

ZF400LS SERVICE MANUAL

First version (Feb. 2023)

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TIBET NEW SUMMIT

MOTORCYCLE CO., LTD.

The contents and pictures of this service manual are for reference only, please refer to the actual product.

Preface

This motorcycle manual provides readers with detailed information about the basic structure, working principles, disassembly and maintenance, as well as troubleshooting and troubleshooting methods of the **ZF400LS** motorcycle. It also introduces the technical specifications, performance parameters, and maintenance adjustment data of this model. The manual is comprehensive, illustrated, and highly practical, and it is hoped that it can provide technical support and guidance for **KOVE** motorcycle users and after-sales service personnel.

The technical specifications, performance parameters, and maintenance adjustment data provided in this manual are based on the latest information. If there are subsequent improvements to this model that are not consistent with this manual, we apologize for any inconvenience caused. We sincerely hope that you can provide valuable opinions and suggestions on the design, manufacturing, and quality of this model, and inform us so that we can make timely improvements. Thank you for your support and cooperation.

All the information, charts, data, and performance indicators included in this manual are accurate as of the time of printing. **TIBET NEW SUMMIT MOORCYCLE CO.,LTD.** reserves the right to modify this manual without prior notice. Any part of this manual is copyrighted by **TIBET NEW SUMMIT MOORCYCLE CO.,LTD.**, and no part of it may be reproduced without the company's permission. Otherwise, criminal and legal responsibilities will be pursued.

Due to the limited expertise of the editor, there may be errors and omissions in this manual. We welcome criticism and corrections from our users and readers.

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Chapter 1

How to use this manual

This manual describes the maintenance procedures for the 450Rally.

Chapters 2 and 3 apply to the entire motorcycle. Chapter 4 describes the procedures for removing/installing components that may be used to perform the services described in the following sections. Chapters 3 to 19 describe the components of the motorcycle, grouped by location. If you are not familiar with this motorcycle, please read the technical characteristics in Chapter 2. Observe the recommendations of the maintenance schedule (Chapter 3) to ensure that the motorcycle is in optimum operating condition. It compensates for the initial wear and tear that occurs during break-in. Find the section you want on that page, then go to the table of contents on the first page of that section. Most sections begin with program sets or system descriptions, maintenance information and troubleshooting. The next few pages give detailed procedures. Refer to each section for troubleshooting, depending on the problem or symptom.

Your safety and the safety of others is very important. To help you make informed decisions, we have provided safety information and other information in this manual.

You must use your own good judgment, and you will find important safety information in various forms, including:

*Safety symbol on motorcycle

*Safety symbols-Precede the safety warning symbol  with one of three signal words, i.e., Danger, Warning, or Caution. The meaning of these signal words is:



DANGER If not avoided, could result in death or serious injury.



WARNING If not avoided, could result in death or serious injury.

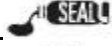


CAUTION If not avoided, could result in injury.

Instructions - How to maintenance the bike properly and safely

SYMBOLS

The symbols used in this manual indicate specific maintenance procedures. If additional information is required in connection with these symbols, it will be explained in detail in the text without the use of these symbols.

	Replace the part with a new one
	Use recommended oils unless otherwise specified
	Use molybdenum oil solution (oil and molybdenum grease mixed in a ratio of 1:1)
	Use multi-purpose high temperature extreme pressure lithium complex grease (Universal Grease SU-T330G/F or equivalent)
	Molybdenum disulfide oil
	Use molybdenum disulfide paste (containing 40% or more molybdenum disulfide, NLGI #2 or equivalent). Example: G-n paste made by Dow Corning USA Honda Moly 60 (USA only) Rocol ASP manufactured by Rocol Ltd. in the UK Rocol paste made by Sumico Lubricants, Japan
	Silicone grease
	Apply locking agent, unless otherwise noted, use the recommended locking agent
	Apply sealant
	DOT4 brake fluid, unless otherwise noted, use the recommended brake fluid
	Fork fluid

Basic Information

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Maintenance Rules

1. Please use original or recommended parts and lubricants for KOVE or their equivalents. Parts that do not meet KOVE's design specifications may damage the motorcycle.
2. Use specialized tools designed for this product to avoid damage and incorrect assembly.
3. Only use metric tools when performing motorcycle maintenance. Metric bolts, nuts, and screws should not be interchanged with imperial fasteners.
4. Use new gaskets, O-rings, split pins, and lock plates when reassembling.
5. When tightening bolts or nuts, start from the larger diameter or inner bolts first. Then tighten in a diagonal incremental pattern to the specified torque, unless a specific sequence is specified.
6. Clean parts with a cleaner during disassembly. Lubricate all sliding surfaces before reassembly.
6. After reassembly, inspect all parts to ensure correct installation and operation.
7. Wire all cables according to the cable routing diagram.
8. Do not bend or twist control cables. Damaged control cables may not function properly and could get stuck or tangled.

Abbreviations:

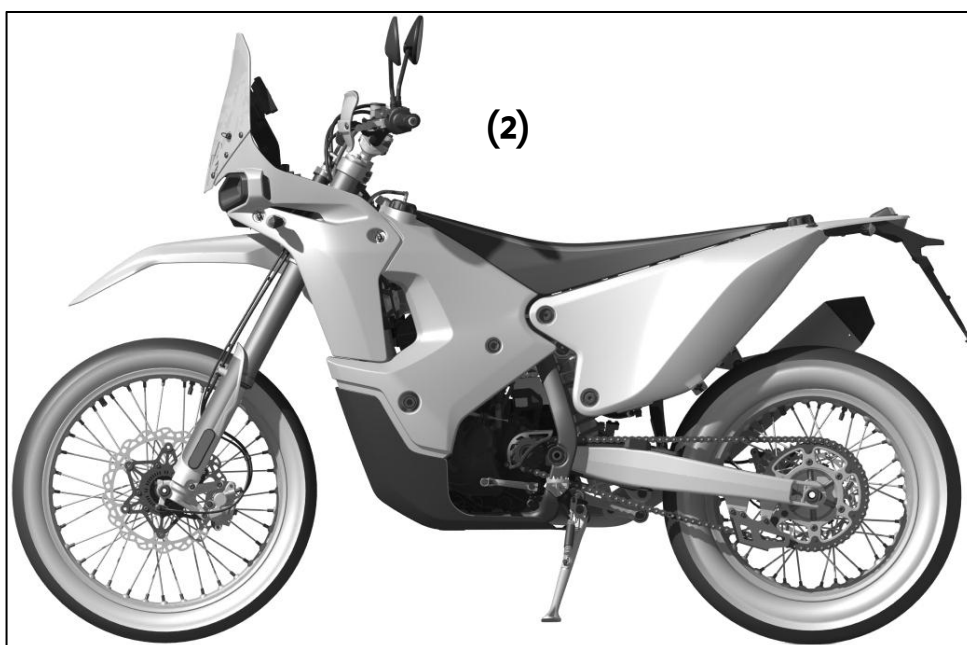
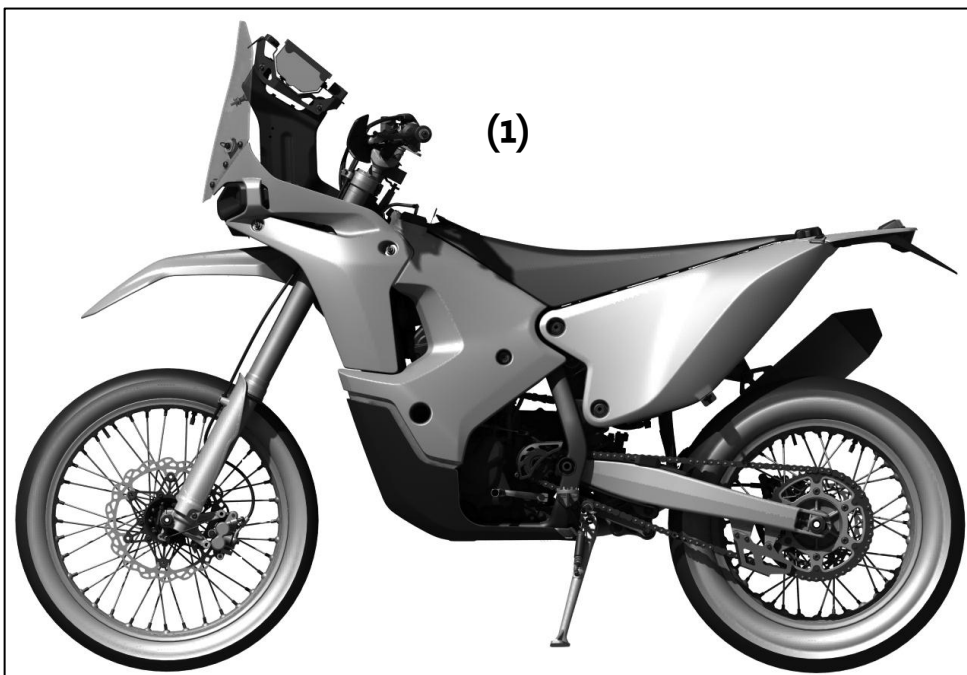
In this manual, the following abbreviations are used to identify respective components or systems.

Abbreviations	Full Name
ABS	Anti-lock braking system (450Rally factory model no ABS)
CKP sensor	Crankshaft position sensor
DLC	Data link connector
DTC	Diagnostic trouble code
ECU	Electronic control unit
ECT sensor	Engine coolant temperature sensor
EEP ROM	Electrically erasable programmable-read only memory
EOP switch	Engine oil pressure switch
EVAP	Evaporative emission control system
IAT sensor	Intake air temperature sensor
MAP sensor	Manifold absolute pressure sensor
MCS	Motorcycle communication system
MIL	Malfunction indicator lamp
O ₂ sensor	Oxygen sensor
SCS Service connector	Service coordination support connector
TP sensor	Throttle position sensor
VS sensor	Vehicle speed sensor

Model Identification

Factory model-(1)

Regular model-(2)



Basic information

	Items	Specification
Dimension	Overall length	2190 mm
	Overall width	830 mm
	Overall height	1487 mm
	Wheelbase	1475 mm
	Seat height (W/O weight)	960 mm
	Pedal height (W/O weight)	360 mm
	Ground clearance (W/O weight)	300 mm
	Curb weight	155 kg
	Maximum load on front axle	150 kg
	Maximum load on rear axle	210 kg
	Maximum load	150 kg
Chassis	Frame type	Cradle
	Front suspension	Upside down telescopic fork
	Front fork travel	305 mm
	Rear suspension	Dual adjustable oil/gas separation
	Rear shock absorber travel	117 mm
	Front tire size	90/90-21M/C
	Rear tire size	140/80-18M/C
	Front tire brand	CST
	Rear tire brand	CST
	Front brake	Hydraulic single disc 298mm
	Rear brake	Hydraulic single disc 240mm
	Caster angle	28°
	Trail	122 mm
	Fuel tank capacity	31L
Engine	Cylinder arrangement	Single cylinder
	Bore×stroke	94.5x64mm
	Displacement	499cm ³
	Compression ratio	12.5:1
	Engine type	DOHC, 4 valves, drive chain
	Lubrication system	Forced pressure lubrication + splash lubrication
	Cooling system	Water cooling
	Air filter element	Paper element/sponge
	Engine weight	37kg
	Ignition sequence	/
	Cylinder number	Single cylinder

Items		Specification
Fuel supply system	ID mark	BOSCH EFI
	Throttle bore	46mm
	Clutch	Wet, multiple-disc
	Clutch operating system	cable operation
	Gear box	Normally engaged two-stage drive, 6-speed
	Primary reduction ratio	2.286 (69/34)
	Secondary reduction ratio	3.769
Transmission system	Gear ratio	1th 2.357 (43/15)
		2th 1.824 (46/14)
		3th 1.474 (40/19)
		4th 1.181(32/20)
		5th 1.000(26/20)
		6th 0.846(23/20)
	Shifting method	International 1-N-2-3-4-5-6
Electricity	Ignition system	Electronic ignition
	Starter system	Electronic starter
	Charging system	Output magneto
	Rectifier/regulator	Full-wave rectification
	Lighting system	Battery

EFI Specification Unit: mm

Items	Specification
Engine idling speed	1600±100 rpm
ECT sensor resistance (40°C/104°F)	1.0-1.2kΩ
IAT sensor resistance (20°C/68°F)	2-4kΩ
Fuel injector resistance (20°C/68°F)	11-13Ω
Oxygen sensor heater resistance (20°C/68°F)	10-40Ω
Idle motor resistance (25°C/77°F)	110-150Ω

Ignition System Specification Unit: mm

Items	Specification
Spark plug	CR8E (NGK)
Spark plug clearance	0.80-0.90
Spark plug resistance	5-8 KΩ

Electric Starter Specification Unit: mm

Items	Standard value	Limit value
Starter motor brush length	12.0-13.0 (0.47-0.51)	6.5 (0.26)

Fuel System Specification

Items		Specification
Throttle body identification number		450R
Fuel line pressure at idling		380Kpa±10kpa
Fuel pump flow (12V、380kpa/hour)		≥30L/h
Fuel supply system	Type	Bosch EFI/
	Throttle bore	46mm

Cooling System

Items		Specification
Cooling capacity	Radiator	1.2 L
Radiator cap release pressure		108-133 kPa
Thermostat	opening temperature	82±2°C
	Full open temperature	92°C
	Valve lift	Not less than 8 mm
Recommended coolant		Silicate-free coolant with ethanol (Dongfeng Castrol LEC-II-25)
Standard coolant concentration		1:1 with distilled water

Lubrication System Specification

Items		Standard value	Limit value
Engine oil quantity	Without oil filter cartridge replacement	1.4 L	-
	With oil filter cartridge replacement	1.6 L	-
	Disassembled	1.8 L	
Recommended engine oil		Recommended using: SG10W-50API Service classification: SG or better (except for oil marked energy efficient on the round API service label) JASO T903 Standard: MA viscosity: SAE 10W-50	-

Cylinder Head/Valve Specification Unit: mm

Items			Standard value	Limit value
Valve	Valve stem outside diameter	Intake	φ5.472-φ5.487	φ5.46
		Exhaust	φ5.46-φ5.475	φ5.44
	Valve guide inside diameter	Intake	φ5.505-φ5.515	φ5.535
		Exhaust	φ5.505-φ5.515	φ5.535
	Valve-stem-to-valve-guide-clearance.	Intake	0.018-0.043	0.07
		Exhaust	0.03-0.055	0.08
	Valve seat contact width		1.2	----
Cylinder head	Flatness		0.05	0.06
	Valve seat contact width		0.8	----

Items	Standard value	Limit value
Valve spring free length	Outside:47.5 Inside:38.1	Outside:47.35 Inside:37.95
Valve clearance	Intake:0.1-0.15 Exhaust:0.15-0.2	Intake > 0.17 Exhaust > 0.22
Valve stem runout	0.02	0.04

Cylinder and piston Unit: mm

Items			Standard value	Limit value
Cylinder	Cylinder inside diameter		$\phi 94.5-\phi 94.52$	$\phi 94.528$
	Out of round		0.05	0.01
	Cylinder surface flatness		0.03	0.05
Piston Piston ring Piston pin	Piston outer diameter		$\phi 94.453-\phi 94.467$	$\phi 94.43$
	Piston pin bore inside diameter		$\phi 20.004-\phi 20.01$	$\phi 20.015$
	Piston-pin-to-piston-pin-bore clearance		0.004-0.018	0.025
	Piston ring end gap	Top ring/2nd ring	0.2-0.35	0.5
		Oil ring	0.2-0.7	1.4
	Piston-ring-to-piston-ring-groove clearance	Top ring	0.03-0.07	0.08
		2nd ring	0.02-0.06	0.08
	Cylinder-to-piston clearance		0.033-0.067	0.07
	Piston pin outside diameter		$\phi 19.992-\phi 20$	$\phi 19.99$
Connecting rod small end	Inside diameter		$\phi 20.015-\phi 20.025$	$\phi 20.04$
	connecting-rod-small-end-to-piston-pin clearance		0.015-0.033	0.05

Shift fork/Shift fork shaft/Crankshaft/Balancer shaft Specification Unit: mm

Items			Standard value	Limit
Shift fork	Right shift fork inner diameter / Left shift fork inner diameter		$\phi 12.016-\phi 12.043$	$\phi 12.045$
	Center shift fork inner diameter		$\phi 12.016-\phi 12.043$	$\phi 12.045$
	Pawl thickness		4.8-4.9	4.8
Shift fork guide bar	Center shift fork guide bar outer diameter		$\phi 11.973-\phi 12$	$\phi 11.95$
	Right/left shift fork guide bar outer diameter		$\phi 11.973-\phi 12$	$\phi 11.95$
	cylindricity		0.006	----
Crankshaft	Small end inside diameter		$\phi 20.015-\phi 20.025$	$\phi 20.04$
	Big end side clearance	Axial	0.15-0.4	0.7
		Radial	0.008-0.016	0.02
Balancer shaft	Shaft diameter		$\phi 19.98-\phi 19.993$	$\phi 19.96$

Clutch/Fuel pump Unit: mm

Items		Standard value	Limit value
Clutch lever free play		10-20 (0.4-0.8)	-
Clutch	Spring free length	25	25
	Friction plate thickness	2.95 - 3.05	2.85
	Clutch plate warpage	0.1	0.14
	Clearance between the pressure plate and the friction plate	0.1 - 0.3	0.6
Fuel pump	Radial clearance between the outer rotor and the inner rotor	0.06 - 0.15	
	End face clearance between the rotor assembly and the cover plate	0.04 - 0.1	

Front wheel/Suspension/Turning Specification

Items		Standard value	Limit value
Tire pressure	Tubeless (Regular)	200kPa(2.0kgf/cm ³ , 29 psi)	-
	Inner tube (Regular)	100kPa(1.0kgf/cm ³ , 15 psi)	-
Axle runout		≤ 0.8	1.0
Rim runout	Radial	≤ 0.8	1.0
	End face	≤ 0.8	1.0
Wheel dynamic balancing		-	Maximum 60g
Front fork	Spring free length/Regular Version/Factory Version	475 mm	-
	Recommended shock absorber oil	Specialized shock absorber oil KHL 5W	-
	Shock absorber oil quantity	260ml into the damper, 300ml into the tube, for a total of 560ml	-

Rear wheel/Suspension Specification

Items		Standard value	Limit value
Tire pressure	Tubeless (Regular)	200kPa(2.0kgf/cm ³ , 29 psi)	-
	Inner tube (Regular)	100kPa(1.0kgf/cm ³ , 15 psi)	-
Axle runout		≤ 0.8	1.0
Rim runout	Radial	≤ 0.8	1.0
	Axial	≤ 0.8	1.0
Wheel dynamic balancing		-	Maximum 60g
Rear shock absorber	Spring free length/Regular Version/Factory Version	230mm/238mm	
	Recommended shock absorber oil	Specialized shock absorber oil KHL 5W	
	Shock absorber oil quantity	380ml	
	Nitrogen gas quantity in the cylinder	1.2mpa	
Drive chain	Dimensions/links	AFAM520C2/114	
	Slack	30-55 mm	

Battery/Charging system specification

Items			Specification
Battery	Model		MTX4L-FPP
	Capacity		12V/4AH
	Leakage current		Can be stored for over 1 year at 25°C
	Voltage (28°C、68°F)	Fully charged	>13.2V
		Need to charge	<12.8V
	Charging current	Normal	2A
		Fast	10A
Magneto	Charing power		280 W/9,000 rpm
	Charging coil resistance (20°C/68°F)		0.1-1.0Ω

Hydraulic brake specification Unit: mm

Items		Standard value	Limit value
Front brake	Specified brake fluid	DOT 4	-
	Brake pad wear indicator	-	To the groove
	Brake disc thickness	4.0-4.01	3.5
	Brake disc warpage	-	0.15
	Main piston outside diameter	11.000-11.050	11.060
	Caliper piston outside diameter	27.000-27.050	27.06
	Caliper piston outside diameter	30.200-30.250	30.260
Rear brake	Specified brake fluid	DOT 4	-
	Brake pad wear indicator	-	To the groove
	Brake disc thickness	4.0-4.01	-3.5
	Brake disc warpage	-	0.15
	Main piston outside diameter	9.000-9.050	9.060
	Caliper piston outside diameter	22.620-22.670	22.680

Light/Instrument/Switch Specification

Items		Specification
Light	Auto headlight (High beam/Low beam)	LED
	Front turn signal light/Location light	LED
	Rear turn signal light	LED
	Brake/Tail light	LED
	License plate light	LED
	Instrument lighting	LCD
	Turn signal indicator light	LED
	Neutral indicator light	LCD
	Oil pressure warning light	LCD
	Coolant high temperature indicator light	LCD
	Malfunction indicator light (MIL)	LCD
	ABS indicator	LCD
Fuse	Spare fuse	15A,10A
	Fuel pump and fan	15A
	FI	10A
	IGN Fuse	15A
	Headlight fuse	15A
	ABS2 fuse	10A
	ABS1 fuse	15A
	The above are the specifications for the Regular model fuses, and the following are the specifications for the Factory model fuses.	
	Spare fuse	10A, 10A
	FI	10A
	Starter and horn	10A
	HEAD	10A
	FAN	10A
ECT Sensor Resistance	40°C (104°F)	1.0-1.3KΩ
	100°C (212°F)	0.1-0.2KΩ

Torque-Engine part

- The torque specifications listed below apply to the specified fasteners.
- Others should be tightened to the standard torque values mentioned below.

Standard torque

Items	Torque N.m	Items	Torque N.m
5mm bolt and nut	6	5mm screw	5
6mm bolt and nut	12	6mm screw	8
8mm bolt and nut	22	6mm hex bolt (8mm head, small)	10
10mm bolt and nut	60	6mm hex bolt (8mmhead, large)	12
12mm bolt and nut	80	6mm hex bolt (10mm head) and nut	12
		8mm hex bolt and nut	22
		10mm hex bolt and nut	60

Engine torque

Items	QTY	Thread size (mm)	Torque N.m	Remarks
Spark plug	1	10	14	
Crankshaft end cover	1	30	5	
Timing mark accessing bolt	1	14	10	
Engine oil drain bolt	1	16	24	Aluminum washer
Oil filter cover bolt	2	6	7-19	Lubricate the seal ring with oil
Oil filter screen bolt	2	20	11-13	Lubricate the seal ring with oil

Cooling system torque

Items	QTY	Thread size (mm)	Torque N.m	Remarks
Water drain bolt	1	6	10	Copper washer
Thermostat cover bolt	2	6	10	
Water pump cover bolt	3	6	10	
Water temperature sensor	1	7	5-8	

Cylinder head and valve torque

Items	QTY	Thread size (mm)	Torque N.m	Remarks
Double-ended cylinder AB bolts	4	10	55-60	Lubricate the thread and end face with oil
Cylinder head to cylinder bolt	4	6	11-13	
Camshaft cap bolt	8	6	11-13	
Cylinder head cover bolt	6	6	10-12	
Timing chain tensioner bolt	2	6	11-13	
Timing chain tensioner plug	1	8	7-9	
Exhaust camshaft pressure relief valve bolt	1	6	10	

Clutch and shift shaft torque

Items	QTY	Thread size (mm)	Torque N.m	Remarks
Clutch boss nut	1	18	80-90	Thread-locking adhesive
Pressure plate bolt	4	6	8-10	
Primary drive gear nut	1	10	115-125	Thread-locking adhesive
Stopper lever bolt	1	6	11-13	
Right crankcase cover bolt	11	6	11-13	
Shift drum segment bolt	1	6	11-13	

Magneto and starter clutch torque

Items	QTY	Thread size (mm)	Torque N.m	Remarks
Generator rotor nut	1	10	80-90	
Stator bolt	2	5	7-9	
Trigger fixed bolt	2	5	7-9	
Left crankcase cover bolt	8	6	11-13	

Case and drive chain system torque

Items	QTY	Thread size (mm)	Torque N.m	Remarks
Timing chain guide plate	2	6	11-13	
Timing chain guide bolt	1	6	10	
Crankcase bolts	12	6	11-13	Replace with new bolts, tightening method is described in the following text
Left oil pump cover bolt	3	5	7-9	

Balance shaft torque

Items	QTY	Thread size (mm)	Torque N.m	Remarks
Balancer shaft driven gear nut	1		80-90	
Balancer shaft drive gear nut	1		115-125	

Torque-Chasis Part

Note: The following parts are for regular model only

Installation position	Thread size (mm)	Torque N.m	Remarks
Front brake hose clip self-tapping screw, front fork guard	ST4.8	1	
Rear mudguard rear section self-tapping screw	ST4.8	1	
OBD self-tapping screw, battery bracket	M4.2	1	
Rear mudguard rear section screw, Licence plate holder	M5	3	
Tail panel screw, Licence plate holder	M5	3	
Fuel hose connector screw	M5	5	
Fuel level sensor screw	M5	5	
Fuel pump screw	M5	5	
Instrument cross pan head screw, headlight housing bracket	M5	4	
Tail light screw, Licence plate holder	M5	4	
Tail panel screw, rear fuel tank	M5	4	
Windshield screw	M5	6	
Rear ABS ring screw	M5	5	Loctite®243 ™
Dual-line clamp screw	M5	5	
Cable hook screw, rear fuel tank	M5	4	
Rear ABS ring screw	M5	5	Loctite®243 ™
Fuel filter bracket screw	M5	4	
Headlight bracket platen screw	M5	4	
Inclination sensor screw	M5	5	
Screw, ECU	M5	4	
Screw, seat lock	M6	8	
Screw, front fork cover	M6	5	
Drive chain guide screw	M6	8	
Rear brake master cylinder screw	M6	8	
Rear fuel tank protection cover screw	M6	8	
Screw, battery bracket	M6	12	
Rear fuel tank battery bracket screw	M6	8	
Screw, headlight cover	M6	8	
Screw, coolant reservoir	M6	8	

Installation position	Thread size (mm)	Torque N.m	Remarks
Side stand switch screw	M6	8	
Front fuel tank mounting bolt	M8	22	
Front fuel tank upper mounting bolt	M8	22	
Ignition switch bolt	M8	22	
Headlight housing bracket bolt	M5	5	
Oil-cooler grille screw, engine lower guard	M5	5	
Radiator grille screw	M5	5	
Screw, front fuel tank cowling bracket, front fuel tank	M5	5	
Brake pedal screw	M5	3	Loctite®243 ™
Headlight screw	M5	5	
Side stand hanger bracket screw	M5	5	
Holder screw, front brake lever	M6	10	
Oil cooler screw	M6	12	
Drive sprocket cover screw	M6	8	
Mounting bracket screw, Muffler	M6	10	
Engine Lower Guard screw	M6	12	
Headlight mounting bracket screw	M6	12	
Rectifier screw	M6	10	
Radiator screw	M6	12	
Brake hose clip screw	M6	10	
Front brake disc screw	M6	12	Loctite®243 ™
Front mudguard screw	M6	8	
Front wheel speed sensor screw	M6	10	
Fuel injector cap screw	M6	8	
Clutch lever holder screw	M6	10	
Screw, horn	M6	12	
Screw, air filter	M6	12	
Screw, rear fuel tank lower mounting bracket	M6	10	
Screw, reinforcement bracket-rear fuel tank	M6	10	
Screw, rear calliper cover	M6	10	

Installation position	Thread size (mm)	Torque N.m	Remarks
Screw, rear brake disc	M6	12	Loctite®243 ™
Screw, mud guard-Rear wheel	M6	10	
Screw, rear wheel speed sensor bracket	M6	12	
Screw, rear wheel speed sensor	M6	8	
Screw, chain guide	M6	10	
Screw, headlight control module	M6	12	
Screw, shift pedal	M6	12	
Screw, ABS module, ABS bracket	M6	12	
Screw, headlight housing bracket - frame	M8	22	Loctite®243 ™
Bolt, chain adjuster	M8	10	
Bolt, middle section, exhaust pipe	M8	22	
Bolt, muffler	M8	22	
Bolt, front fork, lower bracket	M8	22	
Bolt for tail bag	M8	22	
Bolt, upper engine bracket-frame	M8	35	
Bolt, front fork, upper bracket	M8	22	
Bolt, handlebar clamps	M8	22	
Bolt, front brake caliper	M8	32	Loctite®243 ™
Bolt, front fork, front wheel	M8	22	
Rear brake lever bolt	M8	22	Loctite®243 ™
Rear fuel tank mounting bolt	M8	22	Loctite®243 ™
Bolt, licence plate holder, rear fuel tank	M8	22	
Bolt, front fuel tank mounting bracket, front engine bracket	M8	15	
Bolt, front engine bracket, frame	M8	22	
Chain guide wheel bolt	M8	22	
Bolt, fuel level sensor	M10	22	
Bolt, handlebar support, upper bracket	M10	35	Loctite®243 ™
Bolt, rear shock absorber, linkage	M10		
Bolt, rear shock absorber, frame	M10	40	
Bolt, bottom engine	M10		

Installation position	Thread size (mm)	Torque N.m	Remarks
Bolt, upper engine bracket-engine	M10	60	
Bolt, front engine bracket, engine	M10		
Bolt, side stand	M10	2	
Bolt, dog bone, frame	M10	60	
Bolt, linkage, swingarm	M12	60	
Bolt, dog bone, linkage	M12	60	
Bolt, upper bracket, steering head	M14	80	screw greased
Nut, licence plate light	M5	5	
Nut, muffler, muffler bracket	M8	22	
Nut, front engine bracket, frame	M8	26	
Chain guide wheel nut	M8	22	
Nut, rear shock absorber, linkage	M10	40	
Nut, bottom engine	M10	54	
Nut, front engine bracket, engine	M10	54	
Front wheel axle nut	M16	88	
Pivot shaft nut	M16	88	
Rear wheel axle nut	M22	128	
Steering head ring nut	M25	Tighten to 40 Nm loosening the nut, tighten the nut to 10 Nm. Keep the steering head fixed and loosen it by 1/4 turn.	

Note: only for factory model

Installation position	Thread size (mm)	Torque N.m	Remarks
Front brake oil pipe pressure plate and front shock trim attachment screw	ST4.8	3	
Rear mudguard lower cover and tail trim attachment screw	ST4.8	2	
Front and rear oil cup filler cap fastening screws	M4	3	
OBD and electrical bracket connecting bolts	M4.2	1	
Front brake upper pump oil cup cover fastening screw	M4	3	
Small instrument and road book bracket connection nut	M5	4	
Instrument indicator and road book bracket attachment nut	M5	4	
Rear position light/tail light mounting screw	M5	6	
Oil pump and fuel tank connecting bolt	M5	6	
Headlight adjustment controller and handlebar connection bolt	M5	10	
Battery positive and negative cable bolts	M5	4	
Oil pipe fitting mounting plate and left and right rear fuel tank connecting bolts	M5	6	TC4 Titanium
Oil level sensor mounting plate and left fuel tank connection screw	M5	2	TC4 Titanium
Hand windshield and hand windshield bracket	M5	5	
Brake pedal and brake arm connecting bolt	M5	5	(Threading glue) TC4 Titanium
Oil-cooling grille and lower shield connecting bolt	M5	5	TC4 Titanium
Rear brake card oil pipe clamping screw	M5	5	TC4 Titanium
Fuel filter bracket and left fuel tank attachment screw	M5	4	TC4 Titanium
Side bracket hook bracket and fuel tank mounting bolts	M5	5	TC4 Titanium
Front fuel tank guard trim bracket left and right and fuel tank connecting bolts	M5	6	TC4 Titanium
Road book and road book bracket connecting bolts	M5	4	TC4 Titanium

Installation position	Thread size (mm)	Torque N.m	Remarks
Air filter cotton and air filter housing fastening bolts	M5	4	
Throttle cable adjusting nut	M6	5	
Clutch handle adjusting nut	M6	2	
Starter relay nut and main line connecting bolt	M6	5	
Main wire tower wire and engine connection bolt	M6	10	
Chain retainer and flat fork attachment screw	M6	8	TC4 Titanium
Front windshield and windshield mounting bolts	M6	12	
Front reduction trim cover and front reduction attachment screw	M6	8	TC4 Titanium
Front brake disc and wheel hub attachment bolt	M6	12	Threading glue TC4 Titanium
Headlight module and cowl bracket attachment bolts	M6	12	TC4 Titanium
Air filter and frame attachment bolts	M6	10	TC4 Titanium
Horn and frame attachment bolts	M6	12	TC4 Titanium
Lower guard and emergency water bottle connecting bolt	M6	12	TC4 Titanium
Bolts connecting the front brake oil pipe clamp to the upper and lower coupling plate	M6	10	TC4 Titanium
Rear fuel tank protective cover with rear fuel tank mounting screws	M6	6	TC4 Titanium
Rear ABS sensor and bracket mounting screw Head cover bracket and road book bracket attachment bolt	M6	8	TC4 Titanium
Chain guide rear bolt and flat fork connecting bolt	M6	10	TC4 Titanium
Rear water barrier rubber with rear fuel tank connecting bolt	M6	8	TC4 Titanium
Headlight cover trim with headlight mounting bracket attachment bolt	M6	8	TC4 Titanium
Bolts connecting the secondary water bottle to the frame	M6	8	TC4 Titanium
Head cover bracket and road book bracket 1 connecting bolt	M6	10	TC4 Titanium
Muffler mounting bracket and rear fuel tank connecting bolt	M6	10	TC4 Titanium
Bolts connecting the lower shield to the frame	M6	12	TC4 Titanium

Installation position	Thread size (mm)	Torque N.m	Remarks
Headlight mounting bracket and cowl bracket attachment bolt	M6	10	TC4 Titanium
Rear brake disc trim and flat fork attachment bolts	M6	10	TC4 Titanium
Rear brake caliper trim and rear caliper attachment bolt	M6	10	TC4 Titanium
Rear fuel tank mounting bracket and rear fuel tank attachment bolt	M6	10	TC4 Titanium
Rear fuel tank lower mounting bracket and rear fuel tank attachment bolt	M6	10	TC4 Titanium
Steering damper bracket and frame attachment bolt	M6	12	TC4 Titanium
Rear brake master cylinder to frame attachment bolt	M6	12	TC4 Titanium
Rear brake disc and rear wheel hub attachment bolts	M6	12	TC4 Titanium
Hand windshield bracket and clutch handle bracket/brake handle bracket attachment bolts	M6	8	
Bolts connecting steering damper to upper connecting plate	M6	10	TC4 Titanium
Front brake pump and brake handle mount attachment bolt	M6	10	TC4 Titanium
Fuel filler and handle bolts	M6	10	TC4 Titanium
Clutch handle mount bolt with handlebar	M6	10	TC4 Titanium
Instrument operation switch and handgrip connecting bolt	M6	10	TC4 Titanium
Shifter and engine connecting bolt	M6	12	TC4 Titanium
Front mudguard and lower connecting plate connecting bolt	M6	10	TC4 Titanium
Injector cap and throttle fastening bolt	M6	8	TC4 Titanium
Seat cushion lock and rear fuel tank mounting bolts	M6	8	TC4 Titanium
Electrical mounting bracket and frame attachment bolt	M6	12	TC4 Titanium
Oil cooler and frame bolts	M6	12	TC4 Titanium
Bolts connecting the left and right radiators to the frame	M6	12	TC4 Titanium
Bolts connecting the regulator to the electrical bracket	M6	12	TC4 Titanium
Left and right radiator lower bolts to frame	M6	12	TC4 Titanium
Small sprocket cover and engine mounting bolts	M6	10	TC4 Titanium
Chain guide box front bolt and flat fork attachment bolt	M6	10	TC4 Titanium
Head cover bracket and road book bracket fastening nut	M6	8	

Installation position	Thread size (mm)	Torque N.m	Remarks
Rear tank vent fitting screws	M6	4	
Headlamp bracket and head cover bracket connection bolt (rubber)	M6	8	
Frame and air filter housing connection bolt	M6	8	
The left and right sides of the front fuel tank are connected to the underframe nut	M8	22	
Guide sprocket self-locking nut and guide sprocket connecting bolt	M8	22	
Connection bolts under front fuel tank to frame	M8	22	TC4 Titanium
Tail trim piece with tank 2 mounting bolts	M8	22	TC4 Titanium
Flat fork chain adjustment lock nut	M8	22	
Clutch cable lower adjustment nut	M8	8	
Muffler collar	M8	22	
Oil cooler overoiling bolt installation	M10	25	
Brake arm bolt to frame connection bolt	M8	22	Threading glue TC4 Titanium
A cap nut for connecting the front muffler segment to the engine	M8	22	
Front tank mounting bracket bolts left and right	M8	15	TC4 Titanium
Rear tank mounting bolts	M8	22	TC4 Titanium
The front engine suspension is bolted to the frame	M8	26	TC4 Titanium
Engine suspension with frame connection bolt	M8	36	TC4 Titanium
Mounting point on front tank with frame connection bolt	M8	22	TC4 Titanium
Front bottom reduction barrel locking bolt	M8	22	TC4 Titanium
Bolts are connected to rear oil tank in rear block	M8	22	TC4 Titanium

Installation position	Thread size (mm)	Torque N.m	Remarks
Front tank side mounting point with frame connection bolt	M8	22	TC4 Titanium
Upper connecting plate and damping fastening bolt	M8	22	TC4 Titanium
Front brake caliper with bottom barrel bracket connection bolt	M8	32	(Threading glue)TC4 Titanium
Muffler middle section and frame connection bolt	M8	22	TC4 Titanium
Lower connecting plate with damping fastening bolt	M8	22	TC4 Titanium
Muffler rear section and bracket connection bolt	M8	22	TC4 Titanium
Hand windscreen bracket left and right handlebar connection bolts	M8	22	TC4 Titanium
Fasten the upper and lower bracket bolts in the direction	M8	22	TC4 Titanium
Head cover bracket and frame connection bolt	M8	22	TC4 Titanium
Connecting bolt between guide sprocket and U-shaped shake frame	M10	60	TC4 Titanium
Triangle shake frame and rear reducer lower connection bolt	M10	60	
Front engine suspension with engine connection bolts	M10	54	TC4 Titanium
Lower engine rear suspension with frame connection bolts	M10	54	TC4 Titanium
U-shaped shaking frame and frame connection bolt	M10	60	
Lower engine front suspension with frame connection bolts	M10	54	TC4 Titanium
Brake tubing to front brake caliper connection bolt	M10	30	TC4 Titanium
The brake tubing is bolted to the front brake upper pump	M10	22	TC4 Titanium
Brake tubing and rear brake pump, caliper connection bolt	M10	22	TC4 Titanium

Installation position	Thread size (mm)	Torque N.m	Remarks
Brake tubing and rear brake upper pump connection bolt	M10	22	TC4 Titanium
Engine sprocket fastening nut	M10	45	
Engine suspension with engine connection bolt	M10	54	TC4 Titanium
Direction handle lower holder connection bolt	M10	34	TC4 Titanium
Side bracket and frame connection special bolt	M10	First 10N·m, then loosen 1/3 turn, clamping bolt and nut 60N·m	TC4 Titanium
Connecting bolt to frame above rear shock absorption	M10	44	TC4 Titanium
U-shaped shaking frame and triangle shaking frame connection bolt	M12	60	TC4 Titanium
Connecting bolt between flat fork and triangular rocking frame	M12	60	TC4 Titanium
Upper coupling plate and direction column fastening bolt	M14	80	(Thread oiling)
The front oil tank is fitted with hexagonal nuts and connected to the frame	M16	35	TC4 Titanium
Front axle lock nut	M16	88	TC4 Titanium
Flat fork shaft fastening nut	M16	88	TC4 Titanium
Oxygen sensor and muffler front section connection bolt	M18	44	
Rear axle lock nut	M22	128	
The directional post locks the four-slot nut	M25	40N·m first, 10N·m loose, and then a quarter turn	

Installation position	Thread size	Torque N.m	Remarks
Headlight bracket press plate mounting bolt	M5	4	TC4 Titanium
Headlight and headlight mounting bolt	M5	5	TC4 Titanium
ECU and rear fuel tank joint bolt	M5	4	TC4 Titanium
Radiator grille and radiator joint bolt	M5	5	TC4 Titanium
Rear tail cover and fuel tank 1 mounting screw	M5	5	TC4 Titanium
Side guard and windshield joint screw	M5	4	TC4 Titanium
Tilt sensor and electrical mounting bracket joint screw	M5	4	TC4 Titanium

Lubrication and seal points-Engine

Material		Location	Remarks
Sealant	1596	Crankcase joint surface	
	1590	Magneto outlet	
Engine oil		Oil pump rotors (inner and outer) whole surface	
		Valve stem sliding surface and end	
		Timing chain tensioner outer surface	
		Camshaft roller	
		Cylinder hole inner surface	
		Piston outer surface, piston pin and piston ring grooves	
		Piston pin outer surface	
		Piston ring whole surface	
		Clutch friction plate whole surface	
		Clutch lever roller	
		Shift shaft lever section and detent	
		The double gear shaft whole surface	
		Starter clutch whole surface	
		Fork shaft whole surface	
		Connecting rod big end journal bearing inner surface	
		Connecting rod small end bore	
		Gear teeth (primary drive, crankcase, starter reduction)	
		Disc-type gear sliding surface	
		Bearing roller	
		Every O-ring surface	
Molybdenum disulfide oil		Tappet column	
		Camshaft surface	
		Cylinder head CAM shaft hole	
Multi-purpose lubricating grease		Starter motor seal ring	
		Speed sensor seal ring	
		Large and small decorative cover seals	
Degreaser		All joint surfaces	

Lubrication and sealing point - Body part

Materials	Location	Note
Lithium base multi-purpose extreme pressure grease NLGI2#	Steering bearing ring sliding surface	3-5 grams each (0.1-0.2oz)
	Dust seal for steering bearing	
Multi-purpose grease	Side support rotating shaft sliding area	
	Seat latch sliding area	
	Throttle door handle pull slot and roll up area	
	Clutch lever slide area	
	Front axle rod and wheel dust ring rotation area	
	Rear axle rod and dust ring rotation area	
	Rear wheel hub left O-ring	
	Rear shock absorber upper slip area	
	U-shaped frame rotation area and needle roller bearings	
	Tripod rotation area and needle roller bearings	
	Rear flat fork shaft rod and plane bearing, needle roller bearing	
	Guide sprocket mounting stud sliding face	
	Brake arm bolt rotation area	
Silicone grease	Front brake caliper rubber sleeve sliding area	
	Front brake caliper bracket pin sliding area	
	Front brake caliper piston dust-proof oil seal contact area	
	Front brake handle mounting bolt contact area	
	Rear brake caliper bracket pin sliding area	
	Rear brake caliper rubber sleeve sliding area	
	Contact area between rear master cylinder push rod and main piston	
	Rear brake pump dust jacket pushrod mounting area	
Brake fluid	Rear brake caliper dust ring contact area	
	Brake main piston and leather bowl	
	Front and rear main pump hose connector O-ring	
	Brake caliper piston oil seal	
	Brake clamp piston outer surface	
Cable lubricant	Brake pipe joint nut thread	
	Clutch cable	
Special damping fluid KHL 5 W	Seat lock cable	
	Front damping oil seal lip	
	Front damping and dust proof seal lip	
KOVE special chain lube or equivalent	Front shock absorbing end cover O ring	
	Whole surface of chain	
Sealant (Loctite 263 Made by Loctite)	Driving tooth fastening nut	
	Clutch fastening nut	
	Balanced driven tooth fastening nut	
	Balancing drive tooth fastening nut	
	Magneto rotor fastening nut	
Low strength locking agent	Front and rear brake pad mounting bolts	
	Rear and rear ABS ring mounting bolts	
	Brake arm and brake pedal mounting screws	
	Front engine suspension left and right with Rubber bolt	

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Maintenance information

Overview:

This chapter contains all relevant information for the recommended inspections and adjustments. If these maintenance procedures are carried out regularly, they will result in smoother running, longer life and lower maintenance costs. The information in this chapter applies to motorcycles already in use and not yet for sale. All maintenance technicians should be familiar with all the information in this chapter.

Maintenance interval schedule

The table below for the factory only edition :

during each regular maintenance, to check before driving. I: if necessary for inspection and cleaning, adjustment, lubrication or replacement. C: clean. R: replacement. A: adjust. L: lubrication.

ITEM	TIMES	NOTE	Every time use or about 2.5 hours	Every three games or about 7.5 hours	About 15 hours or every six games	Every nine games or about 22.5 hours	Every 12 games or about 30 hours
Fuel line	(note 6)		I				R, *
Fuel pump filter	(note6)						R, *
Throttle adjustment			I				
Air filter element	(note1)		C		R		
Crankcase snorkel			I				
Spark plug			I				
Valve clearance	(note4)				I, *		
Engine oil	(note3) (note5)		I		R		
Engine oil filter	(note3)				R		
Piston piston ring					R, *		
Piston pin					R, *		
Radiator coolant	(note2)		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	(note2)		I				
Brake pads are worn			I				
Braking system			I				
Clutch system	(note5)		I				
Control cable			I, L				
Exhaust pipe/muffler			I				
Friction ring			I				
Horizontal fork/shock absorber linkage mechanism				L, *			
Front fork oil front shock absorber oil	(note3)					R, *	
Nut bolt fastener					I, *		
Wheel/tire			I				
Steering head bearing						I, *	

We recommend referring to the official KOVE maintenance manual to repair these items.

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

Note: 1. Clean the motorcycle promptly after each ride.

2. Replace every 2 years to replace needed mechanical parts.

3. Replace after the first break-in.

4. Check after the first break-in.

5. Replace the engine oil if the clutch friction plate is replaced.

6. Replace every year.

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

Maintenance interval schedule

The following table is for regular edition only:

The motorcycle should be serviced within the specified time, and to ensure safety, it should only be serviced by the special repair store of KOVE.

The meaning of each symbol in the table is as follows.

I: Inspection, cleaning, adjustment, lubrication or replacement if necessary; C: Cleaning; R: Replacement; L: Lubrication.

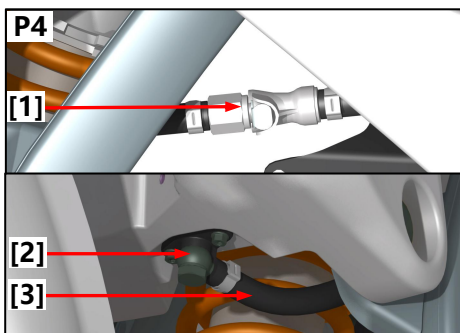
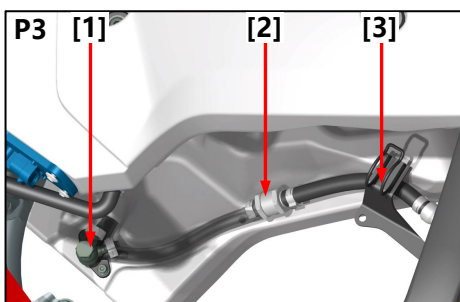
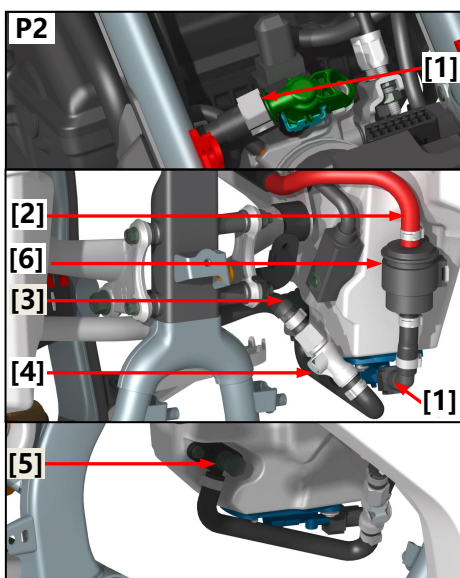
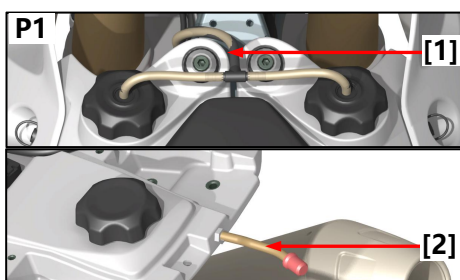
ITEM	times	period	Odometer km (note 2)				
			1000km/3M	3000km/6M	5000km/6M	7000km/6M	9000km/6M
*	Fuel system oil circuit		I		I		I
*	Fuel filter		R 10000km/1year				
*	Throttle operating system		I	I	I	I	I
*	Air filter element	note 1	1000km or every 1 month for replacement, daily for venue or desert rides				
*	Spark plug		I		I		I
**	Exhaust valve clearance		I 2000km/30H				
**	Intake valve clearance		I 2000km/30H				
*	Engine oil		Replace it every 500km for the first 2000km and every 2,000 km after that				
*	Oil filter element		Change the oil together when you change it				
*	Timing chain tension		A	A	A	A	A
**	EFI system		I		I		I
*	Drive chain		I、L	I、L	I、L	I、L	I、L
*	Battery	monthly	I		I		I
*	Brake pads are worn		I	I	I	I	I
**	Braking system		I	I	I	I	I
*	Headlight light		I		I		I
*	clutch		I Paved 5000km/ non-paved 20 hours				
**	fastener		I	I	I	I	I
**	Directional bearing		I	I、L	I	I、L	I
**	coolant		R 30000km/2 year				
**	Shock absorber oil		R 5000km/100H				

*: This item is repaired by the personnel of KOVE locomotive special repair store. If the user has special tools, repair parts and repair ability, he can also repair by himself, and the repair knowledge can refer to this instruction manual.

**: To ensure safety, this item can only be repaired by the personnel of KOVE locomotive special repair store.

Remarks.

1. When driving in dusty areas, such as deserts or grounds need to change or clean the air filter element daily.
2. When the odometer reading exceeds the given maximum figure, its maintenance interval is still repeated at the mileage interval specified in the table.
3. When the vehicle is often used under harsh conditions again, the vehicle maintenance interval should be shortened by 50%.



※Fuel line inspection

Before and after the tank inspection before remove the following content: - fuel tank vent;

- seat cushion assembly;
- before tank decoration or so;
- remove the engine protection plate assembly;
- disconnect the fuel pump power supply 2 p (black) joint.

Inspection

If the quick-connect fitting and its surroundings are dirty, clean them.

1: Check (P1) Fuel tank front and rear vent hoses [1], [2].

Cracked / damaged → Replace.

Hang the front left fuel tank on the left side of the frame.

2: Check (P2) fuel pump to throttle supply hose [2] for damage or leakage and quick connect joint [1], for loose, damaged or leaking connections.

3: Check whether the fuel supply hose [3] connected to the fuel tank on the left and right sides of (P2) is extruded, damaged or leaking and whether the quick connect joint [4] is loose, damaged or leaking and other connections.

4: Check (P2) whether the fuel tank connection supply hose [3] on the left and right sides and the double-hole fuel tank bolts on the left and right sides [1] and P3 [1] are loose or leaking.

5: Check (Fig. 2) whether the fuel filter [6] and the rubber sleeve mono-ear induction clamp are loose, damaged or leaking.

6: Check (P3) whether the fuel check valve [2] and mono-ear induction clamps are loose, damaged or leaking.

Whether the fuel supply hose connecting the rear fuel tank and the front right fuel tank is accurately stuck into the wire hook bracket [3].

7: Check (P4) whether the fuel supply hose [3] connecting the rear fuel tank and the front right fuel tank is extruded, damaged or leaking and whether the quick connect joint [1] is loose, damaged or leaking and other connections.

8: Check (such as the right P3) whether the rear fuel tank connection hose and the double-hole over fuel bolt [2] are loose or leaking and other connections.

Check for the following conditions

Cracked/damaged → Replace.

Extrusion / damage / leakage / looseness → Connect correctly.

Caution.

-Be careful not to damage fuel supply hoses, fittings and fuel lines. Do not use tools.

※Spark plug inspection

The following procedure applies to all spark plugs.

Remove the following components.

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

Caution.

-Blow around the spark plug base with an air gun before removing the spark plug, and also make sure no dust has fallen into the cylinder.

1. Check.

- Spark plug type

Error → Replace.

Manufacturer / Model

NGK/LMAR8A-9CR8E

2. Check.

- Electrode "1"

Damaged/consumed → Replace the spark plug.

- Insulator "2"

Abnormal color → Replace the spark plug.

Normal color should be tan or light tan.

3. Cleaning.

- Spark plug

(Use spark plug cleaner or wire brush)

4. Measure.

- Spark plug gap "a"

(Measured by thickness gauge)

Out of specification → Adjust the gap.

Spark plug gap

0.80-0.90 mm (0.031-0.035 in)

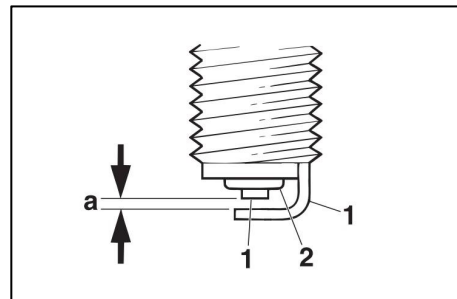
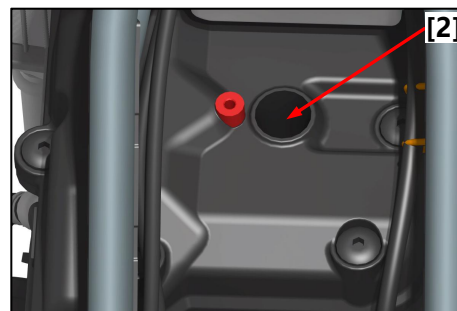
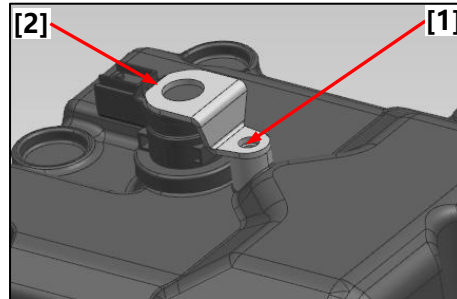
5. Installation.

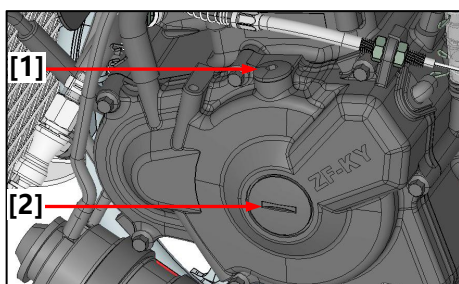
- Spark plugs

Install spark plugs tightened to specified torque.

13 N-m (1.3 kgf-m, 9.6 lb-ft)

Note: before installing the spark plug, first clean the spark plug with the gasket surfaces.



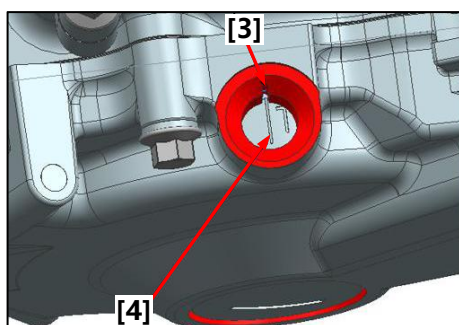


※Check of valve clearance

Note: in cooler conditions, please check and adjust the valve clearance.

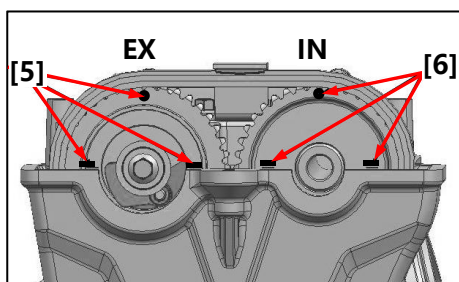
Remove the following parts:

- cylinder cover;
- inspects a hole cover and o-rings [1];
- depending on the hole cover and o-rings [2];

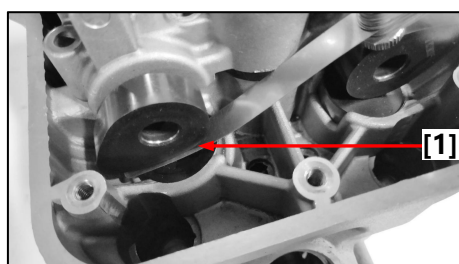


1. installation status: use a 17mm socket wrench to rotate the magneto lock nut, while observing whether the timing mark line "I" [2] on the magneto rotor and the timing mark slot [1] on the left front cover are aligned through the small sight cover screw hole on the left front cover.

2. After the above timing marks are aligned, make sure that the [5] exhaust cam timing line is flush with the end face of the cylinder head at the same time. The timing point is facing directly above the cylinder head. The [6] intake cam timing line is flush with the end of the cylinder head with the timing point facing directly above the cylinder head. If this is not the case, turn the crankshaft another 360 degrees.



☆: The engine is in the correct timing position only if both 1,2 are satisfied.



Check valve clearance by inserting a thickness gauge [1] between the cam and tappet.

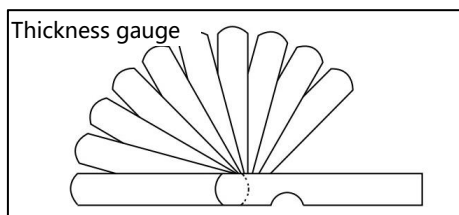
Valve clearance.

Intake: 0.10-0.15mm

Exhaust: 0.15-0.20mm

Notes:

-Record each valve clearance for easy reference of shim selection when valve clearance needs to be adjusted.



※ Inspection and adjustment of valve clearance

Disassemble the following components.

- Tensioner.
- Camshaft bracket.
- Chain press.

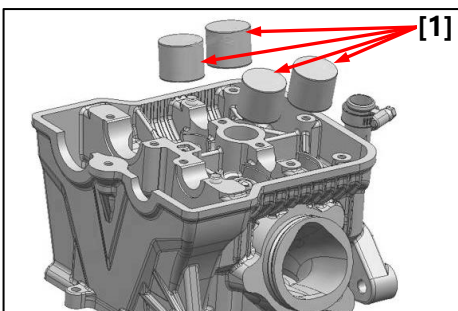
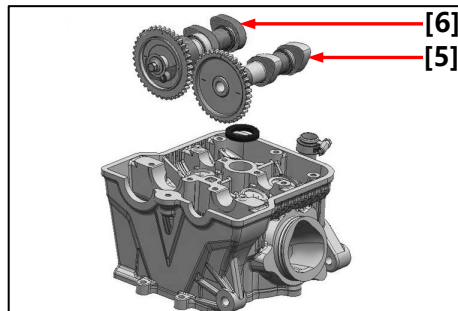
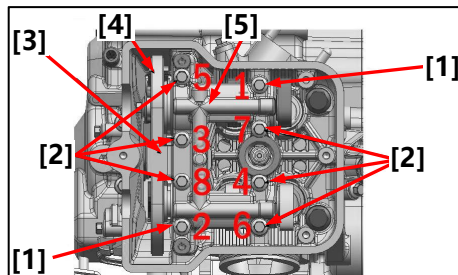
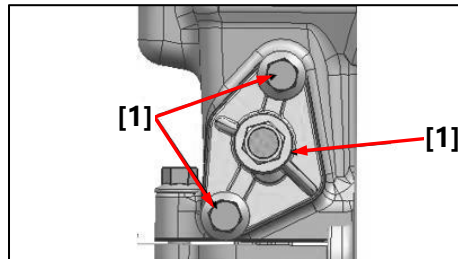
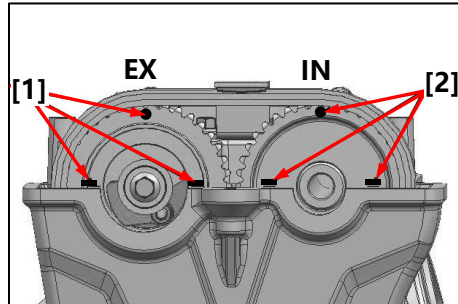
1. Turn the timing driven sprocket to the engine timing position: the positive time line mark of the timing driven sprocket is flush with the cylinder head end face [1],[2]; The inlet and exhaust camshafts are directly above the cylinder head at the correct time point [2],[1].

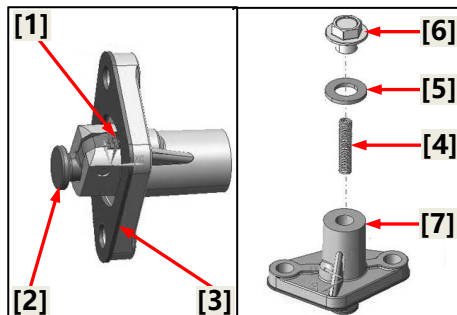
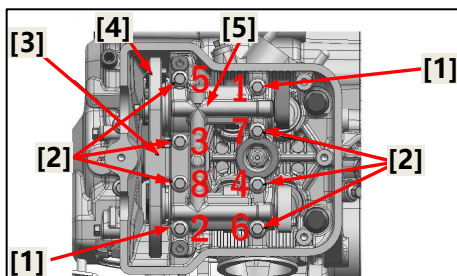
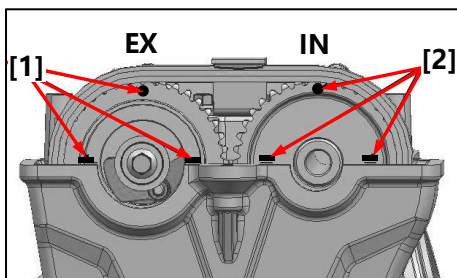
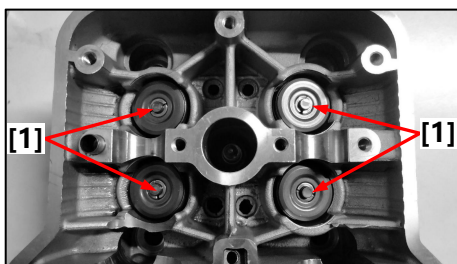
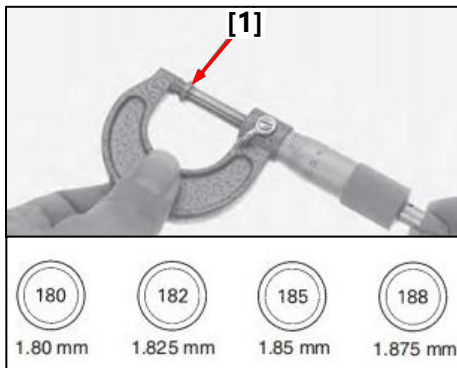
2. Remove the tensioner assembly;
Remove the following parts: - remove the two bolts fastening tensioner M6 x 20 [1]; - remove the tensioner combination [2] and tensioner gasket.

3. remove the camshaft bracket and timing chain pressure plate.
Remove the following components.
- Remove the 2 M6×40 [1] and 6 M6×35 bolts [2] fastening the camshaft bracket in the order of 1→2→3→4→5→6→7→8, then remove the timing chain pressure plate [3] and the camshaft bracket [5].

4. Remove the timing chain and intake and exhaust camshaft shaft;
Remove the following parts: - remove the set of timing on the timing driven sprocket chain [4], the remove the intake camshaft parts [6] and exhaust CAM shaft parts.

Note: remove the valve lifter, [1] and according to the order in place after the gasket, completes the corresponding identification respectively.





The thickness of the gasket [1] was measured and recorded. Note: gaskets to choose from, there are 69 different thickness is 0.025 mm from adjacent thickness (1.200 2.900 mm) with the following equation calculating the new gasket thickness: $A = B (C) + D$

A: B: new gasket thickness record of valve clearance value

C: regulation valve clearance value of

D: Removed the shim thickness with inside diameter micrometer measuring instrument to ensure that the correct gasket thickness.

Apply the oil to the valve rod end; Install the new gasket [1] to the valve spring seat; Apply the oil to sliding zone of the valve lifter, thrust surface; According to the corresponding logo to install valve lifter.

1. Inlet and exhaust camshaft shaft and timing chain installation

Installation: Apply appropriate amount of oil to the inlet and exhaust camshaft and axle diameter parts, install the timing chain [4] on the timing driven sprocket, and the positive time line mark of the timing driven sprocket is flush with the cylinder head end face [1],[2]; Inlet and exhaust camshaft is point [1], [2] the cylinder head.

2. Camshaft bracket mounting

Then install the camshaft support [5], spark plug seal ring and chain press plate [3] on the cylinder head, and tighten the 8 cylinder head support bolts [1] [2] to the specified torque.

The fastening bolt order 1-2-3-4-5-6-7-8; Torque: 11 ~ 13 n. m

3. Combination installation of tensioner

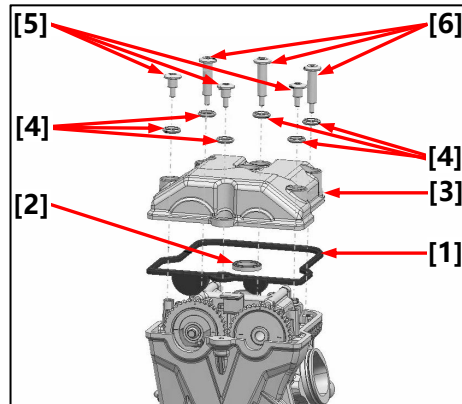
Press down the eccentric wheel of the tensioner [1] by hand, push the tensioner plunger [2] into the tensioner to make the plunger of the tensioner shrink, then align the tensioner gasket [3] and the tensioner combination to the cylinder body mounting hole, and tighten 2 M6x20 bolts to the specified torque; Torque: 11 ~ 13 n. m. The tensioner spring again [4], [5] flat gasket, tensioner plug [6] [7] in turn into the tensioner ontology, fastening tensioner plug, make the tensioner plunger pop-up, tighten bolts [6] to specified torque. Torque: 7 ~ 9 n. m

Note: in time to check if timing chain tensioner, again make sure engine is point is correct.

4. Installation of cylinder head cover

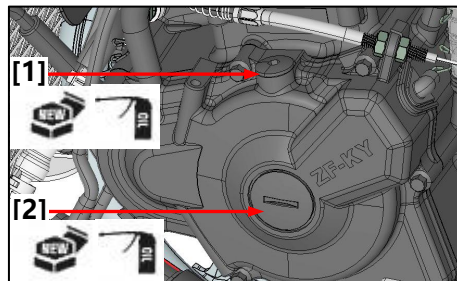
Assemble the cylinder head cover sealing ring [1], spark plug hole sealant pad [2], head cover bolt buffer washer [4] in the designated position of the cylinder head cover. Will three cylinder epicranium fixed bolt M6 x 22.8 [5] and 3 cylinder epicranium fixed bolt M6 x 50.7 [6], in the cylinder head assembly, fastening, in turn, according to the diagonal, and tighten bolts to specified torque.

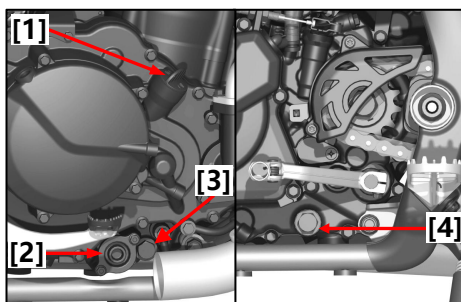
Torque: 10 ~ 12 n. m



5. Installation of large and small visual hole covers

Replace o-rings and blotted out the oil, and assembly left decorative cover [1]. Replace o-rings and install hole cover bolts [2]. Tighten the left decorative covers and depending on the hole cover to specified torque. Torque inspects a hole cover: 6 N.m (0.6 KGF. J m, LBF. 4.4 ft) depending on the hole cover: 15 N.m (LBF. 1.5 KGF. J m, 11 ft)

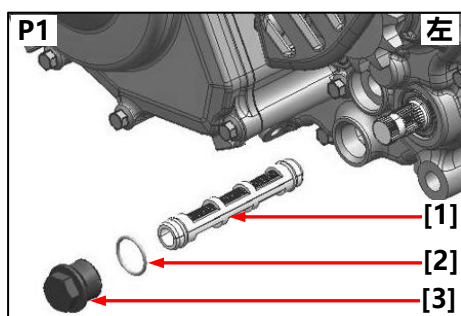




※Engine oil change

After starting the engine for a few minutes, turn off the engine and place a container under the oil drain bolt. Remove the following parts: - engine oil fuel cap [1]; - the oil discharge bolt and aluminum spacer; - the oil filter cover [2] and mesh, the right combination mesh bolts [3]; On the left side of the engine oil filter combination bolts [4].

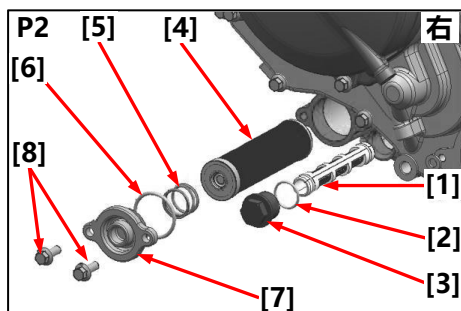
**Oil change fine filter, the required amount of engine oil: 1.6 L
engine removal after reassembling, engine oil quantity required: 1.8 L**



Installation of oil filter:

①. Installation of the left case oil screen (e.g. P1)
Put 1 oil screen combination [1], apply a small amount of engine oil to its O-ring [2], and fit it into the corresponding oil screen hole. Install the oil screen bolt O-ring onto the oil screen bolt, put an appropriate amount of grease in the inner hole of the oil screen bolt [3] and tighten it on the case to the specified torque.

Torque: 11~13 N·m



② Installation of the right body oil screen (e.g. P2)

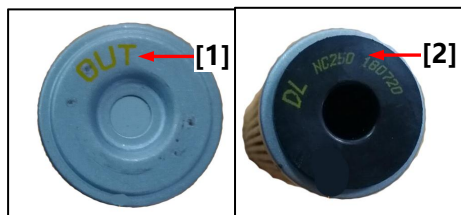
- Put one oil screen combination [1], apply a small amount of oil on its O-ring [2], put it into the corresponding oil screen hole, put the oil screen bolt O-ring on the oil screen bolt, put an appropriate amount of grease in the inner hole of the oil screen bolt [3], and tighten it on the box, and tighten it to the specified torque.

Torque: 11 to 13 N·m.

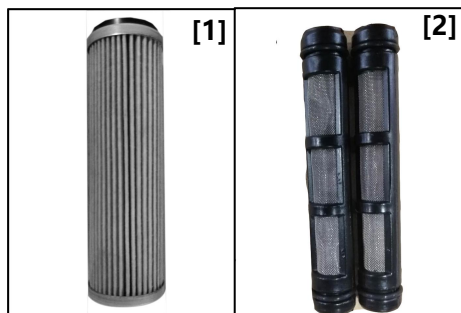
- Put the oil filter parts [4], into the corresponding holes of the right case.

- Put the fine filter spring [5] on the oil filter part, put the fine filter cover O-shaped seal [6] into the fine filter cover [7] seal groove, take two small disc bolts M6×16 [8], put them into the corresponding mounting holes of the fine filter cover, and tighten them to the specified torque.

Torque: 7 ~ 9 N·m



Paper filter element [1] The right OUT letter is marked to install outward [2] The open end faces the left box when installed.



Inspection of oil filter element and oil screen

"Check the oil filter (filter) [2] damage to replace, no damage to cleaning. "Check the oil filter, oil filter (fine filtration) [1] in oil filter [1] must be replaced every time.

※Throttle valve body intake pipe inspection

1. Remove the following components.

- Seat cushions.
- Front trim parts.
- Fuel tank vent pipe.
- Lower engine guards.
- Front left and right side fuel tanks.
- Air filter assembly.
- Throttle valve body.

2. Inspection:

- Throttle valve body intake pipe [1]; Crack/damage → replacement.

The installation sequence is opposite to the disassembly sequence.

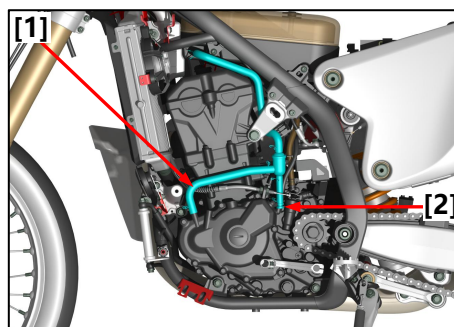
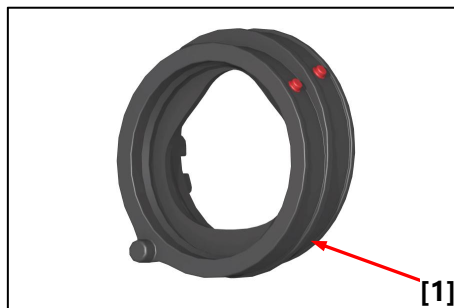
※ Inspection of exhaust gas pipe assembly

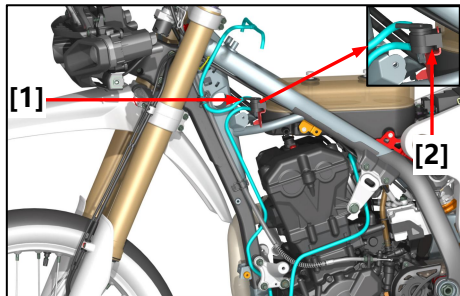
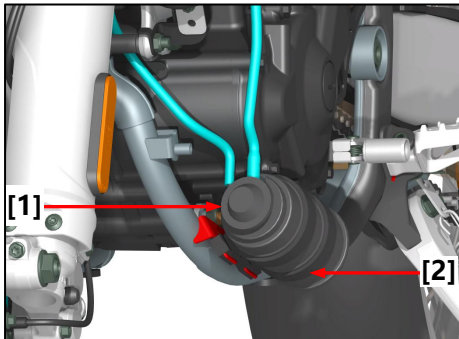
Remove the following components:

- Remove seat cushion assembly;
- remove the decoration before the assembly; Around before
- remove the fuel tank, ventilation tube;
- remove the guard plate assembly; - disconnect around tank before fuel line;
- disconnect the fuel pump 2 p (black) joint;
- remove the front left tank.

The installation sequence is opposite to the disassembly sequence.

Note: throttle fully open or motorcycle in the rain should be more frequently after cleaning or reverse for maintenance, if you can see the sediments in the transparent tube [2], you need to clean up. Remove the crankcase vent plug [1], the sediment discharge into the appropriate containers, and then reinstall the congestion in a reliable way. Check the crankcase ventilation hose [1] crack/damage and replacement. Loose connection parts to correct connection. Note: confirm exhaust pipe assembly, hose is configured correctly.





※Inspection of evaporative emission activated carbon canister and dump valve

Disassemble the following components.

- Removal of the seat cushion assembly.
- Removal of the front trim assembly.
- Removal of the front left and right fuel tank-vent pipes.
- Removing the lower shield assembly.
- Disconnecting the front left and right fuel tank connection fuel lines.
- Disconnect the fuel pump 2P (black) fitting.
- Remove the front left fuel tank.

