



TG300S ABS

MAINTENANCE MANUAL



Royal Alloy



Dear Users,

Thank you for choosing the Royal Alloy brand scooter – TG300S. In order to make your driving safer and more comfortable, please read and fully understand the contents of this manual.

This manual explains the structure, characteristics and maintenance of the motorcycle, as well as the main information such as the structure and maintenance of the engine EFI system, so that you can carry out regular maintenance operations of your vehicle. Since it is not possible to contain a complete mechanical concept in this manual, the user should have basic mechanical knowledge when repairing motorcycles. Repairing or inspecting vehicles without knowing it can be inefficient or even dangerous, so be very cautious so as not to damage parts or injure individuals. **It is highly recommended that you contact your local dealer for repairs and maintenance.**

The Company reserves the right to make any modifications to the Product as a result of its updates. Subject to change, the actual vehicle shall prevail without notice. Major technical changes and changes to repair procedures are communicated to our sales outlets and international subsidiaries in a timely manner, and these changes will be perfected in subsequent editions of the manual.

The following important information will appear in this manual:



Reminder: means the specific procedures implemented to prevent damage to the vehicle.



Warning: Specific procedures implemented to prevent injury to persons.

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(1) Overview of characteristics

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Description of the braking system

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Repair rules

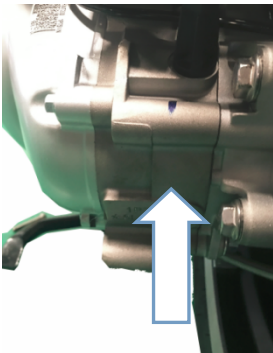
1. Must use parts and lubricants recommended by us or our company; Parts and lubricants that do not meet our design specifications may damage the motorcycle. **Recommended oil brand model: Motul Scooter Expert Semi-synthetic 4-stroke SAE 10W/40-SJ.**
2. When reassembled, new elastic washers, gaskets, O-rings, stand-up pins and retaining rings must be replaced.
3. When tightening bolts and nuts, start with a large diameter or from the inner bolt. Then increase the number of steps diagonally, unless a special order is specified to tighten to the specified torque.
4. After decomposition, clean the parts in a clean solvent; Lubricate any smooth surfaces before assembly.
5. After reassembly, check that all parts are installed and operated correctly.
6. Unclog all cables and harnesses.
7. Please go to our authorized dealer for repair, unless the owner has special tools and repair data and is a qualified mechanic.

Vehicle Identification:

Frame number: engraved under the right pedal.



Engine number: engraved on the rear gearbox.





NOTE: These numbers are necessary for vehicle registration identification and changing the identification number may be severely punished by law, in particular modifying the chassis number will immediately void the warranty

Technical details

Vehicle parameters		Engine parameters	
Model	TG300S	Engine model	1P75MN
Vehicle size (mm).	1845×670×1115	Engine idling	1700(1±10%)
Track (mm).	1390	Engine type	Single-cylinder horizontal water-cooled four-valve overhead cam
Seat height (mm).	780	Bore × stroke (mm).	75*63
Minimum ground clearance (mm).	145	Total displacement (mL).	278 (300cc)
Net weight (kg).	145	Compression ratio	11:1
Maximum load (kg, rider-passenger luggage).	210	Maximum net power (kW/r/min).	18.5/7250

Front specifications/inflation pressure	tyre 110/70-12 32 PSI	Maximum net torque (Nm/r/min).	24.5/6000
Rear specifications/inflation pressure	tyre 120/70-12 34 PSI	Startup mode	Electric start
Front brake	Disc brakes	Ignition method	EFI (Magneti Marelli).
Rear braking	Disc brakes	Valve clearance (mm).	Intake valve: 0.10 ± 0.02 Exhaust valve: 0.15 ± 0.02
Battery capacity	12V 9Ah	Lubrication method	Pressure/splash
Horn	90-100dB(A)	spark plug	NGK CR8EKB
Clutch	Automatic centrifugal dry clutch		

Description of the variable speed system

Items	Description
Variable speed transmission	CVT + V-belt + final gear reduction gearbox
CVT gear ratio	2.3~0.815: 1
Final gear ratio	7.823
Overall gear ratio of the rear wheels of the engine	6.38~18

Lubrication system description

Items		Quantity
The total capacity of engine lubricating oil is 1300ml Grade: SAE10W-40-SJ	Change the oil only	1200ml
	Change the oil and filter element	1250ml
	Remove the engine and fill it with oil	1300ml
Total capacity of transmission lubricating oil 250ml Grade: 75W-80	Change the transmission oil	200ml
	Remove the engine and fill it with oil	250ml

Fuel

Items	Description
Fuel grade	Unleaded gasoline above 95#
Fuel tank capacity	10.5L

Cooling system description

Items		Description
Coolant capacity	When replaced	1.15L
	When disassembling	1.20L
Recommended antifreeze		Coolant or ethylene glycol antifreeze of the same quality is mixed with distilled water at a 1:1 rate, the freezing point reaches -40 ° C, and the boiling point reaches 108 ° C.

Chassis and suspension system description

Items	Description
Chassis	High-strength steel tubular chassis with single bar at the front and double brackets at the rear
Forward tilt	26.30°
Front suspension	Adjustable preload, hydraulic, retractable fork
Front suspension travel	70mm
Rear suspension	Adjustable preload, hydraulic, double-acting shock absorbers
Rear suspension travel	85mm

Front and rear wheel description

Items	Description
Rim material	Aluminum alloy
Front wheel tyres	Tubeless 110/70-12
Rear wheel tyres	Tubeless 120/70-12
Front tyre inflation pressure	32/220 (Psi/KPa)

Rear tyre inflation pressure	34/234 (Psi/KPa)
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Description of the braking system

Items	Description
Braking system	ABS
Front wheel brakes	ç220mm disc hydraulic brake
Rear wheel brakes	ç220mm disc hydraulic brake
Brake fluid	FMVSS DOT4+

Electrical system description

Items	Description	
Battery capacity	12V-9Ah	
Fuse	20-15-15-15A	
Permanent magnet alternator	12 V - 330W at 8000 rpm	
spark plug	NGK CR8EKB	
Lamps/warning lights	High/low beam	12V 20/10W LED
	Front position light (daytime light)	LED

	Tail light (daytime light)	LED
	License plate lights	LED
	Brake lights	LED
	Front and rear turn signals	LED
appearance	Indicator dial light	LED
	Turn warning lights	LED
	High beam warning light	LED
	Engine oil pressure warning light	LED
	Low oil warning light	LED
	EFI fault warning light	LED

Tightening torque

Fastening parts	Quantity	Thread specifications	Torque: Nm
Engine hanger mounting nut	1	M10	45
Engine mounting nut	1	M10	45
Front axle nut	1	M12	60
Rear axle nut	1	M14	100
Bolts are mounted on the rear shock absorber	2	M10	40
Bolts are installed under the rear shock absorber	2	M8	25
Fixed bolts above the front shock absorber	2	M6	12
Fixed bolts under the front shock absorber	2	M12	60
Steering post lock nut	1	M25	70
Orient the mounting nut	1	M10	45
Front brake disc fastening bolts	3	M8	25
Rear wheel fastening bolts	5	M12	60
Rear brake disc fastening bolts	5	M8	25

Other specifications of bolt reference: GB1231-2006 bolt torque standard

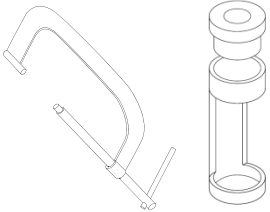
Engine section:



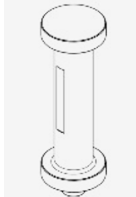
Fastening parts	Quantity	Thread specifications	Torque: Nm
Head bolt A	4	M8	24~26
Head bolt B	2	M6	10~12
Camshaft cover fixing bolts	8	M6	10~12
Timing sprocket bolts	2	M8	25~30
Exhaust pipe joint fixing bolts	2	M7	12~14
Oil filter cover	2	M6	9~12
Closing bolts	3	M6	9~12
Intake manifold bolts	3	M6	9~12
Crankcase drain bolts	1	M28	24~30
Gearbox drain bolt	1	M6	10~12
Front clutch nut	1	M12	70~80
Rear clutch nut	1	M12	55~65
Magneto rotor fixing nut	1	M8	23~27
Water temperature sensor	1	M12	20~24
spark plug	1	M10	12~14


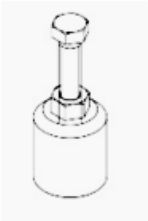



Other specifications of bolt reference: GB1231-2006 bolt torque standard

(2) Tools

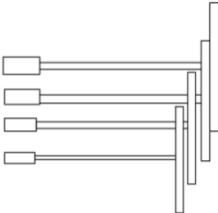

1. Special tools: (The following tools are only operated by professional technicians, and the owner is not allowed to operate without authorization).


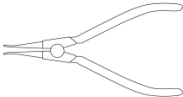
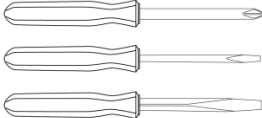
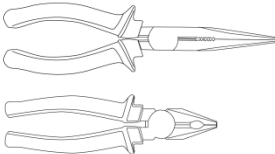
Item	The name of the dedicated tool	Tool number	Image
1	Valve spring compressor	Z01	 The image shows a line drawing of a valve spring compressor. On the left is the main tool, which consists of a curved metal frame with a central handle and two adjustable arms. On the right are the components of the tool: a cylindrical outer shell, a central rod, and a smaller cylindrical inner shell.

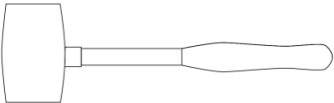

2	Crankshaft positioning bolts (top dead center positioning)	Z02	
3	Clutch drive wheel limiter	Z03	
4	Bearing punches of various specifications	Z06.1--- Z06.8	

5	Oil seal punches of various specifications	Z07.1-- Z07.9	
6	Magneto rotor extractor	Z04	
7	Spark plug sleeve	Z05	
8、	Troubleshooter	Z08	
9、	Shock absorbers adjust the handles	Z09	

2. General tools:

Item	Description	
1	T" sleeves: 8#, 10#, 12#, 14#	 A line drawing showing four T-sleeves of increasing size. Each sleeve consists of a long horizontal shaft with a shorter vertical stem protruding from its center. The vertical stems are of different lengths, corresponding to the sizes listed in the description: 8#, 10#, 12#, and 14#.
2	Toolbox 1	 A photograph of an open toolbox. The toolbox is black with a green interior. It contains a variety of tools, including several wrenches, sockets, and screwdrivers, all neatly organized in their respective compartments.

3	Toolbox 2	
4	Circlip pliers	
5	Screwdriver	
6	Pliers	

7	Nylon hammer	
8	multimeter	

(3) Maintenance

Basic maintenance

1. Spark plug
2. Inspection and replacement of gear oil
3. Inspection and replacement of engine oil
4. Throttle handle adjustment
5. Clean air filter
6. Coolant inspection and replenishment
7. Braking system
8. Front headlight line inspection and adjustment:

Preparation for maintenance

1. Put the motorcycle on main stand on flat ground before maintenance.
2. Ensure that the maintenance environment is well ventilated.
3. Prepare the work area (pad under the engine) and tools.
4. For threaded fasteners or seals, if not otherwise specified, counterclockwise is loosened and clockwise is fastened

The maintenance schedule

I: Inspection and cleaning, adjustment, fastening, adding, lubrication or replacement if necessary. C: Cleaning. R: Replace.

The running-in period of motorcycles is 600miles/1000km, so the riding speed should not exceed 50mph/80km/h for first 1000km.

Basic maintenance

1. Spark plug

A. Removal and cleanup



WARNING: Allow the engine and silencer to cool down before doing the following, to avoid the risk of burning.

1. Support the middle brace of the locomotive, loosen and remove the three screws of the right guard plate (1), remove the right side panel (2), and find the spark plug cap (3).

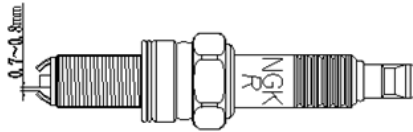
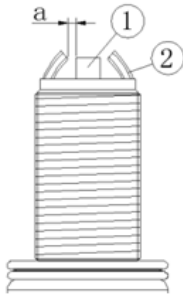


2. Remove the spark plug cap (3).



3. Remove the stain on the bottom of the spark plug with compressed air. Then use the spark plug wrench in the toolbox to unscrew it and remove it from the engine, taking care not to let dust or other substances enter the cylinder.

4. Check the spark plug electrode (1) and the intermediate ceramic (2) to ensure that there are no traces of carbon deposits or corrosion. If necessary, it can be cleaned with a suitable spark plug cleaning tool such as wire or brush, and then removed with compressed air to avoid the removal of carbon deposits entering the engine.



5. Check the electrode spacing with a feeler gauge. The spacing should be 0.7 - 0.8 mm. Adjust the spacing by bending the ground electrode if necessary.

B: Assembly fastening

1. Make sure the gasket is in good condition and fixed, and tighten it manually with the help of the spark plug sleeve (Z05).
2. Ensure that the spark plug cap is installed in place, and there will be no vibration loosening and affect the ignition function.

C: Technical parameters:

Standard spark plug: NGK CR8EKB

Spark plug electrode spacing: 0.7 - 0.8 mm

Spark plug locking torque: 12--14Nm .

 Reminder:

1. If the spark plug insulation material is cracked and the electrode corrosion is serious, the spark plug needs to be replaced.
2. Tighten the spark plug correctly, otherwise the engine may overheat and be damaged; Use only recommended spark plug models, otherwise engine duration and performance may be jeopardized.

2. Inspection and replacement of gear oil

 WARNING: Allow the engine and silencer to cool down beforehand, to avoid the risk of burning.

