. Improper operation may result in explosion. Read the relevant instructions and do not put it in the fire, open the hole or open it.

Shock absorber oil: 6#

Shock absorber capacity: 202 \pm 2mL

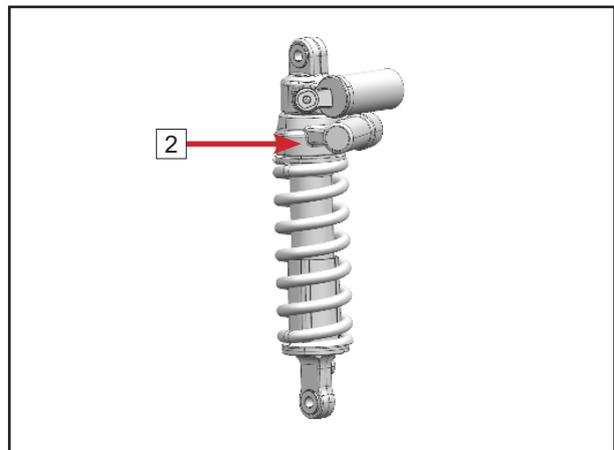
Compression Damping Adjustemnt

The compression damping affects the reaction speed during the shock absorber compress. The lower the damping gear, the slower the suspension compress speed, and the higher the damping gear, the faster the suspension compress speed.

Initial gear: 8 gear

Total gear: 15 gear \pm 2 gear

Use a flat-head screwdriver to rotate the gear **2** counterclockwise (“-” direction)



and record the number of times to reduce compression damping.

Use a flat-head screwdriver to turn the gear **2** clockwise (“+” direction) and record the number of times to increase the compression damping.

Reverse rotation according to the recorded rotation numbers to restore the factory settings. Or rotate counter-clockwise (“-” direction) to the minimum, clockwise (“+” direction) to the shock absorber 8 gear.

Contact the engineer to adjust the damping. Do not adjust it yourself.

Shock Absorber Adjustment Suggestions

Shock Absorber Use Conditions	Major Adjustment Term			Auxiliary Adjustment Term		
	Rear Shock Absorber			Front Shock Absorber		
	Spring preload	Compression Damping	Rebound Damping	Spring preload	Compression Damping	Rebound Damping
1 people (75kg)	3 ring	8±2	12±2	4 ring	10±2	10±2
1 people (75kg)+ equipment (3 cases load)	5 ring	10±2	15±2	4 ring	10±2	10±2
1 people (75kg)+1 people (75kg)	6 ring	12±2	17±2	5 ring	13±2	13±2
1 people (75kg) +1people(75kg)+ equipment (3 cases load)	8 ring	14±2	19±2	6 ring	15±2	15±2
1 people (75kg) + Continuous rough road	3 ring	12±2	15±2	4 ring	10±2	13±2
*Recommended for general and light off-road use	The above are counterclockwise to the limit position, and the number of pre-load laps or damping segments is increased clockwise. This is the recommended value, and users need to adjust it according to personal preferences and actual conditions.					

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13.1 Special Tools

Magneto Rotor Removal Tool

CKM601700-00300



Balancer Shaft Alignment Testing Tool

CKM601700-00038



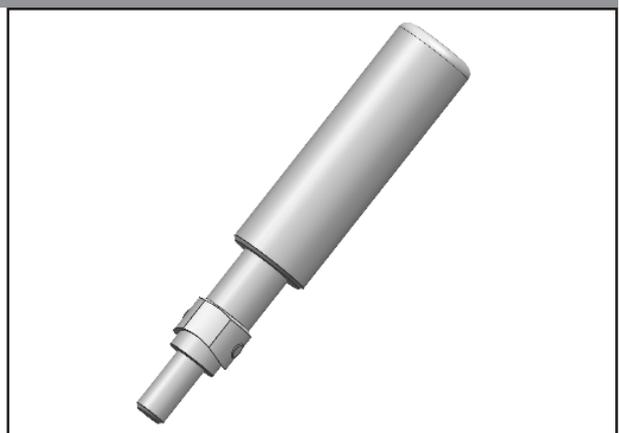
Timing Camshaft Testing Tool

CKM601700-00036



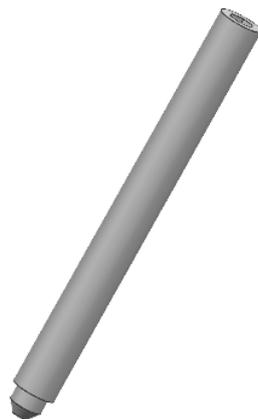
Insertion for Piston Ring Lock

CKM601700-00013



Crankshaft Locking Screw

CKM601700-00033



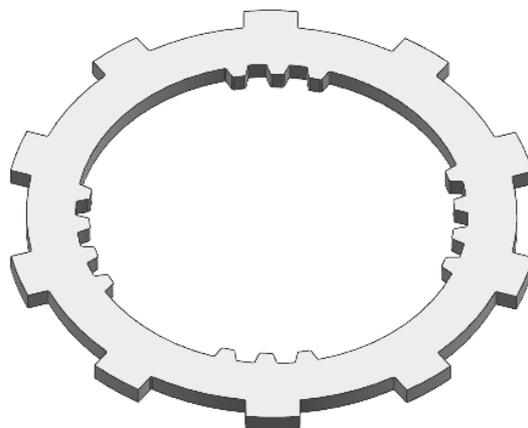
Release Device for Timing Chain Tensioner

CKM601700-02311



Clutch Stop Tool

CKM601700-00515



13.2 Removing the Engine

Preparatory Work

Remove the seat.

Remove relevant body covering parts (refer to Body Covering Parts chapter).

Remove the fuel tank.

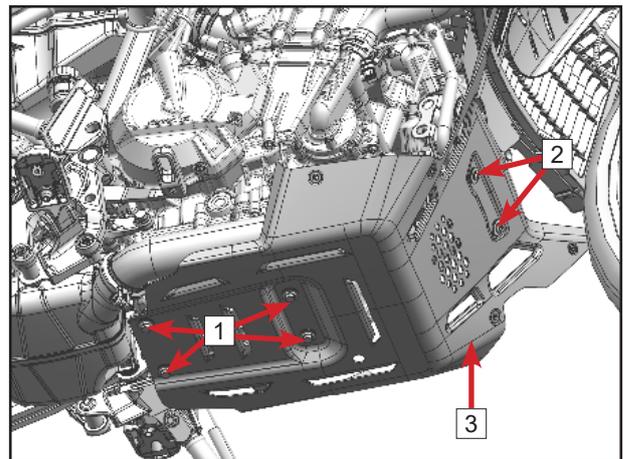
Drain the coolant.

Main Work

Remove bolts 1.

Remove bolts 2.

Remove engine lower panel 3.

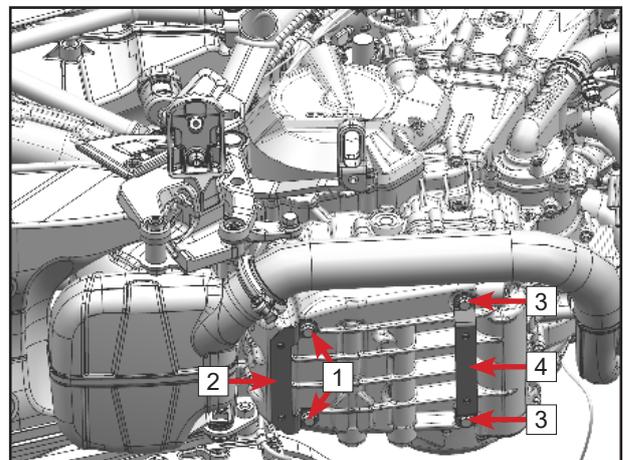


Remove bolts 1.

Remove lower panel rear bracket 2.

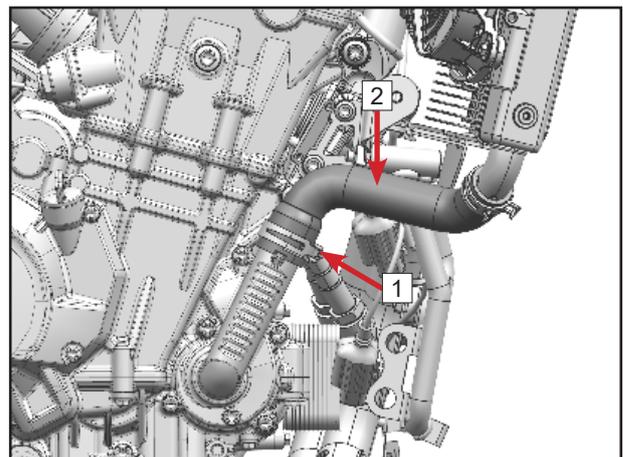
Remove bolts 3.

Remove guard front bracket assembly 4.



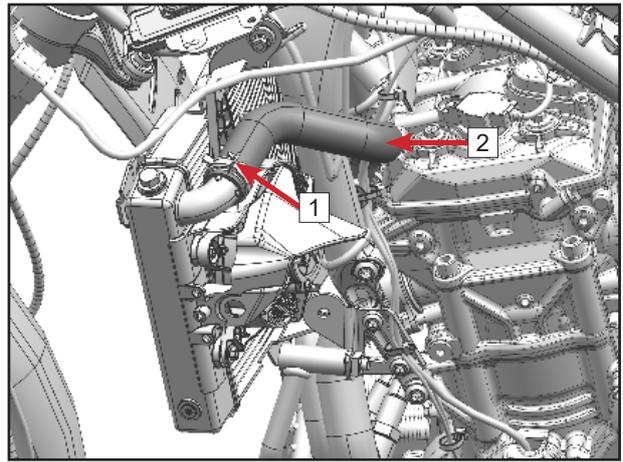
Loosen hose clips 1.

Pull off radiator water outlet hose 2.

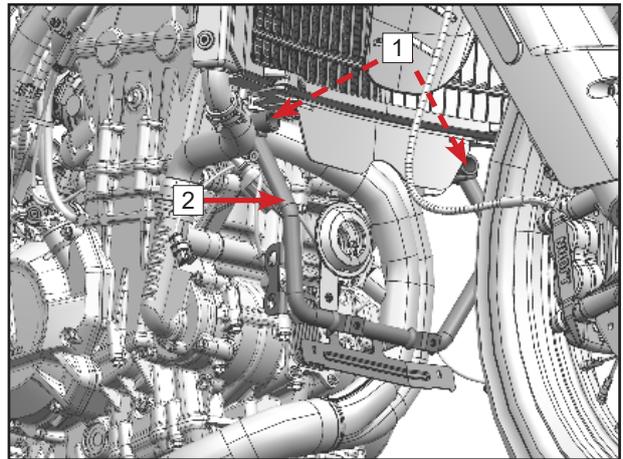


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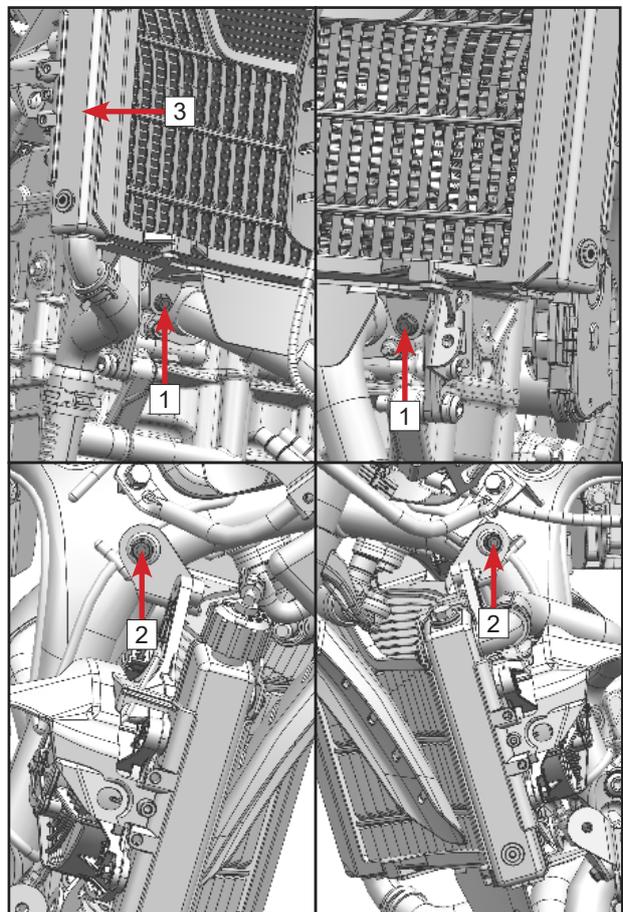
Loosen hose clips **1**.
Pull off radiator water inlet hose **2**.



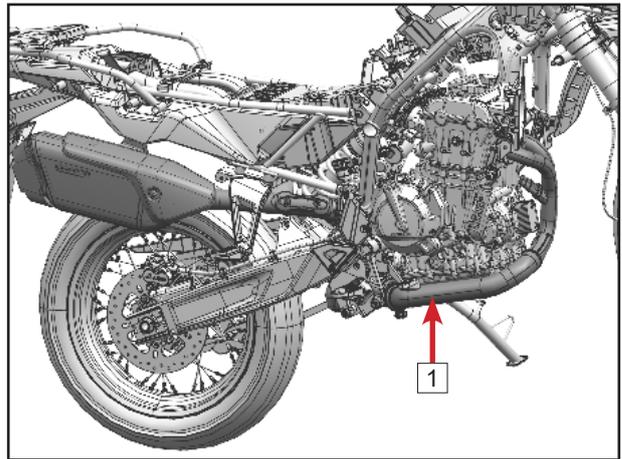
Remove screws **1**.
Remove bracket **2**.



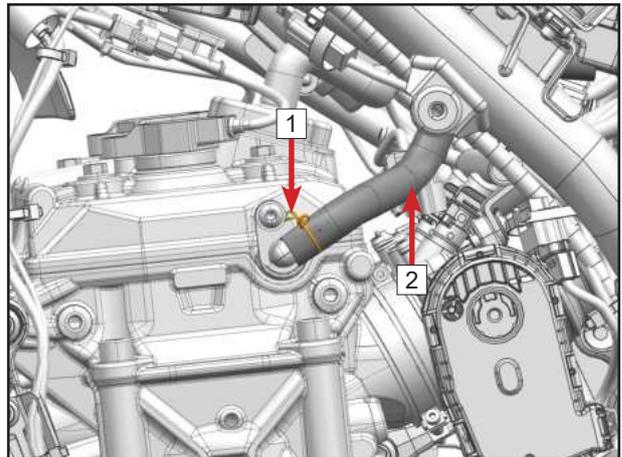
Remove bolts **1**.
Remove bolts **2**.
Remove radiator **3**.



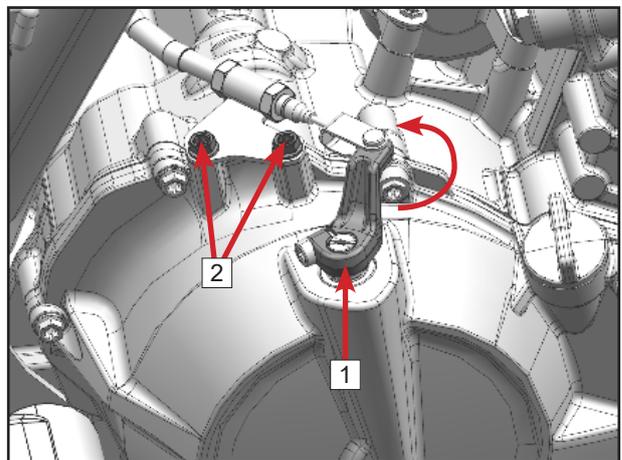
Remove exhaust system **1**. (refer to Exhaust System Chapter)



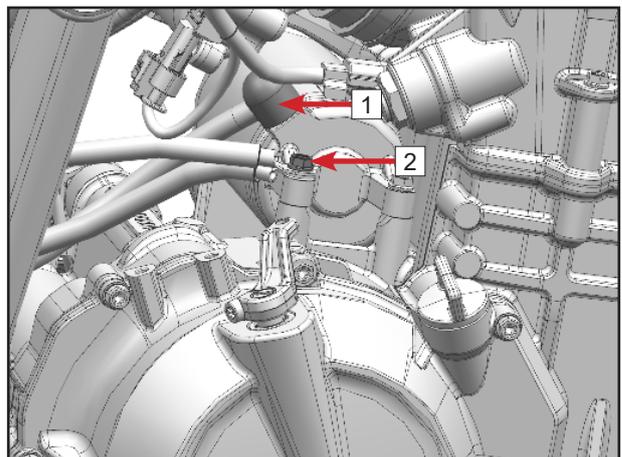
Remove hose clamp **1**, and pull off the vent hose **2**.



Swivel clutch release lever **1** counterclockwise and detach the clutch cable.
Remove screws **2**.
Hang the clutch cable with bracket to the side.

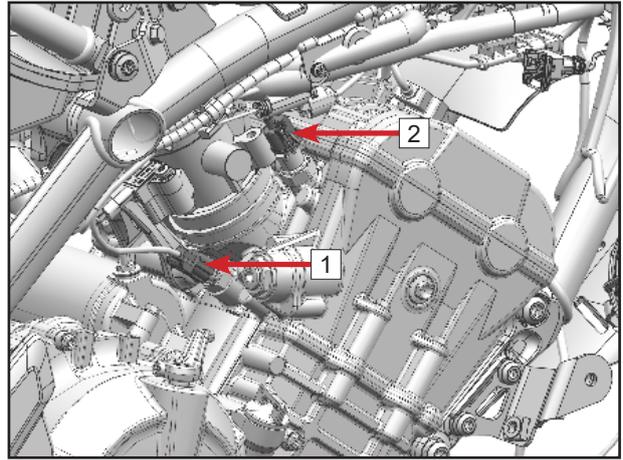


Push back protection cap **1**, and remove the nut.
Hang the positive cable to the side.
Remove screw **2**.
Hang the ground wire to the side.

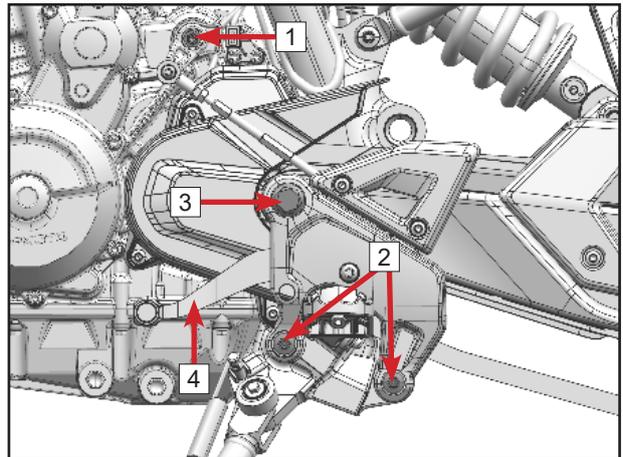


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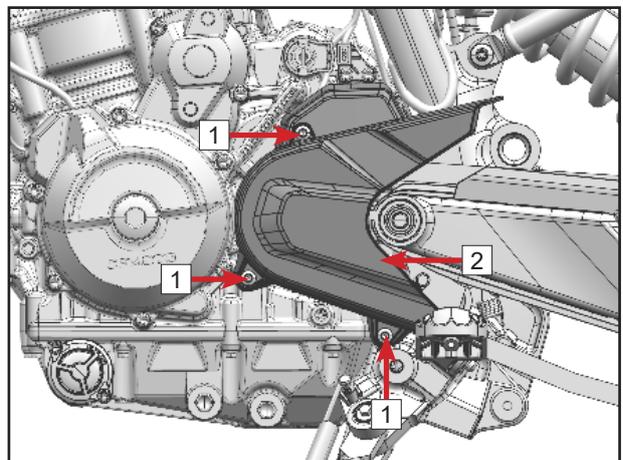
Disconnect connector **1** from the coolant temperature sensor.
Unplug connector **2** from the oil pressure sensor.



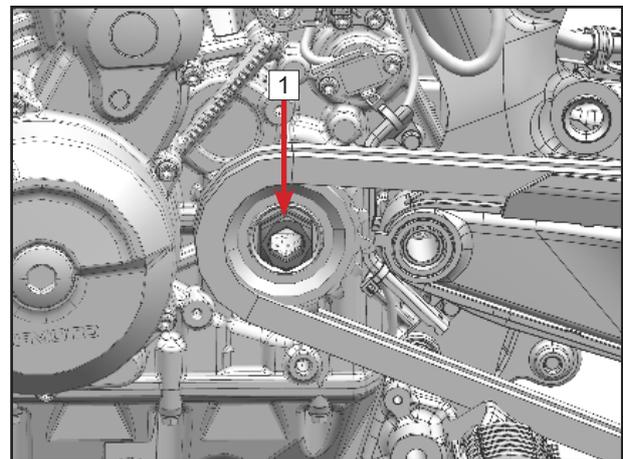
Remove bolt **1**.
Remove bolts **2**.
Remove bolt **3**.
Remove gearshift lever assembly **4**.



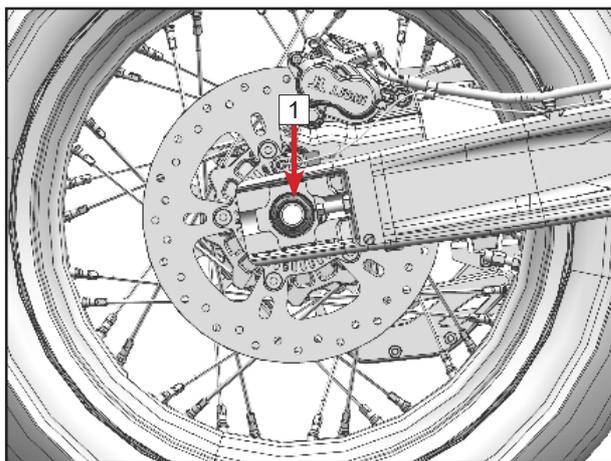
Remove screws **1**.
Remove sprocket guard **2**.



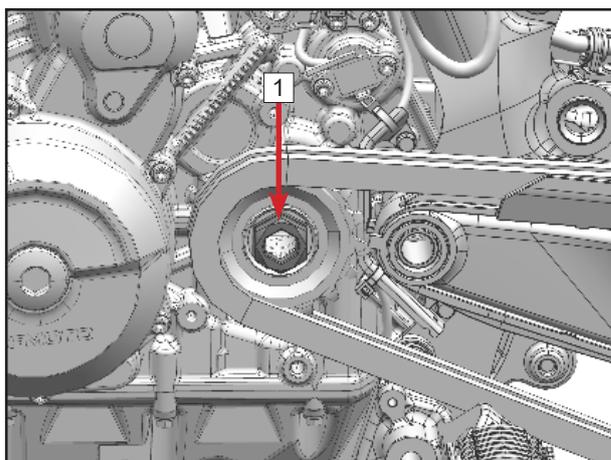
Bend up the lock washer.
Have an assistant operate the rear brake.
Loosen nut **1**.



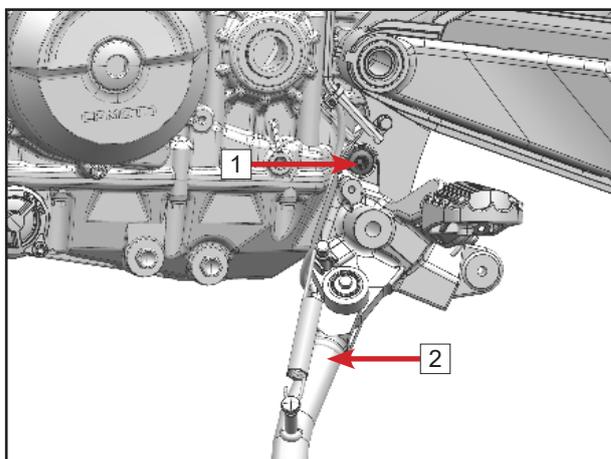
Remove nut **1**.
Remove the chain adjuster.
Push the rear wheel into the foremost position.



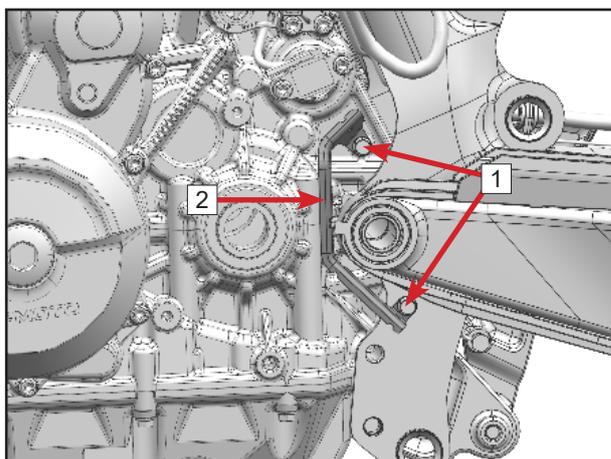
Remove nut **1** with the lock washer.
Take off the engine sprocket.



Remove bolt **1**.
Remove side stand **2**.

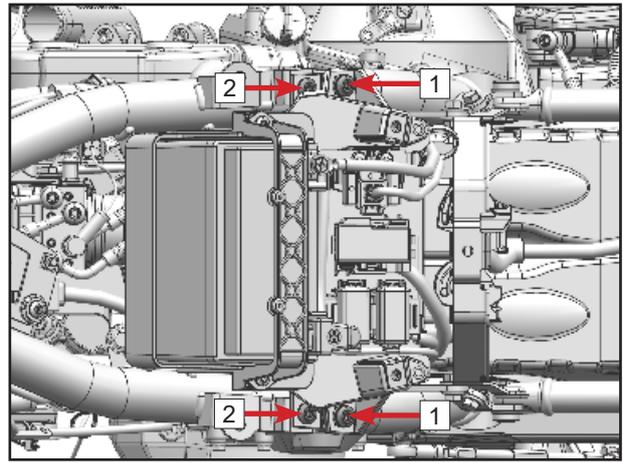


Remove bolts **1**.
Remove cable bracket **2**.

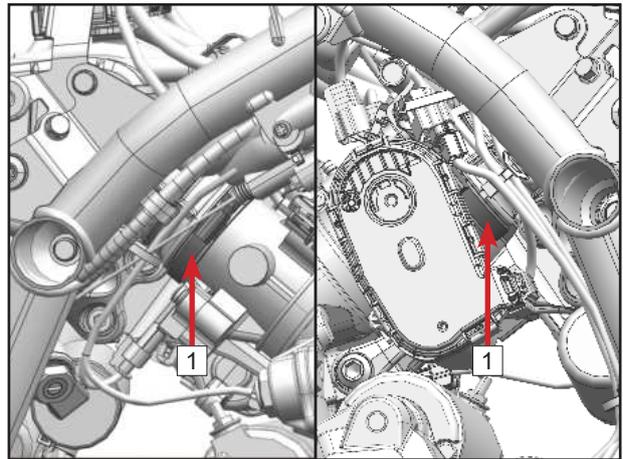


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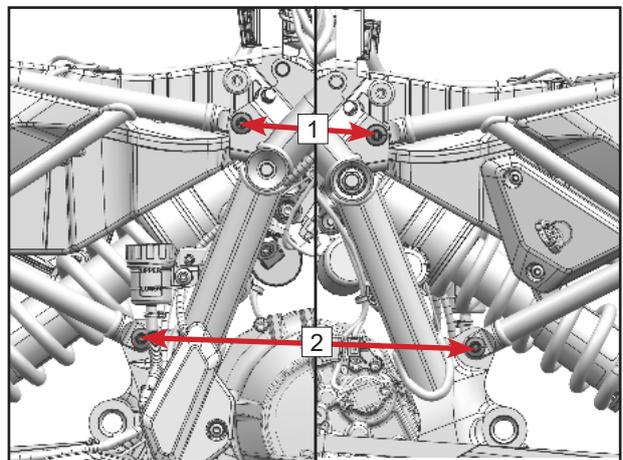
Remove bolts **1**.
Remove ECU and ECU bracket.
Remove bolts **2**.
Remove battery and battery box.



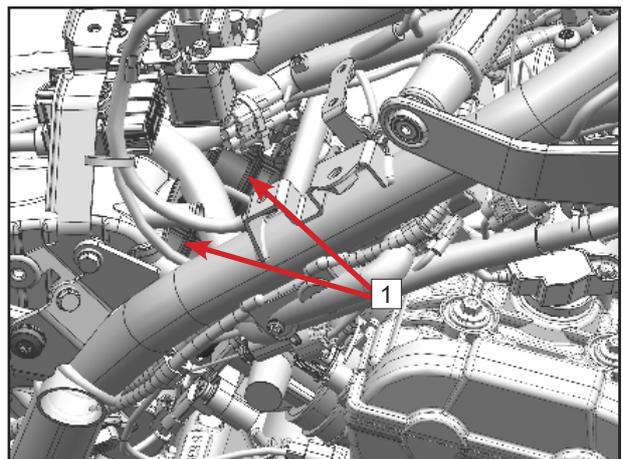
Loosen hose clips **1**.



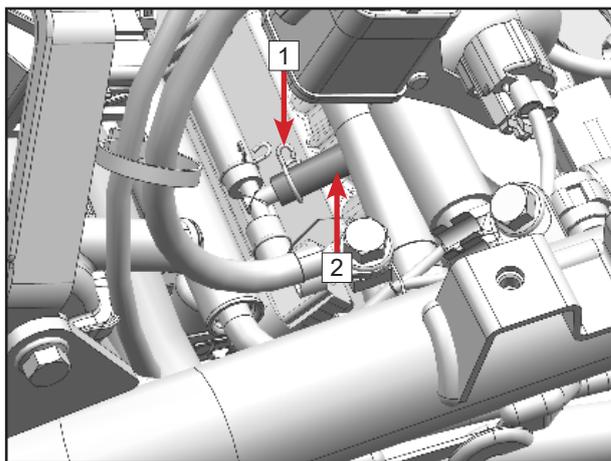
Loosen screws **1**.
Remove screws **2**.
Swivel the rear frame downward.



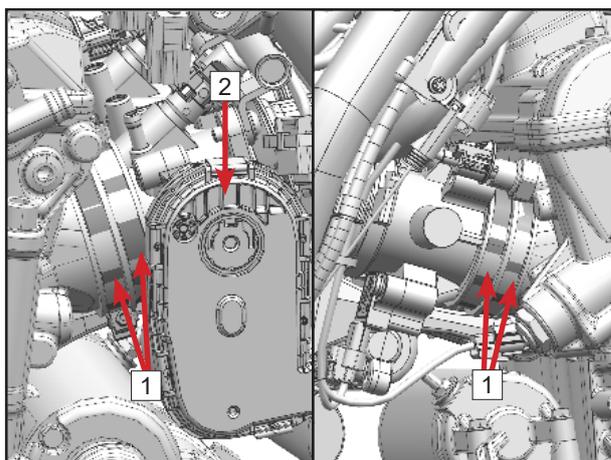
Unplug the air filter outlet pipe **1** from the throttle valve body.



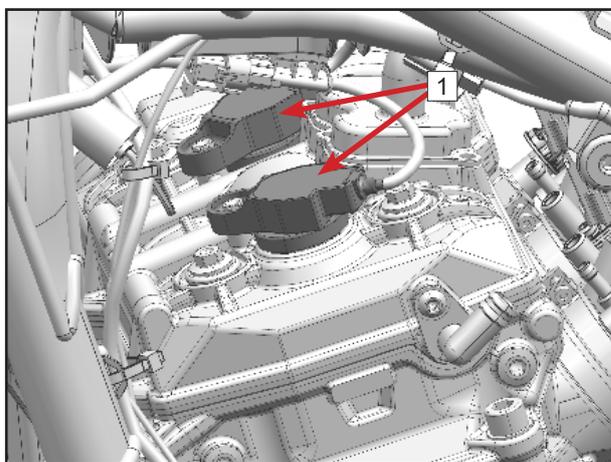
Loosen clamp **1**.
Unplug hose **2**.



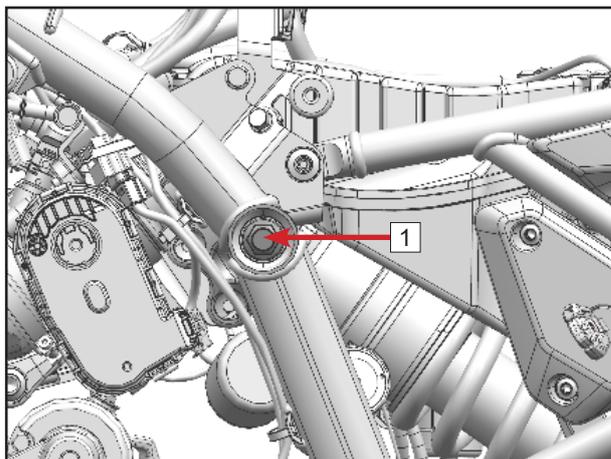
Loosen hose clips **1**.
Pull off the throttle valve body **2** toward the rear and hang it to the side.



Unplug ignition coil **1** connectors.
Unplug other electrical connectors connected to the engine.

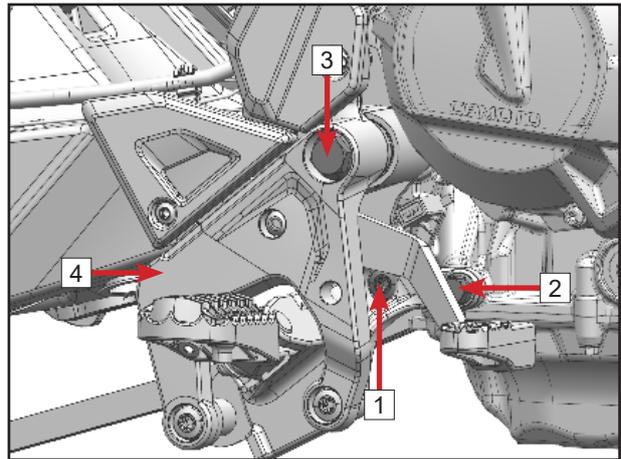


Use support to prop up the bottom of the engine.
Loosen screw **1**.

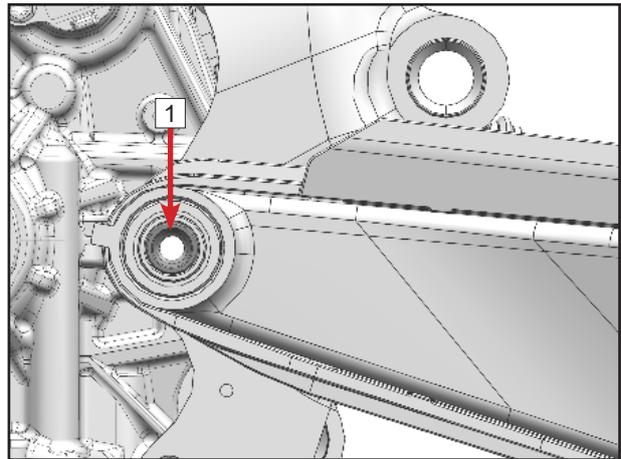


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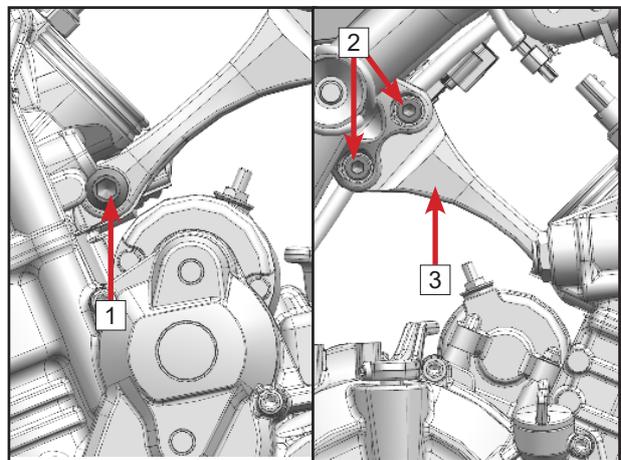
- Remove bolt **1**.
- Remove bolt **2**.
- Remove bolt **3**.
- Remove brake pedal bracket assembly **4**.



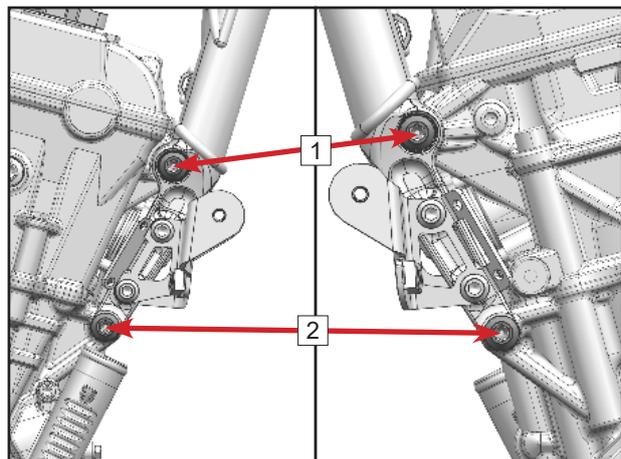
Pull out swingarm pivot **1** far enough so that the engine is released but the swingarm pivot remains secured.



- Remove screw **1**.
- Remove screws **2**.
- Take off the engine bearer **3**.



- Remove screws **1**.
- Remove screws **2**.



Remove swingarm pivot [3].

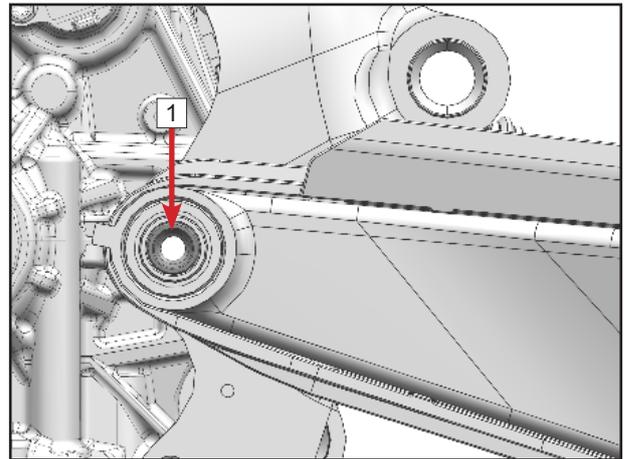
Remove the engine.

NOTE

The help of an assistant is useful in this step.

Make sure that the motorcycle is sufficiently secured against falling over.

Protect the frame and attachments against damage.



13.3 Engine Installation

Install the engine to the vehicle in reverse order of disassembly.

13.4 Engine Air Intake System

13.4.1 Air Filter Assembly

Air Filter Assembly Removal

Preparatory Work

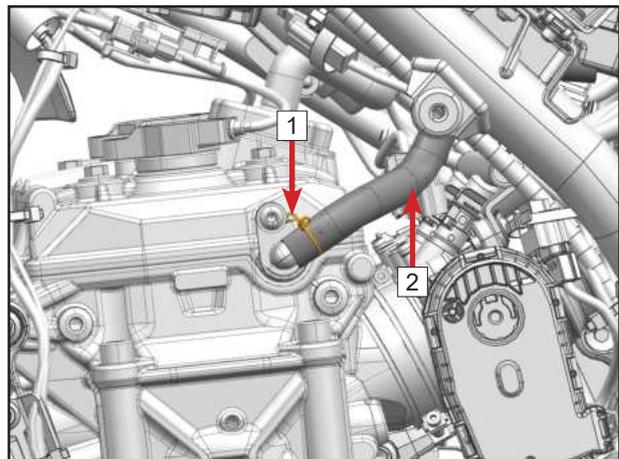
Remove seat.

Remove relevant body covering parts (refer to Body Covering Parts chapter).

Remove fuel tank.

Main Work

Loosen clamp **1**, unplug breather hose **2**.

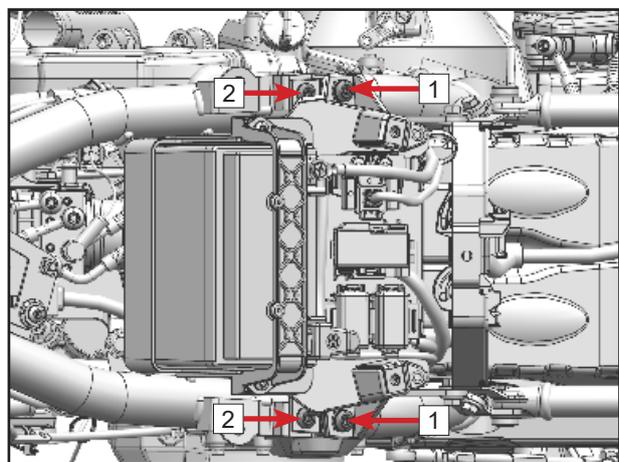


Remove bolts **1**.

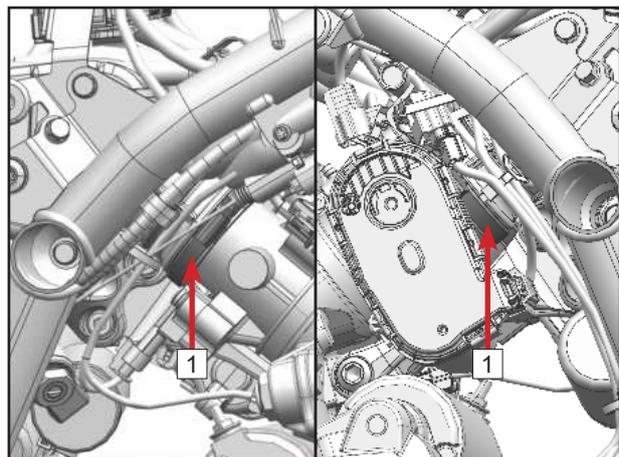
Remove ECU and ECU bracket.

Remove bolts **2**.

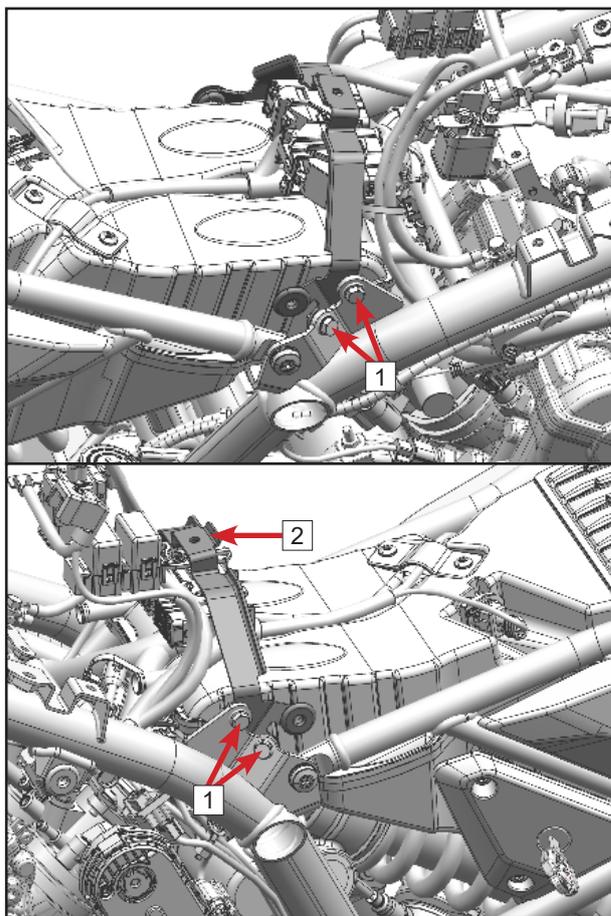
Remove battery and battery box.



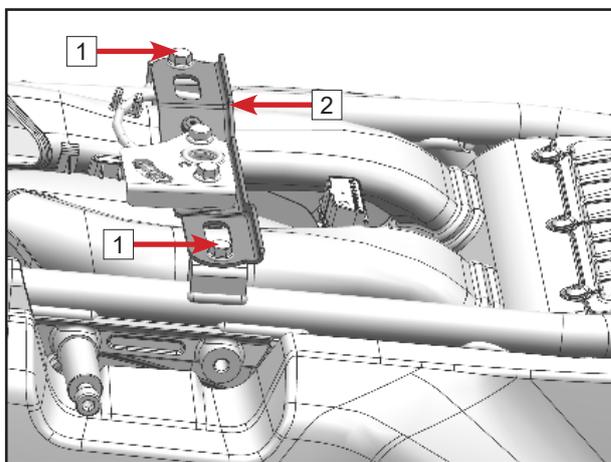
Loosen clamps **1**.



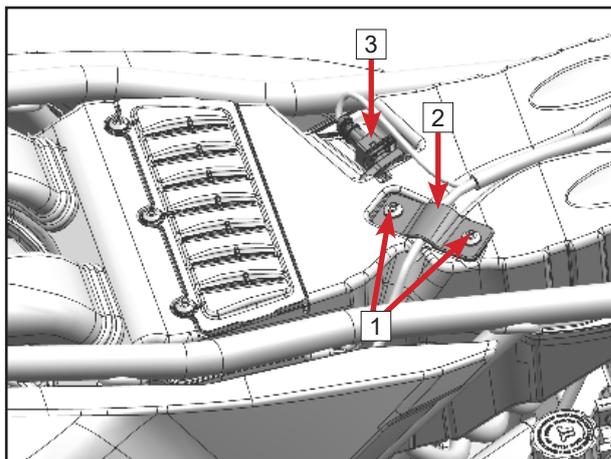
Remove bolts **1**.
Remove seat front bracket **2**.



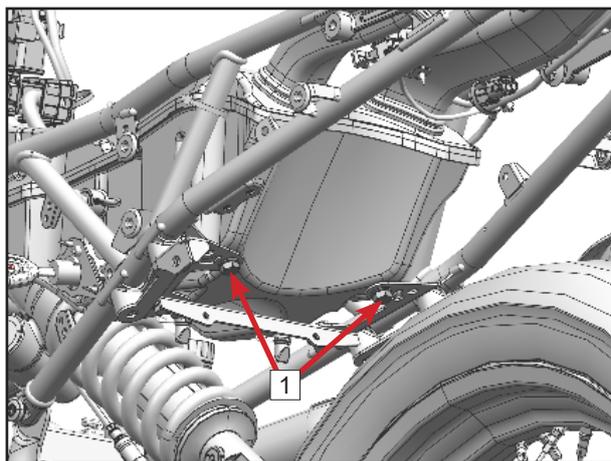
Remove bolts **1**.
Remove seat lock bracket **2**.



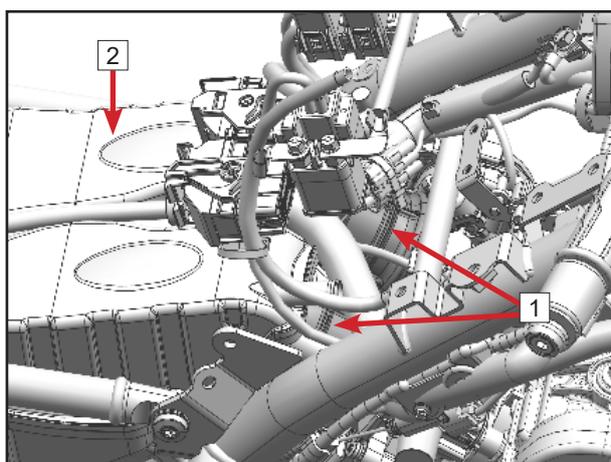
Remove screws **1**.
Remove plate **2**.
Disconnect air intake temperature connector **3**.



Remove bolts **1**.



Unplug the air filter outlet pipe **1** from the throttle valve body.
Remove the air filter assembly **2**.

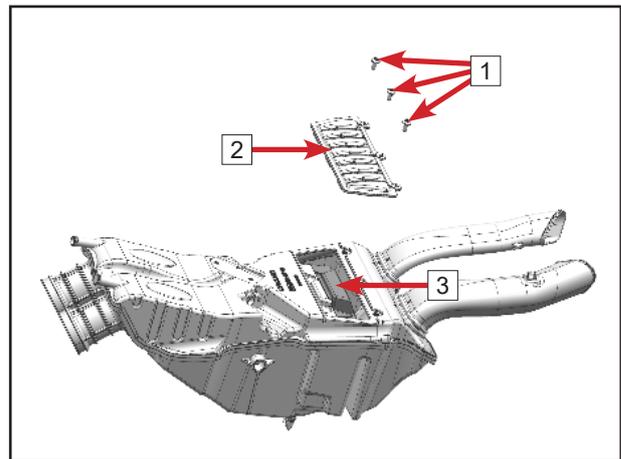


Air Filter Assembly Disassembly

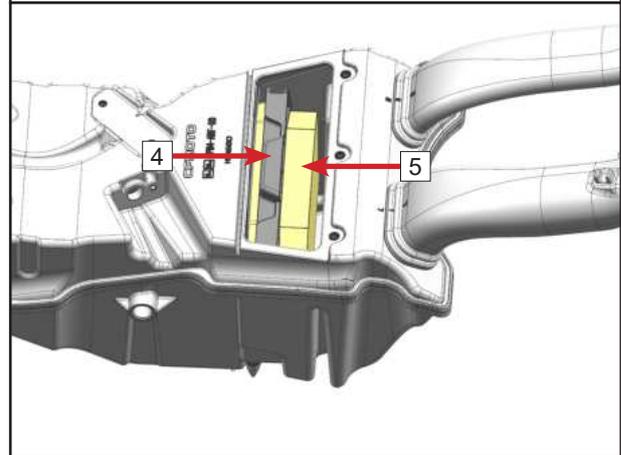
Remove screws **1**.

Remove air filter cover **2**.

Remove filter wedge **3**.



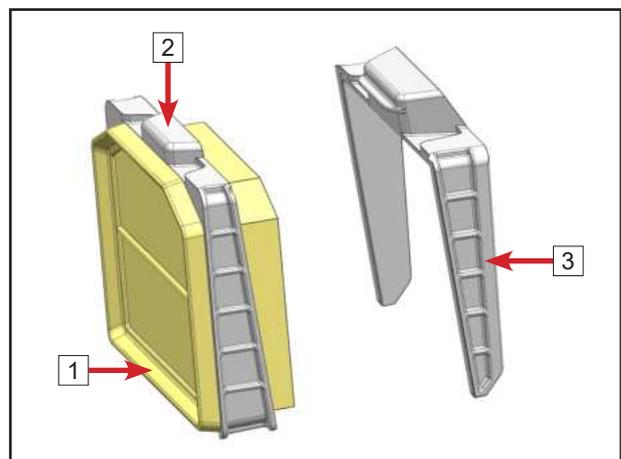
Remove filter element frame **4** with filter element assembly **5**.



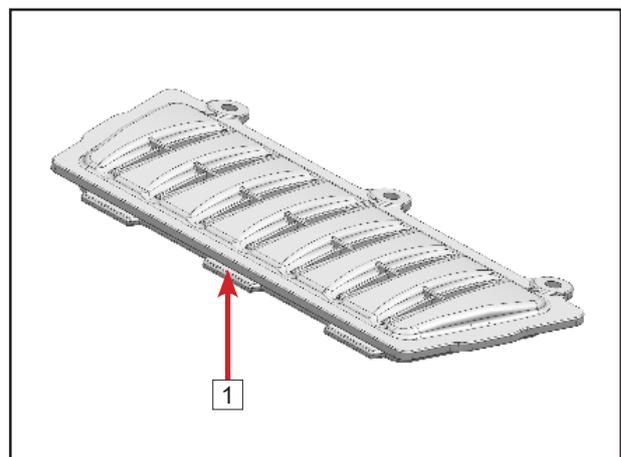
Air Filter Assembly Inspection

Check filter element assembly **1**: If there is too much dust, clean it with low pressure air. If damaged, replace it with a new one.

Check filter element frame **2** and filter wedge **3** for breakage and damage. Replace if found.



Check air filter cover **1** for breakage and damage. Replace if found.



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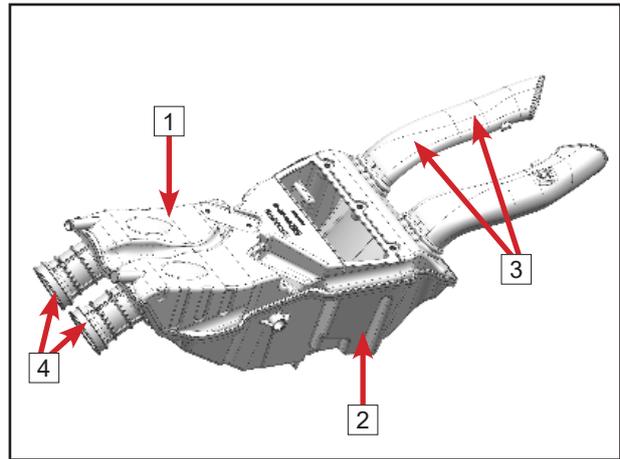
Inspect the air filter upper 1 and lower 2 housings for cracks or damage. If so, replace with new parts.

Clean the air filter housing.

Check air filter inlet 3 and outlet 4 hoses for aging or breakage. If so, replace with new parts.

NOTE

Air filter outlet hose, air filter upper housing and air filter lower housing: if any one of these parts is damaged, all three need to be replaced together.



Air Filter Assembly Assembly

Assemble the air filter assembly in the reverse order of disassembly. It must be confirmed that the filter element is securely installed in the specified position and is reliably sealed.

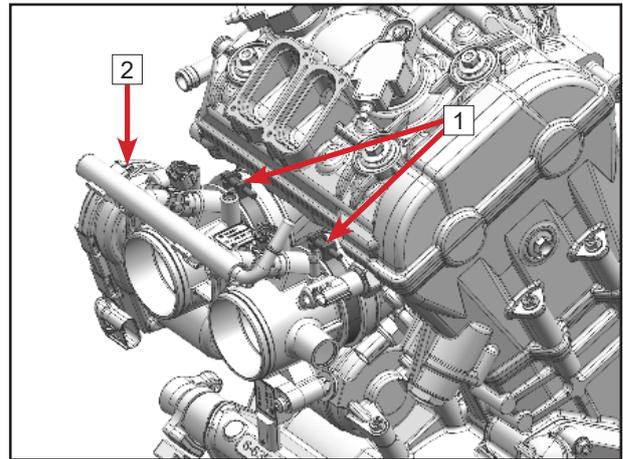
Air Filter Assembly Installation

Install the air filter assembly to the vehicle in the reverse order of removal.

13.4.2 Throttle Body Assembly Throttle Body Assembly Removal and Disassembly

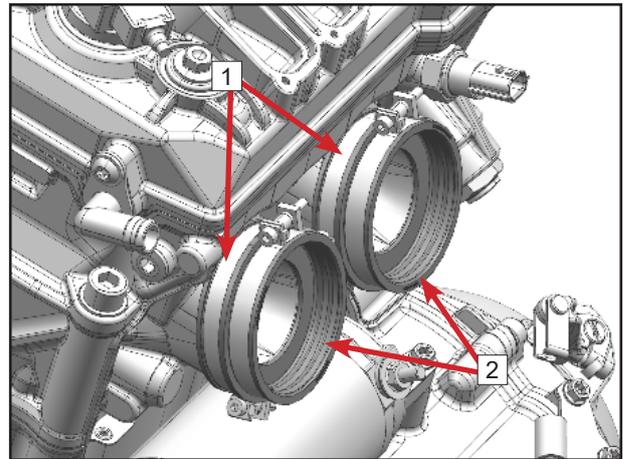
Release clamp **1**.

Remove throttle body assembly **2**.



Release clamp **1**.

Remove throttle body connecting pipe **2**.

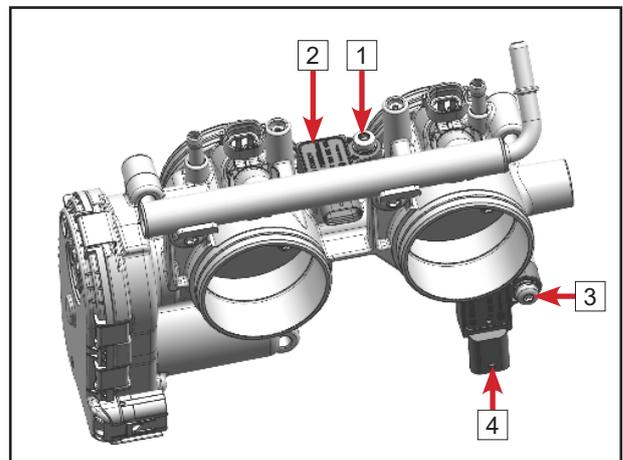


Remove screw **1**.

Remove air intake temperature pressure
sensor **2**

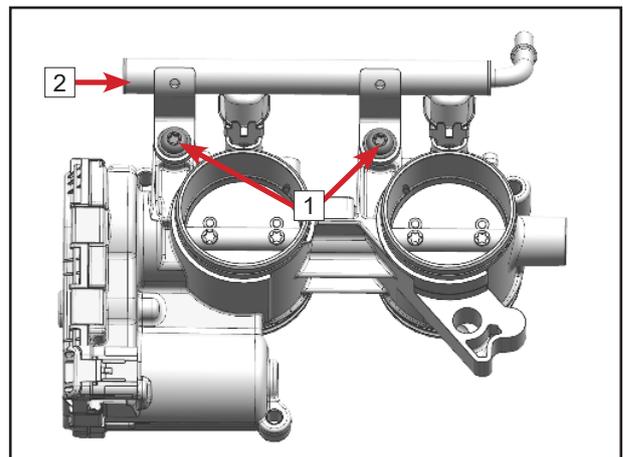
Remove screw **3**.