The installation order is the reverse of the disassembly order.

Inspect.

- Evaporative emission activated carbon canister and rubber sleeve.
- Evaporative emission activated carbon tank connecting hose.
- Dump valve and rubber sleeve.
- Dump valve practice connection hose.

Cracked / damaged → Replace.

Loose connection part → Connect correctly.

Also, check if the hose is kinked or crushed.

※Air filter sponge element replacement / check hose cleaning

Remove the following components.

- Removal of the seat cushion assembly.
- Removal of 2 profile bolts [1].
- Remove the air filter sponge [2].

Install in the reverse order of disassembly.

1. As shown in Figure 1:

Depending on the maintenance interval or any time the air sponge element is too dirty / damaged → Replace.

The air filter sponge is removable, so please clean it each time with a special cleaner for oil-based sponges, dry it, and spray it with special air filter oil for maintenance.

If the motorcycle is used in an unusually humid or dusty place, more frequent inspection is required.

Caution:

-Because gasoline or low flash point solvents are very flammable, it is prohibited to use them to clean the air filter sponge cartridge.

Do not use engine oil on the sponge cartridge.

2. As Figure 2:

Check if the nuts [1], [2] in the air filter box are loose. Loose → tighten.

Clean the inside of the housing [3] of dust or foreign matter.

3. As in Figure 3.

Check whether the air filter case and frame mounting screw [1]/[2] are loose, loose → tighten.

4. As in Fig. 4:

Check if the inlet hose is intact.

Cracked/broken → Replace.

Check if the clamp is installed in the correct position [1].

Incorrect adjustment → Perform correct installation.

Position [2] screw with limit tighten to the limit.

5. As shown in Figure 5:

Check the air filter box leak tube.

Cracked/broken → Replace.

Clean the water inside the leak tube.

Torque.

Air filter sponge anisotropic bolt

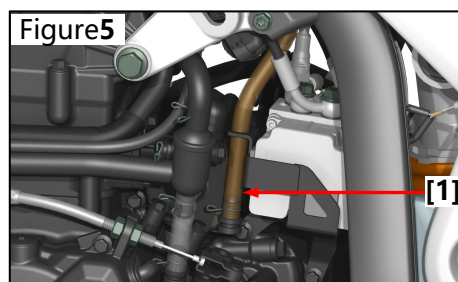
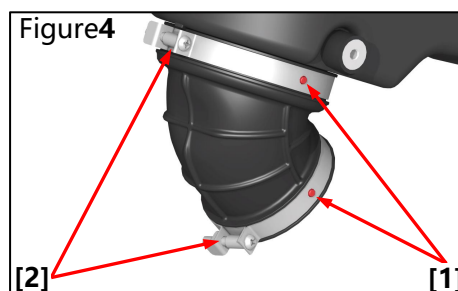
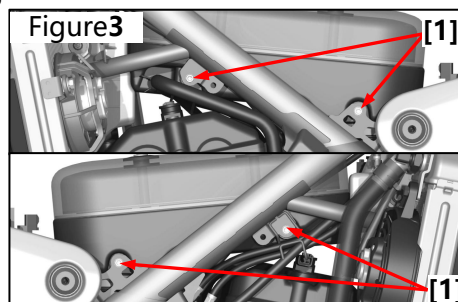
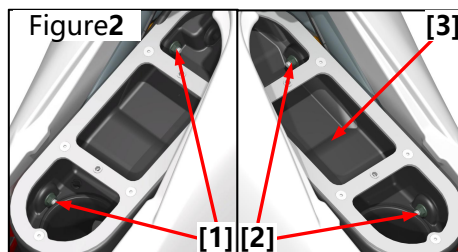
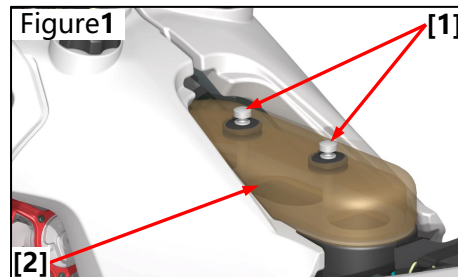
4 N.m (0.4 kgf.m, 0.3 lbf.ft)

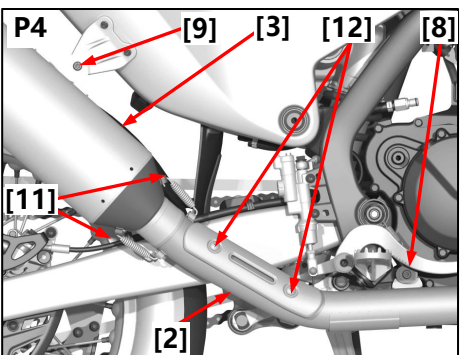
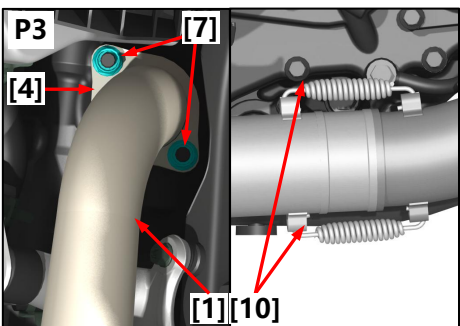
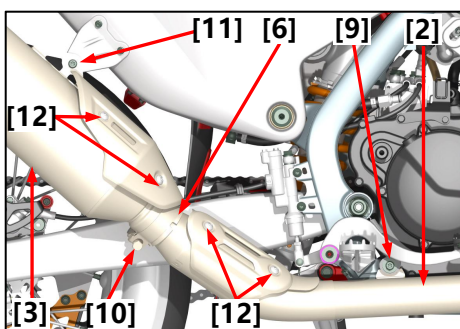
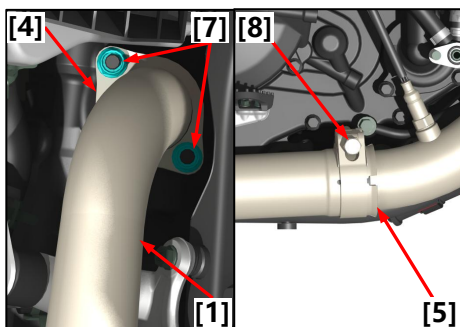
Air filter box and frame mounting bolts

12 N.m (1.2 kgf.m, 8.9 lbf.ft)

Rubber bolt to air filter box

8 N.m (0.8 kgf.m, 6.0 lbf.ft)





※Exhaust system inspection

1. Remove the following components.

- Seat cushion assembly.
- Front trim parts assembly.
- Lower engine guard assembly.

Install in the reverse order of disassembly.

Caution.

-Wait for the muffler to cool down before checking to avoid hand burns.

Figure 1,2 shows the regular edition model.

2. Check.

- Exhaust pipe front section [1];
- Middle section of exhaust pipe [2];
- Exhaust tail section [3];

Cracked / damaged → Replace.

- Seal gasket and gasket [4], [5], [6];

Exhaust air leakage → Replace.

3. Check.

Locking torque

- Exhaust front section nut [7];
- Exhaust pipe mid-hugger bolt [8];
- Exhaust pipe middle bolt [9];
- Exhaust tail section clamp bolts [10];
- Exhaust tail section and bracket bolts [11].
- Exhaust air anti-scalding trim cover bolts [12].

P3,P4 is factory edition

1. Check.

- Exhaust pipe front section [1];
- Middle section of exhaust pipe [2];
- Exhaust tail section [3];

Cracked / damaged → Replace.

- Seal gasket [4];

Exhaust air leak → Replace.

2. Check.

Lock to specified torque

- Exhaust front nut [7];
- Exhaust pipe middle section bolt [8];
- Exhaust tail section and bracket bolts [9];
- Exhaust anti-scald trim cover bolts [12].

3. Check.

Exhaust tension springs [10], [11] for loosening and damage.

Broken/damaged → Replace.

Loose → Connect correctly.

Exhaust mounting bolt torque:

1. Exhaust front section to engine connection nut: 22 N.m (2.2 kgf.m, 16 lbf.ft)
2. Exhaust middle section to frame attachment bolt: 22 N.m (2.2 kgf.m, 16 lbf.ft)
3. Exhaust rear section and bracket attachment bolts: 22 N.m (2.2 kgf.m, 16 lbf.ft)
4. Exhaust hoop bolts: 22 N.m (2.2 kgf.m, 16 lbf.ft) (regular edition only)
5. Muffler anti-scald trim cover mounting screw: 8 N.m (0.8 kgf.m, 6 lbf.ft)

※Adjustment of clutch free travel

Check the clutch cable for kinks or damage.

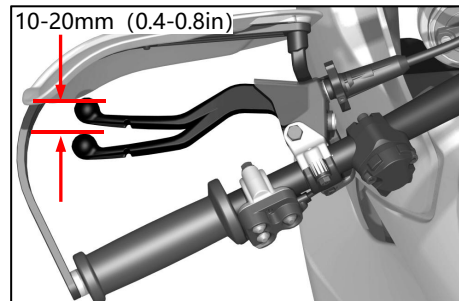
Lubricate the pull cable if necessary.

Check the free play [1];

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

If necessary, adjust to the specified range.

Improper adjustment of the free play can lead to premature clutch wear.



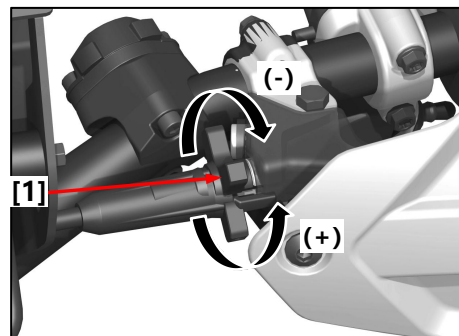
1. The usual use of fine adjustment at the clutch cable end adjustment knob. Turning the adjustment knob [1] in the (+) direction will increase the free play, and turning it in the (-) direction will decrease the free play.

(+) increases free play;

(-) decreases free play;

Adjustment knob [1] is 1/4 turn in one position;

If the correct free play is not obtained even if the adjustment knob exceeds the adjustment limit, select the adjustment knob fully in and turn it out 5 turns, then make more adjustments on the left box side.



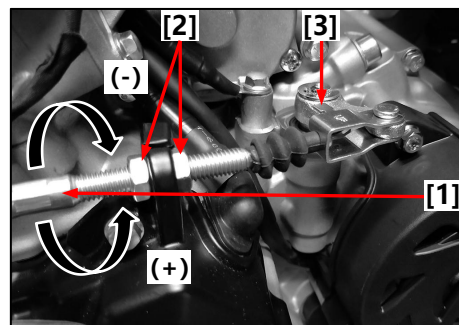
2. Use the lower adjusting bolt [1] on the clutch tappet arm for the main adjustment. Loosen the locknut [2] and turn the adjusting nut as necessary to reach the specified free clearance, tighten the 2 nuts [2] while holding the adjusting nut [1], and tighten the nut over the rubber sleeve to press the clutch tappet anti-release plate [3].

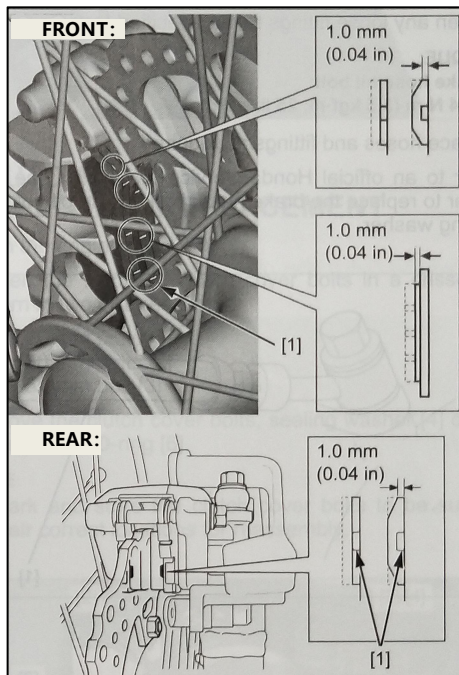
Lock nut [2] Torque.

8.0 N.m (8.0 kgf.m, 6.0 lbf.ft)

3. Start the engine, pull down the clutch handle and put it in gear, making sure the engine does not stall and the motorcycle does not run.

Gradually release the clutch handle, open the throttle, and drive the vehicle smoothly to ensure the clutch is working properly.





※Inspection of brake operation

1. Check: • brake operation is not normal to check the brake system.

Note: in dry road driving, and brake, before and after operation respectively to check the brake is working correctly.

※Inspection of front and rear brake pads

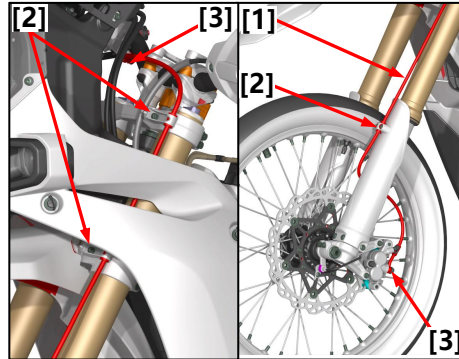
Check the liner. If any one liner wear to 1.0 mm (0.04 in), both pad must be replaced.

Note: wear identification [1], the width of 1.0 mm (0.04 in) if the brake pads wear limit to maintenance, replacement of brake pads.

• Brake disc check
visual check brake disc is damaged or crack. Brake disc limit wear value 3.5mm, if the brake disc wear to the maintenance limit please replace the brake disc.

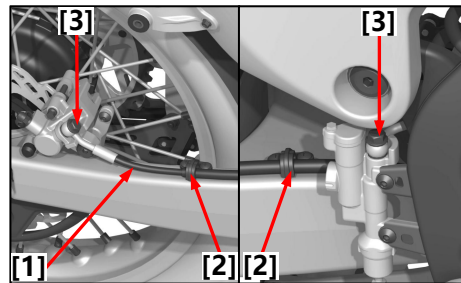
※Inspection of front brake fluid lines

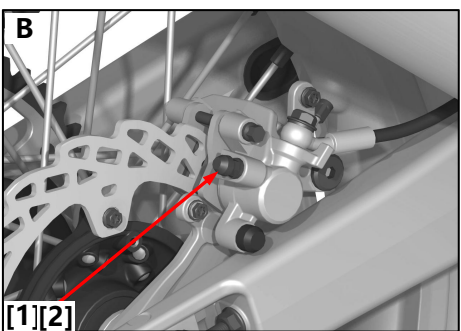
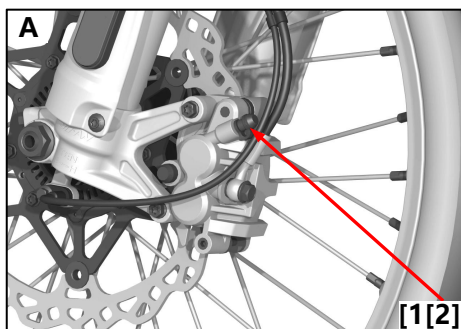
1. Check: • brake tubing [1]; Crack/damage to replace. 2. Review: • brake pipe fixed [2]; Loose - > lock tighten bolts reservation. • brake tubing (bolt) [3]; Loose - > lock bolt. 3. Keep upright, vehicle braking action several times. 4. Check: • brake tubing [1]; The brake fluid leak to replace damaged brake tubing.



※Inspection of rear brake fluid lines

1. Check: • brake tubing [1]; Crack/damage to replace. 2. Review: • brake pipe clamp [2]; Loose - > lock tighten bolts reservation. Loose brake tubing (bolt) and tighten bolts. 3. Keep the vehicle upright, will be the rear brake function several times. 4. Check: • brake tubing [1]; The brake fluid leak to replace damaged tubing.





Note

- Be careful not to spill brake fluid or allow the brake master cylinder reservoir or brake caliper reservoir to overflow.
- When releasing air from the hydraulic brake system, always make sure the brake fluid is adequate before applying the brakes. Neglecting this precaution will allow air to enter the hydraulic brake system and cause the air venting procedure to take significantly longer.

- If venting is difficult, it may be necessary to allow the brake fluid to settle for several hours first. Wait for the small air bubbles in the fluid line to disappear before repeating the venting procedure.

1. Evacuate.

- Using the specified brake fluid, add the brake fluid reservoir to the correct level.
- Install the diaphragm (brake master cylinder reservoir or brake fluid reservoir).
- Tightly connect the clear plastic hose [1] to the drain bolt [2].

**A.Front,
B.Rear,**

※Emission of air from hydraulic brake system (ABS)

The following process applies only to factory edition vehicles



• After removing brake related parts, be sure to exhaust the brake system air.

Note: in the following order, discharge the air brake system. Step 1: before the brake calipers. • step 2: after the brake calipers.



Release the brake system the state of the air: • brake pump decomposition. • brake tubing loose, remove or replace. • brake fluid level is lower than the minimum scale. • brake operation failure.

- Place the other end of the hose in the container.
- Slowly apply the brake several times.
- Fully pull up on the brake handle, or fully depress the brake pedal to hold it in place.
- Loosen the vent screw.

Note

- Loosening the exhaust screw will vent the air and bring the brake handle into full contact with the throttle grip or brake foot pedal.
- Lock the exhaust screw and release the brake handle or brake pedal before releasing the brake.
- Repeat steps (e) through (h) until the brake fluid in the plastic hose is free of any air bubbles.
- After operating the ABS, repeat steps (e) through (i), then add the brake master cylinder reservoir or brake fluid reservoir to the correct level using the specified brake fluid.
- Lock the exhaust screw to the specified torque.

Brake Caliper Exhaust Screw [1].

6 N-m (0.6 kgf-m, 4.4 lb-ft)

m. Using the specified brake fluid, fill the brake master cylinder or brake fluid reservoir to the correct fluid level.



After the hydraulic brake system is emptied, check the operating condition of the brake.

The following are regular edition models: Air Emissions Operation Procedures (ABS)

After the repairer has finished installing the ABS, there must be no gas in the line to ensure the ABS works properly. In this case, you need to use the diagnostic instrument to perform manual exhaust operation on the ABS. Note: Please use the manufacturer's recommended type of brake fluid and do not mix them.

The following is an example of exhausting the front ABS system.

Open the upper pump brake fluid cap, add sufficient brake fluid, and open the lower pump drain bolt.

2. Connect the diagnostic instrument, double-click the routine: front wheel exhaust stage 1, at this time the maintenance personnel while squeezing the handbrake, while adding brake fluid. The handbrake frequency is about 1 time/s. The process lasts about 25s.

3. After the front wheel exhaust stage 1 is executed, there will be a prompt in the diagnostic instrument interface indicating that the execution is complete. At this point, double click on the routine: front wheel exhaust stage 2, the process still requires the maintenance personnel to squeeze the handbrake while adding brake fluid. The process lasts about 90s.

4. After front wheel bleed stage 2 is completed, squeeze the handle and close the lower pump drain bolt. Then, repeatedly squeeze the front brake handle several times and feel the strength to determine if the exhaust is complete.

Exhaust precautions.

Do not repeat the exhaust procedure 2 or more times in a short period of time! If you need to repeat the exhaust procedure, please wait for 5 minutes to cool the solenoid valve to protect it from overheating!

ABS gear ring clearance inspection

Firmly support the motorcycle using a crane or equivalent and lift the wheel off the ground.

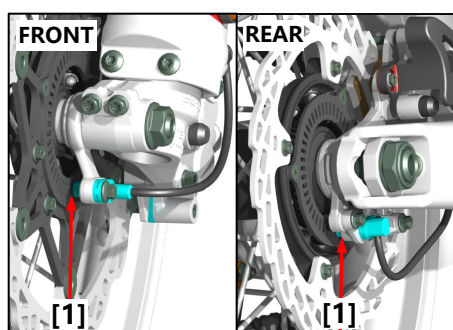
Slowly turn the wheel and measure the clearance [1] between the sensor and the gear ring at multiple points (air gap). Must be within specifications.

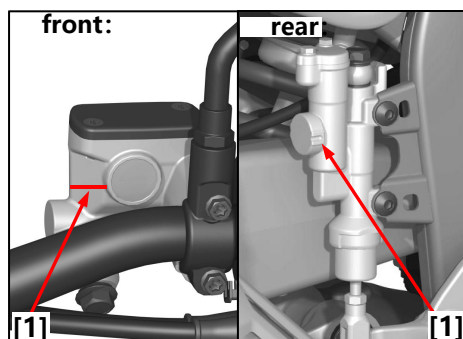
Standard: 0.4-1.2mm (0.02-0.05in)

Clearance (air gap) cannot be adjusted. If not within specification, check each part for deformation, looseness or damage.

Check if the wheel speed sensor is damaged and replace if necessary Check if the gear ring is deformed or damaged and replace if necessary.

- Front gear ring
- Rear gear ring





※Inspection of brake fluid level

Note: do not use different types of brake fluid mixing are incompatible with each other. Filling liquid storage tank, don't let the foreign matter to enter.

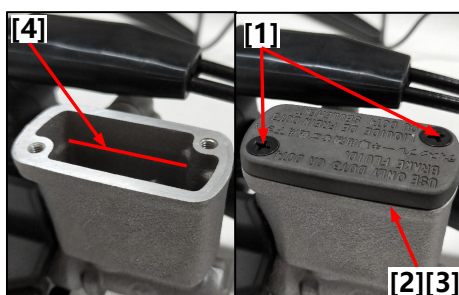
Liquid level check::

Check the liquid level of the storage tank of the front and rear brake master pump. If the liquid level is close to liquid level line [1], check the brake wear. If brake piece did not wear and liquid level is low, please check for leaks of the whole system, and then use the brake fluid filling liquid storage tank.



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

※Brake fluid addition



1. Front brake upper pump.

Remove the front brake master cylinder reservoir cover screw [1], reservoir cover [2] and diaphragm [3]. Fill the reservoir to the upper level [4] with the recommended brake fluid.

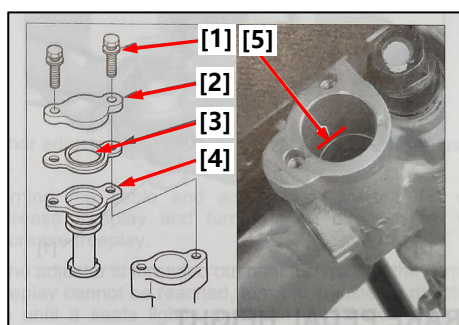
Recommended brake fluid: DOT4 brake fluid

Install the diaphragm and reservoir cap.

Install the front brake master cylinder reservoir cover screw and tighten to the specified torque.

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

Check the front brake hydraulic system for leaks.



2. Rear brake upper pump.

Remove the rear brake master cylinder reservoir cover bolt [1], reservoir cover [2], gasket plate [3] and diaphragm [4].

Fill the reservoir to the upper level line [5] using the recommended brake fluid.

Recommended brake fluid: DOT4 brake fluid

Install diaphragm, gasket and cap.

Install the rear brake master cylinder reservoir cover bolts and tighten to the specified torque.

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

Check the front brake hydraulic system for leaks.

※Adjustment of headlight beam

Caution.

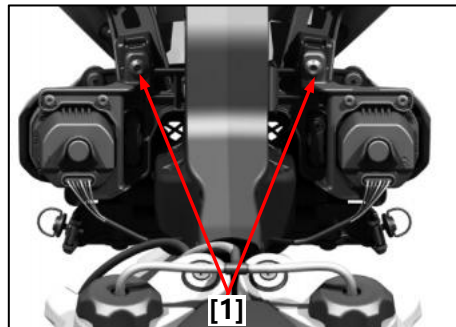
-Adjust the headlight to the light according to the local laws and regulations.

Support the motorcycle vertically on the horizontal plane.

By turning the adjustment screw [1].

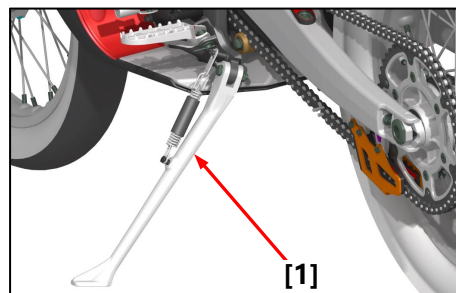
Turn clockwise to move the beam downwards.

Turn counterclockwise to move the beam upward.



※ Inspection of side brackets

Check: check the side stand [1] whether the activities of the smooth; Activity is not smooth, repair or replacement.



※Lubrication of side brackets

Lubricate the pivot points of the side brackets [1], the moving parts between metals and the spring contact points [1]. Recommended lubricant.

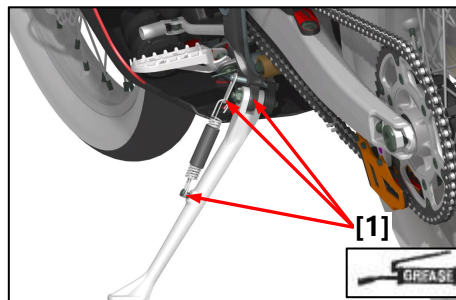
Unisun Grease SU-T330G

Caution.

-Align the switch pin with the hole in the side pedal.

-Aligning the switch slot with the return spring pin.

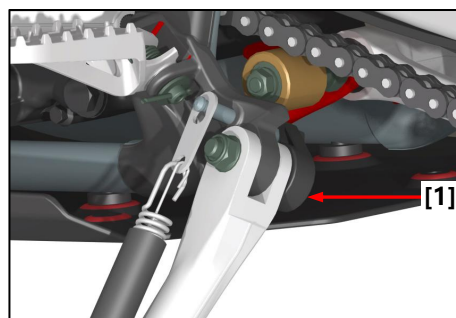
-Replace the switch bolt with a new one.



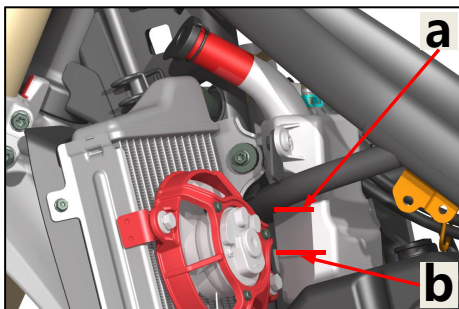
※ Inspection of side stand flame out switch

To check if the side stand ignition cut-off is normal.

1. sitting across the motorcycle with the side stand retracted.
2. starting the engine with the gearbox in neutral, then putting the gearbox into gear while holding the clutch lever.
3. lowering the side stand completely.
4. the engine should stop when the side stand is lowered.



If the vehicle is not stopped when the side stand is lowered → Replace.



※Check of cooling fluid quantity

1. Stand up the vehicle on a flat surface.

Caution.

-Place the motorcycle on a suitable stand.

-Make sure the motorcycle remains upright.

2. Check.

- Coolant level

The coolant level should be between the lowest level mark "a" and the highest level mark "b".

Lower than the minimum level mark → Add the recommended coolant to the correct level.

3. Start the engine, warm it up for a few minutes and then turn it off.

4. Check.

-Coolant level

Caution.

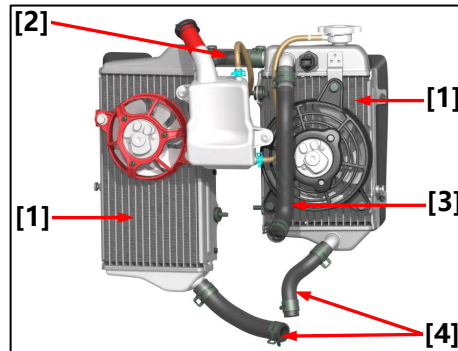
Before checking the coolant level, wait a few minutes for the coolant to settle.

Note:

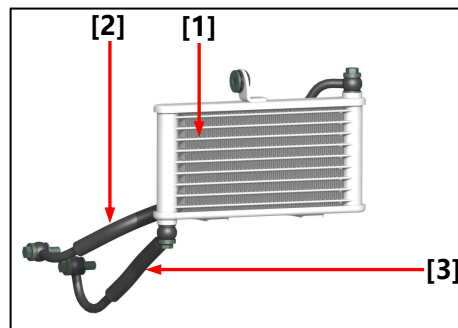
- water instead of the cooling fluid can reduce coolant antifreeze concentration. If water is used instead of coolant, check and correct the antifreeze concentration of coolant if necessary.
- only use distilled water. But if distilled water is not available, soft water can be used instead.

※Inspection of cooling system

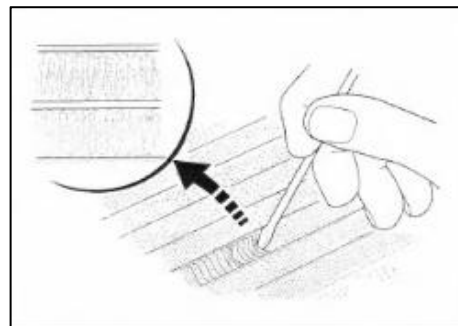
1. Check: radiator [1]; About the radiator, connecting hoses [2]; The radiator water hose [3]; • radiator inlet hose [3]; Crack/damage to replace.

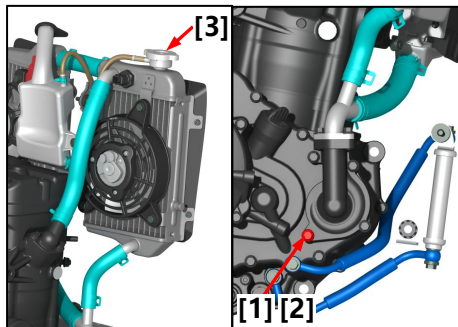


2. Review: oil cooled radiator [1]; Gives oil, oil cooled radiator hose [2]; • oil cooled radiator inlet hose [3]; Crack/damage to replace.



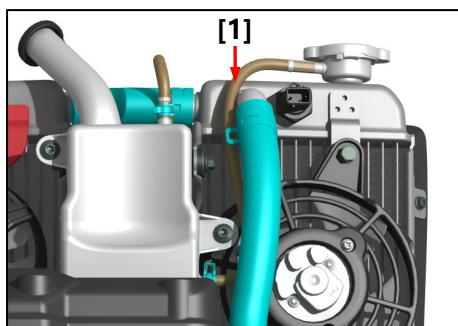
Check whether the air channel of the heat sink is blocked or damaged. Straighten the bent heat sink using a flat-mouth screwdriver, and use compressed air or low water pressure to remove insects, dirt, or other obstacles. If restrict air flow rate is more than 20% of the heat dissipation surface, the change of the radiator.





警告

- Wait for the motorcycle to cool down after the engine is turned off. Perform the following operations to avoid the risk of burns caused by excessive coolant temperature.



警告

- Wait for the vehicle to cool down after the engine is turned off. Perform the following operations to avoid the risk of burns caused by excessive coolant temperature.

※Coolant change

When adding coolant to the tank radiator or sub-tank or checking the coolant dosage, the motorcycle should be placed on level level and in an upright position. Remove/install remove the following parts: - remove the front guard board under the right side of the tank and assembly; - remove the water pump drainage bolt washer [2] [1] peace; - remove the radiator cap [3], the drainage of the coolant. After emptying coolant: - to replace the new flat washer, fitted with water will drain bolt tighten to specified torque. 10 N.m torque: water pump drainage bolt: (1.0 KGF. J m, 10 LBF. Ft.)

Disconnect the siphon hose from the radiator [1] Pull the siphon hose from the clamp, place the hose low outside the engine frame, and drain the coolant from the storage tank. Emptying of coolant, wash with water storage tank, install the hose into the pipe clamp and radiator.

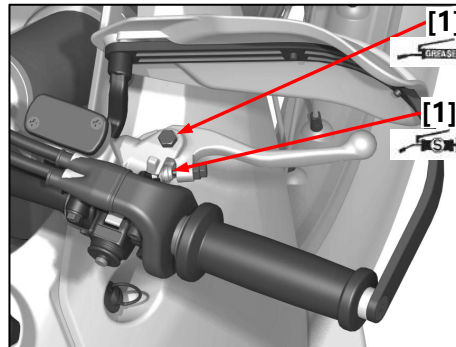
Fill the cooling system up to the neck with the recommended coolant through the water injection hole [2]. Not recommended with antifreeze: including ethanol containing silicate cooling fluid..

The air in the cooling system discharge: according to the following rule out the air in the system: 1. Put the engine into neutral, start the engine and idle for 2-3 minutes. 2. Open closed throttle for three to four times, will all the air in the radiator system. 3. Shut down the engine, if necessary, need to refill coolant. 4. Install the radiator cover, fill store kettle with recommended coolant to standard scale, covering water storage lid.

Lubrication of front brake handle

Lubricate the pivot point of the handle and the contact part of the metal [1].

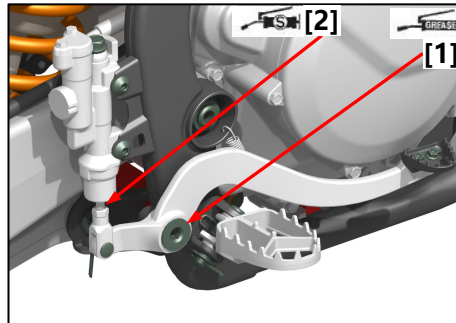
	Recommended Lubricants Use of silicone grease
	Recommended Lubricants Lithium-based multi-purpose grease



※Lubrication of the rear brake arm

The pivot point of the lubricating foot and the contact part of the metal [1].

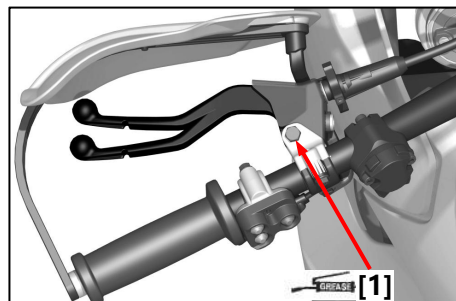
	Recommended Lubricants Lithium-based multi-purpose grease
	Recommended Lubricants Use of silicone grease



※Lubrication of the clutch handle

Lubricate the pivot point of the handle and the contact part of the metal [1].

	Recommended Lubricants Lithium-based multi-purpose grease
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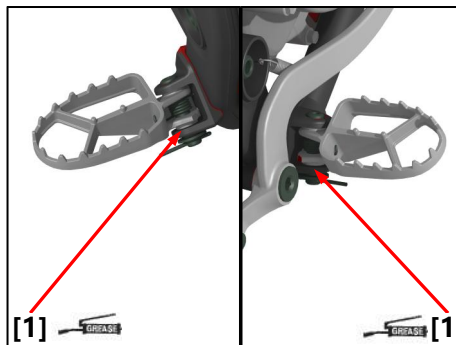


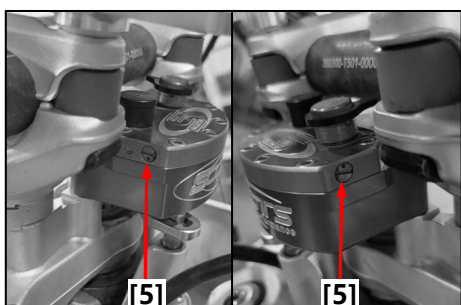
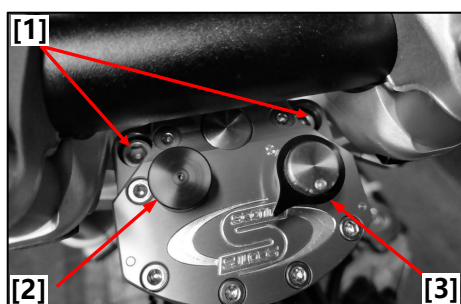
※Lubrication of foot pedal

The anti-slip teeth of the pedal can be repaired by filing the grooves between the teeth with a triangular file, but be careful, filing too much will reduce the life of the boot sole. Filing only the tips of the anti-slip teeth and filing the grooves too deeply will weaken the footrest. Make sure the pins are free to rotate and keep the cotter pin pivot in good condition.

Lubricate the pivot points and metal contact areas of the footrest [1].

	Recommended Lubricants Lithium-based multi-purpose grease
---	--





※Steering damper inspection and adjustment

1. Stand up the vehicle on a flat surface.
Caution.

-Make sure the motorcycle remains upright.

2. Check that.

- whether the front end dampers are working properly by holding the handlebars and turning them left and right [1].

Improper damping/stalling → Adjust.

- The steering damper is leaking oil and damping is not working → Repair.

- Steering damper and bracket mounting (bolts) [1], [4].

Loose → Lock the bolt.

Caution.

-Check the reference valve setting before each ride.

1. The reference valve [3] can adjust the size of resistance you feel when you rotate the direction handle from left to right, and increase the "hardness" of the damper when you rotate the button clockwise (to the right); The damper softens when the button is turned counterclockwise.

2. High speed valves [2] are primarily resistant to large, unexpected impact forces (such as hidden roots and pits). Adjust knob located just below the black lid, the lid was built is tight, adjust when you need to take off the lid. Factory default for high-speed valve from fully rigid position to turn out a circle, we suggest you in cycling for a period of time to adjust it. Adjust in units of 1/8 turns.

3. Sweep control valves [5] are located on both sides of the damper, machined bevels on the grooved head recess side. The distance of the resistance sweep is controlled to extend from the center line to both sides, and then the damper is free to move to the steering gear, allowing the motorcycle to turn easily in tight turns.

☆Specific adjustment → Instruction manual.

※Steering Head Inspection and Adjustment

1. Set up the bike on a flat surface.



•The bike must be firmly supported and there is no danger of tipping over

Notes.

Place the motorcycle on a suitable stand so that the front wheel is elevated.

1. Check.

- Upper and lower dust rings [1].
Cracked/broken → Replace.

2. Check.

- Steering head

Hold the front shock absorber bottom barrel and rock the front fork gently.

Sticking/loose → Adjust the steering head.

3. Disassembly.

- Steering handle
- Upper linkage plate

4. Adjustment.

- Steering head

a. Loosen the steering column retaining four-slot nut [2].

b. Then use a torque wrench to lock the nut to the specified torque.

Notes.

Use a torque wrench perpendicular to the four-slot nut sleeve.

Steering column four-slot nut (locking torque) Hit 40N.m first, loosen and hit 10N.m, then back off 1/4 turn

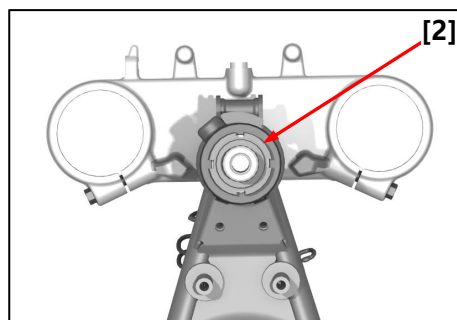
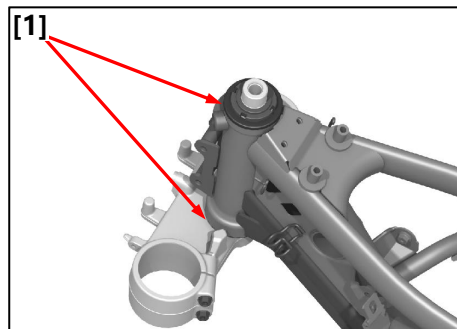
c. After installing the upper coupling plate and handlebars, turn the front shock absorber to the end on both sides and check if there is any looseness or jamming in the steering head. If there is a feeling of dry stalling, please disassemble the lower coupling plate steering column assembly and check the upper and lower bearings.

※Inspection and lubrication of front and rear wheel seals

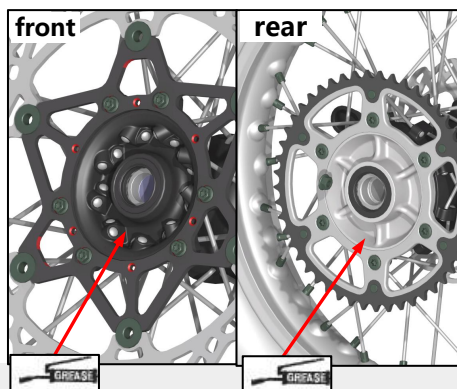
Clean, inspect and lubricate seals regularly especially when wet, muddy or dusty roads are often encountered.

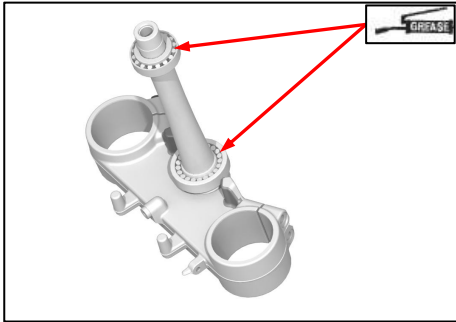
Ensure that all dust seals are in good condition. Apply a very small amount of grease in the groove between the main and secondary lips of the seal during installation.

Lubricate with high temperature lithium complex grease (Unisun Grease SU-T330G/F or equivalent).



•Do not over-lock the steering column four-slot nut.



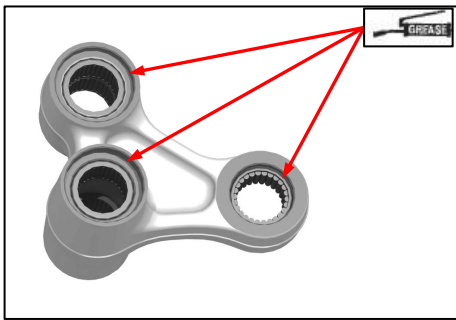


※Lubrication of steering head bearings

Regularly clean, inspect and lubricate steering head bearings especially on wet, muddy or dusty surfaces. Using high temperature extreme pressure lithium complex base grease (optimal sheng SU - T330G grease or similar grease) lubrication.



Recommended Lubricants
Lithium-based multi-purpose grease



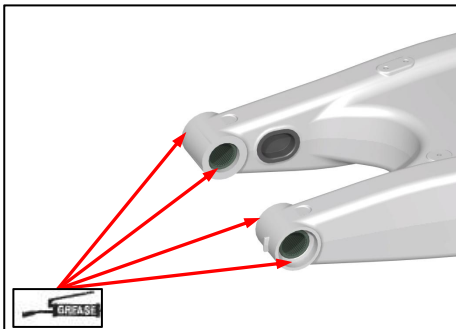
※Inspection and lubrication of the triangular rocker

Clean, inspect and lubricate the triangular rocker bearings regularly. Make sure all dust seals are in good condition. Install and apply a very small amount of grease in the groove between the main and secondary lips of the oil seal.

Lubricate with high temperature extreme pressure lithium complex grease (Unisun Grease SU-T330G/F or equivalent).



Recommended Lubricants
Lithium-based multi-purpose grease



※Inspection and lubrication of the flat fork shaft

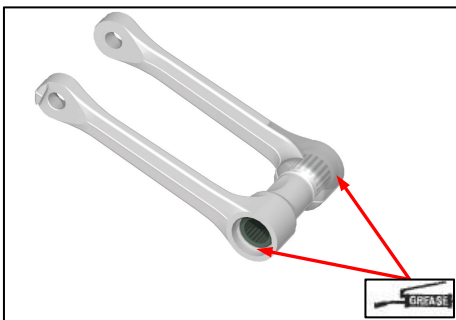
Clean, inspect and lubricate the flat fork bearings regularly. Make sure all dust seals are in good condition. And apply a very small amount of grease in the groove between the main and secondary lips of the oil seal.

Lubricate with high temperature extreme pressure lithium complex grease (Unisun Grease SU-T330G/F or equivalent).

Do not attempt to weld or repair damaged flat forks, welding will weaken the fork strength.



Recommended Lubricants
Lithium-based multi-purpose grease



※Inspection and lubrication of U-shaped rocker

Clean, inspect and lubricate the U-shaped rocker bearings regularly. Make sure all dust seals are in good condition. And apply a very small amount of grease in the groove between the main and secondary lips of the oil seal.

Lubricate with high temperature extreme pressure complex lithium grease (Unisun Grease SU-T330G/F or equivalent).



Recommended Lubricants
Lithium-based multi-purpose grease

Caution.

-For lubrication in the groove between the primary and secondary lips of the oil seal, use Unisun Grease S-UT330G.

※ Inspection of wheel tires

Check the tires for cuts, embedded nails or other damage.

Check that the front and rear wheels are properly mounted and check the tire pressure with a tire pressure gauge when the tires are cold.

Regular edition tire pressure (vacuum tires).

Front side: 200kPa (2.0kgf/cm³, 29 psi)

Rear side: 200kPa (2.0kgf/cm³, 29 psi)

Regular edition tire pressure (inner tube)

Front side: 100kPa (1.0kgf/cm³, 15 psi)

Rear side: 100kPa (1.0kgf/cm³, 15 psi)

☆ Adjust the tire pressure appropriately according to the actual usage.

Support the motorcycle firmly and lift the front wheel off the ground.

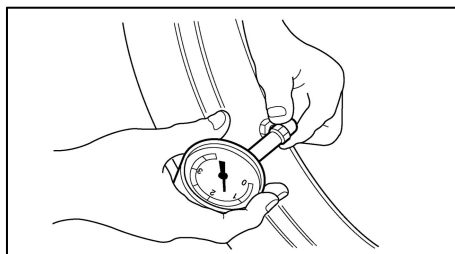
Hold the front fork and move the front wheel sideways with force to see if the wheel bearing is damaged.

Support the motorcycle firmly and lift the rear wheel off the ground.

Hold the rear flat fork and move the rear wheel with force laterally to see if the wheel bearing is damaged.

If excessive wear occurs on the wobble bearing, replace the front/rear wheel bearing.

Contact your local dealer for bearing replacement.



※ Inspection of wheel rim damage and runout

Limit values.

Front wheel: Radial: 0.8mm

Axial direction: 0.8mm

Rear wheel: Radial: 0.8mm

Axial direction: 0.8mm

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 wheel bead clamp nut [4] to the specified torque.

Tools

Front wheel: spoke wrench, 6.0mm

Rear wheel: spoke wrench, 7.0mm

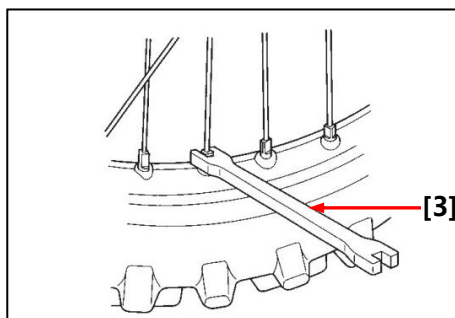
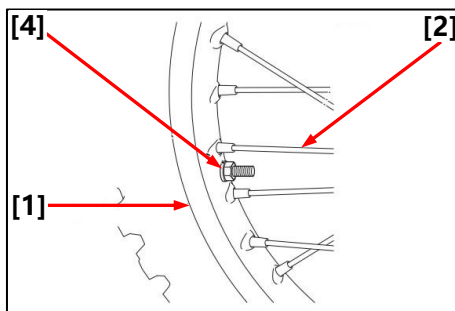
Torque.

Front/rear wheel spokes.

6 N·m (0.6kgf·m, 4.4lbf·ft)

Front/rear tire clamp lock nut.

12 N·m (1.2 kgf·m, 9.0 lbf·ft)



450rally factory edition tire:

front tire	90/90-21M/C 54R	
	Zhengxin/CST	EX02F
rear tire	140/80-18M/C 70R	
	Zhengxin/CST	EX02R
type	Sponge inner tube	

450rally regular edition tire:

front tire	90/90-21M/C 54R	
	Zhengxin/CST	EX01
rear tire	140/80-18M/C 70R	
	Zhengxin/CST	EX01
type	vacuum tire	
	Normal tyre (with inner tube)	

※Replacement of tires

KOVE tires provide excellent handling, braking, durability and comfort in all riding conditions.

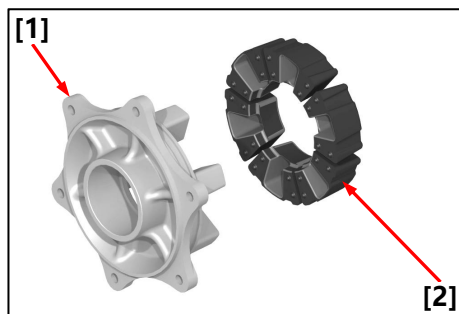


• Installing the wrong tires on a motorcycle can affect handling and stability. This can result in a crash, serious injury or death. In this manual, be sure to use the recommended size and type of tyre.

• When replacing, use the original tire or its equivalent of the same size. Decorative pattern, rated speed and load range is the same as the original tire replacement tires, please replace the new tube. Old tube may be stretched, if within the new tires may fail.

Note:

• ROTATON - labeled tire rolling direction. In tire lateral wall delta these id and the center of the tire tire wear limit. (only regular edition), the tire lateral wall delta these id and the center of the tire tire wear limit. (factory edition only)



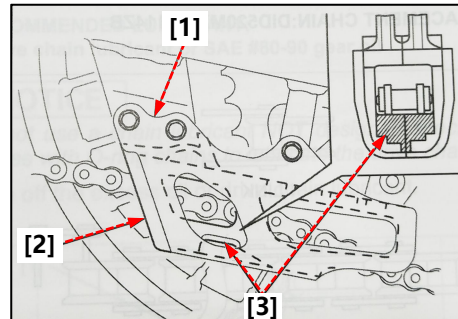
※Inspection of cushion body assembly

1. Check.
 - Buffer body [1].
Cracked / damaged → Replace.
 - Buffer rubber [2].
Damage / wear → Replace.

※Inspection of chain guide box

Check the chain guide box [1] for deformation and damage. Damage/deformation and replacement.

Note: if the chain guide box of metal framework, impact transmission chain, fall off, lead to transmission chain worn or noise. Check the transmission chain guide rail sliding block [2] for wear. If the leading chain slider wear to the limit of [3] position, change the transmission chain guide slide block. Torque: chain guide box installation bolt; 10 N.m (1.0 KGF. Ft, 7. 0 LBF. Ft.)



※Inspection of chain guard card

Check the chain guard for excessive wear.

The wear limit does not exceed:

3mm on the upper side

Lower side 2mm

Caution.

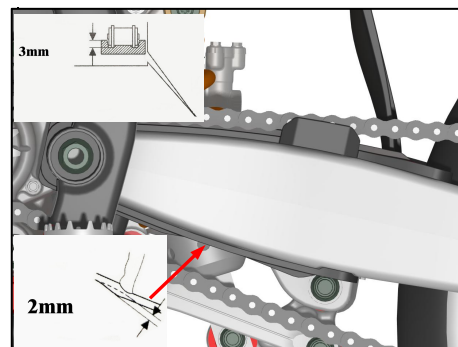
-Replace the chain guard when it exceeds the wear limit.

If the chain guard is worn to the limit or damaged, the chain will damage the rear flat fork or drive chain.

Torque.

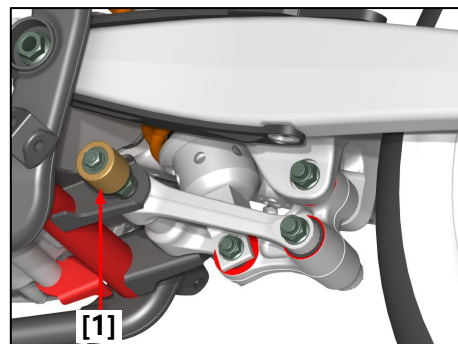
Chain retainer mounting screw x3 [1].

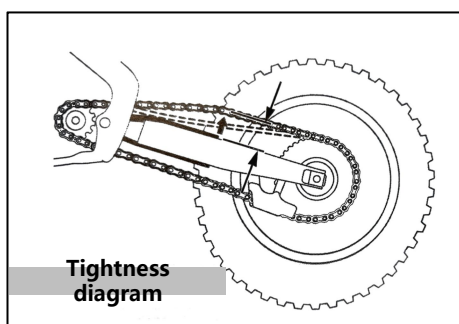
8.0 N.m (0.8 kgf.ft, 6.0 bf.ft)



※Inspection of chain guide wheel

Check the lower guide sprocket [1] for excessive wear or guide sprocket bearing stuck. If necessary, replace the timely replacement. Wear limit: 2 mm (millimeter) note: remove, be sure to use the new bolt and nut. Fastening torque: the side guide sprocket nut: 22 N.m (2.2 KGF. J m, 18 LBF. Ft.)





※Inspection and adjustment of transmission chain tightness

⚠警告

•Do not check or adjust the engine while it is running

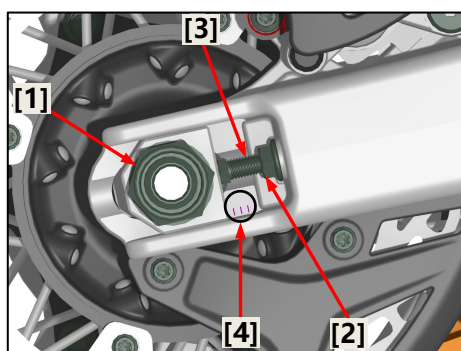
Inspection.

Lift the drive chain at the position shown and measure the distance from the upper surface of the rear flat fork.

Standard: 35-55mm

If the measured value exceeds the standard, please adjust the drive chain.

Driving chain sag: 35-55 mm if sag more than 55 mm, cannot continue to drive motorcycle.



Drive chain tightness adjustment: note:

-The scale lines for the drive chain adjustment are provided on the rear flat fork. The left and right adjusters must be aligned at the same tick mark position. If they are not aligned, the wheels are not aligned and the handlebars may pull to one side.

Loosen the rear axle nut [1], Loosen the drive chain adjuster lock nut [2] and turn the adjusting bolt [3] to adjust the drive chain clearance. Check that the indexing marks [4] are aligned at the same position on the marked scale.

Tighten the rear axle nut [1] to the specified torque.
Torque: 128 N.m (12.8 kgf.m, 94 lbf.ft)
Recheck the drive chain for slack and make sure the rear wheels turn smoothly.

Tighten the adjuster to the adjustment plate and tighten the drive chain adjuster lock nut [2] to the specified torque.
Torque:
12 N.m (1.2 kgf.m, 8.9 lbf.ft)

※Inspection cleaning and lubrication of the drive chain

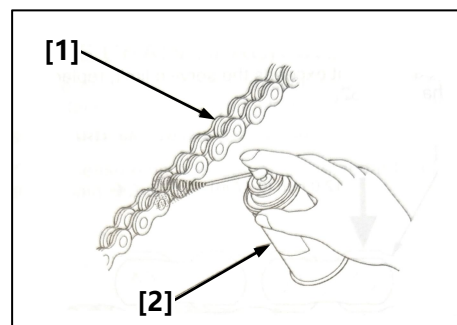
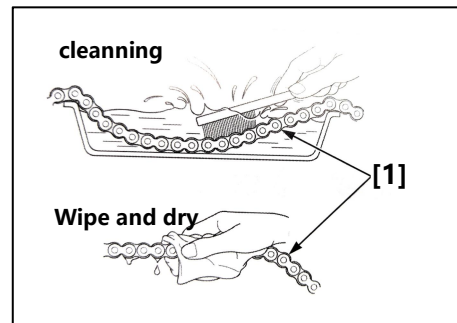
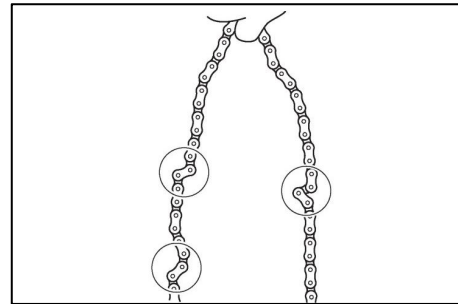
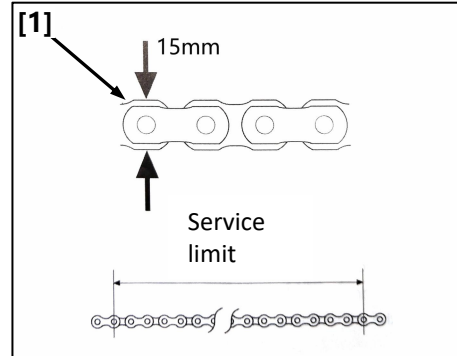
Note: • to ensure the service life of the chain and the intensity of single truncation chain is prohibited. For maximum service life, after each driving should be clean and smooth transmission chain.

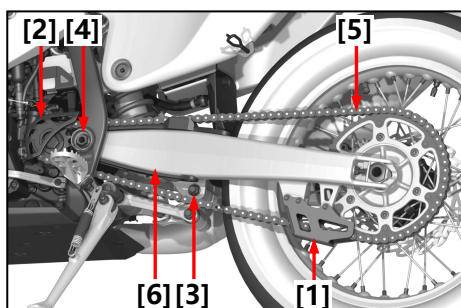
1: measuring the height of the transmission chain (plate) : 15.0 mm.
Using the limit measure the distance between the 17 pins (16 pitch) from the center of the pin to the center of the pin, the chain stays taut, and any kinked joints straighten. Use limit: 257 mm if measured values more than maintenance limit, please change the transmission chain.

2: check your sprocket kink or damage, whether to replace if necessary.

3: clean with non-flammable or high flash point solvent cleaning chain [1] and wipe dry. Make sure the chain is completely dry before lubrication.

4: lubrication with transmission chain lubricant [1] [2] lubrication transmission chain. Recommended lubricants: use a chain lubricant or SAE# gear oil wipe off excess oil, 80-90 or chain lubricant.





※Transmission chain replacement

Disassembly/Installation

Remove the following parts.

- Remove the chain guide box [1];
- Remove the small sprocket trim cover [2];
- Remove the triangle rocker and flat fork attachment bolts [3];
- Remove the lock nut of the flat fork shaft and take out the flat fork shaft [4];
- Remove the chains from the large and small sprockets respectively [5];
- Separate the flat fork [6] from the frame to remove the chain completely.

The order of installation is opposite to the order of disassembly.

-After replacing the chain, adjust the slackness of the drive chain to the specified range.

Standard chain link: 114 links (AFAM)

Replacement chain: A520 XC-3 (X-type oil seal)

Caution.

-Never use a new drive chain on a worn sprocket.

Both the chain and sprockets must be in good condition or the new replacement drive chain will wear out quickly.

When replacing the drive chain, check the sprockets as well.

※ Inspection of the master/follower sprocket

Remove the drive sprocket cover. Inspect the drive sprocket teeth and driven sprocket teeth for wear or damage and replace them if necessary. Consult your dealer to replace the master and driven sprockets.

Never use a new drive chain on a worn sprocket.

The chain and sprockets must be in good condition, otherwise the newly replaced drive chain will wear out quickly.

Check the bolts and nuts on the active and driven sprockets.

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

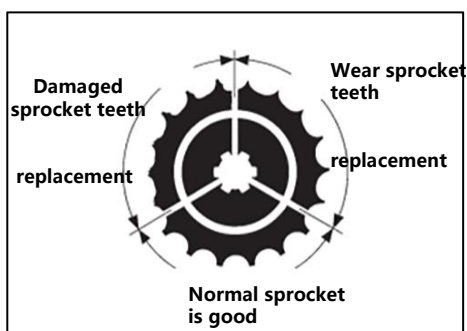
Torque.

Drive sprocket nut.

45 N.m (4.5 kgf.m, 34 lbf.ft)

Slave sprocket bolt.

37 N.m (3.7 kgf.m, 28 lbf.ft)



※Inspection of Front Shock Absorber

Front Shock Absorber

1. Stand up the vehicle on a flat surface.



•The bike must be firmly supported without the risk of tipping over.

2. Review: • tube damage/scratch and replacement. , between the bottom of the shock absorber tube tube and appearance before the spill to replace oil seal.

3. Keep the bike upright, before applying the brake.

4. Check: • shock absorber before action force to press down, steering handle several times, check whether before the shock absorber can smooth the springback. The activity is not smooth - maintenance.



※Inspection of Rear Shock Absorber

Rear Shock Absorber

1. Stand up the vehicle on a flat surface.



The bike must be firmly supported without the risk of tipping over.



2. check:

- Rear shock absorber inner rod

Bent / damaged → Replace the rear shock absorber.

- Rear shock absorber

Oil leakage → Replace the rear shock absorber.

- Spring

Damage/wear → Replace the rear shock absorber.

- Bolt

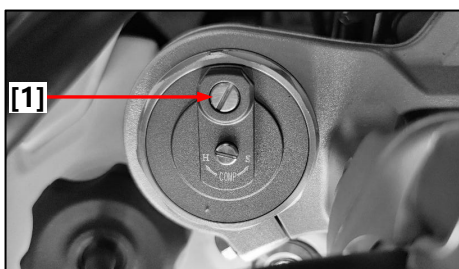
Bend/damage/wear → Replace. 3.

3. Check.

- Rear shock absorber action

Press down the rear of the vehicle seat cushion several times to check whether the rear shock absorber can rebound smoothly.

The movement is not smooth → Repair.



※Front shock absorber air pressure adjustment

The pressure inside the shock acts as a progressive spring, affecting the front reduction throughout its travel.

Air is an unstable gas and his pressure increases when he does his work (inside the shock cavity), so the front shock on this motorcycle will become stiff as the race progresses.

After a race or practice, release the accumulated air pressure in the front shock in time.

Make sure the front shock is fully extended, the front wheel is off the ground and the front shock bleeder bolt is fully loosened [1].

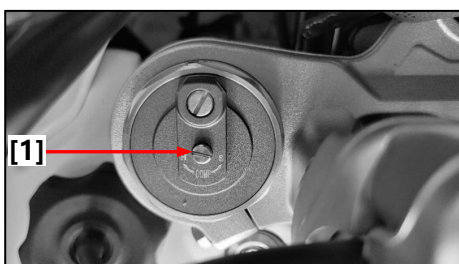
Check the bleeder bolt O-ring for damage and replace if necessary.

Apply the recommended grease to the O-ring. Install and tighten the front damper bleeder bolts to the specified torque: Torque 1.3 N.m (0.1 kgf-m, 1.0 lbf.ft)

※Front shock absorber compression damping adjustment

The compression damping adjustment affects the speed of the front shock compression. There are 22 segments of front damper compression damping. Each segment is 1/4 turn. By turning the compression damping adjustment bolt one full turn, the adjuster will turn 4 segments.

Turn the adjusting bolt clockwise (H) to make the compression damping harder, and counterclockwise (S) to make the compression damping softer.



To set the standard compression damping.

1. turn the compression damping adjusting bolt clockwise until it stops turning.
2. Then turn the adjusting bolt counterclockwise (lighter), the standard compression damping is from the hardest position to turn 10 segments and hear the click position.

You can adjust accordingly according to your weight and riding conditions, make sure that in each adjustment, the adjustment bolt stops at the click position and the left and right ends are adjusted to the same position.

Note:

- don't rotate the adjusting bolt is beyond the given position, otherwise it may damage the adjusting device. Adjusting torque shall not exceed 0.5N·m.

※Front reducer rebound damping adjustment

The rebound damping adjustment affects the speed of the front shock rebound. The front shock rebound damping has 22 segments. Each segment is 1/4 turn. By turning the rebound damping adjustment bolt one full turn, the adjuster will turn 4 segments.

Turn the adjusting bolt clockwise to increase the rebound damping (hard) and counterclockwise to decrease the rebound damping (soft). To set the standard rebound damping.

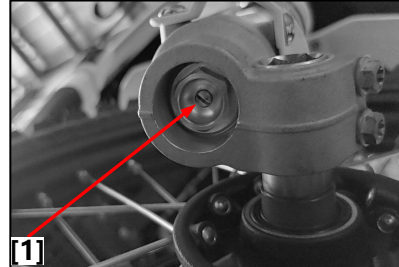
1. turn the rebound damping adjusting bolt clockwise until it stops turning.

2. Then turn the adjusting bolt counterclockwise (lighter), the standard rebound damping is 10 segments from the hardest position, and hear the clicking sound position.

You can adjust accordingly according to your weight and riding conditions, make sure that in each adjustment, the adjusting bolt stops at the click position and the left and right ends are adjusted to the same position. Caution.

-Do not rotate the adjusting bolt beyond the given position, otherwise the adjusting device may be damaged. The adjusting torque should not exceed 0.5N-m.

-Compression damping and rebound damping can both be increased by turning the adjusting bolt clockwise.



※Rear shock absorber adjustment

The rear shock assembly includes a shock gas cylinder containing high-pressure nitrogen gas. Do not attempt to disassemble, repair or dispose of the unit; puncture or exposure to flame may also cause an explosion resulting in serious injury. Repair or disposal should be done by an authorized service store.

Spring Preload Adjustment

Spring preload should be adjusted while the engine is cool by turning the damper spring lock nut and adjusting nut to adjust the spring preload. Adjustment method.

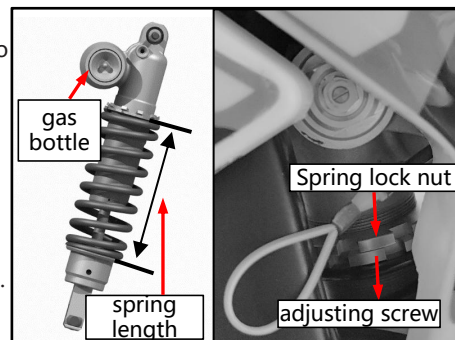
1. Firmly support your motorcycle with a maintenance stand or crane and lift the rear wheel off the ground.

2. Check that the spring preload is at the standard length.

3. Loosen the shock spring lock nut and rotate the adjusting nut. For every turn of the adjusting nut, the spring length will change by 1.5mm.

4. Adjust accordingly as needed.

5. After the adjustment is completed, hold the adjusting nut and tighten the shock spring locking nut. (Torque: 44N-m)



High seat version.

Increase spring preload.

Loosen the shock spring lock nut with an active wrench, turn the adjusting nut and shorten the spring length, the shortest should not be less than: 215mm.

Decrease the spring preload.

Loosen the locking nut of the damper spring with an adjustable wrench, turn the adjusting nut and increase the spring length up to a maximum of: 230 mm.

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

Low seating version.

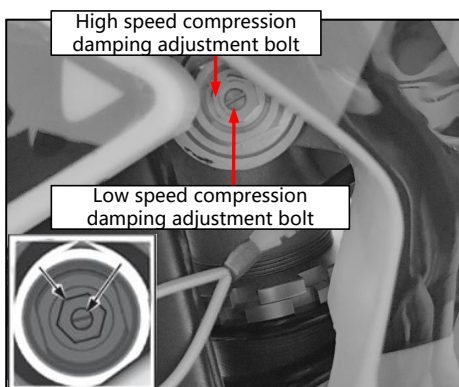
To increase the spring preload.

Loosen the damper spring locknut with an adjustable wrench, turn the adjusting nut and shorten the spring length by a minimum of: 205 mm.

Decrease the spring preload.

Loosen the locking nut of the damper spring with an adjustable wrench, turn the adjusting nut and increase the spring length up to a maximum of: 225 mm.

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

**※Rear reduction compression damping adjustment**

Compression damping can be adjusted individually by adjusting the bolt for 2 stages of high speed compression damping and low speed compression damping, you can adjust accordingly according to your weight and riding conditions.

When adjusting the compression damping adjustment bolts, be sure to use the right size tool to avoid damage.

1. High-speed compression damping adjustment

High-speed compression damping adjustment bolt is effective when damping adjustment is needed for high-speed operation. High-speed damping can be adjusted by turning the hexagonal part of the compression damping adjustment bolt, and the high-speed compression damping adjuster is adjusted in increments of 1/4 turn. Make sure that the high speed compression adjuster is firmly in the brake position and not in between positions.

To adjust to the standard position.

1. Turn the adjusting bolt clockwise (H) until it no longer turns in the position (hardest).

2. Turn the adjusting bolt counterclockwise 2 turns from the hardest position, then $\pm 1/4$ turn.

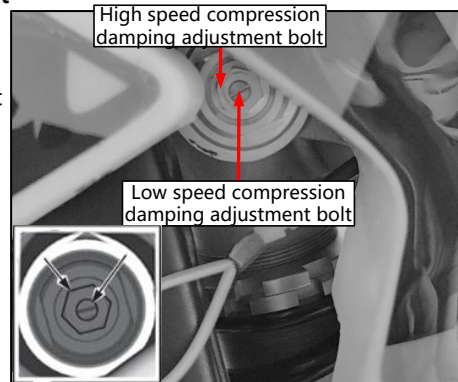
2. Low-speed compression damping adjustment

When damping adjustment is required at relatively low speeds, the low-speed compression damping adjustment bolt should be used. The low-speed compression damping adjustment bolt has 16 segments, each segment is 1/4 turn.

The dampers become stiffer after turning clockwise (H) and softer after turning counterclockwise (S). The adjusting torque does not exceed 0.5N·m.

Adjust to the standard position as follows.

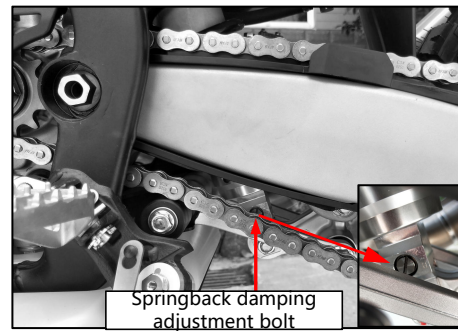
1. Turn the adjusting bolt clockwise (H) until it no longer turns in the position (hardest).
2. Turn the adjusting bolt 8 sections counterclockwise from the hardest position and hear a clicking sound at the position.



3. Rebound damping adjustment

The rebound damping adjusting bolt is located at the lower left end of the rear shock absorber. Turn the adjusting bolt clockwise to increase the rebound damping (hard) and counterclockwise to decrease the rebound damping (soft). To set the standard rebound damping.

1. turn the rebound damping adjusting bolt clockwise (H) until it no longer turns in position.
2. Then turn the adjusting bolt counterclockwise (S, a little lighter), the standard rebound damping is from the hardest position to turn 10 sections, and hear the click position.



Note:

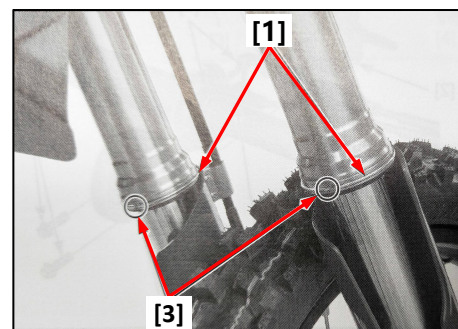
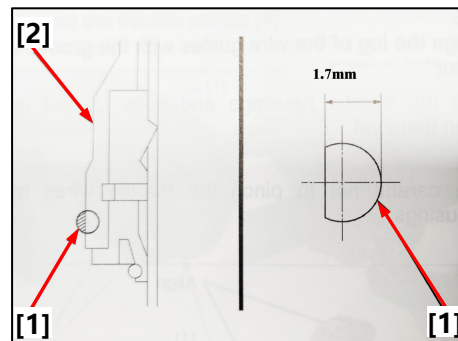
- gently turn adjusting bolt, prevent damage after shock absorbers. Adjustment rebound damping adjustment bolt, be sure to use the size of the right tools, to avoid damage. Every time adjustment, ensure the fixed position of the adjusting bolt is firm. No more than 0.5 N · m torque adjustment.

※ Front Shock Absorber Wear Ring Inspection

Check front shock action by operating the front brakes and compressing the front shocks a few times.

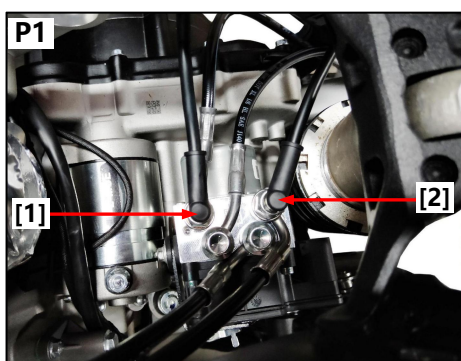
Check the entire front shock assembly for signs of leaks, damage or loose fasteners Check the front shock trim protection plate and dust seal for cleanliness. No dirt or dust remove any dirt that has collected on the bottom of the front shock seals.

Inspect the wear ring [1] for wear or damage. If the wear ring is less than 1.7 mm or flush with the outer tube, replace the wear ring [2]. Ensure that the wear ring end gap [3] faces backwards.



※Motorcycle locking torque inspection

Check that all nuts, bolts and screws are properly locked (every 3 months or 1000km). Torque values - 1-13 pages of "moment of torque value - the engine, car body parts".

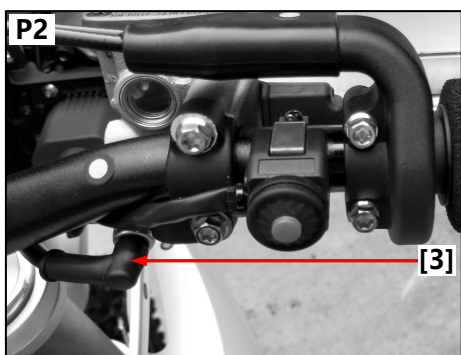


※ Inspection of brake light switch

Brake light switch inspection

1. Checking.
 - Front brake light switch operation
 - Rear brake light switch operation

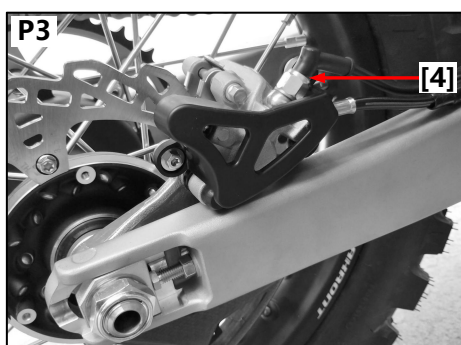
2. Check.
 - Brake switch cable. Crack / damage → Replace.
 - Brake switch (bolt). Loose → Lock the bolt.



Make sure the brake light comes on when operating the brake handle and brake pedal.

If P1: for regular edition brake switch vehicle mounting position.
- Front caliper fuel line into ABS main pump connect (FW), FM out connect to rear front upper pump and brake switch [2].

Such as P2.3: [3], [4] for factory edition brake switch vehicle installation position;



※Inspection of Switches, Light and Signals

1. Check that all switches operate properly and all lights are on.

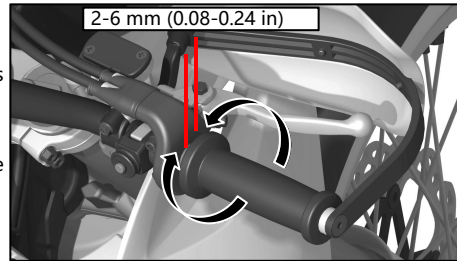
※Adjustment of throttle free travel

Check that the throttle cable is not aged, damaged or kinked.
Turn the throttle handle and check that the throttle opens smoothly and closes automatically in any steering position.

If the throttle handle does not turn smoothly and smoothly, check that the cable is properly routed, that the throttle lever is clean and lubricated with the recommended lubricant (engine oil or appropriate cable lubricant), and that the throttle drum is turning properly.

If there are no abnormalities, but the throttle does not turn smoothly, replace the throttle cable (oil feed, return cable).

