450 Rally Maintenance manuals
First Edition (February 2023)

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

English version

Contents

Chapter 1

How to use this manual

This manual describes the maintenance procedures for the 450 Rally.

Chapter 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. Chapter 3--Chapter 19 describe the motorcycle's components, grouped by location. If you are not familiar with this motorcycle, please read the technical characteristics in Chapter 2. Follow the recommendations of the maintenance schedule (Chapter 3) to ensure that the motorcycle is in optimum operating condition and that emission levels meet domestic environmental requirements, 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. Detailed procedures are given on the next few pages. Refer to each section for troubleshooting based on the fault 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. You will find important safety information in various forms, including.

*Safety labels

*Safety Message - Precede the safety warning symbol ⚠ with one of three signal words, i.e., DANGER, WARNING, or CAUTION. The meaning of these signal words is:

⚠危 险 If you do not follow the instructions, death or serious injury will result.

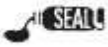
⚠警 告 Failure to follow instructions may result in death or serious injury.

⚠谨 慎 If you do not follow instructions, you may be injured.

Instructions - How to properly and safely service this vehicle

Symbol

The symbols used in this manual represent specific repair procedures. If additional information related to these symbols is required, it will be explained in detail in the text without using these symbols

	Replace parts with new parts before assembly
	Use recommended oils unless otherwise explanation
	Use molybdenum oil solution (oil and molybdenum grease mixed in a ratio of 1:1)
	Use multi-purpose high temperature extreme pressure compound lithium base grease (Youlicheng Grease SU-T330G/F or equivalent grease)
	Molybdenum disulfide grease
	Use molybdenum disulfide paste (40% or more molybdenum disulfide, NLGI #2 or equivalent). For example: G-n paste made by Dow Corning USA Honda Moly 60 (USA only). Rocol paste from Sumico Lubricants, Japan, manufactured by Rocol Ltd.
	Use of silicone grease
	Apply sealant. Use a medium strength sealant unless otherwise specified
	Application of sealants
	Use DOT4 brake fluid. Use recommended brake fluid unless otherwise stated
	Use shock absorbing fluid

Basic information

Maintenance rules

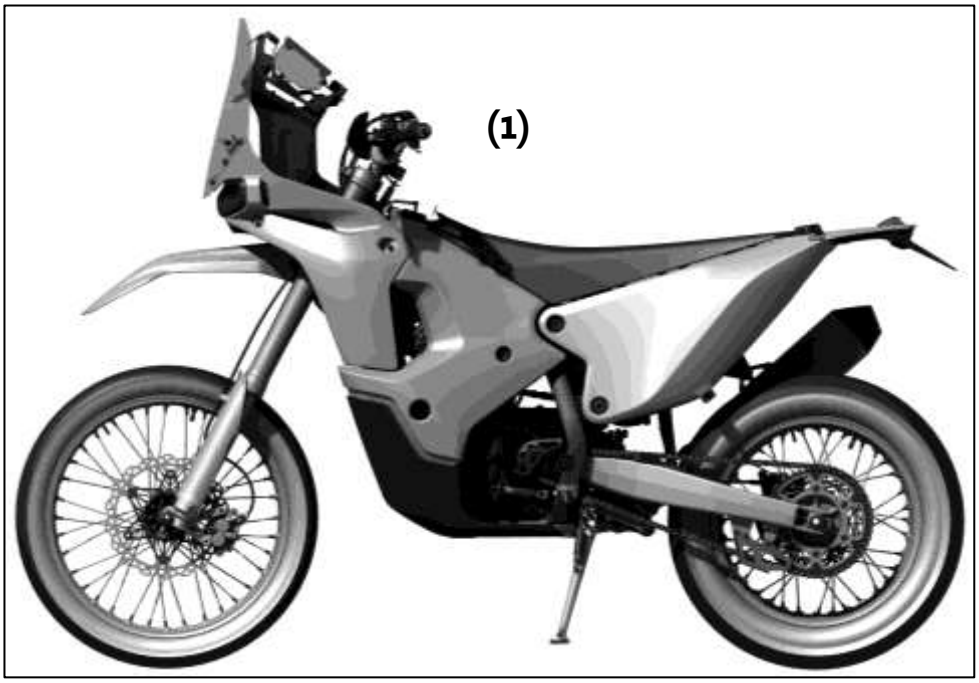
1. Please use genuine or KOVE recommended parts and lubricants or their equivalents for the KUVE. Parts that do not meet KOVE's design specifications may damage the motorcycle.
2. Use special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and bolts are not interchangeable with imperial fasteners.
4. Use new gaskets, O-rings, cotter pins and locking plates when reassembling.
5. When tightening bolts or nuts, start with large diameter or inner bolts. Then tighten in diagonal increments to the specified torque, unless a specific sequence is specified.
6. Clean parts with cleaner when disassembling. Lubricate all sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all wires as shown in the cable and cableway wiring.
9. Do not bend or twist control cables. Damaged control cables will not work properly and may become stuck or tangled.

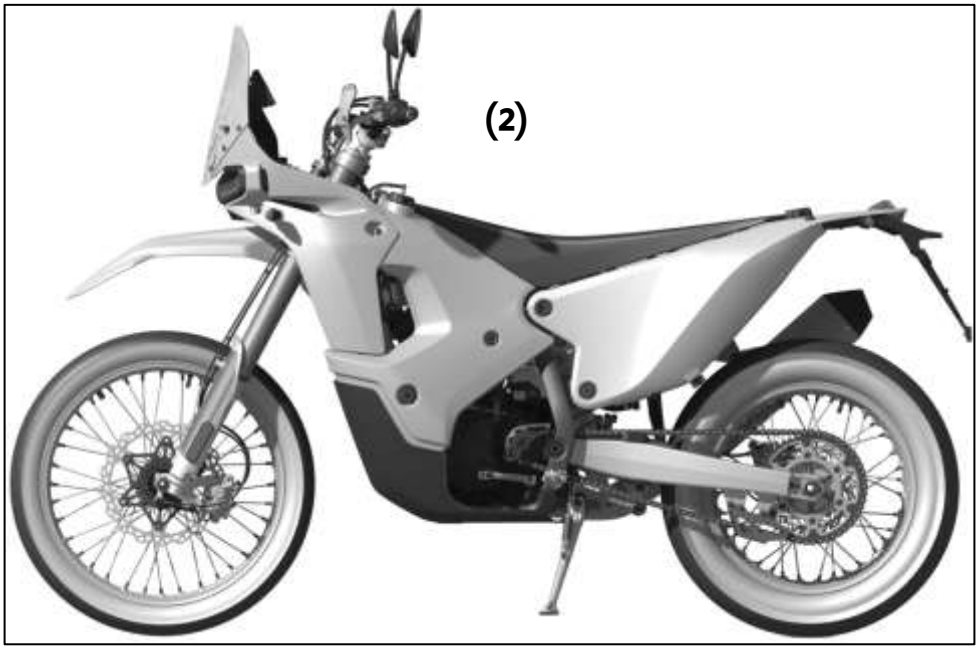
10.Abbreviations

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

Abbreviation	Full Name
ABS	Anti-lock braking system (450Rally factory version without ABS)
CKP sensor	crankshaft position sensor
DLC	Data link connector
DTC	Direct Torque Control
ECU	Engine 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	ManifoldAbsolutePressureSensor
MCS	Motorcycle communication system
MIL	Malfunction Indicator Lamp
O_2sensor	oxygen sensor
SCS Service connector	Service connector
TP sensor	throttle position sensor
VS sensor	vehicle speed sensor

Model identification
factory edition-(1) regular edition-(2)





Basic information

items			specification
Size	Total lenght		2190 mm
	Total Width		830 mm
	Total height		1487 mm
	Axle distance		1475 mm
	Load free seat height		960 mm
	No load pedal height		360 mm
	No load ground clearance		300 mm
	Dry weight		155 kg
	Permissible maximum front axle load		150 kg
	Permissible maximum load on rear axle		210 kg
	Permissible maximum weight		150 kg
Frame	Frame type		Cradle type frame
	Front Suspension		Inverted telescopic fork
	Front shock absorber stroke		305 mm
	Rear Suspension		External spring hydraulic
	Rear shock absorber stroke		117 mm
	Front tire size		90/90-21M/C
	Rear tyre size		140/80-18M/C
	Front tyre brand		Zhengxin
	Rear tyre brand		Zhengxin
	Front Brake		Hydraulic single disc 298mm
	Rear Brake		Hydraulic single disc 240mm
	Caster angle		28°
	Towing distance		122 mm
	Fuel tank capacity		31L
Engine	Cylinder alignment		1 cylinder inline, 18° vertical tilt
	Cylinder diameter and stroke		94.5x64mm
	Displacement		499cm³
	Compression ratio		12.5:1
	Air distribution system		Double overhead camshaft four-valve chain drive
	intake valve	-5°BTDC	-5°BTDC
		35°ABDC	35°ABDC
	exhaust valve	33°BBDC	33°BBDC
		-13°ATDC	-13°ATDC
	lubricating system		Forced pressure lubrication + splash lubrication
	Oil pump type		Oscillating type
	Cooling system		water cooling
	Air filltration		Paper cartridge，oil-based sponge
	Engine dry weight		37kg
	Ignition sequence		/
	Number of cylinder		single cylinder

items			specification
The Fuel Supply System	Type		Bosch EFI
	Throttle valve hole		46mm
Drive system	Clutch system		Wet multichip type
	Clutch operating system		Cable operation
	Gearbox		Normal mesh two-stage transmission, 6-speed
	Primary drive		2.286 (69/34)
	Final drive		3.769
	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)
	Gear Shift Mode		international 1-N-2-3-4-5-6
Electricity	Ignition system		electron ignition
	Starting system		electric starter
	Charging system		Three-phase output magnetic motor
	Regulator/rectifier		Three-phase full-wave rectification
	Lighting System		Battery

EFI specification Measurement units：mm

items	specification
Engine idle	1600±100rpm
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）	11-40Ω
Idle motor resistance（25°C/77°F）	110-150Ω

Ignition system specification Measurement units：mm

items	specification
Sparking plug	CR8E (NGK)
Spark Plug Clearance	0.80-0.90
Spark plug resistance	5-8 KΩ

Electric starter specifications Measurement units：mm

items	Standard value	limit value
Start motor brush length	12.0-13.0 (0.47-0.51)	6.5 (0.26)

Start motor brush length

items		specification
hrottle body identification number		450R
Fuel pressure at idle		380Kpa±10kpa
Fuel pump flow (12V, 380kpa)		≥30L/h
Fuel oil supply system	Type	Bosch EFI/
	Throttle valve hole	46mm

cooling system

items		specification
Cooling capacity	radiator tank	1.2 L
The radiator cap releases pressure		108-133 kPa
Thermostat	Start turning on the temperature	82±2℃
	Fully open temperature	92°C
	valve lift	Not less than 8 mm
Recommended Antifreeze		Alcohol-free silicate coolant (Dongfeng Castrol LEC-II-25))
Standard coolant concentration		1:1 mixture with distilled water

Lubrication system specification

items		Standard value	limit value
engine oil capacity	After oil change	1.4 L	-
	After changing the oil filter	1.6 L	-
	After removing the engine	1.8 L	
Recommended engine oil		Recommended SG10W-50API service classification:SG or higher (except for oils marked as energy efficient on the round API service label)JASO T903 standard:MA viscosity:SAE 10W-50	-

Engine cylinder head/valve specification Measurement units: mm

items			Standard value	limit value
valve	Outside diameter of valve stem	Intake	φ5.472-φ5.487	φ5.46
		Exhaust	φ5.46-φ5.475	φ5.44
	Valve tube diameter	Intake	φ5.505-φ5.515	φ5.535
		Exhaust	φ5.505-φ5.515	φ5.535
	Valve stem and tube clearance	Intake	0.018-0.043	0.07
		Exhaust	0.03-0.055	0.08
	Valve seal tape width		1.2	----
Cylinder Head	Planeness		0.05	0.06
	Width of valve seat working surface		0.8	----

items	Standard value	limit value
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 base circle run-out	0.02	0.04

Cylinder body and piston specifications Measurement units: mm

items			Standard value	limit value
cylinder	cylinder bore		φ94.5-φ94.52	φ94.528
	Out of roundness		0.05	0.01
	Flatness of cylinder surface		0.03	0.05
Piston Piston ring Piston pin	piston outside diameter		φ94.453-φ94.467	φ94.43
	Inner diameter of piston pin hole		φ20.004-φ20.01	φ20.015
	Piston pin and piston pin bore clearance		0.004-0 .018	0.025
	Piston ring closing clearance	top ring/second ring	0.2-0.35	0.5
		oilring	0.2-0.7	1.4
	Piston ring and piston ring groove clearance	top ring	0.03-0.07	0.08
		second ring	0.02-0.06	0.08
	Clearance between cylinder and piston		0.033-0.067	0.07
	Outside diameter of piston pin		φ19.992-φ20	φ19.99
Small end of connecting rod	inner diameter		φ20.015-φ20.025	φ20.04
	Clearance between small end of connecting rod and piston pin		0.015-0.033	0.05

Shift fork/shift fork shaft/crankshaft/balance shaft specifications

Measurement units: mm

items			Standard value	limit value
Shift fork	Internal diameter of the right fork of the secondary shaft / Internal diameter of the left fork of the secondary shaft		φ12.016-φ12.043	φ12.045
	Spindle fork inner diameter		φ12.016-φ12.043	φ12.045
	Jaw thickness		4.8-4.9	4.8
shift fork shaft	Spindle fork shaft outer diameter		φ11.973-φ12	φ11.95
	Outside diameter of countershaft fork shaft		φ11.973-φ12	φ11.95
	cylindricity		0.006	----
crankshaft	Connecting rod small end inner diameter		φ20.015-φ20.025	φ20.04
	Big end clearance of connecting rod	axial direction	0.15-0.4	0.7
		radial direction	0.008-0.016	0.02
balance shaft	Shaft diameter		φ19.98-φ19.993	φ19.96

Clutch/oil pump specifications

Measurement units: mm

items		Standard value	limit value
Clutch handle free clearance		10-20 (0.4-0.8)	-
Clutch	Free spring length	25	25
	Friction plate free thickness	2.95 - 3.05	2.85
	Clutch driven plate flatness	0.1	0.14
	Clutch cover and friction plate clearance	0.1 - 0.3	0.6
oil pump	Radial clearance between outer and inner rotors	0.06 - 0.15	
	End clearance between rotor assembly and cover plate	0.04 - 0.1	

Front wheel/suspension/steering specifications

items		Standard value	limit value
Tire Pressure	Vacuum tire（regular edition)	200kPa(2.0kgf/cm³，29 psi)	-
	Inner Tire（regular edition)	100kPa(1.0kgf/cm³，15 psi)	-
Shaft Runout		≤ 0.8	1.0
Rim Runout	radial direction	≤ 0.8	1.0
	end face	≤ 0.8	1.0
Wheel dynamic balance		-	Max 60g
Front shock absorber	Free spring length/regular edition/factory edition	475 mm	-
	Recommended shock absorber oil	Special shock absorbing oil KHL 5W	-
	shock absorberoil refill amount	260ml in the damper, 300ml in the damping cylinder, total 560ml	-

Rear wheel/suspension specifications

items		Standard value	limit value
Tire Pressure	Vacuum tire（regular edition)	200kPa(2.0kgf/cm³，29 psi)	-
	Inner Tire（regular edition)	100kPa(1.0kgf/cm³，15 psi)	-
Shaft Runout		≤ 0.8	1.0
Rim Runout	radial direction	≤ 0.8	1.0
	axial direction	≤ 0.8	1.0
Wheel dynamic balance		-	Max 60g
Rear shock absorber	Free spring length/regular edition/factory edition	215mm/225mm	
	Recommended shock absorber oil	Special shock absorbing oil KHL 5W	
	shock absorberoil refill amount	380ml	
	Cylinder nitrogen volume	1.2mpa	
driving chain	Size/link	AFAM520C2/114	
	Looseness	30-55 mm	

Battery/charging system specifications

items			specification
Battery	type		MTX4L-FPP
	capacity		12V/4AH
	Electrical leakage value		It can be stored at 25℃ for more than 1 year
	voltage（28℃、68℉)	fully charged	>13.2V
		need to be charged	<12.8V
	Charge Current	normal	2A
		quick	10A
Magnetor	charging capability		280 W/9,000 rpm
	Charging coil resistance（20°C/68°F)		0.1-1.0Ω

Hydraulic brake specification

Measurement units: mm

items		Standard value	limit value
Front Brakes	Specify brake fluid	DOT 4	-
	Brake disc wear indicator	-	To groove
	Brake disc thickness	4.0-4.01	3.5
	Brake disc warped	-	0.15
	Main piston outer diameter	11.000-11.050	11.060
	Caliper piston cylinder outside diameter	27.000-27.050	27.06
	Caliper piston cylinder outside diameter	30.200-30.250	30.260
Rear Brakes	Specified brake fluid	DOT 4	-
	Brake disc wear indicator	-	To groove
	Brake disc thickness	4.0-4.01	-3.5
	Brake disc warped	-	0.15
	Main piston outer diameter	9.000-9.050	9.060
	Caliper piston outside diameter	22.620-22.670	22.680

Light/meter/switch specification

items		specification
Light	Automatic headlight (high/low light)	LED
	Front turn signal/position light	LED
	Rear turn signal light	LED
	Brake/taillight	LED
	License plate lamp	LED
	Meter Light	LCD
	Turn Signal Light	LED
	Neutral indicator light	LCD
	Engine oil pressure indicator	LCD
	Coolant temperature high indicator	LCD
	Malfunction Indicator Lamp（MIL)	LCD
	ABS indicator	LCD
Fuse	Spare fuse	15A,10A
	Oil pump fan	15A
	FI	10A
	IGN fuse	15A
	Headlights start fuse	15A
	ABS2 fuse	10A
	ABS1 fuse	15A
	The above are regular edition fuse specifications, the following are factory edition fuse specifications	
	Spare fuse	10A，10A
	FI	10A
	Starting 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 value - engine part

- Listed below are the specifications apply to the specified torque fasteners. Other should tighten to the above standard torque values.
- The standard torque value

Type of fastener	Torque N.m	Type of fastener	Torque N.m
5mm screw bolt and nut	6	5mm bolt	5
6mm screw bolt and nut	12	6mm bolt	8
8mm screw bolt and nut	22	6mm flange bolt(8mm head，Small flange)	10
10mm screw bolt and nut	60	6mm flange bolt（8mm head，big flange)	12
12mm screw bolt and nut	80	6mm flange bolt（10mm头）and nut	12
		8mm flange screw bolt and nut	22
		10mm flange screw bolt and nut	60

Engine torque value

items	QTY	diameter of screw mm	Torque N.m	Note
spark plug	1	10	14	
Large visual hole cover	1	30	5	
Small visual hole cover	1	14	10	
Engine oil bolt	1	16	24	aluminium backing
Oil filter cover bolt	2	6	7-19	Apply proper amount of oil to the sealing ring
Oil strainer assembly bolt	2	20	11-13	Apply proper amount of oil to the sealing ring

Cooling system torque value

items	QTY	Diameter of screw mm	Torque N.m	Note
Drain bolt	1	6	10	Copper Gasket
Thermostat cover bolt	2	6	10	
Pump chamber bolt	3	6	10	
water temperature sensor	1	7	5-8	

Cylinder head and valve torque

items	QTY	Diameter of screw mm	Torque N.m	Note
cylinder head stud	4	10	55-60	Oil on thread and end face
cylinder head stud	4	6	11-13	
Camshaft support bolt	8	6	11-13	
Cylinder head bolt	6	6	10-12	
Tensioner bolt	2	6	11-13	
Tensioner bolt plug	1	8	7-9	
Exhaust camshaft pressure reducing valve bolt	1	6	10	

Clutch and shift mechanism torque

items	QTY	Diameter of screw mm	Torque N.m	Note
Clutch fastening nut	1	18	80-90	Thread fastening glue
Clutch spring bolt	4	6	8-10	
Drive gear fastening nut	1	10	115-125	Thread fastening glue
Shift mechanism positioning plate assembly	1	6	11-13	
Right crankcase cover bolt	11	6	11-13	
Five star plate bolt	1	6	11-13	

Magneto and starting clutch torque

items	QTY	Diameter of screw mm	Torque N.m	Note
Magneto rotor fastening nut	1	10	80-90	
Magneto stator bolts	2	5	7-9	
Trigger bolt	2	5	7-9	
Left crankcase cover bolt	8	6	11-13	

Box and driveline torque

items	QTY	Diameter of screw mm	Torque N.m	Note
Chain plate	2	6	11-13	
Tensioning plate bolt	1	6	10	
Crankshaft bolts on both sides of closing case	12	6	11-13	Oil, replace the new bolt, fastening method see the following text
Fastening bolt for cover plate of left oil pump	3	5	7-9	

Torque value of crankshaft, piston, cylinder block and

items	QTY	Diameter of screw mm	Torque N.m	Note
Balancing shaft driven tooth fastening nut	1		80-90	
Balancing shaft drive tooth fastening nut	1		115-125	

Torque value - body part

Note: The following standard parts are for regular edition models only

Installation area	Specification	Torsion N.m	Note
Self-tapping nails for the connection of the front brake fluid pipe pressure plate and the front shock absorbing trim	ST4.8	1	
Self-tapping nails for connecting rear fender liner and rear fender rear section	ST4.8	1	
Self-tapping nails for the connection between OBD and electrical bracket	M4.2	1	
Screws for connecting the lower cover plate of the rear mudguard rear section to the tail trim	M5	3	
Screws connecting the rear mudguard lower cover to the rear section of the rear fender	M5	3	
Internal six-flower countersunk head screws for connecting the fuel tank connector mounting plate to the left and right rear fuel tank	M5	5	
Oil level sensor mounting plate and the left fuel tank connected to the internal six flower countersunk head screws	M5	5	
Phillips pan head screw connecting oil pump to fuel tank	M5	5	
Phillips pan head screws for instrument and cowl bracket connection	M5	4	
Phillips pan head screw connecting the position light to the rear trim	M5	4	
Phillips pan head screw for connecting tail light to rear fender rear section	M5	4	
Inner six-flower step screw connecting rear tailcap to rear fuel tank	M5	4	
Inner six-flower step screw connecting the front fender to the front trim of the fuel tank	M5	4	
Internal six-flower countersunk head screw connecting the front gear ring to the front wheel drum	M5	5	Threading glue
Crossed pan head screws for the rear brake pipe clamp to the flat fork	M5	5	
Inner six hexagonal flange face bolts connecting the rear harness clamps to the rear fuel tank	M5	4	
Inner six flower countersunk head screws for rear gear ring to rear drum connection	M5	5	Threading glue
Crossed large pan head screws for the fuel filter mounting bracket to the fuel tank	M5	4	
Hexagon socket head cap screws for connecting headlight bracket pressure plate to headlight bracket	M5	4	
Phillips pan head screw for connecting the roll sensor to the electrical mounting bracket	M5	5	
Crossed large pan head screws connecting ECU to rear fuel tank	M5	4	
Internal hexagonal countersunk head screw connecting the seat cushion locking seat to the rear fuel tank	M6	8	
Hexagonal pan head step screw for front shock trim to front shock absorber	M6	5	
Crossed half-round head screws for the chain guard and flat fork connection	M6	8	
Hexagon socket flower pan head screws for connecting rear brake master cylinder to frame	M6	8	
Inner hexagonal countersunk head screws for connecting the rear fuel tank protection plate to the rear fuel tank	M6	8	
Inner six hexagonal flange face bolts for connecting electrical bracket to fuel tank reinforcement bracket	M6	12	
Inner six flower hexagonal flange face bolts connecting the electrical bracket to the rear fuel tank	M6	8	
Inner hexagonal flower pan head step screws for connecting headlight trim parts to headlight mounting brackets	M6	8	
Hexagon socket pan head step screws for connecting the water reservoir to the frame	M6	8	

Installation area	Specification	Torsion N.m	Note
Hexagon socket flower-shaped pan head screws for connecting side bracket flameout switch to side bracket	M6	8	
Hexagon socket head screws for connecting the left and right front fuel tanks to the tank mounting bracket	M8	22	
Hexagon socket head screws in front of the left and right front fuel tanks connected to the frame	M8	22	
Hexagon socket head bolts connecting ignition lock to upper coupling plate	M8	22	
Inner hexagonal flange bolts connecting the left and right cowl brackets	M5	5	
Inner hexagonal flange bolts connecting the oil cooler grille to the lower shield	M5	5	
Inner hexagonal flange bolts connecting radiator grill to radiator	M5	5	
Inner hexagonal flange bolts connecting the shield mounting bracket to the left and right front fuel tanks	M5	5	
Inner hexagonal flange face bolts of the rear brake pedal connected to the rear brake rocker arm	M5	3	Threading glue
Inner hexagonal flange bolts of headlight and headlight mounting bracket	M5	5	
Inner six hexagonal flange face bolts connecting the side bracket hook bracket to the rear fuel tank	M5	5	
Inner hexagonal flange bolts of the front brake main pump connected to the steering handle	M6	10	
Inner hexagonal flange bolts of the oil cooler connected to the frame	M6	12	
Hexagonal flange face bolts connecting the small sprocket cover to the engine	M6	8	
Inner hexagonal flange face bolts of muffler mounting bracket connected to rear fuel tank	M6	10	
Hexagonal flange face bolts with inner six flowers for connecting the lower shield to the frame	M6	12	
Hexagonal flange face bolts with inner six flowers connecting the hood bracket to the headlight bracket	M6	12	
Inner six hexagonal flange face bolts connecting the regulator to the electrical bracket	M6	10	
Inner hexagonal flange bolts of the radiator connected to the frame	M6	12	
Inner six hexagonal flange face bolts connecting the front brake fluid pipe clamp to the lower coupling plate	M6	10	
Inner six hexagonal flange face bolts connecting the front disc to the front wheel hub	M6	12	Threading glue
Inner hexagonal flange face bolts of front fender to lower coupling plate	M6	8	
Inner hexagonal flange bolt for front ABS sensor mounting	M6	10	
Inner hexagonal flange bolt for connecting injector cap to throttle	M6	8	
Inner hexagonal flange bolt for clutch handle mounting and connection	M6	10	
Inner hexagonal flange bolt for connecting horn to frame	M6	12	
Inner six hexagonal flange face bolts connecting the air filter to the frame	M6	12	
Inner six hexagonal flange face bolts connecting the lower rear fuel tank mounting bracket to the rear fuel tank	M6	10	
Inner six hexagonal flange face bolts connecting the rear fuel tank reinforcement bracket to the rear fuel tank	M6	10	
Inner hexagonal flange bolts connecting the rear brake caliper trim to the rear brake caliper	M6	10	

Installation area	Specification	Torsion N.m	Note
Inner six flower hexagonal flange face bolts for the connection of the rear disc brake disc to the wheel drum	M6	12	Threading glue
Inner hexagonal flower pan head step bolts for the connection of the rear water skin to the rear fuel tank	M6	10	
Hexagonal flange face bolts for rear ABS sensor bracket to rear caliper bracket connection	M6	12	
Inner six flower hexagonal flange face bolts for the rear ABS sensor connected to the bracket	M6	8	
Inner six flower hexagonal flange face bolts for chain guide connection to flat fork	M6	10	
Inner hexagonal flange face bolt of headlight bracket connected to headlight module	M6	12	
Inner six hexagonal flange face bolts connecting the shift lever to the engine	M6	12	
Inner hexagonal flange surface bolts of ABS and ABS bracket	M6	12	
Inner hexagonal flange bolts of the left and right hood brackets connected to the frame	M8	22	Threading glue
Hexagonal bolts connecting left and right chain adjustment	M8	10	
Hexagonal bolts with inner hexagonal flange for connecting the middle part of the muffler to the frame	M8	22	
Hexagonal bolts with inner hexagonal flange for connecting the rear part of muffler to the frame	M8	22	
Hexagonal bolts with inner hexagonal flange for connecting the lower coupling plate to the shock absorber	M8	22	
Rear bag mounting bolts connecting rear end cover and rear fender to rear fuel tank	M8	22	
Inner hexagonal flange bolts connecting the upper suspension plate to the frame	M8	35	
Inner hexagonal flange bolts of the upper coupling plate to the shock absorber	M8	22	
Inner six hexagonal flange face bolts connecting the upper mount to the lower mount	M8	22	
Inner hexagonal flange face bolts of the front brake caliper connected to the front shock absorber	M8	32	Threading glue
Inner hexagonal flange face bolts of the front shock absorber connected to the front axle	M8	22	
Brake arm bolts for the rear brake arm connected to the frame	M8	22	Threading glue
Rear fuel tank mounting bolts connecting the rear fuel tank to the frame	M8	22	Threading glue
Hexagonal flange face bolts connecting the rear section of the rear fender to the rear fuel tank	M8	22	
Inner hexagonal flange face bolts of the front engine suspension plate connected to the fuel tank mounting bracket	M8	15	
Hexagonal flange face bolts of the front engine suspension plate connected to the frame	M8	22	
Sprocket bolt connecting sprocket to U-shaped rocker	M8	22	
Hexagonal bolt connecting oil level sensor to mounting plate	M10	22	
Hexagonal bolts with inner hexagonal flanges connecting the lower mount to the upper coupling plate	M10	35	Threading glue
Flat head bolts connecting the rear shock to the triangular rocker	M10	44	
Hexagonal bolts with inner hexagonal flange for connecting the rear shock absorber to the frame	M10	44	
Hexagonal flange face bolts connecting the lower engine suspension to the engine	M10	54	

Installation area	Specification	Torsion N.m	Note
Hexagonal flange face bolts of the engine upper suspension connected to the bracket	M10	60	
Hexagonal flange face bolts connecting the front engine suspension to the engine	M10	54	
Special bolts for side brackets connected to the frame	M10	2	
Hexagonal flange face bolts for connecting the U-shaped rocker to the frame	M10	60	
Flat head bolts for connecting triangle rocker to flat fork	M12	60	
Flat head bolts for connecting the U-shaped rocker to the triangular rocker	M12	60	
Hexagonal flange surface bolts connecting upper coupling plate to steering column	M14	80	Lubricate with grease
Hexagonal flange face nut connecting the rear license plate light to the rear part of the rear fender	M5	5	
Hexagonal flange face self-locking nut for connecting the rear section of muffler to the bracket	M8	22	
Hexagonal flange face self-locking nut connecting the front engine suspension plate to the frame	M8	26	
Hexagonal flange face self-locking nut of the chain guide wheel and chain guide wheel bolt connection	M8	22	
Hexagonal flange face self-locking nut of the rear shock absorber connected to the triangle rocker	M10	60	
Hexagonal flange face self-locking nut of the lower engine suspension connected to the engine	M10	54	
Hexagonal flange face self-locking nut of the front engine suspension connected to the engine	M10	54	
Front wheel axle nut	M16	88	
Flat fork axle nut	M16	88	
Rear axle nut	M22	128	
4-slot adjusting nut for steering column locking connection	M25	40N-m, loose again 10N-m back 1/4 turn	

Note: The following standard parts are for factory edition models only

Installation area	Specification	Torsion N.m	Note
Front brake oil pipe pressure plate and front shock trim attachment screw	ST4.8X12	3N·m	
Rear mudguard lower cover and tail trim attachment screw	ST4.8X15/16	2N·m	
Front and rear oil cup filler cap fastening screws	M4	3N·m	
OBD and electrical bracket connecting bolts	M4.2X13	1N·m	
Front brake upper pump oil cup cover fastening screw	M4x12	3N·m	
Small instrument and road book bracket connection nut	M5X0.8X5*8	4N·m	
Instrument indicator and road book bracket attachment nut	M5X0.8X5*8	4N·m	
Rear position light/tail light mounting screw	Crossed pan head screws M5X12	6N·m	
Oil pump and fuel tank connecting bolt	M5X20	6N·m	
Headlight adjustment controller and handlebar connection bolt	M5x10	10N·m	
Battery positive and negative cable bolts	M5X10	4N·m	
Oil pipe fitting mounting plate and left and right rear fuel tank connecting bolts	M5X10	6N·m	TC4 titanium alloy
Oil level sensor mounting plate and left fuel tank connection screw	M5X10	2N·m	TC4 titanium alloy
Hand windshield and hand windshield bracket	M5X10(Step diameter 8X height 3.5)	5N·m	
Brake pedal and brake arm connecting bolt	M5x12	5N·m	(Threading glue)TC4 titanium alloy
Oil-cooling grille and lower shield connecting bolt	M5x12	5N·m	TC4 titanium alloy
Rear brake card oil pipe clamping screw	M5X12	5N·m	TC4 titanium alloy
Fuel filter bracket and left fuel tank attachment screw	M5X12	4N·m	TC4 titanium alloy
Side bracket hook bracket and fuel tank mounting bolts	M5X12	5N·m	TC4 titanium alloy
Front fuel tank guard trim bracket left and right and fuel tank connecting bolts	M5X12	6N·m	TC4 titanium alloy
Road book and road book bracket connecting bolts	M5X16/25	4N·m	TC4 titanium alloy

Installation area	Specification	Torsion N.m	Note
Air filter cotton and air filter housing fastening bolts	M5X78	4N·m	
Throttle cable adjusting nut	M6	5N·m	
Clutch handle adjusting nut	M6	2N·m	
Starter relay nut and main line connecting bolt	M6	5N·m	
Main wire tower wire and engine connection bolt	M6	10N·m	
Chain retainer and flat fork attachment screw	M6*12，Head diameter10.5	8N·m	TC4 titanium alloy
Front windshield and windshield mounting bolts	M6,self-locking nut	12N·m	
Front reduction trim cover and front reduction attachment screw	M6X10,stepping 8.5X3.5	8N·m	TC4 titanium alloy
Front brake disc and wheel hub attachment bolt	M6x12	12N·m	Threading glueTC4 titanium alloy
Headlight module and cowl bracket attachment bolts	M6x12	12N·m	TC4 titanium alloy
Air filter and frame attachment bolts	M6X12	10N·m	TC4 titanium alloy
Horn and frame attachment bolts	M6X12	12N·m	TC4 titanium alloy
Lower guard and emergency water bottle connecting bolt	M6x12	12N·m	TC4 titanium alloy
Bolts connecting the front brake oil pipe clamp to the upper and lower coupling plate	M6X12	10N·m	TC4 titanium alloy
Rear fuel tank protective cover with rear fuel tank mounting screws	M6X12	6N·m	TC4 titanium alloy
Rear ABS sensor and bracket mounting screw Head cover bracket and road book bracket attachment bolt	M6X12	8N·m	TC4 titanium alloy
Head cover bracket and road book bracket attachment bolt	M6X12 nut M6X10.4	8N·m	
Chain guide rear bolt and flat fork connecting bolt	M6X12，pan 11	10N·m	TC4 titanium alloy
Rear water barrier rubber with rear fuel tank connecting bolt	M6X12,stepping8.5X3.5	8N·m	TC4 titanium alloy
Headlight cover trim with headlight mounting bracket attachment bolt	M6X12,stepping8.5X3.5	8N·m	TC4 titanium alloy
Bolts connecting the secondary water bottle to the frame	M6X12,stepping8.5X3.5	8N·m	TC4 titanium alloy
Head cover bracket and road book bracket 1 connecting bolt	M6x13	10N·m	TC4 titanium alloy
Muffler mounting bracket and rear fuel tank connecting bolt	M6X13	10N·m	TC4 titanium alloy
Bolts connecting the lower shield to the frame	M6x13	12N·m	TC4 titanium alloy

Installation area	Specification	Torsion N.m	Note
Headlight mounting bracket and cowl bracket attachment bolt	M6X13	10N·m	TC4 titanium alloy
Rear brake disc trim and flat fork attachment bolts	M6X13	10N·m	TC4 titanium alloy
Rear brake caliper trim and rear caliper attachment bolt	M6X13,	10N·m	TC4 titanium alloy
Rear fuel tank mounting bracket and rear fuel tank attachment bolt	M6X13，pam14	10N·m	TC4 titanium alloy
Rear fuel tank lower mounting bracket and rear fuel tank attachment bolt	M6X13，pan14	10N·m	TC4 titanium alloy
Steering damper bracket and frame attachment bolt	M6x16	12N·m	TC4 titanium alloy
Rear brake master cylinder to frame attachment bolt	M6x16	12N·m	TC4 titanium alloy
Rear brake disc and rear wheel hub attachment bolts	M6X16	12N·m	TC4 titanium alloy
Hand windshield bracket and clutch handle bracket/brake handle bracket attachment bolts	M6X20	8N·m	
Bolts connecting steering damper to upper connecting plate	M6x20	10N·m	TC4 titanium alloy
Front brake pump and brake handle mount attachment bolt	M6x20	10N·m	TC4 titanium alloy
Fuel filler and handle bolts	M6x20	10N·m	TC4 titanium alloy
Clutch handle mount bolt with handlebar	M6x20	10N·m	TC4 titanium alloy
Instrument operation switch and handgrip connecting bolt	M6x20	10N·m	TC4 titanium alloy
Shifter and engine connecting bolt	M6X20	12N·m	TC4 titanium alloy
Front mudguard and lower connecting plate connecting bolt	M6X20	10N·m	TC4 titanium alloy
Injector cap and throttle fastening bolt	M6X20	8N·m	TC4 titanium alloy
Seat cushion lock and rear fuel tank mounting bolts	M6X20	8N·m	TC4 titanium alloy
Electrical mounting bracket and frame attachment bolt	M6X20，pan11	12N·m	TC4 titanium alloy
Oil cooler and frame bolts	M6X25	12N·m	TC4 titanium alloy
Bolts connecting the left and right radiators to the frame	M6X25	12N·m	TC4 titanium alloy
Bolts connecting the regulator to the electrical bracket	M6X25	12N·m	TC4 titanium alloy
Left and right radiator lower bolts to frame	M6X25	12N·m	TC4 titanium alloy
Small sprocket cover and engine mounting bolts	M6X30	10N·m	TC4 titanium alloy
Chain guide box front bolt and flat fork attachment bolt	M6X48，pan 11	10N·m	TC4 titanium alloy
Head cover bracket and road book bracket fastening nut	GB/T 6187 self-locking nut，M6	8N·m	

Installation area	Specification	Torsion N.m	Note
Rear tank vent fitting screws	Screw thread with M6	4N·m	
Headlamp bracket and head cover bracket connection bolt (rubber)	Rubber bolt M6X12 nut M6X10	8N·m	
Frame and air filter housing connection bolt	Rubber bolt M6X12 nut M6X10	8N·m	
The left and right sides of the front fuel tank are connected to the underframe nut	Rubber bolt M8X20 nut M8	22N·m	
Guide sprocket self-locking nut and guide sprocket connecting bolt	self-locking nut，M8X1.25	22N·m	
Connection bolts under front fuel tank to frame	Inside M8, outside M16*1*11, length 35.5mm	22N·m	TC4 titanium alloy
Tail trim piece with tank 2 mounting bolts	Hex shaped Step Bolt M8X15 Step 5.5	22N·m	TC4 titanium alloy
Flat fork chain adjustment lock nut	M8	22N·m	
Clutch cable lower adjustment nut	M8	8N·m	
Muffler collar	M8	22N·m	
Oil cooler overoiling bolt installation	M10/copper packing	25N·m	
Brake arm bolt to frame connection bolt	M8 x 16 Step 18.2 Hex Socket Step Bolts	22N·m	Threading glue TC4 titanium alloy
A cap nut for connecting the front muffler segment to the engine	M8X1.25X14	22N·m	
Front tank mounting bracket bolts left and right	M8X10	15N·m	TC4 titanium alloy
Rear tank mounting bolts	M8X11 stepping 25mm	22N·m	TC4 titanium alloy
The front engine suspension is bolted to the frame	M8x115	26N·m	TC4 titanium alloy
Engine suspension with frame connection bolt	M8x16	36N·m	TC4 titanium alloy
Mounting point on front tank with frame connection bolt	M8X20	22N·m	TC4 titanium alloy
Front bottom reduction barrel locking bolt	M8x25	22N·m	TC4 titanium alloy
Bolts are connected to rear oil tank in rear block	M8X25	22N·m	TC4 titanium alloy

Installation area	Specification	Torsion N.m	Note
Front tank side mounting point with frame connection bolt	M8X30	22N·m	TC4 titanium alloy
Upper connecting plate and damping fastening bolt	M8x35	22N·m	TC4 titanium alloy
Front brake caliper with bottom barrel bracket connection bolt	M8x35	32N·m	(Threading glue)TC4 titanium alloy
Muffler middle section and frame connection bolt	M8X35	22N·m	TC4 titanium alloy
Lower connecting plate with damping fastening bolt	M8x40	22N·m	TC4 titanium alloy
Muffler rear section and bracket connection bolt	M8X45	22N·m	TC4 titanium alloy
Hand windscreen bracket left and right handlebar connection bolts	M8X45	22N·m	TC4 titanium alloy
Fasten the upper and lower bracket bolts in the direction	M8x50	22N·m	TC4 titanium alloy
Head cover bracket and frame connection bolt	M8x50	22N·m	TC4 titanium alloy
Connecting bolt between guide sprocket and U-shaped shake frame	Inner hole M10, length 61,	60N·m	TC4 titanium alloy
Triangle shake frame and rear reducer lower connection bolt	M10 x 45 flat head bolt Shaped bolt Ducro	60N·m	
Front engine suspension with engine connection bolts	M10x1.25x115	54N·m	TC4 titanium alloy
Lower engine rear suspension with frame connection bolts	M10x1.25x130	54N·m	TC4 titanium alloy
U-shaped shaking frame and frame connection bolt	M10x1.25x130	60N·m	
Lower engine front suspension with frame connection bolts	M10x1.25x145	54N·m	TC4 titanium alloy
Brake tubing to front brake caliper connection bolt	M10x1.25x22	30N·m	TC4 titanium alloy
The brake tubing is bolted to the front brake upper pump	M10x1.25x22	22N·m	TC4 titanium alloy
Brake tubing and rear brake pump, caliper connection bolt	M10X1.25x22	22N·m	TC4 titanium alloy

Installation area	Specification	Torsion N.m	Note
Brake tubing and rear brake upper pump connection bolt	M10X1.25x22	22N·m	TC4 titanium alloy
Engine sprocket fastening nut	M10X22	45N·m	
Engine suspension with engine connection bolt	M10x30x1.25	54N·m	TC4 titanium alloy
Direction handle lower holder connection bolt	M10x35	34N·m	TC4 titanium alloy
Side bracket and frame connection special bolt	M10x42.3	First 10N·m, then loosen 1/3 turn, clamping bolt and nut 60N·m	TC4 titanium alloy
Connecting bolt to frame above rear shock absorption	M10x52	44N·m	TC4 titanium alloy
U-shaped shaking frame and triangle shaking frame connection bolt	M12X105 Flat head bolt shaped bolt	60N·m	TC4 titanium alloy
Connecting bolt between flat fork and triangular rocking frame	M12X85 Flat head bolt shaped bolt	60N·m	TC4 titanium alloy
Upper coupling plate and direction column fastening bolt	M14x1.5x30	80N·m	(Thread oiling)
The front oil tank is fitted with hexagonal nuts and connected to the frame	M16X1，3mm thickness	35N·m	TC4 titanium alloy
Front axle lock nut	M16x1.5	88N·m	TC4 titanium alloy
Flat fork shaft fastening nut	M16x1.5	88N·m	TC4 titanium alloy
Oxygen sensor and muffler front section connection bolt	M18	44N·m	
Rear axle lock nut	M22X1.5	128N·m	
The directional post locks the four-slot nut	M25x1	40N·m first, 10N·m loose, and then a quarter turn	

Installation area	Specification	Torsion N.m	Note
Headlamp bracket press plate mounting bolt	M5X12	4N·m	TC4 titanium alloy
Headlight and headlight bracket mounting bolts	M5X12	5N·m	TC4 titanium alloy
ECU to rear tank connection bolt	M5X12	4N·m	TC4 titanium alloy
Radiator grille with radiator connection bolt	M5X12	5N·m	TC4 titanium alloy
Rear tail cover with fuel tank 1 Mounting screws	M5X13,stepping 8X3.5	5N·m	TC4 titanium alloy
Connecting screw between side guard plate and windshield glass	M5X13,stepping 8X3.5	4N·m	TC4 titanium alloy
Roll sensor and electrical mounting bracket connection bolt	M5X16	4N·m	TC4 titanium alloy

Lubrication and sealing point - Engine part

Materials		Location	Note
seal gum	1596	Crankcase coupling surface	
	1590	Magneto outlet	
engine oil		The whole surface of the inner and outer rotors of the oil pump	
		Valve rod sliding face and rod end	
		Timing chain the entire surface	
		Camshaft rolling surface	
		Inner surface of cylinder bore	
		Piston outer surface, piston pin hole and piston ring groove	
		Outer surface of piston pin	
		The whole face of the piston ring	
		Clutch friction disc entire surface	
		Clutch pull rod sliding surface	
		Shift shaft rod part and dial plate	
		Double gear shaft whole face	
		Start clutch whole face	
		The entire surface of the fork shaft	
		Crankshaft connecting rod big end bearing inner surface	
		Crankshaft connecting rod small end hole	
		Gear teeth (primary drive, crankcase, starting reduction)	
		Disk tooth sliding surface	
		Each bearing rotation area	
		Surface of each O-ring seal	
Molybdenum disulfide oil		tappet column	
		Camshaft surface	
		Cylinder head CAM shaft hole	
Multi-purpose grease		Starter motor seal ring	
		Speed sensor seal ring	
		Large and small decorative cover seals	
Degreasing agent		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	
	Rear brake caliper dust ring contact area	
Brake fluid	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	
	Brake pipe joint nut thread	
Cable lubricant	Clutch cable	
	Seat lock cable	
Special damping fluid KHL 5 W	Front damping oil seal lip	
	Front damping and dust proof seal lip	
	Front shock absorbing end cover O ring	
KOVE special chain lube or equivalent	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	

Regular maintenance and adjustment

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.

TIMES / ITEM	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.

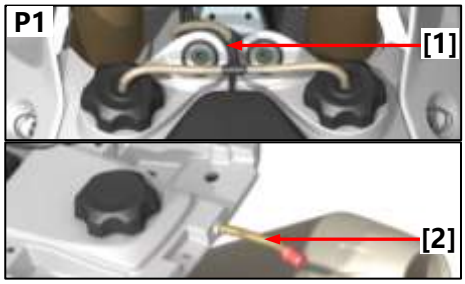
ITEM \ times		period	Odometer km (note 2)				
			1000km/3M	3000km/6M	5000km/6M	7000km/6M	9000km/6M
*	Fuel system oil circuit		I		I		I
*	Fuel filter		R 10000km/1year				
*	Throttle operating system		I	I	I	I	I
*	Air filter element	note 1	1000km or every 1 month for replacement, daily for venue or desert 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				

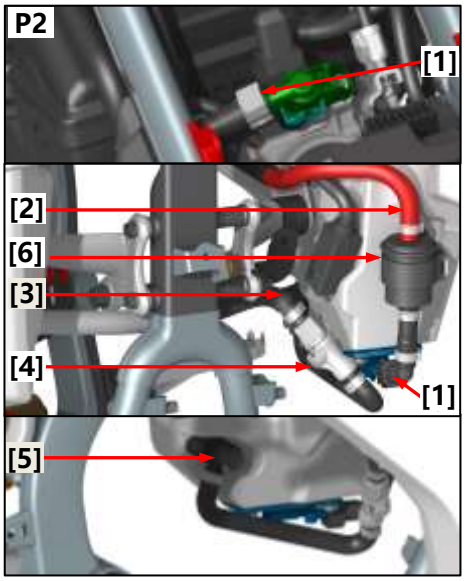
*: This item is repaired by the personnel of KOVE locomotive special repair store. If the user has special tools, repair parts and repair ability, he can also repair by himself, and the repair knowledge can refer to this instruction manual.

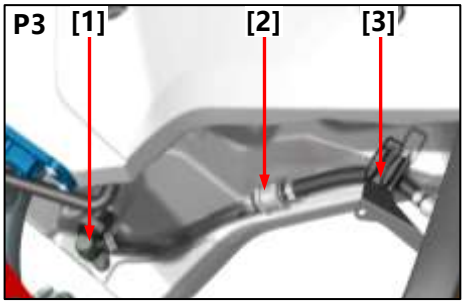
**: To ensure safety, this item can only be repaired by the personnel of KOVE locomotive special repair store.

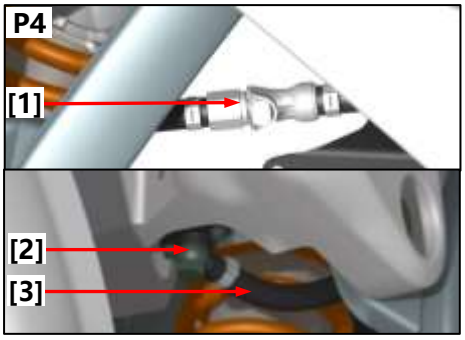
Remarks.

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].

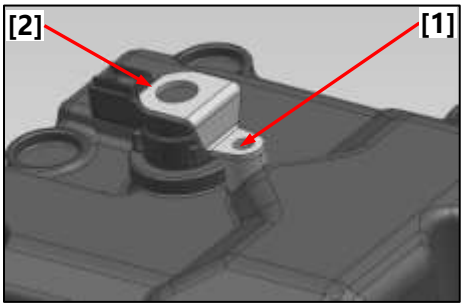
7: Check (P4) whether the fuel supply hose [3] connecting the rear fuel tank and the front right fuel tank is extruded, damaged or leaking and whether the quick connect joint [1] is loose, damaged or leaking and other connections.

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.

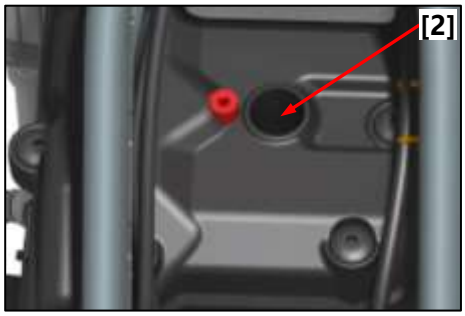
※Spark plug inspection

The following procedure applies to all spark plugs.

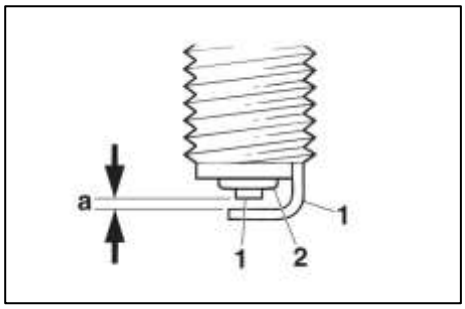
Remove the following components.
- Removal of the seat cushion assembly.
- The front trim assembly.
- The front fuel tank vent pipe.
- Front left and right side fuel tanks.
- Air filter assembly.
- Ignition coil pressure plate screw M6x12 [1].
- Ignition coil pressure plate [2].
- Spark plug [3].



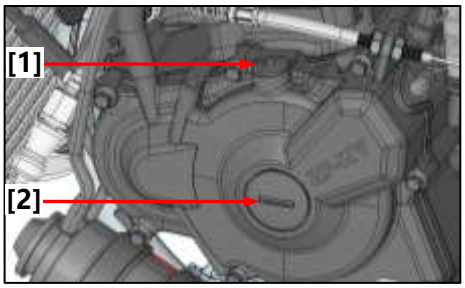
Caution.
-Blow around the spark plug base with an air gun before removing the spark plug, and also make sure no dust has fallen into the cylinder.



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.
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)

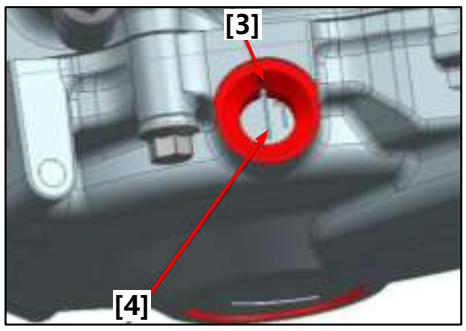


Note: before installing the spark plug, first clean the spark plug with the gasket surfaces.



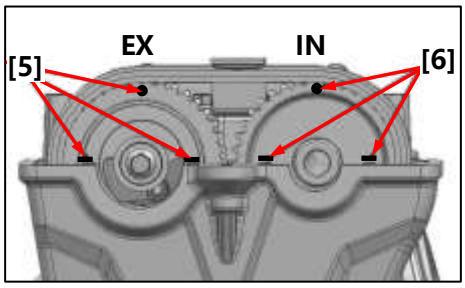
※Check of valve clearance
Note: in cooler conditions, please check and adjust the valve clearance.

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

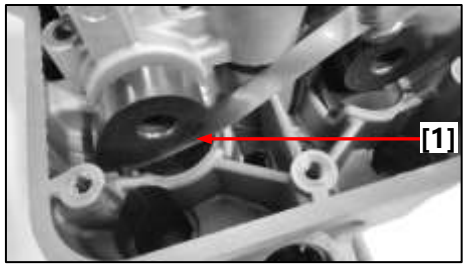


1. installation status: use a 17mm socket wrench to rotate the magneto lock nut, while observing whether the timing mark line " I " [2] on the magneto rotor and the timing mark slot [1] on the left front cover are aligned through the small sight cover screw hole on the left front cover.

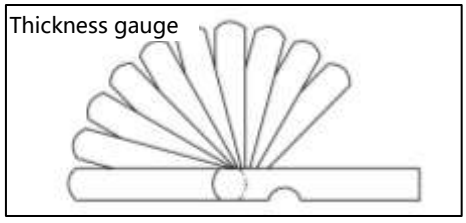
2. After the above timing marks are aligned, make sure that the [5] exhaust cam timing line is flush with the end face of the cylinder head at the same time. The timing point is facing directly above the cylinder head. The [6] intake cam timing line is flush with the end of the cylinder head with the 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.



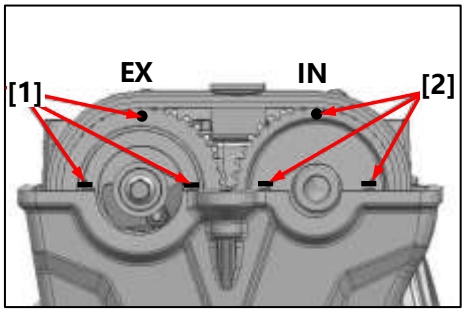
Check valve clearance by inserting a thickness gauge [1] between the cam and tappet.
Valve clearance.
Intake: 0.10-0.15mm
Exhaust: 0.15-0.20mm
Notes:
-Record each valve clearance for easy reference of shim selection when valve clearance needs to be adjusted.



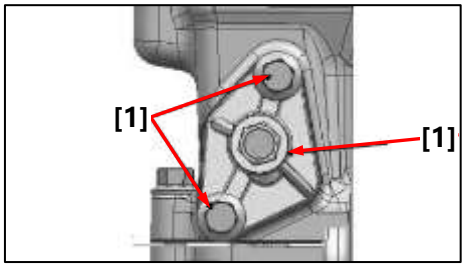
※ Inspection and adjustment of valve clearance

Disassemble the following components.
- Tensioner.
- Camshaft bracket.
- Chain press.

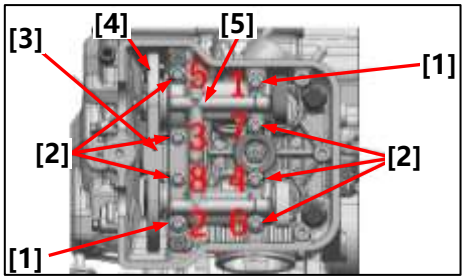
1. Turn the timing driven sprocket to the engine timing position: the positive time line mark of the timing driven sprocket is flush with the cylinder head end face [1],[2]; The inlet and exhaust camshafts are directly above the cylinder head at the correct time point [2],[1].



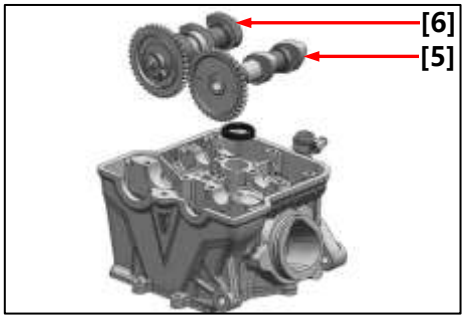
2. Remove the tensioner assembly; Remove the following parts: - remove the two bolts fastening tensioner M6 x 20 [1]; - remove the tensioner combination [2] and tensioner gasket.



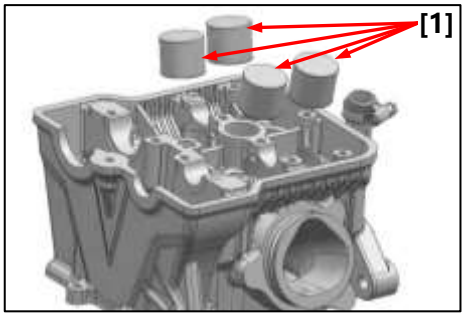
3. remove the camshaft bracket and timing chain pressure plate. Remove the following components.
- Remove the 2 M6×40 [1] and 6 M6×35 bolts [2] fastening the camshaft bracket in the order of 1→2→3→4→5→6→7→8, then remove the timing chain pressure plate [3] and the camshaft bracket [5].

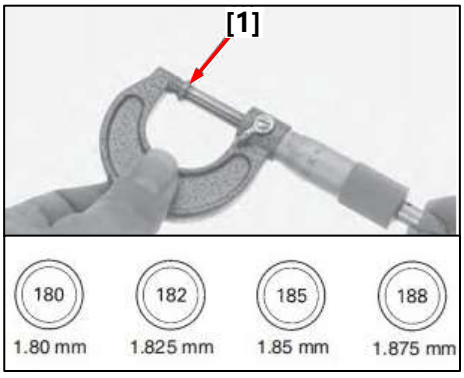


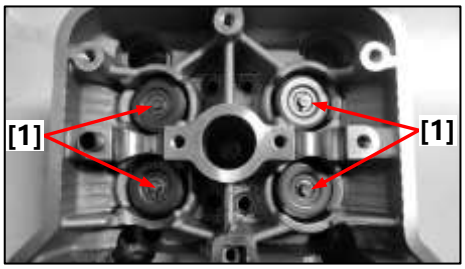
4. Remove the timing chain and intake and exhaust camshaft shaft; Remove the following parts: - remove the set of timing on the timing driven sprocket chain [4], the remove the intake camshaft parts [5] [6] and exhaust CAM shaft parts.

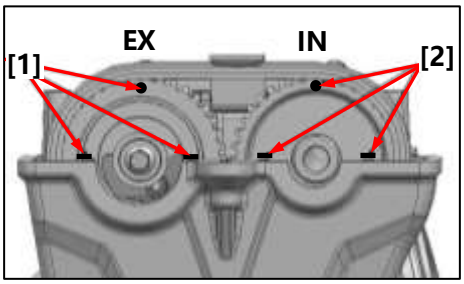


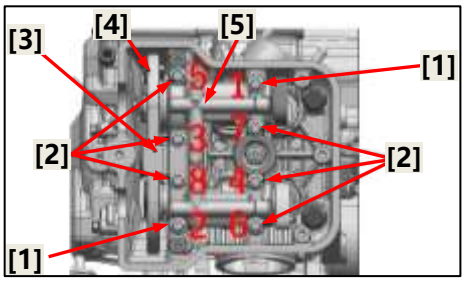
Note: remove the valve lifter, [1] and according to the order in place after the gasket, completes the corresponding identification respectively.

