

800MT

CF800-5

800MT XC

CF800-5

**SERVICE
MANUAL**

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INTRODUCTION

This manual introduces CF800-5 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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This manual has been improved by using many ways to make it accuracy. But we are no response for any difference and missing. CFMOTO reserves right to make improvements and modifications to the products without prior notice. Overhaul and maintenance should be done according to actual condition of vehicle. And CFMOTO is not responsible for production improvements and modifications. This manual is only for reference. If any objections, please ask the nearest dealer to get the latest information. The information in this manual are the latest depends on latest productions on coming out. The images in this manual may not stand for real model assy and parts.

Production CF800-5 is accordance with standard: Q/CFD 111.

The manual standard: GB/T9969-2008 and GB/T19678-2005.

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Conversion table

A	Ampere	lb	Pound
ABDC	After bottom dead center	m	Meter
AC	Alternating current	min	Minute
ATDC	After top dead center	N	Newton
BBDC	Before bottom dead center	Pa	Pascal
BDC	Bottom dead center	PS	Metric horse power
BTDC	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 operate for high efficiency work. And working 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 equipment. 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 base on service manual.
- Non-periodical maintenance in special situations.
- Use tools properly and use CFMOTO genuine parts.
- Special tools, dashboard and tester have been listed into this service manual for necessary genuine parts.
- Strictly operated bas 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 wanna see ignition coil information, use the contents to find our the electrical system and 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 vehicle removal procedures are not included electrical parts, police implements and engine. 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.

GENERAL INFORMATION

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General Information

1.1 Operation Cautions

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



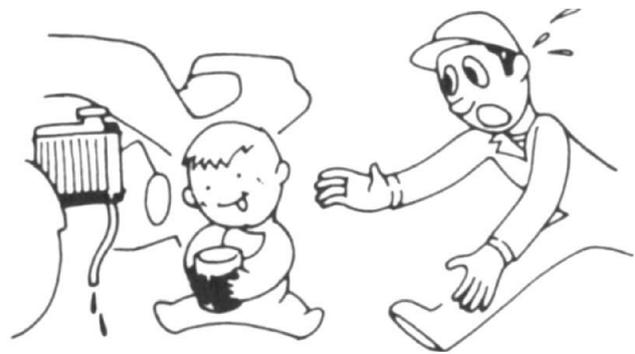
⚠ WARNING: Don't touch the engine or muffler with bare hands when the engine has just stopped to avoid hurt. Wear long-sleeve work clothes.



⚠ 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 drinking the coolant, induce vomiting and consult doctors. Keep coolant away from reach of children.



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 against 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: The asbestos dust on the brake drum is carcinogenic. Do not clean off the dust with compressed air. Use cleaning detergent to avoid dust proliferation.



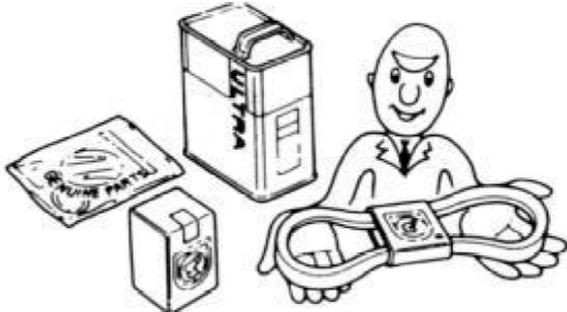
⚠️ DANGER: Be careful to get clamped by the turning parts like wheels and clutch.



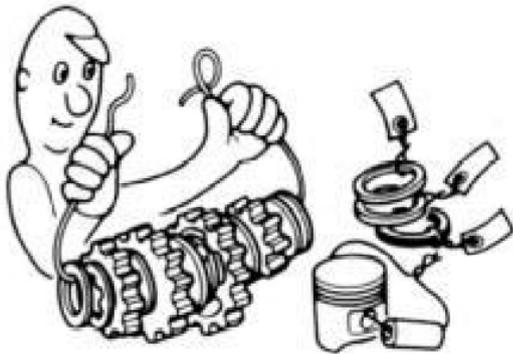
General Information

1.2 Disassembly and Assembly Cautions

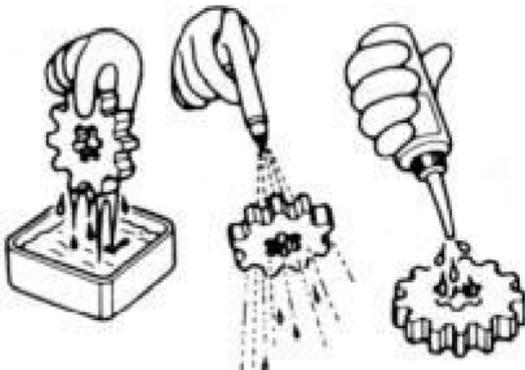
■ Use genuine CFMOTO Parts, lubricants and grease.



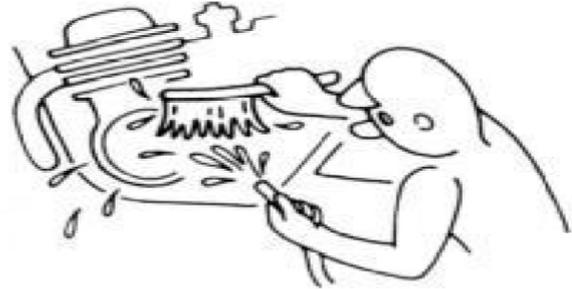
■ Place and store the disassembled parts separately in order for correct assemble.



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



■ 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.

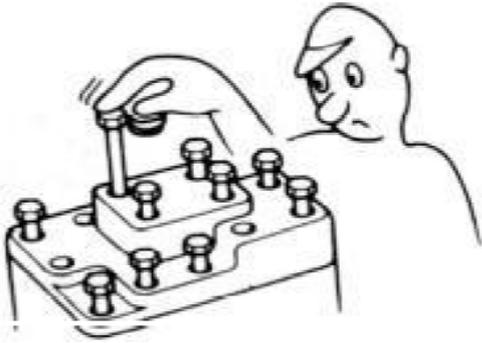


■ Measure the data during disassembly for correct assembly.

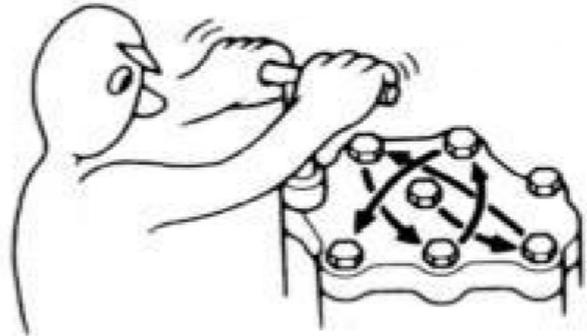


General Information

■ 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.



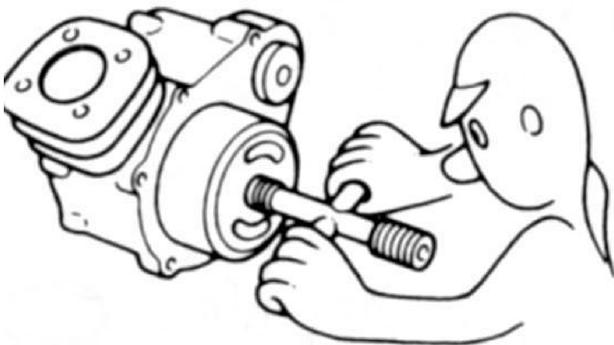
■ Check if the disassembled rubber parts are aged and replace it if necessary. Keep the rubber parts away from grease.



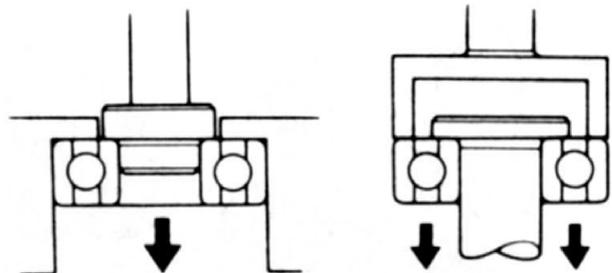
■ Apply or inject recommended lubricant to the specified parts.



■ Use special tools wherever necessary.

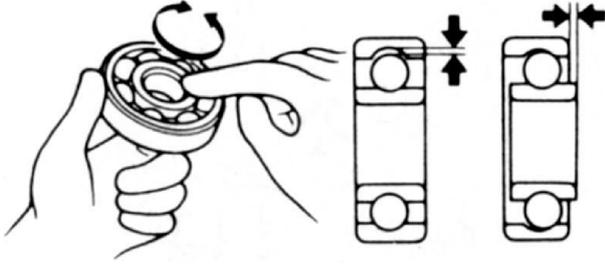


■ If the disassembling of pressed ball bearing is done by pressing the balls, the disassembled should not be used again.



General Information

■ 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.



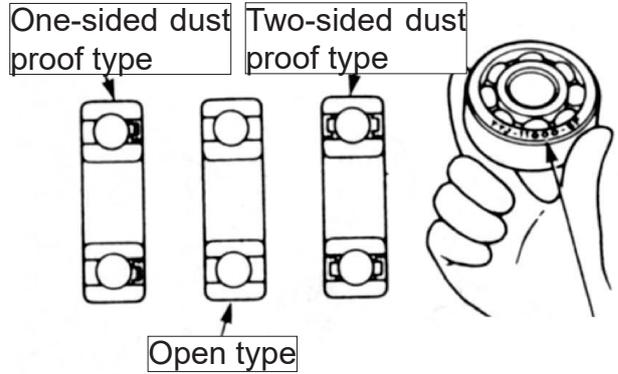
■ Keep the bearing block still when blowing dry the bearing after washing clean. Apply oil or lubricant before assembling.



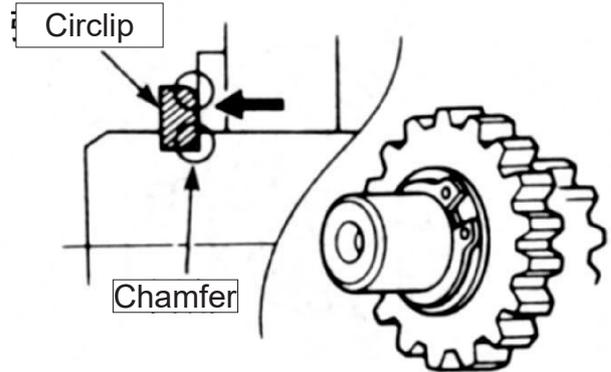
■ After assembling, check if all the tightened parts are properly tightened and can move smoothly.



■ 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.



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

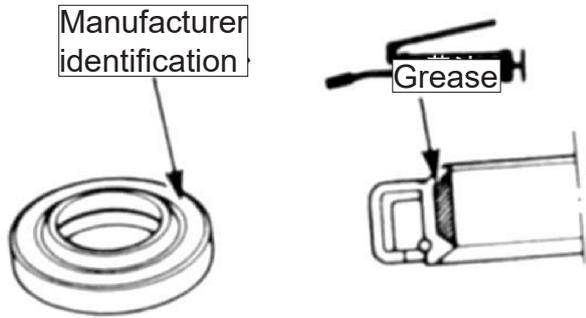


■ Brake fluid and coolant may damage coating, plastic and rubber parts. Flush these parts with water if splashed.

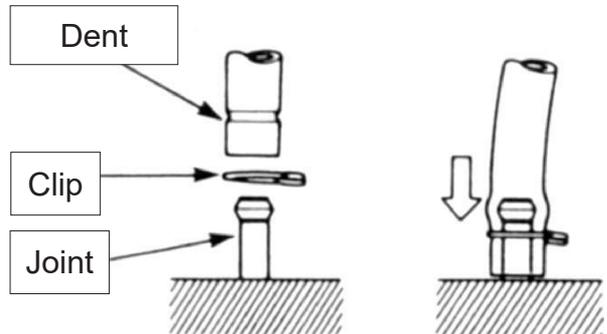


General Information

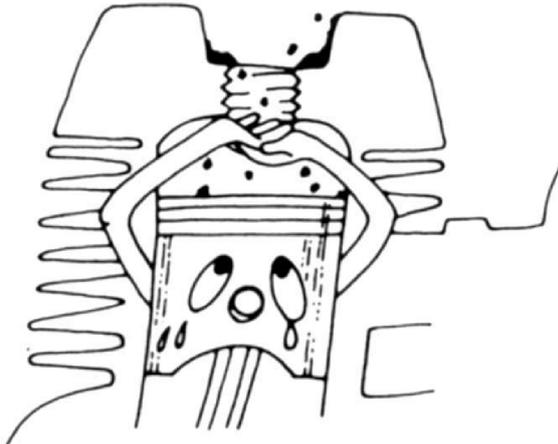
■ Install oil seal with the side of manufacturer's mark outward. Do not fold or scratch the oil seal lip. Apply grease to the oil seal lip before assembling.



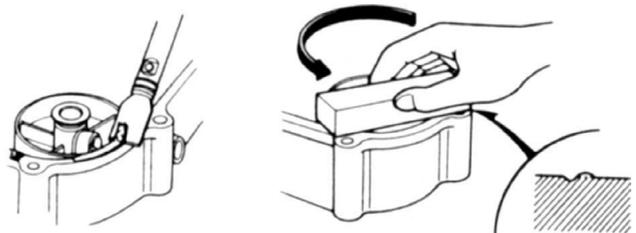
■ When installing pipes, insert the pipe till the end. Fit the pipe clip, if any, into the rove. Replace the pipes or hoses that cannot be tightened.



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



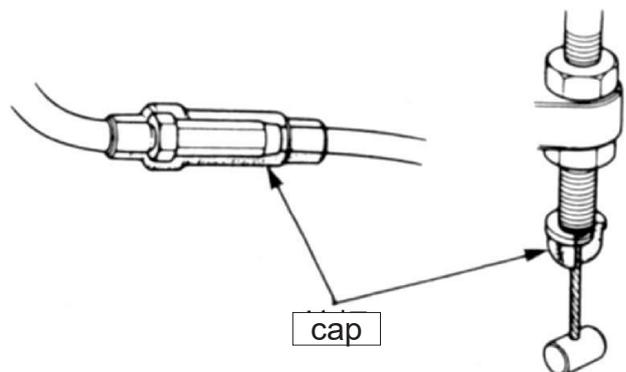
■ Clean the gaskets and washers of the engine cases before assembling. Remove the scratches on the contact surfaces by polishing evenly with an oil stone.



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

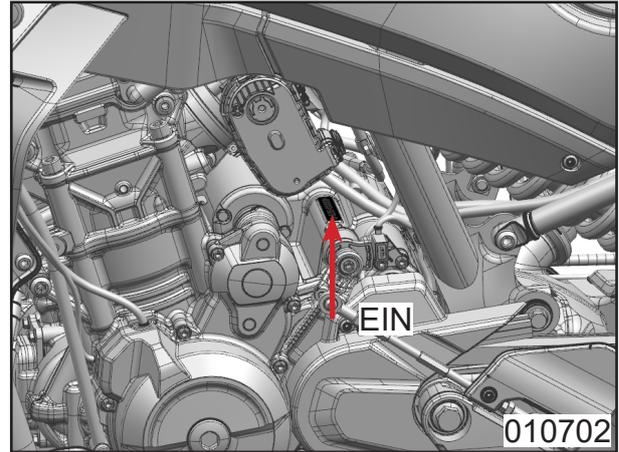
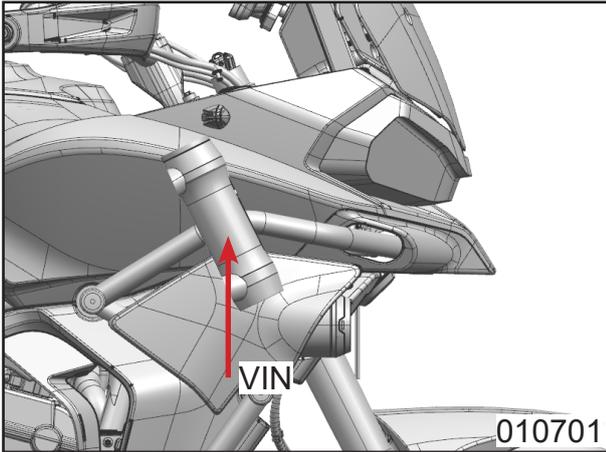


■ When assembling the parts of protection caps, insert the caps to the grooves, if any.

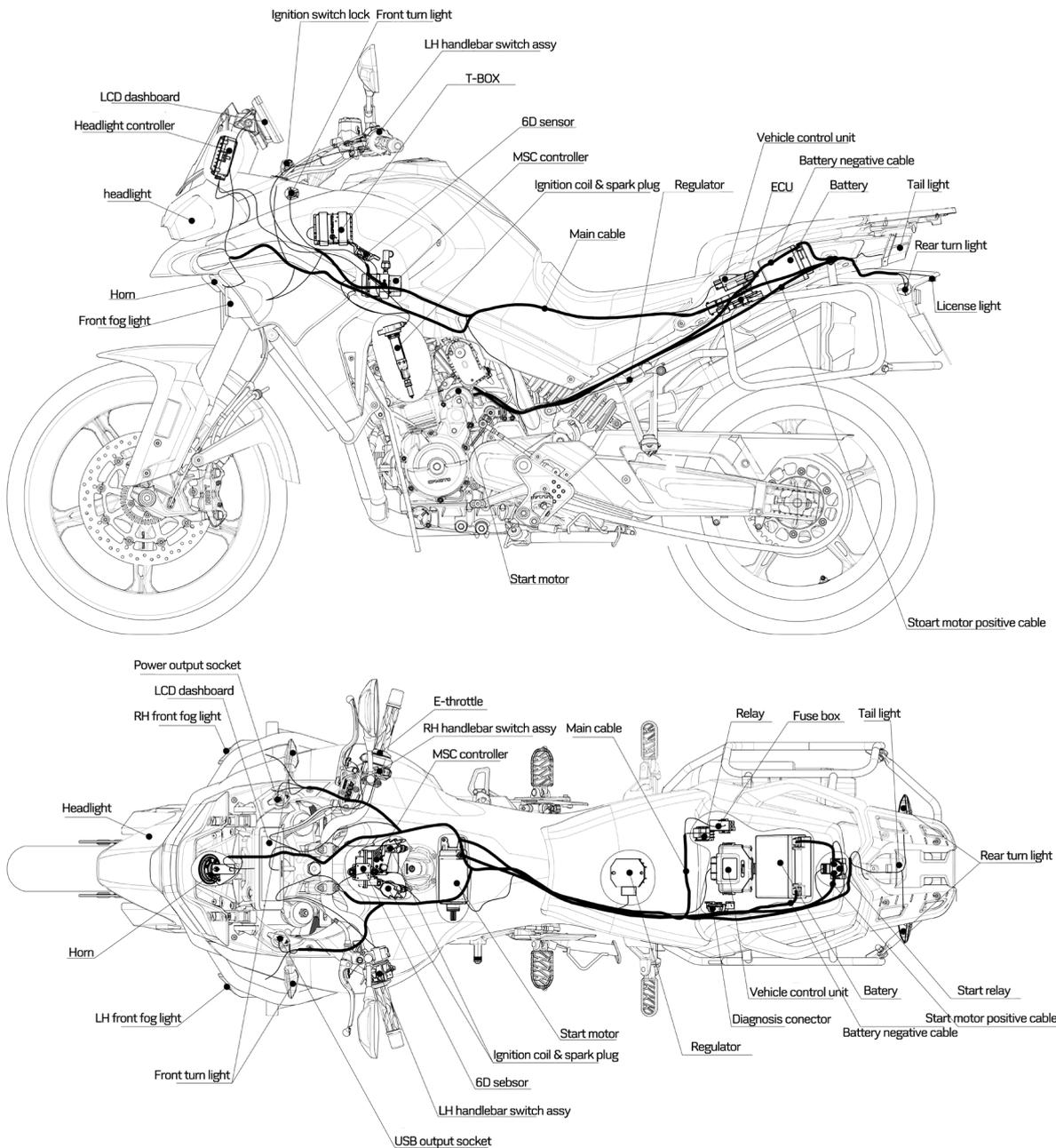


General Information

1.3 VIN and EIN Location

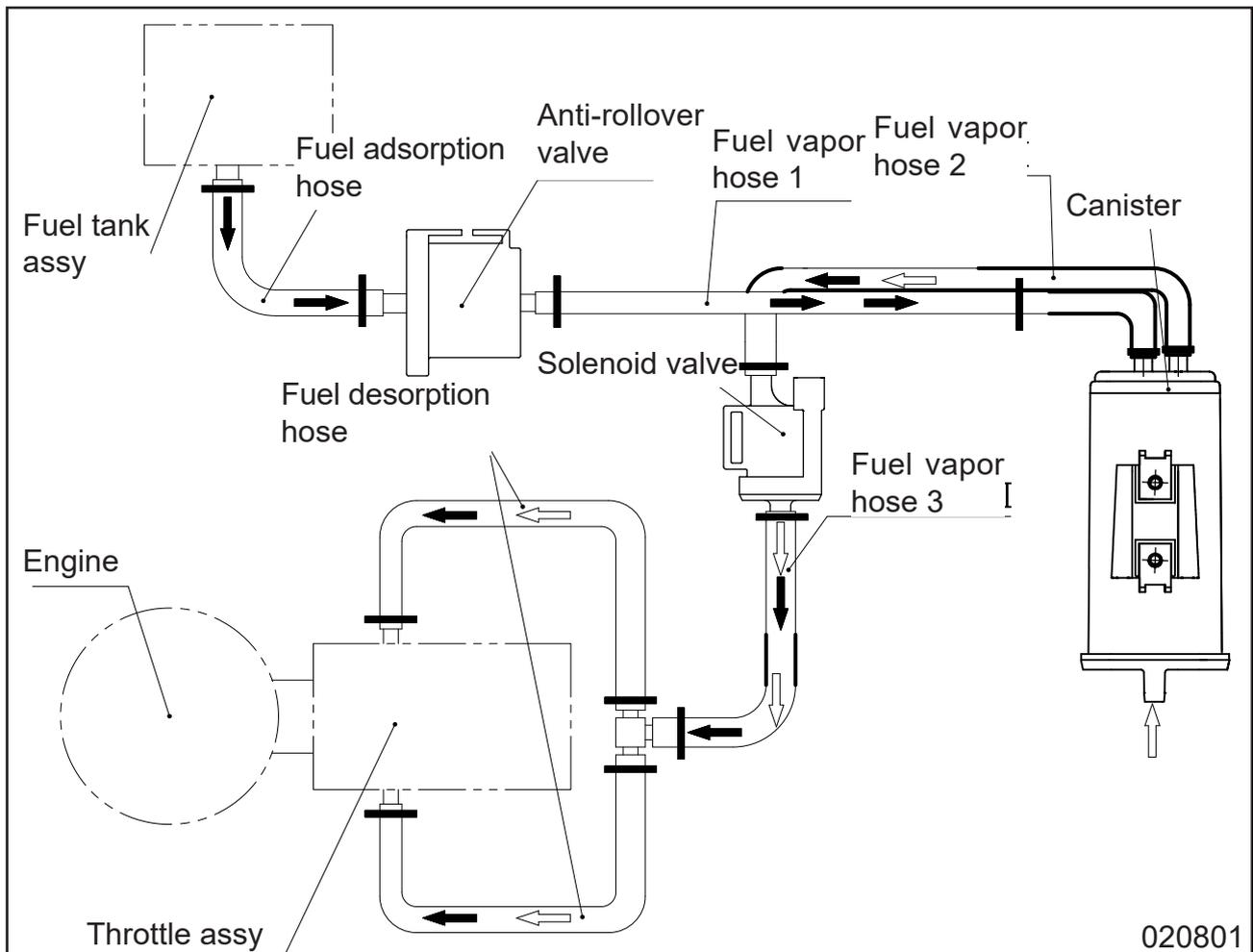


1.4 Electrical Parts Routing



1.5 Fuel Evaporation System Diagram

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



MAINTENANCE INFORMATION

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Maintenance Information

⚠ CAUTION:

- ▶ = 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.

2.1 Maintenance before Operation

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

Maintenance Information

2.2 Break-in Maintenance Schedule

Item	Break-in Maintenance Interval (Service whichever interval comes first)			
	Hour	Calendar	km	Remarks
Engine				
■ Engine oil and oil filter	-	-	1000	Replace
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 hoses	-	-	1000	Inspect for free play
Brake lever	-	-	1000	Inspect for damage and sealing
Wheels				
Tire condition	-	-	1000	Inspect
Tire pressure	-	-	1000	
Rim spokes	-	-	1000	
Suspension system				
■ Rear shock absorber and front forks	-	-	1000	Inspect for leaking (maintain parts according to the requirement)
Cooling system				
Coolant level	-	-	1000	Inspect
■ Coolant	-	-	1000	
■ Radiator fan function	-	-	1000	
Coolant hoses	-	-	1000	
Steering system				
■ Steering bearings	-	-	1000	Inspect
Other parts				
■ Diagnosis connector	-	-	1000	Read with PDA
■ Mobile parts	-	-	1000	Lubricate; inspect for flexibility
■ Bolts and nuts	-	-	1000	Inspect for fastness
■ Cables and wires	-	-	1000	Inspect for damage, bending and routing

Maintenance Information

2.3 Periodic Maintenance Schedule

Item	Periodic Maintenance Interval (Service whichever interval comes first)				
	Hour	Calendar	km	Remarks	
Engine					
	Engine oil and oil filter	-	12M	15000	Replace
■	Clutch	-	-	15000	Inspect
	Idle	-	-	15000	
■	Coolant	-	12M	15000	Replace
		-	48M	-	
	Throttle system	-	-	10000	Inspect
■	Throttle valve	-	-	15000	Clean
▶■	Air filter element	-	-	15000	Inspect
		-	24M	30000	Replace
■	Spark plug	-	-	30000	
■	Valve clearance	-	-	30000	Inspect
Electrical system					
■	Functions of electrical parts	-	12M	10000	Inspect
	Battery	-	6M	5000	
	Fuses or circuit breakers	-	6M	5000	
■	Wires	-	12M	10000	Inspect for damage, bending and routing
Brake system					
	Front and rear brake system	-	12M	10000	Inspect
		-	24M	20000	
	Brake discs	-	12M	10000	
		-	24M	20000	
▶	Brake pads	-	12M	10000	
		-	24M	20000	
	Brake fluid level	-	12M	10000	
		-	-	20000	
■	Brake hoses	-	24M	20000	Inspect for free play
		-	12M	10000	
	Brake lever	-	24M	20000	Inspect for damage and sealing
		-	12M	10000	
■	Brake fluid		24M	-	Replace
Wheels					
	Tire condition	-	12M	10000	Inspect
		-	24M	20000	
	Tire pressure	-	12M	10000	
		-	24M	20000	
■	Wheel bearings	-	-	10000	
		-	-	30000	
■	Rim spokes				

Maintenance Information

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

TECHNICAL INFORMATION

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Technical Information

3.1 General Specifications

Item		Specifications	
Model		CF800-5	CF800-5A
Length		2235 mm	
Width		916 mm	
Height		1470 mm (windshield at highest position)	
Wheel base		1530 mm	
Engine model		288MW	
Displacement		799 mL	
Fuel grade		RQ-95 or above E5	
Gross weight		225 kg	
Passengers		2 people (including driver)	
Load		150 kg	
Tire	Front	110/80 R19 59V TL	
	Rear	150/70 R17 69V TL	
Min. ground clearance		190 mm	
Turning circle diameter		4700 mm	
Steering	Steering angle	Right	35°
		Left	35°
Brake system		Front	Hydraulic Disc
		Rear	Hydraulic Disc
Shock absorber	Suspension	Front wheel	Telescopic
		Rear wheel	Cantilever type
Frame		Steel tube	

Item		Standard
Fuel supplier	Fuel capacity	19 L
	Injector	Type: F01R00MG63
	Fuel pump	Voltage: DC13.5V
		Pressure: 0.33MPa ± 0.01MPa
		Flow: ≥45 L/h
	Current: ≤2.80 A	

3.2 Engine Specification

Item		Type/Specification		
		CF800-5		
Type		Line engine, twin-cylinder, 4-stroke, water-cooled, DOHC		
Bore × Stroke		88 mm × 65.7 mm		
Displacement		799 mL		
Compression ratio		12.8:1		
Low idling speed (Idling)		1450 r/min ± 145 r/min		
Starting		Electric		
Power		77 kw/7500 rpm		
Electrical system	Ignition type	ECU		
	Spark plug/Electrode gap	NGK LMAR9AI-10/0.7 mm ~ 0.9 mm		
	Magneto type	PM three phase AC 29A/350W		
Combustion system	Combustion chamber	Triangular		
	Air filter type	pape filter		
	Gasoline	RQ-95 and above E5		
Valves system	Valves type	SOHC/chain drive		
Lubrication system	Lubrication type	Pressure and splash		
	Oil pump type	Rotor drive		
	Oil filter type	Paper type, replaceable		
	Engine oil type	SAE10W/40 SJ, JASOMA2		
Cooling system	Cooling type	Closed coolant circulation		
	Coolant type	-35°C anti-rust and anti-freeze fluid		
Drive train system	Clutch		Wet and multi-plate clutch	
	Transmission type		6-gear, constant mesh, step transmission	
	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		
Overall size		L(mm)×W(mm)×H(mm): 425 mm × 403 mm × 520 mm		
Dry weight		55 kg		
Output type		Chain		
Rotation of engine output		When moving forward, counter clockwise(left view).		

Technical Information

3.3 Maintenance Specifications

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
		Horizontal	0.8 mm
	Tire	Remaining groove	-
Tire pressure		220 kPa ± 22 kPa (2.2 kgf/cm ² ± 0.22 kgf/cm ²)	-

3.3.2 Rear Wheel

Item		Standard	Service limit	
Rear wheel	Rim run-out	Longitudinal	0.8 mm	
		Horizontal	0.8 mm	
	Tire	Remaining groove	-	1.6 mm
		Tire pressure	250 kPa ± 25 kPa (2.5 kgf/cm ² ± 0.25 kgf/cm ²)	-

3.3.3 Brake System

Item		Standard	Service limit
Front brake	Front (hand) brake free travel	7mm±2mm	-
	Brake disc abrasion	4.5 mm	3.5 mm
Rear brake	Rear (foot) brake free travel	3mm±1.5mm	-
	Brake disc abrasion	5 mm	4 mm

3.3.4 Light, Dashboard and Switch

Item	Standard		
Fuse	Primary	30 A	
	Subsidiary	1×7.5A	1×10A 5×15A
Light, bulb	Headlight (Hi/Lo)	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		Service limit	Remark
	283MU			
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 run-out	0.02mm		-	
Cylinder head junction surface flatness	0.05mm		-	

Technical Information

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-40/SJ, JASOMA2	-	
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
	283MU			
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	-	
Friction pad thickness	0.15mm	0.30mm	
Free length of clutch spring	51.7mm~52.7mm	50.7mm	
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, 1MPa		
Ignition coil resistance	Primary	1.23 Ω	
	Secondary	6kΩ~13kΩ	
Magneto coil resistance	Trigger	400Ω	
Max power	350W		
Stabilized voltage	13.5V~15.0V		
Primary peak voltage, ignition coil	≥27kV		
Peak voltage, trigger coil	≥17V		

Technical Information

3.5 Tighten Torque

3.5.1 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)

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

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

Item	Thread dia.(mm)	Qty.	Torque N•m (kgf•m)	Remark
Front bolt, engine	GB/T5789 M10×1.25×110	2	45~50	
Rear bolt, engine	GB/T6187 M10×1.25	2	45~50	
Bolt, frame	M10×1.25×20	4	40~50	
Front wheel shaft	M20×1.5	1	105~110	
Nut, rear wheel shaft	M18×1.5	1	135~140	
Nut, rear fork shaft	M20×1.5	1	135~140	
Lock nut, steering stem	A000-050007	1	20~25	
Lock screw, upper triple clamp	M26×1	1	110	
Lock screw, triple clamps and shock absorbers	GB/T 70.1 M8×25	6	20~25	
Upper bolt, rear shock absorber	M12×1.25×75	1	50~55	
Lower bolt, rear shock absorber	GB/T 70.1 M12×1.25×60	1	50~55	
Front bolt, swing arm	M12×1.25×75	1	50~55	
Middle bolt, swing arm	GB/T 70.1 M12×1.25×120	1	50~55	
Bolt, tie rod assy	M10×1.25×120	1	45~50	
Bolt, front brake caliper	GB/T70.1 M10×1.25×60	2	45~50	
Bolt, rear fender	GB/T5789 M8×25			
	GB/T70.1 M8×20	3	25~28	

3.6 Consumption Materials&Assembling Materials

Consumption materials include lubricant oil (engine oil), lubricant grease (butter) and coolant. Assembling materials include flange sealants, thread locker.

3.6.1 Vehicle Consumption Materials

Application areas	Notes	Type
Vehicle's head pipe, bearing races Front wheel dust-proof seal lip Rear brake cam movable parts, cam Junction, dashboard soft shaft Shaft joint, throttle cable Throttle handlebar part Pivot, rear pedal(LH), Pivot, rear pedal(RH), Pivot, side stand Rear fork oil seal lip Counter gear/small gear surface and movable parts Main bracket shaft		Multi-purpose lithium base lubrication oil GB/T5671
Thread of rear wheel axle nut and joint Handle bar inner surface		Engine oil
Lower dust-proof seal lip of front shock absorber		Absorber oil 5#

3.6.2 Engine Consumption Materials&Assembling Materials

Item	Specification	Using parts	Remark
Lubricant oil	SAE 10W/50 SJ, JASOMA2	Rotation and moving section in cylinder, crankcase and cylinder head. Details refer to lubricant chart.	Oil Capacity: 2800mL
Lubricant oil with molybdenum		Piston pin, valve stem, valve oil seal, camshaft	
Lubricant 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	

SEAT

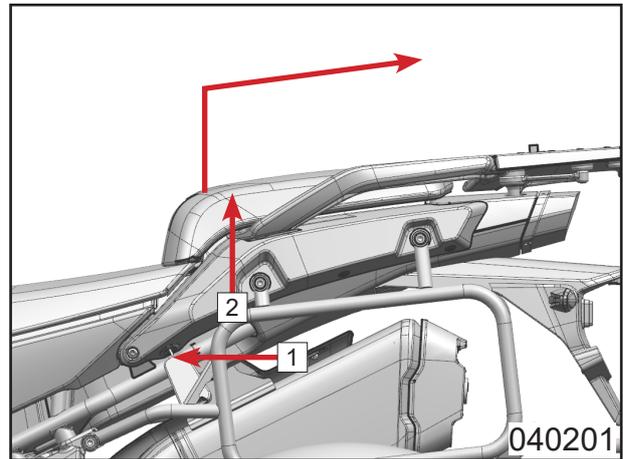
4.1 Seat Removal2

4.2 Seat Installation2

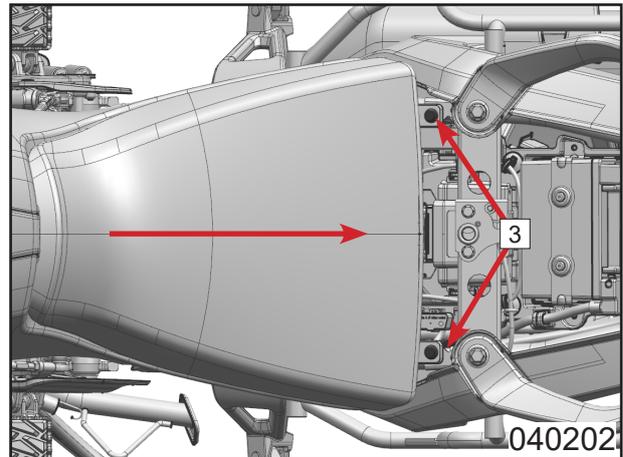
Seat

4.1 Seat Removal

- Insert key into seat lock [1].
- Unlock seat lock [1].
- Lift front part of the seat [2].
- Remove seat.



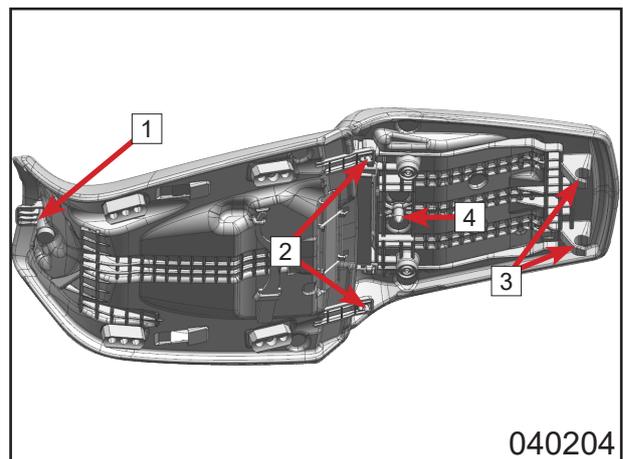
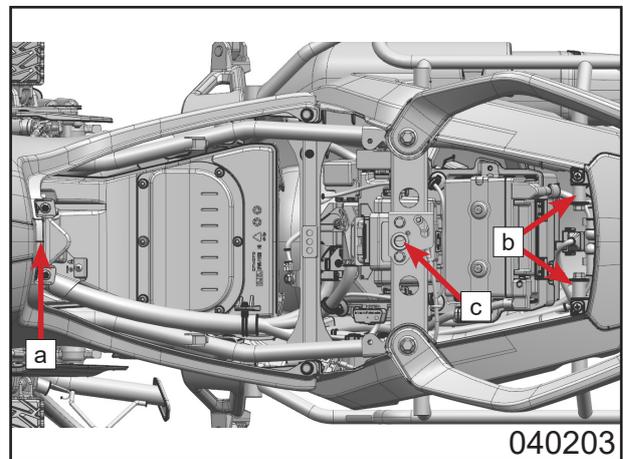
- Remove two bolts and washers [3].
- Lift rear part of the seat.
- Remove seat.



4.2 Seat Installation

- Insert clasp [1] into [a].
- Align four blocks with frame.
- Install two bolts [2].
- Insert two hooks into holes [b].
- Compress columns [3] into seat lock [c].

NOTE: Seat might be loose if not installed in place. Check seat after installation.



BODY COVERING PARTS

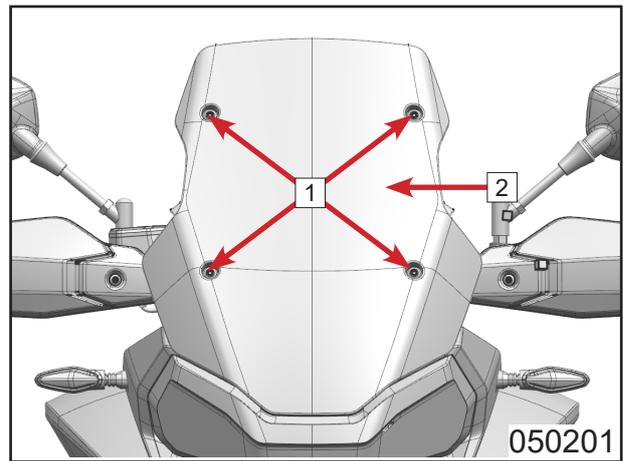
5.1 Windshield	2
5.2 LH&RH Steering Panels	3
5.3 LH&RH Fog Light Guards	3
5.4 Bumpers	3
5.5 Fuel Tank Lower Panels and Fog Light Assy.....	5
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5.11 Side Box Bracket	8
5.12 Tail Light LH&RH Panels.....	9
5.13 Tail Light Upper Cover	9

Body Covering Parts

5.1 Windshield

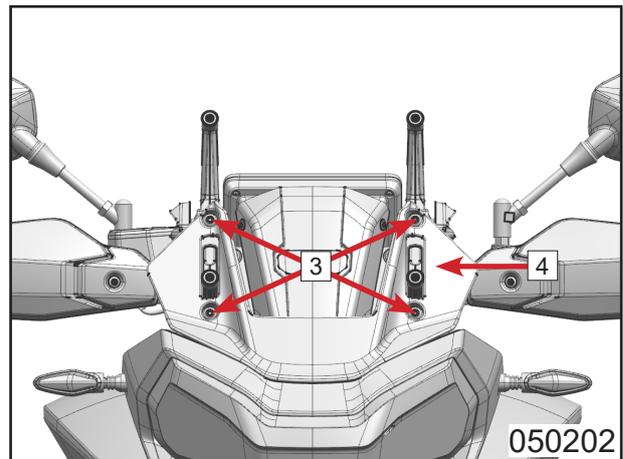
Remove inner hex bolts **1**.

Remove windshield **2**.



Remove inner hex bolts and washers **3**.

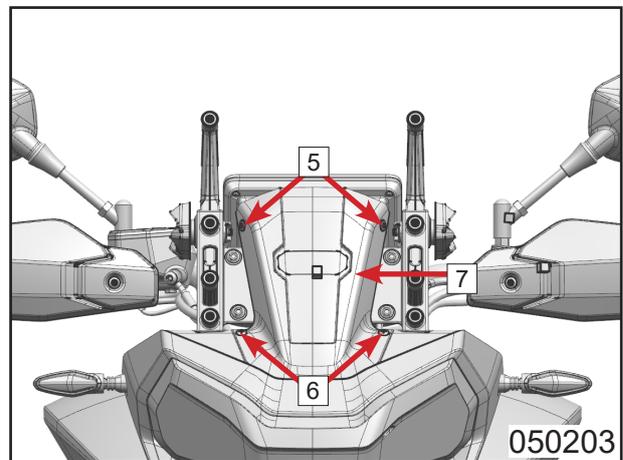
Remove small windshields **4**.



Remove expansion screws **5**.

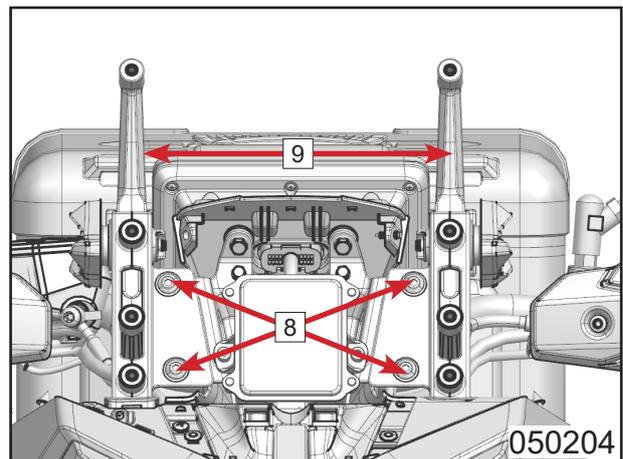
Remove screws **6**.

Remove dashboard front guard **7**.



Remove inner hex bolts **8**.

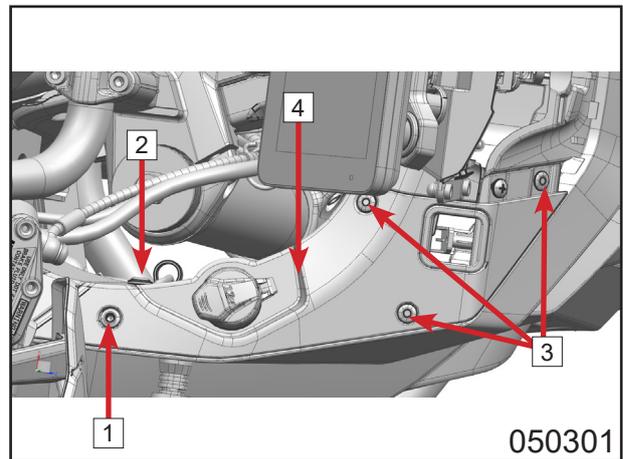
Remove LH&RH windshield brackets **9**.



5.2 LH&RH Steering Panels

Remove inner hex bolts **1** on both sides.
Remove expansion screws **2** on both sides.
Remove expansion screws **3** on both sides.
Remove LH&RH steering panels **4**.
Unplug USB connector and 12V power connector.

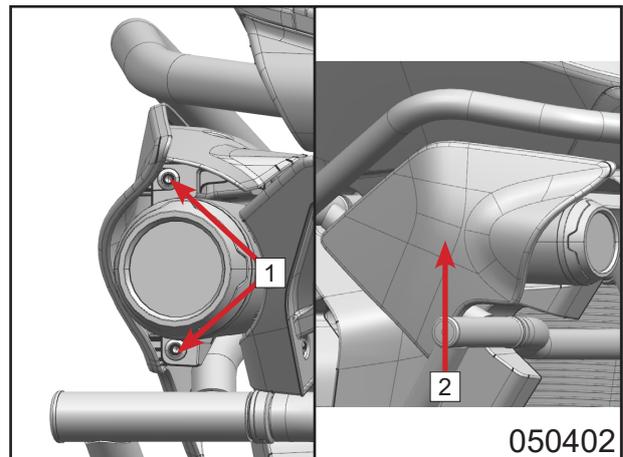
NOTE: 12V power connector may not be removed immediately.



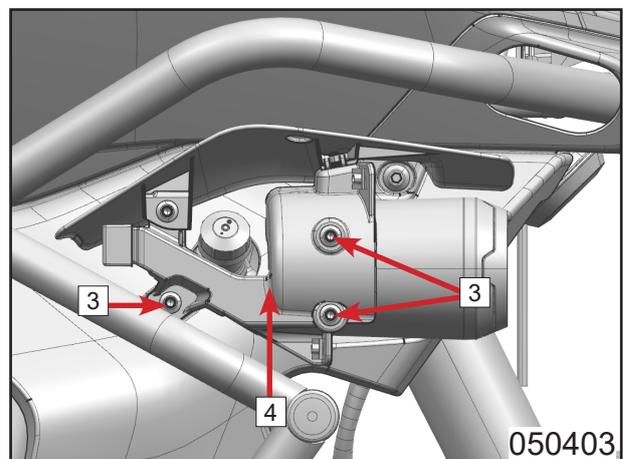
5.3 LH&RH Fog Light Guards

Remove inner hex bolts **1** on both sides.
Remove LH&RH fog light guards **2**.

NOTE: Use extension lever to remove upper inner hex bolts if necessary.

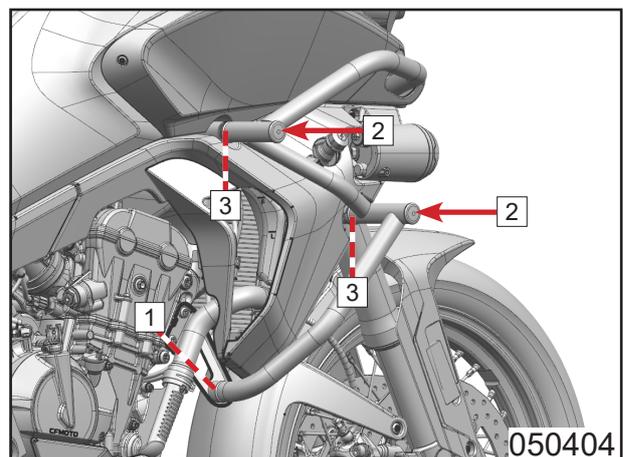


Remove inner hex bolts **3** on both sides.
Remove LH&RH fog light brackets **4**.



5.4 Bumpers

Remove inner hex bolt **1** on the back.
Remove bumper deco covers **2**.
Remove bolts **3**.

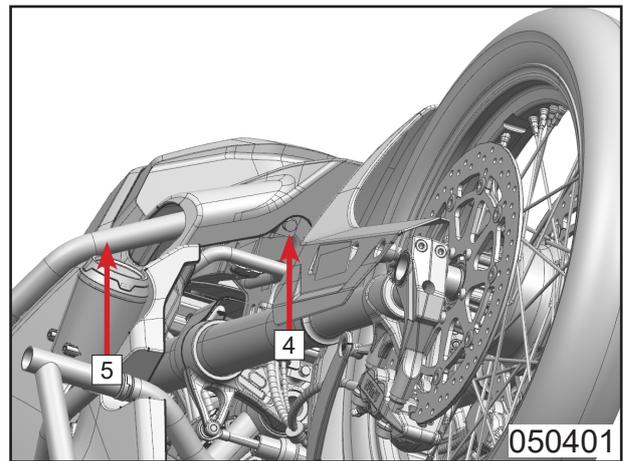


Body Covering Parts

Remove bolt [4].

Remove RH bumper [5].

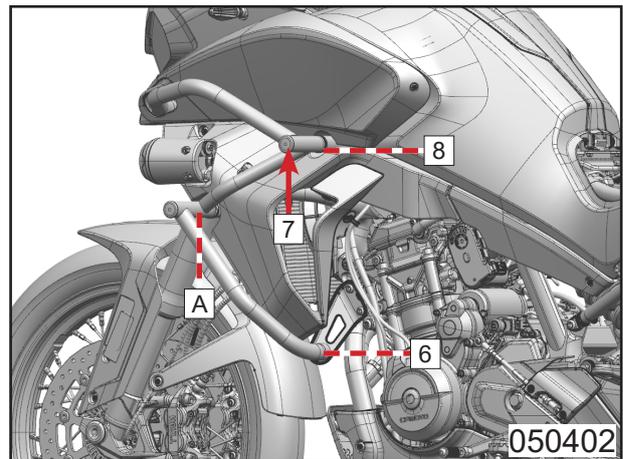
NOTE: Be careful not to drop bumper during removal.



Remove inner hex bolt [6] on the back.

Remove bumper deco cover [7].

Remove bolt [8].

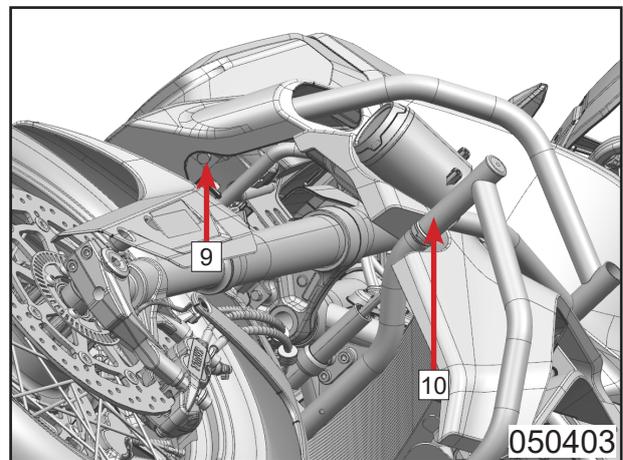


Remove bolt [9].

Remove LH bumper [10].

NOTE: Be careful not to drop bumper during removal.

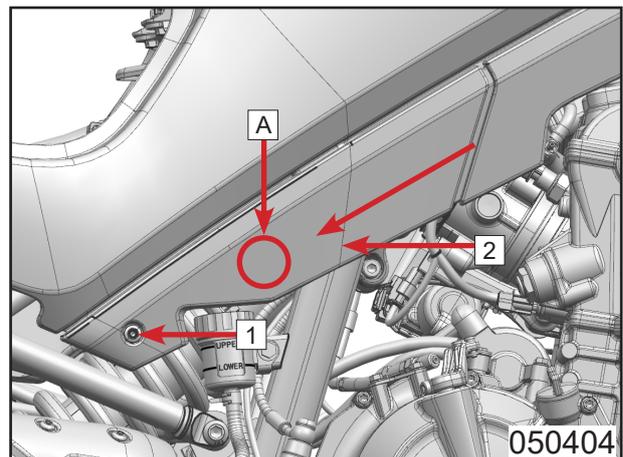
Loosen bolt A to help removing bumper if necessary.



Radiator LH&RH Rear Panels

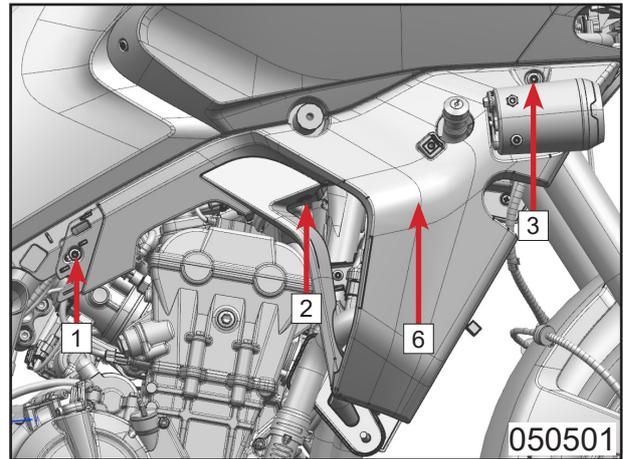
Remove inner hex bolts [1] on both sides.

Loosen tab A towards back side of the vehicle to remove radiator LH&RH rear panels [2].

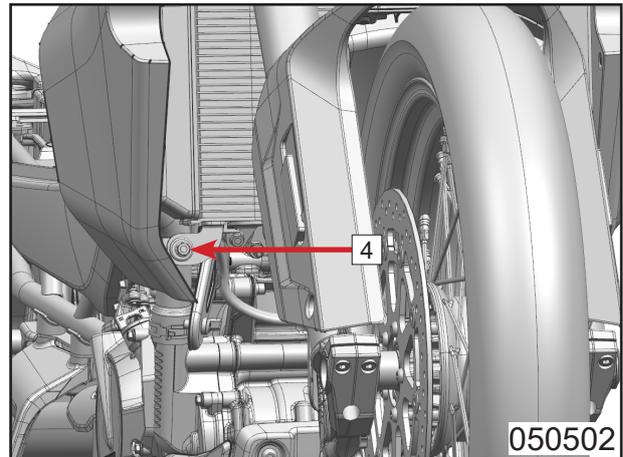


5.5 Fuel Tank Lower Panels and Fog Light Assy

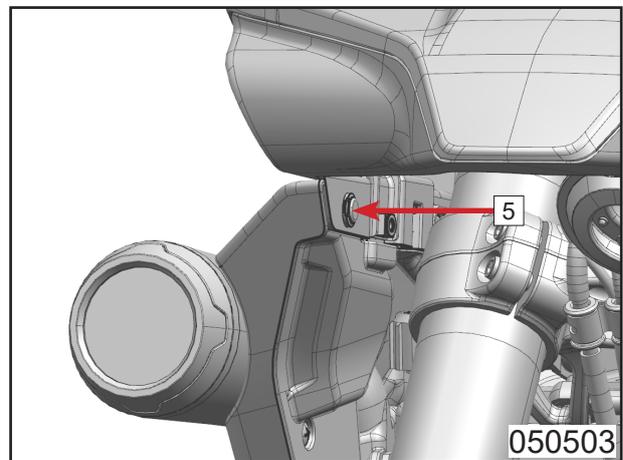
Remove inner hex bolts **1** on both sides.
Remove expansion screws **2** on both sides.
Remove inner hex bolts **3** on both sides.



Remove bolts **4** on both sides.

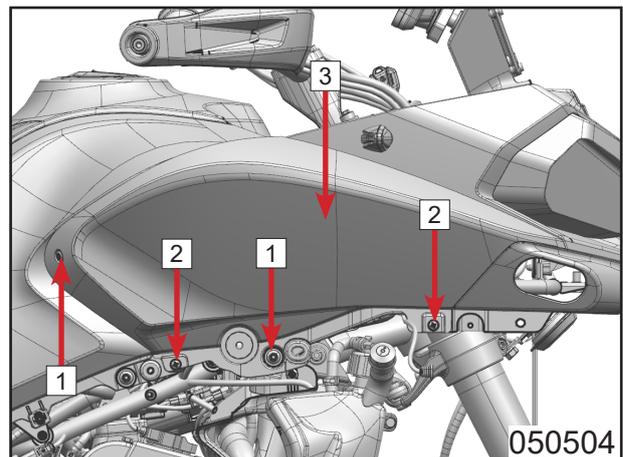


Remove expansion screws **5**.
Unplug connectors.
Remove fuel tank lower panels and fog light assy **6**.



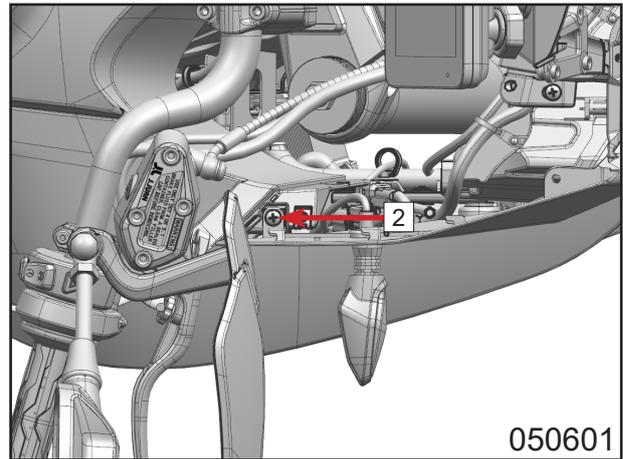
5.6 Fuel Tank LH&RH Front Panels

Remove inner hex bolts **1** on both sides.
Remove screws **2** on both sides.

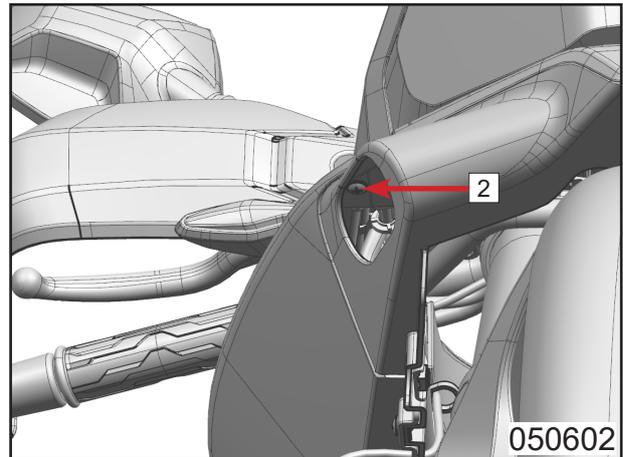


Body Covering Parts

Remove screws **2** on both sides.

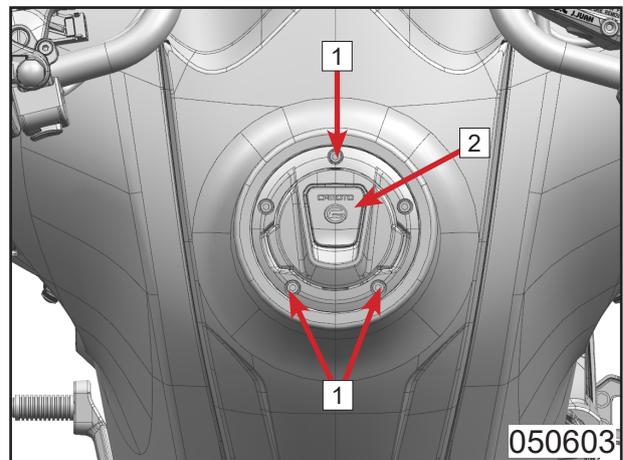


Remove screws **2** on both sides.
Remove fuel tank LH&RH front panels **3**.



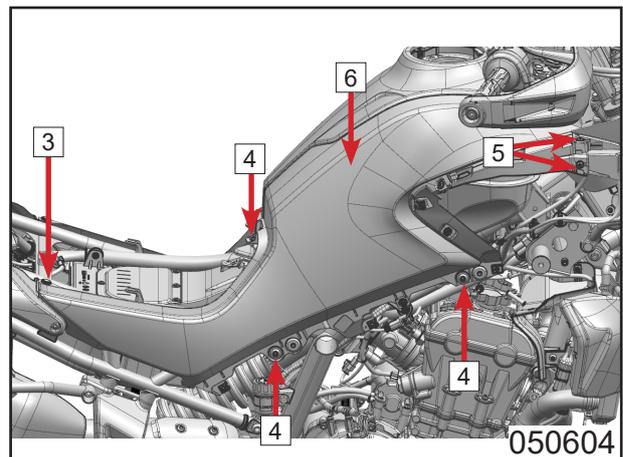
5.7 Fuel Tank Guard

Remove inner hex bolts **1**.
Remove fuel tank cap **2**.

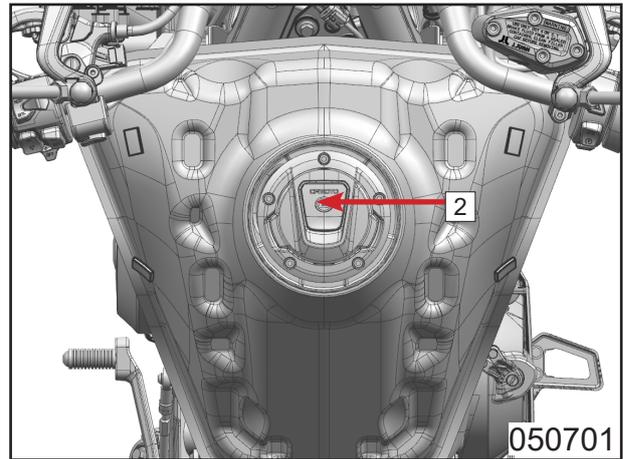


Remove expansion screws **3** on both sides.
Remove inner hex bolts **4** on both sides.
Remove screws **5** on both sides.
Remove fuel tank guard **6**.

NOTE: Loosen handlebar and adjust handlebar angle to help remove fuel tank guard if necessary.



Install fuel tank cap **2**.

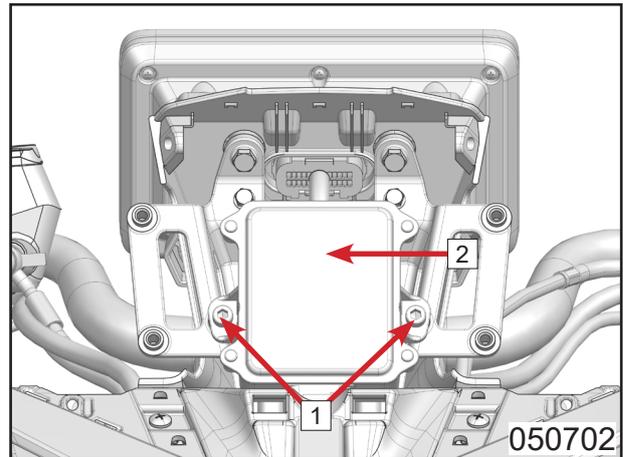


5.8 Dashboard

Remove inner hex bolts **1**.

Unplug connectors.

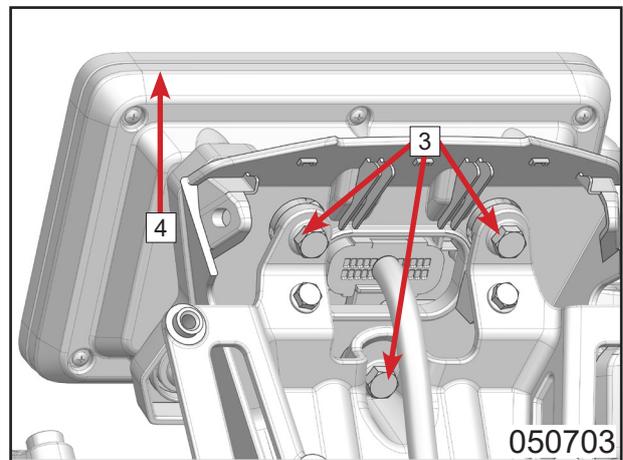
Remove headlight controller **2**.



Remove bolts **3**.

Unplug connectors.

Remove dashboard **4**.



5.9 Headlight Assy

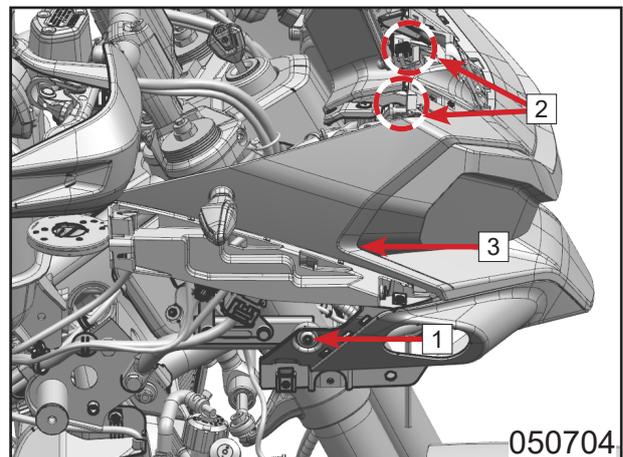
Remove inner hex bolts **1** on both sides.

Remove bolts **2**.

Remove clasps below.

Unplug connectors.

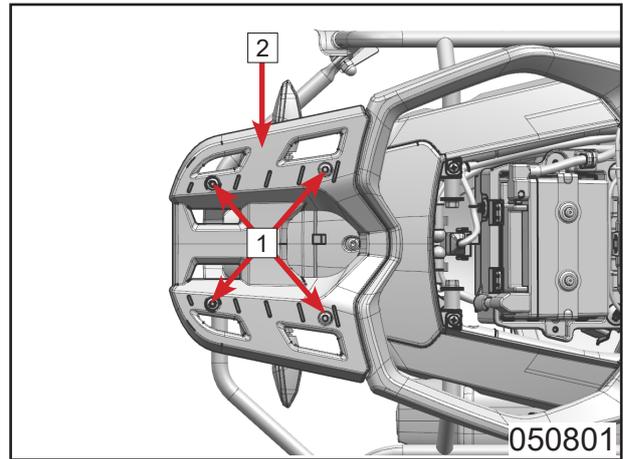
Remove headlight assy **3**.



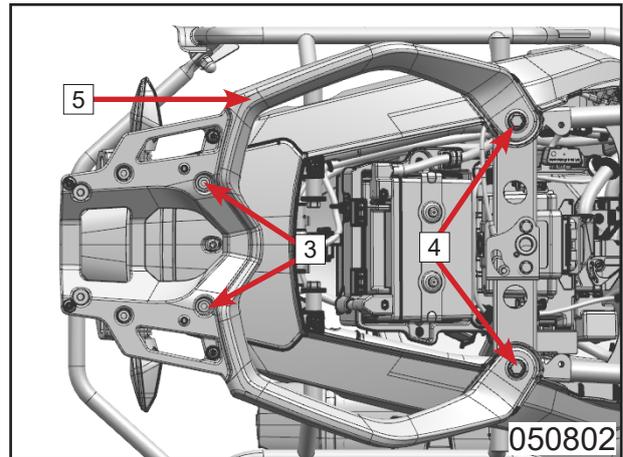
Body Covering Parts

5.10 Rear Armrest

Remove inner hex bolts **1**.
Remove tail box bracket **2**.

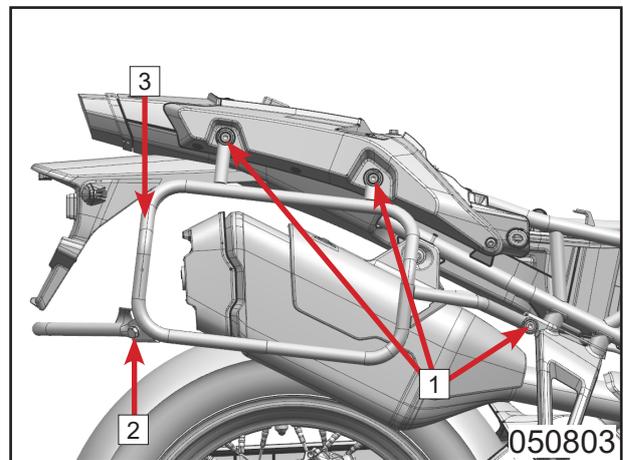


Remove inner hex bolts **3**.
Remove rear armrest **5**.

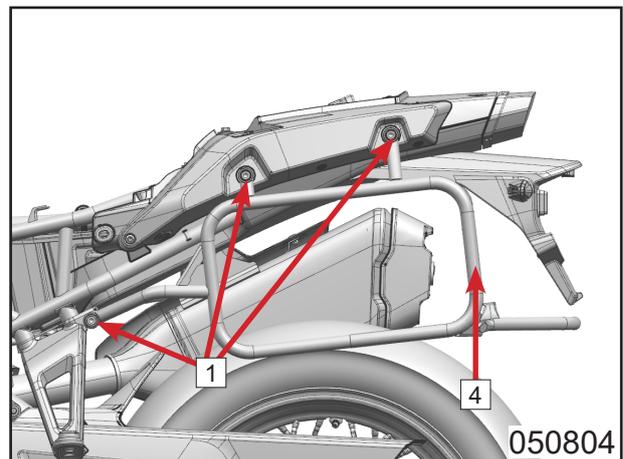


5.11 Side Box Bracket

Remove inner hex bolts **1** on both sides.



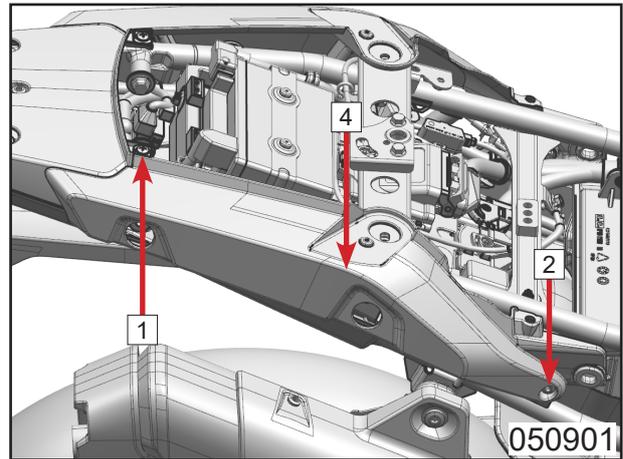
Remove inner hex bolts **1** on both sides.
Loosen bolts **2**.
Remove side box brackets **4**.



5.12 Tail Light LH&RH Panels

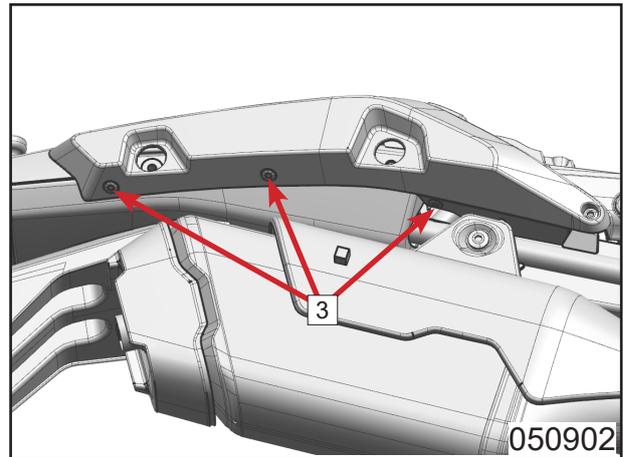
Remove LH&RH screws **1**.

Remove inner hex bolts **2** on both sides.



Remove expansion screws **3** on both sides.

Remove tail light LH&RH panels **4**.



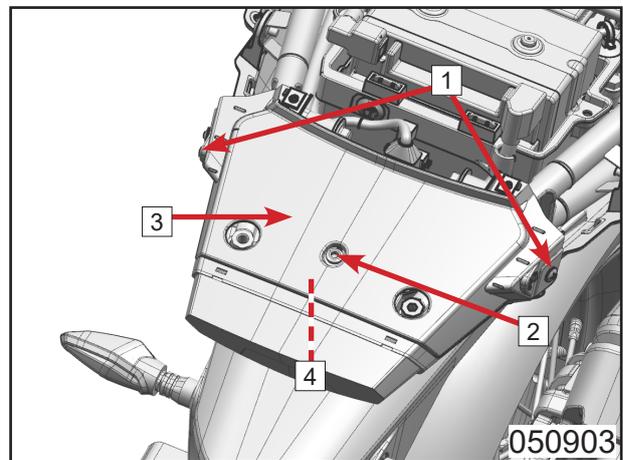
5.13 Tail Light Upper Cover

Remove screws **1**.

Remove inner hex bolts **2**.

Remove tail light upper cover **3**.

NOTE: Do not lose lock strip **4.**



FUEL SYSTEM

6.1 Fuel Tank Removal3
6.2 EVAP System3
6.3 Fuel Pump4
6.4 Floating Ball4

Fuel System

⚠ Danger:

In some situations, the gasoline is highly flammable and explosive.

Do not overfill the fuel tank. When the fuel reaches the neck of the oil filler, it is the maximum capacity.

The engine must be stopped when refueling and must be refueled in a well-ventilated area or outdoors

No smoking, open fire or sparkle in the refueling area or gasoline storage area.

If gasoline spills onto the skin or clothing, wash immediately with soap and water or change the clothes.

Seek medical attention immediately if accidentally contact your eyes or swallow gasoline.

⚠ WARNING:

Please use genuine parts for maintenance. Otherwise, the normal operation of the electronic injection system cannot be guaranteed.

During maintenance, do not disassemble electrical parts.

Carefully handle electrical parts during maintenance.

Turn the ignition switch off during unplugging or plugging in connectors to prevent damaging electrical 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 330kPa) 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.

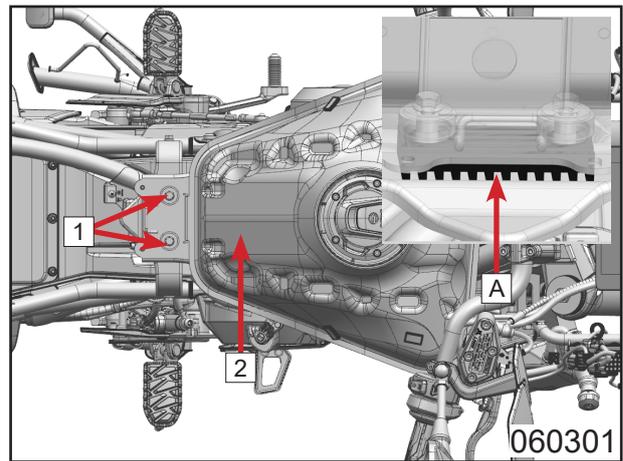
Establish the awareness of environmental protection and effective disposal of waste generated during maintenance.

6.1 Fuel Tank Removal

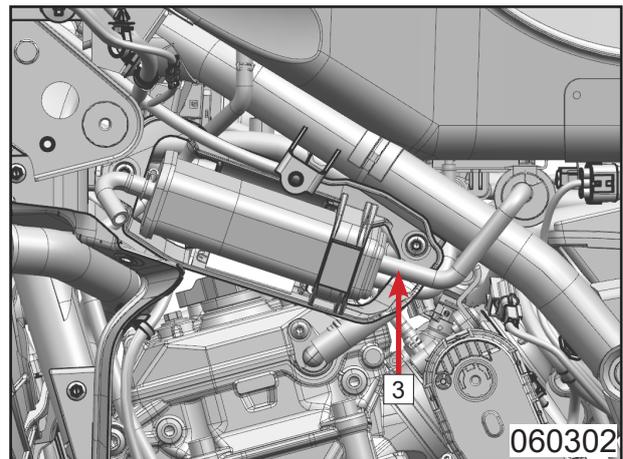
Remove bolts **1**.

Lift fuel tank **2**.

NOTE: Do not lose rubber washer **A**.



Unplug fuel adsorption pipe **3**.

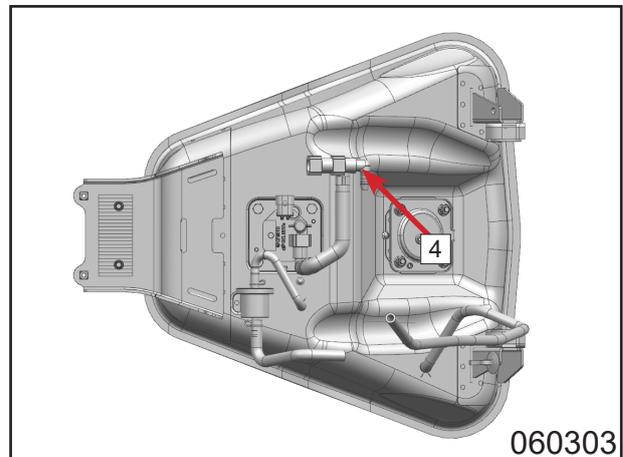


Unplug high-pressure fuel hose quick joint **4**.

Remove fuel tank assy.

⚠ Danger: Never put fuel tank up side down to prevent fuel leaking.

⚠ WARNING: When installing fuel tank, all hoses, pipes and cables can not be extruded.

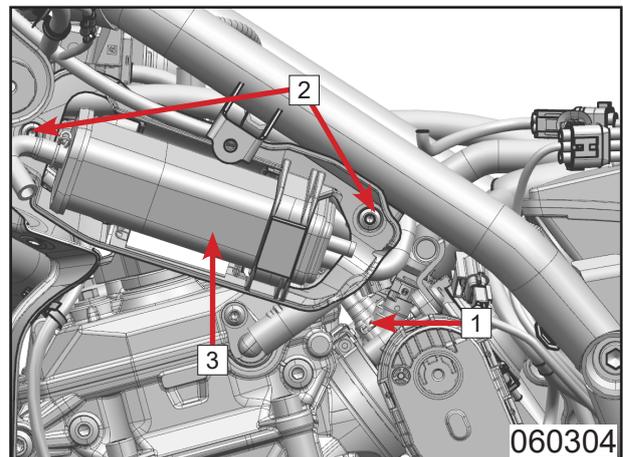


6.2 EVAP System

Remove throttle fuel desorption pipe **1**.

Remove inner hex bolts **2**.

Remove canister **3**.



Fuel System

6.3 Fuel Pump

Release pressure in fuel system.

Ground the vehicle.

Unplug cables related to fuel pump.

Unplug quick joint. Cover with cloth to prevent fuel leaking.

Remove fuel pump cables and connectors.

Clean fuel tank and fuel pump to prevent foreign matters into fuel tank.

NOTE: Excessive foreign matter in the tank may cause the fuel pump to wear out prematurely or block fuel filter.

Remove bolt 1 to bolt 4 in sequence.

Remove fuel pump 5 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

Put the fuel pump seal ring in place from bottom to top and then position the fuel pump on the mounting hole on fuel tank assy.

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

Put fuel pump cap on the junction area.

Install bolt 1 to bolt 4 in sequence.

Plug in quick joint, cables and connectors.

Start to check if fuel pump works.

Fuel pump inspection refers to 08 Electrical System.

6.4 Floating Ball

Release pressure in fuel system.

Ground the vehicle.

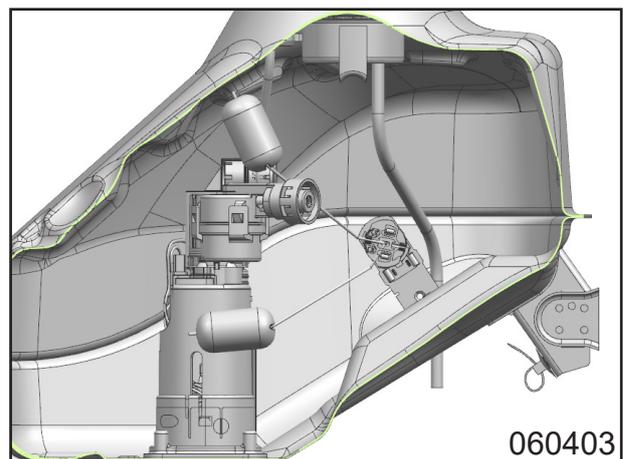
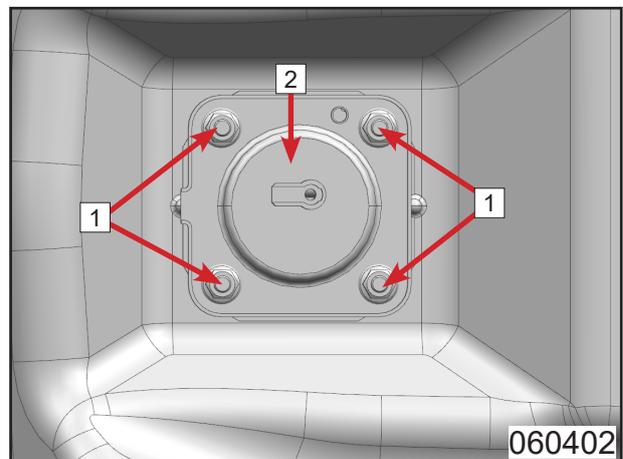
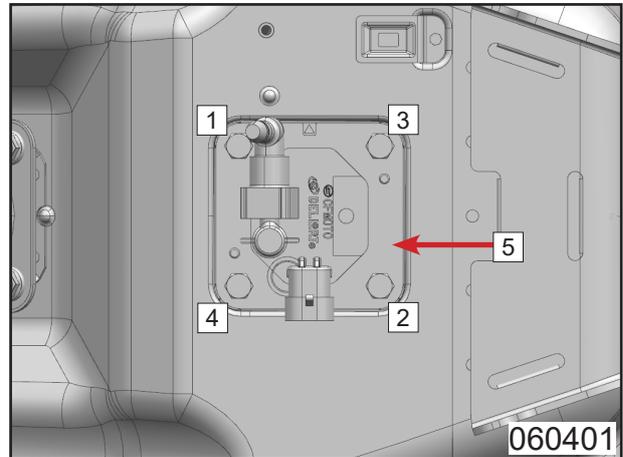
Remove four bolts 1 in criss-cross way.

Remove floating ball 2 carefully.

The floating ball is a bit bent. Lean floating ball during removal to prevent damage.

Installation

Make sure the floating ball face toward the back side of fuel tank. Wrong direction affects the position function of fuel floating ball.



Inspection

Inspect fuel tank if sunk, cracked or other damage. Replace if any defect is found.
Inspect hose if cracked, aged or leaked. Replace if any defect is found.

Installation

Reverse the removal procedures for installation.

NOTE: When installing fuel tank, all hoses, pipes and cables can not be extruded.

LIGHTS, DASHBOARD AND SWITCHES

7.1 Maintenance Information	07-2
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Lights, Dashboard and Switches

7.1 Maintenance Information

7.1.1 Operation Caution

⚠ WARNING:

If the Inspection has to be done check if the battery is normal.

Inspection of switch continuity can be done without removing the switches from the vehicle.

After the inspecting and overhauling of each part, cables and wires should be routed properly.

7.1.2 Inspection Standard

Item		Standard
Fuse	Main fuse	30A
	Auxiliary fuse	1×7.5A 1×10A 5×15A
Light&Bulb	Headlight	High-beam LED:35W Low-beam LED:26W Position light LED:12W
	Turn light	LED:0.5W×3
	Tail light	Rear position light LED:2W Brake light LED:1.5W
	Front fog light	LED:7.5W

7.2 Trouble Shooting

Head light cannot turn on, Hi/Lo switch doesn't work:

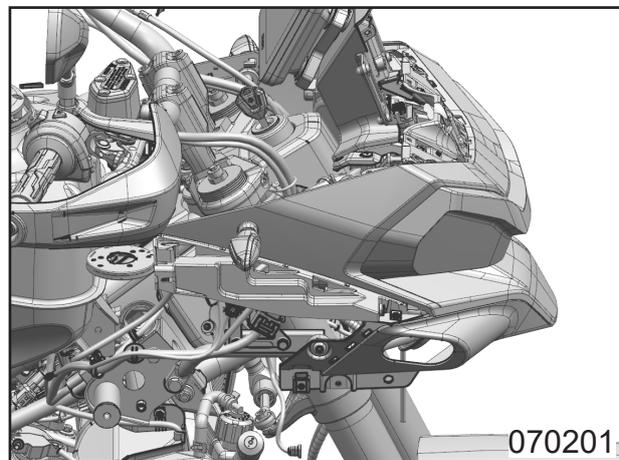
Probable cause:

- 1) Fuse is blown
- 2) Switch is damaged
- 3) Bulb is burnt
- 4) Bad connection
- 5) BCM fault
- 6) Headlight controller malfunction

Headlight

Removal

Refer to 5.10 Headlight Assy of 05 chapter.

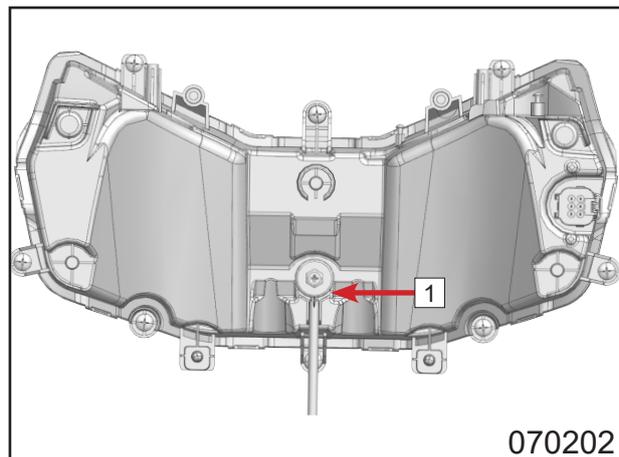


Adjust the headlight angle by adjusting the gear **1**.

Installation

Reverse the removal procedures for installation.

NOTE: The headlight is consisted of LED lights. When the light damages, replace the whole set.



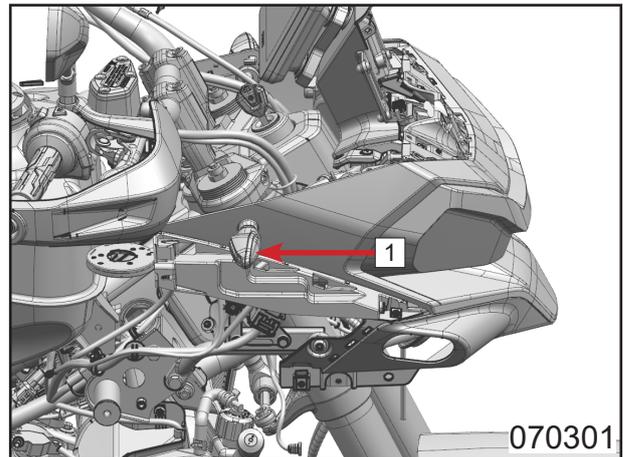
7.3 Turn Light

Front Turn Light

Refer to 5.10 Headlight Assy of 05 chapter.

Installation

Reverse the removal procedures for installation.



Rear Turn Light

Remove bolts 1.

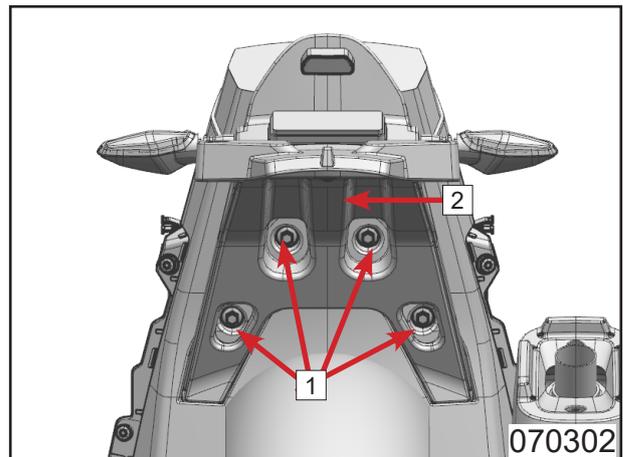
Remove rear fender 2 and rear turn lights.

Unplug connectors.

Installation

Reverse the removal procedures for installation.

NOTE: The turn lights are consisted of LED lights. When the light damages, replace the whole set.



7.4 Tail Light/Brake Light

Remove screws 1.

Remove bolt 2.

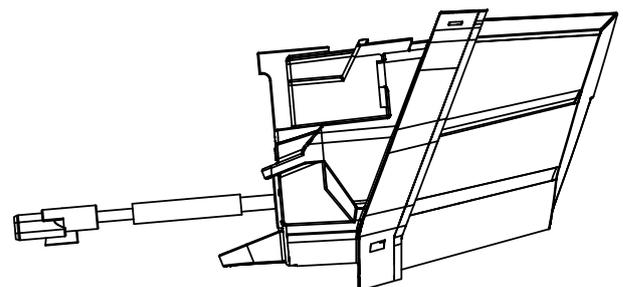
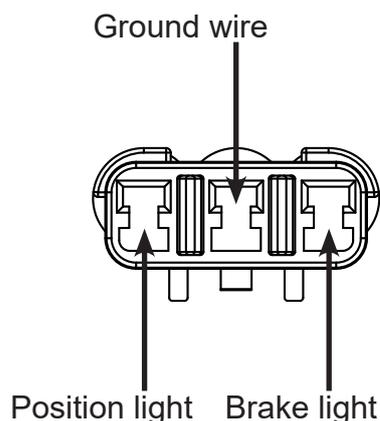
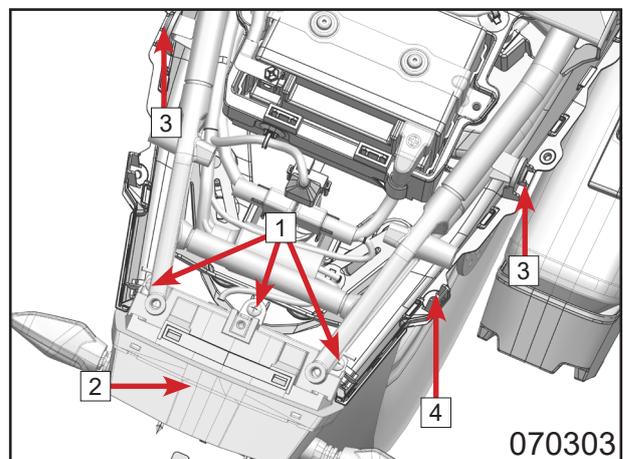
Remove tail light 3.

Remove inner hex bolts 3 if necessary. Shake frame skid plate to leave space for screws.

Installation

Reverse the removal procedures for installation.

NOTE: The tail light is consisted of LED lights. When the light damages, replace the whole set.