Measure the free clearance at the throttle handle flange.
Free clearance: 2-6mm (0.08-0.24in)



1. Fine adjustment on the throttle side

Loosen the locknut [1] and turn the adjuster [2].

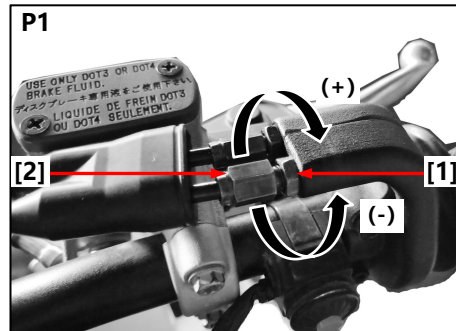
Turning the adjuster in the (-) direction will decrease the free play and turning it in the (+) direction will increase the free play.

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

If the correct free clearance is not obtained even after turning the adjuster to the bottom, return it to the (+) direction until it gently touches the bottom and turn it one turn to the (-) direction, then make more adjustments on the throttle side.

Nut [1] Torque.

5.0 N.m (0.5 kgf.m, 3.7 lbf.ft)



Note: P1 is factory edition, P2 is regular edition.

2. Throttle body side for significant adjustment

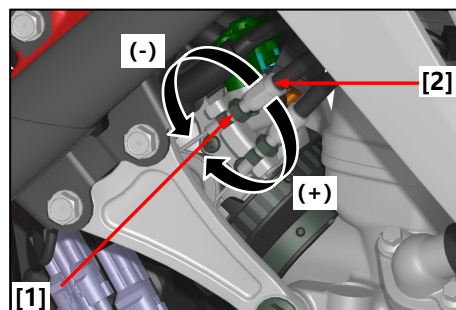
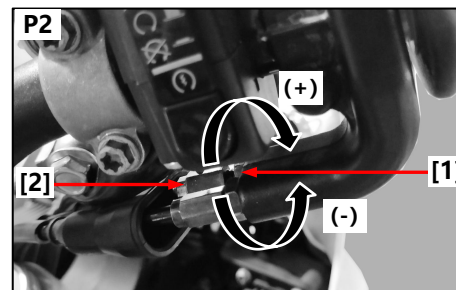
Loosen the intake throttle cable adjuster lock nut [1] and turn the adjuster [2] in the (-) direction to reduce free play and in the (+) direction to increase free play.

After adjustment, hold the adjuster and tighten the inlet throttle cable adjuster lock nut to the specified torque.

Torque.

4.0 N.m (0.4 kgf.m, 3.0 lbf.ft)

(The oil inlet cable and the oil return cable are adjusted the same)



Caution.

-Re-check that the throttle handle turns smoothly with no sticking.

※Inspection and damage lubrication of steel cable

The following procedures apply to all steel cables.

1. Inspection.

- Outer steel cable

Damage → Replace.

2. Check.

- Cable operation

Uneven movement → Lubrication.



Recommended lubricants
Engine oil or suitable steel cable
lubricant

Note: the end of a rope self-reliance, the number will be lubricant drops into the wire, or using the appropriate lubrication equipment.



• Damaged outer cables can cause corrosion and affect their operation. Replace the damage wire as soon as possible.



※Checking of the battery

Before operation.

The battery must be disconnected from the negative cable first, otherwise it will lead to short circuit of the battery.

Charging

Turn off all electrical appliances and engines.

Remove the battery.

Connect the charger to the battery and switch on the charger.

Turn off the appliance after charging and disconnect it from the battery.

Caution.

-If the vehicle is not in use, re-charge its battery every 3 months.

Battery model: MTX4L-FPP

Fully charged voltage: >13.2V

Required charging voltage: <12.8V

Charging current: Standard 2A Max 10A

Working temperature -20°C-60°C

Battery capacity: 12V/4Ah

Overall Dimension LxWxH:

113x69x85(2mm±)

General chassis and exhaust system

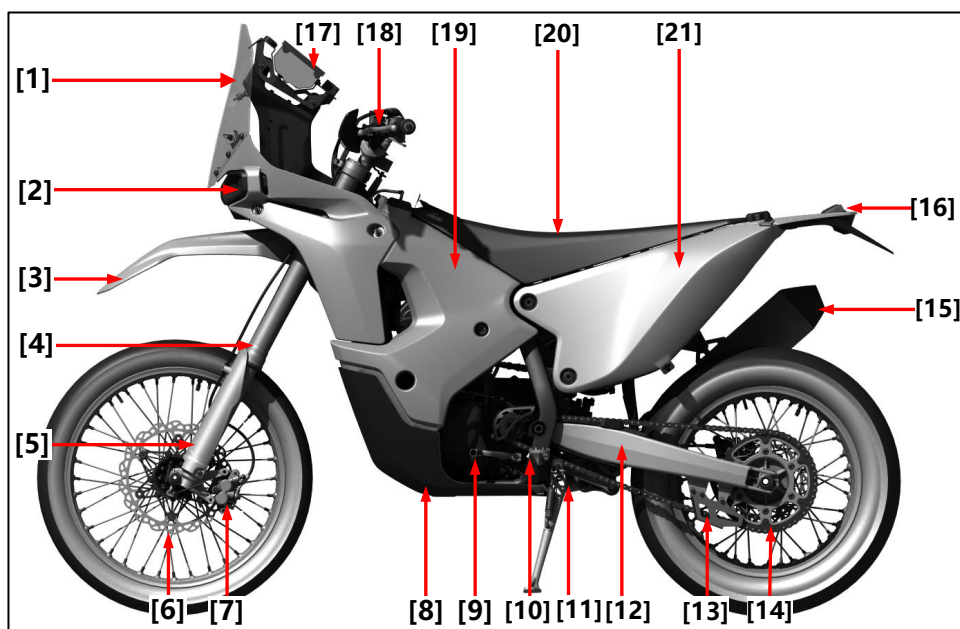
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Maintenance Information

Overview:

- This section introduces the disassembly and installation of body parts and exhaust system.
- When disassembling, label and store the installation fasteners to ensure they are reinstalled in their original positions.
- When installing the valve cover, ensure that the mating areas are correctly aligned before tightening the fasteners.
- After disassembling the exhaust system, be sure to replace the gasket with new one.
- When installing the exhaust system, first loosen all fasteners. Be sure to tighten the exhaust pipe nuts first, and then tighten the installation bolts.
- After installation, be sure to check for leaks and troubleshoot excessive exhaust noise.
- Exhaust system damage.
- Exhaust leaks, poor performance.
- Deformation.
- Muffler blockage.

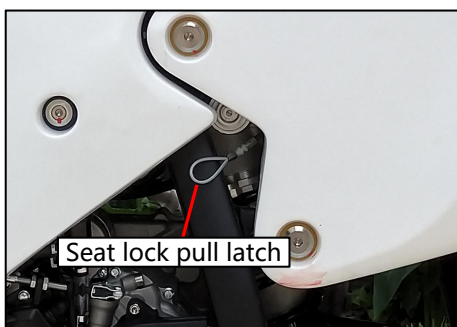
View of vehicle-left



(1) Cowlings	(8) Lower engine guard	(15) Muffler
(2) Headlight	(9) Shift shaft	(16) Rear position light
(3) Front mudguard	(10) Footrest	(17) Road box
(4) Front fork	(11) Side stand	(18) Clutch lever
(5) Front fork cover (left and right)	(12) Swingarm	(19) Front fuel tank-left
(6) Front brake disc	(13) Chain guide	(20) Seat cushion
(7) Front brake caliper	(14) Wheel sprocket and chain	(21) Rear fuel tank

To disassemble the vehicle in the specified order after power is disconnected:

Seat cushion→Cowlings→Front mudguard→Front brake hose platen→Front fork cover (left and right)→Engine lower guard→Headlight housing bracket→Headlight→Handlebar→Front left and right fuel tanks→Rear fuel tank→Wiring harness→Vehicle electronics→Front brake caliper →Front wheel→Front fork →Upper bracket→Lower bracket and steering head→Rear wheel →Rear brake caliper→Rear suspension components →Swingarm→Full exhaust system→Left and right radiators→Oil cooler→Air filter assembly →Throttle body assembly→Engine.

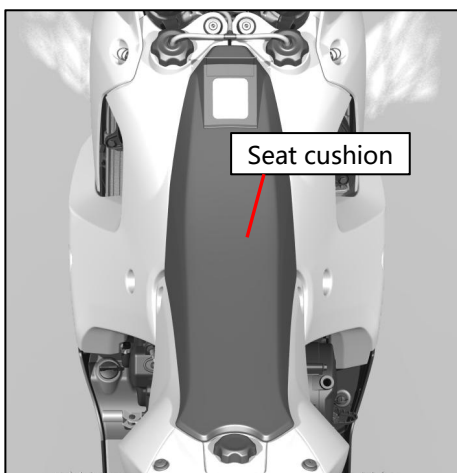


※ Seat cushion

Disassembly/Installation

Disassemble the following components:

Pull down the seat lock pull latch while lifting the rear end of the seat cushion upwards to disengage it from the lock mechanism. Then, remove the seat cushion by lifting it in a rearward and upward direction.



To install the seat cushion:

1. Insert the front and rear pin of the seat cushion assembly into the corresponding slots.
2. Align the seat cushion lock pin with the lock hole, press down on the rear part of the seat cushion, and the lock pin will insert into the lock hole and automatically lock in place. Gently pull upwards to ensure that the seat cushion is securely locked in position.
3. When the seat cushion is closed, the lock will automatically engage.

※ Cowlings

Disassembly/Installation

Disassemble the following components:

- To remove, undo the 1/4 turn quick-lock bolts (3 on each side) located at position [1] in Figure 1 and Figure 2.
- Remove the cowling assembly.

Installation is the reverse of the disassembly procedure.

Figure 1 [1]

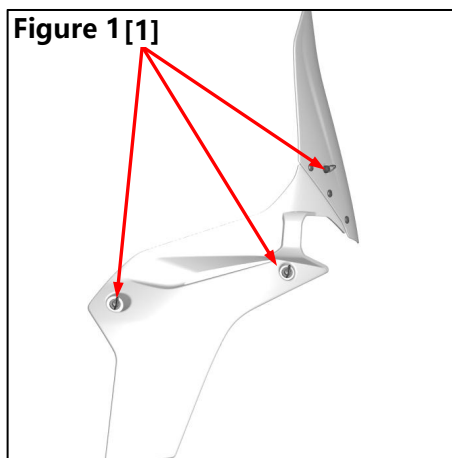
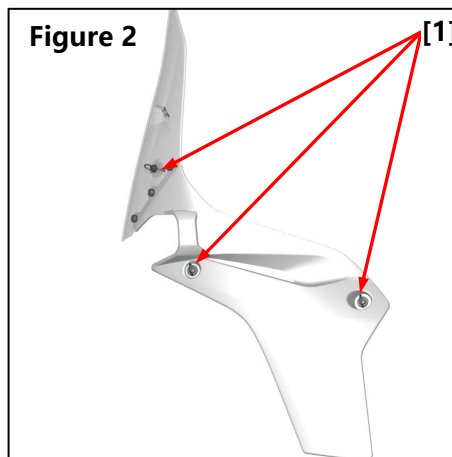


Figure 2



※ Front windshield

Disassembly/Installation

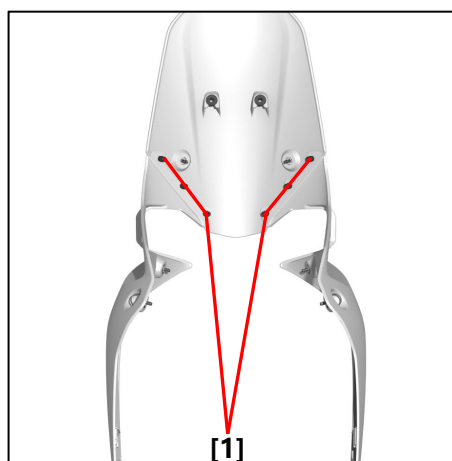
Disassemble the following components:

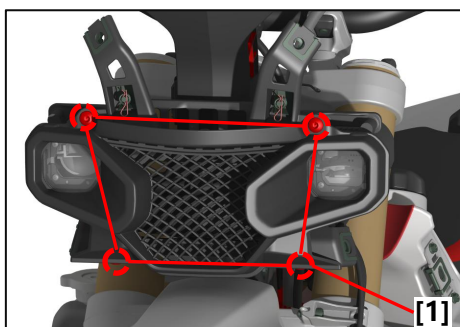
- Remove the 6 internal hexagon stepped screws [1].

Installation is the reverse of the disassembly procedure.

Note:

- Insert the protrusions in order from the front, being careful not to remove the gaskets.





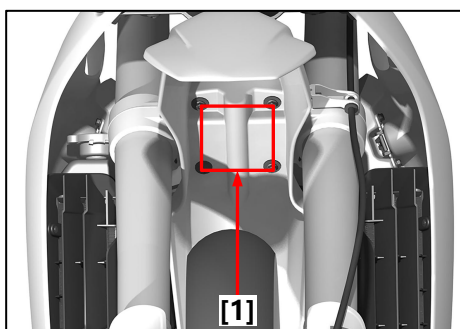
※ Headlight cover

Disassembly/Installation

Disassemble the following components:

- Remove the 4 internal hexagon stepped pan head screws [1].

Installation is the reverse of the disassembly procedure.



※ Front mudguard

Disassembly/Installation

Disassemble the following components:

- Remove the 4 internal hexagon with external hexagon flange bolts [1] and the 4 flat washers and 4 flanged sleeves.

Installation is the reverse of the disassembly procedure.

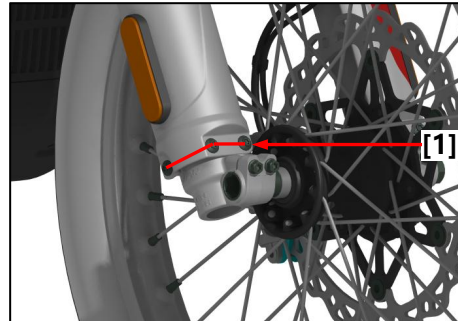
※ Front fork cover (left/right)

Disassembly/Installation

Disassemble the following components:

- Remove the 3 internal hexagon flower-shaped pan head screws [1].
- Remove the right front fork cover.
- The left side front fork cover is removed and installed in the same way as above.

Installation is the reverse of the disassembly procedure.



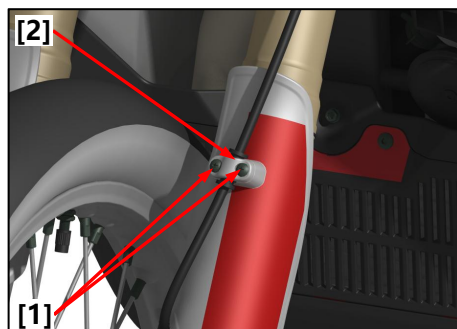
※ Front brake hose platen

Disassembly/Installation

Disassemble the following components:

- Remove 2 M5x10 internal hexagon flanged screws [1].
- Take off the hose platen [2].

Installation is the reverse of the disassembly procedure.





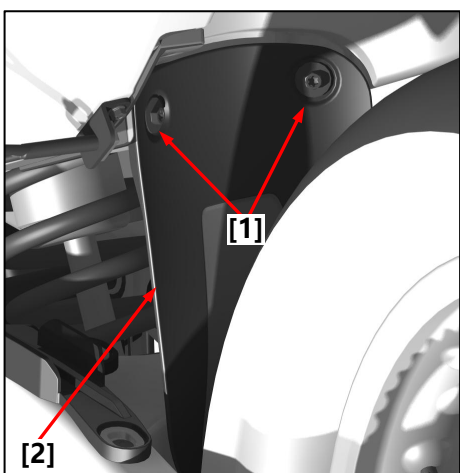
※ Rear fuel tank protection cover

Disassembly/Installation

Disassemble the following components:

- Remove 5 internal hexagon countersunk screws [1].
- Remove the rear fuel tank protection cover [2].

Installation is the reverse of the disassembly procedure.



※ Rear wheel mudguard

Disassembly/Installation

Disassemble the following components:

- Unfasten 2 internal hexagon with external hexagon flange bolts [1].
- Remove the rear wheel mudguard [2].

Installation is the reverse of the disassembly procedure.

Note:

- The rear wheel mudguard is made of rubber. Replace it if it is deformed or damaged.

※ Tail panel (factory model)

Disassembly/Installation

Disassemble the following components:

- Remove 2 internal hexagon pan head screws [1] at the position shown in Figure 1.
- Remove 2 tail bag installation bolts [2] at the position shown in Figure 1.
- Remove 3 cross-slot pan head self-tapping screws [3] at the position shown in Figure 2.
- Take off the tail panel [4].

Installation is the reverse of the disassembly procedure.

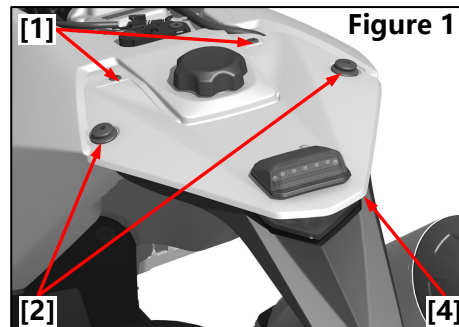


Figure 1

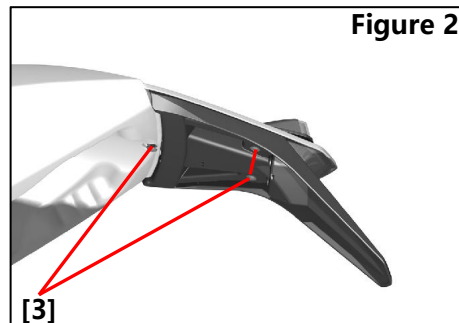


Figure 2

※ Rear mudguard section (factory model)

Disassembly/Installation

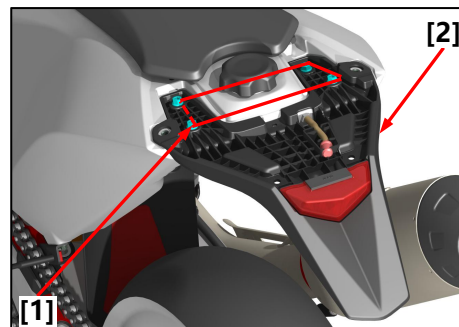
Disassemble the following components:

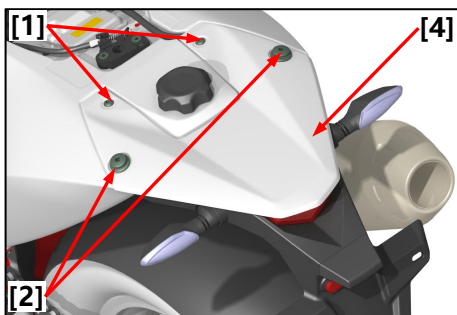
- Disconnect the tail light harness.
- Remove 4 internal hexagon with external hexagon flange bolts [1].
- Remove the rear mudguard section [2].

Installation is the reverse of the disassembly procedure.

Torque:

- Rear mudguard section to rear fuel tank connection bolt :
M8x25 15 N.m (1.5 kgf.ft, 11 lbf.ft)





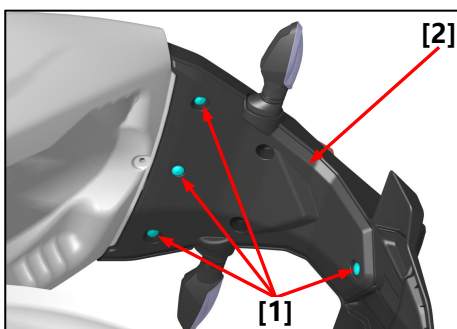
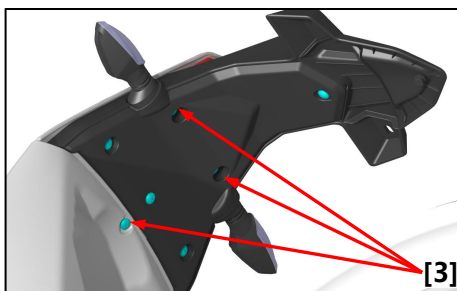
※ Tail panel (regular model)

Disassembly/Installation

Disassemble the following components:

- Remove 2 internal hexagon pan head screws [1].
- Remove 2 tail bag stepped bolts [2].
- Remove 3 self-tapping screws [3].
- Take off the tail panel [4].

Installation is the reverse of the disassembly procedure.



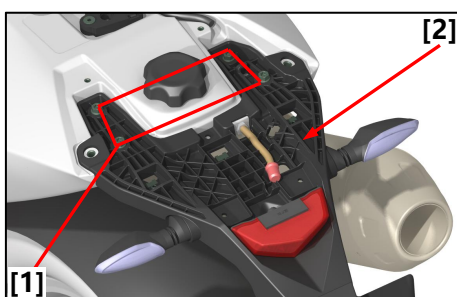
※ Rear mudguard rear section (regular model)

Disassembly/Installation

Disassemble the following components:

- Remove 4 self-tapping screws [1].
- Remove the rear mudguard rear section [2].

Installation is the reverse of the disassembly procedure.



※ Licence plate holder (regular model)

Disassembly/Installation

Disassemble the following components:

- Disconnect the tail light harness.
- Remove 4 internal hexagon with external hexagon flange bolts [1].
- Remove the licence plate holder [2].

Installation is the reverse of the disassembly procedure.

Torque:

- Licence plate holder to rear fuel tank connection bolt.
- M8x25 15 N.m (1.5 kgf.ft, 11 lbf.ft)

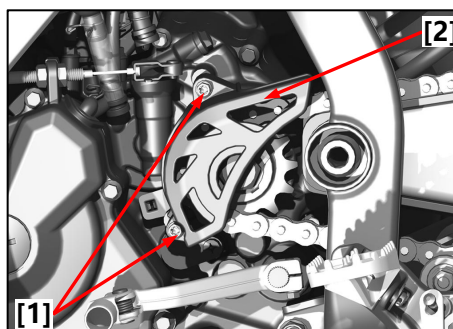
※ Drive sprocket cover

Disassembly/Installation

Disassemble the following components:

- Remove 2 drive sprocket cover bolts [1].
- Take off the drive sprocket cover [2].

Installation is the reverse of the disassembly procedure.



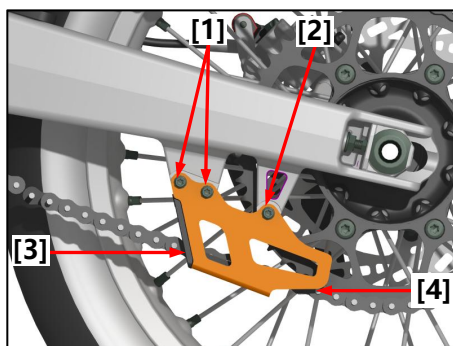
※ Chain guide

Disassembly/Installation

Disassemble the following components:

- Remove 2 M6x55 internal hexagon with external hexagon flange bolts [1].
- Remove 1 M6x12 internal hexagon with external hexagon flange bolt [2].
- Slide out the chain guide rubber [3].
- Remove the chain guide [4].

Installation is the reverse of the disassembly procedure.



Torque:

Chain guide installation bolts [1].

Chain guide installation bolts [2].

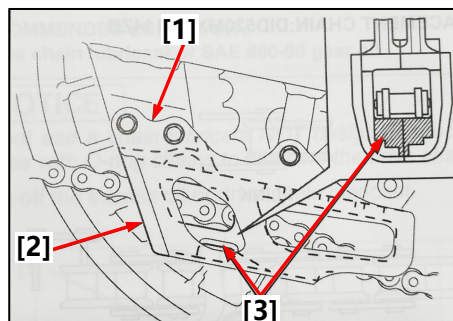
10 N.m (1.0 kgf.m, 7.0 lbf.ft)

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

Damage/deformation → replace.

Note:

- If the chain guide is deformed, it may contact the drive chain, causing the chain to come off, wear, or produce noise. Check if the chain guide rubber [2] is worn. If the rubber is worn to the position indicated by the wear limit mark [3], replace the chain guide rubber.



※ Chain guide wheel

Check if the chain guide wheel [1] is excessively worn or if the wheel bearing is stuck.

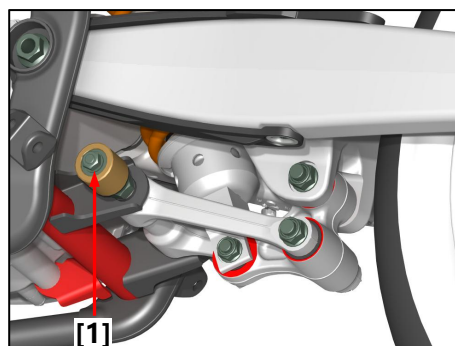
If necessary, replace it.

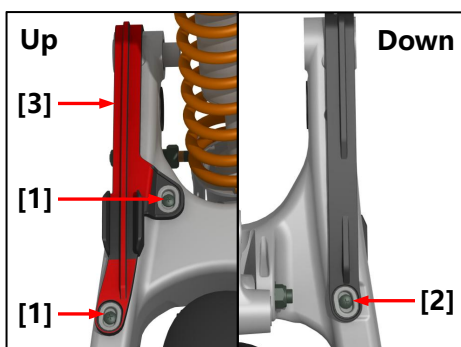
Wear limit: 2 mm.

Note:

When disassembling, be sure to use new bolts and nuts.

Torque: Tighten the chain guide wheel nut 22 N.m (2.2 kgf.m, 18 lbf.ft)





※ Drive chain guide

Disassembly/Installation

Disassemble the following components:

- Remove 2 cross-slot pan head screws on the swingarm [1], [2].
- Remove 1 cross-slot pan head screw on the swingarm [3].
- Take off the drive chain guide [4].

Installation is the reverse of the disassembly procedure.

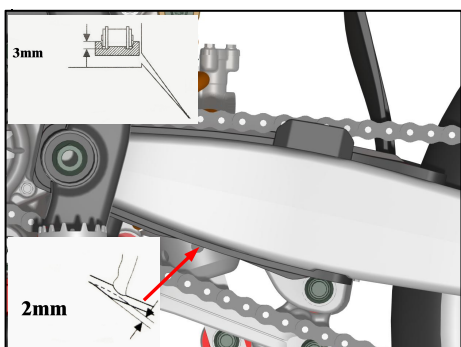
Torque:

Drive chain guide installation screws x3 [1].
8.0 N.m (0.8 kgf.ft, 6.0 lbf.ft)

Check if the chain guide is excessively worn. Wear limit should not be exceeded:

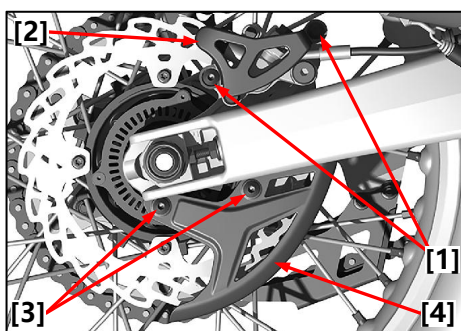
Upper: 3 mm

Lower: 2 mm



Note:

- Replace the chain guide if it exceeds the wear limit.
- If the chain guide is worn to the limit or damaged, it may damage the swingarm or drive chain.



※ Rear caliper cover/rear disc cover

Disassembly/Installation

Disassemble the following components:

- Remove 2 screws [1] and take off the caliper cover [2].
- Remove 2 screws [3] and take off the rear disc cover [4].

Installation is the reverse of the disassembly procedure.

Note: The regular model does not have a rear disc cover.

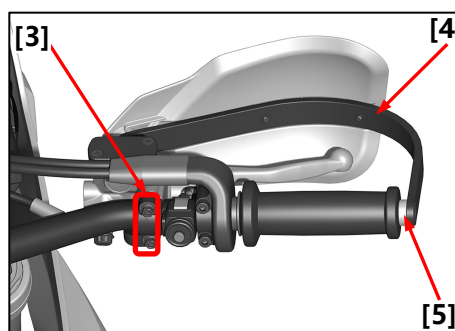
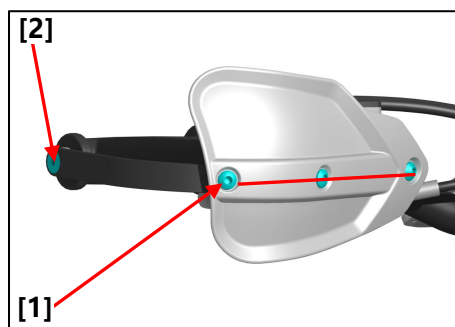
※ **Handguard- (left/right)
(factory model)**

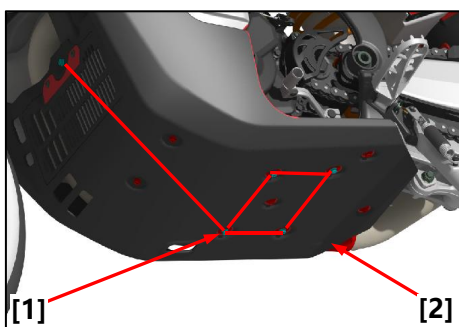
Disassembly/Installation
Disassemble the following components:

- Remove 3 internal hexagon stepped screws [1].
- Remove internal hexagon countersunk screw [2].
- Remove 2 internal hexagon with external hexagon flange bolts [3].
- Take off the handguard bracket [4].
- Remove the handguard bush [5].
- The left and right removal/installation methods are the same.

Installation is the reverse of the disassembly procedure.

Note: The regular model does not have a handguard.



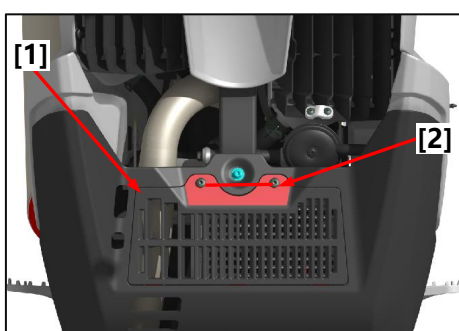


※ Lower engine guard

Disassembly/Installation
Disassemble the following components:

- Remove 5 internal hexagon with external hexagon flange bolts [1].
- Take off the lower engine guard [2].

Installation is the reverse of the disassembly procedure.

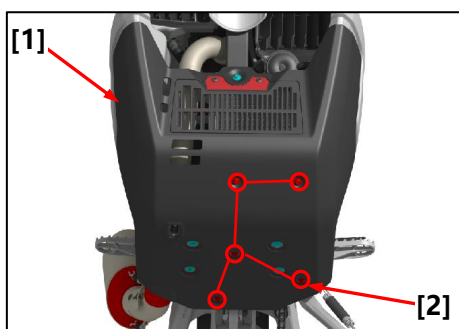


※ Oil-cooler grille

Disassembly/Installation
Disassemble the following components:

- Remove 2 internal hexagon screws [1].
- Take off the oil-cooler grille [2].

Installation is the reverse of the disassembly procedure.

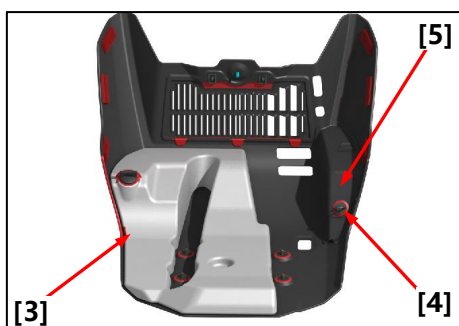


※ Emergency drinking water reservoir (Only factory model)

Disassembly/Installation
Disassemble the following components:

- Remove the lower engine guard [1].
- Remove 5 internal hexagon with external hexagon flange bolts [2].
- Take off the emergency drinking water reservoir [3].

Installation is the reverse of the disassembly procedure.



※ Tool box cover

Disassembly/Installation
Disassemble the following components:

- Unscrew the 1/4-turn quick-lock bolt [4].
- Remove the tool box cover [5].

Installation is the reverse of the disassembly procedure.

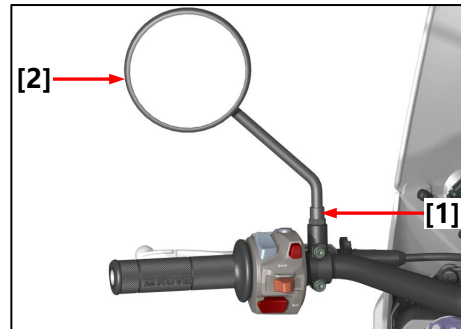
※ Rearview mirror (Regular model)

Disassembly/Installation

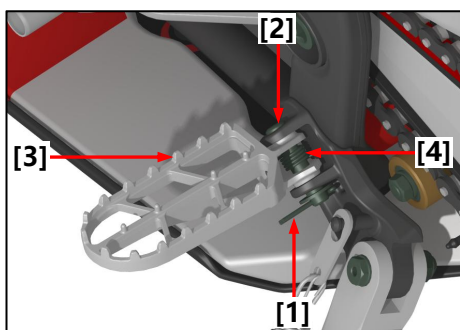
Disassemble the following components:

- Loosen the nut [1].
- Rotate the rearview mirror until it is removed [2].
- The removal and installation of the right rearview mirror is the same as the left.

Installation is the reverse of the disassembly procedure.



Note: The factory model does not have rearview mirrors.



※ Footrest

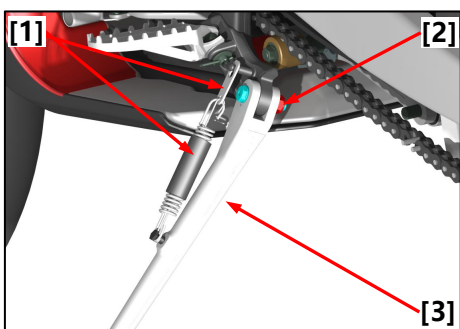
Disassembly/Installation

Disassemble the following components:

- Remove the split pin and washer [1].
- Remove the footrest pin [2].
- Take off the footrest [3] and torsion spring [4].
- The left and right installation/removal methods are the same.

Installation is the reverse of the disassembly procedure.

The factory and regular model have the same installation/removal process.



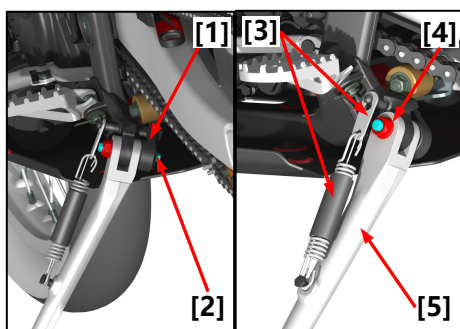
※ Side stand (Factory model)

Disassembly/Installation

Disassemble the following components:

- Remove the side stand spring and side stand installation bracket [1].
- Remove the nut [2] and take out the bolt.
- Remove the side stand [3].

Installation is the reverse of the disassembly procedure.



※ Side stand (Regular model)

Disassembly/Installation

Disassemble the following components:

- Disconnect the side stand switch [1].
- Remove the fastening bolt for the switch [2].
- Remove the side stand spring [3] and side stand installation bracket [4].
- Remove the nut [5] and take out the bolt.
- Remove the side stand [5].

Installation is the reverse of the disassembly procedure.

※ Exhaust system (regular model)

1. Exhaust pipe middle section and muffler

Disassembly/Installation

Disassemble the following components:

- Remove the clamp bolt [1].
- Remove the muffler locking bolt [2].
- Take off the muffler [3].
- Remove the exhaust pipe middle section bolt [4].

- Loosen the clamp bolt [5].

- Remove the middle section [6].

Installation is the reverse of the disassembly procedure.

2. Exhaust pipe front section

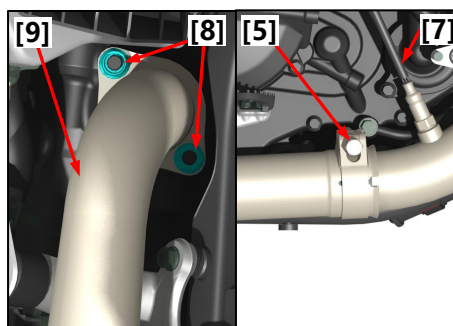
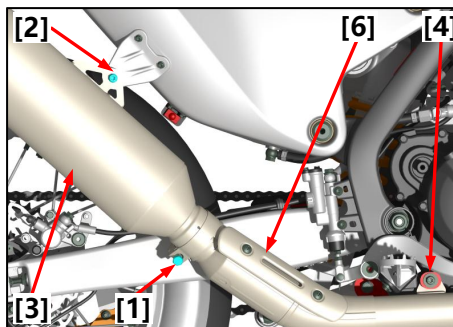
Disassembly/Installation

Disassemble the following components:

- Disconnect the oxygen connector [7].
- Remove the front section nut [8].
- Take off the front section [9].

Check:

- Exhaust gaskets, sealing washers:
Exhaust leakage → replace.
- Exhaust pipe and muffler:
Cracks/damage → replace.



※ Exhaust system (factory model)

Muffler and exhaust pipe

Disassembly/Installation

Disassemble the following components:

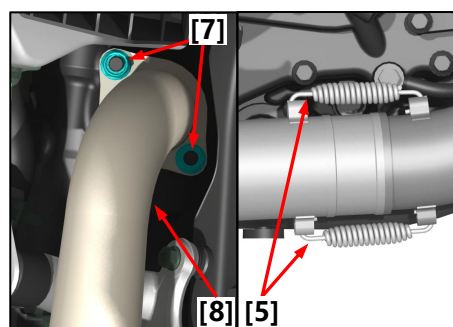
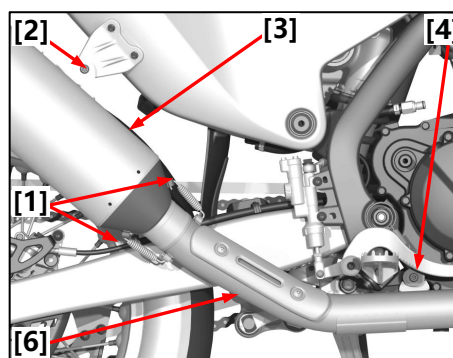
- Remove the muffler tension spring [1].
- Remove the muffler locking bolt [2].
- Remove the muffler [3].
- Remove the exhaust pipe middle section bolt [4].
- Remove the middle section and front section tension springs x2 [5].
- Remove the middle section [6].
- Remove the front section fastening nut [7].
- Remove the front section [8].

Check:

- Exhaust gaskets:
Exhaust leakage → replace.
- Exhaust pipe and muffler :
Cracks/damage → replace.
- Exhaust tension spring :
Fractured/damaged → replace.

Note:

Wait for the exhaust system to cool down before performing removal to avoid burns.



EFI

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8 Fault Code List.....	123

1. Overview:

-This section introduces the EFI system service of MSE8.0, which is equipped with self-diagnostic function, when troubleshooting, please check and troubleshoot according to the fault diagnosis code and fault phenomenon.

-EFI system failure is usually related to poor connector connection or connector corrosion, please check the connector before troubleshooting.

Caution.

- During the repair process, it is prohibited to disassemble the parts of the EFI system.

- Repair process, take electronic components (electronic control unit, sensors, etc.), be very careful not to let them fall, and do not touch the electrical components pin parts to avoid damage caused by electrostatic breakdown.

- Do not arbitrarily remove any parts of the EFI system plug-in from its installation position to avoid accidental damage or water, oil and other foreign objects into the plug-in, affecting the normal work of the EFI system.

- When disconnecting and connecting the plug-in, be sure to put the ignition switch in the off position, otherwise it will damage the electrical components.

- As the idle speed adjustment is completely completed by the EFI system, no manual adjustment is required. The throttle limiting screw of the throttle body has been adjusted at the factory, and the user is not allowed to change its initial position at will.

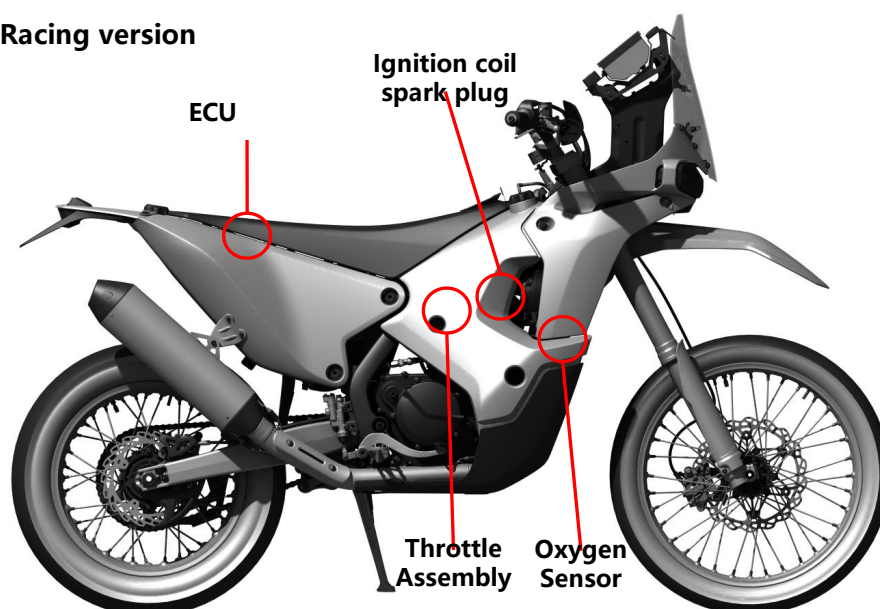
-The car adopts the trigger signal of 24-2 teeth to identify the speed.

The following color codes used are indicated through this section

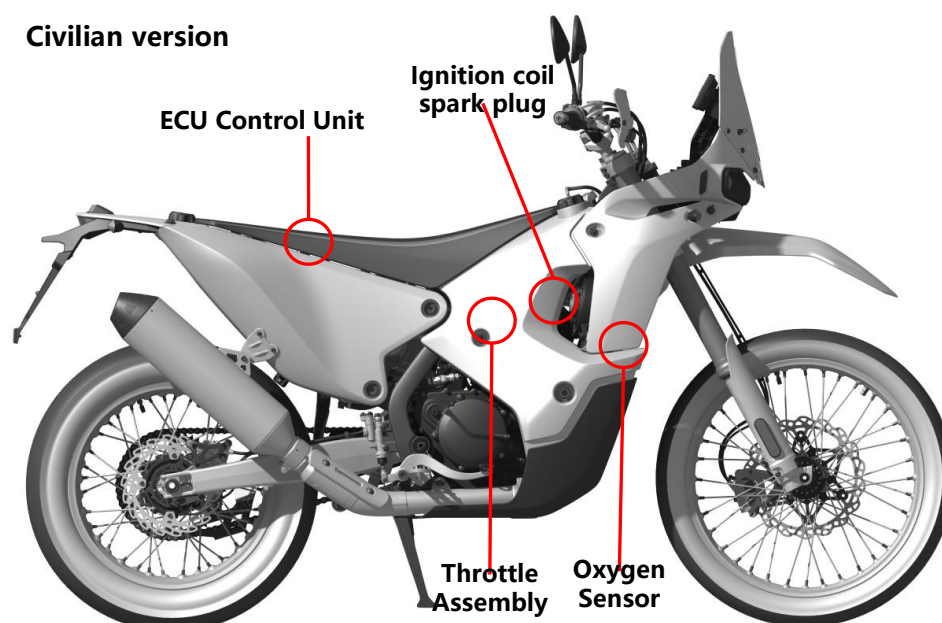
Bl=black	G=green	Lg=light green	R=red	Y=yellow
Br=brown	Gr=gray	O=orange	V=violet	
Bu=blue	Lb=light blue	P=pink	W=white	

2. System location

Racing version



Civilian version



3. EFI system-related components

3.1 ECU electronic control unit

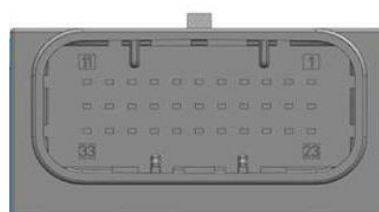
The electronic control unit is the brain of the entire EFI system and electrical appliances. It analyzes and processes the various information provided by the sensors and sends the resulting conclusions in the form of commands to the actuators so that the engine runs in an optimal state.

Caution.

-Do not allow to add load to the housing or to the cover: take it gently and do not allow to drop it on the ground.



ECU Form Factor



Function of each ECU pin.

ECU Connector Outline View

PIN-NO	SIGNAL	FUNCTION	PIN-NO	SIGNAL	FUNCTION
1	A_P_LSVK	Upstream oxygen sensor 1 heating	18	A_S_MIL	MIL灯
2	A_P_STPA	Stepper motor A	19	A_S_IIR	Headlight relay (competitive version)
3	E_F_VSIN	Speed signal input (civilian version)	20	E_A_LSVK1	Upstream oxygen sensor 1
4	U_U_UBD	UBD continuous power supply	21	E_A_DKG	Throttle position sensor
5	E_F_DGA	Engine speed sensor A terminal	22	NC	Reserved
6	E_F_DGB	Engine speed sensor B terminal	23	NC	Reserved
7	M_M_GND1	Power ground 1	24	A_P_STPC	Stepper motor C
8	E_A_DS	Intake pressure sensor	25	A_P_STPB	Stepper motor B
9	A_P_NMOT	Engine speed output	26	E_S_KL15	Ignition Switch
10	M_M_GND2	Power ground 2	27	M_R_SEN	Sensor ground
11	A_P_ZUE1	Ignition coil 1	28	A_S_REL	Oil Pump Relay
12	A_P_EV1	Injector 1	29	A_S_MR	Main Relay
13	A_P_STPD	Stepper motor D	30	E_A_DUMP	Dump switch DUMP
14	E_S_NGEAR	Neutral switch	31	E_S_RES1	Side support switch
15	A_U_5V1	5V power supply1	32	E_A_TMOT	Engine coolant temperature sensor (water temperature sensor)
16	B_D_CANL	CAN communication line low	33	E_A_TANS	Intake air temperature sensor
17	B_D_CANH	CAN communication line height			

Ignition coil shape drawing

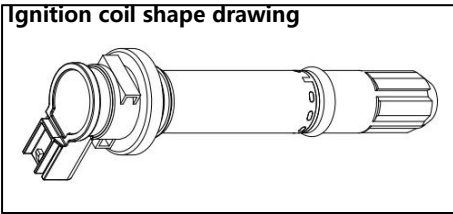
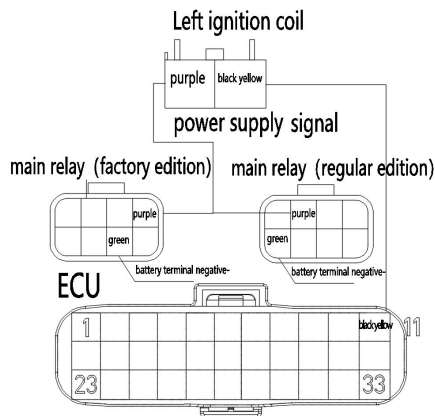


Fig. 1



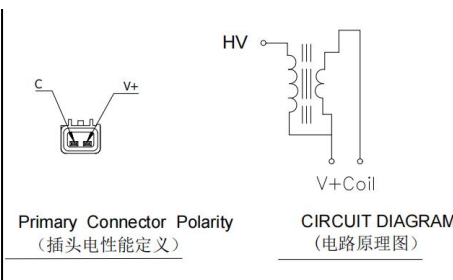
3.2 Ignition Coil

The ignition coil converts the low voltage electricity from the primary winding to the high voltage electricity from the secondary winding, which is discharged through the spark plug to produce a spark that ignites the fuel mixture in the cylinder.

Definition of the function of each pin.

Power: connects to the main relay (violet)
Signal: connect to ECU pin 11 (black and yellow)

Figure 1: shows the wiring diagram of the ignition coil and ECU.



Measure the secondary ignition voltage.

Connecting the engine according to the EFI schematic.
Connecting the peak voltage measuring instrument according to the diagram.
Start the engine.
After starting, the secondary ignition voltage should be $>22,500V$.

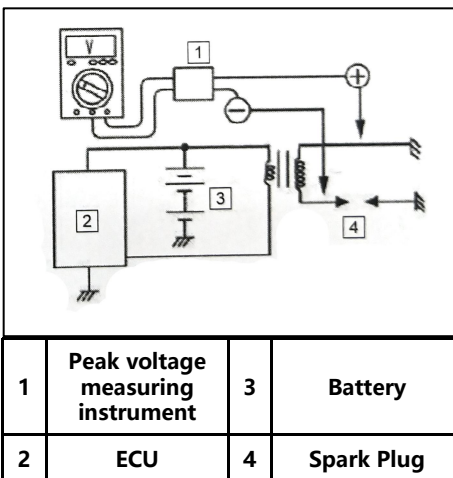
Ignition coil parameter table

1. Static parameters

Primary resistance: $1.3 \pm 10\% \Omega$
Secondary resistance: $8.7 \pm 10\% K\Omega$
Primary inductance: $3.0 \pm 15\% mH$
Secondary inductance: $16 \pm 15\% H$

2.Dynamic parameters.

Supply voltage: $14 \pm 0.5V$
Primary current: $7 \pm 0.9A$
Ignition pulse width: $2.05 \pm 0.5msec$
Secondary high voltage: MIN22.5KV 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

3.3 Spark plug

Caution.

-Before removing the spark plug use an air gun to blow and clean the spark around the plug base and also make sure that no dust has fallen into the cylinder.

1. Check.

• Spark plug type
Incorrect → Replace.
Manufacturer / Model
NGK/LMAR8A-9CR8E

2. Check.

- Electrode "1"
Damaged / depleted → Replace the spark plug.
- Insulator "2"
Abnormal color → Replace the spark plug.
Normal color should be tan or light tan.

3. Cleaning.

- Spark plugs
(Use spark plug cleaner or wire brush)

4. Measurement.

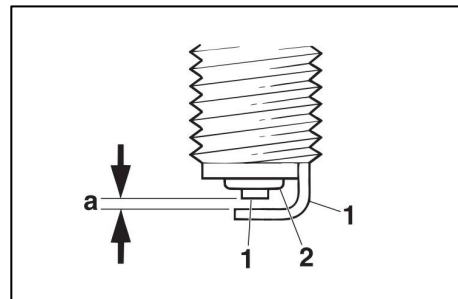
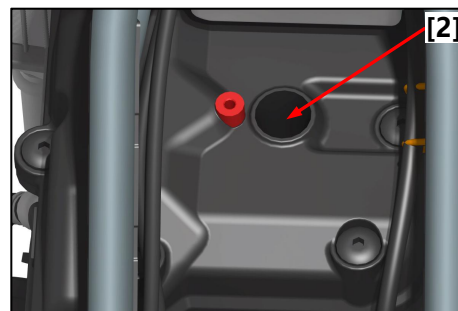
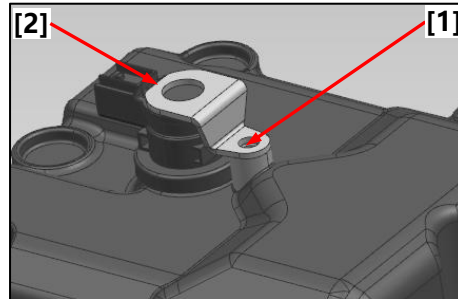
- Spark plug gap "a"
(Thickness gauge measurement)
Out of specification → Adjust the gap.
Spark plug gap
0.80-0.90 mm (0.031-0.035 in)

5. Installation.

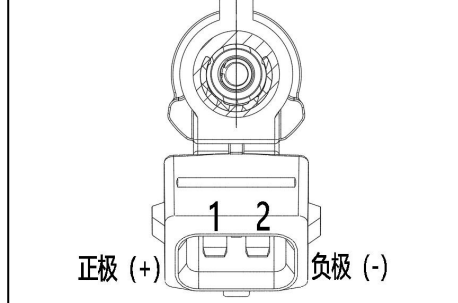
- Spark plugs
Install spark plugs tightened to specified torque of
13 N-m (1.3 kgf-m, 9.6 lb-ft)

Caution.

-Clean the spark plug and gasket surfaces before installing the spark plugs.



Injector profile drawing



3.4 Injector

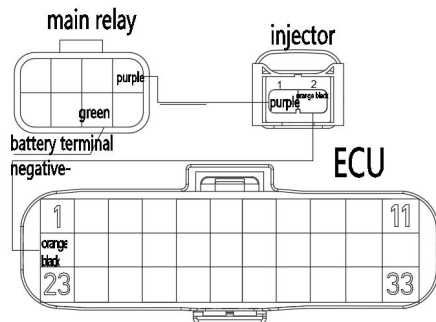
One end of the injector is mounted on the injector holder, and the other end is connected to the fuel pipe through the injector cap. It injects fuel within the specified time according to the instruction of ECU, by which fuel is supplied to the engine and atomized. This injector adopts four-hole injection and shall not be rotated after fixing the card spring.

Definition of the function of each pin.

- 1: Positive (+) connected to the main relay (purple)
- 2: Negative (-) connects to pin 12 of ECU (orange and black)

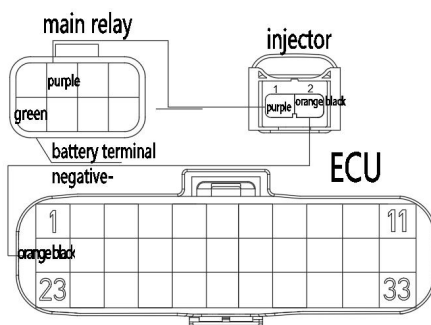
factory edition wiring diagram

Fig1



regular edition wiring diagram

Fig1



Injector resistance: $12.5\Omega \pm 5\%$

Fig 1: shows the wiring diagram of the injector and ECU

Tips 1. in order to avoid contamination of the injector injection area, the injector inlet end should always be located above the outlet end (at the injector installation location on the entire vehicle).

- 2. In order to achieve the best injector assembly, clean silicone-free engine oil must be used to lubricate the upper and lower O-ring circumference; lubricant must not contaminate the injector interior and spray holes;
- 3. Removal and reassembly of the injector must be replaced when the O-ring, the operation does not allow damage to the sealing surface.

Injector installation.

Injector installation by hand, prohibit the use of hammer and other tools to knock

O-ring must be replaced when removing and installing the injector. when disassembling the injector, if necessary, first carry out pressure relief treatment.

After installing the injector, carry out the sealing test to ensure that there is no leakage.

3.5 Fuel Pump

The fuel pump assembly and the wiring diagram of the connection with the fuel pump relay ECU.

This fuel pump assembly integrates a fuel pump, a plastic holder coarse and fine filter and a regulator, which works to pump fuel from the fuel tank to the engine at a certain oil pressure and flow rate.

Function definition of each pin.

1: connected to the fuel pump relay output (+) (brown-green)

2: Connected to the negative terminal of the battery (-) (green)

Performance parameters.

Regulator opening pressure:

$0.33 \pm 0.01 \text{ mpa}$

When the flow rate is 40L/h, the corresponding rated pressure value $330 \pm 10 \text{ kPa}$

This fuel pump assembly is installed at the bottom of the fuel tank on the left front side of the vehicle.

Do not run the fuel pump assembly in the no-load, no-oil condition to avoid damage.

Hold it gently when installing or disassembling, and do not drop it to the ground.

Measuring oil pressure

Connect the oil pressure gauge to the fuel pump assembly outlet, and lock it with clamps to ensure that there is no leakage at the combination Press the ignition off switch, the fuel pump will work for 5 seconds and then stop rotating.

Fuel line pressure relief treatment

The fuel supply pressure of the EFI system is high, and all fuel lines are made of high-pressure resistant fuel lines, so even if the engine is not running, the fuel line also maintains a high pressure, so only during the repair process, note: do not easily disassemble the fuel line: when repairing the fuel system in need of repair, remove the fuel line before the fuel system should be unpressurized, as follows: remove the fuel pump relay, or remove the fuel pump harness connector 2P (Black), start the vehicle and idle until the engine turns off on its own.

Fuel pump outline drawing

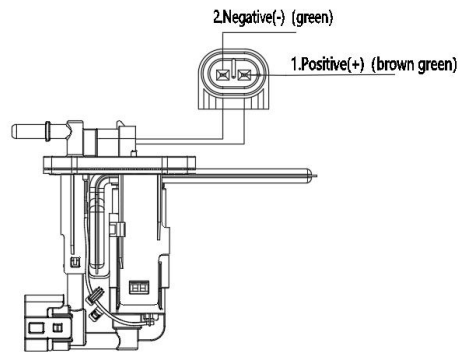


Fig1

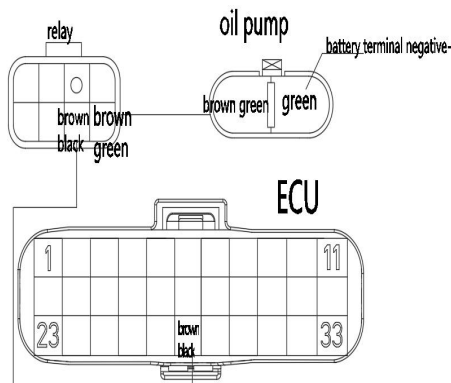
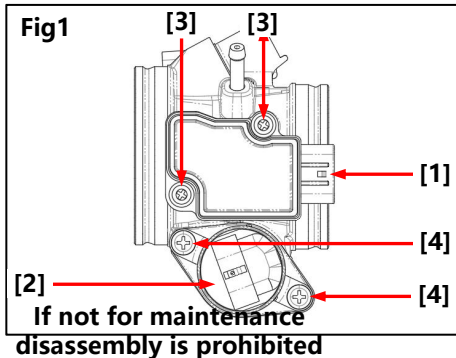
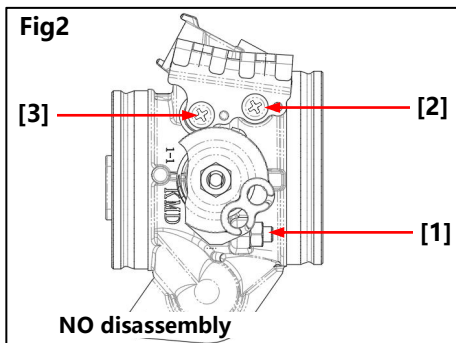


Figure 1: shows the wiring diagram of the fuel pump and ECU.



Three in one sensor mounting screw specifications.
M4x12 screw
Screw tightening torque at position [3]:
 $2.0 \pm 0.4 \text{ N.m}$
Stepper idle motor mounting screw specification: M4x12 screw
M5x14 spring pad combination screw
Screw tightening torque at position [4]:
 $4.0 \pm 0.4 \text{ N.m}$



Specification for installation of the pull wire bracket: M5×10 screws.
Screw tightening torque at position [2]
 $3.5 \pm 0.5 \text{ N.m}$
Screw tightening torque at position [3]
 $4.5 \pm 0.3 \text{ N.m}$

Throttle valve body inspection.

1. flexible movement of the throttle plate, no stalling.
2. throttle body and the oil and gas channel without foreign matter (foreign particles size $< 0.34 \text{ mm}$).
3. Each product without omissions, misgrouping, under-products, internal parts installed securely without falling off.
4. Throttle screw fastening reliable, no loose.

3.6 Throttle Body Assembly

Connects the air filter and engine, controls the opening and closing angle of the throttle plate by the throttle cable, and sends the turning angle signal to the ECU by the throttle position sensor.

As shown in figure 1 on the right sensor locations.

1. intake air temperature, intake air pressure, throttle position [1];
2. Idle speed stepper motor [2];

Sensor installation precautions.

1. The terminals must not be sticky with water, oil and other liquids.
2. Do not contact with harmful gases (Cl , SO_2 , etc.).
3. Do not use falling parts.
4. Do not use external force to deform or break the parts.
5. Do not allow direct contact with the terminals (to prevent static electricity).
6. When cleaning the throttle, the pressure channel must be blocked.

As in Fig 2 idle speed limit screw [1] is not allowed to be adjusted.

警告

- Engine idle speed is completely adjusted by EFI system, manual adjustment of idle speed limit bolt is not allowed.
- It is not allowed to add load on the shell or cover.
- Take it lightly when disassembling and do not allow it to fall on the ground.

3.7 Three-in-one sensor

Intake air temperature

The intake air temperature sensing element is a negative temperature coefficient (NTC) resistor, the resistance of which varies with the intake air temperature.

This sensor delivers a voltage to the ECU controller that indicates the change in intake air temperature.

Intake Pressure

Monitors intake tube pressure to provide the ECU with information on engine load.

Throttle Position

This sensor is used to provide throttle angle information to the ECU. Based on this information, the ECU can obtain engine load information, operating condition information (e.g., start, idle, reverse tow, part load, full load), and acceleration and deceleration information.

Fig 1: shows the wiring diagram of the 3-in-1 sensor and ECU.

Characteristic parameters of intake air temperature sensor

Operating temperature: -40°C/+130°C

Rated voltage: pull-up resistor 1 k operating at 5V or at a constant current of 1mA

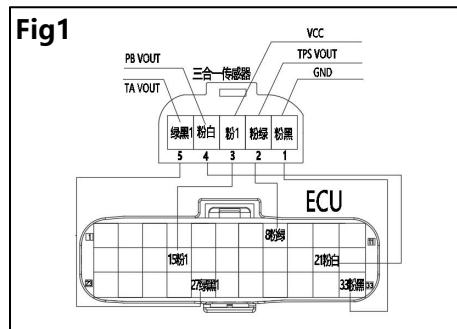
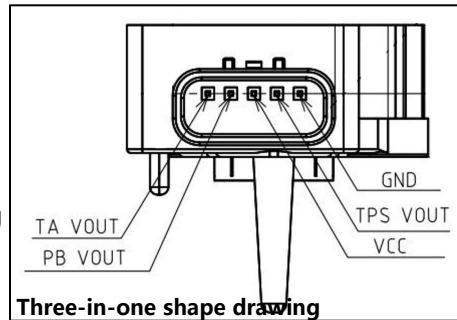
20°C rated voltage: 2.5 kΩ ± 5%

Characteristic parameters of pressure sensors

Parameters	value			Unit
	Minimum	Typical	Maximum	
Pressure test range	10		115	kPa
Operating temperature	-40		130	C
Supply Voltage	4.75	5.0	5.25	V

Throttle position sensor characteristics parameters

Quantity	value			Unit
	Minimum	Typical	Maximum	
Total resistance (pins 1-2)	1.6	2.0	2.4	KΩ
Supply voltage		5		V

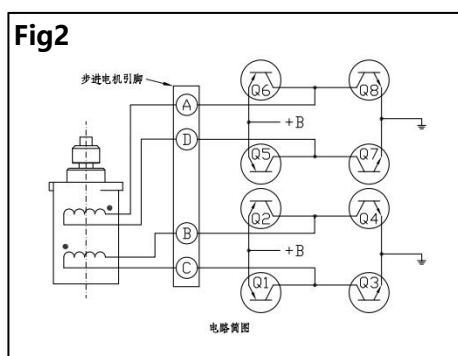
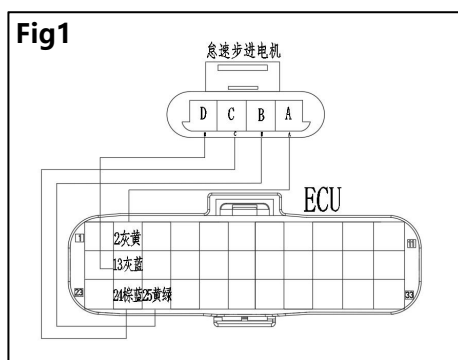
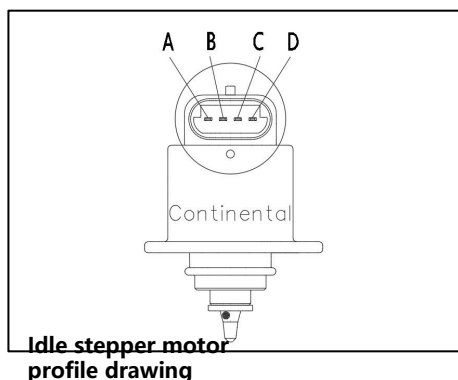


Function definition of each pin.

1. Intake air temperature signal output (GND) (pink and black)
2. Intake air pressure signal output (TPS VOUT) (pink-green)
3. Connected to 5V power supply (VCC) (pink 1)
4. Throttle position signal output (PB VOUT) (pink white)
5. Ground (TA VOUT) (green-black 1)

Installation.

The permissible installation range, which ensures that condensation does not form inside the sensor, as condensation can damage the sensitive components inside the sensor.



3.8 Idle stepper motor

Control the flow of bypass airflow, stepper motor by the ECU according to the engine load, through the engine sensor to control the stepper motor in different operating conditions, the injection volume is also different, so the stepper motor is needed to make up the air intake, so it should be connected according to the specified connection, otherwise it may cause unstable idle speed.

Function of each pin.

Stepper motor pin A / connected to the ECU's 2 (gray-yellow)

Stepper motor pin B / connected to the ECU's 25 (yellow-green)

Stepper motor pin C / connected to the ECU's 24 (brown-blue)

Stepper motor pin D / connected to the ECU's 13 (gray-blue)

Fig 1: The wiring diagram for the idle stepper motor and ECU.

Fig 2: The circuit diagram for the idle stepper motor.

The following table shows the characteristic parameters of the idle stepper motor.

Characteristic parameters			
NO	Item	Spec	Terms
1	Rated Voltage	12V DC	
2	Mini/maxoperating voltage	7.5V-14V	
3	Phase Resistor	$53 \pm 5.3\Omega$	27°C
4	Operating temperature	-40°C-125°C	

3.9 Oxygen sensor

This sensor is used in the feedback system of the electronically controlled fuel injection device to achieve closed-loop control and improve the accuracy of the ECU's control of the air-fuel ratio, which is installed on the front section of the exhaust pipe to determine the oxygen content in the exhaust gas to determine whether the gasoline and air are completely combusted to ensure that the three-way catalytic converter has the maximum conversion efficiency of HC CO and NOx in the exhaust.

Fig 1: shows the wiring diagram of oxygen sensor and ECU.

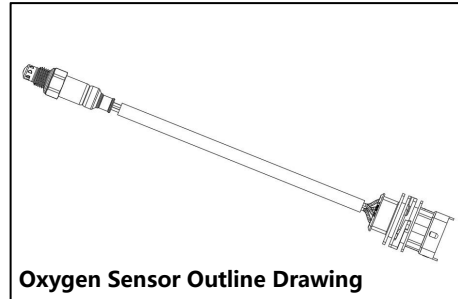
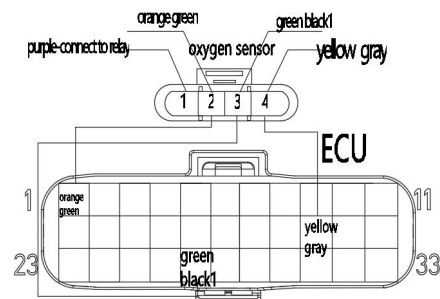
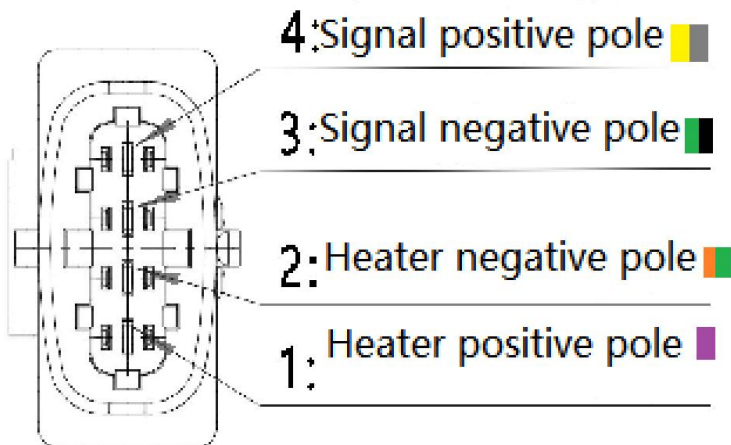
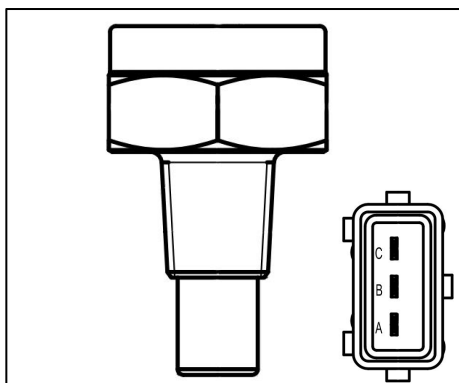


Fig1



Definition of each pin function.

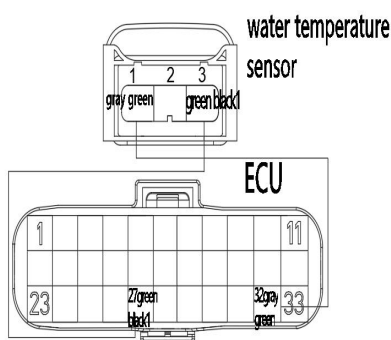




Water temperature profile

- A: Temperature sensor signal +
- C: Signal ground-

Fig1



3.10 Engine water temperature sensor

This sensor is two sets of negative temperature coefficient (NTF) thermistor, its resistance value decreases with the increase of coolant temperature, but not a linear relationship. One group is provided to the ECU to monitor the thermal status of the engine, and A group is provided to the ECU for the water temperature signal.

Definition of the function of each pin.

- A:Signal + connected to ECU pin 32 (grey-green)
- C:Signal - connect to ECU pin 27 (green and black 1)

Fig 1: The wiring diagram for the water temperature sensor and ECU.

ECU resistance value parameter			
Temperature range °C±1	Resistance value (kΩ)		
	Min	Standard	Max
-20	13.65	14.93	16.33
20	2.286	2.435	2.591
80	0.306	0.316	0.327
100	0.178	0.183	0.187

The table on the left shows the characteristics of the temperature and the signal is transmitted to the ECU.

3.11 Sway sensor

The role of this sensor for the side tilt protection, that is, when the car side tilt angle exceeds the allowable angle ($65^{\circ} \pm 10^{\circ}$), OUT pin signal to the ECU, the ECU control engine off, so as to achieve the protection of the driver and the vehicle.

As Fig 1: Install with the UP logo facing up.

Racing version pin function definition.
VDD: connected to the negative battery terminal - (green)
OUT: connect to ECU30 # pin (yellow 4)
GND: connected to the main relay (purple)

Pin function definition for civilian version.
VDD: connected to the negative battery terminal - (green)
OUT: connect to ECU30 # pin (yellow 4)
GND: connected to the power supply (purple)

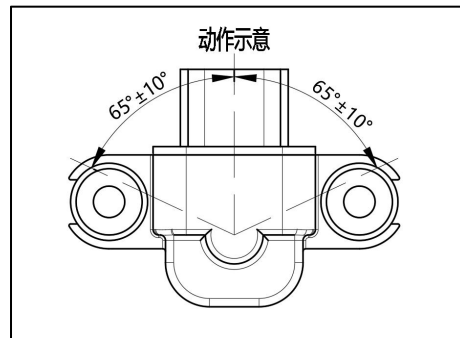
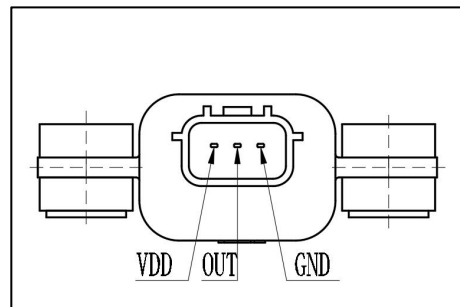
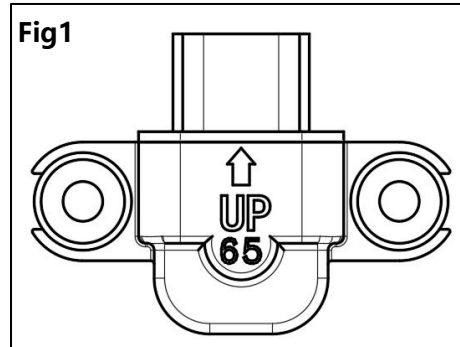
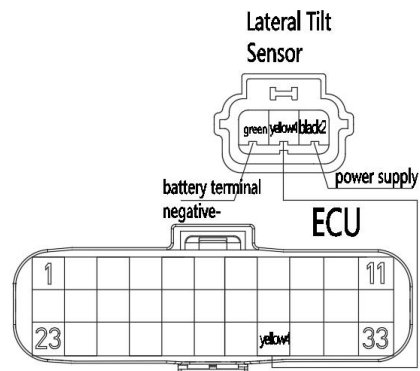
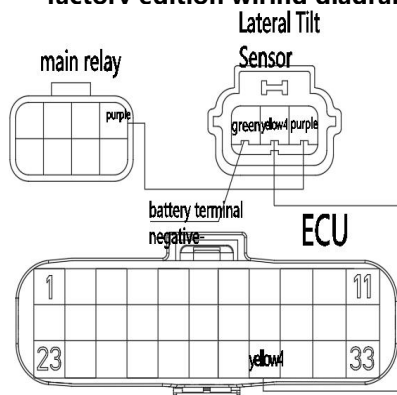


Fig1



regular edition wiring diagram

factory edition wiring diagram



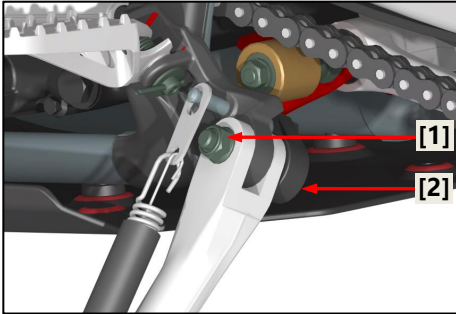


Fig1

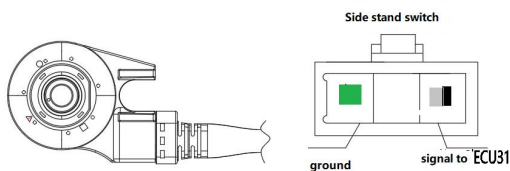


Fig 1: shows the wiring diagram of the side bracket switch and ECU.

3.12 Side bracket switch

Check

Disconnect the side stand switch 3P (white) connector [1].

Check the switch side connector terminal.

The vehicle can be started normally when the side stand is lowered, and automatically turns off after shifting. When the side stand is retracted, the vehicle can be started and driven normally in gear.

Removal/Installation

Remove the following parts.

- Disconnect the side bracket switch connector and remove the side bracket wiring harness from the frame.

- Remove the bolt [1] and side switch [2].

Install in the reverse order of removal.

Caution.

- Align the switch pin with the hole in the side sill.

- Align the switch slots with the return spring pins.

- Replace the switch bolt with a new one.

