

MX250 Motocross Motorcycle Maintenance Manual
Rev.1 (March 2023)

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Preface

This motorcycle manual introduces the basic structure, working principle, disassembly and maintenance, fault diagnosis and troubleshooting methods of MX250 Motocross Motorcycle to readers in detail. In addition, it also introduces the technical specifications, performance parameters and maintenance adjustment data of this model. This manual is informative, illustrated and practical. We hope that this manual can provide technical support and guidance for KOVE motorcycle users and after-sales service personnel in terms of maintenance.

The technical specifications, performance parameters and maintenance adjustment data marked in this manual are determined according to the latest state. We will improve this model later without notice and may cause any inconsistency between the latest model and that described in this manual. We apologize for any inconvenience caused thereof.

We sincerely hope that you will give us your valuable opinions and comments on the design, manufacture and quality of this model to improve it in time. Thank you for your support and cooperation.

All the information, charts, data, and performance indicators published in this manual are as of the printing of this manual. Please understand that TIBET NEW SUMMIT MOTORCYCLE CO., LTD. reserves the right to modify this manual without prior notice. Any part of this manual is the property of TIBET NEW SUMMIT MOTORCYCLE CO., LTD. No unit or individual is allowed to reprint it without our consent. Otherwise, they will be held criminally and legally responsible.

Due to the limited abilities of the editor, errors and omissions are inevitable in this manual. We kindly welcome criticism and correction from users and readers.

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Chapter I

How to use this manual

This manual describes the maintenance procedures of MX250 Motocross.

Section 2 and III apply to the complete motorcycle. Section 11 describes the procedure for removing/installing components that may be used to provide the services described in the following sections. Section 4 to 17 describe the parts of the motorcycle that are grouped according to their positions. If you are not familiar with this motorcycle, please read the technical characteristics in Section 2. Please comply with the recommendations in the Maintenance Cycle List to ensure that the motorcycle is in the best running condition, and it complements the initial wear during the fitting process. Find the section you want on this page, and then go to the table of contents on the first page of that section. Most sections start with an assembly or system description, maintenance information, and troubleshooting. The following pages provide detailed procedures. Refer to Troubleshooting in each section to eliminate the fault or symptom.

Your safety and the safety of others are very important. To help you make an informed decision, we provide safety information and other information in this manual.

You must use your outstanding judgement. You'll see important security information in a variety of forms, including:

* Safety labels on the motorcycle

* Safety Information - Add one of three signal words before the safety warning symbol , i.e. Dangerous, Warning, Caution, meaning:



If you do not follow the instructions, you will be dead or seriously injured.



If you do not follow the instructions, you may be dead or seriously injured.

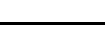
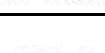


If you do not follow the instructions, you may be injured.

Note: How to properly and safely repair this motorcycle.

Symbol

The symbols used in this manual indicate specific maintenance procedures. If supplementary information related to these symbols is needed, they will be explained in detail in the text without using these symbols.

	Replace parts with new ones before assembly.
	Use the recommended oil unless otherwise specified.
	Use molybdenum oil solution (oil and molybdenum grease are mixed in a ratio of 1:1)
	Multi-purpose high-temperature extreme pressure compound lithium base grease (UNIVERSAL SU-T330G/F grease).
	Use molybdenum disulfide grease (NLGI #2 or equivalent product containing more than 3% molybdenum disulfide). For example: Molykote BR-2 plus produced by Dow Corning in the U.S. and multi-functional M-2 manufactured by Mitsubishi Petroleum Co., Ltd. in Japan
	Use molybdenum disulfide paste (NLGI #2 or equivalent product containing over 40% molybdenum disulfide). For example: G - n slurry produced by Dow Corning in the U.S. and Honda Moly 60 (only available in the United States), Rocol ASP manufactured by Rocol Limited in the UK and Rocol paste produced by Sumico Lubricants Co., Ltd. in
	Use silicone
	Use sealant. Use the medium strength sealant unless otherwise specified,
	Use sealant
	Use DOT4 brake fluid. Use the recommended brake fluid unless otherwise specified.
	Use shock absorber fluid

Basic Information

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Maintenance Instructions

Please use KOVE original parts and lubricants or equivalents recommended by KOVE. Parts that do not meet the design specifications of KOVE may damage the motorcycle. Use special tools designed for this product to avoid damage and incorrect assembly.

Only metric tools can be used when repairing motorcycles. Metric bolts, nuts and screws cannot be interchanged with inch fasteners.

Use new gaskets, O-rings, cotter pins and lock plates when reassembling.

When tightening bolts or nuts, start with the large-diameter or inner bolts first. Then tighten them to the specified torque in diagonal incremental steps, unless a specific sequence is specified.

When disassembling, use the detergent to clean the parts. Clean the parts with detergent before disassembly and lubricate all sliding surfaces before reassembly.

After reassembly, check all parts for proper installation and operation.

Route all wires as shown in the cable and cable duct routing.

Do not bend or twist the control cables. Do not bend or twist the control cable. Damaged control cables may not function properly and may get stuck or tangled.

Abbreviations

In this manual, the following abbreviations are used to identify respective components or systems.

Abbreviations	Full name
CKP sensor	Crankshaft position sensor
DLC	Data link connector
DTC	Diagnostic trouble code
ECU	Engine control module
ECT sensor	Engine coolant temperature sensor
EEPROM	Electrically Erasable Programmable Read-Only Memory
IAT sensor	Intake air temperature sensor
MAP sensor	Intake manifold pressure sensor
MCS	Motorcycle communication system
Oxygen Sensor	Oxygen Sensor
SCS Service connector	Maintenance diagnostic interface
TP sensor	Throttle position sensor

Basic Information - Model Specification



Basic Information - Related Parameters

Item		Parameter
Size	Total length	2165 mm
	Total width	810 mm
	Total height	1230 mm
	Shaft distance	1475 mm
	Unloaded seat height	960 mm
	Unloaded ground clearance	340 mm
	Dry weight	105 kg
	Maximum permitted load on front axle	144 kg
	Maximum permitted load on rear axle	245 kg
	Maximum permitted weight	150 kg
Frame	Frame type	Cradle type
	Front suspension	Inverted type (double-adjustable)
	Front shock absorber stroke	312mm
	Rear suspension	Oil/gas separation type (double-adjustable)
	Rear shock absorber stroke	80.5mm
	Front tire size	80/100-21 M/C 51M
	Rear tire size	100/90-19 M/C 57M
	Front tire brand	Chengxin/CST
	Rear tire brand	Chengxin/CST
	Front brake	288mm/hydraulic single disc
	Rear brake	240mm/hydraulic single disc
	Caster angle	29.36°
	Trail	95mm
	Fuel tank capacity	5L
Engine	Model	ZS177MM-B
	Displacement	249.58ml
	Type	Single-cylinder, water-cooled, four-stroke, four-valve, DOHC (Double Overhead Camshaft), balance-shaft structure
	Cylinder diameter × stroke	77×53.6mm
	Compression ratio	12.6:1
	Valve mechanism	DOHC (Double Overhead Camshaft)
	Lubrication system	Forced pressure lubrication + splash lubrication
	Cooling System	Water-cooled
	Net engine mass	34kg
Drivetrain	Clutch	Manual wet multi-plate
	Transmission	Constant-mesh two-stage transmission with six-gear speed shifting
	Shift mode	Reciprocating operation by left foot
	Primary transmission ratio	2.91
	Final transmission ratio	/
	Gear transmission ratio	1st gear: 2.58; 2nd gear: 1.80; 3rd gear: 1.33; 4th gear: 1.10; 5th gear: 0.96; 6th gear: 0.88
	Shift mode	1-N-2-3-4-5-6

Item		Parameter
Electric system	Ignition mode	Inductor energy-storage type
	Starting mode	Electric starting
	Lighting system	Battery
	Spark plug model	NGK CR8E
	Spark plug clearance	0.7-0.8 mm
	Regulating rectifier	Three-phase full-wave rectification

Cooling system specifications Unit: mm

Item		Specification
Coolant capacity	Radiator (including all water channels)	1.54 L
Radiator cap relief pressure		108.0-133 kPa

Lubrication system specifications Unit: mm

Item		Standard value	Ultimate state
Oil capacity	Oil level (new or disassembled)	1.7 L	-
	Replace the fine filter element	1.5 L	-
Recommended oil	Brand	Shell dedicated oil	-
	Model	SN 10W-40	-
	Grade	API Quality Grade: SL or above API quality grade: SL or equivalent (do not use the oil marked as energy-saving on the circular API service label).	-

Electronic fuel injection system Unit: mm

Item		Specification
Engine idle speed		2000±100 r/min
Maximum engine speed		12500±100 r/min
ECT sensor resistance (40°C/104°F)		1.2kΩ
Fuel injector resistance (20°C/68°F)		11-13Ω
Oxygen sensor resistance (20°C/68°F)		9Ω

Fuel system specification Unit: mm

Item		Specification
Throttle valve body identification number		250R
Fuel pressure at idle speed		330 Kpa±10kPa
Fuel pump flow (at 12V and 300 kPa)		≥15L/h
Fuel supply system	Type	BOSCH EFI
	Throttle orifice	42mm

Battery/charging system specifications Unit: mm

Item		Specification
Battery	Model	MTX2.7-FPP
	Capacity	2.7AH
	Leakage value	It can be stored for more than one year at 25 °C, and the higher the temperature, the shorter the storage time.
	Voltage (28 °C, 68°F)	Fully charged ≥13.3V
		Need to be charged ≤12.8V
	Charging current	Normal 1.5A
		Fast 15A
Magneto	Charging capacity	8000r/min > 9A
	Charging coil resistance (28 °C, 68 °F)	0.1-1.0 Ω

Front wheel/suspension/steering system specifications Unit: mm

Item		Standard	Ultimate state
Minimum tire thread depth			Tire wear limit marks at Δ TWL mark on sidewall and center of tire
Tire pressure		100 kPa(1.0 kgf/cm ³ , 15 psi)	-
Shaft runout		0.05	0.1
Rim runout	Radial	0.6	1.0
	Axial	0.6	1.0
Front Shock Absorber	Free length of spring	475	-
	Tube runout	-	0.2 (0.008)
	Recommended specifications of shock absorber oil	5W (Viscosity)	
	Shock absorber fluid adding capacity	R: Injection volume of damper: 260 $\pm$ 5 ml Shock absorber: 300 $\pm$ 5 ml	R: Injection volume of damper: 260 $\pm$ 5 ml Shock absorber: 300 $\pm$ 5 ml
Steering bearing preload force		First torque to 40N·m, then loosen and torque to 10N·m, and finally back off by 1/4 turn	

Rear wheel/suspension/system specifications Unit: mm

Item		Standard	Ultimate state
Minimum tire thread depth			Tire wear limit marks at Δ TWL mark on sidewall and center of tire
Tire pressure		100 kPa(1.0 kgf/cm ³ , 15 psi)	
Shaft runout		0.05	0.1
Rim runout	Radial	0.6	1.0
	Axial	0.6	1.0
Drive chain	Size/link	DID 520 DMA 4K SDH / 116 sections	-
	Relaxation	30-55	-
Rear shock absorber		Free length of spring	225mm
		Recommended shock absorber oil	5W (Viscosity)
		Shock absorber oil adding volume	380 $\pm$ 3ml
		Nitrogen volume of gas cylinder	1.2mpa

Hydraulic brake specifications Unit: mm

Item		Standard	Ultimate state
Front brake	Designated brake fluid	DOT4	-
	Brake pad wear	4.8-4.82	To groove
	Brake disc thickness	4.0-4.01	3.5
	Brake disc warping	-	0.15
	Outer diameter of main piston	11.000-11.050	11.060
	Outer diameter of brake caliper piston cylinder	27.000-27.050	27.06
	Outer diameter of brake caliper piston cylinder	30.200-30.250	30.260
Rear brake	Specified brake fluid	DOT4	-
	Brake pad wear	6.4-6.42	To groove
	Brake disc thickness	4.0-4.01	-2.5
	Brake disc warping	-	0.15
	Outer diameter of main piston	9.000-9.050	9.060
	Outer diameter of brake caliper piston cylinder	22.620-22.670	22.680

Torque Value——Vehicle Body

Installment position	Volume used for the position	Specification status	Torque force requirement (N·m)
Connecting bolts between seat cushion and subframe	2	M6x15 Step	8
Bolts connecting left and right front trims of fuel tank and fuel tank	2	M5x13 Step	5
Bolts connecting left and right front trims of fuel tank and water tank	2	M5x13 Step	5
Bolts connecting left and right front trims of fuel tank and frame	2	M5x13 Step	5
Bolts connecting left and right front trims of fuel tank and subframe	2	M5x13 Step	5
Bolts connecting left and right vehicle bodies and subframe	6	M6x13 Step	5
Bolts connecting rear tail cover (upper) and subframe	2	M6x15 Step	8
Bolts connecting rear tail cover (lower) and subframe	2	M6x13 Step	5
Self-tapping screws connecting rear splash guard and front section of rear fender	2	ST4.8x15	3
Bolts connecting license plate and upper bracket	1	M5x13 Step	5
Front brake oil pipe clip and lower connecting plate	1	M6x16 Step	10
Connecting bolt between front fender and lower bracket	4	M6x20	12
Self-tapping screw for connecting front brake oil pipe pressing plate and left front shock absorber trim	2	M5x8	4
Connecting nut between left and right front shock absorber trims and front shock absorber	6	M6x12 Step	8
Locking nut of front wheel axle	1	M16x1.5x1	88
Locking bolt on both left and right sides of lower bottom cylinder of front shock absorber	4	M8x25	22
Connecting bolt between front brake disc and wheel drum	6	M6x12	12(Apply glue)
Connecting bolt between front brake disc and wheel caliper	2	M8x35	36(Apply glue)
Connecting bolt between front brake oil pipe and front brake caliper	1	M10x1.25x22	22
Connecting bolt between brake oil pipe and front upper brake pump	1	M10x1.25x22	22
Connecting bolt between upper connecting plate and front shock absorber	2	M8x35	22
Connecting bolt between lower connecting plate and front shock absorber	2	M8x40	22
Connecting screw between OFF switch button and handlebar	1	Self-tapping screw	1
Connecting screw between ON switch and handlebar	1	Self-tapping screw	1
Connecting bolt between clutch handle and socket	2	M6x20	8
Connecting bolt between oiler and handlebar	2	M6x20	8
Connecting bolt between front brake pump and brake handle	2	M6x20	8
Fastening bolt between steering handle and upper socket	4	M8x30	22
Connecting nut between lower socket and upper bracket	2	Self-locking bolt, M8	22
Fastening nut between upper connecting plate and steering column	1	M24x1	128

Installment position	Volume used for the position	Specification status	Torque force requirement (n·m)
Connecting bolt between lower guard protector and frame	4	M6x12 Step	10
Connecting bolt between small sprocket cover and engine	2	M6x30	10
Connecting bolt between fuel pump and fuel tank	4	M5x16	8
Connecting bolt between rear of fuel tank and frame	2	M6x30	10
Connecting bolt between front of fuel tank and frame	1	M6x16	10
Connecting bolt between seat cushion bracket and fuel tank	2	M5x12	5
Radiator and radiator grille	4	M5x12	5
Connecting bolt between radiator-left/right and frame	4	M6x25	10
Connecting nut between clutch cable and engine	2	M8	8
Muffler heat shield mounting screw	2	M6x12	10
Connecting nut between front section of muffler and engine exhaust port	2	M8x1.25x14	16
Pipe clamp between rear and front section of muffler	1	M7x1x40	22
Connecting bolt between muffler rear section and subframe	1	M8x20	22
Connecting bolt between rear section of muffler and rear subframe	1	M8x20	22
Tilt sensor and fuel tank	2	M5x20	4
Connecting bolt between regulating rectifier and air filter box	2	M6x20	10
Connecting bolt between battery box and battery box cover	2	M5x13 Step	5
Connecting bolt between upper part of battery box and frame	1	M6x16 Step	10
Connecting bolt between battery box and subframe	1	M6x15	10
Connecting bolt between subframe and main frame	4	M8x25	34
Upper guide sprocket and tail frame	1	M8x40	22
Connecting bolt between ECU and air filter	2	M5x12	8
Connecting nut between throttle cable and throttle cable bracket	4	M6	4
Connecting bolt between injector cap and throttle	1	M6x20	8
Connecting bolt between starter motor and upper part of housing	2	M6x30	10
Connecting nut between starter motor and positive wire	1	M6	6
Gear shift arm and engine	1	M6x20	10
Connecting bolt between rear brake pedal and brake arm	2	M5x12	8 (Apply glue)
Connecting bolt between rear brake arm and frame	1	M8x16 Step	22
Connecting bolt between rear brake master pump and frame	2	M6x16	12

Installment position	Volume used for the position	Specification status	Torque force requirement (n·m)
Fastening bolt for oil cup cover of rear master pump	2	M5x10	2
Connecting bolt between brake oil pipe and rear upper brake pump	1	M10x1.25x22	22
Connecting bolt between brake oil pipe and rear brake caliper	1	M10x1.25x19	22
Rear brake pump push rod adjusting and tightening nut	1	M6	8
Connecting screw between oil pipe clip and swingarm	4	M5x12	6
Rear wheel axle locking nut	1	M22x1.5	128
Left and right nuts of swingarm and chain adjusting	2	M8	22
Mounting dowel pin for friction plate of rear brake caliper	1	M6	12
Connecting bolt between rear brake disc and wheel hub	4	M6x16	12 (Apply glue)
Connecting bolt between large sprocket and rear wheel hub	6	M8x27	32
Connecting bolt between chain guide assembly and swingarm	1	M6x13	10
Connecting bolt 2 between chain guide assembly and swingarm	2	M6x55	10
Engine small sprocket cover fastening nut	1	M10x22	88
Connecting screw between chain clip and swingarm	3	Philips half-round head screw	8 (Apply glue)
Connecting bolt between upper part of rear shock absorber and frame	1	M10x52	44
Connecting bolt between triangular cradle and lower part of rear shock absorber	1	M10x1.25x45	44
Connecting bolt between U-cradle and frame	1	M10x1.25x130	60
Double-ended connecting nut between guide sprocket and U-cradle	1	M10	60
Connecting bolt between self-locking nut of guide sprocket and guide sprocket	1	Self-locking nut M8x1.25	22
Connecting bolt between U-cradle and triangular cradle	1	M12x105	60
Connecting self-locking bolt between U-cradle and triangular cradle	1	M12x1.25	60
Connecting bolt between swingarm and triangular cradle	1	M12x85	60
Swingarm shaft fastening nut	1	M16x1.5	88
Connecting bolt between front engine suspension and engine	1	M10x1.25x105	54
Connecting bolt between front engine suspension and frame	2	M8x105	26
Connecting bolt between upper engine suspension and engine	2	M10x1.25x25	54
Connecting bolt between upper engine suspension and frame	4	M8x16	36
Connecting bolt between lower front engine suspension and frame	1	M10x1.25x130	54
Connecting bolt between lower rear engine suspension and frame	1	M10x1.25x130	54

Installment position	Volume used for the position	Specification status	Torque force requirement(n·m)
Air filter tank and subframe mounting bolt	2	M5x13 Step	5
Self-tapping screws connecting rear fender and air filter tank	9	ST4.8x15	2
Mounting screws of ignition coil pressure plate and cylinder head	1	M6x12	10
Steering column locking 4-slot nut	1	M25x1	First torque to 40N·m, then loosen and torque to 10N·m, and finally back off by 1/4 turn

Lubrication and Sealing Points – Engine

Material		Position	Notes
Sealant	1596	Crankcase joint surface	
	1590	Magneto rotor outlet port	
Engine oil		Inner oil pump, entire surface of outer rotors	
		Valve rod sliding surface and rod end	
		Entire surface of timing chain	
		Camshaft rolling surface	
		Inner surface of cylinder bore	
		Outer surface of piston, piston pin hole and piston ring groove	
		Outer surface of piston pin	
		Entire surface of piston ring	
		Entire surface of clutch friction plate	
		Clutch rod sliding surface	
		Shift shaft rod part and shift plate	
		Entire surface of dual gear shaft	
		Entire surface of starting clutch	
		Entire surface of shift fork shaft	
		Inner surface of bearing shell at the big end of crankshaft connecting rod	
		Inner hole at the small end of crankshaft connecting rod	
		Gear teeth (primary drive, crankcase, starting reduction)	
		Sliding surface of disc teeth	
		Rotating area of each bearing	
		Surface of each O-ring seal ring	
Molybdenum disulfide oil		Tappet	
		Camshaft cover surface	
		Cylinder head camshaft hole	
Multipurpose grease		Starter motor seal ring	
		Left trim cover seal ring	
Degreaser		All joint surfaces	

Lubrication and Sealing Points - Vehicle Body

Material	Position	Notes
Multi-purpose high-temperature extreme pressure complex lithium-based grease (Universal SU-T330G grease)	Sliding surface of steering bearing and seat ring	
	Dust-proof seal of steering bearing	
	Rear needle roller bearing and flat bearing	
	Sliding area of smooth portion of upper and lower sliding shafts of front brake caliper	
	Contact area of smooth portion of guide pin of front brake caliper	
	Contact area of front brake upper pump tappet and piston combination rocker arm	
	Contact area of smooth portion of brake handle bolt	
	Sliding area of smooth portion of upper and lower sliding shafts of rear brake caliper	
	Contact area of smooth portion of guide pin of rear brake caliper	
	Contact area of push rod and piston of rear brake upper pump	
	U cradle needle roller bearing	
	Triangular cradle needle roller bearing	
	Throttle handle cable groove and rolled area	
	Clutch control lever sliding area	
	Sliding area of brake pedal rotating shaft	
	Contact area of steering column locking nut, washer, and upper connecting plate	
Multi-purpose high-temperature extreme pressure complex lithium-based grease (Universal SU-T330F)	Contact area of oil seal lip of front wheel hub bearing	
	Contact area of oil seal lip of rear wheel hub bearing	
	Contact area of oil seal lip of rear swing arm	
	Contact area of oil seal lip of rotating area of U-cradle	
	Rotating area of triangular cradle and oil seal lip contact area	
Silicone oil	Contact area of dustproof washer, seal ring, and piston of front brake caliper	
	Contact area of front and rear cups and piston of front brake upper pump	
	Contact area of dustproof washer, seal ring, and piston of rear brake caliper	
	Contact area of front and rear cups and piston of rear brake upper pump	
Shock absorber fluid specialized	Seal lip of front shock absorber oil seal	
	Dust-proof seal lip of front shock absorber	
	O-ring of front shock absorber end cover	
Cable lubricant	Clutch cable	
	Throttle cable	
KOVE dedicated chain lubricant or equivalent	Entire surface of chain	
Medium-strength thread locker (Loctite 243)	Locking nut of engine countershaft/ drive sprocket	
	Front brake caliper mounting bolts	
	Front brake disc mounting bolts	
	Rear brake disc mounting bolt	
	Special-shaped bolt for connecting rear brake arm and frame	
Low-strength thread locker (Loctite 222)	Mounting bolts of rear brake arm and brake pedal	
	Fastening bolts for connecting lower bracket and left/right shock absorbers	

Regular Maintenance and Adjustment

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Maintenance Information

Overview:

This chapter contains all relevant information for conducting the recommended inspections and adjustments. Regular implementation of these maintenance procedures will make motorcycle operation smoother, extend its lifespan, and reduce maintenance costs. The information described in this Chapter applies to motorcycles both already in use and sold yet.

All maintenance technicians shall be familiar with all the information described in this Chapter.

Maintenance Interval Table

During each regular maintenance period, please conduct a pre-driving inspection.

I: inspect, clean, adjust, lubricate or replace if necessary. C: Clean R: Replace L: Lubricate. L: Lubrication.

Item \ Frequency	Notes	Each use for approximately 2.5 hours	Every 3 races for approximately 7.5 hours	Every 6 races for approximately 15 hours	Every 9 races for approximately 22.5 hours	Every 12 races for approximately 30 hours
Gasoline pipeline	(Notes 6)	I				R, *
Fuel pump filter	(Notes 6)					R, *
Accelerator adjustment		I				
Air filter	(Notes 1)	C				
Crankcase vent pipe		I				
Spark plug		I				
Valve clearance	(Notes 4)			I, *		
Engine lubricant	(Notes 3) (Notes 5)	I		R		
Engine oil filter element	(Notes 3)			R		
Engine idle speed adjustment		I				
Piston, piston ring				R, *		
Piston pin				R, *		
Radiator coolant	(Notes 2)	I				
Cooling System		I				
Drive chain		I, L	R			
Drive chain slider		I				
Drive chain roller		I				
Driving sprocket		I				
Driven sprocket		I				
Brake fluid	(Notes 2)	I				
Brake pad wear		I				
Brake system		I				
Clutch system	(Notes 5)	I				
Control cable		I, L				
Exhaust pipe/muffler		I				
Friction ring		I				
Swingarm/Shock absorber connecting rod mechanism			L, *			
Front shock absorber oil	(Notes 3)				R, *	
Nuts, bolts, fasteners		I, *				
Wheels/tires		I				
Steering head bearing					I, *	
Fuel pump unit strainer						R, *

We recommend that you refer to KOVE official maintenance manual to repair these items.

This maintenance plan is based on average riding conditions. Frequent use of the vehicle requires more frequent maintenance.

Notes:

1. Clean the motorcycle in a timely manner after each ride.
2. Replace every two years and mechanical components are required for replacement.
3. Replace after the first running-in period.
4. Inspect after the first running-in period.
5. Replace the engine oil if the clutch friction plate is replaced.
6. Replace annually.

Mark*For safety reasons, we recommend that these items be serviced only by the dealer.

*Inspection of Spark Plug

The following procedure applies to all brake pads.

Disassemble the following parts:

- Remove the seat assembly;
- Front front trim assembly
- Front fuel tank vent pipe;
- Front left and right side fuel tanks;
- Air filter element assembly;
- Ignition coil pressure plate screw M6x12 [1];
- Ignition coil pressure plate [2];
- Spark plug [3].

The installation sequence is reversed from the removal sequence.

Torque:

M6x12

Ignition coil pressure plate mounting bolt

10 N·m (1.0 kgf·m, 7.4 lbf·ft)

Notes:

Before removing the spark plugs, use an air gun to blow around the spark plug seats while ensuring no dust falls into the cylinder.

1. Inspection:

- Spark plug type

Mistake → Replace.

Manufacturer/model

NGK/CR8E

2. Inspection:

- Electrode "1"

Damaged/Consumed → Replace the spark plug.

- Insulator "2"

Abnormal color → Replace the spark plug.

The normal color shall be tan or light tan.

3. Cleaning:

- Spark plug
(using spark plug detergent or wire brush)

4. Measurement:

- Spark plug clearance "a"
(measured with a feeler gauge)

Off-specification → Adjust the gap.

Spark plug clearance

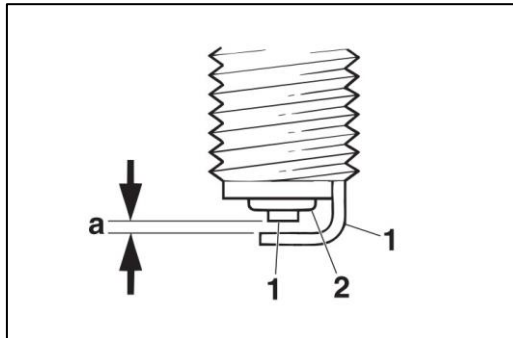
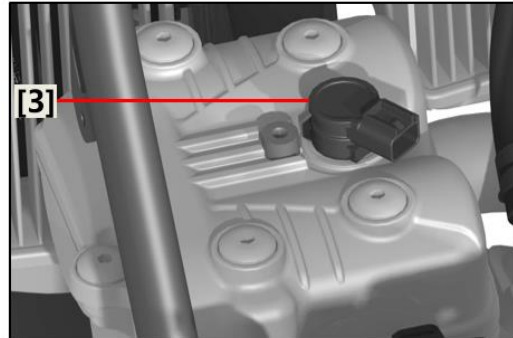
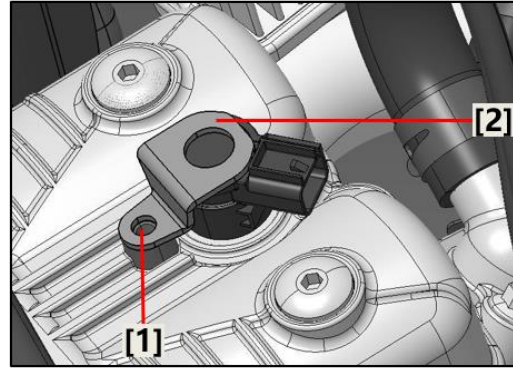
0.80-0.90 mm (0.031-0.035 in)

5. Installation:

- Spark plug

Install the spark plug and tighten it to the specified torque

12 N·m (1.2 kgf·m, 8.8 lbf·ft)



Note:

- Before installing the spark plug, clean the surfaces of the spark plug and the washer first.

※Inspection and Replacement of Engine Oil

Start the engine, warm the motorcycle for several minutes and then turn off the engine. Support the motorcycle upright on a flat surface and place a container under the engine oil bleed bolt.

Disassemble the following parts:

- Engine oil filler cap [1];
- Engine oil bleed bolt [2] and aluminum gasket [3];

Drain the engine oil.

After completely draining the engine oil

Apply engine oil to the threads and seat surface of the engine oil bleed bolt;

Apply engine oil to the new sealing ring;

Install the sealing washer [1] on the engine oil bleed bolt [2];

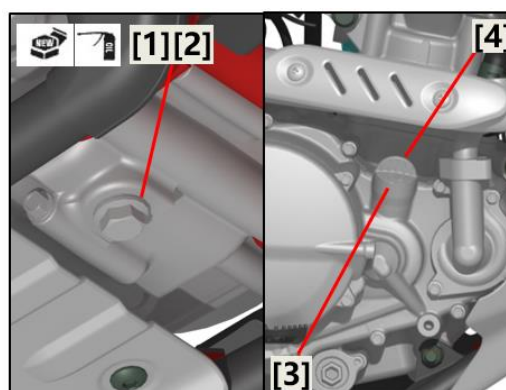
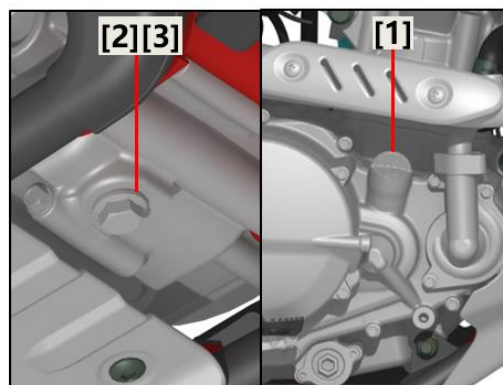
Install the engine oil bleed bolt and tighten it to the specified torque.

Torque:

23 N·m (2.3 kgf·m, 17 lbf·ft)

Inspection

1. Check the engine oil bleed bolt to ensure there is no oil leakage.
2. Check the O-ring on the engine oil filler cap [4], and replace it if damaged.



Engine oil capacity

When replacing the oil filter: 1.5L

When disassembling: 1.7L

Fill the engine with the recommended engine oil.

Recommended engine oil:

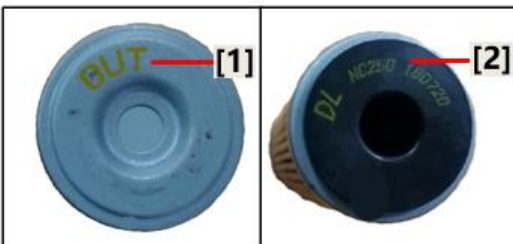
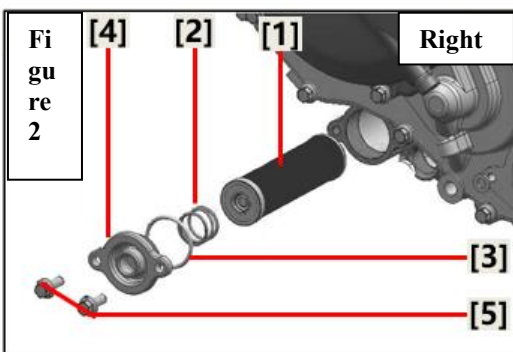
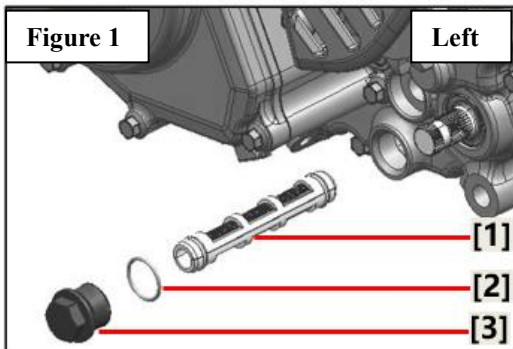
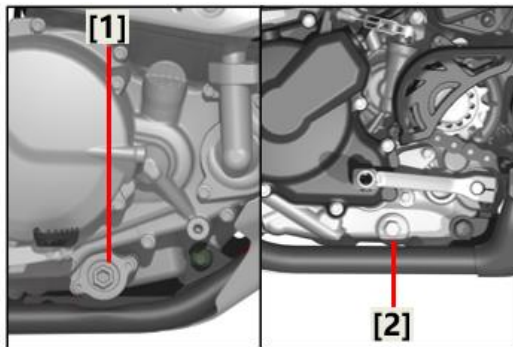
Four-stroke motorcycle oil or equivalent oil.

API service classification: SN or equivalent specification.

JASO T903 Standard: MA

Viscosity: SAE10W-40

Note: The API classification specifies the quality and performance grade of engine oil. Use SN or higher grade oil, excluding oil marked with "Energy Saving" or "Resource Saving" on the circular API service symbol.



※Replacement of Engine Oil Strainer

After completely draining the engine oil

Disassemble the following parts:

- Remove the engine oil strainer cover on the right crankcase [1] to take out the fine-filter strainer;
- Remove the engine oil strainer bolt on the left crankcase [2] to take out the coarse filter strainer.

When replacing the engine oil strainer components,

the required engine oil volume: 1.5L

When reassembling the engine after disassembly,

the required engine oil volume: 1.7L

Installation of Engine Oil Strainer:

①. Installation of the engine oil strainer on the left crankcase (as shown in Figure 1).

Apply a small amount of engine oil to the O-ring [2] of one engine oil coarse filter strainer [1], and install it into the corresponding engine oil strainer hole. Install the O-ring of the engine oil strainer bolt onto the engine oil filter bolt, apply an appropriate amount of grease to the inner hole of the engine oil strainer bolt [3], and fasten it to the crankcase, tightening it to the specified torque.

Torque: 11 - 13 N·m

② Installation of the engine oil strainer on the right crankcase (as shown in Figure 2)

- Install the engine oil filter component [1] into the corresponding hole on the right crankcase.

- Place the fine-filter spring [2] onto the engine oil filter component. Fit the O-ring seal [3] of the fine filter cover into the seal groove of the fine filter cover [4]. Take two small-plate bolts M6×16 [5], insert them into the corresponding mounting holes of the fine-filter cover, and tighten them to the specified torque.

Torque: 7 - 9 N·m

Install the paper filter element [1] with the "OUT" marking on the right facing outwards [2]. The open end shall face the left crankcase during installation.

Inspection of Engine Oil Fine Filter Element and Engine Oil Strainer

Inspect the engine oil strainer (coarse filter) [2]. Damaged → Replace. If not → Clean it.

Inspect the engine oil filter components and the engine oil filter element (fine filter) [1]. **The filter element [1] must be replaced every time the oil is changed.**

※Inspection of Exhaust Pipe

Notes

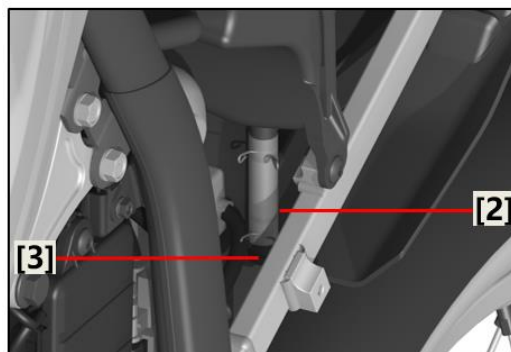
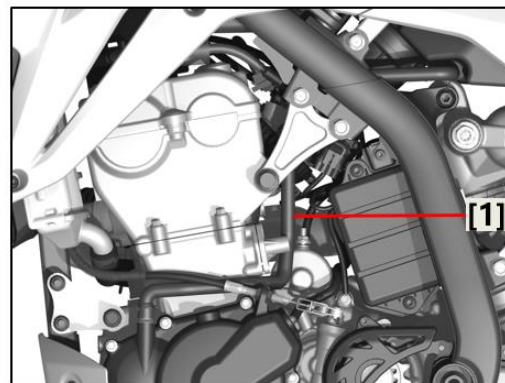
- Maintenance shall be carried out more frequently after the throttle is fully opened in the rain, the motorcycle is washed, or reversed. If a sediment layer can be seen in the transparent tube [2], it needs to be cleaned.

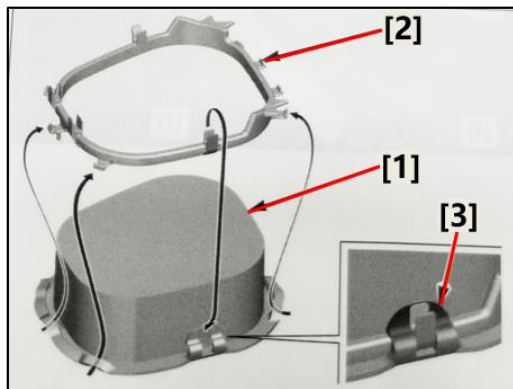
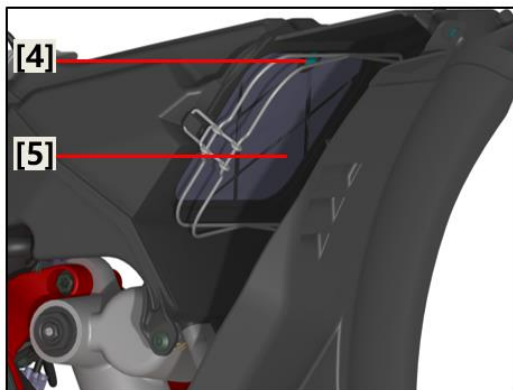
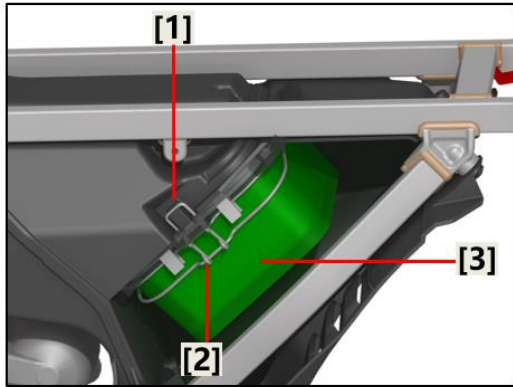
Remove the plug of the transparent air tube [3], drain the sediment into an appropriate container, and then reinstall the plug.

Inspect the crankcase vent hose [1]

Crack/damage → Replace.

Loose connection → Correct connection.





※ Cleaning and Replacement of Air Filter Sponge Element

① . Sponge filter element and filter element bracket

Disassembly/installation

Disassemble the following parts:

- Unhook the hook [1] of the sponge filter element fixing spring [2];
- Open the filter element fixing spring and remove the sponge filter element [3];
- Remove the screws [4] for fixing the metal strainer;
- Take out the metal strainer [5].

The installation sequence is reversed from the removal sequence.

Remove the sponge filter element [1] from the filter element bracket [2].

Note: Be careful not to damage the filter holes [3] of the sponge filter element.

Thoroughly clean the sponge filter element [1] in a cleaning solvent, and then clean it in hot water with detergent or soap solution.

Ensure that there is no dirt or dust in the air filter element. Clean it again if necessary. After cleaning, squeeze out the moisture from the air filter element and let it dry thoroughly.

Note:

Since gasoline or low-flash-point solvents are highly flammable, it is prohibited to use them to clean the air filter sponge filter element.

Apply 50cm³ of KOVE foam air filter oil or equivalents to the inner side of the sponge filter element.

Put the air filter sponge filter element into a plastic bag and evenly apply the air filter oil with both hands.

Note:

Do not use engine oil on the sponge filter element.

※Inspection and Adjustment of Clutch Free Play

Inspect the clutch cable for twists or damage, and lubricate it if necessary.

and lubricate it if necessary.

Inspect the free play [1];

Free play: 10-20mm (0.4-0.8 in)

Adjust it to the specified range if necessary.

Improper adjustment of the free play will cause premature wear of the clutch.

1. Usually, fine-tune at the adjustment knob at the end of the clutch cable. Turning the adjustment knob [1] in the (+) direction will increase the free play, and turning it in the (-) direction will reduce the free play.

(+) Increase free play;

(-) Decrease free play;

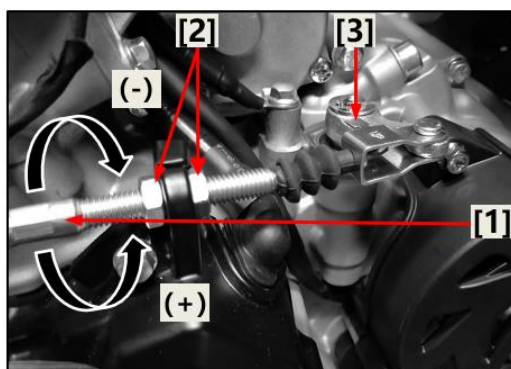
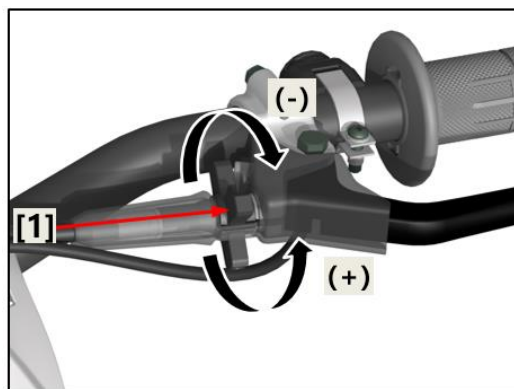
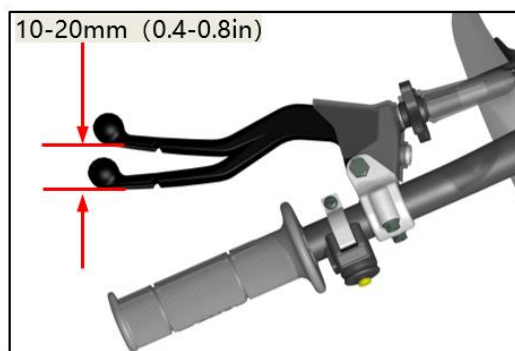
One notch of the adjustment knob [1] is 1/4 turn; If the correct free play cannot be obtained even when the adjustment knob exceeds the adjustment limit, fully screw in and out the adjustment knob for 5 circles, and then make more adjustments on the left case side.

2. Use the lower adjusting bolt [1] on the clutch lifter arm for major adjustments. Loosen the locking nut [2] and turn the adjusting nut as needed to the specified free play. While holding the adjusting nut [1], tighten the 2 nuts [2]. Then put rubber grommets on the tightened nuts, and press the anti-detachment tab [3] of the clutch cable.

Locking nuts [2] torque:

8.0 N·m (8.0 kgf·m, 6.0 lbf·ft)

3. Start the engine, pull the clutch handlebar, shift gears, and ensure that the engine does not stall and the motorcycle does not move unexpectedly. Gradually release the clutch handlebar and open the accelerator. The vehicle shall move smoothly to ensure that the clutch is working properly.



※Inspection and Adjustment of Accelerator Free Stroke

Check whether the throttle cable is aged, damaged or kinked.

Turn the accelerator handle and check that the throttle opens smoothly and closes automatically in any steering position.

If the accelerator handle does not rotate well, check that the cables are wired correctly, the accelerator is clean with recommended lubricant (engine oil or proper cable lubricant), and the accelerator drum rotates normally.

If Ok, but the throttle does not rotate well, replace the accelerator cable (oil inlet and oil return).

Measure the free play at the accelerator handle flange.

Free play: 2-6mm (0.08-0.24 in)

1. Fine-tune on the accelerator side

Loosen the lock nut [1] and turn the adjuster [2]. Turning the adjuster in the (-) direction will reduce the free play, and turning the adjuster in the (+) direction will increase the free play.

After adjustment, hold the adjuster and tighten the locking nut.

If the correct free play cannot be obtained despite turning the regulator to the end, turn it back in the (+) direction until it lightly touches the end, make one turn in the (-) direction, and then make more adjustments on the throttle side.

Nut [1] torque:

5.0 N·m (0.5 kgf·m, 4.0 lbf·ft)

2. Adequately adjust on the throttle side

Loosen the accelerator cable adjuster lock nut [1] and turn the adjuster [2] in the (-) direction to reduce the free clearance and in the (+) direction to increase the free clearance.

After the adjustment, hold the adjuster and tighten the locking nut of the inlet accelerator cable adjuster to the specified torque.

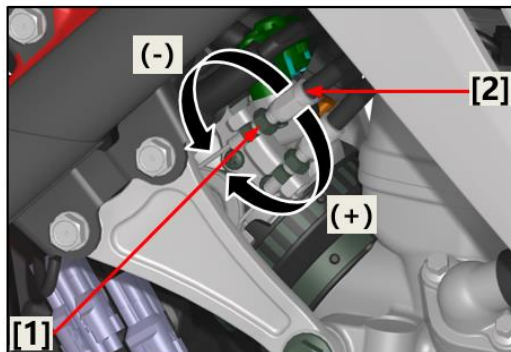
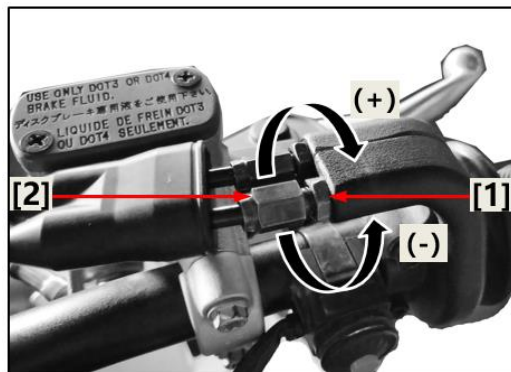
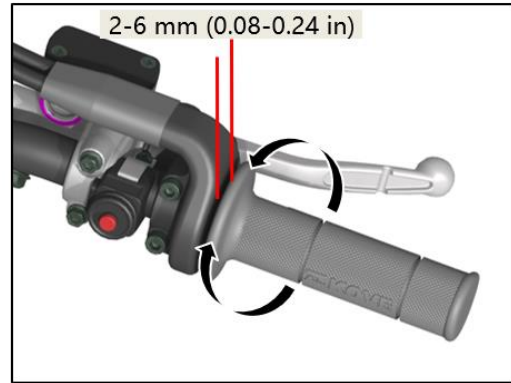
Torque:

4.0 N·m (0.4 kgf·m, 3.0 lbf·ft)

(The oil inlet and oil return cables are subjected to the same adjustment).

Note:

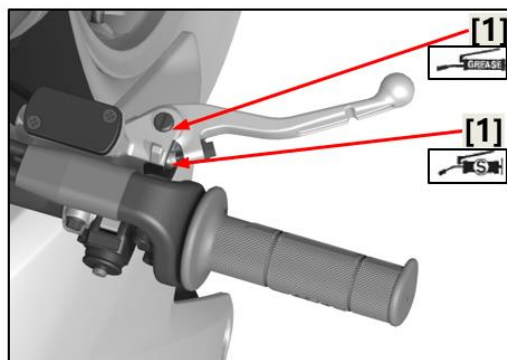
- Re-check whether the accelerator rotates smoothly or not.



※Lubrication of Front Brake Handle

Apply lubrication to the pivot point of the handle and the contact areas of the metal parts [1].

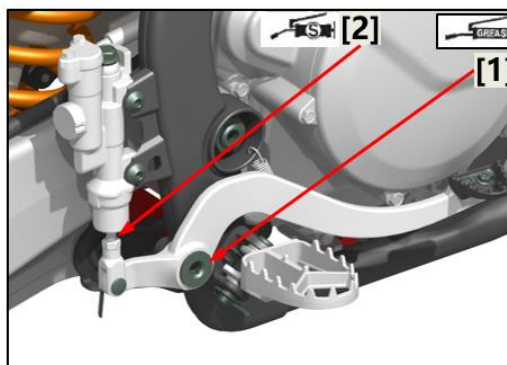
	Recommended lubricating oil Use silicone grease
	Recommended lubricating oil Lithium-based multipurpose grease



※Lubrication of Rear Brake Arm

Apply lubrication to the pivot point of the pedal and the contact areas of the metal parts [1].

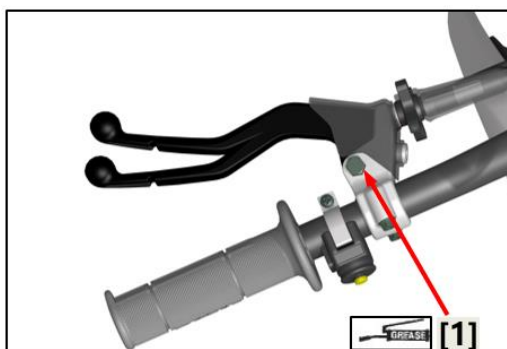
	Recommended lubricating oil Lithium-based multipurpose grease
	Recommended lubricating oil Use silicone grease



※Lubrication of Clutch Handle

Apply lubrication to the pivot point of the handle and the contact areas of the metal parts [1].

	Recommended lubricating oil Lithium-based multipurpose grease
--	--

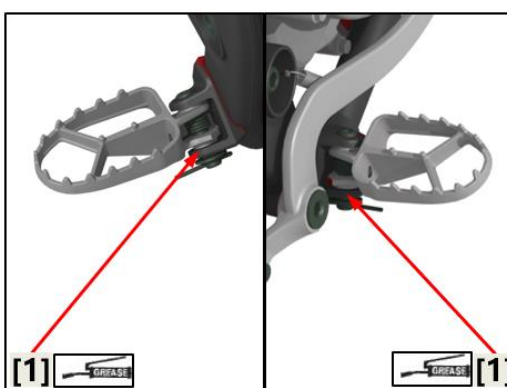


※Inspection and Lubrication of Pedal

The anti-slip teeth of the pedal can be repaired by filing the grooves between the teeth with a triangular file. However, be aware that filing too much will reduce the lifespan of the sole. Only file the tips of the anti-slip teeth. Filing the grooves too deep will weaken the pedal. Make sure that the bolts can rotate freely and keep the cotter pins of the pivot pins in good condition.

