



J200 Motorcycle

Maintenance Manual

SICHUAN EZICITI POWER TECH CO., LTD.

J200 Motorcycle Maintenance Manual

Chief Editor: _____

Editor(s): _____

SICHUAN EZICITI POWER TECH CO., LTD.

Preface

With the increasing variety of motorcycles, new structures and technologies are constantly being adopted. This Manual is hereby provided to our customers and maintenance personnel and specifies the maintenance, adjustment and repair of J200 motorcycle. We hope that this Manual can provide convenience and maintenance technical guidance for our customers and maintenance personnel.

This Manual focuses on motorcycle J200, and details its adjustment from Chapter 1 to Chapter 3. It details the parts and components of the motorcycle respectively from Chapter 4 to Chapter 20. Then, it lists the Electrical System Diagram in Chapter 20.

The standard maintenance procedure, notes and general maintenance knowledge are excluded from this Manual. If any user or maintenance personnel needs to learn about the said contents, please refer to the related documents for details.

As of the printing date of this Manual, all the data herein, including the diagrams, tables, information and performance indexes are the latest. SICHUAN EZICITI POWER TECH CO., LTD. reserves the right of modification without prior notice. Any part of this Manual is the property of SICHUAN EZICITI POWER TECH CO., LTD. Any organization or individual shall not reproduce it without the consent of the Company.

Thanks for choosing “Lambretta” J200 motorcycle!

We wish you comfort and joy in your future journeys with it!

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Overview

Positions of Numbers

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Main Performance and
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Symbols

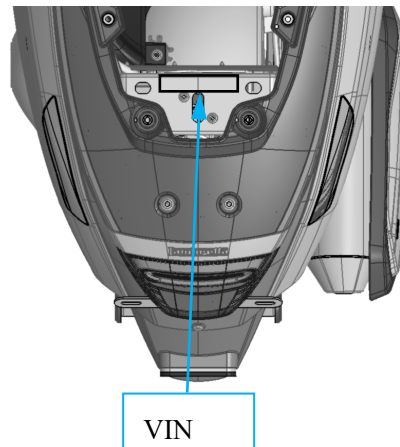
Standard Torques

Positions of Numbers

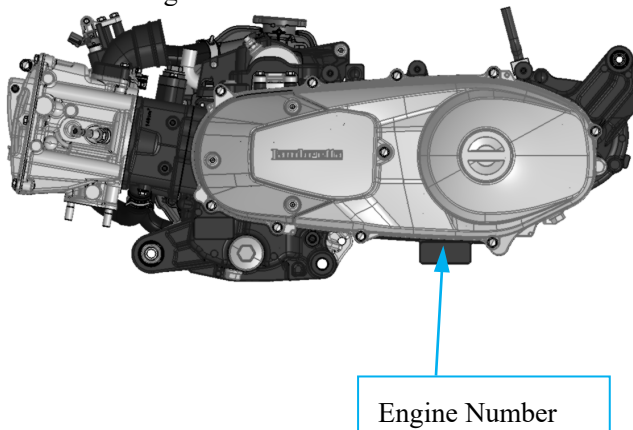
Motorcycle:



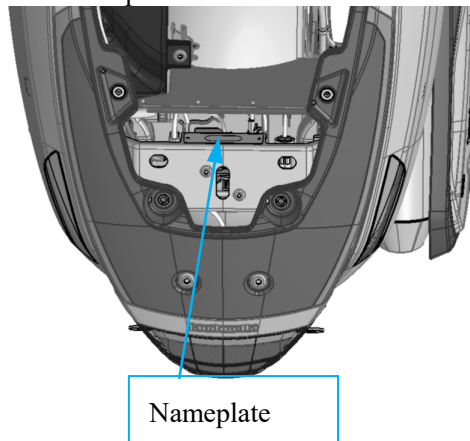
Position of VIN:



Position of Engine Number:

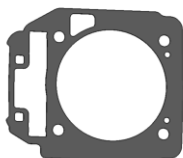


Position of Nameplate:

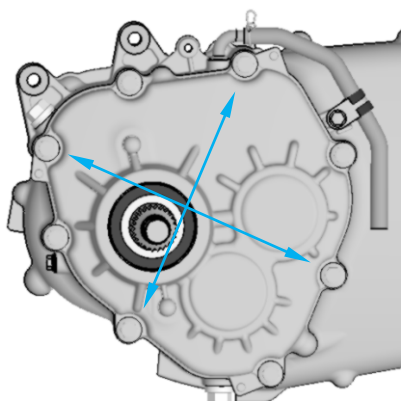


Notes for Maintenance

1. Please use the parts, components, lubricant and other auxiliary materials produced, approved or recommended by SICHUAN EZICITI POWER TECH CO., LTD. The unqualified ones may damage the motorcycle.
2. The washers and split pins of sealing elements shall be replaced with new ones during re-assembling.



3. The fastening of bolts or nuts shall be carried out diagonally and gradually. Normally, fasten bolts or nuts to the required torques by two or three times.



4. Before the check and measurement of disassembled parts and components, do clean them.
Only aphlogistic cleaning agent or that with a high fire point can be used for cleaning them.
Apply lubricant on the sliding surface of parts as required before assembly.
Check the installation, rotation, movement and operation status of parts after assembly.
5. Use the special and general tools as required for disassembling and assembling the motorcycle.
6. Do apply or inject qualified or equivalent lubricating grease (oil) at the required positions.
7. When two or more persons work together, pay attention to safety and cooperate with each other.
8. When removing the battery, first disconnect the negative (-) terminal, then the positive (+) terminal.
When removing or installing the battery, ensure that

tools such as wrenches do not come into contact with the frame.

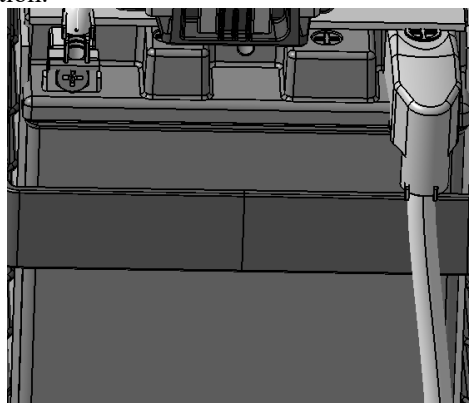


When installing the battery, connect the positive (+) terminal first, then the negative (-) terminal. Upon completion, verify the connections, fastenings, and continuity of all parts.

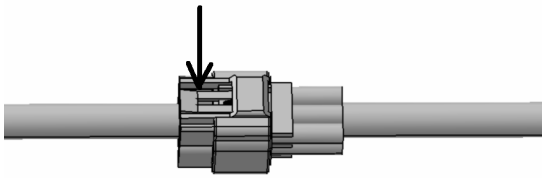


9. When the circuit is abnormal, firstly check whether the fuse is normal. If the fuse is burned out, find out the cause and replaced with a new one of equivalent capacity.

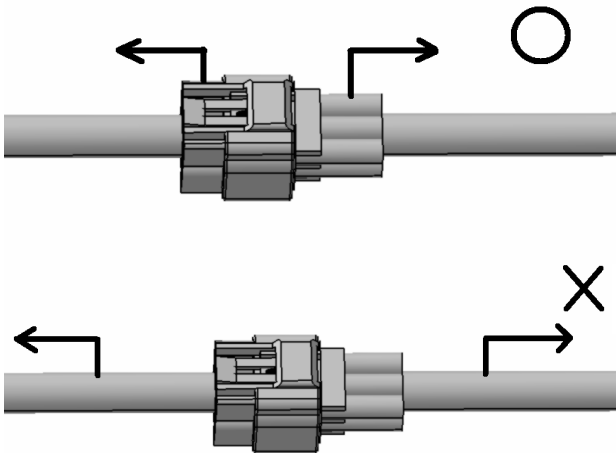
10. The covers shall be fully fixed on the ends after operation.



11. When disconnecting a connector with a latch, first release the latch before proceeding.



When disconnecting, grasp the connector body rather than pulling on the wiring harness.



Before connecting the connectors, make sure that the terminals are not broken, bent, over-lengthened or with other phenomena affecting the insertion of connectors.

12. Fixing strap of harness shall be located at the required position on the frame.

The clip shall fix the harness correctly.

The harness shall not contact with high-temperature parts, edges and sharp parts of the motorcycle.

Besides, it shall not pass the ends or front part of a bolt and screw.

And it shall not be loose or pulled heavily.

If the contact with edge or sharp part cannot be avoided, please protect the harness with a hose or adhesive tape.

The outer layer shall not be damaged.

In case of harness damage, repair it with plastic adhesive tape.

Do not squeeze the harness when installing parts and components.

It also shall not be bent during assembly.

13. When the handlebar is rotated to the ends on the left or right, the harness shall not be tightened or loose. Make sure that there is no obvious bending, pressure or interference.

14. For the application of any test instruments, do understand the operating instruction first and follow the guidance in this Maintenance Manual.

15. Do not fall down or throw any part or component away.

16. In case of terminal rusting, remove it with abrasive paper or other tools first, then connect it.

17. Do not twist or bend cables violently. Or the deformed or damaged cables may cause running problem.

Main Performance and Technical Data

	Item	Data
Dimensions and Weight	Total length	1890 mm
	Total width	741 mm
	Total height	1150 mm
	Wheelbase	1340 mm
	Minimum ground clearance	110 mm
	Total weight	Unloaded weight: 134kg, curb weight: 139kg, loaded weight: 289kg
Body	Frame type	Load-bearing frame
	Caster angle of front suspension	$\geq 26.5^\circ$
	Front suspension	Linkage-type, 5-stage adjustable spring-hydraulic shock absorber
	Rear suspension	5-stage adjustable spring-hydraulic shock absorber
	Front tire size	110/70-12 M/C
	Rear tire size	120/70-12 M/C
	Front tire pressure	One person: 200kPa Two persons: 200kPa
	Rear tire pressure	One person: 200kPa Two persons: 220kPa
	Front brake	Disc diameter $\Phi 220\text{mm}$
	Rear brake	Disc diameter $\Phi 220\text{mm}$
	Fuel tank capacity	9.0L
	Fuel grade	92# or higher unleaded petrol
Engine	Type	Water-cooled One-cylinder Four-stroke Four-valve
	Cylinder diameter $\times$ stroke	62mm $\times$ 57.8mm
	Cylinder displacement	175 cm ³
	Compression ratio	12:1
	Maximum power	12.5kw/8500r/min
	Maximum torque	15.5N·m/6500r/min
	Valve clearance (cold state)	IN: 0.1-0.15mm, EX: 0.15-0.2mm
	Valve drive mechanism	Chain drive
	Air filter	Paper filter
	Cooling method	Water-cooled
	Coolant filling capacity	0.55L
	Crankshaft balance mode	/
	Lubrication method	Splash and force-feed lubrication, replaceable oil filter
	Oil pump type	Internal-meshing gear oil pump
	Crankcase oil grade	SAE 10W-40 (SL grade or higher)
	Crankcase oil filling capacity	1) 0.85L - After engine disassembly and cleaning; 2) 0.8L - Oil change only Integrated
	Oil filter element	(paper element), replaceable
	Gear oil grade	Gear oil 80W-90
	Gear oil filling capacity	1) 0.15L - After gearbox disassembly and cleaning; 2) 0.12L - Gear oil change only
	Starting method	Electric start
	Idle speed	1,650r/min $\pm$ 150 (warm engine)
	Net weight of engine	32.5kg

	Item	Data
Transmission System	Clutch	/
	Transmission type	CVT
	Transmission ratio	CVT transmission ratio: 0.80-2.39
	Final transmission ratio	8.702
Electrical and Electric Fuel Injection System	Generator	240w/5000r/min, permanent magnet AC magneto
	Battery capacity	12V 6.5A.h
	Power supply system	DC power supply; the generator charges the battery
	Fuse	30A*2, 10A*5, 5A*2, 20A*2
	Spark plug	Model BN8RTC
	Spark plug clearance	0.7-0.8mm
	Anti-theft device type	Type II; the ignition switch can lock the steering stem and cut off the ignition circuit
	Fuel supply method	Electric fuel injection, ECU control
	Ignition mode	Electronic fuel injection
	Headlight	1×13.5V 19W
	Front position light	1×13.5V 1.6W
	Turn signal light	Front: 2×13.5V 4W Rear: 2×13.5V 4.5W
	Brake light / rear position light / license plate light	Tail: 13.5V 3.3W/2W/1.8W

Standard Torques

Engine

Item	Thread Diameter (mm)	Torque (N·m)
Bolt M6	6	10
Screw M6	6	7
Bolt M5	5	7
Bolt M8	8	25
Magneto rotor nut M12	12	70
Spark plug bolt M12	12	12
Cylinder bolt M8	8	30
Oil drain bolt M12	12	25
Timing driven sprocket bolt M5	5	7
CVT driving / driven pulley nut M12	12	70
One-way clutch bolt M6	6	10

Standard torque ranges for critical body parts are shown in the table below:

Item	Thread Diameter (mm)	Torque (N·m)
Connection from brake disc to front / rear hub	8	28-32
Front wheel	14	80-90
Connection from brake stay to steering stem and bracket	8	18-25
Rear wheel	16	90-100
Connection from front / rear brake caliper to mounting bracket	8	28-32
Connection from front / rear brake cylinder to hose	10	29-31
Connection from front / rear brake caliper to hose	10	29-31
Connection from ABS to inlet / outlet hose	10	29-31
Connection from front shock absorber to steering stem	8	25-30
Connection from front shock absorber to front left / right control arm	10	50-60
Connection from front left / right control arm to steering stem	10	50-60
Locking of left control arm	8	25-30
Connection from rear shock absorber to frame upper mounting point	10	35-45
Connection from rear shock absorber to lower mounting point	8	24-26
Welded group of handlebar and steering stem	10	50-60
Connection from rear swingarm to engine	10	50-60
Connection from engine hanger to frame	10	50-60
Engine connection shaft	10	50-60
Steering stem adjusting nut	25	33-43 / Loosen 1/2 turn, then re-tighten to 11-13N·m
Steering stem lock nut	25	50-60

Standard torque ranges for other body parts are shown in the table below:

Name and Size	Torque (N·m)
M5 bolt and nut	4-6
M6 bolt and nut	7-9
M8 bolt and nut	18-25
M10 bolt and nut	30-40
M5 screw	4-6
M6 screw	6-8
M6/M5 bolt for assembling nut of plastic parts and inserts	5-7/4-6
M5 bolt for assembling nut clamp of plastic parts	4
M6 bolt for assembling nut clamp of plastic parts	4

Regular Maintenance Schedule

	Mileage (Km)	First 1000	Every 4000	Every 8000	Every 12000	Every 16000
Inspection Items	Time (Month)	First 3	Every 12	Every 24	Every 36	Every 48
Fastener		J		J		
Spark plug ※				J		R
Drive belt ※/■					J	J
Throttle valve controller ※		J		A		
Rubber pad of side and center stands				R		
CVT transmission case and dust cover			J			
Air filter element			J	R		
Engine oil and gear oil ※		R	R	R		
Sliding shoe / CVT roller ※				J	J	J
Engine oil filter ※				R		
Coolant ※/▲		J	J			
Tire pressure and wear		J	J			
Valve clearance ※						A
Suspension ※		J		J		
Brake friction plate ※		J	J			
Brake fluid ※/▲		J		J		

J: Inspect, clean, adjust, or replace if necessary.

R: Replace.

A: Inspect and adjust.

▲: Replace every two years.

■: Replace every 20,000km.

Note:

The item with a “*” shall be submitted to the licensed repair shop for repairing or maintenance.

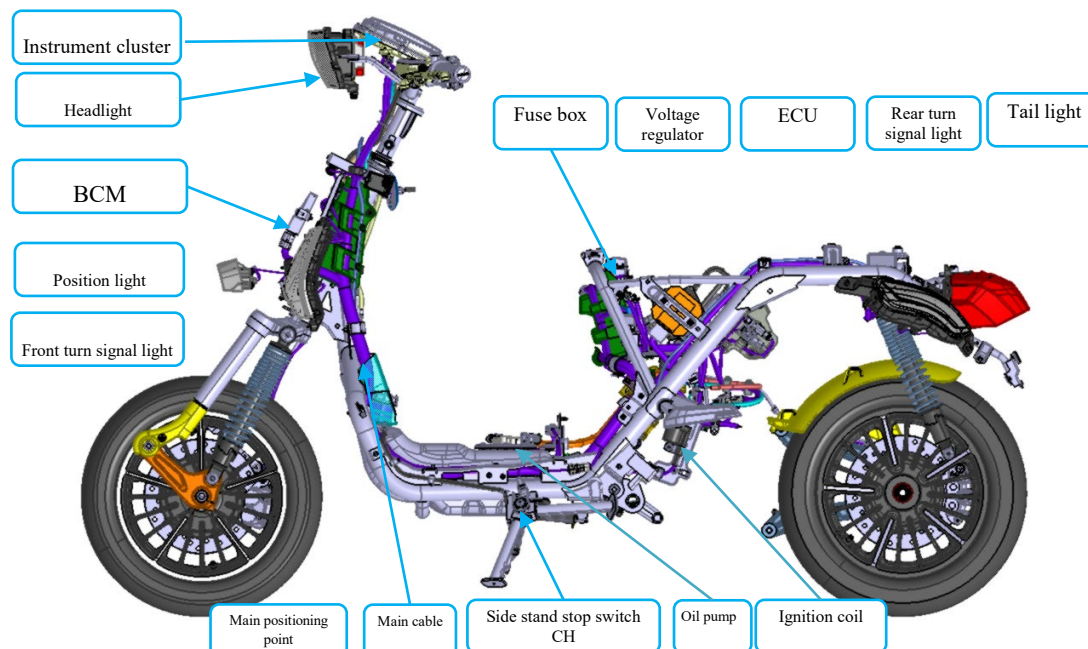
In dusty areas or during catkin seasons, increase the cleaning frequency of the CVT air intake dust cover, and use compressed air to blow out dust and foreign objects from the dust cover every half month or 1,000km to ensure proper heat dissipation of the CVT transmission case and prevent premature damage to the CVT belt.

Wiring Diagram

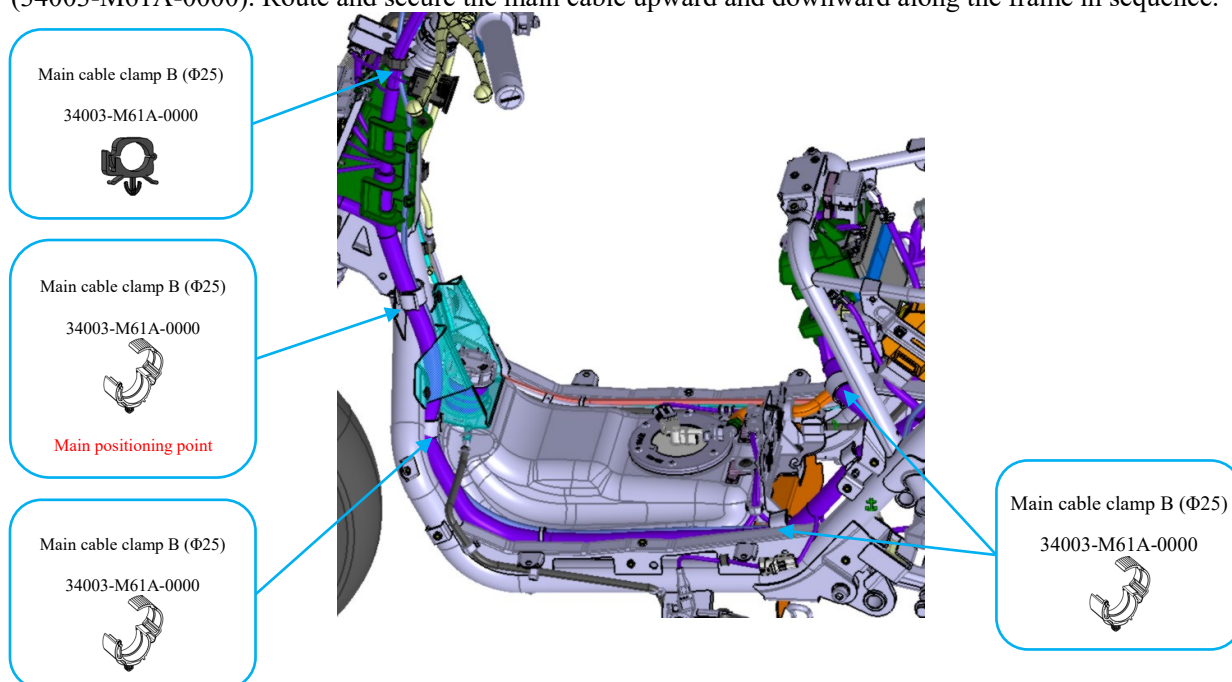
I. Overall layout of harness and hoses

1. Overall layout of the motorcycle main cable

Route the main cable from the front of the frame along the left side, starting from the white main positioning point.

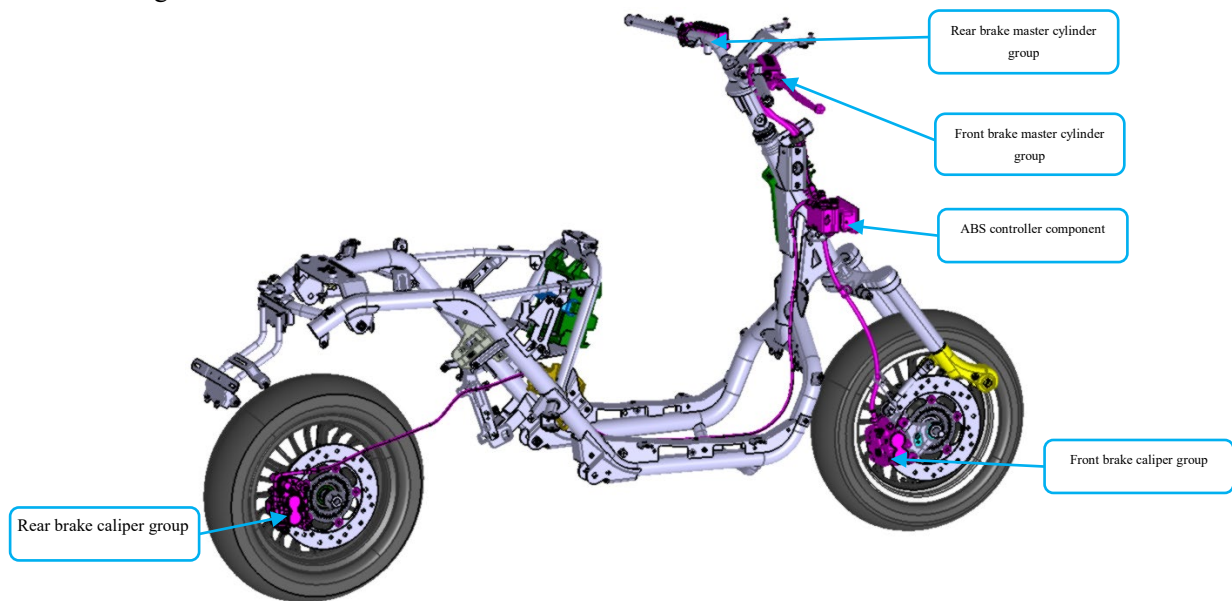


Secure the main cable positioning point (with white mark) to the frame using main cable clamp B (Φ25) (34003-M61A-0000). Route and secure the main cable upward and downward along the frame in sequence.



2. Overall layout of the motorcycle brake hose

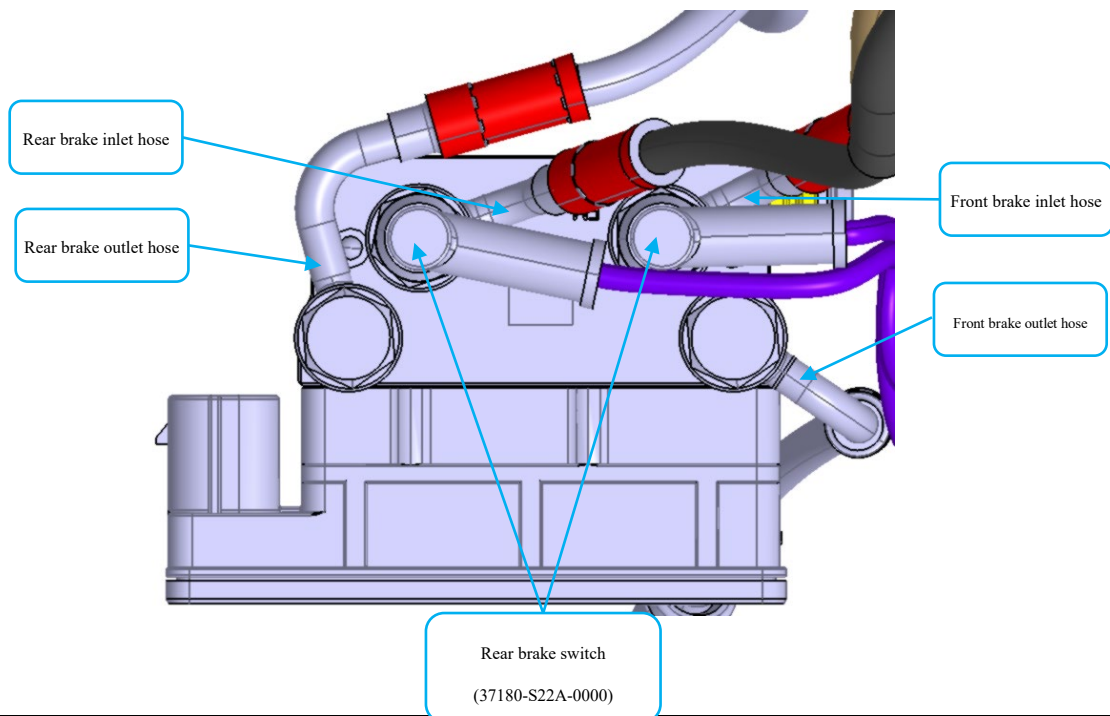
(1) The ABS controller component is located at the front of the frame. The overall layout of the brake hose is shown in the figure.



(2) Assembly of brake hose at the ABS controller component

Distinguish the brake hoses by front / rear and inlet / outlet, then install them into their corresponding positions.

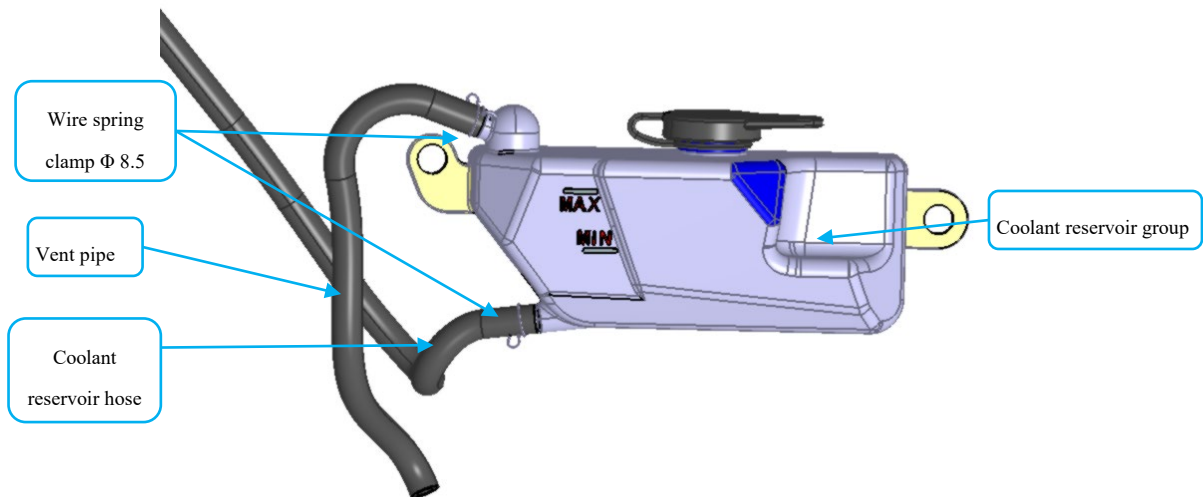
- Install the front brake inlet hose at the "FM" mark on the ABS controller component, and install the rear brake inlet hose at the "RM" mark.



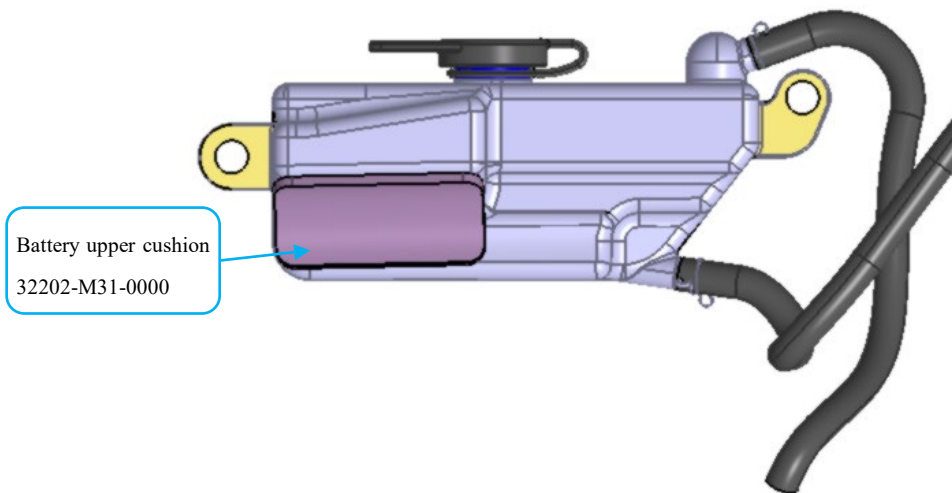
3. Overall layout of the motorcycle coolant hose

(1) Coolant reservoir sub-assembly

Pre-assemble the vent pipe (19301-S22A-0000) and the coolant reservoir hose (19302-S22A-0000) onto the coolant reservoir group (19301-S22A-0001) using steel wire elastic clamps 8.5;



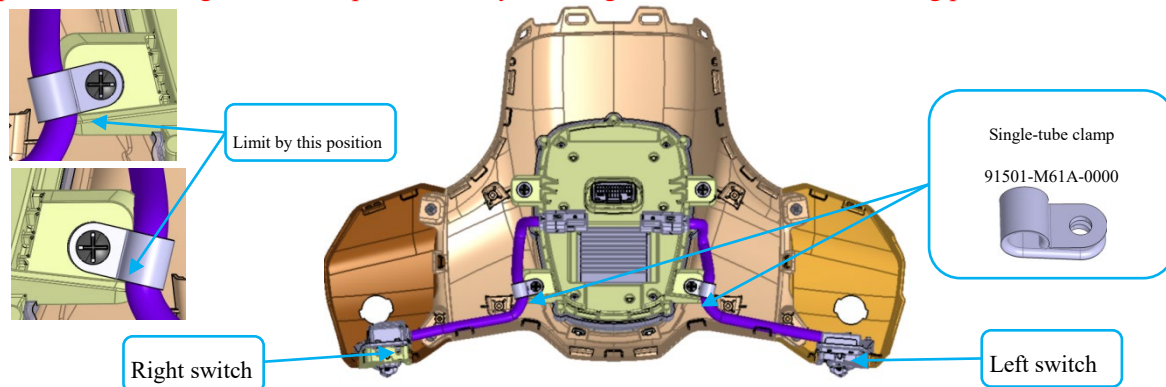
(2) Paste the battery upper cushion at the position shown on the back of the coolant reservoir component.



II. Harness and pipeline routing

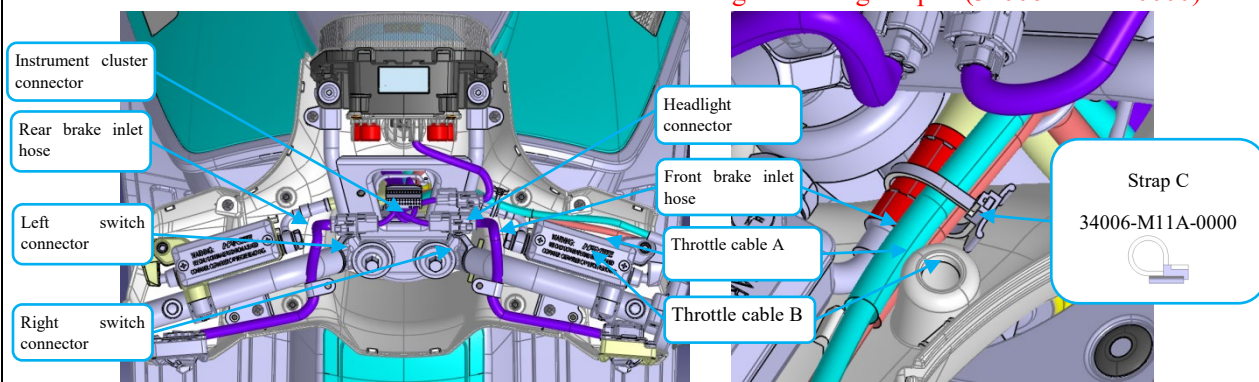
1. Harness and pipeline routing at the handlebar tube

(1) Install the left / right switches onto the upper button housing. Secure the left / right switch cables to the instrument mounting position using single-tube clamp $\Phi 7.6$ (91501-M61A-0000). **Note:** The installation position of the single-tube clamp is limited by the flange of the instrument mounting point.

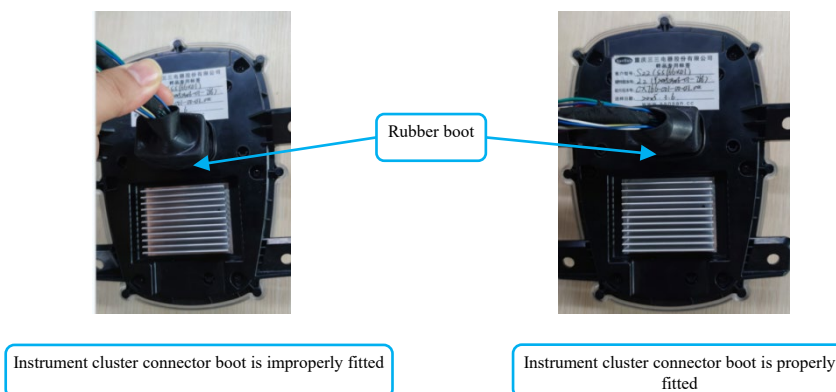


(2) Secure the left switch connector, right switch connector, and headlight connector at the corresponding positions on the handlebar tube.

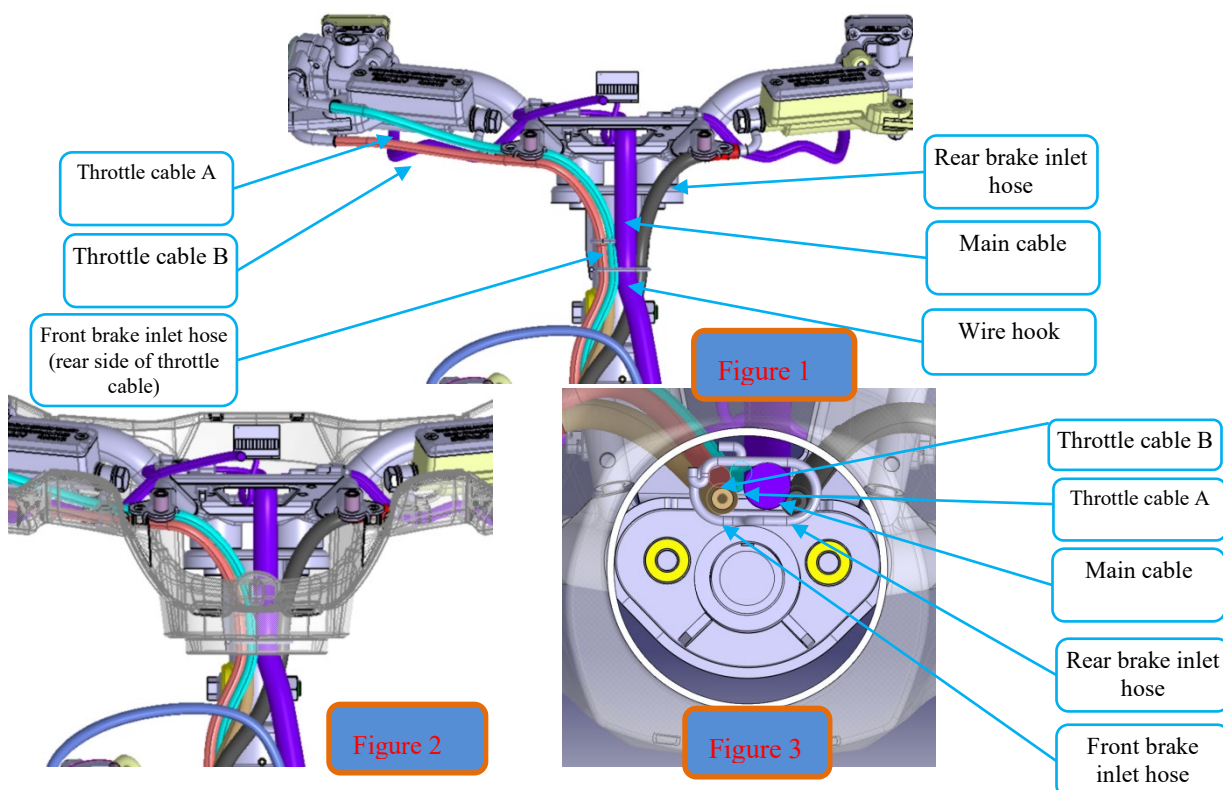
- The harness end with orange tape mark is the left connector, and that with blue tape mark is the right connector.
- Secure the front brake inlet hose and throttle cables A/B together using strap C (34006-M11A-0000).



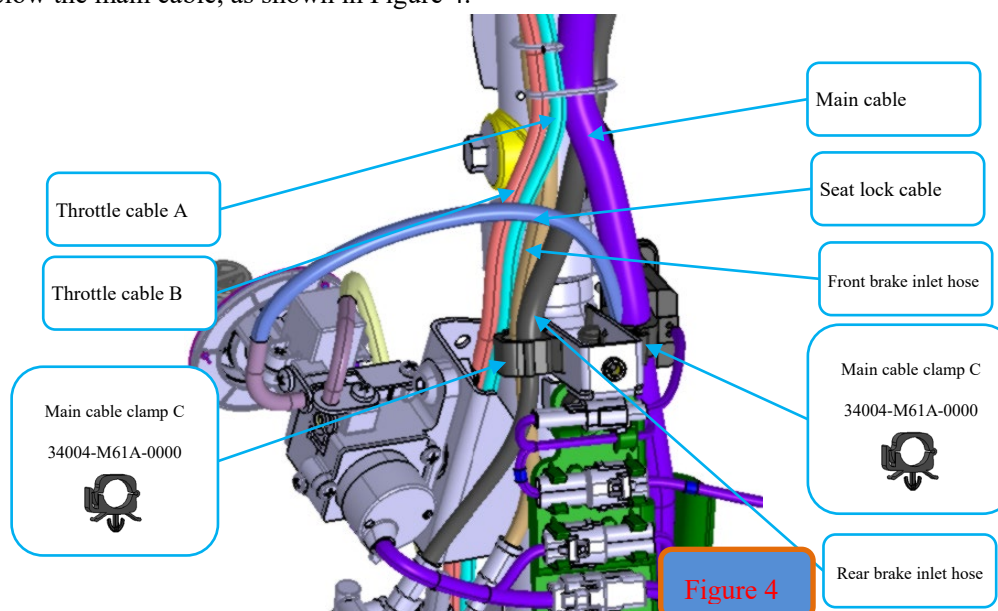
(3) A distinct “click” sound of the connector latch springing back indicates that it is fully seated when the instrument harness is plugged into the instrument cluster. Then snap the connector boot onto the instrument cluster socket.



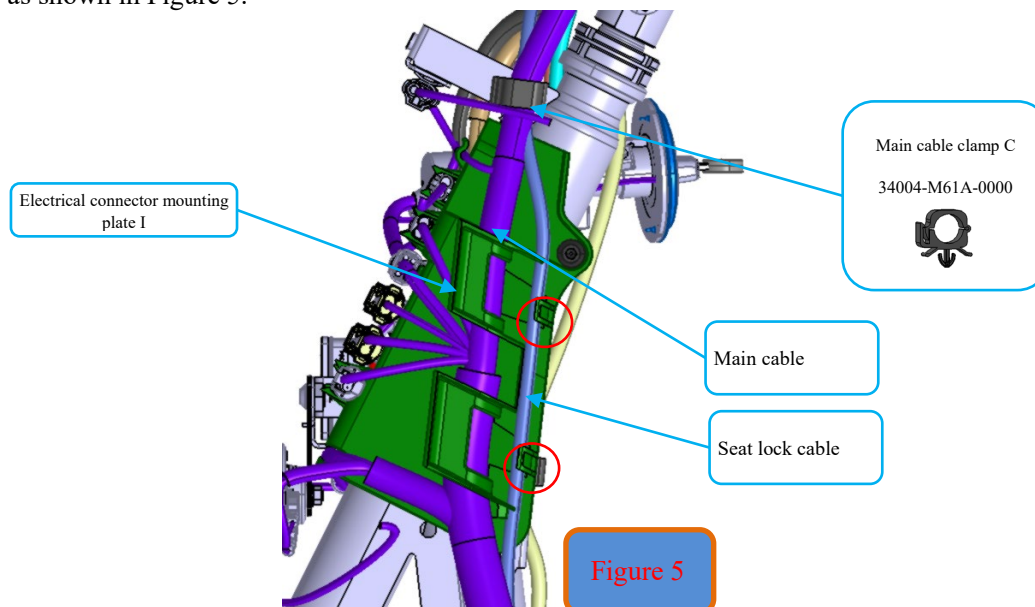
2. Pass throttle cable A, throttle cable B, main cable, front brake inlet hose, and rear brake inlet hose through the wire hooks respectively, and secure them within the wire hooks. As shown in Figure 1 and Figure 2, the routing sequence of the harness and pipelines within the wire hooks is shown in Figure 3.



3. Secure the seat lock cable and the main cable together to the frame using main cable clamp C (34006-M61A-0000). Ensure the seat lock cable runs above throttle cables A / B and front / rear brake inlet hoses, and below the main cable, as shown in Figure 4.

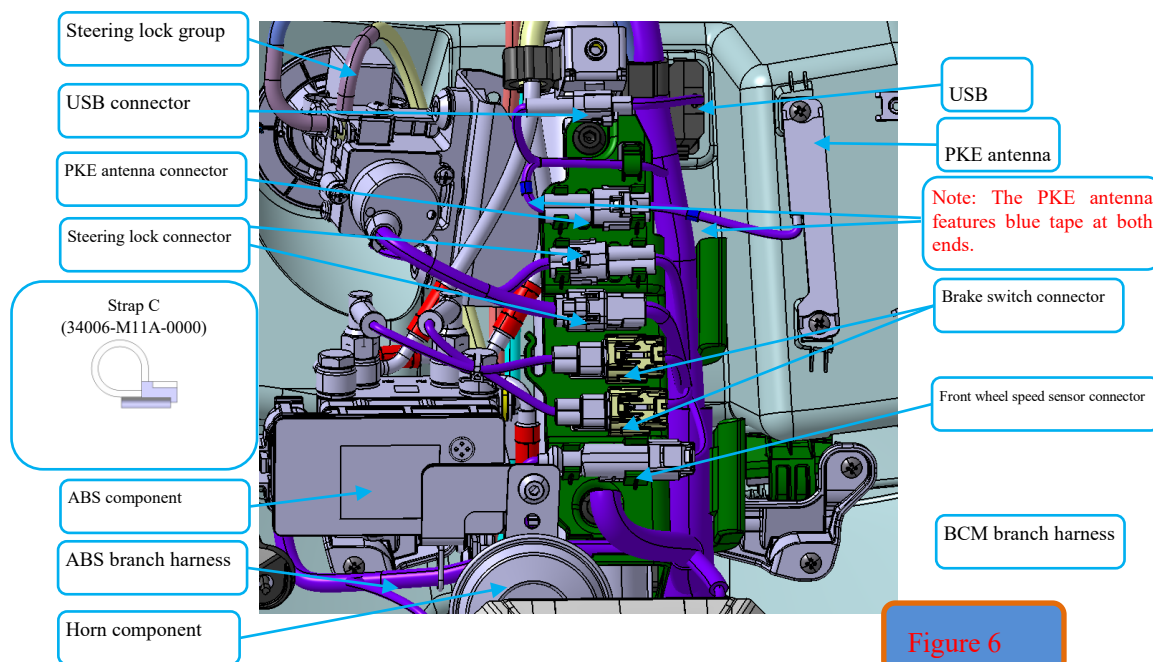


4. Secure the main cable and the seat lock cable within the slot of electrical connector mounting plate I as shown in the figure; and then, secure both the main cable and the seat lock cable to the frame using main cable clamp C (34004-M61A-0000), ensuring the seat lock cable passes below the main cable at main cable clamp C, as shown in Figure 5.

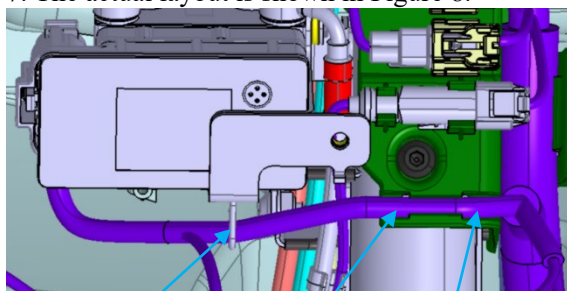


5. After installing all components, arrange the connectors from top to bottom as shown in Figure 6, namely USB (secured to the front cowl mounting bracket on the frame), PKE antenna, steering lock (2-pin connector on top and 6-pin connector at bottom), brake switch, and front wheel speed sensor connector.

- Secure the two brake switch harnesses together with strap C (34006-M11A-0000).
- Connect the PKE antenna connector according to the blue tape mark.



6. Secure the ABS branch harness within the slot of electrical connector mounting plate I and the wire hook of the ABS mounting bracket as shown in the figure, and connect it to the ABS component, as shown in Figure 7. The actual layout is shown in Figure 8.



Wire hook

Cable slot

ABS harness branch

Figure



Figure 8

7. Secure the brake switch connectors and the main cable to the electrical mounting plate accordingly, as shown in Figure 9. Note: Place the farther switch connector at the top end of the mounting plate and the nearer one at the bottom end, as shown in Figure 10.

➤ Secure the two brake switch harnesses together with strap C (34006-M11A-0000).

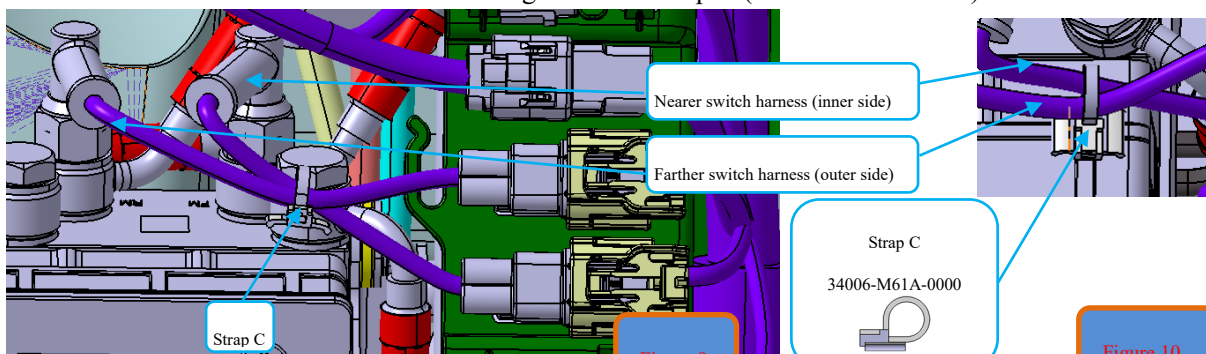
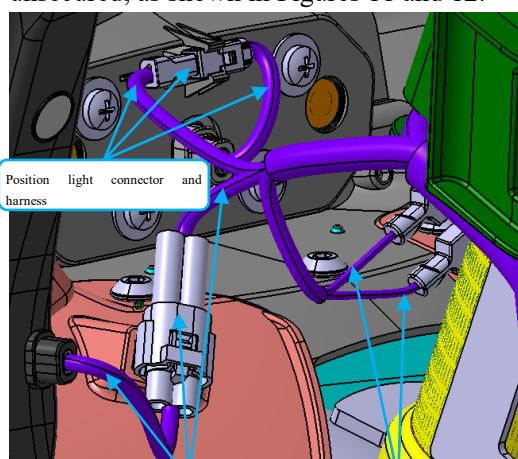


Figure 9

Figure 10

8. Secure the turn signal light and position light connectors as shown in the figure, leaving the harnesses unsecured, as shown in Figures 11 and 12.

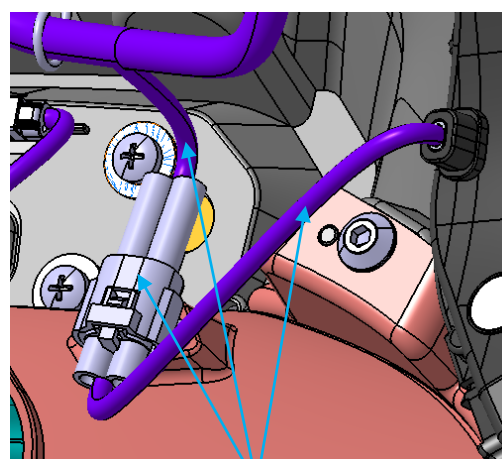


Position light connector and harness

Front left turn signal connector and harness

Horn harness

Figure 11



Front right turn signal connector and harness

Figure 12

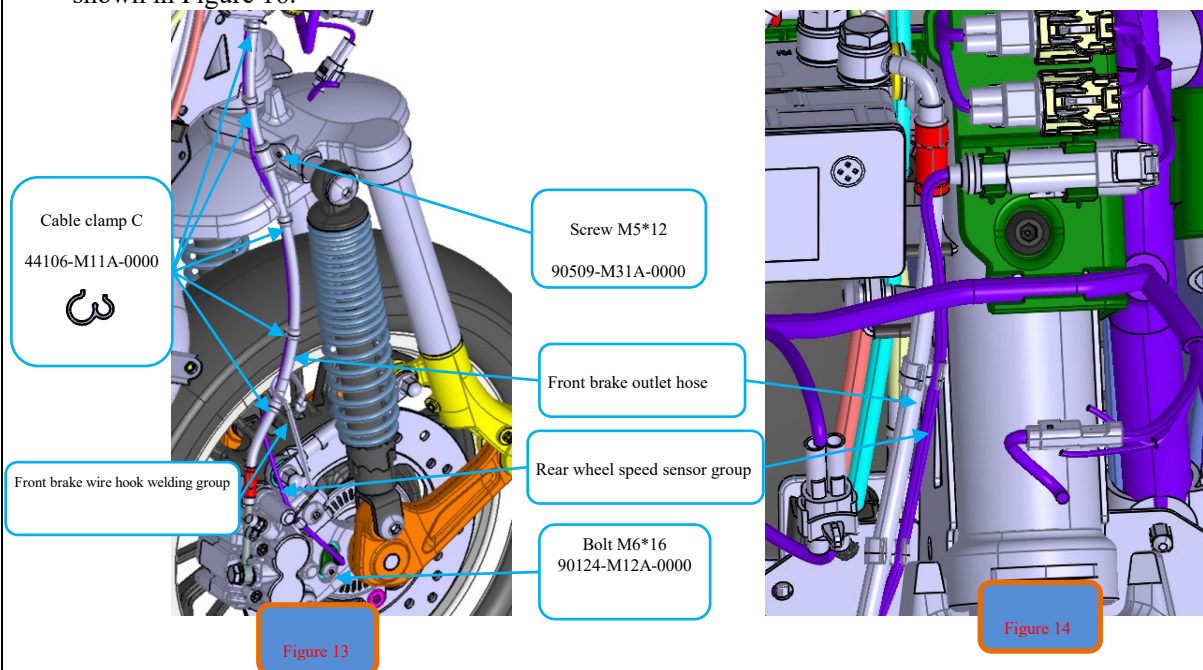
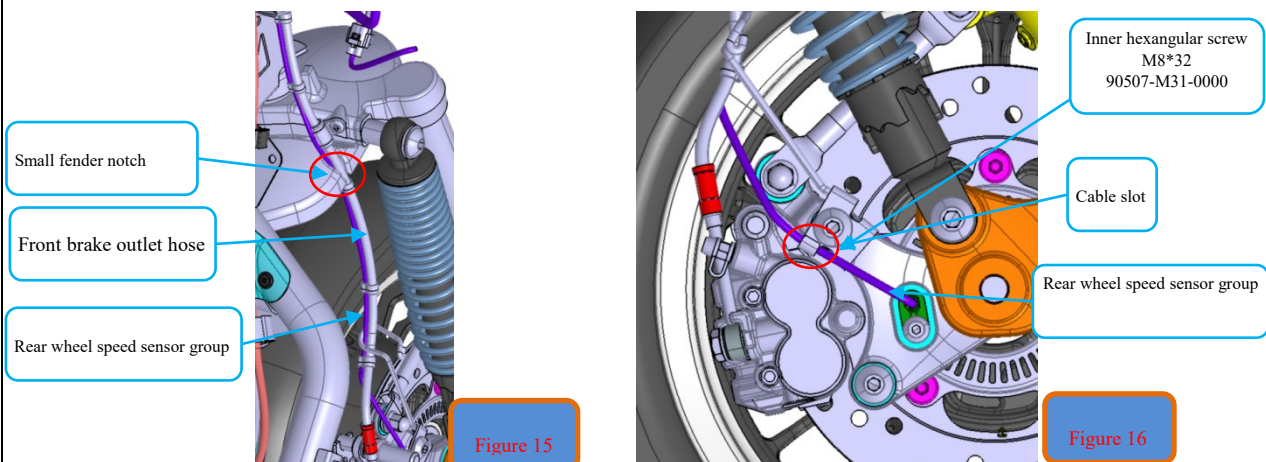
9. Routing and layout for front brake outlet hose and rear wheel speed sensor group

(1) Route the front brake outlet hose downward along the frame head pipe and through the opening of the cover. Secure the clamp on the oil pipeline to the steering stem welding group with screws M5*12 (90509-M31A-0000), then pass it through the front brake wire hook welding group and connect it to the front brake caliper, as shown in Figure 13.

(2) Install the rear wheel speed sensor group (36430-S11A-0000) onto the front caliper mounting bracket with bolt M6*16 (90124-M12A-0000); pass it through the front brake wire hook welding group, and connect it to the front brake outlet hose using five pipe clamps C (44106-M11A-0000) along the pipe, as shown in Figures 13 and 14.

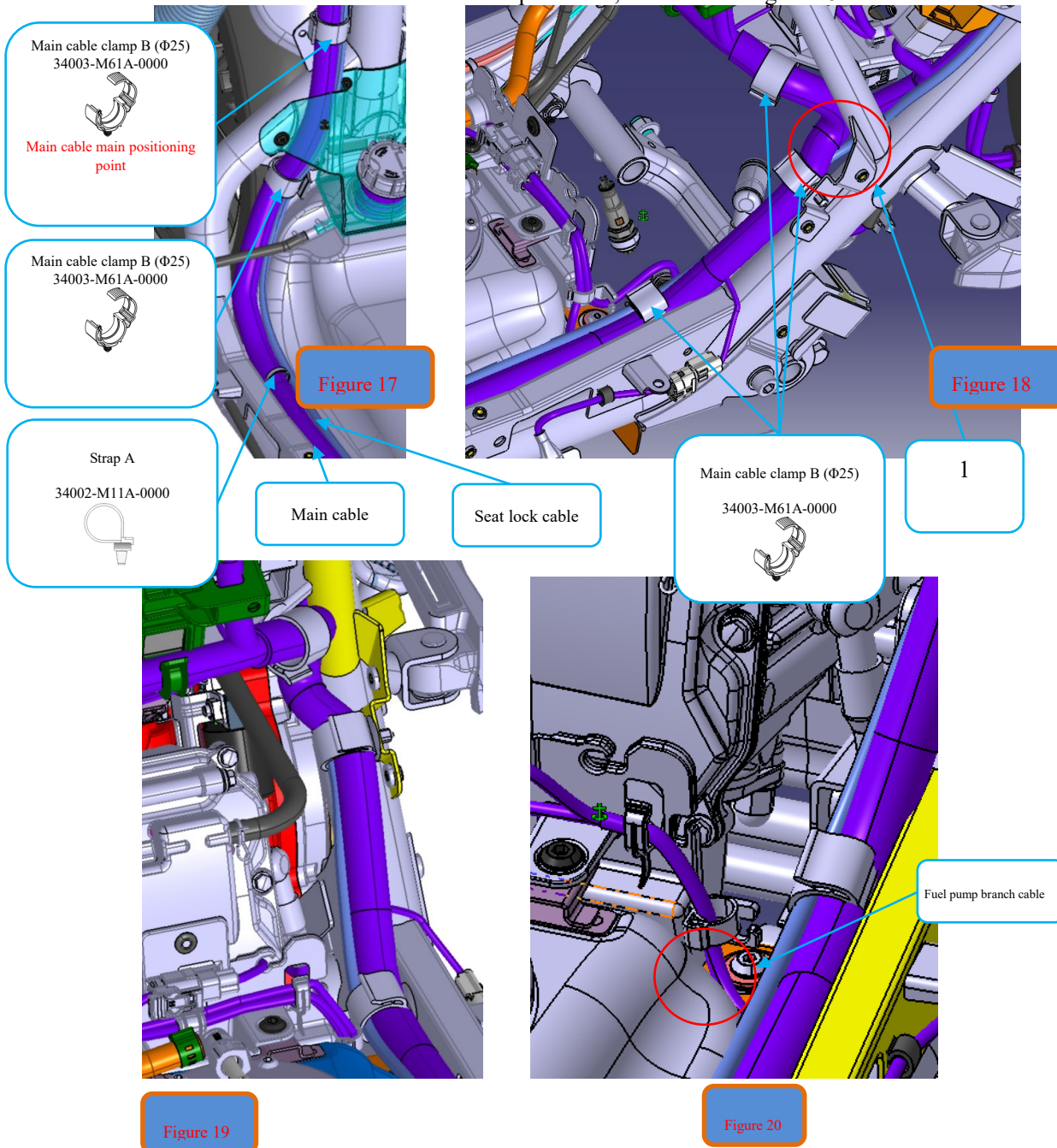
(3) During assembly, route the rear wheel speed sensor harness on the inner side and the front brake outlet hose on the outer side, and snap both into the notches of the small fender (80103-S22A-0000), as shown in Figure 15.

➤ When assembling the front brake wire hook welding group, snap the rear wheel speed sensor harness into the slot of the front brake wire hook welding group first before tightening the mounting screw, as shown in Figure 16.



10. Route the main cable and seat lock cable side by side along the left and right sides of the frame, with the main cable on the outer side and the seat lock cable on the inner side. Secure the lines together to the frame with four main cable clamps B (Φ25) (34003-M61A-0000) and one strap A (34002-M11A-0000), as shown in Figure 17, Figure 18, and Figure 19.

- At the fuel pump branch cable, route the seat lock cable over the fuel pump branch cable, as shown in Figure 20.
- Pass the seat lock cable under the main cable at position 1, as shown in Figure 18.



11. Routing and layout for main cable around fuel tank

(1) Secure the oxygen sensor harness through the fuel tank heat shield slot, route it along the heat shield to the top, and pass it through the heat shield slot to secure the connector onto the heat shield. Secure the fuel pump branch cable to the fuel tank heat shield with cable clamp (Φ12) (91402-M62A-0001). Branch the harness after passing it through cable clip 1, then mate the oxygen sensor main cable connector with the sensor-end connector, as shown in Figure 22;

- Route the fuel pump branch cable under the fuel pipe group, secure it through fuel tank cable clip 2, and insert the connector into the interface;

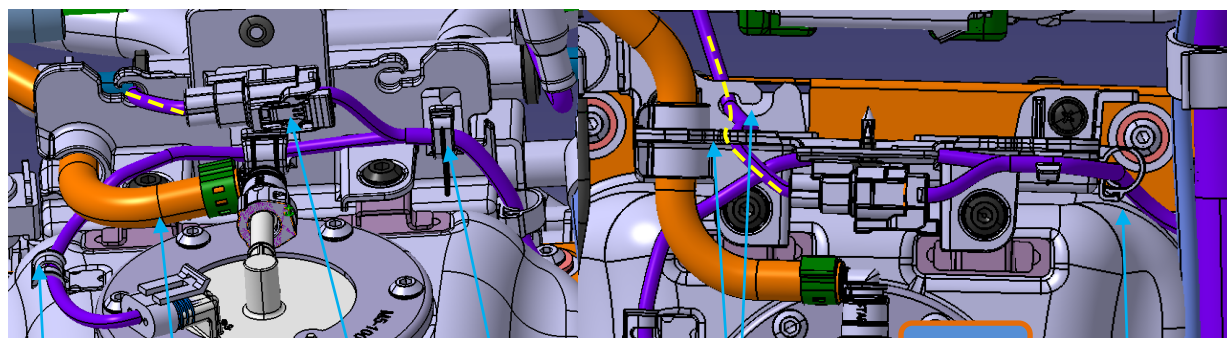


Figure 22

Cable clip 2

Fuel line group

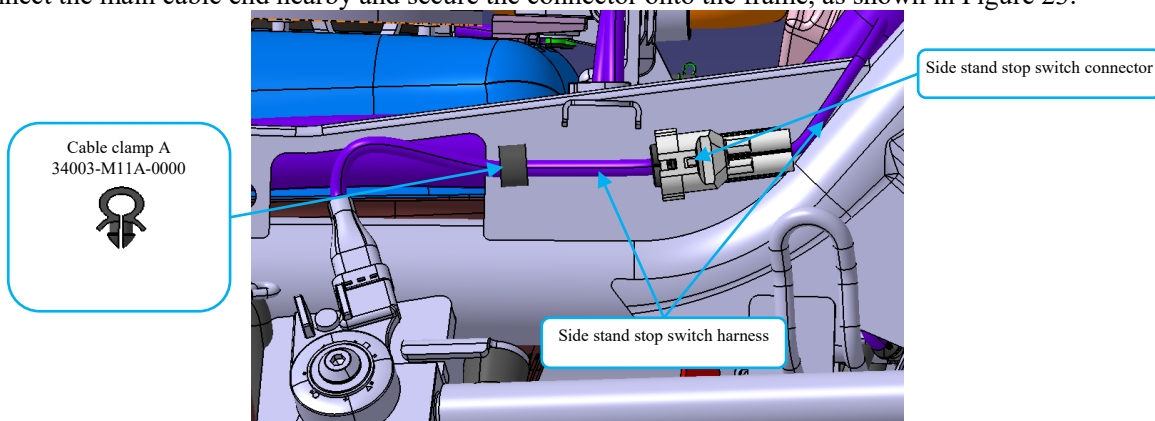
Oxygen sensor connector

Cable clip 1

Cable slot

Cable clamp (Φ12)
91402-M62A-0001

(2) Side stand switch routing: Secure the switch end to the frame with cable clamp A (34003-M11A-0000). Connect the main cable end nearby and secure the connector onto the frame, as shown in Figure 23.

Cable clamp A
34003-M11A-0000

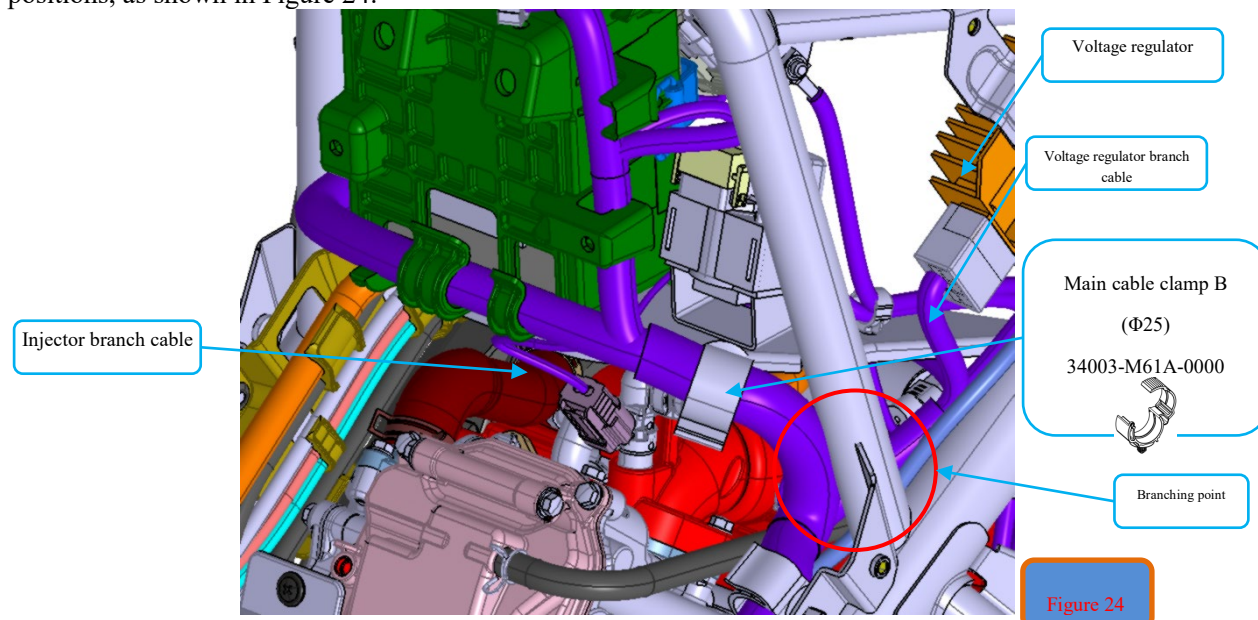
Side stand stop switch connector

Side stand stop switch harness

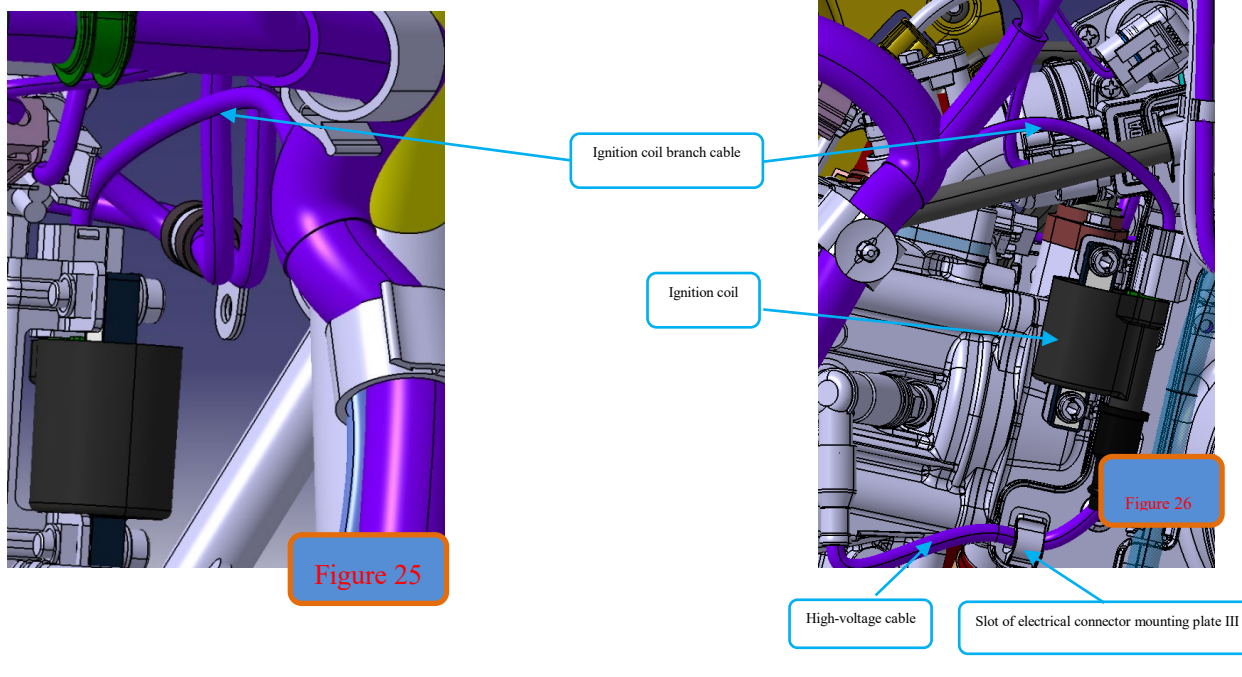
Figure 23

12. Routing and layout for main cable around engine

- (1) Branch the main cable from this point; route one end along the battery box to the right side of the engine, and secure it with main cable clamp B ($\phi 25$) (34003-M61A-0000) and the battery box slot; and route the other end along the left side of the frame to the rear of the vehicle, as shown in Figure 24.
- (2) Insert the injector branch cable and voltage regulator branch cable into their respective connection positions, as shown in Figure 24.



- (3) Locate the ignition coil branch cable at the branching point too. Connect the branch cable to the ignition coil nearby without additional securing, secure the ignition coil high-voltage cable in the slot of electrical connector mounting plate III, as shown in Figures 25 and 26.



(4) Branch the negative branch cable, bonding branch cable, fuse branch cable, and starter relay main cable upward as shown in Figure 27. Route the harness according to the figure. Secure them with main cable clamp B (φ25) (34003-M61A-0000) and the battery box slot, and plug the fuse box into the battery box, as shown in Figure 28.

(5) Pass the positive branch cable through the starter relay and install it onto terminal B of the starter relay, as shown in Figures 27 and 28.

(6) Connect the battery positive harness to the battery positive terminal and starter relay terminal B respectively, and then secure them to the battery box with two cable clamps A (34003-M11A-0000), as shown in Figure 28.

- Pass the fuse box and ECU connector through the battery box before installing the battery box.
- Route the positive branch cable (branching to the main cable) along the inner side of the bracket.