Remove air intake temperature pressure
sensor **4**.



Remove bolts **1**.

Remove fuel rail assembly **2**.



Fuel Rail Assembly

Disassembly

Use both thumbs to push on each side of the circlips **1** to remove them.

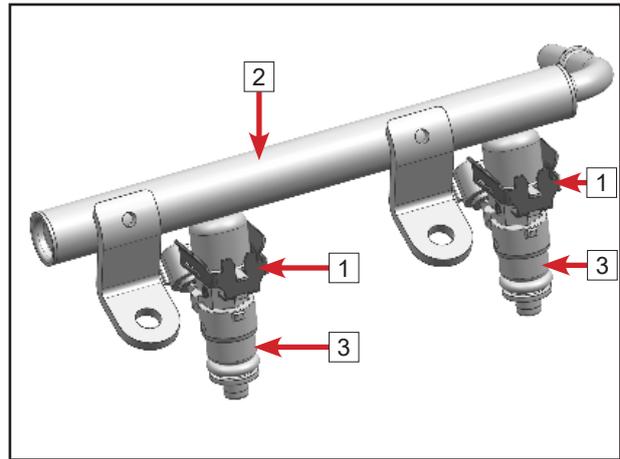
Remove the injectors **3** from the fuel rail assembly **2**.

See the electrical section for details of the fuel injector maintenance.

Installation

Install the injectors **3** to the fuel rail assembly **2**.

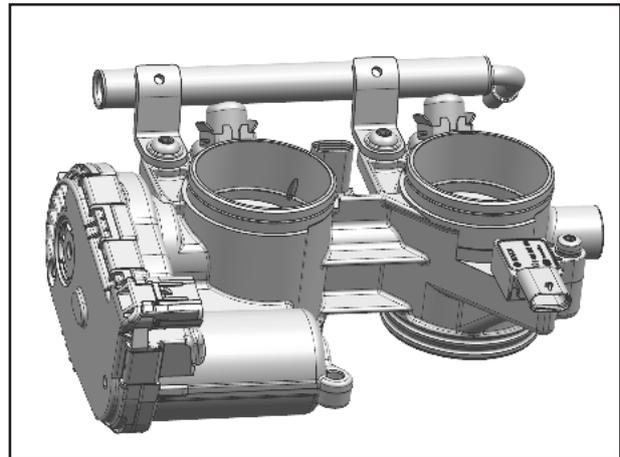
To install the circlips **1**, the tabs of the fuel rail assembly **2** must be snapped into the slots of the circlip.



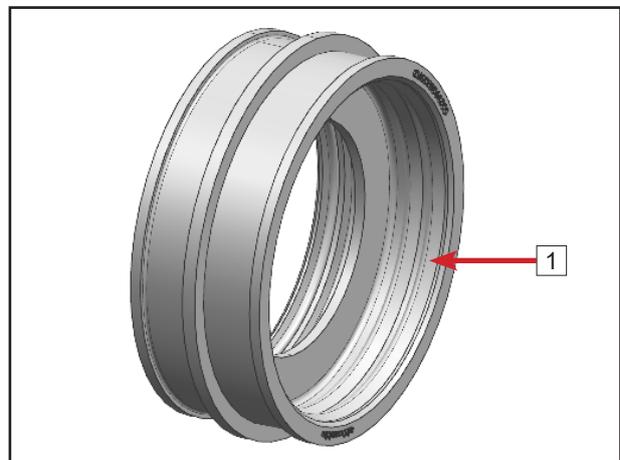
Throttle Body Assembly Inspection

Check whether the throttle body is broken or damaged, if so, replace with new parts.

For TPS and air intake temperature and pressure sensor maintenance information see the electrical section for details.



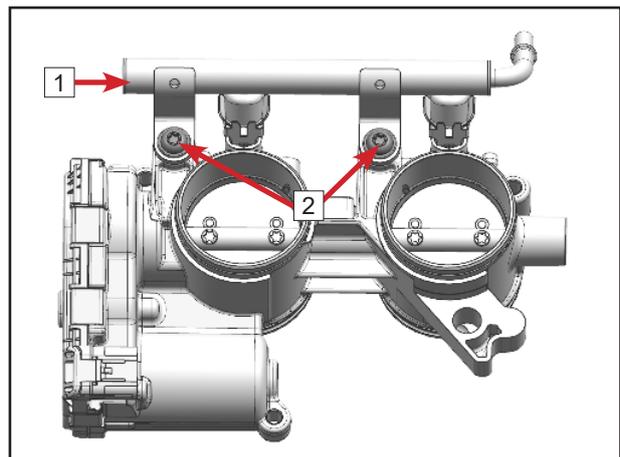
Inspect throttle body connecting pipe **1** for breakage or damage, replace if necessary.



Throttle Body Assembly Installation

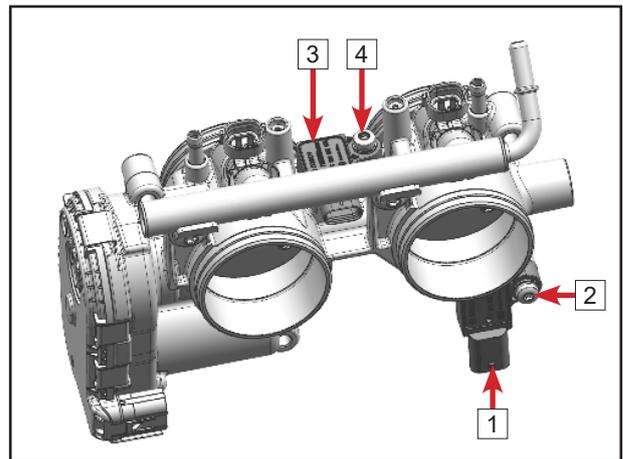
Install fuel rail assembly **1**.

Install bolts **2**.

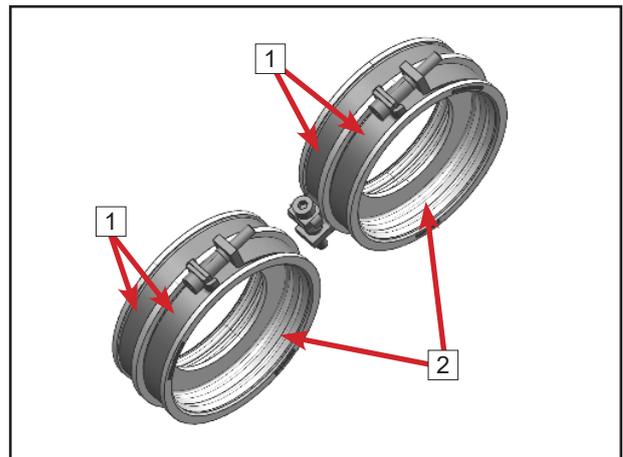


Install air intake temperature and pressure sensor **1** and screw **2**.

Install air intake temperature and pressure sensor **3** and screw **4**.



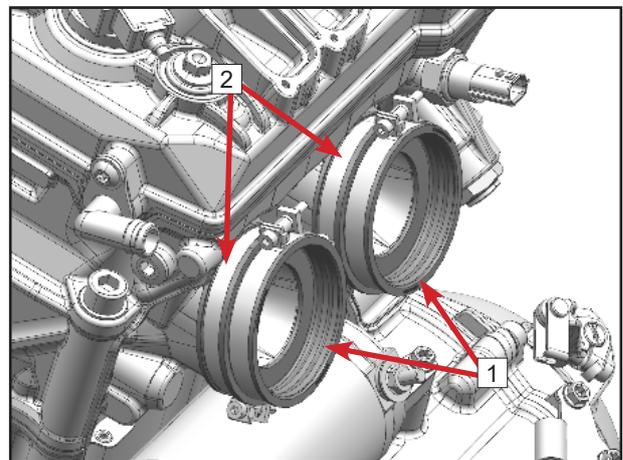
Release clamps **1**, and install them to throttle body connecting pipe **2**.



Install throttle body connecting pipe **1** to engine.

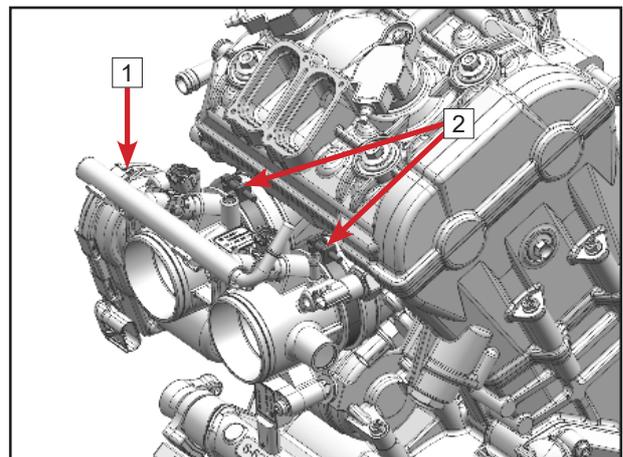
NOTE
The "airboxside" mark on the throttle body connecting pipe faces outward.

Tighten clamps **2**.



Install throttle body assembly **1**.

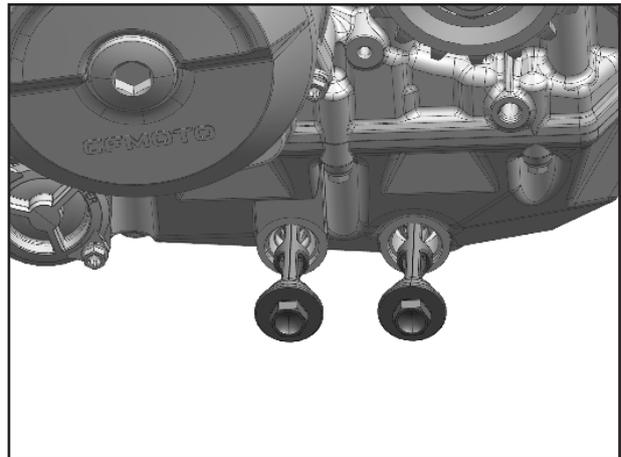
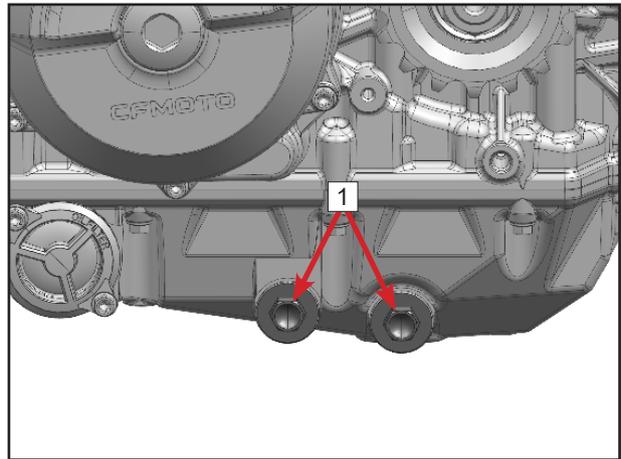
Tighten clamps **2**.



13.5 Engine Disassembly

13.5.1 Draining the Engine Oil

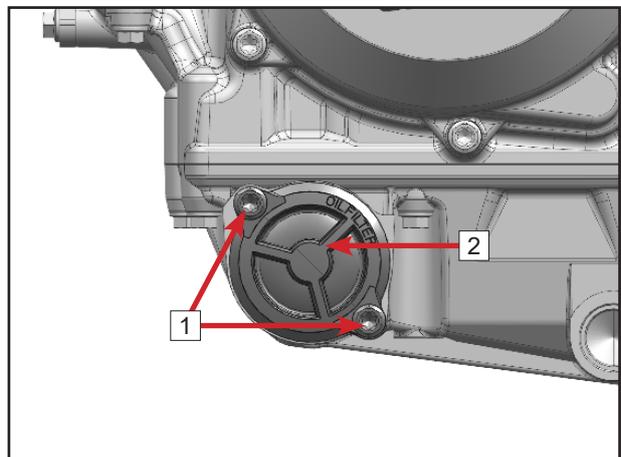
Remove oil drain plugs (1) with the magnet, O-rings, and oil screen. Completely drain the engine oil.



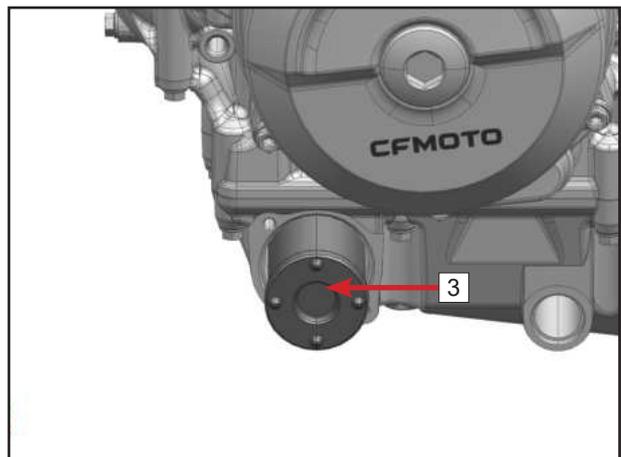
13.5.2 Removing the Oil Filter

Remove screws (1).

Take off oil filter cover (2) with the O-ring.



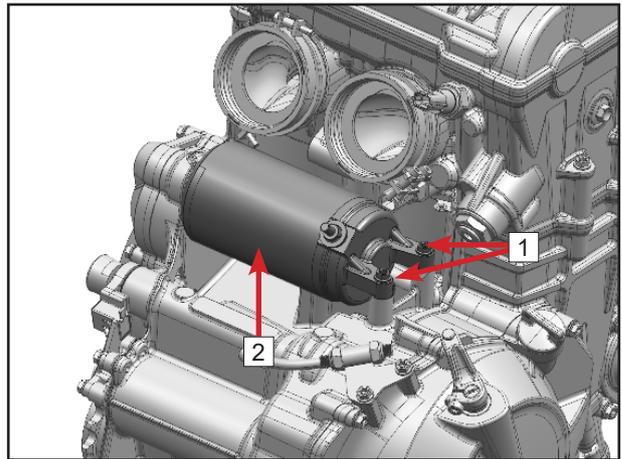
Remove oil filter (3).



13.5.3 Removing the Starter Motor

Remove screw (1).

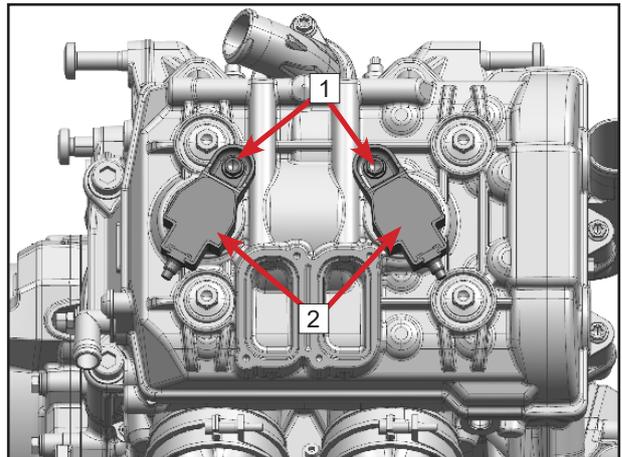
Take off the starter motor (2).



13.5.4 Removing the Valve Cover

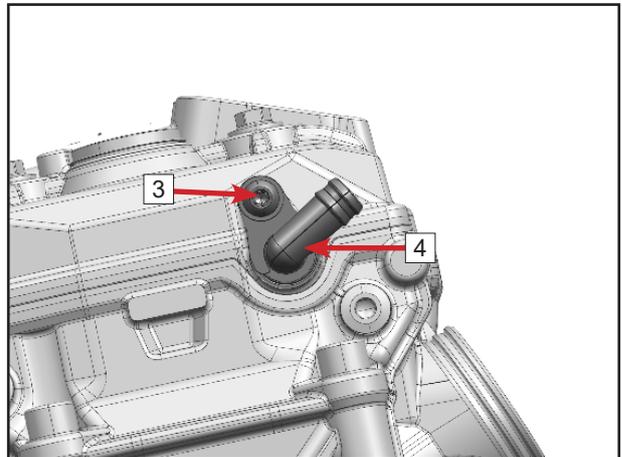
Remove screws (1).

Remove ignition coils (2).



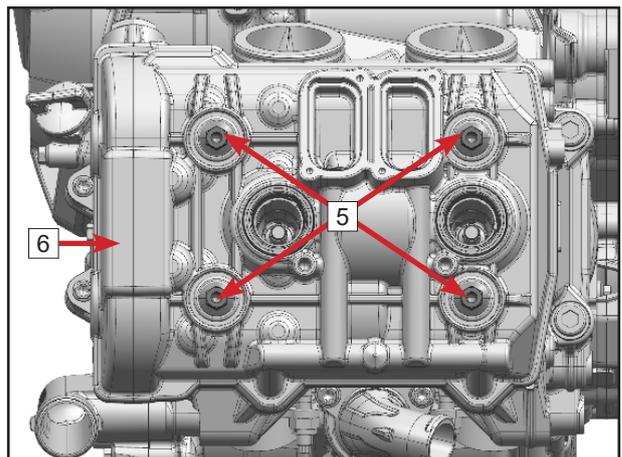
Remove screw (3) with retaining bracket.

Pull off bleeder flange (4).



Remove screws (5) with gaskets.

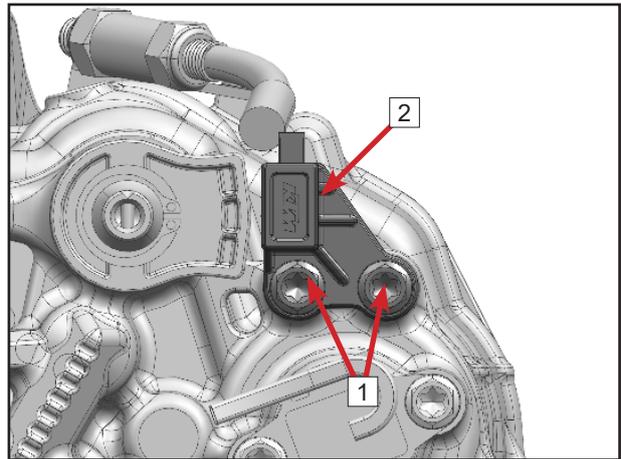
Take off the valve cover (6) with the valve cover seal.



13.5.5 Removing Shift Shaft Sensor

Remove screws (1).

Take off the shaft sensor (2).

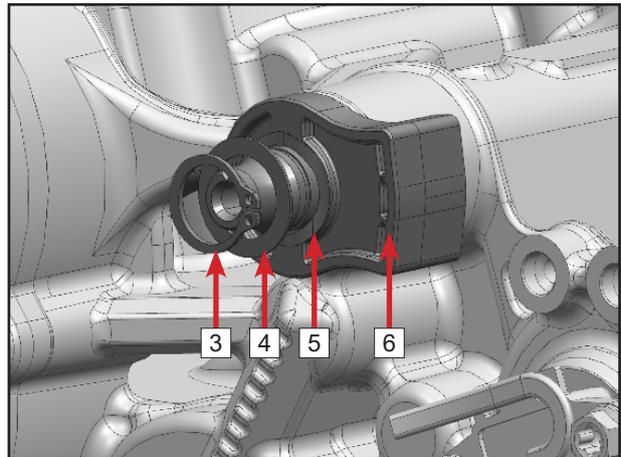


Remove lock ring (3).

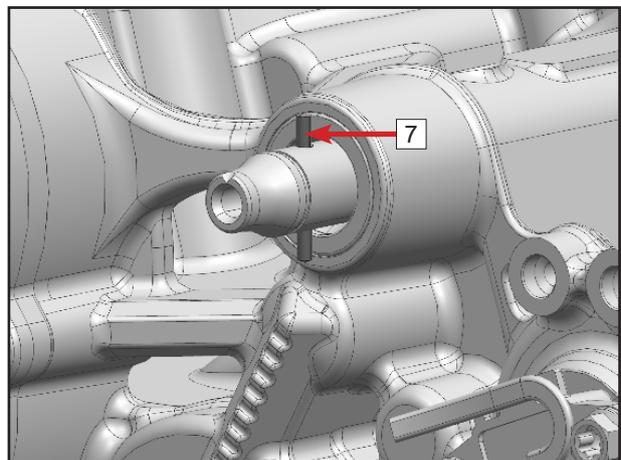
Remove washer (4).

Remove locating washer (5).

Take off magnetic holder (6).



Remove pin (7).

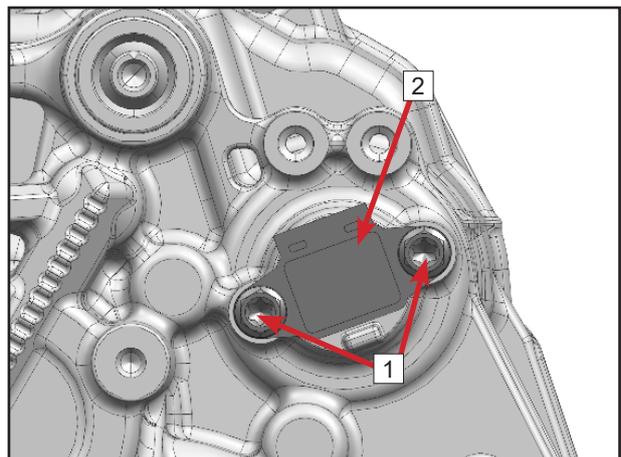


13.5.6 Removing the Gear Position Sensor

Remove the cable tie.

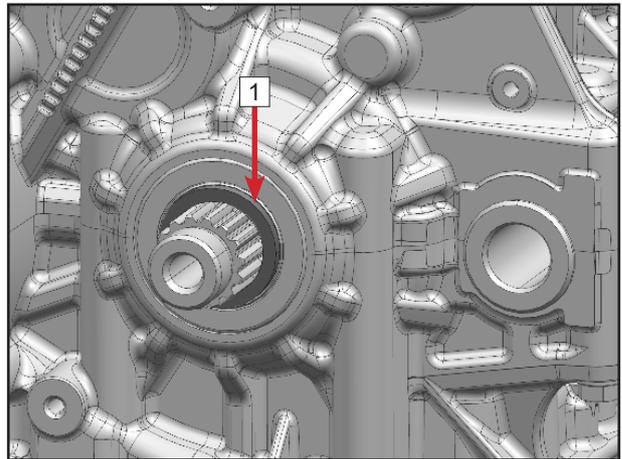
Remove screws (1).

Take off gear position sensor (2).



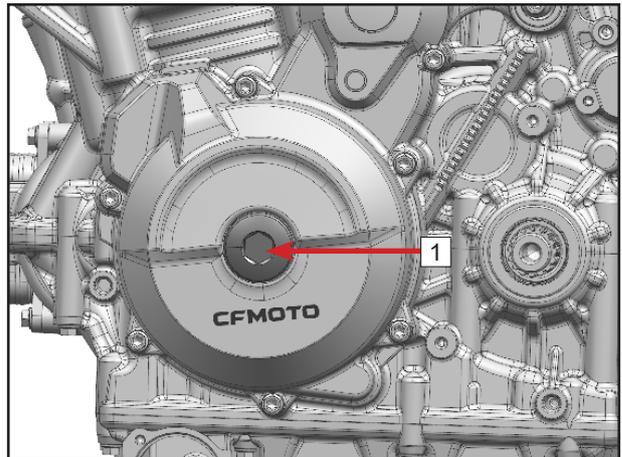
13.5.7 Removing the Spacer

Remove spacer (1) of the countershaft.
Remove the O-ring.

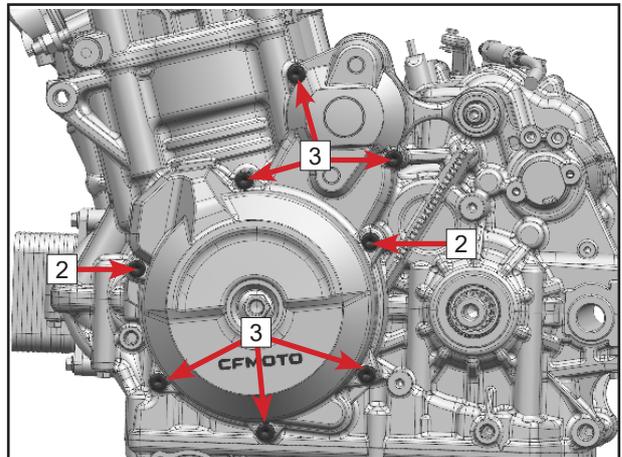


13.5.8 Removing the Alternator Cover

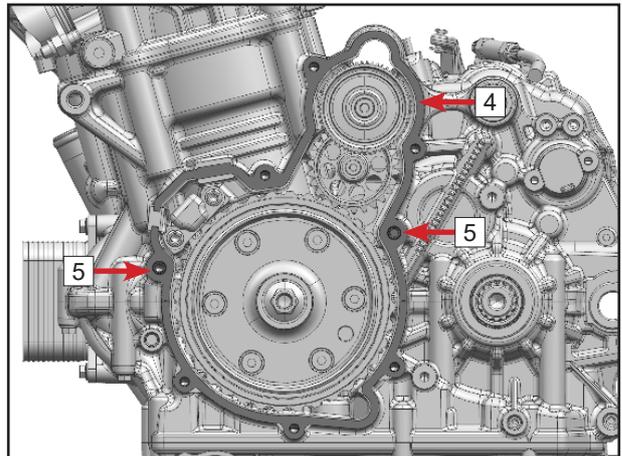
Remove screw plug (1) with the O-ring.



Remove screws (2) and (3).



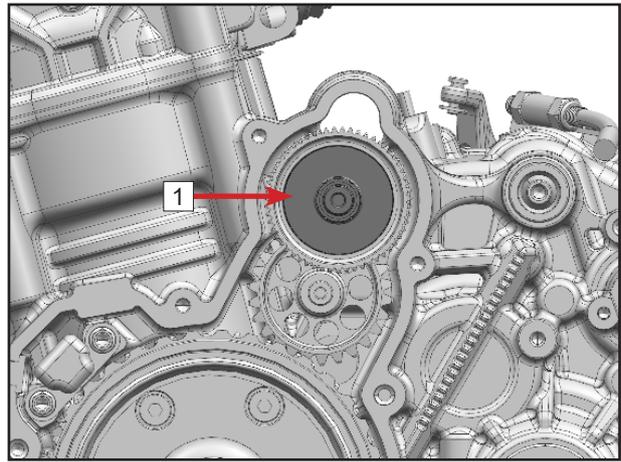
Remove the alternator cover.
Take off alternator cover gasket (4).
Remove dowels (5).



13.5.9 Removing the Torque Limiter and Starter Intermediate Gear

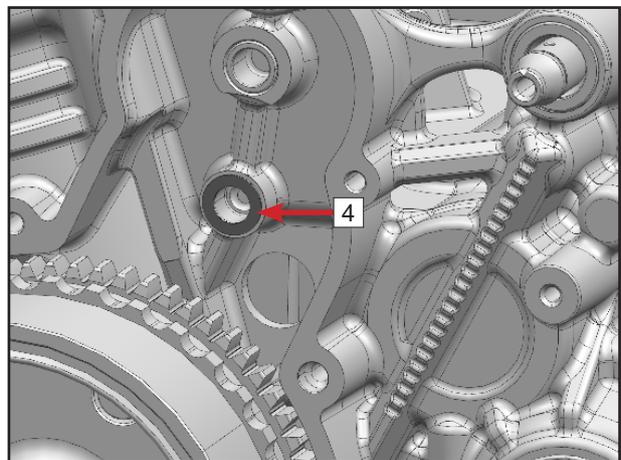
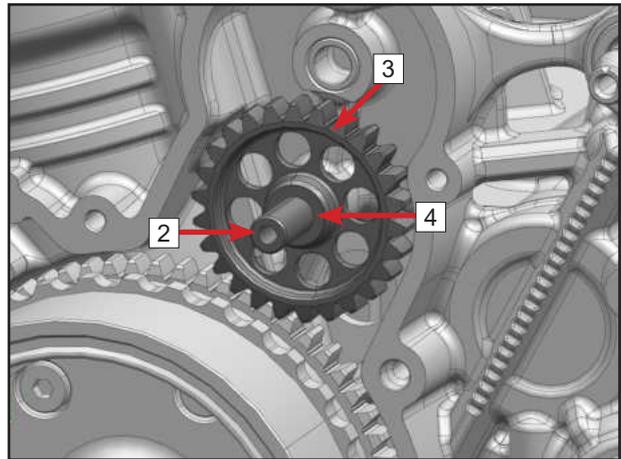
Take off torque limiter (1) with washer.

NOTE
The washer usually sticks to the engine case.



Take off shaft (2) and starter intermediate gear (3) with needle bearing and washers (4).

NOTE
The rear washer usually sticks to the engine case.

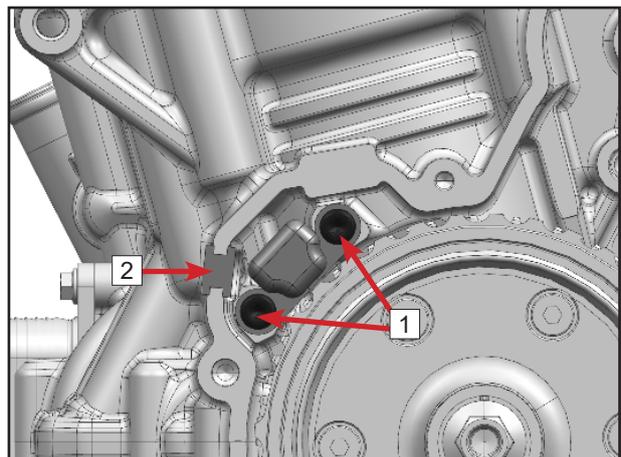


13.5.10 Removing the Ignition Pulse Generator

Remove screws (1).

Pull cable sleeve (2) out of the engine case.

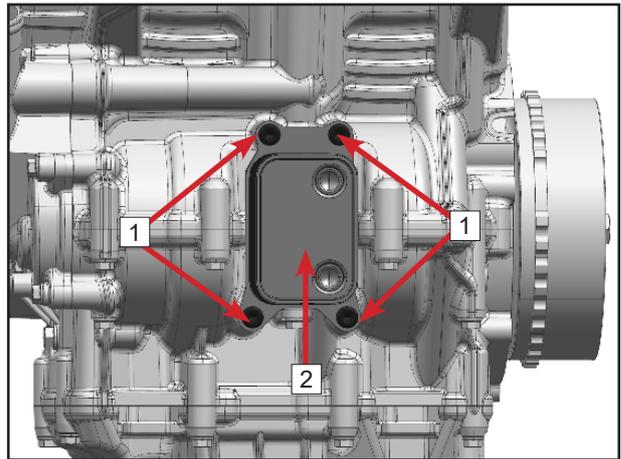
Remove the ignition pulse generator.



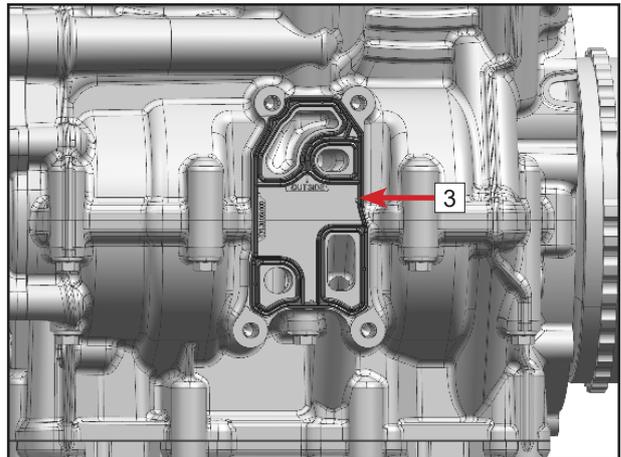
13.5.11 Removing the Heat Exchanger

Remove screws (1).

Take off heat exchanger (2).



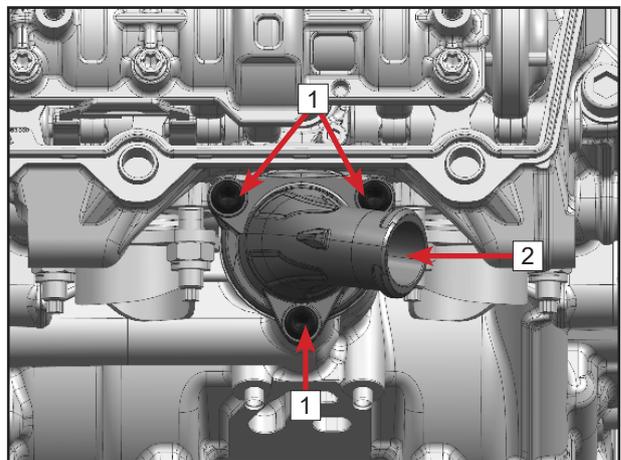
Remove gasket (3).



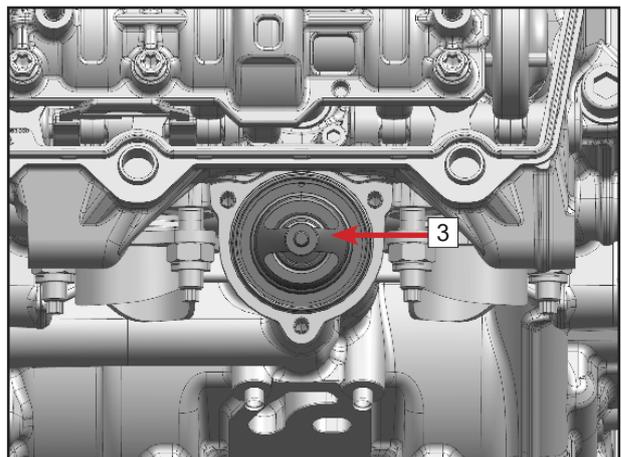
13.5.12 Removing the Thermostat

Remove screws (1).

Take off the thermostat case (2).



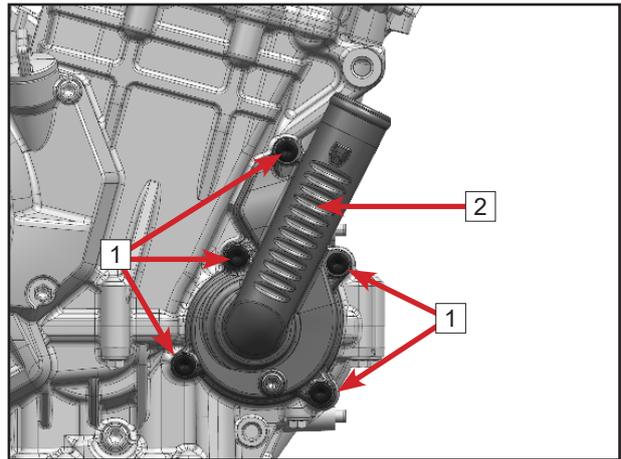
Remove thermostat (3).



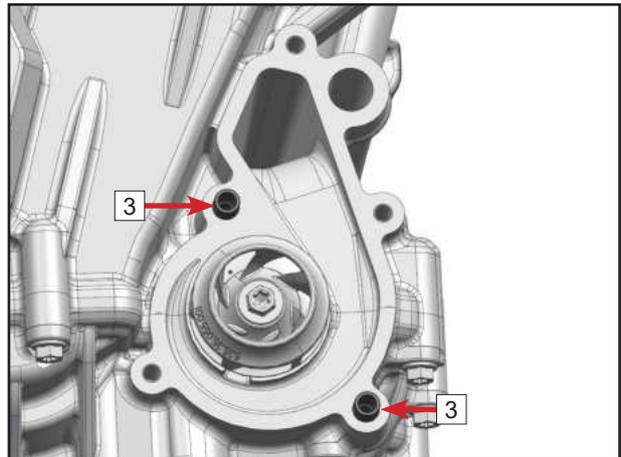
13.5.13 Removing the Water Pump Impeller

Remove screws (1).

Take off water pump cover (2) with the gasket.

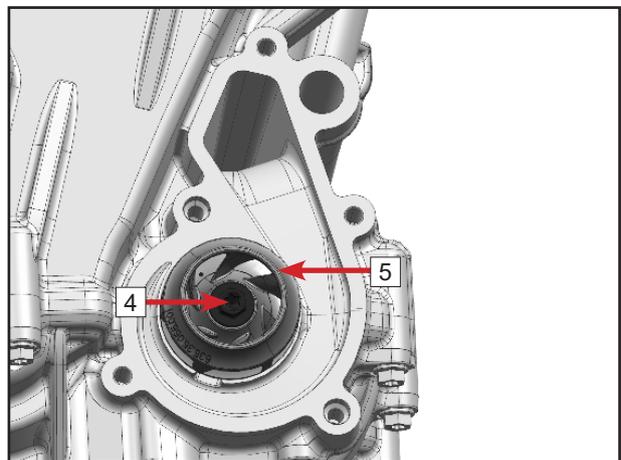


Remove dowels (3).

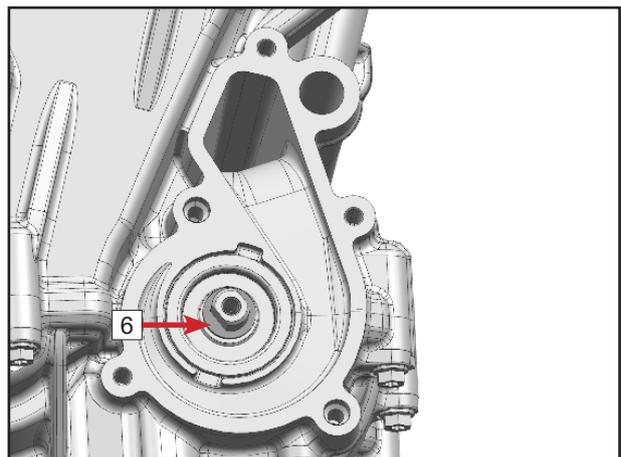


Remove screw (4).

Remove water pump impeller (5).

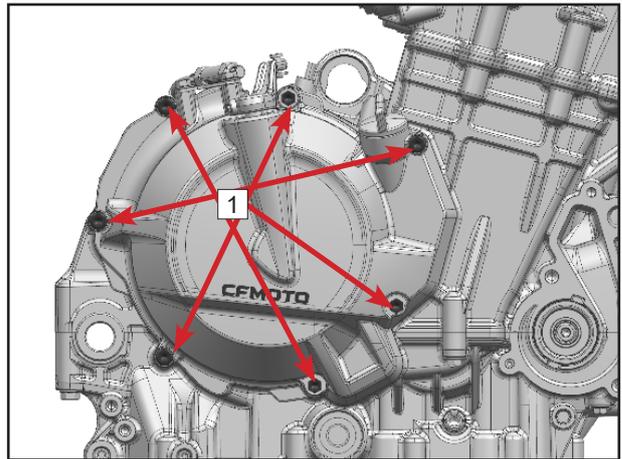


Remove from washer (6).

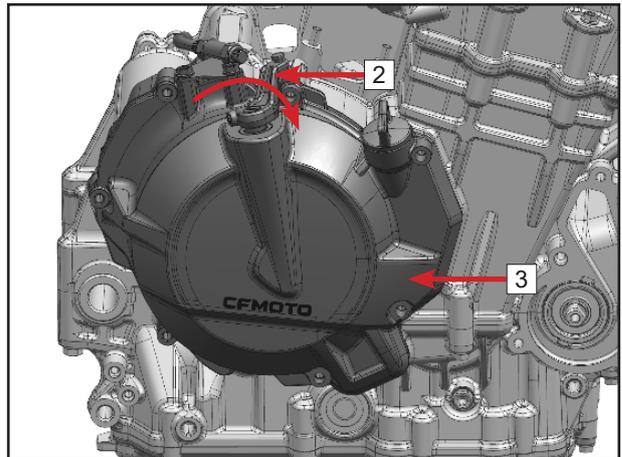


13.5.14 Removing the Clutch Cover

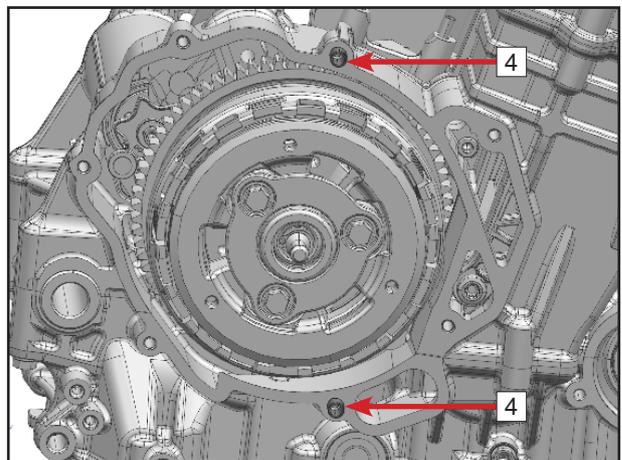
Remove screws (1).



Swivel the clutch lever (2) clockwise and take off clutch cover (3) with clutch cover gasket.



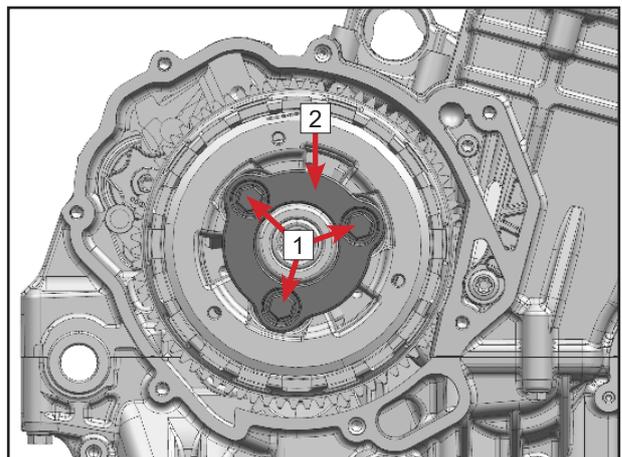
Remove dowels (4).



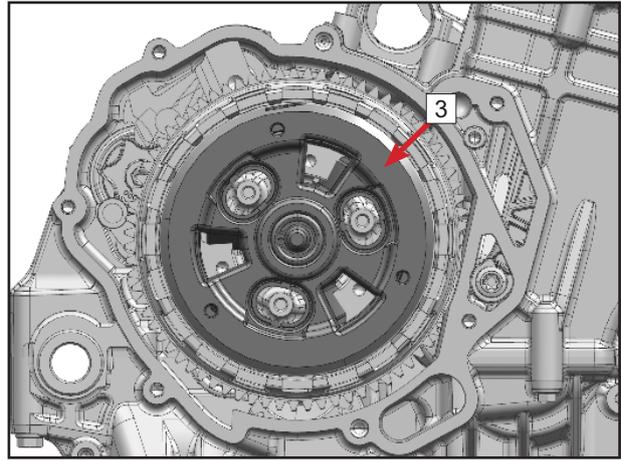
13.5.15 Removing the Clutch Discs

Remove screws (1).

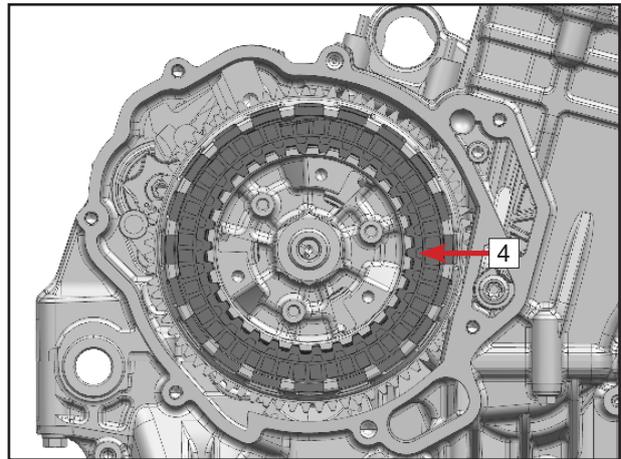
Take off clutch center plate (2) and the springs.



Remove clutch pressure cap (3).



Remove clutch discs (4), support ring, and pretension ring.



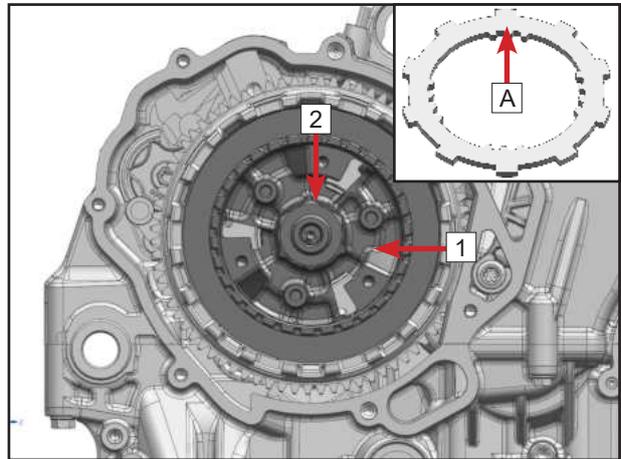
13.5.16 Removing the Clutch Basket

Lock crankshaft with crankshaft locking screw. (Refer to Section 13.5.20.)

Hold the inner clutch hub (1) with the special tool (A) (Clutch stop tool).

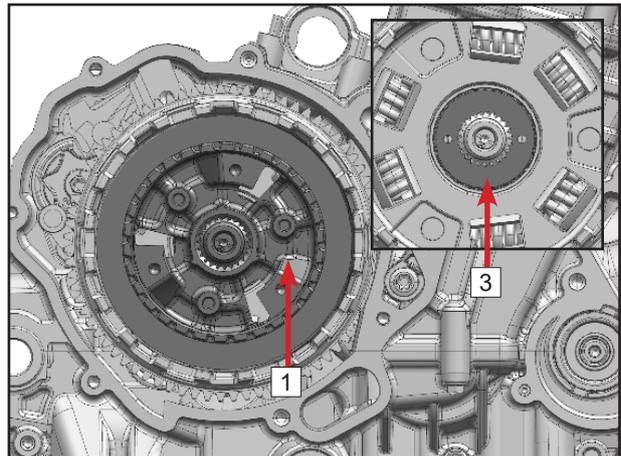
Clutch Stop Tool
(See Section 13.1 for details.)

Remove nut (2) with the washer.
Remove the tool (A).



Take off inner clutch hub (1) and washer (3).

NOTE
The washer usually sticks to the inner clutch hub.



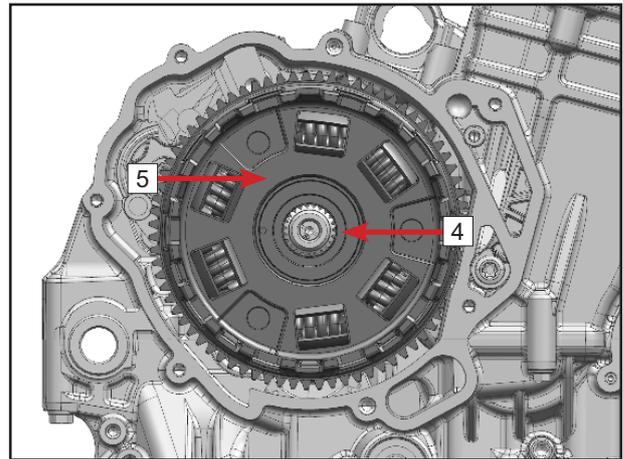
Remove needle bearing (4).

NOTE

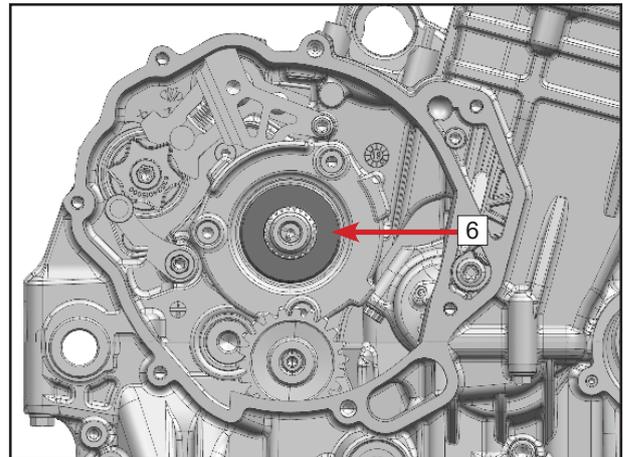
Use a magnetic rod to make disassembly easier.

Do not use pliers, as otherwise the needle bearing will be damaged.

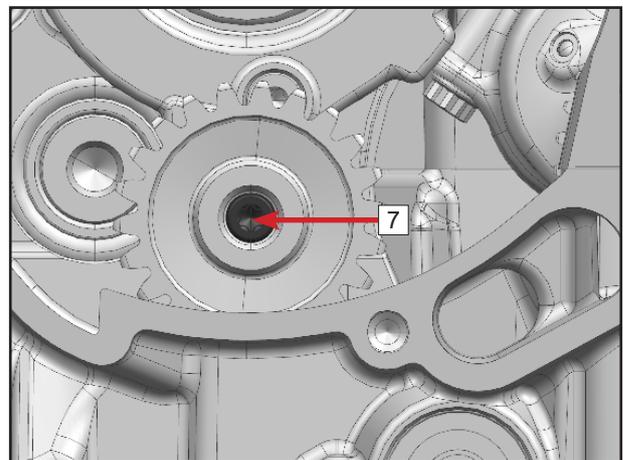
Take off clutch basket (5).



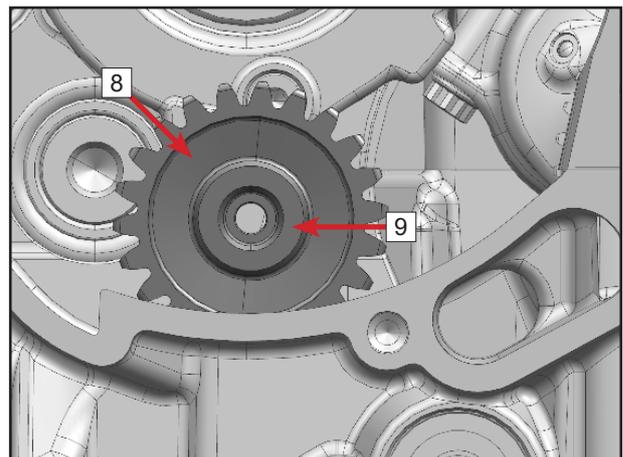
Remove washer (6).



Remove screw (7).



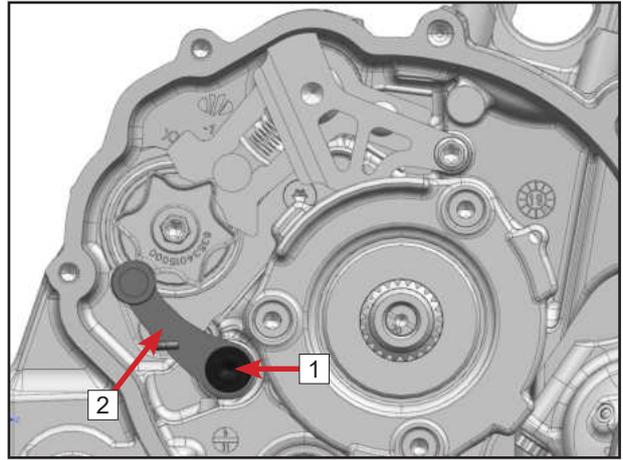
Take off intermediate gear (8) with collar bushing (9).



13.5.17 Removing the Locking Lever

Remove screw (1).

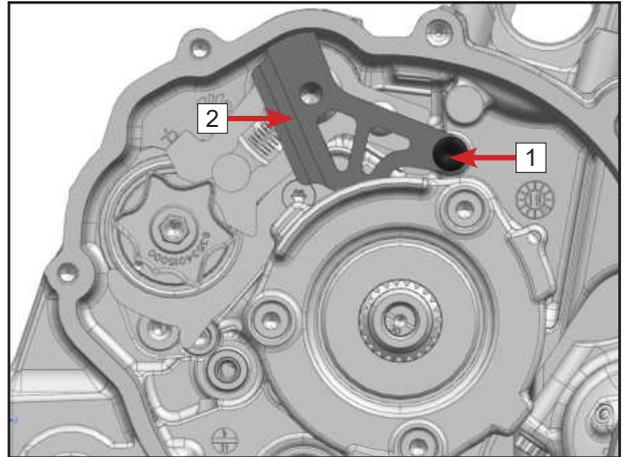
Take off locking lever (2) with the sleeve and spring.



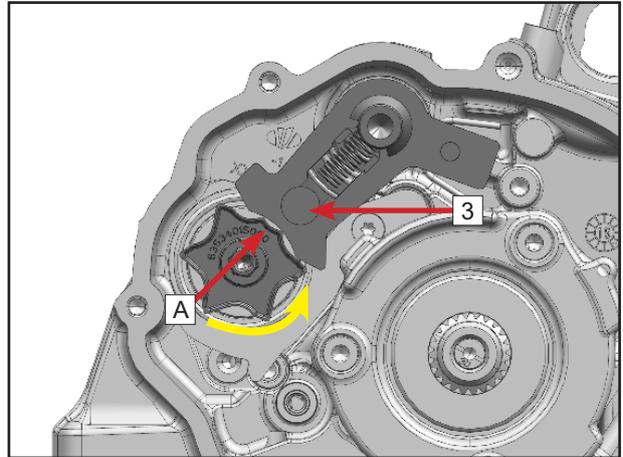
13.5.18 Removing the Shift Shaft

Remove screw (1).

Take off retaining bracket (2).



Twist shift drum until the neutral position (A) is aligned with the sliding plate (3).

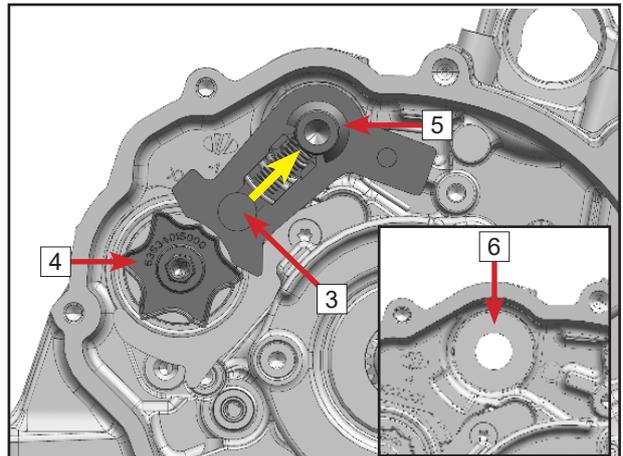


Push sliding plate (3) away from shift drum locating unit (4).

Remove shift shaft (5) with washer (6)

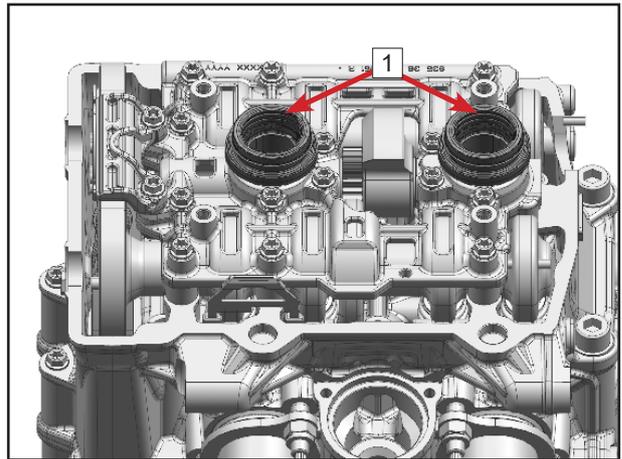
NOTE

The washer usually sticks to the engine case.

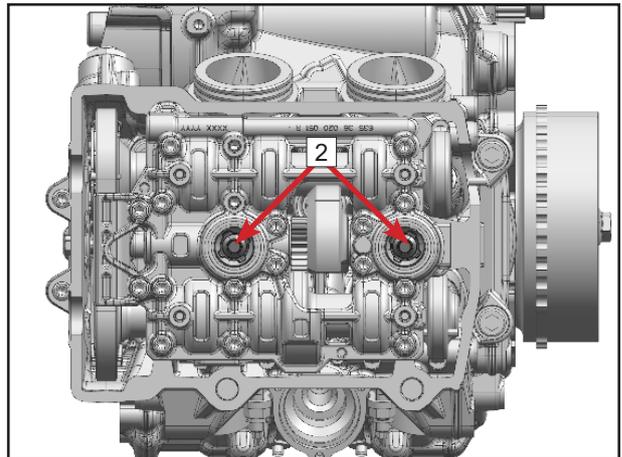


13.5.19 Removing the Spark Plugs

Remove spark plug shaft inserts (1) with the gaskets.



Remove the spark plugs (2).