Apply lubrication to the pivot point of the pedal and the contact areas of the metal parts [1].

	Recommended lubricating oil Lithium-based multipurpose grease
---	--



※Inspection and Adjustment of Steering Head

1. Stand the vehicle on a flat ground.



Warning

- **Ensure that the vehicle is securely supported and not at risk of tipping over.**

Notes:

- Use a suitable stand to lift the front wheels of the motorcycle.

1. Inspection:

- Upper and lower dustproof washers [1];
Cracked/broken → Replace.

2. Inspection:

- Steering head

Hold the front shock absorber bottom cylinder and gently shake the front fork.

Stuck/loose → Adjust steering head.

3. Disassemble:

- Steering handle
- Upper connecting plate

4. Adjustment:

- Steering head

a. Loosen the steering column fixing 4-slot nut [2].

b. Use a torque wrench to lock the nut to the specified torque.

Notes:

Make sure that the torque wrench is aligned perpendicular to the 4-slot nut socket.

Steering column 4-slot nut (locking torque)

First torque to 40N·m, then loosen and torque to 10N·m, and finally back off by 1/4 turn.

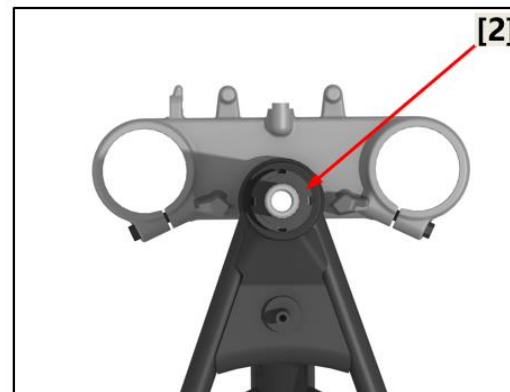
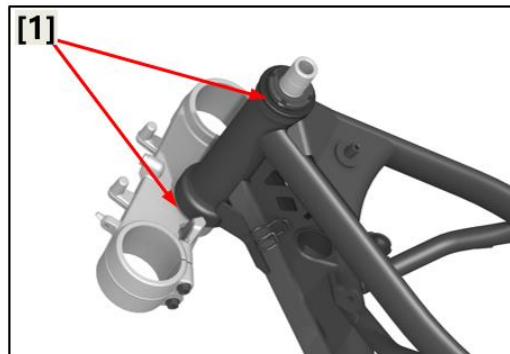
c. After installing the upper bracket and handlebar, rotate the front shock absorber fully to both sides and check for any looseness or sticking in the steering head. In case of dry sticktion, remove the steering column assembly from the lower bracket and inspect the upper and lower bearings.

※Inspection and Lubrication of Front and Rear Wheel Bearing Seal

Regularly clean, inspect and lubricate oil seals, particularly when riding on wet, muddy, or dusty roads.

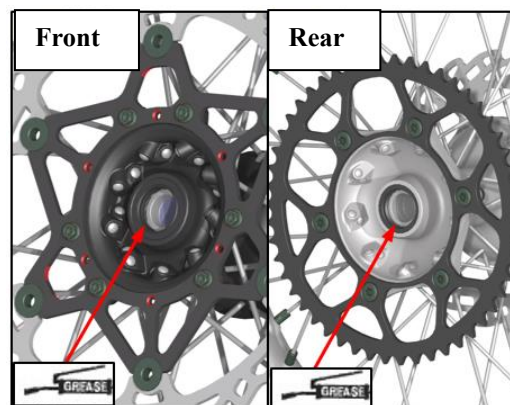
Make sure all dustproof seals are in good condition. During installation, apply a small amount of grease in the groove between the main and auxiliary lips of the oil seal.

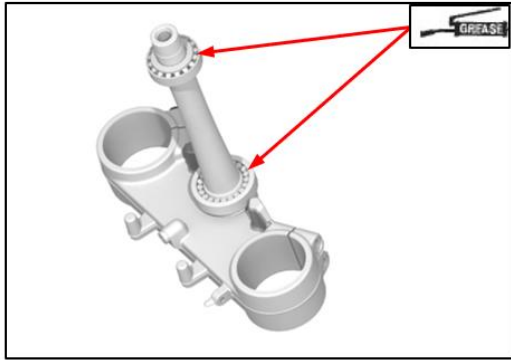
Lubricate with high-temperature extreme pressure composite lithium grease (UNIVERSAL SU-T330G/F or equivalent).



Warning

- **Do not over-tighten the steering column 4-slot nut.**





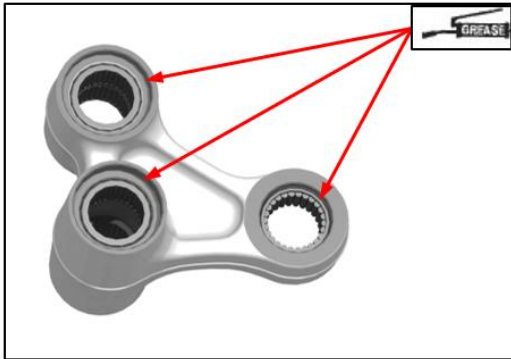
※Inspection and Lubrication of Steering Head Bearing

Regularly clean, inspect and lubricate steering head bearings, particularly when riding on wet, muddy, or dusty roads.

Lubricate with high-temperature extreme pressure composite lithium grease (UNIVERSAL SU-T330G or equivalent).



Recommended lubricating oil
Lithium-based multipurpose grease



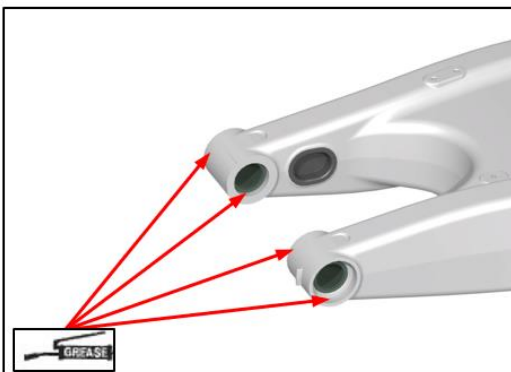
※Inspection and Lubrication of Triangular Cradle

Clean, inspect and lubricate the triangular cradle bearing regularly. Make sure all dustproof seals are in good condition. During installation, apply a small amount of grease in the groove between the main and auxiliary lips of the oil seal.

Lubricate with high-temperature extreme pressure composite lithium grease (UNIVERSAL SU-T330G/F or equivalent).



Recommended lubricating oil
Lithium-based multipurpose grease



※Inspection and Lubrication of Swingarm Axle

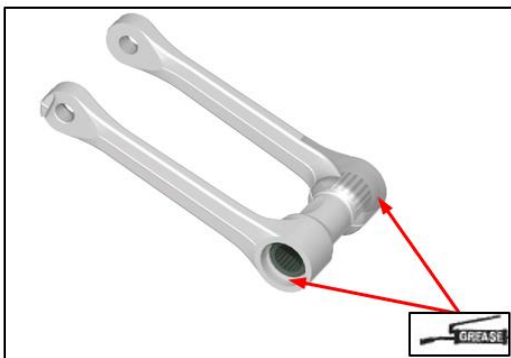
Clean, inspect and lubricate the swingarm bearing regularly. Make sure all dustproof seals are in good condition. Apply a small amount of grease in the groove between the main and auxiliary lips of the oil seal.

Lubricate with high-temperature extreme pressure composite lithium grease (UNIVERSAL SU-T330G/F or equivalent).

Do not attempt to weld or repair damaged swingarms, as welding can weaken the strength of the swingarms.



Recommended lubricating oil
Lithium-based multipurpose grease



※Inspection and Lubrication of U-cradle

Clean, inspect and lubricate the U-cradle bearing regularly. Make sure all dustproof seals are in good condition. Apply a small amount of grease in the groove between the main and auxiliary lips of the oil seal.

Lubricate with high-temperature extreme pressure composite lithium grease (UNIVERSAL SU-T330G/F or equivalent).



Recommended lubricating oil
Lithium-based multipurpose grease

Note:

● For lubrication in the groove between the main and auxiliary lips of the oil seal, please use Universal Grease S-UT330G.

※Inspection of Battery

Disassembly/installation

Disassemble the following parts:

After the vehicle get stall;

- Remove the 2 step screws [1];
- Remove the battery box cover [2];
- Remove the screw at position [3] to disconnect the negative (-) cable of the battery;
- Remove the screw at position [4] to disconnect the positive (+) cable of the battery;
- Remove the battery [5].

The installation sequence is reversed from the removal sequence.

Note:

- The negative wire must be disconnected before disassembling the battery, otherwise the battery will be short-circuited.
- Battery is designed with over-charge protection, and the voltage for over-charge protection is $15.6V \pm 0.3V$.

Charging

Turn off all electrical appliances and the engine;

Remove battery;

Connect the charger to the battery, turn on the charger;

When the charging is completed, turn off the charger, and unplug it from the battery;

Note:

If the vehicle is not in use, recharge its battery every 3 months.

Check charging voltage

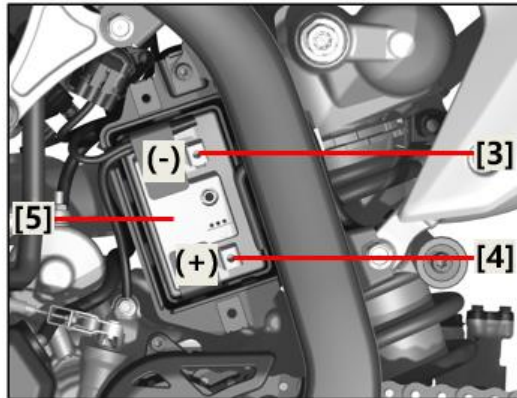
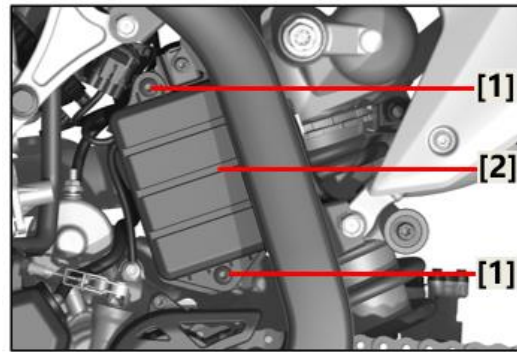
The battery must function properly and be fully charged.

Start the vehicle for a voltage test;

Measuring point positive (+), measuring point grounding (-).

Note:

When measuring the battery voltage after charging, it shall be maintained for at least 30 minutes, otherwise accurate results cannot be obtained due to battery voltage fluctuations after charging.



Torque:

Battery box cover mounting bolts

5.0 N·m (0.5 kgf·m, 4.0 lbf·ft)

Battery terminal step bolt

2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)

Battery specification:

Battery model: MTX2.7-FPP (Lithium battery)

Full charging voltage: > 13.2V

Required charging voltage: < 12.8V

Charging current: standard 1.5A, max. 12A

Operating temperature: -20°C - 60°C

Battery capacity: 12V/2.7Ah

Overall dimension: Length x Width x

Height: 100x60x85(±2mm)

Charging voltage	
5000rpm	13.5V-15.0V

Cooling System

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Section 7 Radiator, Radiator Grille	35

Maintenance Information

Overview:



Warning

Do not remove the radiator cap before the engine and radiator have cooled down, to prevent the coolant from splashing and scalding people.

Note:

Using tap water will cause engine damage.

- Add coolant to the auxiliary water tank. Do not disassemble the radiator cap except when adding or draining the coolant.
- It is not necessary to remove the engine from the frame when servicing the cooling system.
- Avoid spilling coolant on painted surfaces.

Cooling system specification

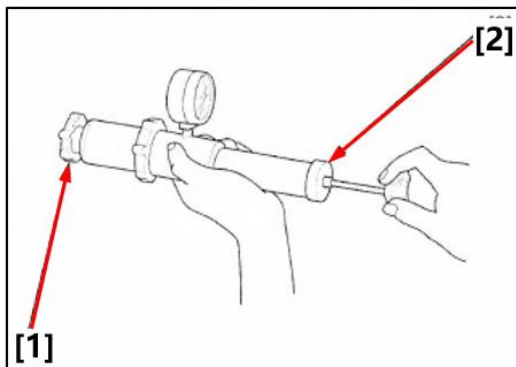
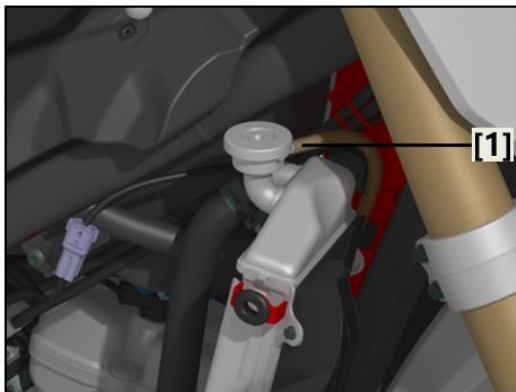
Item		Specification
Coolant capacity	Radiator (including all water channels)	1.54 L
Radiator cap relief pressure		108.0-133 kPa

Troubleshooting

Engine temperature too high

- Coolant temperature indicator fault/water temperature sensor fault
- Thermostat valve not opened
- Insufficient coolant
- Radiator passages, hoses, water pipes blocked
- Air intake in circulation system
- Water pump failure and engine temperature too low
- Coolant temperature indicator fault/water temperature sensor fault
- Thermostat valve opened
- Coolant leakage
- Defects in water pump mechanical mechanism
- O-ring seal ring aged
- Radiator outlet
- Leakage or damage of cylinder head gasket
- Hose connections loosened or hose clamps not tightened
- Hoses damaged or aged
- Radiator damaged
- Thermostat cover and water pump cover pipe joints loose

System Process Mode



Note: This operation shall be conducted when the vehicle is in cold status.

※Cooling System Test

Radiator cap/system pressure detection

- Remove the radiator cap [1].

Lubricate the sealing surface of the cap [1]; Then install the cap onto the tester [2];

Pressurize the radiator cap with a tester.

If the radiator cap cannot maintain the pressure or the released pressure is too high or too low, replace the radiator cap.

The radiator cap must maintain the specified pressure for at least **6 seconds**

Release the pressure of the radiator cap :

108-133 kPa

Connect the detector to the radiator.

Use the detector to pressurize the radiator, engine and hose to check their air tightness.

Note:

- Excessive pressure will damage cooling system components. Do not exceed 133 kPa.
- If the system cannot maintain the specified pressure for at least 6s, repair or replace the component.

※Coolant Replacement/Air Exhausting

When adding coolant to the radiator of the water tank or auxiliary water tank, or checking the coolant level, the motorcycle shall be placed on a flat, horizontal ground and kept in an upright position.

Disassembly/installation

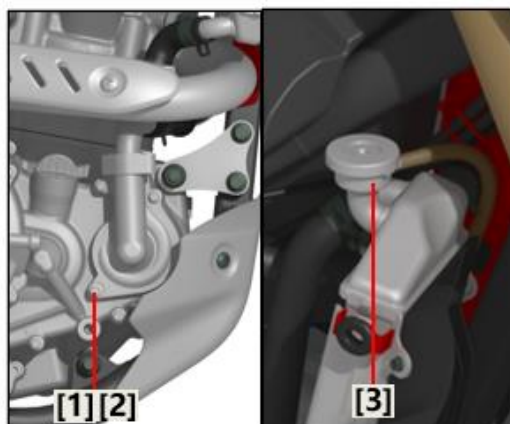
Disassemble the following parts:

- Remove water pump drain bolt [1] and flat washer [2].
- Remove radiator cover [3] and drain coolant.

Torque:

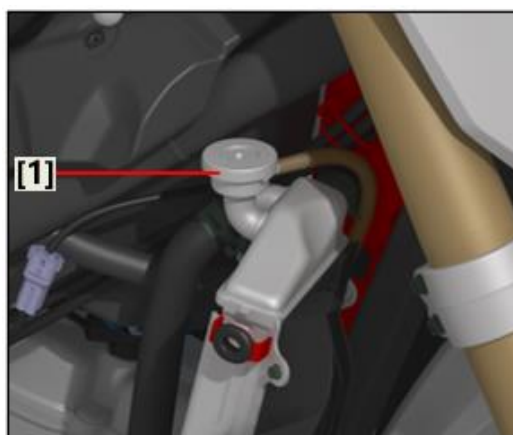
Water pump drain bolt:

10 N·m (1.0 kgf·m, 7.4 lbf·ft)



After the vehicle is turned off, wait for a while until the vehicle cools down before performing the following operations to avoid the risk of scalding due to excessive coolant temperature.

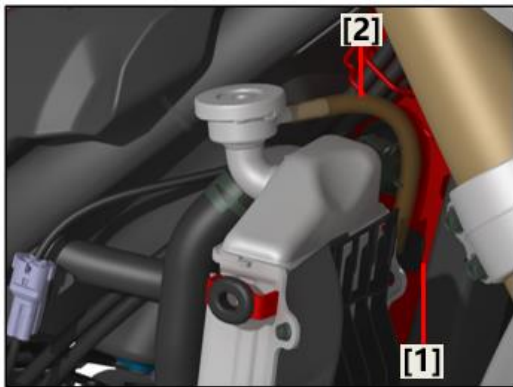
Using the water hole, fill the cooling system with the recommended coolant up to the neck [1].
Recommended antifreeze: Ethanol-containing silicate-free coolant



Air venting inside the radiator

Exhaust air from the radiator system as follows:

1. Shift the engine into neutral, start it, and let it idle for 2-3 minutes.
2. Open and close the accelerator for 3 or 4 times to remove the inside air completely.
3. Shut down the engine and, if necessary, fill the coolant.
4. Install the radiator cap. Fill the storage tank with the recommended coolant and install the fairing.



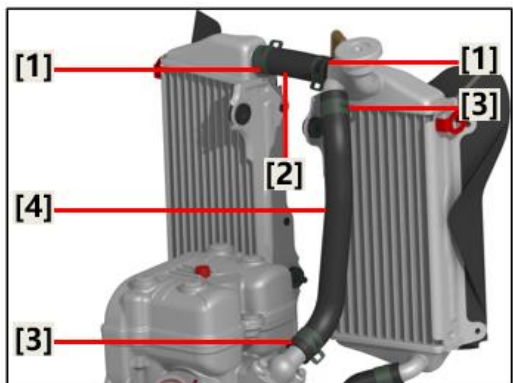
※ Pressure Relief Pipe and Pressure Relief Fixing Socket

Disassembly/installation

Disassemble the following parts:

- Remove the pressure relief fixing socket [1];
- Remove the pressure relief pipe [2].

Note: This operation shall be conducted when the vehicle is in cold status.



※ Engine Outlet Pipe, Inlet Pipe and Connecting Pipes of Left and Right Radiators

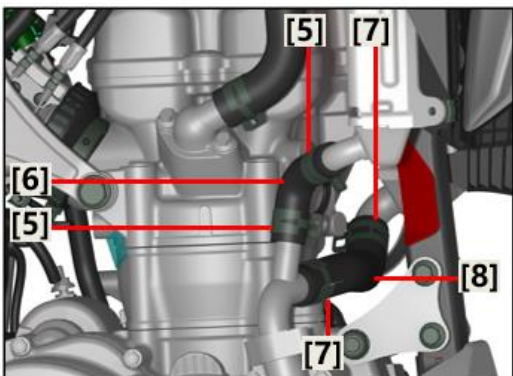
Use special water pipe clamps for disassembly and assembly.

①. Left and right radiator connecting pipes

Disassembly/installation

Disassemble the following parts:

- Remove the connecting pipe clamps [1] of the left and right radiators;
- Remove the connecting pipes [2].



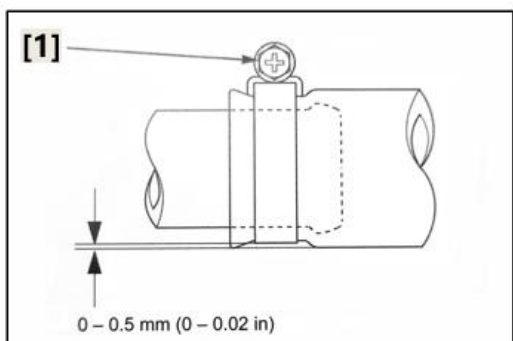
②. Engine inlet pipe

- Remove the inlet pipe clamp [3];
- Remove the radiator inlet pipe [4].

③. Engine outlet pipe

- Remove the outlet pipe clamp [5] of the right radiator;
- Remove the outlet pipe [5] of the right radiator;
- Remove the outlet pipe clamp [5] of the left radiator;
- Remove the outlet pipe [5] of the left radiator;

Note: Try to thoroughly drain antifreeze in the radiator and water channel in advance when the vehicle is in cold state.



As shown in the right figure: It is a diagram of the connecting pipe clamps of the left and right radiators.

※Radiator, Radiator Grille

① Right radiator and grille

Disassembly/installation

Disassemble the following parts:

- Remove 1 M5x12 screw [1];
- Remove the radiator grille [2];
- Remove two radiator mounting bolts [3] and flat gaskets;
- Remove the right radiator [4].

The installation sequence is reversed from the removal sequence.

Torque:

M5x12

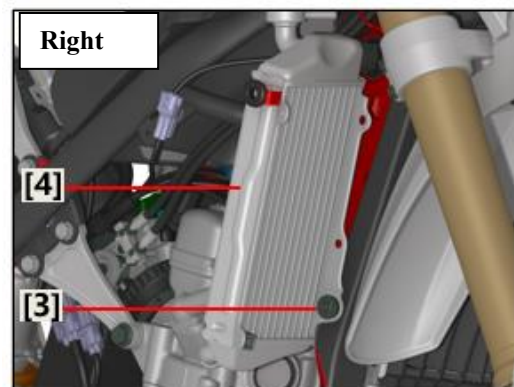
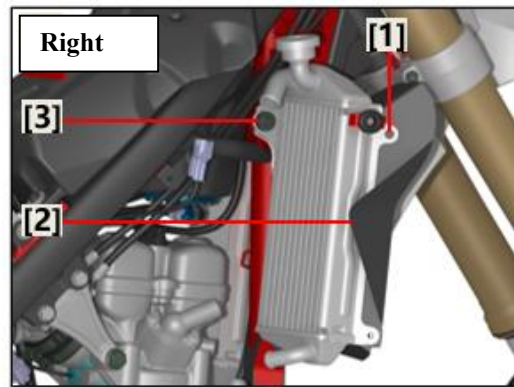
Radiator and radiator grille

5.0 N·m (0.5 kgf·m, 4.0 lbf·ft)

M6X25

Connecting bolts between right radiator and frame

10 N·m (1.0 kgf·m, 7.4 lbf·ft)



② Left radiator and grille

Disassembly/installation

Disassemble the following parts:

- Remove 1 M5x12 screw [1];
- Remove the radiator grille [2];
- Remove two radiator mounting bolts [3] and flat gaskets;
- Remove the right radiator [4].

The installation sequence is reversed from the removal sequence.

Torque:

M5x12

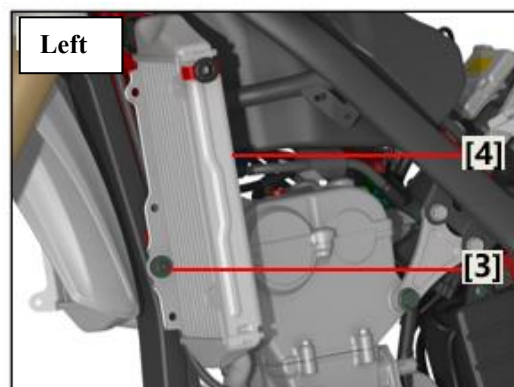
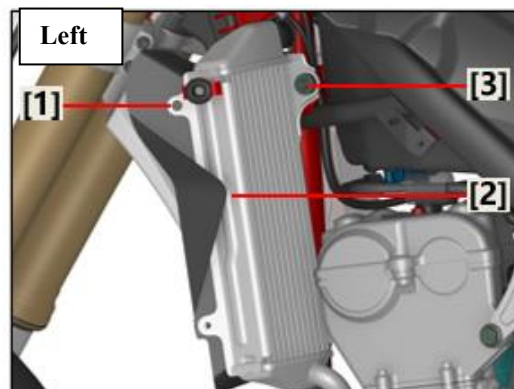
Radiator and radiator grille

5.0 N·m (0.5 kgf·m, 4.0 lbf·ft)

M6X25

Connecting bolts between left radiator and frame

10 N·m (1.0 kgf·m, 7.4 lbf·ft)



Cylinder Head Assembly

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Maintenance Instructions

※Cylinder Head Component

1. Precautions

- The camshaft journal is lubricated by the oil passage in the cylinder head bracket. No foreign matter shall enter the oil passage, otherwise it may easily cause engine damage.
- During assembly, an appropriate amount of lubricating oil must be applied to the camshaft holes in the cylinder head, the camshaft holes in the cylinder head bracket, and the camshaft journal.
- The cylinder head bracket and the cylinder head must be used in pairs.

2. Main parameters and maintenance standards of cylinder head components

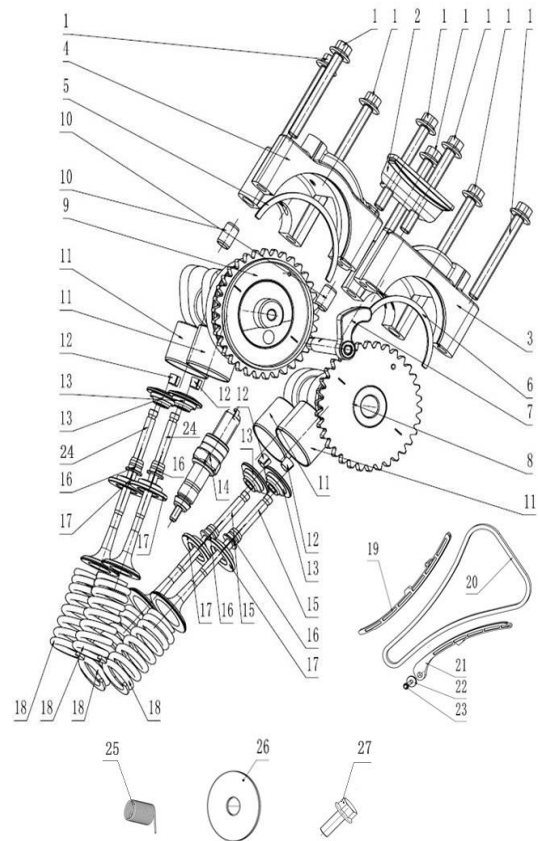
S/N	Item		Standard value	Maintenance limit value	Notes
1	Free length of valve spring		40.1	39.3	
2	Valve clearance	Intake valve	0.10-0.15	<0.05 or > 0.25	
		Exhaust valve	0.15-0.20	<0.10 or > 0.30	
3	Camshaft base circle runout		0.01	0.03	
4	Valve guide bore diameter		5.005-5.015	5.035	
5	Valve rod diameter	Intake valve	4.972-4.987	4.96	
		Exhaust valve	4.960-4.975	4.94	

3. Analysis of fault phenomena and causes

S/N	Fault phenomenon	Cause analysis	Notes
1	Low air pressure in cylinder	Valve clearance too small	
		Valve sealing not tight	
		Incorrect valve timing	
		Breakage of valve spring	
		Spark plug and cylinder head air leakage at mounting position	
		Cylinder head gasket assembly not tightly sealed	
		Cylinder head cracks or blowholes	
2	Black smoke in exhaust	Valve guide wear	
		Oil shield leakage or damage	
		Leakage of cylinder head gasket assembly	
3	Excessive noise or abnormal sound	Valve clearance too large	
		Stuck of valve or broken valve spring	
		Incorrect valve timing	
		Camshaft wear	

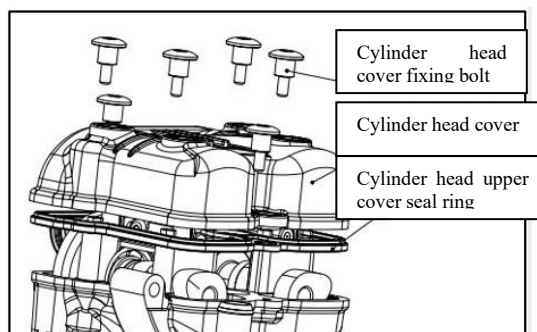
※Cylinder Head Assembly Drawing

S/N	Component Name
1	Cylinder head bracket fixing bolt
2	Chain pressure plate
3	Intake bracket assembly
4	Exhaust bracket assembly
5	Exhaust camshaft bearing C-ring
6	Intake camshaft bearing C-ring
7	Exhaust camshaft pressure-relief valve flyweight assembly
8	R Intake camshaft component
9	R exhaust camshaft component
10	Camshaft bracket dowel pin
11	Valve tappet (DLC-coated)
12	HIPER50 Valve lock clip
13	Valve spring upper seat
14	EFI spark plug (NGK_CR8E)
15	R Intake valve
16	HIPER50 Oil shield assembly
17	Valve spring lower seat
18	R Valve spring
19	R Chain guide panel
20	R Timing chain assembly
21	R Tensioning panel (2#)
22	Tensioning panel bushing
23	GB16674 Small-plate bolt M5×25
24	R Exhaust valve
25	Cam pressure-relief valve return torsion spring (2#)
26	Camshaft pressure-relief valve baffle (φ6.5×2×φ25)
27	GB16674 Small-plate bolt M6×20



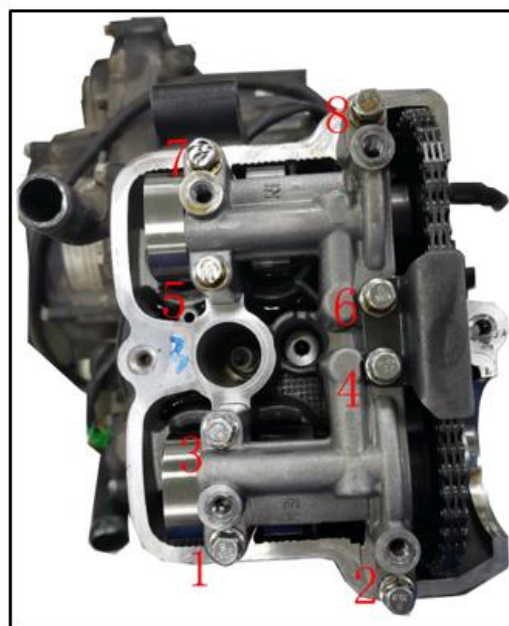
※Disassembly of Cylinder Head Cover

1. Use an M5 hexagon socket wrench to remove the 6 cylinder head cover fixing bolts on the cylinder head cover, as shown in the right figure;
2. Remove the cylinder head cover;
3. Remove the seal ring of the upper cover of the cylinder head.



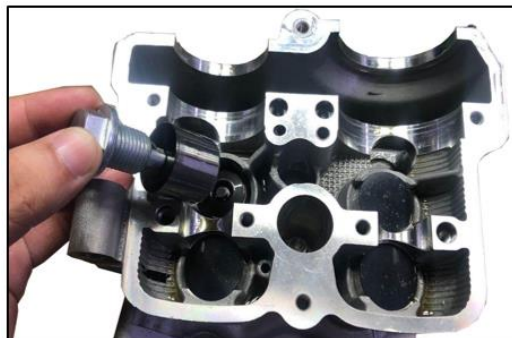
※Disassembly of Cylinder Head

1. Use a 10# wrench to remove the M8 nut [1] on the tensioner, and use an 8# wrench to remove the 2 bolts M6×20 that fasten the tensioner. Then remove the tensioner assembly and the tensioner gasket;
2. Remove the GB/T16674 small-plate M6×25 bolts connecting the cylinder head and the cylinder block;
3. Remove the 8 M6×50 NC250S cylinder head bracket fixing bolts, and then remove the intake and exhaust camshaft brackets, the intake and exhaust camshaft C-rings, and the intake and exhaust camshafts in sequence;
4. Remove the 4 NC250 cylinder head - cylinder block bolts M10×129, and then remove the 4 cylinder head - cylinder block bolt washers 10.5×2×20.



※Disassembly of Cylinder Head

1. Use a magnetic magnet to take out the four valve tappets;
2. Use a valve disassembly tool to press down the valve spring and remove the valve lock clips;
3. Remove the valve spring upper seat, the valve spring, and the valve.



Notes:

1. When disassembling the valve tappets, pay attention to record the specifications of the valve tappets. Record the specifications of the valve tappets corresponding to the respective valves. During assembly, install the tappets according to the corresponding valves.
2. To prevent permanent deformation of the valve spring, do not over-compress the valve spring. Only compress it enough to remove the valve lock clips.
3. All the removed parts shall be marked properly to ensure they are assembled back to their original positions.

Adjust the valve clearance according to different valve tappet specifications
Intake: 0.1 - 0.15mm
Exhaust: 0.15 - 0.2mm
※Inspection of Valve and Valve Spring

1. Check if the valve is bent or if the valve rod has abnormal wear. Measure the outer diameter of the valve rod. Maintenance limit value:

Intake: $\phi 4.96\text{mm}$
Exhaust: $\phi 4.94\text{mm}$

2. The maintenance limit value of the contact surface width is: 1.5mm

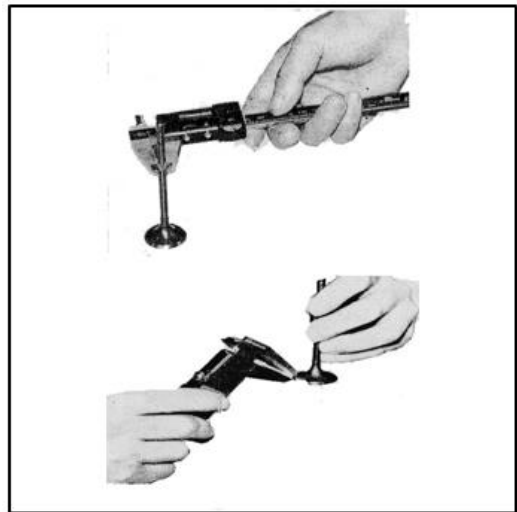
3. Check if the valve spring has abnormal wear and measure the spring length:

Length:
Free length: 40.1mm
Maintenance limit value: 39.3 mm
※Inspection of Camshaft Components

1. Check if there is wear on the camshaft lobe tips, base circles, and journals. Check if the camshaft bearings rotate flexibly and if there is pitting on the sprocket. If there is severe wear, pitting, or if the bearing rotation is jammed, replace the camshaft components with new ones.

2. Check if the pressure-relief valve flyweight assembly has cracks, if the spring fails to rebound, and if there is looseness between the pressure-relief valve centrifugal flyweight and the core shaft. If any of these issues emerges, replace the pressure-relief valve flyweight assembly.

Note: The surface of the camshaft lobe is phosphated. If the phosphate coating is worn and there is no obvious unevenness when touched by hand, it is considered normal wear.



※Inspection of Cylinder Head

1. Check whether the cylinder head has good sealing performance. If the sealing is poor, replace the cylinder head or the valves with new ones.
2. Check whether there are cracks in the spark plug hole and the valve seat.
3. Check whether the cylinder head is deformed, and use a straightedge and feeler gauge to check the flatness of the cylinder head.

Note: Check the flatness of the end face [1] of the cylinder head.



※Inspection and Grinding of Valve Seat

Completely clean the carbon deposits in the combustion chamber. Apply a thin and even layer of red marking compound on the valve seat. Place the valve on the valve seat and tap it gently without rotating. Then take out the valve. If there are interruptions in the contact marks on the valve working surface, the valve seat shall be ground for repair.

First, clean the carbon deposits on the intake and exhaust valve seats. Then apply grinding compound on the valve seats. Then use a grinding tool with a rubber head to suck the valve and grind the valve seats.

※Inspection of Valve Guide

Measure the inner diameter of each valve guide with a dial indicator and record the data.

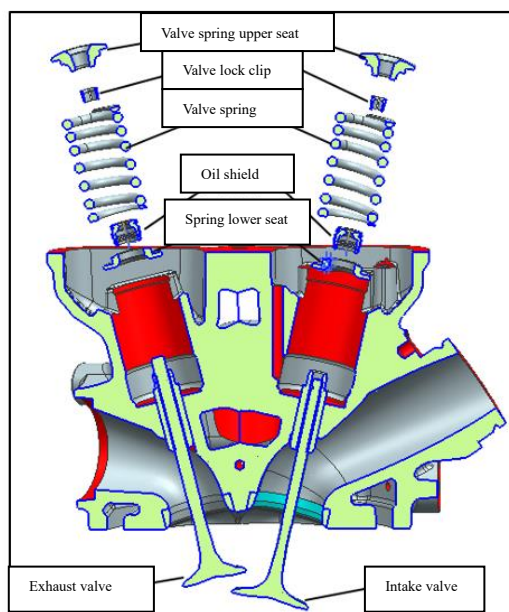
Maintenance limit value: $\phi 5.035$ mm

Note:

Before measuring the inner diameter of the valve guide, completely clean the carbon deposits inside the guide. If the valve guide is severely worn, only the cylinder head can be replaced, as the guide cannot be replaced individually.

※Assembly of Cylinder Head

1. Install the valve spring lower seat and the oil baffle onto the valve guide.
2. Apply lubricant to the intake and exhaust valve stems, then install them into the valve guides. Install the valve springs, valve spring upper seats, and valve lock clips.
3. Use the valve disassembly tool to press down the valve spring, and then install the valve lock clips into the valve spring seats.
4. Check whether the valve lock clips are properly assembled.
5. Conduct an air-tightness test on the assembled cylinder head assembly. If there is no leakage, the next operation can be carried out.



※Adjustment of Valve Clearance

1. Install the removed valve tappets into the corresponding valve tappet holes in the order of disassembly.

2. Install the intake and exhaust camshafts into the intake and exhaust camshaft bracket holes. Then install the bracket dowel pins, intake and exhaust camshaft C-rings, and intake and exhaust camshaft brackets in sequence. For the camshaft bracket bolts, first pre-tighten the two bolts near the dowel pin to $5\text{N}\cdot\text{m}$, then pre-tighten the other two bolts at the diagonal corners, and finally tighten them to $10\text{N}\cdot\text{m}$. After torque tightening, rotate the camshaft to check if it rotates flexibly. If it rotates flexibly, proceed to the next step of checking the valve clearance. If it doesn't rotate flexibly, re-disassemble and reassemble (the camshaft must be able to rotate after torque tightening. If it still can't rotate after multiple disassembly and assembly attempts, replace the cylinder head).

3. Check the valve clearance with a feeler gauge, as shown in the figure:

Valve clearance requirements:

Intake: $0.1 - 0.15\text{mm}$

Exhaust: $0.15 - 0.20\text{mm}$

Maintenance limit value:

Intake $< 0.05\text{mm}$ or Intake $> 0.25\text{mm}$;

Exhaust $< 0.10\text{mm}$ or Exhaust $> 0.30\text{mm}$.

If the valve clearance exceeds the maintenance limit value, adjust the valve clearance by changing the specification of the valve tappet.



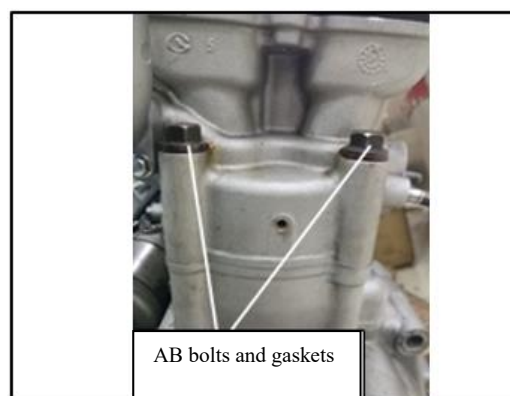
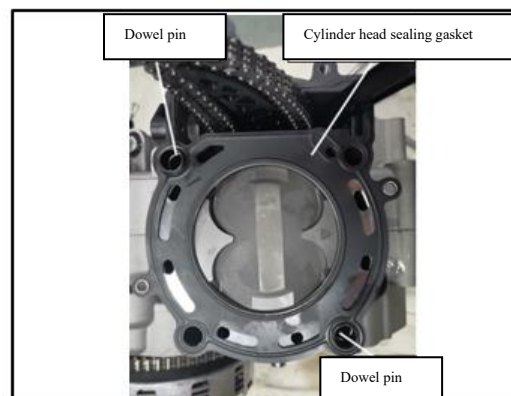
※Installation of Cylinder Head

1. Replace with a new cylinder head gasket assembly, install the dowel pins, and assemble the cylinder head with the adjusted valve clearance.

2. Install the cylinder head-cylinder block bolts and washers onto the AB bolt holes, and then tighten the bolts. The tightening torque is $55 - 60\text{N}\cdot\text{m}$.

3. Install two GB/T16674 small-plate bolts M6×25 for connecting the cylinder head and the cylinder block into the connection holes and tighten them. The tightening torque is $11 - 13\text{N}\cdot\text{m}$.

4. Install the intake and exhaust camshafts onto the cylinder head, then install the timing chain onto the timing driven sprockets of the intake and exhaust camshafts. Then check if the engine is in the timing position (see the figure on the right for the timing position). If it is not in the timing position, readjust the engine's timing position. Then install the large inspection hole cover and the rocker shaft positioning plate bolts onto the left front cover.



※Methods of Engine Timing Adjustment

(1). Use a 17mm socket to rotate the magneto locking nut counterclockwise. At the same time, observe through the inspection hole on the left front cover whether the timing scale line "T" on the magneto rotor is aligned with the timing mark on the left front cover.

(2). After the above-mentioned timing marks are aligned, pay attention to observe whether the timing marks on the intake and exhaust timing driven sprockets are parallel to the upper end face of the cylinder head.

Only when both (1) and (2) are satisfied, the engine is in the correct timing position.

Note: The four timing index lines [1] on the intake and exhaust sprockets are parallel to the end face of the cylinder head simultaneously.

5. Snap the C-rings of the intake and exhaust camshafts into the slots of the camshaft bearings, install 4 dowel pins, assemble the intake and exhaust camshaft brackets onto the intake and exhaust camshafts. Pass two bolts through the chain pressure plate holes and install them on the chain side. Then, install the remaining 6 bracket positioning bolts into the corresponding bracket bolt holes in sequence;

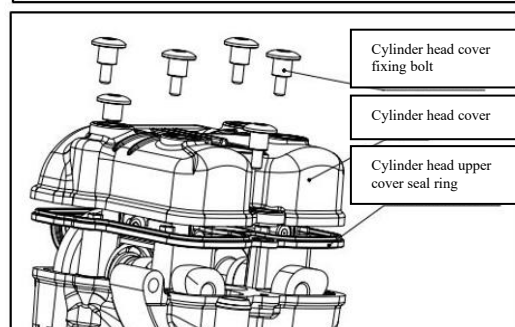
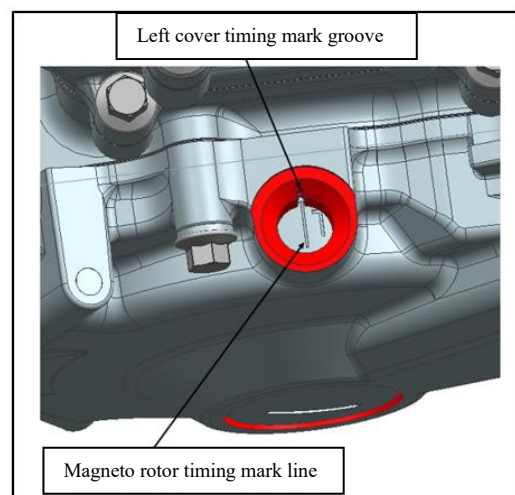
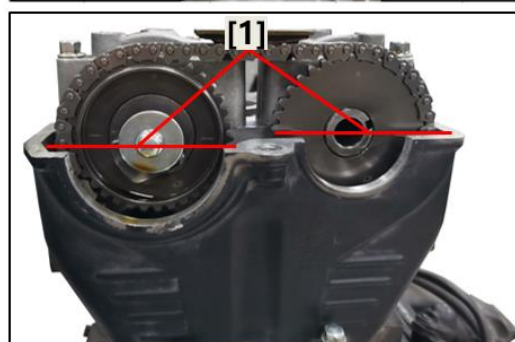
Tightening of the cylinder head bracket bolts (taking the intake bracket as an example): First, pre-tighten the two bolts near the bracket dowel pin (pre-tightening torque $5\text{N}\cdot\text{m}$), then pre-tighten another two bolts, and finally tighten the 4 bracket bolts to $10\text{N}\cdot\text{m}$ (the tightening method of the exhaust bracket bolts is the same as that of the intake). After the bolts are tightened, turn the intake and exhaust camshafts by hand. If they rotate flexibly, proceed to the next step. If they don't rotate flexibly, repeat Step 5. If they still can't rotate after repeated attempts, replace the cylinder head;

6. Install the tensioner into the corresponding holes on the cylinder block and fasten it with 2 GB/T16674 small-plate bolts M6×20. Finally, install the tensioner spring, seal ring, and bolts in place.

※Installation of Cylinder Head Cover

1. Assemble the cylinder head seal ring onto the cylinder head cover;

2. Fit the cylinder head cover onto the cylinder head, and then fix the cylinder head cover with the cylinder head cover fixing bolts (there is a Derbi125 head cover bolt buffer washer between the bolt and the cylinder head cover). The tightening torque of the cylinder head cover fixing bolts is $10\text{N}\cdot\text{m}$.



Cylinder Block, Piston

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Maintenance Instructions

Cylinder Block, Piston

1. Precautions

The lubricating oil for the cylinder head reaches the cylinder head through the oil hole beside the AB bolt on the left engine block. Before installing the cylinder block, make sure the oil hole beside the AB bolt on the left engine block is unobstructed; otherwise, engine will be damaged;

Do not let dust or dirt penetrate into the crankcase.

2. Main parameters and maintenance standards of cylinder block and piston

2. Main parameters and maintenance standards of cylinder block and piston						
S/N	Item		Standard value		Maintenance limit value	Notes
1	Cylinder block	Cylinder diameter		77-77.01	77.1	
		Cylindricity		0.005	0.01	
		Flatness of cylinder surface		0.03	0.05	
		Cylinder clearance		0.03-0.041	0.07	
2	Piston	Skirt diameter, H=7		76.6-76.7	76.58	
		Pin hole diameter		16.001-16.007	16.015	
		Clearance between piston pin and piston pin hole		0.001-0.015	0.025	
3	Piston ring	Closed clearance	First ring	0.15-0.30	0.45	
			Second ring	0.30-0.45	0.6	
			Oil ring	0.20-0.70	1.4	
		Side clearance	First ring	0.03-0.07	0.08	
			Second ring	0.02-0.06	0.08	
4	Outer diameter of piston pin		15.992-16	15.988		

3. Analysis of fault phenomena and causes

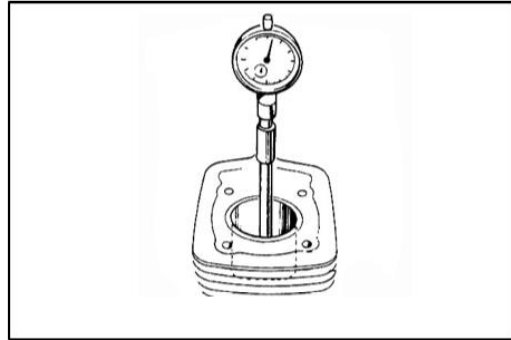
S/N	Fault phenomenon	Cause analysis	Notes
1	Low pressure in cylinder	Abnormal wear of cylinder block or piston ring	
2	Black smoke in exhaust	Abnormal wear of cylinder block, piston or piston ring	
		Piston ring incorrectly installed	
		Scratches or abrasions on piston or cylinder wall	
3	Engine overheating	Excessive carbon deposition on piston	
		Insufficient coolant or poor coolant circulation	
4	Knocking or abnormal noise	Wear of piston pin or cylinder block	
		Excessive carbon deposition on piston	

※Disassembly of Cylinder Block

1. Remove the cylinder head gasket assembly;
2. Remove the dowel pins;
3. Remove the chain guide panel;
4. Remove the cylinder block.

※Inspection of Cylinder Block

1. Check whether the cylinder block has any wear or damage;
2. Measure the inner diameter of the cylinder block at three positions: the top, middle, and bottom of the piston stroke. When measuring, take measurements in two directions perpendicular to each other.
3. Maintenance limit value: 77.1mm.

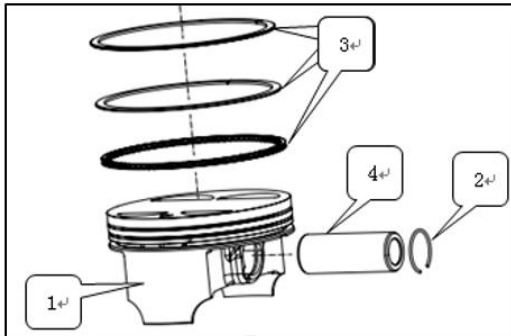


※Disassembly of Piston and Piston Ring

1. Remove the piston pin retainers with needle-nose pliers;
2. Remove the piston pins;
3. Remove the piston;
4. Remove the piston rings.

Note:

Do not let the piston pin retainers fall into the crankcase when removing them.



