A300-D

Service Manual

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Zhejiang KAYO Motor Co., Ltd.
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Preparation Notes

This maintenance manual provides a detailed introduction to the maintenance and adjustment procedures, disassembly and assembly essentials, inspection and repair points, troubleshooting methods, and technical repair data for the A300-D model four-wheel all-terrain vehicle (ATV), and is accompanied by detailed graphic materials to guide operations.

Please read this manual carefully and perform maintenance according to the standard operating procedures, which can effectively extend the service life of various components, improve engine performance, and enhance the reliability of the entire vehicle.

Chapter One mainly introduces general operational matters, the tools used, basic techniques, and maintenance parameters.

Chapter Two introduces the assembly and disassembly techniques for vehicle cover parts.

Chapter Three introduces the regular inspection and adjustment of the entire vehicle.

Chapter Four introduces the disassembly of peripheral assembly components around the engine

Chapter Five introduces the methods and precautions for disassembling, inspecting, repairing, and assembling various parts of the engine.

Chapter Six introduces information related to the vehicle chassis.

Chapter Seven introduces the inspection and repair information for the vehicle's signaling and lighting systems.

Chapter eight introduces the EFI system

Appendix:Wiring Diagram

The contents of this manual may change due to vehicle improvements or other reasons without prior notice. Maintenance and repair should be based on the actual condition of the vehicle.

Zhejiang KAYO Motor Co., Ltd.
Research and Development Center
September 2025

Contents

Conversion table of units in this book

Project	Unit Conversion
Stress	1 kgf/cm2 = 98.0665 kPa; 1 kPa = 1000 Pa
	1 mmHg = 133.322 Pa = 0.133322 kPa
Torque	1 kgf·m = 9.80665 N·m
Volume	1 mL = 1 cm^3 = 1 cc
	1L = 1000 cm^3
force	1 kgf = 9.80665 N
Length	1 inch equals 25.4 mm

Danger / Warning / Caution

Please carefully read the following explanations, which emphasize the specific meanings of the terms 'danger', 'warning', and 'caution', and special attention should be paid to their highlighted meanings when performing maintenance on the engine.

Danger: Indicates the need for alertness in the face of high danger.
Warning: Be vigilant about medium-level risks.
Attention: Indicates attention should be paid to minor dangers.

However, please note that the 'Danger' and 'Warning' notices contained in this repair manual may not cover all potential hazards associated with the use and maintenance of the engine.Therefore, in addition to the provisions concerning 'danger' and 'warning', maintenance personnel must also possess basic knowledge of mechanical safety. If you are not confident in completing the entire maintenance operation process, please consult a more experienced senior technician.

1 Maintenance Information

1.1Work Notes

Safety Precautions

1. It is mandatory to wear work clothes suitable for the job (such as jumpsuits), hats, safety boots, and when necessary, to also wear dust-proof goggles and masks, gloves, and other safety protective equipment to safeguard one's body.
2. Due to the presence of harmful components in exhaust gas, it is prohibited to run the engine for an extended period in enclosed spaces or places with poor ventilation.
3. Immediately after the engine is shut down, the engine and muffler are still very hot; do not touch them before they have cooled to avoid burns.
4. Storage battery solution (dilute sulfuric acid) is a strong corrosive agent, which can cause burn and blindness hazards if it comes into contact with the skin or eyes. If clothing or skin accidentally comes into contact with battery acid, immediately rinse with large amounts of water and seek medical treatment. Storage batteries and battery solutions should be strictly managed and must be placed in a safe location out of reach of children. Hydrogen, which is flammable and explosive, is produced when storage batteries are charged. There is a risk of explosion if a fire source or electrical spark is nearby. Therefore, please charge in a well-ventilated area.
5. As gasoline is flammable, smoking is strictly prohibited in the work area. Not only should you pay attention to open flames, but also to electrical sparks. Additionally, evaporated gasoline is explosive and poses a risk; please select a well-ventilated area for operations.
6. During maintenance, always be careful not to get your hands or clothing caught by rotating parts such as the rear wheel, clutch, and other movable components.
7. When two or more people are working together, they must constantly communicate with each other to ensure safety.

Disassembly and assembly precautions

1. Parts, lubricating oils, and greases must use products recommended by the KAYO brand.
2. Parts of each system should be sorted and stored separately to ensure they can be assembled back to their original positions.
3. Please clean off the mud and dust from the vehicle before conducting maintenance.

4. Gaskets, O-rings, piston pin retainers, split pins, etc., must be replaced with new ones after disassembly.
5. If the opening of the elastic retaining ring is stretched too far during disassembly, it will deform and is likely to fall off after reassembly.Please do not use elastic retaining rings that are already relaxed and have lost their elasticity.
6. After disassembling and inspecting the components, they must be cleaned and then blown with compressed air to remove the cleaning agent before measurement.Apply lubricating oil on the moving surface before assembly.
7. During disassembly, necessary locations should be inspected and relevant data measured to ensure that the assembly can be restored to its pre-disassembly state.
8. Fasteners such as bolts, nuts, and screws should be pre-tightened first, then tightened diagonally in the sequence from the largest to the smallest, from the inside to the outside, according to the specified torque for tightening.
9. Check for aging when dismantling rubber parts, and replace them in advance if necessary.Additionally, since rubber parts are not resistant to the erosion of gasoline, kerosene, and the like, it is best to avoid letting volatile oils and greases adhere to them.
10. Lubricating grease recommended in the maintenance manual should be applied or injected at the specified parts.
11. The correct special tools should be used for disassembly and assembly operations.
12. Ball bearings can be rotated by hand to check if the inner or outer rings revolve smoothly. If a removal method that applies force to the balls was used during disassembly, the bearing should not be reused:

- Bearings with excessive axial and radial clearance should be replaced.
- Bearings with a sensation of sticking should be cleaned; if they still feel stuck after cleaning, they should be replaced. Those that cannot be cleaned should be replaced directly.
- If the fit was originally interference fit on the shaft or bore, the bearing should be replaced if it becomes loose after disassembly and reassembly.

13、Bearings should be coated with oil or grease before assembly.One-way dust-proof bearings should be installed with attention to the direction during assembly. Open or double-sided dust-proof bearings should be installed with the side engraved with the manufacturer's mark and size facing outward during assembly.
14、When installing the rectangular retaining ring, the chamfered side should face the direction of force.Do not use a locking ring that has lost its elasticity and become loose.After assembly, rotate the rectangular retaining ring to ensure it is securely fitted into the groove.
15. After assembly, it is necessary to check whether each fastening part is tightened and whether the operation is normal.
16. Brake fluid and coolant can damage painted surfaces, plastic parts, and rubber components. Do not allow them to come into contact with these parts, and if they do, rinse immediately with water.
17. The oil seal should be installed with the side that has the manufacturer's mark facing outward

(away from the oil).

- During assembly, care should be taken to prevent the lip of the oil seal from curling and to avoid damaging the lip with burrs.
- Apply grease to the oil seal lip before assembly.

18. When installing parts such as rubber hoses, insert the hose into the root of the connector.Those with clamps should install the clamps in the groove of the pipe.Hoses without tension during installation should be replaced.

19. Do not allow dust, dirt, or other particles to enter the engine interior and the brake hydraulic system.

20. The gasket material attached to the mating surfaces of the engine components must be cleaned before assembly.The scratches on the contact surface must be evenly sanded and removed with an oilstone.

21. Do not excessively twist or bend cable-like structures.Deformed or damaged cables can cause malfunctions or breakages.

22. When assembling protective cap parts, those with grooves must have the cap inserted into the groove.

Engine break-in

The engine has many parts that move relative to each other, such as pistons, piston rings, cylinder blocks, and interlocking transmission gears. Therefore, it is necessary to perform standardized break-in during the initial period of use. Break-in allows the moving parts to adapt to each other, correct working clearances, and form a smooth friction surface capable of withstanding heavy loads. Only engines that have undergone standardized break-in possess excellent performance and reliability.

The recommended break-in period is 10 hours, with the following specifications:

0 to 10 hours:Avoid continuous operation at more than 1/2 throttle; frequently vary the vehicle speed and do not run the engine for extended periods at a fixed throttle position. After every hour of operation, cool the engine for 5 to 10 minutes. Avoid sudden acceleration; throttle changes should be gradual, without abrupt increases or decreases. During the break-in period, do not carry any loads.

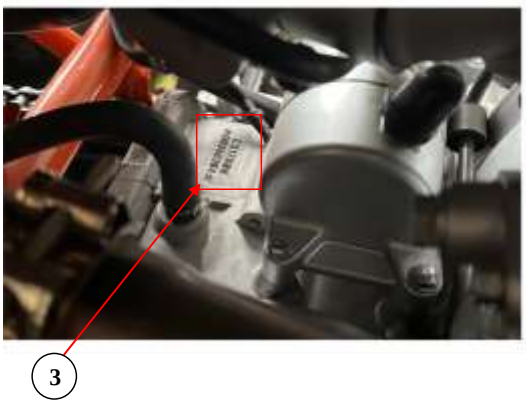
Attention:

- During the break-in period, perform maintenance according to the daily maintenance regulations, and promptly address any malfunctions found;
- After the break-in period ends, perform maintenance on the entire machine before it can enter the normal operation phase.

1.2 Vehicle Identification Number (VIN)

①Information number
②Vehicle nameplate
③Engine Number

Model type	A300-D
Chassis Number	L6JADPLA~
Engine number	LX178MN~



1.3 Main Parameter Table

Project		Parameter
Vehicle model number		A300-D
Length (mm)		1660
Width (mm)		1210
Height (mm)		1030
Wheelbase (mm)		1150
Engine Model		LXYF300
Total Displacement (cc)		292.4
Fuel type		Gasoline with octane rating of 93 or above
Curb weight (kg)		176.0
Number of occupants		1 person (driver)
Maximum Load Capacity (kg)		85
Tire specification	front wheel	Black AT 21 X 7-10
	rear wheel	Black AT 20 X 11-9
Minimum Ground Clearance		115 mm
Engine	Starting method	Electric start
	Engine type	Single cylinder, four-stroke, water-cooled, DOHC, four-valve
	Distribution mode	DOHC
	Bore × Stroke (mm)	78 times 61.2
	Compression ratio	11.0:1
	Lubrication method	Splash lubrication and pressure lubrication
	Oil pump type	Rotary type
	Engine oil grade	SAE 15W-40 SG
	Cooling method	Water cooling

Project		Parameter	
Air Filter Type		Sponge core filter type	
Fuel tank capacity (L)		6.7	
Drivetrain	Clutch type	Manual transmission	
	Shift mode	Five gears with reverse gear	
	Gear shift	R1 N2 3 4 5,	
	Shift mode/sequence	Foot operation/R1 N 2345	
	Output format	Rear Axle Output	
	Engine output rotation direction	When shifting into drive, looking from the rear of the vehicle towards the front, the direction is clockwise.	
Left and right steering angles		< 45 degrees	
Maximum climbing performance		≥17°C	
Brake System Type		front	Disc brake
		after	Disc brake
Braking force (n)		formerly:≥400	
		Post:≥400	
Buffering mode	Hanging method	Front wheel double wishbone independent suspension, rear wheel non-independent suspension	
Chassis type		Steel pipe and steel plate welded type	

1.4 Maintenance Parameter Table

Lubrication device

Project		Standard	Usage Limit
Engine Oil Capacity	Change the engine oil	800ml (oil filter not replaced)	-
	Change the engine oil	900ml (also replace the oil filter)	
	Full capacity	1000 milliliters	-
Recommended engine oil		Only use SAE 15W/40-SG engine oil; do not substitute or mix with different brands or grades of oil, as this can cause engine damage and lead to accidents.	
Oil pump rotor	Internal and external rotor clearance	0.07 mm to 0.15 mm	0.2 mm
	Clearance between the outer rotor and the housing	0.03 mm to 0.10 mm	0.12 mm
	Oil pump rotor end face clearance	0.023 mm to 0.055 mm	0.12 mm
	Engine oil pressure	1500 rpm at 90°C, 200 kPa to 400 kPa, Generally 240 kPa 6000 rpm, at 90°C 600 kPa to 700 kPa, Generally 600 kPa	

Intake system (see details in section 05-Engine part)

Wheels (front and rear wheels)

Project		Standard	Usage Limit
Wheel rim bounce	Vertical	0.8 mm	2.0 mm
	Horizontal	0.8 mm	2.0 mm
Tire	Residual groove	-	3 mm
	Atmospheric pressure	45 kPa (0.45 kgf/cm²)	-

Braking system

Project		Standard	Usage Limit
Front brake	Disc brake Thickness	3.5 mm	3 mm
Rear brake	Brake lever travel	3 to 5 mm	-
	Disc brake Thickness	4 mm	3 mm

Battery / Charging device / Starter / Gear shift

Project			Standard
Rectifier type			Three-phase full-wave, short-circuit
Battery	Capacity		12V 4Ah
	Terminal voltage	Fully	13.1V
		Insufficient	Below 12.8V

ignition device

Project		Standard
Ignition method		ECU controls ignition
Spark plug	Type	Resistor spark plug
	Standard	B8RC
	Spark plug gap	0.6-0.8 mm
	Spark characteristics	Blue and white light

Lighting / Instrumentation / Switches

Project		Standard
Lighting, light bulbs	Headlights	12V
	Taillight/Brake light	12V

fuse

Project		Standard
fuse	Main fuse	15A
	ECU fuse	15A

Valve Mechanism + Cylinder head (see details in section 05-Engine part)

Cylinder + Piston + Piston Ring + Crankshaft Connecting Rod (see details in section 05-Engine)

Clutch + Transmission mechanism (see details in section 05-Engine part)

1.5 Fastener Tightening Torque

Attention:

Before installing the thread, apply anti-rust grease to the threaded part and the mating surface.

Torque for specified tightening location - Vehicle components

Serial Number	Project	Fastener code	Quantity	Torque (N·m)
1	Guide chain sprocket installation bolt	Tri-Valent Chromate M8*45 48-hour Salt Spray	1	25-30
2	Rear disc brake mounting bolt	Tri-Valent Chromate M8*16	4	25-30
3	Front disc brake rotor installation bolt	Blue-White Zinc M8*20*1.25 with step	8	25-30
4	Fixed in front of the engine	Tri-Valent Chromate M10*117*1.25	2	55-66
5	Rear Swingarm Bolt	Blue-White Zinc Φ 16*258*M16*1.5mm 10.9 grade S=19	1	86-103
6	Rear shock bolt	Blue-White Zinc Φ 12*64*M12*1.25mm 10.9 grade S=15	2	55-66
7	Rear Axle Mounting Bolt	Blue-White Zinc Φ 12*95*M12*1.25mm 10.9 grade	2	34-41
8	Front disc brake three-way fixing bolt	Tri-Valent Chromate M8*35 semi-threaded	1	25-30
9	Steering column lock bolt	Tri-Valent Chromate M8*65	2	25-30
10	Rear disc brake lower pump mounting bolt	Tri-Valent Chromate M8*25	2	25-30
11	Brake Pedal Mounting Bolt	Tri-Valent Chromate M8*16	1	25-30
12	Rear disc brake pump mounting bolt	Tri-Valent Chromate M6*25	2	10-12
13	Iron foot pedal fixed bolt	Tri-Valent Chromate M8*16	8	49-59
14	Front car cover fixing bolt	Tri-Valent Chromate M8*16	2	25-30
15	Rear car cover fixing bolt	Tri-Valent Chromate M8*12	2	25-30
16	Front car cover fixing bolt	Tri-Valent Chromate M8*20	2	25-30
17	Front shock fixed bolt	Tri-Valent Chromate M10*55*1.25 half-thread	4	35-45
18	Upper arm fixing bolt	Blue-White Zinc Φ 10*237*M10*1.25mm	2	40-45
19	Lower arm fixing bolt	Tri-Valent Chromate M10*80*1.25	4	40-45
20	Front Disc Brake Lower Pump Mounting Bolt	Tri-Valent Chromate M8*25	4	20-25

21	Rear protective fixing bolt	Tri-Valent Chromate M8*16	4	25-30
22	Fuel tank mounting bolt	Tri-Valent Chromate M8*30+Φ10*16.5	4	25-30
23	Upper pressure plate fixing bolt	Tri-Valent Chromate M8*50	4	25-30
24	Foot Pedal Support Fixed Bolt	Tri-Valent Chromate M8*16	4	25-30
25	Upper pressure plate fixing bolt	Military green M8*30	4	25-30
26	Front and rear wheel locking nuts	Tri-Valent Chromate M10*1.25	16	55-66
27	Rear wheel hub fixed (slotted nut)	Tri-Valent Chromate M18*1.5*H23 slot depth 7	2	77-92
28	Front wheel hub fixed (slotted nut)	Tri-Valent Chromate M14*1.5*H18	2	77-92

Torque for specified fastening points

Fastening torque for unspecified parts

species	Torque N·m	species	Torque N·m
5mm bolt, nut	4.5 ~ 6	5mm screw	3.5~5
6mm bolt, nut	8~12	6mm screw	7~11
8mm bolt, nut	18~25	6mm convex bolt	10~14
10mm bolt, nut	30~40	8mm convex bolt, nut	20~30
12mm bolt, nut	35~50	10mm convex bolt, nut	30~40

Engine repair tools (see section 05-Engine part for details)

Engine-specific tools (see details in section 05-Engine part)

1.6 Lubricating oils and sealants

Application Location	Points to note	Fats and oils
Steering bearing		Lightweight lithium soap -based grease
Throttle cable connection		
Rocker arm moving part		
Inner circumferential surface of the direction column		
Seat lock moving parts		

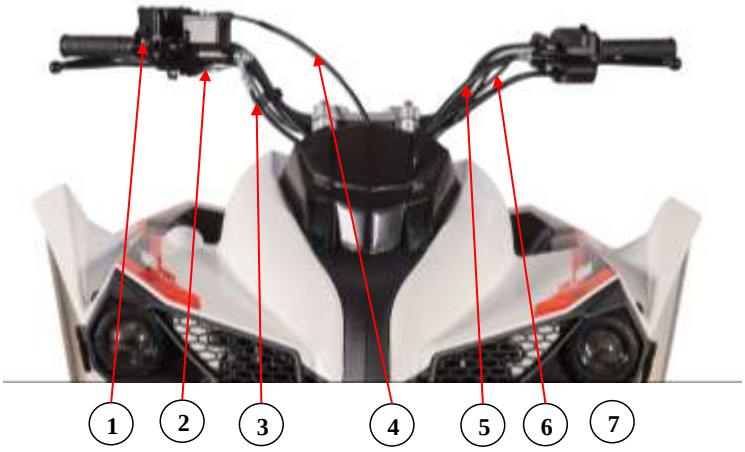
Manipulate cables, bearings, and lubricate all moving parts.

Location	Content	Oil crops
Spherical bearing sleeve for steering shaft	Lubrication	Automotive Universal Lithium-Based Grease GB/T5671
Rear axle bracket		
Front and rear shock absorber joints		
Throttle lever shaft and cable connector		
Throttle and brake lever pivot points		

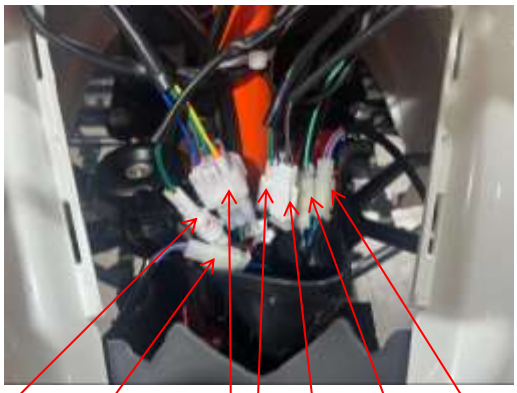
Engine operating materials and installation accessories (see section 05-Engine part for details)

Engine operating materials include lubrication (engine oil), grease , etc.; installation auxiliary materials include flat sealant, thread locking adhesive, etc.