3.13 Trigger

Provide the engine speed signal to the ECU, and the ECU determines the ignition angle, injection phase, etc. based on this signal.

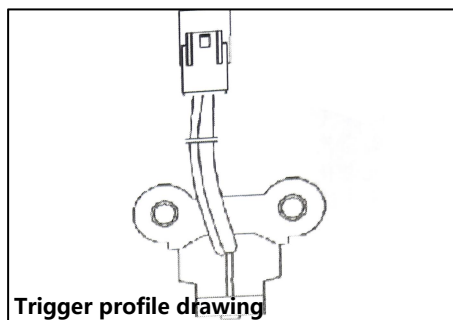


Fig 1: The wiring diagram of the trigger and ECU

Measure the resistance value of the trigger.

Multimeter hit in 1X100Ω file.

Trigger coil resistance: 100Ω-160Ω (20 °)

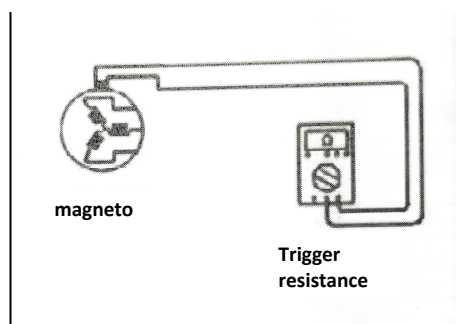
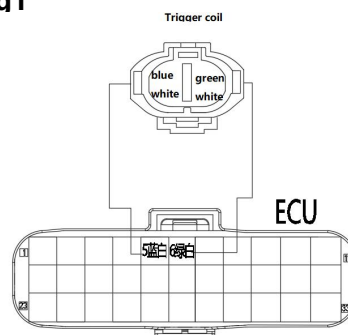
If the trigger resistance value is not in the above range, replace a trigger.

Measure the peak voltage of the trigger

Connect the multimeter and peak voltage adapter according to the diagram as follows.

- + probe: green and white (B) lead
- + probe: blue and white (A) lead

Fig1

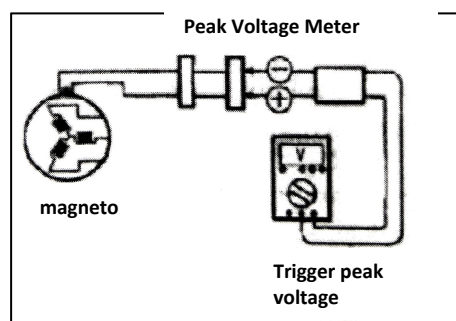


With the multimeter in AC gear.

Put the gear in neutral and hold the start button to let the engine turn for a few seconds, then measure the peak voltage of the trigger coil. Repeat the measurement several times and measure the highest trigger coil peak voltage.

Trigger coil peak voltage: $\geq 2V$ (300r/min)

If the trigger peak voltage is not in the above range, replace a new trigger.



4. System fault diagnosis function introduction

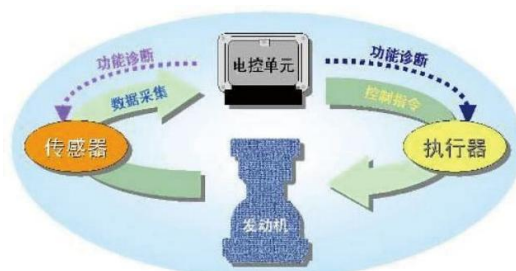
On-board diagnostic system (OBD system) is a diagnostic system integrated in the engine control system that can monitor the status of components affecting exhaust emissions and the main functions of the engine. It has the function of identifying and storing EFI faults.

When repairing a vehicle with OBD system, the repairer can quickly and accurately locate the malfunctioning parts through the diagnostic instrument, which greatly improves the efficiency and quality of repair.

OBD technology involves many brand new concepts, the following is the first introduction to some basic knowledge related to OBD technology, in order to facilitate a better understanding of the subsequent content.

4.1 Fault information logging

The electronic control unit constantly monitors sensors, actuators, associated circuits, fault indicators, battery voltage, etc., and even the electronic control unit itself, and performs confidence checks on sensor output signals, actuator drive signals and internal signals (e.g., closed-loop control, coolant temperature, idle speed control, etc.). As soon as a fault is detected in a link or a signal value is outside the normal range, the electronic control unit immediately records the fault information in the fault memory of the RAM. The fault information is stored in the form of fault codes and is displayed in the order in which the faults appear. Faults can be divided into "current faults" and "historical faults" according to the time of their occurrence.



EFI system Error diagnosis schematic

4.2 Fault Lamp Description and its Control Strategy

Failure Indicator (MIL): Used to indicate the failure of an emission-related component or system, a MIL light is generally an indicator that can be displayed on the instrument panel and is shaped in accordance with regulatory requirements. The MIL light is activated according to the following principles.

1) In normal mode and with empty fault memory

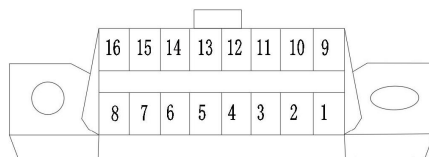
The ECU is initialized immediately when the ignition is switched on and the ignition is switched off. From initialization on, the MIL light is on. The MIL light goes off immediately after the engine starts.

2) In normal mode, and the fault memory is already fault

From the time the ECU is initialized with the ignition switch on, the MIL light is on continuously; if the fault manager requires the MIL to be on in fault mode, the MIL light is on during the subsequent driving cycle; if the fault manager does not require the MIL to be on in fault mode, the MIL light is off after starting.

4.3 OBD Interface Introduction

Pin 4, 7 and 16 on the OBD diagnostic connector are used for EMS with engine management system. Pin 4 of the standard diagnostic connector is connected to the negative terminal of the battery; pin 7 is connected to pin E3 of the ECU, which is the "K" wire of the ECU; pin 16 is connected to the positive terminal of the battery



ISO9141-2 standard diagnostic interface pin number

The diagnostic device communicates with the ECU via the "K" wire 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 line, air-fuel ratio correction, fuel injector, fuel pump relay, speed sensor, carbon canister control valve, speed signal, idle speed, idle speed regulator, system voltage, ECU, fault light 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, carbon canister control valve duty cycle, charge time, injection pulse width, ignition advance angle, oxygen sensor Short-term correction, oxygen sensor voltage, oxygen sensor long-term correction, relative engine load, carbon canister control relative fuel injection, carbon canister purge rate, carbon canister load, idle actuator TEV opening, ambient pressure, altitude correction factor, injection phase, and other parameters.

4.4 Maintenance tools



Tool.

EFI system diagnostic instrument
Function.

Read/clear EFI system fault codes and observe data flow.



Tool:

EFI system adapter
Function.

Check the electrical signal of each pin of the electronic control unit, check the wiring condition, etc.



Tool:

Ignition Timing Light
Function.

Check engine ignition timing, etc. .



Tool:

Digital multimeter
Function.

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



Tool:
Vacuum table
Function.
To check the pressure in
the intake manifold.



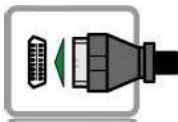
Tool:
Cylinder pressure gauge
Function.
Check the cylinder
pressure of each cylinder.



Tool:
Fuel pressure gauge
Function.
To check the pressure of
the fuel system
to determine the fuel system
pump and fuel pressure
regulator in the fuel system.
Operation.

5. Inspection and diagnosis process

5.1 How to use the diagnostic instrument

- 

1. Connect the diagnostic instrument to the diagnostic interface.
- 

2. Turn on the "ignition switch".
- 

3. Read fault-related information (fault codes, freeze frames, etc.); check the repair manual to confirm the defective parts and types; develop a repair plan based on fault-related information.
- 

4. Troubleshoot.
- 

5. Turn on the ignition again, start the vehicle to read the fault information, and confirm that the fault has been removed.

5.2 Preliminary check

Before starting the troubleshooting steps based on engine fault codes, a preliminary check should first be made to.

1. confirm that the engine fault indicator is working normally.
2. confirm that the fault phenomenon complained by the owner exists and confirm the conditions under which the fault occurs.

Then conduct an external inspection to.

- Check if there is any leakage in the fuel line.
- Check whether the vacuum line is broken, kinked and connected correctly.
- Check for blocked, leaking, crushed or damaged air intake lines.
- Check if the high-voltage wires of the ignition system are broken or aging, and if the ignition sequence is correct.
- Check if the wiring harness joints are clean and firm
- Check whether the sensors and actuators joints are loose or have poor contact.

Important: If the above phenomena exist, the repair work will be carried out for the fault phenomenon first, otherwise it will affect
Otherwise, it will affect the later troubleshooting and repair work.

6. Troubleshooting according to fault codes

This section introduces the meaning of the fault codes used in the current MSE6.0 system, the corresponding diagnostic strategy and possible causes of the faults, as well as the handling strategy of the faults, which can be referred to during the vehicle maintenance process.

All ECU pins mentioned below are based on the actual wiring harness diagram of the project.

6.1 error code: P0030 oxygen sensor heating control circuit open circuit or P0053 oxygen sensor heating unreasonable

Repair Tip.
The fault has been identified as possibly having the following problems
(1) Open circuit between the circuit connected to the ECU pin and the upstream oxygen sensor pin 2.
(2) Open circuit between the circuit connected to the main relay at pin 1 of the upstream oxygen sensor.
(3) Open circuit between upstream oxygen sensor pin 1 and pin 2.

Repair Tip.
Check the following items
(1) Measure the resistance of the line between the ECU connector pin and the upstream oxygen sensor pin 2 and determine if it is normal.
(2) Measure the resistance between the upstream oxygen sensor pin 1 and the main relay to determine if it is normal.
(3) Measure the resistance between the upstream oxygen sensor pin 1 and pin 2 to determine if it is normal.

6.2 error code: P0031 oxygen sensor heating circuit short circuit to ground

Repair Tip.
The fault has been identified as possibly having the following problems
1) The circuit connected to the ECU pin is shorted to ground.

Repair Tip.
Check the following items
1) Measure the resistance of ECU pin to ground is normal.

6.3 error code: P0032 oxygen sensor heating circuit short circuit to the power supply

Repair Tip.
The fault has been identified as possibly having 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 the ECU pin and other power circuits.

Repair Tip.
Check the following items
1) Measure the ECU voltage to see if it is normal.
2) Measure the resistance between the ECU pin and the upstream oxygen sensor pin 1 circuit.

6.4 error code: P0107 Intake pressure sensor circuit voltage is too low

Repair Tip.
The fault has been identified as possibly having the following problems
1) The ECU has detected a short to ground in the sensor signal circuit.

Repair Tip.
Check the following items
1) Resistance between ECU pin and ground.

6.5 error code: P0108 Intake pressure sensor circuit voltage is too high

Repair Tip.
The fault has been identified as possibly having the following problems
1) The ECU has detected a short circuit in the sensor signal circuit to the power supply.

Repair Tip.
Check the following items
1) Voltage of ECU pin.

6.6 error code: P0105 intake pressure sensor circuit signal stuck

Repair Tip.
The fault has been identified as possibly having the following problems
1) The ECU detects that the sensor signal is jumping too much in the intake pressure during normal engine operation is too small.

Repair Tip.
Check the following items
1) The presence of serious air leaks in the intake system.
2) Clogged intake air pressure sensor sampling port.
3) Pressure sensor picking.

6.7 Error code: P0106 Intake pressure sensor circuit signal untrustworthy

Repair Tip. The fault has been identified as possibly having the following problems 1) The intake pressure sampling value used for load calculation exceeded the limit value.	Repair Tip. Check the following items 1) The presence of a serious air leak in the intake system. 2) Intake air pressure sensor sampling port is blocked.
---	---

6.8 error code: P0112 intake air temperature sensor signal voltage is too low

Repair Tip. The fault has been identified as possibly having the following problems 1) The sensor signal circuit connected to the ECU pin is shorted to ground.	Repair Tip. Check the following items 1) Measure the resistance between the sensor signal circuit of ECU pin and ground.
---	--

6.9 error code: P0113 Intake air temperature sensor signal is too high

Repair Tip. The fault has been identified as possibly having the following problems 1) The sensor signal circuit connected to the ECU pin is shorted to the power supply.	Repair Tip. Check the following items 1) Measure the voltage of the sensor signal circuit at the ECU pin to see if it is normal.
---	--

6.10 error code: P0111 Intake air temperature out of range

Repair Tip. The fault has been identified as possibly having the following problems 1) There is a break, short to 5v or ground in the engine intake air temperature sensor.	Repair Tip. Check the following items 1) Measure whether the voltage of the sensor signal circuit at the ECU pin is normal. 2) Check whether the temperature sensor model corresponds to the inventory.
---	---

6.11 error code: P0114 intake air temperature signal stuck

Repair Tip. The fault has been confirmed that there may be the following problems 1) The engine temperature starts below 40°C, the engine runs with a certain load for more than 30min, and the rise in intake air temperature is still less than 3°C.	Repair Tip. Check the following items (1) whether the intake air temperature sensor installation position to position. (2) Whether the ECU PIN pin corresponds.
--	---

6.12 error code: P0117 Engine coolant temperature sensor circuit voltage is too low

Repair Tip. The fault has been identified as possibly having the following problems 1) Short circuit between the circuit connected to the ECU pin and ground.	Repair Tip. Check the following items 1) Measure the resistance connected to the ECU pin to ground.
---	---

6.13 error code: P0118 Engine coolant temperature sensor circuit voltage is too high

Repair Tip. The fault has been identified as possibly having the following problems 1) Short circuit between the circuit connected to the ECU pin and other power circuits.	Repair Tip. Check the following items 1) Measure the voltage connected to the ECU pin to see if it is normal.
---	---

6.14 error code: P0116 engine temperature over range

Repair Tip. The fault has been identified as possibly having the following problems 1) There is a break, short to 5v or ground in the engine temperature sensor.	Repair Tip. Check the following items 1) Measure whether the voltage of the sensor signal circuit at the ECU pin is normal. 2) Check whether the temperature sensor model corresponds to the parts list.
--	---

6.15 error code: P0126 Engine temperature signal stuck

Repair Tip. The fault has been identified as possibly having the following problems 1) As the engine runs, the engine temperature rise performance is not consistent with the actual engine temperature.	Repair Tip. 1) Check whether the engine temperature sensor installation position is in place. 2) Whether the ECU PIN pin corresponds.
--	--

6.16 error code: P0122 Throttle position sensor circuit voltage is too low fault

Repair Tip. The fault has been identified as possibly having the following problems 1) ECU pin is shorted to ground.	Repair Tip. Check the following items 1) Measure the resistance connected to the ECU pin to ground.
--	---

6.17 error code: P0123 Throttle position sensor circuit voltage is too high fault

Repair Tip. The fault has been identified as possibly having the following problems 1) Short circuit between the circuit connected to the ECU pin and other power circuits.	Repair Tip. Check the following items 1) Measure the voltage connected to the ECU pin to see if it is normal.
---	---

6.18 error code: P0130 Oxygen sensor signal unreasonable fault

Fault cause introduction: The system judges that the oxygen sensor signal is unreasonable when the following conditions occur The oxygen sensor signal circuit is coupled with the heating circuit.

Repair Tip. The fault has been identified as possibly having the following problems 1) Check whether the oxygen sensor connector is correct and normal. 2) Check whether the oxygen sensor signal circuit is coupled with the heating circuit.	Repair Tip:
---	---------------------------

6.19 error code: P0131 Oxygen sensor circuit voltage is too low

Repair Tip.
The fault has been identified as possibly having the following problems
1) The signal circuit connected to the ECU pin is shorted to ground.

Repair Tip.
Check the following items
1) Measure the resistance between the signal circuit connected to the ECU pin and ground.

6.20 error code: P0132 oxygen sensor circuit voltage is too high
Cause of failure: When the ECU measures the oxygen sensor circuit voltage after the engine starts, when the signal voltage is higher than 1.5 volts for a long time, it is judged that the oxygen sensor signal circuit is short-circuited to the power supply failure.

Repair Tip.
The fault has been identified as possibly having the following problems
1) Short circuit between the signal circuit connected to the ECU pin and oxygen sensor pin 1.
2) Short circuit between the signal circuit connected to the ECU pin and other power circuits.

Repair Tip.
Check the following items
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.

6.21 error code: P0133 Oxygen sensor response is slow

Repair Tip.
The fault has been identified as possibly having the following problems
1) The oxygen sensor has aged and the sensing element is poisoned and contaminated.

Repair Tip.
Check the following items
1) Replace the oxygen sensor and fix the fault.

6.22 error code: P0134 oxygen sensor signal circuit open circuit fault"
Fault cause: When the ECU measures the oxygen sensor circuit voltage after the engine is started, the system judges that the oxygen sensor signal circuit is open-circuit fault when the signal voltage is always above 1.2 volts.

Repair Tip.
The fault has been identified as possibly having the following problems
1) an open circuit in the circuit connecting the oxygen sensor to the ECU pin.
2) poor connection of the oxygen sensor connector (oxidation of the pin).

Repair Tip.
Check the following items
1) Measure the resistance from the ECU connector to oxygen sensor No.4.

6.23 error code: P0201 One-cylinder injector control circuit open circuit

Repair Tip.
The fault has been identified as possibly having the following problems
1) whether the injector coil is open circuit.
2) whether the injector connector pin to the ECU pin is well connected.
(3) whether the injector connector pin to the main relay connection is good.

Repair Tip.
Check the following items

6.24 error code: P0261 One-cylinder injector control circuit short circuit to ground

Repair Tip. The fault has been identified as possibly having the following problems 1) Each drive circuit connected to the ECU pin is shorted to ground.	Repair Tip. Check the following items 1) Measure the resistance of the circuit connected to the ECU pin to ground.
---	---

6.25 error code: P0262 One-cylinder injector control circuit short-circuit to the power supply

Repair Tip. The fault has been identified as possibly having the following problems 1) The circuit connected to the ECU pin is shorted to another power source.	Repair Tip. Check the following items 1) Measure the voltage of the circuit connected to the ECU pin.
--	--

6.26 error code: P0322 No tachometer pulse signal (open or short circuit)
Fault cause: When the engine is started the ECU monitors both the tachometer signal and other signals.
 By the signal reasonableness system is judged to be the loss of tachometer signal.

Repair Tip. The fault has been identified as possibly having the following problems 1) an open circuit in the circuit connecting the tachometer sensor to the ECU. 2) Short circuit in the circuit connecting the tachometer sensor to the ECU. 3) Open circuit in the tachometer sensor coil.	Repair Tip.
---	--------------------

6.27 error code: P0444 carbon canister control valve control circuit open circuit

Repair Tip. The fault has been identified as possibly having the following problems 1) Open circuit between the circuit connected to the ECU and the carbon canister control valve pin 2. 2) An open circuit between the carbon canister control valve pin 1 and the main relay. 3) Open circuit in the solenoid coil between pin 1 and pin 2 of the carbon canister control valve.	Repair Tip.
--	--------------------

6.28 error code: P0458 carbon canister control valve control circuit voltage is too low

Repair Tip. The fault has been identified as possibly having the following problems 1) The circuit connected to the ECU is shorted to ground.	Repair Tip. Check the following items 1) Measure the resistance to ground connected to the ECU pin to see if it is normal.
--	---

6.29 error code: P0459 carbon canister control valve control circuit voltage is too high

Repair Tip.

The fault has been identified as possibly having the following problems

- 1) Short circuit between the circuit connected to the ECU and the carbon canister control valve pin 1 circuit.
- 2) Short circuit between the circuit connected to the ECU pin and other power circuits.

Repair Tip.

Check the following items

- 1) Measure the voltage at the ECU pin to see if it is normal.
- 2) Measure the resistance between the ECU pin and the carbon canister control valve pin 1 circuit.

6.30 error code: P0508 stepper motor drive pin shorted to ground

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

Fault code: P0511 stepper motor drive pin open circuit or overload

Cause of failure: When the circuit control module in the ECU after the engine is started to continuously monitor the voltage of the idle stepper motor drive circuit, when any of the four circuits have a short circuit to ground/short circuit to power supply/open circuit/overload, the system determines that the stepper motor circuit corresponds to a fault.

Repair Tip.

The fault has been identified as possibly having the following problems

- 1) Any of the stepper motor drive circuits connected to the ECU is shorted to ground to the power supply short/open circuit.

Repair Tip.

Check the following items

- 1) Measure the resistance or voltage between each stepper motor drive circuit connected to the ECU and ground.

6.31 error code: P0560 system battery voltage signal is not reasonable

Fault code: P0562 system battery voltage is too low

Fault code: P0563 system battery voltage is too high

Repair Tip.

The fault has been identified as possibly having the following problems

- 1) the generator has been damaged unable to generate electricity or battery leakage.
- 2) An open circuit in the generator excitation circuit.
- 3) generator regulator has been damaged can not control the amount of power generation resulting in high generation voltage.

Repair Tip.

Check the following items

- 1) Check generator power generation capability (measure generator voltage after starting).

6.32 error code: P0627 oil pump relay control circuit open circuit

Fault code: P0628 Oil pump relay control circuit short-circuit to ground

Fault code: P0629 oil pump relay control circuit short-circuit to power

Repair Tip.

The fault has been identified as possibly having the following problems

- 1) open circuit/short circuit to ground/short circuit to power supply between the oil pump relay control circuit connected to the ECU and the oil pump relay.
- 2) Open circuit between the relay connection to the main relay.
- 3) Open circuit in the solenoid coil of the relay.

Repair Tip.

Check the following items

- 1) Measure the resistance or voltage of the fuel pump relay control circuit connected to the ECU.
- 2) The resistance between the relay to the main relay.
- 3) The resistance between the two legs of the relay.

6.33 error code: P0650 MIL lamp driver stage circuit failure

Repair Tip. The fault has been identified as possibly having the following problems 1) open circuit/short circuit to ground/short circuit to power supply in the MIL lamp drive circuit connected to the ECU. 2) Open circuit between the MIL connection to the main relay. 3) MIL lamp burned out.	Repair Tip. Check the following items 1) Measure the resistance or voltage of the MIL lamp driver circuit connected to the ECU.
--	--

6.34 error code: P2300 Ignition coil short to ground

Repair Tip. The fault has been identified as possibly having the following problems 1) The ignition coil drive circuit is shorted to ground.	Repair Tip. Check the following items 1) Measure the resistance and voltage of the ignition coil drive circuit connected to the ECU.
---	---

6.35 error code: P0301 engine misfire fault

Repair Tip. The fault has been identified as possibly having the following problems 1) abnormal ignition coil drive circuit drive. 2) Abnormal injector circuit drive. 3) Wire harness interference exists in the DG signal.	Repair Tip. Check the following items
---	--

6.36 Error code: P0507 Engine idle speed is too high

Repair Tip. The fault has been identified as possibly having the following problems 1) Air leakage from the air intake system. 2) stepper motor plug jammed at a large opening. 3) Large air leakage from the valve body.	Repair Tip. Check the following items
--	--

6.37 Error code: P0506 Engine idle speed is too low

Repair Tip. The fault has been identified as possibly having the following problems 1) abnormal stepper motor drive and plug jammed at a lower opening. 2) blockage of the air intake system. 3) Small air leakage from the valve body.	Repair Tip. Check the following items
--	--

6.38 Error code: P2177 Non-idling mixture is too lean

Repair Tip. The fault has been identified as possibly having the following problems 1) Low oil supply pressure. 2) Insufficient oil supply.	Repair Tip. Check the following items 1) Whether the fuel pressure regulating valve (3.5 bar) is normal. 2) The fuel supply line is bent and blocked.
---	---

6.39 Error code: P2178 Non-idling mixture is too rich

Repair Tip. The fault has been identified as possibly having the following problems 1) The oil supply pressure is high.	Repair Tip. Check the following items 1) Is the fuel pressure regulating valve (3.5 bar) normal.
--	---

6.40 Error code: P2187 Idle speed mixture is too lean

Repair Tip. The fault has been identified as possibly having the following problems 1) Low oil supply pressure. 2) Insufficient oil supply.	Repair Tip. Check the following items 1) Whether the fuel pressure regulating valve (3.5 bar) is normal. 2) The fuel supply line is bent and blocked.
---	---

6.41 Error code: P2188 Idle speed mixture is too rich

Repair Tip. The fault has been identified as possibly having the following problems 1) The oil supply pressure is high.	Repair Tip. Check the following items 1) Is the fuel pressure regulating valve (3.5 bar) normal.
--	---

6.42 error code: P0501 speed signal break

Repair Tip. The fault has been identified as possibly having the following problems (1) The vehicle is coasting, the speed signal is less than 5km/h, and the duration is greater than 10s.	Repair Tip. Check the following items (1) Check whether the speed sensor connector is loose and whether the sensor installation position is facing the signal plate. (2) The distance between the sensing part of the speed sensor and the signal plate is less than 1.8mm.
--	---

7. Troubleshooting according to the fault phenomenon

This section introduces the meaning of the current fault phenomenon, the corresponding diagnosis strategy and possible causes of the fault, as well as the treatment strategy of the fault, which can be referred to during the vehicle maintenance.

7.1 When starting, the engine does not turn or turns slowly.

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

General diagnostic process.

No.	Procedure	Testing results	Following Steps
1	Use a multimeter to check the voltage between the two terminals of the battery when the engine is started whether around 8-12V.	Y	Next setp
		N	Battery replacement
2	Keep the ignition switch in the starting position and use a multimeter to check if the positive terminal of the starter motor has a voltage of 8V or more.	Y	Next setp
		N	Repair or replace wiring harnesses
3	Disassemble the starter motor and check the working condition of the starter motor. Focus on checking if it has a broken circuit or is stuck due to poor lubrication.	Y	Repair or replace starter motor
		N	Next setp
4	If the fault occurs only in winter, check whether the resistance of the starter motor is too high due to improper selection of engine lubricant.	Y	Change the appropriate grade of lubricant
		N	Next setp
5	Check if the internal mechanical resistance of the engine is too large, resulting in the starter motor not turning or turning slowly.	Y	Checking internal engine resistance
		N	Repeat the above stepsRepeat the above steps

7.2 When starting, the engine can be towed, but cannot be started successfully.

General fault parts: 1, no oil in the fuel tank; 2, fuel pump; 3, speed sensor; 4, ignition coil; 5, engine mechanical parts.

General diagnostic process.

No.	Procedure	Testing results	Following Steps
1	Connect the fuel pressure gauge (access point injector inlet pipe front), turn on the ignition switch, repeat several times if necessary, or start the engine and check whether the fuel pressure is around 300kPa.	Y	Next setp
		N	Inspection and repair of the oil supply system
2	Connect the EFI system diagnostic instrument, observe the "engine speed" data item, start the engine, and observe whether there is a speed signal output.	Y	Next setp
		N	Repair of speed sensor wiring
3	Pull out the ignition high voltage wire, connect the spark plug, make the spark plug electrode from the engine body about 5mm, start the engine, check whether there is blue and white high voltage fire.	Y	Next setp
		N	Inspection of ignition system
4	Check the pressure condition of the engine cylinder and observe whether there is insufficient pressure in the engine cylinder.	Y	Troubleshooting engine mechanical problems
		N	Next setp
5	Connect the EFI adapter, turn on the ignition switch, and check whether the power supply of pins 4# and 15# is normal; check whether the overlap of pins 7# and 10# is normal.	Y	Diagnostic Help
		N	Inspection of the corresponding wiring

7.3 Difficult to start when cold and hot.

General fault parts: 1, fuel containing water; 2, fuel pump; 3, engine temperature sensor; 4, injectors; 5, ignition coil; 6, throttle body and idle bypass airway; 7, engine mechanical parts.

General diagnostic process.

No.	Procedure	Testing results	Following Steps
1	Connect the fuel pressure gauge (access point for the front of the injector inlet pipe), start the engine, and check whether the fuel pressure is around 300kPa.	Y	Next setp
		N	Inspection and repair of oil supply system
2	Pull out the ignition high-voltage wire, connect the spark plug, so that the spark plug electrode is about 5mm from the engine body, start the engine, check whether there is blue and white high-voltage fire.	Y	Next setp
		N	Inspection of ignition system
3	Dial off the engine temperature sensor connector, start the engine, and observe whether the engine starts successfully at this time. (Or connect a 2500 ohm resistor in series with the engine temperature sensor connector instead of the engine temperature sensor, and observe whether the engine starts successfully at this time. start.)	Y	Repair the wiring or replace the sensor
		N	Next setp
4	Pull the throttle gently and observe if it starts easily.	Y	Throttle and idle airway cleaning
		N	Next setp
5	Disassemble the injector and check whether there is leakage or blockage in the injector with the special cleaning analyzer for injectors.	Y	Replacement of faults
		N	Next setp
6	Check the fuel condition and observe whether the failure phenomenon is caused by just after refueling.	Y	Fuel Replacement
		N	Next setp
7	Check the pressure condition of the engine cylinder and observe whether there is insufficient pressure in the engine cylinder.	Y	Troubleshooting engine mechanical problems
		N	Next setp
8	Connect the EFI adapter, turn on the ignition switch, and check whether the power supply of pins 4# and 15# is normal; check whether the overlap of pins 7# and 10# is normal.	Y	Diagnosis Help
		N	Inspection of the corresponding wiring

7.4 Start normally, but idle speed is unstable at any time.

General fault parts: 1, fuel containing water; 2, injector; 3, spark plug; 4, throttle body and idle bypass airway; 5, air intake; 6, idle speed regulator; 7, ignition timing; 8, spark plug; 9, engine mechanical parts.

General diagnostic process.

No.	Procedure	Testing results	Following Steps
1	Check if the air filter is clogged and if there are air leaks in the air intake tract.	Y	Inspection of air intake system
		N	Next setp
2	Check if the idle speed regulator is stuck.	Y	Cleaning or replacement
		N	Next setp
3	Check the spark plug of the cylinder and observe whether its model and gap meet the specification.	Y	Next setp
		N	Adjustment or replacement
4	Check the throttle body and idle bypass airway for carbon buildup.	Y	Cleaning
		N	Next setp
5	Disassemble the injector and use the special cleaning analyzer for injectors to check whether there are leaks, blockage or flow rate over-performance.	Y	Faulty replacement
		N	Next setp
6	Check the fuel condition and observe whether the failure phenomenon is caused by just after refueling.	Y	Fuel Replacement
		N	Next setp
7	Check the pressure of the engine cylinders and observe whether there is a large difference in the engine cylinder pressure.	Y	Troubleshooting engine mechanical problems
		N	Next setp
8	Check whether the mechanical ignition timing of the engine meets the specification.	Y	Next setp
		N	Checking ignition timing
9	Connect the EFI adapter, turn on the ignition switch, and check whether the power supply of pins 4# and 15# is normal; check whether the overlap of pins 7# and 10# is normal.	Y	Diagnostic Help
		N	Inspection of the corresponding wiring

7.5 The speed does not go up or stalls when accelerating.

General fault parts: 1, fuel containing water; 2, intake pressure sensor and throttle position sensor; 3, spark plug; 4, throttle body and idle bypass airway; 5, intake airway; 6, idle speed regulator; 7, injector; 8, ignition timing; 9, exhaust pipe.

General diagnostic process.

No.	Procedure	Testing results	Following Steps
1	Check the air filter for blockage.	Y	Inspection of air intake system
		N	Next setp
2	Connect the fuel pressure gauge (access point for the front of the injector inlet pipe), start the engine, check the fuel pressure at idle speed in about 350kPa.	Y	Next setp
		N	Inspection and repair of oil supply system
3	Check the spark plug of the cylinder and observe whether its model and gap meet the specification.	Y	Next setp
		N	Adjustment or replacement
4	4 Remove the idle speed regulator, check the throttle body, idle speed regulator and idle speed bypass airway for carbon accumulation.	Y	Cleaning of related parts
		N	Next setp
5	Check whether the intake pressure sensor, throttle position sensor and its wiring are normal.	Y	Next setp
		N	Repair the wiring or replace the sensor
6	Disassemble the injector and check whether there is leakage or blockage in the injector with the special cleaning analyzer for injectors.	Y	Faulty replacement
		N	Next setp
7	Check the fuel condition and observe whether the failure phenomenon is caused by just after refueling.	Y	Fuel Replacement
		N	Next setp
8	Check whether the engine ignition sequence and ignition timing meet the specifications	Y	Next setp
		N	Checking ignition timing
9	Check the exhaust pipe for smooth exhaust.	Y	Next setp
		N	Repair or replace exhaust pipes
10	Connect the EFI adapter, turn on the ignition switch, and check whether the power supply of pins 4# and 15# is normal; check whether the overlap of pins 7# and 10# is normal.	Y	Diagnostic Help
		N	Inspection of the corresponding wiring

7.6 Slow response during acceleration.

General fault parts: 1, fuel containing water; 2, intake pressure sensor and throttle position sensor; 3, spark plug; 4, throttle body and idle bypass airway; 5, air intake; 6, idle speed regulator; 7, fuel injector; 8, Ignition timing; 9, exhaust pipe.

General diagnostic process.

No.	Procedure	Testing results	Following Steps
1	Check the air filter for clogging.	Y	Inspection of air intake system
		N	Next setp
2	Connect the fuel pressure gauge (access point for the front of the injector inlet pipe), start the engine and check whether the fuel pressure is around 350kPa at idle speed.	Y	Next setp
		N	Inspection and repair of oil supply system
3	Check the spark plug of the cylinder and observe whether its model and gap meet the specification.	Y	Next setp
		N	Adjustment or replacement
4	Remove the idle speed regulator, check the throttle body, idle speed regulator and idle speed bypass airway for carbon accumulation.	Y	Cleaning of related parts
		N	Next setp
5	Check whether the intake pressure sensor, throttle position sensor and its wiring are normal.	Y	Next setp
		N	Repair the wiring or replace the sensor

No.	Procedure	Testing results	Following Steps
6	Disassemble the injector and check whether there is leakage or blockage in the injector with the special cleaning analyzer for injectors.	Y	Faulty replacement
		N	Next setp
7	Check the fuel condition and observe whether the failure phenomenon is caused by just after refueling.	Y	Fuel Replacement
		N	Next setp
8	Check whether the ignition sequence and ignition timing of the engine meet the specification.	Y	Next setp
		N	Checking ignition timing
9	Check the exhaust pipe for smooth exhaust.	Y	Next setp
		N	Repair or replace exhaust pipes
10	Connect the EFI adapter, turn on the ignition switch, and check whether the power supply of pins 4# and 15# is normal; check whether the overlap of pins 7# and 10# is normal.	Y	Diagnostic Help
		N	Inspection of the corresponding wiring

8. Annexes:

•-List of error codes (PCODE)

No.	Error Code	Instructions (UAES)
1	P0030	Oxygen sensor heating control circuit open circuit
2	P0031	Oxygen sensor heating control circuit shorted to ground
3	P0032	Oxygen sensor heating control circuit shorted to power supply
4	P0053	Oxygen sensor heating unreasonable
5	P0107	Intake pressure sensor shorted to ground
6	P0108	Intake pressure sensor circuit voltage is too high
7	P0106	Intake pressure sensor signal exceeds limit
8	P0105	Intake pressure signal stalling
9	P0112	Intake air temperature sensor signal voltage is too low
10	P0113	Intake air temperature sensor signal voltage is too high
11	P0114	Intake air temperature signal stalling
12	P0111	Intake air temperature signal exceeds limit
13	P0117	Engine coolant temperature sensor circuit voltage is too low
14	P0118	Engine coolant temperature sensor circuit voltage is too high
15	P0126	Engine coolant temperature sensor signal stalling
16	P0116	Engine coolant temperature sensor overrun
17	P0122	Throttle position sensor circuit voltage is too low fault
18	P0123	Throttle position sensor circuit voltage is too high fault
19	P0130	Oxygen sensor signal unreasonable fault
20	P0131	Oxygen sensor circuit voltage too low
21	P0132	Oxygen sensor circuit voltage is too high
22	P0134	Oxygen sensor signal circuit open circuit failure
23	P0133	Oxygen sensor deterioration
24	P0201	One-cylinder injector control circuit open circuit
25	P0261	One-cylinder injector control circuit shorted to ground
26	P0262	One-cylinder injector control circuit shorted to the power supply
27	P0322	No speed sensor pulse signal (open circuit or short circuit)
28	P0444	Carbon canister control valve control circuit open circuit
29	P0458	Carbon tank control valve control circuit voltage is too low
30	P0459	Carbon tank control valve control circuit is too high voltage
31	P0508	Stepper motor drive pins shorted to ground
32	P0509	Stepper motor drive pins shorted to power supply
33	P0511	Stepper motor drive pin open circuit or overload
34	P0560	System battery voltage signal is not reasonable
35	P0562	System battery voltage is too low
36	P0563	System battery voltage is too high
37	P0627	Oil pump relay control circuit open
38	P0628	Oil pump relay control circuit shorted to ground
39	P0629	Oil pump relay control circuit shorted to the power supply
40	P0650	MIL lamp driver stage circuit failure
41	P0501	Speed signal disconnection fault
42	P2300	Ignition coil shorted to ground
43	P0301	Engine Misfire Failure
44	P0507	Engine idle speed high fault
45	P0506	Low engine idle speed fault
46	P2177	Lean mixture at non-idle speed
47	P2178	Thick mixture at non-idle speed
48	P2187	Lean mixture at idle speed
49	P2188	Thick mixture at idle speed

Fuel System

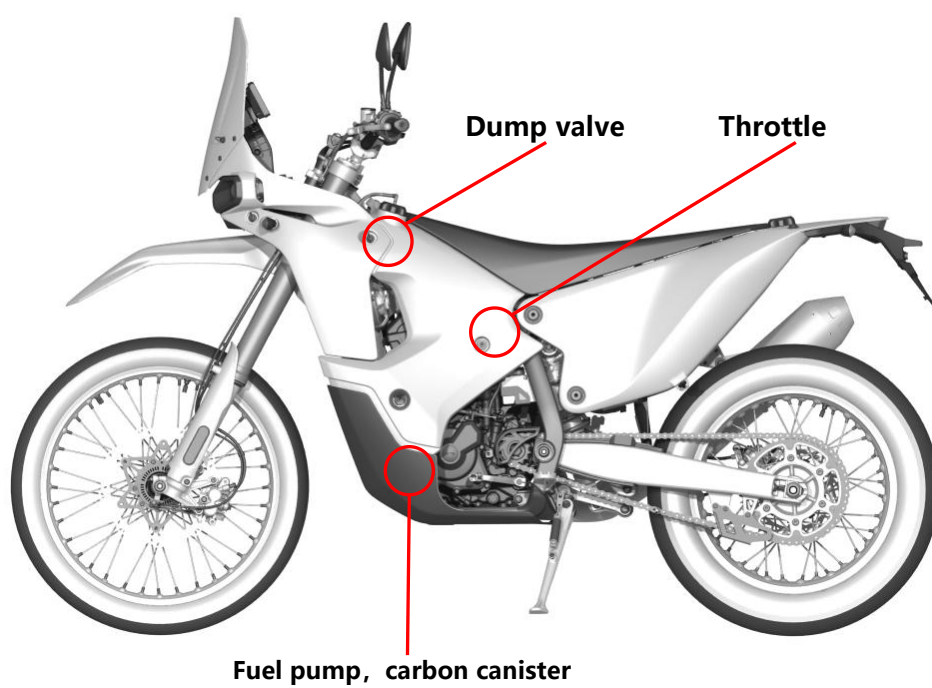
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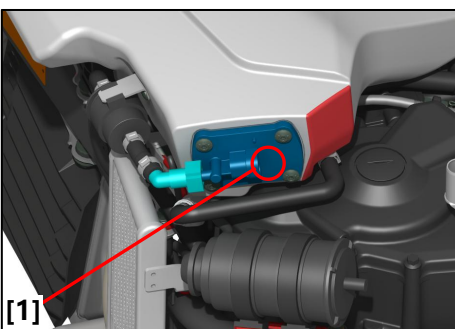
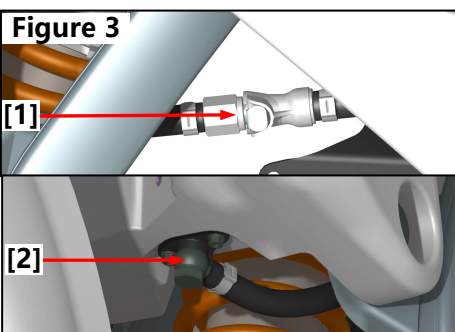
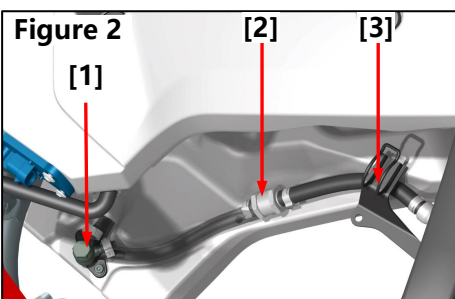
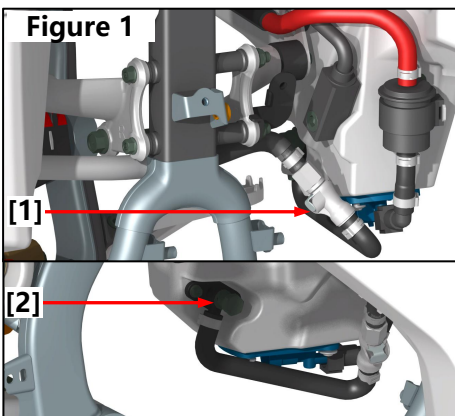
Maintenance Information

Overview:

- Bent or twisted control cables can affect smooth operation and may cause the cables to stick or tangle, resulting in loss of vehicle control.
- Work in well-ventilated areas. Smoking or allowing flames or sparks in the work area or near gasoline storage can cause fire or explosion.
- Release fuel pressure in the system before disconnecting fuel supply hoses.
- After disconnecting the throttle cable, do not operate the throttle from fully open to fully closed. It may result in incorrect idle operation.
- Seal the intake port with tape or a clean cloth to prevent dust and debris from entering the engine after removing the throttle body.
- Do not damage the throttle body. This may cause improper throttle operation.
- After removing the throttle body, prevent dust and debris from entering the throttle bore and passages. Clean them as necessary using compressed air.
- Do not loosen or tighten the nuts and screws with white paint on the throttle body. Loosening or tightening them can cause throttle valve and idle control malfunctions.
- Do not apply commercial carburetor cleaner to the inner side of the throttle bore.
- Throttle body parts not shown in this manual should not be disassembled.
- Disassembly/assembly of the throttle body is required for repair of injectors and idle air control valves.
- Used to inspect the fuel level sensor.

Diagram





※ Fuel Line Inspection

Preparation for front and rear fuel tank Inspection, disassemble the following components:

- Fuel tank vent hose
- Seat
- Left and right front tank cowlings
- Remove the engine lower guard assembly

Inspection:

Hang the front left fuel tank on the left side of the frame.

1. Check for aging, damage, or loose connections of the **left and right fuel tank connecting hose quick connectors** [1] (as shown in Figure 1).

2. Check for loose connections, damage, or leaks in the **left and right fuel tank connecting hoses** and dual-hole union bolts [1], [2] (as shown in Figure 1 and 2).

3. Check for loose connections, damage, or leaks in the **fuel one-way valve** [2] and single-ear clamp (as shown in Figure 2).

Check if the rear fuel tank is accurately seated in the line hook bracket [3] of the front right tank.

4. Check for aging, damage, or loose connections of the **rear fuel tank connecting hose** quick connector [1] (as shown in Figure 3).

5. Check for loose connections, damage, or leaks in the **rear fuel tank connecting hose** and dual-hole union bolts [2] (as shown in Figure 3).

Clean if the quick connector and its surroundings are dirty.

Replace if necessary.

Please contact your dealer for replacement of injector fittings/fuel supply hose assembly.

Note:

- Be careful not to damage the fuel supply hose fittings and fuel hose.
- Do not use tools.

※ Fuel Pressure Release

Note:

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

1. Remove the engine lower guard assembly.
2. Disconnect the fuel pump 2P (black) connector [1].
3. Start the engine and let it idle until the engine stalls.
4. Turn off the ignition switch.

※ Quick Connector

Disassembly

Note:

- Before disconnecting the fuel supply hose, clean the area around the quick connector and ensure no dust enters the fuel system.

Do not bend or twist the fuel supply hose, as it may result in fuel leakage.

1. Release the fuel pressure.

2. Remove the seat.

3. Remove the front cowling assembly.

4. Remove the engine lower guard.

5. Remove the battery terminal bolt [1] and disconnect the battery negative (-) cable [2].

6. Remove the two fuel tanks and the exhaust hose of the air filter assembly, as well as the drain hose.

7. Simultaneously hold the fuel connector release buttons [3], [4] and disconnect the quick connector from the fuel pump unit connector and injector connector.

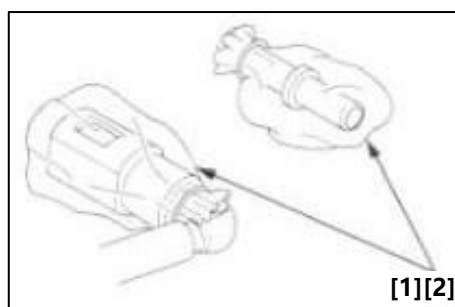
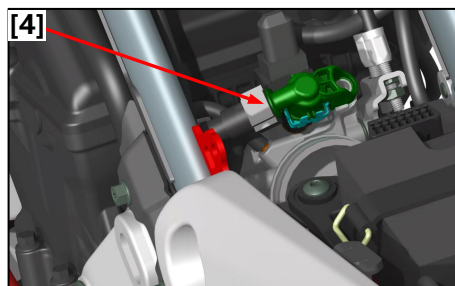
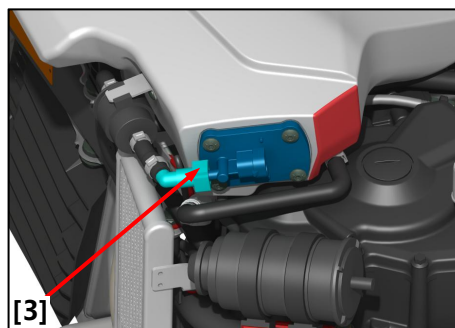
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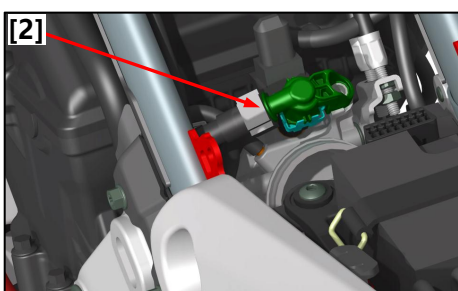
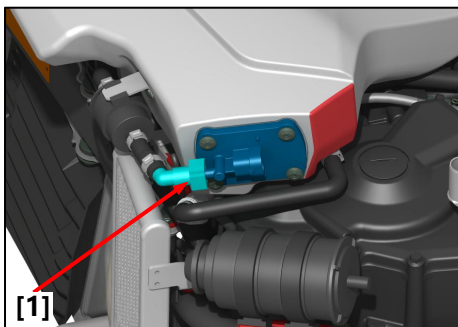
- Drain the remaining fuel from the fuel supply hose into a container.

- Immediately wipe off any spilled fuel.

- Be careful not to damage the sliding sleeve and hose. Do not use tools.

8. To prevent damage and foreign material ingress, cover the disconnected connectors [1] and fuel connector [2] with plastic bags.





※ Quick Connector

Installation

Note:

- Do not bend or twist the fuel supply hose, as it may result in fuel leakage.
- Do not reuse twisted or damaged fuel supply hoses.
- Do not use gloves or cloths when installing the quick connect fittings.

1. Connect the quick connector [1], [2] to the fuel pump unit connector and injector connector respectively. While holding the outer shell of the quick connector, push them in until you hear a "click" sound.

Note:

- Be careful not to damage the sliding sleeve and fuel supply hose.
- Do not use tools.

If the connection is difficult, apply a small amount of engine oil to the fuel connector end.

Ensure a secure connection, and make sure the quick connector are firmly locked in place. visually inspect and tug on the connector shell [1].

2. Connect the battery negative (-) cable [1].

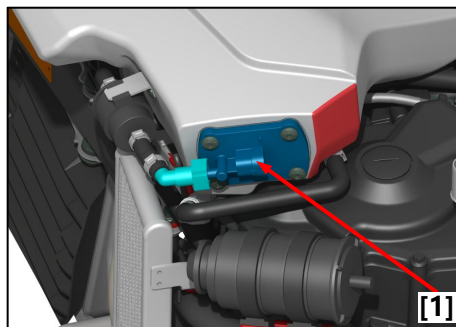
Install and tighten the battery terminal bolt [2] to the specified torque.

Torque:

2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)

※ Increasing Fuel Pressure

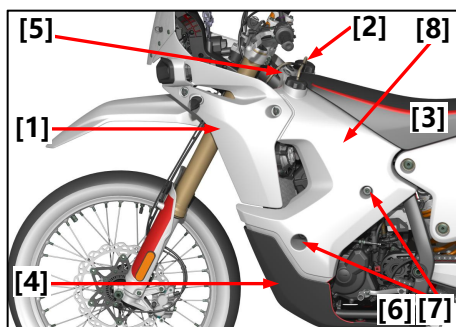
1. Connect the fuel pump power wire quick connector (black) 2P [1].
2. Temporarily install the front left fuel tank onto the frame.
3. With the throttle fully closed, pull the clutch lever all the way in and press the starter switch. The engine will start by increasing the fuel pressure.
4. Turn off the engine and check for any fuel leaks in the fuel lines.



※ Fuel Pump Unit

Disassembly/Installation

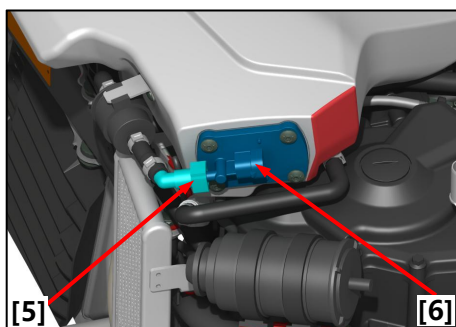
- Remove the front cowl assembly [1].
 - Remove the front tank vent hose [2].
 - Remove the seat [3].
 - Remove the engine lower guard assembly [4].
- Before removing the fuel tank, disconnect the fuel pump power wire quick connector and the fuel hose quick connector.
- Remove the fuel tank upper mounting bolt [5] and the left and right mounting bolts [6], the flip-over collar [7] on both sides, and the left and right tank [8].



The installation sequence is the reverse of the removal sequence.

(The installation process for the left and right tanks is the same.)

Torque for the upper and side mounting bolts:
Fuel tank installation bolt:
22 N·m (2.2 kgf·m, 16 lbf·ft)



Disassembly/Installation

Disassemble the following components:

Remove the fuel tank and clean around the fuel pump. Loosen the four bolts [1] in a crisscross pattern and remove them. Remove the fuel pump and the rubber seal [2].

The installation sequence is the reverse of the removal sequence.

Note:

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

Replace the rubber seal [2] with a new one.

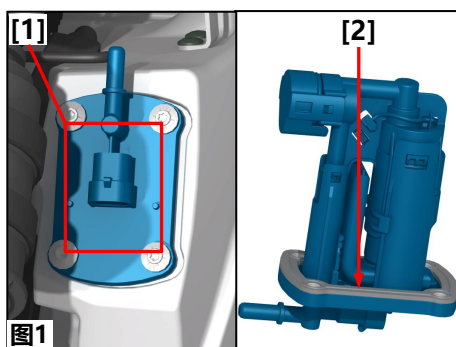
- Clean the rubber seal seating area on the fuel tank and fuel pump baseplate to ensure there are no foreign objects.

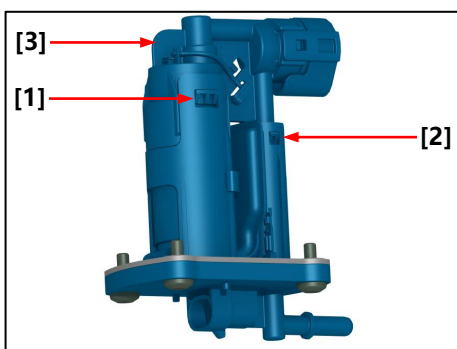
- Place the rubber seal with the convex side facing toward the fuel hose.

- Tighten the four bolts to the specified torque in the indicated sequence.

Torque:

Fuel pump installation bolts:
8 N·m (0.8 kgf·m, 6.0 lbf·ft)





※ Fuel Pump Filter

Disassembly/Inspection/Installation

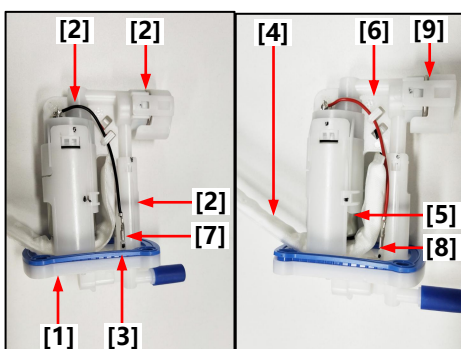
Remove the fuel pump unit.

Disconnect the fuel pump power wire harness connectors.

As shown in the diagram, separate the left and right clasps [1], [2] of the fuel pump bracket and remove the fuel pump bracket.

Note:

- Do not use tools to avoid damaging the fuel pump unit.



As shown in the diagram, disassembly the fuel pump unit.

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

Note:

- Check the fuel pump filter for blockage, damage, or aging, and replace if necessary.

- Properly route the black wire [7] and red wire [8].

- Align the rubber seal with the groove on the fuel pump base unit.

The installation sequence is the reverse of the disassembly sequence.

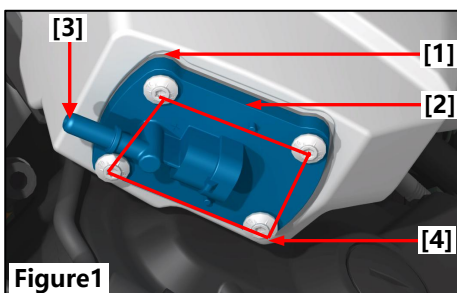


Figure1

※ Installation

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

Install the following components:

- Four M5x16 fuel pump unit bolts.

Note:

- Ensure that the rubber seal [1] is positioned inside the groove on the fuel pump base [2].

Install the fuel pump bracket and fuel pump onto the fuel base.

- Align the fuel pump plate slot with the protrusion on the fuel pump unit.

Install the fuel pump assembly with the fuel connector [3] facing the front left of the fuel tank.

- Be careful not to damage the fuel pump unit.

Tighten the fuel pump unit bolts [4] to the specified torque in the sequence shown in Diagram 1.

Torque:

8.0 N·m (0.8 kgf·m, 6 lbf·ft)

※ Installation of Front and Rear Fuel Tank, and Fuel Line Connections Check

Disassembly/Installation

Remove the following components:

Before installing the fuel tank, disconnect the fuel pump power wire quick connector and the fuel hose quick connector.

- Check if the rubber bolt [1] in **Figure 1** is loose, damaged, or aged.

Tighten the bolt to the specified torque:

Torque: Rubber bolt [1]
22 N·m (2.2 kgf·m, 16 lbf·ft)

- Check if the bolt [1] in **Figure 1** is loose.

Adjust the fuel tank mounting bracket to the appropriate angle and tighten the bolt to the specified torque:

Torque: Front tank mounting bracket bolt [2]
15 N·m (1.5 kgf·m, 11 lbf·ft)

- Before installation, adjust the hex nut [3] in **Figure 1** to the appropriate position and tighten the bolt to the specified torque:

Torque: Front tank mounting hex nut connecting to the frame [3]
15 N·m (1.5 kgf·m, 11 lbf·ft)
(The adjustment and tightening torque for the tank mounting bolts on both sides are the same)

As shown in **Figure 2**:

First, hang the right tank onto the frame and thread the bolts through the flip-over collar, then tighten them to the specified torque:

Torque: Fuel tank mounting bolts [1]
22 N·m (2.2 kgf·m, 16 lbf·ft)

And connect the tank vent hose [2].

The installation sequence is the reverse of the disassembly sequence.

(The installation method for the tanks on both sides is the same)

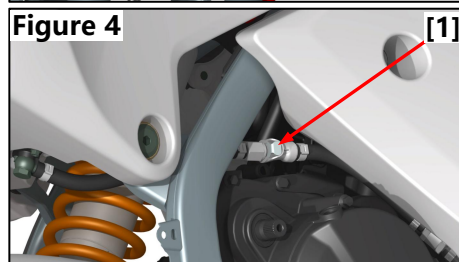
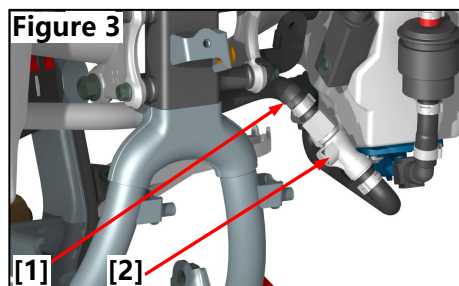
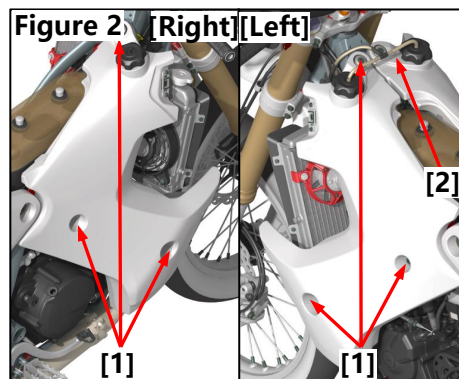
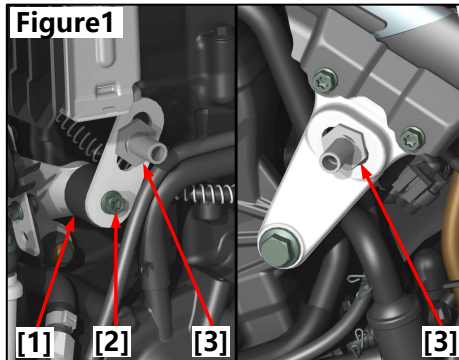
As shown in **Figure 3**:

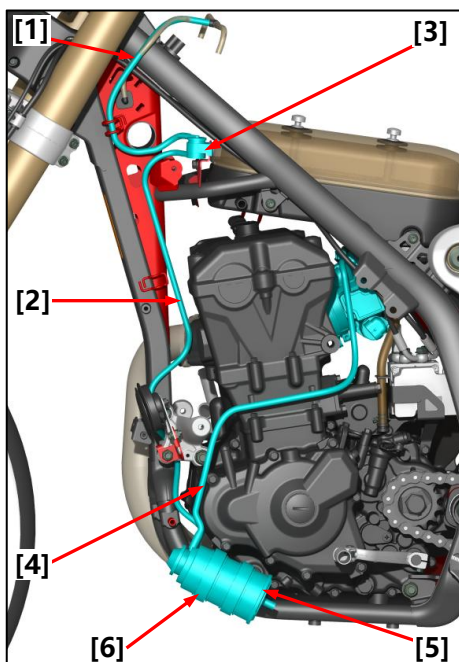
Thread the right fuel tank hose [1] through between the engine and the lower beam of the frame and connect it to the quick connector [2] on the left tank. Check for any looseness, damage, or leaks.

Replace if necessary.

As shown in **Figure 4**:

Connect the rear fuel tank hose to the front right tank using the quick connector [1], then check for any looseness, damage, or leaks. Ensure that the rear tank and front right tank connecting hose is securely inserted into the line hook bracket.





※ **EFI (Evaporative Fuel Emission)
Canister/Dump Valve**
(For regular model only)

Disassembly/Installation

Remove the following components:

- Remove the engine lower shield assembly.
- Remove the left front fuel tank.
- Disconnect the hose connecting the tank to the dump valve [1], and disconnect the hose connecting the dump valve to the canister [2]. Remove the dump valve [3].
- Disconnect the hose connecting the canister to the throttle valve [4].
- Remove the canister [5] from the canister mounting grommet [6].
- Remove the dump valve and canister.

The installation sequence is the reverse of the disassembly sequence.

※ Air Filter Assembly

Slide the intake hose [1] backward and release it from the throttle. Remove the air filter assembly from the frame. The installation sequence is the reverse of the disassembly sequence.

Note:

- When inserting the components into the frame, be careful with the installation of the crankcase ventilation hose [2] to ensure that it is not twisted or deformed.
- Tighten the intake hose clamp screw [3] with a distance of 10 ± 1.0 mm between the ends.

- When connecting the 2P injector connector (gray) [4], align the groove with the protrusion on the injector connector.

Torque:

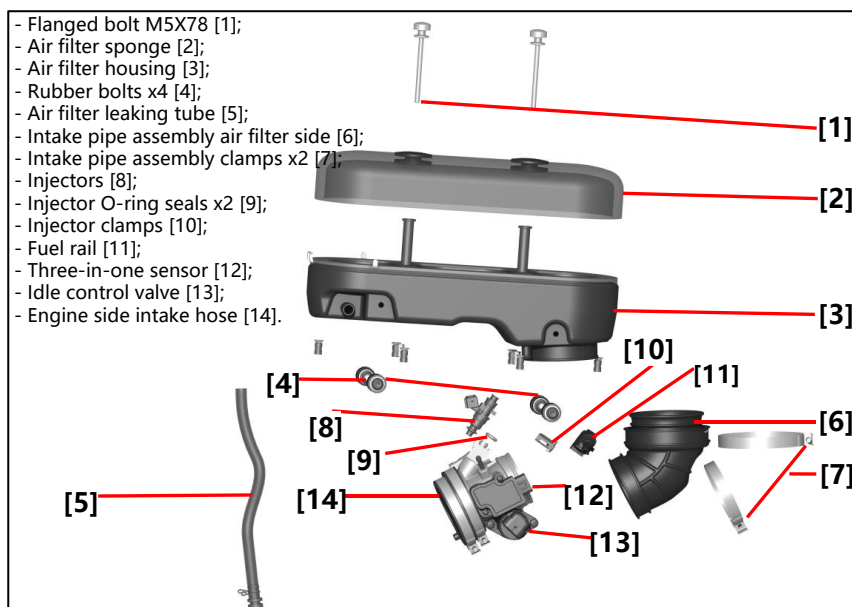
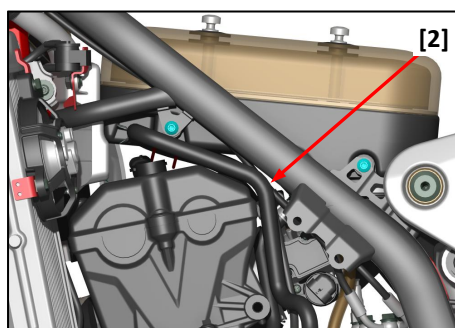
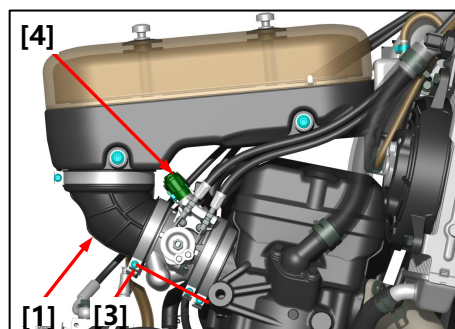
Air filter assembly installation bolts:

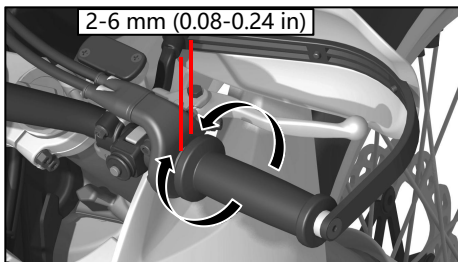
10 N·m (1.0 kgf·m, 7 lb·ft)

Throttle cable connection bolt (at the throttle body):

3.0 N·m (0.3 kgf·m, 2.2 lb·ft)

Adjust the throttle grip free play. If the sensor unit has been removed, perform the throttle position sensor reset procedure.





※ Throttle Free Play

Check the throttle cable for aging, damage, or twisting. Rotate the throttle grip and ensure that the throttle opens smoothly and automatically closes in all positions. If the throttle grip does not rotate smoothly, check the cable routing, clean the throttle body, and lubricate it with the recommended lubricant (engine oil or appropriate cable lubricant). Also, check the throttle drum rotation. If there are no abnormalities but the throttle rotation is not smooth, replace the throttle cable (throttle cable for opening and closing). Measure the free play at the flange of the throttle grip.

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

Figure 1

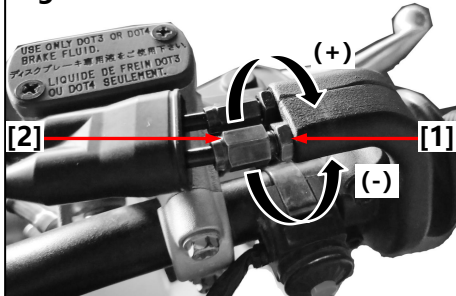
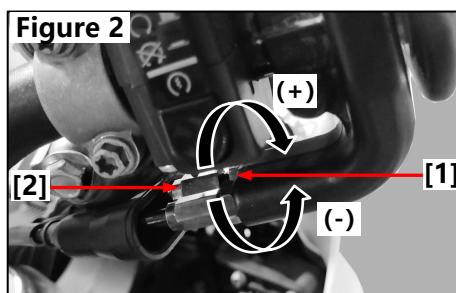


Figure 2



1. Fine Adjustment on the Throttle Cable Guide

Loosen the lock nut [1] and rotate the adjuster [2]. Rotating the adjuster in the (-) direction will decrease the free play, while rotating it in the (+) direction will increase the free play. After adjustment, hold the adjuster and tighten the lock nut.

If the correct free play cannot be obtained even with the adjuster turned to the maximum, return it to the (+) direction until it lightly contacts the bottom, then rotate it one full turn in the (-) direction and perform further adjustment on the throttle assy.

Torque for nut [1]:

5.0 N·m (0.5 kgf·m, 3.7 lbf·ft)

Note: Figure 1 is for the factory model, and Figure 2 is for the regular model.

2. Large Adjustment on the Throttle Assy

Loosen the lock nut [1] of the throttle opening cable and rotate the adjuster [2] in the (-) direction to decrease the free play, or in the (+) direction to increase the free play.

After adjustment, hold the adjuster and tighten the lock nut of the throttle opening cable.

Torque:

4.0 N·m (0.4 kgf·m, 3.0 lbf·ft)

(The adjustment for the throttle cable for opening and closing is the same)

Note:

- Recheck the smoothness of the throttle grip rotation and ensure that there is no sticking.

※ Throttle Assembly and Intake Hose

Throttle Assembly

Disassembly/Installation

Remove the following components:

- Remove the quick connector of the fuel hose [1].
- Remove the mounting screw of the fuel rail [2] and the fuel injector.
- Disconnect the 5P connector of the three-in-one sensor [3].
- Disconnect the 4P connector of the stepper motor [4].
- Loosen the lock nut of the throttle cable adjustment [5].
- Remove the throttle cable from the pulley [6].
- Remove the fastening screws of the intake hose at both ends [7].
- Remove the throttle assembly [9] and the intake hose [10].

The installation sequence is the reverse of the disassembly sequence.

Note:

- During installation, ensure that the intake hose clamps are within the limit point [11], and align the intake hose with the alignment protrusion [8] when connecting it to the engine.

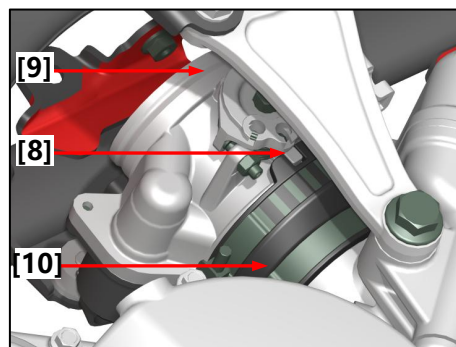
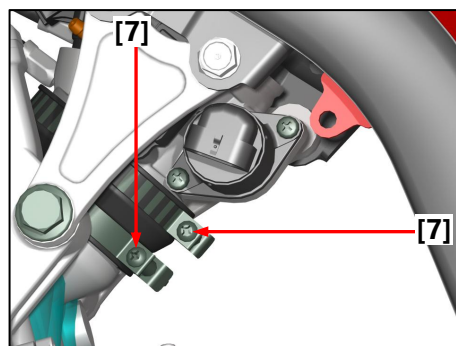
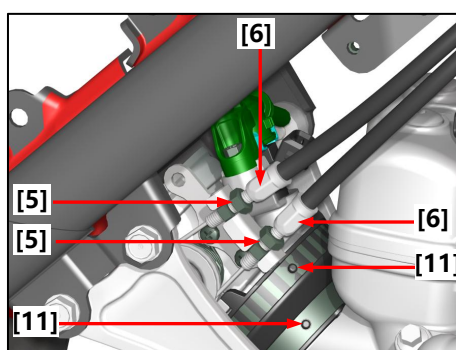
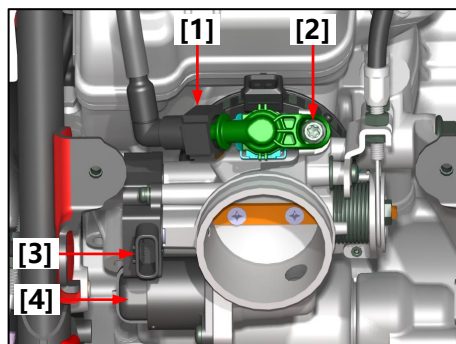
Torque:

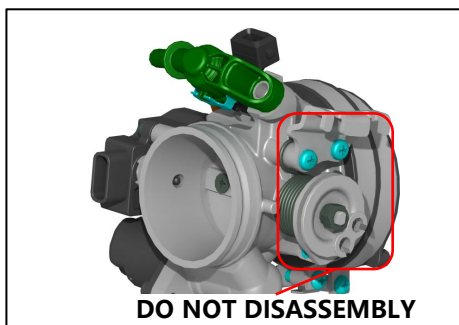
M6x20

Bolt connecting the fuel rail to the throttle assembly:

8.0 N·m (0.8 kgf·m, 6 lbf·ft)

Note: Tighten the intake hose clamps until they reach the limit position.



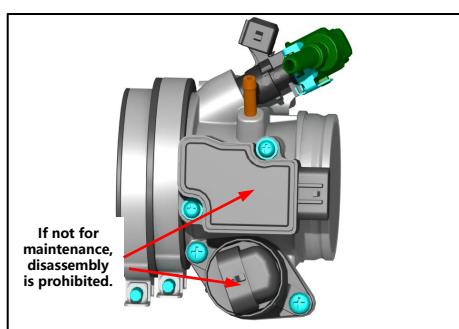


※ Throttle Assembly

Disassembly/Installation

Note:

- The throttle assembly is assembled at the factory and should not be disassembled in any other way than shown in this manual.
- After removing the throttle cable, do not move the throttle valve from fully open to fully closed, as this may damage the throttle valve.
- Avoid damaging the throttle assembly, as it may result in improper operation.
- Do not loosen or tighten the nuts and screws marked with torque specifications, as doing so may cause failure of the throttle assembly.



Removal of Idle Motor/Three-in-One Sensor
Check for carbon deposits in the idle motor air passage of the throttle assembly.
Check the O-rings on the idle motor/three-in-one sensor for deterioration or damage.

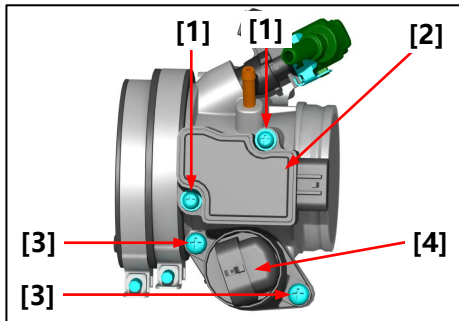
Remove the following components:

- 2 screws [1].
- Remove the three-in-one sensor unit [2].
- 2 screws [3].
- Idle motor [4].

Clean the throttle assembly and idle motor passages with compressed air.

Note:

- Using a steel wire ball for cleaning will damage the throttle assembly.



The installation sequence is the reverse of the removal sequence.

Note:

- Replace with new rubber seals.
- Install each clamp on the intake hose assembly with the screw head [5] facing the right side, and align the left side with the hole [6] to the positioning protrusion.
- Install each clamp with the "UP" marking facing upward toward the throttle assembly and align the groove [7] with the tab.
- Tighten the clamp screws to achieve a distance of 10 ± 1.0 mm (0.4 ± 0.04 in) between the two ends.
- Tighten the fastening bolts to the specified torque.

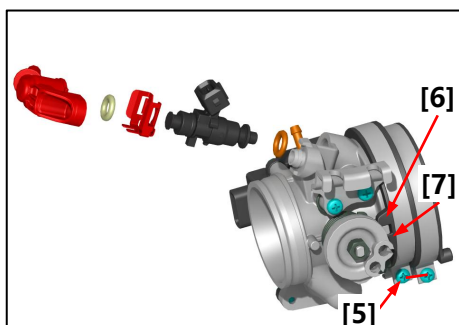
Torque:

Three-in-One Sensor installation screws:

3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)

Idle motor installation screws:

3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)



※ Fuel Rail Assembly

Disassembly/Assembly

Remove the fuel rail assembly from the throttle assembly.

Disassemble the following components:

- 1 bolt [1];
- 1 connector [2];
- Remove the fuel rail [3];
- Remove the injector retainer clip [4];
- Remove the injector [5];
- Remove the injector O-ring [6].

Inspect each component for wear or damage and replace as necessary.

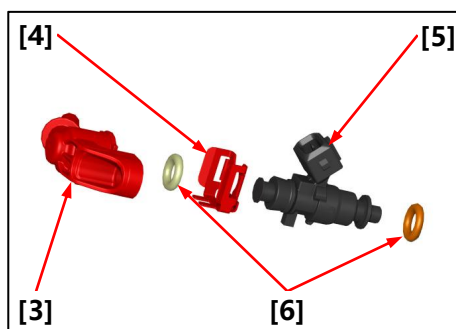
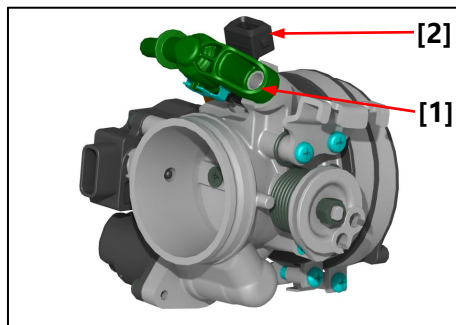
The installation sequence is the reverse of the disassembly sequence.

Note:

- Apply engine oil when replacing new O-rings and seals.
- When installing the injector, be careful not to damage the O-ring.
- Align the injector connector with the fuel connector and insert.