※Inspection of Piston and Piston Ring

1. Measure the outer diameter at a height of 7 mm from the piston skirt

Maintenance limit value: 76.58 mm;

2. Calculate the cylinder-piston clearance

Maintenance limit value: 0.07 mm

3. Measure the inner diameter of the piston pin hole

Maintenance limit value: $\phi 16.015$ mm;

4. Check if there is any wear on the piston and piston ring grooves, and measure the side clearance between the piston rings and the piston ring grooves

Maintenance limit value:

First ring: 0.08 mm

Second ring: 0.08 mm

5. Install the piston rings into the cylinder and then measure the closing clearance

Maintenance limit value:

First ring: 0.45 mm

Second ring: 0.60 mm

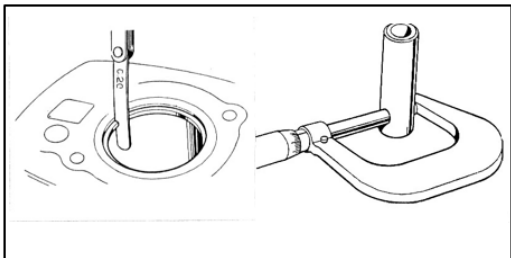
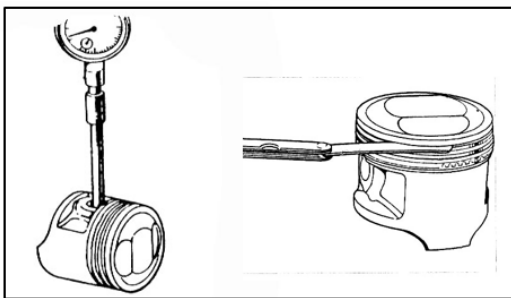
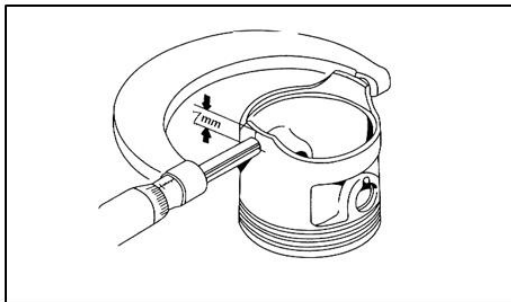
Oil ring: 1.40mm

6. Measure the outer diameter of the piston pin

Maintenance limit value: 15.988 mm

7. Calculate the clearance between the piston pin hole and the piston pin

Maintenance limit value: 0.025 mm



※Installation of Piston Ring

1. Clean the piston ring grooves thoroughly;

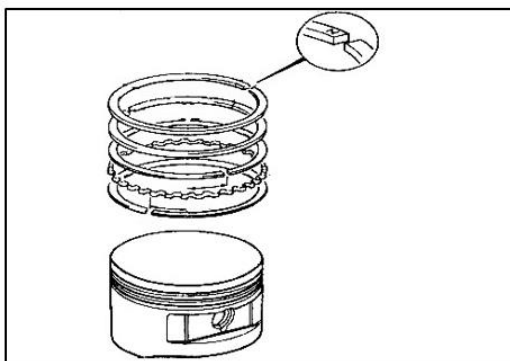
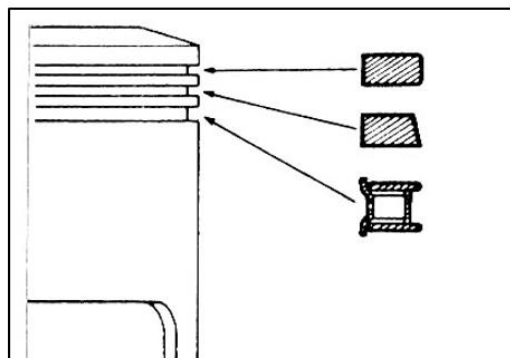
2. Install the piston rings;

Note:

(1) During installation, prevent the piston and piston rings from being damaged;

(2) When installing the piston rings, the marked sides of the first-ring and second-ring shall face the top of the piston, and their openings shall be staggered by 180° towards the piston skirt. The openings of the two oil rings shall be staggered by 120° - 180° and shall not be aligned with the piston pin hole. Each piston ring shall rotate freely.

3. The gaps between the rings of the oil ring shall match the gaps of the spacer ring. When installing the oil ring, install the spacer ring first, and then install the side rails.



※Installation of piston

1. Install the piston pin retainer into the piston retainer grooves;

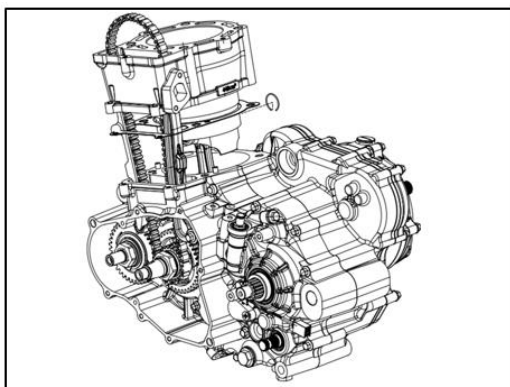
2. Install the piston and piston pin onto the small end of the connecting rod;

Note:

(1) When assembling the piston, the side of the piston top marked with the "△" symbol shall face the exhaust side of the engine;

(2) If the piston pin retainers are severely deformed, replace them with new ones.

3. Install the piston pin retainer on the other side.



※Installation of Cylinder Block

1. Install the cylinder block dowel pins and a new cylinder block gasket;

2. Apply lubricating oil evenly on the surfaces of the cylinder block, piston, and piston rings;

3. Assemble the cylinder block in place;

4. Install the chain guide plate in place.

Note:

Avoid damaging the piston rings when installing the cylinder block

Right Cover, Clutch, Starting Mechanism, Shift Mechanism

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Maintenance Instructions

Right Cover, Clutch, Starting Mechanism, Shift Mechanism

1. Precautions

◆After removing the right cover, the disassembly, installation, and maintenance work of the clutch, oil pump, and Shift Mechanism can be carried out without removing the engine.

◆If there is a malfunction in the operation of the clutch, it can usually be better corrected by adjusting the free play of the clutch handlebar.

2. Main parameters and maintenance standards

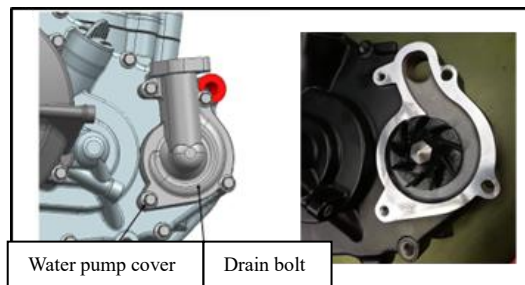
S/N	Item		Standard value	Maintenance limit value	Notes
1	Clutch	Free length of spring	32.3-33.3	32.3	
		Free thickness of driving plate	2.95-3.05	2.85	
		Flatness of driven plate	0.1	0.14	
		Clearance between housing and friction plate	0.1-0.3	0.6	
2	Oil pump	Radial clearance between inner and outer rotors	0.06-0.15	/	
		Axial clearance between rotor and cover plate end face	0.04-0.1	/	

3. Analysis of fault phenomena and causes

S/N	Fault phenomenon	Cause analysis	Notes
1	Clutch slipping during acceleration	Insufficient free play	
		Decline in force value of clutch release spring	
		Worn clutch plate	
2	Handlebar pressure too large	Clutch cable stuck, damaged or dirty	
		Lifting mechanism damage	
3	Vehicle moves slowly after releasing the clutch	Free play too large	
		Worn clutch friction plates	
4	Difficult clutch operation	Sliding groove of the clutch has burrs on outer cover	
5	Low oil pressure	Oil pump failure	
		Oil pump driven gear breakage	
6	Shift pedal fails to return	Return spring broken	
		Interference between shift shaft and crankcase cover	
7	Difficulty in gear shift	Worn or bent stop plate	
		Improper adjustment of clutch	
8	Shift gear misalignment	Shift positioning plate spring is broken or has insufficient elasticity	
9	Cylinder temperature too high	Water pump impeller fault	
10	Difficult electric starting	Starter motor fault	

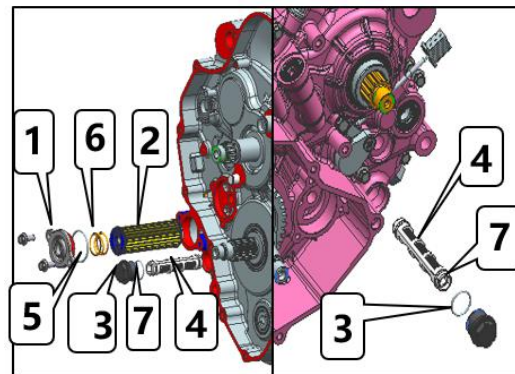
※Disassembly of Water Pump Impeller

Remove the bleed bolt of the water pump cover and drain the cooling water in the engine from the drain bolt. After no water flows out from the bleed bolt, remove the water pump cover and the impeller.



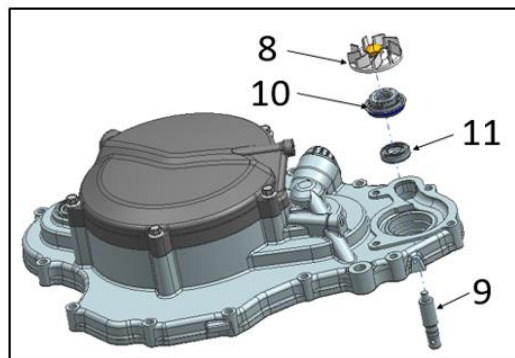
※Disassembly of Right Crankcase Cover

1. First, drain the engine oil completely. (Remove two fastening bolts M6×16 of the right oil fine-filter cover (1), take off the oil fine-filter cover (1), remove the NC250 reverse-gear fine-filter spring (6), take out the fine-filter component (2), remove the oil strainer covers (3) of the left and right cases, take out the oil strainer assembly (4) in the case, wait until the oil in the case drains out completely. When removing the oil strainer cover again, check whether the O-rings (5), (7) of the oil strainer cover are damaged or not.)
2. Remove the connecting screws and take off the right crankcase cover.



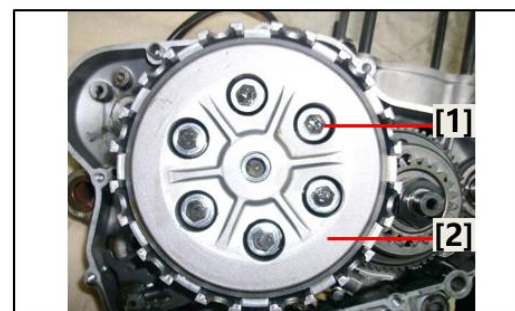
※Disassembly of Water Pump Shaft, Water Seal Assembly, Oil Seal

1. Remove the water pump impeller (8) and take out the water pump shaft (9);
2. Take out the water seal assembly (10) and the oil seal (11) in the water pump shaft hole.



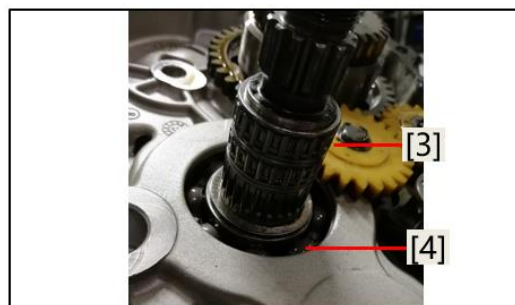
※Disassembly of Clutch

1. Remove the clutch pressure plate springs and bolts [1].
2. Take off the clutch pressure plate, clutch pull rod and friction plates.
3. Remove the clutch lock nut and washer.
4. Remove the clutch center bushing [3], housing [2], clutch bushing and washer [4].
5. Take out the clutch push rod in the center hole of the main shaft.



Note:

When loosening the clutch pressure plate bolts, loosen them in a cross-pattern for two or three times.

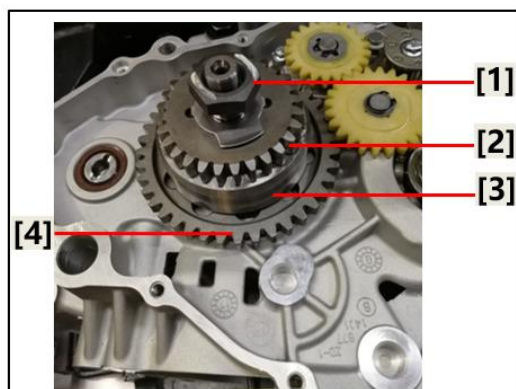


※Disassembly of Driving Gear, Overrunning Clutch, Starting Big Gear

1. Remove the locking nut [1] of the driving gear and the locking nut washer;
2. Remove the overrunning clutch [3] and the starting big gear [4].

Note:

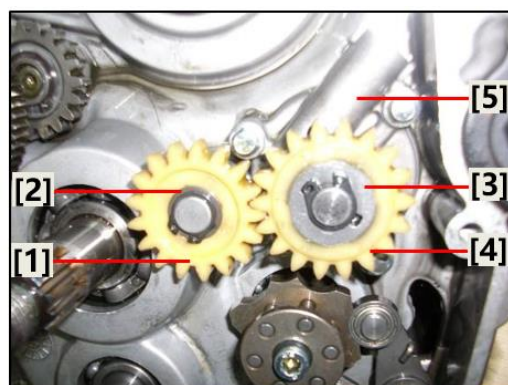
When disassembling the starting big gear assembly, remove the washer of the starting big gear together with the starting big gear, and keep the washer properly.



※Disassembly of Oil Pump in Right Block

1. Remove the idler gear of the oil pump [1] and the retainer of the oil pump idler gear tooth [2];
2. Remove the retainer and washer assembly [3] of the oil pump gear, and the oil pump gear [4];
3. Remove the three GB/T16674 small-plate bolts M6×18 of the right oil pump cover plate [5], and take off the oil pump cover plate assembly and the inner-outer rotor assembly of the oil pump.

Note: There is one washer for the oil pump idler gear tooth above and below the oil pump idler gear. Keep the removed retainers, washers and oil pump pins properly to avoid loss.



※Disassembly of Duplex Gear

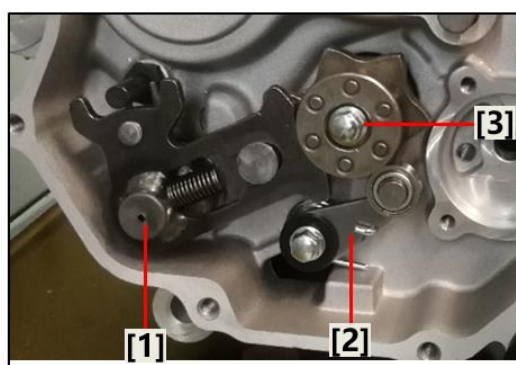
First, remove the GB/T894.4 retainer 15 in the retainer groove of the duplex gear shaft, then take off the duplex gear washer, and finally remove the duplex gear.

※Disassembly of Starter Motor

Remove the fastening screws of the starter motor and take off the starter motor.

※Disassembly of Shift Mechanism

1. Remove the fastening screw GB70.1 M6×35 of the five-star plate, and take off the five-star plate [3].
2. Remove the shift arm component [1];
3. Remove the fastening screw of the positioning plate assembly, and then remove the positioning plate washer and the positioning plate assembly [2].



※Inspection of Right Crankcase Cover

1. Check whether the crankshaft oil seal of the right crankcase cover is damaged. If the oil seal is found to be broken, a new oil seal needs to be replaced.

When replacing the crankshaft oil seal,

Note:

● **Confirm whether the state of the oil seal is correct. The end face [1] of the NC250 crankshaft oil seal shall have the mark "TCV". The marked side shall face outwards during assembly.**

2. Check whether the starting shaft oil seal is damaged. If the oil seal is found to be broken, a new oil seal needs to be replaced.

3. Check whether the water pump impeller has cracks and whether the inserts of the water pump impeller are loose. If there are such phenomena, a new water pump impeller needs to be replaced.

4. Check whether the water seal assembly and the oil seal are broken, and check whether the wear of the water pump shaft is abnormal and whether there is a bending phenomenon. If so, a new water seal assembly, oil seal and new water pump shaft need to be replaced.

When replacing the water seal assembly, oil seal and water pump shaft, please note: (1) Apply an appropriate amount of engine oil in the NC250 water pump shaft hole,

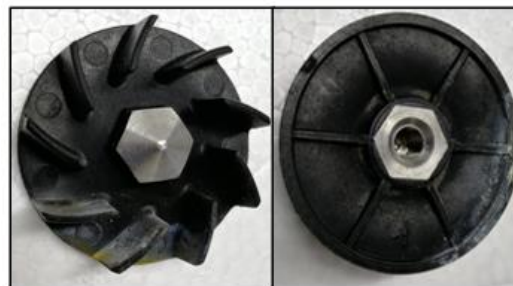
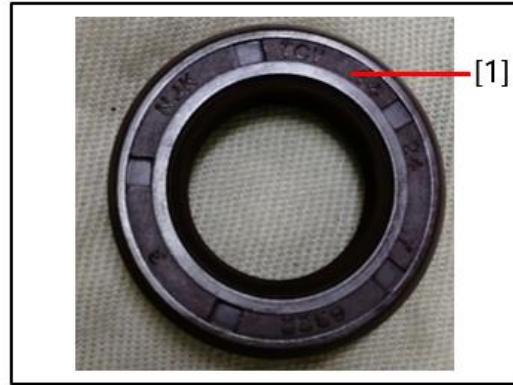
and use special tools to press-fit the NC250 water pump shaft oil seal in place. The marked end face of the oil seal shall face outwards.

(2) Use special tools to press-fit the NC250 water pump shaft water seal in place, 0.5mm lower than the end face. The marked end face of the water seal shall face inwards during assembly;

(3) Apply an appropriate amount of grease (grease model: MYSTIK JT-6) on the main lip of the water seal;

(4) Use special tools to press-fit the new water pump shaft in place;

(5) Install the GB893.1 retainer 22 into the retainer groove of the water pump hole. The assembled water pump shaft shall rotate flexibly.

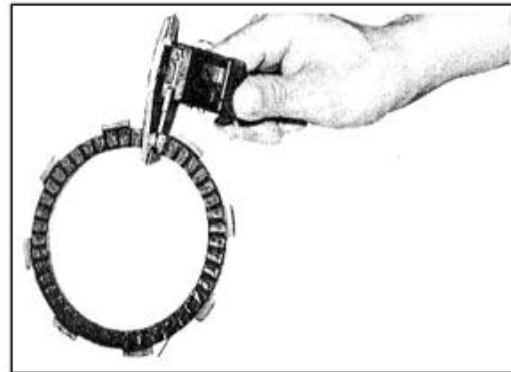
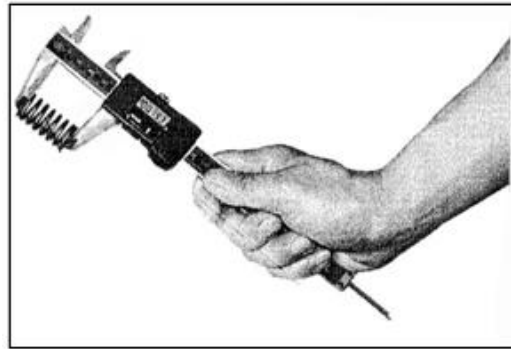


※Inspection of Starting Shaft

Check whether the gears on the starting shaft are worn. This step can be skipped if the engine has only electric starting.

※Inspection of Clutch

1. Measure the free length of the clutch spring.
Maintenance limit value: 32.3 mm
2. If there are signs of scratch or discoloration on the clutch friction plates, they shall be replaced.
Measure the thickness of each clutch friction plate.
Maintenance limit value: 2.85 mm
3. Check whether the surface of the clutch driven plate is distorted.
Maintenance limit: 0.14 mm
4. Check the clearance between the clutch outer cover and the friction plate.
Maintenance limit: 0.6 mm
5. Check whether there are notches or scars on the tooth grooves of the drum-shaped outer cover due to the friction of the clutch disc. If severe, the outer cover needs to be replaced.



※Inspection of Driving Gear

Check whether the driving gear is worn or damaged. If the wear and damage are relatively severe, a new driving gear needs to be replaced.

※Inspection of Overrunning Clutch

Remove the snap-ring on the end face of the overrunning clutch, and check whether the wedges of the overrunning clutch are worn or damaged.

Overrunning clutch housing [1]
Overrunning clutch wedge [2]

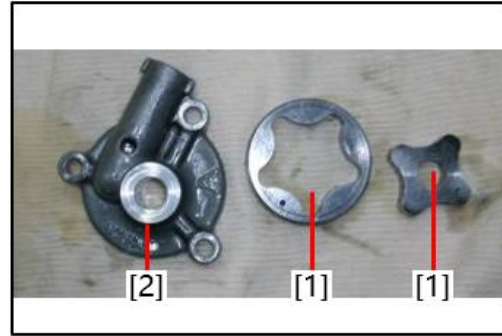


※Inspection of Starting Big Gear

Check whether the large starting gear is worn or damaged.

※Inspection of Oil Pump in Right Block

1. Check whether the inner and outer rotors [1] of the oil pump show signs of wear and damage. If the wear and damage are severe, replace with a new oil pump rotor assembly.
2. Check whether the idler gear of the oil pump and the oil pump gear combination are cracked. If so, replace with new idler gear of the oil pump and oil pump gear assembly
3. Check whether the right oil pump cover plate [2] shows signs of wear and damage. If there are such signs, replace with a new right oil pump cover plate.

**※ Inspection of Starter Motor and Duplex Gear**

Check whether the gear grooves of the starter motor are damaged.

Check whether the duplex gear shows signs of wear and damage.

※Inspection of Shift Mechanism

Check whether the positioning plate roller is worn and whether it rotates flexibly.

※Inspection of Starting Shaft

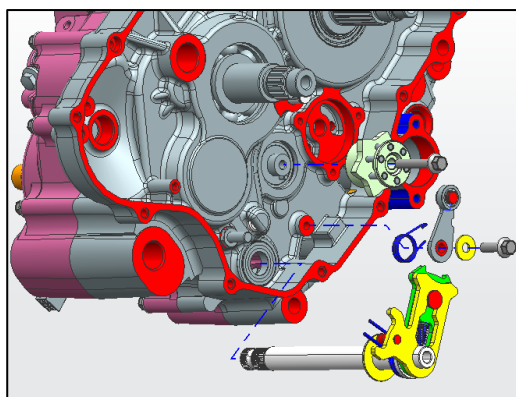
Install the starting shaft into the corresponding starting shaft hole on the right-side. This step can be skipped if there is only electric starting.

※Assembly of Duplex Gear

1. Install the duplex gear onto the duplex gear shaft on right block.
2. Install the duplex gear washer onto the end face of the duplex gear.
3. Install the GB894.1 retainer 15 into the snapping groove on the duplex gear shaft.

※Assembly of Shift Mechanism

1. Install the positioning plate assembly onto right block and fasten it.
2. Install the five-star plate onto the transmission drum. Pay attention to align the notch with the transmission drum pin, then install and fasten the fastening screw.
3. Install the gear-shifting arm. After installing the gear-shifting arm, first check whether the gear-shifting is correct. If it is correct, continue with the assembly.



※Assembly of Oil Pump in Right Block

1. First, install the oil pump pin into the pin hole on the oil pump shaft.
2. Install the rotor assembly into the hole of the right case. Use 3 GB/T16674 small-plate screws M6×18 to fasten the oil pump cover plate assembly to the oil pump rotor.

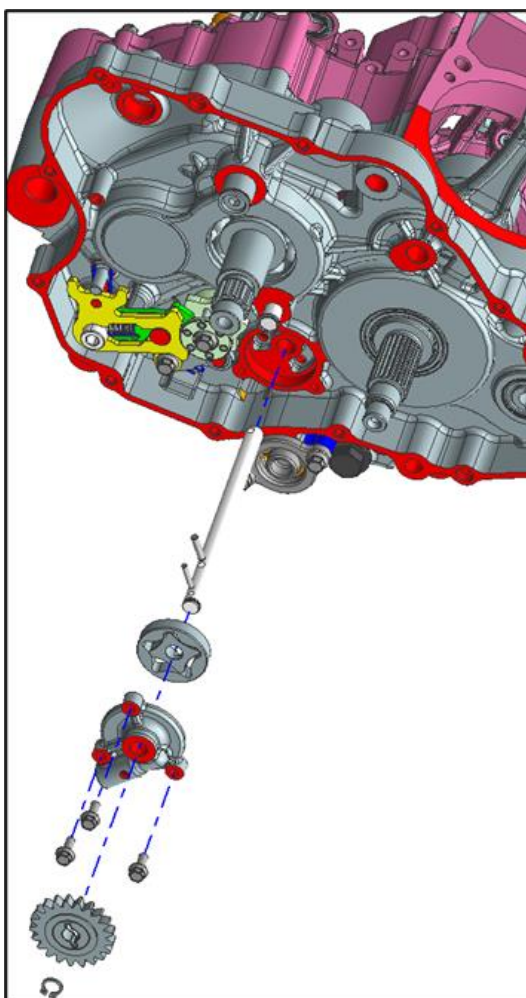
Note:

When installing the oil pump rotors, the marked surfaces of the inner and outer rotors shall face the same direction;

The tightening torque of the oil pump cover plate bolts: 7 - 9 N·m;

After assembling the cover plate, ensure that the oil pump shaft rotates flexibly.

3. Install the oil pump gear assembly onto the oil pump shaft and install the GB894.1 retainer 10 into the snap-ring groove on the oil pump shaft.
4. Install the oil pump idler gear washer onto the oil pump idler gear shaft, then install the oil pump idler gear onto the oil pump idler gear shaft. Next, install another oil pump idler gear washer onto the oil pump idler gear. Finally, install the GB894.1 retainer 10 into the snap-ring groove on the oil pump idler gear shaft.

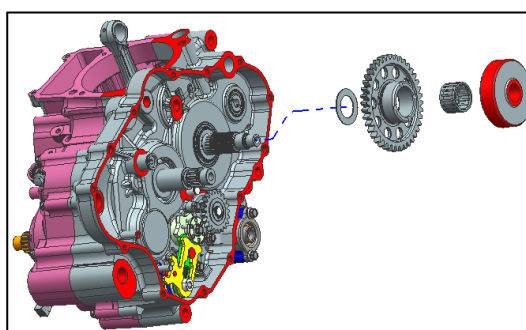


※Assembly of Starting Big Gear and Overrunning Clutch

1. Install the big starting gear washer onto the right crank,
2. Install the big starting gear and the overrunning clutch onto the right crank.

Note:

- Before installing the large starting gear, evenly apply a layer of grease on the inner hole of the large starting gear.
- When assembling the overrunning clutch, be careful not to install the wedge blocks reversely.

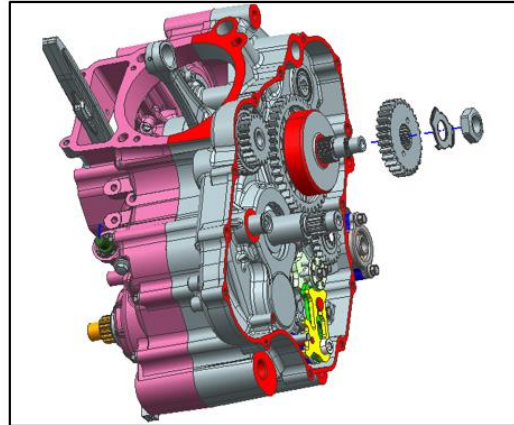


※Assembly of Driving Gear

1. Install the driving gear onto the right crank.
2. Install the washer of the driving gear locking nut onto the driving gear.
3. Apply thread adhesive to 3 - 4 threads of the driving gear locking nut, then install it onto the right crank and tighten it.

Note:

The tightening torque of the driving gear locking nut: 150 - 160N·m



※Assembly of Clutch

1. Install the clutch outer cover washer, clutch shaft bushing, clutch outer cover and clutch center bushing washer onto the driving shaft.

Note: Evenly apply grease to the inner ring of the clutch shaft bushing.

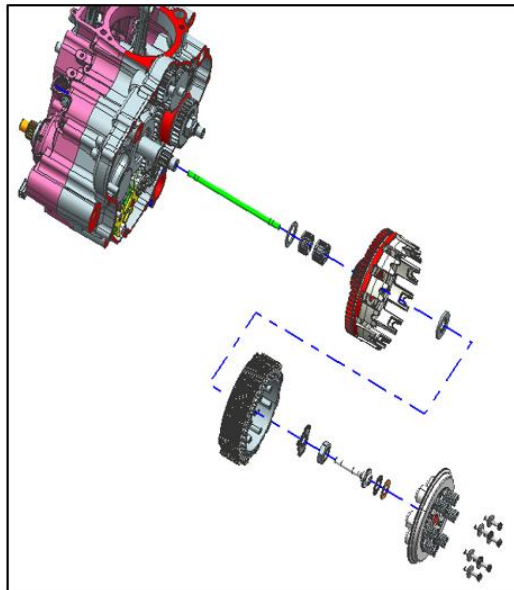
2. First, install the clutch center bushing and the washer of the clutch locking nut onto the driving shaft. Apply thread adhesive to 3 - 4 threads of the clutch locking nut, then install it onto the main shaft and tighten it.

Note:

The tightening torque of the clutch locking nut: 80 - 90N·m

3. First, install the clutch friction plates onto the clutch center bushing and the clutch housing. Then, install the clutch push rod into the central hole of the main shaft, followed by installing the clutch pull rod into the central hole of the main shaft. Next, install the thrust bearing and the pull rod washer onto the pull rod.

4. Install the clutch pressure plate, clutch pressure plate spring and pressure plate screws. Use a torque wrench to tighten the pressure plate screws. Tightening torque: 8 - 10N·m.

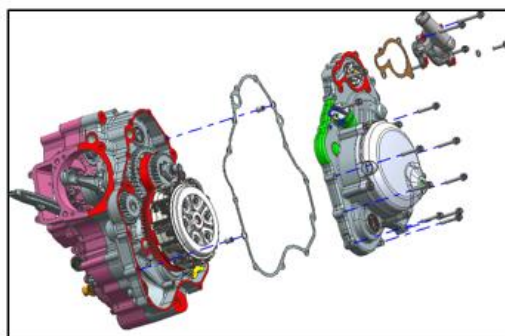


※Assembly of Starter Motor

Evenly apply engine oil to the gear groove end of the starter motor, then install the starter motor in place. Use 2 GB/T16674 small-plate bolts M6×25 to fasten it. Tightening torque: 11 - 13N·m.

※Assembly of Right Crankcase Cover

1. Remove the old right crankcase gasket, install a new one. Position the right crankcase cover and fasten it with 10 GB16674 small-plate bolts M6×30. Tightening torque: 11 - 13N·m.
2. Install the water pump impeller onto the water pump shaft and fasten it. Tightening torque: 2 - 4N·m.
3. Install the water pump cover gasket, then position the water pump cover and fasten it with 3 GB16674 small-plate bolts M6×35 and 1 GB16674 small-plate bolt M6×20. Tightening torque: 11 - 13N·m.
4. Tightening torque for the inspection cover of the right trim cover: 10N·m.



Left Cover, Balance Gear, Magneto

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Maintenance Instructions

The disassembly and installation of the magneto, driving and driven balance gears introduced in this section can be completed by removing the left crankcase cover without removing the engine.

- ◆ Precautions
- ◆ The disassembly and installation of the magneto, driving and driven balance gears introduced in this section can be completed by removing the left crankcase cover without removing the engine;
- ◆ For the inspection of the magneto, you can refer to the methods in the chapter of the battery charging system.

※Left Cover, Balance Gears, Magneto

Remove the fastening bolts of the left crankcase cover and take off the left crankcase cover.

※Disassembly of Magneto Stator

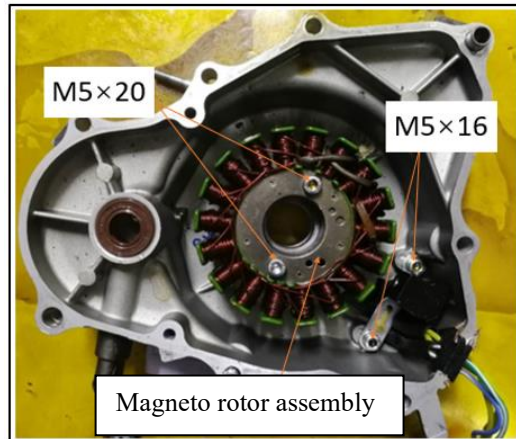
1. Remove 2 GB70.1 sensor fastening bolts M5×16 (blue-white zinc);
2. Remove 2 GB70.1 stator coil screws M5×20, and then remove the magneto stator assembly from the left crankcase cover.

**※Disassembly of Magneto Rotor**

Remove the locking nut of the magneto rotor and use special tools to remove the magneto rotor.

Note:

1. When disassembling the magneto rotor, only special tools are allowed, and striking the magneto rotor is prohibited.
2. If the magneto rotor is accidentally impacted during disassembly and assembly, such as dropping to the ground or being struck by foreign objects, replace with a new magneto rotor.



Special tool for rotor disassembly [1]



※Disassembly of Driving and Driven Balance Gears

1. Remove the timing chain and the chain tensioner plate, and then remove the locking nut of the driving balance gear and the washer of the driving gear locking nut respectively.
2. Remove the crankshaft timing drive sprocket and the driving balance gear.
3. Remove the locking nut of the driven balance gear and the CB125 clutch disc washer.
4. Remove the driven balance gear wheel, NC250 crankshaft bushing and the balance shaft flat key.



※Disassembly of Oil Pump in Left Block

1. Remove 3 small-plate bolts M6×12 (blue-white zinc) that fasten the left oil pump cover plate.
2. Remove the oil pump cover plate and the left oil pump rotor assembly. Keep the oil pump pin properly to avoid loss.



※Inspection of Left Crankcase Cover

Check whether the balance shaft oil seal of the left crankcase cover is damaged. If so, replace the balance shaft oil seal.

※Inspection of Magneto

1. Check whether the magnetic tiles of the magneto stator have cracks or damage. If so, replace with a new magneto rotor.
2. Check whether the magneto rotor is worn or damaged. If so, replace with a new magneto rotor.

※Inspection of Driving and Driven Balance Gears

Check whether the driving and driven balance gears are worn or damaged.

※Inspection of Oil Pump in Left Block

1. Check whether the left block oil pump rotor assembly is worn or damaged.
2. Check whether the left block oil pump cover plate is worn or damaged.



※Installation of Oil Pump in Left Block

1. Install the left oil pump pin [1] into the corresponding hole of the oil pump shaft, and then install the oil pump in left block [2] into the corresponding hole of the left block;
2. Fasten the left oil pump cover plate [4] with 3 bolts M6×12 [3].

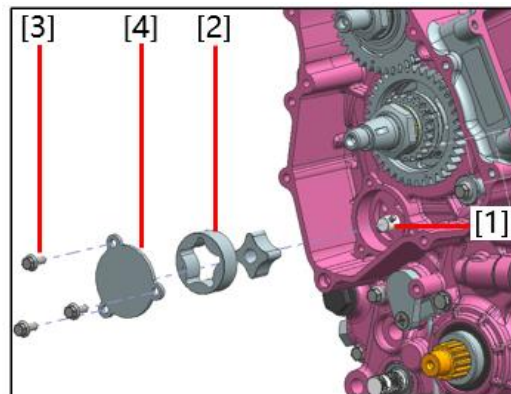
Note:

When installing the oil pump rotors, the marked surfaces of the inner and outer rotors shall face the same direction;

2. Tightening torque of the left oil pump cover plate bolts: 7 - 9N·m.

7 - 9N·m

3. Check whether the oil pump shaft rotates flexibly after fastening.



※Installation of Driving and Driven Balance Gears

1. First, install the NC250SR driven balance gear shaft bushing onto the balance shaft, then install the NC250 balance shaft flat key 4×4×13 into the key way of the balance shaft, and finally install the driven balance gear onto the balance shaft.
2. First, install the driving balance gear onto the left crank, and then install the NC250SR timing driving sprocket onto the left crank.

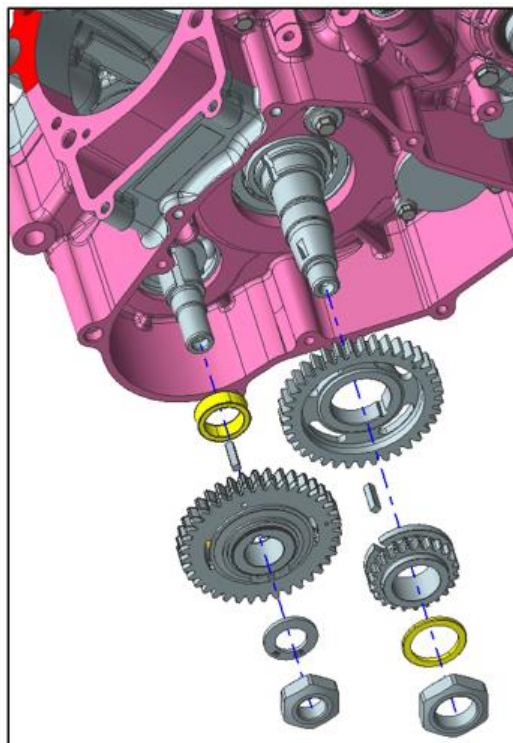
Note:

When installing the driving and driven balance gears, align the timing marks of the driving and driven balance gears, that is, the gears with timing marks on the driving and driven balance gears shall mesh with each other.

3. Place the locking washer of the driving balance gear nut and the CB125 clutch disc washer on the crankshaft timing driving sprocket and the driven balance gear respectively. Apply thread adhesive to 3 - 4 threads of the NC250S timing driving sprocket locking nut and the clutch locking nut M16×1, then install them onto the crankshaft and the balance shaft and tighten them.

Note:

Tightening torque of the locking nuts of the driving and driven balance gears: 80 - 90N·m.

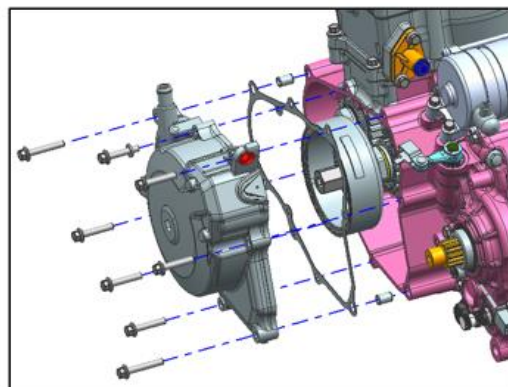
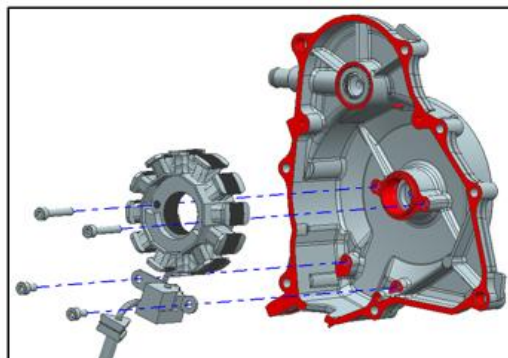


※Installation of Magneto

1. First, install the magneto rotor onto the left crank. Then, apply thread adhesive to 3 - 4 threads of the magneto nut and install it onto the left crank and tighten it.
2. Fasten the magneto stator assembly to the left crankcase cover with 2 GB70.1 M5×16 and 2 GB70.1 bolts M5×20.

Note:

- Tightening torque of the magneto rotor locking nut: 85 - 90N·m.
- Tightening torque of the magneto stator: 7 - 9N·m.



※Installation of Left Crankcase Cover

1. Remove the old gasket and install a new one.
2. Position the left crankcase cover and fasten it with 8 GB16674 small-plate bolts M6×35. The tightening torque is 11 - 13 N·m.

Crankcase, Drive Mechanism

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Maintenance Instructions

1. Precautions

◆ This section introduces the installation and inspection of the transmission, crankshaft, and balance mechanism. When performing the above-mentioned tasks, the crankcase shall be disassembled first. The disassembly of other engine components shall be carried out before disassembling the crankcase. Work to be done before disassembling the crankcase:

Disassembly of cylinder head

Disassembly of cylinder and piston

Disassembly of clutch, oil pump, shift mechanism, and balance gears

Disassembly of magneto

2. Main parameters and maintenance standards

S/N	Item		Standard value	Maintenance limit value	Notes
1	Shift fork	Inner diameter of counter shaft shift fork	14.016-14.043	14.045	
		Inner diameter of main shaft shift fork	12.016-12.043	12.045	
		Thickness of shift fork jaw	4.8-4.9	4.8	
2	Shift fork shaft	Outer diameter of main shaft shift fork shaft	11.973-12	11.95	
		Outer diameter of counter shaft shift fork shaft	13.973-14	13.95	
		Cylindricity	0.006	/	
3	Crankshaft connecting rod	Inner diameter of connecting rod small end	16.015-16.025	16.04	
		Connecting rod big end side clearance	0.15-0.4	0.6	
4	Balance shaft	Shaft diameter	19.98-19.993	19.96	

3. Analysis of fault phenomena and causes

S/N	Fault phenomenon	Cause analysis	Notes
1	Difficulty in gear shift	Bending and deformation of shift fork	
		Bending and deformation of shift fork shaft	
2	Jumping out of gear	Wear of shift gear pawls	
		Bending or wear of shift fork	
		Bending of shift fork shaft	
3	Crankshaft noise	Wear at big end of crankshaft connecting rod	
		Bent connecting rod	
		Wear of crankshaft bearing	
4	Shift gear noise	Wear of shift gear	
		Wear of spline shaft	

※Disassembly of Crankcase

1. Place the engine with the left crankcase facing upwards;
2. Remove 8 GB16674 small-plate bolts M6×65 and 5 GB16674 small-plate bolts M6×45. Separate the left crankcase from the right crankcase and take out 2 dowel pins.



※Disassembly of Crankshaft, Balance Shaft, Main and Counter Shafts

Remove the crankshaft assembly, balance shaft, shift fork shafts, shift forks, transmission drum, and main/counter shaft assemblies from the crankcase.

Note:

Ensure that no components are left behind when removing the main/counter shaft assemblies.



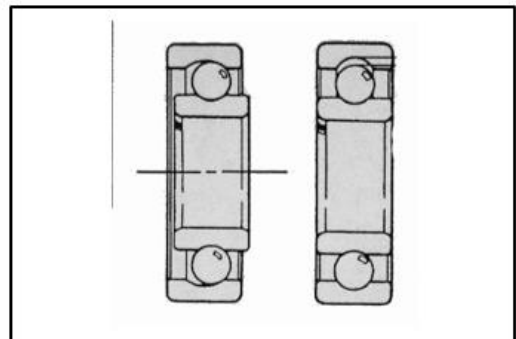
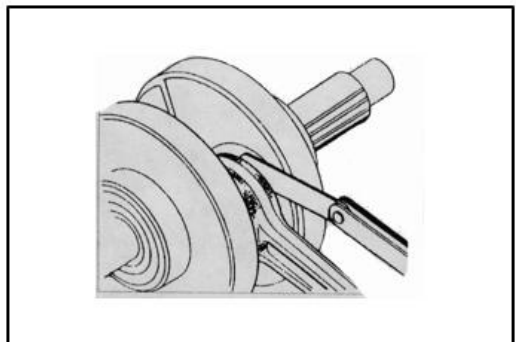
※Inspection of Crankshaft

Place the crankshaft on V-blocks and measure the side clearance of the big end of connecting rod with a feeler gauge.

Maintenance limit value: 0.03 mm

※ Inspection of Left and Right Crankcase Bearings

1. Check whether all the bearings in the left and right cases rotate flexibly. If they do not rotate flexibly or get stuck, replace the bearings with the same model.
2. Remove the crankshaft bearings from the left and right case and check their radial runout and axial runout. If there is noise or excessive radial runout and axial runout, replace the crankshaft bearings with new ones.



※Inspection of Shift Forks, Shift Fork Shaft and Transmission Drum

Check whether each shift fork is worn, bent or has any other faults, and measure the inner diameter of the shift fork.

Maintenance limit value for the main shaft shift fork: $\phi 12.45$ mm

Maintenance limit value for the counter shaft shift fork: $\phi 14.45$ mm

Check whether the main shaft and counter shaft shift fork shafts are worn, damaged or bent, and measure the outer diameter.

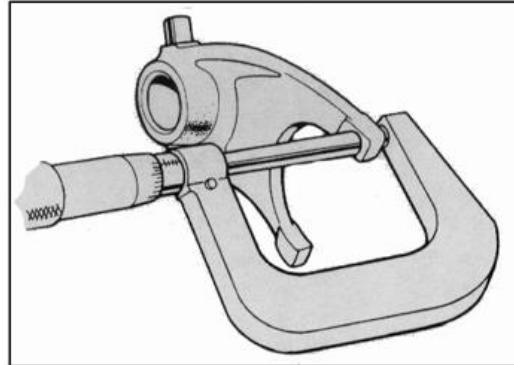
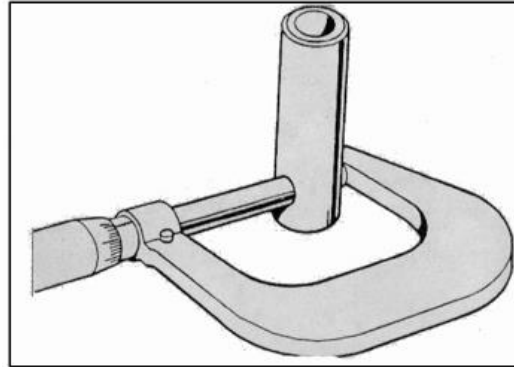
Maintenance limit value for the main shaft shift fork shaft: $\phi 11.95$ mm

Maintenance limit value for the counter shaft shift fork shaft: $\phi 13.95$ mm

Measure the thickness of the fork jaw.

Maintenance limit value: 4.7 mm

Check whether the surface and grooves of the transmission drum are worn or damaged. Check whether the gears of the main/counter shaft assemblies have excessive or abnormal wear, and check whether the retainers between the gears are deformed or fallen off.

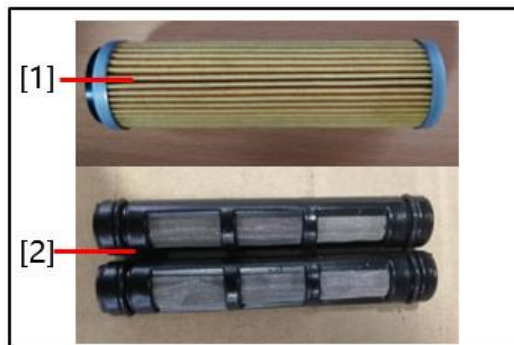


※Inspection of Main and Counter Shafts

Check whether the gears of the main/counter shaft assemblies have excessive or abnormal wear, and check whether the retainers between the gears are deformed or fallen off.

※Inspection of Oil Filter Components and Oil Strainer

1. Check the cleanliness of the oil filter components and the oil strainer. Wash the oil filter components and oil strainer with poor cleanliness thoroughly with clean gasoline.
2. Check whether the oil filter components and the oil strainer are damaged. If there is any damage, replace them with new ones.



※Assembly of Transmission, Crankshaft and Balance Shaft

1. Install the crankshaft and balance shaft into the corresponding holes in the left case.
2. Install the main/counter shaft assemblies into the corresponding holes in the left case, and then install the shift forks in their corresponding positions.

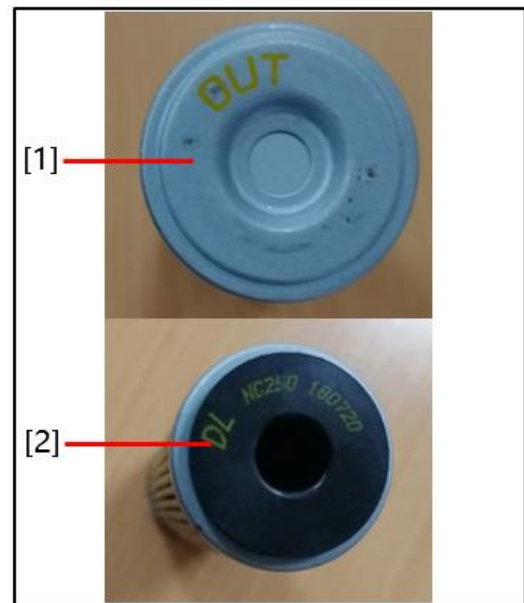
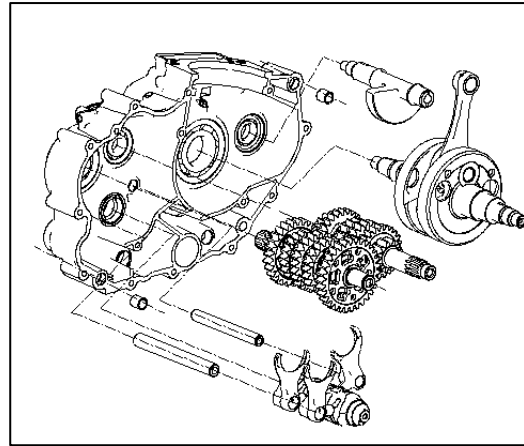
Note:

- The shift fork marked --R is installed on the side of the counter shaft closer to the right case.
- The shift fork marked --L is installed on the side of the counter shaft closer to the left case.
- The shift fork marked --C is installed on the main shaft.

3. Install the transmission drum into the corresponding hole in the left case, then install the other end of the shift fork into the corresponding groove of the transmission drum, and finally install the shift fork shaft into the corresponding shift fork.

Note:

The long shift fork shaft passes through the shift forks marked —R and —L, and the short shift fork shaft passes through the shift fork marked —C.



※Assembly of Case Closing and Oil Strainer

1. Evenly apply a layer of sealant on the mating surface of the right case. Install the dowel pins into the corresponding holes in the left case, then combine the right case with the left one. Pass 5 GB16674 small-plate bolts M6×45 and 8 GB16674 small-plate bolts M6×65 through the corresponding bolt holes in the left-hand case and tighten them. Tightening torque: 11 - 13 N·m.
2. Install the oil fine filter components into the corresponding holes in the crankcase, then install the oil fine filter cover onto the stud bolts and fasten it with 2 GB16674 small-plate bolts M6×16 (blue-white zinc). Tightening torque: 11 - 13 N·m.
3. Install the oil strainer assembly into the corresponding holes in the left and right case, and then fasten it with the oil strainer cover. Tightening torque: 11 - 13 N·m.

Note:

When installing the oil filter, the open end shall face the left-hand case.

Closed end of the oil filter [1];
Open end of the oil filter [2].