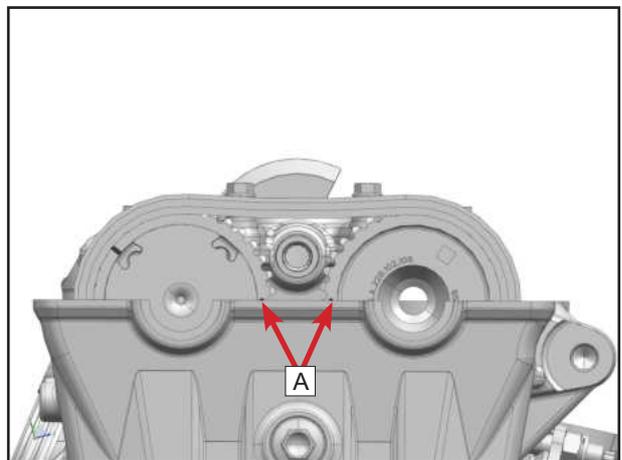


13.5.20 Removing the Camshafts

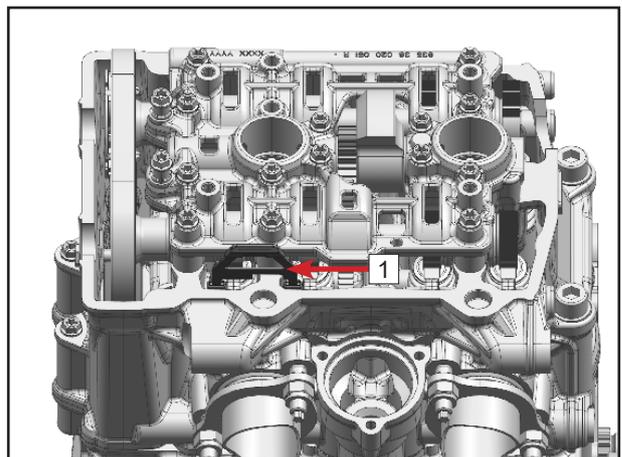
Turn the crankshaft counterclockwise and set it to ignition top dead center of cylinder 2.

The OT2 marking (A) are aligned with the sealing surface.

NOTE
The OT2 markings are dot markings.

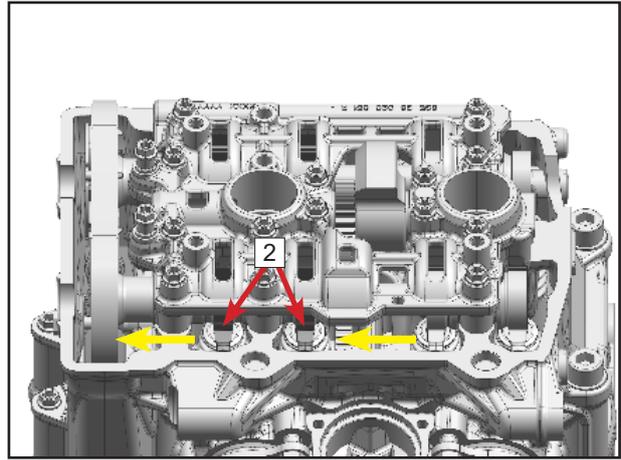


Remove cam lever clip (1).



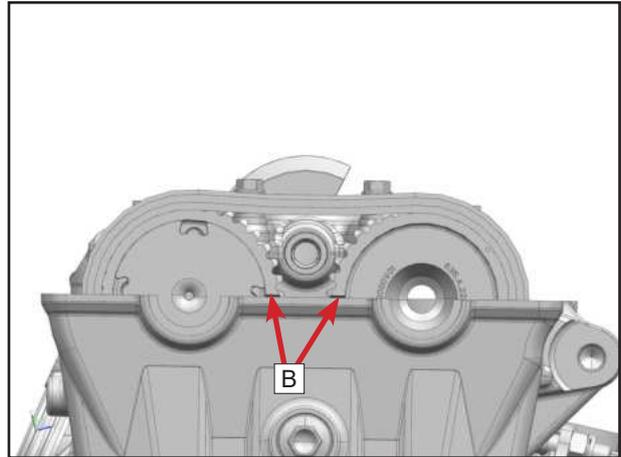
CFMOTO

Push exhaust cam lever (2) on cylinder 2 to the side.



Set the crankshaft to ignition top dead center of cylinder 1.
The OT1 marking (B) are aligned with the sealing surface.

NOTE
The OT1 markings are line markings.

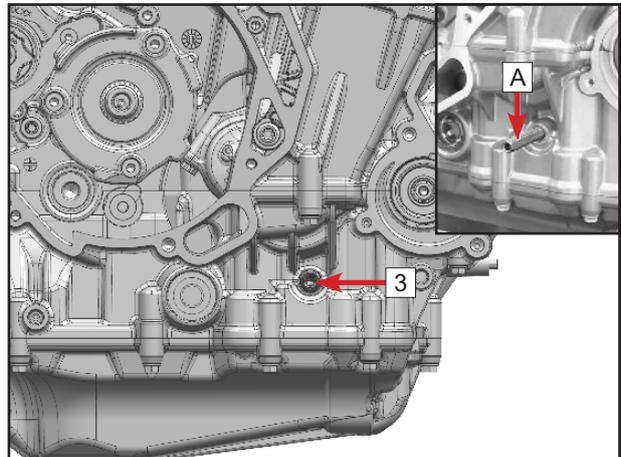


Remove screw (3) with the washer.

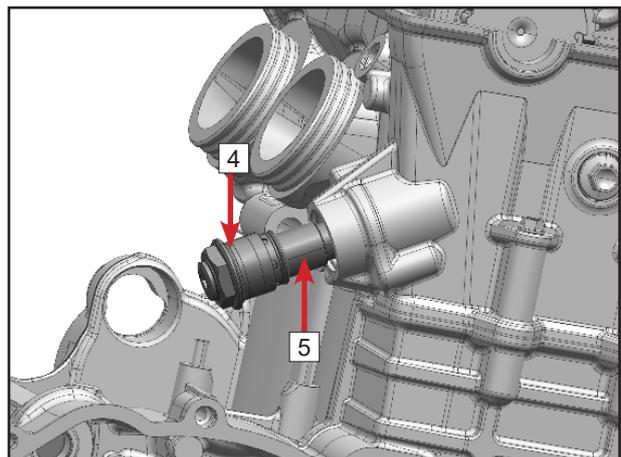
NOTE
Look through the hole to check that the position hole of the crankshaft is visible.

Mount special tool (A) (locking screw).

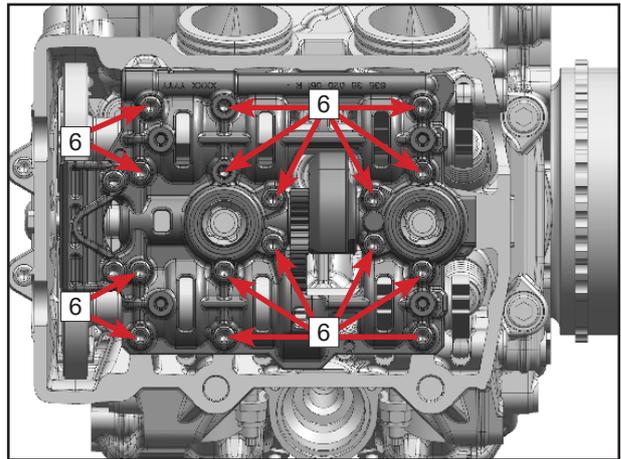
Crankshaft Locking Screw (See Section 13.1 for details.)



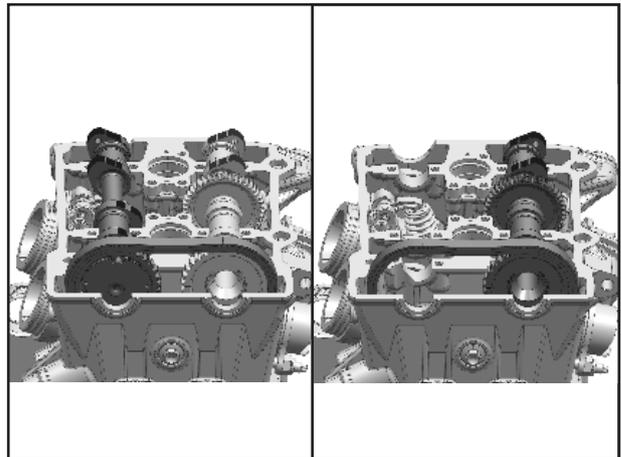
Remove screw (4) with the O-ring.
Take off timing chain tensioner (5) with O-ring.



Loosen and remove screws (6) from the outside to the inside.
Take off camshaft bearing bridge with balancer shaft.

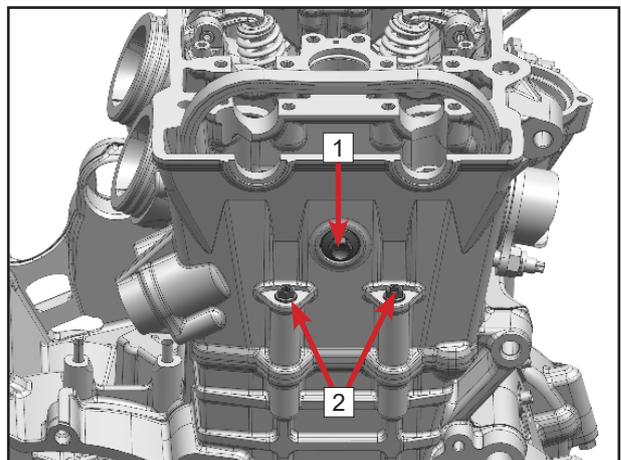


Raise the camshafts at the rear and take the timing chain off the rear sprocket.
Remove the camshafts.

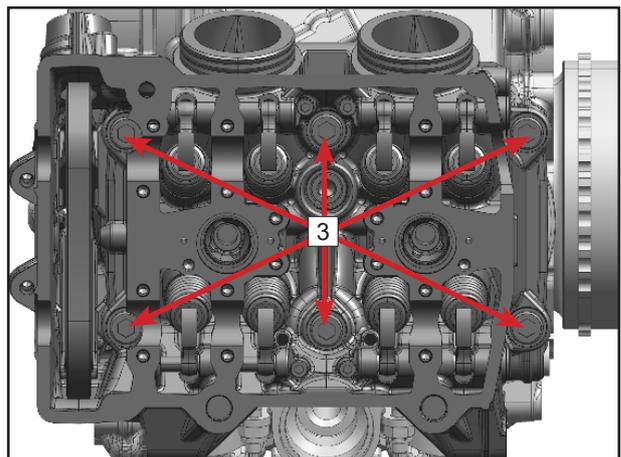


13.5.21 Removing the Cylinder Head

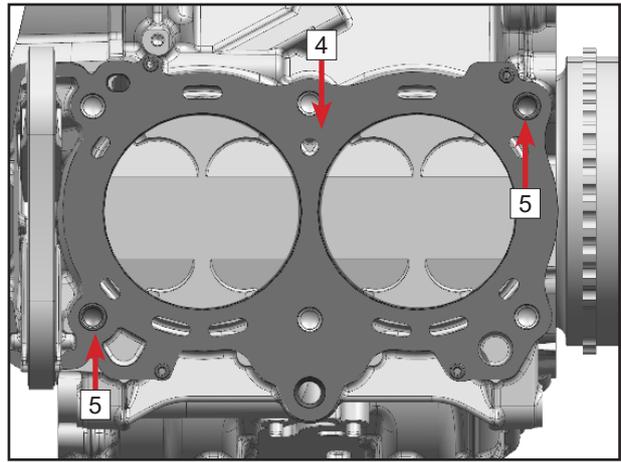
Remove screw (1) with gasket.
Remove screw (2).



Loose screws (3) in a crisscross pattern and remove them with the washers.
Take off the cylinder head.

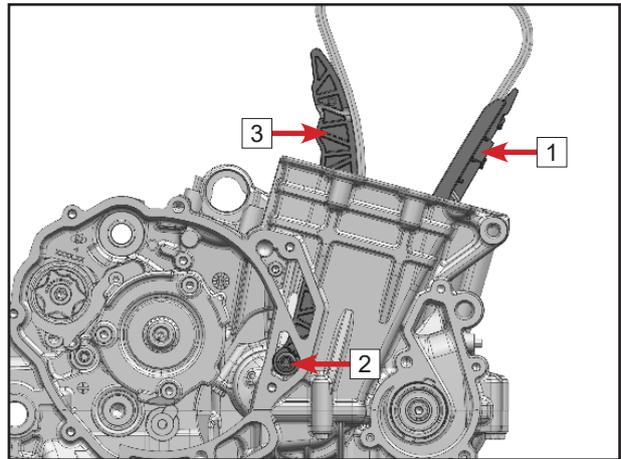


Take off cylinder head gasket (4).
Remove dowels (5).



13.5.22 Removing the Timing Chain Rails

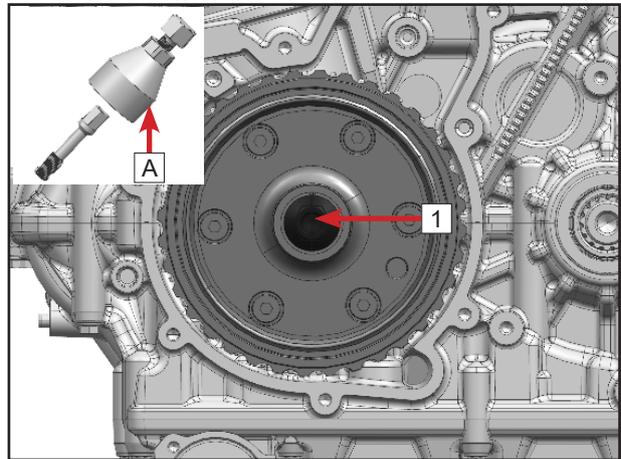
Remove guide rail (1) from the top.
Remove screw (2).
Remove tensioning rail (3) with support bushing upward.



13.5.23 Removing the Rotor

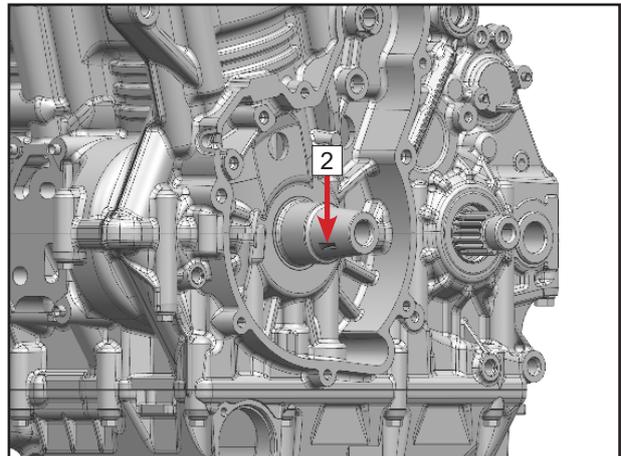
Remove screw (1).
Mount special tool (A) (Magneto rotor removal tool) on the rotor, then pull off the rotor by turning the screw in.

Magneto Rotor Removal Tool
(See Section 13.1 for details.)



Remove the special tool (A).

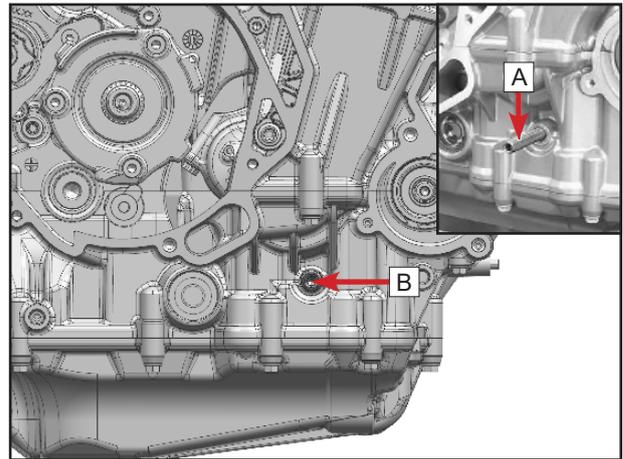
Remove woodruff key (2).



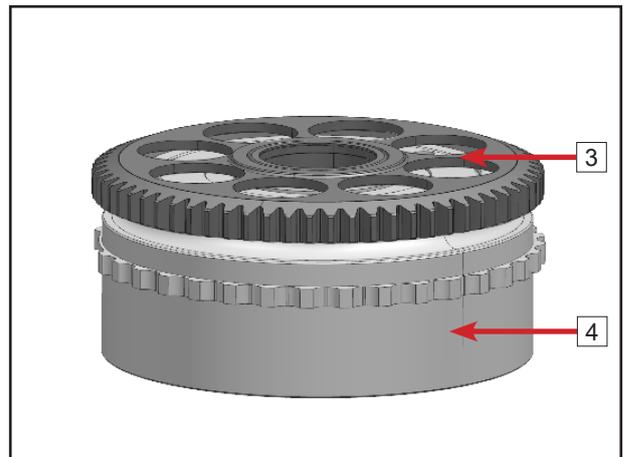
Remove special tool (A) (locking screw).

Crankshaft Locking Screw
(See Section 13.1 for details.)

Replace screw (B) with the washer.



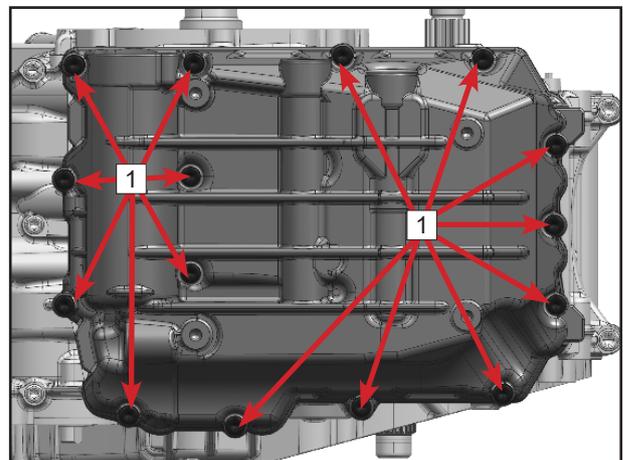
Take off freewheel gear (3) from rotor (4).



13.5.24 Removing the Oil Pan

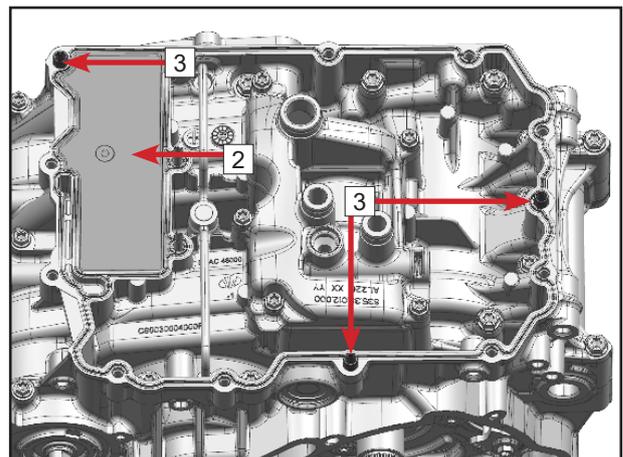
Remove screws (1).

Take off oil pan.

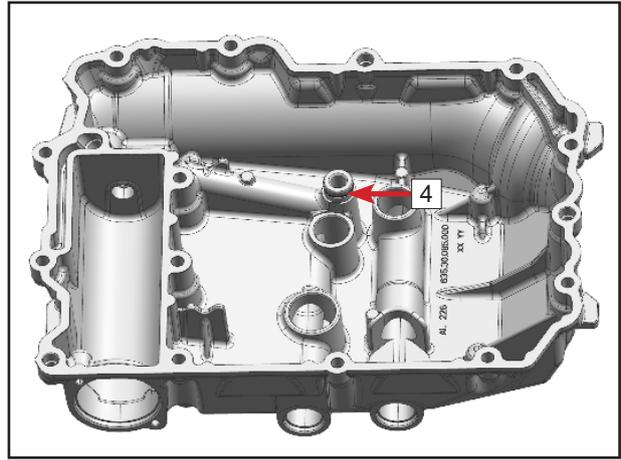


Take off gasket (2).

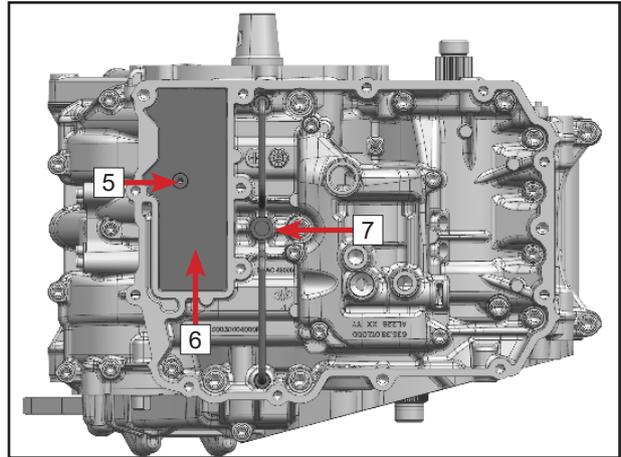
Remove dowels (3).



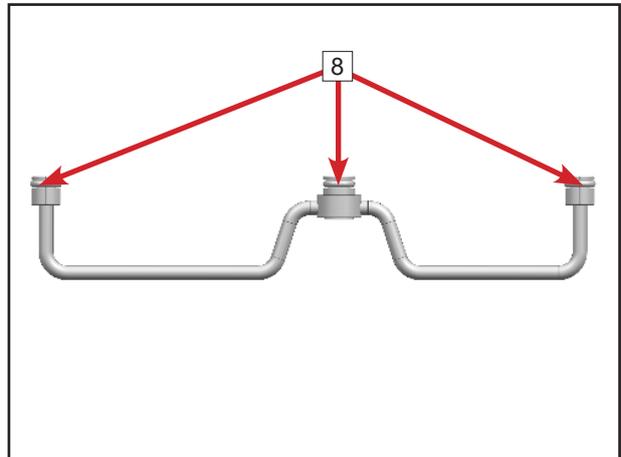
Remove O-ring (4).



Remove screw (5).
Remove pressure plate (6).
Take off oil line (7).

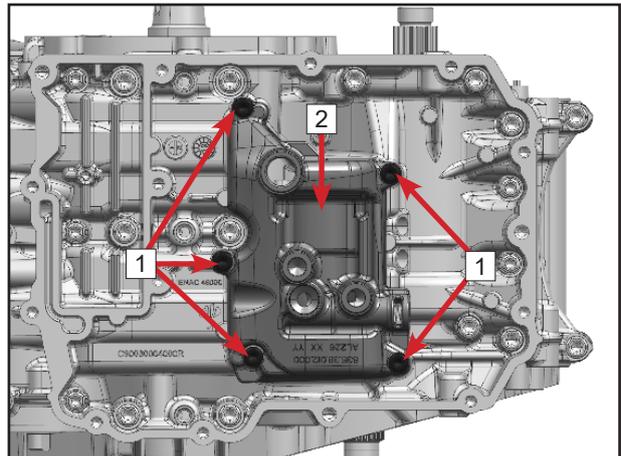


Take off O-rings (8) from the oil line.

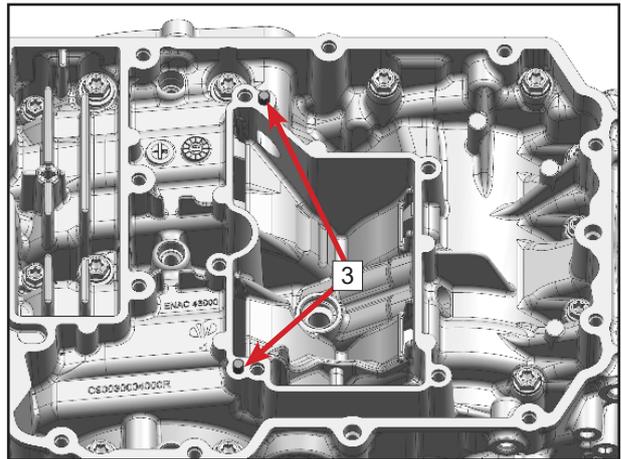


13.5.25 Removing the Oil Pump Unit

Remove screws (1).
Take off oil pump unit (2).

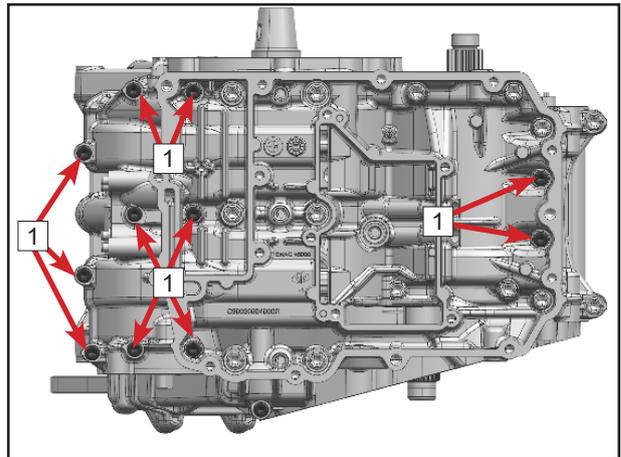


Remove locating pins (3).

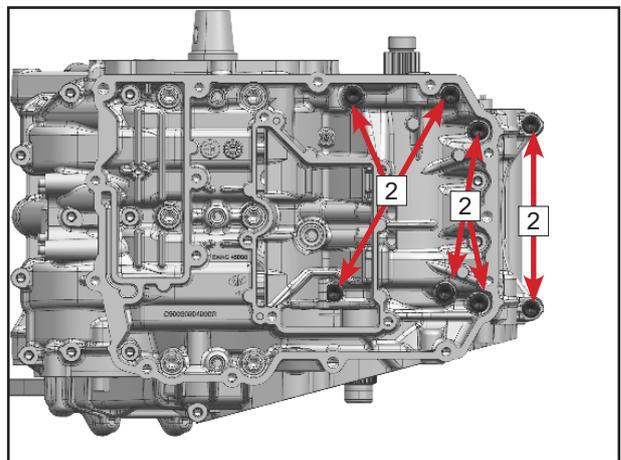


13.5.26 Removing the Engine Case Downwards

Remove screws (1).

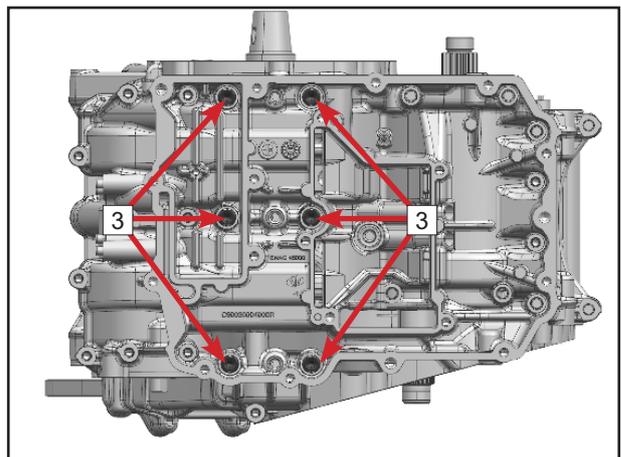


Remove screws (2).



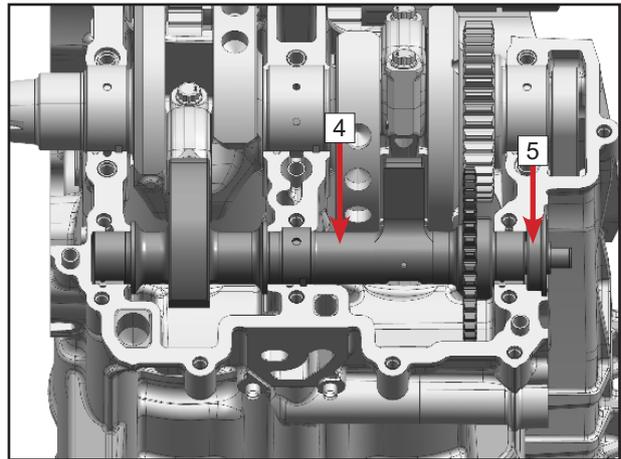
Loosen screws (3) in a crisscross pattern and remove them with the washers. Take off lower section of the engine case.

NOTE
Ensure that the bearing shells remain in place.



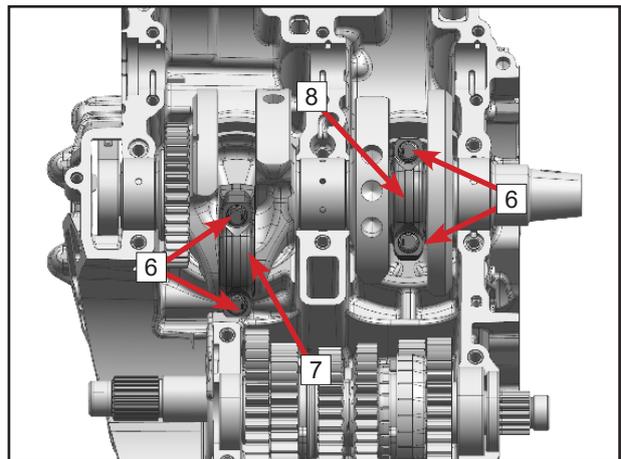
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Remove balancer shaft (4) with radial shaft seal ring (5).

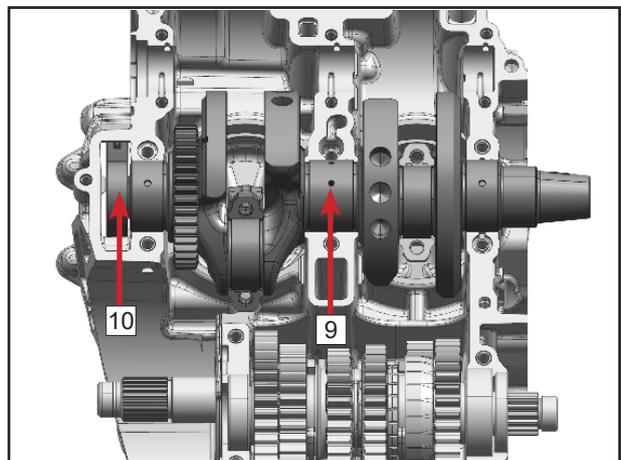


Remove screws (6).
Take off conrod bearing covers (7) and (8).

NOTE
The conrod bearing covers and connecting rods are marked together and must never be mixed up.

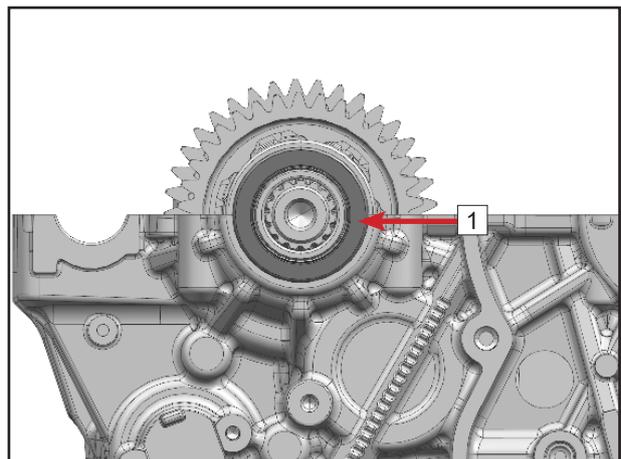


Remove crankshaft (9) with timing chain (10).

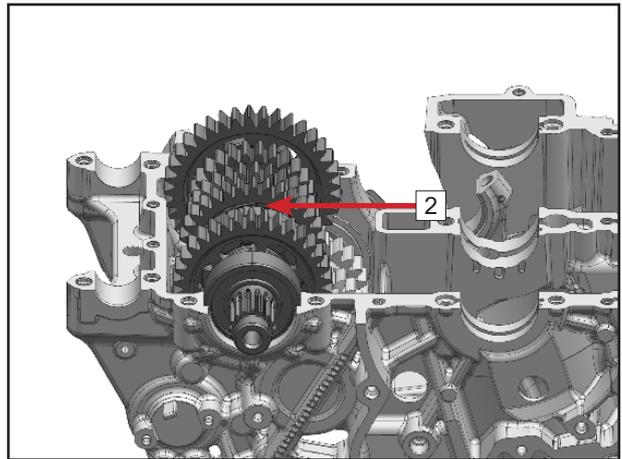


13.5.27 Removing the Transmission Shafts

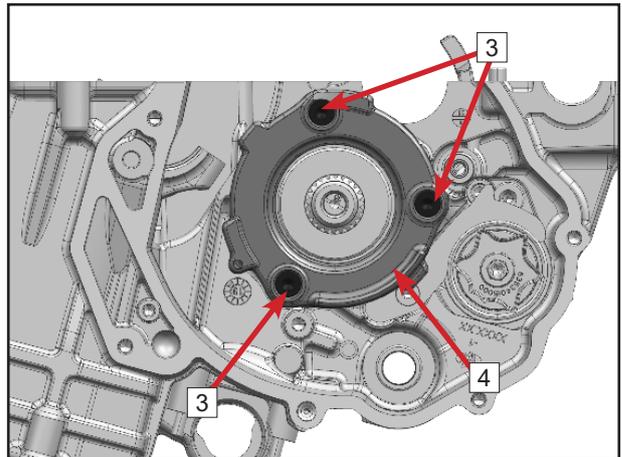
Remove radial shaft seal ring (1).



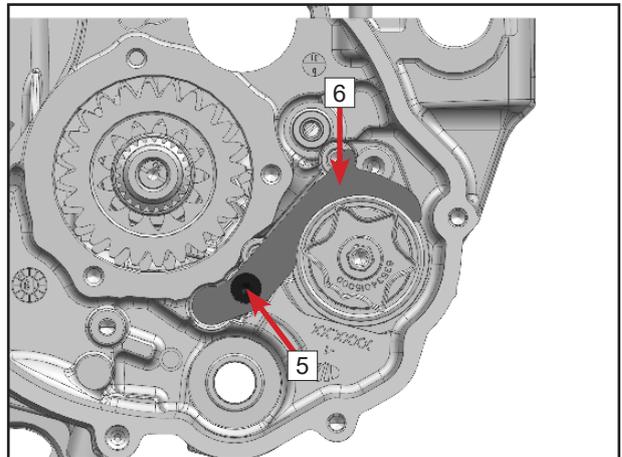
Take off countershaft (2).



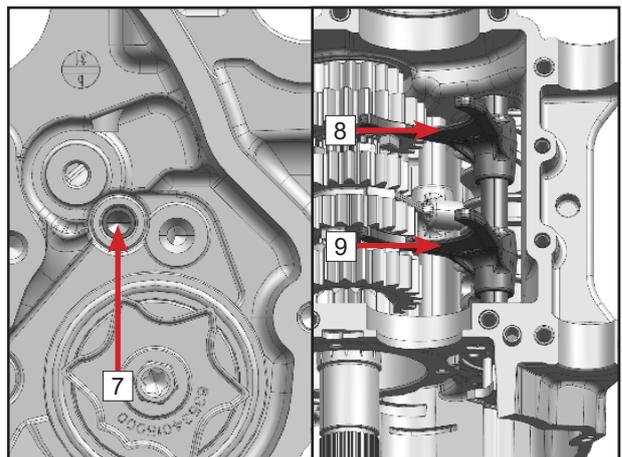
Remove screws (3).
Take off bearing support (4) with bearing.



Remove screw (5).
Take off retaining bracket (6).

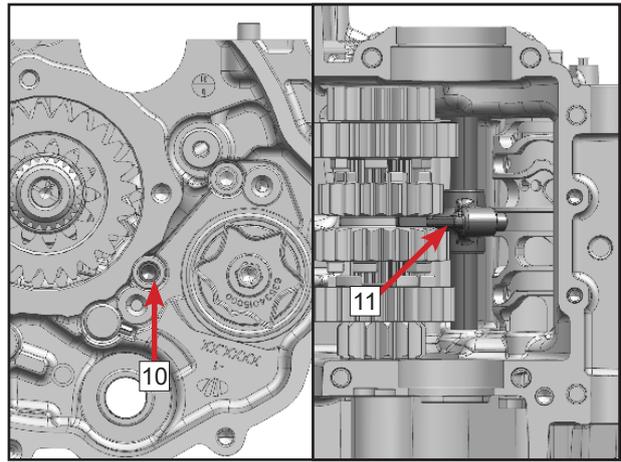


Mount appropriate M8 screw in the shift rail (7).
Remove shift rail (7).
Remove shift forks (8) and (9).

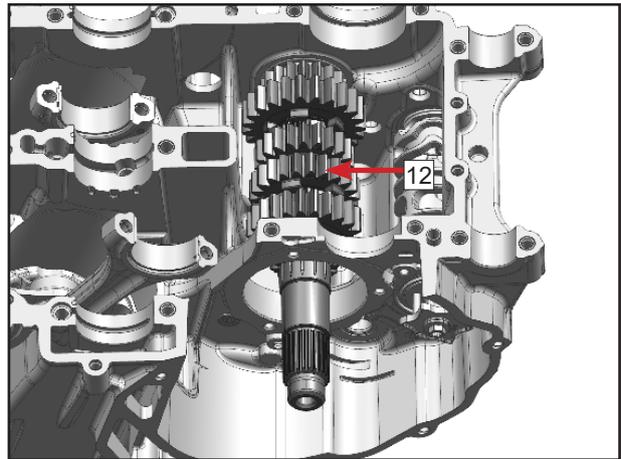


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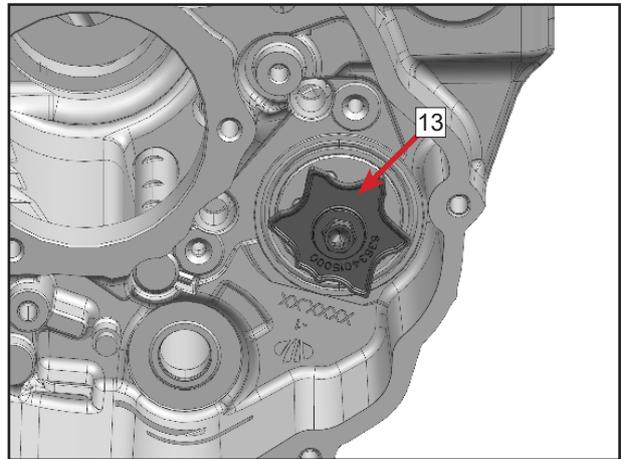
Mount appropriate M8 screw in the shift rail (10).
Remove shift rail (10).
Remove shift fork (11).



Remove main shaft (12).

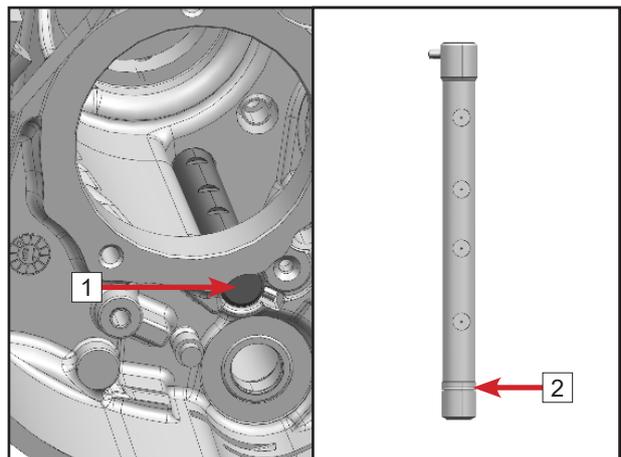


Remove shift drum (13).



13.5.28 Removing the Oil Spray Tube

Remove oil spray tube (1).
Remove O-ring (2).



13.5.29 Removing the Piston

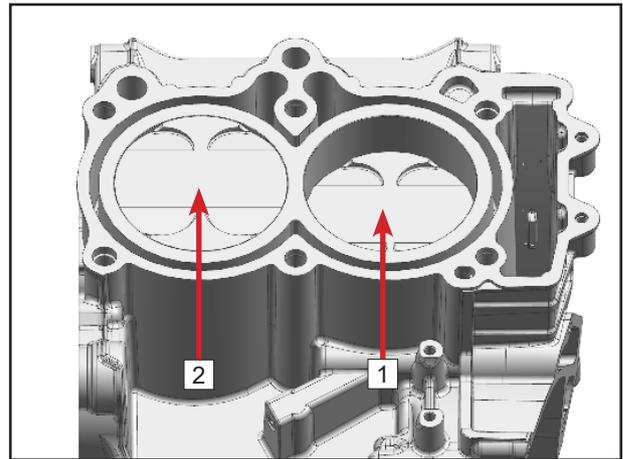
Swing the upper section of the engine case upward.

Mark the piston (1) and (2).

Remove any deposits in the upper area of the cylinders.

NOTE

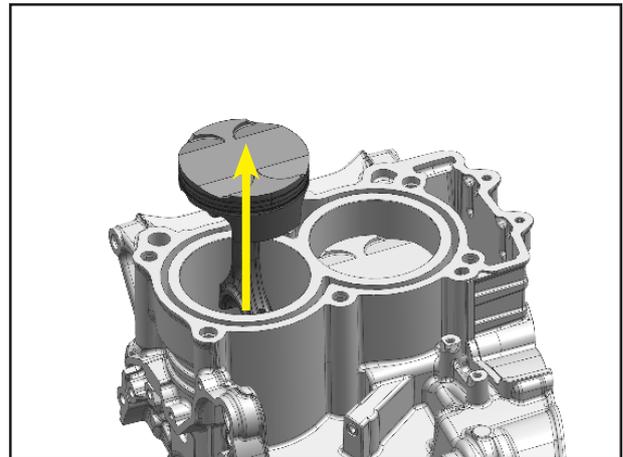
Ensure that the cylinders are not damaged.



Remove piston with connecting rod upward out of the cylinder.

NOTE

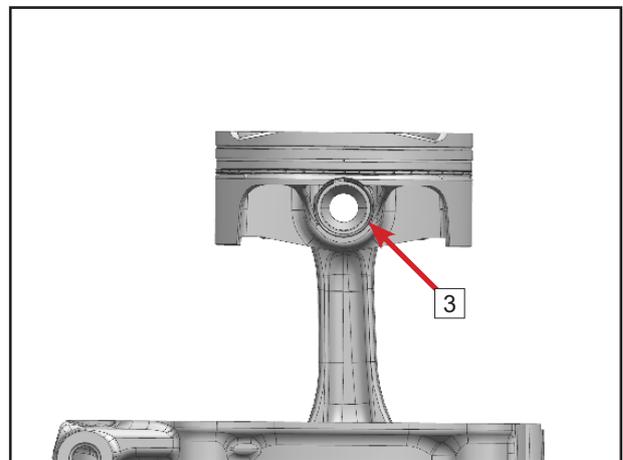
Make sure that the connecting rod does not damage the cylinder.



Clamp connecting rod in the vise.

Guideline: Use soft jaws.

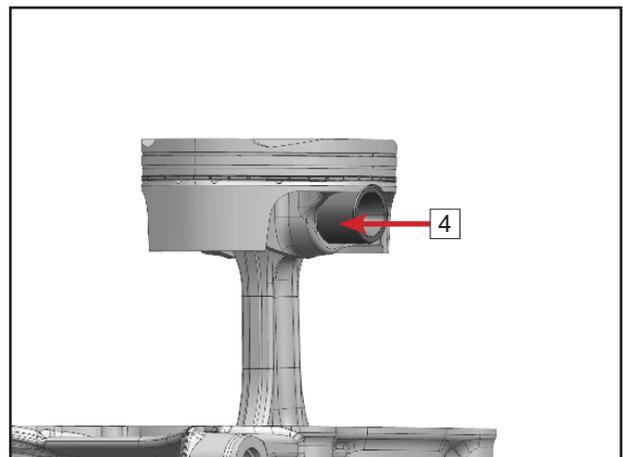
Remove piston ring lock (3).



Remove piston pin (4).

Take off the piston.

Make the piston and connecting rods belonging together correspondingly.

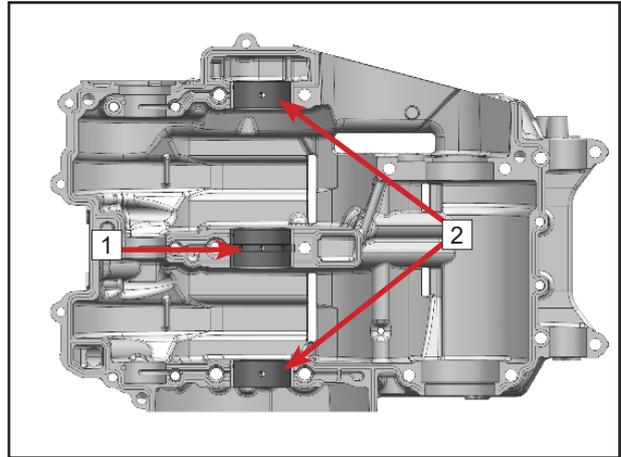
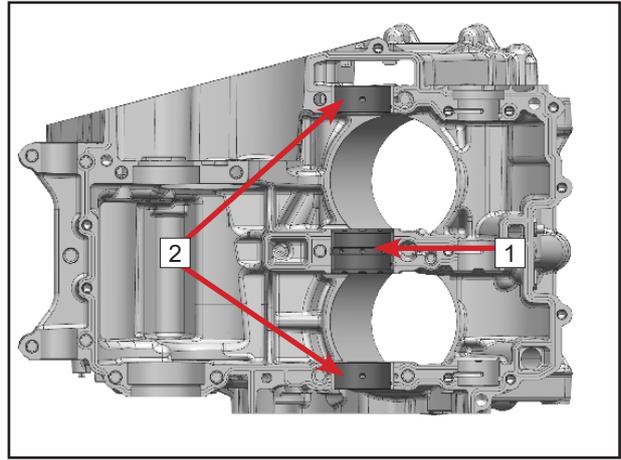


13.6 Working on Individual Parts

13.6.1 Checking the Radial Clearance of Crankshaft Bearings

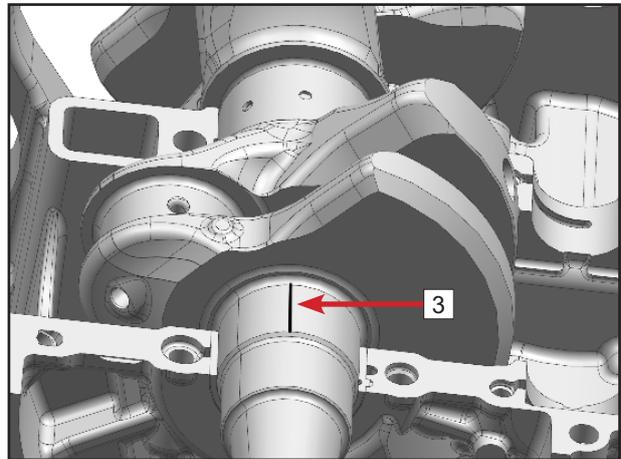
Remove any remnants of sealing compound and clean the sections of the engine case thoroughly.

Clean bearing shells (1) and (2).



Position crankshaft in the upper section of the engine case.

Insert plastigauge clearance gauge (3) 90° offset to the bearing joint.



Mount lower engine case.

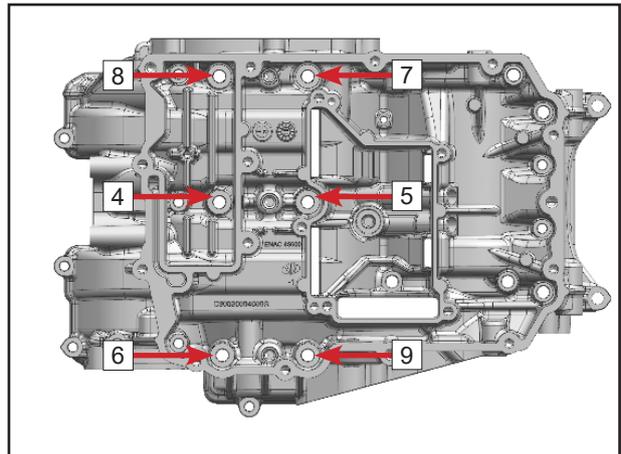
Mount screws with washers and tighten in the order (4) to (9).

Guideline:

Screw, engine case	M8×90	25N•m (18.4lbf•ft)
		Screw support greased

NOTE

Do not twist crankshaft.



Remove lower section of the engine case again. Compare plastigauge clearance gauge with the data on the packaging.

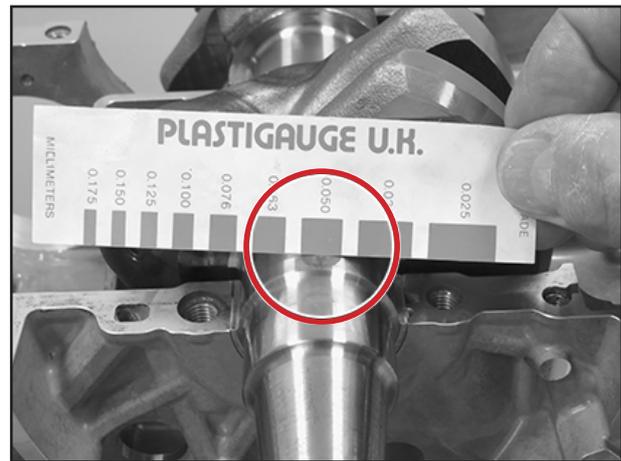
Guideline :

Crankshaft bearing play	
New condition	0.030mm~0.060mm
Wear limit	0.080mm

NOTE

The width of the plastigauge clearance gauge indicates the bearing play.

Clean the part.

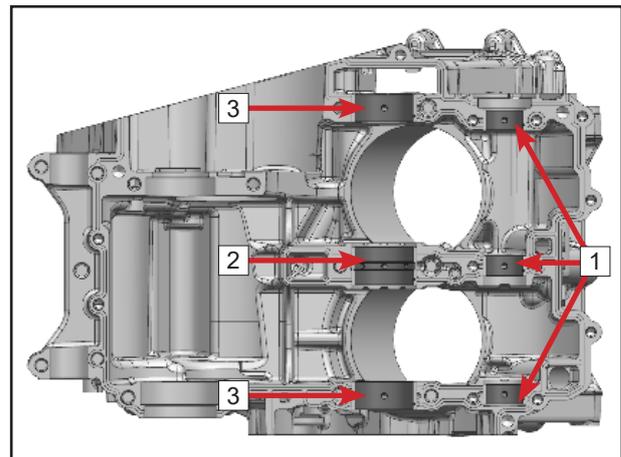


13.6.2 Changing the Main Bearing Shells

Remove bearing shells (1) of the balancer shaft from the upper section of the engine case.

Remove bearing shells (2) and (3) of the crankshaft from the upper section of the engine case.

Clean seat of the bearing shells.



Remove bearing shells (1) of the balancer shaft from the lower section of the engine case.

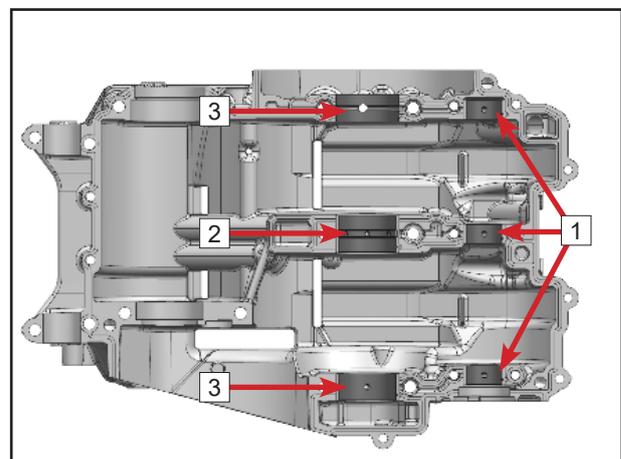
Remove bearing shells (2) and (3) of the crankshaft from the lower section of the engine case.

Clean seat of the bearing shells.

Select the main bearing shells.

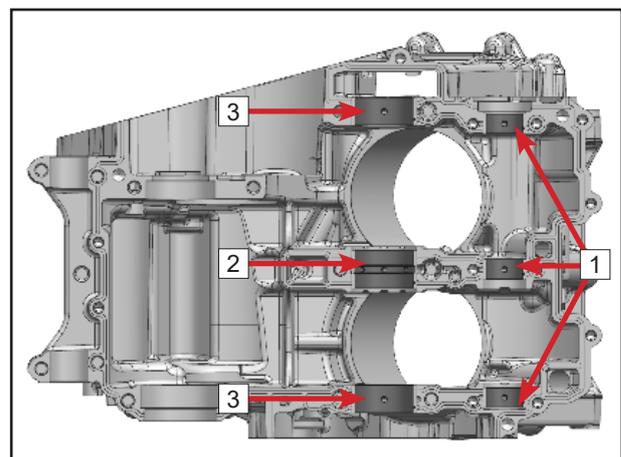
Mount new bearing shells (2) and (3) in the lower section of the engine case.

Mount new bearing shells (1) in the lower section of the engine case.



Mount new bearing shells (2) and (3) in the upper section of the engine case.

Mount new bearing shells (1) in the upper section of the engine case.



13.6.3 Checking the Balancer Shaft

Clean all parts well.

Check the pivot points of the balancer shaft for damage and wear.

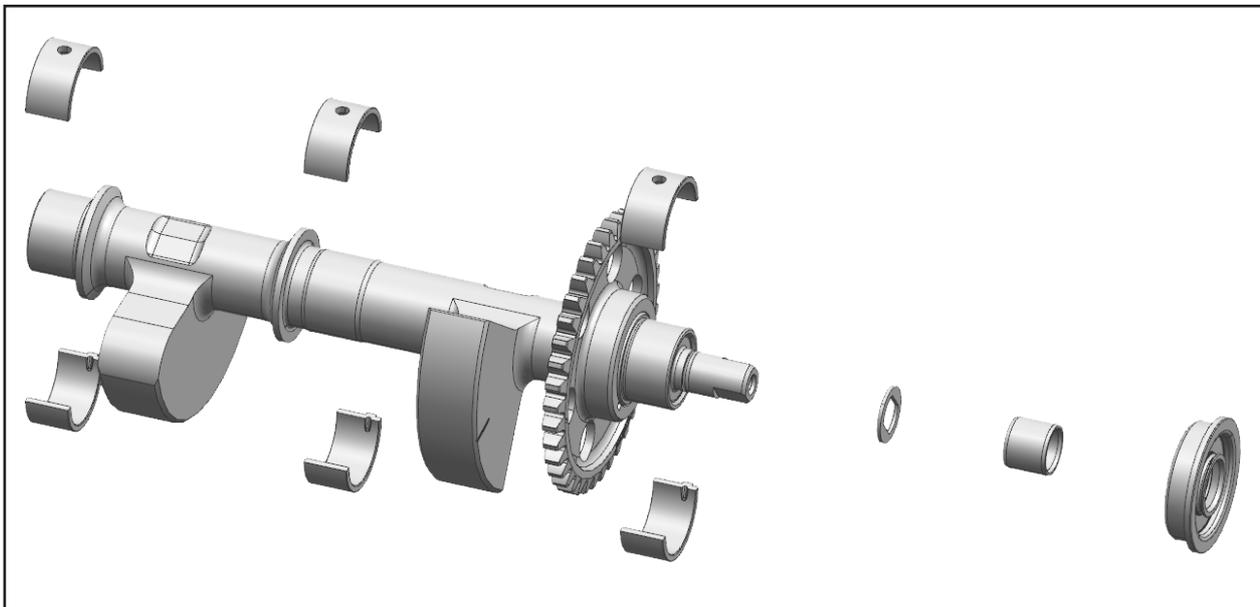
If there is damage or wear:

Change the balancer shaft.

Check the bearing shells of the balancer shaft for damage, abrasion and wear.

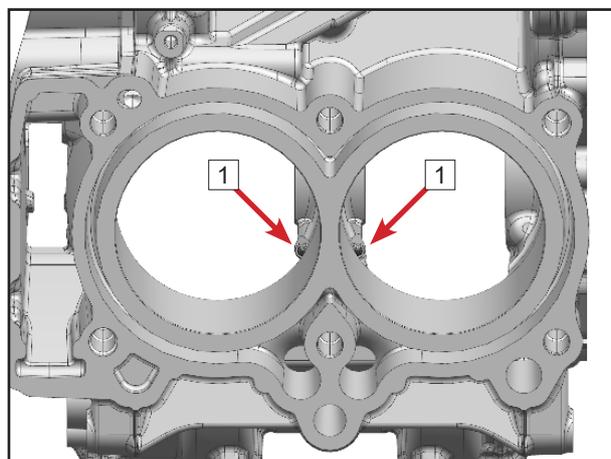
If there is damage, abrasion or wear:

Change bearing shells.

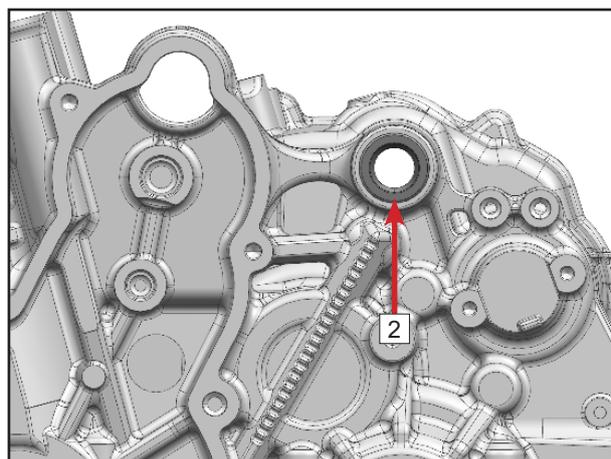


13.6.4 Working on the Upper Section of the Engine Case

Remove oil nozzles (1).



Remove radial shaft seal ring (2) of the shift shaft.



Remove any remnants of the sealing compound and clean the section of the engine case thoroughly.

Warm the section of the engine case in an oven.

Guideline

130 °C (266°F)

Knock the section of the engine case with the right and left side against a level wooden board. This will cause the bearings to drop out of the bearing seats.

NOTE

Any bearings that remain in the section of the engine case must be removed using a suitable tool.

A washer is located behind the bearing (7). Make sure that this washer is not damaged.

Warm the section of the engine case again.