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Lights, Dashboard and Switches

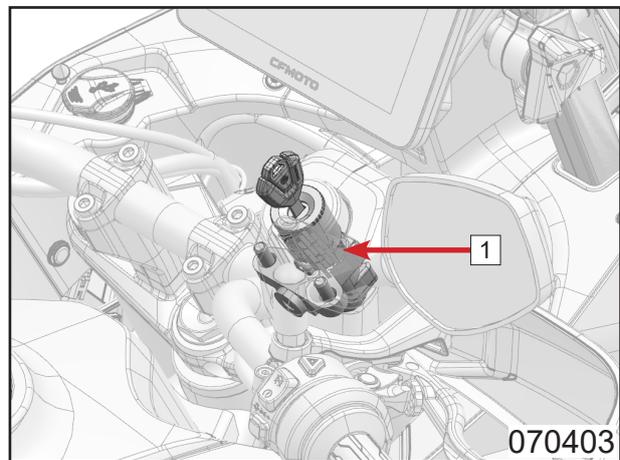
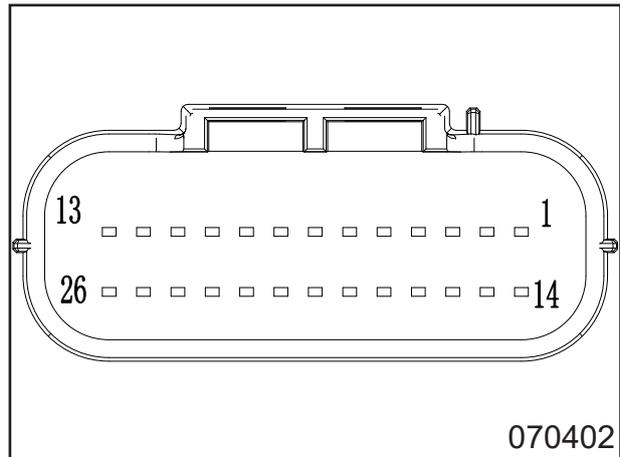
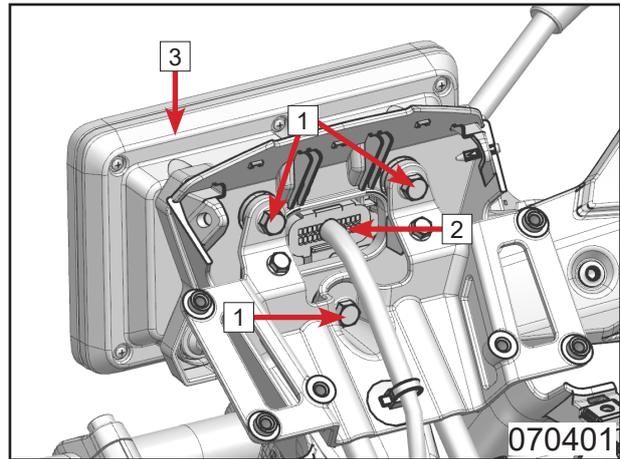
7.5 Dashboard

Refer to 5.9 Dashboard of 05 chapter.

Installation

Reverse the removal procedures for installation.

PIN	Item	Function
1	Power +	12V continuous power
5	Keypad 1	UP/LEFT
6	Keypad 2	DOWN/RIGHT
7	Keypad 3	OK
8	Keypad 4	Back
12	Keyless-go	Offer 12V power signal to light up indicator
14	Power lock	12V power switch signal
22	Ground	Signal ground
23	K-line(reserved)	
24	CAN_H	Speed signal, RPM signal, gear signal, turn signal, position light signal, high-beam signal, fog light signal, oil level signal, oil pressure signal, ABS signal, EFI signal, stop switch
25	CAN_L	
26	Power ground	GND



7.6 Ignition Switch

Inspection

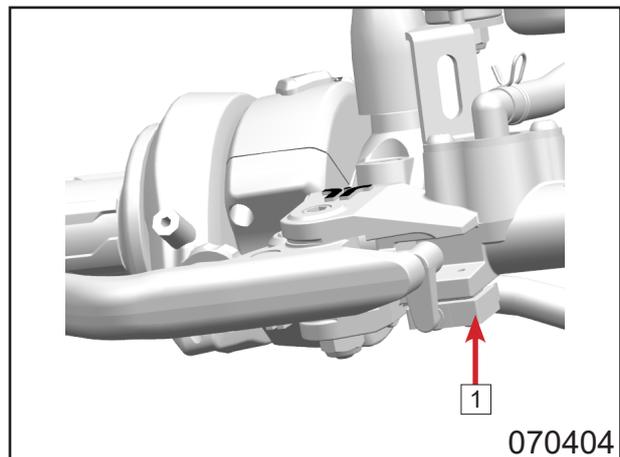
Pull out the connectors between ignition switch 1 and main cable to check its performance.

Ignition switch			
Action/Color	R	B	Occlusion reaches out or not
			No
			No
			Yes

7.7 Front Brake Light Switch

Pull out the connectors between front brake light switch 1 and main cable to check its performance.

- 1) Grip front brake lever, the brake light is on.
- 2) Loosen front brake lever, the brake light is off.



7.8 LH Handlebar Switch

Unplug the connectors between LH handlebar switch and main cable to check its performance.

Menu Button A1			
Function \ Color	G/B	Gr/W	W/G
△	●	●	
▽	●		●

Menu Button B2			
Function \ Color	G/B	Y/B	W/Y
↶	●	●	
SET	●		●

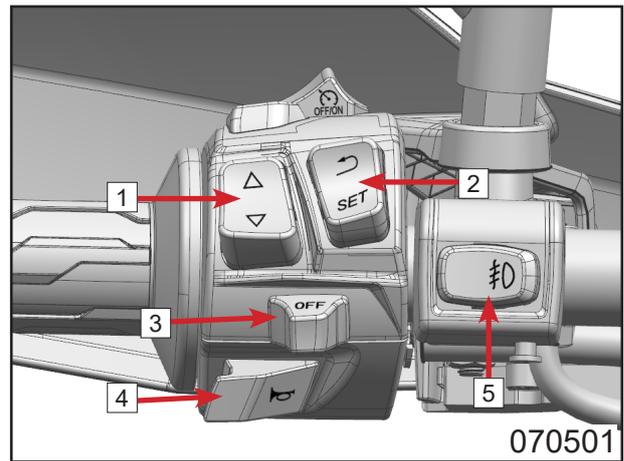
Turn switch 3				
Function \ Color	O	G/B	B/W	Sb
↶	●	●		
OFF		●	●	
↷		●		●

Horn switch 4		
Function \ Color	Lg	G/B
📢	●	●

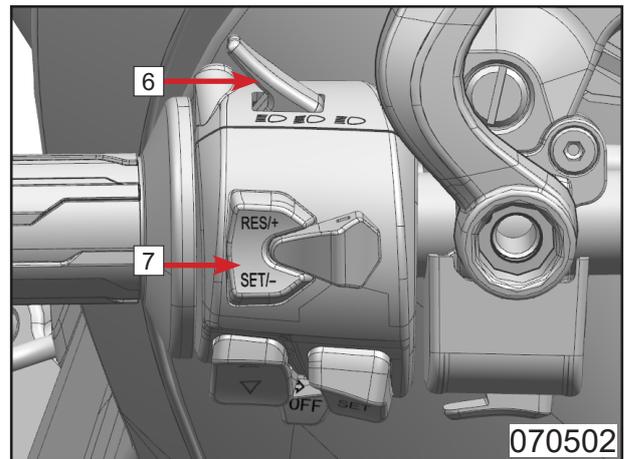
Fog light switch 5 		
Function \ Color	Y/L	G/B
ON	●	●
OFF		

Dimmer switch 6		
Function \ Color	L/Gr	G/B
	●	●
		
	●	●

Cruise switch 7				
Y/W	620 Ω ± 2%	750 Ω ± 2%	1500 Ω ± 2%	6200 Ω ± 2%
R/W				
		SET/-	RES/+	

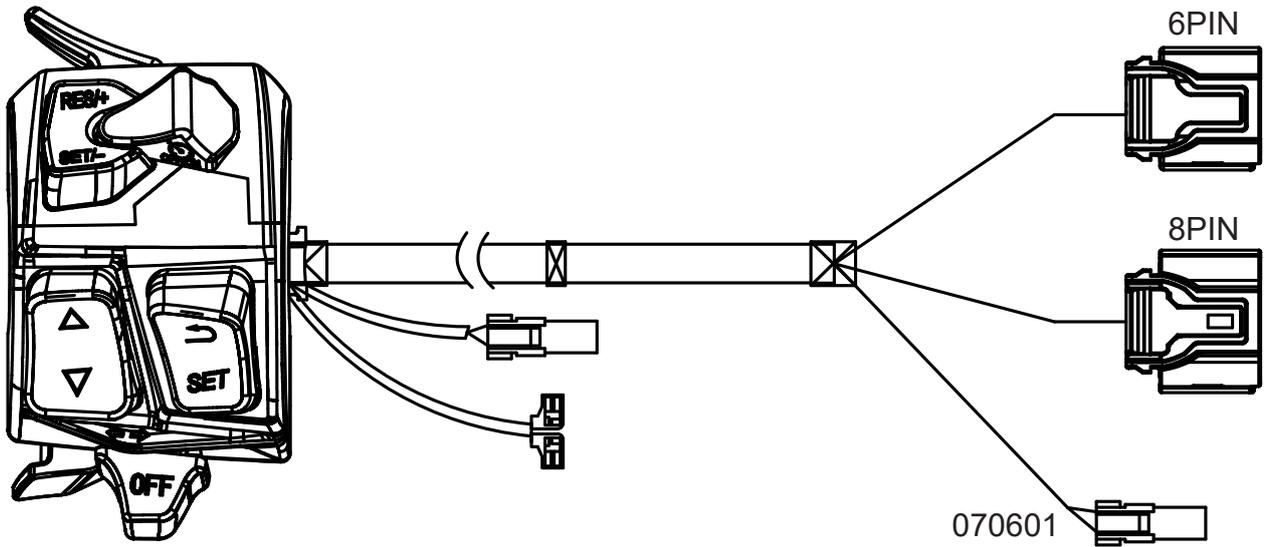


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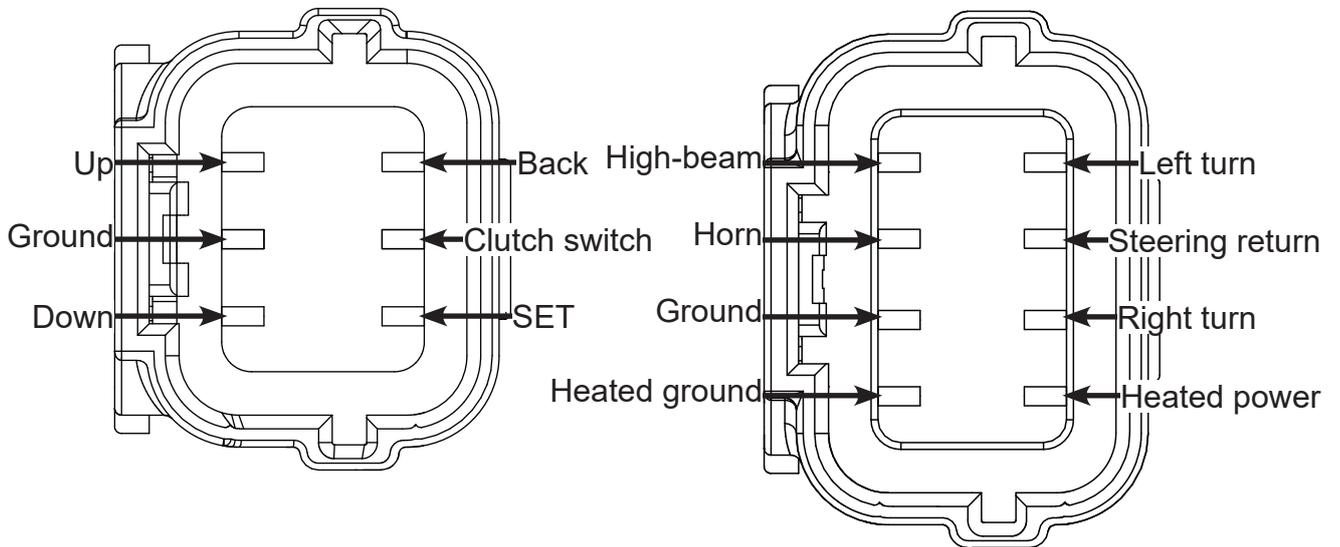
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Lights, Dashboard and Switches



6PIN

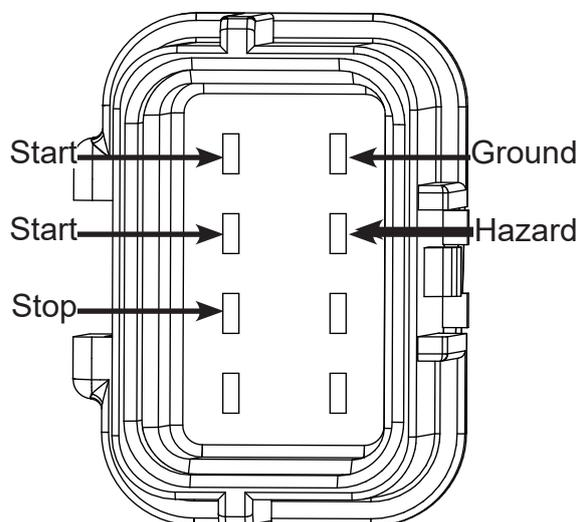
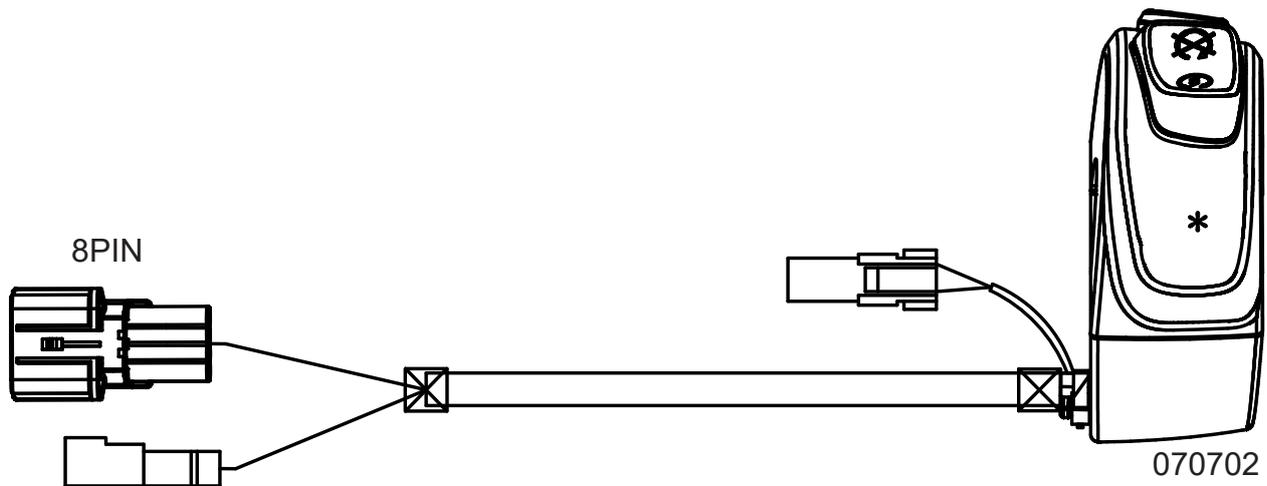
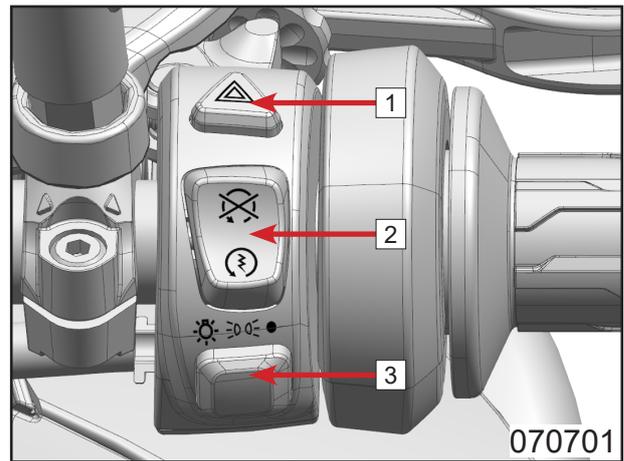
8PIN



7.9 RH Handlebar Switch

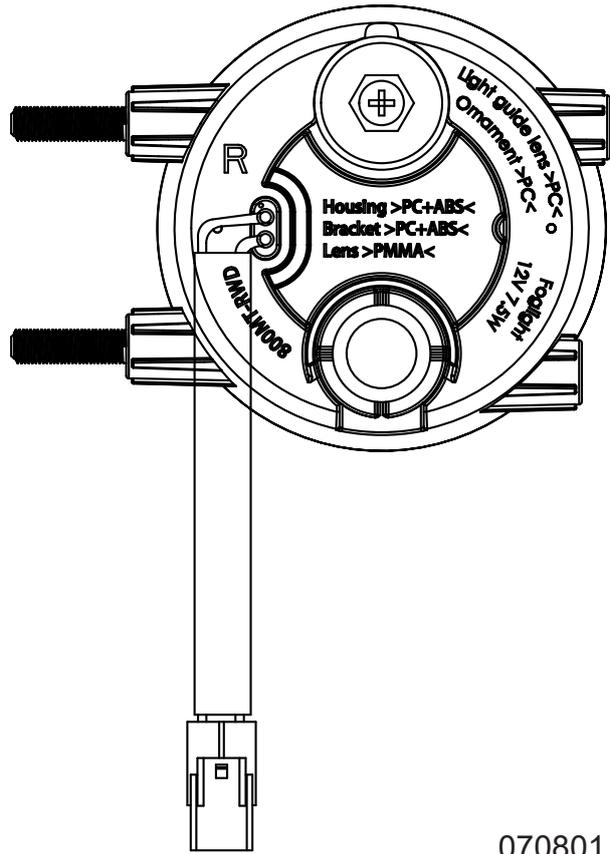
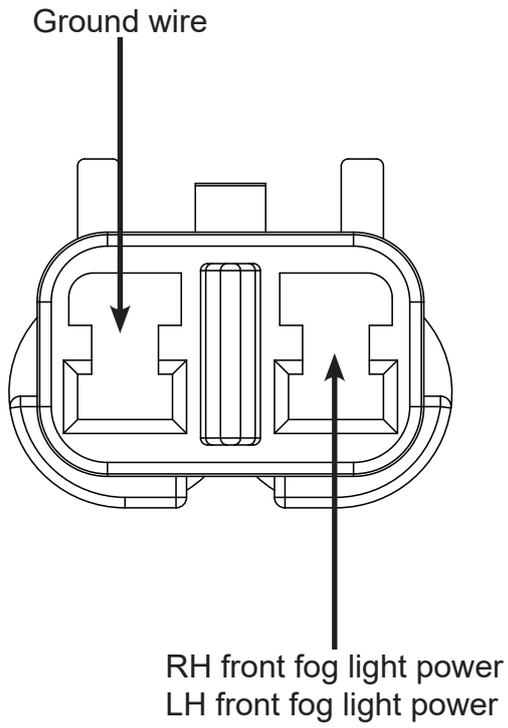
Unplug the connectors between RH handlebar switch and main cable to check its performance.

Hazard switch 1		
Function	Color	
	Lr	G/B
	●—————●	
Start switch 2		
Function	Color	
	G/R	Y/W
	●—————●	
Stop switch 2		
Function	Color	
	B/Br	G/B
	●—————●	
Illumination switch 3		
Function	Color	
	L/W	G/W
	●—————●	
	●—————●	



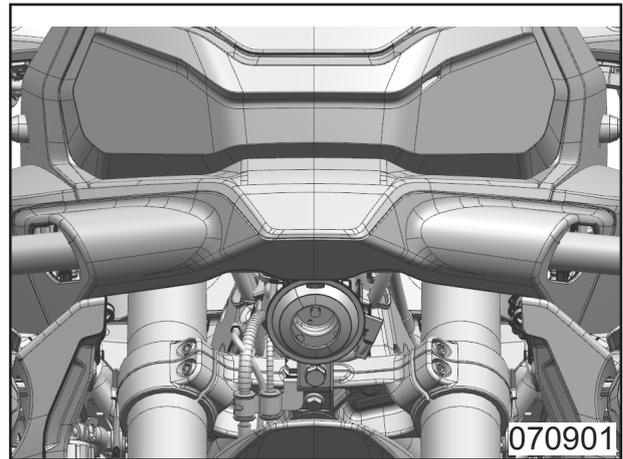
Lights, Dashboard and Switches

7.10 Fog Light



7.11 Horn

Unplug horn connector. Connect with 12V battery to check If the horn works well and the sound is loud and clear. Otherwise, replace with a new horn.

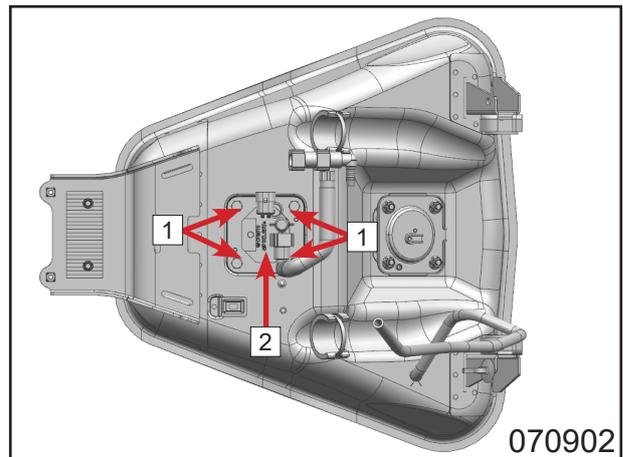


7.12 Fuel Level Sensor

Remove four nuts **1**.

Remove fuel level sensor **2**.

⚠ CAUTION: Remove fuel level sensor slowly, in case it deforms.



Inspection

Inspect fuel level sensor seal ring **3** for deformation, damage or hardening. Replace if it does.

Check the electrical resistance of the oil level sensor at high and low poles.

Resistance:

High: $10\Omega \pm 2\Omega$

Low: $100\Omega \pm 2\Omega$

Connect fuel level sensor and main cable. Turn on ignition switch, the floater of fuel level sensor swings up and down slowly. See the fuel gauge **4** pointer on dashboard.

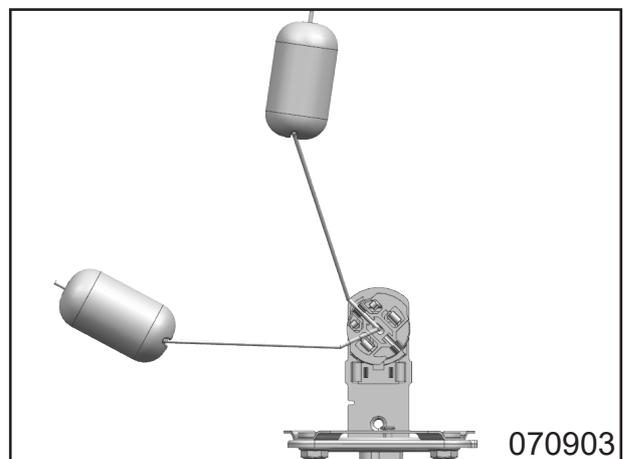
If the pointer can not reach F or E, it means the fuel gauge is not qualified, replace a new one.

If the pointer swings unsteadily, it means the fuel gauge is not qualified, replace a new one.

Installation

Reverse the removal procedures for installation.

⚠ CAUTION: Check leakage after fuel level sensor installation.



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Lights, Dashboard and Switches

7.13 Battery

⚠️ WARNING:

1. Even if the battery is not used, it also loses power every day.
2. Charging condition and charging mode are very important for the service life of the battery. Using high charging current will have a negative impact on the service life.
3. If the charging current, charging voltage and charging time are exceeded, the battery will be damaged.
4. If the battery becomes empty due to repeated start of the vehicle, it needs to be charged immediately.
5. When the battery is stored in the discharge condition for a long time, deep discharge and sulfuric acid salination will occur, which damages the battery.
6. The battery does not need to be maintained, which means the acid level does not need to be checked.
7. Battery wires are not allowed to be removed while the engine is working.
8. It is forbidden to puncture the wire to test the input/output electrical signals.
9. Establish the awareness of environmental protection and effective disposal of waste generated during maintenance.

Removal

Remove rear seat.

Remove battery negative wire lock bolt **1**.

Remove negative wire from the battery.

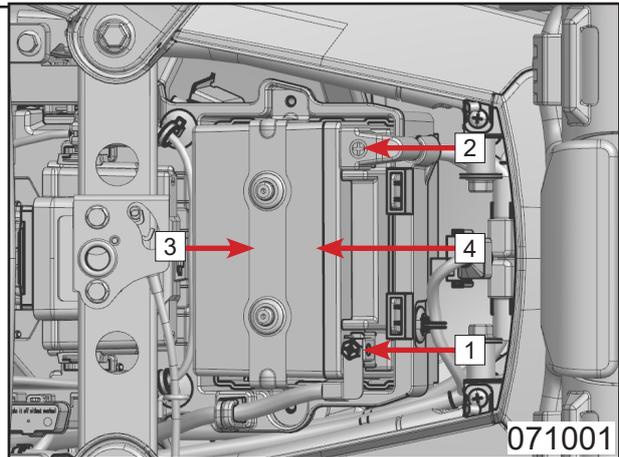
Remove battery positive wire lock bolt **2**.

Remove positive wire from the battery.

Remove battery bracket **3**.

Remove battery **4**.

⚠️ CAUTION: Negative wire must be removed first. Otherwise, it will cause battery short circuit.



Installation

Reverse the removal procedures for installation.

Charge

Shut down all the electrical devices and engine.

Remove battery.

Connect charger and battery.

After charging, remove the charger from the battery.

NOTE: If the vehicle is not used, recharge the battery every three months.

Charging Voltage Inspection

The battery has proper performance and is fully charged.

Start the vehicle and measure the voltage.

Measuring point is positive pole (+), the other measuring point connects ground (-).

Charging Voltage	
5000rpm	13.5V~15.0V

If less than specification:

Inspect the connectors between engine and regulator.

Inspect the connectors between regulator and cables.

Inspect engine electronic winding.

If more than specification:

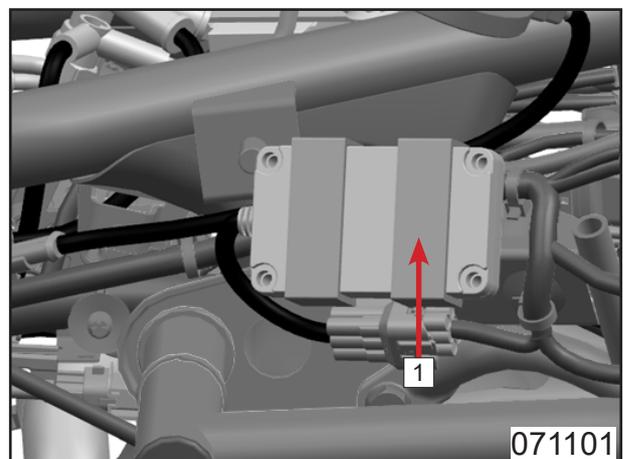
Replace regulator.

7.14 Vehicle T-BOX

T-BOX is tied up by rubber strap on T-Box bracket. T-Box bracket is welded on headlight bracket.

Remove T-BOX **1**.

Inspect connectors for performance.



Installation

Reverse the removal procedures for installation.

7.15 Ground Wire

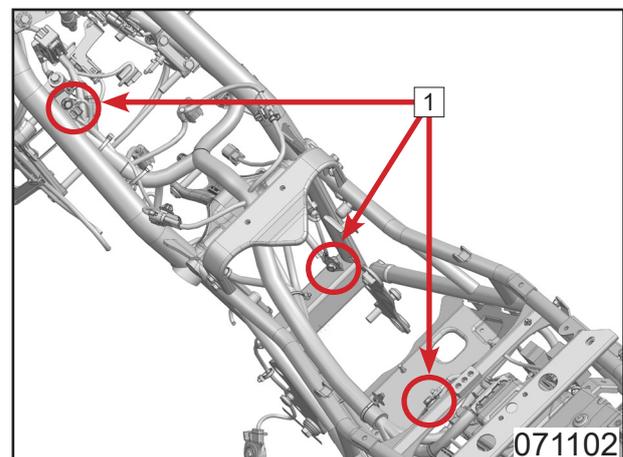
Ground point locates under main seat and rear frame behind air filter.

Inspection

Shut down engine and all electrical parts.

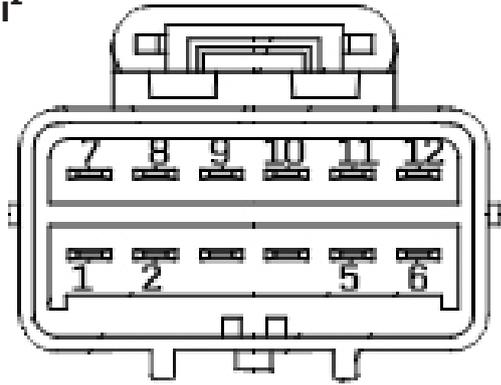
Inspect ground wire.

Inspect bolt **1** for looseness.

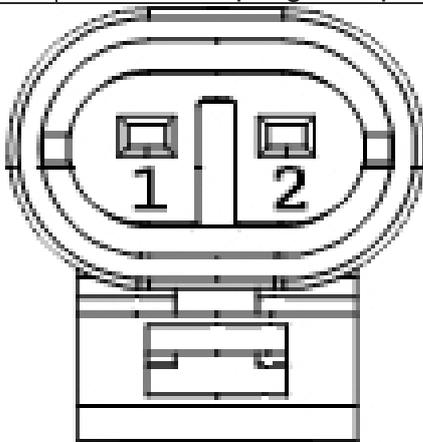


Lights, Dashboard and Switches

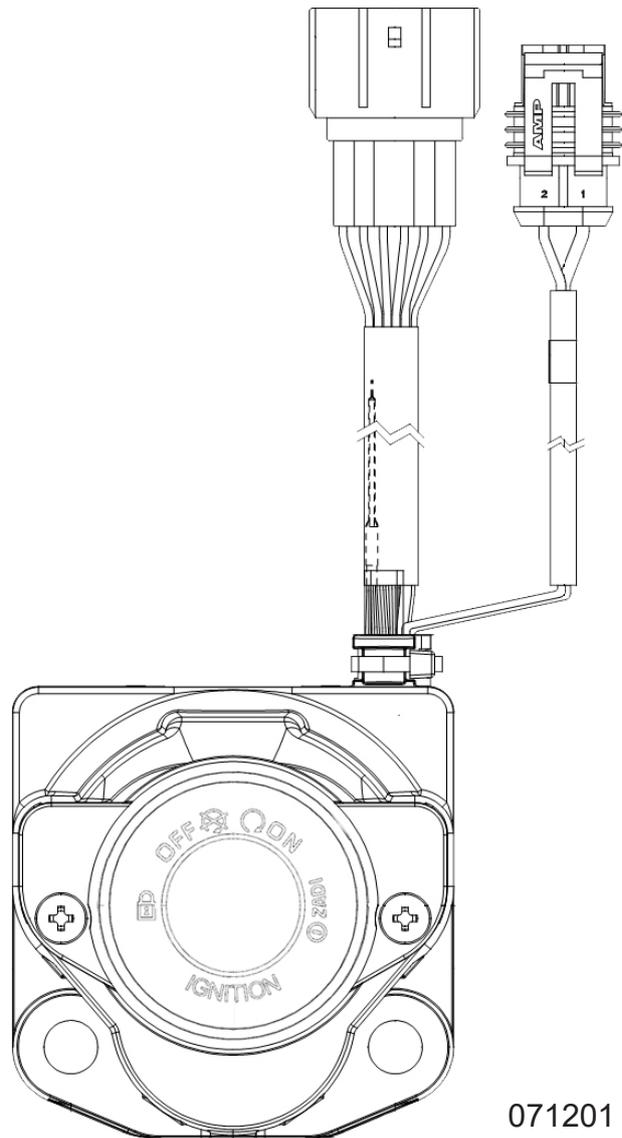
7.16 Start Engine Stop Control Unit



PIN	Function
1	Continuous power
2	Ground
5	Lock/Unlock button (input)
6	Lock input signal
7	Output T15
8	LED output signal
9	CAN_H
10	CAN_L
11	Fuel tank cap power
12	Fuel tank cap signal input

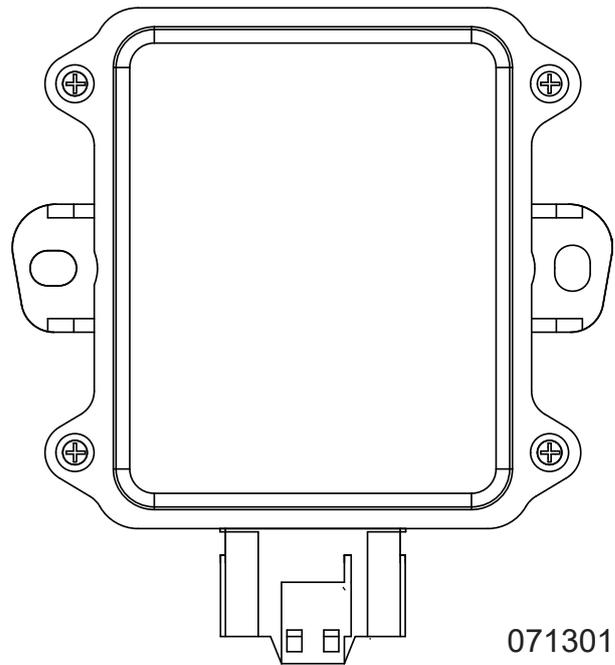
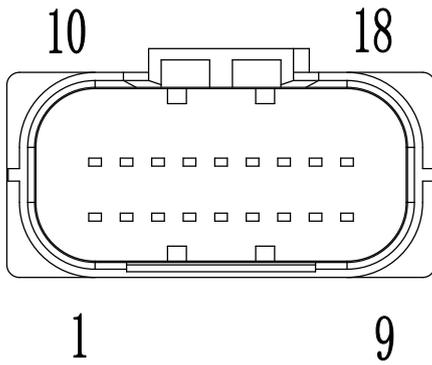


PIN	Function
1	Input/Output
2	Input/Output



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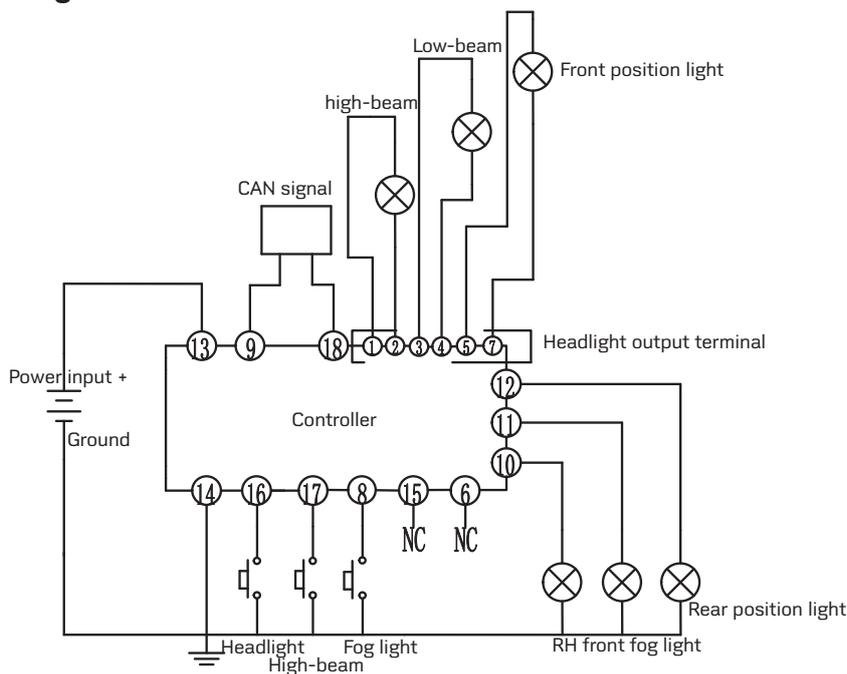
7.17 Headlight Controller



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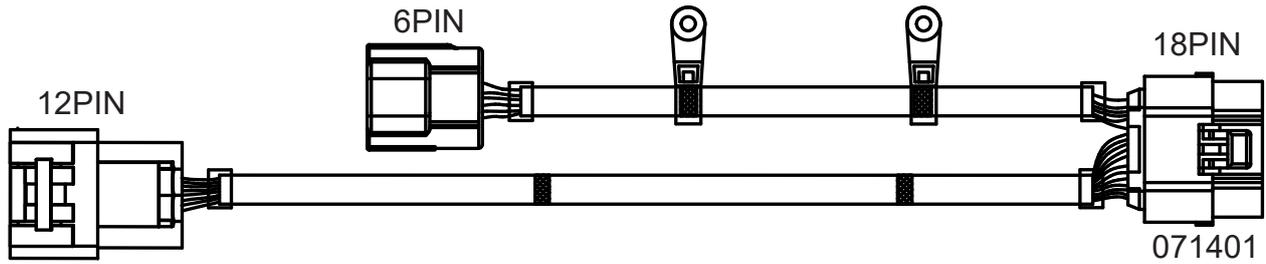
PIN	Function
1	High-beam +
2	High-beam -
3	Low-beam +
4	Low-beam -
5	Front position light +
6	/
7	Front position light -
8	Fog light switch
9	CAN_H
10	LH fog light output
11	RH fog light output
12	Rear position light output
13	Ignition lock power
14	Ground
15	/
16	Illumination switch
17	High-beam switch
18	CAN_L

Diagram

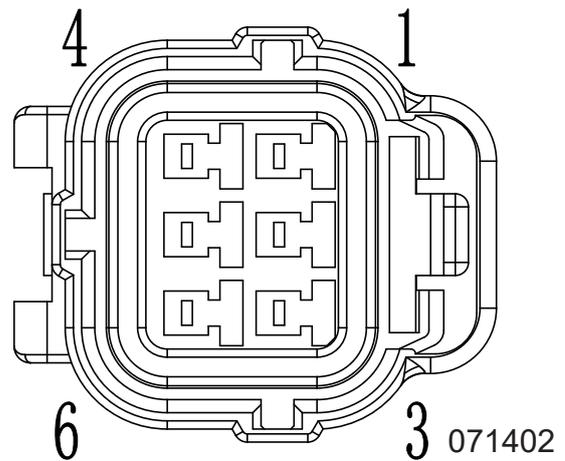


Lights, Dashboard and Switches

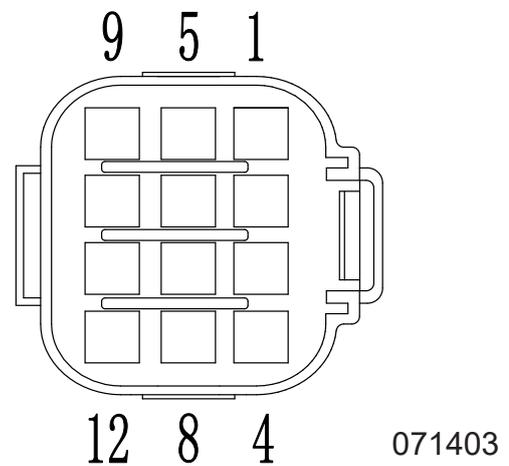
7.18 Headlight Cable



6PIN Connector	
PIN	Function
1	High-beam +
2	High-beam -
3	Low-beam +
4	Low-beam -
5	Front position light +
6	Front position light -

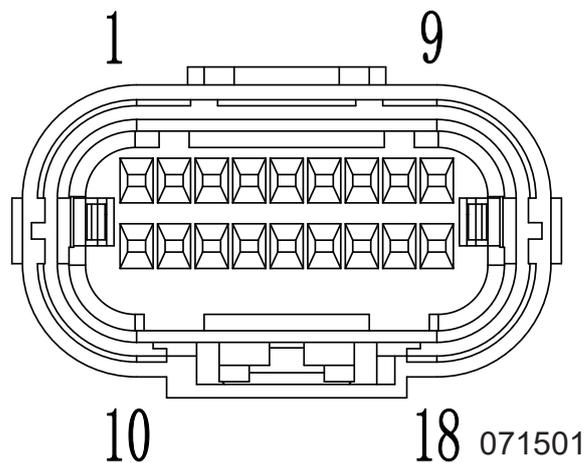


12-PIN Connector	
PIN	Function
1	LH fog light output
2	CAN_L
3	CAN_H
4	Ignition lock power
5	Fog light switch
6	Ground
7	Illumination switch
8	High-beam switch
9	Rear position light output
10	RH fog light output
11	/
12	/



Lights, Dashboard and Switches

18PINConnector	
PIN	Function
1	High-beam +
2	High-beam -
3	Low-beam +
4	Low-beam -
5	Front position light +
6	/
7	Front position light -
8	Fog light switch
9	CAN_H
10	LH fog light output
11	RH fog light output
12	Rear position light output
13	Ignition lock power
14	Ground
15	/
16	Illumination switch
17	High-beam switch
18	CAN_L



ELECTRICAL SYSTEM

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Electrical System

8.5 Trouble Diagnosis by Engine Error	08-29
8.6 Vehicle Control Unit	08-39

8.1 Service Tool

PDA

Function:

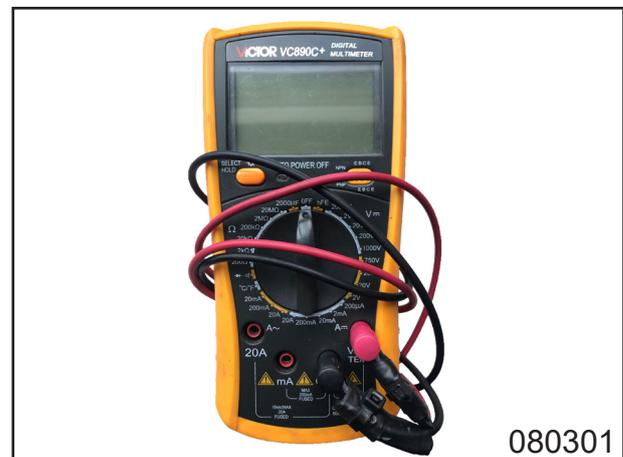
Read erase trouble code of EFI system, observe data flow and accessories test etc.



Digital multimeter

Function:

Inspect the parameter of EFI system like voltage, current and resistant etc.



Electrical System

8.2 Charging System

8.2.1 Charging Diagram

8.2.2 Magneto Coil Resistance

Measure 3-phase magneto stator coil resistance.

If the resistance is out of specification, replace with a new stator.

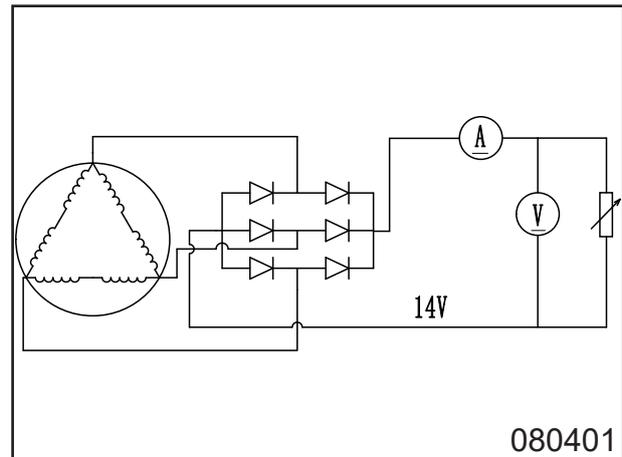
MAG Coil Resistance:

0.55Ω~1.5Ω (Yellow-Yellow)

Resistance between Stator Coil and Core:
∞Ω (Yellow-Ground)

Check for the insulation between stator coil and core.

Turn multimeter to 1×10Ω



8.2.3 MAG Non-loaded Performance

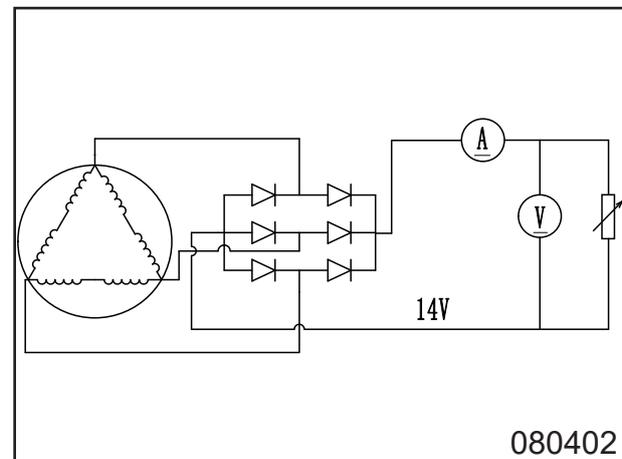
Start the engine and allow it run at 5000r/min. Use multimeter to measure the voltage between 3 output lines.

If the reading is below specification, replace with a new magneto.

Turn Multimeter to **V(AC)**.

Voltage between Output Lines When MAG Non-loaded:

>50V(AC) at 5000r/min



8.2.4 Starter Relay

Put DC12V between positive and negative terminal. Use multimeter to check connection between 2 contacts.

If multimeter clicks, there is connection.

If DC12V is removed, no connection between contacts.

If both above 2 items are proved, it indicates the replay is good. Turn multimeter to DIODE.

⚠ CAUTION: The voltage loaded between terminals can not exceed 2 minutes. Otherwise, starter relay may overheat or burn.

Use multimeter to measure the start relay coil resistance.

If the resistance is out of standard, replace with a new one.

Turn multimeter to 1X10 Ω

Start auxiliary relay resistance: 3 Ω ~5 Ω

Auxiliary Relay

Put 12V between auxiliary starter relay positive and negative terminal. Use multimeter to check the continuity between A and B.

Turn multimeter to DIODE.

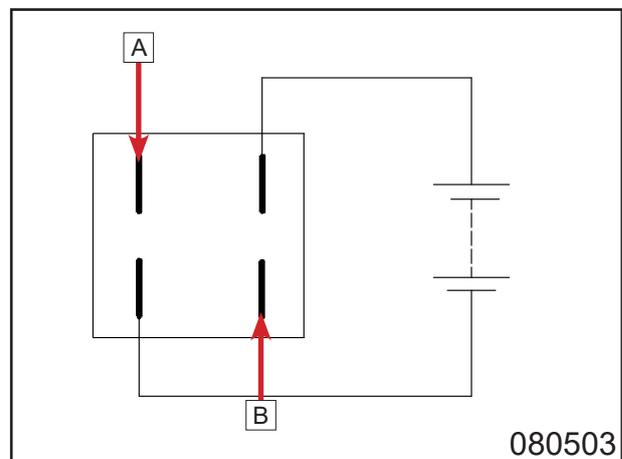
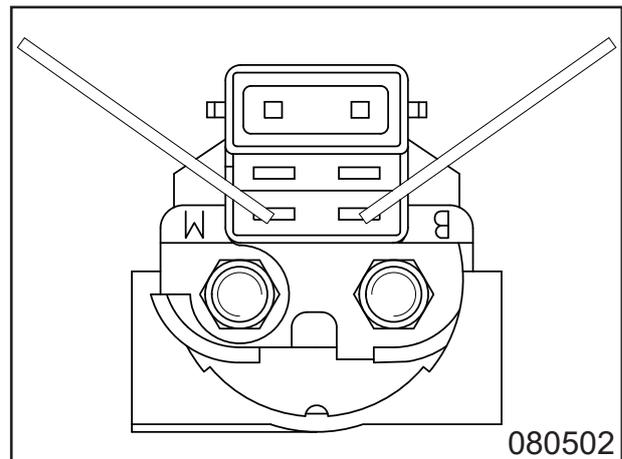
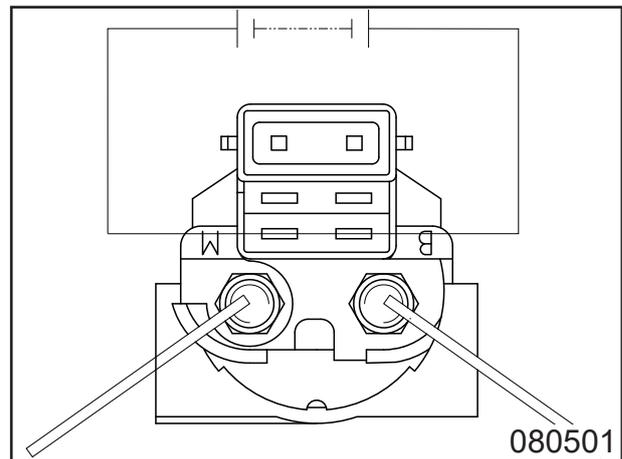
If multimeter clicks, it indicates there is connection between A and B.

If 12V is removed, no connection remains between contacts.

If both above 2 items are proved, it indicates the replay is good.

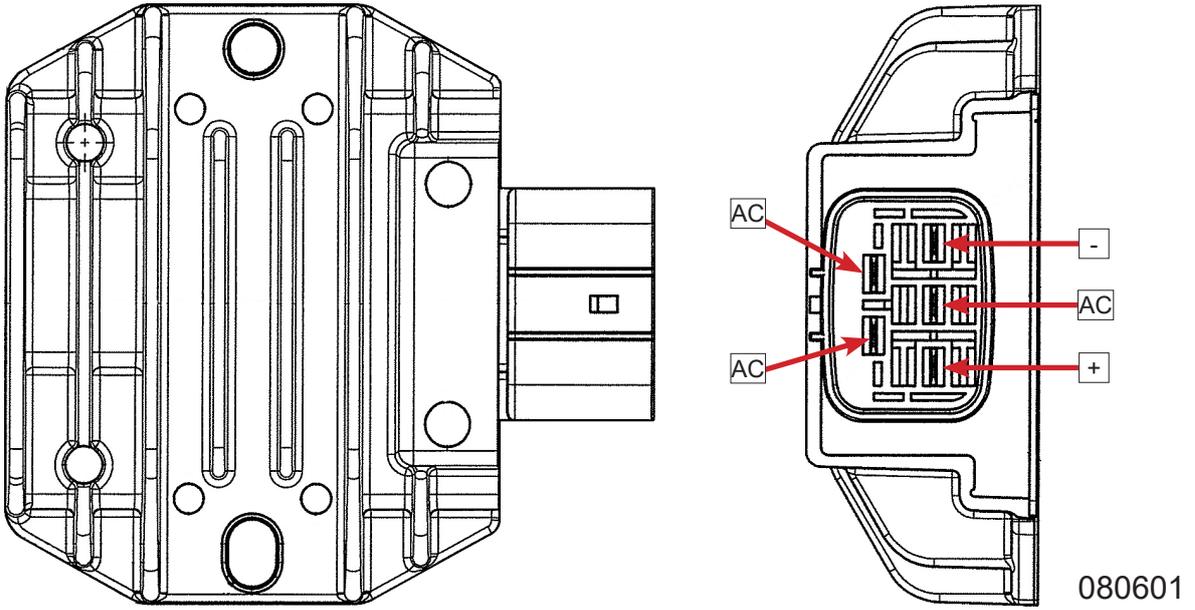
Turn multimeter to 1 \times 100 Ω to measure the relay resistance.

Auxiliary starter relay resistance: 90 Ω ~100 Ω

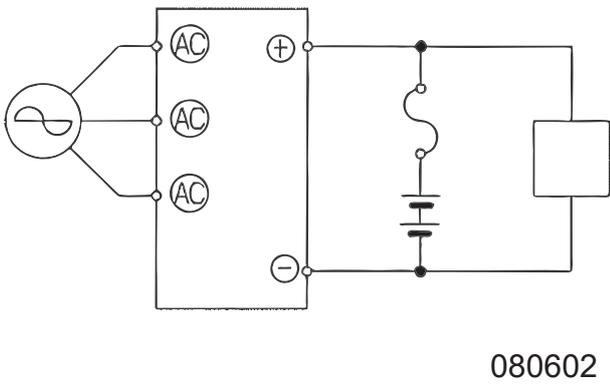


Electrical System

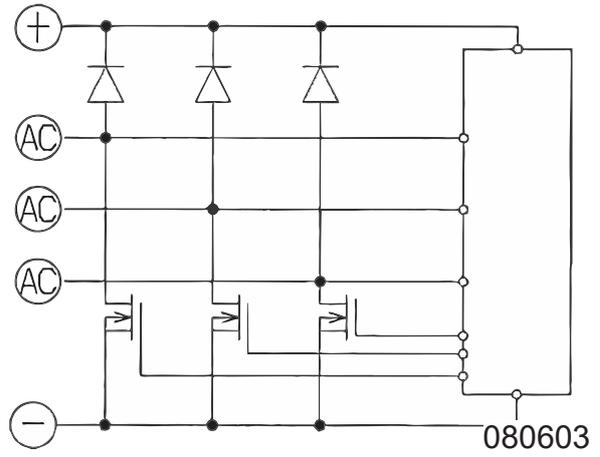
8.2.5 Regulator



Connecting diagram

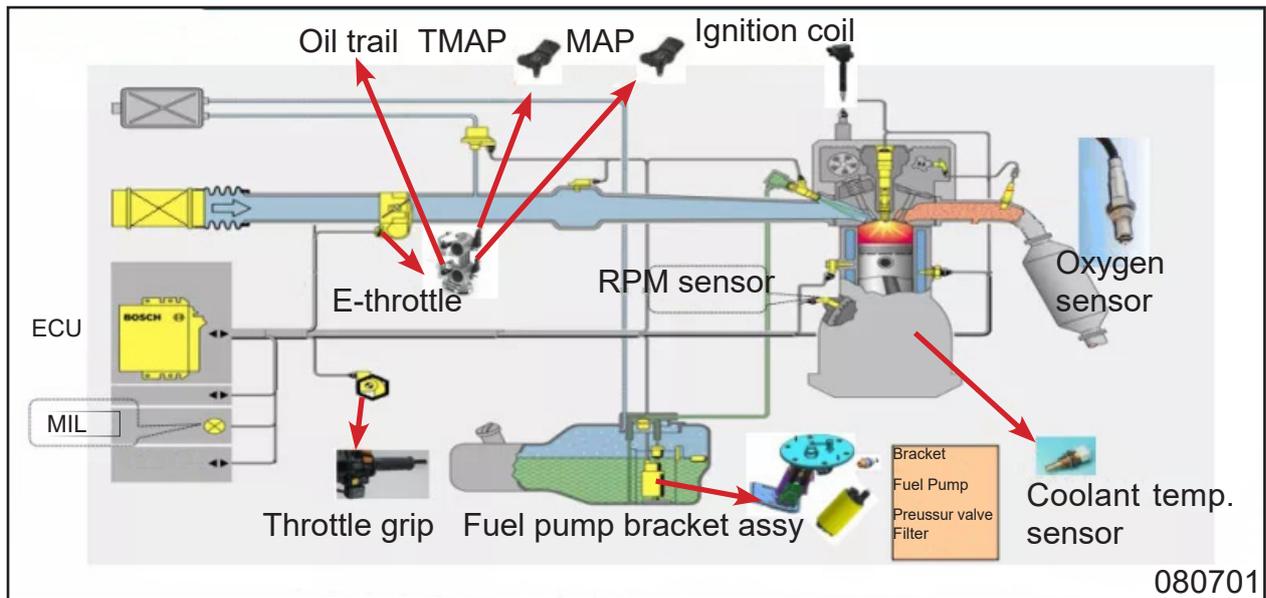


Wire diagram



8.3 EFI System

8.3.1 EFI Structure



8.3.1.1 Sensors

A sensor is a device that measures a physical quantity and converts it into a signal which can be read by an observer or by an instrument. Sensors in EFI system include:

Air pressure sensor (Air density and pressure information)

Air temp. sensor (Air density information)

TPS (Load, load range, speed information)

Trigger (crankshaft information)

Water temp. sensor (engine temp.)

Speedometer sensor (Output shaft RPM information)

Oxygen sensor (Air factor= $\lambda > 1$ or < 1)

Roll-over gear sensor (Output vehicle gradient information)

8.3.1.2 ECU

Electronic Control Unit, the brain of EFI system, which determines the amount of fuel injection, ignition timing and other parameters a engine needs to keep running by calculating and analyzing values provided by sensors.

8.3.1.3 Actuators

Actuators execute the EFI instruction. Main actuators include:

Fuel Pump (Provide high-pressure fuel)

Fuel Injector (Inject the fuel to make it spray better)

Ignition Coil (Provide high ignition energy to spark plug)

Idle Air Control Valve (Provide idle inlet air)

Electrical System

8.3.2 EFI System Maintenance Notice

- Always use genuine CFMOTO parts for maintenance. Otherwise it can not assure a normal performance to EFI system.
- During the maintenance procedure, never try to break down the EFI components.
- In the course of maintenance, EFI parts must be handled carefully.
- Ignition switch must be shut off before connecting or disconnecting connectors. Otherwise, it may cause the EFI parts damage.
- When removing fuel pump from fuel tank, do not energize the fuel pump. Otherwise, a spark can cause a fire.
- Fuel pump is not allowed to operate in a dry environment or under water. Otherwise, its life would be shortened. Besides, reverse connections between positive and negative terminal of fuel pump is not permitted.
- The fuel pressure in EFI fuel supply system is very high (about 330kPa), accordingly, all fuel lines are high pressure resisting. Even if the engine is not running, the fuel pressure is high. Therefore, do not disassemble the fuel line unless it's necessary.

When the fuel line needs to be repaired, release the fuel pressure as follow shows:

Remove fuel pump relay, start the engine and allow it to idle until the engine stalls automatically.

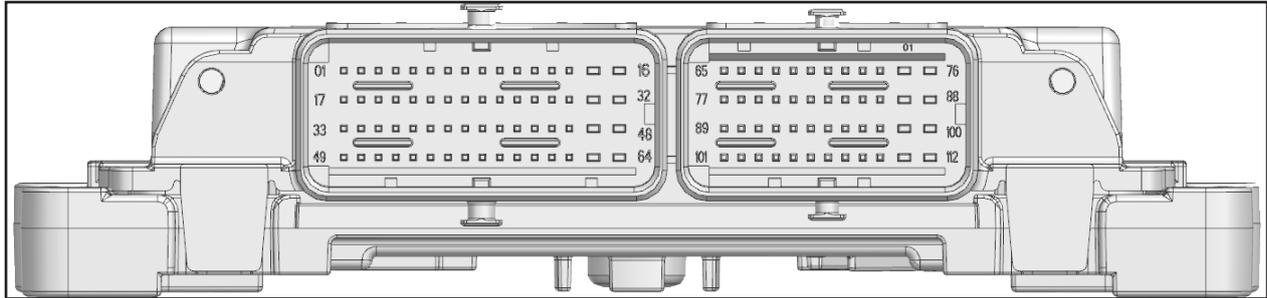
Fuel line removal and fuel filter replacement should be practiced by a professional person in a well-ventilated place.

- If possible, don't do the spark test. If spark test is done unavoidably, try to complete the test as soon as possible. Besides, don't open the throttle, otherwise, a large quantity of unburnt fuel would enter muffler, causing the catalytic converter damage.
- Idle speed is controlled by ECU, so it's unadjustable. The throttle limiter screw has been adjusted by manufacturer before sale. Therefore, it's not recommended to adjust it by the user.
- Don't reverse the battery cable connections. This may damage electrical components.
- Never remove the battery cables When the engine is running.
- Always remove cables and electrical control units which are connected with battery terminals.
- Never test the component input and output electric signal by piercing the cable plastic jacket.
- Respect the environment and dispose of the waste left during maintenance.

8.3.3 Structure and Performance of EFI Parts

8.3.3.1 ECU

Electronic control unit , is the brain of EFI system. It analyzes and cope with the information provided by sensors, and send the conclusion in the form of instruction to actuator, then make the engine run in the optimal condition.



ECU pin function:

No.	Pin function	No.	Pin function	No.	Pin function
1	CAN high	39		77	TPS 1
2		40		78	TPS 2
3		41	Fuel pump relay	79	Gearshift shaft sensor signal
4		42	Headlight relay	80	Sensor 1 to ground
5	Main relay	43	Oxygen sensor 2 to ground	81	
6		44	Clutch switch	82	
7	Pedal 1 to ground	45	Override pedal sensor 1	83	Sensor to ground 6
8		46		84	Sensor to ground
9	Cruise control	47	AGND	85	Intake manifold sensor to ground
10		48	Oxygen sensor heated 2	86	TPS to ground
11		49		87	Throttle actuator B
12	Air intake pressure sensor	50		88	
13	Rain mode switch	51		89	
14		52		90	
15	Interruptible battery	53		91	Air intake pressure sensor 1
16	Interruptible battery	54		92	
17	CAN Low	55		93	
18	K-line	56	Fan control 1	94	Canister control valve
19	5V battery	57		95	
20	Uninterrupted battery	58	Starter control relay	96	Engine RPM sensor A
21	Oxygen sensor 2	59	Pedal 2 to ground	97	Engine RPM sensor B
22		60		98	5V power
23	Brake switch	61		99	Ignition coil 2
24		62		100	Ignition coil 1

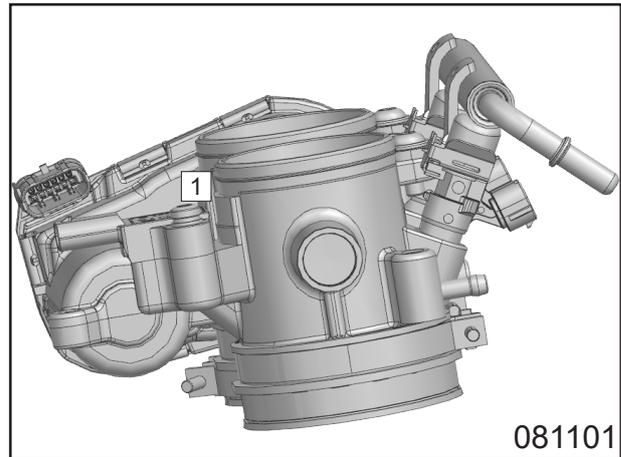
Electrical System

25	Brake light switch	63	ECU to ground 2	101	Engine coolant temp. sensor
26		64	ECU to ground 1	102	Air intake temp. sensor 1
27		65		103	Gearshift sensor signal
28		66		104	Oxygen sensor 1
29	Side stand switch	67		105	
30	Override pedal sensor 2	68	Fuel injector 1	106	
31		69		107	Throttle 5V power
32		70		108	5V power
33		71	AIS solenoid valve	109	Intake manifold sensor 5V power
34		72	Fuel injector 2	110	
35	Ignition switch	73	Oxygen sensor heated 1	111	ECU to ground 4
36	Pedal 2 5V power	74		112	ECU to ground 3
37	Pedal 1 5V power	75	Throttle actuator A		
38		76			

Item		Value			Unit
		Min.	Standard	Max.	
Battery voltage	Normal	9	14±0.1	16	V
	Limit function	6.0~9.0		16.0~18.0	V
Limit and time of battery over voltage	26.0V	Keep part of function, can diagnose the trouble		5	min
Working temperature		-40		70	°C
Storage temperature		-40		70	°C

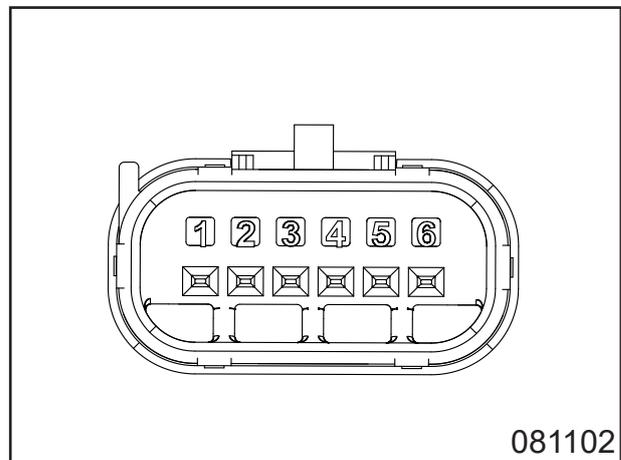
8.3.3.2 Throttle Assy

Connect with air filter and the engine, control the on-off angle of throttle by throttle cable. Send out the angle signal through TPS to ECU.

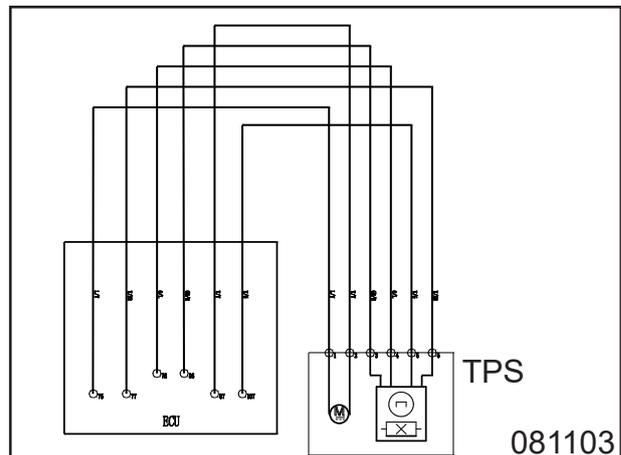


Pin Function:

1. Motor +
2. Motor -
3. Sensor to ground
4. Signal 2
5. Sensor power
6. Signal 1



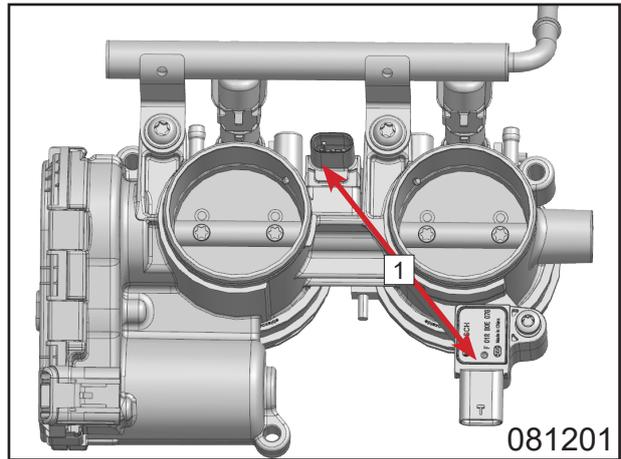
Circuit connecting with ECU.



Electrical System

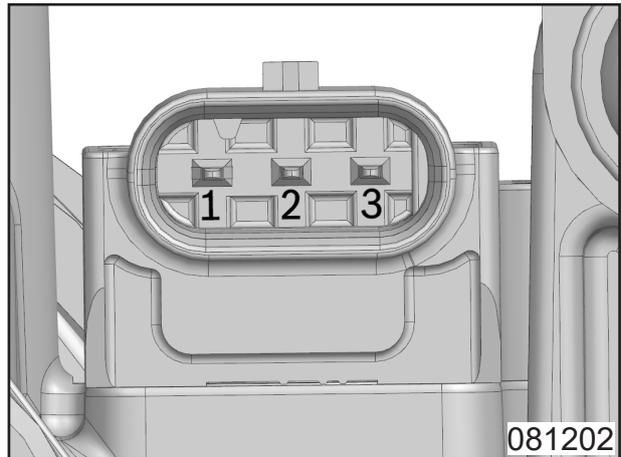
8.3.3.3 Air Intake Pressure Sensor

This sensor detects the pressure of air intake pipe, which provides the engine load signal to ECU.

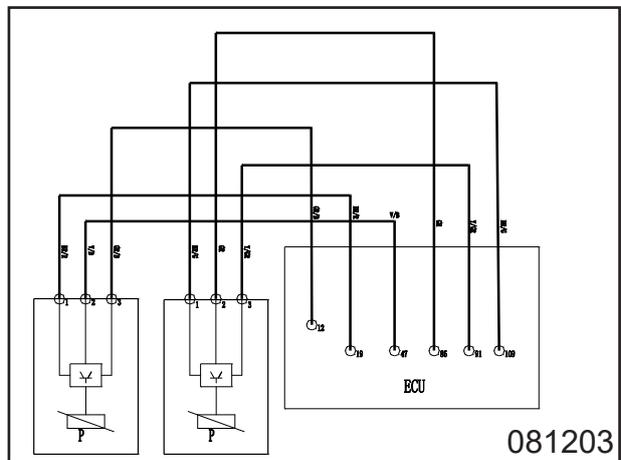


Pin Function:

- 2. Power
- 3. Ground
- 4. Output voltage



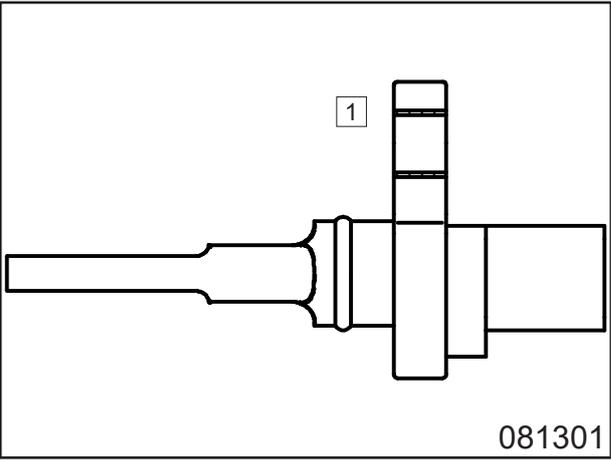
Circuit connecting with ECU.



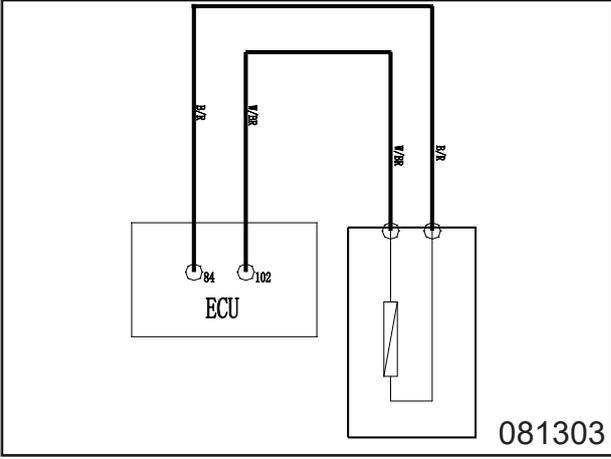
Air intake pressure sensor 1 Air intake pressure sensor 2

8.3.3.4 Air Intake Temperature Sensor

This sensor is a NTC thermo resistance. The resistance becomes lower when the air temperature becomes higher, but it is not a liner relationship.



Circuit connecting with ECU.

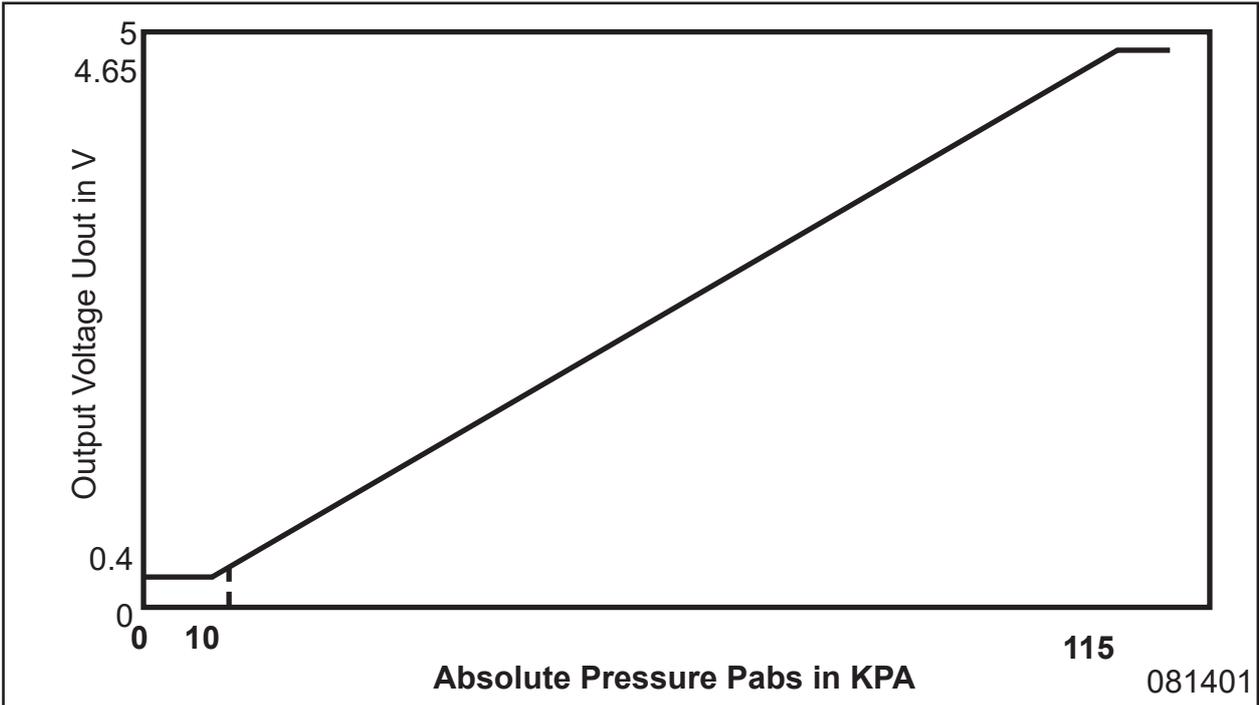


Air intake temperature sensor

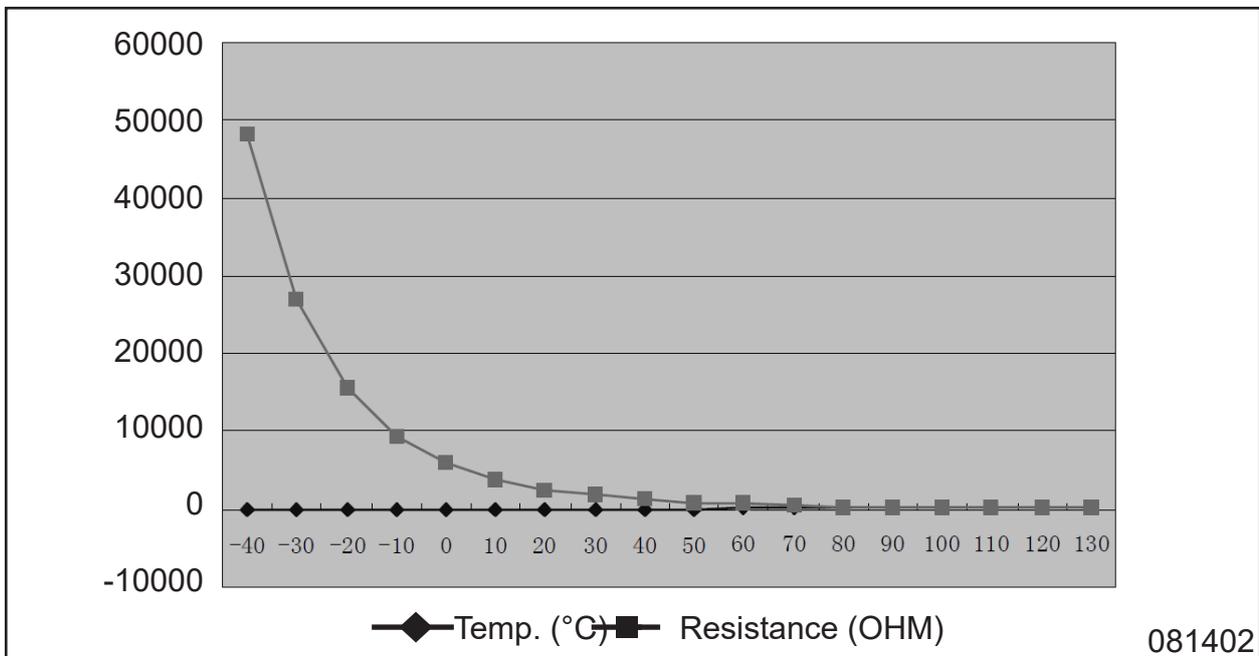
Electrical System

The relationship between output voltage and pressure.

Pressure range: 10~115kPa



The relationship between sensor temperature and resistance.



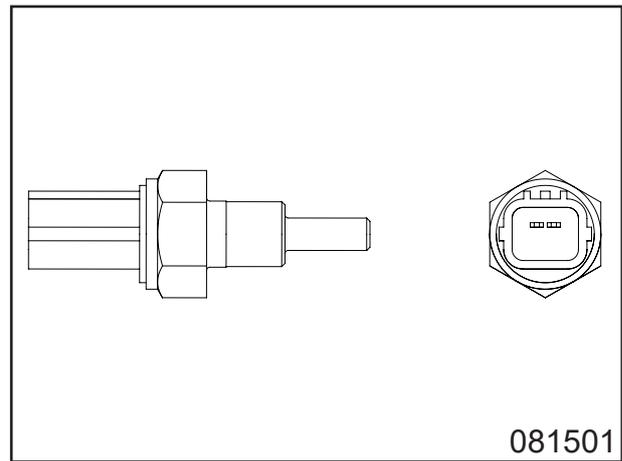
8.3.3.5 Water Temp. Sensor

This sensor is a NTC thermo resistance. The resistance becomes lower when the air temperature becomes higher.

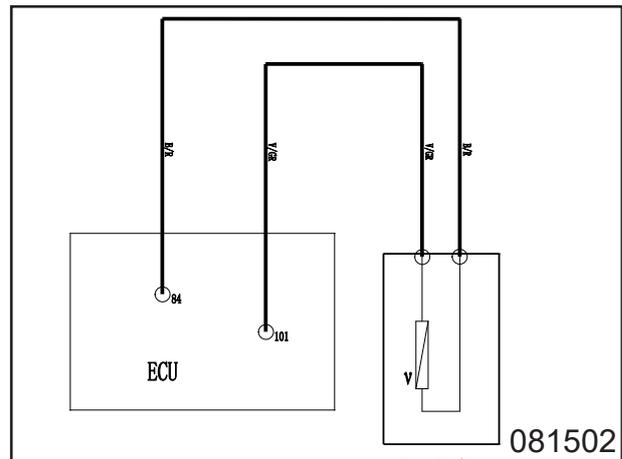
One group of parameters is sent to ECU to monitor engine temperature condition, One group is sent to dashboard to monitor coolant temperature condition.

A and C are one group which provides water temperature signal to the ECU.

Through ECU, B sends the water temperature signal to dashboard.



Circuit connecting with ECU.



Water temp. sensor

The right table shows the relationship between temperature and resistance. This signal is sent to ECU.

Temp. °C	Resistance between B and housing (KΩ)
-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

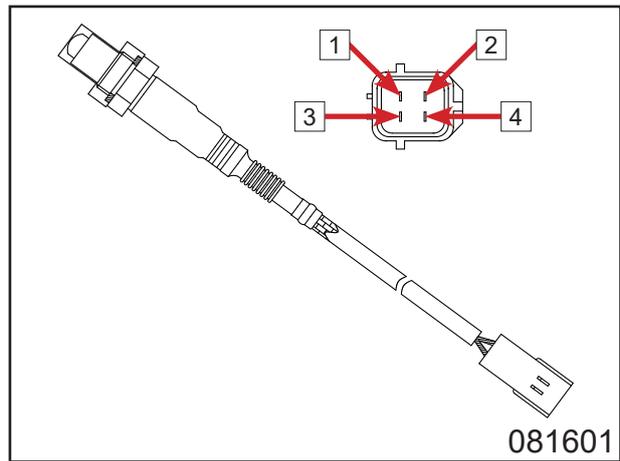
Electrical System

8.3.3.6 Oxygen Sensor

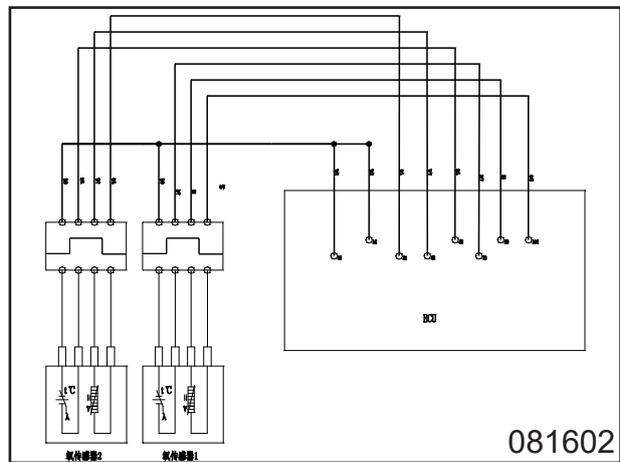
This sensor is used in closed-loop feedback controlled fuel injection to improve the air-to-fuel ratio accuracy and control the emission. It's located in the exhaust stream to measure the amount of oxygen in exhaust and send the signal to ECU, which can revise the fuel injector output, so as to reduce the amounts of unburnt fuel and make catalytic converter convert HC, CO and NO_x of Nitrogen efficiently.

Pin Function:

- 1. Output signal +
- 2. Output signal -
- 3. Heated ground -
- 4. Heated power +

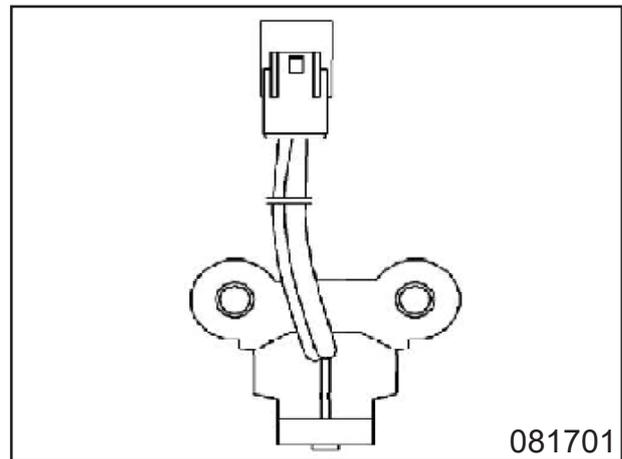


Circuit connecting with ECU.

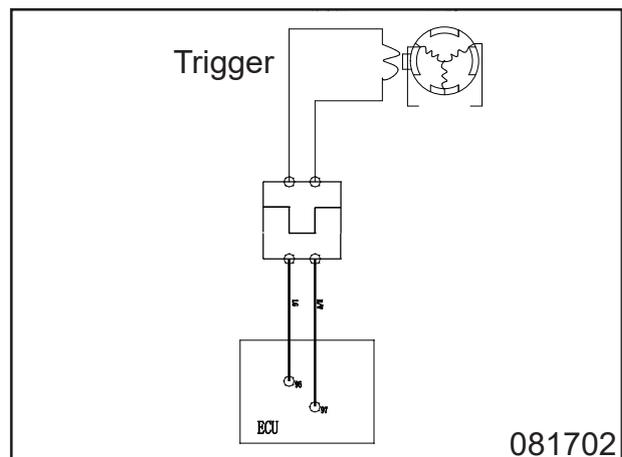


8.3.3.7 Trigger

The trigger transfers signal of engine speed to ECU and by which ECU to confirm engine speed ignition angle and injecting phase.



Circuit connecting with ECU.



Measure trigger resistance

Set multimeter to $1 \times 100\Omega$ range.

Trigger coil resistance: $260\Omega \sim 300\Omega (20^\circ\text{C})$

Replace a new one when resistance is not within above value range.

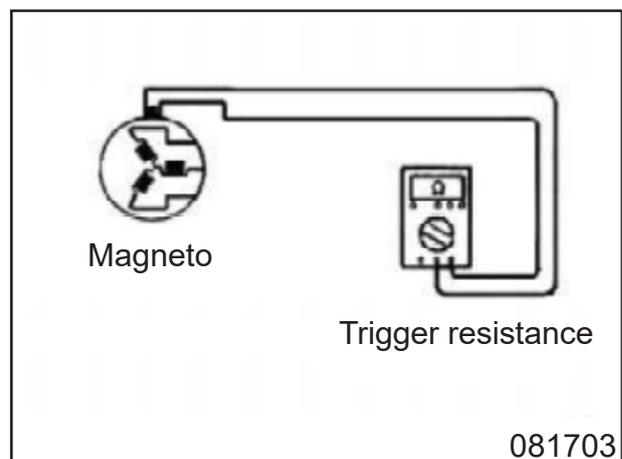
Measure trigger peak voltage

Connect multimeter and peak voltage adapter as shown as right picture

+Probe: Green (B) wire

-Probe: Blue (A) wire

NOTE: Refer to owner manual when using peak value voltage adapter.



Set multimeter to ACV range.

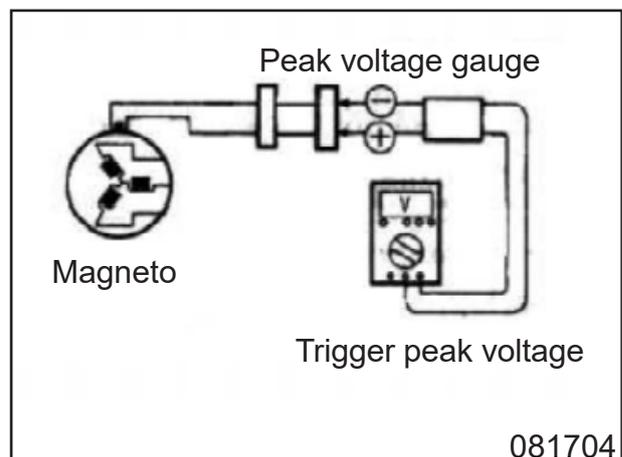
Set engine to Neutral gear, turn on ignition switch.

Press starter button and keep engine running for seconds, then measure trigger coil peak value voltage.

Repeat a few times and record the highest value.

Trigger coil peak value voltage: $\geq 20\text{V}$ (1300r/min)

Replace a new one when peak value voltage is not within above value range.



Electrical System

8.3.3.8 Fuel Pump

The right picture shows the fuel pump assy, fuel pump relay and ECU wiring diagram.

This fuel pump assy consists of fuel pump, plastic bracket, fuel strainer, fuel filter element and pressure-regulating valve. It delivers fuel from the tank to the engine at a certain oil pressure and flow rate.

Pin function:

- 1 Ground
- 2 Fuel pump relay output port

Performance parameter:

Pressure-regulating valve open pressure: 0.4MPa±0.007MPa

Flow rate: 80L/h

Do not run the fuel pump assy when there is no fuel inside the fuel tank, in case of fuel pump damage.

Handle the fuel pump gently. Do not drop it on hard surfaces.

The battery supplies power to the fuel pump through the relay. Only when starting or running the engine can the circuit be switched on.

Measure fuel pressure:

Connect oil pressure gauge and fuel pump oil port, lock with clamp to ensure there is no leak from the junction.

Connect the circuit as the picture shows.

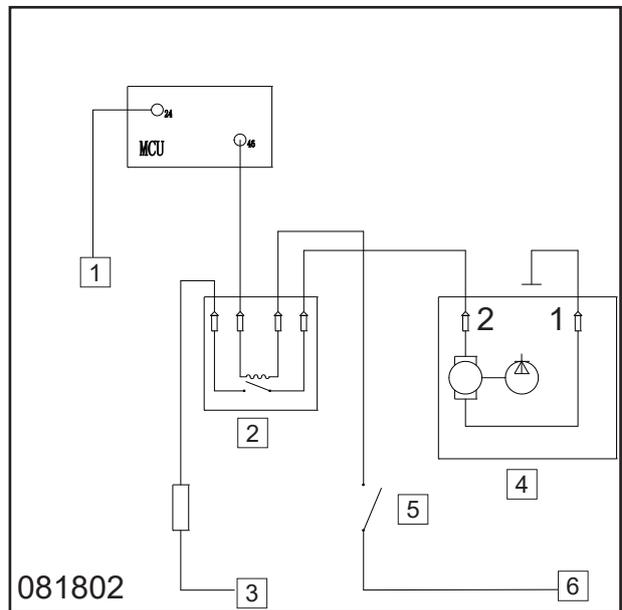
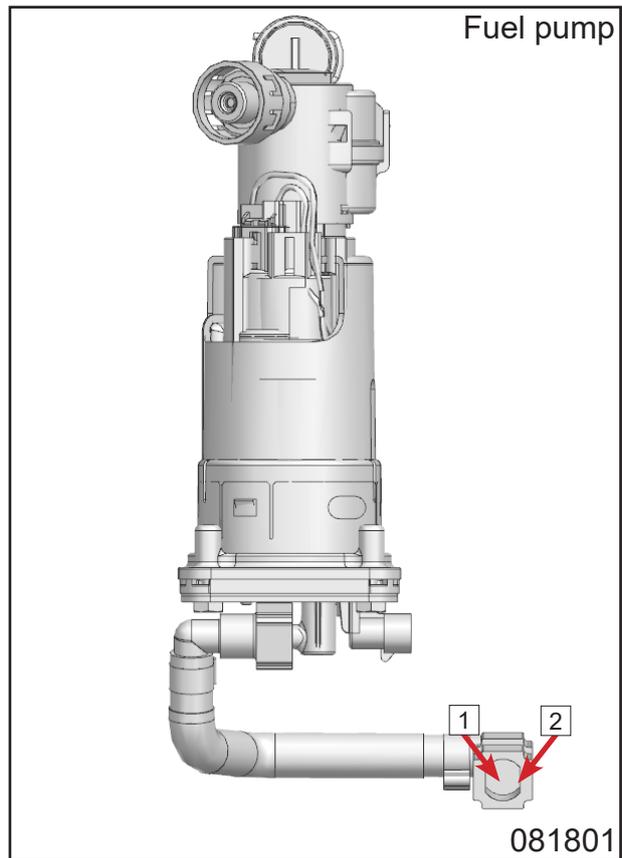
Turn on ignition switch and stop switch.

The fuel pump will work for 5 seconds. When stop working, the oil pressure should reach the specified value. Otherwise, replace with a new fuel pump.

After stopping working, the pressure should maintain **0.2MPa for at least 5 minutes**. Otherwise, replace fuel pump assy.

Fuel hose pressure release method:

The fuel supply pressure in EFI system is high, all fuel hoses are high-pressure resistance. Even the engine does not work, the pressure in fuel passage is still high. So when in the maintenance process, be careful not to remove the fuel hose causally. When servicing EFI system, release the pressure before removing the fuel hose. Remove the fuel pump relay. Start the engine and make it idle until the engine stops automatically.



1	ECU pin 41	3	Battery +	5	Stop switch
2	Fuel pump relay	4	Fuel pump assy	6	Ignition switch

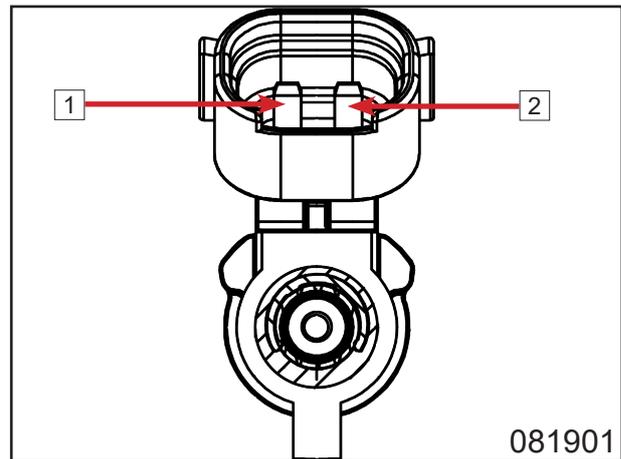
8.3.3.9 Fuel Injector

One end of fuel injector mounts into fuel injector seat, and the other end attaches to the injector cap, which connects with a fuel line. Fuel injector is controlled by ECU to inject fuel at stated time into the engine. This injector nozzle is a 4-hole style. Don't turn injector after the joint between injector and injector cap is installed.