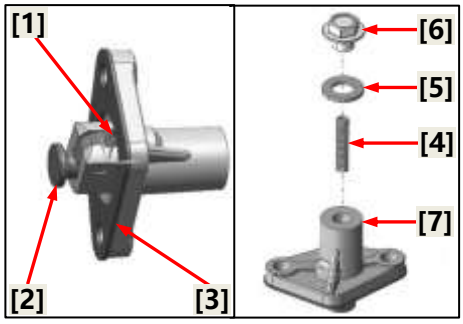












The thickness of the gasket [1] was measured and recorded. Note: · gaskets to choose from, there are 69 different thickness is 0.025 mm from adjacent thickness (1.200 2.900 mm) with the following equation calculating the new gasket thickness: A = B (C) + D
A: B: new gasket thickness record of valve clearance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

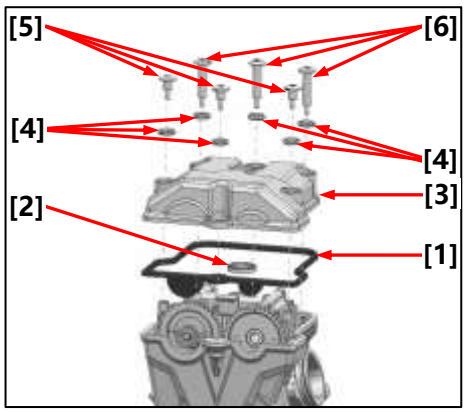
3. Combination installation of tensioner

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.

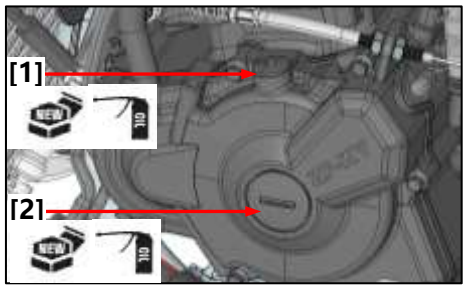
4. Installation of cylinder head cover

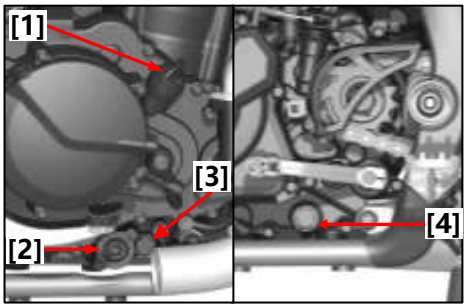
Assemble the cylinder head cover sealing ring [1], spark plug hole sealant pad [2], head cover bolt buffer washer [4] in the designated position of the cylinder head cover. Will three cylinder epicranium fixed bolt M6 x 22.8 [5] and 3 cylinder epicranium fixed bolt M6 x 50.7 [6], in the cylinder head assembly, fastening, in turn, according to the diagonal, and tighten bolts to specified torque.
Torque: 10 ~ 12 n. m

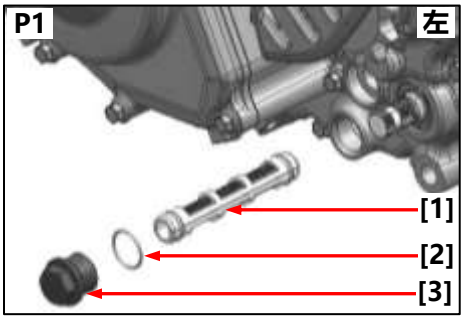


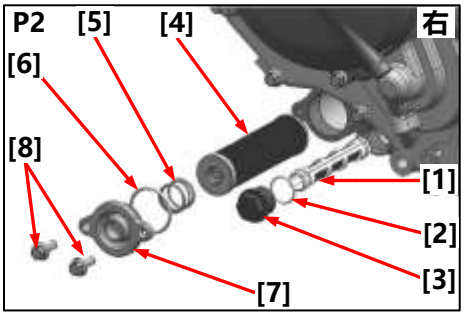
5. Installation of large and small visual hole covers

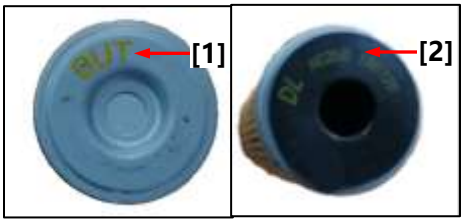
Replace o-rings and blotted out the oil, and assembly left decorative cover [1]. Replace o-rings and install hole cover bolts [2]. Tighten the left decorative covers and depending on the hole cover to specified torque. Torque inspects a hole cover: 6 N.m (0.6 KGF. J m, LBF. 4.4 ft) depending on the hole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

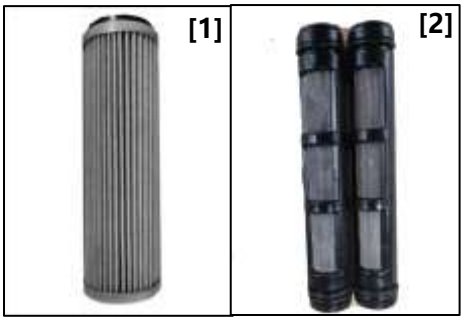












※Engine oil change

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 0-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

②Installation 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 0-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 0-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:

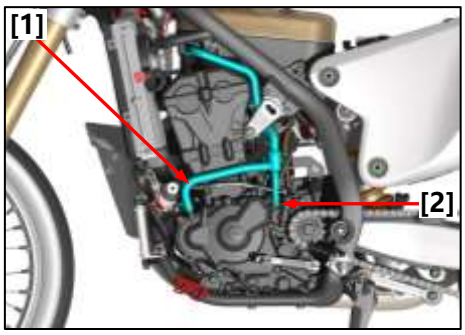
• Throttle valve body intake pipe [1]; Crack/damage → replacement.

The installation sequence is opposite to the disassembly sequence.

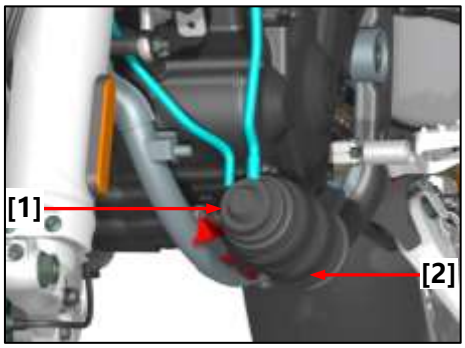
※ Inspection of exhaust gas pipe assembly

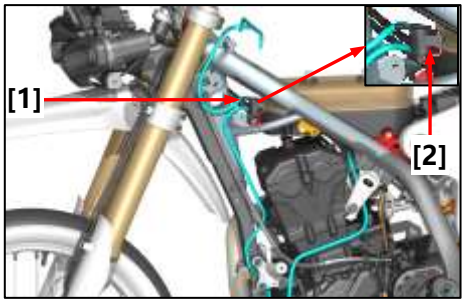
Remove the following components:
- Remove seat cushion assembly;
- remove the decoration before the assembly; Around before
- remove the fuel tank, ventilation tube;
- remove the guard plate assembly; - disconnect around tank before fuel line;
- disconnect the fuel pump 2 p (black) joint;
- remove the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

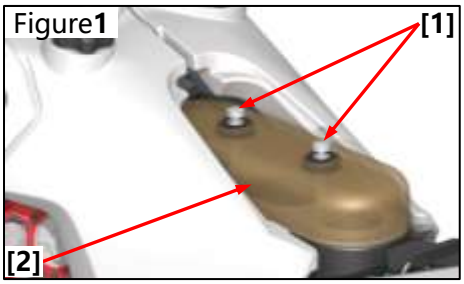
※Air filter sponge element replacement / check hose cleaning

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.

Figure1



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:

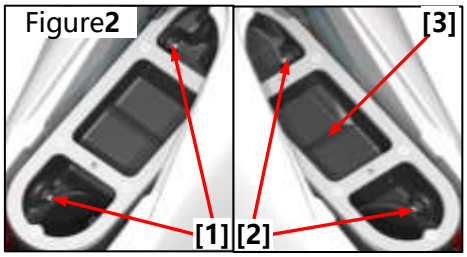
-Because gasoline or low flash point solvents are very flammable, it is prohibited to use them to clean the air filter sponge cartridge.

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.

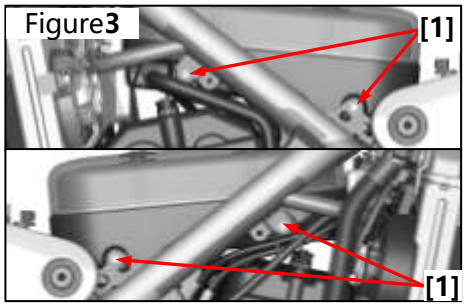
Clean the inside of the housing [3] of dust or foreign matter.

Figure2



3. As in Figure 3.
Check whether the air filter case and frame mounting screw [1]/[2] are loose, loose → tighten.

Figure3

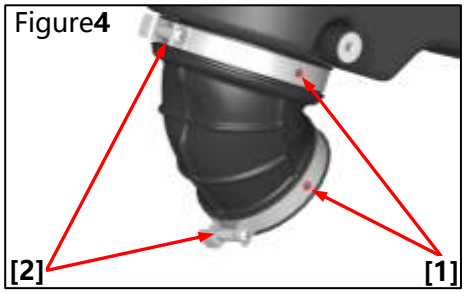


4. As in Fig. 4:
Check if the inlet hose is intact.
Cracked/broken → Replace.

Check if the clamp is installed in the correct position [1].
Incorrect adjustment → Perform correct installation.

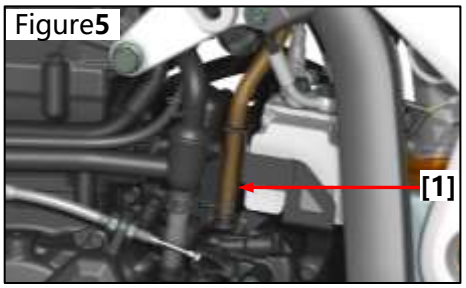
Position [2] screw with limit tighten to the limit.

Figure4

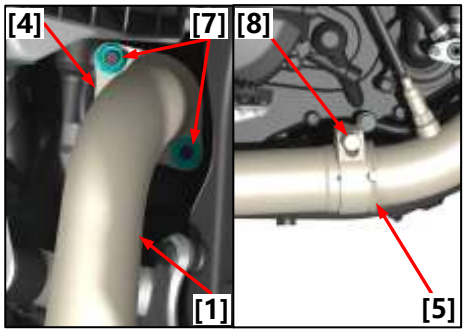


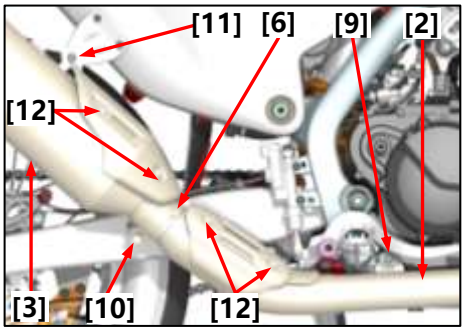
5. As shown in Figure 5:
Check the air filter box leak tube.
Cracked/broken → Replace.
Clean the water inside the leak tube.

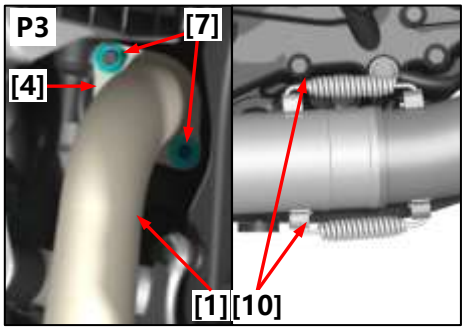
Figure5

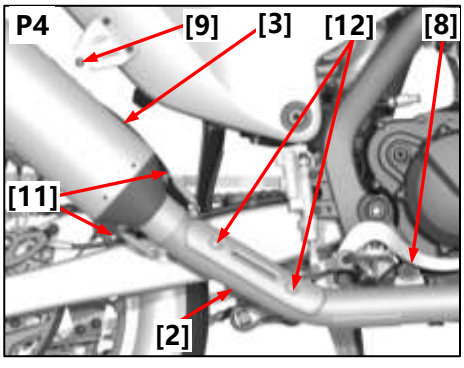


Torque.
Air filter sponge anisotropic bolt
4 N.m (0.4 kgf.m, 0.3 lbf.ft)
Air filter box and frame mounting bolts
12 N.m (1.2 kgf.m, 8.9 lbf.ft)
Rubber bolt to air filter box
8 N.m (0.8 kgf.m, 6.0 lbf.ft)









※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.

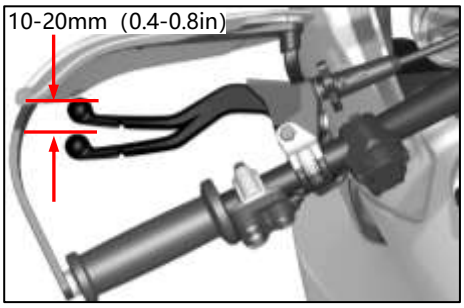
Broken/damaged → Replace.

Loose → Connect correctly.

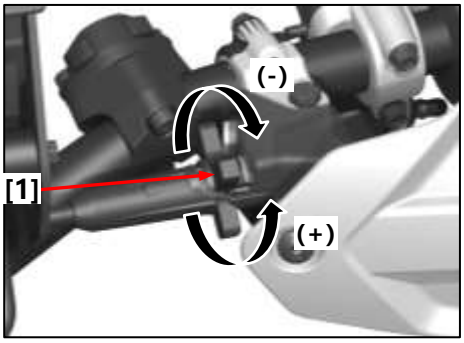
Exhaust mounting bolt torque:

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)

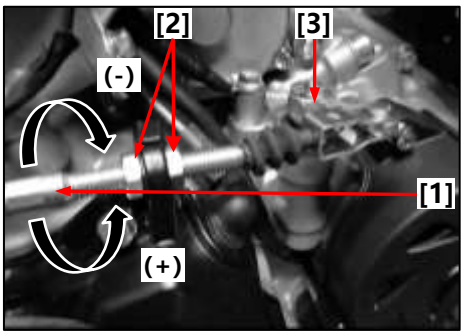
※Adjustment of clutch free travel



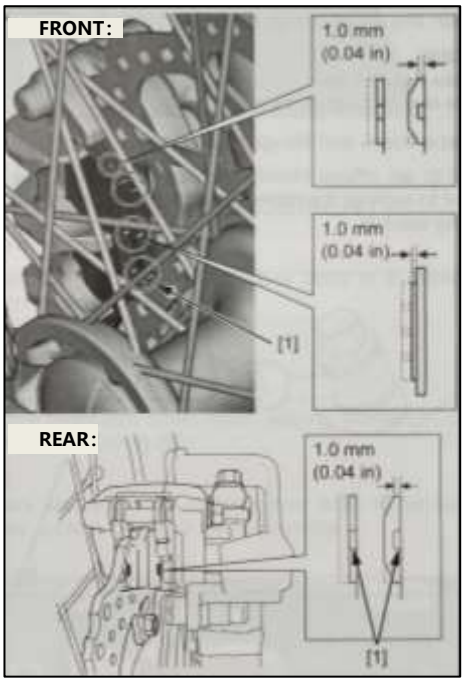
Check the clutch cable for kinks or damage.
Lubricate the pull cable if necessary.
Check the free play [1];
Free play: 10-20mm (0.4-0.8in).
If necessary, adjust to the specified range.
Improper adjustment of the free play can lead to premature clutch wear.



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 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.

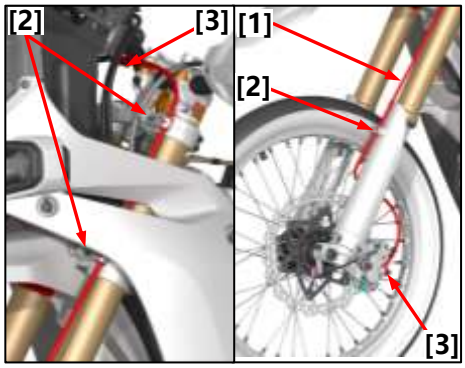
Note: wear identification [1], the width of 1.0 mm (0.04 in) if the brake pads wear limit to maintenance, replacement of brake pads.

•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.

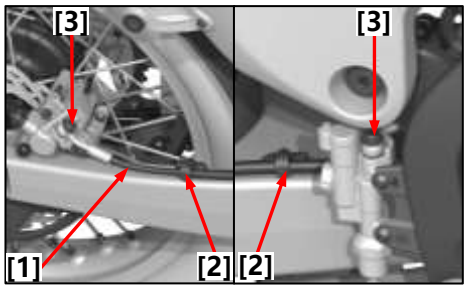
※Inspection of front brake fluid lines

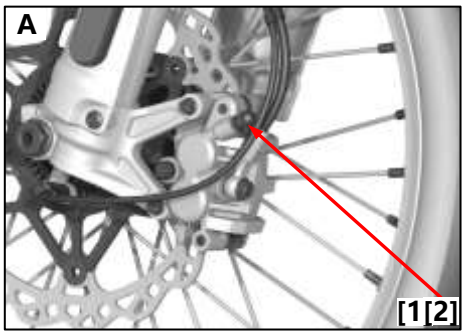
1. Check: • brake tubing [1]; Crack/damage to replace. 2. Review: • brake pipe fixed [2]; Loose - > lock tighten bolts reservation. • brake tubing (bolt) [3]; Loose - > lock bolt. 3. Keep upright, vehicle braking action several times. 4. Check: • brake tubing [1]; The brake fluid leak to replace damaged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

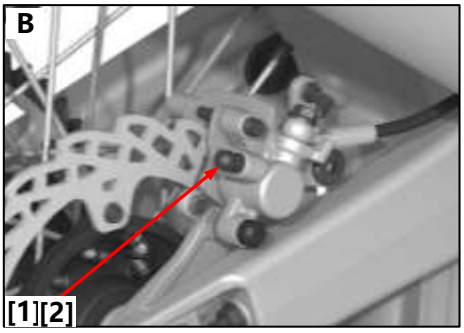


※Inspection ofrear brake fluid lines

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.
a. Using the specified brake fluid, add the brake fluid reservoir to the correct level.
b. Install the diaphragm (brake master cylinder reservoir or brake fluid reservoir).
c. 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

警告

• 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.

警告

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.

d. Place the other end of the hose in the container.
e. Slowly apply the brake several times.
f. Fully pull up on the brake handle, or fully depress the brake pedal to hold it in place.
g. 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.
h. Lock the exhaust screw and release the brake handle or brake pedal before releasing the brake.
i. Repeat steps (e) through (h) until the brake fluid in the plastic hose is free of any air bubbles.
j. 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.
k. 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.

警告

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.

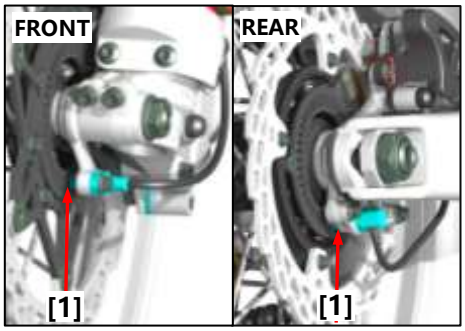
Do not repeat the exhaust procedure 2 or more times in a short period of time! If you need to repeat the exhaust procedure, please wait for 5 minutes to cool the solenoid valve to protect it from overheating!

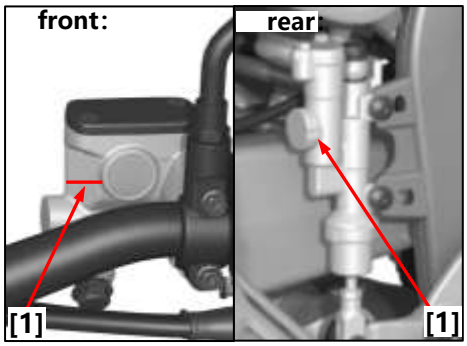
ABS gear ring clearance inspection

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

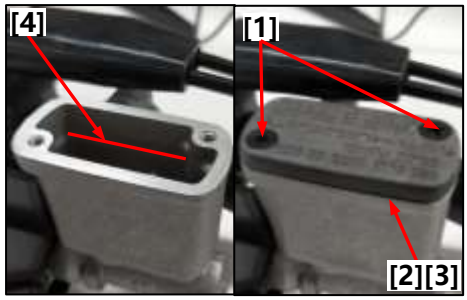
Note: do not use different types of brake fluid mixing are incompatible with each other. Filling liquid storage tank, don't let the foreign matter to enter.

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.

⚠警 告

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



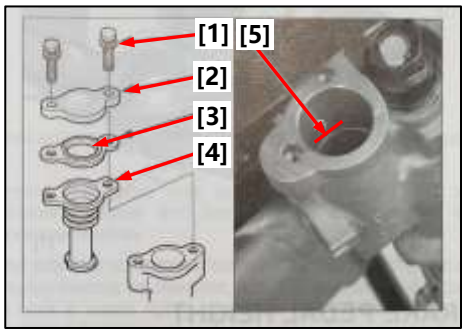
※Brake fluid addition

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, 0.7Ibf.ft)

Check the front brake hydraulic system for leaks.

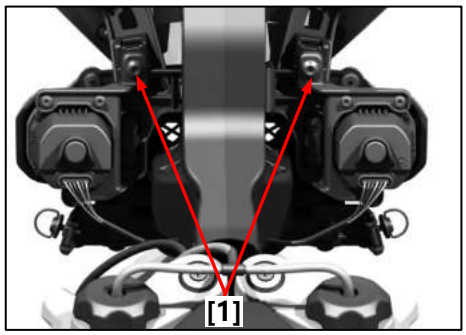


2. Rear brake upper pump.
Remove the rear brake master cylinder reservoir cover bolt [1], reservoir cover [2], gasket plate [3] and diaphragm [4].

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, 1.5Ibf.ft)

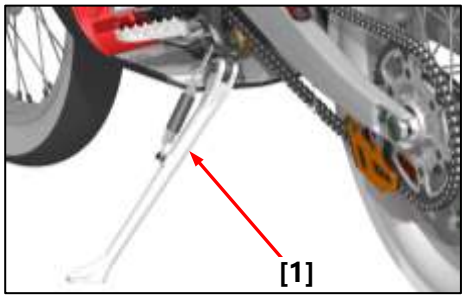
Check the front brake hydraulic system for leaks.

※Adjustment of headlight beam



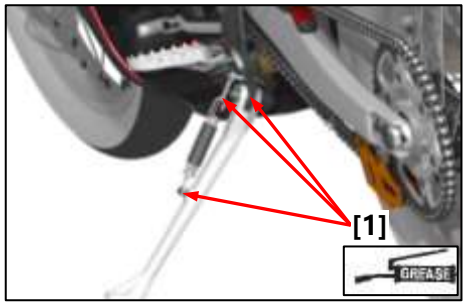
Caution.
-Adjust the headlight to the light according to the local laws and regulations.
Support the motorcycle vertically on the horizontal plane.
By turning the adjustment screw [1].
Turn clockwise to move the beam downwards.
Turn counterclockwise to move the beam upward.

※ Inspection of side brackets



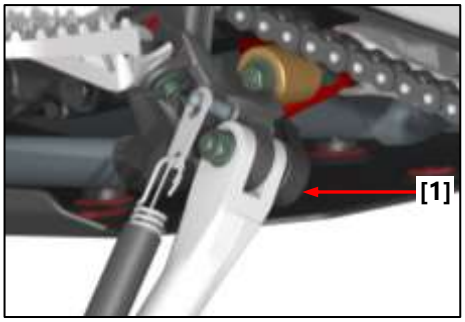
Check: check the side stand [1] whether the activities of the smooth; Activity is not smooth, repair or replacement.

※Lubrication of side brackets



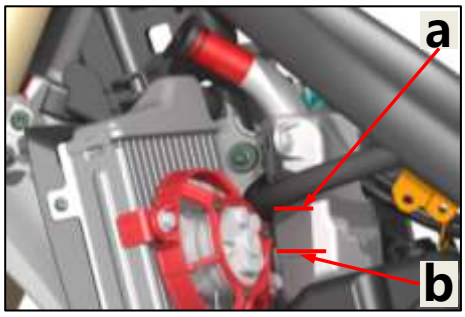
Lubricate the pivot points of the side brackets [1], the moving parts between metals and the spring contact points [1].
Recommended lubricant.
Unisun Grease SU-T330G
Caution.
-Align the switch pin with the hole in the side pedal.
-Aligning the switch slot with the return spring pin.
-Replace the switch 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

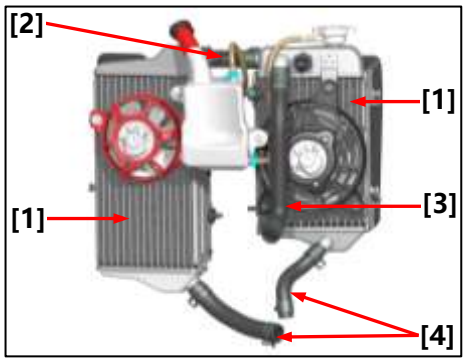
1. Stand up the vehicle on a flat surface.
Caution.
-Place the motorcycle on a suitable stand.
-Make sure the motorcycle remains upright.
2. Check.
- Coolant level
The coolant level should be between the lowest level mark "a" and the highest level mark "b".
Lower than the minimum level mark → Add the 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:

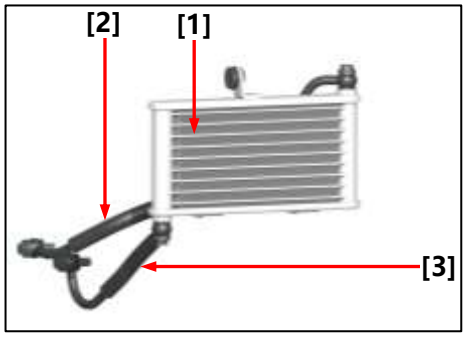
• water instead of the cooling fluid can reduce coolant antifreeze concentration. If water is used instead of coolant, check and correct the antifreeze concentration of coolant if necessary. • only use distilled water. But if distilled water is not available, soft water can be used instead.

※Inspection of cooling system

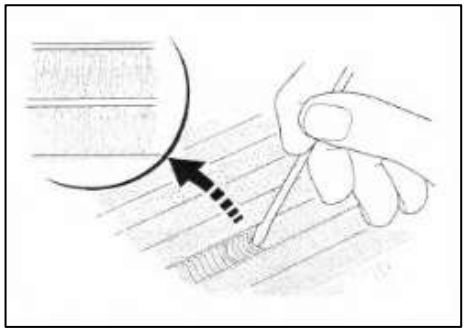
1. Check: radiator [1]; About the radiator, connecting hoses [2]; The radiator water hose [3]; • radiator inlet hose [3]; Crack/damage to replace.

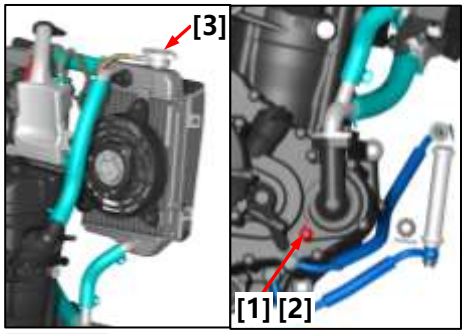


2. Review: oil cooled radiator [1]; Gives oil, oil cooled radiator hose [2]; • oil cooled radiator inlet hose [3]; Crack/damage to replace.



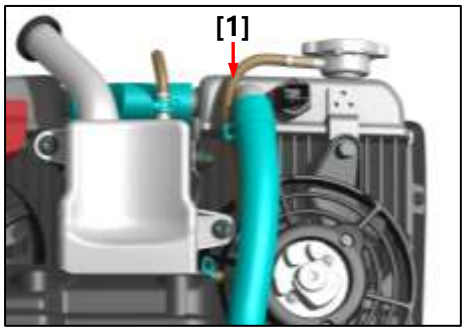
Check whether the air channel of the heat sink is blocked or damaged. Straighten the bent heat sink using a flat-mouth screwdriver, and use compressed air or low water pressure to remove insects, dirt, or other obstacles. If restrict air flow rate is more than 20% of the heat dissipation surface, the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

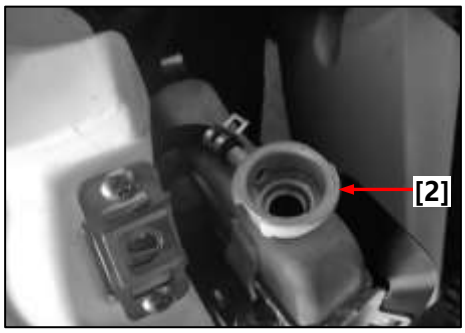




⚠警 告

• 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.)

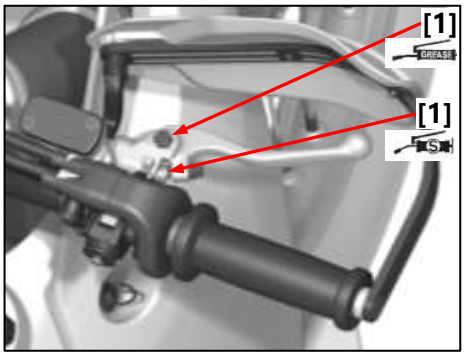
Disconnect the siphon hose from the radiator [1] Pull the siphon hose from the clamp, place the hose low outside the engine frame, and drain the coolant from the storage tank. Emptying of coolant, wash with water storage tank, install the hose into the pipe clamp and radiator.

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

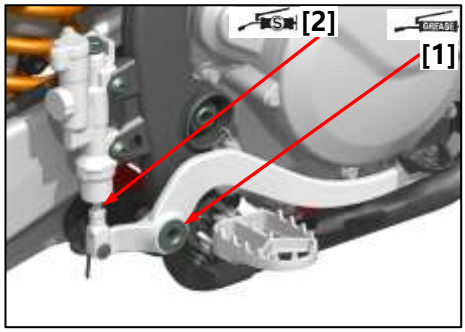
Lubricate the pivot point of the handle and the contact part of the metal [1].



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

※Lubrication of the rear brake arm

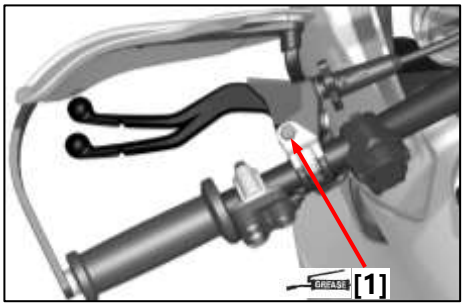
The pivot point of the lubricating foot and the contact part of the metal [1].



GREASE	Recommended Lubricants Lithium-based multi-purpose grease
S	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].

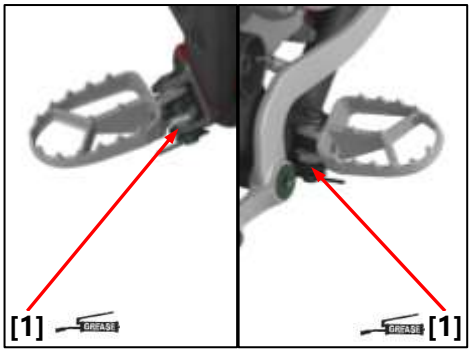


GREASE	Recommended Lubricants Lithium-based multi-purpose grease

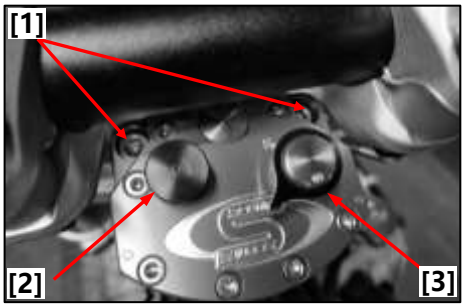
※Lubrication of foot pedal

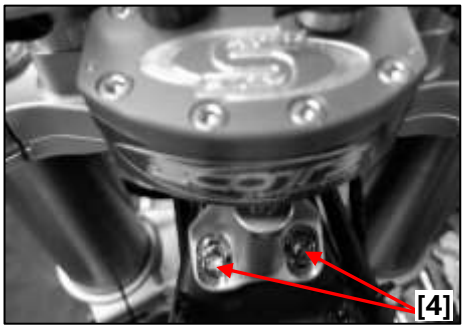
The anti-slip teeth of the pedal can be repaired by filing the grooves between the teeth with a triangular file, but be careful, filing too much will reduce the life of the boot sole. Filing only the tips of the anti-slip teeth and filing the grooves too deeply will weaken the footrest. Make sure the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

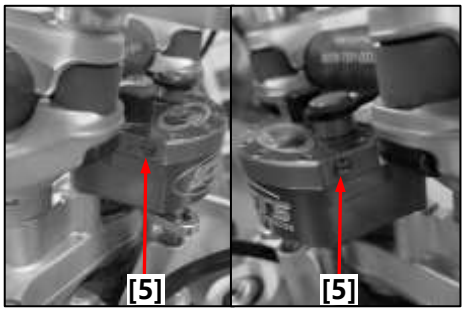
Lubricate the pivot points and metal contact areas of the footrest [1].



GREASE	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.

⚠警 告

•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

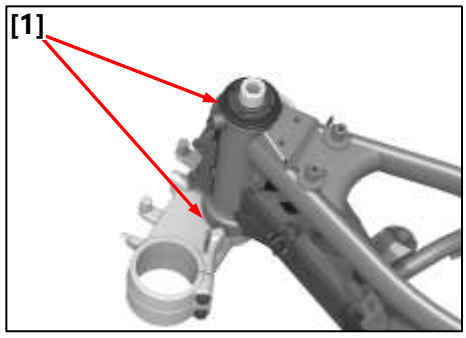
Hold the front shock absorber bottom barrel and rock the front fork gently.
Sticking/loose → Adjust the steering head.

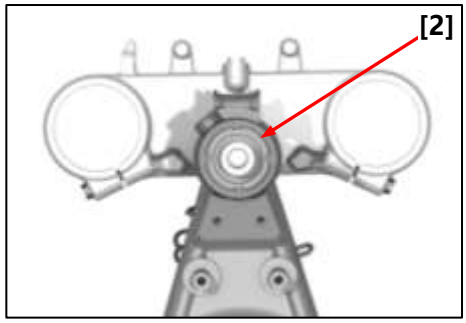
3. Disassembly.
- Steering handle
- Upper linkage plate

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.



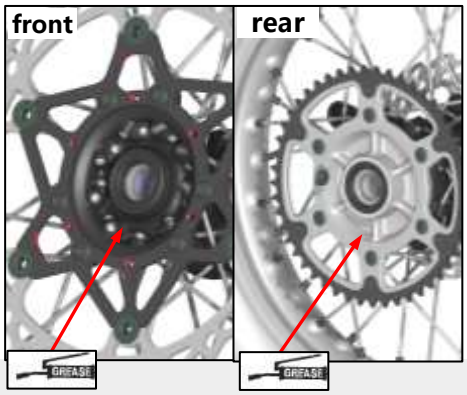


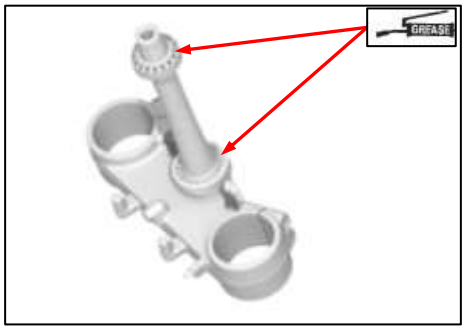
⚠警 告

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

※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).

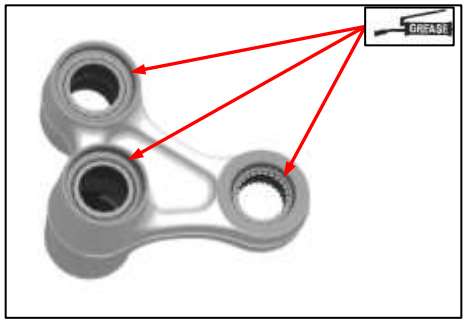




※Lubrication of steering head bearings

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.

GREASE	Recommended Lubricants Lithium-based multi-purpose grease

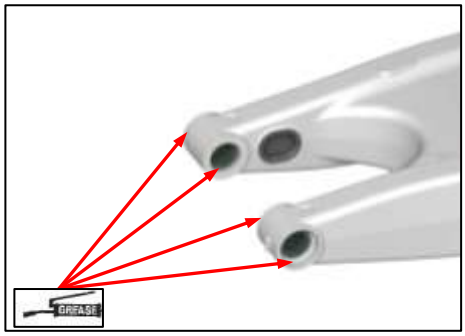


※Inspection and lubrication of the triangular rocker

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).

GREASE	Recommended Lubricants Lithium-based multi-purpose grease



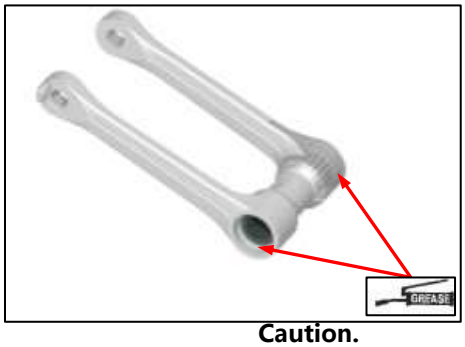
※Inspection and lubrication of the flat fork shaft

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.

GREASE	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.

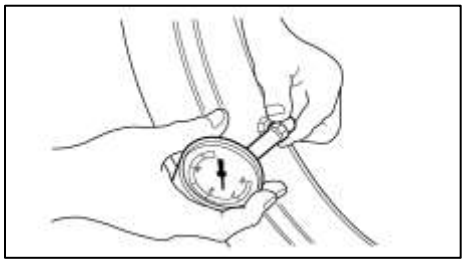
Lubricate with high temperature extreme pressure complex lithium grease (Unisun Grease SU-T330G/F or equivalent).

GREASE	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)

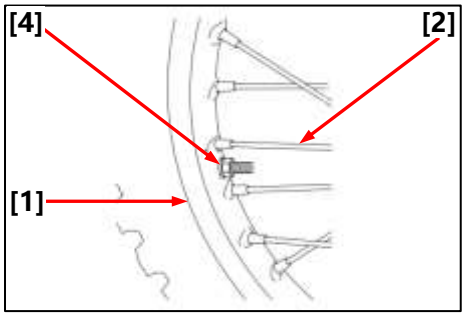
☆ Adjust the tire pressure appropriately according to the actual usage.

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.

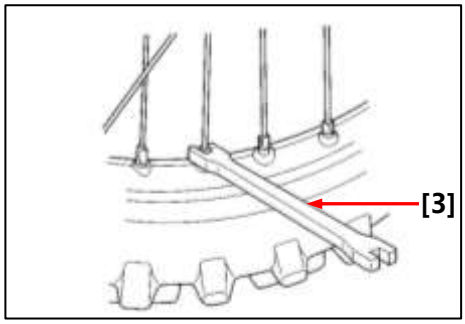
If excessive wear occurs on the wobble bearing, replace the front/rear wheel bearing.
Contact your local dealer for bearing replacement.

※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.

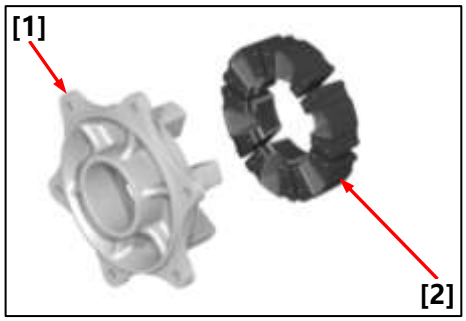
⚠警 告

• 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:

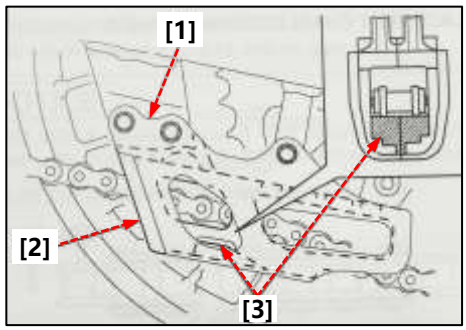
• ROTATON - labeled tire rolling direction. In tire lateral wall delta these id and the center of the tire tire wear limit. (only regular edition), the tire lateral wall delta these id and the center of the tire tire wear limit. (factory edition only)



※Inspection of cushion body assembly

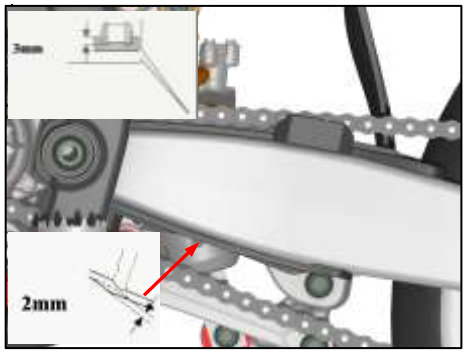
1. Check.
- Buffer body [1].
Cracked / damaged → Replace.
- Buffer rubber [2].
Damage / wear → Replace.

※Inspection of chain guide box



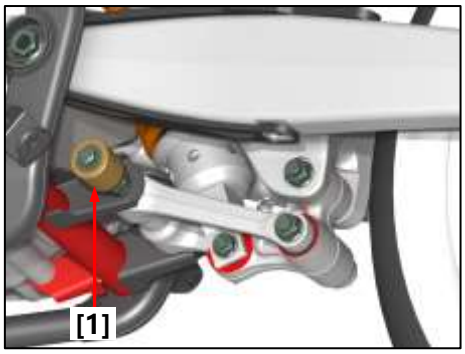
Check the chain guide box [1] for deformation and damage. Damage/deformation and replacement.
Note: if the chain guide box of metal framework, impact transmission chain, fall off, lead to transmission chain worn or noise.
Check the transmission chain guide rail sliding block [2] for wear. If the leading 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

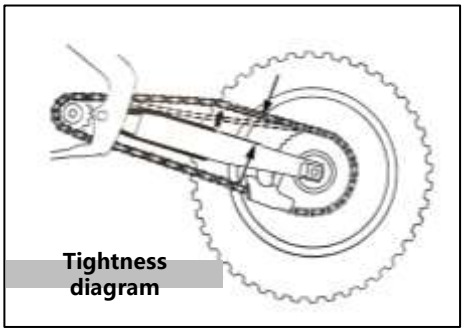


Check the chain guard for excessive wear.
The wear limit does not exceed:
3mm on the upper side
Lower side 2mm
Caution.
-Replace the chain guard when it exceeds the wear limit.
If the chain guard is worn to the limit or damaged, the chain will damage the rear flat fork or drive chain.
Torque.
Chain retainer 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.)



Tightness diagram

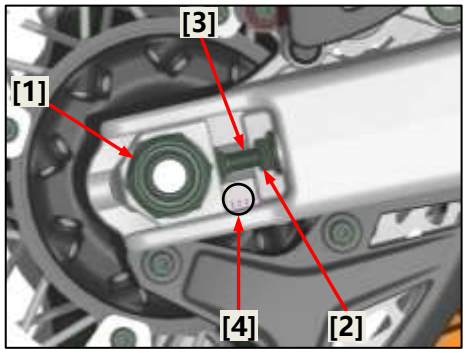
※Inspection and adjustment of transmission chain tightness

⚠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:

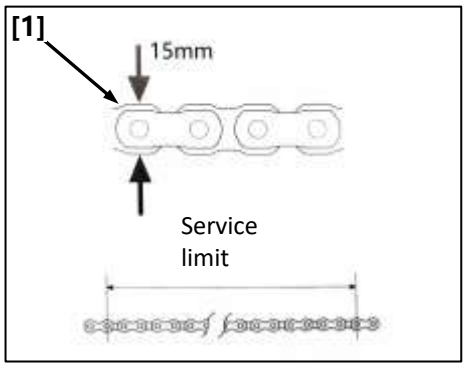
-The scale lines for the drive chain adjustment are provided on the rear flat fork. The left and right adjusters must be aligned at the same tick mark position. If they are not aligned, the wheels are not aligned and the handlebars may pull to one side.

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.

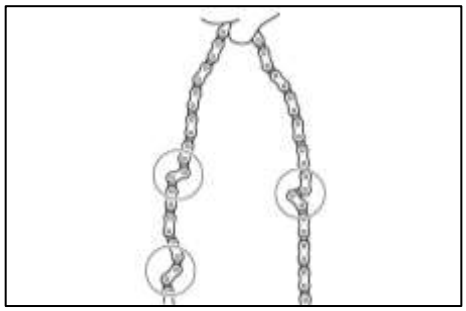
Tighten the rear axle nut [1] to the specified torque.
Torque: 128 N.m (12.8 kgf.m,94 ibf.ft)
Recheck the drive chain for slack and make sure the rear wheels turn smoothly.
Tighten the adjuster to the adjustment plate and tighten the drive chain adjuster lock nut [2] to the specified torque.
Torque.
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.

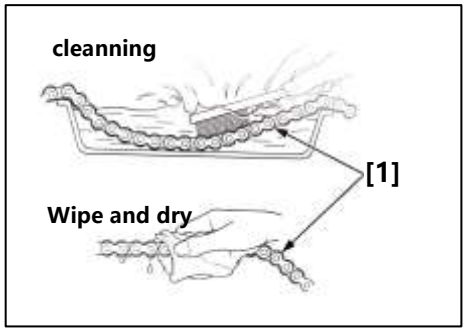


1: measuring the height of the transmission chain (plate) : 15.0 mm. Using the limit measure the distance between the 17 pins (16 pitch) from the center of the pin to the center of the pin, the chain stays taut, and any kinked joints straighten. Use limit: 257 mm if measured values more than maintenance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

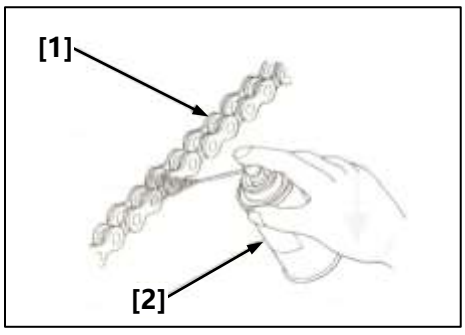


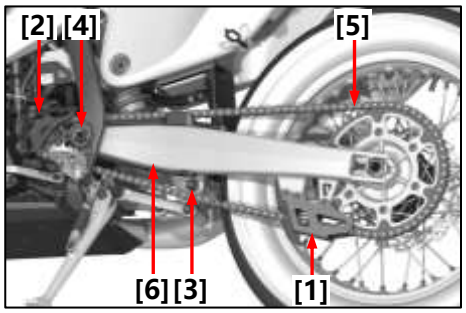
2: check your sprocket kink or damage, whether to replace if necessary.

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.

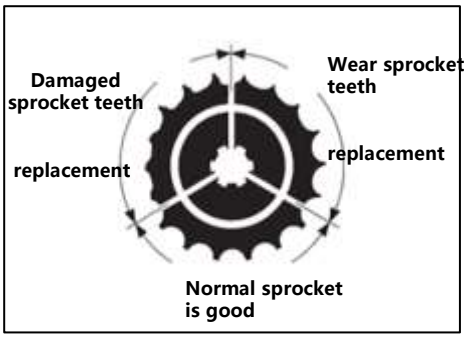
- Remove the chain guide box [1];
- Remove the small sprocket trim cover [2];
- Remove the triangle rocker and flat fork attachment bolts [3];
- Remove the lock nut of the flat fork shaft and take out the flat fork shaft [4];
- Remove the chains from the large and small sprockets respectively [5];
-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

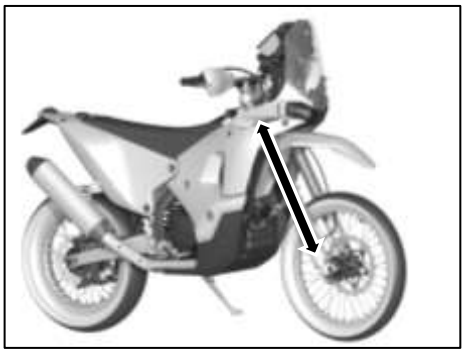


※ Inspection of the master/follower sprocket

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



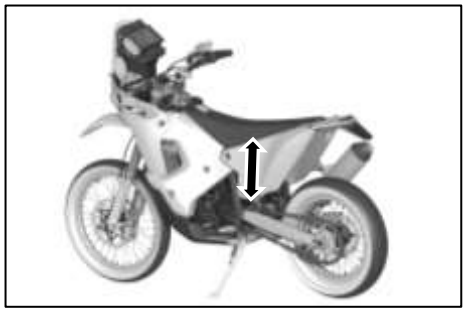
Front Shock Absorber
1. Stand up the vehicle on a flat surface.

⚠警 告

•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

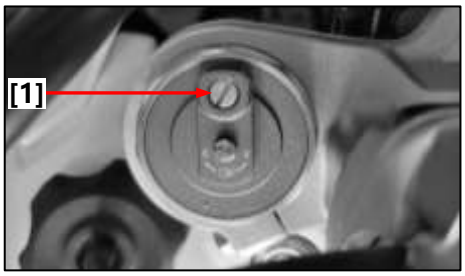


Rear Shock Absorber
1. Stand up the vehicle on a flat surface.

⚠警 告

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.

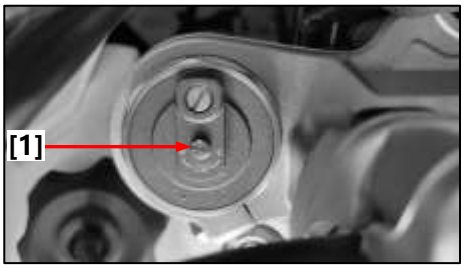
Air is an unstable gas and his pressure increases when he does his work (inside the shock cavity), so the front shock on this motorcycle will become stiff as the race progresses.

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.

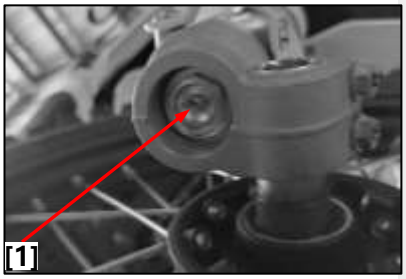
1. turn the compression damping adjusting bolt clockwise until it stops turning.
2. Then turn the adjusting bolt counterclockwise (lighter), the standard compression damping is from the hardest position to turn 10 segments and hear the click position.

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.

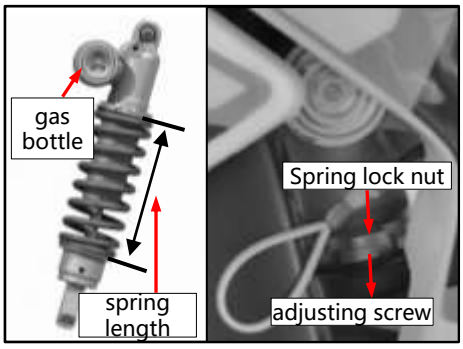
You can adjust accordingly according to your weight and riding conditions, make sure that in each adjustment, the adjusting bolt stops at the click position and the left and right ends are adjusted to the same position.

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.

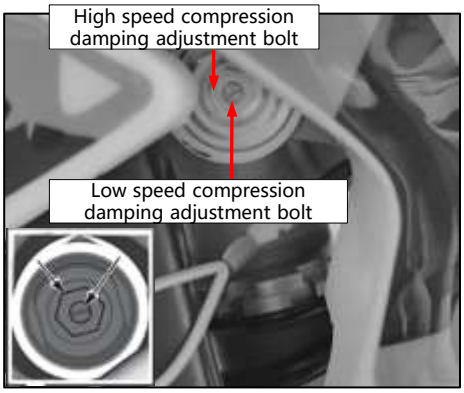
Spring Preload Adjustment

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.

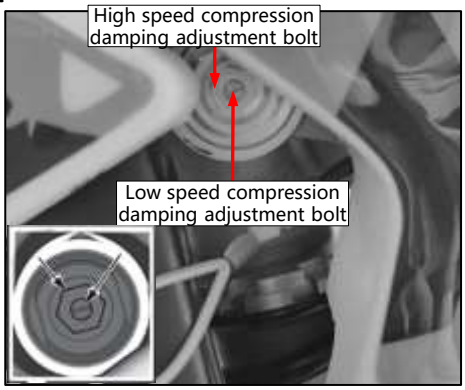
To adjust to the standard position.

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 ± 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.

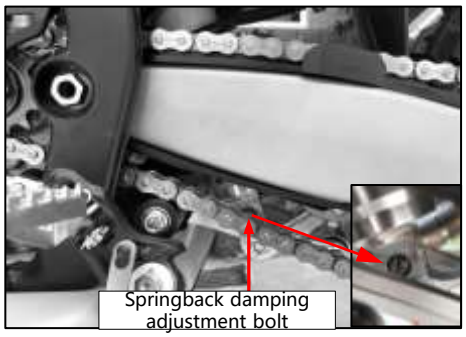
1. Turn the adjusting bolt clockwise (H) until it no longer turns in the position (hardest).
2. Turn the adjusting bolt 8 sections counterclockwise from the hardest position and hear a clicking sound at the position.

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).

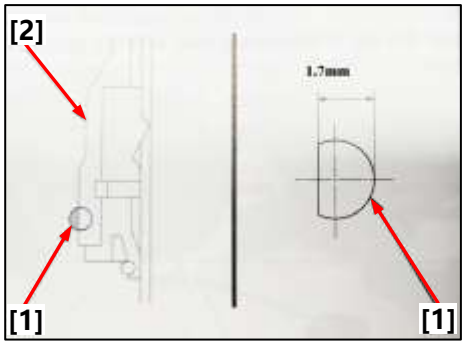
To set the standard rebound damping.

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.

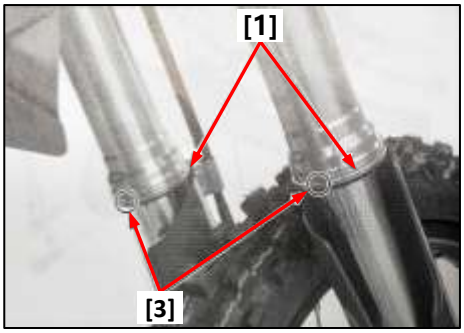


※ Front Shock Absorber Wear Ring Inspection

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.

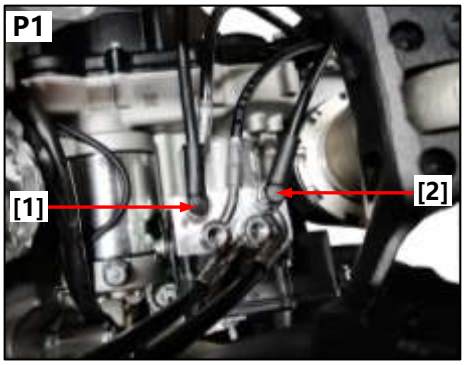
Inspect the wear ring [1] for wear or damage. If the wear ring is less than 1.7 mm or flush with the outer tube, replace the wear ring [2]. Ensure that the wear ring end gap [3] faces backwards.



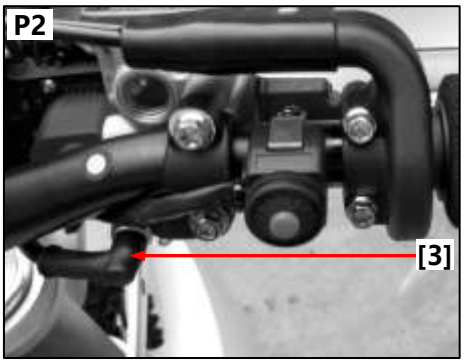
※Motorcycle locking torque inspection

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".

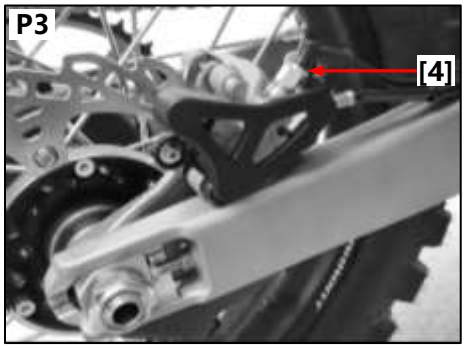
P1



P2



P3



※ 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

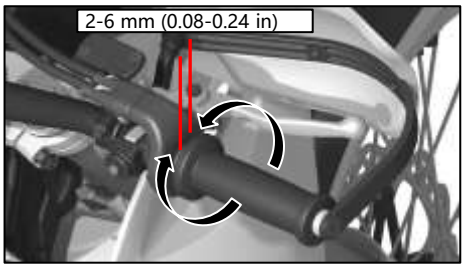
1. Check that all switches operate properly and all lights are on.

※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.

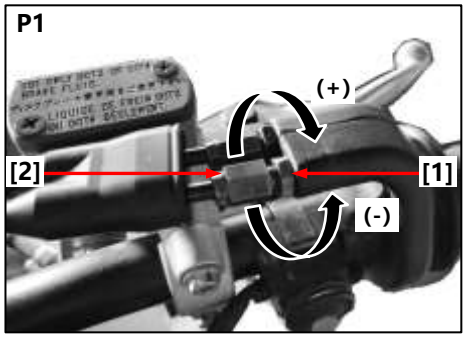
If there are no abnormalities, but the throttle does not turn smoothly, replace the throttle cable (oil feed, return cable).
Measure the free clearance at the throttle handle flange.
Free clearance: 2-6mm (0.08-0.24in)

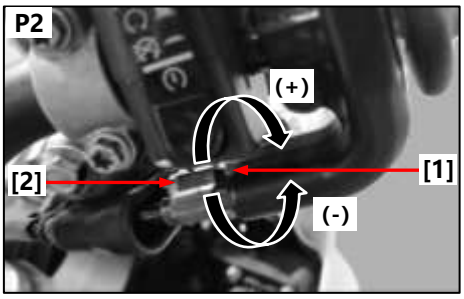


1. Fine adjustment on the throttle side

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)

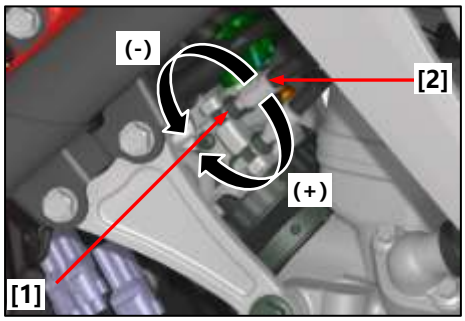




Note: P1 is factory edition, P2 is regular edition.

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.

⚠警 告

•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.