A: Check the process

1. Place scooter on mainstand (1), loosen and remove the dipstick (2).



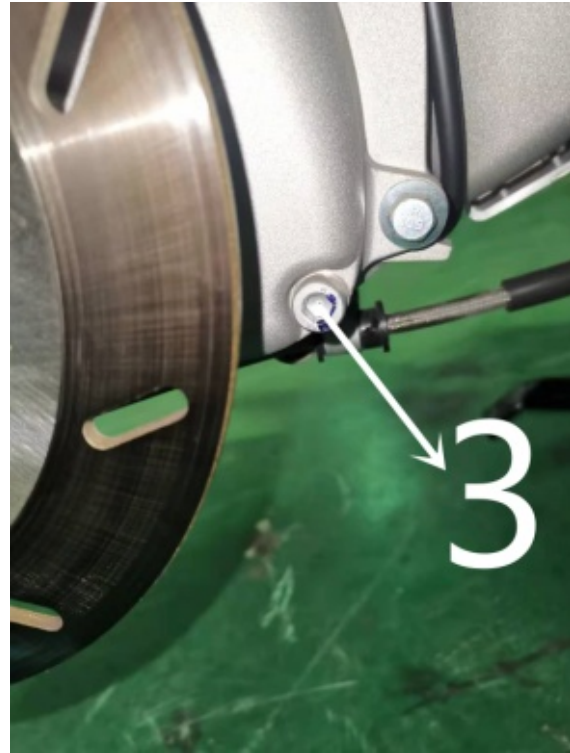
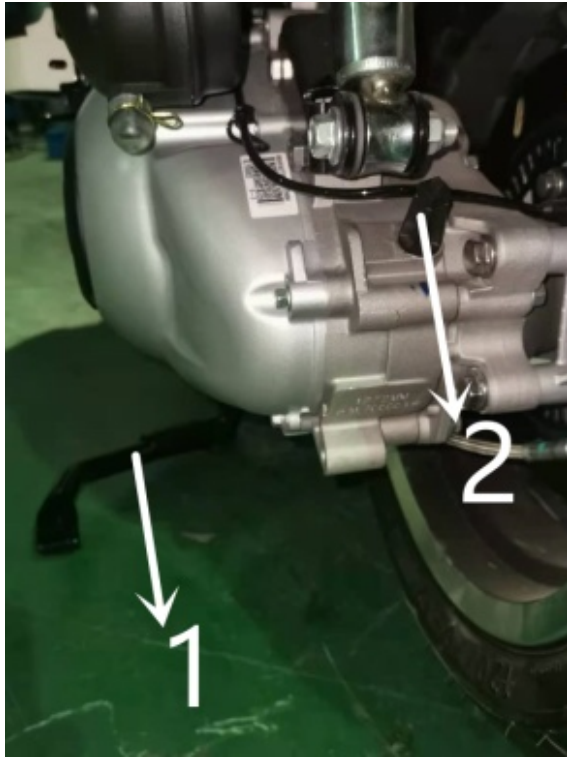
2. Check whether the oil quantity is sufficient (see the technical data), if it is insufficient, it must be topped up. Visually observe the color of the oil, if it is black or has iron filings, change the oil immediately.
3. Tighten the bolt (3). Tightening torque: 16--20Nm
4. Add oil to the gearbox from the plug (2) and tighten the plug (2).
5. Wipe the oil stains on the surface with a rag to confirm that there is no leakage.



Reminder: In the case of insufficient lubrication (low amount of oil), oil deterioration (excess use/age), and not using recommended oil, the wear of the moving parts will be accelerated, resulting in irreparable harm.

B: Engine oil replacement

1. Support the main stand of the scooter (1), loosen and remove the dipstick (2), loosen and remove the bolt (3), and drain the engine oil (prepare suitable containers in advance to collect waste oil).



2. Tighten the bolt (3). Tightening torque: 16--20Nm
3. Add oil to the gearbox from the dipstick port (2) and tighten dipstick (2).
4. Check whether the oil quantity meets the specified requirements, and if it is insufficient, it must be supplemented to the specified amount.
5. Wipe the oil stains on the surface with a rag to confirm that there is no leakage.

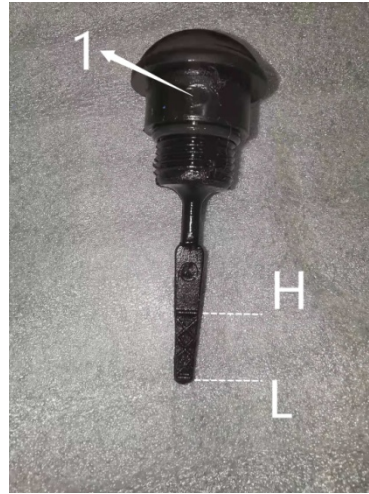
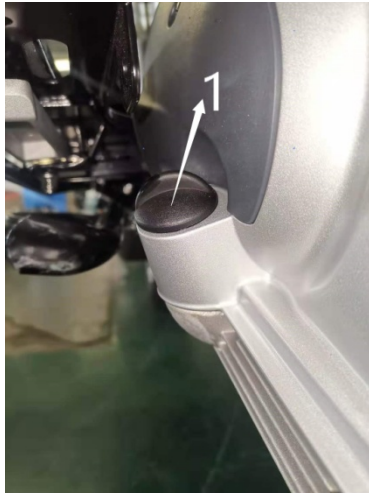
3. Inspection and replacement of engine oil



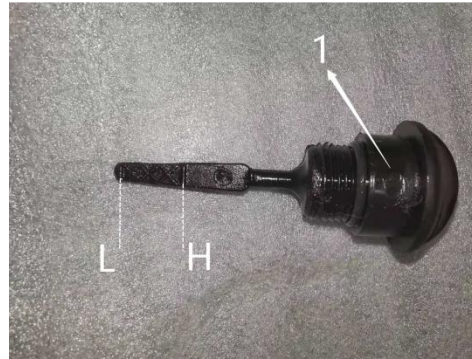
WARNING: Allow the engine and silencer to cool down, to avoid the risk of burning.

A: Check the amount of oil level

1. Place scooter on main stand, start the engine, let it idle for a few minutes, and then turn off the engine.
2. Wait about five minutes for the oil to cool down and return to the crankcase.
3. Loosen and remove the dipstick (1).




4. Wipe the oil on the dipstick (1) with a clean rag, insert the dipstick (1) into the dipstick port (**be sure not to screw back in**), take out the dipstick again (1) and observe whether the oil level is between "H" and "L". Visually observe the color of the oil, if it is black or has iron filings, change the oil immediately.



5. If the oil level is not close to the mark "H", please add a small amount of oil and wait for 5 minutes and check the oil level according to step (4) until it is close to the mark "H", screw in and tighten the oil dipstick (1).

6. Wipe the oil traces on the surface of the engine with a rag to confirm that there is no leakage.

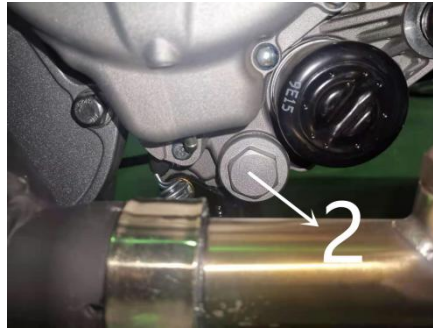
 **Reminder:** In the case of insufficient lubrication (low amount of oil), oil deterioration (excess use/age), and not using recommended oil, the wear of the moving parts will be accelerated, resulting in irreparable harm.

B: Replacement of engine oil

1. Support the main stand, loosen and remove the dipstick (1).



2. Loosen and remove the oil drain bolt on the right box (2), drain the oil (prepare a suitable container in advance to collect the waste oil).



(3) Replacement of oil filter

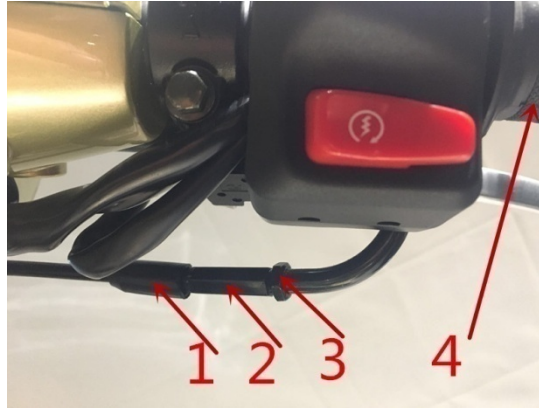
Use an oil filter wrench to loosen and remove the oil filter (do not re-use) and install a new oil filter (3);



4. Screw in and tighten the bolt (2).
5. Add about 1250ml of oil from the inlet of the dipstick (1).
6. Screw in and tighten the dipstick (1).
7. After starting the engine and running for a few minutes, stop the engine and cool down.
8. Check the engine oil level again to meet the specified requirements.

4. Throttle handle adjustment

The free travel of the throttle handle (4) should be 2-3mm, confirm and adjust as follows:



1. Slide out the protective cover (1).
2. Loosen the nut (3).
3. Rotate the bolt (2) to reach the specified value.
4. After the adjustment is completed, lock the nut (3) and check again to confirm the free travel.
5. Install the protective case (1).

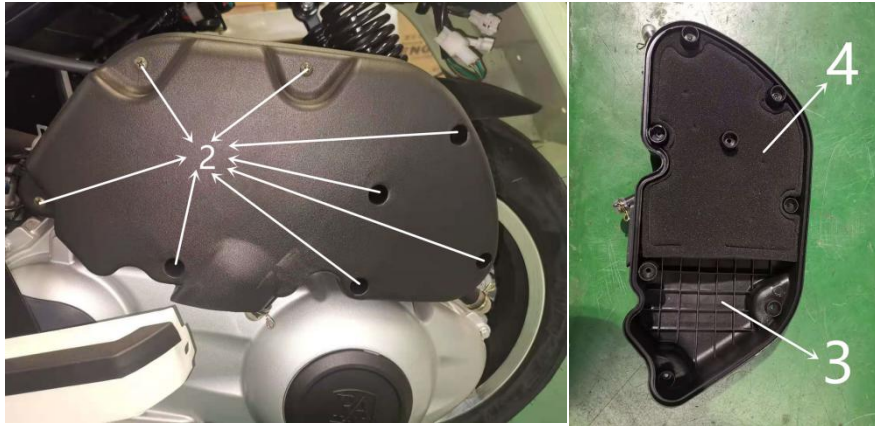
5. Clean air filter

The air filter element is polyurethane foam, if the filter element is clogged with dust, it will cause increased intake resistance, decreased output power, and increased fuel consumption, and must be inspected, cleaned or replaced according to maintenance intervals.

1. Place scooter on mainstand. Remove the left side panel by removing the 3 bolts (1).



2. Loosen and remove 8 screws (2)



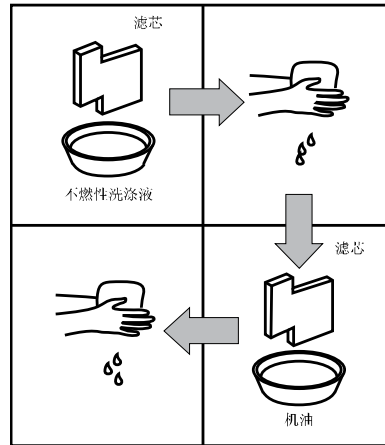
3. Remove the air filter cover (3) and filter element (4).

4. Check whether the filter element (4) is damaged and replace it if necessary

5. Filter element (4) cleaning:


- A suitably sized container is filled with a non-flammable water-soluble cleaning solvent and the filter element is immersed in the solvent for cleaning.
- Squeeze with the palms of both hands to squeeze the solvent out of the cleaned cartridge.

- Do not twist or twist the filter element to avoid tearing the filter element.
- Rinse in free-flowing warm water and dry the filter element with compressed air or a warm air dryer.
- Soak the filter element in clean engine oil and squeeze the excess oil out of the filter element to allow the oil to slightly wet the filter element.
- Reinstall the clean air filter elements in the reverse order in which they were removed. Absolutely ensure that the filter element is safely seated and properly sealed.



NOTE: Running the engine without a filter element increases engine wear.

6. Coolant inspection and replenishment

 **WARNING:** Allow the engine and silencer to cool down to avoid the risk of burning.

Remove the left side panel by removing the 3 bolts (1).



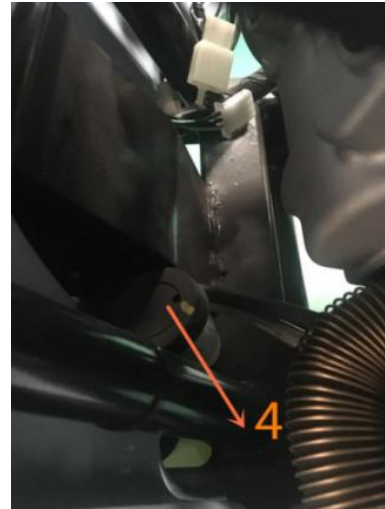
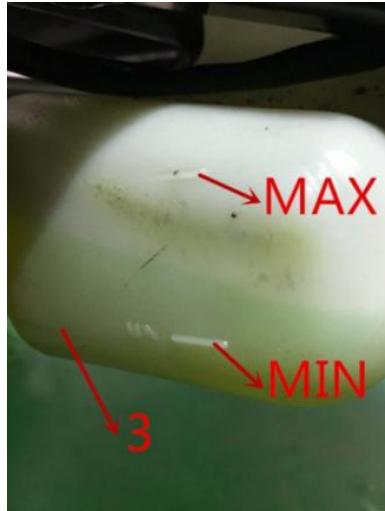
A: Water tank level inspection:

1. Loosen counterclockwise slowly but do not remove the tank cap (2).
2. Wait a few seconds so that possible pressure inside is released
3. Remove the tank cover (2).
4. Check the coolant level, if the liquid level is not visible or the liquid level is very deep to add, the liquid level is close to the water tank cover.

5. Screw clockwise into the tank cap (2).

B: Expansion tank liquid level inspection:

Confirm that the coolant level of the expansion box (3) is between the MIN and MAX shown, otherwise add coolant.



Add process:

1. Remove the plug (4) on the expansion box (3).

2. Add coolant until the liquid level is close to the mark "MAX", do not exceed the mark "MAX", otherwise the coolant will overflow during engine operation.

3. Load the plug (4).



Reminder: If the coolant transition loss or the expansion box is empty, check the cooling system for leaks.

7. Braking system

A: Brake fluid inspection and replenishment

1. Place scooter onto the main stand.
2. Check that the liquid level of the pump on the left and right brakes is above the marked "LOWER" scale line, if the liquid level is lower than the marked "LOWER" scale line, then check the friction shoe block and brake disc to confirm that there is no need to replace and add brake fluid.



Brake fluid addition:

- (a) Remove the 2 screws (1) and the upper pump cover (2).



! NOTE: To avoid the risk of brake fluid spillage, do not grip the brake lever after removing the 2 screws and mainly removing the upper pump cover.

(b) Add brake fluid to the proximity mark "MAX" mark



Reminder:

1. Only in the case that the friction shoe block is new, the liquid level to mark "MAX", the brake fluid level will gradually decrease with the wear of the friction shoe block.
2. When the friction shoe block and brake disc have been worn but do not need to be replaced, the liquid level must not exceed the marked "MAX" line, otherwise there is a risk of brake fluid overflow when replacing the new friction shoe block and brake disc in the later stage

(c) Assemble the pump cover and 2 screws in the sequence of 4, 3 and 2 (1).