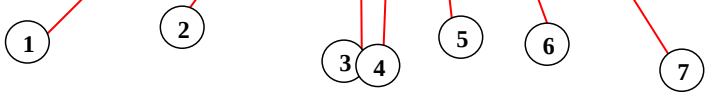
1.7 Cable, Hose, and Control Cable Routing Diagram



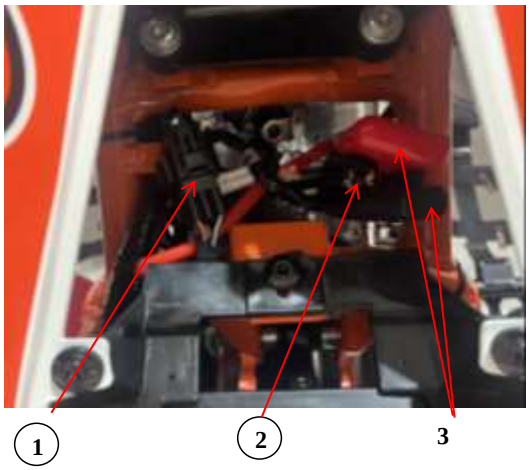
1.Parking Lever 2.Front Brake Switch 3.Front Brake Hose 4.Accelerator Cable 5.Clutch Cable 6.Clutch Switch Wire 7.Multi-Function Switch Wire



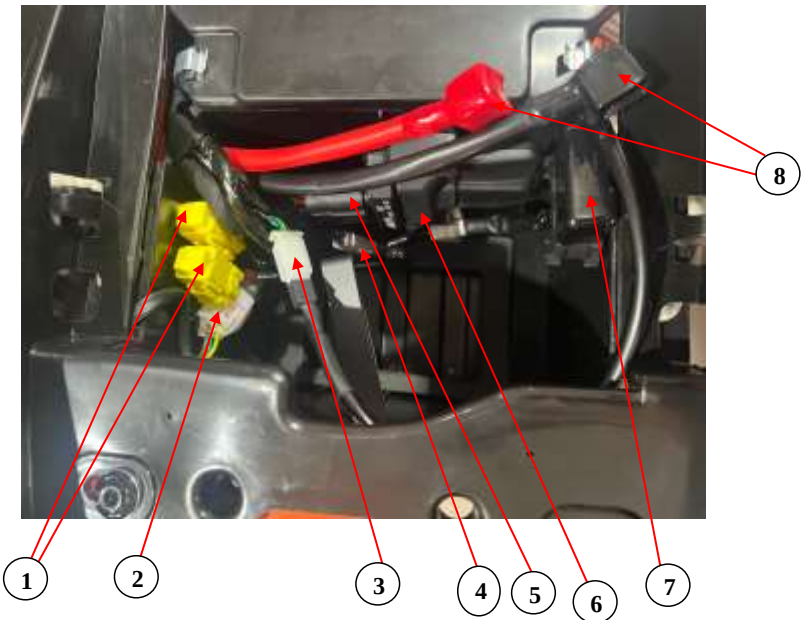
1. Magneto motor connectors



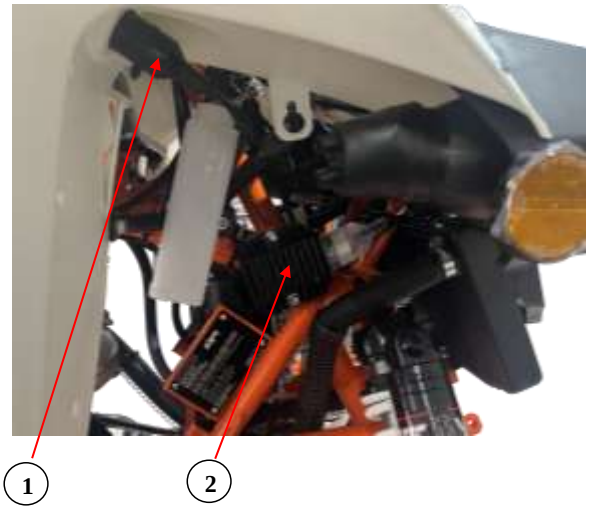
1.Malfunction Indicator Lamp Connector; 2. Headlight Switch Connector; 3. Multi-Function Switch Connector; 4. N Gear Indicator Connector; 5. R Gear Indicator Connector; 6. Clutch Switch Connector; 7. Headlight Switch Connecto



1. Gear Position Switch Connector; 2. Starter Relay; 3. Starter Relay Connector

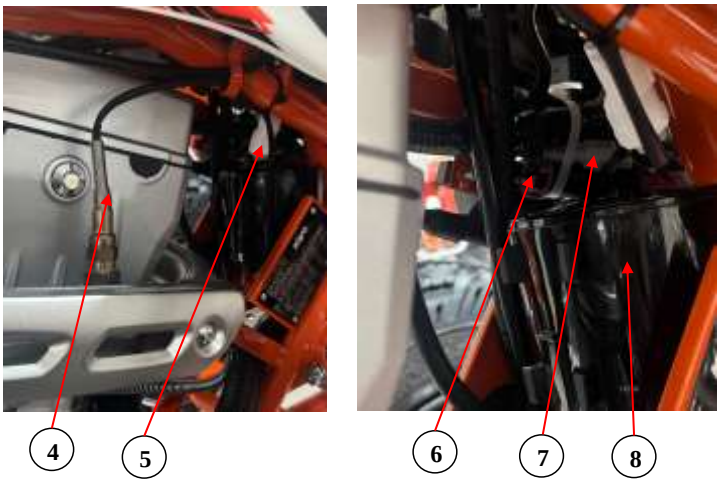


1.Fuse; 2. Taillight Connector; 3. Rear Brake Switch; 4. OBD Connector; 5. ECU Connector; 6. ECU; 7. OBD; 8. Battery Positive/Negative Terminal Connectors

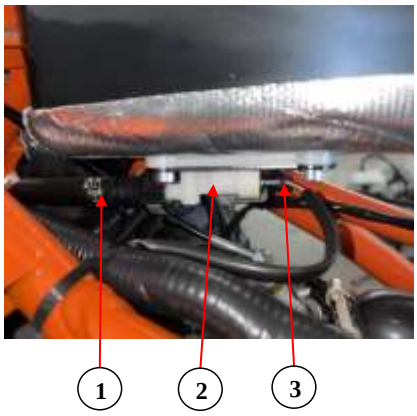


1.Ignition Switch 2.Voltage Regulator

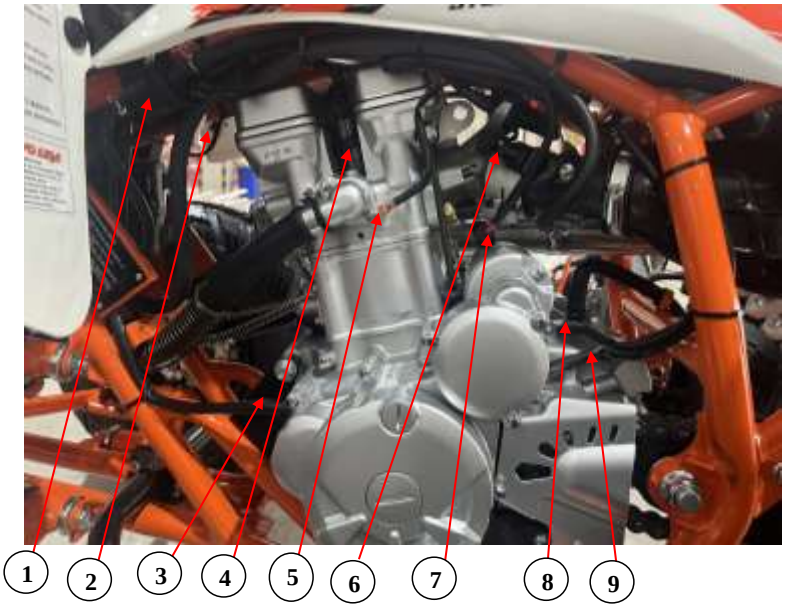
1、High-voltage transformer 2, Carbon Canister 3, Carbon Canister solenoid valve 4, Carbon Canister solenoid valve connector



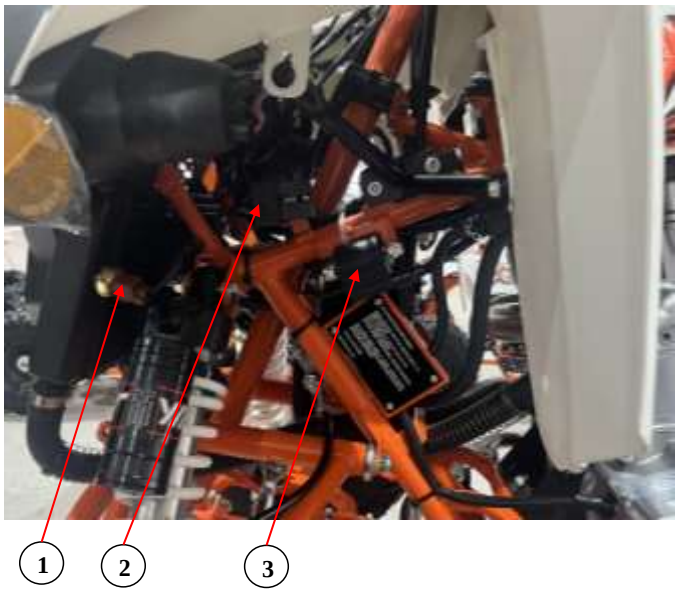
1.Oxygen Sensor (O2 Sensor); 2. Oxygen Sensor Connector; 3. Magneto AC Output; 4. Trigger Connector; 5. Charcoal Caniste



1. Oil pipeline 2. Fuel pump 3. Fuel pump connector



1.Charcoal Canister Solenoid Valve; 2. Fan Connector; 3. Magneto Coil; 4. Ignition Coil; 5. Temperature Sensor; 6. Throttle Position Sensor Connector; 7. Starter Motor Cable; 8. Ground Wire; 9. Gear Position Wire



1.Radiator Connector; 2. Four-Pin Relay; 3. Ignition Coi

4.Accelerator Cable; 5. Fuel Injector; 6. Clutch Cable

Attention:The plastic assembly must be removed before inspecting and repairing the aforementioned components.For specific disassembly instructions, refer to Chapter 2: Body Panels

2 Body Cover Parts

2.1 Maintenance Information

Work Precaution:
When replacing the covers of regulatory warning signs affixed or riveted to vehicles, it is necessary to correctly and completely replenish the corresponding signs in their original form.
This chapter describes the disassembly sequence of the body cover parts. When it is necessary to dismantle related panels for the maintenance of the vehicle's interior components, refer to this chapter.
This chapter describes the disassembly and assembly operations for ceiling frames, Seats, and exterior parts.
Please route pipes and cables according to the wiring diagrams for cables, pipes, and guy wires from the correct position.

2.2 Installation Torque

M10 bolt	45 (4.5)	Torque N·m(kgf·m)
M8 bolt	22 (2.2)	Torque N·m(kgf·m)
M6 bolt	10 (1.0)	Torque N·m(kgf·m)
M5 bolt	5 (0.5)	Torque N·m(kgf·m)
self-tapping screw	4 (0.4)	Torque N·m(kgf·m)

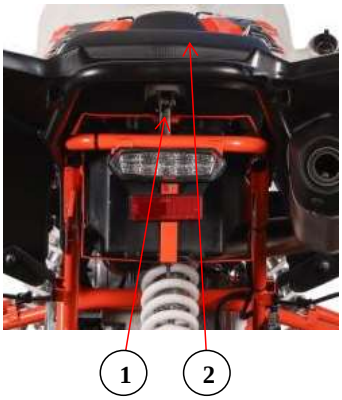
2.3 Seat disassembly

Disassembly

Pull up the Seat hook 1

Lift the back of the Seat and pull the Seat 2 outwards.

Install
The installation is carried out in the reverse order of disassembly.
After installation, check whether the Seat is properly installed and securely fastened.



2.4 Assembly and disassembly of the Head Fairing

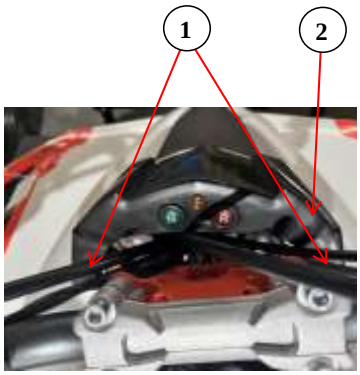
Disassembly

Remove bolt 1

Unplug the malfunction indicator and gear display connectors

Remove the hood 2

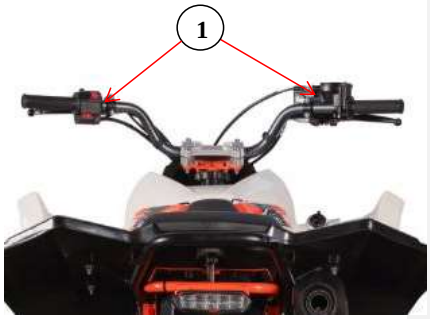
Install
The installation is carried out in the reverse order of disassembly.



2.5 Disassembly and assembly of plastic parts assembly

2.5.1 Disassembly and assembly of plastic parts assembly

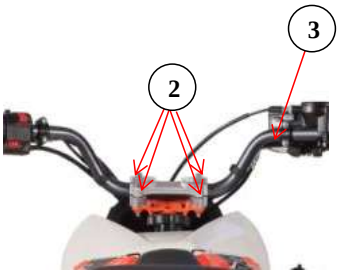
Remove the Seat, head cover, and throttle cable.
Disconnect the combination switch, brake switch
Electric door lock and malfunction indicator light, gear display
all the plugins on the connector



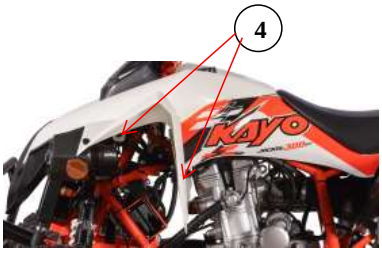
Remove the clutch lever, front disc brake pump 1

Remove the upper pressure block fixing bolt 2

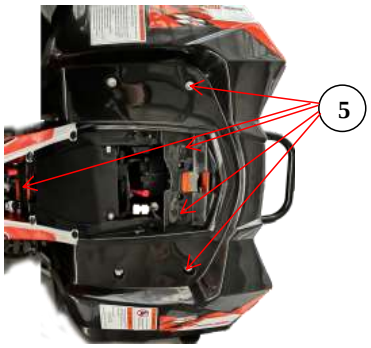
Remove the steering gear assembly 3



Remove the bolts securing the front body (4)
Two on each side



Remove the rear body mounting bolt 5



Detachable plastic assembly 6

Install

The installation is carried out in the reverse order of disassembly.

Attention: If the installation bolt or nut is damaged, please replace them with new parts of the same specification in a timely manner.

After installation, check the headlight connector, the main switch connector, the reverse gear indicator light connector, and the neutral gear indicator light connector to prevent them from becoming loose or being connected incorrectly.

2.5.2 Front body disassembly

Disassembly

Remove the Seat (→2.3)

Remove the hood (→2.4)

Remove the front body fixing bolt 4 (2 on each side)

Remove the rear body fixing bolt 5

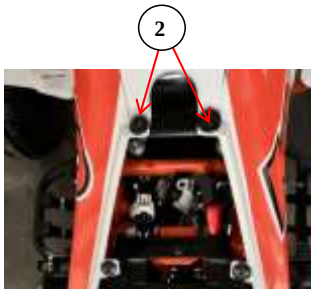
Remove the handlebar assembly.

Disconnect the connectors for the headlight, ignition switch, etc.

Remove the front cover mounting bolt 1 (2 on each side).

Remove the front cover and side panel mounting bolt 2.

Remove the front cover assembly 3.



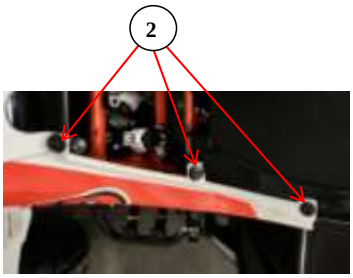
Installation
Installation should be performed in the reverse order of removal.
Note:
If any mounting bolts, mounting nuts, or rubber flat washers are damaged, replace them promptly with new parts of the same specifications.
After installation, check the connectors for the headlight, ignition switch, reverse gear indicator light, neutral gear indicator light, etc., to prevent loosening or incorrect connection.

2.5.3 Removal and installation of left and right panels

Disassembly
Remove the Seat (→2.3)

Remove the left guard panel fixing bolt 1

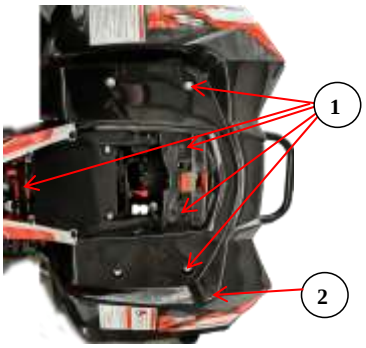
Remove the fixing bolts of the left guard panel 2



Push the left guard plate to release the plastic part on it.
Snap, remove the left guard plate 3
Install:
The disassembly of the right guard plate is the same as that of the left guard plate, and assembly is performed in the reverse order of disassembly.

2.5.4 Rear body assembly disassembly
Note:When disassembling the body of a vehicle, the side panels must be removed first.

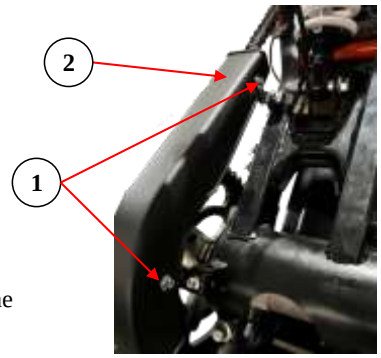
Disassembly
Remove the Seat (→2.3)
Remove the battery, OBD interface, EUC, relay, and taillight connectors
Remove the left and right covers (→2.5.3)
Remove the rear body mounting bolt 1
Rear body part 2 after disassembly



Install
The disassembly of the right guard plate is the same as that of the left guard plate, and assembly is performed in the reverse order of disassembly.

Caution
Turn off the ignition switch, first remove the positive terminal of the battery, and when installing, first connect the negative terminal of the battery.After installation, inspect the dismantled electrical appliances, cables, etc.

2.6 Chain guard disassembly

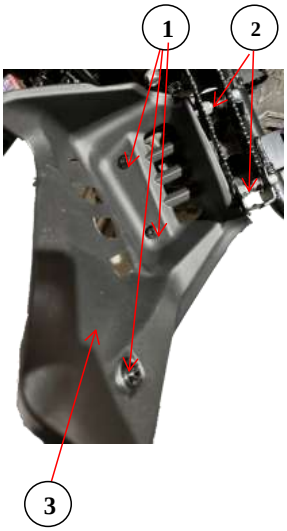


Disassembly

Remove bolt 1
Remove the chain guard 2

Install
The installation is carried out in the reverse order of disassembly.

2.7 Removal and installation of the left and right foot pedals



2.7.1 Removal and installation of the rear pedal

Disassembly

Remove bolt 1

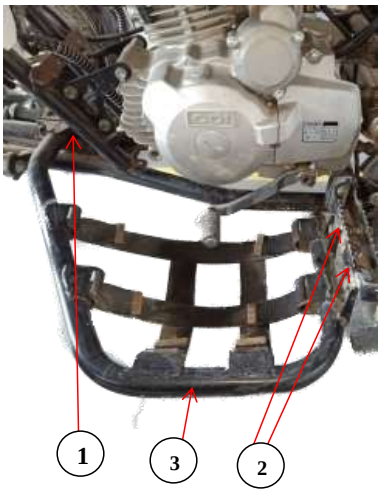
Remove two mounting bolts 2

Remove the left rear pedal 3

Install
The installation is carried out in the reverse order of disassembly.

Caution
The right pedal is removed in the same way as the left pedal, except for the direction.

2.7.2 Pedal guard bracket disassembly and assembly



Disassembly

Remove bolt 1

Remove two mounting bolts 2

Remove the left pedal guard bracket 3

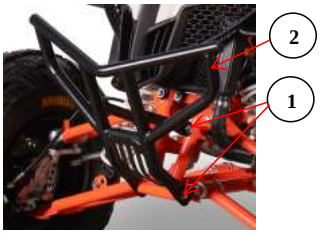
Install

The installation is carried out in the reverse order of disassembly.

Caution

The right pedal guard bracket removal is the same as the left pedal guard bracket, except for the direction.

2.8 Disassembly of front protection



Remove the front protective fixed bolt 1 (2 on each side)

Remove front guard 2

Install

The installation is carried out in the reverse order of disassembly.

3 Regular inspections and adjustments

Maintenance Information

Work precaution

Caution

- As the exhaust contains toxic components such as carbon monoxide (CO), please do not run the engine for an extended period in enclosed or poorly ventilated areas.
- When the engine has just stopped, the muffler and the engine are still very hot, and if they come into contact with the skin, they can cause burns.If it is necessary to carry out maintenance immediately after the engine has stopped, it is essential to wear long-sleeved work clothes and gloves for the task.
- Gasoline is highly flammable; smoking is strictly prohibited in the workplace.Not only should you pay attention to open flames, but also be particularly cautious of electrical sparks.Additionally, due to the explosive risk of evaporated gasoline, operations should be conducted in a well-ventilated area.

Caution

Do not let the drive system or rotating parts catch your hands and clothing.

Caution

The vehicle must be placed on a flat and stable surface.

3.1 Determination of Maintenance Cycles

Maintenance Schedule

Carefully following the regular maintenance schedule can help keep your ATV in a safe and reliable condition at all times.The table below provides a detailed introduction to the intervals for inspecting, adjusting, and lubricating important components.

The maintenance interval is applicable to ATVs operating under normal environmental conditions and at a normal speed (approximately 16 kilometers per hour).If operated under humid and dirty special conditions, the frequency of inspection and maintenance will increase.

If frequently driving in damp, dirty, and adverse conditions, please remove moisture and grime from greased areas and other parts.

Inspection, cleaning, lubrication, adjustment, and replacement of parts are all necessary.

Attention:Parts may need to be replaced after inspection. Please contact your dealer and use genuine parts.

Maintenance and adjustment have strict requirements. If you are not familiar with the maintenance and adjustment of ATV, please visit your dealer for service.

Maintenance period / Maintenance items	Odometer (km) Mileage											
	750	1000	2000	3000	4000	5000	6000	7000	8000	9000	10,000	Perform a daily check before each bike ride.
Engine oil	R			R			R			R		I
Spark plug				I			R			I		
Engine oil filter	C			C			C			C		
Fuel precision filter				R:Every 1800 miles (3000 kilometers) or annually								
cylinder bolt	I			I			I			I		
Air Filter				C			R			C		
Coolant	I			I			I			I		I
Valve clearance				I/A			I/A			I/A		
Oil pump					I				I			
Spark arrester		C:Every 620 miles (1000 kilometers)										
Front and rear disc brake pads			R:Every 2000 km									I
Brake fluid	R:Every 5000 km											
Upper and lower arm						R					R	I
Upper and lower arm ball joint						R					R	I
Front and rear shock absorbers												I
chain		L/R		R		R		R		R		I
Hydraulic braking						R/L					R/L	I
Wheel Rim/Tire				I			I			I	R	I
Flat叉 Bearing		L		L			R			L		I
Telescopic ball joint		L		L			R			L		I
Steering system				I			I			I		I
Battery						I / R					R	I

Steering system				I			I			I		I
Storage battery						I / R					R	I

To maintain its good performance, motorcycles should be inspected and maintained at regular intervals.The meanings of the uppercase letters in the table below are as follows:

I:Inspection, including overhaul, cleaning, lubrication, oiling, repair, or replacement as necessary for

A:Adjust C:Clean R:Replace L:Lubrication

Lubrication requirements

	Project	Lubricating oil types	method	Frequency
	1. Engine oil	SAE 15W-40 SG	Check if the liquid level is at the appropriate height through the visual hole.	Check the fluid level before each ride.
	2.Brake Fluid	DOT3	Maintain the liquid level at an appropriate position, refer to '7. Names and Functions of Each Part'	As needed every 5,000 km
●	3. Hydraulic braking	Grease	Fasten and lubricate	As needed every 5,000 km
●	4.Swingarm Bearing	Grease	Fasten and lubricate	After every 1000 km / inspect every 3000, 9000 km
●	5. Linkage Ball Joint	Grease	Fasten and lubricate	After every 1000 km / inspect every 3000, 9000 km
●	6. Chain	Grease	Lubrication	Check if the chain needs lubrication before each ride.