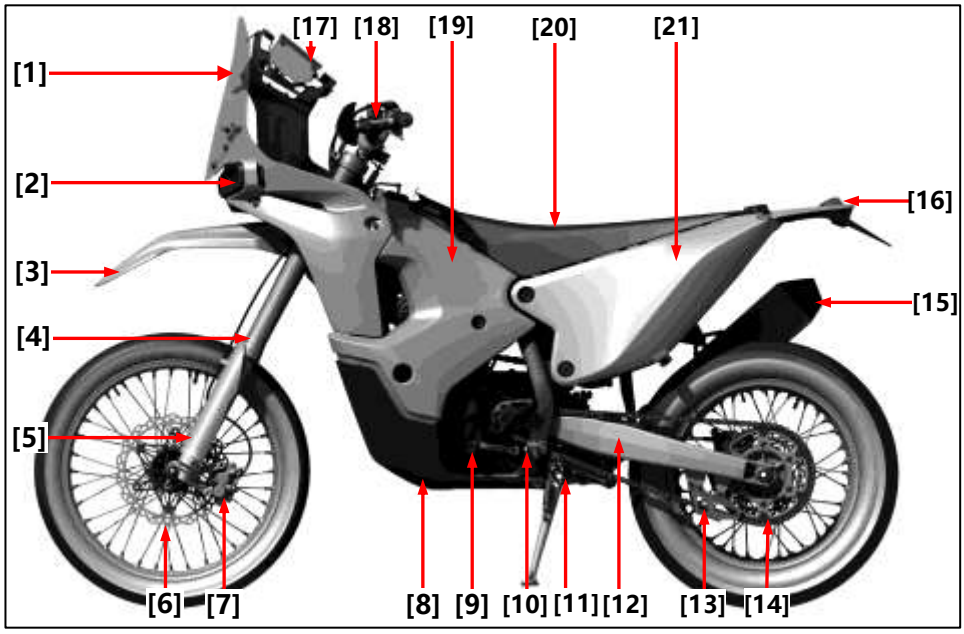
Charging
Turn off all electrical appliances and engines.
Remove the battery.
Connect the charger to the battery and switch on the charger.
Turn off the appliance after charging and disconnect it from the battery.
Caution.
-If the vehicle is not in use, re-charge its battery every 3 months.
Battery model: MTX4L-FPP
Fully charged voltage: >13.2V
Required charging voltage: <12.8V
Charging current: Standard 2A Max 10A
Working temperature -20℃-60℃
Battery capacity: 12V/4Ah
Overall Dimension LxWxH:
113x69x85(2mm±)

Frame, body trim, exhaust system

Maintenance information

Overview.
-This section describes the removal and installation of body trim and exhaust systems.
-When removing, mark and store the installation fasteners to ensure that they are reinstalled in their original locations.
-When installing the valve cover, ensure that the mating areas are properly aligned before tightening the fasteners.
-Be sure to replace the exhaust system with a new gasket after disassembly.
-When installing the exhaust system, loosen all fasteners first. Be sure to tighten the exhaust fitting nuts first, then the mounting bolts.
-Be sure to check the exhaust system for leaks after installation
Troubleshooting Excessive exhaust noise.
-Damaged exhaust system.
-Exhaust gas leaks Poor performance.
-Deformation of the exhaust system.
-Exhaust gas leakage.
-Clogged muffler.

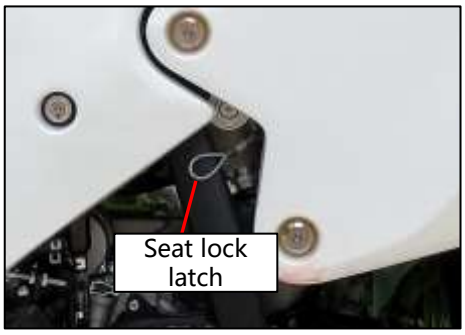
Body trim location/removal diagram



(1) Front decoration assembly	(8)engine lower guard plate	(15) muffler rear section
(2) Headlight	(9) Shift arm	(16) Rear position light
(3) Front fender	(10)Footrest	(17) Road book box
(4) front shock absorber	(11) Side stand	(18) Clutch handle
(5) Front shock absorber decoration (left and right)	(12) rear flat fork	(19) Front oil tank left
(6) Front brake disc	(13) guide chain box	(20) Seat cushion assembly
(7) Front brake caliper	(14) Rear sprocket and chain	(21) Rear oil tank

After the bike is powered off, disassemble it in this order:

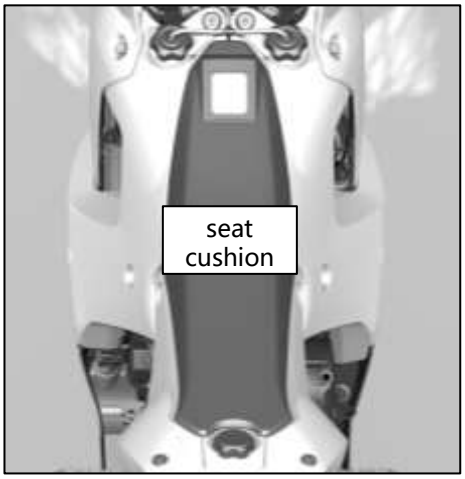
Seat cushion → front trim parts assembly → front fender → front brake oil pipe pressure plate → front shock absorber trim parts (left and right) → engine lower guard → hood bracket → lamps → handlebar → front left and right fuel tank → rear fuel tank → whole vehicle wiring harness → vehicle electrical → front brake caliper → front wheel → front shock absorber → upper linkage plate → lower linkage plate and steering column assembly → rear wheel → rear brake caliper → rear suspension assembly → flat fork → exhaust full section → radiator left and right → oil cooling radiator → air filter assembly → throttle assembly → engine.



※Cushion assembly

Disassembly/Installation
Remove the following components.

Pull down on the seat pull cable while pulling the rear end of the seat up and out of the lock, then remove the seat diagonally upward to the rear.



Install the seat cushion:

1. Snap the front and rear pins of the saddle assembly into the frame slot respectively.
2. Align the saddle locking pin with the locking hole and press down on the rear of the saddle, the locking pin will be inserted into the saddle locking hole and automatically locked by the latch. Gently pull upward to ensure the cushion is firmly locked in place.
3. When the seat cushion is closed, the seat cushion lock will automatically lock.

※Front trim assembly
Disassembly/Installation
Remove the following parts.

- Remove Fig. 1, Fig. 2 - 3 left and right 1/4-turn quick-lock bolts at position [1].
- Removal of the front trim of the fuel tank.

Install in the reverse order of disassembly.

Fig **1**

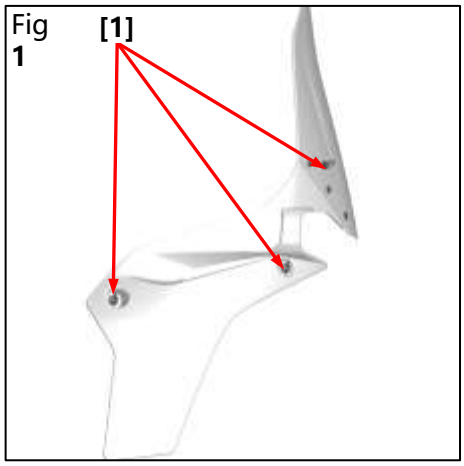
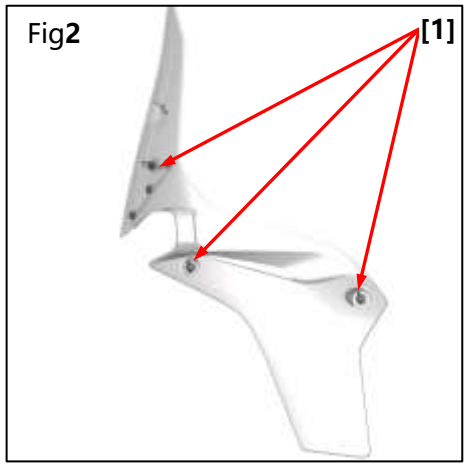


Fig**2**



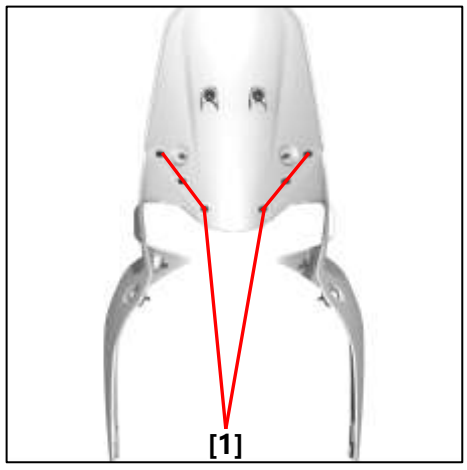
※Front windshield

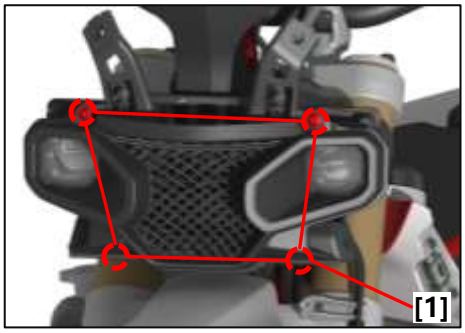
Disassembly/Installation
Remove the following parts.

- Remove the 6 hexagon socket step screws [1];

Install in the reverse order of disassembly.

Caution.
-Insert the tabs sequentially from the front, taking care not to remove the washers.

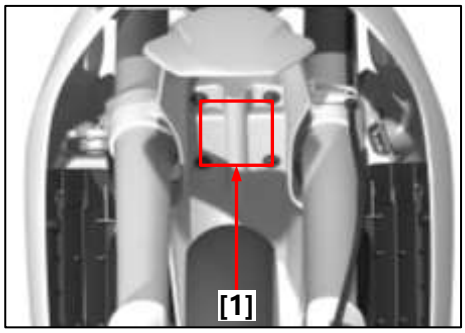




※Headlamp cover
Disassembly/Installation
Remove the following components.

- Remove the 4 hexagon socket step pan head step screws [1];

Install in the reverse order of disassembly.



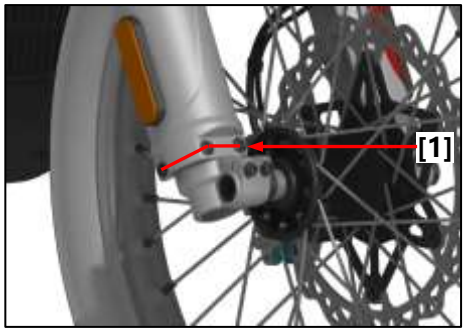
※Front fender

Disassembly/Installation
Disassemble the following parts.

- Remove 4 inner hexagonal flange bolts [1] and 4 flat washers 4 flanged bushings;

Install in the reverse order of disassembly.

※Front shock absorbing trim parts (left and right)

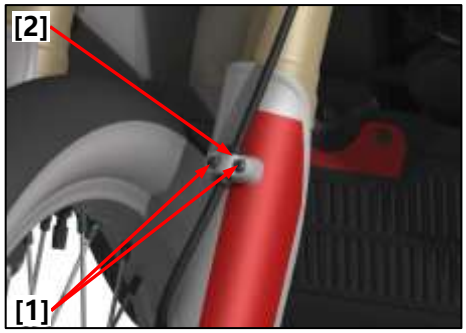


Disassembly/Installation
Disassemble the following components.

- Removal of 3 hexagonal flower head step bolts [1].
- Removal of the front shock absorber trim right.
- Removal and installation of the left shock absorber trim member as above.

The installation order is the reverse of the disassembly order.

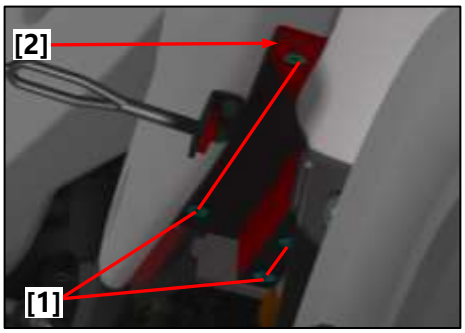
※Front brake tubing press plate



Disassembly/Installation
Remove the following parts.

- Remove 2 x M5x10 internal hexagonal screws [1];
- Remove the oil tube clamps [2];

Install in the reverse order of disassembly.

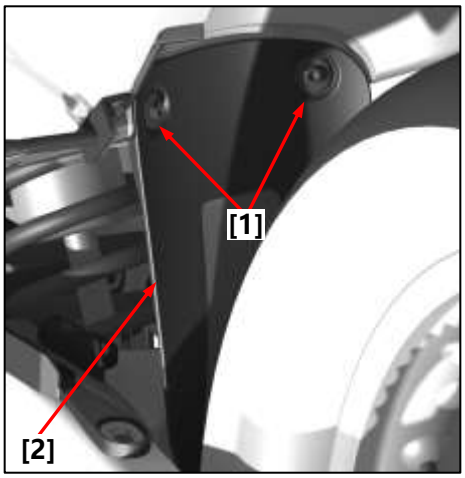


※Rear tank protective cover

Disassembly/Installation
Remove the following components.

- Remove the 5 hexagonal countersunk head screws [1].
- Removal of the rear fuel tank protective cover [2].

Install in the reverse order of disassembly.



※Rear wheel water barrier leather

Disassembly/Installation
Disassemble the following parts.

- Remove the 2 inner hexagonal flange bolts [1];
- Remove the rear wheel water barrier skin [2];

Install in the reverse order of disassembly.

Caution.
-The rear wheel water barrier is a rubber product, if it is deformed and damaged, replace it in time.

※Rear tail cover (factory edition)

Disassembly/Installation
Remove the following components.

- Removal of 2 hexagonal pan head bolts [1] in the position of Fig. 1.
- Removal of 2 tailpack mounting step bolts [2] in the position of figure 1.
- Removal of 3 cross slotted large pan head self-tapping bolts [3] in position Figure 2.
- Removal of the rear tailcap [4] in position Figure 2.

The installation order is the reverse of the removal order.

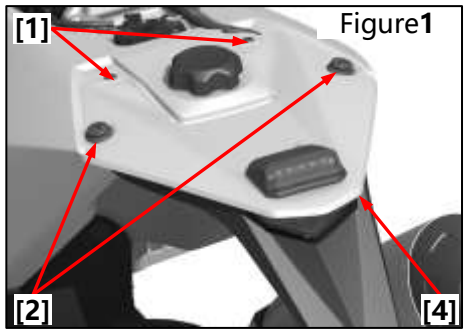


Figure**1**

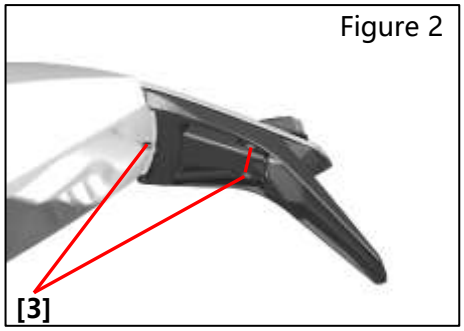


Figure 2

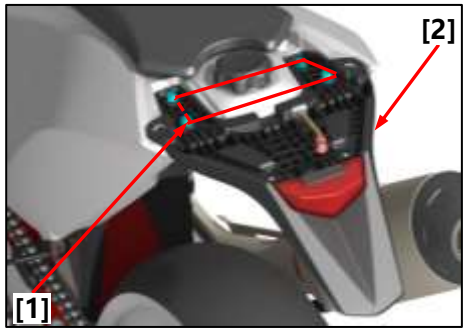
※Rear fender back section (factory edition)

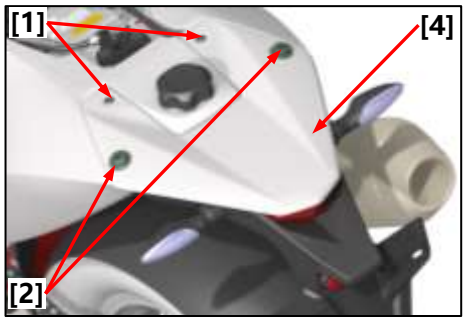
Disassembly/Installation
Remove the following components.

- Disconnect the taillight wiring harness.
- Removing the four inner hexagonal flange bolts [1].
- Remove the rear mudguard rear section [2].

Install in the reverse order of disassembly.

Torque.
Rear mudguard rear section and rear fuel tank attachment bolt
M8x25
15 N.m (1.5 kgf.ft, 11 lbf.ft)

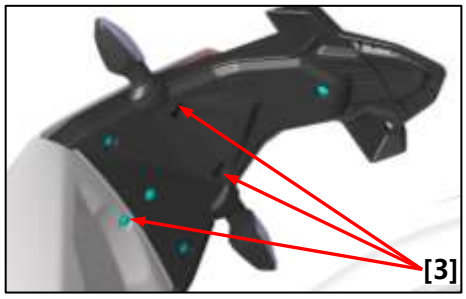




※Rear tail cover（regular edition）

Disassembly/Installation
Disassemble the following parts.

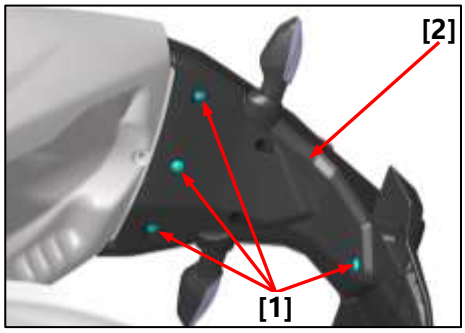
- Remove 2 hexagonal pan head bolts [1];
- Remove 2 tail pack mounting step bolts [2];
- Remove 3 self-tapping nails [3];
- Remove the rear tailcap [4];



The installation order is the reverse of the disassembly order.

※Rear fender liner（regular edition）

Disassembly/Installation
Disassemble the following parts.

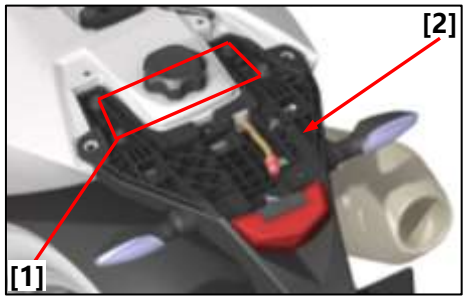


- Remove 4 self-tapping nails [1];
- Remove the rear fender liner [2];

Install in the reverse order of removal.

※Rear fender back section（regular edition）

Disassembly/Installation
Remove the following components.

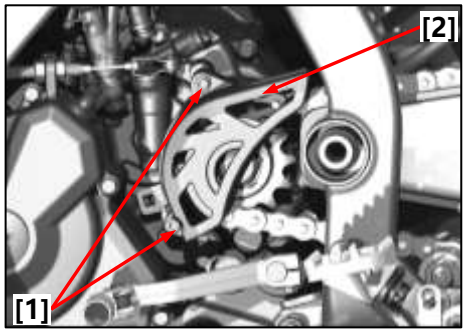


- Disconnect the tail harness;
- Remove the four inner six flower hexagonal flange bolts [1];
- Remove the rear mudguard rear section [2];

Install in the reverse order of disassembly.

Torque.
Rear mudguard rear section and rear fuel tank attachment bolt
M8x25
15 N.m (1.5 kgf.ft, 11 lbf.ft)

※Engine sprocket cover

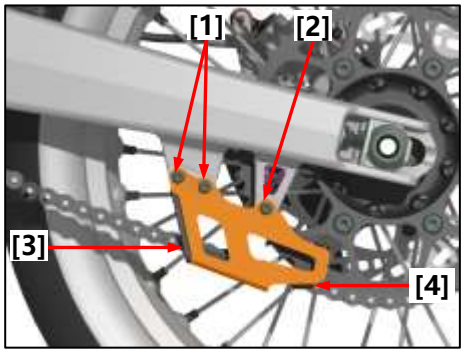


Disassembly/Installation
Remove the following parts.

- Remove the 2 small sprocket cover bolts [1];
- Remove the small sprocket cover [2];

The installation order is the reverse of the disassembly order.

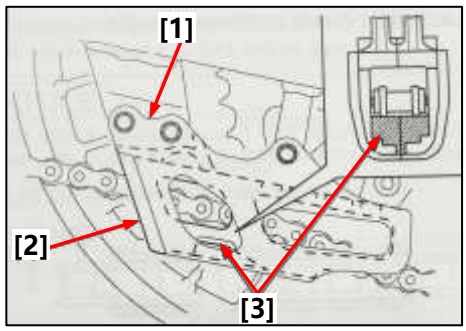
※Chain guide box



Disassembly/Installation
Disassemble the following parts.
- Remove 2 x M6x55 hexagonal socket head cap screws [1];
- Remove 1 x M6x12 hexagonal bolt [2];
- Pull out the drive chain guide slider [3];
- Remove the empty chain guide box [4];

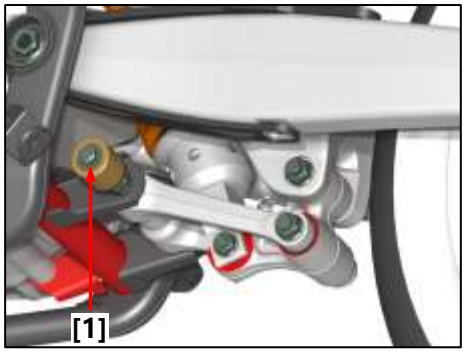
The installation order is the reverse of the disassembly order.

Torque.
Chain guide box mounting bolts [1].
Chain guide box mounting bolts [2].
10 N.m (1.0 kgf.m, 7.0 lbf.ft)

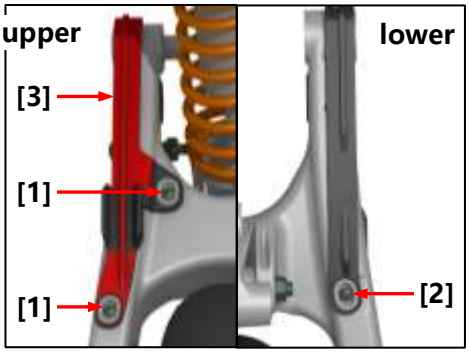


Check the chain guide box [1] for deformation damage.
Damage / deformation → Replace.
Caution.
If the metal frame of the chain guide box is deformed and hits the drive chain, it causes the drive chain to fall off, wear or noise.
Check if the drive chain guide slider [2] is worn.
If the chain guide slider is worn to the position of the limit mark [3], replace the drive chain guide slider.

※Chain guide sprocket



Check whether the lower guide sprocket [1] is excessively worn or the guide sprocket bearing is stuck.
If necessary, replace promptly.
Wear limit: 2mm (mm)
Caution.
When disassembling, be sure to use new bolt nuts.
Torque.
Lower side fastening guide sprocket nut.
22 N.m (2.2 kgf.m,18 lbf.ft)

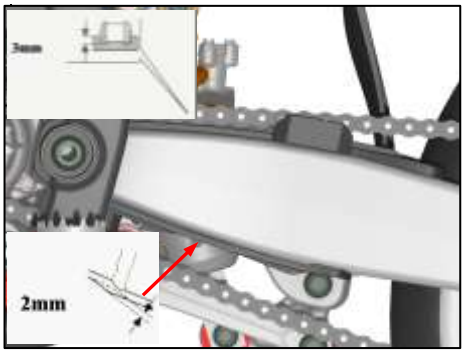


※Chain Guard

Disassembly/Installation
Disassemble the following parts.

- Remove 2 Phillips half-round head screws [1], [2] from the upper part of the flat fork;
- Remove 1 Phillips half-round head screw from the lower part of the flat fork [3];
- Remove the chain guard [4];

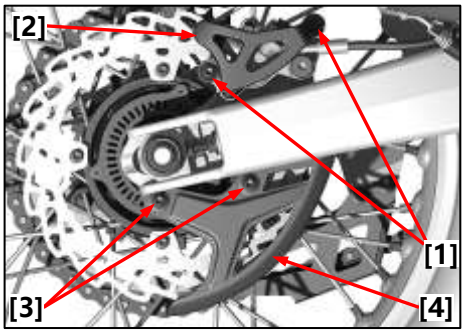
The installation order is the reverse of the disassembly order.
Torque.
Chain retainer mounting screw x3 [1].
8.0 N.m (0.8 kgf.ft, 6.0 lbf.ft)



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.

※Rear brake caliper trim/rear disc brake trim



Disassembly/Installation
Remove the following parts.

- Remove 2 screws [1] to remove the caliper trim [2];
- Remove 2 screws [3] to remove the rear disc brake trim [4];

The installation order is the reverse of the disassembly order.

Note: Regular edition does not have rear disc brake trim.

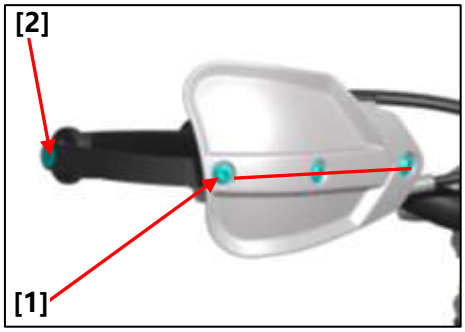
※Hand windshield-(left and right) (factory edition)

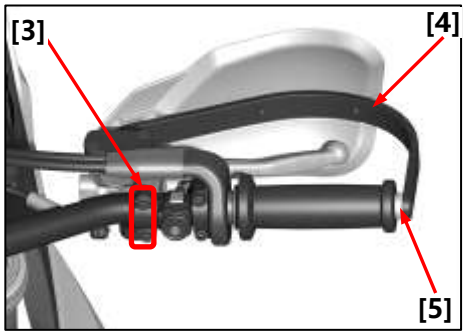
Disassembly/Installation
Remove the following components.

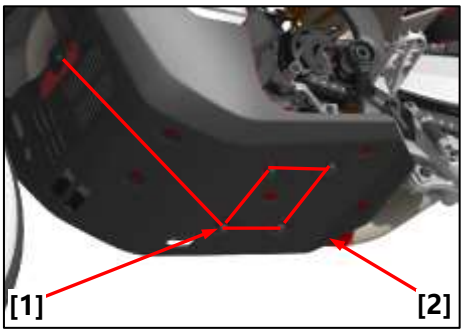
- Removal of 3 hexagon socket step screws [1].
- Removal of hexagon socket countersunk head screws [2].
- Removal of 2 inner hexagonal socket head flange bolts [3].
- Remove the hand windshield bracket [4].
- Remove the hand windshield bushings [5].
- Disassemble in the same manner as left and right.

The installation order is the reverse of the disassembly order.

Note: -regular edition without hand windshield





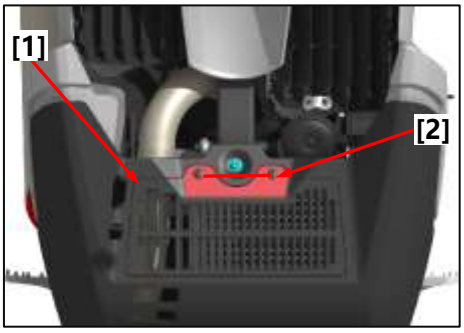


※Engine lower guard assembly

Disassembly/Installation
Disassemble the following parts.

- Removal of 5 inner hexagonal flange bolts [1].
- Remove the lower shield assembly [2].

Install in the reverse order of disassembly.

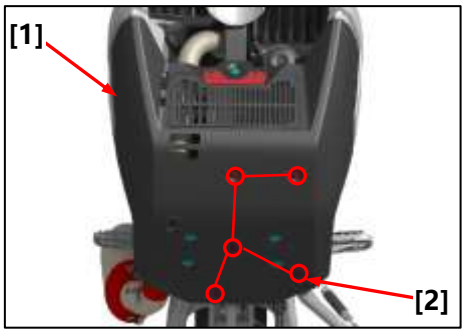


※Oil cooling grille

Disassembly/Installation
Remove the following components.

- Removal of 2 hexagonal screws [1].
- Removal of the oil cooling grille [2].

Install in the reverse order of disassembly.



※Emergency water bottle (regular edition without emergency water bottle)

Disassembly/Installation
Remove the following components.

- Removal of the lower shield [1].
- Removal of the five inner hexagonal flange bolts [2].
- Removal of the emergency water bottle [3].

Install in the reverse order of disassembly.

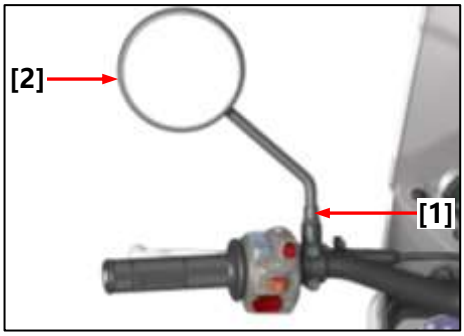
※Tool box cover

Disassembly/Installation
Disassemble the following components.

- Unscrewing the 1/4 turn quick-lock bolt [4].
- Removal of the tool box cover [5].

Install in the reverse order of disassembly.

※Rearview mirror assy (regular edition)

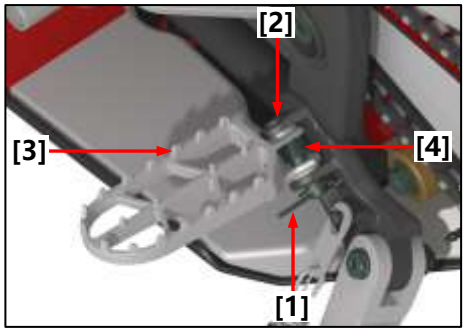


Disassembly/Installation
Disassemble the following parts.

- Loosen the nuts [1].
- Rotate the rearview mirror until the mirror [2] is removed.
- Removal and installation of the right side mirror as for the left.

The installation order is the reverse of the removal order.

Note: factory edition does not have this mirrors.

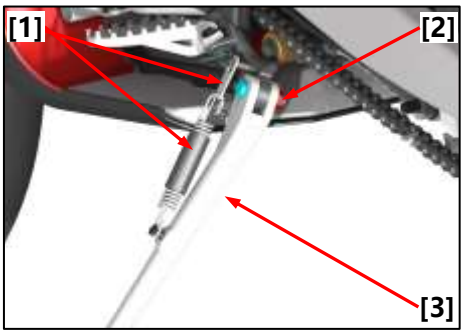


※Left and right side of foot pedal assembly

Disassembly/Installation
Disassemble the following parts.

- Removing the cotter pin and flat pad [1].
- Removal of the main foot pin [2].
- Removing the foot pedal [3] and torsion spring [4].
- Installing and disassembling the same left and right.

The installation order is the opposite of the disassembly order.
Factory edition and regular edition disassembly and assembly are the same as above.



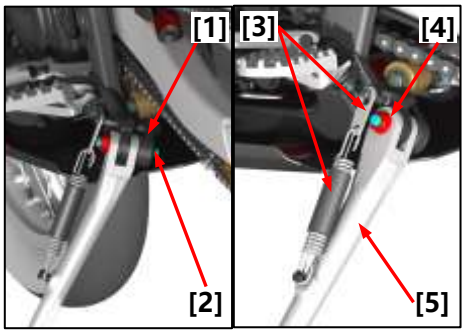
※Side stand assembly (factory edition)

Disassembly/Installation
Remove the following components.

- Removal of side bracket tension springs and side bracket mounting pegs [1].
- Removal of the nut [2] to remove the special bolt for the side bracket.
- Removal of the side bracket [3].

The installation order is the reverse of the disassembly order.

※Side stand assembly (regular edition)

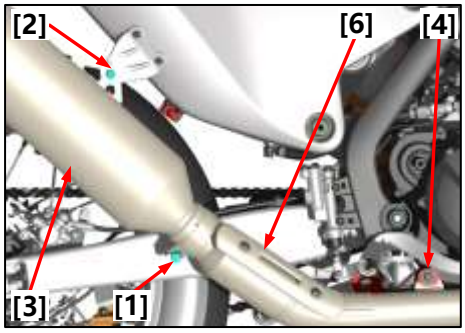


Disassembly/Installation
Remove the following components.

- Disconnect the side bracket flame failure switch harness [1].
- Removing the flame failure switch fastening bolt [2].
- Removing the side bracket tension spring [3] and the side bracket mounting peg.
- Remove the nut [4] to remove the special bolt for the side bracket.
- Removing the side bracket [5].

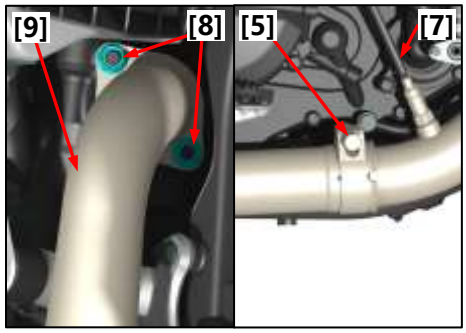
The installation order is the reverse of the disassembly order.

※exhaust assembly (regular edition)



1. Exhaust mid-section, tail section
Removal/Installation
Remove the following components.
- Removal of the hoop locking bolt [1].
- Remove the exhaust tail section locking bolt [2].
- Removing the exhaust tail section [3].
- Remove the exhaust mid-section bolt [4].
- Loosen the hoop locking bolt [5].
- Removing the middle section of the exhaust [6].
The installation order is the reverse of the removal order.

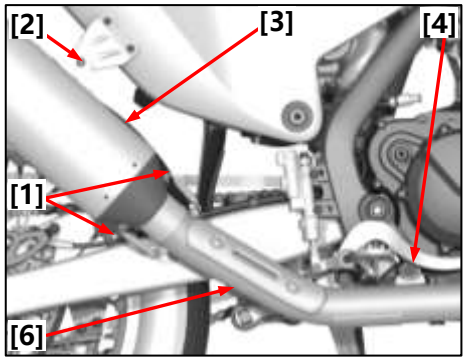
2. Exhaust front section

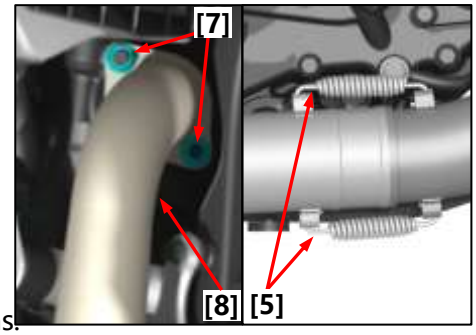


Disassembly/Installation
Remove the following components.
- Disconnect the oxygen sensor harness connector [7].
- Remove the exhaust front section fastening nut [8].
- Remove the front section of the muffler [9].
1. Check.
-Exhaust seal, gasket.
Exhaust air leakage → Replace.
-Exhaust pipe front middle end section
Cracked / damaged → Replace.

※exhaust assembly (factory edition)

Exhaust front section mid section, tail section





Disassembly/Installation
Remove the following parts.
- Removal of exhaust tail section tension spring [1].
- Remove the exhaust tail section bolts [2].
- Removing the exhaust tail section [3].
- Removal of the exhaust mid-section bolts [4].
- Removal of the exhaust mid-section and front section tension springs x2 [5].
- Removal of the middle section of the muffler [6].
- Removal of the muffler front section fastening nut [7].
- Removal of the front section of the muffler [8].
1. Check.
-Exhaust gasket.
Exhaust air leakage → Replace.
-Exhaust pipe front middle end section
Cracked / damaged → Replace.
-Exhaust tension spring
Broken / damaged → Replace.

Caution.

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

EFI

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.

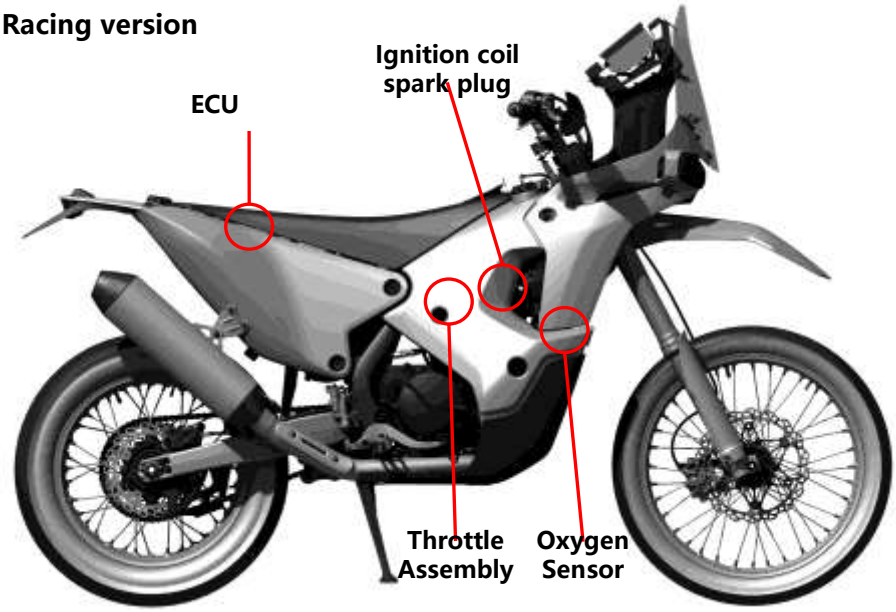
-The car adopts the trigger signal of 24-2 teeth to identify the speed.

The following color codes used are indicated through this section

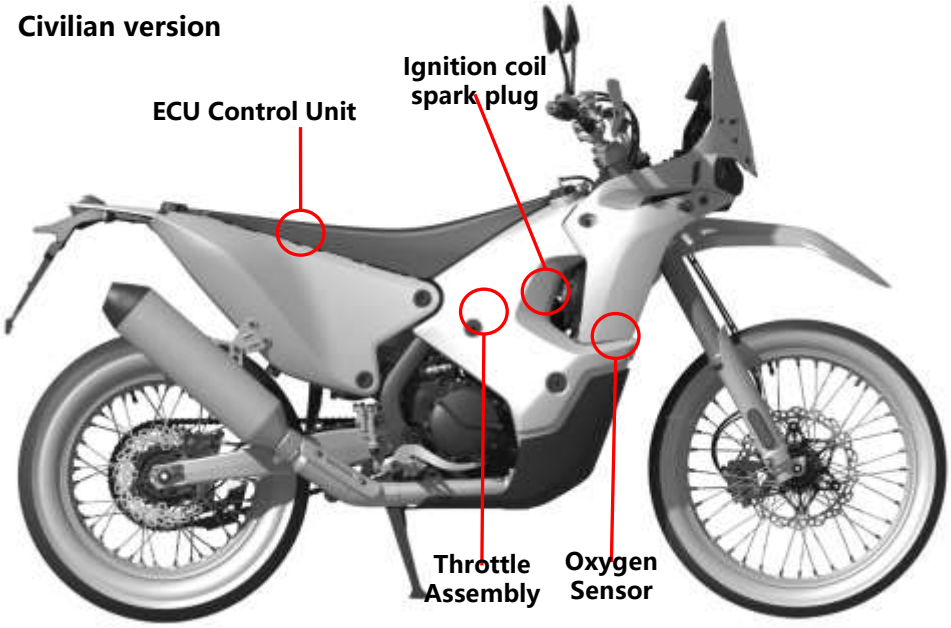
Bl=black	G=green	Lg=light green	R=red	Y=yellow
Br=brown	Gr=gray	O=orange	V=violet	
Bu=blue	Lb=light blue	P=pink	W=white	

2. System location

Racing version



Civilian version



3. EFI system-related components

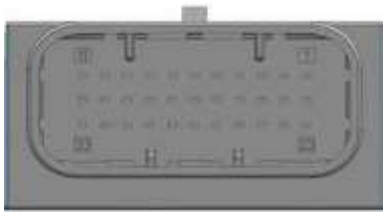
3.1 ECU electronic control unit

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.

ECU Form Factor

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 Connector Outline View

Function of each ECU pin.

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 _IIIR	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

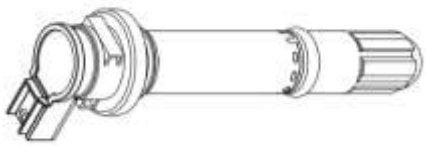
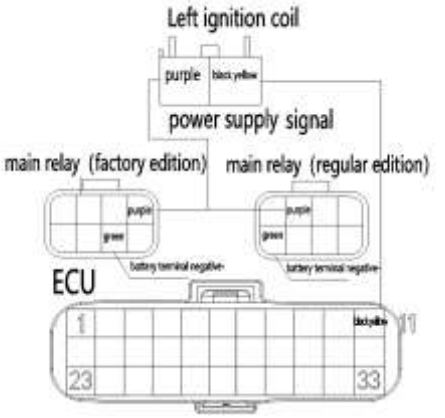
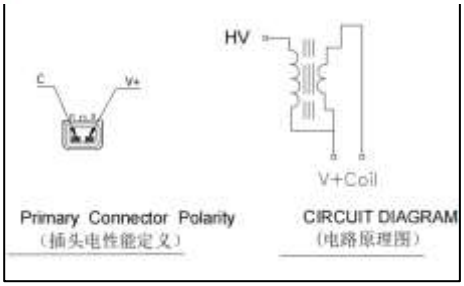
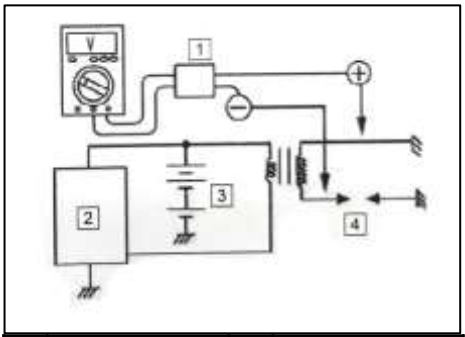


Fig. 1







1	**Peak voltage measuring instrument**	**3**	**Battery**
2	**ECU**	**4**	**Spark Plug**

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.

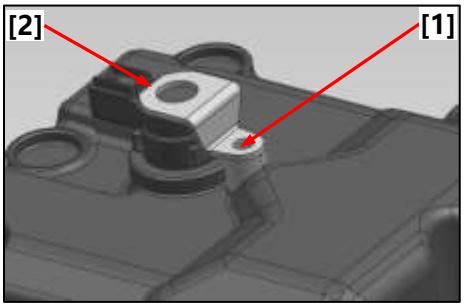
Measure the secondary ignition voltage.

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.

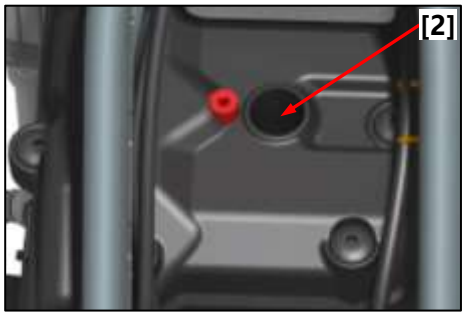
Ignition coil parameter table

1. Static parameters
Primary resistance: 1.3±10%Ω
Secondary resistance: 8.7±10%KΩ
Primary inductance: 3.0±15%mH
Secondary inductance: 16±15%H
2.Dynamic parameters.
Supply voltage: 14±0.5V
Primary current: 7±0.9A
Ignition pulse width: 2.05±0.5msec
Secondary high voltage: MIN22.5KV at 25pF load
Ignition energy： MIN21.5mj
Operating temperature: -35℃-125℃

3.3 Spark plug

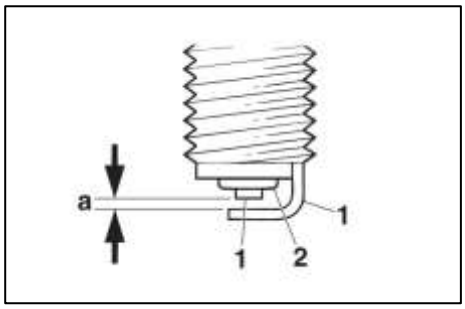


Caution.
-Before removing the spark plug use an air gun to blow and clean the spark around the plug base and also make sure that no dust has fallen into the cylinder.
1. Check.
● Spark plug type
Incorrect → Replace.
Manufacturer / Model
NGK/LMAR8A-9CR8E



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)

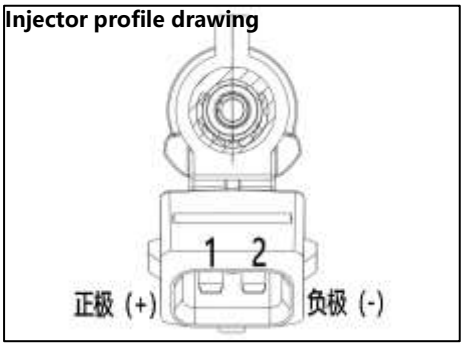


4. Measurement.
- Spark plug gap "a"
(Thickness gauge measurement)
Out of specification → Adjust the gap.
Spark plug gap
0.80-0.90 mm (0.031-0.035 in)

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

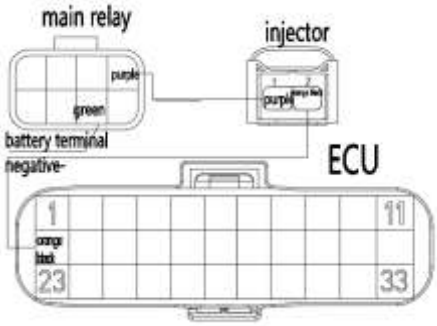
One end of the injector is mounted on the injector holder, and the other end is connected to the fuel pipe through the injector cap. It injects fuel within the specified time according to the instruction of ECU, by which fuel is supplied to the engine and atomized. This injector adopts four-hole injection 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)

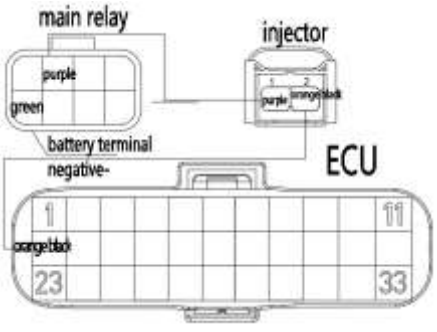
factory edition wiring diagram

Fig1



regular edition wiring diagram

Fig1



Injector resistance: 12.5Ω±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±0.01mpa

When the flow rate is 40L/h, the corresponding rated pressure value 330±10 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.

Fuel pump outline drawing

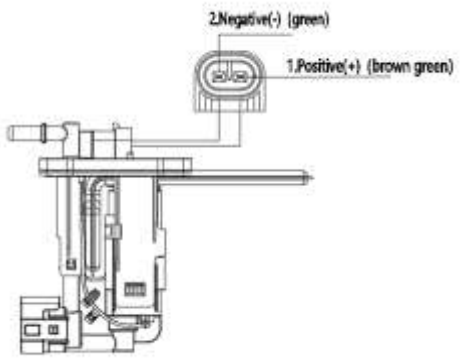


Fig1

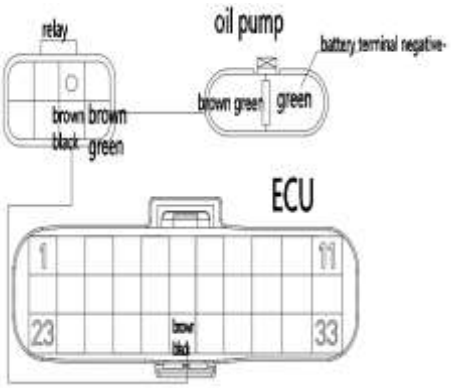


Figure 1: shows the wiring diagram of the fuel pump and ECU.

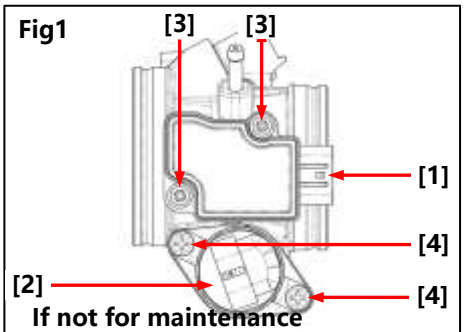
Measuring oil pressure

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.

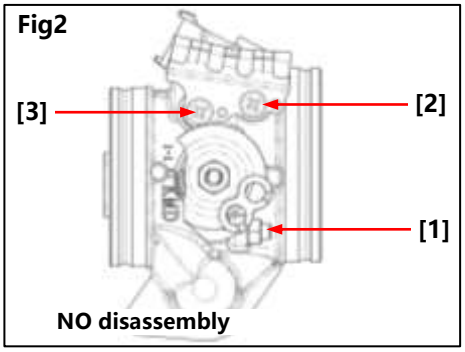
Fig1



If not for maintenance disassembly is prohibited

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

Fig2



NO disassembly

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

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_3, 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.

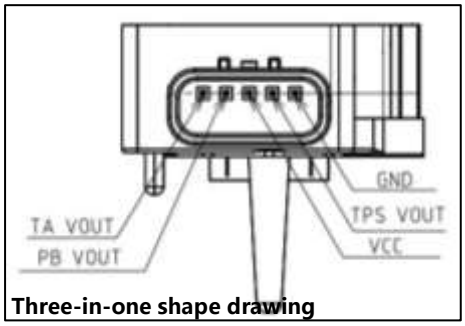
Throttle valve body inspection.
1. flexible movement of the throttle plate, no stalling.
2. throttle body and the oil and gas channel without foreign matter (foreign particles size <0.34mm).
3. Each product without omissions, misgrouping, under-products, internal parts installed securely without falling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

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.



Three-in-one shape drawing

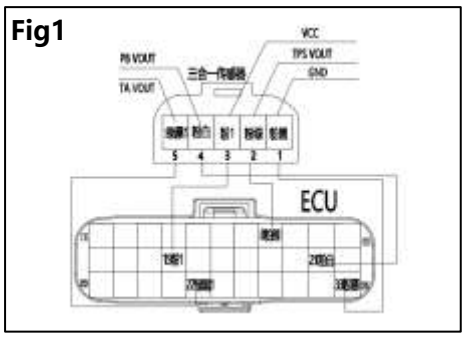
Intake Pressure

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.



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)

Characteristic parameters of intake air temperature sensor

Operating temperature: -40C°/+130C°
Rated voltage: pull-up resistor 1 k operating at 5V or at a constant current of 1mA
20C° rated voltage: 2.5 kΩ ± 5%

Installation.

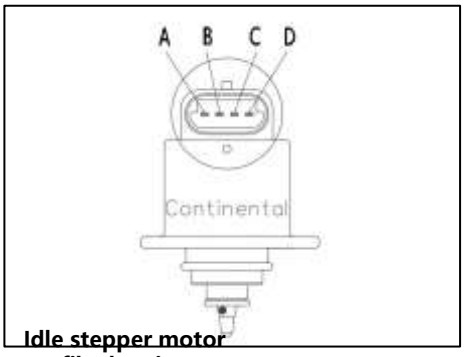
The permissible installation range, which ensures that condensation does not form inside the sensor, as condensation can damage the sensitive components inside the sensor.

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



Idle stepper motor profile drawing

Fig1

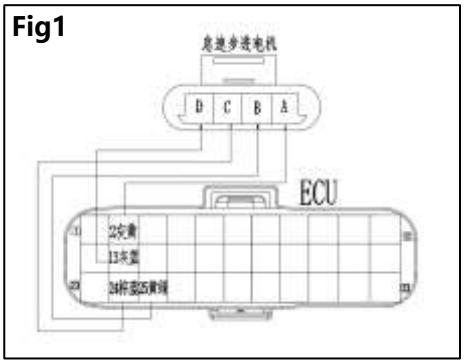
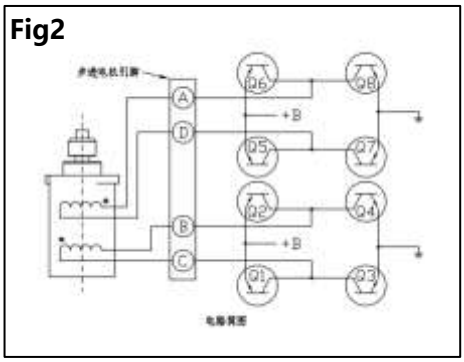


Fig2



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.

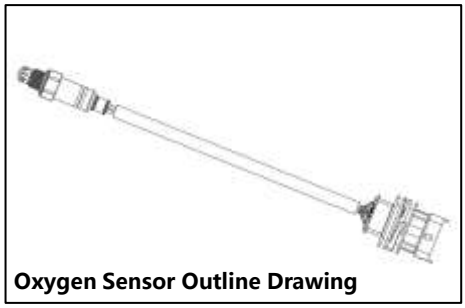
The following table shows the characteristic parameters of the idle stepper motor.

Characteristic parameters			
NO	Item	Spec	Terms
1	Rated Voltage	12V DC	
2	Mini/maxoperating voltage	7.5V-14V	
3	Phase Resistor	53±5.3Ω	27℃
4	Operating temperature	-40℃-125℃	

3.9 Oxygen sensor

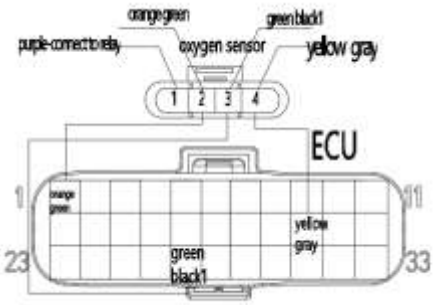
This sensor is used in the feedback system of the electronically controlled fuel injection device to achieve closed-loop control and improve the accuracy of the ECU's control of the air-fuel ratio, which is installed on the front section of the exhaust pipe to determine the oxygen content in the exhaust 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.

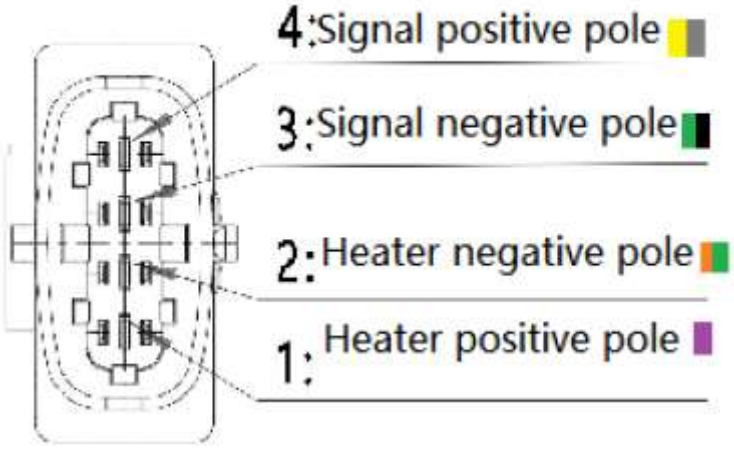


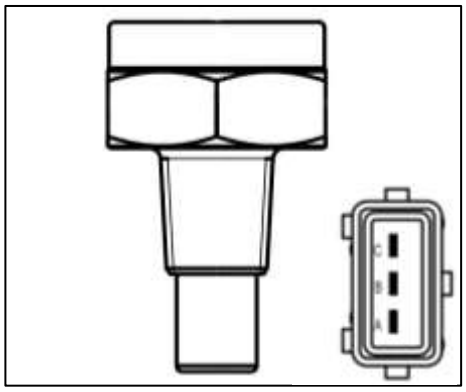
Oxygen Sensor Outline Drawing

Fig1



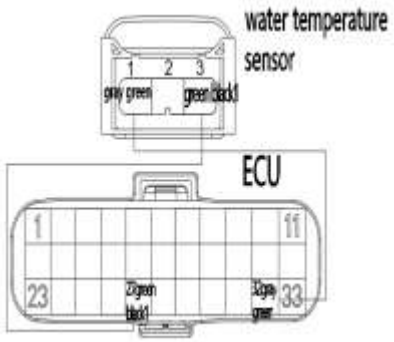
Definition of each pin function.





Water temperature profile
A: Temperature sensor signal +
C: Signal ground-

Fig1



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

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.

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 ° ± 10 °), OUT pin signal to the ECU, the ECU control engine off, so as to achieve the protection of the driver and the vehicle.

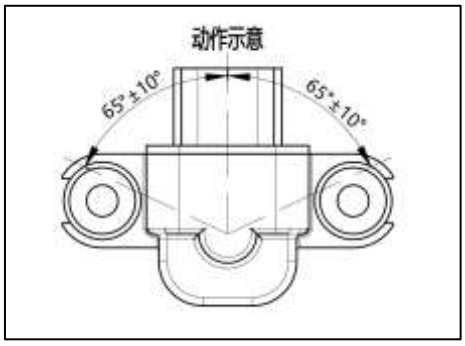
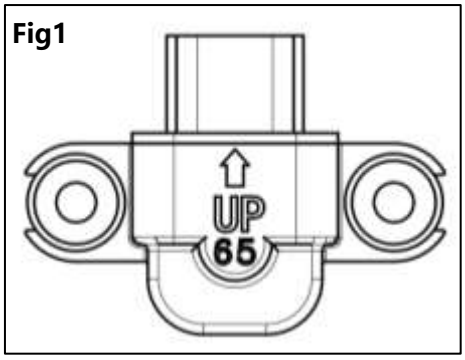
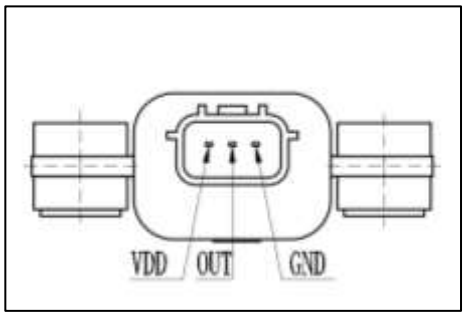


Fig1

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



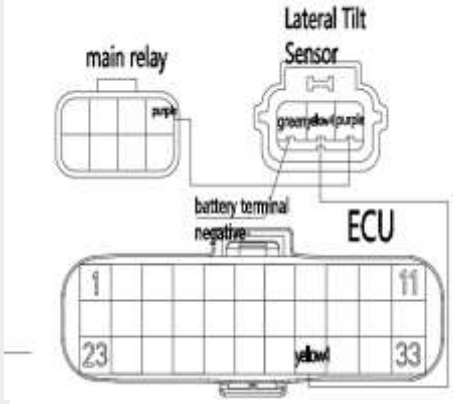
Racing version pin function definition.
VDD: connected to the negative battery terminal - (green)
OUT: connect to ECU30 # pin (yellow 4)
GND: connected to the main relay (purple)

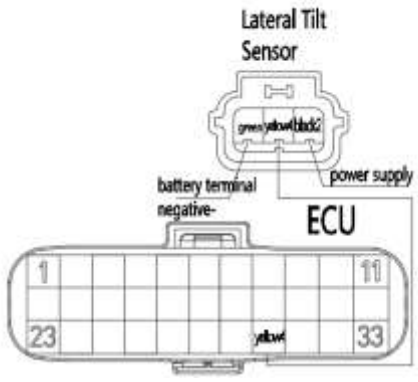


Pin function definition for civilian version.
VDD: connected to the negative battery terminal - (green)
OUT: connect to ECU30 # pin (yellow 4)
GND: connected to the power supply (purple)

regular edition wiring diagram

factory edition wiring diagram





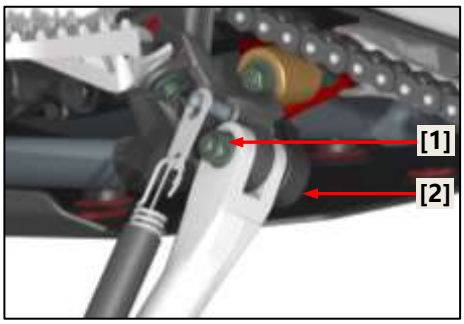


Fig1

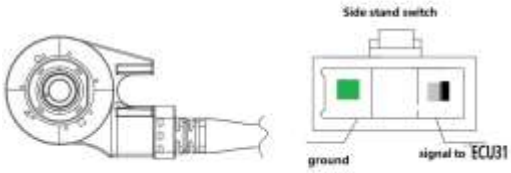


Fig 1: shows the wiring diagram of the side bracket switch and ECU.

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.