B: ABS system check

Turn on the key, the instrument ABS indicator lights up until the ABS lights go out after the front and rear wheels move at the same time.



If the ABS indicator does not light up or the front and rear wheels move at the same time, the ABS light does not go out.

1. Check the gap between the front wheel Hall sensor (1) and the front wheel counting chainring (2), and ensure the gap is 1.0--1.6mm. If it is exceeded, check and adjust the position of the Hall sensor (1).

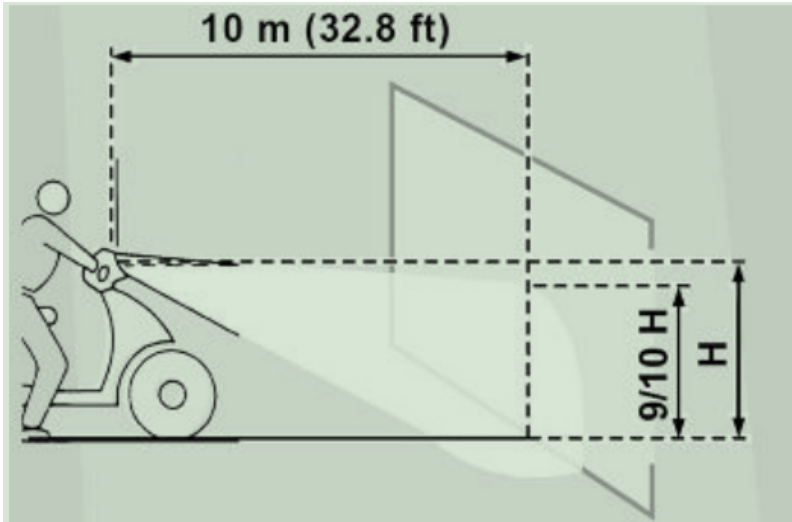
2. Check the gap between the rear wheel Hall sensor (3) and the front wheel counting chainring (4), and ensure the gap is 0.5--1.6mm. If it is exceeded, check and adjust the position of the Hall sensor (3).



8. Front headlight line inspection and adjustment:

A: Quick check of light light

1. Place the motorcycle as shown flat on floor [not on stand], making sure to distance 10m from the vertical wall and the ground level.



2. Turn on the dipped beam, sit on the locomotive, and detect that the light of the lamp shining on the wall should be a little below the horizontal straight line of the headlight (about 9/10 of the total height).

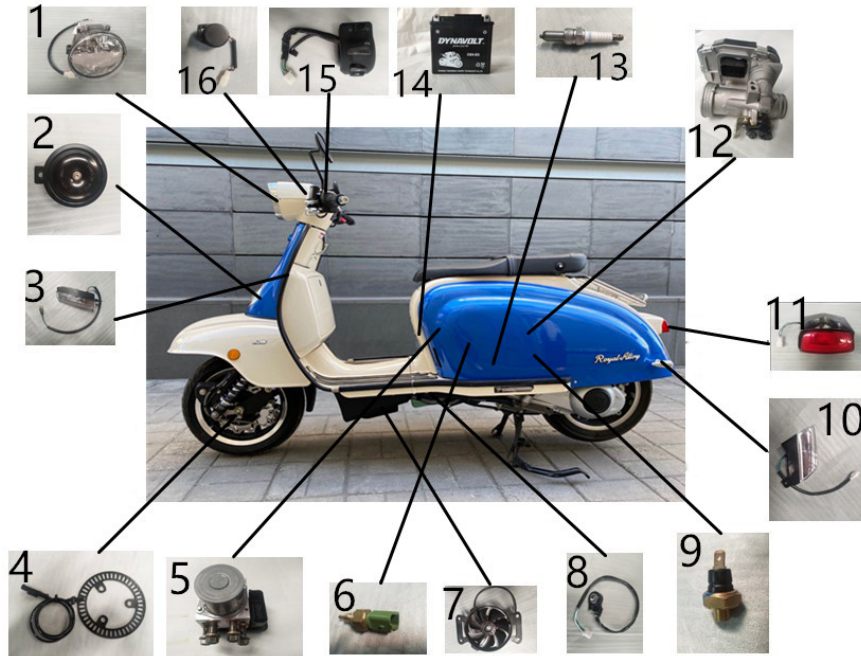
B: Adjustment of headlights

Use a No. 5 inner hexagonal wrench to loosen the headlight adjustment bolt (1); Pushing the bolt in the R direction (1) lowers the headlight line, and when pushing the bolt in the direction F (1), the headlight line is raised.



4. Electrical systems

First, the arrangement of electrical components:





1. Headlights; 2. Horn; 3. Front left and right turn signals; 4. Wheel speed sensor; 5. ABS unit; 6. Water temperature sensor; 7. Fan; 8. Side stand cutout switch; 9. Oil pressure sensor; 10. Rear left and right turn signals; 11. Rear tail light; 12. Throttle body and control unit assembly; 13. Spark plug; 14. Battery; 15. Left handle switch; 16. Buzzer; 17 fuel injection nozzle; 18. Start motor; 19. Voltage regulator; 20. Magnetomotor; 21. Insurance portfolio; 22. Oxygen sensor; 23. Ignition coil; 24. Starting relay; 25. Fan, oil pump, headlight relay; 26. Dumping valve; 27. USB; 28. Electric lock; 29. Right handle switch; 30. Instrumentation; 31. Oil pump; 32. Gasoline sensor;

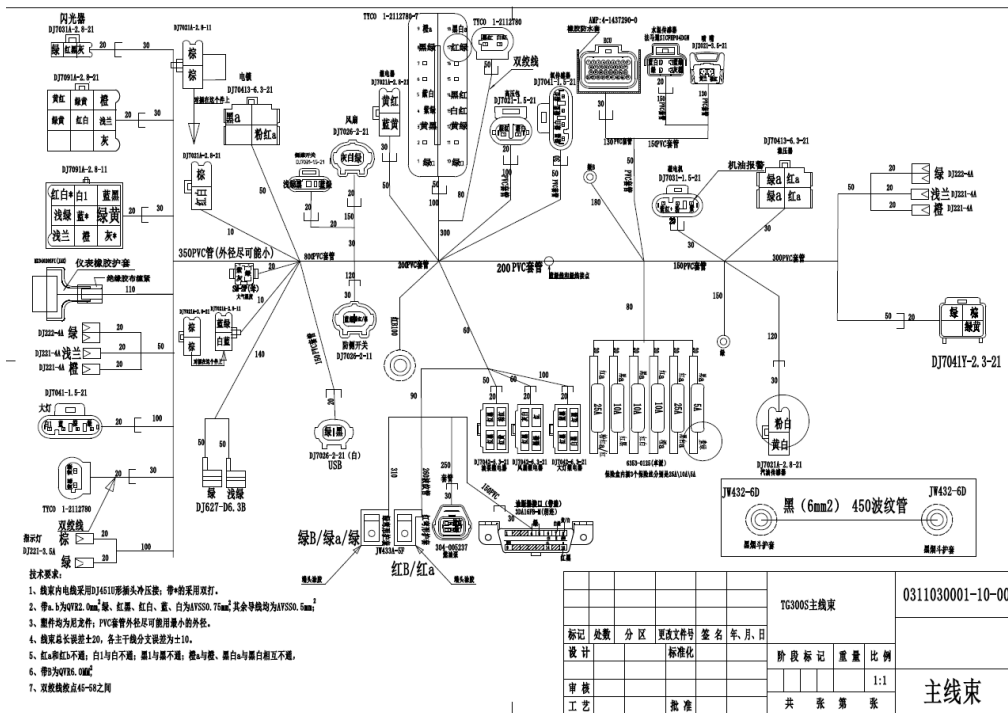


Second, the indication of the dashboard

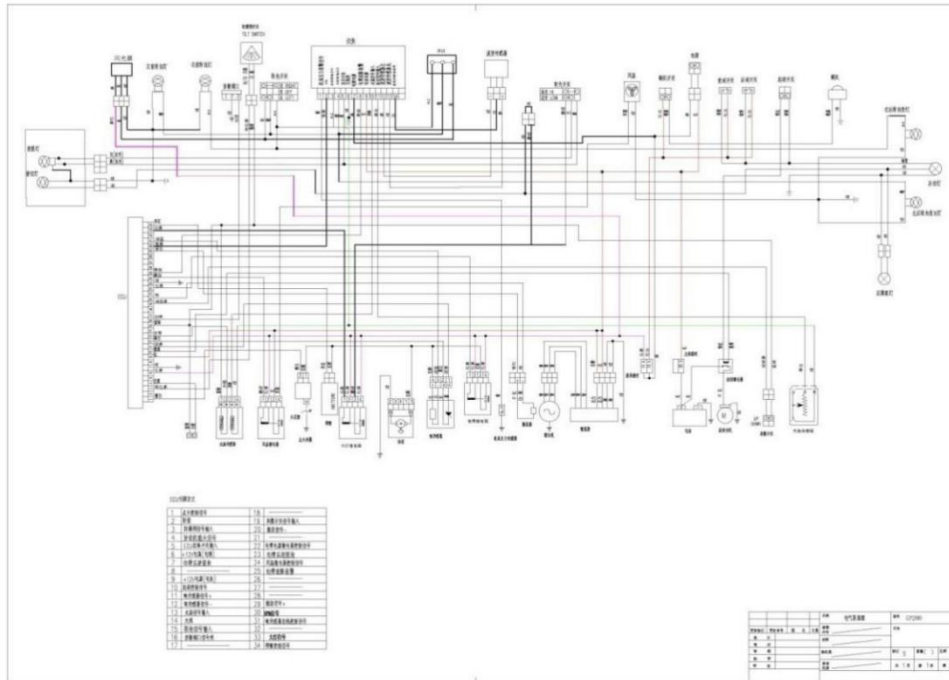
1. Time indication;
2. Bluetooth;
3. Engine speed indication;
4. Atmospheric temperature;
5. Speed indication;
6. Water temperature indication;
7. Single travel time;
8. Total mileage;
9. Right turn indicator;
10. Oil pressure warning light; If it is long and bright while driving, it needs to be repaired or consult a dealer;
11. "MODE" button, ignition key to go to the "ON" position, the function is as follows:
Clear the records for TRIP and TRIP Time, press "MODE" and hold Approximately 5 seconds, released when displayed as 0.
12. Engine failure warning light; If it is long on while driving, it needs to be repaired or consult a dealer.

13. ABS fault warning light, if it is long on during driving, it needs to be inspected/repaired consult the dealer.
14. Water temperature warning light: if it is long on during driving, it needs to be repaired or consult the dealer;
15. High beam indicator;
16. "SET" button, ignition key to go to the "ON" position, the function is as follows:
 - A: Press the "SET" button shortly: kilometers and miles switch between each other;
 - B: Long press the "SET" key: enter the date, clock settings, at this time the date and month digits flash, short press the "MODE" key to adjust, short press the "SET" key to shift, Set month-day-year-hour-minute-AM/PM in turn, press and hold the "SET" key to save and exit after setting, and automatically save and exit if there is no other operation exceeding 15S during this operation.
- 17、 Left turn indicator;
- 18、 Date indication;
- 19、 Number of miles per trip;
- 20、 Petrol gauge;


5. Wiring harness diagram



The wiring harness schematic



4. Engine removal

 NOTE: Wash the engine thoroughly with an appropriate cleaner before removing engine associated parts.

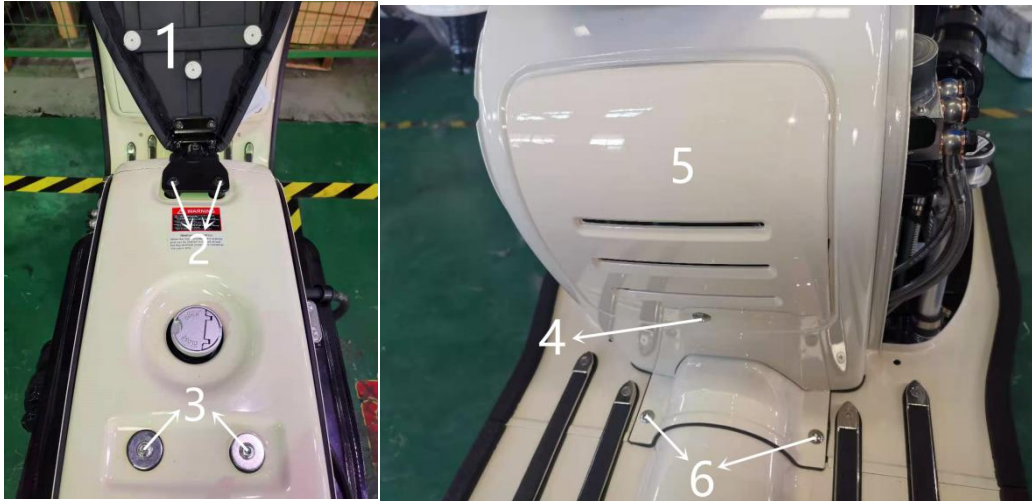
First, remove the left and right guards

1. Remove 6 bolts (1) and remove the right panel (2) and the left panel (3).



Second, remove the centre cover / hoop.

1. Loosen and remove 2 bolts (2), remove the seat cushion (1), loosen and remove 2 bolts (3).
2. Loosen and remove 1 bolt (4), remove the battery cap plate (5), loosen and remove 2 bolts (6).



3. Loosen and remove the 4 bolts (7) and remove the luggage rack (8).

4: Loosen and remove the two nuts (Fig. 9) and remove the rear taillights (Fig. 10).

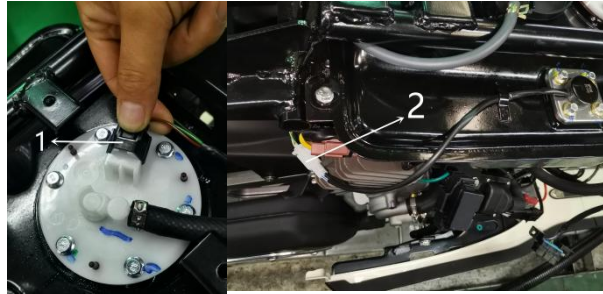


5、 Loosen and remove the 2 bolts (Figure 11) and remove the middle cover.