Lubrication requirements:

1. If frequently used in damp, dirty, and adverse conditions, the maintenance frequency

should be increased.

2. Lubrication:Light Lithium Soap-Based Grease.
3. Lubrication M:MoS_2 lubricant.

3.2 Inspection and Maintenance Methods

Inspection and maintenance projects			Maintenance period			Judging criteria
Inspection site		Inspection items	Daily Inspection	Half Annual Inspection	Annual Inspection	
Steering gear	steering wheel	Operational flexibility	○			
	Steering system	Injury	○			
		Steering system installation status	○			
		Ball pin sway	○			
Braking system	Brake lever	Handle travel	○	○		
		Braking effect	○	○		
	Connecting rods and oil pipes	Relaxation, loosening, and damage	○		○	
	Hydraulic brakes and Disc brakes	Front and rear brake fluid volume	○	○		The brake fluid should be at the minimum level. (LOWER) above
		Disc brake wear and damage	○	○		Current working thickness of the Disc brake When the thickness of the working disc of the rear Disc brake is less than 3.5mm, it should be replaced in a timely manner.
	Brake Pads	Brake pad wear and damage	○	○		Minimum brake pad

						(friction material) thickness ≥1mm; please replace if less than 1mm
Walking mechanism	wheel	Tire pressure	○	○		Front wheel:45 kPa (0.45 kgf/cm²) (6.5 PSI) Rear wheel:45 kPa (0.45 kgf/cm²) (6.5 PSI)
		Tire Cracking and Damage	○		○	
		Tire tread depth and abnormal wear	○		○	If there is no appearance on the tire surface Wear indicator: the remaining groove depth should not be less than 3mm.
		Wheel nuts and wheel shaft loosening	○	○		
		Front wheel bearing play	○		○	
		Rear wheel bearing play	○		○	
Buffering device	Suspension Arm	The sway of the connecting part and the damage to the rocker arm	○		○	
	Shock absorber	Oil leakage and damage	○		○	
		Function			○	
Transmission	Front axle	Transmission, lubrication	○		○	
	Rear axle	Transmission, lubrication	○		○	
	Transmission box	Oil leakage and oil volume	○		○	Loosen the fuel bolt outlet, oil quantity To the mouth of the Kong (Confucius)

Inspection and maintenance projects			Maintenance period			Judging criteria
Inspection site		Inspection items	Daily Inspection	Half Annual Inspection	Annual Inspection	
Transmission	Output shaft Drive shaft	Loosening of the connecting part	○	○		
		Flower key part vibration			○	
Electrical installation	ignition device	Spark plug condition		○		Spark plug gap:0.6mm to 0.7mm
		ignition period		○		
	Battery	Terminal connection status			○	
	Electrical circuit	Loosening and damage at the connection point			○	
Fuel assembly		Fuel leak		○		
		Throttle position			○	Throttle twist grip free play:2 to 6 mm
Lighting fixtures and turn signal indicators		Function	○	○		
Alarm and locking devices		Function			○	
Instrument panel		Function			○	
Exhaust pipe and muffler		Check for any looseness or damage in the installation.			○	
		Muffler function			○	
Chassis		Loosening and damage			○	
Other		Condition of lubricating oil on various parts of the chassis			○	
The part that can confirm anomalies while in operation		Confirm whether there are any abnormalities in the relevant parts	○			

Tighten all nuts, bolts, and washers.It is necessary to tighten all calibrated nuts, bolts, and locknuts to the specified torque.

3.3 Steering Stem, braking system

Place the car on a level surface, grip the steering wheel tightly, and exert force in the direction as shown to check for any looseness.

If you feel shaking, you should confirm whether it is the sway of the direction column or other types of shaking, and carry out the corresponding maintenance.

If there is sway in the steering column, increase the locking force of the steering column lock nut or disassemble the steering column for maintenance.

Free play of the front brake lever:

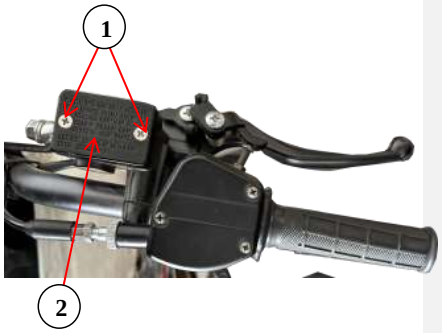
Place the car in a level position and gently turn the steering wheel left and right to confirm if it can rotate smoothly and flexibly.If there is any obstruction felt in certain areas, inspect the main cable assembly and cables for interference. If there is no interference, observe the position of the steering rod end to confirm if there is any interference and check if the steering bearing is damaged.

Attention::It is necessary to ensure that the steering is flexible, otherwise, an accident may occur due to the inability to control the direction when manipulating the steering wheel.

Clearance in the Front Brake Lever:
Operate the front brake lever to check the

braking effectiveness and the lever operation. Check the play at the front brake lever.

Front brake pump assembly
< Liquid Volume >
Check the brake fluid level
Check the brake fluid level through observation port 3. If the fluid level is less than 2/1, the vehicle cannot be used anymore. It is necessary to inspect for leaks in the brake pump, brake lines, and all connections. If the inspection is normal, then the wear of the Disc brakes and brake pads should be checked.If there is damage or wear beyond the limit of use, please replace it.
It is also necessary to check these items before each use of the vehicle.
Remove two exhaust bolts 1
Remove the oil cup cover 2
Add the brake fluid recommended by KAYO until it reaches the upper limit line.



Caution

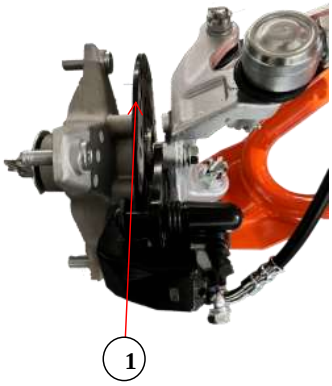
- Do not mix dust or water when adding brake fluid.
- To prevent chemical changes, please use the specified brand of brake fluid.

- Do not splash the brake fluid on plastic

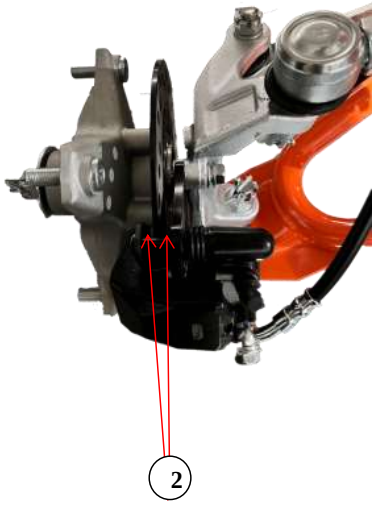
or rubber surfaces as it may damage them.

Turn the direction slightly to the left or right, and wait until the brake pump assembly is level before removing the oil cup cover.

Note:The method for checking the fluid volume of the rear brake pump assembly is the same as that of the front brake pump assembly.



Attention:Please check the brake fluid level regularly to keep it at a safe position, and inspect the oil lines.
Check for any damage to the connection points, and replace them if necessary. Inspect the main pump/caliper for any damage, and replace if needed.
Attention:Do not leave the brake fluid reservoir cap open for an extended period.



Front Disc brake,
Inspect the wear on the brake pads
If the wear has reached the wear limit, replace the brake pads.

Caution
The brake pads need to be replaced as a set.

Disc brake inspection and replacement
Inspect the sliding surface of Disc brake 1 for wear or damage. If the current Disc brake thickness is less than or equal to 3.5mm, replace the Disc brake.

Front Disc brake minimum usable thickness:3.5 mm

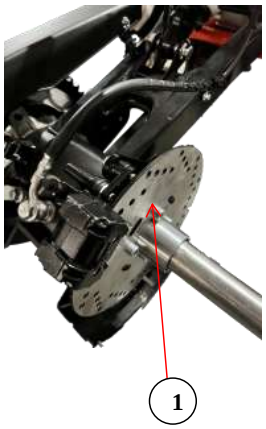
Check the minimum thickness of the brake friction material 2
Minimum friction plate thickness ≥ 1 mm
If less than the minimum friction material thickness, please replace with new brake friction linings.
Check the brake friction plates for damage or cracks; if any damage or cracks are found, replace them with new brake friction plates.

Rear Disc brake
Inspect the wear on the brake pads
If the wear has reached the wear limit, replace the brake pads.

Caution
The brake pads need to be replaced as a set.

Disc brake inspection and replacement
Inspect the sliding surface of Disc brake 1 for wear or damage. If the current Disc brake thickness is less than or equal to 3.5mm, replace the Disc brake.

Rear Disc brake minimum usable thickness:3.0 mm



Check for faults and wear on the brake friction material 2.
Minimum friction material thickness A ≥ 1 mm
If less than the minimum friction material thickness, please replace with new brake friction linings.
Check the brake friction plates for damage or cracks; if any damage or cracks are found, replace them with new brake friction plates.

Commented [A1]: Need to change

Commented [A2]: Need to change

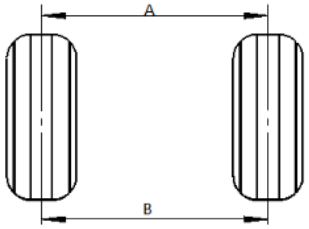
Change oil
Brake fluid should be changed once a year.

3.4 Wheel

Jack up the front wheel at the horizontal position using a tool, ensure that there is no force acting on the wheel from the body of the vehicle, rock the front wheel from side to side to check if the connections are secure and to see if there is any play.
If there is any vibration, check and tighten the arm, wheel spindle, rim bolts, and nuts.
If there is still shaking, check and replace:Bearing, rocker arm buffer sleeve, ball pin

Front Wheel Size

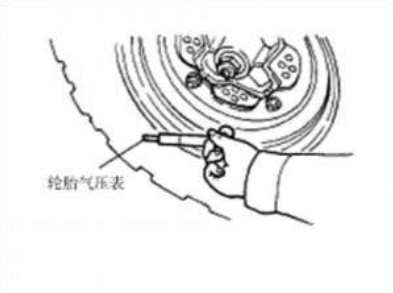
Place the body of the car in a horizontal position and measure the front wheel toe size; the front of the front wheel relative to the direction in which the vehicle travels forward is:A, the following is behind the wheel:B
Front track width:A-B=1.5 ~ 2.5 mm
F for forward direction



If not within this range, adjust the locking nut 2 of the steering lever 1.
Attention:After adjusting the front-end toe size, drive the vehicle slowly to ensure that the handlebar can correctly control the direction of the body.

Tire pressure
Use a barometer to check the tire pressure.

Caution
Tyre pressure should be checked when the tires are cool.Using the vehicle with inappropriate tire pressure will result in poor handling and ride comfort, and cause adverse effects such as uneven tire wear.



Designated air pressure/tires

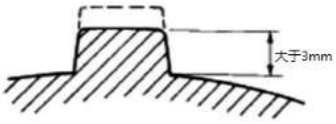
	front wheel	rear wheel
Atmospheric pressure	45 kPa (0.45 kgf/cm²)	45 kPa (0.45 kgf/cm²)
Tire Size	See Chapter One	See Chapter One

Tire tread pattern

Check the tire tread; once the tread depth is less than 3mm, replace with new tires.

Caution

The tire tread must be replaced immediately when it is less than 3mm.



Wheel nuts and wheel spindles

Inspect the front wheel spindle, the rear wheel spindle nut 1, and the pin for looseness.

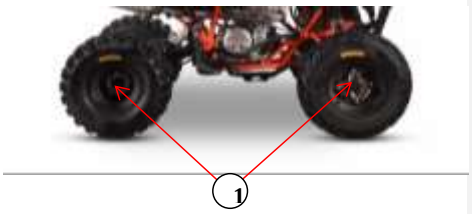
Tighten to the specified torque when there is a loose .

Torque:Front wheel axle nut:49N·mm to 59N·mm

(5.0 kgf·mm to 6.0 kgf·mm)

Rear wheel axle nut:55N·mm to 66N·mm

(5.5 kgf·mm to 6.6 kgf·mm)



The wobble of the wheel rim
Use a tool to jack up the front wheel, and when there is no force acting on the front wheel from the body of the vehicle, rock the wheel axially to check for any play.

Remove the front wheel when there is vibration and inspect the wheel hub.

3.5 Suspension System

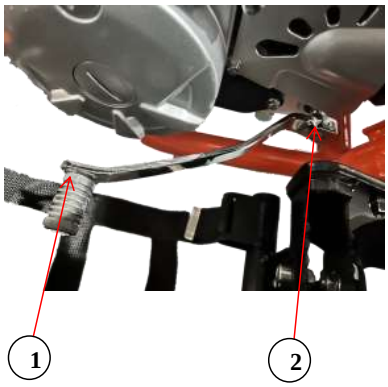
Place the body of the car in a horizontal position, compress the body up and down several times as shown in the diagram. If there is any sway or unusual noise, check for oil leaks in the shock absorbers, and inspect for any damage or looseness in the fastening parts.

Shock absorber adjustment

Adjust the shock absorber's adjustment point 1 with a special tool according to the load. Clockwise rotation is from top to bottom, counterclockwise rotation is from bottom to top, allowing for biHandlebar adjustment. It can be tailored according to the rider's comfort and the customer's requirements.

3.6 Shift Mechanism, Fuel System

Shift mechanism
Shift gears, check if the shift mechanism 1 is flexible and whether the gear is engaging properly. If the shifting is not smooth, adjust the tightness of the shift linkage bolt 2.



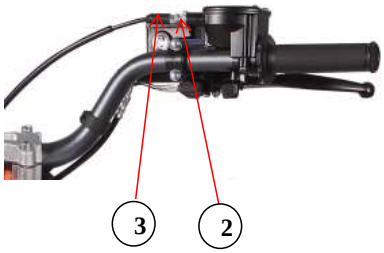
Fuel assembly
Fuel system status
Remove the Seat.
Check for aging or damage to the fuel line.
Check for any accumulation of impurities or damage to the gasoline fine filter and replace with a new one in a timely manner.
Replace with a new part when the fuel line shows signs of aging or damage.
Check the fuel tank vent pipe or the adsorption tube of the fuel evaporation system for cracks or bends, and replace with a new one if any damage is found

3.7 Throttle Check

Check the free travel of throttle button 1

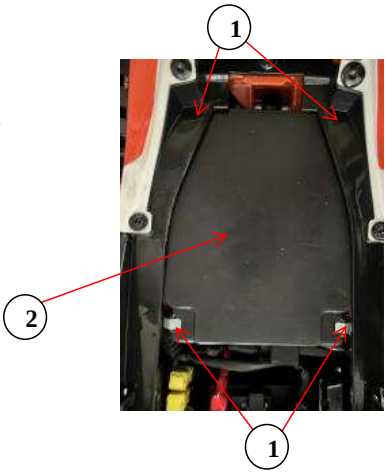
Break:2 to 6 mm

When the clearance is not within the specified range, adjust the clearance.
Remove the sheath 3
Loosen the throttle cable locking nut 2
Turn the regulator and adjust the free travel of the throttle button.
After adjustment, securely install the throttle cable sleeve 3 with nut 2.
If adjusting the regulator still fails to achieve the specified clearance or if the movement remains unsmooth, replace the new throttle cable.



3.8 Intake System Inspection

When the air filter element becomes dirty, it will affect the intake and cause a decrease in engine power. If the operating area has a lot of dust, maintenance should be performed more frequently than the maintenance schedule recommends.
Remove the Seat, front body assembly, and left and right side panels
Remove the air filter retainer clip 1
Remove the cover plate of the air filter 2
Clean or replace the filter

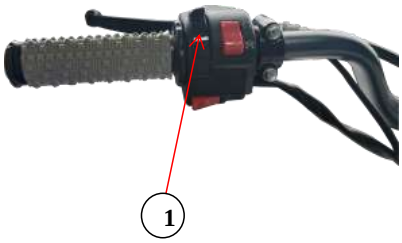


3.9 Lighting fixture

Attention:Before inspecting the lighting system, the entire vehicle system requires power-up.

Front Headlights Inspection

Push the headlight switch 1 forward to check if the vehicle's headlights turn on. If they do not light up, please check for any wiring mistakes. If the wiring is correct, replace the headlights promptly.



Taillight inspection

Grasp the brake lever with your hand, check the taillight. If the taillight does not illuminate, please check if the wiring is incorrect. If the wiring is correct, replace the taillight promptly.

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4. Engine Surrounding Area

Maintenance Information

Work precaution

- When performing maintenance, please ensure the vehicle is turned off and stationary for no less than 1 hour, and only proceed with the maintenance after confirming that the hot components have cooled down to prevent injury to the maintenance personnel.
- When working, be careful not to damage the frame, engine block, bolts, and cables.
- During the disassembly and assembly of the engine, the chassis should be wrapped and protected to prevent damage to it.
- When removing the engine, appropriate containers should be prepared to collect the coolant, engine oil, and fuel to protect the environment. During installation, the coolant and engine oil should be replenished as required.

Fastening torque

Engine Upper Mount Bolt, Tri-Valent Chromate M10×20×1.25, 25~30N·m
Engine Upper Mounting Ear Bolt, Tri-Valent Chromate M10×117×1.25 55~66N·m

4.1 Fuel System

Disassembly

Remove the saddle, fuel tank cap, handlebar assembly, and front body assembly (→ Chapter 2 Body Coverings)

Remove installation bolt 1

Remove the oil pipe connected to the Carbon Canister solenoid valve 2

Remove the oil pump connection pipe and its plug 3

Remove fuel tank 4

Caution

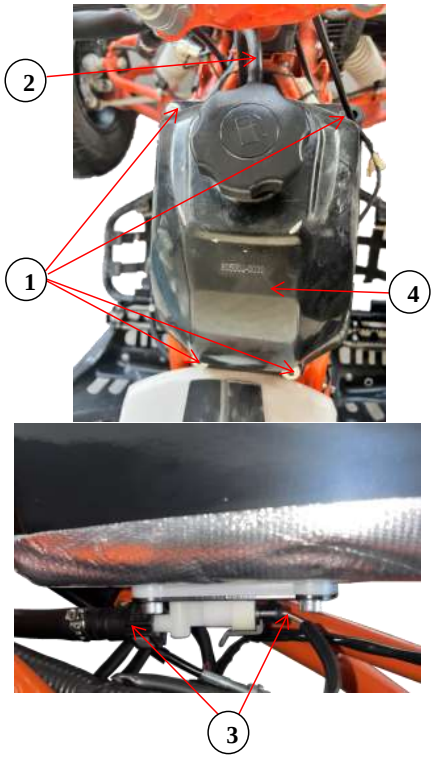
Gasoline is highly flammable, therefore smoking and open flames are strictly prohibited in the workplace.

Not only should open flames be taken seriously, but also great care should be taken with electrical sparks.

Additionally, due to the risk of explosion from gasoline evaporation (vaporization), operations should be conducted in a well-ventilated area.

When disassembling the fuel tank, if there is still fuel in the tank, the fuel line should be tightly tied in advance to prevent fuel leakage before removing the tank.

For a considerable period of time after the engine stops running, the fuel line maintains a relatively high fuel pressure.Therefore, do not dismantle the oil pipe easily during the maintenance process, and depressurize the fuel system before dismantling the oil pipe.Pressure release methods:1. The vehicle transmission is in 'neutral' gear; 2. Disconnect the oil pump assembly harness from the vehicle harness connector; 3. Start the engine until it automatically shuts off, then turn the ignition key on and off 2-3 times with an interval of 3 seconds between each, and then turn off the key switch. Only after completing the above operations can the oil line be dismantled. After the oil line

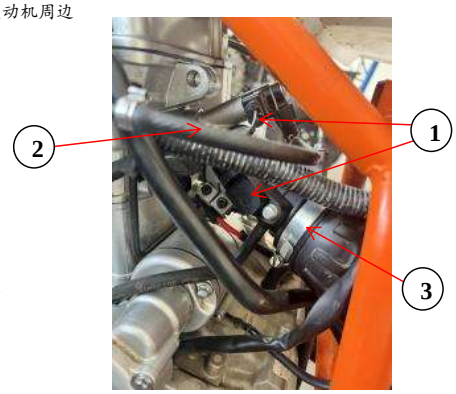


is reassembled, reconnect the oil pump assembly harness connector.

4.2 Intake System

Disassembly

Remove the seat Seat, front and rear body assemblies (→ Chapter 2 Body Coverings) fuel tank assembly



Throttle body
Unplug the plug 1
Remove the oil pipe connected to the Carbon Canister solenoid valve 2
Remove the air filter clamp 3
Remove the throttle cable 4
Remove the bolt 5 fastened to the engine.
Remove the intake valve body 6

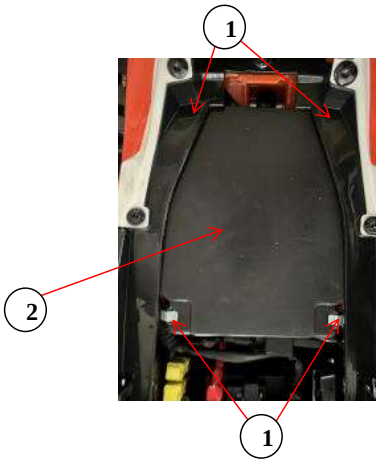
Air filter

Remove the air filter retaining clip 1

Remove the tracheal tube

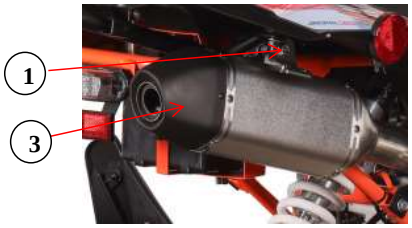
Loosen the clamp

Remove the cover plate of the air filter 2



Caution
Remove the clips, and the air filter cover can be taken off,
Replace and clean the filter element 3

Install
The installation is carried out in the reverse order of disassembly.