Pin function:

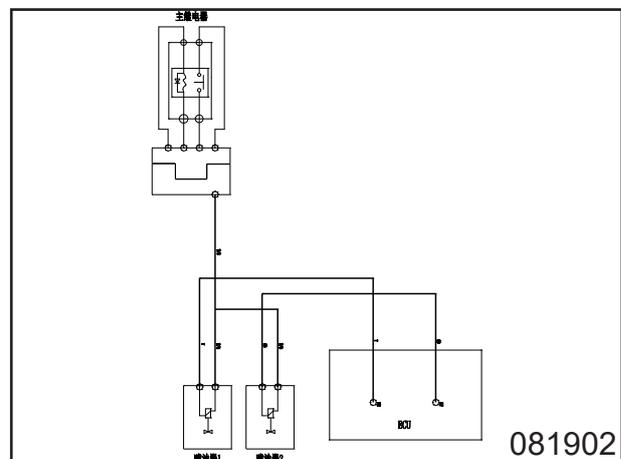
- 1: + connects fuel pump relay output
- 2: - connects ECU

Fuel injector resistance: $12\Omega \pm 0.6\Omega$ (20°C)



1	Fuel pump relay	2	ECU
---	-----------------	---	-----

Circuit connecting with ECU.



Fuel Injector Installation

Install fuel injector manually. Never knock fuel injector with a hammer.

When removing and installing fuel injector, the O-rings on both ends must be replaced.

Perform pressure relief before fuel injector removal if necessary.

Test the fuel injector sealing after installation to ensure no leaks.

Electrical System

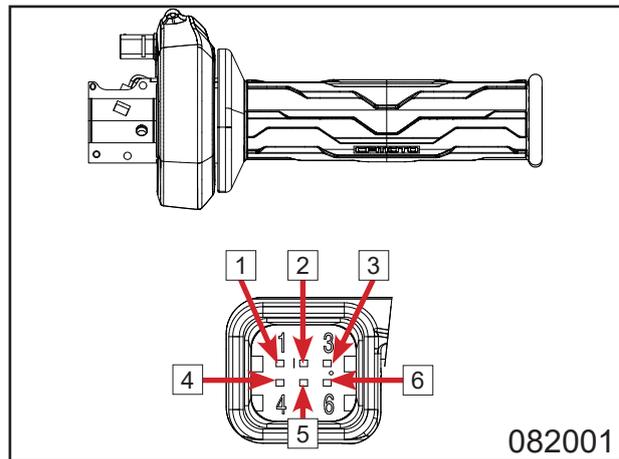
8.3.3.10 E-throttle

The vehicle adopts e-throttle assy. When the driver turns the throttle grip, ECU combines the throttle angle, engine PRM, gear, engine temperature, vehicle mode and other information to provide the best fuel supply.

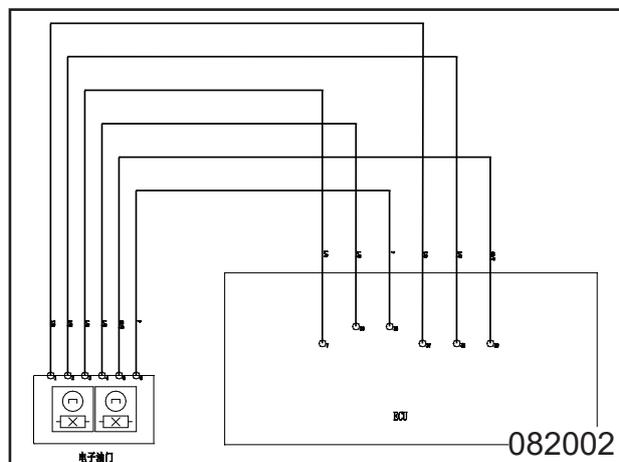
The e-throttle assy can provide the driver with more accurate fuel supply and more ideal throttle response.

Pin function:

1. Power 1
2. Signal 1
3. Ground 1
4. Signal 2
5. Ground 2
6. Power 2



Circuit connecting with ECU.

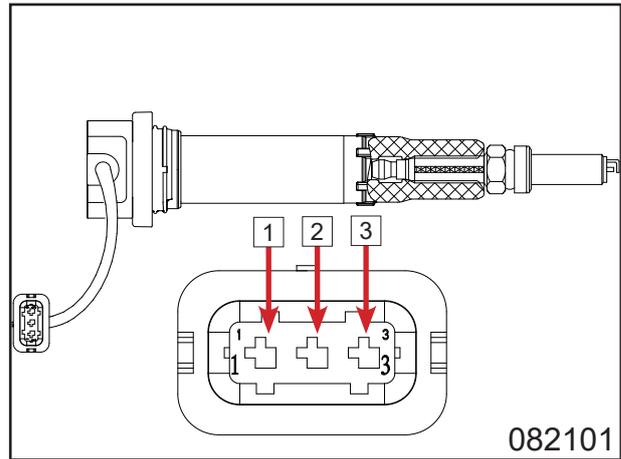


8.3.3.11 Ignition coil

Ignition coil transforms the low voltage of primary coil to high voltage of secondary coil needed to spark the spark plug and ignite the mixture of air and fuel in cylinder.

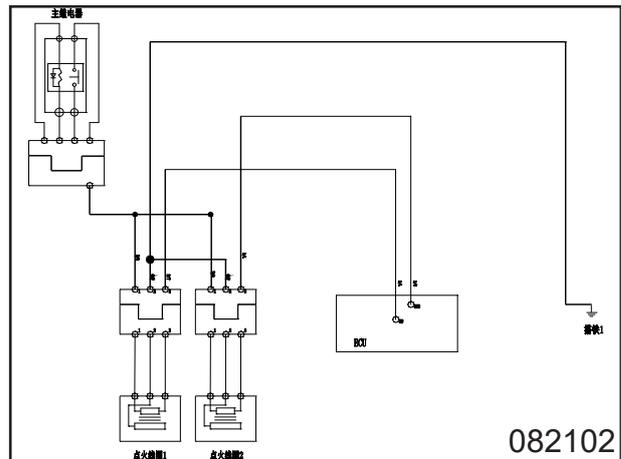
Pin function:

1. Signal
2. Ground
3. Power



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Circuit connecting with ECU.



082102

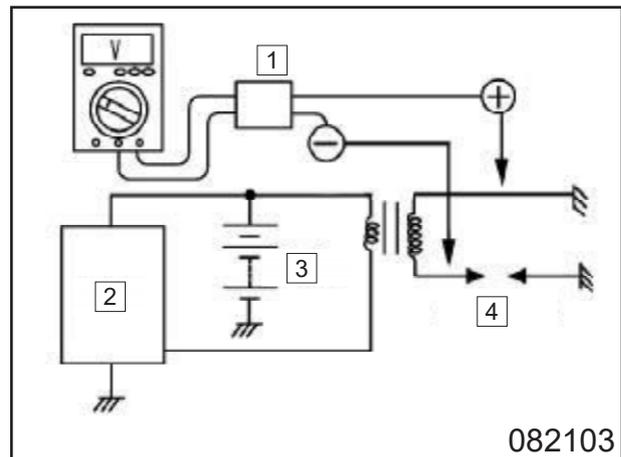
Secondary Ignition Voltage Test:

Connect the engine according to EFI wiring diagram.

Connect the peak voltage tester according to the right diagram.

Start the engine.

Secondary ignition voltage should be more than **15 kV**.



082103

1	Peak voltage gauge	3	Battery
2	ECU	4	Spark plug

Ignition coil parameter chart table:

Item	Value				
	Min	Standard	Max	Unit	
Stated Voltage		14		V	
Operating Voltage	6		16.5	V	
Resistance (20°C~25°C)	Primary	0.74	0.76	0.78	Ω
	Secondary	10.1	10.6	11.1	kΩ
Primary Current		7		A	

Electrical System

8.3.4 UP6.0 Fault Code

No.	Code	Instruction
1	P0322 00	Crankshaft signal loss
2	P0108 17	Manifold Absolute Pressure/Barometric Pressure Circuit High
3	P0107 16	Manifold Absolute Pressure/Barometric Pressure Circuit Low
4	P0106 29	Manifold Absolute Pressure/Barometric Pressure Circuit Range/Performance
5	P0105 23	Manifold Absolute Pressure/Barometric Pressure Circuit
6	P2A0D 17	Manifold Absolute Pressure Sensor "B" Circuit High
7	P2A0C 16	Manifold Absolute Pressure Sensor "B" Circuit Low
8	P2A0B 29	Manifold Absolute Pressure Sensor "B" Circuit Range/Performance
9	P2A0A 23	Manifold Absolute Pressure Sensor "B" Circuit
10	P0113 17	Intake Air Temperature Sensor 1 Circuit High
11	P0112 16	Intake Air Temperature Sensor 1 Circuit Low
12	P0111 29	Intake Air Temperature Sensor 1 Circuit Range/Performance
13	P0118 17	Engine Coolant Temperature Sensor 1 Circuit High
14	P0117 16	Engine Coolant Temperature Sensor 1 Circuit Low
15	P0116 29	Engine Coolant Temperature Sensor 1 Circuit Range/Performance
16	P0688 16	ECM/PCM Power Relay Sense Circuit/Open
17	P0688 29	ECM/PCM Power Relay Sense Circuit/Open
18	P0650 12	MIL Control Circuit High
19	P0650 11	MIL Control Circuit Low
20	P0650 13	MIL Control Circuit Open
21	P0692 12	Fan 1 Control Circuit High
22	P0691 11	Fan 1 Control Circuit Low
23	P0480 13	Fan 1 Control Circuit
24	P0629 12	Fuel Pump "A" Control Circuit High
25	P0628 11	Fuel Pump "A" Control Circuit Low
26	P0627 13	Fuel Pump "A" Control Circuit /Open
27	P0459 12	Evaporative Emission System Purge Control Valve Circuit High
28	P0458 11	Evaporative Emission System Purge Control Valve Circuit Low
29	P0444 13	Evaporative Emission System Purge Control Valve Circuit Open
30	P0497 00	Evaporative Emission System Incorrect Purge Flow
31	P0917 17	Gear Shift Position Circuit High
32	P0916 16	Gear Shift Position Circuit Low
33	P0915 29	Gear Shift Position Circuit Range/Performance
34	P1001 00	Shaft Gears Position Sensor Self-learning Not plausible (Gangi=0)
35	P082C 00	Shaft Gears Position Sensor Circuit High
36	P082B 00	Shaft Gears Position Sensor Circuit Low
37	P1002 00	Shaft Gears Position Sensor Self-learning Not plausible (Gangi~=0)
38	P0412 12	Secondary Air Injection System Switching Valve "A" Circuit
39	P0414 11	Secondary Air Injection System Switching Valve "A" Circuit Shorted

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40	P0413 13	Secondary Air Injection System Switching Valve "A" Circuit Open
41	P0411 29	Secondary Air Injection System Incorrect Flow Detected
42	P0568 1C	Cruise Control Multi-Function Input "A" Circuit Range/Performance
43	P0568 24	Cruise Control Multi-Function Input "A" Circuit Stuck
44	P0568 13	Cruise Control Multi-Function Input "A" Circuit
45	P0262 12	Cylinder 1 Injector Circuit High
46	P0261 11	Cylinder 1 Injector Circuit Low
47	P0201 13	Injector Circuit/Open – Cylinder 1
48	P0265 12	Cylinder 2 Injector Circuit High
49	P0264 11	Cylinder 2 Injector Circuit Low
50	P0202 13	Injector Circuit/Open – Cylinder 2
51	P0268 12	Cylinder 3 Injector Circuit High
52	P0267 11	Cylinder 3 Injector Circuit Low
53	P0203 13	Injector Circuit/Open – Cylinder 3
54	P0271 12	Cylinder 4 Injector Circuit High
55	P0270 11	Cylinder 4 Injector Circuit Low
56	P0204 13	Injector Circuit/Open – Cylinder 4
57	P0563 17	System Voltage High
58	P0562 16	System Voltage Low
59	P0560 1C	System Voltage Not plausible
60	P0501 29	Vehicle Speed Sensor "A" Range/Performance
61	P0507 00	Idle Air Control System RPM Higher Than Expected
62	P0506 00	Idle Air Control System RPM Lower Than Expected
63	P1098 00	DUMP control Circuit low
64	P1099 00	DUMP control Circuit high
65	P0641 00	Sensor Reference Voltage "A" Circuit/Open
66	P0651 00	Sensor Reference Voltage "B" Circuit/Open
67	P0571 29	Brake Switch "A" Circuit
68	P0571 1C	Brake Switch "A" Circuit
69	P2138 00	Throttle/Pedal Position Sensor/Switch "D"/"E" Voltage Correlation
70	P0326 17	Max error of DFP_KS1: internal failure path number: knock sensor 1
71	P0325 17	Min error of DFP_KS1: internal failure path number: knock sensor 1
72	P0328 00	Knocksensor fault: short circuit sensor 1, line A, Max
73	P0327 00	Knocksensor fault: short circuit sensor 1, line A, Min
74	P0328 15	Knocksensor fault: short circuit sensor 1, line B, Max
75	P0327 14	Knocksensor fault: short circuit sensor 1, line B, Min
76	P1386 00	Diagnostic Fault Check knock control signal evaluation
77	P0300 00	Misfire detected
78	P0301 00	Misfire detected on cylinder 1
79	P0303 00	Misfire detected on cylinder 3
80	P0304 00	Misfire detected on cylinder 4
81	P0302 00	Misfire detected on cylinder 2
82	P130A 00	Cylinder selective fuel cutoff active due to catalyst damaging misfire

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83	P0300 22	Random/Multiple Cylinder Misfire Detected
84	P0300 21	Random/Multiple Cylinder Misfire Detected
85	P0300 29	Random/Multiple Cylinder Misfire Detected
86	P2301 00	Ignition Coil "A" Primary Control Circuit High
87	P2307 00	Ignition Coil "C" Primary Control Circuit High
88	P2310 00	Ignition Coil "D" Primary Control Circuit High
89	P2304 00	Ignition Coil "B" Primary Control Circuit High
90	P2300 00	Ignition Coil "A" Primary Control Circuit Low
91	P2306 00	Ignition Coil "C" Primary Control Circuit Low
92	P2309 00	Ignition Coil "D" Primary Control Circuit Low
93	P2303 00	Ignition Coil "B" Primary Control Circuit Low
94	P0123 17	Throttle/Pedal Position Sensor/Switch "A" Circuit High
95	P0122 16	Throttle/Pedal Position Sensor/Switch "A" Circuit Low
96	P0121 29	Throttle/Pedal Position Sensor/Switch "A" Circuit Range/Performance
97	P0223 17	Throttle/Pedal Position Sensor/Switch "B" Circuit High
98	P0222 16	Throttle/Pedal Position Sensor/Switch "B" Circuit Low
99	P0221 29	Throttle/Pedal Position Sensor/Switch "B" Circuit Range/Performance
100	P2106 12	Throttle Actuator Control System Forced Limited Power
101	P2106 19	Throttle Actuator Control System Forced Limited Power
102	P2106 92	Throttle Actuator Control System Forced Limited Power
103	P2106 13	Throttle Actuator Control System Forced Limited Power
104	P1568 00	Idle Speed Contr.Throttle Pos. mechanical Malfunction
105	P1545 00	Throttle Pos.Contr. Malfunction
106	P1559 00	Idle Speed Contr.Throttle Pos. Adaptation Malfunction
107	P1545 22	Throttle Pos.Contr. Malfunction
108	P1545 21	Throttle Pos.Contr. Malfunction
109	P1579 00	Idle Speed Contr.Throttle Pos. adaptation not started
110	P1564 00	Idle Speed Contr.Throttle Pos. Low Voltage During Adaptation
111	P1565 00	Idle Speed Control Throttle Position lower limit not attained
112	P1559 29	Idle Speed Contr.Throttle Pos. Adaptation Malfunction
113	P2123 17	Throttle/Pedal Position Sensor/Switch "D" Circuit High
114	P2122 16	Throttle/Pedal Position Sensor/Switch "D" Circuit Low
115	P2138 29	Throttle/Pedal Position Sensor/Switch "D"/"E" Voltage Correlation
116	P2128 17	Throttle/Pedal Position Sensor/Switch "E" Circuit High
117	P2127 16	Throttle/Pedal Position Sensor/Switch "E" Circuit Low
118	P0606 94	ECM/PCM Processor
119	P0606 92	ECM/PCM Processor
120	P2106 29	Throttle Actuator Control System Forced Limited Power
121	P0606 64	ECM/PCM Processor
122	P0606 61	ECM/PCM Processor
123	P0606 67	ECM/PCM Processor
124	P0606 1C	ECM/PCM Processor
125	P0606 55	ECM/PCM Processor
126	P0606 00	ECM/PCM Processor
127	P0606 62	ECM/PCM Processor

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128	P0606 96	function monitoring: fault of ECU ADC - Null Load Test Pulse
129	P0606 97	function monitoring: fault of ECU ADC - test voltage
130	P0606 47	function monitoring: fault of ECU monitoring modul error
131	P0606 17	Reported OverVoltage of VDD5
132	P0606 16	Reported UnderVoltage of VDD5
133	P0606 49	Diagnostic fault check to report "WDA active"
134	P0606 48	Diagnostic fault check to report "WDA active" due to errors in query-/response communication
135	P0606 91	Diagnostic fault check to report "WDA active" due to overvoltage detection
136	P0053 1E	O2 Sensor Heater Resistance Bank 1 Sensor 1
137	P0059 1E	O2 Sensor Heater Resistance Bank 2 Sensor 1
138	P0030 13	O2 Sensor Heater Control Circuit Bank 1 Sensor 1
139	P0031 11	O2 Sensor Heater Control Circuit Low Bank 1 Sensor 1
140	P0032 12	O2 Sensor Heater Control Circuit High Bank 1 Sensor 1
141	P0050 13	O2 Sensor Heater Control Circuit Bank 2 Sensor 2
142	P0051 11	O2 Sensor Heater Control Circuit Low Bank 2 Sensor 1
143	P0052 12	O2 Sensor Heater Control Circuit High Bank 2 Sensor 1
144	P0130 29	O2 Sensor Circuit Bank 1 Sensor 1
145	P0131 16	O2 Sensor Circuit Low Voltage Bank 1 Sensor 1
146	P0132 17	O2 Sensor Circuit High Voltage Bank 1 Sensor 1
147	P0133 00	O2 Sensor Circuit Slow Response Bank 1 Sensor 1
148	P0134 13	O2 Sensor Circuit No Activity Detected Bank 1 Sensor 1
149	P0150 29	O2 Sensor Circuit Bank 2 Sensor 1
150	P0151 16	O2 Sensor Circuit Low Voltage Bank 2 Sensor 1
151	P0152 17	O2 Sensor Circuit High Voltage Bank 2 Sensor 1
152	P0153 00	O2 Sensor Circuit Slow Response Bank 2 Sensor 1
153	P0154 13	O2 Sensor Circuit No Activity Detected Bank 2 Sensor 1
154	P2177 00	System Too Lean Off Idle bank1
155	P2178 00	System Too Rich Off Idle bank1
156	P2179 00	System Too Lean Off Idle bank2
157	P2180 00	System Too Rich Off Idle bank2
158	U0073 88	Control Module Communication Bus Off
159	U0140 87	Lost Communication With Body Control Module
160	U0121 87	Lost Communication With Anti-Lock Brake System (ABS) Control Module
161	U0155 87	Lost Communication With Instrument Panel Cluster (IPC) Control Module
162	U0198 87	Lost Communication With Gateway "A"
163	U0131 87	Lost Communication With Power Steering Control Module
164	P062F 42	Internal Control Module EEPROM Error
165	P062F 43	Internal Control Module EEPROM Error
166	P1610 00	Manufacturer controlled computer and auxiliary outputs
167	P1611 00	Manufacturer controlled computer and auxiliary outputs
168	P1612 00	Manufacturer controlled computer and auxiliary outputs
169	P1613 00	Manufacturer controlled computer and auxiliary outputs
170	P1614 00	Manufacturer controlled computer and auxiliary outputs
171	P01980	倾倒开关故障

Electrical System

8.4 Fault Diagnosis and Treatment

Engine Body:

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

Electrical System

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>Replace</p> <p>Replace</p> <p>Clean or replace</p> <p>Adjust or replace</p> <p>Adjust</p> <p>Replace</p> <p>Adjust or replace</p> <p>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 worn 4. Cylinder worn or scraped 5. Valve stem worn 6. Oil seal of valve stem damaged 	<p>Check oil level and drain</p> <p>Replace</p> <p>Replace</p> <p>Replace</p> <p>Replace</p> <p>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>Adjust</p> <p>Replace</p> <p>Adjust</p> <p>Replace</p> <p>Replace</p> <p>Replace or repair</p> <p>Clean or replace</p> <p>Clean or replace</p> <p>Clean or replace</p> <p>Adjust or replace</p> <p>Clean or replace</p> <p>Replace</p> <p>Tighten or replace</p> <p>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(see7-5) 	<p>Clean</p> <p>Check and add or drain</p> <p>Replace</p> <p>Clean</p> <p>Tighten or replace</p> <p>Change oil</p>

Electrical System

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

Ignition System:

Troubles	Possible Cause	Countermeasures
No spark or weak spark	1. Flame igniter malfunction 2. Spark plug burnt 3. Incorrect spark plug clearance 4. Carbon deposit in spark plug 6. Battery low voltage 7. Ignition coil malfunction 8. Trigger coil malfunction 9. Incorrect trigger clearance 10. Other circuit malfunction	Replace Replace Adjust Clean Replace Charge or replace Replace Replace Adjust Inspect

8.5 Trouble Diagnosis by Engine Error

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

1. Confirm if trouble light is ok.
2. Confirm there's no trouble code record by PDA 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:

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

Electrical System

(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	Use PDA to test, turn on ignition switch, check if power supply of ECU pin 35 and 20 is normal; check if pin 63, 64, 111 and 112 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 ignition switch or start 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 water temp. sensor connector, check whether the engine can be started or not. (Or replace water temp. sensor with a 300Ω resistance. Check whether the engine can be started or not.)	YES	Change fuel
		NO	Next step
4	Check whether the failure happens right after fueling.	YES	Use PDA to check
		NO	Repair related circuit
5	Use PDA to test, turn on ignition switch, check if power supply of ECU pin 35 and 20 is normal; check if pin 63, 64, 111 and 112 work normally.	YES	Use PDA 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 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 pump gauge ,start engine, check if 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 water temp. sensor connector, check whether the engine can be started or not. (Or replace water temp. sensor with a 2500Ω resistance. Check whether the engine can be started or not.)	YES	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 injector
		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

Electrical System

(5) Difficult to start in any conditions

General failure part: 1. Water in fuel tank; 2. Fuel pump; 3. Injector; 4. Ignition coil; 5. Throttle body and by-pass; 6. Air intake pipe; 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	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 water temp. sensor connector, check whether the engine can be started or not.	YES	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

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 if spark plug is suitable for requirement including its type and clearance.	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 or block.	YES	Replace
		NO	Next step
6	Check whether the failure happens right after fueling.	YES	Change fuel
		NO	Next step
7	Check if cylinder pressure is insufficient.	YES	Eliminate engine mechanical failures
		NO	Next step
8	Check if ignition timing complies with standard regulation.	YES	Next step
		NO	Check and repair ignition timing

Electrical System

(7) 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. 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	Check if there is carbon deposit inside throttle body and air control valve.	YES	Clean
		NO	Next step
4	Disconnect water temp. sensor connector and start engine to check idle speed is stable or not.	YES	Repair circuit or replace sensor
		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 fueling.	YES	Change fuel
		NO	Next step
7	Check if cylinder pressure is insufficient.	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. Injector; 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	Check if there is carbon deposit inside throttle body and air control valve.	YES	Clean
		NO	Next step
4	Disconnect water temp. sensor connector and start engine to check idle speed is stable or not.	YES	Repair circuit or replace sensor
		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

(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 PDA to test if ignition advance angle, fuel spray and air intake volume is normal.	YES	Next step
		NO	Next step
		NO	Repair air intake 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 PDA to test, turn on ignition switch, check if power supply of ECU pin 35 and 20 is normal; check if pin 63, 64, 111 and 112 work normally.	YES	Use PDA 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	Check if there is carbon deposit inside throttle body and air control valve.	YES	Clean
		NO	Next step
4	Remove water temp. sensor connector, start engine to check if idle speed is too high.	YES	Repair wiring or replace sensor
		NO	Next step
5	Check if ignition timing complies with standard regulation.	YES	Next step
		NO	Check and repair ignition timing

Electrical System

(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 ignition switch or start engine, check if fuel pressure is around 250kpa.	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 T PS and its circuit is normal.	YES	Next step
		NO	Repair wiring or 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 ignition switch or start 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

Electrical System

Item	Procedures	Results	Next
5	Check if T PS and its circuit is normal.	YES	Next step
		NO	Repair wiring or 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

Electrical System

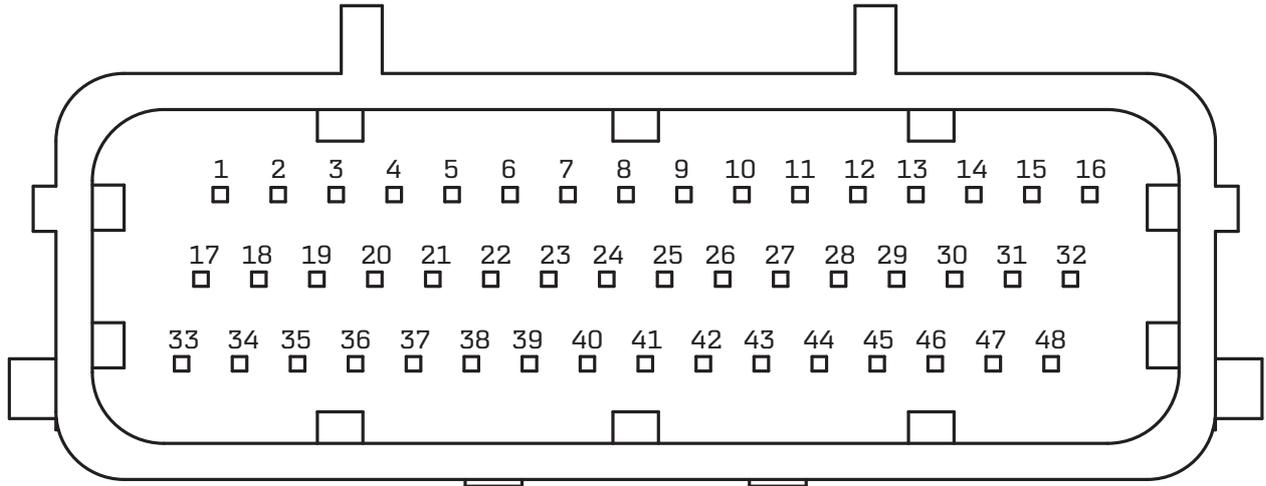
(13) Difficult to accelerate and bad performance

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 ignition switch or start 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 timing
5	Check if spark plug is suitable for requirement including its type and clearance.	YES	Next step
		NO	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 T PS and its circuit is normal.	YES	Next step
		NO	Repair wiring or replace sensor
8	Disassemble injector and use special tool to check if there is leakage or block.	YES	Replace
		NO	Next step
9	Check whether the failure happens right after filling fuel.	YES	Change fuel
		NO	Next step
10	Check if ignition timing complies with standard regulation.	YES	Next step
		NO	Check and repair ignition timing
11	Check if exhaust gas exhale smoothly.	YES	Next step
		NO	Repair or replace exhaust pipe

8.6 Vehicle Control Unit



PIN	Function	Remark	IN/OUT/COM/GND/ SUPPLY
1	Rear RH turn light		OUT
2	Start relay		OUT
3	Front RH turn light		OUT
4	Hazard system	Reserved	IN
5	Offer 5V power to sensor	Reserved	SUPPLY
6	Horn switch	Ground	IN
7	Oil pressure switch	Ground	IN
8	Outer sensor ground		GND
9	RH turn switch	Ground	IN
10	Back-up sensor	Reserved	IN
11	Standard_CAN_L		COM
12	Handlebar heating		OUT
13	Standard_CAN_H		COM
14	Driver heated seat power		OUT
15	Horn		OUT
16	Power to MCU(30A)		SUPPLY
17	Power to ECU	ECU PIN35	OUT
18	Rear LH turn light		OUT
19	Front LH turn light		OUT
20	Ignition switch		IN
21	Oil temp. sensor	Reserved	IN
22	LH turn switch	Ground	IN
23	Rear brake switch 1	Reserved	IN
24	Fuel pump signal	ECU PIN41	IN
25	Rear brake switch 2	Reserved	IN
26	Stop switch	Ground	IN
27	Hazard switch	Ground	IN
28	Fan 1 ground		GND
29	Message_CAN_H		COM
30	Driver heated seat ground		GND
31	Rear brake light	Reserved	OUT

Electrical System

32	Power to MCU(30A)		SUPPLY
33	Power to MCU(30A)		SUPPLY
34	Power to outer controller	K15 power	OUT
35	Passager heated seat	Reserved	OUT
36	Fan 2 power	Reserved	OUT
37	Fuel level sensor		IN
38	Oil level switch	Reserved	IN
39	Turn reset switch	Ground	IN
40	Vehicle ground		GND
41	Front brake switch	Reserved	IN
42	Vehicle ground		GND
43	Passager seat switch	Reserved	IN
44	Fan 1		OUT
45	Message_CAN_L		COM
46	Fuel pump control		OUT
47	Start signal	ECU PIN58	IN
48	Power to MCU(30A)		SUPPLY

COOLING SYSTEM

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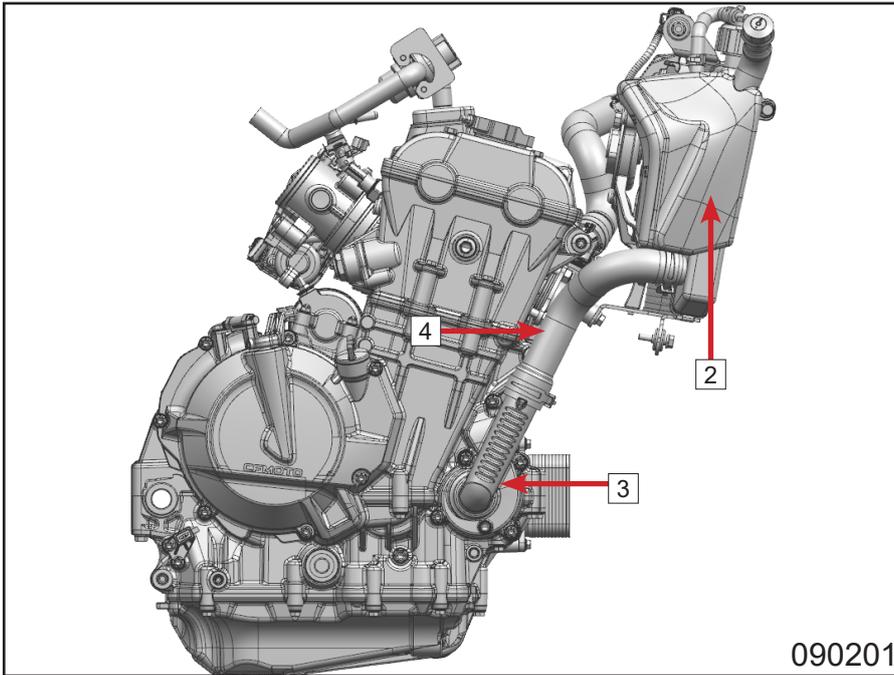
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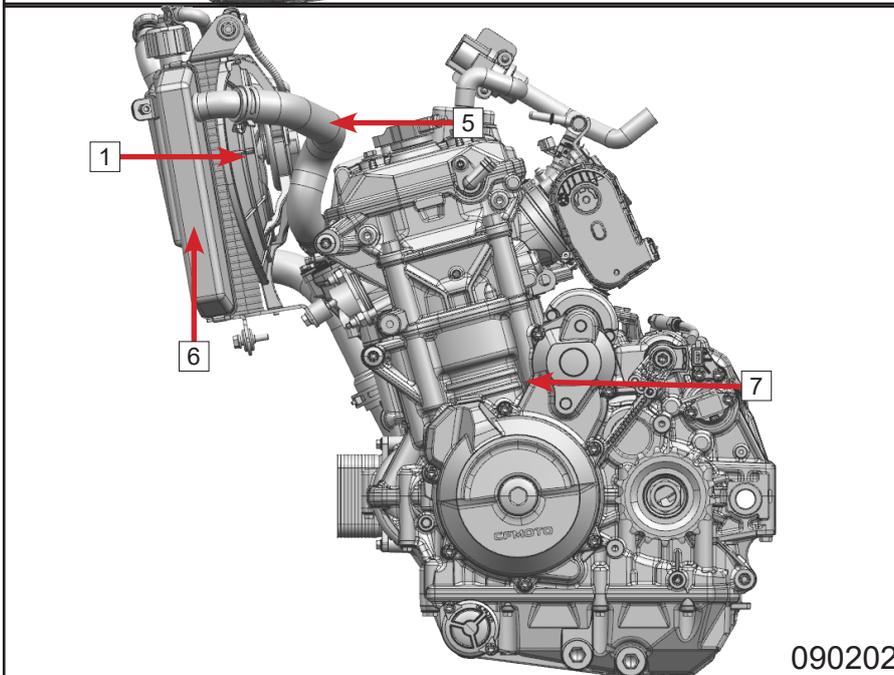
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Cooling System

9.1 Cooling System Diagram



1. Fan Motor
2. Reservoir tank
3. Water pump assy
4. Radiator water outlet pipe
5. Radiator water inlet pipe
6. Radiator
7. Engine assy



⚠ 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 .

⚠ WARNING:

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**.

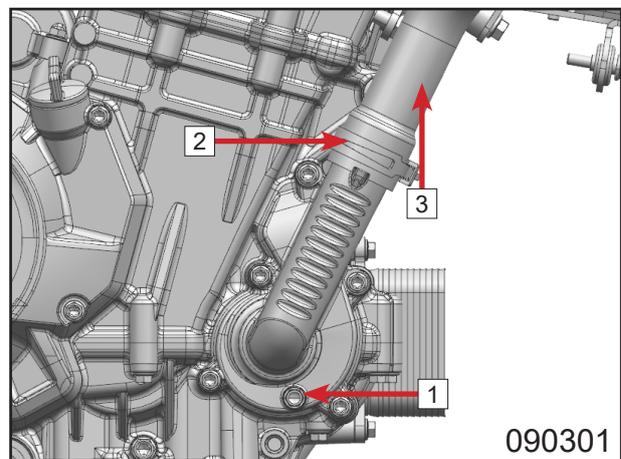
Drain coolant.

Loosen clamp **2**.

Remove water outlet pipe **3**.

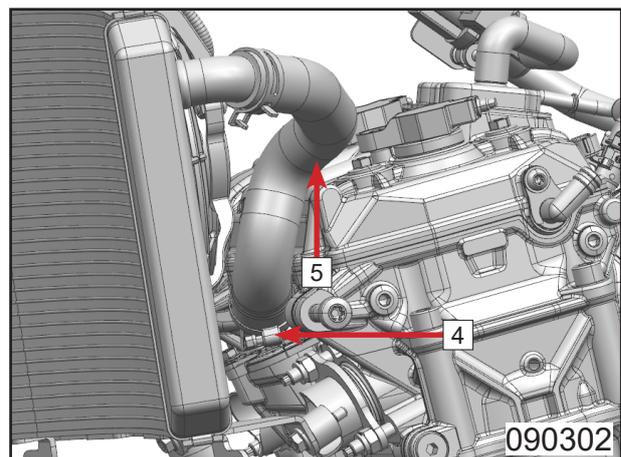
NOTE: After water outlet pipe removal, there is still some coolant spilling out.

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



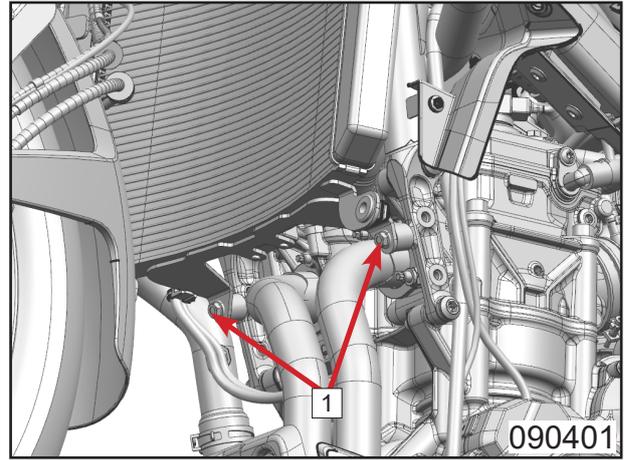
Loosen clamp **4**.

Remove water inlet pipe **5**.



Cooling System

Remove two bolts 1.



Remove bolt 2.
Remove radiator 3.

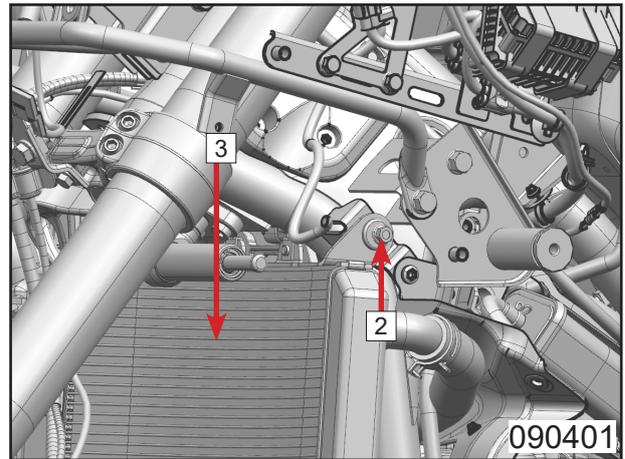
Installation

Reverse the removal procedures for installation.

9.3 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 of 40% or 50%.

⚠ 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

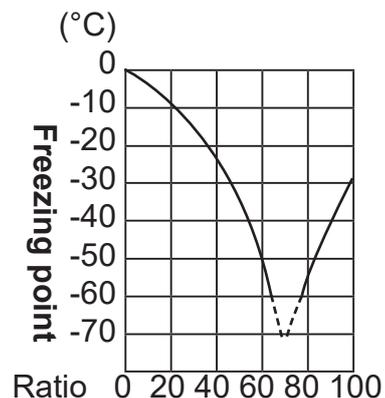
1.4kgf/cm²

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.

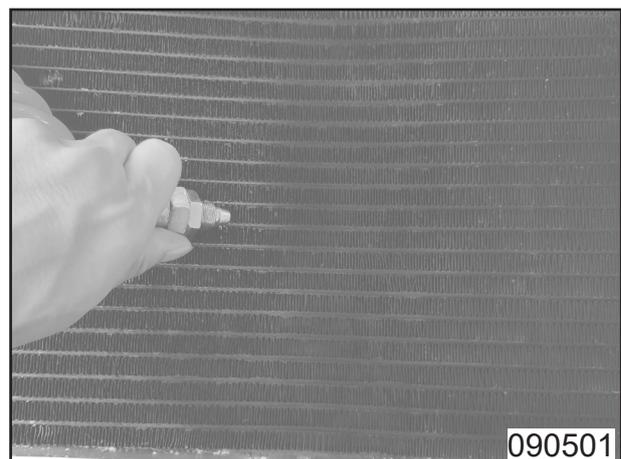
NOTE: When remove the gauge, cover radiator cap with cloth, in case the coolant spills out.

NOTE: The testing pressure does not exceed the open pressure.

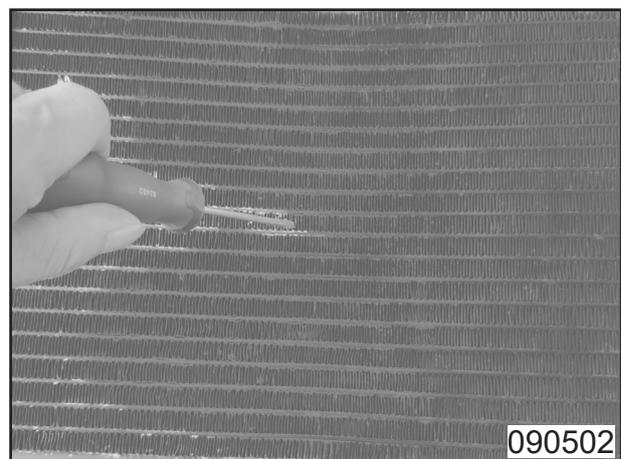
9.5 Radiator and Water Pipes

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.

Cooling System

9.6 Fan Motor Inspection

Remove bolts [1].

Remove fan motor assy [2].

Rotate impeller to check performance. Replace fan motor assy if stuck or other defect is found.

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

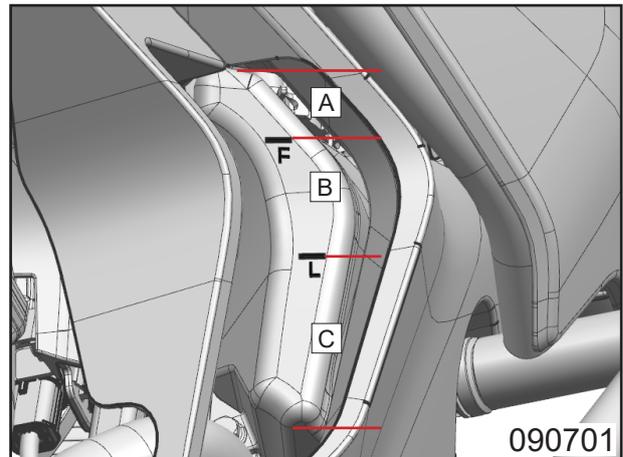
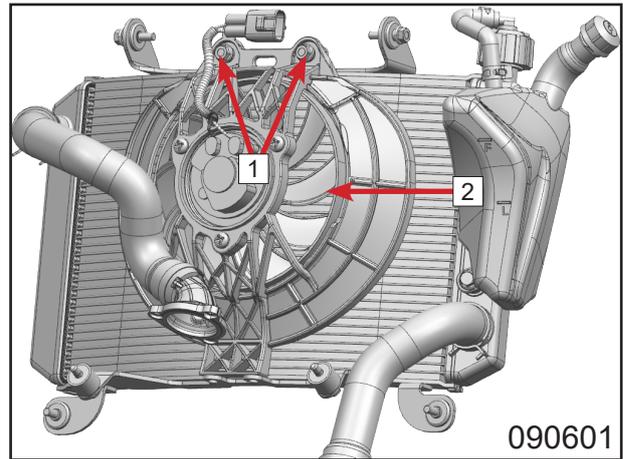
⚠️ WARNING: The coolant temperature is very high and compressed as well when the vehicle is running. Do not open radiator, radiator hose, reservoir tank or other cooling system part before engine or cooling system completely cools down. Once scalding occurs, rinse the wound with running cold water for 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

Support vehicle with side stand on level ground.

Put a pen under water pump.

Remove drain bolt **1** and drain coolant.

Install drain bolt.

Open radiator cap **2**.

Add coolant.

Loosen drain bolt. Tighten drain bolt until the coolant flow is stable.

Add coolant until it reaches radiator filling port.

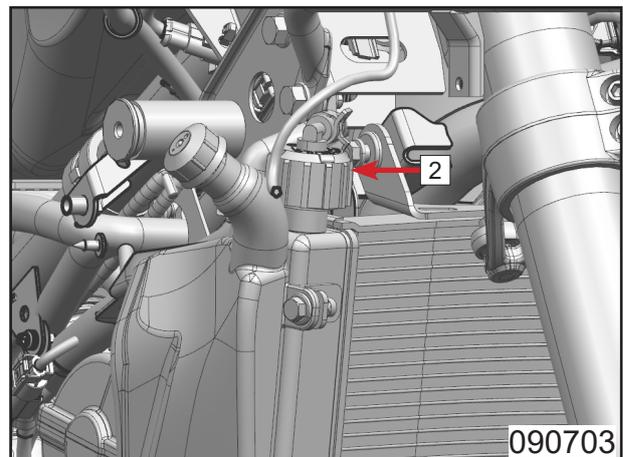
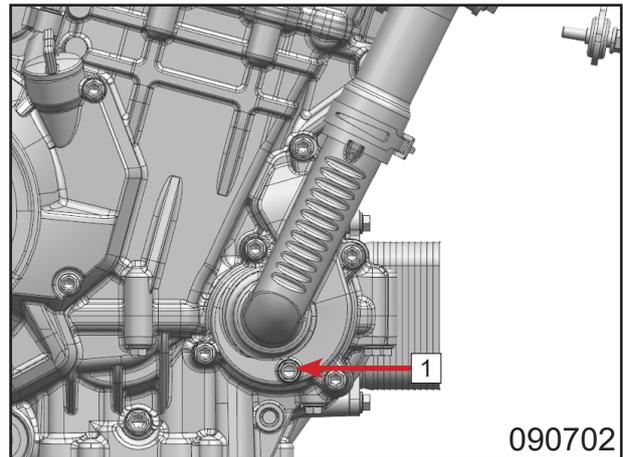
Install radiator cap.

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

Install reservoir tank cap.

Make engine idling for 2~3 minutes.

Check coolant level again after engine cools down.



MUFFLER ASSY

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10.1.1 Engine Panels	2
10.1.2 Exhaust Pipe	3
10.1.3 Rear Muffler Body.....	4
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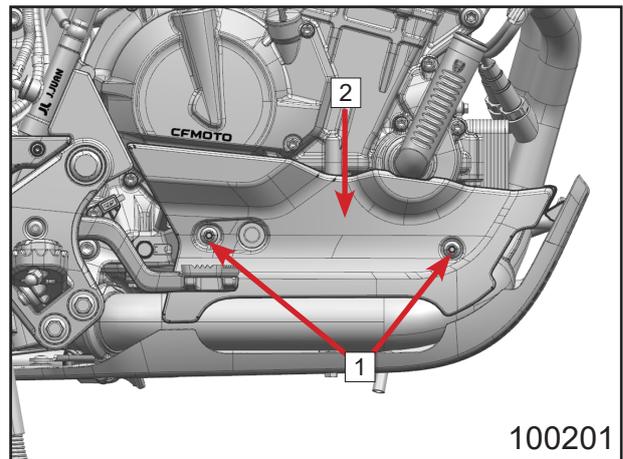
Muffler Assy

⚠ 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.

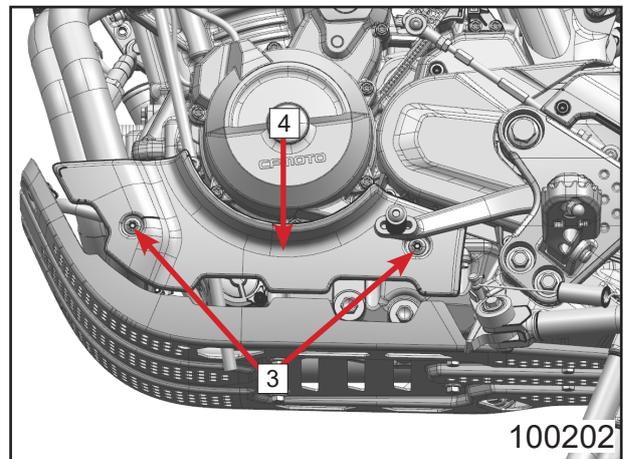
10.1 Muffler Removal

10.1.1 Engine Panels

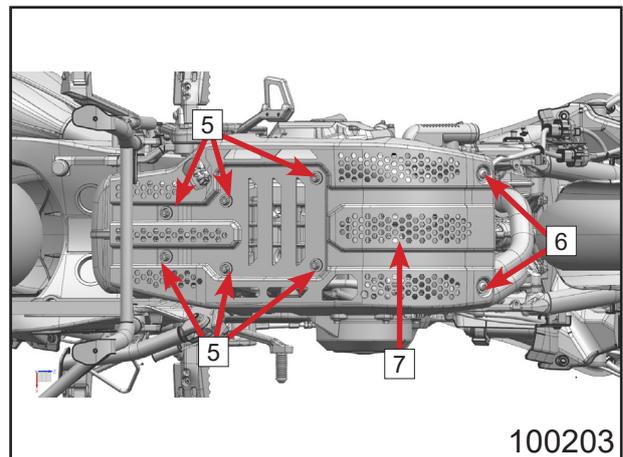
Remove inner hex bolts **1**.
Remove engine RH panel **2**.



Remove inner hex bolts **3**.
Remove engine LH panel **4**.

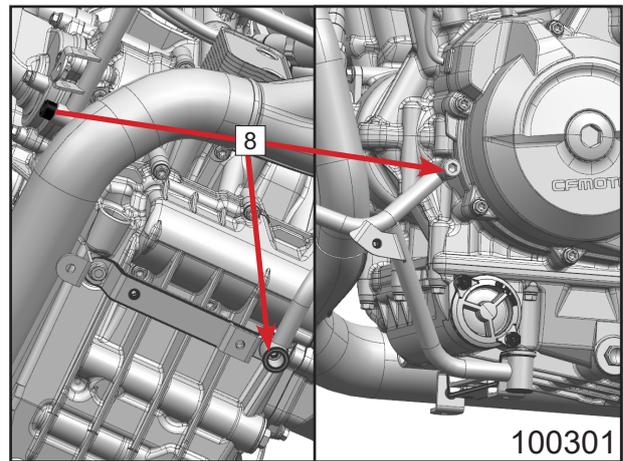


Remove bolts and washers **5**.
Remove inner hex bolts **6**.
Remove engine lower panel **7**.



Muffler Assy

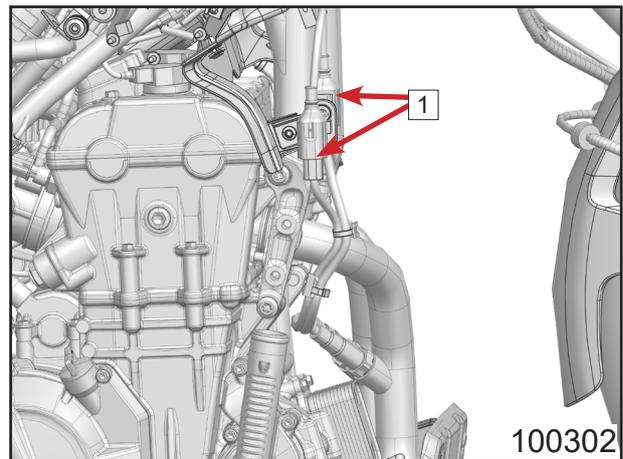
Remove inner hex bolts **8**.
Remove bumper.



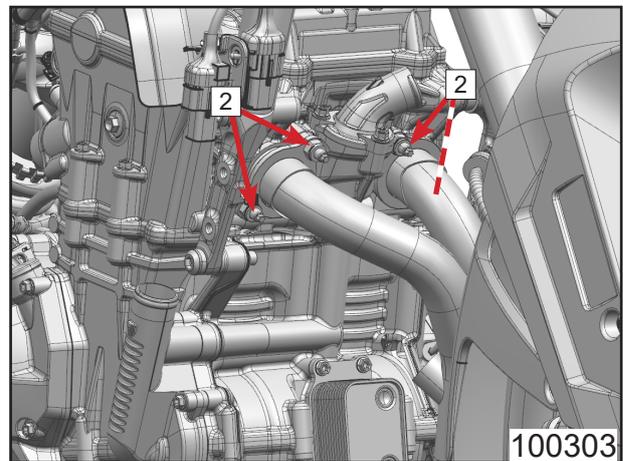
10.1.2 Exhaust Pipe

Unplug oxygen sensor connectors **1**.

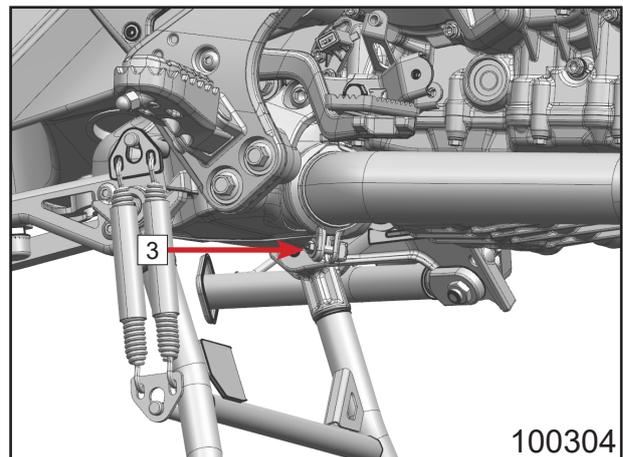
NOTE: The marks "L" and "R" on oxygen sensors align with joints.



Remove lock nuts **2**.

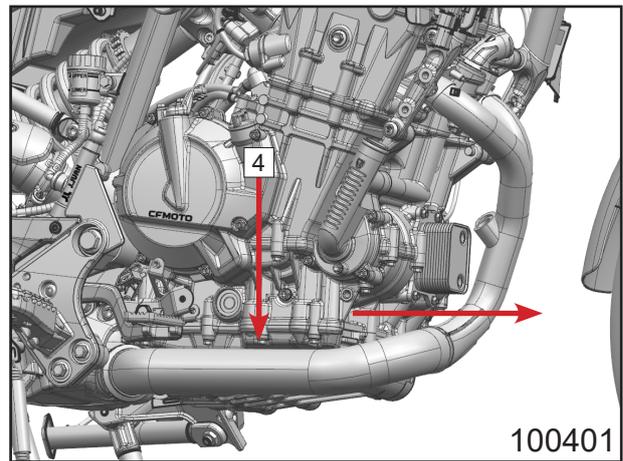


Loosen clamp **3**.



Muffler Assy

Remove exhaust pipe 4.



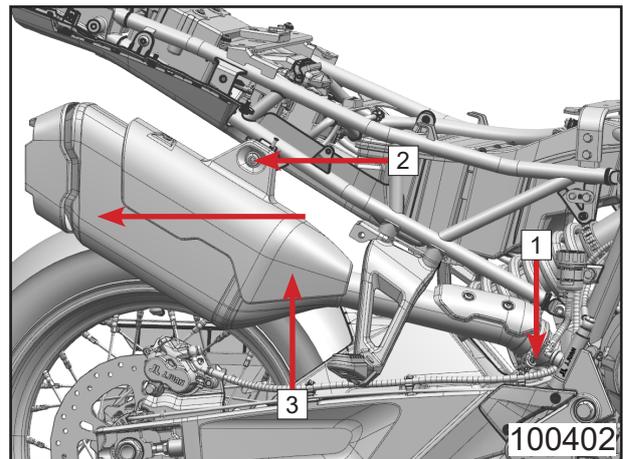
10.1.3 Rear Muffler Body

Loosen clamp 1.

Remove inner hex bolt 2.

Remove rear muffler body 3.

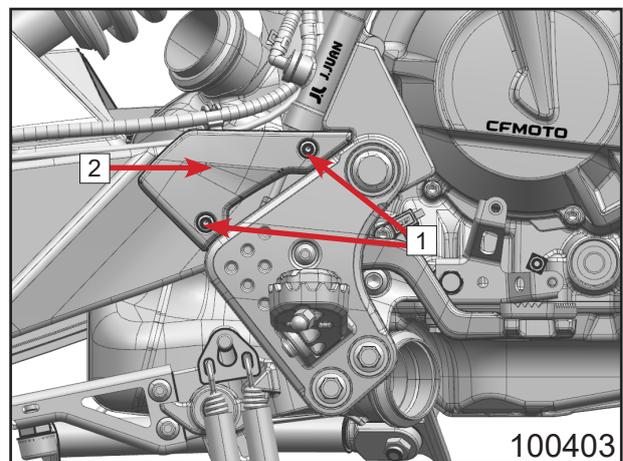
NOTE: Hold muffler body during removal to avoid it dropping.



10.1.4 Front Muffler Body

Remove inner hex bolts 1.

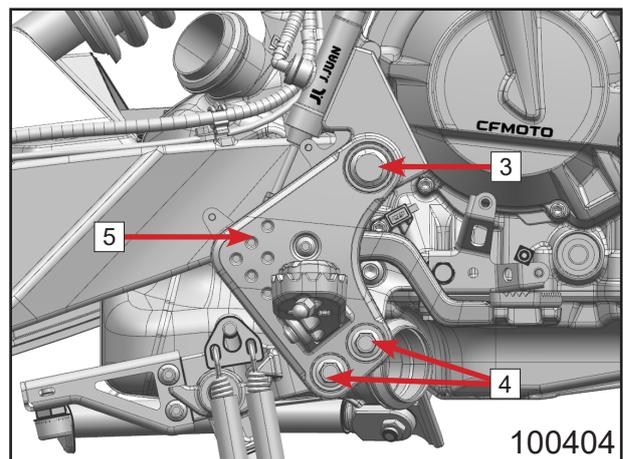
Remove RH footrest bracket panel 2.



Remove bolt 3.

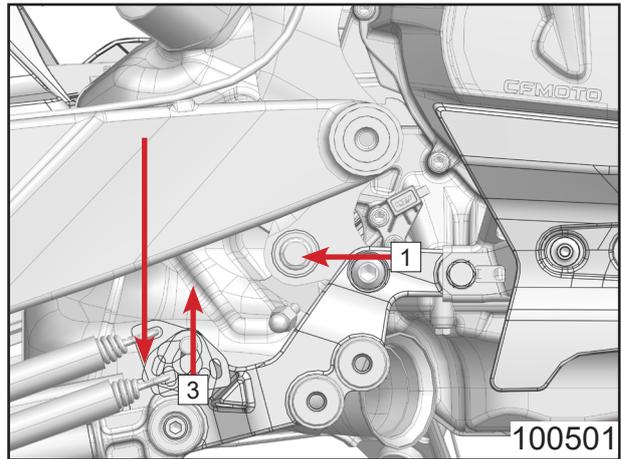
Remove bolts 4.

Hang RH footrest bracket 5 on the side.

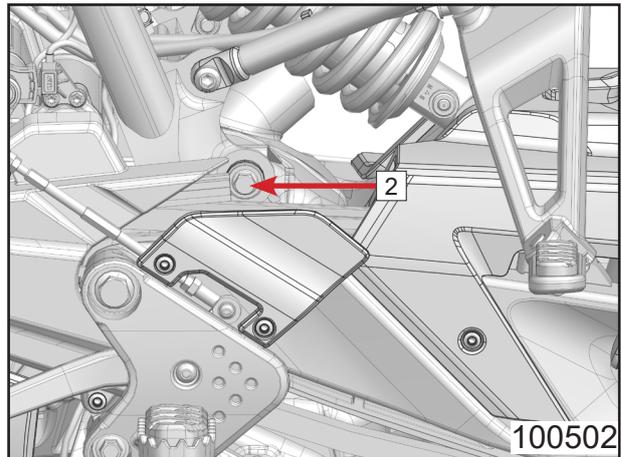


Muffler Assy

Remove bolt and washer 1 on right side.



Remove bolt and washer 2 on left side.
Remove front muffler body 3.



Muffler Assy

10.2 Muffler Inspection

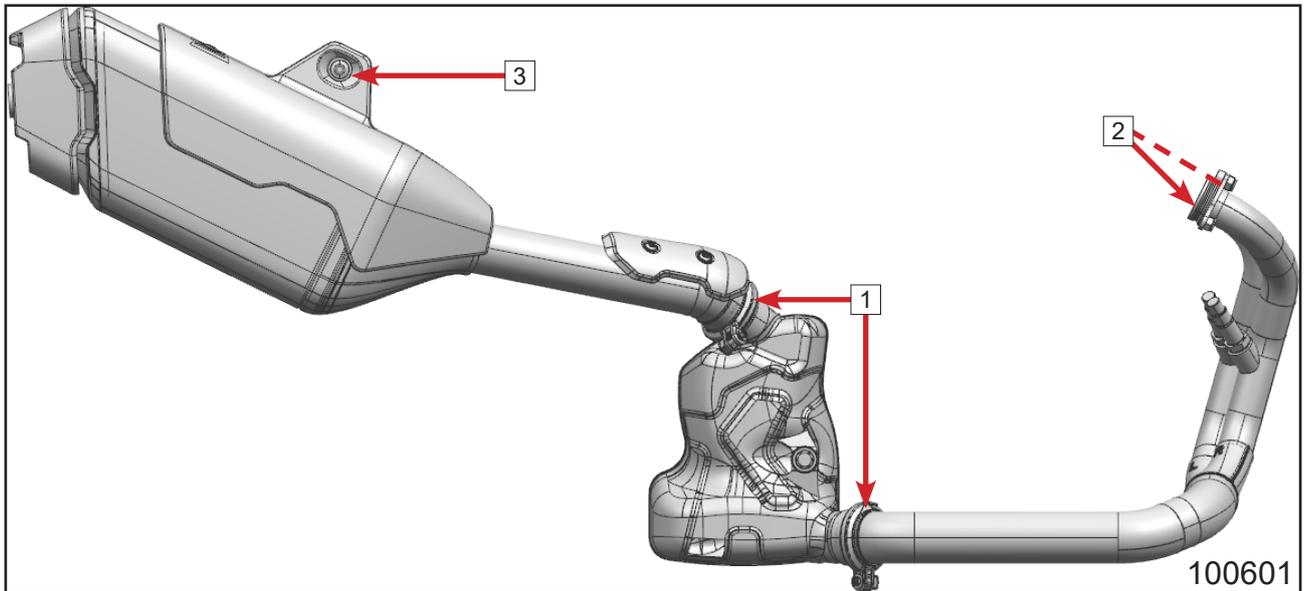
Inspect muffler appearance for any defect. Replace if necessary.

Inspect muffler graphite ring seal sleeve I 1.

Inspect two muffler gaskets 2.

Inspect for cracks or damage. Replace if any defect is found.

Inspect three damping sleeves 3 for cracks, rust or other damage. Replace if any defect is found.



WHEELS AND BRAKE SYSTEM

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Wheels and Brake System

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

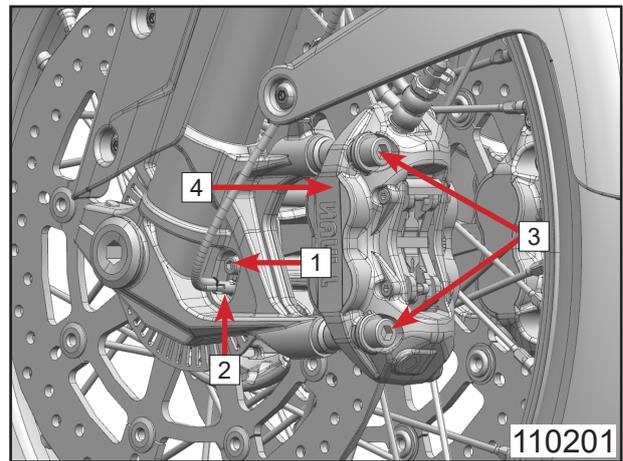
11.1 Front Brake Caliper

Remove inner hex bolt [1].

Remove speed sensor [2].

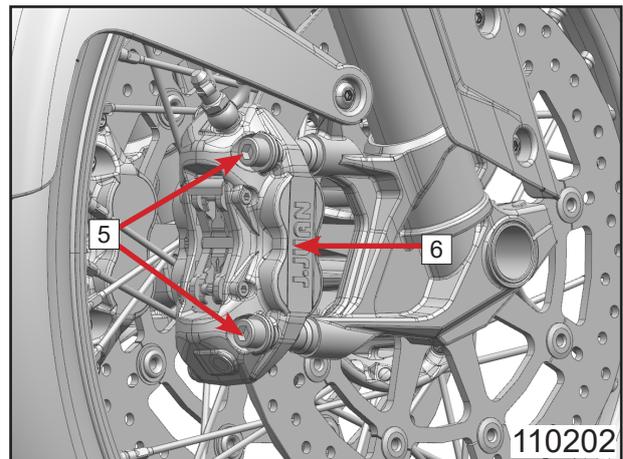
Remove inner hex bolts [3].

Remove LH front brake caliper [4].



Remove inner hex bolt [5].

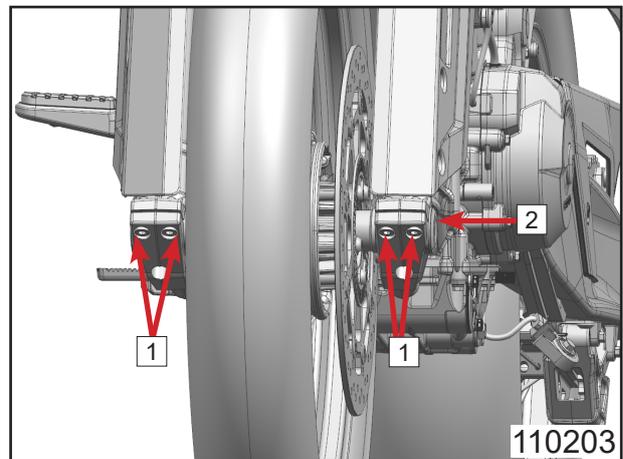
Remove RH front brake caliper [6].



11.2 Front Wheel

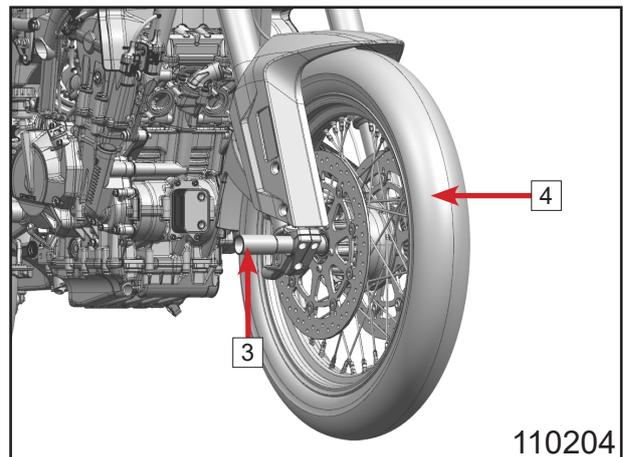
Remove inner hex bolt [1].

Remove nut [2].



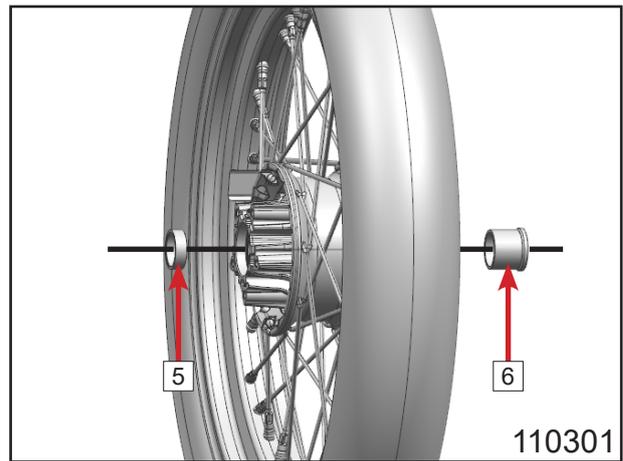
Pull out front wheel shaft [3].

Remove front wheel [4].

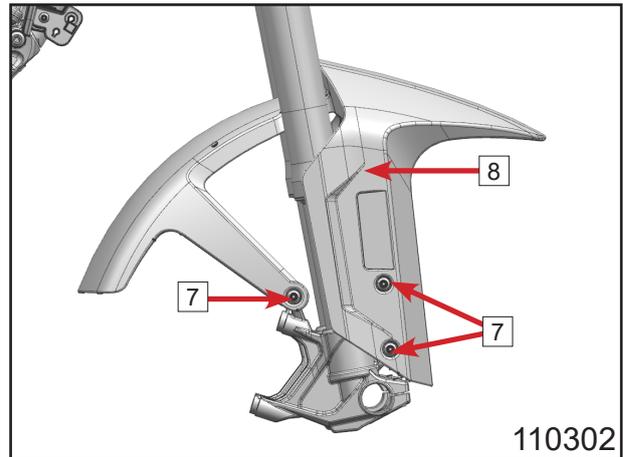


Wheels and Brake System

Keep front wheel spacer **5** and bushing **6** to prevent missing.

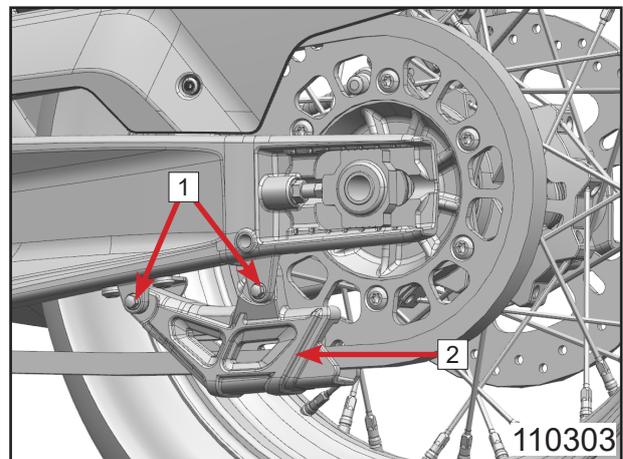


Remove inner hex bolts **7** on both sides.
Remove front fender **8**.

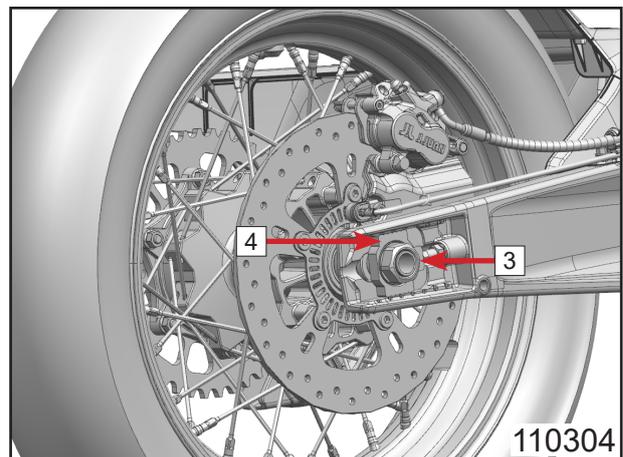


11.3 Rear Wheel Removal

Remove bolts **1**.
Remove chain guide **2**.



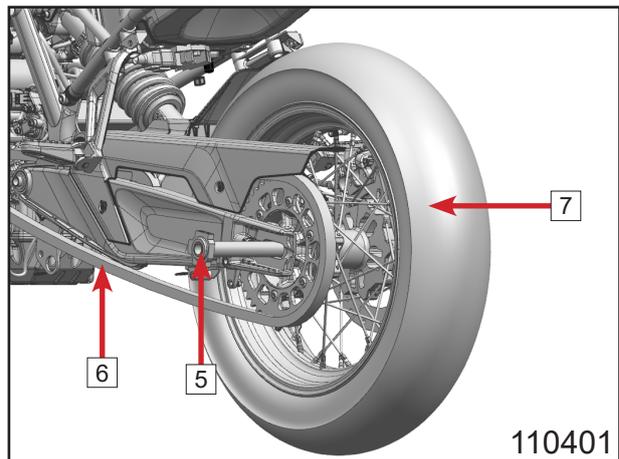
Remove nut **3**.
Remove adjusting block **4**.



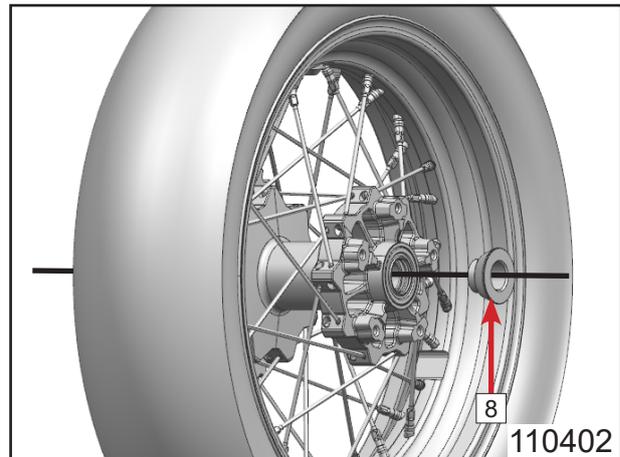
Wheels and Brake System

Pull out rear wheel shaft [5].
Push rear wheel [7] forward to release the chain.
Remove chain [6] from sprocket.
Remove rear wheel [7].

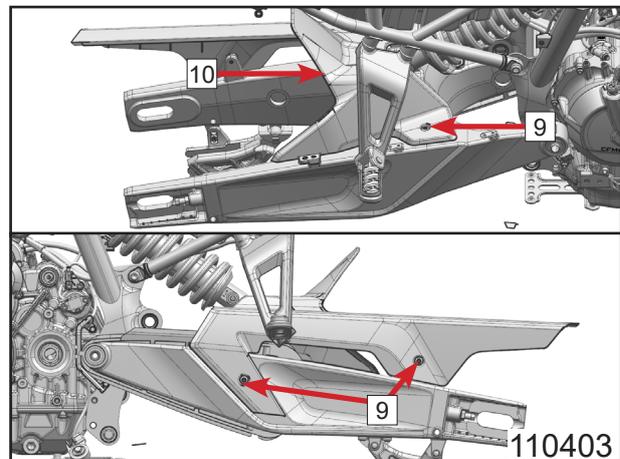
⚠ CAUTION: Lean rear wheel slightly to right during removal, in case of sprocket seat falling down to cause injury.



Keep wheel bushing [8] to prevent missing.

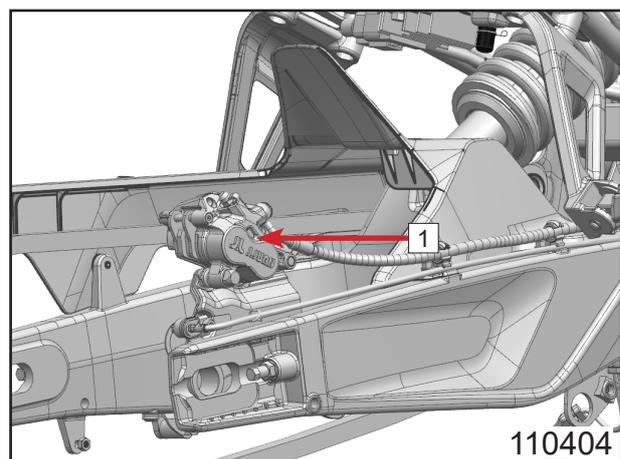


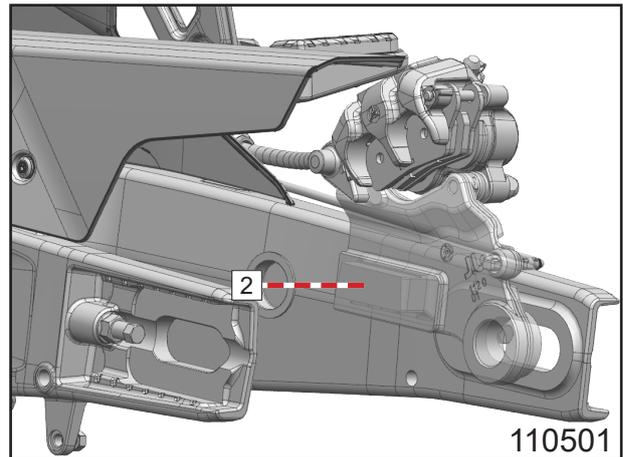
Remove inner hex bolts [9].
Remove rear fender [10].



11.4 Rear Brake Caliper Removal

Remove rear brake caliper from limit block [2].
Remove rear brake caliper [1].



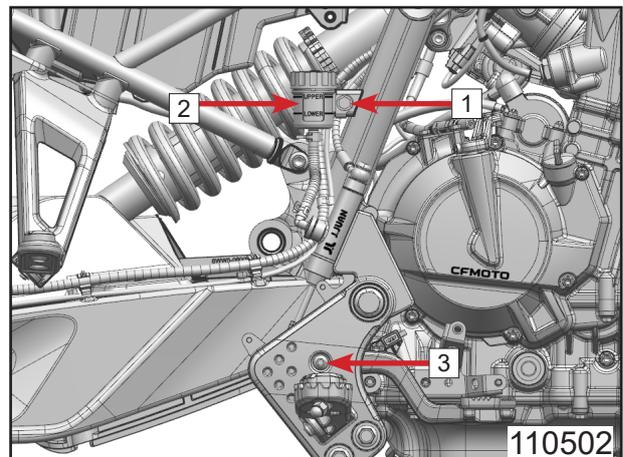


11.5 Brake Master Cylinder

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.

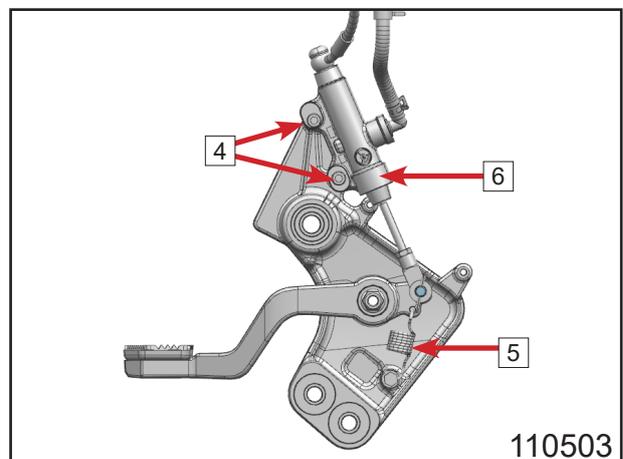


Remove inner hex bolt **3**.

Remove inner hex bolts **4**.

Remove spring **5** carefully.

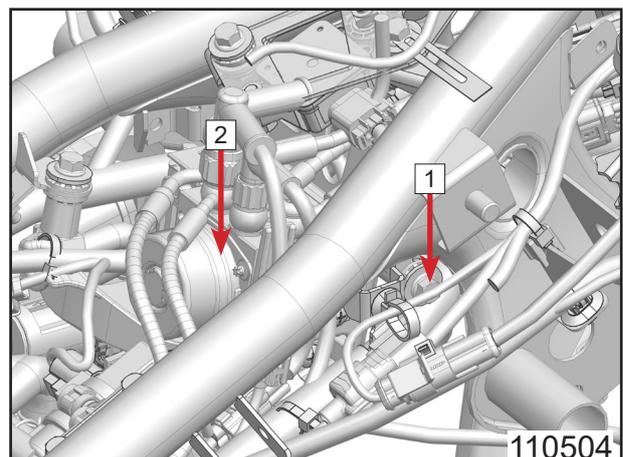
Remove brake master cylinder **6**.



11.6 ABS Actuator

Remove bolt and washer **1**.

Remove ABS actuator **2**.

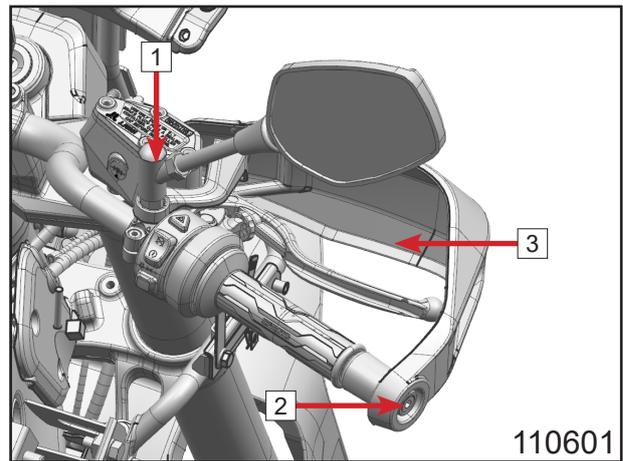


Wheels and Brake System

11.7 Hand Brake Master Cylinder Assy

Removal

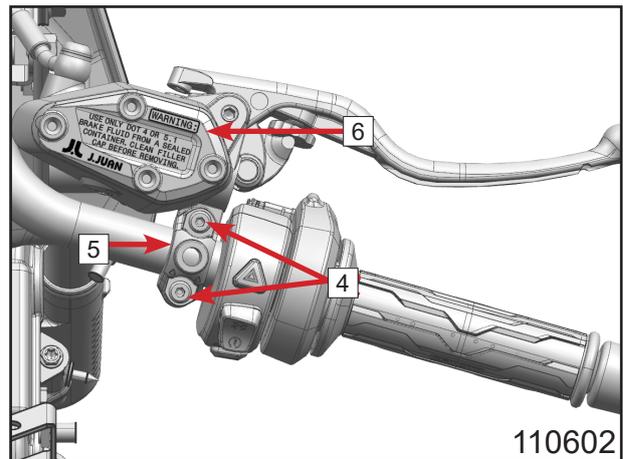
- Remove RH rear view mirror [1].
- Remove inner hex bolt [2].
- Remove RH hand guard [3].



- Remove inner hex bolts [4].
- Remove press cover [5].
- Remove hand brake master cylinder assy [6].

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

Remove whole brake system.

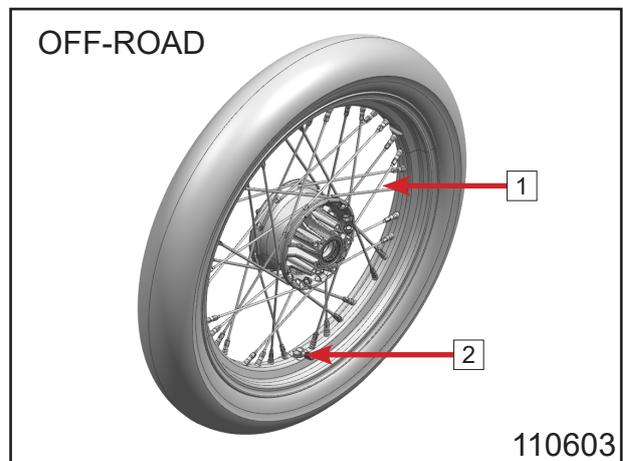


11.8 Wheel Inspection

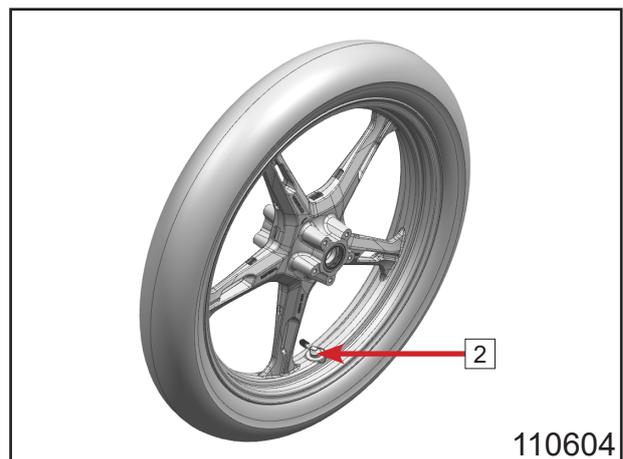
11.8.1 Front Wheel

Inspect spokes [1] for twist, deformation, cracks or damage. Replace if any defect is found.

Inspect spoke elastic ring for deformation which leads to rim leakage and damage. Replace if any defect is found.



Inspect tire pressure sensor [2] inflating valve for damage or leaking. Replace with new tire pressure sensor if inflating valve is damaged or tire pressure abnormal.

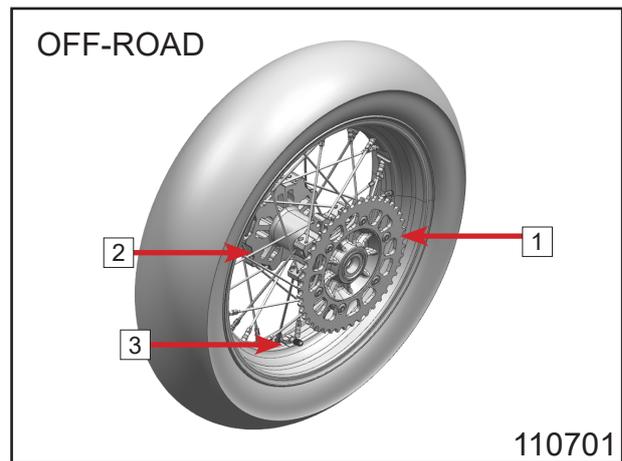


11.8.2 Rear Wheel

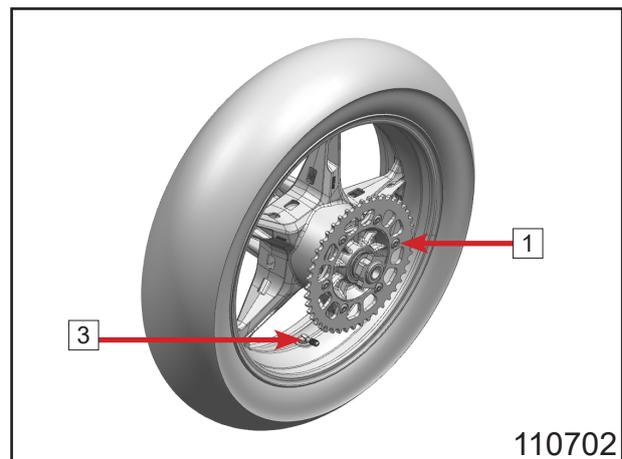
Remove sprocket **1** from rear wheel.

Inspect spokes **1** for twist, deformation, cracks or damage. Replace if any defect is found.

Inspect spoke elastic ring for deformation which leads to rim leakage and damage. Replace if any defect is found.

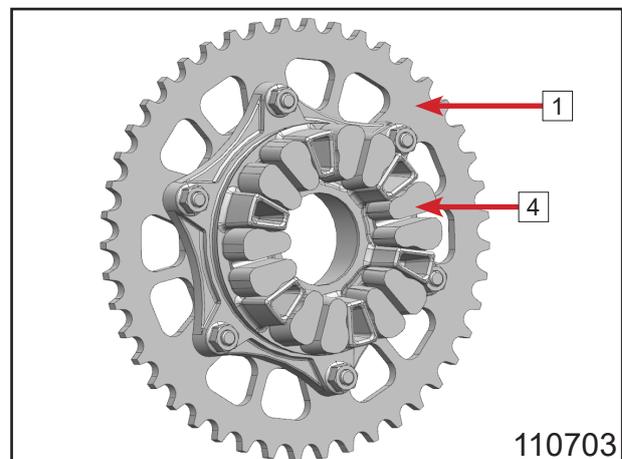


Inspect tire pressure sensor **2** inflating valve for damage or leaking. Replace with new tire pressure sensor if inflating valve is damaged or tire pressure abnormal.



Inspect six damping rubbers **4** for aged or damage. Replace if any defect is found.

Inspect sprocket seat **1** and rear sprocket for wear or damage. Replace if any defect is found.



Spoked Wheel

Check tire jump during tire replacement. If tire jump > 2.0 , adjust spoke nut.

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

Check spoke nut torque (value: $4\text{N}\cdot\text{m}\sim 9\text{N}\cdot\text{m}$). If torque value is incorrect, set it to correct tighten torque and make spoke jump < 1.0 .

Wheels and Brake System

11.8.3 Tire Pressure

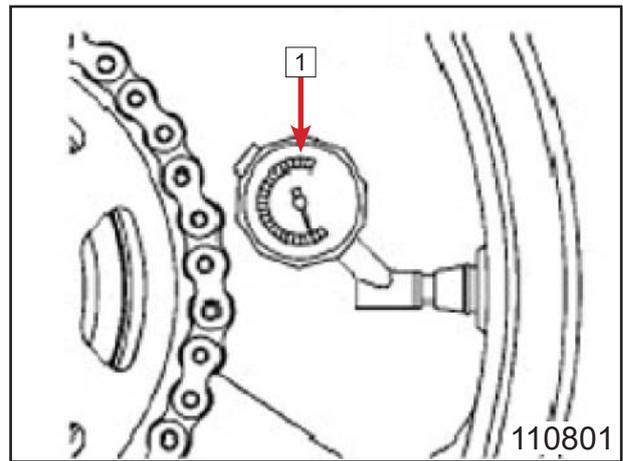
Remove tire inflation valve cap.

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

Pressure	kPa	kgf/cm ²	psi
Front wheel	250	2.5	36.3
Rear wheel	280	2.8	40.6

Adjust the tire pressure according to the standard if necessary.

Install tire inflation valve cap.

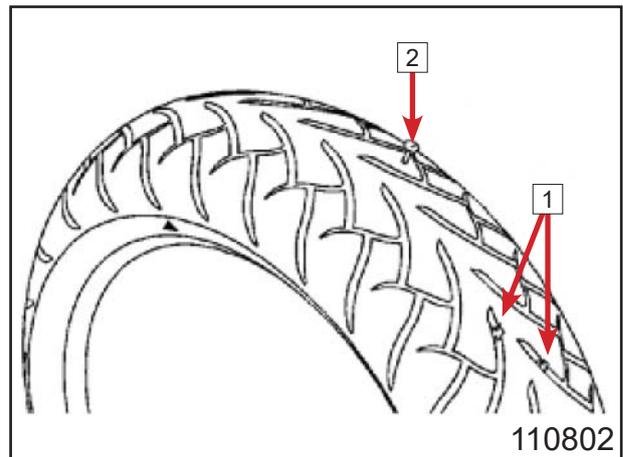


11.8.4 Tire Appearance

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

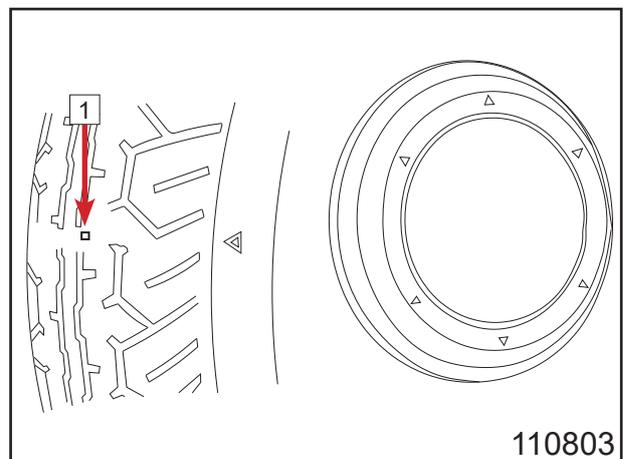
Inspect the tire for cracks or damages by watching it. Replace if any defect is found.