Frame, Body Trim, Exhaust System

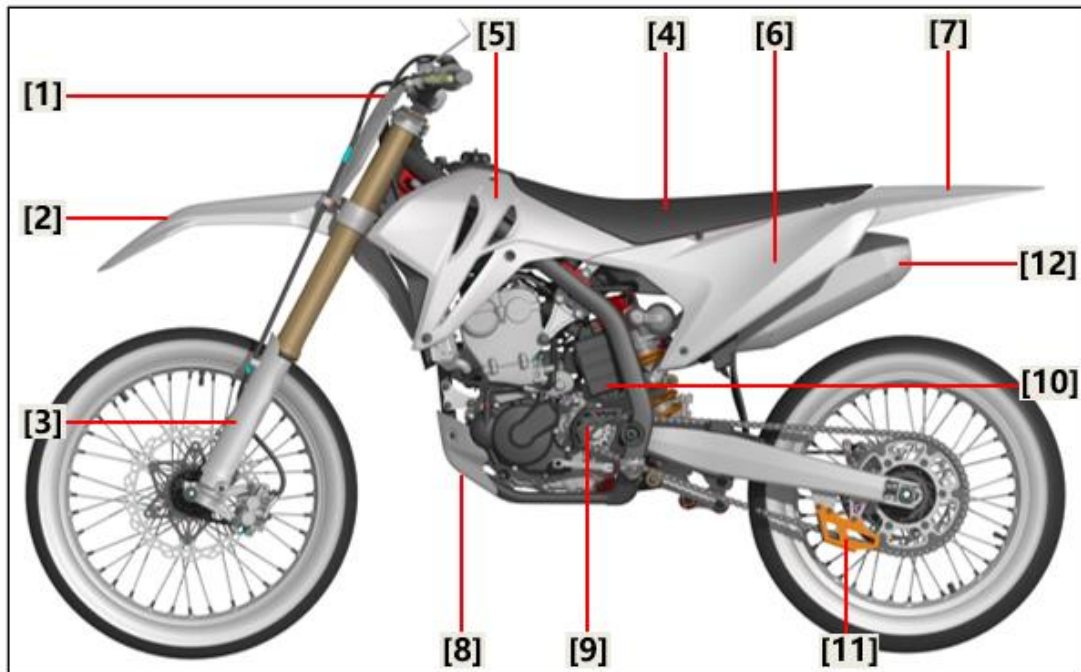
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Maintenance Instructions

Overview:

- This section describes the disassembly and reassembly of body trim and exhaust system;
- For disassembly, mark and store the mounting fasteners to ensure that they are reinstalled in their original positions;
- For bonnet installation, ensure that the matching areas are correctly aligned before tightening the fasteners;
- After removing the exhaust system, be sure to use new washers;
- When installing the exhaust system, loosen all fasteners first. Be sure to tighten the exhaust pipe joint nut before tightening the mounting bolts;
- After installation, be sure to check for the exhaust system leak, or unacceptable exhaust noise at the time of troubleshooting;
- Exhaust system damage;
- Inadequate exhaust gas leak performance;
- Exhaust system deformation;
- Exhaust gas leak;
- Muffler blockage.

Body Trim Position



(1) license plate	(5) Fuel tank front trim	(9) Small sprocket cover
(2) Front fender	(6) Vehicle body (left and right)	(10) Battery box cover
(3) Front shock absorber trims (left and right)	(7) Rear tailgate	(11) Chain guide assembly
(4) Seat cushion assembly	(8) Lower protector	(12) Muffler

After the motorcycle is powered off, carry out disassembly in this order below:

Seat cushion assembly → Front fuel tank trims (left and right) → Vehicle body (left and right) → Rear tail cover → License plate → Front fender → Front shock absorber trims → Lower protector → Small sprocket cover → Front brake caliper → Front wheel → Front shock absorber → Steering handle → Upper bracket → Lower bracket and steering column assembly → Rear wheel → Rear brake caliper → Rear suspension and cradle assembly → Swingarm → Rear splash guard → Full-length muffler → Radiator (left and right) → Fuel tank assembly → Subframe → Air filter assembly → Throttle body assembly → Vehicle wiring harness → Vehicle electrical components → Engine.

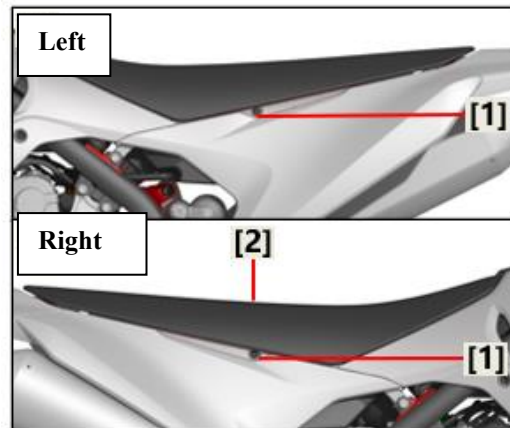
※Seat Cushion Assembly

① Disassembly/installation:

Disassemble the following parts:

- Remove 2 hexalobular socket pan head bolts [1]
- Pull upward to remove the seat cushion [2].

The installation sequence is reversed from the removal sequence.



② Disassembly/installation:

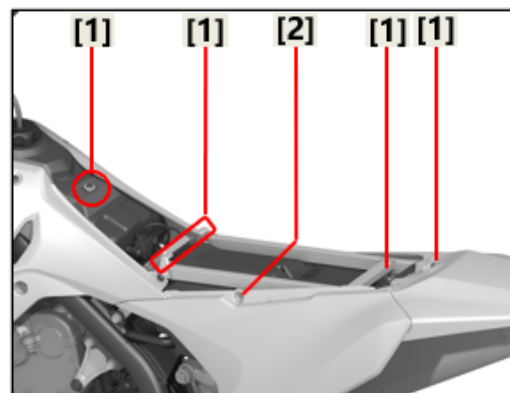
Install the following components:

Insert the bottom rods of the seat cushion under the four frames [1] in sequence, and install the fastening bolts on both sides [2] of the seat cushion.

Torque:

Connecting bolts between seat cushion and subframe [2]

8.0 N·m (0.8 kgf·m, 6.0 lbf·ft)



※Battery Box Cover

Disassembly/installation

Disassemble the following parts:

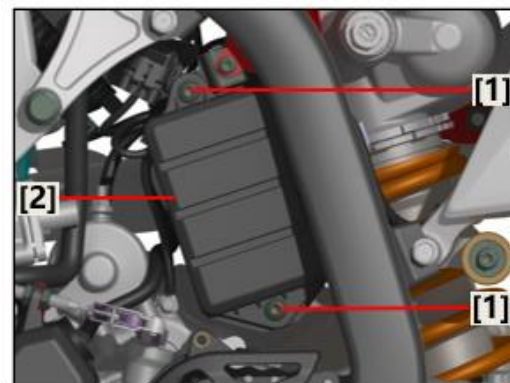
- Remove 2 M5x13 hexalobular socket step bolts [1]
- Remove the battery box cover [2].

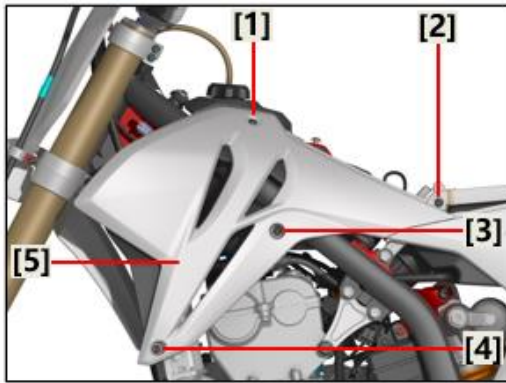
The installation sequence is reversed from the removal sequence.

Torque:

Battery box cover mounting bolts

5.0 N·m (0.5 kgf·m, 4.0 lbf·ft)





※Front Tank Trims (Left and Right)

Disassembly/installation

Disassemble the following parts:

- Remove 4 M5x13 hexalobular socket pan head step bolts [1], [2], [3], [4];
- Remove the front fuel tank trim [5].

The installation sequence is reversed from the removal sequence.

The left and right installation and disassembly are the same.

Torque:

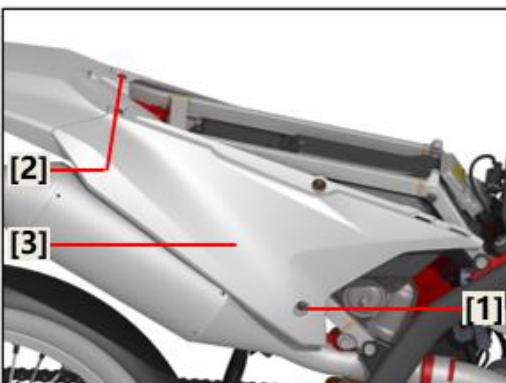
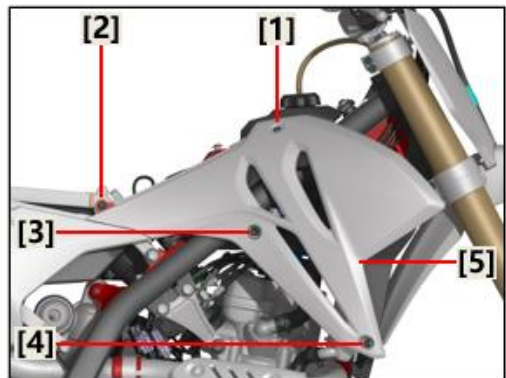
Step bolts connecting left and right front trims of fuel tank and fuel tank [1]

Step bolts connecting left and right front trims of fuel tank and subframe [2]

Step bolts connecting left and right front trims of fuel tank and frame [3]

Step bolts connecting left and right front trims of fuel tank and water tank [4]

5.0 N·m (0.5 kgf·m, 4.0 lbf·ft)



※Vehicle Body Cover (Left and Right)

Disassembly/installation

Disassemble the following parts:

- Remove 6 M6x13 hexalobular socket pan head step bolts [1], [2] on each side (left and right);
- Remove the left and right vehicle body covers [3].

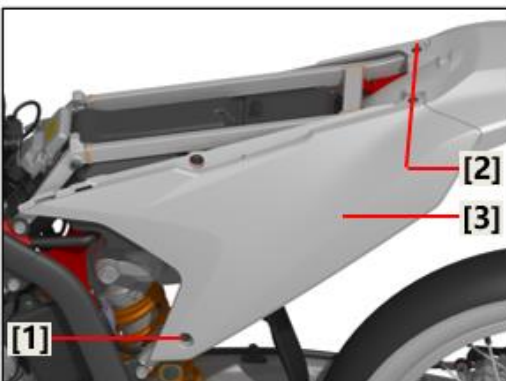
The left and right installation and disassembly are the same.

The installation sequence is reversed from the removal sequence.

Torque:

Connecting bolt between subframe and frame

5.0 N·m (0.5 kgf·m, 4.0 lbf·ft)



※Rear Tailgate

Disassembly/installation

Disassemble the following parts:

- Remove 2 M6x13 hexalobular socket step screws [1] and 2 M6x15 hexalobular socket step screws [2] on the upper part of the rear tail;
- Remove the rear tailgate [3];

The installation sequence is reversed from the removal sequence.

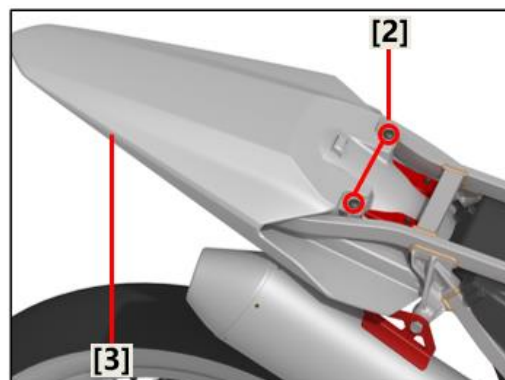
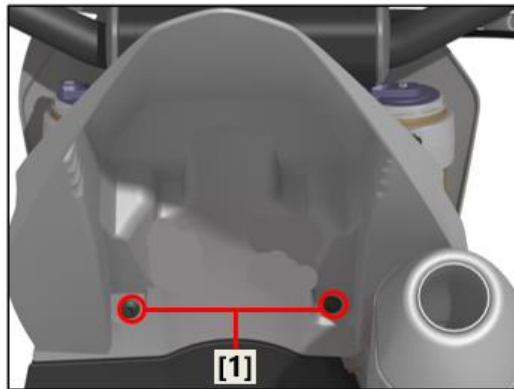
Torque:

Connecting bolts between tailgate and subframe [1]

5.0 N·m (0.5 kgf·m, 4.0 lbf·ft)

Connecting bolts between rear tailgate (front) and subframe [2]

8.0 N·m (0.8 kgf·m, 6.0 lbf·ft)



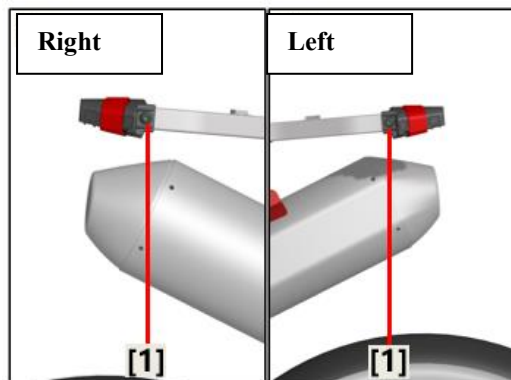
※Tailpipe plug

Disassembly/installation

Disassemble the following parts:

- Remove the rear tail cover from the subframe;
- Remove the left and right tailpipe plugs [1] from the rear section of the subframe.

The installation sequence is reversed from the removal sequence.



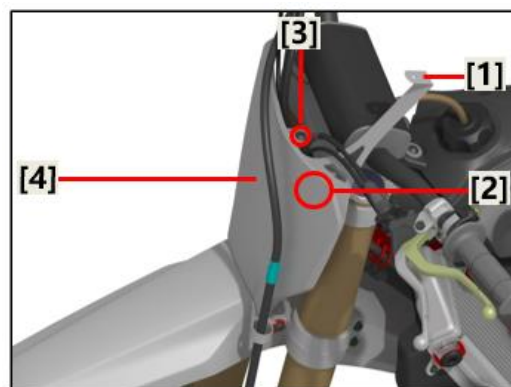
※License Plate

Disassembly/installation

Disassemble the following parts:

- Remove the strap [1] from the back of the license plate [2];
- Remove 1 M5x13 hexagon socket step screw [3];
- Pull upwards to remove the license plate [4].

The installation sequence is reversed from the removal sequence.



Torque:

Bolts connecting license plate and upper bracket [3]

5.0 N·m (0.5 kgf·m, 4.0 lbf·ft)



※Front Fender

Disassembly/installation

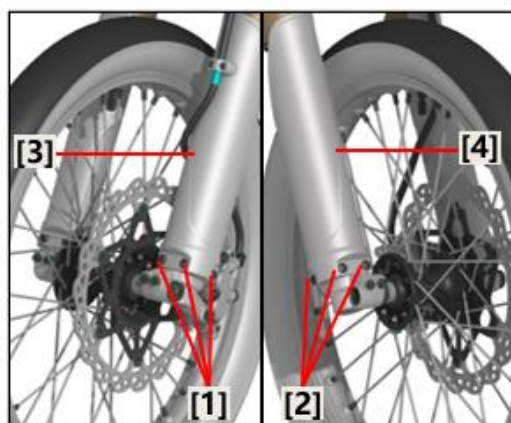
Disassemble the following parts:

- Remove 4 hexalobular socket hexagon flange bolts [1], 4 flat gaskets and 4 flanged bushings;
- Remove the front fender [2];

The installation sequence is reversed from the removal sequence.

Torque:

Front fender and lower connecting plate [1]
12 N·m (1.2 kgf·m, 9.0 lbf·ft)



※ Front Shock Absorber Trims (Left and Right), Oil Pipe Pressure Plate

①. Front shock absorber trim

Disassembly/installation

Disassemble the following parts:

- Remove 6 M6x12 hexagon socket step screws at positions [1] and [2];
- Remove the left and right shock absorber trims [3] and [4].

The installation sequence is reversed from the removal sequence.

Torque:

Mounting bolts of front shock absorber trims
8.0 N·m (0.8 kgf·m, 6.0 lbf·ft)

②. Oil pipe pressure plate

Disassembly/installation

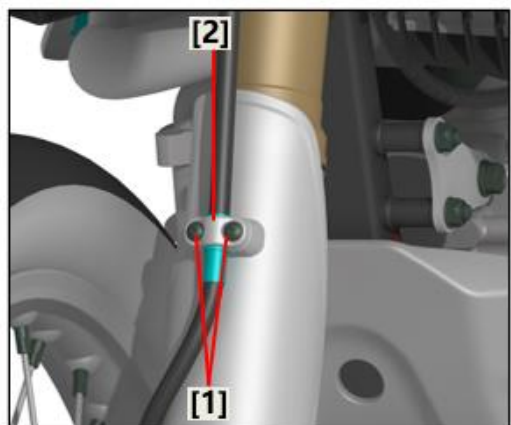
Disassemble the following parts:

- Remove 2 M5x8 hexagon socket head cap screws [1];
- Remove the pressure plate [2].

The installation sequence is reversed from the removal sequence.

Torque:

Brake hose pressure plate mounting bolt [1]
4.0 N·m (4.0 kgf·m, 3.0 lbf·ft)



※Engine Lower Protector

Disassembly/installation

Disassemble the following parts:

- Remove 4 M6x12 hexalobular socket step bolts [1];
- Remove the lower protector [2].

The installation sequence is reversed from the removal sequence.

Torque:

Lower protector mounting bolt

10 N·m (1.0 kgf·m, 7.4 lbf·ft)

※Engine Small Sprocket Cover and Chain Pressure Plate

Disassembly/installation

Disassemble the following parts:

- Remove 2 hexalobular socket flange bolts [1];
- Remove the small sprocket [2] and chain pressure plate.

The installation sequence is reversed from the removal sequence.

Torque:

Small sprocket cover mounting bolt

10 N·m (1.0 kgf·m, 7.4 lbf·ft)

※Rear Splash Guard

Disassembly/installation

Disassemble the following parts:

- Remove 2 self-tapping screws ST4.8x15 [1].
- Remove the rear splash guard.

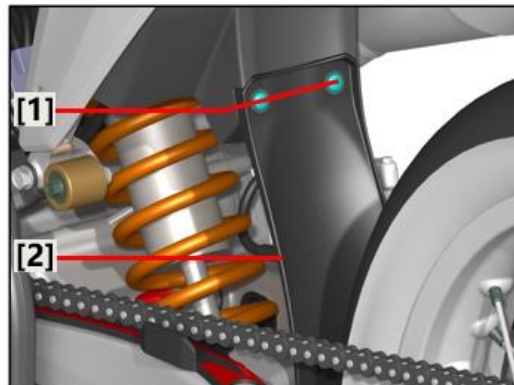
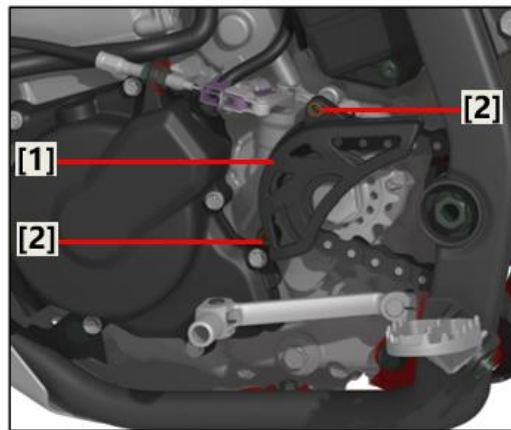
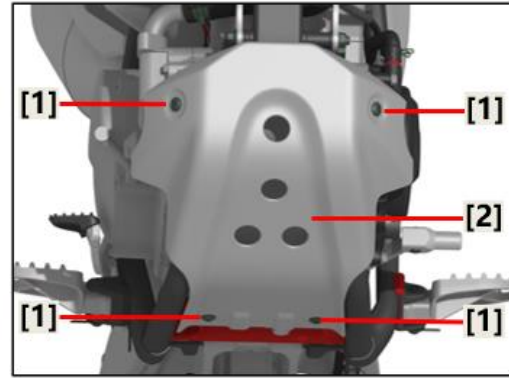
The installation sequence is reversed from the removal sequence.

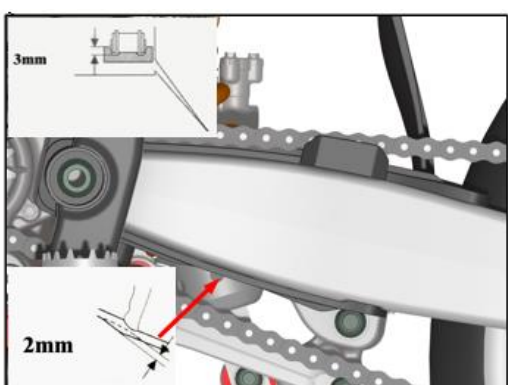
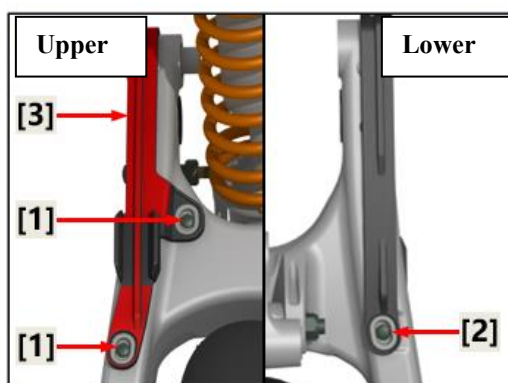
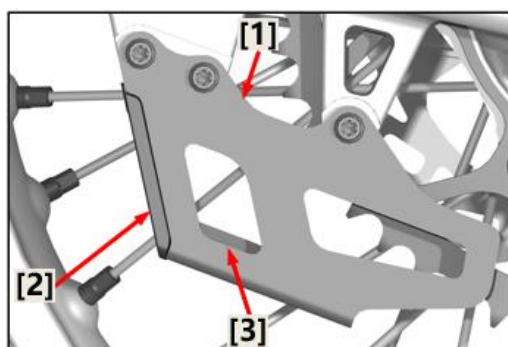
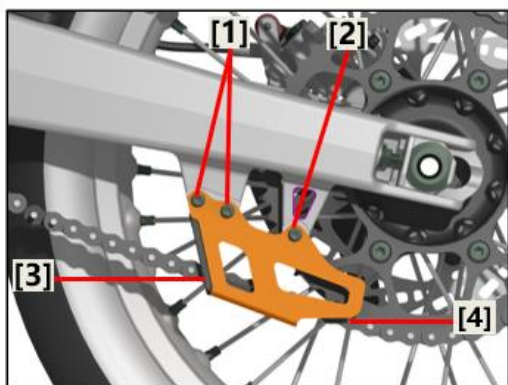
Torque:

Self-tapping screws connecting rear splash guard

3.0 N·m (0.3 kgf·m, 2.2 lbf·ft)

Note: Replace the rear splash guard promptly if it is damaged or cracked.





※Chain Guide Box

Disassembly/installation

Disassemble the following parts:

- Remove 2 M6x55 hexalobular socket hexagon bolts [1];
- Remove 1 M6x13 hexalobular socket hexagon bolt [2];
- Pull out the drive chain guide rail slider [3];
- Remove the empty chain guide box [4].

The installation sequence is reversed from the removal sequence.

Torque:

Chain guard box mounting bolt [1]

Chain guard box mounting bolt [2]

10 N·m (1.0 kgf·m, 7.4 lbf·ft)

Check whether the chain guide box [1] is deformed or damaged.

Note:

If the metal frame of the chain guide box is deformed, it may hit the drive chain, causing the drive chain to fall off, wear or generate noise.

Check whether the chain guide rubber [2] is worn.

If the chain guide rubber is worn to the position of the wear limit mark [3], replace the drive chain guide rail rubber.

※Chain Clip

Disassembly/installation

Disassemble the following parts:

- Remove 2 Philips half-round head screw [1] on the upper part of the swingarm;
- Remove 1 Philips half-round head screw [1] on the lower part of the swingarm;
- Remove the chain clip [3].

The installation sequence is reversed from the removal sequence.

Torque:

Chain clip mounting screw x3

8.0 N·m (0.8 kgf·m, 6.0 lbf·ft)

Inspect the chain clip for excessive wear.

Wear limit not exceed:

Upper side 3mm

Underside 2mm

Note:

◆Please replace the chain clip in time if it exceeds the wear limit.

◆If the chain clip reaches its wear limit or is damaged, it can lead to damage in the rear swingarm or drive chain.

※Fuel Tank

①. Fuel tank

Disassembly/installation

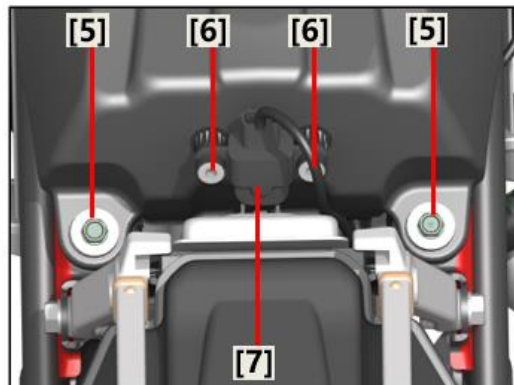
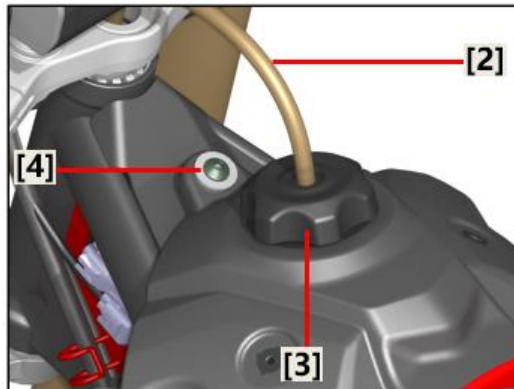
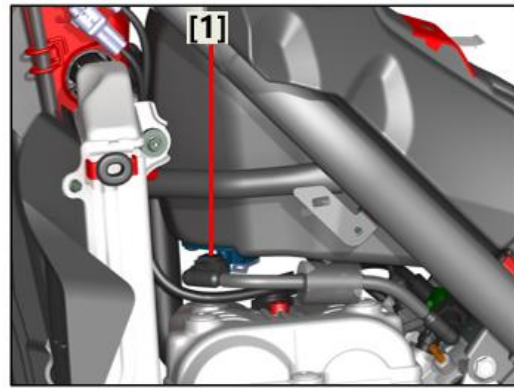
Disassemble the following parts:

- Disconnect the fuel pump plug;
- Disconnect the fuel pipe quick connector [1];
- Remove the fuel tank vent pipe [2];
- Unscrew the fuel tank cap counterclockwise [3];
- Remove 1 M6x16 front fuel tank connecting bolt [4];
- Remove 2 M6x30 rear fuel tank connecting bolts [5].

The installation sequence is reversed from the removal sequence.

Torque:

Bolt connecting subframe and frame
Bolt connecting rear fuel tank and frame
10 N·m (1.0 kgf·m, 7.4 lbf·ft)



②. Tilt Sensor

Disassembly/installation

Disassemble the following parts:

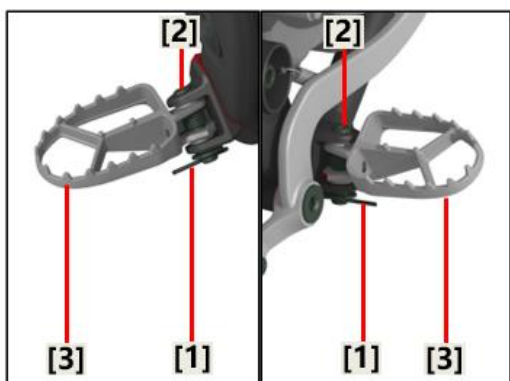
- Disconnect the sensor quick connector;
- Remove 2 M6x20 tilt sensor mounting screws [6].
- Remove the tilt sensor [7].

The installation sequence is reversed from the removal sequence.

Torque:

Tilt sensor and fuel tank mounting bolts
4.0 N·m (0.4 kgf·m, 3.0 lbf·ft)

Note: When installing the tilt sensor, the “UP” mark shall face upwards



※Pedal Assembly

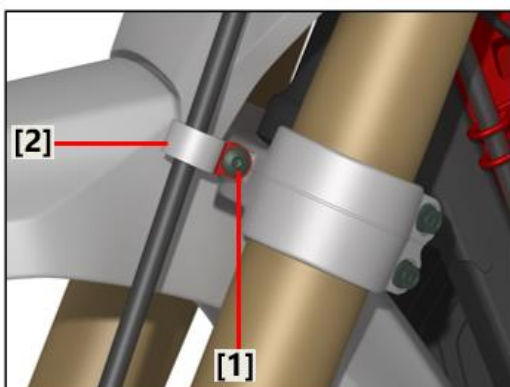
Disassembly/installation

Disassemble the following parts:

- Remove the cotter pin and gasket [1];
- Remove the pedal main pin [2];
- Remove the left and right pedals [3].

The installation sequence is reversed from the removal sequence.

Note: Replace the pedals promptly if the anti-slip teeth are worn.



※Oil Pipe Clip

Disassembly/installation

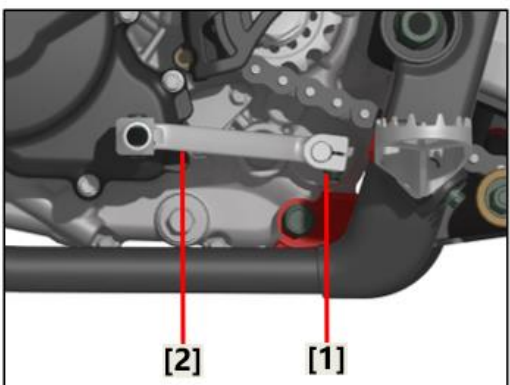
Disassemble the following parts:

- Remove 1 M6x16 step bolt [1];
- Remove the front brake oil pipe clip [2];

The installation sequence is reversed from the removal sequence.

Torque:

Connecting bolt between oil pipe clip and lower bracket
10 N·m (1.0 kgf·m, 7.4 lbf·ft)



※Gear-shifting Arm

Disassembly/installation

Disassemble the following parts:

- Remove 1 M6x20 [1].
- Remove the gear-shifting arm [2].

The installation sequence is reversed from the removal sequence.

Torque:

Connecting bolt between gear-shifting arm and engine
10 N·m (1.0 kgf·m, 7.4 lbf·ft)

※Muffler Assembly

Before disassembly, remove the oxygen sensor or disconnect the wire harness plug.

Disassembly/installation

Disassemble the following parts:

- Remove the muffler connection clamp locking bolt [1];
- Remove the bolts connecting muffler rear section and subframe [2];
- Remove the bolts connecting muffler rear section and rear subframe [3];
- Remove the muffler rear section [4];
- Remove 2 M8x1.25 cap nuts [5];
- Remove the muffler front section [6].

The installation sequence is reversed from the removal sequence.

Torque:

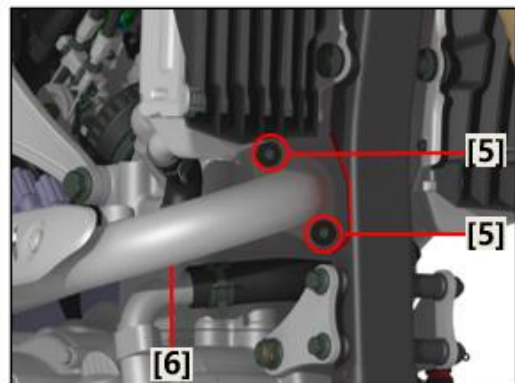
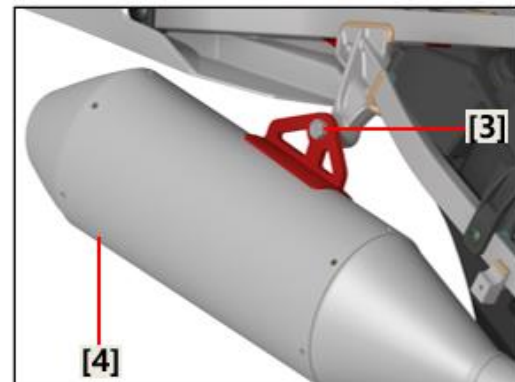
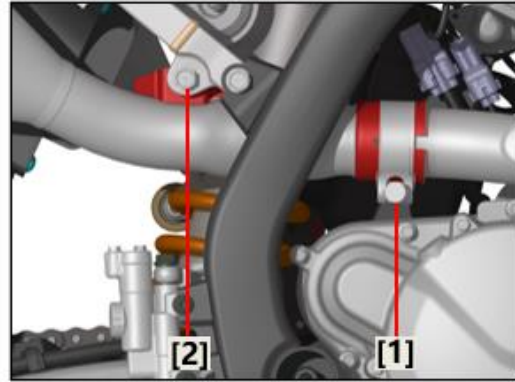
Connecting nut M8x1.25 between muffler rear section and engine exhaust port
16 N·m (1.6 kgf·m, 12 lbf·ft)

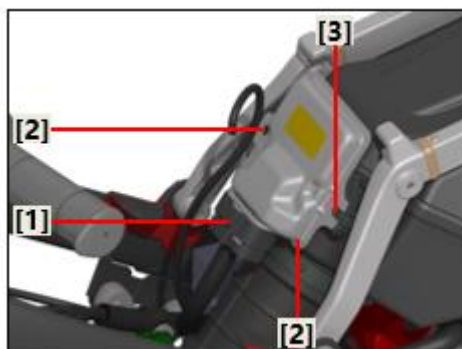
Connecting bolt between muffler rear section and subframe
M8x20
22 N·m (2.2 kgf·m, 16 lbf·ft)

Connecting bolt between muffler rear section and subframe
M8x20
22 N·m (2.2kgf·m, 16 lbf·ft)

Clapm bolt between muffler rear section and front section
M7x1.0x40
22 N·m (2.2 kgf·m, 16 lbf·ft)

Note: If the sound of the muffler rear section becomes louder after the vehicle has been used for a period of time, contact the local dealer for inspection or repair.





※Electronic Control Unit (ECU)

Disassembly/installation

Disassemble the following parts:

- Remove the ECU wire harness plug [1];
- Remove 2 cross-recessed pan head screws [2];
- Remove the ECU [3].

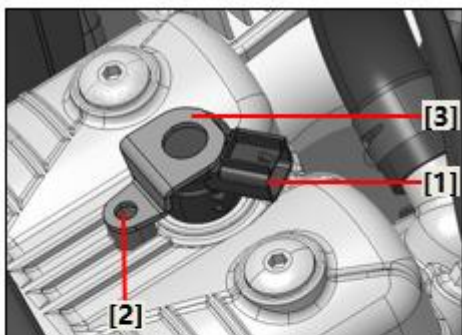
The installation sequence is reversed from the removal sequence.

Torque:

M5x12

ECU mounting screw

4.0 N·m (0.4 kgf·m, 3.0 lbf·ft)



※Ignition Coil

Disassembly/installation

Disassemble the following parts:

- Disconnect the ignition coil wire harness plug [1];
- Remove the bolt at position [2];
- Remove the ignition coil pressure plate [3];
- Pull out the ignition coil upwards [4].

The installation sequence is reversed from the removal sequence.

Torque:

M6x12

Ignition coil pressure plate mounting bolt

10 N·m (1.0 kgf·m, 7.4 lbf·ft)



*Voltage Regulator

Disassembly/installation

Disassemble the following parts:

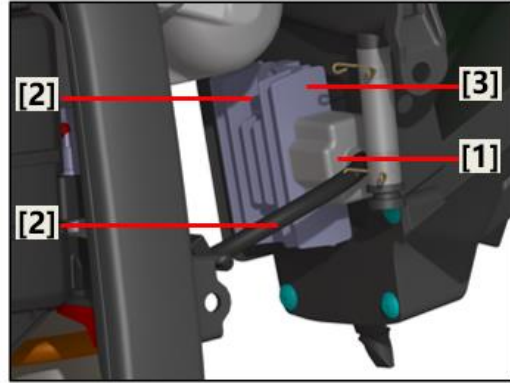
- Remove the 6p plug of the voltage regulator wire harness [1];
- Remove 2 M6x20 screws [2];
- Remove the voltage regulator [3].

The installation sequence is reversed from the removal sequence.

Torque:

Voltage regulator and air filter tank mounting screws

10 N·m (1.0 kgf·m, 7.4 lbf·ft)



*Starting Relay

Disassembly/installation

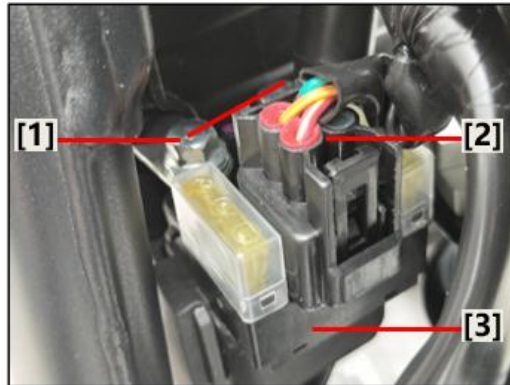
Disassemble the following parts:

- Remove the bolt connecting the starting relay to the battery positive electrode and the starter motor output [1];
- Remove the 4p connecting plug of starting relay wire harness [2];
- Remove the starting relay and rubber grommet [3].

Torque:

Bolt connecting the starting relay to the battery positive electrode and the starter motor output

8.0 N·m (0.8 kgf·m, 6.0 lbf·ft)

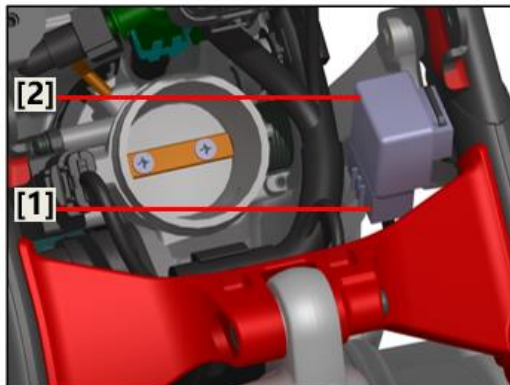


*Main Relay

Disassembly/installation

Disassemble the following parts:

- Remove the 8p plug of the main relay wire harness [1];
- Remove the main relay and rubber grommet [2] from the hook on the right side of the frame.



*Starter Motor

Disassembly/installation

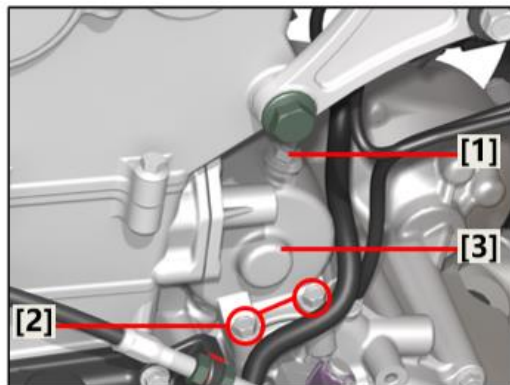
Disassemble the following parts:

- Remove the wire harness connecting nut and washer [1];
- Remove 2 M6x30 hexagon head screws [2];
- Remove the starter motor [3].

Torque:

Connecting bolt between starter motor and case

10 N·m (1.0 kgf·m, 7.4 lbf·ft)



*Battery Box

Disassembly/installation

Disassemble the following parts:

- Remove 2 M5x13 hexagon socket pan head step bolts [1];
- Disconnect the battery positive and negative terminal;
- Remove the battery box cover [2];
- Take out the battery [4] and the battery rubber pad belt [3];
- Remove the bolts connecting the battery box to the frame [5], [6];
- Remove the battery box from the frame [7].

The installation sequence is reversed from the removal sequence.

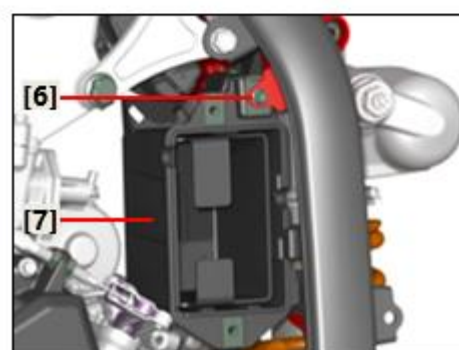
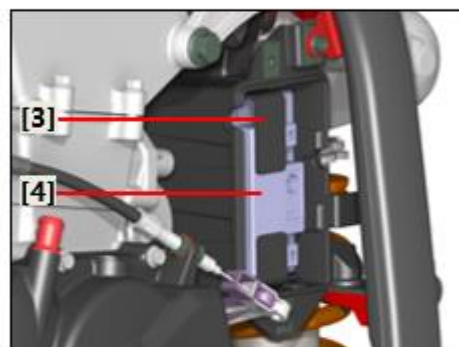
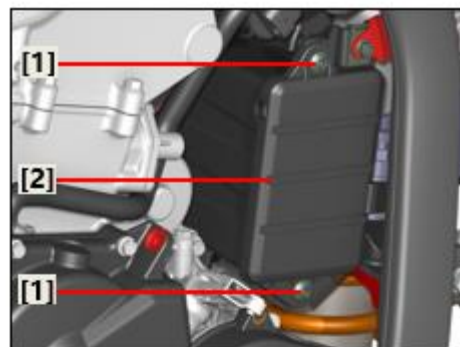
Torque:

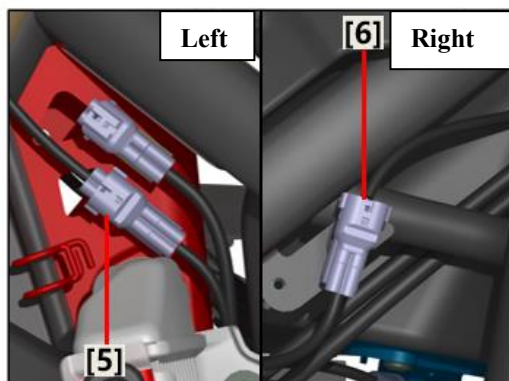
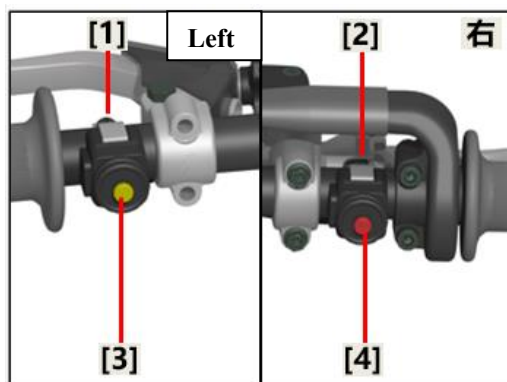
Battery box cover mounting bolts

5.0 N·m (0.5 kgf·m, 4.0 lbf·ft)

Connecting bolt between battery box and subframe

10 N·m (1.0 kgf·m, 7.4 lbf·ft)





※ON and OFF Switch

Disassembly/installation

Disassemble the following parts:

- Remove 1 screw [1];
- Remove the left-hand OFF switch button [3];
- Remove 1 screw [2];
- Remove the right-hand ON switch button [4];
- Pull out the switch plugs from the left and right sides of the frame [5], [6].

The installation sequence is reversed from the removal sequence.

Torque:

On and OFF switch mounting self-tapping screw
1.0 N·m (0.1 kgf·m, 0.8 lbf·ft)

*Subframe and Air Filter Assembly

Disassembly/installation

Disassemble the following parts:

- Loosen the clamp [1] connecting the air intake pipe of the air filter to the throttle body;
- Remove the crankcase venting pipe [2];
- Remove the bolts [3], [4], [5], [6] connecting the subframe to the main frame;
- Remove the subframe and air filter assembly [7].

The installation sequence is reversed from the removal sequence.

Torque:

M5X13 Step

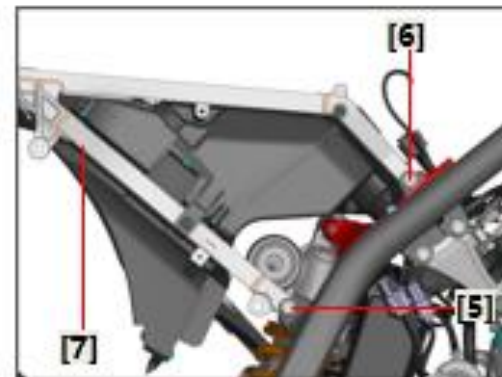
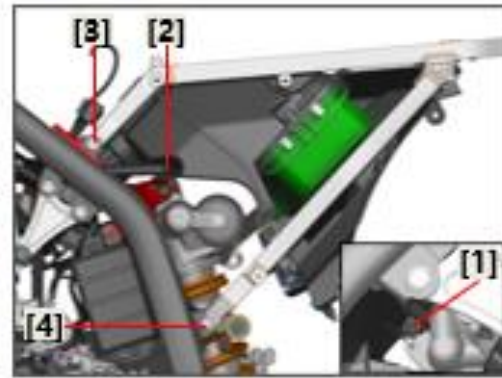
Air filter and subframe mounting bolt

5.0 N·m (0.5 kgf·m, 4.0 lbf·ft)

M8x20

Connecting bolt between subframe and main frame

34 N·m (3.4 kgf·m, 18 lbf·ft)



*Rear Fender

Disassembly/installation

Disassemble the following parts:

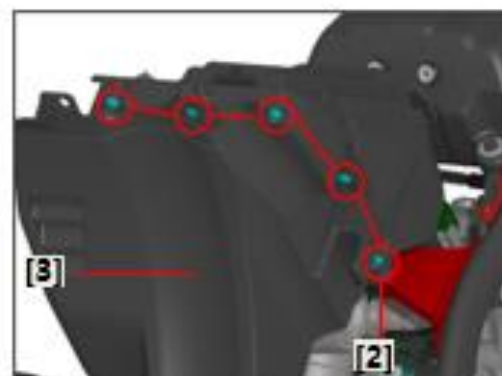
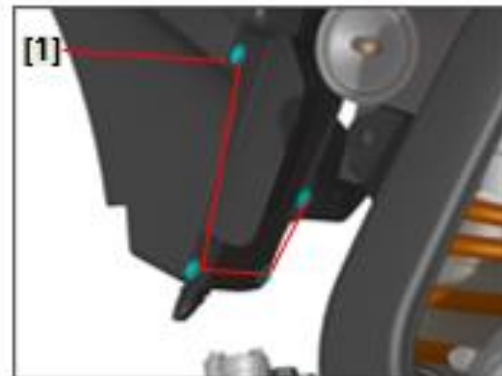
- Remove 4 self-tapping screws ST4.8x15 [1];
- Remove 5 self-tapping screws ST4.8x15 [2];
- Remove the rear fender [3].

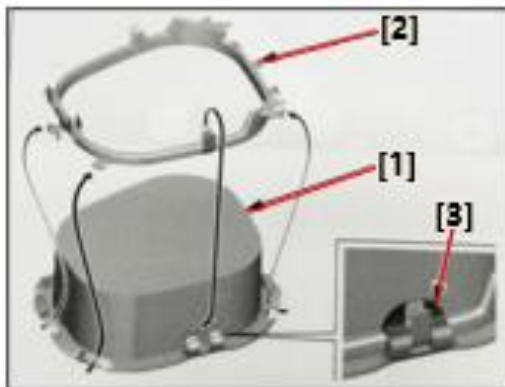
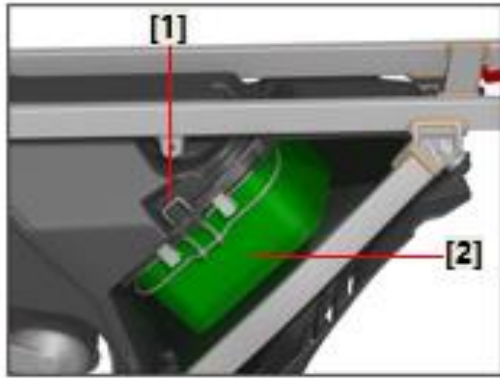
The installation sequence is reversed from the removal sequence.

Torque:

Self-tapping screws connecting rear fender and air filter tank [1], [2]

2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)





※Air Filter Tank Assembly and Sponge Filter Element

① Sponge filter element and filter element bracket

Disassembly/installation

Disassemble the following parts:

- Pull open the fixing spring [1] of the sponge filter element;
- Open the filter element fixing spring and remove the sponge filter element [2];
- Remove the screws [3] fixing the metal filter screen;
- Take out the metal filter strainer [4].

The installation sequence is reversed from the removal sequence.

Remove the sponge filter element [1] from the filter element bracket [2].

Note: Be careful not to damage the filter holes [3] of the sponge filter element [3].

Thoroughly clean the sponge filter element [1] in a cleaning solvent, and then clean it in hot water with detergent or soap solution.

Ensure that there is no dirt or dust in the air filter element. Clean it again if necessary. After cleaning, squeeze out the moisture from the air filter element and let it dry thoroughly.

Note:

Since gasoline or low-flash-point solvents are highly flammable, it is prohibited to use them to clean the air filter sponge filter element.

Apply 50cm³ of KOVE foam air filter oil or equivalents to the inner side of the sponge filter element.

Put the air filter sponge filter element into a plastic bag and evenly apply the air filter oil with both hands.

Note: Do not use engine oil on the sponge filter element.

*Throttle Body Assembly and Intake Pipe

① Throttle

Disassembly/installation

Disassemble the following parts:

- Remove the fuel pipe quick connector [1];
- Remove the mounting screws [2] of the fuel rail cap and the fuel rail injector holder;
- Disconnect the three-in-one 5p sensor plug [3];
- Disconnect the idle stepper motor plug [4];
- Loosen the throttle cable adjusting nut [5];
- Remove the throttle cable [6] from the rotary table;
- Remove the fastening screws [7] of the clamps at both ends of the intake pipe;
- Remove the throttle body [9] and the intake pipe [10].

The installation sequence is reversed from the removal sequence.