4.3 Exhaust System

Disassembly

Remove the seat Seat, steering wheel assembly, and front and rear wheels.
Body assembly (→ Chapter 2: Body panels)

Remove the muffler cylinder and muffler tube fixing bolt 1

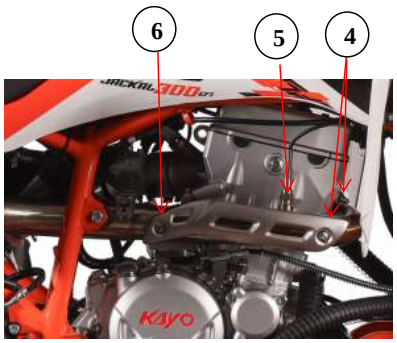
Release the muffler clamp 2

Remove the muffler's back end 3

Remove the muffler and disconnect the bolt connecting to the engine 4
(One on each side)

Remove oxygen sensor plug 5

Remove the front section of the muffler 6



Install

The installation is carried out in the reverse order of disassembly.

Spark arrester

Disassembly

Remove the bolt securing the fixed spark arrester 1

Remove spark plug 2

Cleanliness

Ensure the exhaust system is completely cool before cleaning.

Use a tool to remove the spark arrester.(See the figure on the right)

Carefully remove the spark plug dust cover from the muffler assembly.

Use soap and water to remove carbon deposits from the spark arrester screen,
Then carefully remove the stubborn parts with a brass wire brush.
Carbon, then rinse and dry the spark arrester.(See

The image is for illustrative purposes only and may not match your spark plug model. of its precise image).

Clean any carbon from the muffler flange and the muffler connector.
Residue.

Insert a clean and dry spark arrester into the muffler assembly.
In the middle, and replace the muffler component's end cap.Then, prison
Tighten the fixture screw securely.

If the spark arrester becomes damaged or exhibits excessive wear, replace the spark arrester by contacting the Pacific Rim Service Department to obtain a replacement.

Spark Arrester Maintenance Schedule

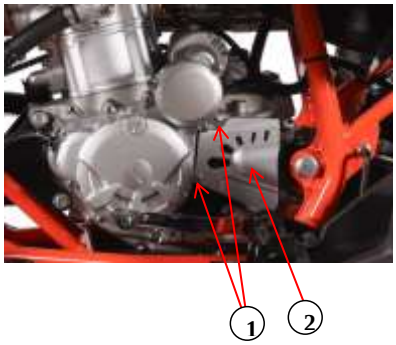
Spark arrester maintenance intervals (or whichever comes first):Clean the spark arrester every 100 hours or 6 months or 620 miles (1,000 kilometers).

Spark arrester Warranty

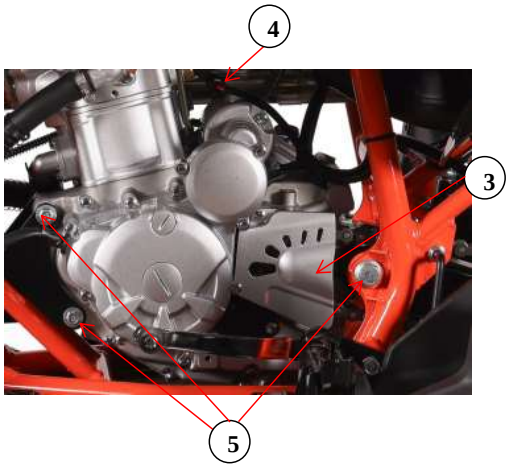
Pacific Rim International West Inc. warrants that the spark arrester meets the efficiency requirements of USFS standard 5100-1d for at least 100 hours of endurance under normal use and when maintained and installed as recommended.

4.4 Removal and installation of the engine

Remove the Seat, headrest, steering wheel assembly, and plastic parts.
Assembly, left and right pedals (→ Chapter 2 Body Covering
Cloak
Remove the intake and exhaust system
Disconnect the clutch cable
Remove engine side mounting bolt 1
Remove the engine side cover 2
Release the connectors for the stabilizer, gear display, and Magneto motor, etc.

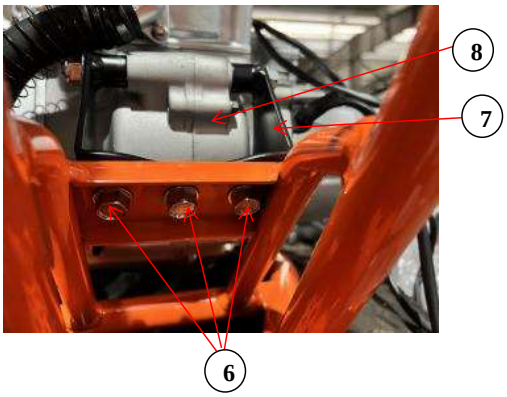


Remove the chain 3
Remove the spark plug cap 4
Remove engine mounting bolt 5



Remove the engine hoist box mounting bolt 6
Remove engine hoist box 7
Remove engine 8

Install
The installation is carried out in the reverse order of disassembly.



Engine 5

警告：发动机机油不得和其他品牌的发动机机油混用

5.1 Maintenance Information

Conversion table of units in this book

Project	Unit Conversion
Stress	1 kgf/cm² = 98.0665 kPa, 1 kPa = 1000 Pa 1 mmHg = 133.322 Pa = 0.133322 kPa
Torque	1kgf · m = 9.80665 N · m
Volume	1 mL = 1 cm³ = 1 cc 1L = 1000 cm³
Torque	1 kgf = 9.80665 N

Danger / Warning / Caution

Please carefully read the following explanations, which emphasize the specific meanings of the terms 'danger', 'warning', and 'caution', and particular attention should be paid to their highlighted meanings when conducting maintenance on the engine.

Danger: Indicates the need for alertness in the face of high danger.
Warning: Be vigilant about medium-level risks.
Attention: Indicates attention should be paid to minor dangers.

However, please note that the 'Danger' and 'Warning' notices contained in this repair manual may not cover all potential hazards in the use and maintenance of engines. Therefore, in addition to the provisions of 'Danger' and 'Warning', maintenance personnel must also possess basic knowledge of mechanical safety. If you are not confident in completing the entire repair process, please consult a more experienced senior technician.

General preventive measures

Warning:The correct maintenance process is crucial for the safety of maintenance personnel and the reliability and safety of the engine.

·When two or more people work together, they should pay attention to safety.

· When starting an engine indoors, it is necessary to ensure that exhaust gases are vented to the outside.

· When handling toxic or flammable substances at work, it is essential to strictly follow the manufacturer's instructions and ensure that the workplace is well-ventilated.

·Do not use gasoline as a cleaning fluid.

· To avoid burns, do not touch the engine oil or exhaust system components until they have cooled down.

· If the fuel, lubrication, and exhaust systems have been repaired, it is necessary to inspect their marking and leakage.

· To protect the natural environment, do not dispose of used engine oil and parts randomly.

Warning:

·During maintenance and repair, if replacement parts are needed, only genuine parts provided by KAYO Company or recommended products must be used.

·Parts that have been disassembled and need to be reused should be kept in order, so as not to cause confusion during reassembly.

·Ensure the use of special tools as required by the maintenance manual.

·Ensure that the parts used in assembly are clean, and lubrication is required where necessary.

·Use dedicated lubricants, adhesives, and sealants.

·When tightening bolts, screws, and nuts, first tighten those of the larger specifications, and proceed from the inside to the outside according to the specified torque.

· Tighten bolts with torque requirements using a torque wrench. If the threads are contaminated with grease and engine oil, they must be wiped clean.

·After disassembling the components, they should be inspected; before measuring, the components should be cleaned.

·After assembly, inspect the fastening and operation of the components.

·Do not use disassembled components such as oil seals, O-rings, gaskets, self-locking nuts, locking washers, split pins, and elastic retaining rings; new parts should be replaced during assembly.

5.2 Introduction to Fuel and Engine Oil

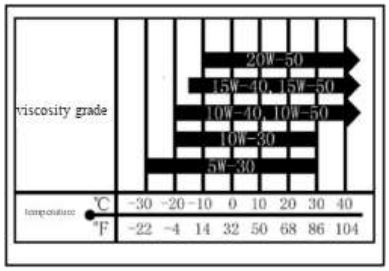
Warning: Engine oil must not be mixed with engine oil of other brands.

Fuel: Use unleaded gasoline with an octane rating of 93# or above.

Engine oil: Use SAE 15W-40 engine oil for 4-stroke motorcycles, quality grade.

According to the API classification of SG grade or above, if there is no SAE 15W-40 engine oil, based on the ambient temperature of the engine operation,

Select the appropriate engine oil as shown in the right diagram.



5.3 Engine Break-in

The engine has many parts that move relative to each other, such as pistons, piston rings, cylinder blocks, and interlocking transmission gears. Therefore, it is necessary to perform standardized break-in during the initial period of use. Break-in allows the moving parts to adapt to each other, correct working clearances, and form a smooth friction surface capable of withstanding heavy loads. Only a properly run-in engine will have excellent performance and reliability.

The recommended break-in period is 20 hours, with the following specifications:

0 to 10 hours

Avoid continuous operation at ≥50% throttle, constantly varying the vehicle speed, and not running at a fixed throttle position; after every hour of operation, cool the engine for 5 to 10 minutes; avoid sudden acceleration, and throttle changes should be gradual, without abrupt increases or decreases.

10 to 20 hours

Avoid operating the throttle at more than 3/4 for an extended period; you can use it freely but not at full throttle.

Engine coding area

Engine coding area

Engine cylinder head displacement marking

Engine Displacement Identification

Engine Maintenance for 5.4

Maintenance Details

Maintenance time	Odometer reading			
	1000 kilometers	4,000 kilometers	8000 kilometers	12,000 kilometers
Fuel system	Cleanse	Cleanse	Cleanse	Cleanse
Oil filter	Cleanse	Cleanse	Cleanse	Cleanse
Control Unit	Adjust	Adjust, clean and debug	Adjust clean and debug	Adjust, clean and
Carburetor	Cleanse	Cleanse	Cleanse	Cleanse
Air Filter	Cleanse	Cleanse	Cleanse	Cleanse
Spark plug gap	Adjust	Adjust, clean and debug	Adjust, clean and	Adjust, clean and
Valve clearance	Adjust	Adjust debugging	Adjust debugging	Adjust debugging
Engine lubrication	Replace	Replace once every 2000 km		
Filter medium	Cleanse	Cleanse	Cleanse	Cleanse
Timing chain	Check	Adjust debugging	Adjust debugging	Adjust debugging
Carburetor idle speed idle speed	Adjust	Adjust debugging	Adjust debugging	Adjust debugging
Drive chain	Adjust and lubricate every 5000 km.			
Battery	Charge	Charge (Recharge)	Charge (Recharge)	Charge (Recharge)
Disc brake	Check	Adjust debugging	Adjust debugging	Replace
Brake system	Adjust	Adjust debugging	Cleanse	Cleanse
Brake light switch	Adjust	Adjust debugging	Adjust debugging	Adjust debugging
Illuminating system	Check	Check	Adjust debugging	Adjust debugging
Clutch	Adjust	Adjust debugging	Adjust debugging	Adjust debugging
Shock Absorber	Adjust	Adjust debugging	Cleanse	Cleanse
Nuts/bolts	Tighten	Tighten	Tighten	Tighten
Front and rear wheels	Check	Check	Check	Replace
Turn handlebar bearing	Check	Adjust debugging	Adjust debugging	Replace

5.4 Maintenance of Engine Body

5.4.1 Engine Maintenance Precautions

1.Only parts, lubricants, or other auxiliary materials produced by KAYO and recommended for use should be utilized.If materials used do not conform to the 'KAYO' specifications or requirements, it may damage the motorcycle.

2.Whenever disassembly and reassembly occur, washers, seals, and split pins, etc., should be replaced.

3.When tightening bolts or nuts, they should be done in a crisscross sequence, gradually

tightened in 2 to 3 steps to achieve the specified torque.

4.When cleaning parts, a cleaning solvent that is non-flammable or has a high ignition point should be used.Before assembly, lubricating oil should be applied to the sliding surfaces of the parts.

5.After assembly, it is necessary to check whether all parts are installed correctly, and perform rotation, movement, and operational checks.

5.4.2 Engine Lubrication System

Lubricating oil inspection

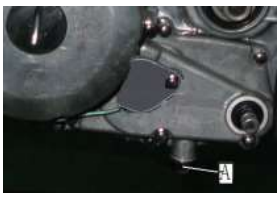
If the engine has just been started, wait for a few minutes.
Ensure the engine oil reaches the bottom of the crankcase.Position the engine vertically
On the ground, the oil level should be observed through the oil level sight glass 3.
Between the upper and lower scales of the observation window.
If the oil level is above the upper mark 1, excess oil should be removed.
If the oil level is below the lower mark 2, lubricating oil should be replenished.

Lubricating oil change

When changing the lubricating oil, it should be done when the engine is warm and not yet cold.Proceed cautiously, for this ensures swift and thorough elimination of the bend.
Lubricating oil in the axle box.Place an oil pan under the engine when changing it.
Below the machine, unscrew oil drain bolt A to release the lubricating oil.
Check if the nut washer is damaged, and if so, replace it with a new one.
Change.After completely draining the lubricating oil, install the oil drain bolt and washer.
Insert and tighten the screw.The tightening torque is:15N
Replenish new lubricating oil and check the engine oil level.

Engine oil filter replacement

Remove the fine filter cover and take out the oil filter.Replace
New oil filter, then install the filter cover.



Pressure relief valve replacement

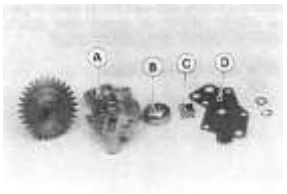
Remove the right crankcase cover of the engine and unscrew the relief valve A.
During installation, replace the pressure relief valve with a new one and tighten it.
The tightening torque is:15 Newton-meters

Oil pump disassembly

Remove the right crankcase cover of the engine,
Remove screw A and oil pump B.

Oil pump installation

Metal and debris on the clear oil filter A.
Apply lubricating oil to the oil pump that needs to be installed.
Inspect pin B and seal ring C and the oil filter screen
Has it been installed already.Finally, install the oil pump,
Tighten the screw.



Disassembly of oil pump components

Remove the elastic retaining ring B and washer C, and extract the oil pump shaft.
Remove screw E from the oil pump cover, then remove oil pump cover A.
Remove the inner rotor and outer rotor.

Oil pump inspection

After disassembling the oil pump, inspect the oil pump body A,

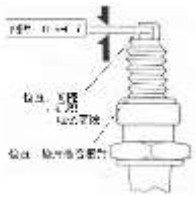
Outer rotor B, inner rotor C, oil pump cover D, any
A replacement is required for the corresponding parts or oil pump components in case of damage.

Engine oil filter cleaning

Remove the right crankcase cover and take out the oil filter screen to clean it.
Caution: Do not use gasoline for cleaning.and check for any damage,
If damaged, it needs to be replaced.
Install the filter screen back into the housing, then attach the right crankcase cover.

Spark plug

Remove the spark plug with a socket wrench and visually inspect the spark plug.
Is the insulator damaged?Whether the electrode has eroded, if so,
It should be replaced.



Check the electrode gap with a feeler gauge.Between the spark plug
The gap is 0.6 to 0.7 mm.

Adjust the clearance cautiously.Then, use a spark plug cleaner.
Or wire brushes to remove carbon deposits and debris.

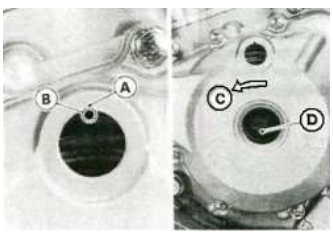
When installing spark plugs, they should first be hand-threaded into the socket.
Tighten it further with a socket wrench, then replace the spark plug cap.

Valve clearance

Attention:When adjusting the valve clearance, the engine should be in
In a cold machine state.

Remove the cylinder head cover, unscrew the inspection cover and decorative cover A.

Timing mark

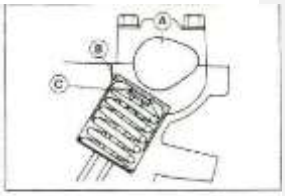


Rotate the crankshaft D counterclockwise and observe through the left front cover C.
Align point A on the left front cover with the timing mark on the magneto.
The timing mark B (T-notch) is aligned, and the piston is at this position at this time.
The compression stroke has reached its upper limit.

Camshaft timing line '—' and cylinder head
The mating surfaces are parallel.

Valve clearance check

Insert the feeler gauge A between the camshaft and the valve lifter,
Check the valve clearance.
Intake Valve Clearance:0.1 to 0.19
Exhaust Valve Clearance:0.15 to 0.24
If the gap is not correct, it needs to be adjusted.



Valve clearance adjustment

Remove the camshaft bracket and move away camshaft A.
Remove the valve stem and hold it steady B.
Remove the valve adjustment shim C.
Select a new adjusting shim according to the valve clearance requirements.

When installing the valve clearance shim, the shim has a mark.
One side faces towards the valve, standing firm.Then install the valve lifter,
Install the camshaft and ensure the timing position is correct.
Measure and adjust the valve clearance after modification.If a reconfiguration is needed,
Then adjust according to the above steps until it is correct.
Install the camshaft bracket, and then install the cylinder head cover.

Cylinder pressure test

Preheat the engine, then turn it off.

And remove the spark plug.Then install at the spark plug installation point.
Pressure tube B, then install pressure gauge A on the pressure tube, and
Fully open the choke and throttle knobs, and press down hard.
Pull the starter handle 4 to 6 times.

Attention:Check for air leaks at all connections of the pressure gauge.
Phenomenon.Performing repeated start-up operations on the engine, one
Until the pressure gauge stops rising.Maximum reading is usually
It can be achieved after 4 to 6 starts.

Cylinder compression force:≥1,200 kPa

5.4.3 Cooling System

If the engine's water-cooling system fails, it will cause the engine to overheat or overcool, thus affecting the normal operation of the engine. Therefore, regular maintenance of the engine's liquid-cooling system is necessary.Malfunctions should be addressed promptly.

The choice of coolant should vary according to the temperature and environmental conditions of different regions.The freezing point temperature of the coolant should be lower than the local ambient temperature.Do not use tap water or hard water as a substitute for coolant.Due to the coolant's functions of cooling, anti-scaling, rust prevention, and increasing the boiling point, whereas tap water only has the function of cooling, engines that use tap water or hard water for an extended period are highly prone to issues such as pump shaft corrosion and leakage, scaling in the water channels leading to poor heat dissipation, and resulting in engine overheating.

When the engine is cold, open the radiator cap to check the coolant level in the radiator. If it has decreased significantly, it indicates a leak, and further inspection is required to determine whether it is an internal or external leak.By observing the color of the engine oil, it is possible to determine if there is an internal leak in a water-cooled engine. If the coolant enters the engine oil, the oil will emulsify, degrade, and change color, appearing as a milky white liquid.At this point, the machine should be disassembled for a focused inspection of parts related to the water channels, such as the cylinder head, cylinder block, cylinder head gasket, and the right crankcase cover.

Determine if there is an external leak by observing whether there are traces of fluid at the

cooling pump cover, radiator, auxiliary water tank, water pipes, and their connections.

Cooling pump disassembly

Place the engine below before disassembling the cooling pump.
A box, unscrew the drain bolt of the engine to release water.
Coolant in the engine.
Tighten the water pump cover bolt.Remove the cooling pump cover.
Remove the cooling pump impeller locking nut.
Remove the cooling pump impeller and gasket.
Inspect the impeller for any damage, and check if the flat washer is intact.
If damaged, a replacement is required.

Inspect the cooling pump cover for any damage on the face.In case of damage
Needs to be replaced.

Cooling pump installation

Install the flat washer onto the cooling pump shaft.

Install the cooling pump impeller on a flat gasket.

Tighten the locking nut of the cooling pump impeller.
Nut tightening torque:8 N.m

Install the cooling pump cover.

5.4.4 Cylinder Head and Valves

Removal of cylinder head cover

Remove the cylinder head cover bolt A.
Remove the cylinder head cover.

Camshaft bracket removal

Remove the cylinder head cover
Remove the scaffold connection bolts
Remove the camshaft bracket

Camshaft removal

Remove the cylinder head cover
Remove the scaffold connection bolts
Remove the camshaft bracket
Disassemble the tensioner.
Remove the chain.
Remove the camshaft

Attention:The timing chain must not fall into the crankcase.

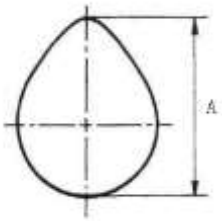
5 发动机

Camshaft inspection

Check the lift distance of each cam.
Measure the length A of the cam's protruding part with a micrometer,
Check for signs of wear.

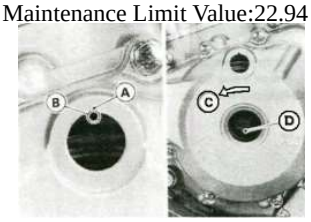
Test item Standard value Maintenance limit

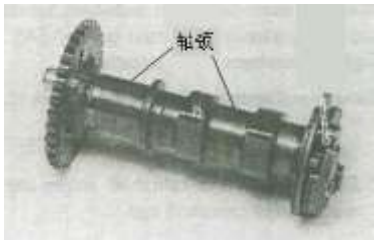
Intake Camshaft Height	36.20～36.30	36.10
Exhaust Camshaft Height	36.17 to 36.27	36.07



Inspect the journal diameter of each cam, and check for wear.