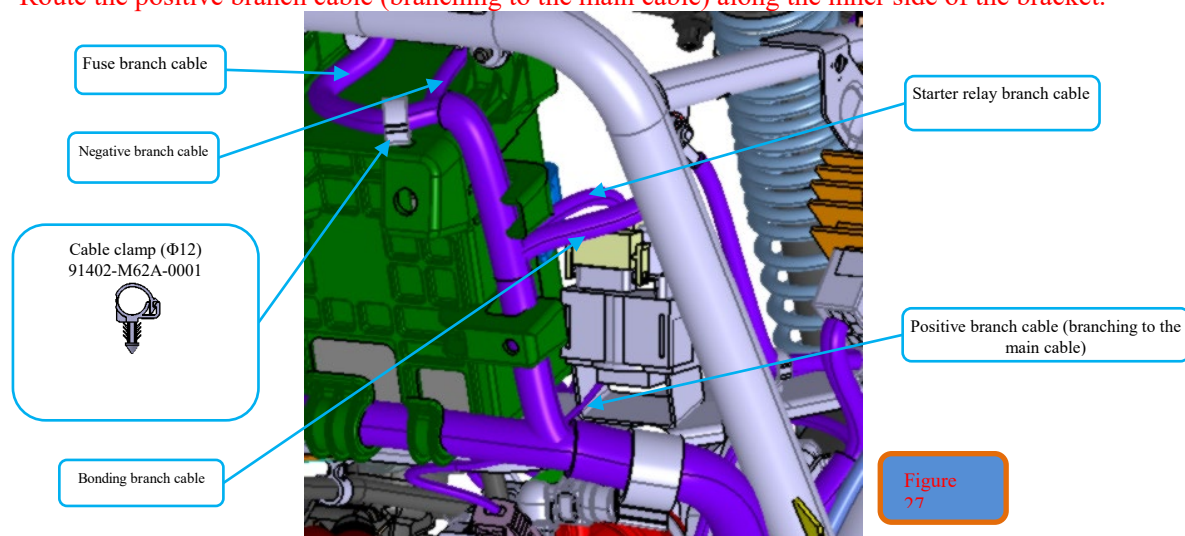


Figure 27

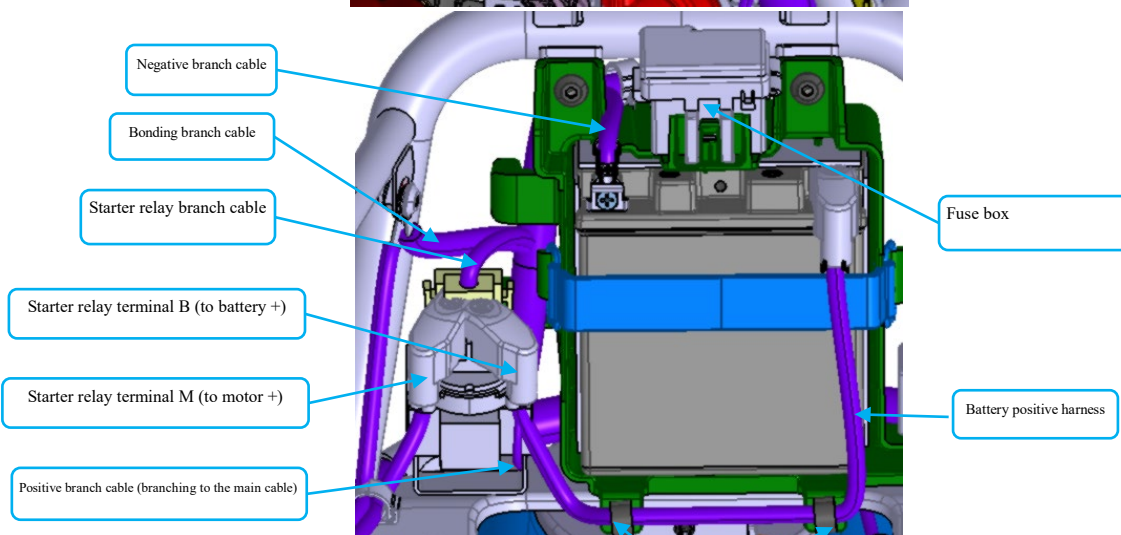


Figure 28

Cable clamp A
34003-M11A-0000



(7) Route the starter motor harness as shown in Figures 29, 30, and 31. Secure it to the engine with one cable clip (91406-E05-0500) and to the frame with three cable clamps (Φ12) (91402-M62A-0001). Use a cable clamp (7×7) (44103-M61A-0000) to secure the two harnesses together at the section between the engine and the frame.

- Arrange the starter motor harnesses side by side, with the positive cable on the right and the negative cable on the left, as shown in Figure 31.
- Secure the starter motor negative harness and the bonding branch cable together to the frame bonding point with M6*12. (Note: Place the starter motor negative harness at the bottom and the bonding branch cable on top)
- Use a strap (51063-M11A-0000) to secure the 3-in-1 sensor harness, idle sensor harness, and vent pipe together, as shown in Figure 29.



Figure 29

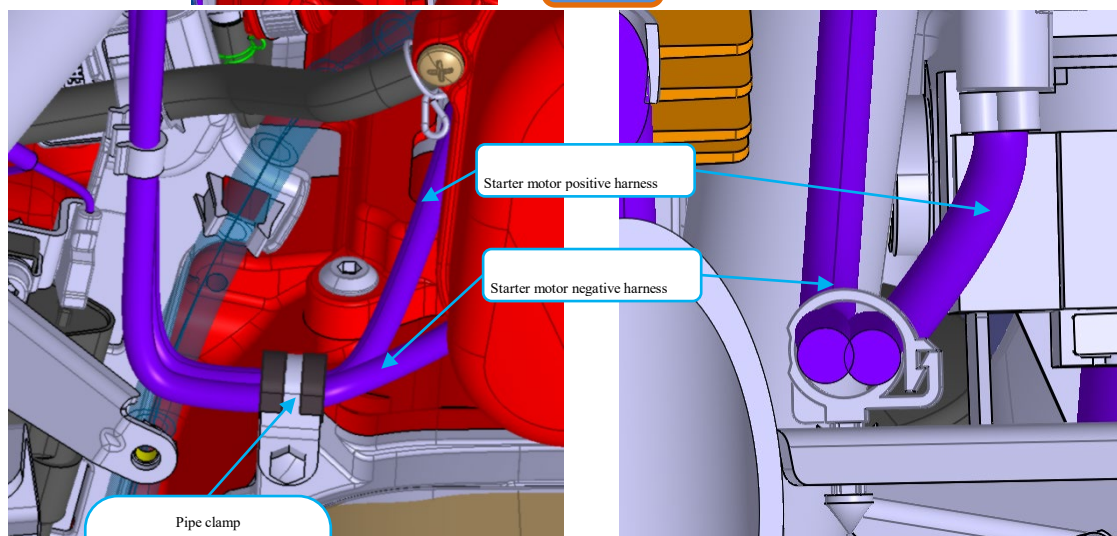


Figure 30

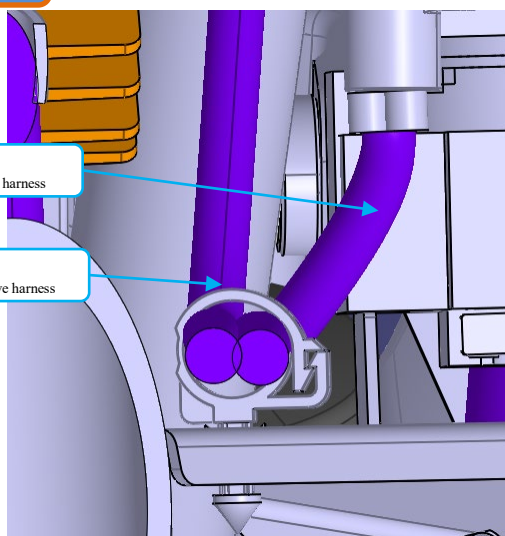


Figure 31

(8) Route the ECU harness, canister harness, OBD harness, ECU bonding harness, and the branch harness composed of the rear wheel speed sensor, rear oxygen sensor, water temperature sensor and magneto harnesses) along the right side of the frame; and secure the branch harness to the frame with a cable clamp ($\phi 12$) (91402-M62A-0001), as shown in Figure 23.

- Plug and secure the OBD connector onto the battery box.
- Secure the rear oxygen / rear wheel speed sensor main cable and the rear wheel speed sensor harness to electrical connector mounting plate II as shown in Figure 33.

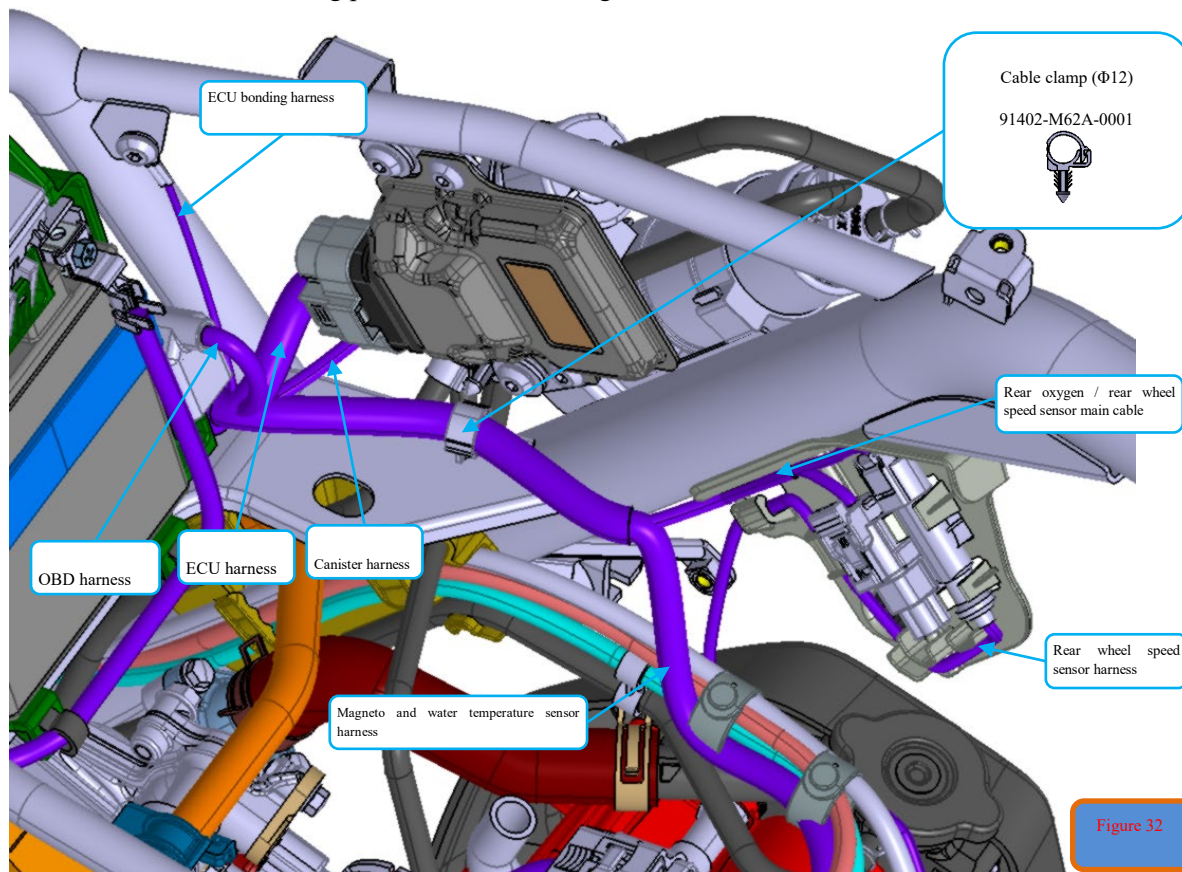


Figure 32

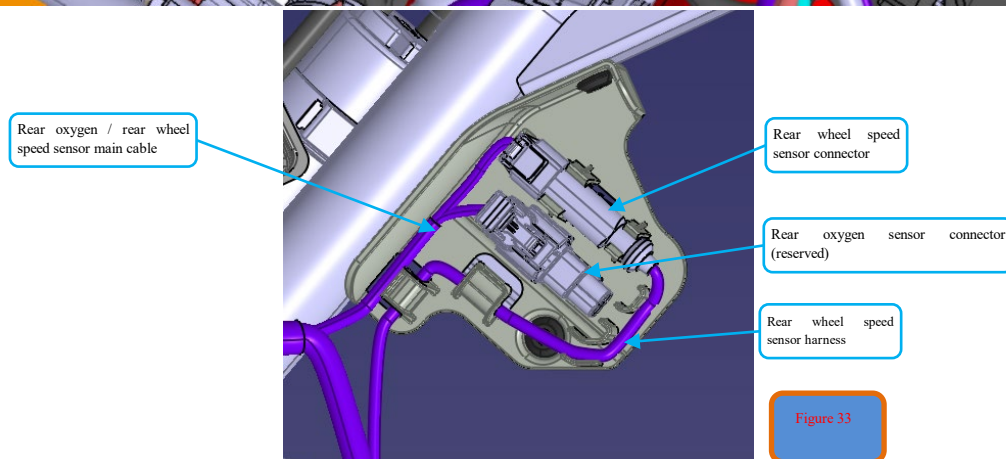
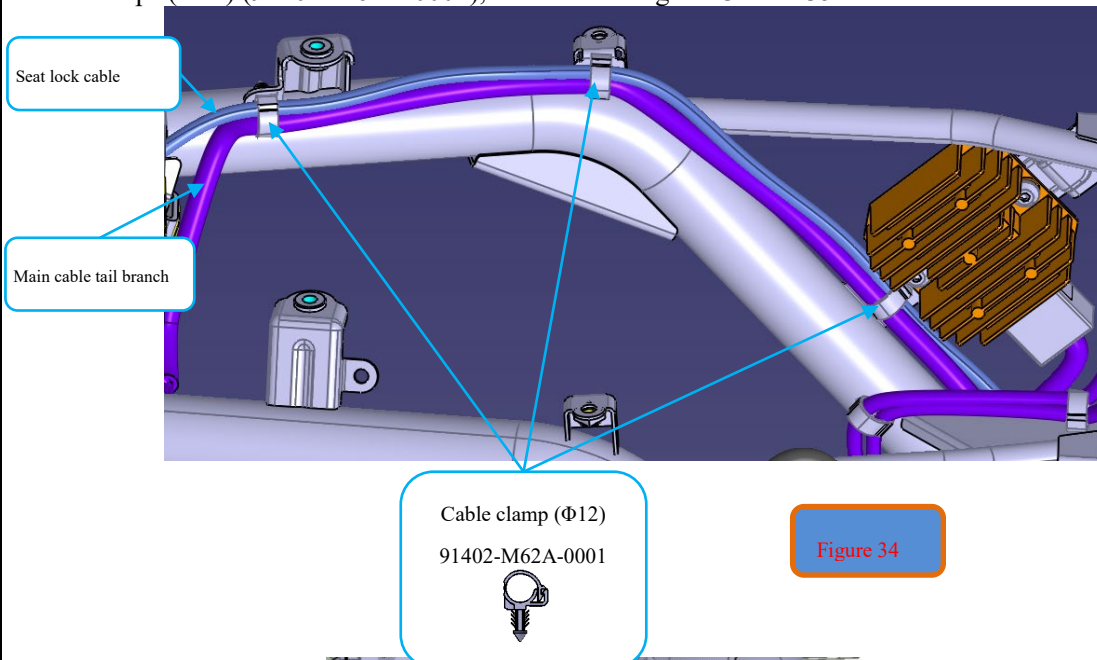
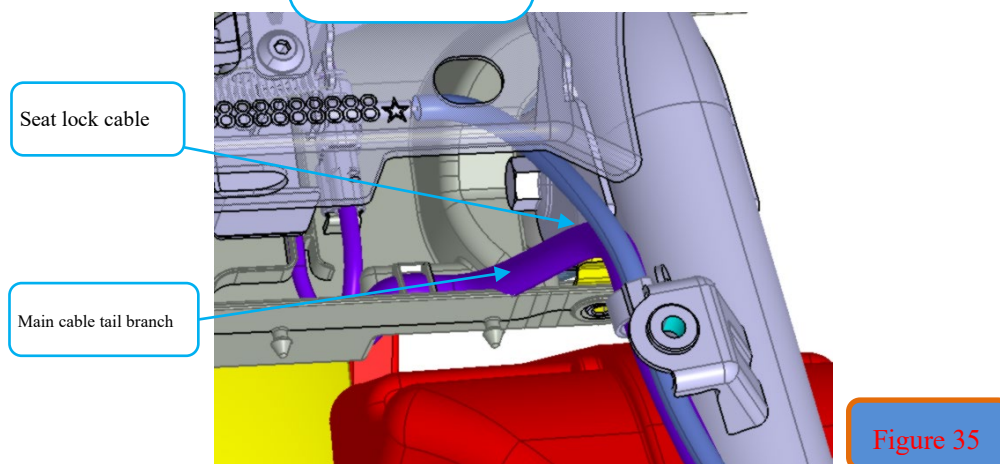


Figure 33

13. Route the main cable tail branch and the seat lock cable side by side along the frame, with the main cable on the lower side and the seat lock cable on the upper side. Secure the lines together to the frame with three cable clamps ($\Phi 12$) (91402-M62A-0001), as shown in Figures 34 and 35.



14. The rear harness consists of the rear turn signal harness, tail light harness, gyroscope harness, seat lock harness, and buzzer harness; secure each connector and harness to its designated snap-in position as shown in Figure 36.

- Secure the buzzer harness and seat lock harness together with strap C (34006-M11A-0000).

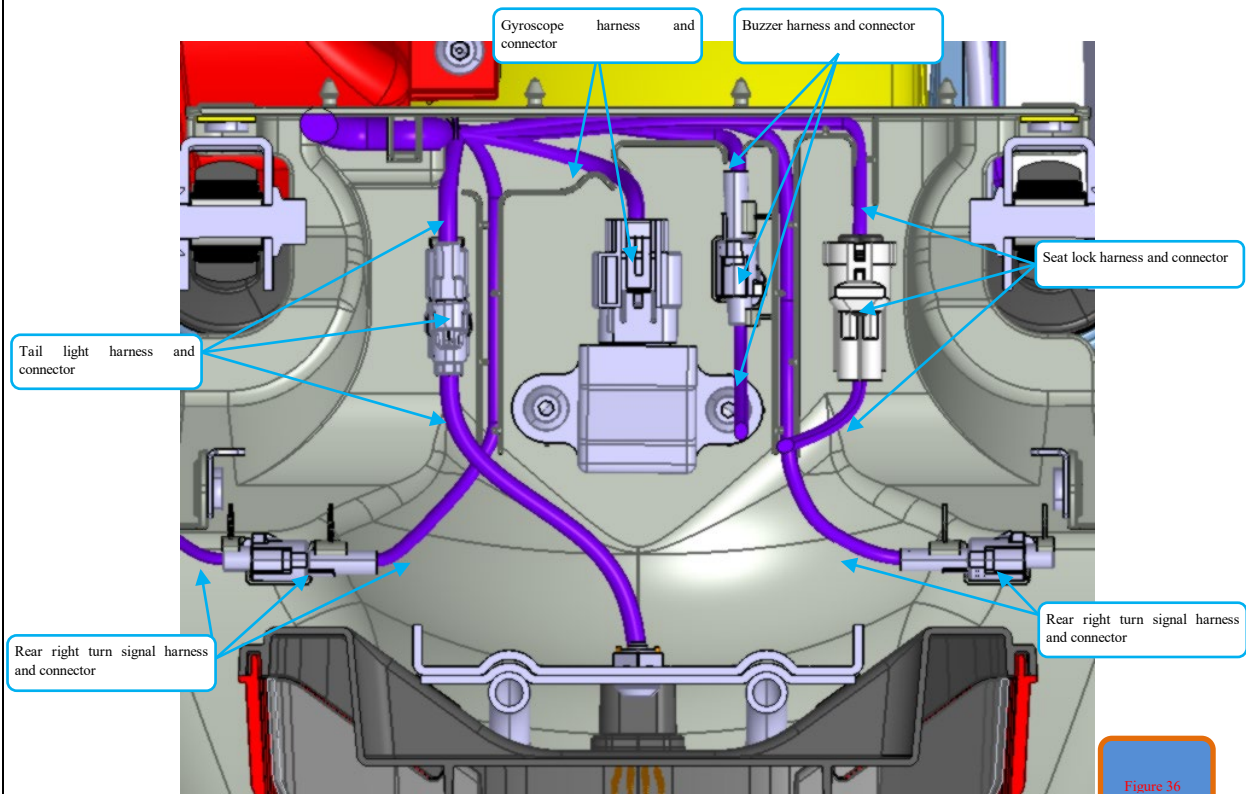


Figure 36

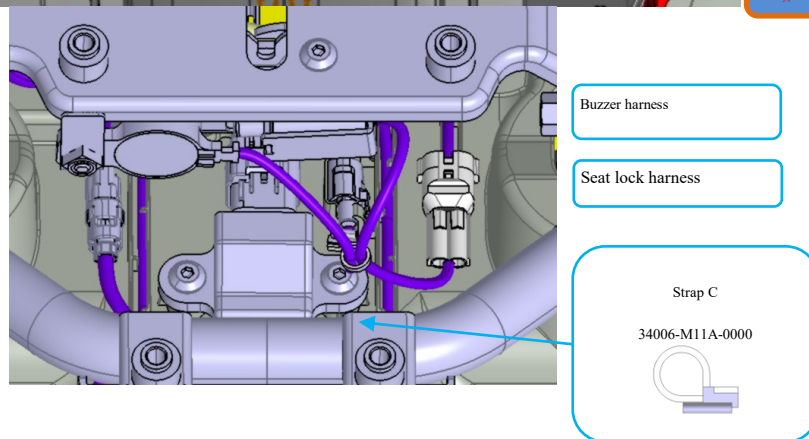
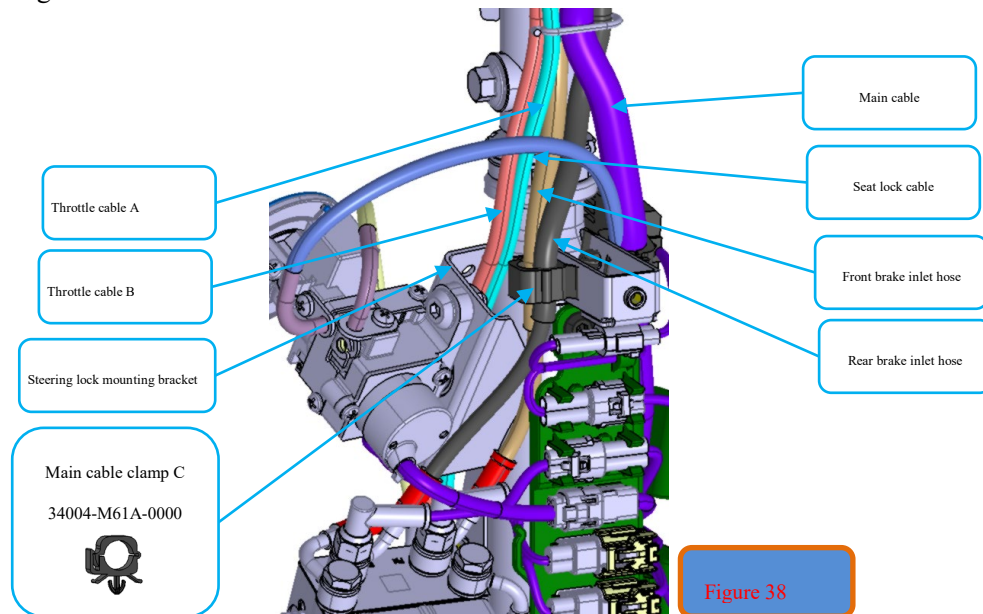
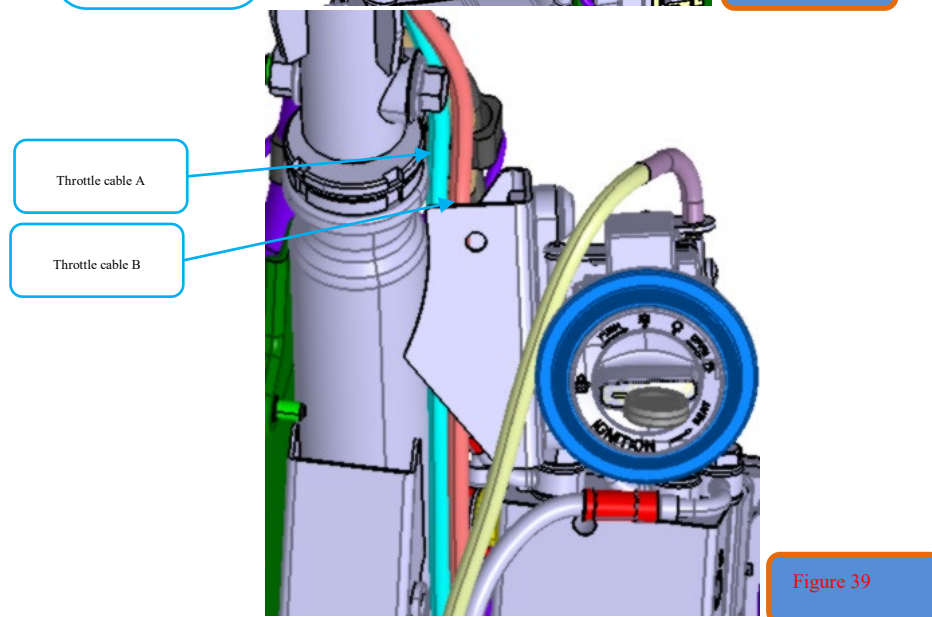


Figure 37

15. Secure the front brake inlet hose and rear brake inlet hose together to the frame with main cable clamp C (34004-M61A-0000), as shown in Figure 38.

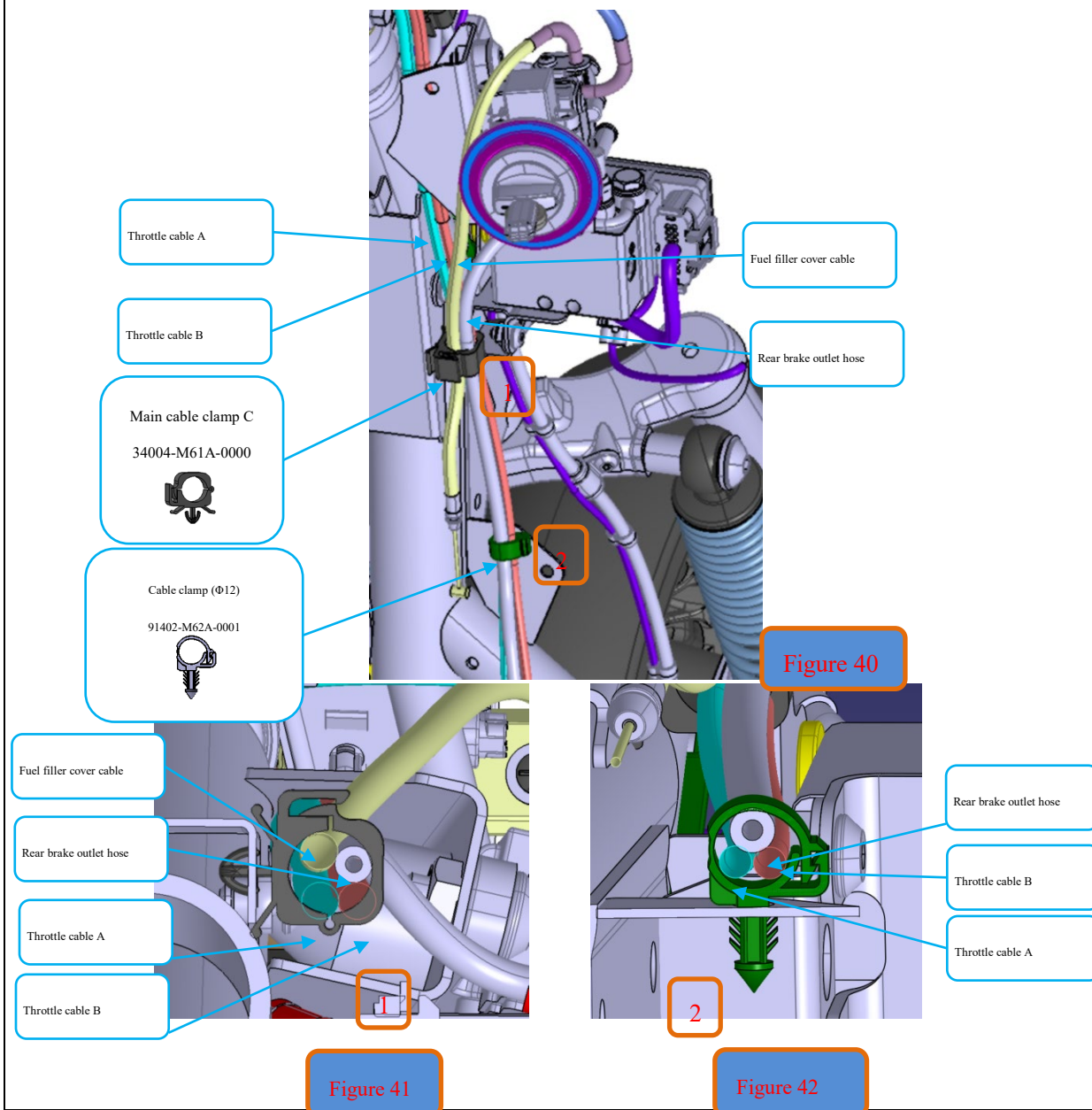
16. Route throttle cables A and B through the middle of the steering lock mounting bracket, as shown in Figures 38 and 39.

- Arrange them side by side, with throttle cable A on the left side and throttle cable B on the right side, as shown in Figure 39.



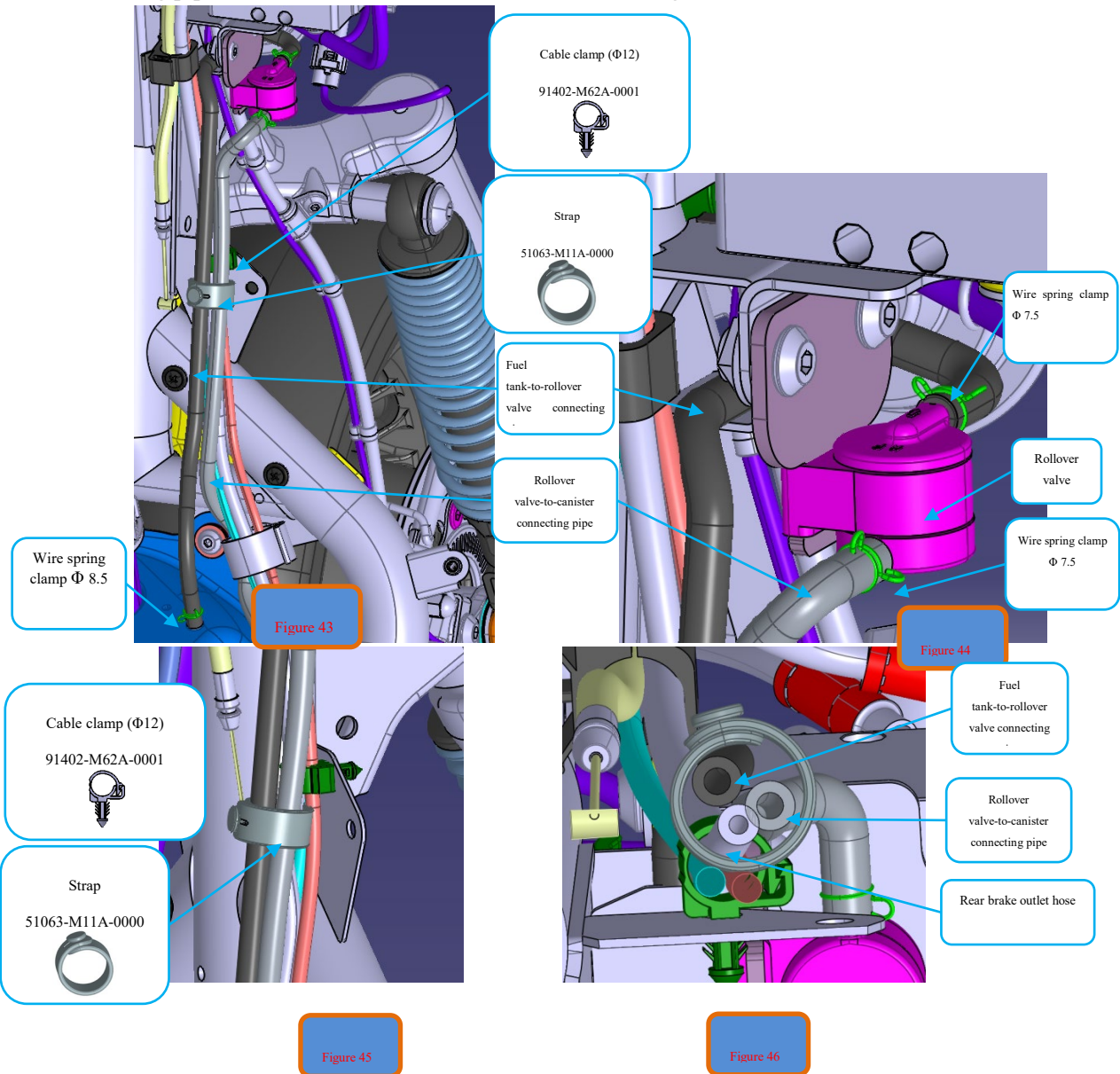
17. Route throttle cables A and B, the fuel filler cover cable, and the rear brake outlet hose downward along the frame. Secure throttle cables A and B, the fuel filler cover cable, and the rear brake outlet hose to the frame at position 1 with main cable clamp C (34004-M61A-0000). Secure throttle cables A and B and the rear brake outlet hose to the frame at position 2 with a cable clamp (Φ12) (91402-M62A-0001), as shown in Figure 40.

- Follow the routing sequence as shown in Figure 41 to route throttle cables A and B, fuel filler cover cable, and rear brake outlet hose.
- Follow the routing sequence as shown in Figure 42 to route throttle cables A and B and the rear brake outlet hose.



18. Route the fuel tank-to-rollover valve connecting pipe through the frame, and then route it downward along the frame together with the rollover valve-to-canister connecting pipe. Secure the fuel tank-to-rollover valve connecting pipe, the rollover valve-to-canister connecting pipe, and the rear brake outlet hose together with a strap (51063-M11A-0000), as shown in Figures 43 and 44.

- The strap mounting position is shown in Figure 45.
- The routing sequence for the fuel tank-to-rollover valve connecting pipe, the rollover valve-to-canister connecting pipe, and the rear brake outlet hose is shown in Figure 46.



19. Routing and layout of pipelines and cables on the right side of the fuel tank

(1) Secure throttle cables A and B, the rear brake outlet hose, and the rollover valve-to-canister connecting pipe to the frame with main cable clamp B (Φ25) (34003-M61A-0000), as shown in Figures 47 and 48.

- Arrange throttle cables A and B and the rear brake outlet hose side by side inside the right main frame tube and main cable clamp B, as shown in Figures 47 and 48.
- When securing the rollover valve-to-canister connecting pipe inside main cable clamp B, route it below throttle cables A and B and the rear brake outlet hose, **ensuring the rollover valve-to-canister connecting pipe is not pinched to maintain proper ventilation**, as shown in Figure 48.

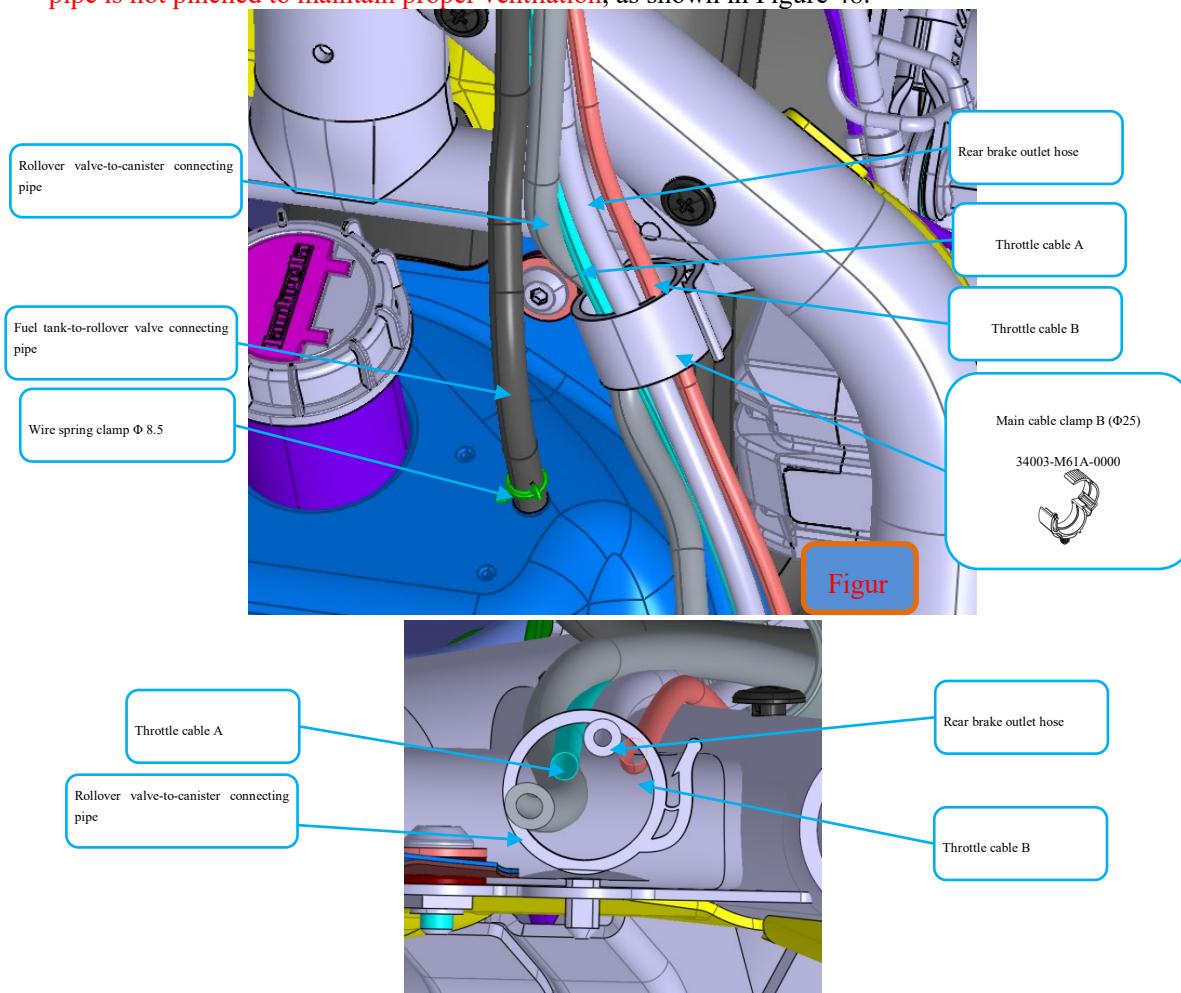
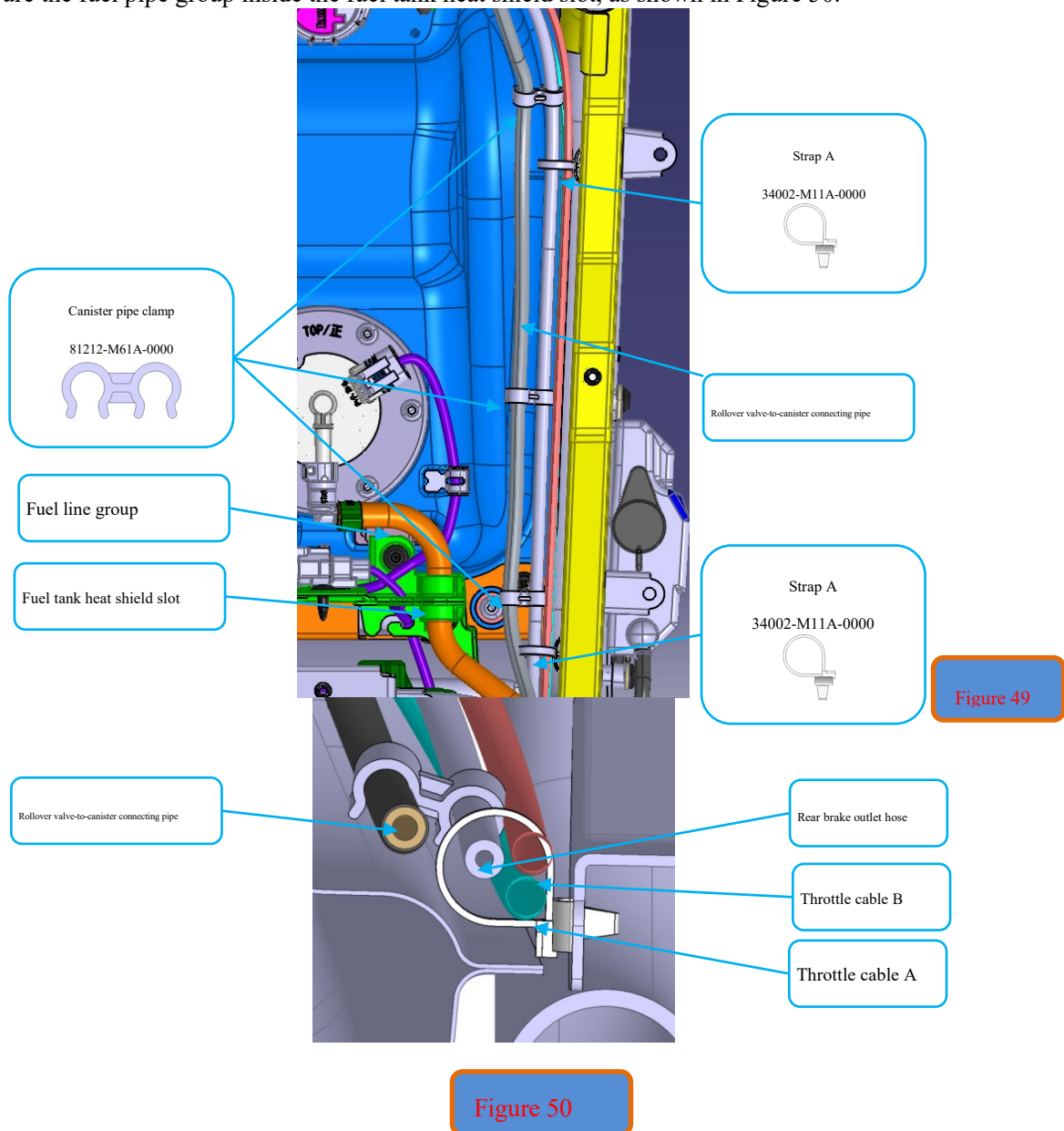


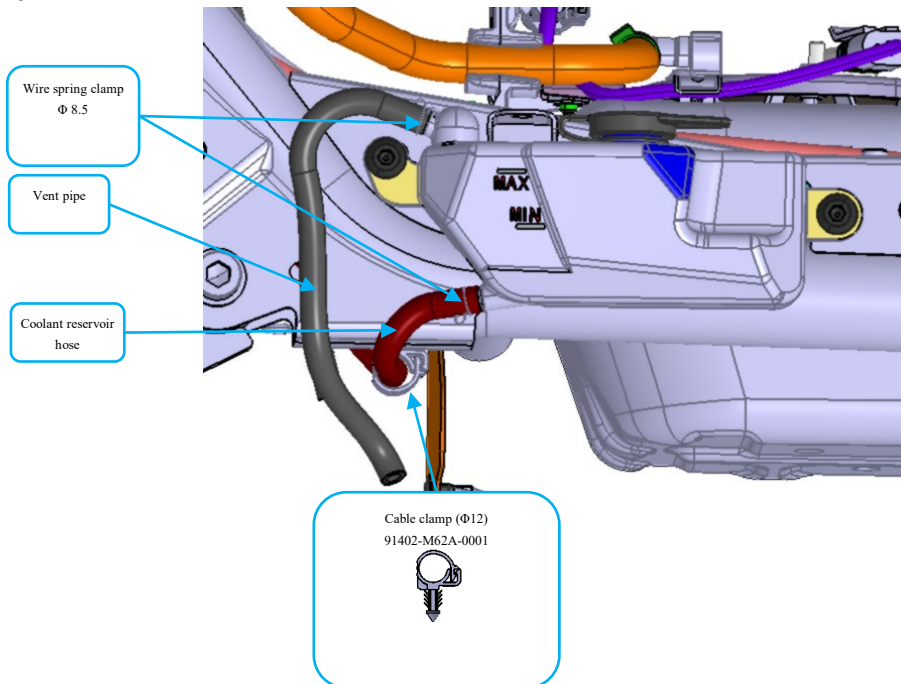
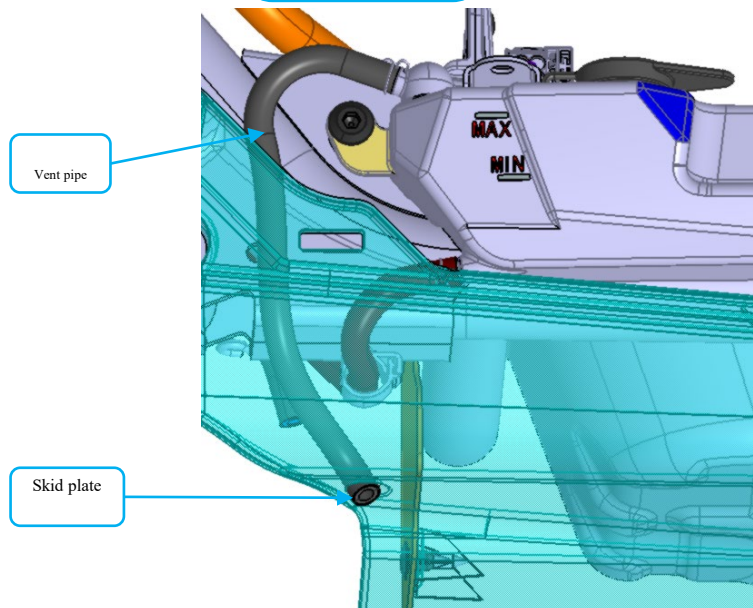
Figure 48

- (2) Secure throttle cables A and B and the rear brake outlet hose to the frame with 2 straps A (34002-M11A-0000) as per the routing sequence shown in Figures 49 and 50.
- (3) Secure the fuel tank-to-rollover valve connecting pipe to the rear brake outlet hose with 3 canister pipe clamps (81212-M61A-0000), as shown in Figure 49.
- (4) Secure the fuel pipe group inside the fuel tank heat shield slot, as shown in Figure 50.



20. Routing and layout of cooling system pipelines

- (1) Secure the coolant reservoir hose to the lower side of the engine hanger right mounting bracket with a cable clamp ($\Phi 12$) (91402-M62A-0001), as shown in Figure 51.
- (2) When installing the skid plate, route the vent pipe through the reserved hole in the skid plate, as shown in Figure 52.

**Figure 51****Figure 52**

21. Routing and layout of fuel evaporation pipelines

- (1) Secure the rollover valve-to-canister connecting pipe to the frame with a cable clamp ($\Phi 12$) (91402-M62A-0001), as shown in Figures 53 and 54.
- (2) Secure the rollover valve-to-canister connecting pipe and solenoid valve connecting pipe B together with a cable clamp ($\Phi 12$) (91402-M62A-0001), as shown in Figures 53 and 54.

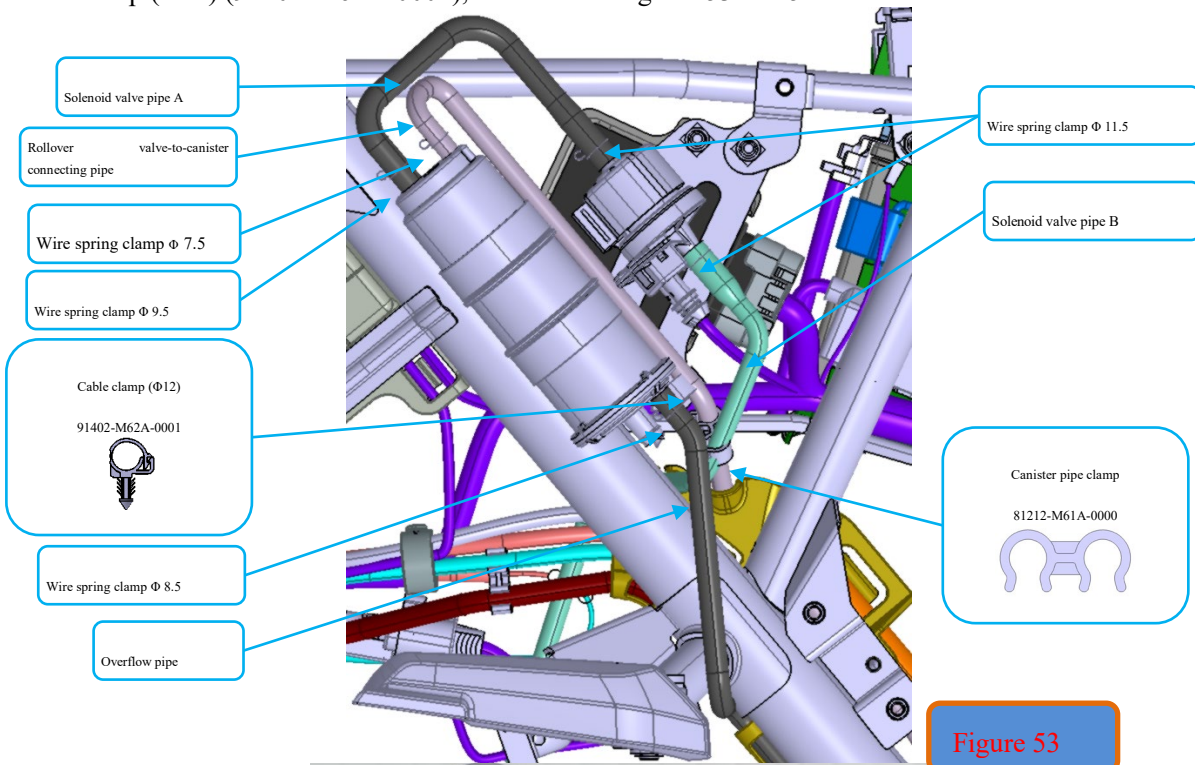


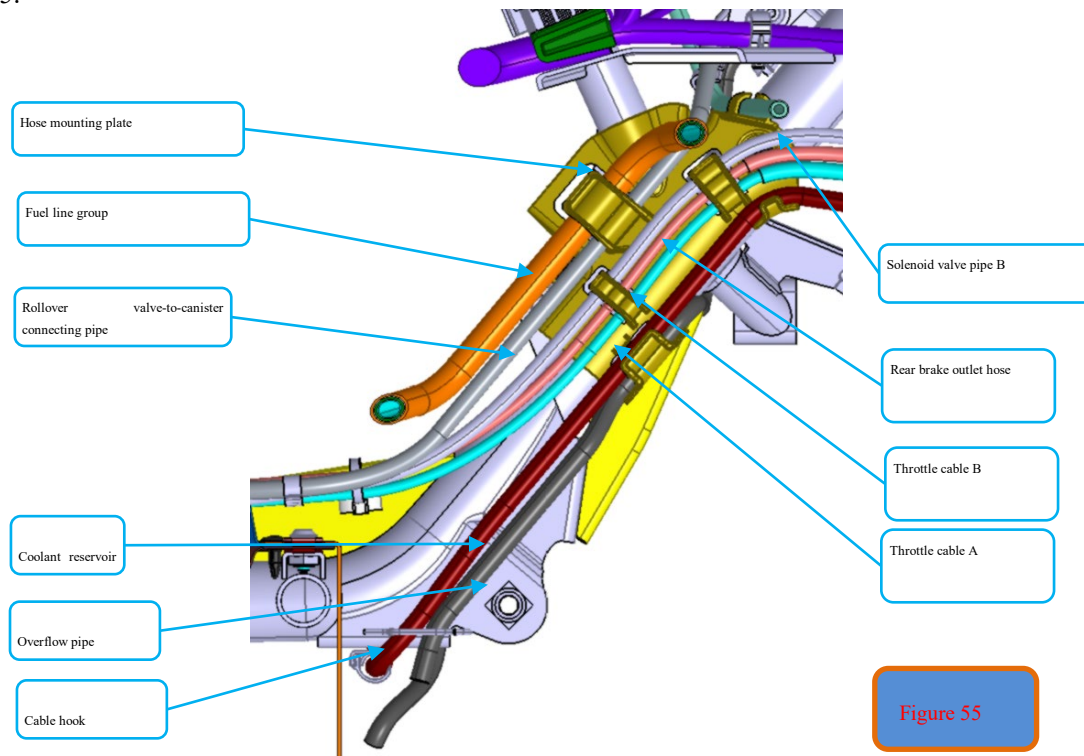
Figure 53



Figure 54

22. Routing and layout of harnesses and pipelines around the engine

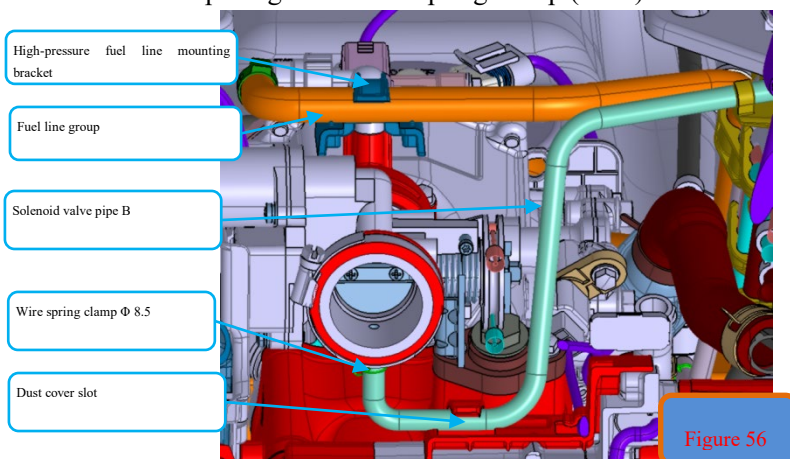
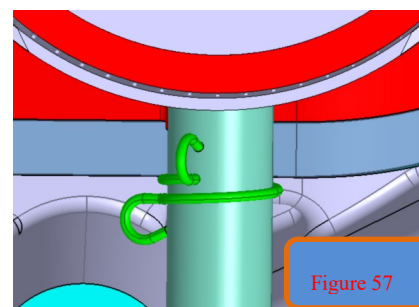
- (1) Secure the fuel pipe group, rollover valve-to-canister connecting pipe, coolant reservoir hose, overflow pipe, solenoid valve connecting pipe B, rear brake outlet hose, and throttle cables A and B inside the slot of the pipeline mounting plate as per Figure 50, as shown in Figure 55.
- (2) Secure the coolant reservoir hose and the overflow pipe inside the frame cable hooks, as shown in Figure 55.



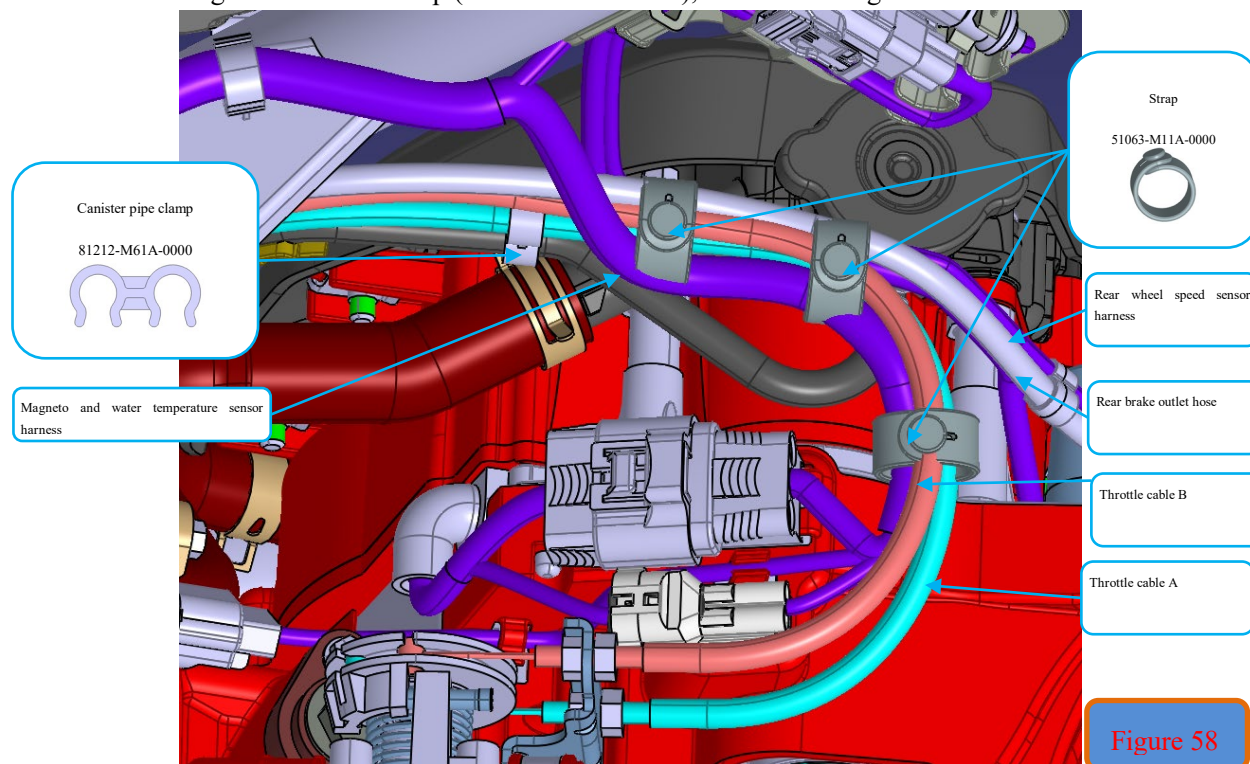
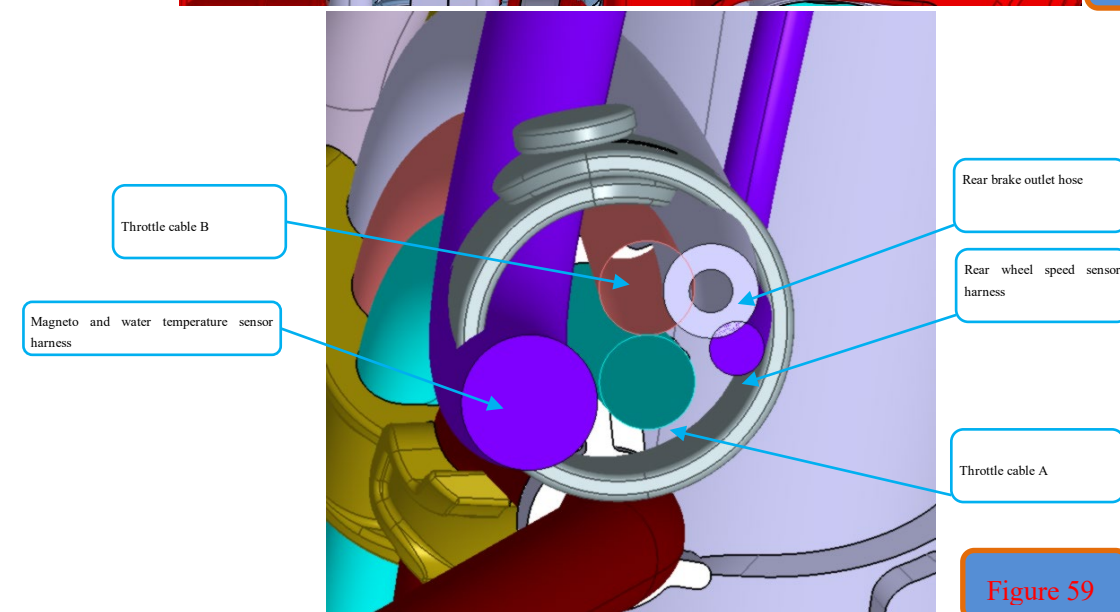
(3) Secure the fuel pipe group inside the slot of the high-pressure fuel pipe mounting bracket, as shown in Figure 56.

(4) Secure solenoid valve connecting pipe B inside the dust cover slot, as shown in Figure 56.

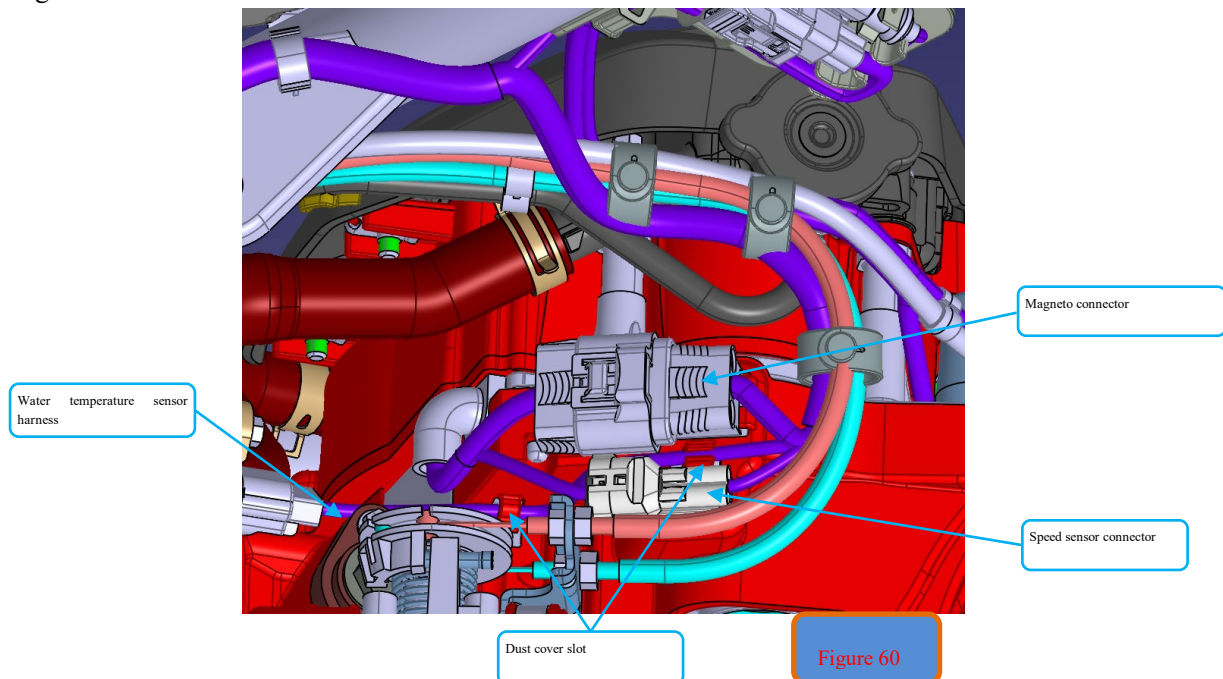
- Ensure the opening of the wire spring clamp ($\Phi 8.5$) faces the left side, as shown in Figure 57.



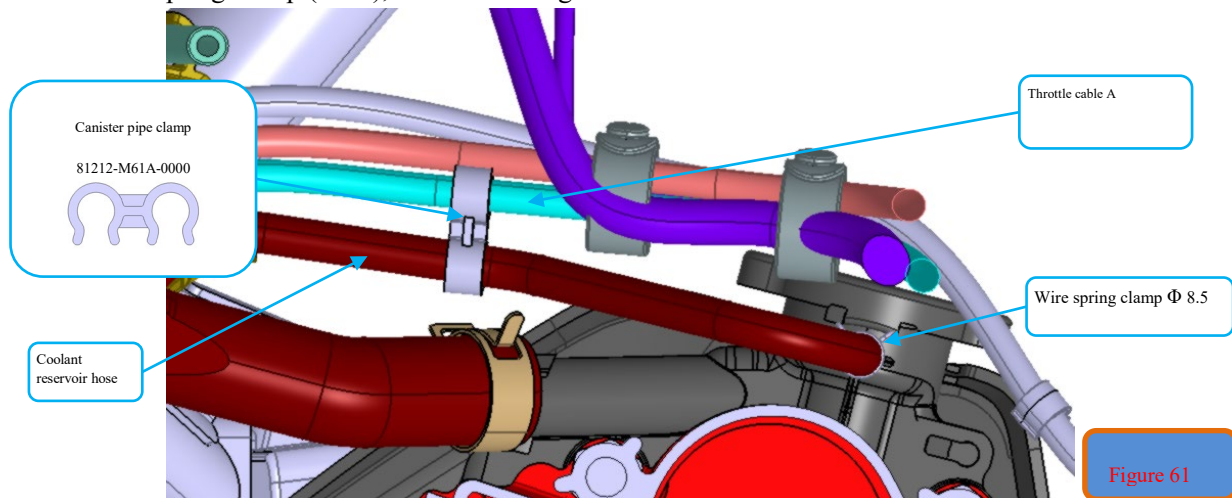
(5) Secure the magneto harness, water temperature sensor harness, rear wheel speed sensor cable, rear brake outlet hose, and throttle cables A and B together with two straps (51063-M11A-0000). The routing of each pipeline is shown in Figure 59. Secure the magneto harness, water temperature sensor harness, and throttle cables A and B together with one strap (51063-M11A-0000), as shown in Figure 58.



(6) Secure the water temperature sensor harness inside the dust cover slot as shown in Figure 55. The magneto connector and speed sensor connector are secured at their corresponding positions on the dust cover, as shown in Figure 60.



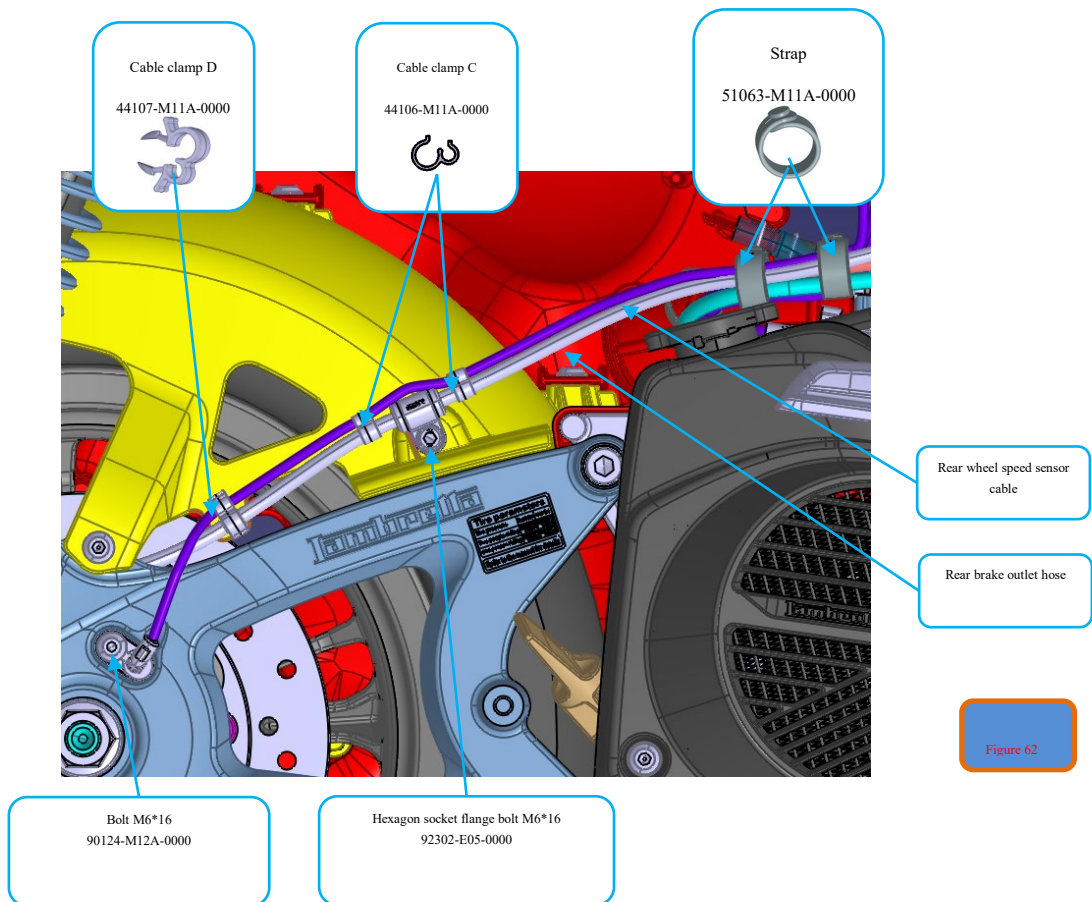
(7) Secure the coolant reservoir hose and throttle cable A together with a cable clamp ($\Phi 12$) (91402-M62A-0001). Assemble the coolant reservoir hose to the small branch pipe of the radiator filler neck with the wire spring clamp ($\Phi 8.5$), as shown in Figure 61.