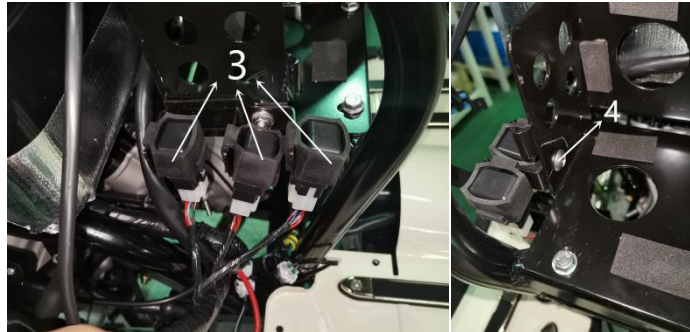


Third, remove the fuel tank

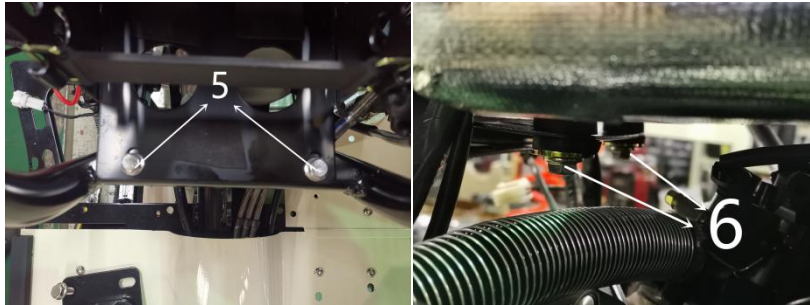
1. Disconnect the oil pump plug (1) and the oil level sensor plug (2);



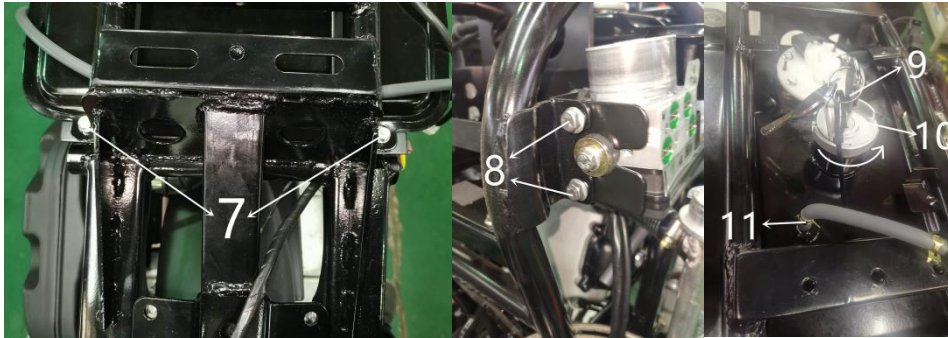
2. Remove 3 relays (3), loosen and remove 1 bolt (4), remove the relay bracket;



3. Loosen and remove 4 bolts (5) (6) and remove the battery holder;



4. Loosen and remove the 2 bolts (7), remove the bolt securing the ABS (8), and insert the key (9) into the tank lock (10) Rotate counterclockwise together with the lock cover to remove the tank lock, loosen the clamp and pull out the air pipe (11).

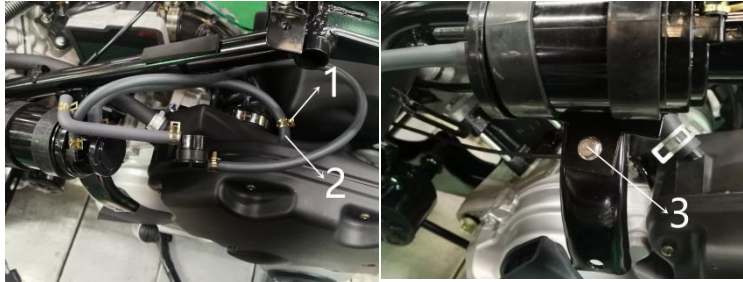


6、 Remove the tank by pinching and unplugging the high-pressure tubing quick coupling (Figure 12) by hand.

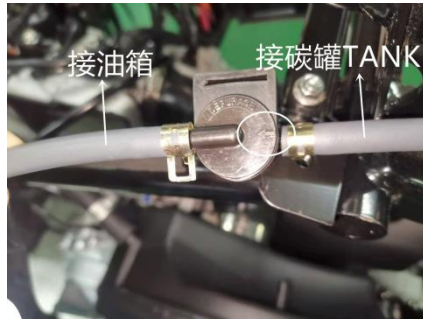


Remove the fuel evaporation system

1. Loosen the clamp (1), pull out the air pipe (2), loosen and remove 1 bolt (3), and remove the carbon canister;

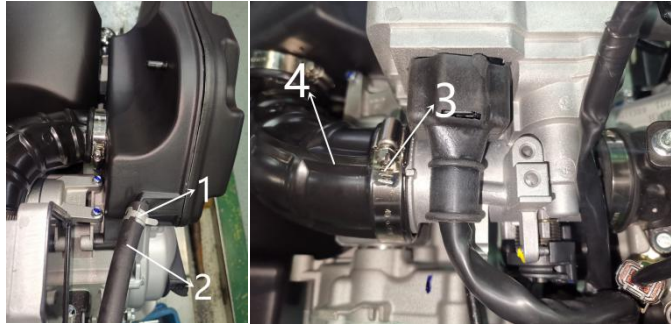


Reminder: Each tubing in the system does not need to be disassembled, if it is disassembled and assembled, pay attention to: connect the tilt valve arrow direction to the carbon canister "TANK" interface.



5. Remove the air filter

1. Unclamp (1) and separate the air pipe (2), Twist the clamp (5) to separate the air filter outlet pipe (6)



2. Loosen and remove 3 bolts (5), remove the air filter;

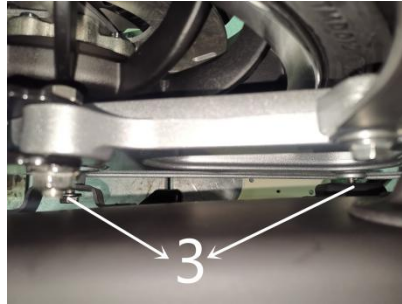



6. Remove the exhaust system

1. Loosen but do not remove the clamp bolt (1), loosen and remove the bolt (2)



2. Loosen but do not remove the 2 bolts (3), remove the silencer (4)




 Reminder: Check the graphite sleeve after each disassembly of the silencer (6), and replace the inner hole if it is damaged or broken.

3. Disconnect the oxygen sensor plug (8)



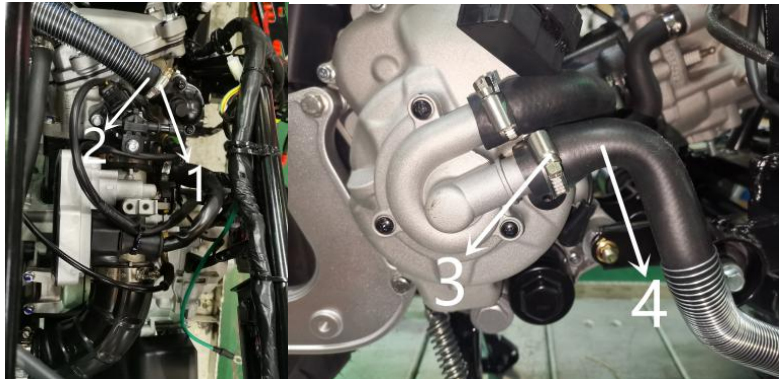
5. Remove 2 nuts (7) and remove the exhaust pipe;




 NOTE: When reassembling, screw in the 2 nuts (7) and bolts (2) initially but do not lock, and then lock the 2 nuts (7) after the clamp bolt (1) is locked and bolts (3).

7. Drain the coolant

1. Loosen the clamp bolts (1, 3), slide out the water pipe (Figs. 2, 4), and collect the coolant into the container prepared in advance.



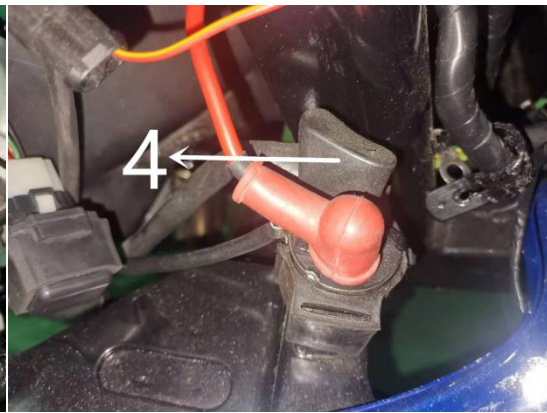
 Reminder:

Removing the expansion box cap helps coolant drain.

Raising the front wheels at least 55cm above the ground allows optimum drainage of coolant in the system circuit.

8. Remove the connecting plug

1. Pull out the spark plug cap (1)

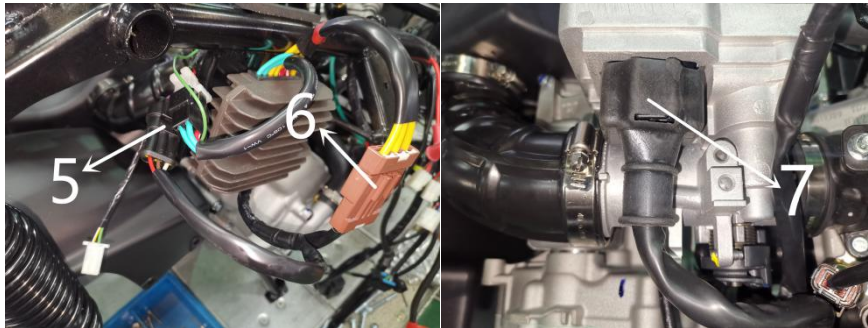


2. Disconnect the plug of the water temperature sensor (2)

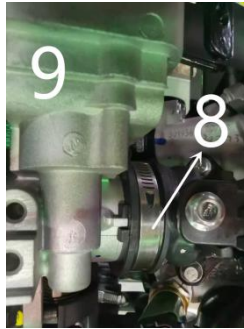
3. Disconnect the injector plug (3)

4. Disconnect the cable plug of the starter motor (4)

5. disconnect the magneto plug (5) and disconnect the regulator plug (6)



6. Disconnect the ECU plug (7)



7. Loosen the clamp (8) and remove the throttle body (9)

8. Loosen and remove the bolt (10), remove the grounding wire; Remove the grounding wire and tighten the removed bolt to prevent loss;



9. Remove the rear wheel


1. Loosen and remove the bolts (1 and 2), remove the right rear shock absorber (3);



2. Loosen and remove the four bolts (4) (5) and nuts (6), and remove the rear flat fork (7);

3. Hold the left brake lever (8), loosen and remove the 5 bolts (9), and remove the rear wheel (10);



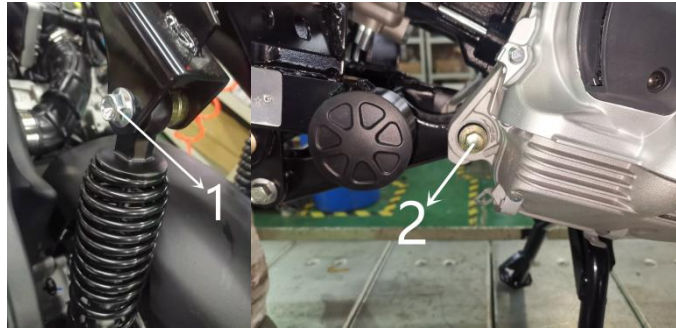
 Reminder: The bolt thread part of (13) is coated with Loctite 243 thread glue when reassembling; Tightening torque: 60Nm.

4. Loosen and remove 2 bolts (11), remove bushings (12) and brake discs (13);



10. Remove the engine


1. Loosen and remove 1 bolt (1) to remove the left rear shock absorber from the frame; loosen and remove the engine fixed shaft nut (2), do not remove the fixed shaft;



2. Reconfirm that the connection of the engine has been removed, remove the shaft, and remove the engine.



11. Reassembly

 Reminder: The reassembly is carried out according to the above reverse process, according to the required

tightening torque

(5) Engine disassembly and maintenance



NOTE: Clean the engine thoroughly with an appropriate cleaner before disassembling it so that impurities do not enter the inside of the engine.

Basic principles:

1. Replace rubber parts

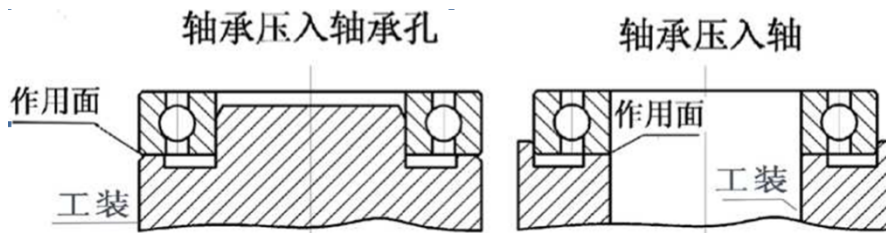
In principle, if the engine is disassembled for more than 2 years, it is recommended to directly replace the rubber parts such as oil seals and O-rings, and check the crankshaft oil seal (F2) and the drive shaft oil seal (1) within 2 years. Whether the lip is damaged or aged, otherwise replace.

2. Tightening torque according to standard

If the nut tightening torque is not specified, see the "Screw Tightening Torque Reference Value Table" and GB 1231-2006 bolt torque standard

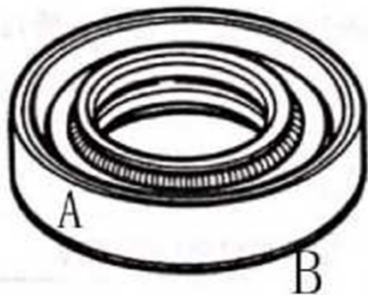
3. Bearing assembly principle

When replacing a bearing, the principle is that the new bearing is pressed into the bearing bore or shaft in such a way that the outer and inner rings of the bearing must not be stressed at the same time, otherwise the bearing may be damaged again or produce noise.



4. Oil packaging and matching principle

If the oil seal is conditionally coated with a little anaerobic glue on the A side when replacing, the B side at the bottom of the oil seal is the stressed surface, and the uniform force should be ensured when tapping, and a little butter should be applied to the lips when replaced; In particular, it should be noted that the oil seal spring should be checked for integrity during assembly.




First, check and adjust the compression pressure: insufficient compression pressure will lead to insufficient power or difficulty in starting.