Intake and exhaust camshafts Standard value:22.967 to 22.980
Maintenance Limit Value:22.94





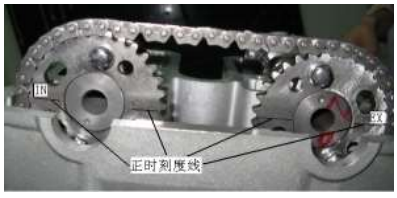
Camshaft installation

Timing mark

Rotate the crankshaft D counterclockwise and observe through the left front cover C.
Align point A on the left front cover with the timing mark on the magneto.
The timing mark B (T-notch) is aligned, and the piston is at this position at this time.
The compression stroke has reached its upper limit.

When installing the camshaft, the timing line of the camshaft is aligned correctly.
The "—" is parallel to the mating surface of the cylinder head.
Apply lubricating oil on the camshaft journals and cam lobes.

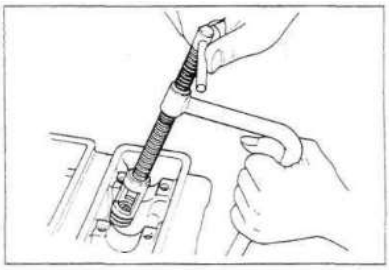
5-14



Cylinder head removal

Remove the intake manifold.
Disassemble the plumbing fitting
Remove the cylinder head cover
Remove the camshaft bracket.
Remove the camshaft.
Remove the cylinder block connecting bol
Finally, remove the cylinder head.

Cylinder head disassembly



Use a valve spring compressor to press down t
Remove the valve lock clip.Then relax the valve re
Remove the valve spring seat, valve spring, and inn
Seat rings and valves.

Attention:To prevent permanent deformation of the
Do not overly compress the valve spring, only enou
Lock the clips in place.

All disassembled parts should be marked to ensure that
Achieve the original assembly position during assembly.

Inspection of the valve and valve guide

Check if the valves are bent, burnt, or if there is damage to the valve stems.
Abnormal wear.
Inspect the movement of the valve in the valve guide and measure its outer diameter.

Standard Value Maintenance Limit Value
Intake valve:4.475 to 4.49, 4.460
Exhaust valve:4.455 to 4.470 4.440

Then insert each valve into the catheter and observe its movement.

Measure each with an inside micrometer or special measuring tool.
The inner diameter of the valve guide.Finally, calculate the valve stem and valve guide
The gap in between.

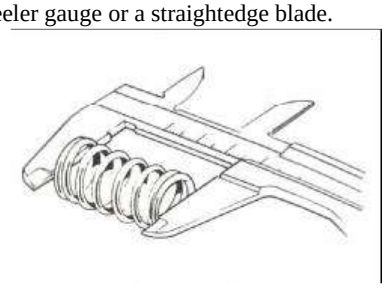
Standard Value Maintenance Limit Value
Intake manifold guide:4.510 to 4.522 4.59
Exhaust Valve Guide:4.510 to 4.522 4.59
Intake Valve to Guide Clearance:0.02 to 0.047 0.07
Intake Valve to Guide Clearance:0.04 to 0.067 0.08

Attention:Before measuring the internal diameter of the valve guide, the debris inside the guide should first be cleared.
Carbon deposits have been completely removed.
If the valve guide needs to be replaced, the valve seat should be reconditioned.
Conduct new surface grinding treatment.

Completely remove the carbon deposits in the combustion chamber.
Remove the residue from the cylinder head surface with a scraper. Combustion chamber
And it must not damage the surface of the cylinder head.

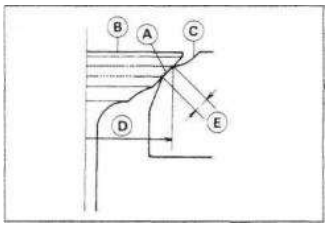
Cylinder head inspection

Check for cracks in the spark plug holes and valve seats.
Check if the cylinder head is deformed, and use a feeler gauge or a straightedge blade.
Check the flatness of the cylinder head.
Maintenance threshold 0.05



Valve spring inspection

Measure the free height of the intake and exhaust valve springs.
Maintenance Limit Value:(Intake and exhaust)

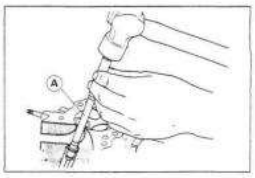


Standard Value Maintenance Limit Value
Valve spring:36.2 34.5
Valve spring:41.1 39.4

Valve guide replacement

Secure the cylinder head and use a valve guide removal tool.
Remove the valve guide from the valve port outward.

Attention:When removing the valve guide, do not damage the cylinder head.



On the cylinder head, install the new valve guide and O-ring. Assembled and pressed in place.Then, the newly installed valve guide is reamed.

Attention:When expanding the hole, cutting oil must be applied to cutter A.
When inserting or removing the drill bit, it should be rotated.

Finally, clean the cylinder head with a cleaner and use Compressed air is used to remove all metal shavings accumulated on the cylinder head.

Valve seat inspection

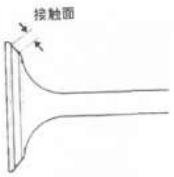
Measure the valve seat ring gate line diameter D and gate line width E.

The standard value for the gate diameter D is:Intake valve:28.3 to 28.5
Exhaust valve:24.2 to 24.4
The standard value for the gate line width E is:Intake valve, exhaust valve 1.0～1.2

If the valve seat ring's gate line diameter or gate line width does not meet the standards, The seat ring needs to be repaired.Bring it to the correct sealing degree.

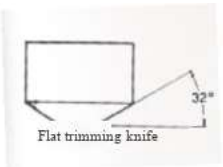
Valve inspection

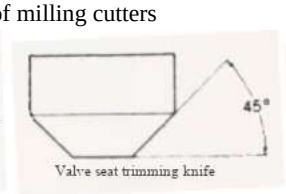
Remove the valve and inspect the valve contact surface.
If the valve contact surface is very rough, the wear is uneven or it is not aligned with If the valve seat does not make proper contact, the valve should be replaced.

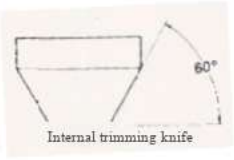


Valve seat repair

Valve seat milling cutter
Three different types of milling cutters

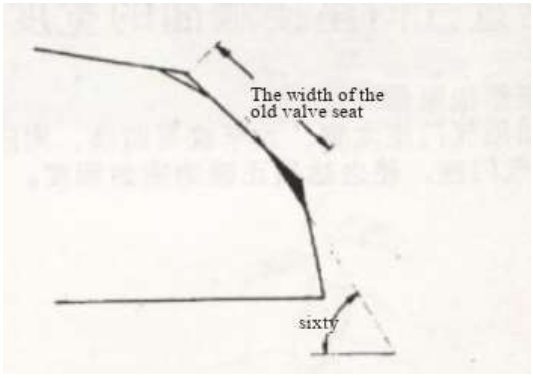




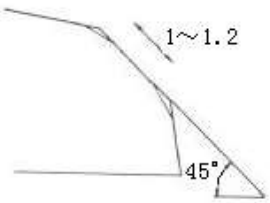


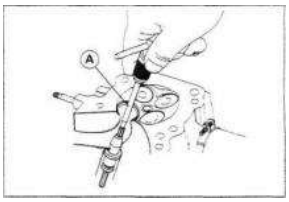
Use a 32-degree milling cutter to mill the upper annular band of the valve seat.

Use a 60-degree milling cutter to mill the annular groove at the bottom of the valve seat.



Use a milling cutter at a 45-degree angle for the precision machining of the valve seat working surface,
Adjust it to the correct width.
Standard value for working face width:1.0 to 1.2.

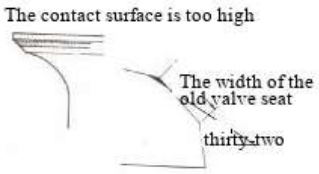




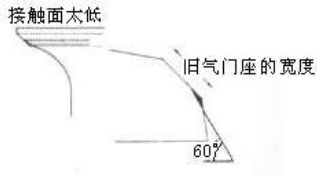
Apply ink to the valve seat and rotate the valve into place,

Then remove the valve and check if the contact surface is correct and in good condition.

Attention:The quality of the contact surface between the valve and valve seat is crucial to the engine.
The sealing of motivation will be a very important factor.

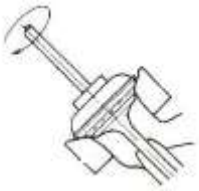


If the valve contact surface is too high, it can be milled with a 32-degree milling cutter. Reduce the contact surface by shaving.



If the valve contact surface is too low, use a 60-degree milling cutter to mill it.
Shave, raise the contact surface.
Finally, use a 45-degree milling cutter for the machining process to mill the surface.
The valve seat contact surface is machined to the specified width.

After the valve seat has been machined, a coating should be applied to the valve seat.
A layer of abrasive.Then, insert the valve and use a rubber stopper.
Grind the suction valve by drawing air into it.Grinding completed, clean
All residue remaining in the cylinder head, valve seats, and valve guides
Abrasive on the pipe.



Cylinder head assembly

Before assembling the intake valve, the oil baffle should be installed in the valve guide first.
Manage it.

Then, after applying lubricating oil to the intake and exhaust valve stems, install them into the valves.
Inside the catheter.Install the valve spring and valve spring seat properly.

Attention:When installing the valve spring, the spring should have a closer pitch. One end, facing towards the cylinder head.

Then press down the valve spring with a valve spring compressor, and then...
The valve lock is assembled into the valve spring seat.

Attention:To prevent permanent deformation of the valve spring, it must not be excessively stressed.
Compress the spring slightly so that it can fit into the valve lock clip.

Then gently tap the end of the valve stem with a plastic hammer to secure the locking clip.
Firmly lodged in the annular groove.

Cylinder head installation

After removing the cylinder head gasket, clean the cylinder surface thoroughly.
Then, install a new seal ring and positioning pins.

Attention:Do not allow dust and impurities to enter the cylinder.

1. Install the locating pin and the new cylinder head gasket.
2. Install the cylinder head, A and B bolts, and washers.
3. Install the cylinder block connecting bolts.
4. Install the valve adjusting shim and valve stem.
5. Install the camshaft.
6. Install the positioning pin and cam bracket.
7. Install a tensioner.

Attention:First, tighten bolts A and B, then proceed with the cylinder block.
Fastening the connecting bolt.
On the valve stem and the cam and journal of the camshaft.
Apply clean engine oil.

When installing the camshaft, align the timing marks correctly.

Install the new cylinder head gasket into the cylinder head cover. in the groove of it.

Then, install the cylinder head cover on the engine.
Tighten the cylinder head cover bolts.
The torque for tightening the bolt is:10 Newton-meters (Nm).

Cylinder block and piston

Cylinder block removal

Remove the cylinder head (refer to Section 6)
Remove the sealing pad, positioning pin.
Remove the cylinder block.

Attention:When disassembling the cylinder head, the timing chain must not fall into the crankcase.

Scrape off the paper gasket residue from the cylinder surface with a scraper.

Attention:If the paper pad is soaked in gasoline, it can be easily disassembled. Avoid damaging the contact surface of the cylinder while performing this task.

Cylinder inspection

Inspect the cylinder for wear or damage.
Measure the internal diameter of the cylinder at three positions, i.e., the piston
Points A at the top, B in the middle, and C at the bottom of the route, and they should be perpendicular to each other.
of the two directions.
A equals 10, B equals 60, C equals 100.

The standard value for cylinder bore is:78.00 to 78.01

Maintenance Limit Value:78.1

Piston disassembly

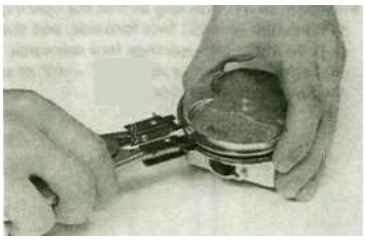
Remove the piston pin retainer with pliers.

Attention:Do not let the retaining ring fall into the crankcase.

Remove the piston pin from the piston, and then take out the piston.

Piston/Piston ring inspection

Measure the clearance between the piston ring and the piston ring groove with a thickness gauge A.



Measurement standard value:
First stage:0.02 to 0.06
Second ring:0.02 to 0.06

Maintenance Limit Value:
First Ring Road, Second Ring Road:0.16

Remove the piston ring.

Attention:Do not damage the piston rings during disassembly.

Insert each piston ring into the cylinder, then measure the clearance.

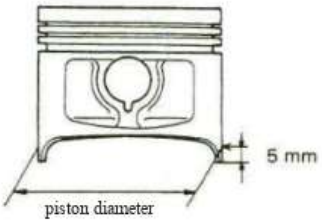
Standard value:
First stage:0.15 to 0.3
Second ring:0.20 to 0.35

Maintenance Limit:
First stage:0.65
Second ring:0.7

Check for wear or cracks in the piston, and indentation in the piston ring.
Is there any wear on the slot.

Measurement is located 5mm above the bottom of the piston skirt.
outer diameter.

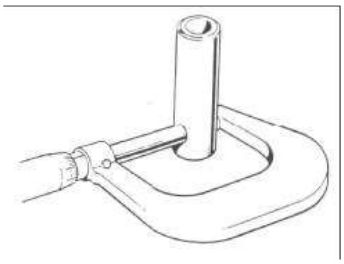
Standard value is:77.950 to 77.97
Maintenance Limit Value:77.805



Calculate the clearance between the cylinder and the piston.
Maintenance Limit Value:0.12

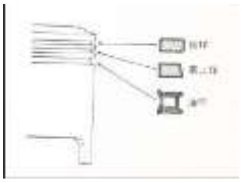
Measure the diameter of the piston pin hole:

Standard value is:17.002 to 17.008
Maintenance Limit Value:17.04



Measure the outer diameter of the piston pin:

Standard value is:16.9940 to 17.000
Maintenance Limit Value:16.96



Piston ring installation

Thoroughly clean the piston ring groove.
Install the piston ring.

Attention:During installation, care should be taken to prevent damage to the piston and piston rings. Damaged. When installing the piston ring, the side with the marking should face upwards. After assembly, the piston ring should be able to rotate freely. Do not reverse the installation positions of the top ring and the second ring.

Separate the piston ring gap by 120 degrees, do not align the gaps of each one.

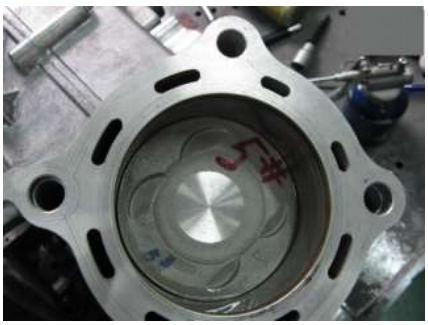
The openings of the oil rings are aligned with each other.

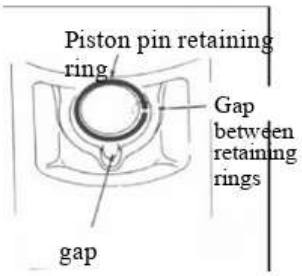
An oil ring composed of three circles, between each of the rings
The clearance should be matched with that of the spacer.
When installing the oil ring, the spacer should be installed first,
followed by the installation of the oil ring.

Piston installation

Install the piston, piston pin, and New Piston Circlip properly.

Attention:The side with the '▲' mark when installing the piston
Adjust the exhaust valve.
The end clearance of the piston pin retainer should be misaligned with the cut section of the piston.In the process of decomposition
When reassembling, be sure to use a new piston pin retainer.
The piston pin retainer must not fall into the crankcase.





Cylinder installation

Install the new paper pad and positioning pins.

Apply a layer of engine oil to the cylinder and piston rings.
Install the cylinder.

Attention:During installation, care should be taken to avoid damaging the piston.
The timing chain must not fall into the crankcase.

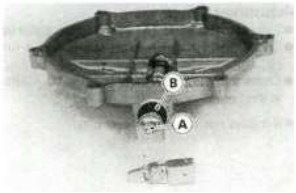
Install the cylinder head gasket and positioning pins
Install cylinder head

5.4.5 Clutch Components

Clutch cover removal

Remove the clutch cable
Loosen the clutch fastening bolt
Remove the clutch cover

Attention:Do not move out when removing the clutch.
Clutch lever A, to avoid damaging oil seal B
If moved out, a new oil seal needs to be replaced.



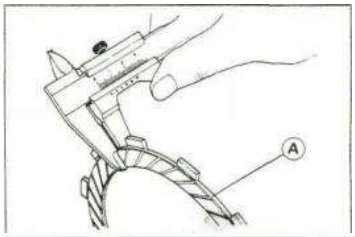
Clutch cover installation

Install clutch cover locating pin
Move the clutch lever downward
Replace the new clutch cover gasket
Install the clutch cover
Fastening installation screw
Fastening torque:9.8 N·m

Removal of the right crankcase cover

Drain the engine oil.
Release the coolant
Disassemble the plumbing
Remove the clutch cover
Remove the water pump cover
Remove the water pump impeller
Loosen the right crankcase cover connecting bolt B
Remove the right crankcase cover

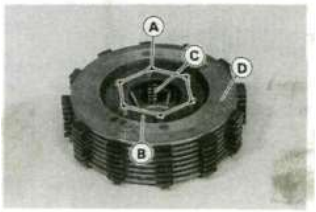
Removal of the clutch and driving gear



Remove clutch push rod A and flat washer B
Remove the clutch release disk C

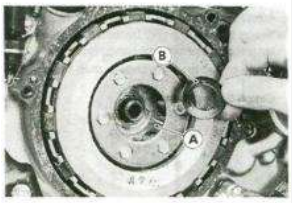
Loosen the clutch locking nut A
Loosen the primary active gear locking nut B

Remove the clutch assembly
Remove the clutch bushing and flat washer
Remove the primary drive gear
Remove the drive gear and install a semi-circular key



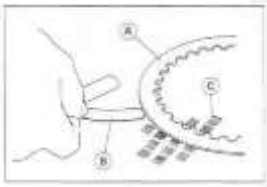
Clutch disassembly

Loosen clutch spring bolt A
Remove the clutch lifting plate B, spring C, and center sleeve D
Remove the clutch driven friction disc (rubber disc),
Driven friction plate (steel plate friction plate)

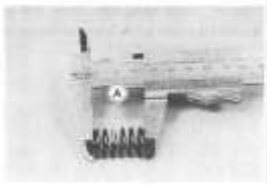


Clutch inspection

Cursor caliper checks the thickness of the active friction plate:
Standard value:2.92 to 3.08
Maintenance Limit Value:2.7



Thickness gauge inspection of the driven friction plate flatness
Standard value:<=0.1
Maintenance Limit Value:0.2



Cursor caliper checks the free height of the clutch spring

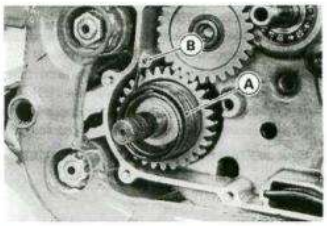
Standard value:35.5
Maintenance Limit Value:34

Installation of the clutch and the driving gear

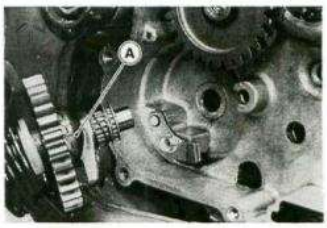
Install the semi-circular key for the drive gear
Install the drive gear
Install the clutch flat washer and sleeve

Install the clutch cover
Install a gasket under the center sleeve

Installation Center Set A
Install clutch locknut washer B
Install the clutch lock nut
Installation torque is:78N·m



Install clutch release bearing
Install the push rod and washer
Install the locking nut washer for the active gear
Install the locking nut for the active gear
Installation torque is:98N·m



Attention:When installing the locknut washer for the clutch

The concave side of the gasket should face the clutch and the driving gear.

Installation of the right crankcase cover

Install the Locating Pin should be transliterated as it is a named entity, possibly a part number or technical term) and new sealing gasket.

Install the right crankcase cover
Install the fastening screw
Installation torque is:10 Newton-meters

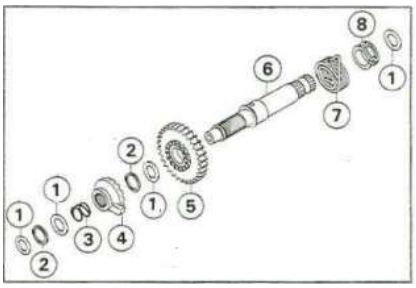
Install the clutch cover
Install the fine filter and fine filter cover
Install the pump impeller
Install the pump cover

5.4.6 Foot starter mechanism, shift mechanism

Removal of the starting shaft

Remove the right crankcase cover
Remove the clutch
Remove the start reset spring from hole B of the box body.

Remove the starting shaft component A



Disassembly of the starting shaft

The starting shaft assembly is disassembled into the following parts
1: Flat washer 2: Elastic stop ring
3: Spring 4: Start Ratchet
5: Starting gear 6: Starting shaft
7: Reset spring 8: Spring bushing

Start-up shaft inspection

Inspect each part of the starting shaft assembly for damage,
If damaged, replace with new parts.

Installation of the starting shaft

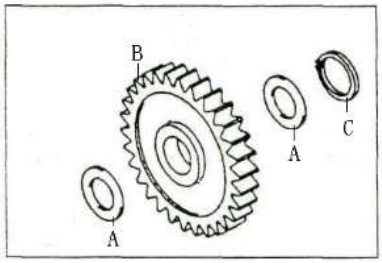
The installation and removal of the starting shaft are reverse processes.
Insert the starting shaft into the starting shaft hole.
Hang the reset spring into the corresponding hole of the box body.