23. Routing and layout of rear brake outlet hose and rear wheel speed sensor cable

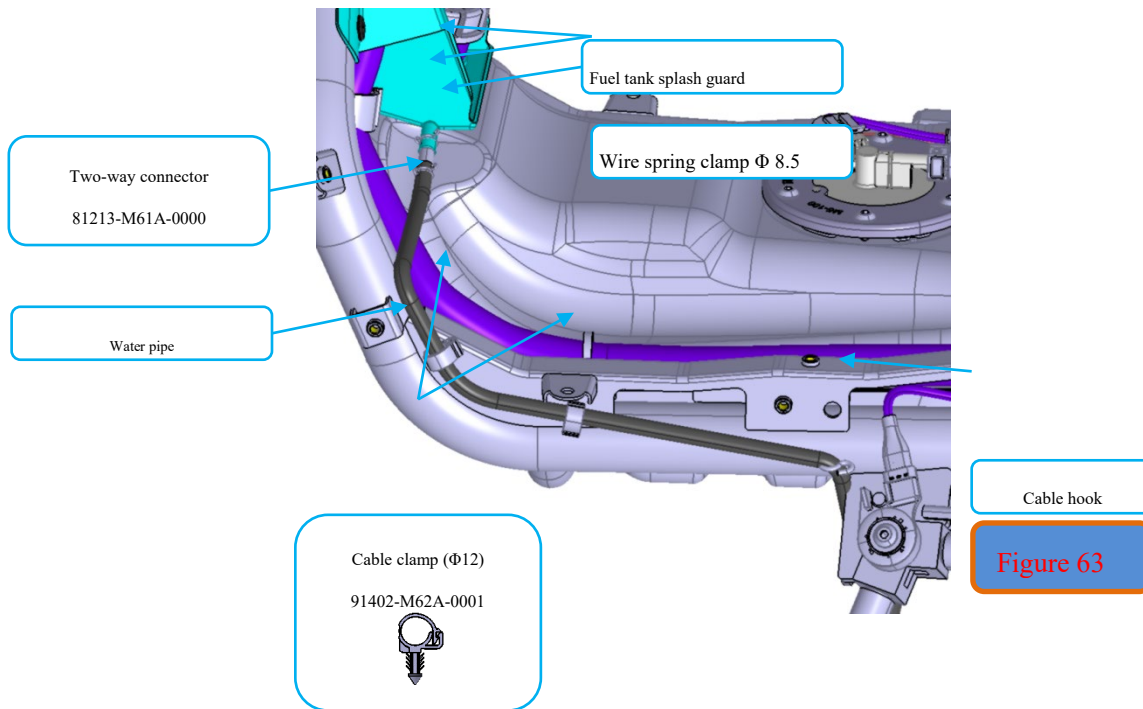
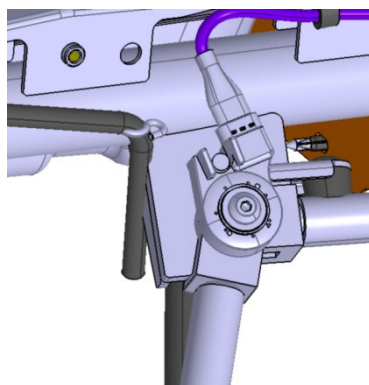
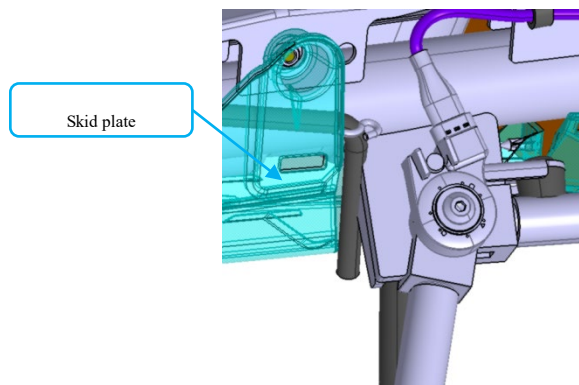
- (1) Install the rear brake outlet hose and the fender together onto the rear swingarm with a hexagon socket flange bolt M6*16 (92302-E05-0000), as shown in Figure 57.
- (2) Install the rear wheel speed sensor group (36430-S11A-0000) onto the rear swingarm with bolts M6*16 (90124-M12A-0000). Secure the rear brake outlet hose and the rear wheel speed sensor together to the fender with cable clamp D (44107-M11A-0000). Connect them along the rear brake outlet hose with two cable clamps C (44106-M11A-0000), and bundle the rear brake outlet hose, rear wheel speed sensor cable, and throttle cables A/B together with a strap (51063-M11A-0000), as shown in Figure 62.
- (3) Route the rear brake outlet hose and the rear wheel speed sensor cable side-by-side vertically.

➤ **Note:** The rear brake outlet hose must be routed at the bottom, and the rear wheel speed sensor cable must be routed on the top.

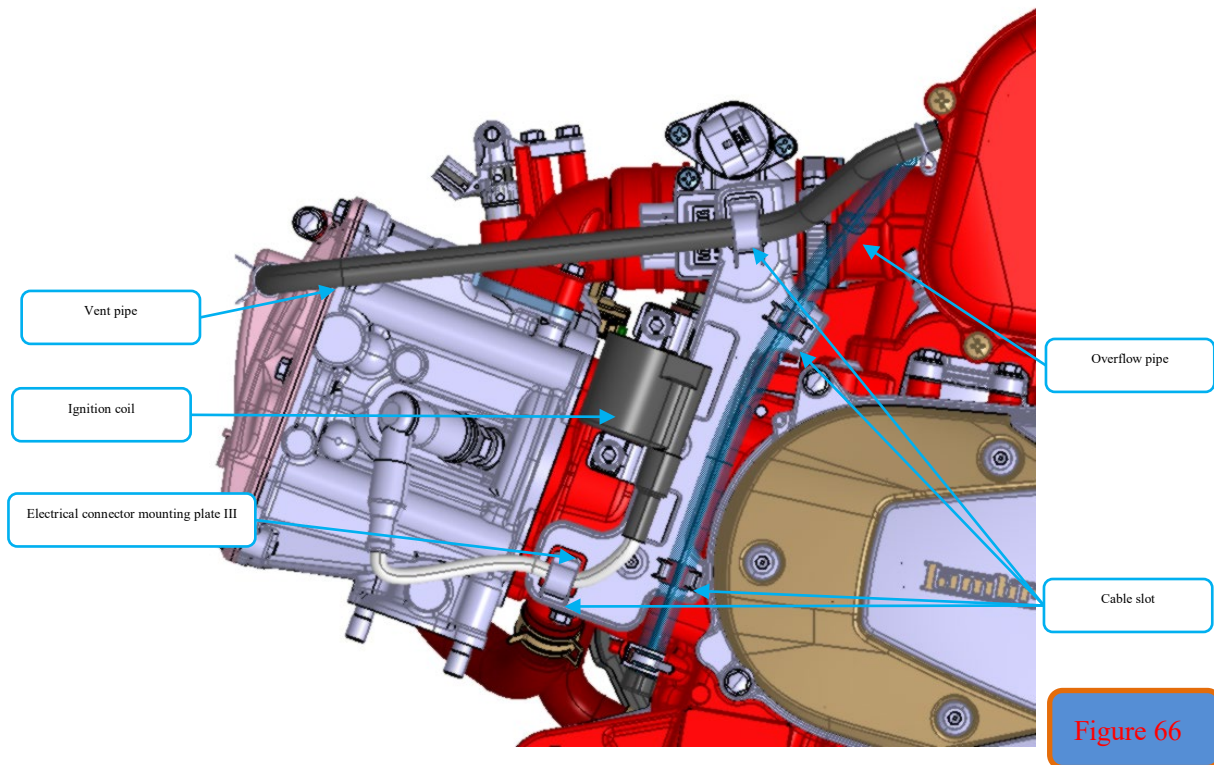


24. Connect the water drain pipe to the fuel tank splash guard using a two-way connector, and secure it with two wire spring clamps ($\Phi 8.5$). Route the water drain pipe along the frame and secure it to the frame with two cable clamps ($\Phi 12$) (91402-M62A-0001), and pass the pipe through and secure it with the cable hook on the frame, as shown in Figures 63 and 64.

- After assembling the skid plate, pull the end of the water drain pipe out through the gap between the skid plate and the side stand mounting bracket, as shown in Figure 65.



25. The routing of the air filter overflow pipe, vent pipe, and ignition coil cable is shown in Figure 66. Snap the pipes and cables into the slots on the electrical connector mounting plate III respectively.



Symbols

Meanings of the symbols herein are as follows:



Instructions

Measures to be noted during operation, inspection and maintenance



Note:

Special instructions or treatment measures proposed to prevent certain damage to the motorcycle



Warning:

Special instructions or measures put forward to avoid serious injury or personal injury

	It shall be replaced with a new one during re-assembling.
	Use special tools.
	Use general tools.
	The fastening torque is: 50N·m .
	Use the recommended oil.
	Use thread locker.
	Use lithium grease.

2 Lubrication System

Maintenance Notice

Troubleshooting

Engine Lubrication System Diagram

Inspection and Replacement of Engine Oil

Inspection and Replacement of Gear Oil

Inspection of Oil Pump

Engine Oil Type Selection

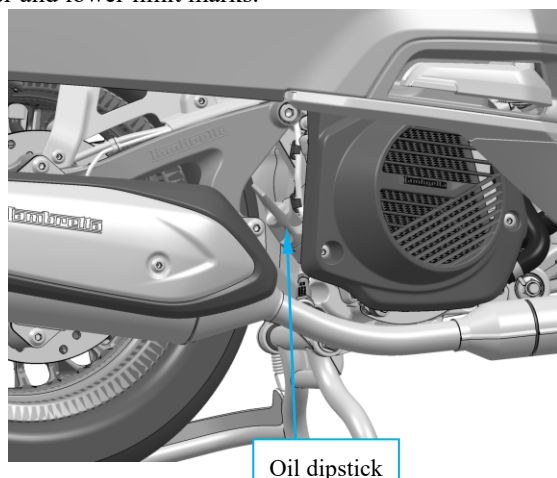
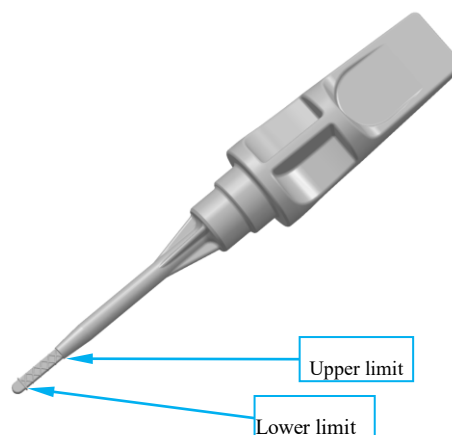
Maintenance Notice

This section introduces the inspection and replacement of engine oil as well as the cleaning methods for the oil strainer cover. It also introduces the parts and components of the entire motorcycle.

Engine oil is a vital factor affecting engine performance and service life and must be selected as specified. It is prohibited to replace crankshaft oil with ordinary oil, gear oil, vegetable oil, etc. At the time of ex-factory delivery, the crankshaft of this engine is filled with SAE 10W-40 SL grade engine oil, and the gearbox is filled with 80W-90 gear oil. When replacing the oil, drain the original oil from the crankshaft and gearbox completely before refilling with new oil as specified.

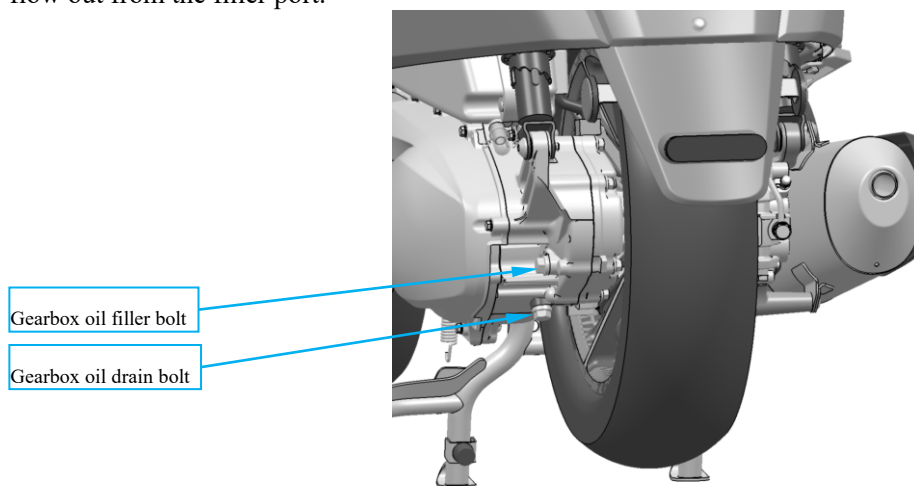
The engine does not need to be removed upon oil inspection, replenishment, or replacement.

To inspect the crankshaft oil level, place the motorcycle on level ground and support it with the center stand. If the engine is cold, idle it for more than 5 minutes, then turn it off and let it sit for 3-5 minutes. Unscrew the dipstick and wipe it clean, reinsert it into the dipstick hole while keeping it vertical to the end surface without screwing it in, then remove the dipstick and observe whether the oil level is between the upper and lower limit marks. If refilling with new oil after draining, tighten the drain bolt or oil strainer cover as required. After adding oil, start the engine and idle for more than 5 minutes, then turn it off and let it sit for 3-5 minutes. Re-inspect the oil level according to the above method to check if it is between the upper and lower limit marks. If it is below the lower limit mark, add oil until it is within the upper and lower limit marks.



To inspect the gear oil level, place the motorcycle on level ground and support it with the center stand. Loosen the gearbox oil filler bolt and slowly inject gear oil through the filler port. Stop filling when the gear oil begins to

flow out from the filler port.



To replace the gearbox gear oil, loosen the oil drain bolt and collect the gear oil with an oil tray. After the gear oil is completely drained, tighten the drain bolt according to the torque requirements. Loosen the gearbox oil filler bolt and inject new gear oil according to the required filling capacity.

Technical specifications: Crankshaft engine oil filling capacity:

1) 0.85L - After engine disassembly and cleaning; 2) 0.8L - Oil change only

Gear oil filling capacity:

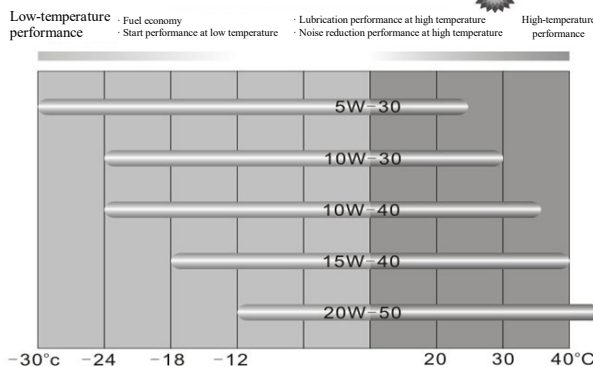
1) 0.15L - After gearbox disassembly and cleaning; 2) 0.12L - Gear oil change only



Warning:

Frequent and long-term contact with engine oil may cause skin cancer. However, this is unlikely to happen unless you process used engine oil every day. Clean your hands with suds and water immediately after processing. Keep it away from children.

Select viscosity according to temperature



Troubleshooting

⌘ Engine Oil Pollution

1. The engine oil is not changed in line with the Maintenance Schedule;
- 2) The oil filler bolt threads are damaged or the sealing is poor.
3. The piston ring is abraded.

⌘ Low Engine Oil Pressure

1. The oil level is too low;

2. The oil passage or oil strainer is blocked;
3. The oil pump is faulty;

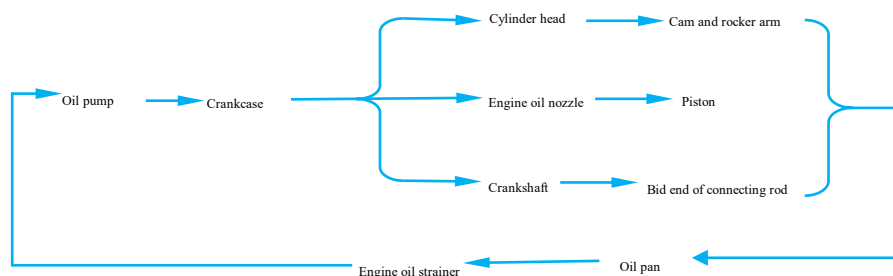
4. The mating parts such as the crankshaft and connecting rod are worn.

⌘ High Engine Oil Consumption

1. The engine leaks oil;
2. The piston ring is abraded;
3. The guide rods of intake valve and exhaust valve are abraded;

4. The oil drip pan is abraded or damaged.

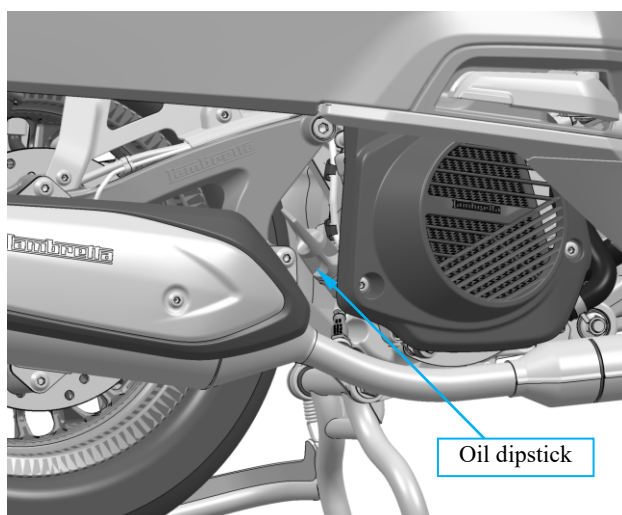
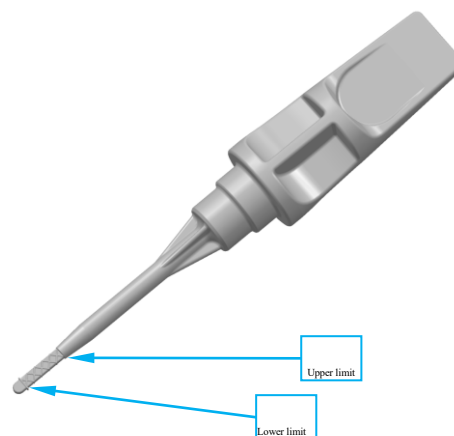
Engine Lubrication System Diagram



Inspection of Engine Oil

Turn off the engine, place the motorcycle on level ground and hold it upright with both front and rear wheels touching the ground. Unscrew the dipstick and wipe the oil off the dipstick. Reinsert the dipstick into the dipstick hole while keeping it vertical to the end surface without screwing it in, then remove the dipstick and observe whether the oil level is between the upper and lower limit marks.

Inspect the engine oil



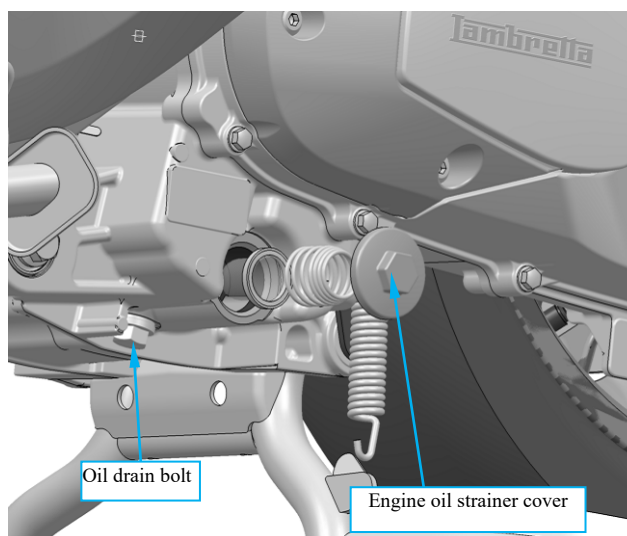
Replenishing method: Slowly add engine oil through the dipstick port using a funnel until the oil level is between the upper and lower limit marks. Then install the dipstick and tighten it.

Engine Oil Change

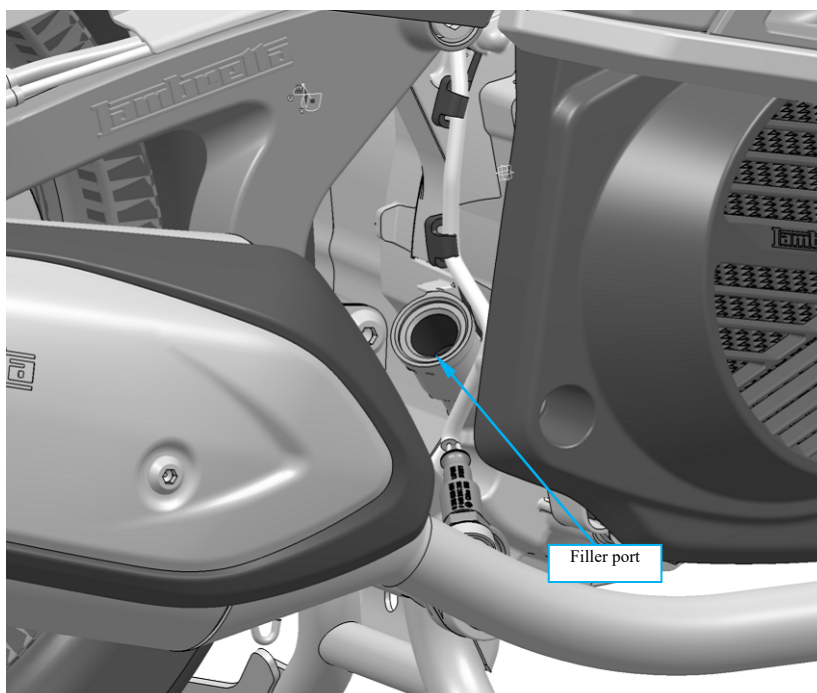
Engine oil change shall be performed after the engine is turned off and cooled down but not yet cold, ensuring that the engine oil in the crankshaft is drained quickly and completely. When draining oil, lean the motorcycle to the left with the side stand. Unscrew the oil strainer cover or oil drain bolt, and collect the engine oil in the crankshaft with an oil tray. Clean the oil strainer cover. After the oil is completely drained, reinstall the oil strainer cover or oil drain bolt, and tighten the oil strainer cover to the specified torque.

When filling with new oil, unscrew the dipstick, measure 0.8L of new engine oil, and slowly inject it into the crankshaft through a funnel. Install the dipstick and wipe off any oil stains around the filler port.

Drain the engine oil



Fill the engine oil

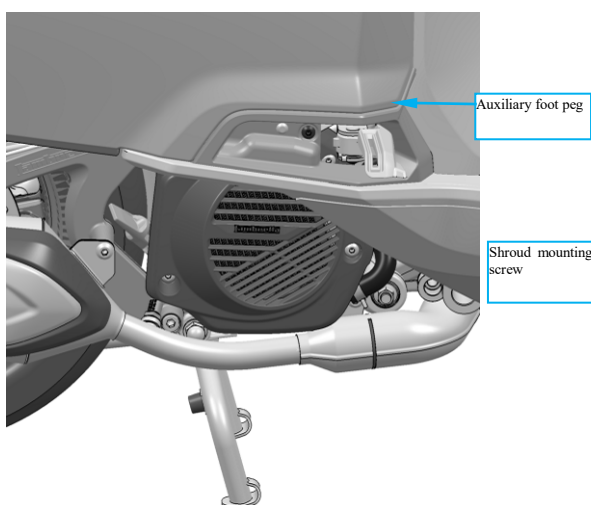


Oil pump

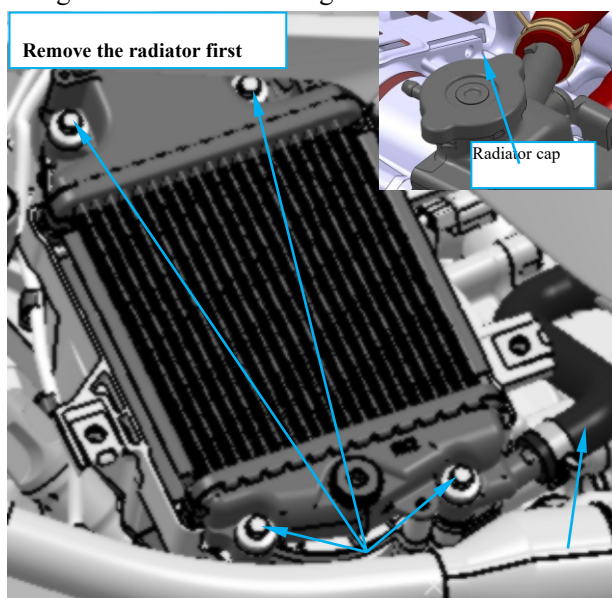
When the oil pump malfunctions, remove the engine, or repair or replace this part on the complete motorcycle. Only the method without engine removal is described. Refer to the engine removal methods. This section includes the following main contents: Removal steps and illustrations of oil pump; Installation steps of oil pump; and Disassembly and assembly of oil pump, and so on.

Removal Steps and Illustrations of Oil Pump:

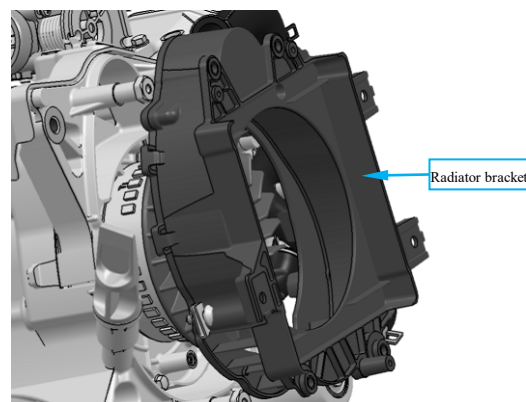
1. Support the motorcycle with the center stand on level ground. Drain the engine oil from the crankshaft. Open the auxiliary foot pegs, unscrew the radiator shroud mounting screws, and remove the radiator shroud.



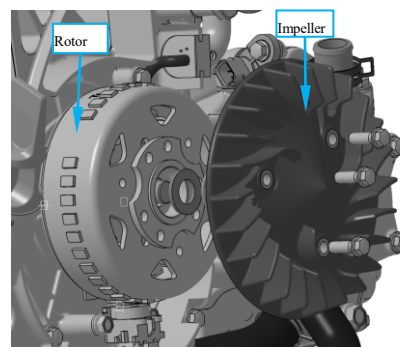
2. Drain the coolant and remove the radiator, etc. Loosen the radiator outlet hose clamps and pull out the hose. Collect the coolant with a basin. Unscrew the radiator cap to drain the coolant completely. Loosen the radiator connecting bolts to remove the right cover after removing the radiator.



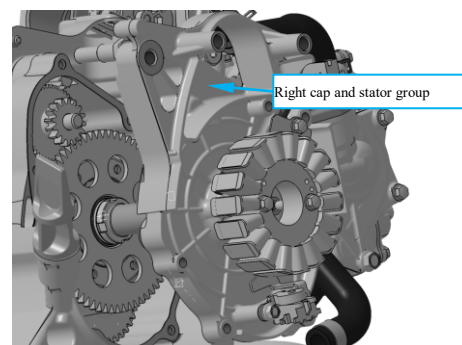
3. Remove the radiator bracket.



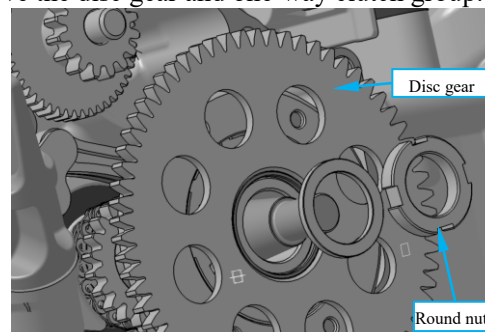
4. Remove the fan impeller and rotor.



5. Take down the right cap and stator group.

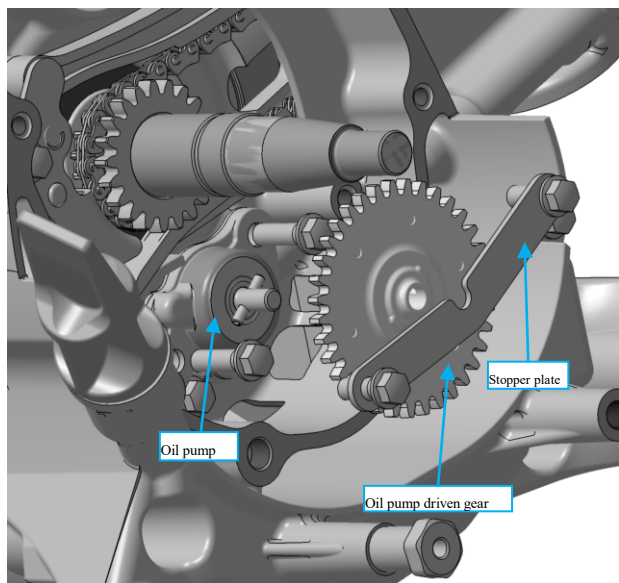


6. Remove the disc gear and one-way clutch group.



Note: The round nut locking the one-way clutch has a left-hand thread, so pay attention to the

rotation direction during removal and
7. Remove the gear stopper plate, oil pump driven gear, and oil pump.



Note: When removing the oil pump driven gear, use a hook-shaped tool to gently pry it out from the center!

installation!

Installation Steps of Oil Pump:

The installation steps are the reverse of removal steps.

Pay attention to the following items during assembly:

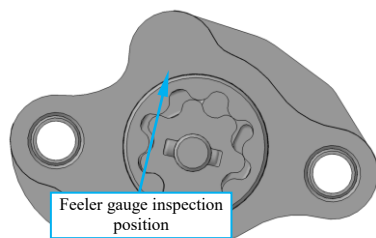
1. The parts shall be clean and undamaged.
2. When assembling the oil pump driven gear, ensure that the slot on the gear and the pin on the oil pump are aligned in direction.
3. When assembling the one-way clutch and disc gear, the disc gear and one-way clutch group must be combined before being placed onto the crankshaft together, aligning the keyway with the half-moon key of the crankshaft.
4. Apply thread locker to the round nut and rotor lock nut. Tighten them to the specified torque. Note that the round nut has a left-hand thread.
5. When assembling the fan impeller, apply thread locker to the bolts. Note that the bolt model is M6*18, and excessively long bolts may damage the magneto stator coils.
6. After everything is completed, do not forget to fill with coolant and engine oil.

Sequence	Step	Remarks
	Disassembly Sequence	The assembly sequence is the reverse of disassembly sequence.
1	Loosen the radiator shroud screws to remove the radiator shroud.	
2	Remove the water hose clamps to drain the water, and remove the radiator.	
3	Remove the fan impeller and magneto rotor.	Apply thread locker during assembly. The tightening torque is 70N.m.
4	Remove the right cover.	
5	Remove the one-way clutch.	Apply thread locker during assembly. The tightening torque is 70N.m.
6	Remove the oil pump gear stopper plate and gear.	
7	Remove the oil pump.	

Inspection of Oil Pump

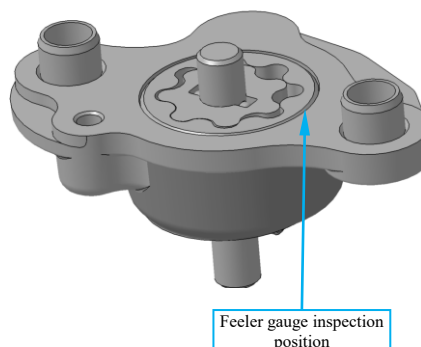
Inspection of Radial Clearance

Maintenance limit: 0.20mm



Inspection of Oil Pump Clearance

Maintenance limit: 0.25mm



3

Inspection and Adjustment

Maintenance Notice

Timing Phase

Coolant

Cleaning and Replacement of
Air Filter Element

Idle Speed

Vacuum Filling Method for
Brake Fluid

CVT and Drive Belt

Headlight Aiming

Suspension System

Spark Plug

Lubricating Oil

Cylinder Pressure

Throttle Control

Brake System

Running System

Battery

Steering Stem Bearings

Bolts, Nuts and Fasteners

Maintenance Notice

This section introduces the inspection and adjustment of motorcycle J200, and the related technical requirements.



Instruction:

Unless otherwise specified or indicated in the Maintenance Schedule, please inspect and adjust J200 motorcycle before each operation.

Technical Specifications

Engine

Spark plug	BN8RTC
Spark plug clearance	0.7-0.8mm
Valve clearance (cold state)	IN: 0.1-0.15mm EX: 0.15-0.2mm
Idle speed	1650 r/min±150r/min
Cylinder pressure	≥ 0.5MPa/500r/min

Body

Throttle grip free play	2-6mm
Front brake lever free play	11-19mm
Rear brake lever free play	11-19mm
Tire pressure	Front wheel One person: 200kPa, two persons: 200kPa Rear wheel One person: 200kPa, two persons: 220kPa
Tire size	Front wheel 110/70-12 47L Rear wheel 120/70-12 51L

Spark Plug

Removal of Spark Plug Cap

Then take down the spark plug with a socket wrench. Visually check the spark plug insulator for damage and the electrode for ablation. If yes, replace them. Check the electrode clearance with a feeler gauge. The clearance of spark plug electrodes is 0.7-0.8mm. Adjust the clearance prudently. Clean carbon deposits and foreign matter with spark plug cleaner or a wire brush. Check if the spark plug sealing gasket is in good condition.

To install the spark plug, align it properly and screw it in slowly by hand.

Then, tighten it with a socket wrench, and reattach the spark plug cap.

Clearance: 0.7-0.8mm

间隙: 0.7~0.8mm

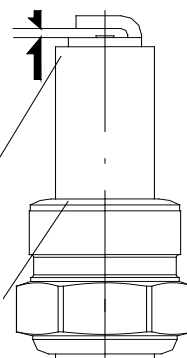
Inspect if:

Clearance
Carbon deposit
Electrode corrosion

由极腐蚀

Inspect: if the gasket can be used for sealing

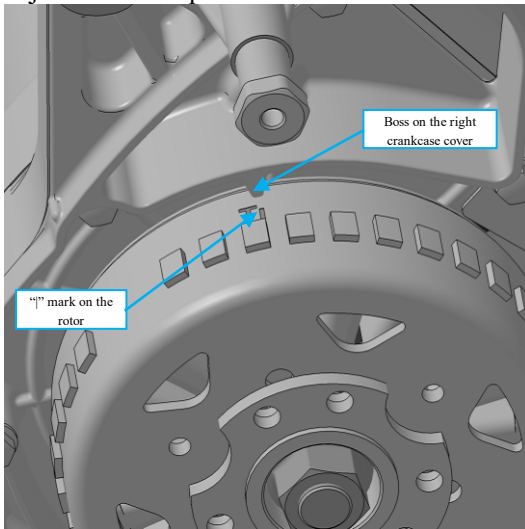
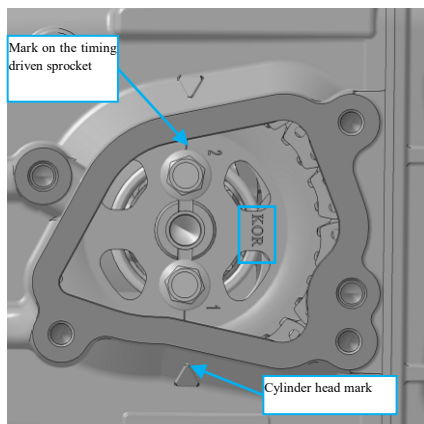
检查: 垫片能否密封



Timing Phase

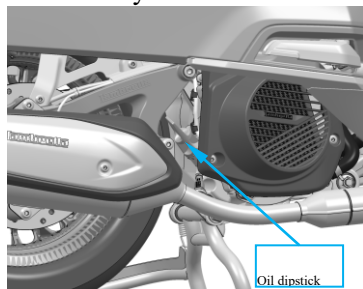
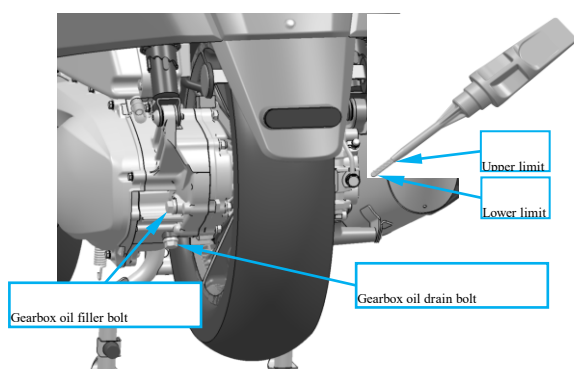
Perform this procedure during engine reassembly or if the valve timing is in doubt.

If the valve timing is correct, the “|” mark on the rotor must align with the boss on the right crankcase cover, while the mark on the timing driven sprocket aligns perfectly with the cylinder head mark. Ensure the “KOR” mark on the timing driven sprocket faces as shown in the figure. If these conditions are not met, adjustment is required.



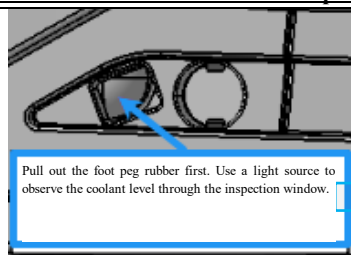
Lubricating Oil

Check the crankcase engine oil and gear oil levels as described in the “Lubricating Oil” section. Replenish as necessary if the oil level is low.

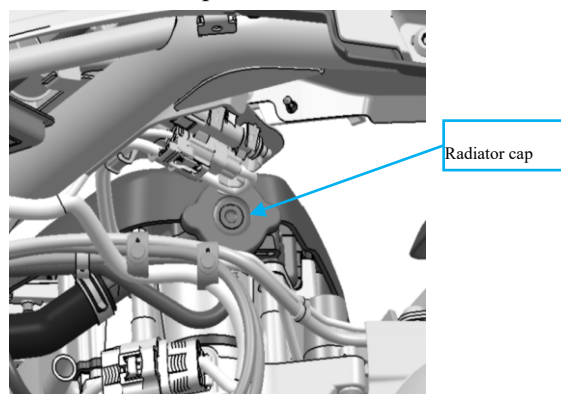


Coolant

Place the motorcycle on the center stand on level ground. The coolant level in the reservoir is visible from the right foot peg area. Check if the coolant level is between the upper and lower limits as shown in the figure below. If the level is below the lower mark, replenish the coolant.

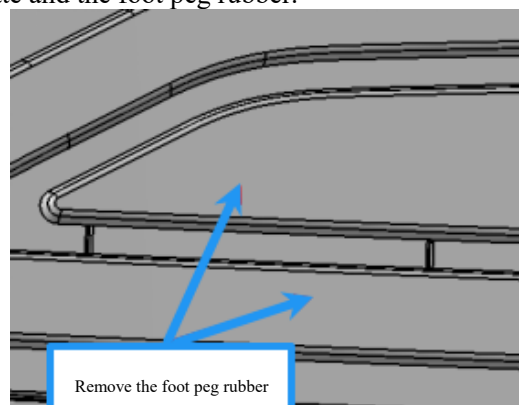


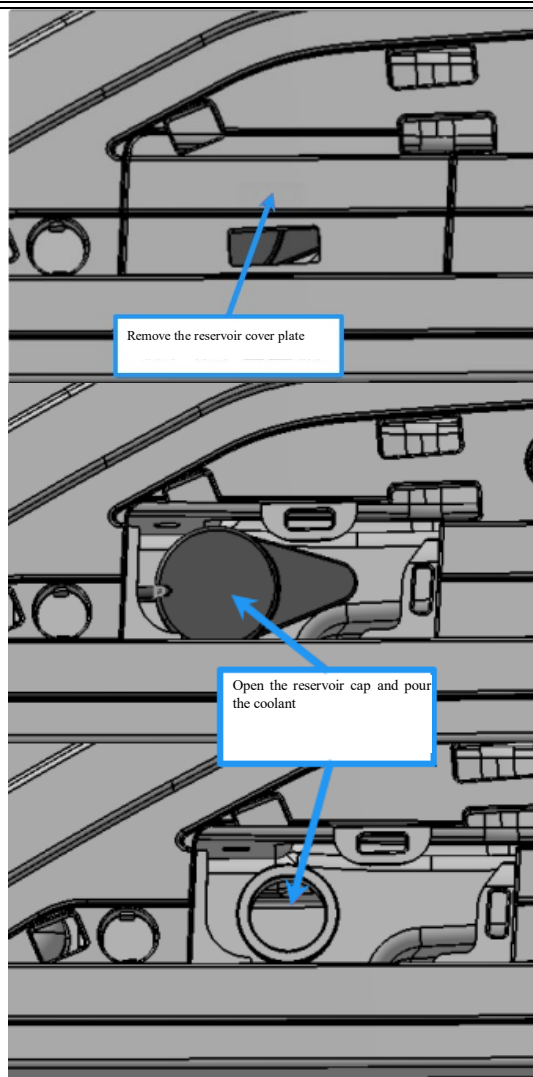
Open the seat and remove the storage box to access the radiator cap. Check the coolant level. The coolant must always reach the radiator filler neck; if it is lower than this level, replenish the coolant.



Coolant reservoir refilling:

1. Park the motorcycle on the center stand and remove the left foot peg rubber as shown in the figure below.
2. Remove the reservoir cover plate.
3. Open the reservoir cap and slowly pour the coolant through a funnel until it reaches the “MAX” mark. Then, close the reservoir cap and reinstall the cover plate and the foot peg rubber.





Remove the reservoir cover plate

Open the reservoir cap and pour the coolant

The coolant added should meet the requirements of the minimum ambient temperature of the motorcycle. Do use a funnel when filling, or the coolant may flow out. Check if the water hose of coolant reservoir is leaky or damaged. If any, replace it. If the coolant reservoir is dry, inspect the entire coolant system, including the internal engine passages, for leaks and perform repairs.



Warning:

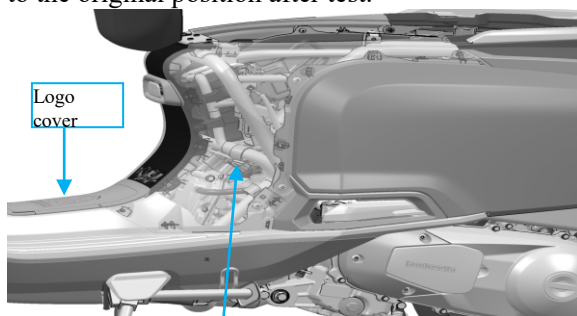
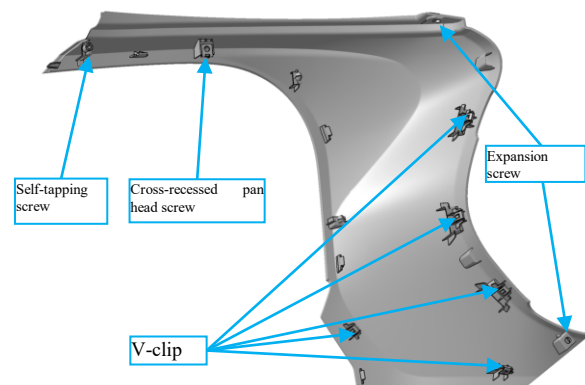
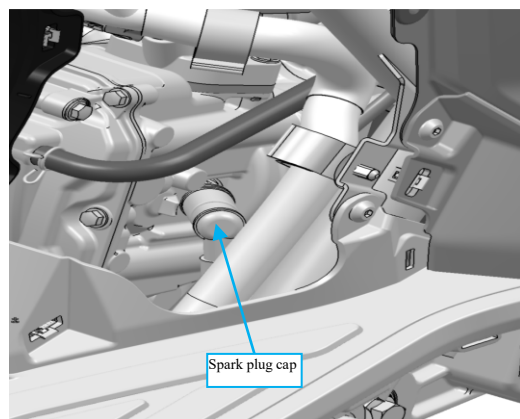
Before opening the reservoir cap or radiator cap, ensure the engine and radiator have cooled completely. Failure to do so may cause coolant to spray out, resulting in severe burns.

Cylinder Pressure

If you suspect that the cylinder pressure is abnormal when the engine cannot be started or it is hard to be started and there are no other faults, check the cylinder pressure.

Cylinder pressure: $\geq 0.5\text{MPa}/500\text{rpm}$.

Remove the logo cover and the left side cover inner panel. During measurement, remove the spark plug and install a pressure gauge into the spark plug hole. Fully open the throttle grip and press the start button. Check all gauge connections for air leaks. Reset the pressure gauge to zero, then press the start button again until the gauge reading stops rising. This is typically achieved 3-5s after start. The maximum reading is the cylinder pressure. Install the spark plug to the original position after test.



Too low cylinder pressure is normally caused by the following reasons:

1. Valve:

- The adjustment of valve clearance is improper;
- The valve is burnt or bent;
- The valve airtightness is poor;
- The valve timing is improper;
- The valve spring is damaged.

2. Cylinder head:

- The spark plug airtightness is poor;
- The cylinder head gasket is leaky or damaged;
- The cylinder head is cracked or has air hole.

3. Piston:

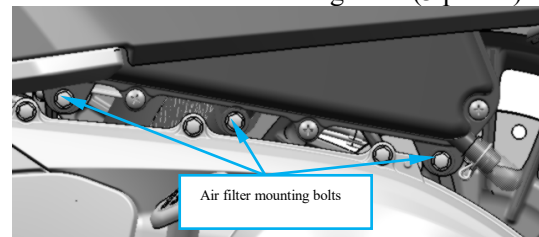
- The clearance of piston ring is too large or the piston ring is cracked;
- The piston is cracked or damaged;
- The piston ring is abraded.

4. Cylinder block

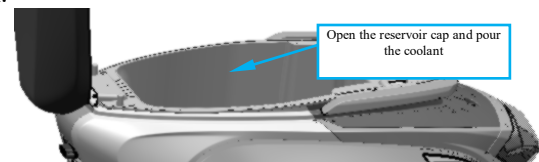
- The cylinder block bore is damaged;

Cleaning and Replacement of Air Filter Element

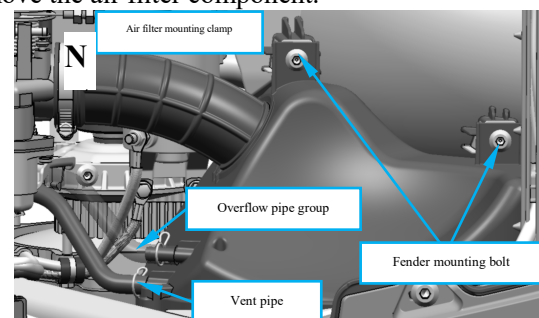
1. Remove the air filter mounting bolts (3 pieces).



2. Open the seat with the key and remove the storage box.



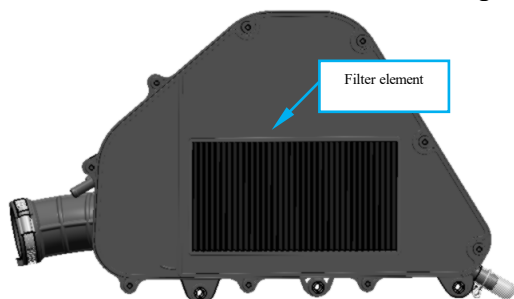
3. Loosen the air filter mounting clamp and remove the fender mounting bolts (2 pieces). Disconnect the overflow pipe group and the vent pipe group, then remove the air filter component.



4. Loosen the air filter cover mounting screws (9 pieces) and remove the air filter cover.



5. Take down the filter element for cleaning.



Instructions:

1. Remove the filter element and check its condition. This is a wet-type paper filter element, so do not use vibration or high-pressure air to clean dust or foreign objects.
2. Replace the filter element if it is excessively dirty, cracked, or damaged.
3. Shorten the cleaning and replacement intervals for the air filter element when operating in dusty areas.
4. Keeping the air filter clean can improve the engine efficiency and prolong its service life.

After cleaning or replacing the filter element, reassemble the vehicle in the reverse order of disassembly.



Warning:

When removing and installing the air filter, use soft materials such as sponge to wrap the edges of the sheet metal parts to prevent the air filter from rubbing against the sheet metal edges, which could cause scratches on the air filter.

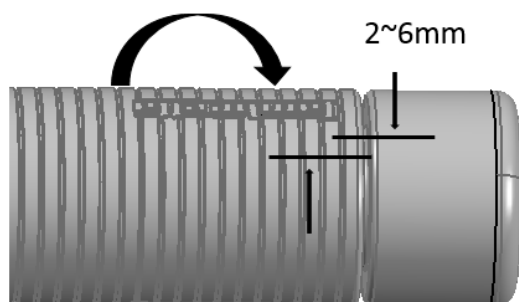


Throttle Control

First, check the throttle cable for deformation, twist or damage.

Then, measure the free play of throttle grip. Rotate the throttle grip to one end of its free play. Use a marker to draw a straight line across the grip and the counter weight. Then, rotate the grip to the opposite end of its free play and measure the offset distance of the line. This distance is the throttle grip free play.

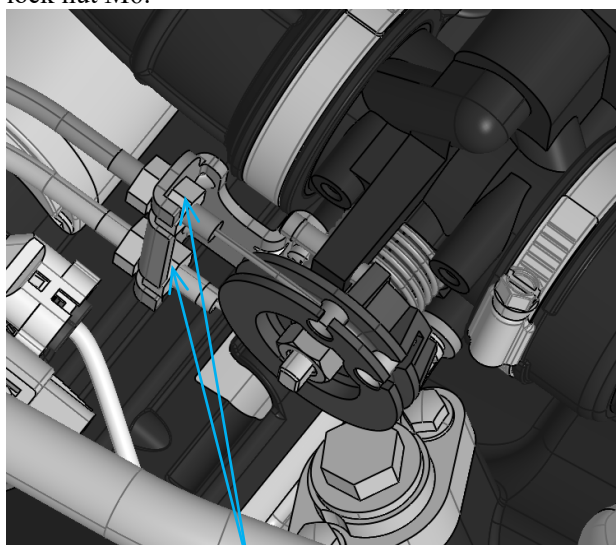
Free play of 2-6mm



If the free play is too short or too long, adjust it.

Adjustment methods:

Fine adjustment: Open the seat and remove the storage box. Loosen the lock nut M6 and rotate the adjuster tube to achieve the desired free play. Then, tighten the lock nut M6.



Nut M6

Idle Speed



Note:

Inspect and adjust the idle speed after other items of engine are qualified.

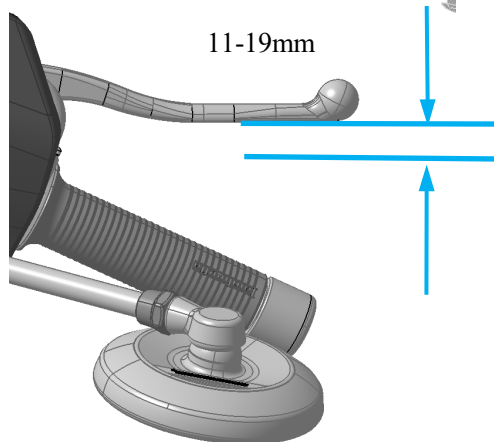
The idle speed is controlled by the ECU. The intake air flow of throttle under idle speed has been adjusted upon delivery. Do not adjust the adjusting screw. When the idle speed is unstable, there is no idle speed or the idle speed is excessively high, find out the cause in line with the EMS troubleshooting.

Idle speed 1650r/min±150r/min

Brake System

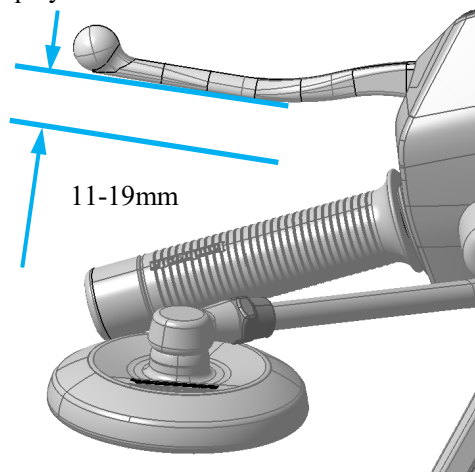
Check the free play of front brake lever.

Free play of front brake lever: 11-19mm



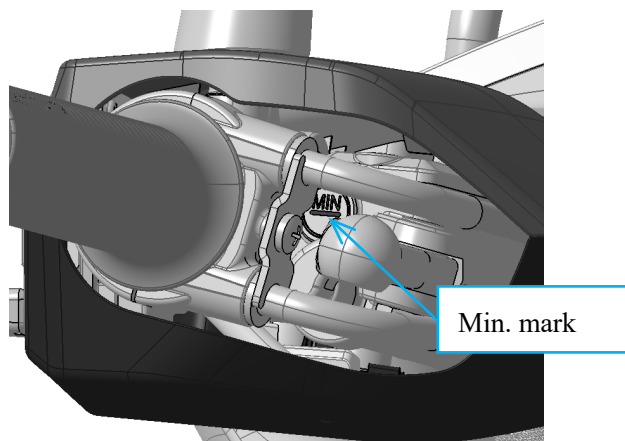
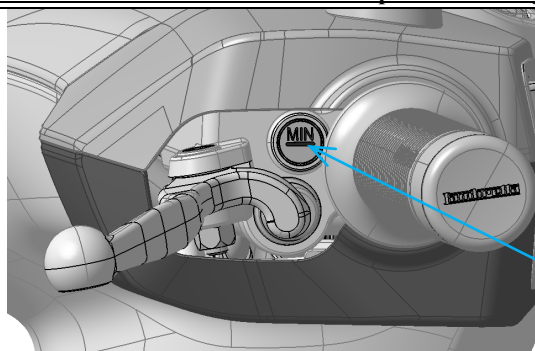
Check the free play of rear brake lever.

Free play of rear brake lever: 11-19mm



Check the level of brake liquid:

Check the level of brake liquid in the front brake cylinder. If it is under the lower limit, fill **DOT 4**.



Min. mark

If the brake liquid is feculent or contains impurity or unpleasant odor, discharge the liquid completely and then refill. Please refer to the vacuum filling method of brake fluid below.

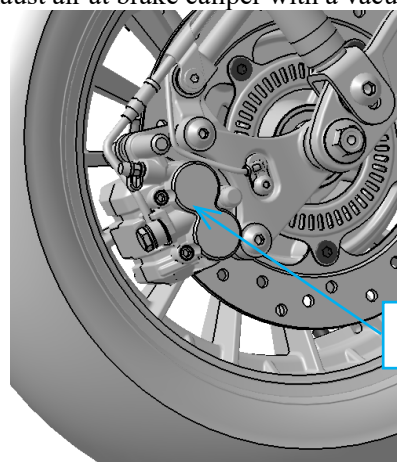
If the brake liquid reservoir in front and rear brake cylinders are empty, exhaust air at brake caliper with a vacuum pump and fill liquid later.

Please refer to the vacuum filling method of brake fluid below.

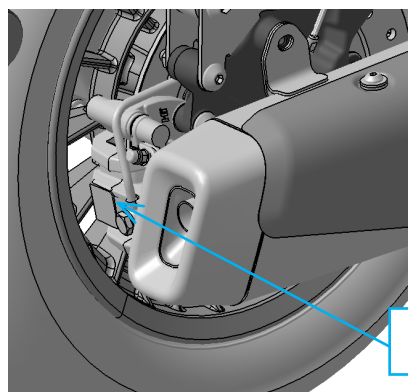
Vacuum Filling Method for Brake Fluid

This method is applicable to a new motorcycle or when the brake liquid reservoir is empty.

1. Exhaust air at brake caliper with a vacuum pump.

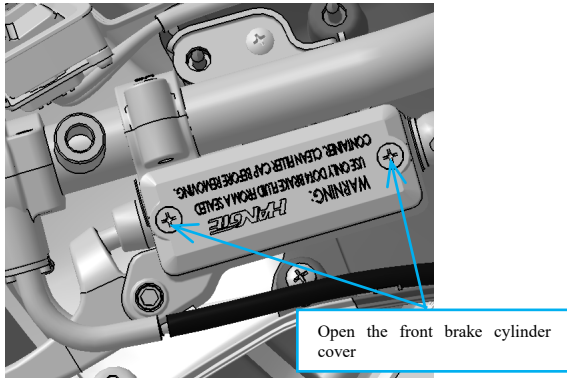
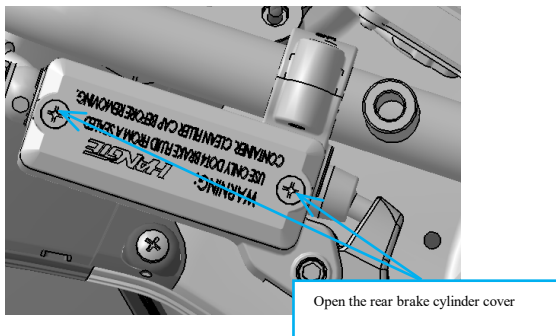


Front brake caliper



Rear brake caliper

2. Open the brake cylinder cover and fill the brake liquid.



3. Operate the brake lever to discharge air in the brake caliper.
4. When the air is discharged completely, pump out the brake liquid and pinch the lever tightly or step the pedal to the end, then screw the exhaust bolt quickly with a torque range of $7-9\text{N}\cdot\text{m}$.
5. Install the brake cylinder cover. The sealing gasket shall be flat. Replace it if necessary.
6. Check the oil cup, hydraulic brake hose and connecting parts for oil leakage.



Notes:

1. Use DOT4 non-petroleum brake fluid.
2. Prevent impurity, or the chemical changes will degrade the brake performance.



Warning:

Brake liquid is with strong causticity. Do not contact painted or plastic parts. In case of contact with eyes or skin, wash with water immediately and consult a doctor.

Running System

Tire Specifications and Pressure

Check whether the tire pressure meets the requirements or not with a pressure gauge.





Note:

Check the pressure when tires are cool so as to get correct results.

Tire specifications and suggested pressure:

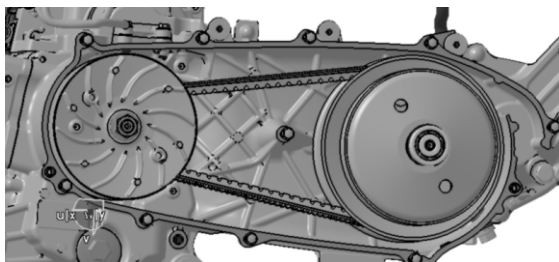
Tire specifications	Front tire		Rear tire	
	110/70-12 56M		120/70-12 58S	
Cold tire pressure	One person		Two persons	
	Front tire	Rear tire	Front tire	Rear tire
	200kPa	200kPa	200kPa	220kPa

If the tire pressure does not meet the pressure requirements specified, check the tire for cut, iron nail or other sharp articles.

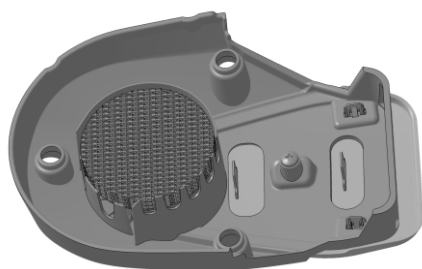
CVT and Drive Belt

Inspection of CVT and Drive Belt

Place the motorcycle on its center stand on level ground. Open the left crankcase cover and inspect the CVT and drive belt.



Since there is a filter sponge inside the trim cover, clean dust and foreign objects from the sponge in a timely manner to avoid affecting CVT cooling and reducing the drive belt's service life.



Battery

Removal of Battery

First, open the seat and remove the storage box. Remove the strap and disconnect the negative terminal of the battery, followed by the positive terminal. Then, the battery can be removed.

Clean the electrode connections and outer surface.

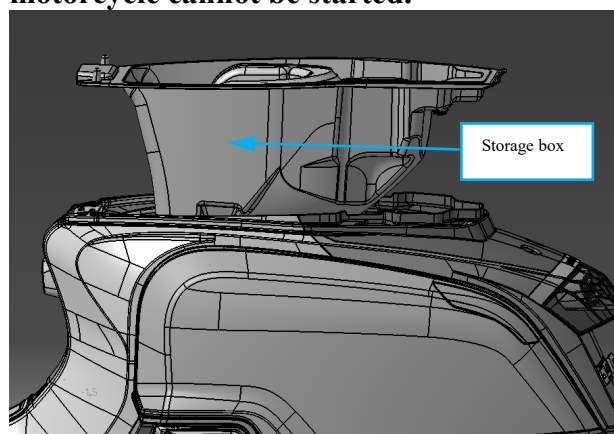
Installation of Battery

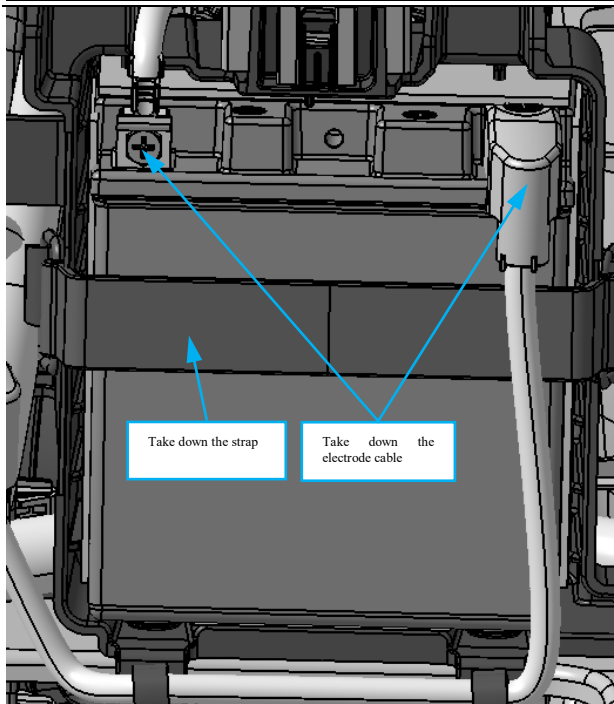
The installation sequence is the reverse of removal sequence. Do connect the positive electrode first.



Note:

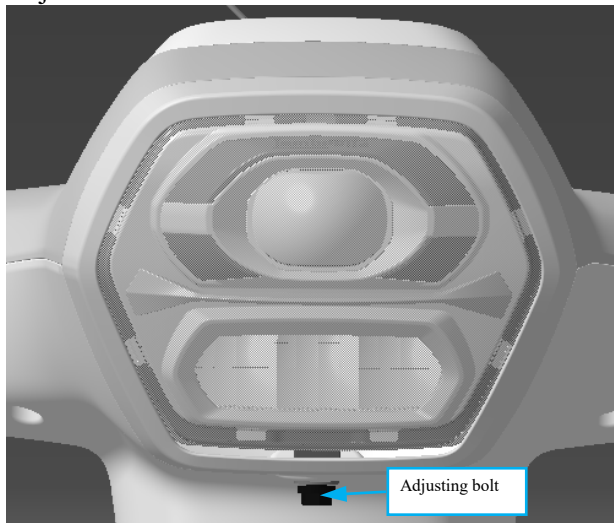
1. The starter and EMS are powered by the battery; therefore it is important to keep the battery capacity sufficient. Otherwise, the motorcycle cannot be started.





Headlight Aiming

Check the headlight direction before riding.
It can be adjusted vertically.
Adjustment methods:



Loosen the adjusting bolt under the headlight with a wrench. Rotate the headlight up or down to the desired height, then tighten the adjusting bolt.

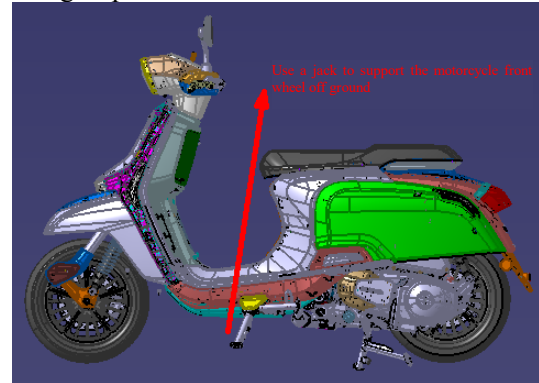
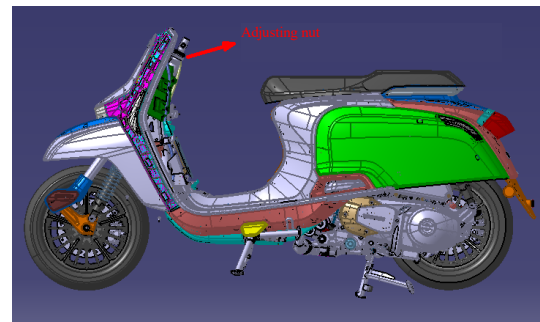


Note:

The adjusting bolt shall be tightened to the specified torque of 2-3N.m.

Steering Stem Bearings

Support the motorcycle with a jack or others and make the front wheel off ground. Check the rotation of handlebar. If it cannot rotate balanced, or there is axial displacement or jam, adjust the adjusting nut of front fork stem. Refer to the removal of control unit sub-group for the removal of the front cover.



Suspension System

Front Suspension

Apply the front brake and compress the steering stem several times to check that the front suspension is functioning properly. If there is abnormal noise or click, check all fasteners and tighten them to the required torque.

Rear Suspension

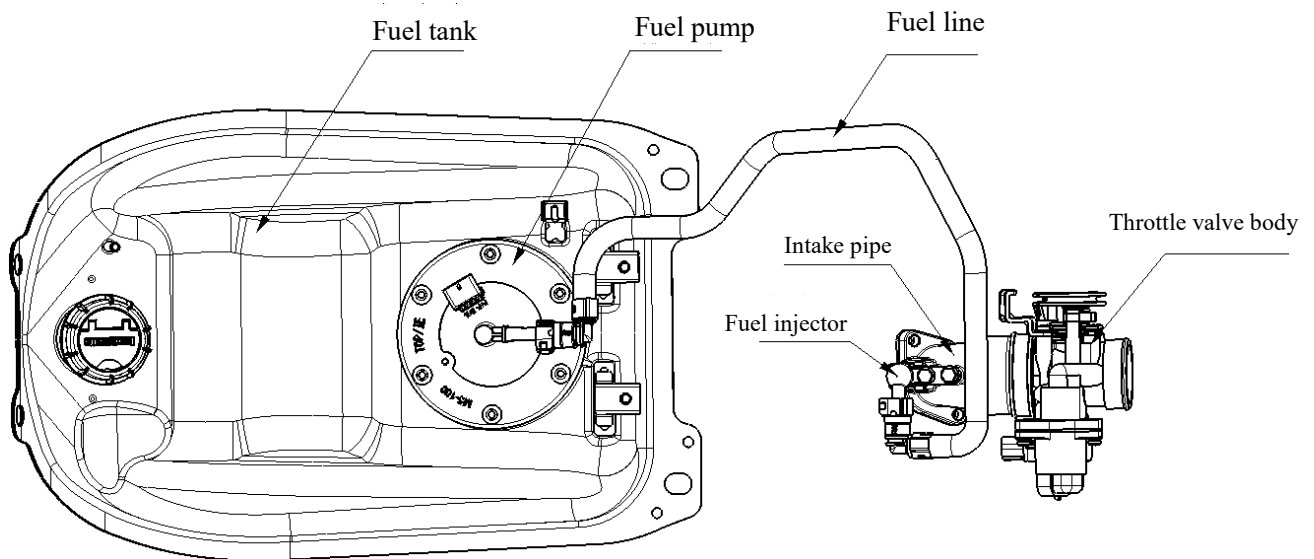
Press down firmly on the rear of the seat and check that the rear shock absorber returns to its original position properly. In case of sticking or failure to return, inspect the shock absorber for oil leaks, bending, or deformation. Replace it if necessary.

Bolts, Nuts and Fasteners

All bolts, nuts and fasteners shall be tightened in line with the Maintenance Schedule. All split pins, clamps, locks and others shall be checked.

4

Fuel and Air Intake System



Fuel System

Maintenance Notice

Replacement of Fuel Filter

Troubleshooting

Removal and Installation of Air Filter

Removal and Installation of Fuel Tank

Removal and Installation of Throttle Valve Body

Removal and Installation of Fuel Tank

Maintenance Notice

This chapter introduces relevant contents about the fuel system.



Warning:

Do avoid fire during fuel processing!

Pay attention to the mounting positions of seals when disassembling the components and parts of fuel system. New seals shall be used during re-assembly.

Do not disassemble the throttle valve body (only the fuel injector can be disassembled).

Technical Specifications

Opening diameter	Φ32mm
Idle speed	1650r/min±150 r/min
Free play of throttle grip	2~6mm

Troubleshooting

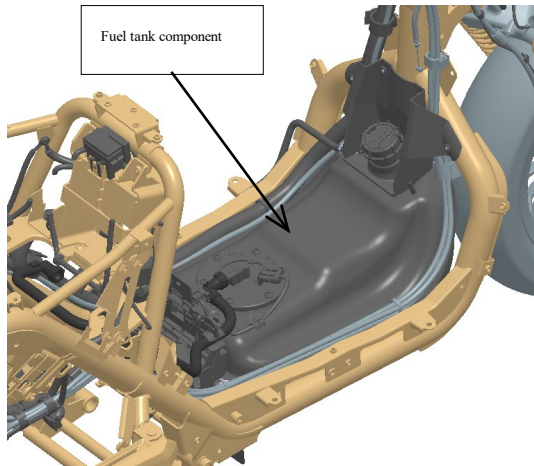
The engine can be ignited but cannot be started.

- | | |
|---|---|
| 1. There is no fuel or the fuel is insufficient in the fuel tank; | 5. The fuel line is blocked; |
| 2. The fuel in the cylinder is too much; | 6. The fuel quality is poor (containing water); |
| 3. The air filter is blocked; | 7. The fuel has been stored for a long period; |
| 4. The ignition of spark plug is discontinuous; | 8. The fuel pump is faulty; |
| | 9. The fuel injector is faulty (blocked). |

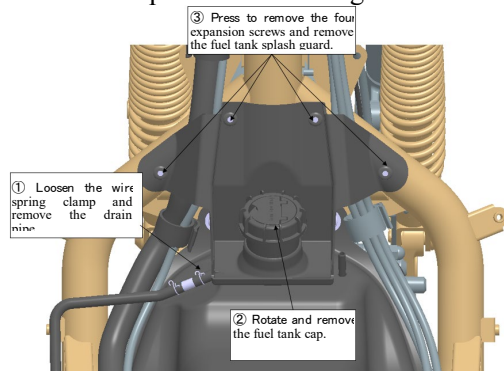
Removal and Installation of Fuel Tank

Removal Steps:

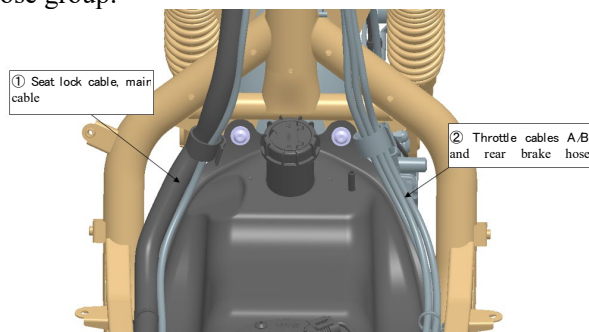
1. Refer to the section titled **Removal Steps of Covering Parts** to remove all covering parts. The fuel tank system components are only assembled to the frame as shown below:



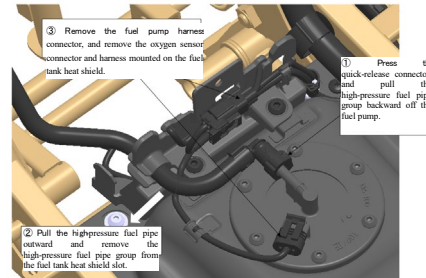
2. ① Loosen the wire spring clamp and remove the drain pipe; ② Rotate and remove the fuel tank cap; ③ Press to remove the four expansion screws and remove the fuel tank splash guard upward from the fuel filler neck; ④ Reinstall the fuel tank cap back onto the fuel tank to prevent fuel leakage.



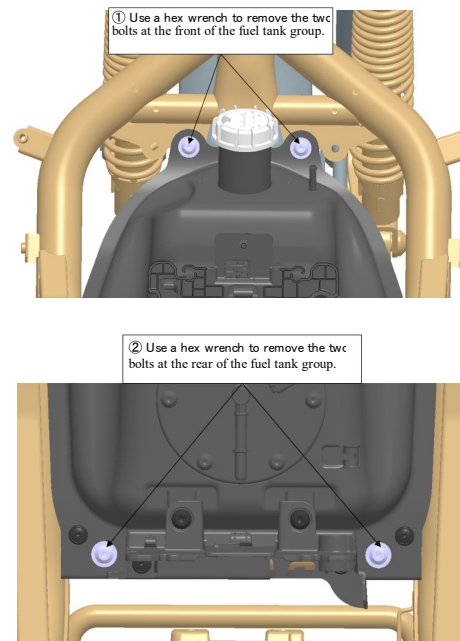
3. Refer to the relevant chapters to disassemble the seat lock cable group, throttle cables A/B, and rear brake hose group.