If tire expands or has bulges on it, replace with a new tire.



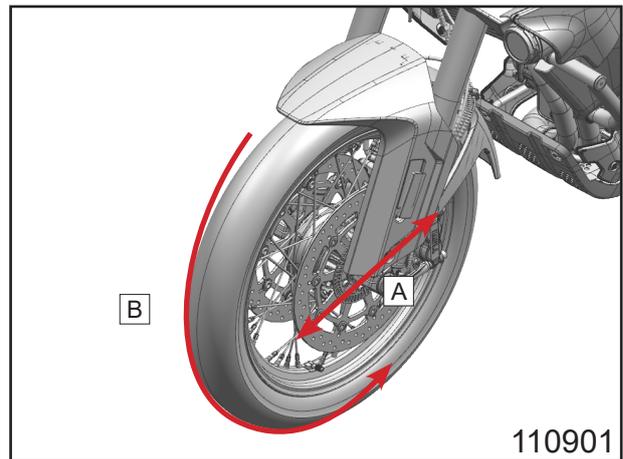
Inspect tire for wear condition. The tire may be punctured or damaged if beyond service limit. Majority of the tire accidents happen due to exceeding service limit. Pay attention not to use the tire if the pattern is worn in case of injury.

When the tire thread wears to the block **1** height, replace a new tire.

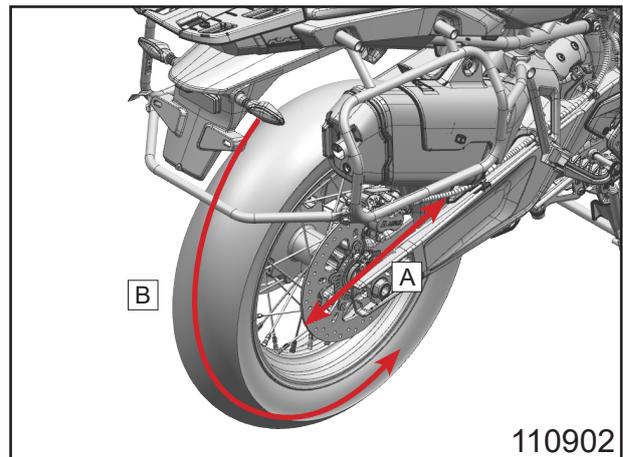


11.8.5 Wheel Bearing

Lift the front wheel with jack.
Inspect the front wheel bearing for damage by pushing or pulling the wheel **A**.
Rotate the front wheel **B** to inspect the for the smooth movement and noise.
Replace if any defect is found.

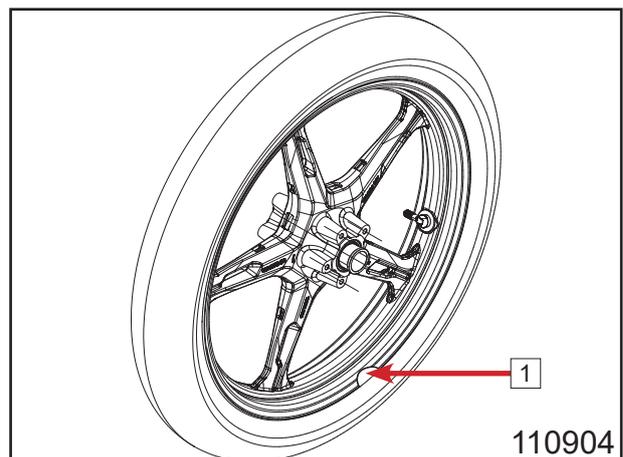
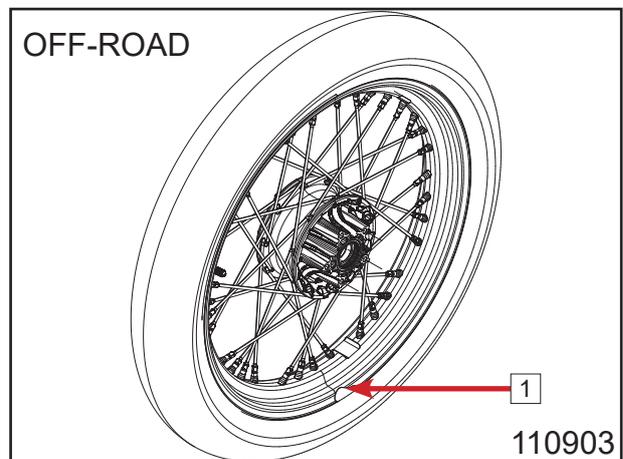


Lift the rear wheel with jack.
Inspect the rear wheel bearing for damage by pushing or pulling the wheel **A**.
Rotate the rear wheel **B** to inspect the for the smooth movement and noise.
Replace if any defect is found.



11.8.6 Rim

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



Wheels and Brake System

11.9 Brake System Inspection

⚠️WARNING:

Brake fluid can irritate 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.

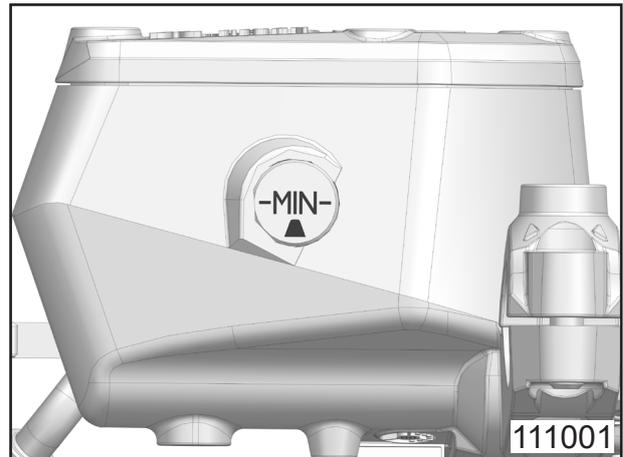
If you spill brake fluid on your clothing, change your clothing.

11.9.1 Hand Master Cylinder Inspection Front Brake Fluid Level Inspection

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

Watch the fluid level to check the fluid level.

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



Brake Fluid Replacement

Remove two screws [1].

Remove reservoir cap [2].

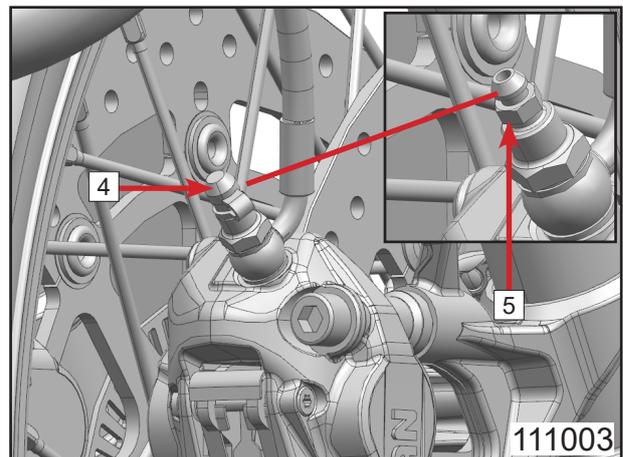
Remove reservoir gasket [3].

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 cap [4].

Connect a clean 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.

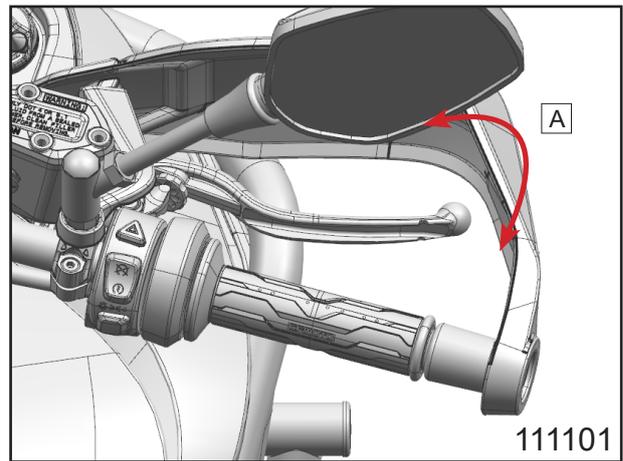
Repeat the above procedures until the new brake fluid sprays out.

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

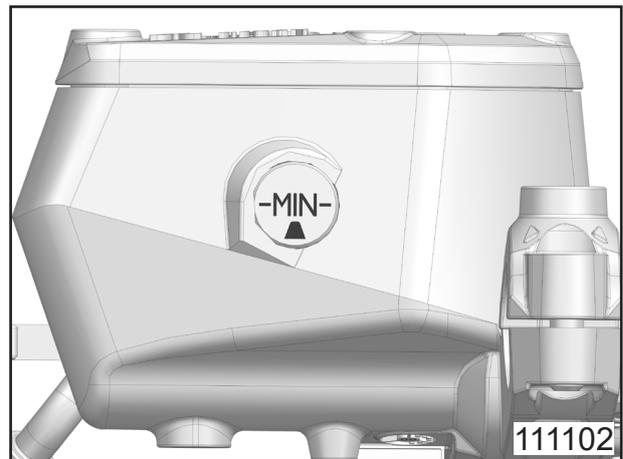
⚠ WARNING: If there is air inside of brake system, replace brake fluid repeatedly until there is no air in drained brake fluid.

Brake Fluid Addition

Add brake fluid until the level is above LOWER and within view window.



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Install reservoir gasket **3**.

Install reservoir cap **2**.

Install two screws **1**.



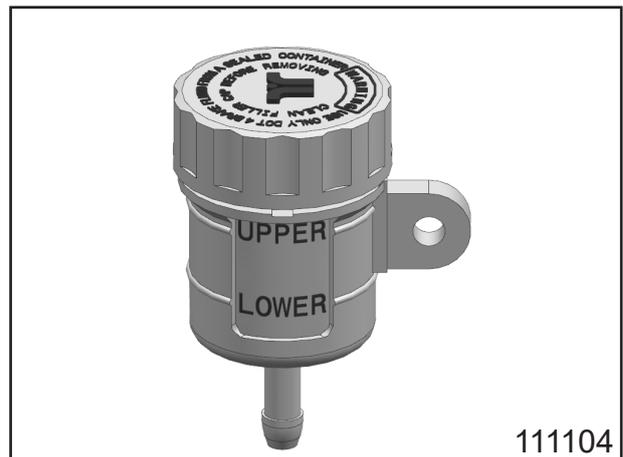
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11.9.2 Rear Master Cylinder Inspection Rear Brake Caliper

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

Watch the fluid level to check the fluid level.

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



111104

Install reservoir gasket [3].

Install reservoir cap [2].

11.9.3 Brake Hose Inspection

Inspect brake hose, connectors and pipes for damage, cracks or leaking.

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

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

Tighten all the brake hose connecting bolts and nuts.

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

11.9.4 Brake Calipers and Brake discs Inspection

Front Brake Caliper

Remove brake caliper.

Inspect each brake pad thickness.

Brake pad thickness service limit: 2.5mm

Replace brake pads before it reaches to service limit. Replace brake pads in set.

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

⚠ WARNING: Do not run the vehicle right after replacing new brake discs or pads. Do break-in on brake pads. Operate the brake lever several times until brake pad and brake caliper engage well.

Brake Disc

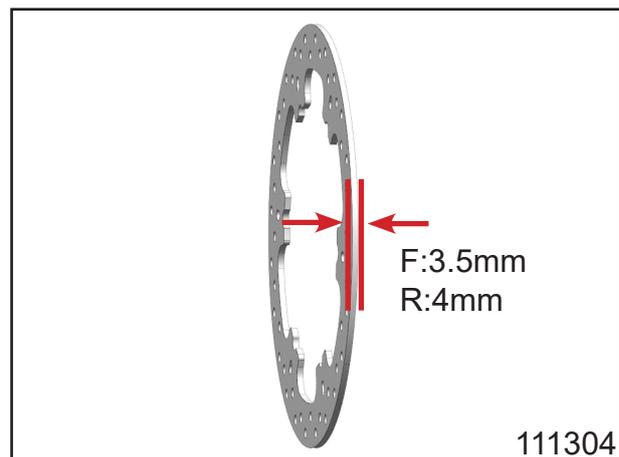
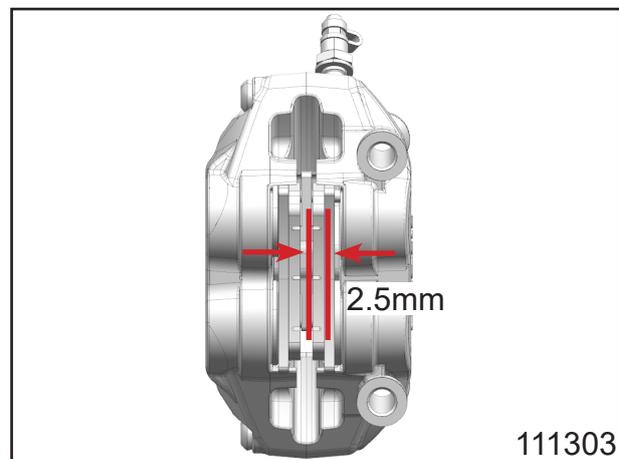
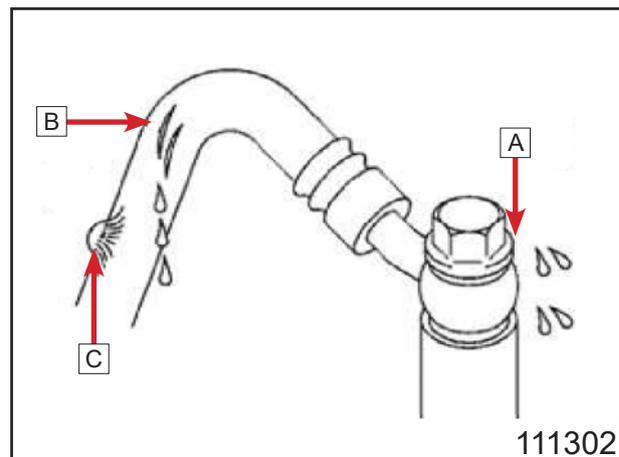
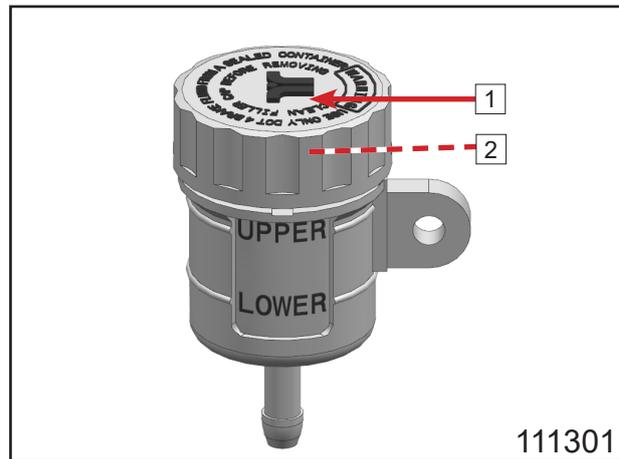
Inspect brake disc thickness.

Front brake disc thickness service limit: 3.5mm.

Rear brake disc thickness service limit: 4mm.

Replace brake discs before it reaches to service limit.

Inspect brake discs for deep scratches or other damages. Replace if any defect is found.

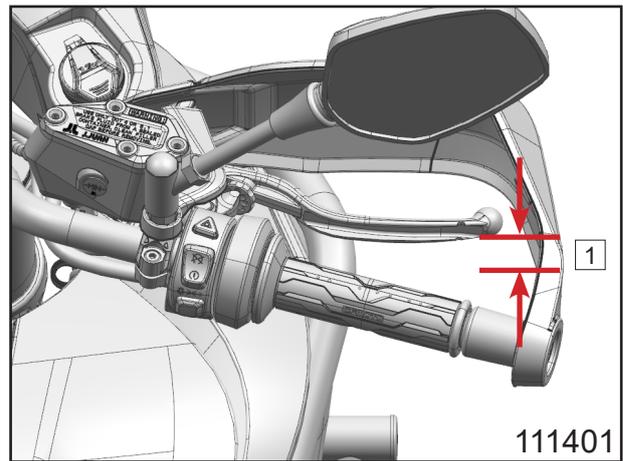


Wheels and Brake System

11.10 Free Play

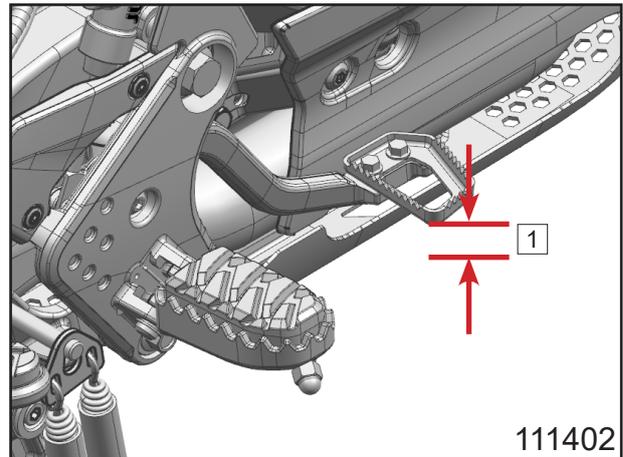
11.10.1 Front Brake Lever Free Play

Inspect front brake lever free play 1.
Standard: $7\text{mm}\pm 2\text{mm}$



11.10.2 Rear Brake Pedal Free Play

Inspect rear brake lever free play 1.
Standard: $3\text{mm}\pm 1.5\text{mm}$



SHOCK ABSORBERS AND REAR FORK

12.1 Handlebar	2
12.2 Front Shock Absorbers.....	2
12.3 Chain.....	2
12.4 Rear Fork.....	3
12.5 Chain Inspection.....	4
12.5.1 Chain Looseness Adjustment	6
12.6 Front Shock Absorber.....	7
12.7 Rear Shock Absorber	7

Shock Absorbers and Rear Fork

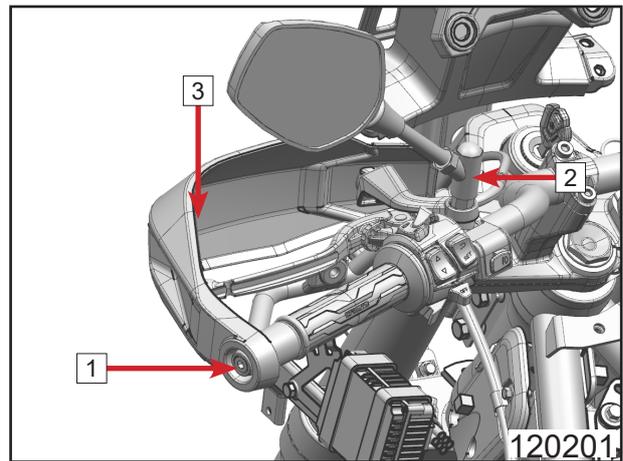
12.1 Handlebar

Remove inner hex bolts and bushings [1] on both sides.

Remove two rear view mirrors [2].

Remove hand guards [3].

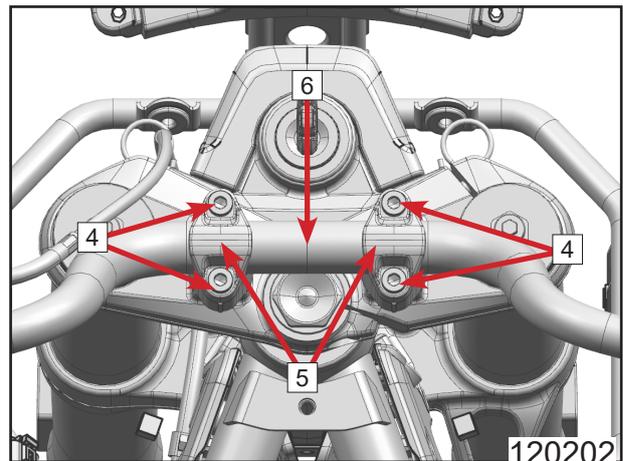
Insert bolts and bushings [1] in to prevent balancer missing.



Remove inner hex bolts [4].

Remove handlebar press cover [5].

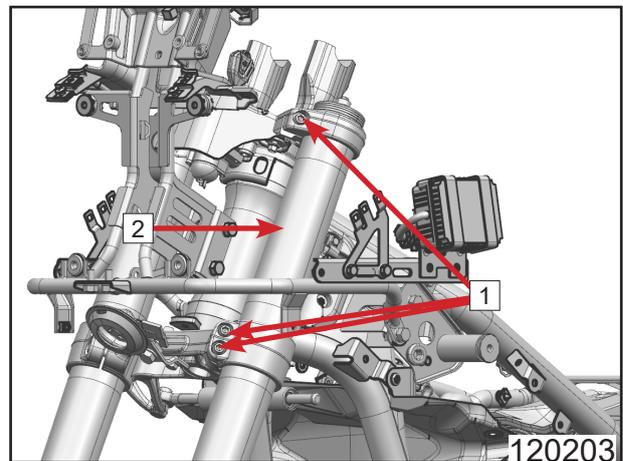
Place handlebar [6] carefully.



12.2 Front Shock Absorbers

Remove inner hex bolts [1] on both sides.

Remove LH&RH front shock absorbers [2].



12.3 Chain

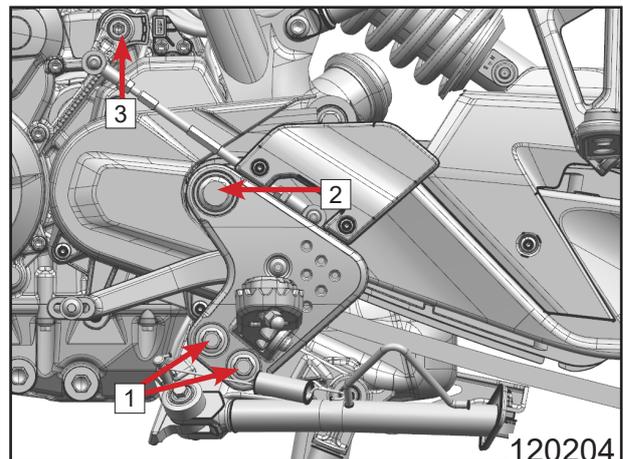
Remove bolts [1].

Remove bolt [2].

Remove inner hex bolt [3].

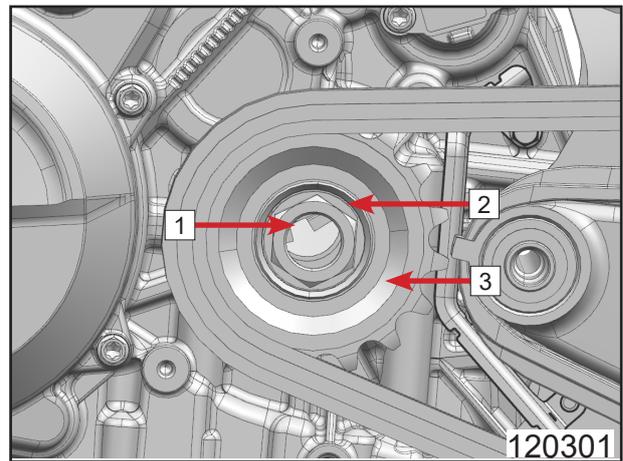
Remove LH footrest bracket.

Insert bolt [2] back.

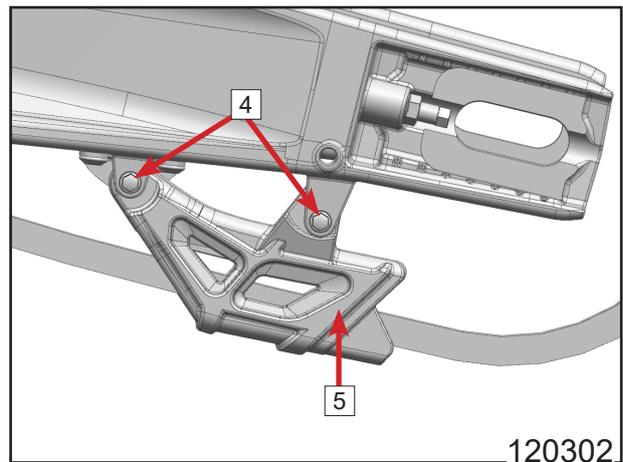


Shock Absorbers and Rear Fork

- Lift lock washer [2].
- Remove nut [1].
- Remove lock washer [2].

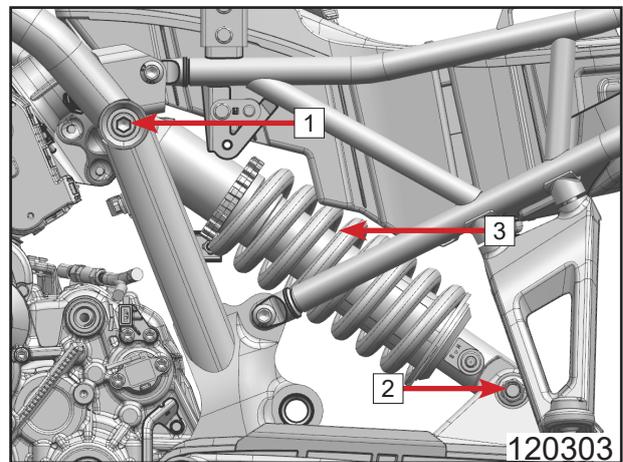


- Remove bolts [4].
- Remove chain guide [5].
- Remove chain.
- To prevent the chain from falling on the ground or coming into contact with other contaminants, such as chain smudges. The chain must be cleaned and lubricated with professional chain cleaning agent and chain oil during installation.

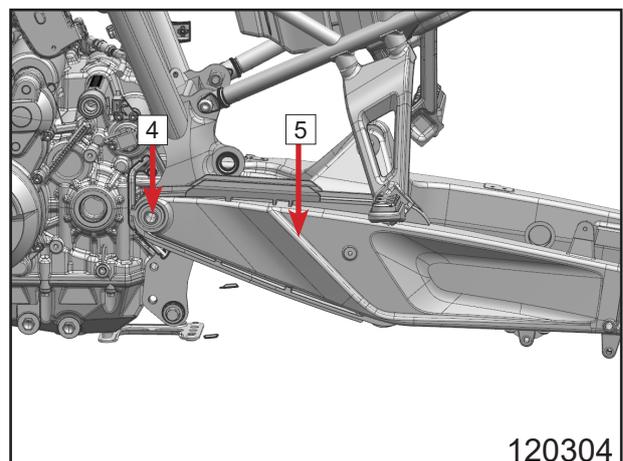


12.4 Rear Fork

- Remove inner hex bolt [1].
- Remove bolt and nut [2].
- Remove rear shock absorber [3].



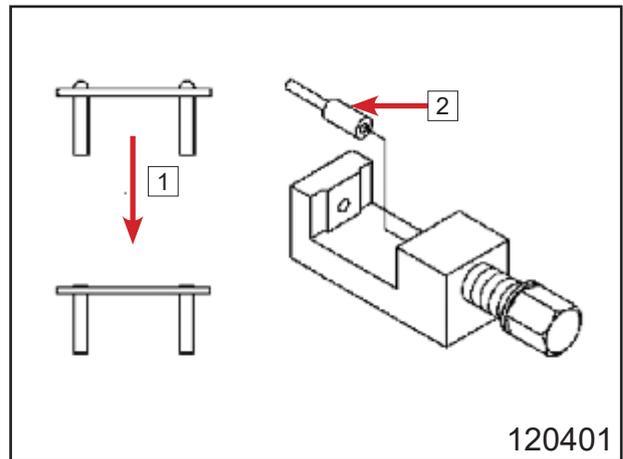
- Remove rear fork shaft [4].
- Remove rear fork [5].



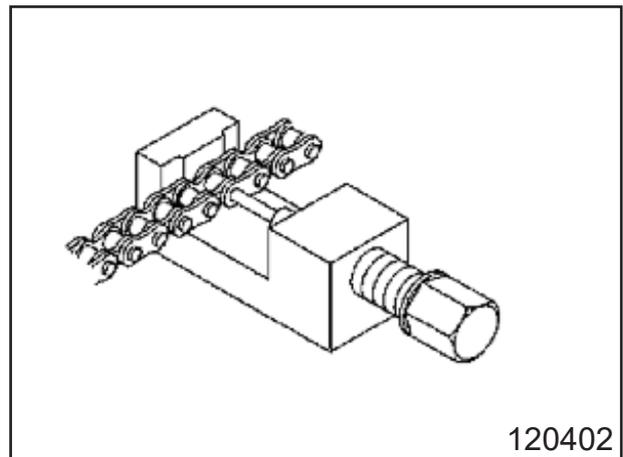
Shock Absorbers and Rear Fork

12.5 Chain Inspection

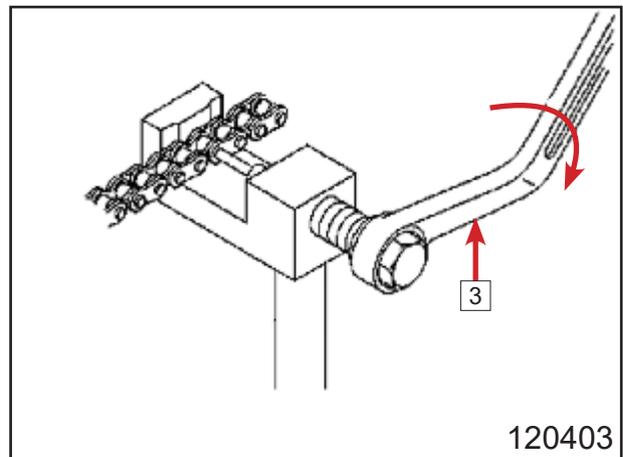
Press hard **1** to make two pin heads parallel.
Set the cutting and riveting pin **2** as picture shows.



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.

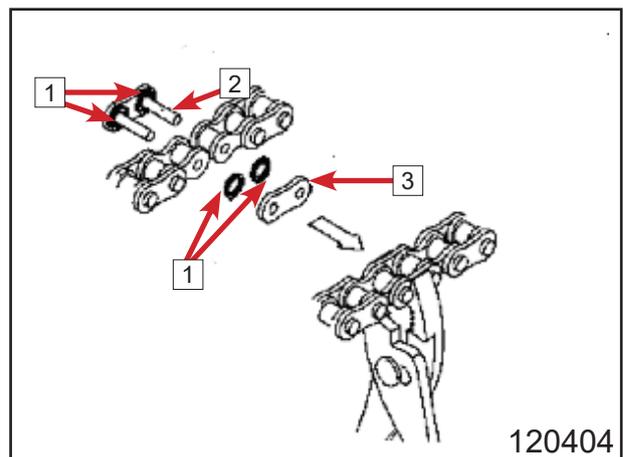
Insert chain pins into chain knots.

Install seal rings **1**.

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

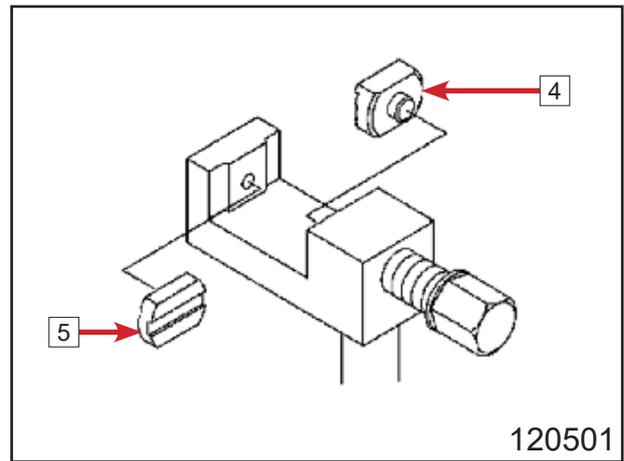
Fix the chain board with hand or plier.

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

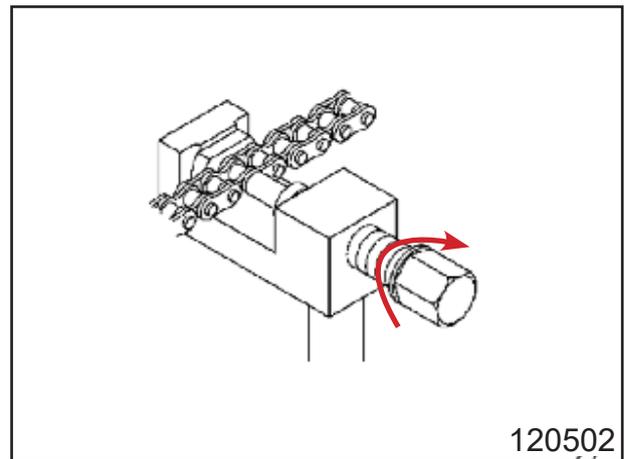


Shock Absorbers and Rear Fork

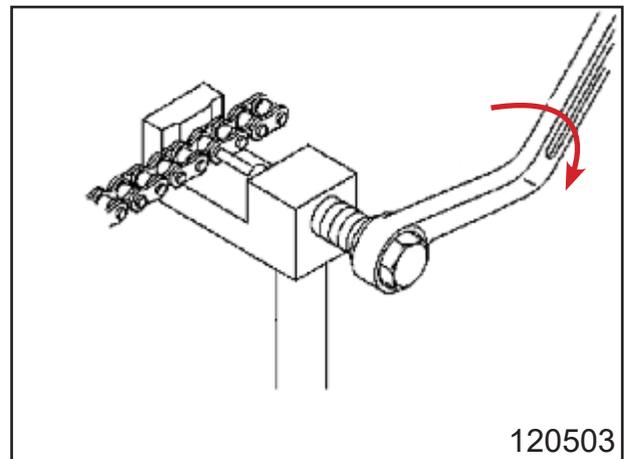
Set the holder **4** and **5**.



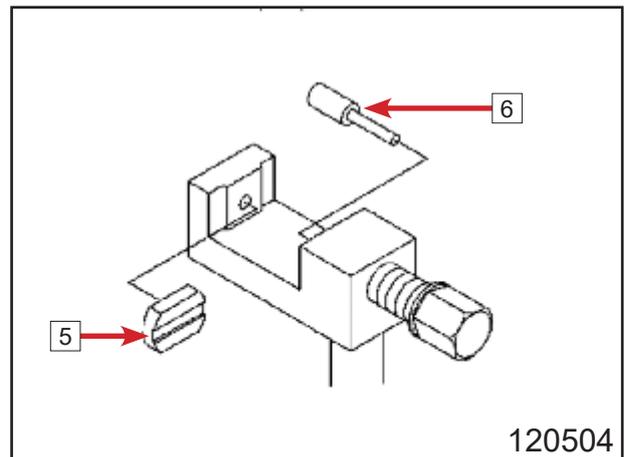
Align the holder and chain board.
Rotate the pin seat until it touches the chain board.



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

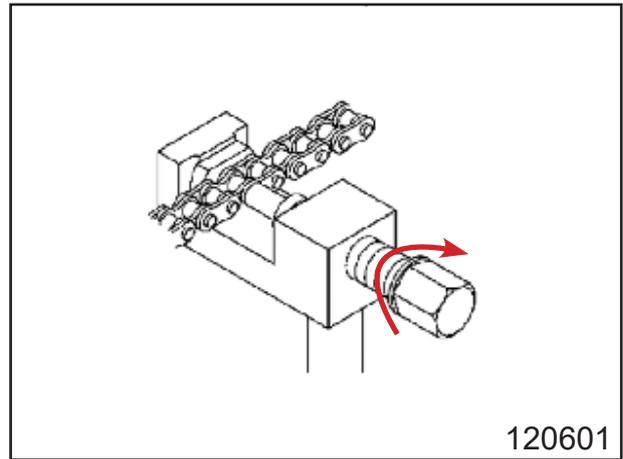


Set the holder **5** and cutting and riveting pin **6** as picture shows.

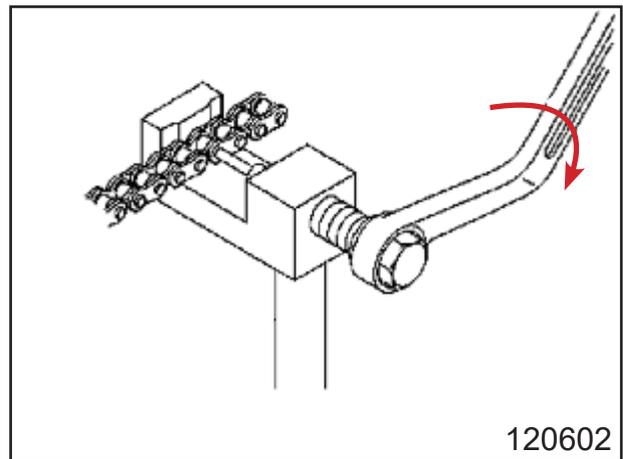


Shock Absorbers and Rear Fork

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.



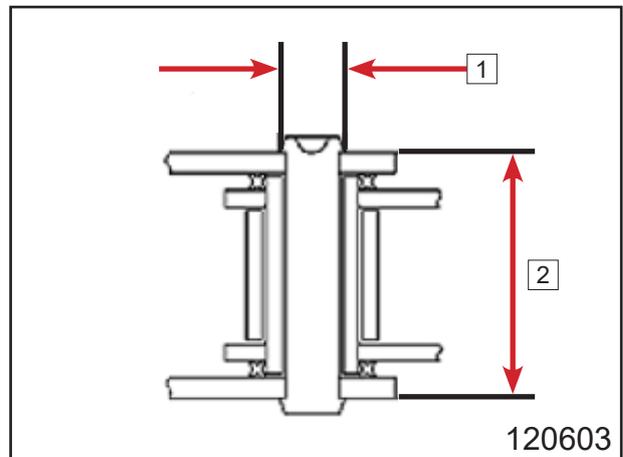
Inspection

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.

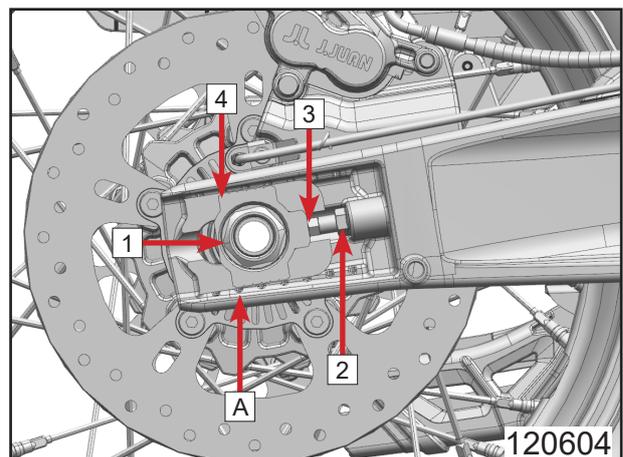


12.5.1 Chain Looseness Adjustment

Adjust adjusting nut [2] according to requirement.

Chain sag standard: 30mm~40mm

⚠ CAUTION: Adjusting nuts must be set the same distance on both sides.



Shock Absorbers and Rear Fork

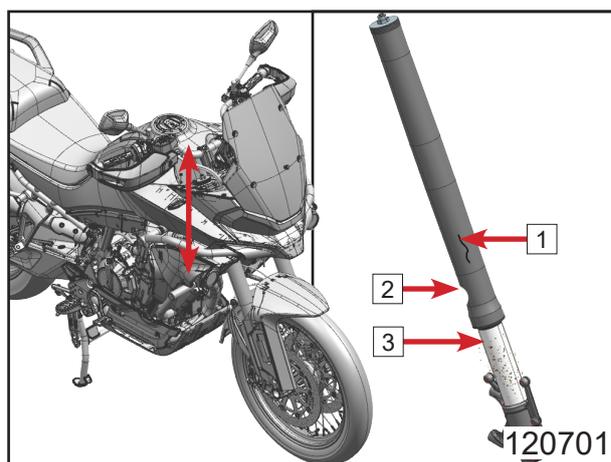
12.6 Front Shock Absorber

Inspection

Inspect front shock absorber appearance for damage **2**, cracks **1** or other damage. Replace if any defect is found.

Clean dust and mud **3** on front shock absorber.

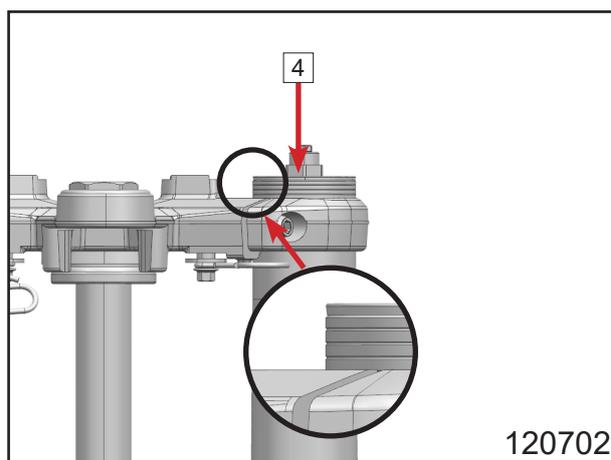
Press down handlebar several times to check compression/rebound function of front shock absorber.



Installation

Reverse the removal procedures for installation.

CAUTION: During installation, the upper surfaces **4** of both shock absorbers should be parallel.

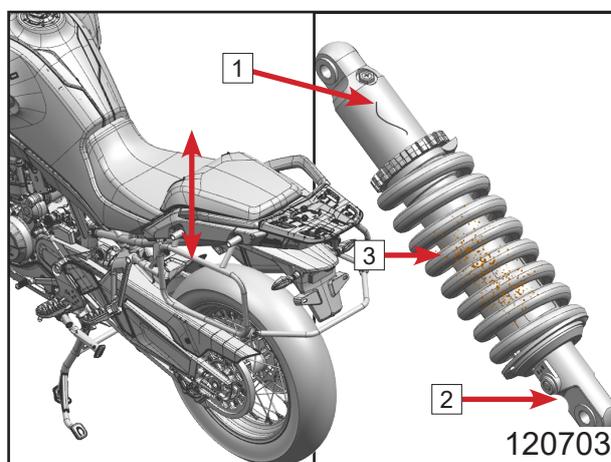


12.7 Rear Shock Absorber

Inspect rear shock absorber appearance for damage **2**, cracks **1** or other damage. Replace if any defect is found.

Clean dust and mud **3** on rear shock absorber.

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



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13.1 Removing The Engine

Preparatory work

Switch off the ignition by turning the ignition key to the position \otimes .

Remove the seat.

Disconnect the negative cable of the 12-V battery.

Remove main silencer.

Raise motorcycle with rear lifting gear.

Remove the left side cover.

Remove the battery cover.

Remove left fuel tank cover.

Remove the right side cover.

Remove right fuel tank spoiler.

Remove engine guard.

Remove the fuel tank.

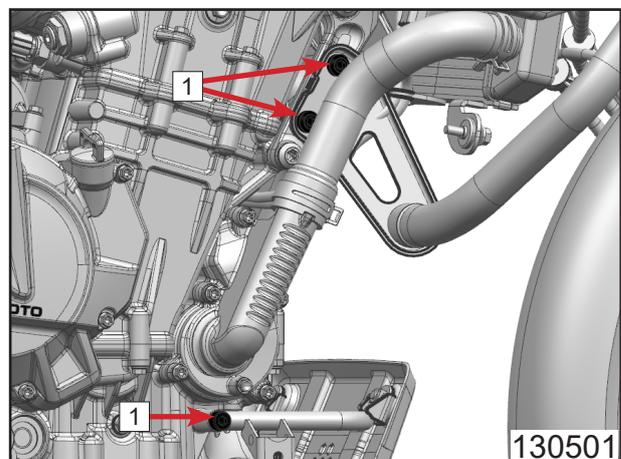
Remove the exhaust system.

Drain the coolant.

Main work

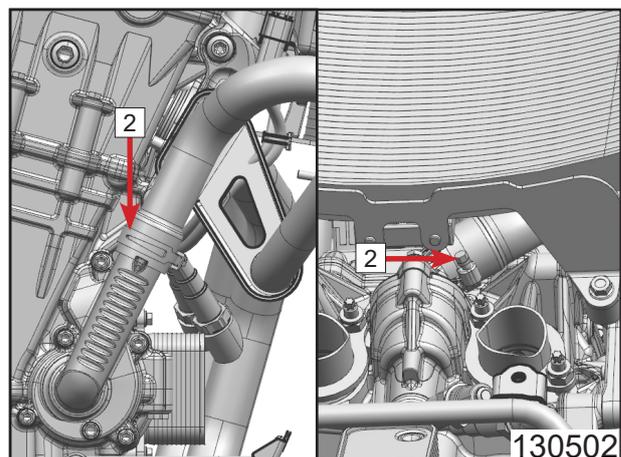
Remove screws **1**.

Hang the activated charcoal filter to the side.



Loosen hose clips **2**.

Pull off the radiator hoses.



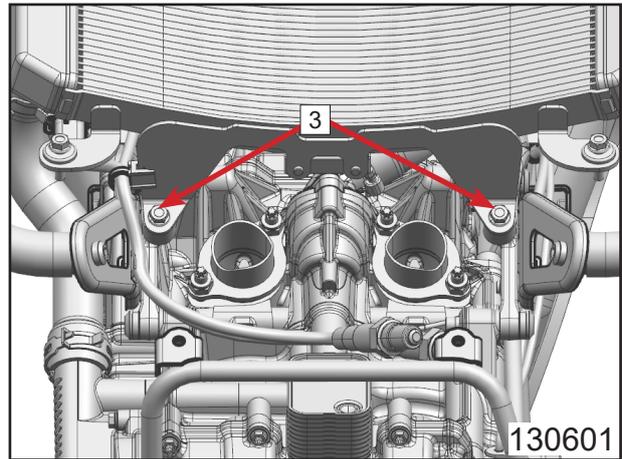
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Remove screws **3**.
Swing the radiator forward.

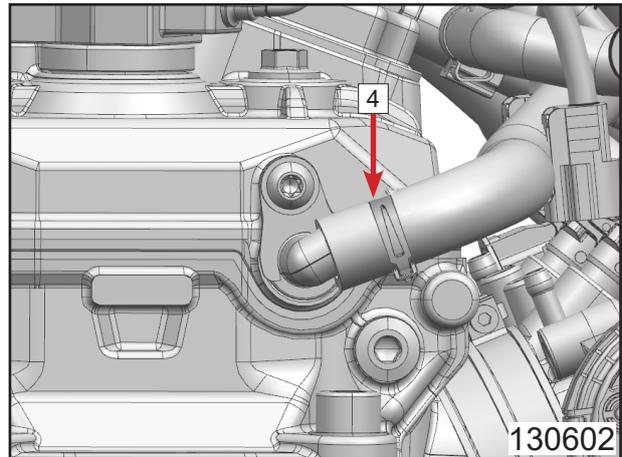
Info

Pay attention to the cooling fins.

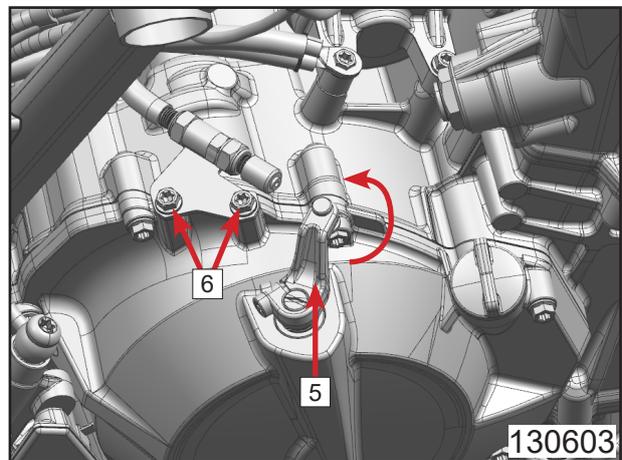
Remove the cable ties.
Disconnect plug-in connector.



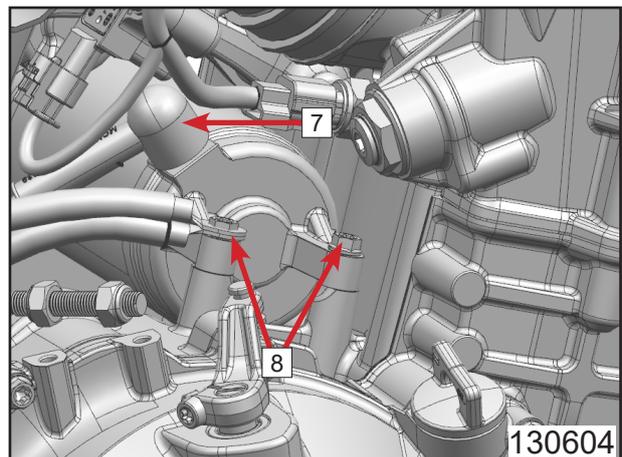
Remove hose clamp **4** and pull off the vent hose.



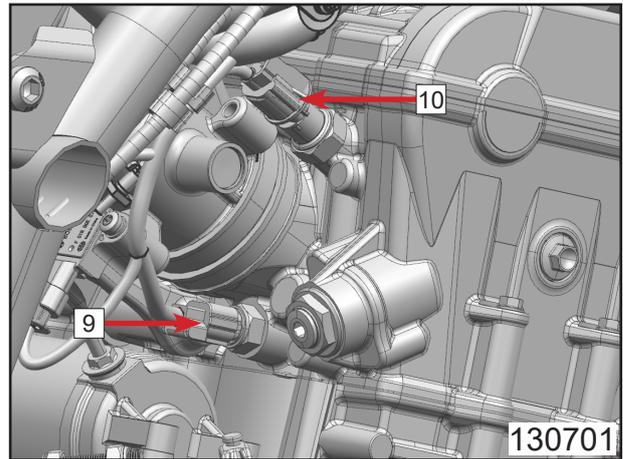
Swivel clutch release lever **5** counterclockwise and detach the inner clutch cable.
Remove screws **6**.
Hang the inner clutch cable with bracket to the side.



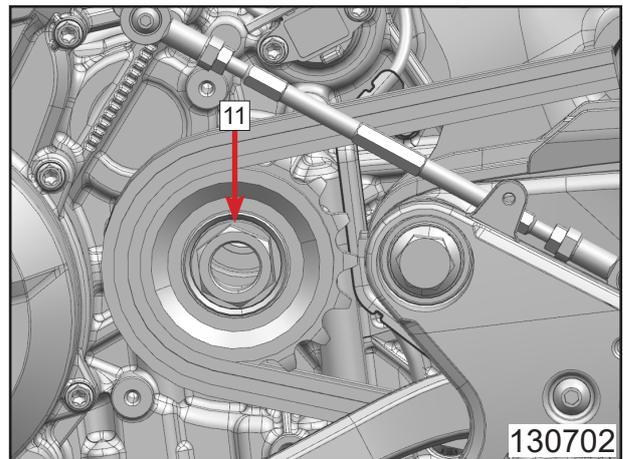
Push back protection cap **7** and remove the nut.
Hang the positive cable to the side.
Remove screws **8**.
Hang the ground wire to the side.



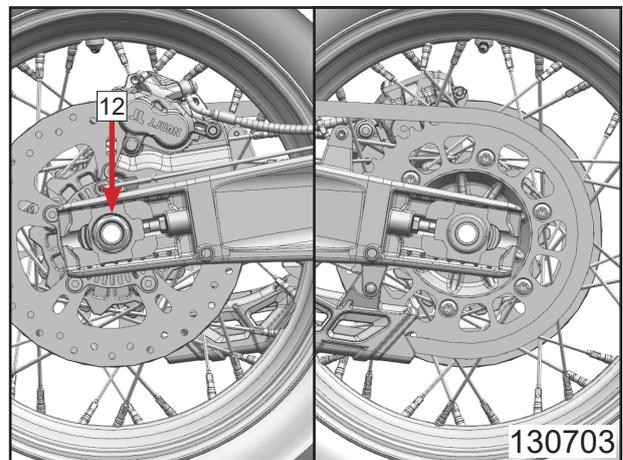
Disconnect connector **9** from the coolant temperature sensor.
Unplug connector **10** from the oil pressure sensor.



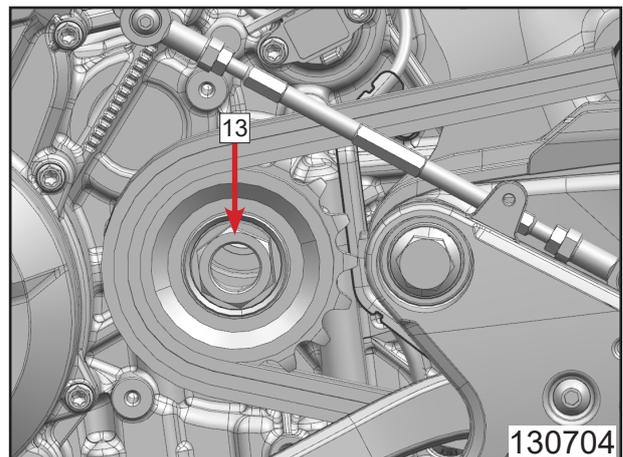
Bend up the lock washer.
Have an assistant operate the rear brake.
Loosen nut **11**.



Remove nut **12**.
Remove the chain adjuster.
Push the rear wheel into the foremost position.

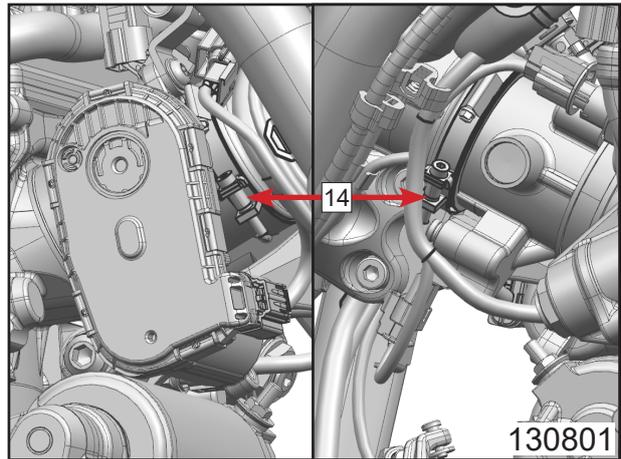


Remove nut **13** with the lock washer.
Take off the engine sprocket.

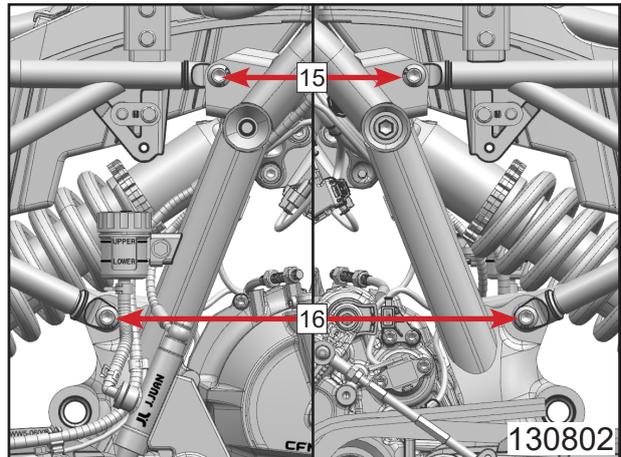


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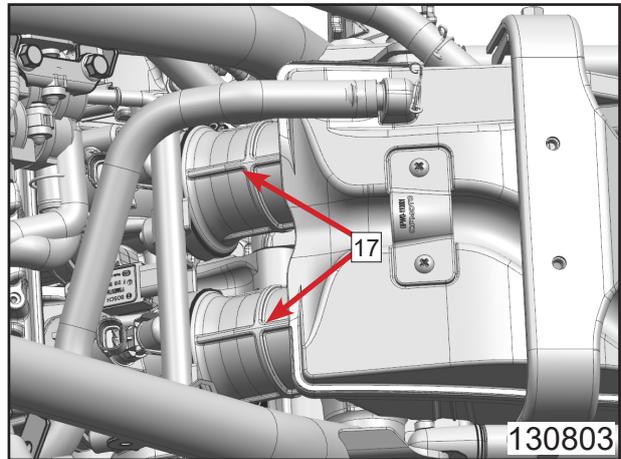
Loosen hose clips **14**.



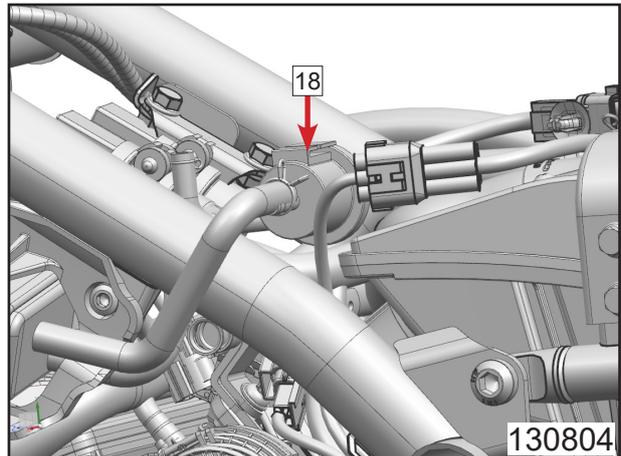
Loosen screws **15**.
Remove screws **16**.
Swivel the subframe downward.



Remove hose clips **17**.

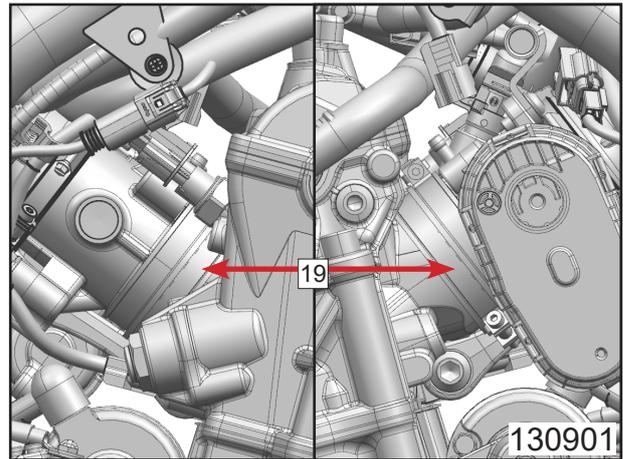


Pull off hose **18**.

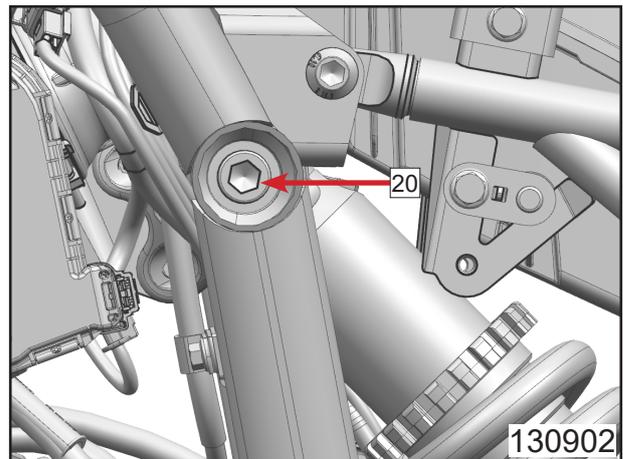


Loosen hose clips **19**.
Pull off the throttle valve body toward the rear and remove to the side.

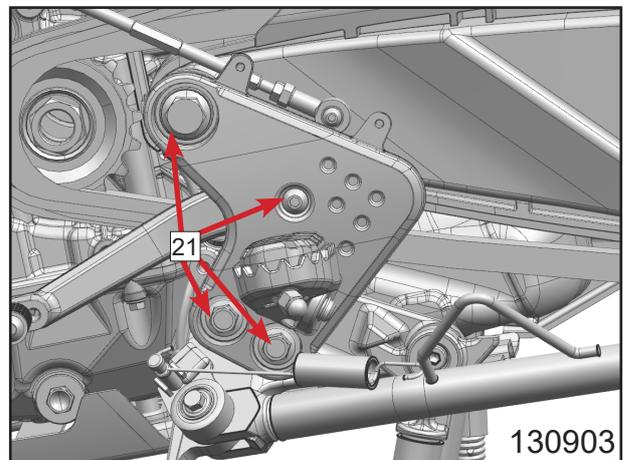
使用支撐物支撐在發動機底部。



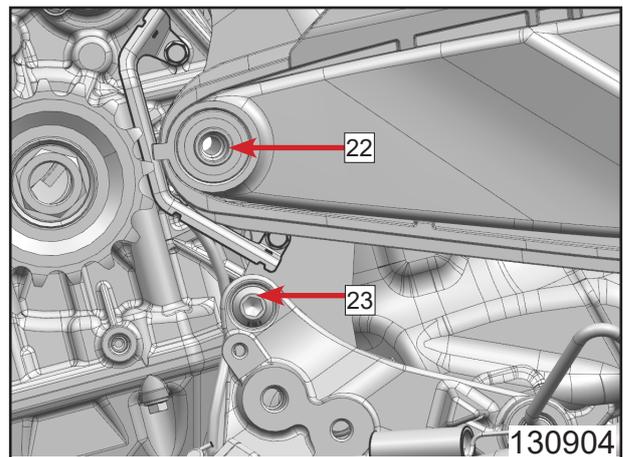
Remove protection cap.
Loosen screw **20**.



Remove screw **21**.
Remove the footrest bracket.

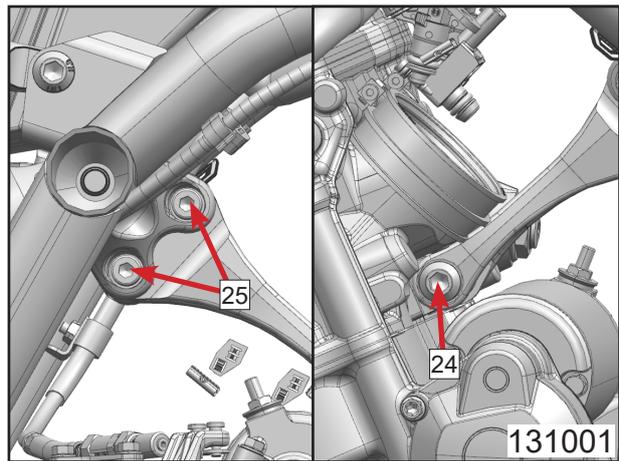


Remove screw **22**.
Pull out swingarm pivot **23** far enough so that the engine is released but the link fork remains secured.

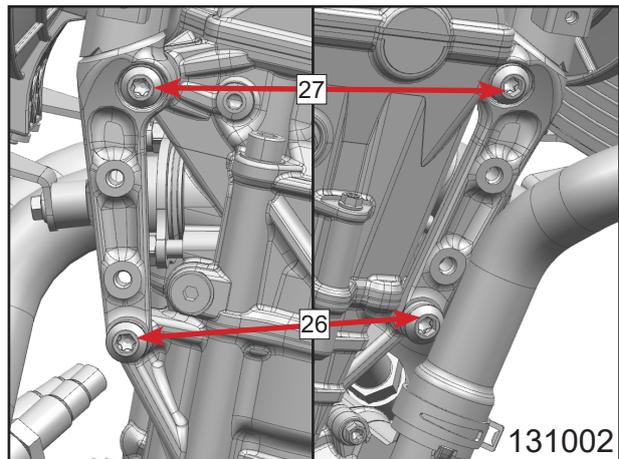


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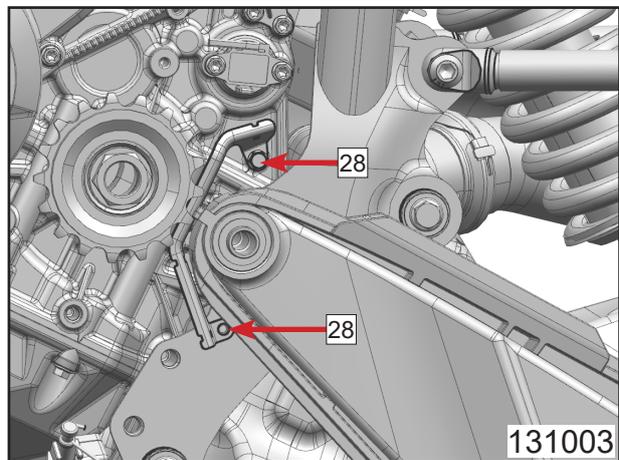
Remove screw 24.
Remove screws 25.
Take off the engine bearer.



Remove screws 26.
Remove screws 27.



Remove screws 28.



取下发动机。

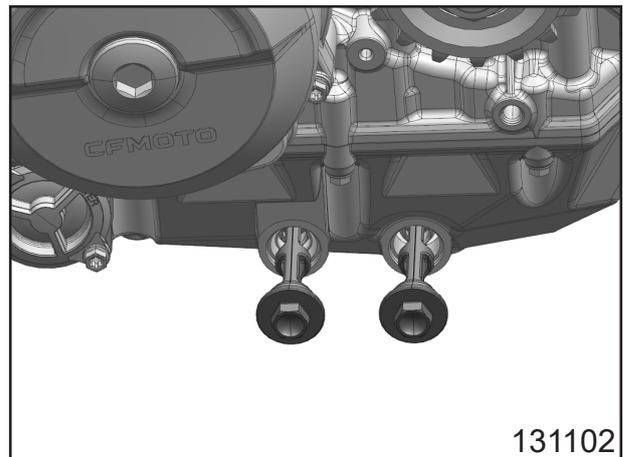
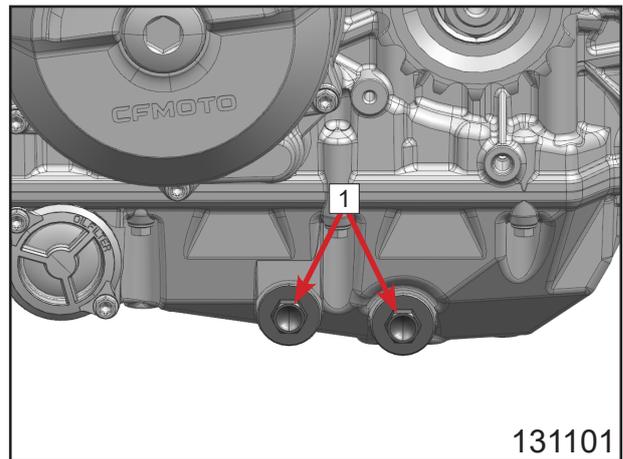
Info

The help of an assistant is useful in this step.
Make sure that the motorcycle is sufficiently secured against falling over.
Cover the components them against damage.

13.2 Engine Disassembly

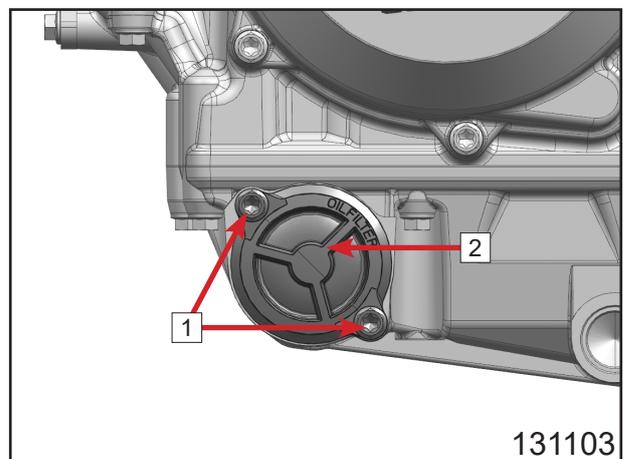
13.2.1 Draining the engine oil

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

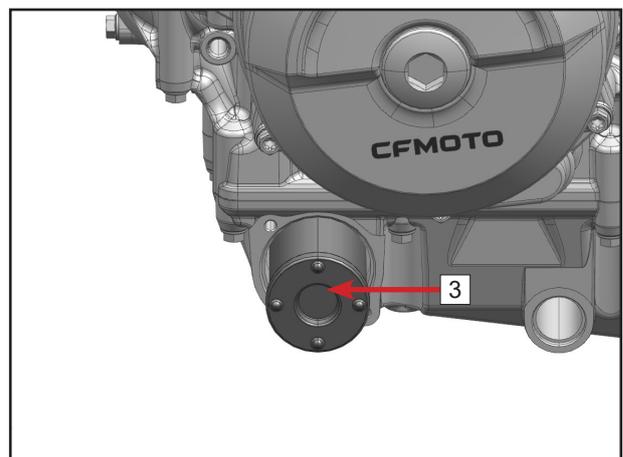


13.2.2 Removing the oil filter

Remove screws (1).
Take off oil filter cover (2) with the O-ring.



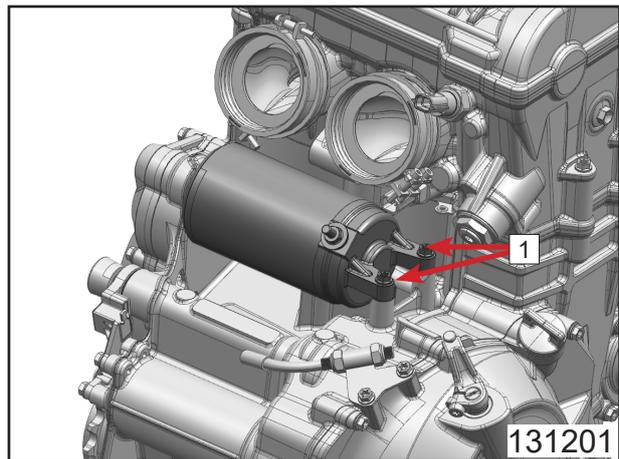
Remove oil filter (3).



13.2.3 Removing the starter motor

Remove screw (1).

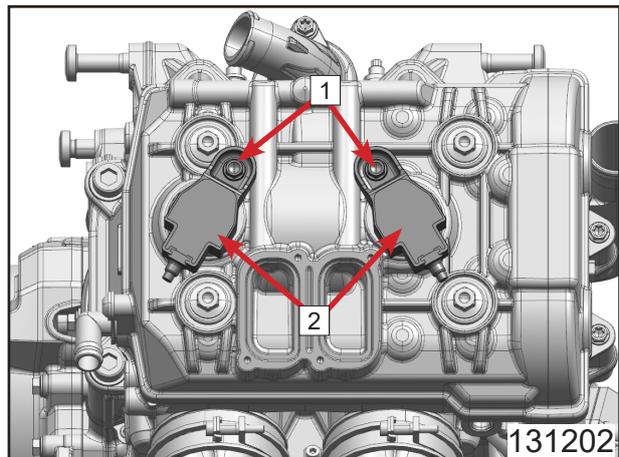
Take off the starter motor.



13.2.4 Removing the valve cover

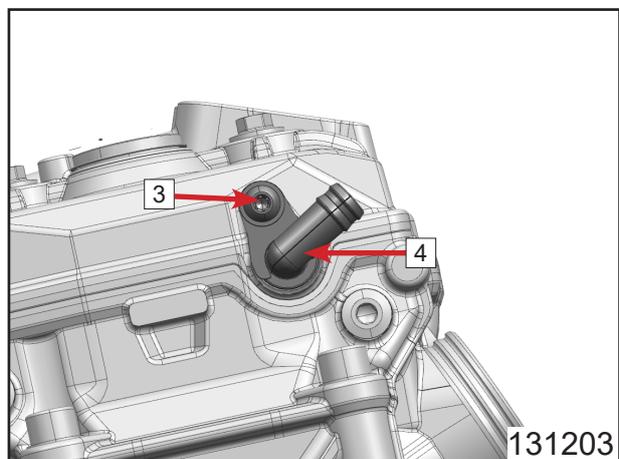
Remove screws (1).

Remove ignition coils (2).



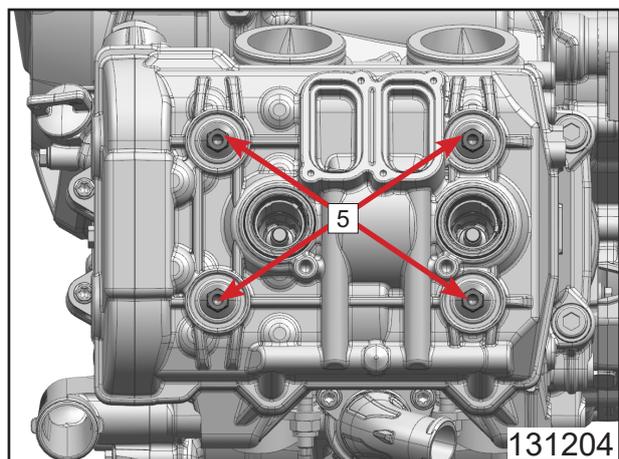
Remove screw (3) with retaining bracket.

Pull off bleeder flange (4)



Remove screws (5) with gaskets.

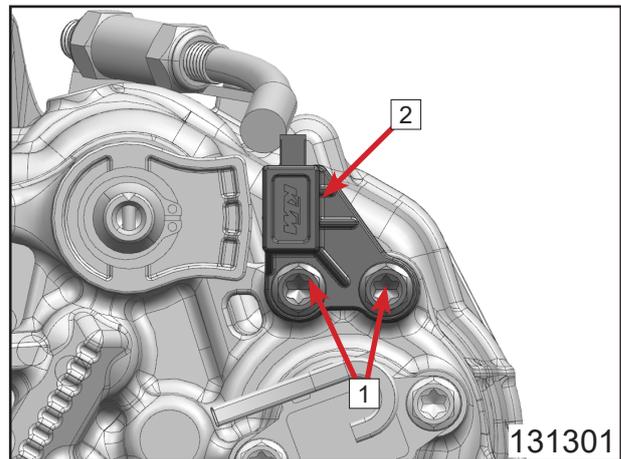
Take off the valve cover with the valve cover seal.



13.2.5 Removing shift shaft sensor

Remove screws (1).

Take off the shaft sensor (2).

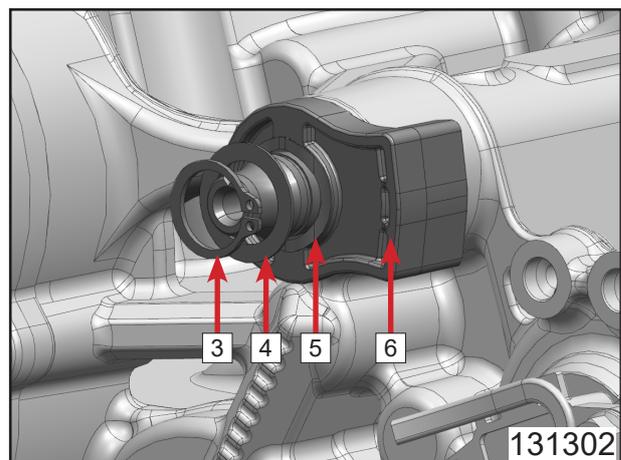


Remove lock ring (3).

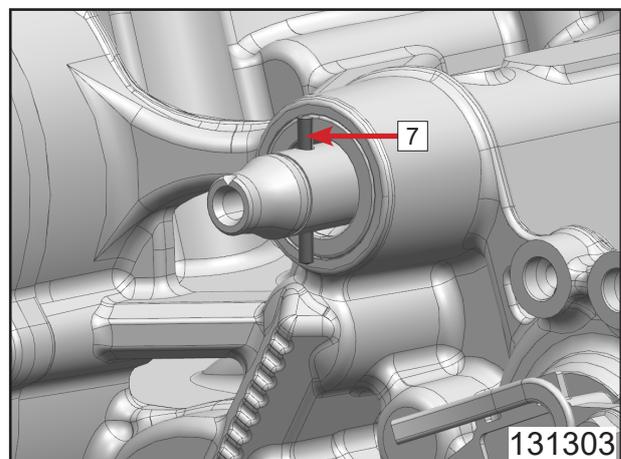
Remove washer (4).

Remove locating washer (5).

Take off magnetic holder (6).



Remove pin (7).

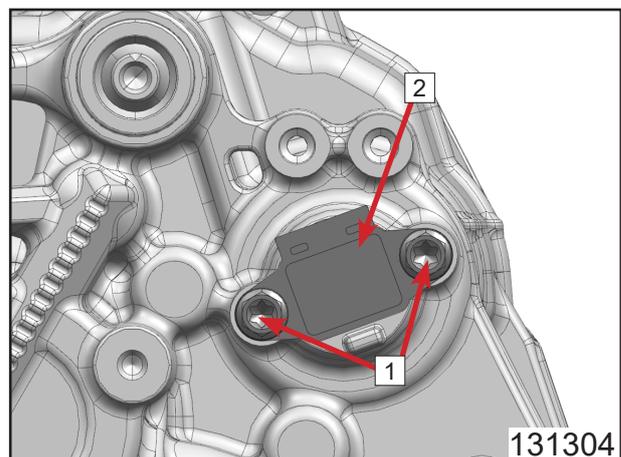


13.2.6 Removing the gear position sensor

Remove the cable tie.

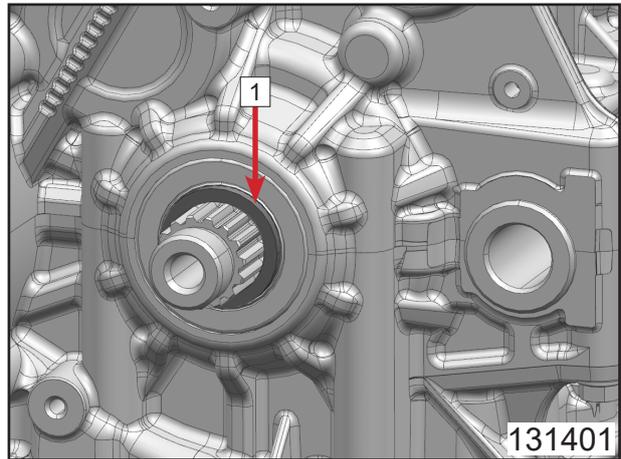
Remove screws (1).

Take off gear position sensor (2).



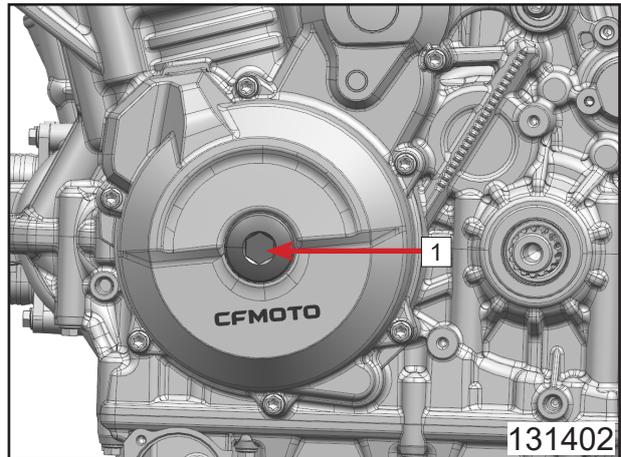
13.2.7 Removing the spacer

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

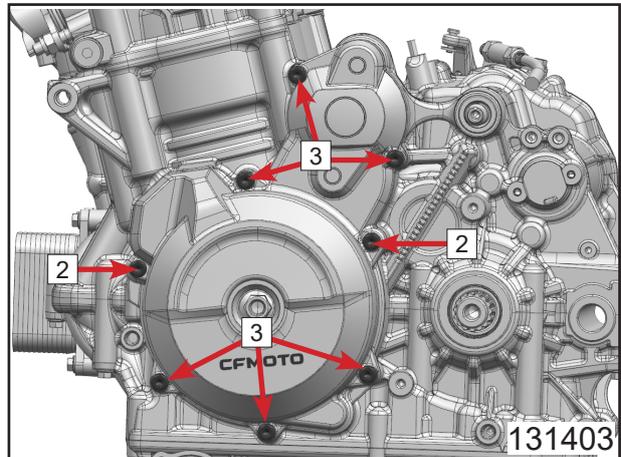


13.2.8 Removing the alternator cover

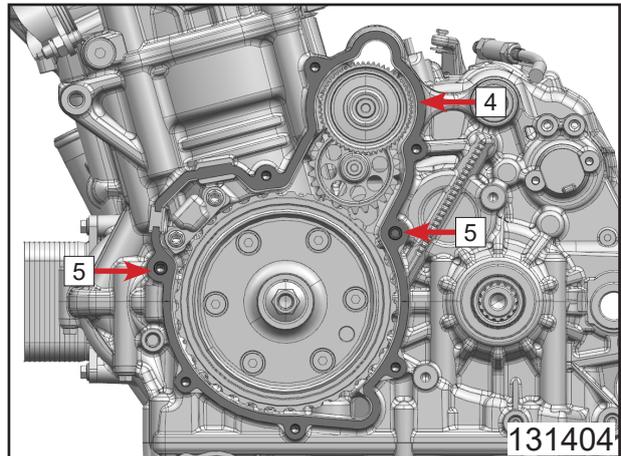
Remove screw plug (1) with the O-ring.



Remove screws (2) and (3).



Mount puller and pull off the alternator.
Take off alternator cover gasket (4).
Remove dowels (5).

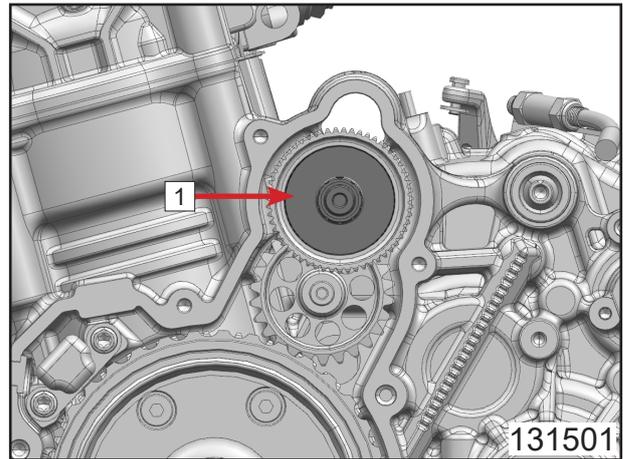


13.2.9 Removing the torque limiter and the starter intermediate gear

Take off torque limiter (1) with washer.

Info

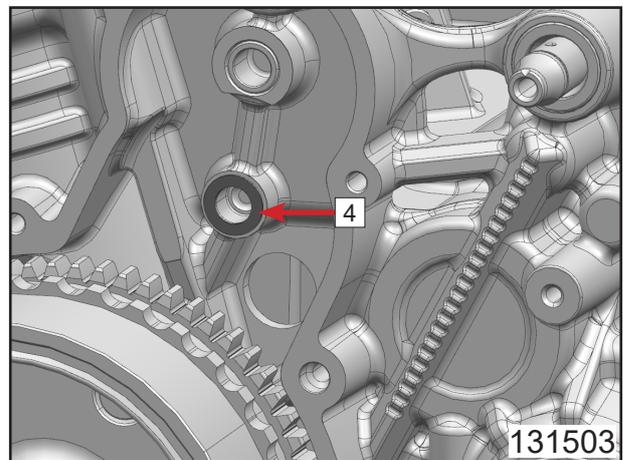
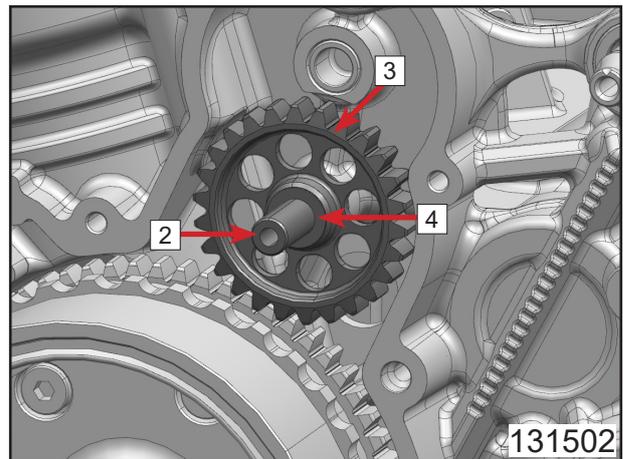
The washer usually sticks to the engine case.



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

Info

The rear washer usually sticks to the engine case.

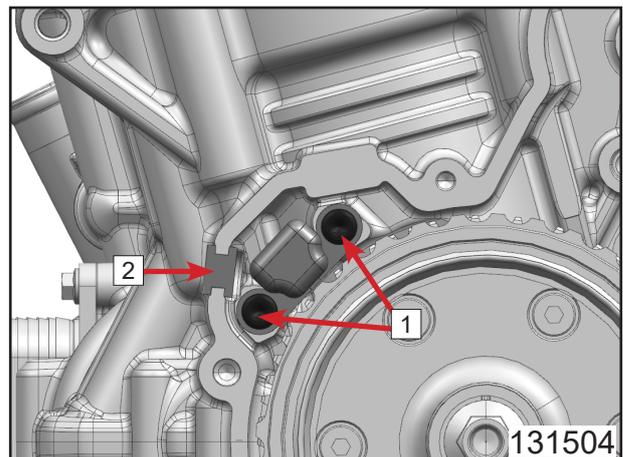


13.2.10 Removing the crankshaft speed sensor

Remove screws (1).

Pull rubber grommet (2) out of the engine case.

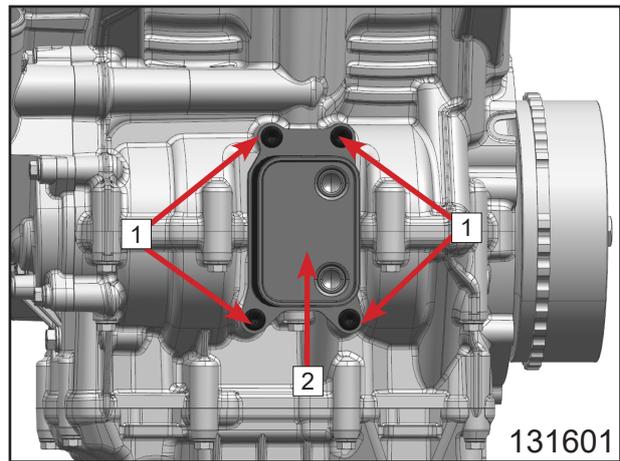
Remove the crankshaft speed sensor.



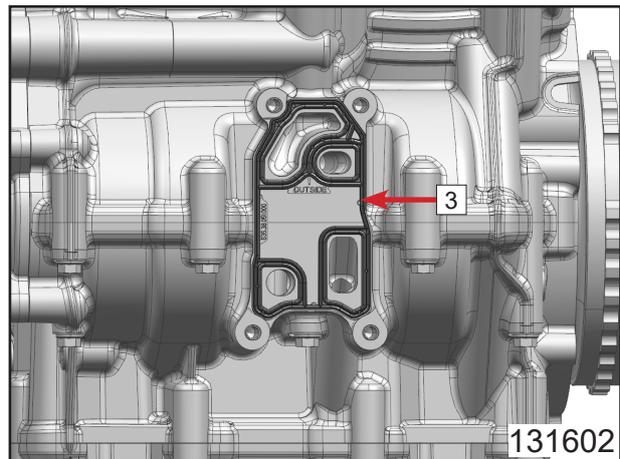
13.2.11 Removing the heat exchanger

Remove screws (1).

Take off heat exchanger (2).



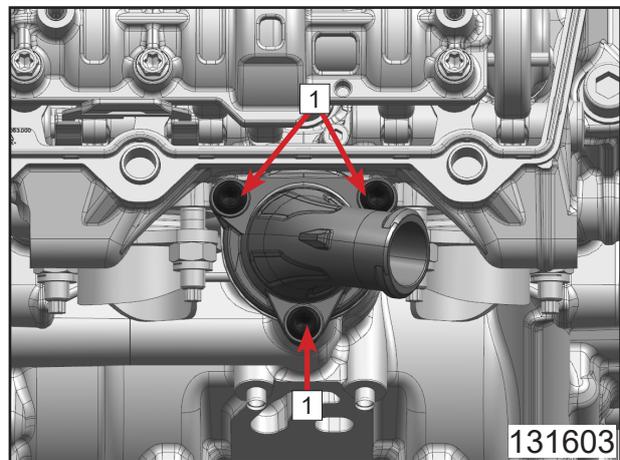
Remove gasket (3).



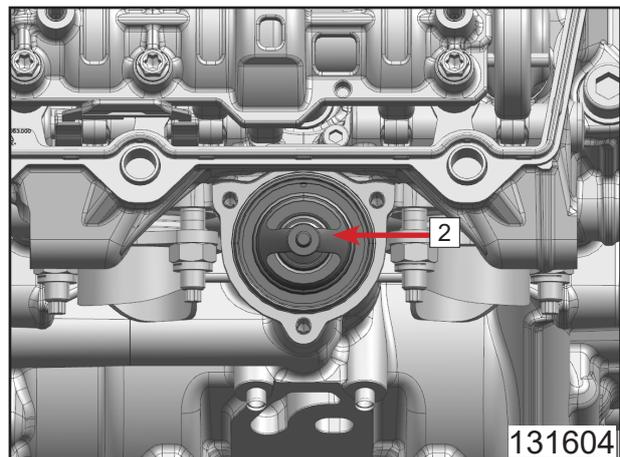
13.2.12 Removing the thermostat

Remove screws (1).

Take off the thermostat case.



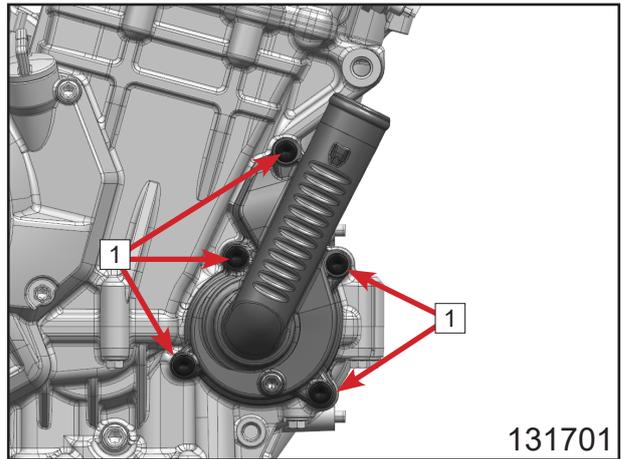
Remove thermostat (2).