Guideline

130 °C (266°F)

Insert new cold bearings (3) and (4) in the bearing seat on the left side of the heated section of the engine case; if necessary, use a suitable pressing tool to push them all the way in and make them flush.

NOTE

When pressing in, ensure that the section of the engine case lies flat in order to prevent damage.

Only press the bearings in using the outer bearing race; otherwise, the bearings will be damaged when they are pressed in.

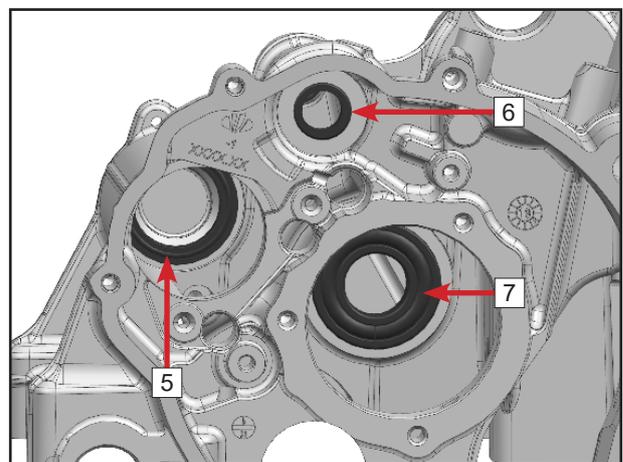
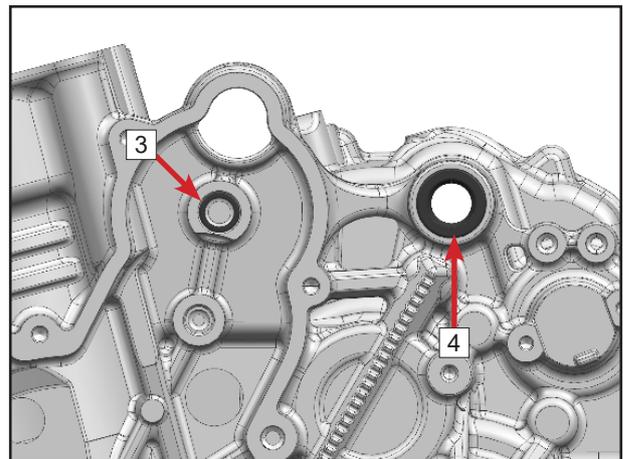
Insert new cold bearings (5), (6) and (7) in the bearing seat on the right side of the heated section of the engine case; if necessary, use a suitable pressing tool to push them all the way in and make them flush.

NOTE

Do not forget the washer under the bearing (7).

When pressing in, ensure that the section of the engine case lies flat in order to prevent damage.

Only press the bearings in using the outer bearing race; otherwise, the bearings will be damaged when they are pressed in.

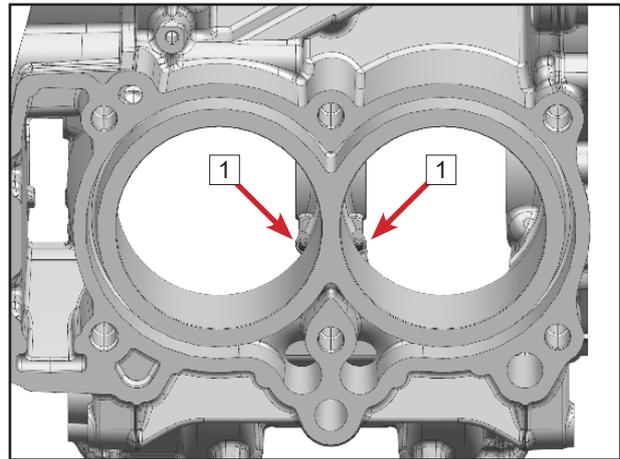


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After the section of the engine case has cooled, check that the bearings are firmly seated.

NOTE

If the bearings are not firmly seated after cooling, it is likely that they will rotate in the engine case when warm. In this case, the engine case must be renewed.



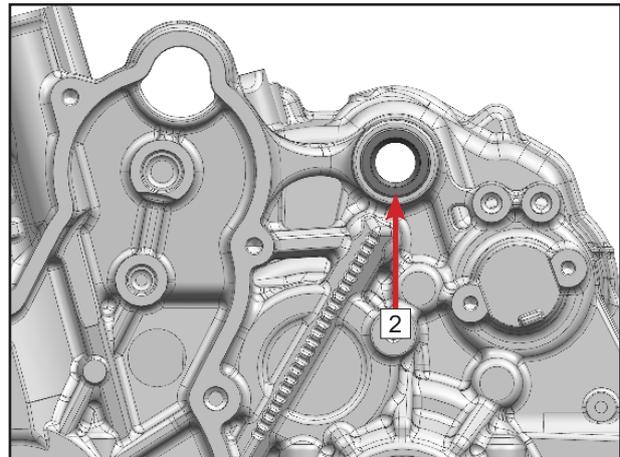
Press in new radial shaft seal ring (2) of the shift shaft from the outside to the inside with the open side facing in.

NOTE

The radial shaft seal ring must be flush on the outside.

Blow compressed air through all oil channels and oil nozzles, and check that they are clear.

Mount and tighten oil nozzles (1).



Guideline

Oil nozzle for piston cooling	M5	2 N•m (1.5 lbf •ft) 243 Thread locker
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13.6.5 Working on the Lower Section of the Engine Case

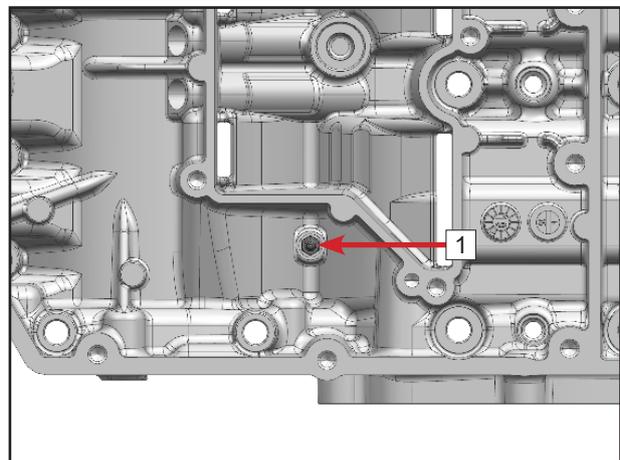
Remove oil nozzle (1).

Blow compressed air through all oil channels and oil nozzles, and check that they are clear.

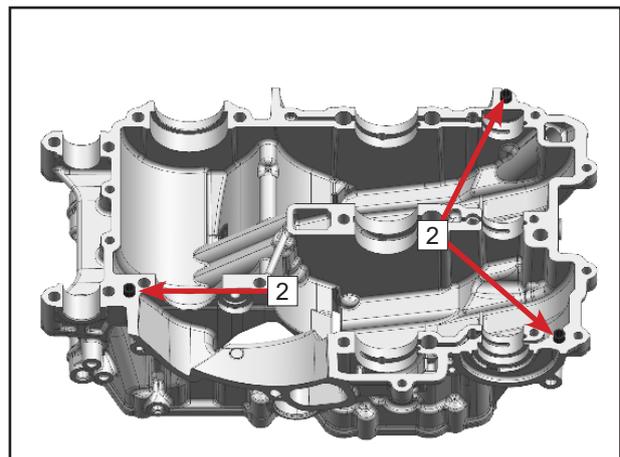
Mount and tighten oil nozzle (1).

Guideline

Nozzle, engine vent	M5	2 N•m (1.5 lbf •ft) 243 Thread locker
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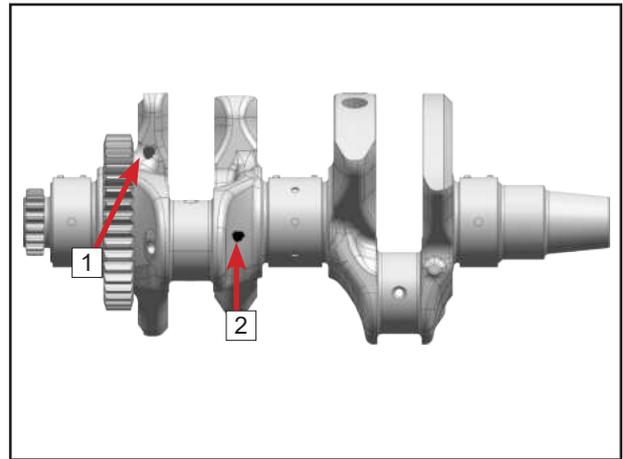
Swivel section of the engine case.
Check that dowels (2) are seated correctly.



13.6.6 Selecting the Main Bearing Shells New Crankshaft

Select the new bearing shells according to color coding (1).

NOTE
Color coding (2) refers to the conrod bearing.

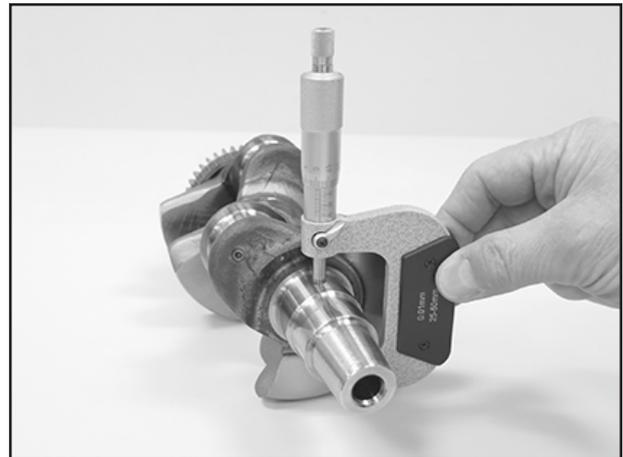


Used Crankshaft

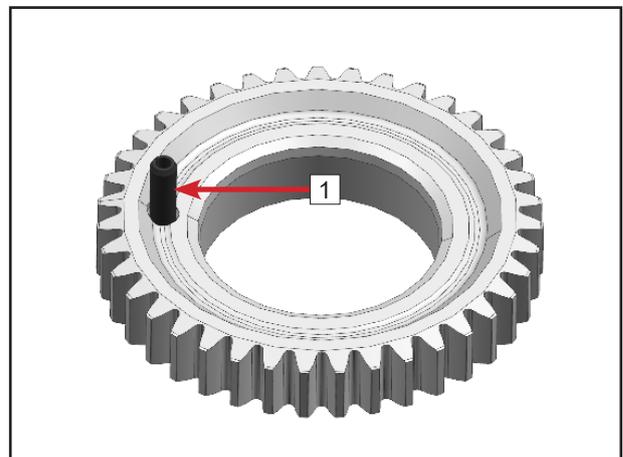
Measure all main bearing shells and select the new bearing shells accordingly.

Guideline

Crankshaft - main bearing diameter
Blue 37.985mm ~ 37.995 mm
Red 37.995mm ~ 38.005 mm



13.6.7 Installing the Primary Gear Wheel Mount dowel pin (1) in the primary gear wheel.



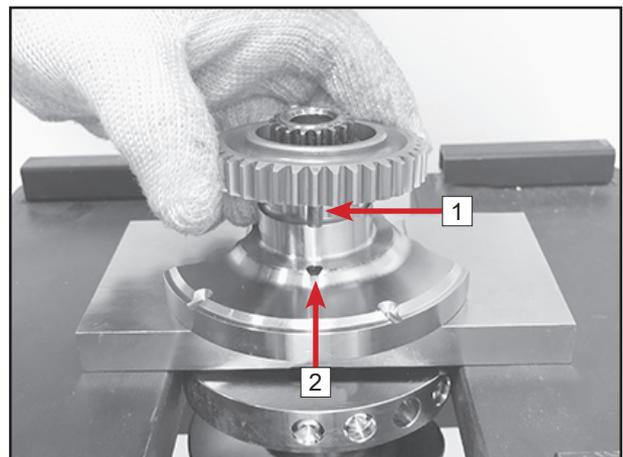
Position the crankshaft with a proper plate in the press.

Heat up primary gear wheel.

Guideline: 150 °C (302 °F)

Position primary gear wheel on the crankshaft.

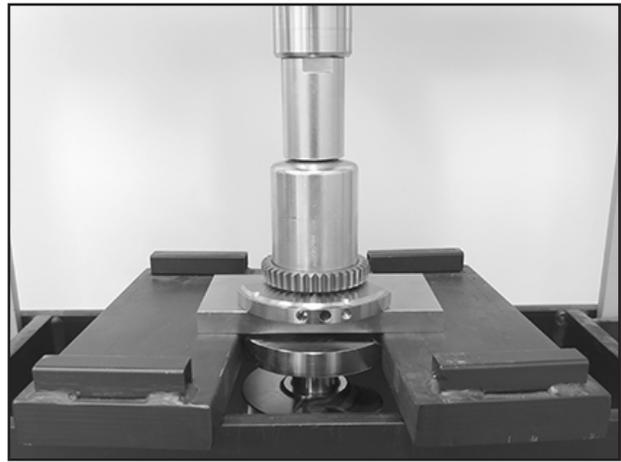
Dowel pin (1) engages in hole (2).



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Mount primary gear wheel all the way with a proper pressing tool.

The marking is visible after mounting.

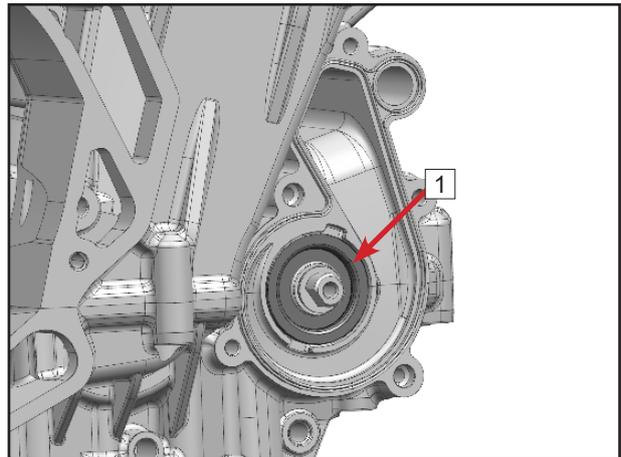


13.6.8 Radial Shaft Seal Ring of Water Pump, Changing Preparatory Work

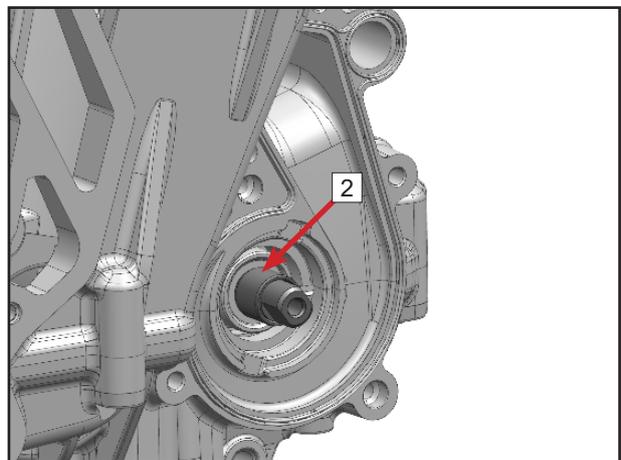
Remove the water pump impeller.

Main Work

Remove radial shaft seal ring (1) of the water pump.



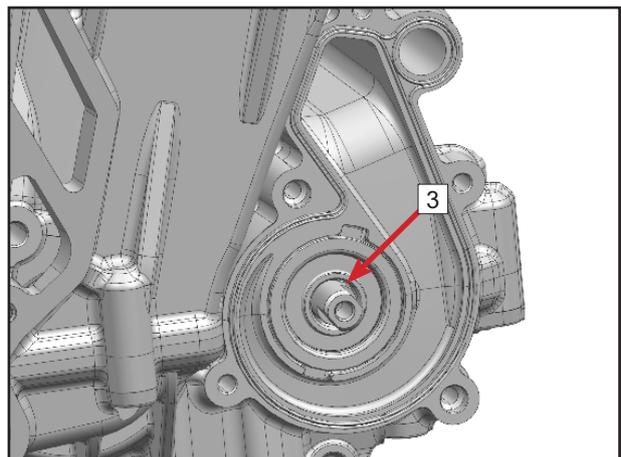
Remove water pump impeller (2).



Remove O-ring (3).

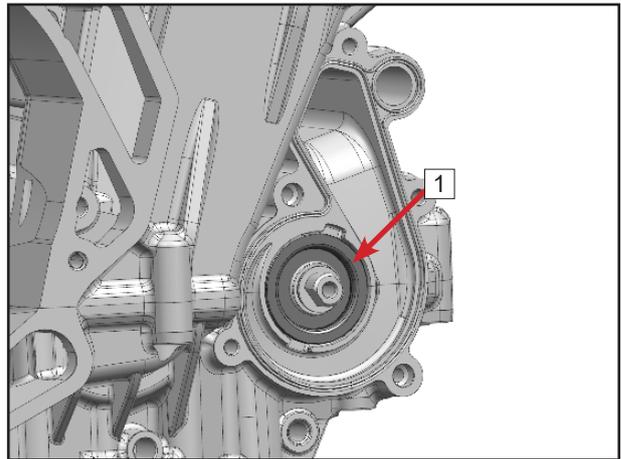
Grease and mount the new O-ring (3).

Long-life grease



Grease and mount new radial shaft seal ring (1).

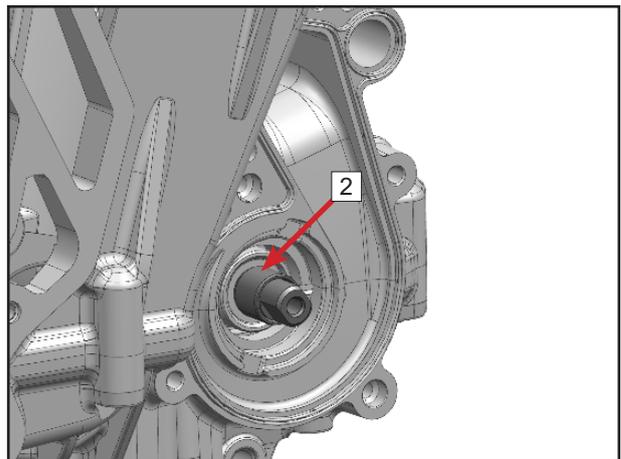
Long-life grease



Mount the new water pump impeller (2).

Finishing Work

Mount the water pump cover.

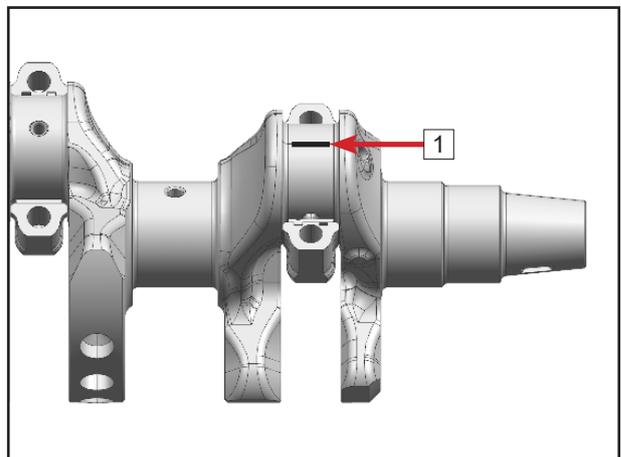


13.6.9 Checking the Radial Clearance of Lower Conrod Bearing

NOTE

Perform operations for both connecting rods.

Position the bearing shells. Insert Plastigauge clearance gauge (1) 90° offset to the bearing joint.



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Position the conrod bearing cover. Mount and tighten the screws.

Guideline:

Screw, conrod bearing	M8	1st stage: 5 N•m (3.7 lbf•ft) 2nd stage: 15 N•m (11.1 lbf•ft) 3rd stage: 90°
Collar and thread oiled		

NOTE
Do not twist connecting rod.

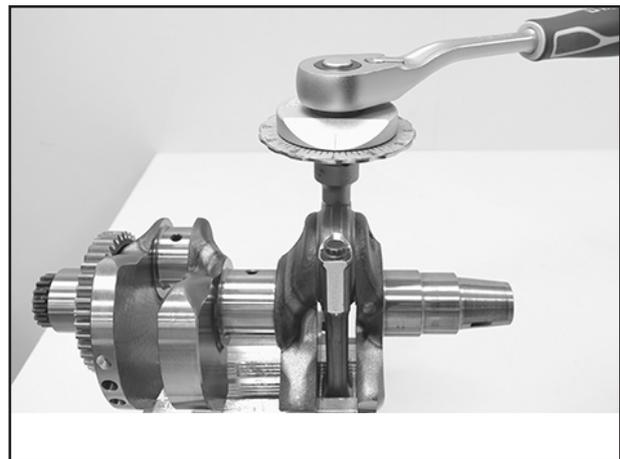
Remove the conrod bearing cover again. Compare Plastigauge clearance gauge with the data on the packaging.

Guideline:

Connecting rod - radial clearance of lower conrod bearing
New condition:0.030mm~0.060 mm
Wear limit:0.080 mm

NOTE
The width of the Plastigauge clearance gauge indicates the bearing play.

Clean the parts.



13.6.10 Changing the Conrod Bearing

NOTE
Perform operations for both connecting rods.

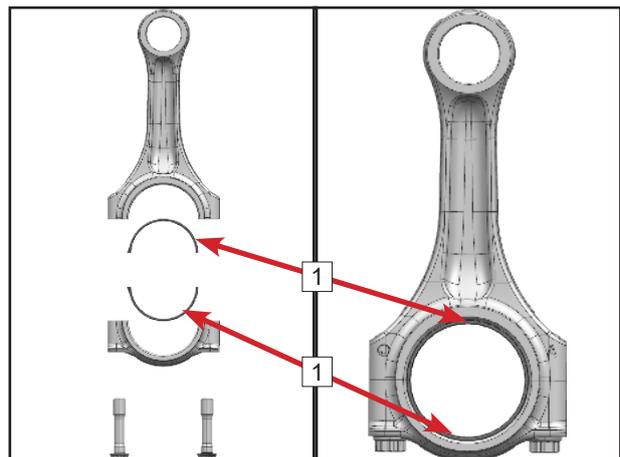
Condition

Connecting rod removed

Main Work

Take off bearing cover and remove bearing shells (1).

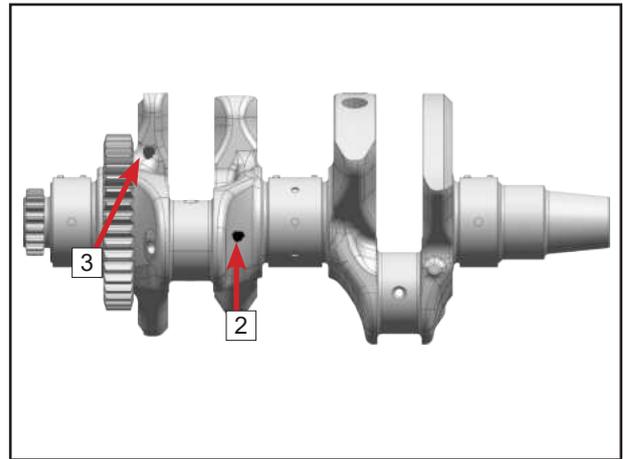
NOTE
The conrod bearing cover and connecting rod are jointly marked. Make sure that each conrod bearing cover is mounted on the same connecting rod.



New Crankshaft

Select the new bearing shells according to color coding (2).

NOTE
Color coding (3) refers to the crankshaft bearing.



Used Crankshaft

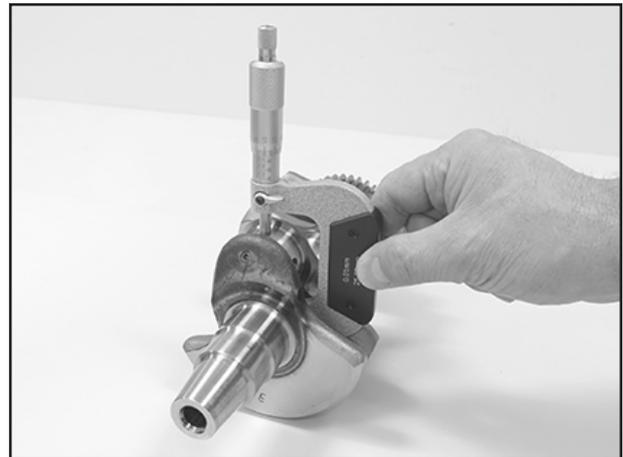
Measure the crank pin diameter and select the new bearing shells accordingly.

Guideline:

Crankshaft - crank pin diameter
Blue: 37.983 mm~ 37.993 mm
Red: 37.993 mm~ 38.003 mm

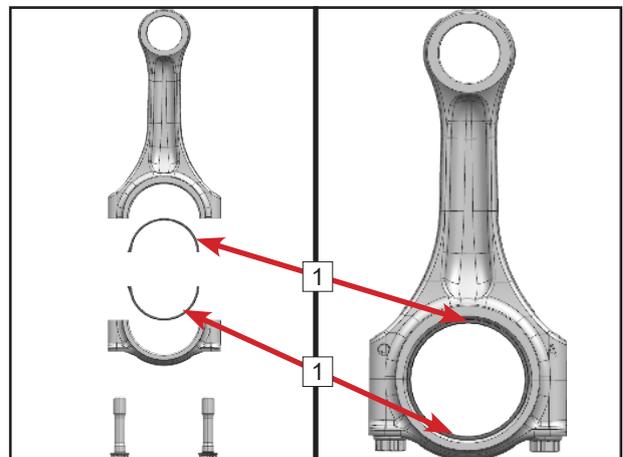
Check pivot points for damage and abrasion.

If damage or abrasion is discernible:
Change the crankshaft.



Mount new bearing shells (1) on conrod bearing cover and connecting rod.

NOTE
The conrod bearing cover and connecting rod are jointly marked. Make sure that each conrod bearing cover is mounted on the same connecting rod.



Finishing Work

Check the radial clearance of lower conrod bearing.

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13.6.11 Checking/Measuring the Cylinder

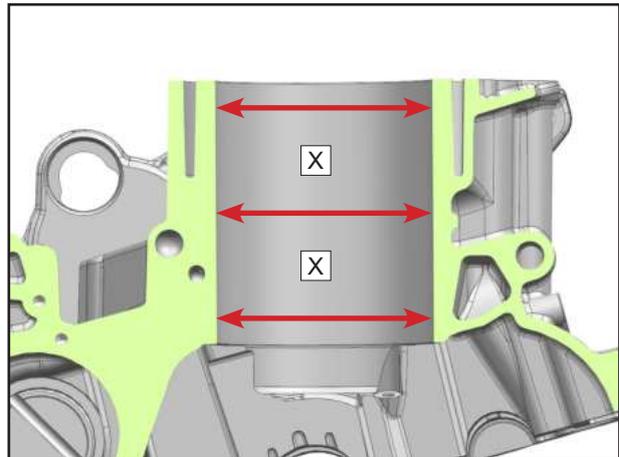
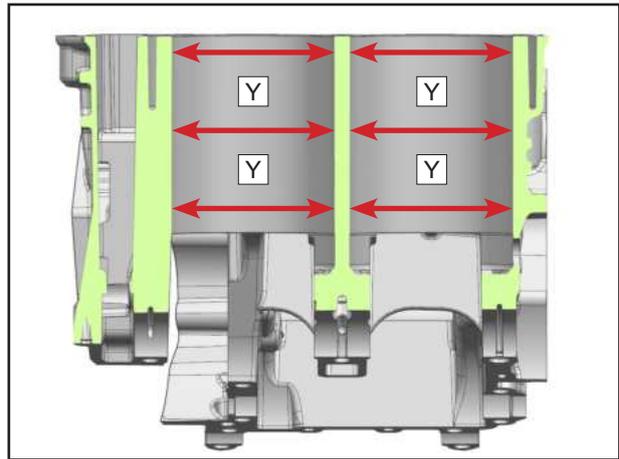
Check the O-ring of the chain adjuster for damage and wear.

If there is damage or wear: Change the O-ring.

Check the cylinder bearing surface for damage.

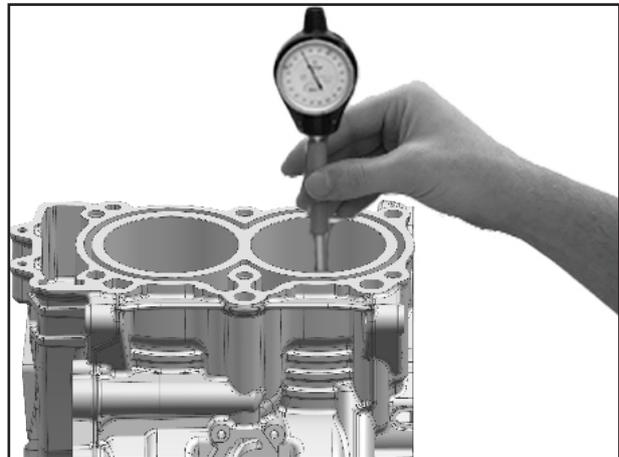
If the cylinder bearing surface is damaged: Change the cylinder and piston.

Measure the bore diameter at several locations on the (X)- and (Y)-axes using a micrometer to identify oval wear.



Guideline:

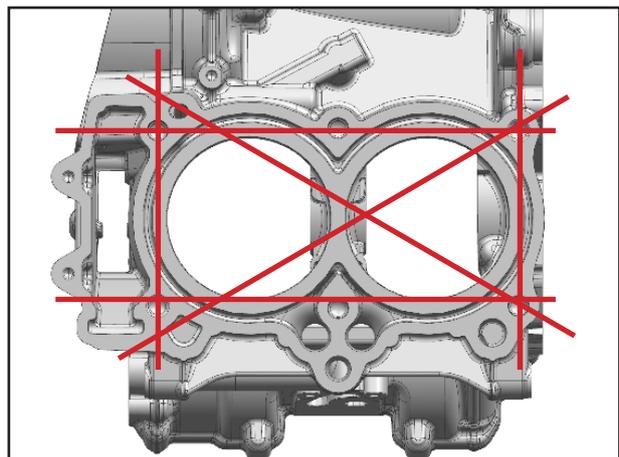
Cylinder - bore diameter
Size:88.000mm~88.012 mm



Using a straightedge and a feeler gauge, check the sealing surface of the cylinder head for distortion.

Cylinder/cylinder head - sealing area distortion
≤ 0.05 mm

If the measured value does not meet specifications: Change engine case.



13.6.12 Checking/Measuring the Piston

Check the piston bearing surface for damage.

If the piston bearing surface is damaged:
Replace the piston and, if necessary, the cylinder.

Check that the piston rings move easily in the piston ring grooves.

If the piston ring is stiff: Clean the piston ring groove.

NOTE
An old piston ring can be used to clean the piston ring groove.

Check the piston rings for damage.

If the piston ring is damaged: Change the piston ring.

NOTE
Mount the piston ring with the marking facing upward.

Use a feeler gauge to measure clearance (A) of the piston rings in the piston ring groove.

Guideline

Piston ring - groove clearance
First ring (rectangular ring) $\leq 0.08 \text{ mm } (\leq 0.0031 \text{ in})$
Second ring (lower compression ring) $\leq 0.08 \text{ mm } (\leq 0.0031 \text{ in})$
Oil scraper ring $\leq 0.06 \text{ mm } (\leq 0.0024 \text{ in})$

If clearance (A) is larger than the specified value:

Change the piston and piston rings.

Check/measure the cylinder.

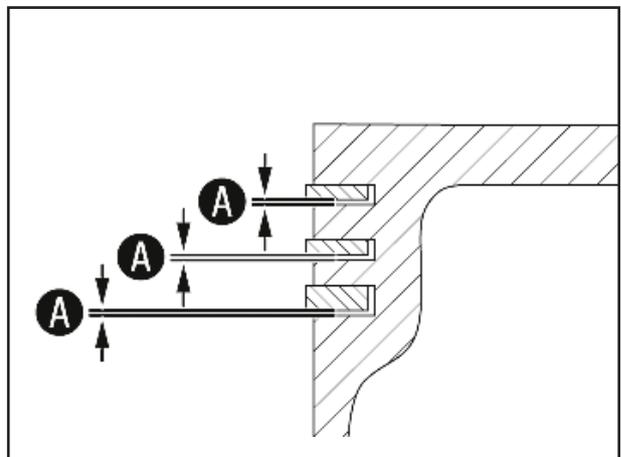
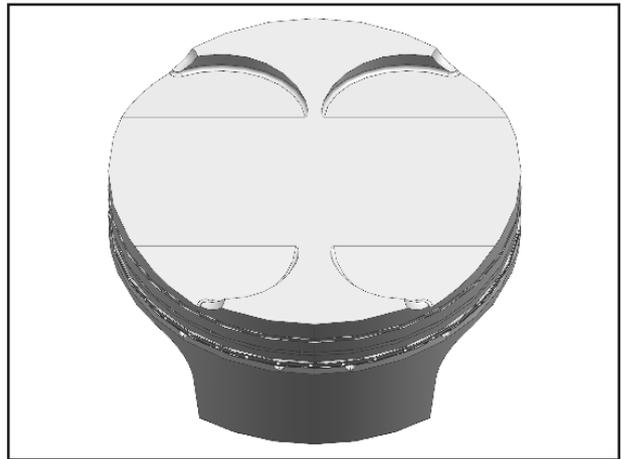
Check piston pin for discoloration, signs of wear or flaking of the coating.

If the piston pin exhibits significant discoloration/signs of wear, or the coating is flaking: Change the piston pin.

Place the piston pin in the connecting rod and check the seating for play.

If the piston pin seating has excessive play:

Change the connecting rod and piston pin.

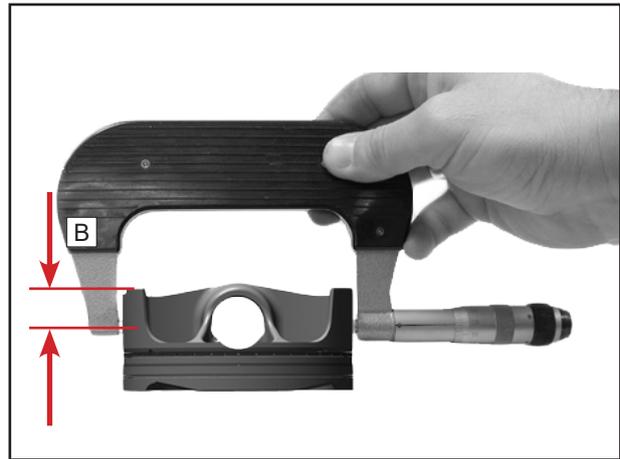


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Measure the piston at the piston skirt, at right angles to the piston pin, at a distance (B).

Guideline

Piston - diameter
Size 87.920mm~ 87.980 mm
Distance (B) 6 mm (0.24 in)



13.6.13 Checking the Piston Ring End Gap

Remove the piston ring from the piston.
Place the piston ring in the cylinder and align with the piston.

Guideline

Below the upper edge of the cylinder 10 mm

Measure end gap (A) with a feeler gauge.

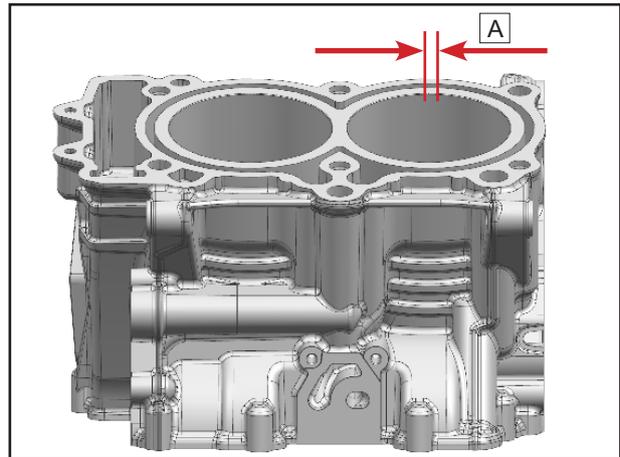
Guideline

Piston ring end gap
Compression rings: ≤ 0.80 mm
Oil scraper ring: ≤ 1.00 mm

If the end gap is greater than the specified value: Check/measure the cylinder.

If cylinder wear lies within the specified tolerance: Change the piston ring.

Mount the piston ring with the marking facing toward the piston head.



13.6.14 Determining the Piston/Cylinder Mounting Clearance

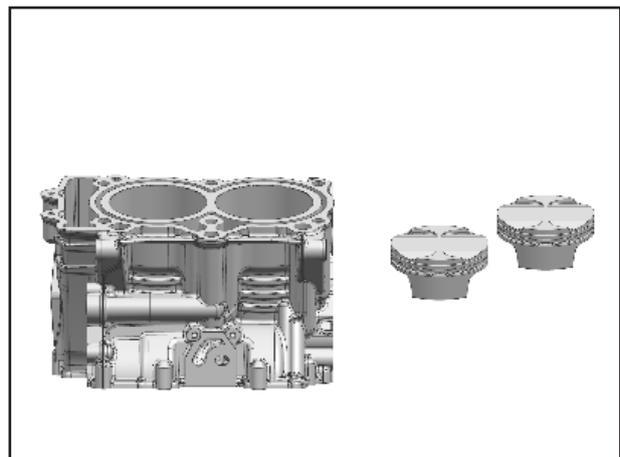
Check/measure the cylinder.

Check/measure the piston.

The smallest piston/cylinder mounting clearance is the result of the smallest cylinder bore diameter minus the largest piston diameter. The largest piston/cylinder mounting clearance is the result of the largest cylinder bore diameter minus the smallest piston diameter.

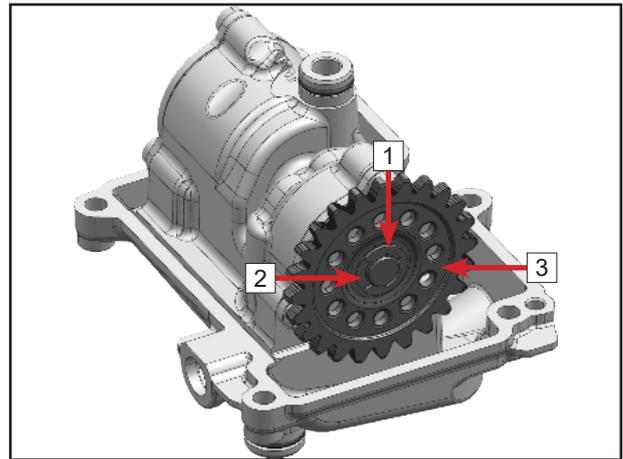
Guideline

Piston/cylinder - mounting clearance
New condition: 0.035mm~0.070 mm
Wear limit: 0.10 mm

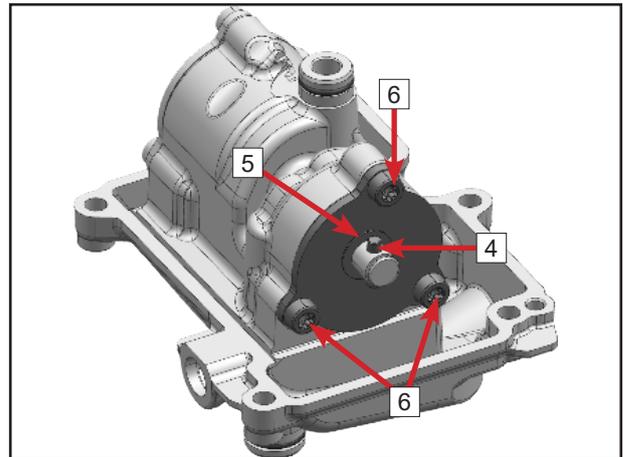


13.6.15 Removing the Oil Pumps

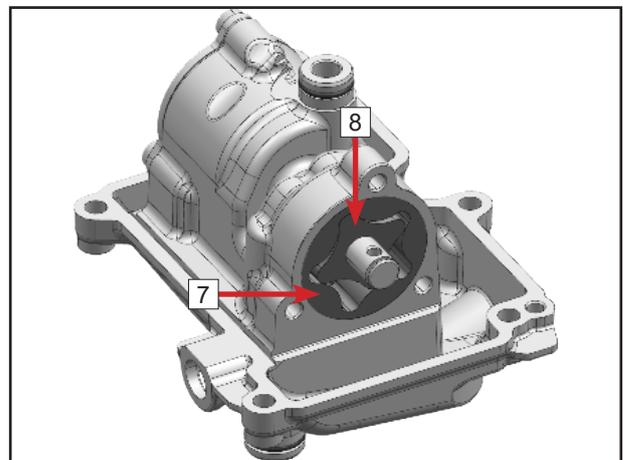
Remove lock ring (1) and washer (2).
Take off oil pump gear wheel (3).



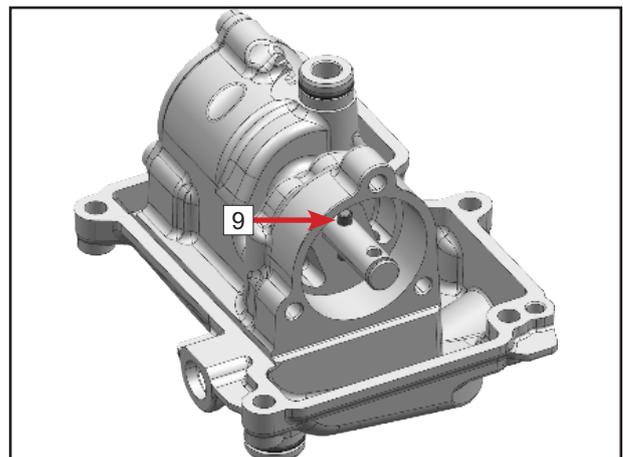
Remove pin (4) and washer (5).
Remove screws (6).
Take off the oil pump cover.



Remove external rotor (7).
Remove internal rotor (8).

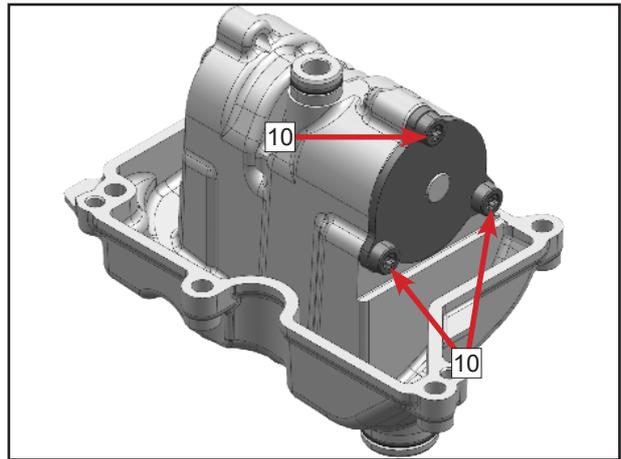


Remove pin (9).

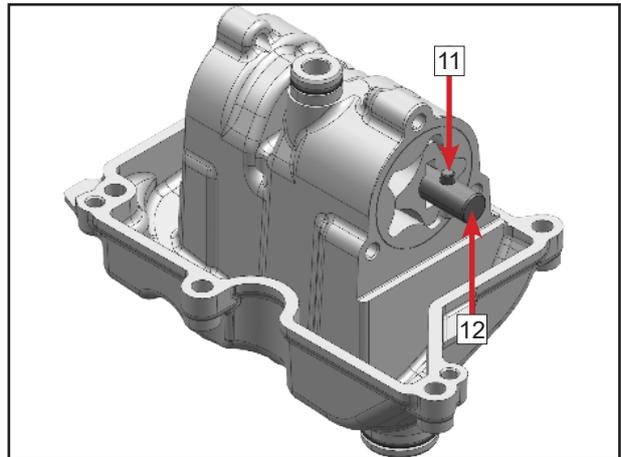


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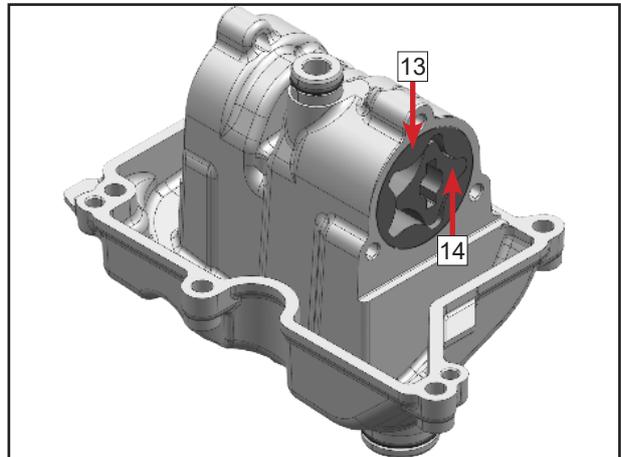
Remove screws (10).
Take off the oil pump cover.



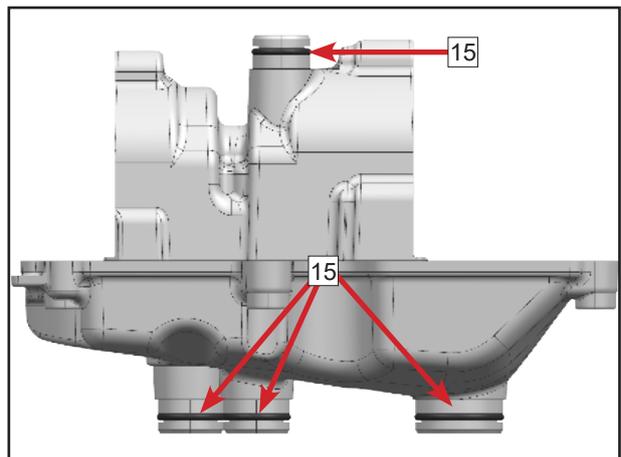
Remove pin (11) and oil pump shaft (12).



Remove external rotor (13) and internal rotor (14).



Remove O-rings (15).

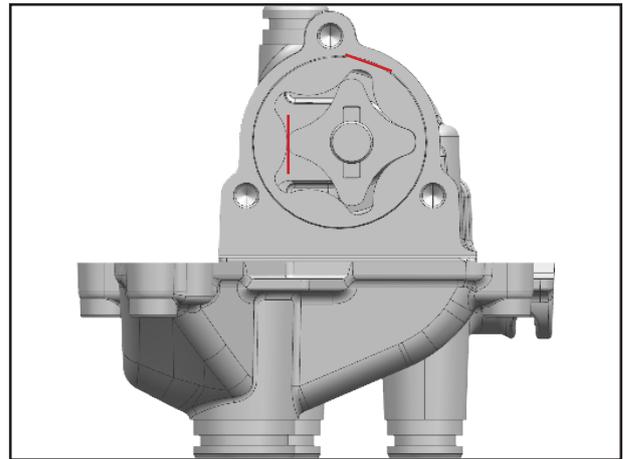
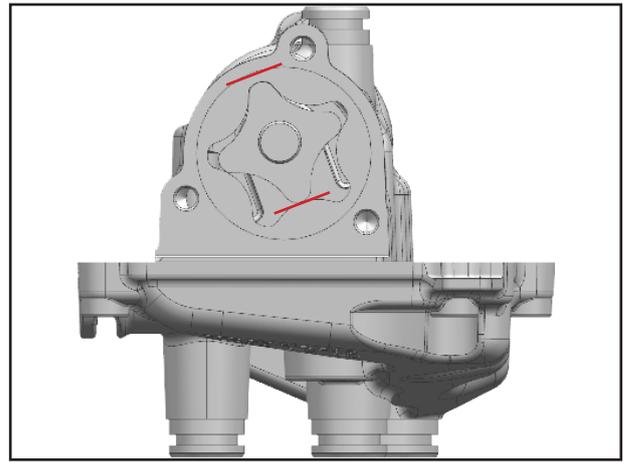


13.6.16 Checking the Oil Pumps for Wear

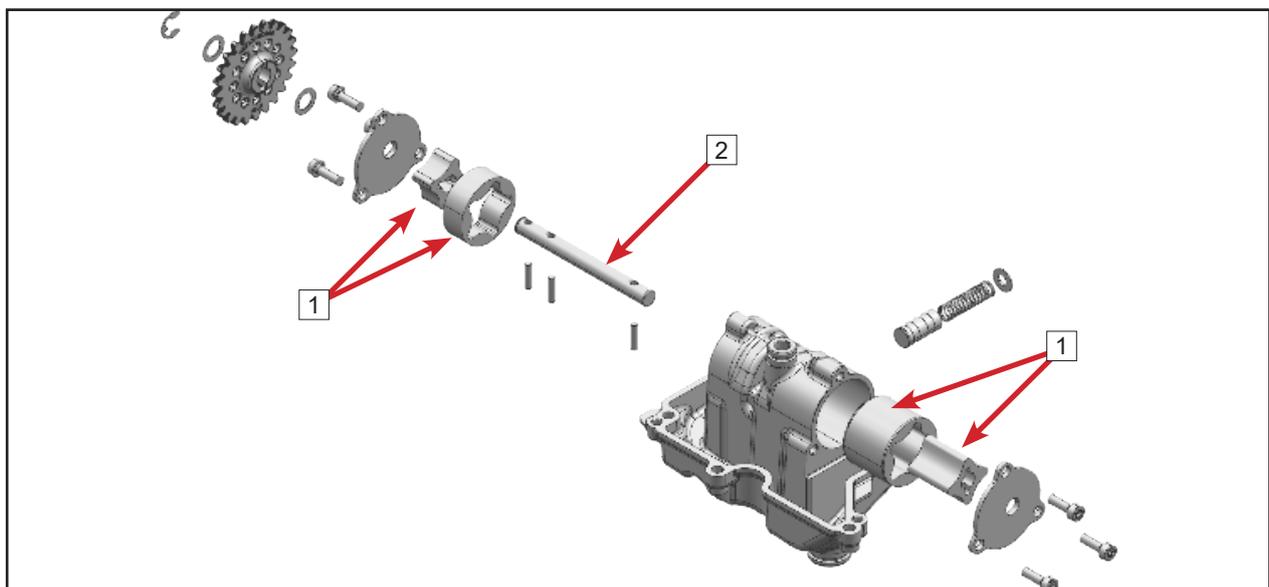
Use a feeler gauge to measure the play between the external rotor and oil pump housing as well as between the external rotor and internal rotor.

Oil pump
Play between external rotor and oil pump housing: ≤ 0.15 mm
Clearance, external rotor/internal rotor: ≤ 0.20 mm
Axial play: 0.03mm~0.08 mm

If the measured value does not meet specifications: Change the oil pump and, if necessary, the oil pump housing.



Check the internal rotor and external rotor of oil pumps (1) for damage and wear.
 If there is damage or wear: Change the oil pumps.
 Check oil pump shaft (2) for damage and wear.
 If there is damage or wear: Change the oil pump shaft.
 Check both oil pump covers for damage and wear.
 If there is damage or wear: Change the oil pump cover.



CFMOTO

13.6.17 Checking the Oil Pressure Control Valve

Remove washer (1).

Remove spring (2).

Measure the length of spring (2).

Oil pressure regulator valve - minimum length spring: 40.0 mm

If the measured length is less than the specified value: Change the spring.

Check control piston (3) for damage and wear.

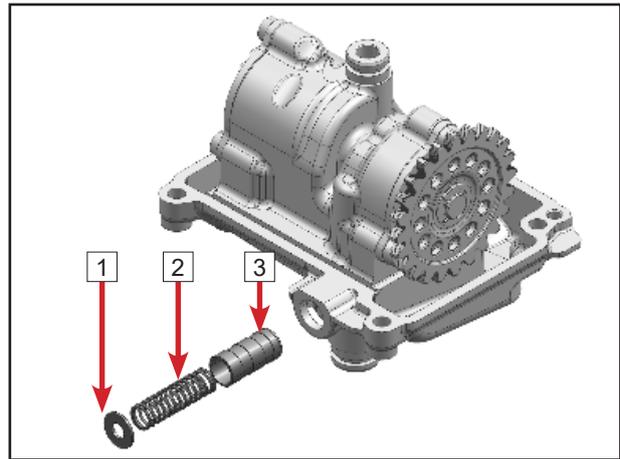
If there is damage or wear: Change the control piston.

Check the control piston for smooth operation in the oil pump housing.

If the control piston is stiff: Change the control piston or the oil pump housing.

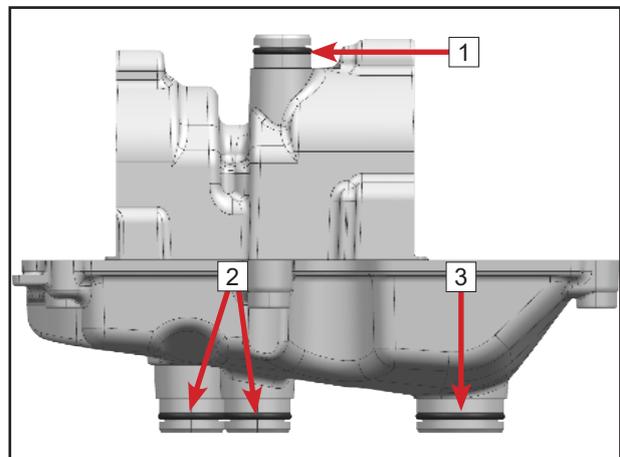
Thoroughly oil control piston (3) and spring (2) and mount them.

Mount washer (1).



13.6.18 Installing the Oil Pumps

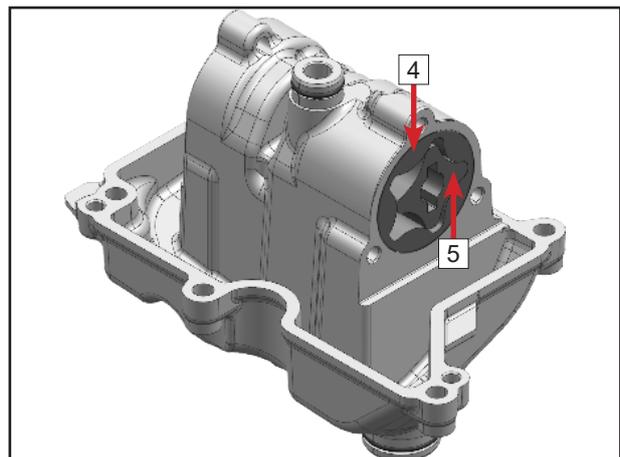
Mount and grease the new O-rings (1), (2) and (3).



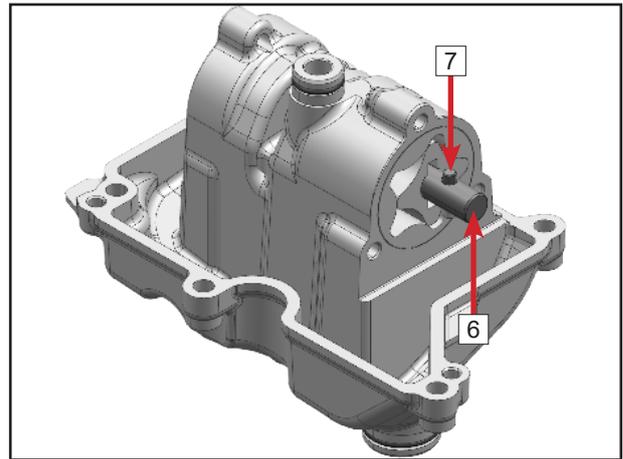
Mount external rotor (4) and internal rotor (5).

The rounded side of the external rotor must face the oil pump housing.

Oil the parts.



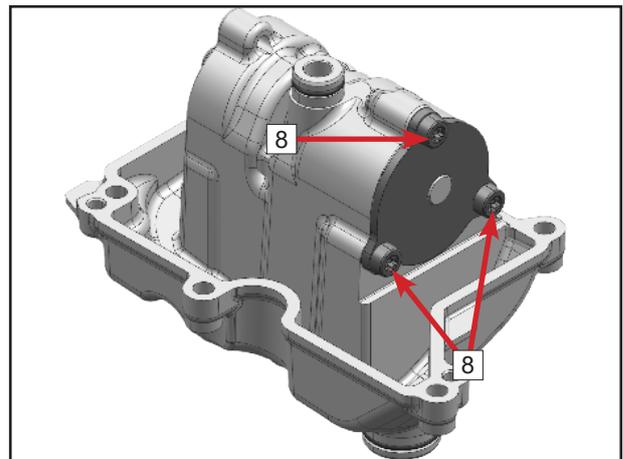
Mount oil pump shaft (6) with pin (7).



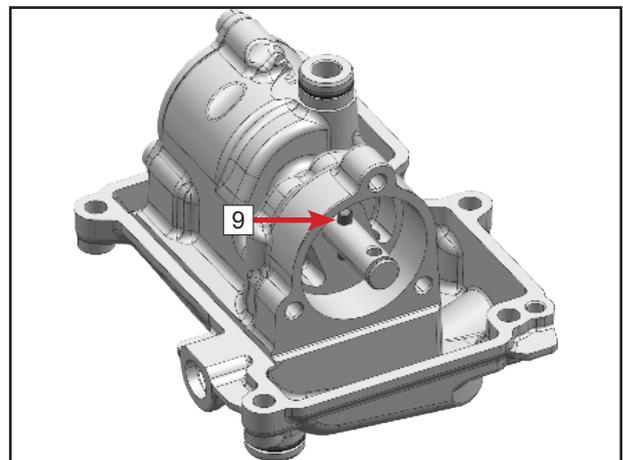
Position the oil pump cover.
Mount and tighten screws (8).