1. Check:

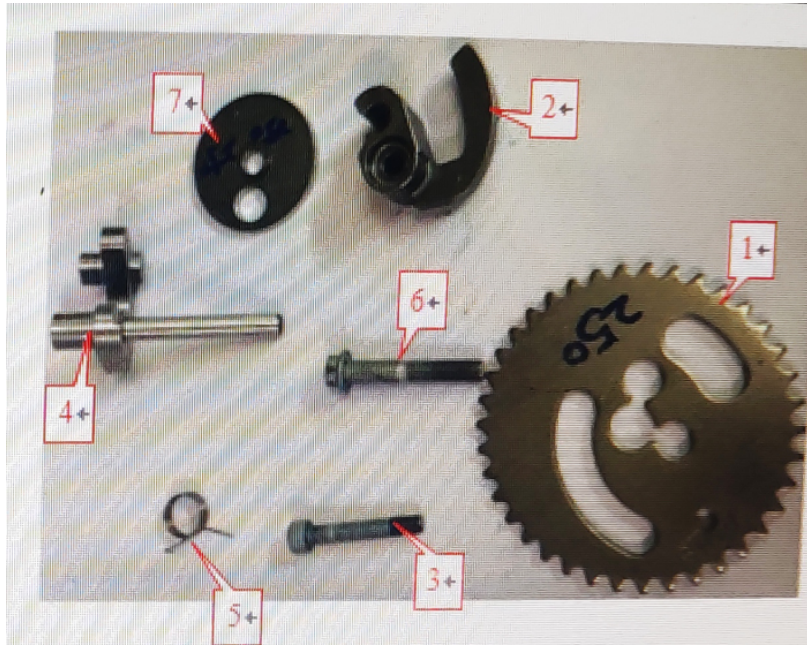
- Valve clearance, exceeding the specified value => adjustment, see section "**Valve clearance adjustment**".
- Start the engine, warm up for a few minutes and shut down.

2. Removal of pressure relief mechanism:

- removal of bolts (6) and gaskets (7);
- remove the return torsion spring (5) and the pressure reducing valve combination (4);
- Again assemble the gasket (7) and bolt (6), bolt (6) tightening torque 11–13Nm;

 **Reminder:** After the cylinder pressure is tested, assemble the reset torsion spring (5) and pressure reducing valve combination (4).





3. Remove:

- Spark plug.
- Note: Before removing the spark plug, blow off the surrounding dirt with compressed air to prevent it from falling into the engine.

4. Installation:

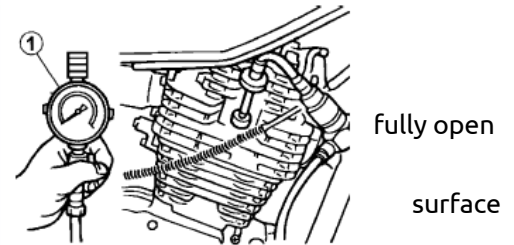
- Pressure gauge (1).

5. Measure:

- Compression pressure, start the engine when the throttle is until the compression reading is stable.

If the maximum allowable pressure = > check the cylinder head, valve and piston head for carbon deposits.

If it falls below the minimum pressure = > spray a few drops of oil into the cylinder and measure again.



As shown in the following table:

Compression pressure (injection of oil into the cylinder)	
reading	diagnosis
Higher than when there is no oil	The piston is worn or damaged
Same as when there is no oil	Piston rings, valves or seals of cylinder heads or pistons can be damaged => repaired

Compression pressure:

Standard value:

1100kPa (11kg/cm²)

Minimum value:

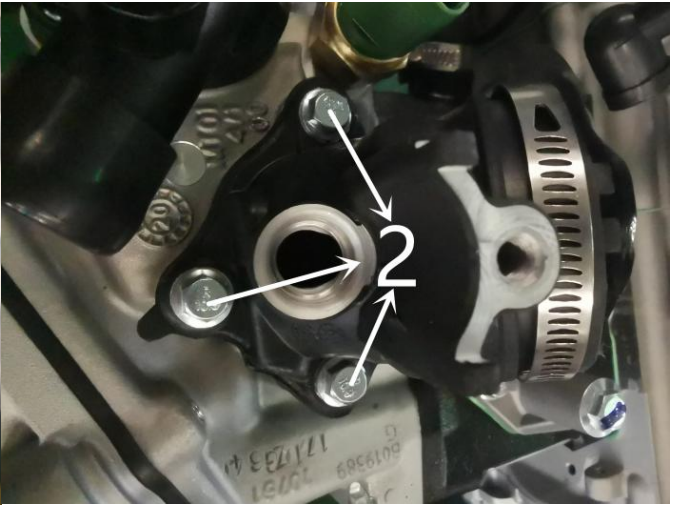
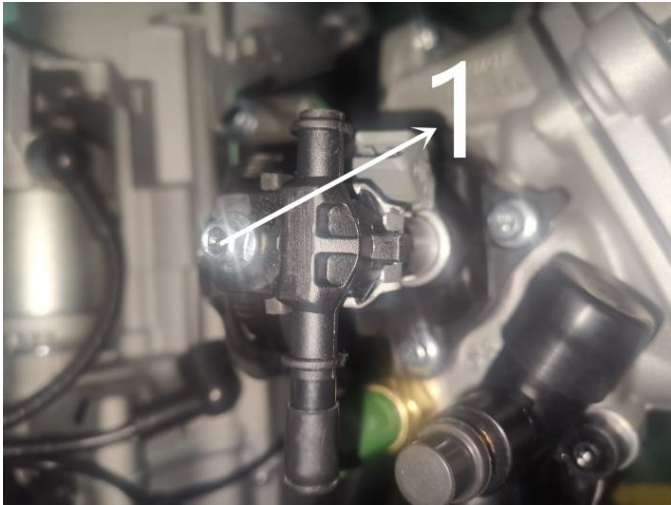
950kPa (9.5kg/cm²)



Reminder: After the cylinder pressure test is completed, it is assembled in reverse order.

Second, disassemble and install the intake manifold

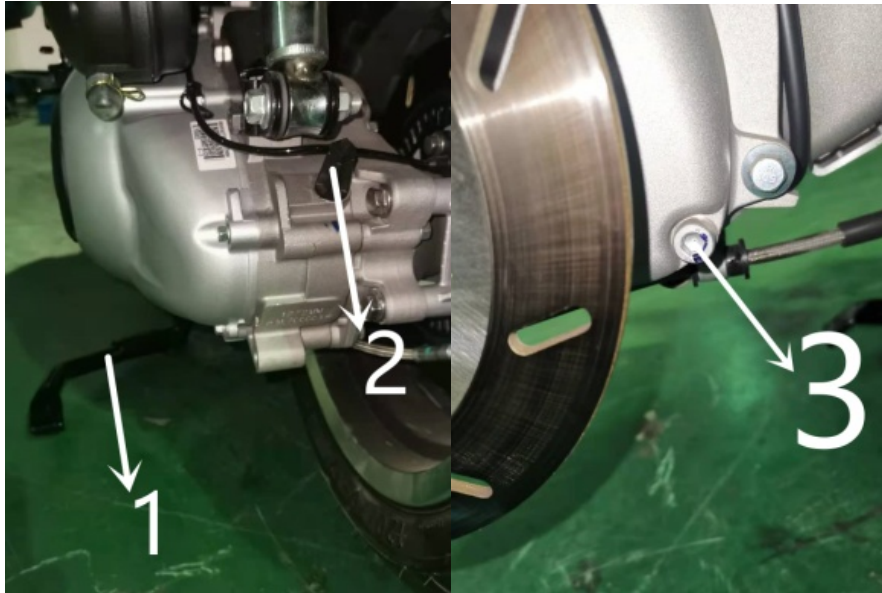
1. Remove the bolt (1) and remove the fuel injection nozzle;
2. Remove the 3 screws (2) and remove the intake manifold;



Third, drain oil and refuel

1. Drain oil from the gearbox

Loosen and remove the gearbox drain bolt (3) and drain the oil (prepare a suitable container in advance to collect the gear oil).



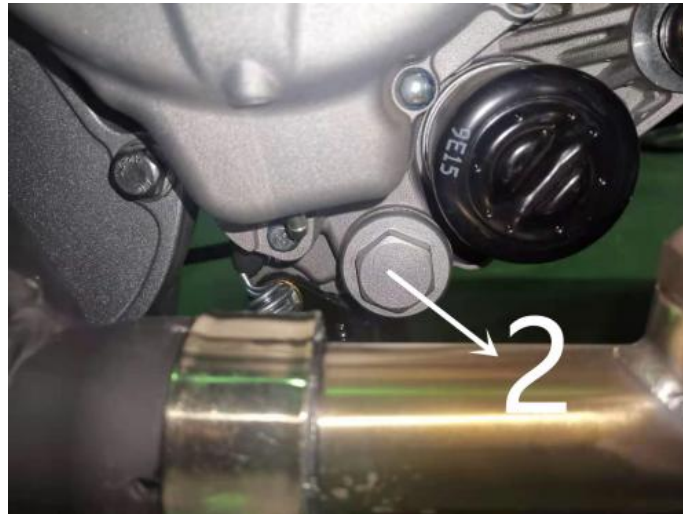
Reassembly Notes:

(1) Rear gearbox: 75W/80 lubricating oil 200 C C.

(2) The tightening torque of the oil drain bolt (3) is $25\text{N} \cdot \text{m}$

2. Oil drainage from crankcase

Loosen and remove the crankcase drain bolt (2) and drain the oil (prepare suitable containers in advance to collect the oil).



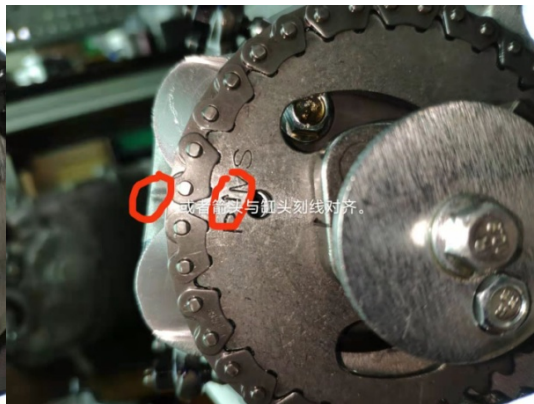
Reassembly Note :

(1) Crankcase: 10 W/40 lubricating oil 1000C C , it is recommended to use the grade APL SJ above grades.

The tightening torque of the drain bolt (2) is 24 to 30N • m

Fourth, the adjustment of valve clearance:

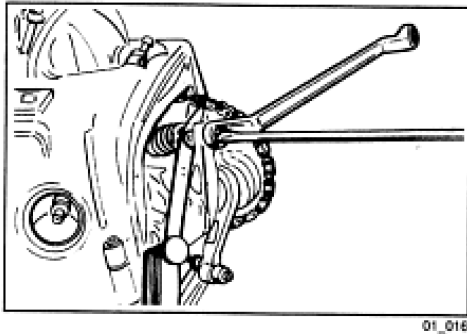
1. When checking the valve clearance, the timing mark of the valve mechanism must be aligned according to the following instructions.



- 2、
- Check with a thick gauge that the gap between the valve and the adjustment gasket meets the specified value. If the intake and exhaust valve clearances are different from the following specified values, loosen the locknuts according to the figure and adjust the valve clearance.

Intake valve (cold engine state): 0.10mm

Exhaust valve (cold state): 0.1to 5mm



5. Cylinder piston grouping:

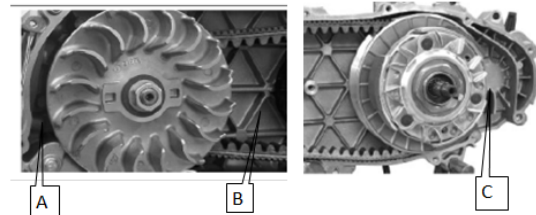
1. The cylinder piston is divided into four groups of MNOP, which correspond to the assembly, and the assembly of different groups is not allowed.
2. The piston triangular arrow points to the exhaust port side of the cylinder.



6. Disassembly and assembly inspection of CVT

1. Lock the clutch cover of the driven pulley with a special tool.

Remove the nut, clutch cover, and driven pulley assembly.
Check the cleanliness of the belt cavity and blow the air gun to clean all dust (A&B&C) from all parts of the cavity.



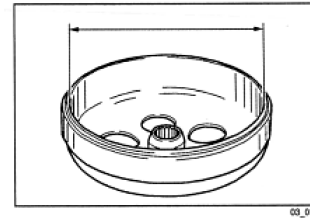
2. Check whether the clutch cover is worn or damaged.

Measure the inner diameter of the clutch cover.

Standard value: $\varnothing 134 \pm 0.2 / 0 \text{ mm}$

Maximum: $\varnothing 134.5 \text{ mm}$

Note: Check eccentricity: 0.20mm max.



3. Inspection and installation of clutch 'shoe'

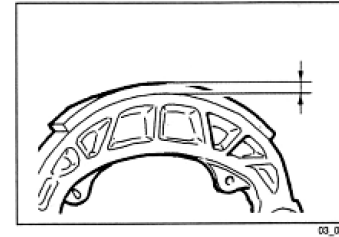
Check the minimum thickness of the friction material of the shoe piece, the minimum thickness: 1mm.

Check the cam and shaft seat for wear;

Check whether the spring is worn or damaged;

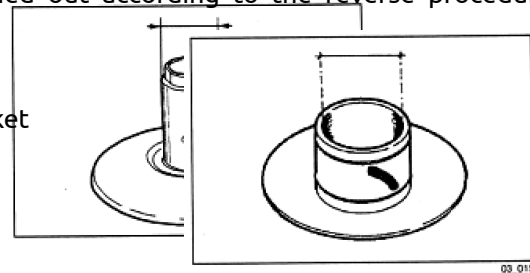
If an anomaly is found, the 'shoe' should be replaced;

The installation of the shoe with spring assembly is carried out according to the reverse procedure of disassembly.



shoe piece, the

4. Check and measure the outer diameter of the pulley slide jacket



Minimum allowable diameter: $\phi 40.950\text{mm}$

Standard diameter: $\phi 41(-0.015/-0.035)\text{mm}$

5. Remove 2 leather bowls and 2 sealing rings, and measure the inner diameter of the sliding sleeve of the moving driven disk

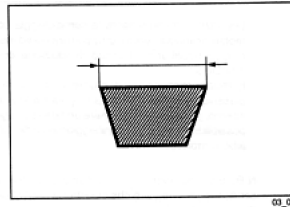
Maximum permissible diameter: $\phi 41.08\text{mm}$

Standard diameter: $\phi 41(+0.035/0)\text{mm}$

6. Check the transmission belt for damage

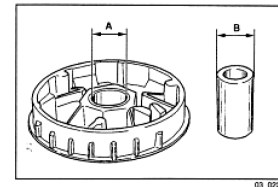
Check belt width: Minimum width: 19.5mm

Standard value: $21.3 \pm 0.2\text{mm}$



7. Active wheels

(1) Check whether the active wheel bushing indicated in the figure has abnormal wear phenomenon, and



measure the inner diameter A.