Removal of the Idler gear assembly

Remove the right crankcase cover
Remove the clutch assembly
Remove the Idler Gear Circlip
Remove the Idler gear

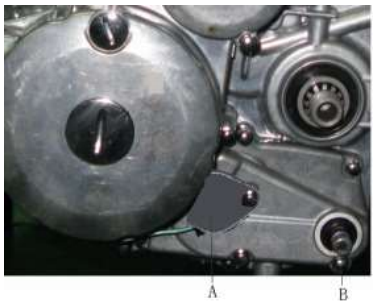
Installation of the Idler gear starting mechanism

Install the shim A below the Idler gear
Install an Idler gear
Install pad A above the Idler tooth
Install elastic retaining ring C
Install the clutch
Install the right crankcase cover



Removal of the transmission cover

Remove component A of the dashboard display.
Remove the transmission cover bolt B
Remove the transmission cover

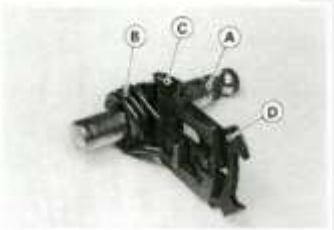


Removal of the shift shaft

Remove the shift plate mounting screw
Remove the gear shift plate D
Remove shift lever component E
Loosen the Stopper Platemounting screw
Remove the Stopper Plateassembly C
Remove the five-star shift plate

Remove the shift arm positioning bolt F

Gear shift shaft inspection



Check if the shift shaft A is bent or damaged, if bent
It needs to be corrected, and if damaged, it needs to be replaced.

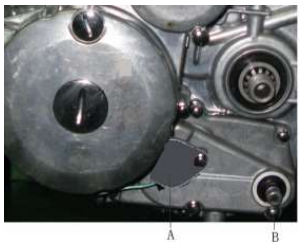
Check if reset spring B is deformed or damaged,
If so, it needs to be replaced.

Inspect the shift arm C for damage, and replace it if it is damaged.

Check if the shift paddle D is damaged, and if so, it needs to be replaced.

Stopper Plate installation

Install five-star slider positioning pin
Install five-star toggle switch
Installation Gear Position Sensor
Install the gear position sensor screw
Screw Tightening Torque:15 Newton-meters (N·m).



Install the Stopper Plate assembly
Install the Stopper Plate bolt
Stopper Plate bolt installation torque:10 Newton-meters (Nm).

Gear shift lever installation

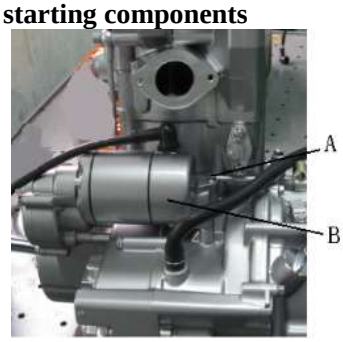
Install the shift arm positioning bolt F
Installation torque for the shift arm positioning bolt:37 Newton-meters.

Gearbox cover installation

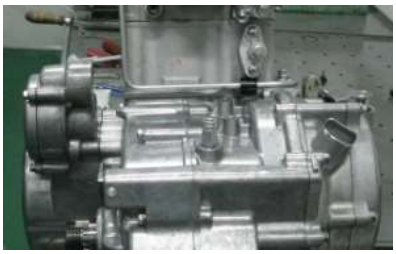
Install the transmission cover locating pin
Install a new sealing gasket
Install the transmission cover
Install the display component

5.4.7 Magneto motor and electric starting components

Removal of the starter motor



Remove motor installation bolt A
Remove the starter motor B

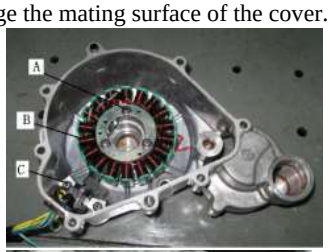


Removal of the left front cover

Release the engine oil

Remove the left front cover bolt
Remove the left front cover.

Caution: When removing the left front cover, do not damage the mating surface of the cover.



Demolition of the electroMagneto motor

Remove the Spindle and install bolt A
Remove the Spindle pin pressure plate installation screw C
Remove the Magneto motor spindle B

Remove the rotor installation bolt and washer
Remove the Magneto motor rotor component

Removal of the electric start gear

Remove disc gear A and the bushing below the disc gear
Remove the small double-sprocket B and flat washer

Remove the bolt for installing the gear chamber cover on the left front cover
Remove the gear chamber cover
Remove the large double-sprocket and flat washer

Inspect both large and small double-sprocket gears and disc gears
Check for wear and damage, and replace if present.

Electric start gear installation

Install disc-shaped gear sleeve A
Install a spur gear
Install the double-pinion gear and flat washer

Installation of the Magneto motor

Install the Magneto motor rotor component
Install rotor retaining bolts
The bolt tightening torque is:120 N·m

Install Magneto motor spindle component B
Install spindle locking bolt A
Tightening torque is:5 Newton-meters
Install the Spindle holder pressure plate
Terminal block bolt
Tightening torque is:10 Newton-meters

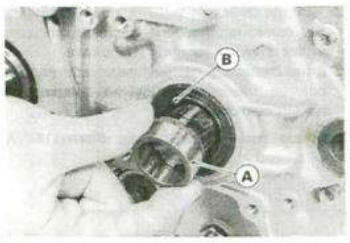
Left front cover installation

Install the left front cover positioning pin
Install a new sealing gasket
Install the left front cover
Tighten the left front cover installation bolt
Tightening torque is:10 Newton-meters

Starting motor installation

Install the starting motor inside the left cover
Tighten the motor mounting bolts
Tightening torque is:10 Newton-meters

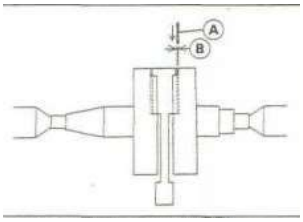
Install a large double-gear and a flat washer, one each on the top and bottom.
Inside the gear case cover on the left front hood,
Install a new gear chamber cover gasket
Install the gear chamber cover
Tighten the gear chamber cover bolt
Tightening torque is:10 Newton-meters



5.4.8 Crankshaft and Transmission Mechanism

Work before the separation of the crankcase
Remove the engine and place it on a clean workbench to drain the lubricating oil, remove the right crankcase cover, remove the clutch assembly, remove the oil pump assembly, remove the starting shaft assembly, remove the left front cover, remove the magneto assembly, remove the electric start gear and starter motor, remove the transmission cover, remove the shift arm assembly, remove the Stopper Plate assembly and five-star shift plate, remove the cylinder

head assembly, remove the cylinder block assembly, remove the piston assembly, remove the chain, chain adjustment plate, chain tensioning plate, and disassemble the crankcase.



Remove the Counter shaft Bushing A and O-ring B.

Loosen the crankcase connection bolt.

Remove the right crankcase

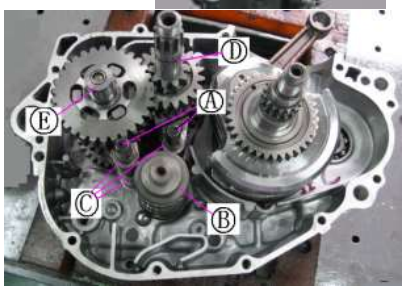
Remove the locating pin of the box body

Remove the sealant from the end face without damaging the box end face.

Attention:By tapping on the left and right crankcase with a soft hammer respectively Separate the crankcase; do not use a screwdriver to pry it apart.

Removal of the transmission mechanism

Remove fork shaft A
Remove the fork C
Remove speed drum B
Remove main shaft D and auxiliary shaft E



Removal of the crankshaft

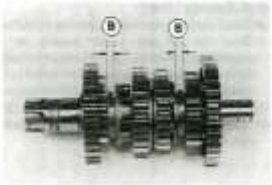
Remove the balance shaft driven gear A

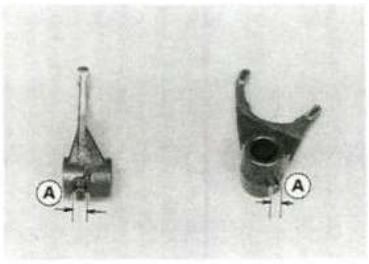
Remove the balance shaft

Remove the crankshaft

Crankshaft inspection

Measure the end face of the crankshaft connecting rod with thickness gauge A and Total clearance at the crank end face B.
Standard value is:0.2 to 0.4

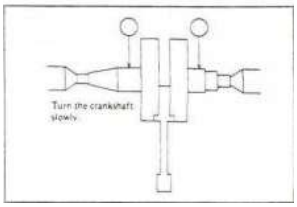




Maintenance limit value is:0.6

Turn the crankshaft by hand and check its radial runout with a dial indicator.
Pulsating, standard value is:<= 0.03
Maintenance limit value is:0.05

Inspect the crankshaft bearing for wear or damage,
If necessary, replace it.

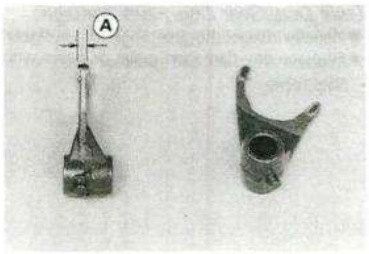


Transmission mechanism inspection

Check if the gears on the main and auxiliary shafts in each gear shift are operating smoothly and if there is flexible axial movement.

Inspect the main and auxiliary shaft gears for wear or damage at each gear position.

Check the width of the fork slot B:
Standard value is:5.0 to 5.18
Maintenance limit value is:5.33



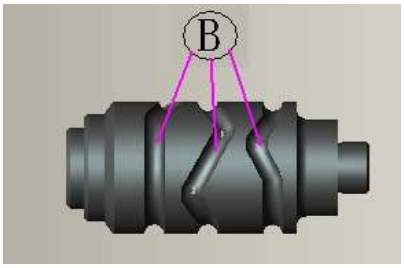
Inspect the fork and toggle plate thickness A

Standard value is:4.93 to 5.0
Maintenance limit value is:4.83

Check the diameter of the fork pin A

Standard value is:5.9 to 5.95
Maintenance limit value is:5.8

Check the width of the shift drum fork slot B



Standard value is:6.05-6.15
Maintenance limit value is:6.2

Crankshaft installation

Place the right crankcase flat and lay the crankshaft flat.
Gently press into the crankcase.

Turn the crank to see if it rotates smoothly.

Installation of the transmission mechanism

Combine the main and auxiliary shafts and assemble them simultaneously into the

crankcase.

Assembled speed drum

Assemble the fork, insert the fork plate into the main and auxiliary shafts,
The fork pin is inserted into the spline slot of the shift drum.
Please ensure the marks on the fork are not installed incorrectly.

Align the fork shaft hole of the shift fork, and insert the shift fork shaft.

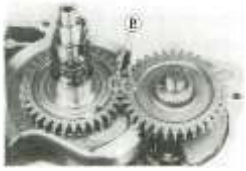
Turn the main and auxiliary shafts to see if they rotate smoothly,
If not, the transmission mechanism needs to be reassembled.
Various components, follow the steps mentioned above.

Assembly balance shaft

When assembling the balance shaft, mark A should be placed on the spline of the balance shaft.

Align the marked point on the driven gear with the balance shaft.
At the same time, the balance shaft mark B on the driven gear must be aligned with
The marks on the balance shaft drive gear are aligned.

Apply lubricating oil to each gear and moving part.

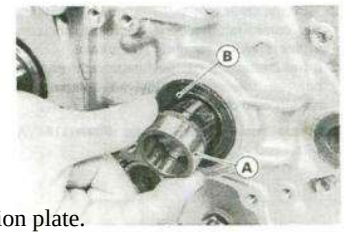


Apply sealant to the end face of the box.

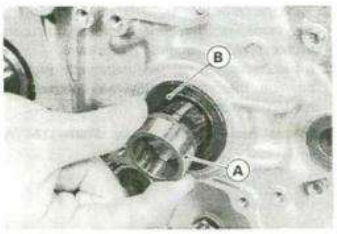
Join the left crankcase with the right crankcase.

Tighten the crankcase mounting bolts
The bolt torque is 10~15 N.m.

Install O-ring B on the sub-axis and sub-axis sleeve A.



Install the chain, chain adjustment plate, and chain tension plate.
Install the piston component
Install the cylinder block assembly
Install the cylinder head component
Install the Stopper Plate assembly and Star Selector Plate
Install the shift arm component
Install the transmission cover
Install the electric start gear and starting motor
Install the Magneto motor components
Install the left front cover
Install the starting shaft component
Install the oil pump component
Install the clutch assembly
Install the right crankcase cover
Lubricate



5.5 Fault Diagnosis

The engine fails to start or is difficult to start / and performs poorly at high speeds.

The engine is lacking power / The engine is making unusual noises

Poor performance at low engine speed or idling.

The engine fails to start or is difficult to start.

Check direction	Possible reasons
1. Check if fuel has reached the carburetor → If it has not entered the carburetor →	1. There is no fuel in the fuel tank. 2, oil switch is clogged. 3. Oil pipeline blockage. 4. The carburetor float needle is stuck.
If the carburetor has entered;	
2. Remove the spark plug to check the spark → If the spark is weak or there is no spark at all →	1. The spark plug is damaged or not clean. 2. Magneto failure. 3. Ignition switch malfunction. 4. Sensor failure. 5. Ignition failure. 6. Ignition coil failure. 7. High-voltage cable failure. 8. There is a short circuit or open circuit in the power supply loop.
Spark normal,	
3. Check cylinder pressure → Pressure too low →	1. The starting mechanism is slipping and cannot rotate. 2. The valve clearance is too small or non-existent. 3. The valve guide is bent. 4. The cylinder seat does not fit well with the valve. 5. Cylinder and piston ring wear. 6. The cylinder head gasket is not sealing properly. 7. The assembly is not in place. 8. The valve timing is not correct.
Pressure normal, start the engine.	

4. Attempt to restart the engine → The engine can ignite but still cannot start → 1. The throttle opening is too large.
Engine fails to ignite, 2, intake manifold is leaking air
3. Incorrect ignition timing

5. Remove the spark plug → the spark plug is moist → 1. The carburetor is rich in fuel.
Spark plug dry, 2. Throttle opened too wide

6. Close the choke and restart the engine.

The engine power is insufficient.

Check direction Possible reasons

1. Rapid acceleration from idle to high speed → No change in vehicle speed → 1. Clutch slipping

The vehicle speed is normal. 2. Clutch wear

2. Gradually increase the engine speed → No change in engine speed → 1. The fuel system is not supplying fuel smoothly.
Engine speed increasing normally, 2. Air filter is clogged.
3. The air hole in the carburetor cover is blocked.
4. Muffler blockage.

3. Check the ignition timing → Incorrect ignition switch → 1. CDI igniter is damaged.
Ignition timing is correct 2, magneto has a fault.
3. Pulse generator failure.

4. Check the valve clearance → Incorrect valve clearance → 1. Improper valve clearance adjustment

Valve clearance is correct 2, valve seat wear

5. Check cylinder pressure → Cylinder pressure is too low → 1. Valve clearance is too small.
Cylinder pressure is normal. 2. The valve is bent or seized.

3. Valve seat wear.
4. Cylinder and piston ring wear.
5. Cylinder gasket is damaged.
6. The valve timing is not correct.
7. The spark plug has not been assembled properly.

6. Check the carburetor → Carburetor blockage → 1. Fuel is not clean
The carburetor is not clogged; 2, failure to clean the carburetor regularly.

7. Check the spark plugs → Excessive carbon buildup on the spark plugs or incorrect color →1. No regular maintenance work has been performed.

Spark plug normal. 2. Spark plug heat value is incorrect.

3. The spark plug electrode gap is too small.

8. Observe the oil level window to check the engine oil level → Incorrect oil level → 1. The oil level is too high
Engine oil level normal, 2. Oil level too low
3. The engine oil is not clean.

9. Remove the cylinder head cover and inspect the lubrication of the valves. 1. The oil pipe for the engine oil is blocked.
Condition → Abnormal valve lubrication → 2. Abnormal operation of the oil pump

Valve lubrication normal

10. Check if the engine is overheating → Engine overheating → 1. Excessive carbon buildup in the combustion chamber.

The engine does not overheat, 2. The fuel used does not meet specifications.

3. The clutch is slipping.
4. The mixture is too rich.
5. The engine oil level is too high.

11. During high-speed driving → Engine makes knocking sounds → 1. Piston and cylinder wear

Engine has no knocking sound, 2. Excessive carbon deposit in the combustion chamber.

3. Using fuel that does not meet specifications
4. The ignition timing is too advanced.

The performance of the engine is poor at low speed and idling.

Check direction	Possible reasons
1. Check the ignition timing and valve clearance → Incorrect → Correct	1. CDI failure. 2, magneto electric machine failure. 3. Sensor failure. 4. The valve clearance is too small.
2. Check for air leaks in the carburetor connection → Air leak detected. No air leakage phenomenon,	1. Carburetor sealing ring deformed. 2. Carburetor connection is loose. 3. The sealing ring is broken.
3. Check the spark plug firing condition → Weak spark or intermittent firing → Spark normal	1. The spark plug is damaged. 2, magneto failure. 3. Ignition coil failure. 4. CDI failure. 5. Sensor failure. 6. Ignition switch malfunction. 7. Spark plug cap malfunction. 8. There is a misconnection or short circuit in the power circuit.

The performance is poor at high engine speeds.

Check direction	Possible reasons
1. Check the ignition timing and valve clearance → Incorrect → Correct	1. Magneto failure. 2, CDI failure. 3. Sensor failure. 4. Improper valve clearance.

2. Disassemble the carburetor fuel line → Fuel flow is restricted → 1. The fuel in the fuel tank has been used up.

Fuel can leak freely

2, The vent hole of the fuel tank cap is blocked.

3. The fuel line from the fuel tank to the carburetor is blocked.
4. The oil switch is clogged.
5. The gasoline filter is clogged.
6. The negative pressure pipeline for the oil circuit is not properly connected.

3. Check the carburetor → Carburetor blockage → 1. Float needle blockage.

Carburetor is not clogged

2, the float level is too low.

3. The carburetor jet is blocked.
4. The float is stuck.

4. Check the valve timing→Incorrect→1. The timing chain and timing gears are not installed correctly.

Correct

2, gear wear is severe.

5. Check the high-speed spark plug firing condition → Abnormal firing → 1. Magneto failure.

Jump start normal,

2, CDI failure.

3. Sensor failure.
4. Ignition switch malfunction.
5. Ignition coil failure.
6. Spark plug cap malfunction.
7. Spark plug damaged.
8. There is a short circuit in the power supply loop.

The engine is making unusual noises.

Check direction	Possible reasons
1. The valve is making abnormal noises.	1. The valve clearance is too large. 2. Valve wear.
2. Piston and cylinder knocking	1. Piston and cylinder liner wear. 2. Piston pin and connecting rod small-end wear. 3. Worn-out big end of the crankshaft connecting rod.
3. Bearing noise	1. Crankshaft connecting rod bearing damage. 2. Camshaft bearing wear.
4. Cam chain noise	1. Chain elongation. 2. Worn timing chain sprocket teeth. 3. Chain tension plate or guide plate wear. 4. Improper tensioner adjustment of the chain.
5. Abnormal noises from the driving gear and the driven gear	1. The gear processing accuracy is insufficient 5. Oil pump disassembly

6 Vehicle Chassis

Maintenance Information

Caution

• The chassis must be securely supported before starting work on the front wheels and suspension system.

Do not exert too much force on the wheel.Caution not to damage the wheels

When removing or installing tires from the rim, it is necessary to use a special tire and rim protector to avoid damaging the rim.

Maintenance Benchmark

Project		Standard	Use the limit
Wheel rim	Lateral Runout	0.8 mm	2.0 mm
	Radial Runout	0.8 mm	2.0 mm
Tire	Residual groove	—	3 mm
	Atmospheric pressure	45 kPa (0.45 kgf/cm²)	—
Front brake	Brake lever free play	3-5 mm	—

Fastening torque

Project	Fastener code	Torque (N·m)
Rear disc brake mounting bolt	Tri-Valent Chromate M8*16	25-30
Front Disc Brake Rotor Mounting Bolt	Blue-White Zinc M8*20*1.25 with step	25-30
Rear Swingarm Bolt	Blue-White Zinc Φ 16*258*M16*1.5mm 10.9 grade S=19	86-103
Rear shock bolt	Blue-White Zinc Φ 12*64*M12*1.25mm 10.9 grade S=15	55-66
Rear Axle Mounting Bolt	Blue-White Zinc Φ 12*95*M12*1.25mm 10.9 grade	34-41
Front disc brake three-way fixing bolt	Tri-Valent Chromate M8*35 semi-threaded	25-30
Rear disc brake lower pump mounting bolt	Tri-Valent Chromate M8*25	25-30
Rear disc brake pump mounting bolt	Tri-Valent Chromate M6*25	10-12
Front shock fixed bolt	Tri-Valent Chromate M10*55*1.25 half-thread	35-45
Upper arm fixing bolt	Blue-White Zinc Φ 10*237*M10*1.25mm	40-45
Lower arm fixing bolt	Tri-Valent Chromate M10*80*1.25	40-45

Front Disc Brake Lower Pump Mounting Bolt	Tri-Valent Chromate M8*25	20-25
Front and rear wheel locking nuts	Tri-Valent Chromate M10*1.25	55-66
Rear wheel hub fixed (slotted nut)	Tri-Valent Chromate M18*1.5*H23 slot depth 7	77-92
Front wheel hub fixed (slotted nut)	Tri-Valent Chromate cased M14*1.5*H18	77-92

Tool

hexagon socket m6	Assembly tool shaft
Open-end ratchet wrench S8	Pneumatic wrench S12
Open-end wrench S10-S12	Pneumatic wrench S14
Open-end ratchet wrench S14	Socket wrench M12
Open-end wrench s17-s19	Socket wrench M14
Open-end ratchet wrench S22	Socket wrench M20
Open-end ratchet wrench s24	Socket wrench M24
Phillips screwdriver	Long-nose pliers

6.1 Troubleshooting

一、Difficulty in Steering
1. The bolt at the top of the direction shaft is too tightly fastened.
2. The steering knuckle is too tightly locked with the chassis
3. Deformation of the direction column
4. Low tire pressure
5. Tire Wear
二. Direction causes sway
1. Steering bearing damage, poor
fastening
2. The left and right shock absorbers are not matched.
3. Wheel misalignment
4. Frame deformation
5. Tire wear, uneven wear
6. Wheel bearing play
三. Front Wheel Bounce
1. Wheel rim deformation
2. Poor quality of wheel bearing
3. Poor tire condition
四. Improper wheel balance
5. The fastening around the wheel shaft is poor.
4, the wheels do not rotate smoothly.