Guideline

Screw, oil pump cover	M6	10 N•m 243 Thread locker
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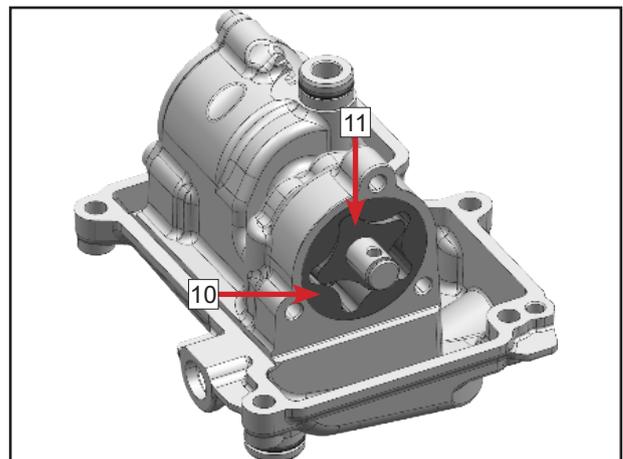
Mount pin (9).



Mount external rotor (10) and internal rotor (11).

The rounded side of the external rotor must face the oil pump housing.

Oil the parts.



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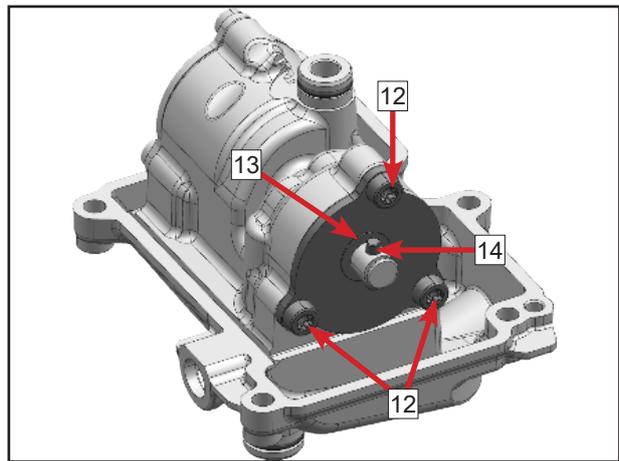
Position the oil pump cover.
Mount and tighten screws (12).

Guideline

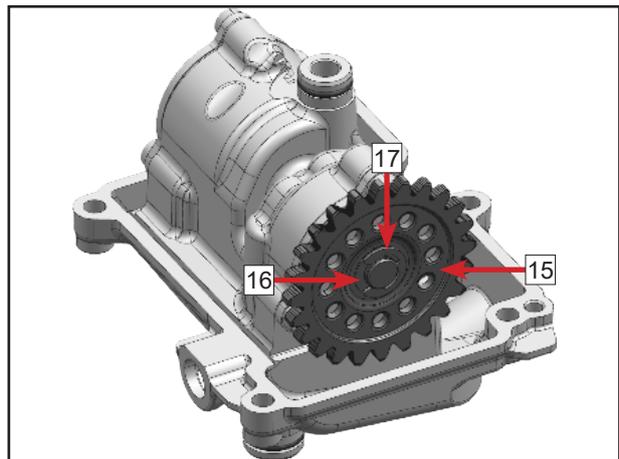
Screw, oil pump cover	M6	10 N•m 243 Thread locker
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Mount washer (13).

Mount pin (14).



Mount oil pump gear wheel (15).
Mount washer (16) and lock ring (17).



13.6.19 Preparing Timing Chain Tensioner for Installation

Fully compress the timing chain tensioner.

NOTE

This requires considerable force since the oil has to be pressed out.

Release the timing chain tensioner.

Without pressure, the timing chain tensioner expands fully.



Place two compensating disks or similar aids next to the piston of the timing chain tensioner. This should ensure that when pushed down, the piston does not fully withdraw.

Guideline

Thickness of the compensating disks

2mm~ 2.5 mm

Release the timing chain tensioner.

The latching system locks and the piston stops moving.
--

End position of piston after latching

3 mm

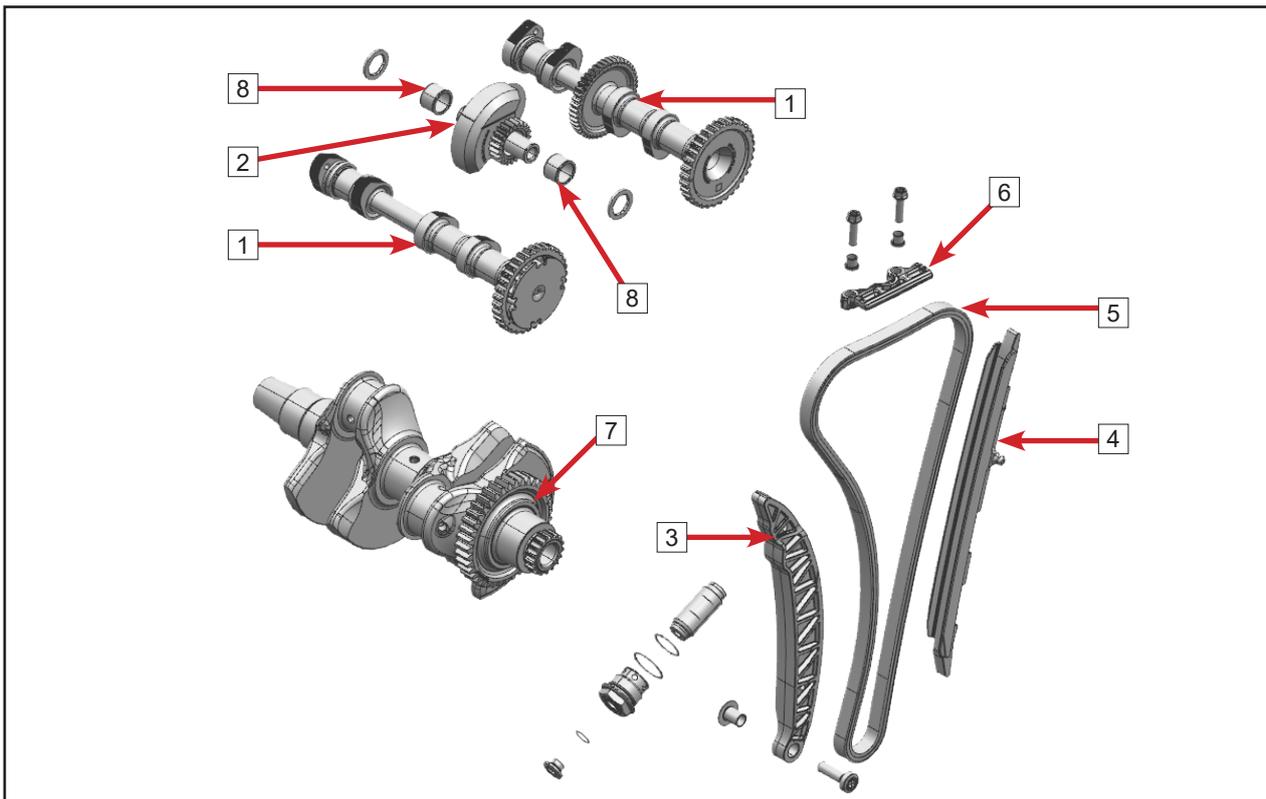
NOTE

This position is necessary for installation.

If the timing chain tensioner is now pressed in once more (while it is installed) and then pulled out no more than halfway (preventing it from coming out fully), the latching system locks and the timing chain tensioner can no longer be compacted; this function is necessary to ensure sufficient tension of the timing chain, even at low oil pressure.



13.6.20 Checking the Timing Assembly



Clean all parts well.

Check camshafts (1) for damage and wear.

If there is damage or wear: Change the camshafts.

Check balancer shaft (2) for damage and wear.

If there is damage or wear: Change the balancer shaft.

Check tensioning rail (3) for damage and wear.

If there is damage or wear: Change the tensioning rail.

Check guide rail (4) for damage and wear.

If there is damage or wear: Change the guide rail.

Check timing chain (5) for damage and wear.

If there is damage or wear: Change the timing chain.

Check the timing chain links for smooth operation. Let the timing chain hang down freely.

The chain links no longer align in a straight line: Change the timing chain.

Check guide rail (6) for damage and wear.

If there is damage or wear: Change the guide rail.

Check timing chain sprocket (7) for damage and wear.

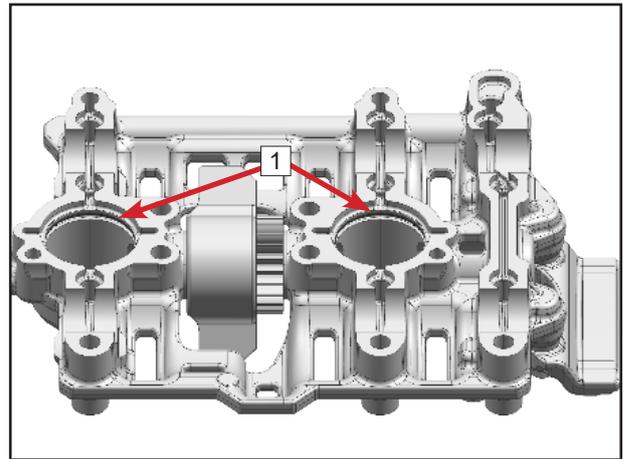
If there is damage or wear: Change the crankshaft.

Check balancer shaft bearing (8) for damage and wear.

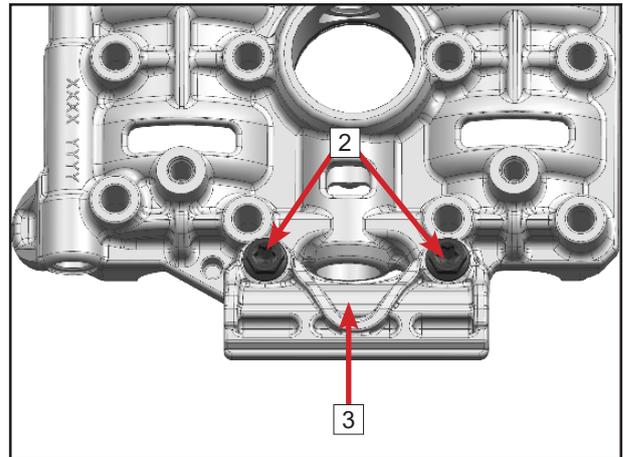
If there is damage or wear: Change the balancer bearing.

13.6.21 Working on the Camshaft Bearing Bridge

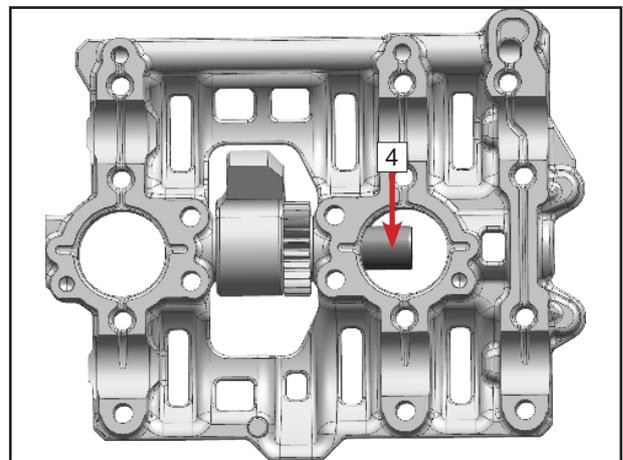
Remove O-rings (1).



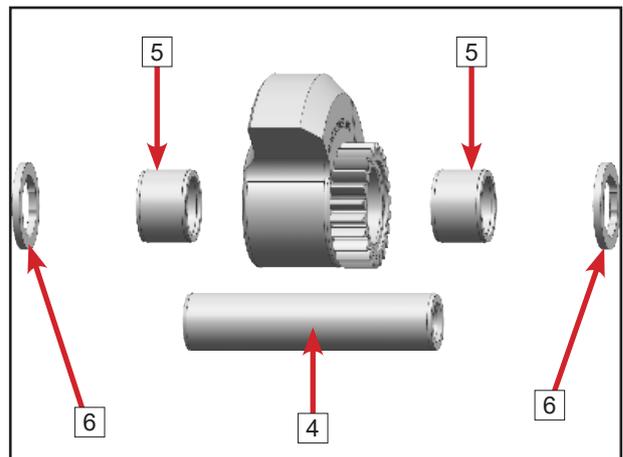
Remove screws (2).
Take off guide rail (3).



Pull out spindle (4) of the balancer shaft with appropriate screw M10.

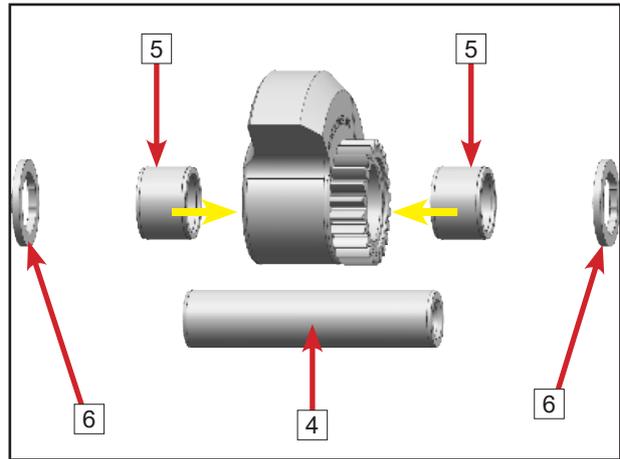


Remove balancer shaft (4) with needle bearings (5) and washers (6).

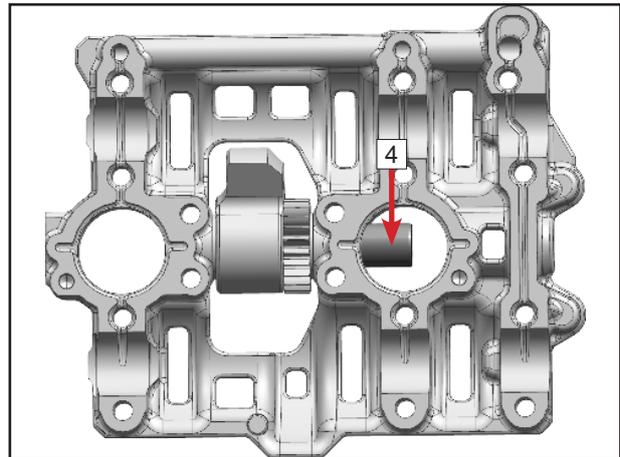


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Mount new needle bearings (5) in the balancer shaft and oil.
Position balancer shaft (4) with washers (6) in the camshaft bearing bridge.

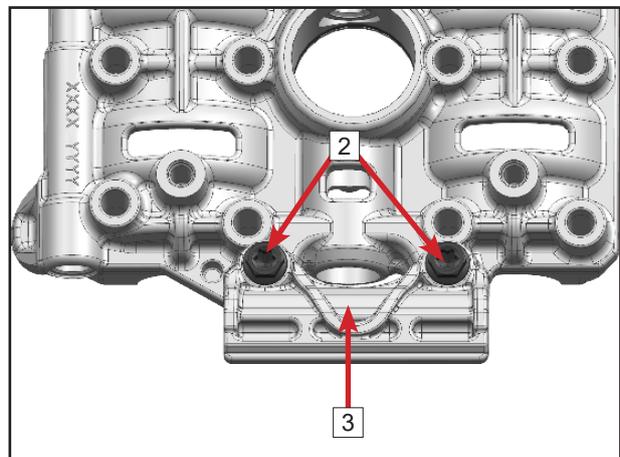


Mount spindle (4) of the balancer shaft in the center between the spark plug shafts.
Remove screw M10.

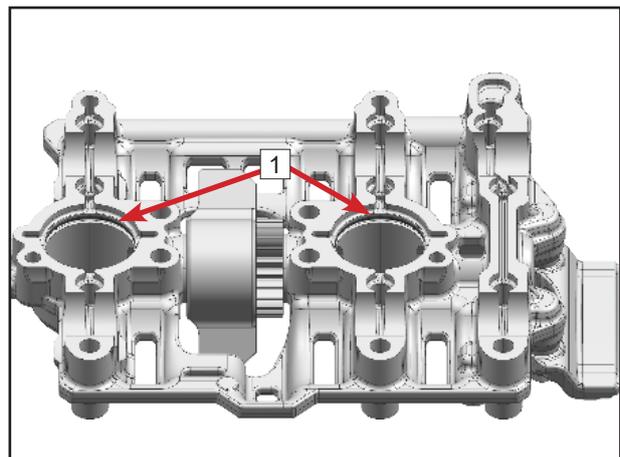


Position guide rail (3).
Mount and tighten screws (2).
Guideline

Screw, upper guide rail
M6
8 N•m
243 Thread locker

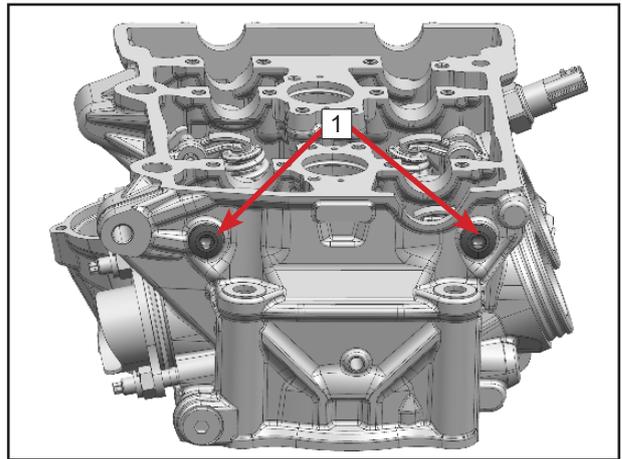


Mount and grease the new O-rings (1).

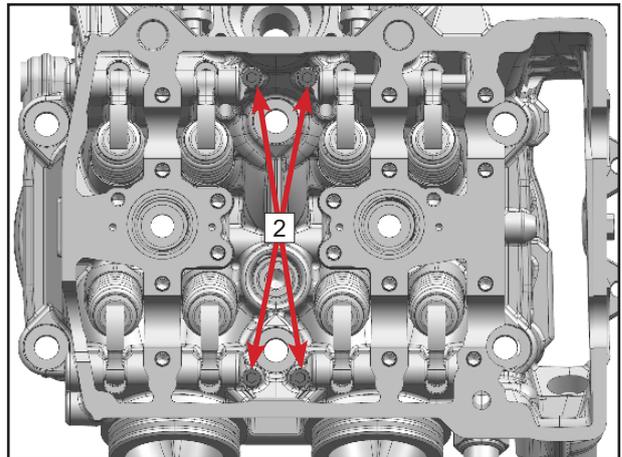


13.6.22 Working on the Cylinder Head

Remove screw plugs (1) with the O-rings.

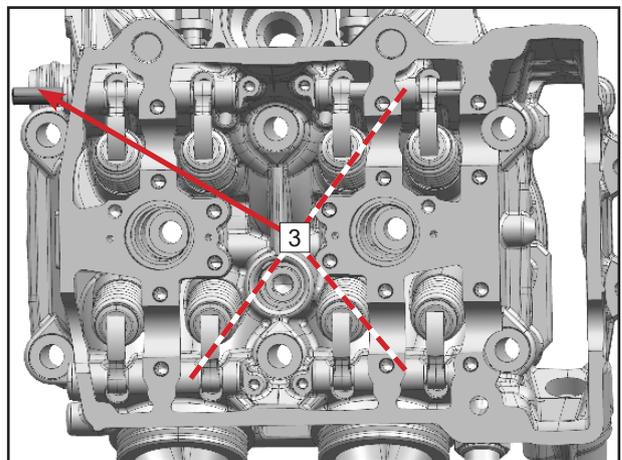


Remove screws (2).

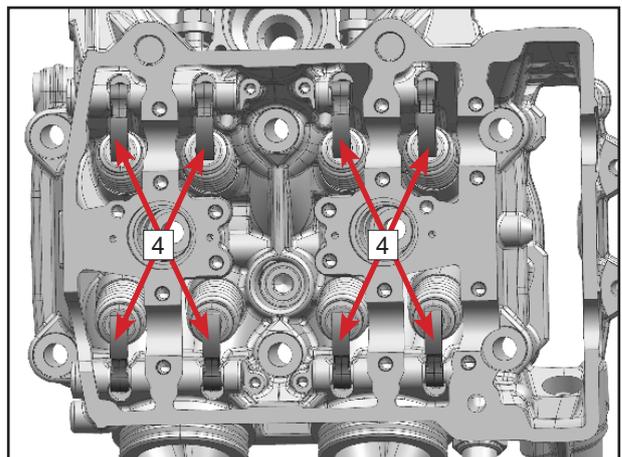


Mount appropriate screw M4 onto cam lever shaft.

Remove cam lever shafts (3).

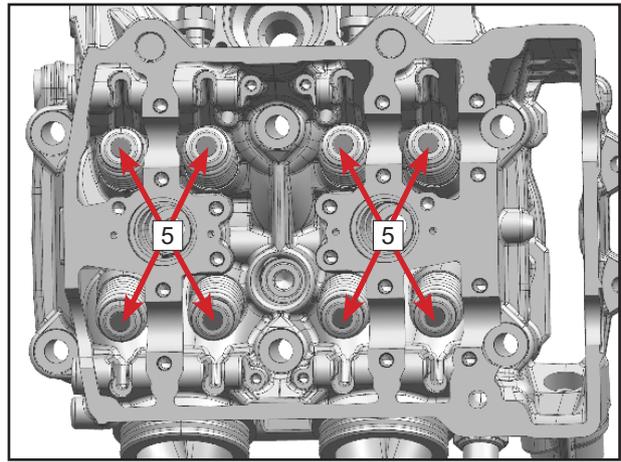


Take off cam lever (4).

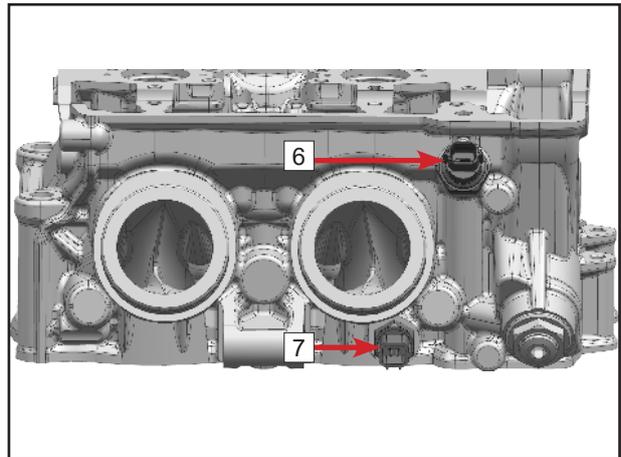


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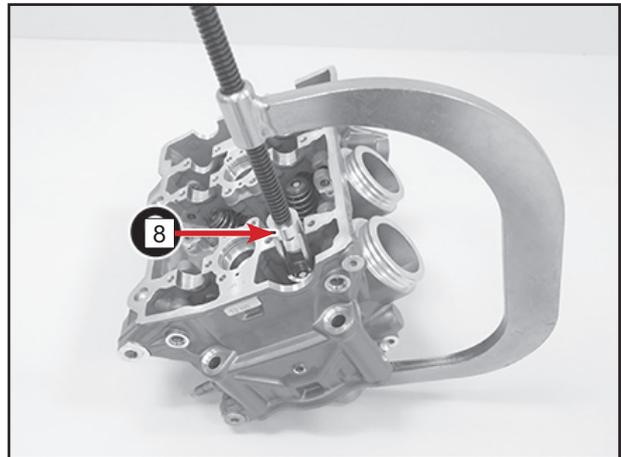
Remove shims (5) and label according to their normal built-in position.



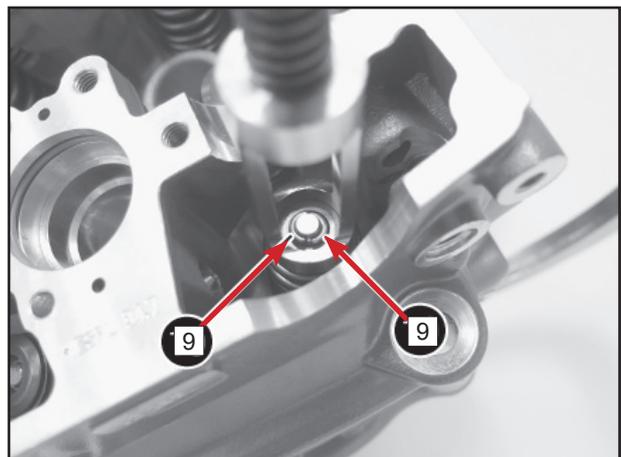
Remove oil pressure sensor (6) with O-ring.
Remove coolant temperature sensor (7) with the O-ring.



Tension valve spring with a valve spring compressing clamp (8).



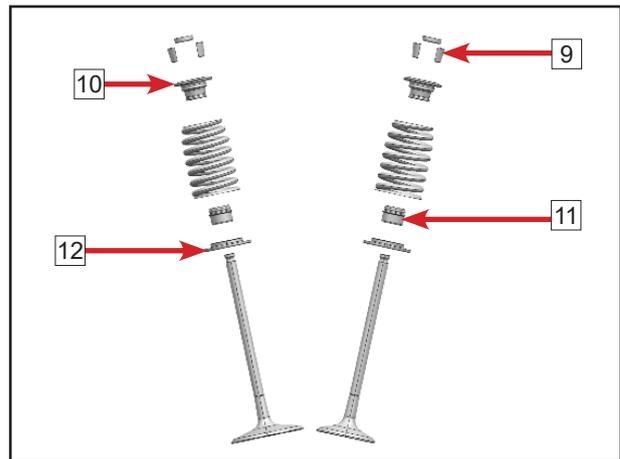
Remove valve collets (9) and release the valve spring.



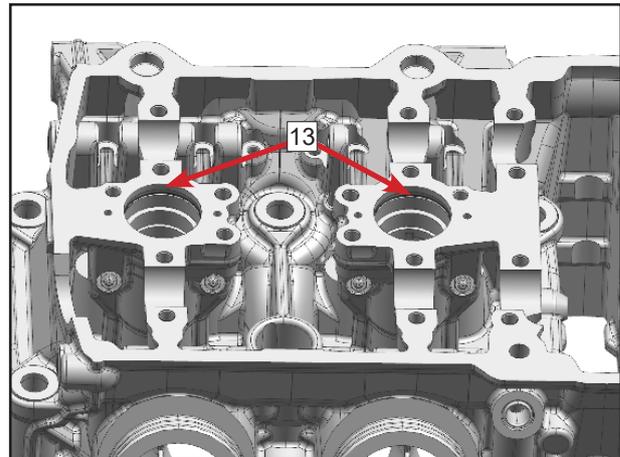
Remove valve spring retainers (10), valve springs, valve stem seals (11) and valve spring seats (12).

NOTE

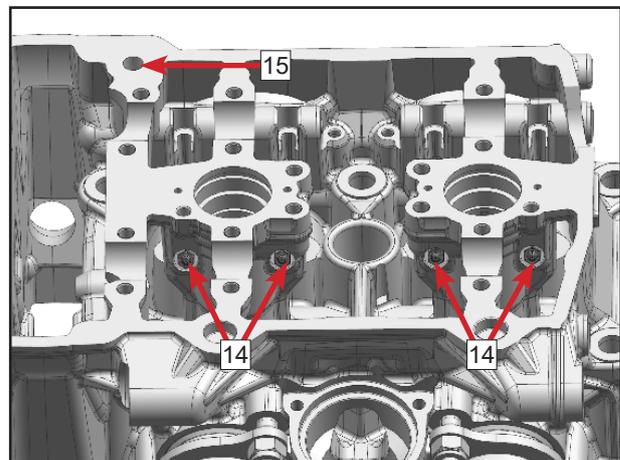
Place the valves in a box according to their normal built-in position and label them.



Remove O-rings (13).



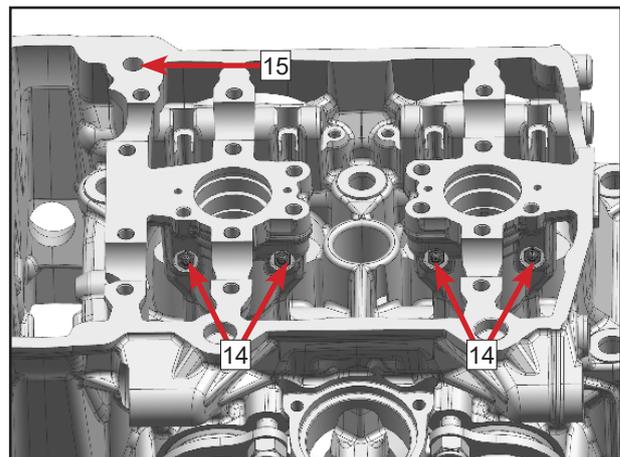
Remove oil nozzles (14).
Remove oil screen (15) and clean it.
Check the cylinder head.



Mount oil screen (15).
Mount oil nozzles (14).

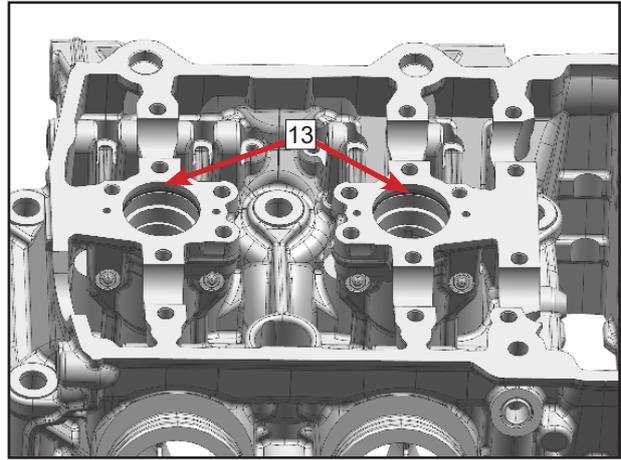
Guideline

Oil nozzle in cylinder head
M5
2 N•m
243 Thread locker

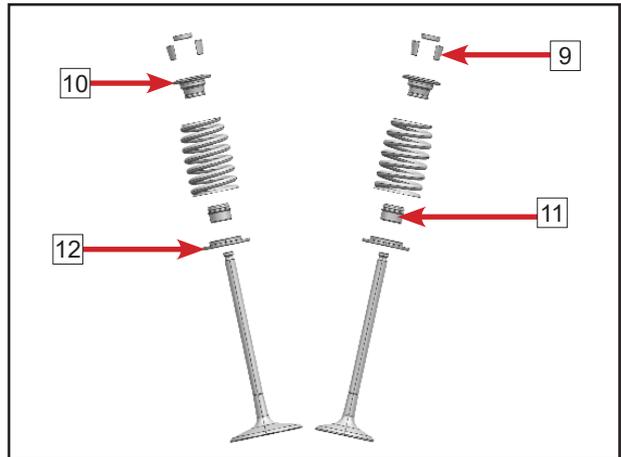


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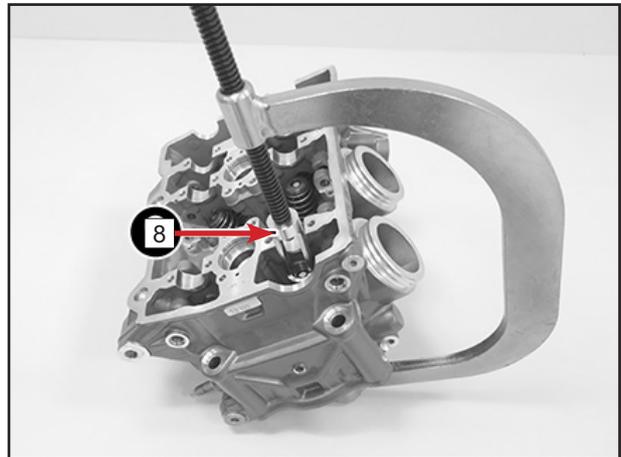
Mount and grease O-rings (13).



Mount valve spring seats (12) and new valve stem seals (11).
Mount valve spring retainers (10) and valve springs.

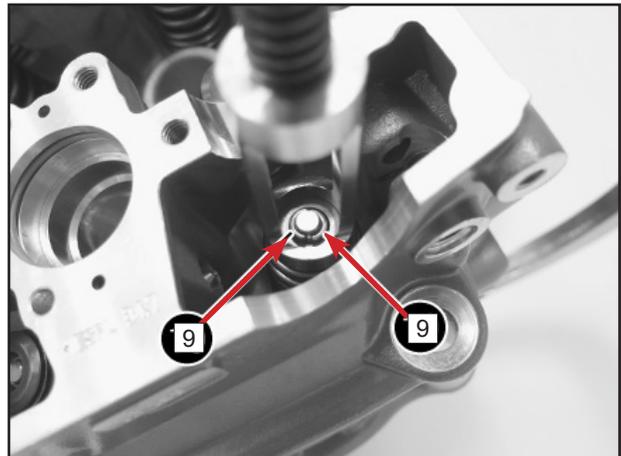


Tension valve spring with a valve spring compressing clamp (8).



Mount valve collets (9). Release the tension on the valve spring.

NOTE
When mounting the valve collets, check they are seated properly, preferably use a little grease to secure the valve collets on the valve.



Mount coolant temperature sensor (7) with the new O-ring.

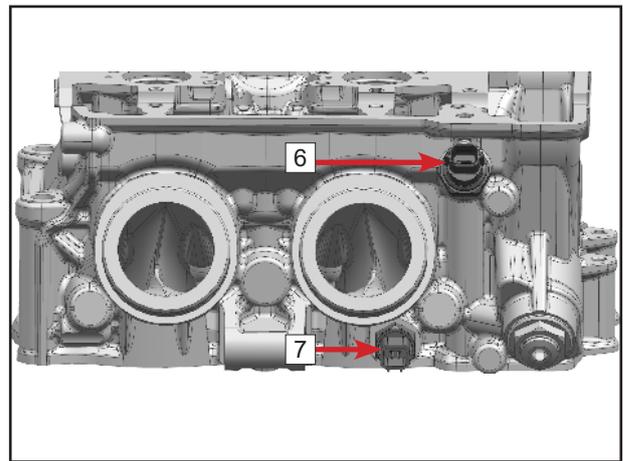
Guideline

Coolant temperature sensor
M10×1.25
10 N•m

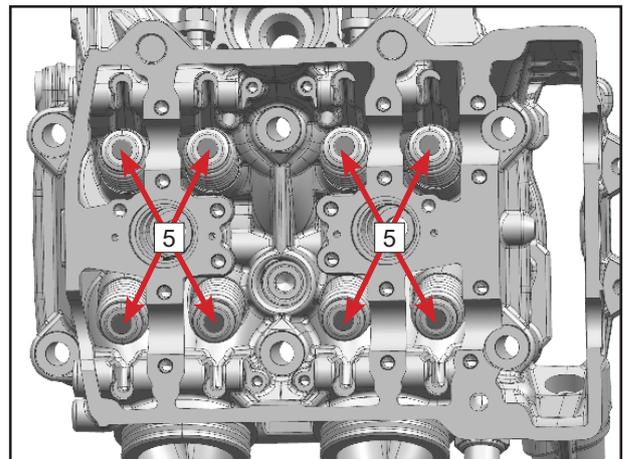
Mount oil pressure sensor (6) with new O-ring.

Guideline

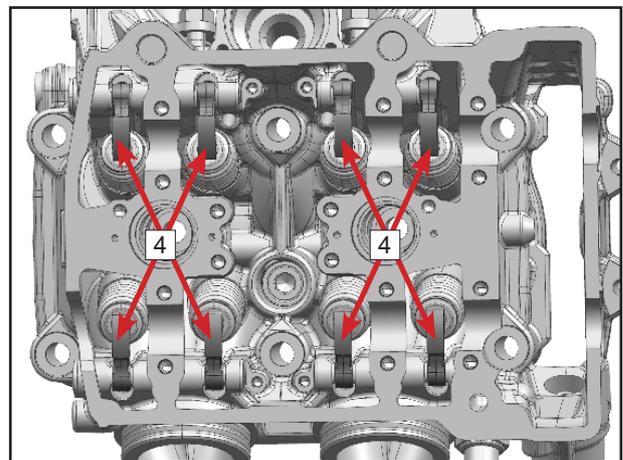
Oil pressure sensor
M10×1
10 N•m



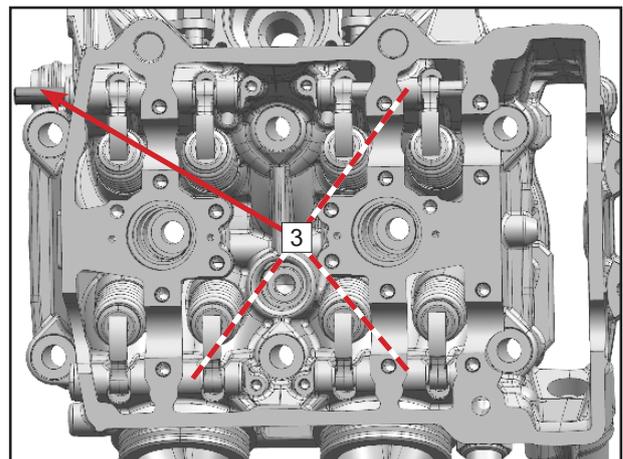
Place shims (5) into the valve spring retainer according to their normal built-in position.



Position cam levers (4).



Mount cam lever shafts (3).

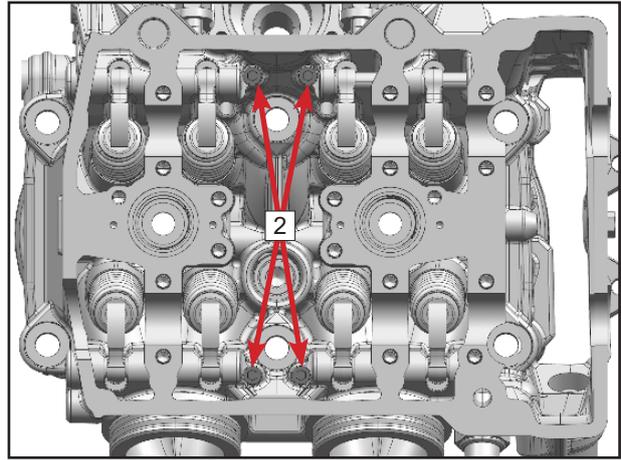


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Mount and tighten screws (2).

Guideline

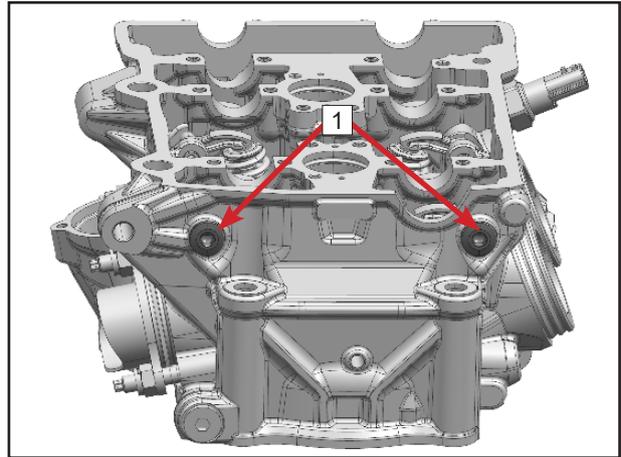
Screw, cam lever axial lock
M5
6 N•m
243 Thread locker



Mount screw plugs (1) with new O-rings.

Guideline

Screw plug, cam lever axis
M10×1
10 N•m



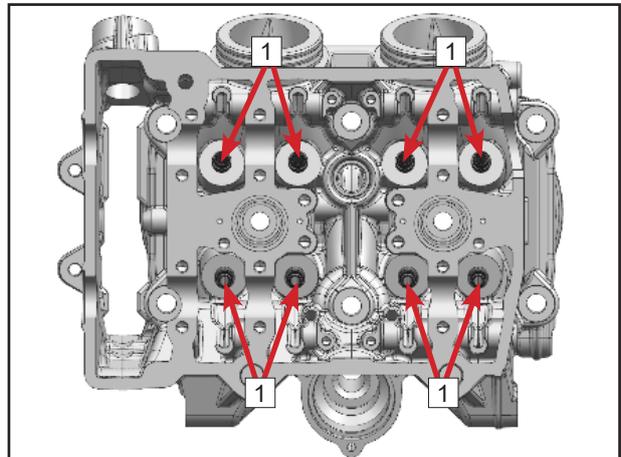
13.6.23 Checking the Cylinder Head

Check valve guides (1) using a limit plug gauge.

If the gauge is easy to insert into the valve guide: Change the valve guide and valve.

Check the sealing surface of the spark plug thread and the valve seats for damage and cracking.

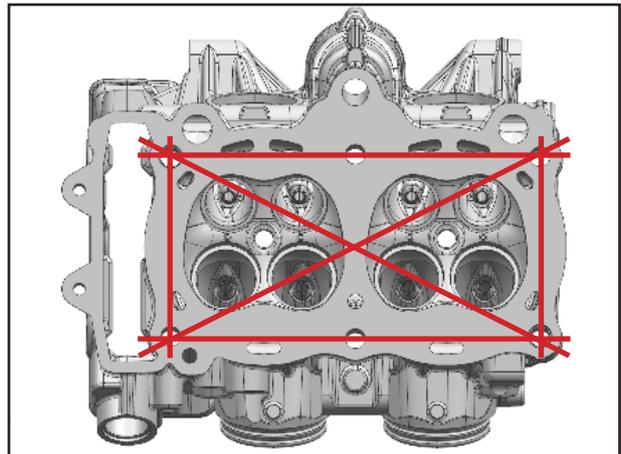
If there is damage or cracking: Change the cylinder head.



Check the sealing surface of the cylinder for distortion using a straightedge and a feeler gauge.

Cylinder/cylinder head - sealing area distortion
≤ 0.05 mm

If the measured value does not meet specifications: Change the cylinder head.

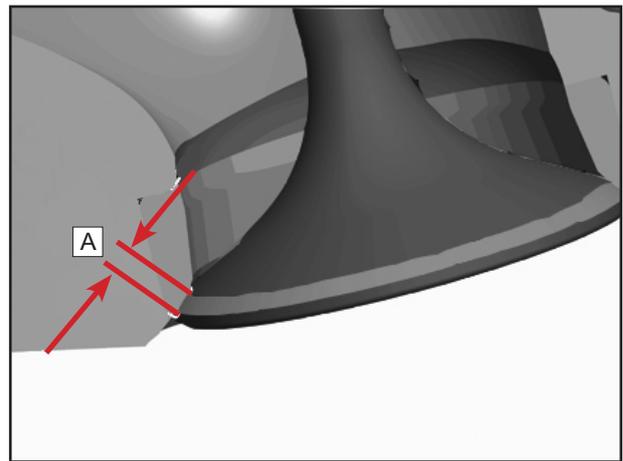


Check sealing seat (A) of the valves.

Valve - sealing seat width	
Intake	2.80 mm

Valve - sealing seat width	
Exhaust	3.00 mm

If the measured value does not meet specifications: Machine the valve seat.
Blow compressed air through all oil channels and oil nozzles, and check that they are clear.



Check valve (2) for damage and wear.

If there is damage or wear: Change the valve.

Check the valve for run-out.

Valve - run-out	
On the valve plate	≤ 0.05 mm
On the valve stem	≤ 0.05 mm

If the measured value does not meet specifications: Change the valve.

Check the valve stem diameter.

Valve - valve stem diameter	
Exhaust	
4.95mm~4.97 mm	
Intake	
4.97mm~4.99 mm	

If the measured value does not meet specifications: Change the valve.

Check valve spring (3) for damage and wear.

If there is damage or wear: Change the valve spring.

Measure the length of the valve springs.

Valve spring	
Minimum length (without valve spring seat)	
44.0 mm	

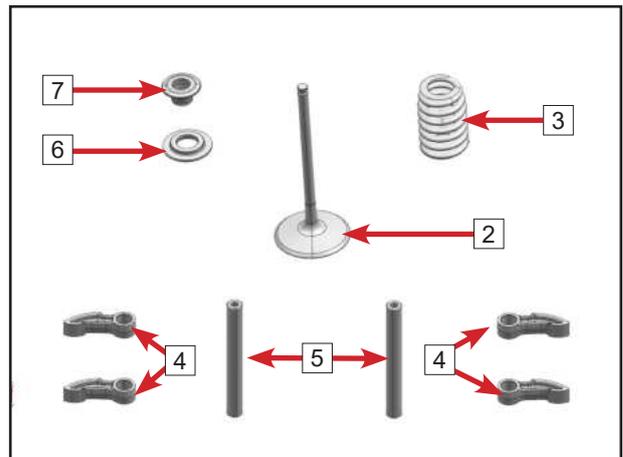
If the measured value does not meet specifications: Change the valve springs.

Check cam levers (4) for damage and wear.

If there is damage or wear: Change the cam lever.

Check cam lever shafts (5) for damage and wear.

If there is damage or wear: Change the



cam lever shaft.

Check valve spring seat (6) for damage and wear.

If there is damage or wear: Change the valve spring seat.

Check valve spring retainer (7) for damage and wear.

If there is damage or wear: Change the valve spring retainer.

13.6.24 Checking the Clutch

Check clutch push rod (1) for damage and wear.

If there is damage or wear: Change clutch push rod.

Check axial bearing (2) for damage and wear.

If there is damage or wear: Change the axial bearing.

Check the length of clutch springs (3).

Clutch spring - length	≥ 43.0 mm
------------------------	----------------

If the clutch spring length is shorter than specified: Change all clutch springs.

Check the contact surface of clutch pressure cap (4) for damage and wear.

If there is damage or wear: Change the clutch pressure cap.

Check the thrust surfaces of the clutch facing discs in clutch basket (5) for damage and wear.

If there is damage or wear: Change the clutch disc pack and the clutch basket.

Check needle bearing (6) for damage and wear.

If there is damage or wear: Change the needle bearing.

Check intermediate clutch discs (7) for damage and wear.

If the intermediate clutch discs are not level and are pitted: Change the clutch disc pack.

Check clutch facing discs (8) for discoloration and scoring.

If there is discoloration or scoring: Change the clutch disc pack.

Check the thickness of the clutch disc pack.

Clutch disc pack - thickness	
New condition	35.60mm~36.50 mm
Wear limit	34.80 mm

If the clutch disc pack does not meet specifications: Change the clutch disc pack.

Check pretension ring (9) and support ring (10) for damage and wear.

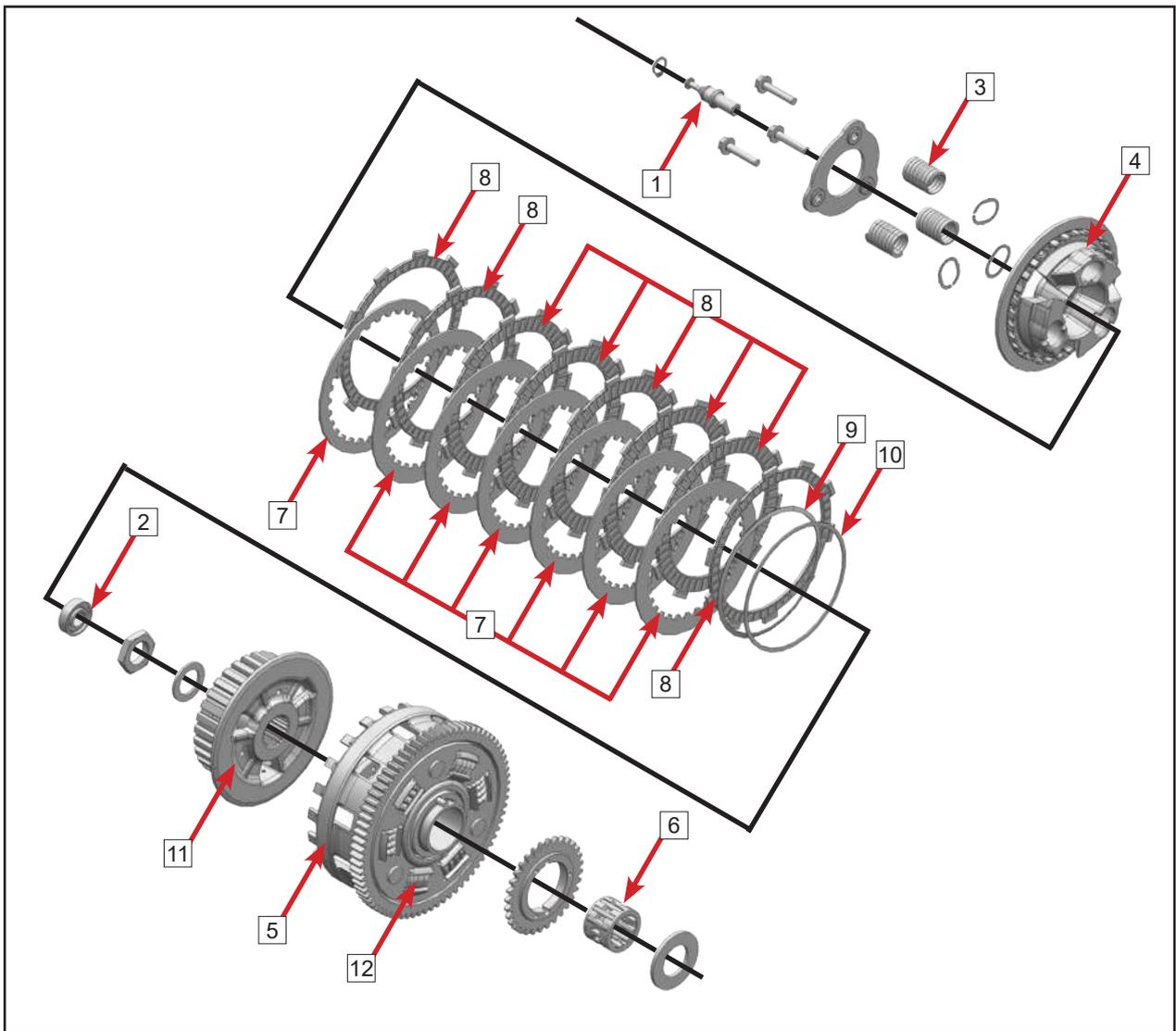
If there is damage or wear: Change the pretension ring and support ring.

Check inner clutch hub (11) for damage and wear.

If there is damage or wear: Change the inner clutch hub.

Check springs (12) of the clutch basket for damage and wear.

If there is damage, wear or play in the direction of rotation: Change the clutch basket.



13.6.25 Removing the Shift Drum Locating Unit

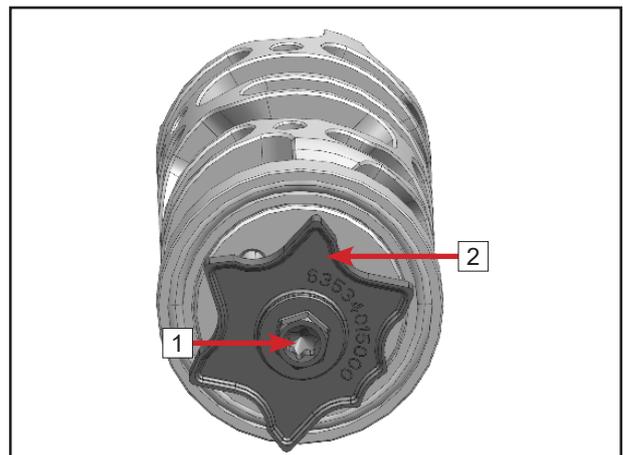
Clamp shift drum.

Guideline

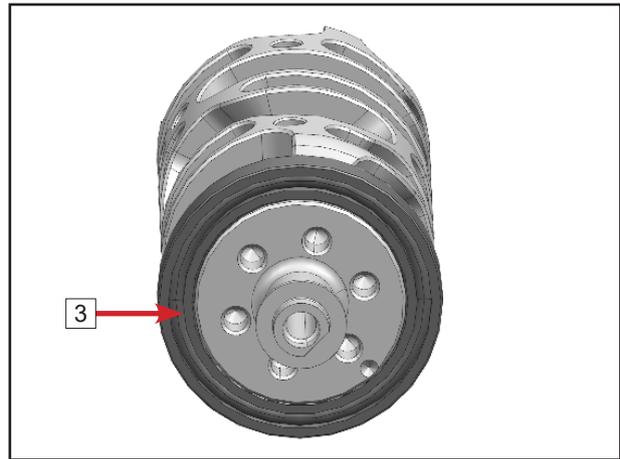
Use soft jaws.

Remove screw (1).

Take off the shift drum locating unit (2).



Remove bearing (3).



13.6.26 Checking the Shift Mechanism

Check shift forks (1) on plate (A) for damage and wear (visual check).

If there is damage or wear: Change the shift fork and gear wheel pair.

Check shift grooves (B) of shift drum (2) for wear.

If the shift groove is worn: Change the shift drum.

Check the seat of the shift drum in bearings (3).

If the shift drum is not seated correctly: Change the shift drum and/or the bearing.

Check bearings (3) for ease of movement and wear.

If the bearings are stiff or are worn: Change the bearings.

Check shift rails (4) on a flat surface for run-out.

If there is run-out: Change the shift rail.

Check the shift rails for scoring, wear and smooth operation in the shift forks.

If there is scoring or corrosion, or if the shift fork is stiff: Change the shift rail.

Check sliding plate (5) in contact areas (C) for wear.

If the sliding plate is worn: Change the sliding plate.

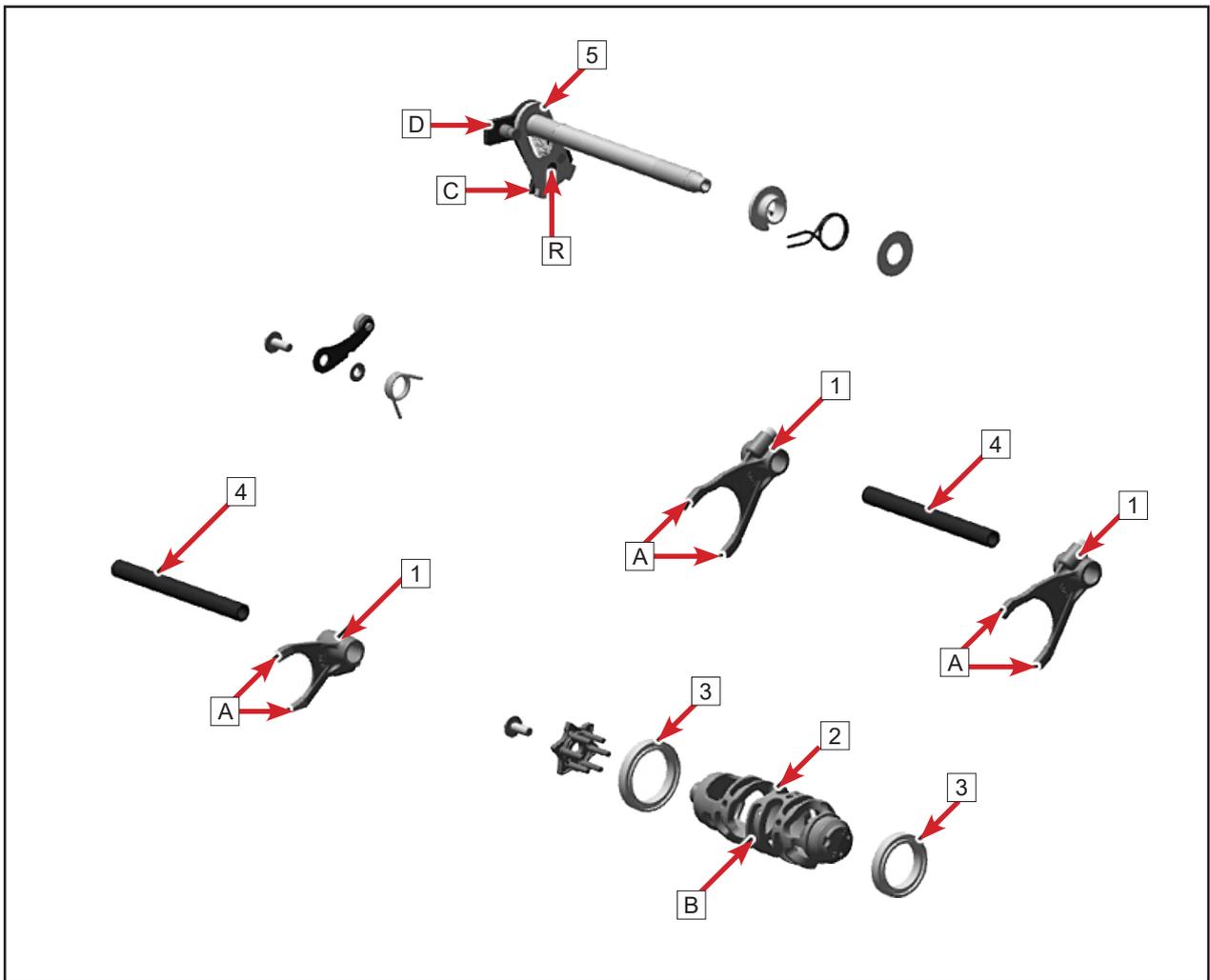
Check return surface (D) on the sliding plate for wear.

If deep notches are present: Change the sliding plate.

Check guide pin for looseness and wear.

If the guide pin is loose and/or worn: Change the sliding plate.

Preassemble the shift shaft.