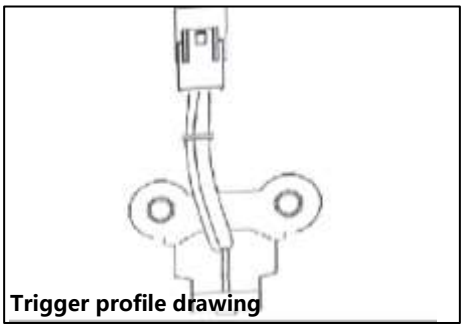
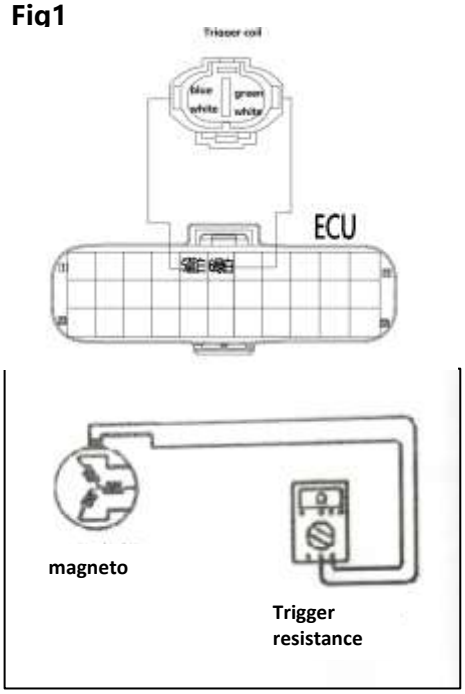
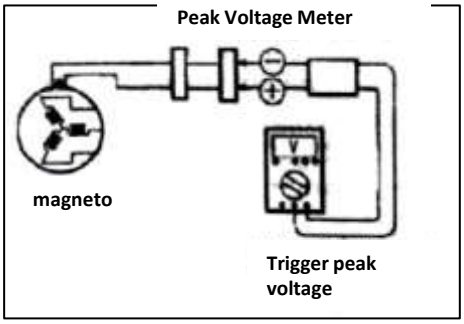


Fig1

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



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: ≥ 2V (300r/min)

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

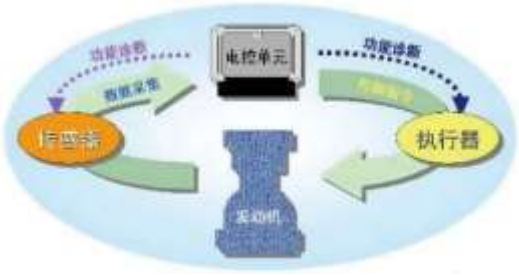
4. System fault diagnosis function introduction

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

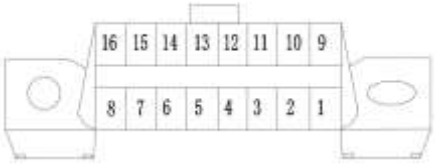
4.2 Fault Lamp Description and its Control Strategy

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.

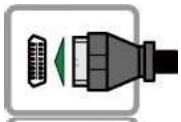
Tool:
Vacuum table
Function.
To check the pressure in the intake manifold.

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

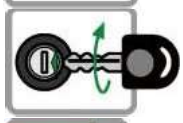
Tool:
Fuel pressure gauge
Function.
To check the pressure of the fuel system
to determine the fuel system pump and fuel pressure regulator in the fuel system.
Operation.

5. Inspection and diagnosis process

5.1 How to use the diagnostic instrument

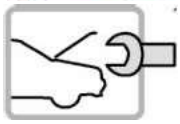


1. Connect the diagnostic instrument to the diagnostic interface.



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.

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

Repair Tips. 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℃, the engine runs with a certain load for more than 30min, and the rise in intake air temperature is still less than 3℃.	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 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 tacho sensor pulse signal (open or short circuit)
Fault cause: When the engine is started the ECU monitors both the tacho sensor signal and other signals.
By the signal reasonableness system is judged to be the loss of tacho sensor signal.

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

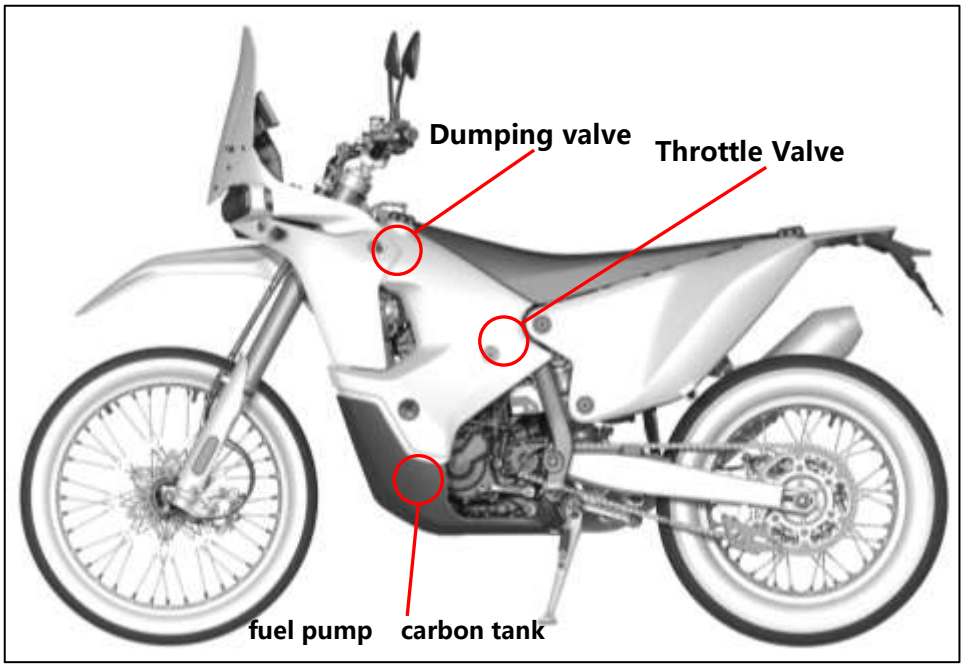
Fuel System

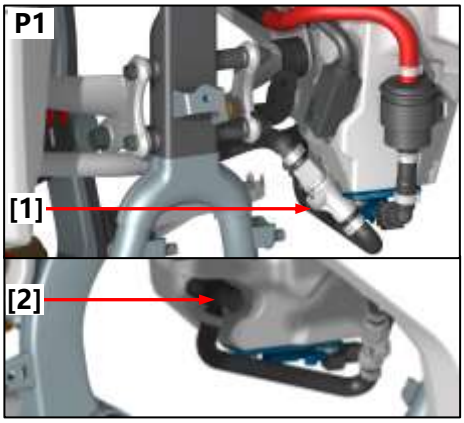
Maintenance information

Overview

-Bending or twisting control cables can interfere with smooth operation and can cause cables to stick or become tangled, which can cause loss of vehicle control.
-Work in a well-ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
-Release fuel pressure in the system before disconnecting the fuel supply hose.
-Don't open the throttle from fully open to fully closed after removing the throttle cable. It may result in improper idle operation.
-Seal the air inlet with a piece of tape or clean cloth to prevent dirt and debris from entering the engine after the throttle body is removed.
-Do not damage the throttle body. This may cause the throttle to operate incorrectly.
-Prevent dust and debris from entering the throttle bores and air passages after the throttle body is removed. Clean them out using compressed air if necessary.
-Do not loosen or tighten the white painted nuts and bolts on the throttle body. Loosening or tightening them will cause throttle valve and idle speed control failure.
-Do not apply commercial carburetor cleaner to the inside of the throttle bore.
-Throttle body parts not shown in this manual should not be removed.
-For injector and idle air control valve repairs, throttle body removal/installation is required.
-For checking the fuel level sensor.

Parts Location





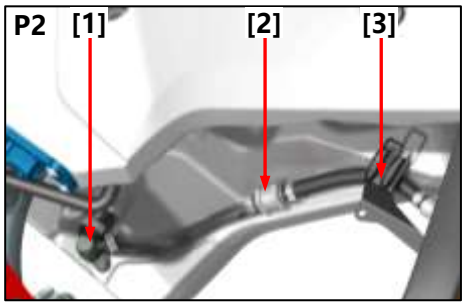
※Fuel Line Inspection

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.

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

1. Check (as right P1) the connection condition such as aging damage of the left and right fuel tank connecting hose quick connect connector [1].

2. Check (as right P1, 2) whether the left and right fuel tank connecting hoses and double-hole over fuel bolts [1], [2] are loose, damaged or leaking.

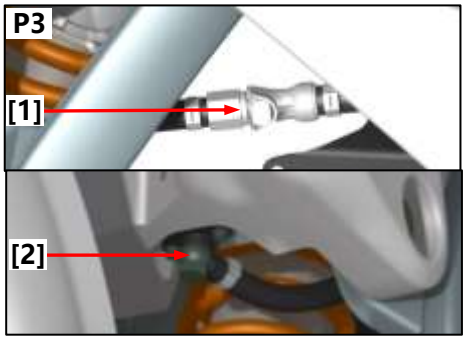


3. Check (such as right P2) whether the fuel check valve [2] and single-ear induction clamps are loose, damaged or leaking.
Is the rear fuel tank and front right fuel tank connection hose accurately stuck into the wire hook bracket [3].

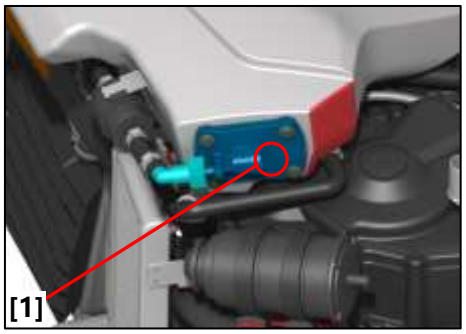
4. Check (e.g. right P3) whether the connection condition of the rear tank and the front right tank connecting hose quick-connect fitting [1] is damaged by aging.

5. Check (e.g. right P3) whether the rear fuel tank connecting hose and the double-hole over-fuel bolt [2] are loose, damaged or leaking.

If the quick connect fitting and its surroundings are dirty, clean them.
Replace them if necessary.



Contact your dealer for replacement of the injector fitting/oil supply hose assembly.
Caution.
-Be careful not to damage the fuel supply hose fitting and fuel line. -Do not use tools.

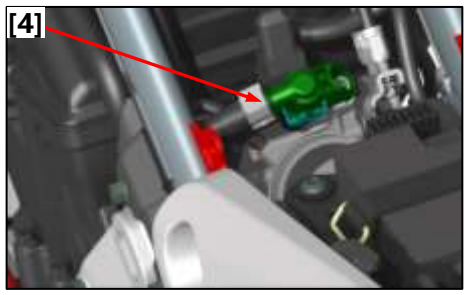


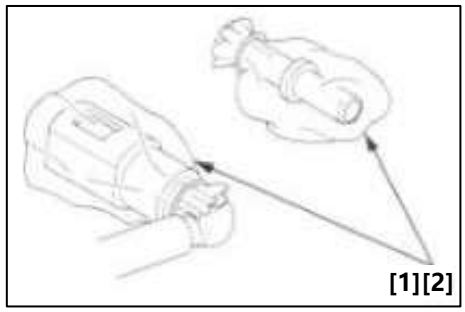
※Fuel Pressure Relief

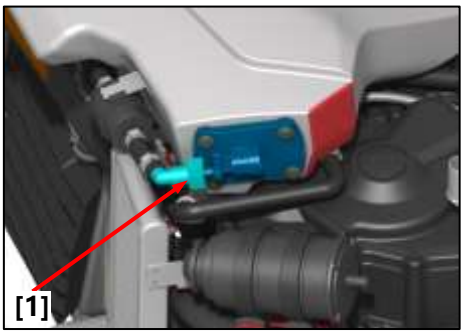
Caution.
-Before disconnecting the fuel supply hose, relieve system pressure as follows.
1. remove the lower engine shield assembly.
2. disconnect the fuel pump 2P (black) fitting [1].
3. start the engine and allow it to idle until the engine stalls.
4. Turn off the ignition switch.

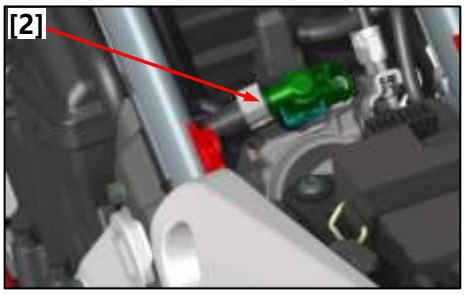
※ Quick Connect Removal

Disassembly
Caution.
-Before disconnecting the fuel supply hose, clean around the quick disconnect and make sure no dirt enters the fuel system.
Do not bend or twist the fuel supply hose. This may cause a fuel leak.
1. relieve fuel pressure.
2. Remove the seat cushion assembly.
3. Remove the front trim assembly.
4. Remove the lower engine shield.
5. remove the battery terminal bolt [1] disconnecting the negative (-) battery cable [2].
6. remove the front side 2 fuel tanks and air filter assembly waste gas pipe, leaky water pipe.
6. Press and hold the fuel connector release button [3], [4] respectively, and disconnect the quick connect connector from the fuel pump unit connector and the injector connector.
Caution.
-Drain the remaining fuel from the fuel supply hose into a suitable container.
-Wipe off any spilled fuel immediately.
-Be careful not to damage the slide retainer and hose. Do not use tools.
7. To prevent damage and entry of foreign objects, cover the disconnected connector [1] and fuel fitting end [2] with a plastic bag.









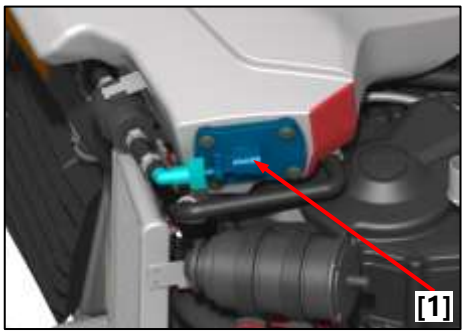
※ Quick Connect Head Installation

Caution.
-Do not bend or twist the fuel supply hose, this may cause fuel leaks.
-Do not reuse kinked or damaged fuel supply hoses.
-Do not use gloves or rags when installing quick-connect couplings.
1. Connect quick-connect fittings [1], [2] to the fuel pump unit connector and injector connector, respectively, while holding the quick-connect housing until you hear a "click".

Caution.
-Be careful not to damage the sliding ring and fuel supply hose.
-Do not use tools.
If connection is difficult, apply a small amount of oil to the fuel fitting end.
Make sure the connection is secure and the quick connect coupling is locked firmly in place; visually inspect and pull on the connector housing [1].
2. Connect the negative (-) battery cable [1].
Install and tighten the battery terminal bolts [2] to the specified torque.
Torque.
2.0 N-m (0.2 kgf-m ,1.5 lbf-ft)

※Increasing Fuel Pressure

1. Connect the fuel pump power supply wire quick plug connector (black) 2p[1]; 2. Temporarily left before the fuel tank is installed on the frame; 3. In the case of throttle fully closed, pull the clutch handle to the bottom, and press the starter switch; The engine will increase the fuel pressure to start; 4. Turn off the engine check whether there is a leak in the fuel line.



※Fuel pump unit

Removal/Installation

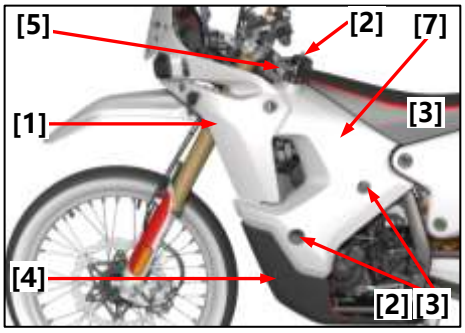
- Disassemble the front trim assembly [1];
- Disassemble the front fuel tank vent pipe [2];
- Disassemble the seat cushion assembly [3];
- Remove the lower engine shield assembly [4];

Before removing the fuel tank, disconnect the fuel pump supply line speed connector fuel line quick release fitting.

Remove the front fuel tank upper connecting bolts [5] and left and right side fuel tank connecting bolts [6], the left and right 3 of the turn over bushing [7] and the left and right fuel tanks [7].

The installation order is opposite to the disassembly order.

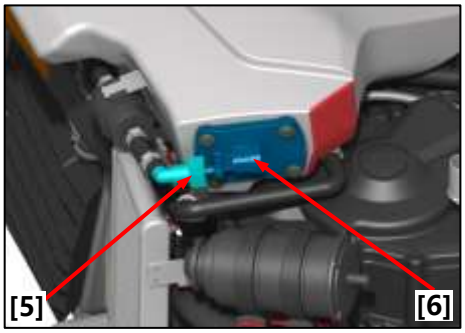
(The left and right side fuel tanks are installed in the same way)



Front fuel tank upper connecting bolt and side connecting bolt installation

Torque.

Fuel tank mounting nut. 22 N-m (2.2kgf-m, 16 lbMt)



Disassembly/Installation

Remove the following components.

Remove the fuel tank and clean around the fuel pump. Cross loosen the 4 mounting bolts [1] and remove them in several steps as shown in Figure 1. Remove the fuel pump and rubber seal [2].

Install in the reverse order of removal.

Caution.

-Be careful not to damage the fuel pump unit.

Drain the remaining fuel from the fuel pump unit into a suitable container and wipe off the spilled fuel immediately.

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

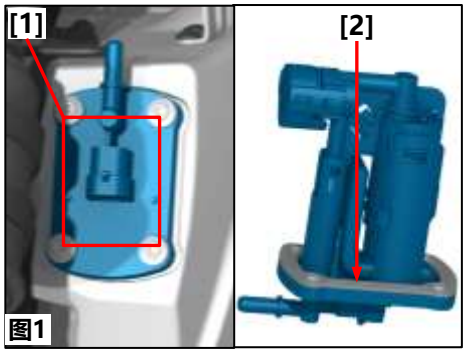
-Clean the rubber seal seating area of the fuel tank and fuel pump base plate to ensure that there are no foreign objects.

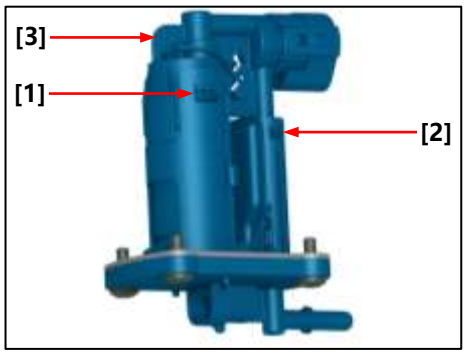
-Place the rubber seals with the tabs facing the fuel line.

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

Fuel pump mounting bolts.

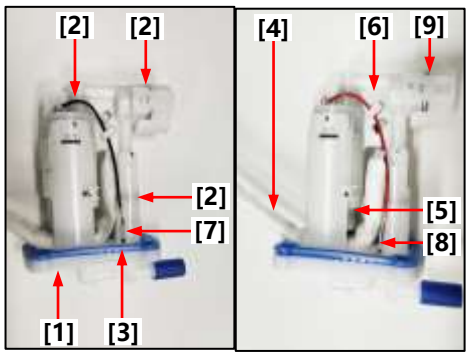
8 N-m (0.8 kgf-m, 6.0 lbf.ft)





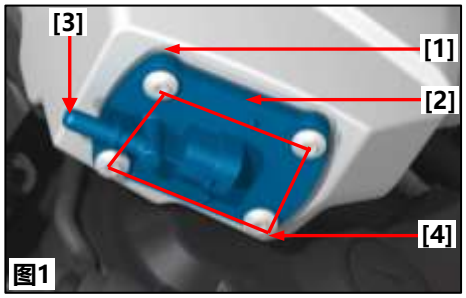
※Fuel pump filter

Remove/check/installation dismantling the pump unit disconnect pump motor wiring harness connector [7], [8]. As shown, open fuel pump bracket left and right sides of the card buckle [1], [2], remove the fuel pump bracket. Note: • don't use tools in order to avoid damage to the pump unit.



Disassemble the fuel pump unit as shown in the figure on the right.
- Fuel pump base [1].
- O-ring x3 [2].
- Rubber seal [3].
- Fuel filter (screen) [4].
- Fuel pump [5].
- Fuel pump unit bracket [6].
- Fuel pressure regulating valve [9].

Caution.
-Check the fuel filter for clogging, damage or deterioration, and replace it if necessary.
-Lay the black wire [7] and red wire [8] correctly.
-Align the rubber seal with the fuel pump base unit recess.
Install in the reverse order of removal.

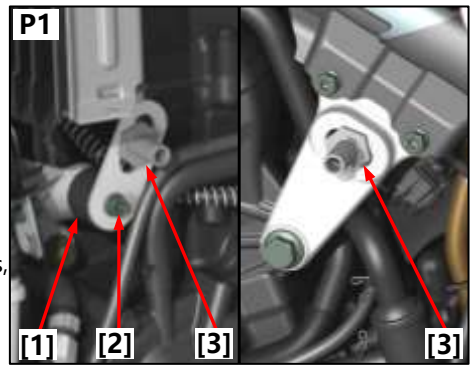


※Installation

Apply engine oil to the new rubber seal [1].
Install the following components.
- 4 x M5x16 fuel pump unit mounting bolts.

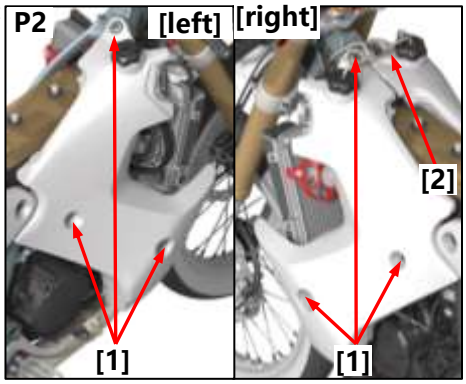
Caution.
-Make sure the rubber seal [1] is located in the fuel pump base recess [2].
Install the fuel pump bracket and fuel pump onto the fuel base.
-Align the fuel pump plate slots with the fuel pump unit lugs.
Install the fuel pump assembly so that the fuel fitting [3] is toward the left front of the fuel tank.
-Be careful not to damage the fuel pump unit.
Tighten the fuel pump unit mounting bolts [4] to the specified torque in the order shown in Figure 1.
Torque.
8.0 N-m (0.8kgf-m , 6lbf-ft)

※Front side fuel tank and rear fuel tank mounting fuel line connection check



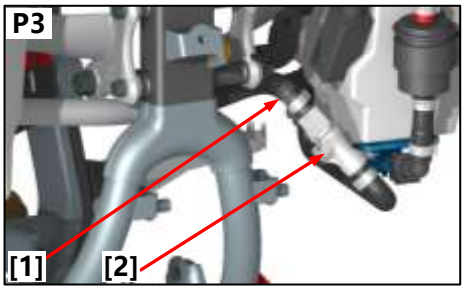
Disassembly/Installation
Remove the following.
Before installing the fuel tank, disconnect the fuel pump supply line speed connector fuel line quick release connector.
-Check the P1 rubber screw bolt [1] for looseness, breakage, and deterioration.
and tighten the bolts to the specified torque.
Torque: rubber screw [1]
22N-m (2.2kgf-m, 16 lbMt)

-Check P1 bolt [1] for looseness adjust tank mounting bracket to proper angle and tighten bolt to specified torque.
Torque: front fuel tank mounting bracket bolts [2];
15N-m (1.5kgf-m, 11 lbMt)

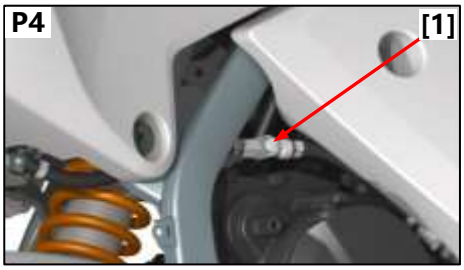


-Adjust the Figure 1 hexagonal nuts [3] to the proper position and tighten the bolts to the specified torque before installation.
Torque: front fuel tank mounting hex nut to frame connection [3];
15 N-m (1.5 kgf-m, 11 lbMt)
(Left and right side fuel tank mounting bolts are adjusted with the same locking torque)

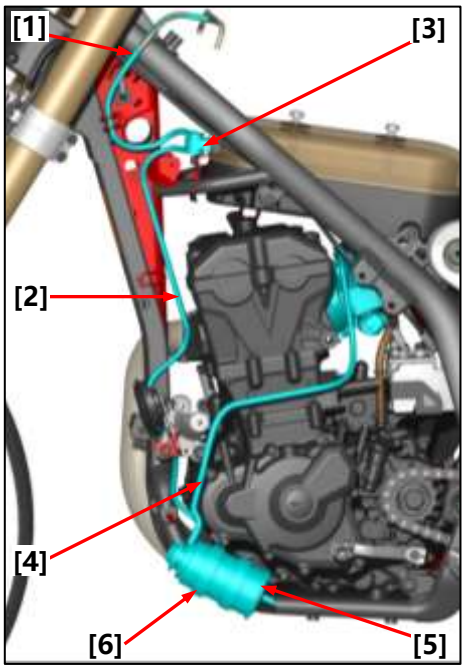
As P2.
first hang the right side tank on the frame and tighten the bolt through the turning over inch sleeve to the specified torque.
Torque: fuel tank mounting screw [1]
22N-m (2.2kgf-m, 16 lbMt)
and connect the tank vent hose [2].
The installation order is the reverse of the disassembly order.
(The left and right side tanks are installed in the same way)



As in P3.
Connect the right side tank fuel hose [1] through the engine and frame lower beam to the left side tank quick plug [2] and check for looseness, damage or leaks.
Replace if necessary.



As in P4.
The rear tank fuel hose is connected to the front right side tank using the quick plug [1] then check for looseness, damage or leaks.
The rear fuel tank and front right side fuel tank connection hose is accurately seated in the wire hook bracket.

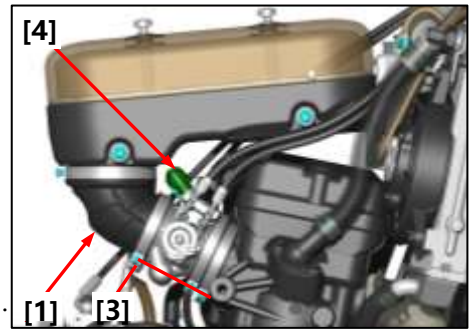


※EFI (evaporative fuel emission) carbon canister/dump valve
(regular edition only)

Disassembly/Installation
Disassembly of the following.
- Disassembly of the dump valve and carbon tube.
- Removal of the lower engine guard assembly.
- Removal of the left front fuel tank.
- Disconnecting the fuel tank connecting dump valve hose [1], connecting dump valve carbon tube hose [2] removing the dump valve [3].
- Disconnect the carbon canister discharge connection throttle hose [4] Remove the carbon canister [5] from the carbon canister retaining rubber sleeve [6].

Install in the reverse order of removal.

※Air filter assembly



Remove the air filter housing assembly from the frame by loosening the air intake hose [1] toward the rear and from the throttle side.

Install in the reverse order of removal.

Caution.

- When placing the assembly into the frame, carefully install the crankcase breather hose [2], making sure it is not kinked or deformed.

-Tighten the intake hose holding screws [3] with a distance of 10 ± 1.0 mm between the band ends.

-When connecting the injector 2P (gray) fitting [4

Align the notch with the lug of the injector fitting.

Torque.

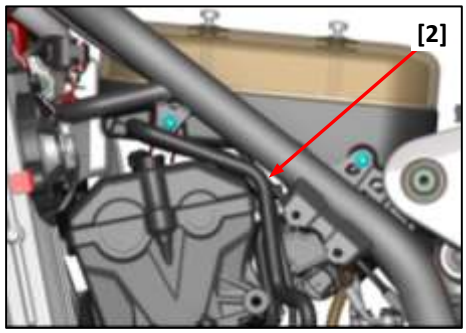
Air filter assembly mounting bolts.

10N-m (kgf-m, lbMt)

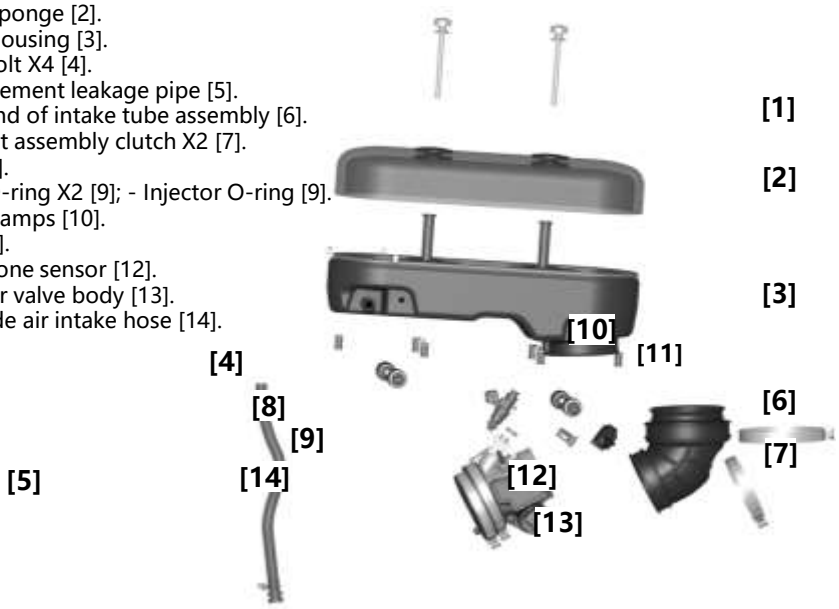
Throttle cable attachment bolt (at throttle body).

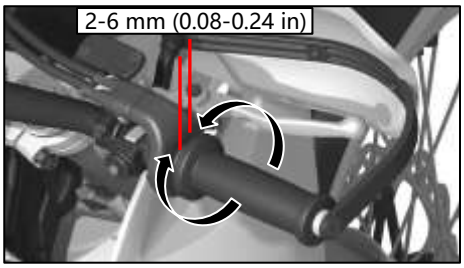
3.0 N-m (0.3 kgf-m, 2.2 lbf-ft)

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



- Anisotropic bolt M5X78 [1].
- Air filter sponge [2].
- Air filter housing [3].
- Rubber bolt X4 [4].
-Air filter element leakage pipe [5].
-Air filter end of intake tube assembly [6].
-Intake duct assembly clutch X2 [7].
-Injector [8].
- Injector O-ring X2 [9]; - Injector O-ring [9].
- Injector clamps [10].
-Oil rail [11].
- Three-in-one sensor [12].
- Idle motor valve body [13].
- Engine side air intake hose [14].

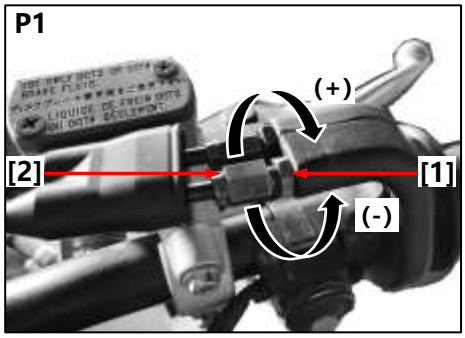




※Throttle Free Travel

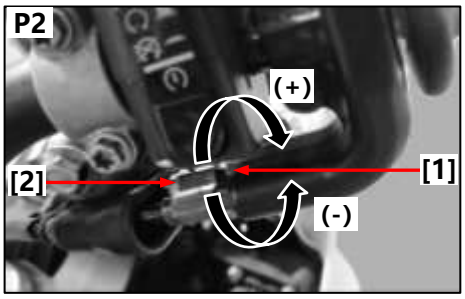
Check that the throttle cable is not aged, damaged or kinked.
Turn the throttle handle and check that the throttle opens smoothly and closes automatically in any steering position.

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

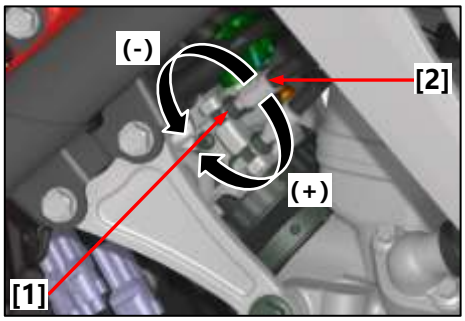
Loosen the locknut [1] and turn the adjuster [2].
Turning the adjuster in the (-) direction will decrease the free play and turning it in the (+) direction will increase the free play.
After adjustment, hold the adjuster and tighten the lock nut.
If the correct free clearance is not obtained even after 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 and 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.

※Throttle assembly and air intake hose

①. Throttle

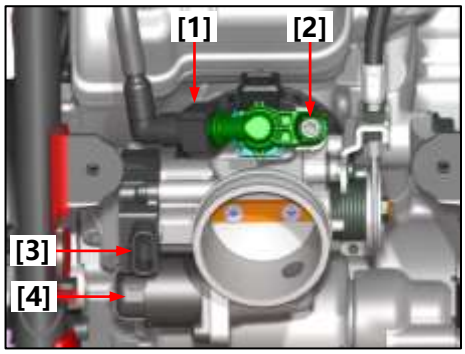
Removal/Installation
Remove the following parts.
- Remove the fuel line quick coupling [1];
- Remove the fuel rail cap mounting screw [2] and the fuel rail mount injector;
- Disconnect the triple sensor plug 5p [3];
- Disconnect the stepper motor motor plug 4p[4];
- Loosen the throttle cable adjustment nut [5];
- Remove the throttle cable from the turntable [6];
- Remove the intake pipe clamp fastening screws at both ends [7];
- Remove the throttle valve body [9] and intake pipe [10].

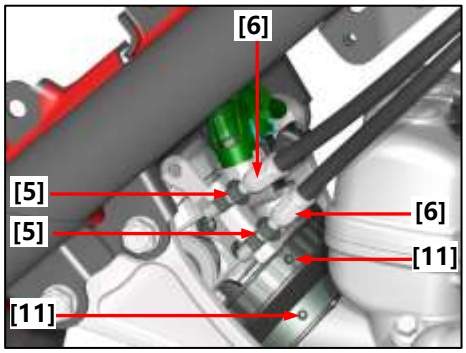
The installation order is the reverse of the disassembly order.

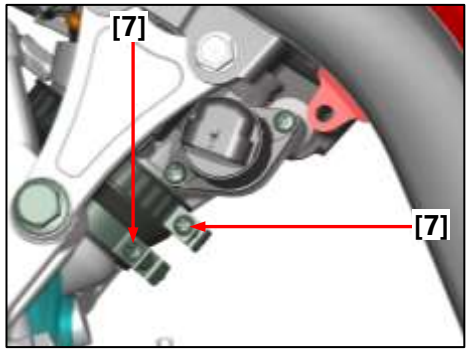
Caution.
-Installation of intake pipe clamps should be in the limit point [11], intake pipe and engine connection aligned with the limit tab [8] within.

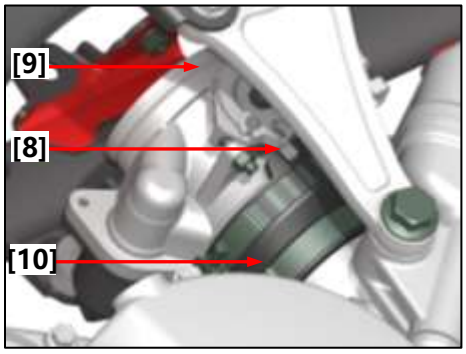
Torque.
M6x20
Injector cap and throttle connecting bolt
8.0 N.m (0.8 kgf.ft, 6 lbf.ft)

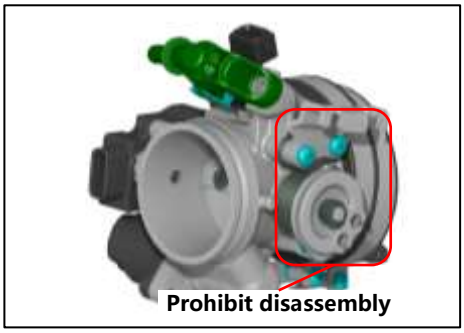
Note. Throttle inlet pipe mounting clamps can be screwed to the limit.







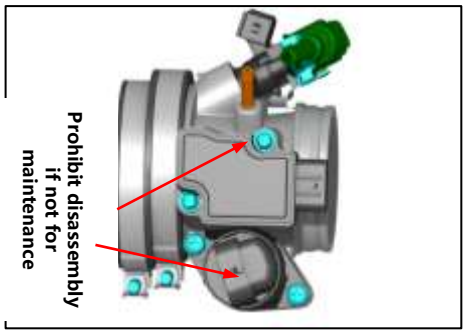




Throttle Valve Body

Removal/installation

note: • throttle body, is the factory assembly good way to remove the outside not shown in this manual. , throttle pull don't will throttle after removed from open to close, which may lead to damage of throttle. Don't damage the throttle body; This may cause the throttle to not work properly. • don't loosen or tighten the nuts and bolts, coated with torsion logo loosen or tighten they lead to throttle body malfunction.



Disassemble the idle motor / triple sensor

Inspect the idle motor air passage in the throttle body for carbon buildup.

Inspect the O-ring on the idle motor/triple sensor for deterioration or damage.

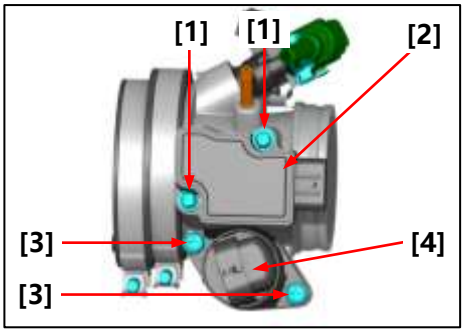
Remove the following parts.

- 2 screws [1];
- Remove the 3-in-1 sensor unit [2];
- 2 screws [3];
- Idle speed motor valve body [4];

Clean the throttle body and idle motor valve body piping with compressed air.

Caution.

-Cleaning with a wire ball will damage the throttle valve body.



The installation order is the reverse of the removal order.

Caution.

-Replace new rubber seals

-Install each clamp in the intake tube assembly with the screw head [5] facing the right side and align the left side band hole [6] with the locating tab.

-Install each clamp with the "UP" mark facing up

Facing the throttle body and aligning the notch [7] with the lug.

-Tighten the clamp screws so that the distance between the two ends is 10±1.0 mm (0.4±0.04 in)

Install the tightening bolts to the specified torque.

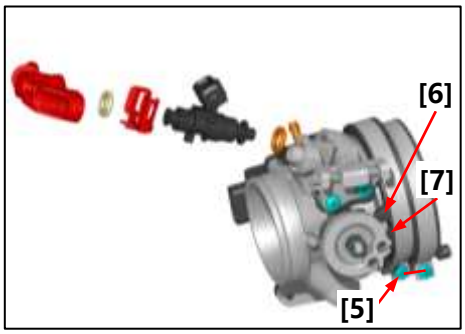
Torque.

3-in-1 sensor mounting screws.

3.4 N-m (0.3 kgf-m, 2.5lbf.ft)

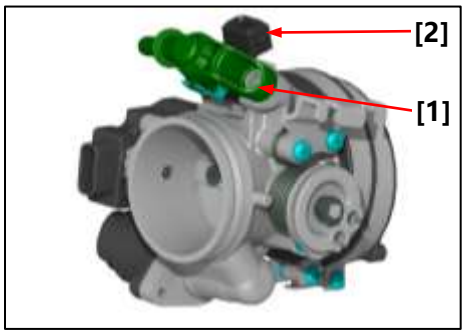
Idle motor valve body mounting screw: 3.4 N-m (0.3 kgf-m, 2.5lbf.ft)

3.4 N-m (0.3 kgf-m, 2.5lbf.ft)

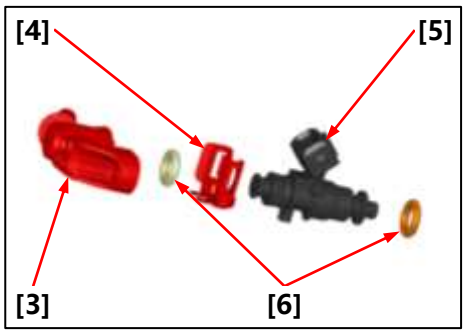


※Oil rail assembly

Removal/Installation
Remove the oil rail assembly from the throttle assembly.
Remove the following parts.
- 1 bolt [1];
- 1 wire harness connector [2] ;
- Remove the oil rail [3];
- Remove the injector clips [4];
- Remove the injector [5];
- Remove the injector O-ring [6].



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



Install in the reverse order of disassembly.

Caution.
-Apply oil when replacing the new O-ring and seal.
-Be careful not to damage the O-rings when installing the injectors.
-Insert the injector fitting in line with the fuel fitting.

Torque.
Fuel rail assembly connecting bolt
12 N-m (1.2 kgf-m, 8.9 lbf.ft)

Cooling System

Maintenance information

Overview

⚠警告

Do not remove the radiator cap before the engine and radiator cool down to prevent the coolant from splashing out and scalding people

NOTE

The use of coolant with silicate inhibitors can lead to premature wear of water pump seals or blockage of radiator passages.
Using tap water can cause engine damage.
l - Add coolant to the reservoir; do not remove the radiator cap except to add or drain coolant.
Do not remove the engine from the frame when servicing the cooling system.
-Avoid leakage of coolant to painted surfaces.
Check for leaks with a cooling system tester after system maintenance.
Check the coolant temperature indicator/water temperature sensor.
Check the fan control relay.
Troubleshooting

Engine temperature is too high

-Coolant temperature indicator/water temperature sensor failure
-Throttle valve not open
-Faulty radiator cap
-Insufficient coolant
-Blocked radiator passages, hoses, water pipes
-Circulation system air intake
-Failure of cooling fan motor
-Fan control relay failure
-Faulty water pump

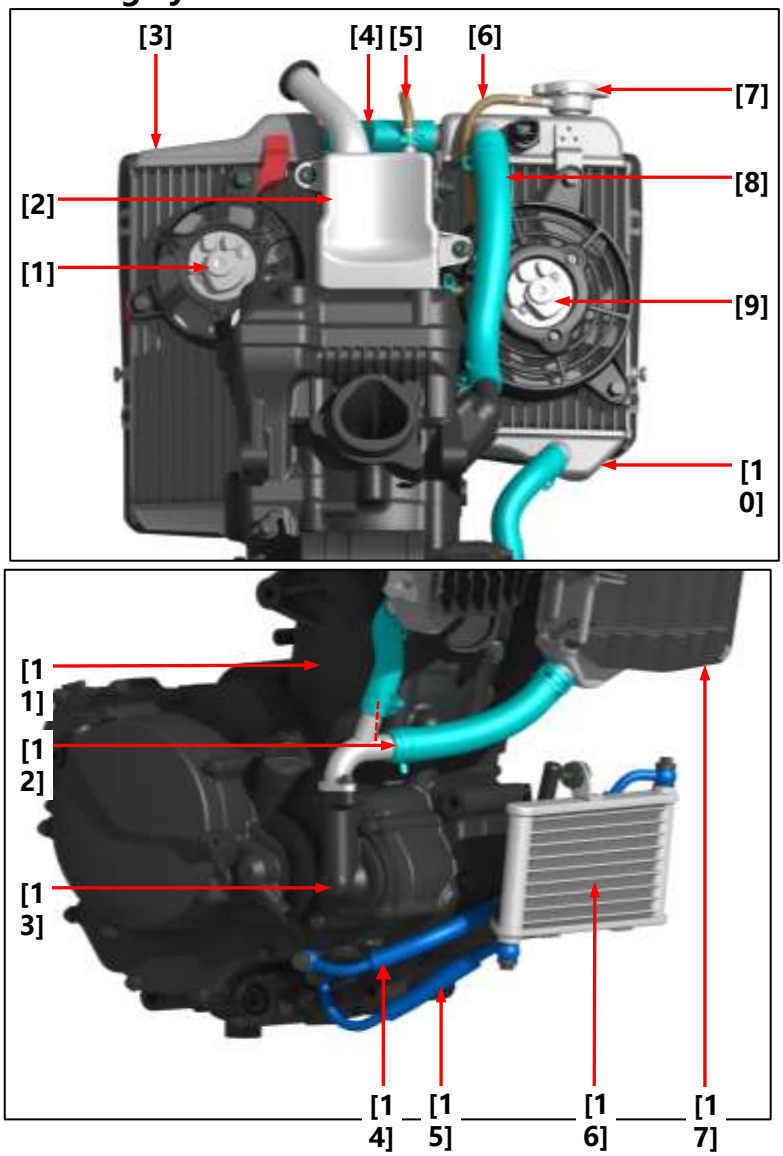
Engine temperature too low

-Faulty coolant temperature indicator/water temperature sensor
-Throttle valve open
-Fan control relay failure

Coolant leakage

-Defective water pump mechanism
-O-ring deterioration
-Radiator cap failure
-Damaged or deteriorated cylinder head gasket
-Hose connection is loose or not clamped
-Damaged or deteriorated hoses
-Damaged radiator
-Thermostat cover, water pump cover pipe joint is loose

Cooling System Flow Chart

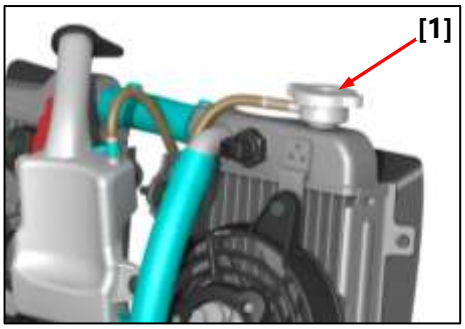


1	Radiator fan left	6	Siphon Tube	11	Thermostat	16	Oil Cooled Radiators
2	Water reservoir	7	Radiator cap	12	Engine Intake Hose	17	Radiator grille
3	Radiator left	8	Engine outlet pipe	13	Water pump		
4	Radiator left and right connecting pipes	9	Radiator fan right	14	Oil-cooled radiator inlet pipe		
5	Overflow pipe	10	Radiator right	15	Oil-cooled radiator discharge pipe		

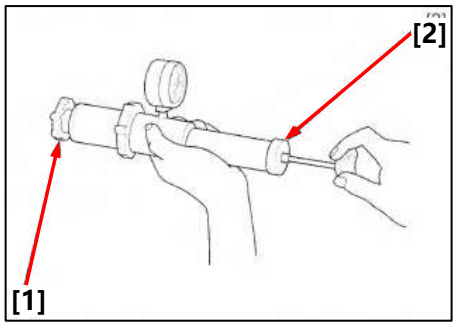
※Cooling System Test

Radiator system pressure check.
Disassembly/Installation
Removal of the following components.

- Removal of the front trim assembly.
- Remove the radiator cap [1].



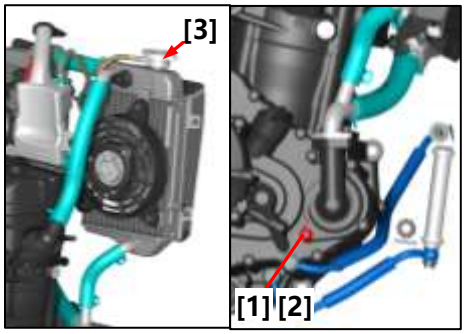
Lubricate the sealing surface of the cap [1]; then install the cap on the tester [2].
Use the tester to pressurize the radiator cap.
Replace the radiator cap if it does not hold pressure or if the release pressure is too high or too low.
The radiator cap must hold the specified pressure for at least 6 seconds
Radiator cap release pressure.
108-133Kpa



Connect the detector to the radiator.
Use the tester to pressurize the radiator, engine and hoses to test their airtightness.

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

Note. This operation is performed when the bike is running cold.



⚠警 告

• After motorcycle shuts off, wait for the car to cool down for a while, and then perform the following operations to avoid the risk of burns due to excessive coolant temperature.

※Coolant change

When adding coolant to the tank radiator or sub-tank or checking the coolant dose, the motorcycle should be placed on a level flat surface and in an upright position.

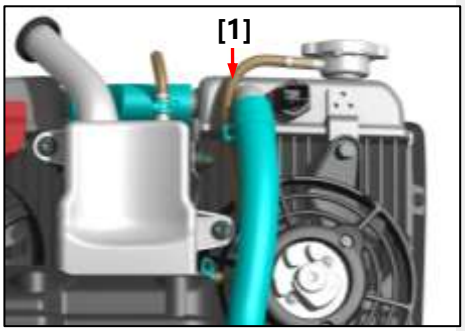
Disassembly/Installation
Remove the following components.

- Removal of the front right side fuel tank and lower guard assembly.
- Removal of water pump drain bolts [1] and flat washers [2].
- Remove the radiator cap [3] and drain the coolant.

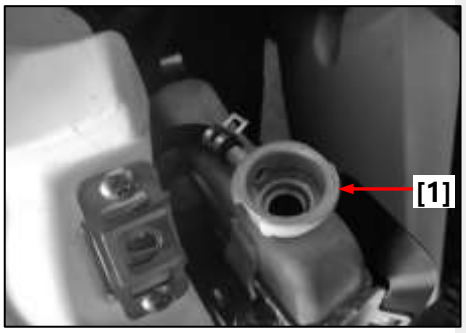
Drain the coolant :

-After replacing the flat washer with a new one, install the drain bolt. Tighten the drain bolt to the correct torque.
Torque.
Water pump drain bolt.
10 N.m (1.0 kgf.m, 10 lbf.ft)

Disconnect the siphon hose from the radiator [1] and pull the siphon hose out of the hose clamp.
Place the hose in a lower position outside the engine frame and drain the coolant from the storage tank.
Drain the coolant, flush the inside of the storage tank with water, and install the hose into the hose clamp and over the radiator



Fill the cooling system up to the neck with the recommended coolant through the water injection hole [1].
Not recommended with antifreeze: including ethanol containing silicate cooling fluid

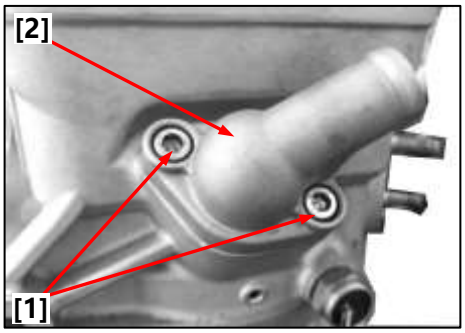


※Air is discharged from the radiator

⚠警 告

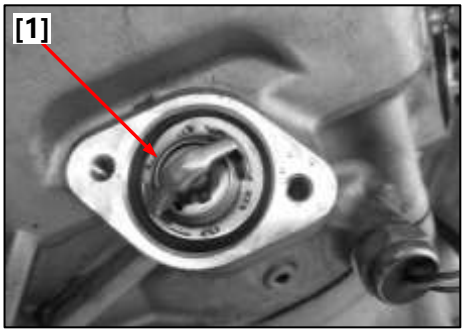
• After motorcycle shuts off, wait for the car to cool down for a while, and then perform the following operations to avoid the risk of burns due to excessive coolant temperature.

Recommended antifreeze.
Remove air from the system as follows.
1. Shift the engine to neutral, start the engine and allow it to idle for 2-3 minutes.
2. Open and close the throttle three to four times to remove the air from the radiator system.
3. Turn off the engine and fill it with coolant if necessary. 4.
4. Install the radiator cap.
Fill the reservoir with the recommended coolant to the standard scale and close the reservoir cap.

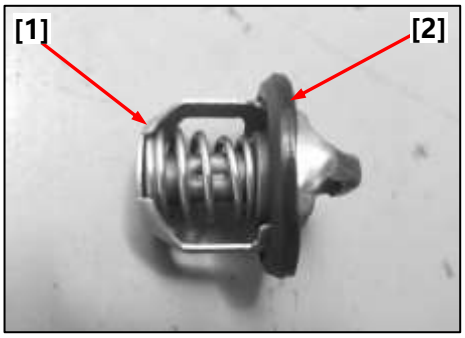


※Thermostat

Remove/install
- emptying of coolant.
- remove the bolts [1] and [2] thermostat cover.

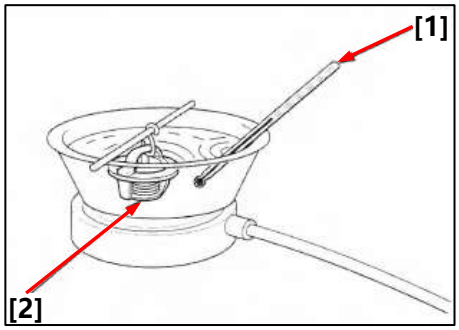


Remove the thermostat from the cylinder head [1].
Install in the reverse order of removal.
Torque.
Thermostat cover bolts.
12 N.m (1.2 kgf.m, 9.0 lbf.ft)
Caution.
-When installing the thermostat, be careful to install the thermostat seal properly and snap it into the round recess in the waterway of the middle cylinder.



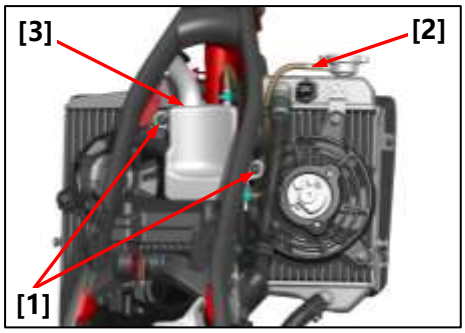
Inspection:

Thermostat [1] appearance whether there is damage. If the thermostat valves are open at room temperature, need to change. Check whether the seal [2] is damaged, if you need the replacement.



Heat the water to operating temperature for 5 minutes with an electric heating element.
Suspend the thermostat [2] in hot water and check its operation.
Thermostat starts to open at.
82±2°C (176-183°F)
Valve ramp-up.
92°C (197.6°F) not less than 8 mm
If the thermostat responds at a temperature other than that specified, replace the thermostat.

※Water reservoir

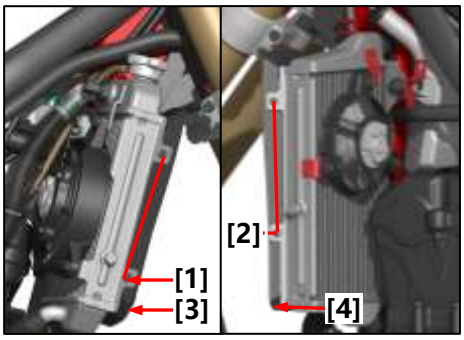


Disassembly/Installation
Remove the following components.

Drain the sub kettle coolant .
- Remove the sub kettle mounting bolts [1];
- Remove the siphon hose clamps [2].
- Remove the sub kettle [3].

Install in reverse order of removal.
Torque :
Reservoir mounting bolts.
10 N-m (1.0 kgf-m, 7.4 lbf.ft)

※Radiator grille



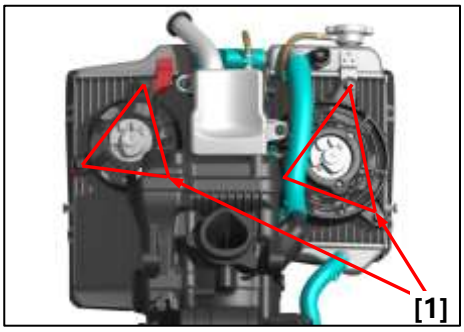
Disassembly/Installation
Remove the following components.

- Remove the front trim assembly;
- Remove the lower engine shield assembly;
- Remove the front left and right side fuel tanks;
- Disconnect the fuel line and fuel pump harness connector 2P (black);
- Remove the radiator grille mounting bolts [1][2];
- Remove the radiator left and right grilles [3][4].

The installation order is the reverse of the removal order.

Torque:
Radiator grille mounting bolts.
8 N-m (0.8 kgf-m, 6.0 lbf.ft)

※Fans

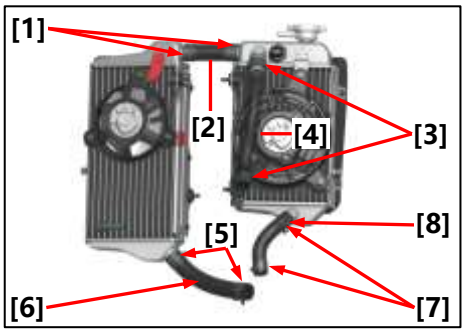


Disassembly/Installation
Disassemble the following components.
- Drain radiator tank coolant;
- Disconnect the radiator fan motor 2P (white) wire harness connector;
- Remove the radiator fan left and right side mounting 6 bolts [1];
- Remove the radiator fans on the left and right sides.

The installation order is the reverse of the removal order.

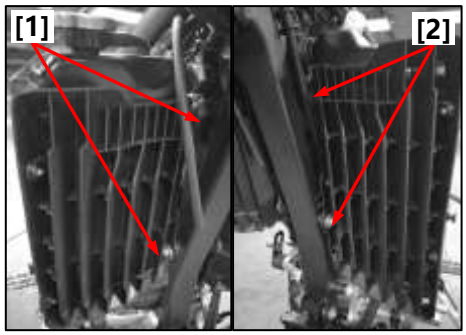
Torque :
Radiator fan cover mounting bolts.
8 N-m (0.8 kgf-m, 6.0 lbf.ft)
Fan motor check.
Battery voltage 12V Motor running at full speed with amperometer current not exceeding 3A, if motor does not rotate or current exceeds specified then replace fan motor.

※Water pipes



Disassembly/Installation
Remove the following parts.
- Loosen the pipe clamps [1] and loosen the water pipe above the radiator [2];
- Loosen the pipe clamp [3] and loosen the water pipe [4] on the right side of the radiator;
- Loosen the clamp [5] and loosen the water pipe [6] on the lower left side of the radiator;
- Loosen the pipe clamp [7] and loosen the water pipe [8] on the lower right side of the radiator.
The installation sequence is the reverse of the removal sequence.

※Radiator

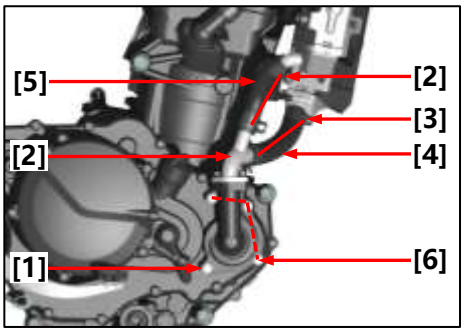


Disassembly/Installation
Remove the following parts.
- Remove the radiator left and right side mounting bolts [1], [2];
- Remove the left and right radiator assemblies;
Install in the reverse order of disassembly.
Torque:
Radiator do superior both sides mounting bolts
12 N-m (1.2 kgf-m, 8.8 lbf.ft)

※Water pump

End face seal inspection.
Make sure there is no continuous coolant leakage when starting the engine.
If necessary, replace the water pump as an assembly.

Caution.
Place a clean oil pan under the engine, coolant will flow when the water pump body is removed.
After installation, add the specified coolant.
Keep the motorcycle in an upright position on level ground.



Removal/Installation
Remove the following parts.
- Water drain bolt and gasket [1];
- Remove the lower radiator hose clamp [2], [3];
- Remove the water inlet pipe [4], [5];
- Install the water pump valve body cover bolts [6].

The installation sequence is the reverse of the disassembly sequence.

Torque:
Water pump body cover mounting bolts.
12 N-m (1.2 kgf-m, 9.0 lbf.ft)
Water pump discharge bolt.
10 N.m (1.0 kgf.m, 7.5 lbf.ft)

※Water pump impeller

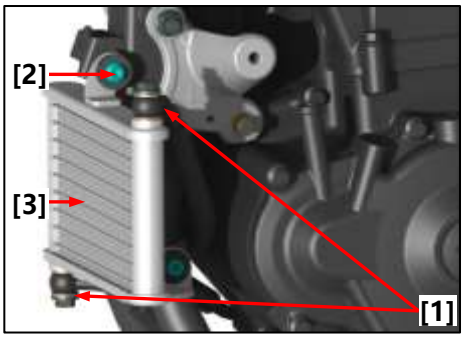
Disassembly/Installation
Remove the following components.

- Remove the right side cover of the crankcase;
- Remove the water pump valve body cover [1] and gasket [2] from the right side cover of the crankcase;
- Remove the C-clamp [3] and retaining pin [4] at the rear of the crankcase side cover;
- Remove the water pump impeller [5].

Inspect.
Whether the water pump cover gasket is broken If broken, replace it in time.
Replace the water pump impeller in time if it is broken.

The installation order is the reverse of the disassembly order.

Crankcase side cover mounting bolts.
10 N.m (1.0 kgf.m, 7.5 lbf.ft)



※ Oil-cooled radiator

Make sure there is no continuous oil leakage when starting the engine.
If necessary, replace the oil cooled radiator as an assembly.

Caution.
Place a clean oil pan under the engine where oil will escape when the oil cooled radiator is removed. After installation, add the specified oil.

Keep the motorcycle in an upright position on level ground.

Removal/Installation
Remove the following parts.