Torque:

Torque for the fuel rail assembly connecting bolt: 12 N·m (1.2 kgf·m, 8.9 lbf·ft).



Cooling system

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Maintenance information

Overview



Do not remove the radiator cap before the engine and radiator have cooled down to prevent scalding hot fluid and steam may be blown out.

Note:

Using coolant with silicate corrosion inhibitors can cause premature wear of the water pump seal or blockage of radiator passages.

Using tap water can damage the engine.

- Add coolant to the coolant reservoir; do not remove the radiator cap except for adding or draining coolant.
- It is not necessary to remove the engine from the frame when servicing the cooling system.
- Avoid coolant leakage onto painted surfaces.
- After system maintenance, use a cooling system tester to check for leaks.
- Check the coolant temperature indicator/water temperature sensor.
- Check the fan control relay.

Troubleshooting:

Engine overheating

- Faulty coolant temperature indicator/water temperature sensor
- Thermostat not opening
- Faulty radiator cap
- Low coolant
- Blocked radiator passages, hoses, or pipes
- Air in the cooling system
- Faulty cooling fan motor
- Faulty fan control relay
- Water pump failure

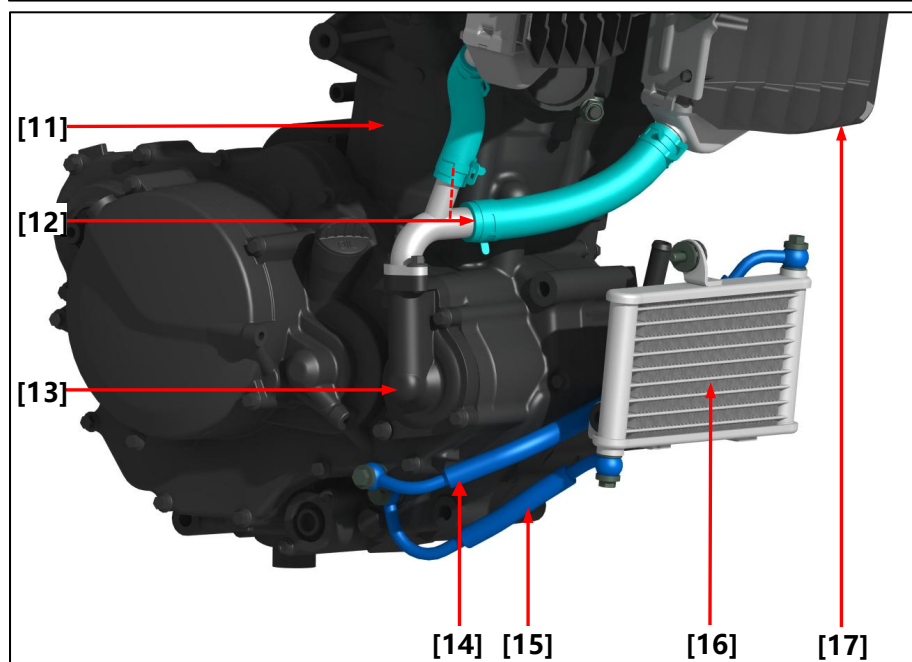
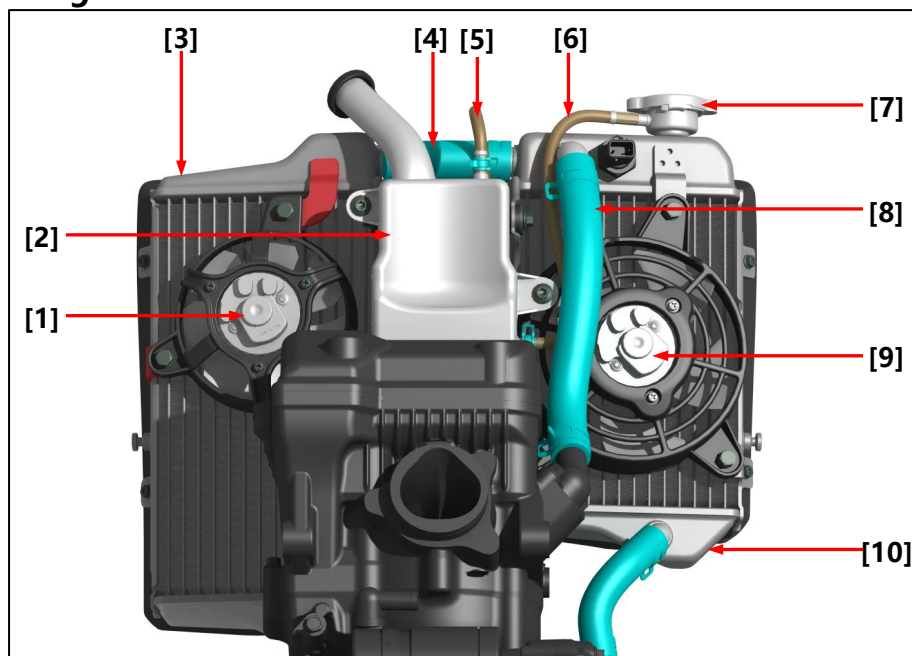
Engine temperature too low

- Faulty coolant temperature indicator/water temperature sensor
- Thermostat open
- Faulty fan control relay

Coolant leakage

- Defect in water pump mechanical mechanism
- Aging of O-ring seals
- Faulty radiator cap
- Damaged or aging cylinder head gasket
- Loose hose connections or improperly tightened clamps
- Damaged or aging hoses
- Damaged radiator
- Loose thermostat cover or water pump cover pipe joint

Diagram



1	Radiator fan (left)	6	Coolant reservoir hose	11	Thermostat	16	Oil cooler
2	Coolant reservoir	7	Radiator cap	12	Engine inlet hose	17	Radiator grille
3	Radiator (left)	8	Engine outlet hose	13	Water pump		
4	Radiator connection pipe	9	Radiator fan (right)	14	Oil cooler inlet hose		
5	Coolant reservoir breather hose	10	Radiator (right)	15	Oil cooler outlet hose		

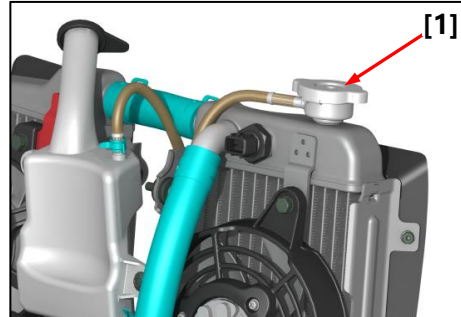
※Cooling system test

Cooling System Pressure Check:

Disassembly/Assembly

Disassemble the following components:

- Remove the front side cowling assembly.
- Remove the radiator cap [1].



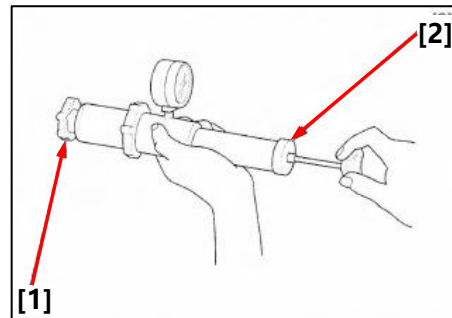
Lubricate the sealing surface of the cap [1]; then install the cap onto the tester [2]. Apply pressure to the radiator cap using the tester.

If the radiator cap cannot hold pressure or releases pressure that is too high or too low, replace the radiator cap.

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

Radiator cap pressure release:

108-133 kPa



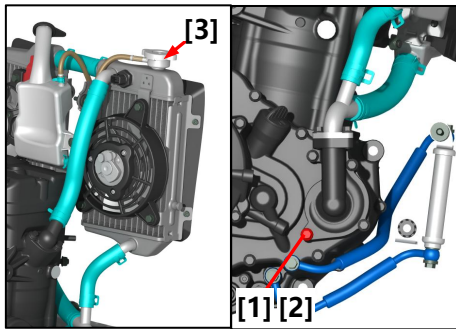
Connect the tester to the radiator.

Apply pressure to the radiator, engine, and hoses using the tester to check for airtightness.

Note: This operation should be performed with the vehicle in a cold state.

Note:

- Excessive pressure can damage cooling system components, do not exceed 133 kPa.
- If the system cannot maintain the specified pressure for at least 6 seconds, repair or replace the components.



WARNING

- After the vehicle has been turned off, wait for a period of time for the vehicle to cool down before performing the following operations to avoid the risk of scalding from high coolant temperatures.

※Changing the coolant

When adding coolant to the radiator or coolant reservoir, or when checking the coolant level, the motorcycle should be placed on a level surface and in an upright position.

Disassembly/Assembly

Disassemble the following components:

- Remove the right-side front fuel tank and lower cowl assembly.
- Remove the coolant drain bolt [1] and the copper washer [2].
- Remove the radiator cap [3] and drain the coolant.

Drain the coolant:

- After replacing the new copper washer, install the drain bolt.

Tighten the drain bolt to the correct torque.

Torque:

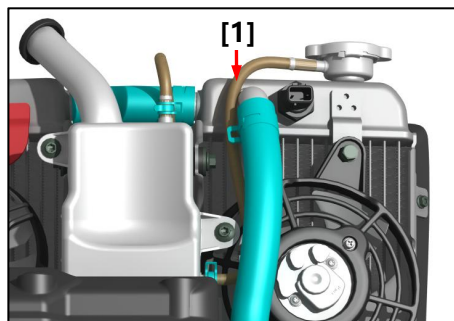
Coolant drain bolt:

10 N.m (1.0 kgf.m, 10 lbf.ft)

Disconnect the coolant reservoir hose [1] from the radiator and remove it from the hose clamp.

Place the hose in a lower position outside the engine frame and empty the coolant from the coolant reservoir.

Drain the coolant, rinse the interior of the reservoir with water, and install the hose onto the hose clamp and radiator.



Through the filling hole, fill the cooling system with the recommended coolant until it reaches the neck [1].

Recommended coolant: Ethanol-based, silicate-free coolant.



※Checking the coolant level

Recommended coolant:

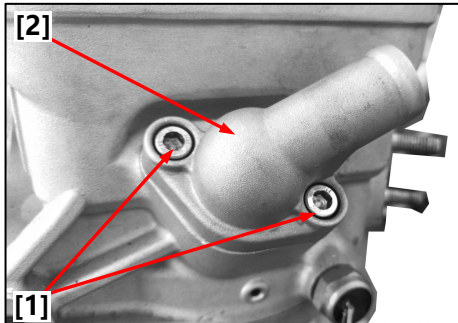
To eliminate air from the system, follow these steps:

1. Shift the engine into neutral, start the engine, and let it idle for 2-3 minutes.
2. Open and close the throttle three to four times to purge the air from the radiator system.
3. Shut off the engine and, if necessary, add coolant.
4. Install the radiator cap.

Fill the coolant reservoir with the recommended coolant to the standard level and close the reservoir cap.



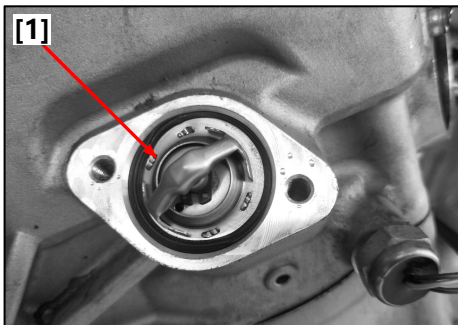
- After the vehicle has been turned off, wait for a period of time for the vehicle to cool down before performing the following operations to avoid the risk of scalding from high coolant temperatures.



※Thermostat

Disassembly/Assembly:

- Drain the coolant.
- Remove bolt [1] and thermostat cover [2].



Remove the thermostat [1] from the cylinder head.

Install the components in the reverse order of disassembly.

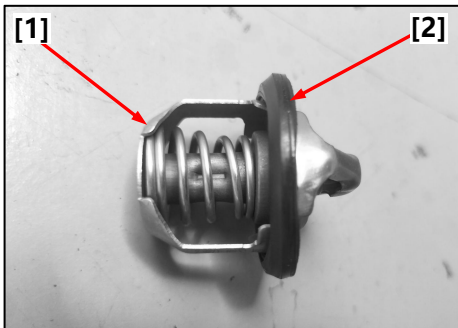
Torque:

Thermostat cover bolt:

12 N.m (1.2 kgf.m, 9.0 lbf.ft)

Note:

When installing the thermostat, make sure to correctly install and seat the thermostat sealing ring into the circular groove of the water passage.

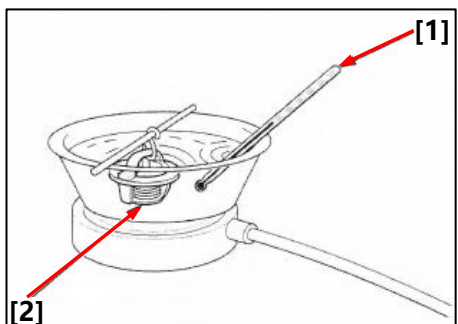


Inspection:

Check if the thermostat [1] has any damage on its exterior.

If the thermostat valve is in the open position at room temperature, it needs to be replaced.

Check if the sealing ring [2] is damaged and replace if necessary.



Heat water using an electric heating element to the operating temperature for 5 minutes. Suspend the thermostat [2] in the heated water and check its operation.

Thermostat opening temperature:

$82 \pm 2^{\circ}\text{C}$ (176-183°F)

Valve lift:

Not less than 8 mm at 92°C (197.6°F)

If the thermostat does not respond within the specified temperature range, replace the thermostat.

※Coolant reservoir

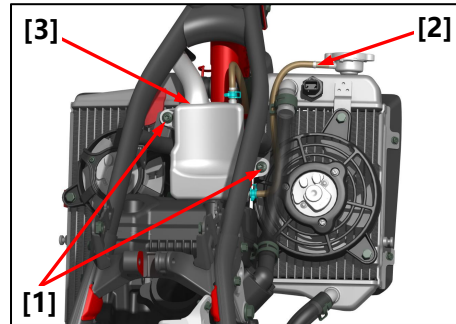
Disassembly/Assembly:
Disassemble the following components:

- Drain the coolant from the reservoir.
- Remove the mounting bolt [1] of the reservoir.
- Remove the hose clamp [2] from the coolant reservoir hose.
- Remove the reservoir [3].

Install the components in the reverse order of disassembly.

Torque:

Coolant reservoir mounting bolt:
10 N·m (1.0 kgf·m, 7.4 lbf.ft)



※Radiator grille

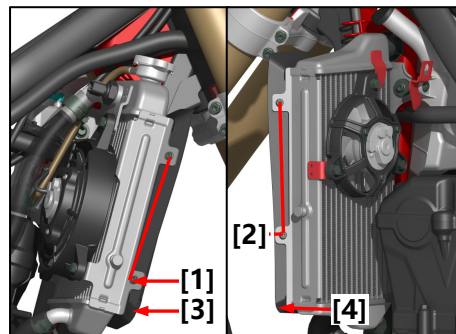
Disassembly/Assembly:
Disassemble the following components:

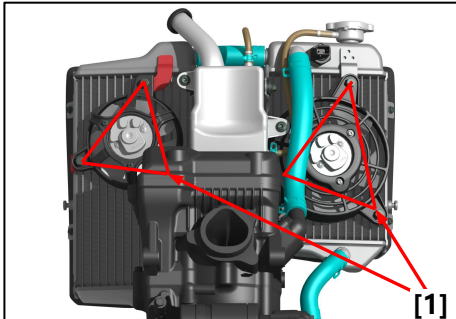
- Remove the front cowling assembly.
- Remove the engine lower cowl assembly.
- Remove the left and right front fuel tanks.
- Disconnect the fuel hose and the 2P (black) fuel pump wire harness connector.
- Remove the radiator grille mounting bolts [1][2].
- Remove the left and right radiator grilles [3][4].

Install the components in the reverse order of disassembly.

Torque:

Radiator grille mounting bolts:
8 N·m (0.8 kgf·m, 6.0 lbf.ft).





※Radiator fan

Disassembly/Assembly:

Disassemble the following components:

- Drain the coolant from the radiator.
- Disconnect the 2P (white) wire harness connector of the radiator fan.
- Remove the six bolts [1] securing the radiator fan on both sides.
- Remove the left and right radiator fans.

Install the components in the reverse order of disassembly.

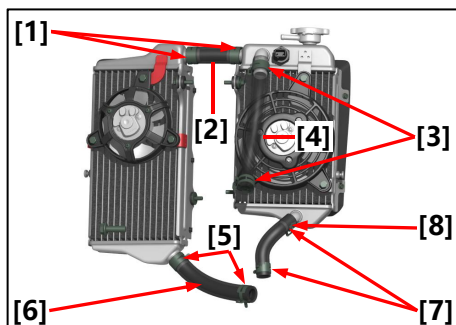
Torque:

Radiator fan cover mounting bolts:

8 N·m (0.8 kgf·m, 6.0 lbf.ft)

Radiator fan motor inspection:

With a battery voltage of 12V, the motor should run at full speed with an ammeter reading not exceeding 3A. If the motor does not rotate or the current exceeds the specified limit, replace the radiator fan motor.



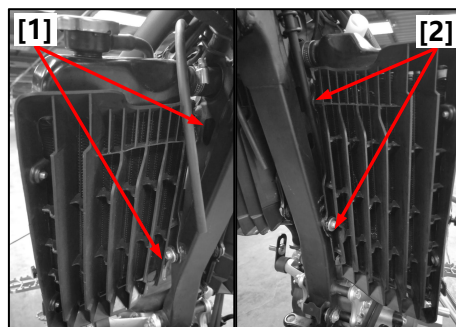
※Radiator hose

Disassembly/Assembly:

Disassemble the following components:

- Loosen the clamp [1] and disconnect the water hose on top of the radiator [2].
- Loosen the clamp [3] and disconnect the water hose on the right side of the radiator [4].
- Loosen the clamp [5] and disconnect the water hose on the lower left side of the radiator [6].
- Loosen the clamp [7] and disconnect the water hose on the lower right side of the radiator [8].

Install the components in the reverse order of disassembly.



※Radiator

Disassembly/Assembly:

Disassemble the following components:

- Remove the bolts [1], [2] securing the radiator on the left and right sides.
- Remove the left and right radiator assemblies.

Install the components in the reverse order of disassembly.

Torque:

Radiator **left/right** side mounting bolts:

12 N·m (1.2 kgf·m, 8.8 lbf.ft)

✂Water pump

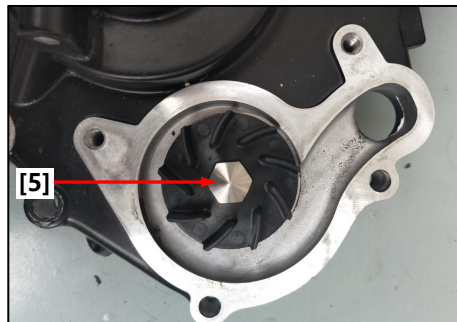
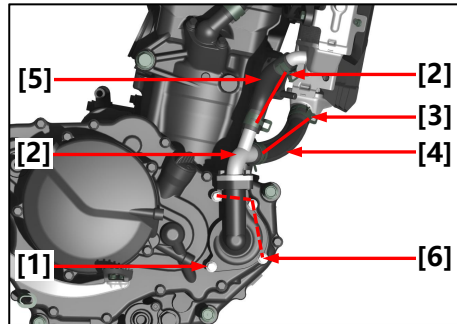
End face seal inspection:
Ensure there is no continuous coolant leakage when starting the engine.
If necessary, replace the water pump as an assembly.

Note:
Place a clean pan under the engine as coolant may flow out when disassembling the water pump body.
After installation, add the specified coolant.
Keep the motorcycle upright on a level surface.

Disassembly/Assembly:
Disassemble the following components:
- Remove the drain bolt and gasket [1].
- Remove the lower radiator hose clamps [2], [3].
- Remove the inlet hoses [4], [5].
- Water pump cover mounting bolt [6].

Install the components in the reverse order of disassembly.

Torque:
Water pump cover mounting bolt:
12 N·m (1.2 kgf·m, 9.0 lbf.ft)
Coolant drain bolt:
10 N·m (1.0 kgf·m, 7.5 lbf.ft)



✂Impeller

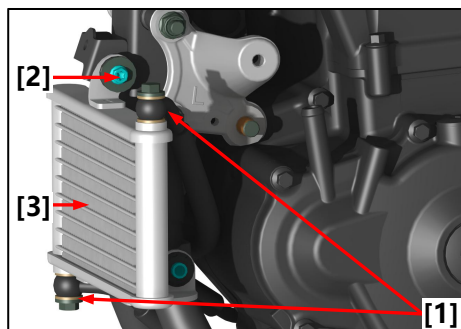
Disassembly/Assembly:
Disassemble the following components:

- Remove the right crankcase cover.
- Remove the water pump cover [1] and gasket [2] from the right crankcase cover.
- Remove the circlip [3] and dowel pin [4] from the rear of the crankcase cover.
- Remove the impeller [5].

Inspection:
Check if the water pump cover gasket is damaged and replace it if necessary.
Replace the impeller if it is damaged.

Install the components in the reverse order of disassembly.

Crankcase cover mounting bolt:
10 N·m (1.0 kgf·m, 7.5 lbf.ft).



※Oil cooler

When starting the engine, ensure there is no continuous oil leakage.
If necessary, replace the oil cooler as an assembly.

Note:

Place a clean oil pan under the engine as oil may flow out when disassembling the oil cooler.
After installation, add the specified oil.

Keep the motorcycle upright on a level surface.

Disassembly/Assembly:

Disassemble the following components:

- Remove the oil hose union bolts [1].
- Remove the oil cooler mounting bolt [2].
- Remove the oil cooler [3].

Install the components in the reverse order of disassembly.

Torque:

Oil hose union bolt:

12 N·m (1.2 kgf·m, 8.8 lbf.ft)

Engine removal/installation

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Section 2 Diagram 152

Section 3 Engine removal 153

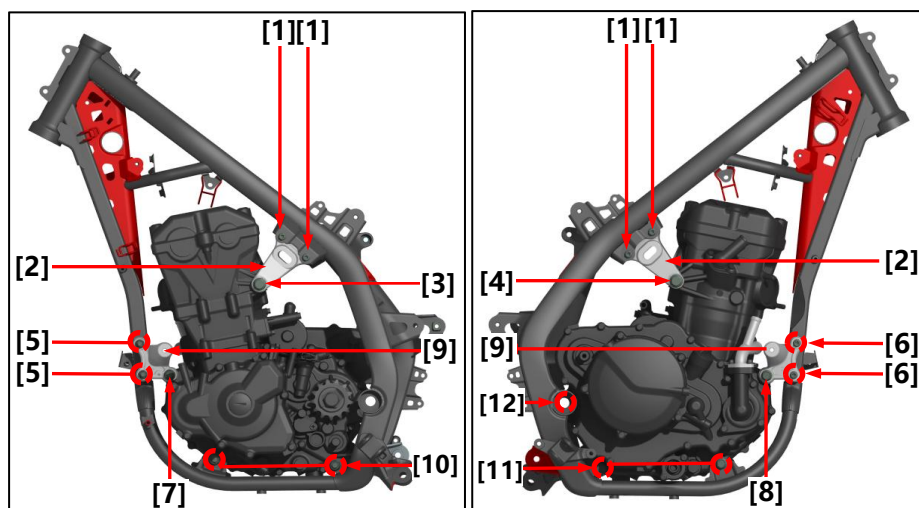
Section 4 Engine installation 157

Maintenance information

Overview:

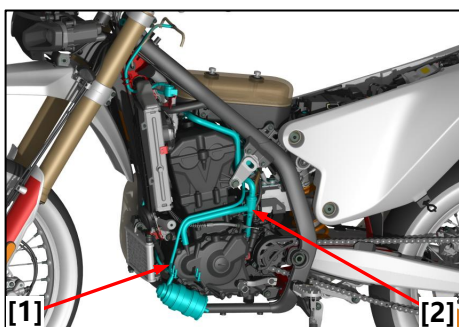
Disassembly and installation of the engine require the use of a specialized workbench or equivalent to support the motorcycle.

Diagram



According to the position and name, the torque specifications for fastening are as follows:

[1]	Engine bracket bolt (upper) x4	36N.m	[7]	Engine mounting bolt (front)	54N.m
[2]	Engine bracket (upper)		[8]	Engine mounting nut (front)	54N.m
[3]	Engine mounting bolt (left upper side)	54N.m	[9]	Engine bracket (front)	
[4]	Engine mounting bolt (right upper side)	54N.m	[10]	Engine mounting bolt (bottom) x2	54N.m
[5]	Engine bracket bolt (front) x2	26N.m	[11]	Engine mounting nut (bottom) x2	54N.m
[6]	Engine bracket nut (front) x2	26N.m	[12]	Pivot shaft and nut	88N.m



※ Engine removal

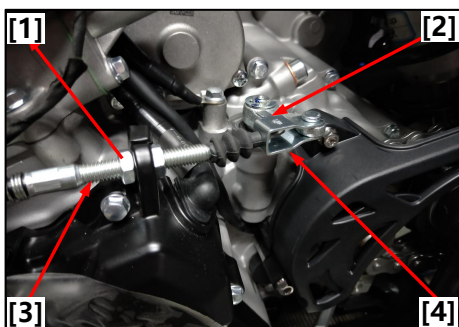
- Remove the seat.
- Disconnect the negative terminal of the battery.
- Remove the front cover assembly.
- Remove the engine lower guard assembly.
- Remove the fuel tank ventilation pipe.
- Remove the quick disconnect for the fuel lines on the left and right fuel tank.
- Drain the engine oil.
- Drain the coolant.

Note:

- Allow the vehicle to cool down for some time before draining the engine coolant to avoid burns from high temperatures.

Disassemble the following components:

- Fuel evaporative system and related parts [1].
- Exhaust hose assembly [2].



The installation sequence is the reverse of the disassembly sequence.

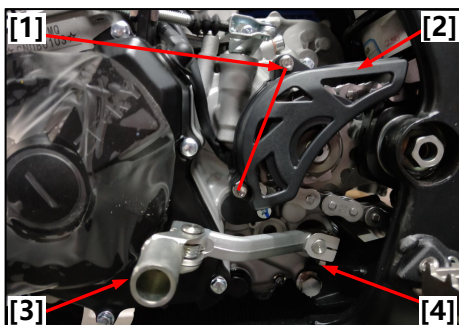
① Clutch cable

Installation/disassembly

Disassemble the following components:

- Loosen the travel adjustment bolt [1] and release the clutch safety plate [2].
- Then disconnect the clutch cable [3] from the pull lever [4].

The installation sequence is the reverse of the disassembly sequence.



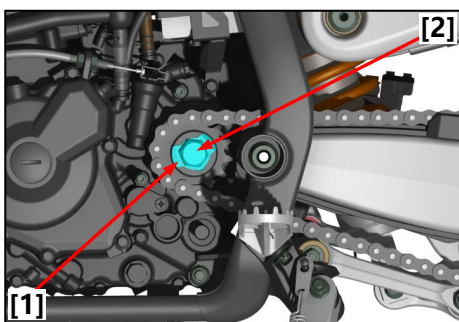
② Drive sprocket cover/shift pedal assembly

Installation/disassembly

Disassemble the following components:

- Remove bolt [1].
- Remove the sprocket cover [2].
- Remove bolt [4].
- Remove the shift pedal assembly [3].

The installation sequence is the reverse of the disassembly sequence.



③ Drive sprocket

Installation/disassembly

Disassemble the following components:

- Release the sprocket securing nut lock plate [1] and remove the sprocket nut [2].
- Remove the drive sprocket.

The installation sequence is the reverse of the disassembly sequence.

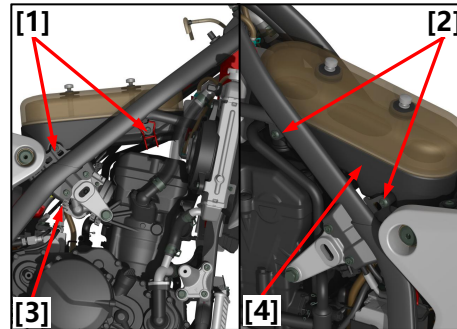
④ Air filter assembly

Installation/disassembly

Disassemble the following components:

- Remove the left and right bolts [1], [2].
- Remove the air filter assembly connecting clamp [3] to the throttle body.
- Remove the air filter assembly [4].

The installation sequence is the reverse of the disassembly sequence.



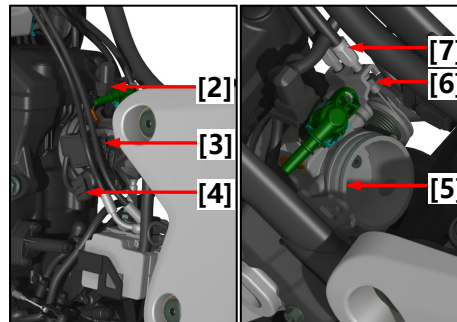
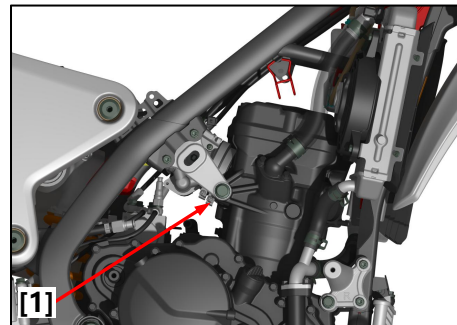
⑤ Throttle body assembly

Installation/disassembly

Disassemble the following components:

- Remove the intake pipe clamp [1].
- Disconnect the fuel injector connector [2].
- Disconnect the three-in-one sensor connector [3].
- Disconnect the stepper motor connector [4].
- Remove the throttle body assembly [5].
- Loosen the adjustment nut [6].
- Remove the throttle cable [7].

The installation sequence is the reverse of the disassembly sequence.



⑥ Oil cooler radiator

Keep the motorcycle in an upright position on a level surface.

Disassembly/installation

Disassemble the following components:

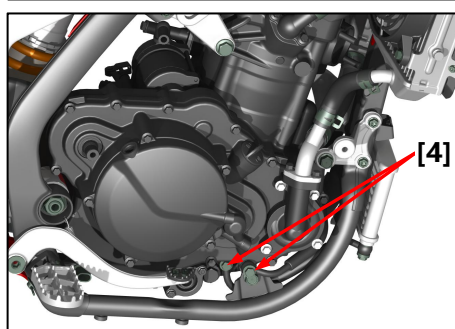
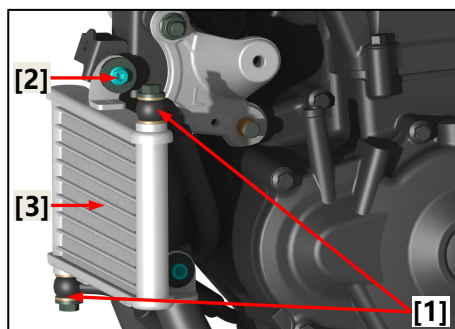
- Remove the oil inlet/outlet pipe oil bolts [4].
- Remove the oil cooler radiator mounting bolt [2].
- Remove the oil cooler radiator [3].

The installation sequence is the reverse of the disassembly sequence.

Note: Please be prepared with appropriate container to catch the oil as a amount of oil will drain out when removing the oil bolt [4].

Torque:

Install oil cooler radiator oil bolts:
22 N·m (2.2 kgf·m, 16.2 lbf·ft)



⑦ ABS assembly

Disassembly/installation

Disassemble the following components:

Drain the brake oil from the front and rear brake systems.

- Seat assembly.
- Air filter assembly.
- ABS bracket.

Disconnect the ABS pump 18P (black) connector.

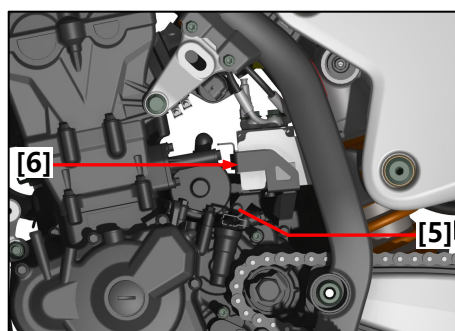
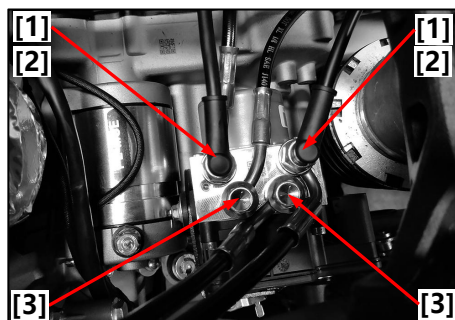
Remove the brake light switch nut [1] and the upper and lower two sealing washers [2].

Remove the ABS nut [3] to disconnect the brake hose.

- Remove the ABS bracket mounting nut [5].
- Remove the ABS assembly [6].

The installation sequence is the reverse of the disassembly sequence.

Note: The factory version of the vehicle does not have an ABS.



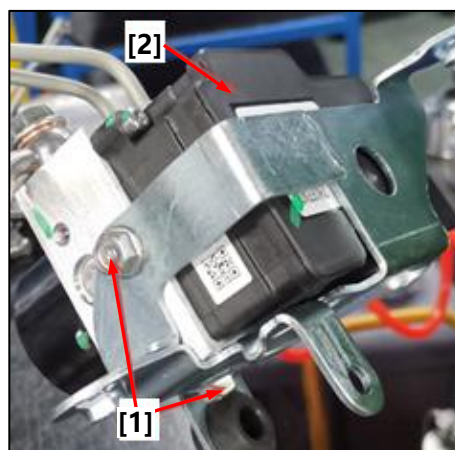
Remove the two bolts [1] and ABS [2] from the bracket.

Torque:

ABS to bracket connecting bolt:
12 N·m (1.2 kgf·m, 8.8 lbf·ft)

Oil bolt:

22 N·m (2.2 kgf·m, 16 lbf·ft).



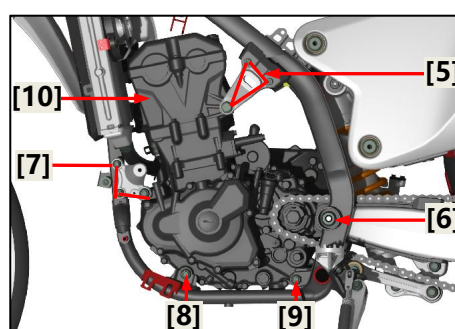
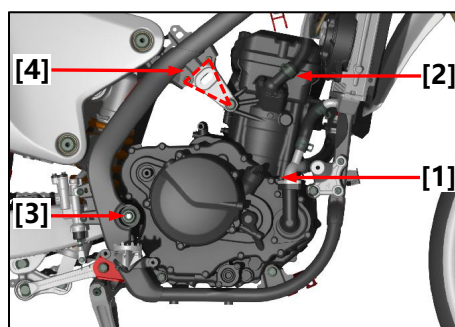
⑧ Engine

Removal/installation

Disassemble the following components:

- Remove the bolt [1] and engine outlet pipe clamp [2].
- Remove the pivot shaft nut [3] and take out the pivot shaft [6] and washer.
- Remove the left and right engine bracket bolts [4] and [5].
- Remove the front engine bracket nut [7], washer, and bolt.
- Remove the bottom engine mounting nuts [8][9] and bolts for the engine.
- Remove the engine [10].

The installation sequence is the reverse of the disassembly sequence.



Engine installation:

Note:

- Do not use the oil filter as a fulcrum.
- The jack height must be continuously adjusted to relieve pressure and facilitate bolt installation.
- Carefully align the mounting points with the jack to prevent damage to the engine, frame, radiator, hoses, wires, and cables.
- Raise the rear of the motorcycle, lifting the rear wheel 150mm off the ground.
- Place the engine on a jack or other adjustable support below the frame.
- Align the front engine suspension bolt holes with the frame mounting bracket and then install the bolt and collar.
- Lift the engine while rotating upward at the rear to install the remaining bolts and collars.
- Install the rear engine nut with a washer.
- Following the sequence to tighten the nuts in specified torque.

Cylinder head and valves

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Section 7 Inspection of valve lifter, camshaft and cylinder head	165
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Maintenance information

Overview:

- This chapter covers the maintenance and inspection of cylinder head, valves, camshaft, and valve lifters.
- When repairing the cylinder head cover, camshaft, and tensioner, determine whether it is necessary to remove the engine from the chassis based on the vehicle model and obstruction; when repairing the cylinder head and valves, it must be removed from the chassis.
- During disassembly, make proper markings and keep the disassembled parts in order to ensure correct reassembly.
- Before inspection, clean all removed components with a cleaning agent and blow them dry with compressed air.
- Camshaft lubricating oil is injected through the oil passages in the cylinder head and camshaft cap, so the oil passages should be cleaned before assembling the cylinder head and camshaft cap.
- When disassembling the cylinder head and cylinder head cover, be careful not to damage the mating surfaces.

Cylinder head/valves specifications

Items	Standard (mm)	Limit (mm)
Valve spring free length	Outer: 47.5 Inner: 38.1	Outer: 47.35 Inner: 37.95
Valve clearance	Intake: 0.1 ~ 0.15 Exhaust: 0.15 ~ 0.2	Intake > 0.17 Exhaust > 0.22
Camshaft runout limit	0.02	0.04

Items			Standard (mm)	Limit (mm)
Valves	Valve stem diameter	Intake	φ5.472 ~ φ5.487	φ5.46
		Exhaust	φ5.46 ~ φ5.475	φ5.44
	Valve guide inside diameter	Intake	φ5.505 ~ φ5.515	φ5.535
		Exhaust	φ5.505 ~ φ5.515	φ5.535
	Valve-stem-to-valve-guide-clearance	Intake	0.018 ~ 0.043	0.07
		Exhaust	0.03 ~ 0.055	0.08
Cylinder head	Valve seat width		1.2	----
	flatness		0.05	0.06
	Valve seat contact width		0.8	----

1. Troubleshooting

Low cylinder pressure:

1. Valves:

Incorrect valve clearance adjustment;
Poor valve sealing;
Incorrect valve timing;
Broken valve springs.

2. Cylinder head:

Loose connection between spark plug
and cylinder head.
Damaged cylinder head gasket.
Cracks or sand holes in the cylinder
head.

3. Cylinder, piston, piston rings:

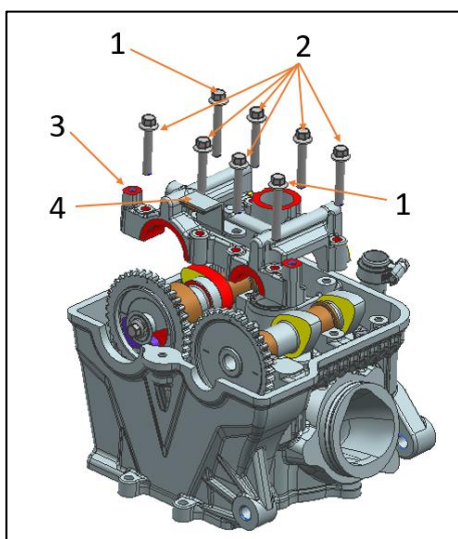
Excessive or broken piston ring
clearance.
Cylinder distortion.

Exhaust smoke is black:

1. Worn valve guides.
2. Stem seal leakage or damage.
3. Cylinder head gasket leakage.
4. Excessive piston ring clearance.

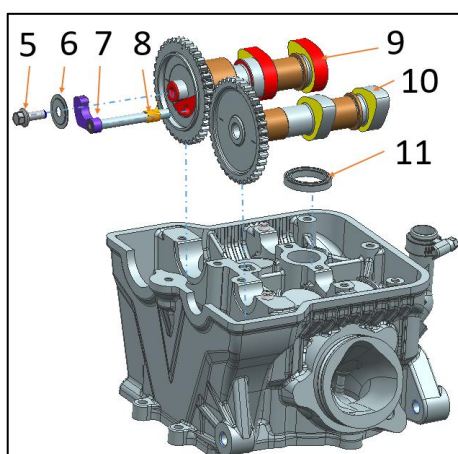
Excessive or unusual engine noise:

1. Incorrect valve adjustment.
2. Stuck valves or broken valve springs.
3. Excessive valve lifter wear.
4. Incorrect valve timing.
5. Worn camshaft.
6. Broken relief valve.

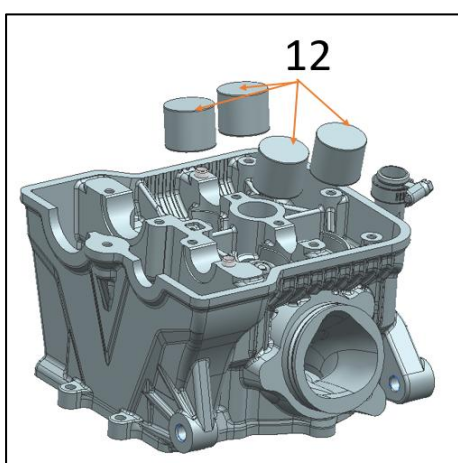


1. Cylinder head assembly diagram:

- (1) Small disc bolt M6×40_7 grade 24h.
- (2) Small disc bolt M6×35_7 grade 24h.
- (3) NC450S camshaft cap.
- (4) NC450S timing chain guide.

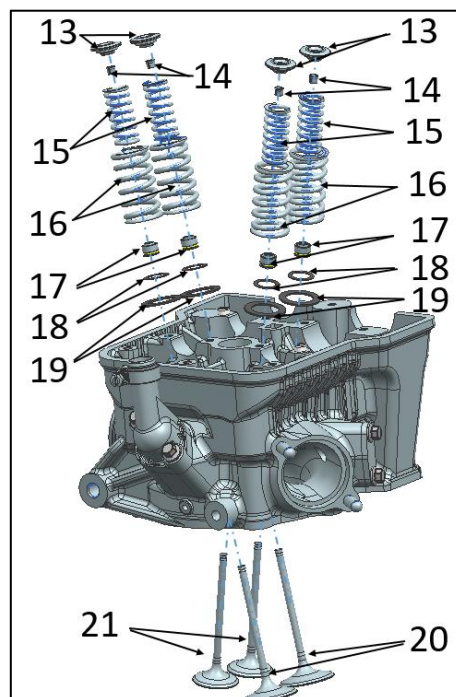


- (5) Small disc bolt M6×16_7 grade 24h.
- (6) NC250S camshaft baffle.
- (7) NC450S camshaft pressure relief valve.
- (8) NC250 camshaft pressure relief valve reset torsion spring (2#).
- (9) NC450S exhaust camshaft component.
- (10) NC450S intake camshaft component.
- (11) Derbi125 spark plug hole sealing ring.

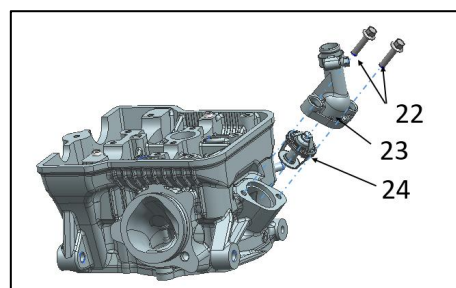


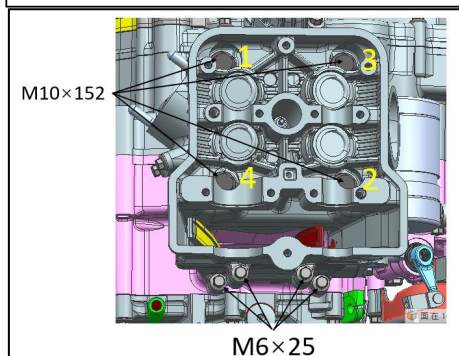
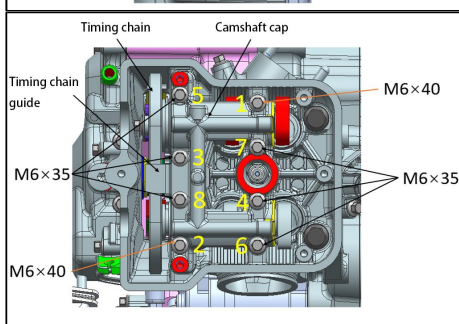
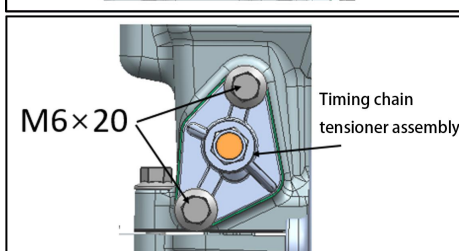
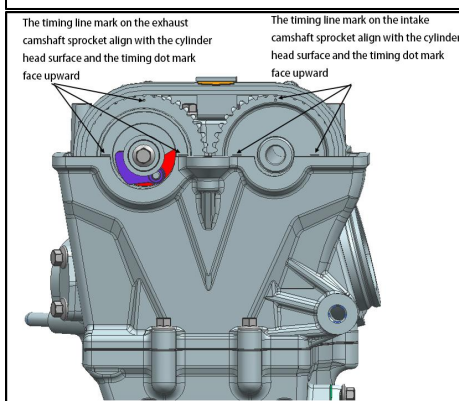
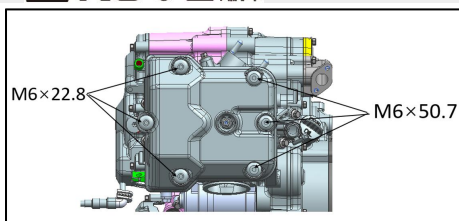
- (12) NC450S valve lifters (DLC coating).

- (13) NC450S valve spring retainer.
- (14) CB125 valve cotter (improved type).
- (15) NC450S valve inner spring.
- (16) NC450S valve outer spring.
- (17) CG125D valve stem seal.
- (18) CG125D valve inner spring seat (bottom).
- (19) NC450S valve outer spring seat.
- (20) NC450S intake valve (stem diameter $\phi 5.5$)
- (21) NC450S exhaust valve (stem diameter $\phi 5.5$)



- (22) Bolt M6×25
- (23) NC450S thermostat cover
- (24) NC450S thermostat (2# vent hole $\phi 2$)





※ Removal of cylinder head cover

1. Remove the three bolts (special M6×22.8) and the three bolts (special M6×50.7).
2. Remove the cylinder head cover and the cylinder head cover gasket.

※ Removal of cylinder head

1. Rotate the camshaft sprocket to the align position:
The timing line mark on both the intake and exhaust camshaft sprockets align with the cylinder head surface and the timing dot mark face upward.

2. Remove the two M6×20 bolts securing the tensioner, and then remove the tensioner assembly and the tensioner gasket.

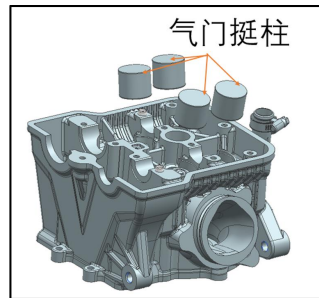
3. Remove the two M6×40 bolts and six M6×35 bolts securing the camshaft cap in the following sequence: 8→7→6→5→4→3→2→1. Then remove the timing chain guide and the camshaft cap. Remove the timing chain from the camshaft sprocket, and then remove the intake camshaft assembly and the exhaust camshaft assembly.

4. First, remove the four M6×25 cylinder head-to-cylinder connecting bolts. Then, remove the four double-ended cylinder AB bolts (M10×152) in the sequence: 4→3→2→1. Finally, remove the four AB bolt washers.

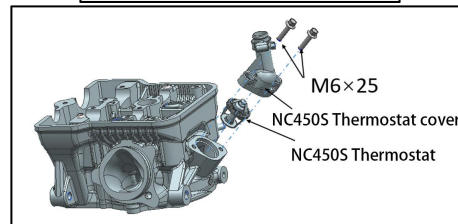
5. Remove the cylinder head.

Disassembly of cylinder head

1. Remove the 4 valve lifters and make corresponding markings for identification.



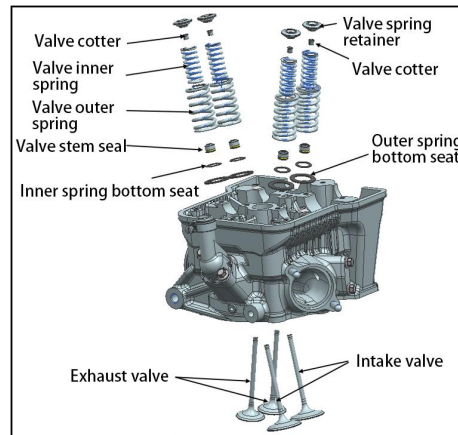
2. Remove the 2 M6×20 bolts securing the NC450S thermostat cover, then take off the cover and the thermostat.



3. Use a valve spring compressor to compress the valve springs, remove the valve cotter, and then release the valve spring compressor. Take off the valve spring retainer, the inner and outer valve springs, the inner and outer spring seats, as well as the intake and exhaust valves. Make corresponding markings for each component.

Note:

- To prevent permanent deformation of the valve springs, avoid excessive compression. It is sufficient to remove the valve cotters.
- All removed parts should be properly labeled to ensure correct assembly later on.



※ Inspection of valves and valve springs

1. Check if the valves are bent or if the valve stems have abnormal wear. Measure the outer diameter of the valve stems.

Limit:

Intake: $\phi 5.46\text{mm}$

Exhaust: $\phi 5.44\text{mm}$

2. Limit for the contact surface width: 1.5mm

Note:

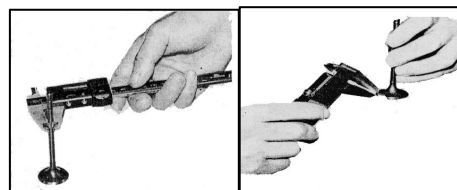
- If the valve contact surface is rough, unevenly eroded, or does not make proper contact with the valve seat, it cannot guarantee sealing performance and should be replaced.

3. Check for abnormal wear on the valve springs and measure their free length.

Limit :

Outer spring: 47.35mm

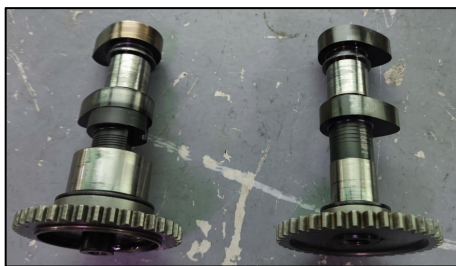
Inner spring: 37.95mm.





※ Inspection of valve lifter

Check the front and side of the valve lifter for any abnormal wear, such as severe wear or damage. If there is significant wear or a large clearance gap after installation, the valve lifter needs to be replaced.



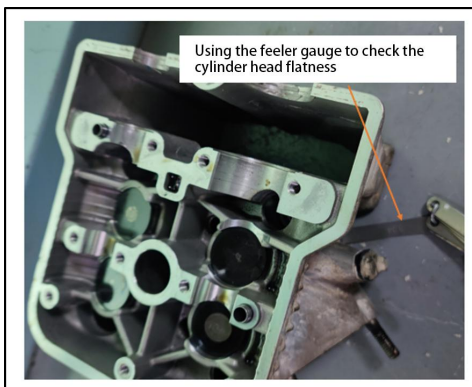
※Inspection of camshaft components

1. Check the surface of the camshaft for any wear or damage. If there is severe wear, the camshaft components should be replaced with new ones.



※Inspection of cylinder head

1. Check the sealing performance of the cylinder head. If the sealing performance is poor, it is necessary to replace the cylinder head or valves.
2. Check if the cylinder head is deformed and measure its flatness using a straightedge and a feeler gauge.



Combustion chamber leak test: Inflate to 0.3Mpa and the leakage should be $\leq 6000\text{pa}/10$ seconds.
Testing parameters: Inflation time 5 seconds, balance time 3 seconds, testing time 2 seconds, deflation time 0.5 seconds, maximum test pressure 320Kpa, minimum test pressure 290Kpa, judgment value 1.2Kpa.

※ Assembly of cylinder head components

1. Install the valve inner and outer spring bottom seats (3, 4) and the valve stem seal (5) onto the valve guide.
2. Apply a small amount of lubricating oil to the intake and exhaust valve (1, 2), then insert them into the valve guide. Install the outer valve spring (6), inner valve spring (7), valve cotters (8), and valve spring retainers (9).
3. Use a valve spring compressor to compress the valve springs slightly, then install the valve cotters into the valve spring retainers.

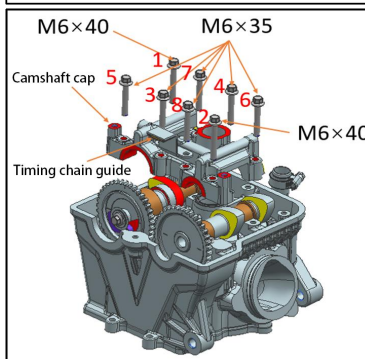
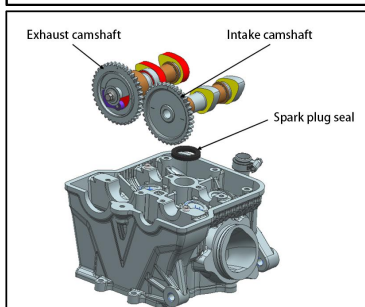
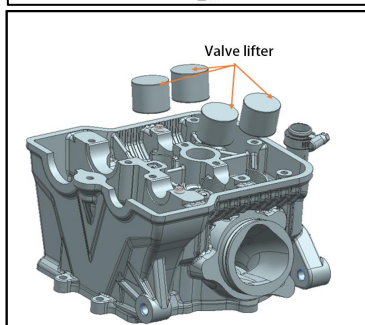
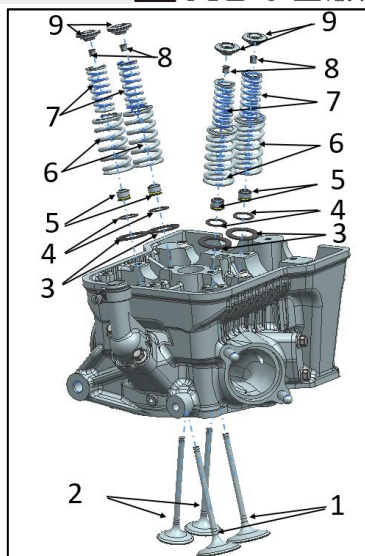
Note:

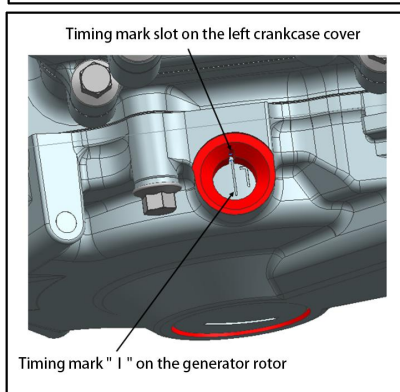
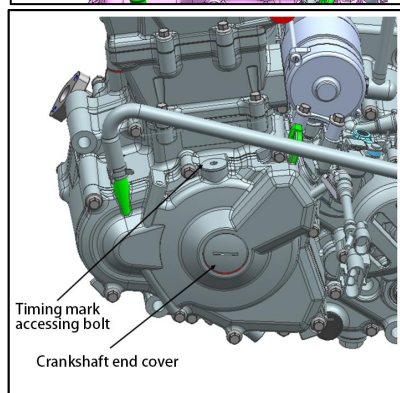
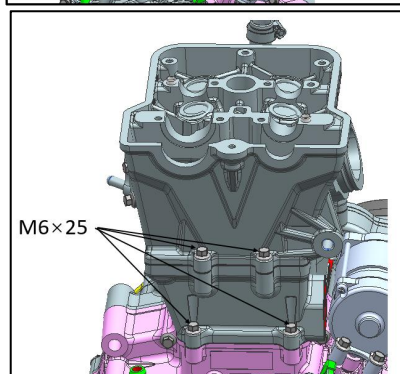
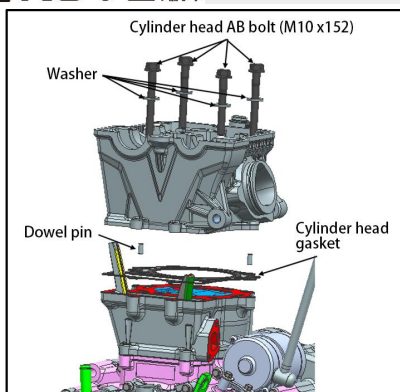
- To prevent permanent deformation of the valve springs, do not compress the springs excessively. They should be compressed only enough to install the valve cotters.

4. Check if the valve cotters are properly assembled.
 5. Perform an air tightness test on the assembled cylinder head assembly. If the cylinder head assembly passes the air tightness test, proceed to the next step (assembly according to the cylinder head diagram).
 6. Apply lubricating oil to the surface of the valve lifters and install them in their respective positions on the cylinder head.
 7. Apply lubricating grease to the surfaces of the assembled intake and exhaust camshafts, and install them in the camshaft grooves on the cylinder head. Install the spark plug seal into the camshaft cap.
 8. Install the camshaft cap and timing chain guide in the designated positions on the cylinder head. Secure them using two M6×40 bolts and six M6×35 bolts. Tighten the bolts in the following sequence: 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8.
- Tightening torque: 11-13 Nm.
9. Rotate the intake and exhaust camshafts to align the timing mark with the surface of the cylinder head. With the timing dot mark facing upward, check the valve clearance using a feeler gauge. The intake valve clearance should be 0.1mm to 0.15mm, and the exhaust valve clearance should be 0.15mm to 0.2mm.

Note:

- The camshaft should rotate flexibly without interference or sticking.
- When adjusting the valve clearance, ensure that the camshaft is in the correct timing position, and measure the valve clearance after tightening the camshaft cap bolts to a torque of 10N.m.





※ Installation of the cylinder head

1. First, remove the camshaft cap from the cylinder head with the adjusted valve clearance, and then remove the intake and exhaust camshaft components.
2. Remove the old cylinder head gasket and install new one, followed by the installation of the dowel pins ($\varnothing 6 \times 12$).
3. Install the cylinder head onto the cylinder, and then install the washers onto the cylinder head AB bolts. Install the AB bolts into the connecting holes between the cylinder head and the cylinder, and tighten them securely.

Note:

- The cylinder head gasket must be replaced with a new one.
- When tightening the AB bolts, tighten them diagonally. The first tightening should be done to a torque of 20N.m, the second tightening to 40N.m, the third tightening torque should be between 55N.m and 60N.m.

4. First, install two M6 x 25 bolts into the connecting holes between the cylinder and the crankcase and tighten them securely. Then, install two M6 x 25 bolts into the connecting holes between the cylinder head and the cylinder, and tighten them securely. Tightening torque: 11N.m to 13N.m.
5. First, check if the engine is in the correct timing position. If it is not, readjust the engine's timing position. Then, install the intake and exhaust camshaft components, ensuring that the camshaft timing line is aligned with the end face of the cylinder head, and the timing dot mark is facing upward. Finally, install the timing chain onto the intake and exhaust camshafts.

※Method for adjusting engine timing:

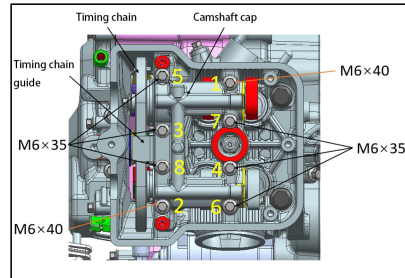
- (1) Remove the crankshaft end cover and timing mark accessing bolt.
 - (2) Use a special tool to rotate the generator lock nut, and at the same time, observe whether the timing mark "I" on the generator rotor aligns with the timing mark slot on the left crankcase cover through the small inspection screw hole.
 - (3) After aligning the timing marks as described above, continue to install the intake and exhaust camshaft components, making sure that the timing marks on the intake and exhaust camshafts are flush with the cylinder head surface, and the timing dot marks are facing upward. Then install the timing chain on the intake and exhaust camshaft.
- ☆: The engine is in the correct timing position only if both (2) and (3) are satisfied.

6. After adjusting the timing position, assemble the timing mark accessing bolt and the crankshaft end cover onto the left crankcase cover.

7. Install the removed camshaft cap, spark plug seals, and timing chain guide onto the cylinder head, and then tighten the 8 cylinder head cap bolts in the following sequence:

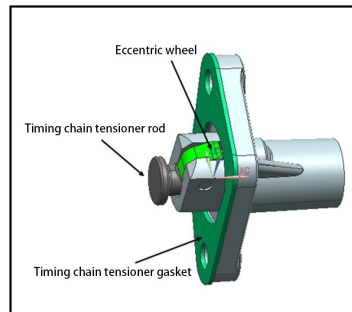
1→2→3→4→5→6→7→8.

Tightening torque: 11-13 N·m



8. Press the timing chain tensioner rod into the timing chain tensioner housing by hand to put it in the contracted state, align the tensioner gasket and the tensioner assembly with the installation hole on the cylinder, and tighten them with 2 M6×20 bolts.

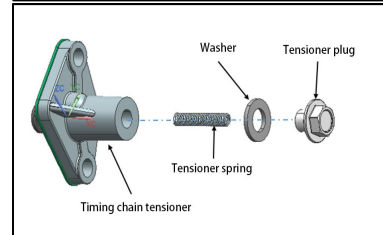
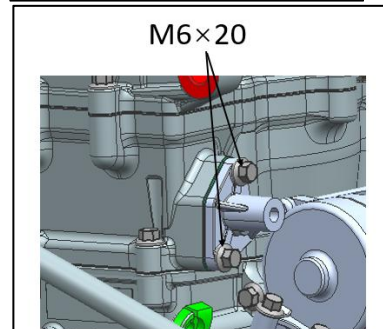
Tightening torque: 11-13 N·m



9. Install the tensioner spring, washer, and tensioner plug into the tensioner, and tighten the tensioner plug to make the tensioner rod pop out.

Tightening torque: 7-9 N·m.

10. Check if the timing chain is tensioned and verify the correct timing point of the engine again.

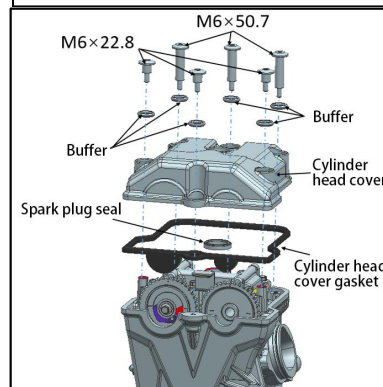


※Installation of the cylinder head cover

1. Take the NC450S cylinder head cover gasket and buffer, and assemble them at the specified positions on the cover.

2. Take 3 pieces of NC450S cylinder head cover bolt M6×22.8 and 3 pieces of cylinder head cover bolt M6×50.7, and assemble them on the cylinder head, tightening them diagonally.

Tightening torque: 10-12 N·m.



Cylinder and piston

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Maintenance information

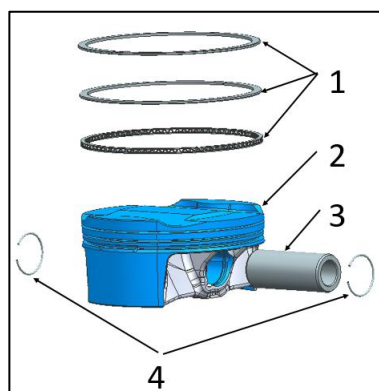
Overview:

- The cylinder head lubricating oil is delivered from the small oil hole next to the left body AB bolt to the cylinder head. Before installing the cylinder head, ensure that the small oil hole next to the left body AB bolt is unobstructed. It is important not to install the solid pin of the cylinder into the oil passage hole.

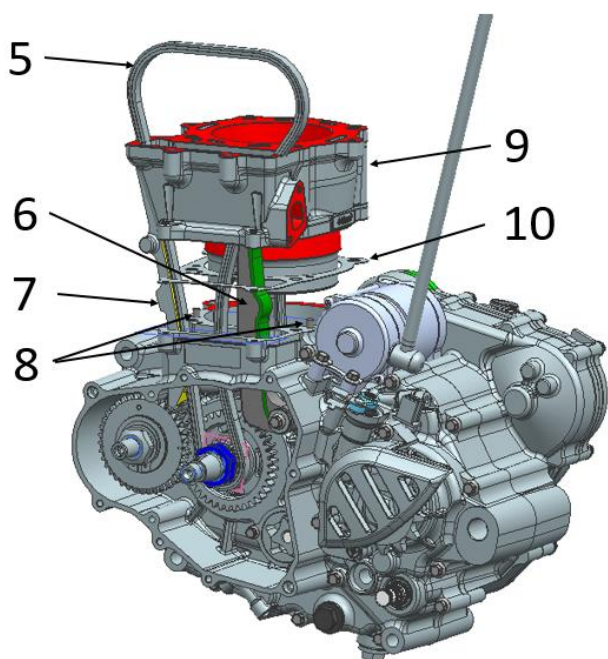
Cylinder, piston, piston rings and piston pin specifications

Items			Standard (mm)	Limit (mm)
Cylinder	Cylinder bore		$\varnothing 94.5 \sim \varnothing 94.52$	$\varnothing 94.528$
	Out of round		0.05	0.01
	Cylinder surface flatness		0.03	0.05
Piston, piston rings, piston pin	Piston skirt diameter		$\varnothing 94.453 \sim \varnothing 94.467$	$\varnothing 94.43$
	Piston pin bore inside diameter		$\varnothing 20.004 \sim \varnothing 20.01$	$\varnothing 20.015$
	Piston pin to piston pin bore clearance		$0.004 \sim 0.018$	0.025
	Piston ring end gap (installed)	Top ring /2nd ring	$0.2 \sim 0.35$	0.5
		Oil ring	$0.2 \sim 0.7$	1.4
	Piston ring side clearance	Top ring	$0.03 \sim 0.07$	0.08
		2nd ring	$0.02 \sim 0.06$	0.08
	Piston to cylinder clearance		$0.033 \sim 0.067$	0.07
	Piston pin outside diameter		$\varnothing 19.992 \sim \varnothing 20$	$\varnothing 19.99$
Connecting rod	Small end inside diameter		$\varnothing 20.015 \sim \varnothing 20.025$	$\varnothing 20.04$
	Piston pin to small end inside bore clearance		$0.015 \sim 0.033$	0.05

※Assembly diagram

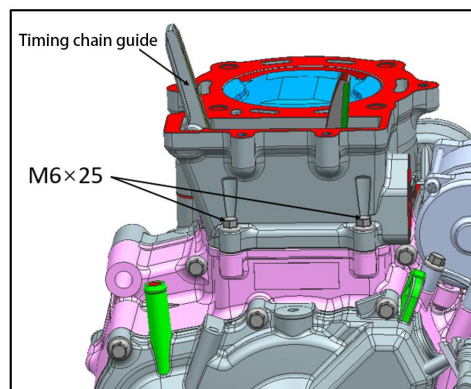


1. NC450S piston rings;
2. NC450S piston;
3. NC450S piston pin;
4. NC450S piston pin clips;
5. NC450S timing chain (5×134 tooth-chain);
6. NC450S timing chain guide (No.2);
7. NC450S timing chain guide;
8. Dowel pins $\phi 6 \times 12$;
9. NC450S cylinder component (cylinder marking 449, shot blasting and passivation).
10. NC450 cylinder gasket (foamed metal rubber composite board).

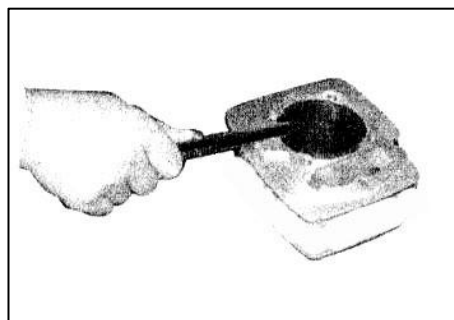


※Disassembly of the cylinder

1. Remove the timing chain guide and remove the two cylinder-to-crankcase connecting bolts M6×25, then remove the cylinder.

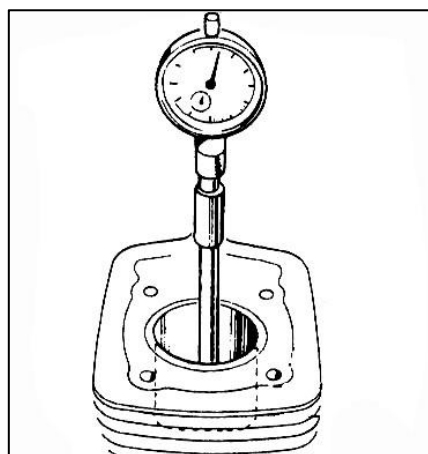


2. Clean off any remaining gasket material from the cylinder surface using a scraper.



※Cylinder inspection

1. Check for any wear or damage to the cylinder.
 2. Measure the inner diameter of the cylinder, taking measurements at three positions: the top, middle, and bottom of the cylinder wall. Measurements should be taken in two directions perpendicular to each other. Limit: $\varnothing 94.528\text{mm}$.



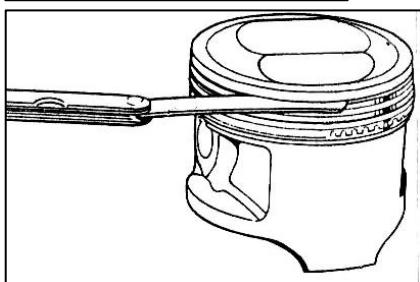


※Disassembly of the piston

Use needle-nose pliers to remove the piston pin clip. Take off the piston pin and piston.

Note:

- Be careful not to let the piston pin clip fall into the crankcase.



※Inspection of the piston and piston rings

1. Remove the piston rings.
2. Measure the gap between the piston rings and the ring grooves.

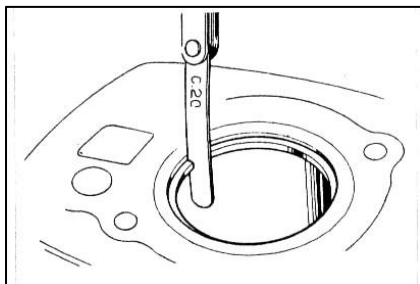
Limit:

Top ring: 0.08mm

Second ring: 0.08mm

Oil ring: 0.08mm

3. Check for wear or cracks on the piston and wear on the ring grooves.



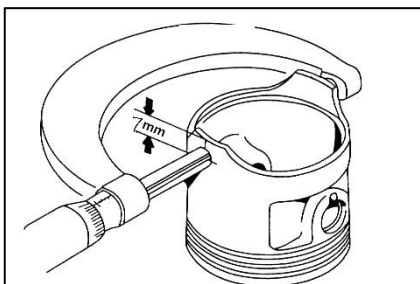
4. Insert the piston rings into the cylinder and measure the ring end gap.

Limit:

Top ring: 0.5mm

Second ring: 0.5mm

Oil ring: 1.4mm



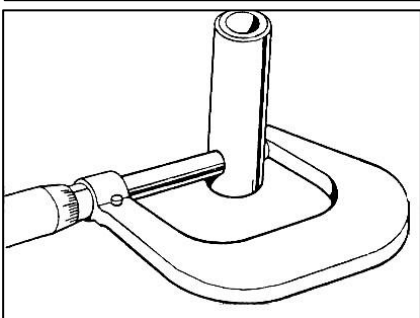
5. Measure piston skirt diameter, 7mm from the bottom edge of the piston.

Limit: $\phi 94.43$ mm

6. Calculate the clearance between the cylinder and the piston.

Piston-to-cylinder clearance=Cylinder bore-piston skirt diameter.

Limit: 0.1mm



7. Measure the outside diameter of the piston pin.

Limit : $\phi 19.99$ mm

8. Calculate the clearance between the piston and the piston pin.

Piston-pin-to-piston-pin-bore clearance=piston pin bore inside diameter-piston pin outside diameter

Limit: 0.025mm.

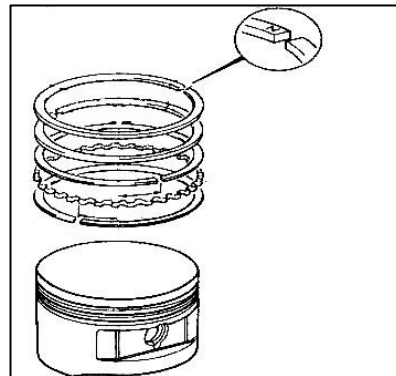
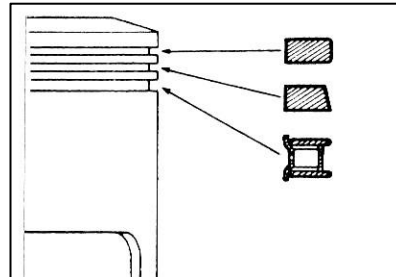
※Installation of Piston Rings

1. Thoroughly clean the grooves of the piston rings.
2. Install the piston rings.

Note:

1. During installation, prevent any damage to the piston and piston rings.
2. When installing the piston rings, ensure that the first ring and second ring are not swapped, and the marked side of the rings faces the top of the piston.
3. After installation, the piston rings should rotate freely.

3. The clearances between the rings in the oil ring set should match the clearances of the spacer ring. Install the spacer ring first and then install the oil rings.

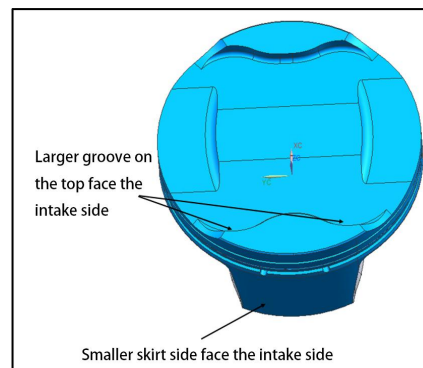


※Installation of Piston

Install the piston rings, piston pin, and new piston pin circlip on one side.

Note:

1. When installing the piston, the smaller skirt side should face the intake side or the side with a larger groove on the top should face the intake side.
2. The opening of the piston pin clip should face downward.
3. If the piston pin clip is severely deformed, it must be replaced with a new one.
4. Do not allow the piston pin clip to fall into the crankcase.

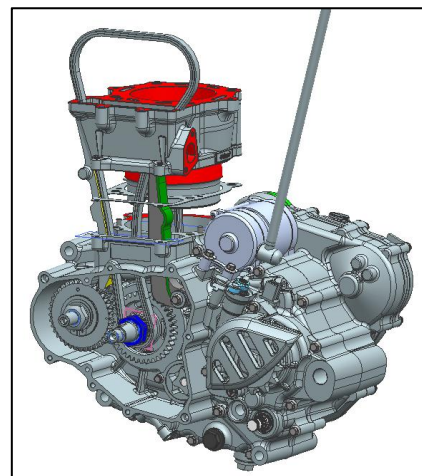


※Installation of cylinder

1. Install the dowel pins and a new cylinder gasket.
2. Apply a thin layer of engine oil on the surface of the cylinder wall, piston wall, and piston rings.
3. Rotate the openings of the piston rings 120° apart from each other before gently fitting the cylinder in place.
4. Install the timing chain guide.