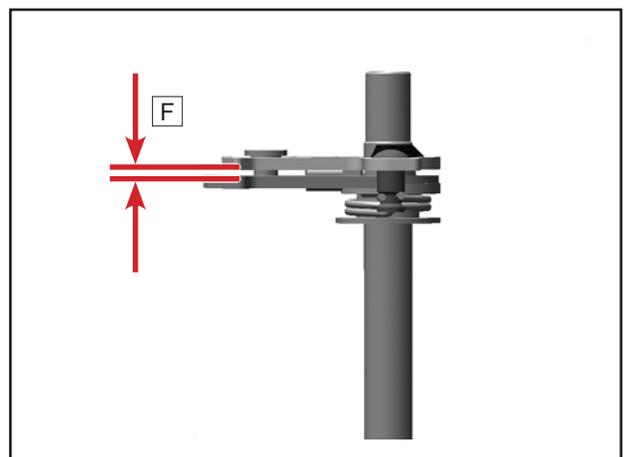
Check clearance (F) between the sliding plate and the shift quadrant.

Shift shaft - play in sliding plate/shift quadrant

0.40mm~ 0.80 mm

If the measured value does not meet specifications:

Change the sliding plate.



13.6.27 Preassembling the Shift Shaft

Fix the short end of the shift shaft in a vise.

Guideline:

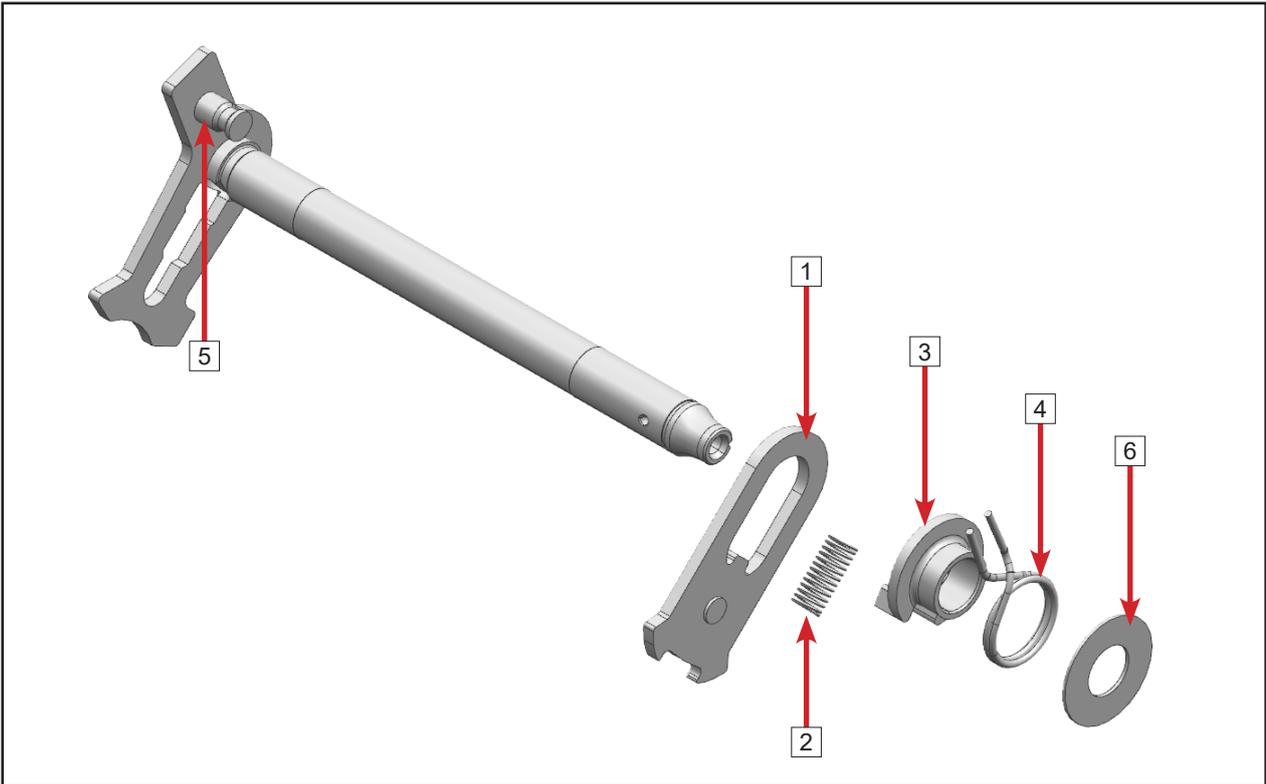
Use soft jaws.

Mount sliding plate (1) with the guide pin facing down and attach the guide pin to the shift quadrant.

Mount pressure spring (2).

Push on spring guide (3), push return spring (4) over the spring guide with the offset end facing upward and lift the offset end over abutment bolt (5).

Mount stop disk (6).



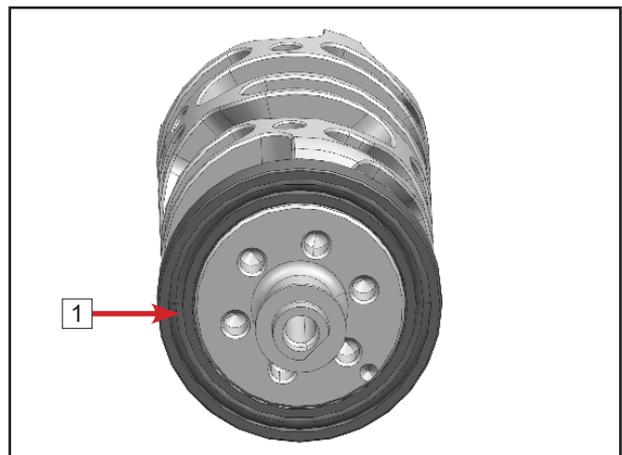
13.6.28 Installing the shift drum locating unit

Clamp shift drum.

Guideline

Use soft jaws.

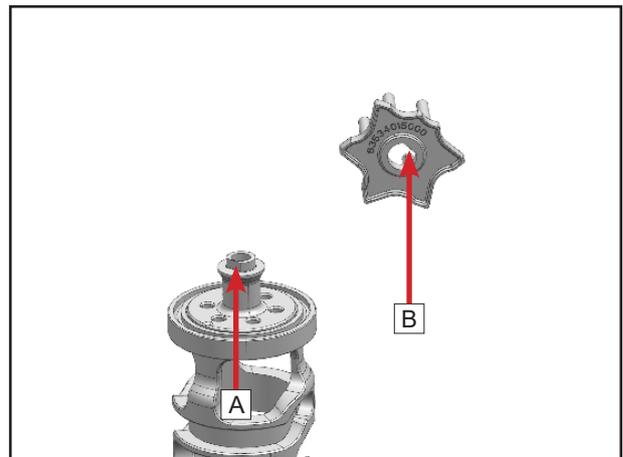
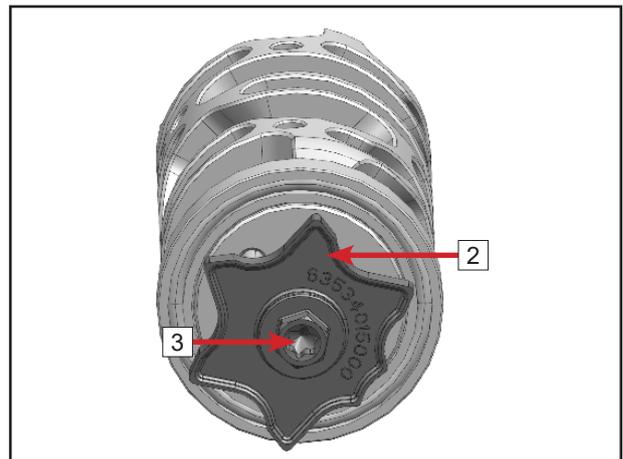
Mount bearing (1).



Position shift drum locating unit (2).
The flat surface (A) of the shift drum
engages in the flat surface (B) of the shift
drum locating unit.
Mount and tighten screw (3).

Guideline:

Screw, shift drum locating
M6
10 N•m
243 Thread locker



13.6.29 Disassembling the Main Shaft

Remove oil nozzle (1).

Secure the main shaft in the vise with the gear teeth facing downward.

Guideline

Use soft jaws.

Remove stop disk (2) and second-gear fixed gear (3).

Remove sixth-gear idler gear (4).

Remove needle bearing (5) and stop disk (6).

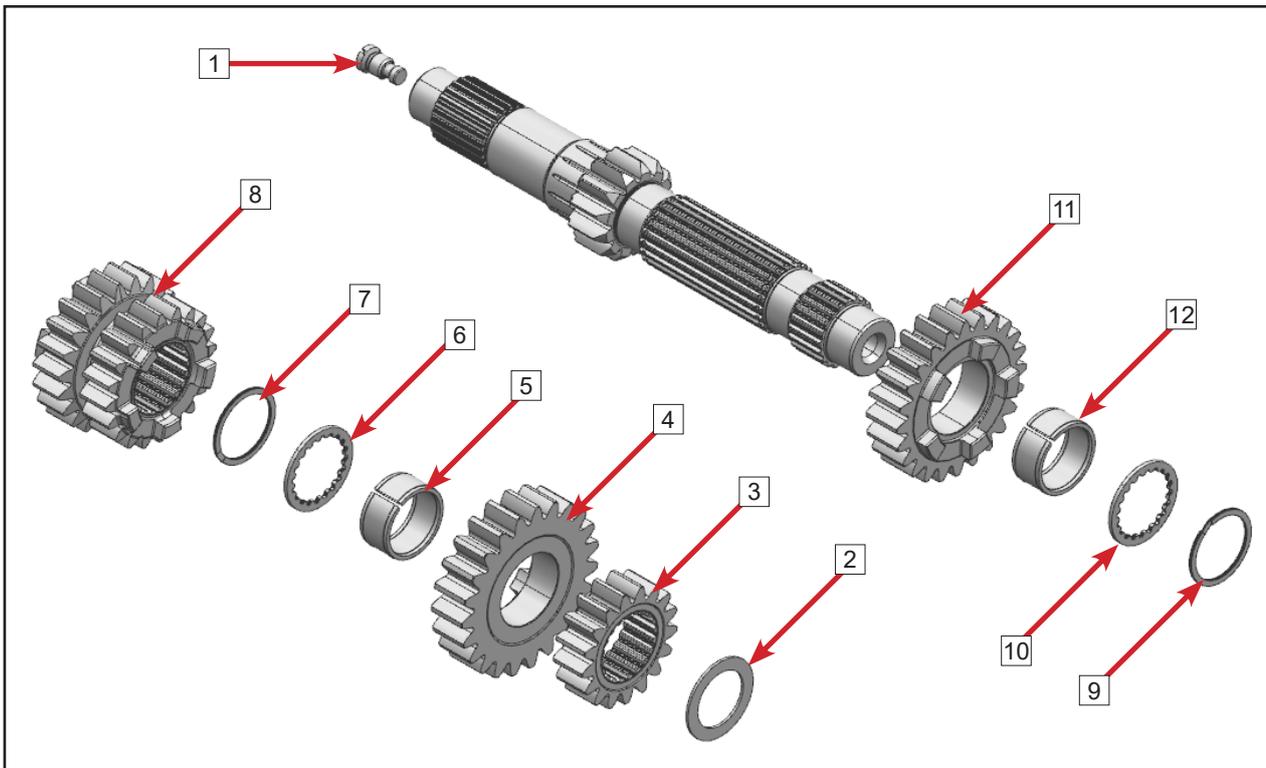
Remove lock ring (7).

Remove third/fourth-gear sliding gear (8).

Remove lock ring (9).

Remove stop disk (10) and fifth-gear idler gear (11).

Remove needle bearing (12).



13.6.30 Disassembling the Countershaft

Remove bearing (1) with distance sleeve (2).

Secure the countershaft in the bench vise with the toothed end facing downward.

Guideline

Use soft jaws.

Remove bearing (3).

Remove stop disk (4) and first-gear idler gear (5).

Remove needle bearing (6) and stop disk (7).

Remove the fifth-gear sliding gear (8) and lock ring (9).

Remove stop disk (10) and fourth-gear idler gear (11).

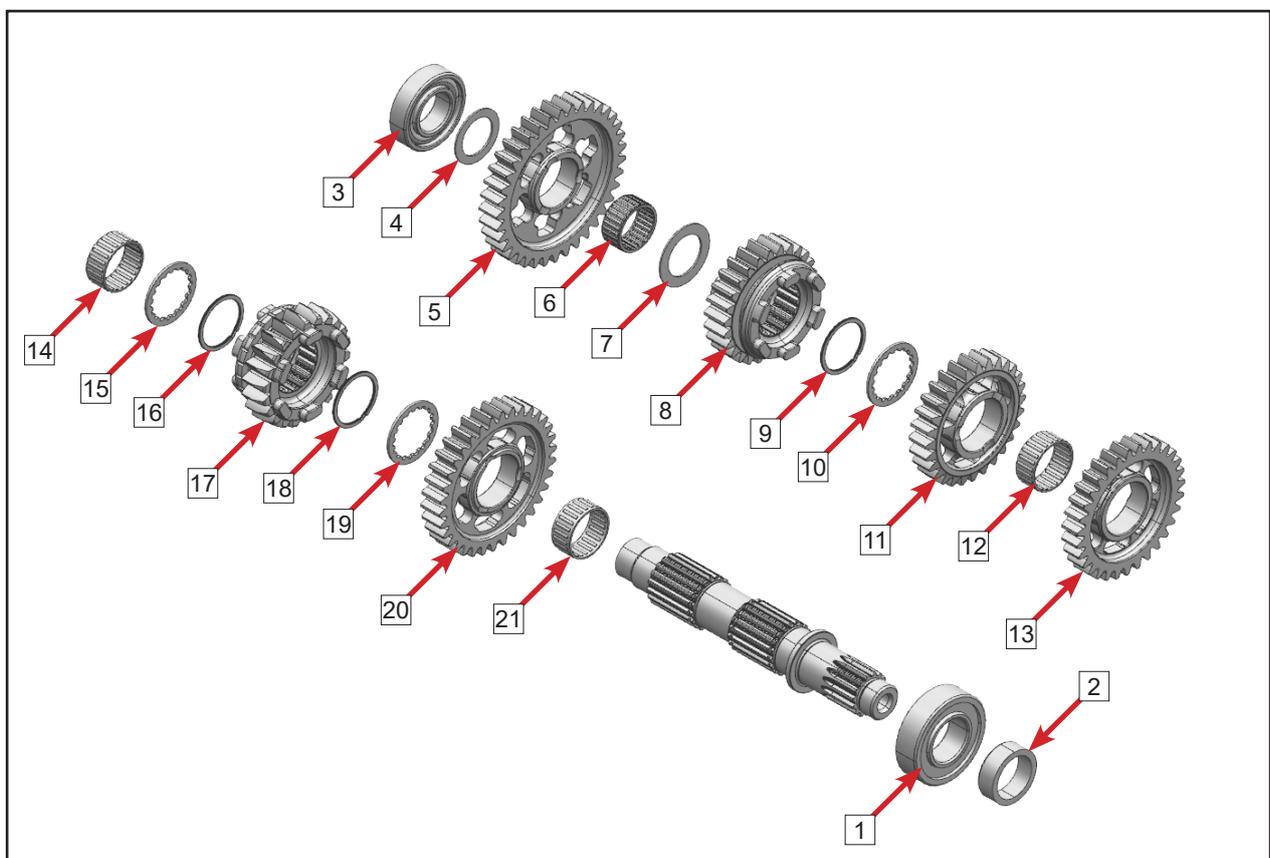
Remove needle bearing (12) and third-gear idler gear (13).

Remove needle bearing (14) and stop disk (15).

Remove lock ring (16) and sixth-gear sliding gear (17).

Remove lock ring (18) and stop disk (19).

Remove second-gear idler gear (20) and needle bearing (21).



13.6.31 Checking the Transmission

Check needle bearings (1) for damage and wear.

If there is damage or wear:

Change the needle bearing.

Check the pivot points of main shaft (2) and countershaft (3) for damage and wear.

If there is damage or wear: Change the main shaft and/or countershaft.

Check the tooth profiles of main shaft (2) and countershaft (3) for damage and wear.

If there is damage or wear: Change the main shaft and/or countershaft.

Check the pivot points of idler gears (4) for damage and wear.

If there is damage or wear: Change the gear wheel pair.

Check the shift dogs of idler gears (4) and sliding gears (5) for damage and wear.

If there is damage or wear: Change the gear wheel pair.

Check the tooth faces of idler gears (4), sliding gears (5), and fixed gear (6) for damage and wear.

If there is damage or wear: Change the gear wheel pair.

Check the tooth profiles of sliding gears (5) for damage and wear.

If there is damage or wear: Change the gear wheel pair.

Check sliding gear (5) for smooth operation in the profile of main shaft (2).

If the fixed gear is stiff: Change the sliding gear or the main shaft.

Check sliding gears (5) for smooth operation in the profile of countershaft (3).

If the fixed gear is stiff: Change the sliding gear or the countershaft.

Check stop disks (7) for damage and wear.

If there is damage or wear: Change the stop disks.

Use new lock rings (8) with every repair.

Check bearings (9) for damage and wear.

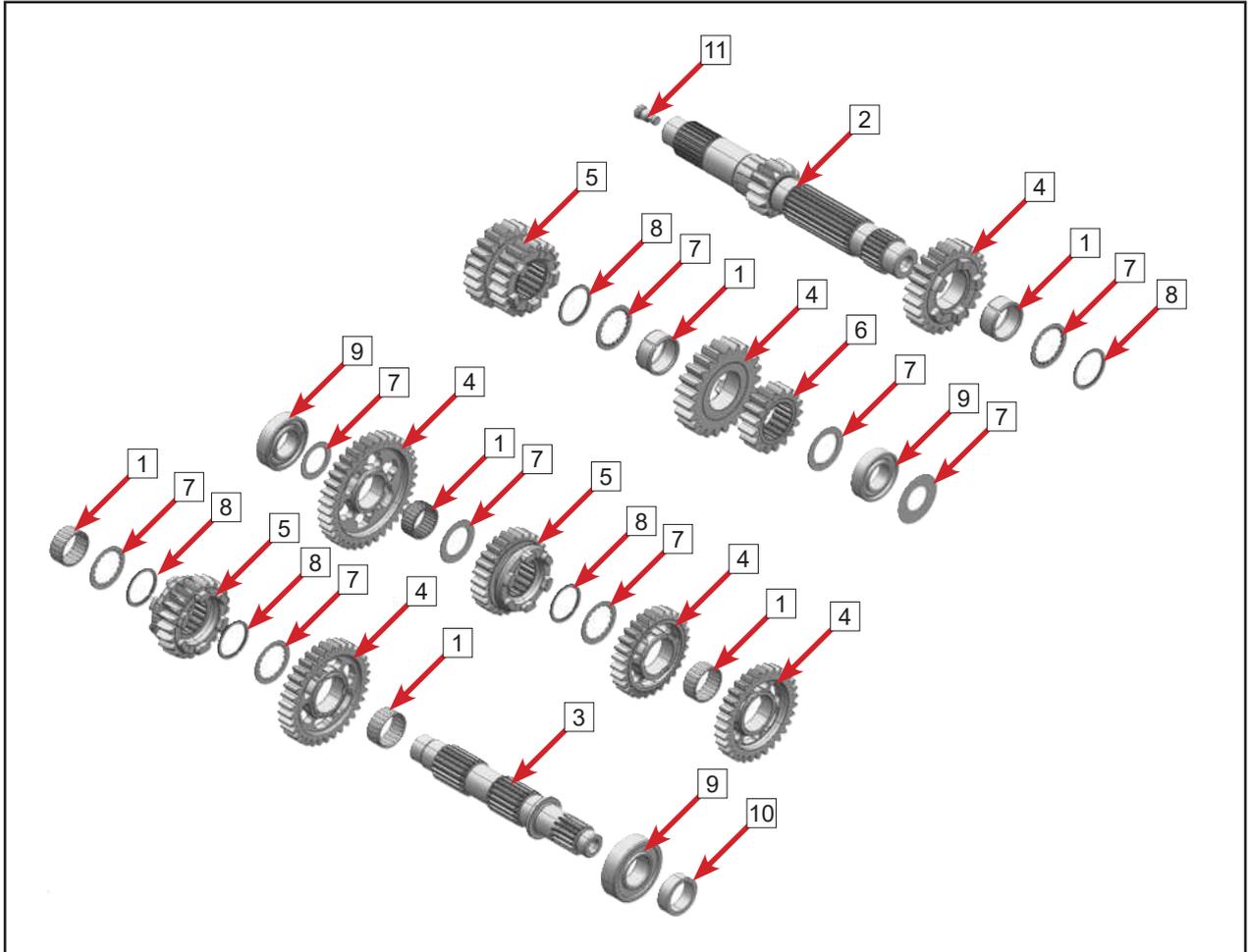
If there is damage or wear: Change the bearings.

Check distance sleeve (10) for damage and wear.

If there is damage or wear: Change distance sleeve.

Check oil nozzle (11) to ensure that they are free.

If the oil nozzle is blocked: Clean the oil nozzle and change as necessary.



13.6.32 Assembling the Main Shaft

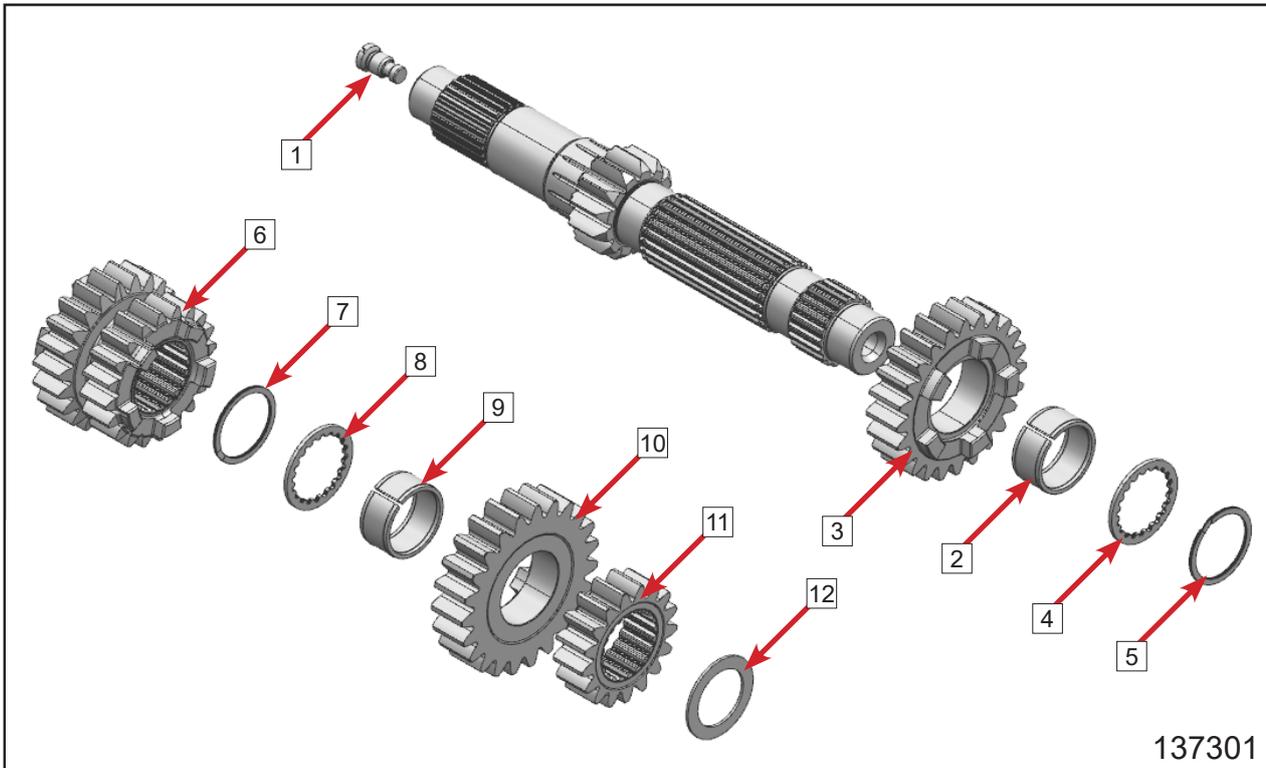
NOTE

Use new lock rings with every repair.

Preparatory Work

Carefully lubricate all parts before assembling.

Check the transmission.



Main Work

Mount and tighten oil nozzle (1).

Guideline

Oil nozzle for clutch lubrication

M8

5 N•m

243 Thread locker

NOTE

Ensure that there is no thread locker in the hole.

Secure the main shaft in the vise with the gear teeth facing downward.

Guideline

Use soft jaws.

Mount needle bearing (2), and mount fifth-gear idler gear (3) with the shift dogs facing up.

Mount stop disk (4).

Mount new lock ring (5).

The lock ring engages in the groove of the transmission shaft.

Attach third/fourth-gear sliding gear (6) with the small gear wheel facing up.

Mount new lock ring (7).

The lock ring engages in the groove of the transmission shaft.

Mount stop disk (8) and needle bearing (9).

Mount sixth-gear idler gear (10) with the shift dogs facing downward.

Mount second-gear fixed gear (11) with the collar facing downward and mount stop disk (12).

Finally, check all the gear wheels for smooth operation.

13.6.33 Assembling the Countershaft

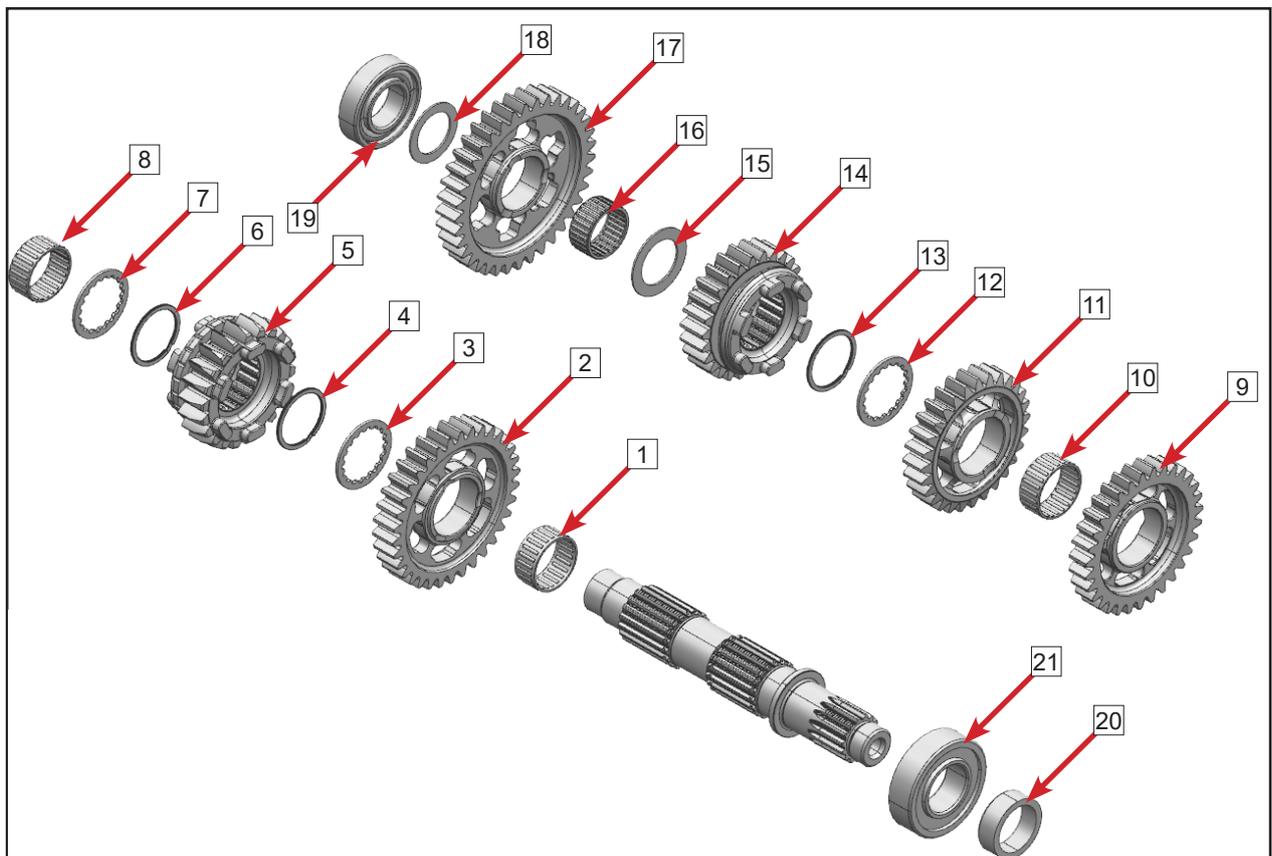
NOTE

Use new lock rings with every repair.

Preparatory Work

Carefully lubricate all parts before assembling.

Check the transmission.



Main Work

Secure the countershaft in the bench vise with the toothed end facing downward.

Guideline

Use soft jaws.

Mount needle bearing (1) and second-gear idler gear (2) onto the countershaft with the protruding collar facing downward.

Mount stop disk (3).

Mount new lock ring (4).

The lock ring engages in the groove of the transmission shaft.

Mount the sixth-gear sliding gear (5) with the shift groove facing up.

Mount new lock ring (6).

The lock ring engages in the groove of the transmission shaft.

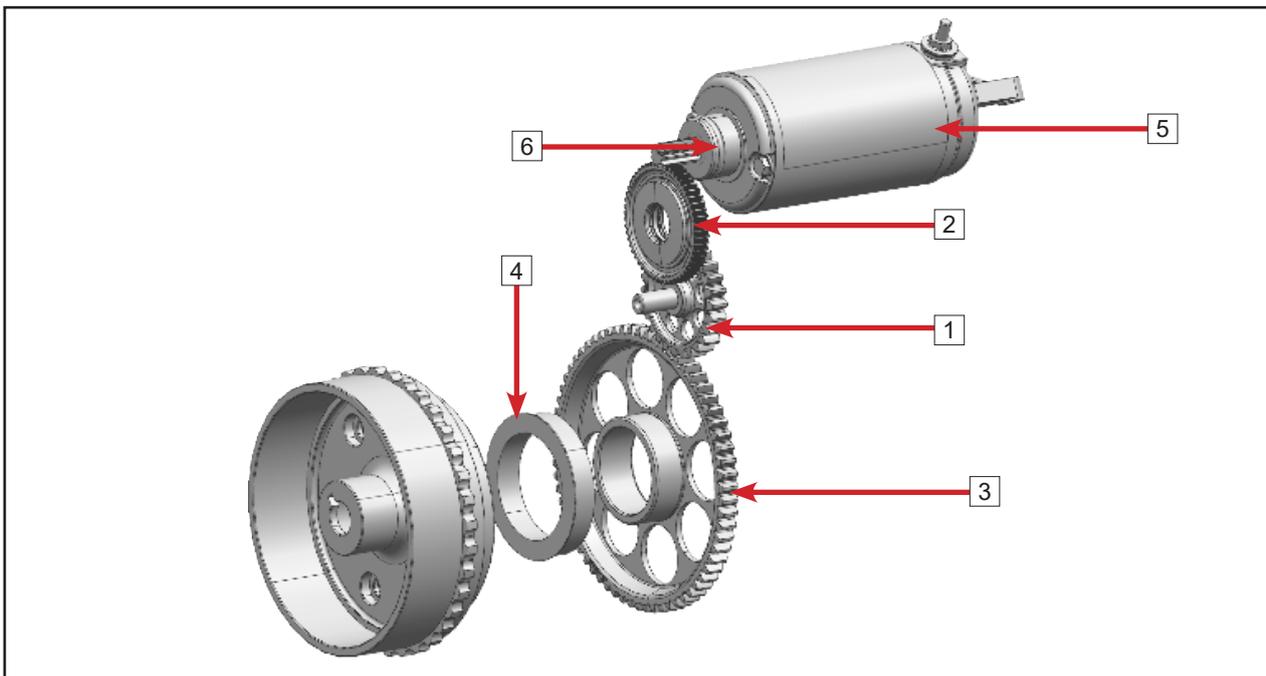
Mount stop disk (7).

CFMOTO

Mount needle bearing (8) and the third-gear idler gear (9) with the collar facing up.
Mount needle bearing (10) and the fourth-gear idler gear (11) with the collar facing down.
Mount stop disk (12).
Mount new lock ring (13).
The lock ring engages in the groove of the transmission shaft.
Mount the fifth-gear sliding gear (14) with the shift groove facing down and stop disk (15).
Mount needle bearing (16) and first-gear idler gear (17) with the recess facing down, and stop disk (18).
Mount bearing (19).
Take the countershaft out of the vise.
Mount distance sleeve (20) with bearing (21).
Finally, check all the gear wheels for smooth operation.

13.6.34 Checking the Electric Starter Drive

Check the gear teeth and bearing of starter intermediate gear (1) for damage and wear.
If there is damage or wear:
Change the starter intermediate gear.
Check the gear teeth and bearing of torque limiter (2) for damage and wear.
If there is damage or wear: Change torque limiter.
Check gear mesh and bearing of freewheel gear (3) for damage and wear.
If there is damage or wear: Change freewheel gear or bearing.
Check freewheel (4) for damage and wear.
If there is damage or wear: Change the freewheel.
Check the gear teeth of the starter motor (5) for damage and wear.
If there is damage or wear: Change starter motor.
Change O-ring (6) of the starter motor.
Connect negative cable of a 12-volt power supply to the housing of the starter motor.
Connect positive cable of the power supply briefly with the connector of the starter motor.
If the starter motor does not turn when the circuit is closed: Change starter motor.



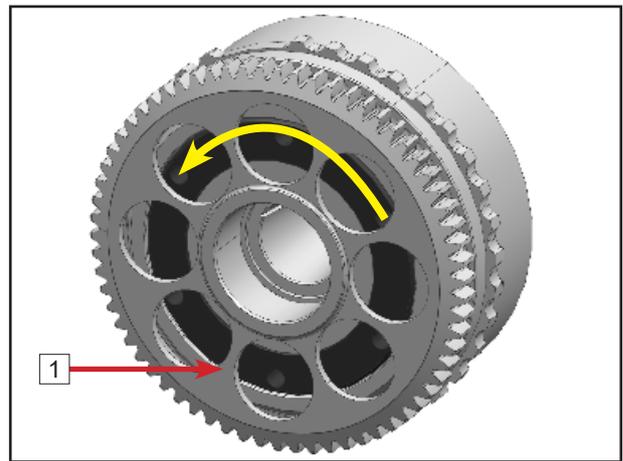
13.6.35 Checking the Freewheel

Insert freewheel gear (1) into the freewheel hub while turning the freewheel gear counterclockwise; do not wedge it.

Check the locking action of freewheel gear (1).

The freewheel gear cannot be turned counterclockwise and does not block clockwise:

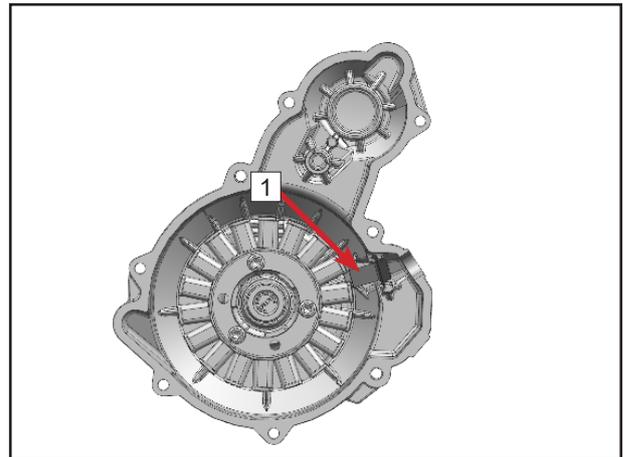
Change the freewheel.



13.6.36 Working on the Alternator Cover

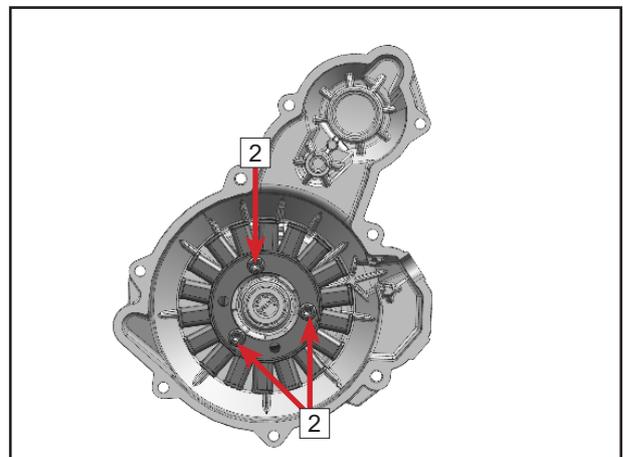
Remove the cable retainer (1).

Pull the rubber grommet out of the engine case.

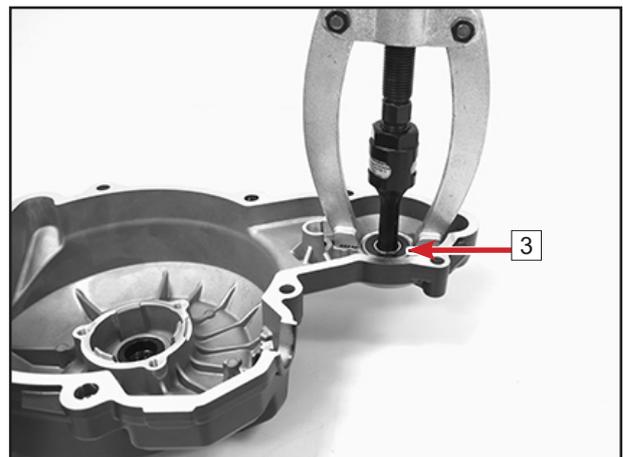


Remove screws (2).

Remove the stator.



Remove bearing (3) using a proper bearing puller.

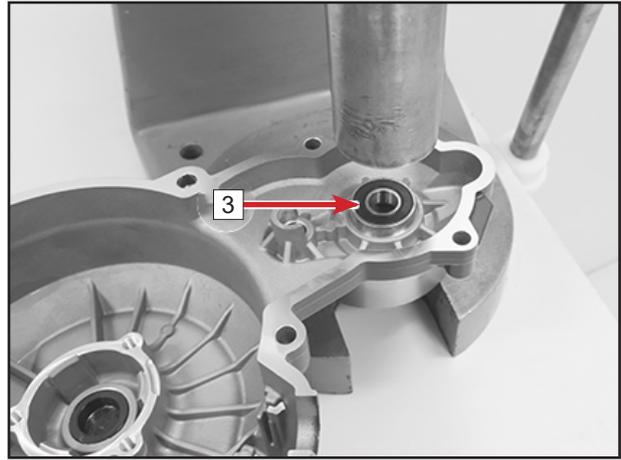


CFMOTO

Press in new bearing (3) all the way using a suitable tool.

NOTE

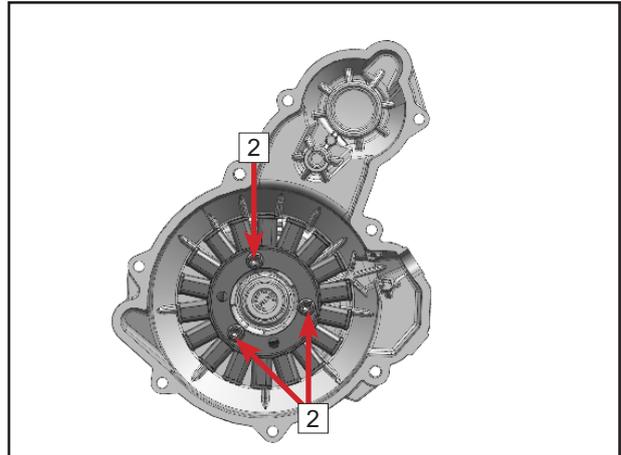
Provide suitable support for the alternator cover while pressing in.



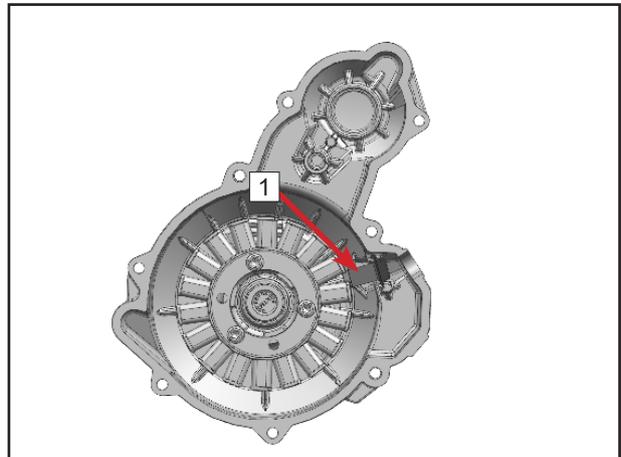
Position the stator.
Mount and tighten screws (2).

Guideline

Screw, stator
M6
10 N•m
243 Thread locker



Apply sealing compound lightly in the area of the rubber grommet.
Position the rubber grommet in the alternator cover.
Position the cable retainer (1).
The retaining bracket engages in the attachment (A).



13.7 Engine Assembly

13.7.1 Installing the Piston

NOTE

The operations are the same for both pistons.

Clamp connecting rod in the vise.

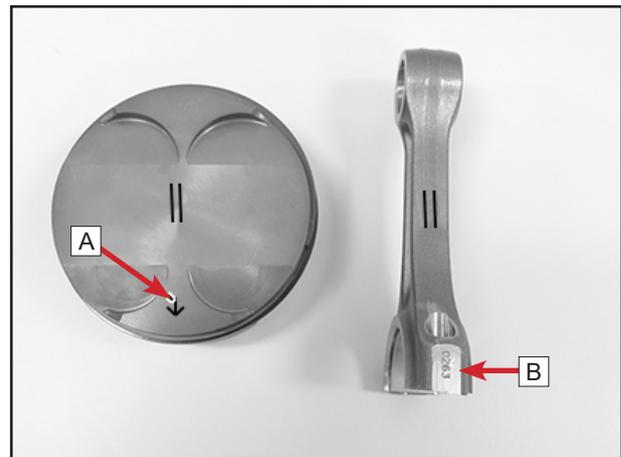
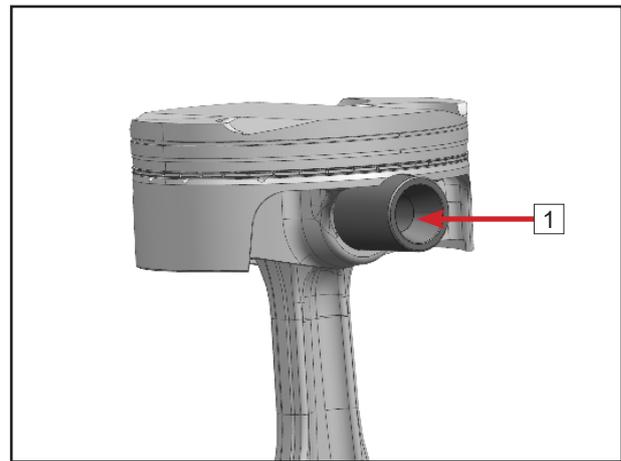
Guideline

Use soft jaws.

Position piston on the associated connecting rod.

Mount piston pin (1).

The piston marking (A) and lettering (B) of the connecting rod point forward after assembly.



Position the new piston ring lock (2).

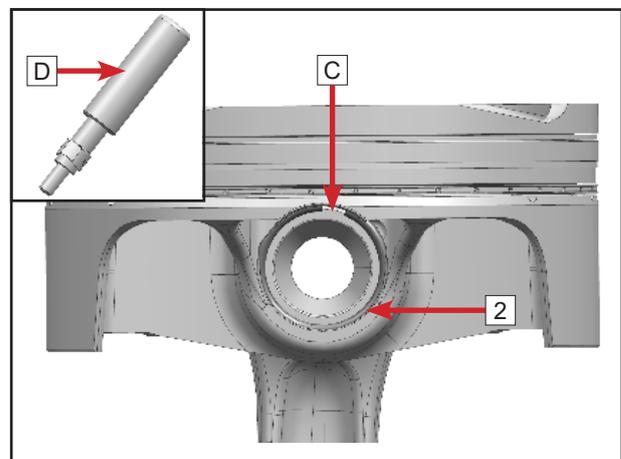
Insert the special tool (D) and press it with force towards the piston.

Turn the special tool (D) (Insertion for piston ring lock) clockwise, thereby pushing the piston ring lock into the groove.

Insertion for Piston Ring Lock
(See Section 13.1 for details.)

Ensure that the piston ring lock is in the correct position on both sides.

The open side (C) of the piston ring lock faces upwards.



Oil the cylinder and piston.

Shift the gap of the piston rings by 120°.

Mount piston ring compressor (3) on the piston.

Clamp the piston rings together using the tool.



CFMOTO

Position the piston with the tool on the cylinder.

Tap lightly on the piston ring compressor from the top with a plastic hammer so that it lies flush with the cylinder.

NOTE

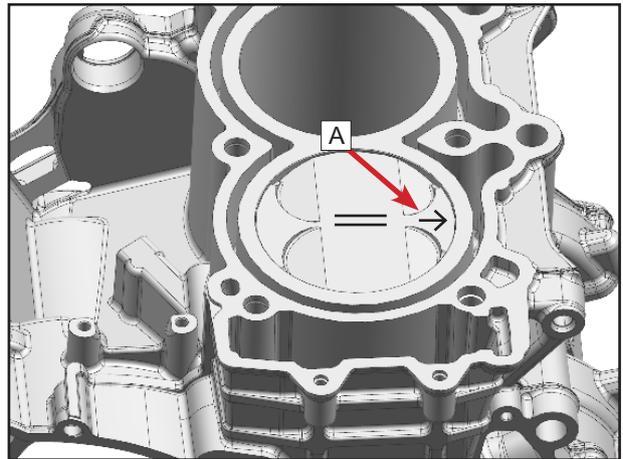
The tool must press the piston rings together properly and lie flush with the cylinder.

Drive the piston into the cylinder by striking it carefully with the hammer handle.

NOTE

The piston rings should not catch or they will be damaged.

Ensure that piston marking (A) faces the exhaust side.

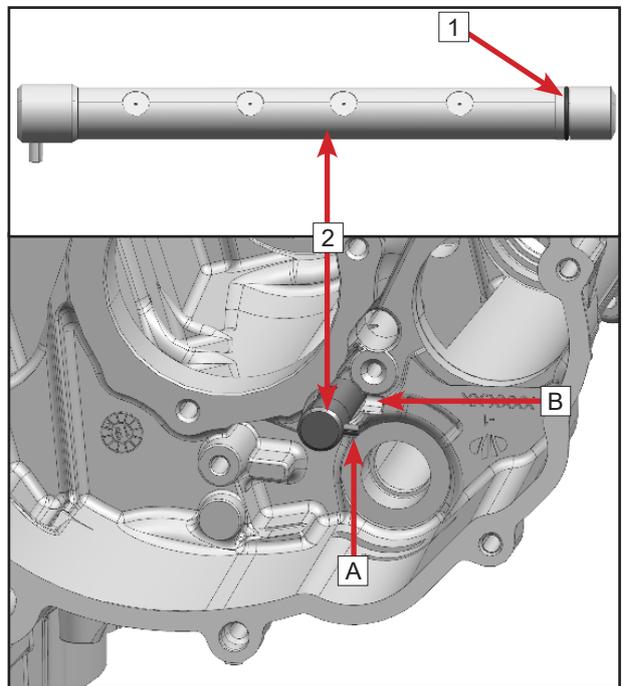


13.7.2 Installing the Oil Spray Tube

Mount the new O-ring (1) on the oil spray tube (2).

Mount the oil spray tube.

The pin (A) engages in the recess (B).



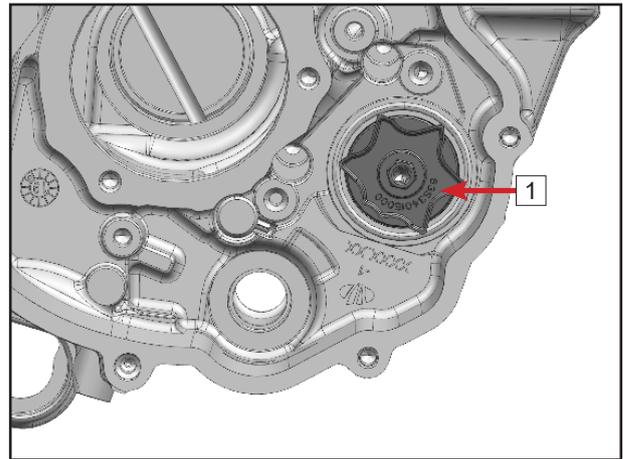
13.7.3 Installing the Transmission Shafts

Preparatory Work

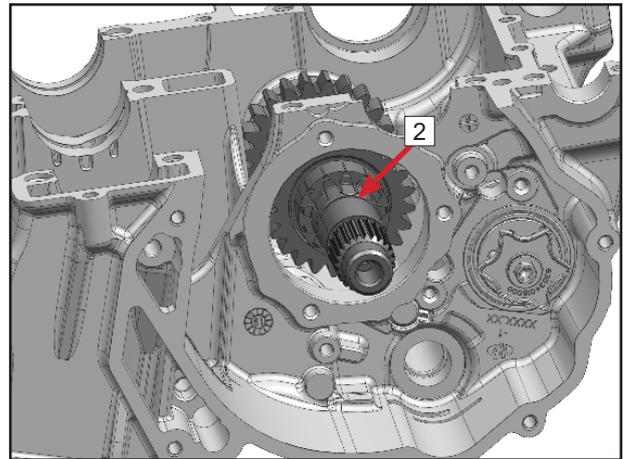
Oil all bearings.

Main Work

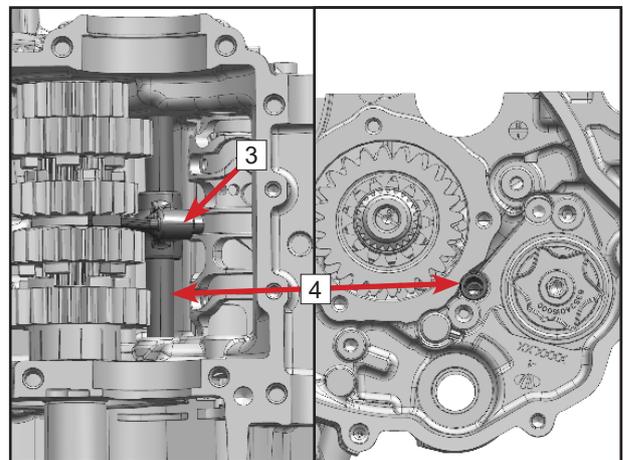
Mount shift drum (1).



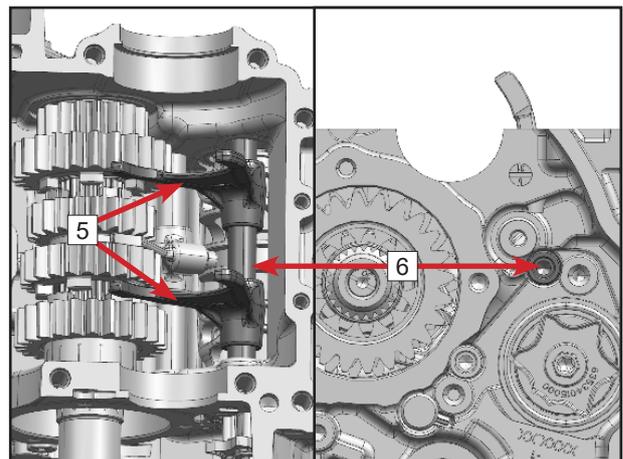
Mount main shaft (2).



Position shift fork (3).
Mount shift rail (4).



Position shift forks (5).
Mount shift rail (6).



CFMOTO

Position retaining bracket (7).
Mount and tighten screw (8).

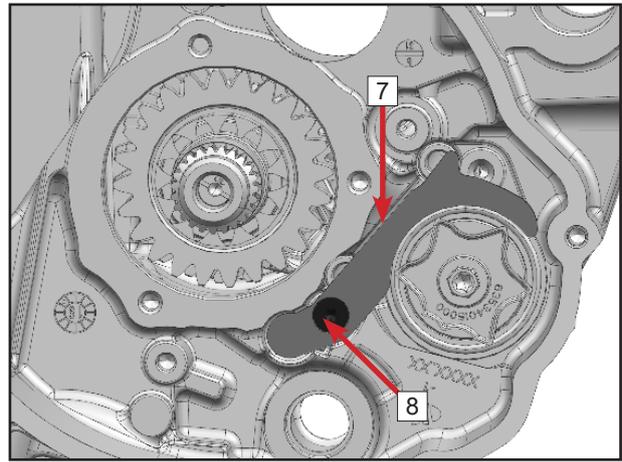
Guideline

Screw, shift drum retaining bracket

M5

6 N•m

243 Thread locker



Position bearing support (9) with bearing.
Mount and tighten screws (10).

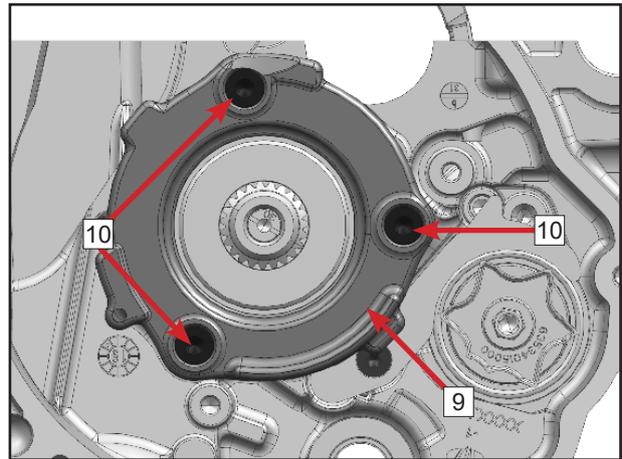
Guideline

Screw, main shaft bearing support

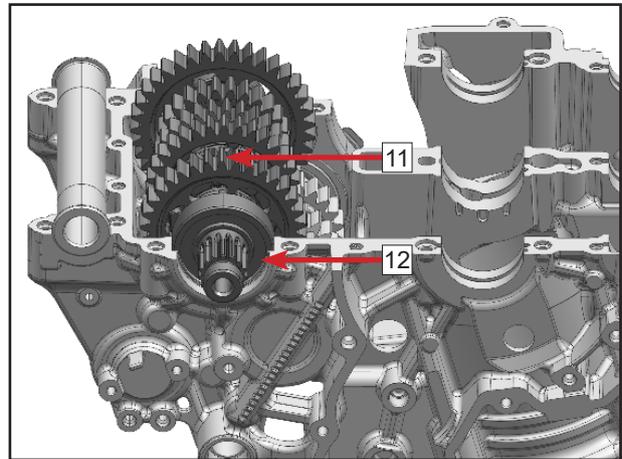
M6

10 N•m

243 Thread locker



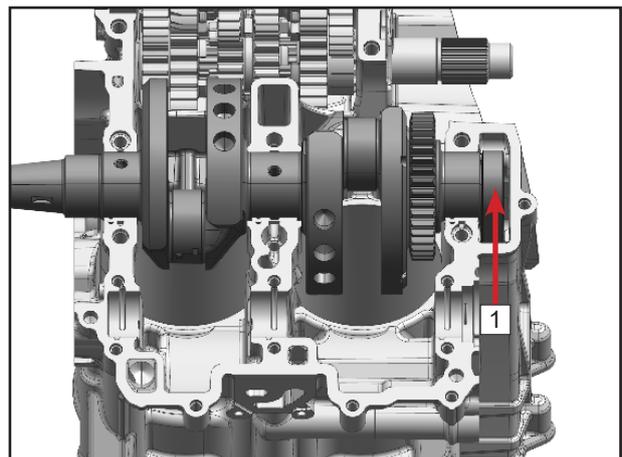
Position countershaft (11)
Mount radial shaft seal ring (12).



13.7.4 Installing the Lower Engine Case

Oil the bearing shells.

Position crankshaft with timing chain (1).



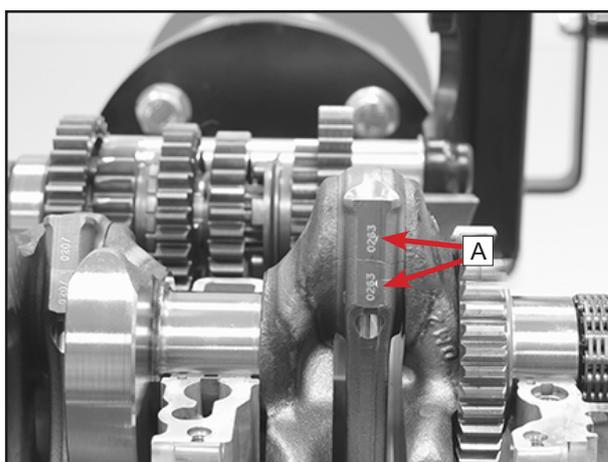
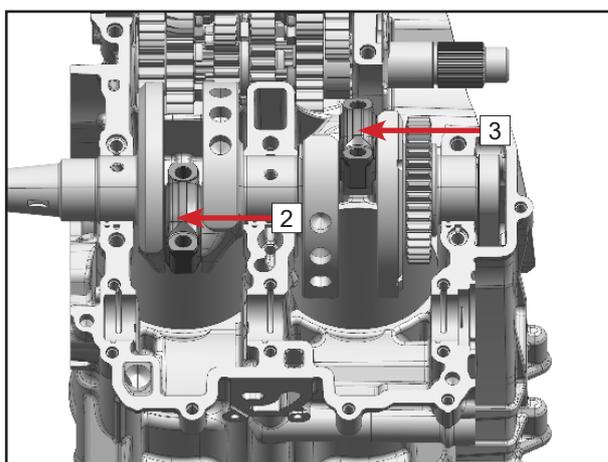
Oil the bearing shells.