- Remove the inlet and outlet oil pipe overflow bolts [1];
- Remove the oil-cooled radiator mounting bolts [2];
- Remove the oil cooled radiator [3];

The installation order is the reverse of the removal order.

Torque:
Mounting oil-cooled radiator over-oil bolt.
12 N-m (1.2 kgf-m, 8.8 lbf.ft)

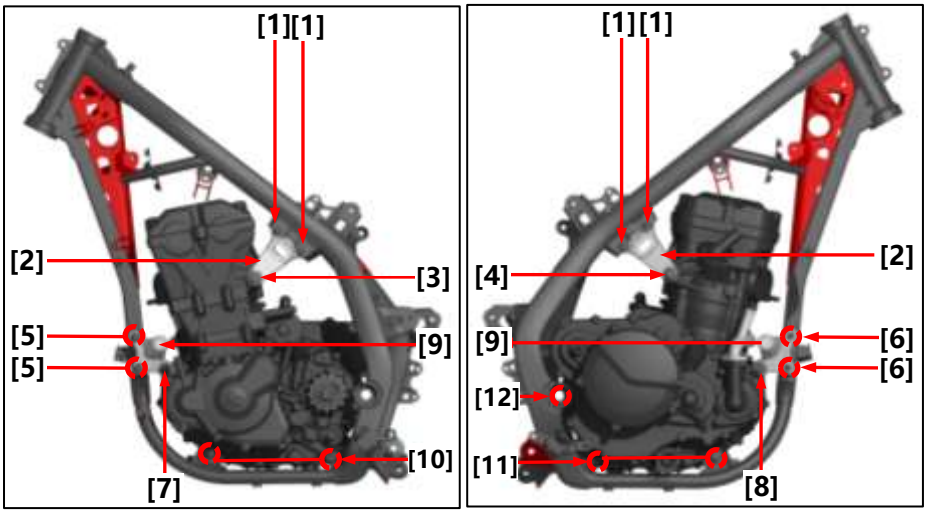
Engine removal/installation

Maintenance information

Overview

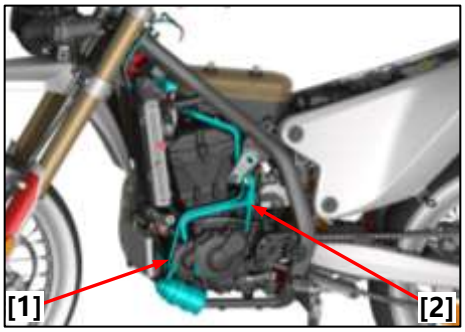
Removing and installing, you need to use professional table or equivalent to support the motorcycle. You need to use a jack or other adjustable bracket to support and control the engine

Parts Location



[1]	Engine upper suspension and frame attachment bolts x4	36N.m	[7]	Engine and front suspension connecting bolts	54N.m
[2]	Engine upper suspension bracket left and right		[8]	Self-locking nuts for engine and front suspension connection	54N.m
[3]	Engine upper suspension and engine connecting bolt left	54N.m	[9]	Engine front suspension bracket left and right	
[4]	Engine upper suspension and engine connecting bolt right	54N.m	[10]	Engine lower front, lower rear suspension and frame connecting bolt x2	54N.m
[5]	Frame and front suspension attachment bolts x2	26N.m	[11]	Engine lower front, lower rear suspension and frame attachment self-locking nuts x2	54N.m
[6]	Frame and front suspension connecting self-locking nut x2	26N.m	[12]	Flat fork axle fastening nut and flat fork axle	88N.m

※Engine Removal



- Removing the seat cushion assembly.
- Disconnecting the negative battery terminal.
- Removing the front trim assembly.
- Removing the lower engine guard assembly.
- Removing the fuel tank vent pipe.
- removing the front left and right side fuel tank and fuel pump connector fuel line quick release fittings.
- Drain the engine oil.
- Evacuate the coolant.

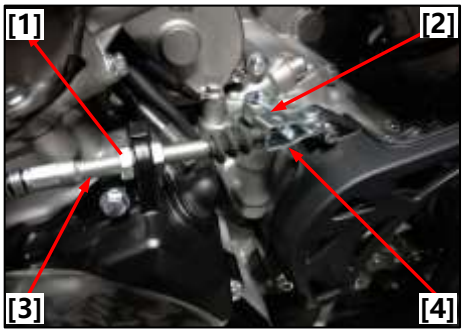
Caution.

-Let the vehicle stand still for a period of time to avoid high temperature burns when draining the engine coolant.

Remove the following components.

- Fuel evaporation system and associated components [1].
- Exhaust gas pipe assembly [2].

Install in the reverse order of removal.



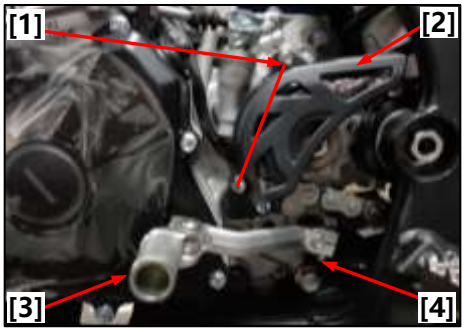
① Clutch cable

Installation / Disassembly

Remove the following parts.

- Loosen the travel adjustment bolt [1] and disengage the clutch safety plate [2]. Then disconnect the clutch pull cable [3] from the clutch tappet arm [4].

The installation sequence is the reverse of the disassembly sequence.



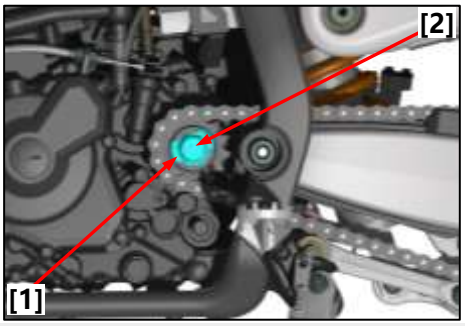
② Engine flywheel cover/shift lever assembly

Installation / Disassembly

Remove the following components.

- Removal of bolts [1].
- Removal of the small flywheel cover [2].
- Remove the bolts [3].
- Remove the gearshift lever assembly [4].

The installation order is the reverse of the disassembly order.



③ Small engine driven flywheel

Installation / Disassembly

Remove the following parts.

- Disengage the drive small flywheel fastening nut locking tab [1] and remove the small flywheel fastening nut [2].
- Remove the drive small flywheel.

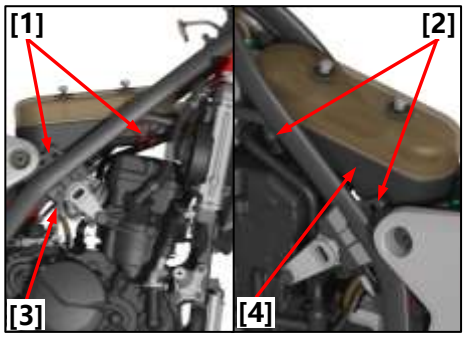
The order of installation is the reverse of the order of disassembly.

④ Air filter assembly

Installation / Disassembly
Remove the following parts.

- Remove the air filter assembly left and right 2 side bolts [1], [2];
- Remove the air filter assembly connecting the throttle intake pipe holding hoop [3];
- Remove the air filter assembly [4].

The installation order is the reverse of the disassembly order.

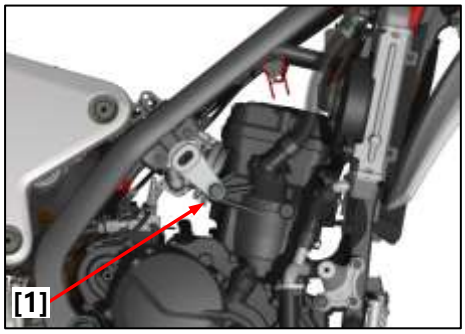


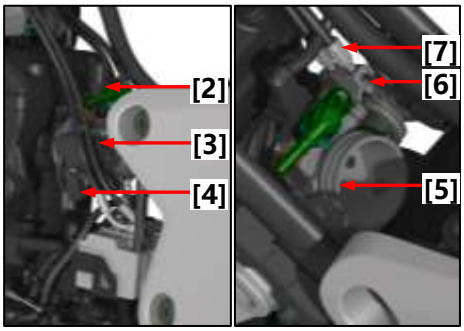
⑤ Throttle assembly

Installation / Disassembly
Remove the following parts.

- Remove the intake pipe clamps [1];
- Unplug the fuel injector [2];
- Unplug the triple sensor [3];
- Unplug the stepper motor motor [4];
- Remove the throttle assembly [5];
- Loosen the adjustment nut [6];
- Remove the throttle wiring harness [7].

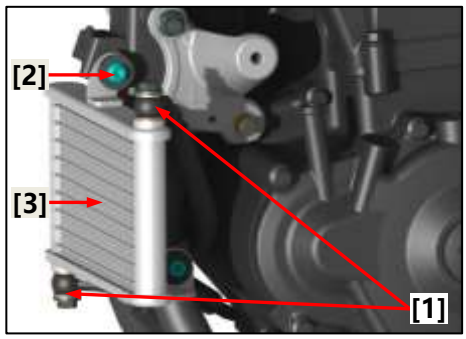
The installation sequence is the reverse of the disassembly sequence .





⑥ Oil-cooled radiator

Keeps the motorcycle upright on level ground.

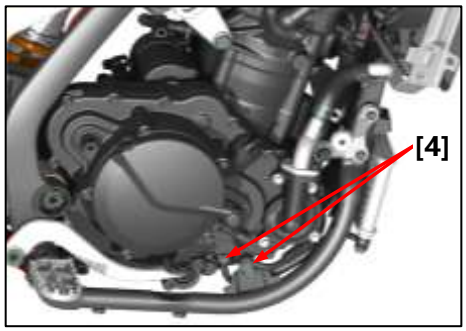


Disassembly/Installation
Remove the following parts.

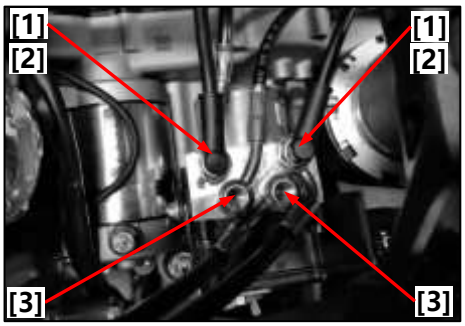
- Removal of the inlet and outlet oil pipe over oil bolts [1], [4].
- Remove the oil-cooled radiator mounting bolts [2].
- Remove the oil-cooled radiator [3].

The installation order is the reverse of the disassembly order.

Torque :
Installation of oil-cooled radiator over-oil bolt.
12 N-m (1.2 kgf-m, 8.8 lbf.ft)



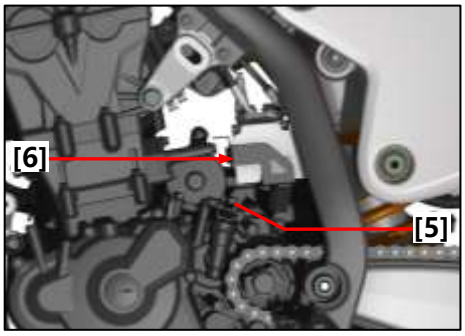
⑦ ABS pump



Disassembly/Installation
Disassemble the following components.
Drain the brake fluid from the front and rear brake hydraulic system.

- Seat cushion assembly.
- Air filter assembly.
- ABS pump bracket.

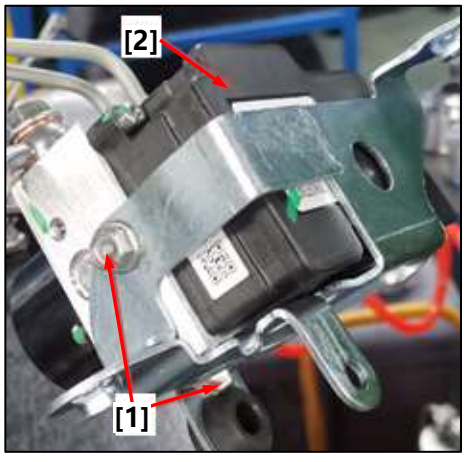
Disconnect the ABS pump 18P (black) connector
Remove the brake hose brake light switch nut [1] and the upper and lower 2 sealing washers [2].
removing the ABS nut [3] to disconnect the brake hose [4].
- Removal of ABS bracket mounting nut [5].
- Remove the ABS bracket ABS pump [6].



Install in reverse order of removal.

Note: factory edition do not have an ABS pump.

Remove the two mounting bolts [1] and the ABS pump 2] from the bracket.
Torque.
ABS pump to bracket attachment bolts.
12 N.m (1.2 kgf.m, 8.8 lbf.ft)
Brake hose oil bolt.
22 N.m (2.2 kgf.m, 16 lbf.ft)

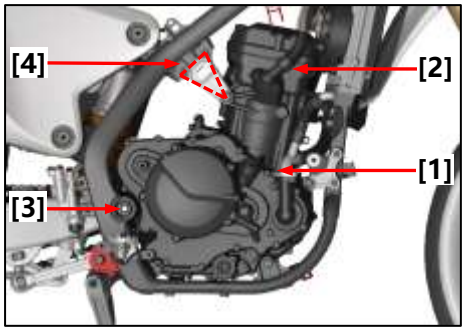


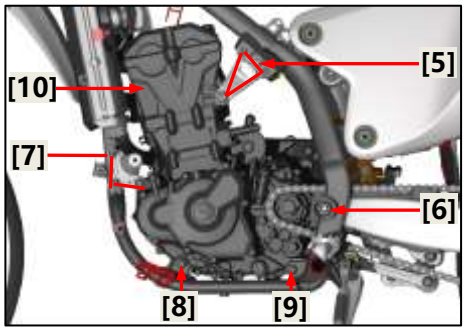
⑧ Engine

Disassembly/Installation
Remove the following parts.

- Removal of bolts [1] engine outlet pipe hugger [2].
- Remove the rear flat fork shaft nut [3] to remove the rear flat fork shaft [6] and spacer.
- Remove the engine upper suspension left and right attachment bolts [4] and [5].
- Removing the front engine suspension attachment nuts [7], washers and bolts.
- Removing the lower engine front and rear attachment nuts [8][9], bolts.
- Removal of the engine assembly [10].

The installation order is the reverse of the disassembly order.





Engine Installation

Caution.

-Not applicable to oil filters as jacking points.
-Jack height must be constantly adjusted to relieve pressure for bolt-on 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 so that the rear wheel is 150mm off the ground
placing the engine on a jack or other adjustable bracket under the frame.
aligning the front engine suspension bolt holes with the frame mount, then installing the bolts and bushings.
lifting the engine while rotating it upward at the rear to install the other hanger bolts and bushings.
Installing the rear engine suspension nuts with washers.
Tighten the bolts and nuts to the specified torque in the order indicated.

Cylinder head and valve

Maintenance information

Overview

-This chapter covers maintenance and inspection of cylinder heads, valves, camshafts, and tappets.

-When repairing the cylinder head, camshaft and tensioner, judge whether the engine needs to be removed from the frame according to the model and shade; when repairing the cylinder head and valve, the engine must be removed from the frame.

-When disassembling, mark the disassembled parts and put them away to ensure that they are correctly placed when reassembling.

-Before inspection, clean all disassembled parts with a cleaning agent and blow them dry with compressed air.

-Camshaft lubricant is injected through the oil lines in the cylinder head and camshaft bracket, so the oil lines should be cleaned before assembling the cylinder head and camshaft bracket.

-When removing the cylinder head and cylinder head cover, be careful not to damage the joint surface.

Cylinder head/valve specification

item	standard value mm	Maintenance limit value mm
Valve spring free length	inner:47.5 outter:38.1	inner:47.35 outter:37.95
valve clearance	intake :0.1 ~ 0.15 exhaust:0.15 ~ 0.2	intake > 0.17 exhaust > 0.22
Camshaft base circle runout	0.02	0.04

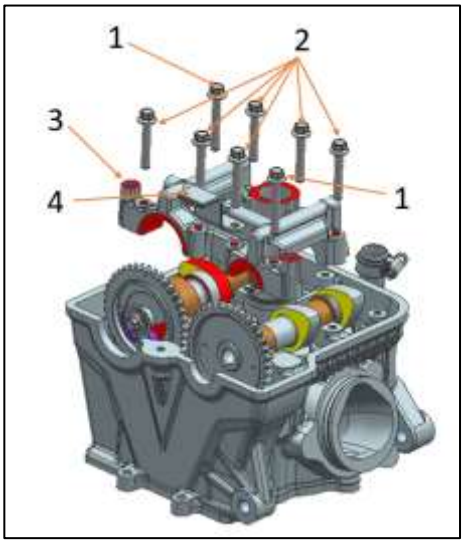
item			standard value mm	Maintenance limit value mm
valve	Outside diameter of valve stem	intake	φ5.472 ~ φ5.487	φ5.46
		exhaust	φ5.46 ~ φ5.475	φ5.44
	Valve tube inner diameter	intake	φ5.505 ~ φ5.515	φ5.535
		exhaust	φ5.505 ~ φ5.515	φ5.535
	Valve stem and tube clearance	intake	0.018 ~ 0.043	0.07
		exhaust	0.03 ~ 0.055	0.08
	Valve seal tape width		1.2	----
Cylinder Head	flatness		0.05	0.06
	Width of valve seat face		0.8	----

1.Troubleshooting

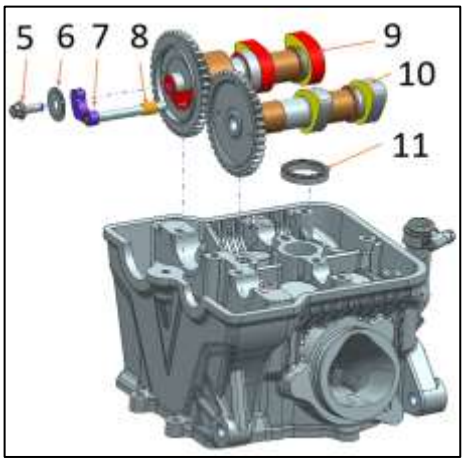
Low air pressure in the cylinder.
1. valves.
Incorrect adjustment of valve clearance.
Poor valve sealing.
incorrect air distribution timing.
Broken valve springs.
2, cylinder head
The spark plug is not tightly connected to the cylinder head.
Damaged cylinder head gasket.
Cracks or sand holes in the cylinder head.
3、cylinder block, piston, piston ring
Piston ring gap is too large or fracture.
cylinder block pulling.

Exhaust with black smoke.
1, valve guide wear.
2, oil shield leaking or damaged.
3、Leakage of cylinder head gasket.
4, piston ring gap is too large.

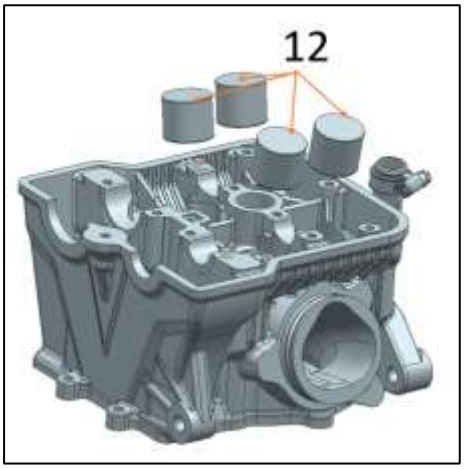
Excessive warm-up noise or strange noise
1、Incorrect valve adjustment.
2, valve stuck or broken valve spring.
3, excessive wear of the tappet.
4、Incorrect timing of air distribution.
5, camshaft wear.
6、Fracture of the pressure reducing valve dump block.



A. Cylinder head assembly drawing.
(1) Small plate bolt M6×40_7 grade 24h.
(2) Small plate bolt M6×35_7 grade 24h.
(3) NC450S camshaft bracket.
(4) NC450S chain pressure plate.

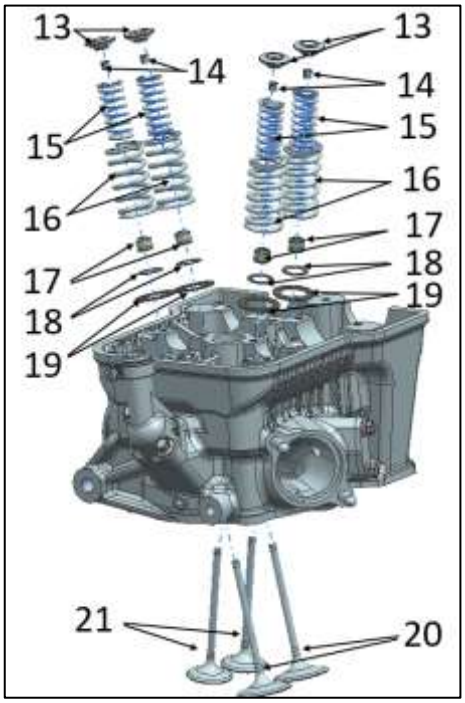


(5)Small plate bolt M6×16_7 grade 24h.
(6)NC250S camshaft stopper.
(7)NC450S camshaft pressure reducing valve.
(8)NC250 cam pressure reducing valve reset torsion spring (2#).
(9) NC450S exhaust camshaft components.
(10) NC450S intake camshaft components.
(11)Derbi125 spark plug hole seal.

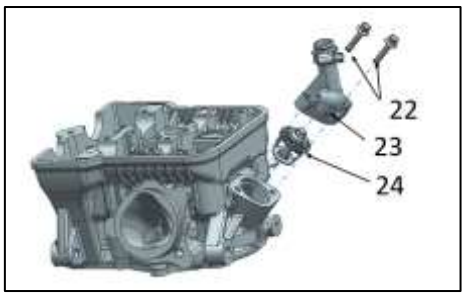


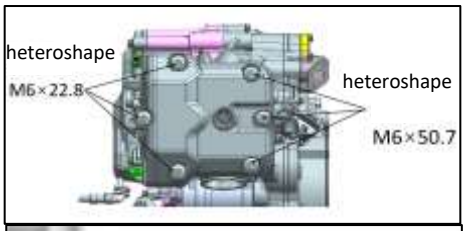
(12)NC450S valve tappet (DLC coating).

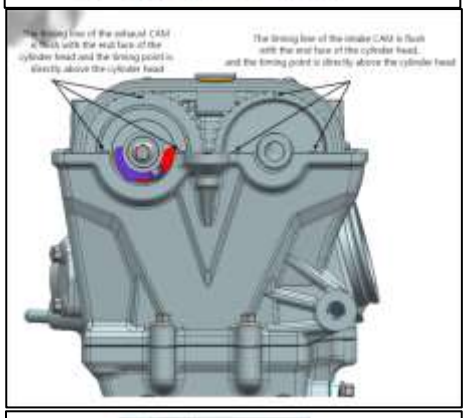
(13) NC450S valve spring upper seat.
(14)CB125 foot valve locking clip (improved type).
(15)NC450S valve inner spring.
(16)NC450S valve outer spring.
(17)CG125D oil shield combination.
(18)CG125D inner valve spring seat (lower).
(19)NC450S outer valve spring seat
(20)NC450S intake valve (rod diameter φ5.5)
(21)NC450S exhaust valve (rod diameter φ5.5)

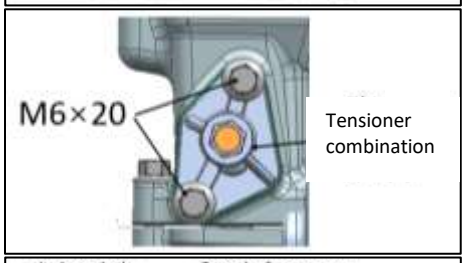


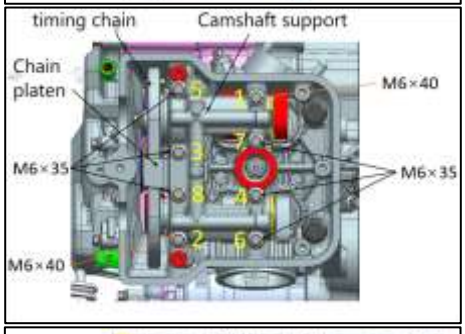
(22)Bolt M6×25
(23)NC450S thermostat cover
(24)NC450S thermostat (2#_vent hole φ2)

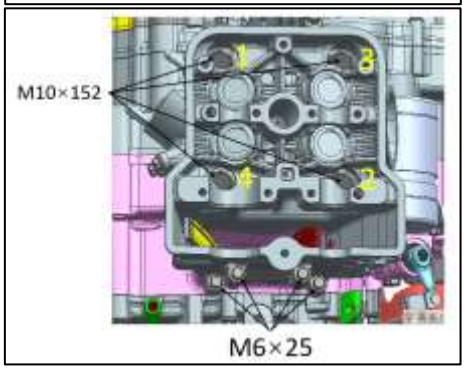












Disassembly of cylinder head cover

1、Remove the 3 NC450S cylinder head cover fixing bolts (shaped M6×22.8) and 3 NC450S cylinder head cover fixing bolts (shaped M6×50.7).
fixing bolts (shaped M6×22.8), 3 NC450S cylinder head cover fixing bolts (shaped M6×50.7).
2、Remove the head cover and the head cover gasket.

Disassembly of cylinder head

1、Turn the timing sprocket to the engine timing position.
The timing sprocket timing line mark is flush with the end face of the cylinder head, and the intake and exhaust camshaft timing point is facing the top of the cylinder head.

2、Remove the 2 bolts of tightening tensioner M6×20.
then remove the tensioner combination and tensioner gasket.

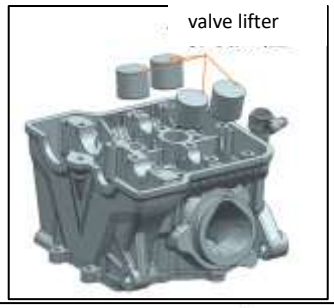
3、Remove the 2 bolts M6×40 and 6 bolts M6×35 that fasten the camshaft bracket in the order of 1→2→3→4→5→6→7→8; then remove the chain pressure plate and camshaft bracket, remove the timing chain on the timing driven sprocket, and remove the intake camshaft parts and exhaust camshaft parts.

4. Remove the four M6×25 cylinder head bolts first.
in removing 4 cylinder double-headed bolts AB (M10×152), in the order of 1→2→3→4, and then remove 4 AB bolts flat washers.

5, remove the cylinder head.

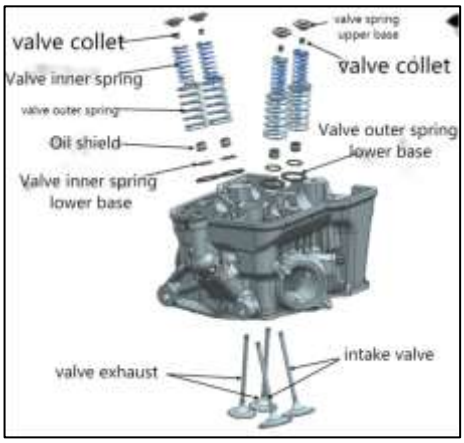
Disassembly of cylinder head

1, remove the four pieces of valve tappet, respectively, a good corresponding mark.



2. Remove the 2 NC450S thermostat cover fastening bolts M6×20 and remove the NC450S thermostat cover and the NC450S thermostat.

3、Use the valve remover to press down the valve spring and remove the valve locking clip; then relax the valve remover and remove the upper seat of the valve spring, the inner and outer valve springs and the lower seat of the inner and outer valve springs as well as the intake and exhaust valves, respectively, to make the corresponding markings.



Caution.
-In order to prevent permanent deformation of the valve spring, the valve spring should not be overly compressed, only the valve locking clip should be able to be removed.
-All parts removed should be marked to ensure that they reach their original assembly position during assembly.

Inspection of valves and valve springs

1, check whether the valve is bent or the valve stem has abnormal wear, measure the valve stem outer diameter. Maintenance limit value.
Intake: φ5.46mm
Exhaust: φ5.44mm
2、The width of the contact surface maintenance limit value: 1.5mm

Caution.
-If the valve contact surface is very rough, uneven abrasion or contact with the valve seat is not normal, can not guarantee the sealing performance, should be replaced valve.

3、Check the valve spring for abnormal wear and measure the free length. Repair limit value.
Outer spring: 47.35mm
Inner spring: 37.95mm

Inspection of valve tappet

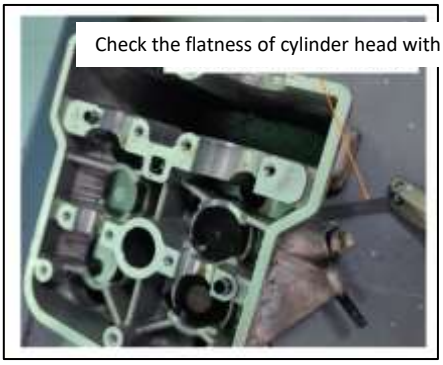
Check the front and side of the tappet for abnormal wear. If the wear and tear is serious or the clearance is large after installation, a new tappet is required.

Inspection of camshaft

1. Check whether the camshaft surface is worn and destroyed. If the wear is serious, replace the camshaft parts with new ones.

Inspection of cylinder head

1、Check whether the cylinder head is well sealed, if the cylinder head is poorly sealed, replace the cylinder head or valve with a new one.
2、Check whether the cylinder head is deformed, and check the flatness of the cylinder head with a knife edge ruler and a plug ruler.



Check the flatness of cylinder head with a stopper

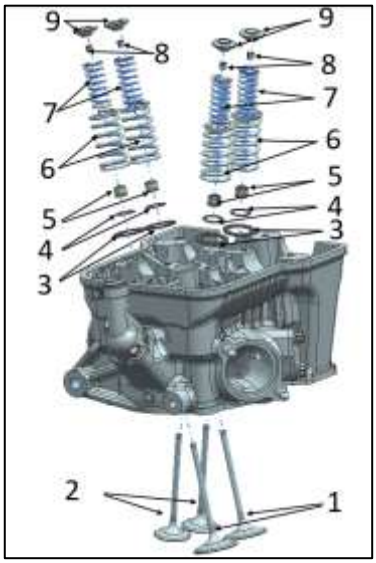
Combustion chamber leak detection test: Inflation 0.3Mpa, leakage ≤6000pa/10sec.
Testing parameters: Inflation time 5S, balance time 3S, detection time 2S, deflation time 0.5S, upper limit of pressure detection 320Kpa, lower limit of pressure detection 290Kpa, judgment value 1.2Kpa.

Assembly of cylinder head components

1, the valve spring lower seat (3, 4), oil shield (5) installed on the valve guide.

2, the intake valve rod (1), exhaust valve rod (2) coated with a small amount of lubricant, installed into the valve guide, installed the valve outer spring (6), valve inner spring (7), valve lock clip (8) and valve spring upper seat (9).

3, then use the valve remover to press down the valve spring, and then install the valve lock clip into the valve spring upper seat.



Note:

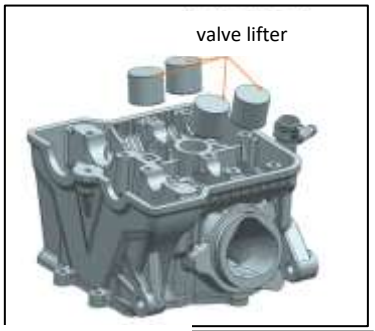
• to prevent valve spring produce permanent deformation, not overly compression spring, to load the valve lock clamp.

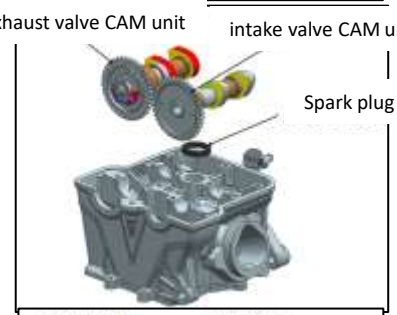
4、Check whether the valve lock clip assembly is in place.

5, the assembled cylinder head combination for gas tightness testing, if the cylinder head combination gas tightness testing qualified then you can proceed to the next step (according to the cylinder head composition diagram assembly).

6, the valve tappet surface lubrication oil into the cylinder head corresponding position.

7、In the intake and exhaust camshaft parts completed by the department, grease the journal surface and assemble them in the camshaft groove position of the cylinder head, and take the spark plug hole seal and install it into the camshaft bracket.

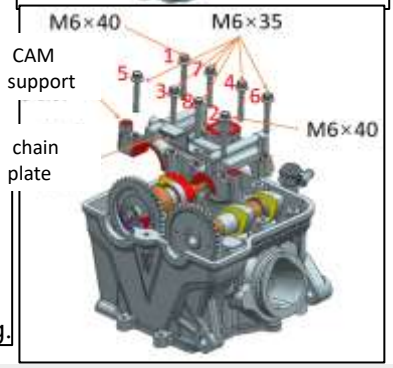




8. then assemble the camshaft bracket and chain pressure plate at the designated position in the cylinder head, and fasten the chain pressure plate and camshaft bracket with two M6×40 and six M6×35 bolts, in the order of 1→2→3→4→5→6→7→8.

Tightening torque: 11~13N.m.

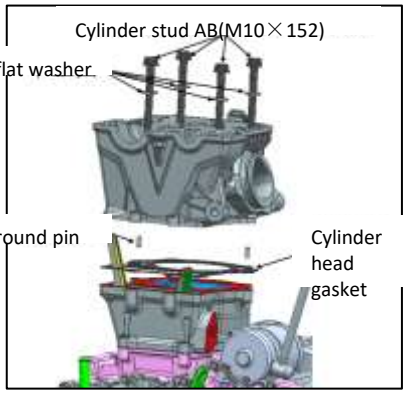
9. After rotating the intake and exhaust camshafts until the timing line is flush with the cylinder head and the timing point is facing upwards, check the intake and exhaust valve clearance with a stopper; intake valve clearance 0.1mm~0.15mm, exhaust valve clearance 0.15mm~0.2mm.



Attention.

-Camshaft should rotate flexibly without interference and stalling

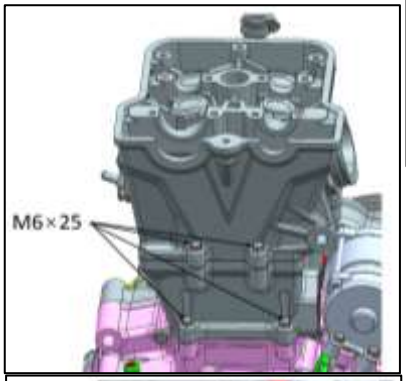
-When adjusting the valve lash, make the camshaft in the timing position and torque the camshaft bracket tightening bolt to 10N.m before measuring.



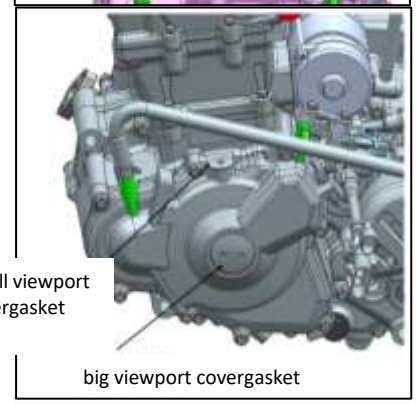
Assembly of cylinder head components

1、Remove the camshaft bracket that has been adjusted for the valve clearance cylinder head, and then remove the intake and exhaust camshaft parts.
2、Remove the old cylinder head gasket, install the new cylinder head gasket, and then install the cylindrical pin (ø6×12).
3, put the cylinder head on the cylinder body, then put the A and B bolts flat washers on the NC450S cylinder double-head bolt AB, then put the NC450S cylinder double-head bolt AB into the cylinder head, cylinder body connection hole and tighten it.

Caution.
-The cylinder head gasket must be replaced with a new one.
A, B bolt nut tightening need to be done diagonally, the first time for 20N.m pre-tightening, the second time for 40N.m tightening, and finally the third tightening torque: 55 ~ 60N.m.

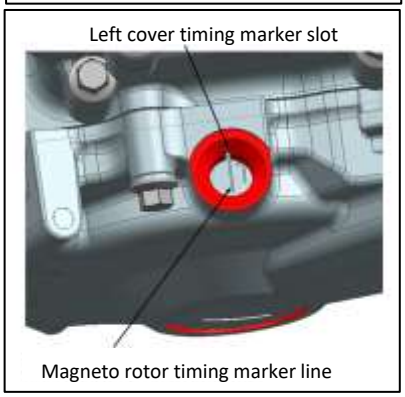


4、First put 2pcs M6×25 bolts into the cylinder body, box
Body connection hole and tighten, then put 2 M6×25 bolts into the connection hole of cylinder head and body and tighten.
Tightening torque: 11~13N.m.
5. First check whether the engine is in the timing position, if not, readjust the engine timing position; then install the intake and exhaust camshaft parts so that the camshaft timing line is flush with the end surface of the cylinder head and the timing point is directly above the cylinder head, then install the timing chain to the intake and exhaust camshaft.

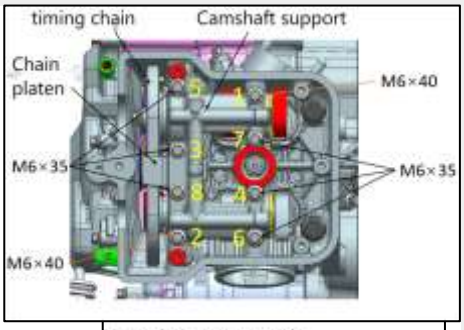


NC450S engine timing adjustment

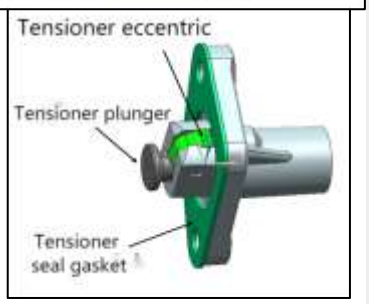
(1) Remove the large viewport cover and small viewport cover of the left front cover.
(2) Rotate the magneto lock nut with a special tool and observe whether the timing mark line "Ⅰ" on the rotor of the magneto and the timing mark slot on the left front cover are aligned through the screw hole of the small sight hole cover on the left front cover.
(3) After the above timing mark is correct, continue to install the intake and exhaust camshaft parts so that the timing line of the intake and exhaust camshaft parts is flush with the end surface of the cylinder head and the timing point is facing the upper part of the cylinder head, and then install the timing chain to the intake and exhaust cam timing driven sprocket.
☆: Only if (2)(3) is satisfied at the same time, the engine is in the correct timing position.

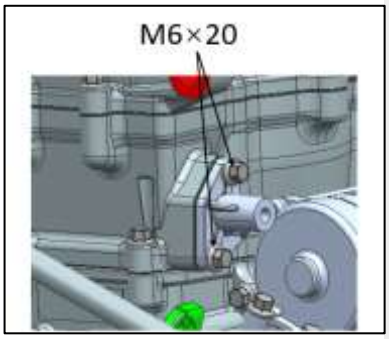


6、After adjusting the timing position, assemble the large viewport cover and small viewport cover to the left front cover.
7. Then install the removed camshaft bracket, spark plug seal and chain pressure plate onto the cylinder head, and tighten 8 bolts of the cylinder head bracket, tightening bolts in the order of 1→2→3→4→5→6→7→8.
Tightening torque: 11~13N-m

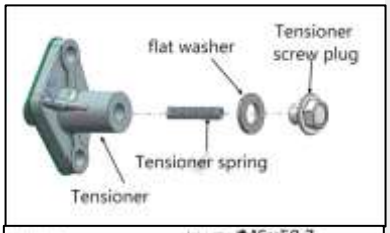


8, press down the tensioner eccentric wheel by hand, press the tensioner plunger into the tensioner, make the tensioner plunger in a contracted state, then align the tensioner gasket, tensioner combination to the cylinder mounting hole, and fasten with 2 M6×20 bolts.
Tightening torque: 11 ~ 13N-m





9, and then the tensioner spring, flat washer, tensioner screw plug in turn into the tensioner body, tighten the tensioner screw plug, so that the tensioner plunger pops out.
Tightening torque: 7~9N-m.
10、Check whether the timing chain is tensioned and confirm again whether the engine timing point is correct.



Installation of cylinder head
1、Take NC450S cylinder head cover seal, head cover bolt cushion washer, assemble in NC450S cylinder head cover specified position.
2、Take 3 pieces NC450S cylinder head cover fixing bolt M6×22.8, 3 pieces cylinder head cover fixing bolt M6×50.7, assemble in cylinder head, tighten diagonally in turn.
Tightening torque: 10~12N-m.

Cylinder block and piston

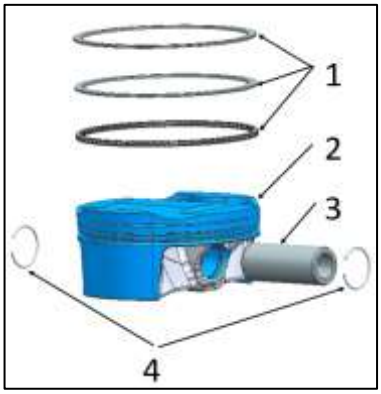
Maintenance instructions

Caution.
-The cylinder head lubricating oil goes to the cylinder head through the small oil hole next to the left body AB pin of the engine, make sure the small oil hole next to the left body AB pin is clear before installing the cylinder. Do not put the cylinder solid locating pin into the oil passage hole.

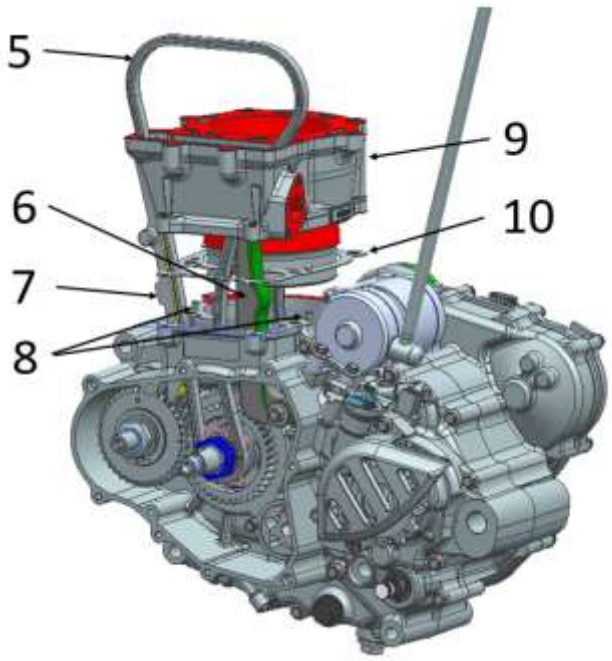
Cylinder, piston, piston ring, piston pin, specification parameters

item			standard values mm	Maintenance limit values mm
cylinder	Cylinder bore diameter		φ94.5 ~ φ94.52	φ94.528
	deroundness		0.05	0.01
	Flatness of cylinder surface		0.03	0.05
Piston Piston ring piston pin	Piston outside diameter		φ94.453 ~ φ94.467	φ94.43
	Piston pin bore bore diameter		φ20.004 ~ φ20.01	φ20.015
	Clearance between piston pin and piston pin hole		0.004 ~ 0 .018	0.025
	Piston ring closing clearance	Top ring/second ring	0.2 ~ 0.35	0.5
		Oil ring	0.2 ~ 0.7	1.4
	Piston ring groove clearance	Top ring	0.03 ~ 0.07	0.08
		Second ring	0.02 ~ 0.06	0.08
	Clearance between cylinder and piston		0.033 ~ 0.067	0.07
	Outside diameter of piston pin		φ19.992 ~ φ20	φ19.99
Small end of connecting rod	Inside diameter		φ20.015 ~ φ20.025	φ20.04
	Clearance between small end of connecting rod and piston pin		0.015 ~ 0.033	0.05

Assembly drawings

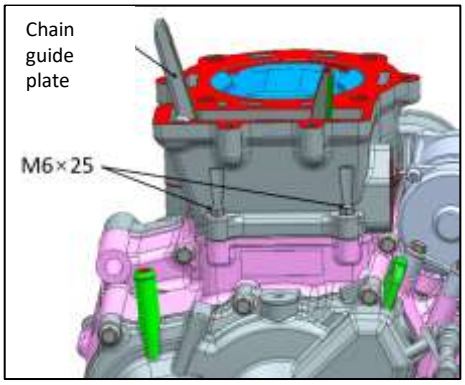


1、NC450S piston ring assembly.
2、NC450S piston.
3、NC450S piston pin.
4、NC450S piston pin retaining ring.
5、NC450S timing chain assembly (5×134_tooth chain).
6、NC450S chain tensioning plate combination (2#).
7、NC450S chain guide plate combination.
8、Cylinder pin φ6×12.
9、NC450S cylinder block parts (cylinder standard 449_passivated by shot blasting).
10, NC450 cylinder block gasket (foam metal rubber composite plate).

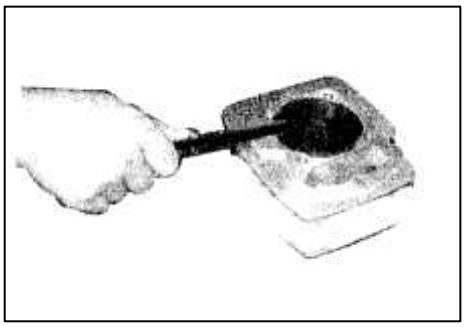


Disassembly of the cylinder

1、Take off the chain guide plate, remove the two cylinder block and box connecting bolts M6×25, remove the cylinder block.

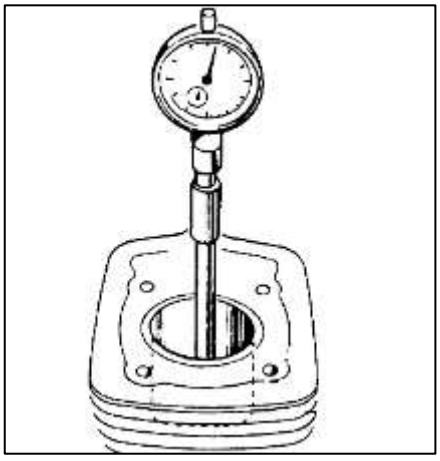


2、Scrape the remaining gasket on the cylinder surface with a scraper.



Inspection of the cylinder

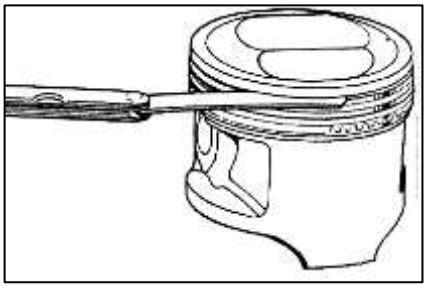
1、Check whether the cylinder block is worn or destroyed.
2、Measure the cylinder bore, should measure three positions, namely the top, middle and bottom of the piston stroke, the measurement should be made in two directions at right angles to each other.
Repair limit value: φ94.528mm



Disassembly of piston

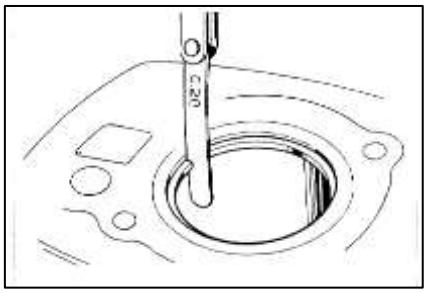
Remove the piston pin retainer with sharp nose pliers and take off the piston pin and piston.

Caution.
-The piston pin retainer should not be dropped into the crankcase when removing the retainer.

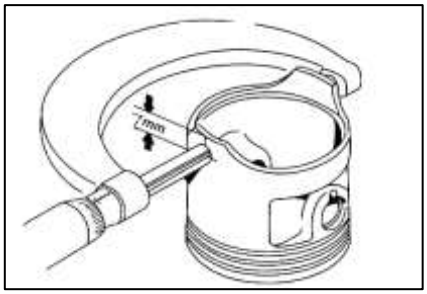


Inspection of pistons and piston rings

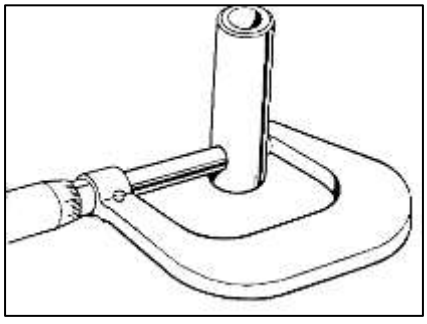
1、Remove the piston ring.
2、Measure the clearance between the piston ring and the piston ring groove, repair limit value.
First ring: 0.08 mm
Second ring: 0.08 mm
Oil ring: 0.08 mm
3、Check whether the piston is worn or cracked, and whether the piston ring groove is worn.



4、Insert the piston ring into the cylinder, then measure the piston ring closing gap.
Repair limit value.
The first ring: 0.5mm
Second ring: 0.5mm
Oil ring: 1.4 mm



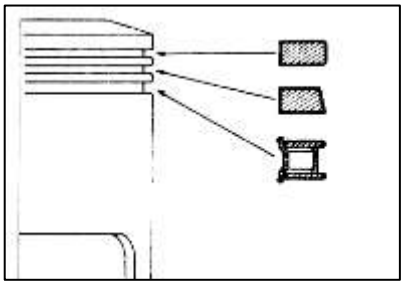
5. Measure the outside diameter located at a height of 7 mm from the piston skirt.
Repair limit value: φ94.43 mm
6、Figure out the clearance between the cylinder and the piston.
Repair limit value: 0.1mm



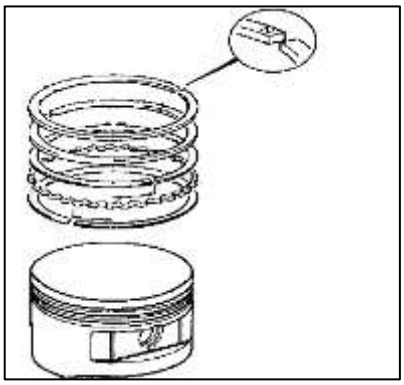
7、Measuring the outer diameter of the piston pin.
Repair limit value: φ19.99 mm
8、 Calculate the clearance between the piston and the piston pin.
Repair limit value: 0.025 mm

Installation of piston rings

1, the piston ring groove will be thoroughly cleaned.
2、Fit the piston ring.



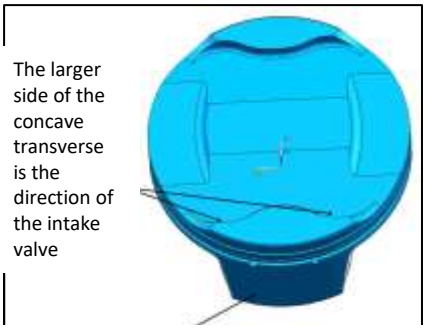
Caution.
1, in the installation, should prevent the piston and piston ring from being destroyed.
2、When installing the piston ring, the first ring and the second ring should not be installed wrongly, and the side of the first ring and the second ring with the mark should face the top of the piston.
3、After installation, the piston ring should rotate flexibly.



3、The gap between each ring in the oil ring should be matched with the gap of the spacer ring; when installing the oil ring, the spacer ring should be installed first, and then the side guide.

Installation of piston

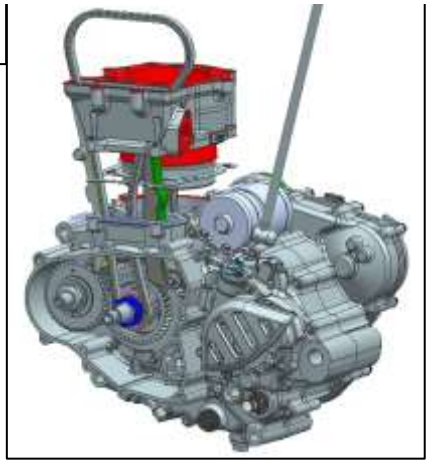
Install the piston ring, piston pin and new piston pin retainer on one side.



The smaller side of the skirt is the direction of the intake valve

Attention.

1. when installing the piston, the smaller side of the skirt should face the intake side of the engine, or the larger side of the top groove should face the intake side.
2. the opening of the piston pin retaining ring end gap should be facing downward.
3. the piston pin retaining ring must be replaced with a new retaining ring if the deformation is serious.
4. Do not let the piston pin retainer fall into the crankcase.



Cylinder installation

1, install the cylinder block locating pin, new cylinder block gasket.
2, in the cylinder block, piston and piston ring surface evenly coated with a layer of oil;.
3、First stagger the openings between the piston rings 120° from each other, then gently assemble the cylinder block in place.
4、Assemble the chain guide plate in place.

Note: When installing the cylinder block, avoid destroying the piston rings.

Clutch, driving gear, overrunning clutch, oil pump, gearshift mechanism

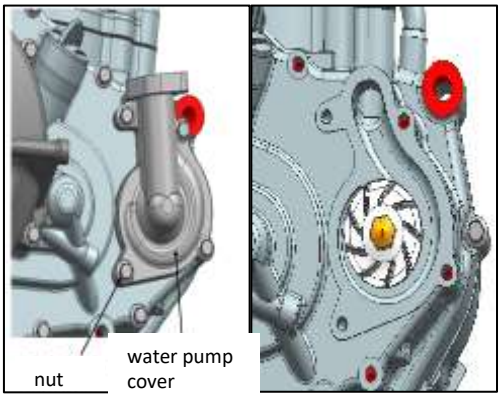
Maintenance instructions

Instructions

After removing the right crankcase cover, the disassembly, installation and maintenance work concerning the clutch, oil pump and gearshift mechanism can be carried out without removing the engine.

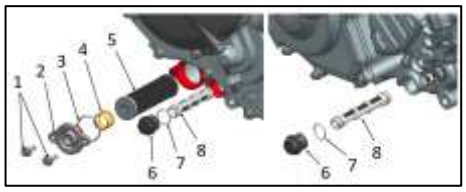
Clutch oil pump specifications

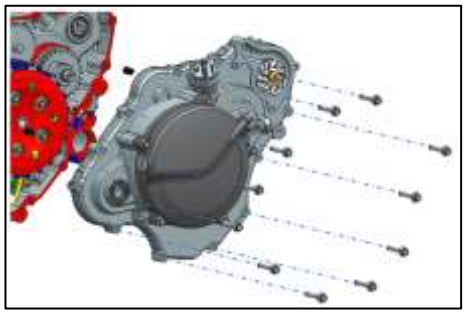
item		standard values mm	Maintenance limit values mm
Clutch	Free spring length	25	25
	Friction plate free thickness	2.95 ~ 3.05	2.85
	Clutch driven plate flatness	0.1	0.14
	Clutch cover and friction plate clearance	0.1 ~ 0.3	0.6
Oil pump	Radial clearance between outer and inner rotors	0.06 ~ 0.15	----
	End clearance between rotor assembly and cover plate	0.04 ~ 0.1	----



Water pump cover removal

Remove the water pump cover drain bolt, release the cooling water from the engine at the drain bolt, and remove the water pump cover and the water pump cover gasket when there is no water flowing from the drain bolt.



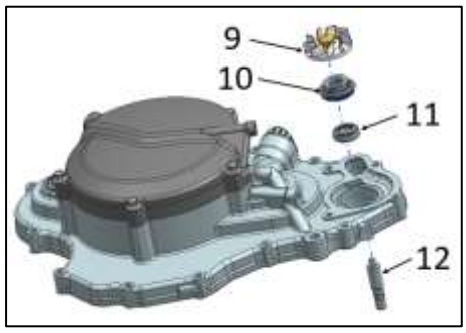


Right crankcase cover removal

1、Drain the engine oil first (remove the two fastening bolts (1) M6×16 of the oil filter cover (2) on the right side, remove the oil filter cover (2), remove the oil filter spring (4), remove the oil filter parts (5), remove the oil filter cover (6) of the left and right box, remove the oil filter combination (8) in the box, and wait until the oil in the box is finished; when removing the oil filter cover. pay attention to the oil screen cover O-rings (3), (7) are not damaged.

2. Remove the connecting bolts and take off the right crankcase cover.

Note: When taking the right cover, remove the two locating pins together and keep the locating pins in a safe place.



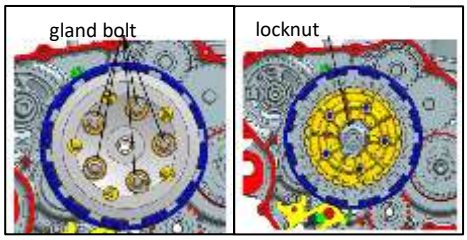
Impeller, water pump shaft, water seal assembly and oil seal removal

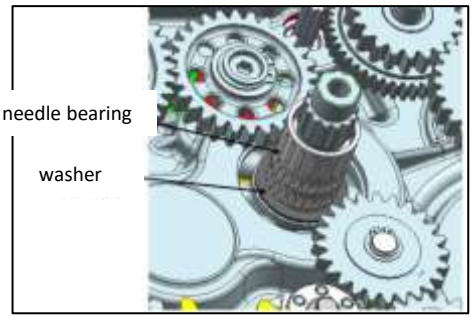
1、Remove the pump impeller (9) and remove the pump shaft (12).

2、Take off the water seal assembly (10) and oil seal (11) in the pump shaft hole.

Disassembly Clutch

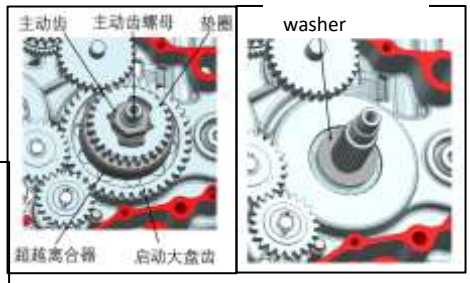
1、Remove the clutch pressure plate bolt and spring, note that when twisting and loosening the clutch pressure plate bolt, it should be twisted and loosened in a cross way in two or three times.
2、Remove the clutch pressure plate and clutch top lever.
3、Remove the clutch lock nut and thrust spacer.
4、Remove the clutch center sleeve, outer cover, needle bearing and spacer.
5、Take out the clutch push rod in the center hole of the main shaft.





Disassembly active gear, overclutch, starter gear

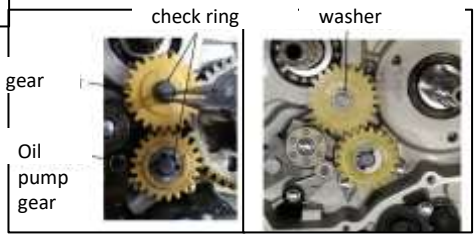
1、Remove the active gear lock nut and lock nut washer.
2、Take off the active gear, overrunning clutch and starting large disc gear.



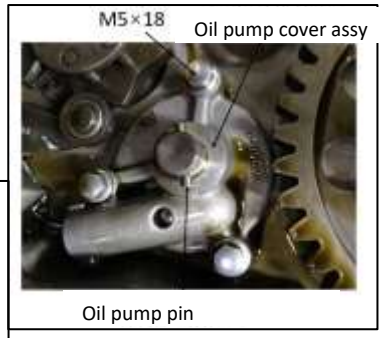
Note:
when you start down the big gear combinations, will start the big gear the washer below to be removed, and properly keep the gasket.

Disassembly right body oil pump

1、Remove the oil pump over-bridge gear and oil pump gear combination retaining ring with expansion pliers.
2、Remove the oil pump over-bridge gear gasket, oil pump over-bridge gear, oil pump gear combination.
3, remove the right oil pump cover plate of three bolts M5 × 18, take off the oil pump cover plate combination and oil pump inside and outside rotor combination.