1. Wheel bearing malfunction
2. Incorrect installation of the front wheel
3. Brake oil line, cable entanglement

五, the rear suspension is too soft

1. Rear shock absorber spring force weakened
2. Low tire pressure

六, the rear suspension is too stiff.

1. Rear shock absorber damage
2. Tire pressure is too high

七, Abnormal Noise from Rear Shock Absorber

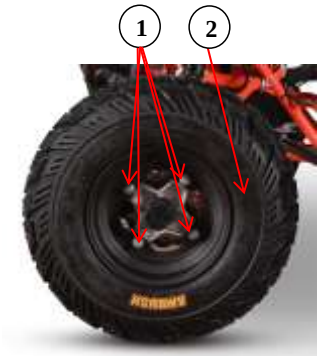
1. Rear shock absorber malfunction
2. The shock absorber fastening parts are loose.

八. Poor braking performance

1. Improper brake adjustment
2. Disc brake surface contamination
3. Brake Pad Wear

6.2 Front Wheel

Disassembly



Lift the front wheel with a tool and ensure that no force is acting on the front wheel.
Remove the retaining nut 1
Remove front wheel 2

Wheel Rim Inspection
Inspect wheel rim 3 for damage, deformation, or scratches; replace if any abnormalities are found.Slowly rotate the wheel and measure the runout of rim 3 with a micrometer.
Usage Limit:Axial:2.0 mm
Radial:2.0 mm

Rim installation
Press rim 4 into the tire on a dedicated machine.

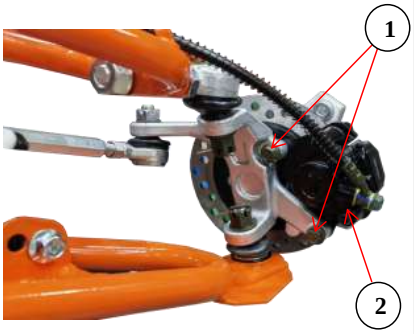
Front wheel mounting bracket removal
Remove the front wheel
Remove front brake caliper 5
Remove the cotter pin
Remove the wheel rim axle mounting nut 6
Remove the Disc brake and the mounting bracket together.
Remove the front wheel mounting bracket

Install

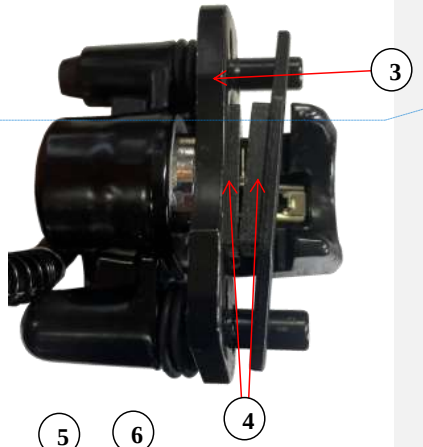
The installation is carried out in the reverse order of disassembly.
Front wheel hub nut torque:49 to 59 Newton meters
Note:The removal and installation of the rear wheel is similar to that of the front wheel, please refer to the front wheel procedure.

6.3 Braking System

Front brake caliper removal
Remove the front wheel
Remove the 2 bolts installed on the Disc brake 1
Remove brake caliper 2
Check
Inspect the brake calipers for cracks and check for oil leakage at all fastening points; replace if any issues are found.
Install
Brake Caliper Mounting Bolt 2 Torque:10N·m to 12N·m (apply thread locking compound)



Brake pad removal
Loosen a tight bolt
Pull up the hoof block support 3
Remove brake pad 4
Check
Measure the thickness of segment 4 of the hoof block. When the thickness of segment 4 is less than or equal to 3 mm, both brake linings should be replaced with new ones simultaneously.
Install
The installation is carried out in the reverse order of disassembly.



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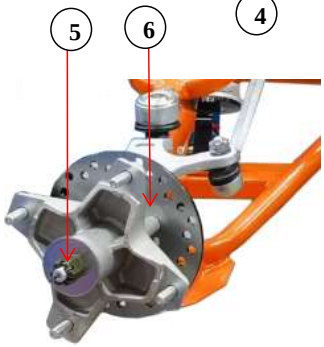
Front Disc brake removal
Remove the front wheel
Remove the brake caliper
Remove the split pin and unscrew the slotted nut 5
Remove the front wheel hub assembly 6 from the vehicle.



Remove the front disc brake rotor mounting bolt 7

Remove the Disc brake 8

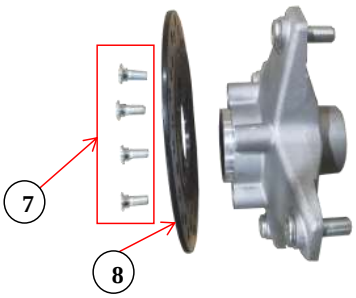
Check

Front Disc brake thickness:Replace the Disc brake if it is less than 3mm

Install

Install the Disc brake

Disc brake Retaining Bolt Torque:10 to 12 Newton meters

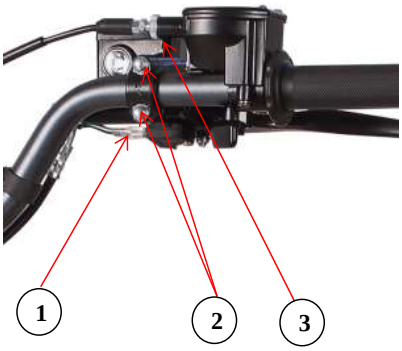


Front parking brake pump removal

Unplug the brake switch connector 1

Remove bolt 2

Separate the front brake hand pump 3 in the direction of the handle



Install

The installation is carried out in the reverse order of disassembly.

Attention:

Do not hang the brake pump with the brake line using brake fluid.

Due to concerns that the front brake lever pump might tip over, causing air to enter the hydraulic system, it is necessary to maintain the installation position while securing it to the handlebar.

The routing of the oil pipeline on the body of the vehicle, as per the wiring layout of cables and similar items in Chapter One, must ensure the unobstructed flow of the braking oil line.

When the braking system assembly is installed, it is necessary to check the braking force.

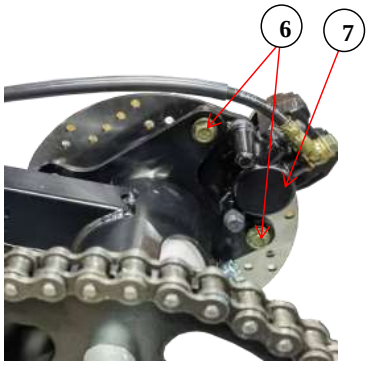
Rear brake caliper body removal

Remove bolt 6

Remove the rear brake caliper assembly 7

Install

The installation is carried out in the reverse order of disassembly.



Attention: The routing of the oil pipeline on the body of the vehicle, as per the wiring diagram of cables and similar lines in Chapter One, must ensure the unobstructed flow of the braking oil line. When the braking system assembly is installed, it is necessary to check the braking force. If the front and rear cannot be 联动 controlled in the braking system, check whether the connections are properly connected. Also, inspect the level of the brake fluid in the brake reservoir to ensure it is between the upper and lower limit marks, and if necessary, add the recommended KAYO brake fluid to bring it within the range of the upper and lower limit marks.Check if the brake switch and brake lights are functioning properly.

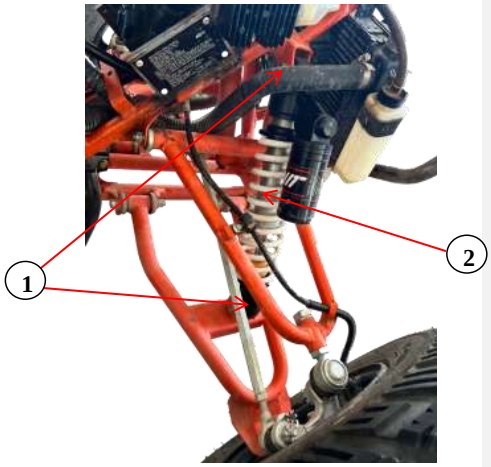
6.4 Front Suspension System

Removal of the right front suspension assembly

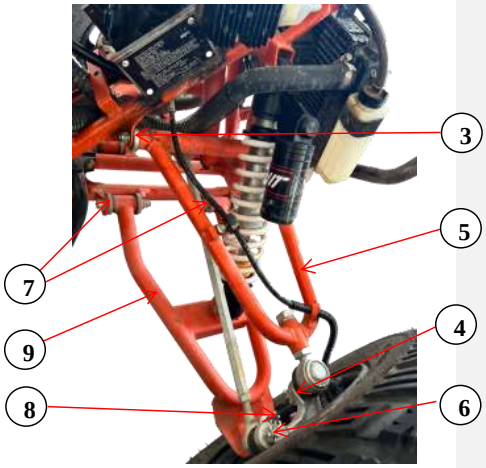
Attention: When repairing the suspension system, the left and right suspension systems cannot be removed at the same time, otherwise the body of the vehicle will tip over due to lack of support.

Park the vehicle body on a level ground and

use a jack to securely support the front part of the car.
Remove the front body panel
Remove the front wheel
Remove the brake caliper
Remove the front wheel hub bracket
Remove the bolt 1 from the right front shock absorber mounted on the body and the right front lower control arm.
Remove the right front shock absorber 2



Remove the bolt and nut securing the right front upper arm mounted on the frame 3
Remove the right front upper arm ball pin and install it in the opening pin and nut 4 of the left steering knuckle.
Remove the right front upper arm 5



Remove the split pin and locking screw from the steering lever ball pin
Mother 6
Remove the bolt and nut 7 of the right front lower control arm mounted on the chassis.
Remove the right front lower arm ball joint lock bolt 8
Remove the right front lower arm 9
Pull the steering knuckle off the drive shaft.The suspension system of this vehicle comes in various configurations, suitable for different customer groups.The above introduction pertains to the basic configuration of the suspension system; the maintenance methods for other configurations are similar, and maintenance can be carried out by referring to the aforementioned methods.

Install

The installation is carried out in the reverse order of disassembly.

The disassembly and installation methods for the left front suspension assembly are the same as those for the right front suspension assembly.

Rocker arm assembly disassembly

Remove the left front shock absorber.

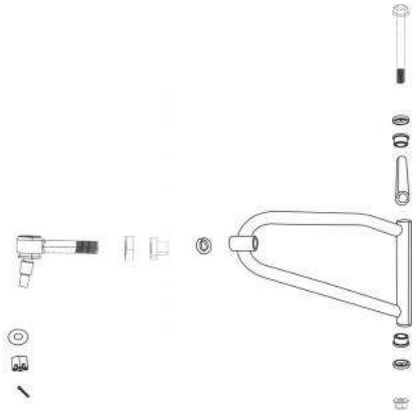
Remove the bolt and nut securing the upper left front arm mounted on the chassis (left front suspension assembly diagram)

Remove the bolt and nut securing the lower left front arm mounted on the chassis (left front suspension assembly diagram)

Before removing the shock absorber, the wheel, brake caliper, and rim support must be dismantled first.

Before removing the bolts, the steering rod should be disconnected first.

Before removing the left front arm assembly, the steering knuckle must be pulled out from the front constant velocity drive shaft.



Remove the left front arm assembly

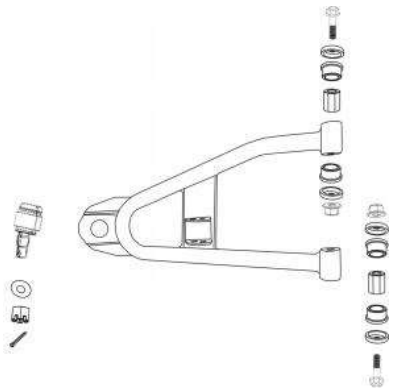
Inspect the upper and lower arms

Remove the left front upper arm welding assembly 4 (left front suspension assembly diagram)

Remove the left front lower arm welding assembly 8 (left front suspension assembly diagram)

Check if the grease inside the ball pin has deteriorated (grease type:Check if the dust cover on the ball pin (No. 2 lithium-based grease GB7324-87) is broken or aged, and if such issues are present, replace the ball pin with a new one.

Remove the buffer sleeve assembly from the left front upper and lower arm welding assembly to inspect for damage or aging. Replace with a new one if necessary.



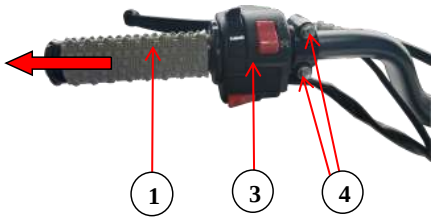
Install
Use a special tool to press the ball pin into the rocker arm assembly.
The installation is carried out in the reverse order of disassembly.

Attention: The upper and lower arms must not have any play after installation; if there is play, replace with a new buffer sleeve assembly.

Inspect the left steering knuckle
Remove the left steering knuckle
Remove the wheel hub bearing using a special tool.
Check if the wheel hub bearing is damaged, if it rotates smoothly, and if there is excessive clearance; replace with a new one if any defects are found.

Install
The installation is carried out in the reverse order of disassembly.

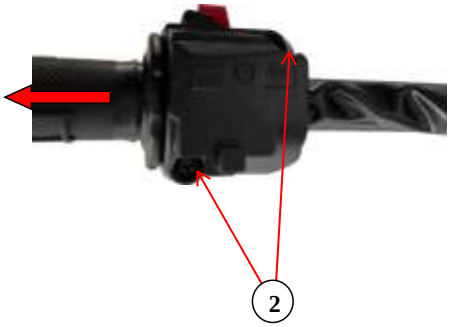
6.6 Steering System



Remove the front dashboard display cover

Handlebar

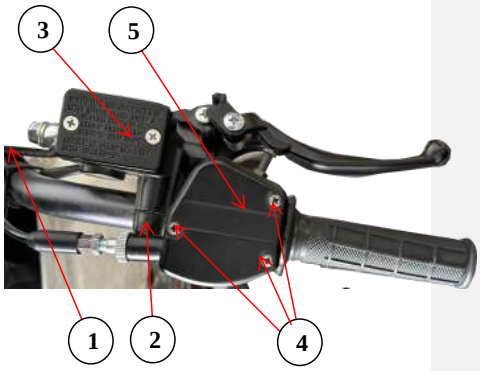
Disassemble with the left handlebar



Release the combination switch and clutch switch plug-ins
Pull out the left handle sleeve 1 in the direction of the arrow
Remove the assembly switch mounting bolt 2
Remove the combination switch 3

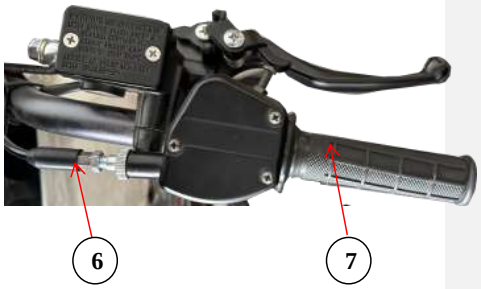
Remove the clutch assembly fixing bolt 4
Remove the clutch assembly

Install
The installation is carried out in the reverse order of disassembly.



Disassemble with the right hand

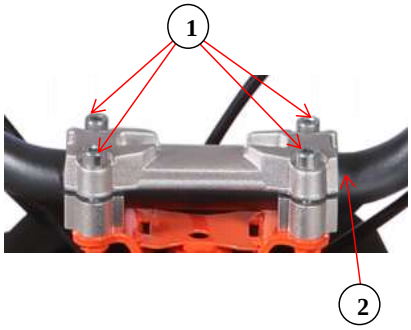
Release the brake switch plug 1
Remove the front brake mounting screw 2 (total of 2 screws)
Remove front brake lever 3
Remove the fixing bolt 4 from the accelerator cover
Remove the accelerator cover 5
Remove the throttle cable 6
Remove the accelerator mounting bolt
Pull off the right grip in the direction of the arrow 7
Remove the accelerator



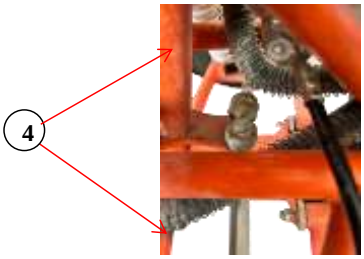
Install
The installation is carried out in the reverse order of disassembly.

Handlebar pipe disassembly
Remove the left-hand grip.
Remove the handle
Remove the block fixing bolt 1
Remove the Handlebar tube 2

Install
The installation is carried out in the reverse order of disassembly.



Steering system disassembly
Steering shaft assembly
Disassembly
Remove the steering gear assembly
Remove the front body panel
Remove the front wheel
Release the split pin and locking nut on the steering lever 3
Remove the steering lever 4



Remove the steering arm (1 set for left and right each)
Remove the fixing bolt 5
Remove the block clamp, block clamp 6
Remove the split pin and locking nut 7
Lift the steering shaft upwards to remove the steering shaft assembly.

Install
The installation is carried out in the reverse order of disassembly.
Attention: When installing the split pin, a new one must be used; after installation is complete, it is necessary to check the steering flexibility and whether the left and right steering angles are the same; when assembling the steering arm, be sure to place the steering arm in the middle before assembling the steering shaft; when assembling the steering shaft, be patient and ensure that the left and right steering angles are consistent before tightening all

components.

Rear shock absorber removal

Disassembly

When repairing the suspension system, the body of the vehicle should first be hoisted, and then the suspension system should be dismantled; otherwise, the body will collapse due to lack of support.

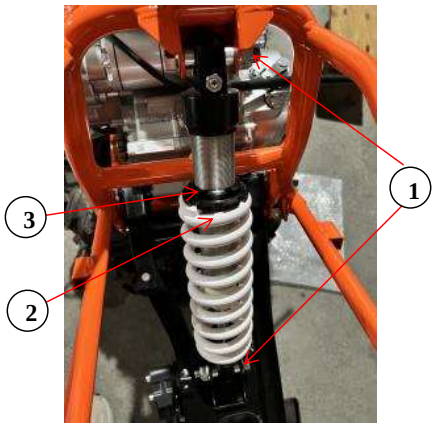
Park the vehicle body on a level ground and secure the rear support with a jack.

Remove the rear body

Remove the rear wheel

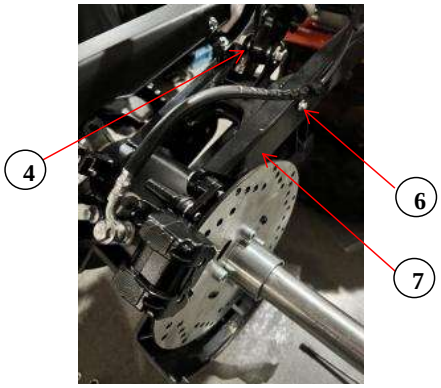
After removal, the shock absorber is mounted on the body of the vehicle and the screw 1 on the flat fork assembly.

Dismantle and reduce shock 2



Check

Inspect the dismantled shock absorber and adjust cam 3 to the appropriate position.



Install

The installation is carried out in the reverse order of disassembly.

6.7 Rear Drive Shaft Assembly

Removal of the rear driveshaft assembly

Before removing the rear driveshaft, the body of the vehicle must be suspended in the air, otherwise the body will tip over due to the lack of support at the rear of the vehicle.

Park the vehicle body on a level ground, then secure the rear of the vehicle with a jack before starting the work.

Remove the rear body

Remove the rear wheel
Remove the chain guard
Remove the rear brake caliper

Remove the shock absorber and rear fender mounting bolt 4
Remove chain 5
Remove the flat fork assembly and the bolts and nuts connecting it to the frame (part number 6).
Remove the rear driveshaft assembly 7

Check

The exploded view of the rear driveshaft assembly is as follows

Number	Name	Quantity	Number	Name	Quantity
1	Rear axle	1	8	Rear derailleur	1
2	Rear aluminum seat	1	9	Steel rear sprocket	1
3	New rear caliper mounting bracket	1	10	Rear Wheel Hub Seat	2
4	Hand external card	1	11	Steel wire retaining ring	1
5	Disc brake rotor	1	12	Flat washer GB97.1-85	1

Commented [A4]: The table has been modified, the image needs to be changed.

4

6	Internal hexagon cylindrical head screw GB70-85	4	13	Flange bolt GB5789	1
7	rear disc brake rotor	1			

Inspection after the rear driveshaft disassembly

- Check if the rim is damaged, and if so, replace it with a new part.
- Check the Disc brake thickness; if the Disc brake thickness is ≤3mm, a new Disc brake should be replaced.
- Check the driveshaft for bending or damage, and if present, replace with a new driveshaft.
- Inspect the cross assembly; if damaged, replace with a new part.
- Inspect the sprocket, and if any teeth are damaged, replace it with a new sprocket.
- Inspect the rest of the items for damage, and if any are damaged, replace them with new ones.