- Maximum permissible diameter: $\varnothing 26.12\text{mm}$
- Standard diameter: $\varnothing 26 (+0.021/0)\text{ mm}$

Note: Never lubricate or clean the bushing.

(2) The outer diameter B of the active roller slide sleeve indicated in the measurement drawing.

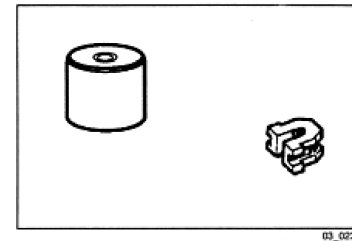
- Minimum permissible diameter: $\zeta 25.95\text{mm}$
- Standard diameter: $\zeta 26(-0.02/-0.041)\text{mm}$

(3) Check whether the roller is damaged or worn.

- Minimum permissible diameter: $\zeta 20\text{mm}$
- Standard diameter: $\zeta 21 \pm 0.1\text{mm}$

(4) Check whether the roller pressure plate is worn.

(5) Check the wear of the roller groove and belt contact surface on the moving disk and fixed disk.



Reassembly Notes:

(1) Check and confirm: the sealing surface of the clutch roller (Puli bead) is opposite to the clutch rotation direction.

(2) Active wheel nut (coated with Loctite 243 thread glue), tightening torque 70 to 80N, m .
Driven wheel nut (coated with Loctite 243 threaded glue), tightening torque 55 to 65 N *m.

7. Maintenance of the engine

1. Starting the engine should gently operate the throttle to start. After 30~60s of operation, it will be moderately opened. Do not accelerate immediately after the cold engine starts, wait for 1~3min of operation before accelerating.

2. When starting electrically, each starting time should not exceed 5s, and each start should be separated by 10 seconds. If it cannot be started for 5 consecutive times, check whether there is a fault, and it is strictly forbidden to press the start button again after starting and running.

3. After the engine starts normally, idle for 3~5 seconds, let the engine lubrication system start working before driving. At the same time, pay attention to avoid running at high speeds and heavy loads before the engine is warmed up.

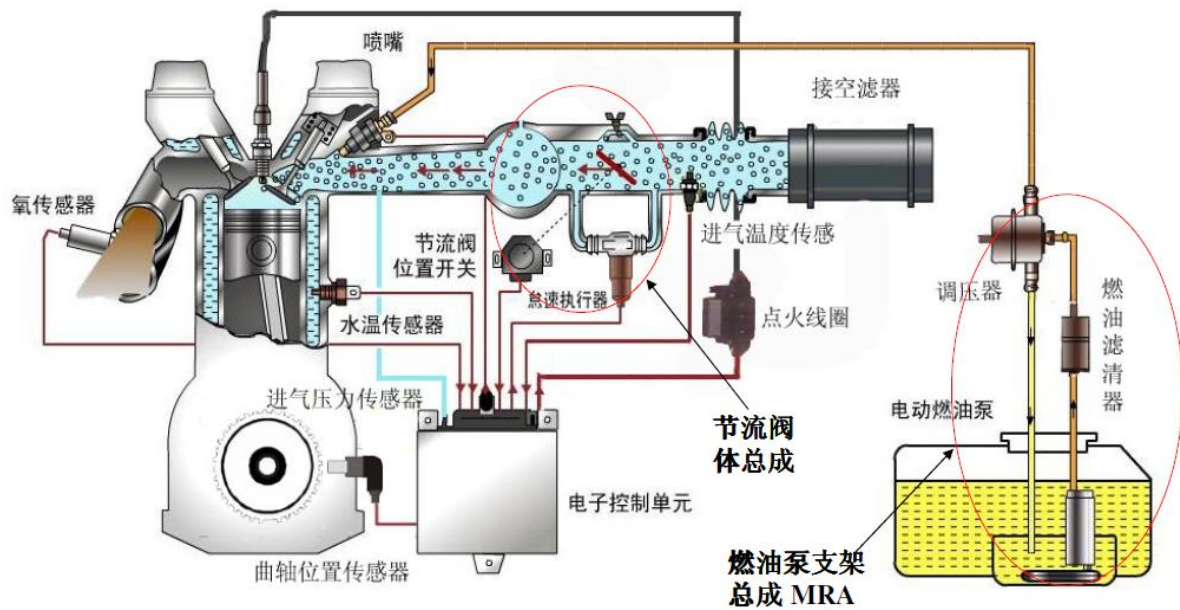
4. After the new machine is installed on the motorcycle, during the driving period of the first 1000 kilometers, it cannot be operated at high speed for a long time, nor can it make its speed exceed 80% of its maximum speed. Do not allow the throttle valve to operate with it fully open. After driving 500 km, a repair should be carried out to compensate for the slight wear during the running-in period in order to ensure the good performance of the engine.

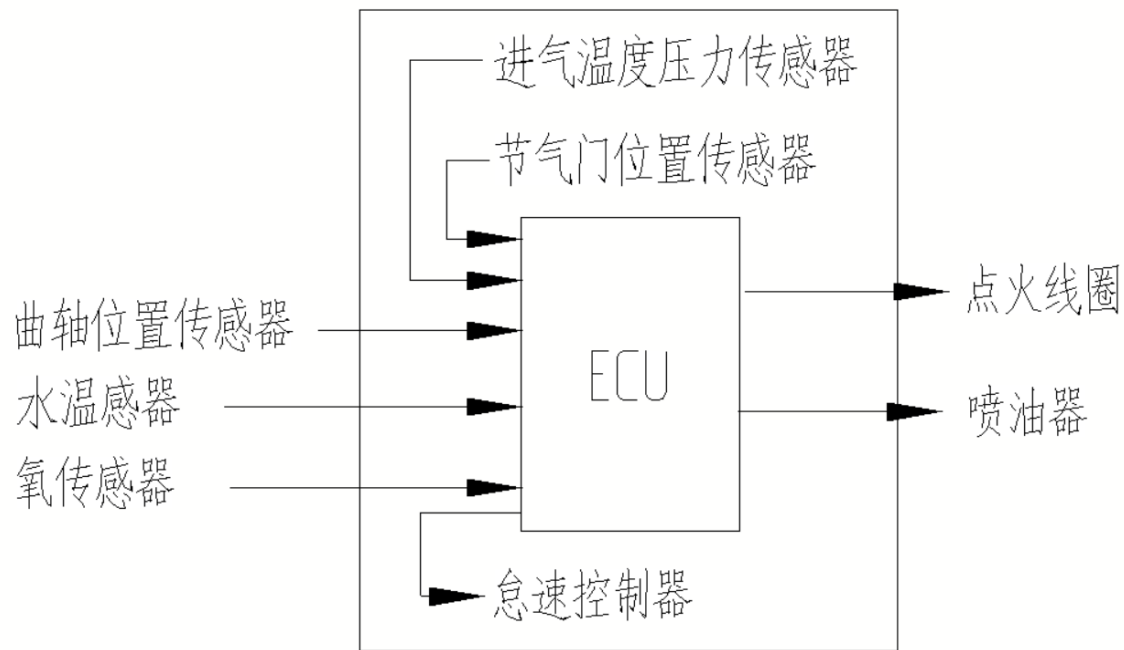
5. Check and clean the air filter every 10,000 kilometers, mainly to check the sealing of each joint surface of the air filter, and remove the sand and dust on the inner cavity and filter element of the air filter. Pay attention to the sealing of each joint surface during assembly, replace or repair the parts that have lost the sealing effect, ensure the air filtration effect, extend the service life of the engine piston and cylinder block, and effectively avoid

the occurrence of burning engine oil or insufficient power.

(6) EFI system

This model uses Magneti Marelli EFI system, the schematic diagram is as follows:





The fuel supply circuit consists of oil pump assembly (including filter, pressure regulator), high-pressure oil pipe and fuel injector;

The ignition circuit consists of ECU, high-voltage coil, high-voltage wire, spark plug cap and spark plug.

1. Instructions for the maintenance of EFI system

1. Special note: Please use genuine parts, otherwise the normal operation of the EFI system cannot be guaranteed. some

Although the installation size and external dimensions of EFI parts are similar, the performance parameters are not the same at all.

2. Precautions for the maintenance process (important items, please read carefully).

(1) When disconnecting and connecting the connector, be sure to turn off the ignition switch, otherwise the electrical device may be damaged.

(2) The fuel supply pressure of the EFI system is high (about 250kpa), and all fuel lines are made of high-pressure resistant oil pipes. High fuel pressure is also maintained in the oil circuit for a long time after the engine stops. Therefore, do not easily disassemble the oil pipe during the maintenance process, and the fuel system should be depressurized before disassembling the oil pipe, and the pressure relief method:

- support the middle brace of the locomotive;

- Disconnect the plug-in connection between the oil pump assembly harness and the vehicle wiring harness;
- Start the engine until the engine automatically goes out, then turn on and off the ignition key 2-3 times in a row, each time with an interval of 3 seconds, and then turn off the key switch;
- After completing the above operations, the oil pipe can be removed, and after the oil pipe is reinstalled, the oil pump assembly harness plug is reconnected.

(3) Do not turn on the power when removing the fuel pump from the fuel tank to avoid electric sparks causing fire.

(4) The fuel pump is not allowed to run in dry state or water.

(5) The adjustment of idle speed is completely solidified by the EFI system program, and manual adjustment is not required. The throttle limit screw of the throttle body is adjusted at the factory, and the user is not allowed to change its initial position at will.

(6) When the engine is running, it is not allowed to disassemble the battery.

Second, the system fault diagnosis function introduction

On-board diagnostic system abbreviated as OBD, is the abbreviation of **On-Board Diagnostic**. When the system fails, the fault light (MIL) or check engine warning light is on, and the OBD system will store the fault information in memory. The relevant information can be read in the form of fault codes via standard diagnostic instruments and diagnostic interfaces. According to the prompt of the fault code, the maintenance personnel can quickly and accurately determine the nature and location of the fault.

1. Fault information recording

The electronic control unit continuously monitors the sensor, actuator, related circuit, fault indicator and battery voltage, etc., and even the electronic control unit itself, and detects the reliability of the sensor output signal, actuator drive signal and internal signals (such as lambda closed-loop control, cylinder temperature/coolant temperature, idle speed control and battery voltage control, etc.). Once a certain link is found to be faulty, or a signal value is not trustworthy, the electronic control unit immediately sets fault information records in the fault memory of RAM. The fault information record is stored in the form of a fault code, and the fault code that has always existed is called the current fault code; transient faults due to poor contact, etc., and the current record that has disappeared is a historical fault code; Troubleshooted, but not cleaned up the fault code operation is also stored in the fault memory as historical fault codes.

2. Fault code table

P0110	Air temperature sensor	Inlet air temperature sensor
P0115	Water temperature sensor	Water temperature sensor
P0120	Throttle position sensor	Throttle position sensor
P0130	Lambda sensor	Oxygen sensor

P0135	Lambda sensor heater	Oxygen sensor heater
P0201	Injector	nozzle
P0230	Fule pump relay	Oil pump relay
P0335	Engine rpm sensor	Engine speed sensor
P0351	Coil high tension	Ignition voltage
P0480	Fan relay	Fan relays
P0505	Idle control actuator	Idle control unit
P0530	Light relay	Headlamp relays
P0560	Battery voltage	Battery voltage
P0611	Data buffering...	Data buffering tips.... (non-faulty).

3. Description of fault indicator and its control strategy

The fault indicator is generally an indicator that can be displayed on the meter and is shaped to meet the requirements of regulatory standards.

The instructions for working with the fault indicator are as follows:

(1) In normal mode with no current fault code

Turn on the ignition switch, the ECU initializes, the fault light turns on, and the MIL light goes out immediately

after the engine starts successfully.

(2) When the current fault code is present

At the time of engine operation, if the current fault occurs, the fault light changes from off to continuous on, alerting the driver that a fault has occurred. When the engine is extinguished, the current fault is converted into a historical fault and stored in the EFI ECU.

(3) There is a fault code

In special cases, the key switch can be turned off for more than 10 seconds, and then quickly switch the key 5 times to reset the ECU, the ECU reset will clear all self-learning data, and there may be some abnormal situations in the whole vehicle after reset, and the ECU is required to return to normal after completing adaptive learning again.

4. Connection and use of diagnostic instrument:

Diagnostic instrument functions: read fault code, clear fault code, data flow display, status identification display, etc.



(1) Connect the diagnostic instrument to the diagnostic interface on the EFI harness;



(2) Turn on the ignition switch;

(3) Read the fault code; Check the maintenance manual to confirm the faulty part and type; Develop maintenance plans based on inquiry information and experience;

(4) After troubleshooting, use the fault diagnostic instrument to clear the historical fault code.

5. Diagnostic process for maintenance according to fault symptoms

A. Before starting the steps of fault diagnosis according to engine fault symptoms, a preliminary inspection should be carried out first:

(1) Confirm that the engine fault indicator is working normally;

- (2) Check with a fault diagnostic instrument to confirm that there is no fault information record;
- (3) Confirm the existence of the fault phenomenon complained by the owner, and confirm the conditions under which the fault occurs.

B. Then conduct visual inspection:

- (1) Check whether the fuel pipeline is leaking;
- (2) Check whether the intake pipeline is blocked, leaked, flattened or damaged;
- (3) Check whether the high-voltage line of the ignition system is broken and aging;
- (4) Check whether the grounding of the wiring harness is clean and firm;
- (5) Check whether the connectors of each sensor and actuator are loose or have poor contact;

Important: If the above phenomenon exists, the maintenance operation is carried out for the fault phenomenon first, otherwise it will affect the subsequent fault diagnosis and maintenance work.

6. Common fault symptoms:

- (i). When starting, the engine does not rotate or rotates slowly.

General fault parts: 1. Battery; 2. Starting motor; 3. Wiring harness or starting relay and related control circuits;

4. Engine mechanical part.

General diagnostic process:

Item No.	Detection steps	Next steps
1	Use a multimeter to check the voltage between the two terminal posts of the battery to see if it is about 9-12V when the engine is started.	Replace the battery
2	The ignition switch is kept in the starting position, and check with a multimeter whether the terminal post of the positive terminal of the starting motor has a voltage of more than 9V.	Check the wiring related to the starter motor
3	Disassemble the starter motor and check the working condition of the starter motor. It is important to check for open circuits or jamming due to poor lubrication.	Repair or replace the starter motor
4	If the fault occurs only in winter, check whether the resistance of the starting motor is too large due to improper selection of engine lubricating oil.	Change to the appropriate lubricating oil
5	Check that the internal mechanical resistance of the engine is not excessive and that the starting transmission system is working properly.	Overhaul the inside of the engine

(ii). When starting, the engine can turned over but cannot be started successfully.