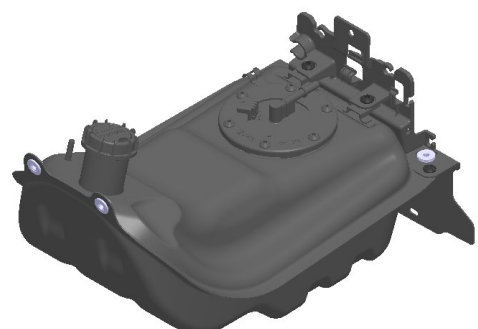
4. ① Press the quick-release connector, and pull the high-pressure fuel pipe group backward off the fuel pump; ② Pull the high-pressure fuel pipe outward and remove the high-pressure fuel pipe group from the fuel tank heat shield slot; ③ Remove the fuel pump harness connector, and remove the oxygen sensor connector and harness mounted on the fuel tank heat shield.



5. ① Use a hex wrench to remove the two bolts at the front of the fuel tank group. ② Use a hex wrench to remove the two bolts at the rear of the fuel tank group.



6. At this point, the fuel tank components can be removed from the motorcycle. Refer to subsequent chapters for the disassembly and assembly of the fuel tank components.



To avoid pollution of fuel supply pipeline, seal the joint with adhesive tape after it is pulled up.

Since the fuel tank cap is removed to disassemble the fuel tank splash guard, it is recommended to re-install the cap onto the fuel tank as soon as possible to prevent loss and fuel leakage.

Installation Steps:

The installation sequence is the reverse of removal sequence.

During installation, pay attention to the routing of the fuel pump control cable and strictly follow the routing diagram. Avoid the pollution of fuel line.

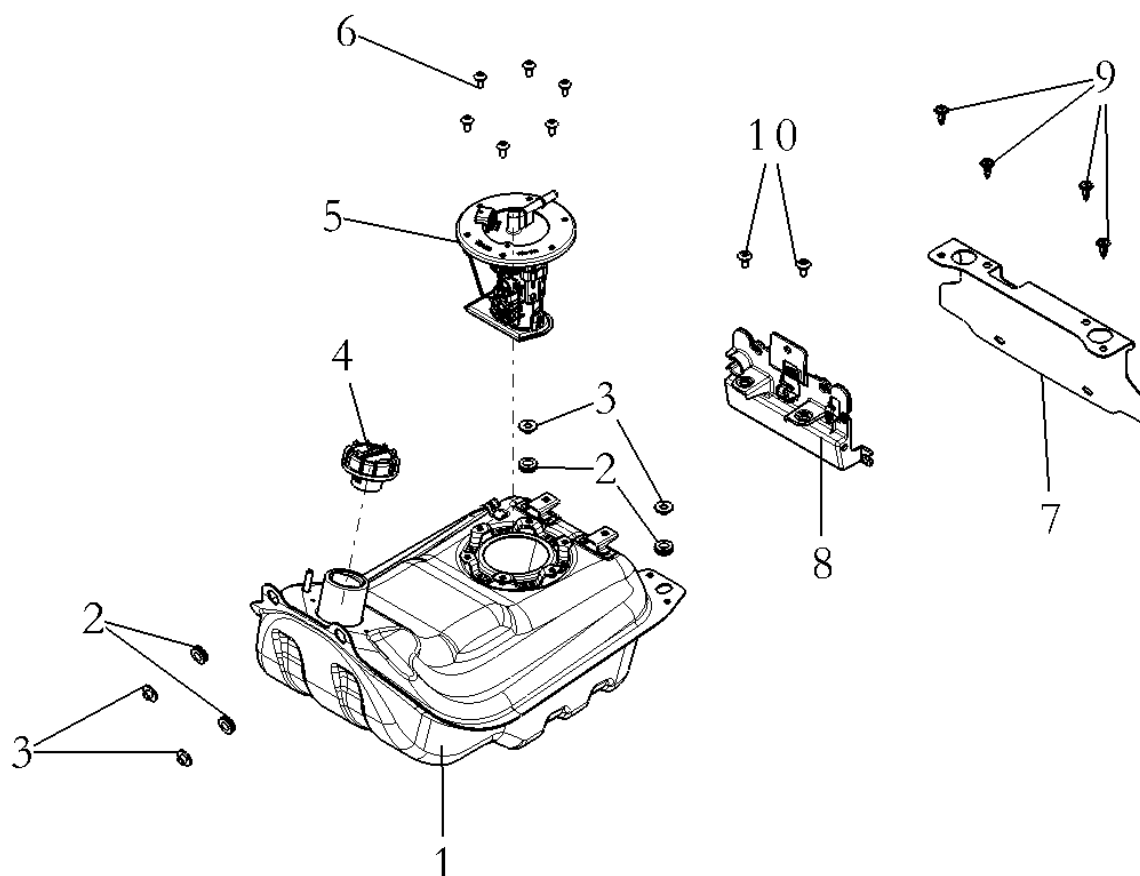
Removal / Installation of Fuel Tank

Sequence	Step	Quantity	Remarks
	Removal Sequence		The installation sequence is the reverse of removal sequence.
1	Removal of motorcycle covering parts	/	Refer to the removal instructions in the relevant chapters.
2	Wire spring clamp	1	
3	Water hose	1	
4	Fuel tank cover	1	
5	Push-type expansion screw	4	
6	Fuel tank splash guard	1	
7	Seat cable, main cable	1	Refer to the removal instructions in the relevant chapters.
8	Throttle cables A/B, and rear brake hose group	1	Refer to the removal instructions in the relevant chapters.
9	High-pressure fuel pipe group	1	
10	Bolt M6*16	2	
11	Fuel tank component	1	

Disassembly and Assembly of Fuel Tank

Please refer to the following figure for the disassembly and assembly of fuel tank.

The assembly and disassembly are in a reverse sequence.



Sequence	Step	Quantity	Remarks
	Assembly Sequence		The disassembly sequence is the reverse of assembly sequence.
1	Fuel tank welded group	1	
2	Rubber pad (III)	4	
3	Liner group (III)	4	
4	Fuel tank cap group	1	
5	Fuel pump component	1	
6	Hexagon socket screw M5×12	6	
7	Fuel tank heat insulation rubber	1	
8	Fuel tank heat shield	1	
9	Expansion screw	4	
10	Convex bolt M6*12	2	

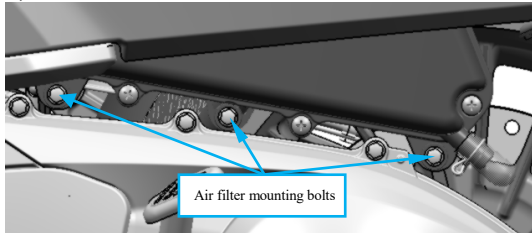
Air Inlet System

Removal and Installation of Air Filter

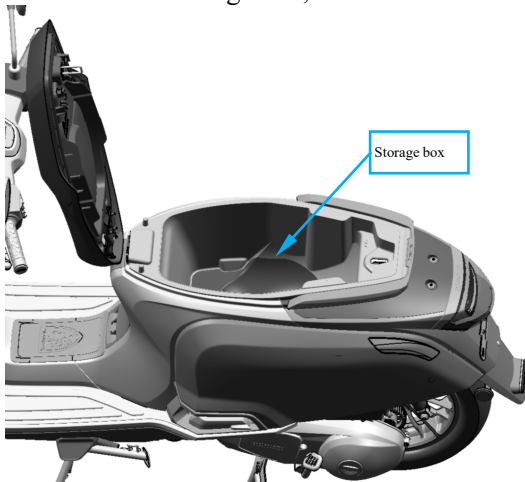
After the air filter is removed, the upper and lower housings can be disassembled to take out the filter element for cleaning or replacement.

Removal Steps:

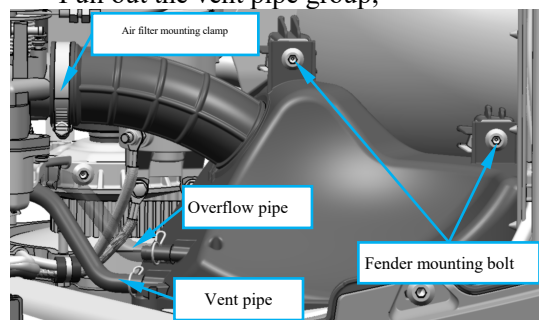
1. Remove the air filter mounting bolts (3 pieces);



2. Use the key to open the seat;
3. Take out the storage box;



4. Loosen the air filter mounting clamp connecting to the throttle valve body;
5. Remove the fender mounting bolts (2 pieces);
6. Pull out the overflow pipe group;
7. Pull out the vent pipe group;

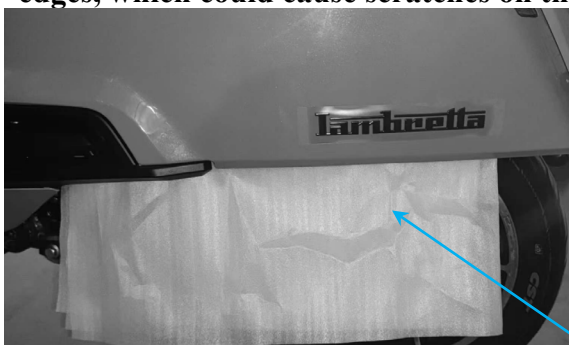
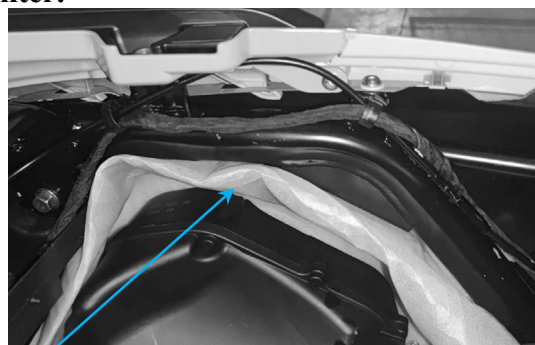


8. Take out the air filter.



Warning:

When removing and installing the air filter, use soft materials such as sponge to wrap the edges of the sheet metal parts to prevent the air filter from rubbing against the sheet metal edges, which could cause scratches on the air filter.



Sponges

Installation Steps of Air Filter:

The installation steps are the reverse of removal steps.

Sequence	Step	Quantity	Remarks
	Removal Sequence		The installation sequence is the reverse of removal sequence.
1	Remove the air filter mounting bolt	3	
2	Open the seat	1	Refer to the Disassembly / Assembly of Seat
3	Take out the storage box	1	
4	Loosen the air filter mounting clamp connecting to the throttle valve body	1	
5	Remove the fender mounting bolt	2	
6	Pull out the overflow pipe group	1	
7	Pull out the vent pipe group	1	

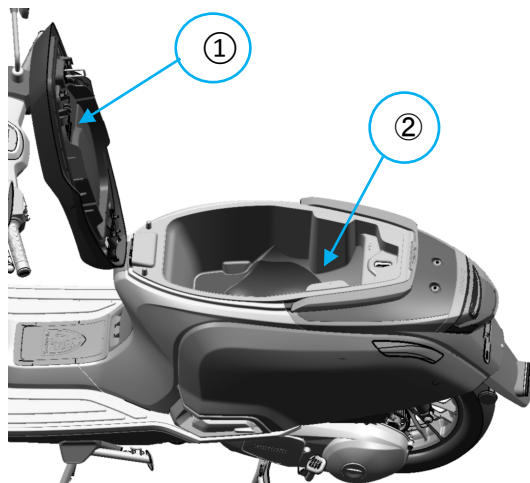
Throttle Valve

Removal and Installation of Throttle Valve Body

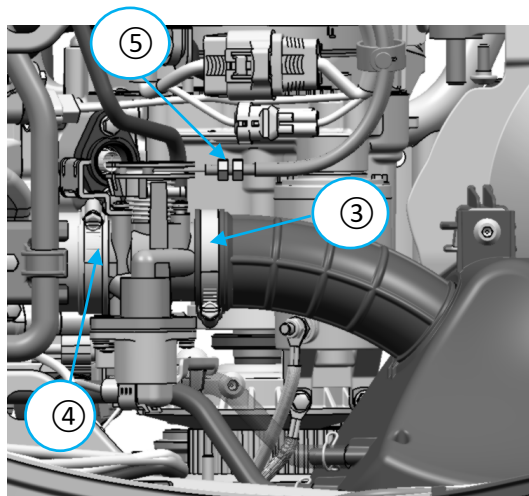
Installation Steps:

The installation steps are the reverse of removal steps. Align the locating slot of intake air pipe with the throttle during installation.

1. Open the seat ① and remove the storage box ②.



2. Remove the connecting pipe clamp ③, air inlet pipe clamp ④ and throttle cable ⑤;



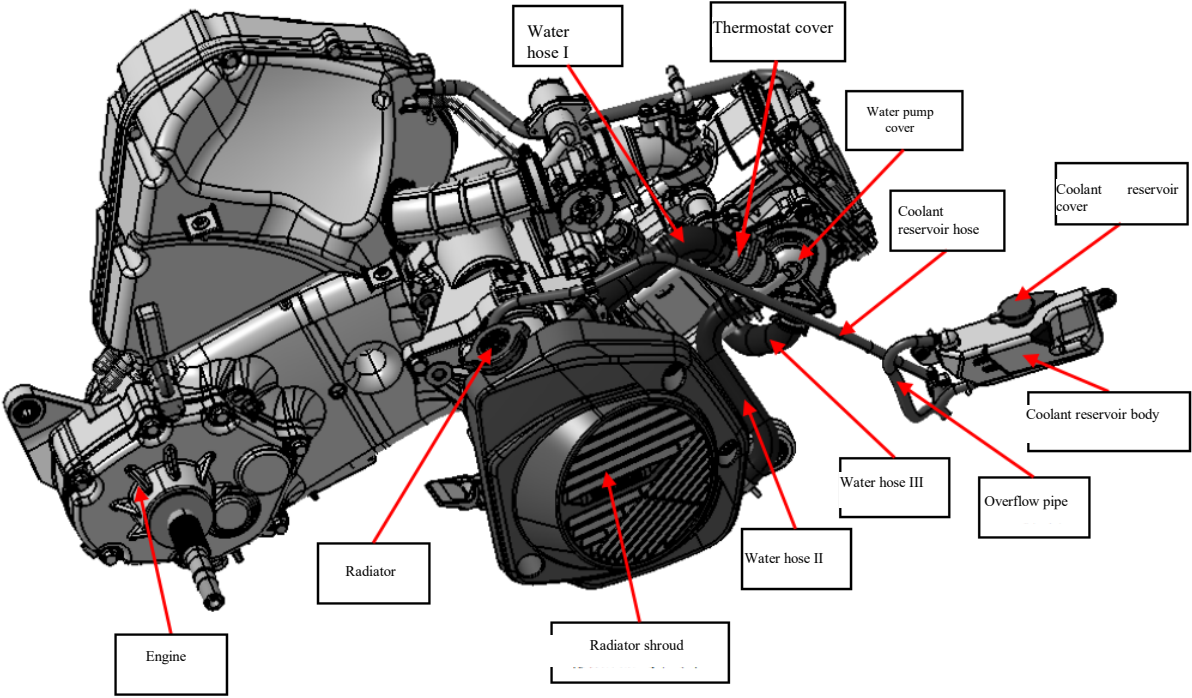
Sequence	Step	Quantity	Remarks
	Removal Sequence		The installation sequence is the reverse of removal sequence.
1	Open the seat	1	Refer to the Removal / Installation of Seat
2	Take out the storage box	1	
3	Remove the air filter connecting pipe clamp, and pull out the air filter connecting pipe to separate it from the throttle valve body.	1	
4	Remove the connecting clamp between the throttle valve body and the air inlet pipe.	1	
5	Take out the throttle valve body	1	



Note:

Do not disassemble the throttle valve body further. If the sensors shall be replaced, please follow the guidance of EMS system experts.

5 Cooling System



Cooling System

Maintenance Notice

Troubleshooting

Performance Inspection

Radiator

Cooling and Electrical System

Maintenance Notice

Maintenance of this section must be performed at room temperature or low temperature to avoid injury to maintenance personnel.

The maintenance shall be carried out on the motorcycle.

After inspection and maintenance, use airtightness testing equipment to conduct a leak test on the radiator.



Warning:

When the coolant temperature is above 100°C, if the radiator cover is opened, pressure decrease will cause boiling, so do not open the cover at high temperature.



Note:

Coolant on the paint surface may cause damage. In this case, wash it with water rapidly.

Maintenance Criteria

Item		Standard value	Limit
Valve opening temperature of thermostat	Start open	82°C	/
	Fully open	92°C	/
	Fully open degree (92°C)	4-7mm	/
Boiling temperature of coolant (mixing ratio 50%)	Atmospheric pressure	107.7°C	/
	1.1bar	125.6°C	/
Coolant capacity		0.55L	Replenish the coolant if the level is below the "MIN" mark on the coolant reservoir.

Mixing Ratio of Coolant

Applicable Lowest Temperature	Mixing Ratio	Antifreeze (ml)	Pure Water (ml)
-9°C	20%	110	440
-16°C	30%	165	385
-25°C	40%	220	330
-37°C	50%	275	275
-44.5°C	55%	302.5	247.5

System

The boldfaced words are the mixing ratio of coolant upon delivery.

Please fill the coolant as required by SICHUAN EZICITI POWER TECH CO., LTD.

Do not mix it with other coolants.

The coolant is toxic, so don't drink it.

In addition to considering the lowest temperature, a mixing ratio applicable to a temperature with a leeway of -5°C shall be chosen.

Troubleshooting

Water temperature rise is too high

- ①. The BCM control is ineffective;
- ②. The coolant volume is insufficient;
- ③. The water hose is blocked;
- ④. The radiator blades are blocked;
- ⑤. The radiator is blocked;
- ⑥. The water pump is abnormal;
- ⑦. The cable is short-circuited.

No or little temperature rise occurs

- ①. The BCM control is ineffective;
- ②. The cable is short-circuited.

There is water leakage

- ①. The mechanical sealing is not good;
- ②. The O rings are degraded or in poor contact;
- ③. The water hose is damaged or deteriorated.
- ④. The radiator is damaged.

Performance Inspection

Radiator Airtightness Check

Mount the radiator on the airtightness testing equipment. Inject 0.15-0.18MPa of compressed air into the radiator and maintain the pressure for 30s. If no leakage occurs, the radiator is qualified.

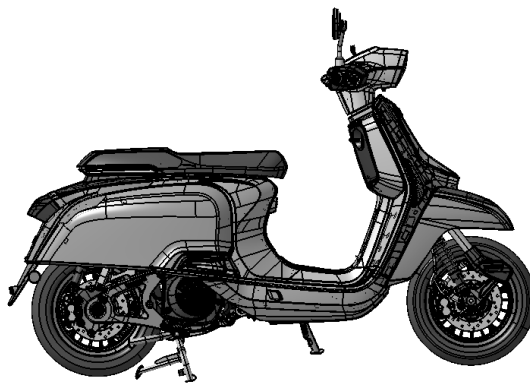
Specified pressure: 0.15-0.18MPa.

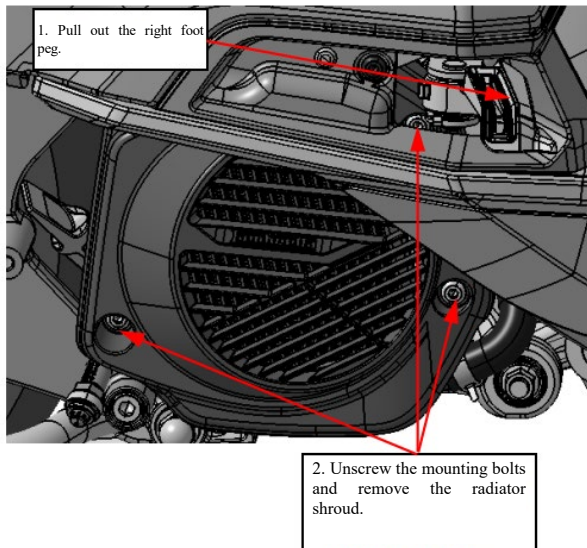
Check the hoses and all connection points for leakage. Do not exceed the specified pressure, as this may damage the radiator and various connection points.

Radiator

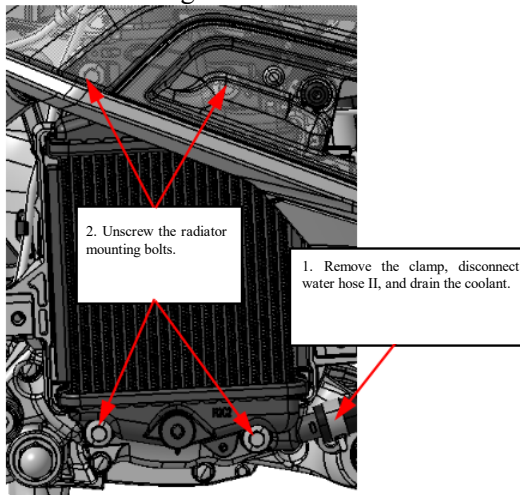
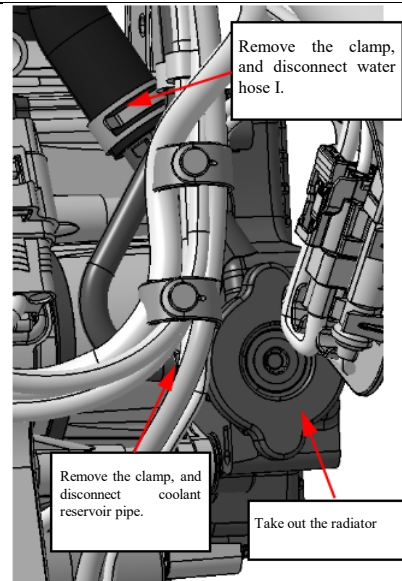
Removal of Radiator

1. Park the motorcycle on level ground and extend the center stand to lift the rear wheel off the ground. Then, unscrew the mounting bolts and remove the radiator shroud.



System

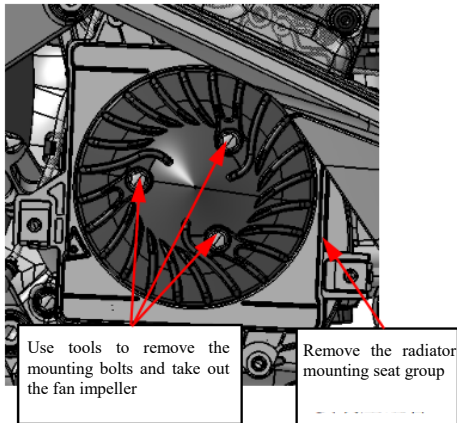
2. Use clamp pliers to remove the clamp, disconnect water hose II, and drain the coolant. Then, unscrew the radiator mounting bolts.



3. Open the seat and remove the storage box. Use tools to remove the clamps, disconnect water hose I and the coolant reservoir pipe, then take out the radiator.

System

4. Remove the radiator mounting seat group, then use tools to remove the mounting bolts and take out the fan impeller.

**Installation of Radiator**

Install it in the reverse sequence of removal.

Do not damage the radiator fins during removal and installation.

After installation, remember to refill the coolant and check all connection points for water leaks.

6

Removal and Installation of Engine

Maintenance Notice

Installation of Engine

Removal of Engine

Maintenance Notice

It is necessary to remove the engine from the frame only when performing maintenance on the engine crankshaft, cylinder head, etc. When maintaining other parts of the engine, it is not necessary to remove the engine from the frame.

Before removing the engine, support the motorcycle on level ground with the center stand, and drain the coolant and engine oil.

The assembly sequence is the reverse of disassembly sequence.

During re-installation, all wiring and hoses must be routed according to the routing diagram, and removed straps shall be inspected and replaced with new ones if necessary.

Specifications

Net weight of engine: 32.5kg

Engine crankcase oil capacity: after disassembly and cleaning - 0.85L; during oil change - 0.8L

Reduction gear oil capacity: after disassembly and cleaning - 0.15L; during gear oil change - 0.12L

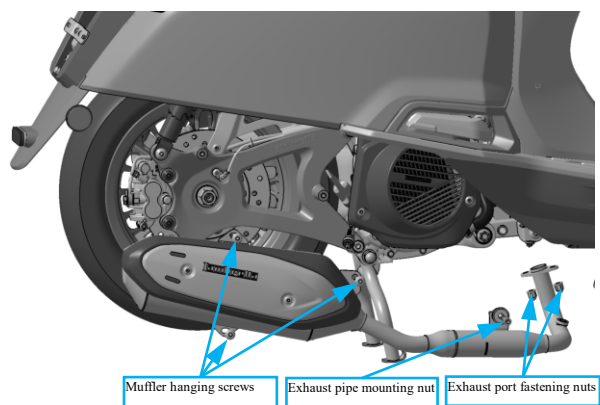
Coolant capacity: radiator 0.45L; reservoir 0.1L

Key Torques

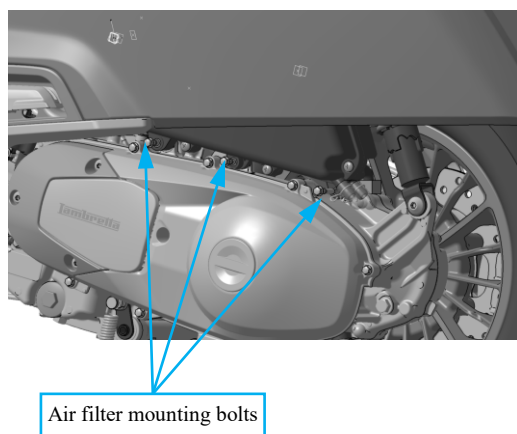
Engine connection shaft M10×1.25: 55N.m

Removal of Engine

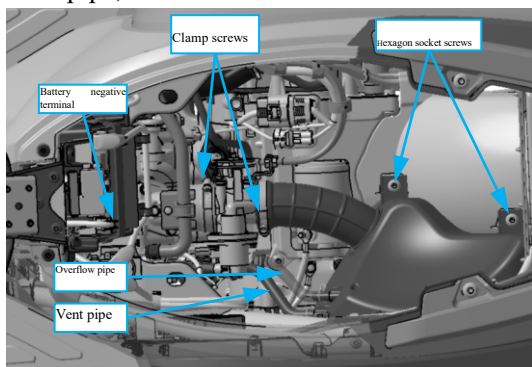
Place the motorcycle on a platform, fix the front wheel, and place a jack under the footrest. Remove the muffler fasteners and oxygen sensor, and take off the muffler.



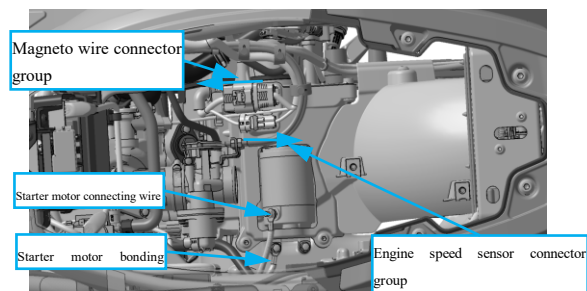
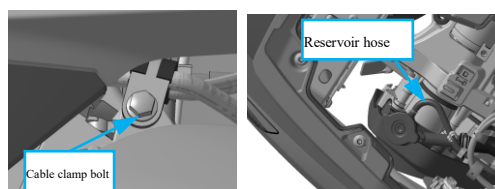
Loosen the left air filter mounting bolt.



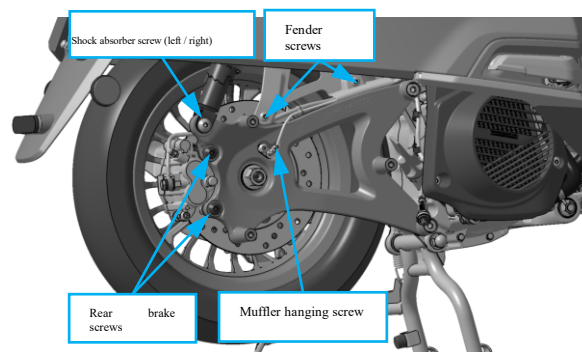
Open the seat, remove the storage box, remove the battery negative terminal screw, loosen the screw connecting to the air filter, unplug the vent pipe and overflow pipe, and take out the air filter.



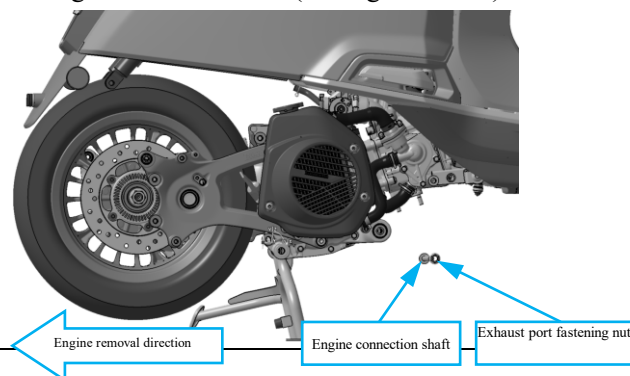
Remove the magneto wire, engine speed sensor wire, starter motor wire, and bonding wire. Loosen the bolt for the wire clip securing the starter motor wire and bonding wire on the left cover. Remove the fuel pipe, fuel injector connector wire, and reservoir hose. (See figure below)



Loosen the fender screw, rear wheel speed sensor screw, brake screw, and shock absorber screw (see figure below).



Loosen the engine hanging nut, adjust the jack position, take out the engine connection shaft, and drag the engine out backward. (See figure below)



Installation of Engine

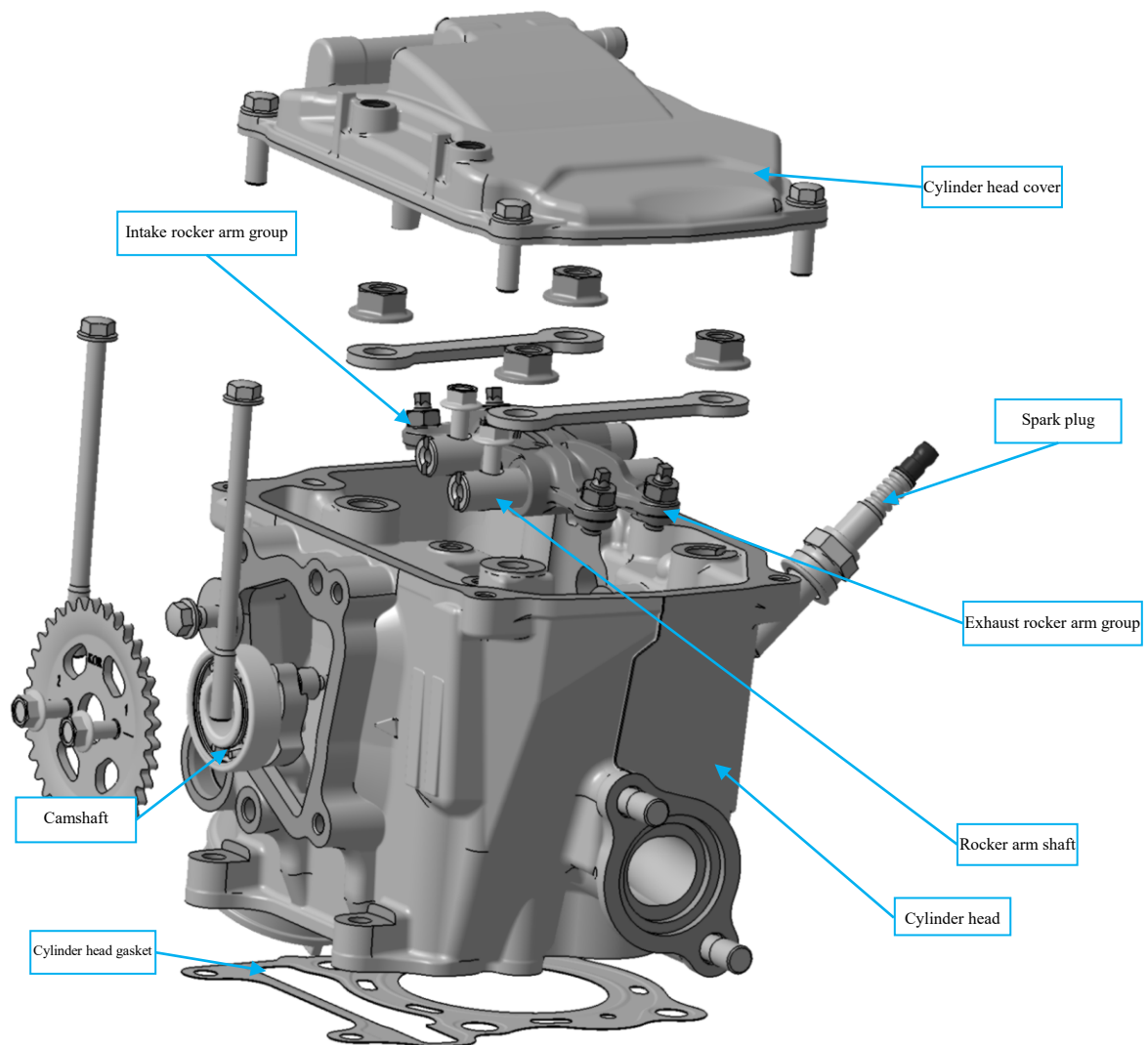
The installation sequence is the reverse of removal sequence.

During installation, pay attention to the cables which shall be arranged in line with the wiring diagram.

Removal / Installation of Engine			
Sequence	Step	Quantity	Remarks
	Removal Sequence		The installation sequence is the reverse of removal sequence.
1	1.1 Remove the muffler, open the seat, remove the storage box, and disconnect the battery negative terminal. Remove the air filter, motor connection cables, fuel pipe, etc. 1.2. Remove the fender, left / right rear shock absorber bolts, and brake bolts. 1.3. Adjust the jack height and move out the engine.		Refer to the related contents
2	Silencer assembly	1	
3	Screw M8×16	3	Tightening torque: 25N·m
4	Screw M8×35	1	Tightening torque: 25N·m
5	Exhaust port cap nut M8	2	Tightening torque: 10N·m
6	Exhaust port sealing gasket	1	
7	Air filter connecting bolt M6×30	3	Tightening torque: 7N·m
8	Hexagon socket screw M6	4	Tightening torque: 7N·m
9	Shock absorber mounting bolt M8×32	2	Tightening torque: 25N·m
10	Rear brake mounting screw M8×32	2	Tightening torque: 30N·m
11	Engine	1	
12	Engine connection shaft	1	
13	Engine connection shaft nut M10×1.25	1	Tightening torque: 55N·m

7

Cylinder Head Cover, Cylinder Head, Cylinder Block and Piston



Cylinder Head Cover and Cylinder Head

Maintenance Notice	Cylinder Head Cover
Troubleshooting	Camshaft and Rocker Arm Group
Cylinder Head	

Maintenance Notice

Remove the engine from the frame to perform this maintenance and inspection.

The lubrication of the camshaft and rocker arms is achieved by the oil pump pumping oil through the oil passages in the cylinder head. Before assembly, please check whether the oil passages are clear and clean them.

Clean all components and parts with cleaning agent and dry them with compressed air before assembly.

Clean all parts and components with cleaning agent and dry them with compressed air before assembly.

Technical Specifications and Maintenance Criteria

Item		Standard Value	Maintenance Limit
Camshaft	Left bearing clearance	0.011-0.025	0.05
	Right bearing clearance	0.011-0.025	0.05
	Intake cam height	5.18	4.98
	Exhaust cam height	4.79	4.59
Rocker arm Rocker arm shaft	Shaft diameter	10.979-10.994	10.950
	Hole diameter	11.00-11.018	11.05
	Fit clearance	0.006-0.039	0.1
Cylinder Head	Left bearing bore	28-28.021	22.05
	Right bearing bore	35-35.025	35.05
Valve spring	Free length	37	36
	Spring force at 33mm installation length	70-80	65
Valve	External diameter of IN valve rod	4.475-4.49	4.44
	Internal diameter of conduit	4.5-4.512	4.55
	Fit clearance	0.01-0.037	0.09
	External diameter of EX valve rod	4.48-4.465	4.44
	Internal diameter of conduit	4.5-4.512	4.55
	Fit clearance	0.025-0.047	0.10
Valve clearance	IN	0.1-0.2	/
	EX	0.15-0.25	/
Piston, piston pin	Piston external diameter	61.955-62.965	61.9
	Fit clearance to the cylinder hole	0.04-0.06	0.15
	External diameter of piston pin	13.992-13.997	13.995
	Internal diameter of piston pin hole	14.002-14.008	14.02
	Fit clearance	0.005-0.016	0.025
Small end of connecting rod	Internal diameter	14.01-14.028	14.05
	Clearance to piston pin	0.013-0.036	0.055
Piston ring	First ring end gap	0.1-0.3	0.5
	Second ring end gap	0.2-0.4	0.6
	First ring side clearance	0.015-0.05	0.12
	First ring width	2.5-2.7	2.2
	Second ring side clearance	0.015-0.05	0.12
	Second ring width	2.5-2.7	2.2
	Oil ring side clearance	0.035-0.1	0.30

Key Torques

Cylinder head cap bolt	10N·m
Cylinder head bolt	30N·m
Camshaft bolt	7N·m
Spark plug	10N·m

Troubleshooting

Low Cylinder Pressure

1. Valve:
 - The adjustment of valve clearance is improper;
 - The valve is burnt or bent;
 - The valve airtightness is poor;
 - The valve timing is improper;
 - The valve spring is damaged.
2. Cylinder head:
 - The spark plug airtightness is poor;
 - The cylinder head gasket is leaky or damaged;
 - The cylinder head is cracked or has air hole.
3. Piston:
 - The clearance of piston ring is too large or the piston ring is cracked;
 - The piston is cracked or damaged;
 - The piston ring is abraded.
4. Cylinder block:
 - The cylinder block bore is damaged;

6. The piston or cylinder hole is with scratch.

Excessive Noise

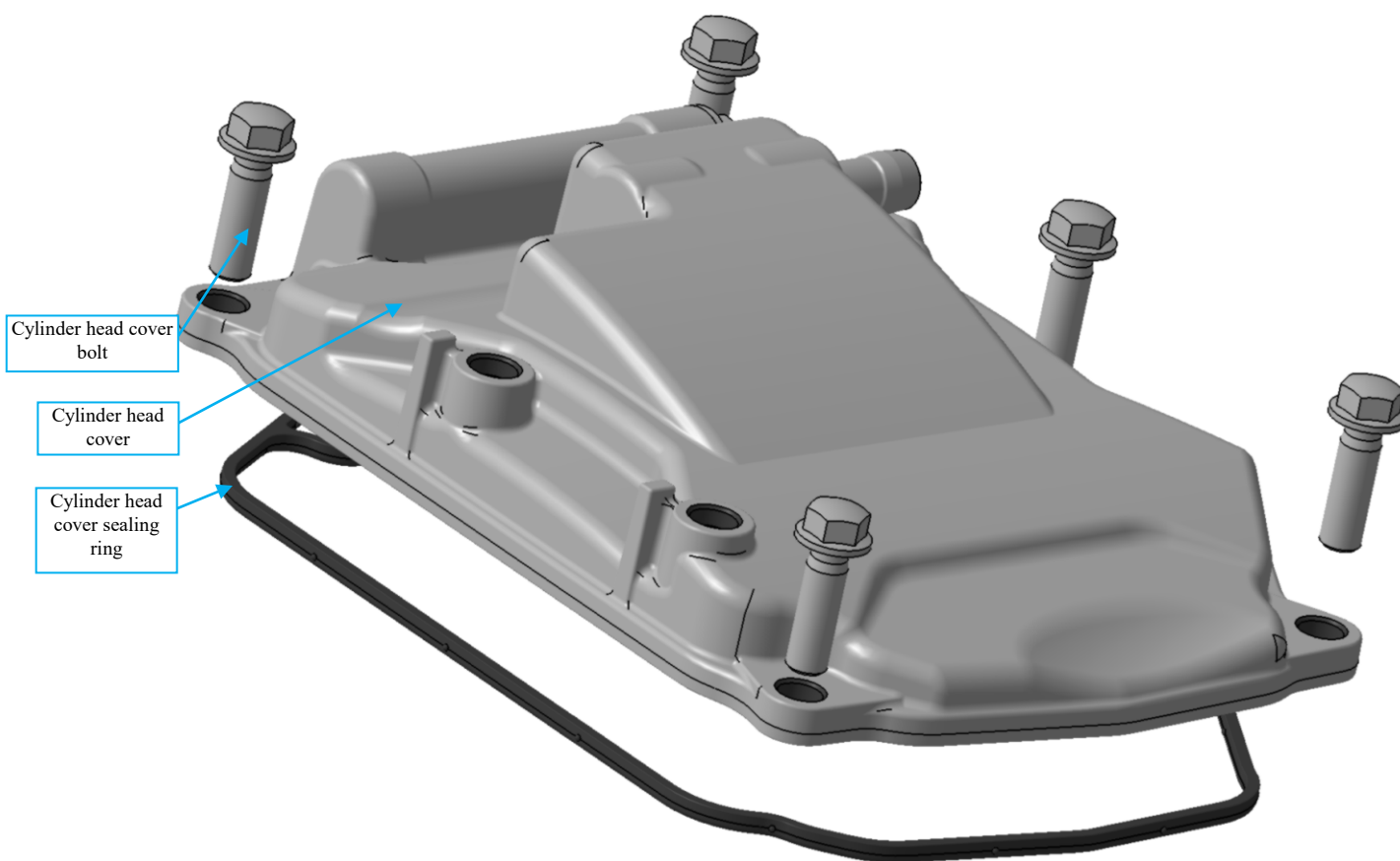
1. The adjustment of valve clearance is improper;
2. The valve is stuck or the valve spring is broken;
3. The camshaft is abraded or damaged;
4. The timing chain is too long, abraded or damaged;
5. The tensioner of timing chain is faulty;
6. The timing driven sprocket is abraded;
7. The cylinder and piston are abraded;
8. The rocker arm or rocker arm shaft is abraded;
9. The piston pin hole and piston pin are abraded.

Overheating, Knocking (Excessive Cylinder Pressure)

1. Carbon deposition in the combustor is heavy.

Blue Smoke from the Exhaust

1. The valve guide is abraded;
2. The splash guard is leaky or damaged;
3. The piston or piston ring is abraded;
4. The clearance of piston ring is too large;
5. The piston ring is installed improperly;

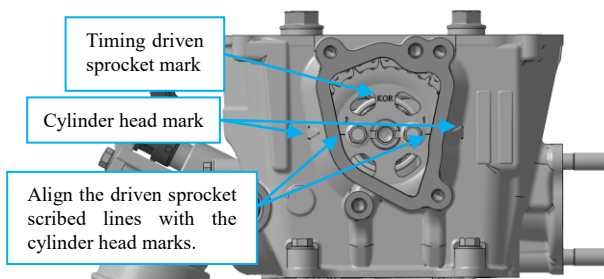
Removal / Installation of Cylinder Head Cover

Removal / Installation of Cylinder Head Cover			
Sequence	Step	Quantity	Remarks
	Removal Sequence		The installation sequence is the reverse of removal sequence.
1	Cylinder head cover bolt	5	Fastening torque 10N·m
2	Cylinder head cover	1	
3	Cylinder head cover sealing ring	1	In case of damage, replace it.

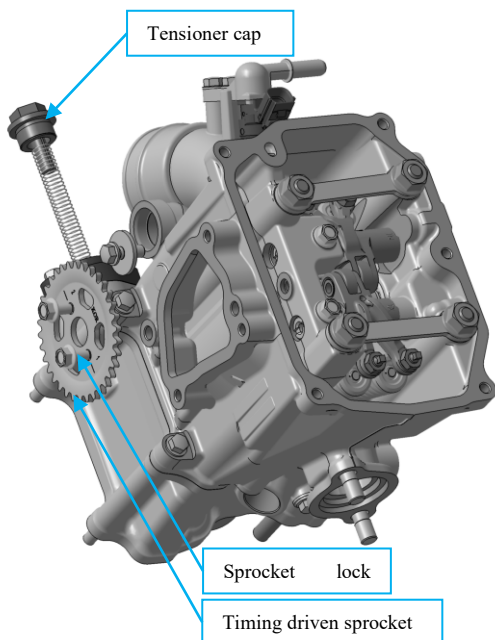
Camshaft and Rocker Arm Group

Removal Steps of Camshaft:

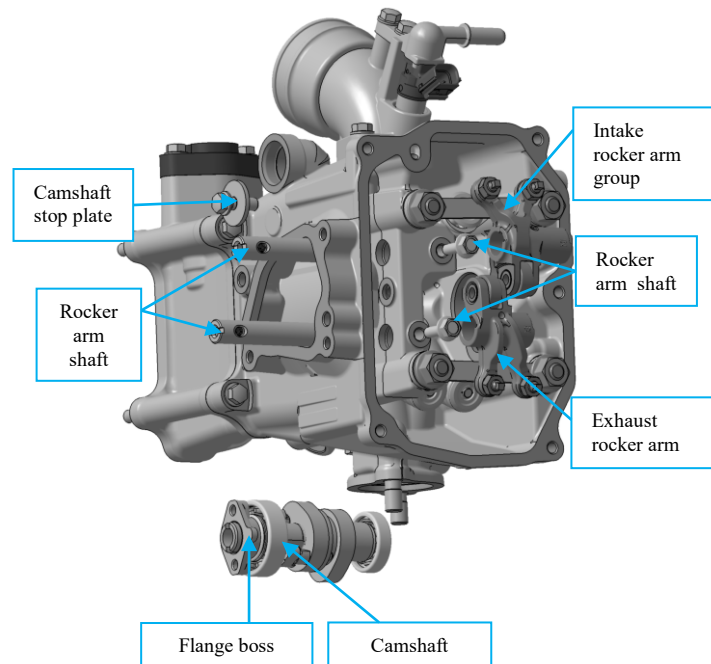
1. Remove the cylinder head cover and water pump (refer to the Disassembly of Cylinder Head Cover). Rotate the camshaft until the mark faces the cylinder head cover and the scribed lines align with the cylinder head marks.



2. Loosen the sprocket lock bolt. Loosen the tensioner cap, then use a flat-head screw driver to retract the tensioner plunger to slacken the chain, and remove the timing driven sprocket.

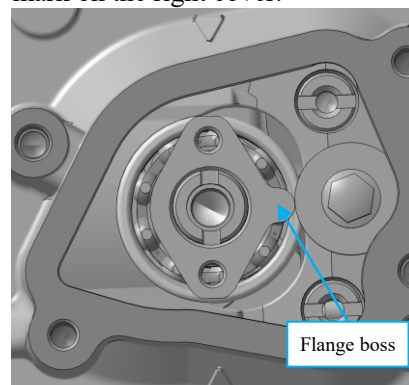


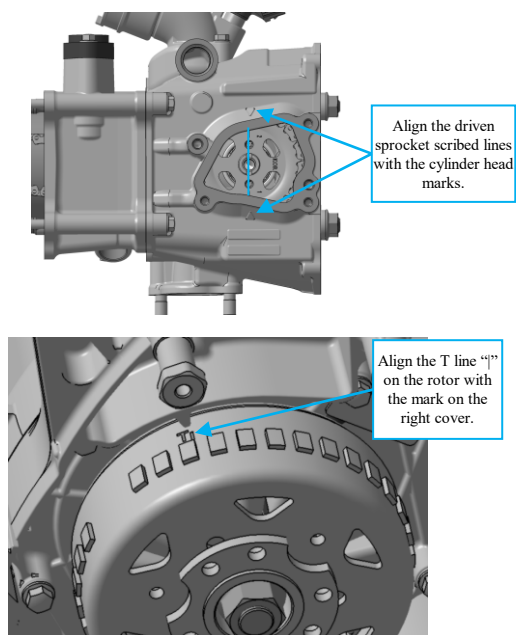
3. Loosen the camshaft limit plate and rocker arm shaft limit screws. Pull out the rocker arm shafts and camshaft, and then take out the intake / exhaust rocker arm groups.



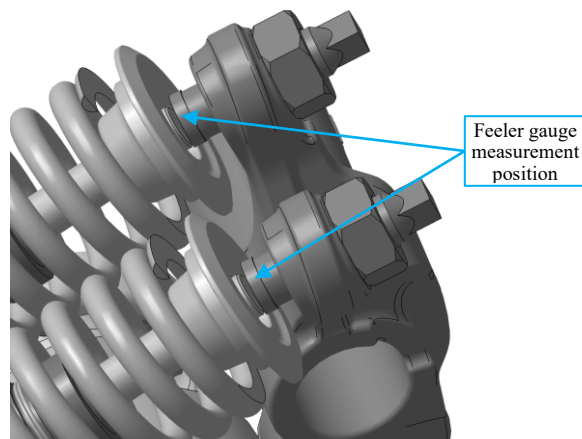
Installation Steps of Camshaft and Intake / Exhaust Rocker Arms:

1. Clean all parts and components and smear oil on the camshaft boss surface and journal.
2. Following the reverse sequence of removal, first install the camshaft, assemble the rocker arms, rocker arm shafts, camshaft limit plate, and rocker arm shaft limit screws in place, and tighten them according to the torque specifications.
3. When installing the camshaft, ensure the flange boss faces the cylinder head cover. Rotate the crankshaft to set the piston at the top dead center of the compression stroke, aligning the T line “|” on the rotor with the mark on the right cover.

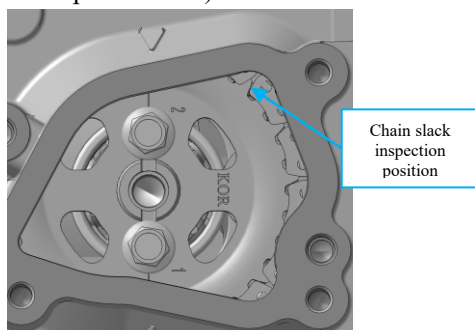




5. Confirm that the valve clearance is within the specified range.



4. After aligning the timing, install the driven sprocket fastening bolts and tighten them to the specified torque. Insert a flat-head screwdriver into the tensioner bore and screw in the tensioner plunger to ensure the chain is moderately tensioned (the chain play shall be approximately 0.5mm when pushed up and down).



6. Install the cylinder head cover, then tighten the bolts and the tensioner cap according to the torque specifications (refer to Installation of Cylinder Head Cover).

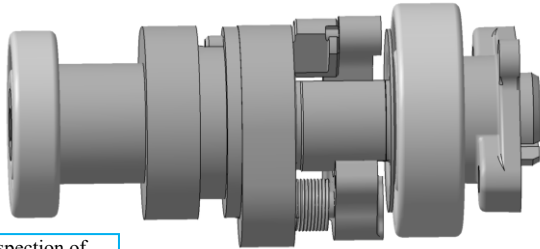
Removal / Installation of Camshaft

Sequence	Step	Remarks
	Removal Sequence	The installation sequence is the reverse of removal sequence.
1	Cylinder head cover bolt	Tightening torque: 10N·m
2	Remove the tensioner cap, and unscrew the tensioner plunger	Tightening torque: 10N·m
3	Timing driven sprocket bolt	Tightening torque: 7N·m
4	Camshaft stopper bolt	
5	Rocker arm shaft stopper bolt	Tightening torque: 7N·m
6	Intake rocker arm group	
7	Intake rocker arm group	
8	Camshaft	Confirm that the chain tension is appropriate and the valve clearance meets the requirements.

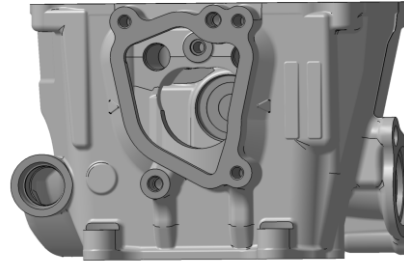
Inspection of Camshaft

Check the camshaft for abnormal wear, the bearings for excessive play, and the cam for wear.

Check the camshaft for abnormal wear.



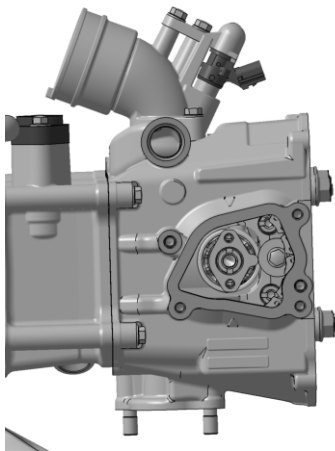
Inspection of camshaft



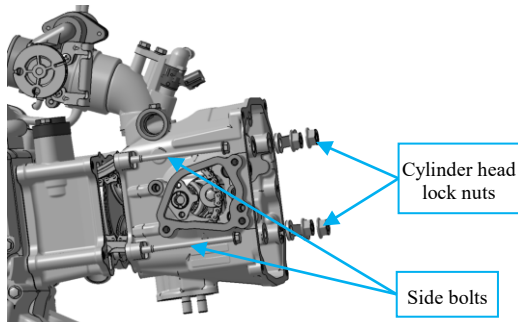
Cylinder Head

Removal Steps of Cylinder Head:

1. Remove the driven sprocket following the camshaft removal / installation procedure mentioned above.



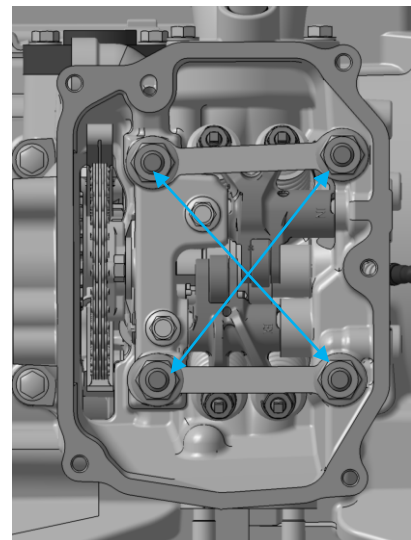
2. Loosen the cylinder head lock nuts and side bolts, and then remove the cylinder head group.



Installation Steps of Cylinder Head:

Install it in the reverse sequence of removal. Pay attention to the following items during installation:

1. Clean all parts and components. Check the cylinder head oil passages to ensure they are clear, clean, and free of leaks. Confirm the position of the locating pins.
2. Replace the cylinder head gasket.
3. Tighten the cylinder head lock nuts in two stages using a crisscross pattern to the specified torque. After the cylinder head nuts are secured, tighten the side bolts in sequence to the specified torque.
4. Following the camshaft removal / installation procedure, verify the timing position, chain tension, and valve clearance.

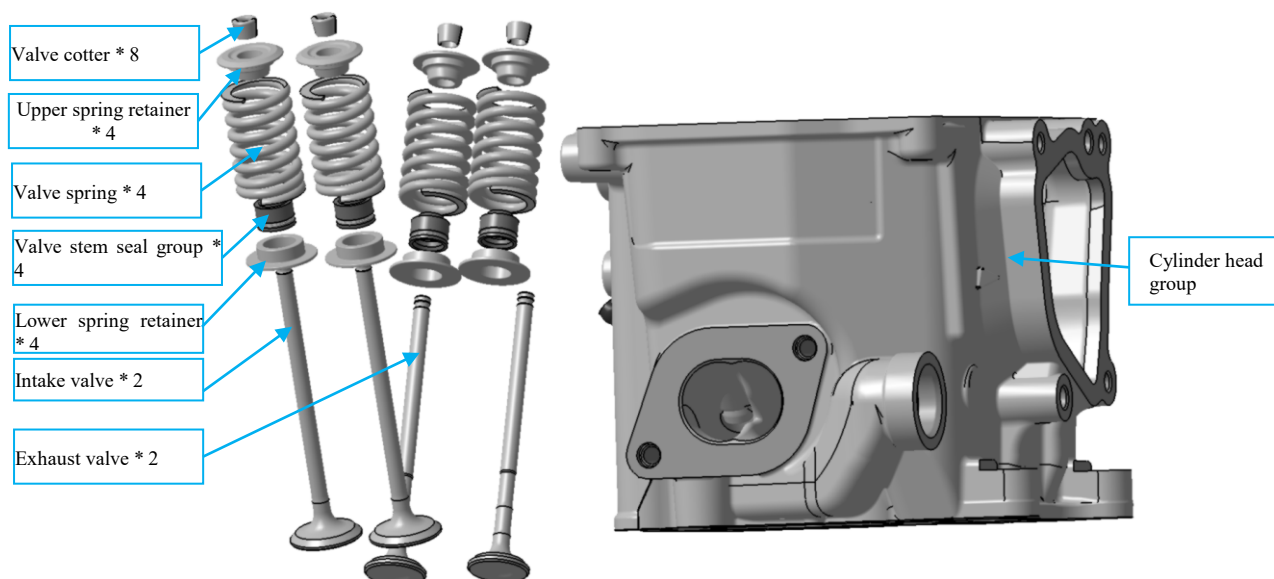


Disassembly / Assembly of Cylinder Head

Sequence	Step	Remarks
	Disassembly Sequence	The assembly sequence is the reverse of disassembly sequence.
1	Cylinder head cover bolt	Tightening torque: 10N·m
2	Remove the tensioner cap, and unscrew the tensioner plunger	Tightening torque: 10N·m
3	Timing driven sprocket bolt	Tightening torque: 7N·m
4	Cylinder head lock nut	Tightening torque: 28N·m
5	Side bolt	Tightening torque: 10N·m
6	Cylinder head	
7	Sealing gasket of cylinder head	Replace it with a new one during assembly

Disassembly / Assembly of Cylinder Head Group

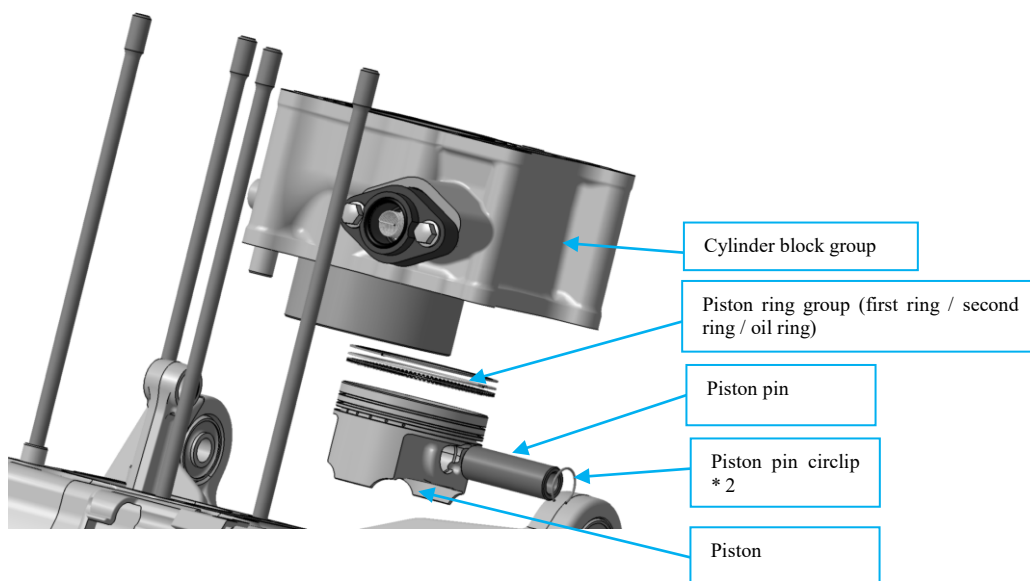
After removing the cylinder head group, perform further disassembly / reassembly according to the figure below.



Sequence	Step	Remarks
	Disassembly Sequence	The assembly sequence is the reverse of disassembly sequence.
1	Loose the cylinder head cover bolt	Tightening torque: 10N·m
2	Loosen the tensioner cap, and unscrew the tensioner plunger	Tightening torque: 10N·m
3	Loosen the timing driven sprocket bolts to remove the timing driven sprocket	Tightening torque: 7N·m
4	Loosen the camshaft stopper plate bolt to remove the camshaft	Tightening torque: 7N·m
5	Loosen the rocker arm shaft stopper bolt, and remove the intake / exhaust rocker arm groups	
6	Loosen the cylinder head lock nuts, and remove the cylinder head	Tightening torque: 28N·m
7	Valve cotter, upper spring retainer	
8	Valve springs, valve stem seals	Replace with new valve stem seal group during reassembly
9	Lower spring retainer, valve	

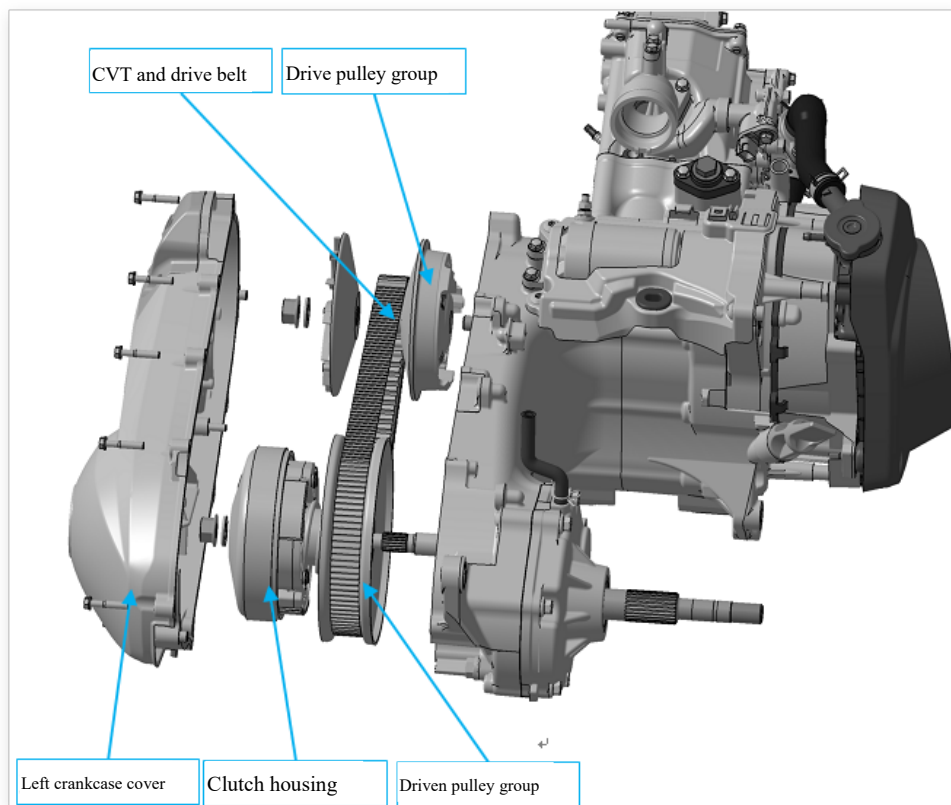
Disassembly / Assembly of Cylinder Block and Piston Head

After the cylinder head is removed as described above, the cylinder block and piston can be removed.



Sequence	Step	Remarks
	Disassembly Sequence	The assembly sequence is the reverse of disassembly sequence.
1	Loose the cylinder head cover bolt	Tightening torque: 10N·m
2	Loosen the tensioner cap, and unscrew the tensioner plunger	Tightening torque: 10N·m
3	Loosen the timing driven sprocket bolts to remove the timing driven sprocket	Tightening torque: 7N·m
4	Loosen the camshaft stopper plate bolt to remove the camshaft	Tightening torque: 7N·m
5	Loosen the rocker arm shaft stopper bolt, and remove the intake / exhaust rocker arm groups.	
6	Loosen the cylinder head lock nuts, and remove the cylinder head	Tightening torque: 28N·m
7	Remove the side bolt	Tightening torque: 10N·m
8	Sealing gasket of cylinder head	Replace with a new cylinder head sealing gasket during reassembly
9	Cylinder block, and cylinder block sealing gasket	
10	Piston pin circlip, and piston pin	Replace with a new cylinder block sealing gasket during reassembly
11	Piston	Position the piston top mark toward the intake side

8

CVT Transmission and Reduction Mechanism

CVT Transmission and Reduction Mechanism

Maintenance Notice

Left crankcase cover

Troubleshooting

CVT Transmission and
Reduction Mechanism

Maintenance Notice

When performing maintenance and inspection mentioned in this section, the engine does not need to be removed from the frame. Open the seat first, remove the storage box, loosen the left crankshaft cover bolts to remove the left crankshaft cover, and remove the CVT transmission mechanism from the engine.

Before assembly, use compressed air to blow off dust and foreign matter attached to the parts. Apply the lubricating grease to sliding or rotating parts, and apply thread locker to threaded parts.

Key Torques

Lock nut 70N·m

Left crankshaft cover fastening bolt 10N·m

Troubleshooting

The rear wheel does not rotate during acceleration

1. Clutch slipping;
2. CVT and drive belt broken;
3. CVT and roller group wear;
4. CVT driven pulley spring failure.

The vehicle lacks power

1. Clutch slipping;
2. Drive belt worn.

Left Crankcase Cover and CVT

Removal Steps of Left Crankcase Cover and CVT:

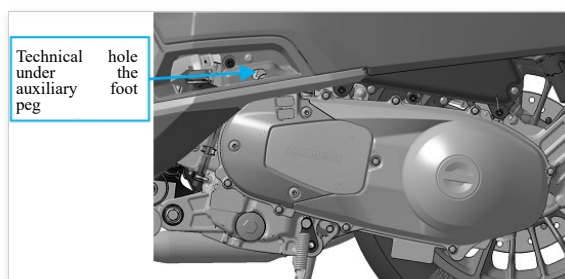
1. Open the seat and remove the storage box.



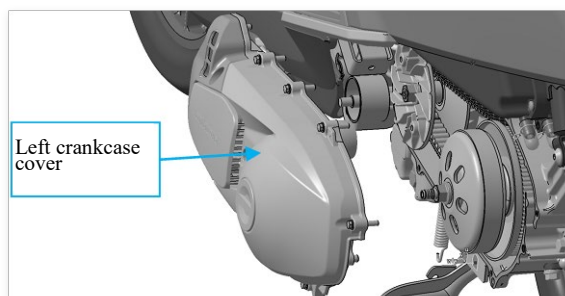
Note

In areas or seasons with heavy sand and wind, especially with floating objects like willow catkins, shorten the cleaning interval for the filter sponge. This prevents foreign matter from clogging the sponge, which may lead to high CVT transmission case temperatures, reduced efficiency, and shortened belt life.

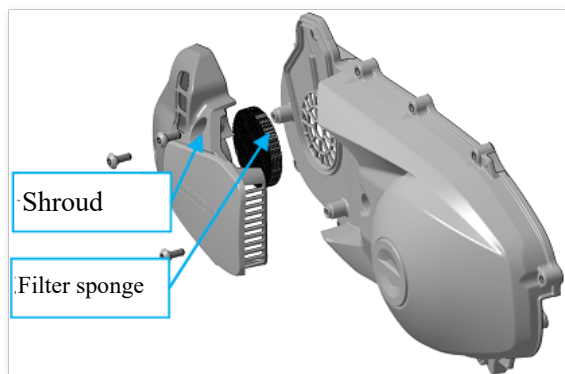
2. Open the auxiliary foot peg. A technical hole is provided on the bottom plate, making it easier to remove and install a hidden left crankcase cover bolt by utilizing the storage box space. The remaining left crankcase cover bolts are in open positions.



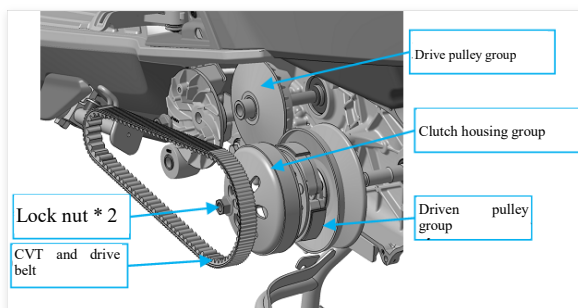
3. Tap gently with a bakelite hammer to remove the left crankcase cover.



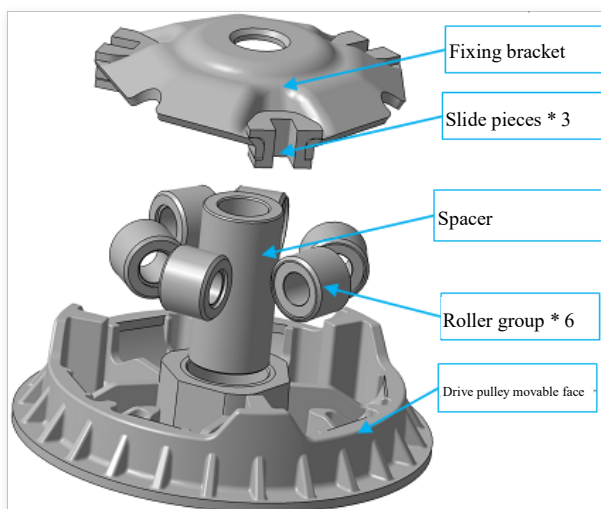
4. Remove the CVT shroud screws and clean the dust and foreign matter from the filter sponge.



5. Loosen the drive / driven pulley nuts with a pneumatic wrench, then remove the CVT groups (drive pulley group, clutch housing group, and driven pulley group) and the drive belt.



6. Check the spacer, drive pulley movable face, roller group, etc., for abnormal wear.

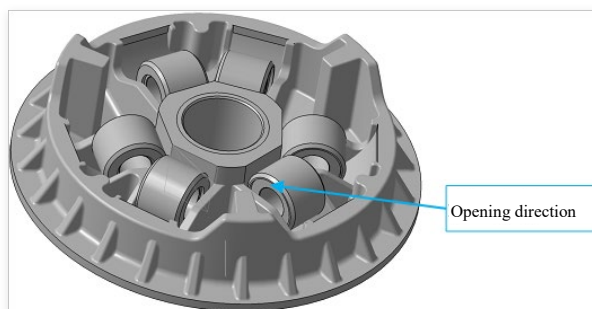


Removal / Installation of Left Crankcase Cover and CVT:

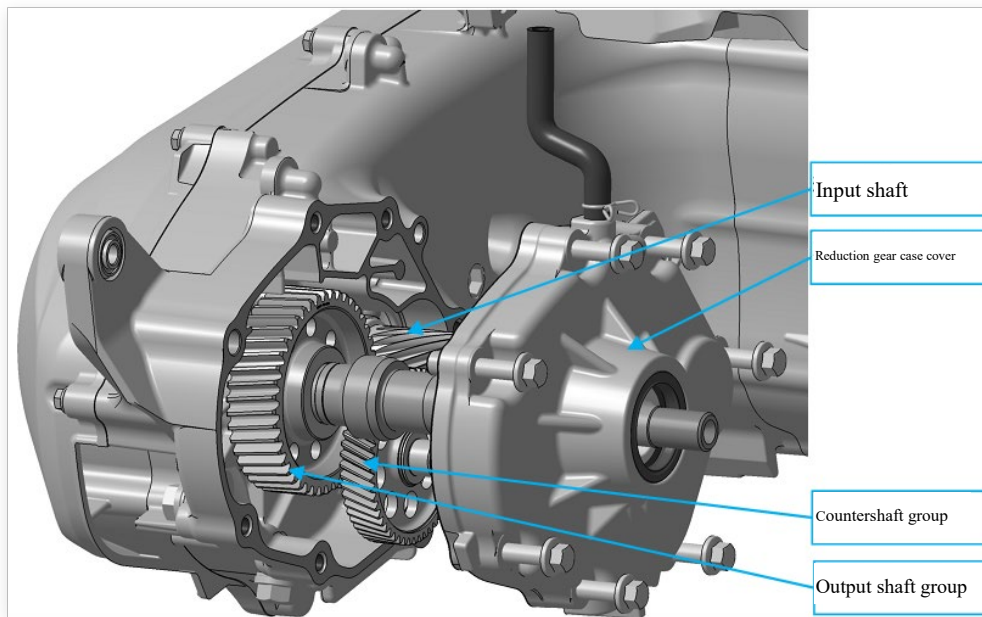
Sequence	Step	Remarks
	Removal Sequence	The installation sequence is the reverse of removal sequence.
1	Open the seat and remove the storage box	
2	Loosen the bolts and remove the left crankcase cover	
3	Loosen the drive / driven pulley lock nuts	Apply thread locker and tighten them to 70N·m
4	Remove the drive pulley fixed face and the clutch housing	
5	Remove the driven pulley group and the drive belt	
6	Remove the drive pulley movable face, roller group, etc.	