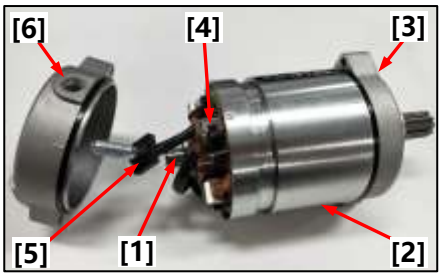
Attention.
The oil pump over-bridge teeth have 1 oil pump over-bridge teeth washer on top and bottom, the removed retaining ring, washer and oil pump pin should be properly stored to avoid loss.



Disassembly starter motor

Remove the fastening screw M6x25 of the starter motor and remove the starter motor.

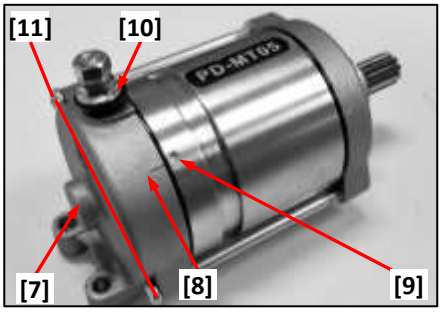
Remove the o-ring [1]. The installation sequence and remove the reverse order. Note: the replacement of a new o-ring and coated with engine oil.



Caution.

Install the armature [1] into the motor housing from the housing slot [2] side
body so that the commutator lever is facing the rear side.
Install the front cover [3] with the tabs aligned with the recesses (index line [8] aligned).
Install the carbon brush assembly [4] onto the motor drive shaft [1] The wire harness [5] is threaded into the rear cover hole [6] while the rear cover [7] is installed.
Caution:

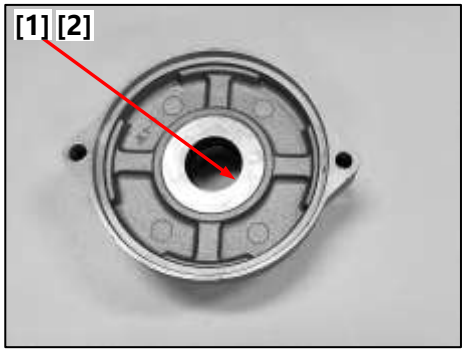
Prevent damage to the oil seal lip with the armature shaft aligned with the rear cover index line [8] and the groove [9] on the motor housing.
Install the front and rear cover attachment bolts [11] harness positive fastening nuts [10].



※Inspection of starter motor

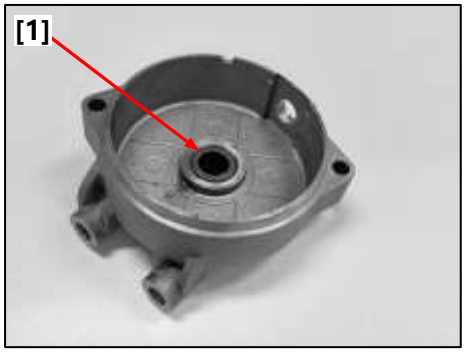
Front cover

Check whether the oil seal [1] in the front cover is deteriorated, worn or damaged.
Turn the inner ring of the bearing [2] with your finger, the bearing should rotate smoothly, and also check whether the outer seat ring fits tightly with the front cover.



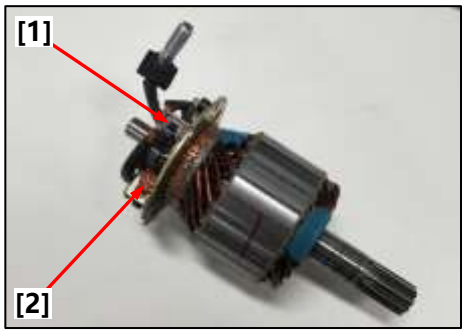
Rear cover

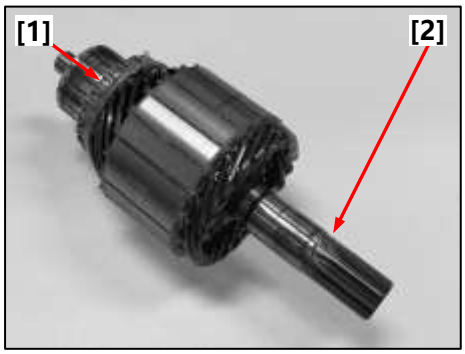
Check the bushing [1] in the rear cover for wear or damage.
Check the carbon brush for damage and measure the length of the carbon brush [1].
Operating limit: 6.5 mm
Check the conductivity of the rear cover as follows.
-Conductivity should be maintained between positive brushes [2] and cable terminals.
-Between the cable terminal and the back cover: should not be conductive.

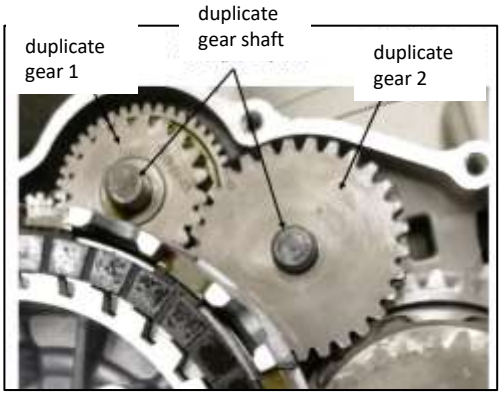


Rotor

Remove any metal debris from the commutator rod [1].
Check commutator bar for discoloration.
Check for conduction on the rotor as follows.
-Between a pair of commutator bars; there should be conduction.
-Between each commutator bar and the armature shaft [2].
There should be no conductivity.

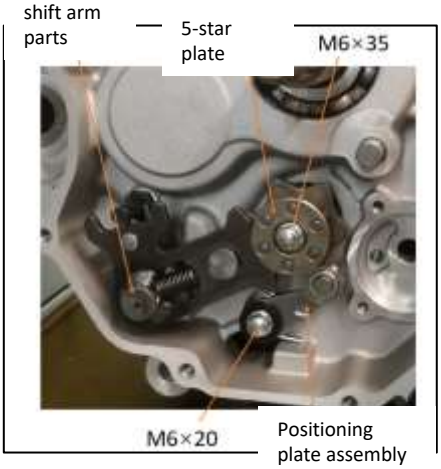






Disassembly of duplex gear

Remove the duplex gear shaft first, then remove the duplex gear one and duplex gear two.

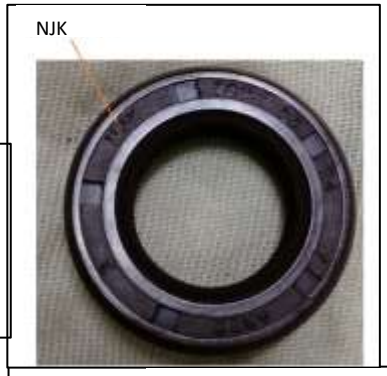


Disassembly of gearshift mechanism

1、Remove the five-star plate fastening screw M6×35 and remove the five-star plate.
2、Remove the shift arm parts.
3、Remove the positioning plate combination fastening screw M6×20, remove the positioning plate washer and positioning plate combination.

Inspection of right crankcase cover

1, check whether the right crankcase cover crankshaft oil seal is broken, if the oil seal is found to be broken then it needs to be replaced with a new oil seal.

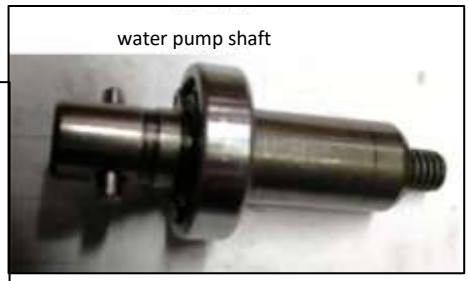


Two points should be noted when replacing crankshaft oil seal:

1. Make sure the state of oil seal is correct, the end face of NC450S crankshaft oil seal should be marked with "NJK".
2. The marked side should face outward during assembly.

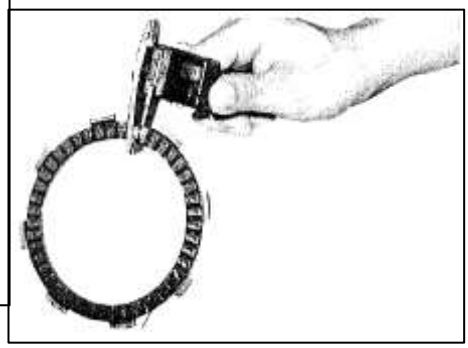
Inspection of right crankcase cover, impeller, water pump shaft, water seal oil seal

1、Check whether there are cracks in the impeller of the water pump and whether the inserts of the impeller of the water pump are loose, if there is the above phenomenon, it is necessary to replace the impeller of the water pump with a new one.
2、Check whether the water seal component and oil seal are broken, check whether the water pump shaft is abnormally worn and bent, if so, replace the water seal component, oil seal and new water pump shaft.



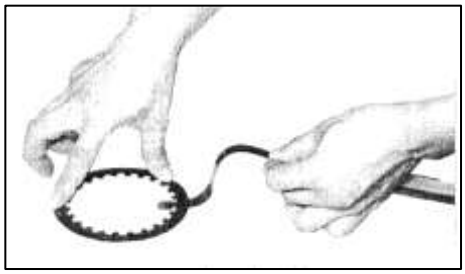
When replacing the water seal assembly, oil seal and pump shaft, attention should be paid to.:

1. Apply an appropriate amount of oil in the NC450S water pump shaft hole and press the NC450S water pump shaft oil seal into place with special tooling, with the oil seal end mark facing outward.
2. Press the NC450S water seal into place with special tooling, 0.5mm below the end face, with the water seal end mark facing outward when assembling the water seal.
3. Apply an appropriate amount of lubricant to the main lip of the water seal.
4. Press the new water pump shaft into place with special tooling.
5. The assembled water pump shaft should be flexible in rotation.



Inspection of clutch active friction plate

1. If the clutch friction plate shows signs of abrasion or discoloration, it should be replaced. Measure the thickness of each clutch friction plate.
Repair limit value: 2.85mm
2、Check the surface of the clutch follower plate for distortion, and use a gap gauge for the inspection (flatness).
Repair limit value: 0.14 mm



3. Check the gap between the clutch cover and the friction plate.
Maintenance limit value: 0.6 mm

Inspection of clutch cover

Check whether the groove on the drum of the outer cover is notched and scarred by the friction of the clutch disc. If serious, the outer cover needs to be replaced.

Overreach clutch housing

Overreach clutch block

nspection of overclutch

Remove the ring on the end face of the overrunning clutch, and check whether the wedge of the overrunning clutch is worn and damaged, and whether the wedge spring is stretched or broken.

Oil pump plate

Oil pump inner and outer rotor combination

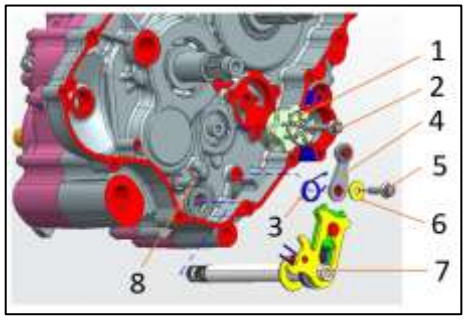
Inspection of Right body oil pump

1. Check whether the rotor inside and outside the oil pump is worn and damaged. If the wear and damage are serious, it is necessary to replace the new oil pump rotor assembly;
2, check the gear oil pump across the bridge and oil pump gear combinations have burst phenomenon, there is need to replace the new machine oil pump gear and gear oil pump combination
3 bridge, inspect right oil pump cover for wear and damage phenomenon, if has the need to change new oil pump cover board right.

Oil pump gear

Oil pump gear assembly

Assembly of shift mechanism



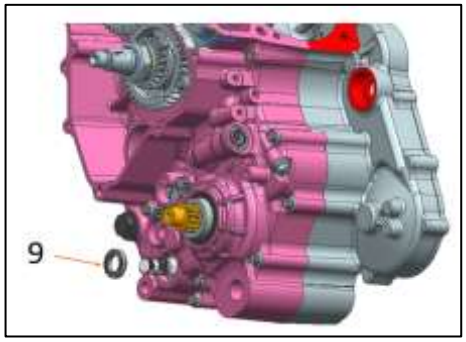
1、Install the positioning plate combination (4) and flat washer (6), snap the positioning plate spring (3) into the corresponding position of the positioning plate and fasten it with the M6×20 bolt (5).

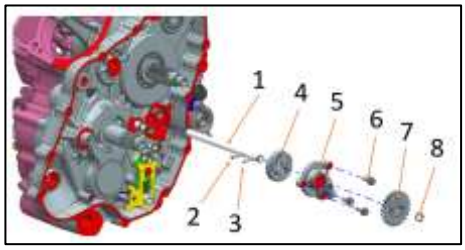
2, put the five-star plate combination (1) on the shift drum, take a M6 × 35 bolt (2), apply 3 to 4 teeth thread fastening adhesive on the threads, and tighten the bolt.

3. Take the NC250 shift arm part (7) and put it into the corresponding position (note: the shift arm return spring is stuck into the right body shift arm positioning bolt (8)).

4. test whether the gearshift is correct and smooth.

5、Take the shift arm oil seal (9) and assemble it in the left body shift arm oil seal hole position with tooling.





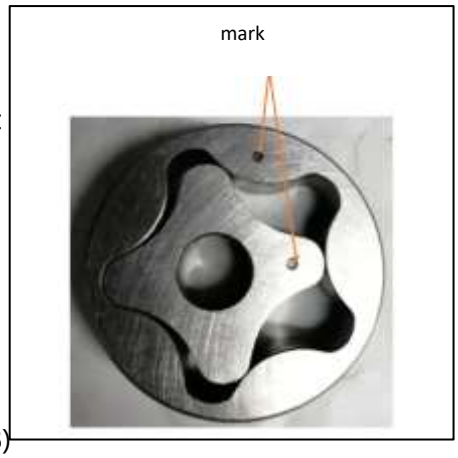
Assembly of right body oil pump

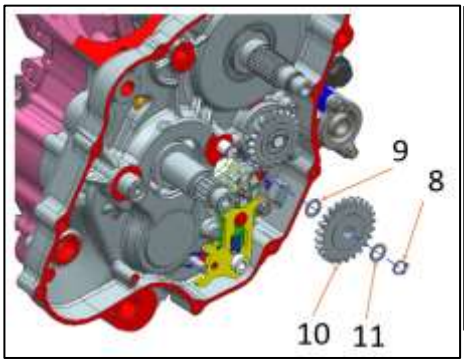
1、Put the oil pump shaft (1) through the corresponding hole in the case. Note: there are 2 pin holes on the shaft facing the right box

2, put the oil pump pin (2) through the oil pump shaft (1), and then put the oil pump rotor assembly (4) into the corresponding oil pump hole in the right body (the marked face of the oil pump rotor assembly should face the same direction), and

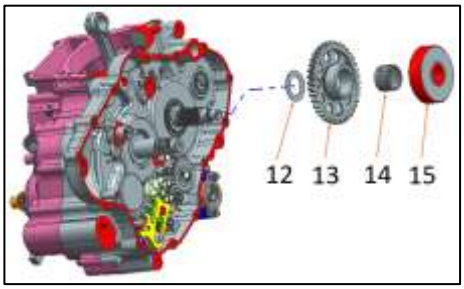
3, then install the oil pump cover assembly (5) to the oil pump and fasten it with 3 bolts (6) of M5×18.

4、Put the oil pump pin (3) through the oil pump shaft, then put the oil pump gear combination (7) onto the oil pump shaft, and finally put the retaining ring (8) onto the snap ring groove of the oil pump shaft.





Attention.
1. when installing the oil pump rotor, the marked surface of the inner and outer rotor should face the same direction.
2. tightening torque of the oil pump cover bolts: 7 to 9 N.m.
3. After assembling the cover plate, make sure that the oil pump shaft is flexible in rotation.。

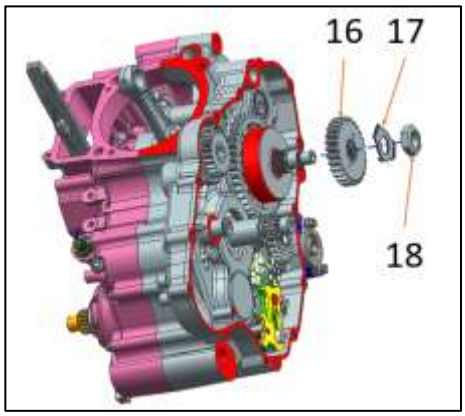


4. Install the oil pump over-axle gear washer (9) on the oil pump over-axle gear shaft, install the oil pump over-axle gear (10) on the oil pump over-axle gear shaft, then install the oil pump over-axle gear washer (11) on the oil pump over-axle gear, and finally install the retaining ring (8) on the snap ring groove of the oil pump over-axle gear shaft.。

Caution.
Apply oil evenly on the inner hole of the starter large disc teeth before installing the starter large disc teeth.

Installation of starter gears and overclutch

1、Install the starter large disc tooth washer (12) onto the right crank.
2、Install the starter large disc tooth (13), needle bearing (14) and overrunning clutch (15) on the right crank.

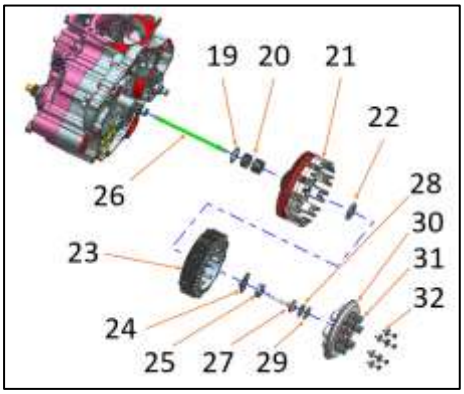


Installation of active gears

1、Fit the active tooth (16) to the right crank
2、Fit the active tooth lock nut washer (17) to the active tooth.
3、Apply 3~4 teeth thread fastening adhesive to the active tooth lock nut (18), install it on the right crank and fasten it.
Tightening torque: (115 ~ 125) N - m
Thread fastening adhesive name: Loctite 263

Installation of clutch

1. Install the clutch cover washer (19), needle roller bearing (20), clutch cover (21) and clutch center sleeve washer (22) on the spindle;



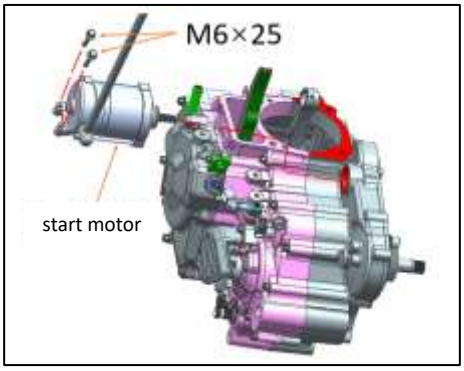
Note: The clutch needle rollers are evenly coated with engine oil.

2, first clutch center sleeve combination (23), clutch lock nut washer (24) installed on the spindle, clutch lock nut (25) coated with 3 to 4 teeth thread fastening adhesive will be installed on the spindle and tightened.

Note: Clutch lock nut tightening torque: 80～90N.m

3, then put the clutch push rod (26) into the center hole of the main shaft, then put the clutch top rod (27) into the center hole of the main shaft, then put the thrust bearing (28) and top rod washer (29) onto the top rod.

4. Install the clutch pressure plate (30), clutch pressure plate spring (31), and pressure plate screw (32), and tighten the pressure plate screw with a torque wrench, tightening torque: 8 to 10 N-m.



Installation of starter motor

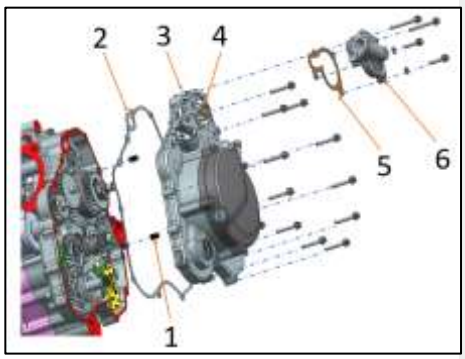
Assemble the starter motor in place after evenly applying oil to the slotted end of the starter motor and fasten it with 2 bolts M6×25 with a tightening torque of 11 to 13 N.m.

Installation of right crankcase cover

1, the two locating pins (1) to the box locating pin hole, remove the old right crankcase gasket (2), install the new gasket, the right crankcase cover (3) assembly in place and 11 bolts M6 × 35 tightening, tightening torque: 11 ~ 13N.m

2、Fit the water pump impeller (4) to the water pump shaft and tighten it, tightening torque: 2～4N-m.

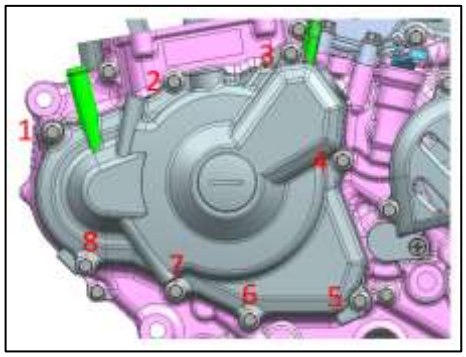
3、Fit the pump cover gasket (5) and assemble the pump cover (6) in place and fasten it with 2 bolts M6×45 and 2 bolts M6×25.



Magneto, balance driving and driven gear

Repair instructions

The removal and installation of the magneto and balanced master and slave gears described in this section
This can be done by simply removing the left crankcase cover without removing the engine.



Disassembly of the left crankcase cover

Remove the left front cover 8 fastening bolts and remove the left crankcase cover.

Disassembly of magneto stator

1、Remove the 2 bolts M5×10 fastening screws of sensing.
2、Remove the 2 bolts M5×40 fastening screws of the stator coil, and then remove the magneto stator combination from the left crankcase cover.

Disassembly of rotor

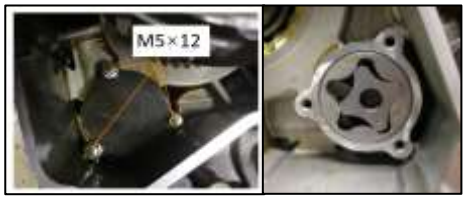
Remove the magneto rotor lock nut and remove the magneto rotor with special tools.

Attention.
1. magneto rotor disassembly can only be disassembled with special tools, do not allow knocking magneto rotor.
2. The magneto rotor should be replaced with a new magneto rotor if the rotor is subjected to accidental impact during disassembly and assembly, such as if the magneto rotor falls to the ground or is struck by a foreign object.

Disassembly of balancing master and slave gears

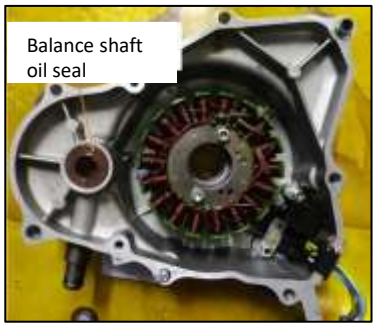
1、Remove the balance active gear lock nut (1) and active gear lock nut washer (2), respectively.
2、Remove the crankshaft timing active sprocket (3) and balance active gear (4).
3、Remove the balance follower gear lock nut (5) and disc washer (6).
4、Remove the balance tooth driven wheel (7), crankshaft sleeve and balance shaft flat key.

Disassembly of left body oil pump



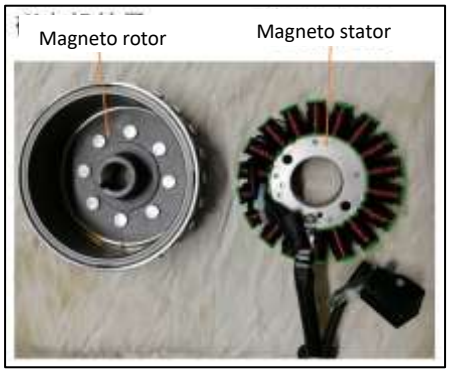
1、Remove the 3 bolts M5×1 2 that fasten the left oil pump cover plate.
2、Remove the oil pump cover plate, remove the left oil pump rotor assembly, the oil pump pin should be properly stored to avoid loss.

Inspection of the left crankcase cover



Check the balance shaft oil seal of the left crankcase cover for damage. If so, replace the balance shaft oil seal.

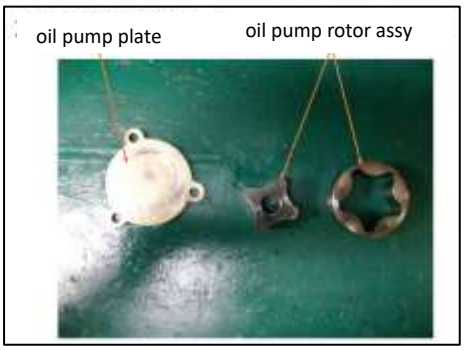
Inspection of magneto stator and rotor



1、Check whether the magnetic motor rotor tile is cracked or broken, if so, it needs to be replaced with a new magnetic motor rotor.
2, check whether the magneto stator coil is black, if there is a need to replace the new magneto stator.

Balancing master and slave gears Inspection

1、Check whether the balance master and driven gears are worn or damaged.
2、Balance driven gear buffer spring is broken, if there is broken need to replace the new gear.

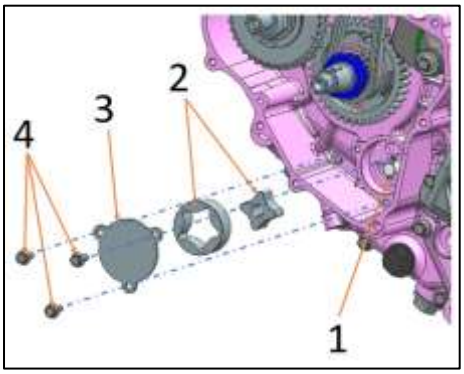


Inspection of the left body oil pump

1、Check the left body oil pump rotor assembly for wear and damage.
2、Check the left body oil pump cover plate for wear and damage.

Installation of the left body oil pump

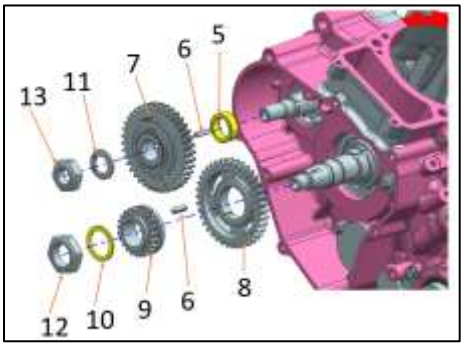
1、Fit the left body oil pump pin (1) into the corresponding hole of the oil pump shaft, and then fit the left body oil pump (2) into the corresponding hole of the left body.
2、Fasten the oil pump left cover (3) with 3 bolts M5×1 2 (4).



Attention.
1. when installing the oil pump rotor, the marked surface of the inner and outer rotor should face the same direction.
2. tightening torque of the left oil pump cover bolt: 7 to 9N-m.
3. Check whether the oil pump shaft rotates flexibly after tightening.

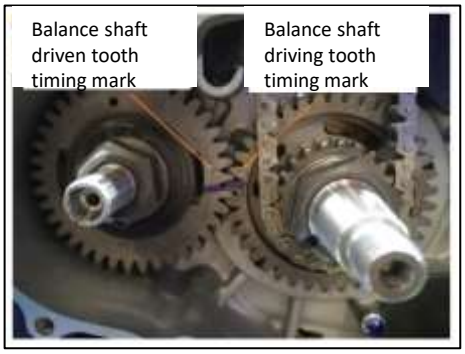
Inspection of the left body oil pump

1、First install the crankshaft sleeve (5) to the balance shaft, then install the balance shaft flat key (6) into the keyway of the balance shaft, and finally install the balance driven gear combination (7) to the balance shaft.
2. first install the balance active gear (8) onto the left crank, then install the balance shaft flat key (6) into the keyway of the crankshaft, and then install the crankshaft timing sprocket (9) onto the left crank.



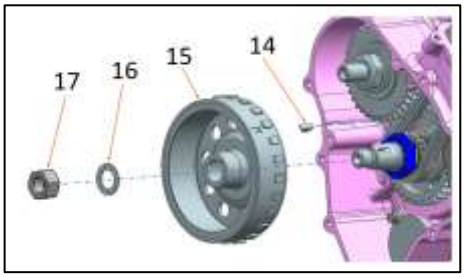
Attention.
When loading the balanced master and driven teeth, the timing marks of the balanced master and driven teeth should be corrected, i.e. the teeth with timing marks of the balanced master and driven teeth should be engaged with each other.

(10) and disc washer (11) onto the crankshaft timing active sprocket (9) and balance driven gear combination (7), and put 3 to 4 teeth of thread fastening adhesive on the balance shaft active tooth lock nut M24×1 (12) and balance shaft driven tooth lock nut M16×1 (13) and then put them onto the crankshaft and balance shaft and fasten them.
Balancing driven tooth lock nut tightening torque.
80～90N.m.
Balancing active tooth locking nut tightening torque
115~125N-m.



Installation of magneto rotor

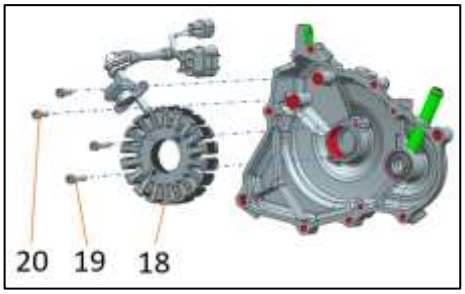
1, magneto semi-circular key (14) a, installed in the crankshaft semi-circular key slot.
2, the magneto rotor (15) will be installed on the left crank, and then the magneto nut (17) will be installed on the left crank and fastened with the washer (16) after applying 3 to 4 teeth of thread fastening adhesive.



Note: the magneto rotor lock nut tightening torque: 80-90 n. m

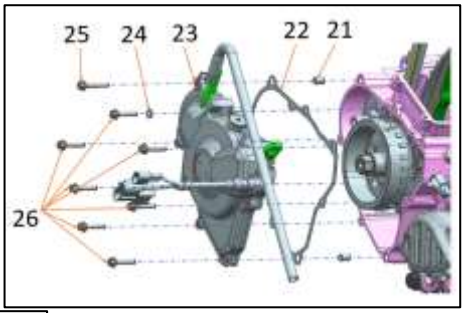
Installation of magneto rotor

Fasten the magneto stator assembly (18) to the left crankcase cover with 2 screws M5×10(20) and 2 screws M5×40(19), tightening torque: 7 ~ 9N·m.



Installation of magneto left crankcase cover

1, remove the old gasket (21), install the new gasket;.
2, the two locating pins (22) will be installed to the box body.
3, then the left crankcase cover (23) assembly in place and two M6 × 35 bolts (24) fastened, six M6 × 30 bolts (25) fastened, tightening torque: 11 ~ 13 N .m.



Note: One of the M6 × 30 bolts (26), the disk part coated with three and glue, set into the flat washer (27), inserted into the corresponding position shown in the figure

Crankcase, crankshaft, variable speed drive, balance shaft

Maintenance instructions

This section introduces the installation and testing of transmission, crankshaft and balancing mechanism. When carrying out the above work, the crankcase should be separated first, and the disassembly of other parts about the engine should be carried out before the crankcase is separated.

Work before crankcase separation:
-Disassembly of cylinder head
-Cylinder/piston disassembly
-Disassembly of clutch, oil pump, gearshift mechanism, balance gear
-Disassembly of magneto

Shift forks/Shift fork shaft/Crankshaft /Balance Shaft Specifications

item			standard values mm	Maintenance limit values mm
Shift forks	Internal diameter of the right fork of the secondary shaft / Internal diameter of the left fork of the secondary shaft		φ12.016 ~ φ12.043	φ12.045
	Internal diameter of spindle fork		φ12.016 ~ φ12.043	φ12.045
	Jaw thickness		4.8 ~ 4.9	4.8
Shift fork shaft	Spindle fork shaft OD		φ11.973 ~ φ12	φ11.95
	Subshaft fork shaft OD		φ11.973 ~ φ12	φ11.95
	Cylindricity		0.006	----
Crankshaft	Connecting rod small head inner diameter		φ20.015 ~ φ20.025	φ20.04
	Big end side clearance of connecting rod	axial direction	0.15 ~ 0.4	0.7
		radial direction	0.008 ~ 0.016	0.02
Balance Shaft	diameter of axle		φ19.98 ~ φ19.993	φ19.96

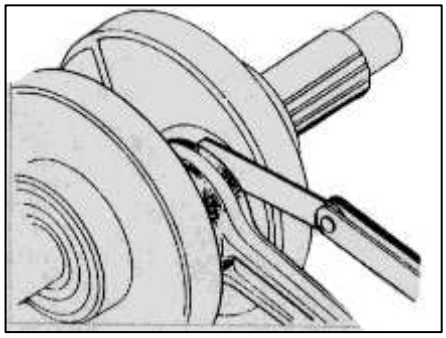
Crankcase Disassembly

1. Place the left crankcase of the engine upward; 2, remove the 3 bolts M6 M6 x 65 x 70, 3 bolt, six bolt fastening screws M6 x 45, separate left crankcase and right crankcase, remove the two pins.

Crankshaft/Balance Shaft/Main shaft and Co-Shaft Disassembly

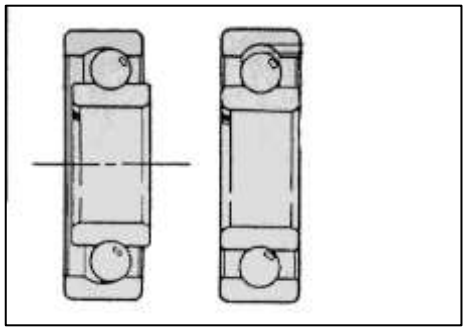
Remove the crankshaft assembly, balance shaft, fork shaft, fork, shift drum, Main shaft and Co-Shaft from the box.

Caution.
Make sure no parts are left behind when picking up the Main shaft and Co-Shaft assemblies.



Inspection of crankshaft

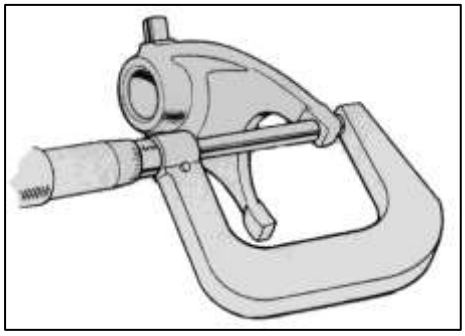
Measure the side clearance of the big head of the connecting rod with a thickness gauge.
Repair limit value: 0.7 mm



Inspection of the left and right box bearings

1, check the left and right box all bearing rotation is flexible; If the rotation is not flexible or there is a card phenomenon, the same type of bearing should be replaced.

Measure the thickness of the fork claw. Maintenance limit value: 4.7 mm



Check the variable speed drum surface and grooves for wear or damage.

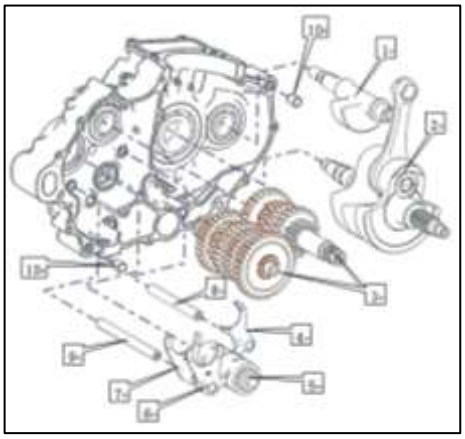
Inspection of main and auxiliary shaft components

Check whether the gears of the main and auxiliary shaft components have excessive or abnormal wear, and check whether the rings between the gears have deformation and fall off.。

Inspection of oil filter parts and oil screen

1、Check the cleanliness of the oil filter parts and oil screen; rinse the poorly cleaned oil filter parts and oil screen with clean gasoline.

2、Check whether the oil filter parts and oil screen are damaged; if there is damage, replace the oil filter parts and oil screen with new ones.



Transmission/crankshaft/balance shaft assembly

1, the balance shaft (1), (2) the crankshaft to the corresponding hole in the left body, 2 (3), the main and auxiliary shaft component to the left the corresponding hole in the body, then fork (4), (5), (7) assembly to the corresponding position,

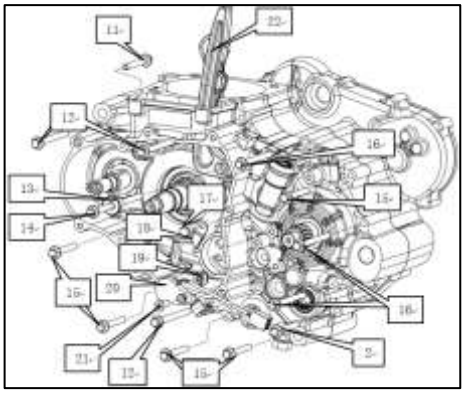
Attention.

1. the fork marked with --R is installed into the side of the secondary shaft against the right body.
2. The fork marked with --L is installed into the side of the secondary shaft against the left body.
3. The fork marked with --C is mounted on the main shaft.

Caution.

The long fork shaft passes through the fork marked -R, marked -L, and the short fork shaft passes through the fork marked -C.

3. Install the shift drum (5) into the corresponding hole of the left body, then assemble the other end of the fork into the corresponding slot of the shift drum, and finally install the fork shaft (8) and (9) into the corresponding fork.



combination

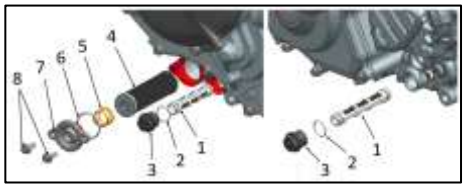
1. apply a layer of sealant evenly on the combined box surface of the right box body, install the positioning pin (10) into the corresponding hole of the left box body, and then close the right box body on the left box body.

2, take six M6 × 45 screws (15), three M6 × 65 screws (16), three M6 × 70 screws (12), one M6 × 40 bolts (11), apply 3 to 4 teeth of thread adhesive, then insert them into the corresponding bolt over hole in the crankcase, and tighten them with a pneumatic gun.

3、Take the tensioning plate (22), tensioning plate bushing (13) and one M6×105 bolt (14), apply 3~4 teeth thread glue to the bolt, first insert the tensioning plate bushing into the corresponding hole of the tensioning plate, then fasten the tensioning plate in the corresponding hole of the left body with a screw;.

4、Put the CG125D-2# gear dynamic contact (19) into the corresponding slot of the gear drum, then take the gear wire harness (20), put it into the corresponding hole of the left body, and fasten it with one M6×20 screw (21).

5. Take one M6×12 bolt (17), press the gear display harness under the CB125 foot-2# block wire piece (18) and fasten it tightly in the corresponding position of the left body.



Fastening torque: 11 ~ 13 N·m.

Assembly of oil screen

1、Assembly of the left body oil filter
Take 1 oil screen combination (1), apply a small amount of oil on its O-ring and put it into the corresponding oil screen hole. Fit the oil screen cover 0-ring (2) to the oil screen cover, apply an appropriate amount of grease to the inner hole of the oil screen cover (3), and fasten it to the case.
Fastening torque: 11 ~ 13 N-m.
2, the right body oil screen assembly
a. Take 1 oil screen combination (1), apply a small amount of oil on its O-ring, install it into the corresponding oil screen hole, install the oil screen cover 0-shaped seal (2) onto the oil screen cover, play an appropriate amount of oil in the inner hole of the oil screen cover (3), and fasten it on the box.
Fastening torque: 11~13 N-m.
b. Take the oil filter part (4) and put it into the corresponding hole of the right box
c. Put the fine filter spring (5) onto the oil filter parts, set the fine filter cover 0-shaped seal (6) into the seal groove of the fine filter cover (7), take 2 small disc bolts M6×16, put them into the corresponding holes of the fine filter cover, and fasten them in the corresponding positions of the right body
Fastening torque: 7 to 9 N-m.

closed end

opened end The installation should face to the left of the box

Caution.
When installing the oil fine filter, the open end should face the left box

Front wheel/suspension/steering

Overview

-When servicing the front wheel, front shock and steering column, a special workbench or equivalent is required to support the motorcycle.
-Do not operate the brake handle after removing the front and rear wheels.
-After installing the front wheel, apply the brake handle to check the brake operation.
-After installing the front wheel, perform an air gap check.

Troubleshooting

Hard steering

-Low tire pressure
-Faulty tires
-The steering column adjustment nut is too tight
-Worn or damaged steering runout seat
-Bent steering column

Steering to one side or not straight ahead

-Bent axle
-Wheel not installed correctly
-Wheel bearings worn or damaged
-Steering bearing damaged or loose
-Damaged frame
-Wheel bearing failure

Front wheel shake

-Bent edges
-Faulty tires
-Worn or damaged wheel bearings
-Lax axle
-Tires and wheels are unbalanced

Wheel is difficult to turn

-Faulty wheel bearings
-Bent axle
-Braking resistance

Soft suspension

-Low tire pressure
-Shock absorber spring weakness
-Shock absorber fluid level is low
-Incorrect shock absorber oil specification (low viscosity)

Rigid suspension

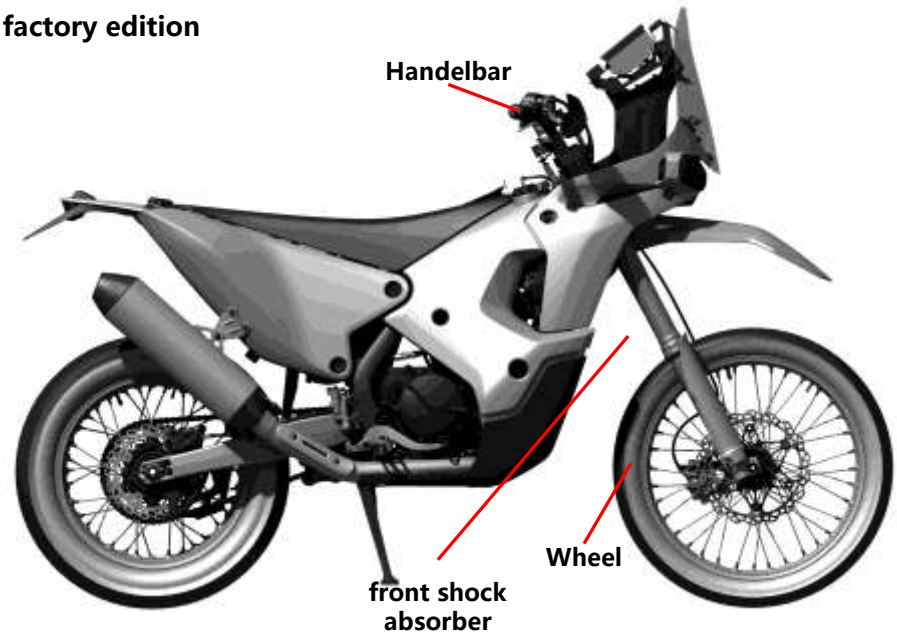
-Tire air pressure
-Shock absorber deformation
-High fluid level in shock absorber
-Incorrect shock absorber oil specification (high viscosity)
-Shock absorber oil channel blockage

Front suspension noise

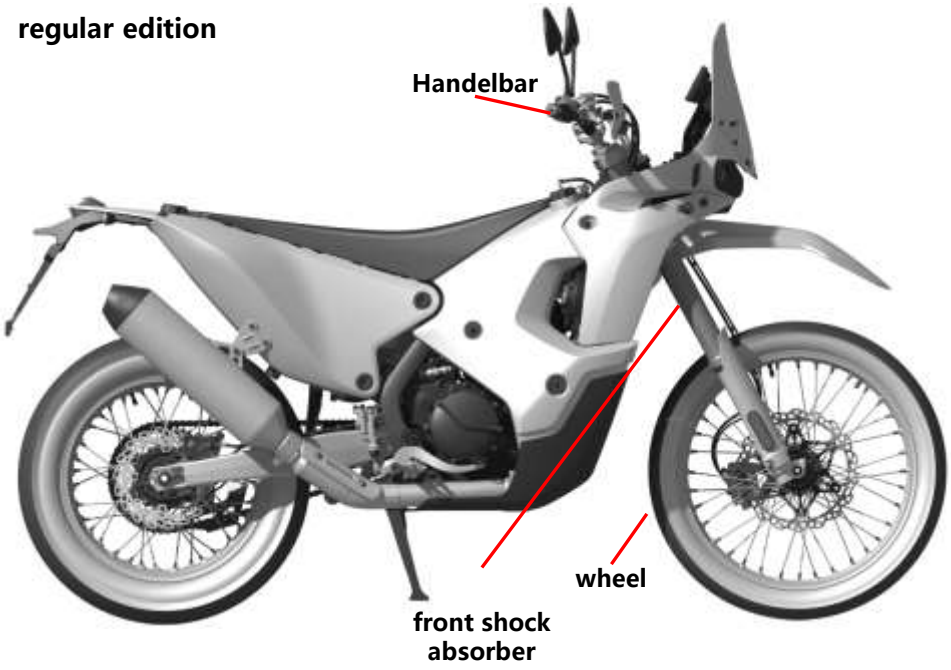
-Loose shock absorber fasteners
-Incorrect shock absorber oil specification (low viscosity)
-Front shock absorber bushing slider worn

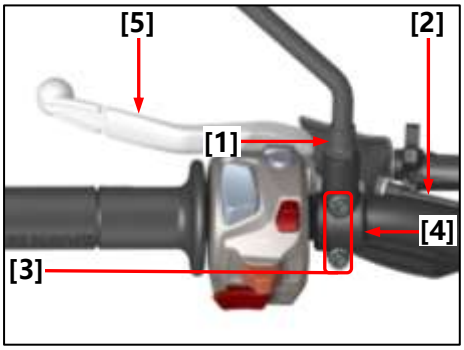
Component Location

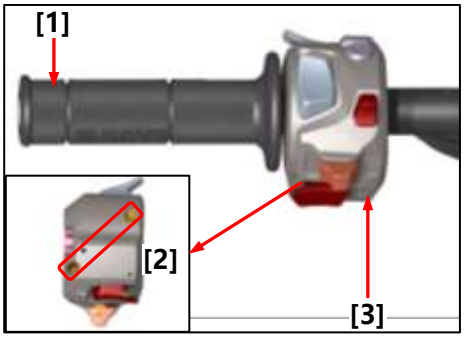
factory edition

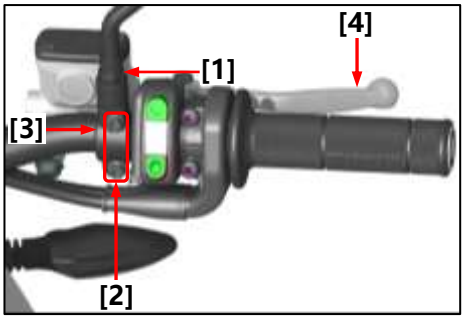


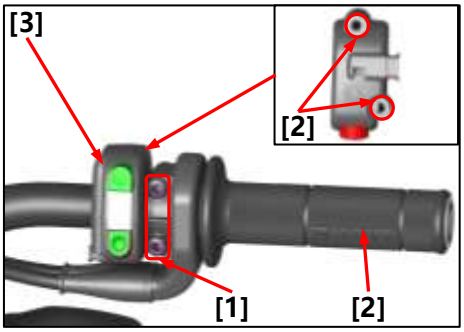
regular edition











※Handlebar-left (regular edition)

Left rear view mirror/clutch handle/left handle switch
Disassembly
Remove the following parts.

- Remove the nut [1] to remove the rearview mirror.
- Clutch switch connector [2].
- Two M6x20 inner hexagonal flange bolts [3].
- Clutch handle mount [4].
- Clutch handle [5].

- Removal of the right-hand handle rubber [1].
- Two self-tapping Phillips screws [2] at the bottom of the left-hand handle switch.
- Right handle switch housing [3].

Install in the reverse order of removal.

※Handlebar-right (regular edition)

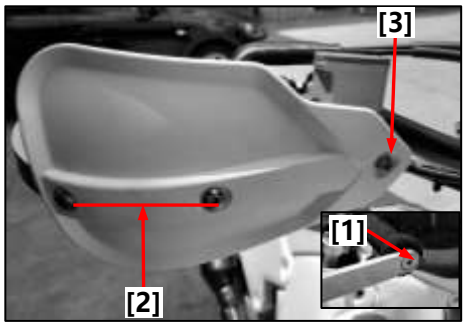
Right rear view mirror/front brake handle/right hand grip switch
Disassembly
Remove the following parts.

- Loosen the nuts [1] to remove the rearview mirror;
- Remove the two M6x20 inner hexagonal flange bolts [2];
- Remove the brake handle mount [3];
- Remove the brake handle [4].

- Remove 2 screws [1];
- Remove the oiler and handle rubber [2];
- Remove the 2 screws [3] from the bottom of the right-hand handle switch;
- Remove the right-hand handle switch [4].

The installation order is the reverse of the disassembly order.
Caution.
-The fuel filler must be installed with the tab accurately into the truck handle restriction hole.

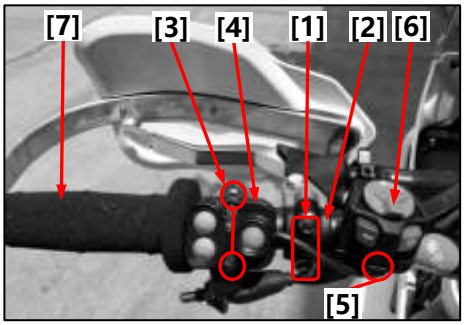
※Handlebar-left (factory edition)



Hand guard/clutch handle/left handle switch
Disassembly
Disassemble the following parts.

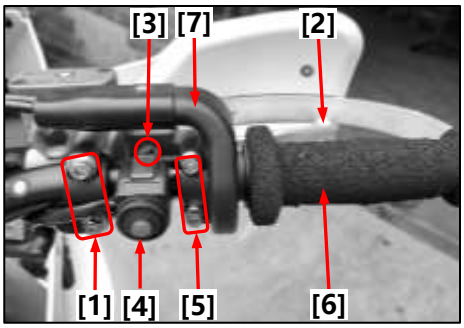
- Removal of hexagon socket countersunk head screws [1].
- Removal of 2 hexagon socket step screws [2].
- Remove the inner hexagonal socket flange screw [3].

- Remove 2 inner hexagonal socket head flange bolts [1].
- Removing the clutch handle catch [2].
- Removing the left hand guard.
- Remove the 2 inner six-flower hexagonal flange bolts [3] behind the combination button.
- Remove the combination button [4].
- Remove the two hexagonal socket head bolts [5].
- Remove the left handlebar switch [6].
- Remove the left handlebar rubber [7].



The installation sequence is the reverse of the disassembly sequence.

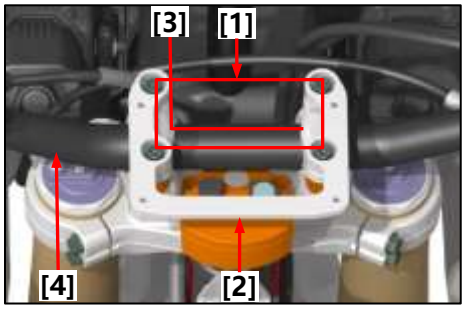
※Handlebar-right (factory edition)



Handguard/ Brake Handle/ Starter Switch/ Throttle Turner
Disassembly
Disassemble the following components.

- Removal of the hand guard as above (left).
- Removal of 2 inner hexagonal flange bolts [1].
- Removal of the front brake handle [2].
- Removal of the starter switch screw [3].
- Removal of the starter switch [4].
- Remove the two inner hexagonal flange bolts [5].
- Remove the throttle handle rubber [6] and the throttle filler [7].

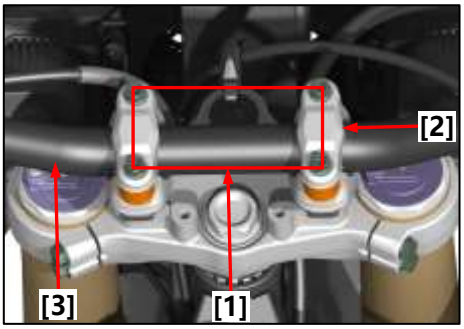
The installation order is the reverse of the disassembly order.



※Handelbar (factory edition)

Disassembly
Disassemble the following parts.

- Removal of four internal six-flower external hexagonal flange screws M8x50 [1].
- Remove the directional handle pressure block (ENB bracket) [2].
- Remove the steering handle upper clamp X2 [3].
- Removing the handlebar tube [4].

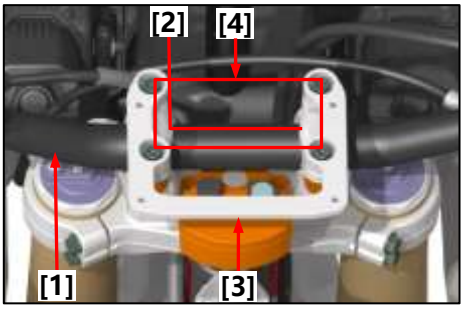


The installation order is the reverse of the removal order.

※Handelbar (regular edition)

Disassembly
Disassemble the following parts.

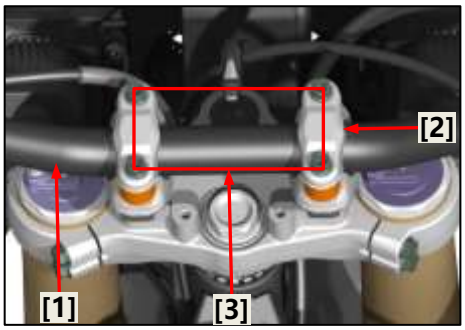
- Remove 4 inner hexagonal flange bolts M8x45 [1]
- Remove the directional upper clamp X2 [2]
- Remove the handgrip tube [3]



Install in the reverse order of disassembly.

※Handlebar installation (factory edition)

Handlebar [1] and steering handle upper clamp [2] steering handle pressure block (ENB bracket) [3] tighten bolt [4], then tighten bolt [4] to the specified torque.
Torque: 22 N.m (2.2 kgf.m, 16 lbf.ft)

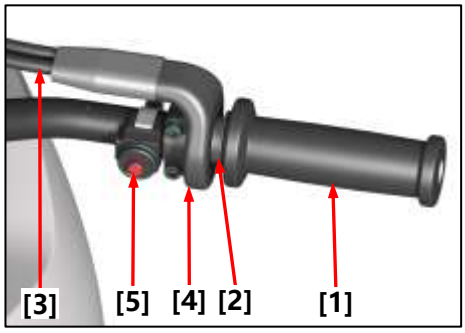


※Handlebar installation (regular edition)

Tighten the bolt [3] on the handlebar [1] and the clip [2] on the steering handle, and then tighten the bolt [3] Tighten to the specified torque.
Torque: 22 N.m (2.2 kgf.m, 16 lbf.ft)

※factory edition
Handlebar installation
installation:

Right handlebar: Throttle lever - Handlebar rubber - Start button
Clean the sliding surface of the throttle handlebar rubber [1] and throttle turnbuckle [2], and apply grease to the top of the throttle cable and the rolled-up area. Attach the throttle cable [3] to the throttle turnbuckle and install the throttle turnbuckle cable into the throttle lever [4], install the start button [5] on the handlebar, and tighten the bolt.

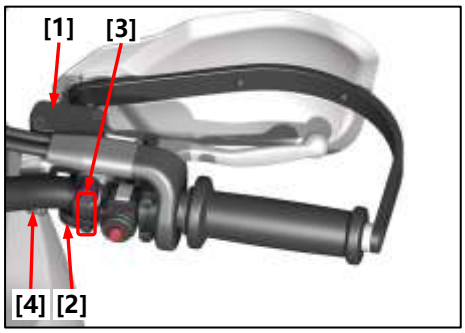


installation:

Front brake handle

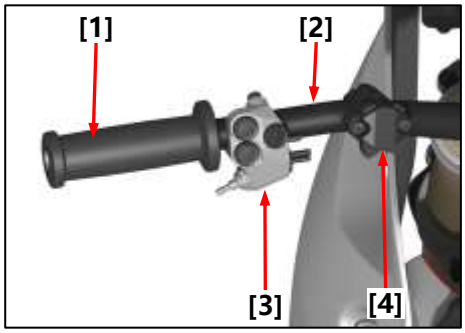
Front brake handle [1] and brake handle mount [2] then tighten the bolt [3] to the specified torque.

Torque: 8 N.m (0.8 kgf.m, 6 lbf.ft)
Connect the brake light switch connector [4].



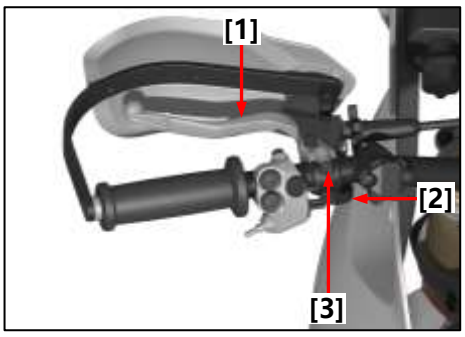
installation:

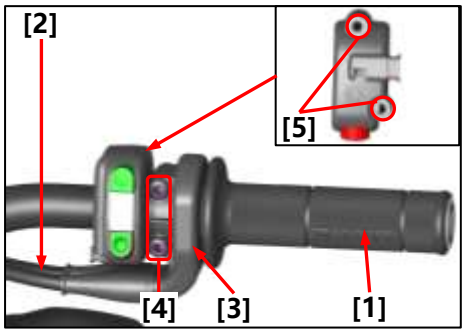
Left handlebar: Handlebar adhesive - Switch button - Instrument button
Clean the surface of the left handlebar adhesive [1] and the outer surface of the handlebar tube [2]
Apply handlebar adhesive to the inner surface of the handlebar and the outer surface of the handlebar, wait 3-5 minutes, then install the handlebar adhesive; turn the handlebar so that the adhesive is evenly applied, install the instrument button [3] on the handlebar, install the switch button [4], and then tighten the rear bolt to the specified torque.
Torque: 8 N.m (0.8 kgf.m, 6 lbf.ft)



installation :

Clutch Handle / Handle Bracket
clutch handle [1] and clutch handle bracket [2].
Then tighten the bolts [3]
to the specified torque.
Torque: 10 N.m (1.0 kgf.m, 8 lbf.ft)

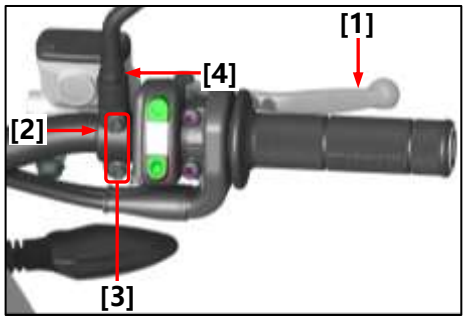




※installation: (regular edition) Handlebar parts

Right Handlebar: Right Handlebar Switch - Throttle Turner - Handlebar Rubber

Clean the sliding surface of the throttle handlebar rubber [1] and the throttle lever, and apply grease to the top of the throttle cable and the rolled-up area. Connect the throttle cable [2] to the throttle turner and install the throttle turner and cable into the throttle lever [3], then tighten the fuel filler mounting bolts [4]. Install the right hand switch by tightening the screw at the bottom of the switch [5].



※installation: (regular edition) Handlebar parts

Right handlebar: brake handle - rear view mirror

Install the brake handle [1] brake handle bracket/card holder [2] then tighten the bolt [3] to the specified torque.

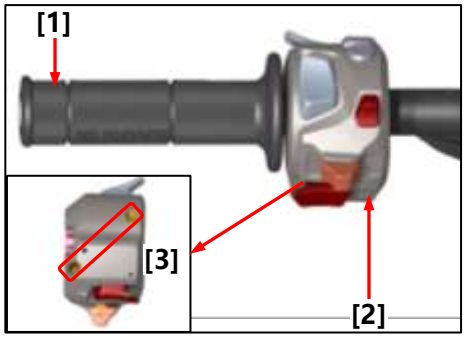
Torque.