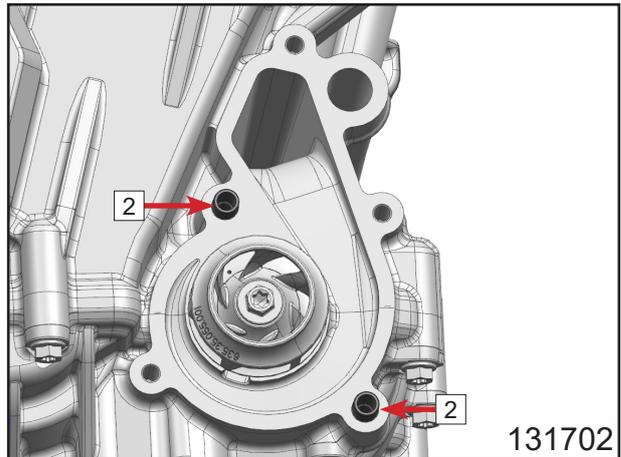
13.2.13 Removing the water pump impeller

Remove screws (1).

Take off water pump cover with the gasket.

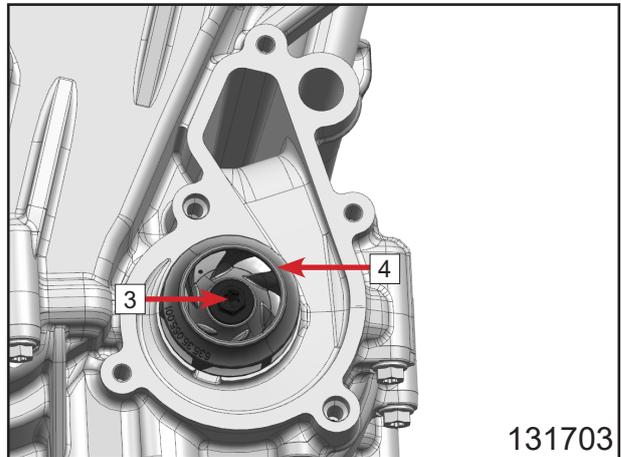


Remove dowels (2).

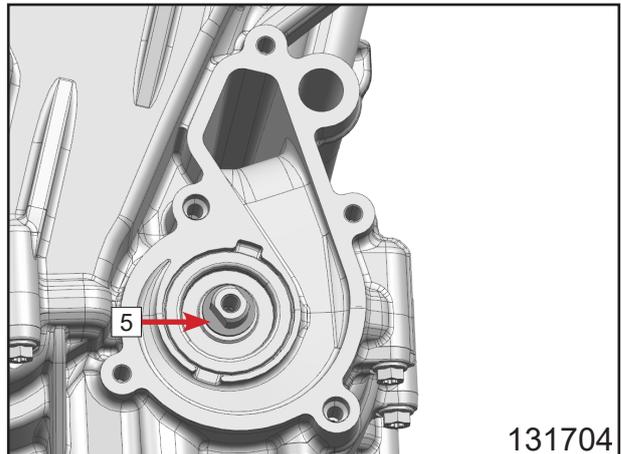


Remove screw (3).

Remove water pump impeller (4).

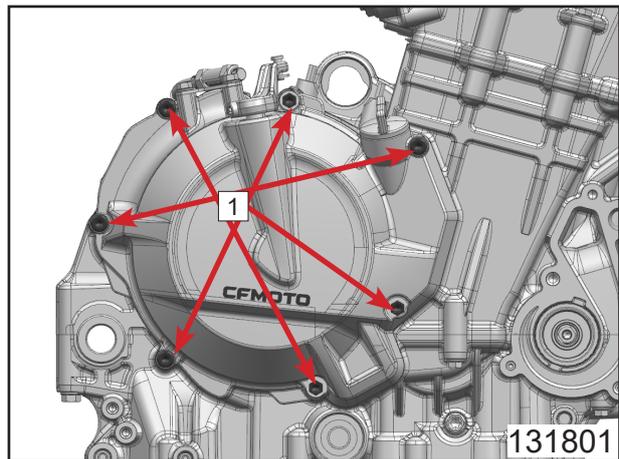


Remove from washer (5).

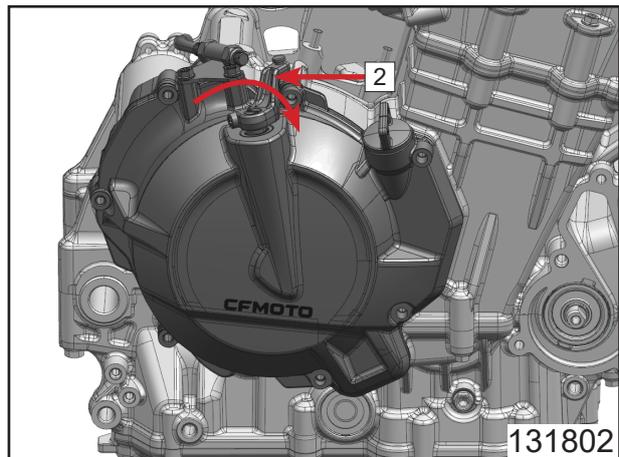


13.2.14 Removing the clutch cover

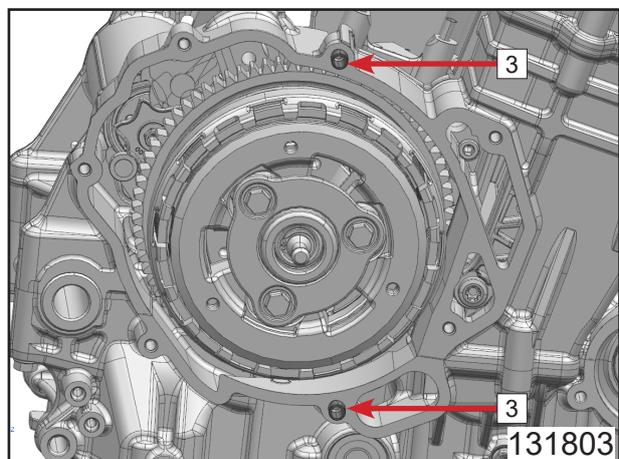
Remove screws (1).



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



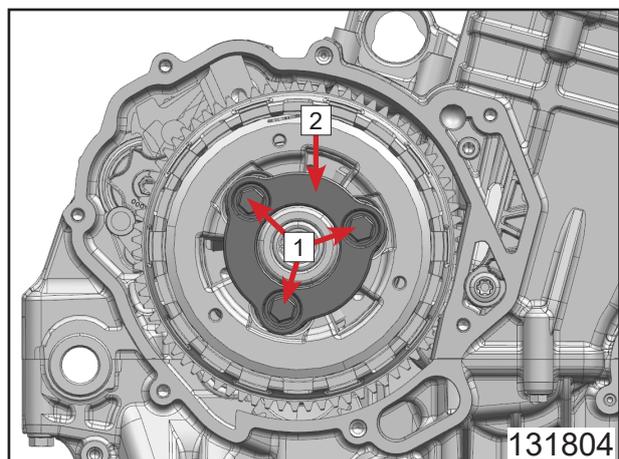
Remove dowels (3).



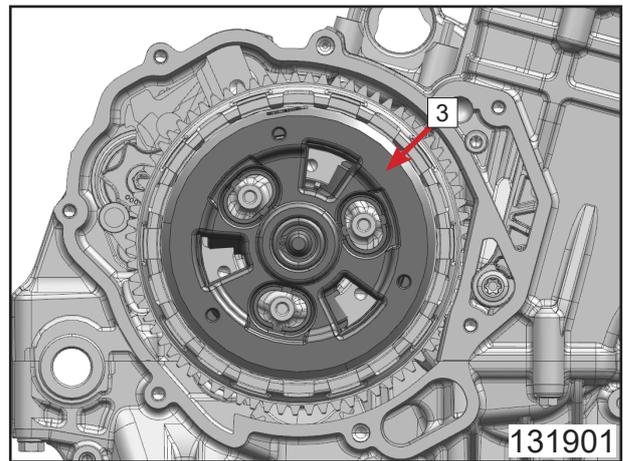
13.2.15 Removing the clutch discs

Remove screws (1).

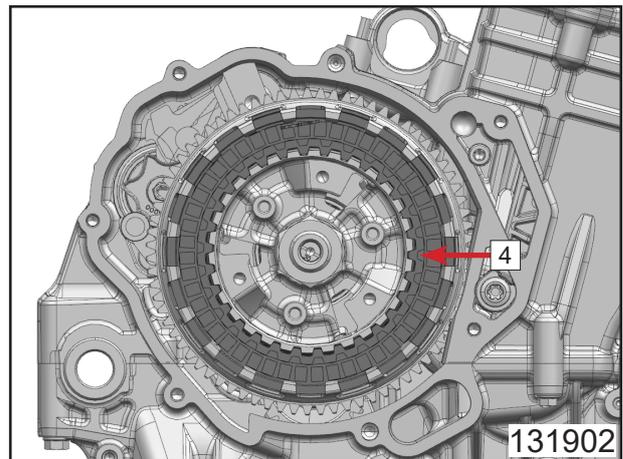
Take off clutch center (2) and the springs.



Remove clutch pressure cap (3).

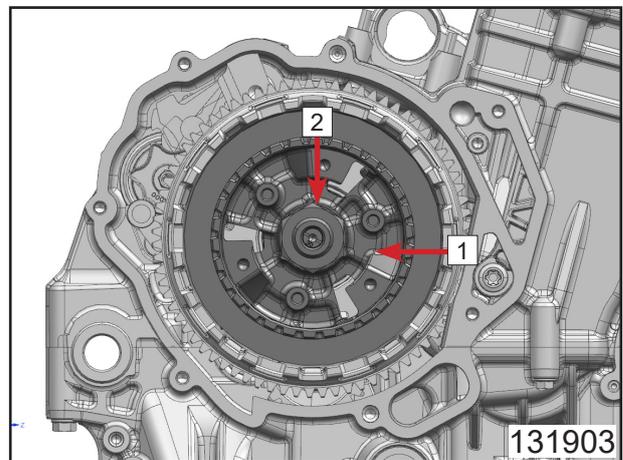


Remove clutch discs (4), support ring, and pretension ring.



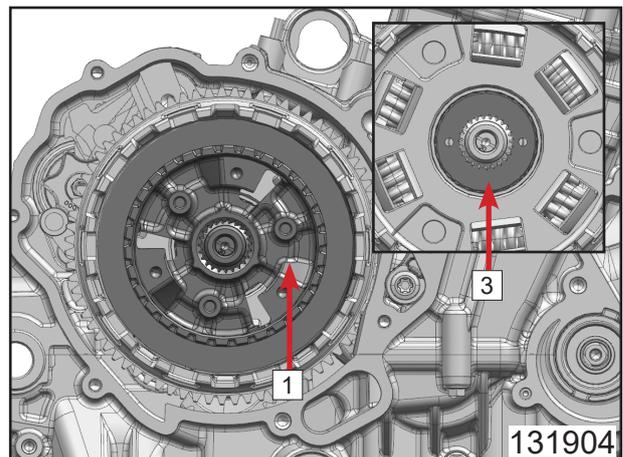
13.2.16 Removing the clutch basket

Hold the inner clutch hub (1) with the special tool (Holding wrench).
Remove nut (2) with the washer.



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

Info
The washer usually sticks to the inner clutch hub.



CFMOTO

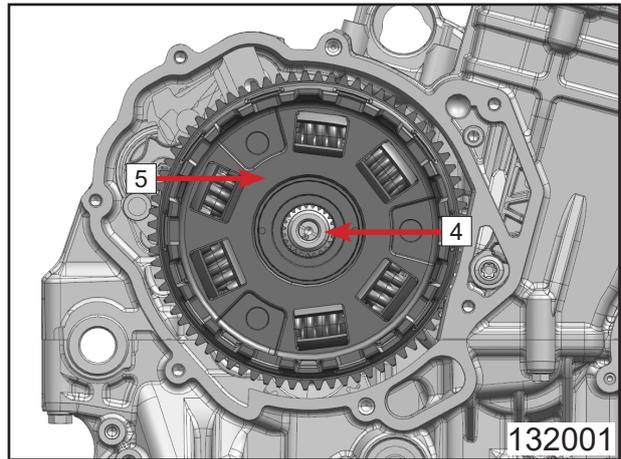
Remove needle bearing (4).

Info

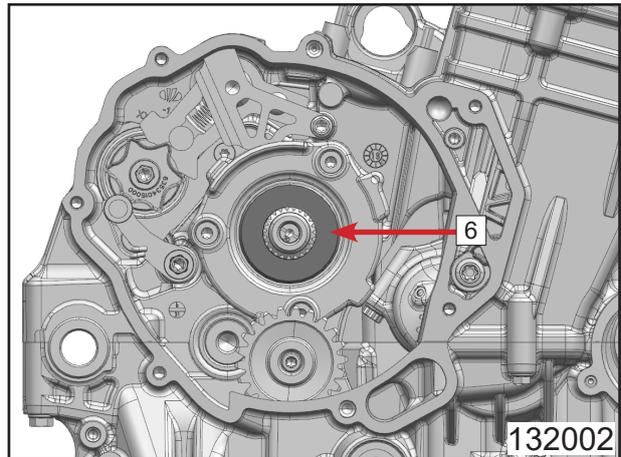
Use a magnetic rod to make disassembly easier.

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

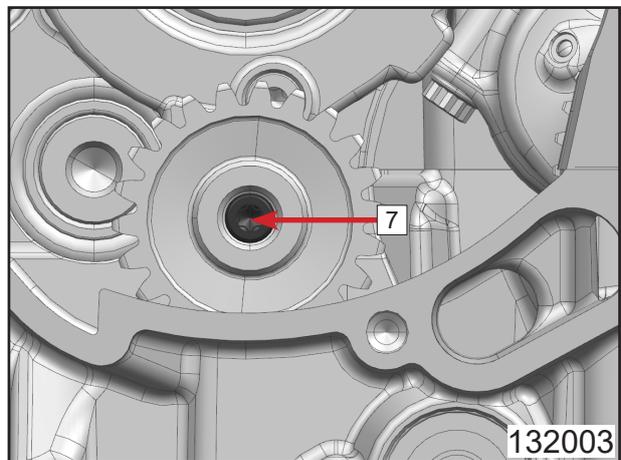
Take off clutch basket (5).



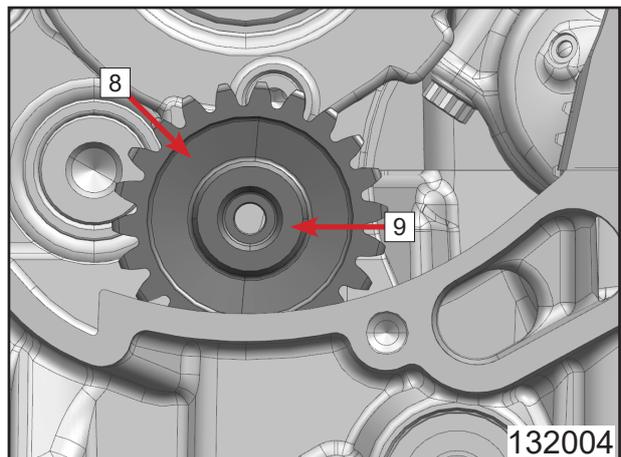
Remove washer (6).



Remove screw (7).



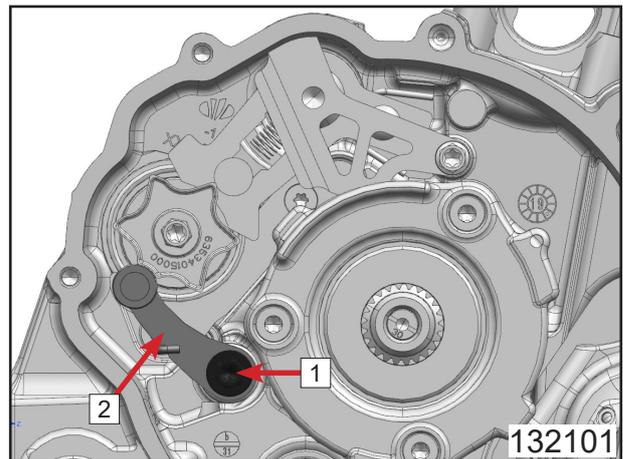
Take off intermediate gear (8) with collar bushing (9).



13.2.17 Removing locking lever

Remove screw (1).

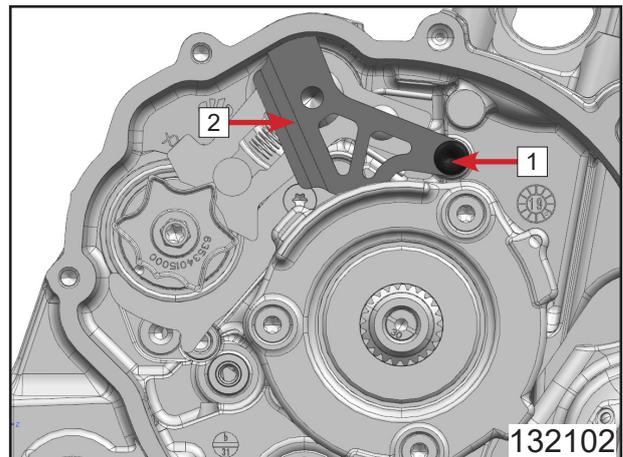
Take off locking lever (2) with the sleeve and spring.



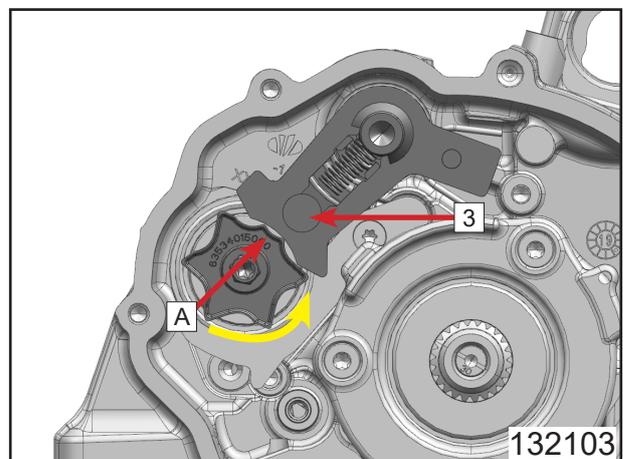
13.2.18 Removing the shift shaft

Remove screw (1).

Take off retaining bracket (2).



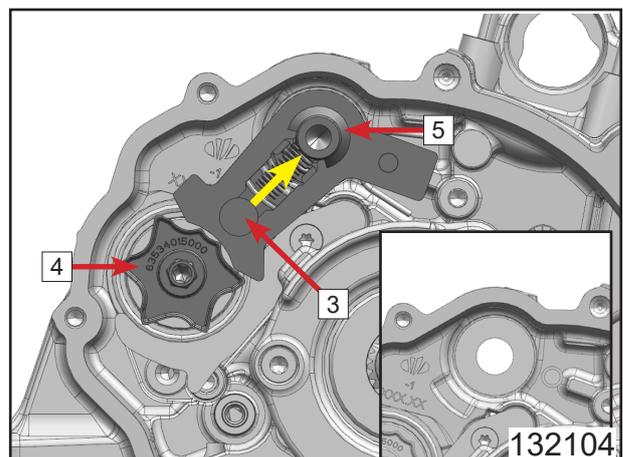
Twist shift drum until the neutral position (A) is aligned with the sliding plate (3).



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

Remove shift shaft (5) with washer (6)

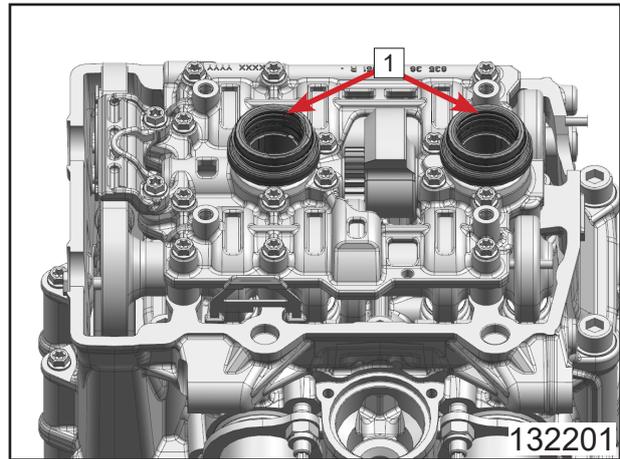
Info
The washer usually sticks to the engine case.



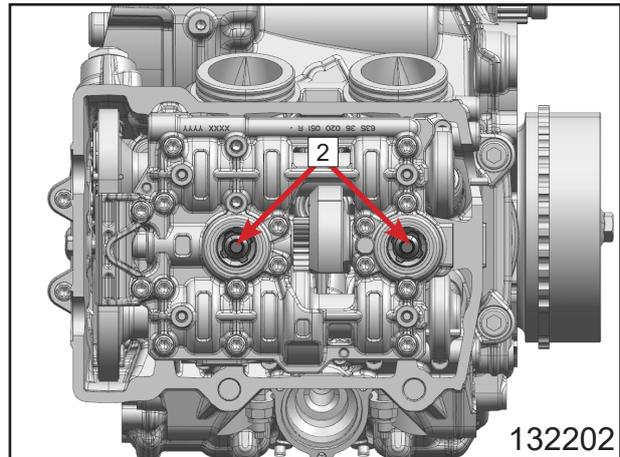
CFMOTO

13.2.19 Removing the spark plugs

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



Remove the spark plugs (2).

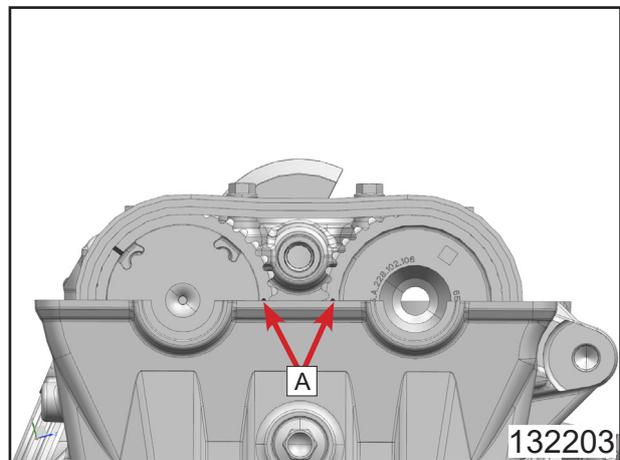


13.2.20 Removing the camshafts

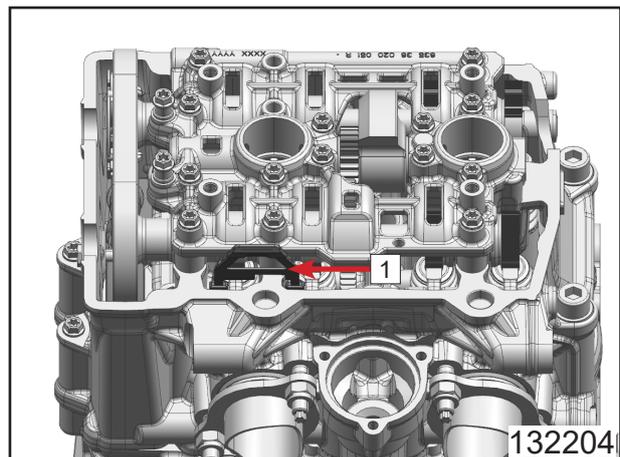
Turn the crankshaft counterclockwise and set it to ignition top dead center of cylinder 2.

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

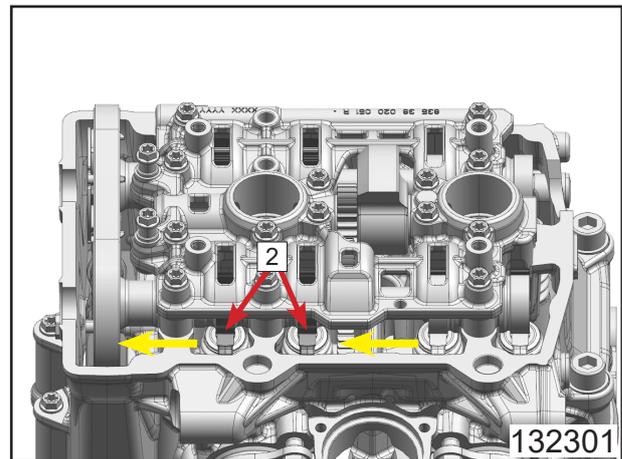
Info
The OT2 markings are dot markings.



Remove cam lever clip (1).

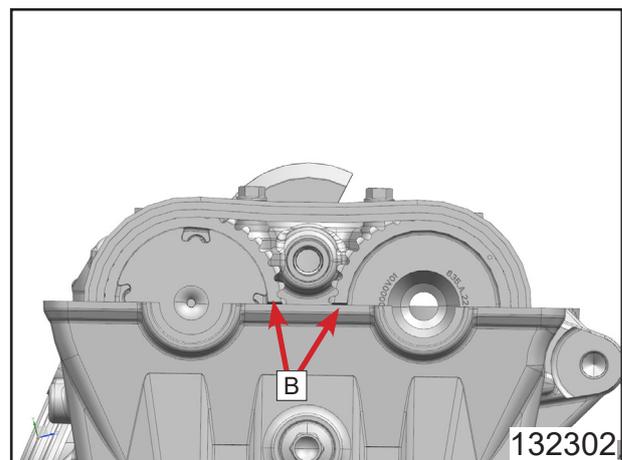


Push exhaust cam lever (2) on cylinder 2 to the side.



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

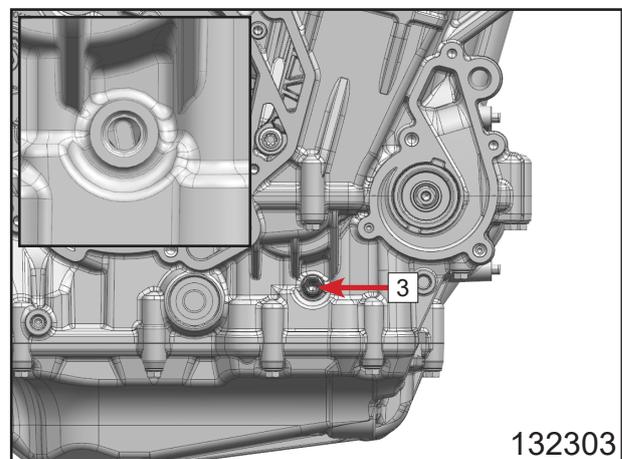
Info
The OT1 markings are dot markings.



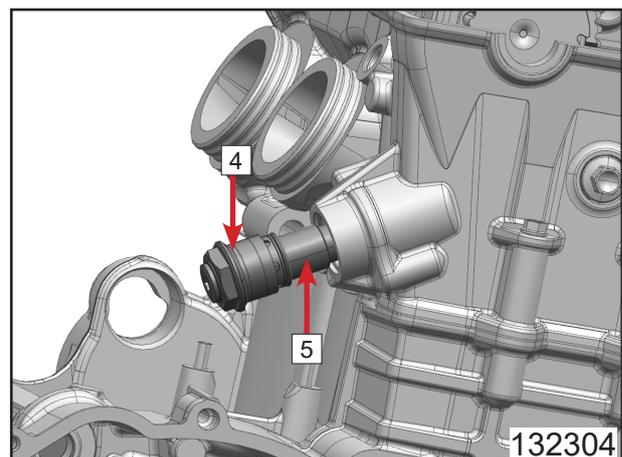
Remove screw (3) with the washer.

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

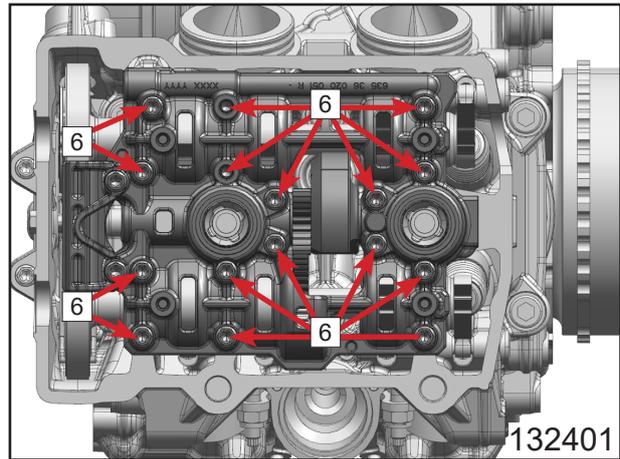
Mount special tool (locking screw).



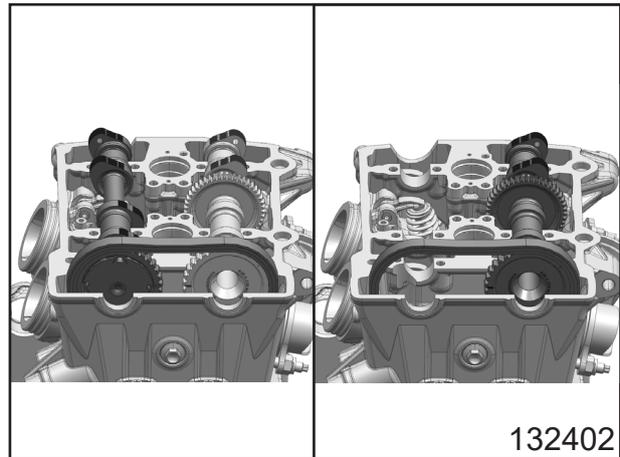
Remove screw (4) with the O-ring.
Take off timing chain tensioner (5) with O-ring.



Loosen and remove screws (7) from the outside to the inside.
Take off camshaft bearing bridge with balancer shaft.

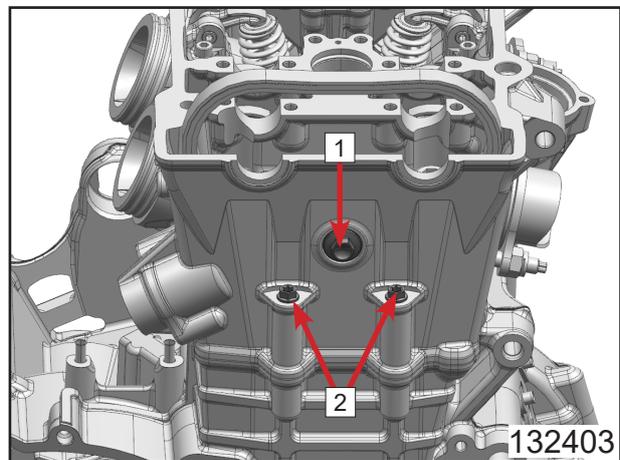


Raise the camshafts at the rear and take the timing chain off the rear sprocket.
Remove camshaft.

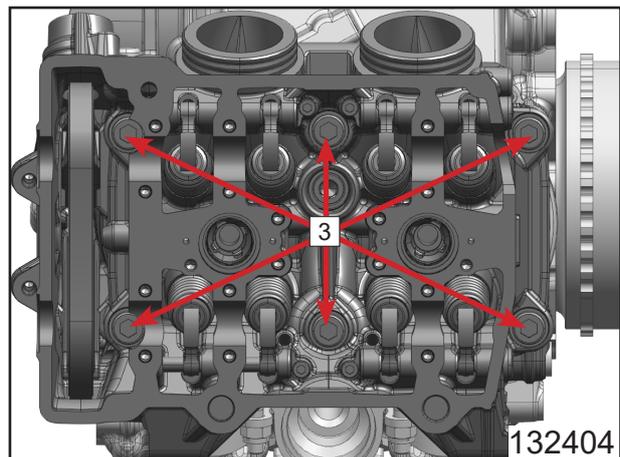


13.2.21 Removing the cylinder head

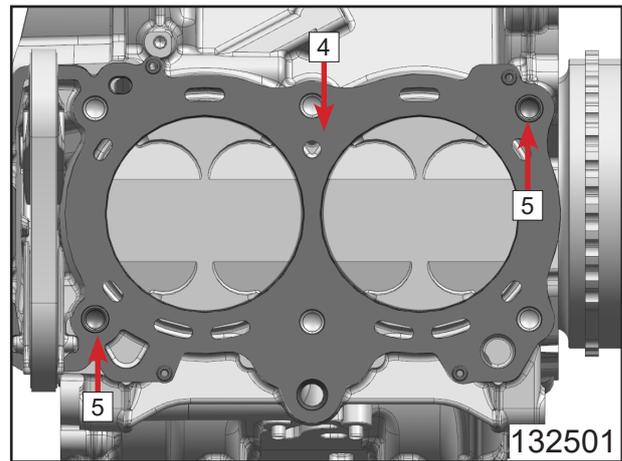
Remove screw (1) with gasket.
Remove screw (2).



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

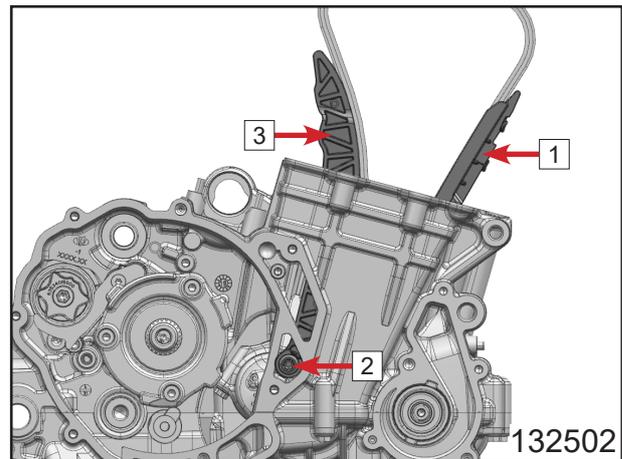


Take off cylinder head gasket (4).
Remove dowels (5).



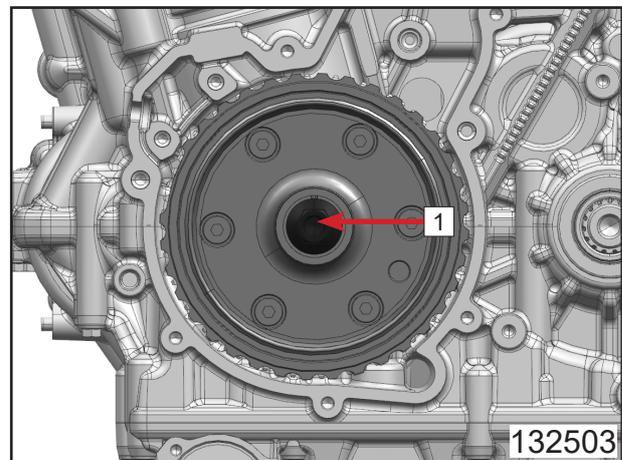
13.2.22 Removing the timing chain rails

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

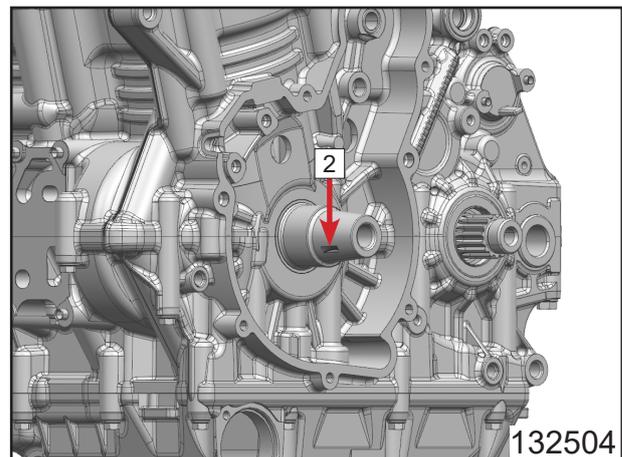


13.2.23 Removing the rotor

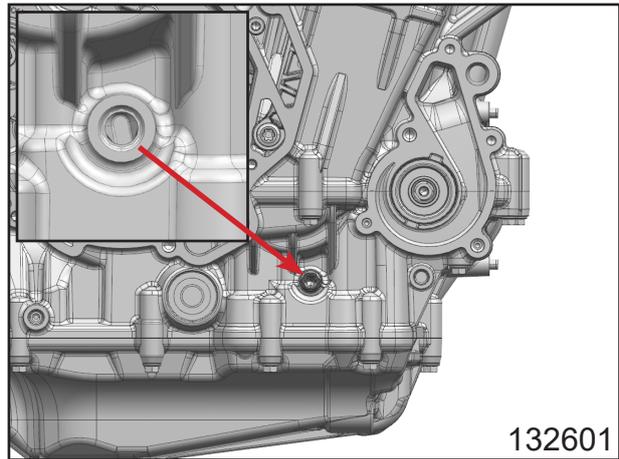
Remove screw (1).
Mount special tool (pressing tool).
Mount special tool (puller) on the rotor.
Hold it tight using the special tool and pull off the rotor by turning the screw in.
Remove the special tool.



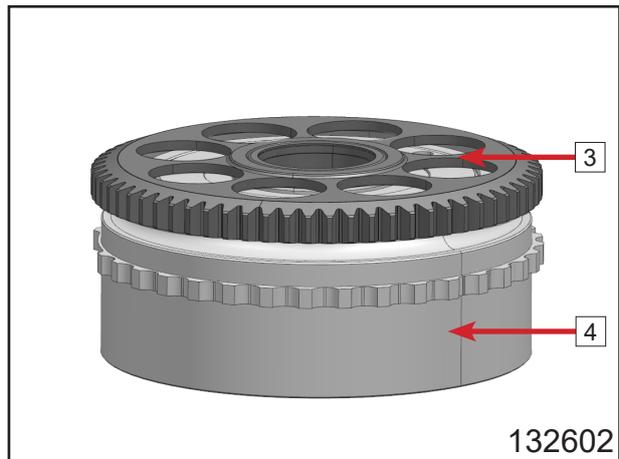
Remove woodruff key (2).



Remove special tool (locking screw).



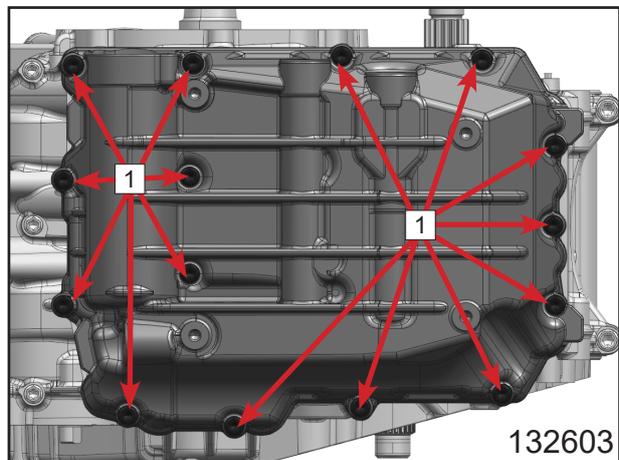
Take off freewheel gear (3) from rotor (4).



13.2.24 Removing the oil pan

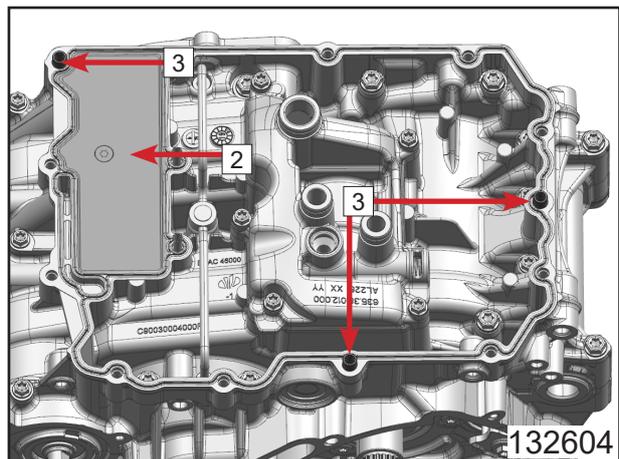
Remove screws (1).

Take off oil pan.

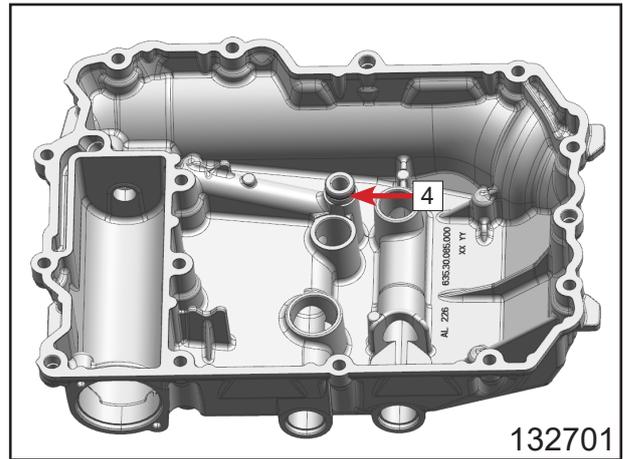


Take off gasket (2).

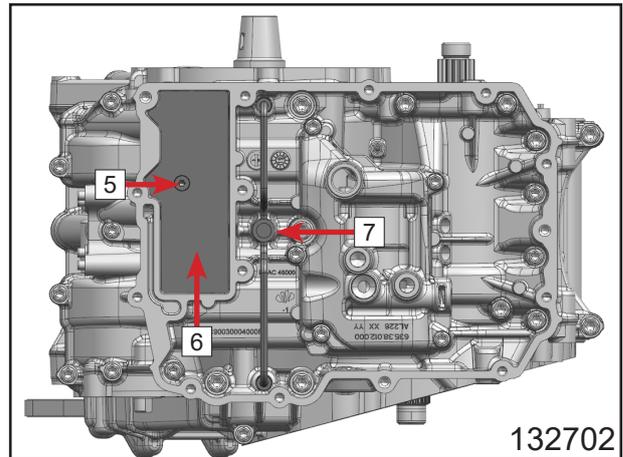
Remove dowels (3).



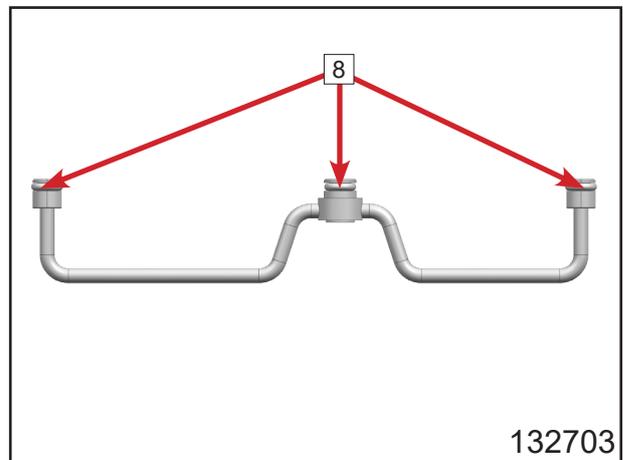
Remove O-ring (4).



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

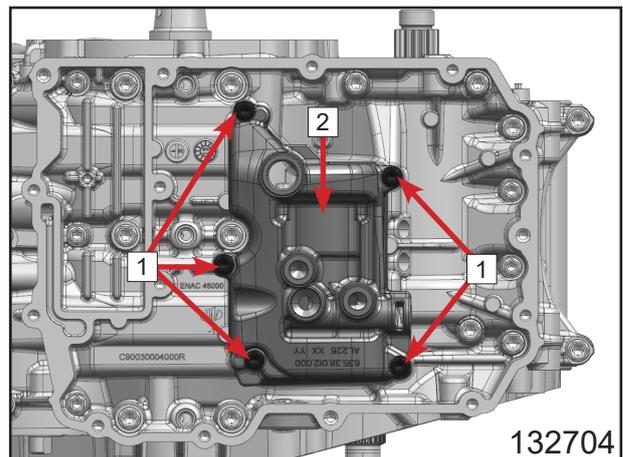


Take off O-rings (8) from the oil line.

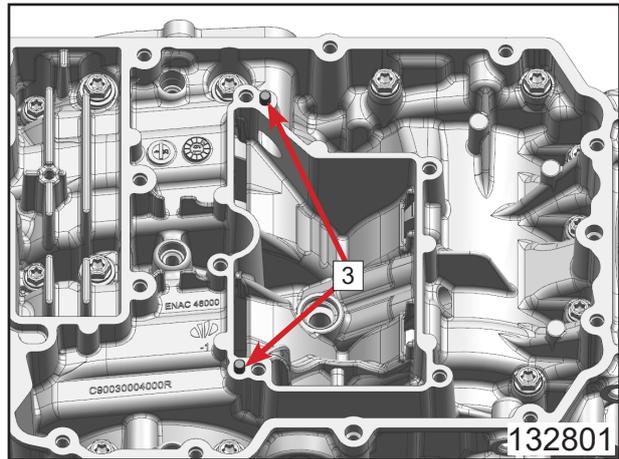


13.2.25 Removing the oil pump unit

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

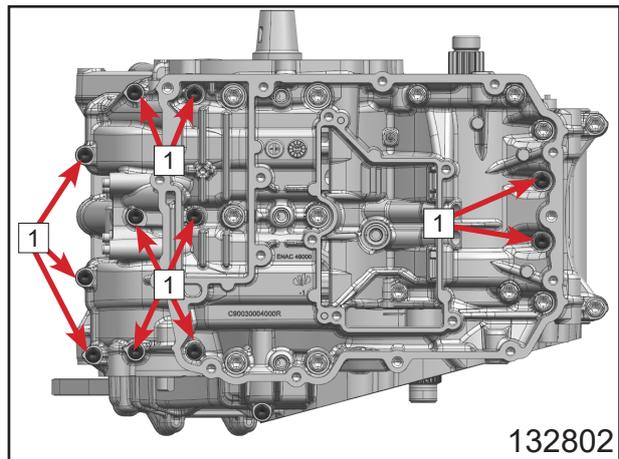


Remove locating pins (3).

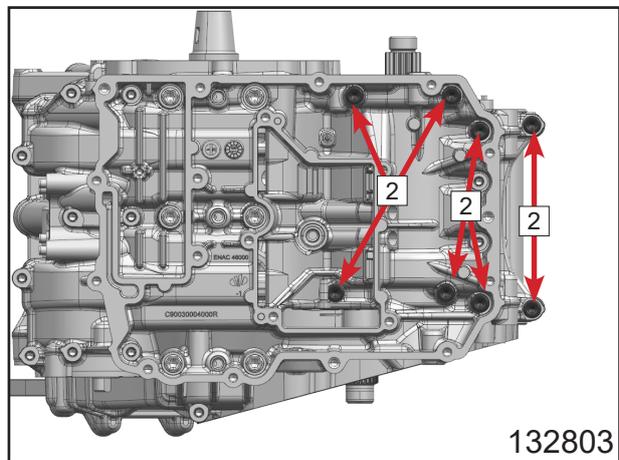


13.2.26 Removing the engine case downwards

Remove screws (1).

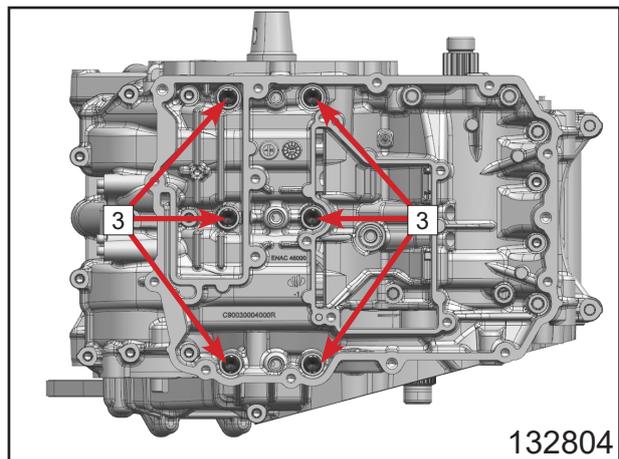


Remove screws (2).

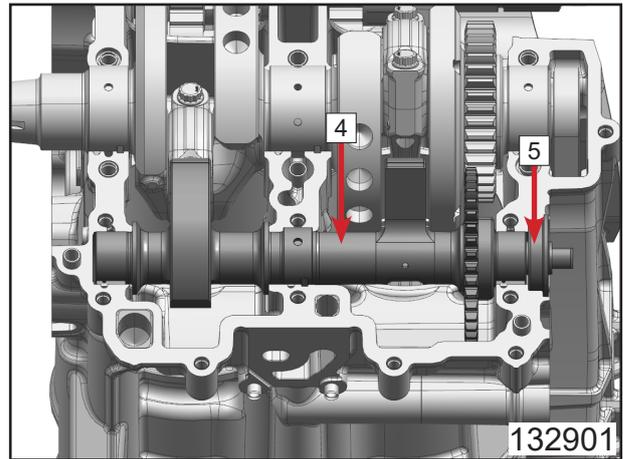


Loosen screws (3) in a crisscross pattern and remove them with the washers. Take off lower section of the engine case.

Info
Ensure that the bearing shells remain in place.

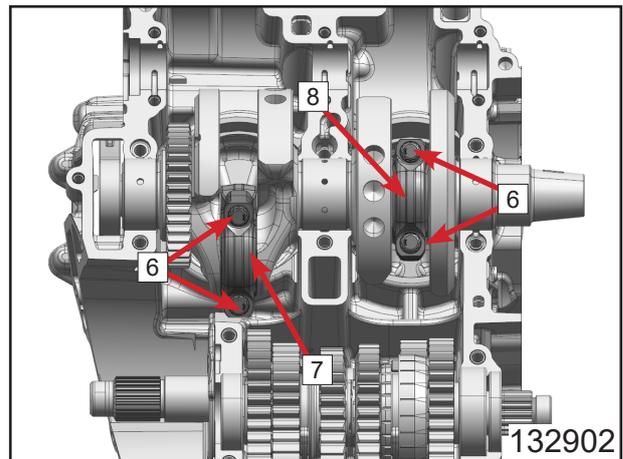


Remove balancer shaft (4) with radial shaft seal ring (5).

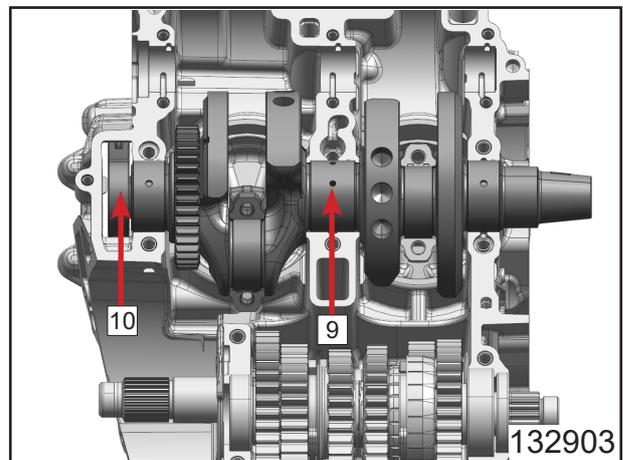


Remove screws (6).
Take off conrod bearing covers (7) and (8).

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

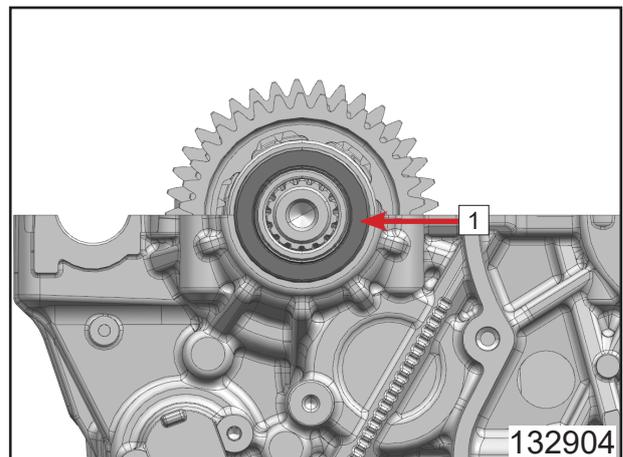


Remove crankshaft (9) with timing chain (10).

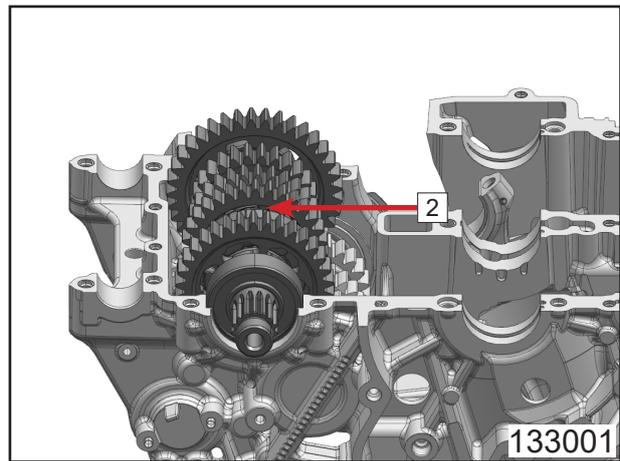


13.2.27 Removing the transmission shafts

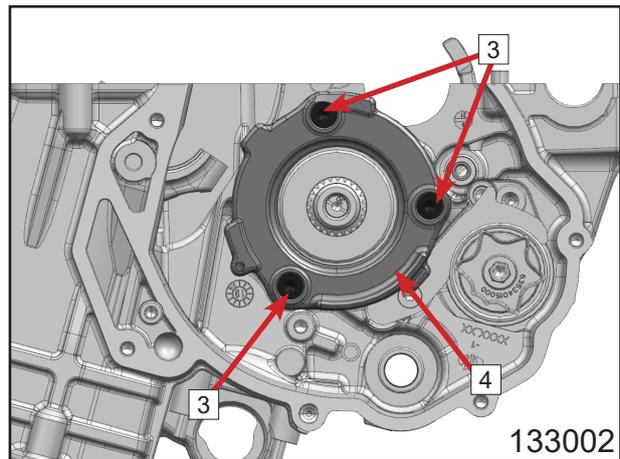
Remove radial shaft seal ring (1).



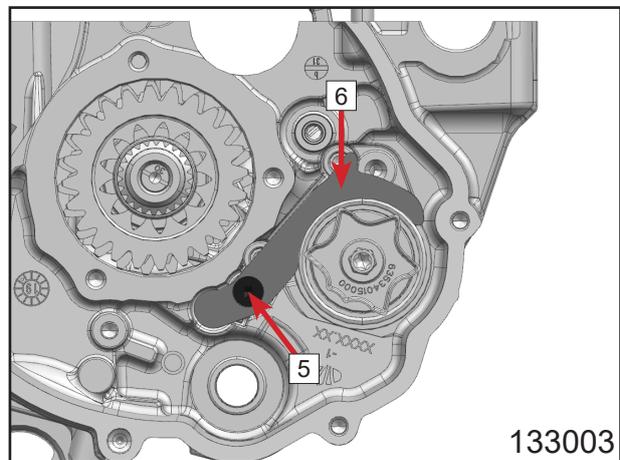
Take off countershaft (2).



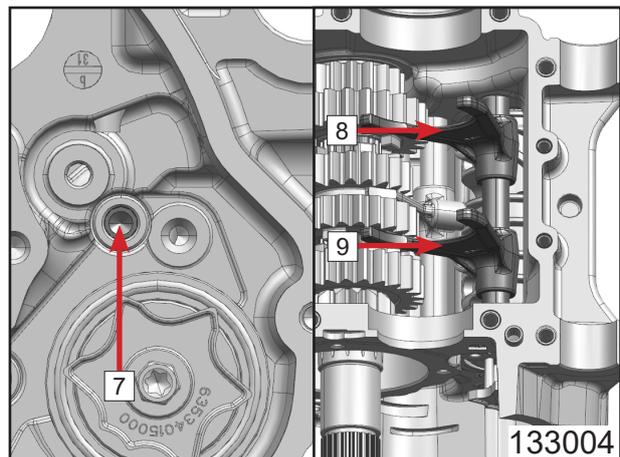
Remove screws (3).
Take off bearing support (4) with bearing.



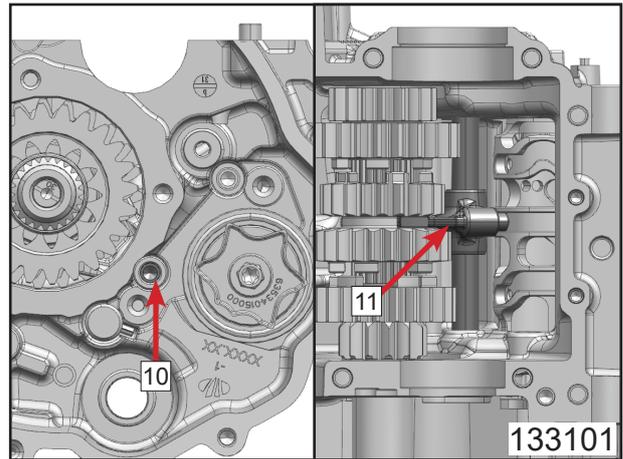
Remove screw (5).
Take off retaining bracket (6).



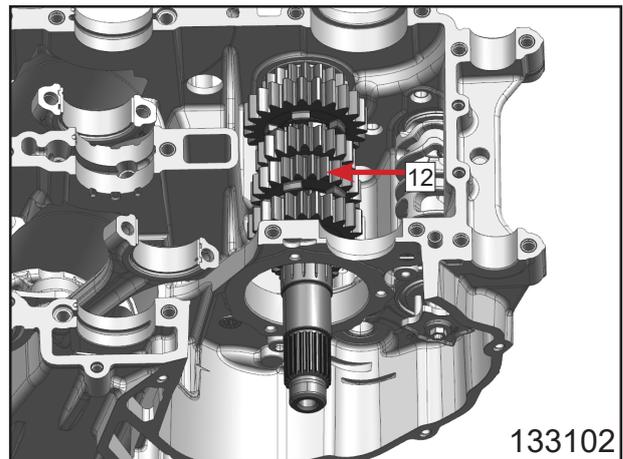
Mount appropriate M8 screw in the shift rail (7).
Remove shift rail (7).
Remove shift forks (8) and (9).



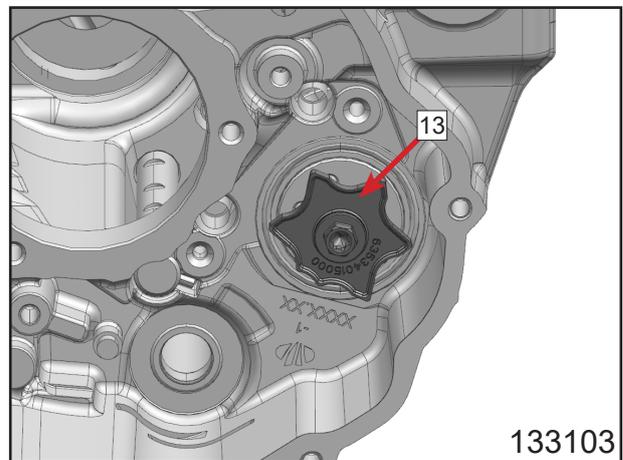
Mount appropriate M8 screw in the shift rail (10).
Remove shift rail (10).
Remove shift forks (11).



Remove main shaft (12).

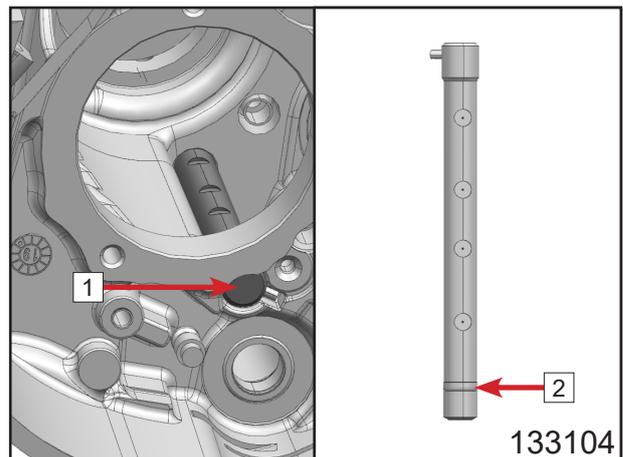


Remove shift drum (13).



13.2.28 Removing oil spray tube.

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



13.2.29 Removing the piston

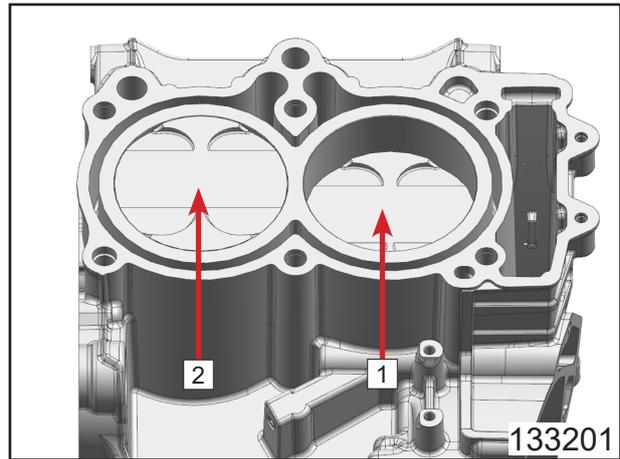
Swing the upper section of the engine case upward.

Mark the piston (1) and (2).

Remove any deposits in the upper area of the cylinders.

Info

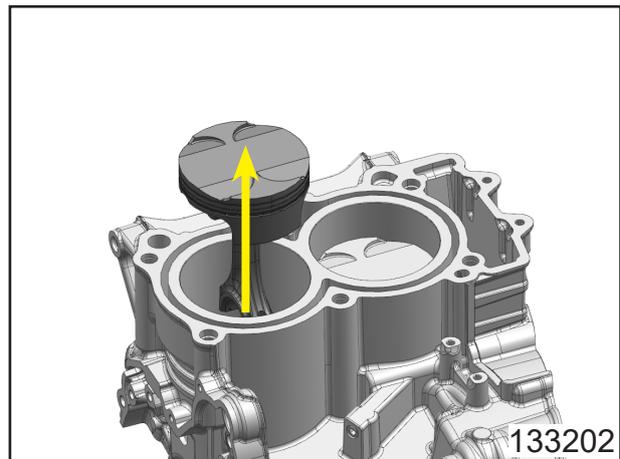
Ensure that the cylinders are not damaged.



Remove piston with connecting rod upward out of the cylinder.

Info

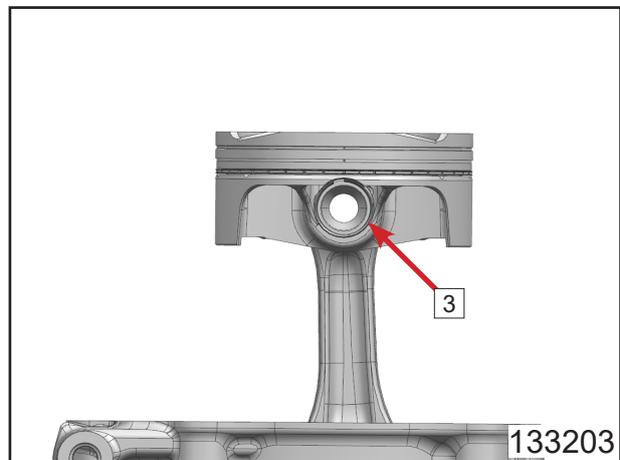
Make sure that the connecting rod does not damage the cylinder.



Clamp connecting rod in the vise.

Guideline: Use soft jaws.

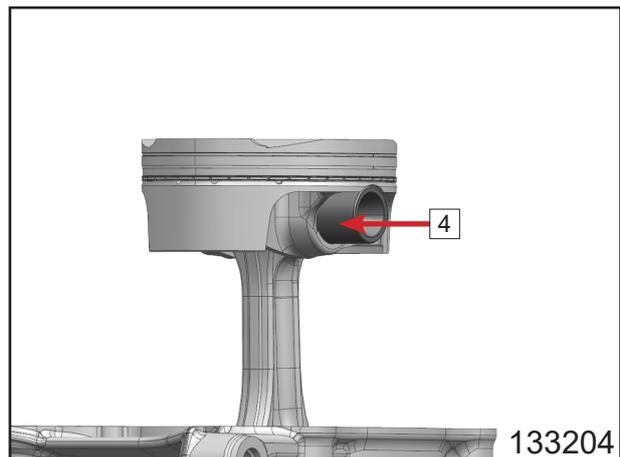
Remove piston ring lock (3).



Remove piston pin (4).

Take off the piston.

Make the piston and connecting rods belonging together correspondingly.

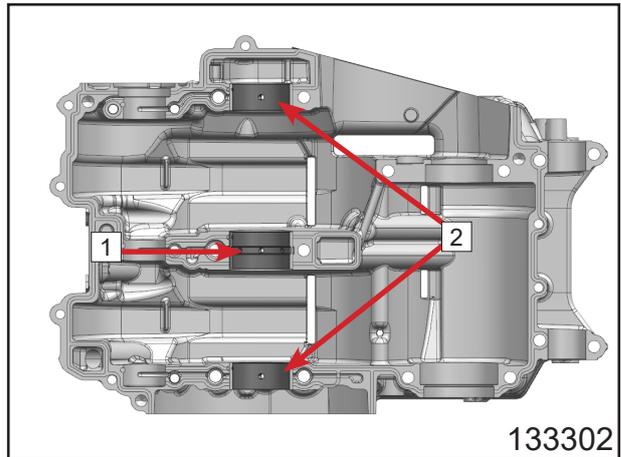
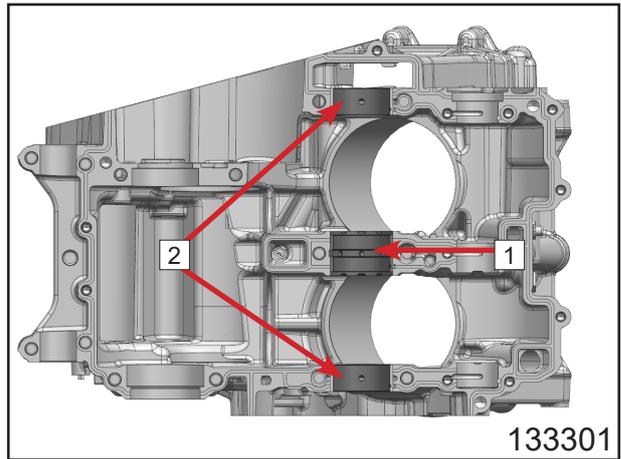


13.3 Working on individual parts

13.3.1 Checking the radial clearance of crankshaft bearings

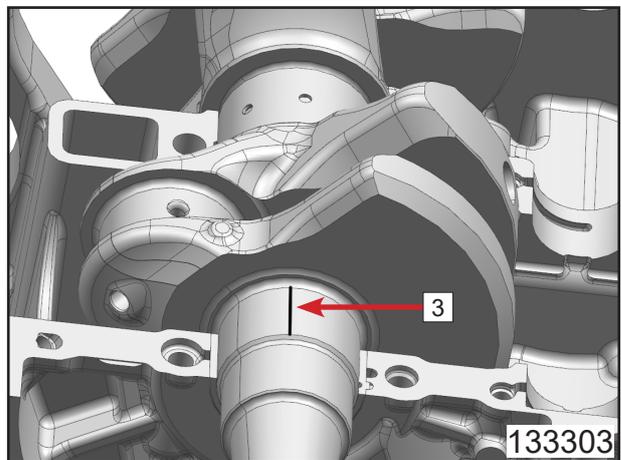
Remove any remnants of sealing compound and clean the sections of the engine case thoroughly.

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.

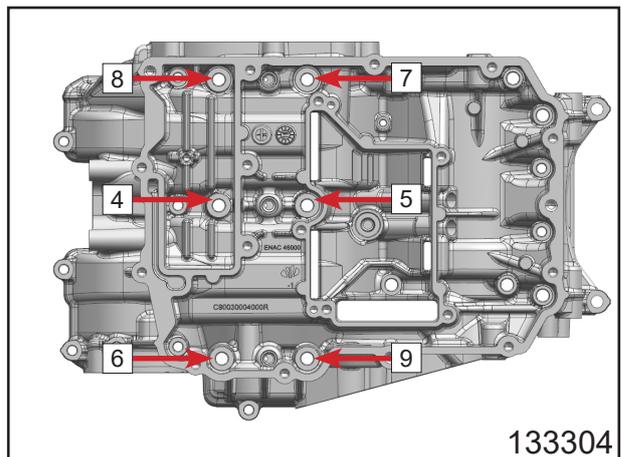
mount screws with washers and tighten in the order (4) to (9).

guideline:

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

Info

Do not twist crankshaft.



CFMOTO

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

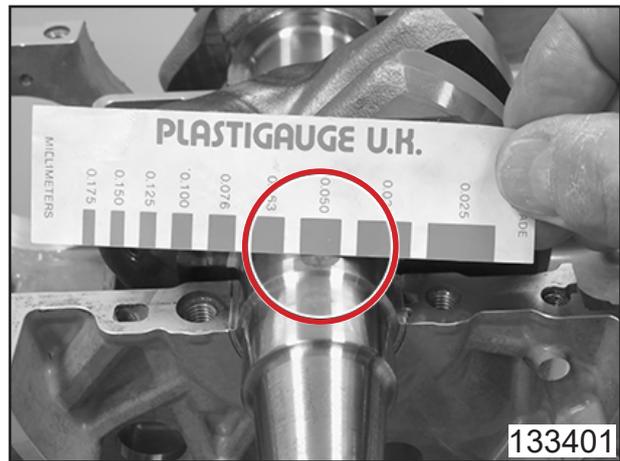
Guideline :

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

Info

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

Clean the part.



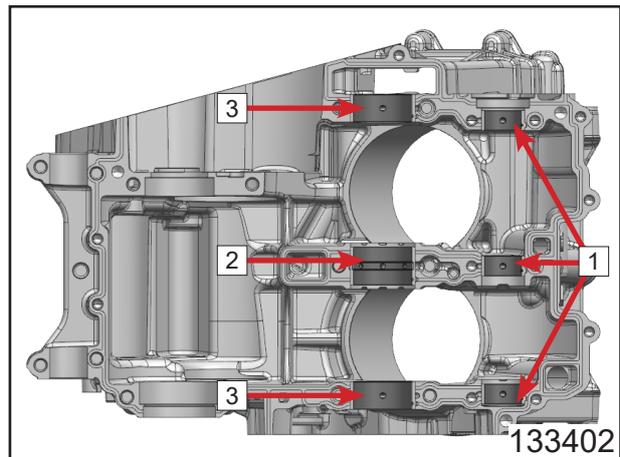
133401

13.3.2 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.



133402

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

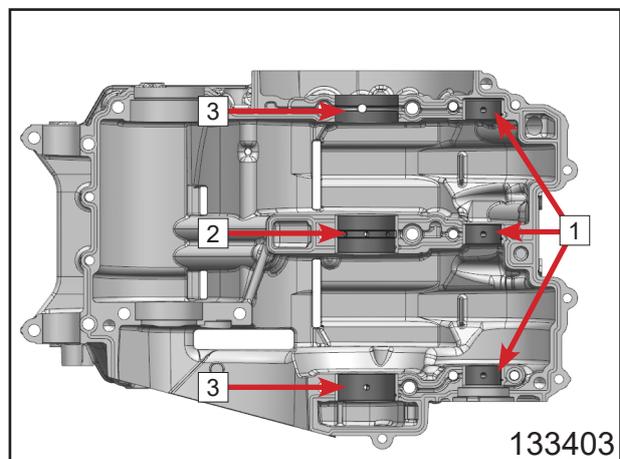
Remove bearing shells (2) and (3) of the crankshaft from the lower section of the engine case.

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.

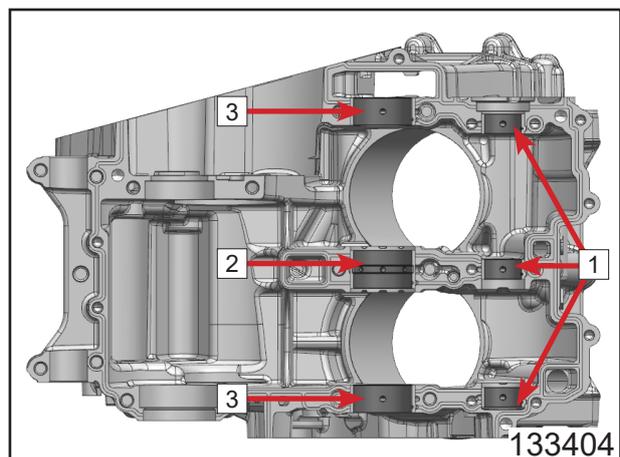
Mount new bearing shells (1) in the lower section of the engine case



133403

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

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



133404

13.3.3 Checking the balancer shaft

Clean all parts well.

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

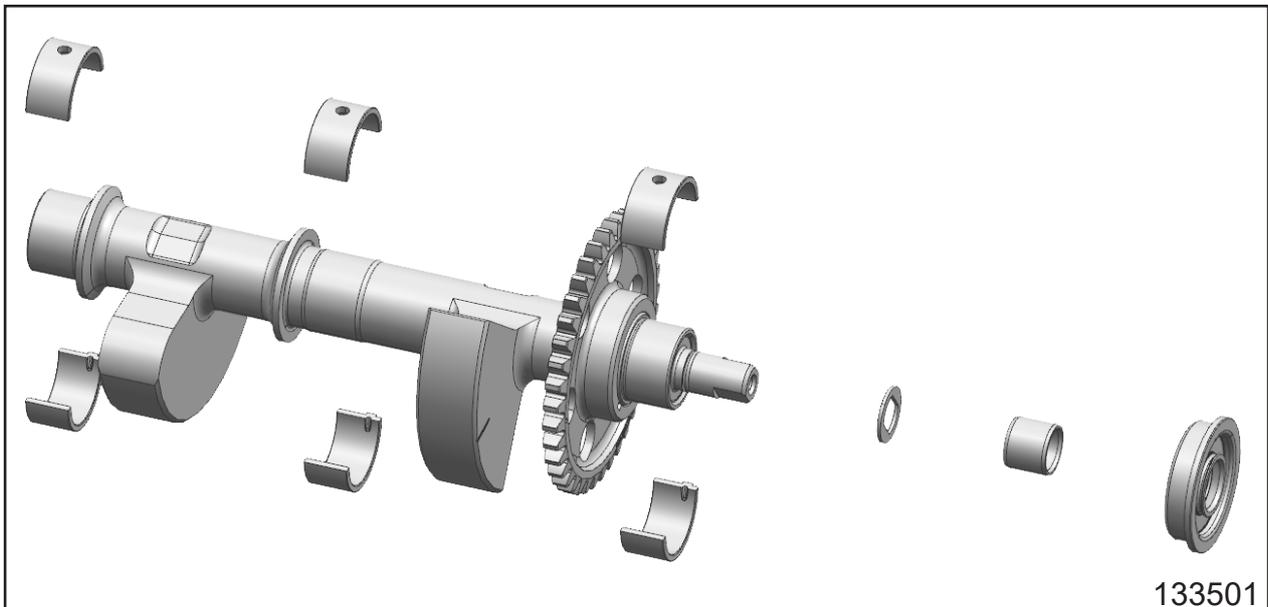
If there is damage or wear:

Change the balancer shaft.

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

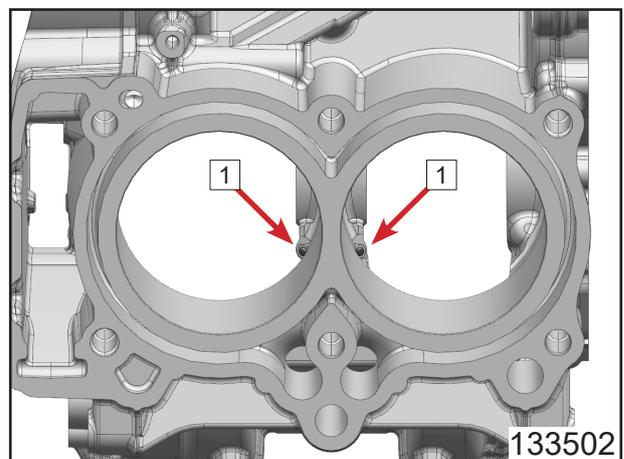
If there is damage, abrasion or wear:

Change bearing shells.

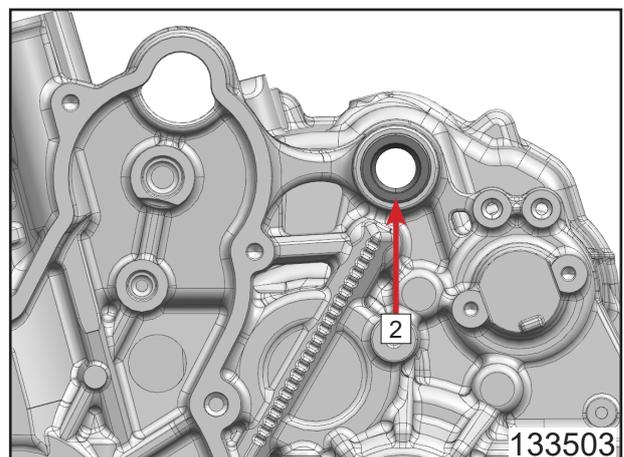


13.3.4 Working on the upper section of the engine case

Remove oil nozzles (1).



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



CFMOTO

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

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.

Info

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

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.

Info

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.

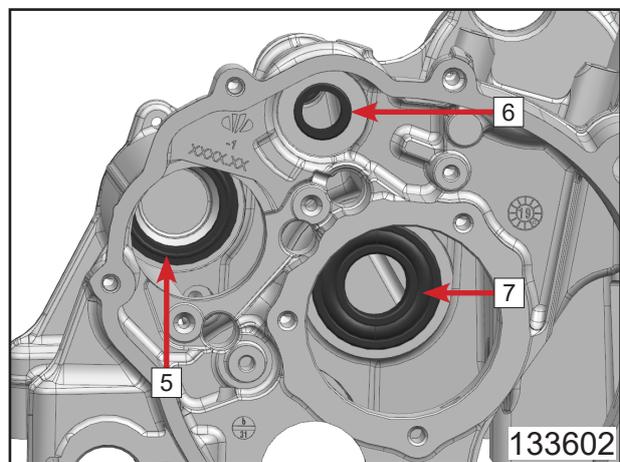
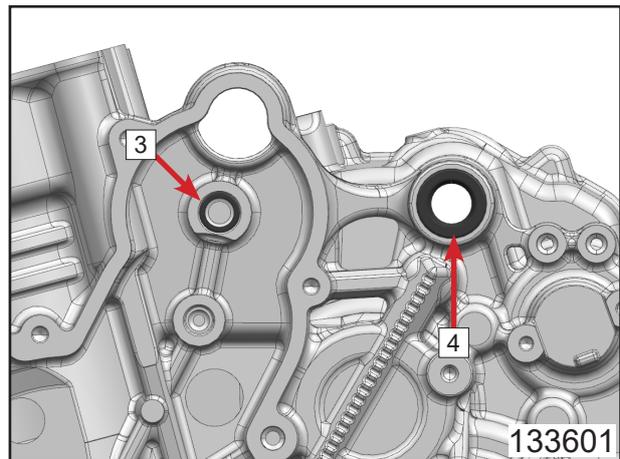
Insert new cold bearings (5), (6) and (7) in the bearing seat on the right side of the heated section of the engine case; if necessary, use a suitable pressing tool to push them all the way in and make them flush.

Info

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.



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

Info
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.

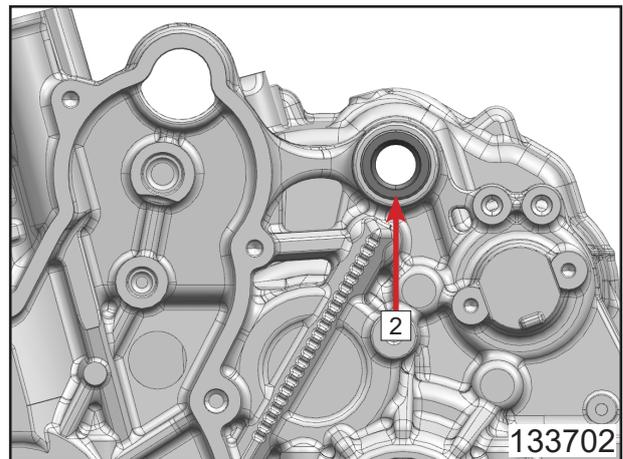
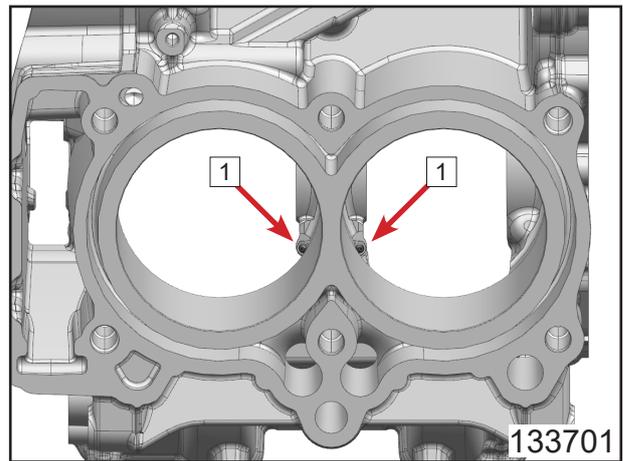
Info
The radial shaft seal ring must be flush on the outside.

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 螺纹胶
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13.3.5 Working on the lower section of the engine case

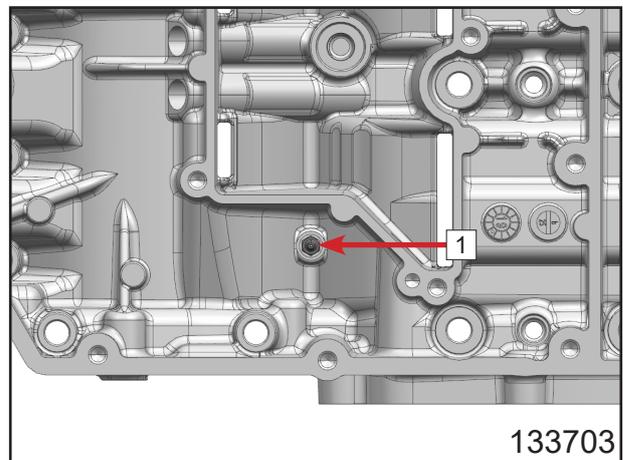
Remove oil nozzle (1).

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

Mount and tighten oil nozzle (1).

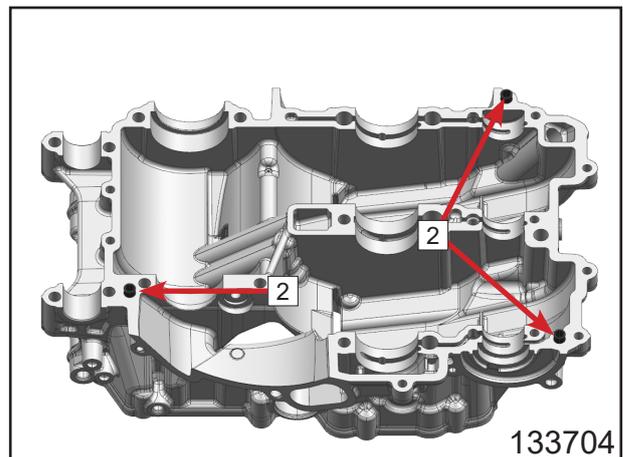
Guideline

Nozzle, engine vent	M5	2 N•m (1.5 lbf•ft) 243 螺纹胶
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Swivel section of the engine case.

Check that dowels (2) are seated correctly.

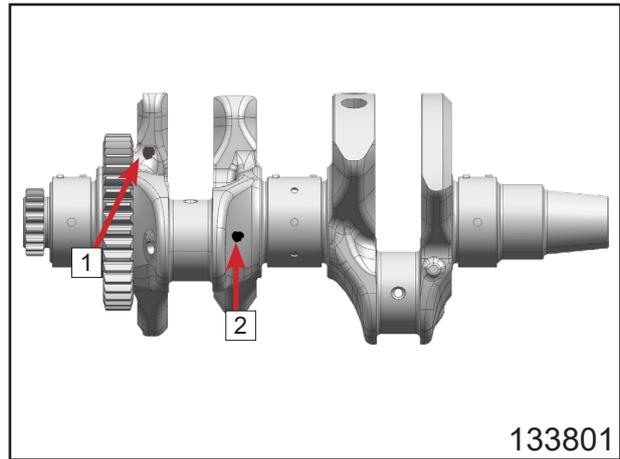


13.3.6 Selecting the main bearing shells

New crankshaft

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

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

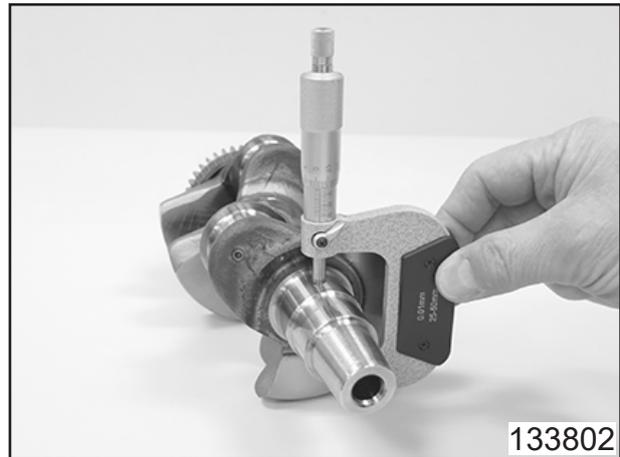


Used crankshaft

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

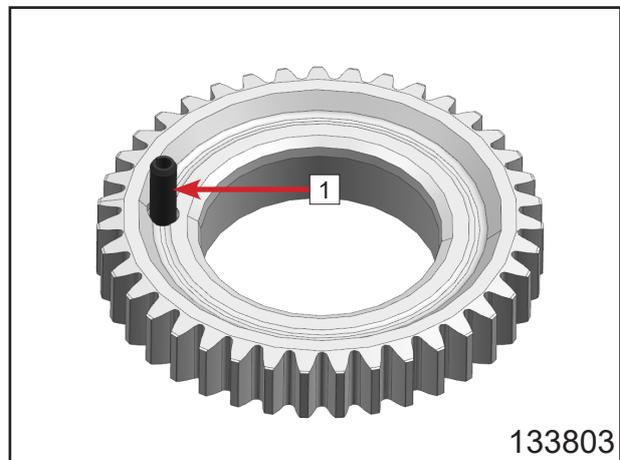
Guideline

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



13.3.7 Installing the primary gear wheel

Mount dowel pin (1) in the primary gear wheel.



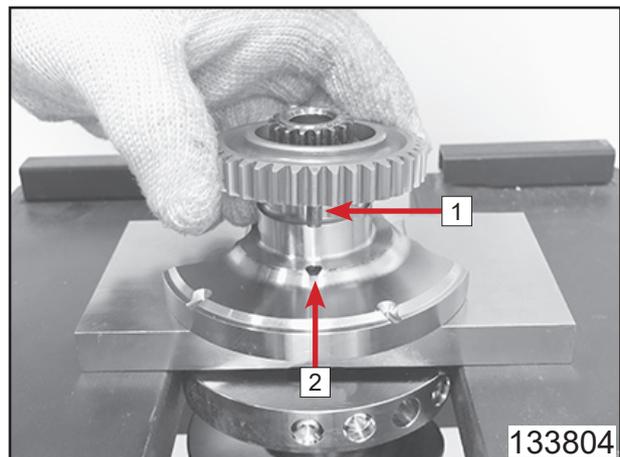
Position the crankshaft with special tool (Separator plate) in the press.

Heat up primary gear wheel.

Guideline: 150 °C (302 °F)

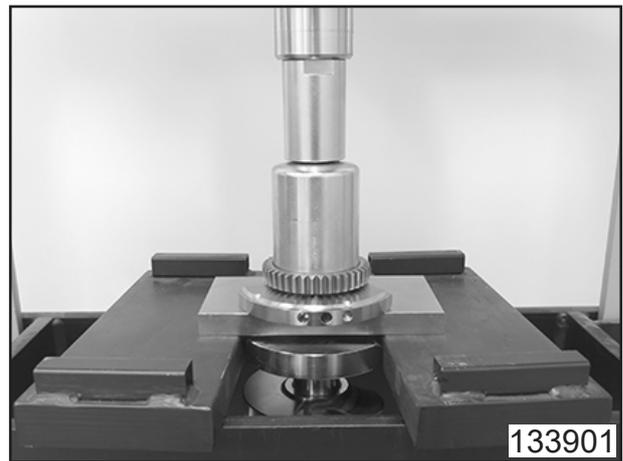
Position primary gear wheel on the crankshaft.

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



Mount primary gear wheel all the way with special tool (Pressing tool).

The marking is visible after mounting.



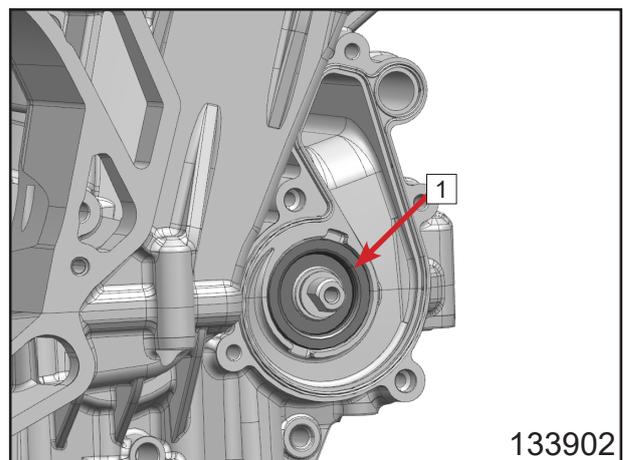
13.3.8 Radial shaft seal ring of water pump, changing

Preparatory work

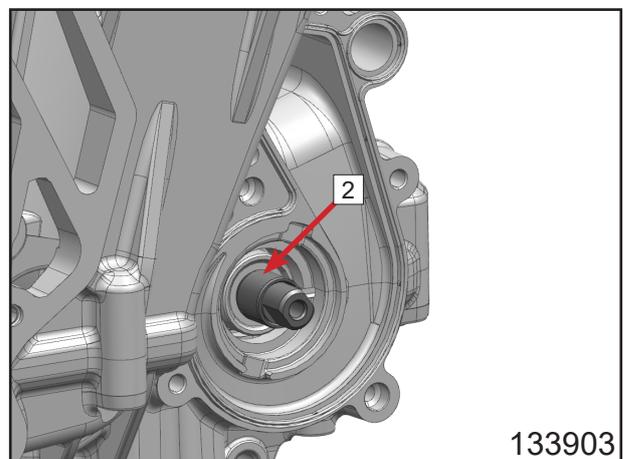
Remove the water pump impeller.