**Notes**

1. When disassembling or assembling the CVT, do not damage the mating surfaces of the drive / driven pulleys and the drive belt.
2. When assembling the drive pulley movable face, first place the roller group into the grooves of the movable face. When assembling the roller group, arrange the opening direction clockwise.
3. Fill the spacer with new lubricating grease, and apply thread locker to the lock nuts.



Reduction Gear Case Cover and Reduction Mechanism



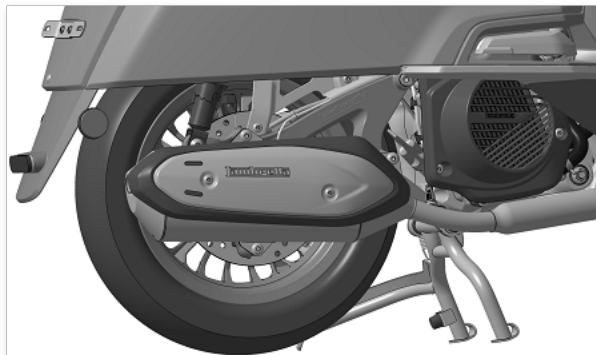
Maintenance Notice

When performing maintenance and inspection of this section, it is not necessary to remove the engine from the frame. First remove the exhaust muffler, then loosen the lower bolt of the right rear shock absorber and the rear swingarm. Loosen the fender and remove the rear wheel to disassemble or assemble the reduction mechanism. Before assembly, use compressed air to blow off dust and foreign matter attached to the parts. Apply lubricating grease to sliding or rotating parts, and tighten the bolts and nuts to the specified torque.

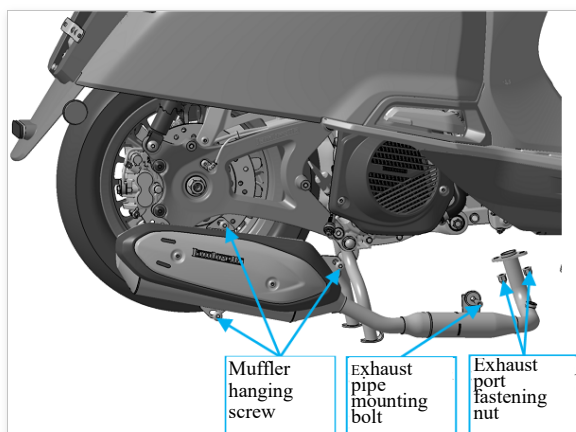
Removal Steps of Reduction Gear Case Cover:

1. Stabilize the motorcycle on a level surface with the center stand. Open the seat and remove the storage box, then remove the air filter.

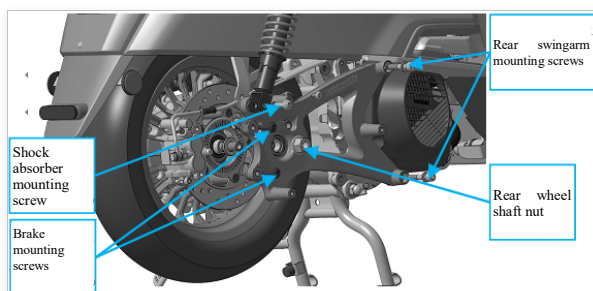
(Refer to the Removal of Air Filter);



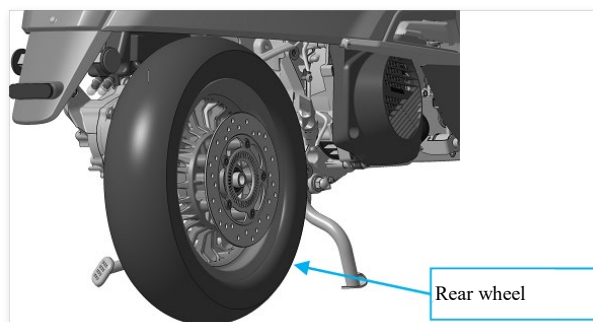
2. Remove the exhaust muffler.



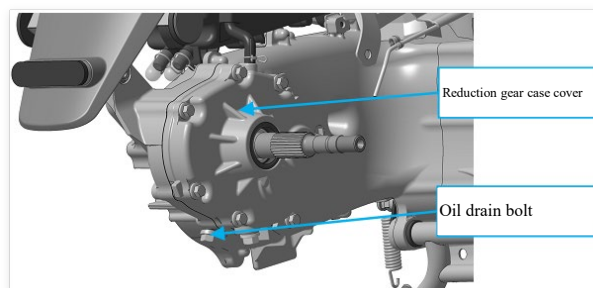
Loosen the upper and lower screws of the right rear shock absorber, the rear swingarm mounting screws, the brake mounting screws, rear wheel lock nut, etc.



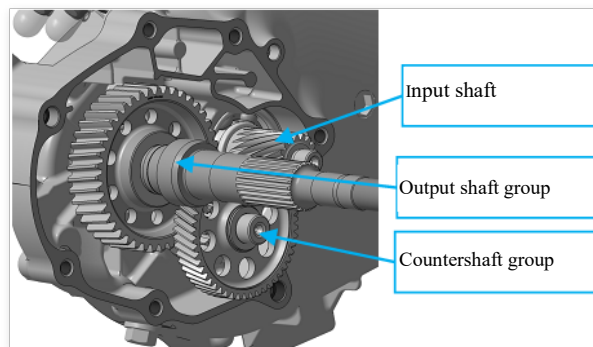
4. Take out the rear wheel.



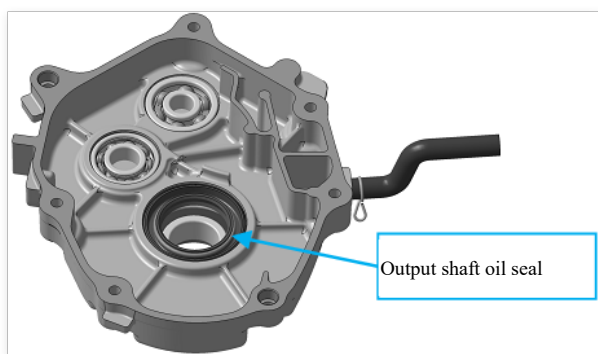
5. Remove the rear wheel. Loosen the drain bolt and collect the oil with an oil tray. Loosen the reduction gear case cover fastening bolts and remove the cover.



6. Remove the drive gear.

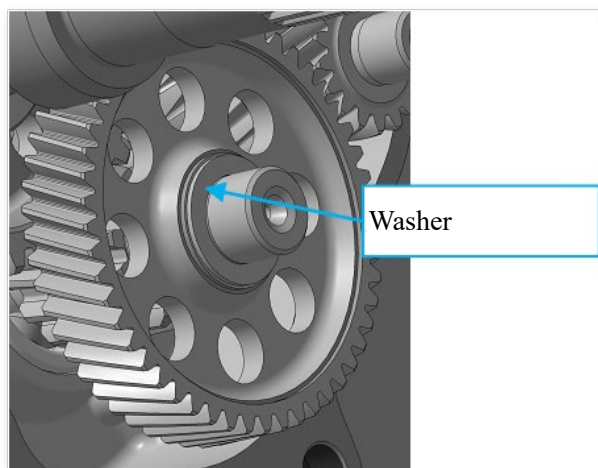


7. Disassemble the reduction gear case cover, remove the oil seal, and replace with new ones.



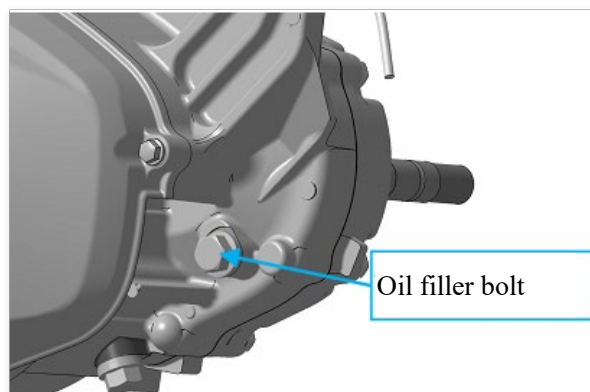
Notes

1. When assembling the gears, ensure that the washers on the countershaft group are not omitted.



8. The assembly sequence of the reduction gear case cover and motorcycle parts is the reverse of the disassembly sequence.

2. Install the reduction gear case cover and tighten the fastening bolts to the specified torque. Loosen the oil filler bolt and the oil level control bolt. Slowly inject 0.12L~0.15L of gear oil 85W-90 into the oil filler, or until the lubricant flows out from the oil filler.

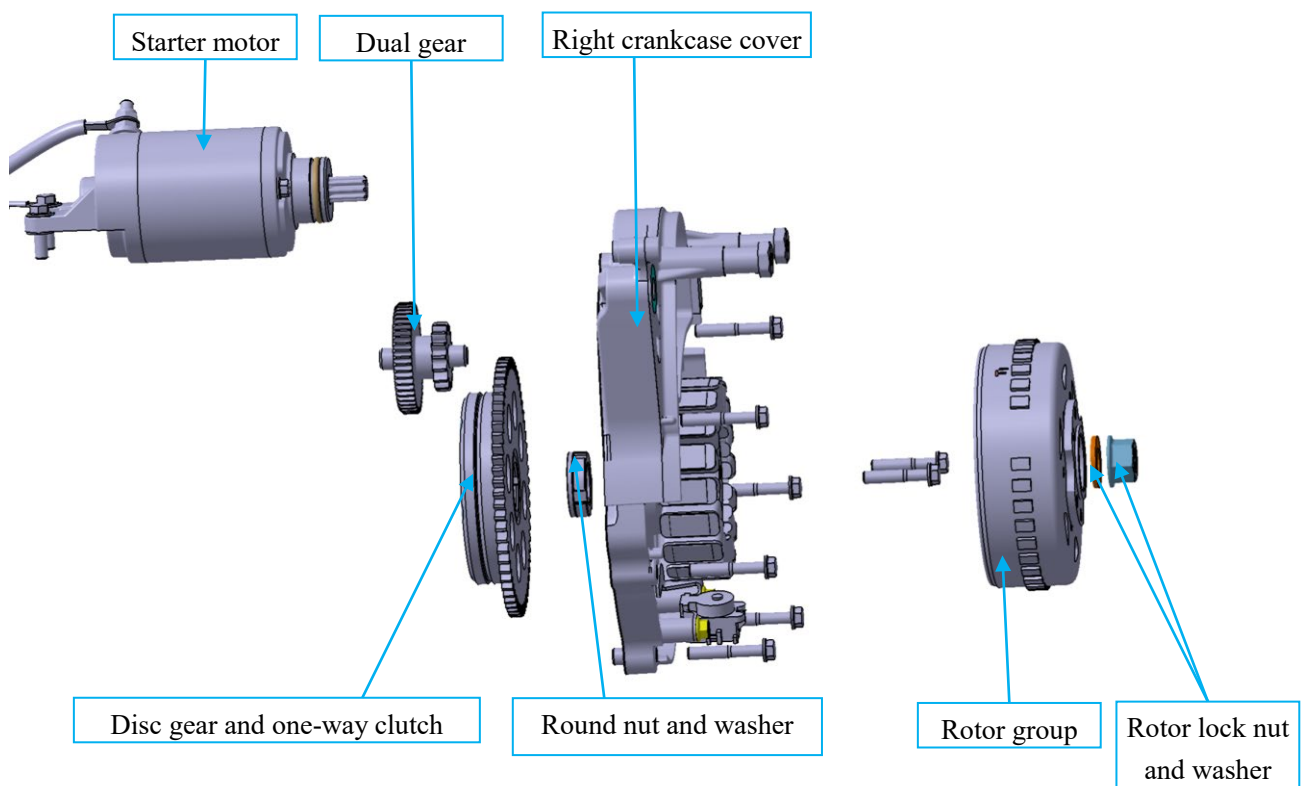


Removal / Installation Steps of Reduction Gear Case Cover and Reduction System:

Sequence	Step	Remarks
	Removal Sequence	The installation sequence is the reverse of removal sequence.
1	Open the seat and remove the storage box and the air filter. Loosen the upper and lower mounting bolts of the right rear shock absorber.	Torque of bolt M10: 40N·m; Torque of bolt M8: 25N·m
2	Remove the exhaust muffler and the fender.	
3	Loosen the brake bolts, the lower bolt of the right rear shock absorber, the speed sensor bolts, and the right reflector screws. Remove the rear swingarm.	Torque of the bolt connecting rear swingarm to engine: 55N·m
4	Loosen the rear wheel axle nut and remove the rear wheel.	Rear wheel nut tightening torque: 95N·m
5	Loosen the drain bolt and drain the lubricating oil.	Drain bolt torque: 25N·m
6	Remove the reduction gear case cover bolts, the reduction gear case cover, and the sealing gasket.	Replace with a new gasket during reassembly.

9

Right Crankcase Cover, Magneto and Starting System



Right Crankcase Cover, Magneto and Starting System

Maintenance Notice	Rotor Group
Right Crankcase Cover	Starter Motor and Driving System

Maintenance Notice

Take down the engine from the frame during maintenance. Drain the lubricating oil and coolant.
Clean all components and parts with cleaning agent and dry them with compressed air before assembly.

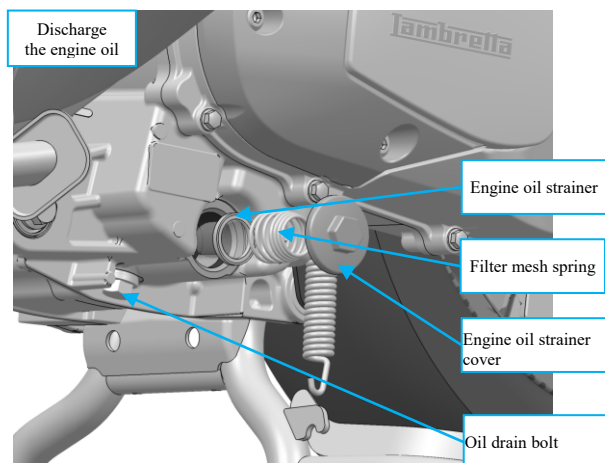
Key Torques

Rotor fastening bolt	70N·m
Rotor fastening bolt	10N·m
Trigger fastening bolt	7N·m
Starter clutch round nut	70N·m

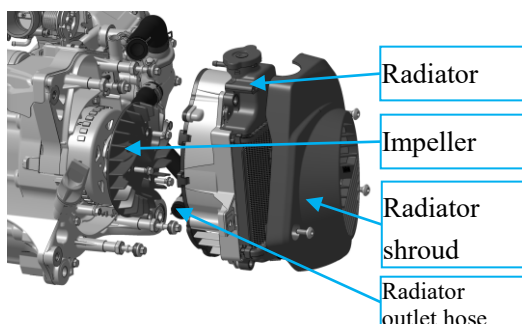
Right Crankcase Cover and Magneto

Removal Steps of Right Crankcase Cover:

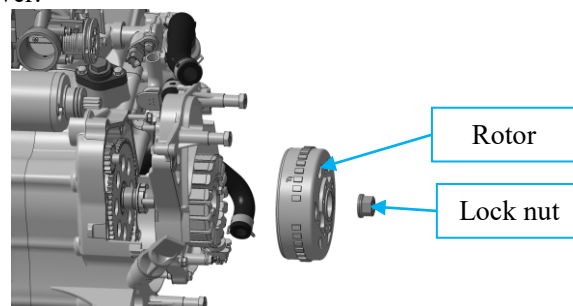
1. Unscrew the engine oil strainer cover or oil drain bolt, drain the lubricating oil completely; remove the radiator outlet hose clamp, pull out the water hose, and drain the coolant thoroughly.



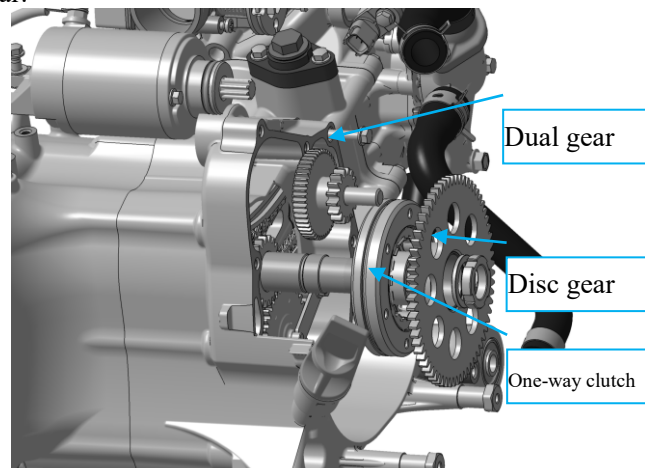
2. Remove the radiator shroud, radiator, impeller, etc.



3. Loosen the rotor lock nut, remove the rotor with special tools, and take off the right crankcase cover.



4. Remove the round nut with special tools, and take off the disc gear, one-way clutch, and dual gear.

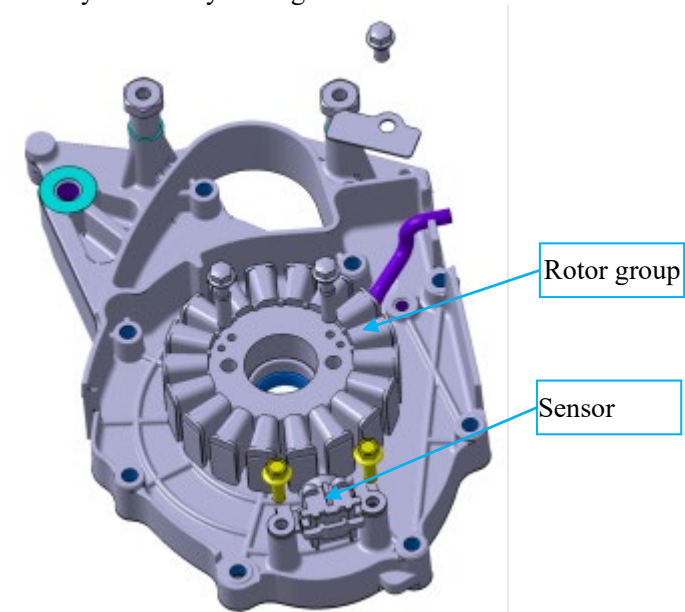


Removal / Installation of Right Crankcase Cover and Magneto

Sequence	Step	Remarks
	Removal Sequence	The installation sequence is the reverse of removal sequence.
1	Drain the crankcase oil	
2	Drain the coolant, and remove the water pump cover	
3	Remove the right crankcase cover and its sealing gasket	Replace with a new gasket during assembly
4	Remove the dual gear shaft and dual gear	
5	Remove the rotor bolt, rotor group, and disc gear	Apply thread locker to the rotor bolt during assembly

Disassembly / Assembly of Magneto Stator

Refer to the figure below for the disassembly / assembly of magneto stator

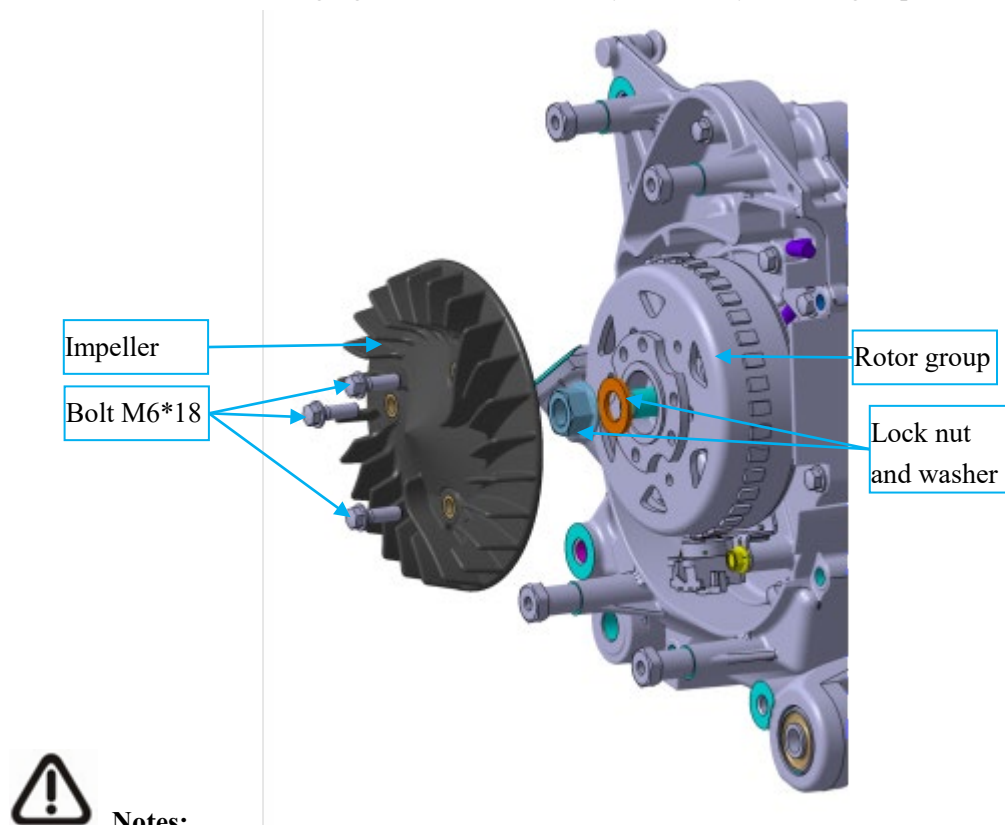
**Notes:**

1. Do not damage the enameled wires or crush the stator coils.
2. Apply thread locker to the stator group and sensor mounting bolts, and tighten them to the specified torque.

Rotor Group

Disassembly Steps of Rotor Group:

Please refer to the following figure for the disassembly / assembly of rotor group.



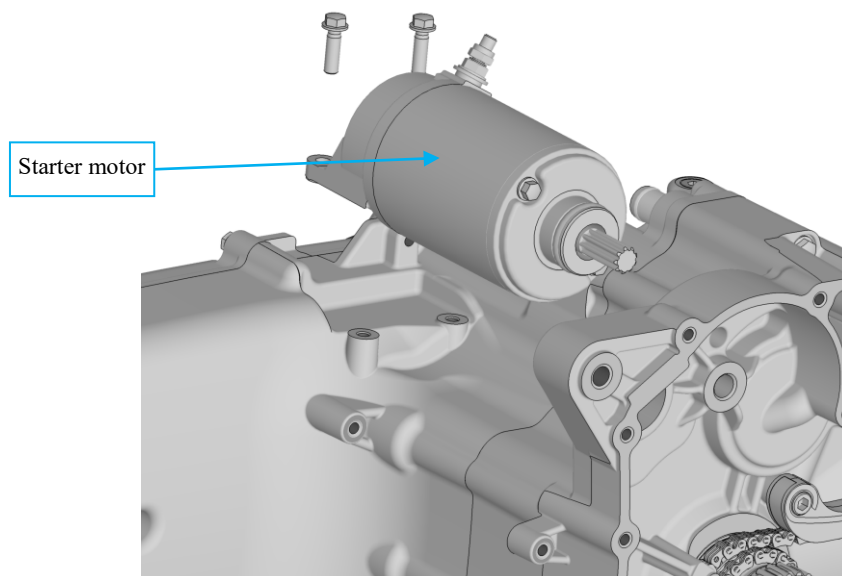
Notes:

1. When removing the rotor, a special tool must be connected to the rotor process thread (M27*1, LH).
2. Thread locker must be used for assembling the M6*18 bolts and the rotor lock nut, and they must be tightened to the specified torque.
3. The impeller bolt model is M6*18. Do not install incorrectly, otherwise the magneto stator enameled wires will be damaged.

Starter motor

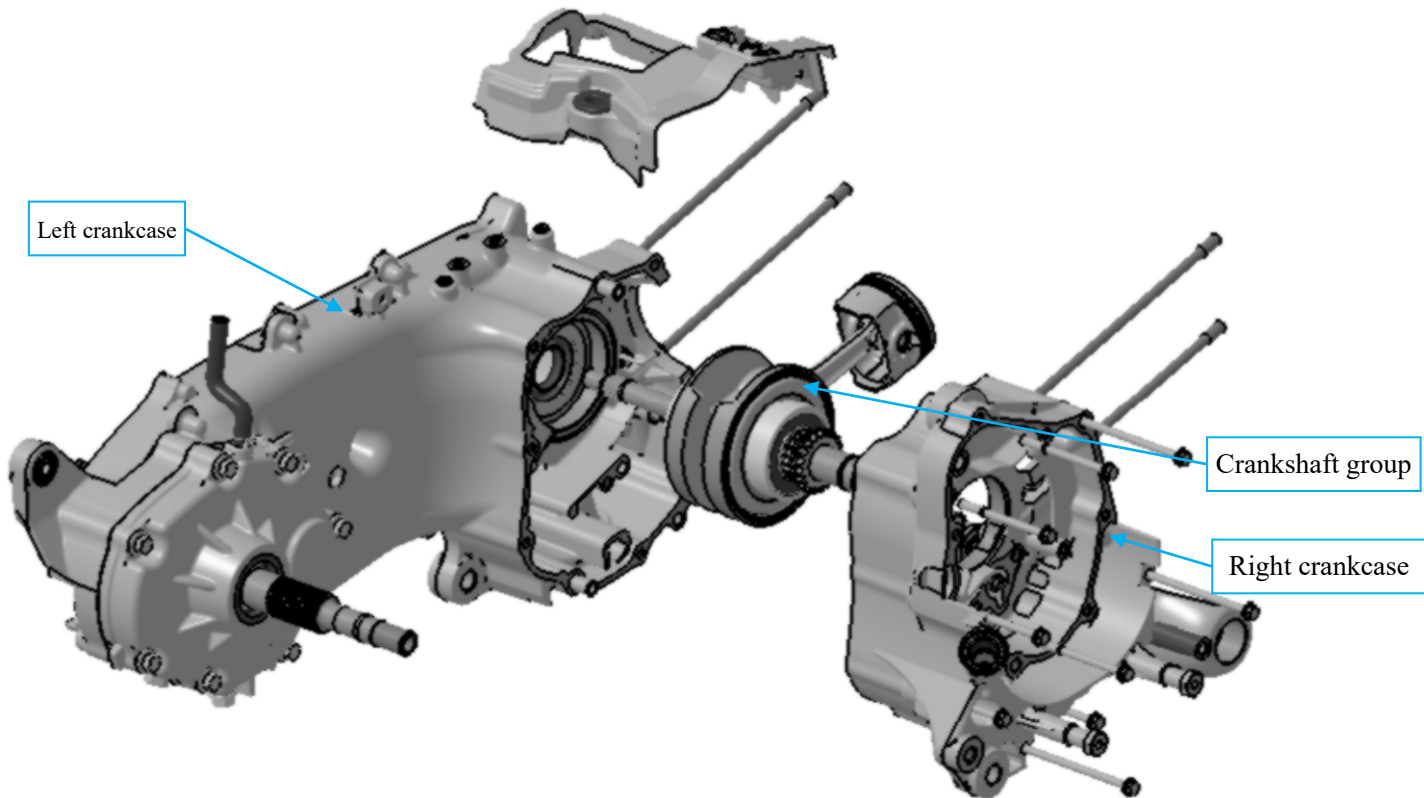
Removal / Installation of Starter Motor

Refer to the figure below for the removal / installation of starter motor.



10

Crankcase and Crankshaft



Crankcase and Crankshaft

Maintenance Notice

Crankshaft

Troubleshooting

Crankcase

Maintenance Notice

Take down the engine from the frame during maintenance.

To repair the crankshaft and balance shaft, the left and right crankcases must be separated, which is commonly known as crankcase separation. Before crankcase separation, the following parts and components of engine shall be removed:

1. Right crankcase cover, magneto, and starting system [Refer to *Right Crankcase Cover, Magneto, and Starting System*];
2. Left crankcase cover and CVT [Refer to *CVT Transmission and Reduction Mechanism*];
3. Cylinder head cover, camshaft, and cylinder block [Refer to *Cylinder Head Cover, Cylinder Head, Cylinder Block and Piston*];

Clean all components and parts with cleaning agent and dry them with compressed air before assembly.

Technical Specifications and Maintenance Criteria

Item		Standard Value	Maintenance Limit
Crankshaft Bearing Free Play	Left crankshaft bearing	0.028-0.046	0.08
	Right crankshaft bearing	0.005-0.020	0.05
Connecting rod	Big end side clearance	0.1-0.3	0.5
	Radial clearance	0-0.008	0.15

Troubleshooting

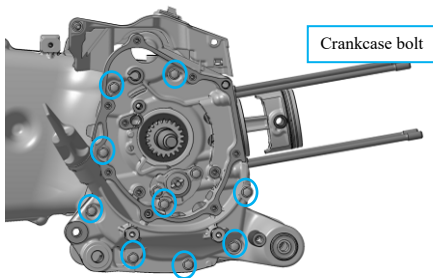
Engine Noise

1. The crankshaft bearing is damaged;
2. The connecting rod big end bearing is damaged;

Crankcase

Removal Steps of Crankcase:

1. Remove the engine from the frame (with engine oil drained completely), and place it on the assembly workbench.
2. Remove the radiator (including water pump components), magneto rotor, right crankcase cover (including magneto stator group), plate gear, and one-way clutch, etc. [Refer to related sections].
3. Remove the left crankcase cover, CVT components, etc. [Refer to related sections].
4. Remove the cylinder head components, cylinder block, starter motor, and other parts and components [Refer to related sections].
5. Remove the crankcase bolts from the left and right crankcases.



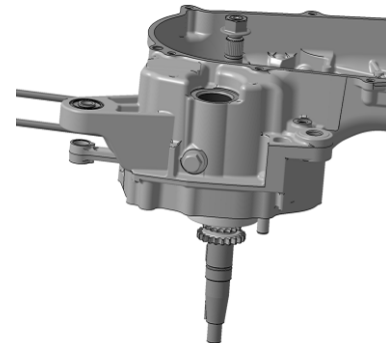
6. Place the left crankcase on the bottom and gently tap the right crankcase with a bakelite hammer to loosen the left and right crankcases.
7. Move the right crankcase upward steadily.
8. Remove the bearing retainer.



Note:

1. Do not use screwdriver or similar tools to separate the left and right crankcases, or the sealing surface will be damaged.
2. Clean off the residual sealant from the mating surfaces. If necessary, lightly grind along the mating surfaces with a fine oilstone, but ensure no scratches are left across the crankcase from inside to outside to avoid potential leakage.

9. The crank and connecting rod components and the left crankcase are an interference fit. If separation is required, place the left crankcase and crankshaft group in an oven set to 120°C for 1h (Alternatively, use a heat gun set to 650°C to heat the periphery of the crankshaft hole on the left cover side of the left crankcase for over 20min.).
10. Place the heated group on the assembly workbench with the crankshaft suspended. Install the nut M12 on the left crank end until the nut is flush with the end face, then tap the left crank end face with an iron hammer.

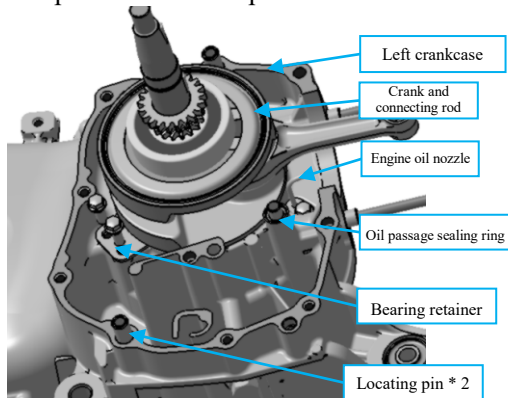


Note:

Wear protective gloves when removing the group from the oven to avoid burns from high-temperature parts.

Installation Steps of Crankcases:

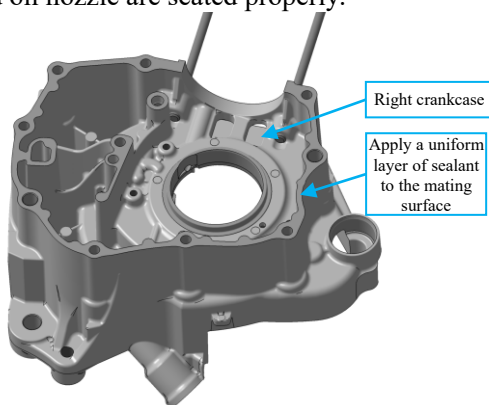
1. Place the left crankcase in an oven set to 120°C for 1h (Alternatively, use a heat gun set to 650°C to heat the periphery of the crankshaft hole on the left cover side of the left crankcase for over 20min.). Remove it and place it on the assembly workbench. Smoothly install the crank-connecting rod group into the crankcase. If any sticking is felt, gently shake the crankshaft to accelerate seating. Install the bearing retainer immediately after the crankshaft is seated to prevent displacement. Install the piston components after the parts have cooled down.



Note:

Wear protective gloves when removing the crankcase from the oven to avoid burns from high-temperature parts.

2. Apply a uniform layer of sealant to the mating surface of the right crankcase. Confirm that the locating pins, oil passage sealing rings, and oil nozzle are seated properly.

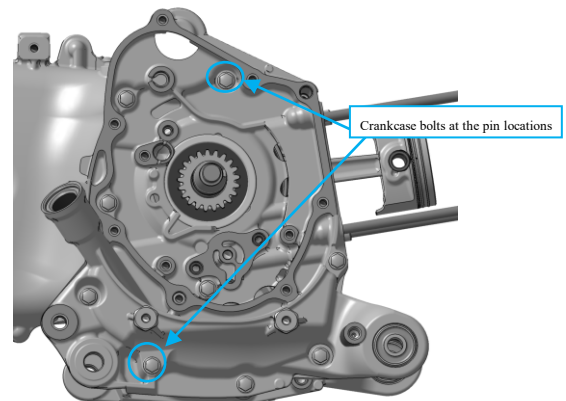


Note:

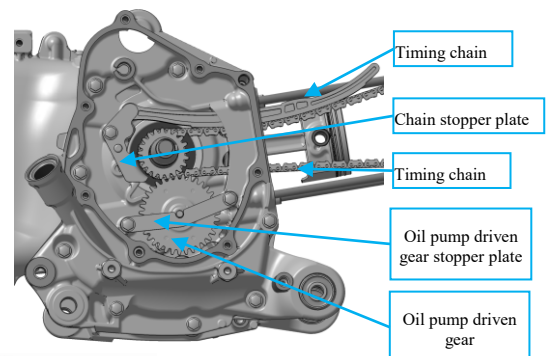
Press or use bakelite hammer to connect the crankcases. Do not beat them heavily.

3. Gently place the right crankcase on the left crankcase. Keep the left and right mating

surfaces parallel during mating. If there is a small gap and the mating surfaces are not seated, tap the right crankcase lightly with a bakelite hammer. After the mating surfaces are flush, insert the crankcase bolts. Tighten the two crankcase bolts at the pin locations first according to the torque requirements, then tighten the remaining crankcase bolts in sequence.



4. Install the timing chain, tensioner plate, chain stopper plate, oil pump components, oil pump driven gear, and oil pump driven gear stopper plate in sequence.

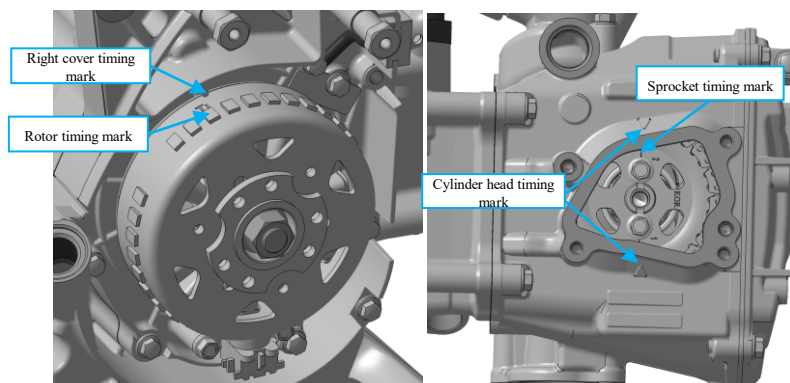


Note:

When installing the oil pump driven gear, ensure the pin on the oil pump shaft aligns with the corresponding slot on the gear. After being seated, the end face of the oil pump driven gear must be lower than the oil pump drive gear on the crank.

5. Install other engine parts and components in sequence. First, install the cylinder block sealing gasket, cylinder block group, chain guide plate, cylinder head components, and timing driven sprocket, then align the valve timing. Adjust the tensioner to the proper

chain tension and adjust the valve clearance. Second, install the disc gear and one-way clutch components and tighten the round nut. Install the dual gear and dual gear shaft. Then, install the right crankcase cover (including magneto stator group), magneto rotor, and fan impeller. Next, install the radiator base, radiator components, water pump, etc. Finally, install the CVT components, drive belt, and left crankcase cover (Refer to related sections for details).

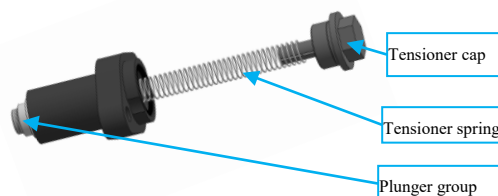


6. Install the assembled engine onto the frame. Install the pipelines and cables, and fill with sufficient engine oil and coolant. After confirmation, prop up the center stand on flat ground and start the engine. After idling for 3-5min., slowly increase the throttle to 6,00rpm-7,000rpm and run steadily for 3-5min. Observe whether the coolant level drops. If it drops, replenish the coolant.



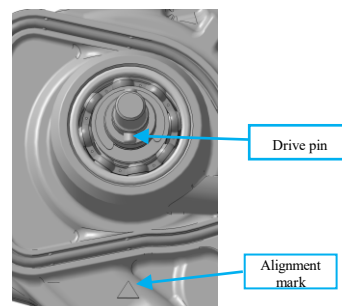
注意：

When installing the tensioner spring, rotate the spring clockwise by 10°-20° to ensure the spring snaps into the slot at the bottom of the plunger group. When installing the tensioner cap, if it cannot be screwed in after half a turn, return the spring to its free state, adjust the position of the tensioner cap, and screw it in again. Do not keep idling the cap to avoid permanent deformation of the spring.



Note:

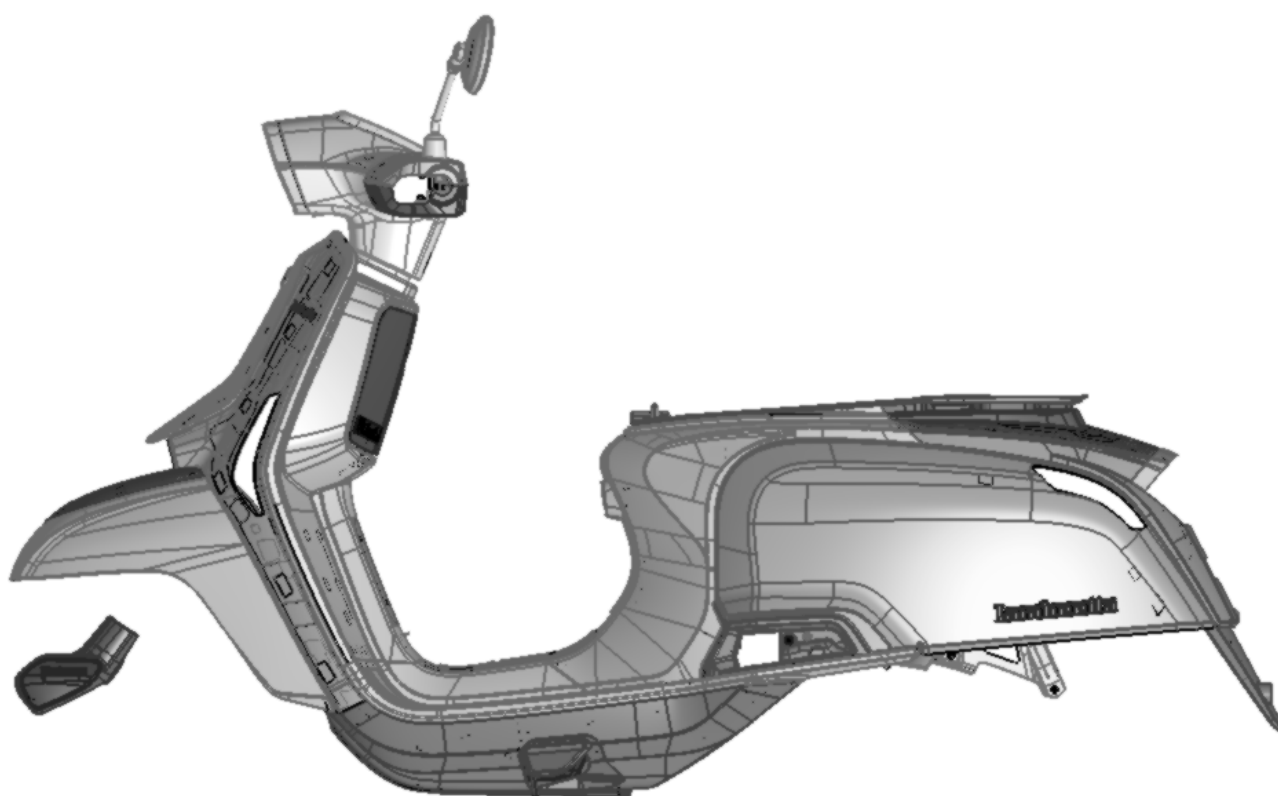
When installing the water pump, align the drive pin on the water pump shaft with the mark on the water pump body, so that the pin can align with the corresponding slot on the camshaft.



Sequence	Step	Quantity	Remarks
	Removal Sequence		The installation sequence is the reverse of removal sequence.
1	Rotor nut	1	Tightening torque: 70N·m
2	Right crankcase group	1	
3	One-way clutch round nut	1	Left-hand thread, tightening torque: 70N·m
4	Crankcase bolt M6*130	2	Tightening torque: 10N·m
5	Crankcase bolt M6*65	6	Tightening torque: 10N·m
6	Bearing retainer bolt M6*16	2	Tightening torque: 10N·m
7	Crank-connecting rod-piston group		

11

Body and Exhaust System



Body and Exhaust System

Maintenance Notice

Removal / Installation of Rear
Fender

Troubleshooting

Removal / Installation of
Exhaust Muffler

Covering Parts, Tail Light, Rear
Turn Signal Light, Headlight,
Instrument Cluster and Left /
Right Handlebar Switches

Maintenance Notice

When performing maintenance and service in this section, be careful not to scratch and damage the covering parts, instrument cluster and lights.

Removing or maintaining parts and components before the exhaust system cools may cause severe burns.

This part mainly includes the disassembly and installation of covering parts, rear fender, exhaust muffler, and lights.

Troubleshooting

Excessive Noise

1. Damage of exhaust system;
2. Exhaust leakage;

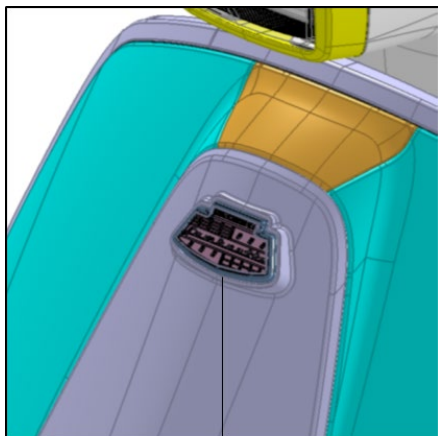
Abnormal Operation

1. Deformation of exhaust system;
2. Exhaust leakage;
3. Blocking of muffler.

Covering Parts, Tail Light, and Rear Turn Signal Light

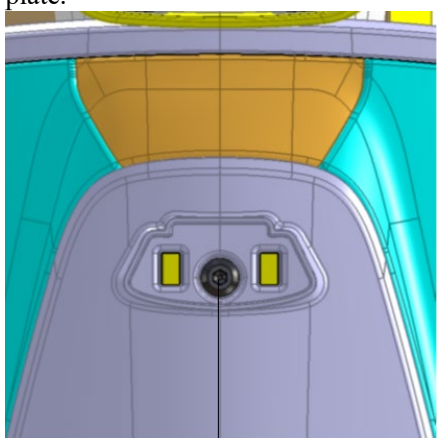
Disassembly Steps of Covering Parts, Tail Light, and Rear Turn Signal Light:

1. Support the motorcycle on level ground with the center stand. Use a tool to pry the emblem from the notch of the emblem and remove the emblem.



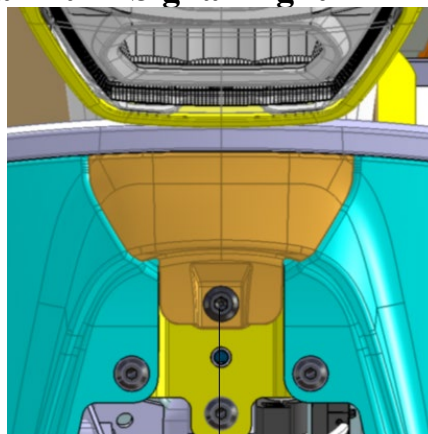
Notch

2. Use a tool to remove the mounting bolt (1 piece in total) and remove the front cover plate.

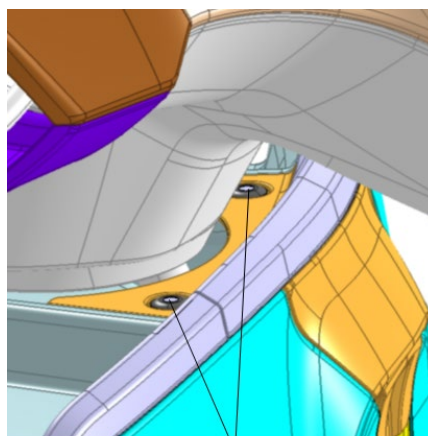


Mounting bolt

3. Use a tool to remove the mounting bolt (1 piece in total) and the top push-type expansion screws (2 pieces), and remove the group of the front cover upper trim panel and the middle section of the side guards.

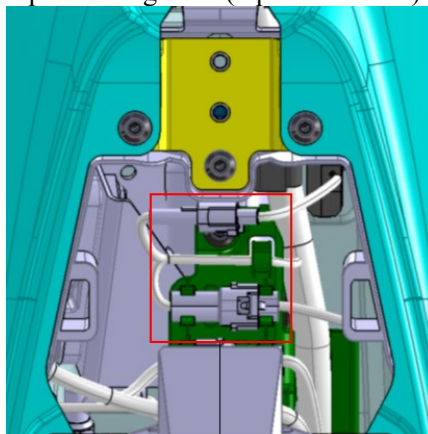


Mounting bolt

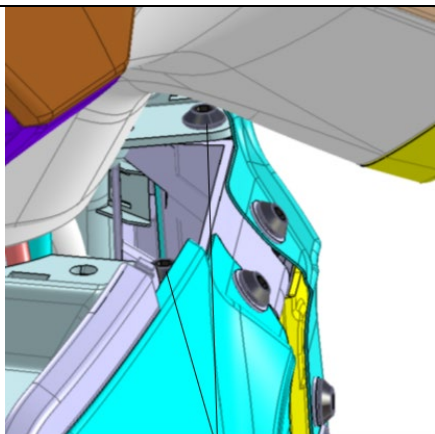


Push-type expansion screws

4. Remove the USB and keyless antenna connectors and separate the male and female connectors, and then use a tool to remove the top mounting bolts (2 pieces in total).

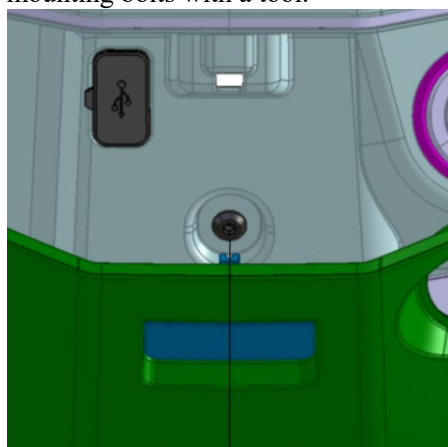


USB and keyless antenna connector



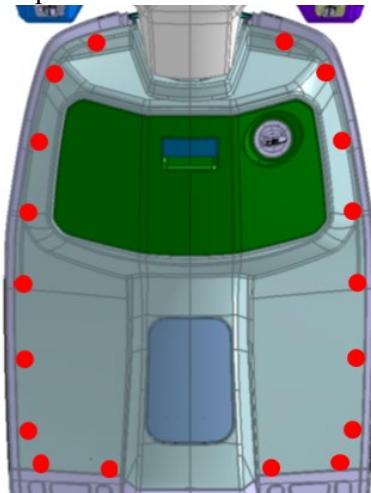
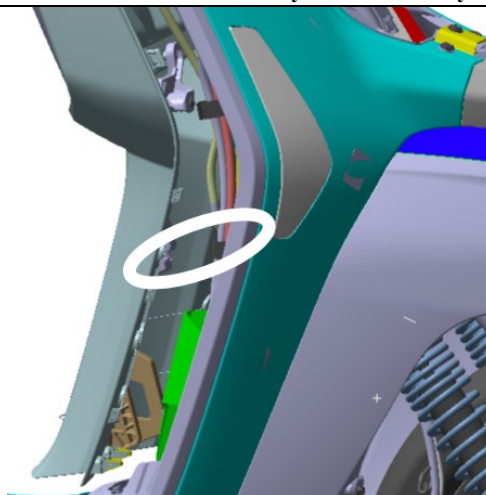
Mounting bolts

5. Open the document box cover and remove the mounting bolts with a tool.

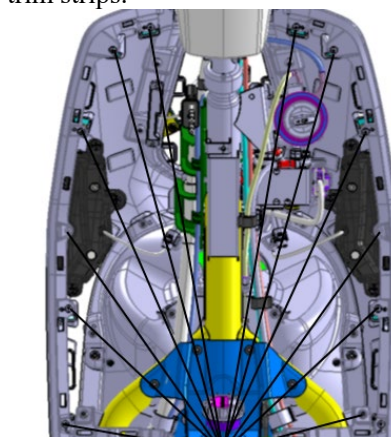


Mounting bolt

6. Use a tool to pry open the buckles between the front cover and each part, and remove the group of front cover and document box. During the removal process, pull the throttle cable out of the mounting slot, then take off the group of front cover and document box.

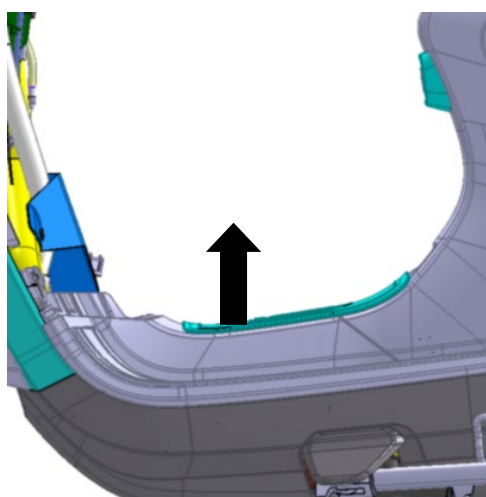


7. Use a tool to remove the mounting screws on the side trim strips (12 screws in total, 6 on each side), and take off the left and right side trim strips.

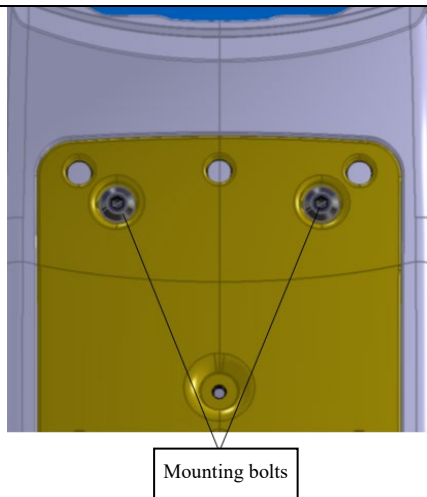


Mounting bolts

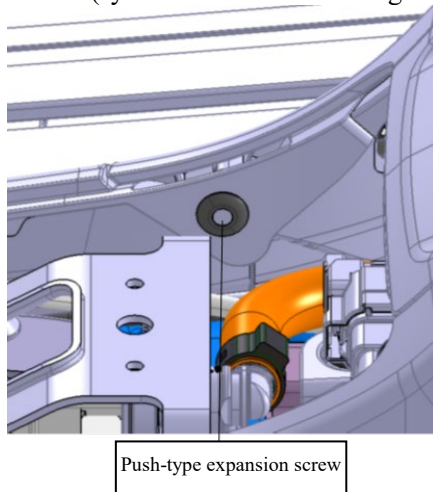
8. Pull open the front end of the logo cover by hand.



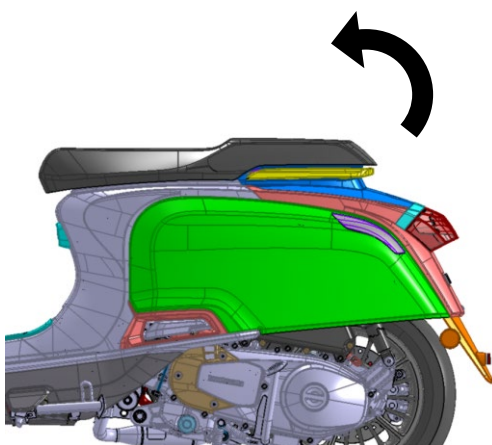
9. Use a tool to remove the mounting bolts of the logo cover liner, and take off the logo cover liner.



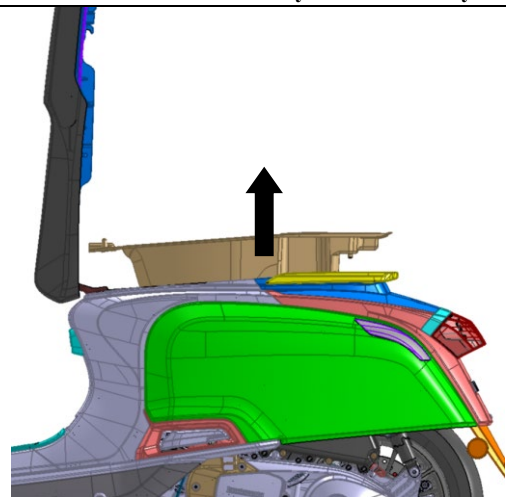
10. Use a tool to remove the push-type expansion screws (symmetrical on left and right sides).



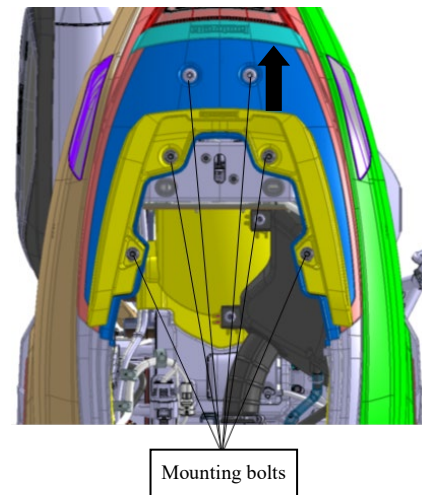
11. Open the seat lock and flip open the seat.



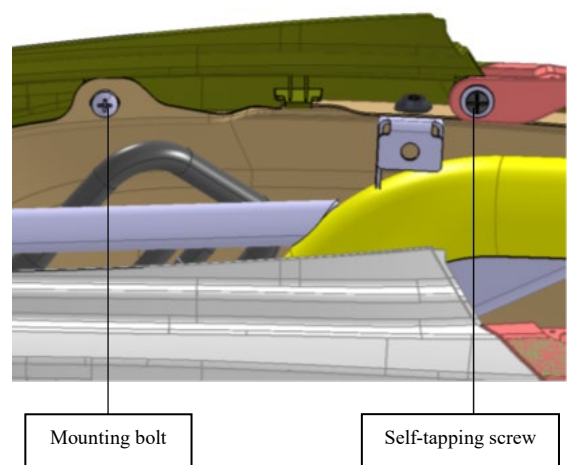
12. Lift and remove the storage box.



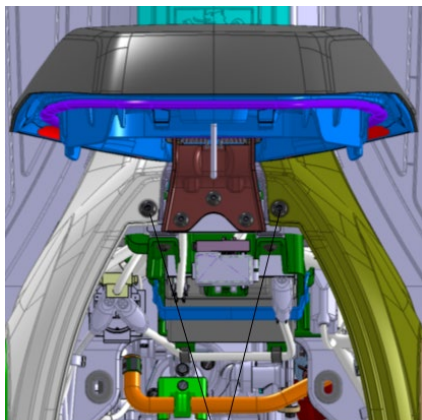
13. Use a tool to remove the mounting bolts of the rear grab bar and rear center cover, and then take off the rear grab bar and rear center cover.



14. Use a tool to remove the mounting bolts and self-tapping screws of the side cover inner panel (same on left and right sides).

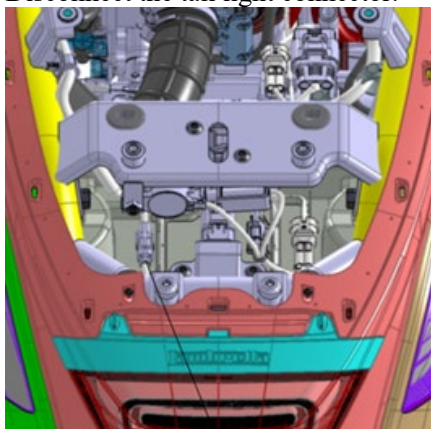


15. Use a tool to remove the mounting bolts, and pull the side cover inner panel outward to remove it (symmetrical on left and right sides).



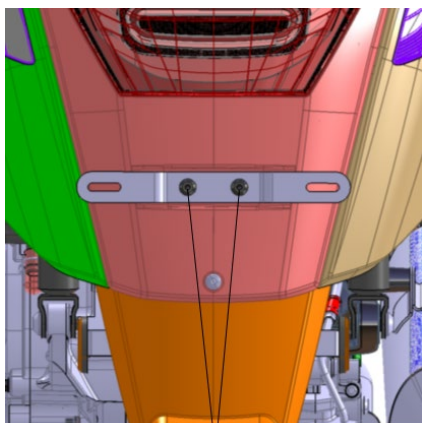
Mounting bolts

16. Disconnect the tail light connector.



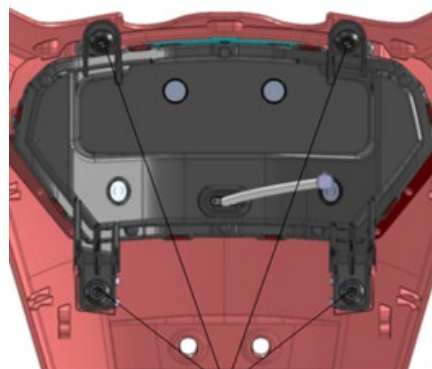
Connector

17. Use a tool to remove the tail light cover mounting bolts, remove the license plate mounting plate, and pull the group of tail light cover and tail light backward to remove.



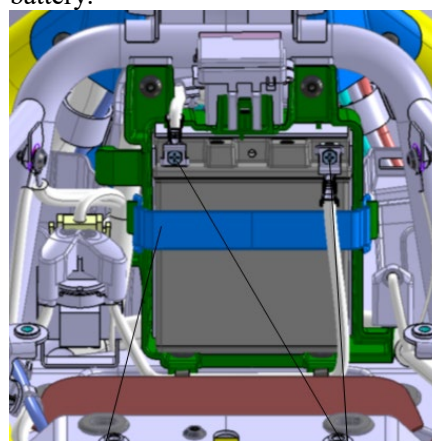
Mounting bolts

18. Use a tool to remove the tail light mounting bolts, and take off the tail light.



Mounting bolts

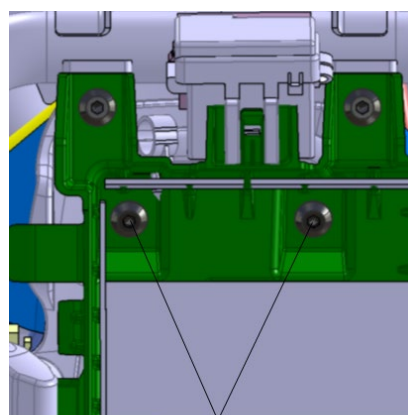
19. Remove the battery strap, use a tool to remove the mounting bolts, and take off the battery.



Battery fixing strap

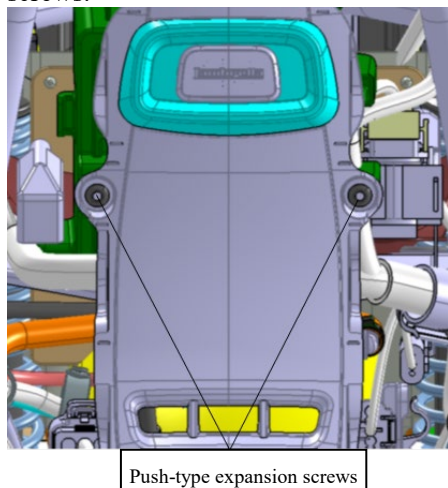
Mounting bolts

20. Use a tool to remove the luggage hook decorative cover mounting bolts.



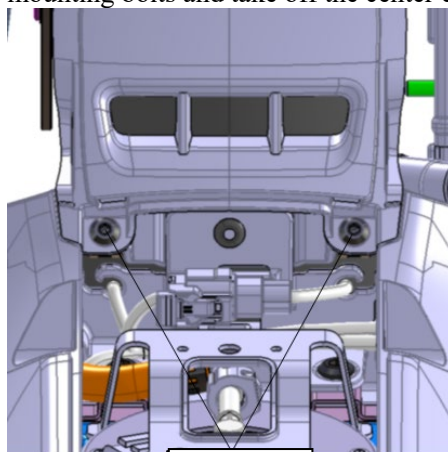
Mounting bolts

21. Use a tool to remove the push-type expansion screws.



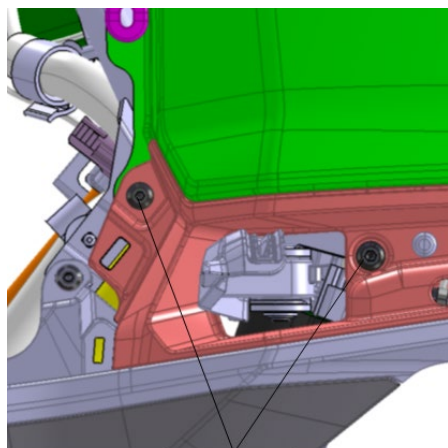
Push-type expansion screws

22. Use a tool to remove the center cover mounting bolts and take off the center cover.



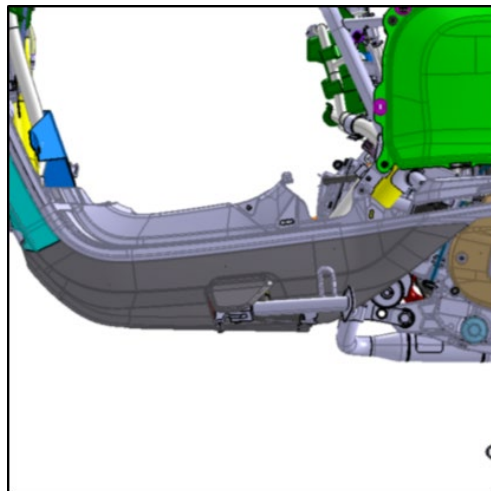
Mounting bolts

23. Use a tool to remove the foot peg trim panel mounting bolts (symmetrical on left and right sides), and pull forward with force to remove the foot peg trim panel.

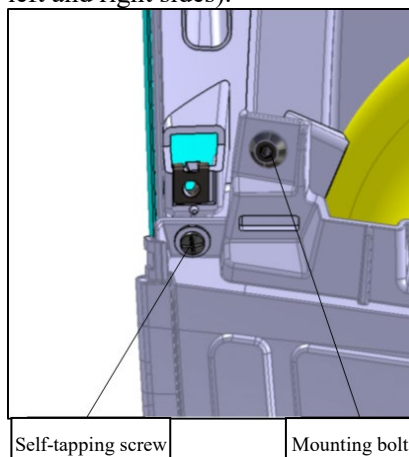


Mounting bolts

24. The side guards are installed via snap-fit. Pull outward with force to remove the side guards (symmetrical on left and right sides).



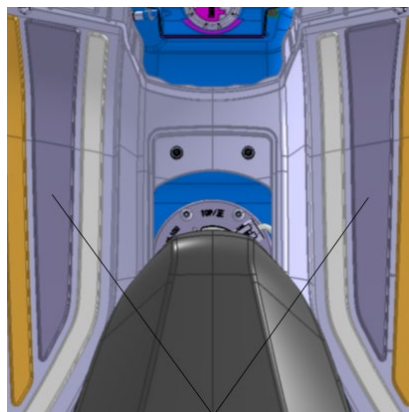
25. Use a tool to remove the foot peg mounting bolts and self-tapping screws (symmetrical on left and right sides).



Self-tapping screw

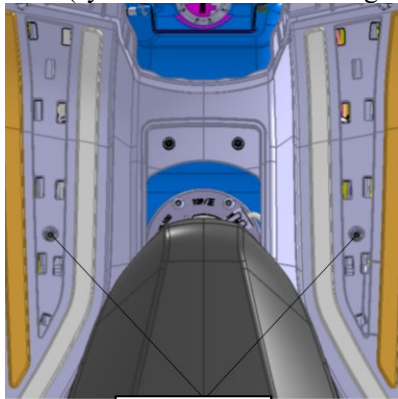
Mounting bolt

26. Pull upward with force to remove the left and right foot peg rubber II.

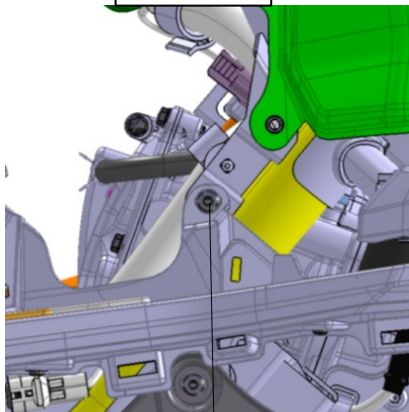


Foot peg rubber II

27. Use a tool to remove the foot peg mounting bolts (symmetrical on left and right sides).

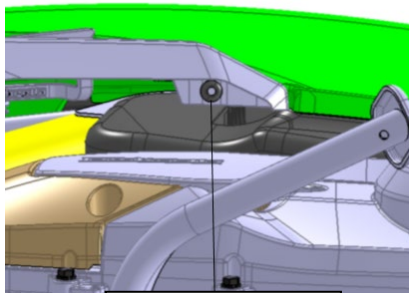


Mounting bolts

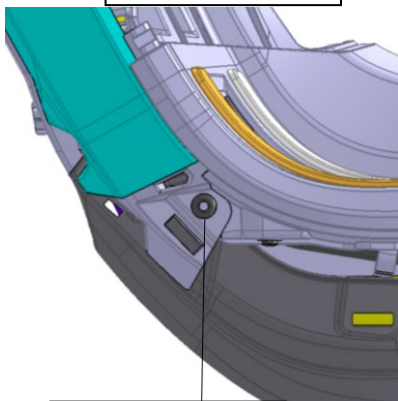


Mounting bolts

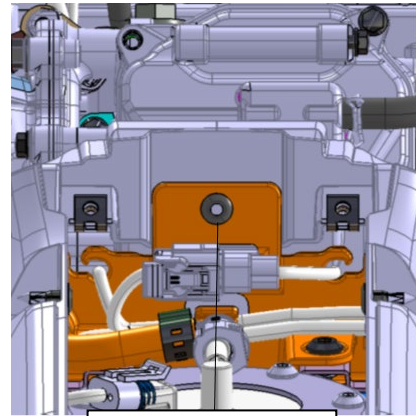
28. Use a tool to remove the 5 push-type expansion screws (symmetrical on left and right sides) and take off the foot peg.



Push-type expansion screw

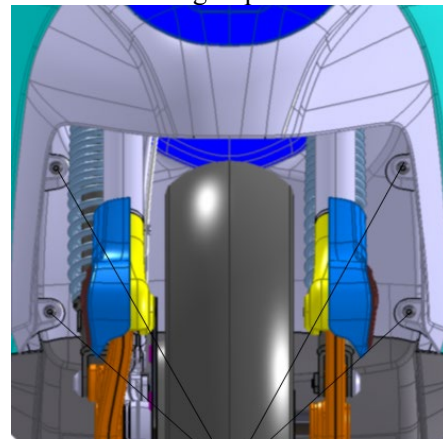


Push-type expansion screw

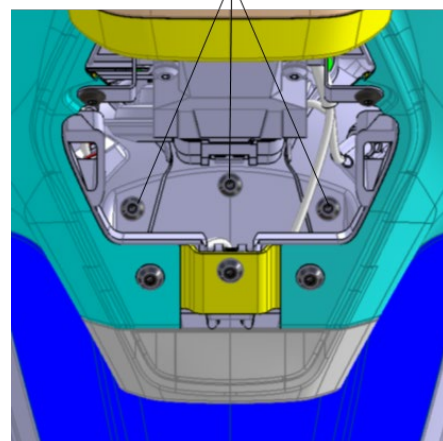


Push-type expansion screw

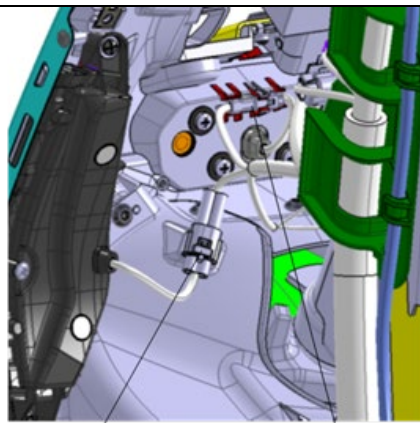
29. Use a tool to remove the screws (7 pieces in total) of the front fender group, and take off the front fender group.