10 N.m (1.0 kgf.m, 8.0 lbf.ft)

Install the rearview mirror and tighten the nut [4]

Check the following.

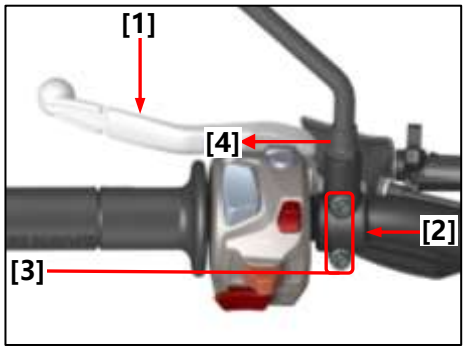
- Connect the brake light switch connector
- Throttle handle free travel



※installation: (regular edition) Handlebar parts

Left handlebar: Handlebar adhesive-Left handlebar switch

Clean the surface of the left handlebar adhesive [1] and the outer surface of the handlebar tube apply the handlebar adhesive to the inner surface of the handlebar and the outer surface of the handlebar,wait for 3-5 minutes,then install the handlebar adhesive turn the handlebar so that the adhesive is evenly applied,left handlebar switch [2] then tighten the bottom screw [3].



※installation: (regular edition) Handlebar parts

Left handlebar: Clutch handle - Rear view mirror

Clutch handle [1] and clutch handle bracket [2], then 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.

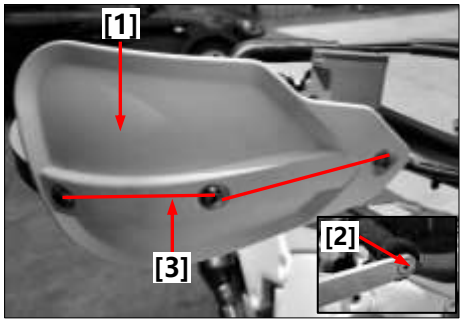
-Clutch handle free play

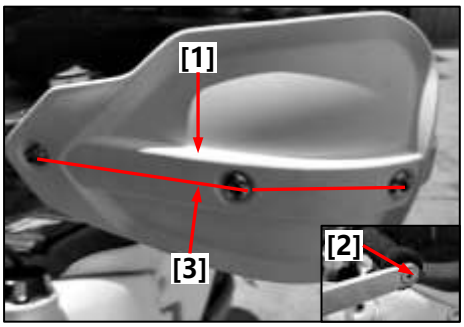
-Connect the clutch switch connector

Installation.

Left and right handlebars: Handguard (factory edition)

Handguard [1] Install the clutch bracket/brake handle bracket, install one end of the handguard bracket at the end of the handlebar tube [2] Handguard [3] Three screws on each of the 2 sides of the left and right handguard brackets are fixed, and then tighten the bolts to the specified torque.





Torque.

Hand windshield bracket left and right and handlebar connection bolts

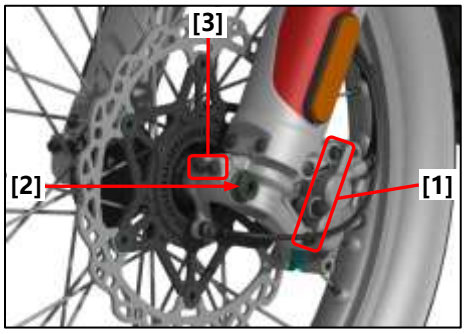
22 N.m (2.2 kgf.m, lbf.ft)

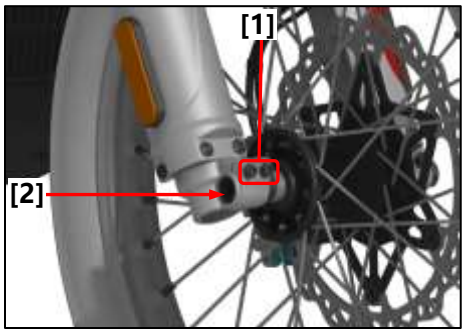
Hand windshield and hand windshield bracket

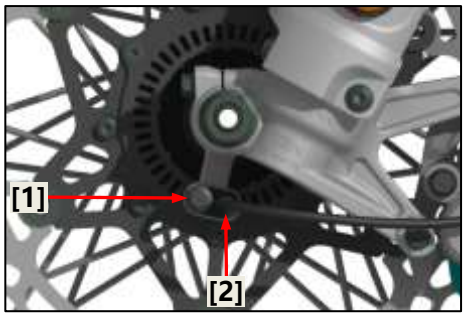
4 N.m (0.4 kgf.m, lbf.ft)

Hand windshield bracket and clutch handle bracket/brake handle bracket attachment bolt

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







Wipe the tip and mounting area of the front wheel speed sensor [1] to remove any foreign material.
Install the wheel speed sensor and tighten the bolts [2].
Check the air gap between the wheel speed sensor and the gear ring.

※front wheel

Note.factory edition vehicles front wheels are removed in the same manner as below.

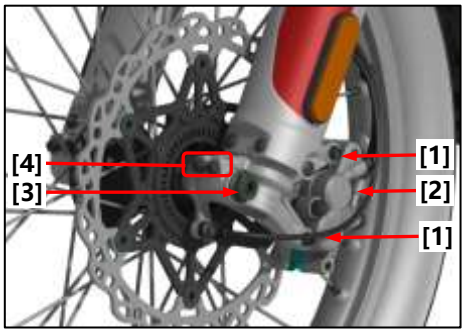
Removal/Installation
Remove the following parts.

- Removal of 2 brake caliper bolts [1].
- Front axle lock nut [2] and loosen the shock absorbing left and right bottom bucket bolts [3].
- Use a service bench or motorcycle-specific service bench to prop up the vehicle and lift the front wheel off the ground, pull out the axle and remove the front wheel.

Installation: (regular edition)
Place the wheel between the front shocks, carefully align the axle holes and insert the axle from the right side, pre-tighten the shock bottom barrel axle lock bolts [1] to a torque of .5 N.m, before tightening the front axle lock nuts [2] to the specified torque.
Torque :
Front axle locknut
88 N.m (8.8 kgf.m, 65 lbf.ft)
With the front brakes engaged, move the front shock up and down several times to seat the axle and check the brake operation before tightening the left and right shock bottom cartridge tightening bolts [2] to the specified torque.
Torque.
Tightening bolts of shock bottom cylinder
22 N.m (2.2 kgf.m, 16 lbf.ft)
Brake caliper mounting bolts
27 N.m (2.7 kgf.m, 20 lbf.ft)

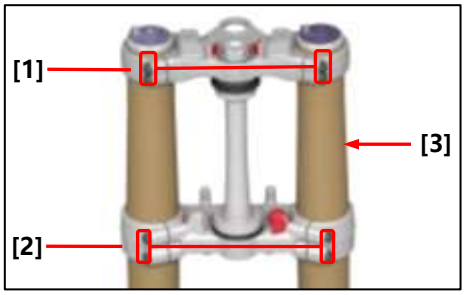
Caution.
Install and apply a very small amount of grease in the groove between the main and secondary lip of the wheel bearing oil seal.
Lubricate with high-temperature extreme-pressure lithium complex grease (Unisun Grease SU-T330G/F or equivalent).

※front shock absorber

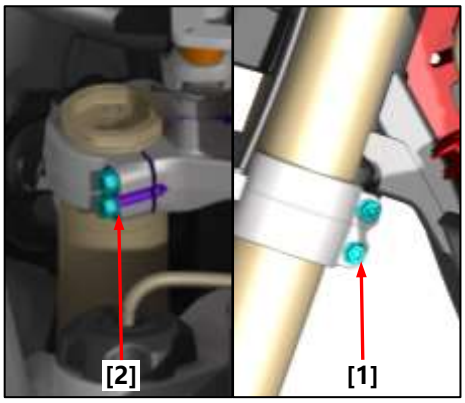


Removing the front shock absorber Disassemble the following components.
- Front wheels.
- Front brake calipers.
- Remove the brake mounting bolts [1] and the front brake caliper [2].
- Remove the front axle lock nut [3] then loosen the left and right shock bottom cylinder lock bolts [4] hold the front wheel and remove the front axle .

Caution.
-Do not hang the brake caliper on the brake fluid pipe.
-Do not operate the brake handle before and after removing the brake caliper.

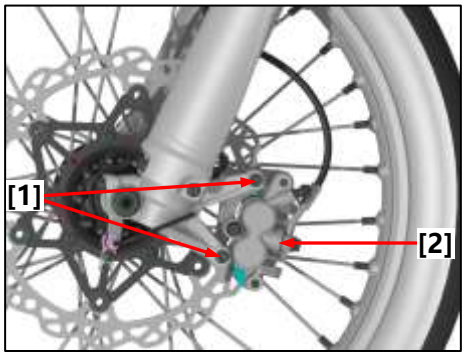


Loosen the upper connecting plate locking bolt [1] to firmly support the shock loosen the lower connecting plate locking bolt [2] and pull the shock fork tube [3], then rotate it from top to bottom to pull out the upper and lower connecting plate hole part until all out.



The installation sequence is the reverse of the disassembly sequence.

Tighten the lower plate locking bolt [1] to the specified torque. N.m torque: 22 (2.2 KGF. J m, 1 bf. 16 ft) will even powder on bolt [2] tighten to specified torque.. N.m torque: 22 (2.2 KGF. J m, 16 1 bf. Ft.)



*** Front shock absorber maintenance**

Place a workbench or equivalent under the engine to lift the front wheels off the ground.

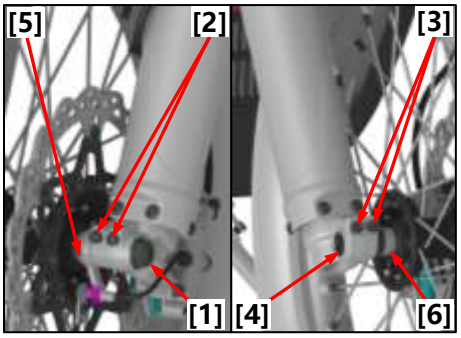
Remove the following parts.

- Remove the brake mounting bolts [1].
- Front brake caliper [2].

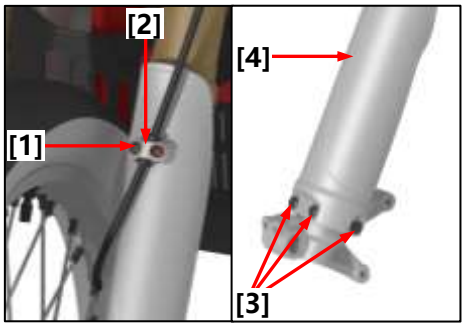
Caution.

Do not suspend the brake caliper from the brake hose.

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



- Remove the front axle nut [1].
- Loosen the left shock absorber bottom barrel locking bolt [2].
- Loosen the right shock absorber bottom barrel locking bolt [3].
- Removing the front axle by holding the front wheel [4].
- Removing the front wheel.
- removing the left inch bushing [5] and the right inch bushing [6] from the front wheel.

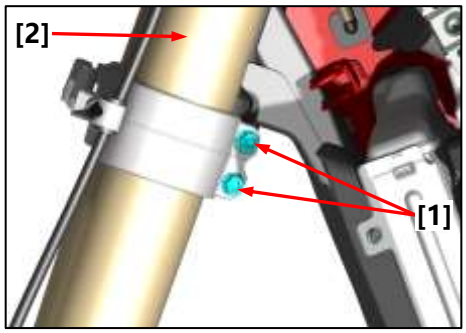


- Remove 2 screws [1];
- brake hose clip [2].
- remove the former subtracter armor plate bolts [3];
- shock absorber plate [4];

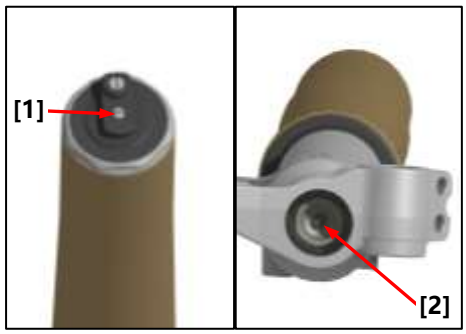
- loosen the lock bolt connection plate [1] if you plan to replace the former subtracter damping oil, loosen the damping adjustment on cover components [2]. Note: do not remove the subtracter cover before adjusting components.

Use a special tool to loosen subtracter before cover component tools: lock nut wrench, 50 mm note: do not remove the subtracter inner cavity cover components.

Hold front shock absorber rod to loosen the bottom bottom allied board locking bolt [1] to be removed before the shock absorber [2].



Record compression damping controller [1] and [2] rebound damping controller of the current location counterclockwise rotation compression and rebound damping controller, and set it in the most soft place.



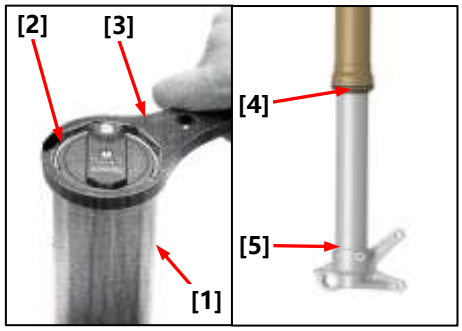
Removing the front shock absorber

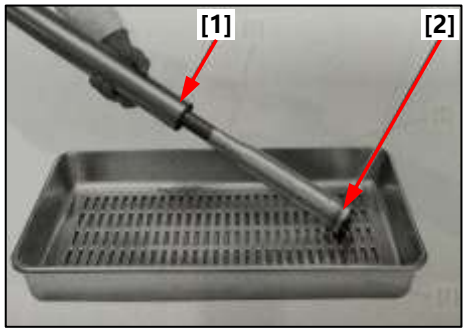
Hold the outer tube [1] and remove the front shock absorber upper cover [2] from the outer tube with the special tool

Tools.

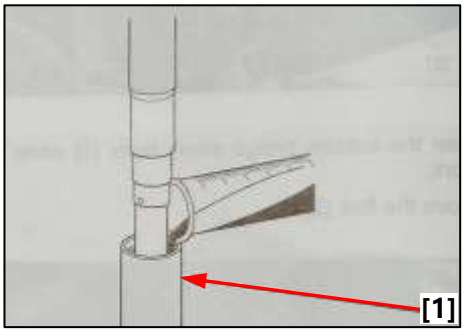
Locknut wrench, 50 mm [3]

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

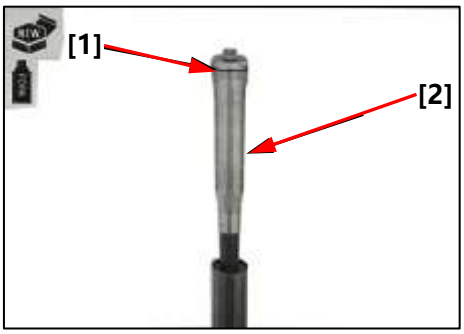




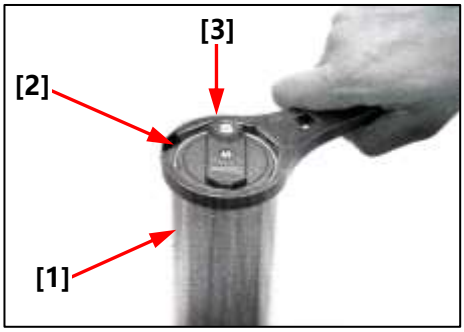
Compression pipe outside a few times, eliminate the outer tube in [1] from the shock absorber damping oil remove the o-rings [2].



Pour the recommended damping oil into the outer tube [1].
Recommended: oil shock absorber oil (viscosity: 5 w) standard total capacity of 560 ml + 5 high pressure oil storehouse 260 ml 300 ml + 5 + 5 / tube



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

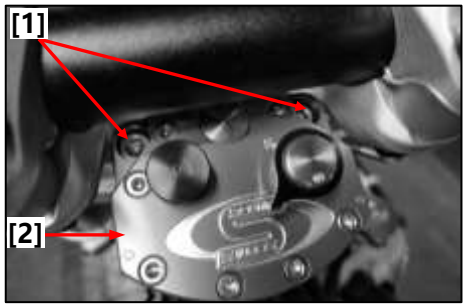


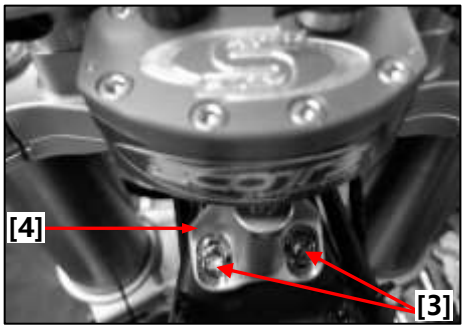
Slowly pull up the outer tube [1]
Temporarily tighten the upper adjustment cap [2] of the shock absorber into the outer tube using the special tool
Tool.
Lock nut wrench, 50 mm [3]

※Steering damper

Disassembly/Installation
Remove the following parts.
- Screws [1];
-Remove the steering damper [2];
- Screws [3];
-Remove the steering damper bracket [4];

The order of installation is reversed from the order of removal.
Torque.
Steering damper mounting screws.
10 N.m (1.0 kgf.m, 7.0 lbf.ft)
Steering damper bracket mounting screws.
10 N.m (1.0kgf.m, 7.0 lbf.ft)
Caution.
Installation requires application of (Loctite) low strength thread adhesive.

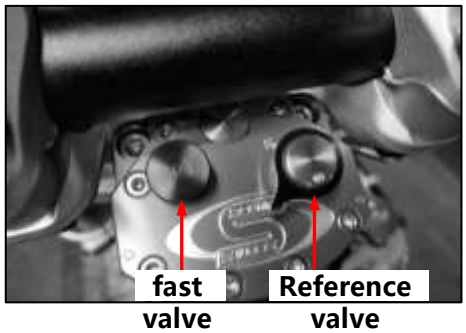




The reference valve adjusts the amount of resistance you feel when you turn the steering handle from left to right, increasing the "stiffness" of the damper when you turn the button clockwise (to the right) and softening it when you turn the button counterclockwise.

When you turn the reference valve knob, you will feel a "click", with 8 clicks in one rotation.
The starting position of the reference valve is from clockwise, turn backwards 8 clicks (one full revolution), we recommend you ride for a while before making adjustments.

After 20+ clicks of counterclockwise rotation, the base valve is basically closed, but the high speed valve is still resisting the resistance shock. The high speed valve is less effective when the bottom control valve is turned clockwise (to the right) and more effective when it is turned counterclockwise (to the left).
Caution.
-Check the reference valve setting before each ride.



Turning the high speed valve clockwise (to the right) will increase its sensitivity, which means that less force is needed for the high speed valve to respond. Do not set this too "hard" as it may limit your steering response time.

The high speed valve does not click, each position is a new setting, and adjustments are best made in 1/8 turn increments.

The high speed valve is less effective when turning the reference valve clockwise (to the right); it is more effective when turning the reference valve to the left.

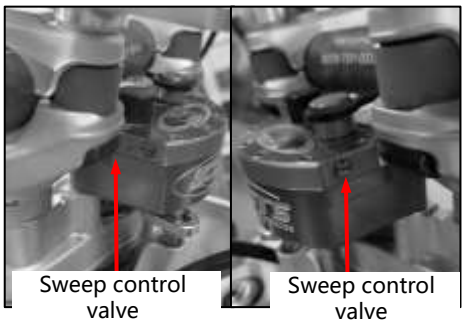
Do not test the high speed valve while the motorcycle is in the stand.

Do not turn the valve more than 3 turns from the fully closed position.

The high speed valve resists mainly large, unexpected impact forces (such as hidden roots and potholes).

The adjustment knob is located under the black cover. This cover is tight and you will need to remove the cover when adjusting.

The factory preset is one turn of the high speed valve from the fully rigid position, we recommend that you adjust it only after a period of riding. Adjustment is made in 1/8 turn increments.



The sweep control valves are located on both sides of the damper, with machined bevels on the grooved head recess side. The distance of the controlled resistance sweep extends from the centerline to both sides, and then the damper is free to move into the steering gear, allowing the motorcycle to turn easily in tight turns.

As shown on the left: you can think of each sweep control as the face of a clock, if set at 3 o'clock, the right valve will face the front of the motorcycle and the left valve will face the back of the motorcycle. Allowing for no damping in the section.

At 12 o'clock, both valves face up.

At 6 o'clock, both valves face down.

The sweep control valve is to be preset to 12 o'clock direction for off-road riding and 6 o'clock direction for road riding.

9 o'clock direction - damping is 34 degrees

12 o'clock - damping is 44 degrees

3 o'clock direction - damping is 54 degrees

6 o'clock - damping is 90 degrees

Rear wheel, suspension

Overview

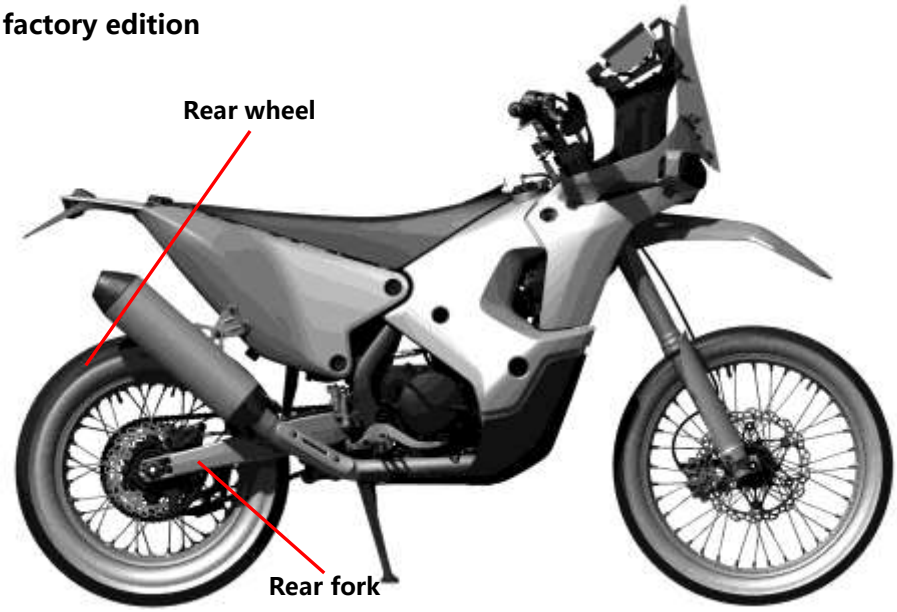
-When repairing the rear wheel and suspension and related parts, you need to support the motorcycle with a professional workbench or equivalent.
-Do not operate the brake pedal after removing the rear wheel.
-Check the brake operation by depressing the brake pedal after installing the rear wheel.
-After installing the rear wheel, perform an air gap check.
-All suspension pivots and suspension points can only be replaced with genuine Escalade bolts and nuts.

Troubleshooting

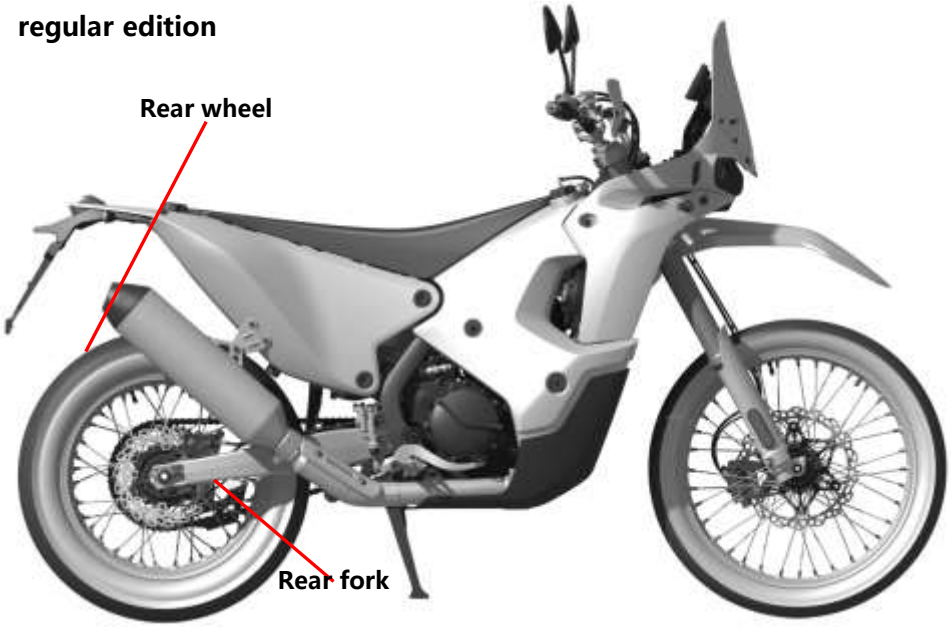
Steering to one side or not straight ahead
-Drive chain adjuster unevenly adjusted
-Shaft bent
-Flat fork shaft wear
Rear wheel shaking
-Tires have deformation
-Wheel bearings worn or damaged
-Slave flange bearings worn or damaged
-Shaft not properly tightened
-Rear flat fork pivot bearing is damaged
-Suspension assembly bolts not properly tightened
-Tires and rims unbalanced
Wheel is difficult to turn
-Damaged wheel bearings
-Bent axle
-Drive chain too tight
-Braking resistance
Soft suspension
-Low tire pressure
-Incorrect suspension adjustment
-Shock absorber spring weakness
-Shock absorber unit leaking oil
Stiff suspension
-Tire pressure is high
-Suspension incorrectly adjusted
-Shock absorber rod bent
-Damaged suspension or slew pivot bearing
-Slewing pivot improperly tightened
Rear suspension noise
-Loose suspension fasteners.
-Suspension pivot bearing worn or damaged
-Shock absorber failure

Component Location

factory edition



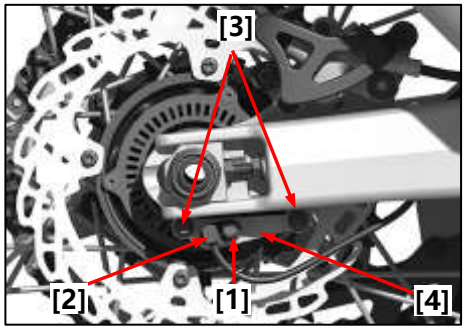
regular edition



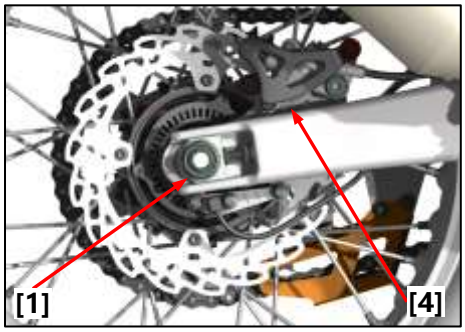
※Rear wheel

Place a bench or equivalent under the engine to lift the rear wheels off the ground.

Disassembly/Installation
Remove the following components.
- 1 bolt [1].
- Rear wheel speed sensor [2].
- 2 bolts [3].
- Removal of the wheel speed sensor bracket [4].



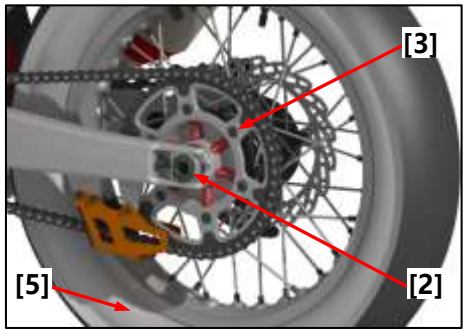
Disassembly/Installation
Remove the following components.
- Loosen the rear axle lock nut [1].
- Remove the rear wheel axle [2] by holding the rear wheel.
- Push the rear wheel forward to disengage the chain from the large sprocket [3].
- Remove the rear brake caliper and caliper bracket [4]
- Remove the rear wheel assembly [5];



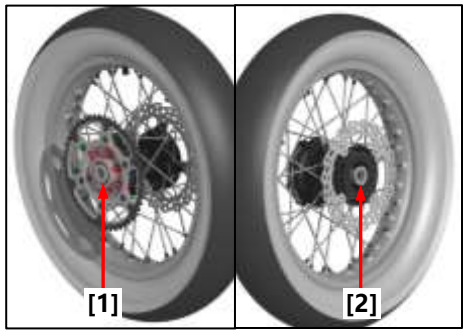
Torque.
Rear wheel axle lock nut
128 N.m (12.8 kgf.m, 95 lbf.ft)

Installation is in reverse order of removal.

Note: after, remove the wheels do not operate the brake pedal.



Remove the following parts.
Rear wheel T-bush - left side [1];
Rear wheel bushings-right side [2];



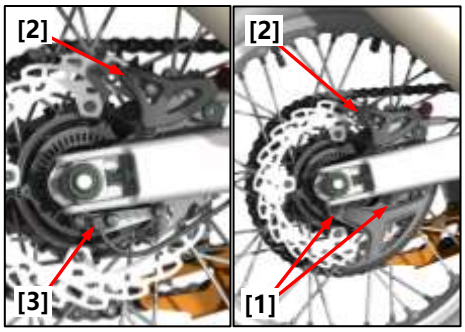
Caution.
-When installing the wheels, be careful not to let the calipers fall out of the rear flat fork tabs or damage the brake pads.
Install the rear axle from the left side.
-Before installing the rear wheel speed sensor [1], wipe the sensor tip and mounting area to remove any foreign material.
-Adjust drive chain slack.
-Check the clearance between the wheel speed sensor and the gear ring.

Inspection.
Turn the inner ring of each bearing with your finger, and the bearing should turn smoothly and quietly.
Also check that the outer ring of the bearing fits snugly in the hub.
If the bearing does not turn smoothly, rotate smoothly, or is not securely installed in the hub, replace the bearing.

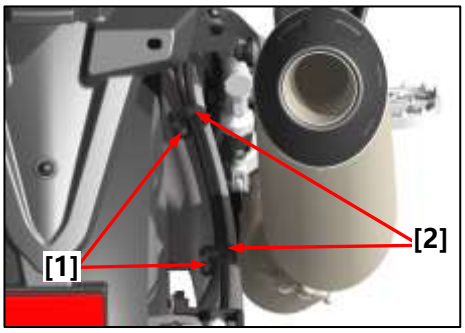
※Rear fork

Disassembly/Installation
Remove the following parts.

- Rear brake disc trim [1] factory edition models.
- Rear caliper trim [2].
- Rear wheel speed sensor [3] regular edition models.

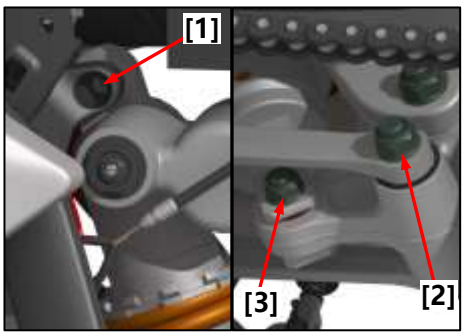


- Disconnect the wheel speed sensor 2P (black) plug.
- Remove the screw [1] and the wire clip x2 [2].

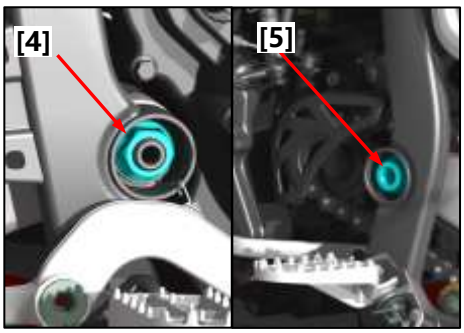


- Removal of the rear shock absorber attachment bolts [1].
- Removal of U-shaped rocker attachment bolts [2].
- Removal of the lower rear shock absorber and triangular rocker attachment bolts [3].
- Removing the rear flat fork nut [4].
- Take out the flat fork shaft [5]

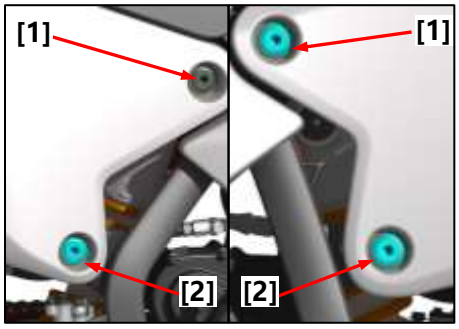
Remove the brake hose, speed sensor wire and drive chain.



Install in the reverse order of removal.
Caution.
Install the rear flat fork shaft from the left side.
Apply grease to the flat fork shaft.
Torque.
Flat fork shaft nut.
88 N.m (8.8 kgf.m, 65 lbf.ft)

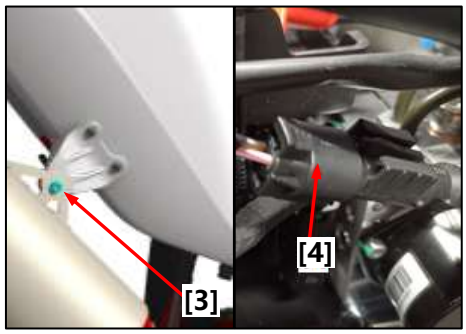


※Rear shock absorber/suspension assembly



Rear Shock Absorber
Remove the following components.

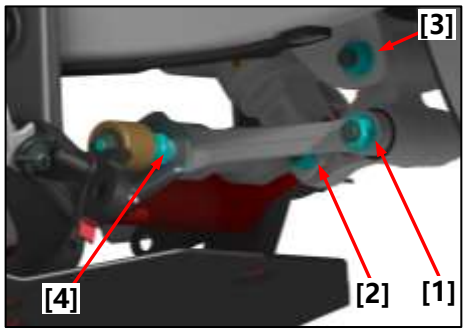
- Seat cushion assembly.
- Loosen the rear fuel tank assembly attachment nut [1].
- Loosen the lower nut [2] of the rear fuel tank to bracket connection.
- Remove the rear muffler and muffler bracket attachment bolts [3] lifting the rear fuel tank assembly.
- Disconnect the wheel speed sensor 2P (black) connector [4].



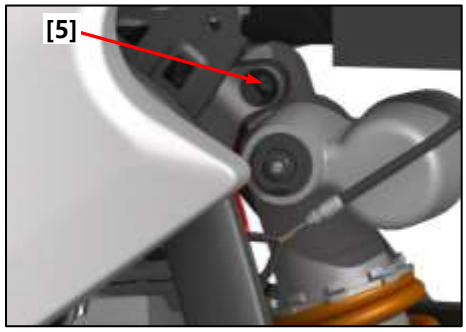
Rear shock absorber / triangle rocker / U-shaped rocker

Disassembly/Installation
Disassemble the following components.

- Removal of the U-shaped rocker to triangular rocker attachment nut [1].
- Remove the rear shock absorber and triangular rocker attachment nut [2].
- Remove the flat fork and triangular rocker attachment nut [3].
- Remove the nut [4] connecting the U-shaped rocker to the frame and take off the bolt.
- Removing the bolts connecting the upper part of the rear shock absorber to the frame [5].



Install in the reverse order of disassembly.
Caution.
Install the mounting bolts from the left side.



U-shape rocker and frame attachment nut.
Flat fork and triangle rocker attachment nut.
Rear shock absorber to triangle rocker attachment nut.
U-frame to triangle crankset attachment nut.
Torque.
60 N-m (6.0 kgf-m, 44 lbf-ft)

Upper rear shock absorber to frame attachment bolt :
Torque: 44 N-m (4.5 kgf-m, 32 lbf-ft)

Hydraulic brake system

Overview:

-This section describes the maintenance of routine brake components of the braking system.
-ZF400LS for 2 models of which the civilian version is equipped with ABS, but the brake fluid change procedure is performed differently than the exhaust procedure for competitive vehicles.
-Contaminated brake discs or pads can reduce braking efficiency.
-Discard contaminated brake pads and clean contaminated discs with a good quality brake degreaser.
-When servicing the system, always use fresh DOT 4 brake fluid in a sealed container do not mix different types of fluids they may not be compatible.
-Never allow contaminants (dirt, water, etc.) to enter an open reservoir.
-Be sure to check brake operation once the hydraulic system is open, or if the brakes feel loose and the brake system must be drained.
-When removing the wheel speed sensor, be sure to check the clearance between the wheel speed sensor and the gear ring after installation.
-Spilled brake fluid can severely damage instrument faces and painted surfaces and rubber parts; be careful when removing the reservoir cap, making sure the front reservoir is level first.

Troubleshooting

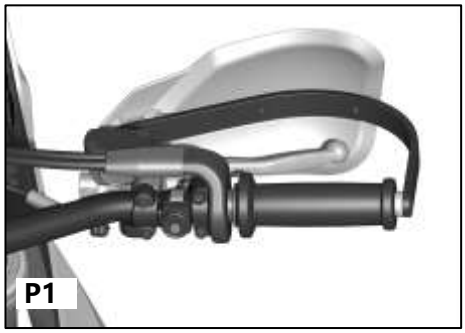
Brake lever/pedal is soft or floppy
-Air in the hydraulic system
-Hydraulic system leakage
-Contaminated brake pads/discs
-Worn caliper piston seal
-Worn main piston bowl
-Contaminated brake pads/discs
-Contaminated brake caliper
-Brake pump contaminated
-Caliper sliding abnormally
-Low brake fluid level
-Fuel channel blocked
-Brake disc twisted/deformed
-Caliper piston sticking/worn
-Main piston sticking/worn
-Bent brake lever/pedal

Brake lever/pedal needs force
-Clogged/restricted oil passages
-Caliper piston sticking/worn
-Caliper not sliding properly
-Caliper piston seal worn
-Main piston sticking/worn
-Bent brake lever/pedal

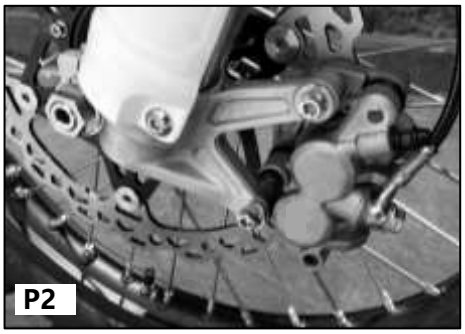
Braking resistance
-Contaminated brake pads/discs
-Wheel misalignment
-Brake pads/discs severely worn
-Brake disc twisted/deformed
-Caliper sliding abnormally
-Clogged/restricted oil passages
-Caliper piston is stuck

Parts Location

Front brake upper pump



Front brake caliper



Rear brake upper pump

Rear brake calipers

Note: The four figures above are all factory edition

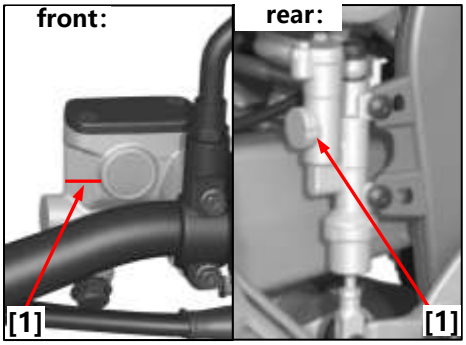
※Brake fluid level check

⚠警 告

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

Caution.

Do not mix different types of brake fluids that are incompatible with each other. When filling the reservoir, do not allow foreign objects to enter.

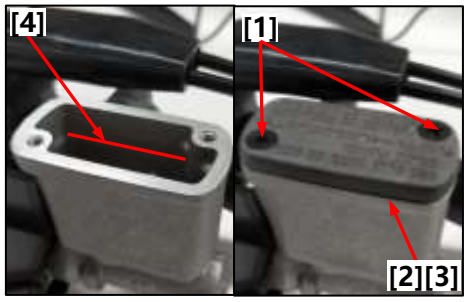


※ liquid level check

Front and rear brake master cylinder reservoir level conditions, check the brake fluid level.

If the level is near the lower level line [1], check for worn brake pads.

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



※Brake fluid level addition

-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 line with recommended brake fluid [4]。

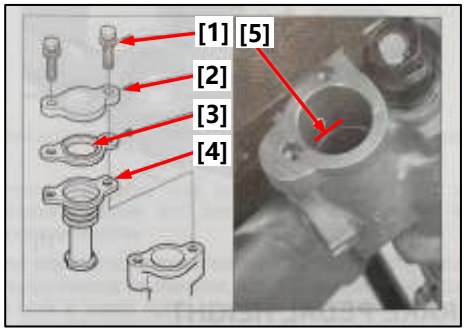
Use the recommended brake fluid: DOT4 brake fluid

Install the diaphragm and reservoir cap.

Install the front brake master cylinder reservoir cover screws and tighten to the specified torque. Torque: 1.0 N.m (0.1 kgf.m, 0.7Ibf.ft)

Check the front brake hydraulic system for leaks.

-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 using the recommended brake fluid [5]

Recommended brake fluid.

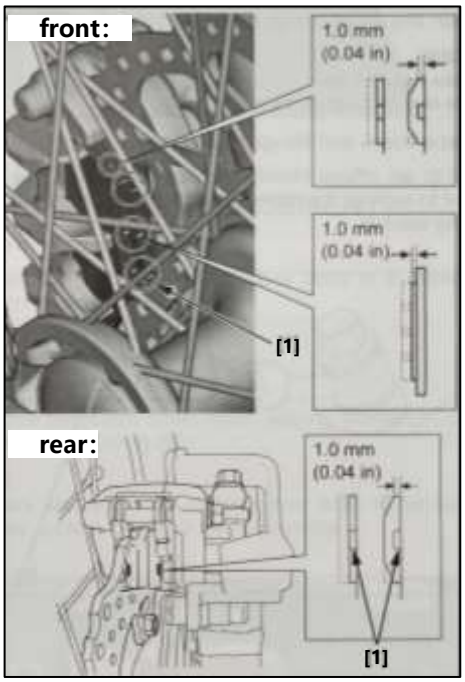
DOT4 brake fluid

Install diaphragm [4] gasket [3] cover [2].

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

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

Check the front brake hydraulic system for leaks.



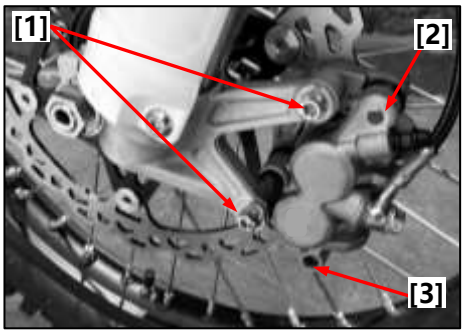
※Brake pad inspection and replacement

Check the liner.

If either liner is worn to 1.0mm (0.04in), both liners must be replaced.

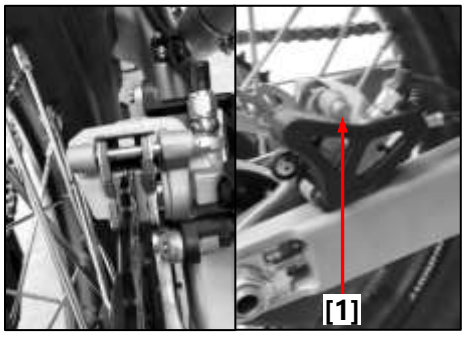
Caution.
The width of the wear mark [1] is 1.0mm (0.04in)
If the brake pads are worn to the service limit, consult your dealer for brake pad replacement.

Replacement
-Front brake pads



Removal/Installation
If replacing new brake pads, remove the hexagonal internal six-talk bolt in position [1] before removing the brake pads, remove the caliper [2], place the tool between the brake pads, pry left and right to allow the piston to retract, remove the friction pads locating pin [3], and you can remove the brake pads.

Note: After removing the brake pads, do not operate the brake lever.



•Rear brake pads

Removal/Installation
If replacing the brake pads with new ones, remove the brake pads by locating the locating pin in position [1] .

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

※Emission of air from hydraulic brake systems (ABS)

The following procedure is only applicable to factory edition

⚠警 告

-Be sure to vent the brake system air after removing brake related parts.

Caution.

- Follow the sequence below to bleed the brake system air.
- Step 1: Front Brake Calipers
- Step 2: Rear Brake Calipers

⚠警 告

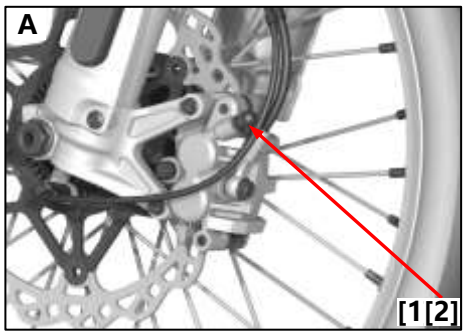
Release of air from the brake system.

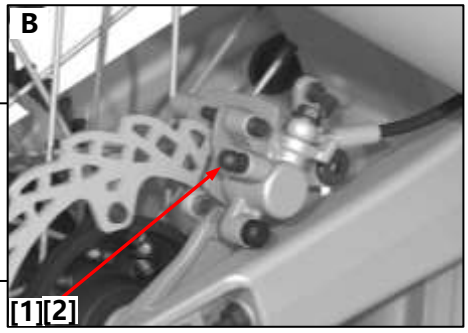
- Brake pump disassembled.
- Brake fluid line is loose, disassembled or replaced.
- Brake fluid level is below the minimum scale.
- Faulty brake operation.

- 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, resulting in a significantly longer time required for the air venting procedure.
- 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.

a. Using the specified brake fluid, add the brake fluid reservoir to the correct level.
b. Install the diaphragm (brake master cylinder reservoir or brake fluid reservoir).
c. Tightly connect the clear plastic hose [1] to the discharge bolt [2].
d. Place the other end of the hose in the container.
e. Slowly apply the brake several times.
f. Fully pull up on the brake handle, or fully depress the brake pedal to hold it in place.





g. Loosen the air 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.

h. Tighten the air vent screw before releasing the brake handle or brake foot pedal.
i. Repeat steps (e) through (h) until there are no air bubbles in the brake fluid in the plastic hose.
j. 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.
k. 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.

⚠警 告

After the hydraulic brake system is drained, the operating condition of the brakes needs to be checked.

A. front、
B. rear、

The following is for regular edition models: Air Venting Operation Procedure (ABS)

After the repairer has finished installing ABS, there must be no gas in the line to ensure the ABS works properly. In this case, you need to perform manual air venting operation for ABS with the help of diagnostic instrument.
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.

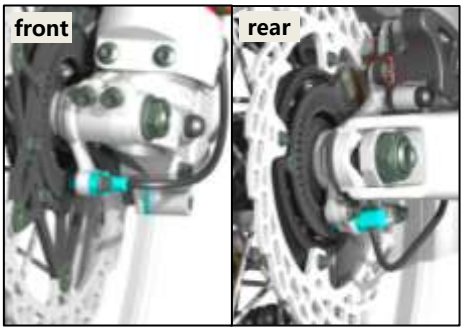
2. Connect the diagnostic instrument, double-click the routine: front wheel exhaust stage 1, at this time the maintenance personnel while pinching the handbrake, while adding brake fluid, handbrake frequency is about 1 times / s. The process lasts about 25s.

3. After the front wheel exhaust stage 1 is executed, the diagnostic instrument interface will be prompted to indicate that the execution is complete. At this time, 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.

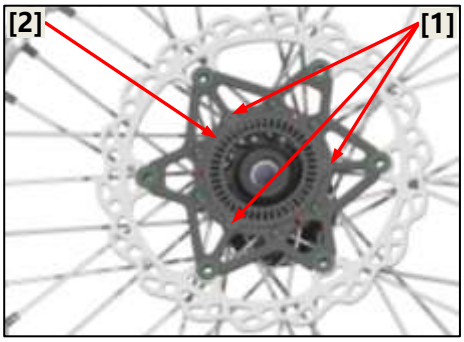
4. After front wheel bleed stage 2 is completed, squeeze the handle and close the lower pump drain bolt. Then, repeatedly squeeze the front brake handle several times and feel the strength to determine if the exhaust is complete.

Note: Do not repeat the exhaust procedure 2 times or more 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 ring clearance check

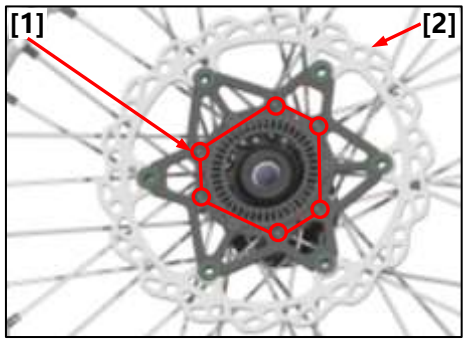


Use a crane or equivalent to securely support the motorcycle and lift the wheel off the ground.
Slowly turn the wheel and measure the clearance (air gap) between the sensor and the gear ring at multiple points.
Must be within specifications.
Standard: 0.4-1.2mm (0.02-0.05in)
Gap (air gap) cannot be adjusted or is not within specifications, check each part for deformation, looseness or damage.
Check if the wheel speed sensor is damaged, and replace it if necessary.
Check the gear ring for deformation or damage, and replace if necessary.
-Front gear ring
-Rear gear ring



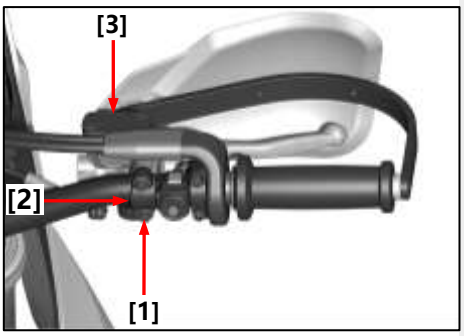
Disassembly/Installation
Remove the following parts.
- Remove the screws [1];
- Removal of ABS gear ring.
Install in the reverse order of disassembly.
The front and rear gear rings are installed in the same way.
Torque.
Front and rear ABS gear ring screws
4 N.m (0.4 kgf.m, 3.0 lbf.ft)
Apply low strength thread adhesive.

※Check and replace front and rear brake discs



Disassembly/Installation
Remove the following components.
- Remove the cable clamps [1].
- Removal of the brake disc [2].
The front and rear brake discs are installed and removed in the same manner.
Apply low strength thread adhesive during installation.
Torque.
Front brake caliper mounting bolts.
12 N.M (1.2 kgf.m, 9.0 lbf.ft)

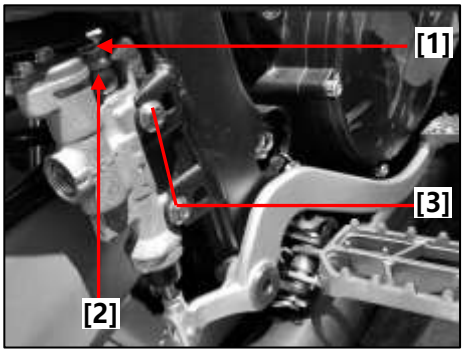
Brake disc inspection Visually inspect the brake disc for damage or cracks. Measure the brake disc limit wear value of 3.5mm and replace it if necessary.



※Front brake pump

Drain the brake fluid from the front brake
Disassembly/Installation
Remove the following components.
- Brake light switch connector.
- oil bolts;.
- sealing washers.
- Brake hoses.
- 2 bolts [1].
- Brake handle catch [2].
- Brake pump [3].
The order of installation is the reverse of the order of disassembly.

Caution.
-Replace the seal gasket with a new one.
-Install the brake handle mount with the "UP" mark facing up.
-Align the edge of the master cylinder with the punch mark on the handlebar and tighten the upper bolt first, then the lower bolt.
-When connecting the brake hose, be sure to place the eyelet fitting into the groove.
Torque.
Brake handle mount.
8 N.m (0.8 kgf.m, 6.0 lbf.ft)
Brake pipe locking 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

Remove the following components.

- Remove the brake pipe locking bolts [1];
- Upper and lower sealing washers [2];
- Disconnect the brake hoses to loosen the rear brake upper pump mounting bolts [3].。

Installation is installed in the reverse order of disassembly.

Caution.

-When tightening the brake pipe locking bolts, make sure to place the horizontal limit pins against the limiters.

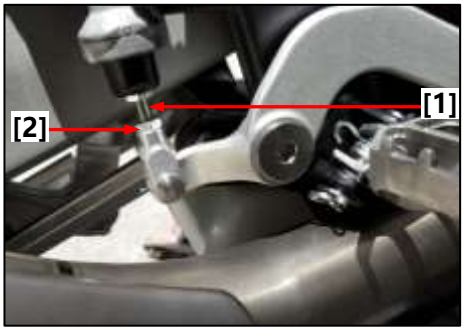
Torque.

Rear brake upper pump mounting bolts.

12 N.m (1.2 kgf.m, 9 lbf.ft)

Brake pipe override bolt.

22 N.m (2.2 kgf.m, 16 lbf.ft)



After removing the pushrod, adjust the pushrod length so that the distance from the center of the mounting bolt hole under the master cylinder to the center of the connection pin hole is the standard length If adjusting the length to a longer position, make sure that the lower end of the pushrod thread [1] is visible inside the fitting.

After adjustment, tighten the coupling nut [2] to the specified torque.

Torque.

Rear master cylinder pushrod joint nut.

6 N.m (0.6 kgf.m, 4.4 lbf.ft)

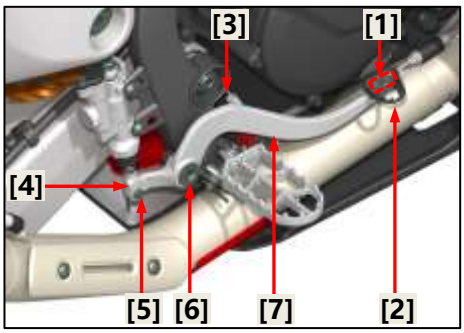
※Brake pedal

Support the motorcycle firmly with the main bracket.

Disassembly/Installation

Remove the following parts.

- Removal of the 2 hexagonal bolts at position [1].
- Removal of the brake pedal at position [2].
- Removal of the brake return tension spring at position [3].
- removal of the cotter pin and flat pad at position [4].
- removal of the rear brake pump pin at position [5].
- Remove the brake arm mounting bolt and spacer at position [6].



Install in the reverse order of removal.

Caution.

Apply grease to the oil seal locations (lubrication grooves) on both sides of the brake arm pivot shaft.

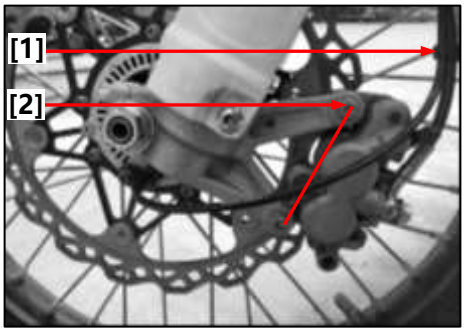
Torque.

Brake arm mounting bolt: 22N.M (2.2kgf.ft;16lbf.ft)

Brake pedal mounting bolt: 8N.

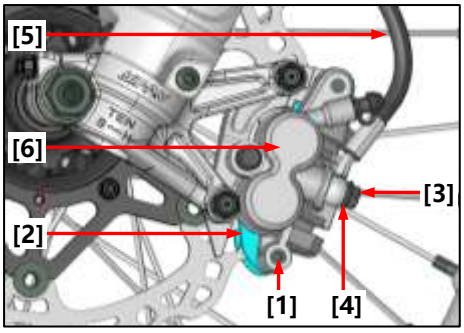
Need to apply (Loctite) low strength thread adhesive when installing brake pedal.

※Front brake caliper

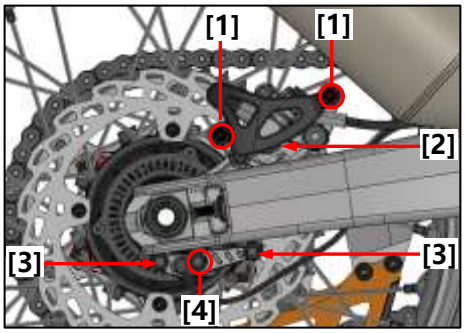


Drain the brake fluid from the front brake hydraulic system.
Note. factory edition is the same as regular edition disassembly and installation.
Disassembly/Installation
Remove the following parts.
- Wire clips [1].
- 2 bolts [2].

- brake pad locating pin [1].
- brake pads [2].
- Over-oil bolt [3].
- Fuel line sealing gasket X2 [4].
- Brake hose [5].
- brake caliper [6].



The order of installation is the reverse of the order of disassembly .
Caution.
-Replace a new sealing washer after disassembling the oil pipe.
-When tightening the brake pipe locking bolt, be sure to place the eyelet stop pin against the caliper body.
Before installing the wheel speed sensor, wipe the sensor tip and mounting area to remove any foreign material.
Torque.
Front caliper mounting bolts.
22 N.m (2.2 kgf.ft; 16 lbf.ft)
Brake pipe locking bolts.
22 N.m (2.2 kgf.ft; 16 lbf.ft)

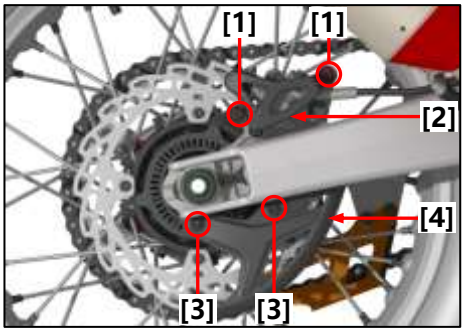


※Rear brake caliper

Brake caliper trim cover/wheel speed sensor bracket (regular edition)

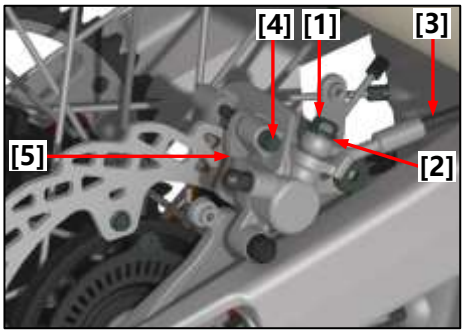
Remove/install the brake fluid in the evacuated rear brake hydraulic system.

- Locking bolts [1].
- Rear brake caliper trim cover [2].
- 2 locking bolts [3].
- Wheel speed sensor bracket [4].



Brake caliper decorative cover / brake disc decorative cover (factory edition)

Drain the brake fluid from the rear brake hydraulic system
Disassembly/Installation
- Locking bolts [1].
- Caliper trim cover [2].
- 2 locking bolts [3].
- brake disc trim cover [4].



Rear brake caliper

Removal/installation of the rear brake caliper
- Brake pipe over oil bolt [1
- Seal washer x2 [2].
- Brake hose [3].
- Brake caliper pin bolt [4].
- Brake pads [5].

-Apply 0.4 g (0.01 oz) of grease to the sliding area of the brake caliper pin bolt.
-When tightening the brake pipe locking bolt, be sure to lean the eyelet stop pin against the calibration body.
The installation sequence is the reverse of the removal sequence.
Torque.
Brake pipe over grease bolt: 22N.M (2.2kgf.ft;16lbf.ft)
Caution.
-Please replace the new sealing gasket after disassembling the oil tube.

Note.
The rear caliper specification （factory edition） is the same as the（regular edition）.

ABS

Overview:

-This section covers repair of the anti-lock braking system (ABS). For other repairs to the brake system (conventional braking), see the section on hydraulic brakes.
-The ABS control unit is integrated into the regulator. Do not disassemble the ABS regulator. When the ABS regulator fails, the ABS assembly will be replaced.
The ABS control unit performs a pre-start self-diagnosis to check if the ABS is working properly until the vehicle speed reaches 10 km/h (6 mph). After the pre-start self-diagnosis, the ABS control unit continuously monitors the ABS function and vehicle operating conditions until the ignition is switched off (normal self-diagnosis).
-When the ABS control unit detects a fault, it stops the ABS function and switches back to normal braking operation, and the ABS indicator light flashes or stays on, so be careful when test driving.
-Read the "ABS Troubleshooting Information" carefully and follow the troubleshooting flowchart to check and troubleshoot the ABS system. Follow each step of the procedure individually. Before starting diagnosis and troubleshooting, write down the diagnostic code and possible fault location. After troubleshooting, clear the Diagnostic Trouble Code (DTC) and perform a pre-start self-diagnosis to ensure the ABS indicator is working properly.
-The ABS diagnostic system cannot identify a fault that is not caused by a faulty ABS (e.g., squealing discs, unevenly worn pads).