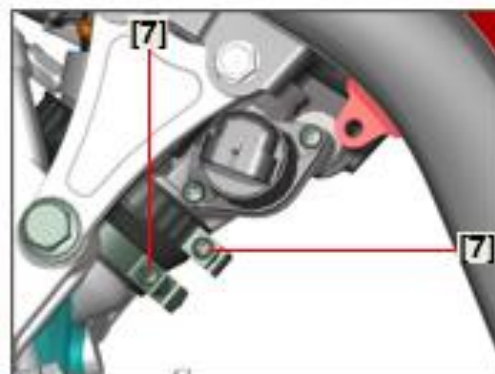
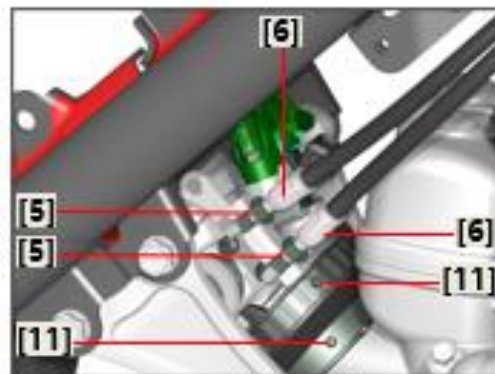
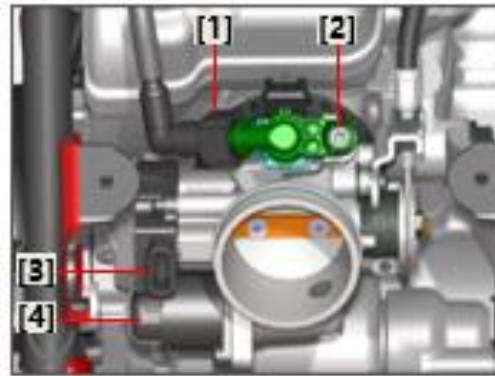
Note: When installing, the intake pipe clamp shall be within the limit point [11], and when connecting the intake pipe to the engine, align it with the limit convex plate [8].

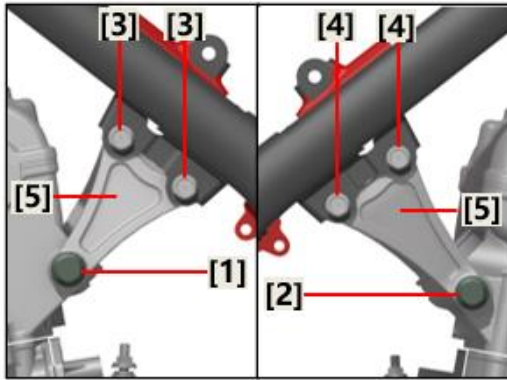
Torque:

M6x20

Connecting bolt between injector cap and throttle
8.0 N·m (0.8 kgf·m, 6.0 lbf·ft)

Tighten the intake pipe clamp of the throttle to the limit.





*Engine Disassembly and Assembly

① Upper suspension bracket

Disassembly/installation

Disassemble the following parts:

- Remove the bolts [1], [2] connecting the bracket to the engine;
- Remove the bolts [3], [4] connecting the bracket to the frame;
- Remove the left and right upper suspension brackets [5].

Torque:

M8x16

Connecting bolts between engine upper suspension and frame [3], [4]

36 N·m (3.6 kgf·m, 27 lbf·ft)

M10x25

Connecting bolts between engine upper suspension and engine [1], [2]

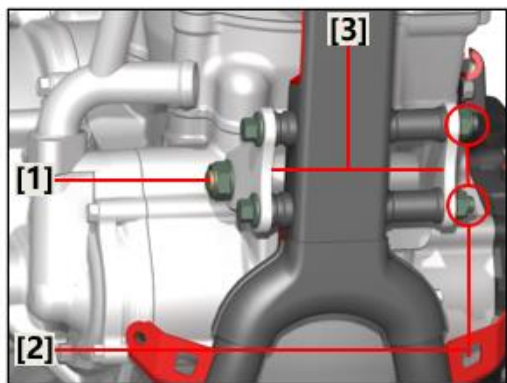
54 N·m (5.4 kgf·m, 40 lbf·ft)

② Front suspension bracket

Disassembly/installation

Disassemble the following parts:

- Remove the bolt [1] connecting the front suspension bracket to the engine;
- Remove the bolt [2] connecting the front suspension bracket to the frame;
- Remove the left and right front suspension brackets [3].



Torque:

M10x105

Connecting bolt between engine front suspension bracket and engine [1]

54 N·m (5.4 kgf·m, 40 lbf·ft)

M8x105

Connecting bolt between engine front suspension and frame

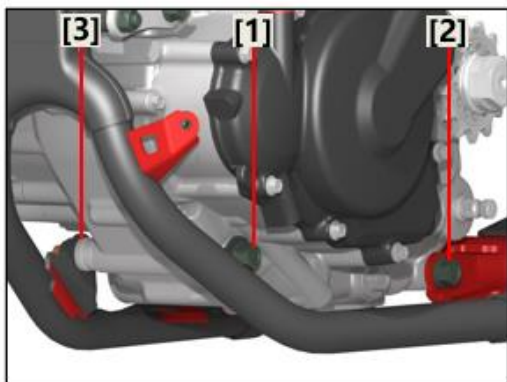
26 N·m (2.6 kgf·m, 19 lbf·ft)

③ Front and rear lower engine connections

Disassembly/installation

Disassemble the following parts:

- Remove the bolt [1] connecting the front lower part of the engine to the frame;
- Remove the bolt [2] connecting the rear lower part of the engine to the frame;
- Remove the mounting bushing [3].



Torque:

M10x130

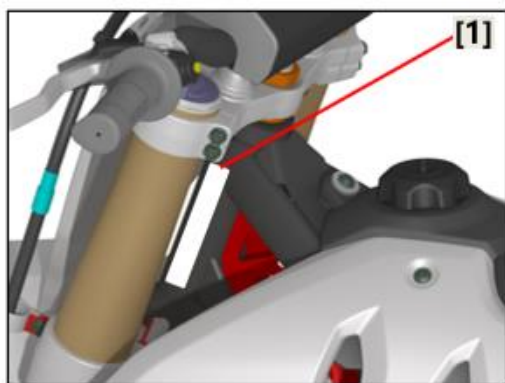
Connecting bolt between engine lower front suspension and frame

54 N·m (5.4 kgf·m, 40 lbf·ft)

M10x130

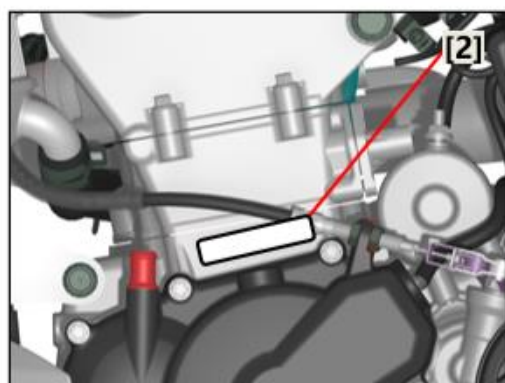
Connecting bolt between engine lower rear suspension and frame

54 N·m (5.4 kgf·m, 40 lbf·ft)



※Serial Number and Engine Number

For serial number registration of the MX250, the VIN and engine serial number are required. They may also be required when ordering accessories. You can record these numbers in the quick-reference section at the back of this manual. The vehicle identification number (VIN) [1] is printed on the left side of the head tube.



The engine number [2] is printed on the left-hand crankcase.

Electronic Fuel Injection (EFI) System

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Maintenance Information

Overview:

- This section introduces UMC's MSE8.0 EFI system equipped with self-diagnostic capabilities. For troubleshooting, please check and rectify faults according to the diagnostic codes and symptoms.
- EFI system failures are usually caused by connector disconnection or connector corrosion. Please check the connector before troubleshooting.

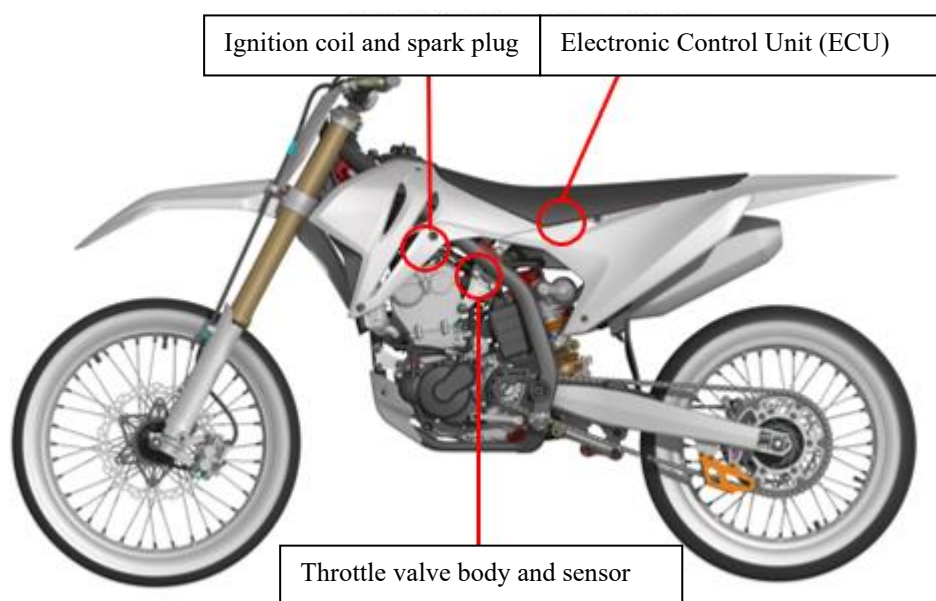
Precautions:

- During maintenance, it is forbidden to disassemble the parts of EFI system.
- During maintenance, extreme care shall be exercised on work with electronic components (ECUs, sensors, etc.) to prevent missing. Furthermore, do not touch the pins of electrical components at will to avoid damage caused by electrostatic breakdown.
- Do not remove the connectors of any components of the EFI system from their installation positions without authorization, to avoid accidental damage or foreign matters such as water and oil entering the connectors, which may affect the normal operation of the EFI system.
- When disconnecting and connecting the connector, be sure to put the ignition switch in the off position, otherwise the electrical components will be damaged.
- Since idle speed adjustment is completely completed by EFI system, manual adjustment is not needed. The limit screw of the throttle body has been adjusted at the factory, and the user is not allowed to change its initial position at will.
- This vehicle uses 24-2 teeth trigger signal to identify the speed.

The color codes used below are indicated in this section.

BI = Black	G = Green	Lg = Light Green	R = Red	Y = Yellow
Br = Brown	Gr = Gray	O = Orange	V = Purple	
Bu = Blue	Lb = Light Blue	P = Pink	W = White	

System Location



3. Introduction of System Troubleshooting

On-board diagnosis system (OBD system) refers to the diagnosis system integrated in the engine control system, which can monitor the components that affect exhaust emissions and the main functional states of the engine. It has the function of identifying and storing EFI faults.

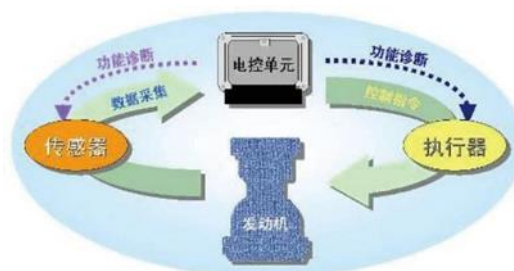
When repairing vehicles with OBD system, maintenance personnel can quickly and accurately locate the faulty parts through diagnostic instrument, which greatly improves the efficiency and quality of maintenance.

OBD technology involves many brand-new concepts. First of all, some basic knowledge related to OBD technology is introduced in order to facilitate understanding.

3.1 Fault information record

The ECU constantly monitors sensors, actuators, related circuits, fault indicators, battery voltages, etc., and even the ECU itself, and detects the reliability of sensor output signals, actuator drive signals and internal signals (such as closed-loop control, coolant temperature, idle speed control, etc.). Once any fault is identified, or any signal value exceeds the normal range, the electronic control unit immediately records the fault information in the fault memory of RAM. Fault information is stored in the form of fault code and displayed in the order of fault occurrence.

Faults can be divided into "current faults" and "historical faults" according to their occurrence time.



Schematic of Fault Diagnosis of EFI System

3.2 Description of fault lamp and its control strategy

Fault Indicator (malfunction indicator light, MIL): It is used to indicate the failure of emission-related components or systems. MIL lamps are generally an indicator lamp that can be displayed on the dashboard and shaped to meet the requirements of regulations and standards.

The activation of MIL lamp follows the following principles:

1) In normal mode, and the fault memory is empty

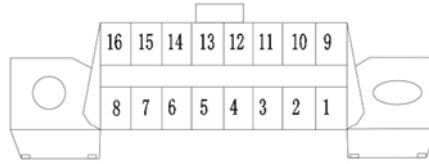
Turn on the ignition switch, turn on the stop switch, and the ECU will be initialized immediately. From initialization, the MIL lamp is on. The MIL lamp goes out immediately after the engine starts.

2) In normal mode, and the failed memory has failed

When the ignition switch is turned on and ECU is initialized, the MIL lamp remains on; If the fault manager requires the MIL to be illuminated in the fault mode, the MIL lamp is illuminated in the subsequent driving cycle; If the fault manager does not require the MIL to light up in fault mode, the MIL lamp goes out after startup.

3.3 Introduction of OBD interface

The pins for connecting the engine management system (EMS) are pins 4, 7 and 16 on the OBD diagnostic interface. Pin 4 of the standard diagnostic connector is connected to the battery negative terminal. Pins 7 is connected to pins E3 of ECU, that is, the "K" line of ECU. Pin 16 is connected to the battery positive terminal



ISO9141-2 Standard Diagnostic Interface Pin Sequence Number

The diagnostic instrument can communicate with the ECU through the "K" line and can read the following information:

- **Version information display**

ECU hardware number, ECU software number.

- **Fault code display**

Intake pressure sensor, intake temperature sensor, engine temperature sensor, throttle position sensor, oxygen sensor, oxygen sensor heating circuit, air-fuel ratio correction, fuel injector, fuel pump relay, speed sensor, canister control valve, speed signal, idle speed, idle speed regulator, system voltage, ECU, fault lamp and other fault information.

- **Engine parameter display**

Battery voltage, engine speed, target idle speed, vehicle speed, engine temperature, engine temperature sensor signal voltage, intake air temperature, intake air temperature sensor signal voltage, intake air pressure, intake air volume, stepper motor target position, throttle position sensor signal voltage, throttle opening, relative throttle position, canister control valve duty cycle, charging time, fuel injection pulse width, ignition advance angle, oxygen sensor short-term correction, oxygen sensor voltage, oxygen sensor long-term correction, engine relative load, canister control relative fuel injection, canister purification rate, canister load, idle actuator TEV opening, ambient pressure, altitude correction factor, fuel injection phase and other parameters.

3.4 Maintenance tool



Tool name:

Diagnostic instrument for EFI system

Function:

Read/Clear fault codes of EFI system and observe the data stream.



Tool name:

Adapter of EFI system

Function:

Check the electrical signal of each ECU pin, check the circuit condition, etc.



Tool name:

Ignition timing lamp

Function:

Check engine ignition timing, etc.



Tool name:

Digital multimeter

Function:

Check the characteristic parameters such as voltage, current and resistance in EFI system.



Tool name:

Vacuum meter

Function:

Check the pressure in the intake manifold.



Tool name:

Cylinder pressure gauge

Function:

Check the cylinder pressure of each cylinder.



Tool name:

Fuel pressure gauge

Function:

Check the pressure of the fuel system for finding out the working conditions of the fuel pump and fuel pressure regulator in the fuel system.

4. Maintenance and Troubleshooting Process

4.1 Usage of diagnostic instrument



1. Connect the diagnostic instrument to the diagnostic interface.
2. Turn on the "ignition switch".
3. Read fault related information (fault code, frozen frame, etc.); read the maintenance manual to confirm the faulty parts and types; make the maintenance plan according to fault related information.
4. Troubleshooting.
5. Turn on the ignition switch again, start the vehicle to read the fault information, and confirm that the fault has been eliminated.

4.2 Preliminary check

Before starting the troubleshooting steps based on engine fault codes, a preliminary check shall be performed:

1. Confirm that the engine fault indicator lamp works normally;
2. Confirm the existence of the fault phenomena complained by the vehicle owner, and confirm the conditions under which the fault occurs.

Then make a visual inspection:

- Check whether there is leakage in the fuel pipeline;
- Check whether the vacuum pipeline is broken, kinked and connected correctly;
- Check whether the air intake pipeline is blocked, leaked, squashed or damaged;
- Check whether the high-voltage wire of the ignition system is broken and aged, and whether the ignition sequence is correct;
- Check whether the harness ground joint is clean and firm;
- Check whether the sensors and actuator connectors are secured or in poor contact.

Important note: If the above phenomenon exists, the maintenance operation shall be carried out. If not, it will affect the subsequent fault diagnosis and maintenance work.

5. Troubleshoot according to Fault Codes

This Section introduces the meaning of fault codes used in MSE 8.0 system, the corresponding diagnosis strategy, possible fault causes and fault treatment strategy, which can be used as a reference in the process of vehicle maintenance.

For details of the relevant ECU pins mentioned below, the actual harness diagram of the project may prevail.

5.1 Fault code: P0030 Oxygen sensor heating control circuit open or P0053 Oxygen sensor heating unreasonable

Maintenance tips: The fault has been confirmed and may have the following problems (1) There is an open circuit between the circuit connected to the ECU pin and the upstream oxygen sensor pin 2; (2) Open circuit for upstream oxygen sensor pin 1 to main relay; (3) Open circuit between pin 1 and pin 2 of upstream oxygen sensor.	Maintenance tips: Check the followings (1) Measure the resistance of the line between ECU connector pin and upstream oxygen sensor pin 2 to assess its performance; (2) Measure the resistance between the upstream oxygen sensor pin 1 and the main relay to assess its performance (3) Measure the resistance between pin 1 and pin 2 of the upstream oxygen sensor to assess its performance
--	--

5.2 Fault code: P0031 Oxygen sensor heating circuit shorted to ground

Maintenance tips: The fault has been confirmed and may have the following problems 1) The circuit connected to the ECU pin is short-circuited to ground.	Maintenance tips: Check the followings 1) Measure whether the ECU's resistance to ground pin is normal.
---	--

5.3 Fault code: P0032 The oxygen sensor heating circuit is shorted to the power supply

Maintenance tips: The fault has been confirmed and may have the following problems 1) Short circuit between the circuit connected to the ECU pin and the upstream oxygen sensor pin 1 circuit. 2) Short circuit between the circuit connected to ECU pin and other power supply circuits.	Maintenance tips: Check the followings 1) Measure whether ECU voltage is normal; 2) Measure the resistance between the ECU pin and the upstream oxygen sensor pin 1 circuit.
---	--

5.4 Fault code: P0107 Intake pressure sensor circuit voltage too low

Maintenance tips: The fault has been confirmed and may have the following problems 1) The ECU sensor signal circuit is shorted to ground.	Maintenance tips: Check the followings 1) Resistance between ECU pin and ground.
--	---

5.5 Fault code: P0108 Intake pressure sensor circuit voltage too high.

Maintenance tips: The fault has been confirmed and may have the following problems 1) ECU detects that the sensor signal circuit is short-circuited to the power supply.	Maintenance tips: Check the followings 1) Voltage of ECU pin.
---	--

5.6 Fault code: P0105 Intake pressure sensor circuit signal stuck

Maintenance tips: The fault has been confirmed and may have the following problems 1) ECU detects that the fluctuation amplitude of intake pressure is too small when the sensor signal is running normally.	Maintenance tips: Check the followings 1) Severe intake system leakage; 2) Intake pressure sensor sampling port is blocked; 3) Oil pressure sensor
---	---

5.7 Fault code: P0106 Intake pressure sensor circuit signal unbelievable

Maintenance tips: The fault has been confirmed and may have the following problems 1) Intake pressure sampling value used for load calculation exceeds limit.	Maintenance tips: Check the followings 1) Severe intake system leakage; 2) Intake pressure sensor sampling port is blocked.
--	---

5.8 Fault code: P0112 Intake temperature sensor signal voltage too low

Maintenance tips: The fault has been confirmed and may have the following problems 1) Sensor signal circuit connected to ECU pin is short-circuited to ground.	Maintenance tips: Check the followings 1) Measure the resistance between the sensor signal circuit at the ECU pin and ground.
---	--

5.9. Fault code: P0113 Intake air temperature sensor signal too high

Maintenance tips: The fault has been confirmed and may have the following problems 1) Sensor signal circuit connected to ECU pin is short-circuited to ground.	Maintenance tips: Check the followings 1) Measure whether the voltage of the sensor signal circuit of ECU pin is normal.
---	---

5.10 Fault code: P0111 Intake temperature out of range

Maintenance tips: The fault has been confirmed and may have the following problems 1) The engine intake air temperature sensor has a break, short circuit to 5v or ground.	Maintenance tips: Check the followings 1) Measure whether the voltage of the sensor signal circuit of ECU pin is normal 2) Check whether the temperature sensor model matches the parts list.
---	---

5.11 Fault code: P0114 intake temperature signal stuck

Maintenance tips: The fault has been confirmed and may have the following problems 1) Start the engine below 40°C, runs under a certain load for over 30min, yet intake air temperature rise shall be still less than 3°C.	Maintenance tips: Check the followings 1) Check if the intake temperature sensor is properly installed; 2) Verify if the ECU PIN connections are properly aligned.
---	--

5.12 Fault code: P0117 Engine coolant temperature sensor circuit voltage too low

Maintenance tips: The fault has been confirmed and may have the following problems 1) Fault code: P0122 The circuit connected to the ECU pin short-circuited to ground	Maintenance tips: Check the followings 1) Measure the resistance between the ECU pin and ground
---	--

5.13 Fault code: P0118 Engine coolant temperature sensor signal voltage too high

Maintenance tips: The fault has been confirmed and may have the following problems 1) Short circuit between circuit connected to ECU pin and other power supply circuit	Maintenance tips: Check the followings 1) Measure whether the voltage connected to the ECU pin is normal.
--	--

5.14 Fault code: P0116 Engine temperature out of range

Maintenance tips: The fault has been confirmed and may have the following problems 1) The engine intake air temperature sensor has a break, short circuit to 5v or ground.	Maintenance tips: Check the followings 1) Measure whether the voltage of the sensor signal circuit of ECU pin is normal 2) Check whether the temperature sensor model matches the parts list.
---	---

5.15 Fault code: P0126 Engine temperature signal stuck

Maintenance tips: The fault has been confirmed and may have the following problems 1) As the engine operates, the performance of rising engine temperature is inconsistent with the actual engine temperature.	Maintenance tips: 1) Check if the intake temperature sensor is properly installed; 2) Verify if the ECU PIN connections are properly aligned.
---	--

5.16 Fault code: P0122 Throttle position sensor circuit voltage too low

Maintenance tips: The fault has been confirmed and may have the following problems 1) ECU pin circuit short to ground.	Maintenance tips: Check the followings 1) Measure the resistance between the ECU pin and ground.
---	---

5.17 Fault code: P0123 Throttle position sensor circuit voltage too high

Maintenance tips: The fault has been confirmed and may have the following problems 1) Short circuit between circuit connected to ECU pin and other power supply circuit	Maintenance tips: Check the followings 1) Check if the voltage connected to the ECU pin is normal.
--	---

5.18 Fault code: P0130 Oxygen sensor signal unreasonable

Fault cause description: When the oxygen sensor signal shows the following conditions, the system judges that the oxygen sensor signal is unreasonable. The oxygen sensor signal circuit is coupled with the heating circuit.

Maintenance tips: The fault has been confirmed and may have the following problems 1) Check whether the oxygen sensor connector is correct and normal; 2) Check whether the oxygen sensor signal circuit is coupled to the heating circuit.	Maintenance tips:
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5.19 Fault code: P0131 Oxygen sensor signal voltage too low

Maintenance tips: The fault has been confirmed and may have the following problems 1) The signal circuit connected to the ECU pin is short-circuited to ground.	Maintenance tips: Check the followings 1) Measure the resistance between the signal circuit connected to the ECU pin and ground.
--	---

5.20 Fault code: P0132 Oxygen sensor signal voltage too high

Fault cause description: When the engine starts, ECU measures the voltage of oxygen sensor circuit. When the signal voltage is higher than 1.5 volts for a long time, it is assessed that the oxygen sensor signal circuit is short-circuited to the power supply.

Maintenance tips: The fault has been confirmed and may have the following problems 1) Short circuit between signal circuit connected to ECU pin and oxygen sensor pin 1; 2) Short circuit between signal circuit connected to ECU pin and other power supply circuit.	Maintenance tips: Check the followings 1) Measure the resistance between the signal circuit connected to the ECU pin and the oxygen sensor pin 1; 2) Measure the voltage of the signal circuit connected to the ECU pin.
---	--

5.21 Fault code: P0133 Oxygen sensor response relatively slow

Maintenance tips: The fault has been confirmed and may have the following problems 1) The oxygen sensor has aged, with the sensing element contaminated.	Maintenance tips: Check the followings 1) Replace the oxygen sensor to fix the fault.
---	--

5.22 Fault code: P0134 Oxygen sensor signal circuit open

Fault cause description: When the ECU measures the voltage of oxygen sensor circuit after the engine starts, and when the signal voltage is always above 1.2 volts, it is assessed that the oxygen sensor signal circuit suffers open-circuit fault.

Maintenance tips: The fault has been confirmed and may have the following problems 1) Open circuit for oxygen sensor to ECU pin; 2) Poor connection of oxygen sensor connector (pin oxidation).	Maintenance tips: Check the followings 1) Measure the resistance of ECU connector to oxygen sensor 4.
---	--

5.23 Fault code: P0201 Injector control circuit of cylinder 1 open

Maintenance tips: The fault has been confirmed and may have the following problems 1) Check if the injector coil is open- circuited; 2) Check if the connection between injector connector pin and ECU pin is secured; 3) Check if the connection between injector connector pin and main relay is secured;	Maintenance tips: Check the followings
--	--

5.24 Fault code: P0261 Injector control circuit of cylinder 1 short to ground

Maintenance tips: The fault has been confirmed and may have the following problems 1) Each drive circuit connected to the ECU pin is short-circuited to ground.	Maintenance tips: Check the followings 1) Measure the resistance of the circuit connected to the ECU pin to ground.
--	--

5.25 Fault code: P0262 Injector control circuit of cylinder 1 short to power

Maintenance tips: The fault has been confirmed and may have the following problems 1) The circuit connected to the ECU pin is short-circuited to another power supply.	Maintenance tips: Check the followings 1) Measure the voltage of the circuit connected to the ECU pin.
---	---

5.26 Fault code: P0322 No speed sensor pulse signal (open circuit or short circuit)

Fault cause: When the engine starts, ECU monitors the speed sensor signal and other signals as well. According to the rationality of the signal, the system assesses that the signal of the speed sensor is lost.

Maintenance tips: The fault has been confirmed and may have the following problems 1) Open circuit for speed sensor connected to ECU; 2) The circuit of the speed sensor connected to the ECU is short-circuited; 3) Open circuit of speed sensor coil.	Maintenance tips:
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5.27 Fault code: P0444 canister control valve circuit open

Maintenance tips: The fault has been confirmed and may have the following problems 1) Open circuit between the circuit connected to ECU and pin 2 of canister control valve. 2) Open circuit for pin 1 of canister control valve connected to main relay; 3) Open circuit of solenoid between pin 1 and pin 2 of canister control valve.	Maintenance tips:
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5.28 Fault code: P0458 canister control valve circuit voltage too low

Maintenance tips: The fault has been confirmed and may have the following problems 1) The circuit connected to the ECU is short-circuited to ground.	Maintenance tips: Check the followings 1) Measure whether the resistance to ground connected to the ECU pin is normal.
---	---

5.29 Fault code: P0459 Canister control valve circuit voltage too high

Maintenance tips: The fault has been confirmed and may have the following problems 1) Open circuit between the circuit connected to ECU and pin 2 of canister control valve; 2) Short circuit between the circuit connected to ECU pin and other power supply circuits.	Maintenance tips: Check the followings 1) Measure whether the voltage of ECU pin is normal; 2) Measure the resistance between ECU pin and pin 1 circuit of canister control valve.
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5.30 Fault code: P0508 stepper motor drive pin circuit short to ground

Fault code: P0509 stepper motor drive pin circuit short to power

Fault code: P0511 Open circuit or overload for stepper motor drive pin

Fault cause description: When the engine starts, the circuit control module in ECU continuously monitors the driving circuit voltage of the idle stepper motor. When any one of the four circuits has short circuit to ground/short circuit or overload to power supply/open circuit, the system assesses that the stepper motor circuit has the fault.

Maintenance tips: The fault has been confirmed and may have the following problems 1) Any one of the driving circuits of the stepper motor connected to the ECU is short circuit to ground and short circuit/open circuit to power supply.	Maintenance tips: Check the followings 1) Measure the resistance or voltage between each stepper motor drive circuit connected to the ECU and ground.
---	--

5.31 Fault code: P0560 System battery voltage signal is unreasonable

Fault code: P0562 System battery voltage too low

Fault code: P0563 System battery voltage too high

Maintenance tips: The fault has been confirmed and may have the following problems 1)The generator is damaged and unable to work well, or the battery is leaking; 2) Open circuit of generator excitation circuit; 3) The generator adjuster is damaged and unable to control the power generation, resulting in too high generation voltage.	Maintenance tips: Check the followings 1) Check the generating capacity of the generator (measure the generator voltage after starting)
--	--

5.32 Fault code: P0627 fuel pump relay control circuit open

Fault code: P0628 Fuel pump relay control circuit short to ground

Fault Code: P0629 Fuel pump relay control circuit short to power

Maintenance tips: The fault has been confirmed and may have the following problems 1) Open circuit/short circuit to ground/short circuit to power supply between pump relay control circuit connected to ECU and pump relay; 2) Open circuit between relay and main relay; 3) Open circuit of electromagnetic coil of relay.	Maintenance tips: Check the followings 1) Measure the resistance or voltage of the fuel pump relay control circuit connected to ECU; 2) Resistance between relay and main relay; 3) Resistance between relay pins.
---	---

5.33 Fault Code: P0650 MIL lamp drive circuit fault

Maintenance tips: The fault has been confirmed and may have the following problems 1) MIL lamp drive circuit connected to ECU is open/short to ground/short to power supply. 2) Open circuit between MIL and main relay; 3) MIL lamp burns out.	Maintenance tips: Check the followings 1) Measure the resistance or voltage of the MIL lamp drive circuit connected to the ECU
--	---

5.34 Fault code: P2300 Ignition coil short circuit to ground

Maintenance tips: The fault has been confirmed and may have the following problems 1) Ignition coil drive circuit short to ground.	Maintenance tips: Check the followings 1) Measure the resistance and voltage of the ignition coil drive circuit connected to the ECU.
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5.35 Fault code: P0301 engine misfire

Maintenance tips: The fault has been confirmed and may have the following problems 1) Ignition coil drive circuit malfunction; 2) Injector circuit drive malfunction; 3) DG signal interference in wiring harness.	Maintenance tips: Check the followings
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5.36 Fault code: P0507 Engine idle speed too high

Maintenance tips: The fault has been confirmed and may have the following problems 1) Intake system leak; 2) The stepper motor plug sticks at larger opening; 3) The Valve body leakage is too large.	Maintenance tips: Check the followings
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5.37 Fault code: P0506 Engine idle speed too low

Maintenance tips: The fault has been confirmed and may have the following problems 1) The stepper motor drive abnormal, plug stuck at lower opening; 2) The intake system is blocked; 3) The valve body leakage is too small.	Maintenance tips: Check the followings
--	--

5.38 Fault Code: P2177 Mixture too lean under non-idle conditions

Maintenance tips: The fault has been confirmed and may have the following problems 1) Too low fuel pressure; 2) Insufficient fuel supply.	Maintenance tips: Check the followings 1) Whether the fuel pressure regulator (3.5bar) is functioning properly. 2) Fuel supply line is bent or clogged.
--	--

5.39 Fault code: P2178 Mixture too rich under non-idle conditions

Maintenance tips: The fault has been confirmed and may have the following problems 1) Too high fuel pressure.	Maintenance tips: Check the followings 1) Whether the fuel pressure regulator (3.5bar) is functioning properly.
---	---

5.40 Fault code: P2187 Mixture too lean under idle conditions

Maintenance tips: The fault has been confirmed and may have the following problems 1) Too low fuel pressure; 2) Insufficient fuel supply.	Maintenance tips: Check the followings 1) Whether the fuel pressure regulator (3.5bar) is functioning properly. 2) Fuel supply line is bent or clogged.
--	--

5.41 Fault code: P2188 Mixture too rich under idle conditions

Maintenance tips: The fault has been confirmed and may have the following problems 1) Too high fuel pressure.	Maintenance tips: Check the followings 1) Whether the fuel pressure regulator (3.5bar) is functioning properly.
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5.42 Fault code: P0501 Vehicle speed signal open circuit

Maintenance tips: The fault has been confirmed and may have the following problems 1) When the vehicle is in a coasting state, the vehicle speed signal is less than 5km/h, and this condition lasts for more than 10 seconds.	Maintenance tips: Check the followings 1) Check whether the vehicle speed sensor connector is loose, whether the sensor installation position is facing the signal disc directly; 2) The distance between the speed sensor's sensing area and the signal disc is less than 1.8mm.
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6. Troubleshoot according to Fault Phenomena

This section introduces the meaning of current fault phenomena, corresponding diagnosis strategies, possible fault causes, and fault treatment strategies, which can be used as a reference in the process of vehicle maintenance.

6.1 When starting, the engine does not rotate or rotates slowly.

Common fault locations: 1. battery; 2. starter motor; 3. wiring harness or ignition switch; 4. engine mechanical parts.

General diagnostic process:

S/N	Operational procedures	Testing result	Subsequent procedures
1	Use a multimeter to check the voltage between the two terminals of the battery to see if it is around 8-12V when the engine is starting.	Yes	Next step
		No	Replace battery
2	Keep the ignition switch in the start position and use a multimeter to check whether the positive terminal of the starter motor has a voltage of more than 8V.	Yes	Next step
		No	Repair or replace the harness
3	Disassemble the starter motor and check its working condition. Focus on checking whether there is an open circuit or it is stuck due to poor lubrication.	Yes	Repair or replace the starter motor
		No	Next step
4	If the fault only occurs in winter, check whether the improper selection of engine lubricating oil leads to too large resistance of the starter motor.	Yes	Change with the lubricating oil of the appropriate grade
		No	Next step
5	Check whether the internal mechanical resistance of the engine is too large, resulting in the starter motor not rotating or rotating slowly.	Yes	Maintain the internal resistance of the engine
		No	Repeat the above procedures

6.2 When starting, the engine can be cranked but fails to start successfully.

Common fault locations: 1. empty fuel tank; 2. fuel pump; 3. speed sensor; 4. ignition coil; 5. engine mechanical parts.

General diagnostic process:

S/N	Operational procedures	Testing result	Subsequent procedures
1	Connect the fuel pressure gauge (the connection point is at the front end of the fuel injector inlet pipe), turn on the ignition switch and repeat the step if necessary, or start the engine, and check that the fuel pressure is around 330 kPa.	Yes	Next step
		No	Maintain the fuel supply system
2	Connect the diagnostic instrument of the EFI system, Observe the "engine speed" data item, start the engine and check if there is a speed signal output.	Yes	Next step
		No	Maintain the speed sensor circuit
3	Remove the ignition high-voltage wire, connect a spark plug, and place the spark plug electrode about 5mm away from the engine block, start the engine and check if there is a blue-white high-voltage spark.	Yes	Next step
		No	Maintain the ignition system
4	Check the pressure of the engine cylinders, observe if there is insufficient pressure in the engine cylinders.	Yes	Troubleshoot engine mechanical faults
		No	Next step
5	Connect the adapter of EFI system, turn on the ignition switch, and check whether the power supply of 4#, 15# pin is normal; check whether the 7#, 10# pin is grounded properly.	Yes	Diagnostic help
		No	Maintain corresponding lines

6.3 Difficulty starting the engine when it's cold or hot.

Common fault locations: 1. water in the fuel; 2. fuel pump; 3. engine temperature sensor; 4. injector; 5. ignition coil; 6. throttle body and idle air bypass air passage; 7. engine mechanical parts.

General diagnostic process:

S/N	Operational procedures	Testing result	Subsequent procedures
1	Connect the fuel pressure gauge (the connection point is at the front end of the fuel injector inlet pipe), start the engine, and check that the fuel pressure is around 330 kPa.	Yes	Next step
		No	Maintain the fuel supply system
2	Remove the ignition high-voltage wire, connect a spark plug, and place the spark plug electrode about 5 mm from the engine body. Start the engine and check if the spark plug ignition intensity is normal.	Yes	Next step
		No	Maintain the ignition system
3	Remove the engine temperature sensor connector, start the engine, and observe whether the engine is started successfully at this time. (Or connect a 2,500Ω resistor in series at the engine temperature sensor connector to replace the sensor, and observe whether the engine starts successfully at this time.)	Yes	Maintain the line or replace the sensor
		No	Next step
4	Gently pull the accelerator and observe if it is easy to start.	Yes	Clean the throttle and the idle-speed air passage
		No	Next step
5	Remove the fuel injector and check the fuel injector for leakage or blockage using a special fuel injector cleaning analyzer.	Yes	Replace it in case of failure
		No	Next step
6	Check the fuel condition to see if the fault phenomenon happens just after refueling.	Yes	Change fuel
		No	Next step
7	Check the pressure of the engine cylinders, observe if there is insufficient pressure in the engine cylinders.	Yes	Troubleshoot engine mechanical faults
		No	Next step
8	Connect the adapter of EFI system, turn on the ignition switch, and check whether the power supply of 4#, 15# pin is normal; check whether the 7#, 10# pin is grounded properly.	Yes	Diagnostic help
		No	Maintain corresponding lines

6.4 The engine starts normally, but the idle speed is unstable at all times.

Common fault location: 1. water in fuel; 2. fuel injector; 3. spark plug; 4. throttle body and idle bypass air passage; 5. air intake duct; 6. idle; 7. ignition timing; 8. spark plug; 9. engine mechanical parts.

General diagnostic process:

S/N	Operational procedures	Testing result	Subsequent procedures
1	Check whether the air filter is blocked and the air intake duct is leaked.	Yes	Maintain the air intake system
		No	Next step
2	Check whether the idle speed adjuster is stuck.	Yes	Clean or replace
		No	Next step
3	Check the spark plug of the cylinder to see whether its model and clearance meet the specifications.	Yes	Next step
		No	Adjust or replace
4	Check the throttle body and idle bypass air passage for carbon deposition.	Yes	Wash
		No	Next step
5	Remove the fuel injector and check the fuel injector for leakage, blockage or excessive deviation in flow rate using a special fuel injector cleaning analyzer.	Yes	Replace it in case of failure
		No	Next step
6	Check the fuel condition to see if the fault phenomenon happens just after refueling.	Yes	Change fuel
		No	Next step
7	Check the pressure of the engine cylinders, observe if there is too large pressure difference.	Yes	Troubleshoot engine mechanical faults
		No	Next step
8	Check whether the mechanical ignition timing of the engine meets the specifications.	Yes	Next step
		No	Maintain the ignition timing
9	Connect the adapter of EFI system, turn on the ignition switch, and check whether the power supply of 4#, 15# pin is normal; check whether the 7#, 10# pin is grounded properly.	Yes	Diagnostic help
		No	Maintain corresponding lines

6.5 When accelerating, the engine speed does not increase or flames out during acceleration.

Common fault location: 1. water in fuel; 2. air intake pressure sensor and throttle position sensor; 3. spark plug; 4. throttle body and idle bypass air passage; 5. air intake duct; 6. idle speed controller; 7. fuel injector; 8. ignition timing; 9. exhaust pipe.

General diagnostic process:

S/N	Operational procedures	Testing result	Subsequent procedures
1	Check whether the air filter is clogged.	Yes	Maintain the air intake system
		No	Next step
2	Connect the fuel pressure gauge (the connection point is at the front end of the fuel injector inlet pipe), start the engine, and check that the fuel pressure is around 330 kPa at idle.	Yes	Next step
		No	Maintain the fuel supply system
3	Check the spark plug of the cylinder to see whether its model and clearance meet the specifications.	Yes	Next step
		No	Adjust or replace
4	Remove the idle speed controller and check the throttle body, idle speed controller and idle bypass air passage for carbon deposition.	Yes	Clean related parts
		No	Next step
5	Check whether the intake pressure sensor, throttle position sensor and their lines are normal.	Yes	Next step
		No	Maintain the line or replace the sensor
6	Remove the fuel injector and check the fuel injector for leakage or blockage using a special fuel injector cleaning analyzer.	Yes	Replace it in case of failure
		No	Next step
7	Check the fuel condition to see if the fault phenomenon happens just after refueling.	Yes	Change fuel
		No	Next step
8	Check whether the ignition sequence and ignition timing of the engine meet the specifications.	Yes	Next step
		No	Maintain the ignition timing
9	Check whether the exhaust pipe exhausts smoothly	Yes	Next step
		No	Repair or replace exhaust pipe
10	Connect the adapter of EFI system, turn on the ignition switch, and check whether the power supply of 4#, 15# pin is normal; check whether the 7#, 10# pin is grounded properly.	Yes	Diagnostic help
		No	Maintain corresponding lines

6.6 Slow response when accelerating.

Common fault location: 1. water in fuel; 2. intake pressure sensor and throttle position sensor; 3. spark plug; 4. throttle body and idle bypass air passage; 5. air intake duct; 6. idle adjuster; 7. fuel injector; 8. ignition timing; 9. exhaust pipe.

General diagnostic process:

S/N	Operational procedures	Testing result	Subsequent procedures
1	Check whether the air filter is clogged.	Yes	Maintain the air intake system
		No	Next step
2	Connect the fuel pressure gauge (the connection point is at the front end of the fuel injector inlet pipe), start the engine, and check that the fuel pressure is around 330 kPa at idle.	Yes	Next step
		No	Maintain the fuel supply system
3	Check the spark plug of the cylinder to see whether its model and clearance meet the specifications.	Yes	Next step
		No	Adjust or replace
4	Remove the idle speed controller and check the throttle body, idle speed controller and idle bypass air passage for carbon deposition.	Yes	Clean related parts
		No	Next step
5	Check whether the intake pressure sensor, throttle position sensor and their lines are normal.	Yes	Next step
		No	Maintain the line or replace the sensor

S/N	Operational procedures	Testing result	Subsequent procedures
6	Remove the fuel injector and check the fuel injector for leakage or blockage using a special fuel injector cleaning analyzer.	Yes	Replace it in case of failure
		No	Next step
7	Check the fuel condition to see if the fault phenomenon happens just after refueling.	Yes	Change fuel
		No	Next step
8	Check whether the ignition sequence and ignition timing of the engine meet the specifications.	Yes	Next step
		No	Maintain the ignition timing
9	Check whether the exhaust pipe exhausts smoothly	Yes	Next step
		No	Repair or replace exhaust pipe
10	Connect the adapter of EFI system, turn on the ignition switch, and check whether the power supply of 4#, 15# pin is normal; check whether the 7#, 10# pin is grounded properly.	Yes	Diagnostic help
		No	Maintain corresponding lines

7. List of fault codes (PCODE)

S/N	Fault code	Description (UAES)
1	P0030	Oxygen sensor heating control circuit fault
2	P0031	Oxygen sensor heating control circuit short to ground
3	P0032	Oxygen sensor heating control circuit short to power
4	P0053	Oxygen sensor heating unreasonable
5	P0107	Intake pressure sensor short to ground
6	P0108	Intake pressure sensor circuit voltage too high
7	P0106	Intake pressure sensor signal out of range
8	P0105	Intake temperature sensor signal stuck
9	P0112	Intake temperature sensor signal voltage too low
10	P0113	Intake temperature sensor signal voltage too high
11	P0114	Intake temperature signal stuck
12	P0111	Intake temperature signal out of range
13	P0117	Engine coolant temperature sensor circuit voltage too low
14	P0118	Engine coolant temperature sensor circuit voltage too high
15	P0126	Engine coolant temperature sensor signal stuck
16	P0116	Engine coolant temperature sensor out of range
17	P0122	Throttle position sensor circuit voltage too low
18	P0123	Throttle position sensor circuit voltage too high
19	P0130	Oxygen sensor signal unreasonable
20	P0131	Oxygen sensor circuit voltage too low
21	P0132	Oxygen sensor circuit voltage too high
22	P0134	Open circuit in oxygen sensor signal circuit
23	P0133	Oxygen sensor aged
24	P0201	Open circuit for fuel injector control circuit of cylinder 1
25	P0261	Short circuit to ground for fuel injector control circuit of cylinder 1
26	P0262	Short circuit to power for fuel injector control circuit of cylinder 1
27	P0322	No speed sensor pulse signal (open circuit or short circuit)
28	P0444	Carbon canister control valve circuit open
29	P0458	Carbon canister control valve circuit voltage too low
30	P0459	Carbon canister control valve circuit voltage too high
31	P0508	Stepper motor drive pin circuit short to ground
32	P0509	Stepper motor drive pin circuit short to power
33	P0511	Stepper motor drive pin open circuit or overload
34	P0560	System battery voltage signal unreasonable
35	P0562	System battery voltage too low
36	P0563	System battery voltage too high
37	P0627	Oil pump relay control circuit open
38	P0628	Oil pump relay control circuit short to ground
39	P0629	Oil pump relay control circuit short to power
40	P0650	MIL lamp drive circuit fault
41	P0501	Vehicle speed signal open circuit
42	P2300	Ignition coil short to ground
43	P0301	Engine misfire fault
44	P0507	Engine idle rotating speed too high
45	P0506	Engine idle rotating speed too low
46	P2177	Lean fuel supply system fault when not idling
47	P2178	Rich fuel supply system fault when not idling
48	P2187	Mixture too lean when idling
49	P2188	Mixture too rich when idling

Fuel System

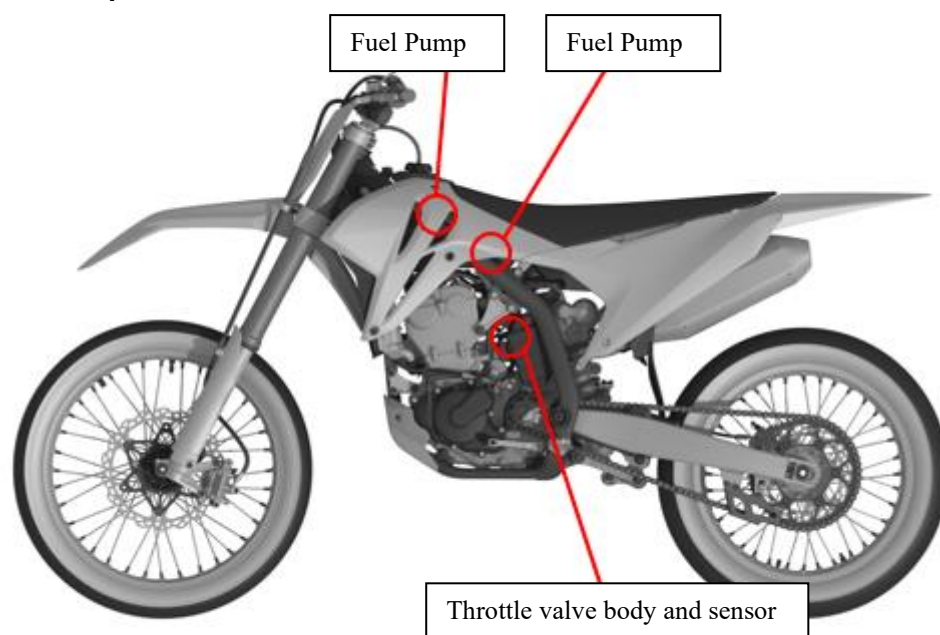
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Maintenance Instructions

Overview:

- Bending or kinking the control cable can affect the smooth operation and may cause the cable to bind or tangle, resulting in loss of vehicle control.
- Please work in a well-ventilated area. Smoking or allowing flame, spark in a place where gasoline is stored can cause a fire or explosion.
- Release the fuel pressure in the system before disconnecting the fuel supply hose.
- Do not turn the throttle from fully open to fully close after removing the throttle cable, as this may cause incorrect idle operation.
- Seal the intake port with tape or a clean cloth to prevent dirt and debris from entering the engine after the throttle body is removed.
- Do not damage the throttle body, which may lead to incorrect throttle operation.
- Keep dust and debris out of the throttle bore and air passages after the throttle body is removed. Clean them using compressed air, if necessary.
- Do not loosen or tighten any nuts or screws on the throttle body painted with torsion markers, as this may cause throttle valve and idle speed control faults.
- Do not apply commercial carburetor detergent on the inside of the throttle bore.
- The throttle body parts not shown in this manual shall not be disassembled.
- For the repair of the injector and the idle air control valve, the throttle body needs to be disassembled/installed.
- For checking the fuel level sensor.

Position of Components



*Fuel Pipeline Inspection

Remove the following components:

- Seat cushion assembly;
- Front tank left and right trims, and clamp the fuel tank vent hose [1] with a hose clamp;
- Front mounting bolts [2] and rear mounting bolts [3] of the fuel tank;
- Remove the tip sensor wire harness connector [4];
- Slowly lift the fuel tank [5].

Note:

Do not hang the fuel tank from the fuel supply hose.

Cover the frame with a rag to prevent damage to the frame.

The installation sequence is reversed from the removal sequence.

Note:

Be careful not to twist or bend the fuel supply hose.

Inspection

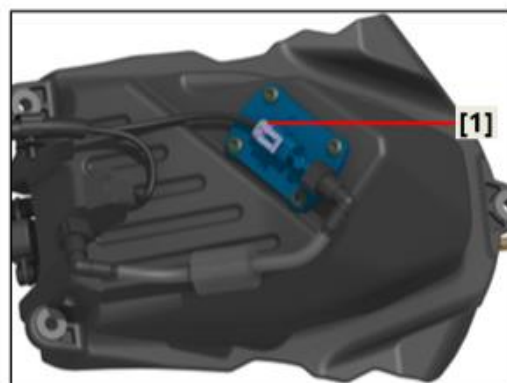
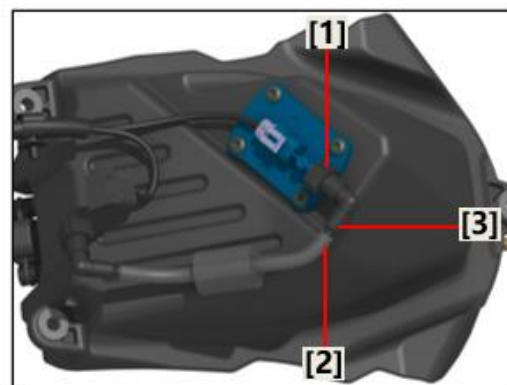
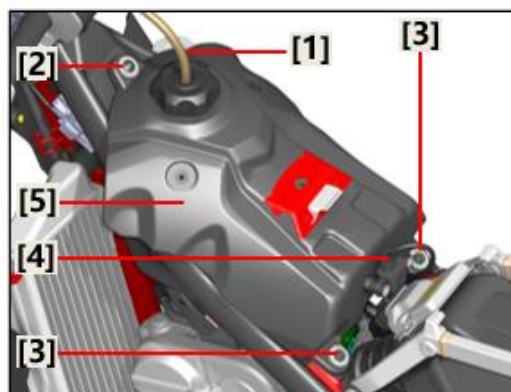
Hang the fuel tank on the right side of the frame. Check the connection status such as aging and damage to the quick connector [1].