Main work

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



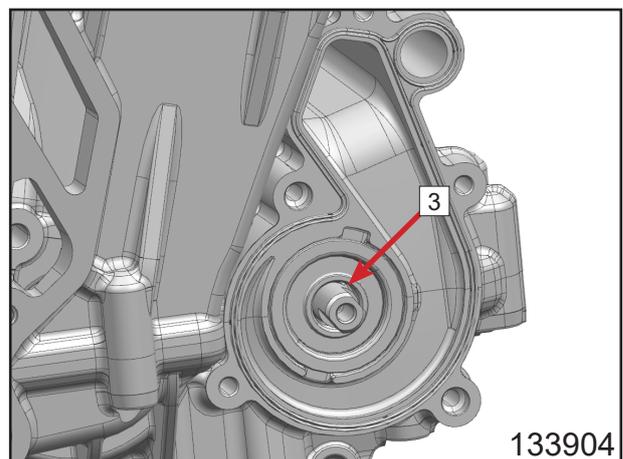
Remove water pump impeller (2).



Remove O-ring (3).

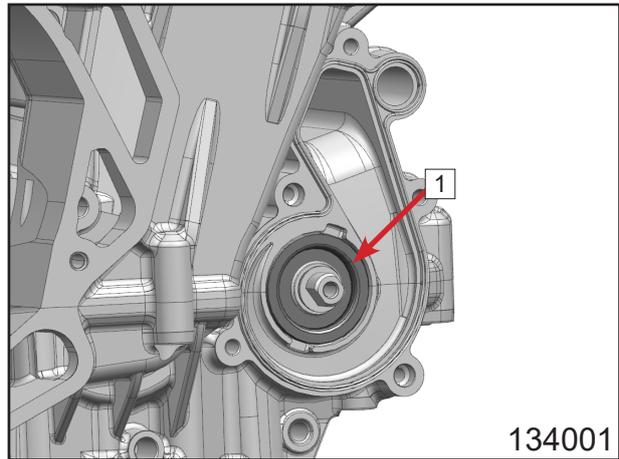
Grease and mount the new O-ring (3).

Long-life grease



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

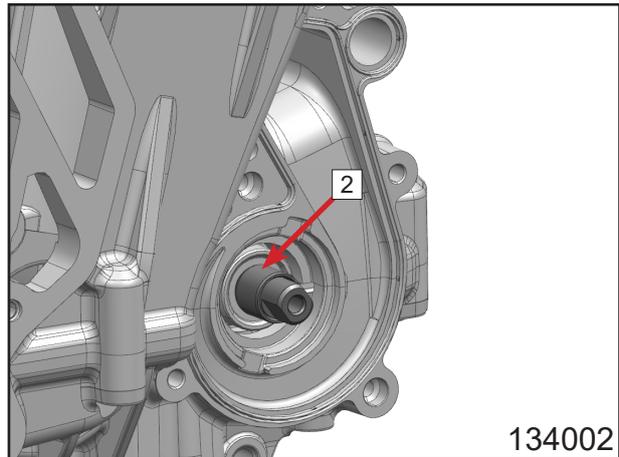
Long-life grease



Mount the new water pump impeller (2).

Finishing work

Mount the water pump cover.

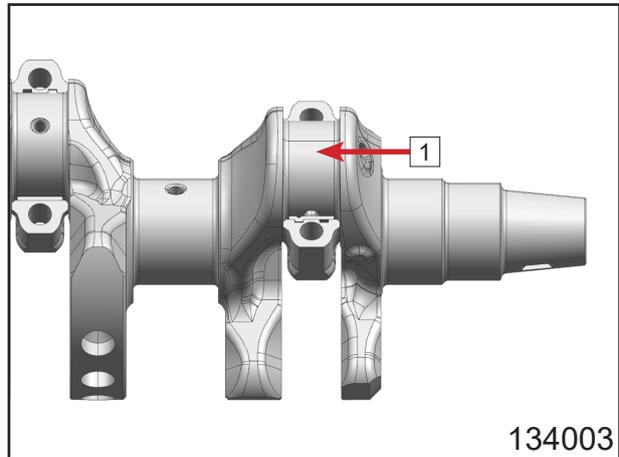


13.3.9 Checking the radial clearance of lower conrod bearing

Info

Perform operations for both connecting rods.

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



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		

Special tool :
Multi-tooth wrench socket
Angle disc

Info
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

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

Clean the parts.

13.3.10 Changing the conrod bearing

Info
Perform operations for both connecting rods.

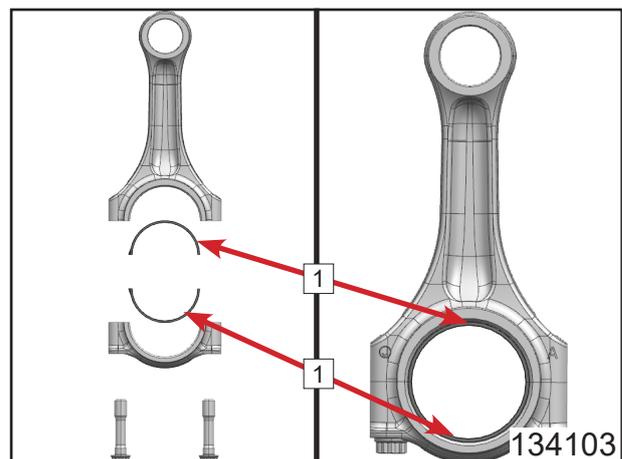
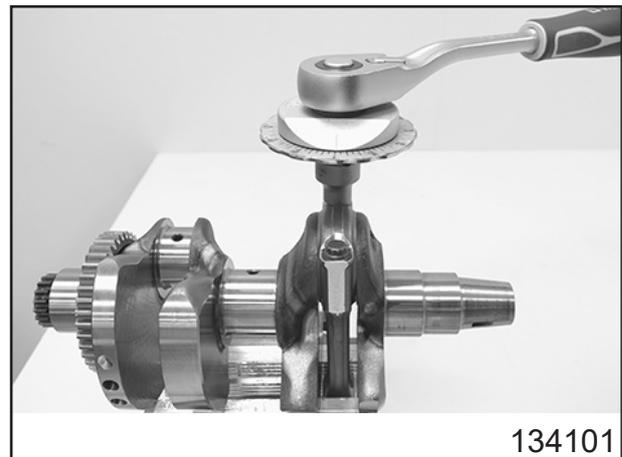
Condition

Connecting rod removed

Main work

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

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

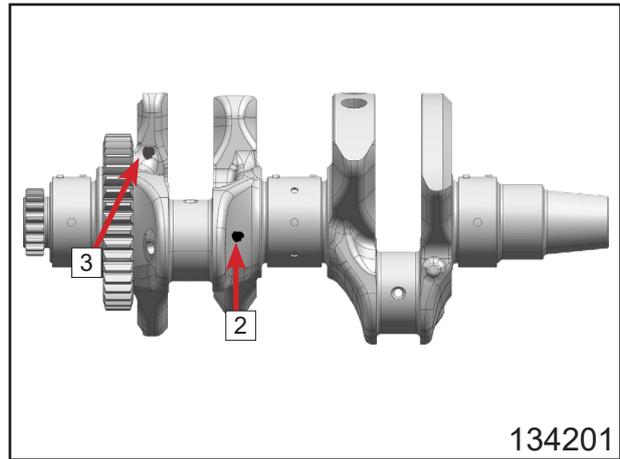


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New crankshaft

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

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



Used crankshaft

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

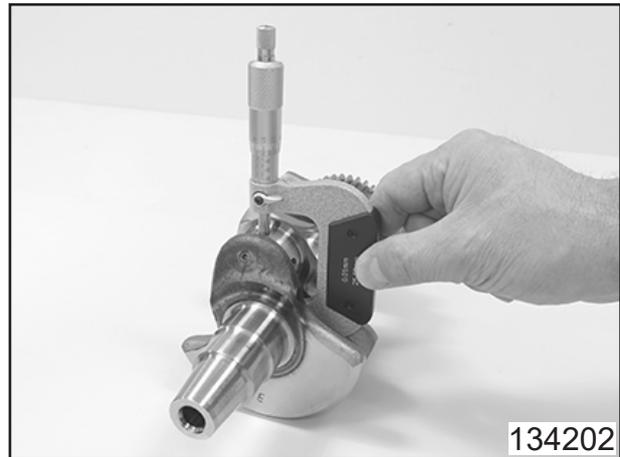
Guideline:

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.

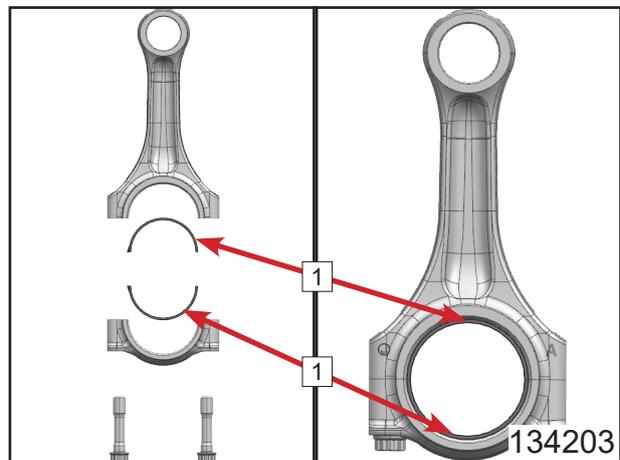
If damage or abrasion is discernible:

Change the crankshaft.



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

Info
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.

13.3.11 Checking/measuring the cylinder

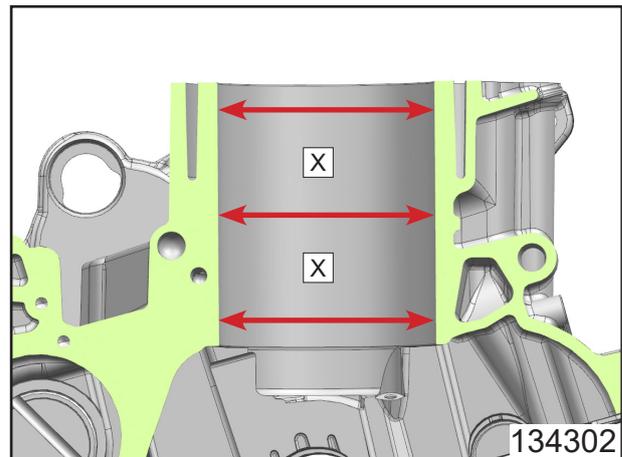
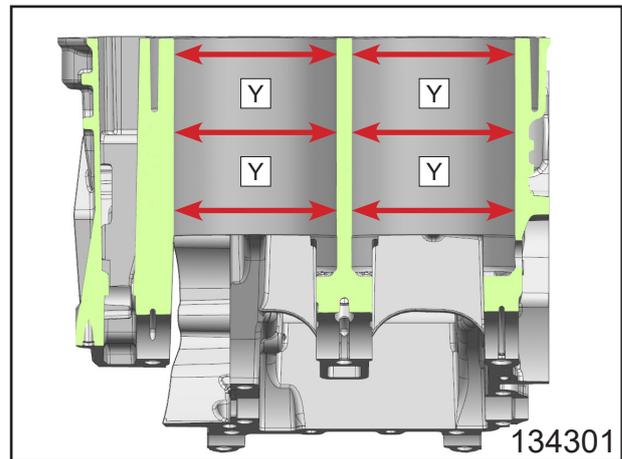
Check the O-ring of the chain adjuster for damage and wear.

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

Check the cylinder bearing surface for damage.

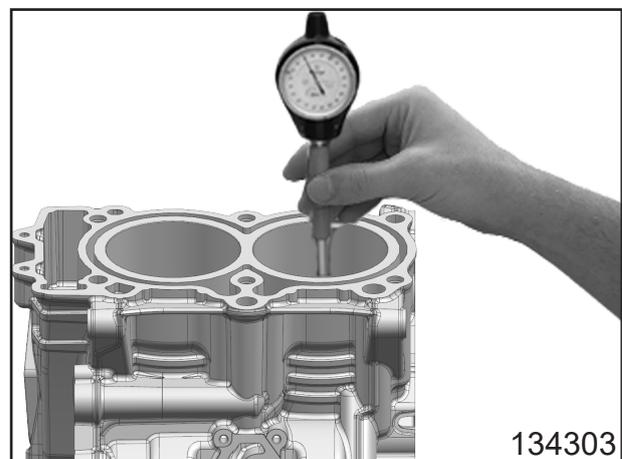
If the cylinder bearing surface is damaged: Change the cylinder and piston.

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



Guideline:

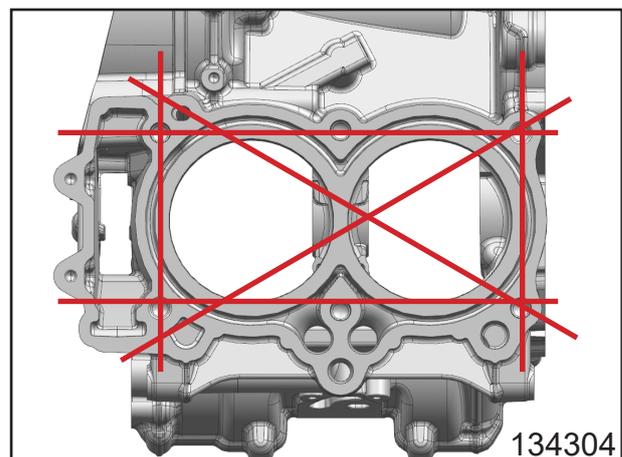
Cylinder - bore diameter
Size: 88.000mm~88.012 mm



Using a straightedge and the special tool(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.



13.3.12 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.

Tip
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.

Info
Mount the piston ring with the marking facing upward.

Use the special tool (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.

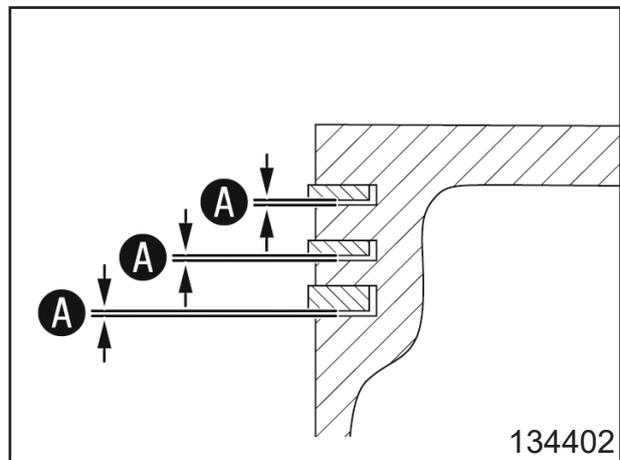
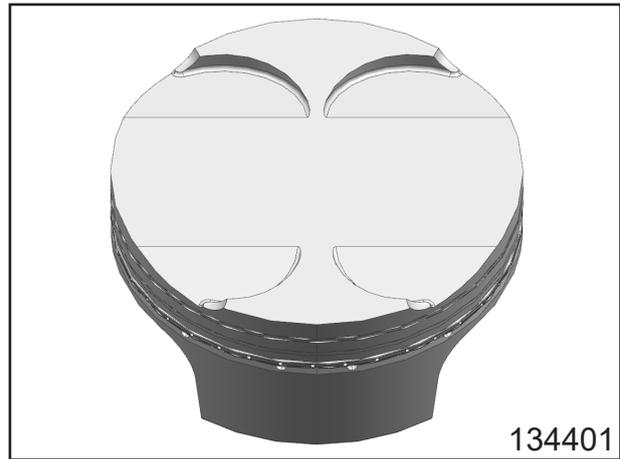
Check piston pin for discoloration, signs of wear or flaking of the coating.

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:

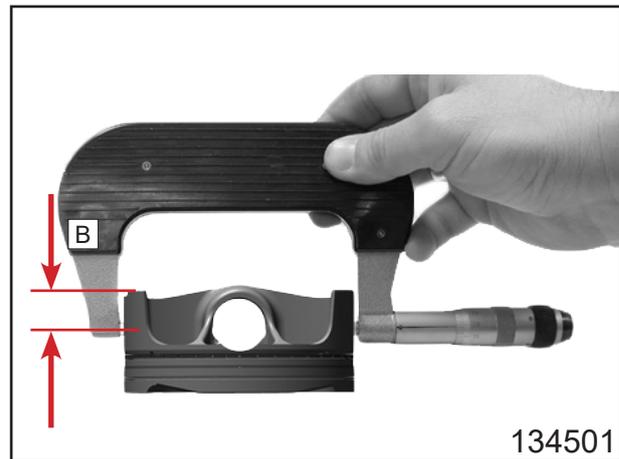
Change the connecting rod and piston pin.



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)



134501

13.3.13 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.

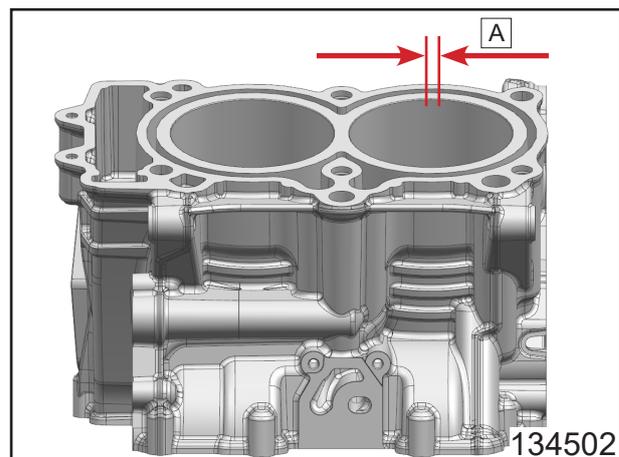
Guideline

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.



134502

13.3.14 Determining the piston/cylinder mounting clearance

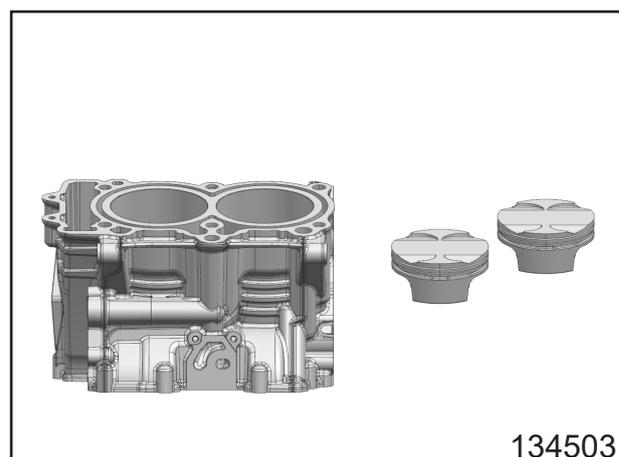
Check/measure the cylinder.

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

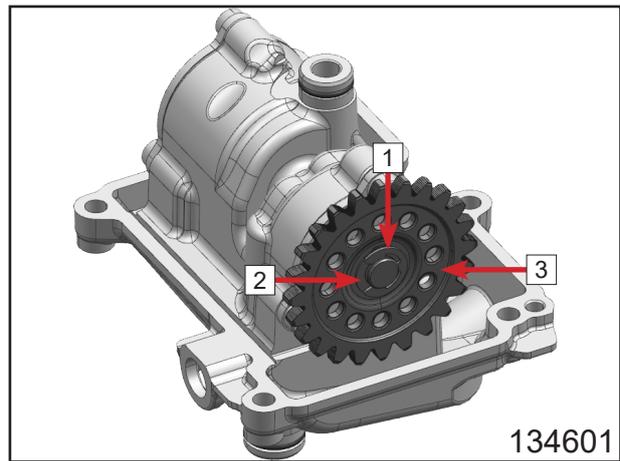


134503

13.3.15 Removing the oil pumps

Remove lock ring (1) and washer (2).

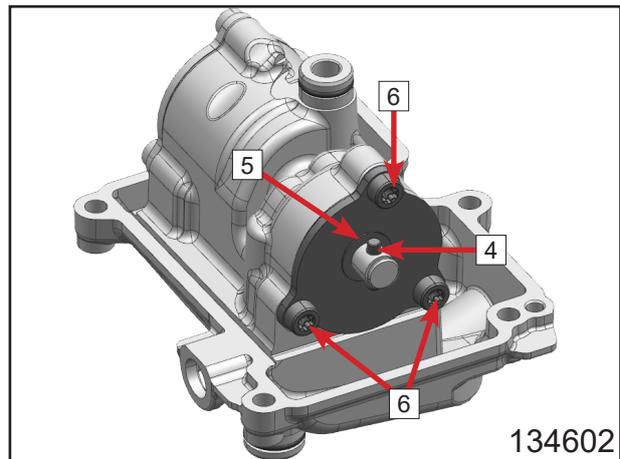
Take off oil pump gear wheel (3).



Remove pin (4) and washer (5).

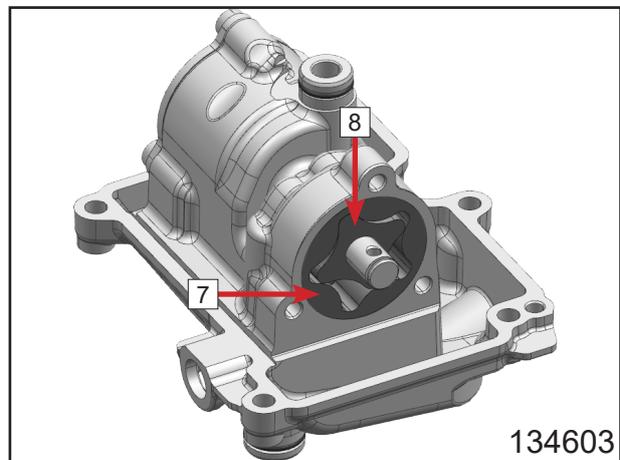
Remove screws (6).

Take off the oil pump cover.

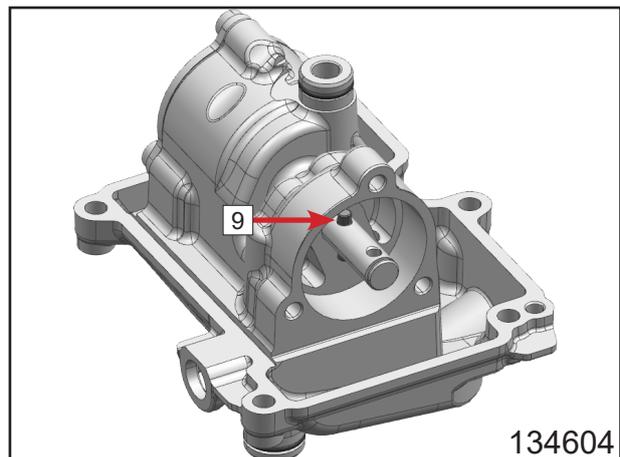


Remove external rotor (7).

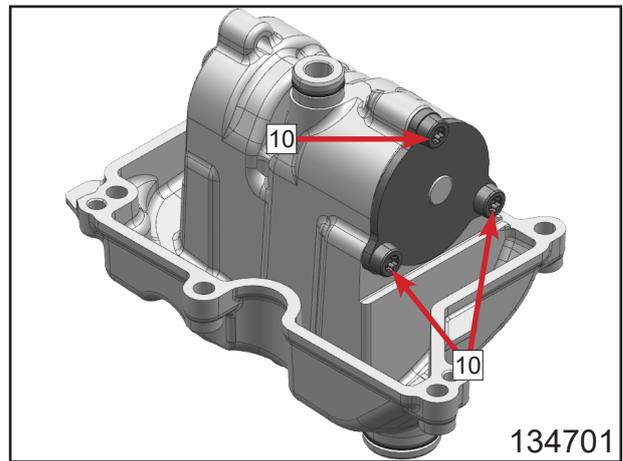
Remove internal rotor (8).



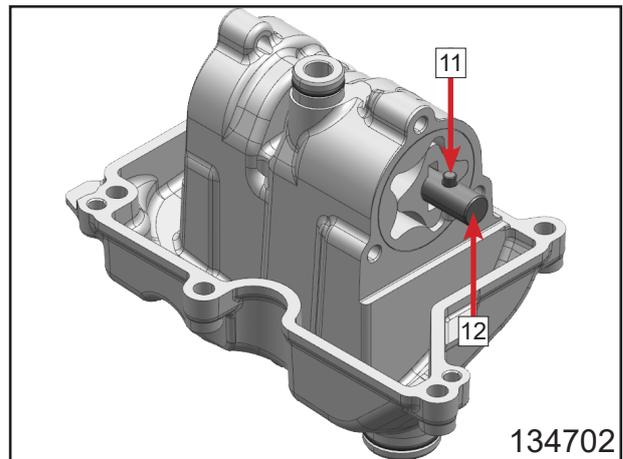
Remove pin (9).



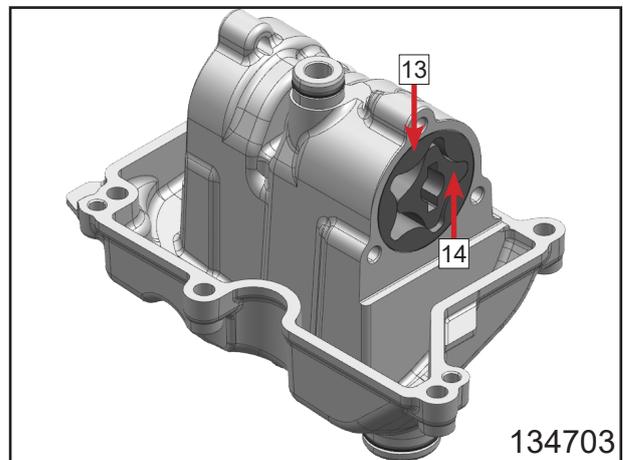
Remove screws (10).
Take off the oil pump cover.



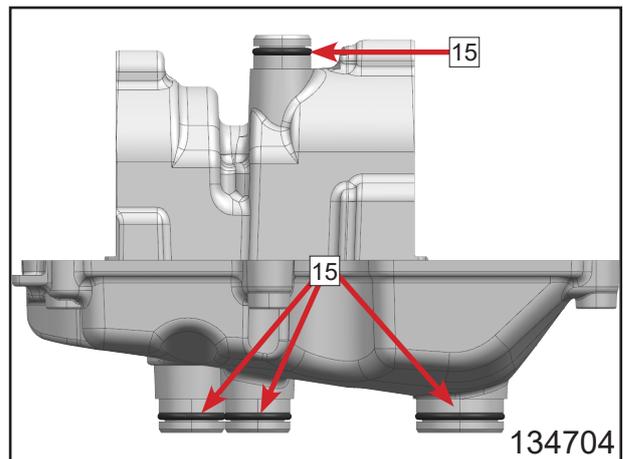
Remove pin (11) and oil pump shaft (12).



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



Remove O-rings (15).



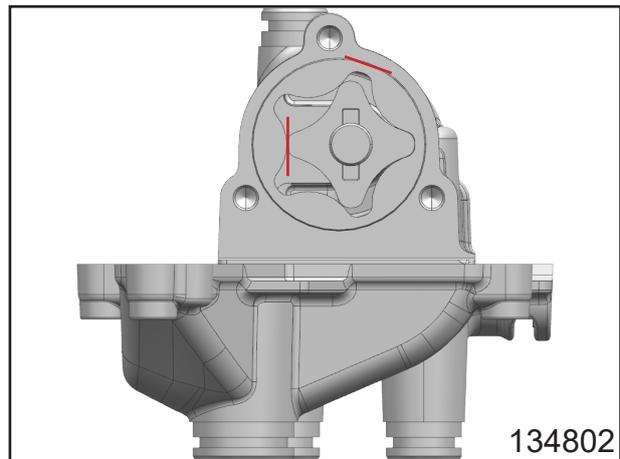
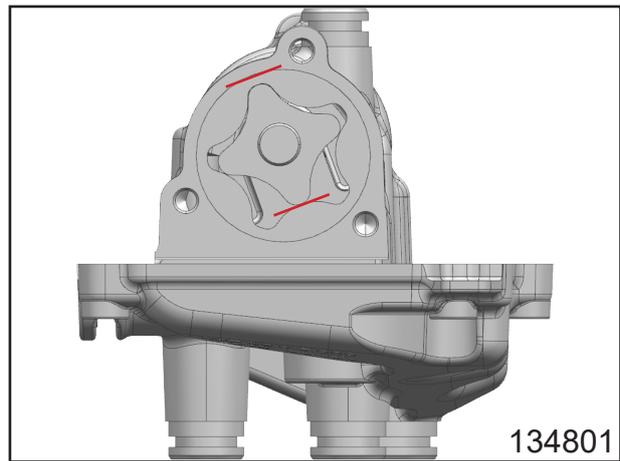
CFMOTO

13.3.16 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.

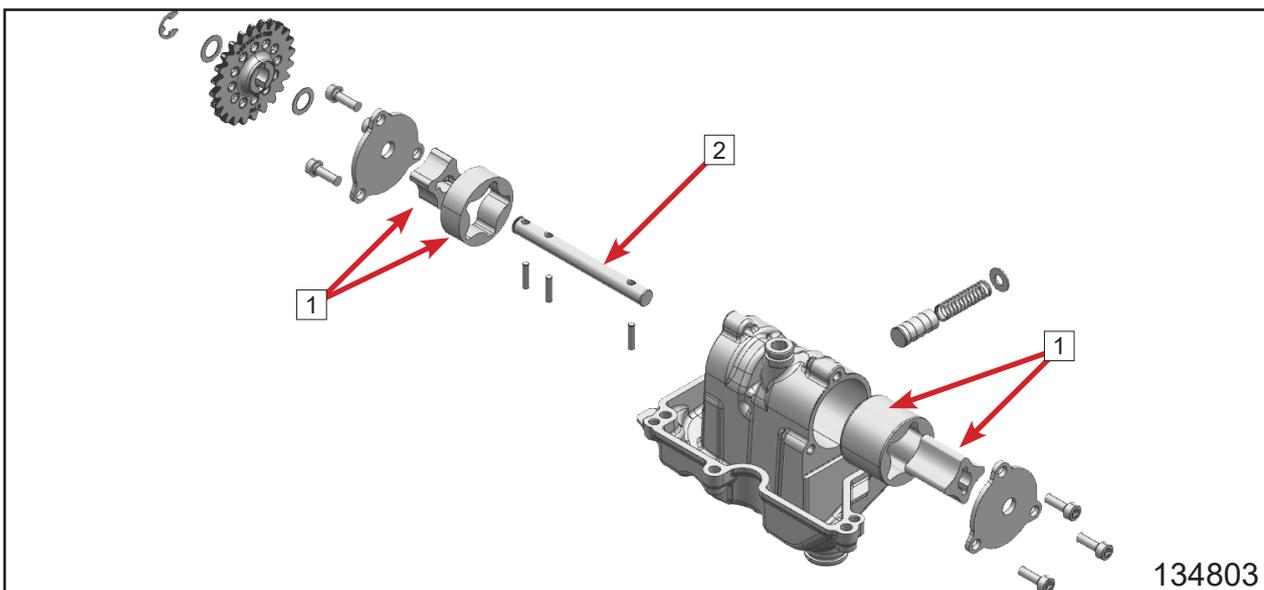
If there is damage or wear: Change the oil pumps.

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.



13.3.17 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.

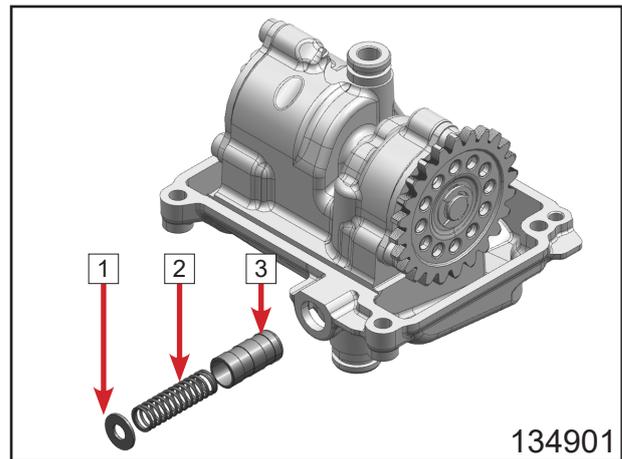
If there is damage or wear: Change the control piston.

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.

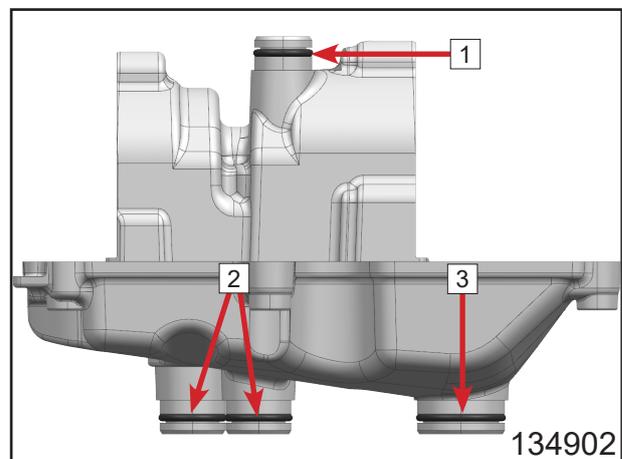
Thoroughly oil control piston (3) and spring (2) and mount them.

Mount washer (1).



13.3.18 Installing the oil pumps

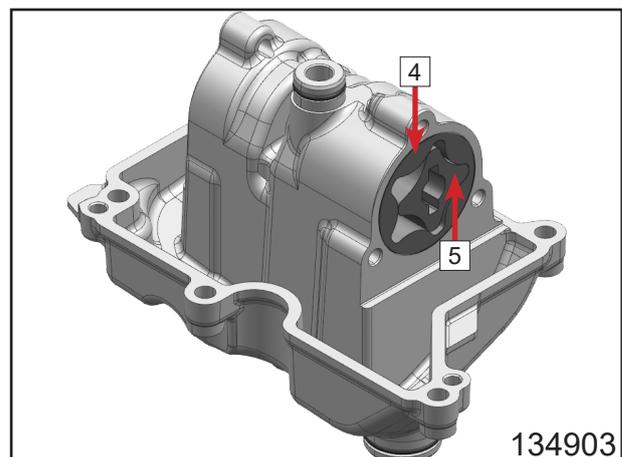
Mount and grease the new O-rings (1), (2) and (3).



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

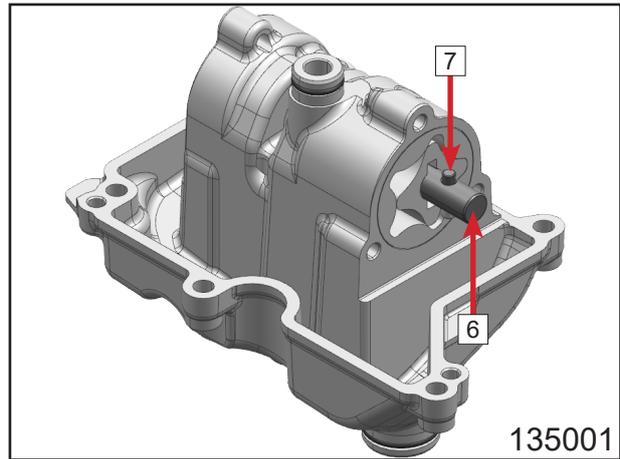
The rounded side of the external rotor must face the oil pump housing.

Oil the parts.



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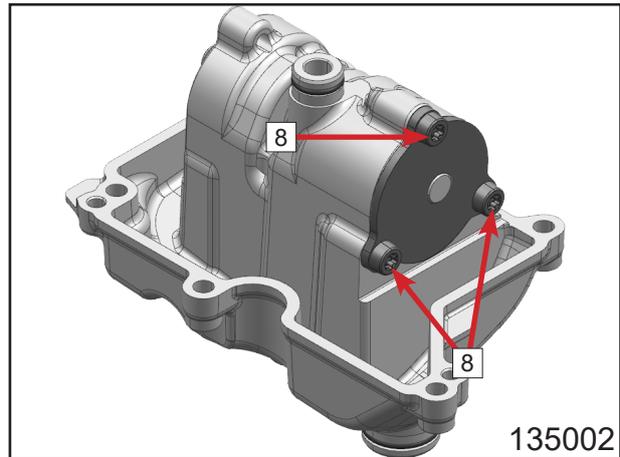
Mount oil pump shaft (6) with pin (7).



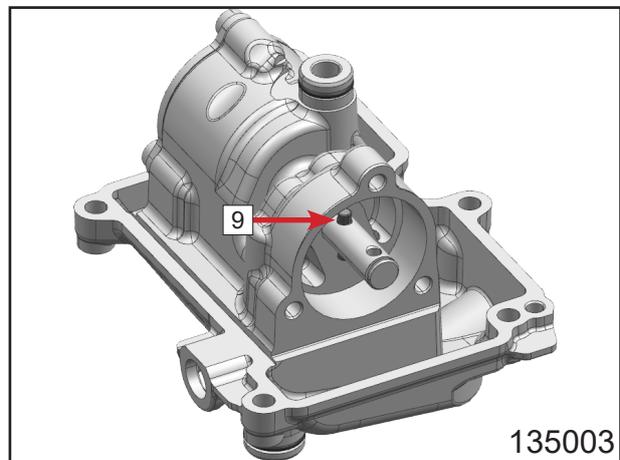
Position the oil pump cover.
Mount and tighten screws (8).

Guideline

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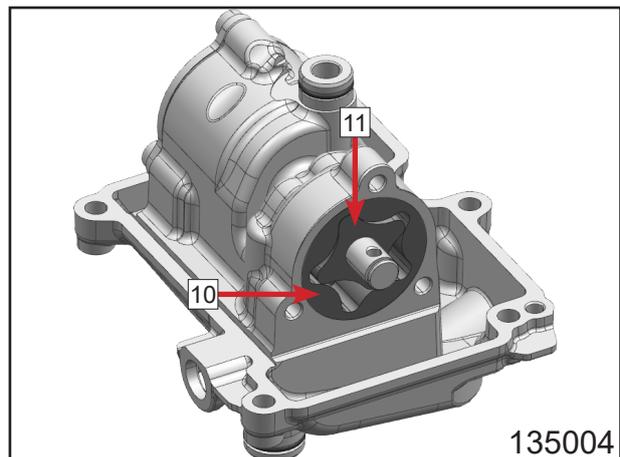
Mount pin (9).



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

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

Oil the parts.

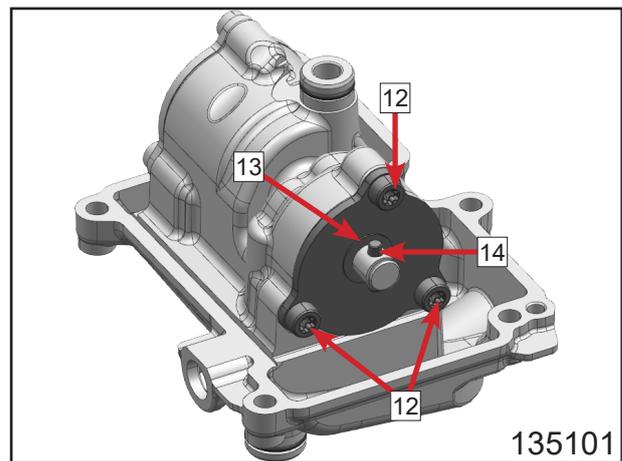


Position the oil pump cover.
Mount and tighten screws (12).

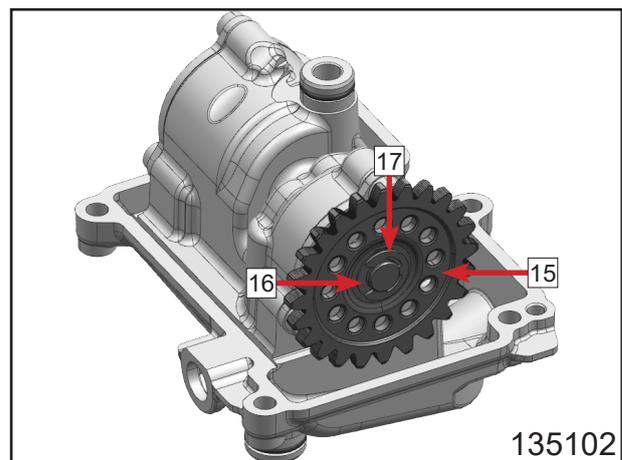
Guideline

Screw, oil pump cover	M6	10 N•m 243 螺纹胶
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Mount washer (13).
Mount pin (14).



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



13.3.19 Preparing timing chain tensioner for installation

Fully compress the timing chain tensioner.

Info
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.



CFMOTO

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

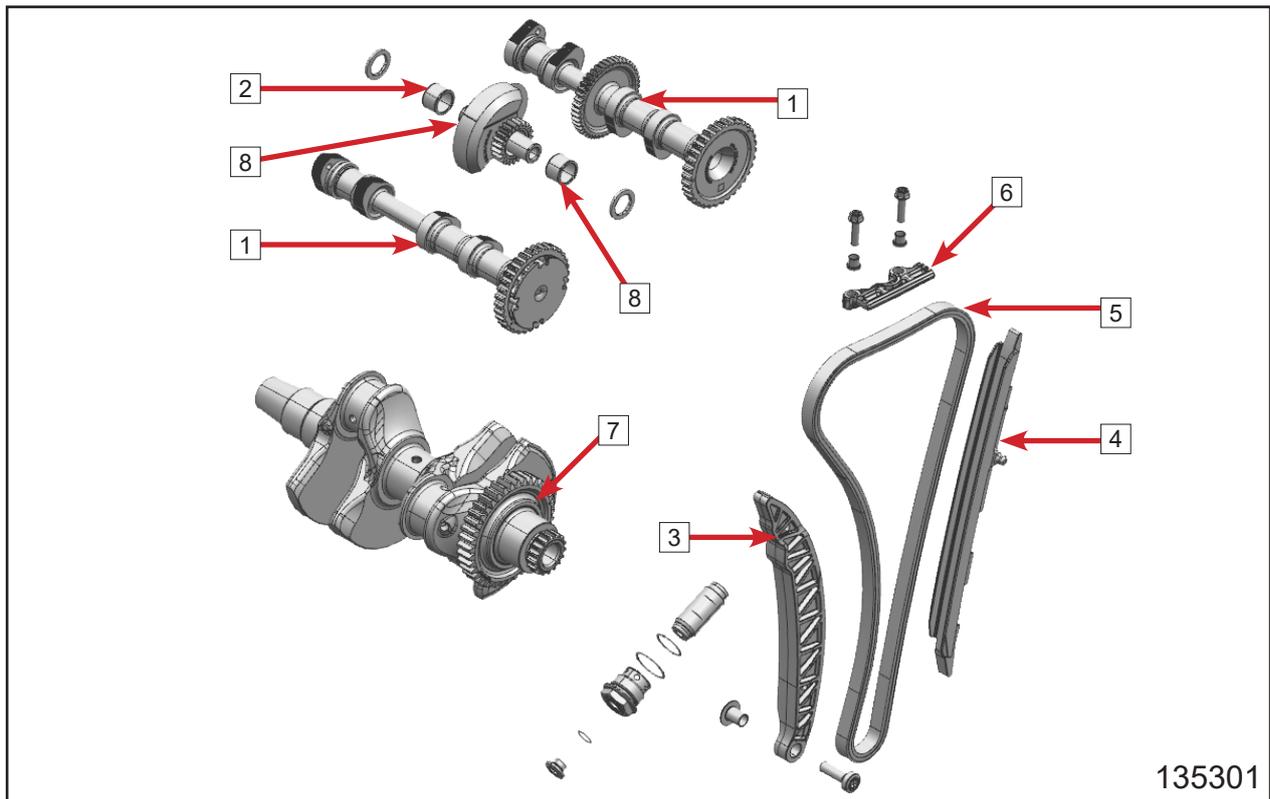
3 mm

Info

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.



13.3.20 Checking the timing assembly



135301

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.

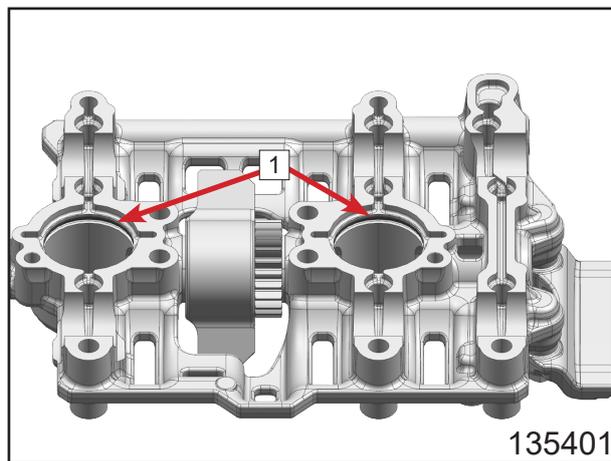
Check balancer shaft bearing (8) for damage and wear.

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

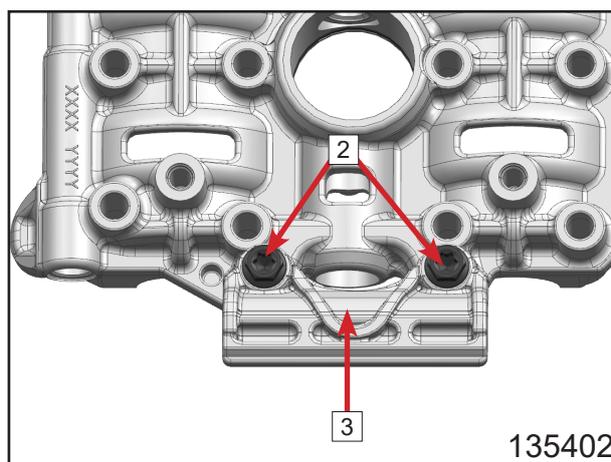
CFMOTO

13.3.21 Working on the camshaft bearing bridge

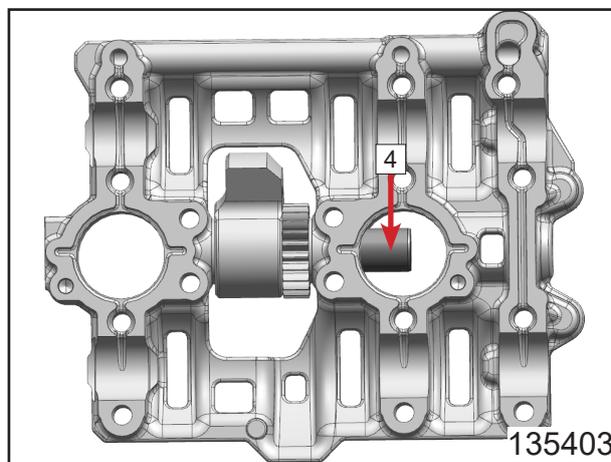
Remove O-rings (1).



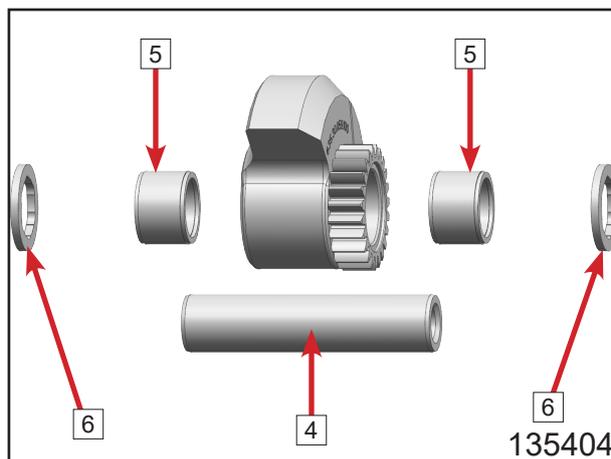
Remove screws (2).
Take off guide rail (3).



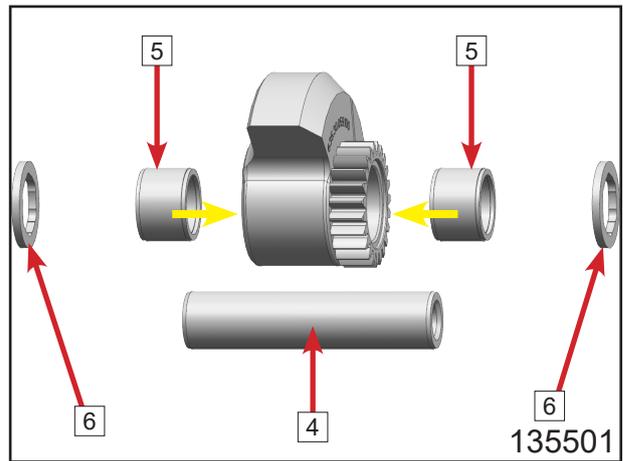
Pull out spindle (4) of the balancer shaft with appropriate screw M10.



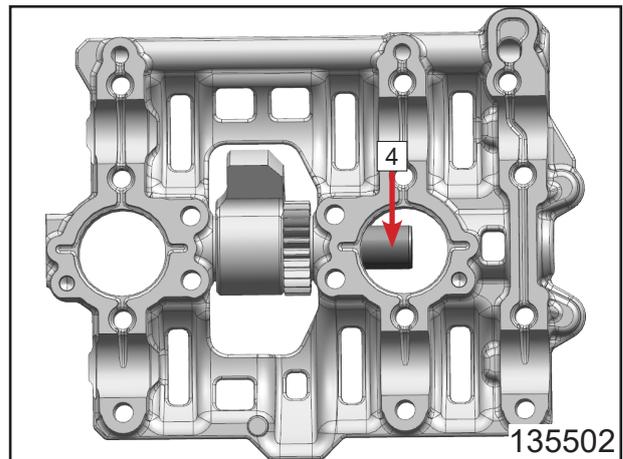
Remove balancer shaft with needle bearings (5) and washers (6).



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

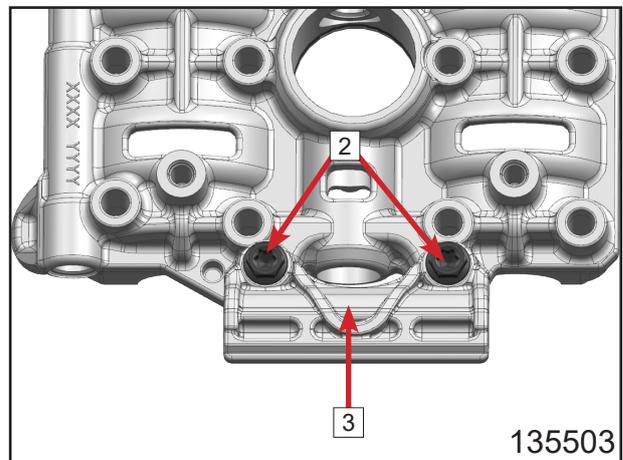


Mount spindle (4) of the balancer shaft in the center between the spark plug shafts.
Remove screw M10.

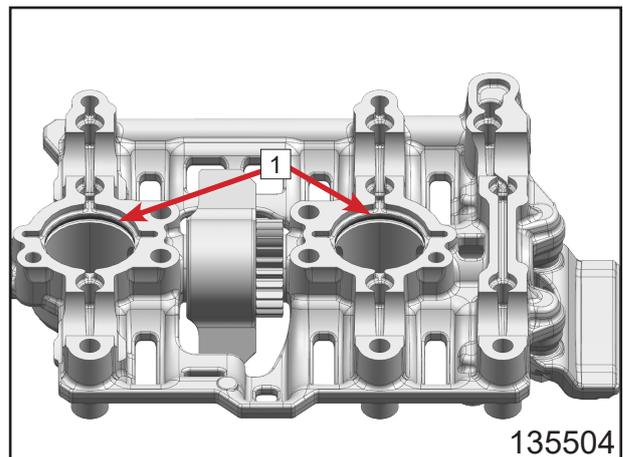


Position guide rail (3).
Mount and tighten screws (2).
Guideline

Screw, upper guide rail
M6
8 N•m
243 螺纹胶

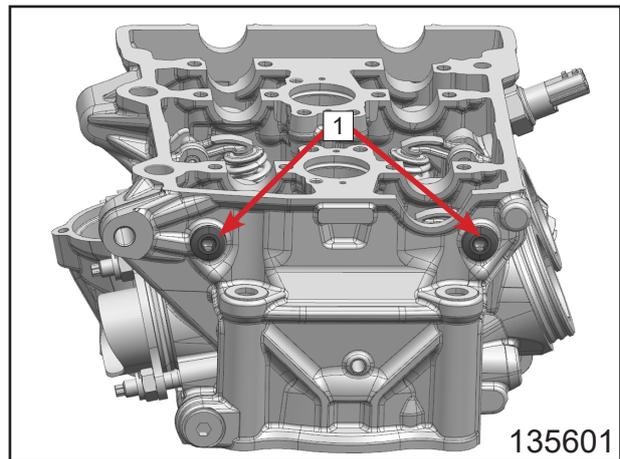


Mount and grease the new O-rings (1).

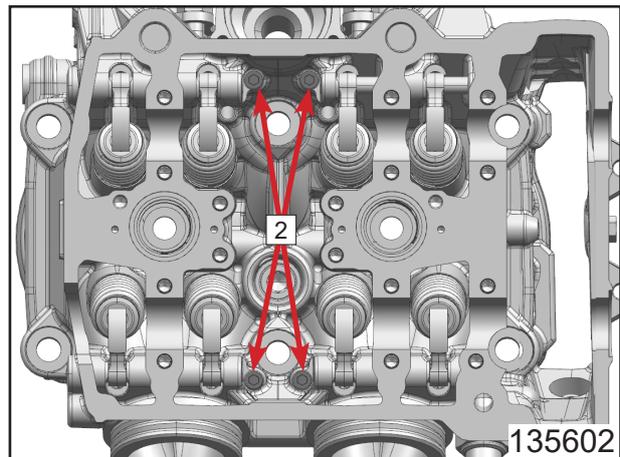


13.3.22 Working on the cylinder head

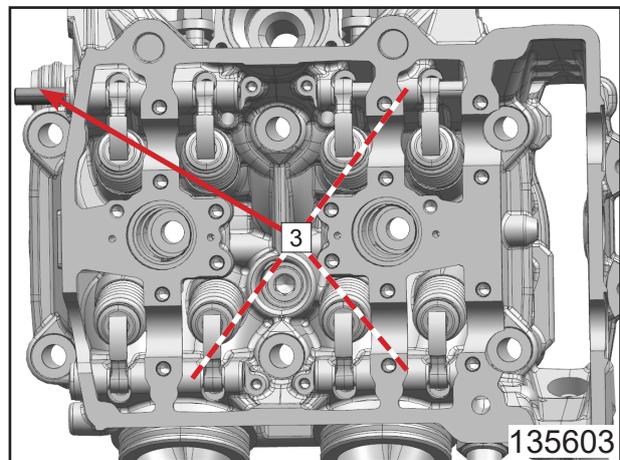
Remove screw plugs (1) with the O-rings.



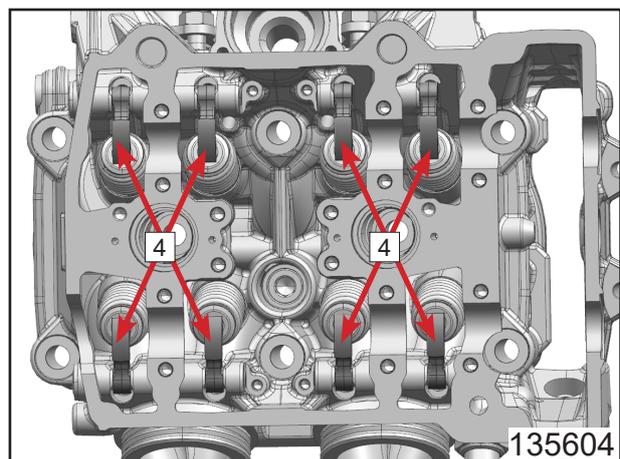
Remove screws (2).



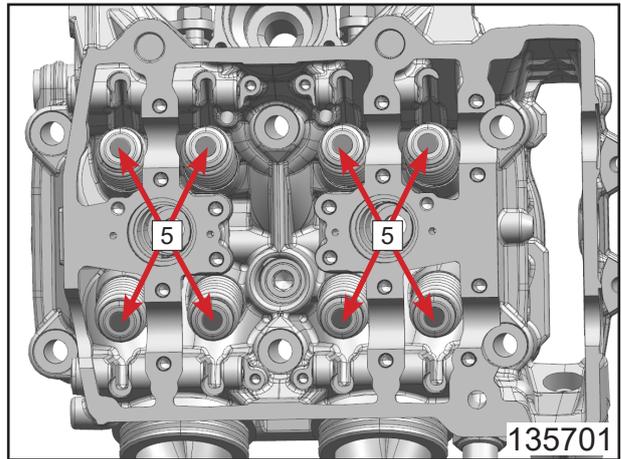
Mount disassembly tool M4.
Remove cam lever shafts (3).



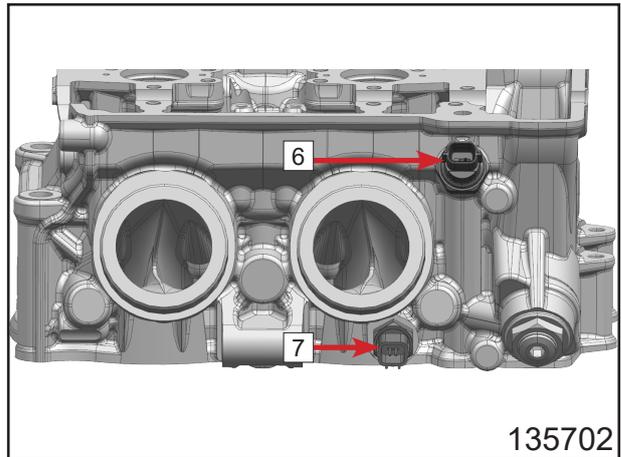
Take off cam lever (4).



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

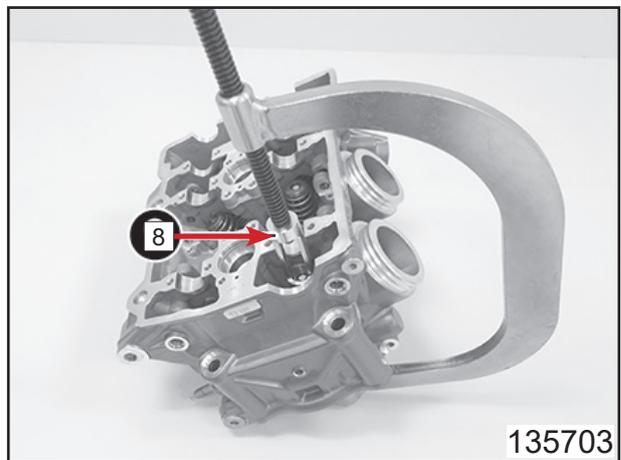


Remove oil pressure sensor (6) with O-ring.
Remove coolant temperature sensor (7) with the O-ring.

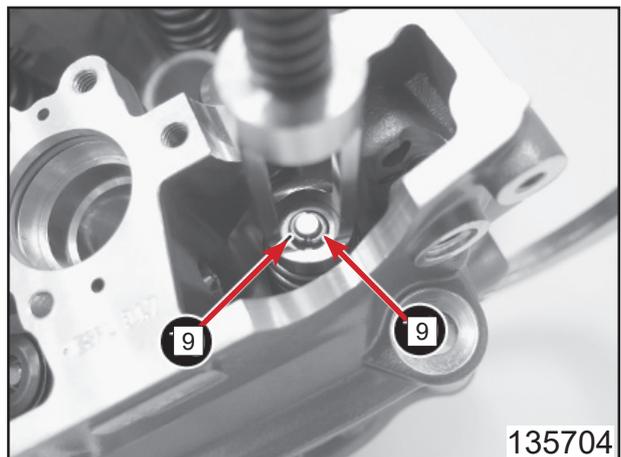


Tension valve spring with special tool (8).

Valve spring mounter
Insert for valve spring lever



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

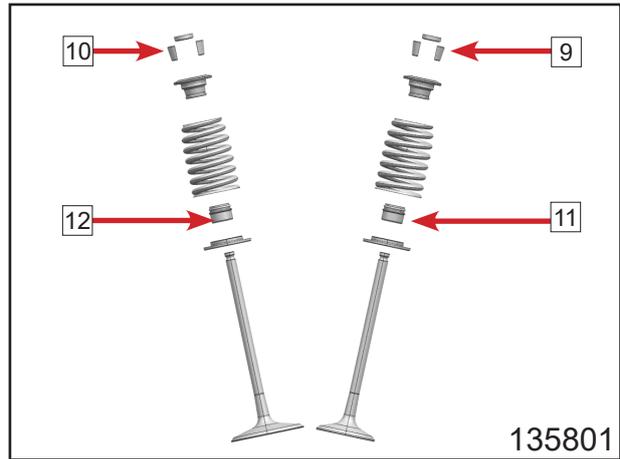


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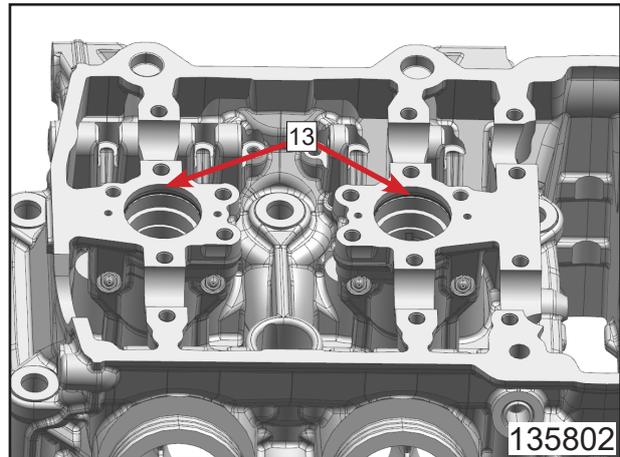
Remove valve spring retainers (10), valve springs, valve stem seals (11) and valve spring seats (12).

Info

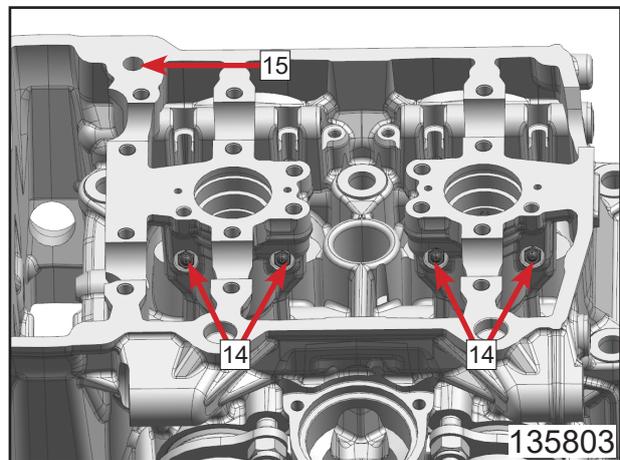
Place the valves in a box according to their normal built-in position and label them.



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).

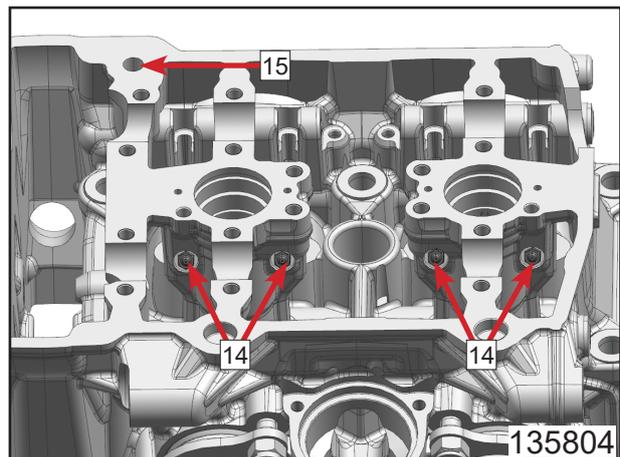
Guideline

Oil nozzle in cylinder head

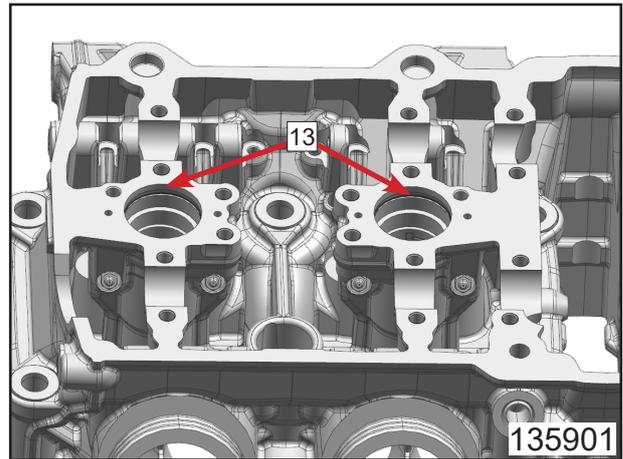
M5

2 N•m

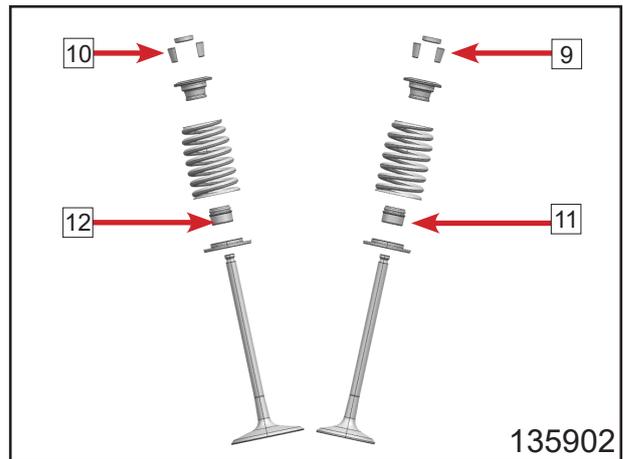
243 螺纹胶



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.

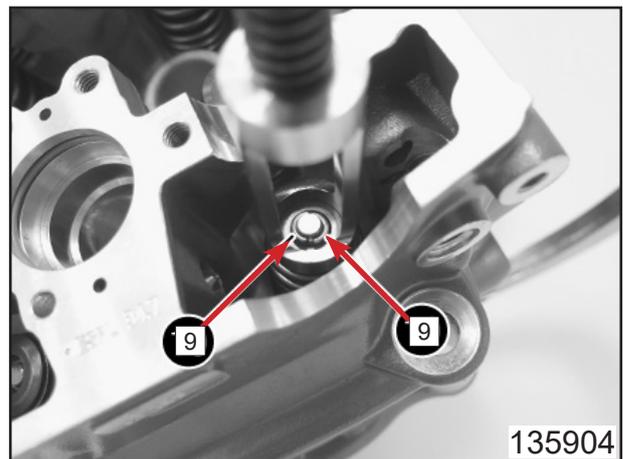
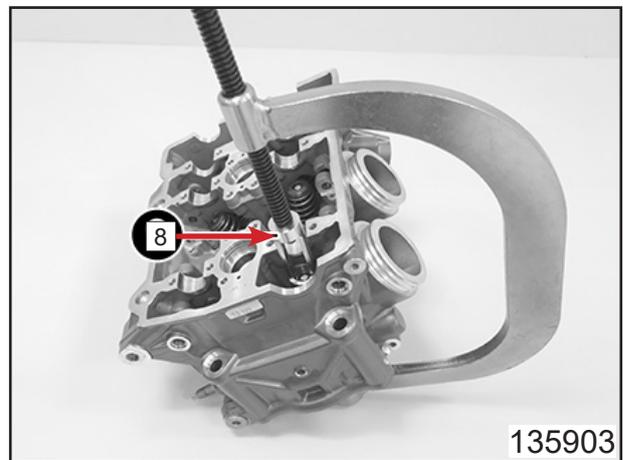


Tension valve spring with special tool (8).

Valve spring mouter
Insert for valve spring lever

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

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



CFMOTO

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

Guideline

Coolant temperature sensor

M10×1.25

10 N•m

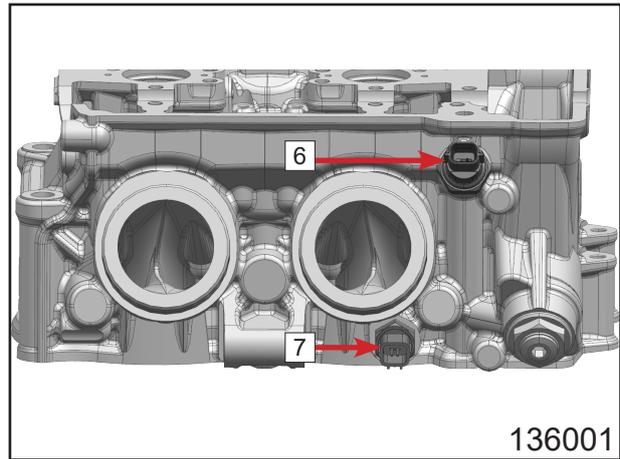
Mount oil pressure sensor (6) with new O-ring.

Guideline

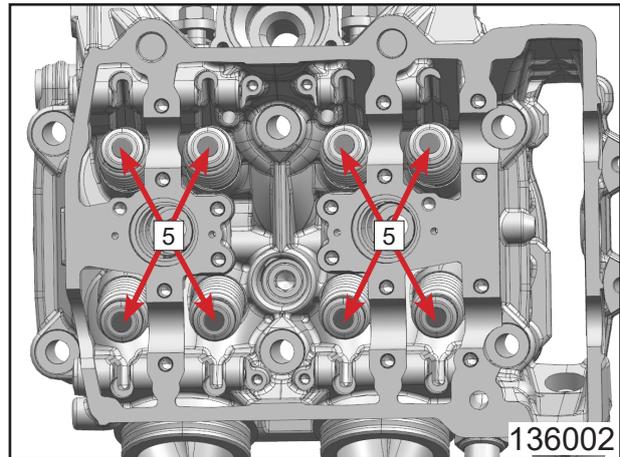
Oil pressure sensor

M10×1

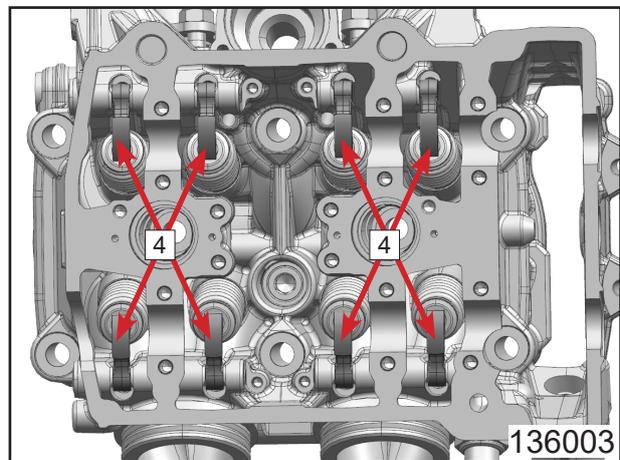
10 N•m



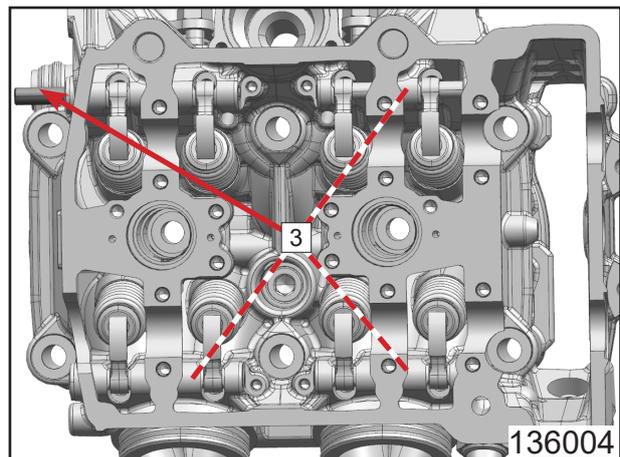
Place shims (5) into the valve spring retainer according to their normal built-in position.



Position cam levers (4).



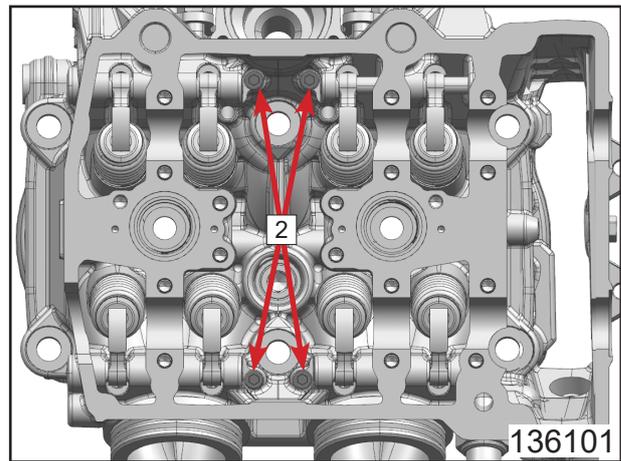
Mount cam lever shafts (3).
Remove disassembly tool.



Mount and tighten screws (2).

Guideline

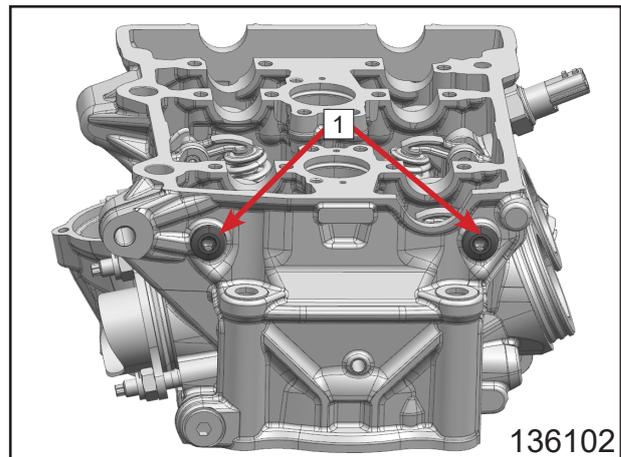
Screw, cam lever axial lock
M5
6 N•m
243 螺纹胶



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

Guideline

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



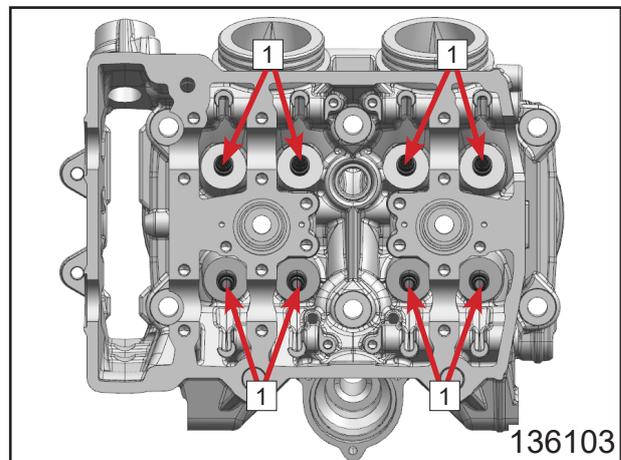
13.3.23 Checking the cylinder head

Check valve guides (1) using the special tool (Limit plug gauge).

If the special tool 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.

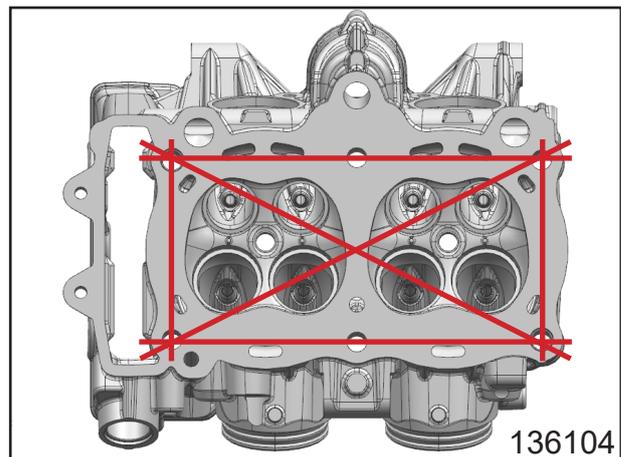
If there is damage or cracking: Change the cylinder head.



Check the sealing surface of the cylinder for distortion using a straightedge and the special tool (Feeler gauge).

Cylinder/cylinder head - sealing area distortion
≤ 0.05 mm

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

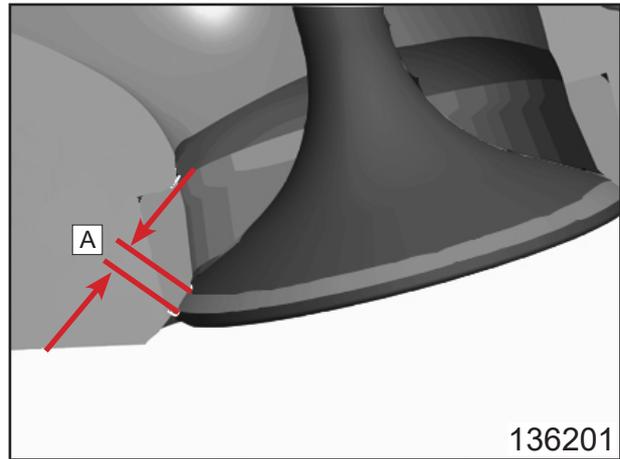


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Check sealing seat (A) of the valves.

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	

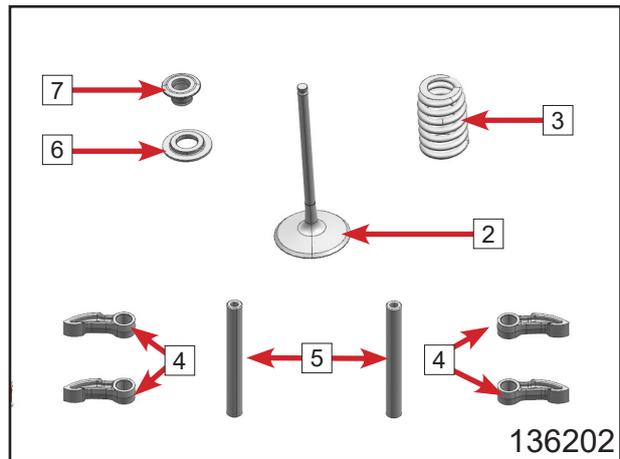
If the measured value does not meet specifications: Change the valve springs.

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.

13.3.24 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.

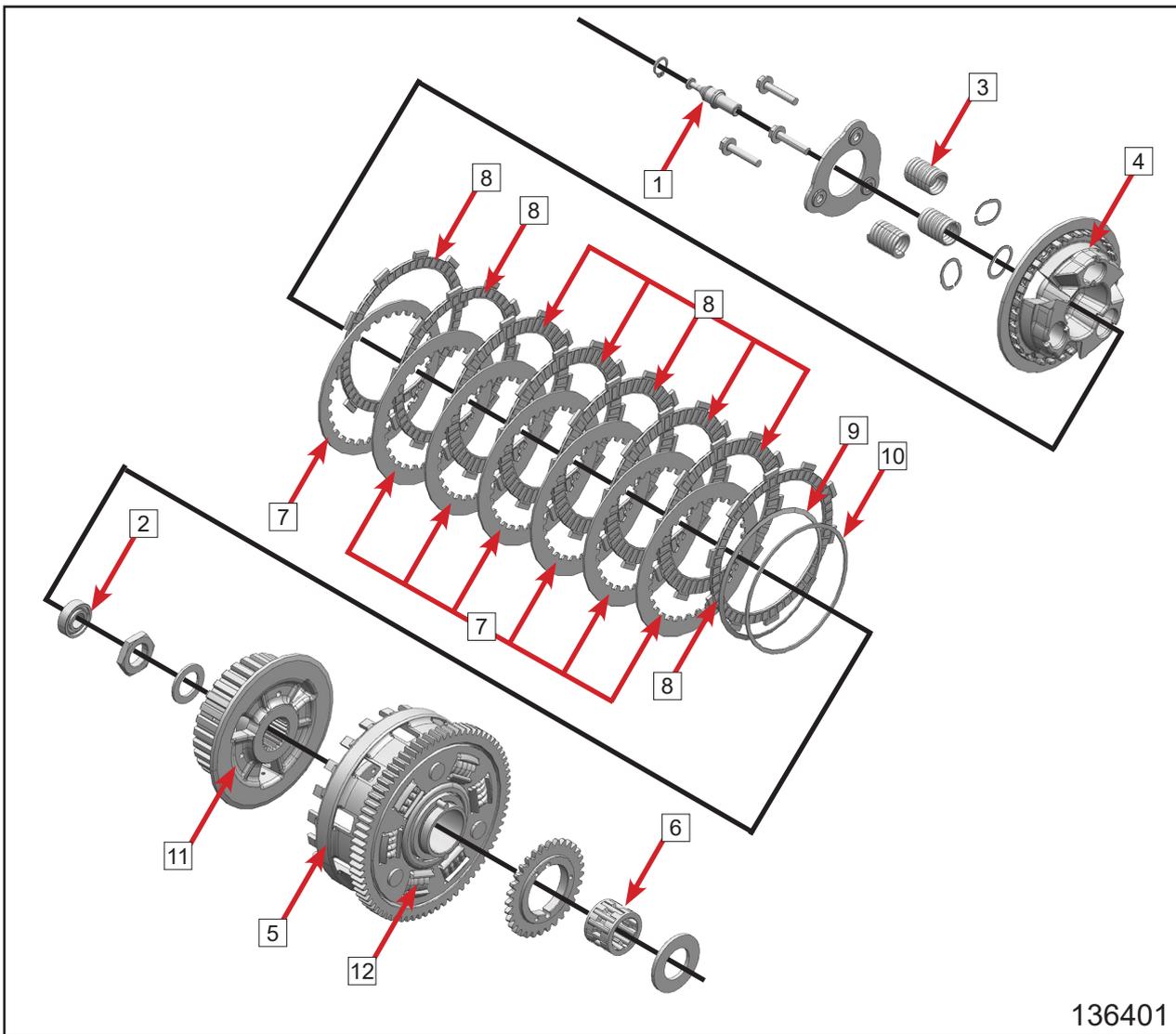
If there is damage or wear: Change the pretension ring and support ring.

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.



13.3.25 Removing the shift drum locating unit

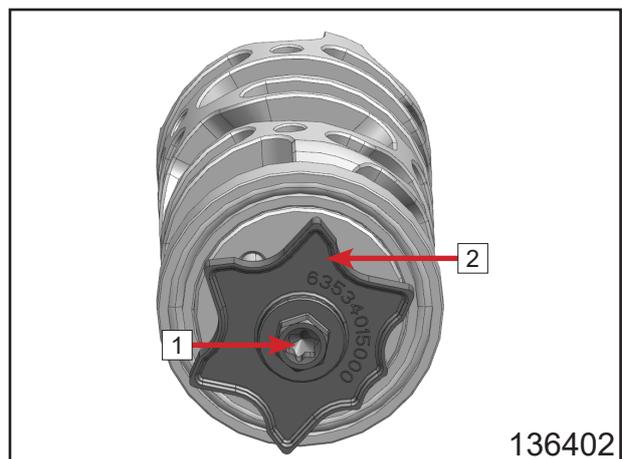
Clamp shift drum.

Guideline

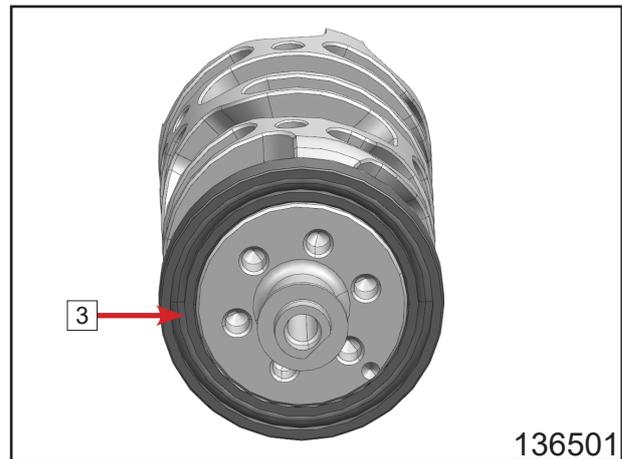
Use soft jaws.

Remove screw (1).

Take off the shift drum locating unit (2).



Remove bearing (3).



13.3.26 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.

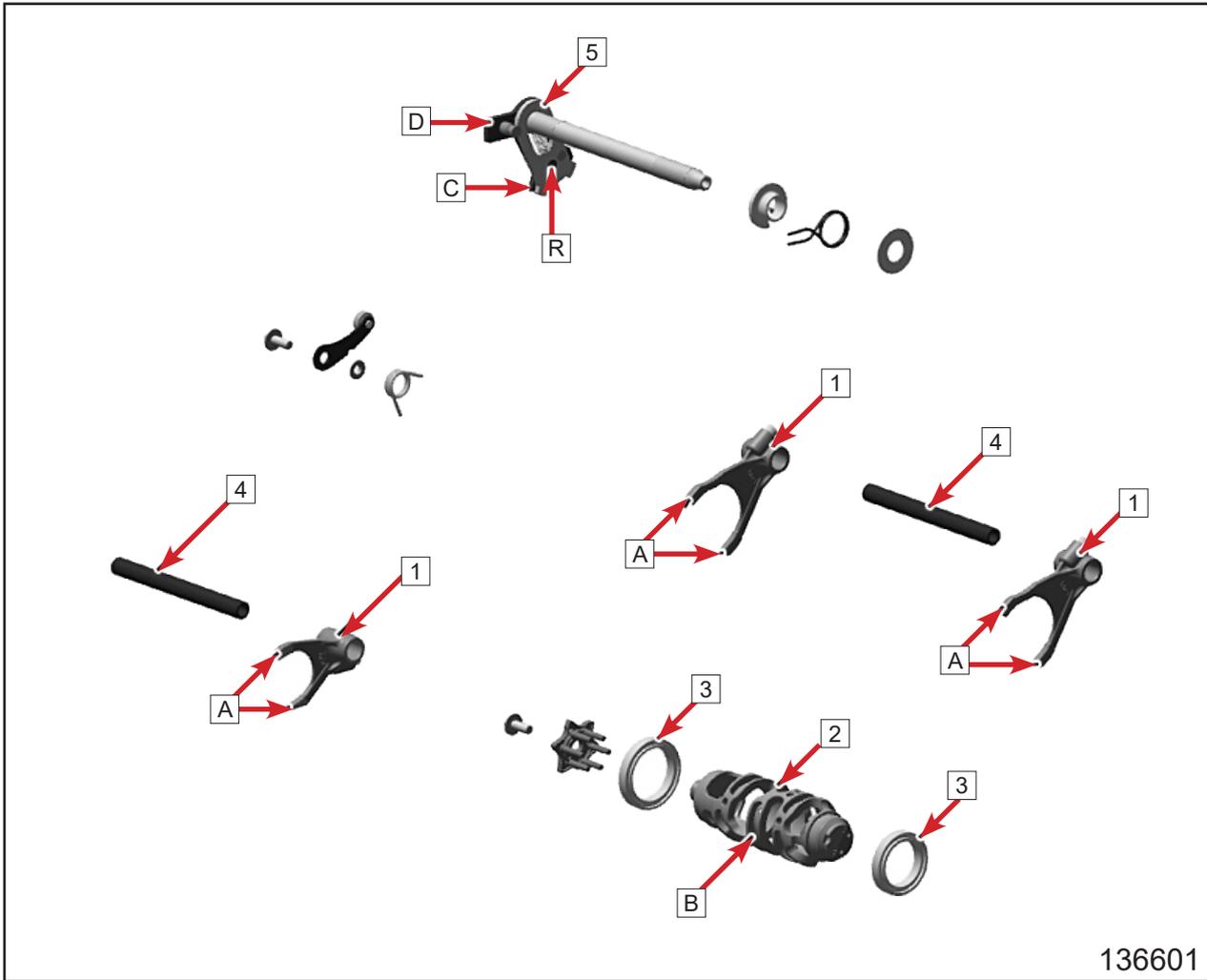
Check return surface (D) on the sliding plate for wear.

If deep notches are present: Change the sliding plate.

Check guide pin (E) for looseness and wear.

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

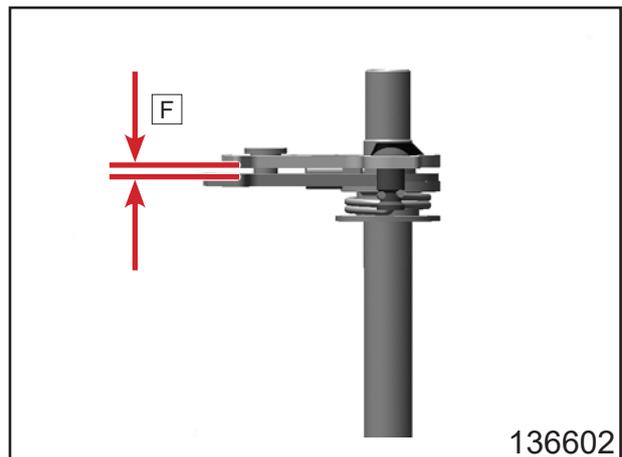
Preassemble the shift shaft.



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.