General fault parts: 1. The fuel tank is oil-free; 2. Fuel pump; 3. Speed sensor; 4. Ignition coil; 5. Engine

mechanical part.

General diagnostic process:

Item No.	Procedure	Next steps
1	Connect the EFI system diagnostics, observe the "engine speed" data item, start the engine, and observe whether there is a speed signal output.	Overhaul the speed sensor circuit and speed sensor
2	Remove the spark plug cap, attach the spark plug, put the spark plug on the engine body, start the engine, and check whether there is a continuous spark.	Overhaul the ignition system
3	Connect the fuel pressure gauge, turn on the key switch, and check whether the fuel pressure is around 250KPa. If there is no fuel pressure gauge, you can pinch the hardness of the high-pressure oil pipe by hand.	Overhaul the oil supply system
4	Check the pressure of the engine cylinder and observe whether the engine cylinder has insufficient pressure.	Troubleshoot engine mechanics (pay attention to check whether the engine valve clearance is too small).

5	Remove the injector from the intake pipe (the oil circuit and wiring harness connectors are not removed), start the engine, and check for fuel injection.	Overhaul injector lines and injectors
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(iii). Difficult to start.

General fault parts: 1. Fuel contains water; 2. Fuel pump; 3. Coolant temperature sensor; 4. Injector; 5. Ignition coil; 6. Throttle body and idle bypass airway; 7. Air intake; 8. Ignition timing; 9. Spark plug; 10. Engine mechanical part.

General diagnostic process:

Item No.	Procedure	Next steps
1	Pull down the coolant temperature (cylinder head temperature) sensor connector, start the engine, and observe whether the engine starts successfully at this time.	Servicing the wiring or replacing the coolant temperature (cylinder head temperature) sensor
2	Connect the fuel pressure gauge, turn on the key switch, and check whether the fuel pressure is about 250KPa (preliminary hand pinching can be judged).	Overhaul the oil supply system

3	Remove the spark plug cap, attach the spark plug, put the spark plug on the engine body, start the engine, and check for strong spark.	Overhaul the ignition system
4	Gently add the throttle and observe if it starts easily.	Clean the throttle and idle airways
5	Check that the air filter is not blocked and that there is no air leakage in the intake tract (especially the relevant connections of the intake pipe).	Overhaul the air intake system
6	Check the spark plug to see if its model and clearance meet the specifications.	Adjust or replace
7	Check the engine cylinder pressure to see if there is insufficient cylinder pressure.	Troubleshoot engine mechanics (pay attention to check whether the engine valve clearance is too small)
8	Check that the fuel label (and whether it contains ethanol) meets the requirements of the whole vehicle.	Change the fuel

(iv). , normal start, idle unstable.

General fault parts: 1. Fuel contains water; 2. Injector; 3. Spark plug; 4. Throttle body and idle bypass airway;

5. Air intake; 6. Idle speed regulator; 7. Ignition timing; 8. Spark plug; 9. Engine mechanical part; 10. Coolant temperature (cylinder temperature) sensor.

General diagnostic process:

Item no.	Procedure	Next steps	remark
1	Check that the air filter is not blocked and that there is no air leakage in the intake system.	Overhaul the air intake system	
2	Check if the throttle is issued.	Wash or replace	
3	Check the spark plug to see if its model and clearance meet the specifications.	Adjust or replace	
4	Check the throttle body and idle bypass airway for carbon deposits.	cleaning	
5	Check that the fuel label (and whether it contains ethanol) meets the requirements of the whole vehicle.	Change the fuel	

6	Check the engine cylinder pressure to see if there is sufficient cylinder pressure.	Troubleshoot engine mechanics (pay attention to check whether the engine valve clearance is too small)	
7	Check that the ignition sequence and ignition timing of the engine meet the specifications.	Overhaul ignition timing	
8	Check the injector for leaks, blockages, or out-of-specification flow.	Replacement of faults	
9	Pull the coolant temperature sensor connector, start the engine, and observe whether the engine is idle and unstable during warm-up.	Repair the wiring or replace the sensor	Unstable idle during warm-up

(5) The starting is normal, and the idle speed is too high.

General fault parts: 1. Throttle body and idle bypass airway; 2. Idle speed regulator; 3. Coolant temperature sensor;

4. Ignition timing.

General diagnostic process:

Item no.	Procedure	Next steps
1	Check if the throttle cable is stuck or too tight, causing the throttle to not close completely.	adjust
2	Check the intake system for air leaks.	Overhaul the air intake system
3	Remove the idle regulator and check for carbon deposits in the throttle body, idle regulator, and idle bypass airway.	Cleaning of related parts
4	Pull down the coolant temperature sensor connector, start the engine, and observe whether the engine is idle too high at this time.	Repair the wiring or replace the sensor
5	Check that the engine's ignition timing meets specifications.	Overhaul ignition timing

(6) When accelerating, the speed does not go up or stalls, the acceleration response is slow, and the acceleration weakness performance is poor.

General fault parts: 1. Fuel contains water; 2. Intake pressure sensor and throttle position sensor; 3. Spark plug; 4. Throttle body and idle bypass airway; 5. Air intake; 6. Idle speed regulator; 7. Injector; 8. Ignition timing; 9. Exhaust pipe.

General diagnostic process:

Item no.	Procedure	Next steps	remark
1	Check the air filter for blockages.	Overhaul the air intake system	
2	Connect the fuel pressure gauge, start the engine, and check whether the fuel pressure of the engine is about 250kPa under full working conditions.	Overhaul the oil supply system	
3	Check the spark plug to see if its model and clearance meet the specifications.	Adjust or replace	
4	Remove the idle regulator and inspect the throttle body, idle regulator, and idle bypass airway for carbon deposits.	Cleaning of related parts	
5	Check whether the ECU unit and its wiring are normal.	Repair the wiring or replace the ECU assembly	
6	Check the injector for leaks or blockages.	Replacement of faults	

7	Check that the fuel label (and whether it contains ethanol) meets the requirements of the whole vehicle.	Change the fuel	
8	Check that the ignition sequence and ignition timing of the engine meet the specifications.	Overhaul ignition timing	
9	Check whether the exhaust pipe is exhausted smoothly.	Repair or replace the exhaust pipe	
10	Remove the spark plug cap, attach the spark plug, put the spark plug on the engine body, start the engine, and check whether there spark.	Overhaul the ignition system	
11	Check for clutch slip, low tyre pressure, brake drag, and whether the user has adjusted the final gear ratio.	Repair	Poor acceleration weakness

Third, the disassembly and assembly of the injector

1. Disconnect the oil pump connector, start the engine until the engine automatically extinguishes, and remove the fuel tank.

2. Press the push-in connector button with both fingers at the same time to pull out the push-in connector.



3. Disconnect the injector connector



4. Disassemble the bolt and remove the injector.



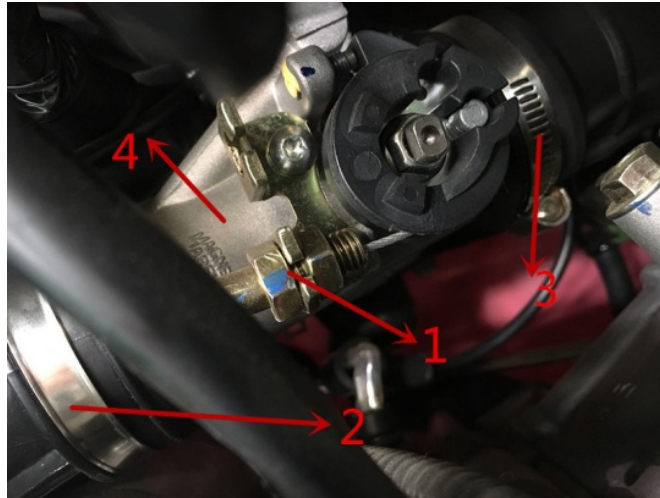
5. Assemble according to the above reverse process during assembly.

Fourth, the disassembly and assembly of the throttle body

1. Remove the fuel tank
2. Disconnect the plug



3. Disconnect the throttle line (1).



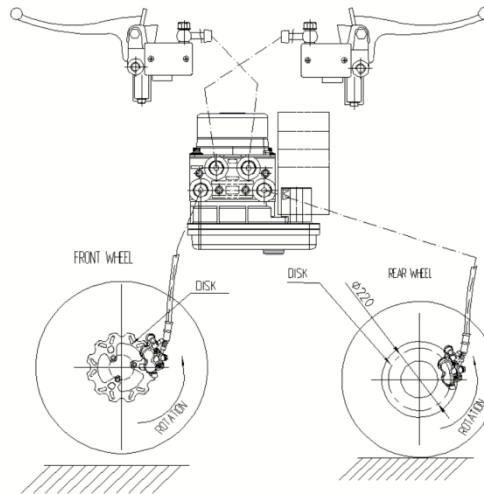
4. Loosen the clamp between the air filter and the throttle body (2), and loosen the clamp connecting the throttle body and the intake manifold (3).
5. Remove the throttle body (4).
6. Assemble according to the above reverse process during assembly.

(7) Braking system:

The scooter is equipped with a two channel ABS brake system: one front disc brake, one rear disc brake, ABS integrated unit.

Operate the right brake lever to apply pressure to the front caliper.

Operate the left brake lever to apply pressure on the rear caliper.

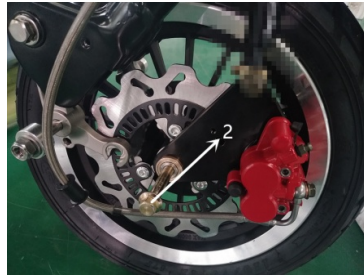


First, the front brake calipers and brake discs are removed:

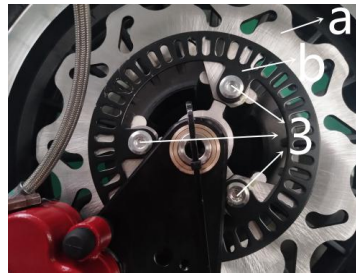
1. Place scooter on main stand, loosen and remove the bolts (1). Tightening torque M8: 25Nm.




2. Loosen and remove the front wheel axle bolt (2) and remove the front wheel. Tightening torque M12: 60Nm.



3. Loosen and remove 3 bolts (3), remove the brake disc (A) and the ABS rotor (B).




 Reminder: The bolt thread part of Figure 4 is coated with Loctite brand 243 thread glue when reassembling;
Tightening torque M8: 25Nm.

4. Loosen and remove 2 nuts and 2 built-in bolts (4).




Remove 2 friction pads (5).



 Reminder: Do not operate the brake lever after the friction pad(s) is/are removed, otherwise the caliper plunger will come out and cause brake fluid leakage.

6. The inspection and replacement of friction pads and brake discs are described in Part III below.

 Note: Reassembly is carried out according to the reverse process above.

Second, the rear brake calipers and brake discs are removed

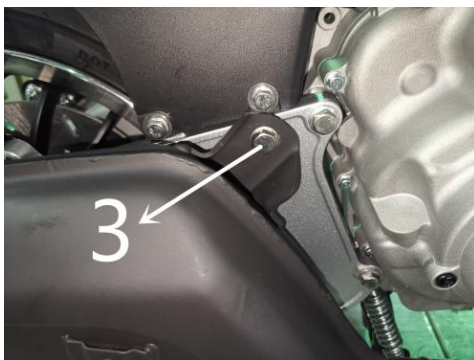
1. Support the middle brace of the locomotive, loosen and remove the three bolts of the right protective plate (Figure 1), and remove the right protective plate.



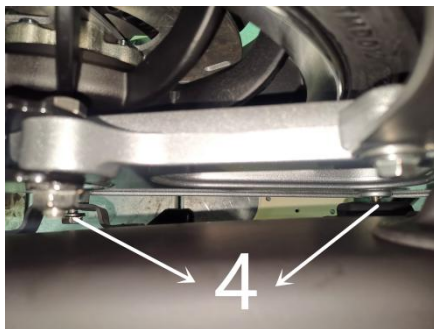
2. Loosen but do not remove the bolt (2).



3、 Loosen and remove the bolts (3).



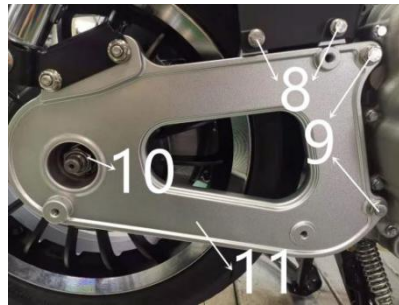
4. Loosen but do not remove the 2 bolts (4) and remove the silencer.



5. Loosen and remove the bolts (5 and 6), and remove the right rear shock absorber (7).




6. Loosen and remove the bolts (8, 9) and nuts (10), and remove the rear flat fork (11). NUT (10) TIGHTENING TORQUE: 100NM



7. Hold the left brake lever (12), loosen and remove the 5 bolts (13), and remove the rear wheel. Tightening torque M12



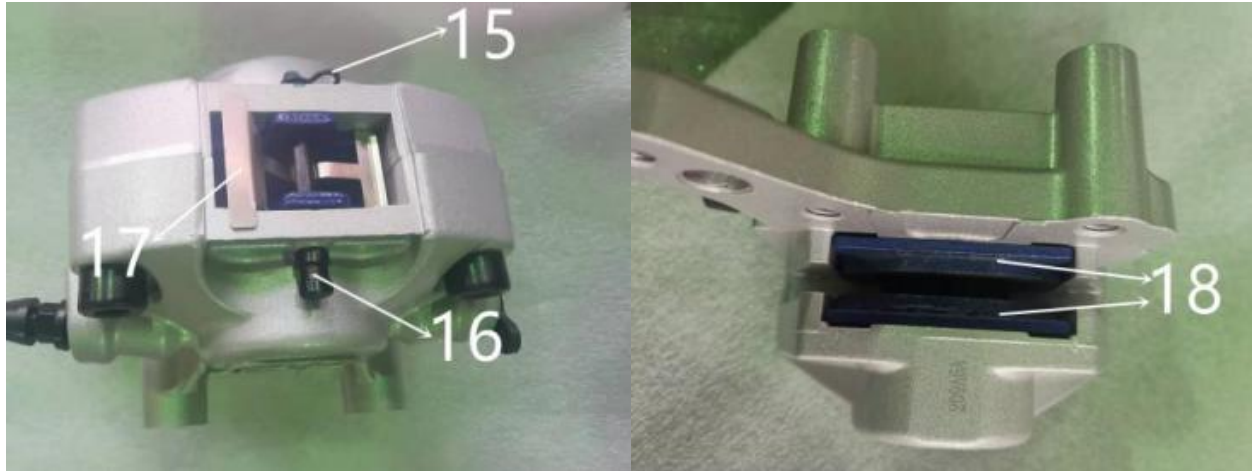
 Reminder: The bolt thread part of Figure 4 is coated with Loctite brand 243 thread glue when reassembling;
Tightening torque: 60Nm.