Mounting bolts



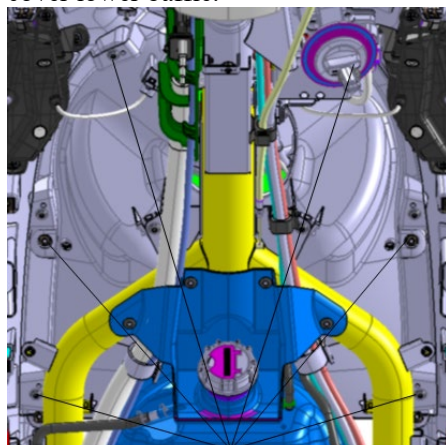
30. Disconnect the turn signal light connectors (same on left and right sides) and the daytime running light (DRL) connector.



Turn signal light connector

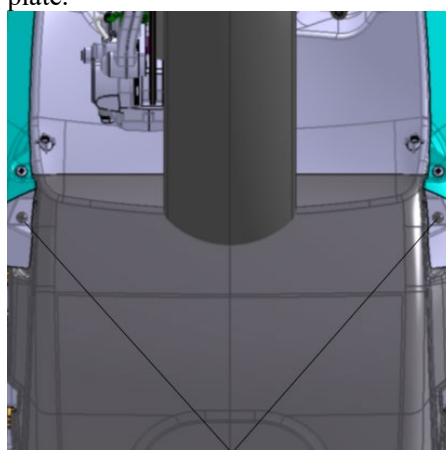
DRL connector

31. Use a tool to remove the mounting screws between the front cover group and the front cover lower baffle.



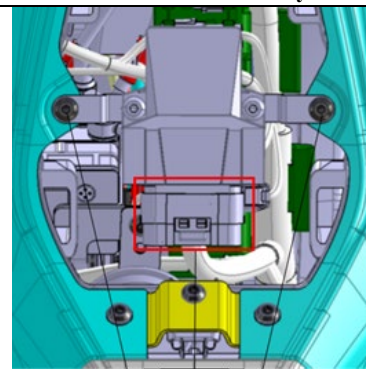
Mounting bolts

32. Use a tool to remove the self-tapping screws between the front cover group and the skid plate.



Self-tapping screws

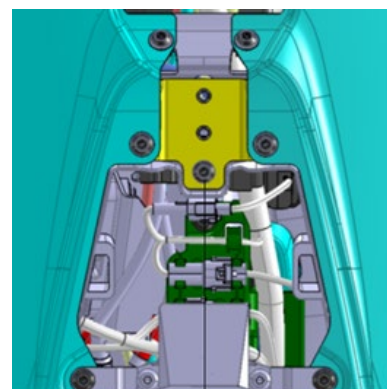
33. Remove the BCM connector, and use a tool to remove the BCM bracket mounting bolts.



Connector

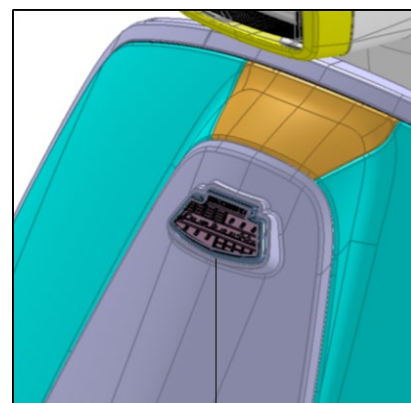
Mounting bolts

34. Use a tool to remove the mounting screws between the front cover group and the frame, and take off the front cover group.



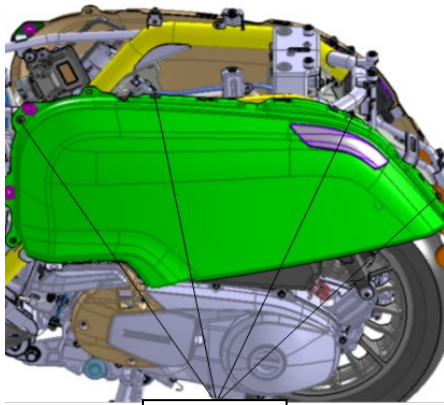
Mounting bolt

35. Disconnect the rear turn signal light connector.



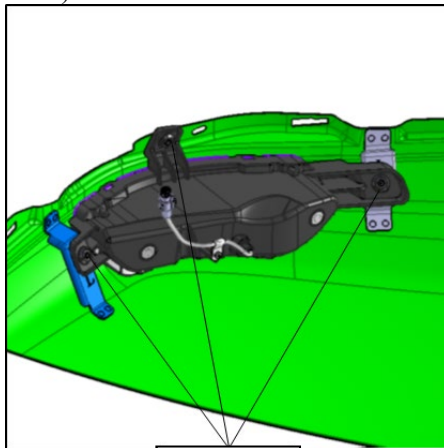
Rear turn signal light connector

36. Use a tool to remove the mounting bolts of the side cover welded group, and take off the side cover welded group (symmetrical on left and right sides).



Mounting bolts

37. Use a tool to remove the rear turn signal light mounting bolts, and take off the rear turn signal lights (symmetrical on left and right sides).



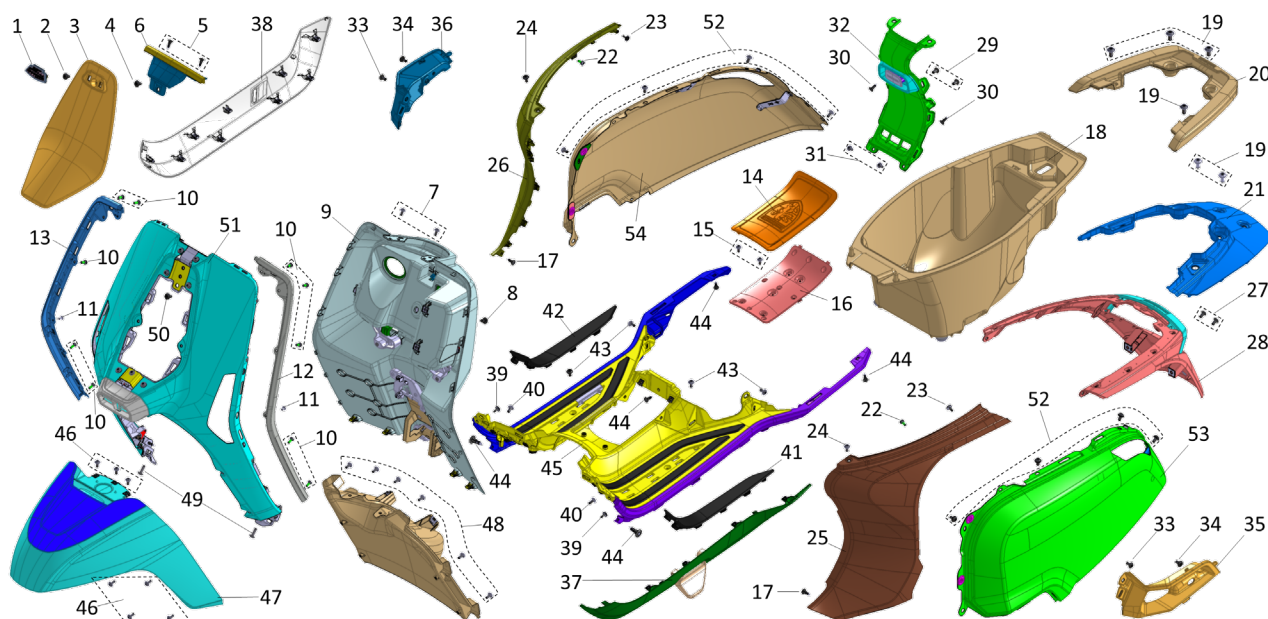
Mounting bolts

The assembly of covering parts, tail light and turn signal lights shall be the reverse of disassembly sequence.



Note:

Do not scratch the surface of covering parts and break the buckle during disassembly and assembly.

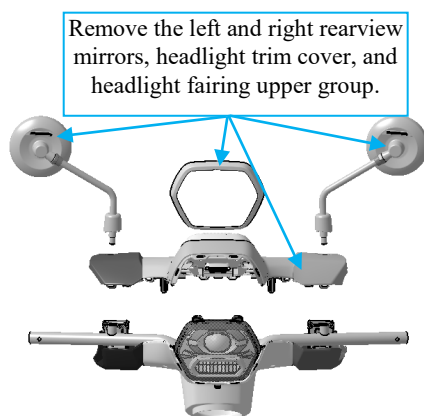


Sequence	Step	Quantity	Remarks
	Removal Sequence		The installation sequence is the reverse of removal sequence.
1	Scutcheon	1	
2	Convex bolt M6×10	1	
3	Front cover panel	2	
4	Convex bolt M6×10	1	
5	Push-type expansion screw	2	
6	Group of the front cover upper trim panel and the middle section of the side guards	1	
7	Bolt M5×12	2	
8	Convex bolt M6×10	1	
9	Group of front cover and document box	1	
10	Bolt M5×12	10	
11	Self-tapping screw ST4.2* 9.5	2	
12	Front section of the side guards (L)	1	
13	Front section of the side guards (R)	1	
14	Logo cover	1	
15	Bolt M5×12	2	
16	Logo cover liner	1	
17	Push-type expansion screw	2	
18	Storage box	1	
19	Bolt M8×16	6	
20	Rear grab bar	1	
21	Rear center cover	1	
22	Bolt M5×12	2	
23	Self-tapping screw group ST4.2*13	2	
24	Convex bolt M6×10	2	
25	Side cover inner panel L	1	
26	Side cover inner panel R	1	
27	Bolt M6×12	2	

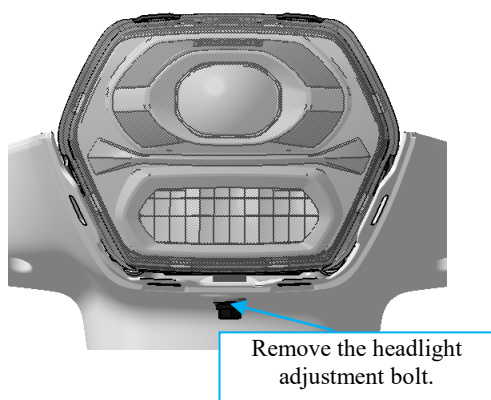
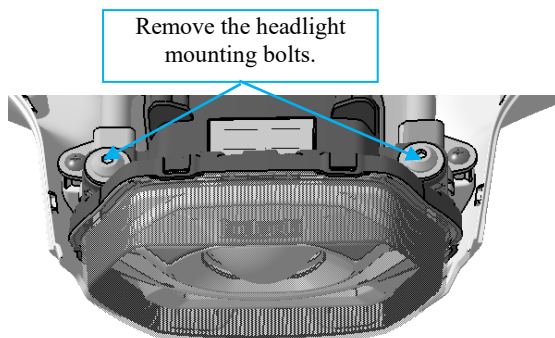
28	Tail light cover	1	
29	Bolt M6×12	2	
30	Push-type expansion screw	2	
31	Bolt M5×12	2	
32	Center cover	1	
33	Bolt M6×12	2	
34	Convex bolt M6×10	2	
35	Auxiliary foot peg trim panel (L)	1	
36	Auxiliary foot peg trim panel (R)	1	
37	Side guard L	1	
38	Side guard R	1	
39	Self-tapping screw group ST4.2*13	2	
40	Bolt M6×12	2	
41	Left foot peg rubber II	1	
42	Right foot peg rubber II	1	
43	Bolt M6×12	4	
44	Push-type expansion screw	5	
45	Foot pedal	1	
46	Bolt M5×12	7	
47	Front fender group	1	
48	Bolt M5×12	6	
49	Self-tapping screw ST4.2* 13	2	
50	Bolt M6×12	1	
51	Front cover group	1	
52	Bolt M6×12	8	
53	Side cover welded group L	1	
54	Side cover welded group R	1	

Removal Steps of Headlight, Instrument Cluster and Left / Right Handlebar Switches:

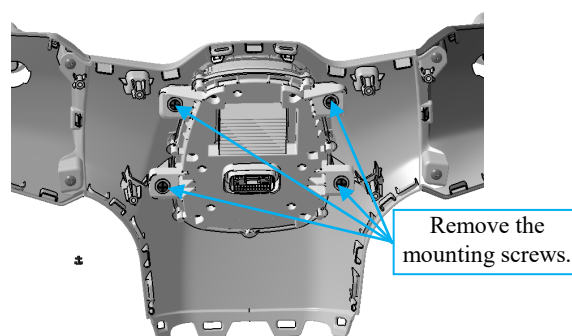
1. Support the motorcycle on level ground with the side stand, and remove the left / right rearview mirrors, headlight trim cover, and headlight fairing upper group in sequence. Disconnect the instrument cluster, and left / right handlebar switch connectors when removing the headlight fairing upper group.



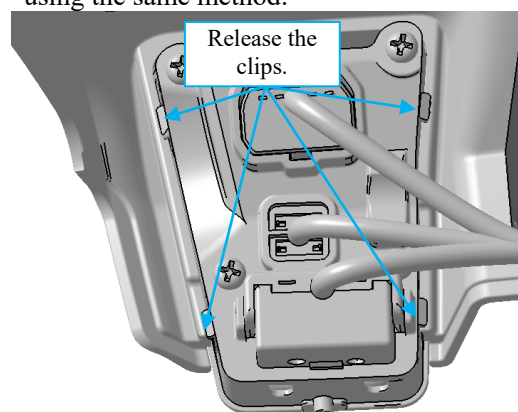
2. First remove the headlight adjustment bolt, and then remove the two headlight mounting bolts. Disconnect the headlight connector and remove the headlight component. Be careful not to scratch the trim surface.



3. Remove the four mounting screws of the instrument cluster, and take off the instrument cluster.



4. Release the four clips of the right handlebar switch, and take off the right handlebar switch. Remove the left handlebar switch using the same method.



Installation Steps of Covering Parts, Headlight, Instrument Cluster and Left / Right Handlebar Switches:

The installation sequence of covering parts, headlight, instrument cluster and left / right handlebar switches is in reverse of removal sequence. Be careful not to scratch the covering parts or to damage the headlight during installation.

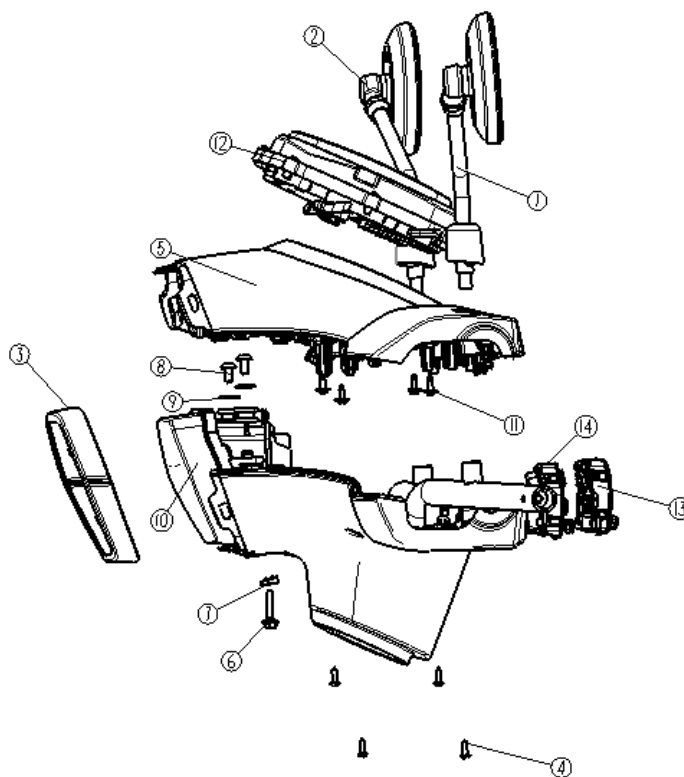


Note:

Do not scratch the surface of covering parts and break the buckle during disassembly

and assembly.

Removal / Installation of Headlight and Instrument Cluster

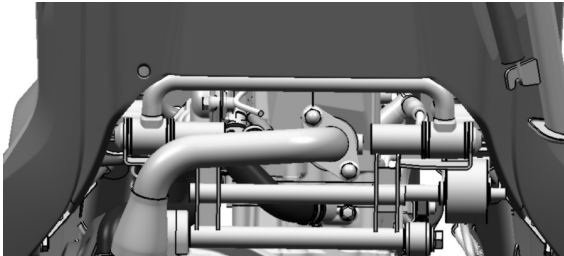


Sequence	Step	Quantity	Remarks
	Removal Sequence		The installation sequence is the reverse of removal sequence.
1	Left rearview mirror component	1	
2	Right rearview mirror component	1	
3	Headlight trim cover	1	
4	Large-disc self-tapping screw st4.2×13	4	
5	Headlight fairing upper group	1	
6	Bolt M5×16	1	
7	Limit boss	1	
8	Bolt M6×12	2	
9	Large washer, Grade A, φ 6	2	
10	Headlight part	1	
11	Large-disc self-tapping screw st4.2×13	4	
12	Instrument cluster component	1	
13	Left handlebar switch component	1	
14	Right handlebar switch component	1	

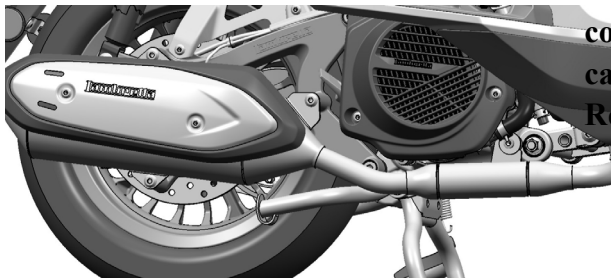
Removal / Installation of Exhaust System

Removal Steps of Exhaust Muffler:

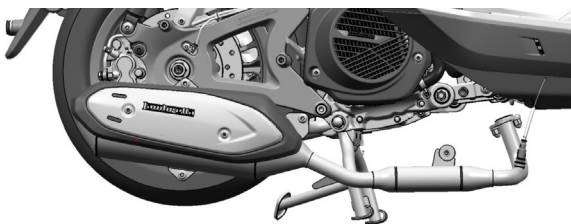
1. Support the motorcycle on level ground with the center stand and remove the cap nuts connecting the exhaust muffler to the engine.



2. Remove the bolts connecting the exhaust muffler to the frame.



3. Remove the exhaust muffler and take down the oxygen sensor.



Installation Steps of Exhaust Muffler:

The muffler gasket at the engine exhaust port shall be replaced with a new one. If the rubber pads are aged or cracked, they shall also be replaced.

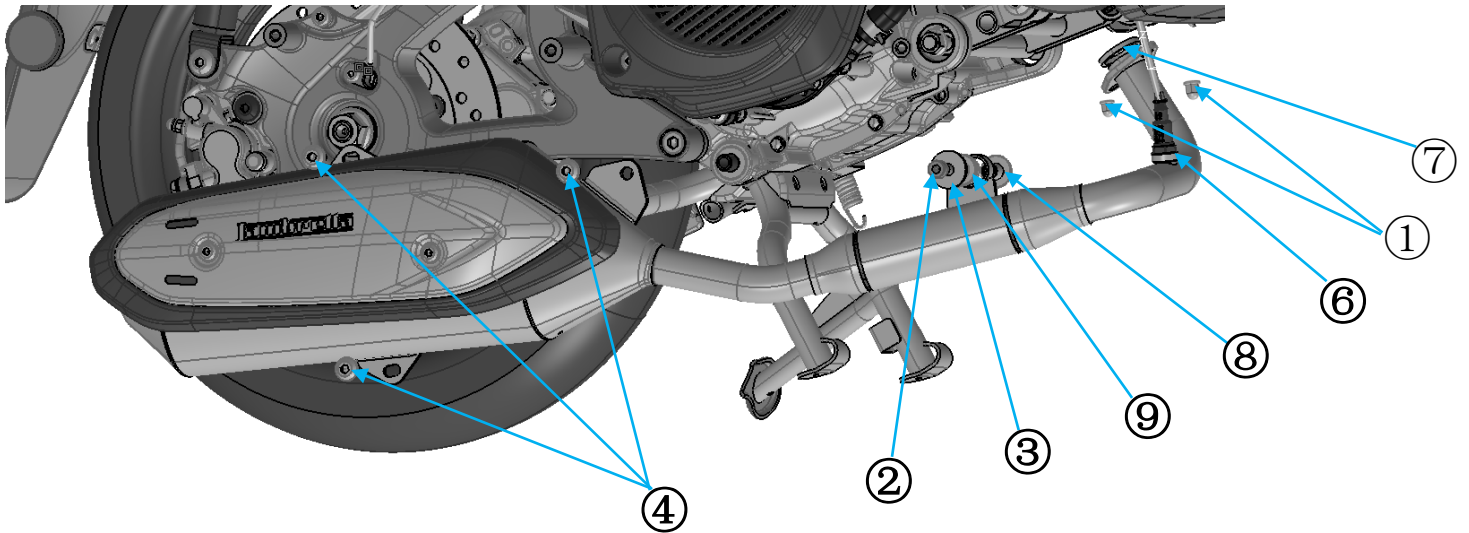
During installation, first install and tighten the oxygen sensor. After positioning the exhaust muffler, pre-install the cap nuts and bolts simultaneously. Tighten the cap nuts first, and then tighten the bolts connecting the exhaust muffler to the bracket; otherwise, it may easily cause air leakage at the engine exhaust port.



Note:

Make sure that the muffler is completely cooled before installation, otherwise it could cause burns.

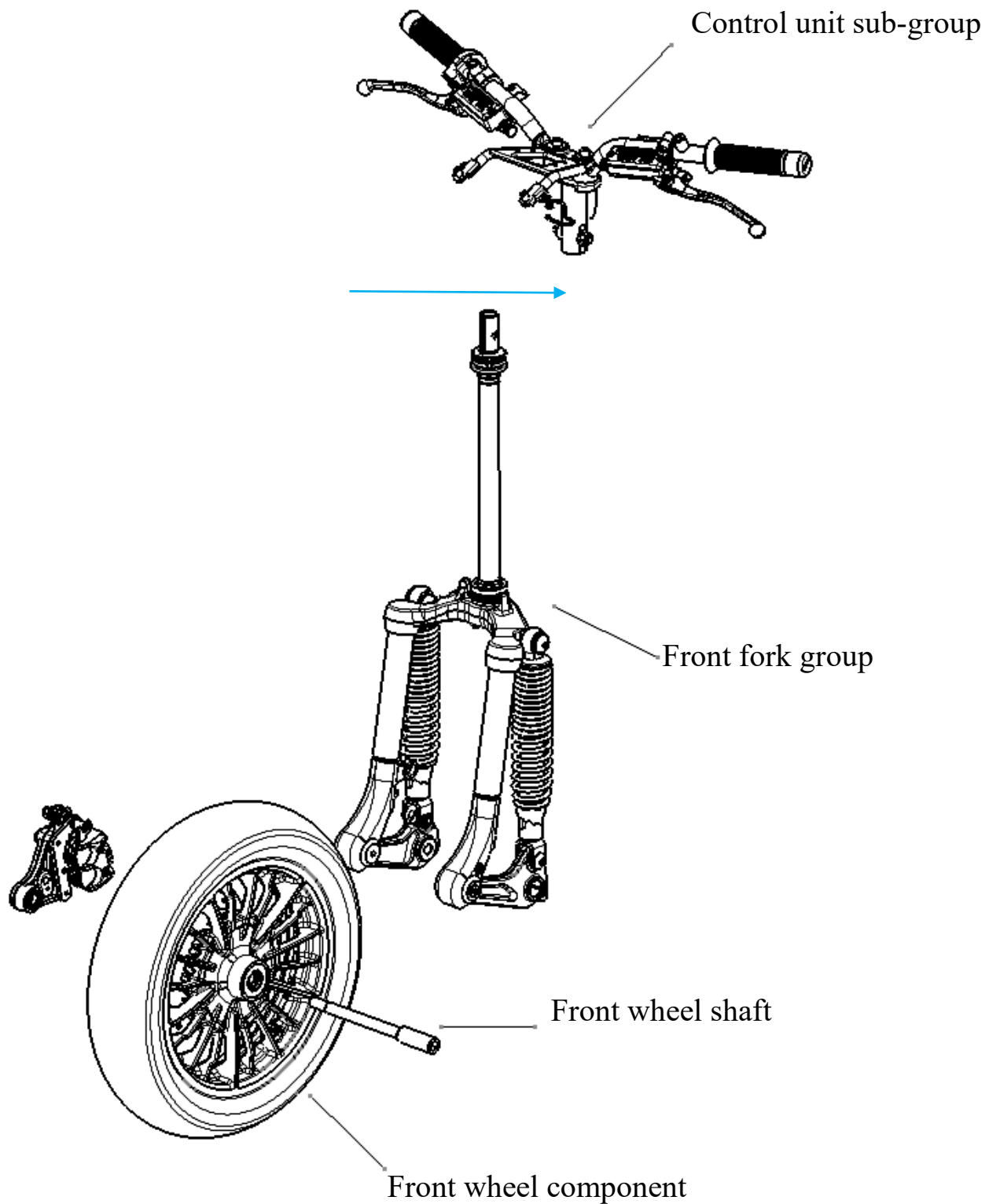
Removal / Installation of Exhaust Muffler



Sequence	Step	Quantity	Remarks
	Removal Sequence		Installation Sequence
1	Cap nut M8	2	9
2	Bolt M8×35	1	8
3	Extra-large washer, grade C, φ 8	1	7
4	Hexagon socket button head screw M8×16	3	6
5	Muffler welded group	1	5
6	Oxygen sensor group	1	4
7	Exhaust sealing gasket	1	3 Replace after removal depending on the circumstances
8	Liner group II	1	2
9	Rubber II	1	1 Replace after removal depending on the circumstances

12

Front Wheel, Front Suspension, Steering Stem and Front Brake



Front Wheel, Front Suspension, Steering Stem and Front Brake

Maintenance Notice	Front Suspension
Key Torques	Steering Stem
Troubleshooting	Front Brake
Control Unit sub-group	Front Brake Caliper
Front Wheel	

Maintenance Notice

- When servicing the front wheel, park the motorcycle on level ground and support it on the center stand. Place a service jack under the engine or chassis, then adjust the height until the front wheel is off the ground.
- Only tires marked “TUBELESS” can be used.
- Since inhaling friction piece dust will cause discomfort of respiratory, please do not use air duct or dry brush cleaning brake group, but go to a professional service shop for repair and maintenance.

Key Torques

Front wheel shaft	80-90N·m	Lower fastening bolt of front shock absorber	50-60N·m
Fastening bolt of handlebar	50-60N·m	Upper fastening bolt of front shock absorber	25-30N·m
Fastening screw of brake disc	28-32N·m		

Troubleshooting

Unstable Steering

1. The stem bearing is damaged;
2. The tire pressure is insufficient;
3. The tire is damaged;
4. The wheel bearing is damaged;
5. The steering stem adjusting nut is too tight or loose.

Motorcycle Running to One Side or Not in Straight Line

1. The left and right shock absorbers are not evenly adjusted;
2. The front fork is bended;
3. The front wheel shaft is bended and the wheel is installed incorrectly;
4. The wheel bearing is damaged;

Run-out of Front Wheel

1. The rim is bended and deformed;
2. The wheel bearing is abraded;
3. The front wheel shaft is loose;
4. The tire is damaged.

Wheel Rotation Difficulty

1. The wheel bearing and bearing sleeve are damaged.
2. The tire pressure is insufficient;
3. The friction plate of brake fails to return.

Over-soft of Front Suspension

1. The elastic force of front shock absorber spring is not enough;
2. The hydraulic oil level is too low or the liquid model is wrong.

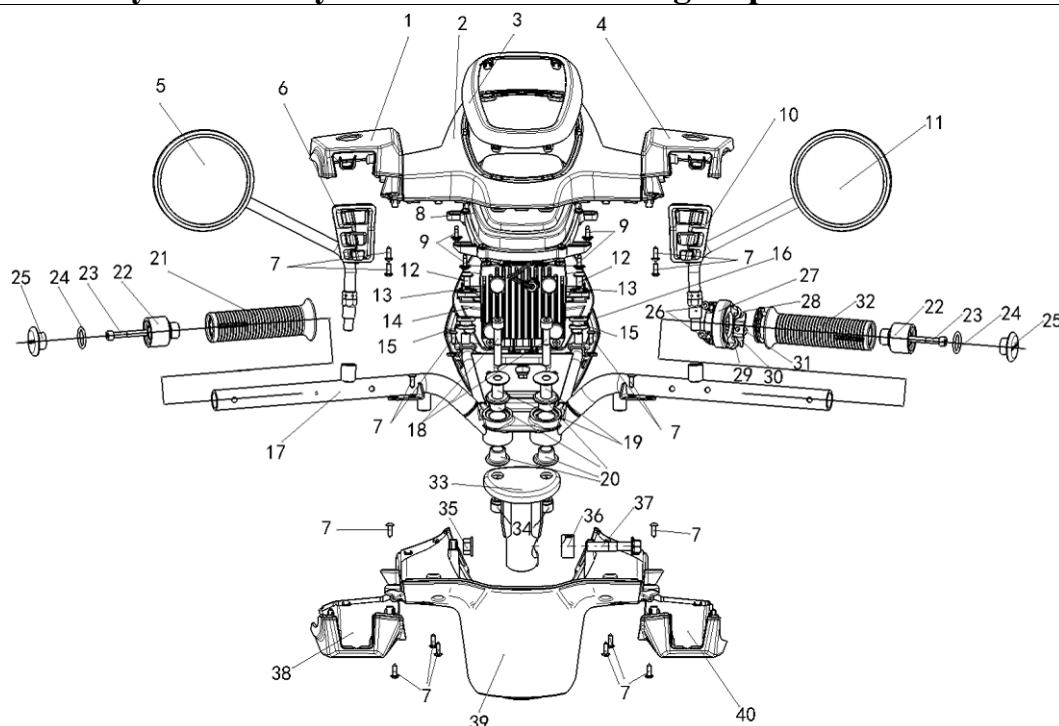
Over-hard of Front Suspension

1. The hydraulic oil level is too high or the liquid grade is wrong.
2. The front shock absorber shaft is bended.
3. The front shock absorber is blocked.

Bad Performance of Brake

1. There is air in the brake hose;
2. The brake shoe is abraded;
3. There is water or greasy dirt on the brake shoe.

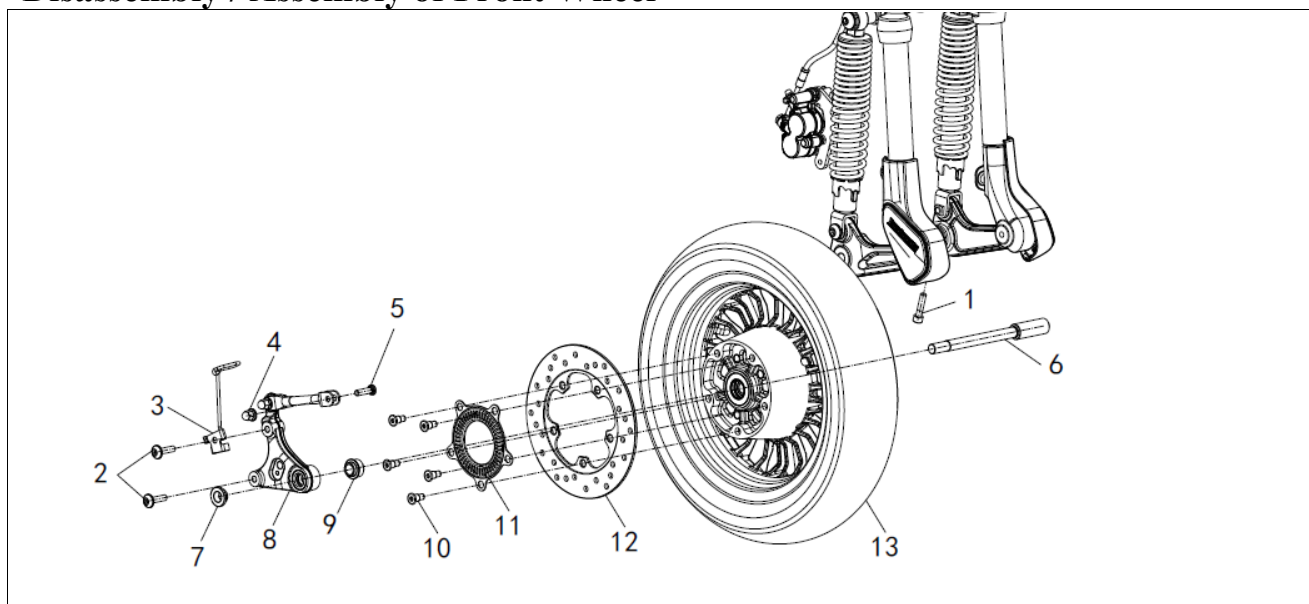
Disassembly / Assembly of Control Unit Sub-group



Maintenance Requirements

Sequence	Step	Quantity	Remarks
Disassembly Sequence		The assembly sequence is the reverse of disassembly sequence.	
1	Remove the left rearview mirror component (5)	1	
2	Remove the right rearview mirror component (11)	1	
3	Remove the self-tapping screw group ST4.2*13 (9)	4	
4	Remove the large-disc self-tapping screw st4.2×13 (7)	4	
5	Remove the hexagon socket flange bolt M6×12 (12)	2	
6	Remove the headlight trim cover (16)	1	
7	Remove the hexagon flange bolt M10×1.25×50 (37)	1	Note: The torque is 50-60N·m.
8	Remove the large-disc self-tapping screw st4.2×13 (7)	4	
9	Remove the trim cover of counter weight (25)	2	Note: The trim cover of the counter weight has a left-hand thread.
10	Remove the socket head cap screw M6×40 (23)	2	
11	Remove the counter weight (22)	2	
12	Remove the socket head cap screw M5×20 (26)	2	
13	Remove the cross-recessed pan head screw M5×10 (31)	1	

Disassembly / Assembly of Front Wheel



Note

Contaminated brake disc and friction disc will degrade the brake performance. So, the friction disc shall be replaced and the contaminated brake disc shall be cleaned.

After removing the brake caliper, do not pull the brake lever, otherwise it will be difficult to assemble the front wheel.

The motorcycle bearings shall be replaced in a complete set.

Maintenance Requirements

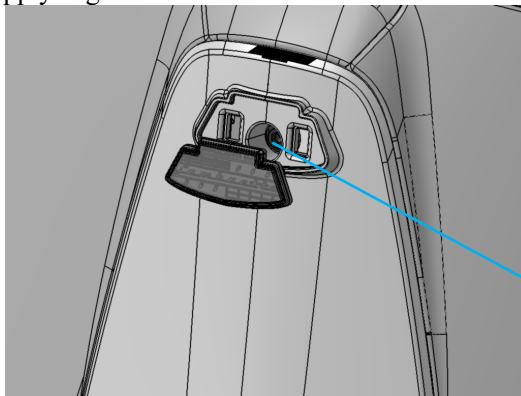
Sequence	Step	Quantity	Remarks
Disassembly Sequence		The assembly sequence is the reverse of disassembly sequence.	
1	Socket head cap screw M8×55	1	Tightening torque: 25-30N·m
2	Hexagon socket screw M8×32	2	Tightening torque: 28-32N·m
3	Front brake wire hook welded group	1	
4	Cap nut M8	1	Tightening torque: 18-25N·m Apply the thread locker
5	Stay mounting bolt	1	
6	Front wheel shaft	1	Apply lithium grease during assembly
7	Front wheel right spacer II	1	Apply lithium grease during assembly
8	Front brake caliper bracket group / stay welded group	1	
9	Front wheel spacer	1	Apply lithium grease during assembly
10	Brake disc bolt	5	Tightening torque: 28-32N·m Apply the thread locker
11	Speed signal panel	1	
12	Brake disc	1	
13	Front wheel group	1	

Disassembly / Assembly of Front Suspension

Note: To disassemble the front suspension system, remove certain covering parts in advance as per the following procedures:

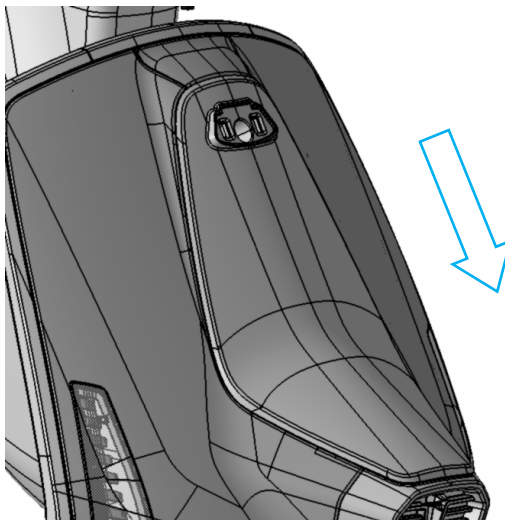
Disassembly of Front Fender Component:

1. Use a pry tool or a flat-head screw driver to gently pry up the decorative emblem. Take care not to damage the exterior covering parts. Apply slight force to remove the emblem.

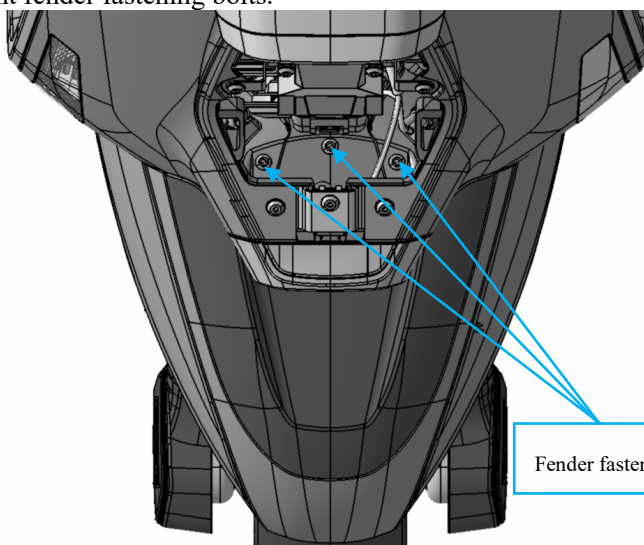


Emblem fastening bolt

2. Unscrew the emblem fastening bolt.
3. Slide the front cover plate downward and remove it.

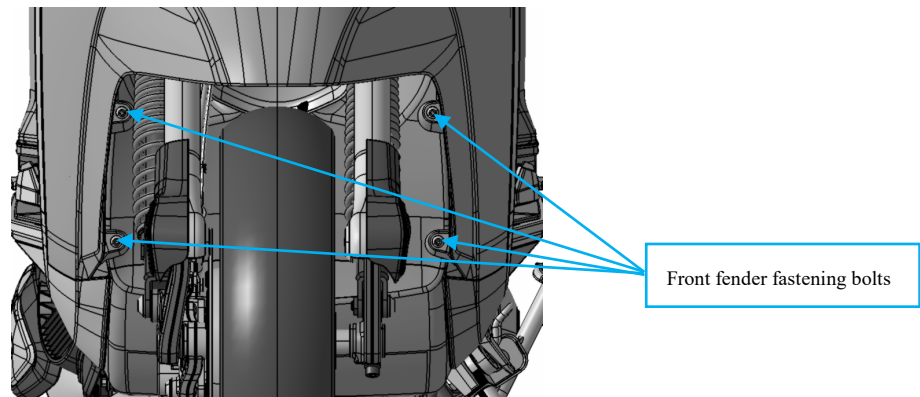


4. After the front cover plate is removed, three front fender fastening bolts are visible from a top-down view. Disassemble these front fender fastening bolts.



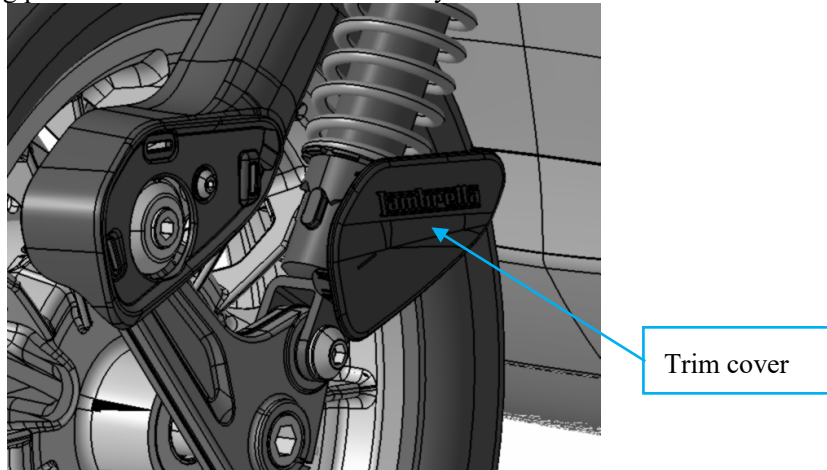
Fender fastening bolts

5. There are four additional fastening bolts located underneath the front fender. Remove these fastening bolts to detach the front fender.

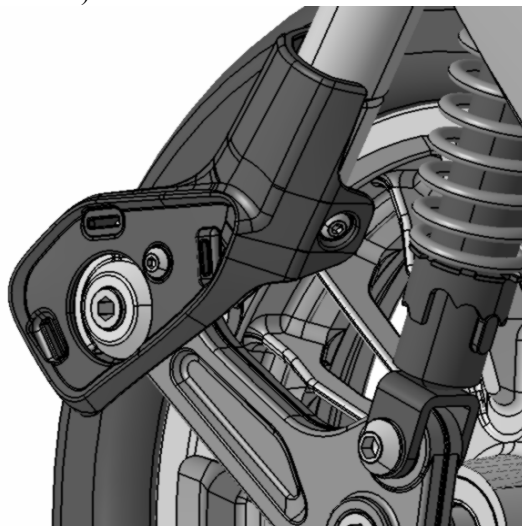


Disassembly of Front Turn Signal Light Trim Cover:

1. Use a pry tool or a flat-head screwdriver to gently pry up the front turn signal trim cover. Take care not to damage the exterior covering parts. Remove the trim cover laterally.

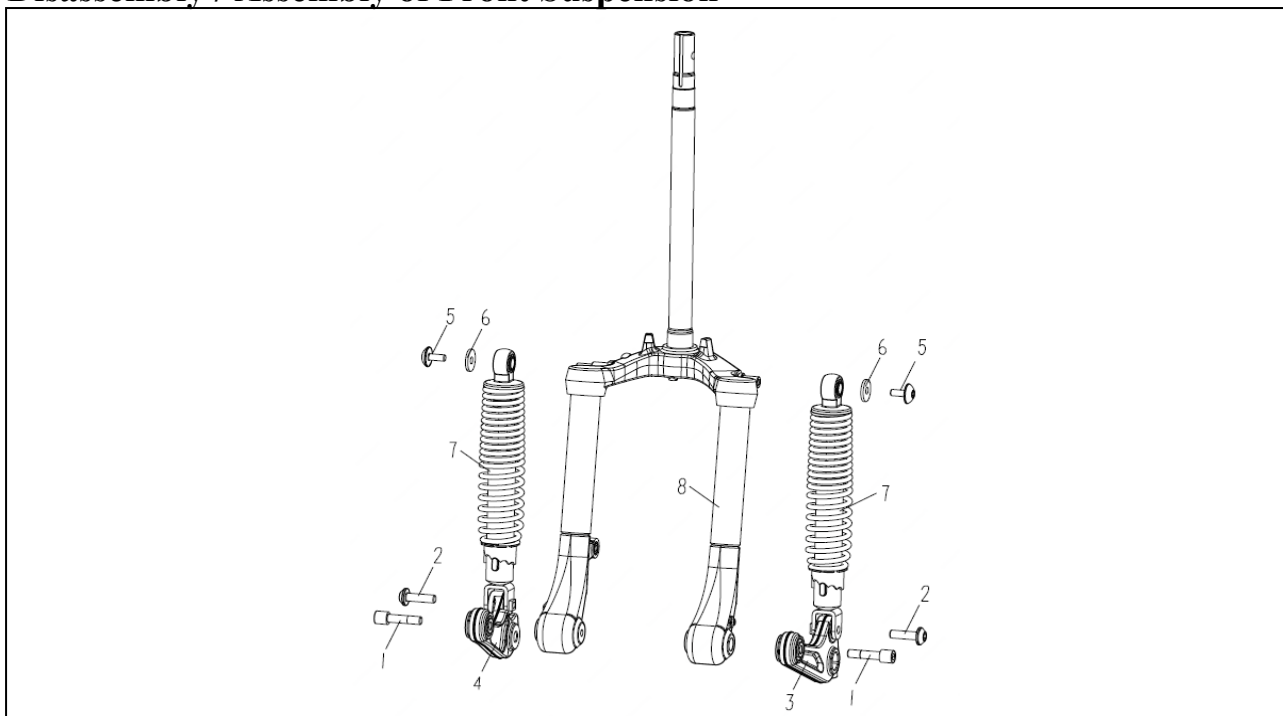


2. Remove the two fastening bolts for the trim cover to detach the front turn signal trim cover (the procedure is the same for both left and right sides).



Note: The assembly sequence is the reverse of disassembly sequence. During the process, take care not to scratch the covering parts, and avoid damaging the structural integrity of the plastic clips!

Disassembly / Assembly of Front Suspension



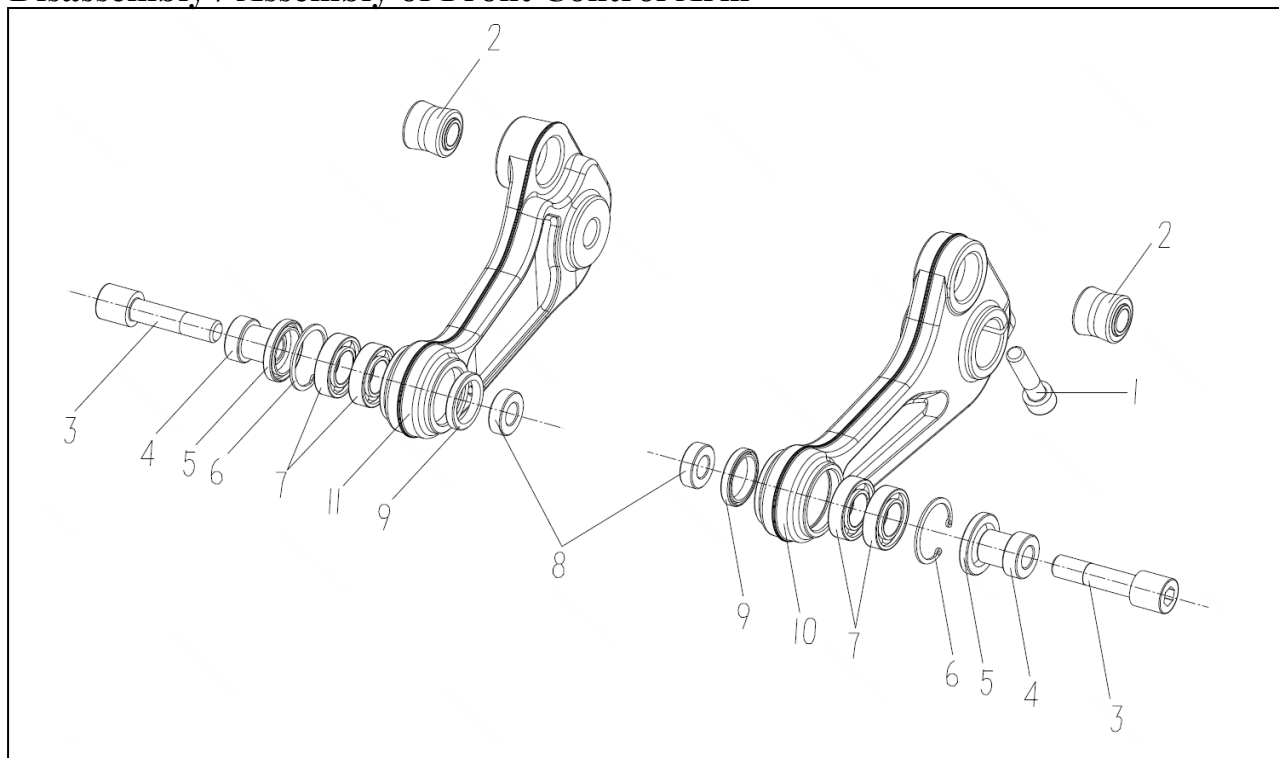
Note

The master cylinder of front brake shall be lifted up with steel wire rope to the height at least the same as the height of the original installation position. Do not twist the brake hose.

After removing the brake caliper, do not pull the brake lever, otherwise it will be difficult to assemble the front wheel.

Maintenance Requirements

Sequence	Step	Quantity	Remarks
Disassembly Sequence			The assembly sequence is the reverse of disassembly sequence.
1	Bolt M10×1.25×41	2	Required tightening torque: 50-60N·m
2	Screw M10×1.25×45	2	Required tightening torque: 50-60N·m
3	Front control arm group (L)	1	
4	Front control arm group (R)	1	
5	Screw M8×20	2	Required tightening torque: 25-30N·m
6	Washer 8	2	GB/T5287-8
7	Front shock absorber component	2	
8	Steering stem welded group	1	

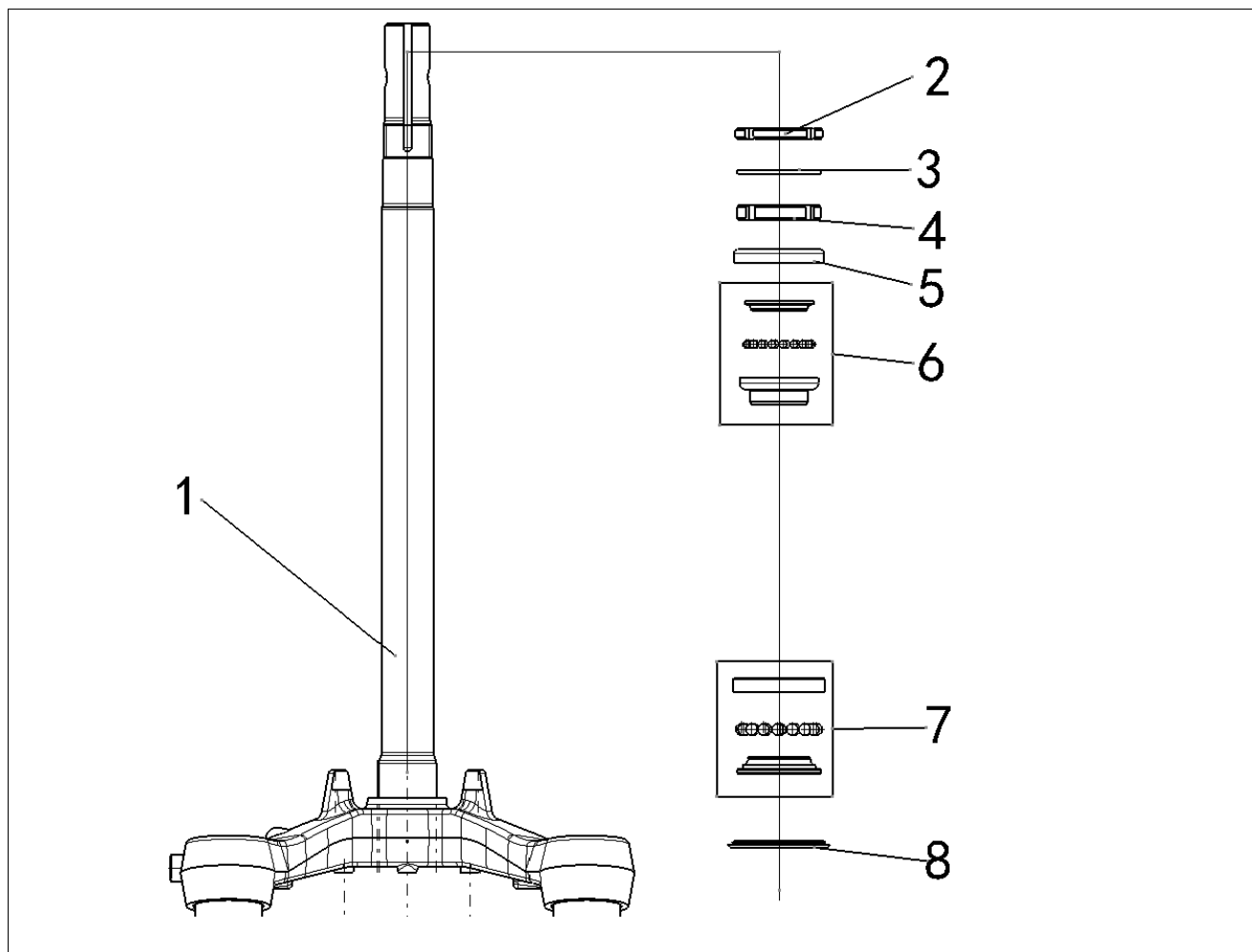
Disassembly / Assembly of Front Control Arm**Note**

A special tool must be used for the disassembly of front control arm bearings; bearings and oil seals must be replaced with new parts once they are removed, and during assembly, apply an appropriate amount of lubricating grease and rotate the bearings to ensure smooth rotation!

Maintenance Requirements

Sequence	Step	Quantity	Remarks
Disassembly Sequence			The assembly sequence is the reverse of disassembly sequence.
1	Bolt M8×35	1	Required tightening torque: 25-30N·m
2	Rubber bushing group	2	
3	Bolt M10×1.25×41	2	Required tightening torque: 50-60N·m
4	Front control arm left bushing	2	
5	Oil seal 20×28×4	2	GB/T9877
6	Retainer 28	2	GB/T893.1
7	Roller bearing 61902-2RS	4	GB/T276
8	Front control arm right bushing	2	
9	Oil seal 20×26×4	2	GB/T9877
10	Front control arm (L)	1	
11	Front control arm (R)	1	

Disassembly / Assembly of Steering Stem

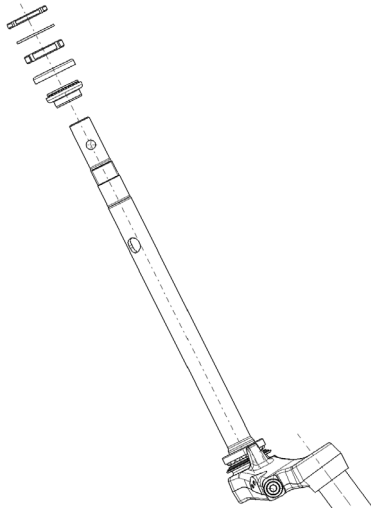


Maintenance Requirements

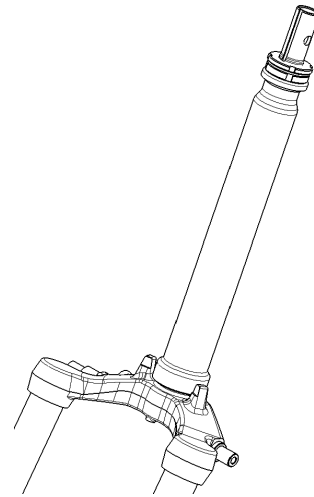
Sequence	Step	Quantity	Remarks
Disassembly Sequence		The assembly sequence is the reverse of disassembly sequence.	
1	Steering stem welded group	1	
2	Adjusting nut B	1	Assembling torque: 50-60N·m
3	Gasket	1	
4	Steering stem adjusting nut	1	When assembling the bearing adjusting nut, first tighten it to a torque of 33-43N·m, loosen it by 1/2 turn, and then re-tighten it to a torque value of 11-13N·m.
5	Steering stem dust-proof ring B	1	
6	Upper bearing group	1	
7	Lower bearing group	1	
8	Steering stem dust-proof ring A	1	

Assembly of Steering Stem

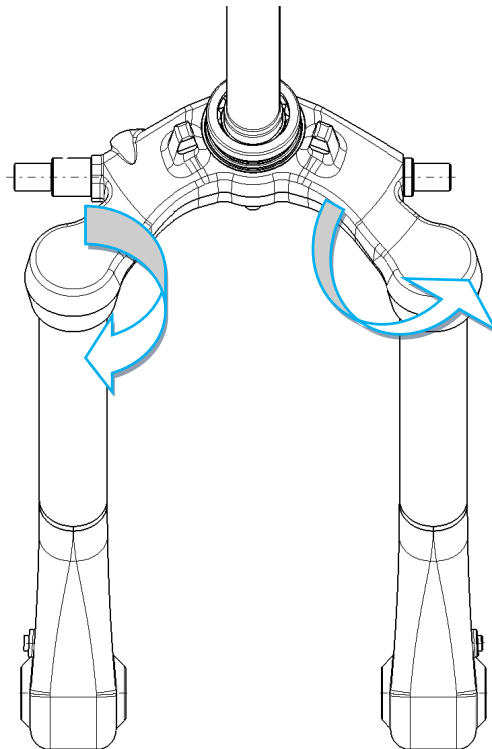
1. Apply sufficient lithium grease to the surface of bearing roller. Put the steering stem into the frame head pipe. Install the bearings in sequence; tighten the steering stem adjusting nut to a torque of $33\text{--}43\text{N}\cdot\text{m}$, loosen it by $1/2$ turn, and then re-tighten it to a torque value of $11\text{--}13\text{N}\cdot\text{m}$. (Figures 1, 2)
2. Install the washer followed by adjusting nut B with a torque value of $50\text{--}60\text{N}\cdot\text{m}$. (Figures 1, 2)
3. Rotate the steering stem left and right to check for any sticking. (Figure 3)



(Figure 1)



(Figure 2)



(Figure 3)

Front Brake

Maintenance Notice

- Contaminated brake disc and friction disc will degrade the brake performance. So, the friction disc shall be replaced and the contaminated brake disc shall be cleaned.
- Since inhaling friction piece dust will cause discomfort of respiratory, please do not use air duct or dry brush cleaning brake group, but go to a professional service shop for repair and maintenance.
- Spilled brake fluid will seriously damage the surface of instrument glass and oil and gas components, and is harmful to some rubbers. So, be careful when removing the master cylinder and first make sure that the master cylinder is placed horizontally.
- Do not let contaminants (dust, dirt, water, etc.) enter the master cylinder.
- Once the hydraulic system is opened, or the brake is loose, the air must be removed from the brake system.
- DOT4 brake fluid shall be used for system maintenance. Do not mix it with brake fluid of another model.
- Before riding the motorcycle, check the braking status.

Troubleshooting

Loose Brake

1. There is air in the brake hose;
2. The brake hose has leakage;
3. The brake liquid level is too low;
4. The brake friction disc is smudgy;
5. The piston seal of brake minor cylinder is abraded or aged;
6. The piston seal of brake master cylinder is abraded or aged;
7. The piston of brake minor cylinder is stuck or aged;
8. The piston of brake master cylinder is stuck or aged;
9. The brake shoe is abraded;
10. The brake shoe slips difficultly;
11. The brake hose is blocked;
12. The brake disc is warped or deformed;
13. The brake hose is contaminated.

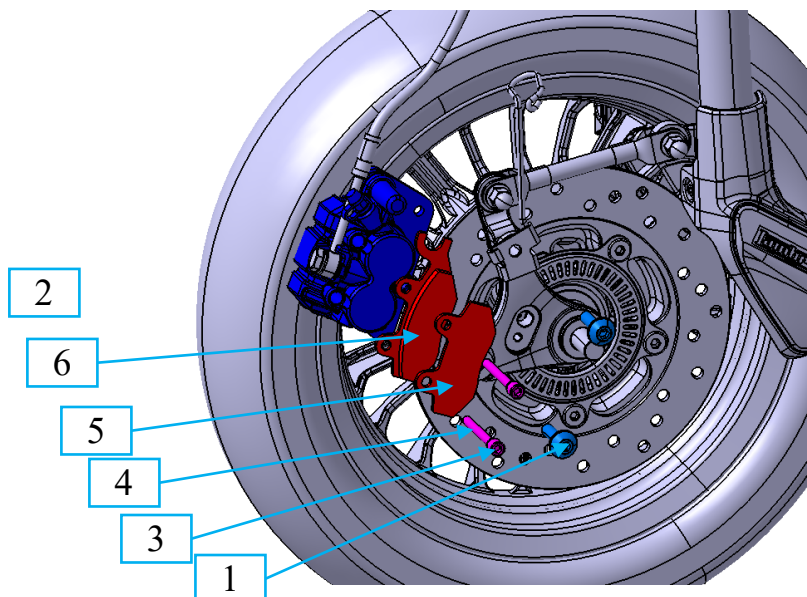
Inflexible Brake Lever

1. The brake system is blocked;
2. The brake caliper piston is stuck or abraded.
3. The brake shoe slips difficultly;
4. The brake hose is blocked;
5. The master pump piston of brake is stuck or abraded.
6. The brake lever is bended.

Brake Running Sideways

1. The brake disc / friction disc is smudgy;
2. The wheel has not been adjusted correctly;
3. The brake disc is warped or deformed;
4. The brake shoe slips difficultly;

Disassembly / Assembly of Front Brake Caliper Component



Note

Contaminated brake disc and friction disc will degrade the brake performance. So, the friction disc shall be replaced and the contaminated brake disc shall be cleaned.

The master cylinder of front brake shall be lifted up with steel wire rope to the height at least the same as the height of the original installation position. Do not twist the brake hose.

After removing the brake caliper, do not pull the brake lever, otherwise it will be difficult to assemble the front wheel.

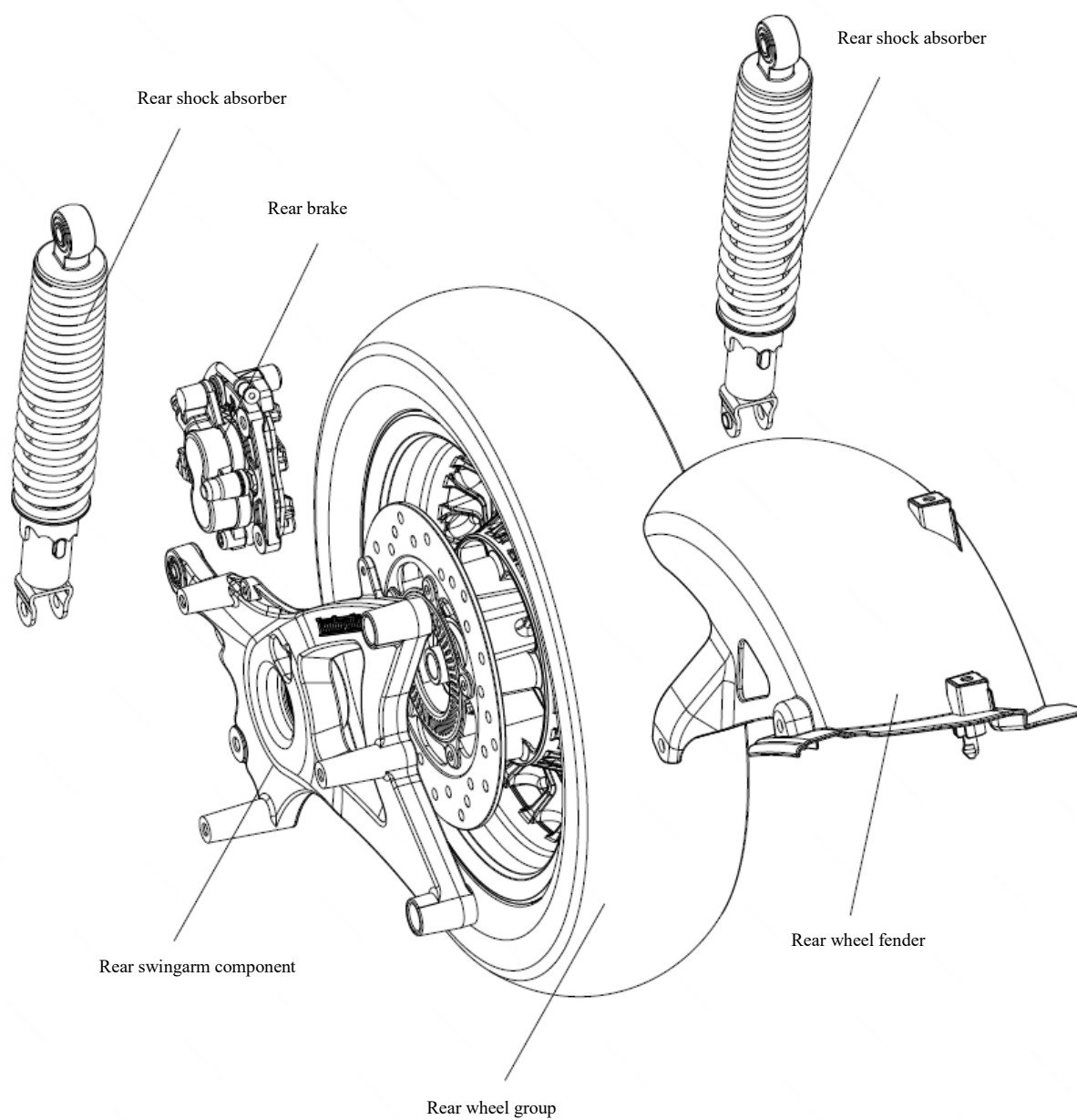
Since inhaling friction piece dust will cause discomfort of respiratory, please do not use air duct or dry brush cleaning brake group, but go to a professional service shop for repair and maintenance.

After replacing the friction plate, repeatedly operate the brake lever to reset the caliper and cylinder piston against the friction plate.

Maintenance Requirements

Sequence	Step	Quantity	Remarks
Disassembly Sequence		The assembly sequence is the reverse of disassembly sequence.	
1	Brake caliper bolt	2	Tightening torque: 28-32N·m
2	Front brake caliper component	1	The master cylinder of front brake shall be lifted up with steel wire rope. Do not twist the brake hose.
3	Screw plug	2	
4	Slide shaft of brake pad	2	
5	Inner brake pad	1	
6	Outer brake pad	1	

13

Rear Wheel, Rear Suspension and Rear Brake

Rear Wheel, Rear Suspension and Rear Brake

Maintenance Notice	Rear Swingarm
Troubleshooting	Rear Shock Absorber
Rear Wheel	Rear Swingarm Group

Maintenance Notice

This part introduces the removal, installation and maintenance of rear wheel, rear brake, rear swingarm, and rear shock absorber. When the rear wheel and rear shock absorber are repaired, the motorcycle shall be reliably held up by a jack or other support under the engine.

Key Torques

Rear wheel fastening bolt: 90-100N·m

Rear swingarm bolt: 55-60N·m

Rear shock absorber upper bolt: 35-45N·m

Rear shock absorber lower bolt: 24-26N·m

Brake disc fastening screw: 28-32N·m

Troubleshooting

Swing of Rear Wheel

1. The wheel is bended;
2. The tire pressure is too low;
3. The wheel bearing sleeve is damaged.

Abnormality of Suspension

1. Shock absorber leaks oil.
2. Fastening bolts are loose.
3. The shock absorber is bended.

Bad Performance of Brake

1. There is air in the brake hose;
2. The brake shoe is abraded;
3. There is water or greasy dirt on the brake shoe.

Rear Wheel Rotation Difficulty

1. The wheel bearing sleeve is damaged;
2. The wheel is installed incorrectly;
3. The friction plate of rear brake fails to return.

Abnormal Noise

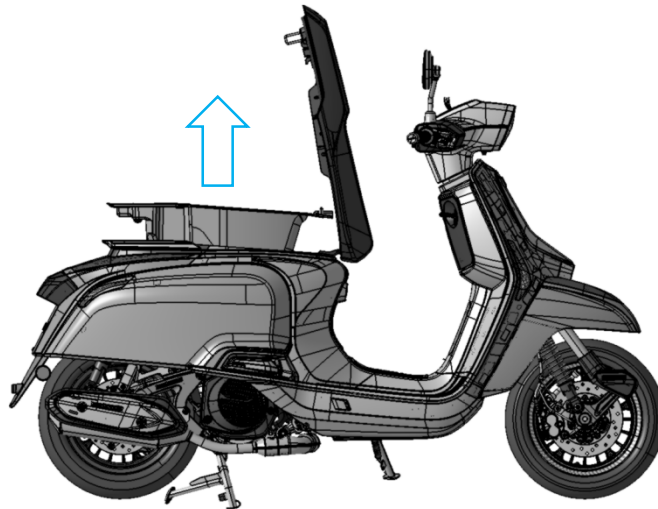
1. The fastener is loose.
2. The shock absorber and oil seal group is damaged.