13.3.27 Preassembling the shift shaft

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

Guideline:

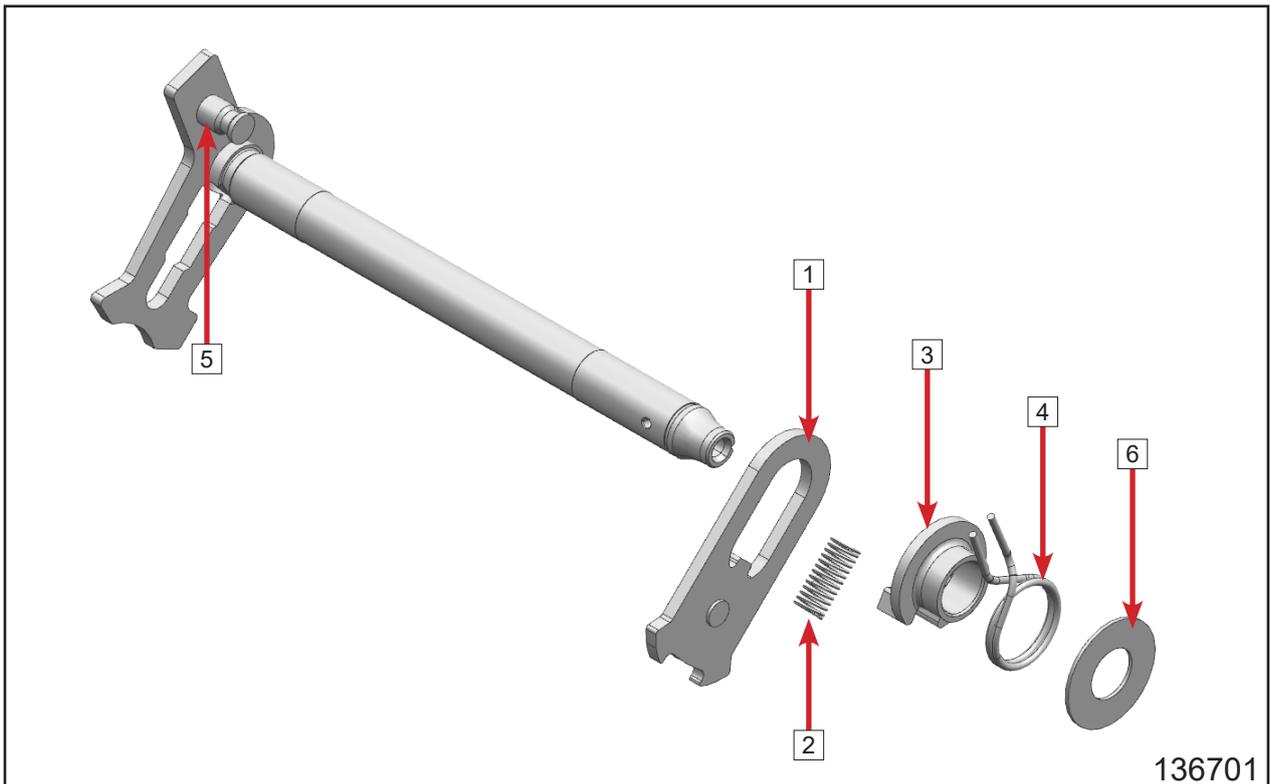
Use soft jaws.

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).



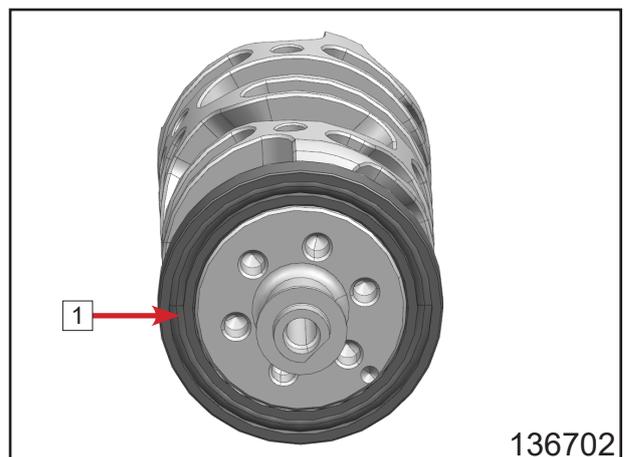
13.3.28 Installing the shift drum locating unit

Clamp shift drum.

Guideline

Use soft jaws.

Mount bearing (1).

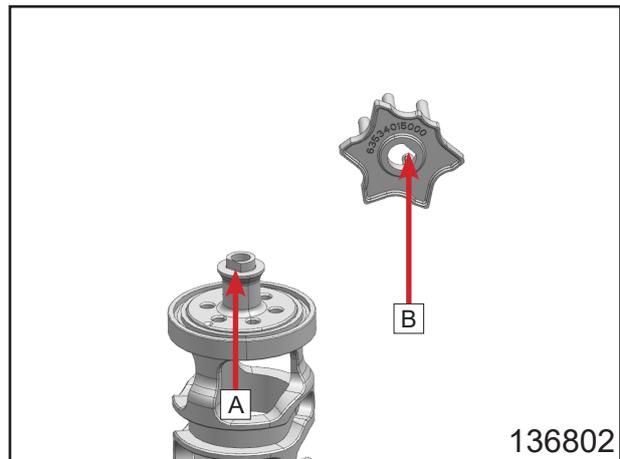
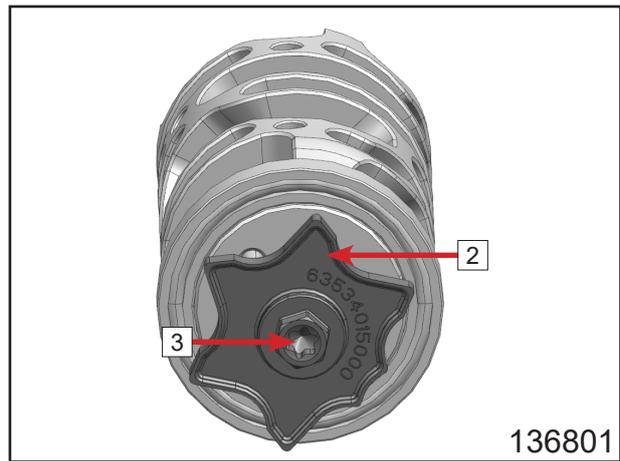


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Position shift drum locating unit (2).
]The flat surface (A) of the shift drum engages in the flat surface (B) of the shift drum locating unit.
Mount and tighten screw (3).

Guideline:

Screw, shift drum locating
M6
10 N•m
243 螺纹胶



13.3.29 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).

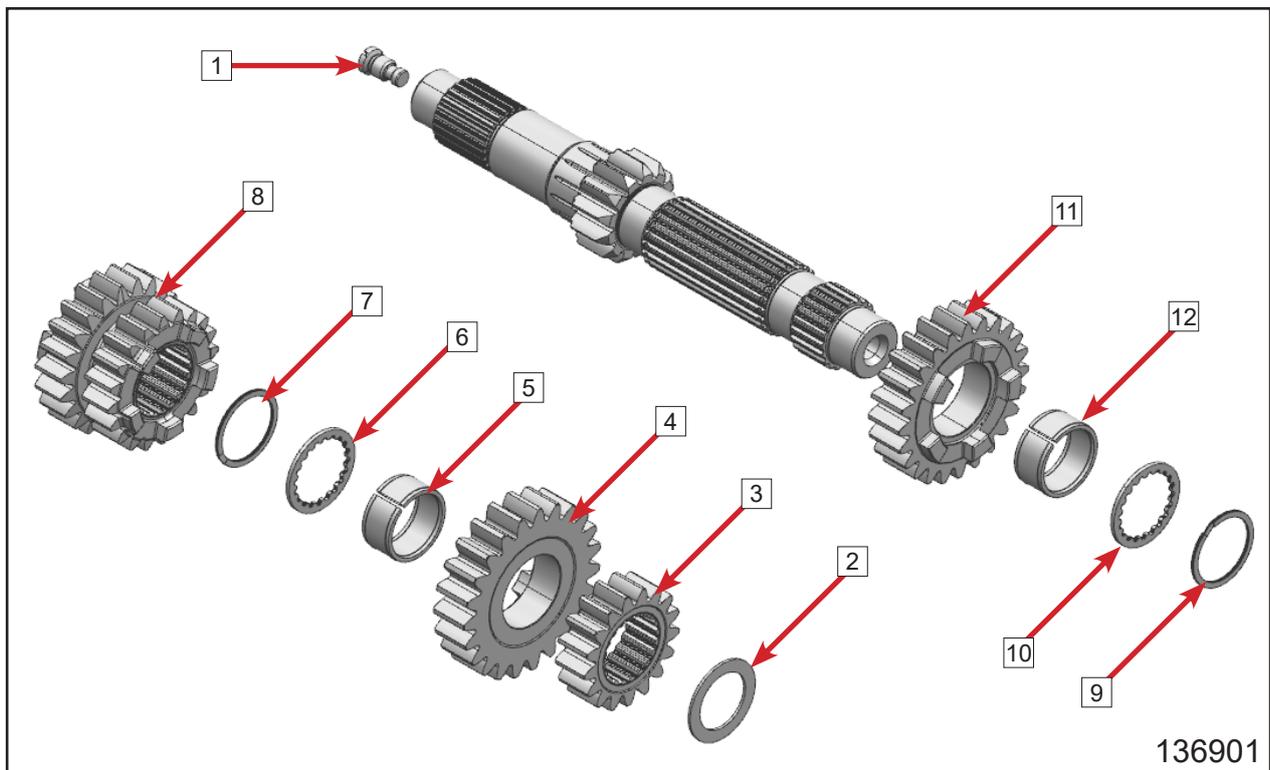
Remove lock ring (7).

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).



13.3.30 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).

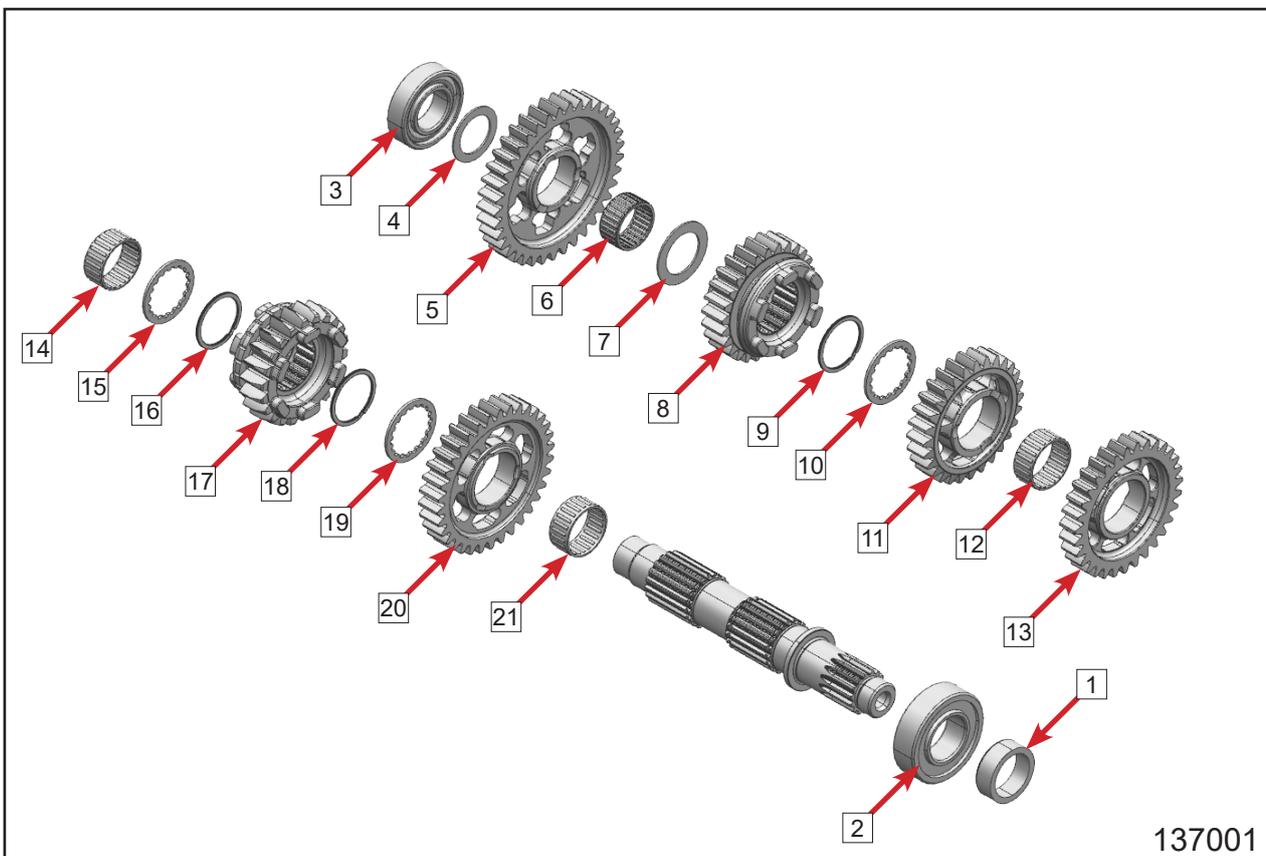
Remove needle bearing (12) and third-gear idler gear (13).

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).



13.3.31 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.

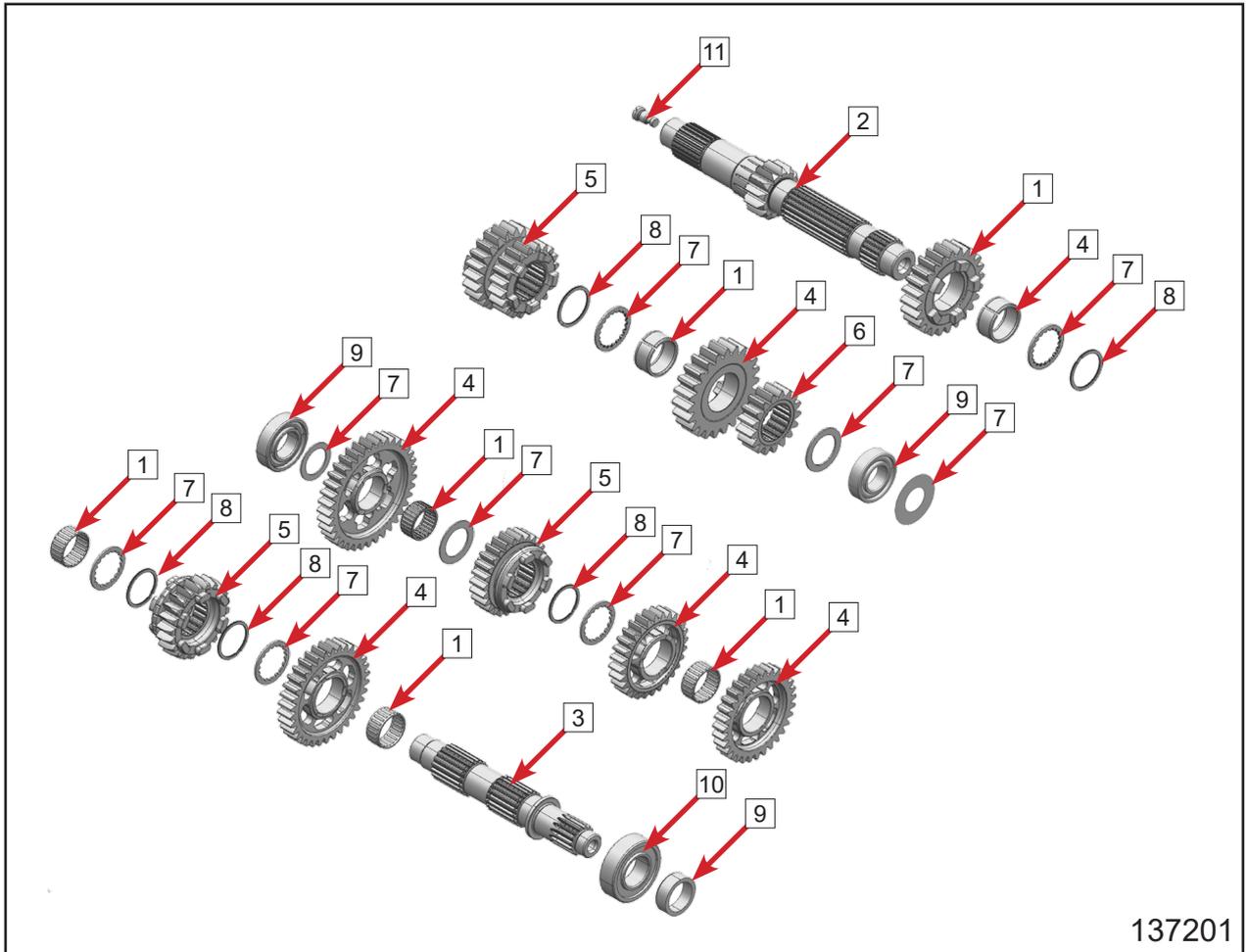
If there is damage or wear: Change the bearings.

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.



13.3.32 Assembling the main shaft

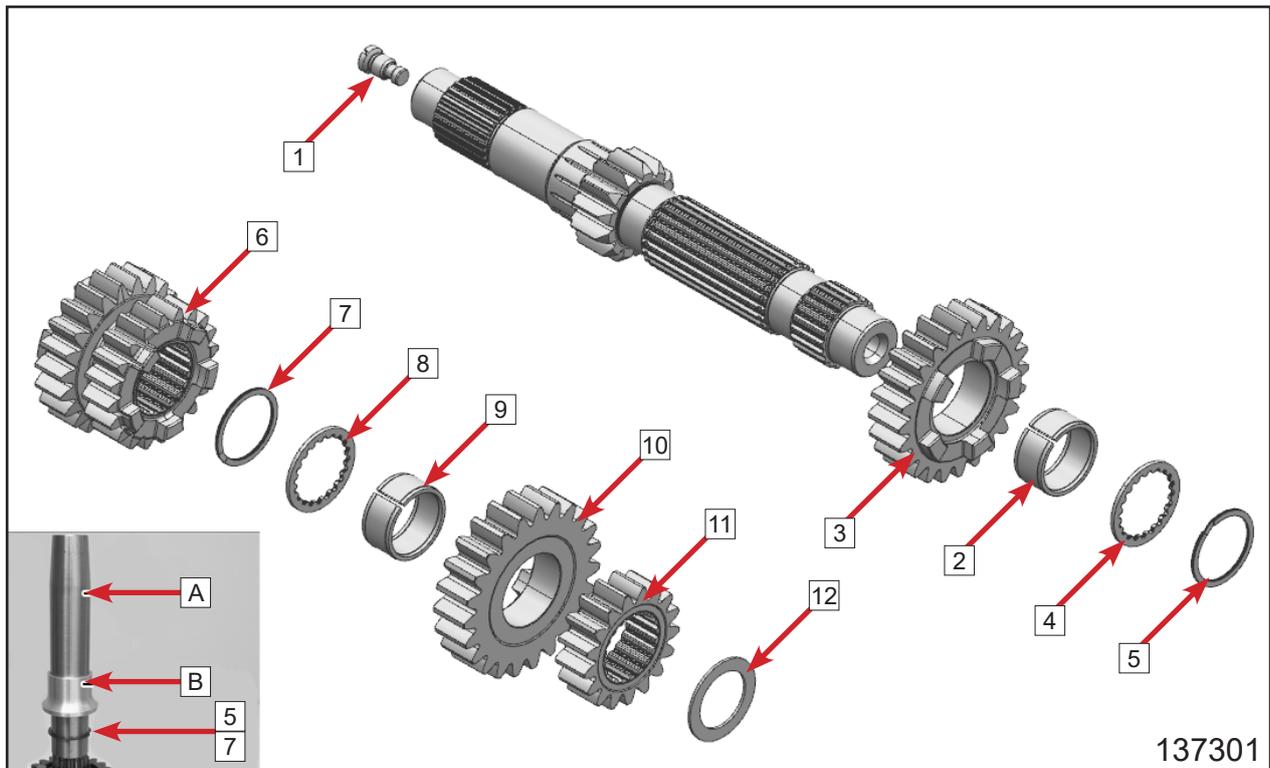
Info

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

43 螺纹胶

Info

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).

Position special tool (Mounting tool for lock ring) on the transmission shaft.

Position new lock ring (5) on special tool (A) and push down with sleeve (B).

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.

Position special tool (Mounting tool for lock ring) on the transmission shaft.

Position new lock ring (7) on special tool (A) and push down with sleeve (B).

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.

13.3.33 Assembling the countershaft

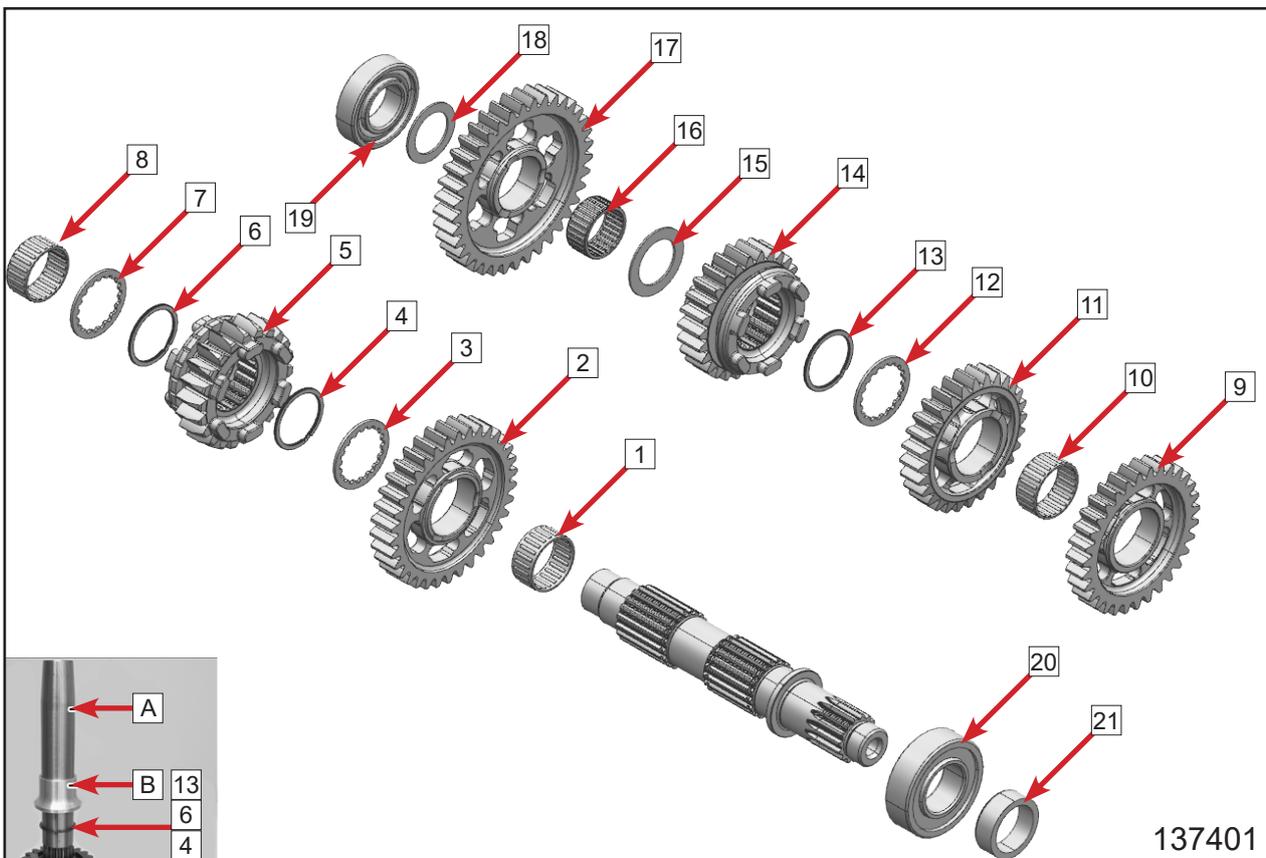
Info

Use new lock rings with every repair.

Preparatory work

Carefully lubricate all parts before assembling.

Check the transmission.



137401

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).

Position special tool (Mounting tool for lock ring) on the transmission shaft.

Position new lock ring (4) on special tool (A) and push down with sleeve (B).

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

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

Position special tool (Mounting tool for lock ring) on the transmission shaft.

Position new lock ring (6) on special tool (A) and push down with sleeve (B).

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

Mount stop disk (7).

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).

Position special tool (Mounting tool for lock ring) on the transmission shaft.

Position new lock ring (13) on special tool (A) and push down with sleeve (B).

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.

13.3.34 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.

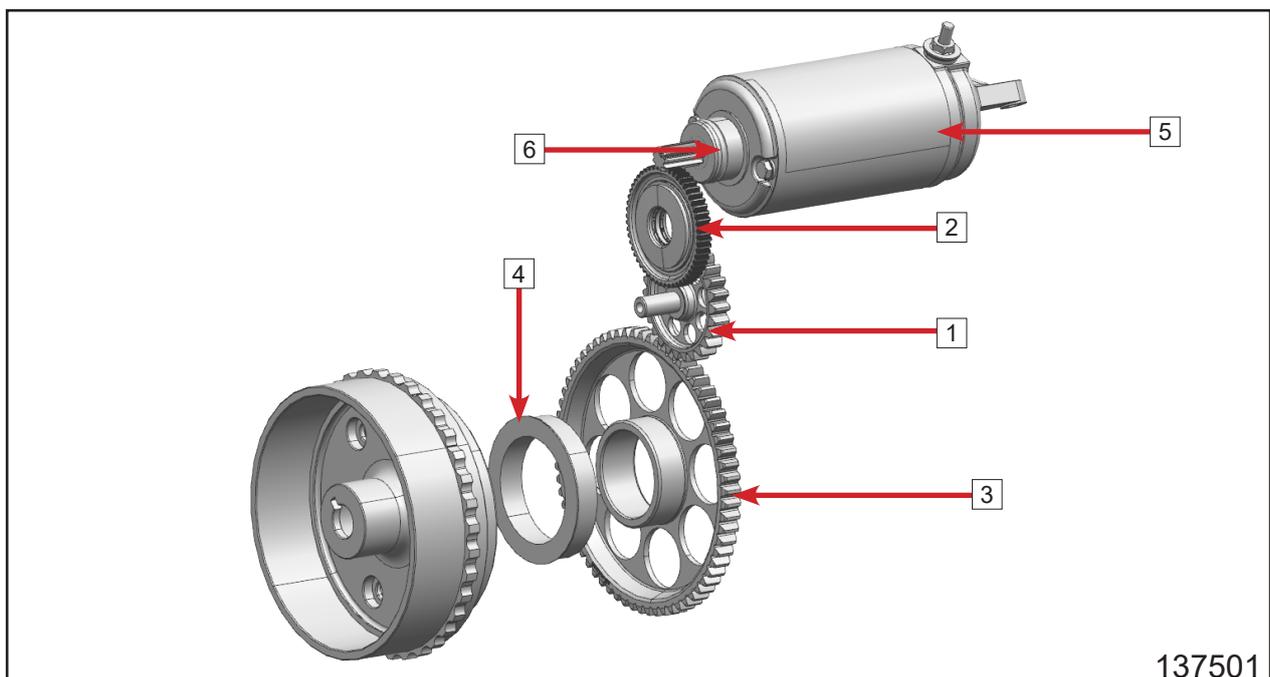
If there is damage or wear: Change starter motor.

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.



137501

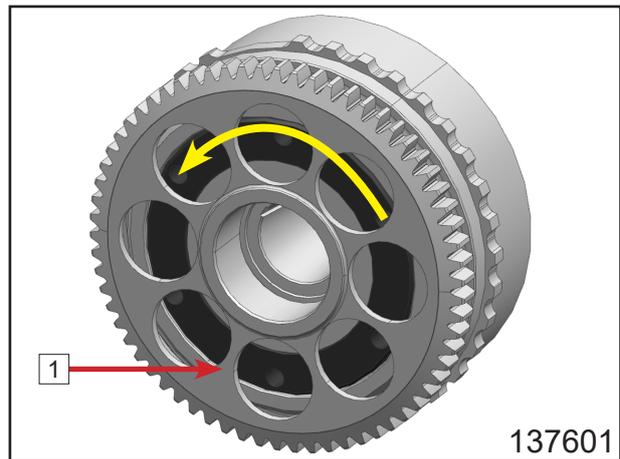
13.3.35 Checking the freewheel

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:

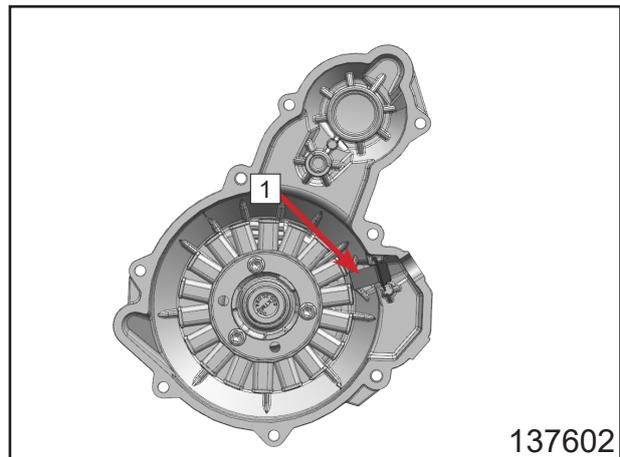
Change the freewheel.



13.3.36 Working on the alternator cover

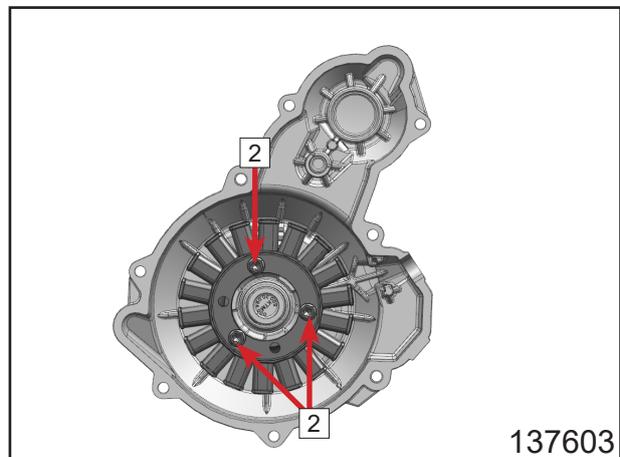
Remove the cable retainer (1).

Pull the rubber grommet out of the engine case.



Remove screws (2).

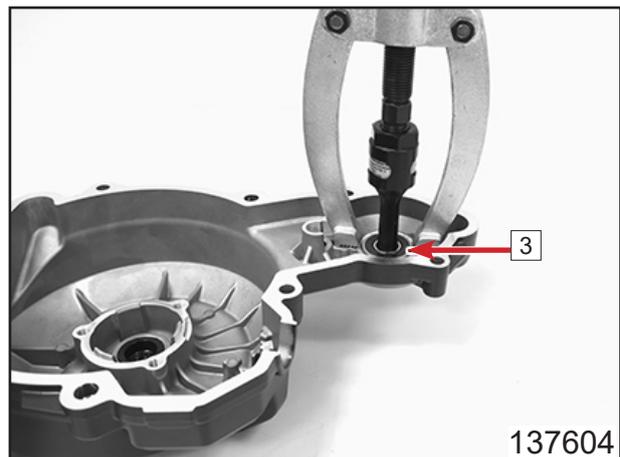
Remove the stator.



Remove bearing (3) using the special tool.

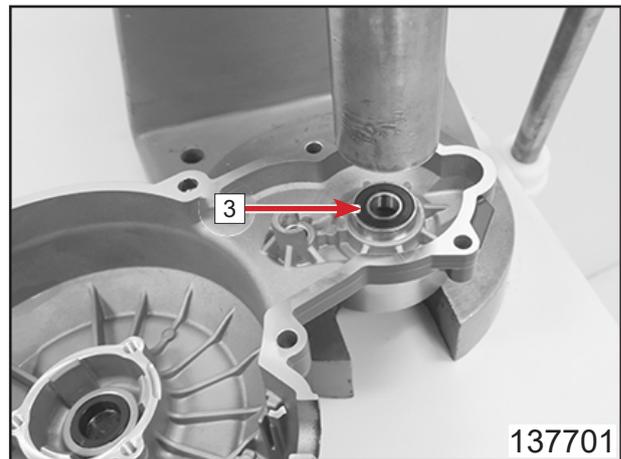
Bearing puller

Internal bearing puller



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

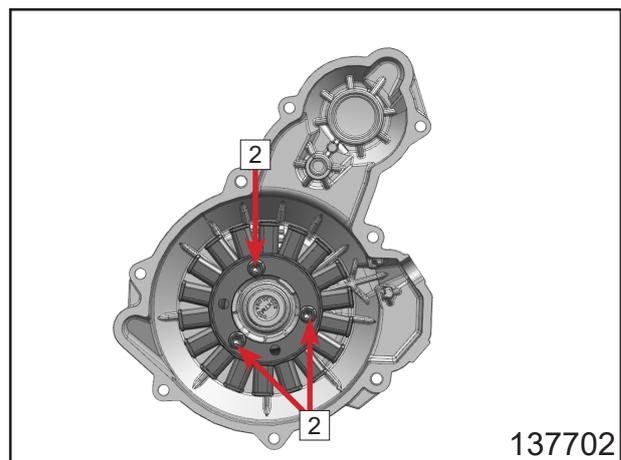
Info
Provide suitable support for the alternator cover while pressing in.



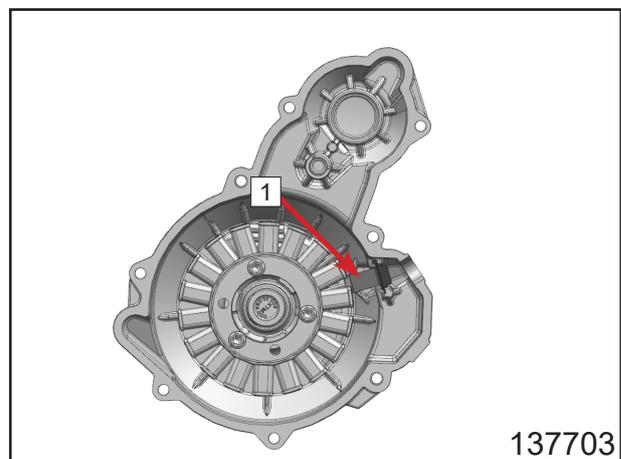
Position the stator.
Mount and tighten screws (2).

Guideline

Screw, stator
M6
10 N•m
243 螺纹胶



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).



13.4 Engine assembly

13.4.1 Installing the piston

Info

The operations are the same for both pistons.

Clamp connecting rod in the vise.

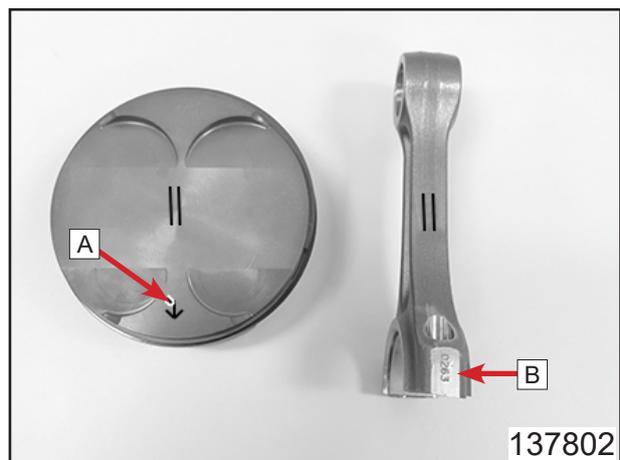
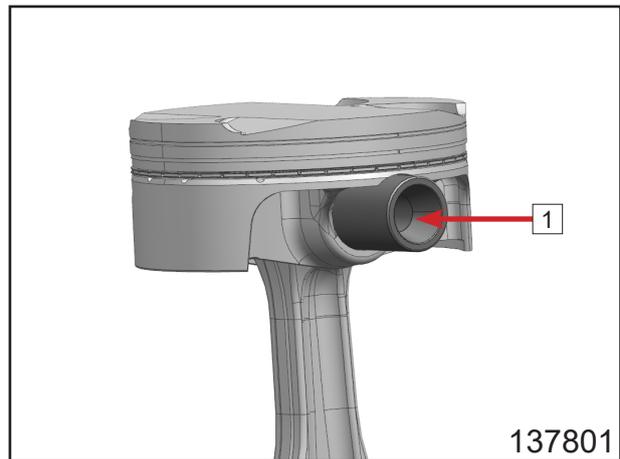
Guideline

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.



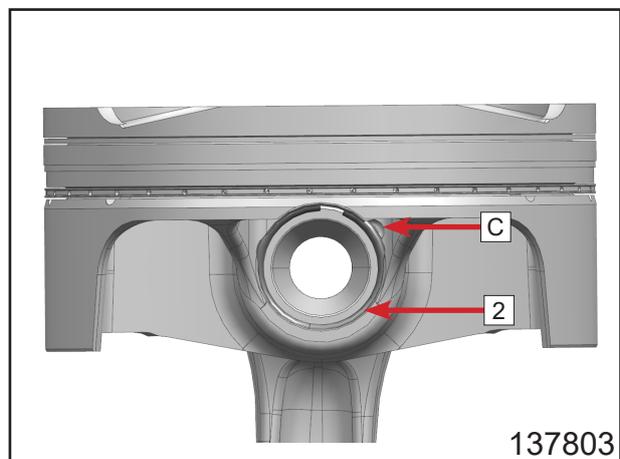
Position the new piston ring lock (2).

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

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

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.

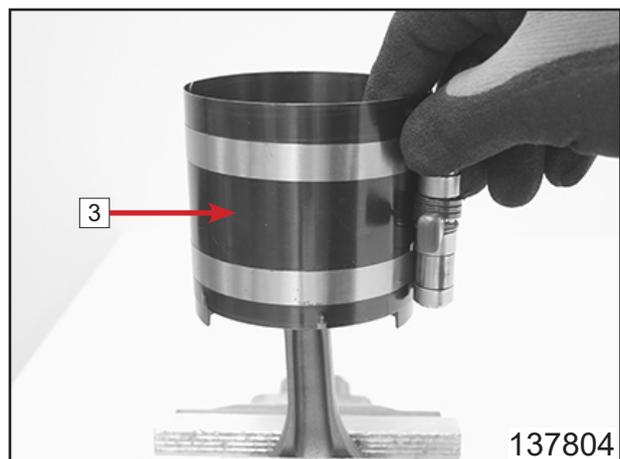


Oil the cylinder and piston.

Shift the gap of the piston rings by 120°.

Mount special tool (Piston ring compressor) on the piston.

Clamp the piston rings together using the special tool.



Position the piston with the special tool on the cylinder.

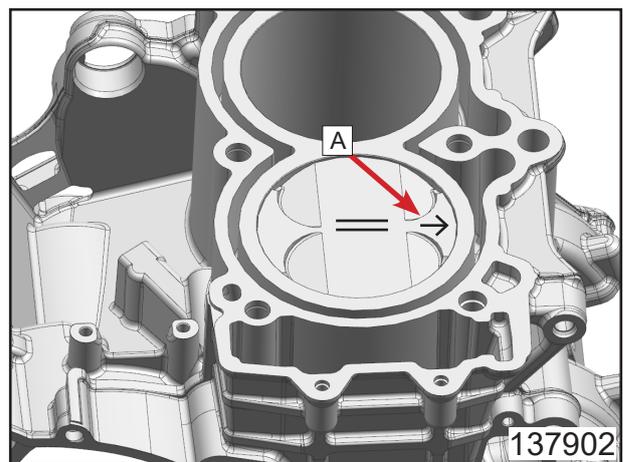
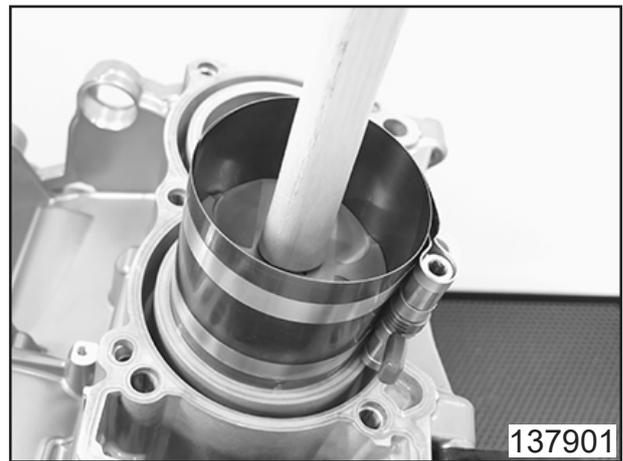
Tap lightly on the piston ring compressor from the top with a plastic hammer so that it lies flush with the cylinder.

Info
The special 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.

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

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

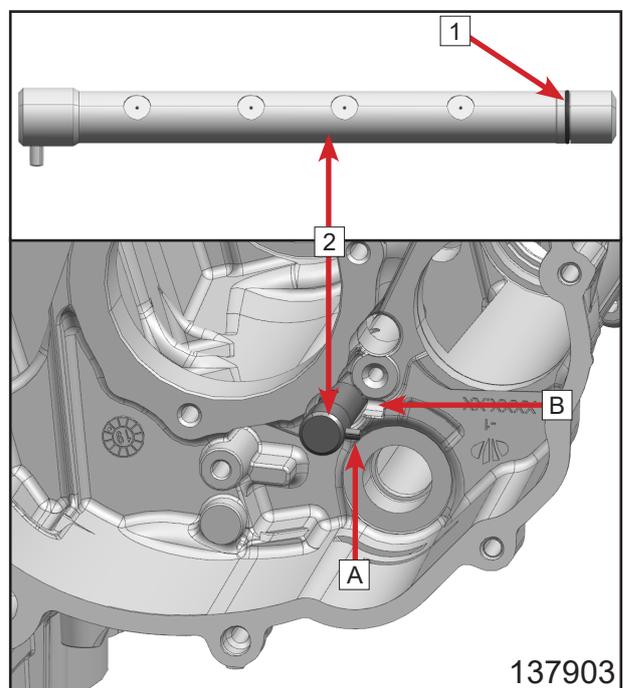


13.4.2 Installing the oil spray tube

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).



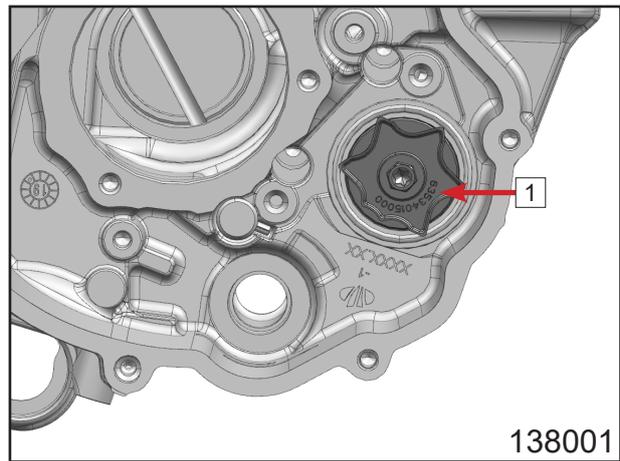
13.4.3 Installing the transmission shafts

Preparatory work

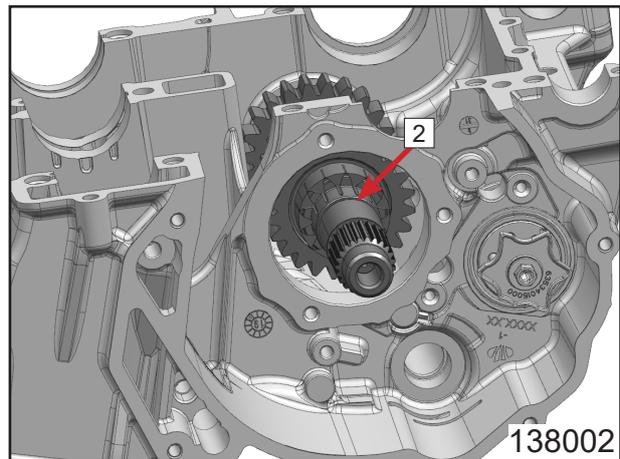
Oil all bearings.

Main work

Mount shift drum (1).

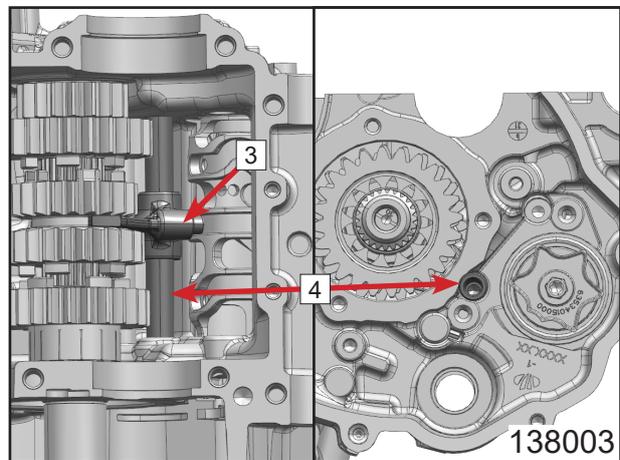


Mount main shaft (2).



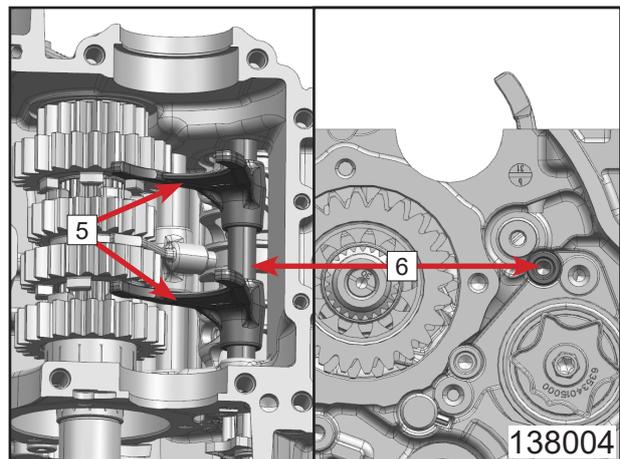
Position shift fork (3).

Mount shift rail (4).



Position shift forks (5).

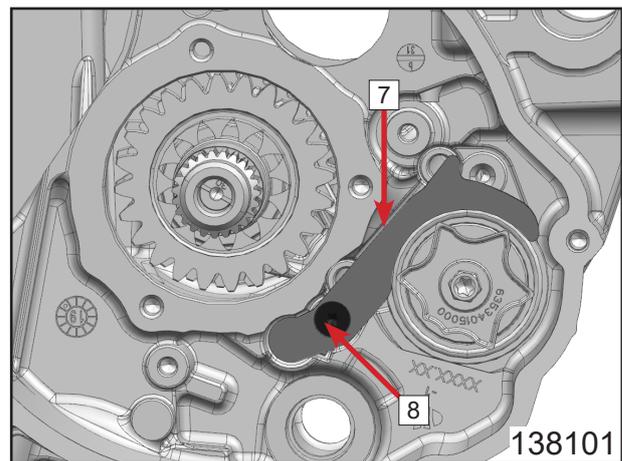
Mount shift rail (6).



Position retaining bracket (7).
Mount and tighten screw (8).

Guideline

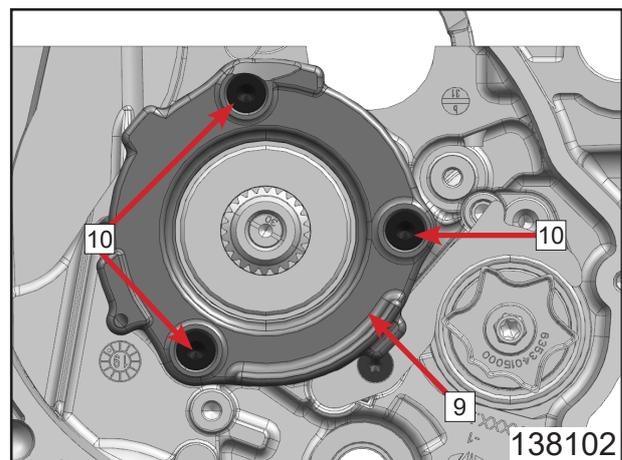
Screw, shift drum retaining bracket
M5
6 N•m
243 螺纹胶



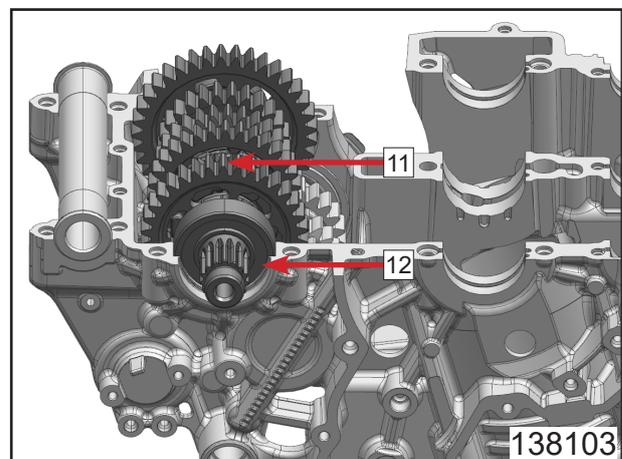
Position bearing support (9) with bearing.
Mount and tighten screws (10).

Guideline

Screw, main shaft bearing support
M6
10 N•m
243 螺纹胶



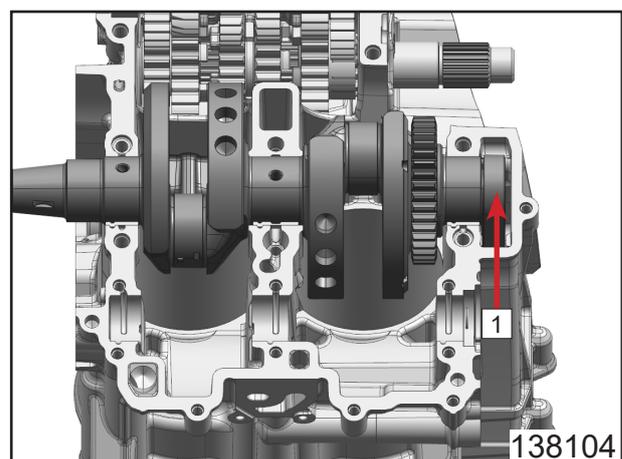
Position countershaft (11)
Mount radial shaft seal ring (12).



13.4.4 Installing the lower engine case

Oil the bearing shells.

Position crankshaft with timing chain (1).



CFMOTO

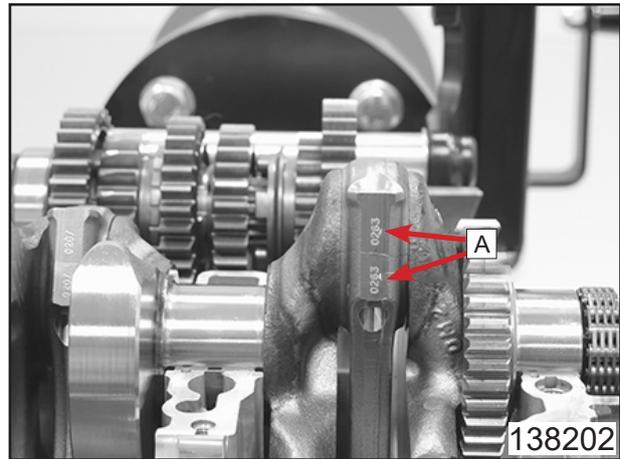
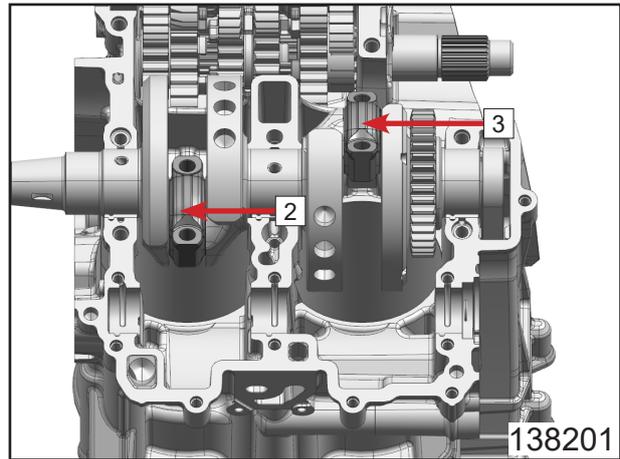
Oil the bearing shells.

There is no oil or grease on the connecting rod joint face.

Position conrod bearing covers (2) and (3) on the associated connecting rod.

Info

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

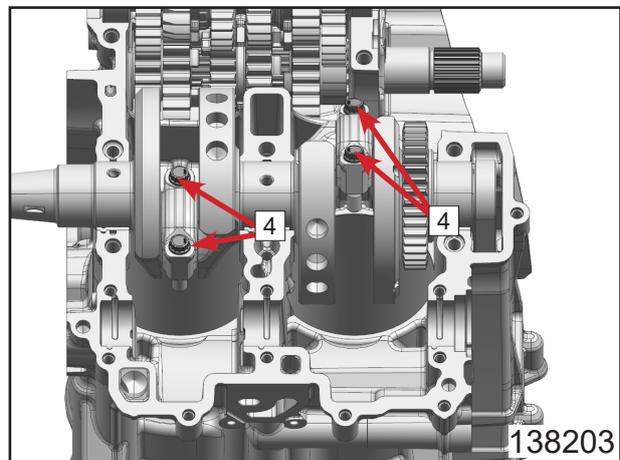
90°

Collar and thread oiled

Special tool:

Multi-tooth wrench socket

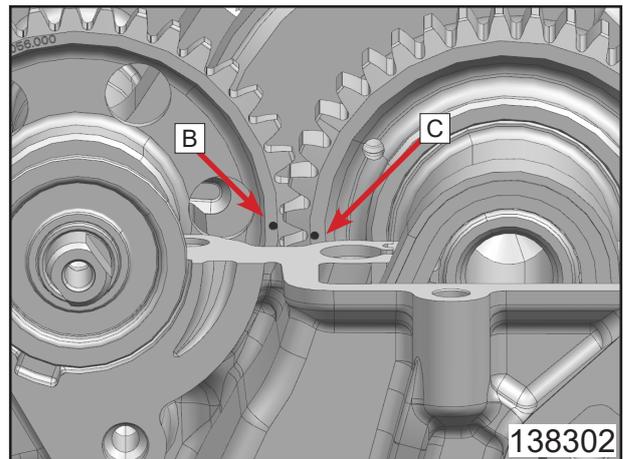
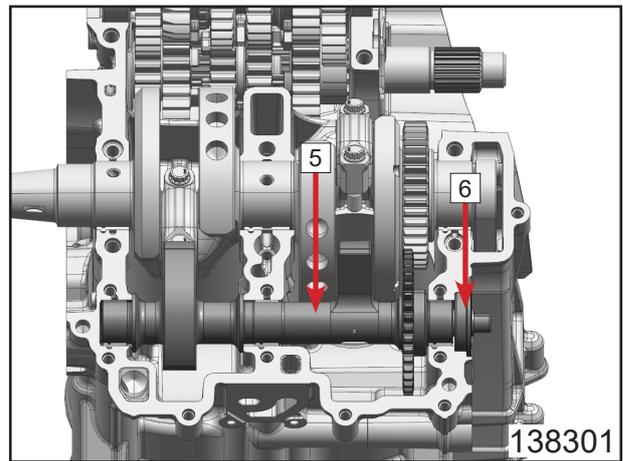
Angle disc



Oil the bearing shells.
Position balancer shaft (5) with new greased radial shaft seal ring (6).

Long-life grease

Align markings (B) and (C).

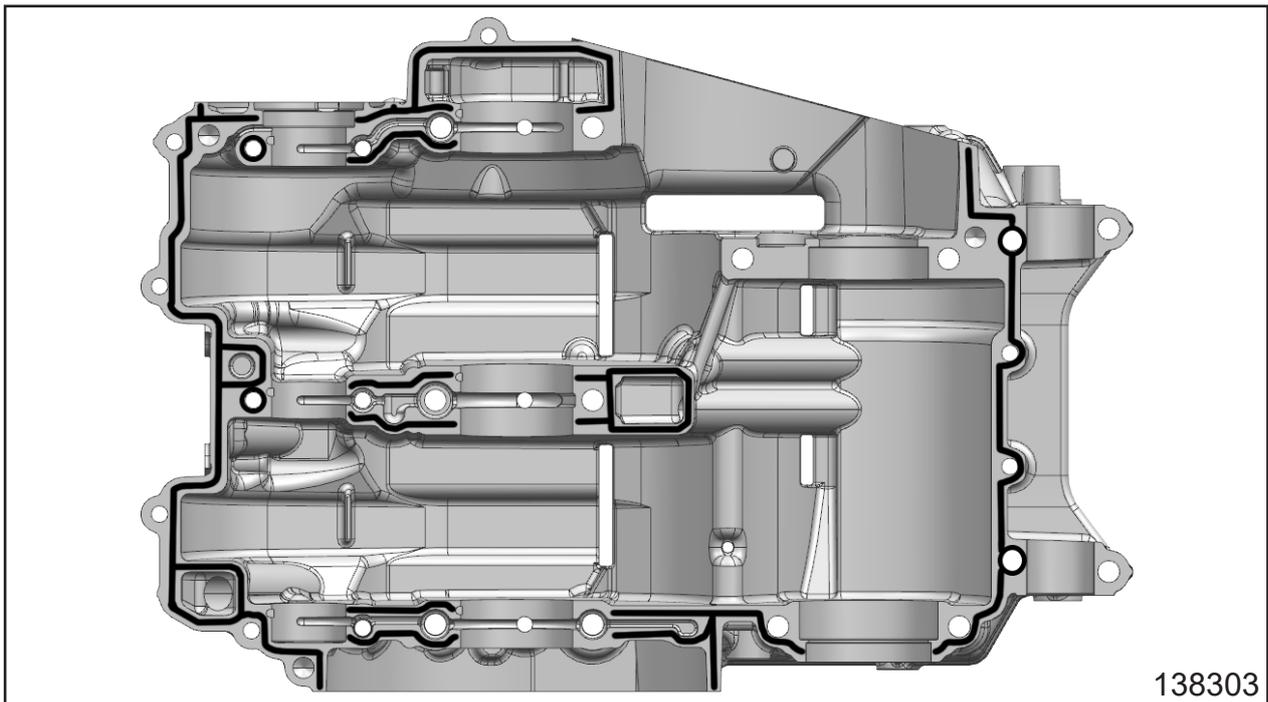


Degrease the sealing surface. Apply sealing compound to the lower section of the engine case.

Loctite® 5910

Info

Ensure that the dowels are seated properly.



CFMOTO

Mount lower engine case. If necessary, strike lightly again with a rubber mallet.

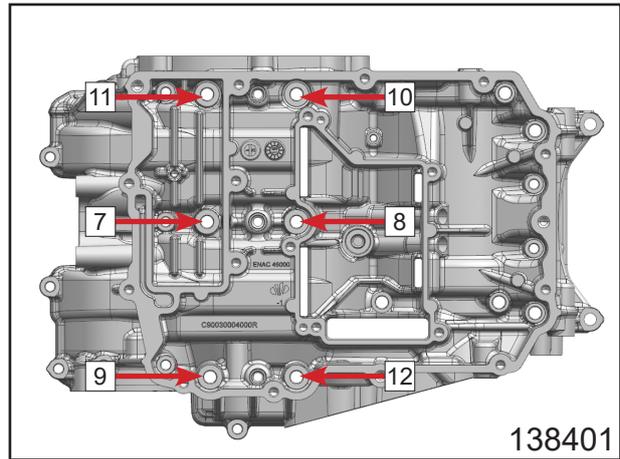
Info

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

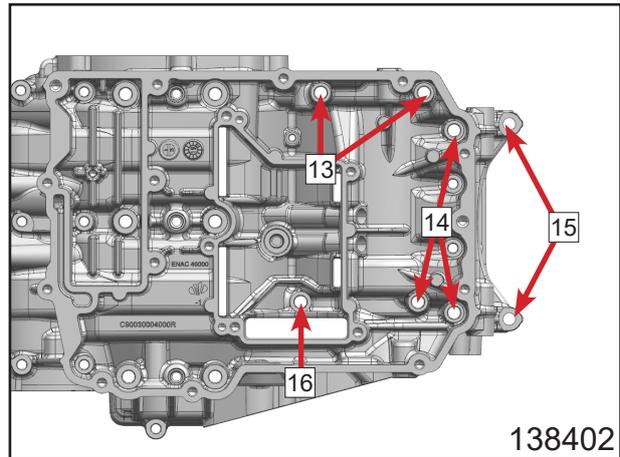


138401

Mount and tighten screws (13).

Guideline

Screw, engine case
M8x90
25 N•m
Screw support greased



138402

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

Mount and tighten screws (17).

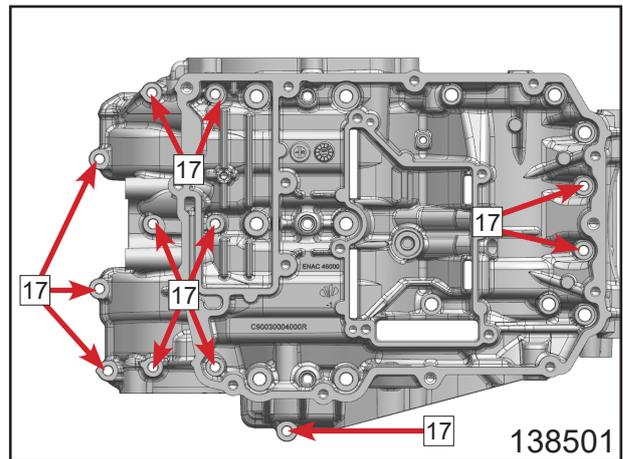
Guideline

Screw, engine case
M6×60
12 N•m

Mount and tighten screws (18).

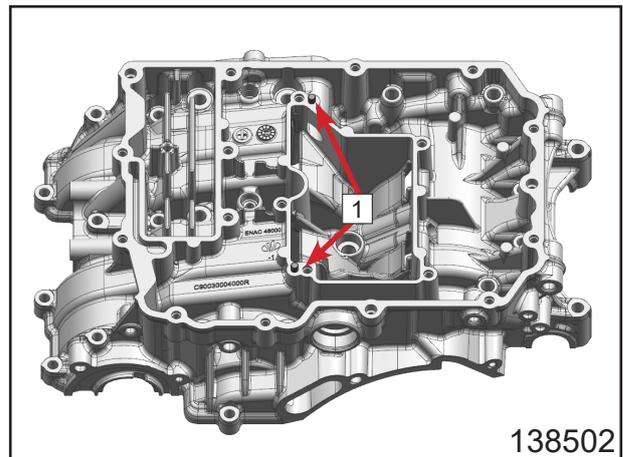
Guideline

Screw, engine case
M6×30
12 N•m



13.4.5 Installing the oil pump unit

Mount locating pins (1).



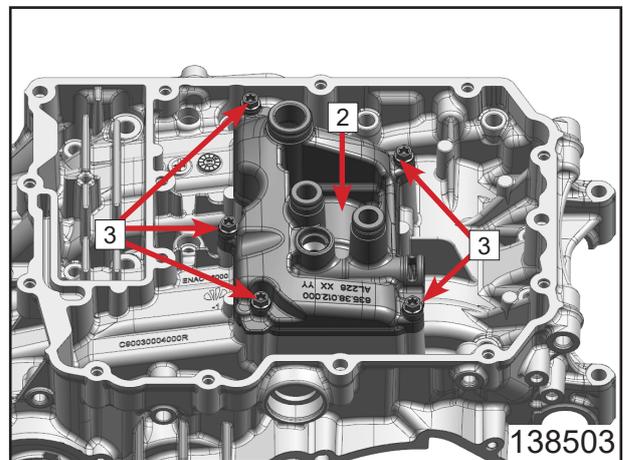
Grease O-rings of the oil pump.

Position oil pump unit (2).

Mount and tighten screws (3).

Guideline

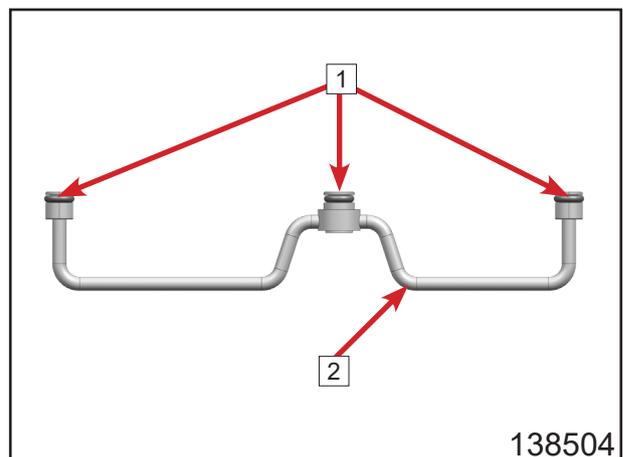
Screw, oil pump unit
M6
10 N•m



13.4.6 Installing the oil pan

Grease the new O-rings (1) and mount on the oil line (2).

Mount oil line (2).

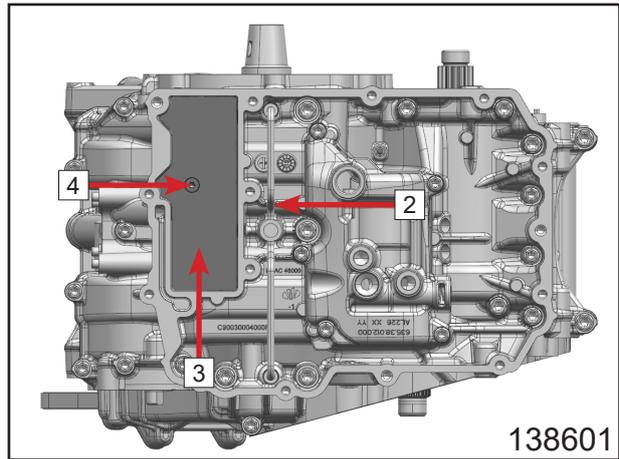


CFMOTO

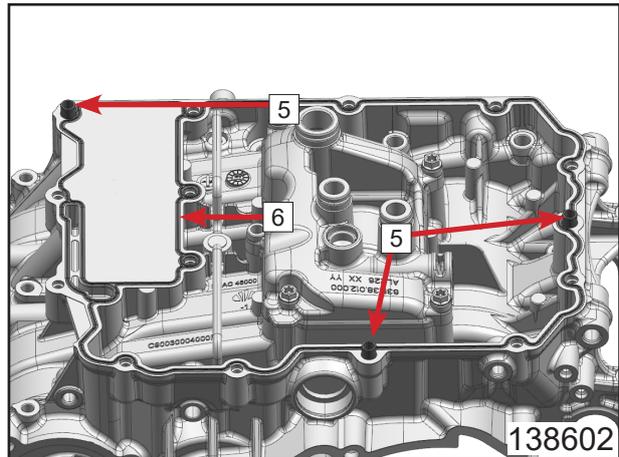
Position pressure plate (3).
Mount and tighten screw (4).

Guideline

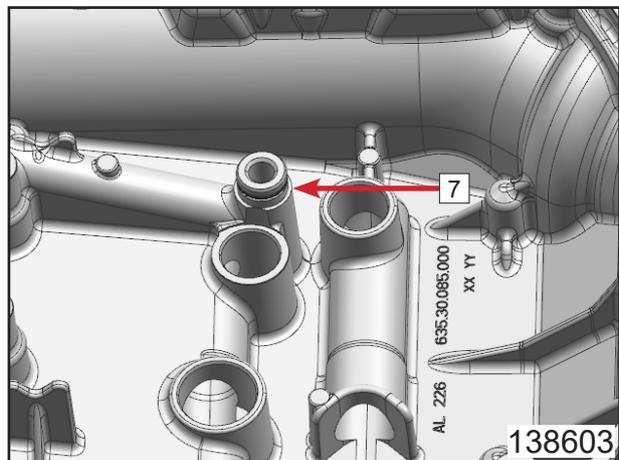
Screw, pressure plate
M5
3 N•m
243 螺纹胶



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.

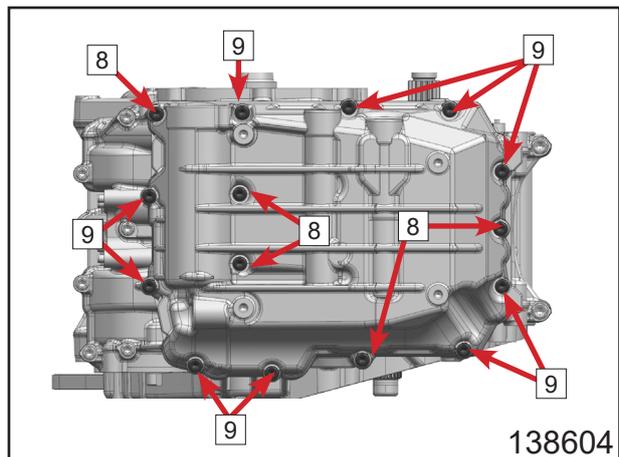
Guideline

Screw, oil pan
M6×35
10 N•m

Mount screws (9) and tighten all screws in a crisscross pattern.

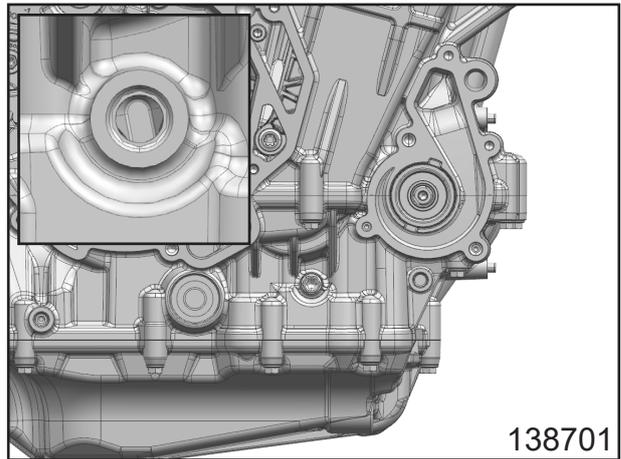
Guideline

Screw, oil pan
M6×30
10 N•m

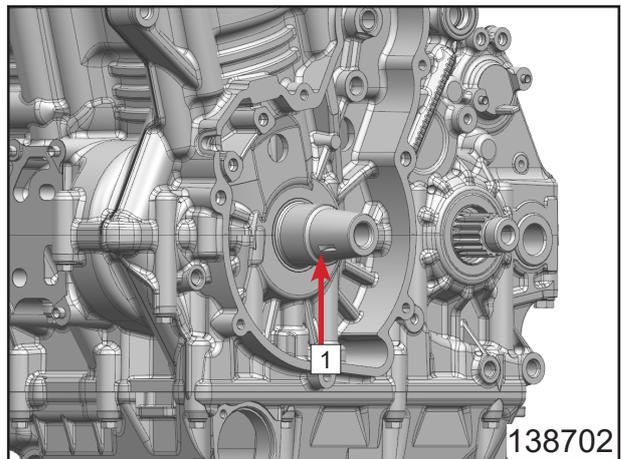


13.4.7 Installing the rotor

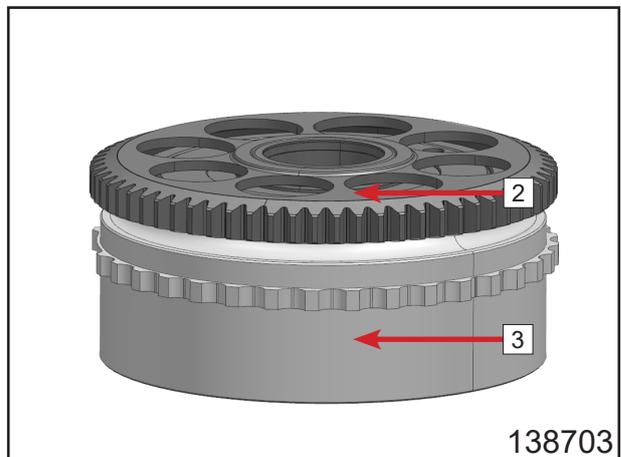
Position crankshaft to cylinder 1 TDC and lock with special tool (Locking screw).



Mount woodruff key (1).



Turn the freewheel gear (2) counterclockwise and mount in the rotor (3).



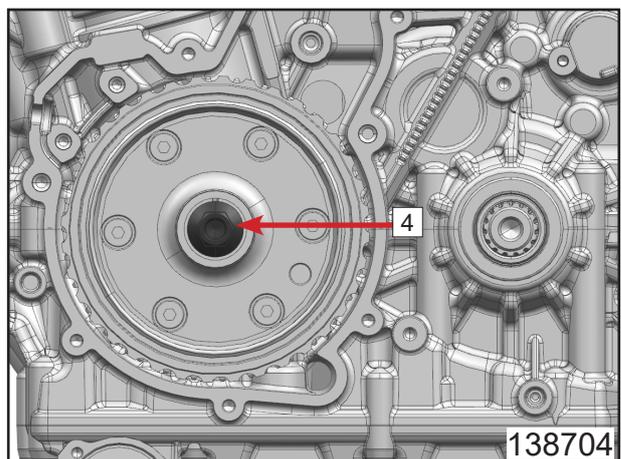
Mount the rotor with the freewheel gear.

Info
Ensure that the woodruff key is seated properly.

Mount and tighten screw (4).

Guideline

Screw, rotor
M12x1.5
90 N•m
Thread greased



CFMOTO

13.4.8 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 螺纹胶

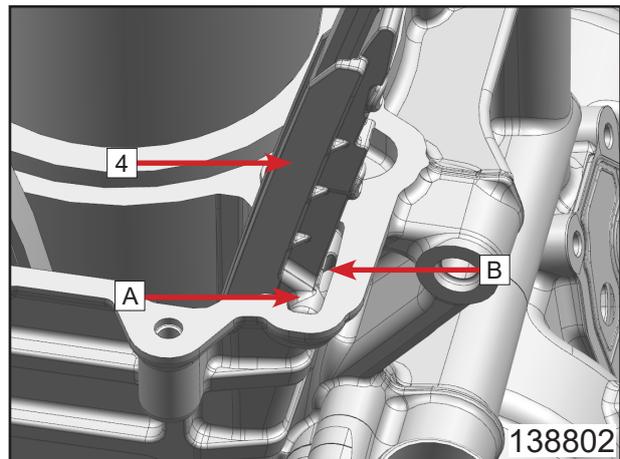
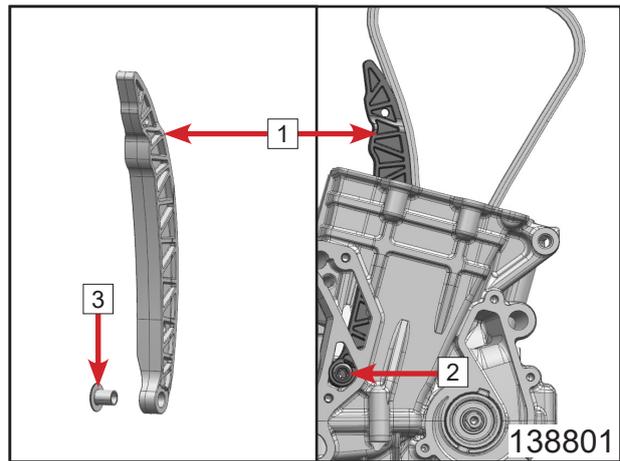
Info

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).

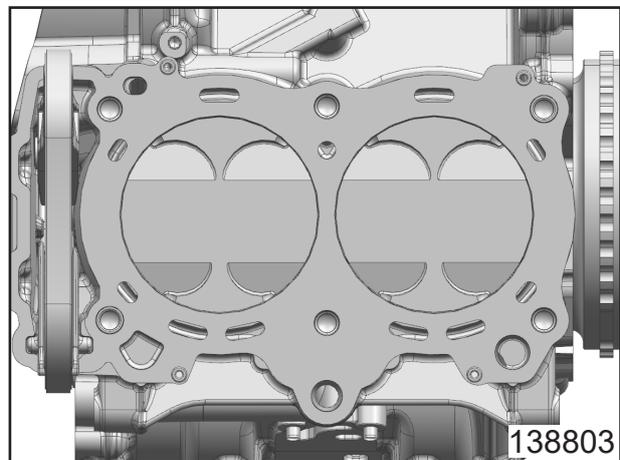


13.4.9 Installing the cylinder head

Put the new cylinder head gasket in place.

Info

Ensure that the dowels are seated properly.



Position the cylinder head.

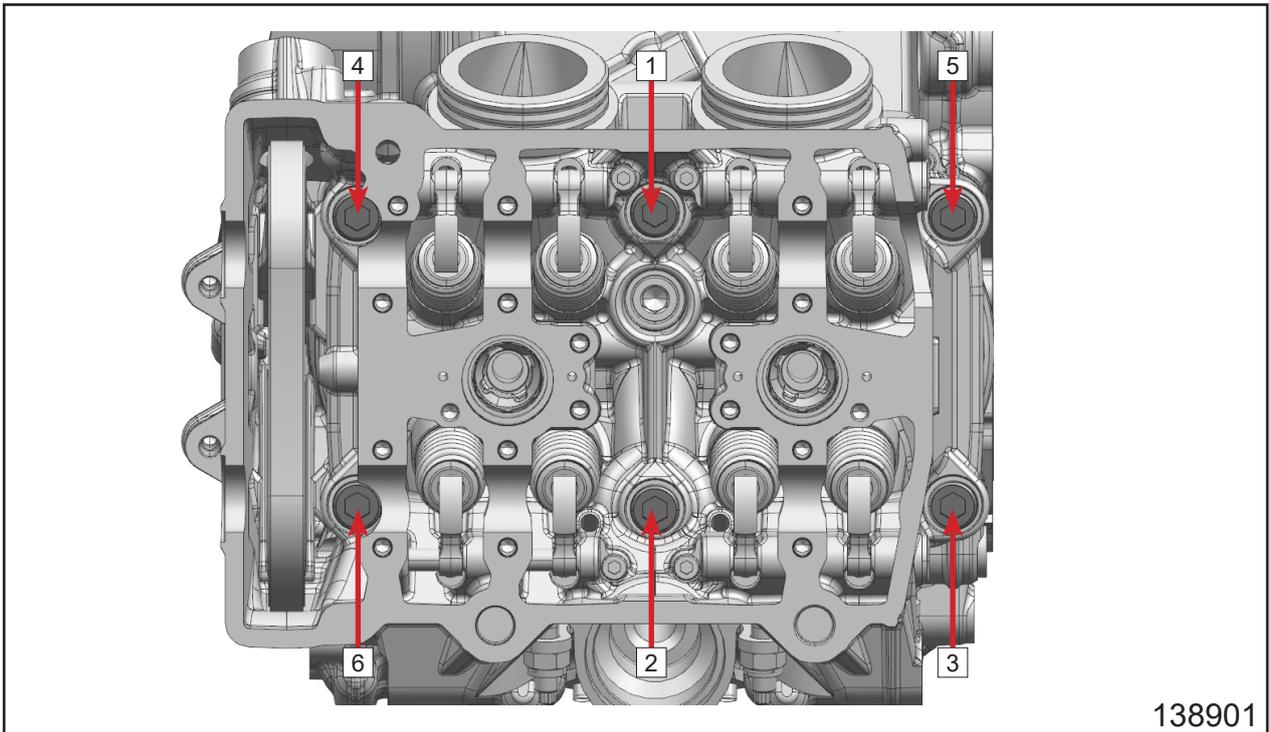
Mount cylinder head screws with washers and tighten step by step in the order from (1) to (6).

Guideline

Screw, cylinder head	M10x1.25	<p>Tightening sequence: Observe tightening sequence.</p> <p>1st stage 5 N•m</p> <p>2nd stage 15 N•m</p> <p>3rd stage 90°</p> <p>4th stage 90°</p> <p>Collar greased / thread oiled</p>
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Info

Always use new cylinder head screws.



CFMOTO

Mount and tighten screws (7).

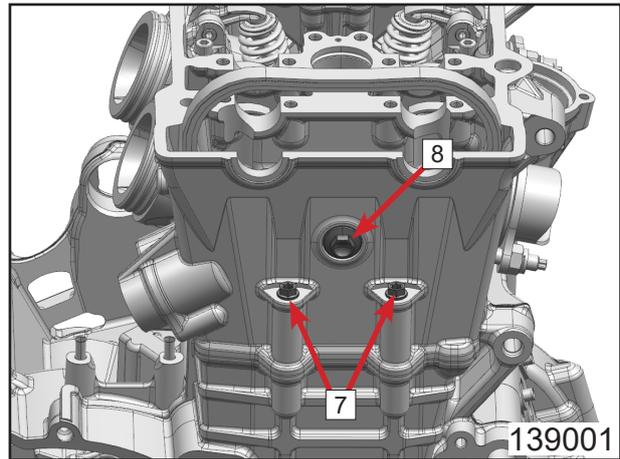
Guideline

Screw, cylinder head
M6
10 N•m

Mount and tighten screw (8) with gasket.

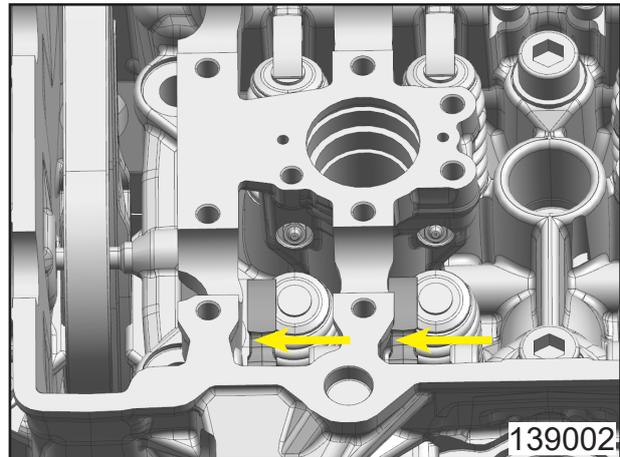
Guideline

Screw, timing chain shaft
M6
10 N•m



13.4.10 Installing the camshafts

Push exhaust cam lever (1) on cylinder 2 to the side.

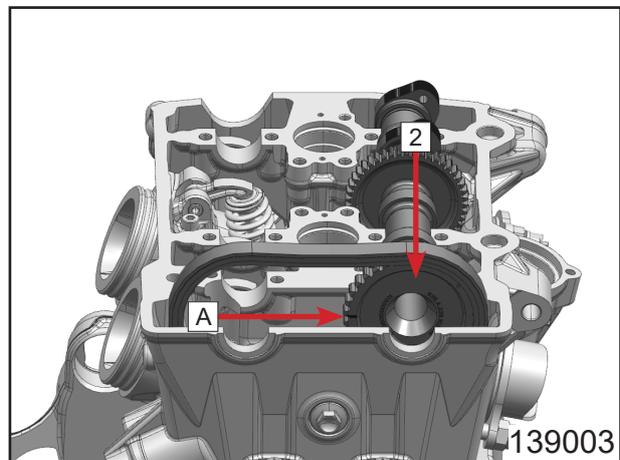


Pull up the timing chain and position the exhaust camshaft (2).

Info
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.

Info
The OT1 markings are line markings.

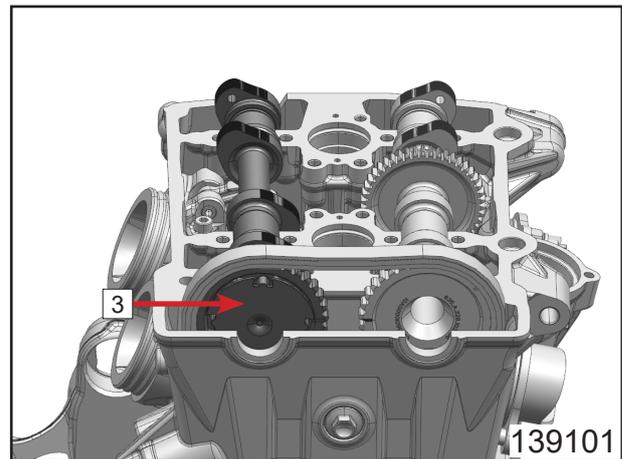


Slip in intake camshaft (3).

Info

The centrifuge of the engine vent is located on the intake camshaft.

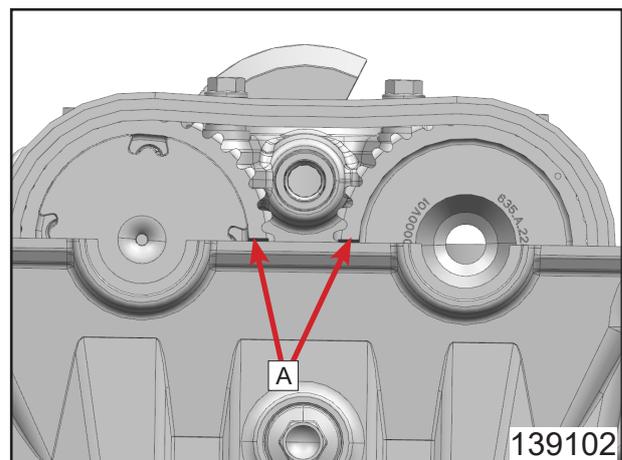
Keep the timing chain taut.



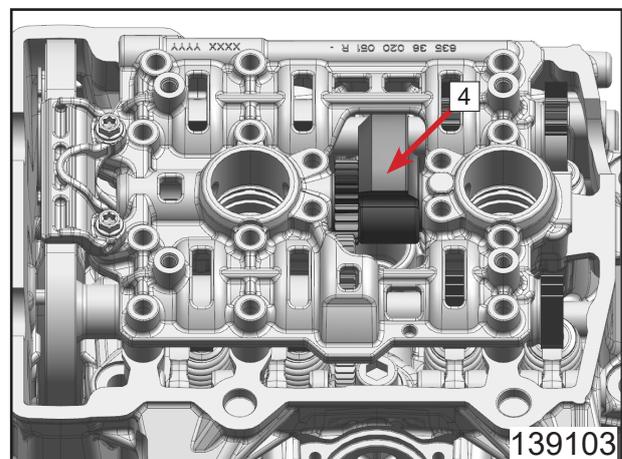
The OT1 markings (A) are aligned with the sealing surface.

Info

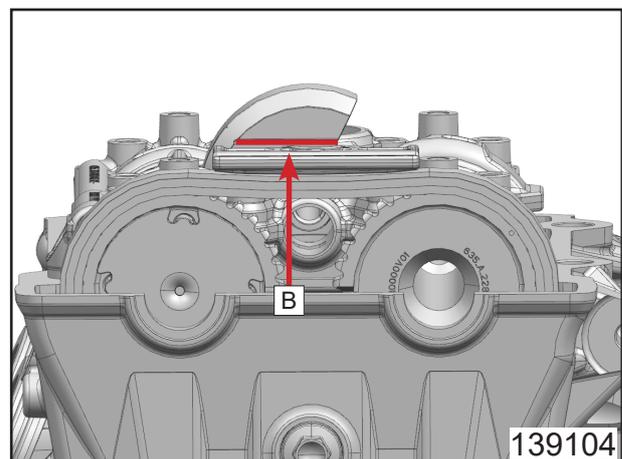
The OT1 markings are line markings.



Mount camshaft bearing bridge with balancer shaft (4).



The marking (B) of the balancer shaft is aligned parallel to the sealing surface.



CFMOTO

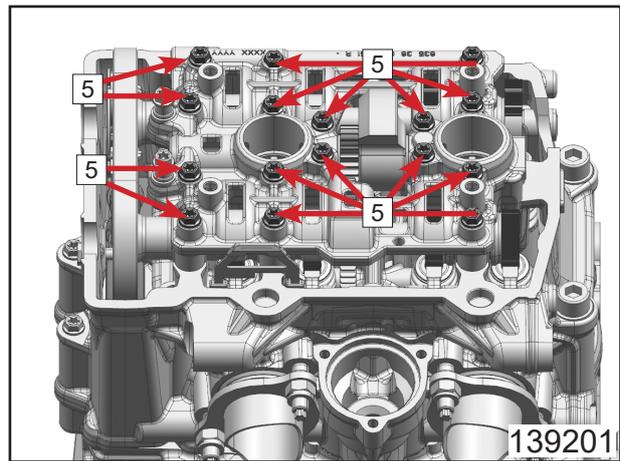
Mount screws (5) and tighten them from the inside to the outside.

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.

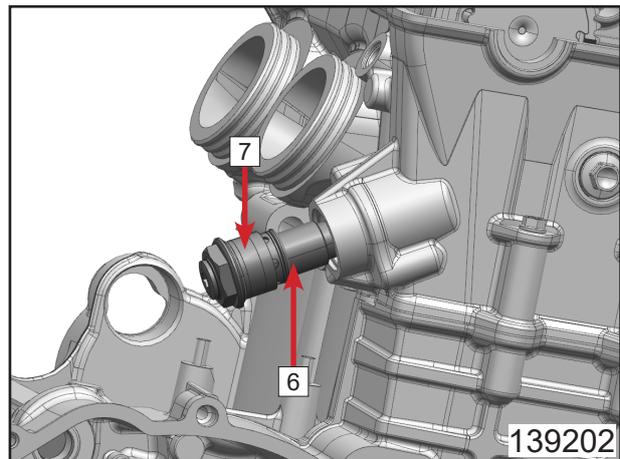
Mount and tighten screw plug (7) with new O-ring.

Guideline

Plug, timing chain tensioner

M24×1.5

25 N•m



Remove screw (8) with the O-ring and use a special tool (Release device for timing chain tensioner) to push the timing chain tensioner toward the timing chain.

The timing chain tensioner unlocks.

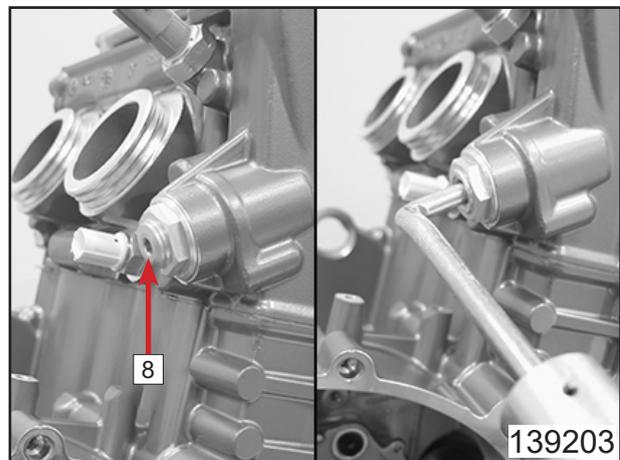
Mount and tighten screw (8) with the O-ring.

Guideline

Screw, unlocking of timing chain tensioner
--

M10×1

10 N•m

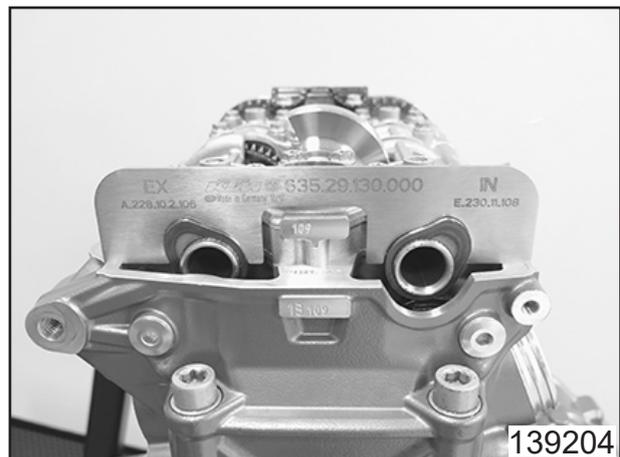


Remove the special tool (Locking screw).