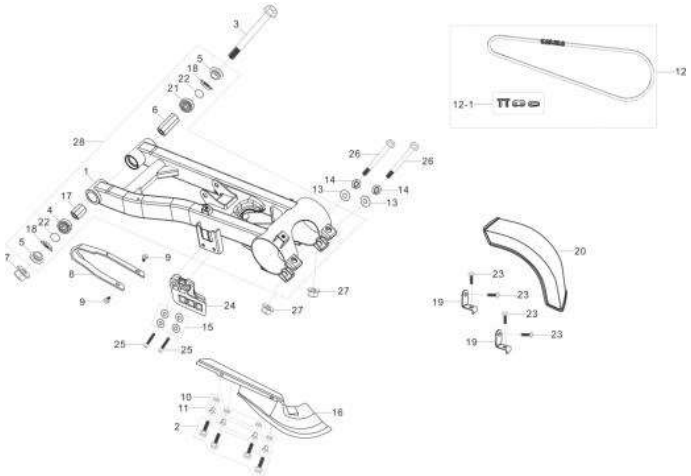
Install

Assemble in reverse order when disassembling the rear driveshaft.

Attention: When installing the sleeve, apply lithium-based grease containing molybdenum disulfide to both ends of the flat fork shaft.

The assembly diagram of the rear fork is as follows

Rear fork assembly



Number	Name	Quantity	Number	Name	Quantity
1	Flat Fork Assembly/Metalworking	1	15	Flat washer Tri-Valent Chromateed Φ6*12*1.5	4
2	Flange bolt GB5789 Tri-Valent Chromate M6*25	4	16	Rear fender lower guard	1
3	Flange shaft Blue-White Zinc Φ16*258*M16*1.5mm	1	17	Flat bushing, centerless grinding, φ16*22*L28.5	1
4	Cylindrical roller bearing	1	18	Flat step sleeve,Centerless	2

	HK2220			Ground, φ16*35*H7+φ16*30*H9	
5	Step bushing Blue-White Zinc Φ17*40*H12.5 with external step	2	nineteen	Chain guard front and rear mounting plates	2
6	Flat bushing, centerless grinding, φ16*22*L55	1	20	Chain Mesh HK222830	1
7	Hexagon flange self-locking nut GB6187-86 Tri-Valent Chromate M16*1.5 Height 14.8	1	21	Roller bearing	1
8	Guide chain sleeve	1	22	Flat O-ring Φ28*3.1	2
9	Cross recessed machine screw GB819 Tri-Valent Chromate M6*20	2	23	External hexagon small head flange bolt GB5787 Tri-Valent Chromate M6*12	4
10	Oil cooler rubber sleeve, I-beam shape, black, Φ9*20*10	4	24	Chain guide	1
11	Oil cooler bushing T-shaped Φ6.5*9*10+Φ20*2	4	25	Internal hexagon cylindrical head screw GB70-85 Tri-Valent Chromate M6*45	2
12	Chain 530HS 102L	1	26	Flange shaft Blue-White Zinc Φ12*95*M12*1.25mm	2
12-1	Chain coupling	1	27	Hexagon flange self-locking nut, Tri-Valent Chromate M12*1.25	2
13	Flat washer Tri-Valent Chromate Φ12*24*2	4	28	Rear fork assembly	1
14	Spring mat GB93-87 Tri-Valent Chromate Φ12*20*3	2			

7 Signal and Lighting System

Maintenance Notice

When conducting a checkout of the Work, the entire vehicle can be powered on; when performing disassembly and installation work, the vehicle should first be disconnected from power, and hands should be kept dry.

Item specifications

Name	Specification	Quantity	Remarks
Headlights	With lens, Da Ba Wang	2	replacement
Rear lights	MZ-201 with E24 Mark Waterproof Plug	1	replacement
Document display	Green neutral gear indicator light	1	replacement
Document display	Red Reverse Gear Indicator Light	1	replacement
Malfunction Indicator Light	Waterproof plugin	1	replacement

7.1 Troubleshooting

I. The headlights are not working.
1. Light bulb damaged
2. Poor contact in connectors
3. Handle switch is damaged

II. Malfunction Indicator Light
1. Poor contact of the connector
2. Indicator light damaged

III. Rear lights not illuminating
1. Light bulb damaged
2. Poor contact in connectors
3. Handle switch is damaged

Four, the display is not lighting up
1. Screen damage
2. Poor contact in connectors

7.2 Headlight Inspection

With the ignition switch set to ON, turn the lighting switch to
Lighting check, ensure the headlights are on

－ Light up:Normal

－ Not lit:

- Main cable breakage or short circuit
- Fuse blown
- Switch is broken

If the front headlight is damaged, the entire front headlight should be replaced.

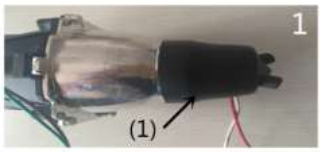
7.3 Front Headlights and Rear Taillights Disassembly

Headlights

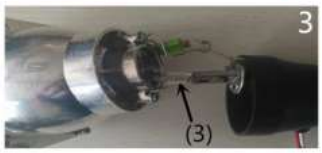
Disassembly

Remove the front headlight plug 1

Remove the two bolts inside the Head Fairing visor.
The front headlight assembly can be replaced immediately.

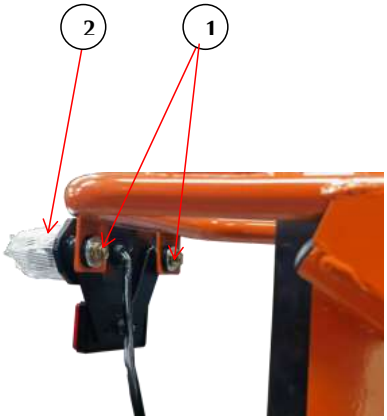


Steps to change a light bulb
Remove rubber sleeve 1
Remove the fixed clamp 2
Remove bulb 3 to replace the bulb.



Install
Proceed in the reverse order of disassembly

Rear lights



Disassembly

Release the rear light plug-in

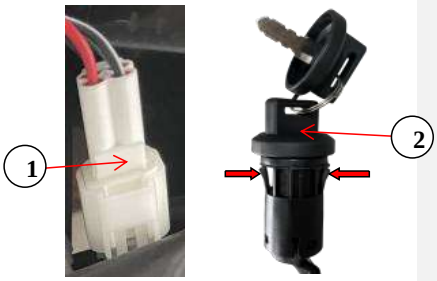
Remove the screw (1)

Remove the rear light 2

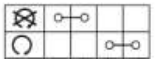
Install
Proceed in the reverse order of disassembly

7.4 Ignition switch

Disassembly
Remove the connection of the electric door lock connector 1
Remove the electric gate lock 2



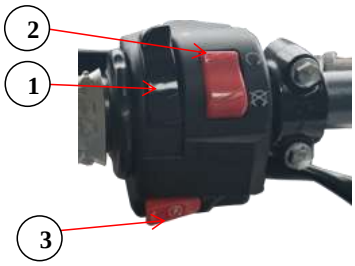
Check
Check whether there is conductivity between the terminals of each control switch connector as per the following tables.
A connection between the ● — ● is normal.

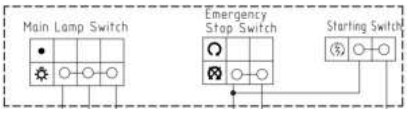


Install
Proceed in the reverse order of disassembly

7.5 Combination Switch

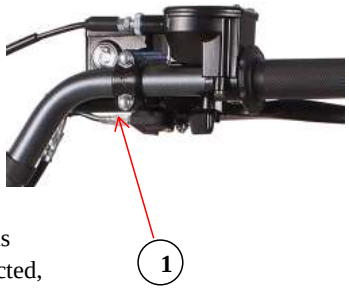
Disassembly
Remove the Head Fairing
Disassemble the combination switch connector
Check whether there is conductivity between the terminals of each control switch connector as per the following tables.
A connection between the ● — ● is normal.
Lighting Switch 1
Ignition switch 2
Switch on 3





Install

Proceed in the reverse order of disassembly



7.6 Brake Light Switch

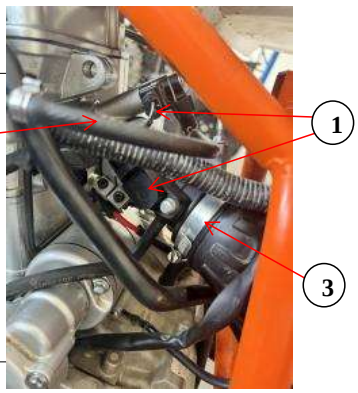
Check if there is conductivity between the terminals
Check if the brake light switch 1 is properly connected,
After confirming that the link is in place, when holding the brake lever,
Conducts when the parking brake lever is engaged, otherwise does not conduct.
Normal.If abnormalities are found in the above examination, replace accordingly
Brake Light Switch

7.7 Malfunction Indicator Light

When the malfunction indicator light comes on, it indicates your
The vehicle's power system has malfunctioned.This may
Causing power reduction, abnormal operation, or even complete failure.
Complete power failure.Therefore, if the malfunction indicator light comes on
Please contact your local dealer promptly,
Check and resolve any issues in the power system,
To avoid unnecessary risks.Specific issues
You can check the fault code list.

8 EFI

8.1. Throttle Body



Disassembly

Remove the Seat, front and rear body assemblies
(→ Chapter 2 Body Panels) Fuel tank assembly

Throttle valve
Unplug the plug 1
Remove the oil pipe connected to the Carbon Canister solenoid valve 2
Remove the air filter clamp 3
Remove the throttle cable 4
Remove the bolt 5 fastened to the engine.
Remove the throttle body 6

Install
Proceed in the reverse order of disassembly

8.2 Fuel pump

Disassembly

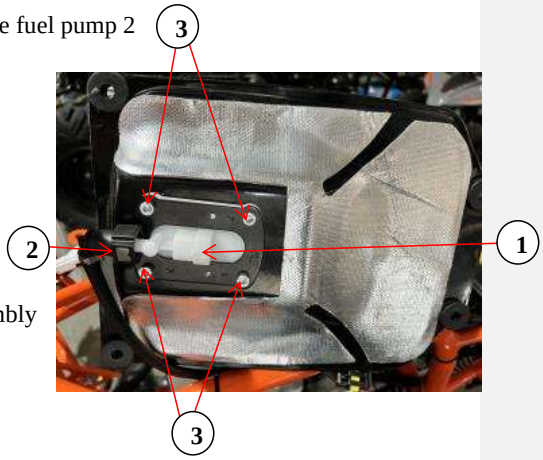
Remove the front body and the bolts securing the fuel tank.

Unplug the fuel pump connector 1

Disconnect the fuel line connected to the fuel pump 2

Remove the retaining bolt 3
(Total of four stars)

Remove the fuel pump



Install
Proceed in the reverse order of disassembly

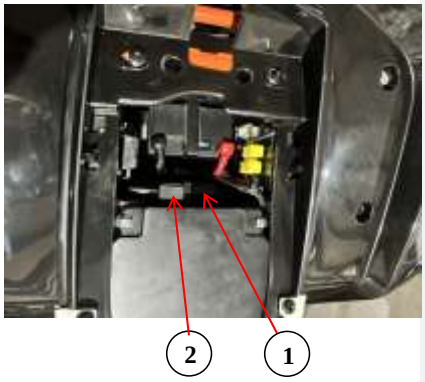
8.3 European Currency Units

Disassembly

Remove the Seat

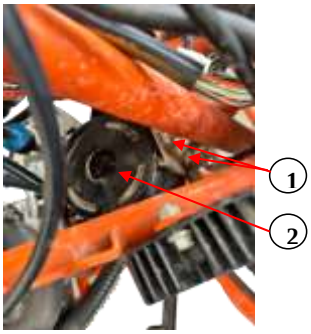
Unplug the ECU plug 1

Remove ECU 2



Install
Proceed in the reverse order of disassembly

8.4 Carbon Canister



Disassembly

Remove the front body panel

Disconnect the fuel line connecting the Carbon Canister to the fuel tank.

Disconnect the oil pipe connecting the Carbon Canister and the solenoid valve of the Carbon Canister.

Remove the bolt 1 securing the Carbon Canister

Remove the Carbon Canister

Install
Proceed in the reverse order of disassembly

8.5 Carbon Canister Solenoid Valve

Disassembly

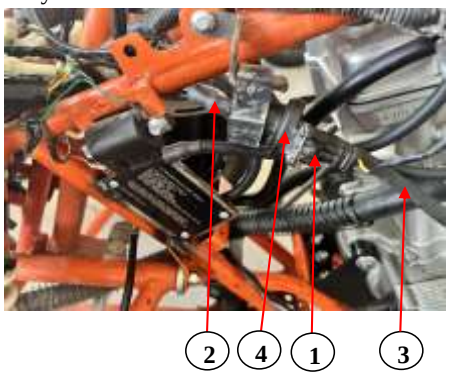
Unplug the Carbon Canister solenoid valve plug 1

Remove the oil pipe connected to the Carbon Canister T port 2

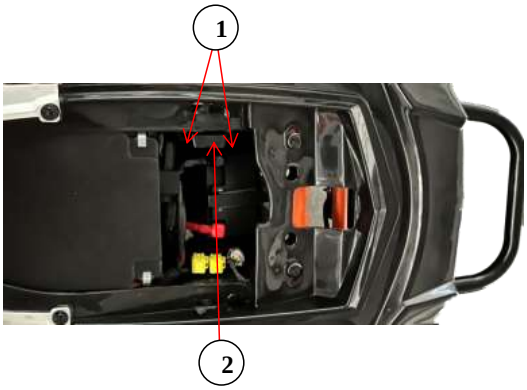
Remove the oil pipe connecting to the throttle body

Remove the Carbon Canister solenoid valve 4

Install
Proceed in the reverse order of disassembly



8.6 OBD



Disassembly

Remove the Seat

Remove two mounting bolts 1

Remove OBD interface 2

Install

Proceed in the reverse order of disassembly

8.7 EFI System Fault Diagnostic Tool Usage

The Fault Diagnosis System, commonly abbreviated as OBD, stands for On-Board Diagnostic in English.When the electronic fuel injection system malfunctions, the Malfunction Indicator Light (MIL) turns on, and at the same time, the OBD system stores the fault information in the memory. The relevant information can be read in the form of fault codes through standard diagnostic tools and diagnostic interfaces.Based on the fault code hints, maintenance personnel can quickly and accurately determine the nature and location of the fault.

1. Malfunction Indicator Light Description

① In normal mode, and no current fault codes present.

Turn on the ignition switch, the ECU initializes, the malfunction indicator light comes on, and the MIL light turns off immediately after the engine starts successfully.

When the current fault code exists

When the engine is running, if the current fault occurs, the malfunction indicator light transitions from off to steady on, alerting the driver to a fault.Once the engine is turned off, the current fault will be converted into a historical fault and stored in the electronic control unit (ECU) of the fuel injection system.

2. Read the fault code，according to the diagnostic tool.

Diagnostics tool features:Read fault codes, clear fault codes, display data stream.

① Connect the diagnostic instrument to the diagnostic interface on the electronic fuel injection harness;

② Turn on the ignition switch;

③Read the fault code, consult the repair manual to confirm the fault component and type, and develop a repair plan based on the information obtained and experience.

④After troubleshooting, use the fault diagnostic tool to clear the historical fault codes;

Read the data stream to analyze the reasons for some ECU failures that do not report fault codes.

Note:The ECU intake port must not be blocked, as it can easily lead to the failure of the electronic injection system.

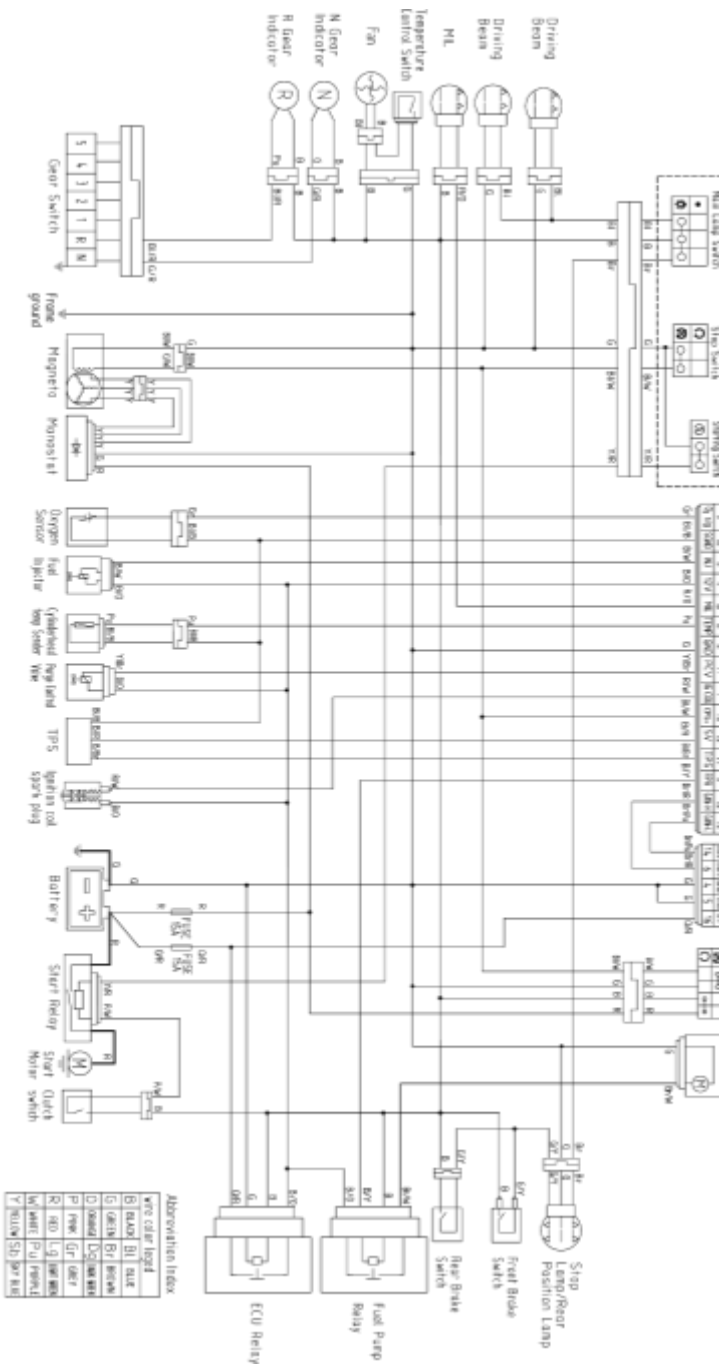
8.8 Malfunction Indicator Light Code

Serial Number	Fault Code	meaning	Flash count
1	P0118	The cylinder head temperature signal voltage is high.	7
2	P0117	Low voltage signal for cylinder head temperature	7
3	P0562	Low power voltage	0
4	P0563	High power supply voltage	5
5	P0131	Oxygen sensor 1 signal voltage low	6
6	P0132	Oxygen sensor 1 signal voltage is high	**6**
7	P0122	Throttle Position Sensor Signal Voltage Low	11
8	P0123	Throttle Position Sensor Signal Voltage High	11
9	P0650	Malfunction Indicator Light Open Circuit	0
10	P0650	Fault Light Short Circuit	0
11	P0201	Injector 1 open circuit	8
12	P0262	Injector 1 has a short circuit to the power supply.	8
13	P2300	Ignition 1, clear the way.	10
14	P2301	Ignition 1 causes a short circuit in the electrical system.	10
15	P0231	Oil pump Open Circuit	9
16	P0232	Oil pump for power supply short circuit	9
17	P0335	Crack in the crankshaft signal circuit	4
18	P0336	The crankshaft signal is unreliable.	0
19	P0139	Oxygen sensor 1 signal is stuck in the lean state.	6
20	P2196	Oxygen sensor 1 signal is stuck in a rich state.	6
21	P2505	ECU abnormal reset	3
22	P0607	ECU power tube damaged	14
23	P1441	Carbon Canister solenoid valve Open Circuit circuit	2

8.9 EFI fault code

Serial Number	Category	Sensor Failure Indicator
sensor		
1	P0117	The cylinder head temperature signal voltage is greater than 3.2V, and the cylinder head temperature is above 150 ℃.
2	P0118	The cylinder head temperature signal voltage is less than 0.07V
3	P0122	Throttle position sensor signal voltage is less than 0.01V
4	P0123	Throttle position sensor signal voltage exceeds 3.2V
5	P0131	Oxygen sensor signal voltage is less than 0.01V
6	P0132	Oxygen sensor signal voltage exceeds 1.1V
7	P0139	The transition time from a lean state to a rich state response rate for the oxygen signal is longer than certain calibration values (oxygen failure response time 1200 milliseconds).
8	P2196	The time it takes for the oxygen signal to switch from a rich state to a lean state response rate is longer than certain calibration values (oxygen failure response time 1200 milliseconds).
9	P0335	Crankshaft Position Sensor Signal Open Circuit
10	P0336	The crankshaft position sensor signal is unreliable.
Actuator		
11	P0231	Oil pump Open Circuit
12	P0232	Oil pump circuit short-circuit to the power supply
13	P2300	Ignition coil Open Circuit
14	P2301	The ignition coil circuit is short-circuited to the power supply.
15	P0201	Injector Open Circuit
16	P0262	The injector circuit is short-circuiting to the power supply.
17	P1441	Carbon Canister solenoid valve Open Circuit circuit

Appendix


Driving Beam
Driving Beam
MIL
Temperature Control Switch
Fan
N Gear Indicator
R Gear Indicator
Gear Switch
Frame ground
Magneto
Monostat
Oxygen Sensor
Fuel Injector
Cylinderhead Temp Sender Wire
Regulated
TPS
Ignition coil
Spark plug
Battery
Start Relay
Start Motor
Start Clutch switch
ECU Relay
Fuel Pump Relay
Rear Brake Switch
Front Brake Switch
Stop Lamp/Rear Position Lamp
Abbreviation Index
wire color legend
B BLACK
Bl BLUE
G GREEN
Br BROWN
O ORANGE
Dg DARK GREEN
P PINK
Gr GREY
R RED
Lg LIGHT GREEN
W WHITE
Pu PURPLE
Y YELLOW
Sb SKY BLUE