Rear Swingarm

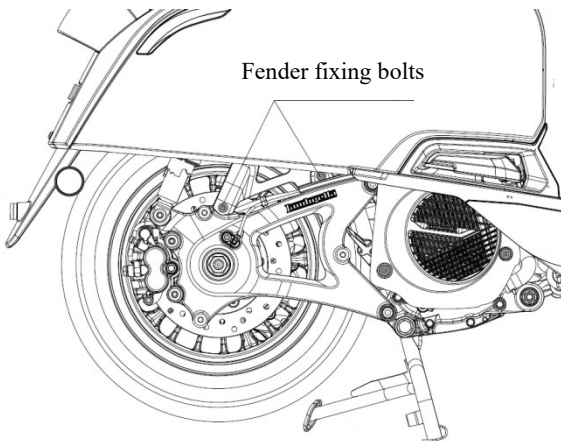
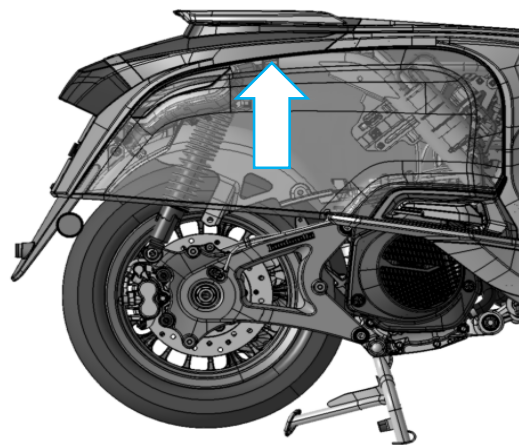
Note: When disassembling the rear swingarm and rear wheel, support the motorcycle with the center stand. If it is not necessary to remove the rear shock absorber, only remove the rear shock absorber connected to the rear swingarm to ensure the rear wheel remains off the ground. Before disassembling the rear swingarm, remove the muffler and rear fender in advance. For muffler disassembly, refer to “Disassembly/Assembly of Exhaust Muffler”. The steps for removing the rear fender are as follows:

Removal of Rear Fender

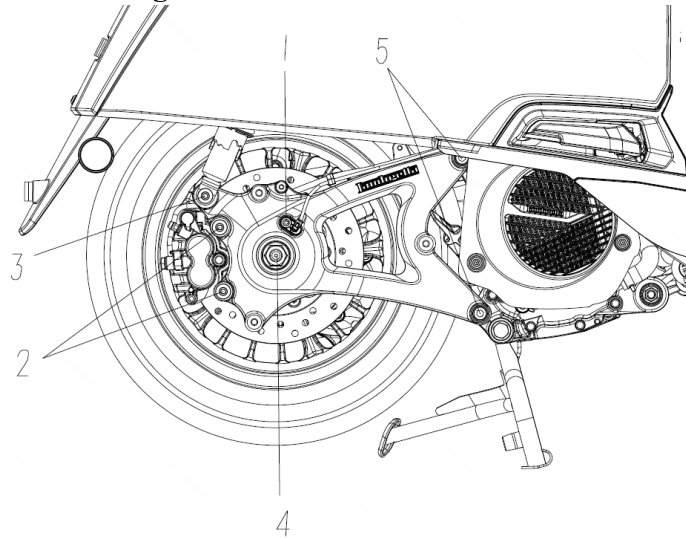
1. Open the seat, and upward lift the luggage box which is designed for quick-release without bolt fixation;



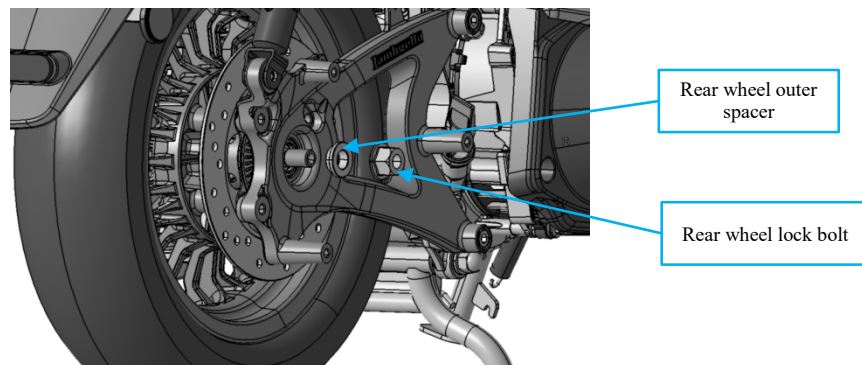
2. To remove the air cleaner, refer to the “Removal of Air Intake System”;
3. After removing the fender fixing bolts, lift the rear fender group upward for removal.



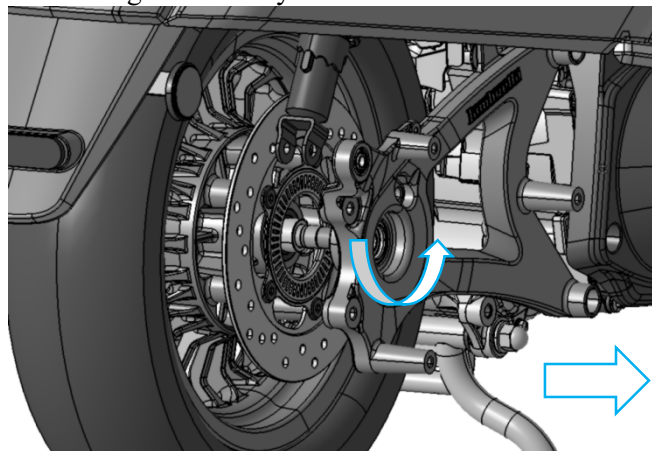
Removal Steps of Rear Swingarm and Rear Wheel



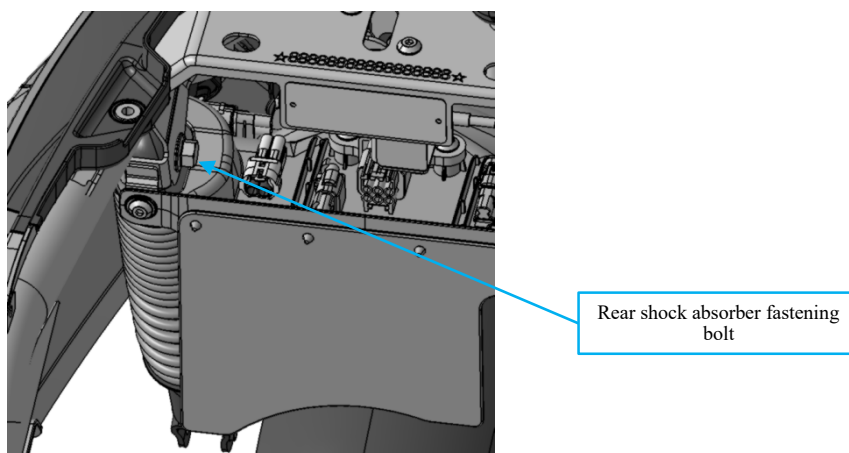
1. Remove the ABS sensor fastening bolt “1” and take off the ABS sensor.
2. Remove the rear brake caliper fastening bolt “2” and take off the rear brake. Take care to suspend the rear brake caliper with a wire to avoid any stress on the oil hose.
3. Remove the rear shock absorber lower fastening bolt “3”. If only the rear swingarm component needs to be removed, only disassemble the lower bolt on the rear swingarm side.
4. Remove the rear axle fastening bolt “4” and then take out the rear wheel outer spacer.



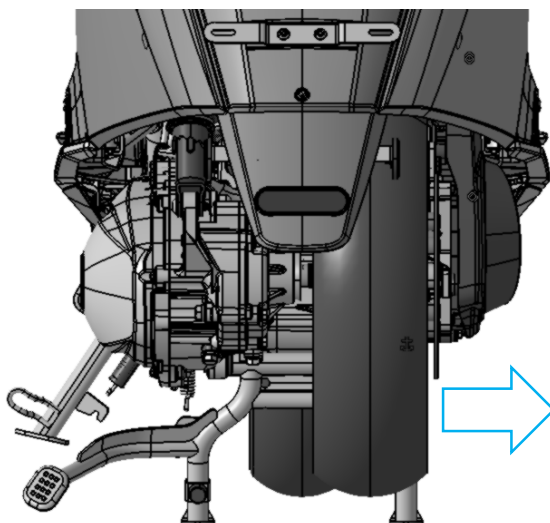
5. Remove the rear swingarm fastening bolt “5” and take out the bolt washer.
6. Adjust the angle of the rear shock absorber, rotate the rear swingarm upward appropriately to clear the dipstick, and remove the rear swingarm laterally.



7. To remove the rear shock absorber on the swingarm side, remove the storage box first. Use a ratchet wrench or socket wrench to unscrew the rear shock absorber fastening bolt, then remove the rear shock absorber.



8. Remove the rear wheel laterally.



Installation Steps of Rear Swingarm and Rear Wheel

Install it in the reverse sequence of removal.

The fastening torque of the rear wheel bolt is 90-100N·m.



Note:

Before removing the brake caliper, make sure that the rear brake caliper is lower than the rear brake cylinder to avoid air entering the cylinder and degrading the braking performance. After removing the rear brake caliper, do not operate the rear brake lever unless replacement is required.

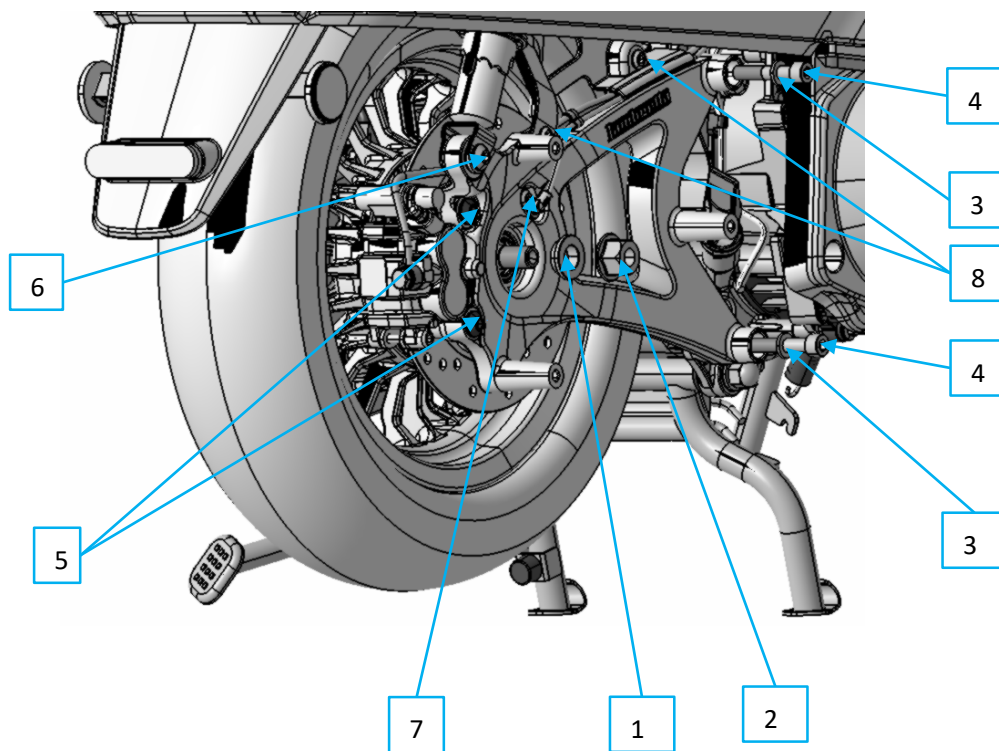


Warning:

The rear swingarm bolt must be tightened to the specified torque of 55-60 N·m.

Installation of Rear Swingarm

To install the rear swingarm, first tighten the rear wheel fastening nut (M16×1.5) to a torque of 90-100N·m. Then, tighten the rear swingarm fastening bolt (M10×1.25×53) to a torque of 55-60N·m.



The component installation sequence is shown as follows:

1. Install the rear wheel group;
2. Install the rear swingarm;
3. Install the rear brake caliper;
4. Install the rear shock absorber (refer to the following section for details);
5. Install the rear wheel speed sensor;
6. Install the rear fender.

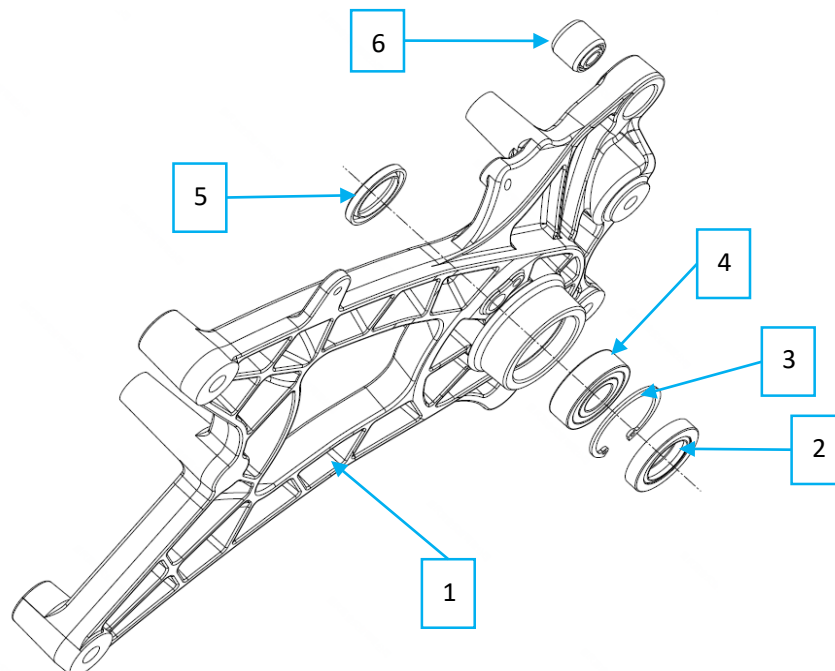
The installation sequence for component mounting accessories (bolts, washers, etc.) is as follows:

Sequence	Step	Quantity	Remarks
	Bolt mounting sequence		
1	Rear wheel outer spacer	1	Apply lubricating grease appropriately
2	Nut M16×1.5	1	Tightening torque: 90-100N·m
3	Washer 10	2	GB/T97.3
4	Bolt M10×1.25×53	2	Tightening torque: 55-60N·m
5	Bolt M8×32	2	Tightening torque: 28-32N·m
6	Bolt M8×32	1	Tightening torque: 28-32N·m
7	Hex flange bolt M6×16	1	
8	Convex bolt M6×16	2	

Disassembly / Assembly of Rear Swingarm Group

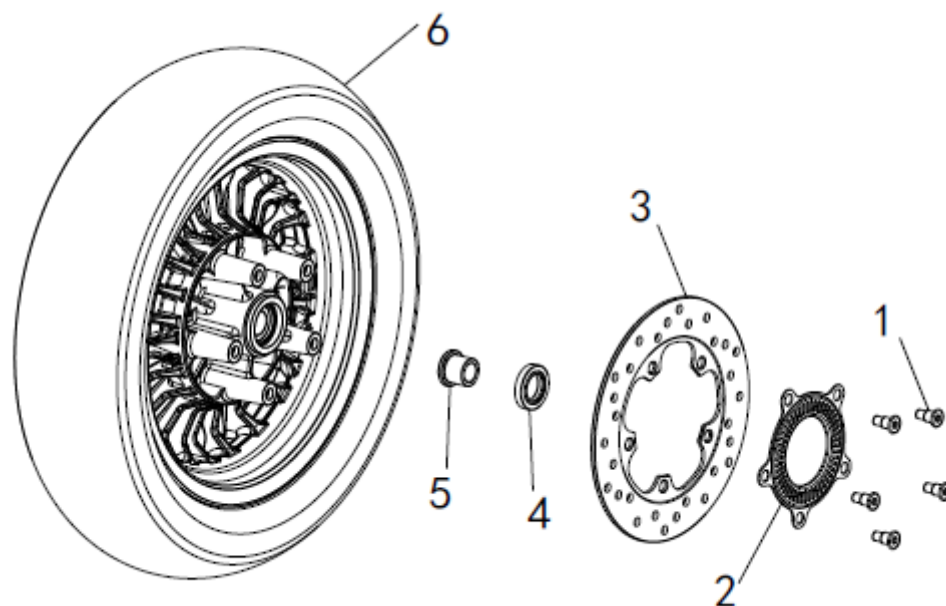
Please refer to the following figure for the disassembly / assembly of rear swingarm group.

The seal ring and deep groove ball bearings shall be replaced with new ones after removal. Apply an appropriate amount of lubricant during assembly, and then check if the needle roller bearing rotates freely.



Sequence	Step	Quantity	Remarks
Disassembly Sequence			The assembly sequence is the reverse of disassembly sequence.
1	Rear swingarm	1	
2	Oil seal 25×40×7	1	Make sure that the shaft sleeve rotates flexibly during assembly
3	Snap ring for hole 35	1	GB/T893.1
4	Deep groove ball bearing 6203-2RS	1	Make sure that the bearing rotates flexibly during assembly
5	Oil seal 25×35×4	1	Make sure that the shaft sleeve rotates flexibly during assembly
6	Rubber cushion spacer 8×20×19	1	

Rear Wheel

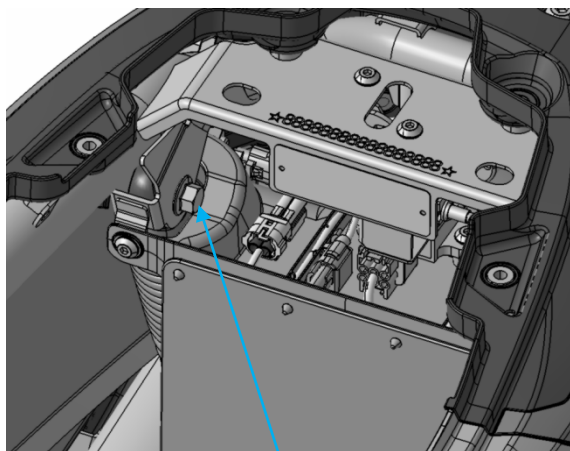


Maintenance Requirements

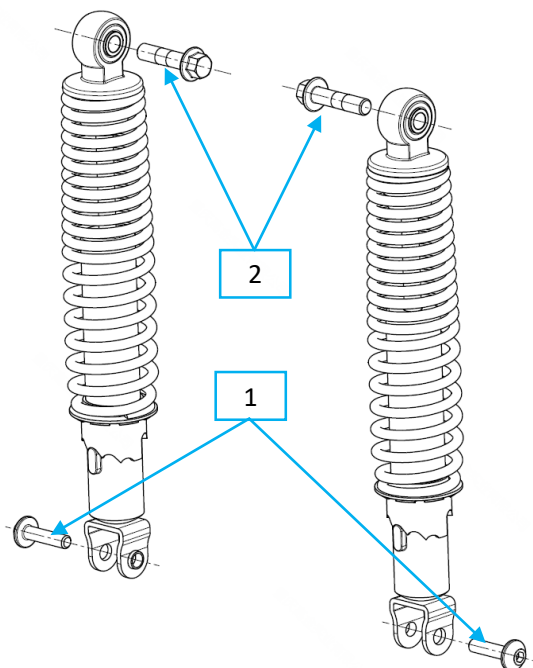
Sequence	Step	Quantity	Remarks
	Removal Sequence		The installation sequence is the reverse of removal sequence.
1	Brake disc bolt	5	Tightening torque: 28-32N·m Apply the thread locker
2	Speed signal panel	1	
3	Brake disc	1	
4	Oil seal 25×40×7	1	
5	Rear wheel outer spacer	1	Apply lithium grease during assembly
6	Rear wheel group	1	

Disassembly / Assembly of Rear Suspension

Note: Remove the storage box for rear shock absorber disassembly. First, use an M8 Allen wrench to remove the lower fastening bolt, then use a No. 13 ratchet wrench or socket to remove the upper fastening bolt.



Upper fastening bolt of rear shock absorber



Maintenance Requirements

Sequence	Step	Quantity	Remarks
	Removal Sequence		The installation sequence is the reverse of removal sequence.
1	Screw M8×32	2	Tightening torque: 24-26N·m
2	Hexagon flange bolt M10×1.25×40	2	Tightening torque: 35-45N·m

Rear brake

Maintenance Notice

- Contaminated brake disc and friction disc will degrade the brake performance. So, the friction disc shall be replaced and the contaminated brake disc shall be cleaned.
- Since inhaling friction piece dust will cause discomfort of respiratory, please do not use air duct or dry brush cleaning brake group, but go to a professional service shop for repair and maintenance.
- Spilled brake fluid will seriously damage the surface of instrument glass and oil and gas components, and is harmful to some rubbers. So, be careful when removing the master cylinder and first make sure that the master cylinder is placed horizontally.
- Do not let contaminants (dust, dirt, water, etc.) enter the master cylinder.
- Once the hydraulic system is opened, or the brake is loose, the air must be removed from the brake system.
- DOT4 brake fluid shall be used for system maintenance. Do not mix it with brake fluid of another model.
- Before riding the motorcycle, check the braking status.

Troubleshooting

Loose Brake

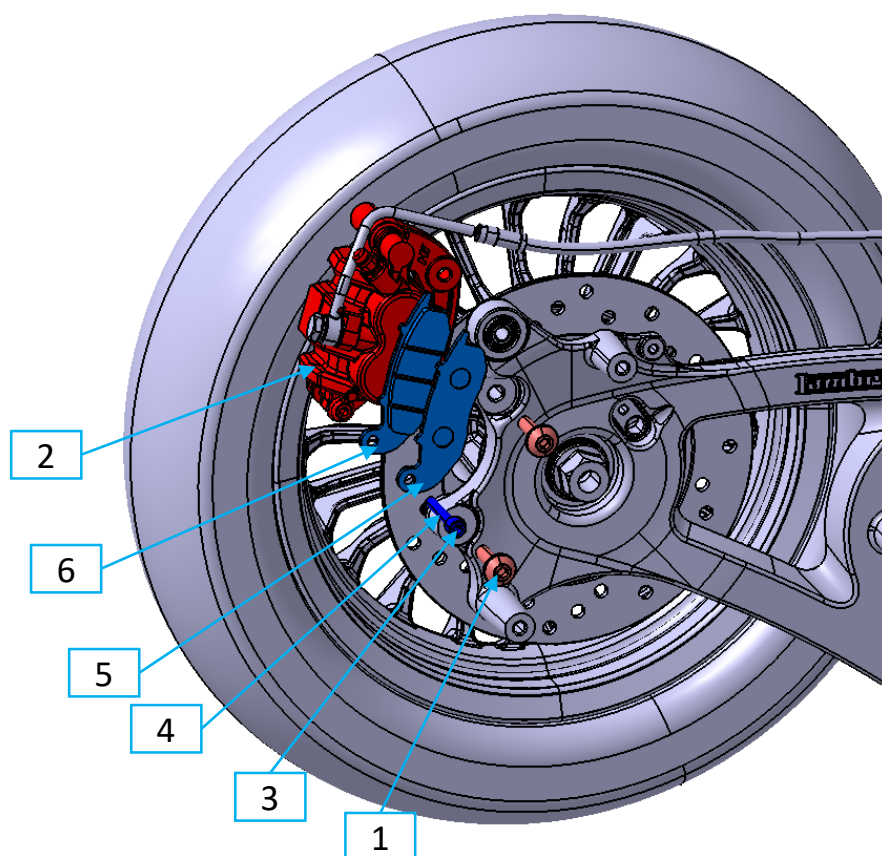
1. There is air in the brake hose;
2. The brake hose has leakage;
3. The brake liquid level is too low;
4. The brake friction disc is smudgy;
5. The piston seal of brake minor cylinder is abraded or aged;
6. The piston seal of brake master cylinder is abraded or aged;
7. The piston of brake minor cylinder is stuck or aged;
8. The piston of brake master cylinder is stuck or aged;
9. The brake shoe is abraded;
10. The brake shoe slips difficultly;
11. The brake hose is blocked;
12. The brake disc is warped or deformed;
13. The brake hose is contaminated.

Inflexible Brake Lever

1. The brake system is blocked;
2. The brake caliper piston is stuck or abraded.
3. The brake shoe slips difficultly;
4. The brake hose is blocked;
5. The master pump piston of brake is stuck or abraded.
6. The brake lever is bended.

Brake Running Sideways

1. The brake disc / friction disc is smudgy;
2. The wheel has not been adjusted correctly;
3. The brake disc is warped or deformed;
4. The brake shoe slips difficultly;

Disassembly / Assembly of Rear Brake Caliper Component**Notes**

Contaminated brake disc and friction disc will degrade the brake performance. So, the friction disc shall be replaced and the contaminated brake disc shall be cleaned.

The master cylinder of rear brake shall be lifted up with steel wire rope to the height at least the same as the height of the original installation position. Do not twist the brake hose.

After removing the brake caliper, do not pull the brake lever, otherwise it will be difficult to assemble the wheel.

Since inhaling friction piece dust will cause discomfort of respiratory, please do not use air duct or dry brush cleaning brake group, but go to a professional service shop for repair and maintenance.

After replacing the friction plate, repeatedly operate the brake lever to reset the caliper and cylinder piston against the friction plate.

Maintenance Requirements

Sequence	Step	Quantity	Remarks
	Removal Sequence		The installation sequence is the reverse of removal sequence.
1	Bolt M8×32	2	Tightening torque: 28-32N·m
2	Rear brake caliper component	1	The master cylinder of rear brake shall be lifted up with steel wire rope. Do not twist the brake hose.
3	Screw plug	1	
4	Slide shaft of brake pad	1	
5	Inner brake pad	1	
6	Outer brake pad	1	

14

Overview of Electrical System

Notes for Circuit Inspection

System Principle and
Composition

Notes for Circuit Inspection

1. When disconnecting and connecting the connector, turn OFF the ignition switch, otherwise the electrical elements may be damaged.
2. The circuit shall be inspected with a probe that can be inserted from the front and back ends of connector and contact reliably with the terminals.
3. Power supply and related electrical elements shall be disconnected during the circuit on-off inspection.
4. When conducting the inspection with voltage, check the battery voltage first.
5. In case of electrical system failure, the following steps are generally followed for diagnosis:
 - A. Observe the fault phenomenon to determine which subsystem is out of order;
 - B. Minimize the fault scope by exclusive method according to the schematic circuit diagram;
 - C. Check whether the subsystem is open-circuited, short-circuited or connected incorrectly;
 - D. Check whether relevant components are failed or damaged.
6. When looking for line fault, check the part that can be easily removed first. The parameter detection method and part replacement method can be used, but when adopting the part replacement method, make sure that there is no overload in the line to avoid damaging new parts.
7. Multimeter and clamp meter shall be always available for circuit inspection.
8. Most instantaneous electrical failures are caused by fault of wire terminal or wire.

System Principle and Composition

The electrical system is essential for a motorcycle to run safely, reliably and efficiently. It covers a wide range of subjects including the motor, electrical & electronic technology, computer, electrochemistry, acoustics, optical materials and the like. With the development of electronic technology, the motorcycle electrical system will also have significant changes. The electrical system of motorcycle J200 adopts many advanced automotive electronics technology, which is much more complicated than traditional ones. It composes of the following sub-systems:

- Power supply system
- Starting system
- Engine management system
- Lighting signal system
- Information display system

They will be introduced in the following chapters respectively.

15

Battery and Power Supply System

Overview

Introduction to Main Parts and Components

Schematic Circuit Diagram

Diagnosis of Major Faults

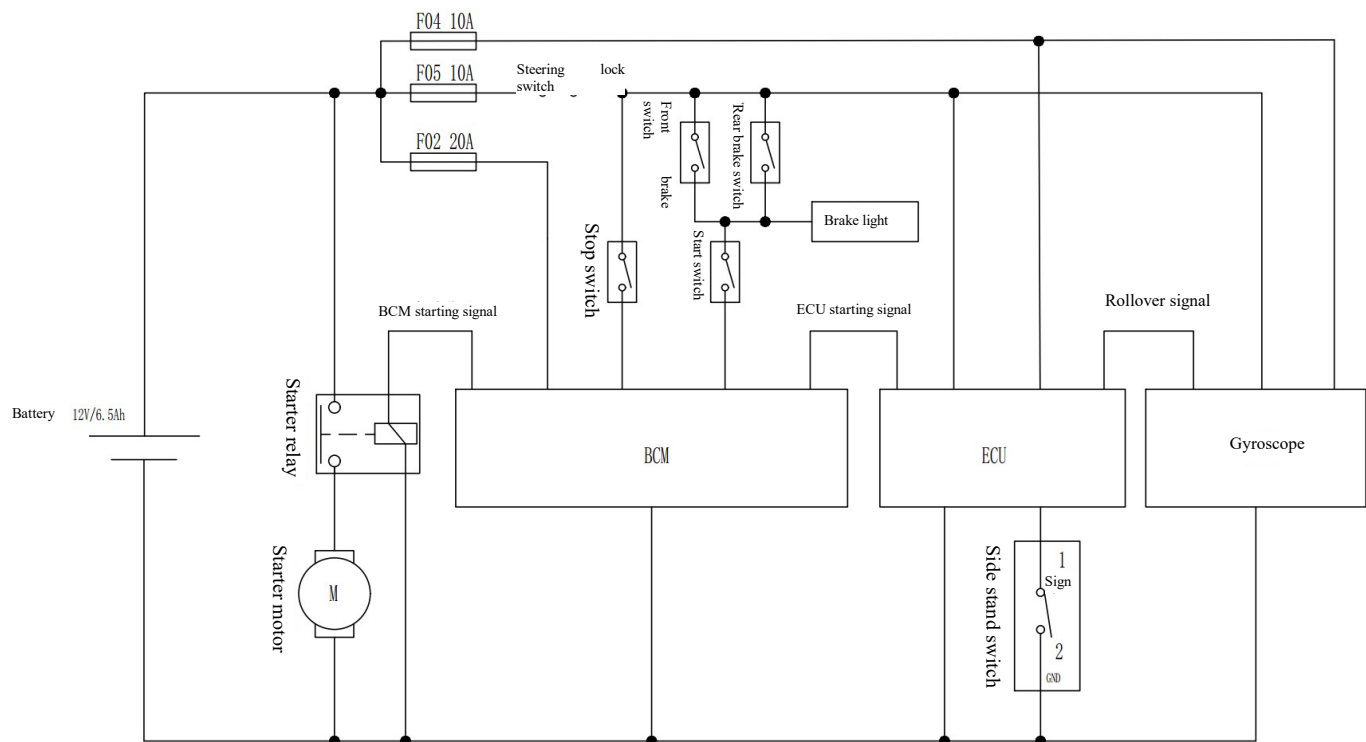
Parts Layout Diagram

Overview

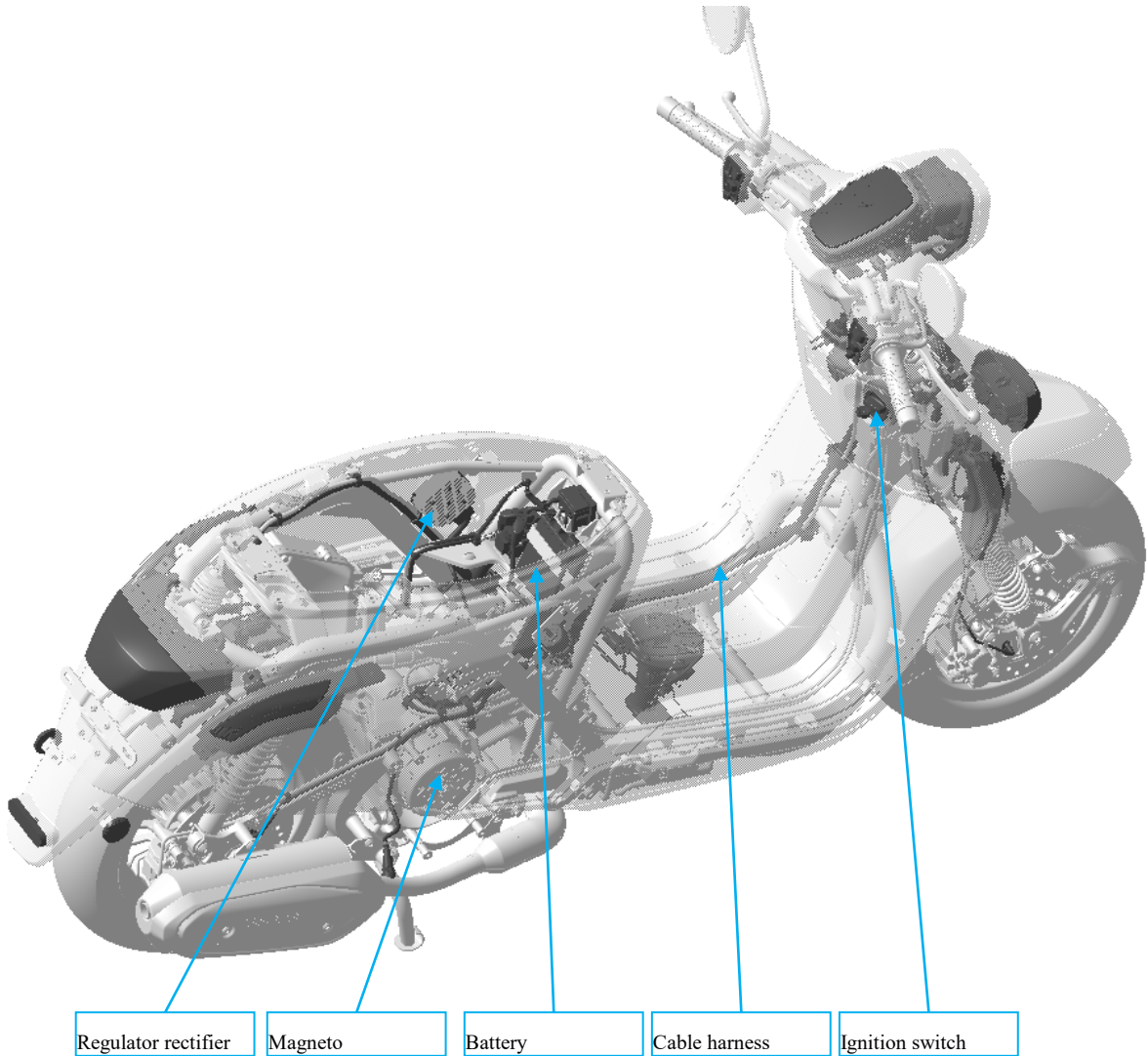
The power supply system is the premise of the running of the whole electrical system, which can provide sufficient electric energy for other electrical sub-systems. Its functions include charging, saving and discharging electricity. The power supply system of motorcycle J200 is featured by 240W and above. It consists of the following parts:

- Magneto
- Regulator rectifier
- Battery
- Integrated ignition switch
- Fuses

Schematic Circuit Diagram



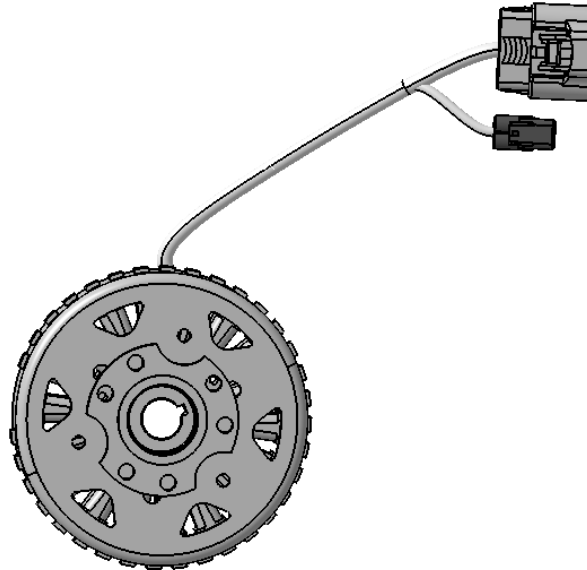
Parts Layout Diagram



Introduction to Main Parts and Components

Magneto

1. Outside View



2. Working Principle

The crankshaft drives the rotor to rotate, and the stator winding coils cut the magnetic line of force to generate induced electromotive force and output alternating current, and the formula is $E=Blv$. The magneto of motorcycle is a permanent magnet alternator and the permanent magnet steel is the rotor and the coil winding is the stator. Magneto is the main power supplier of electrical system.

3. Basic Parameters

The stator windings have 18 poles which are connected in three-phase (Δ) and the resistance of each phase is 0.3-0.5 Ω ;

Rated power: 240W/5000r/min (cold state) (maximum attenuation of 8% at hot state).

4. Fault Mode

The rotor magnet steel is broken;

The magnetism of magnet steel has faded;

The stator winding is short-circuited to ground;

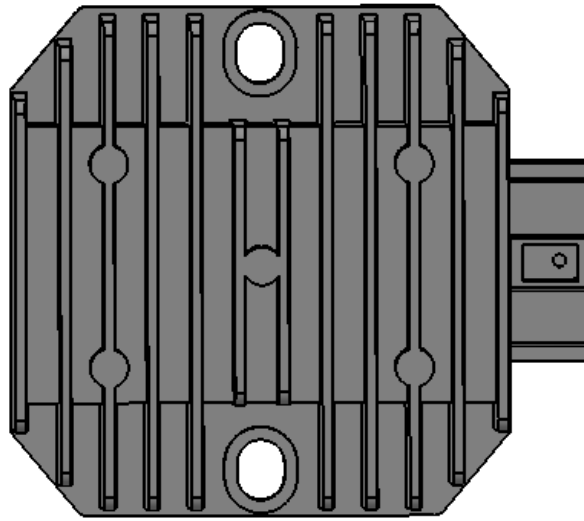
The stator winding suffers turn-to-turn short circuit;

The stator winding welding point has fell off or suffers short-circuit;

The rotor and stator suffer friction damage (by foreign matters).

Regulator Rectifier

1. Outside View



2. Working Principle

The three-phase sinusoidal alternating current output by magneto, which fluctuates with the speed, is converted into stable direct current through the full-wave rectification and controllable stable-voltage charging circuit. The power will be provided to the load line and charge the battery.

3. Basic Parameters

Structural style: three-phase full-wave rectification, short circuit mode (MOS tube);

Regulation voltage: $14.5V \pm 0.5V$;

Maximum operating current: 20A.

4. Fault Mode

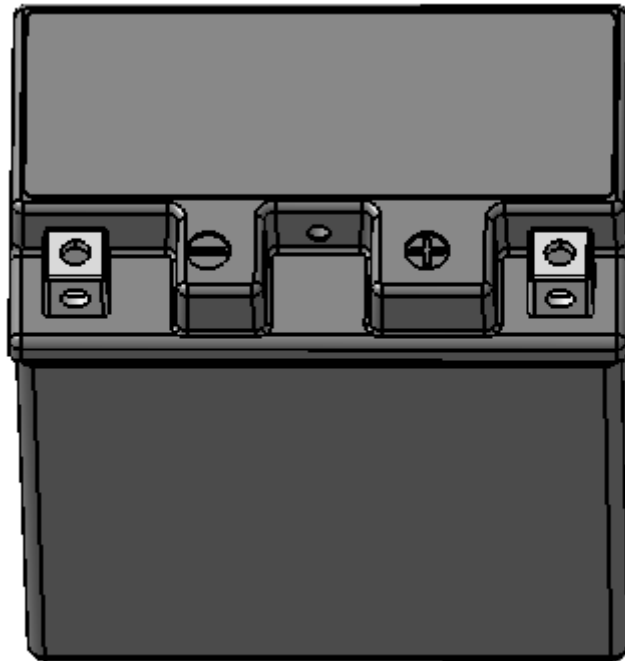
The voltage regulator circuit is out of control and the battery is overcharged;

The rectifier circuit is open-circuited or short-circuited and the battery cannot be charged or charged fully;

The outgoing line is open-circuited or short-circuited.

Battery

1. Outside View



2. Working Principle

Two kinds of lead (negative electrode) and lead dioxide (positive electrode), immersed in the electrolyte (sulfuric acid solution) can generate a voltage of 2V, and the voltage can reach 12-13V when six single cells are connected in series. It is the auxiliary power supply of electrical system and can absorb the over-voltage in the circuit.

3. Basic Parameters

Battery type: valve-controlled charged lead-acid battery, model: 12V/6.5A·h;

Rated capacity of 10HR: 6.5A·h (25°C±2°C);

4. Fault Mode

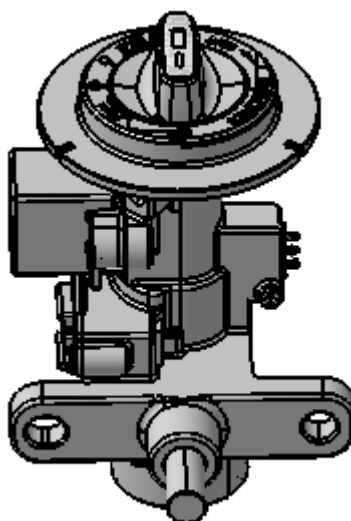
The pole-plate is polarized and the capacity is reduced, which is unable to provide power for starting, and the charging performance is degraded;

The liquid leakage leads to corrosion of electrode;

There is excessive internal resistance and serious self-discharge phenomena, and the voltage is lower than 5V.

Integrated Ignition Switch

1. Outside View



2. Working Principle

The integrated ignition switch serves as the main switch for the entire vehicle power supply, incorporating the steering lock, seat lock, and fuel filler cap release functions.

3. Basic Parameters

Switch function list:

Switch											
Line No. Gear	Knob status	①	②	⑤	⑨	⑥	⑩	Can the key be retracted	Solenoid plunger	Blue backlight	Latch bolt status
	/							No	Retracted	ON	Remains retracted
	/							No	Retracted	ON	Remains retracted
	Depressible							Yes	Remains extended; retracts when terminals ③ and ⑦ are energized	OFF	Remains retracted
SEAT	/							No	Remains extended	OFF	Remains retracted
	Depressible							Yes	Remains extended; retracts when terminals ③ and ⑦ are energized	OFF	Remains extended

The mutual opening rate of the switch key shall not be greater than 0.1%;

Rated operational current of the switch: 10A

4. Fault Mode

The lock cylinder is failed and the switch cannot be turned on flexible or the key cannot turn on the switch;

The switch cannot be connected due to the failure of switch contact;

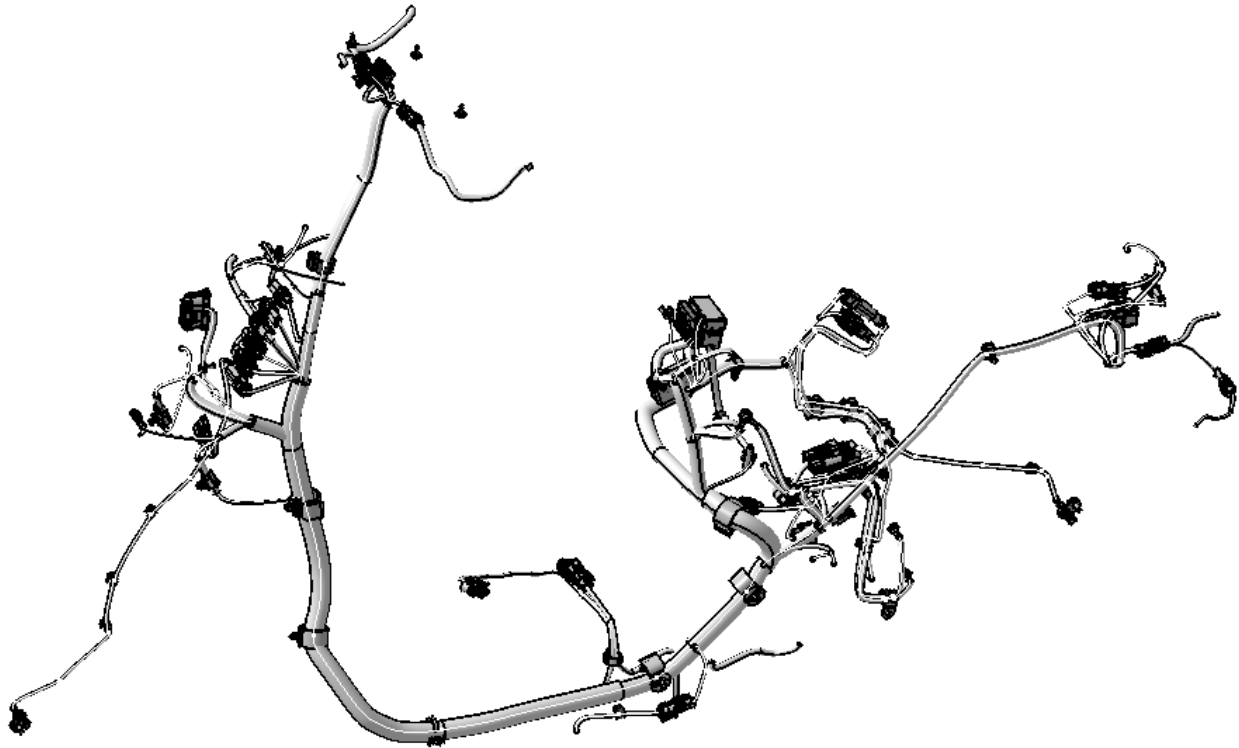
The switch contact is short-circuited in contact with the shell, which leads to burn of the main fuse and the power failure of motorcycle;

The outgoing line is open-circuited or short-circuited to ground;

The latch bolt fails to stretch out and the head can't be locked.

Cable Harness

1. Outside View



2. Working Principle

The cable harness is composed of various specifications of wires, connector sheath, terminals, conduits, tapes, safety pieces and other parts through bifurcating, riveting, binding and assembling. The electrical and electronic equipment can work normally with the connection of harness.

3. Basic Parameters

The on-off state of line in each color shall conform to the electrical wiring diagram;

The riveting of each bifurcation and terminal shall be firm;

The conduits and tapes shall be tied tightly;

Each connector and corresponding electrical and electronic equipment shall be reliably connected.

4. Fault Mode

The terminal and connector have not been assembled firmly;

The damaged wire sheath is short-circuited to ground or adjacent wire;

The connection at the bifurcation is corrosive and is unreliable or open-circuited;

There is instantaneous fault and poor contact of wire terminals or wires (most instantaneous electrical faults are caused by this);

There is poor contact or burning of the safety pieces;

The wire harness is not tied firmly to the motorcycle, which leads to wire vibration, abrasion, failure or poor contact.

Diagnosis of Major Faults

Fault Phenomenon	Possible Cause	Solutions
Power failure of the whole motorcycle: The instrument displays nothing and other electrical functions cannot be performed when turning the key.	The fuse is burnt out; The fuse circuit is in bad contact; The battery positive and negative circuits of battery are in bad contact; The battery has no power; The ignition switch is failed; The outgoing line of ignition switch is not connected well with the main cable; The circuits of main cable are open-circuited or short-circuited.	Replace the fuse; Reconnect; Reconnect; Charge the battery or replace it; Repair or replace; Reconnect; Repair or replace.
Excessively low voltage of the battery: When the power is turned on, the voltage displayed on the instrument cluster is below 12V.	The complete motorcycle has been stored for a long time; The charging line is faulted or the quiescent current of motorcycle is excessive; The battery capacity attenuates and fails to store energy, and the battery discharges itself.	Charge with DC regulator charger; Check the charging line and the quiescent current; Replace the battery.
Battery undercharged: After the engine is started, the voltage displayed on the instrument cluster remains below 13V.	The outgoing line of regulator rectifier is not connected well with the main cable or magneto; The circuits of main cable are open-circuited or short-circuited; The magneto is failed; The regulator rectifier is failed; The battery stores no energy;	Reconnect; Repair or replace; Replace the magneto; Replace the regulator rectifier; Replace the battery.
Battery overcharged: The battery releases gas or is deformed.	The regulator rectifier is failed.	Replace.

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Starting system

Overview

Introduction to Main Parts and Components

Schematic Circuit Diagram

Diagnosis of Major Faults

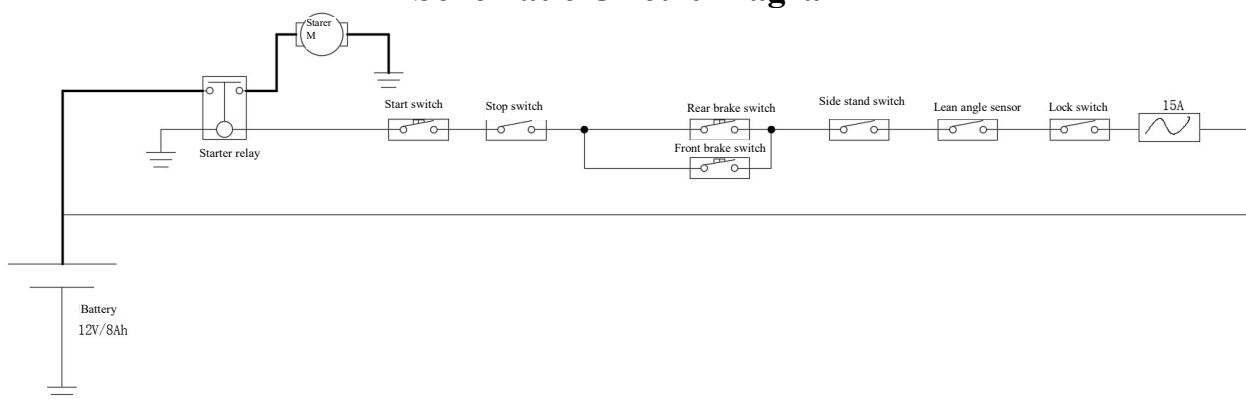
Parts Layout Diagram

Overview

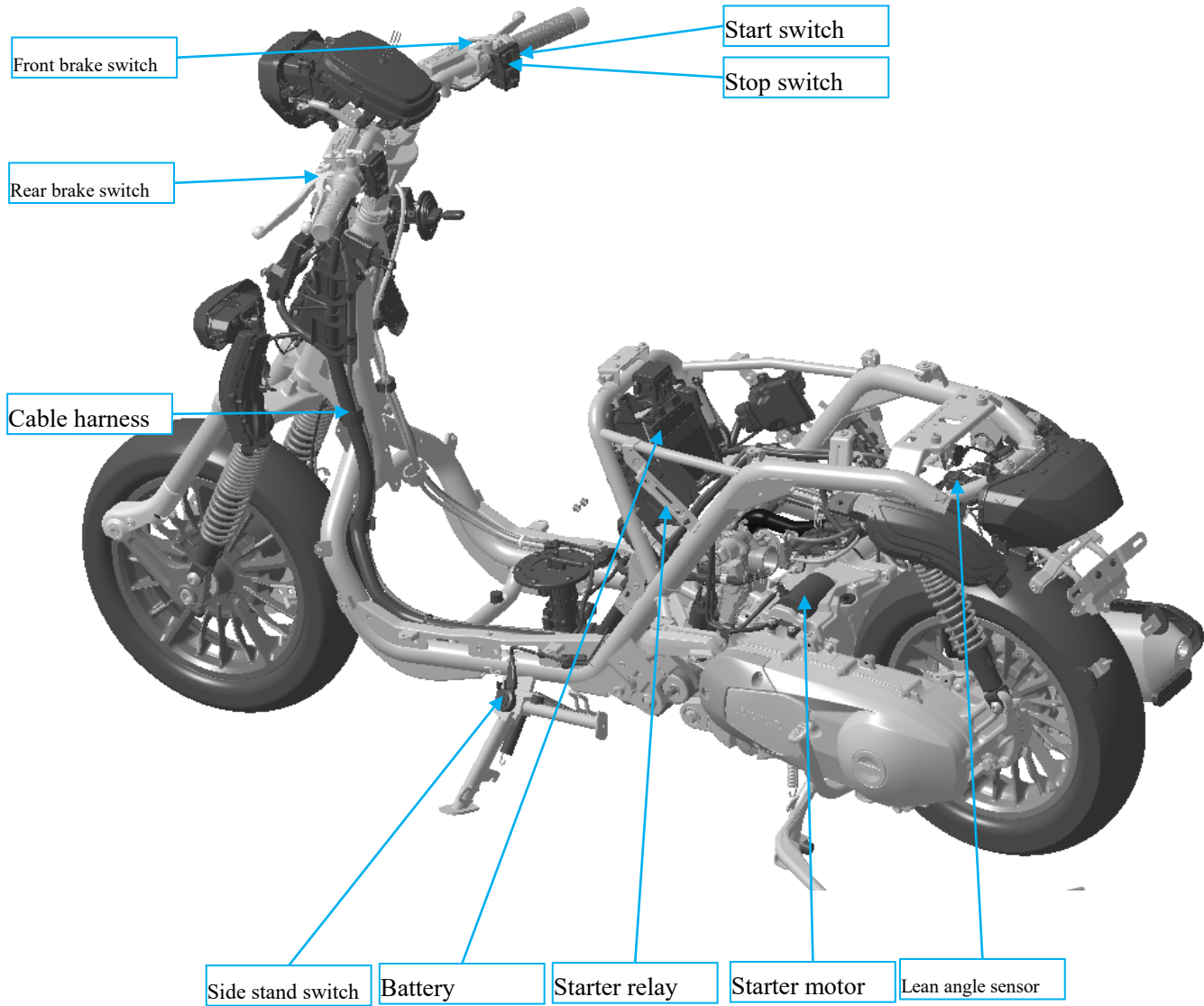
The engine can only be started with the help of external force at the initial and then enter the ignition and oil supply process, and thus the internal combustion engine can combust and run stably. J200 motorcycle is only equipped with an electronic starting system. First, the safety interlocks for the lean angle sensor, side stand switch, and brake switch must be cleared. Then, pressing the start button energizes the starter relay; the starter motor subsequently rotates, driving the intermediate gear and one-way clutch to crank the engine into its work cycle for normal ignition and fuel injection combustion. The system consists of the following parts:

- Starter motor;
- Starter relay;
- Battery;
- Start switch and stop switch;
- Lean angle sensor, side bracket switch and bracket switch.

Schematic Circuit Diagram



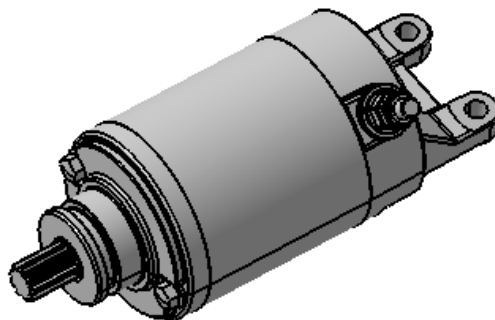
Parts Layout Diagram



Introduction to Main Parts and Components

Starter motor

1. Outside View



2. Working Principle

A current-carrying conductor is subjected to the electromagnetic force in a magnetic field, $F=Bli$. When supplying power to the positive and negative poles of starter motor (negative pole connected to motorcycle), the motor shaft will rotate to drive the initial running of the engine through reduction gear, one-way clutch and crank.

3. Basic Parameters

Specifications: 12V 335W;

Rotation direction of output shaft: clockwise seen from the tooth;

Output characteristics:

	Status	Voltage (V)	Current (A)	Rev speed (r/min)	Torque (N · m)
Motor characteristics	No-load	11.5	≤30	≥10000	
	With load	10.5	≤85	≥8000	0.40
	Brake	6	≤250		≥1.5
Battery		12V–7Ah			

4. Fault Mode

The motor suffers open-circuit failure;

The carbon brush is over abraded;

The stator magnet steel is broken;

The magnetism of magnet steel has faded;

The friction between enameled wire of rotor winding and stator causes short-circuit;

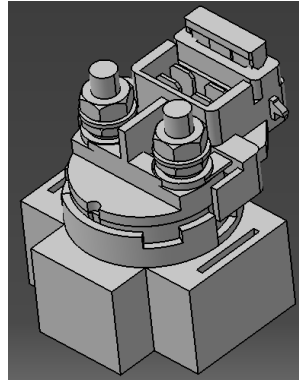
The bearing is failed and the motor generates abnormal noise;

The poor oil seal leads to oil entering in motor and short-circuit;

The poor waterproof leads to water entering in motor water and performance decline.

Starter relay

1. Outside View



2. Working Principle

The two ends of relay coil supplied with voltage will generate an electromagnetic force to connect the movable contact and stationary contact. The large current passing the starter motor and relay contacts are controlled with the small current passing the operating switch and relay coil. The J200 starter relay also contains a power circuit (power pole B, coil terminal).

3. Basic Parameters

Nominal voltage: DC 12V;

Rated current: DC150A (5S);

Pick-up voltage: (4.5~7.5)V;

Drop-out voltage: DC (1~3.5)V;

Contact voltage drop: below 0.2V (at 150A);

Coil current: below 3.5A (at 12V).

4. Fault Mode

The coil or lug plate is open-circuited and the contact cannot be closed;

The coil is short-circuited and the contact cannot be closed;

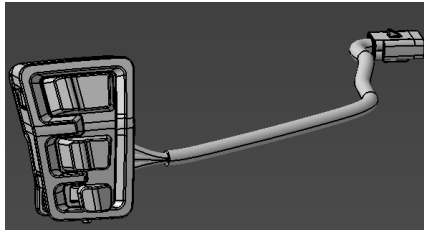
The contact is corrosive or ablative, and cannot be connected even if closed;

The contacts are stuck together and fail to be disconnected due to over-current;

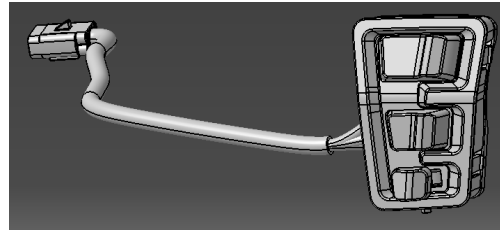
The power circuit (power pole B, coil terminal) is open-circuited, which leads to starting failure of motorcycle.

Integrated Left / Right Switches, Side Stand Switch and Gyroscope

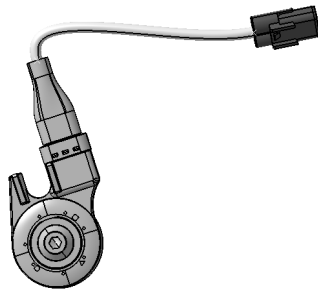
1. Outside View



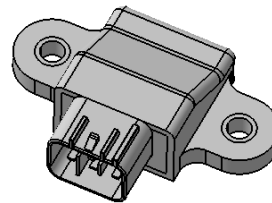
Integrated left switch



Integrated right switch



Side stand switch



Gyroscope

2. Fault Mode

The switch locating pin is fractured, causing looseness during operation;

The switch cannot be put on or be fully put on;

The switch is seized and fails to reset;

The failure of switch or open-circuit of outgoing line leads to connection failure of switch;

The outgoing line is short-circuited and the switch is dysfunctional;

The switch of the side stand is loose and the contact is in poorly contracted;

The outgoing line of the side stand switch is abraded, open-circuited or short-circuited;

The gyroscope is faulted;

The switch suffers abrasion, vibration, water filling, corrosion or fault.

Diagnosis of Major Faults

Fault Phenomenon	Possible Cause	Diagnostic Approach	Solutions
Closing failure of starter motor: After pressing the start button, there is no closing sound of relay and the starter motor fails to run.	<p>The battery is under-voltage;</p> <p>The corresponding fuse is not connected or burnt out;</p> <p>The side stand switch maintains continuity.</p> <p>The brake switch has failed in an open-circuited condition;</p> <p>The start button is open-circuited and failed;</p> <p>The stop switch is open-circuited and failed;</p> <p>The starter relay is open-circuited and failed;</p> <p>The circuits of main cable are open-circuited.</p>	<p>Inspect the battery voltage;</p> <p>Check if the fuse is blown;</p> <p>Inspect the side stand switch for proper continuity and cutout functions;</p> <p>Inspect the brake switch for proper continuity and cutout functions;</p> <p>Check the switch for failure according to the switch function list;</p> <p>Apply the pick-up voltage to the starter relay coil; if the terminals fail to close, the starter relay is defective;</p> <p>Check for operating voltage between the two wires of the starter relay coil on the main cables.</p>	<p>Charge the battery;</p> <p>Connect or replace the fuse;</p> <p>Connect or replace the gear switch;</p> <p>Connect or replace the side stand switch;</p> <p>Connect the circuit or replace the left switch;</p> <p>Connect the circuit or replace the left switch;</p> <p>Replace the starter relay;</p> <p>Repair or replace the main cable;</p>
Running failure of starter motor: There is a closing sound of motor, but the starter motor fails to run.	<p>The battery is under-voltage;</p> <p>The connector of thick wire is loose;</p> <p>The motor suffers open-circuit failure;</p> <p>There is open-circuit between the pole contacts of starter relay;</p> <p>The motor suffers short circuit and failure;</p> <p>The engine is stuck and the motor is stalled;</p>	<p>Check the battery voltage drop. If there is no drop, first check whether the connector is loose, then check whether there is open circuit in relay or motor; if there is a serious drop (less than 5V), it is determined that the motor is short-circuited or stalled.</p>	<p>Charge the battery;</p> <p>Fasten the connector;</p> <p>Replace the motor;</p> <p>Replace the starter relay;</p> <p>Replace the motor;</p> <p>Check the engine.</p>
Over-low motor speed	<p>The voltage or capacity of battery is too low;</p> <p>The connector is poorly connected;</p> <p>The starter motor output torque is insufficient;</p> <p>The engine resistance is too high;</p>		<p>Charge or replace the battery;</p> <p>Fasten the connector;</p> <p>Replace the motor;</p> <p>Check the engine.</p>

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Lighting Signal System

Overview

Introduction to Main Parts and Components

Schematic Circuit Diagram

Diagnosis of Major Faults

Parts Layout Diagram

Overview

Lighting signal system is essential for a motorcycle to run safely and includes headlight system, signal light control system and horn system.

Headlight system:

The headlight is used for illuminating the road during night riding, letting surrounding vehicles and people to aware the motorcycle. The high beam will be adopted during high speed riding and the anti-dazzle low beam will be used when passing other vehicles. The illumination of the headlight is controlled by the switch and the Body Control Module (BCM).

Signal control system:

When the motorcycle is to turn, the turn signal will flash to draw surrounding vehicles and people's attention to give way. When riding at night, the tail light is needed to indicate the presence of the motorcycle and to illuminate the license plate. A brake light aims to tell the vehicle behind that the motorcycle is braking to slow down. The flashing of the turn signal lights is controlled by the switch and the BCM. The illumination of the front / rear position lights and the license plate light is controlled solely by the ignition switch, while the illumination of the brake light is controlled solely by the brake switch.

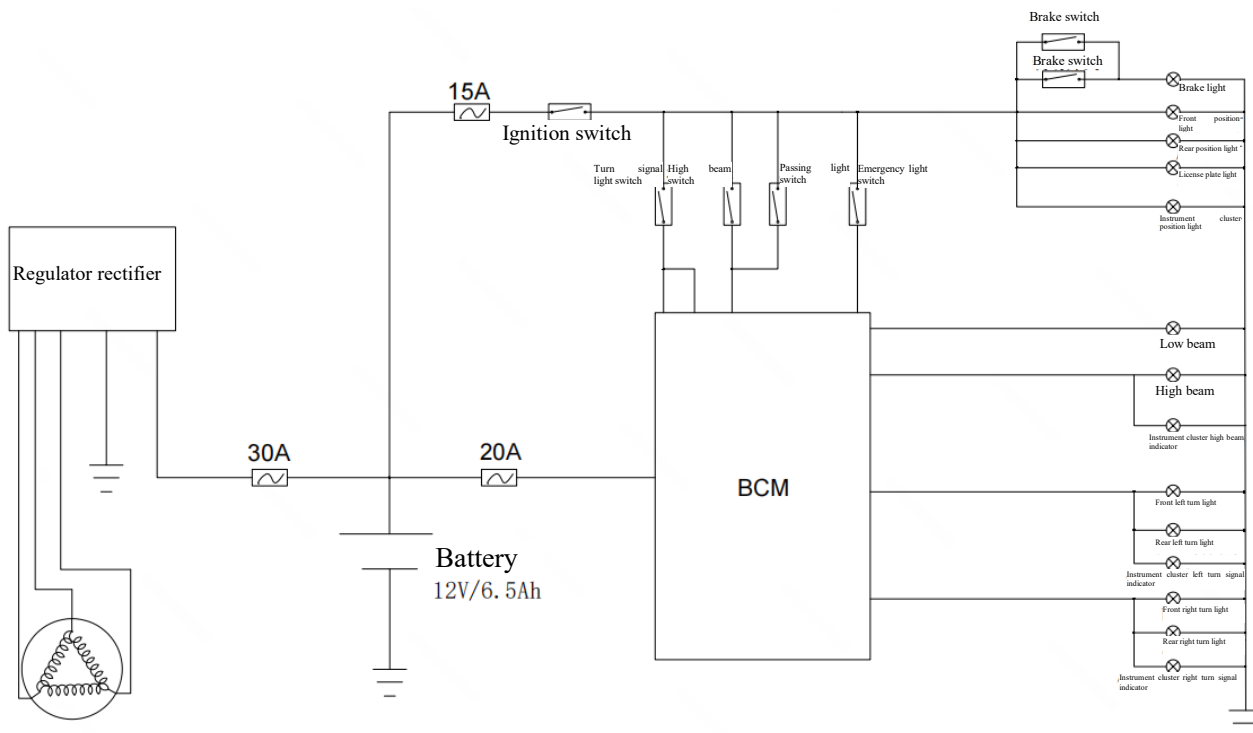
Horn system:

If there are other vehicles or people around that are obstructing or may obstruct the motorcycle, the horn can be used to ensure the safety of riding. The horn is controlled by the horn button.

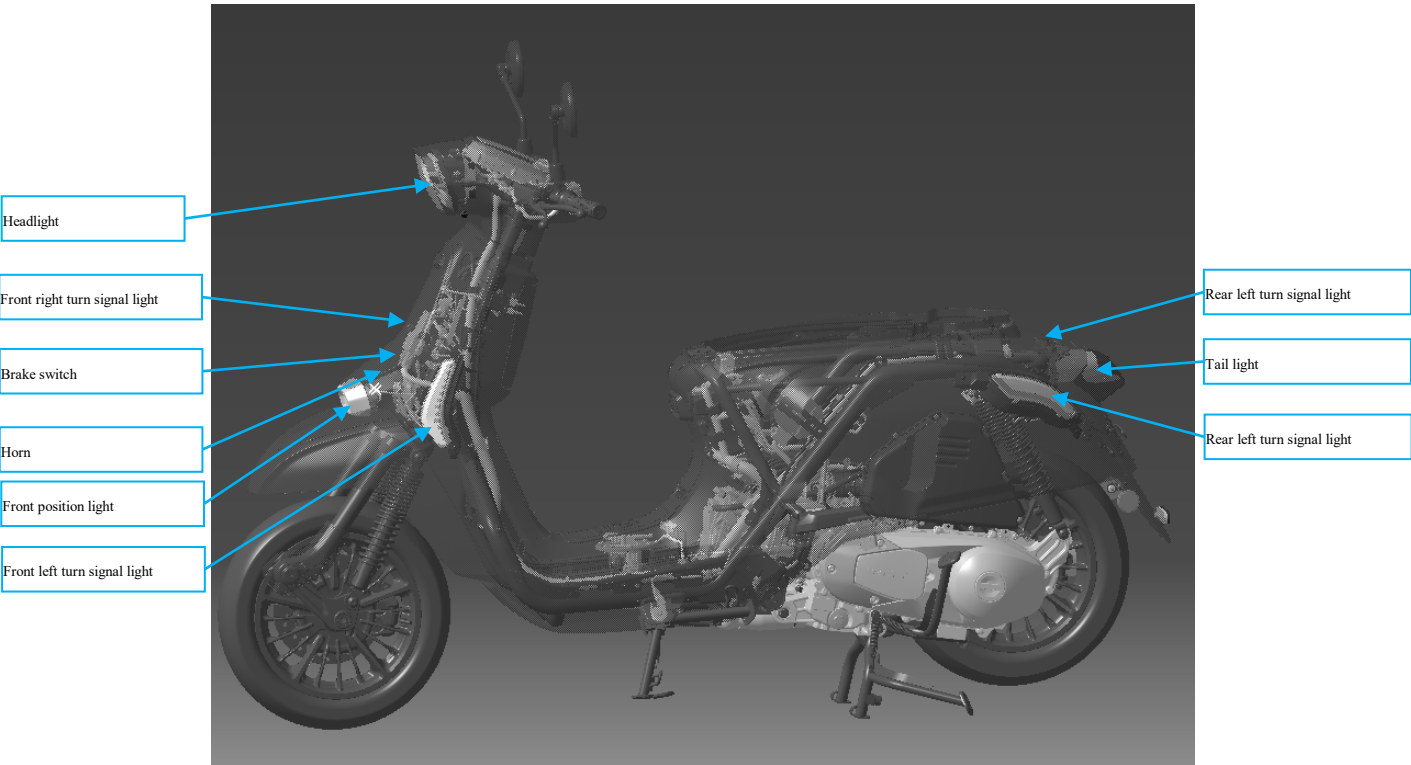
Parts and components:

- Headlight
- Front position light
- Tail light group
- Turn signal light
- Horn
- BCM
- Front brake light switch
- Rear brake light switch
- Left / right integrated switches

Schematic Circuit Diagram



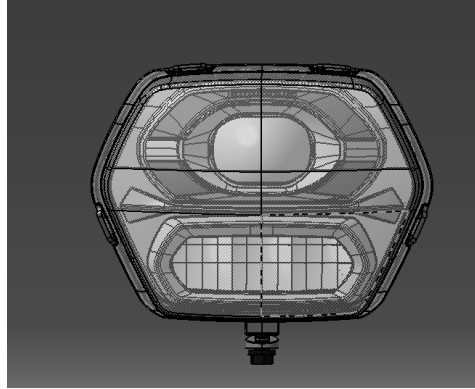
Parts Layout Diagram



Introduction to Main Parts and Components

Headlight

1. Outside View



2. Working Principle

The headlight LEDs generally have high beam filament and low beam filament. The high beam filament is located at the focal point of paraboloid of the headlight reflector and the ray will become a parallel beam after being reflected by the reflector and scattered through the lens, which can evenly illuminate the road within 100m ahead. The low beam filament is located above the focal point, and the ray can illuminate the road within 30m in front after reflection. Since there is a visor below the LED, the ray is dazzle-free.

3. Basic Parameters

High beam specifications: LED, 19W;

Low beam specifications: LED, 9W;

4. Fault Mode

The light LED is failed;

There is water or dust in the lighting;

The welding of circuit board is loose;

The light housing glass is scratched;

The light wire is open-circuited or short-circuited;

The reflector is overheated and deformed;

The visor is broken or loose;

The ray is deflected.

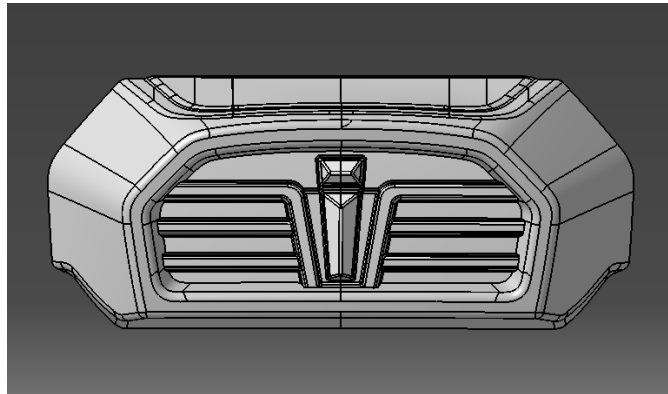
5. Light Adjustment

Up and down adjustment: Adjust the adjusting screw below the headlight. After loosening the adjusting screw, adjust the light beam up and down.

Left and right adjustment: It is not available for this motorcycle.

Front Position Light

1. Outside View



2. Working Principle

The front position light, featuring a direct-lit design with an internal diffusing agent, delivers white illumination.

3. Basic Parameters

Position light specifications: LED, 1.5W;

4. Fault Mode

The light LED is failed;

There is water or dust in the lighting;

The welding of circuit board is loose;

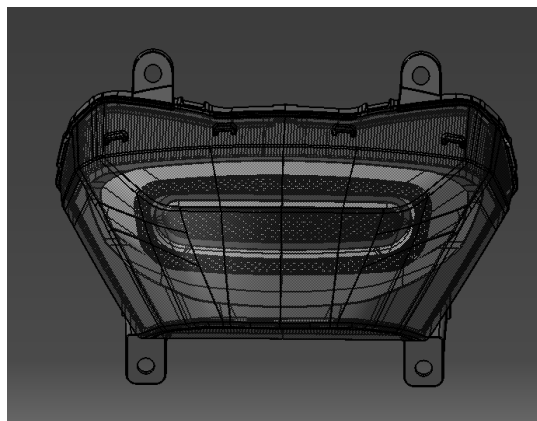
The light housing glass is scratched;

The light wire is open-circuited or short-circuited;

The visor is broken or loose;

Tail Light Group

1. Outside View



2. Working Principle

Tail light integrates the function of rear position light, brake light and license plate light. The illumination from the rear position light and brake light is red, while that from the license plate light is white.