Gently move the fuel supply hose [2] back and forth. Check that its free clearance is 1-2 mm and the quick connector [3] is firmly connected.

If the quick connector and its surroundings are dirty, please clean them.

Check if the fuel supply hose is aged, damaged, or leaking, and replace if necessary.

Please contact your dealer to replace the fuel supply hose assembly.

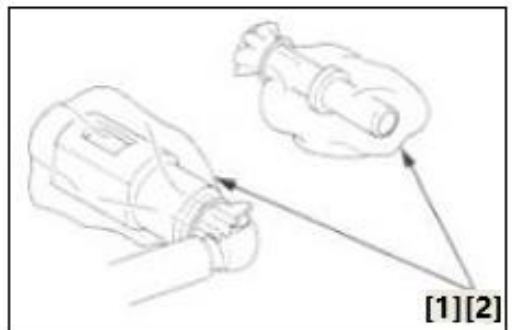
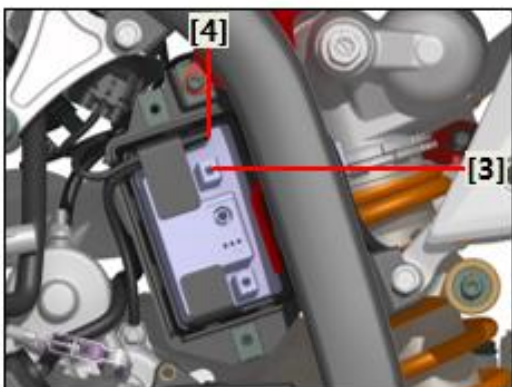
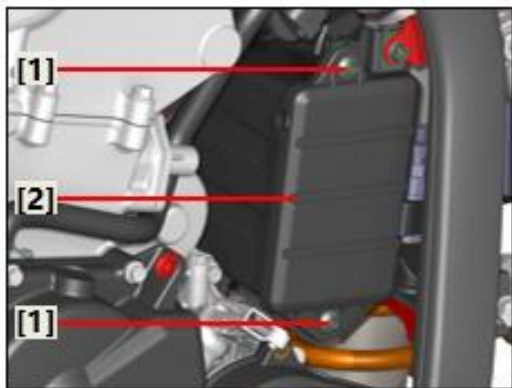


*Fuel Pressure Release

Note:

Before disconnecting the fuel supply hose, release the system pressure as follows.

1. Hang the fuel tank on the right side of the frame.
2. Disconnect the 2p (black) connector [1] that supplies power to the fuel pump unit.
3. Start the engine and let it idle until it stops to release the fuel pressure in the fuel supply hose.



*Quick Connector

Disassembly

Note: Clean around the quick connector before disconnecting the fuel supply hose, ensuring no dust enters the fuel system.

Do not twist or bend the fuel supply hose which may result in a fuel leakage.

1. Release the fuel pressure.
2. Remove the battery box cover bolts [1] and the battery box cover [2]

3. Remove the battery terminal bolts [3].

Disconnect the battery negative (-) cable [4].

4. Place a rag over the quick connector.

5. Press the fuel connector, release button [5] and disconnect the quick connector from the fuel connector.

Note:

Drain the remaining fuel in the fuel supply hose into a suitable container and wipe off the spilled fuel immediately.

Be careful not to damage the sliding collar and the hose.

6. Cover the disconnected connector [1] and fuel connector end [2] with plastic bags to prevent damage and foreign materials from getting in.

*Quick Connector

Installation

Note:

Do not bend or twist the fuel supply hose, which may cause fuel leakage.

Do not reuse kinked or damaged fuel supply hoses.

Do not use gloves or rags when installing the quick connector.

1. Connect the quick connector to the fuel connector until a "click" is heard, while holding the quick connector housing [1].



Note:

Be careful not to damage the sliding ring and the fuel supply hose.

If it is not easy to connect, apply a small amount of machine oil to the fuel connector end, making sure the connection is secure and the quick connector is firmly locked in place; visually inspect and pull the connector housings [1], [2].

2. Connect the battery negative (-) cable [1]. Install and tighten the battery terminal bolts [2] to the specified torque.

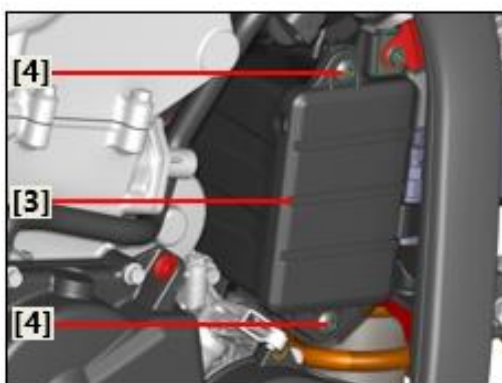
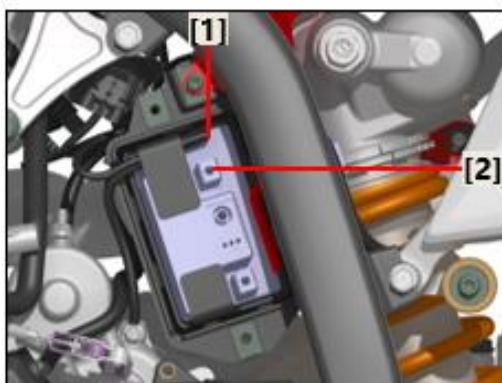
Torque:

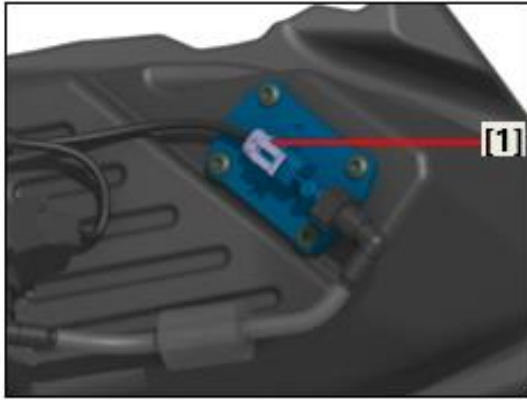
2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)

3. Install the battery box cover [3] and the battery box cover bolts [4] and tighten the bolts to the specified torque.

Torque:

5.0 N·m (0.5 kgf·m, 4.0 lbf·ft)





*Fuel Pressure Addition

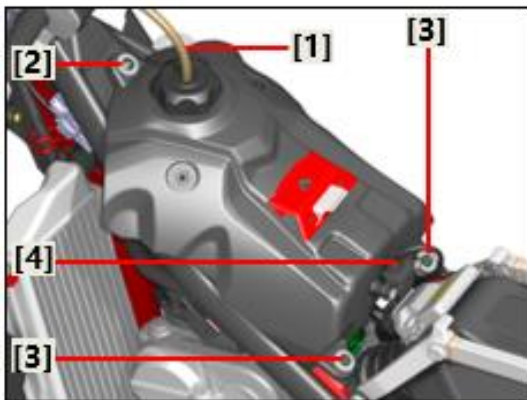
1. Connect the power supply wire harness connector (black) 2p[1] of the fuel pump.
2. Temporarily install the fuel tank onto the frame.
3. With the throttle fully closed, pull the clutch handle all the way down and press the starter switch.
The engine will start by increasing the fuel pressure.
4. Turn off the engine.
Check for leaks in the fuel pipeline.

*Fuel Pump Unit

Disassembly/installation

Disassemble the following parts:

- Clamp the fuel tank vent hose [1] with a hose clamp.
- Remove the front mounting bolts [2] and rear mounting bolts [3] of the fuel tank.
- Disconnect the tip sensor wire harness connector [4].
- Lift the fuel tank upwards and hold it.
- Press the quick connector button [5] of the fuel pipe and pull out the fuel supply hose.
- Disconnect the power supply wire harness 2P (black) connector [6] of the fuel pump.
- Remove the fuel tank



Disassembly/installation

Disassemble the following parts:

Remove the fuel tank and clean the area around the fuel pump. Loosen and remove the 4 mounting bolts [1] in a cross-pattern step by step as shown in Figure 1. Remove the fuel pump [6] and the rubber seal [2].

The installation sequence is reversed from the removal sequence.

Note:

Be careful not to damage the fuel pump unit. Drain the remaining fuel in the fuel pump unit into a suitable container and wipe off any spilled fuel.

Replace with a new rubber seal [2].

- Clean the rubber seal seat areas of the fuel tank and the fuel pump base plate to ensure there is no foreign matter.

- Place the rubber seal with the boss facing the fuel pipe.

- Tighten the 4 mounting nuts to the specified torque in the order as shown.

Torque:

Fuel pump mounting nuts:

8.0 N·m (0.8 kgf·m, 6.0 lbf·ft)

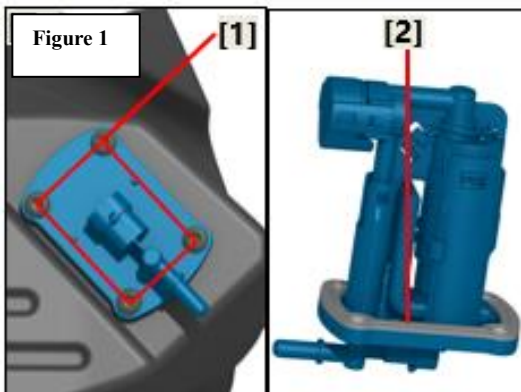
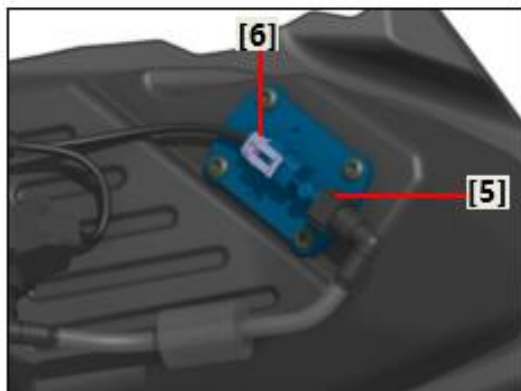


Figure 1

*Fuel Pump and Filter Element

Disassembly/inspection/installation:

Remove the fuel pump unit

Disconnect the wire harness connectors [7], [8] of the fuel pump motor.

As shown in the figure, disassemble the clips [1], [2] on the left and right sides of the fuel pump bracket. Take out the fuel pump bracket.

Note:

Do not use tools for disassembly and assembly to avoid damaging the fuel pump unit.

Remove the fuel pump unit as shown in the following figure.

- Fuel pump base [1];
- rings x3 [2];
- Rubber seal [3];
- Fuel filter (strainer) [4];
- Fuel pump [5];
- Fuel pump unit bracket [6];
- Fuel pressure regulator [9].

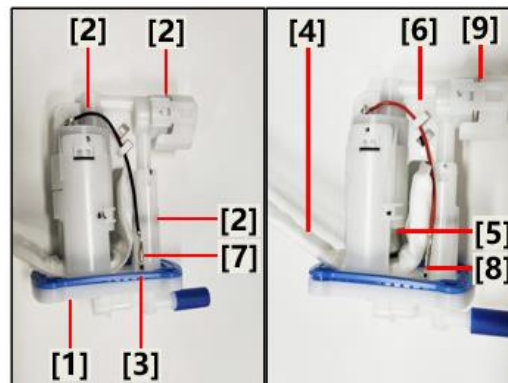
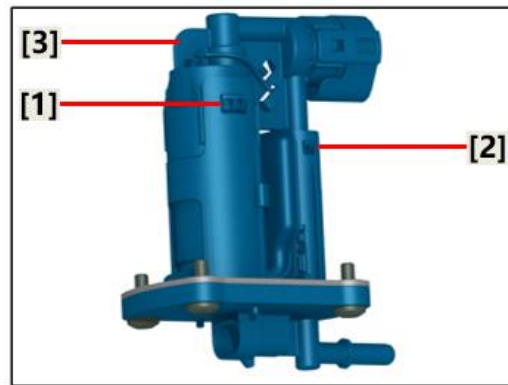
Note:

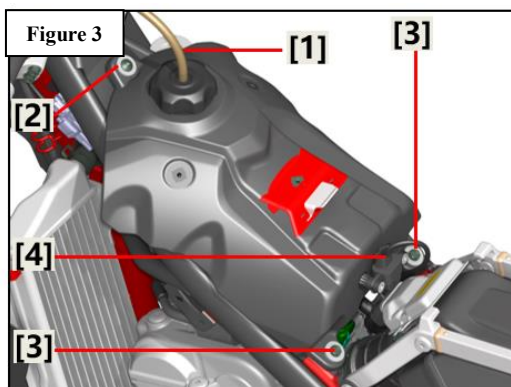
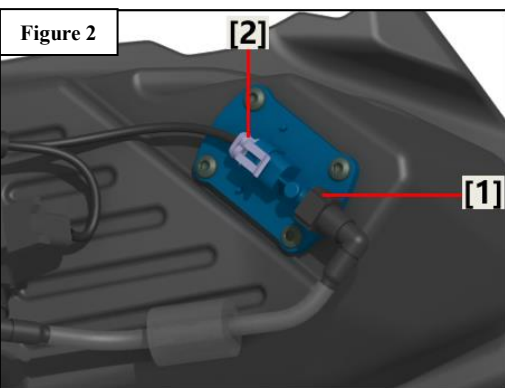
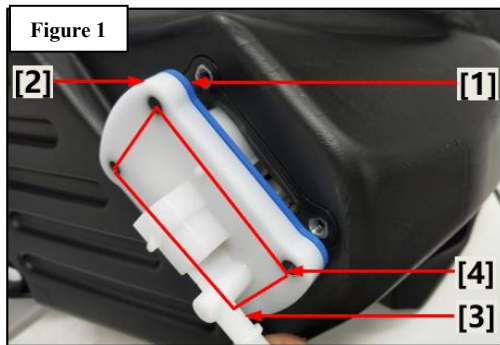
Check if the fuel filter is stuck, damaged, or aged, and replace if necessary.

Lay the black wire [7] and red wire [8] correctly.

Align the rubber seal with the groove of the fuel pump base unit.

The installation sequence is reversed from the removal sequence.





*Installation

Apply engine oil to the new rubber seal [1].

Install the following components:

- 4 M5x16 fuel pump mounting bolts.
- Ensure that the rubber seal [1] is placed in the groove of the fuel pump base [2].
- Install the fuel pump bracket and fuel pump onto the fuel base.
- Align the fuel pump plate groove with the lugs of the fuel pump unit. Install the fuel pump assembly so that the fuel connector [3] faces the front-left of the fuel tank.

Note:

Be careful not to damage the fuel pump unit.

Tighten the mounting bolts [4] of the fuel pump device to the specified torque in the order shown in Figure 1.

Torque: 8.0 N·m (0.8 kgf·m, 6.0 lbf·ft)

As shown in Figure 2: Hold the fuel tank and connect the fuel quick connector [1] to the outlet interface of the fuel tank.

Install the fuel tank onto the frame.

- Connect the power supply wire harness 2p connector [2] of the fuel pump unit
- As shown in the Figure 3:
- Install the front connecting bolt [2] of the fuel tank and the I-shaped rubber bushing, and the rear connecting bolt [3] and the I-shaped rubber bushing.
- Connect the wire harness connector [4] of the tilt sensor.

- Remove the clamp [1] of the fuel tank vent hose.

Note:

Be careful not to twist or bend the fuel supply hose.

As shown in Figure 3: Tighten the 3 fuel tank mounting bolts to the specified torque.

Torque:

M6x16

Connecting bolt between front of fuel tank and frame

M6x30

Connecting bolt between rear of fuel tank and frame

10 N·m (1.0 kgf·m, 7.4 lbf·ft)

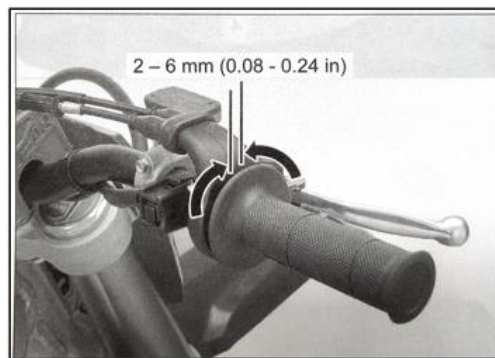
※Accelerator Free Play

Check whether the throttle cable is aged, damaged or kinked. Turn the accelerator handle and check that the throttle opens smoothly and closes automatically in any steering position.

If the accelerator handle does not rotate well, check that the cables are wired correctly, the accelerator is clean and greased, and the accelerator drum rotates normally. If Ok, but the accelerator does not rotate well, replace the accelerator cable (oil inlet and oil return).

Measure the free play at the accelerator handle flange.

Free play: 2-6mm (0.08-0.24 in)



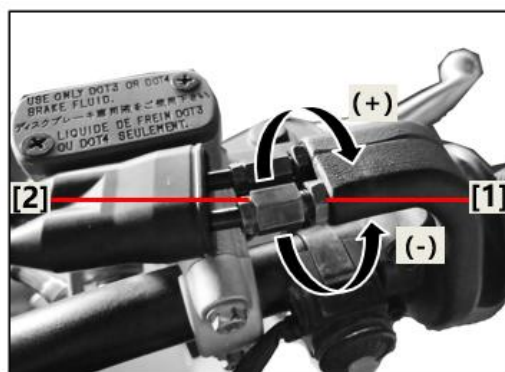
①.Fine-tune on the accelerator side

Loosen the locking nut [1] and turn the adjuster [2].

Turning the adjuster in the (-) direction will reduce the free play, and turning the adjuster in the (+) direction will increase the free play.

After adjustment, hold the adjuster and tighten the locking nut.

If the correct free play cannot be obtained despite turning the regulator to the end, turn it back in the (+) direction until it lightly touches the end, make one turn in the (-) direction, and then make more adjustments on the throttle side.



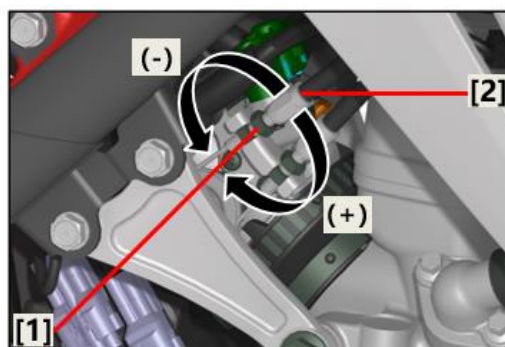
②.Adequately adjust on the throttle body side

Loosen the accelerator cable adjuster lock nut [1] and turn the adjuster [2] in the (-) direction to reduce the free clearance and in the (+) direction to increase the free clearance.

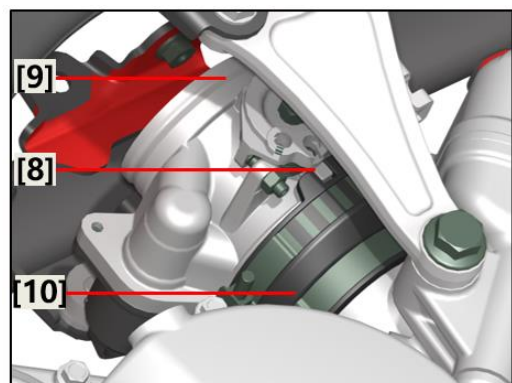
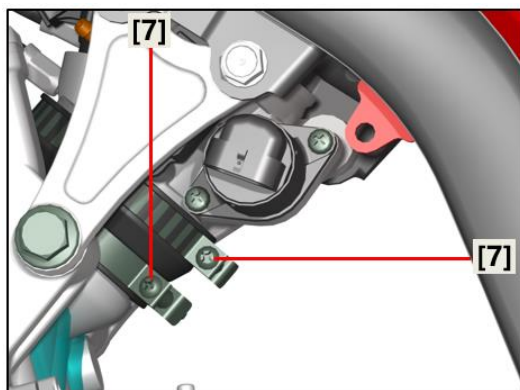
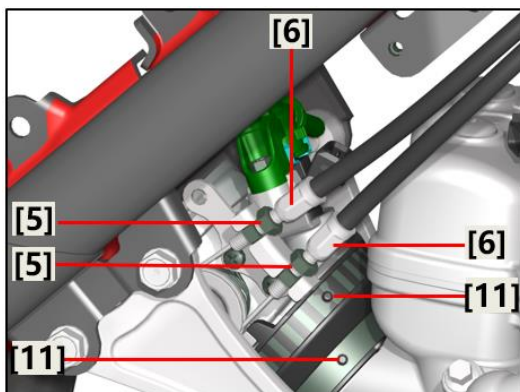
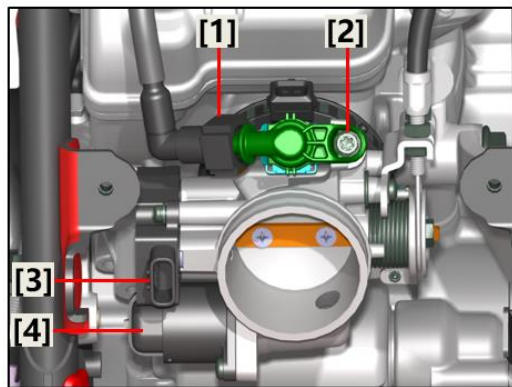
After the adjustment, hold the adjuster and tighten the locking nut of the inlet accelerator cable adjuster to the specified torque.

Torque:

4.0 N·m (0.4 kgf·m, 3.0 lbf·ft)



Re-check whether the accelerator rotates smoothly or not.



*Throttle Body Assembly and Intake Pipe

①. Throttle

Disassembly/installation

Disassemble the following parts:

- Remove the fuel pipe quick connector [1].
- Remove the mounting screws [2] of the fuel rail cap and the fuel rail injector holder.
- Disconnect the 5p three-in-one sensor connection plug [3].
- Disconnect the idle stepper motor plug [4].
- Loosen the throttle cable adjusting nut [5],
- Remove the throttle cable [6] from the rotary table.
- Remove the fastening screws [7] of the clamps at both ends of the intake pipe.
- Remove the throttle body [9] and the intake pipe [10].

The installation sequence is reversed from the removal sequence.

Note:

When installing, the intake pipe clamp shall be within the limit point [11], and when connecting the intake pipe to the engine, align it with the limit convex plate [8].

Torque:

M6x20

Connecting bolt between injector cap and throttle
8.0 N·m (0.8 kgf·m, 6.0 lbf·ft)

Tighten the intake pipe clamp of the throttle to the limit.

*Throttle Valve Body

Disassembly/assembly

Note:

- The throttle body is pre-assembled at the factory and must not be disassembled in any manner other than as specified in this manual.
- After removing the throttle cable, do not let the throttle from fully open to fully closed, as this may damage the throttle.
- Do not damage the throttle body; this may cause the throttle to malfunction.
- Do not loosen or tighten the nuts and screws marked with torque values, as loosening or tightening them may cause malfunctions of the throttle body.

Disassemble the idle motor/three-in-one sensor
Check if there is carbon deposition in the air passage of idle stepper motor in the throttle body.
Check if the O-ring on the idle stepper motor/three-in-one sensor for deterioration or damage.

Disassemble the following parts:

- 2 screws [1],
- Disconnect the three-in-one sensor unit,
- 2 screws [3],
- Idle motor valve body [4];

Clean the throttle body and the pipeline of the idle speed motor valve body with compressed air.

Note:

- Cleaning with a steel wool will damage the throttle body.

The installation sequence is reversed from the removal sequence.

Note:

- Replace the rubber seal with a new one.
- Install each clamp on the intake pipe assembly with the screw head [5] facing the right side, and align the hole [6] on the left side with the positioning complex plate.
- Install each clamp with the “UP” marked side facing upwards towards the throttle body and align the groove [7] with the lug.
- Tighten the clamp screw so that the distance between the two ends is 10 ± 1.0 mm (0.4 ± 0.04 in). Install the fastening bolts to the specified torque.

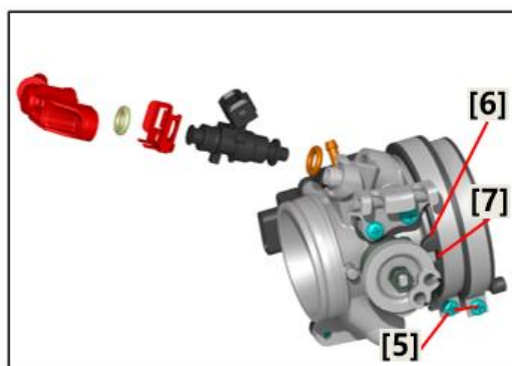
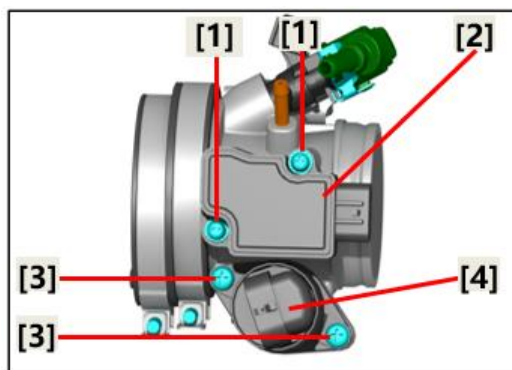
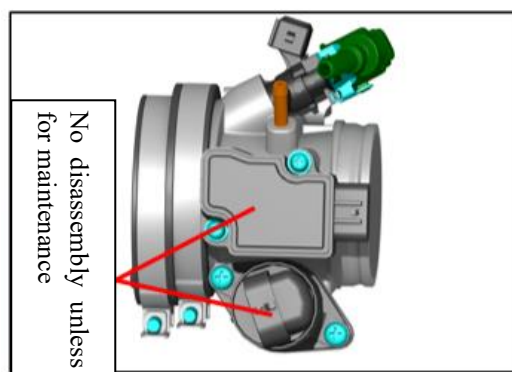
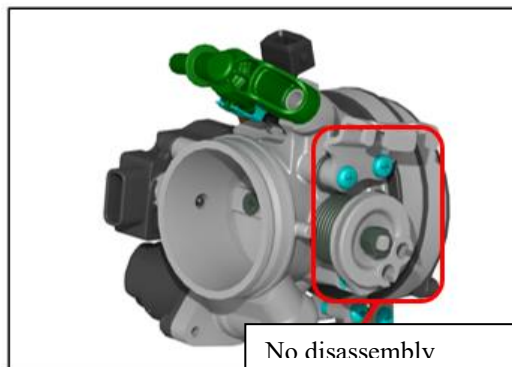
Torque:

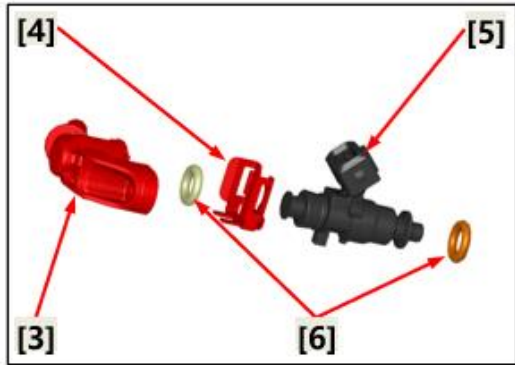
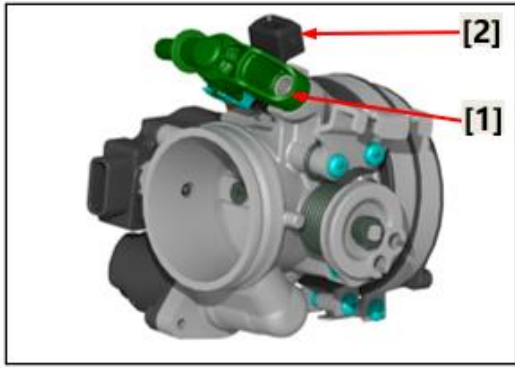
Three-in-one sensor mounting screw:

2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)

Idle motor valve body mounting screw:

4.0 N·m (0.4 kgf·m, 3.0 lbf·ft)





Fuel Rail Assembly

Disassembly/installation

Remove the fuel rail assembly from the throttle assembly.

Disassemble the following parts:

- 1 screw [1].
- 1 wiring harness connector [2].
- Remove the fuel rail [3].
- Remove the fuel injector clip [4].
- Remove the fuel injector [5].
- Remove the O-ring seal [6] of the fuel injector.

Check each part for wear or damage and replace it if necessary.

The installation sequence is reversed from the removal sequence.

Torque:

Fuel rail assembly connecting bolt:

8.0 N·m (0.8 kgf·m, 6.0 lbf·ft)

Note:

- Apply engine oil when replacing new O-rings and seal rings
- Be careful not to damage the O-ring when installing the fuel injector.
- Align the fuel injector connector with the fuel connector and insert them.

Front Wheel, Suspension, Steering

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Maintenance Instructions

Overview:

- In maintenance of front wheel, front shock absorber and steering column, dedicated work bench or equivalent means shall be used to support the motorcycle.
- Do not operate the brake handle after the front and rear wheels are removed.
- After installing the front wheel, check the braking operation with the brake handle.

Troubleshooting

Hard turning

- Insufficient tire pressure
 - Faulty tire
- Over-tight adjusting nut on steering column
- Wear or damage of bump steering retainer
 - Steering column bending

Turning to one side or not going straight

- Axle bending
- Incorrect installation of wheel
- Wear or damage of wheel bearing
- Damaged or loose steering bearing
 - Frame damage
- Failure of wheel bearing

Front wheel shaving

- Rim bending
 - Faulty tire
- Wear or damage of wheel bearing
 - Axle slack
- Unbalanced tires and wheels

Wheels are difficult to turn

- Failure of wheel bearing
 - Curved axle
 - Brake resistance

Soft suspension

- Low tire pressure
- Weak shock absorber spring
- Low liquid level in shock absorber
- Incorrect specification of absorber oil (low viscosity)

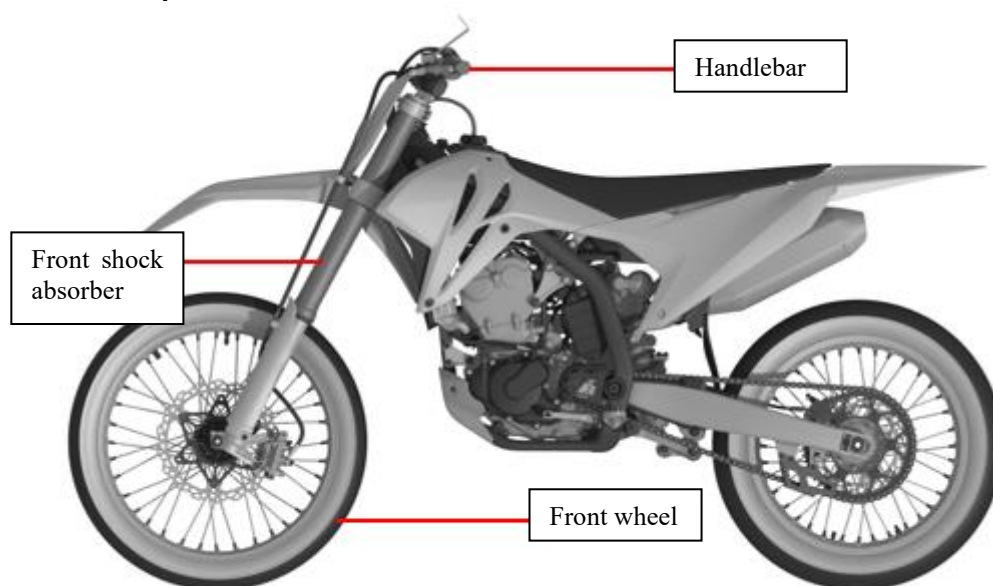
Hard suspension

- Tire pressure
- Deformation of shock absorber
- High liquid level in shock absorber
- Incorrect specification of absorber oil (high viscosity)
 - Blockage in absorber oil passage

Noise from front suspension

- Loose absorber fastener
- Incorrect specification of absorber oil (low viscosity)
 - Wear of slider on front absorber bushing

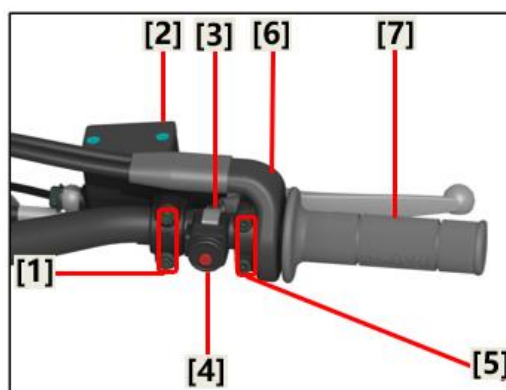
Position of Components



*Right Handlebar

Brake handle/ON switch/Oiler
Disassembly/installation
Disassemble the following parts:

- Remove 2 M6x20 bolts [1];
- Remove the front brake handle [2];
- Remove the ON switch screw [3];
- Remove the ON switch [4];
- Remove 2 M6x20 bolts [5];
- Remove the accelerator grip [6] and the handlebar grip [7].



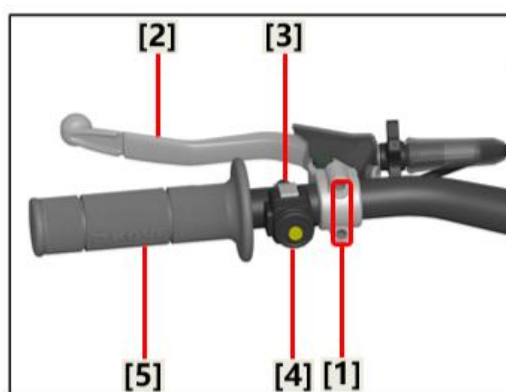
The installation sequence is reversed from the removal sequence.

Torque:

Front brake handle mounting bolt:

Oiler mounting bolt:

8.0 N·m (0.8 kgf·m, 6.0 lbf·ft)



*Left Handlebar

Clutch handle/left handlebar switch
Disassembly/installation
Disassemble the following parts:

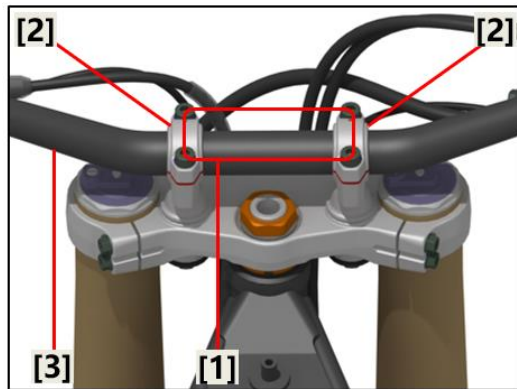
- Remove 2 M6x20 bolts [1];
- Remove the clutch handle [2];
- Remove the OFF switch screw [3];
- Remove the OFF switch [4];
- Remove the left handlebar grip [5];
- Remove the chest protector at the middle position of the handlebar [6].

The installation sequence is reversed from the removal sequence.

Clutch handle mounting bolt:

8.0 N·m (0.8 kgf·m, 6.0 lbf·ft)





*Steering Handle

Disassembly

Disassemble the following parts:

- Remove 4 M8x30 bolts [1];
- Remove 2 upper handlebar clamps [2];
- Remove the handlebar tube [3].

The installation sequence is reversed from the removal sequence.

*Lower Handlebar Clamp

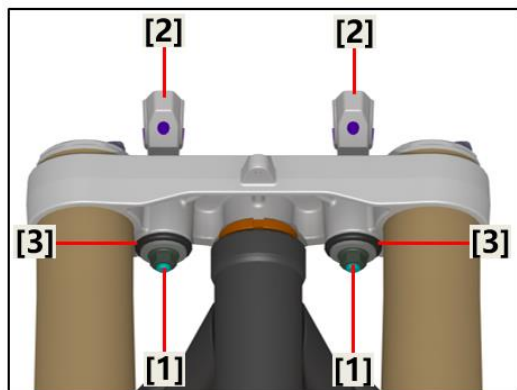
Disassembly

Disassemble the following parts:

- Remove 2 hexagon flange nuts [1] and flat gaskets;
- Pull out 2 lower handlebar clamps [2] upwards;
- Remove 4 handlebar buffer rubbers [3] from the holes of the upper brackets.

The installation sequence is reversed from the removal sequence.

Note: The handlebar buffer rubbers are rubber products. If they are deformed or damaged, please replace them in time.



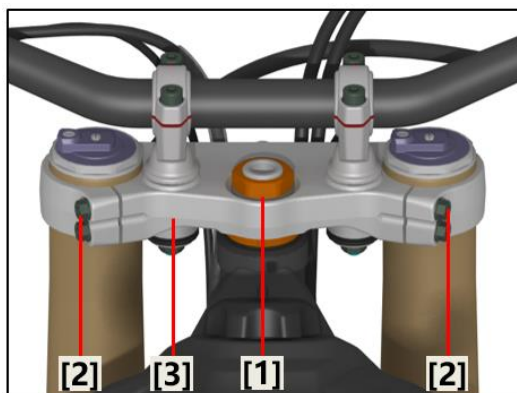
*Upper and Lower Brackets and Steering Column Assembly

Upper bracket

Disassembly/installation

Disassemble the following parts:

- Remove the M24x1 steering column locking nut [1] and flat gasket;
- Remove the left and right locking bolts [2] of the upper bracket;
- Remove the upper bracket [3].



Lower bracket and steering column assembly

- Remove the 4-slot nut [4] and the upper dustproof washer [5];
- Take out the lower bracket and steering column assembly [6] downwards.

Riser tube pressure bearing:

Upper 32005X

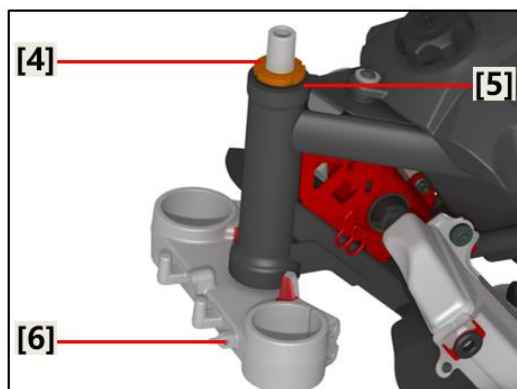
Lower 32006X

Fastening bolt between upper bracket and steering column

128 N·m (12.8 kgf·m, 95 lbf·ft)

Steering column locking 4-slot nut

First torque to 40N·m, then loosen and torque to 10N·m, and finally back off by 1/4 turn.



*Steering Bearings

Firmly support the motorcycle and lift the front wheel off the ground. Check if the handlebar can rotate freely from side to side.

Make sure the control cables do not interfere with the rotation of the handlebar.

Move the front shock absorber back and forth to check the wear of the steering tapered pressure bearings.

If there is any abnormality, check the tightness of the steering top thread [1] and the steering bearings [2], and make adjustments or replacements if necessary.

Please contact your local dealer to adjust the tightness of the steering top thread and replace the steering bearings.

*Front Wheel

Disassembly/installation

Disassemble the following parts:

- Remove 2 brake caliper bolts [1];
- Remove the front wheel axle locking nut [2];
- Loosen the bolt of the right bottom cylinder of the shock absorber [3];
- Use a maintenance workbench or a special motorcycle maintenance stand to lift the vehicle; Lift the front wheels off the ground;
- Pull out the wheel axle and remove the front wheel.

Install:

Place the wheel between the front shock absorbers, carefully align the axle holes and insert the front wheel axle from the left side.

Pre-tighten the locking bolt [1] of the bottom cylinder axle of the shock absorber to the torque.

5 N·m

Tighten the front wheel axle locking nut [2] to the specified torque.

Torque:

88 N·m (8.8 kgf·m, 65 lbf·ft)

With the front brake engaged, move the front shock absorber up and down several times to seat the axle and check the operation of the brake.

Then tighten the bolts [1] of the left and right bottom cylinder of the shock absorber to the specified torque.

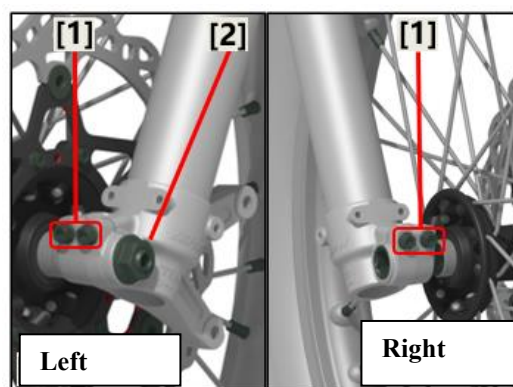
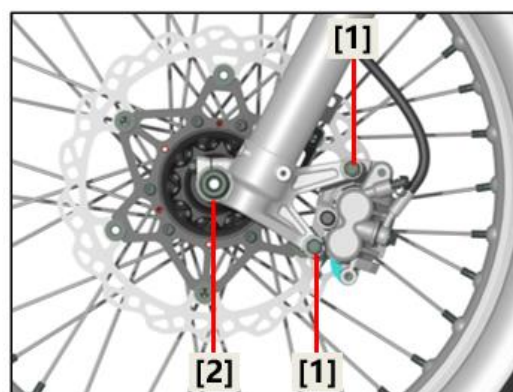
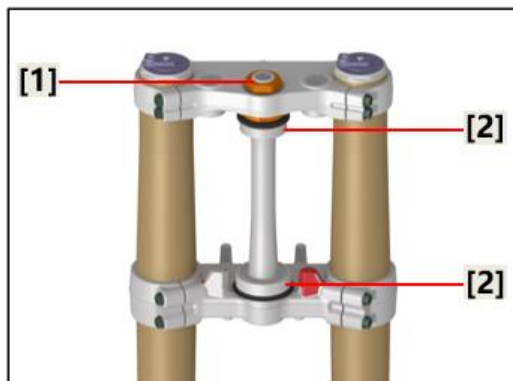
Torque:

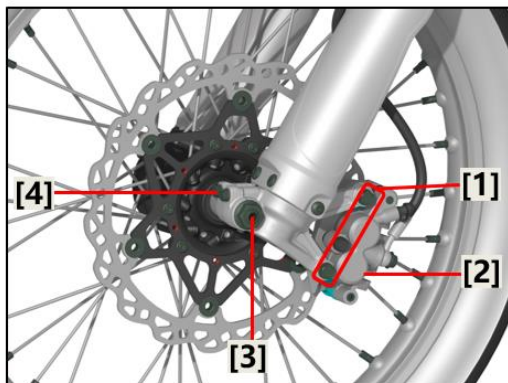
22 N·m (2.2 kgf·m, 16 lbf·ft)

Note:

During installation, apply a very small amount of grease in the groove between the main and auxiliary lips of the hub bearing oil seal.

Lubricate with high-temperature extreme pressure composite lithium grease (UNIVERSAL SU-T330G/F or equivalent).





*Front Shock Absorber

Disassembly/installation

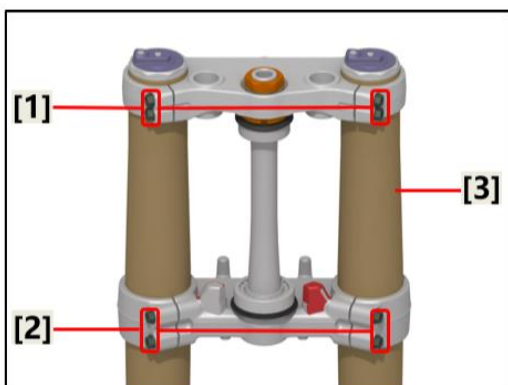
Disassemble the following parts:

- Remove the brake mounting bolt [1];
- Front brake caliper [2];
- Remove the locking nut of the front wheel axle [3];
- Loosen the locking bolts [4] of the left and right bottom cylinders of the shock absorber, hold the front wheel, remove the front wheel axle and take out the front wheel.

Note:

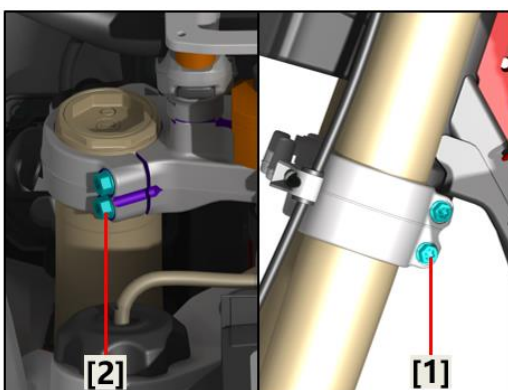
Do not hang the brake caliper on the brake hose.

Do not operate the brake handle after removing the brake caliper.



Loosen the locking bolt [1] of the upper bracket, firmly support the shock absorber, loosen the locking bolt [2] of the lower bracket and pull the fork tube [3]. Then rotate it from top to bottom and pull it out of the holes of the upper and lower brackets until it is completely removed.

The installation sequence is reversed from the removal sequence.



Tighten the locking bolts [1] of the lower bracket to the specified torque.

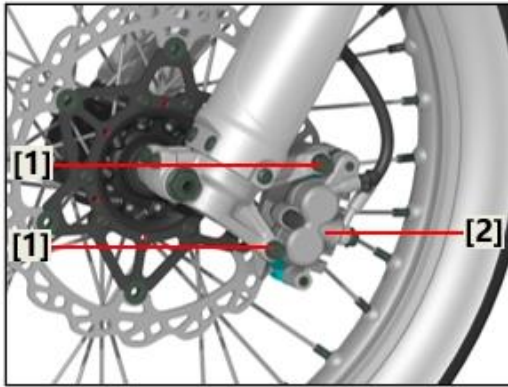
Torque:

22 N·m (2.2 kgf·m, 16 lbf·ft)

Tighten the locking bolts [2] of the upper bracket to the specified torque.

Torque:

22 N·m (2.2 kgf·m, 16 lbf·ft)



*Front Shock Absorber Maintenance

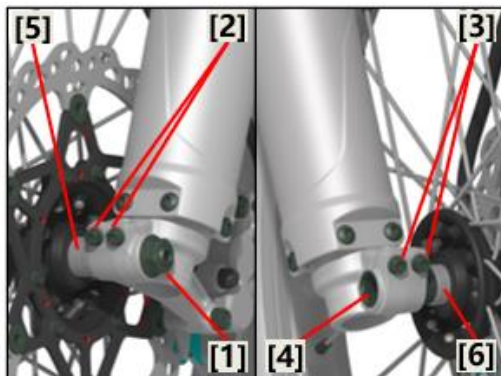
Place a workbench or equivalents under the engine and lift the front wheel off the ground.

Disassemble the following parts:

- Remove the brake mounting bolt [1];
- Front brake caliper [2];

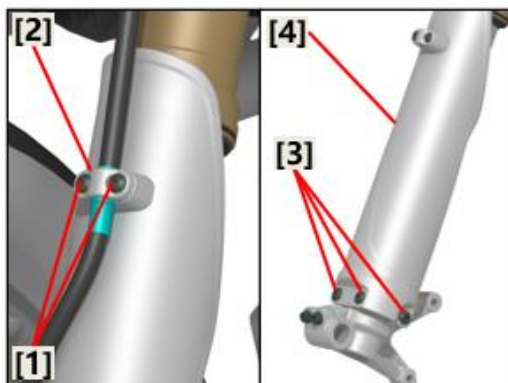
Note:

Do not hang the brake caliper on the brake hose.
Do not operate the brake handle after removing the brake caliper.



- Remove the front wheel axle nut [1];
- Loosen the locking bolt [2] of the left front absorber bottom cylinder;
- Loosen the locking bolt [2] of the right front absorber bottom cylinder;
- Hold the front wheel and remove the front wheel axle [4];
- Remove the front wheel;
- Remove the left bushing [5] and the right bushing [6].

The installation sequence is reversed from the removal sequence.



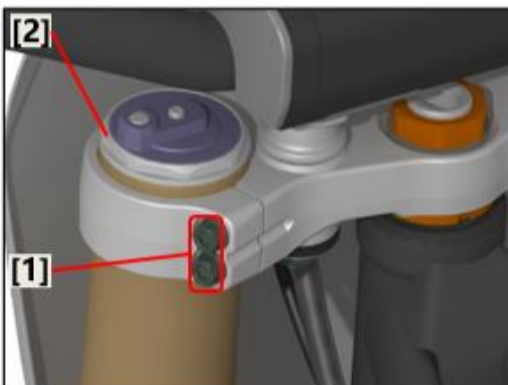
- Remove the 2 screws [1];
- Brake hose clamp [2];
- Remove the bolts [3] of the front absorber guard;
- Shock absorber guard [4].

- Loosen the locking bolt [1] of the upper bracket;

If you plan to replace the front shock absorber oil, loosen the upper adjustment cover assembly [2] of the front shock absorber.

Note:

Do not remove the upper adjustment cover assembly of the front shock absorber.

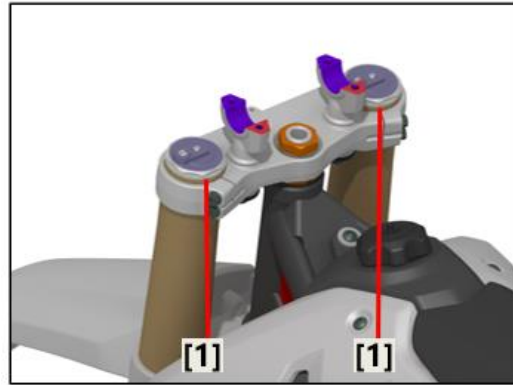


Use a special tool to loosen the upper cover assembly of the front absorber inner cavity.