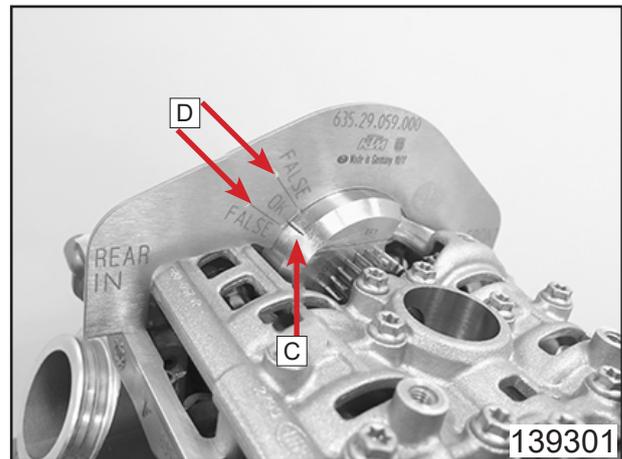
Crank the engine several times.

Turn the crankshaft counterclockwise to ignition top dead center of cylinder 1 and lock it using special tool. (Locking screw)

Check position of the camshafts with special tool (Setting gauge).



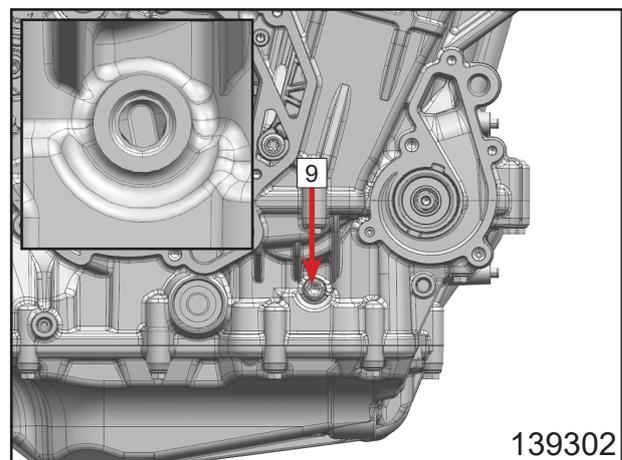
Check position of the balancer shaft with special tool (Setting gauge).
The marking (C) of the balancer shaft is located in the (D) area of the adjusting gauge.



Remove special tool (Locking screw).
Mount and tighten screw (9) with the washer.

Guideline

Screw plug, locking screw
M8
15 N•m



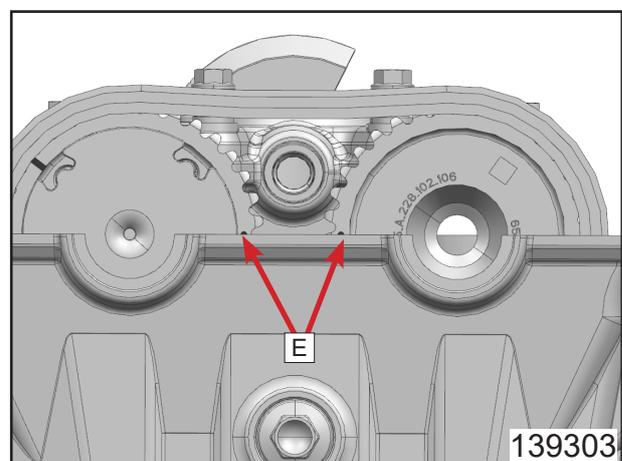
Turn the crankshaft counterclockwise by the specified value and set it to ignition top dead center of cylinder 2.

Guideline

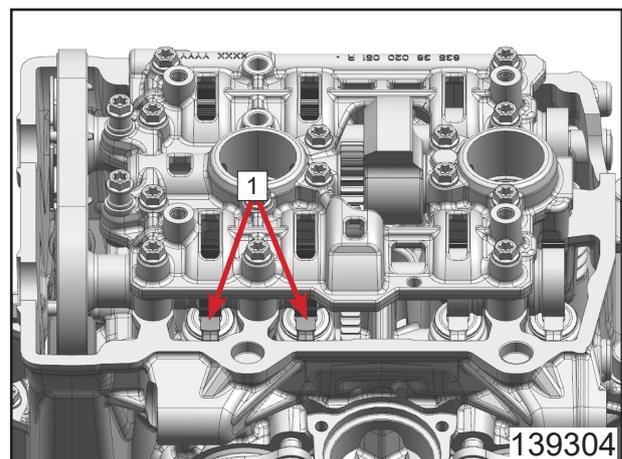
435°

The OT2 markings (E) are aligned with the sealing surface.

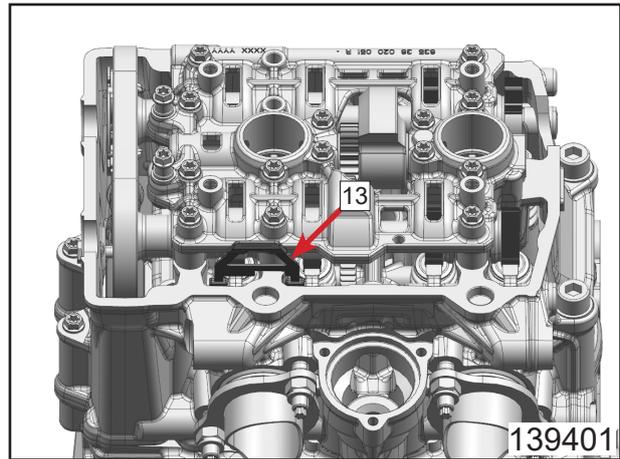
Info
The OT2 markings are dot markings.



Position exhaust cam lever (1) on cylinder 2.



Mount cam lever clip (13).



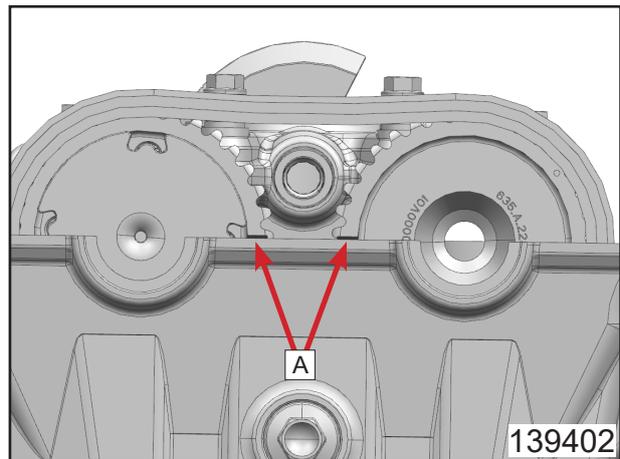
13.4.11 Checking the valve clearance

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.

Info
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 the special tool (1).

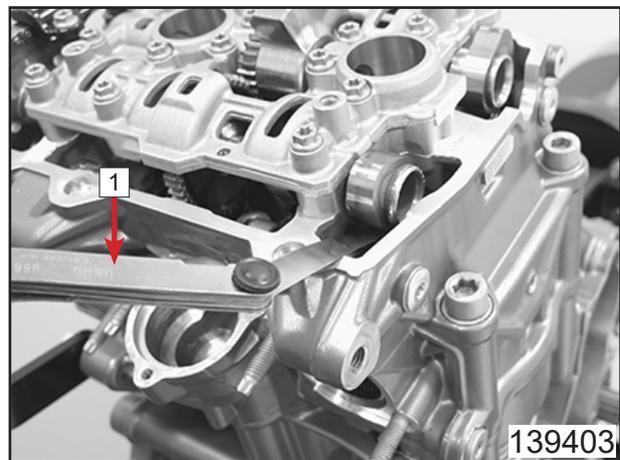
Guideline

Valve play, cold
Intake at: 20 °C 0.10mm~0.15 mm
Exhaust at: 20 °C 0.15mm~0.20 mm

Special tool: Feeler gauge

If the valve clearance does not meet specifications:

Adjust the valve clearance.



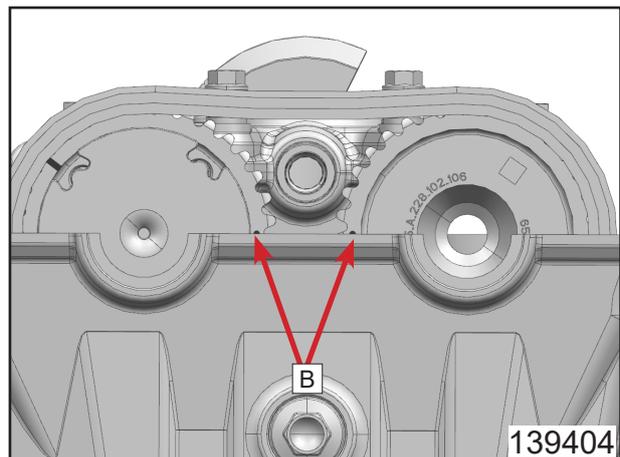
Turn the crankshaft counterclockwise by the specified value and set it to ignition top dead center of cylinder 2.

Guideline

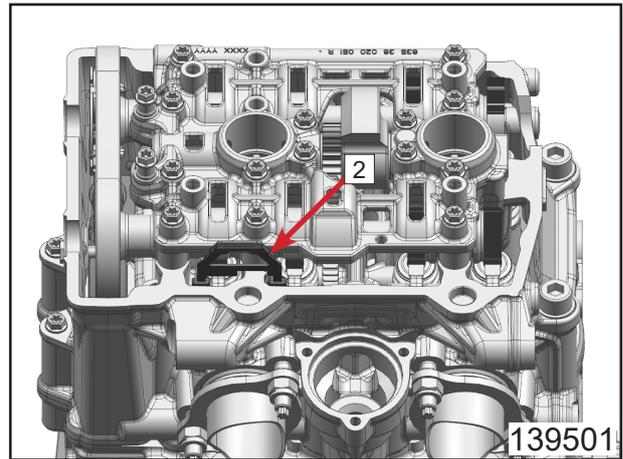
435°

The OT2 markings (B) are aligned with the sealing surface.

Info
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 the special tool (1).

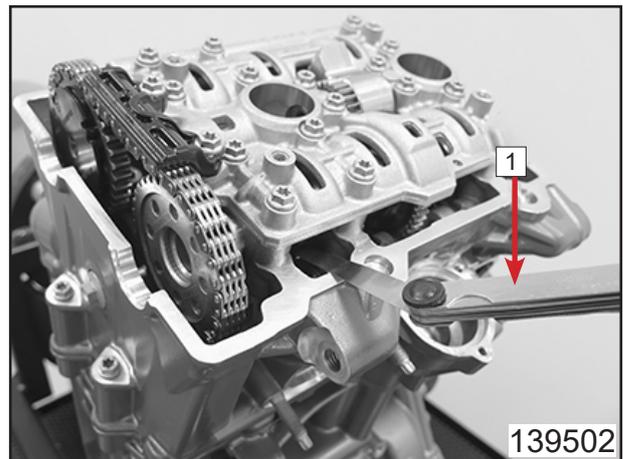
Guideline

Valve play, cold
Intake at: 20 °C 0.10mm~0.15 mm
Exhaust at: 20 °C 0.15mm~ 0.20 mm

Special tool: Feeler gauge

If the valve clearance does not meet specifications:

Adjust the valve clearance.



13.4.12 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.

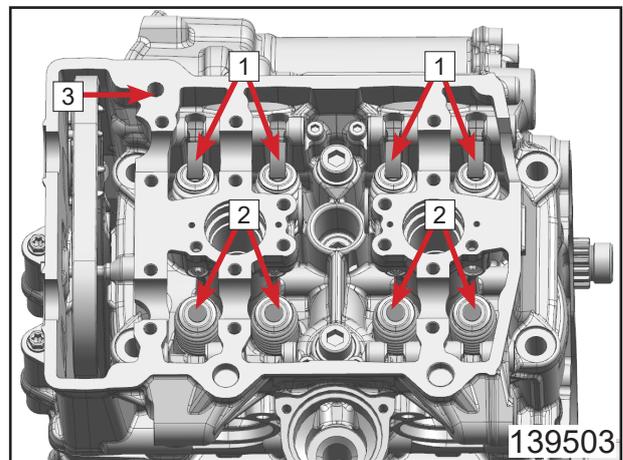
Correct the shims based on the results of the valve clearance check.

Insert suitable shims.

Clean oil screen (3).

Install the camshafts.

Check the valve clearance.

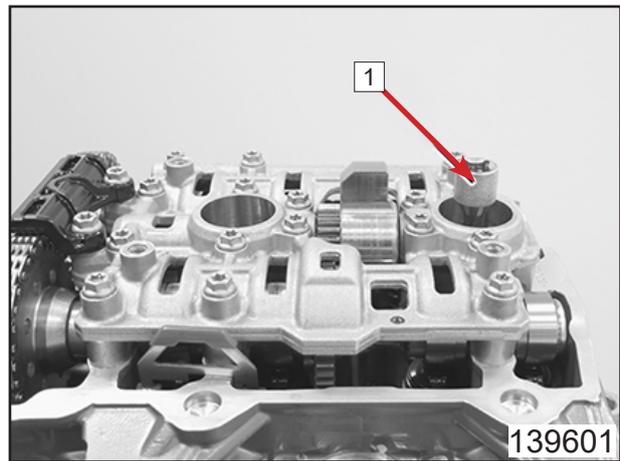


13.4.13 Installing the spark plugs

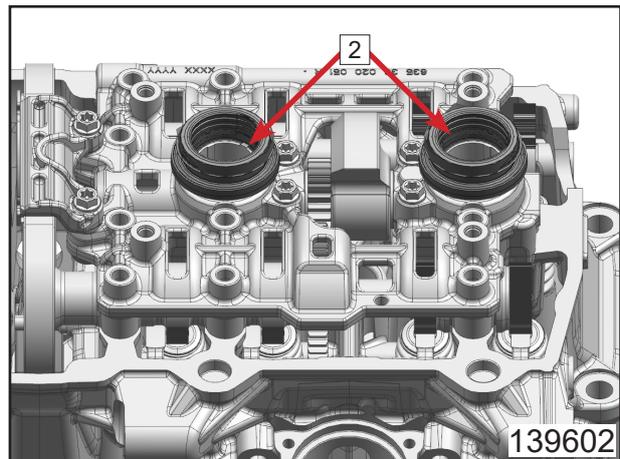
Mount and tighten the spark plugs using a special tool (Spark plug wrench with link).

Guideline

Spark plug
M10
11 N•m



Grease the O-rings and mount spark plug shaft inserts (2) with gasket.



13.4.14 Installing the shift shaft

Slide shift shaft (1) with the washer into the bearing seat.

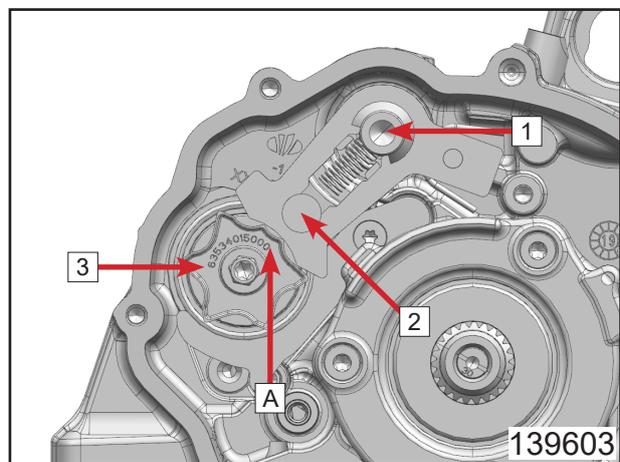
Push sliding plate (2) away from shift drum locating unit (3). Insert the shift shaft all the way.

Info

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.

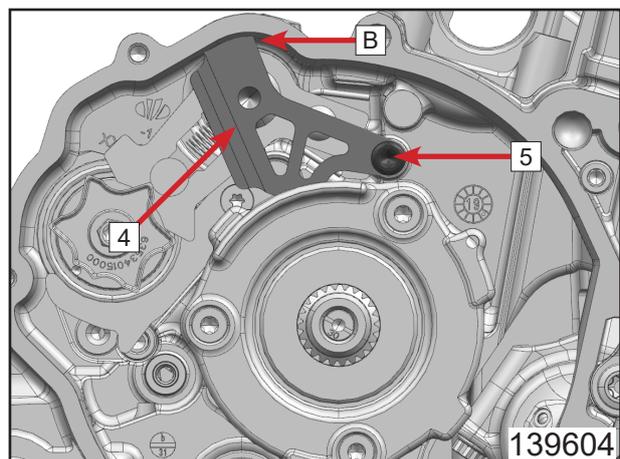


Position retaining bracket (4) in the groove (B).

Mount and tighten screw (5).

Guideline

Screw, shift shaft retaining bracket
M6
10 N•m
243 螺纹胶

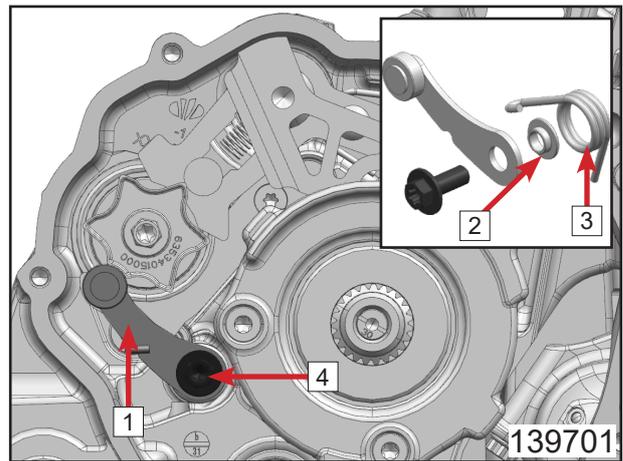


13.4.15 Installing the locking lever

Position locking lever (1) with sleeve (2) and spring (3).
Mount and tighten screw (4).

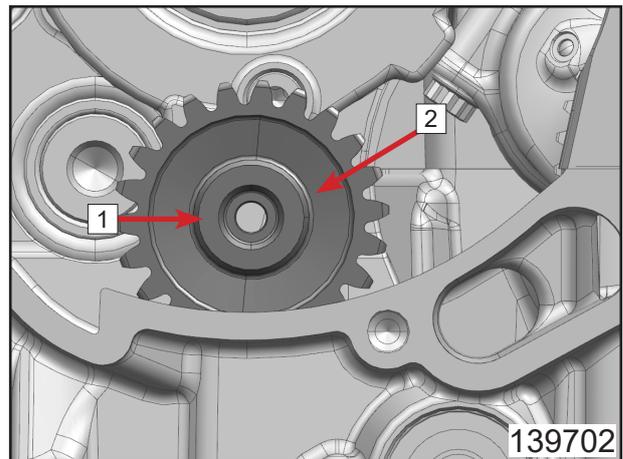
Guideline

Screw, locking lever
M6
10 N•m
243 螺纹胶



13.4.16 Installing the clutch basket

Oil collar bushing (1) thoroughly.
Position collar bushing (1) with oil pump idler gear (2).



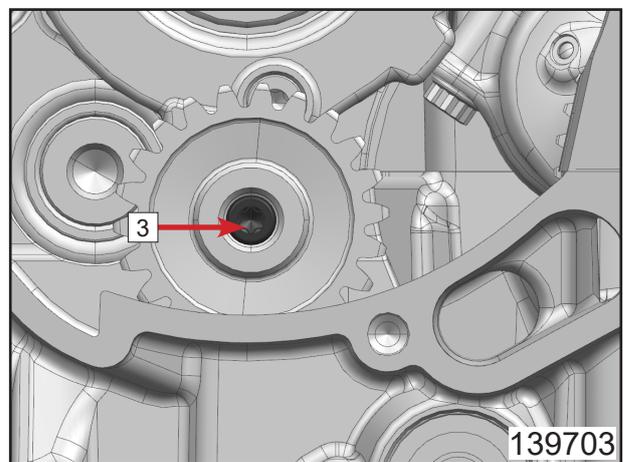
Mount and tighten screw (3).

Guideline

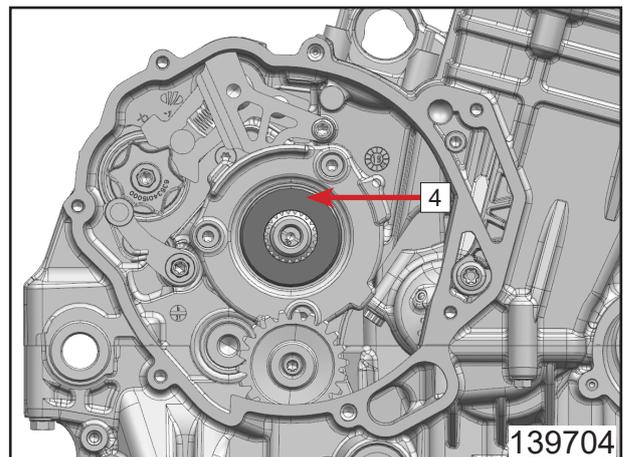
Screw ,oil pump idler gear
M8
15 N•m
243 螺纹胶

Info

The screw (3) must always be replaced.



Mount washer (4).



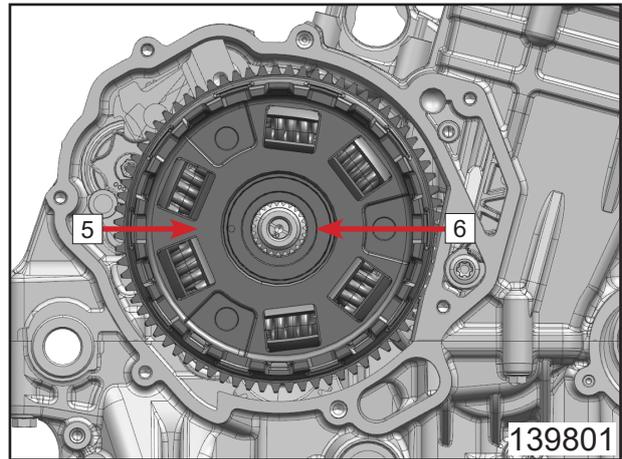
CFMOTO

Position the clutch basket (5).

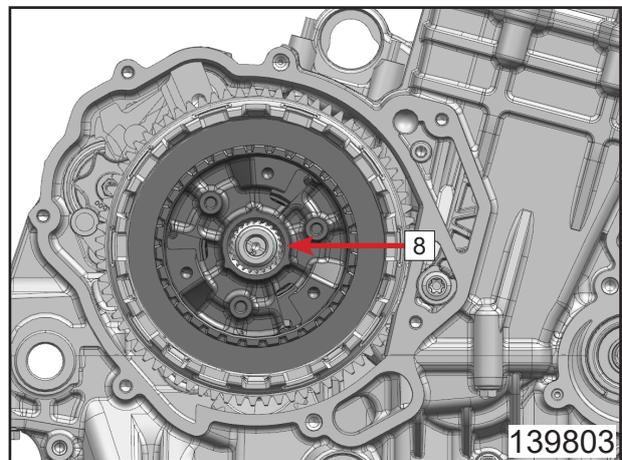
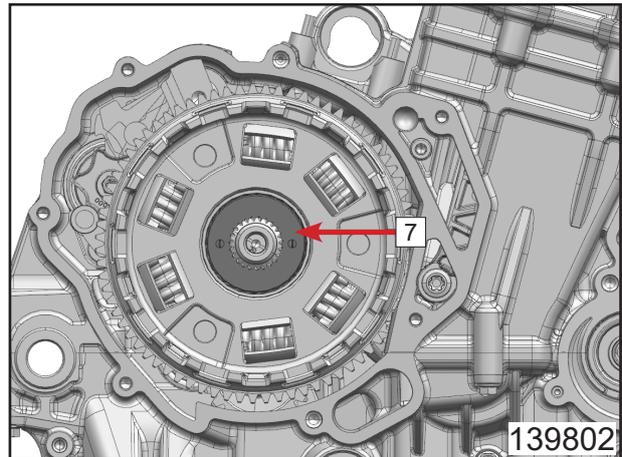
Info

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.

Use a special tool (Holding wrench) to hold the inner clutch hub (8) and tighten the nut (9).

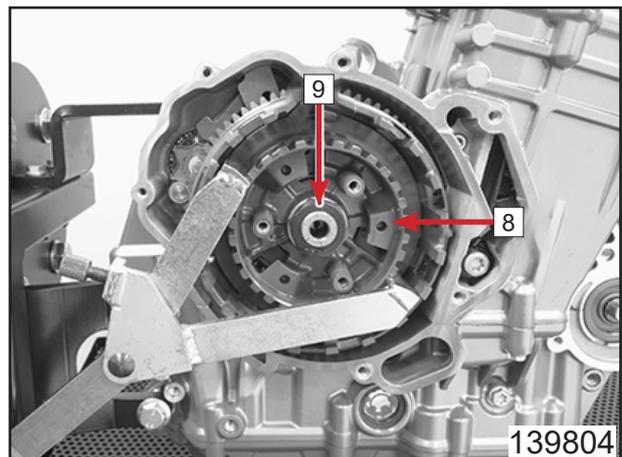
Guideline

Nut, inner clutch hub

M20×1.5

120 N•m

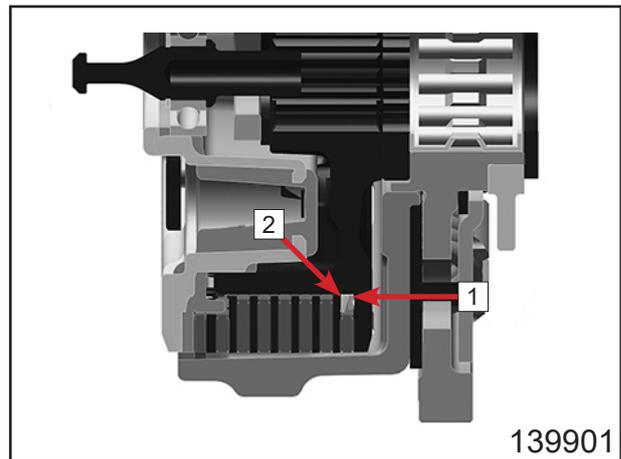
243 螺纹胶



13.4.17 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.



139901

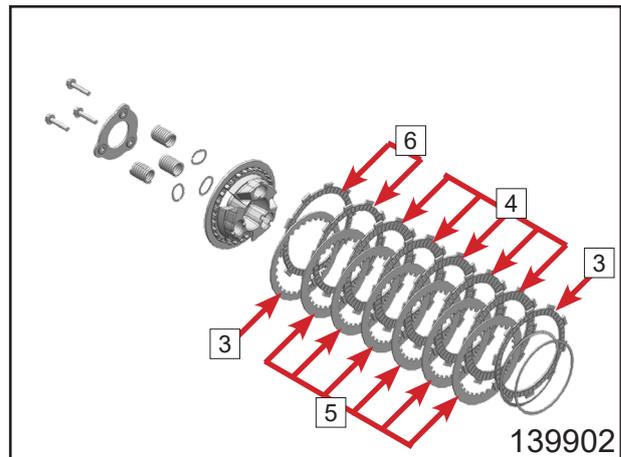
Thoroughly oil the clutch facing discs.

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.

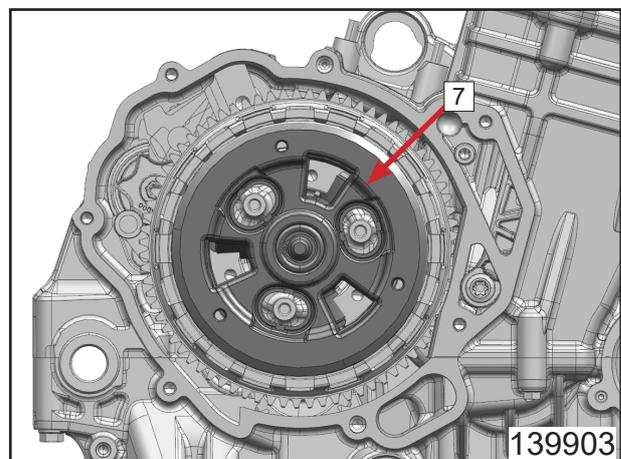


139902

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.



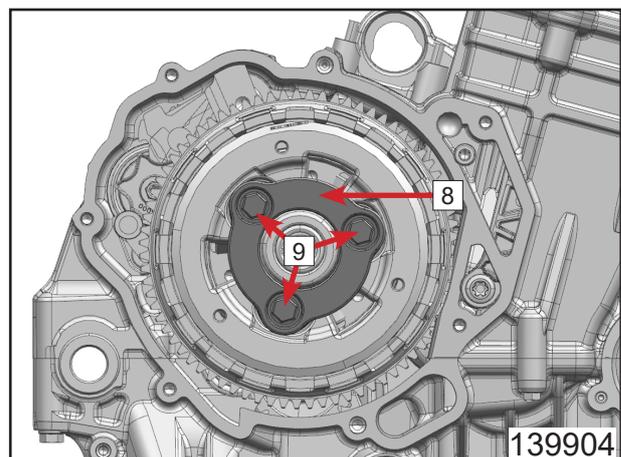
139903

Position clutch center (8) and the springs.

Mount and tighten screws (9).

Guideline

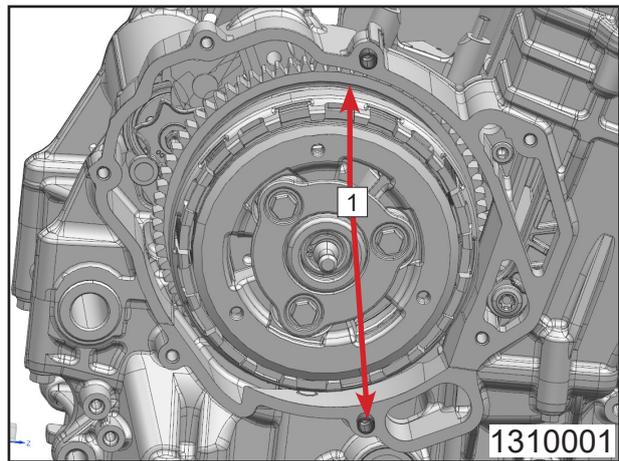
Screw, clutch spring
M6
10 N•m



139904

13.4.18 Installing the clutch cover

Mount dowels (1).

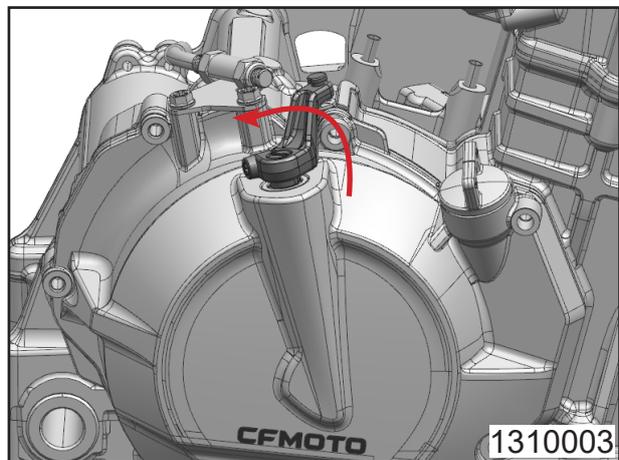
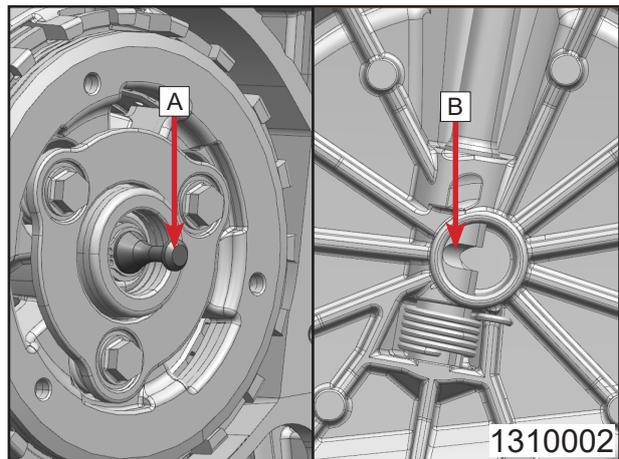


Position the clutch cover with the clutch cover gasket.

Clutch push rod (A) engages in groove (B).

Info

Swivel clutch release lever counterclockwise.



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

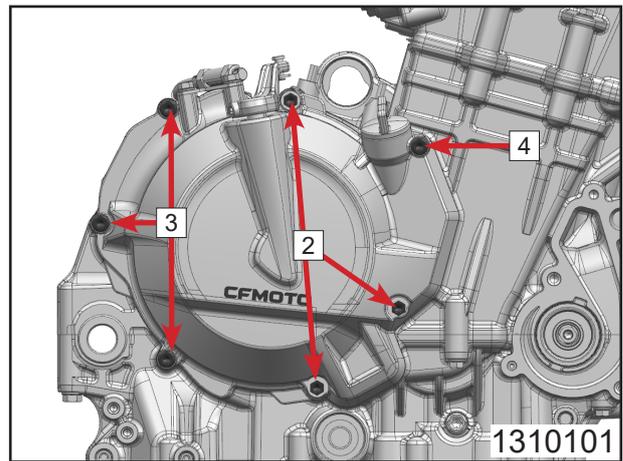
Mount screw (4) and tighten all screws in a crisscross pattern.

Guideline

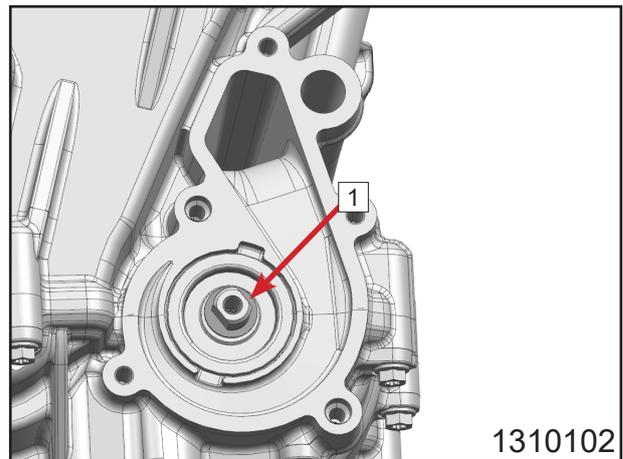
Screw, clutch cover
M6x35
10 N•m

13.4.19 Mounting the water pump cover

Mount form washer (1).



1310101



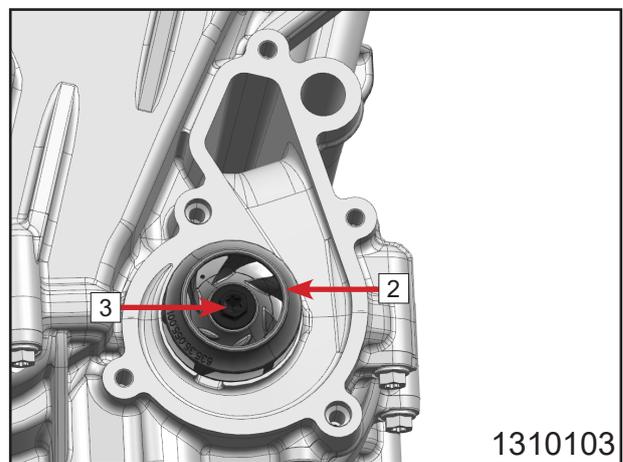
1310102

Mount water pump impeller (2).

Mount and tighten screw (3).

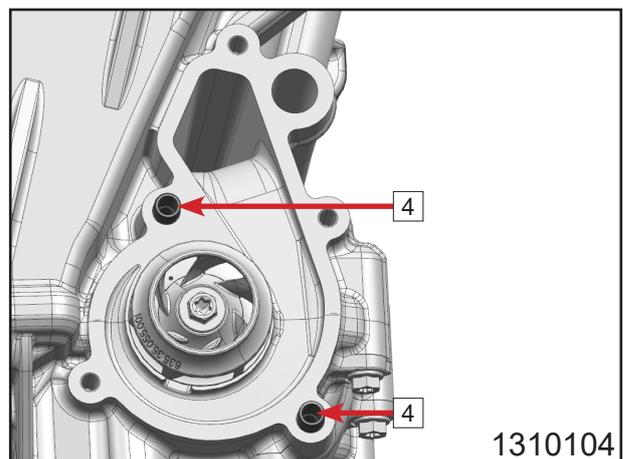
Guideline

Screw, water pump wheel
M6
10 N•m
243 螺纹胶



1310103

Mount dowels (4).

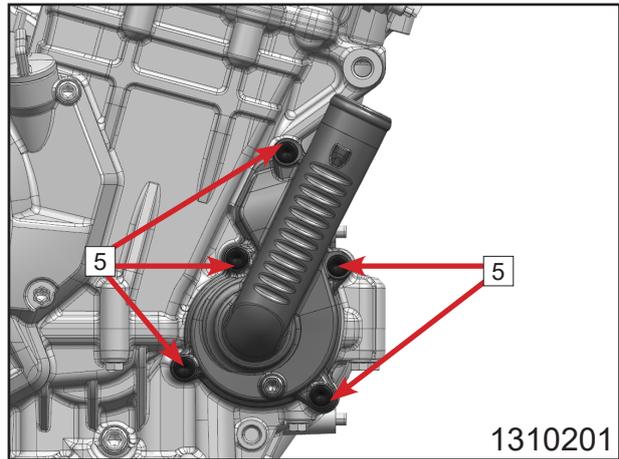


1310104

Position water pump cover with the gasket.
Mount and tighten screws (5).

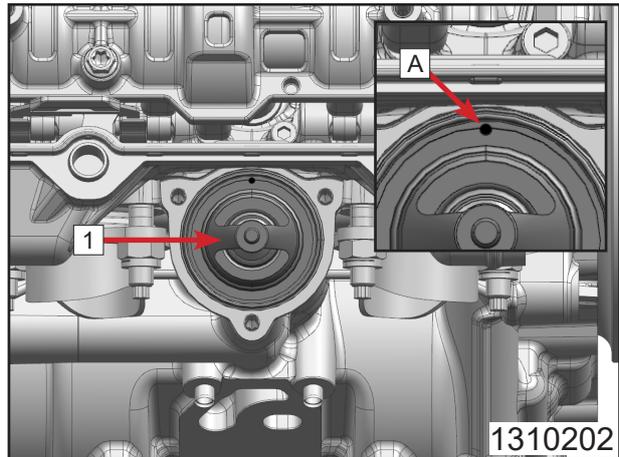
Guideline

Screw, water pump cover
M6
10 N•m
243 螺纹胶



13.4.20 Installing the thermostat

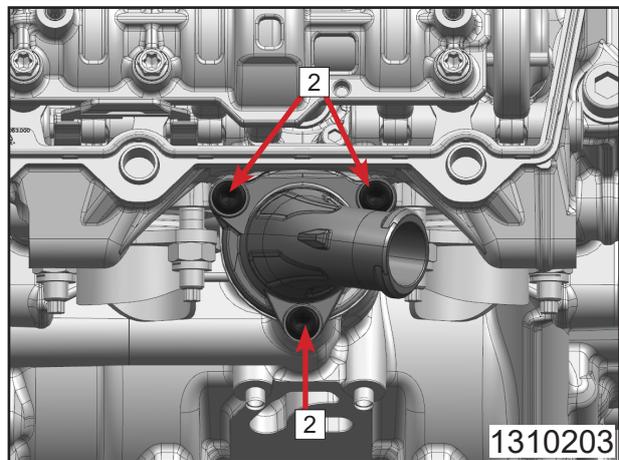
Position thermostat (1) with the gasket.
Drill hole (A) must face upward.



Position the thermostat case.
Mount and tighten screws (2).

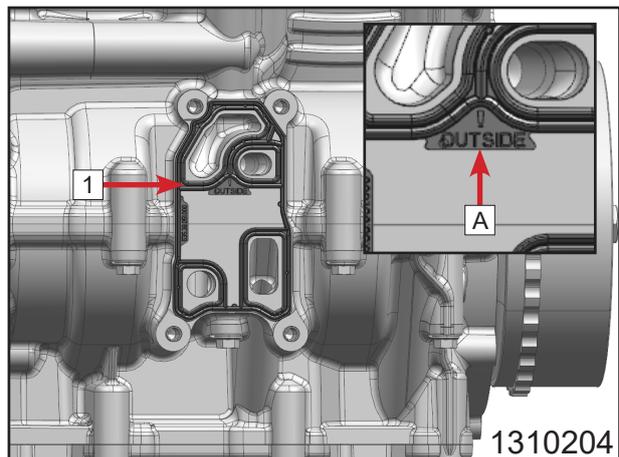
Guideline

Screw, thermostat case
M5
6 N•m
243 螺纹胶



13.4.21 Installing the heat

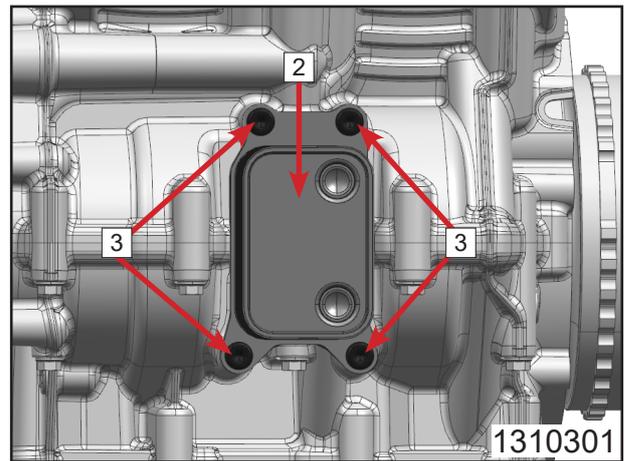
Position gasket (1).
The **OUTSIDE** marking (A) is legible.



Position heat exchanger (2).
Mount and tighten screws (3).

Guideline

Screw, heat exchanger
M6
10 N•m
243 螺纹胶



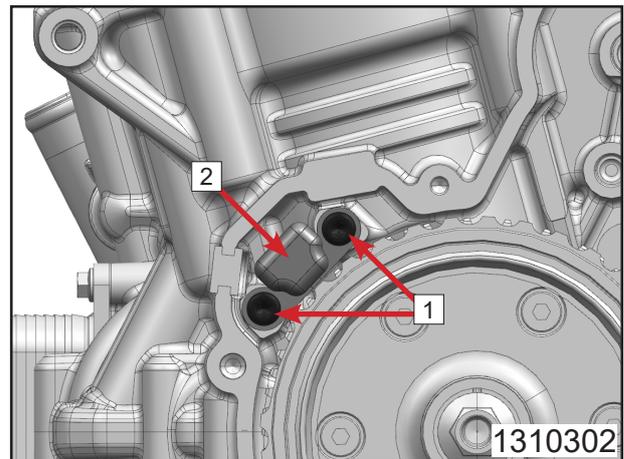
13.4.22 Installing the crankshaft speed sensor

Position the crankshaft speed sensor.
Mount and tighten screws (1).

Guideline

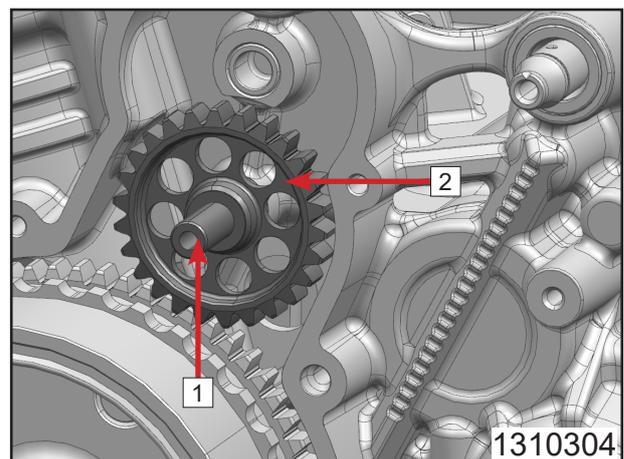
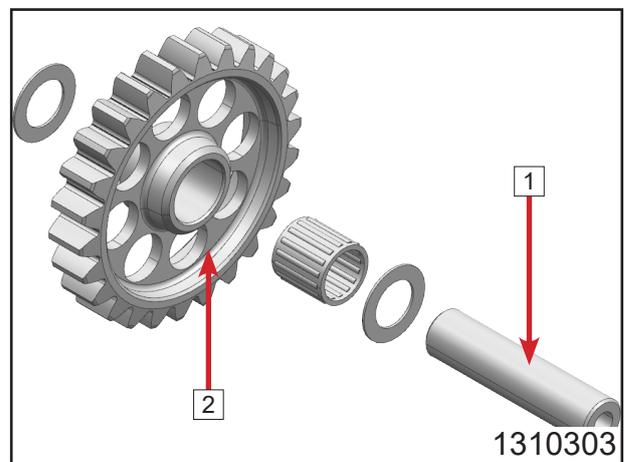
Screw, crankshaft speed sensor
M5
6 N•m
243 螺纹胶

Position the cable and position rubber grommet (2) in the engine case.

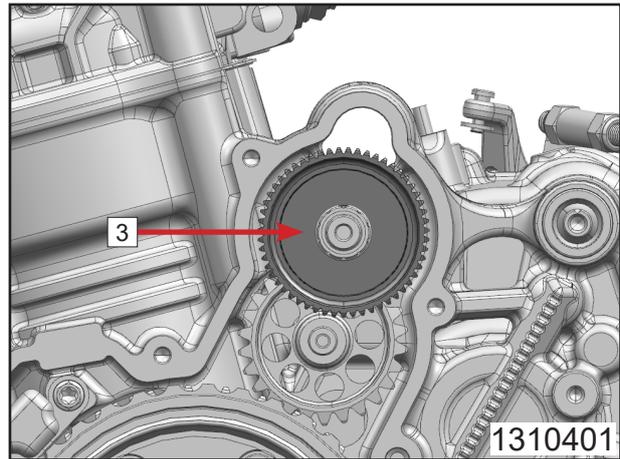


13.4.23 Installing the torque limiter and the starter intermediate gear

Mount shaft (1) and starter intermediate gear (2) with the needle bearing and the washers.



Mount torque limiter (3) with the rear washer.

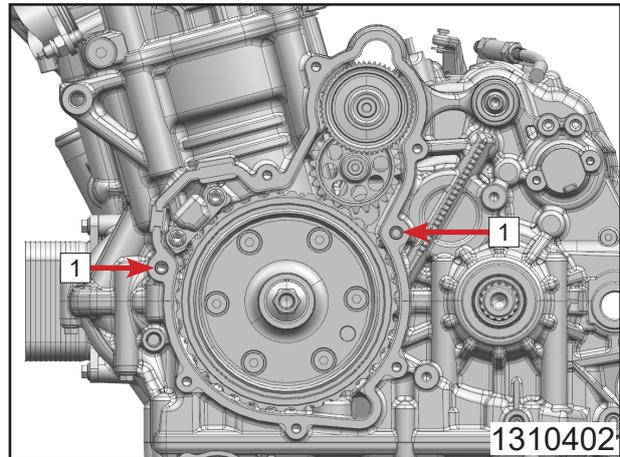


13.4.24 Installing the alternator cover

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

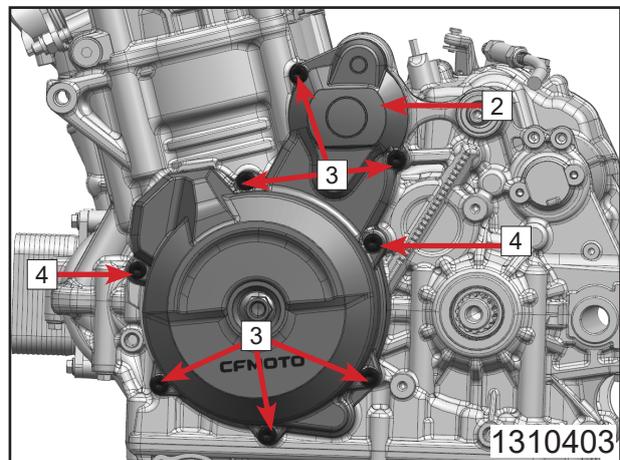
Mount and tighten screws (4).

Guideline

Screw, alternator cover

M6x35

10 N•m



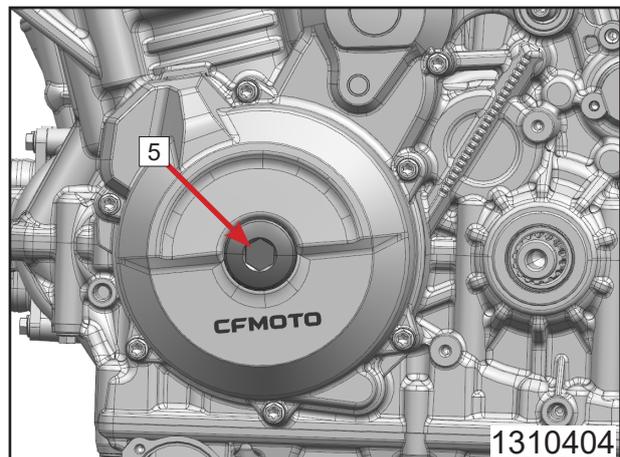
Mount and tighten screw plug (5) with the O-ring.

Guideline

Screw plug, alternator cover

M24x1.5

8 N•m

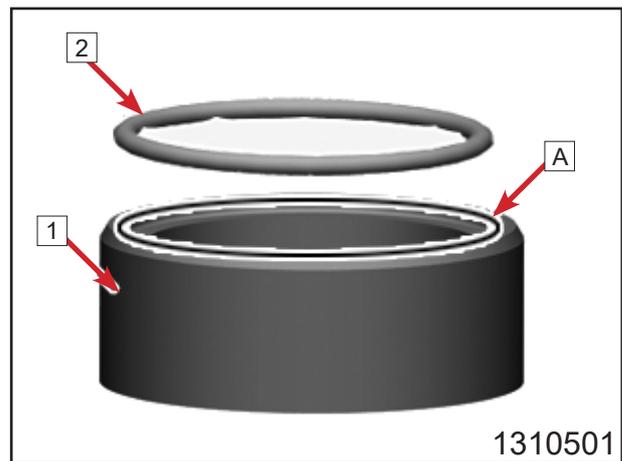


13.4.25 Installing the spacer

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.



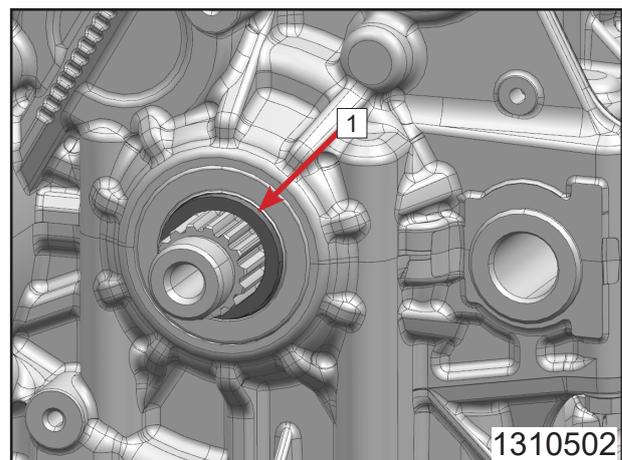
Grease the radial shaft seal ring.

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.



13.4.26 Installing the gear position sensor

Position gear position sensor (1).

Mount and tighten screws (2).

Guideline

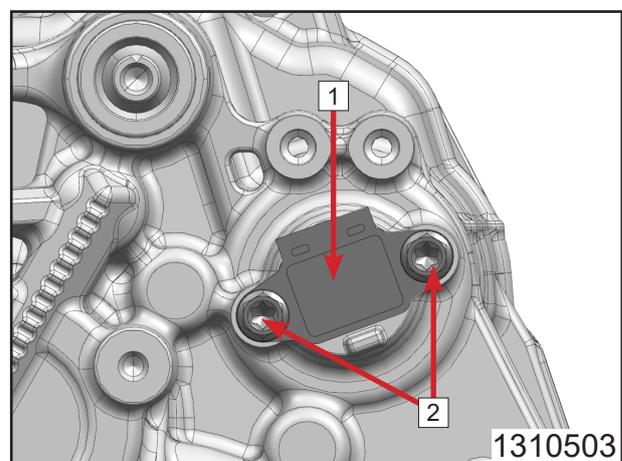
Screw, gear position sensor

M5

6 N•m (4.4 lbf ft)

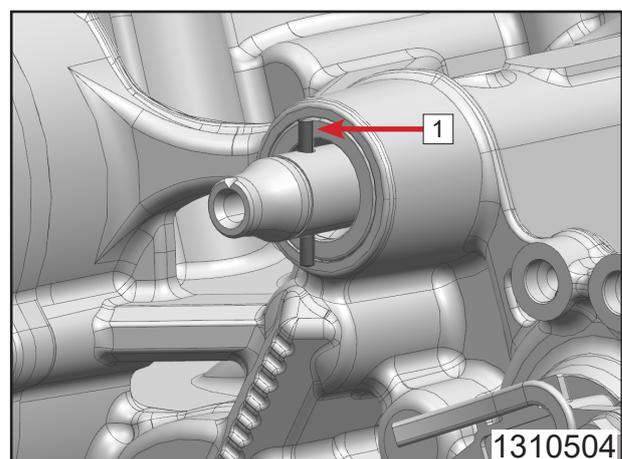
243 螺纹胶

Secure the cable with a cable tie.

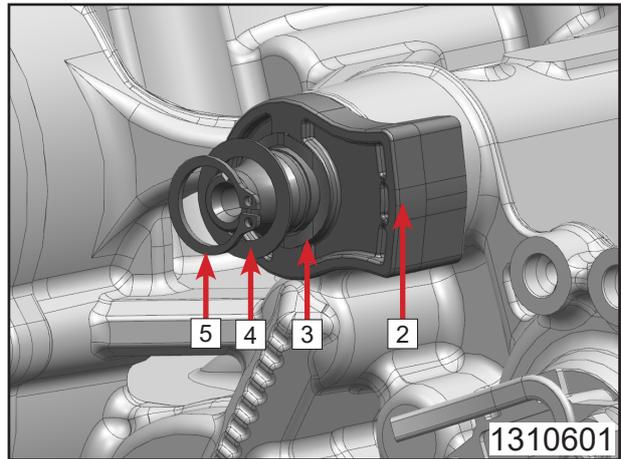


13.4.27 Installing the shift shaft sensor

Mount pin (1).

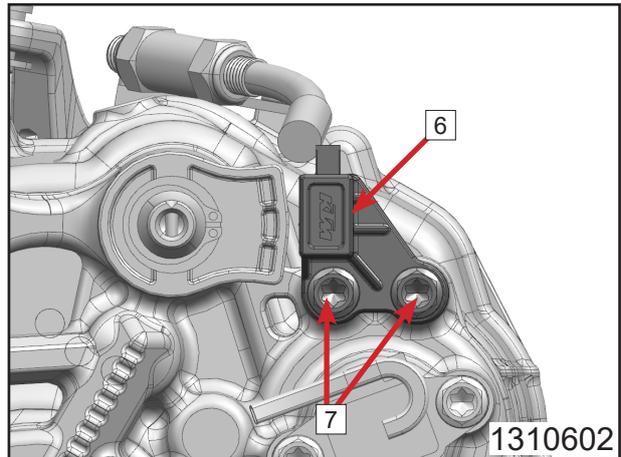


- Mount magnetic holder (2).
- Mount locating washer (3).
- Mount washer (4).
- Mount lock ring (5).



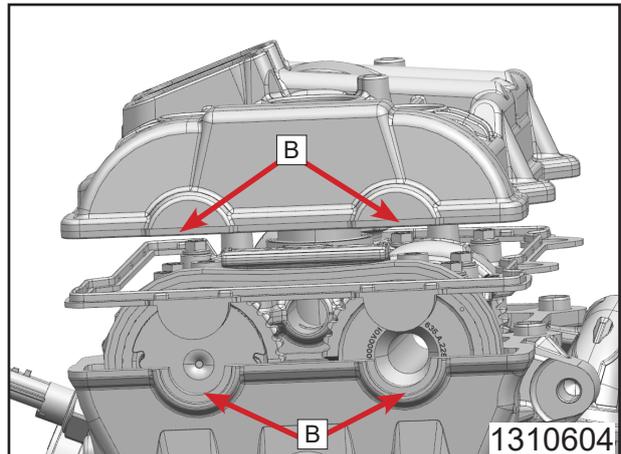
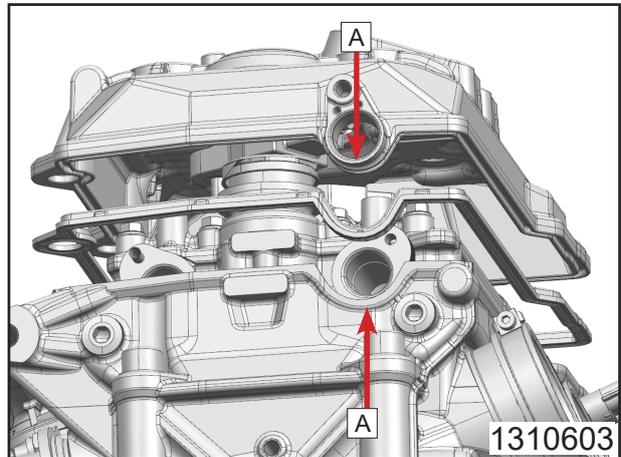
- Position the shift shaft sensor (6).
 - Mount and tighten screws (7).
- Guideline

Screw, shift shaft sensor
M5
6 N•m
243 螺纹胶



13.4.28 Installing the valve cover

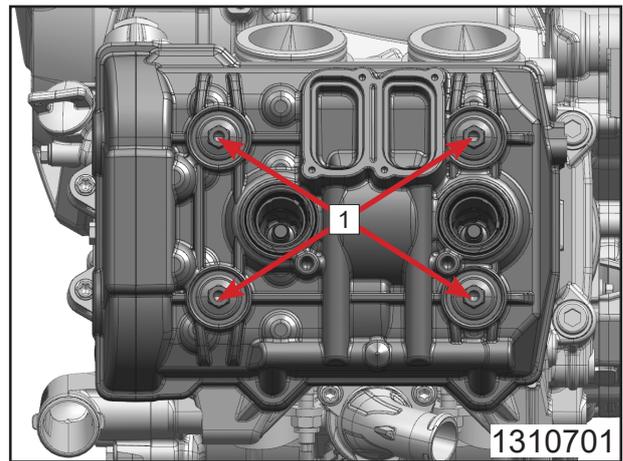
- Clean and degrease the valve cover seal.
- Apply a thin layer of sealing compound to area (A) and (B).



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).

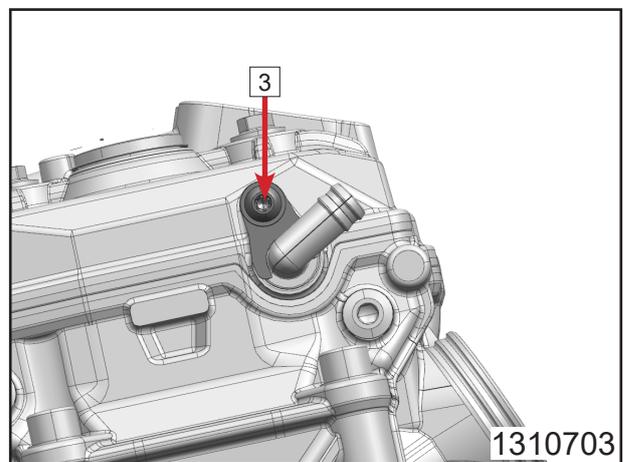
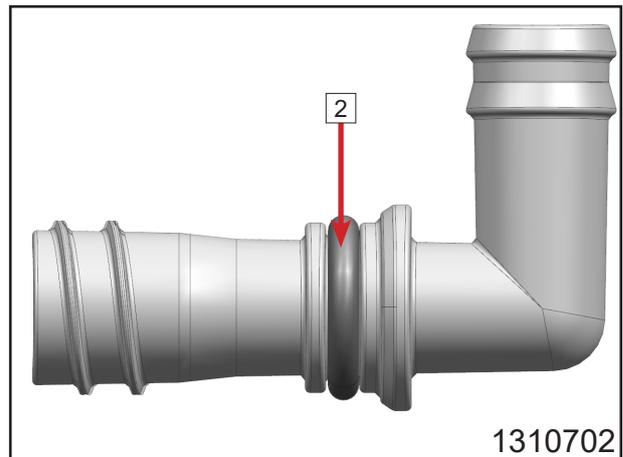
Long-life grease

Position the bleeder flange in the valve cover.

Mount and tighten screw (3) with retaining bracket.

Guideline

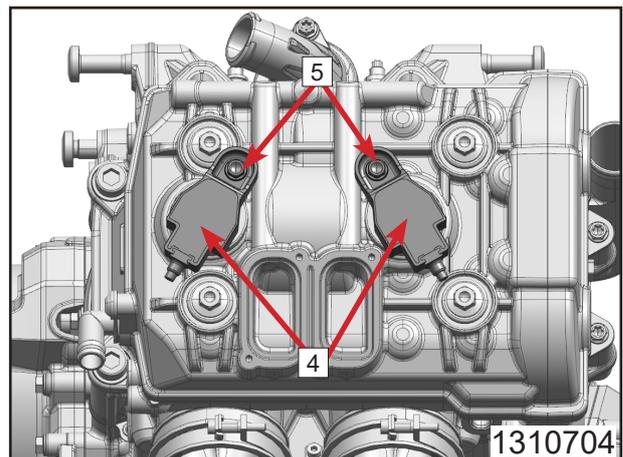
Screw, bleeder flange
M6×12
8 N•m
243 螺纹胶



Mount ignition coils (4).
Mount and tighten screws (5).

Guideline

Screw, ignition coil
M6
8 N•m



13.4.29 Installing the starter motor

Grease the O-ring and mount the starter motor.

Long-life grease

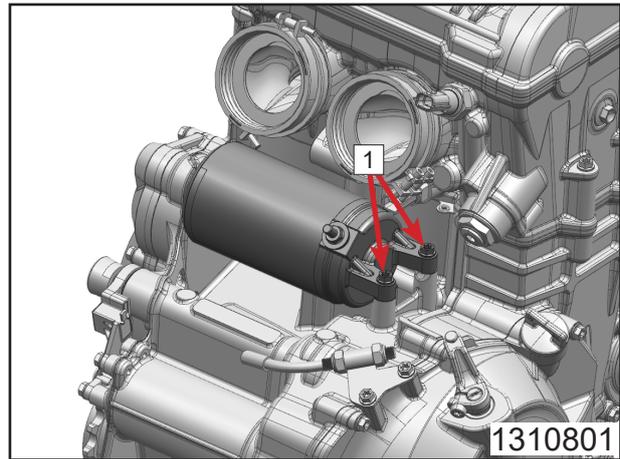
Mount and tighten screw (1).

Guideline

Screw, starter motor

M6

10 N•m

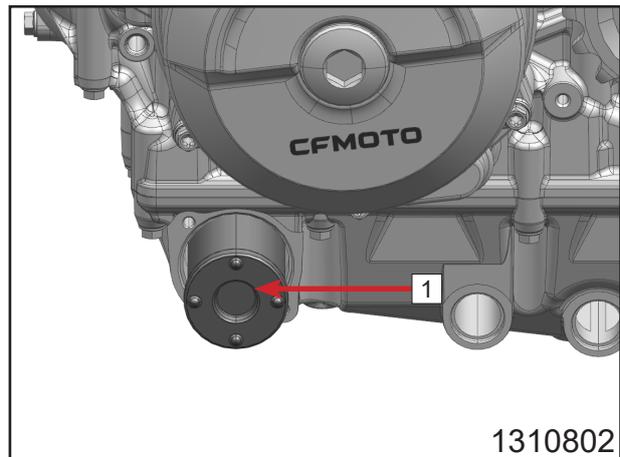


13.4.30 Installing the oil filter

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.

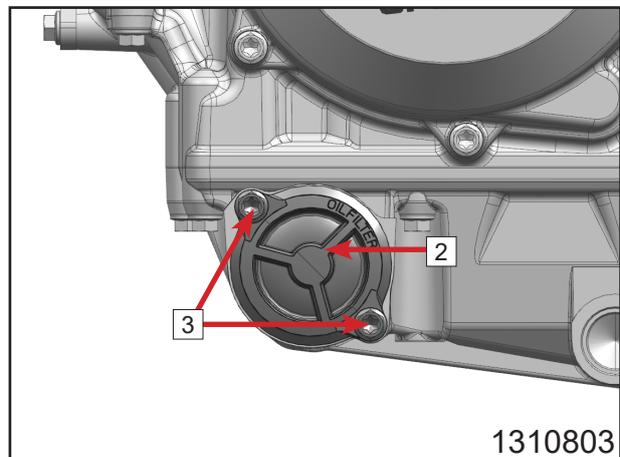
Mount and tighten screws (3).

Guideline

Screw, oil filter cover

M5

6 N•m



13.4.31 Installing the oil drain plug

Mount the new O-rings.

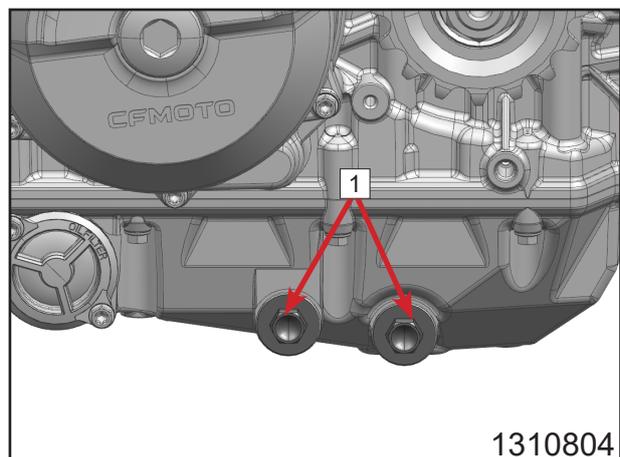
Mount and tighten the oil drain plugs (1) with the magnet, O-rings, and oil screen.

Guideline

Plug, oil screen

M20×1.5

20 N•m



HANDLEBAR AND TRIPLE CLAMPS

14.1 Handlebar	2
14.1.1 LH Handlebar Switch.....	2
14.1.2 RH Handlebar Switch	3
14.2 Throttle Grip	3
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14.3.2 Clutch Cable Free Play Adjustment.....	4
14.3.3 Handlebar Interference Inspection	4
14.4 Triple Clamps and Front Forks	5

Handlebar and Triple Clamps

14.1 Handlebar

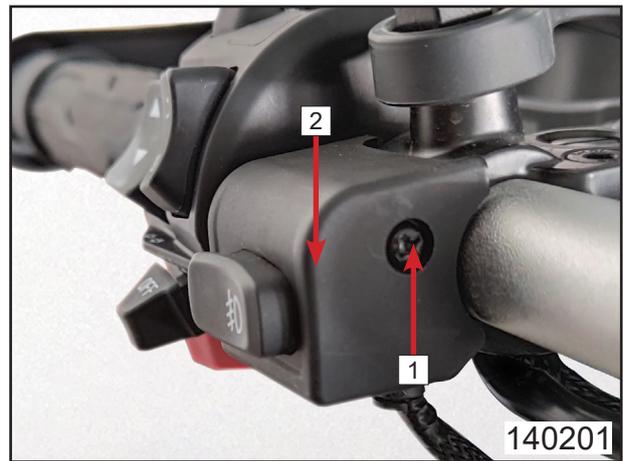
Handlebar removal refers to 12.1.

14.1.1 LH Handlebar Switch

Removal

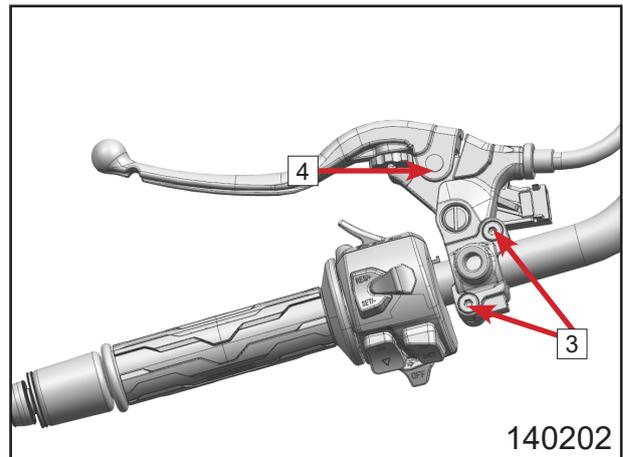
Remove screw.

Remove fog light switch.



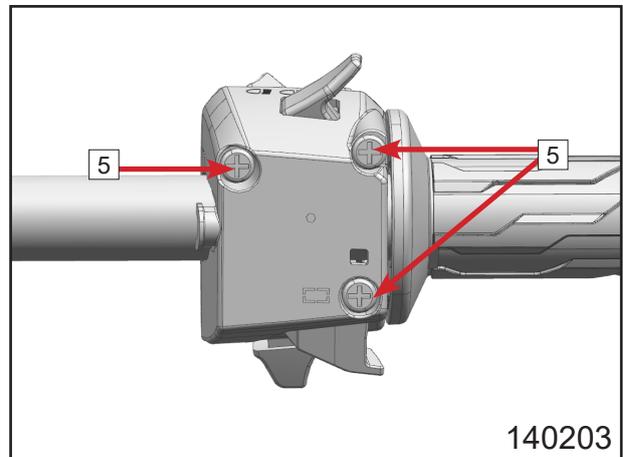
Remove inner hex bolt **3**.

Remove clutch lever **4**.



Remove screws **5**.

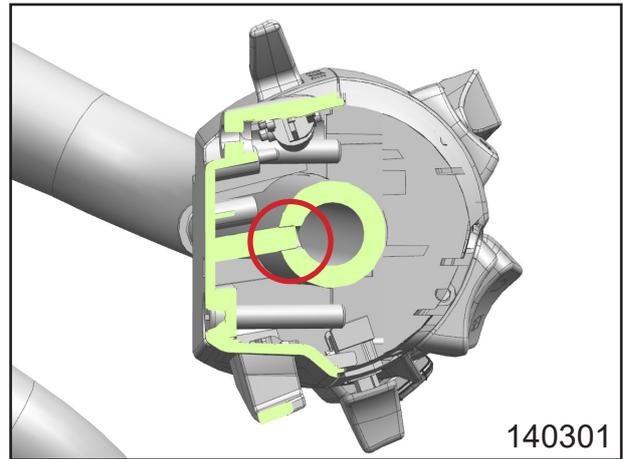
Remove LH handlebar switch.



Handlebar and Triple Clamps

Installation

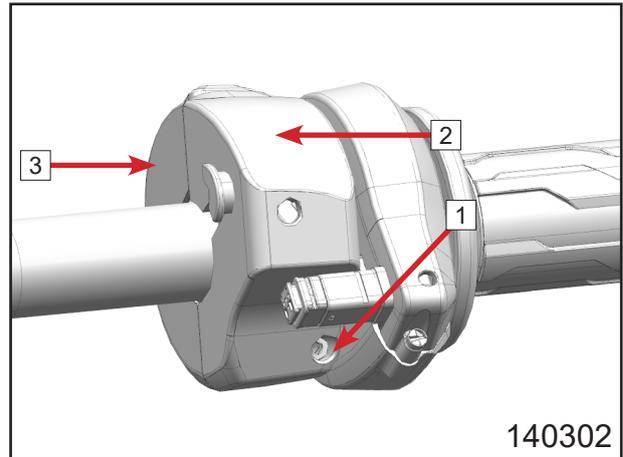
Align LH lower housing position pin with holes on LH handlebar switch.
Install LH upper cover.
Install three screws.



14.1.2 RH Handlebar Switch

Removal

Remove bolt [1].
Separate RH handlebar switch lower cover [2] and upper cover [3].



Installation

Reverse the removal procedures for installation.

14.2 Throttle Grip

E-throttle refers to Electrical System.

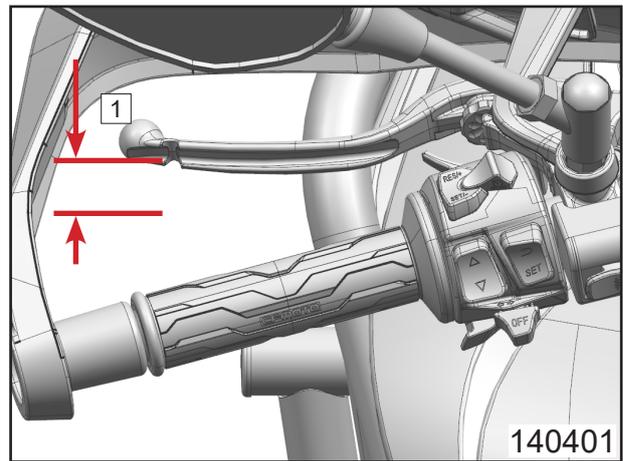
Handlebar and Triple Clamps

14.3 Handlebar Inspection

14.3.1 Clutch Lever Free Play Inspection

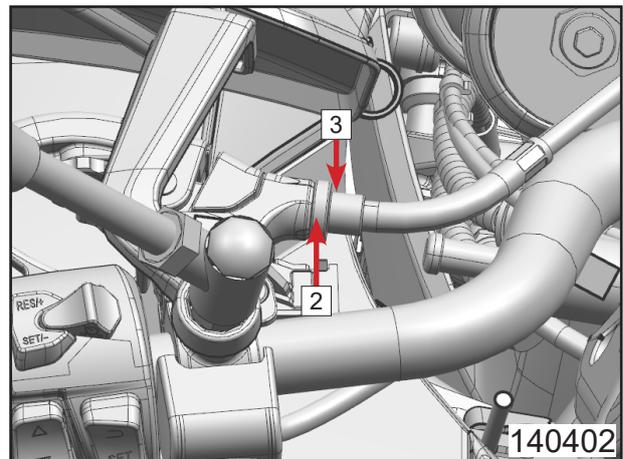
Inspect clutch lever if it is smooth to return.
Inspect clutch lever free play **1**.

Free play standard: 3mm~6mm

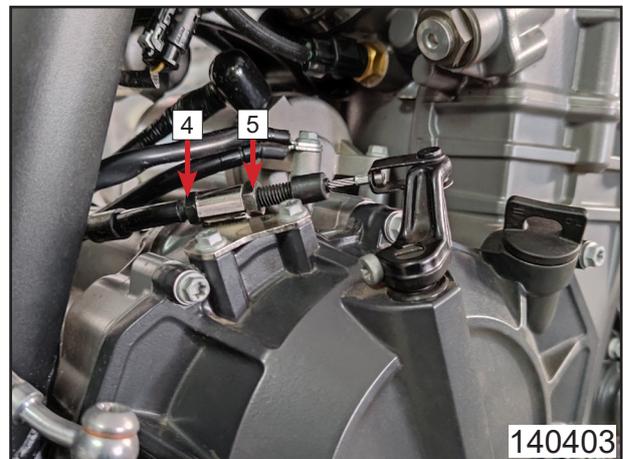


14.3.2 Clutch Cable Free Play Adjustment

Minor adjustment: Loosen lock nut **2** and rotate the adjusting nut **3** for adjustment. At last, tighten the lock nut **2**.



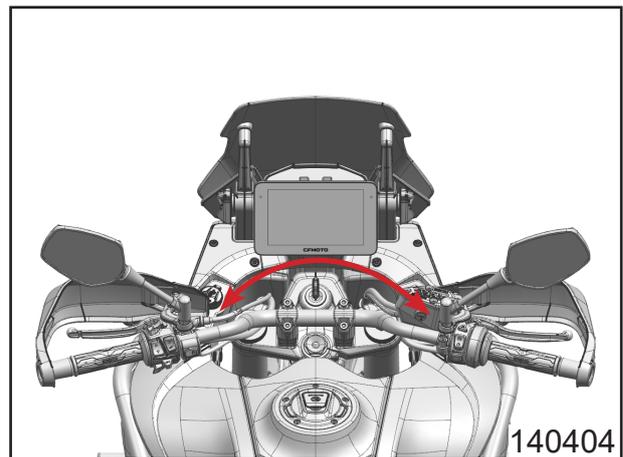
Major adjustment: Loosen lock nut **5** and rotate the adjusting nut **4** for adjustment. At last, tighten the lock nut **5**.



14.3.3 Handlebar Interference Inspection

Turn the handlebar left and right to check whether cables interfere front wheel.

When the turning angle is the maximum, check if the handlebar interferes the fuel tank.



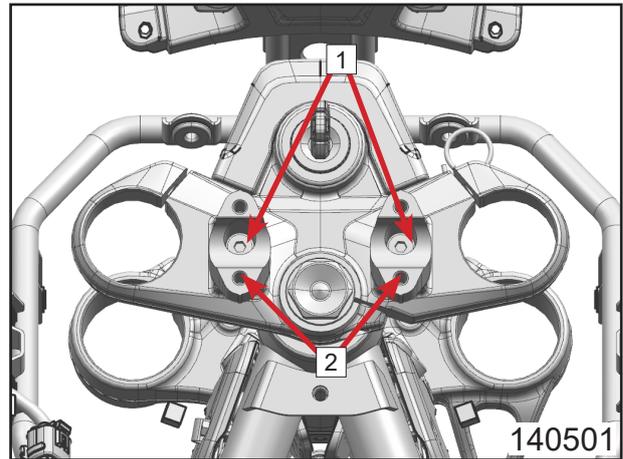
Handlebar and Triple Clamps

14.4 Triple Clamps and Front Forks

Removal

Remove two inner hex bolts [1].

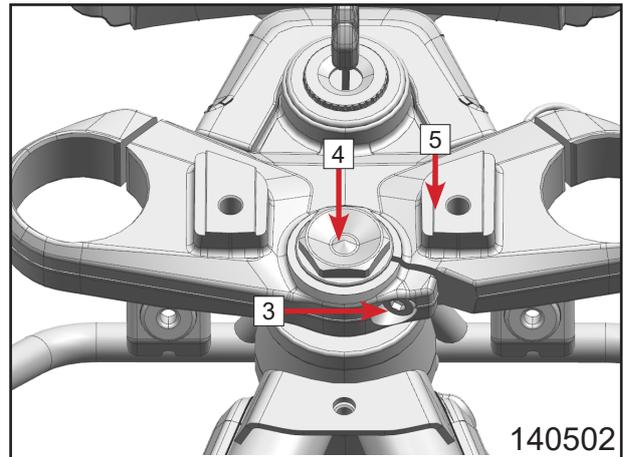
Remove handlebar seat [2].



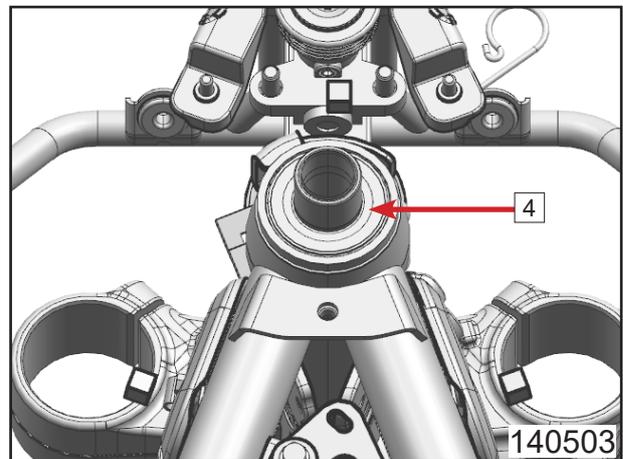
Remove inner hex bolts [3].

Remove upper triple clamp screw and washer [4].

Remove upper triple clamp [5].

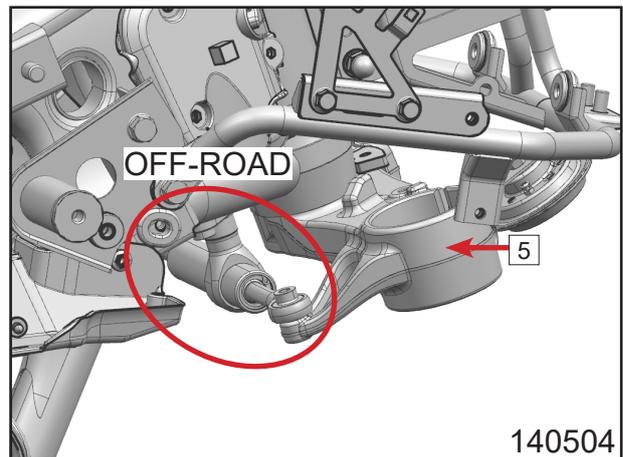


Remove dust-proof cover and washer kit [4].



Remove inner hex bolts. Separate steering damper and lower triple clamp (OFF-ROAD).

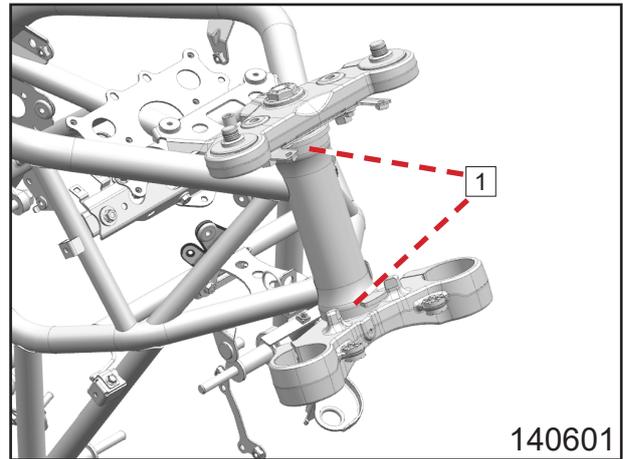
Remove lower triple clamp [5].



Handlebar and Triple Clamps

Inspection

Inspect steel ball assy 1 for wear or missing. Replace if any defect is found.
Inspect bearing cage for cracks or abnormal wear. Replace if any defect is found.



140601

Installation

Reverse the removal procedures for installation.

Steering column nut torque: 25 N•m

Upper triple clamp lock screw torque: 110 N•m

NOTE: Apply enough grease to bearing cage during installation and replacement.

CLEAN AND CONSERVATION

15.1 Motorcycle Clean.....	2
15.2 Inspection and Maintenance in Winter	3

Clean and Conservation

15.1 Motorcycle Clean

⚠ CAUTION: Clean the motorcycle periodically, to help it keep value and appearance. Avoid direct sunlight on the motorcycle while cleaning.

Seal air exhaust system to prevent water into the system.

Clean chunks of dirt with gentle water-jet in advance.

Use common motorcycle cleaner to clean serious smudges and wipe it with hairbrush.

⚠ CAUTION:

Use the hot water with specialized cleaner for motorcycle and a piece of sponge.

It is not allowed to use the cleaner directly on dry vehicle body. Flush the vehicle with water in advance.

If the vehicle has been used in snow-melting salt, clean it with cold water. Otherwise, the hot water will exacerbate erosion.

Dry the car completely after washing the motorcycle with gentle water-jet.

Remove the seal plug for exhaust system.

⚠ WARNING: The dirty or damp braking system will reduce the braking performance. Pay attention to keep the brake system clean and dry.

After cleaning, run the vehicle for some distance until the engine reaches certain temperature.

Push the guard upwards from the handlebar, in order to let the water evaporate.

After the motorcycle cools down, lubricate all sliding parts and bearing parts.

Clean the chain.

Use anti-rusting agent on exposed metal parts (except brake discs and exhaust system).

Use gentle curing agent on all painting parts.

⚠ CAUTION: Do not polish the plastic parts which is in delivery. Otherwise, it will serious effects on the quality.

Use gentle cleaning agent and curing agent on all plastic parts and powder-coated parts.

Lubricate ignition switch lock/steering lock with engine oil.

15.2 Inspection and Maintenance in Winter

⚠ CAUTION:

If the motorcycle is used in winter, it must be taken into consideration that the street is covered with snow-melting salt. Therefore, protective measures must be taken against erosion.

If the vehicle has been used in snow-melting salt, clean it with cold water. Otherwise, the hot water will exacerbate erosion.

Clean the motorcycle.

Clean brake system.

⚠ CAUTION:

If the vehicle has been used in snow-melting salt, clean it with cold water after the brake calipers and brake pads cool down. Dry all the parts after cleaning. Do not remove brake parts when cleaning.

Use waxy preservative liquid for engine, swing arms and other exposed or galvanized parts (except brake pad).

⚠ CAUTION:

The preservative liquid is not allowed to get into the brake pads. Otherwise, it will reduce the braking effect seriously.

Clean the chain.

STORAGE

16.1 Parking2

16.2 Motorcycle Use after Storage.....2

Storage

16.1 Parking

⚠ CAUTION:

If parking for a long time, please execute the following measures.

Before parking the motorcycle, please check its functions and wear condition. If the bike needs maintenance, service or adjustment, operate it during parking (when service station has less work), which prevents long wait at the service station before peak season arrives.

- Add fuel additives for the last refueling before parking the motorcycle.
- Add fuel.
- Clean the motorcycle.
- Replace engine oil, oil filter and clean oil strainer.
- Check coolant and coolant level.
- Check tire pressure.
- Remove battery.
- Charge the battery.

Without direct sunlight condition, battery storage temperature: 0~35°C

Place the vehicle at a dry place without obvious temperature fluctuation.

Advice to use wheel bracket to lift the motorcycle.

Cover the motorcycle with breathable canvas or cover.

⚠ CAUTION:

It is not allowed to use air-proof material to cover the motorcycle. Otherwise, the moisture can not get out which causes erosion.

The short-time running of the engine will cause severe damage if the motorcycle has parked. The temperature of the engine is not high enough after short-time running. The moisture that comes into being during combustion condenses after the engine cools down, which causes valve body and exhaust pipes erosion.

16.2 Motorcycle Use after Storage

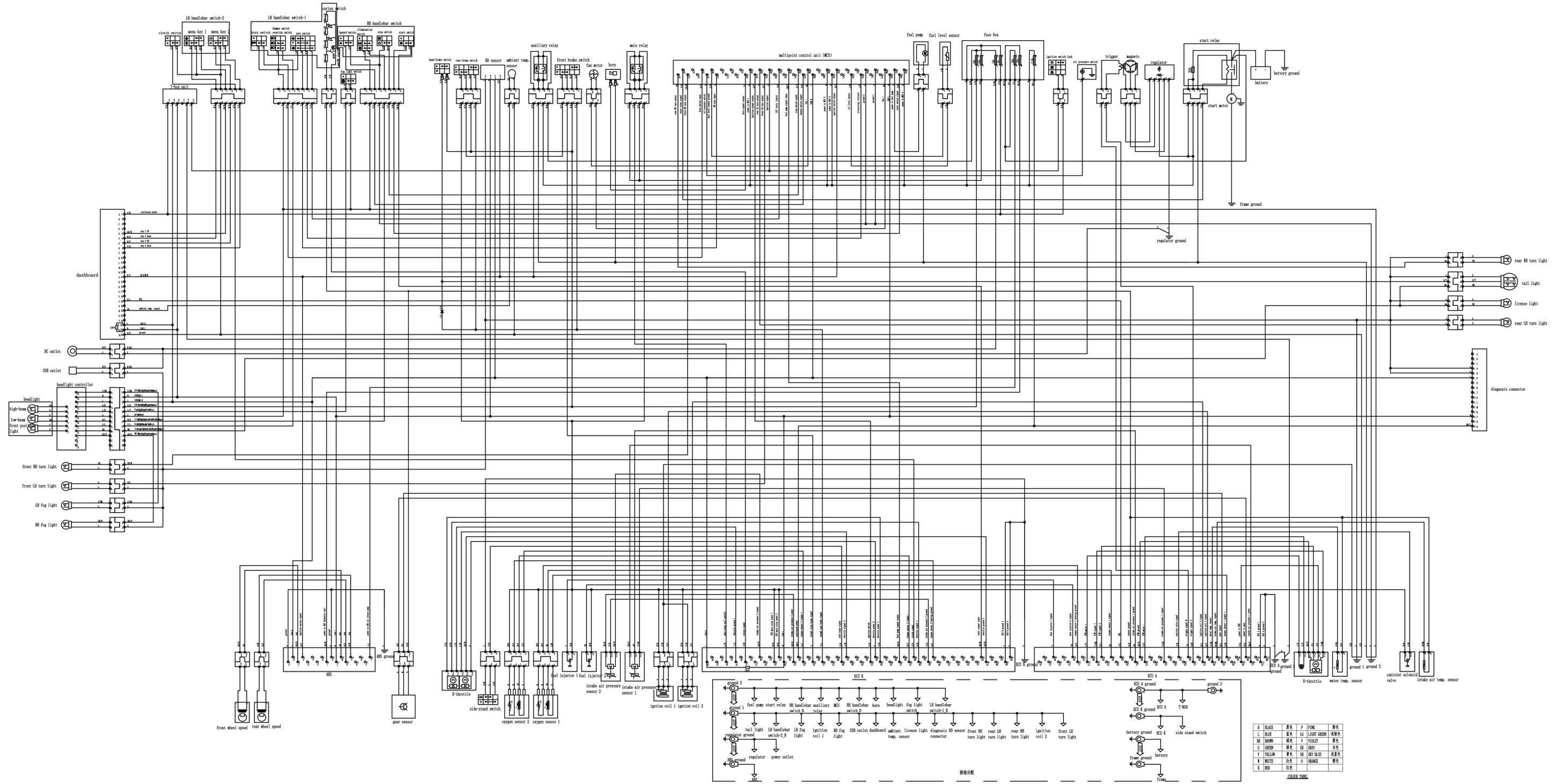
Remove the motorcycle from front wheel bracket.

Remove the motorcycle from rear wheel bracket.

Install battery.

Inspect and maintain the motorcycle before use every time.

Drive the motorcycle to test it.



字母	颜色	名称	缩写	颜色	
B	BLACK	黑色	P	PINK	粉色
L	LIGHT BLUE	浅蓝色	SG	LIGHT GREEN	浅绿色
BR	BROWN	棕色	V	VIOLET	紫色
C	GREEN	绿色	GR	GRAY	灰色
Y	YELLOW	黄色	SN	SKY BLUE	天蓝色
W	WHITE	白色	O	ORANGE	橙色
R	RED	红色			

导线颜色