Note:

When installing the cylinder, avoid damaging the piston rings.



Clutch, primary drive gear, overrunning clutch, oil pump, shift shaft

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Section 10 Assembly clutch, starter motor and right crankcase cover	186

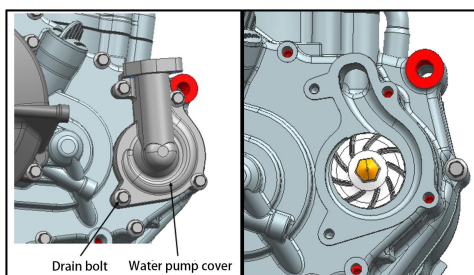
Maintenance information

Overview:

The disassembly, installation, and maintenance work related to the clutch, oil pump, and shift shaft can be carried out without removing the engine after removing the right crankcase cover.

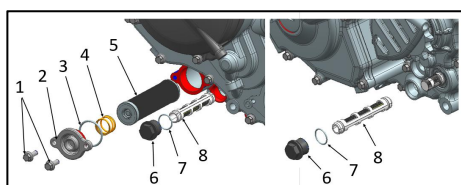
Clutch and oil pump specifications

Items		Standard (mm)	Runout limit (mm)
Clutch	Clutch spring free length	25	25
	Friction plate thickness	2.95 ~ 3.05	2.85
	Clutch plate warpage limit	0.1	0.14
	Clearance between the clutch housing and the friction plate.	0.1 ~ 0.3	0.6
Oil pump	Inner-rotor-to-outer-rotor-tip clearance	0.06 ~ 0.15	----
	Rotor-assembly-to-cover clearance	0.04 ~ 0.1	----



※Remove water pump cover

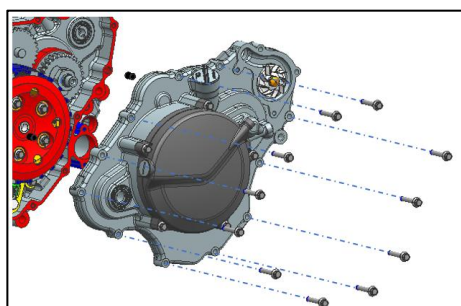
Remove the drain bolt on the water pump cover and drain the coolant from the engine. Remove the water pump cover and the gasket when there is no more water flowing from the drain bolt hole.



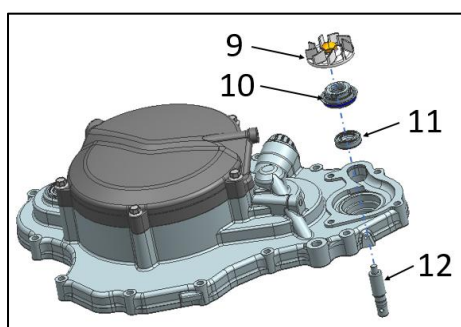
※Remove right crankcase cover

1. First, drain the engine oil. Remove the two M6×16 bolts (1) securing the oil filter cover (2). Take off the oil filter cover (2), remove the filter spring (4), and take out the oil filter component (5). Remove the oil filter screen cover (6) on the left and right crankcase, and take out the oil filter screen assembly (8) from the crankcase. Wait until all the oil inside the crankcase has drained completely. When removing the oil filter cover, check if the O-ring (3) and (7) of the oil filter cover are damaged.

2. Remove the connecting bolts and take off the right crankcase cover.



Note: When removing the right crankcase cover, remove the 2 dowel pins together and keep them properly stored.

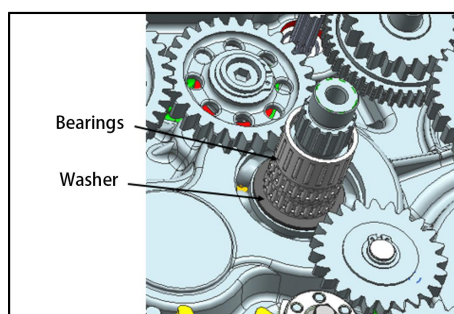
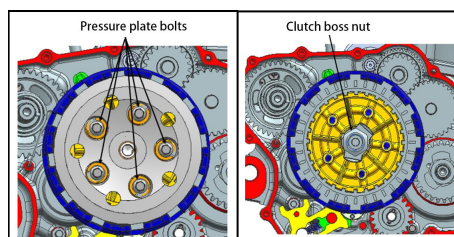


※ Impeller, impeller shaft, water seal assembly and oil seal disassembly

1. Remove the water pump impeller (9) and take out the impeller shaft (12).
2. Take out the water seal assembly (10) and oil seal (11) from the impeller shaft hole.

※Clutch disassembly

1. Remove the pressure plate bolts and springs. When loosening the pressure plate bolts, loosen them in a cross pattern in two or three stages.
2. Take off the pressure plate and the push rod.
3. Remove the clutch boss nut and lock washer.
4. Disassemble the clutch boss, clutch housing, bearings, and washers.
5. Remove the clutch push rod from the center hole of the crankshaft.

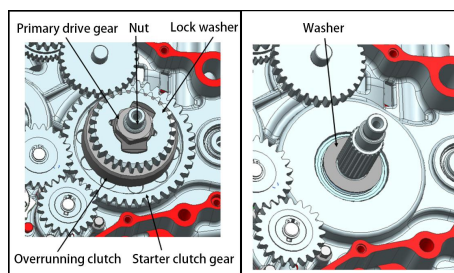


※Primary drive gear, overrunning clutch, starter clutch gear disassembly

1. Remove the primary drive gear nut and the lock washer.
2. Take off the primary drive gear, overrunning clutch and starter clutch gear.

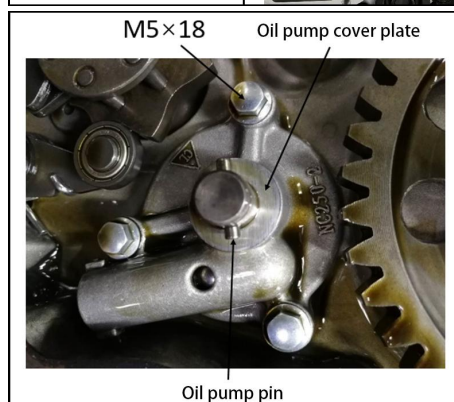
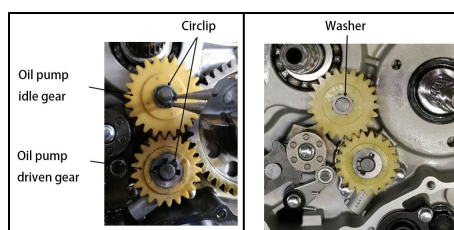
Note:

When disassembling the starter clutch gear assembly, remove the washer below the starter clutch gear and keep it properly stored.



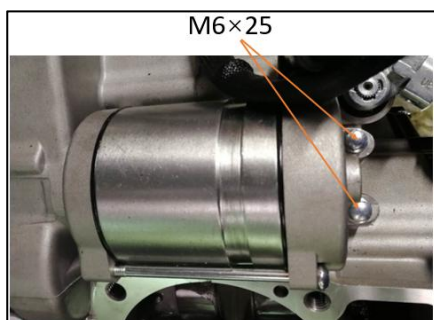
※Rightside oil pump disassembly

1. Use expanding pliers to remove the circlip of the oil pump idle gear and oil pump driven gear.
2. Disassemble the oil pump idle gear washer, oil pump idle gear, and oil pump driven gear.
3. Remove the three M5×18 bolts on the right oil pump cover plate, and take off the oil pump cover plate assembly and the oil pump inner and outer rotor assembly.



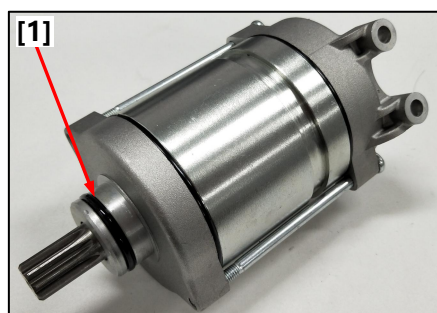
Note:

There is one washer above and below the oil pump idler gear. The removed circlips, washers, and oil pump pins should be properly stored to prevent loss.

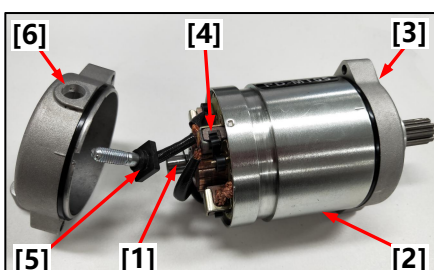


※Disassembly of the starter motor

Remove the fastening screw M6×25 to detach the starter motor. Take off the starter motor.

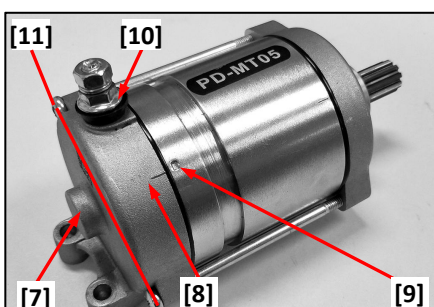


Remove O-ring [1].
Install in the reverse order of disassembly.
Note:
Replace the O-ring with a new one and apply engine oil.



Note:

Install the armature [1] into the starter motor yoke from the yoke groove [2] side, with the commutator rod facing the rear side. When installing the front cover [3], align the protrusion with the groove (align with index line [8]).
Install the brush holder set [4] onto the armature shaft [1] and thread the harness [5] through the rear cover hole [6], then install the rear cover [7].



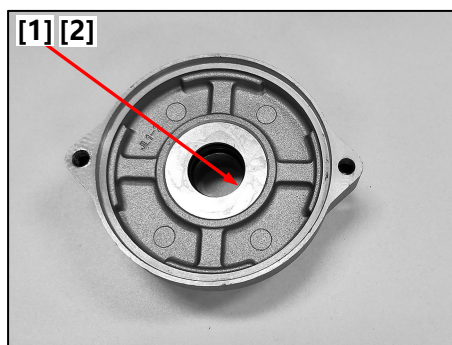
Note:

Align the oil seal lip on the armature shaft to prevent damage. Align the index line [8] on the rear cover with the groove [9] on the motor housing.
Install the front and rear cover connecting bolts [11] and tighten the positive terminal fastening nut [10].

※Inspection

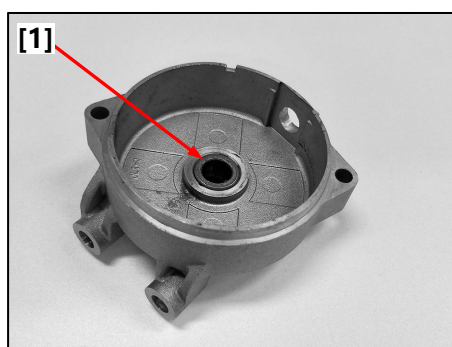
Front cover

Check if the oil seal [1] in the front cover has deteriorated, worn out, or damaged.
Rotate the inner ring [2] of the bearing with your fingers. The bearing should rotate smoothly, and check if the outer race is tightly fitted to the front cover.



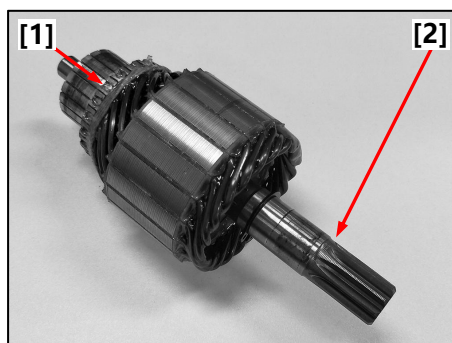
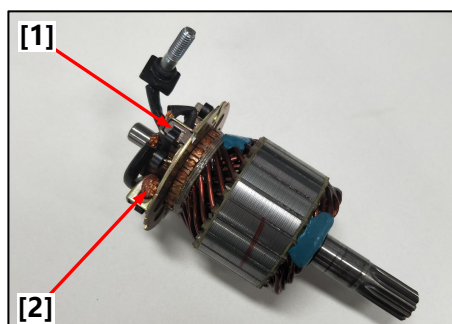
Back Cover

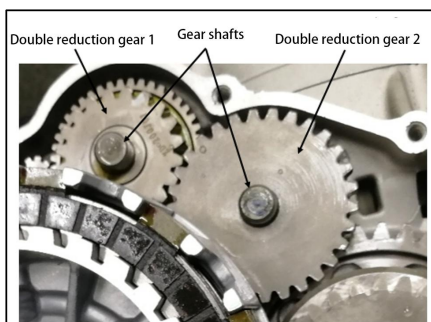
Check if the bushing [1] in the back cover is worn out or damaged.
Inspect the brush for any damage and measure its length [1].
The limit is 6.5 mm.
Check the continuity of the back cover using the following steps:
- There should be continuity between the positive brush [2] and the cable terminal.
- There should be no continuity between the cable terminal and the back cover.



Rotor

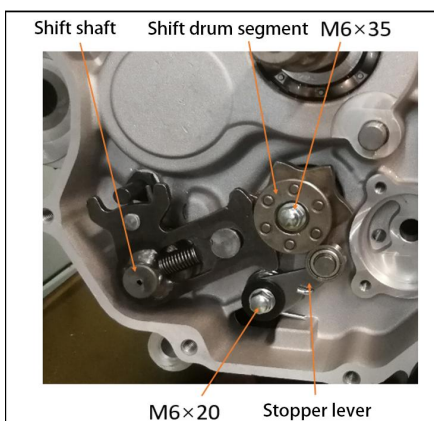
Remove any metal debris from the commutator bar [1].
Check if the commutator bar has changed color.
Check the continuity on the rotor as follows:
- There should be continuity between a pair of commutator bars.
- There should be no continuity between each commutator bar and the armature shaft [2].





※Disassembly of double reduction gear

Remove the double reduction gear shafts.
Remove double reduction gear 1 and 2.



※Disassembly of shift shaft

1. Remove the M6×35 fixing screws of the shift drum segment and take off the shift drum segment.
2. Remove the shift shaft assembly.
3. Remove the M6×20 fixing screws of the stopper lever, and remove the stopper lever washer and stopper lever assembly.

※Inspection of right crankcase cover

1. Check if the crankshaft oil seal on the right crankcase cover is damaged. If the oil seal is found to be cracked, it needs to be replaced.

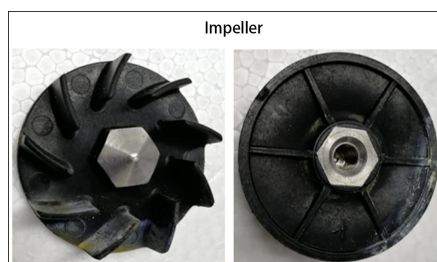
When replacing the crankshaft oil seal, pay attention to the following:

1. Verify if the condition of the oil seal is correct. The NC450S crankshaft oil seal should have the "NJK" marking on its end face.
2. During assembly, the marked side should face outward.



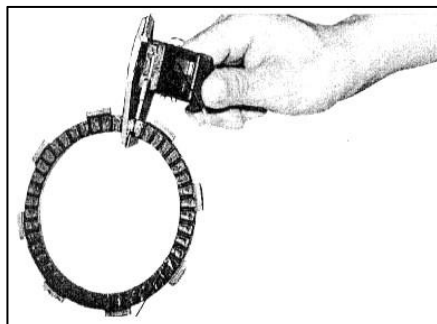
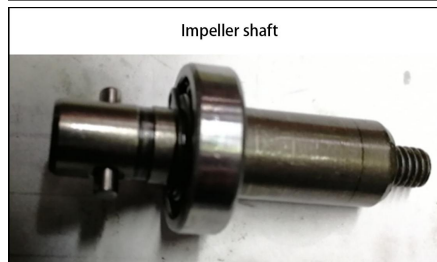
※Inspection of impeller shaft, impeller, water seal assembly, and oil seal

1. Check if the impeller has any cracks or if the fittings of the impeller are loose. If any of these issues are present, replace the impeller with a new one.
2. Inspect the water seal assembly and oil seal for any signs of damage. Check if the impeller shaft shows abnormal signs of wear or bending. If so, replace the water seal assembly, oil seal, and the impeller shaft with new ones.



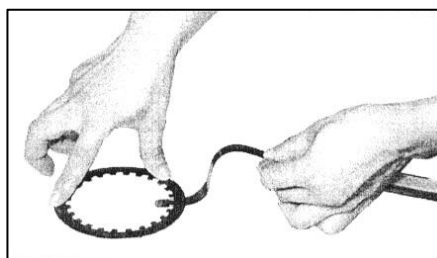
When replacing the water seal assembly, oil seal, and impeller shaft, please take note of the following:

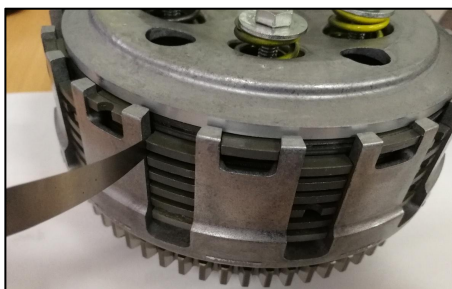
1. Apply a suitable amount of engine oil inside the NC450S impeller shaft hole. Use the dedicated tool to press-fit the NC450S oil seal into place, with the marked end of the oil seal facing outward.
2. Use the dedicated tool to press-fit the NC450S water seal assembly into place, ensuring it is positioned 0.5mm below the end face. When assembling the seal, make sure the marked end of the seal faces outward.
3. Apply a sufficient amount of lubricating oil to the main lip of the seal.
4. Use the dedicated tool to press-fit the new impeller shaft into place.
5. The assembled impeller shaft should rotate smoothly.



※Checking the friction plates and the clutch plates

1. If there are signs of abrasion or discoloration on the friction plates, they should be replaced. Measure the thickness of each friction plate. Runout limit: 2.85mm.
2. Inspect the surface of the clutch plates for any distortion. Use a flatness gauge for the inspection. Runout limit: 0.14mm.





3. Inspect the clearance between the clutch housing and the friction plates.
Runout limit: 0.6mm.

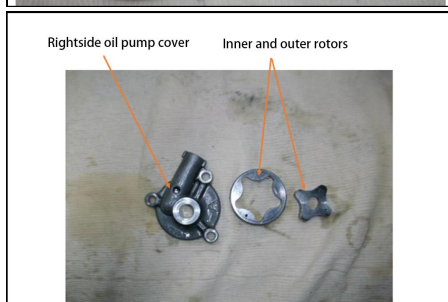
※Inspection of clutch housing

Check if there are any notches or scars on the drum-shaped grooves of the housing due to friction with the friction plates. If the damage is severe, the clutch housing needs to be replaced.



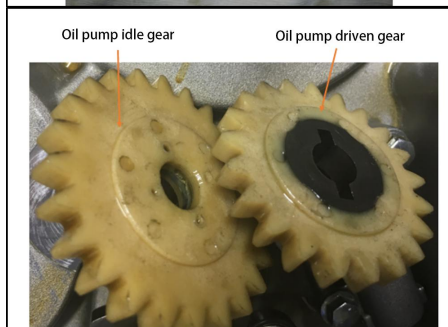
※Inspection of overrunning clutch

Remove the circlip from the end face of the overrunning clutch and inspect the condition of the wedge block for wear or damage. Check if the wedge block spring has been elongated or broken.



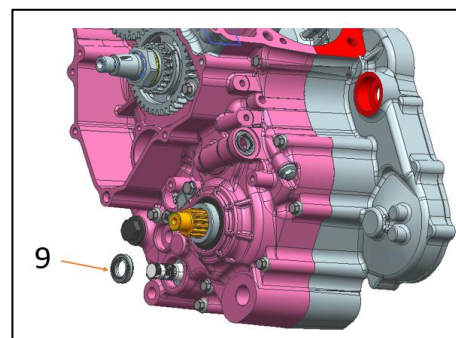
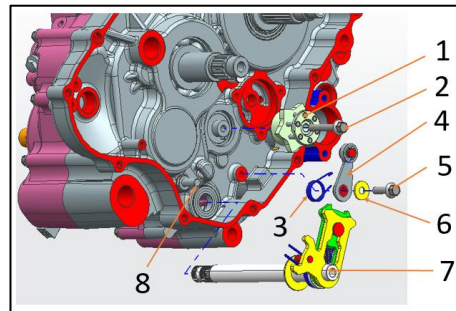
※Inspection of rightside oil pump

1. Check for any signs of wear or damage on the inner and outer rotors of the oil pump. If there is significant wear or damage, the oil pump rotor assembly needs to be replaced.
2. Inspect the combination of the oil pump idle gear and the oil pump driven gear for any signs of breakage. If there are any, replace the oil pump idle gear and the oil pump driven gear with new ones.
3. Check if the right oil pump cover plate shows any signs of wear or damage. If so, replace the right oil pump cover plate with a new one.



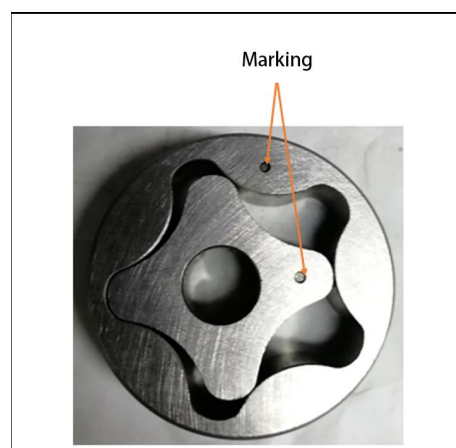
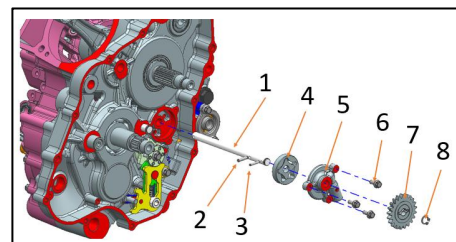
※Assembly of the shift shaft

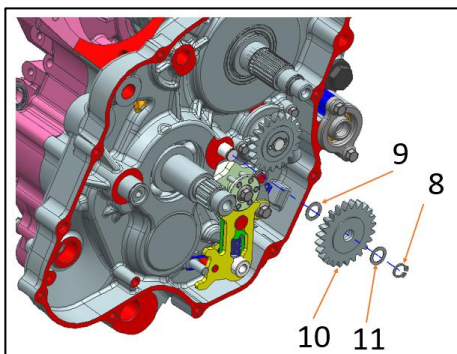
1. Install the stopper lever (4) and washer (6). Insert the stopper lever spring (3) into their respective positions on the stopper lever and secure them with M6×20 bolt (5).
2. Mount the shift drum segment (1) onto the shift drum bearing. Take an M6×35 bolt (2) and apply a full circle of thread-locking adhesive on the threads. Tighten the bolt.
3. Take the NC250 shift shaft (7) and install it in the corresponding position (Note: The shift shaft spring should be inserted into the shift shaft positioning bolt (8)).
4. Test the shifting to ensure correctness and smooth operation.
5. Take the shift shaft oil seal (9) and use the tool to assemble it in the left crankcase shift shaft oil seal hole.



※Assembly of the rightside oil pump

1. Insert the oil pump shaft (1) through the corresponding hole in the crankcase. Note: The shaft has two pin holes facing the right side of the crankcase.
2. Insert the oil pump pins (2) through the oil pump shaft (1), and then install the oil pump rotor assembly (4) into the corresponding oil pump hole on the right crankcase (the side with markings on the oil pump rotor assembly should face the same direction).
3. Install the oil pump cover assembly (5) onto the oil pump and tighten it with three M5×18 bolts (6).
4. Thread the oil pump pin (3) through the oil pump shaft, then install the oil pump driven gear assembly (7) onto the oil pump shaft, and finally install the circlip (8) onto the ring groove on the oil pump shaft.

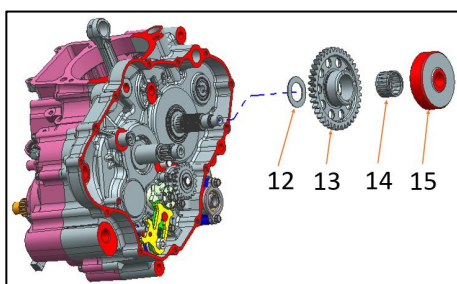




Note:

1. When installing the oil pump rotor, the marked surfaces of the inner and outer rotors should face the same direction.
2. Tightening torque for the oil pump cover bolts: 7-9 N.m.
3. After the cover assembly, ensure smooth rotation of the oil pump shaft.

5. Install the oil pump idle gear washer (9) onto the oil pump idle gear shaft, then install the idle gear (10) onto the gear shaft. Next, install the washer (11) onto the gear, and finally, install the circlip (8) onto the groove on the oil pump idle gear shaft.

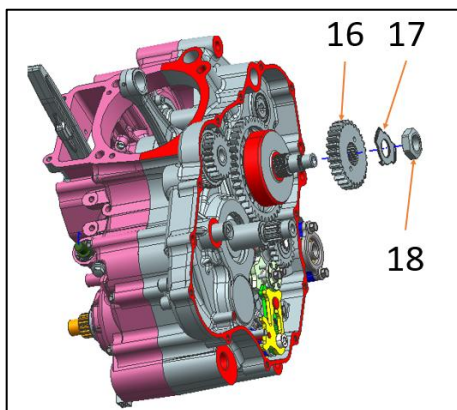


※Installation of the starter clutch gear and overrunning clutch

1. Install the starter clutch gear washer (12) onto the right crankshaft.
2. Install the starter clutch gear (13), bearing (14), and overrunning clutch (15) onto the right crankshaft.

Note:

Before installing the starter clutch gear, uniformly apply oil to the inner hole of the gear.



※Installation of the primary drive gear

1. Install the primary drive gear (16) onto the right crankshaft.
2. Install the lock washer (17) onto the primary drive gear.
3. Apply a full circle of thread-locking adhesive (Loctite 263) on the threads of the nut (18), then install it onto the right crankshaft and tighten it.

Tightening torque: (115-125) N•m.

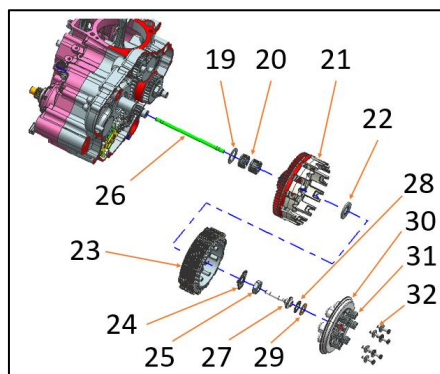
※Installation of the clutch

1. Install the washer (19), bearings (20), clutch housing (21), and thrust plate (22) onto the main axle.

Note: Apply oil evenly to the bearings.

2. First, install the clutch boss (23) and lock washer (24) onto the main axle. Apply a full circle of thread-locking adhesive (Loctite 263) on the threads of the clutch boss nut (25) and install it onto the main axle, then tighten it.

Note: Clutch boss nut tightening torque: 80-90 N·m.

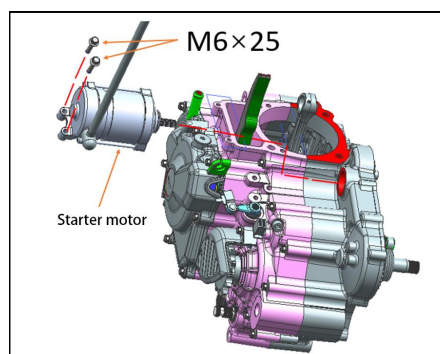


3. Next, install the clutch push rod (26) into the center hole of the main axle, then install the push rod (27) into the center hole of the main axld. Install the thrust bearings (28) and push rod washer (29) onto the push rod.

4. Install the pressure plate (30), pressure plate springs (31), and pressure plate screws (32). Tighten the pressure plate screws using a torque wrench. Tightening torque: 8-10 N·m.

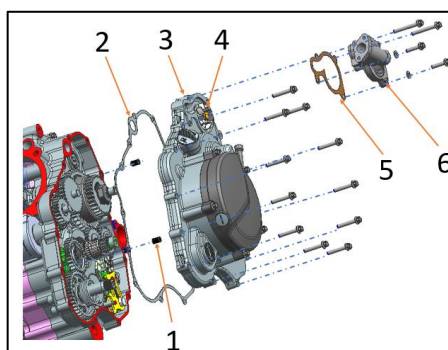
※Assembly of the starter motor

After applying oil evenly to the gear slot of the starter motor, assemble the starter motor in place and tighten it with two M6×25 bolts. Tightening torque: 11-13 N·m.



※Installation of the right crankcase cover

1. Install two dowel pins (1) into the crankcase pin holes. Remove the old gasket (2) and replace it with a new one. Assemble the right crankcase cover (3) in place and tighten it with 11 M6×35 bolts. Tightening torque: 11-13 N·m.
2. Install the impeller (4) onto the impeller shaft and tighten it. Tightening torque: 2-4 N·m.
3. After installing the water pump cover gasket (5), assemble the water pump cover (6) in place and tighten it with two M6×45 bolts and two M6×25 bolts.

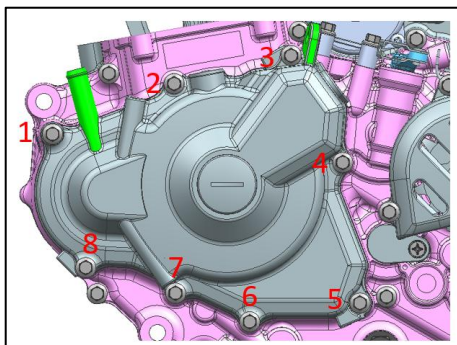


Generator and starter clutch

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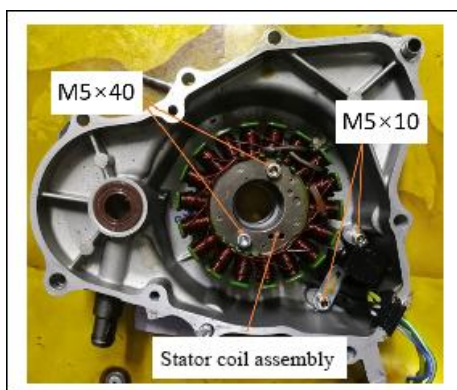
Maintenance information

To disassemble and install the generator and the balancer drive/driven gear, it is only necessary to remove the left crankcase cover, without removing the entire engine.



※Disassembly of the Left Crankcase Cover

Remove the 8 fastening bolts on the generator cover and take off the generator cover.



※Disassembly of the stator coil

1. Remove the 2 M5×10 screws that secure the sensor.
2. Remove the 2 M5×40 screws that secure the stator coil, and then remove the stator coil assembly from the generator cover.



※Disassembly of the generator rotor

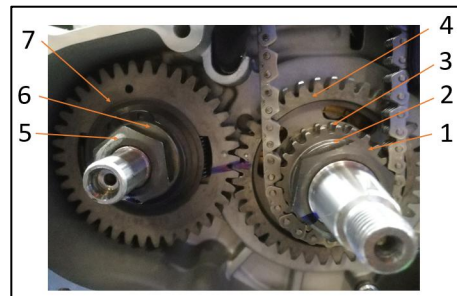
Remove the locking nut of the generator rotor and use a specialized tool to remove the generator rotor.

Note:

1. When disassembling the generator rotor, only use a specialized tool for disassembly. Do not strike the generator rotor.
2. If the generator rotor is subjected to unexpected impacts during disassembly or assembly, such as falling or being struck by foreign objects, it should be replaced with a new generator rotor.

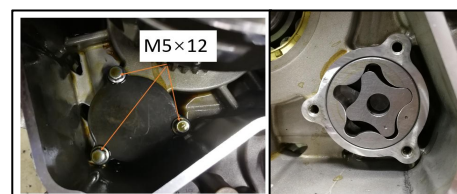
※Disassembly of the balancer drive/driven gear

1. Remove the locking nut (1) and the washer (2) of the balancer drive gear.
2. Remove the timing chain sprocket(3) and the balancer drive gear(4);
3. Remove the locking nut (5) of the balancer driven gear and the disc washer (6).
4. Remove the balancer driven gear(7)、balancer collar、 woodruff key.



※Disassembly of the leftside oil pump

1. Remove the three M5×12 screws that secure the leftside oil pump cover plate.
2. Remove the oil pump cover plate and the assembly of the oil pump rotor. Ensure that the oil pump pin is properly stored to prevent loss.



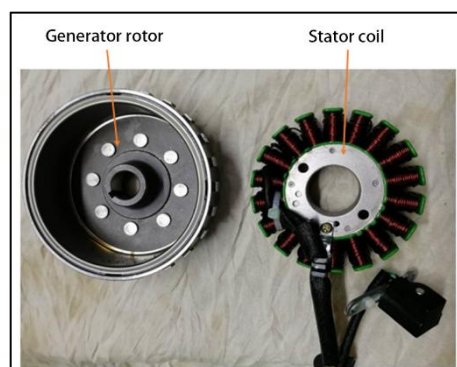
※Inspection of the generator cover

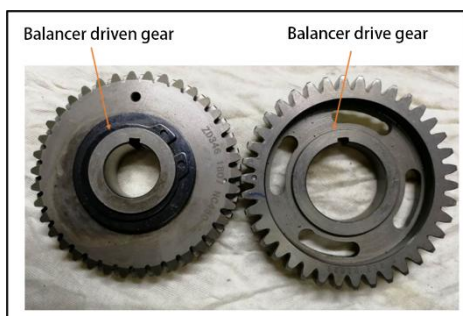
Inspect the oil seal of the balancer shaft in the generator cover for any signs of damage. If damage is present, the balancer shaft oil seal must be replaced.



※Inspection of the stator coil and generator rotor

1. Inspect the generator rotor for any cracks or damage to the magnets. If any are found, replace a new one.
2. Inspect the stator coil for discoloration. If discoloration is present, replace a new one.





※Inspection of balancer drive and driven gears

1. Check for wear or damage on the balancer drive and driven gears.
2. Inspect the buffer spring on the driven gear for any signs of breakage. If broken, replace the gear.

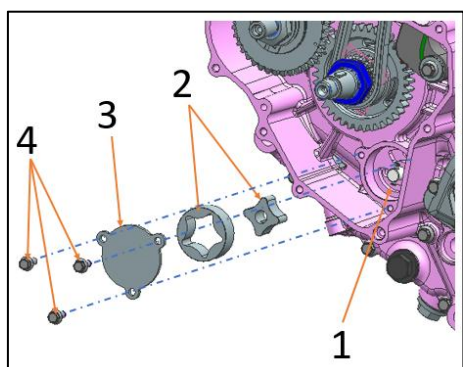


※Inspection of the leftside oil pump

1. Inspect the rotor components of the leftside oil pump for any signs of wear or damage.
2. Check the cover plate of the leftside oil pump for wear or damage.

※Installation of the leftside oil pump

1. Insert the pin (1) of the oil pump into the corresponding hole on the oil pump shaft, and then install the leftside oil pump rotor assembly (2) into the corresponding hole on the left crankcase.
2. Secure the left cover plate (3) of the oil pump using three M5×12 bolts (4).

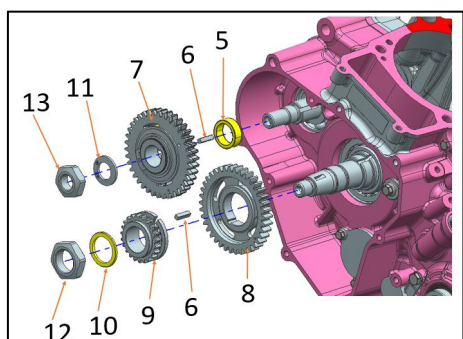


Note:

1. When installing the oil pump rotor, ensure that the marked surfaces of the inner and outer rotors face the same direction.
2. Torque specification for the bolts securing the left oil pump cover plate: 7-9 N·m.
3. After tightening, check if the oil pump shaft rotates smoothly.

※Installation of balancer drive and driven gears

1. First, install the balancer collar (5) onto the balancer shaft, then insert the woodruff key (6) into the the balance shaft. Finally, install the assembly of the driven gear (7) onto the balancer shaft.
2. Install the drive gear (8) onto the crankshaft, then insert the woodruff key (6) into the crankshaft, and finally, install the timing chain sprocket (9) onto the crankshaft.



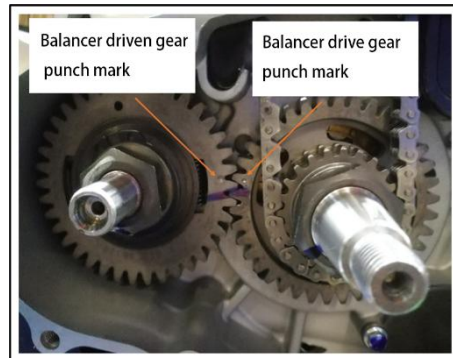
Note:

When installing the balancer drive and driven gears, ensure that the punch marks on the gears align with each other, the teeth with punch marks should engage with each other.

Place the disc washer(10) (11) onto the timing chain sprocket (9) and the balancer driven gear (7). Apply thread locking adhesive to 3-4 threads of the balance drive gear lock nut M24×1 (12) and the balance driven gear lock nut M16×1 (13). Install them onto the crankshaft and balancer shaft and tighten them.

Torque specification for the balancer drive gear lock nut: 115-125 N·m.

Torque specification for the balancer driven gear lock nut: 80-90 N·m.

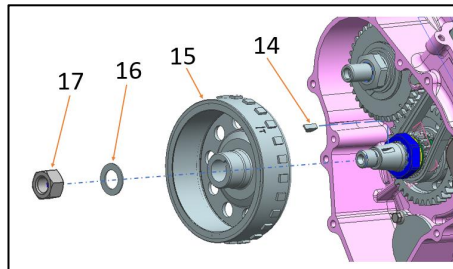


※Installation of the generator rotor

1. Install the **woodruff key (14)** into the crankshaft's keyway.
2. Mount the generator rotor (15) onto the crankshaft, then **apply thread locking adhesive to 3-4 threads of the generator rotor nut (17)**. Install the washer (16) and nut (17) onto the crankshaft and tighten.

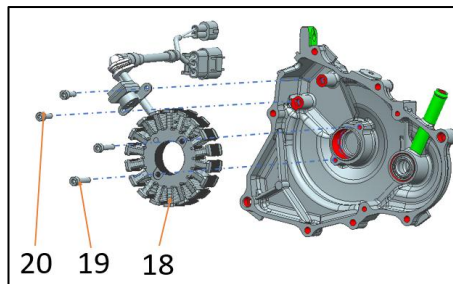
Note:

Torque specification for the generator rotor nut: 80-90 N·m.



※Installation of the stator coil

Secure the stator coil assembly (18) onto the generator cover using two M5×10 screws (20) and two M5×40 screws (19).
Torque specification: 7-9 N·m.

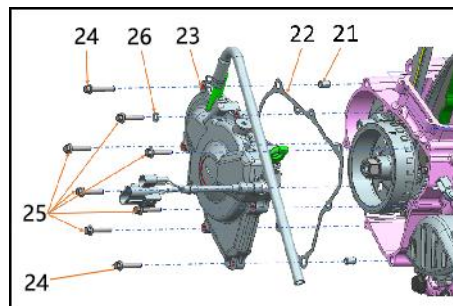


※Installation of the generator cover

1. Remove the old sealing gasket (22) and install a new one.
 2. Install two dowel pins (21) onto the crankcase.
 3. Position the generator cover (23) and secure it using two M6×35 screws (24) and six M6×30 screws (25).
- Torque specification: 11-13 N·m.

Note:

Apply thread locking adhesive to one M6×30 bolt (25), insert it into the washer (26), and place it in the corresponding location as shown in the diagram.



Crankcase, crankshaft, balancer shaft, transmission

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Maintenance information

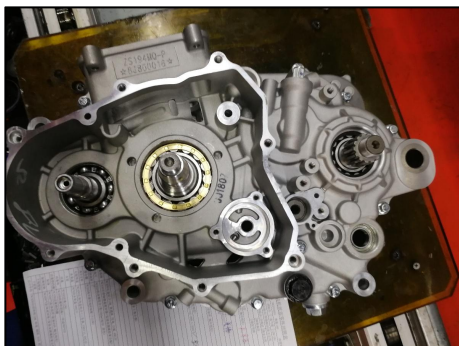
In this section, will introduce the installation and inspection of the transmission, crankshaft, and balancer mechanism. Before performing the aforementioned tasks, the crankcase should be separated. The disassembly of other engine components should be done prior to separating the crankcase.

Tasks before crankcase separation:

- Disassembly of the cylinder head.
- Disassembly of the cylinder/piston.
- Disassembly of the clutch, oil pump, shifting mechanism, and balance gears.
- Disassembly of the generator.

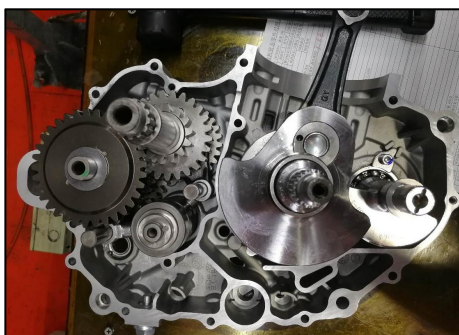
Shift forks/shift fork guide bar/crankshaft/balancer shaft specifications

Items			Standard (mm)	Runout limit (mm)
Shift forks	Shift fork "L" , "R" inside diameter		$\phi 12.016 \sim \phi 12.043$	$\phi 12.045$
	Shift fork "C" inside diameter		$\phi 12.016 \sim \phi 12.043$	$\phi 12.045$
	Shift fork pawl thickness		4.8 ~ 4.9	4.8
Shift fork guide bar	Main axle shift fork guide bar outside diameter		$\phi 11.973 \sim \phi 12$	$\phi 11.95$
	Drive axle shift fork guide bar outside diameter		$\phi 11.973 \sim \phi 12$	$\phi 11.95$
	Cylindricity		0.006	----
Crankshaft	Connecting rod small end inside diameter		$\phi 20.015 \sim \phi 20.025$	$\phi 20.04$
	Connecting rod big end clearance	Axial diameter	0.15 ~ 0.4	0.7
		Radial diameter	0.008 ~ 0.016	0.02
Balancer shaft	Shaft diameter		$\phi 19.98 \sim \phi 19.993$	$\phi 19.96$



※Crankcase disassembly

1. Place the left crankcase of the engine facing upwards.
2. Remove the fastening bolts, including 3 bolts M6×70, 3 bolts M6×65, and 6 bolts M6×45, to separate the left and right crankcase. Remove 2 locating pins.

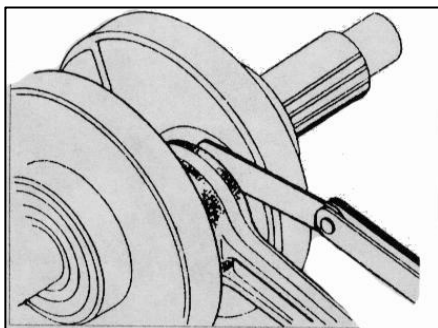


※Crankshaft/balancer shaft/Main and drive axle disassembly

Take out the crankshaft assembly, balancer shaft, shift fork guide bar, shift fork, shift drum, and main and drive axle components from the crankcase.

Note:

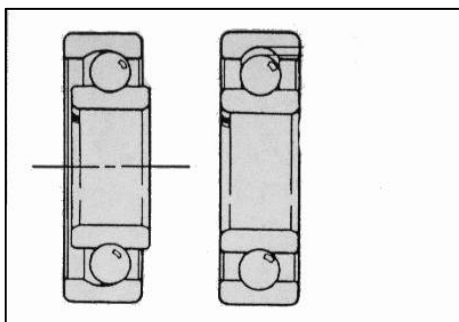
Ensure that no components are left behind when removing the main and drive axle components.



※Crankshaft inspection

Measure the side clearance of the connecting rod using a thickness gauge.

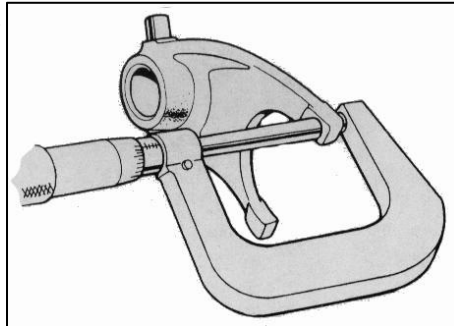
Repair limit: 0.7 mm



※Crankcase bearings inspection

Check the smooth rotation of all bearings in the left and right crankcases. If there is any stiffness or seizing, replace the bearings with the same model.

Measuring the thickness of the shift fork pawl.
Repair limit: 4.7 mm.



Inspect the surface and grooves of the shift drum for wear or damage.



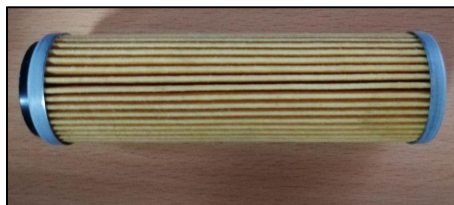
※Inspection of the main and drive axle components

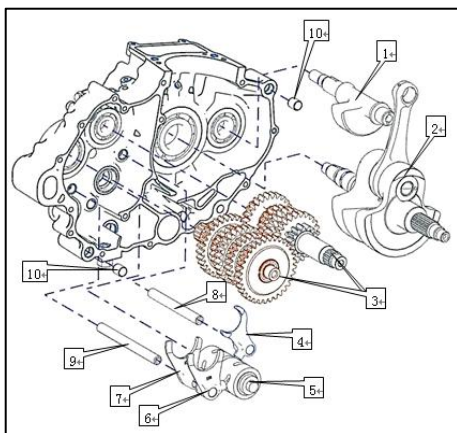
Inspect each gear of the main and drive axle components for excessive or abnormal wear. Check if there is any deformation or detachment of the retaining rings between the gears.



※Inspection of the oil filter components and oil filter screen

1. Check the cleanliness of the oil filter components and oil filter screen. Clean the oil filter components and oil filter screen with clean gasoline if they are dirty.
2. Check for any damage to the oil filter components and oil filter screen. If there is any damage, replace them with new ones.





※Assembly of Transmission/Crankshaft/balancer shaft

1. Install the balance shaft (1) and crankshaft (2) into the corresponding holes of the left crankcase.

2. Install the main and drive axle components (3) into the corresponding holes of the left crankcase, and then assemble the shift forks (4), (6), (7) into their respective positions.

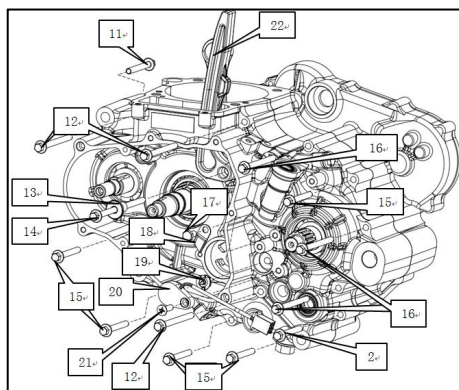
Note:

- 1. The shift fork marked with - R should be installed on the right side of the drive axle.
- 2. The shift fork marked with - L should be installed on the left side of the drive axle.
- 3. The shift fork marked with - C should be installed on the main axle.

3. Install the shift drum (5) into the corresponding hole of the left crankcase, and then assemble the other end of the shift fork into the corresponding groove of the shift drum. Finally, install the shift fork guide bar (8), (9) into their respective shift forks.

Note:

The long shift fork guide bar passes through the shift forks marked - R and - L, while the short shift fork guide bar passes through the shift fork marked - C.



※Assembly the crankcase

1. Apply a layer of sealant evenly on the mating surface of the right box. Install two locating pins (10) into the corresponding holes on the left case, then mate the right and left crankcase.

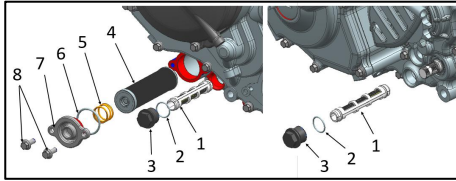
2. Take six M6×45 screws (15), three M6×65 screws (16), three M6×70 screws (12), and one M6×40 screw (11). Apply 3-4 threads of thread-locking adhesive, then insert them into the corresponding bolt through-holes in the crankcase. Tighten them using an air gun.

3. Take a timing chain guide (22), a timing chain guide liner (13), and one M6×105 screw (14). Apply 3-4 threads of thread-locking adhesive to the screw. First, install the timing chain guide liner into the corresponding hole of the timing chain guide, then use the screw to secure the timing chain guide to the corresponding hole in the left crankcase.

4. Place the CG125D-2# gear display contact (19) into the corresponding slot of the shift drum. Then take the gear display harness (20) and install it into the corresponding hole of the left crankcase, securing it with one M6×20 screw (21).

5. Take one M6×12 screw (17), press the gear display harness under the CB125D-2# wire stopper (18), and tighten it in the corresponding position on the left crankcase.

Tightening torque: 11-13 N·m.



※Assembly of oil filter

1. Assembly of the left and right crankcase oil filter screen.

Take one oil filter screen assembly (1). Apply a small amount of engine oil to the O-ring and install it into the corresponding oil filter screen hole. Install the O-ring (2) onto the oil filter screen cover (3). Apply an appropriate amount of lubricating grease to the inner hole of the oil filter screen cover and tighten it onto the crankcase.

Tightening torque: 11-13 N•m.

2. Assembly of the oil filter.

Take the oil filter component (4) and install it into the corresponding hole in the right crankcase. Place the filter spring (5) onto the oil filter component. Fit the O-ring (6) into the sealing groove of the fine filter cover (7). Take two small flange bolts M6×16, insert them into the corresponding holes of the fine filter cover, and tighten them in the corresponding position on the right body.

Tightening torque: 7-9 N•m.



The closed end is the sealed end



The open end should face the left crankcase.

Note:

When installing the oil filter, the open end should face the left crankcase.

Front wheel/suspension/steering

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Overview:

- When servicing the front wheel, front suspension, and steering, it is necessary to use a specialized workbench or equivalent to support the motorcycle.
- Do not operate the brake lever after removing the front or rear wheel.
- After installing the front wheel, check the brake operation by applying the brake lever.
- After front wheel installation, perform a clearance check.

Troubleshooting

Hard steering

- Insufficient tire pressure.
- Faulty tire.
- Steering column adjustment nut tightened too much.
- Worn or damaged steering head bearing.
- Bent steering column.

Pulling to one side or not tracking straight

- Bent axle.
- Incorrect wheel installation.
- Worn or damaged wheel bearings.
- Damaged or loose steering bearings.
- Frame damage.
- Faulty wheel bearings.

Front wheel wobbling

- Rim deformation.
- Faulty tire.
- Worn or damaged wheel bearings.
- Loose axle.
- Tire and wheel imbalance.

Difficult wheel rotation

- Faulty wheel bearings.
- Bent axle.
- Brake resistance.

Soft suspension

- Low tire pressure.
- Weak front fork spring.
- Low front fork oil level.
- Incorrect front fork oil specification (low viscosity).

Stiff suspension

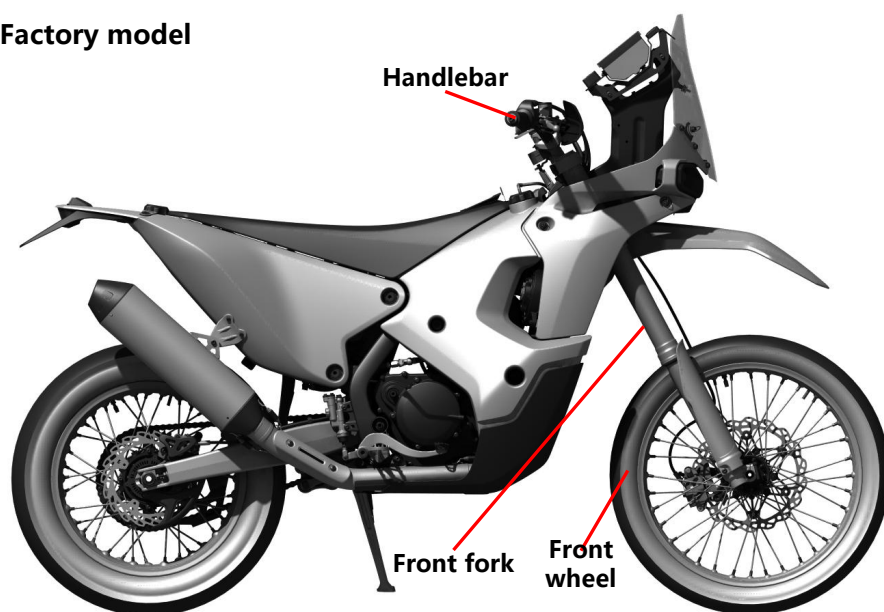
- Tire pressure.
- Deformed front fork.
- High front fork oil level.
- Incorrect front fork oil specification (high viscosity).
- Clogged front fork oil passage.

Front suspension noise

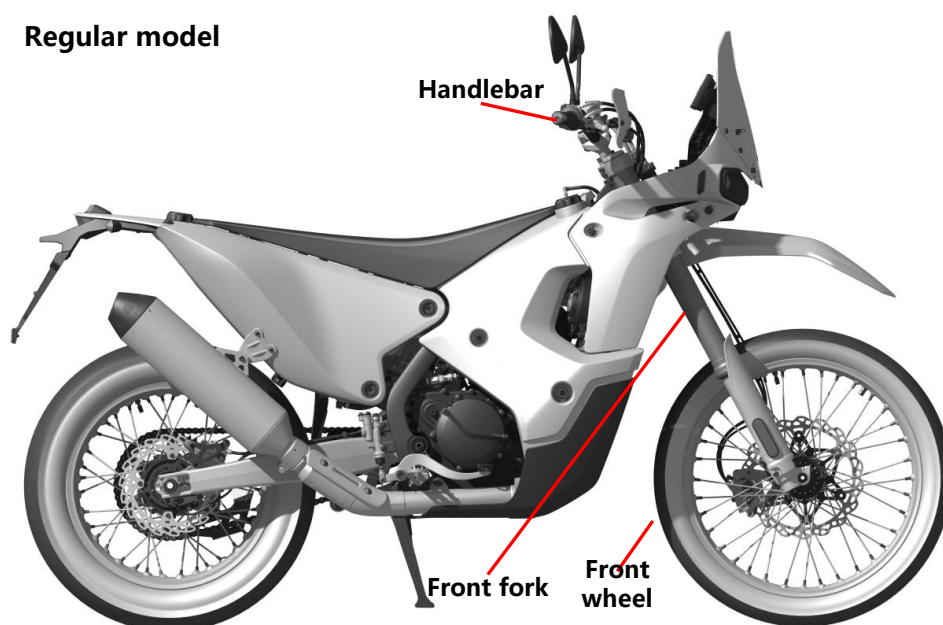
- Loose front fork fasteners.
- Incorrect front fork oil specification (low viscosity).
- Worn slide bushing of the front fork.

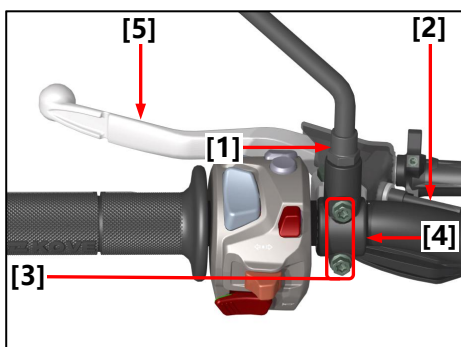
Location

Factory model



Regular model



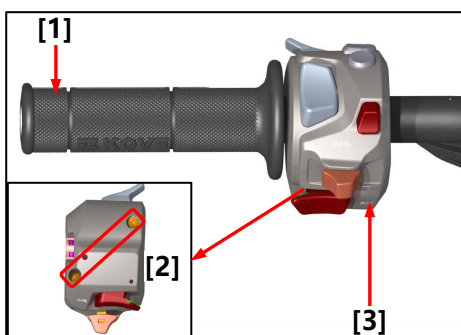


※Left Handle (Regular model)

Left rearview mirror / Clutch lever / Left handle switch disassembly

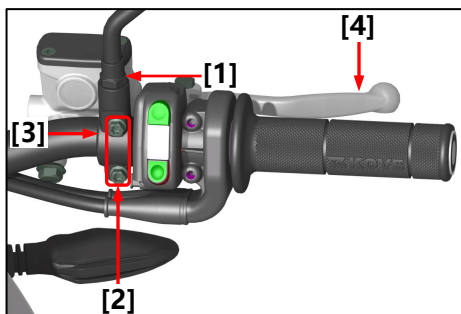
Disassemble the following components:

- Remove the nut [1] and take off the rearview mirror.
- Disconnect the clutch switch connector [2].
- Remove two M6x20 hexagon flange bolts [3].
- Remove the clutch lever base [4].
- Remove the clutch lever [5].



- Remove the right handle grip [1].
- Remove the two self-tapping cross screws at the bottom of the left handle switch [2].
- Remove the right handle switch cover [3].

Installation is the reverse of the disassembly procedure.

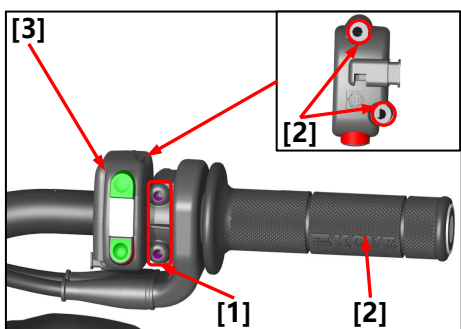


※Right Handle (Regular model)

Right rearview mirror / Front brake lever / Right handle switch disassembly

Disassemble the following components:

- Loosen the nut [1] and remove the rearview mirror.
- Remove two M6x20 hexagon flange bolts [2].
- Remove the brake lever base [3].
- Take off the brake lever [4].



- Remove 2 screws [1].
- Remove the throttle and handle grip [2].
- Remove two screws at the bottom of the right handle switch [3].
- Remove the right handle switch [4].

Installation is the reverse of the disassembly procedure.

Note:

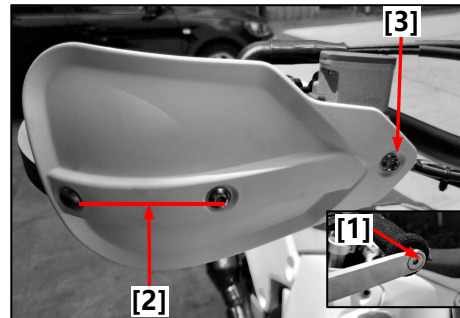
- The projection of the throttle must be accurately inserted into the handlebar's limit hole during installation.

※Left Handle (Factory model)

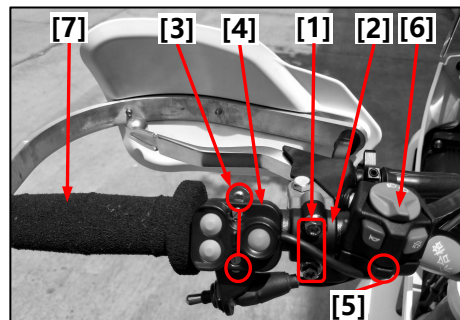
Handguard / Clutch lever / Left handle switch disassembly

Disassemble the following components:

- Remove the hexagon socket flathead screw [1].
- Remove two hexagon step screws [2].
- Remove the hexagon flange bolt [3].



- Remove two hexagon flange bolts [1].
 - Remove the clutch lever bushing [2].
 - Remove the left handguard.
 - Remove two hexagon flange bolts behind the combination button [3].
 - Remove the combination button [4].
 - Remove two hexagon cylindrical head screws [5].
 - Remove the left handle switch [6].
 - Remove the left handle grip [7].
- Installation is the reverse of the disassembly procedure.



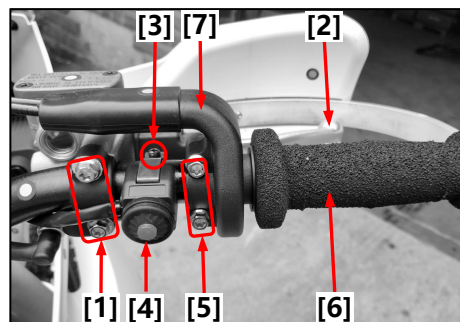
※Right Handle (Factory model)

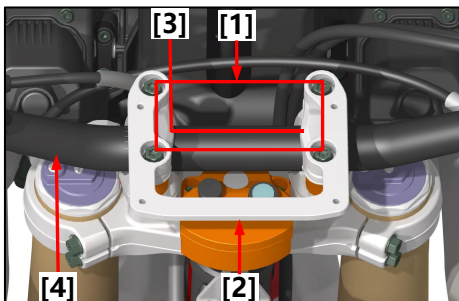
Handguard / Brake lever / Start switch / Throttle grip disassembly

Disassemble the following components:

- Disassemble the handguard as mentioned above (left).
- Remove two hexagon flange bolts [1].
- Remove the front brake lever [2].
- Remove the screw of the start switch [3].
- Take off the start switch [4].
- Remove two hexagon flange bolts [5].
- Remove the throttle grip and throttle assembly [6].

Installation is the reverse of the disassembly procedure.





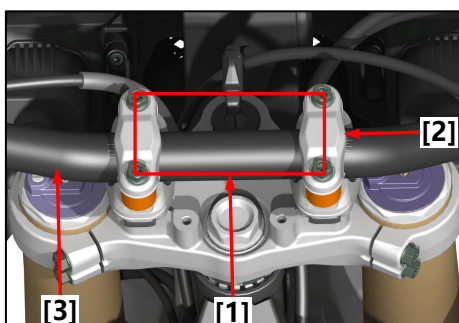
※Handlebar (Factory model)

Disassembly

Disassemble the following components:

- Remove four M8x50 hex flange bolts [1].
- Take off the handlebar pressure block (ENB bracket) [2].
- Remove the handlebar upper clamp X2 [3].
- Remove the handlebar [4].

Installation is the reverse of the disassembly procedure.



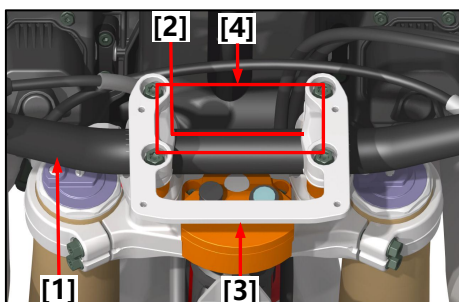
※Handlebar (Regular model)

Disassembly

Disassemble the following components:

- Remove four M8x45 hex flange bolts [1].
- Take off the handlebar upper clamp X2 [2].
- Remove the handlebar [3].

Installation is the reverse of the disassembly procedure.

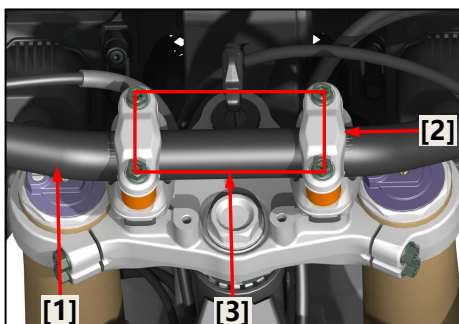


※Installation of Handlebar (Factory model)

Tighten the bolts [4] for the handlebar [1], handlebar upper clamp [2], and handlebar pressure block (ENB bracket) [3], then tighten the bolt [4] to the specified torque.

Torque:

22N.m (2.2 kgf.m, 16 lbf.ft)



※Installation of Handlebar (Regular model)

Tighten the bolts [3] for the handlebar [1] and handlebar upper clamp [2], then tighten the bolt [3] to the specified torque.

Torque:

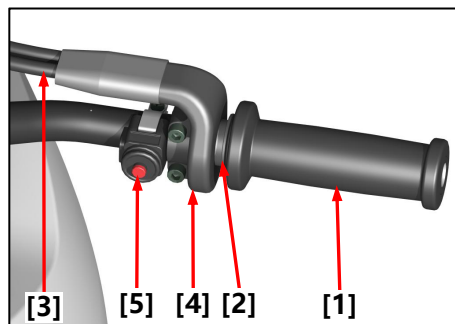
22N.m (2.2 kgf.m, 16 lbf.ft)

※Installation of Handlebar (Factory model)

Installation:

Right handlebar: Throttle grip - Handlebar grip - Start button

Clean the sliding surfaces of the throttle grip [1] and throttle assembly [2], apply lubricant to the area above the throttle cable and the winding area. Connect the throttle cable [3] to the throttle assembly and install it into the throttle housing [4]. Install the start button [5] onto the handlebar and tighten the bolt.

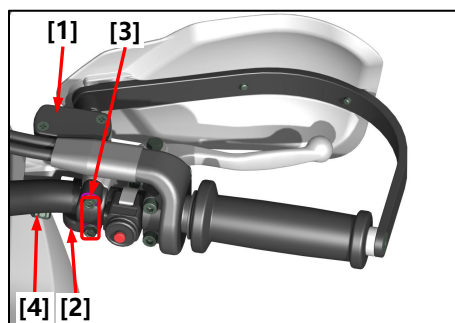


Installation:

Front Brake Lever

Install the front brake lever [1] and brake lever bracket [2], then tighten the bolt [3] to the specified torque.

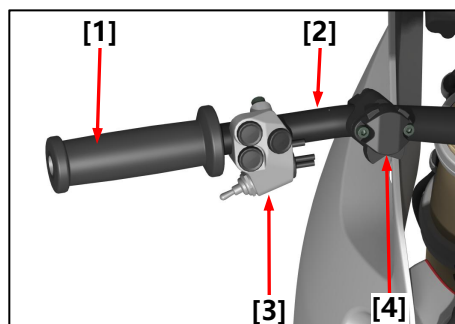
Torque: 8N.m (0.8 kgf.m, 6 lbf.ft)
Connect the brake light switch connector [4].



Installation:

Left handlebar: Handlebar grip - Switch button - Instrument button

Clean the surface of the left handlebar grip [1] and the outer surface of the handlebar [2]. Apply handlebar grip adhesive to the inner surface of the grip and the outer surface of the handlebar. Wait for 3-5 minutes, then install the handlebar grip. Rotate the grip to evenly distribute the adhesive. Install the instrument button [3] onto the handlebar and install the switch button [4], then tighten the rear bolt to the specified torque.



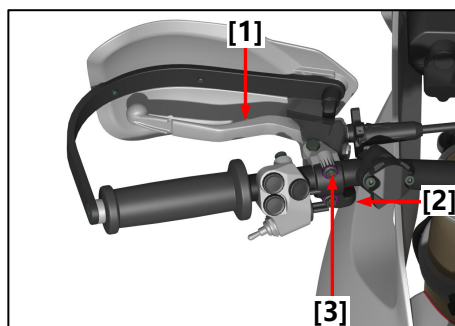
Torque: 8N.m (0.8 kgf.m, 6 lbf.ft)

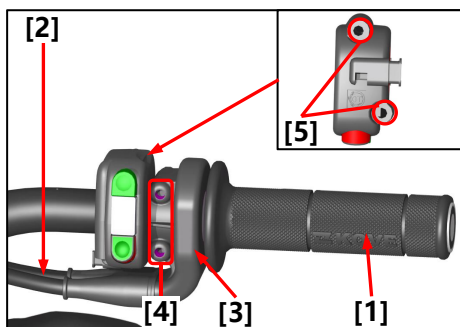
Installation:

Clutch lever/Handlebar bracket

Install the clutch lever [1] and clutch lever bracket [2], then tighten the bolt [3] to the specified torque.

Torque: 10N.m (1.0 kgf.m, 8 lbf.ft)



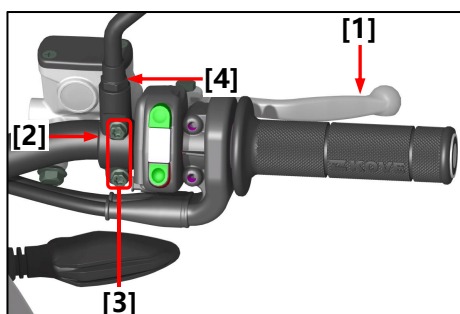


※Installation: Handlebar Components (Regular model)

Right handlebar: Right hand switch - Throttle grip - Handlebar grip

Clean the throttle grip [1] and the sliding surface of the throttle assembly. Apply lubricant to the area above the throttle cable and the winding area. Connect the throttle cable [2] to the throttle grip and insert the throttle grip and cable into the throttle housing [3]. Then tighten the throttle grip bolt [4].

Install the right hand switch and tighten the bottom screw of the switch [5].



Right handlebar: Brake lever - Rearview mirror

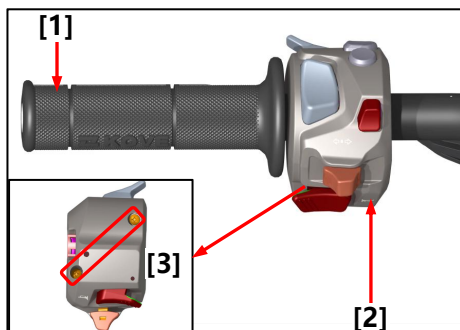
Install the brake lever [1] and the brake lever bracket [2], then tighten the bolt [3] to the specified torque.

Torque: 10N.m (1.0 kgf.m, 8.0 lbf.ft)

Install the rearview mirror and tighten the nut [4].

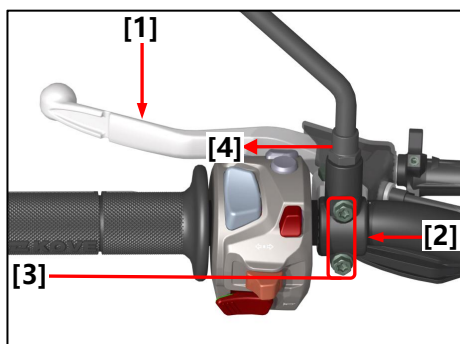
Check the following:

- Connect the brake light switch connector.
- Throttle grip free play.



Left handlebar: Grip - Left handle switch

Clean the surface of the left grip [1] and the outer surface of the handlebar tube. Apply grip adhesive to the inner surface of the grip and the outer surface of the handlebar. Wait for 3-5 minutes. Install the grip by rotating the handlebar to evenly spread the adhesive. Install the left handle switch [2] and tighten the bottom screw [3].



Left handlebar: Clutch lever - Rearview mirror

Install the clutch lever [1] and the clutch lever bracket [2]. Tighten the bolt [3] to the specified torque.

Torque:

10 N.m (1.0 kgf.m, 8.0 lbf.ft)

Install the rearview mirror and tighten the nut [4].

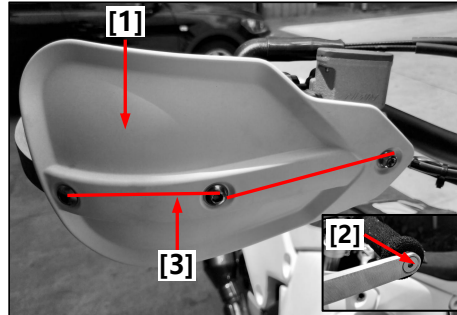
Check the following:

- Free play of the clutch lever.
- Connection of the clutch switch connector.

Installation:

Left and right handlebars: handguard (Factory model)

To install the handguard [1], attach the clutch lever bracket or brake lever bracket to one end of the handguard support and mount it on the handlebar grip end [2]. Secure the left and right handguard supports with three screws on each side [3]. Then, tighten the bolts to the specified torque.



Torque:

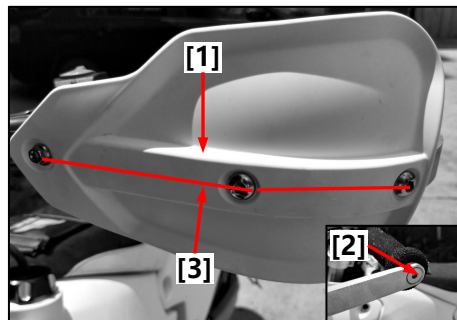
Handlebar connection bolts for handguard support:

22 N.m (2.2 kgf.m, lbf.ft)

Handguard to handguard support:

4 N.m (0.4 kgf.m, lbf.ft)

Bolts connecting handguard support to clutch lever bracket or brake lever bracket:
8 N.m (0.8 kgf.m, lbf.ft).



※Front Wheel

Note: The disassembly method for the front wheel is the same for the factory model.

Disassembly/Installation

Disassembly:

- Remove 2 brake caliper bolts [1].
- Loosen the front wheel axle locknut [2] and loosen the left and right fork stub screws [3].
- Use a maintenance workbench or a specialized motorcycle repair stand to elevate the vehicle and lift the front wheel off the ground. Pull out the axle and remove the front wheel.

Installation: (Regular model)

Place the wheel between the front fork, align the axle hole carefully, and insert the axle from the right side. Pre-tighten the fork stub screws [1] to a torque of 5 N.m. Then, tighten the front wheel axle locknut [2] to the specified torque.

Torque:

Front wheel axle locknut
88 N.m (8.8 kgf.m, 65 lbf.ft)

With the front brake engaged, push the handlebar let the front fork up and down several times to ensure the axle is in place. Check the operation of the brake system. Then, tighten the left and right fork stub screws [2] to the specified torque.

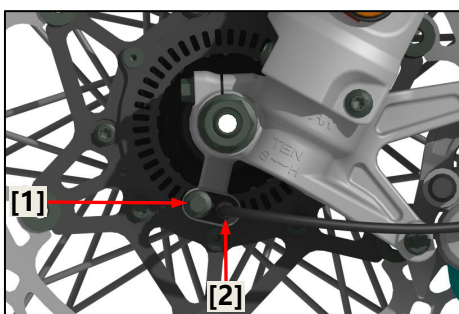
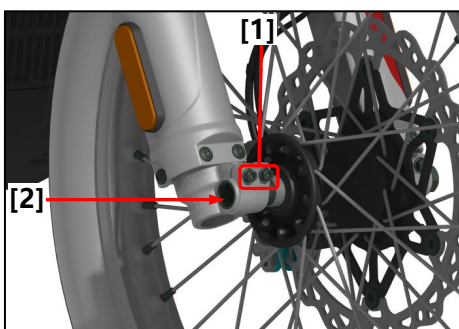
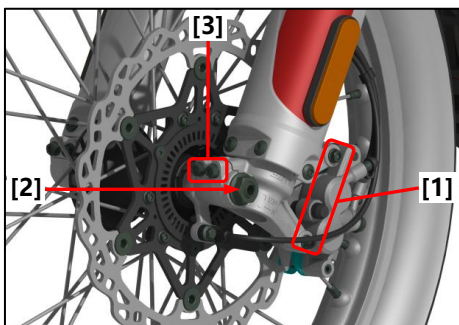
Torque:

Fork stub screws
22 N.m (2.2 kgf.m, 16 lbf.ft)
Brake caliper mounting bolts
27 N.m (2.7 kgf.m, 20 lbf.ft)

Note:

Apply a small amount of grease to the groove between the wheel bearing oil seal during installation.