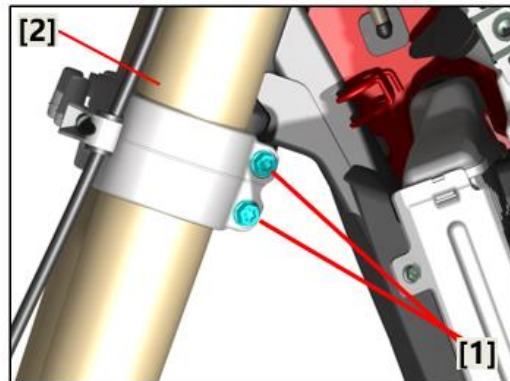
Tools:

Locking nut wrench, 50mm

Note: Do not remove the upper cover assembly of the absorber inner cavity.

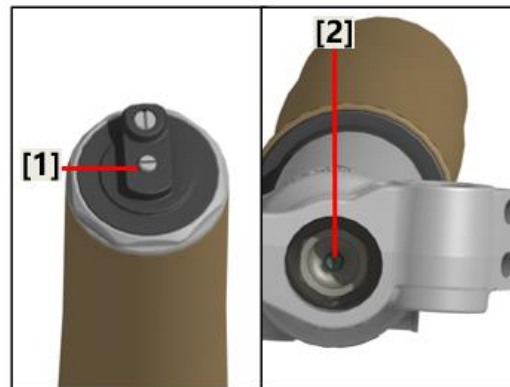


- Hold the outer rod of the front absorber and loosen the locking bolt [1] of the lower bracket at the bottom;
- Remove the front shock absorber [2].



Record the current positions of the compression damping adjuster [1] and the rebound damping adjuster [2].

Turn the compression and rebound damping adjusters counterclockwise and set them to the softest positions.



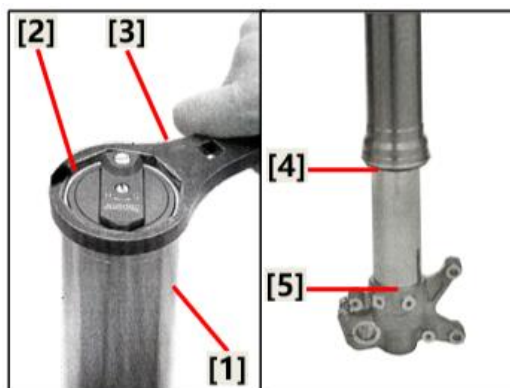
Disassemble the front shock absorber

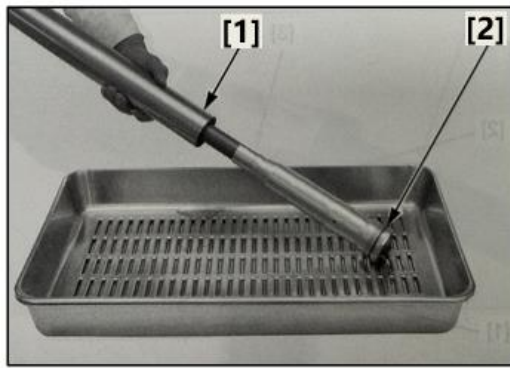
Hold the outer hose [1] and use a special tool to remove the upper cover [2] of the front shock absorber from the outer hose

Tools:

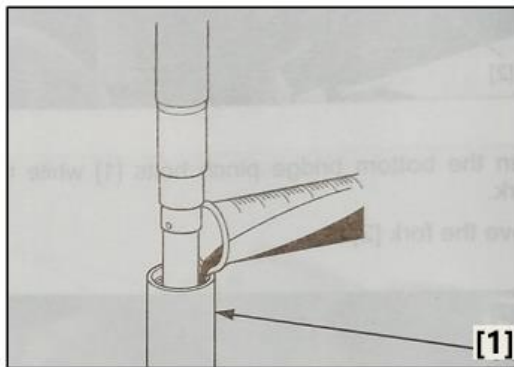
Locking nut wrench, 50mm [3]

Slowly slide the outer hose down until the dustproof seal [4] is on the bottom cylinder [5].





Compress the outer hose [1] several times to drain the shock absorber oil from it, and then remove the O-ring [2] from the shock absorber.



Pour the recommended shock absorber oil into the outer hose [1].

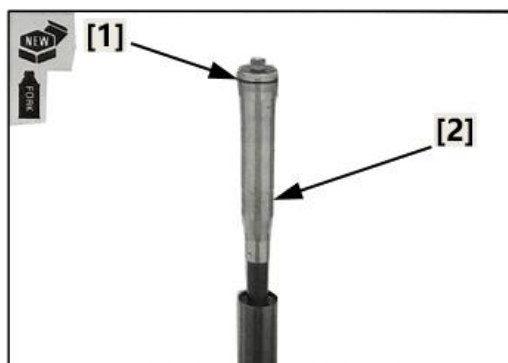
Recommended shock absorber oil:

Shock absorber oil (viscosity: 5W)

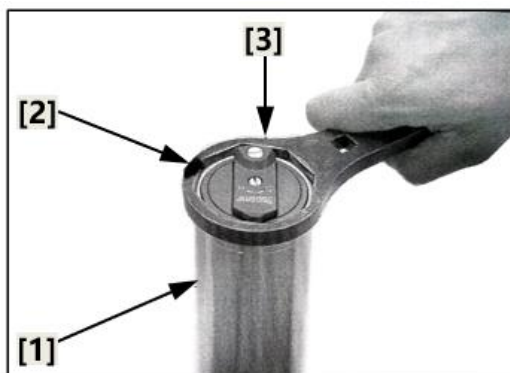
Standard total capacity of shock absorber oil:
560ml $\pm$ 5

High-pressure chamber: 260ml $\pm$ 5 / Inner tube:
300ml $\pm$ 5

Note: Pump the fork tube slowly several times to remove the trapped air at the lower part of the fork hose.



Apply the recommended shock absorber oil to the new O-ring [1] and install the O-ring on the front shock absorber [2].

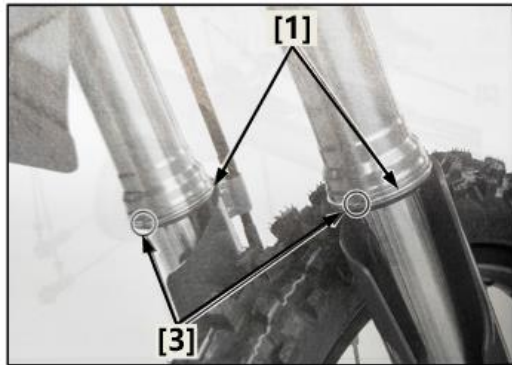
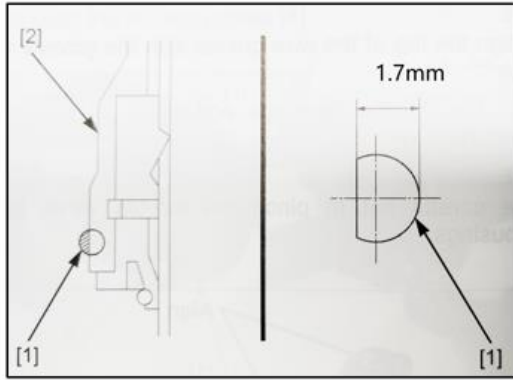


Slowly pull up the outer hose [1].

Use a special tool to temporarily tighten the upper adjustment cover [2] of the shock absorber into the outer hose.

Tools:

Locking nut wrench, 50mm [3]



***Inspection of Front Shock Absorber Wear Ring**

Check the operation of the front shock absorber by operating the front brake and compressing the front shock absorber several times.

Check the entire front shock absorber assembly for signs of leakage, damage, or loose fasteners. Check if the decorative protector and the dustproof seal ring of the front shock absorber are clean, free of dirt or dust. Remove the dirt or dust accumulated at the bottom of the front shock absorber seal.

Check the wear ring [1] for wear or damage. If the wear ring is less than 1.7 mm thick or flush with the outer hose, replace the wear ring [2]. Ensure that the end clearance [3] of the wear ring faces backward.

Rear Wheel, Suspension

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Maintenance Instructions

Overview:

- In maintenance of rear wheel, suspension and relevant components, dedicated work bench or equivalent means shall be used to support the motorcycle.
- Do not operate the brake pedal after the rear wheel is dismantled.
- After installing the rear wheel, step on the brake pedal to check the brake operation.
- After the rear wheel is installed, conduct a clearance check.
- All suspension pivots and mounting points can only be replaced with original KOVE bolts and nuts.

Troubleshooting

Turning to one side or not going straight

- Non-uniform adjustment of drive chain adjuster
- Axle bending
- Wear of swingarm axle

Rear wheel shaving

- Tire deformation
- Wear or damage of wheel bearing
- Wear or damage of driven flange bearing
- Improper tightening of axle
- Damage to rear swingarm pivot bearing
- Improper tightening of suspension assembly bolts
- Unbalanced tires and rims

Wheels are difficult to turn

- Damaged wheel bearing
- Curved axle
- Over-tight drive chain
- Brake resistance

Soft suspension

- Low tire pressure
- Improper adjustment of suspension
- Weak shock absorber spring
- Oil leakage from shock absorber unit

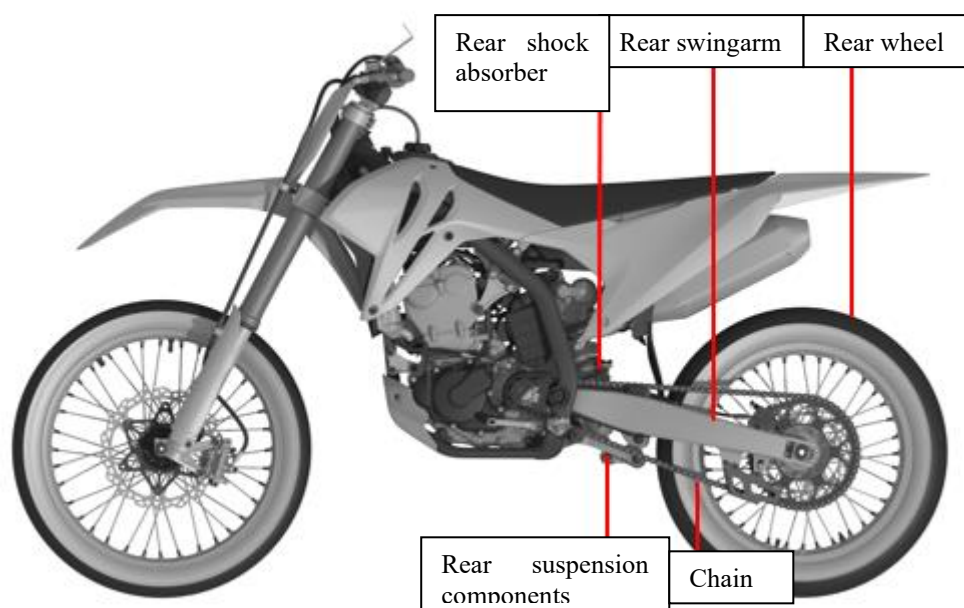
Hard suspension

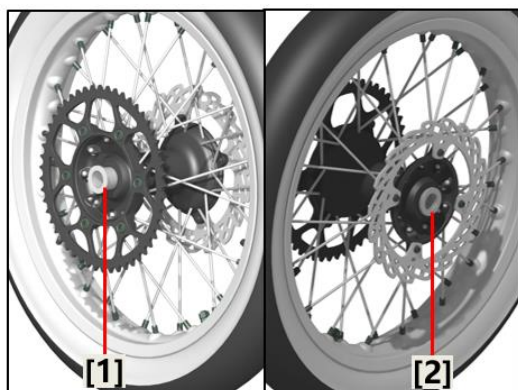
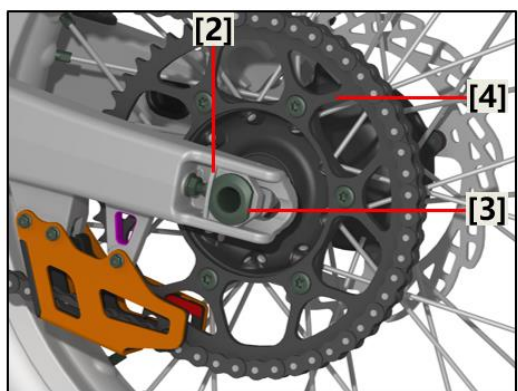
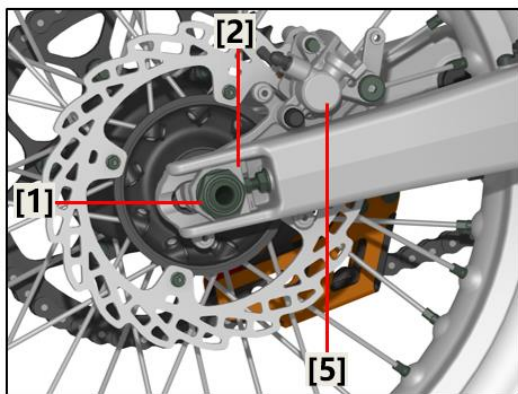
- High tire pressure
- Improper adjustment of suspension
- Bending of shock absorber rod
- Damage to suspension or slewing pivot bearing
- Improper tightening of slewing pivot

Noise from rear suspension

- Loose suspension fasteners
- Wear or damage of suspension pivot bearing
- Shock absorber failure

Position of Components





※Rear Wheel

Place a workbench or equivalents under the engine and lift the rear wheel off the ground.

Disassembly/installation

Disassemble the following parts:

- Remove the locking nut of the rear wheel axle [1];
- Withdraw the chain adjusters on both the left and right sides [2] so that the wheel can move forward continuously.
- Hold the rear wheel and remove the rear wheel axle [3];
- Push the rear wheel forward to disengage the chain from the large sprocket [4];
- Remove the rear brake caliper and the caliper bracket [5];
- Remove the rear wheel assembly.

The installation sequence is reversed from the removal sequence.

Torque:

Rear wheel axle locking nut

128 N·m (12.8 kgf·m, 95 lbf·ft)

Note:

- Do not operate the brake pedal after the wheel is disassembled.

Disassemble the following parts:

Rear wheel T-shaped bushing - Left side [1];

Rear wheel bushing - Right side [2].

The installation sequence is reversed from the removal sequence.

Note:

- When installing the wheel, be careful not to let the brake caliper fall out of the rear swingarm boss or damage the brake pad.
- During installation, apply a very small amount of grease in the groove between the main and auxiliary lips of the hub bearing oil seal.
- Lubricate with high-temperature extreme pressure composite lithium grease (UNIVERSAL SU-T330G/F or equivalent).
- Clean the installation area and insert the rear wheel axle from left to right.
- Adjust the looseness of drive chain.

※ Inspection of Wheels and Tires

Check tires for cuts, embedded nails, or any other signs of damage.

Check that the front and rear wheels are properly installed. Ensure the tire is in a cold state, then use a tire pressure gauge to check the tire pressure.

Tire pressure (inner tube):

Front: 100 kPa (1.0 kgf/cm², 15 psi)

Rear: 100 kPa (1.0 kgf/cm², 15 psi)

☆ Adjust the tire pressure appropriately based on the specific usage requirements.

Firmly support the motorcycle and lift the front wheel off the ground.

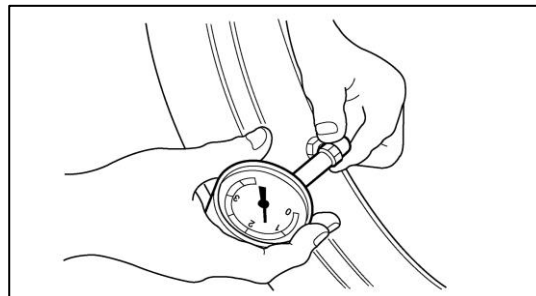
Hold the front fork and move the front wheel laterally with force to check if the wheel bearings are damaged

Firmly support the motorcycle and lift the rear wheel off the ground.

Hold the rear swingarm and move the rear wheel laterally with force to check if the wheel bearings are damaged.

If there is play or excessive wear of the bearings, replace the front/rear wheel bearings.

Please contact your local dealer to replace the bearings.



※ Replacement of Tires

KOVE's tires provide outstanding handling, braking, durability, and comfort in various riding conditions.



- Installing improper tires on your motorcycle can affect handling and stability. This may cause crashes, severe injured or even death.
- Make sure to use the sizes and types of tires recommended in this manual.

● When replacing tires, use original tires or equivalent tires of the same size.

● The tread pattern, rated speed, and load range shall be the same as the original tires. When replacing the tires, please replace the inner tubes with new ones.

The old inner tubes may be stretched and could fail if installed in new tires.

Note:

- Indicate the tire wear limit by marking the △ TWI mark on both the sidewall and center position of the tire.

Tire specifications:

Front wheel	80/100-21 M/C 51M	
	Chengxin/CST	CM736
Rear wheel	100/90-19 M/C 57M	
	Chengxin/CST	CM739
Type	Ordinary inner tube (butyl rubber)	

※Inspection of Rim Damage and Runout**Wheel rim runout:**

Limit value:

Front wheel: Radial: 1.0 mm

Axial: 1.0 mm

Rear wheel: Radial: 1.0 mm

Axial: 1.0 mm

Check the wheel rim [1] and spokes [2] for damage.

Use a spoke wrench [3] to tighten any loose spokes to the specified torque. Tighten the rim tire clip nuts [4] to the specified torque.

Tools

Front wheel: Spoke wrench, 6.0mm

Rear wheel: Spoke wrench, 7.0mm

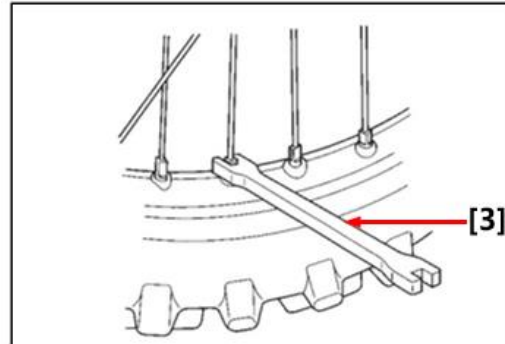
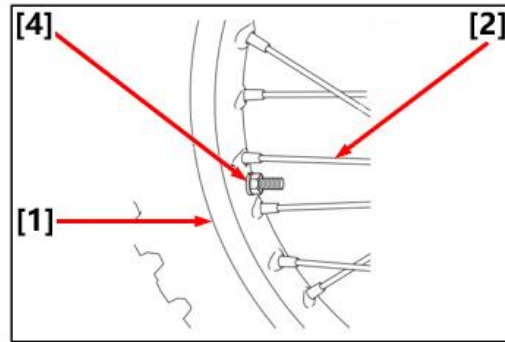
Torque:

Front/rear wheel spokes:

6.0 N·m (0.6 kgf·m, 4.4 lbf·ft)

Front/rear tire clip locking nuts:

12 N·m (1.2 kgf·m, 9.0 lbf·ft)



※Rear Swingarm

Disassembly/installation

Disassemble the following parts:

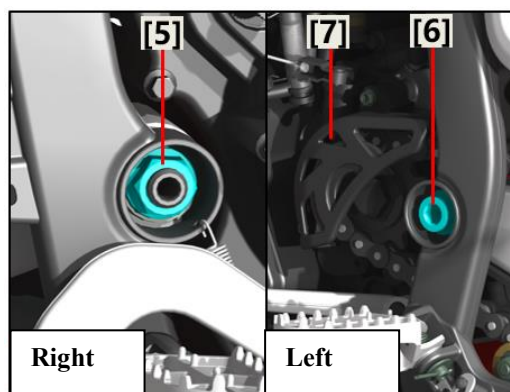
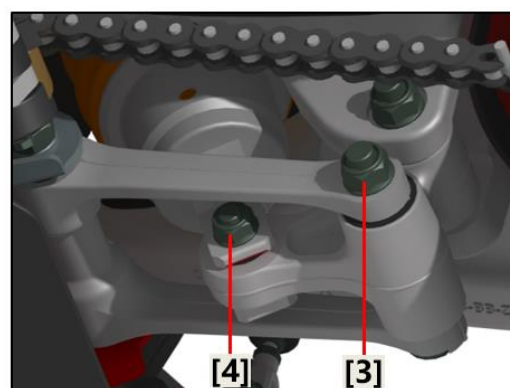
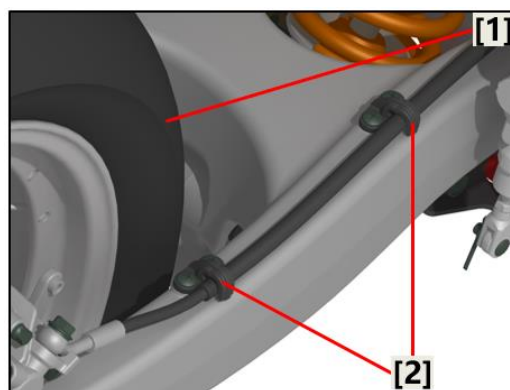
- Remove the rear wheel assembly [1];
- Remove the rear brake caliper oil pipe from the swingarm clip [2];
- Remove the U-cradle connecting bolt [3];
- Remove the connecting bolt [4] between the lower part of the rear shock absorber and the triangular cradle;
- Remove the rear swingarm nut [5] and the swingarm axle [6];
- Remove the small sprocket decorative cover and the chain pressure plate [7].
- The rear swingarm can be removed.

The installation sequence is reversed from the removal sequence.

Torque:

Swingarm shaft locking nut:

88 N·m (8.8 kgf·m, 65 lbf·ft)



※Rear Shock Absorber/Suspension Components

Shock absorber

Disassemble the following parts:

- Remove the locking nut of the rear wheel axle [1] and flat gasket.
- Take out the rear wheel axle [2] and the left and right chain adjusters [3].
- Push the rear wheel forward to disengage the chain from the rear sprocket.
- Remove the rear wheel assembly, rear brake caliper, and bracket.
- Remove the rear swingarm locking nut [4] and flat gasket.
- Remove the swingarm axle [5].

Disassemble the rear shock absorber, triangular cradle, and U-cradle

Disassembly/installation

Disassemble the following parts:

- Remove the connecting nut [1] between the U-cradle and the triangular cradle.
- Remove the connecting nut [2] between the rear shock absorber and the triangular cradle.
- Remove the connecting nut [3] between the swingarm and the triangular cradle.
- Remove the nut [4] connecting the U-cradle to the frame and take out the bolt.
- Remove the connecting bolt [5] between the upper part of the rear shock absorber and the frame.
- Take out the rear shock absorber [6].

The installation sequence is reversed from the removal sequence.

Note: Install the bolts from the left side during installation.

Connecting bolt between U-cradle and frame

Connecting bolt between swingarm and triangular cradle

Connecting bolt between U-cradle and triangular cradle

Torque:

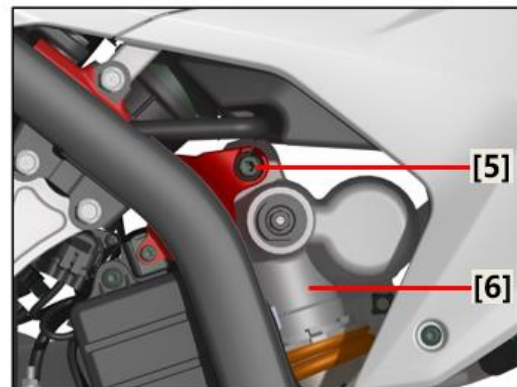
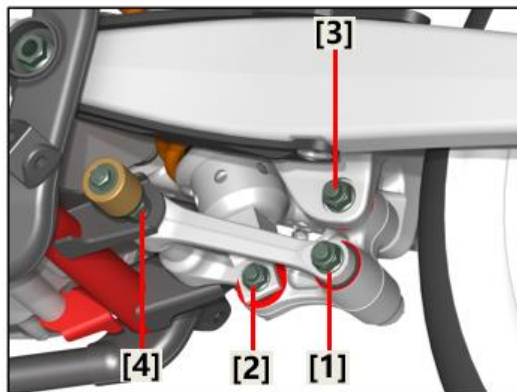
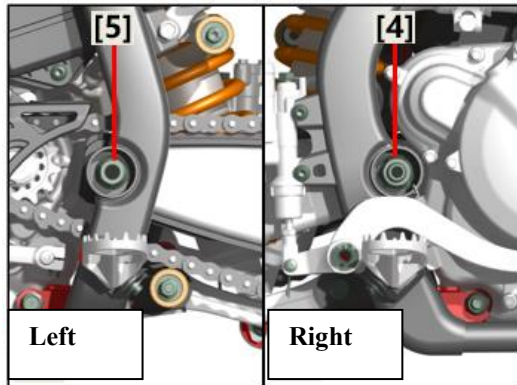
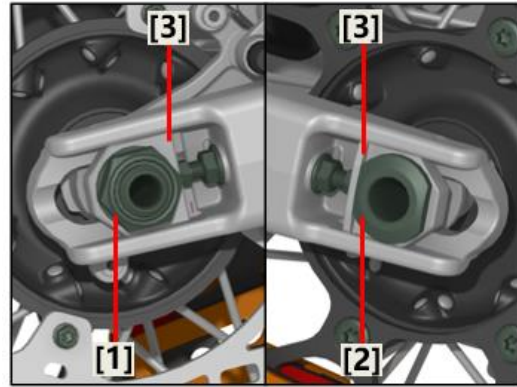
60 N·m (6.0 kgf·m, 44 lbf·ft)

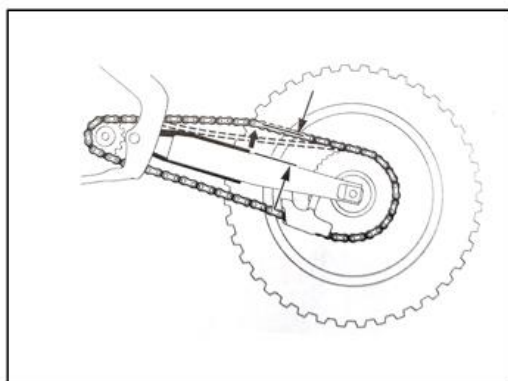
Connecting bolt between upper part of rear shock absorber and frame

Connecting bolt between swingarm and triangular cradle

Torque:

44 N·m (4.4 kgf·m, 33 lbf·ft)





※Drive Chain



Warning

Risk of amputation! Do not check or adjust while the engine is running.

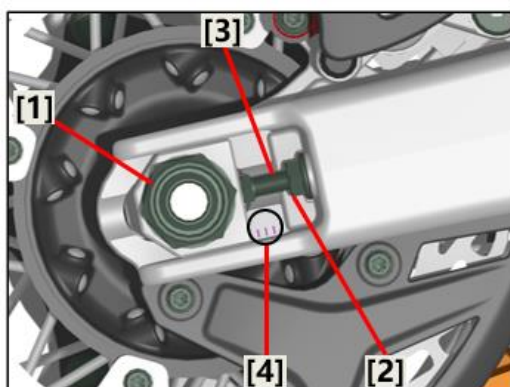
Lift the drive chain at the position shown in the figure and measure the distance from the upper surface of the rear swingarm.

Standard: 65-70 mm

If the measured value is out of the standard range, adjust the drive chain.

※Adjustment

Note: There are scale lines for drive chain adjustment on the rear swingarm. The indicator marks on the left and right adjusters must be aligned at the same position. If they are not aligned, the wheel is not aligned, and the handlebar may be pulled to one side.



Loosen the rear wheel axle nut [1].

Loosen the locking nut [2] of the drive chain adjuster and turn the adjustment bolt [3] to adjust the drive chain clearance.

Check if the graduation marks [4] are aligned at the same position as the marked scale lines.

Tighten the rear wheel axle nut to the specified torque.

Torque: 128 N·m (12.8 kgf·m, 95 lbf·ft)

Re-check if the drive chain is loose and ensure the rear wheel rotates smoothly.

Press the adjuster tightly against the adjustment plate and tighten the locking nut of the drive chain adjuster to the specified torque.

Torque: 22 N·m (2.2 kgf·m, 16 lbf·ft)

※Guide Sprocket

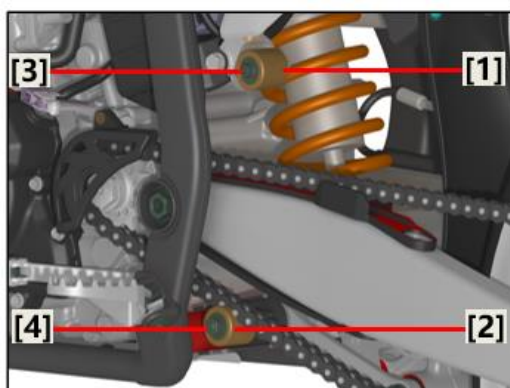
Check if the upper guide sprocket [1] and the lower guide sprocket [2] are excessively worn or if the guide sprocket bearings are seized.

Replace them in time if necessary.

Wear limit: Upper side: 2mm

Lower side: 2mm

Note: Always use new bolts and nuts when disassembling.



Check if the guide sprocket bolts and nuts are tightened to the correct torque values.

Torque:

Upper guide sprocket bolt connecting to the subframe:

22 N·m (2.2 kgf·m, 18 lbf·ft)

Lower guide sprocket fastening nut:

22 N·m (2.2 kgf·m, 18 lbf·ft)

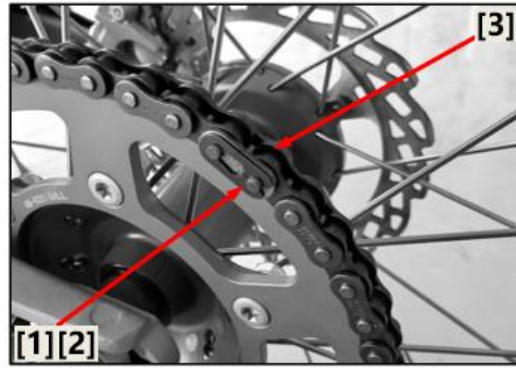
※Inspection, Cleaning and Lubrication of Drive Chain

Notes

● For optimal service life, please clean and lubricate the drive chain after every drive.

1. Disassemble

Remove the small sprocket decorative cover, the master link clip [1], the link plate [2], and the master link [3], then disconnect the drive chain. Check if the master link clip is in good condition. Replace if necessary.

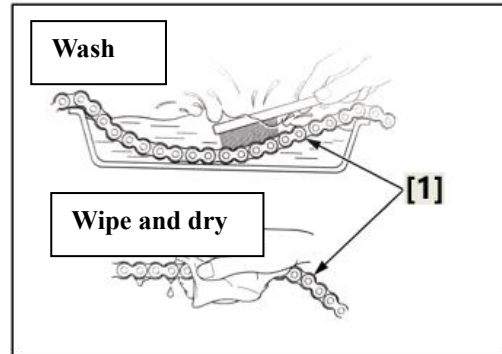


2. Cleaning

Clean the drive chain [1] with a non-flammable or high-flash-point solvent and dry it. Ensure the chain is completely dry before lubrication.

Check the drive chain for damage or wear.

Replace any damaged rollers, loosely assembled links, or an unusable drive chain.

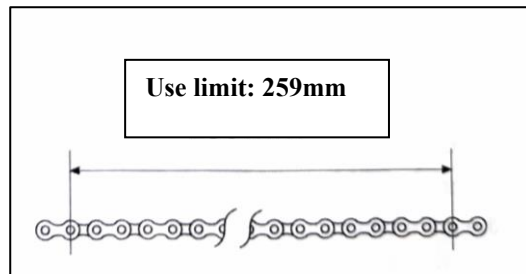


2. Measurement

Measure the distance between 17 pins (16 pitches) from the center of one pin to the center of the next, while ensuring the chain remains tight and any bent joints are straightened.

Use limit: 259mm

If the measured value exceeds the maintenance limit, please replace the drive chain.

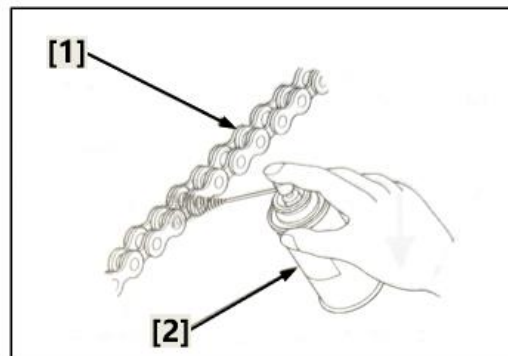


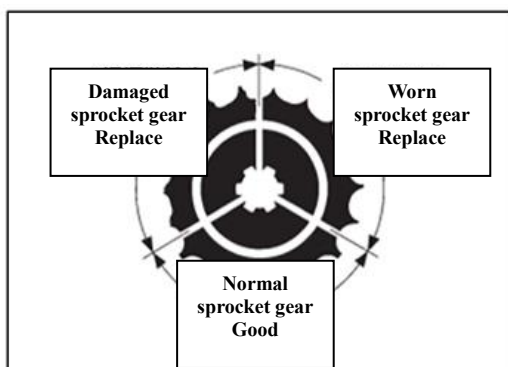
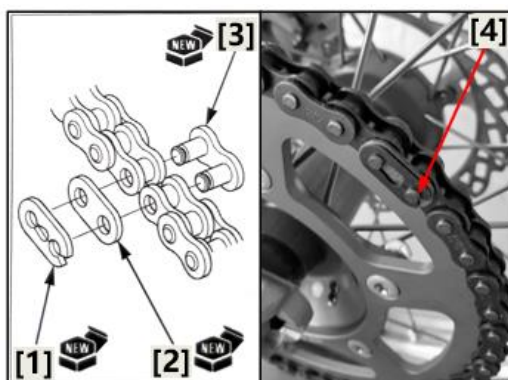
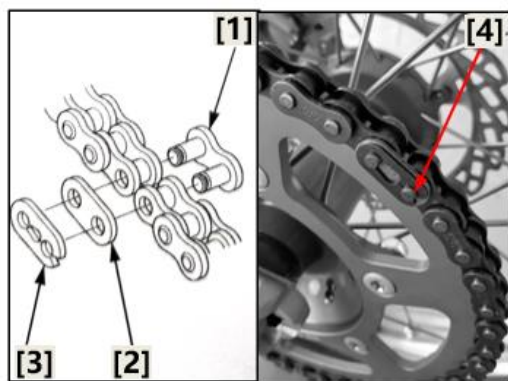
3. Lubrication

Apply drive chain lubricant [2] to properly lubricate the drive chain [1].

Recommended lubricants:

Use chain lubricant or SAE #80-90 gear oil to wipe off any excess oil or lubricant.





Note:

When installing the drive sprocket on the engine countershaft, thread adhesive (medium-strength thread locker, Loctite 243) shall be applied.

4. Installation

Install the drive chain on the sprockets.
Install the master link [1] and the link plate [2].
Install the master link clip [3] with its open end [4] always facing rearward when the drive chain is on the upper side of the swingarm.
Install the small sprocket decorative cover.
Adjust the looseness of drive chain.

※Replacement of Drive Chain

Remove the drive sprocket cover and the master link clip [1].

Note: Be careful not to damage the master link clip.

Remove the link plate [2] and the master link [3] to disconnect the drive chain.

Remove the drive chain.

Tools:

Drive chain tool kit

Note: When using the special tool, please follow the manufacturer's instructions.

Standard link: 116 links

Replaced chain: DID 520 DMA 4K SDH

Note: Never use new drive chains on worn sprockets. Both the chain and sprocket must be in good condition; otherwise, the newly replaced drive chain will wear out quickly.

When replacing the drive chain, inspect the sprocket as well.

Install the drive chain on the sprockets.

Install the new master link [3] and the link plate [2].

Install the new master link clip [1] with its open end [4] always facing rearward when the drive chain is on the upper side of the swingarm.

Install the small sprocket decorative cover.

Adjust the looseness of drive chain.

※Drive/Driven Sprockets

Remove the drive sprocket cover.

Check the drive sprocket gear teeth and driven sprocket gear teeth for wear or damage, replace them if necessary.

Consult your dealer to replace the drive sprocket and driven sprocket.

Never use new drive chains on worn sprockets.

Both the chain and sprocket must be in good condition; otherwise, the newly replaced drive chain will wear out quickly.

Check the bolts and nuts on the drive sprocket and driven sprocket.

If there is any looseness, tighten to the specified torque value.

Torque:

Drive sprocket nut:

88 N·m (8.8 kgf·m, 65 lbf·ft)

Bolts connecting driven sprocket to wheel hub

32 N·m (3.2 kgf·m, 24 lbf·ft)

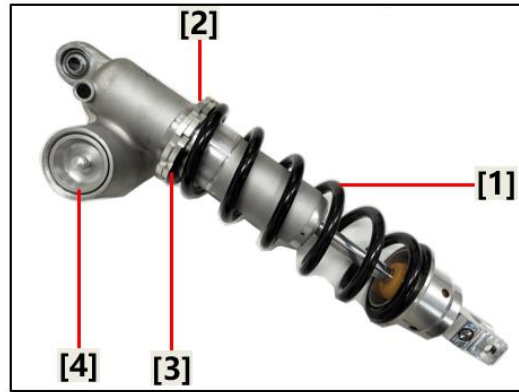
※Rear Shock Absorber

Spring preload adjustment

Adjustment method

1. Securely support your motorcycle with a maintenance bracket or a crane and lift the rear wheels off the ground.
2. Check whether the spring preload is in the standard length.
3. Loosen the shock absorber spring locking nut [2] and rotate the adjusting nut. The spring [1] length will change by 1.5 mm for each turn of the adjusting nut.
4. Make corresponding adjustments as needed.
5. After the adjustment is completed, hold the adjusting nut [2] and tighten the shock absorber spring locking nut [3].

Torque: 44 N·m



Increase spring preload:

Loosen the shock absorber spring locking nut [2] with a special tool, rotate the adjusting nut [3], and shorten the spring [1] length. The minimum length shall not be less than 220mm.

Reduce spring preload:

Loosen the shock absorber spring locking nut [2] with a special tool, rotate the adjusting nut [3], and increase the spring [1] length. The minimum length shall not be higher than 235mm.

Each turn of the adjusting nut will change the spring length and spring preload.

Note:

The rear shock absorber includes a shock absorber gas cylinder [4] containing high pressure nitrogen. Do not attempt to remove, repair or dispose of the device. Piercing or exposure to flame may also cause an explosion, causing serious injury. Repair or disposal shall be completed by special repair shop.

Hydraulic Brake

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Maintenance Instructions

Overview:

- This section describes the maintenance of conventional brake components of the brake system.
- The implementation method of the brake fluid replacement procedure and the exhausting procedure.
- Contaminated brake discs or brake pads will reduce braking efficiency.
- Discard contaminated brake pads and clean contaminated brake discs with high-quality brake degreaser.
- In maintenance of the system, be sure to use fresh DOT 4 brake fluid in a sealed container and do not mix different types of fluids which may not be compatible.
- Prevent any contaminants (dirt, water, etc.) from entering the unclosed reservoir.
- Once the hydraulic system is turned on, or if the braking force is insufficient, the brake system must be emptied, and the brake operation must be checked.
- Spilled brake fluid will seriously damage the instrument surface, painted surface and rubber parts; be careful when removing the reservoir lid, first make sure that the front reservoir is horizontal.

Troubleshooting

Soft or spongy brake handlebar/pedal

- Air in hydraulic system
- Leakage in hydraulic system
- Contaminated brake pads/discs
- Wear of brake caliper piston seal
- Wear of main piston cup
- Contaminated brake pads/discs
- Contaminated brake caliper
- Contaminated brake pump
- Abnormal sliding of brake caliper
- Low brake fluid level
- Oil passage blockage
- Distortion/deformation of brake disc
- Brake caliper piston stuck/worn
- Main piston stuck/worn
- Bent brake bar/pedal

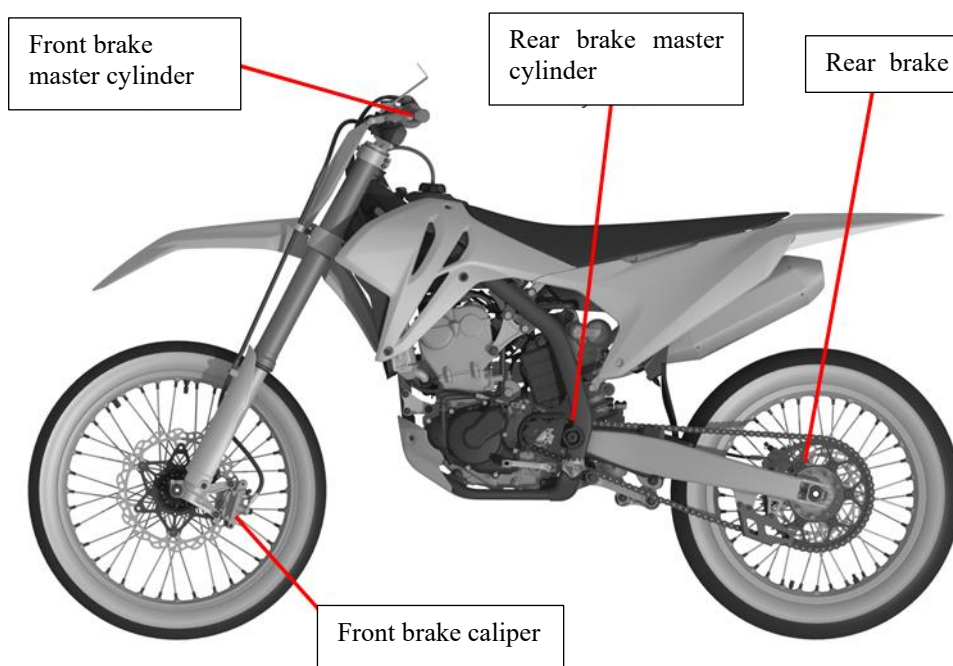
Apply force to the brake handle/pedal

- Blocked/restricted oil passage
- Brake caliper piston stuck/worn
- Abnormal sliding of brake caliper
- Wear of brake caliper piston seal
- Main piston stuck/worn
- Bent brake bar/pedal

Brake resistance

- Contaminated brake pads/discs
- Misaligned wheels
- Severe wear of brake pads/discs
- Distortion/deformation of brake disc
- Abnormal sliding of brake caliper
- Blocked/restricted oil passage
- Caliper piston stuck

Position of Components



※ Inspection of Brake Fluid Level



Spilled brake fluid can damage paint, plastic or rubber parts.

Note:

Ensure not to mix incompatible types of brake fluids together.

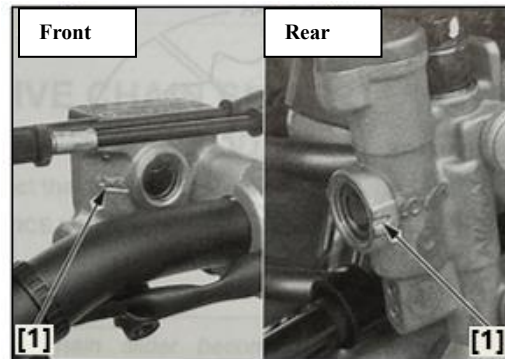
During the process of filling the reservoir, take care to prevent any foreign matter from entering.

※ Level Inspection

Check the brake fluid level in both the front and rear brake master cylinder liquid reservoirs.

If the level is close to the lower level line [1], check the brake pads for wear.

If the brake pads are not worn and the level is low, check the entire system for leaks and proceed to fill the reservoir with brake fluid.

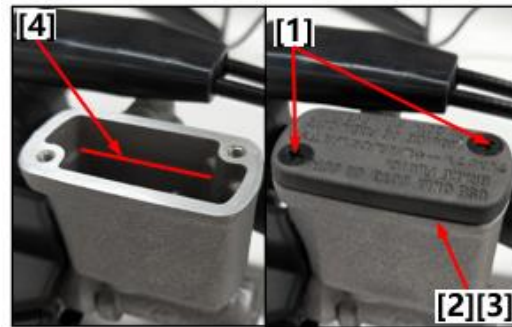


※ Brake Fluid Addition

● Front brake master cylinder:

Remove the front brake master pump reservoir cover bolt [1], reservoir cover [2] and diaphragm [3].

Fill the reservoir with the recommended brake fluid to the upper level line [4].



Use the recommended brake fluid: DOT4 brake fluid

Install the diaphragm and the reservoir cover.

Install and tighten the front brake master cylinder reservoir cap screws to the specified torque.

Torque: 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)

Check the front brake hydraulic system for leaks.

● Rear brake master cylinder:

Remove the rear brake master pump reservoir cover bolt [1], reservoir cover [2], pad [3] and diaphragm [4].

Fill the reservoir with the recommended brake fluid to the upper level line [5]. Recommended brake fluid:

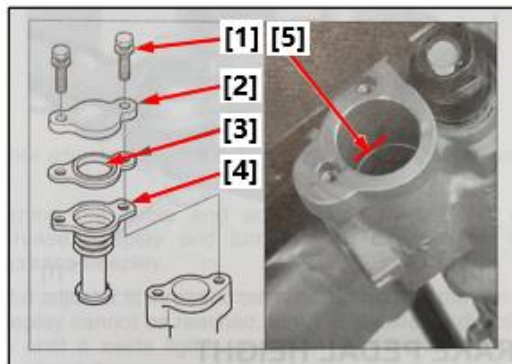
DOT4 brake fluid

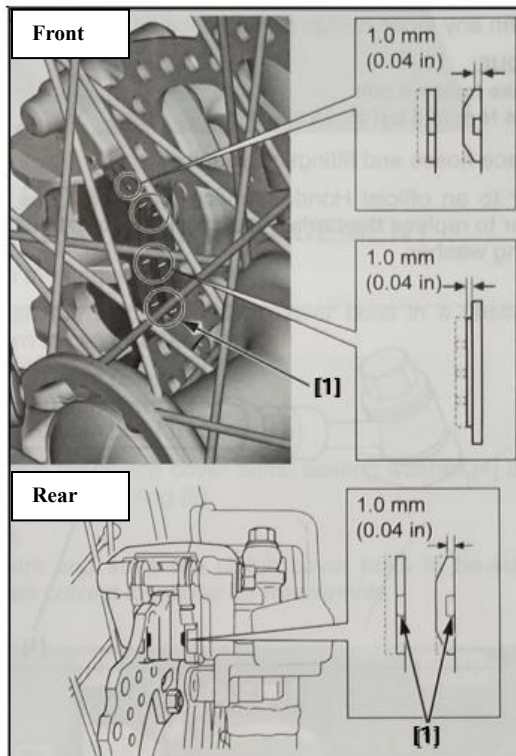
Install the diaphragm [4], pad [3], and caover [2].

Install and tighten the rear brake pump reservoir cover bolt [1] to the specified torque.

Torque: 2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)

Check the front brake hydraulic system for leaks.





※Inspection and Replacement of Brake Pads

Check the linings.

If any of the linings is worn down to 1.0 mm, both linings must be replaced.

Note:

The width of the wear indicator [1] is 1.0 mm. If the brake pad is worn to the service limit, consult the dealer to replace the brake pad.

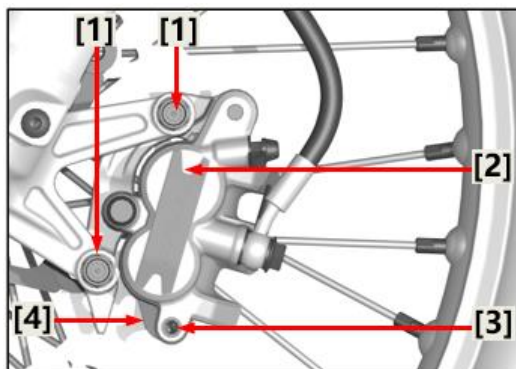
Replace:

● Front brake pad

Disassembly/installation

When replacing the brake pads, first remove the caliper mounting bolts at position [1], then remove the caliper [2]. Place a tool between the brake pads and pry it left and right to retract the piston. Remove the brake pad dowel pin [3], and then the brake pad [4] can be removed.

Note: Do not operate the brake rod after removing the brake pads.

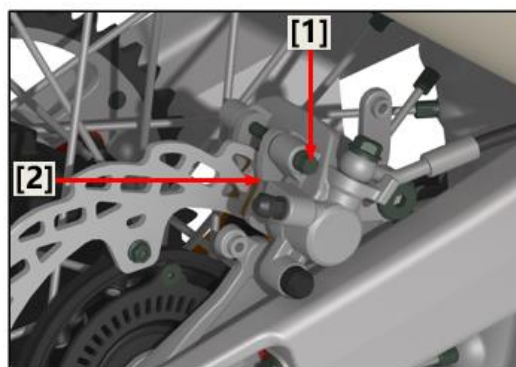


● Rear brake pad

Disassembly/installation

When replacing the brake pads, remove the brake pad dowel pin bolts at position [1], and then the brake pads [2] can be removed.

Note: Do not operate the brake rod after removing the brake pads.



※ Inspection and Replacement of Brake Discs

Inspection

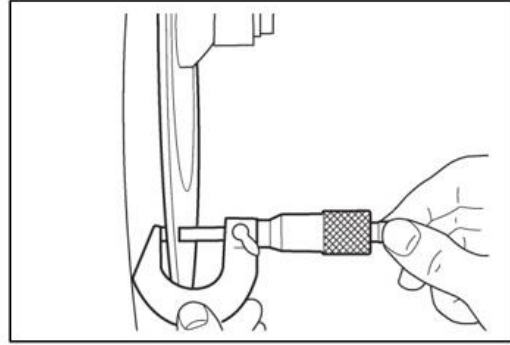
- Visually check the brake disc for damage or cracks.

Measure the wear limit of brake disc:

Front brake disc: 3.5 mm

Rear brake disc: 2.5 mm

Replace if necessary.



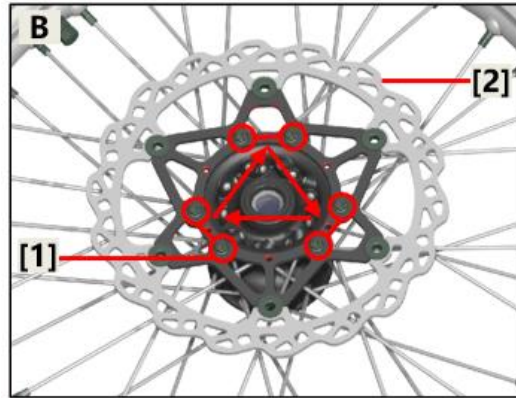
Replace

A: Front

Disassembly/installation

Disassemble the following parts:

- Remove the front wheel;
- Remove 6 mounting bolts of the brake disc;
- Remove the disc brake disc [2].