8: Loosen and remove the 2 bolts (14) to remove the brake disc and rear calipers. Tightening torque M8: 25Nm.




10. Remove the clamp (15), pull out the pin shaft (16), remove the spring plate (17), and pay attention to the spring plate (17) to assemble it in the direction of the drawing.

Remove the friction hoof block (18).



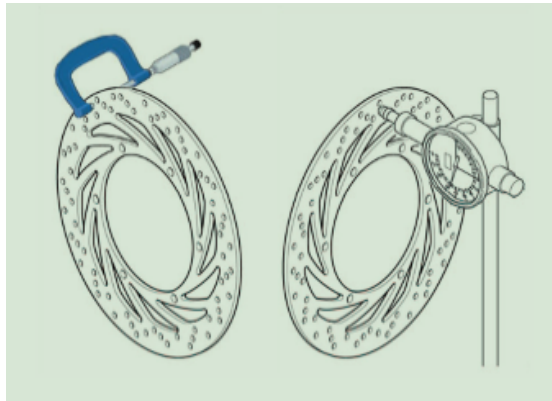
⚠️Reminder: Do not operate the brake lever after the friction shoe block is removed, otherwise the caliper plunger will come out and cause brake fluid leakage.

12. The inspection and replacement of friction shoe blocks and brake discs are described in Part III below.

 Note: Reassembly is carried out according to the reverse process above.

Third, the front and rear friction shoe block and brake disc inspection

1. Check and replace the brake disc

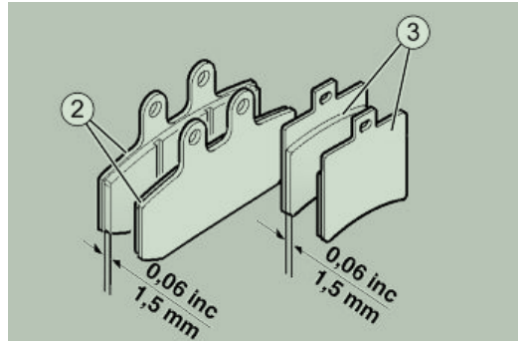


(1) Carry out visual inspection of the surface, and replace it if there is serious scratch or rust.

(2) Use a micrometer to measure the thickness at multiple points on the circumference of the brake disc, and replace it if the minimum thickness is less than or close to the minimum limit (3.6mm).

(3) Use a dial indicator to measure the runout of the brake disc, and replace it if it exceeds the tolerance limit (0.3mm).

2. Rub the shoe block to check and replace



(1) Figure 2 is the front brake friction shoe block, and Figure 3 is the rear brake friction shoe block.

(2) Measure the thickness of friction materials with vernier depth calipers (Figure 2 and Figure 3), as long as the thickness of one friction material is reduced to 1.5mm, two friction shoe blocks need to be replaced at the same time.

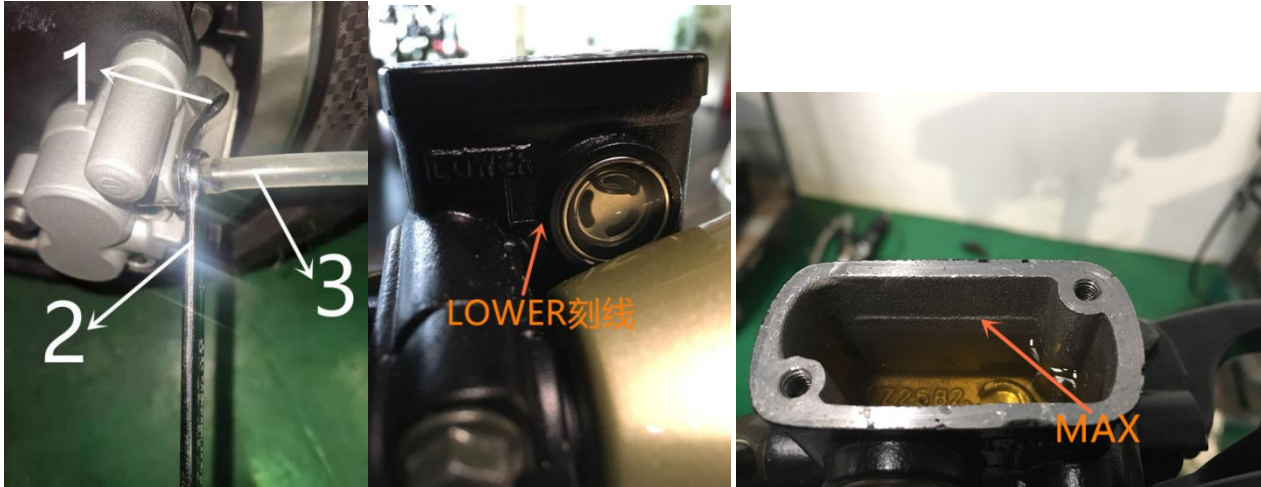
5. Remove the brake fluid circuit bubbles.

Considering the danger to the locomotive and the rider, it is necessary to remove air bubbles from the brake fluid circuit after modifying or restoring the brake system.

1. Front brake fluid system

(1) Pull out the rubber cap of the bleed valve (1).

(2) Insert a plastic transparent tube (3) into the bleed valve (2), and a container is connected to the other end of the tube (3) to collect the discharged brake fluid.



(3) Quickly press and release the right brake lever several times, and then press the right brake lever hard without letting go.

(4) Loosen the valve (2) 1/4 turn to allow the brake fluid to flow into the container. Release pressure on the brake

lever until the end of the stroke.

(5) Repeat the above operation until there are no bubbles in the brake fluid entering the container.



Reminder: During the operation, always check the brake fluid level in the upper pump reservoir, and add it in time can not be drained, otherwise bubbles will be generated in the pipeline.

(6) Tighten the bleed valve (2) and remove the tube (3), attach the bleed valve cap (1).

(7) Add brake fluid to the "MAX" scale on the pump reservoir.

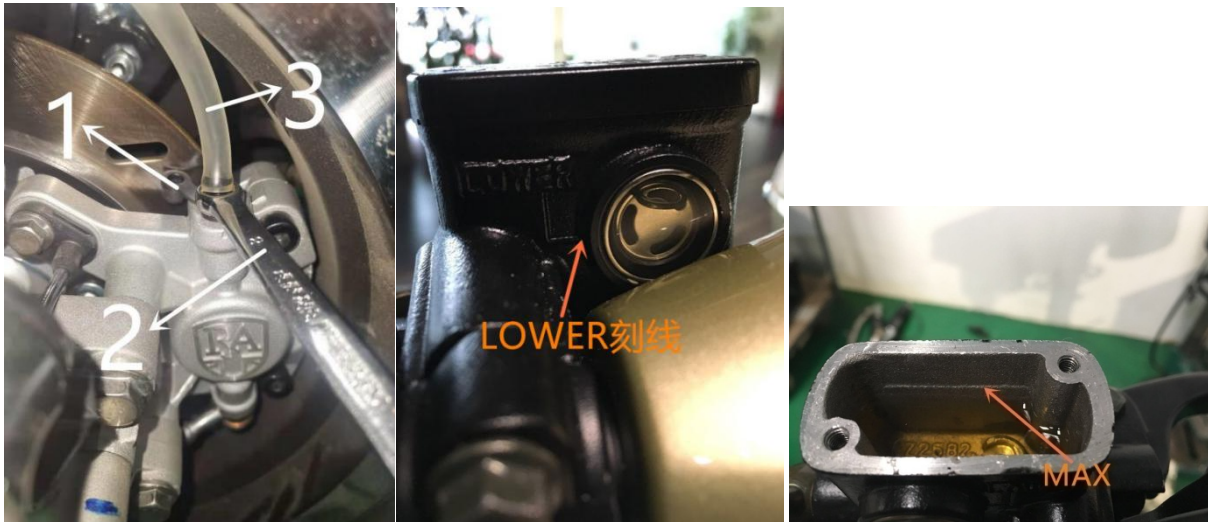
2. Rear brake fluid circuit

The same as the removal process of the brake fluid circuit.

3. Brake fluid replacement

1. Replace the front brake fluid

(1) Pull out the rubber cap of the bleed valve (1);



(2) Insert a clear plastic through tube (3) into the bleed valve (2), and a container is connected to the other end of the tube (3) to collect the discharged brake fluid.

(3) Quickly press and release the right brake lever several times, and then press the right brake lever hard without letting go.

(4) Loosen the air valve for about 1 turn to let the brake fluid flow into the container. Release pressure on the brake lever until the end of the stroke.

(5) Always check the liquid level of the upper pump reservoir, and close the bleed valve if it is lower than the "LOWER" engraving line (2).



Reminder: During the operation, always check the brake fluid level in the upper pump reservoir, and it cannot be drained, otherwise bubbles will be generated in the pipeline.

(6) Add brake fluid above the "MAX" scale of the reservoir

(7) Repeat steps (3), (4), (5), and (6).

(8) Observe the liquid in the transparent plastic tube, and when the liquid color changes from black to clear, tighten the bleed valve (2) and remove the tube (3).

(9) Install the rubber cap of the bleed valve (Figure 1).

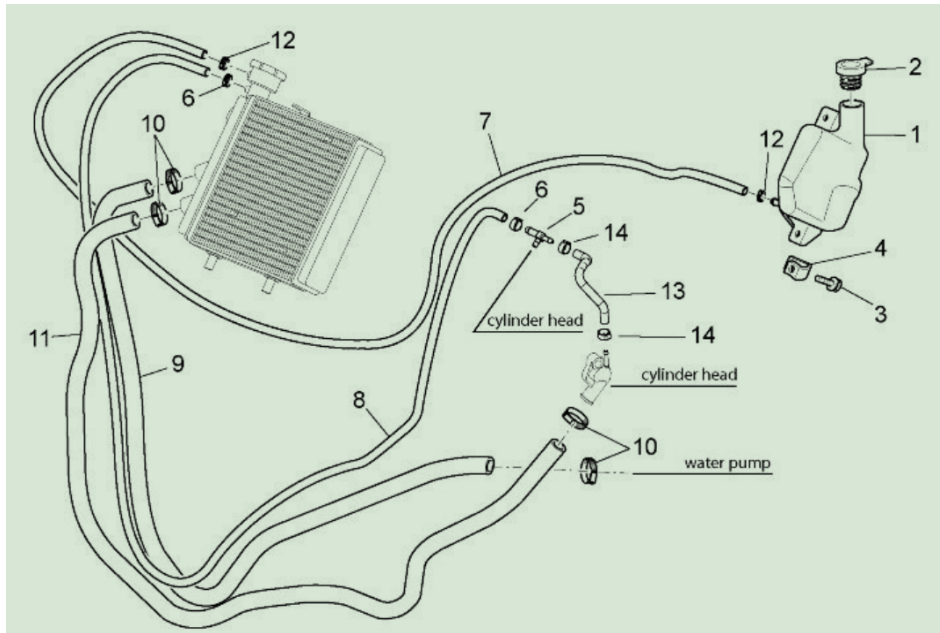
(10) Add brake fluid to the "MAX" scale of the reservoir.

4. Replace the rear brake fluid

Same as previous brake fluid replacement process.

5. Cooling system

1. System composition:



Second, coolant replacement


1. Drain the coolant

(1) Remove 6 bolts (1) and remove the right guard plate (2) and the left guard plate (3).



(2) Loosen the clamp bolt (4) and slide out the water pipe (5) to collect the coolant into the container prepared in advance.



 Reminder:

Removing the expansion box cap helps coolant drain.

Raising the front wheels at least 55cm above the ground allows sufficient drainage of coolant in the system circuit.

2. Fill with coolant

(1) Replace the outlet pipe (5) and tighten the clamp bolt (4).



(2) Fill the expansion box with coolant until the liquid level reaches the "MAX" reference scale

(3) Fill the tank with coolant until it is topped up and covered with the tank lid (2).



- (4) Start the engine and run at idle until the fan works.
- (5) Turn off the engine and cool down sufficiently (about 12 hours).
- (6) Check the liquid level position of the expansion tank and water tank again, if necessary to add to the correct liquid level.
- (7) Reinstall the right shield (2) and the left guard plate (3).

Final inspection

After the repair and maintenance of the whole vehicle, before normal riding, perform the following checks:

1. Visual inspection

1. The paint surface of the leaky parts
2. Assembly of leakage plastic parts
3. Bumping, scratching

2. Second, tightening torque inspection

1. Front and rear suspension devices
2. Front and rear brake calipers, brake discs
3. Front and rear wheels and axles
4. Connection between engine and frame
5. Handlebar, steering mechanism
6. Locking of plastic parts

3. Electrical system

First check whether the positive and negative poles of the battery are correct, and then perform the following checks:

1. Key switch
2. Headlights: high beam, low beam, position light, warning light
3. Adjust the low-beam light line of the headlamp according to the regulations
4. Front and rear brake switches and brake lights
5. Left and right turn switches and left and right turn signals
6. Lights and various instructions of the dashboard
7. Horn
8. Starting motor
9. Engine emergency stop switch and side brace stop function

4. Liquid level inspection

1. Hydraulic brake system liquid level
2. Engine coolant liquid level
3. Engine oil level
4. Engine gear oil level

5. Vehicle road inspection

1. Cold start
2. Operation of the dashboard

3. Sensitivity of throttle control
4. Stability of acceleration and braking
5. The effect of front and rear braking: TG125S with/without ABS, TG300S with ABS
6. The effect of front and rear shock absorption
7. Whether there is abnormal noise and or vibration

6. Inspection of vehicles after riding

1. Hot start
2. Brake lever stroke
3. Front and rear tyre pressure
4. Rearview mirror angle
5. Radiator fan operation
6. Possible leakage(s)
7. Abnormal engine sound and or vibration

After the above checks are completed, the user can ride normally.

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