Use a high-temperature extreme pressure lithium-based grease (such as UNIVERSAL SU-T330G/F or equivalent) for lubrication.



Wipe the tip and installation area of the front wheel speed sensor [1] to remove any foreign objects.

Install the wheel speed sensor and tighten the bolt [2].

Check the gap between the wheel speed sensor and the ABS ring.

※Front fork

Disassembly of the Front fork:

Disassemble the following components:

- Front wheel
- Front brake caliper
- Remove the brake mounting bolt [1] and front brake caliper [2]
- Remove the front wheel axle locknut [3] and then loosen the left and right fork stub screws [4]. Hold onto the front wheel and remove the front wheel axle.

Note:

- Do not hang the brake caliper on the brake hose.
- Do not operate the brake lever after the brake caliper removed.

Loosen the upper triple clamp bolt [1]. Firmly support the suspension and loosen the lower triple clamp bolt [2]. Pull the fork tube [3] and rotate it downward to remove it from the upper and lower triple clamp holes until it is completely removed.

Installation is the reverse of the disassembly procedure.

Tighten the lower triple clamp bolt [1] to the specified torque.

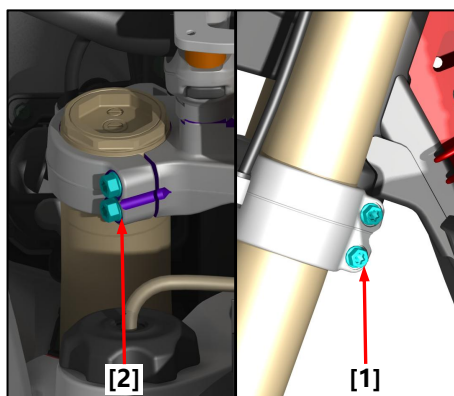
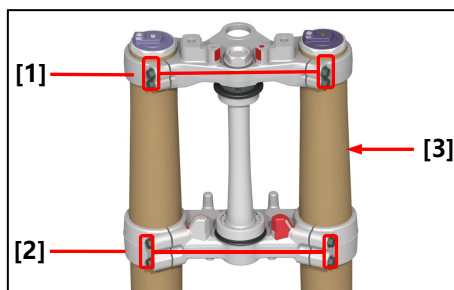
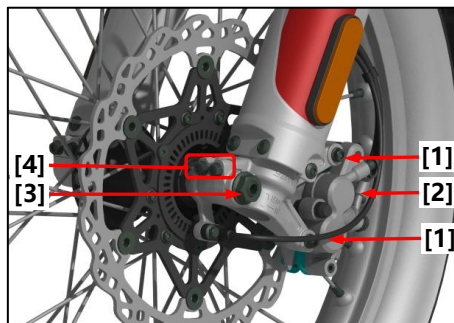
Torque:

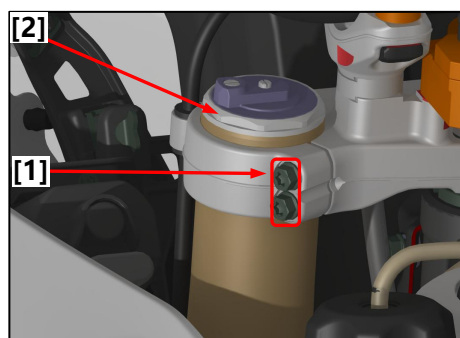
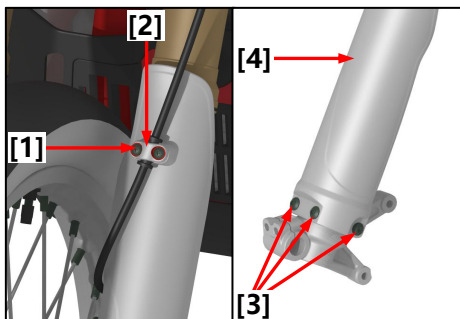
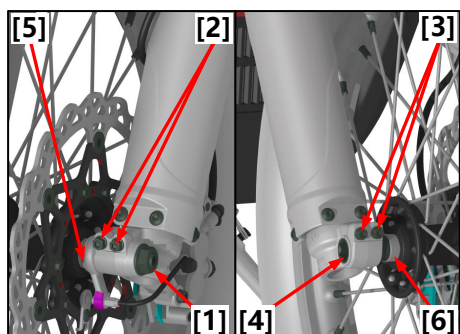
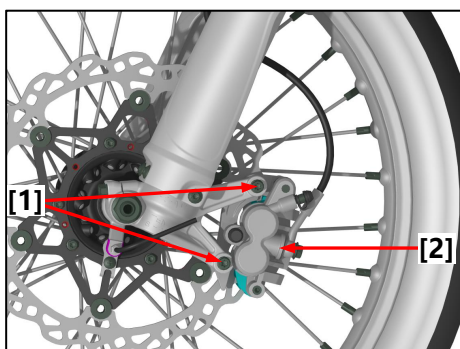
22 N.m (2.2 kgf.m, 16 lbf.ft)

Tighten the upper triple clamp bolt [2] to the specified torque.

Torque:

22 N.m (2.2 kgf.m, 16 lbf.ft)





※Front fork Maintenance

Place a workbench or equivalent object under the engine to raise the front wheels off the ground.

Disassemble the following components:

- Remove the brake caliper mounting bolts [1].
- Front brake caliper [2].

Note:

- Do not hang the brake caliper on the brake hose.
- Do not operate the brake lever after the brake caliper removed.

- Remove the front wheel axle nut [1].
- Loosen the left fork stub bolt [2].
- Loosen the right fork stub bolt [3].
- Hold the front wheel and remove the front wheel axle [4].
- Remove the front wheel.
- Remove the left spacer [5] and right spacer [6] from the front wheel.

- Remove 2 screws [1].
- Brake hose clip [2].
- Remove the front fork guard plate bolt [3].
- Front fork guard plate [4].

- Loosen the upper triple clamp bolt [1].

If you plan to replace the damping oil in the front fork, loosen the adjustment upper cover assembly [2].

Note:

Do not remove the front fork upper cover adjustment assembly.

To loosen the front fork inner cavity upper cover assembly, use the following specialized tool:

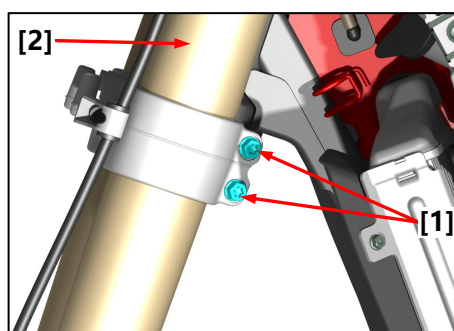
- Locking nut wrench, 50mm.

Note: Do not remove the front fork inner cavity upper cover assembly.

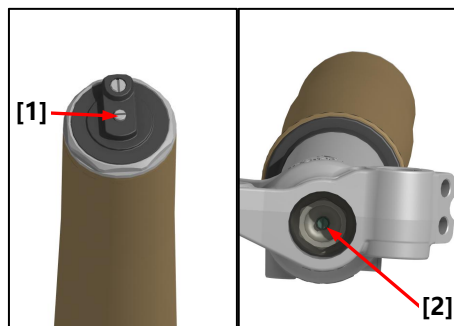


Hold the front fork outer rod and loosen the lower triple clamp bolt [1].

Remove the front fork [2].



Take note of the current positions of the compression damping adjuster [1] and rebound damping adjuster [2]. Rotate the compression and rebound damping adjusters counterclockwise and set them to the softest position.



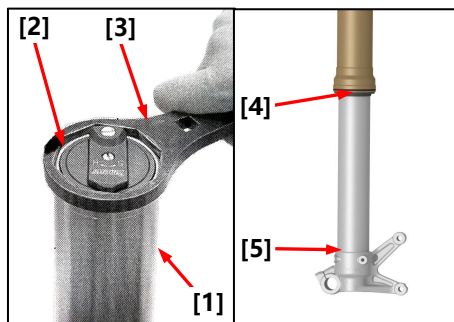
Remove the front fork

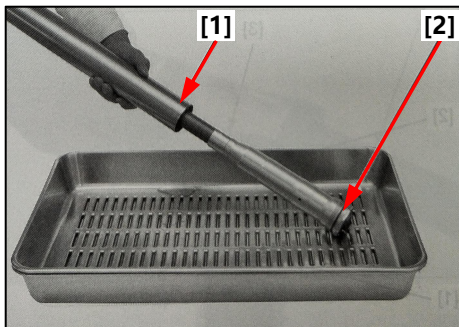
Hold the outer tube [1] and use the specialized tool to remove the front fork upper cover from the outer tube [2].

Tool:

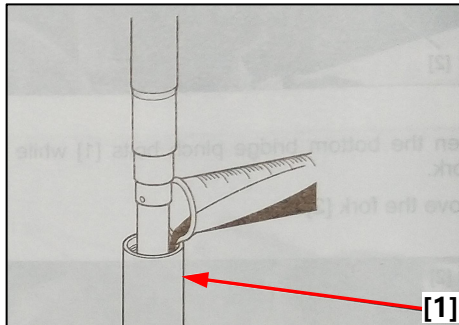
Locking nut wrench, 50mm [3].

Slowly slide the outer tube downward until the dust seal [4] is positioned on the bottom [5].





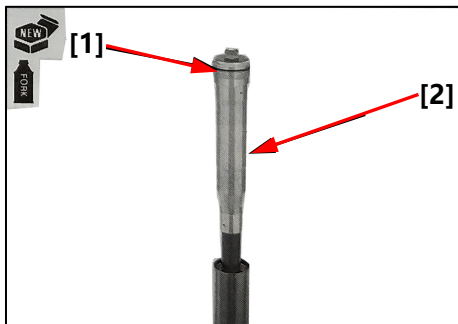
Compress the outer tube several times to purge the damping oil from the outer tube [1]. Remove the O-ring [2] from the fork.



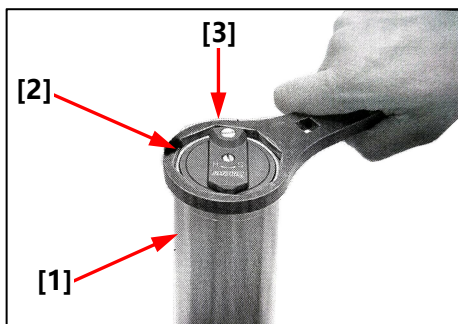
Pour the recommended damping oil into the outer tube [1].

Recommended damping oil:
damping oil (viscosity: 5W)
Total capacity of standard damping oil:
560±5ml
Inside the damper: 260±5ml, Fork tube:
300±5ml

Note: Pump the fork tube slowly several times to purge any trapped air from the lower portion of the fork tube.



Apply the recommended damping oil to the new O-ring [1]. Install the O-ring onto the front fork [2].



Slowly raise the outer tube [1]. Temporarily tighten the front fork adjustment cover [2] to the outer tube using the specialized tool.

Tool:
Locking nut wrench, 50mm [3].

※Steering stabilizer

Disassembly/Installation

Disassemble the following components:

- Screw [1].
 - Remove the steering stabilizer [2].
 - Screw [3].
 - Remove the steering stabilizer bracket [4].
- Installation is the reverse of the disassembly procedure.

Torque:

Steering stabilizer installation screw:

10 N.m (1.0 kgf.m, 7.0 lbf.ft).

Steering stabilizer bracket installation screw:

10 N.m (1.0 kgf.m, 7.0 lbf.ft).

Note:

Apply (Loctite®) low-strength thread locking adhesive during installation.

THE BASE CONTROL VALVE

The Base Valve adjusts the amount of resistance you feel as you turn the bars left to right. As you turn this knob clockwise (to the Right) you will increase the "stiffness" of the stabilizer. Counter clockwise would be less stiff, a softer feeling.

As you turn the Base Valve knob, you will feel a "click." There are 8 clicks to one full turn of the knob.

Starting position for the Base Valve is eight clicks (one full turn) back **OUT** from full **CLOCKWISE**. We recommend starting there and adjusting it only after riding for a while.

More than twenty (20) clicks counter-clockwise is basically **OFF** for the Base Valve, however the High Speed Valve will still absorb impact, according to where you have it set.

Turn this knob clockwise (to the Right) you will increase the "stiffness" of the stabilizer. Counter clockwise would be less stiff, a softer feeling.

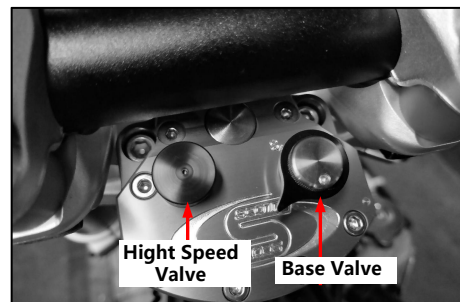
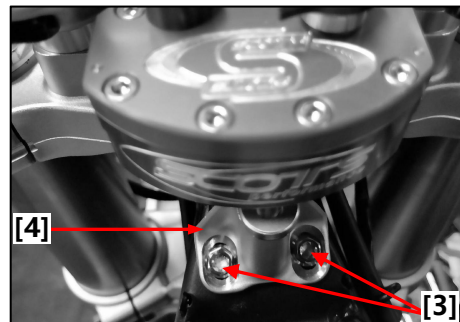
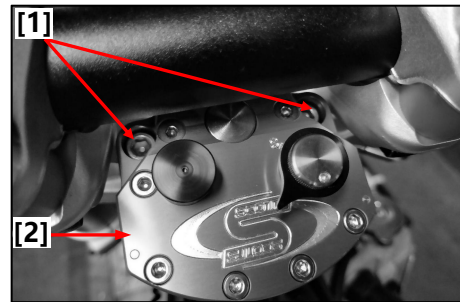
WARNIGN: Check settings before EACH Ride!

THE HIGH SPEED VALVE

Located under the Black Cap which is just pushed on tight.

The High Speed Valve is pre-set to One Turn Out from the Full Stiff Position before shipping. Before changing this, ride with the stabilizer for some time to get the feel of it. Then, adjust in 1/8th turn increments, until you find a setting you like.

This valving circuit is designed to help absorb large, unexpected hits, such as hidden tree roots or a pot hole. It reacts to spikes that exceed your current base valve setting.



By turning the High Speed Valve **CLOCKWISE** (to the right) you will increase its sensitivity. This means that the High Speed Valve will require less force to respond.

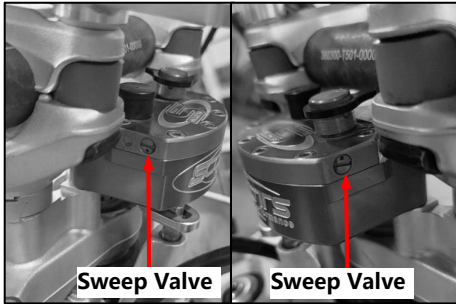
Warning: Do not set this valve too "stiff", as it can limit your steering response time.

Unlike the Base Valve, there is no "Click". Each position is a new setting. Adjustment is best made in 1/8th turn increments.

The Hight Speed Valve has less effect as you turn the Base Valve setting clockwise (to the right). Conversely, it has more effect as you turn the Base Valve to the left.

Do not test the High Speed Valve while the bike is on a stand.

Never turn valve more than 3 full turns out from Full Stiff positon



The sweep control valves are located on both sides, a machined bevel on one side of the slot head groove, these are what control the distance of damping force (or sweep), from the center line out to either side until it releases. The stabilizer is then free to move to the steering stop. This allows for easy steering in tight turns.

Always look at each sweep control as the face of a clock.

If setting is at 3 o' clock, the right-side valve would face toward the FRONT of the bike and the left-side valve would be facing towards the BACK of the bike.

At the 12 o' clock setting both would be facing UP.

At the 6 o' clock setting both would be facing DOWN.

Sweep controls are preset to twelve o' clock for off-road units and 6 o' clock for road bike units.

9 o' clock - damping is 34 degrees

12 o' clock - damping is 44 degrees

3 o' clock - damping is 54 degrees

6 o' clock - damping is 90 degrees

REAR WHEEL/SUSPENSION

Section 1 Overview 217

Section 2 Troubleshooting 217

Section 3 Location 218

Section 4 Rear wheel 219

Section 5 Swingarm 221

Section 6 Shock absorber/suspension 222

Overview:

- When working on the rear wheel, suspension, and related components, it is necessary to support the motorcycle with a professional workbench or equivalent.
- Do not operate the brake pedal after removing the rear wheel.
- After installing the rear wheel, press the brake pedal to check the brake operation.
- After the rear wheel is installed, perform a clearance check.
- Only use original KOVE bolts and nuts to replace all suspension pivots and suspension points.

Troubleshooting

Steering to one side or not tracking straight

- Uneven adjustment of the drive chain adjuster.
- Bent axle.
- Worn swingarm axle.

Rear wheel wobbling

- Deformed tire.
- Worn or damaged wheel bearings.
- Worn or damaged driven flange bearing.
- Improperly tightened axle.
- Damaged rear swingarm pivot bearings.
- Improperly tightened suspension component bolts.
- Tire and rim imbalance.

Difficulty in rotating the wheel

- Damaged wheel bearings.
- Bent axle.
- Drive chain too tight.
- Brake resistance.

Soft suspension

- Low tire pressure.
- Incorrect suspension adjustment.
- Weak shock absorber spring.
- Leaking shock absorber unit.

Stiff suspension

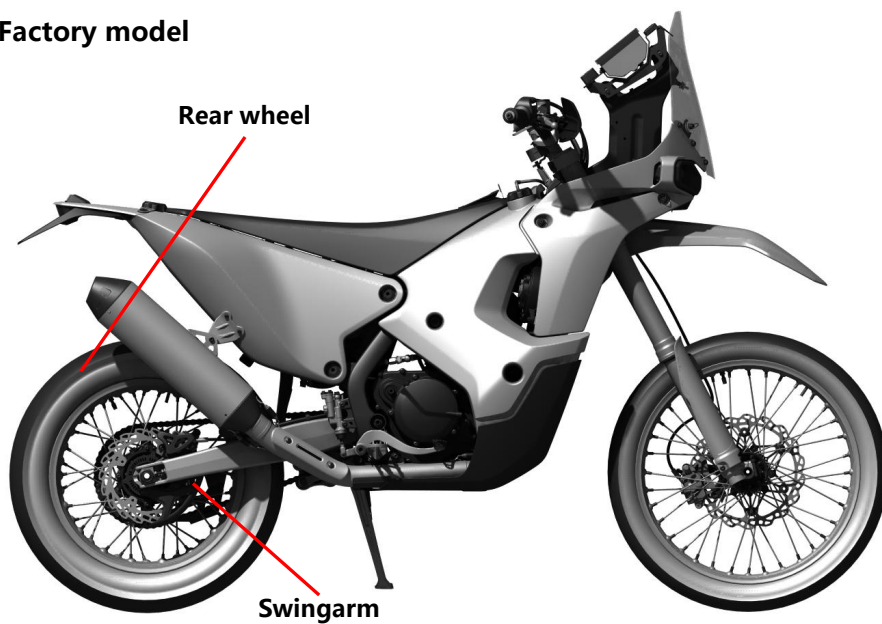
- High tire pressure.
- Incorrect suspension adjustment.
- Bent shock absorber rod.
- Damaged suspension or pivot bearings.
- Improperly tightened pivot.

Rear suspension noise

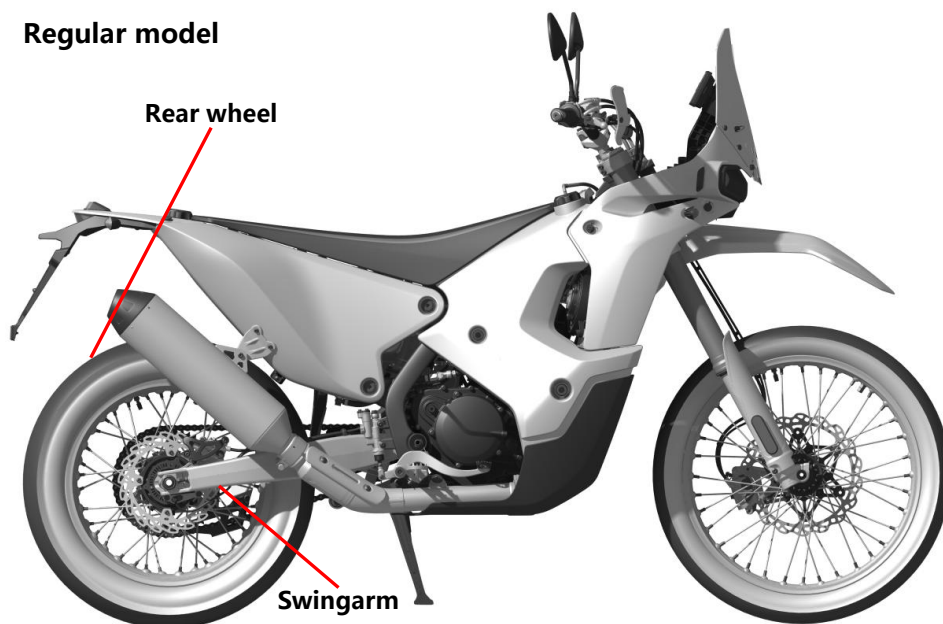
- Loose suspension fasteners.
- Worn or damaged suspension pivot bearings.
- Faulty shock absorber.

Location

Factory model



Regular model



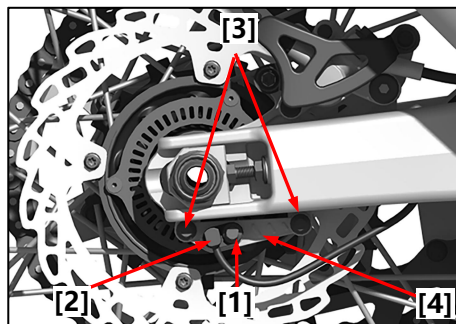
※ Rear Wheel

Place a workbench or equivalent under the engine to lift the rear wheel off the ground.

Disassembly/Installation

Remove the following components:

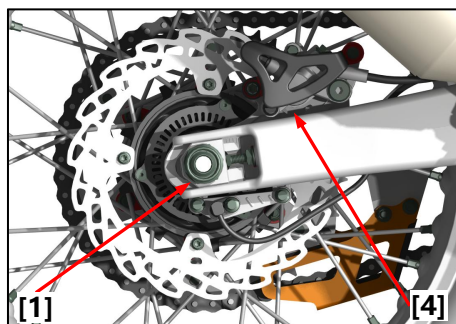
- 1 bolt [1]
- Rear wheel speed sensor [2]
- 2 bolts [3]
- Remove the wheel speed sensor bracket [4]



Disassembly/Installation

Remove the following components:

- Loosen the rear wheel axle locknut [1]
- Hold the rear wheel and remove the rear wheel axle [2]
- Push the rear wheel forward to disengage the chain from the rear sprocket [3]
- Remove the rear brake caliper and caliper bracket [4]
- Remove the rear wheel assembly [5]

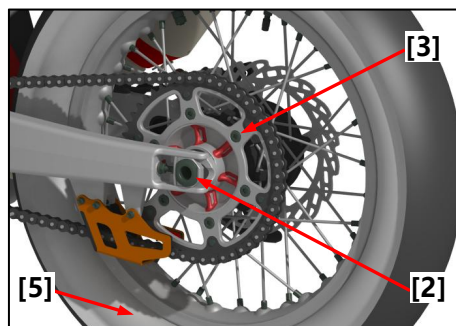


Torque:

Rear wheel axle locknut:

128 Nm (12.8 kgf.m, 95 lbf.ft)

Installation is the reverse of the disassembly procedure.

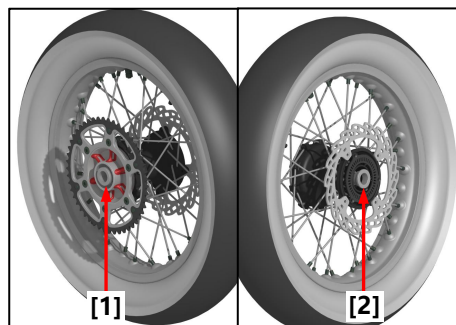


Note:

- Do not operate the brake pedal after removing the wheel.

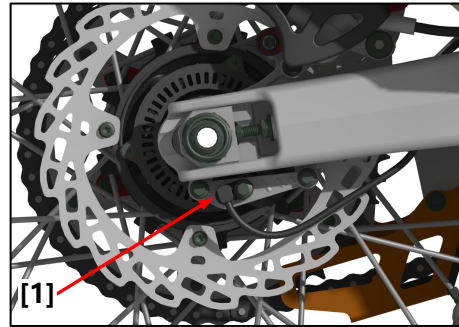
Remove the following components:

- Rear wheel T-type spacer - Left side [1]
- Rear wheel spacer - Right side [2]



Note:

- When installing the wheel, take care not to let the brake caliper detach from the rear swingarm and avoid damaging the brake pads. Install the rear wheel axle from the left side.
- Before installing the rear wheel speed sensor [1], wipe the sensor tip and the installation area to remove any foreign objects.
- Adjust the tension of the drive chain.
- Check the clearance between the wheel speed sensor and the ABS ring.


Inspection:

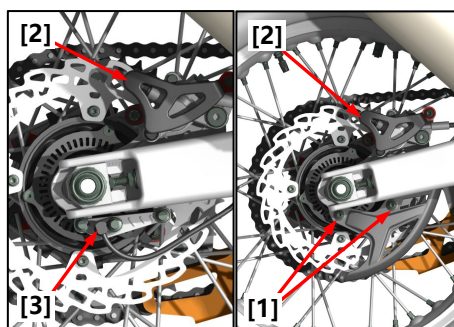
Rotate the inner race of each bearing with your finger. The bearings should rotate smoothly and quietly. Also, check if the outer race of the bearings fits tightly with the wheel hub. If the bearings rotate unevenly, have rough rotations, or are not securely installed in the wheel hub, replace the bearings.

※ Swingarm

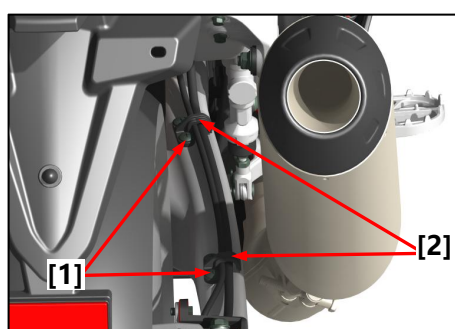
Disassembly/Installation

Remove the following components:

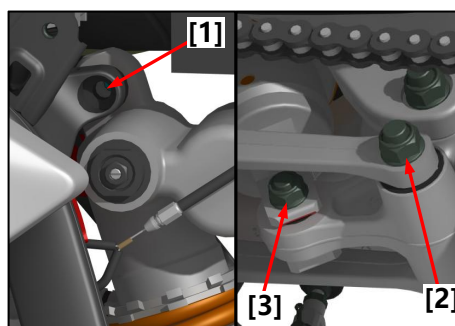
- Rear brake disc cover [1] for factory model;
- Rear caliper cover [2];
- Rear wheel speed sensor [3] for regular model;



- Disconnect the 2P (black) plug of the wheel speed sensor;
- Remove screw [1] and wire clamp x2 [2];



- Remove the shock absorber connecting bolt [1];
- Remove the dog bones connecting bolt [2];
- Remove the lower shock absorber to linkage bolt [3];
- Remove the swingarm axle nut [4];
- Remove the swingarm axle [5]



Move the brake hose, speed sensor wire, and drive chain aside.

Installation is the reverse of the disassembly procedure.

Note:

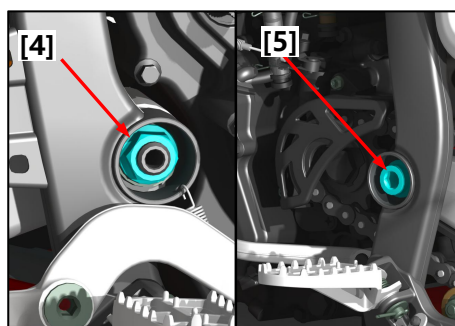
Install the swingarm axle from the left side.

Apply grease to the swingarm axle.

Torque:

Swingarm axle nut:

88 Nm (8.8 kgf.m, 65 lbf.ft)

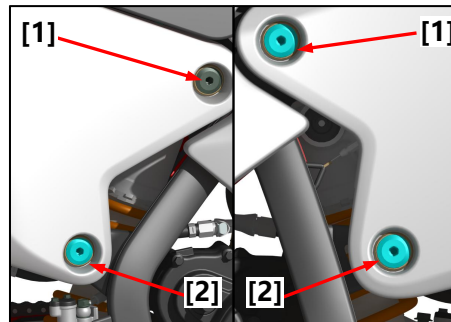


※Rear Shock Absorber/Suspension

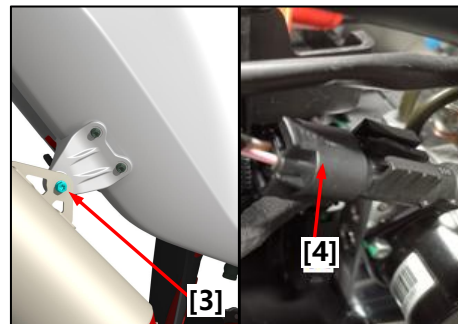
Shock Absorber

Disassemble the following components:

- Seat
- Loosen the rear fuel tank connecting nut [1]
- Loosen the lower nut connecting the rear fuel tank to the bracket [2]



- Remove the bolt connecting the muffler and the muffler bracket [3] to lift the rear fuel tank;
- Disconnect the 2P (black) plug of the wheel speed sensor [4];

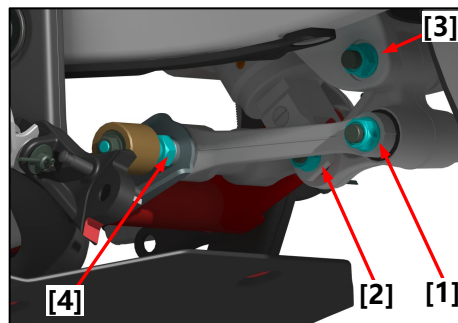


Shock absorber and linkage

Disassembly/Installation

Disassemble the following components:

- Remove the nut connecting the dog bones and the linkage [1]
- Remove the nut connecting the shock absorber and the linkage [2]
- Remove the nut connecting the swingarm and the linkage [3]
- Remove the nut and bolt connecting the dog bones and the frame [4]
- Remove the bolt connecting the upper part of the shock absorber and the frame [5]



Installation is the reverse of the disassembly procedure.

Note:

Install the bolts from the left side.

Dog bones and frame connecting nut:

Swingarm and linkage:

Dog bones and linkage connecting nut:

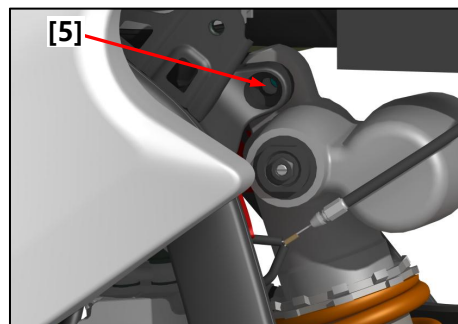
Torque: 60 N·m (6.0 kgf·m, 44 lbf·ft)

Bolt connecting the upper part of the shock absorber and the frame:

Shock absorber and linkage connecting nut torque:

Torque:

44 N·m (4.4 kgf·m, 32 lbf·ft)



Hydraulic Brake

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Section 8: Front Brake Pump	230
Section 9: Rear Brake Pump/Brake Pedal	231
Section 10: Front brake calliper	232
Section 11: Rear brake calliper	233

Overview:

- This section covers the maintenance of common brake components in the brake system.
- The ZF400LS is available in two models, with the REGULAR version equipped with ABS. However, the procedure for changing the brake fluid differs from the procedure for purging the air in the FACTORY version.
- Contaminated brake discs or brake pads can reduce braking efficiency.
- Dispose of contaminated brake pads and clean the contaminated brake discs with a high-quality brake degreaser.
- When servicing the system, always use new DOT 4 brake fluid from a sealed container, and do not mix different types of fluids as they may be incompatible.
- Do not allow contaminants (dirt, water, etc.) to enter the open reservoir.
- Once the hydraulic system is opened or if the brakes feel spongy, it is necessary to bleed the brake system and perform a brake operation check.
- When removing the wheel speed sensor, always check the gap between the sensor and the ring after installation.
- Overflowing brake fluid can cause severe damage to instrument surfaces, paint surfaces, and rubber components. Be cautious when removing the reservoir cap, ensuring that the front reservoir is level first.

Fault resolution

Brake lever/pedal soft or floppy

- Air in the hydraulic system
- Leakage in the hydraulic system
- Contaminated brake pads/discs
- Brake caliper piston seal worn
- Worn main piston bowl
- Brake pads/ Brake calipers contaminated
- Brake caliper contaminated
- Brake pump contaminated
- Brake caliper sliding irregularly
- Brake fluid level low
- Oil passage blockage
- Brake disk twisted/deformed
- Brake caliper piston stuck/worn
- Stuck/worn main piston
- Brake lever/pedal bent

Brake lever/pedal requires force

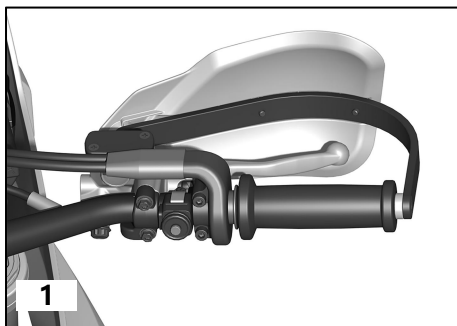
- Oil passage blockage/restriction
- Brake caliper piston sticking/worn
- Brake caliper sliding abnormally
- Brake caliper piston seal worn
- Main piston sticking/worn
- Brake lever/pedal bent

Brake resistance

- Brake pads/brake discs contaminated
- Wheel misalignment
- Brake pads/brake discs severely worn
- Brake disc warped/deformed
- Brake caliper sliding abnormally
- Oil passage blockage/restriction
- Caliper piston stuck

Location

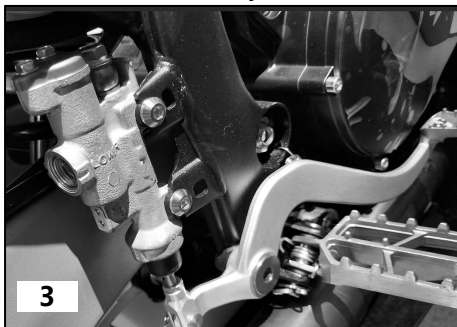
Front Brake Pump



Front brake calliper



Front Brake Pump



Rear brake calliper



Note: The four images above are all FACTORY model.

※ Brake fluid level checking



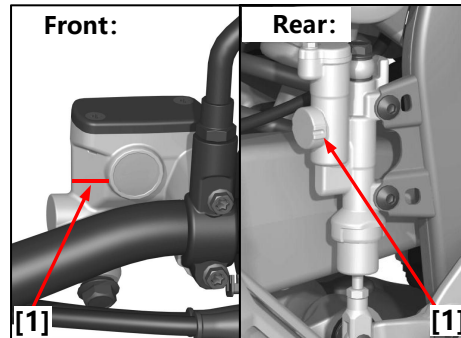
Overflowing brake fluid can damage paint, plastic, or rubber parts.

Note:

- Do not mix different types of brake fluids together as they may be incompatible.
- When refilling the reservoir, ensure that no foreign objects enter.

※ Fluid Level Check

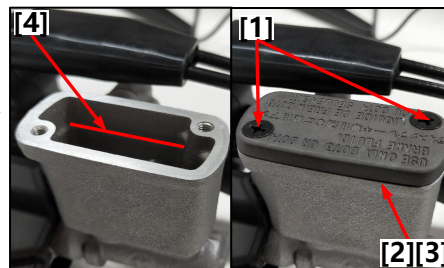
Check the fluid level of the front and rear reservoirs to inspect the brake fluid level. If the fluid level is close to the lower level mark [1], check for brake pad wear. If the brake pads are not worn and the fluid level is low, check the entire system for leaks and then refill the reservoir with brake fluid.



※ Adding Brake Fluid

• Front brake pump:

Remove the front brake reservoir cap screw [1], reservoir cap [2], and diaphragm [3]. Fill the reservoir with the recommended brake fluid up to the upper fluid level mark [4].



Recommended brake fluid: DOT4 brake fluid.

Install the diaphragm and reservoir cap.

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

Torque: 1.0 N.m (0.1 kgf.m, 0.7 lb-ft).

Check for any leaks in the front brake hydraulic system.

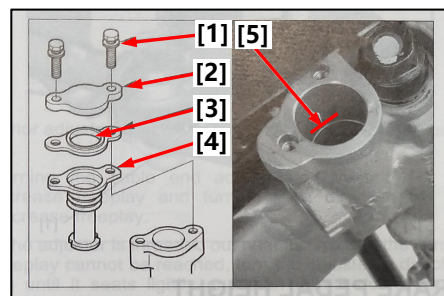
• Rear brake pump:

Remove the rear brake master cylinder reservoir cap bolt [1], reservoir cap [2], gasket [3], and diaphragm [4].

Fill the reservoir with the recommended brake fluid up to the upper fluid level mark [5].

Recommended brake fluid: DOT4 brake fluid.

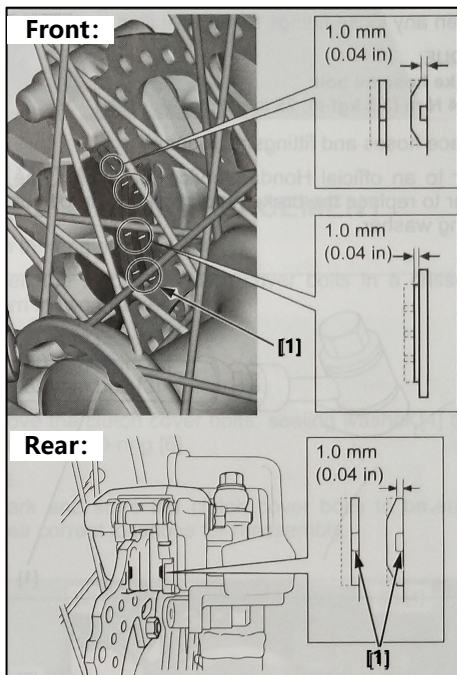
Install the diaphragm [4], gasket [3], and cap [2].



Install the rear brake reservoir cap bolt [1] and tighten it to the specified torque.

Torque: 2.0 N.m (0.2 kgf.m, 1.5 lb-ft).

Check for any leaks in the rear brake hydraulic system.



※ Inspection and replacement of brake pads

Check the brake pads.

If either of the brake pads is worn to 1.0mm (0.04in), both brake pads must be replaced.

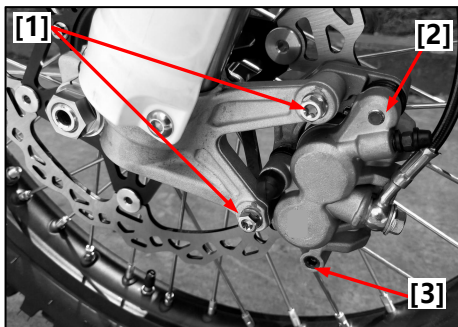
Note:

The wear indicator [1] has a width of 1.0mm (0.04in).

If the brake pads are worn to the service limit, consult the dealer to replace the brake pads.

Replacement:

• Front brake pads

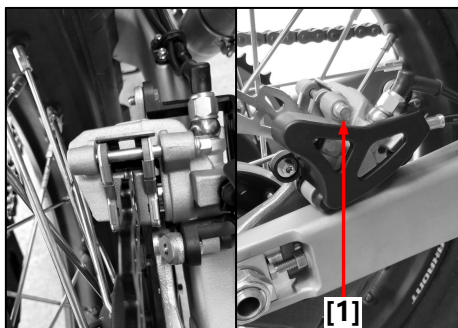


Removal/Installation

If replacing the brake pads, remove the hexagon socket head bolt [1] at the specified position before disassembling the brake pads. Remove the caliper [2], place a tool between the brake pads, lever left and right to retract the piston, and remove the friction pad positioning pin [3]. Then, the brake pads can be removed.

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

• Rear brake pads



Removal/Installation

If replacing the brake pads, remove the positioning pin at position [1], and then the brake pads can be removed.

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

※ Bleeding the Air from the Hydraulic Brake System (ABS)

The following procedure is only for **FACTORY model**



- After disassembling brake-related components, it is imperative to bleed the brake system to remove air.

Note:

Follow the sequence below to bleed the brake system.

- Step 1: Front brake caliper.
- Step 2: Rear brake caliper.



Conditions for releasing air from the brake system:

- Brake pump disassembled.
- Brake fluid line loosened, disassembled, or replaced.
- Brake fluid level below the minimum mark.
- Brake operation is faulty.

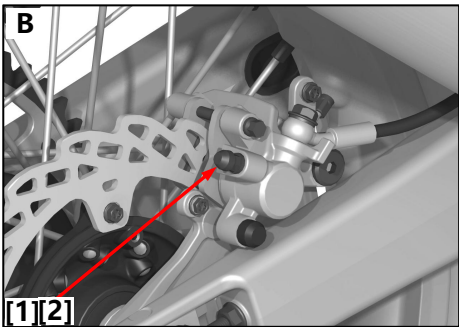
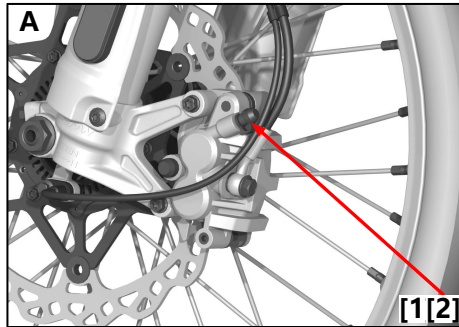
Note:

- Be careful not to let brake fluid splash or overflow from the brake fluid reservoir.
- When releasing air from the hydraulic brake system, make sure that the brake fluid is sufficient before applying the brakes. Neglecting this precaution can allow air to enter the hydraulic brake system, significantly prolonging the air bleeding process.

- If air bleeding is difficult, it may be necessary to allow the brake fluid to settle for several hours. Once the small air bubbles in the brake lines disappear, repeat the bleeding procedure.

1. Bleeding:

- Use the specified brake fluid and fill the brake fluid reservoir to the correct level.
- Install the diaphragm (brake fluid reservoir).
- Firmly connect the transparent plastic hose [1] to the bleeder bolt [2].
- Place the other end of the hose in a container.
- Slowly apply the brakes several times.
- Fully pull the brake lever or fully depress the brake pedal and hold it in place.



- Loosen the bleeder screw.

Note:

Loosening the bleeder screw will release air and allow the brake lever or brake pedal to fully contact the throttle grip or footrest.

- Tighten the bleeder screw and then release the brake lever or brake pedal.

- Repeat steps (e) to (h) until there are no air bubbles in the brake fluid in the plastic hose.

- Repeat steps (e) to (i), then use the specified brake fluid to fill the brake fluid reservoir to the correct level.

- Tighten the bleeder screw to the specified torque.

Bleeder screw of the brake caliper [1]:

6 N·m (0.6 kgf·m, 4.4 lb·ft)

- Fill the brake fluid reservoir with the specified brake fluid to the correct level.

A. Front

B. Rear



After bleeding the hydraulic brake system, it is necessary to check the operation of the brakes.

The following procedure is only for REGULAR model (ABS)

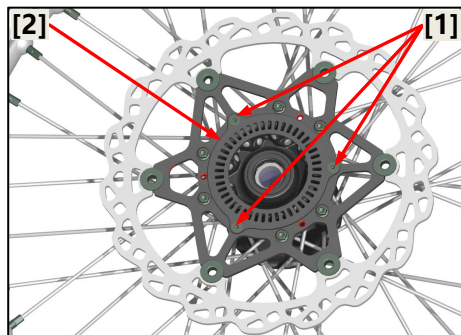
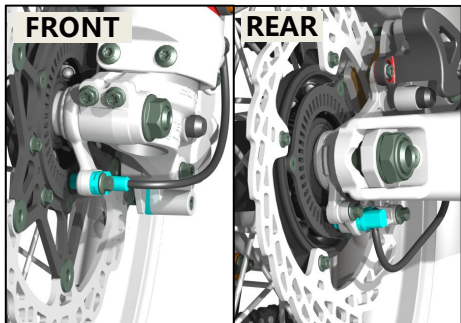
After the installation of ABS is completed, it is necessary to ensure that there is no air in the brake lines for the proper functioning of the ABS system. This requires performing a manual air bleeding operation using a diagnostic tool.

Note: Please use the recommended type of brake fluid from the manufacturer and avoid mixing different types.

The following steps outline the air bleeding process for the front wheel ABS system:

1. Open the brake fluid reservoir cap, add an adequate amount of brake fluid, and open the bleed screw at the lower pump.
2. Connect the diagnostic tool and select the program "Front Wheel Air Bleeding Stage 1." During this stage, the technician should squeeze the handbrake while simultaneously adding brake fluid at a frequency of approximately 1 time per second. This process should last for about 25 seconds.
3. Once Stage 1 of the front wheel air bleeding is completed, the diagnostic tool will provide a prompt indicating the completion. Double-click on the program "Front Wheel Air Bleeding Stage 2." During this stage, the technician should continue squeezing the handbrake while adding brake fluid. This process should last for approximately 90 seconds.
4. After Stage 2 of the front wheel air bleeding is completed, hold the handbrake lever and close the bleed screw at the lower pump. Then, squeeze the front brake lever several times to assess the firmness and determine if the air bleeding process is complete.

Important note regarding air bleeding: It is strictly prohibited to repeat the air bleeding procedure 2 or more times in a short period. If it is necessary to repeat the air bleeding procedure, please wait for 5 minutes first to allow the electromagnetic valve to cool down and protect it from overheating damage.

**Inspection of ABS Ring Clearance**

Secure the motorcycle firmly using a crane or equivalent device, and lift the wheel off the ground.

Rotate the wheel slowly and measure the clearance (air gap) between the sensors and the ring at multiple points.

It must be within the specified range.

Standard: 0.4-1.2mm (0.02-0.05in)

If the clearance cannot be adjusted or is not within the specified range, inspect each component for deformation, looseness, or damage.

Check if the wheel speed sensor is damaged and replace if necessary.

Check if the ring is deformed or damaged and replace if necessary.

-Front ABS ring

-Rear ABS ring

Disassembly/Installation

Disassemble the following components:

- Remove screw [1].

- Take off the ABS ring.

Installation is the reverse order of disassembly.

The installation method is the same for both front and rear rings.

Torque:

Front and rear ABS ring screws:

4 N.m (0.4 kgf.m, 3.0 lbf.ft)

Apply low-strength thread locking adhesive.

※ Inspection and Replacement of Front and Rear Brake Discs

Disassembly/Installation

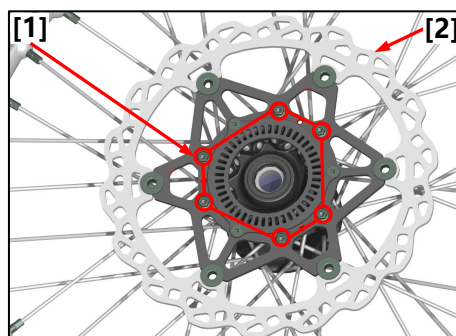
Disassemble the following components:

- Remove the line clamp [1].
- Take off the brake disc [2].

The disassembly and installation methods are the same for both front and rear brake discs. Apply low-strength thread locking adhesive during installation.

Torque:

Front brake caliper mounting bolts:
12 N.m (1.2 kgf.m, 9.0 lbf.ft)



Brake Disc Inspection: Visually inspect the brake disc for any damage or cracks. Measure the minimum thickness of the brake disc, which should not exceed 3.5mm. Replace if necessary.

※ Front Brake Pump

Drain the brake fluid from the front brake hydraulic system.

Disassembly/Installation

Disassemble the following components:

- Brake light switch connector.
- Oil bolt.
- Sealing washer.
- Brake hose.
- 2 bolts [1].
- Brake lever bracket [2].
- Brake pump [3].

Installation is the reverse order of disassembly.

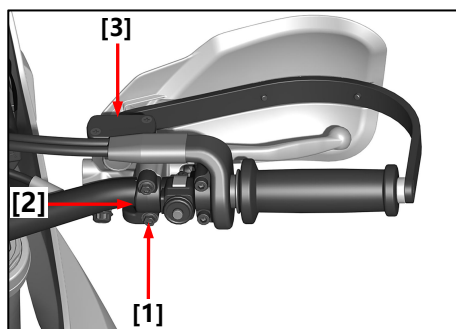
Note:

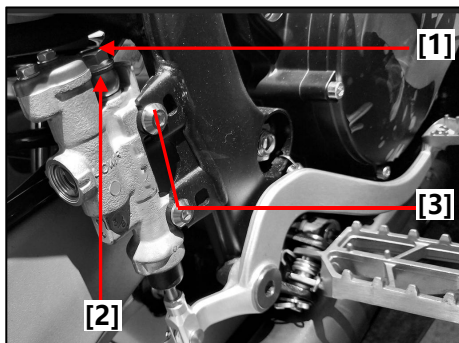
- Replace the sealing washer with a new one.
- Install the brake lever bracket with the "UP" mark facing upward.
- Align the edge of the master pump with the punch mark on the handlebar. Tighten the upper bolt first, then tighten the lower bolt.
- When connecting the brake hose, make sure to place the hole-eye joint into the groove.

Torque:

Brake lever bracket:
8 N.m (0.8 kgf.m, 6.0 lbf.ft)

Brake pipe lock bolt:
22 N.m (2.2 kgf.m, 16 lbf.ft)





※ Rear Brake Pump

Drain the brake fluid from the rear brake hydraulic system.

Disassembly/Installation

Disassemble the following components:

- Remove the brake pipe locking bolt [1].
- Upper and lower sealing washers [2].
- Disconnect the brake hose and loosen the rear brake pump installation bolt [3].

Install in the reverse order of disassembly.

Note:

- When tightening the brake pipe locking bolt, make sure that the horizontal limiting pin is against the stopper.

Torque:

Rear brake pump installation bolt:

12 N.m (1.2 kgf.m, 9 lbf.ft)

Brake pipe union bolt:

22 N.m (2.2 kgf.m, 16 lbf.ft)



After removing the push rod, adjust its length so that the distance between the center of the lower pump mounting bolt hole and the center of the connecting pin hole is the standard length. If adjusting to a longer position, ensure that the lower end of the push rod thread [1] is visible inside the joint.

After adjustment, tighten the connecting nut [2] to the specified torque.

Torque:

Rear master pump push rod joint nut:

6 N.m (0.6 kgf.m, 4.4 lbf.ft)

※ Brake Pedal

Securely support the motorcycle with a main stand.

Disassembly/Installation:

Disassemble the following components:

- Remove the two hex bolts at position [1].
- Remove the brake pedal at position [2].
- Remove the brake return spring at position [3].
- Remove the clevis pin and washer at position [4].
- Pull out the rear brake pump pin at position [5].
- Remove the brake arm installation bolt and washer at position [6].

Install the components in the reverse order of disassembly.

Note:

Apply grease to the oil seal positions (lubrication grooves) on both sides of the brake arm pivot.

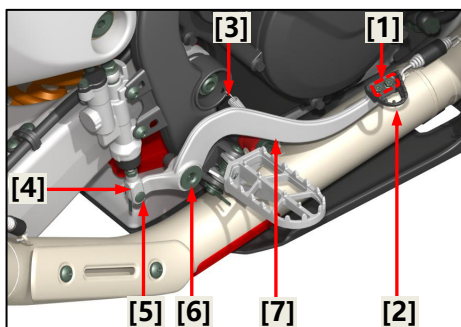
Torque:

Brake arm installation bolt:

22 N.m (2.2 kgf.m, 16 lbf.ft)

Brake pedal installation bolt: 8 N.m

Apply Loctite or similar low-strength thread locking adhesive when installing the brake pedal.



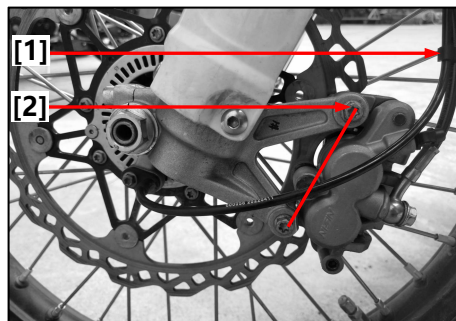
※ Front Brake Caliper

Drain the brake fluid from the front brake hydraulic system.

Note: The disassembly and installation process is the same for both the factory model and the regular model. Disassembly/Installation

Disassemble the following components:

- Line clamp [1].
- 2 bolts [2].

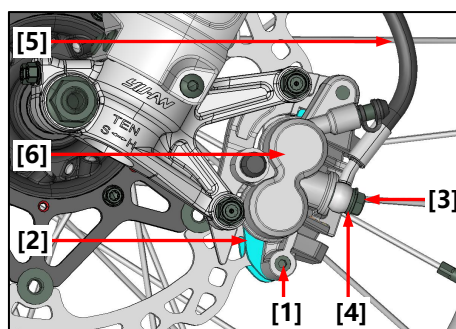


- Brake pad locating pin [1].
- Brake pads [2].
- Brake hose lock bolt [3].
- Brake hose sealing washers (2) [4].
- Brake hose [5].
- Brake caliper [6].

Installation is the reverse order of disassembly.

Note:

- Replace the sealing washers with new ones after removing the brake hose.
- When tightening the brake hose lock bolt, make sure the hole-eye stop pin rests against the brake caliper body.



Before installing the wheel speed sensor, clean the sensor tip and the installation area to remove any foreign objects.

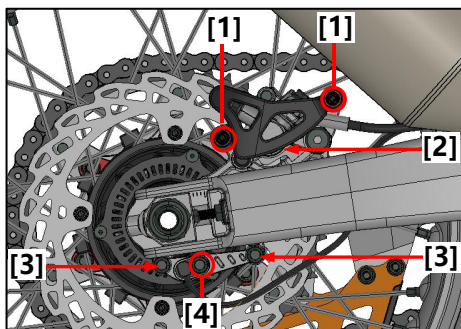
Torque:

Front brake caliper mounting bolts:

26 N.m (2.6 kgf.m, 19 lbf.ft)

Brake pipe lock bolt:

22 N.m (2.2 kgf.m, 16 lbf.ft)



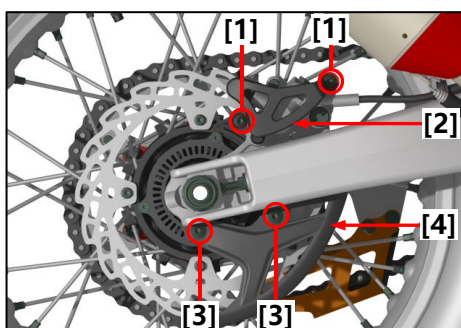
※Rear Brake Caliper

Brake Caliper Decorative Cover/Wheel Speed Sensor Bracket (Regular model)

Drain the brake fluid from the rear brake hydraulic system.

Disassembly/Installation

- Locking bolt [1].
- Rear brake caliper decorative cover [2].
- 2 locking bolts [3].
- Wheel speed sensor bracket [4].

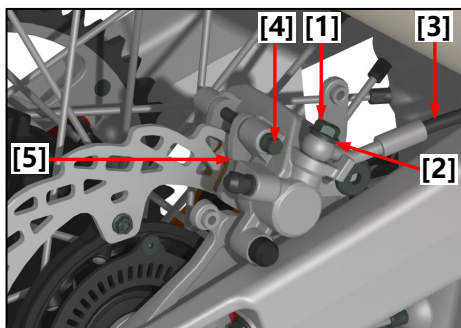


Brake Caliper /Brake Disc Decorative Cover (Factory model)

Drain the brake fluid from the rear brake hydraulic system.

Disassembly/Installation

- Locking bolt [1].
- Caliper decorative cover [2].
- 2 locking bolts [3].
- Brake disc decorative cover [4].



Rear Brake Caliper

Disassembly/Installation of Rear Brake Caliper

- Brake pipe bleeder bolt [1].
- Sealing washers x2 [2].
- Brake hose [3].
- Caliper mounting pin bolt [4].
- Brake pads [5].

- Apply 0.4g (0.01 oz) of lubricant to the sliding area of the caliper mounting pin bolt.
- When tightening the brake pipe lock bolt, make sure the hole-eye stop pin rests against the calibration body.

Installation is the reverse order of disassembly.

Torque:

Brake pipe bleeder bolt:
22 N.m (2.2 kgf.m, 16 lbf.ft)

Note:

- Replace the sealing washers with new ones after removing the brake hose.

Note:

The specifications for the rear caliper are the same for both the factory model and the regular model.

ANTI-LOCK BRAKING SYSTEM (ABS)

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Overview:

- This section describes the maintenance of the Anti-lock Braking System (ABS). For other brake system maintenance (conventional brakes), please refer to the hydraulic brake section.
- The ABS control unit is integrated into the modulator. Do not disassemble the ABS modulator. When there is a failure in the ABS modulator, the ABS assembly should be replaced.
- The ABS control unit performs a self-diagnosis before startup to check if the ABS is functioning properly, up to a vehicle speed of 10 kilometers per hour (6 miles per hour). After the pre-startup self-diagnosis, the ABS control unit continuously monitors the ABS function and vehicle operation until the ignition switch is turned off (routine self-diagnosis).
- When the ABS control unit detects a fault, it will deactivate the ABS function and revert to conventional brake operation, and the ABS indicator light will flash or remain illuminated. Exercise caution when riding in this condition.
- Read the "ABS Troubleshooting Information" carefully and follow the troubleshooting flowchart to diagnose and eliminate ABS system faults. Follow each step of the procedure sequentially. Before starting diagnostics and troubleshooting, take note of the diagnostic trouble code and the possible faulty component.
- After troubleshooting, clear the diagnostic trouble codes (DTCs) and perform a pre-startup self-diagnosis to ensure the ABS indicator light is functioning properly.
- The ABS diagnostic system cannot identify faults caused by issues other than ABS malfunctions (e.g., squealing brake discs, uneven brake pad wear).

Important notes:

- Dropping may damage the ABS modulator. Additionally, if connectors are disconnected while current is flowing, excessive voltage may damage the control unit. Before performing maintenance, make sure to turn off the ignition switch.
- Overflowing brake fluid can cause severe damage to plastic parts and paint surfaces.
- When replacing the wheel speed sensor and/or the ABS ring, make sure to check the clearance.

ABS System Introduction

System introduction:

The ABS assembly consists of the Hydraulic Control Unit (HCU), Electronic Control Unit (ECU), and a motor. It is installed on the chassis and has a wheel speed sensor on each front and rear wheel.

Function of the ABS warning light: The ABS warning light indicates whether the ABS is functioning properly. If there is a fault in the ABS, the warning light will illuminate to alert the rider. In extreme riding conditions where there is a significant difference in wheel speed between the front and rear wheels, such as during wheelie or rear-wheel skid maneuvers, the ABS may temporarily deactivate. To ensure proper ABS functionality, it is necessary to stop the bike and turn off the ignition switch. If the vehicle is restarted and reaches a speed of 12 km/h, the warning light will automatically turn off, and the ABS will be reactivated.

After turning on the ignition switch, the ABS warning light will illuminate. After the initial self-check when the riding speed exceeds 10 km/h, if there are no abnormalities, the warning light will remain off during the same ignition cycle. If the ABS warning light remains on during riding (≥ 10 km/h), it indicates a fault in the ABS. In this case, the ABS cannot be activated, but the braking system itself will still function. It's just that the ABS control system is malfunctioning.

ABS mode switch: To disable or enable the ABS function, please ensure that the motorcycle is continuously powered on and perform the mode switch when the vehicle is below a certain speed. It is recommended to perform the mode switch when the vehicle is stationary. The ABS modes include ABS on, only rear-wheel off, and ABS off. The ABS mode can be selected through the instrument setting. Regardless of whether the ABS function is on or off, if the power is disconnected and then reconnected, the ABS will automatically switch to the on mode.

Precautions for ABS braking

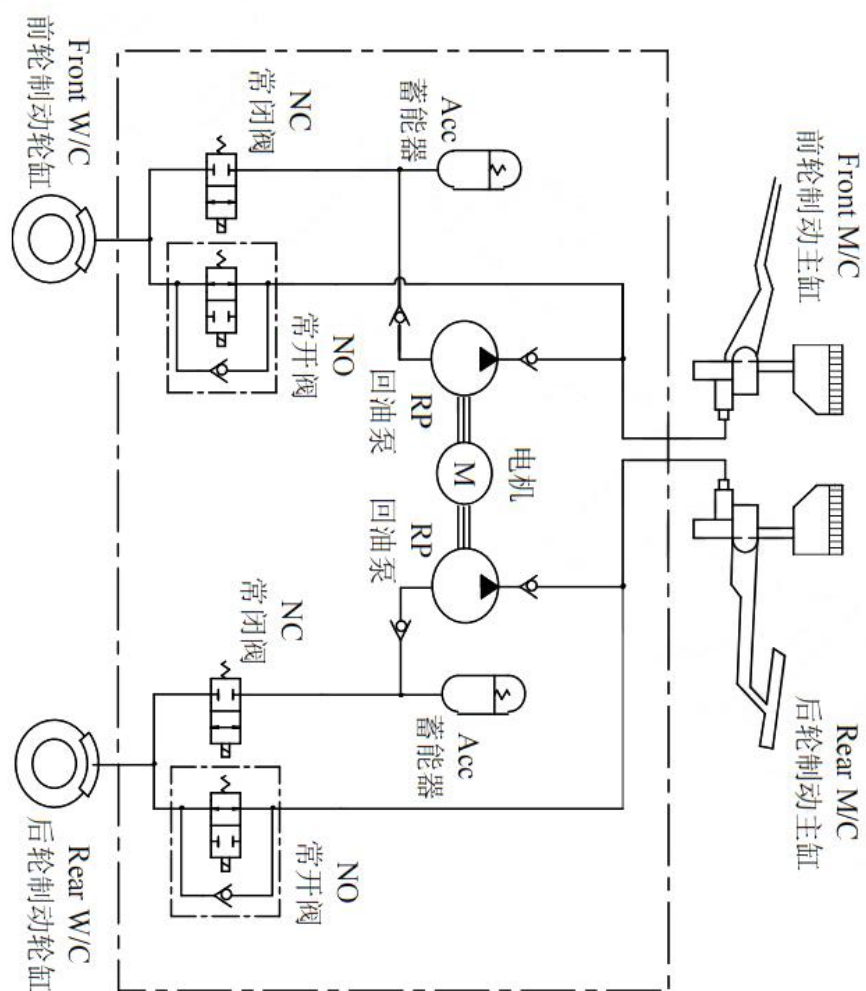
ABS function impairment

Modifications such as shortening or lengthening the suspension travel, using different wheels or tire specifications, incorrect tire pressure, or using non-approved or recommended brake pads may hinder the optimal functioning of the ABS. To ensure the best ABS performance, only use parts and tires approved or recommended by the manufacturer for the braking system.

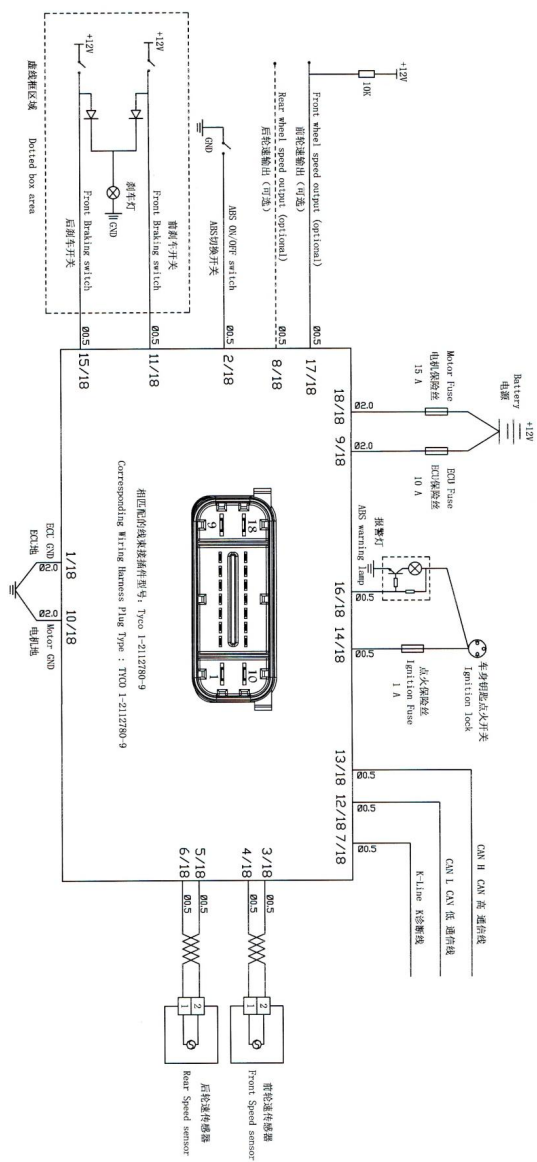
ABS system braking advise

- First principle of ABS braking: Brake as if the vehicle is not equipped with ABS.
- When operating the brake lever, avoid applying excessive and sudden brake pressure. Apply significant brake pressure only after the brake pads have fully engaged.
- You may sense the ABS activated through slight vibrations in the brake lever or rear brake pedal, as well as brief sounds.
- Do not use the brakes while in gear for full braking.
- Regularly practice braking within the range of ABS control, as it allows you to fully utilize the potential of the Anti-lock Braking System in the event of a severe accident.

Mechanical Diagram

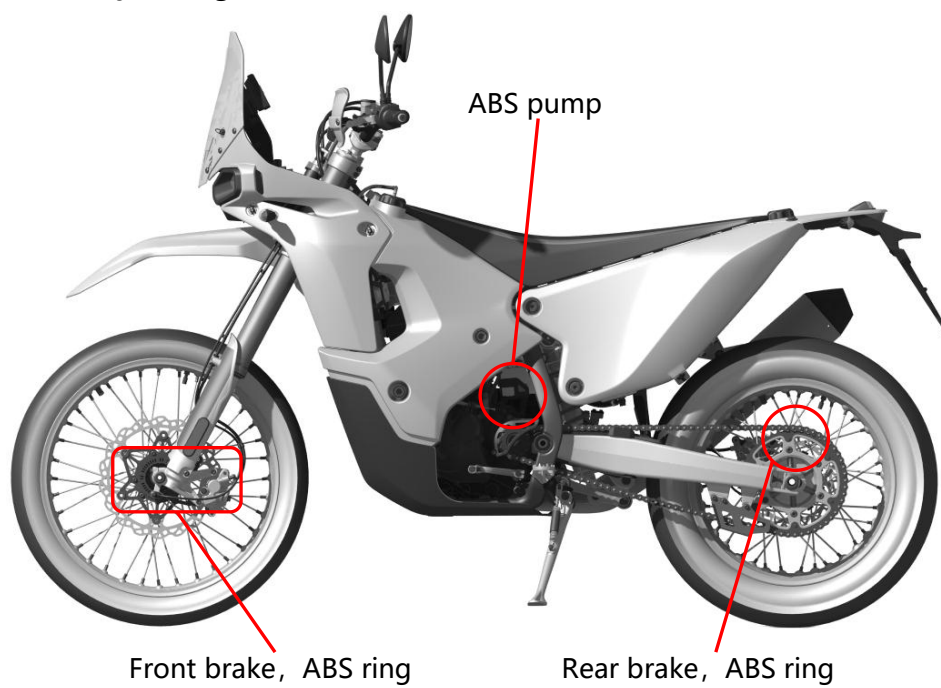


Electrical Diagram



System Location

Only for regular model

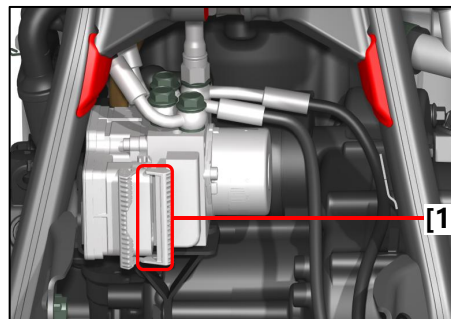


※ABS Pump

Drain the hydraulic brake fluid from the braking system, disconnect the negative (-) terminal of the battery.

Disassemble the following components:

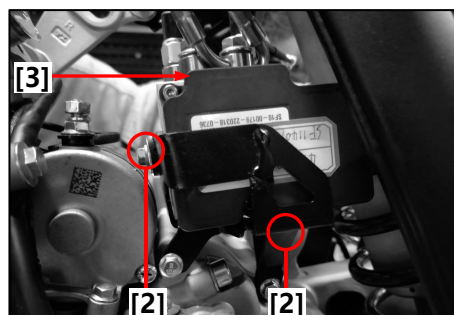
- Disconnect the 18P (black) connector of the ABS modulator [1].
- Remove the brake hose union bolt and washer, and disconnect the brake hose from the master cylinder.

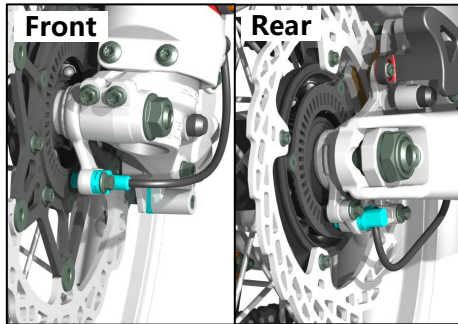


Remove two mounting bolts [2] and the ABS pump assembly [3] from the bracket.

Torque specifications:

- Torque for ABS bracket-to-engine connection bolt: 10 N.m (1.0 kgf.m, 7.4 bf.ft).
- Torque for ABS bracket-to-ABS assembly connection bolt: 10 N.m (1.0 kgf.m, 7.4 bf.ft).
- Torque for brake hose union bolt: 22 N.m (2.2 kgf.ft, 16 lbf.ft).





※ Wheel Speed Sensor Clearance Inspection

Securely support the motorcycle with a hoist or equivalent, and lift the wheel off the ground.

Slowly rotate the wheel and measure the gap (air gap) between the sensor and the ABS ring at multiple points.

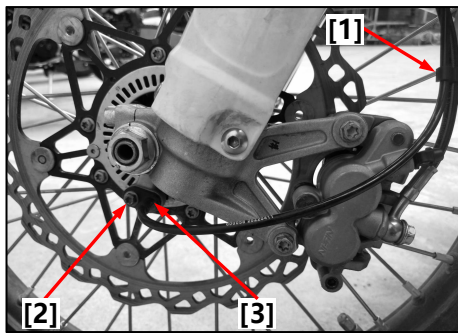
The gap must be within the specified range. Standard: 0.4-1.2 mm (0.02-0.05 in).

If the gap cannot be adjusted or is not within the specified range, check each part for deformation, looseness, or damage.

Check if the wheel speed sensor is damaged and replace if necessary. Check if the ABS ring is deformed or damaged and replace if necessary.

- Front ABS ring
- Rear ABS ring

Note: The factory model does not have front and rear wheel speed sensors.



※ Front Wheel Speed Sensor

Disassembly/Installation:

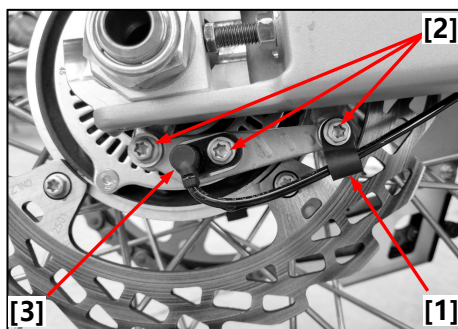
Disassemble the following components:

- Hose clamp [1]
- Bolt [2]
- Front wheel speed sensor [3]

Install the components in the reverse order of disassembly.

Note:

Thoroughly clean the sensor tip and the sensor installation area (brake caliper bracket), and ensure no foreign objects are present. After installation, check the clearance.



※ Rear Wheel Speed Sensor

Disassembly/Installation:

Disassemble the following components:

- Hose clamp [1]
- Bolt [2]
- Rear wheel speed sensor [3]

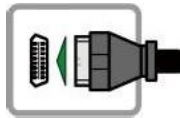
Install the components in the reverse order of disassembly.

Note:

Thoroughly clean the sensor tip and the sensor installation area (brake caliper bracket), and ensure no foreign objects are present. After installation, check the clearance.

Inspection and Diagnostic Process for Troubleshooting

(1) How to use a diagnostic tool:



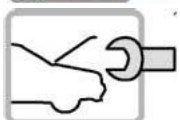
1. Connect the diagnostic tool to the diagnostic interface.



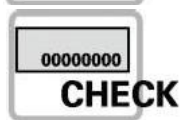
2. Turn on the "ignition switch."



3. Read the relevant fault information (fault codes, freeze frame, etc.), consult the repair manual to confirm the faulty component and type, and develop a repair plan based on the fault information.



4. Troubleshoot the fault.



5. Turn the ignition switch ON, start the bike, and read the fault information again to confirm that the fault has been resolved.

(2) Preliminary inspection

Before proceeding with the ABS fault code diagnosis, perform the following preliminary checks:

1. Confirm that the ABS fault indicator light is working properly.
2. Confirm the existence of the reported fault by the owner and identify the conditions under which the fault occurs.

Then perform the following checks:

- Check if the sensor clearances are normal.
- Check if the ABS ring is smooth and free from deformation.
- Check if the ABS fuse is in good condition.
- Check if the wiring harness and grounding points are clean and secure.
- Check if there are any loose or poor connection in the ABS assembly and sensor connector.

Important Note:

If any of the above conditions are present, prioritize the repair work for the specific fault before proceeding with the fault diagnosis and repair. Neglecting these preliminary checks may affect the accuracy of subsequent fault diagnosis and repair work.

Troubleshooting with Diagnostic Tool:

Fault diagnosis should be performed when the vehicle is in a stationary state. Mechanics can connect the diagnostic tool to the OBD interface to retrieve ABS information. The fault types and corresponding troubleshooting measures can be found in the table below.