There is no oil or grease on the connecting rod joint face.

Position conrod bearing covers (2) and (3) on the associated connecting rod.

NOTE

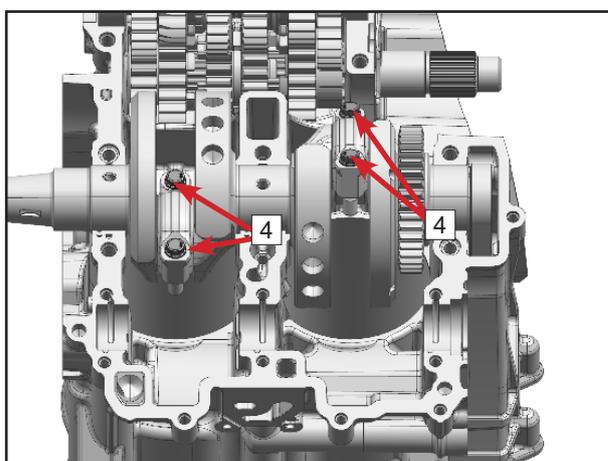
The markings (A) on the connecting rod and conrod bearing cover must be identical and legible from the front.



Mount and tighten new screws (4).

Guideline

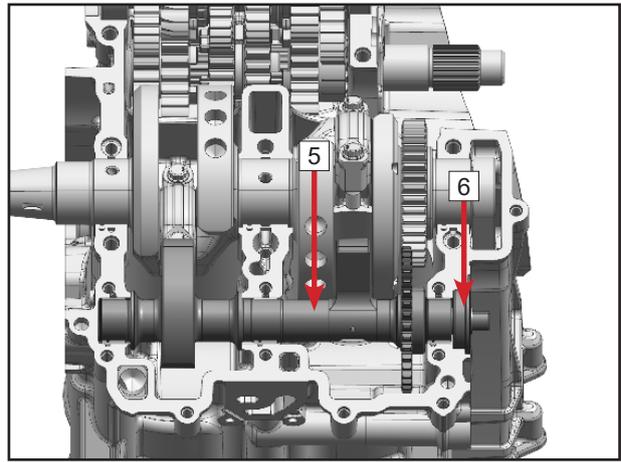
Screw, conrod bearing
M8
1st stage
5 N•m
2nd stage
15 N•m
3rd stage
90°
Collar and thread oiled



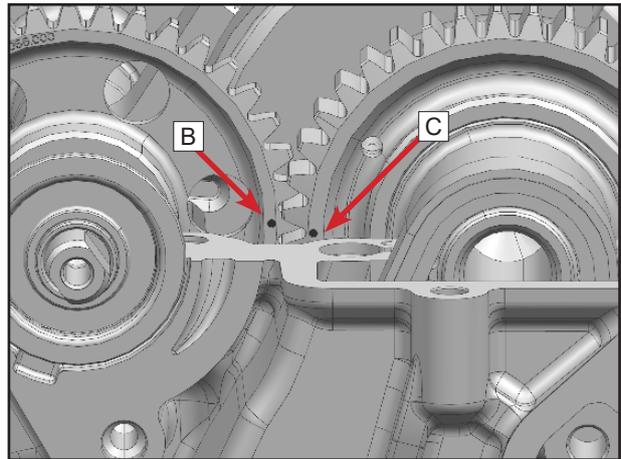
CFMOTO

Oil the bearing shells.
Position balancer shaft (5) with new greased radial shaft seal ring (6).

Long-life grease



Align markings (B) and (C).

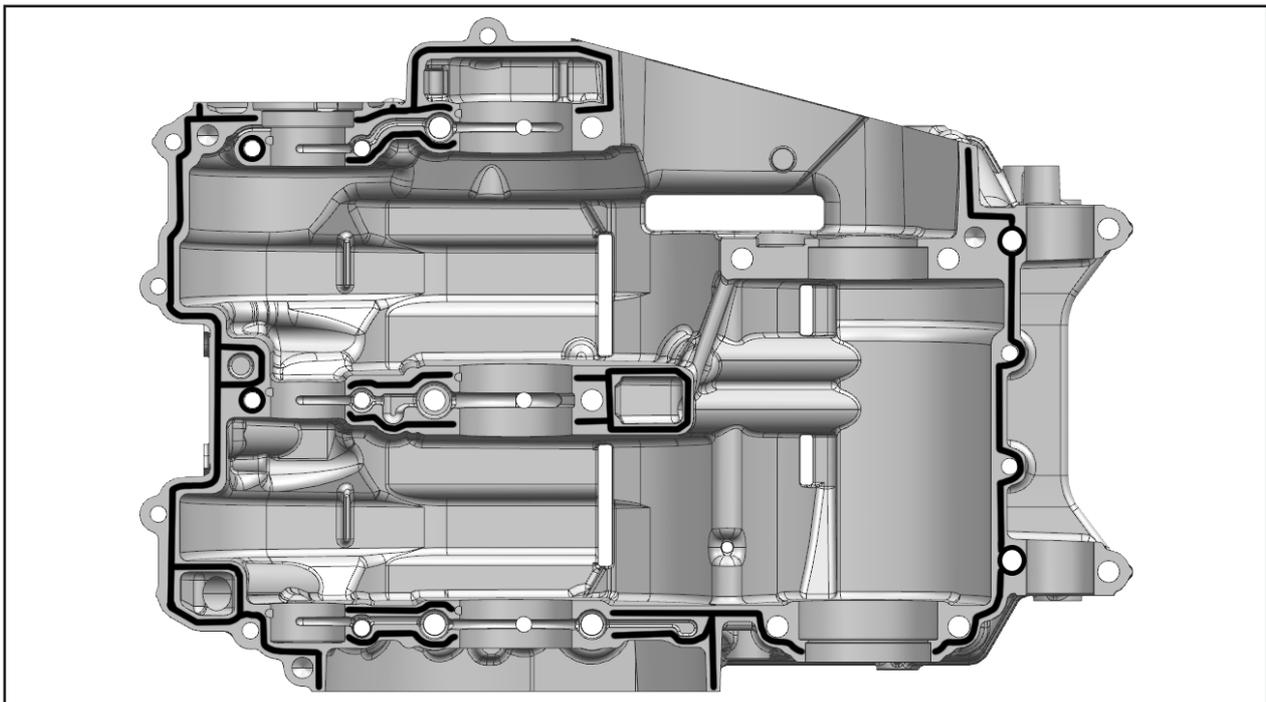


Degrease the sealing surface. Apply sealing compound to the lower section of the engine case.

Loctite® 5910

NOTE

Ensure that the dowels are seated properly.



Mount lower engine case. If necessary, strike lightly again with a rubber mallet.

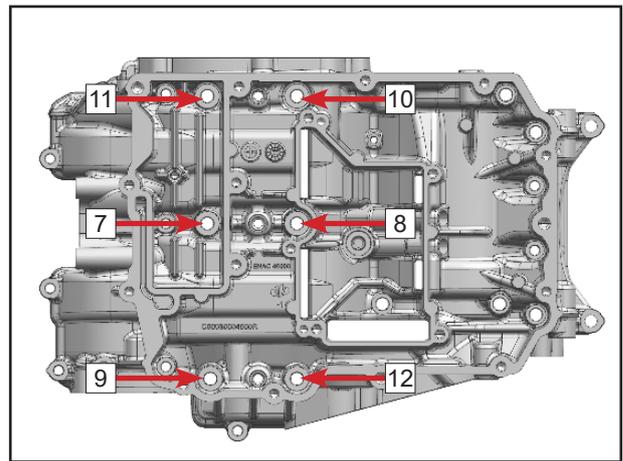
NOTE

Do not use the screws to pull the two sections of the engine case together.

Mount screws with washers and tighten in the order (7) to (12).

Guideline

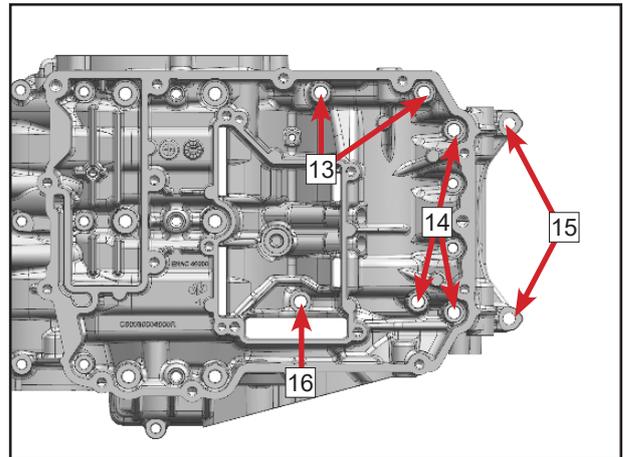
Screw, engine case
M8x90
25 N•m
Screw support greased



Mount and tighten screws (13).

Guideline

Screw, engine case
M8x90
25 N•m
Screw support greased



Mount and tighten screws (14).

Guideline

Screw, engine case
M8x65
25 N•m
Screw support greased

Mount and tighten screws (15).

Guideline

Screw, engine case
M8x55
25 N•m
Screw support greased

Mount and tighten screw (16).

Guideline

Screw, engine case
M8x45
25 N•m
Screw support greased

CFMOTO

Mount and tighten screws (17).

Guideline

Screw, engine case

M6×60

12 N•m

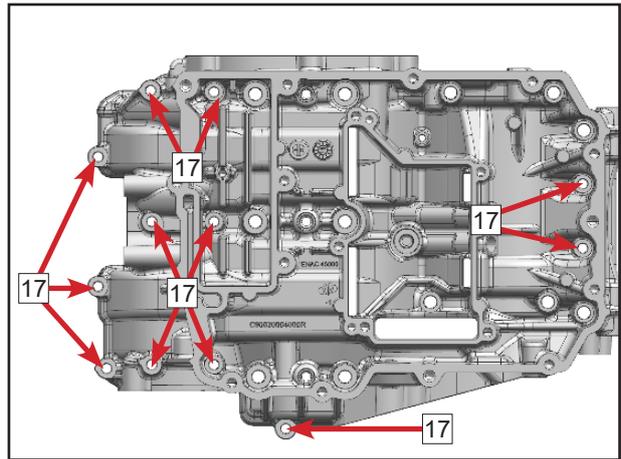
Mount and tighten screws (18).

Guideline

Screw, engine case

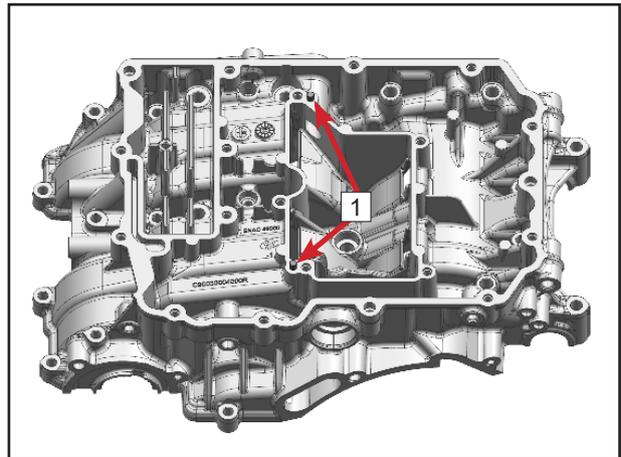
M6×30

12 N•m



13.7.5 Installing the Oil Pump Unit

Mount locating pins (1).



Grease O-rings of the oil pump.

Position oil pump unit (2).

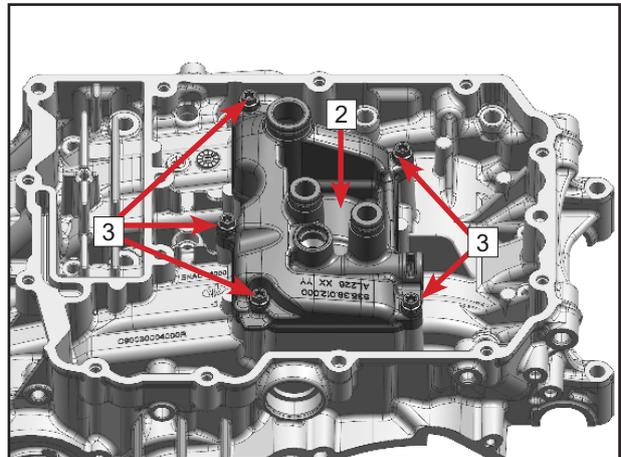
Mount and tighten screws (3).

Guideline

Screw, oil pump unit

M6

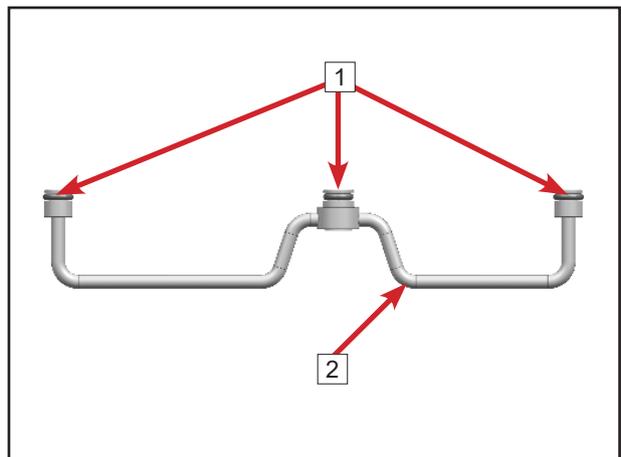
10 N•m



13.7.6 Installing the Oil Pan

Grease the new O-rings (1) and mount on the oil line (2).

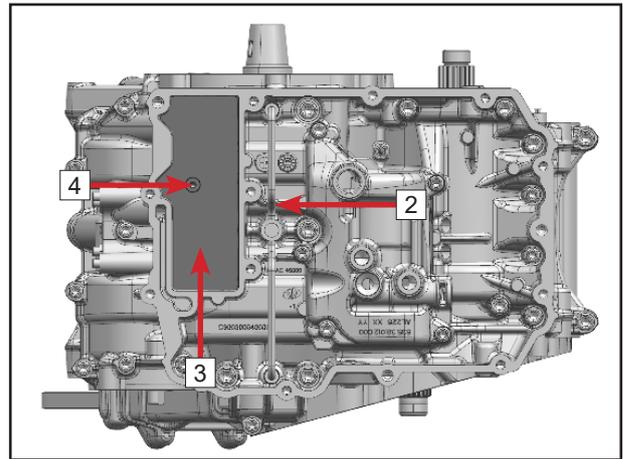
Mount oil line (2).



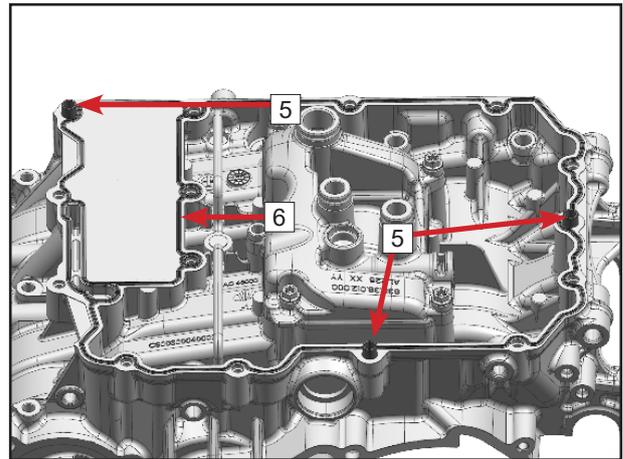
Position pressure plate (3).
Mount and tighten screw (4).

Guideline

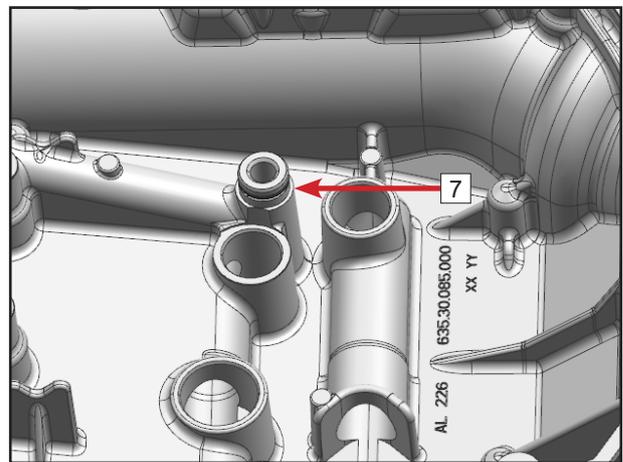
Screw, pressure plate
M5
3 N•m
243 Thread locker



Mount dowels (5).
Mount gasket (6).



Grease and mount the new O-ring (7).



Position oil pan.
Mount screws (8) but do not tighten yet.

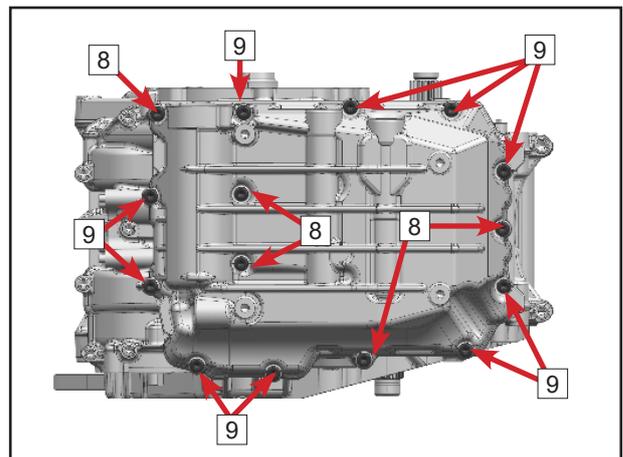
Guideline

Screw, oil pan
M6×35
10 N•m

Mount screws (9) and tighten all screws in a crisscross pattern.

Guideline

Screw, oil pan
M6×30
10 N•m

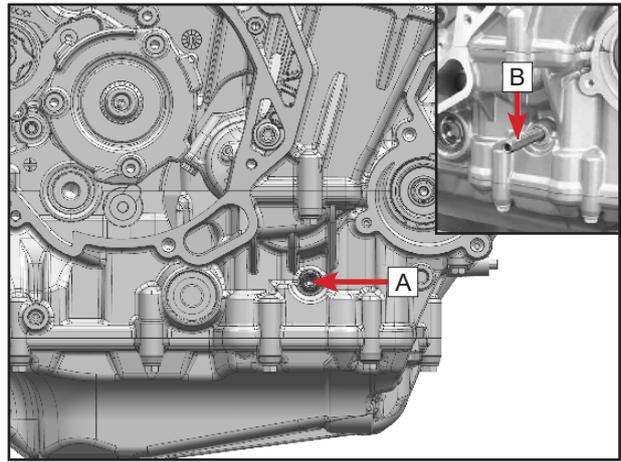


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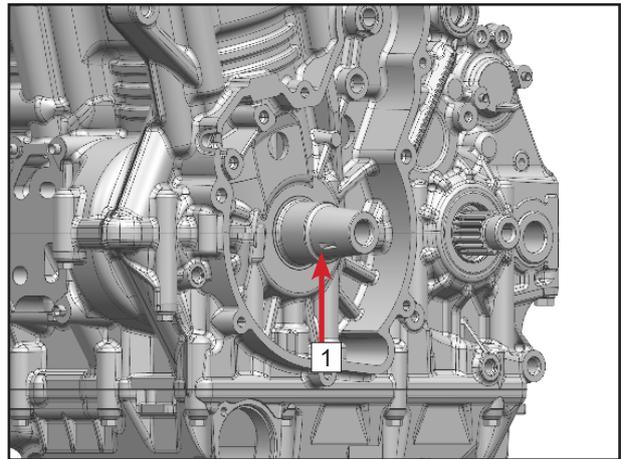
13.7.7 Installing the Rotor

Position crankshaft to cylinder 1 TDC.
Remove screw (A) with the washer.
Mount special tool (B) (locking screw).

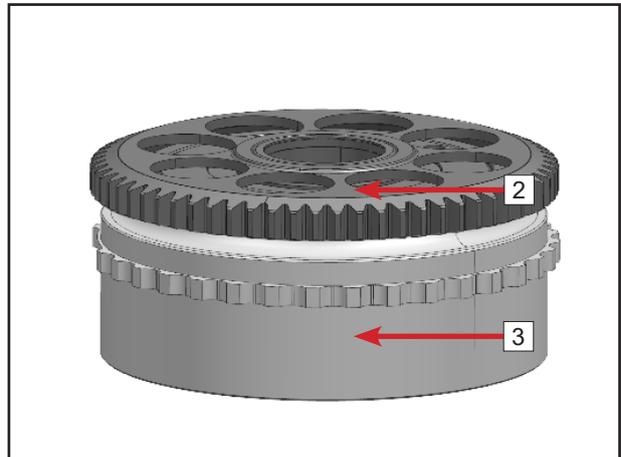
Crankshaft Locking Screw (See Section 13.1 for details.)



Mount woodruff key (1).



Turn the freewheel gear (2)
counterclockwise and mount in the rotor
(3).



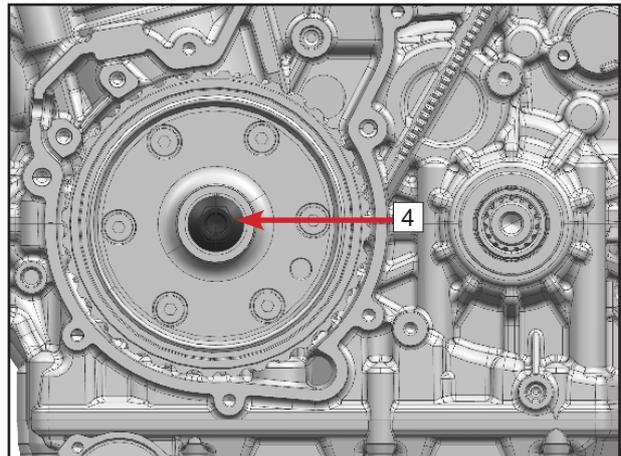
Mount the rotor with the freewheel gear.

NOTE
Ensure that the woodruff key is seated properly.

Mount and tighten screw (4).

Guideline

Screw, rotor
M12x1.5
90 N•m
Thread greased



13.7.8 Installing the Timing Chain Rails

Position tensioning rail (1) with support bushing (2).

Mount and tighten screw (3).

Guideline

Screw, tensioning rail
M8
15 N•m
243 Thread locker

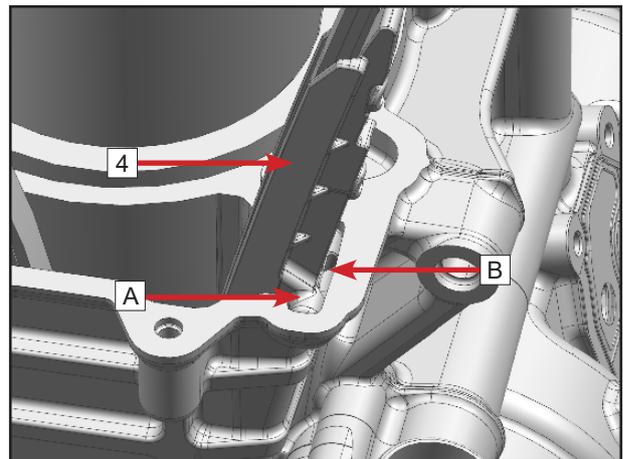
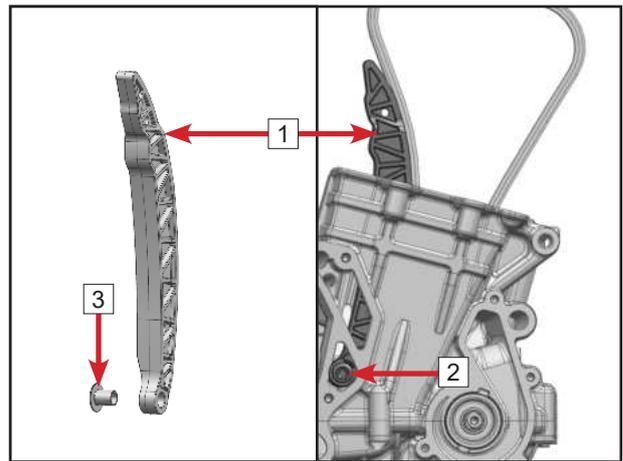
NOTE

Ensure that there is no thread locker on the collar of the screw; otherwise, the tensioning rail may lock and break.

Check the tensioning rail for freedom of movement.

Position guide rail (4) from above in the engine case.

Holder (A) engages in the recess (B).

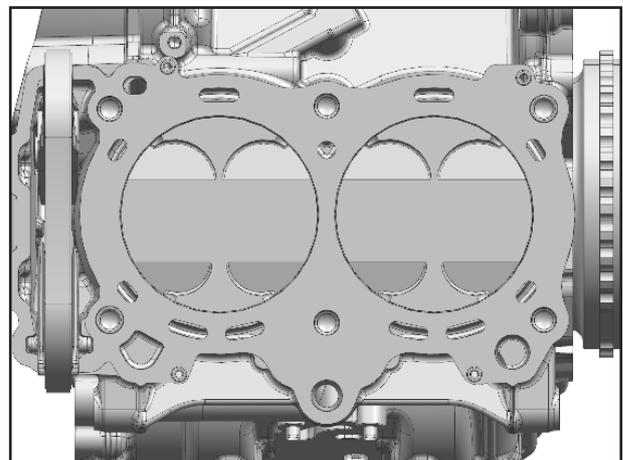


13.7.9 Installing the Cylinder Head

Put the new cylinder head gasket in place.

NOTE

Ensure that the dowels are seated properly.



CFMOTO

Position the cylinder head.

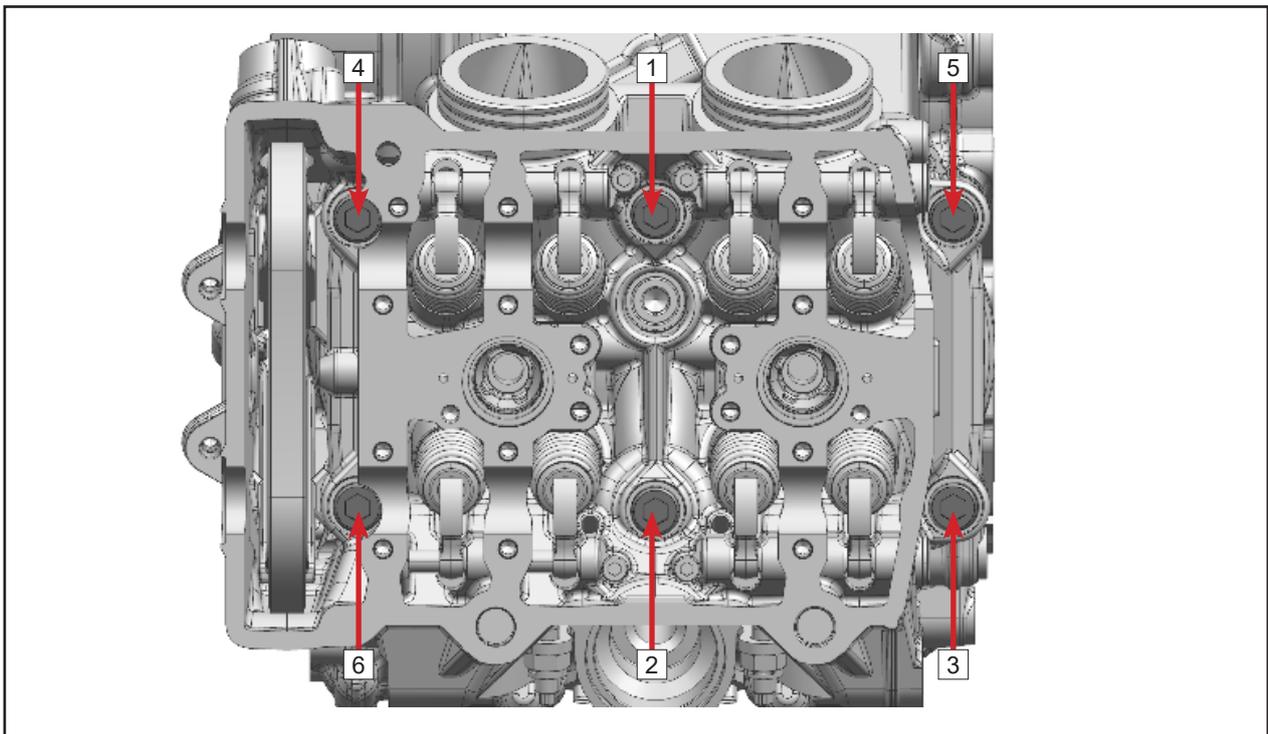
Mount cylinder head screws with washers and tighten step by step in the order from (1) to (6).

Guideline

Screw, cylinder head	M10x1.25	Tightening sequence: Observe tightening sequence. 1st stage 5 N•m 2nd stage 15 N•m 3rd stage 90° 4th stage 90° Collar greased / thread oiled
----------------------	----------	--

NOTE

Always use new cylinder head screws.



Mount and tighten screws (7).

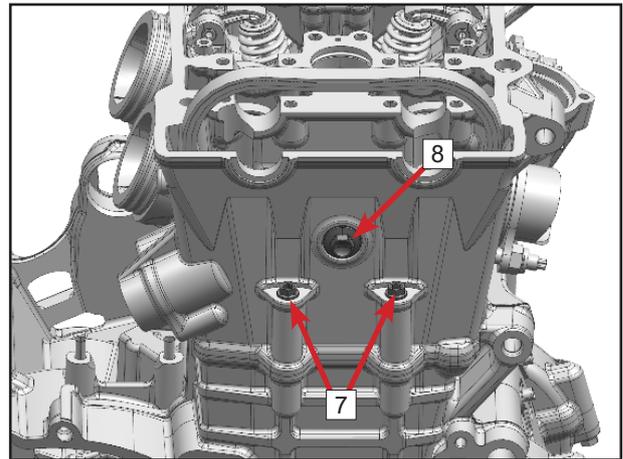
Guideline

Screw, cylinder head
M6
10 N•m

Mount and tighten screw (8) with gasket.

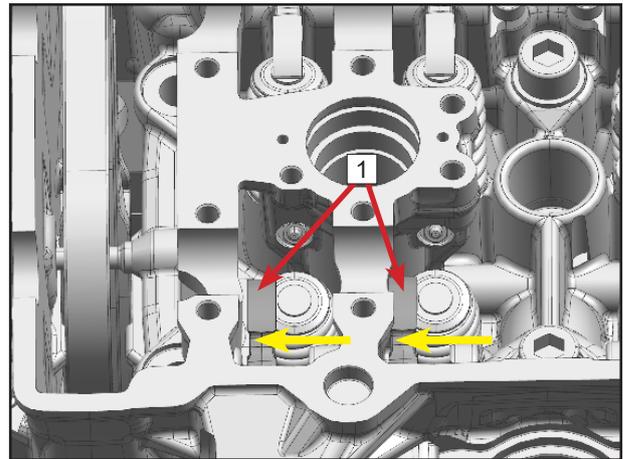
Guideline

Screw, timing chain shaft
M6
10 N•m



13.7.10 Installing the Camshafts

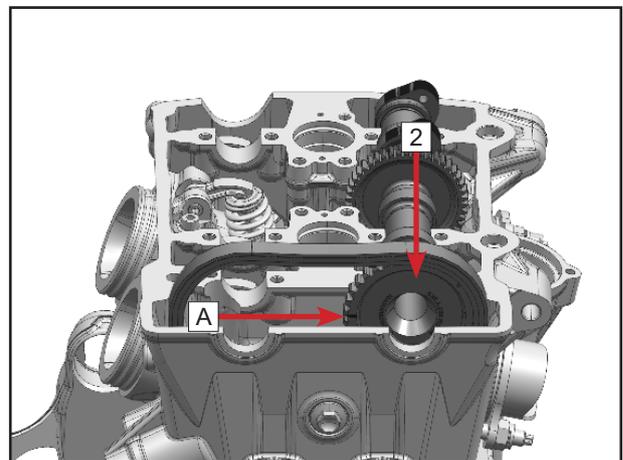
Push exhaust cam lever (1) on cylinder 2 to the side.



Pull up the timing chain and position the exhaust camshaft (2).

NOTE
The drive gear wheel for the balancer shaft is located in the exhaust camshaft.
Place timing chain over rear sprocket of the exhaust camshaft and keep taut.
The OT1 marking (A) is aligned with the sealing surface.

NOTE
The OT1 markings (A) are line markings.



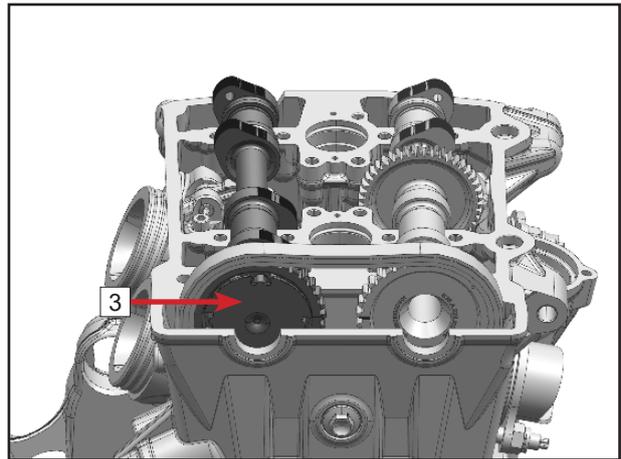
CFMOTO

Slip in intake camshaft (3).

NOTE

The centrifuge of the engine vent is located on the intake camshaft.

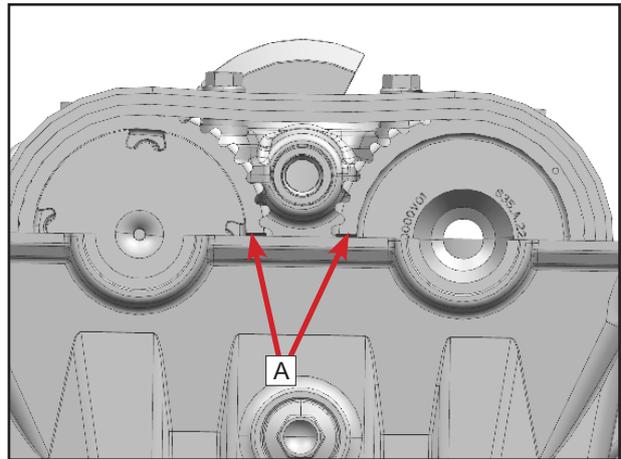
Keep the timing chain taut.



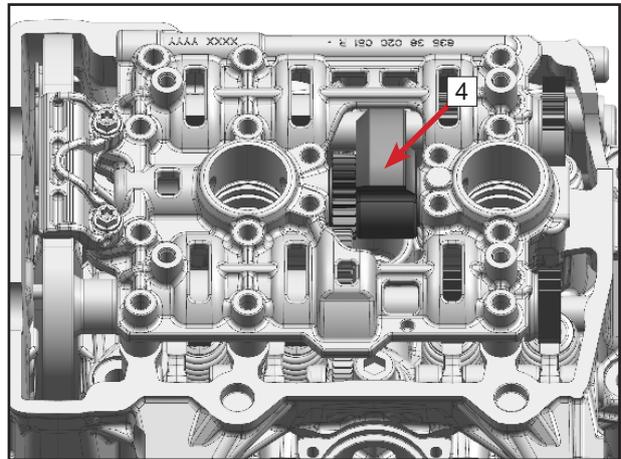
The OT1 markings (A) are aligned with the sealing surface.

NOTE

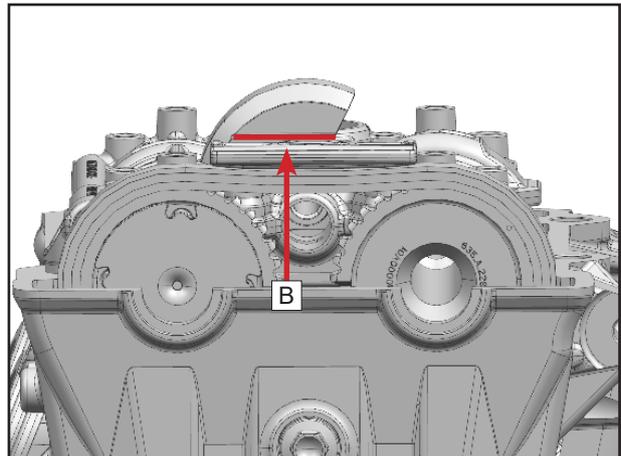
The OT1 markings are line markings.



Mount camshaft bearing bridge with balancer shaft (4).



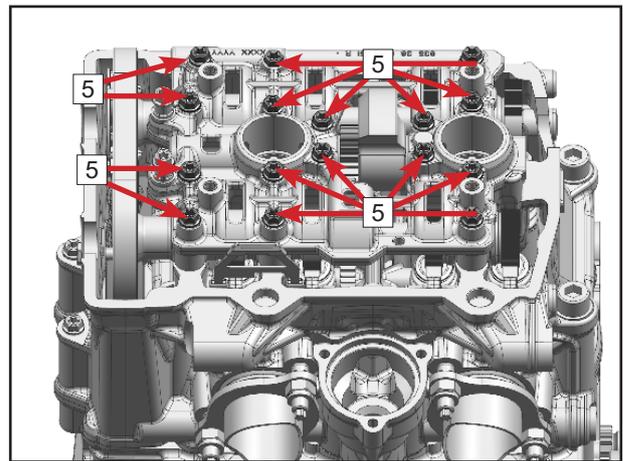
The marking (B) of the balancer shaft is aligned parallel to the sealing surface.



Mount screws (5) and tighten them from the inside to the outside.

Guideline

Screw, camshaft bearing bridge
M6
10 N•m

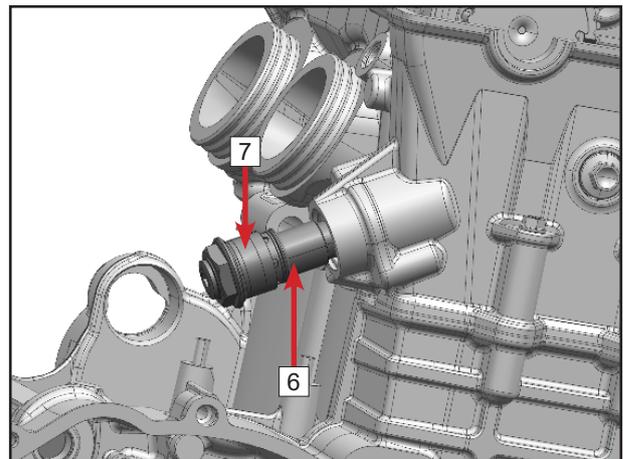


After it has been positioned in the installation location, insert timing chain tensioner (6) with a new O-ring.

Mount and tighten screw plug (7) with new O-ring.

Guideline

Plug, timing chain tensioner
M24×1.5
25 N•m



Remove screw (8) with the O-ring and use a special tool (A) (Release device for timing chain tensioner) to push the timing chain tensioner toward the timing chain.

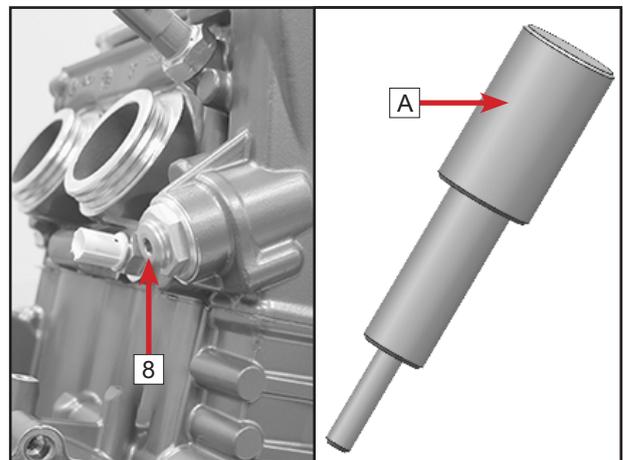
Release Device for Timing Chain Tensioner (See Section 13.1 for details.)

The timing chain tensioner unlocks.

Mount and tighten screw (8) with the O-ring.

Guideline

Screw, unlocking of timing chain tensioner
M10×1
10 N•m



Remove the special tool (Locking screw).

Crankshaft Locking Screw (See Section 13.1 for details.)

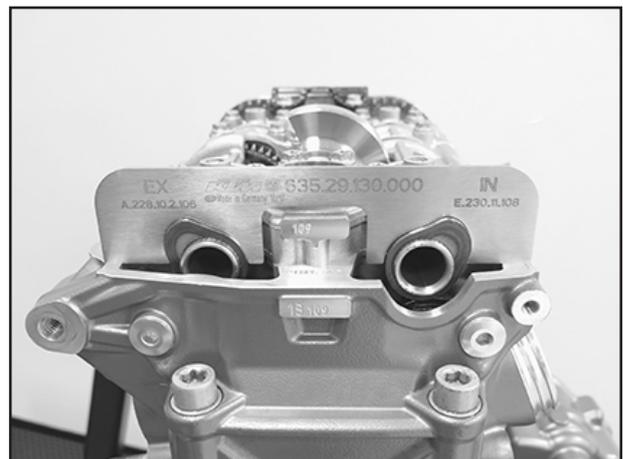
Crank the engine several times.

Turn the crankshaft counterclockwise to ignition top dead center of cylinder 1 and lock it using special tool (Locking screw).

Crankshaft Locking Screw (See Section 13.1 for details.)

Check position of the camshafts with special tool.

Timing camshaft Testing Tool (See Section 13.1 for details.)

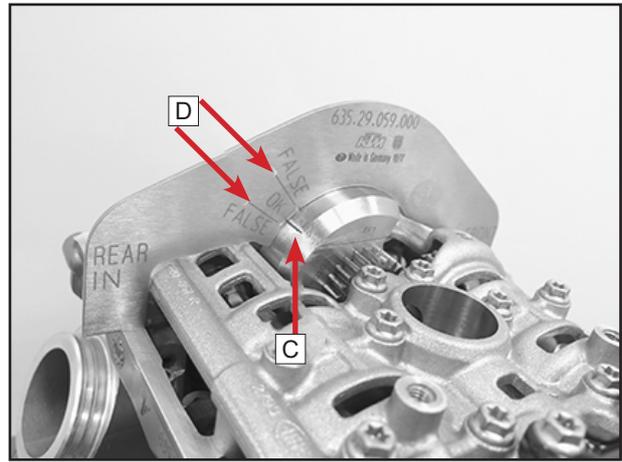


CFMOTO

Check position of the balancer shaft with special tool.

Balancer shaft Alignment Testing Tool
(See Section 13.1 for details.)

The marking (C) of the balancer shaft is located in the (D) area of the adjusting gauge.



Remove special tool (A) (Locking screw).

Crankshaft Locking Screw
(See Section 13.1 for details.)

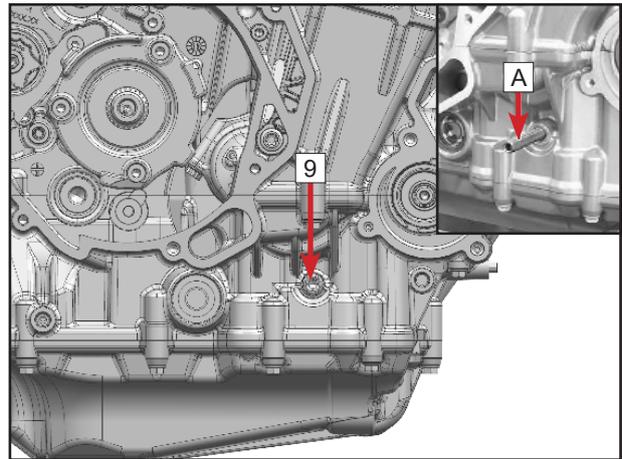
Mount and tighten screw (9) with the washer.

Guideline

Screw plug, locking screw

M8

15 N•m



Turn the crankshaft counterclockwise by the specified value and set it to ignition top dead center of cylinder 2.

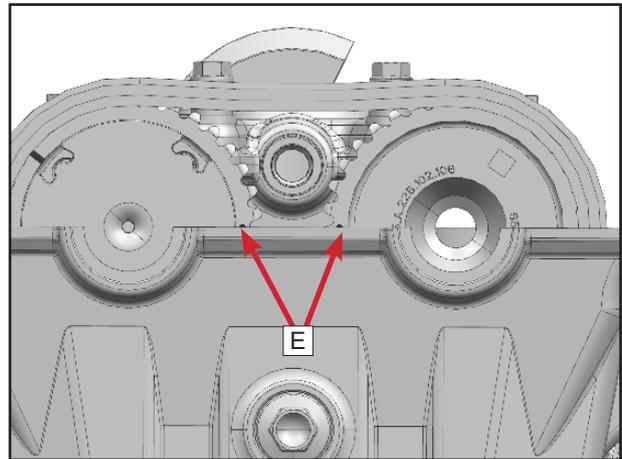
Guideline

435°

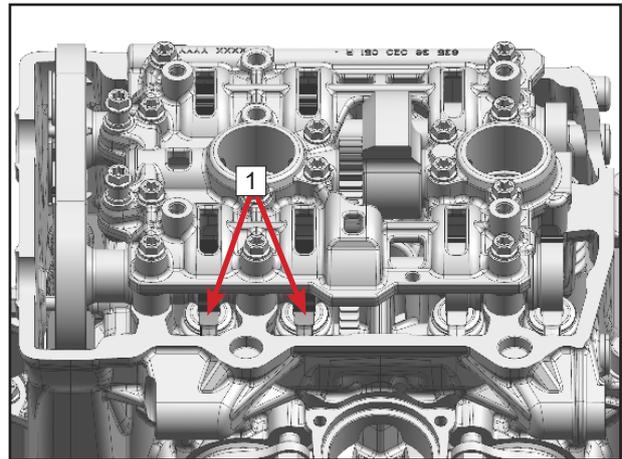
The OT2 markings (E) are aligned with the sealing surface.

NOTE

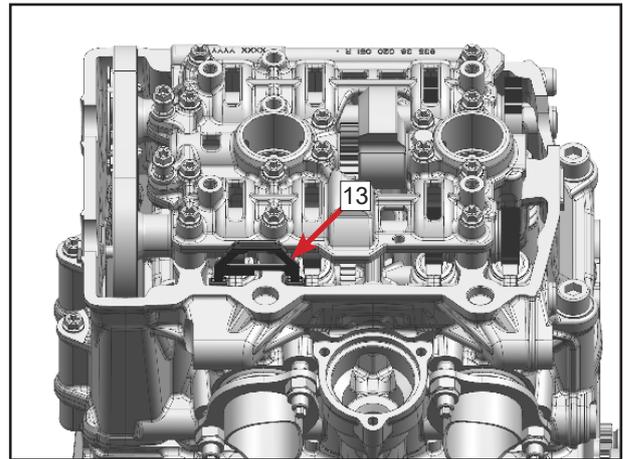
The OT2 markings are dot markings.



Position exhaust cam lever (1) on cylinder 2.



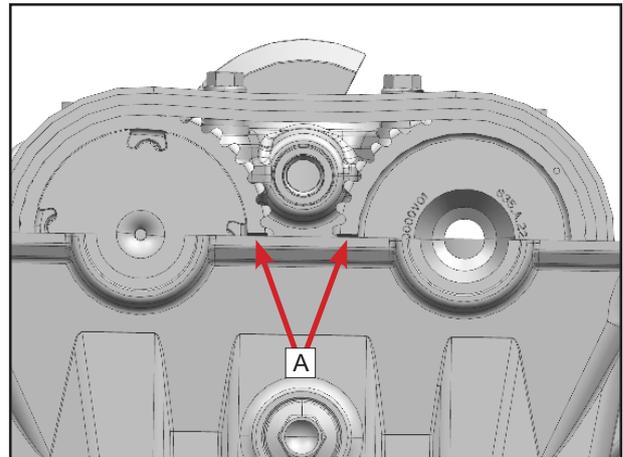
Mount cam lever clip (13).



13.7.11 Checking the Valve Clearance

Crank the engine several times.
Turn the crankshaft counterclockwise and set it to ignition top dead center of cylinder 1.

The OT1 markings (A) are aligned with the sealing surface.



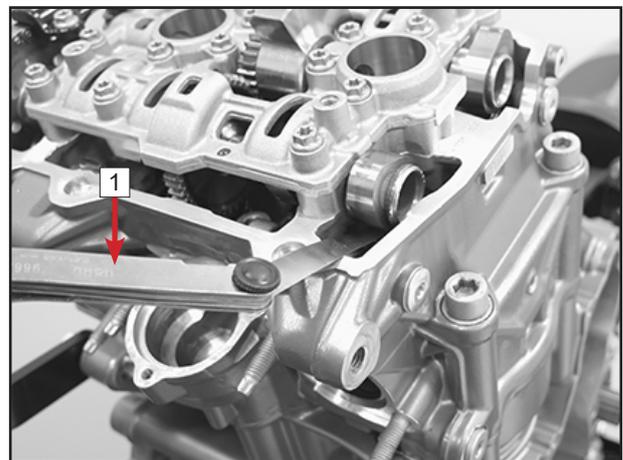
NOTE

The OT1 markings are line markings.

Check the valve clearance at the exhaust valves and the intake valves between the camshaft and cam lever using a feeler gauge (1).

Guideline

Valve play, cold
Intake at: 20 °C 0.10mm~0.15 mm
Exhaust at: 20 °C 0.15mm~0.20 mm



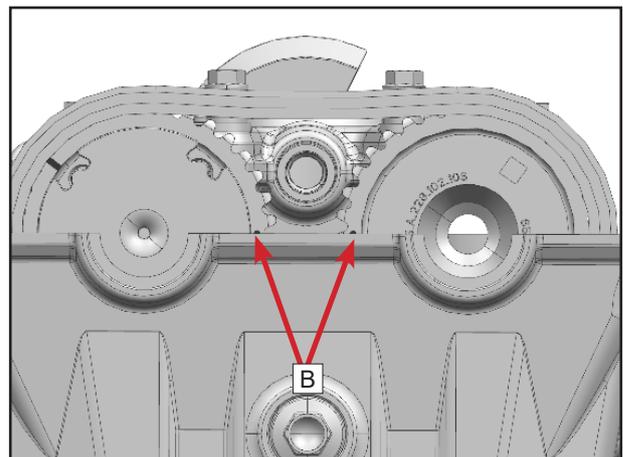
If the valve clearance does not meet specifications:
Adjust the valve clearance.

Turn the crankshaft counterclockwise by the specified value and set it to ignition top dead center of cylinder 2.

Guideline

435°

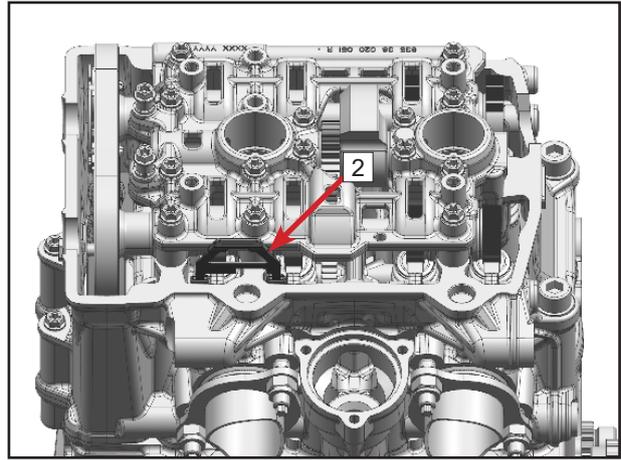
The OT2 markings (B) are aligned with the sealing surface.



NOTE

The OT2 markings are dot markings.

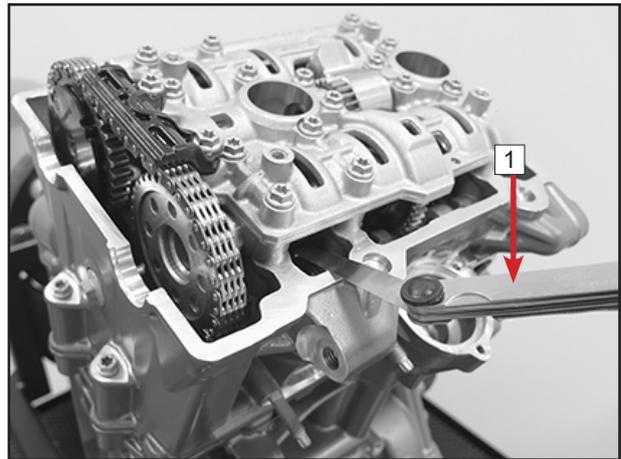
Remove cam lever clip (2).



Check the valve clearance at the exhaust valves and the intake valves between the camshaft and cam lever using a feeler gauge (1).

Guideline

Valve play, cold
Intake at: 20 °C 0.10mm~0.15 mm
Exhaust at: 20 °C 0.15mm~ 0.20 mm



If the valve clearance does not meet specifications:

Adjust the valve clearance.

13.7.12 Adjusting the Valve Clearance and Cleaning the Oil Screen

Preparatory Work

Remove the camshafts.

Main Work

Swing up cam lever (1).

Remove shims (2) and set them down according to the installation position.

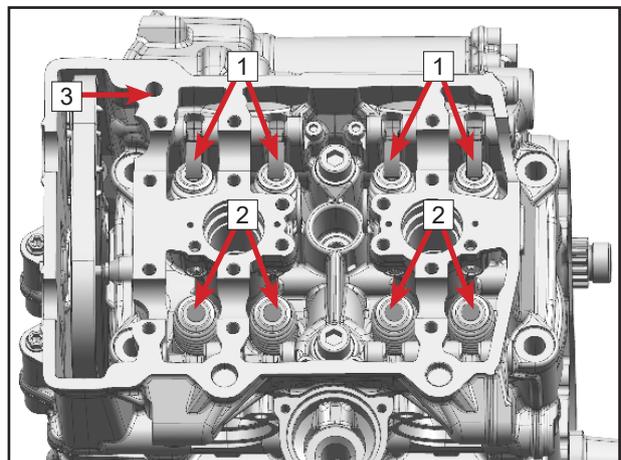
Correct the shims based on the results of the valve clearance check.

Insert suitable shims.

Clean oil screen (3).

Install the camshafts.

Check the valve clearance.

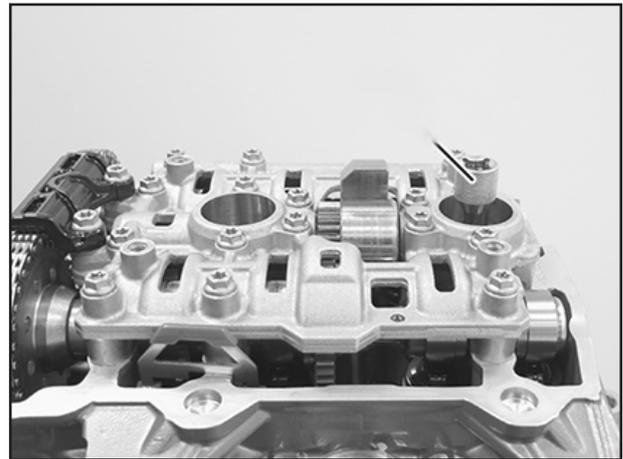


13.7.13 Installing the Spark Plugs

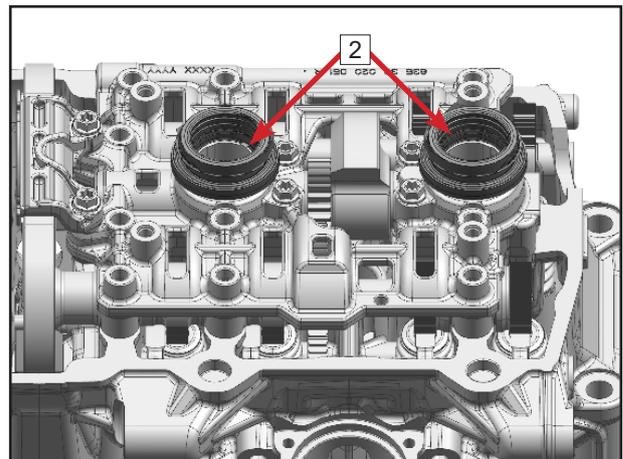
Mount and tighten the spark plugs.

Guideline

Spark plug
M10
11 N•m



Grease the O-rings and mount spark plug shaft inserts (2) with gasket.



13.7.14 Installing the Shift Shaft

Slide shift shaft (1) with the washer into the bearing seat.

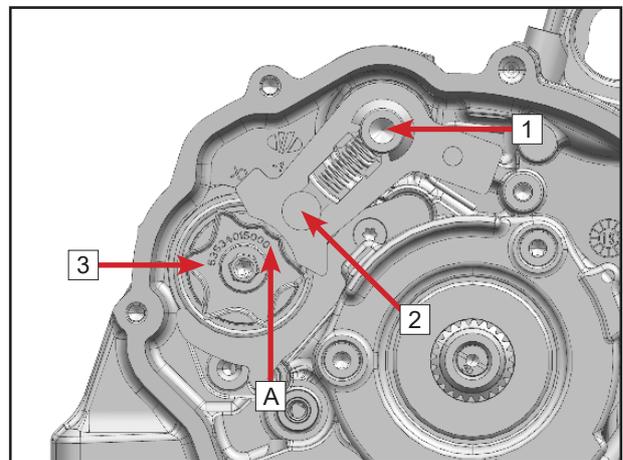
Push sliding plate (2) away from shift drum locating unit (3). Insert the shift shaft all the way.