Caution.
-If dropped, the ABS regulator may be damaged. In addition, if the connector is disconnected while current is flowing, excessive voltage may damage the control unit Be sure to turn off the ignition before servicing.
-Spilled brake fluid can severely damage plastic parts and painted surfaces.
-Be sure to check the air gap when replacing wheel speed sensors and/or gear rings.

ABS system function introduction

System Description.

The ABS assembly consists of a hydraulic control unit (HCU), an electronic control unit (ECU) and a motor, mounted on the frame with a wheel speed sensor on the front and rear wheels respectively.

The function of the ABS warning light: to indicate whether the ABS is working properly If the ABS is malfunctioning, the warning light will come on to warn the driver. When the speed difference between the front and rear wheels is extremely high under extreme driving conditions, such as when performing a front wheel off-balance stunt or when the rear wheel skids, the ABS may fail when riding normally again. To ensure proper ABS function, stop and turn off the ignition switch. If the vehicle is restarted and the speed reaches 12km/h, the alarm light will automatically turn off and ABS will be re-enabled.

After turning on the ignition switch, the ABS alarm light comes on, and when the first ride speed is greater than 10km, after passing the self-test, the alarm light goes off after the same ignition cycle if there is no abnormality the alarm light stays off. If the ABS is always on during driving (≥10km/h), it means that there is a fault in the ABS. At this time ABS can not be enabled ABS function failure brake system itself still works only ABS control system failure.

ABS state switching switch: to disable or turn on the ABS function, please ensure that the motorcycle has been in the power state; and the speed needs to be below a certain value to be feasible, it is recommended to switch the state when the vehicle is stationary. The ABS mode can be set through the instrumentation whether the ABS function is on or off, after power off and then re-powered, the ABS automatically becomes on.

ABS braking precautions

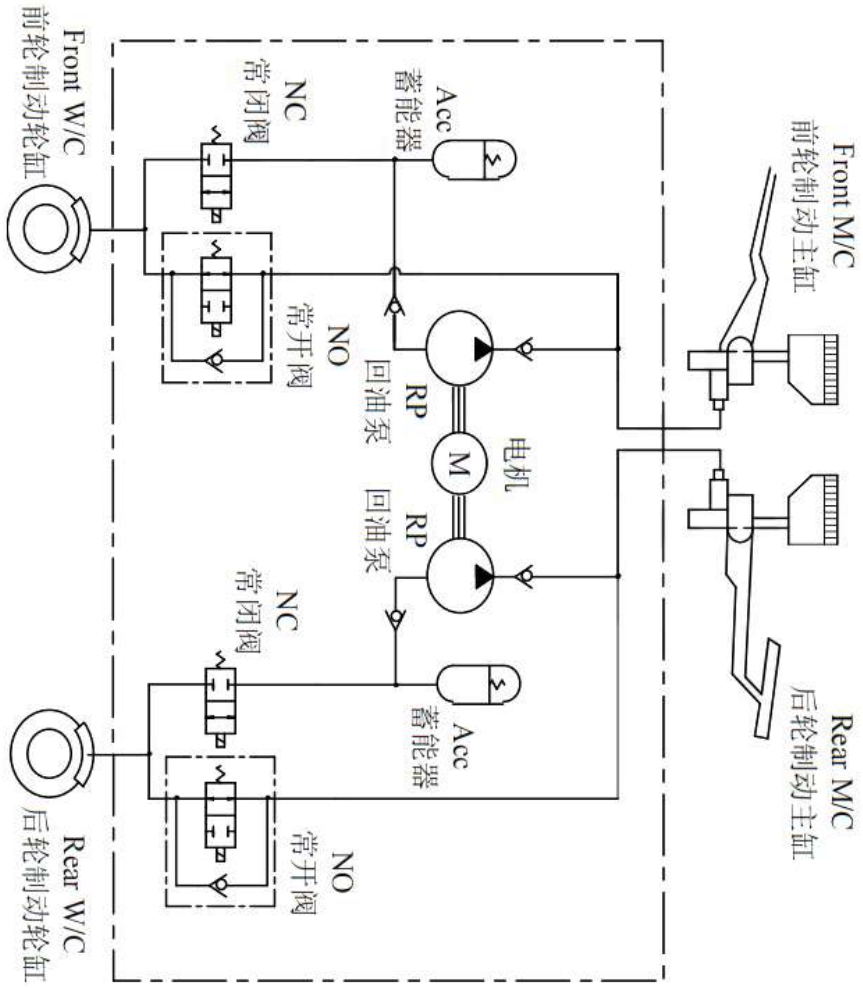
Impaired ABS function

If modifications are made, such as shortening or lengthening the shock travel, using other wheels, other tire sizes, incorrect tire pressure, other brake friction pads, etc., the ABS may not continue to function optimally. The ABS may not continue to function optimally, and the optimal function of the ABS can only be guaranteed when using spare parts and tires approved or recommended by the supplier on the braking system.

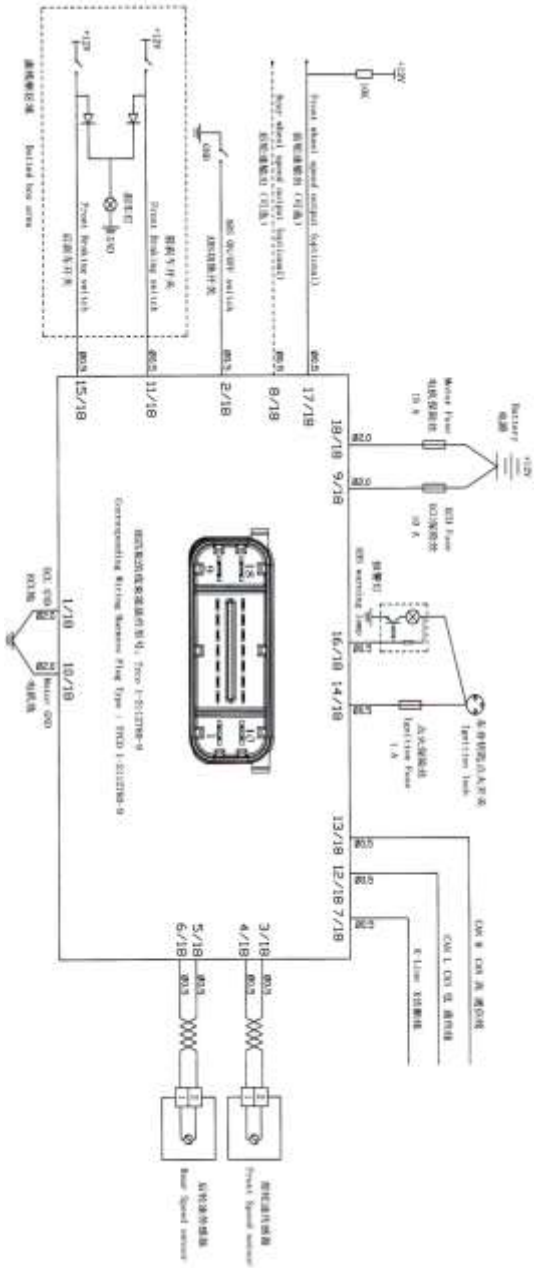
ABS System Braking Recommendations

- The first rule of ABS braking: brake as if you are not equipped with ABS.
- When braking with the brake handle, do not increase the braking pressure too quickly and violently after the brake pads have fully engaged.
- You can sense ABS intervention by the slight vibration of the brake handle or rear brake pedal and by a short sound.
- do not perform full braking operations with gears.
- Practice braking regularly within the control range of the ABS, which allows you to use the full potential of the anti-lock braking system in the event of a serious accident.

Mechanical schematics

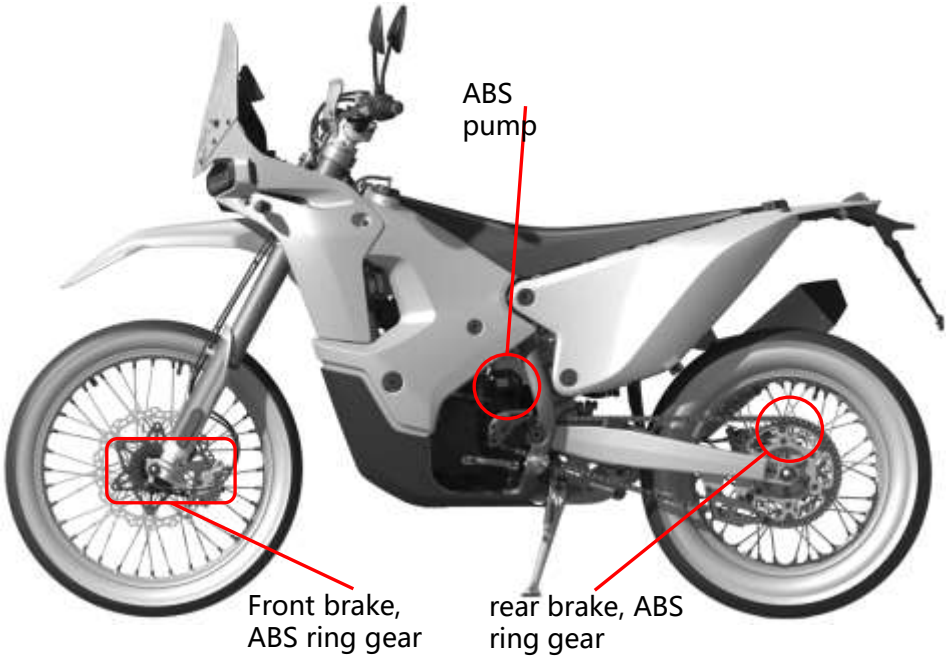


Electrical schematic



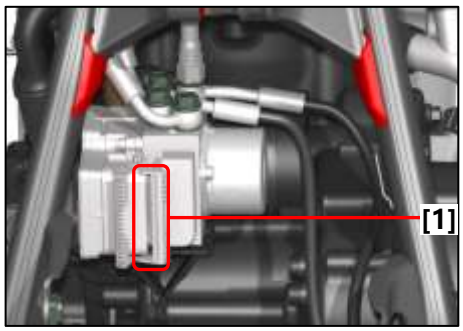
System Location

regular edition:

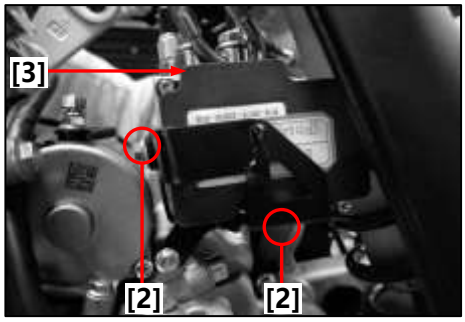


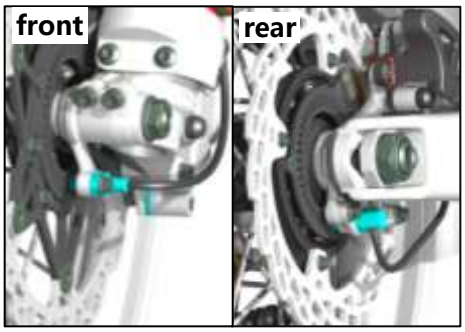
※ABS master pump

Drain the brake fluid from the brake hydraulic system.
Disconnect the negative (-) battery connection.
Disassemble the following components.
- Disconnect the ABS regulator 18P (black) connector [1]
- Remove the brake fluid line locking bolt and sealing washer and disconnect the brake fluid line from the master cylinder.



Remove the two mounting bolts [2] and the ABS master cylinder [3] from the bracket.
Torque.
ABS bracket and engine attachment bolts
10 N.m (1.0 kgf.m, 7.4 bf.ft)
ABS bracket to ABS assembly connection bolt
10 N.m (1.0 kgf.m, 7.4 bf.ft)
Mounting bolts for brake oil pipe.
22 N.m (2.2 kgf.ft, 16 lbf.ft)





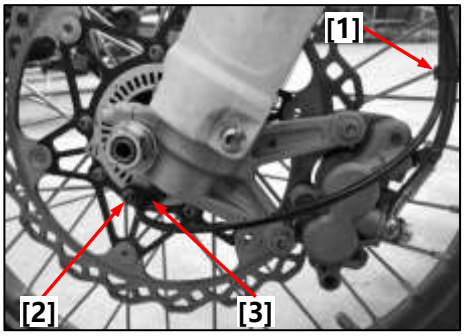
※Wheel speed sensor
Air gap inspection

Use a crane or equivalent to securely support the motorcycle and lift the wheel off the ground.

Slowly turn the wheel and measure the clearance (air gap) between the sensor and the gear ring at multiple points.
Must be within specifications.
Standard: 0.4-1.2mm (0.02-0.05in)

Gap (air gap) cannot be adjusted or is not within specifications, check each part for deformation, looseness or damage.
Check if the wheel speed sensor is damaged, replace if necessary Check if the gear ring is deformed or damaged, replace if necessary.
-Front gear ring
-Rear gear ring

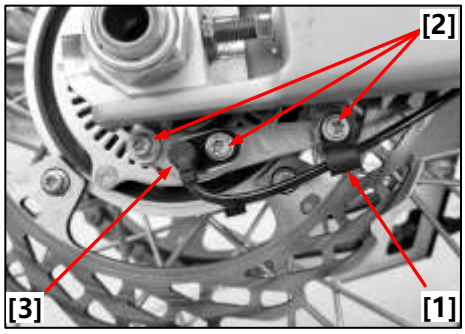
Note: There are no front and rear wheel speed sensors in the factory edition



※Front wheel speed sensor
Disassembly/Installation
Remove the following components.
- Wire clips [1].
- Bolts [2].
- Front wheel speed sensor [3].

The installation order is the reverse of the disassembly order.
Caution.

After thoroughly cleaning the sensor tip and sensor mounting area (caliper bracket) and ensuring that no foreign objects are allowed to be installed, check the air gap.



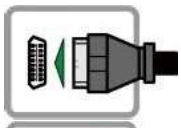
※Rear wheel speed sensor
Disassembly/Installation
Remove the following components.
- Wire clips [1];
- Bolt [2];
- Rear wheel speed sensor [3];

The installation order is the reverse of the disassembly order.
Caution.

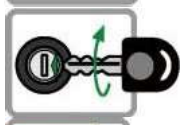
Clean the sensor tip and sensor mounting area (caliper bracket) thoroughly to ensure that no foreign material is allowed. After installation, check the air gap.

Check Diagnostic Process and Troubleshooting

(1) . How to use the diagnostic meter

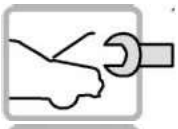


1. Connect the diagnostic instrument to the diagnostic interface.



2.Turn on the ignition switch.

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



4. Troubleshooting

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

(2) .preliminary check

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

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

Then perform the following checks.

-Check that the sensor gap is normal.
-Check that the ABS gear ring is flat and free of deformation.
-Check if the ABS fuse is normal.
-Check that the wiring harness power and grounding points are clean and firm.
-Check the ABS assembly and each sensor connector for looseness or poor contact.

Important Notes.

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

Troubleshooting - Diagnostics

Troubleshooting needs to be tested in a parked state. The repairer can read the ABS information through the diagnostic instrument, connected to the OBD interface, and the fault type and treatment measures are shown in the following table.

(3) .Fault code information

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

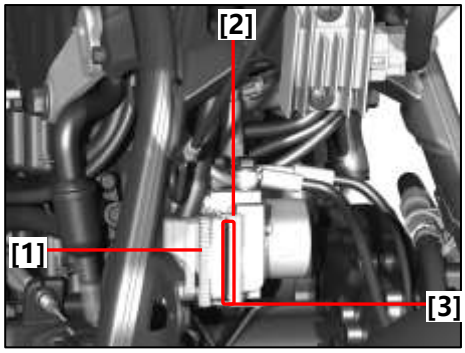
(4) .Fault code corresponding measures

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≤1.5mm)； 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.
轮速输出口故障 (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.

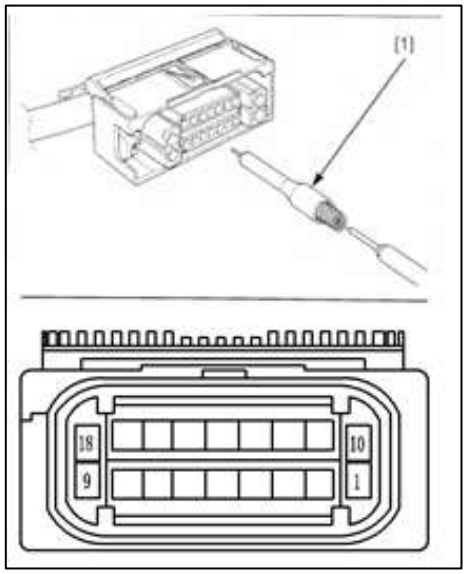
Note: The C0060, C0061, and C0062 faults will not occur for products that are configured in software without a brake signal.

※Circuit Check

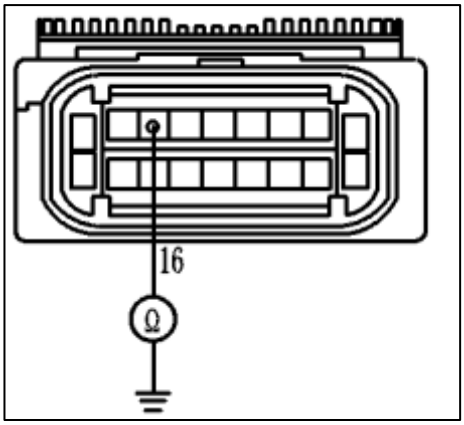


1. ABS plug check

Turn off the ignition switch
Remove the ABS regulator cover.
Turn the locking lever [1] to this side while pressing the locking tab [2] to release it.
Make sure the lock lever is turned all the way and disconnect the ABS regulator 18P (black) connector [3].
Connection procedure.
Make sure that the lock lever is fully against the wire side of the connector.
Press straight down in the area shown (as indicated by the arrow) and connect the ABS regulator 18P (black) connector until the latch clicks, making sure the connector is securely locked.



-Before disconnecting the connector, be sure to clean around and away from any foreign objects on the connector.
-ABS failures are usually associated with poor connections or corroded connections, check these connections before proceeding.
-On the ABS regulator 18P (black) connector terminal
(harness side, except terminals 9 and 18), always use a test probe [1]. Insert the test probe into the connector terminal and then connect the digital multimeter probe to the test probe.



※ABS Indicator Troubleshooting

ABS indicator light does not light up (when ignition switch is on)

Note: before you start to check, and check the initial combination meter operation.

1.Indicator running check

Turn off the ignition switch

Disconnect the ABS regulator 1 (black) connector.

Turn on the ignition switch with the engine stop switch " ".

Check the ABS indicator light.

Does the ABS indicator light come on?

YSE - ABS regulator fault

NO - Perform step 2

2.Indicator signal line short circuit check

Turn off the ignition switch

Check harness side ABS regulator 18P (black)

Conductivity between connector [1] terminal and ground

Tool.

Multimeter

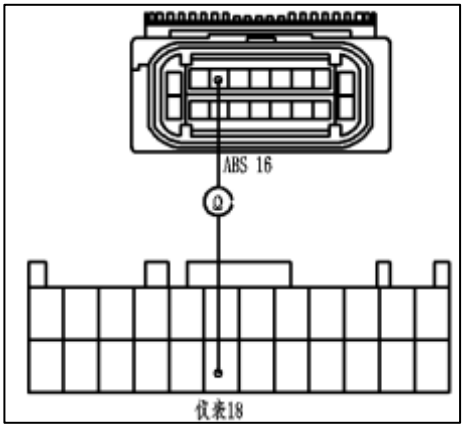
Connection: 16-ground

Is there conductivity?

YES - Purple and white wire shorted

NO - Combination meter fault

ABS light stays on (light does not go off when motorcycle is running)



1.检修线路开路

关Turn off the ignition switch

Check harness side ABS regulator 18P (black)

Conductivity between connector [1] terminal and ground

Tool.

Multimeter

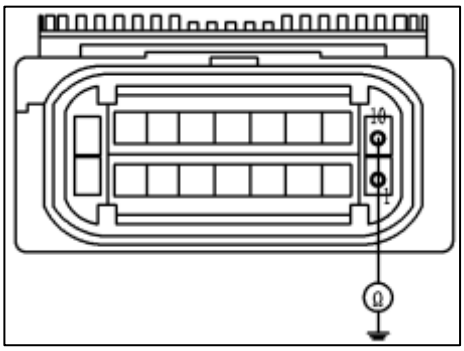
Connection: 16-ground

Is there conductivity?

YES - Purple and white wire shorted

NO - Combination meter fault

ABS light stays on (light does not go off when motorcycle is running)



2.Modulator ground circuit check

Turn off the ignition switch.

Check the conduction between the harness side ABS regulator 18P (black) connector [1] terminal and ground.

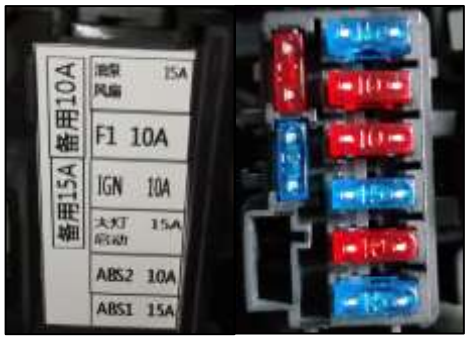
Connection: 1-Ground / 10-Ground

Is there conductivity?

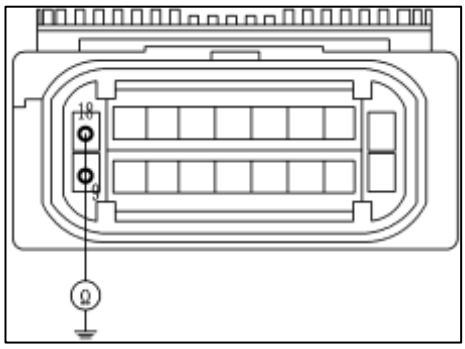
YES -Go to step 3

NO -Green wire open circuit

3.Fuse inspection
Remove the following components.
-Remove the seat cushion by pulling down the seat cushion pull lock
Remove the fuse box cover from the fuse box.
Check for a blown ABS main fuse.
Is the fuse blown?
YES -Go to step 4
NO -Go to step 5



4.Power input line short circuit check
With the ABS main fuse (15A/20A) removed, check the continuity between the ABS regulator 18P (black) connector on the harness side and ground
Tool.
Test Probe 07ZAJ-RDJA110
Connection: 9-ground/18-ground
Is there conductivity?
YES - shorted yellow wire / shorted black and blue wire
N O - Intermittent failure, replace with new A B S main fuse (15A/20A) and recheck.

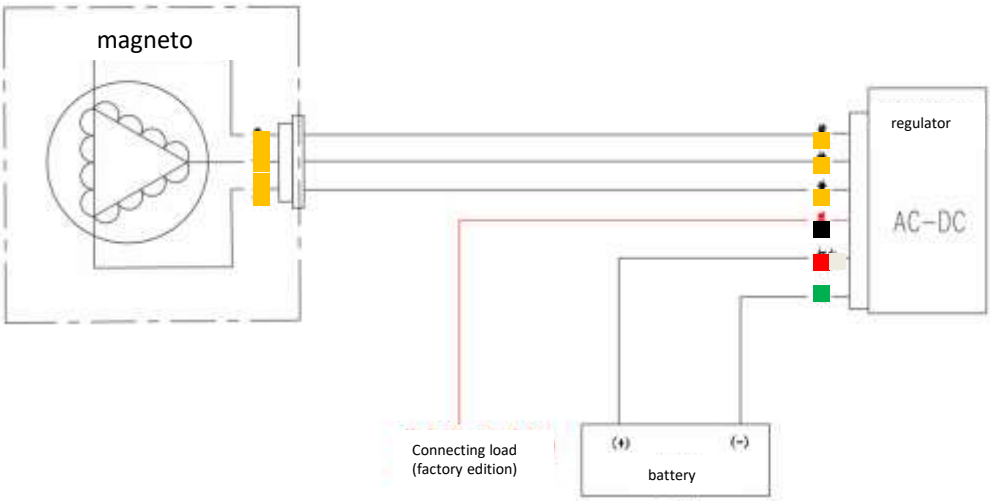


5. Power input line open circuit check
Install ABS main fuse (15A/20A)
Turn on the ignition switch and measure the voltage between the ABS regulator 18P (black) connector [1] terminal and ground on the harness side.
Tool
Test Probe 07ZAJ-RDJA110
Connection: 9 (+) - Ground (-) / 18 (+) - Ground (-)
Is there a battery voltage?
YES-ABS modulation fault
NO-open yellow wire/open black and blue wire

Electrical parts

1.Power supply system

Charging circuit diagram



※magneto

Magneto coil resistance

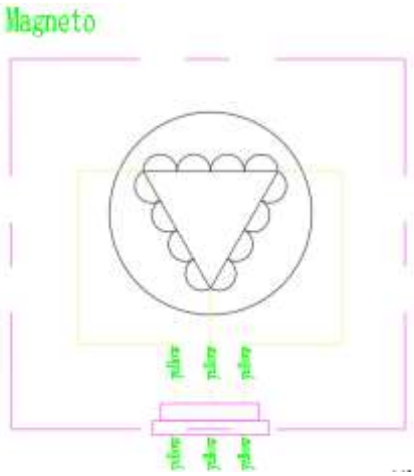
Measure the resistance between the magneto stator coils, the resistance value is within the specified range, it means the magneto is good; otherwise, it means abnormal, replace immediately.

Normal magneto coil resistance range.

0.45 Ω - 1.5 Ω (yellow - yellow).

Insulation resistance ∞ Ω (yellow - ground).

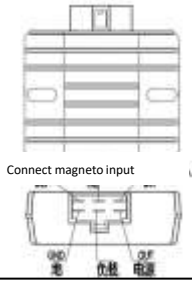
Check the multimeter should be set at 1x10Ω file.



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.

P1

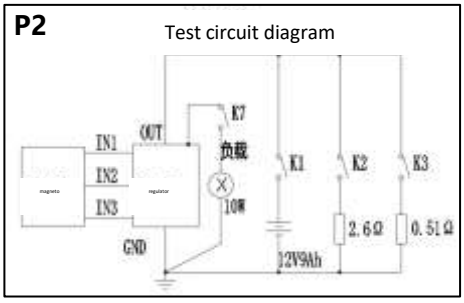


※rectifier

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

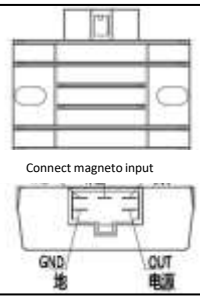
For example, P1: is the outline diagram and pin definition of the factory edition model regulator rectifier.
P2: is the test wiring diagram of regulator rectifier.

P2



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)

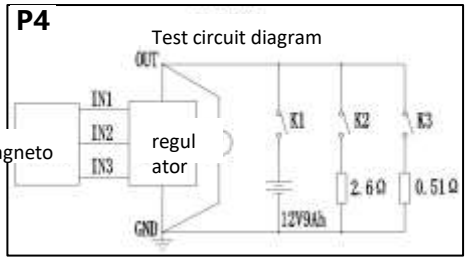
P3



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)

P4



※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.

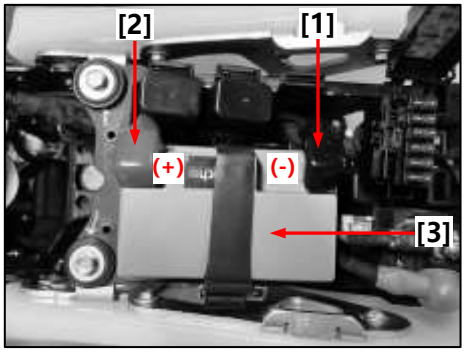
The battery must be disconnected from the negative cable first, otherwise the battery may be short-circuited.

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℃-60℃
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.

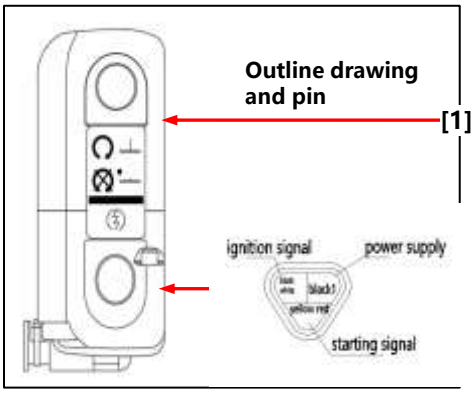
② When the switch is in the " ⊗ " (stop) position, the engine cannot be started.

[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

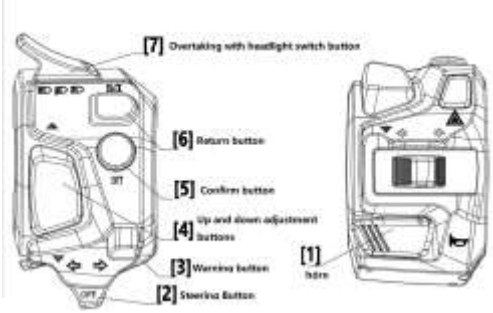
Flameout combination button [1]			
color	black white	black	yellow red
◯	○	○	
⊗			

starting button [2]			
color	black white	black	yellow red
press	○		○

※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.

Shape drawing and function

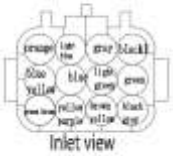


p2

function \ color	blue yellow	blue	green	light green	grey	orange	light blue	black
sinuser	●	●						
horn			●	●				
steering					●	●		
							●	
warning					●	●	●	
overtake		●	●	●	●	●	●	●

p1

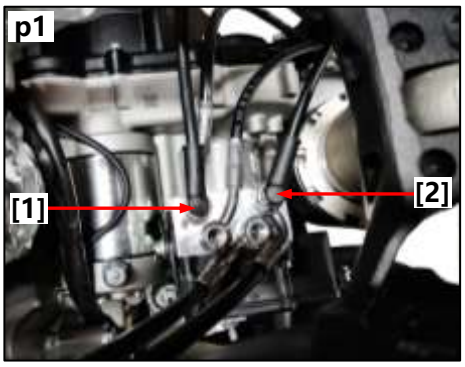
Left combination switch



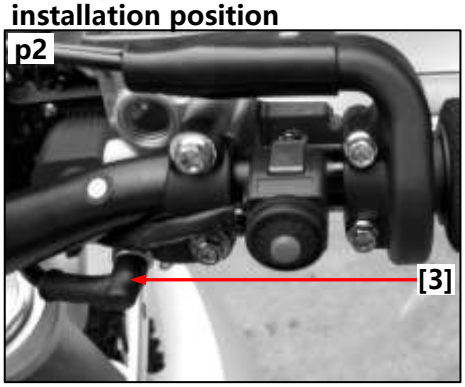
Meter switch

function \ color	green	grey white	yellow	brown red	black red	note
▲	●	●				200mA
▼	●		●			200mA
BACK	●			●		200mA
SET	●				●	200mA

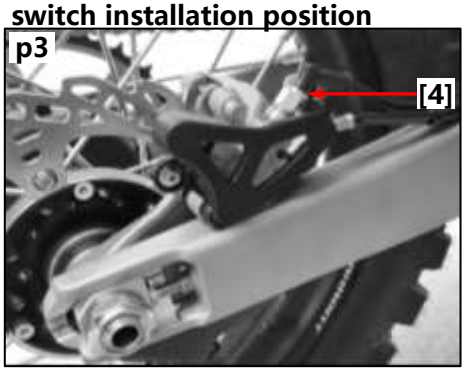
p1: Wiring diagram for the left hand combination switch.



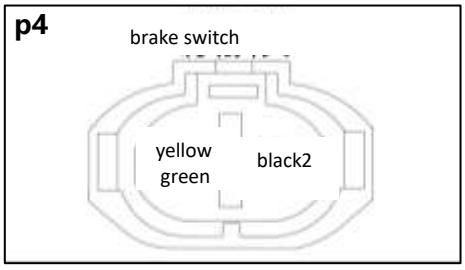
p1: regular edition Brake switch installation position



p2: factory edition Brake switch installation position



p3: factory edition Brake switch installation position



p4: Brake switch wiring harness definition diagram.

※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)

※Turn signal flasher (flasher)

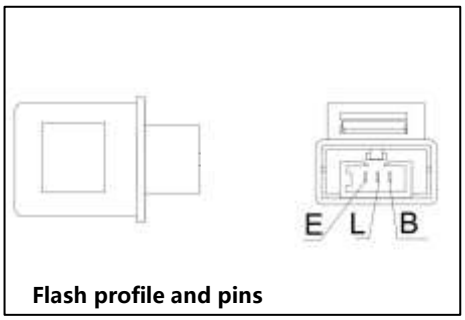
Attention.

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.

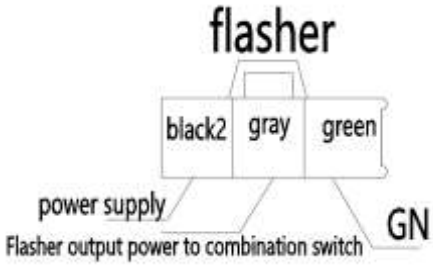
Install in reverse order of disassembly.



Flash profile and pins

P1: wiring diagram for the flasher

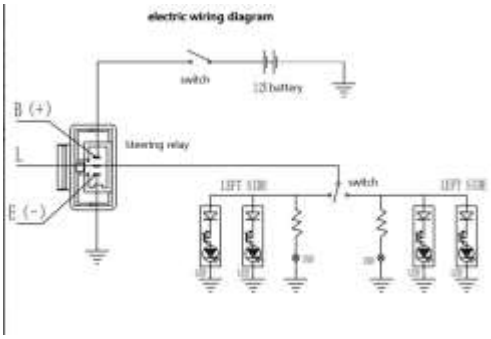
P1



Relay circuit check

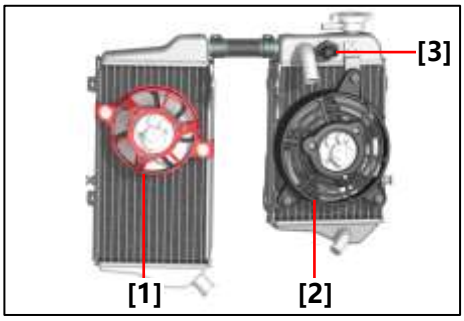
1. Power line open circuit check.
   Turn on the ignition switch, measure the voltage between the black line and the green line, the normal voltage for the battery voltage, and vice versa to check the black and green line open circuit or fuse blown fault.
2. Output line open circuit check.
   Check the 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: ≤9V;

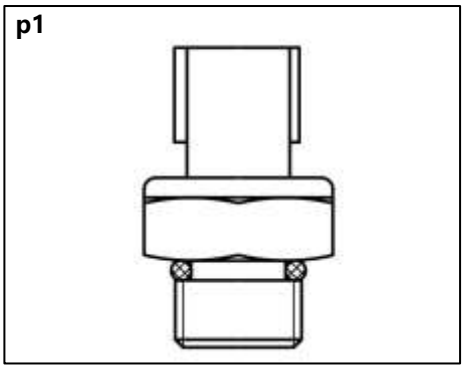


As shown above.
[1] for fan left.
[2] for fan right.
[3] the temperature control switch.

※Fan and temperature control switch

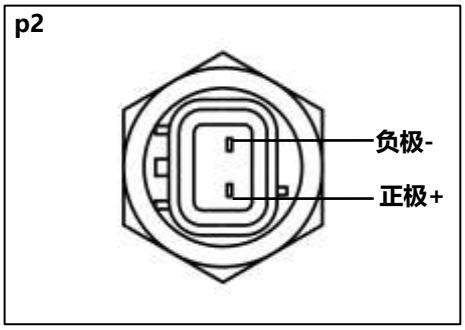
Fan motor check.
Battery voltage 12V motor running at full speed, amperage meter current does not exceed 3A, if the motor does not rotate or the current exceeds the specified then replace the fan motor.

p1



p1 is the outline drawing of temperature control switch.

p2



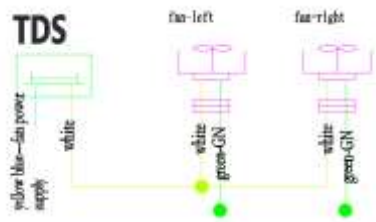
p2:is the pin diagram of the temperature control switch.

Parameters:

Conduction temperature: 93±3℃,

Disconnect temperature: 83±3℃

p3



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.

⚠警 告

-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 1x10Ω.

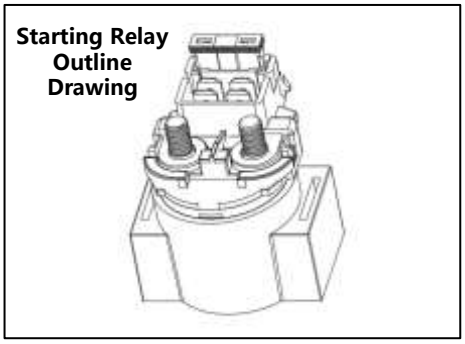
P2: Starting relay schematic.

Auxiliary Relay

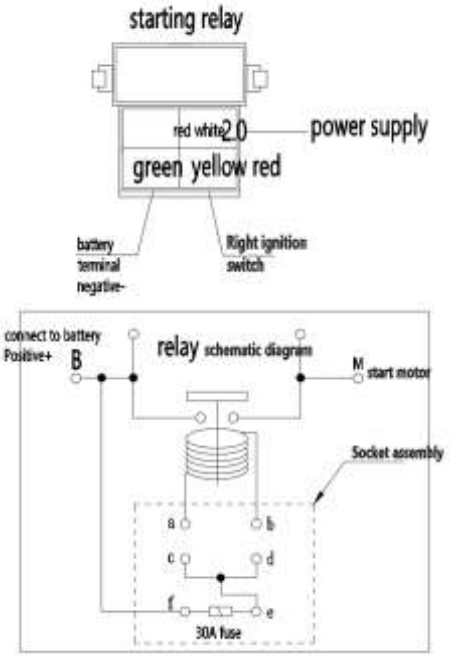
Apply DC12V voltage to the control circuit coil of the auxiliary relay, use a multimeter to measure whether the A B two contacts are connected, measurement of the multimeter dialed in the through file, if the contacts tick and the multimeter issued a continuous tick sound, it means that the two contacts 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.

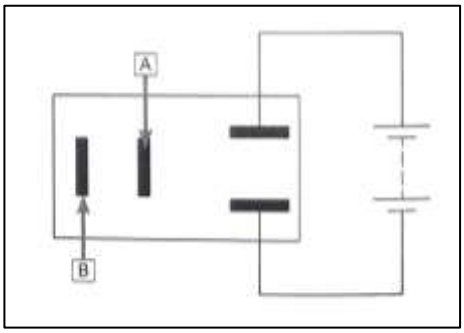
The normal coil resistance range is 90Ω-100Ω



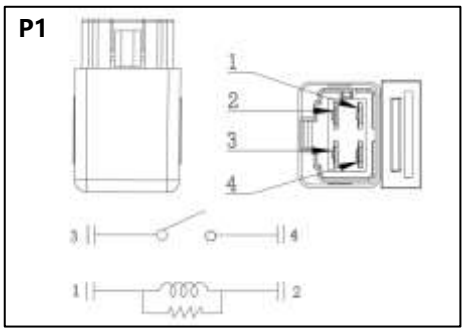
p1



p2

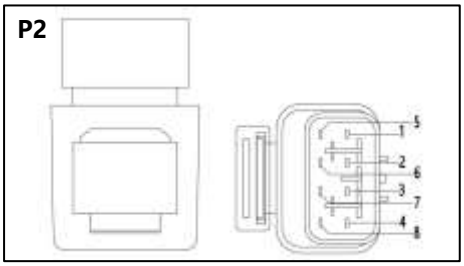


P1

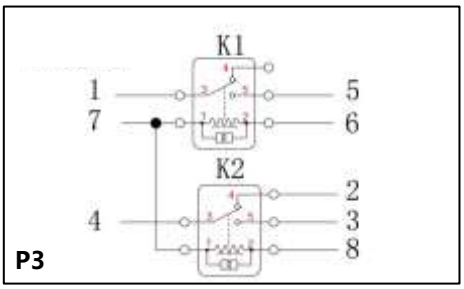


P1：headlamp relay outline drawing and electrical wiring diagram.

P2

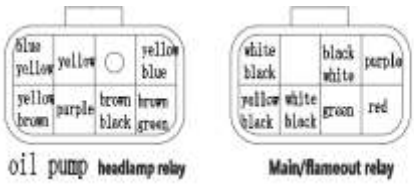


p2,p3：The outline diagram and electrical wiring diagram of the vehicle relay.



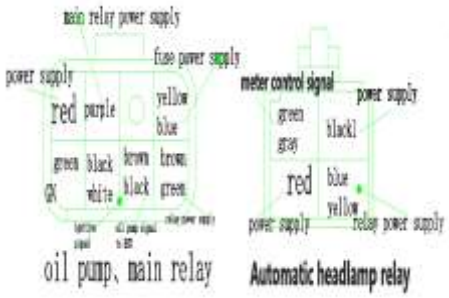
P3

P3



p3：Wiring diagram for factory edition relay.

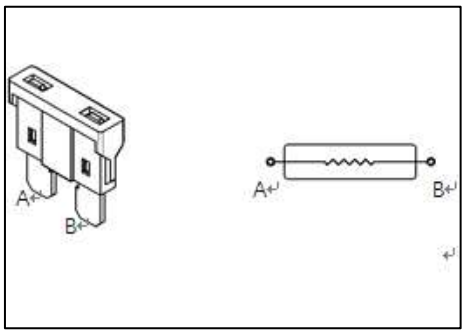
P4



p4：regular edition relay wiring diagram.

※Fuse

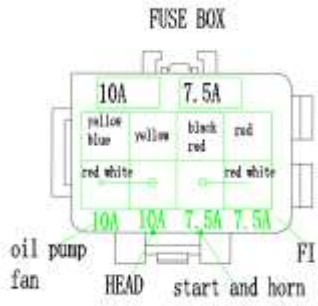
To avoid short circuit, be sure to set the main power switch to "OFF" first when checking or replacing the fuse.
2. Check.
- Fuse
a. Connect a digital multimeter bit to the fuse and check for conduction.
b. If it is not conducting, replace the fuse.
3. Replace.
- Replace the fuse
a. Set main power switch 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.



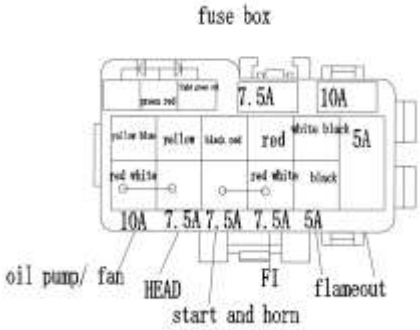
⚠警 告

-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.

factory edition Headlamp outline drawing

regular edition Headlamp outline drawing

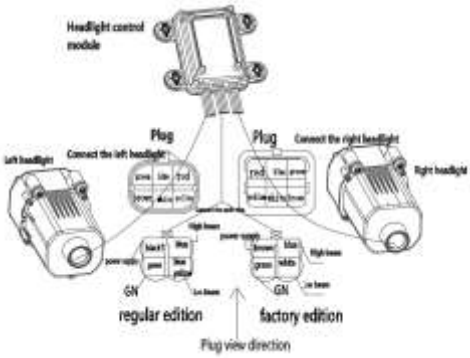
3.Lights

※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.

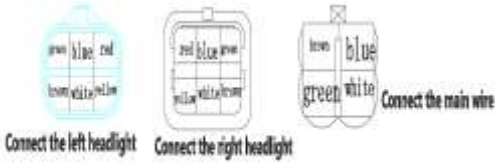
The headlights do not light up after starting the vehicle or the high and low beam cannot switch fault.
Check.
1. switch is damaged.
2. headlight relay damage.
3. plug-in connector abnormal, back pin, crooked pin, plug in place, etc.

P1



P1：Headlight and headlight control module wiring diagram.

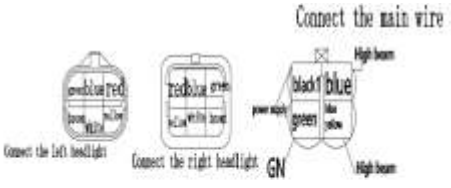
P2



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

P2：Wiring diagram for regular edition headlight assembly

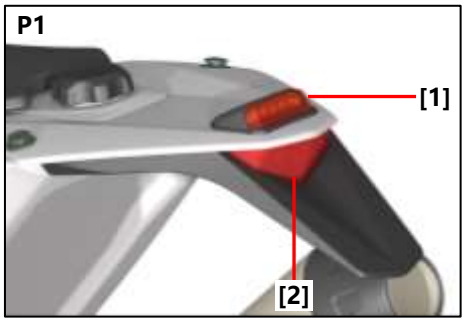
P3



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

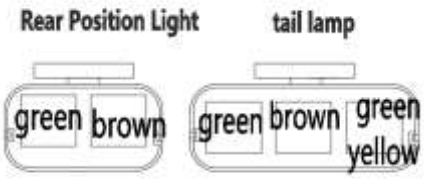
※Rear position light, tail light (factory edition)

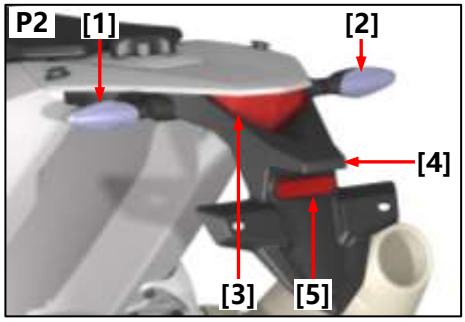


P1：The rear position light is at position [1] and the rear tail light is at [2].

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).





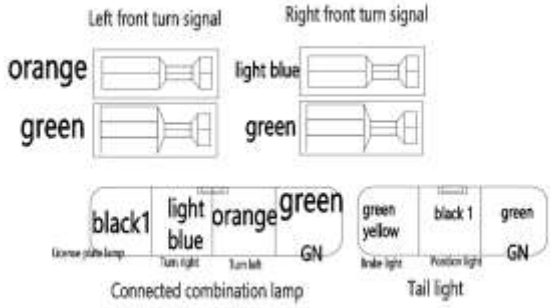
※Front and rear turn signals, rear taillights, license plate lights (regular edition)

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.

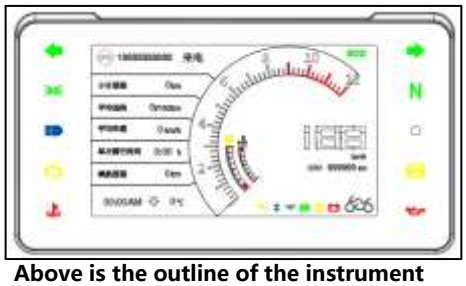
P1: Position [1] is front turn signal right, [2] is front turn signal left.
P2: Position [1] for the left rear turn signal, [2] for the right rear turn signal, [3] for the rear taillight, [4] for the license plate light. [5] rear reflector .

P3：Wiring diagrams for front and rear turn signals, taillight plates, and lights



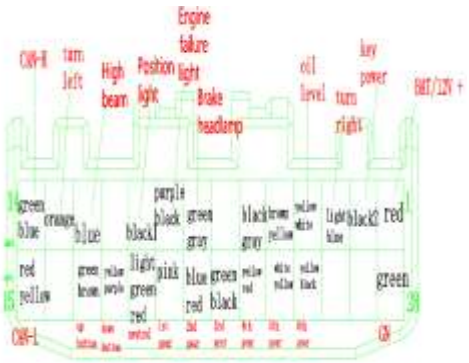
4.Others parts

※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.

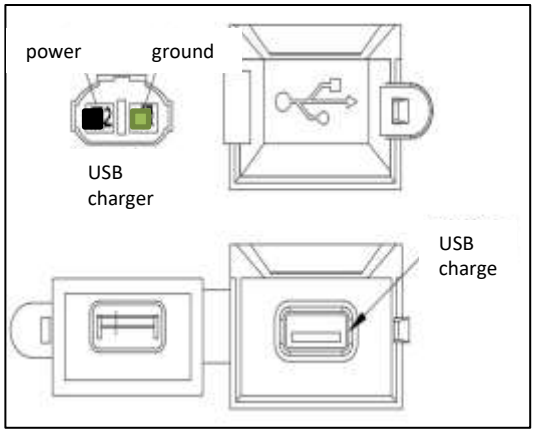
※USB charging socket (regular edition)

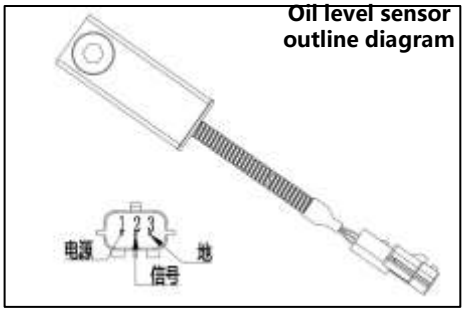
Fast charge protocol: QC2.0/QC3.0/PD3.0 fast charge protocol is supported. Support Huawei Fast charge protocol FCP/SCP; Support Samsung Fast Charge Agreement AFC; Apple 2.4A, etc.;

(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)

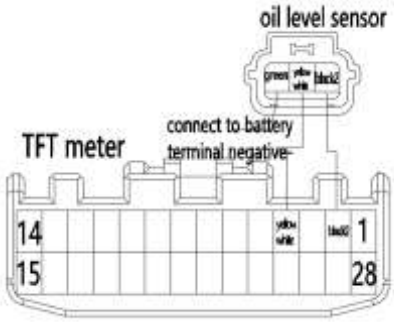




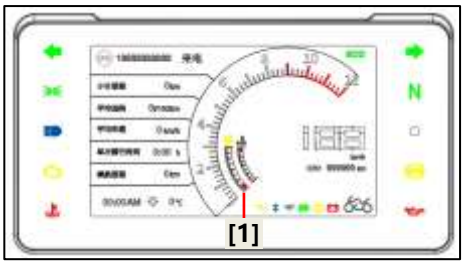
※Oil level sensor (regular edition)

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.

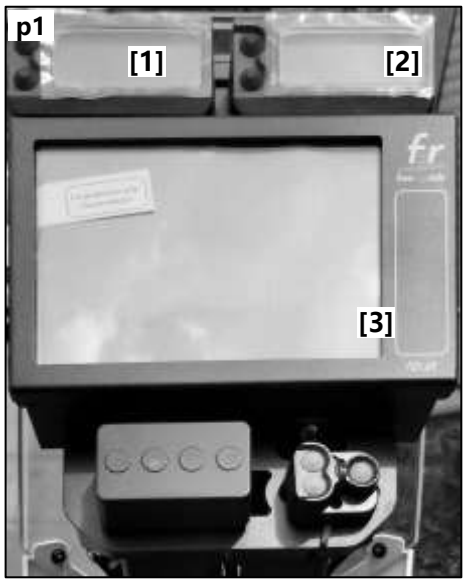
2. Press and hold the up and down buttons on the left side of the speedometer at the same time to turn off the speedometer.

-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.

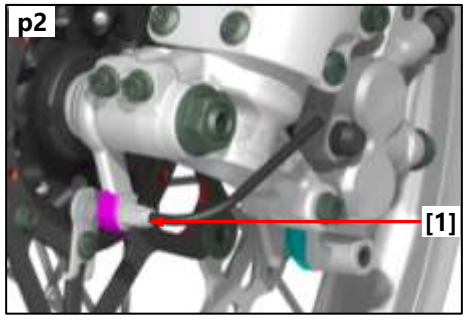
p1



•Wheel speed sensor

Position [1] in p2 on the left is the wheel speed sensor of the speedometer component.。

p2



•External GPS receiver

Such as the left figure 2 position [1] for external GPS receiver

Installation.

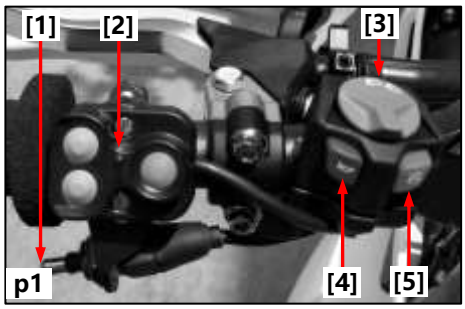
Use its own double-sided tape to external GPS stick in the empty space in the front of the rally car, the vehicle is placed in the open outdoor space to facilitate GPS receiving signals.

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.

p3



※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.

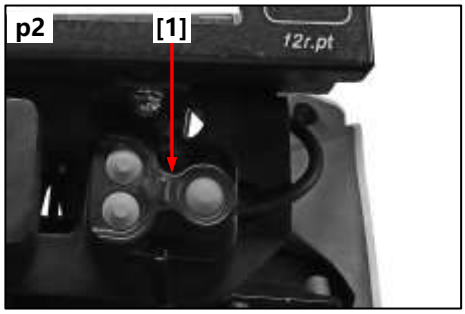
[1] : The thumb button is used to move forward and backward to control the rolling of paper books in the book box. After power failure, the manual mode can be switched to continue operating the book box;

[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.

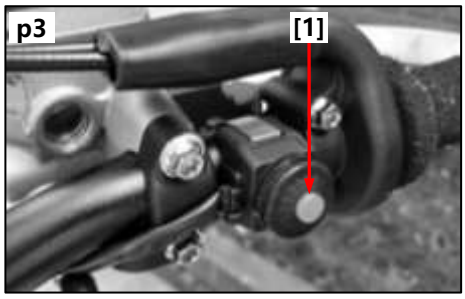
[4] : vehicle horn button;

[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.

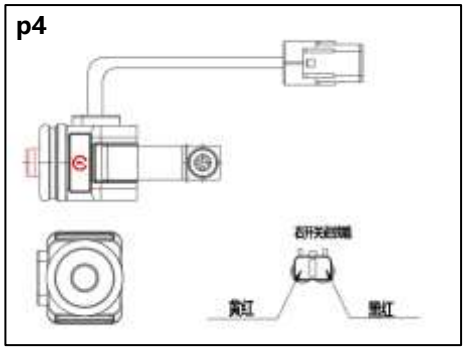


※Right handle switch (factory edition)

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.

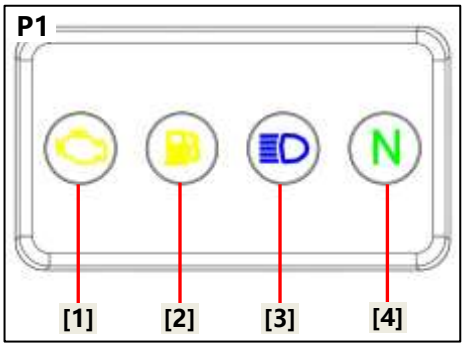
※meter light
(factory edition)

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 bean is turned on;
[4]. Neutral indicator.
This light comes on when in neutral.

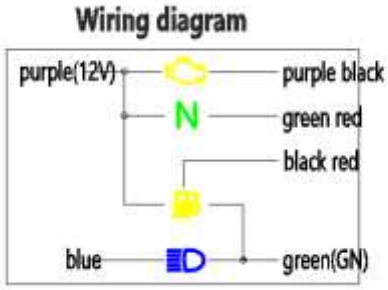
P2: wiring diagram of METER indicator light.

P3: the meter indicator function parameter.

P1



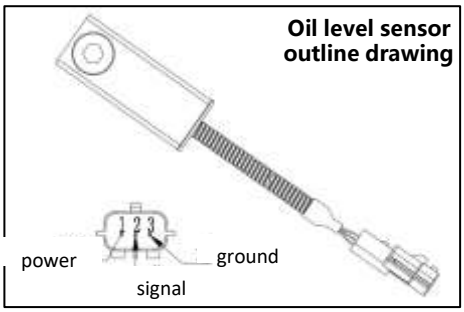
P2



P3

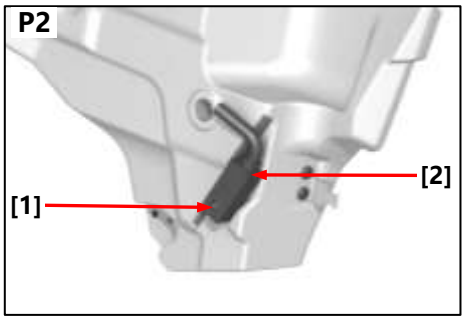
Indicator light instruction

name	fault light	Oil level indicator	High beam	Neutral light
Icon				N
color	orange	$0 \leqslant V_{in} < 1.2V$, Show red $1.2 \leqslant V_{in} < 1.69V$, Show orange $1.69 \leqslant V_{in} < 2.6V$, Show green $2.6V \leqslant V_{in}$, No Show	blue	green
signal	low		high	low



※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)

P3

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.

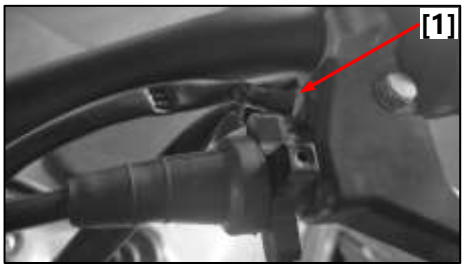
※Horn

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.

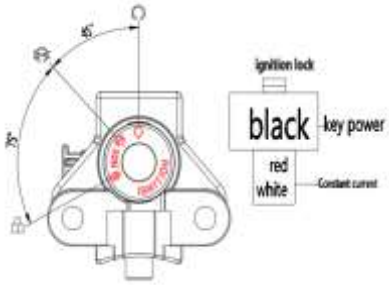
Note: The factory edition does not have a clutch switch.



※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



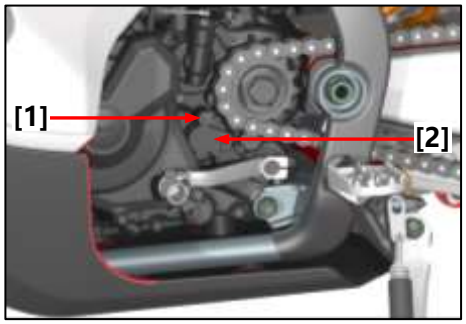
When stopping (including long stops), the ignition switch must be in the " ⊠" or "PUSH" position to ensure the safety of the vehicle and to prevent the battery from "losing power".

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	red	orange	Key removal and insertion
○		—		NO
⊠				YES
🔒				YES



※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.

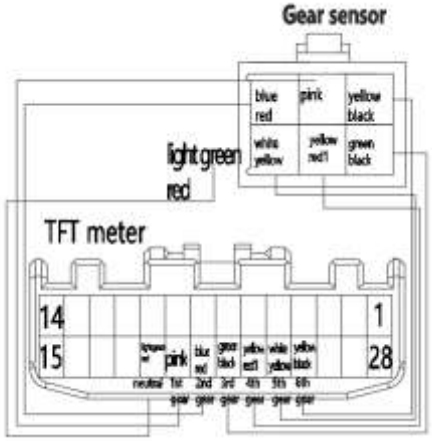
Removal/Installation

Remove the following components.

- Small sprocket trim cover.
- Removal of the screw at position [1].

-The gear sensor [2] can be removed.

P1



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						