(3) Fault Code Information Table

DTC	Failure Description
C0024	MCU_MU_CLK_Monitor_Failed 微控制器时钟检测错误
C0032	MCU_MC_ROM_Failed 微控制器ROM错误
C0033	MCU_MC_RAM_Failed 微控制器RAM错误
C0040	MCU RAM Stack Overflow Fault 微控制器RAM堆栈错误
C0041	MCU Hardware Reset 微控制器硬件复位
C0044	Solid State Relay_Relay over current 固态继电器_过流
C0045	Solid State Relay_Relay shorted (Stuck on) 固态继电器_继电器短路（卡死）
C0046	Solid State Relay_shorted to ground 固态继电器_与地短接
C0051	Battery Voltage_Battery under-voltage 1 (7V < Voltage < 9V) 电池电压过低1，（大于7伏小于9伏）
C0052	Battery Voltage_Battery under-voltage 2 (Voltage <= 7V) 电池电压过低2，（小于等于7伏）
C0053	Battery Voltage_Battery over-voltage 电池电压过高
C0060	Brake Pedal Not Applied with Decel不踩刹车有减速度
C0061	Brake Pedal Always Applied Without Decel Fault 踩下刹车时没有减速度
C0062	Brake Diode Breakdown 刹车二极管击穿
C0070	Pump Motor control_Bad connection or Pump supply open or low voltage 泵电机连接差或供电端开路或电压过低
C0071	Pump Motor control_Pump ground open or Motor open 泵电机开路或地线开路
C0072	Pump Motor control_Pump FET shorted 泵电机开关管短路
C0073	Pump Motor control_Pump FET open 泵电机的开关管开路
C0074	Pump Motor control_Pump over current 泵电机过流
C0075	Pump Motor control_Pump motor blocked 泵电机堵转
C0080	Front_WSS_HSS_Short_To_Battery前轮轮速传感器高端与电源短接
C0081	Front_WSS_LSS_Short_To_Battery前轮轮速传感器低端与电源短接
C0082	Front_WSS_HSS_Short_To_Ground or WSS short circuited 前轮轮速传感器高端接地或短路
C0083	Front_WSS_LSS_Short_To_Ground or WSS open 前轮轮速传感器低端接地或开路
C0084	Front_WSS_Plausibility01前轮轮速传感器信号失真等级01
C0085	Front_WSS_Plausibility02前轮轮速传感器信号失真等级02
C0086	Front_WSS_Plausibility03前轮轮速传感器信号失真等级03

C0087	Front_WSS_Plausibility04前轮轮速传感器信号失真等级04
C0088	Front_WSS_Plausibility05前轮轮速传感器信号失真等级05
C0100	Rear_WSS_HSS_Short_To_Battery后轮轮速传感器高端与电源短接
C0101	Rear_WSS_LSS_Short_To_Battery后轮轮速传感器低端与电源短接
C0102	Rear_WSS_HSS_Short_To_Ground or WSS short circuited 后轮轮速传感器高端接地或短路
C0103	Rear_WSS_LSS_Short_To_Ground or WSS open 后轮轮速传感器低端接地或开路
C0104	Rear_WSS_Plausibility01 后轮轮速传感器信号失真等级01
C0105	Rear_WSS_Plausibility02后轮轮速传感器信号失真等级02
C0106	Rear_WSS_Plausibility03后轮轮速传感器信号失真等级03
C0107	Rear_WSS_Plausibility04后轮轮速传感器信号失真等级04
C0108	Rear_WSS_Plausibility05后轮轮速传感器信号失真等级05
C0120	Front_NO Coils Short to battery 前轮常开线圈接电源
C0121	Front_NO Coils Short to ground or Open solenoid 前轮常开线圈接地或开路
C0130	Front_NC Coils Short to battery 前轮常闭线圈接电源
C0131	Front_NC Coils Short to ground or Open solenoid 前轮常闭线圈接地或开路
C0160	Rear_NO Coils Short to battery 后轮常开线圈接电源
C0161	Rear_NO Coils Short to ground or Open solenoid后轮常开线圈接地或开路
C0170	Rear_NC Coils Short to battery后轮常闭线圈接电源
C0171	Rear_NC Coils Short to ground or Open solenoid后轮常闭线圈接地或开路
C0210	Warning Lamp output_ Short to battery 报警灯输出与电源短路
C0213	Warning Lamp output_ Short to ground or open报警灯输出与地短路或开路
C0230	Vehicle speed output_ Short to ground 车速输出口与地短路
C0231	Vehicle speed output_ Short to battery 车速输出口与电源短路

(4) Corresponding Measures for Fault Code

故障类型(failure type)	DTC	采取措施(Handling)
微控制器故障 (MCU Failure)	C0024~C0041	ABS 故障 , 请咨询供应商后, 更换新 ABS ABS failure, please replace new ABS after consulting supplier.
固态继电器故障 (Solid State Relay Failure)	C0044~C0046	ABS 故障 , 请咨询供应商后, 更换新 ABS ABS failure, please replace new ABS after consulting supplier.
电池电压故障 (The battery voltage Failure)	C0051~C0052	主要是外围电路故障! Mainly peripheral circuit failure! 检查车辆供电系统(线束连接、保险丝、电瓶、整流器) Check the vehicle power supply system(The fuse, battery, rectifier)
刹车信号故障 (The brake signal failure)	C0060~C0062	主要是外围电路故障! Mainly peripheral circuit failure!

		1.检查刹车二极管是否损坏; Check the brake diode 2.检查刹车信号线和 ABS 连接情况。 Check the connection between brake line and ABS
电机故障(Pump motor fault)	C0070、C0071	主要是外围电路故障! Mainly peripheral circuit failure! 检查电机供电线 Check the motor power supply line
电机故障(Pump motor fault)	C0072~C0075	ABS 故障, 请咨询供应商后, 更换新 ABS ABS failure, please replace new ABS after consulting supplier.
轮速传感器接线故障 (Wheel speed sensor wiring fault)	C0080~C0083 C0100~C0103	主要是外围电路故障! Mainly peripheral circuit failure! 1.检查传感器线束与 ABS 连接通断情况, 若问题未解决, 进行下一步; Check the connection between sensor wire and ABS 2.尝试更换轮速传感器。 Try to change the wheel speed sensor.
轮速信号质量故障 (Wheel speed signal quality failure)	C0084~C0088 C0104~C0108	主要是外围故障! Mainly peripheral failure! 1.检查前后轮速传感器安装是否规范(传感器头部与齿圈的距离 $\leq 1.5\text{mm}$); Check the installation of wheel speed sensor(The gap between sensor head and the tone wheel is 1.5 mm or less) 2.检查齿圈是否有变形以或损坏。 Check if there is a deformation, or a damage with the tone wheel
线圈故障 (coil failure)	C0120~C0171	ABS 故障, 请咨询供应商后, 更换新 ABS ABS failure, please replace new ABS after consulting supplier.
报警灯输出故障 (warning lamp output failure)	C0210、C0213	主要是外围电路故障! Mainly peripheral circuit failure! 检查仪表盘与 ABS 连接处线束, 若问题未解决, 请更换仪表, 若问题仍未解决, 请咨询供应商 Check the connection between dash board and ABS, if the problem not solved, please change the dash board. If the problem remains unresolved, please consult the supplier.
轮速输出故障 (WSS output failure)	C0230、C0231	主要是外围电路故障! Mainly peripheral circuit failure! 检查外围电路和仪表, 若问题未解决, 请咨询供应商后, 更换新 ABS Check the circuit and dash board, if the problem not solved, please replace new ABS after consulting supplier.

Note: For products that do not have brake signal in software configuration, faults C0060, C0061, and C0062 will not occur.

※ Circuit Troubleshooting

1. Inspection of ABS Connector

Turn off the ignition switch.

Remove the cover of the ABS modulator.

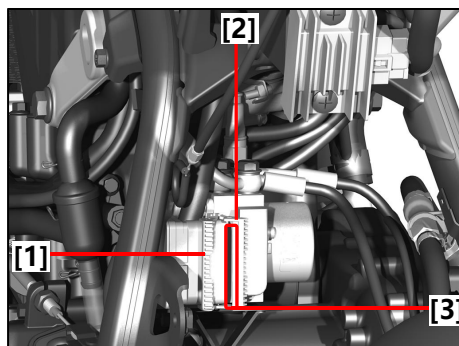
Rotate the lock lever [1] to this side while simultaneously pressing the lock piece [2] to release it.

Ensure that the lock lever continues to rotate and disconnect the ABS modulator 18P (black) connector [3].

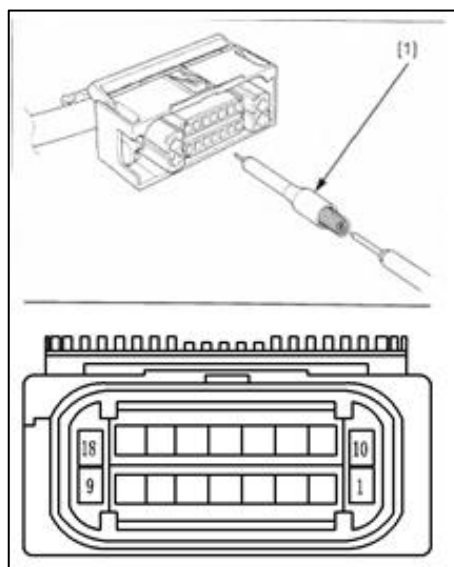
Connection procedure:

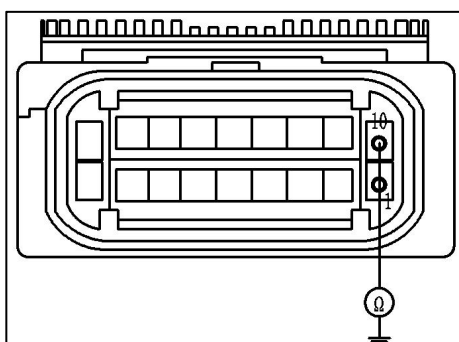
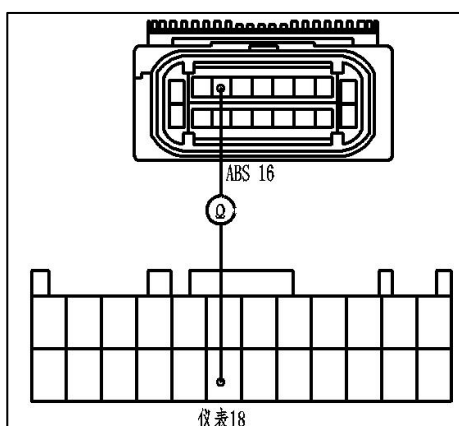
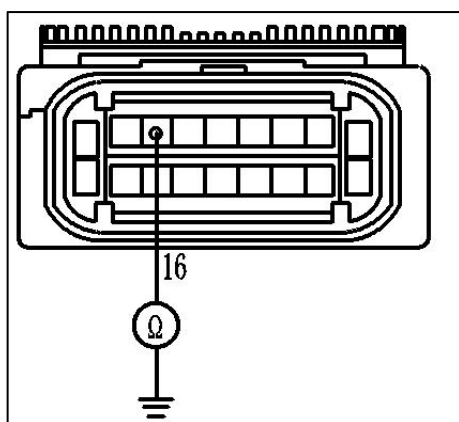
Ensure that the lock lever is fully pressed against the wire side of the connector.

Press firmly to connect the ABS modulator 18P (black) connector until the lock tab clicks, ensuring a secure connection.



- Before disconnecting the connector, make sure to clean the surrounding area and keep it free from foreign objects.
- ABS faults are often related to poor or corroded connections. Before proceeding, check these connections.
- When testing the terminals of the ABS modulator 18P (black) connector (except terminals 9 and 18 on the harness side), be sure to use a test probe [1]. Insert the test probe into the connector terminal and connect the digital multimeter probe to the test probe.





※ ABS Indicator Light Troubleshooting

ABS indicator light does not illuminate (when the ignition switch is ON)

Note:

Before starting the inspection, check the initial operation of the instrument.

1. Indicator operation check

Turn off the ignition switch.

Disconnect the ABS modulator 18P (black) connector.

Turn the emergency OFF switch to "O" position.

Check the ABS indicator light.

Does the ABS indicator light illuminate?

YES - ABS modulator fault.

NO - Proceed to step 2.

2. Indicator signal wire short circuit check

Turn off the ignition switch

Check the continuity between the harness-side ABS modulator 18P (black) connector [1] terminal and ground.

Tools:

Multimeter

Connection: 16 - Ground

Is there continuity?

YES - Purple-white wire short circuit.

NO - Instrument cluster fault.

ABS indicator light remains illuminated (the indicator light does not go off while the motorcycle is in motion).

1. Open Circuit Inspection

Turn off the ignition switch.

Disconnect the ABS modulator 18P (black) connector.

Check the continuity between the ABS modulator 18P (black) connector [P16] terminal on the wire harness side and the instrument indicator light signal.

Tool:

Multimeter

Connection: 16 - Instrument signal wire

Is there continuity?

YES - Proceed to step 2.

- Instrument malfunction

NO - Purple-white wire open circuit

2. Modulator Ground Wire Open Circuit Check

Turn off the ignition switch.

Check the continuity between terminal [1] and ground on the ABS modulator 18P (black) connector on the wire harness side.

Connection: 1 - Ground / 10 - Ground

Is there continuity?

YES - Proceed to step 3.

NO - Green wire open circuit

3. Fuse Check

Remove the following components:

-Remove the seat cushion.

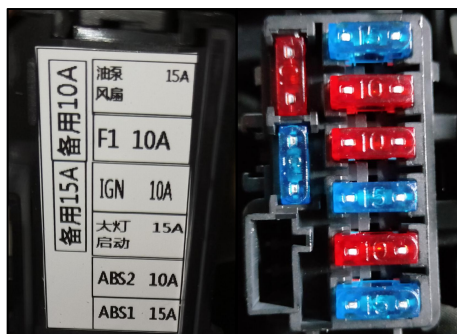
Remove the fuse box cover from the fuse box.

Check if the ABS main fuse is burned-out.

Is the fuse burned-out?

YES - Proceed to step 4.

NO - Proceed to step 5.



4. Power Input Wire Short Circuit Check

With the ABS main fuse (15A/20A) removed, check the continuity between the ABS modulator 18P (black) connector on the wire harness side and ground.

Tool:

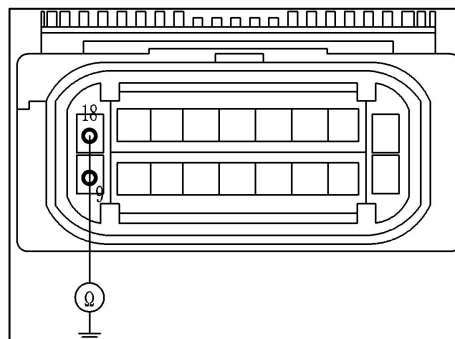
Test probe 07ZAJ-RDJA110

Connection: 9 - Ground / 18 - Ground

Is there continuity?

YES - Yellow wire short circuit / Black-blue wire short circuit.

NO - Intermittent fault, replace the ABS main fuse (15A/20A), and recheck.



5. Power Input Wire Open Circuit Check

Install the ABS main fuse (15A/20A).

Turn on the ignition switch and measure the

voltage between terminal 1 on the ABS modulator 18P (black) connector on the wire harness side and ground.

Tool:

Test probe: 07ZAJ-RDJA110

Connection: 9 (+) - Ground (-) / 18 (+) -

Ground (-)

Is there voltage?

YES - ABS modulator malfunction

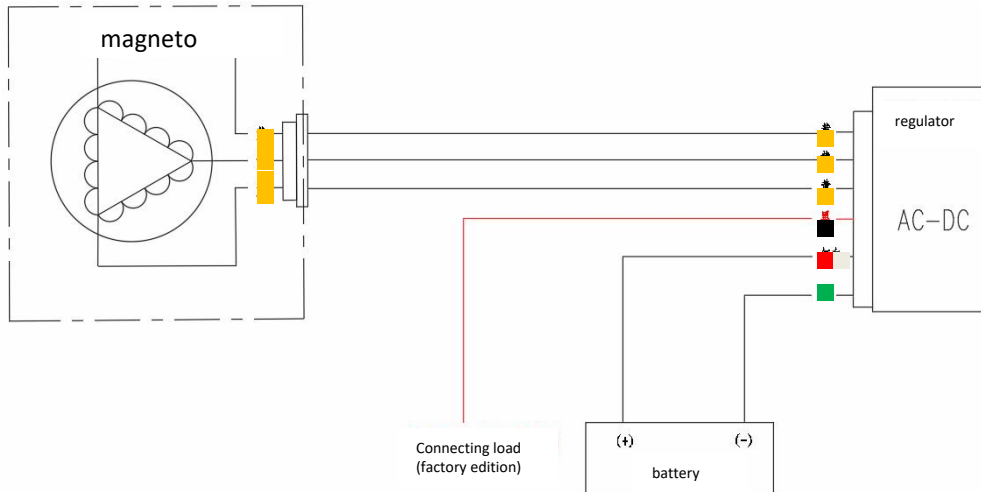
NO - Yellow wire open circuit / Black-blue wire open circuit.

Electrical parts

1 Power supply system.....	250
2 Switchs.....	254
3 Lights	261
4 Other parts	264

1. Power supply system

Charging circuit diagram

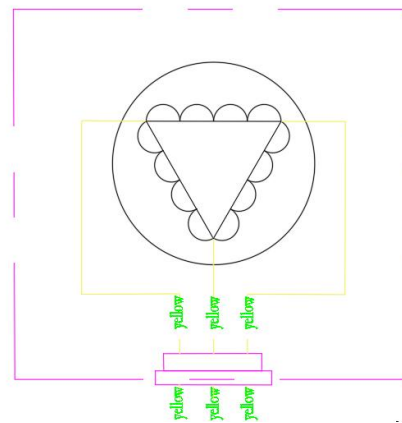


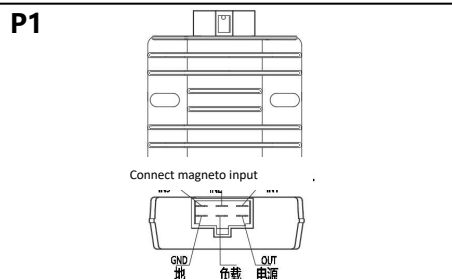
※magneto

Magneto coil resistance
Measure the resistance between the magneto stator coils, the resistance value is within the specified range, it means the magneto is good; otherwise, it means abnormal, replace immediately.
Normal magneto coil resistance range.
 $0.45\ \Omega - 1.5\ \Omega$ (yellow - yellow).
Insulation resistance $\infty\ \Omega$ (yellow - ground).
Check the multimeter should be set at $1 \times 10\ \Omega$ file.

Magneto performance at load
Start the engine, use a multimeter to measure the voltage between the three output lines of the magneto stator coil has been, if the voltage is the same size, it means that the magneto is good; on the contrary, abnormal, need to replace.

Magneto



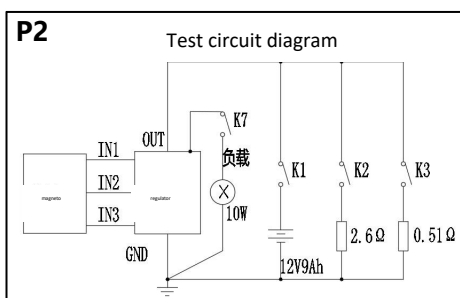


※rectifier

After the engine runs, when the battery is fully charged at 5000r/min, use a multimeter to measure the voltage between 13.5V and 15V at both ends of the red, red, white, and green lines. If the voltage is not within this range, replace the rectifier regulator

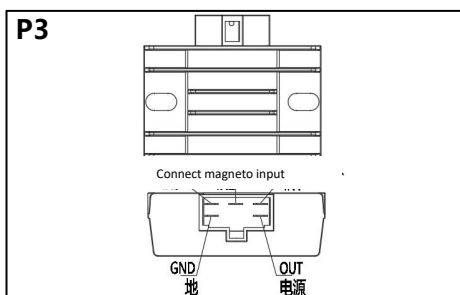
For example, P1: is the outline diagram and pin definition of the factory edition model regulator rectifier.

P2: is the test wiring diagram of regulator rectifier.



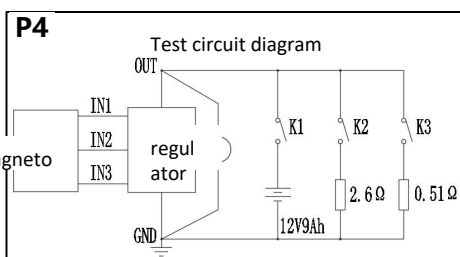
Function definition of each pin:

- 1: Pick up magnet motor input (yellow)
- 2: Magnetizing motor input (yellow)
- 3: Connect magneto input (yellow)
- 4: GND ground (green)
- 5: Load (black)
- 6: OUT to power (red and white)



For example, P3: is the regular edition model regulator outline diagram and pin definition.

P4: is the test wiring diagram of regulator rectifier.



Function definition of each pin:

- 1: IN1 connects to magneto input (yellow)
- 2: IN2 connects to magneto input (yellow)
- 3: IN3 connected to magneto input (yellow)
- 4: GND ground (red and white)
- 5: OUT connected to the power supply (green)

※Check and replace the battery

1. Before installing the battery, if the electrode is found to be dirty, please wipe it clean before installing it, otherwise it may fail to function due to poor contact.
 2. If the battery is deformed, abnormally hot, smoking and other abnormal phenomena occur during use, please stop using it immediately and go to the special maintenance store of Kaiyue Motorcycle for investigation in time.
 3. If the battery is placed in high temperature and humid environment for a long time, the function may fail and the life may be shortened. Before using it again, please make sure the appearance and function of the battery are normal before installing and using it.
 4. If the whole car can not start, please check whether the battery is charged or damaged, such as battery power loss, please charge in time, such as battery damage, please replace in time.
- If the battery is not used for a long time, please pay attention to the following conditions.
To prevent the occurrence of over-discharge situation, the battery should be charged once every two months.
- When the battery is not in use, it should be placed in a cool and dry environment and prevent the battery from short-circuiting the positive and negative poles.

Battery

Disassembly/Installation

Remove the following components.

- Turn off the ignition switch.
- Remove the seat cushion.
- Disconnect the negative (-) battery cable [1], then the positive (+) cable [2] by removing the terminal bolt. Remove the rubber band and the battery [3].

Installation order is the reverse of the disassembly order

Caution.

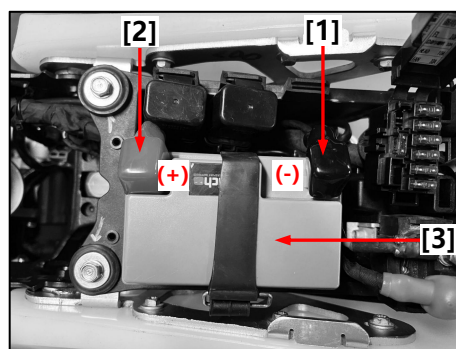
The battery must be disconnected from the negative cable first, otherwise the battery may be short-circuited.

Charge

Switching off the ignition.
Removing the battery.
Connecting the charger to the battery and turning on the charger.
Turn off the charger and remove the battery after charging.

Check the charging voltage
Start the vehicle for voltage testing.
Measure the point positive (+),
measure the electrical ground (-).

charging voltage	
5000rpm	13.5V-15.0V



If the displayed value is less than the specified value.

Check the plug from the engine to the regulator rectifier.
Check the plug from the regulator rectifier to the wiring harness.
Check the electronic winding of the engine.

If the displayed value is greater than the specified value.

Check the battery for overcharge protection or replace the regulator rectifier.

Battery model: MTX4L-FPP

Fully charged voltage: > 13.2V

Need charging voltage: < 12.8V

Charging current: Standard 1.5A

Max 12A

Working temperature -20°C-60°C

Battery capacity: 12V/4Ah

Overall Dimension LxWxH:

113x69x85

Warnings and precautions for battery use

1. It is strictly forbidden to invade the battery into seawater or water, avoid drenching; when not in use for a long time, it should be placed in a cool and dry environment.
2. It is forbidden to use or leave the battery next to high temperature sources, such as open flame, heater.
3. It is strictly prohibited to over-discharge, and when charging, please strictly follow the requirements for charging.
4. It is strictly forbidden to use the battery by reversing the positive and negative poles.
5. It is forbidden to connect the battery directly to the positive and negative terminals for short circuit.
6. Prohibit knocking or throwing or stepping on the battery.
7. It is forbidden to decompose the battery in any way.
8. It is forbidden to weld the battery directly and pierce the battery with nails or other sharp instruments.
9. It is forbidden to use it in the place of strong electricity and strong magnetic field, otherwise it will easily destroy the safety protection device of the battery and bring unsafe hidden danger.
10. If it starts badly, please don't start it frequently, it is recommended to use it after replenishing the electricity to prevent the battery from over discharging.
11. If the battery emits bad smell, heat, discoloration, deformation or any abnormality occurs during use, storage or charging, immediately remove the battery from the vehicle or charger and stop using it.

2.Switchs

※Right combination switch (regular edition)

Disconnect the plug of the right hand handle switch harness linked to the main cable and check the action on/off of each switch.

[1] Flame-out self-locking button.

① The engine can be started only when the switch is in the "○" (running) position.

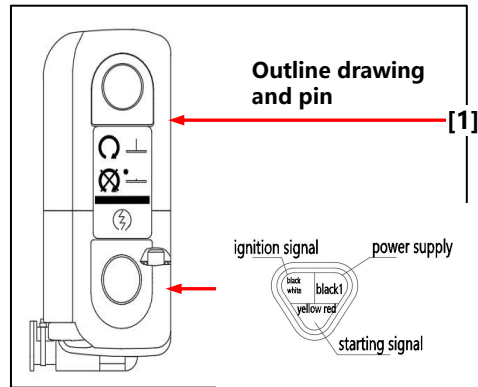
② When the switch is in the "⊗" (stop) position, the engine cannot be started.

[2] Activation of the self-resetting button.

When the emergency flameout switch is placed in the "○" position.

①The engine is in neutral, press this button to make the engine start.

②If the engine is not in neutral, you need to retract the side bracket and squeeze the clutch handle, press this button also can make the engine start.



Switch on/off function wiring table

Flameout combination button [1]				starting button [2]			
color	black	white	black	yellow	red	color	black
○						press. ⚡	white
⊗							black
							yellow
							red

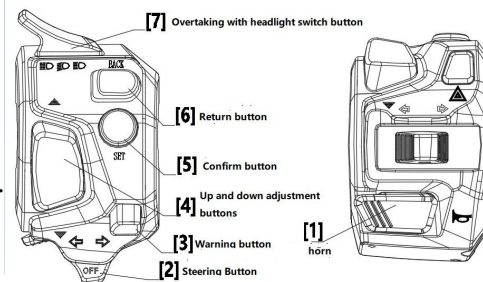
※Left combination switch (regular edition)

Disconnect the connector connecting the switch harness with the main cable with the left hand, and check whether the switch works.

p2

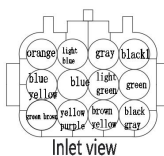
function	color	blue yellow	blue	green	light green	gray	orange	light blue	black
simmer	⚡	●	●						
horn	🔊			●	●				
steering	🏍️					●	●		
warning	⚠️					●	●	●	●
overtake	🏍️		●	●	●	●	●	●	●

Shape drawing and function



p1

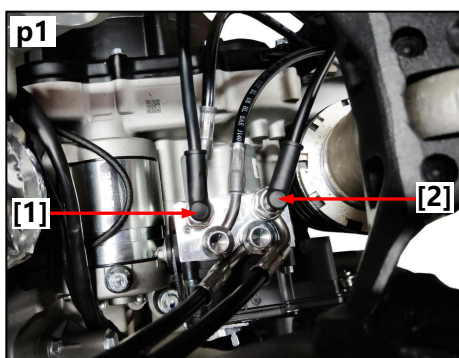
Left combination switch



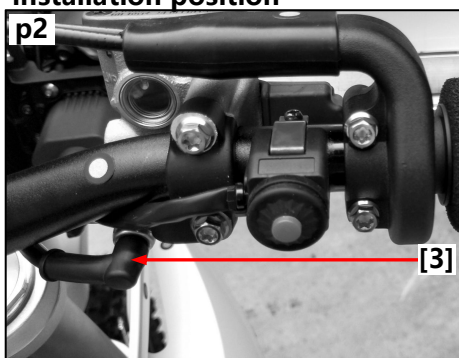
Meter switch

color	green	green white	yellow	brown	black	red	note
▲	●	●					200mA
▼	●		●				200mA
BACK	●			●			200mA
SET	●				●		200mA

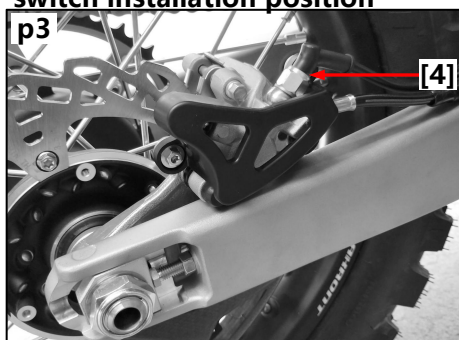
p1: Wiring diagram for the left hand combination switch.



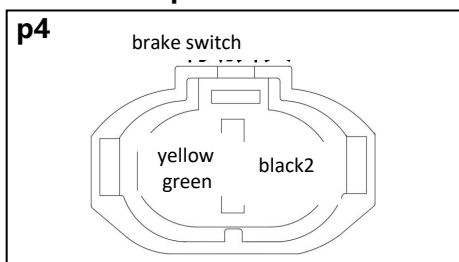
p1: regular edition Brake switch installation position



p2: factory edition Brake switch installation position



p3: factory edition Brake switch installation position



※brake switch

The brake switch working status is judged by the lighting of the brake light.
 1: front brake handle pinch: brake light on.
 2: front brake handle release: brake light off.
 3: depress the rear brake pedal: brake light on.
 4: release the rear brake pedal: brake light off.

p1: for regular edition brake switch mounting position.

- Front caliper fuel line into the ABS main pump to FW, FM out to the front upper pump and brake switch [2].
 The installation torque is the same as below.

-Rear caliper fuel line into ABS main pump to RW, RM out to rear upper pump and brake switch [1].

p2.3 : position [3], [4] for factory edition brake switch mounting position.

Torque.
 Brake switch mounting
 M10X1.25
 22N-m (2.2kgf.ft;18lbf.ft)

p4: Brake switch wiring harness definition diagram.

※Turn signal flasher (flasher)

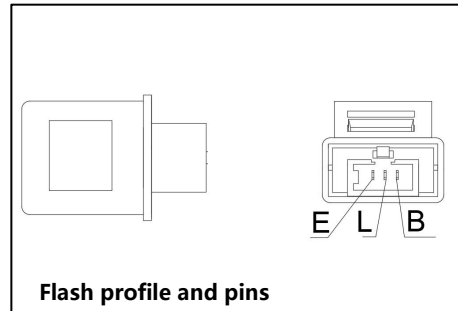
Attention.

The flasher is equipped with wire break alarm prompt function and load overload protection function.

Removal/Installation

- Turn off the ignition switch.
- Removing the seat cushion assembly.
- Removal of the flasher.

Install in reverse order of disassembly.



Flash profile and pins

P1: wiring diagram for the flasher

P1

Relay circuit check

1. Power line open circuit check.

Turn on the ignition switch, measure the voltage between the black line and the green line, the normal voltage for the battery voltage, and vice versa to check the black and green line open circuit or fuse blown fault.

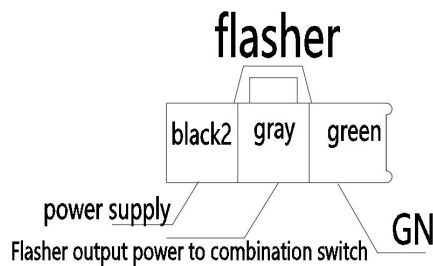
2. Output line open circuit check.

Check the connection of the left switch to the gray line of the flasher

3. Flashing frequency abnormal or not flashing.

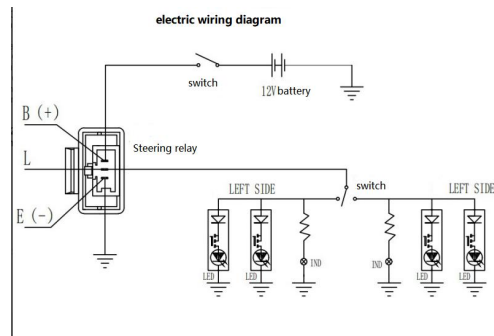
Check whether there is damage to each turn signal.

Check whether the turn signal wire is shorted to ground, resulting in short circuit protection for the flasher.

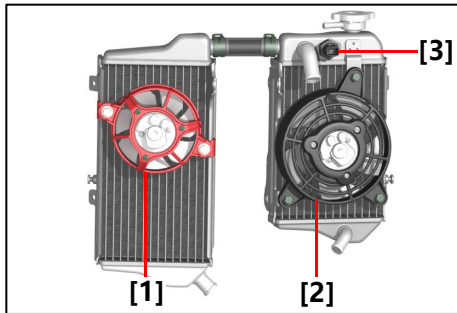


P2

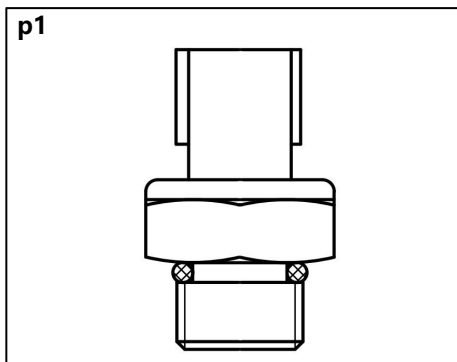
p2: Electrical schematic diagram of the flasher



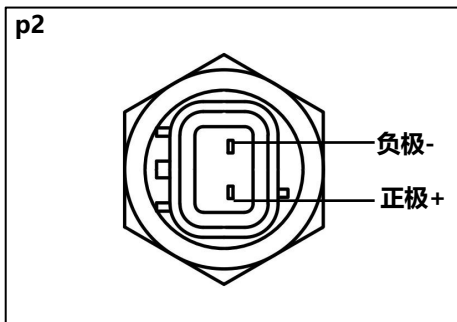
1. Rated voltage: DC12.8V;
2. Rated power: LED light, front turn signal, rear turn signal + instrument: 1.5W*2+0.05W;
3. Working voltage range: DC11~16V, minimum action voltage: $\leq 9V$;



As shown above.
[1] for fan left.
[2] for fan right.
[3] the temperature control switch.



p1 is the outline drawing of temperature control switch.

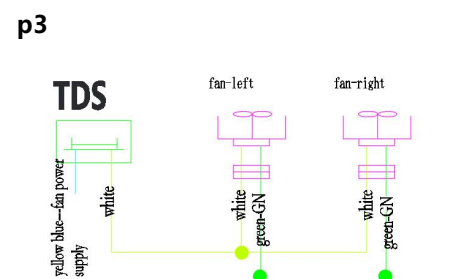


p2:is the pin diagram of the temperature control switch.

Parameters:

Conduction temperature: $93 \pm 3^{\circ}\text{C}$,

Disconnect temperature: $83 \pm 3^{\circ}\text{C}$



3 is the wiring diagram of the cooling fan and the temperature control switch.

※starting relay

Load DC12V voltage on the contacts of both ends of the control circuit coil of the starter relay, then use a multimeter to measure whether the B+ and M contacts are connected.

If the relay contacts emit a ticking sound and the multimeter emits a continuous ticking sound, it means that the two contacts are connected: the opposite means that they are not connected: when DC12V is not loaded at both ends of the coil, the two contacts are not connected. The above two can confirm whether the state of the relay is good, measurement of the multimeter should be dialed in the on-off file.



-Don't load the voltage on the relay coil for more than 1 minute, otherwise it will cause the coil to overheat and result in burning the coil.

P1: Wiring diagram for starting relay

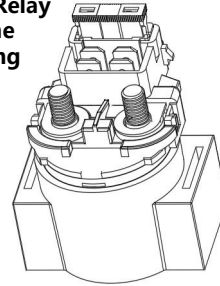
When using a multimeter to measure the resistance between the relay coils, if the resistance is not within the specified range of 3Ω - 5Ω , it is necessary to replace the new parts. When measuring, the multimeter should be set to $1 \times 10\Omega$.

P2: Starting relay schematic.

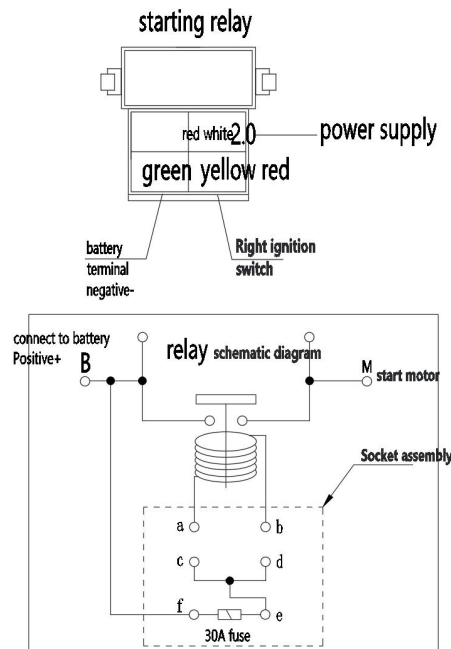
Auxiliary Relay

Apply DC12V voltage to the control circuit coil of the auxiliary relay, use a multimeter to measure whether the A B two contacts are connected, measurement of the multimeter dialed in the through file, if the contacts tick and the multimeter issued a continuous tick sound, it means that the two contacts are connected: vice versa: when the coil is not loaded with DC12V voltage at both ends, the two contacts are not connected. The above two items can confirm whether the relay is in good condition. The normal coil resistance range is 90Ω - 100Ω .

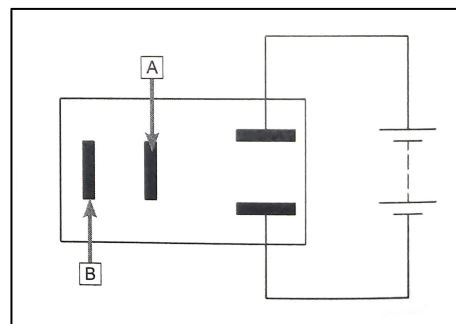
Starting Relay Outline Drawing

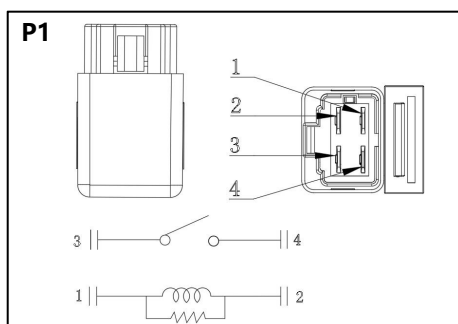


p1

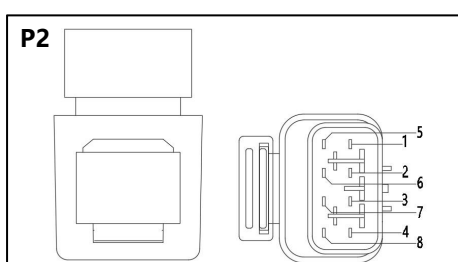


p2

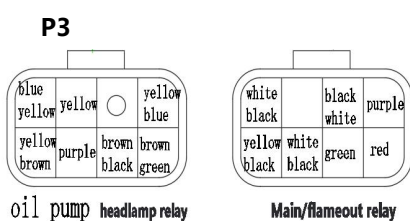
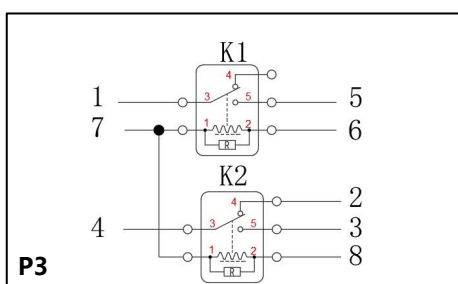




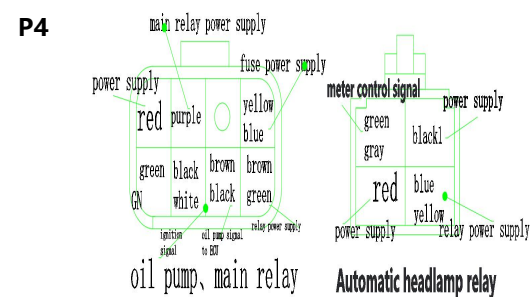
P1: headlamp relay outline drawing and electrical wiring diagram.



p2,p3: The outline diagram and electrical wiring diagram of the vehicle relay.



p3: Wiring diagram for factory edition relay.



p4: regular edition relay wiring diagram.

※Fuse

To avoid short circuit, be sure to set the main power switch to "OFF" first when checking or replacing the fuse.

2. Check.

- Fuse

a. Connect a digital multimeter bit to the fuse and check for conduction.

b. If it is not conducting, replace the fuse.

3. Replace.

- Replace the fuse

a. Set main power switch to "OFF".

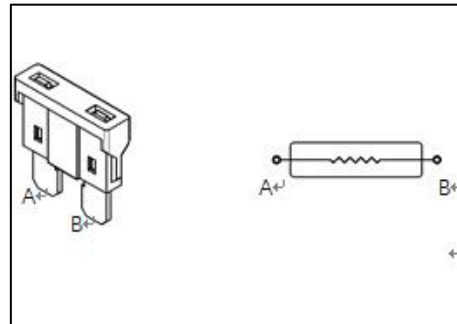
b. Install a new guaranteed fuse with the correct amperage.

c. Turn on the power switch and check the circuit for proper operation.

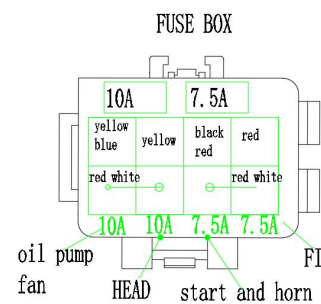
d. If the fuse blows again immediately, check the circuit.



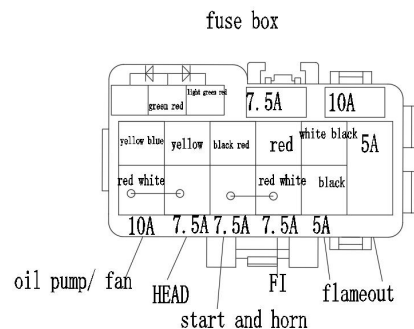
-Never use a fuse that is not of the specified amperage. Casual use or use of fuses with the wrong amperage may cause extensive damage to electrical components, lead to lighting and ignition system failure, and may cause a fire.



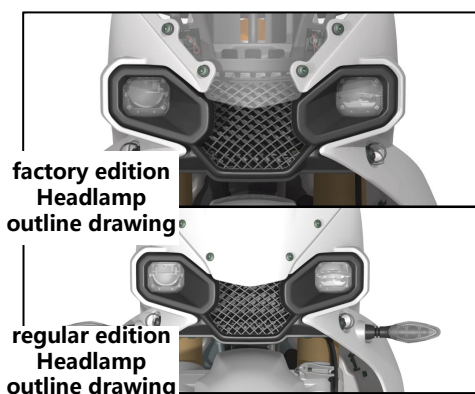
P1



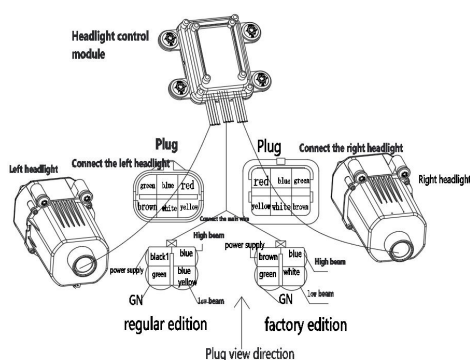
P1: Wiring diagram for factory edition vehicle fuse box.



P2: Wiring diagram for regular edition vehicle fuse box.



P1



3.Lights

※Headlight assembly and headlight control module

The headlights come on automatically after starting the vehicle and turn off automatically after the engine is turned off.

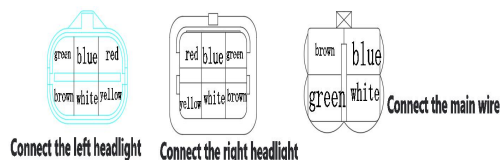
The headlights do not light up after starting the vehicle or the high and low beam cannot switch fault.

Check.

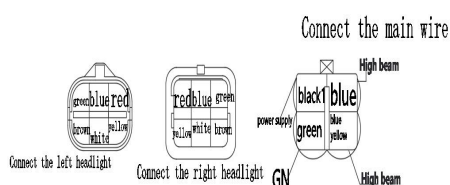
1. switch is damaged.
2. headlight relay damage.
3. plug-in connector abnormal, back pin, crooked pin, plug in place, etc.

P1: Headlight and headlight control module wiring diagram.

P2: Wiring diagram for regular edition headlight assembly



P3



color	function	color	function
red	Negative of High beam	green	Negative pole of position light
yellow	Negative of low beam	brown	Positives of position light
blue	positive of high beam	white	positive of low beam

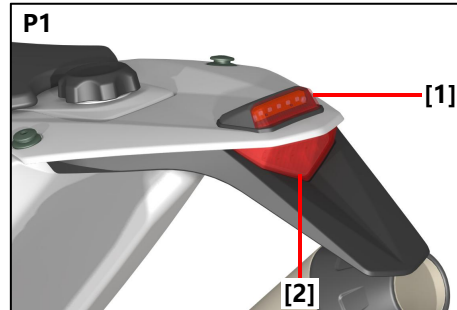
P3: Wiring diagram for factory edition headlight assembly

color	function	color	function
red	Negative of High beam	green	Negative pole of position light
yellow	Negative of low beam	brown	Positives of position light
blue	positive of high beam	white	positive of low beam

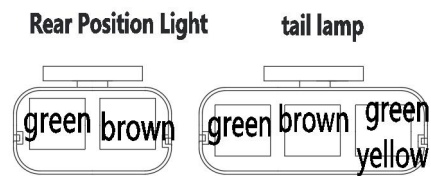
※Rear position light, tail light
(factory edition)

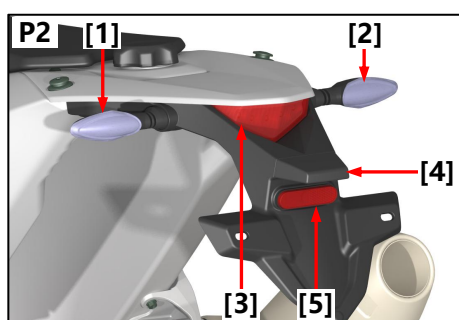
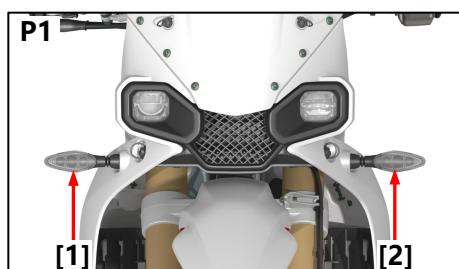
P1: The rear position light is at position [1] and the rear tail light is at [2].

When the vehicle is in starting state.
1: the rear position light comes on after the vehicle starts.
2: After the vehicle is turned off, the rear position light goes off.
3: Depress the rear brake pedal: the rear brake light comes on;
4: Release the rear brake pedal: the rear brake light goes off.



P2: rear position light, rear tail light wiring diagram (factory edition).





※Front and rear turn signals, rear taillights, license plate lights (regular edition)

Turn on the ignition switch.

1: Press the left and right turn signal buttons respectively, the lights come on.

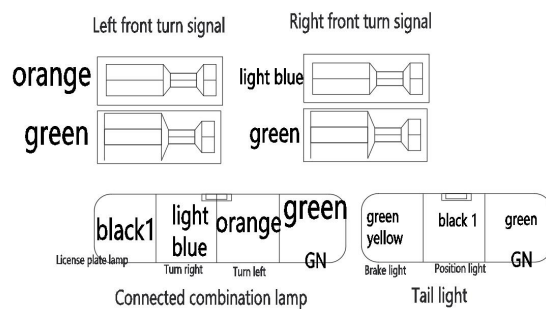
2: Press the turn signal centering button, the light goes out.

3: the license plate light comes on automatically.

P1: Position [1] is front turn signal right, [2] is front turn signal left.

P2: Position [1] for the left rear turn signal, [2] for the right rear turn signal, [3] for the rear taillight, [4] for the license plate light. [5] rear reflector .

P3: Wiring diagrams for front and rear turn signals, taillight plates, and lights

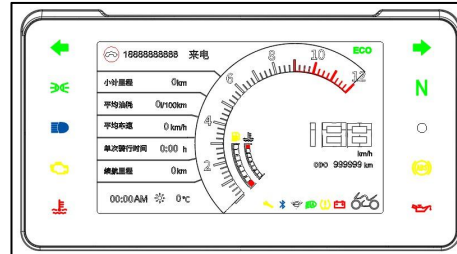


4.Others parts

※meter (regular edition)

Display check:

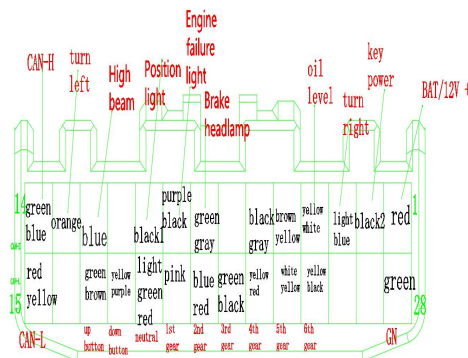
When the ignition lock switch is turned to "  " (on), the instrument is energized to play the power-on animation, followed by a self-test, and all function modules and symbols are displayed; if the display is missing during the self-test, please refer it to an Escalade locomotive special repair store for service.



Above is the outline of the instrument

P2

P2: Define for meter pin functions.



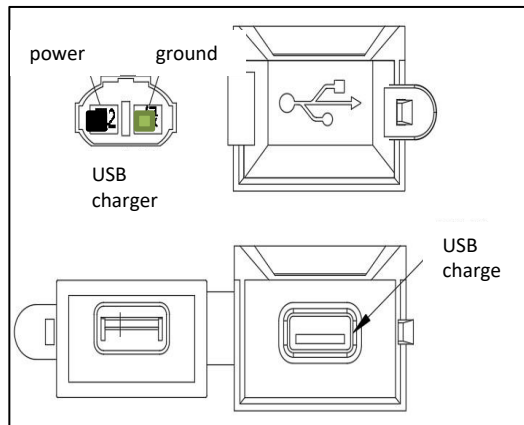
※USB charging socket (regular edition)

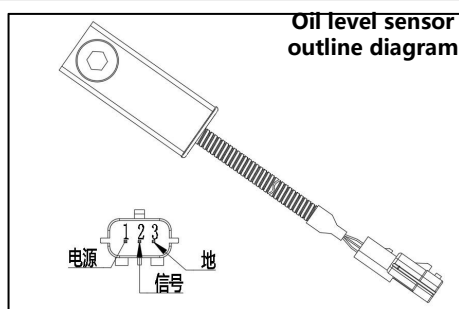
Fast charge protocol: QC2.0/QC3.0/PD3.0 fast charge protocol is supported. Support Huawei Fast charge protocol FCP/SCP; Support Samsung Fast Charge Agreement AFC; Apple 2.4A, etc.;

(2) Output 5V/3A when the fast charge protocol is not identified;

(3) Output voltage range: DC5V-12V (automatically adjusted according to the fast charge protocol);

(4) Maximum output power: 18W (5V/3A; 9V/2A; 12 v / 1.5 A)

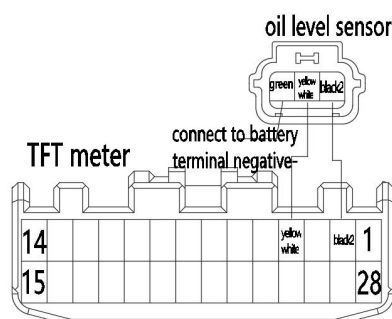




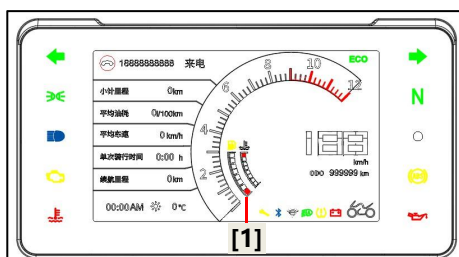
※Oil level sensor (regular edition)

Convert the fuel liquid height signal into a standard electrical signal and output it to the indicator light.

p2



P2: wiring diagram of oil level sensor and TFT meter.



As shown in the figure above, position [1] is 8 grids in the instrument oil quantity display area.

TFT meter oil level displays parameters

1	< 0.2V, > 5.5V, 8 bars flashing display
2	< 1.2V, > 0.2V, one 8 grid
3	< 1.48V, two grids
4	< 1.69V, three grids
5	< 1.97V, four grids
6	< 2.6V, five grids
7	< 3.18V, six grids
8	< 3.6V, seven grids
9	> 3.6V, < 5.5V, eight grids

Note: regular edition oil level sensor disassembly and installation is the same as factory edition

※Road book box, speedometer, and directionometer (factory edition)



Display check.

Long press the start button " " to the vehicle start state when the instrument is energized, if the instrument is not on, you can wake up the instrument by short press the instrument button.

Such as the left figure 1 position [1] for the speedometer, [2] for the heading gauge, the [3] the main body of the pull road book box.

-speedometer

1. Short press any button on the left side of the speedometer speedometer on. After power on when there is no button activity or wheel movement, the speedometer will go to sleep after 20 minutes. When the wheels are turning, the speedometer will wake up automatically.

2. Press and hold the up and down buttons on the left side of the speedometer at the same time to turn off the speedometer.

-Directionometer

1. Short press any button on the left side of the speedometer to turn on the speedometer. When there is no button activity or movement after power on, the speedometer will go to sleep after two hours. When the wheels turn, the speedometer will wake up automatically.

2. Press and hold the up and down buttons on the left side of the speedometer at the same time to turn off the speedometer.

•Wheel speed sensor

Position [1] in p2 on the left is the wheel speed sensor of the speedometer component.

•External GPS receiver

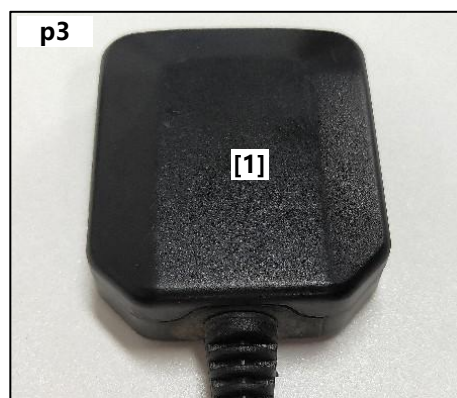
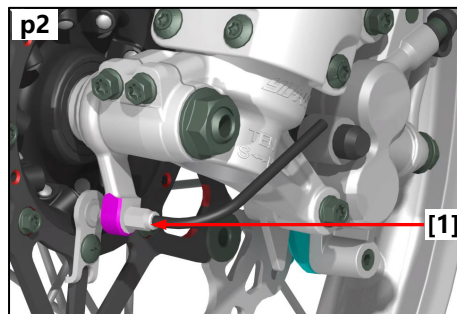
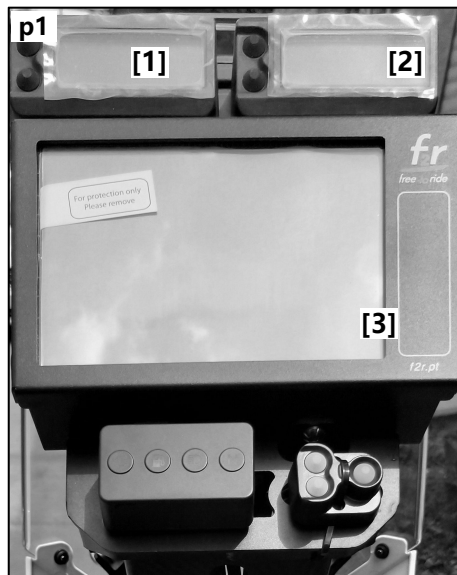
Such as the left figure 2 position [1] for external GPS receiver Installation.

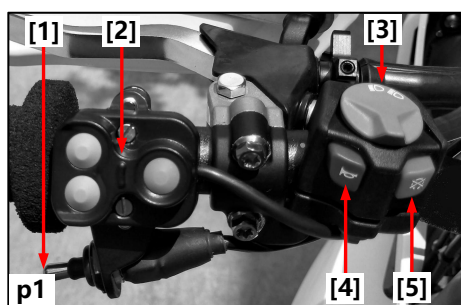
Use its own double-sided tape to external GPS stick in the empty space in the front of the rally car, the vehicle is placed in the open outdoor space to facilitate GPS receiving signals.

Attention.

-When the external GPS is powered on for the first time, or in a new location, it may take a few minutes to receive the signal, please be patient.

-During this time, a small LED inside the GPS receiver will remain on. Once a signal is obtained, the small LED inside the GPS receiver will start flashing.





※Left-handle switch (factory edition)

p1: Position [1] is the control button of the road book box,[2] is the combination button of the speedometer,[3] near and far light switch button,[4] horn button, and [5] flame out button.

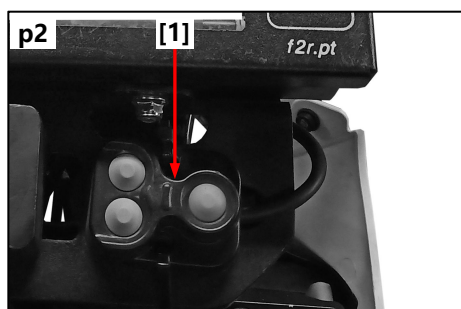
[1] : The thumb button is used to move forward and backward to control the rolling of paper books in the book box. After power failure, the manual mode can be switched to continue operating the book box;

[2] : The combination button of the speedometer is used to set and switch the function menu in the speedometer;

[3] : Near and far light switch button of headlamp after vehicle starting.

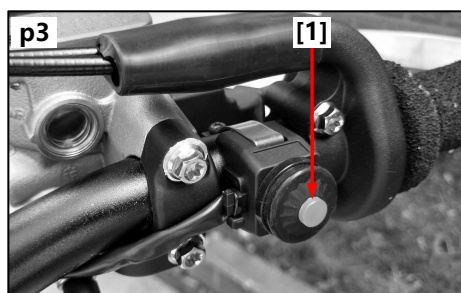
[4] : vehicle horn button;

[5] : vehicle ignition button.



※Combination button (factory edition)

p2: Position [1] is the combination button of the heading table, which is used to set and switch the function menu in the heading table.



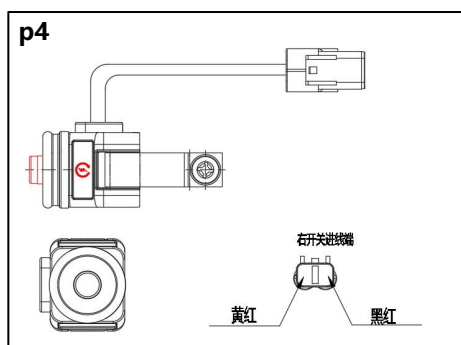
※Right handle switch (factory edition)

factory edition do not have ignition lock and key, press the vehicle start button to start the vehicle.

Start button:

p3: Button [1] (self-reset)

p4: start button outline and the wire harness outlet.



※meter light (factory edition)

P1:

[1] is the engine fault indicator light.
This light comes on when there is a fault in the EFI system (after the engine is powered on, this light is lit. After normal start, this fault light goes off as normal);

[2]. Fuel indicator.

Display the current fuel level: no light, indicating sufficient fuel level; green, indicating normal fuel level; orange, indicating low fuel level; red, indicating low fuel level;

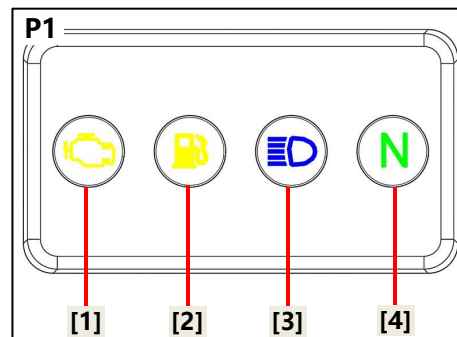
[3]. High beam indicator.

This light comes on when the high beam is turned on;

[4]. Neutral indicator.

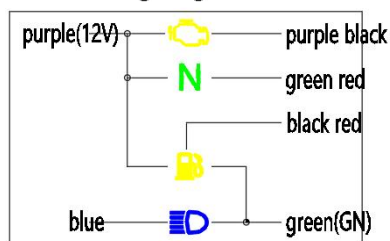
This light comes on when in neutral.

P2: wiring diagram of METER indicator light.



P2

Wiring diagram

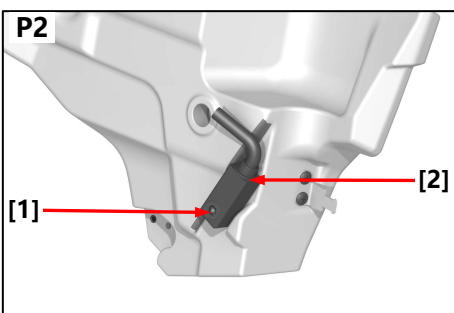
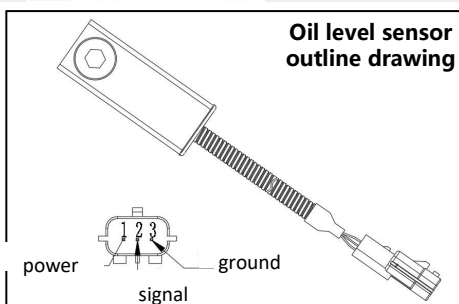


P3

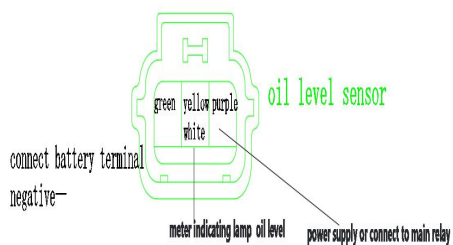
P3: the meter indicator function parameter.

Indicator light instruction

name	fault light	Oil level indicator	High beam	Neutral light
Icon				
color	orange	$0 \leq V_{in} < 1.2V$, Show red $1.2 \leq V_{in} < 1.69V$, Show orange $1.69 \leq V_{in} < 2.6V$, Show green	blue	green
signal	low	$2.6V \leq V_{in}$, No Show	high	low



P3



※Oil level sensor (factory edition)

Convert the fuel liquid height signal into a standard electrical signal and output it to the indicator light.

※Oil level sensor

Disassembly/Installation

Remove the following components.

- Disconnect the sensor plug.
- Remove 1 countersunk hexagonal head bolt at position [1] P2.
- Remove the oil level sensor at position [2] P2.

The installation order is the reverse of the removal order.

Torque.

Oil level sensor and left fuel tank mounting bolt:

M10x1.0x36

22 N.M (2.2kgf.ft;16bf.ft)

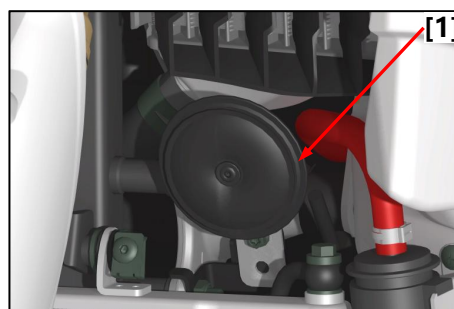
inspection

Check if the oil level sensor gasket is deformed, damaged or hardened. If so, please replace it in time.

P3: the wiring diagram of the oil level sensor and meter indicator light.

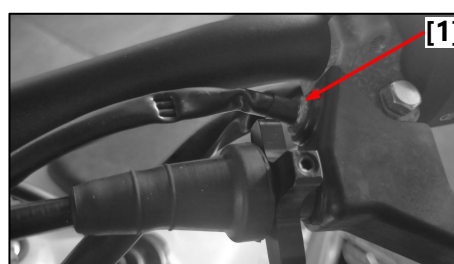
※Horn

Unplug the harness connector on the horn [1] and connect it to the 12V power supply, the normal sound of the horn means normal, otherwise, it needs to be replaced.



※Clutch switch (regular edition)

When in gear position, pinch the clutch handle, put away the side support, you can press the start button, realize the vehicle start.

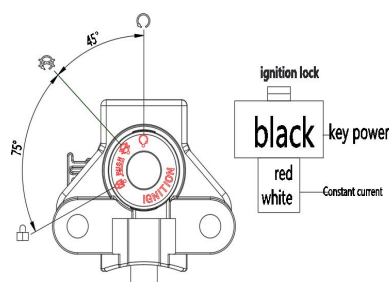


Note: The factory edition does not have a clutch switch.

※ignition lock

Remove the connector connecting the ignition lock to the main cable, and check the switch connection status of the ignition lock.

position	function
	Use in parking (power off)
	Use when starting or driving

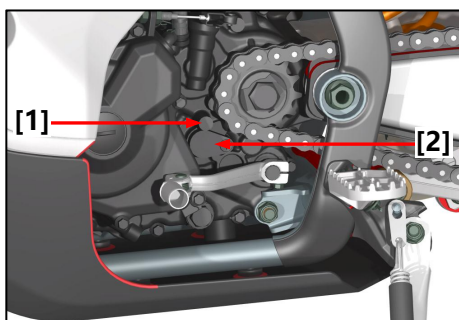


When stopping (including long stops), the ignition switch must be in the " " or "PUSH" position to ensure the safety of the vehicle and to prevent the battery from "losing power".

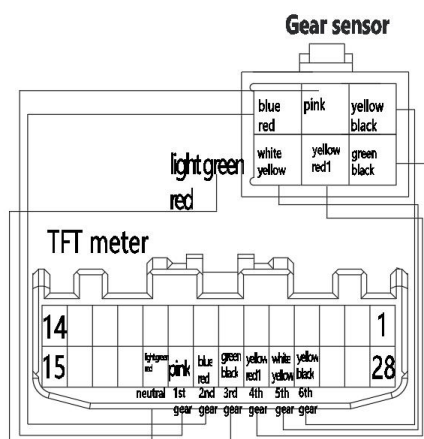
Do not push the motorcycle while the steering mechanism is locked, otherwise it will lose its balance.

Note.factory edition has no ignition lock.

Electrical logic table			
Gear	color		Key removal and insertion
	red	orange	
			NO
			YES
			YES



P1



※Gear sensor

Check:

Disconnect the plug that connects the gear sensor harness to the main cable, check the gear sensor harness connector, and check the sensor harness connection status.

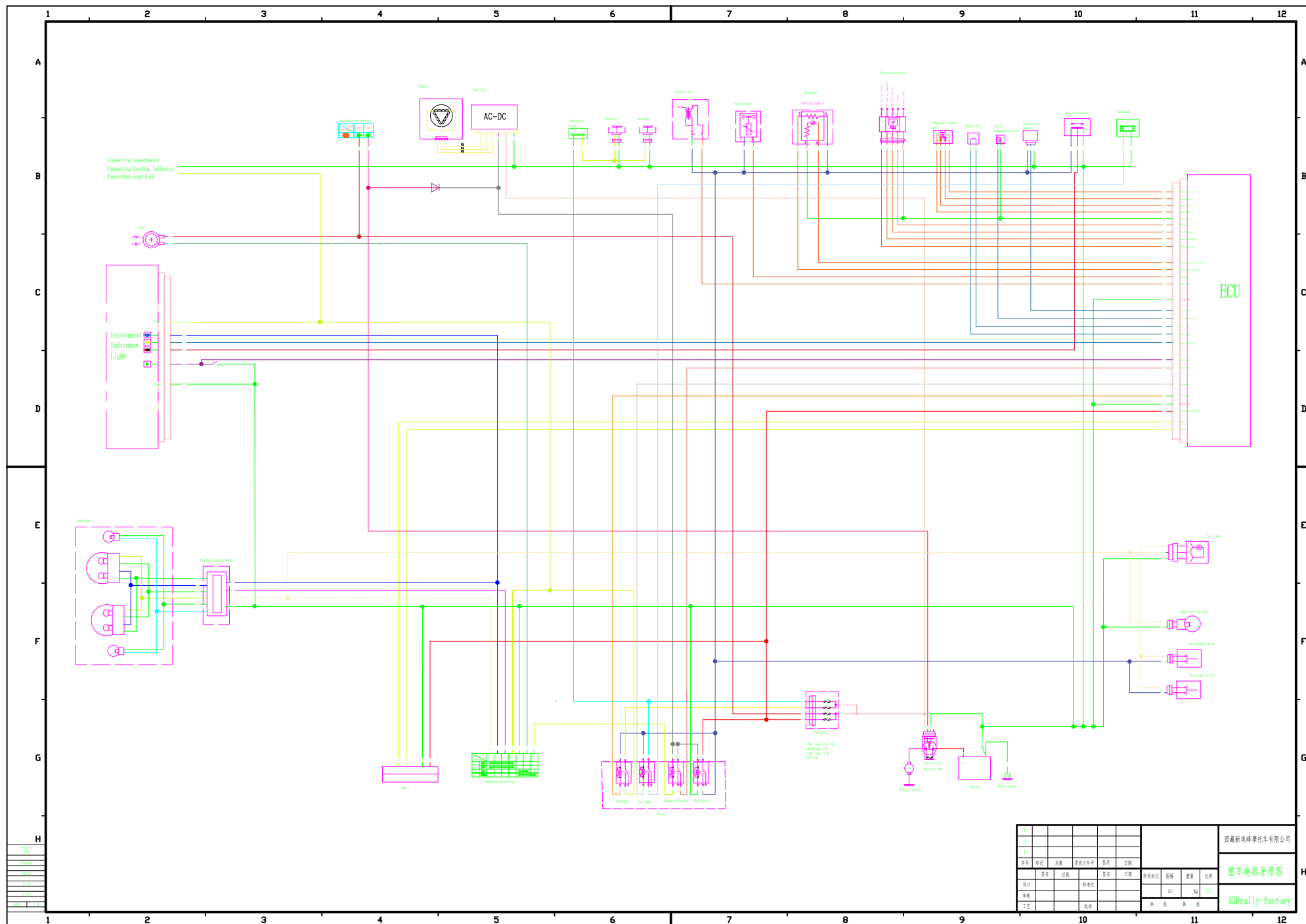
Removal/Installation

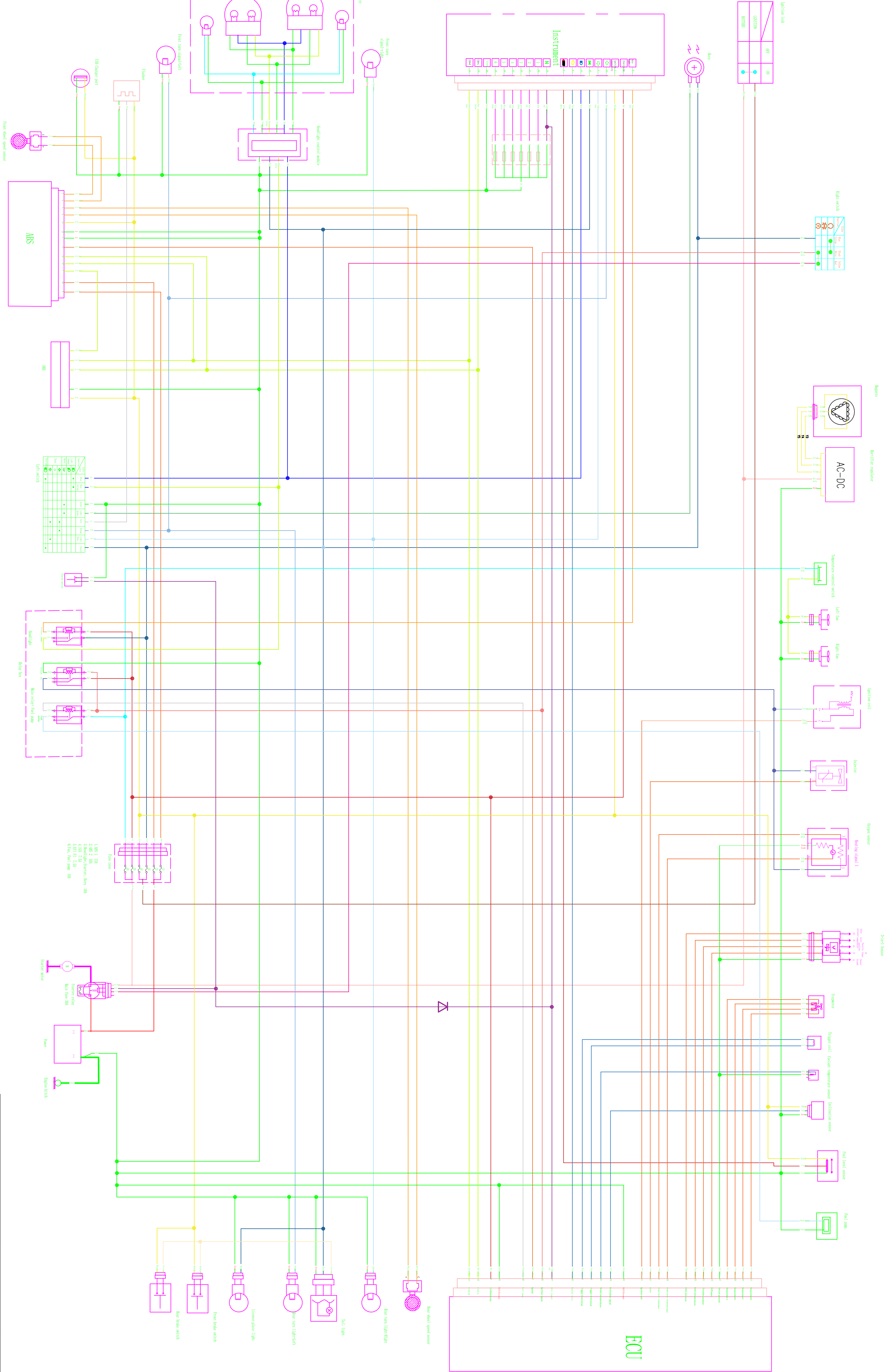
Remove the following components.

- Small sprocket trim cover.
- Removal of the screw at position [1].
- The gear sensor [2] can be removed.

P1: wiring diagram of the gear sensor and meter connection.

Gear display on/off relationship							
Gear display	0	1	2	3	4	5	6
resistance (Ω) (±2%)	0	2K	1K	20K	10K	5.1K	3.3K
NOTE:	Gear control module to meter, analog, resistance value						





西藏新永峰摩托车有限公司										Motorcycle Circuit		450Rally Regular	
3	2									比例		1:2	
1										图号		Kg	
序号	标记	日期	审核	设计	审核	日期	比例	图号		图号		图号	
共 1 张										第 1 张			