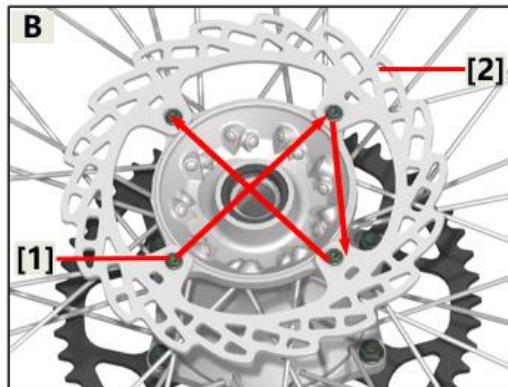


B: Rear

Disassembly/installation

Disassemble the following parts:

- Remove the rear wheel;
- Remove 4 mounting bolts of the brake disc;
- Remove the disc brake disc [2].



Note:

Apply a small amount of thread adhesive to the bolt during installation. (Medium-strength thread locker Loctite 243)

Tighten the bolts in the order indicated by the arrow.

Torque:

Front brake disc mounting bolt:

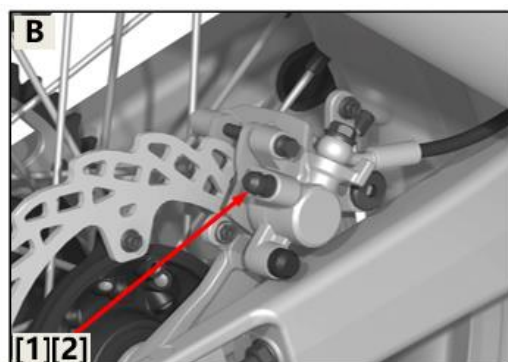
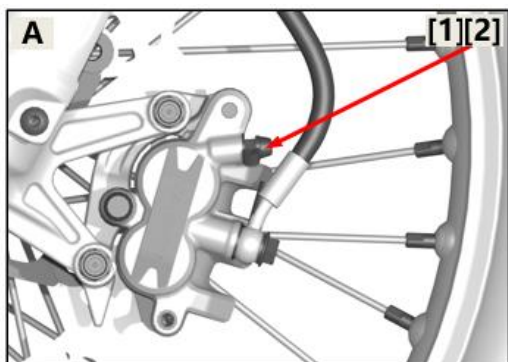
M6x12

12 N·m (1.2 kgf·m, 9.0 lbf·ft)

Rear brake disc mounting bolt:

M6x12

12 N·m (1.2 kgf·m, 9.0 lbf·ft)



Note

- Take care to avoid spilling brake fluid or allowing the brake master cylinder reservoir or brake caliper reservoir to overflow.
- When releasing the air from the hydraulic brake system, ensure that the brake fluid level is sufficient before running the brake. Skipping this prevention measure will allow air to enter the hydraulic brake system, resulting in a significant increase in the time required for the exhausting procedure.

- If releasing is difficult, it may be necessary to allow the brake fluid to settle for several hours. Once the small bubbles in the hose have disappeared, repeat the release procedure.

1.Exhaust:

- Fill the brake fluid reservoir to the appropriate level using the specified brake fluid.
- Install the diaphragm (brake master cylinder reservoir or brake fluid reservoir).
- Connect the clear plastic hose [1] tightly to the bleed bolt [2].

A.Front

B.Rear

※Hydraulic Brake System Exhausting

Warning

- After removing the brake-related parts, ensure to bleed the brake system.

Note:

Exhaust the brake system in the following sequence.

Step 1: Front brake caliper.

Step 2: Rear brake caliper.

Warning

- State of releasing brake system air:
- Brake pump is disassembled.
- Brake hose is loose, removed or replaced.
- Brake fluid level is below the minimum mark.
- There is a malfunction in the brake operation.

d.Place the other end of the hose in the container.

e.Run the brake slowly/several times.

f.Pull up the brake handle completely, or press the brake pedal all the way down until it is fully engaged.

g.Loosen the bleed screw.

Note

Loosen the bleed screw to release air and ensure that the brake handle makes full contact with the throttle grip or brake pedal.

h.Tighten the bleed screw and release the brake handle or brake pedal.

i.Repeat steps (e) to (h) no bubbles are visible in the brake fluid within the plastic hose.

j.After operating the ABS, repeat steps (e) to (i) and fill the brake master cylinder reservoir or brake fluid reservoir to the appropriate level using the specified brake fluid.

k.Tighten the bleed screw to the specified torque.

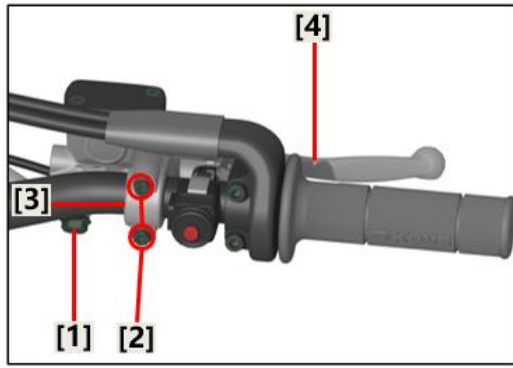
Brake caliper bleed screw [1];

6 N·m (0.6 kgf·m, 4.4 lbf·ft)

m. Fill the brake master cylinder or brake fluid reservoir to the appropriate level using the specified brake fluid.

Warning

- After air is completely removed from the hydraulic brake system, check the operation of the brakes.



※Front Brake Master Cylinder

Drain the brake fluid from the front brake hydraulic system.

Disassembly/installation

Disassemble the following parts:

- Oil bolt and sealing washer [1];
- 2 bolts [2];
- Brake handle holder [3];
- Brake pump [4];

The installation sequence is reversed from the removal sequence.

Note:

- Replace with a new sealing washer.
- Install the brake handle holder with the “UP” marked side facing upwards.
- Align the edge of the master cylinder with the punch mark on the handlebar. Tighten the upper bolt first, and then the lower bolt.
- When connecting the brake hose, make sure to place the eyelet fitting into the groove.

Torque:

Brake handle holder:

8.0 N·m (0.8 kgf·m, 6.0 lbf·ft)

Brake hose oil passing bolt:

22 N·m (2.2 kgf·ft, 16 lbf·ft)

※Rear Brake Cylinder

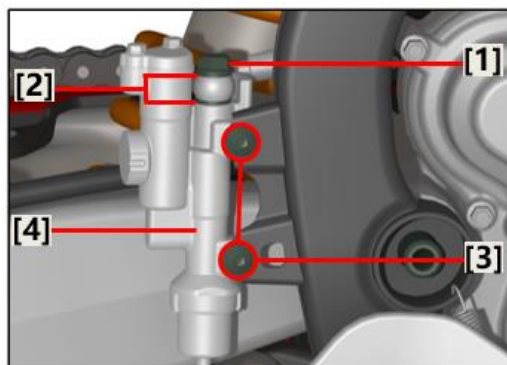
Drain the brake fluid from the rear brake hydraulic system

Disassembly/installation

Disassemble the following parts:

- Remove the brake pipe locking bolt [1];
- Sealing washer [2], disconnect the brake hose'
- Remove the brake cylinder mounting bolt [3]
- Remove the rear brake cylinder [4]

The installation sequence is reversed from the removal sequence.



Note:

- When tightening the brake pipe locking bolt, ensure that the horizontal limit pin is against the limiter

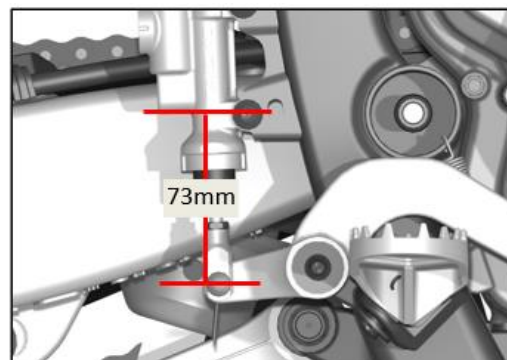
Torque:

Rear brake cylinder mounting bolt:

12 N·m (1.2 kgf·m, 9.0 lbf·ft)

Brake pipe locking bolt:

22 N·m (2.2kgf·m, 16 lbf·ft)

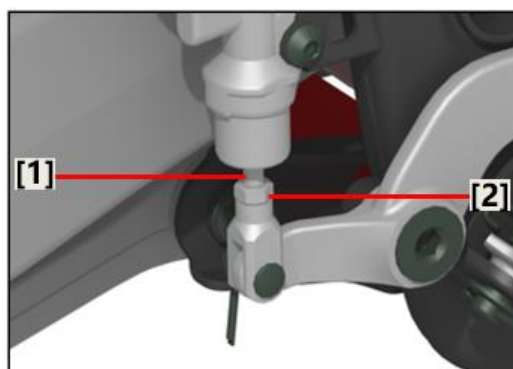


※Adjustment of brake pedal

After removing the push rod, adjust its length so that the distance from the center of the lower mounting bolt hole of the brake pump to the center of the connecting pin hole is the standard length of **73mm**. If the length is adjusted to a longer position, make sure that the lower end of the push rod thread [1] is 5 mm in the connector, and tighten the connecting nut [2] to the specified torque after adjustment.

Rear brake pump push rod adjustment tightening nut:

6.0 N·m (0.6 kgf·m, 4.4 lbf·ft)



※Brake pedal

Firmly support the motorcycle with the main stand.

Disassembly/installation

Disassemble the following parts:

- Remove 2 hex head cap bolts at position [1];
- Remove the brake pedal at position [2];
- Remove the brake rebound tension spring at position [3];
- Remove the cotter pin and flat gasket at position [4];
- Pull out the rear brake pump pin bolt at position [5];
- Remove the brake arm mounting bolt and washer at position [6];
- Remove the rear brake arm [7].

The installation sequence is reversed from the removal sequence.

Note:

- Apply grease to the oil seal positions (lubrication grooves) on both sides of the brake arm pivot.
- Apply low-strength Loctite 222 thread adhesive when installing the brake pedal.

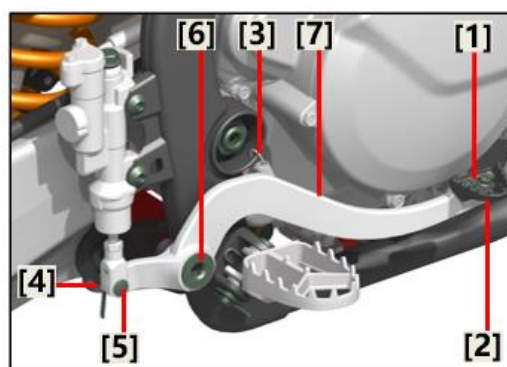
Torque:

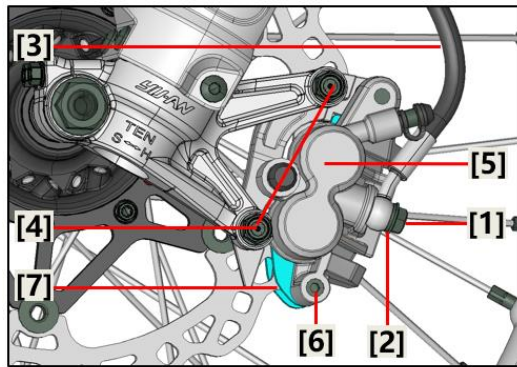
Brake arm mounting bolt:

22 N·m (2.2 kgf·m, 16 lbf·ft)

Brake pedal mounting bolt:

8.0 N·m (0.8 kgf·m, 6.0 lbf·ft)





※Front brake caliper

Drain the brake fluid from the front brake hydraulic system.

Disassembly/installation

Disassemble the following parts:

- Oil passing bolt [1];
- 2 Oil pipe sealing washer [2];
- Brake hose [3];
- 2 bolts [4];
- Brake caliper [5];

The installation sequence is reversed from the removal sequence.

Note:

- Replace the brake caliper mounting bolts and sealing washers.
- When tightening the brake pipe locking bolt, make sure to place the eyelet stop pin against the brake caliper body.

Torque:

Front brake caliper mounting bolt:

36 N·m (2.6 kgf·m, 27 lbf·ft)

Brake pipe locking bolt:

22 N·m (2.2 kgf·m, 16 lbf·ft)

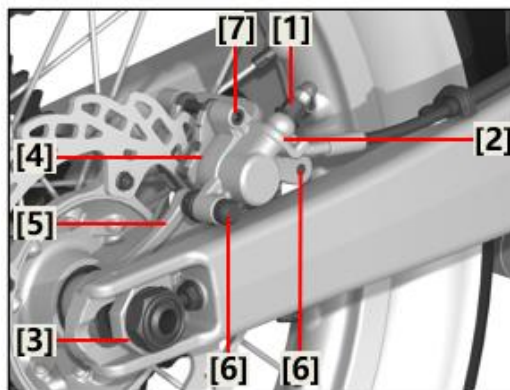
※Rear brake caliper

Drain the brake fluid from the front brake hydraulic system.

Disassembly/installation

Disassemble the following parts:

- Oil passing bolt [1];
- 2 Sealing washers [2];
- Remove the locking nut of the rear wheel axle [3];
- Pull out the rear wheel axle;
- Remove the rear wheel;
- Remove the rear brake caliper [4];
- Caliper bracket [5].



The installation sequence is reversed from the removal sequence.

Note:

- When tightening the brake pipe locking bolt, make sure to place the eyelet stop pin against the brake caliper body.
- Replace with new washers and sealing washers.
- Apply multi-purpose grease to the sliding area of the smooth portion of the upper and lower sliding shafts [6] of the rear brake caliper and the contact area of the smooth portion of the guide pin [7] of the rear brake caliper.

Torque:

Brake pipe locking bolt:

22 N·m (2.2 kgf·m, 16 lbf·ft)

Vehicle Electrics

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Maintenance Instructions

Precautions:

- During maintenance, it is forbidden to disassemble the parts of EFI system.
- During maintenance, extreme care shall be exercised on work with electronic components (ECUs, sensors, etc.) to prevent missing. Furthermore, do not touch the pins of electrical components at will to avoid damage caused by electrostatic breakdown.
- Do not remove the connectors of any components of the EFI system from their installation positions without authorization, to avoid accidental damage or foreign matters such as water and oil entering the connectors, which may affect the normal operation of the EFI system.
- When disconnecting and connecting the connector, be sure to put the ignition switch in the off position, otherwise the electrical components will be damaged.

※Electronic Control Unit (ECU)

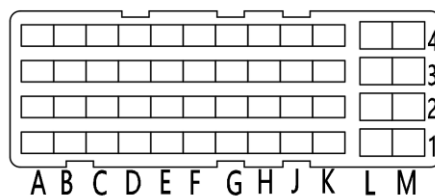
The electronic control unit is the brain of the whole EFI system and electrical appliances. It analyzes and processes all kinds of information provided by sensors, and sends the conclusion to the actuator in the form of command, so that the engine can run in the optimum state.

Note: It is not allowed to increase the load on the housing or cover plate; handle with care and prevent falling to the ground.

Drawing of ECU

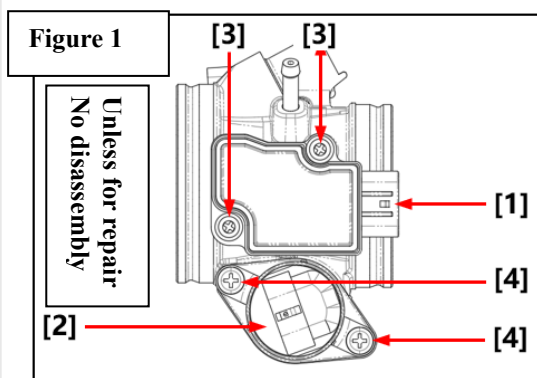


※Schematic Diagram of Outgoing Direction of ECU Connector



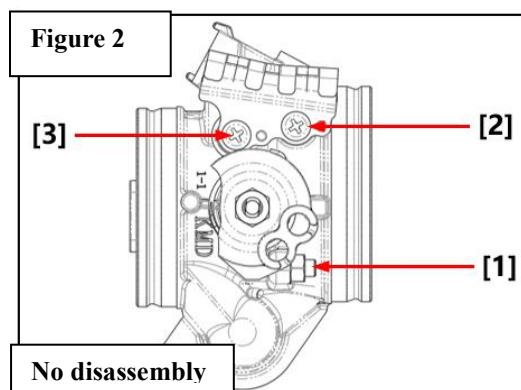
Function definitions of ECU pins:

PIN-NO	Function	Wire Harness Color	PIN-NO	Pin Function	Wire Harness Color
1	Upstream oxygen sensor 1 heating	Orange-green	18	-	-
2	Stepper motor A	Gray-yellow	19	-	-
3	-	-	20	Upstream oxygen sensor 1	Yellow-gray
4	UBD continuous power supply	Red-white	21	Throttle position sensor	Pink-white
5	Engine speed sensor A-end	Blue-white	22	-	-
6	Engine speed sensor B-end	Green-white	23	-	-
7	Power GND 1	Green	24	Stepper motor C	Brown-blue
8	Intake pressure sensor	Pink-green	25	Stepper motor B	Yellow-green
9	-	-	26	Ignition switch	Black-white
10	Power ground 2	Green	27	Sensor GND	Green-black
11	Ignition coil 1	Black-yellow	28	Oil pump relay	Brown-black
12	Fuel injector 1	Orange-black	29		
13	Stepper motor D	Gray-blue	30	Dump switch DUMP	Yellow
14	-	-	31		
15	5V power supply 1	Pink	32	Engine coolant temperature sensor	Gray-green
16	CAN communication line low	Red-yellow	33	Intake air temperature sensor	Pink-black
17	CAN communication line high	Green-blue		-	-



Specification for the three-in-one sensor mounting screws:
M4x12 screw
The fastening torque of the screw at position [3] is $2.0 \pm 0.4 \text{ N} \cdot \text{m}$

Specification for the stepper idle motor mounting screws:
M5x14 spring washer assembly screw
The fastening torque of the screw at position [4] is $4.0 \pm 0.4 \text{ N} \cdot \text{m}$



Installation specification for the cable bracket:
M5x10 screw;
The fastening torque of the screw at position [2] is $3.5 \pm 0.5 \text{ N} \cdot \text{m}$
The fastening torque of the screw at position [3] is $4.5 \pm 0.3 \text{ N} \cdot \text{m}$

※ Throttle Body Assembly

Connect the air filter and engine, control the angle of the throttle plate through the accelerator cable, and the throttle position sensor will send the angle signal to ECU.

As the position of sensor shown in Figure 1:

1. Intake air temperature, intake air pressure, throttle position [1];
2. Idle stepper motor [2]

Precautions in sensor installation:

1. The terminals shall not be stained with water, oil and other liquids;
2. Do not contact harmful gases (Cl, SO₃, etc.);
3. Do not use the components that have been dropped;
4. Do not exert external force to cause deformation or damage of parts;
5. Direct contact with terminals is not allowed (to prevent static electricity);
6. It is necessary to block the pressure channel when cleaning the throttle.

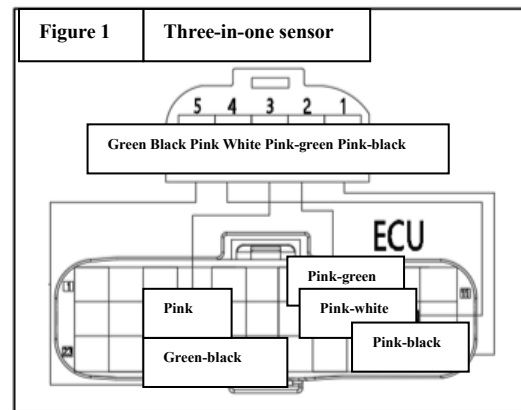
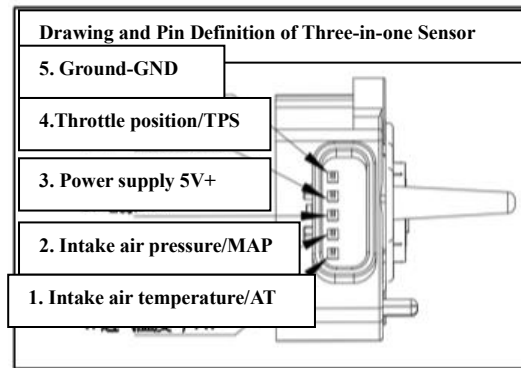
As shown in Figure 2, the idle limit screw [1] is not allowed to be adjusted.

⚠ Warning

- The engine idle speed is completely adjusted by EFI system, and manual adjustment of the idle limit bolts is not allowed.
- It is not allowed to increase the load on the shell or cover plate.
- When dismounting, handle with care and do not allow them to drop on the ground.

Throttle valve body inspection:

1. The throttle plate moves flexibly and is not stuck;
2. There is no foreign matter in throttle body and oil/gas passages (foreign particle size < 0.34 mm);
3. There is no missing assembly and incorrect assembly of parts or missing parts, and the internal parts are installed firmly without falling off;
4. The throttle screw is tightened reliably without loosening.



Characteristic parameters of intake air temperature sensor

Operating temperature: - 40°C / +130°C
 Rated voltage: Operate at 5V with a pull-up resistor of 1 k Ω , or operate with a constant current of $\leq 1\text{mA}$
 Rated voltage at 20°C: 2.5 k $\Omega \pm 5\%$

※Three-in-one Sensor

Intake air temperature

The intake air temperature sensing element is a negative temperature coefficient (NTC) resistor. Its resistance varies with the intake air temperature. This sensor sends a voltage representing the change in intake air temperature to the ECU controller.

Intake pressure

Monitor the intake pipe pressure and provide the engine load information for ECU.

Throttle position

This sensor is used to provide the throttle angle information to the ECU. Based on this information, the ECU can obtain engine load information, operating condition information (such as starting, idling, engine braking, part-load, full-load), as well as acceleration and deceleration information.

Figure 1 is a wiring diagram for connection between three-in-one sensor and ECU.

Function definitions of pins:

1. Intake air temperature signal (AT) is connected to ECU 33# (pink-black)
2. Intake air pressure signal (MAP) is connected to ECU 8# (pink-green)
3. Connect to 5V power supply, connected to ECU 15# (pink 1)
4. Throttle position (TPS) is connected to ECU 21# (pink-white)
5. Ground (GDN) is connected to ECU 27# (green-black)

Install:

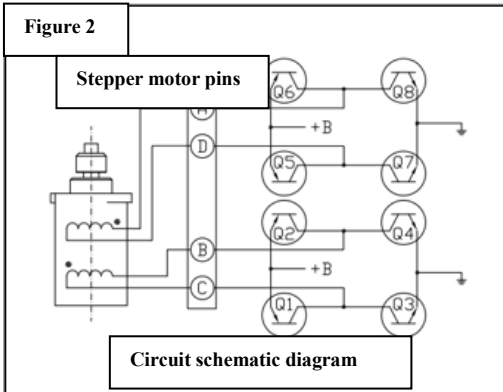
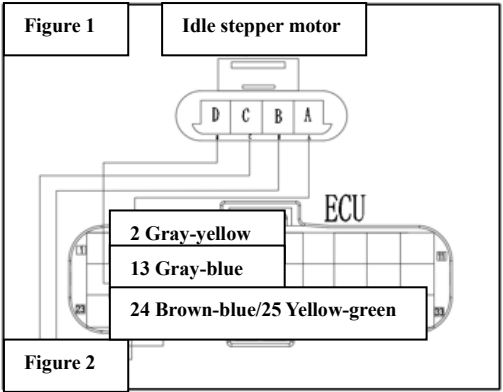
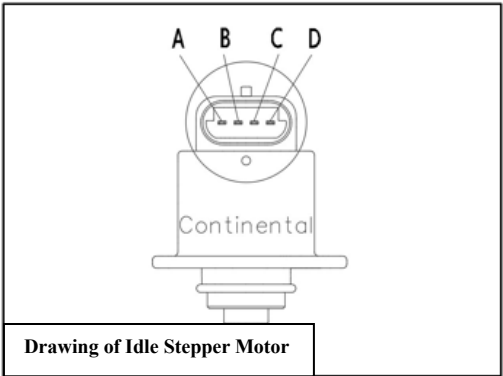
It shall be installed within a permissible range, making sure that no condensate water will be generated in the sensor, because condensate water will damage the sensing elements inside the sensor.

Characteristic parameters of pressure sensor

Parameter	Value			Unit
	Minimum value	Typical value	Maximum value	
Pressure test range	10		115	kPa
Operating temperature	-40		130	C
Power voltage	4.75	5.0	5.25	V

Characteristic parameters of throttle position sensor

Volume	Value			Unit
	Minimum	Typical	Maximum	
Total resistance (P1-2)	1.6	2.0	2.4	K Ω
Power voltage		5		V



※Idle Stepper Motor

It is designed to control the bypass air flow. The stepper motor is controlled by ECU using the engine sensor based on the engine load, and the fuel injection volume is different under different operating conditions, thus it is required to supplement air intake for the motor, and connect in specified method, otherwise it may cause unstable idle speed.

Functions of pins:

- Stepper motor pin A/connected to ECU 2 (gray-yellow)
- Stepper motor pin B/connected to ECU 25 (yellow-green)
- Stepper motor pin C/connected to ECU 24 (brown-blue)
- Stepper motor pin D/connected to ECU 13 (gray-blue)

Figure 1 is a wiring diagram for connection between idle stepper motor to ECU

Figure 2 is a circuit diagram of idle stepper motor.

The following table shows the characteristic parameters of idle stepper motor.

Characteristic parameters			
N O	Item	Specification	Conditions
1	Rated voltage	12V DC	
2	Minimum/maximum operating voltage	7.5V-14V	
3	Phase resistance	53±5.3Ω	27°C
4	Operating temperature	-40°C-125°C	

※Starting Relay

Apply DC12V to the contacts at both positive and negative terminals of the control circuit coil of starting relay, and measure with a multimeter to check for interconnection between the contacts: If the relay contacts make a tick sound and the multimeter makes a continuous beep sound, it indicates that the two contacts are interconnected, if not, it indicates that they are not interconnected. if there is no DC12V voltage applied to two ends of the coil, the two contacts are not interconnected: The above two items can be used to confirm whether the relay is in good condition, and the multimeter shall be set to the diode file during the measurement

⚠ Warning

- The time for applying voltage to the relay coil shall not exceed 1 minute, otherwise it may cause overheating and even burnout of the coil.

Figure 1 is a wiring diagram of starting relay.

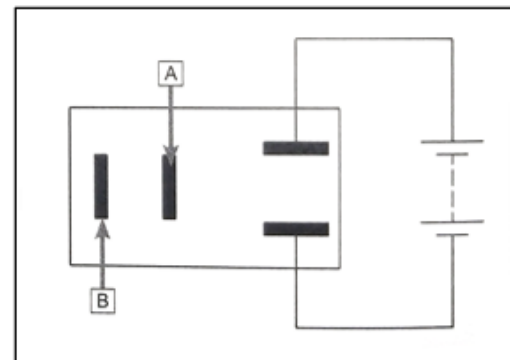
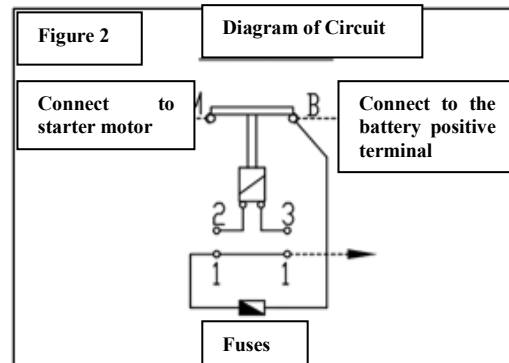
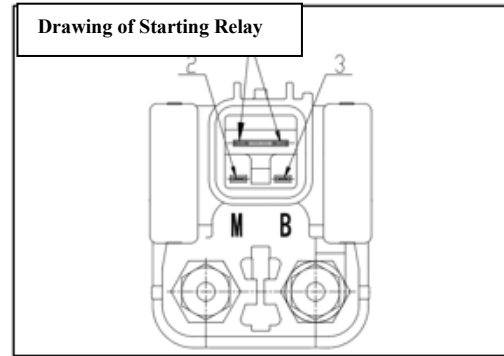
When measuring the resistance between relay coils using a multimeter, if the resistance is not within the specified range of 3Ω - 5Ω , replacement with new parts is need. The multimeter is set to the gear $1 \times 10 \Omega$ during the measurement.

Figure 2 is a schematic of starting relay.

Auxiliary relay

Apply a DC 12V voltage to the positive and negative terminals of the control circuit coil of the auxiliary relay, and use a multimeter to measure whether the two contacts A and B are connected. When measuring, set the multimeter to the diode file. If the contact makes a ticking sound and the multimeter makes a continuous beeping sound, it means that the two contacts are connected; otherwise, it means they are not connected. The above two items can be used to confirm whether the relay is in good condition, and the multimeter shall be set to the diode file during the measurement

The normal coil resistance range is 90Ω - 100Ω .



※Rectifier regulator

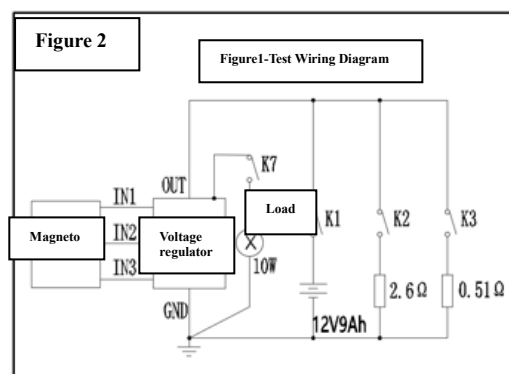
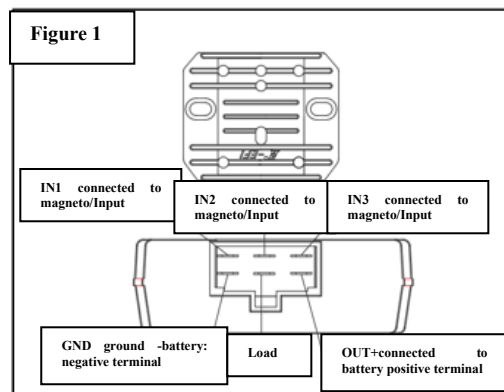
After the engine starts running and reaches 5000 r/min, when the battery is fully charged, use a multimeter to measure the voltage between the two ends of the red, red-white, and green wires. The voltage shall be within the range of 13.5V - 15V. If it is not within this range, the rectifier regulator needs to be replaced.

Figure 1: Drawing of regulating rectifier and definition of pins

Figure 2: Test wiring diagram of regulating rectifier.

Function definitions of pins:

- 1: IN1 connected to magneto input (yellow)
- 2: IN2 connected to magneto input (yellow)
- 3: IN3 connected to magneto input (yellow)
- 4: GND connected to battery: negative terminal (green)
- 5: Load connected to ECU P26 (black-white)
- 6: OUT connected to battery positive terminal (red-white)



※Engine Water Temperature Sensor

The sensor is a thermistor for two sets of negative temperature coefficient (NTF), with its resistance value decreased with the increase of coolant temperature, but it is not a linear relationship. One set is provided to ECU to monitor the thermal state of the engine.

The set A provides water temperature signal to ECU.

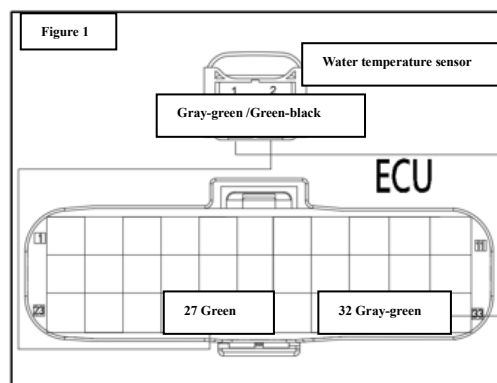
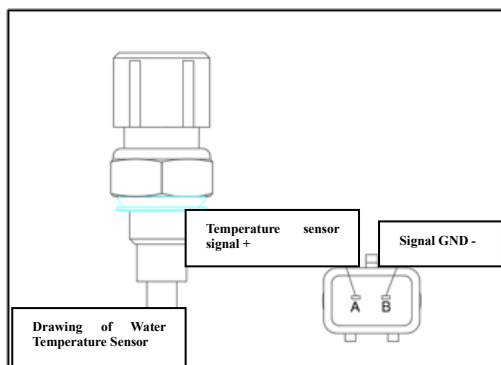
Function definitions of pins:

A. Signal + connecting ECU P32 (gay-green)

B. Signal + connecting ECU P32 (gray green)

Figure 1: Wiring diagram between water temperature sensor and ECU.

Right Figure: Characteristic table of temperature, of which the signal is transmitted to the ECU.



Temperature range °C	Resistance value (kΩ)
-20	14.93
20	2.435
80	0.3169
100	0.1830

※Oxygen Sensor

This sensor is used in the feedback system of the EFI device to achieve closed-loop control and improve the control accuracy of the air-fuel ratio by ECU. It is installed on the air passage front section of the exhaust pipe to measure the oxygen content in the exhaust gas to determine whether the gasoline and air are completely burned, so as to ensure that the three-way catalytic converter has the maximum conversion efficiency for HC, CO and NOx in the exhaust gas.

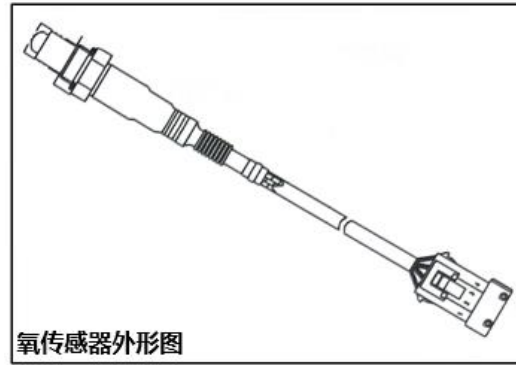
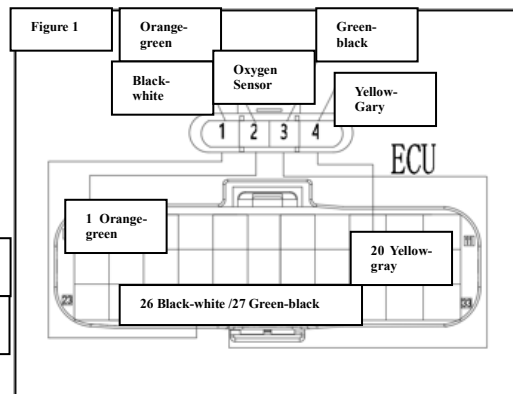
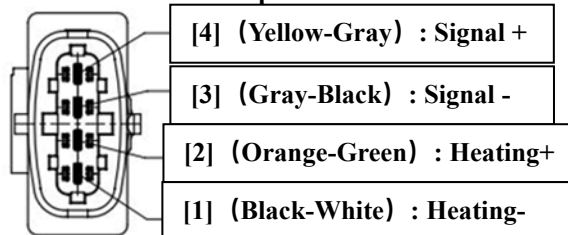


Figure 1: Wiring diagram between oxygen sensor and ECU.

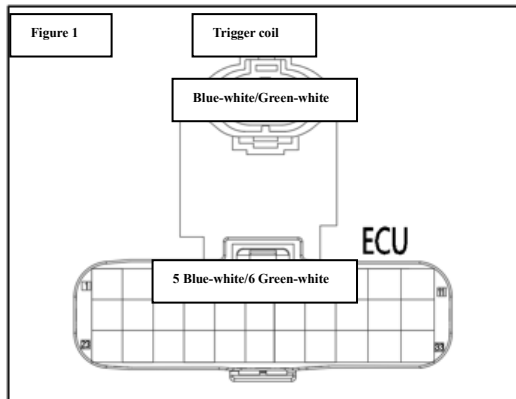
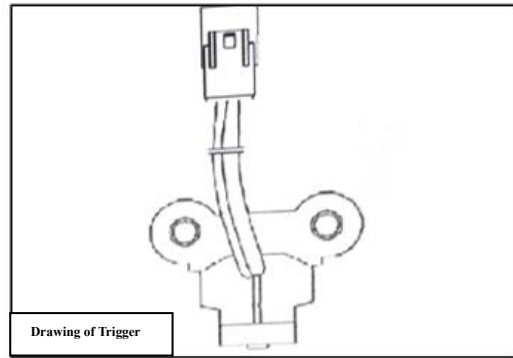
Function definitions of pins:



※Trigger

It provides engine speed signal to ECU, and the ECU determines the ignition angle and fuel injection phase, etc. based on the signal.

Figure 1: Wiring diagram between trigger and ECU.



Measure the resistance value of trigger unit:

The multimeter is set to gear 1X 100Ω:

Trigger coil resistance: 100Ω-160Ω (20°)

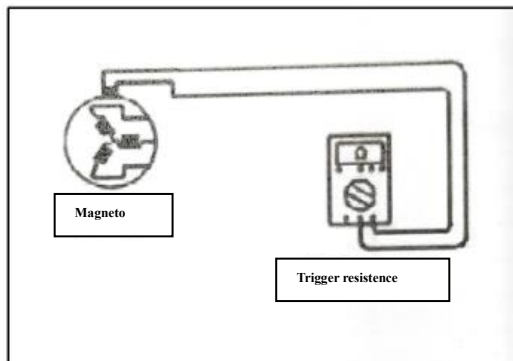
If the resistance value of trigger unit is not within the above range, replace the trigger unit.

Measure the peak voltage of trigger unit

Connect the multimeter to the peak voltage adapter as shown in the figure:

+ Probe: blue-white (B) lead

+ Probe: green-white (A) lead



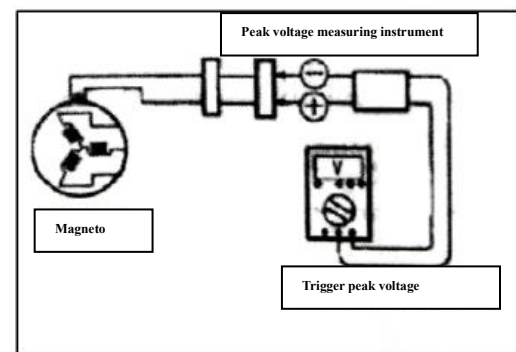
Multimeter is set to the AC gear:

Set the gear in neutral, press and hold the start button to make the engine running for a few seconds, and then measure the trigger coil voltage:

Repeat the measurement several times, and obtain the measured highest output voltage of trigger coil:

Highest output voltage of trigger coil: $\geq 2V$ (200r/min)

If the highest voltage value of trigger unit is not within the above range, replace the trigger unit.



※Fuel Pump

The fuel pump assembly integrates the fuel pump, plastic bracket, full-flow filter, fine filter and pressure regulating valve. The working process is to use the certain oil pressure and flow to pump the fuel from the fuel tank to the engine.

Function definitions of pins:

1: Grounding (-) (Green)

2: Connect to the output terminal (+) of the fuel pump relay (Brown-Green).

Performance parameters:

Opening pressure of pressure regulating valve:
 0.33 ± 0.01 mpa

At a flow rate of 40L/h, the corresponding rated pressure is 330 ± 10 kPa

The fuel pump assembly is installed at the fuel tank bottom at the left front part of the vehicle. Do not run the fuel pump assembly in a no-load and oil-free state in case damage is caused. Handle with care during installation or disassembly, and take care not to drop it to the ground.

Measure oil pressure

Connect the oil pressure gauge to the fuel outlet of the fuel pump assembly, and lock it with a clamp to ensure that there is no leakage at the junction. Press the stop switch, and the fuel pump will stop running after an operation of 5 seconds. Now measure to check that the oil pressure reaches the specified pressure value (330 kpa). If so, it indicates that the fuel pump is in good condition, on the contrary, it indicates that the fuel pump is in abnormal condition and needs to be replaced.

Pressure relief of fuel line

The fuel supply pressure of the electronic fuel injection system is high. All fuel pipes are made of high-pressure resistant hoses. Even when the engine is not running, there is still a relatively high pressure in the oil circuit. Therefore, note during maintenance: do not disassemble the fuel pipes easily; when maintaining the fuel system that needs repair, relieve the pressure of the fuel system before disassembling the fuel pipes and the methods are as follows: remove the fuel pump relay or the 2P (black) wire harness connector of the fuel pump, start the vehicle and let it idle until the engine shuts off on its own.

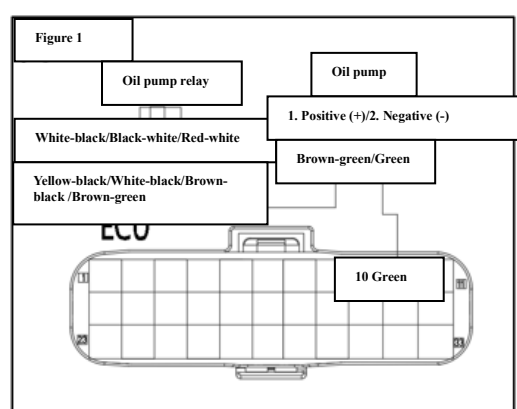
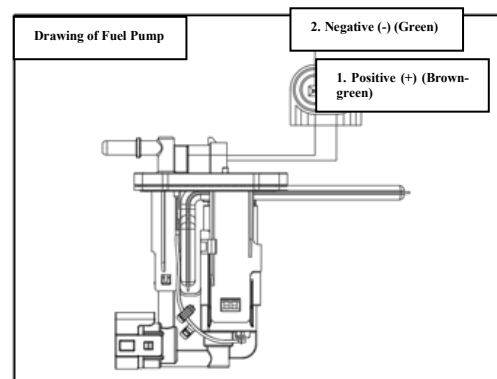


Figure 1: Wiring diagram between fuel pump and ECU.

※Fuel Injector

One end of the injector is installed on the injector seat, and the other end is connected to the oil pipe through the injector cap. It injects fuel within the specified time according to the command of ECU, thus providing fuel to the engine and atomizing it. The fuel injector adopts four-hole injection, and cannot rotate after the circlip is fixed.

Function definitions of pins:

1. Positive (+) connected to + DC12V (Black-white)
2. Negative (-) connected to ECU P12 (Orange-black)

Injector resistance: $12.5 \Omega \pm 5\%$

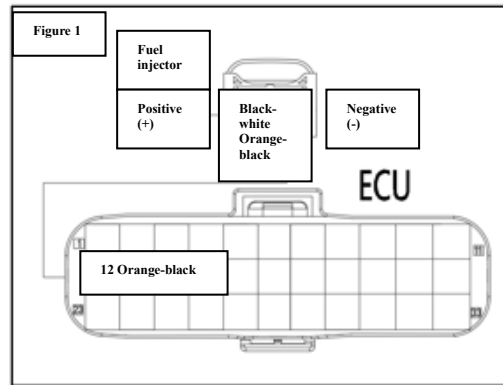
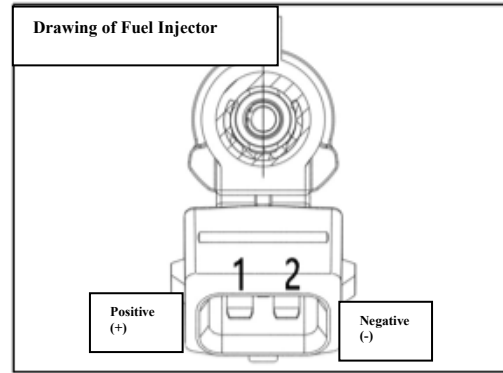
Figure 1: Wiring diagram between fuel injector and ECU.

Note:

1. In order to avoid contamination to the injecting area, the fuel inlet end of the injector shall always be above the fuel outlet end (at the injector mounting position on the entire vehicle);
2. To achieve the best assembly of fuel injector, it is necessary to lubricate the upper and lower O-ring with clean silicone-free engine oil; Lubricating oil shall not contaminate the inside and orifice of the injector;
3. The O-ring must be replaced when removing and reassembling the injector, and the sealing surface must not be damaged during such operation.

Installation of fuel injector:

Fuel injector shall be installed by hand, and it is not allowed to strike with hammer. The O-ring must be replaced when removing and installing the fuel injector; Before dismounting the fuel injector, relieve pressure if necessary. After installation of the injector, check the sealing performance to ensure no leakage.



※Ignition Coil

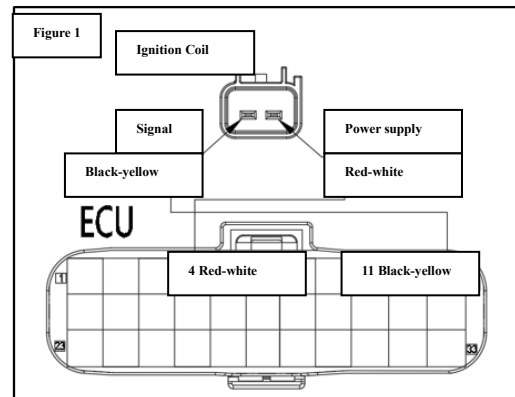
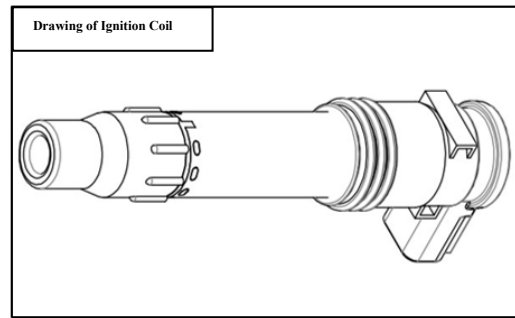
The ignition coil converts low voltage electricity of the primary winding into high voltage electricity of the secondary winding, and generates sparks through the discharge of spark plugs to ignite the fuel mixture in the cylinder.

Function definitions of pins:

Power: connect ECU P4 (Red-white)

Signal: connect ECU P11 (Black-yellow)

Figure 1: Wiring diagram for between ignition coil and ECU.



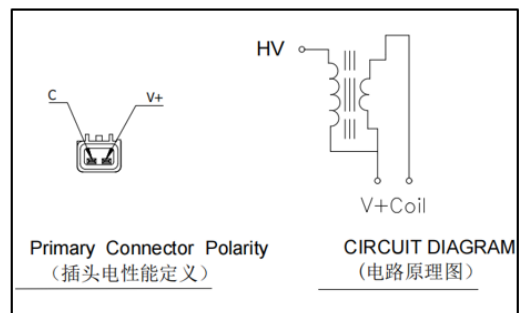
Measure secondary ignition voltage:

Connect the engine according to the schematic diagram of EFI;

Connect the peak voltage measuring instrument as shown in the figure;

Start the engine;

After starting, the secondary ignition voltage shall be $> 22500V$



Parameter Table of Ignition Coil

1. Static parameters

Primary resistance: $1.3 \pm 10\% \Omega$

Secondary resistance: $8.7 \pm 10\% \Omega$

Primary inductance: $3.0 \pm 15\% mH$

Secondary inductance: $16 \pm 15\% H$

2. Dynamic parameters:

Power voltage: $14 \pm 0.5V$

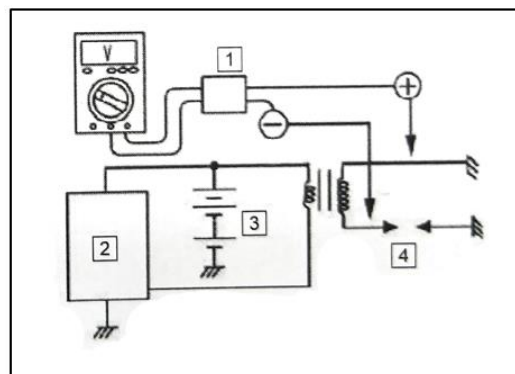
Primary current: $7 \pm 0.9A$

Ignition pulse width: $2.05 \pm 0.5 msec$

Secondary high voltage: MIN 22.5KV at 25pF load

Ignition energy: MIN21.5mj

Operating temperature: $-35^{\circ}C - 125^{\circ}C$



1	Peak voltage measuring instrument	3	Battery
2	ECU	4	Spark plug

※Side Tilt Sensor

The sensor is designed to provide side tilt protection. When the side tilting angle of vehicle exceeds an allowable range ($65^{\circ} \pm 10^{\circ}$), the OUT pin signal is transmitted to ECU, and ECU controls the engine stall, thus providing protection for both the driver and the vehicle.

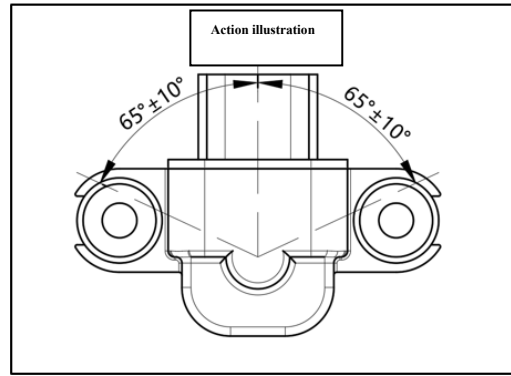
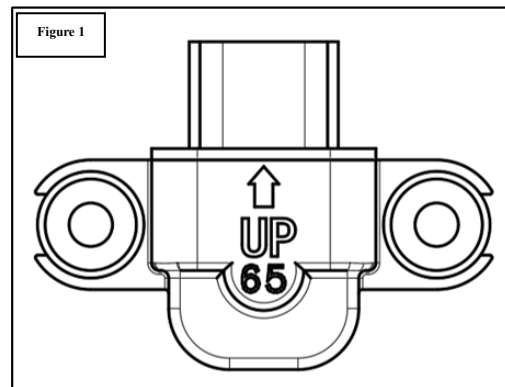


Figure 1: Install with the “UP” facing up.



Function definitions of pins:

VDD: Connecting + DC12V (Green)
OUT: Connect pin 30# of ECU (yellow)
GND: Grounding (Black-white)

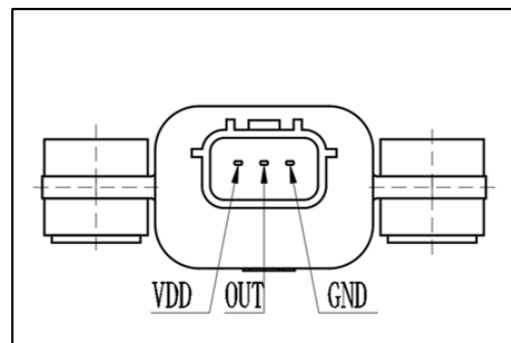


Figure 2: Wiring diagram between side tilt sensor and ECU.