NOTE

The neutral position (A) must be aligned with the sliding plate (2) for assembly.

Let the sliding plate engage in the shift drum locating unit.

Shift through the transmission.

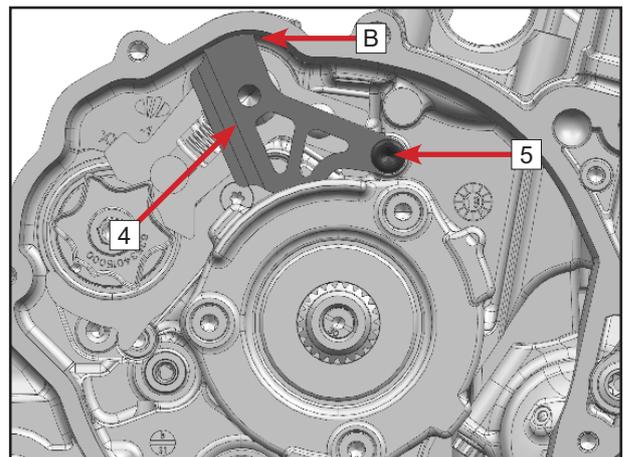


Position retaining bracket (4) in the groove (B).

Mount and tighten screw (5).

Guideline

Screw, shift shaft retaining bracket
M6
10 N•m
243 Thread locker



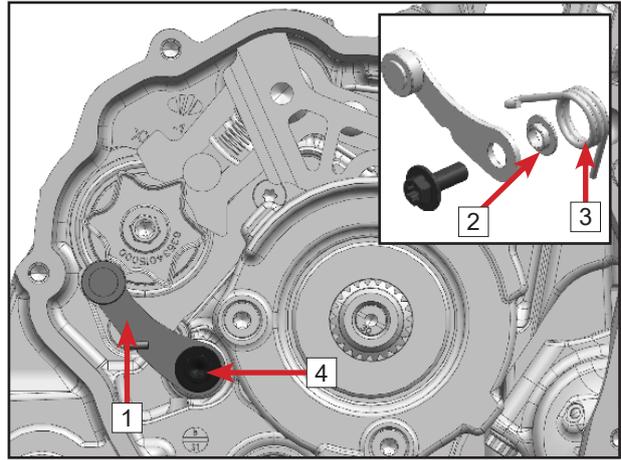
CFMOTO

13.7.15 Installing the Locking Lever

Position locking lever (1) with sleeve (2) and spring (3).
Mount and tighten screw (4).

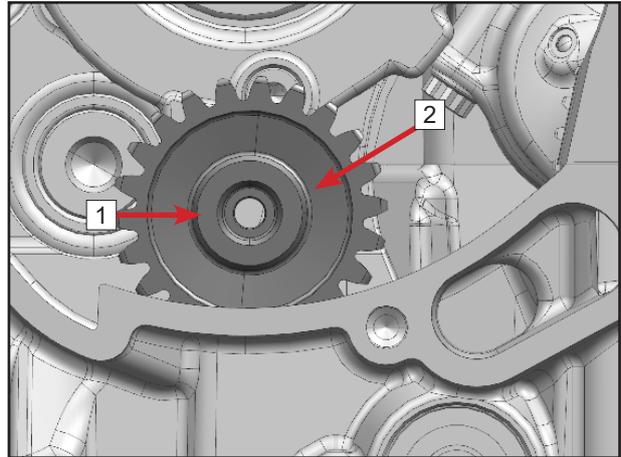
Guideline

Screw, locking lever
M6
10 N•m
243 Thread locker



13.7.16 Installing the Clutch Basket

Oil collar bushing (1) thoroughly.
Position collar bushing (1) with oil pump idler gear (2).



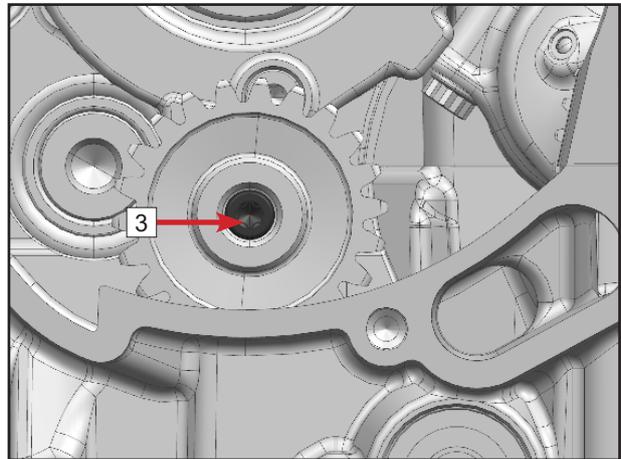
Mount and tighten screw (3).

Guideline

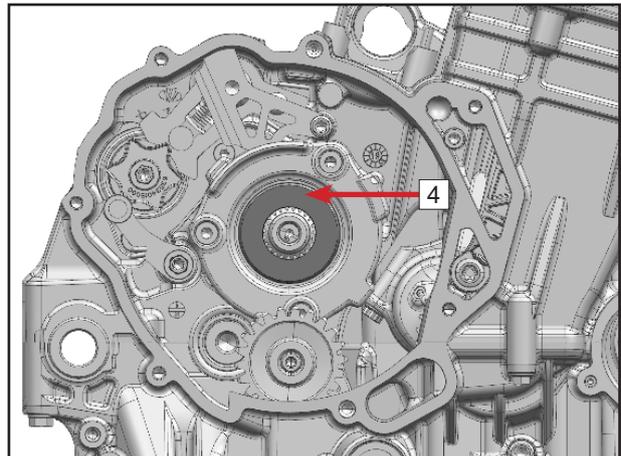
Screw, oil pump idler gear
M8
15 N•m
243 Thread locker

NOTE

The screw (3) must always be replaced.



Mount washer (4).

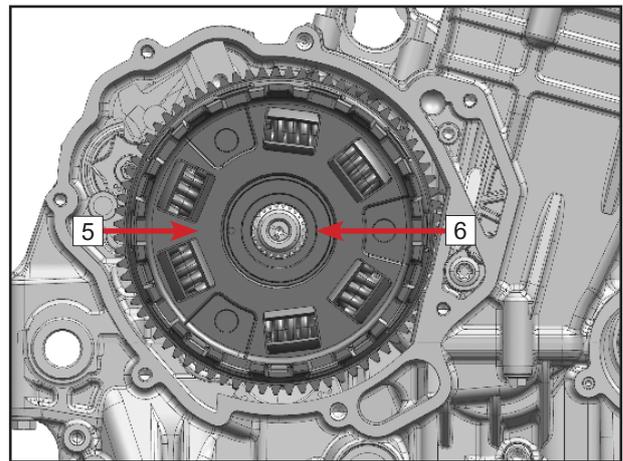


Position the clutch basket (5).

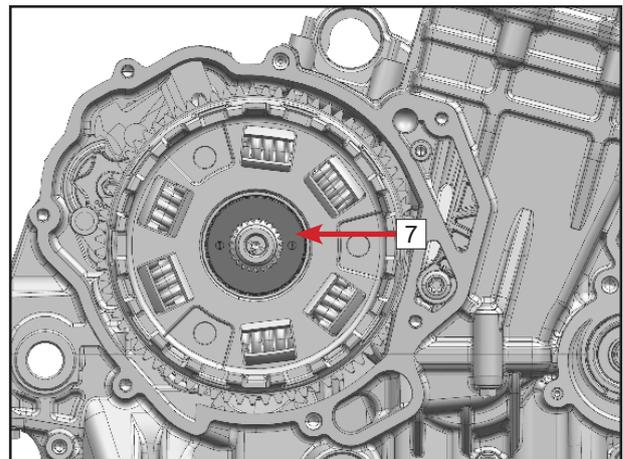
NOTE

Turn the clutch basket and oil pump idler gear backwards and forwards slightly to help them mesh more easily.

Mount needle bearing (6).



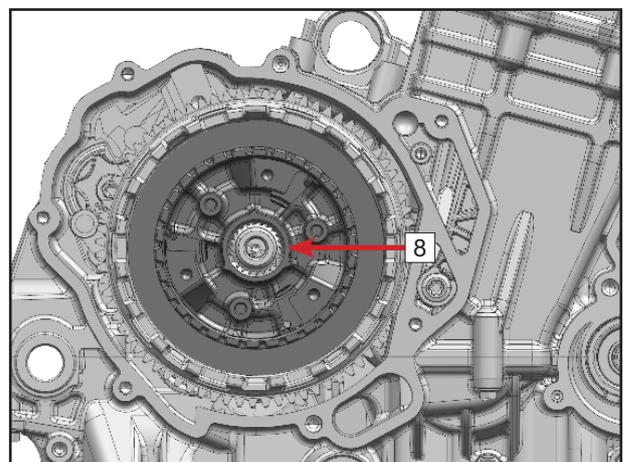
Mount washer (7) and inner clutch hub (8).



Mount nut (9) with the washer.

Lock crankshaft with crankshaft locking screw. (Refer to Section 13.5.20.)

Use a special tool (A) (Clutch stop tool) to hold the inner clutch hub (8) and tighten the nut (9).



Clutch Stop Tool
(See Section 13.1 for details.)

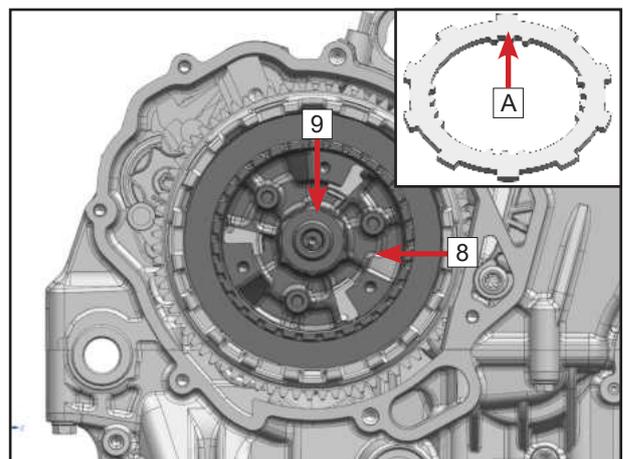
Guideline

Nut, inner clutch hub

M20×1.5

120 N•m

243 Thread locker



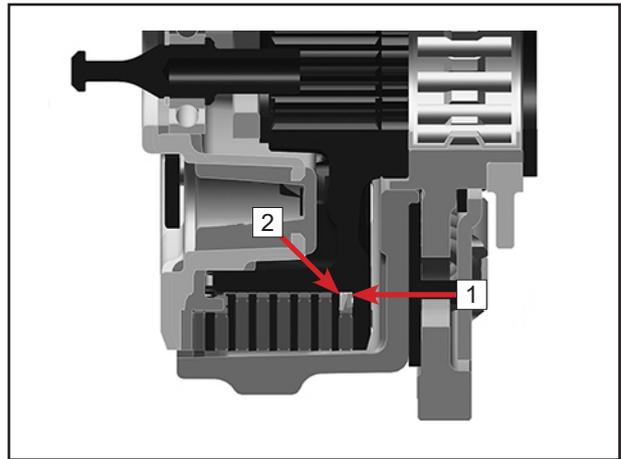
Remove the clutch stop tool (A).

Remove crankshaft locking screw. (Refer to Section 13.5.23.)

13.7.17 Installing the Clutch Discs

Mount support ring (1) and pretension ring (2).

The pretension ring rests against the support ring on the inside and the outside faces away from the support ring.



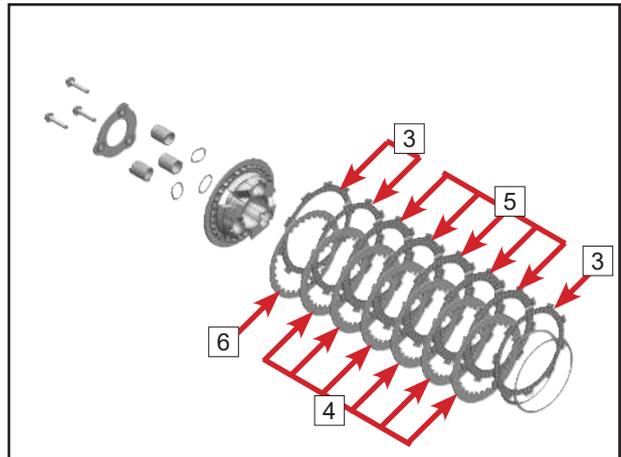
Thoroughly oil the clutch facing discs.

Mount a clutch facing disc (3) with a larger inside diameter.

Alternately mount 6 intermediate clutch discs (4) and 5 of the same clutch facing discs (5).

Alternately mount 2 clutch facing discs (3) and an intermediate clutch disc (6) with a larger inside diameter.

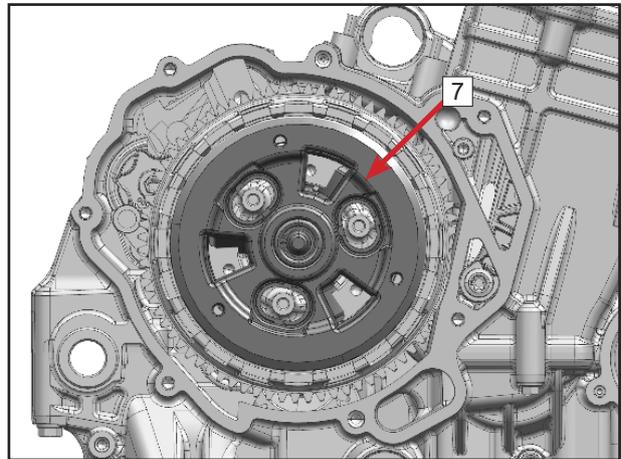
The outer clutch facing disc must be mounted offset by one mesh.



Position clutch pressure cap (7).

The gear teeth of the outer intermediate clutch disc engage in the clutch pressure cap.

The clutch pressure cap rests flush against the outer clutch facing disc.

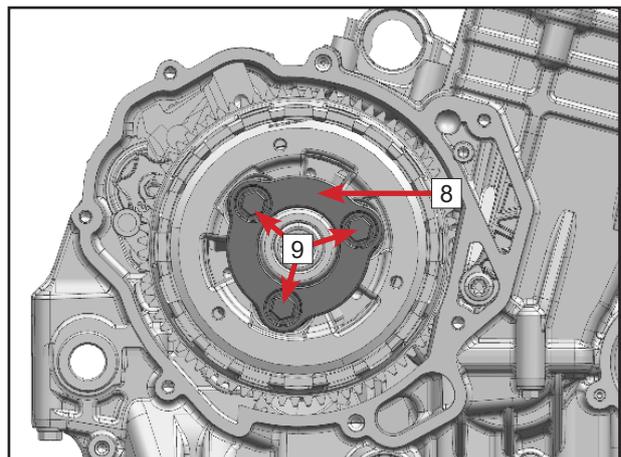


Position clutch center (8) and the springs.

Mount and tighten screws (9).

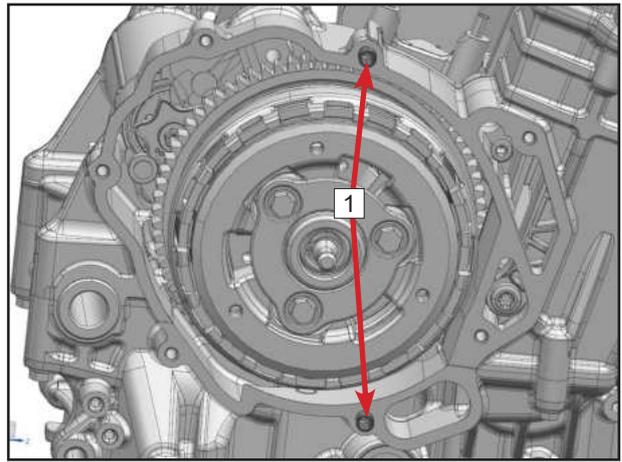
Guideline

Screw, clutch spring
M6
10 N•m



13.7.18 Installing the Clutch Cover

Mount dowels (1).

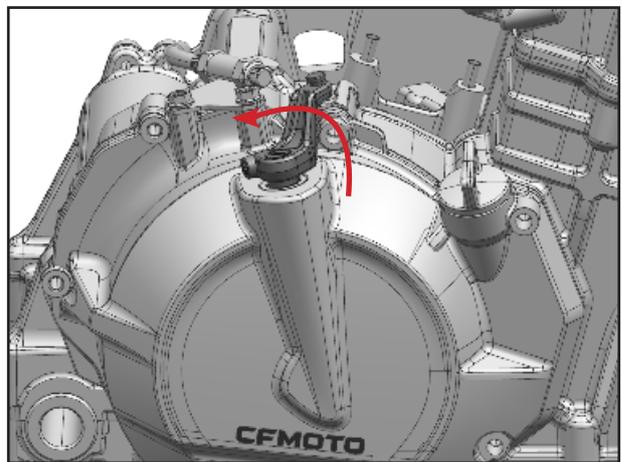
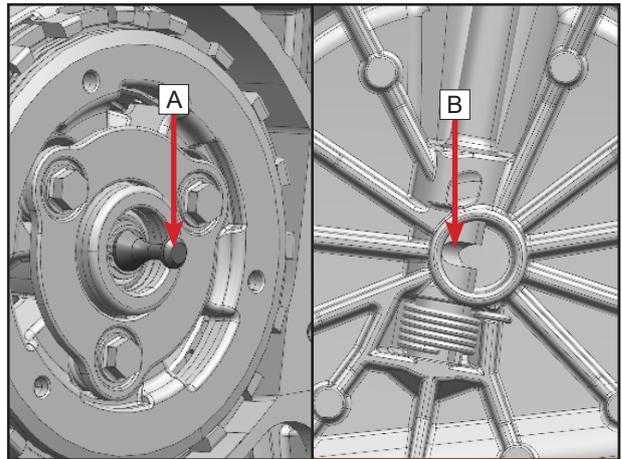


Position the clutch cover with the clutch cover gasket.

Clutch push rod (A) engages in groove (B).

NOTE

Swivel clutch release lever counterclockwise.



CFMOTO

Mount screws (2), but do not tighten yet.

Guideline

Screw, clutch cover

M6x30

10 N•m

Mount screws (3), but do not tighten yet.

Guideline

Screw, clutch cover

M6x25

10 N•m

Mount screw (4) and tighten all screws in a crisscross pattern.

Guideline

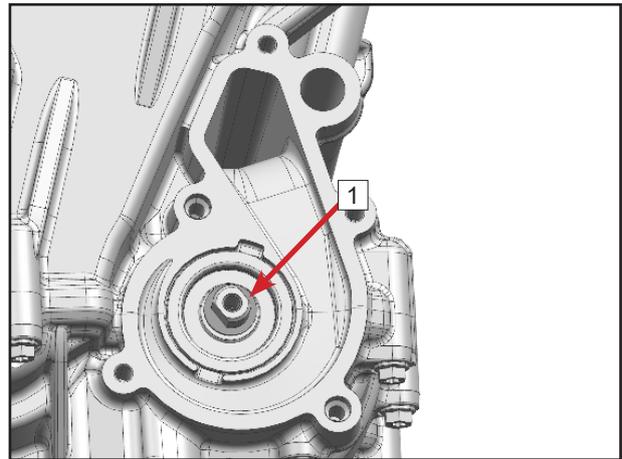
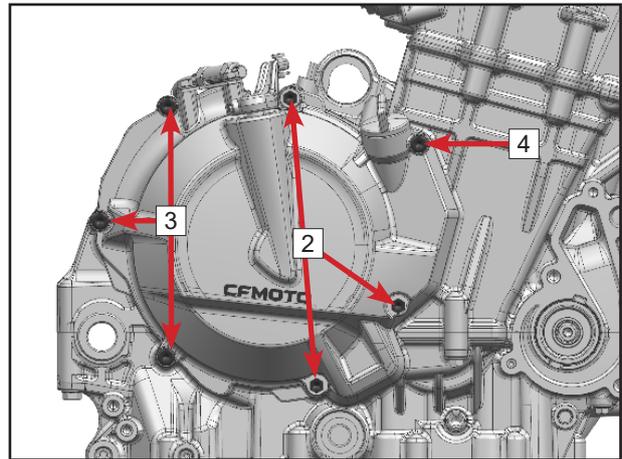
Screw, clutch cover

M6x35

10 N•m

13.7.19 Mounting the Water Pump Cover

Mount form washer (1).



Mount water pump impeller (2).

Mount and tighten screw (3).

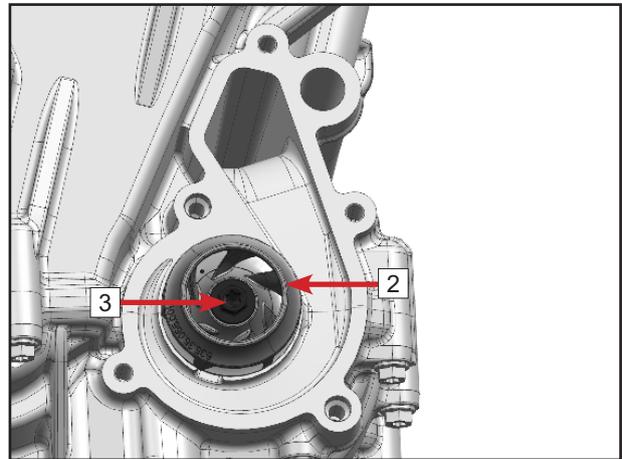
Guideline

Screw, water pump wheel

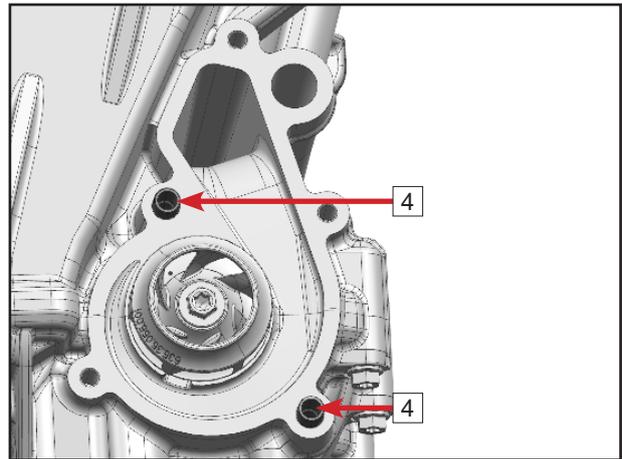
M6

10 N•m

243 Thread locker



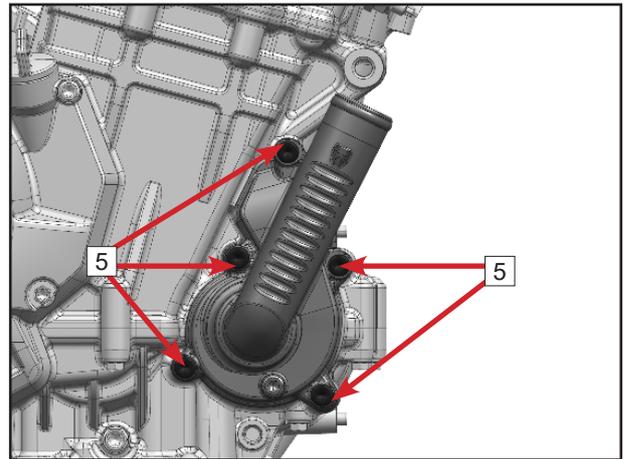
Mount dowels (4).



Position water pump cover with the gasket.
Mount and tighten screws (5).

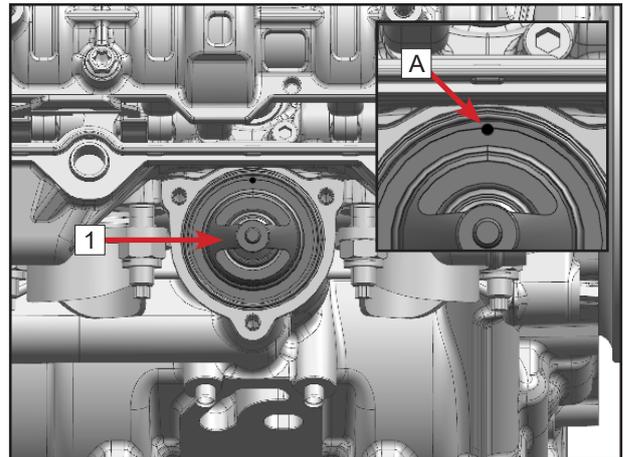
Guideline

Screw, water pump cover
M6
10 N•m
243 Thread locker



13.7.20 Installing the Thermostat

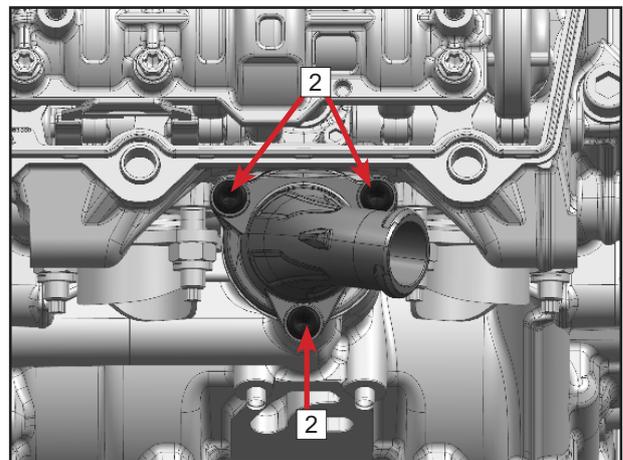
Position thermostat (1) with the gasket.
Drill hole (A) must face upward.



Position the thermostat case.
Mount and tighten screws (2).

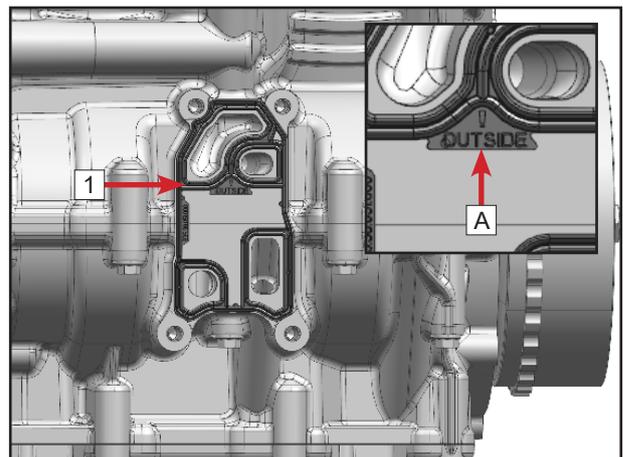
Guideline

Screw, thermostat case
M5
6 N•m
243 Thread locker



13.7.21 Installing the Heat Exchanger

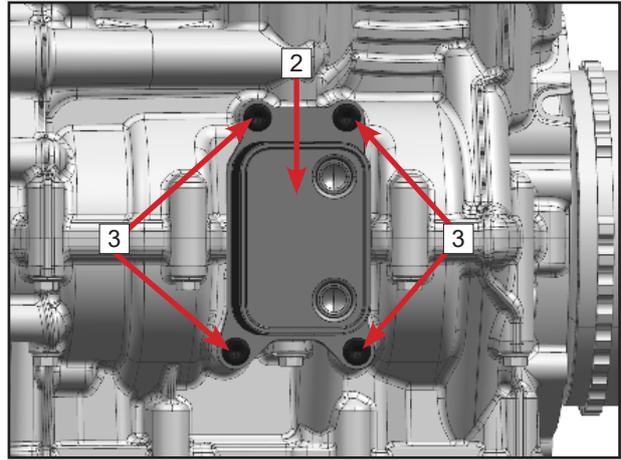
Position gasket (1).
The **OUTSIDE** marking (A) is legible.



Position heat exchanger (2).
Mount and tighten screws (3).

Guideline

Screw, heat exchanger
M6
10 N•m
243 Thread locker



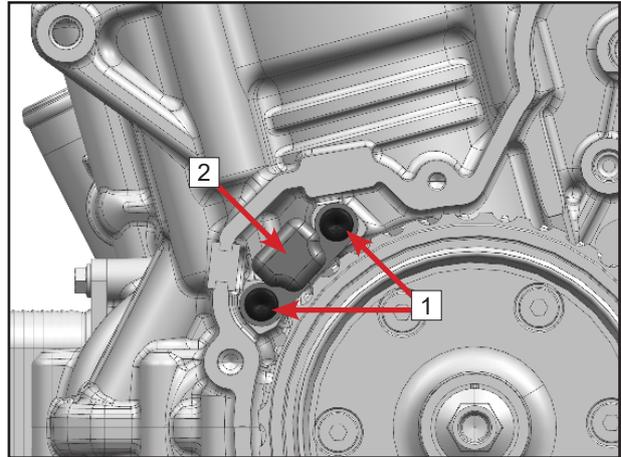
13.7.22 Installing the Crankshaft Speed Sensor

Position the crankshaft speed sensor.
Mount and tighten screws (1).

Guideline

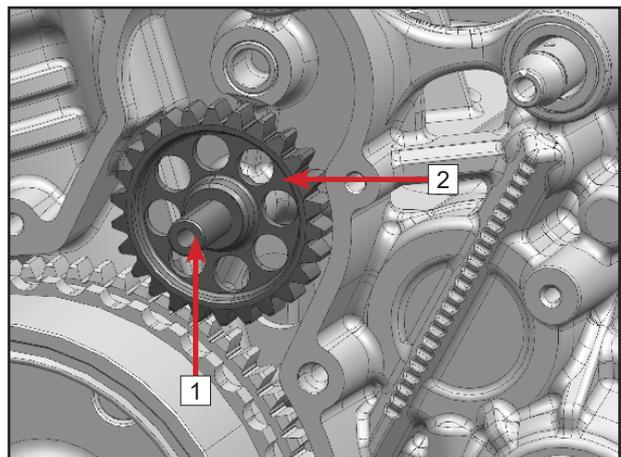
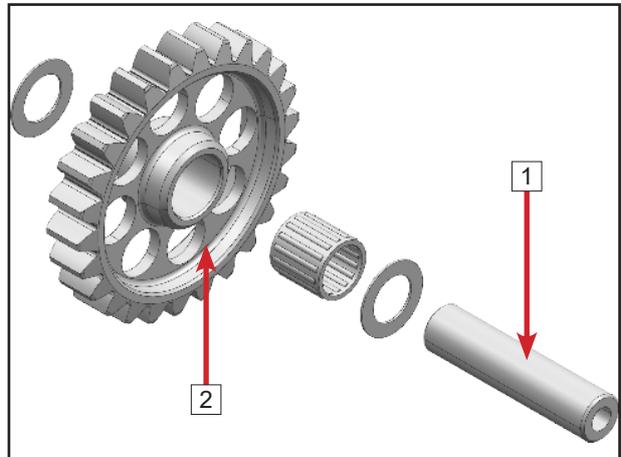
Screw, crankshaft speed sensor
M5
6 N•m
243 Thread locker

Position the cable and position rubber grommet (2) in the engine case.

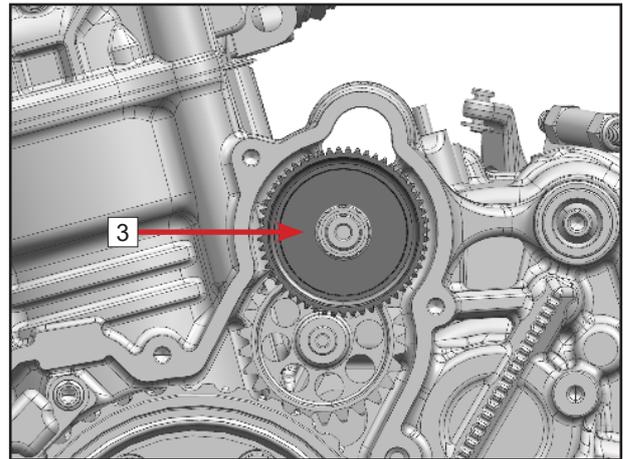


13.7.23 Installing the Torque Limiter and the Starter Intermediate Gear

Mount shaft (1) and starter intermediate gear (2) with the needle bearing and the washers.



Mount torque limiter (3) with the rear washer.

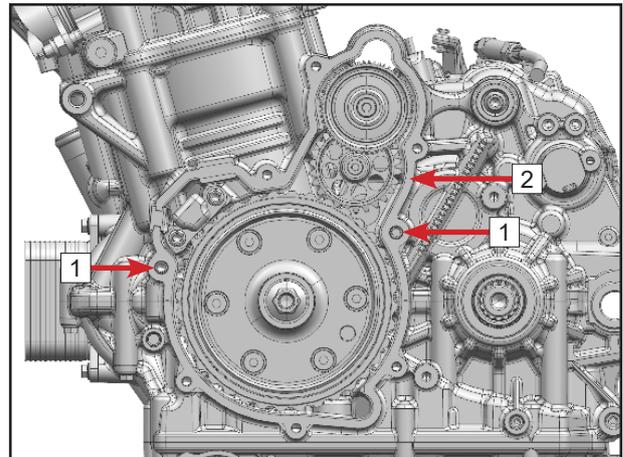


13.7.24 Installing the Alternator Cover

Apply sealing compound lightly in the area of the rubber grommet.

Loctite® 5910

Mount dowels (1) and put alternator cover gasket (2) in place.



Position the alternator cover.
Mount and tighten screws (3).

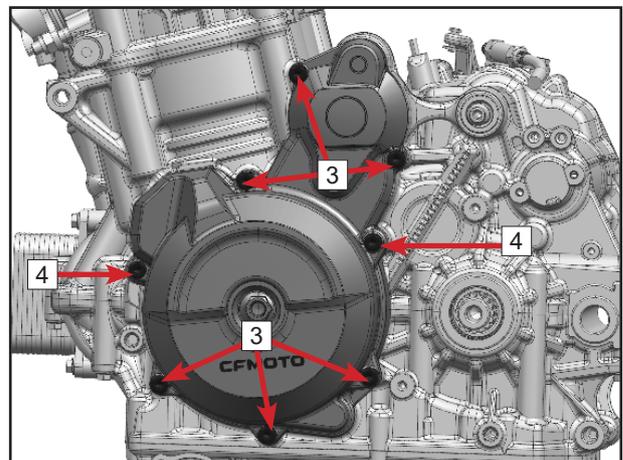
Guideline

Screw, alternator cover
M6x30
10 N•m

Mount and tighten screws (4).

Guideline

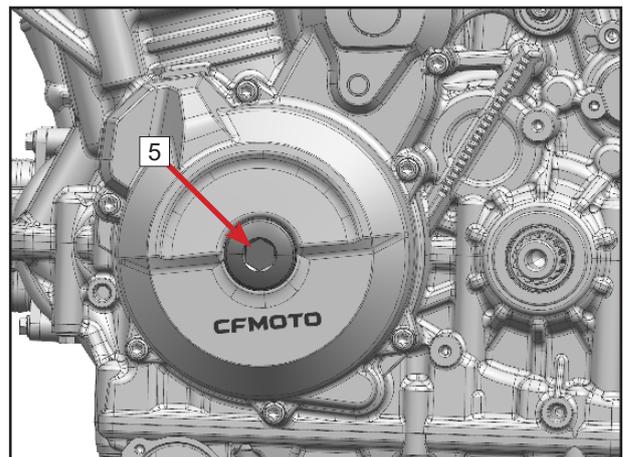
Screw, alternator cover
M6x35
10 N•m



Mount and tighten screw plug (5) with the O-ring.

Guideline

Screw plug, alternator cover
M24x1.5
8 N•m

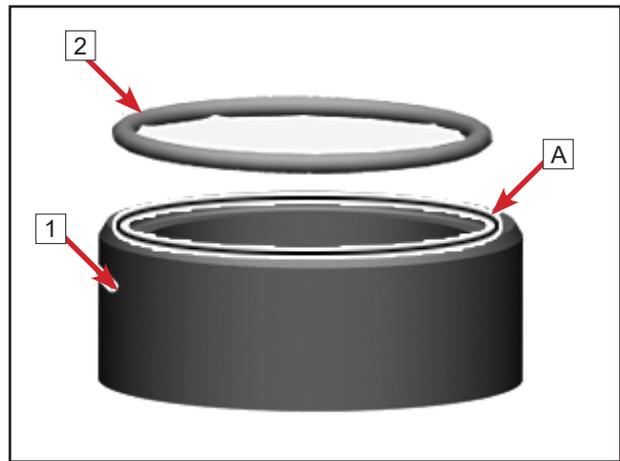


13.7.25 Installing the Spacer

Before mounting, grease spacer (1) in area (A) and O-ring (2).

Long-life grease

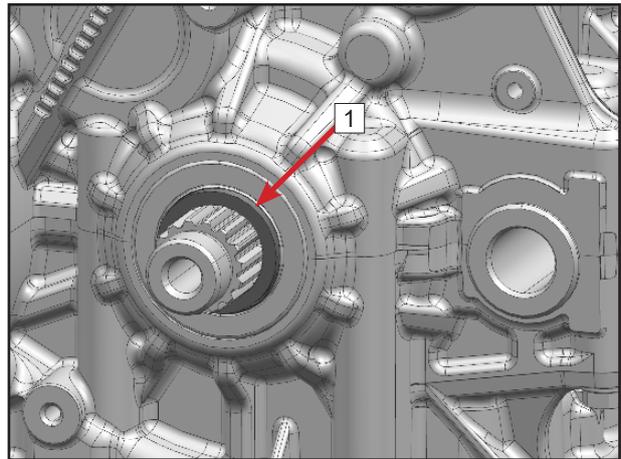
Position the O-ring in the recess of the spacer.



Grease the radial shaft seal ring.

Long-life grease

Push spacer (1) with the O-ring onto the countershaft with a twisting motion. The recess with the O-ring faces inward. The radial shaft seal ring rests against the spacer along its entire circumference.



13.7.26 Installing the Gear Position Sensor

Position gear position sensor (1).
Mount and tighten screws (2).

Guideline

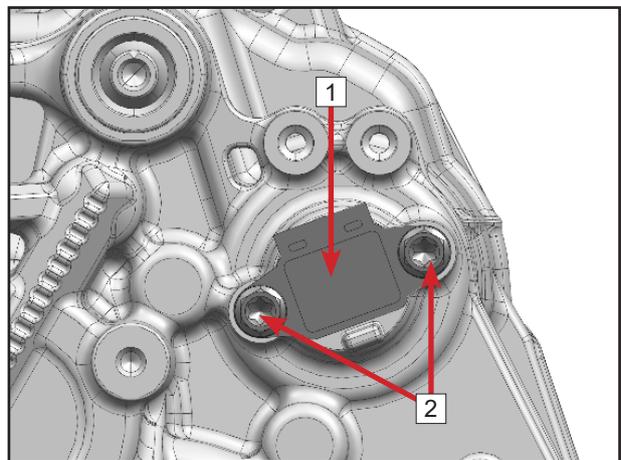
Screw, gear position sensor

M5

6 N•m

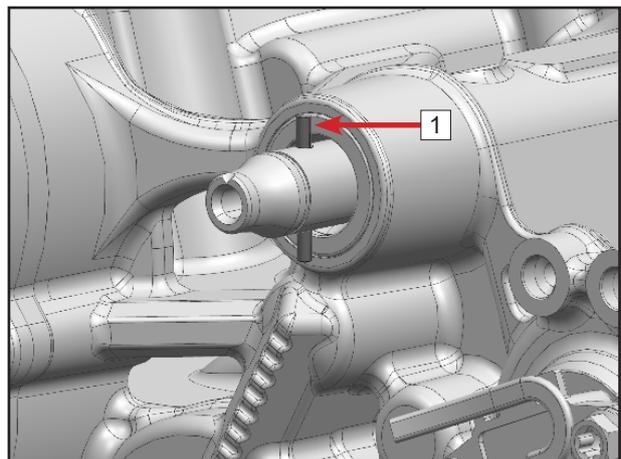
243 Thread locker

Secure the cable with a cable tie.

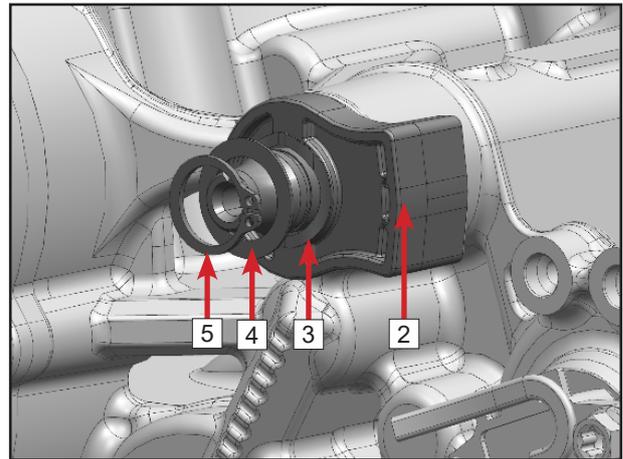


13.7.27 Installing the Shift Shaft Sensor

Mount pin (1).

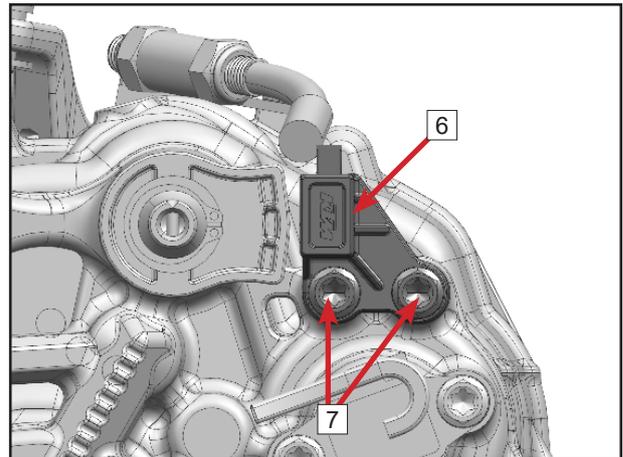


- Mount magnetic holder (2).
- Mount locating washer (3).
- Mount washer (4).
- Mount lock ring (5).



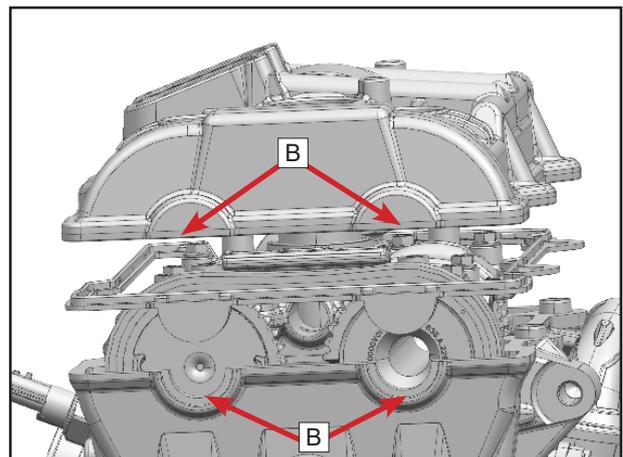
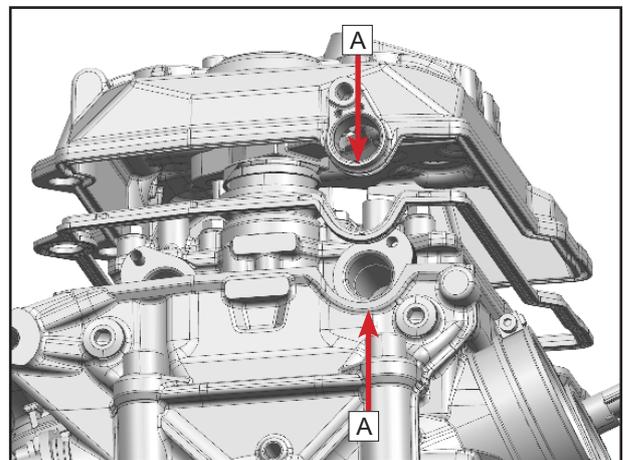
- Position the shift shaft sensor (6).
- Mount and tighten screws (7).
- Guideline

Screw, shift shaft sensor
M5
6 N•m
243 Thread locker



13.7.28 Installing the Valve Cover

- Clean and degrease the valve cover seal.
- Apply a thin layer of sealing compound to area (A) and (B).

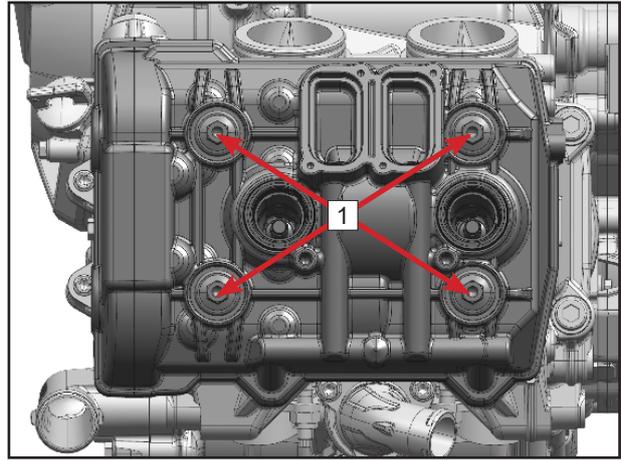


CFMOTO

Position the valve cover with the valve cover seal.
Mount and tighten screws (1) with the gaskets.

Guideline

Screw, valve cover
M6
10 N•m



Grease O-ring (2).

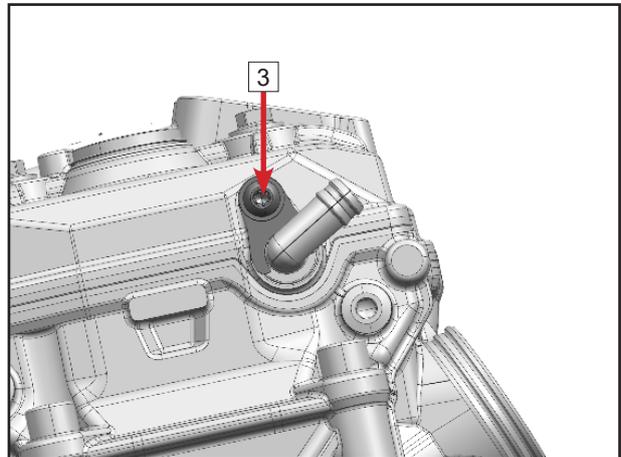
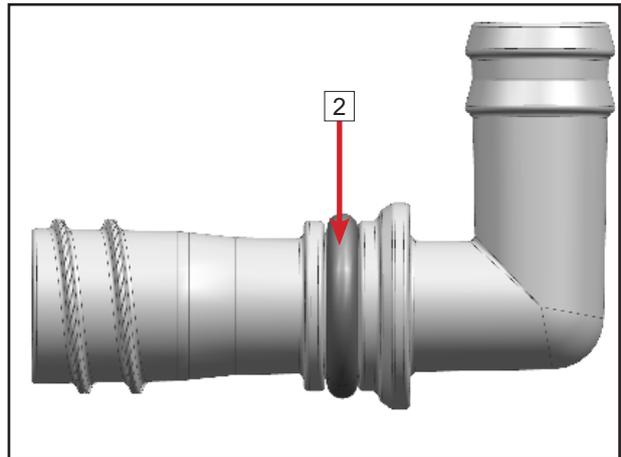
Long-life grease

Position the bleeder flange in the valve cover.

Mount and tighten screw (3) with retaining bracket.

Guideline

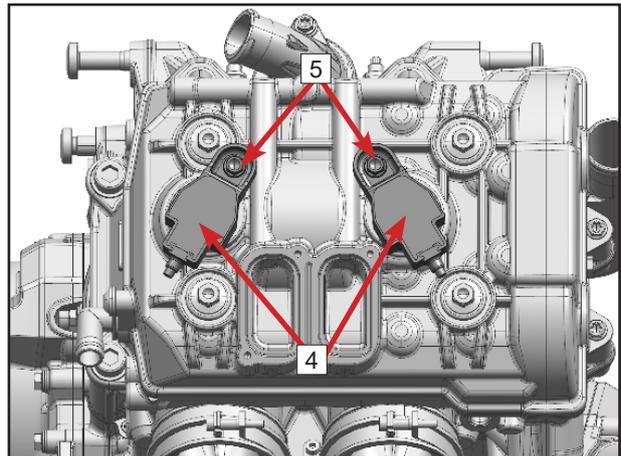
Screw, bleeder flange
M6×12
8 N•m
243 Thread locker



Mount ignition coils (4).
Mount and tighten screws (5).

Guideline

Screw, ignition coil
M6
8 N•m



13.7.29 Installing the Starter Motor

Grease the O-ring and mount the starter motor.

Long-life grease

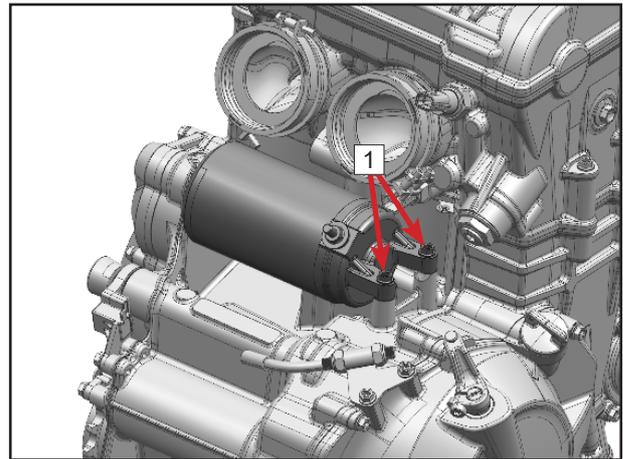
Mount and tighten screw (1).

Guideline

Screw, starter motor

M6

10 N•m

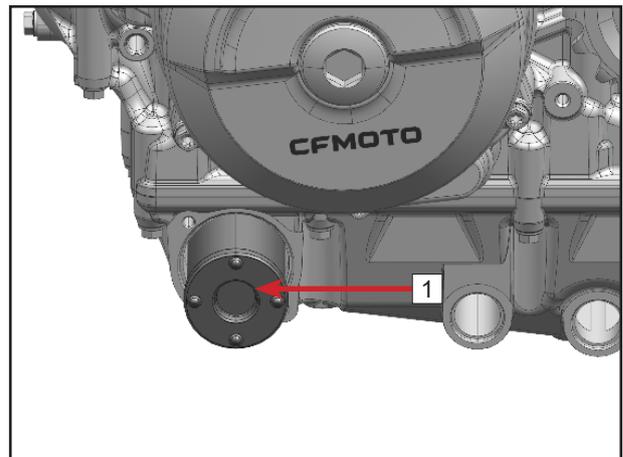


13.7.30 Installing the Oil Filter

Tilt the motorcycle to one side and fill the oil filter housing to about $\frac{1}{3}$ full with engine oil.

Engine oil (SAE 10W/50)

Mount oil filter (1).



Oil the O-ring of oil filter cover (2).

Mount the oil filter cover.

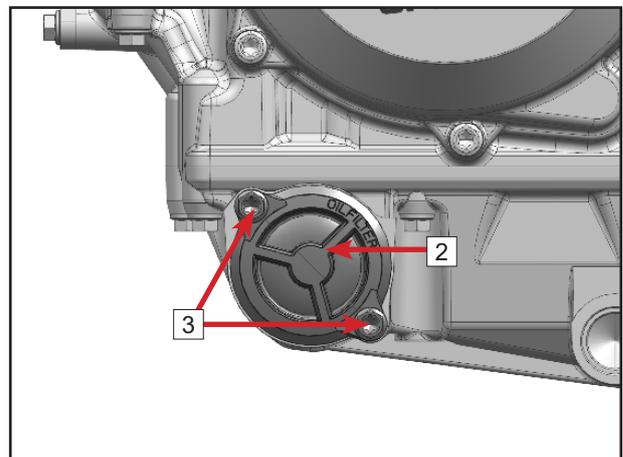
Mount and tighten screws (3).

Guideline

Screw, oil filter cover

M5

6 N•m



13.7.31 Installing the Oil Drain Plug

Mount the new O-rings.

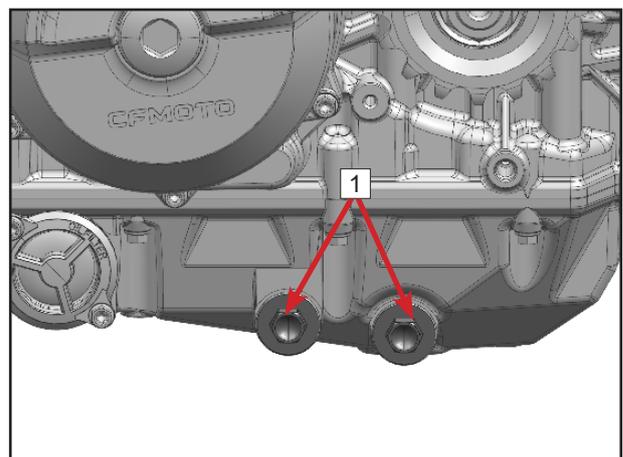
Mount and tighten the oil drain plugs (1) with the magnet, O-rings, and oil screen.

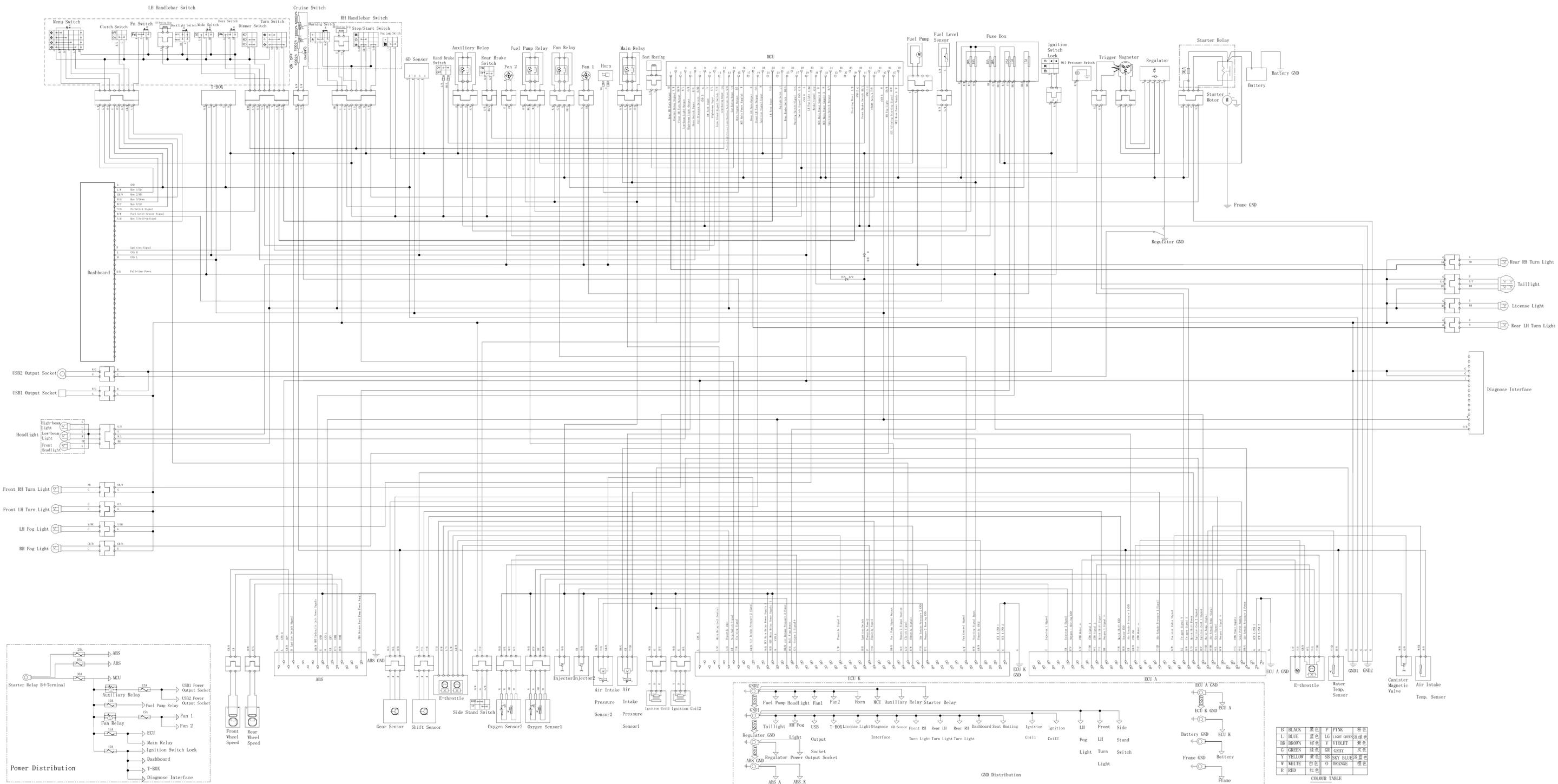
Guideline

Plug, oil screen

M20×1.5

20 N•m





Color	Chinese	English	Chinese
B	黑色	P	棕色
L	蓝色	LG	绿色
BR	棕色	V	紫色
G	绿色	GR	灰色
Y	黄色	SB	蓝色/灰色
W	白色	O	橙色
R	红色		

COLOUR TABLE