3. Basic Parameters

Tail light LED specifications: LED, 2W;

License plate light LED specifications: LED, 1.8W;

Brake light LED specifications: LED, 3.3W;

System

4. Fault Mode

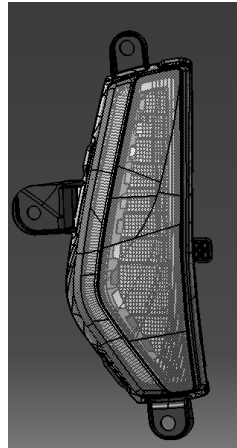
The light LED is failed;

The light holder is loose;

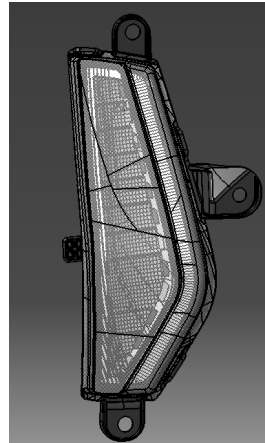
The light wire is open-circuited or short-circuited;

There is water or dust in the lighting;

The lens is scratched or damaged;

Front Turn Signal Light**1. Outside View**

Front left turn light



Front right turn light

2. Working Principle

A front turn signal light comprises a lens, a housing, a reflector, a PCB, and LEDs. The light emitted by the LED is reflected by the reflector to become concentrated, then scattered by the lens to produce a uniform and soft orange light.

3. Basic Parameters

Front turn light LED specifications: LED, 4W;

4. Fault Mode

The light LED is failed;

The light holder is loose;

The light wire is open-circuited or short-circuited;

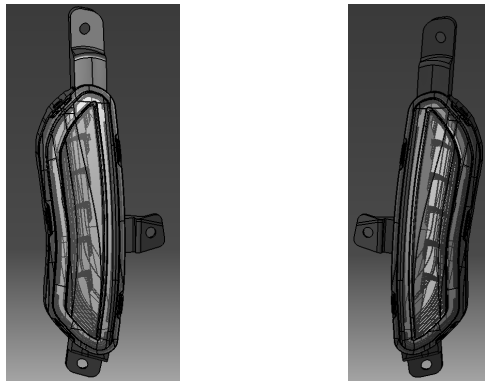
There is water or dust in the lighting;

The lens is scratched or damaged;

The handle is loose or fractured.

Rear Turn Signal Light

1. Outside View



Rear left turn light Rear right turn light

2. Working Principle

A rear turn signal light comprises a lens, a housing, a reflector, a PCB, and LEDs. The light emitted by the LED is reflected by the reflector to become concentrated, then scattered by the lens to produce a uniform and soft orange light.

3. Basic Parameters

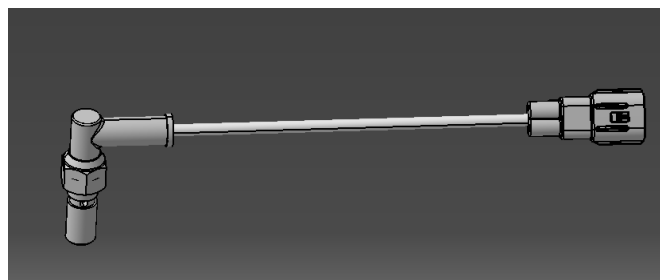
Turn light LED specifications: LED, 4.5W;

4. Fault Mode

- The light LED is failed;
- The light holder is loose;
- The light wire is open-circuited or short-circuited;
- There is water or dust in the lighting;
- The lens is scratched or damaged;
- The handle is loose or fractured.

Brake switch

1. Outside View



2. Working Principle

The brake switch is integrated into the brake master cylinder. Squeezing the brake lever increases hydraulic pressure within the brake master cylinder, which triggers the switch to close the circuit and illuminate the brake light. Releasing the brake lever restores the hydraulic pressure within the brake master cylinder, breaking the circuit and extinguishing the brake light.

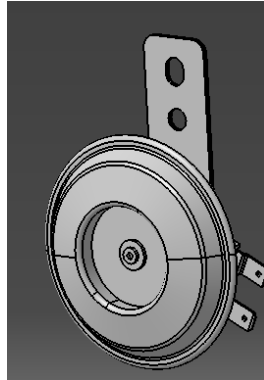
3. Basic Parameters

Actuation pressure: 0.1-0.6Mpa

4. Fault Mode

System

Switch corrosion, leakage, or malfunction

Horn**1. Outside View****2. Working Principle**

Horn working current loop: positive-pole lug plate → horn coil → contact → negative-pole lug plate. The magnetic field generated by current passing the horn coil will generate magnetism to move the bass diaphragm and treble diaphragm to disconnect the contracts, and then the current will be interrupted and the electromagnetic force will disappear. As a result, the diaphragm will spring back by itself and the contacts will be connected again, and the circuit will be closed again. By repeating the above actions, the diaphragm will vibrate continuously and make sounds. The contacts clearance can be adjusted by screws to change the vibration frequency of diaphragm, thus changing the pitch of sound.

3. Basic Parameters

Fundamental frequency: (450 ± 30) Hz, sound pressure level: (105-118)dB

4. Fault Mode

The contracts are burnt out;

The clearance between contacts is too large or too small (which can be adjusted and repaired);

The coil is short-circuited or open-circuited;

The outgoing insert is fractured or rusty.

5. Horn Adjustment

The contact arm may deform after a long time use, which may cause excessive large or small clearance and lead to excessive low horn volume or no sound. The problem can be fixed by adjusting the screw. Loosen the lock nut first, and then turn the screw clockwise or counterclockwise and switch on the horn power supply at the same time to adjust it to loudest sound, and at lost tighten the nut.

Diagnosis of Major Faults

Fault Phenomenon	Possible Cause	Solutions
The headlight fails to be lit; The high beam fails to be lit; The low beam fails to be lit; All lights cannot be lit.	The engine is not started; The engine speed sensor is failed; The voltage regulator is failed; The corresponding fuse is not connected or burnt out; The corresponding switch is failed; The BCM is failed; The light LED is failed; There is poor connection on circuit; The circuits of main cable are open-circuited.	Start the engine; Replace the engine speed sensor; Connect or replace the fuse; Repair or replace the switch; Replace the BCM; Replace the headlight; Reconnect; Repair or replace the main cable;
The headlight cannot be lit;	The main fuse, LED or circuit is in poor contact; The BCM is failed.	Reconnect; Replace the BCM.
Tail light fails to be lit; The rear position light fails to be lit; The license plate light fails to be lit; The front position light cannot be lit; All lights cannot be lit.	The light LED is failed; There is poor connection on circuit; The circuits of main cable are open-circuited.	Replace the tail light; Replace the front position light; Reconnect; Repair or replace the main cable;
The turn signal light fails to be lit; The front turn signal light fails to be lit; The rear turn signal light fails to be lit; All lights cannot be lit.	The battery is under-voltage; The corresponding fuse is not connected or burnt out; The switch of left-turn signal light is failed; The switch of right-turn signal light is failed; The light LED is failed; The BCM is failed; There is poor connection on circuit; The circuits of main cable are open-circuited.	Charge the battery; Connect or replace the fuse; Repair or replace the left switch; Repair or replace the left switch; Replace the turn signal light; Replace the BCM; Reconnect; Repair or replace the main cable;
The brake light fails to be lit;	The corresponding fuse is not connected or burnt out; The front brake light switch is failed; The rear brake light switch is failed; The light LED is failed; The circuit is faulted.	Connect or replace the fuse; Replace the front brake light switch; Adjust or replace the rear brake light switch; Replace the brake light; Check and repair.
The horn fails to make sound;	The corresponding fuse is not connected or burnt out; The horn button is failed; The horn is failed; There is poor connection on circuit; The circuits of main cable are open-circuited.	Connect or replace the fuse; Repair or replace the left switch; Adjust or replace the horn; Reconnect; Repair or replace the main cable;

18

Information Display System

Overview

Introduction to Main Parts and Components

Schematic Circuit Diagram

Diagnosis of Major Faults

Parts Layout Diagram

Overview

The information display system displays the static and dynamic information of the motorcycle through the instrument panel and provides it to the driver for safe operation.

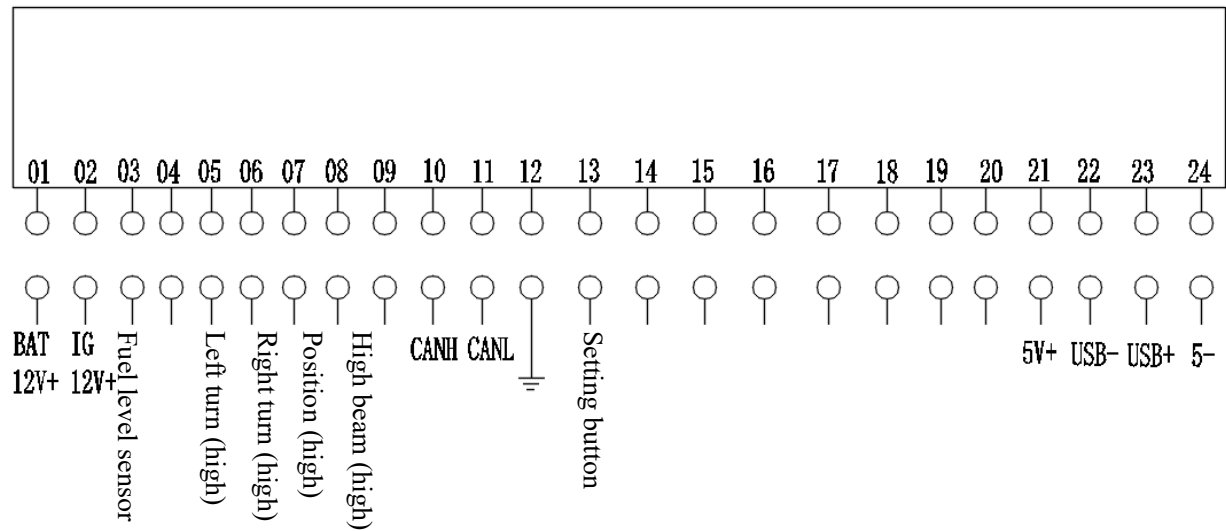
The motorcycle J200 information display system features: speedometer, tachometer, fuel level sensor, voltmeter, water temperature sensor, turn signal indicators, high beam indicator, position light, odometer/trip meter, clock, oil service indicator, BCM fault light, Bluetooth module, incoming call display, ABS malfunction indicator light (MIL), TCS MIL, engine MIL, and key detection indicator.

The signals of motorcycle J200 information display system are all electronic signals, and the instrument is an all-electronic instrument.

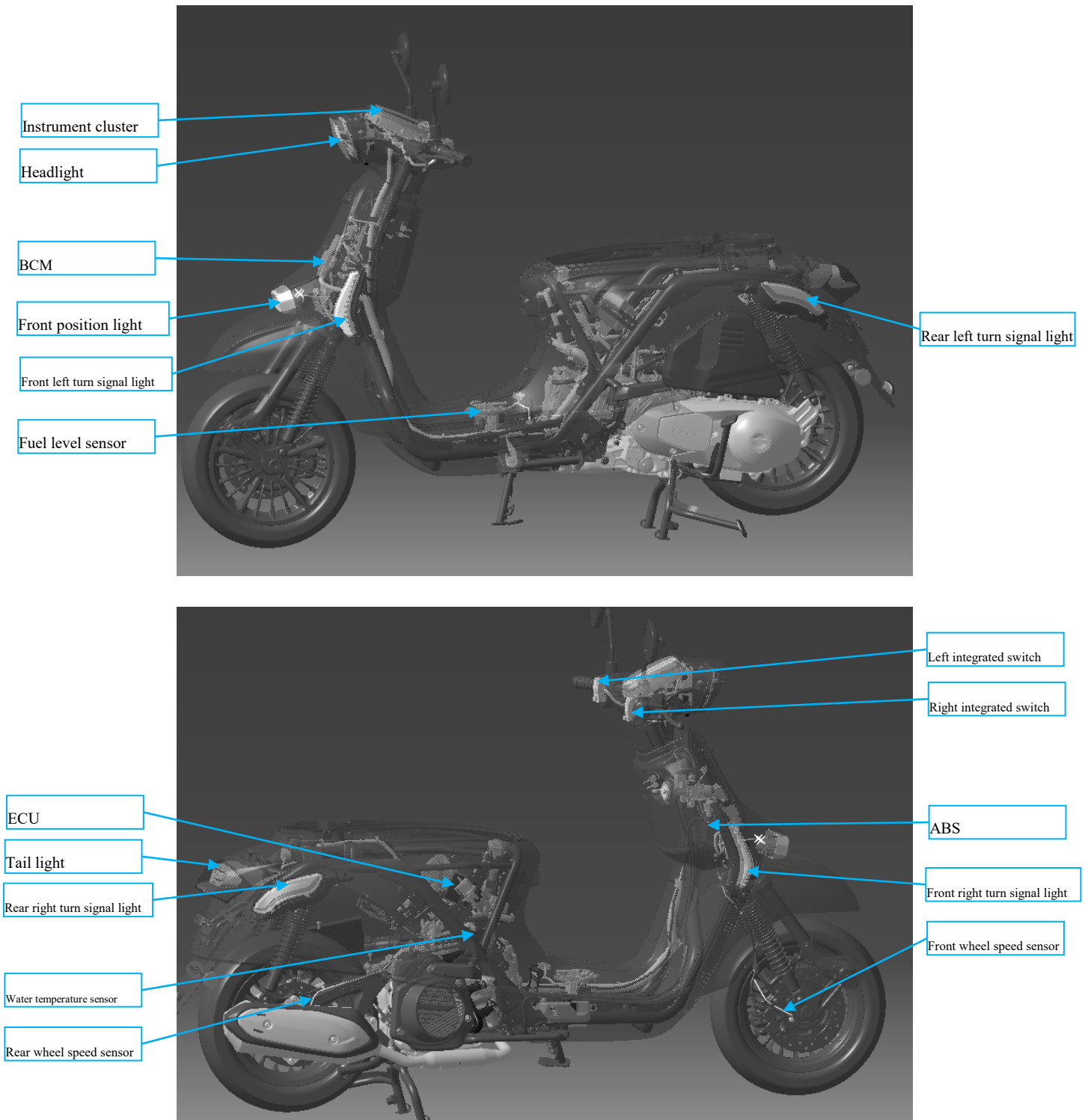
Parts and components of the system:

- Instrument cluster
- Speed sensor
- Fuel level sensor
- Signal switch
- BCM
- ABS
- ECU

Schematic Circuit Diagram



Parts Layout Diagram



Introduction to Main Parts and Components

Instrument cluster

1. Outside View



2. Working Principle

The all-electronic instrument is also known as digital instrument. The electronic signals (including digital signals and analog signals) input will be converted to digital signals after been processed in circuit and then be output through CPU to drive the stepping motor pointer, LCD and LED to display information.

3. Pin Function Table

Pin No.	Function	Signal	Pin No.	Function	Signal
1	BAT	+12V	13	SET	Setting button
2	IGN	+12V	14		
3	OIL	Oil quantity	15		
4			16		
5	L-indicator	Left turn	17		
6	R-indicator	Right turn	18		
7	PO-LIGHT	Position light	19		
8	HI-LIGHT	High beam	20		
9			21	5V+	Voltage output
10	CAN-H	CAN-H	22	USB-DM	USB-
11	CAN-L	CAN-L	23	USB-DP	USB+
12	GND	Ground	24	GND	Ground

4. Basic Function

Its display items include: speedometer, tachometer, fuel level sensor, voltmeter, water temperature sensor, turn signal indicators, high beam indicator, odometer/trip meter, clock, oil service indicator, low fuel warning light, Bluetooth module, incoming call display, ABS MIL, TCS MIL, engine MIL, key detection indicator, and ambient light sensor.

5. Fault Mode

Part of functions cannot be displayed correctly;

The time and mode cannot be changed via operating button;

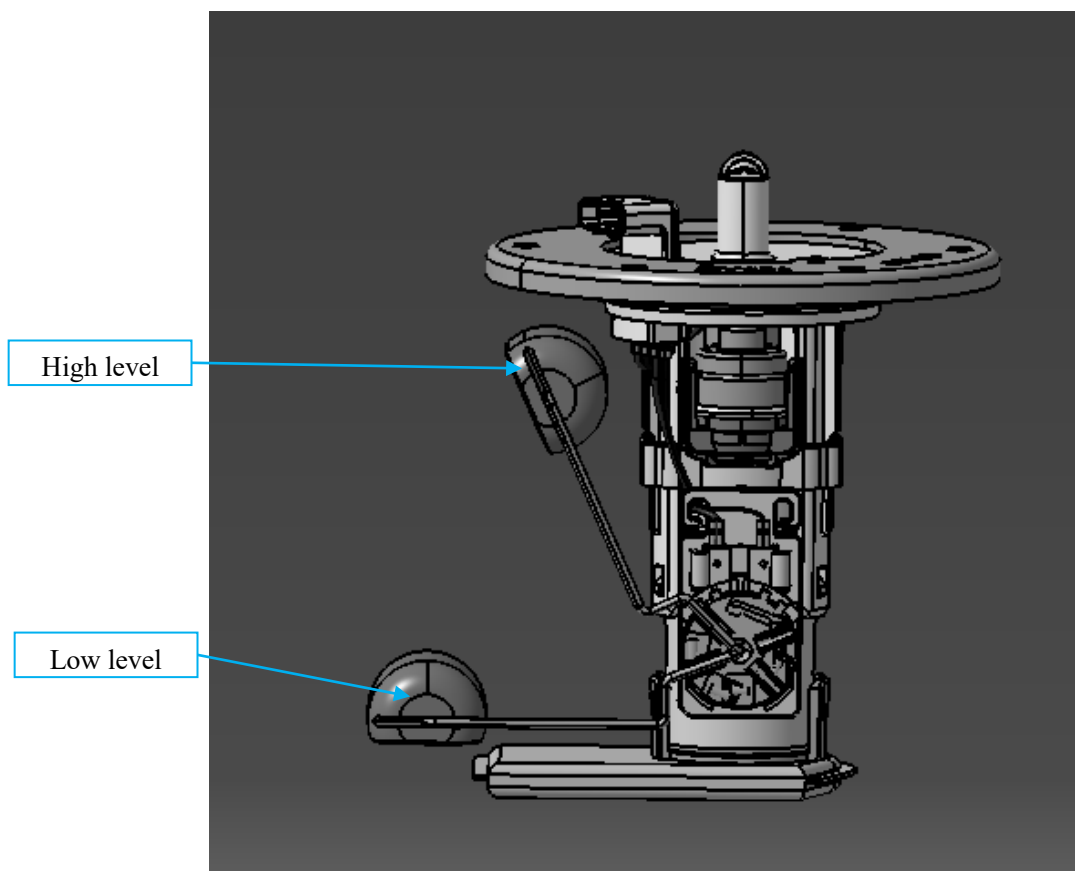
There is water in the instrument cluster;

The housing is broken due to mechanical vibration;

The surface is discolored or scratched.

Fuel Level Sensor

1. Outside View



2. Working Principle

The fuel level sensor and fuel pump are assembled on the fuel pump assembly, including float, float rod, contact chip, thick film circuit board, outgoing line and so on. The contact chip and the thick film circuit board constitute a variable resistance and the float level changes with the fuel level, driving the floating rod to rotate, and the position of variable resistance tap will change with it, and the corresponding resistance value will be output.

3. Corresponding Relation of Instrument Display Scale and Fuel Level Sensor

Warning light flashing (frequency: 2Hz)	97Ω~220Ω
Display 1 bar (warning light on)	72Ω~97Ω
Display 2 bars	52Ω~72Ω
Display 3 bars	20Ω~52Ω
Display 4 bars	2Ω~20Ω

4. Fault Mode

The float fell off;

The contact chip and thick film circuit board are poorly contacted;

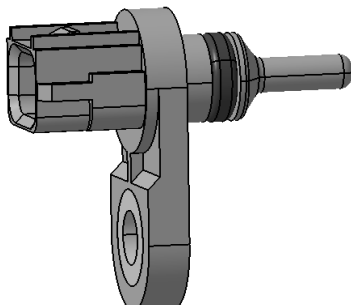
The bracket is fractured;

The circuit board is damaged;

The outgoing line fell off;

Water Temperature Sensor

1. Outside View



2. Working Principle

Water temperature sensor: After the engine starts, the water temperature rises, and the resistance of the IAT sensor reaches a preset value. The ECU receives and processes this signal, then transmits it to the instrument cluster, which displays the water temperature scale to inform the driver.

3. Corresponding Relation of Instrument Display Scale and Water Temperature

Temperature °C	Standard resistance (Ω)
$T \leq 60^{\circ}\text{C}$	0 bars: Water temperature icon displays normally.
$60^{\circ}\text{C} < T \leq 80^{\circ}\text{C}$	1 bar: Water temperature icon displays normally.
$80^{\circ}\text{C} < T \leq 100^{\circ}\text{C}$	2 bars: Water temperature icon displays normally.
$100^{\circ}\text{C} < T \leq 115^{\circ}\text{C}$	3 bars: Water temperature icon displays normally.
$115^{\circ}\text{C} < T \leq 120^{\circ}\text{C}$	4 bars: Water temperature warning icon illuminates red, and scale bar turns red.
$120^{\circ}\text{C} < T$	4 bars: Water temperature display and warning icon flash simultaneously, and scale bar remains red.

Diagnosis of Major Faults

Fault Phenomenon	Possible Cause	Solutions
Motorcycle speed indicator fault: The motorcycle speed is not displayed; The indicated motorcycle speed is far from the real one.	The space between the speed sensor and the signal panel is too large; The motorcycle speed sensor is failed; The signal panel is failed; The instrument cluster is failed; The circuit is not connected well or is open-circuited or short-circuited.	Reduce the space to be less than 2mm; Replace the vehicle speed sensor; Replace the signal panel; Replace the instrument cluster; Reconnect or repair.
No mileage increase indication for motorcycle speed	The instrument cluster is failed.	Replace the instrument cluster.
Engine speed indication fault	The circuit is not connected well or is open-circuited; The instrument cluster is failed; The ECU is failed.	Reconnect or repair; Replace the instrument cluster; Replace the ECU.
The ABS fault light is always on; When the motorcycle is powered on, the instrument self-check ABS fault light fails to be lit.	The ABS fault occurs; The instrument cluster is failed; The circuit is not connected well or is open-circuited or short-circuited.	Replace the ABS; Replace the instrument cluster; Reconnect or repair.
There is fuel but no fuel level indication; There is fuel level indication but no fuel.	The fuel sensor is failed or the float is stuck; The instrument cluster is failed; The circuit is not connected well or is open-circuited or short-circuited.	Replace the fuel sensor; Replace the instrument cluster; Reconnect or repair.
Temperature warning light stays on	The circuit is not connected well or is open-circuited; The instrument cluster is failed; Water temperature sensor is failed; The ECU is failed.	Reconnect or repair; Replace the instrument cluster; Replace the water temperature sensor; Replace the ECU.
False alarm of voltage alarm light Alarm failure of voltage alarm light	The circuit is not connected well or is open-circuited; The instrument cluster is failed.	Reconnect or repair; The instrument cluster is failed.
The BCM fault light is always on.	The BCM fault occurs; The instrument cluster is failed.	Replace the BCM; Replace the instrument cluster.
Failure of instrument displaying ECU information	The circuit is not connected well or is open-circuited; The instrument cluster is failed; The ECU is failed.	Reconnect or repair; Replace the instrument cluster; Replace the ECU.
Lighting failure of turn signal indicator Lighting failure of high beam indicator	The circuit is not connected well or is open-circuited; The instrument cluster is failed.	Reconnect or repair; Replace the instrument cluster.
No clock display; It cannot be adjusted or there is a serious time error;	The right switch upper adjustment button is faulty. The instrument cluster is failed.	Replace the right switch; Replace the instrument cluster.
Mode change failure; Function regulation failure of instrument	The right switch upper adjustment button is faulty. The instrument cluster is failed.	Replace the right switch; Replace the instrument cluster.

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Engine Management System

Overview

The engine management system of motorcycle J200 adopts the closed-loop electronic injection system which can effectively control the mixture air-fuel ratio by controlling the fuel injection volume, so as to reach the best air-fuel ratio of engine under various working conditions, and to improve power, reduce fuel consumption, reduce exhaust pollution, improve driving performance, low temperature starting performance and idle performance.

The controls of closed-loop electronic fuel injection system include: fuel quantity control, ignition timing control, ignition closed angle, etc. The fuel quantity control is the most important function of the system, which includes: λ closed-loop control, start control, post-start control, warm-up control, idle control, partial load control, full load control, acceleration and deceleration control, over-speed fuel cut-off control and deceleration fuel cut-off control.

The system mainly consists of:

1. Sensors:

- Three-in-one sensor (intake air temperature, intake air pressure, and throttle valve opening information)
- Engine temperature sensor (engine temperature)
- Muffler oxygen sensor (Excess air coefficient greater than or less than 1)
- Engine speed sensor (rev, crankshaft position)

2. Actuators:

- Fuel pump
- Fuel injector (fuel supply)
- Ignition coil
- High-voltage connecting wire
- Spark plug (ignition)
- Throttle valve, idle stepping motor (air intake)

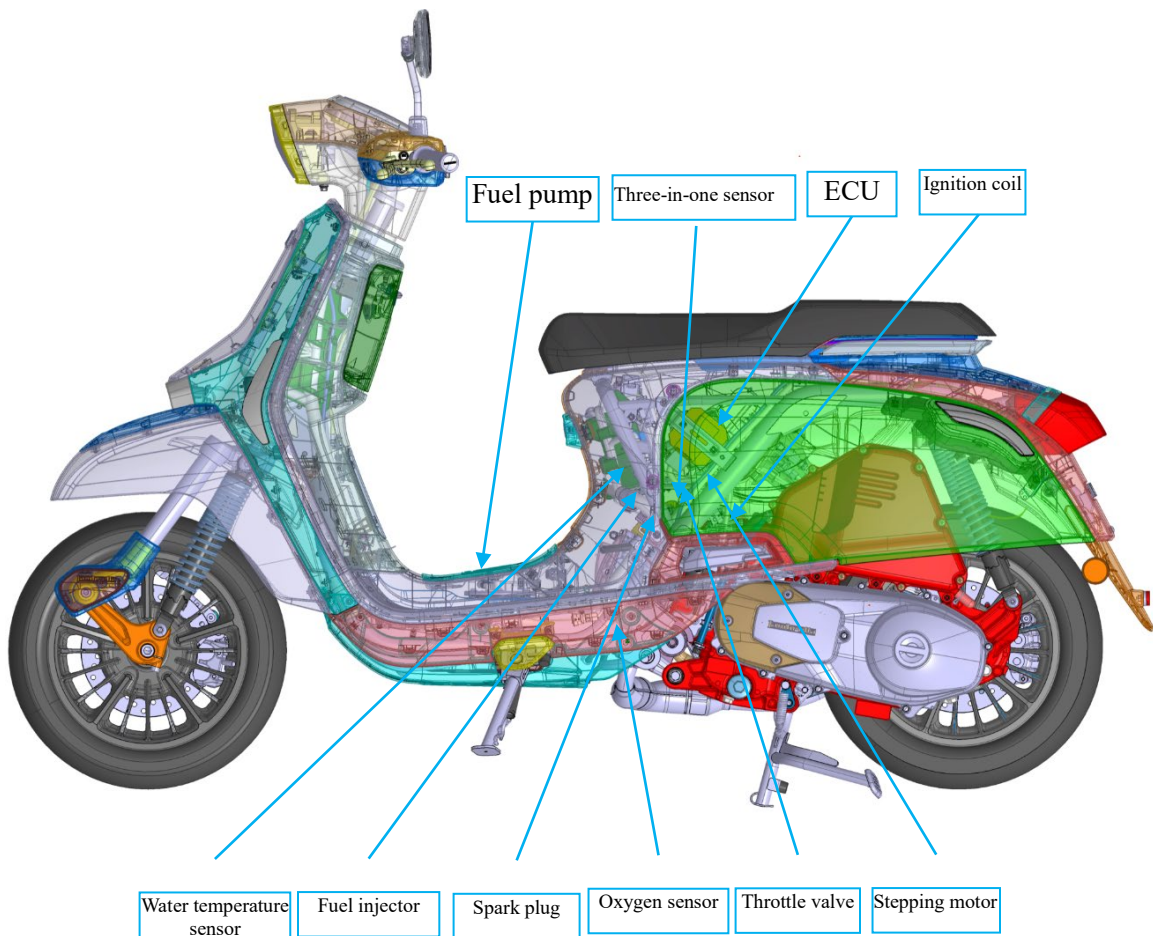
3. Electronic control unit:

- ECU

Notes for Maintenance

1. The fault of electronic fuel injection system can be diagnosed by the fault indicator on instrument and also by communicating the special diagnostic device with the ECU.
2. During fault diagnosis, prioritize checking whether the power supply circuit and grounding wire are normal.
3. If the throttle position is adjusted, it is necessary to turn off the key switch and restart for the self-learning of idle position of engine.
4. If any sensor fails, the ECU will continue to run in limping with default value. Please drive the motorcycle to the special maintenance shop for repairing. If the actuator fails, the ECU will not be able to control the normal running of the motorcycle. Please contact the special maintenance shop immediately repairing.

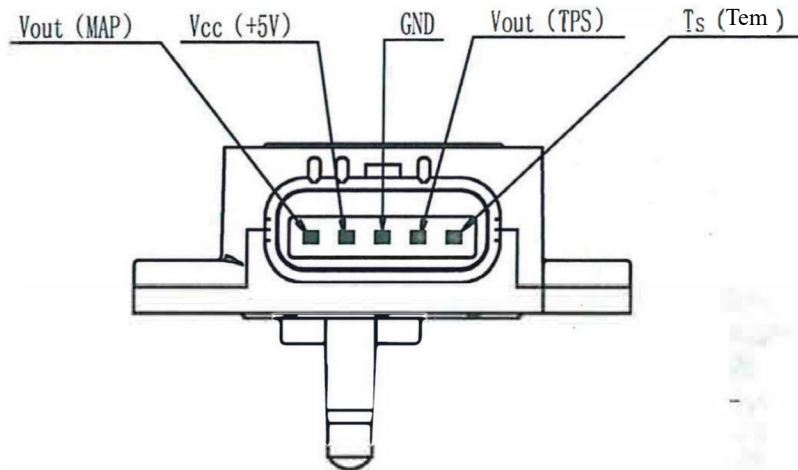
Parts Layout Diagram



Introduction to Main Parts and Components

Three-in-one Sensor

1. Pin Definition



2. Working Principle

The three-in-one sensor integrates the function of absolute pressure sensor of intake manifold, absolute temperature sensor of intake pipe and sensor of throttle valve opening.

The absolute pressure sensor of intake manifold consists of the pressure conversion element (elastic diaphragm + strain resistance) and the signal processing circuit that amplifies the output signal of conversion units. Since the vacuum chamber is at one side of the pressure conversion element and the intake manifold pressure is introduced from the other side. So, the higher of absolute pressure in the intake manifold, the greater the deformation of diaphragm, that is, the deformation is proportional to the pressure. The resistance value of the strain resistance attached to the elastic diaphragm changes in proportion to its deformation. With this, the changes of pressure in intake manifold can be converted to electrical signal.

The core temperature sensing element of the engine intake air temperature sensor is composed of a semiconductor thermistor with negative temperature coefficient (NTC). Generally, the temperature sensor requires a special measuring circuit to test its resistance characteristics. The output characteristics of the semiconductor thermistor with NTC is that the resistance value of thermistor is inversely proportional to the change of temperature: that is, the higher temperature, the lower output resistance of thermistor; and the lower temperature, the higher output resistance of thermistor.

The throttle sensor is an angle sensor with linear output, which is essentially an angular displacement sliding rheostat, and it consists of two arc-shaped sliding resistors and two sliding arms. The rotating shaft of sliding arm is connected with the throttle shaft on the same axis. And 5V power supply voltage U_S is applied on both ends of the sliding rheostat. When the throttle rotates, the sliding arm will rotate along with it and move on the sliding resistor and extract the potential U_P of contact as the output voltage, so that the throttle opening angle signal can be converted into a voltage signal.

3. Basic Parameters

Pressure test range: 10-115KPa;

Limiting pressure: 655KPa (pressure greater than this value will cause permanent damage);

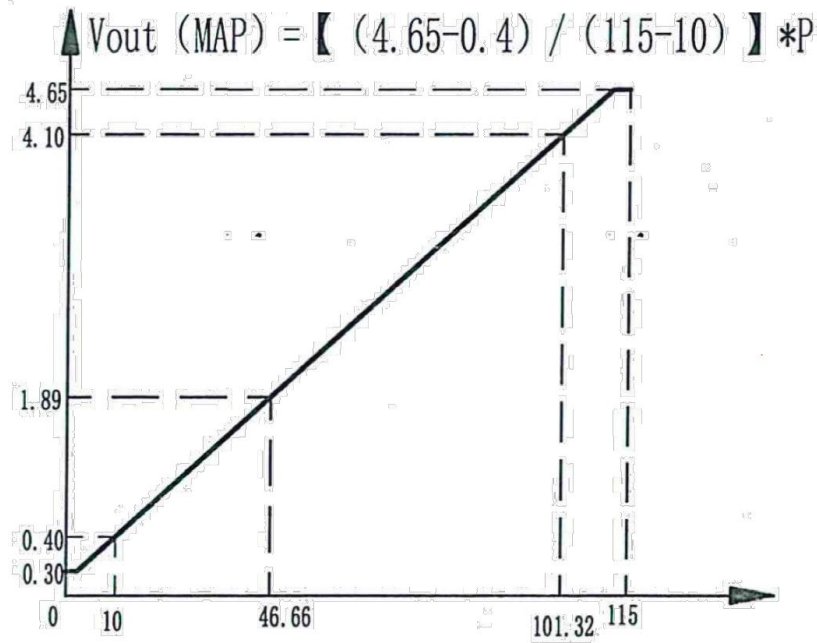
Operating temperature range: -40°C-120°C;

Storage temperature range: -40°C-120°C

Operating voltage range: $5V \pm 0.1V$ DC;

Zero-power resistance range of thermistor: $R_{25} = 10.00K\Omega \pm 0.1K\Omega$

Diagram of relation of intake pressure and output voltage:

Pressure-Voltage Output Curve

See the characteristic parameters of thermistor when the intake air temperature sensor is not loaded in the following table:

R-T Characteristics Table			
temperature/°C	Rmin/KΩ	Rcent/KΩ	Rmax/KΩ
-40	265.00	276.72	288.92
-20	88.016	90.889	93.846
0	31.511	32.203	32.908
25	9.900	10.000	10.100
50	3.516	3.588	3.661
85	1.030	1.064	1.099
100	0.6512	0.6757	0.7011
120	0.3728	0.3890	0.4059
140	0.2253	0.2363	0.2478

Throttle valve position & opening

Measurement range: 10°-90° (from idle speed to full open)

Throttle position sensor reference voltage: 5V±0.3V

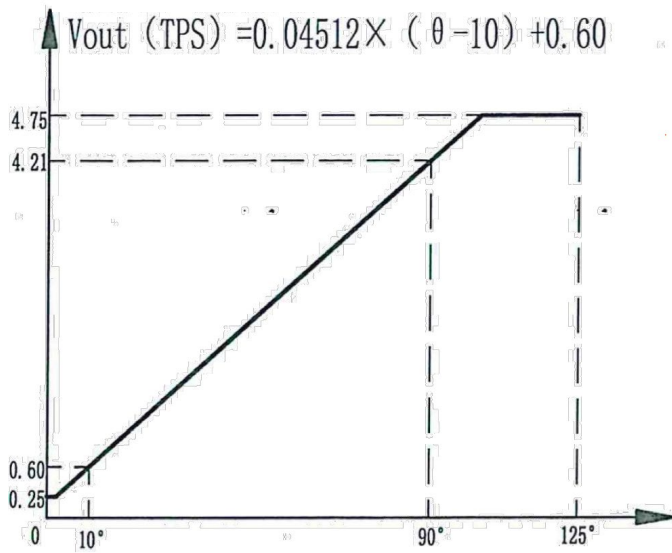
When the throttle valve is fully closed, the normal output voltage range is (0.60±0.20)V.

When the throttle is fully opened, the normal output voltage range is (4.30±0.20)V of the reference

voltage.

The performance curve of throttle position sensor is as follows:

Angle-Voltage Output Curve:



4. Fault Mode

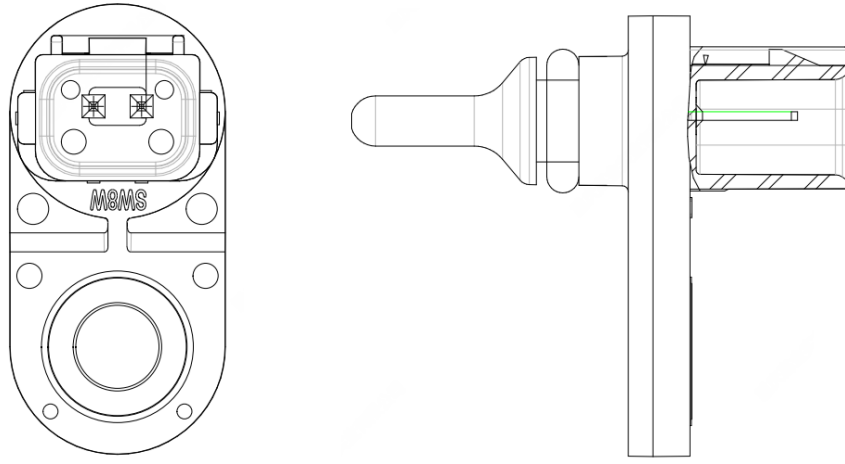
The sensor probe is blocked by a foreign matter;

The joint of sensor leaks air;

The sensor is short-circuited or open-circuited;

There is water in the sensor;

The sensor suffers mechanical failure;

Engine Temperature Sensor**1. Outside View****2. Working Principle**

The engine temperature sensor is a thermistor with negative temperature coefficient (NTC), which utilizes the thermistor's temperature sensitivity to convert the change of ambient temperature into the change of thermistor resistance value, and then converted it into a voltage signal through a bleeder circuit and output it to the ECU. The thermistor resistance decreases as the temperature of the coolant increases, but not linearly.

3. Basic Parameters

The temperature curve R-T of engine temperature sensor is as follows:

TEMP. ° C	NOMINAL k Ω	TEMP. C	NOMINAL k Ω	TEMP. C	NOMINAL kΩ	TEMP. OC	NOMINAL k Ω	TEMP. C	NOMINAL k Ω
-40.0	64.30	0.0	6.643	40.0	1.138	80.0	0.2815	120.0	0.0917
-39.0	60.28	1.0	6.322	41.0	1.095	81.0	0.2729	121.0	0.0894
-38.0	56.54	2.0	6.018	42.0	1.053	82.0	0.2646	122.0	0.0872
-37.0	53.06	3.0	5.731	43.0	1.014	83.0	0.2566	123.0	0.0851
-36.0	49.81	4.0	5.459	44.0	0.9755	84.0	0.2488	124.0	0.0830
-35.0	46.79	5.0	5.201	45.0	0.9391	85.0	0.2414	125.0	0.0810
-34.0	43.96	6.0	4.957	46.0	0.9042	86.0	0.2342	126.0	0.0790
-33.0	41.32	7.0	4.726	47.0	0.8708	87.0	0.2273	127.0	0.0771
-32.0	38.86	8.0	4.507	48.0	0.8389	88.0	0.2206	128.0	0.0753
-31.0	3,656	9.0	4.300	49.0	0.8082	89.0	0.2141	129.0	0.0735
-30.0	34.41	10.0	4.103	50.0	0.7789	90.0	0.2078	130.0	0.0717
-29.0	32.40	11.0	3.916	51.0	0.7508	91.0	0.2018	131.0	0.0700
-28.0	30.52	12.0	3.739	52.0	0.7238	92.0	0.1960	132.0	0.0684
-27.0	28.76	13.0	3.571	53.0	0.6980	93.0	0.1904	133.0	0.0668
-26.0	27.11	14.0	3.411	54.0	0.6732	94.0	0.1849	134.0	0.0653
-25.0	25.57	15.0	3.260	55.0	0.6495	95.0	0.1797	135.0	0.0638
-24.0	24.12	16.0	3.116	56.0	0.6267	96.0	0.1746	136.0	0.0623
-23.0	22.76	17.0	2.979	57.0	0.6048	97.0	0.1697	137.0	0.0609
-22.0	21.49	18.0	2.849	58.0	0.5838	98.0	0.1649	138.0	0.0595
-21.0	20.30	19.0	2.725	59.0	0.5636	99.0	0.1603	139.0	0.0581
-20.0	19.18	20.0	2.608	60.0	0.5443	100.0	0.1559	140.0	0.0568
-19.0	18.13	21.0	2.496	61.0	0.5257	101.0	0.1516	141.0	0.0556
-18.0	17.14	22.0	2.389	62.0	0.5079	102.0	0.1475	142.0	0.0543
-17.0	16.22	23.0	2.288	63.0	0.4907	103.0	0.1435	143.0	0.0531
-16.0	16.34	24.0	2.192	64.0	0.4742	104.0	0.1396	144.0	0.0519
-15.0	14.53	25.0	2.100	65.0	0.4584	105.0	0.1358	145.0	0.0508
-14.0	13.75	26.0	2.013	66.0	0.4432	106.0	0.1322	146.0	0.0497
-13.0	13.03	27.0	1.929	67.0	0.4285	107.0	1,286	147.0	0.0486
-12.0	12.35	28.0	1.850	68.0	0.4144	108.0	0.1252	148.0	0.0476
-11.0	11.70	29.0	1.774	69.0	0.4009	109.0	0.1219	1,490	0.0465
-10.0	11.10	30.0	1.702	70.0	0.3879	110.0	0.1187	150.0	0.0455
-9.0	10.53	31.0	1.633	71.0	0.3753	111.0	0.1156	151.0	0.0446
-8.0	9.989	32.0	1.567	72.0	0.3633	112.0	0.1126	152.0	0.0436
-7.0	9.482	33.0	1.505	73.0	0.3517	113.0	0.1097	153.0	0.0427
-6.0	9.003	34.0	1.445	74.0	0.3405	114.0	0.1069	154.0	0.0418
-5.0	8.551	35.0	1.388	75.0	0.3297	115.0	0.1041	155.0	0.0409
-4.0	8.125	36.0	1.333	76.0	0.3193	116.0	1,015	156.0	0.0401
-3.0	7.722	37.0	1.281	77.0	0.3094	117.0	0.0989	157.0	0.0393
-2.0	7.342	38.0	1.231	78.0	0.2997	118.0	0.0964	158.0	0.0385
-1.0	6.983	39.0	1.184	79.0	0.2905	119.0	0.0940	159.0	0.0377
0.0	6.643	40.0	1.138	80.0	0.2815	1,200	0.0917	160.0	0.0369

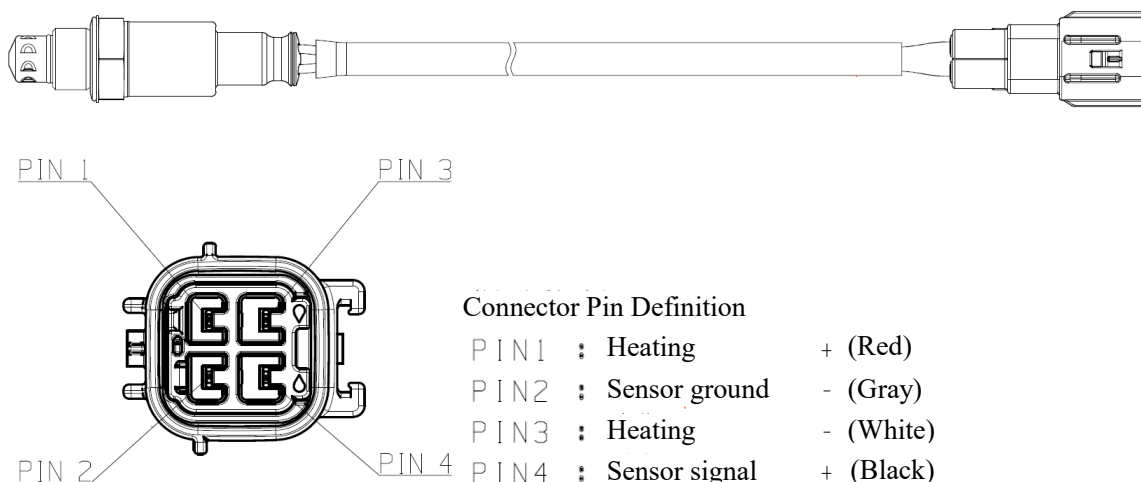
4. Fault Mode

The resistance is inaccurate;

The sensor is open-circuited or short-circuited.

Oxygen Sensor

1. Outside View and Definition of Pins



2. Working Principle

The OSMa oxygen sensor utilizes a flat-structured, multi-layer ceramic element as its basic element, with a zirconia layer serving as the core element. This zirconia element functions as a simple solid-state galvanic cell. Based on electrochemical principles, the cell generates a potential difference between the electrodes due to the difference in oxygen ion concentrations. The external electrode's oxygen ion concentration varies according to actual working conditions due to its exposure to exhaust gas, while the internal electrode maintains a constant oxygen ion concentration using reference air. When the engine's air-fuel ratio is lean, the oxygen ion concentration in the exhaust gas is relatively high. This results in a small concentration difference and a small potential difference between the internal and external electrodes, keeping the oxygen sensor's output voltage signal close to 0V. Conversely, when the air-fuel ratio is rich, the oxygen ion concentration in the exhaust gas is relatively low. This creates a large concentration difference and a large potential difference, causing the sensor output voltage to approach 1V.

3. Basic Parameters

Characteristic parameter of oxygen sensor with exhaust temperature at 450°C:

Rich mixture ($\lambda < 1$), output voltage of oxygen sensor: $\geq 600\text{mV}$;

Lean mixture ($\lambda > 1$), output voltage of oxygen sensor: $\leq 100\text{mV}$;

Rich-lean response time $\leq 80\text{ms}$;

Lean-rich response time $\leq 65\text{ms}$.

Heater power when exhausting at 13.5V & 450°C: 7.0W

Heater current when exhausting at 13.5V & 450°C: $0.52\text{A} \pm 0.10\text{A}$

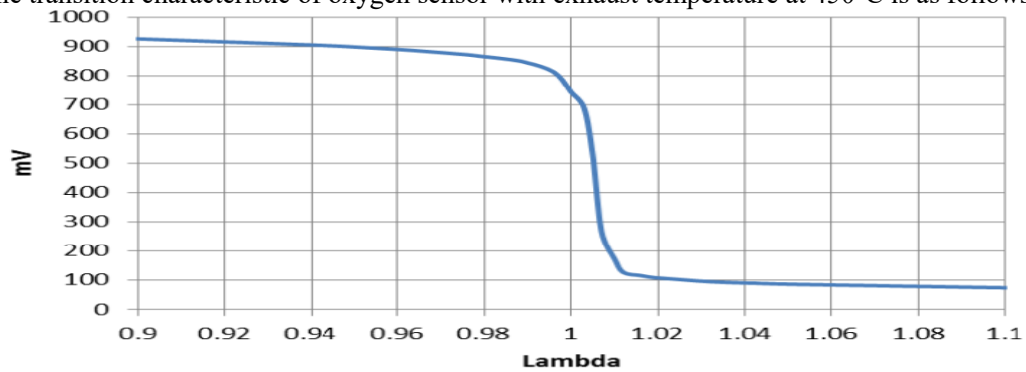
Nominal voltage of oxygen sensor: 13.5V

Maximum operating voltage of oxygen sensor: 18V

Minimum operating voltage of oxygen sensor: 10V

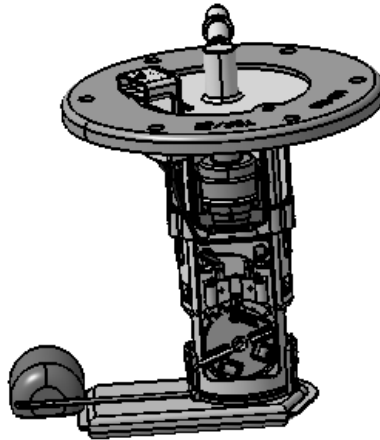
Limit voltage of oxygen sensor (at 21°C, $< 60\text{s}$): 21V

The transition characteristic of oxygen sensor with exhaust temperature at 450°C is as follows:



4. Fault Mode

- The heating element is failed;
- The sensing element is failed;
- The ceramic tube is broken;
- The heating circuit is short-circuited or open-circuited;
- The sensor circuit is short-circuited or open-circuited.

Fuel Pump**1. Outside View****2. Working Principle**

The fuel pump assembly integrates the fuel pump core, bracket, strainer, and pressure regulator valve, and is installed inside the fuel tank. When the fuel pump core operates, the fuel passes through the strainer for filtration. It then travels through the fuel pump core to the pressure regulator valve, where it is regulated to a specific pressure before being output to the external fuel line and finally to the fuel injector. The fuel's constant fuel pressure is set to 350kPa. (Including fuel level sensor)

3. Basic Parameters

Storage temperature: -40°C-80°C;

Operating temperature: -30°C-70°C;

Fuel temperature: -30°C-60°C;

Insulation resistance of conductive parts and insulation parts: > 500MΩ;

Fuel level sensor resistance: 2Ω-100Ω.

4. Fault Mode

The fuel pump fails to rotate;

The pressure regulating valve fails;

The support fails to vibrate;

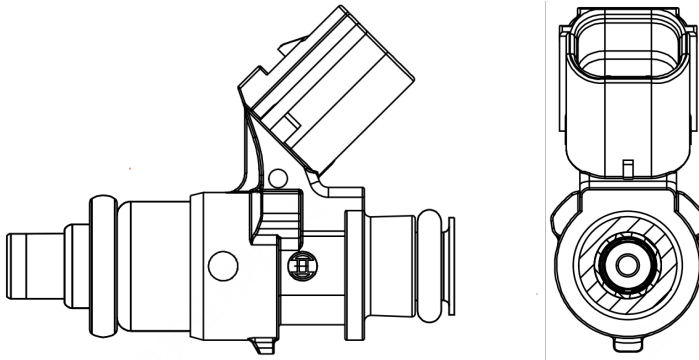
The fuel pump is short-circuited or open-circuited;

The fuel leaks from the seal ring.

The fuel level sensor resistance is open-circuited or short-circuited.

Fuel Injector

1. Outside View



2. Working Principle

The fuel injector is actually an element controlled by an electromagnetic switch. The fuel is supplied from the top.

There is an electromagnetic coil winding round an iron core and the two electrodes from the electromagnetic coil are the input control interface of the injector. The injector is directly connected to the control circuit of engine electronic control module (ECM) and system power through the engine cable harness.

The electromagnetic coil of the injector directly receives the output control voltage signal of the engine ECM, that is, the ECM directly drives the electromagnetic coil to control the opening and closing time of the lower ball valve of the injector. When the electromagnetic coil is energized, the electromagnetic force generated will overcome the spring force of ball valve and the fuel pressure to raise the ball valve, and the high-pressure fuel (350kPa) in the fuel line can pass through the valve seat hole of injector, flow through the injection orifice plate and form a cone spray which will be sprayed onto the intake valve. When the fuel injector is deenergized, the magnetic force of electromagnetic coil will disappear, and the ball valve of fuel injector will close under the action of the return spring, so that the fuel injection will stop. The injector orifice plate is a thin plate located at the injector head for precise control of fuel injection volume and uniform atomization.

3. Basic Parameters

Operating temperature range: -30°C-125°C

System fuel pressure: 350kPa

Static coil resistance: $12.0\Omega \pm 0.6\Omega$

Maximum end fuel leakage rate: 0.6cc/min.

Normal operating voltage: 9-15V

Storage temperature range: -40-60°C

4. Fault Mode

The fuel injector is blocked;

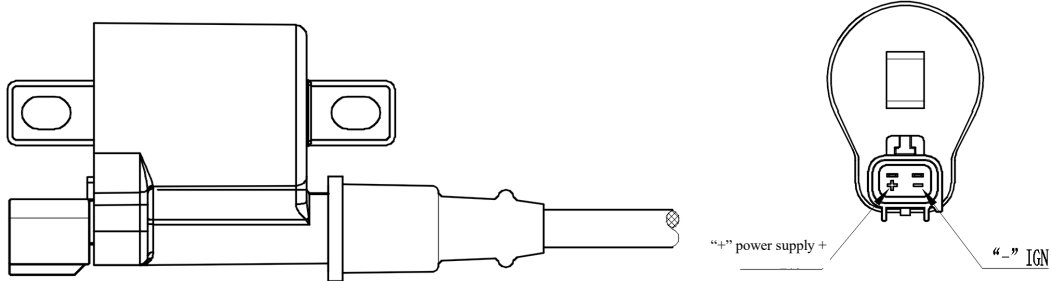
The electromagnetic coil is open-circuited or open-circuited;

The fuel injector fails to vibrate;

The fuel leaks from the seal ring.

Ignition Coil

1. Outside View and Definition of Pins



2. Working Principle

The ignition coil consists of primary winding, secondary winding, iron core, shell and so on. When the voltage of battery is applied to the primary winding, the primary winding is charged. Once the ECU cuts off the primary resistance circuit, the charging stops. Meanwhile, the high voltage electricity will be detected in the secondary winding, and sparks will be generated through the discharge of the high voltage connection wire and spark plug so as to ignite the mixture of fuel and air in the cylinder.

3. Basic Parameters

Operating voltage: 6V-16V;

Primary coil resistance: $1.0\Omega \pm 0.15\Omega$;

Secondary coil resistance: $10k\Omega \pm 1.5k\Omega$;

Spark plug cap resistance: $5K\Omega \pm 1K\Omega$;

Insulation resistance: under normal temperature condition, the insulation resistance between ignition coil shell and copper sheath of spark plug cap shall be greater than $1000M\Omega$;

4. Fault Mode

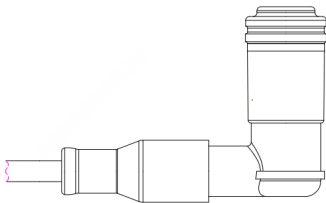
The primary winding is open-circuited;

The secondary winding is broken down and short-circuited;

The surface discharges.

○ High-voltage Connecting Wire

1. Outside View



2. Working Principle

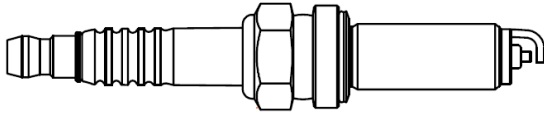
The high voltage connecting wire connects the ignition coil to the spark plug. It consists of spark plug cap, high voltage wire and ignition coil connector cap.

3. Fault Mode

The connection between voltage wire, spark plug cap and ignition coil connector cap is loose;

The insulation rubber sleeves of spark plug cap or ignition coil connector cap is aged or leaks electricity;

The circlip of spark plug cap or ignition coil connector cap is failed or in poor contact.

Spark plug**1. Outside View****2. Working Principle**

The spark plug is to introduce the high voltage generated by the ignition coil into the combustor and spark the mixture between its two electrodes. The spark plug mainly consists of center electrode, side electrode, connecting screw, insulator, sealing washer and shell. The damping resistance powder is applied between the connecting screw and center electrode to better suppress the interference caused by ignition. The spark plug has different calorific value which is determined by the length of insulator skirt section. The longer the insulator skirt section is, the lower degree of heat dissipation and the lower calorific value, and vice versa.

3. Basic Parameters

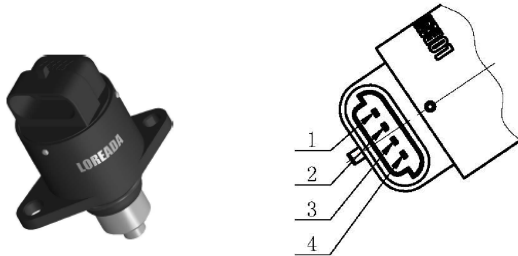
Spark plug model: BN8RTC;
(3-10) k Ω resistance in spark plug.

4. Fault Mode

There is heavy carbon deposits in the spark plug;
The spark plug electrode is burnt;
The spark plug insulator breaks;
The spark plug is overheated;
The spark plug leaks air.

Idle Stepping Motor

1. Outside View and Definition of Pin



<div>EXTENSION</div> <div>↓</div>	STEP	Q1-Q4	Q2-Q3	Q5-Q8	Q6-Q7	STEP	<div>↑</div> <div>RETRACTION</div>
	1	ON	OFF	ON	OFF	1	
	2	ON	OFF	OFF	ON	2	
	3	OFF	ON	OFF	ON	3	
	4	OFF	ON	ON	OFF	4	
	1	ON	OFF	ON	OFF	1	
4-step Motor Drive Table							

2. Working Principle

The principle of idle bypass air volume control valve is derived from the one of stepping motor. It consists of a rotor which composes of two special-shape permanent magnets, a stator which composes of two sets of two phase electromagnetic coils, a threaded rotor drive mechanism which changes rotational motion to straight motion, a cone control valve, an input circuit signal connector, a spring, a metal fixing shell for assembly, a rubber seal ring and other elements. When a specific electric pulse input signal acts on the two sets of electromagnetic coils, the polarity of the electromagnetic field formed by the coils will be changed in a certain order. According to the principle of like charges repelling each other while opposite charges attracting, the rotor mechanism will be driven to rotate in a certain direction. Therefore, the stepping motor can convert the electrical pulse input signal into a discontinuous mechanical rotational motion, and then transform the rotating motion of the rotor into the linear motion of regulating head.

3. Basic Parameters

Rated operating voltage: 12V;

Allowable operating voltage: 7.5V-14V;

Allowable operating temperature: -40°C-125°C;

Specification of DC resistance of each coil: $53\Omega \pm 5.3\Omega$ (tested under 27°C);

Resonant frequency range: 70pps-120pps;

4. Fault Mode

The line is blocked or leaks air;

The idle actuator is blocked;

The electromagnetic coil is open-circuited or open-circuited;

The idle actuator fails to vibrate.

ECU**1. Outside View****2. Working Principle**

ECU obtains various information about the actual working status of the engine or vehicle through a number of sensors allocated to the engine management system. ECU drives the actuator of the system with pre-set and pre-stored data to optimize and control the engine operating condition.

The main input signal sensors of electronic fuel injection system include: engine intake manifold pressure (MAP) sensor, engine intake manifold air temperature (MAT) sensor, cylinder cover temperature/coolant temperature (CLT) sensor, oxygen (O2) sensor, crankshaft positions (CPS) sensor and so on.

The ECU controls the engine through the system-equipped actuators. The actuators of the system mainly include the fuel injectors (INJ), ignition coil (IGN), electric fuel pump and idle air control valve (IACV) and other elements.

3. Basic Parameters

Normal operating voltage: 9V-16V;

The ECU system has the short-time anti-26V voltage protection function and short-time anti-13V reversed polarity voltage protection function. If the ECU is subjected to over-voltage or reverse polarity voltage for a long time, the hardware will be permanently damaged.

Storage temperature range: -40°C-105°C

Operating temperature: -20°C-85°C

4. Fault Mode

The connector is failed;

The element is damaged;

Water enters in and causes short-circuit;

The elements are failed after vibration.

EMS Faults Diagnosis Process

1. Analyze feedback by user

Keep a detailed record of the problem (fault, other information reported by the user) and the occurrence process stated by the user.

2. Check, record and sort out DTCs

The fault can be determined by the instrument indicator or using fault diagnosis tester and reading the fault code.

Fault diagnosis code confirmation procedure:

Turn on the power $\Rightarrow$ Connect the fault diagnosis instrument $\Rightarrow$ Read the history fault and clear the history fault $\Rightarrow$ Turn off the power and then turn it on $\Rightarrow$ Start the engine and running it at idle for 2min. (press the start button for 5s if it cannot be started) and accelerate and decelerate it for 2-3 times $\Rightarrow$ Read the current fault with PCHUD software.

3. Check appearance

Check whether the wiring connector, fuse, high voltage connecting wire, throttle valve and their parts are abnormal.

4. Check basic function

Check the battery voltage

Check the starting, idle running and acceleration condition

Check whether the fuel pump is running

Check the ignition spark and spark plug

Check whether there is scrap iron in the engine speed sensor

Check whether the rubber hose of pressure sensor is broken

Check whether the fuel injector is blocked

Check other items.

5. Handle the fault according to the confirmed fault code, appearance check and basic function check results.

6. Use a fault diagnosis unit to check whether the data of heat engine at idle is in the specified range.

7. Analyze and process the fault according to the methods in the Fault Diagnosis Table.

8. Clear the fault code.

EMS Fault Diagnosis Table

Fault Phenomenon	Possible Cause	Solutions
Starting difficulties	<p>The starting system is faulted;</p> <p>There is excessive engine starting resistance or insufficient cylinder pressure;</p> <p>The air filter is clogged or there is leakage in the throttle valve body or the air inlet hose;</p> <p>There is no spark or abnormal spark;</p> <p>The fuse is broken;</p> <p>The engine starting speed is lower than 300r/min;</p> <p>The high-voltage connecting wire is poorly connected;</p> <p>The spark plug cap is aging or waterlogged, or the insulation is poor;</p> <p>The main cable is faulty or poorly grounded;</p> <p>The spark plug is faulty;</p> <p>The ignition coil is faulty;</p> <p>The emergency stop switch is faulty;</p> <p>ECU fault occurs;</p> <p>The engine speed sensor or signal wheel is faulty;</p> <p>There is no or insufficient fuel pressure;</p> <p>The fuel pump relay fault occurs;</p> <p>The fine filter is blocked or the fuel pump is faulty;</p> <p>The fuel line is blocked or leaks;</p> <p>The fuel injector is faulty;</p> <p>The intake air pressure sensor is faulty or the hose is broken;</p> <p>The ignition timing is incorrect;</p> <p>The fuel has deteriorated or contains water.</p>	<p>Repair the starting system with the methods described in the previous chapter;</p> <p>Check the engine mechanical part;</p> <p>Repair the air filter, throttle valve body or air inlet hose;</p> <p>Replace the fuse;</p> <p>Check the starting system;</p> <p>Reconnect;</p> <p>Replace the spark plug cap;</p> <p>Repair the cable;</p> <p>Remove carbon deposits or replace the spark plug;</p> <p>Replace the ignition coil;</p> <p>Replace the emergency stop switch;</p> <p>Reconnect or replace the ECU;</p> <p>Remove iron filings and adjust the gap;</p> <p>Reconnect or replace the fuel pump relay;</p> <p>Replace the fine filter or fuel pump;</p> <p>Replace the fuel line;</p> <p>Replace the fuel injector;</p> <p>Replace the inlet air pressure sensor or hose;</p> <p>Re-adjust the ignition timing;</p> <p>Replace with the qualified fuel.</p>
The engine has unstable idle speed or no idle speed, and it shuts off when the fuel is returned;	<p>There is insufficient cylinder pressure;</p> <p>The air filter is clogged or there is leakage in the throttle valve body or the air inlet hose;</p> <p>The exhaust system is blocked;</p> <p>Check the ignition system;</p> <p>The high-voltage connecting wire is poorly connected;</p> <p>The spark plug cap is aging or waterlogged, or the insulation is poor;</p> <p>The spark plug has deposited carbon or is faulty;</p> <p>The engine speed sensor or signal wheel is faulty;</p> <p>The ignition timing is incorrect;</p> <p>Check the fuel supply system;</p> <p>The fine filter is blocked or the fuel pump is faulty;</p> <p>The fuel line is blocked;</p> <p>The fuel injector is faulty;</p> <p>Check the idle speed control system;</p> <p>The idle speed screws are loose;</p> <p>The throttle position sensor is faulted;</p> <p>The inlet air pressure sensor and hose is faulty;</p> <p>The water temperature sensor is faulty;</p> <p>The idle stepping motor is faulty;</p> <p>The circuit is poorly connected or grounded;</p> <p>The ECU fault occurs;</p> <p>The fuel is with incorrect grade number, deteriorated or contains water.</p>	<p>Check the engine mechanical part;</p> <p>Repair the air filter, throttle valve body or air inlet hose;</p> <p>Replace or clean it;</p> <p>Reconnect;</p> <p>Replace the spark plug cap;</p> <p>Remove carbon deposits or replace the spark plug;</p> <p>Remove iron filings and adjust the gap;</p> <p>Re-adjust the ignition timing;</p> <p>Replace the fine filter or fuel pump;</p> <p>Replace the fuel line;</p> <p>Replace the fuel injector;</p> <p>Adjust and tighten the interest speed screws;</p> <p>Replace the throttle position sensor;</p> <p>Replace the inlet air pressure sensor or connecting pipe;</p> <p>Replace the water thermometer sensor;</p> <p>Replace the idle stepping motor and its piping;</p> <p>Check and connect the circuit;</p> <p>Reconnect or replace the ECU;</p> <p>Replace with the qualified fuel.</p>

EMS Fault Diagnosis Table (Cont'd)

Fault Phenomenon	Possible Cause	Solutions
Excessively high engine idle speed	The throttle cable fails to return; The fuel pump pressure regulator is faulty; The intake air temperature sensor is faulty; The idle stepping motor and connecting pipe are faulty;	Adjust the throttle cable and idle speed screws; Replace the pressure regulator; Replace the intake air temperature sensor; Replace the idle stepping motor.
The engine has insufficient power; The engine speed fails to increase or the engine stalls during acceleration; the acceleration response is sluggish; It performs poorly and lacks power when accelerating; The engine sputters and the motorcycle speed is unstable;	The engine has mechanical fault; The air filter is clogged or there is leakage in the throttle valve body or the air inlet hose. The exhaust system and three-way catalytic converter are blocked; The ignition coil, high-voltage cable or spark plug is faulty; The fuel pump or fuel line is faulty; The fuel injector is blocked or faulty; There are abnormal signals from sensors; The circuit is poorly connected or grounded; The ECU fault occurs.	Repair the engine mechanical part; Repair the air filter, throttle valve body or air inlet hose; Replace or clean it; Maintain or replace; Maintain or replace; Clean or replace; Replace the failed sensor; Check and connect the circuit; Reconnect or replace the ECU.
There is excessive fuel consumption	There is insufficient cylinder pressure; The ignition coil, high-voltage cable or spark plug is faulty; A failure in the phase sensor or its wiring occurs; The fuel pump or fuel line is faulty; The fuel injector is blocked or faulty; The ECU fault occurs.	Repair the engine mechanical part; Maintain or replace; Maintain or replace; Maintain or replace; Clean or replace; Reconnect or replace the ECU.
When other electrical loads are used, idle performance is poor or the engine stalls	Other electrical loads are too large or intermittently short-circuited causes unstable battery voltage; A short circuit between the system wiring and the wiring of other loads causes unstable system signal voltage;	Replace the said other electrical loads; Check and connect the circuit.

Fault Correspondence Table

Diagnostic Item	Fault Flag	Pcode	Specification (UAES)	Description (UAES)	Solutions
Upstream cylinder 1 oxygen sensor heater	E_hsve	B_sihsv	P0030	The control circuit of the upstream cylinder 1 oxygen sensor heater is open-circuited.	① Check the oxygen sensor connector; ② Check and replace the oxygen sensor; ③ Check and replace the cables;
		B_mnhsv	P0031	The control circuit voltage for the upstream cylinder 1 oxygen sensor heater is too low.	
		B_mxhsv	P0032	The control circuit voltage for the upstream cylinder 1 oxygen sensor heater is too high.	
Intake air pressure sensor	E_lm	B_mnlm	P0107	The intake air pressure sensor is short-circuited to ground.	① Check the intake air pressure sensor connector; ② Check and replace the intake air pressure sensor; ③ Check and replace the cables;
		B_mxlm	P0108	The intake air pressure sensor is short-circuited to power supply.	
Intake Air Temperature Sensor	E_ta	B_mxta	P0112	The intake air temperature sensor signal voltage is too low.	① Check the intake air temperature sensor connector; ② Check and replace the intake air temperature sensor; ③ Check and replace the cables;
		B_mnta	P0113	The intake air temperature sensor signal voltage is too high.	
Temperature sensor of engine coolant	E_tm	B_mxtm	P0117	Excessively low voltage of engine coolant temperature sensor circuit	① Check the cylinder temperature sensor connector; ② Check and replace the cylinder temperature sensor; ③ Check and replace the cables;
		B_mntm	P0118	Excessively high voltage of engine coolant temperature sensor circuit	
Throttle position sensor	E_dk	B_mndk	P0122	The throttle position sensor circuit voltage exceeds the lower limit	① Check the throttle position sensor connector; ② Check and replace the throttle position sensor; ③ Check and replace the cables;
		B_mxdk	P0123	The throttle position sensor circuit voltage exceeds the higher limit	
Upstream cylinder 1 oxygen sensor signal	E_lsv	B_nplsv	P0130	The upstream cylinder 1 oxygen sensor signal is unreasonable	① Check the oxygen sensor connector; ② Check and replace the oxygen sensor; ③ Check and replace the cables;
		B_mnlsv	P0131	The upstream cylinder 1 oxygen sensor signal circuit voltage is too low.	
		B_mxlsv	P0132	The upstream cylinder 1 oxygen sensor signal circuit voltage is too high.	
		B_silsv	P0134	The upstream cylinder 1 oxygen sensor signal circuit voltage is faulted	

Cylinder 1 fuel injector	E_ev1	B_siev1	P0201	Open-circuited control circuit of the injector of cylinder 1	Cylinder 1- Injector Circuit	① Check the fuel injector connector; ② Check and replace the fuel injector; ③ Replace the cables;
		B_mnev1	P0261	The control circuit of cylinder 1 fuel injector is short-circuited to ground	Cylinder 1- Injector Circuit Low	
		B_mxev1	P0262	The control circuit of cylinder 1 fuel injector is short-circuited to power supply	Cylinder 1- Injector Circuit High	
Idle air control actuator	E_stpe	B_sistpe	P0511	A failure occurs in the idle air control actuator control circuit	Idle Air Control Circuit	① Check the fuel injector mounting position, the intake manifold-to-engine mounting surface, and the throttle body-to-intake manifold connection for air leaks. ② Perform the initialization procedure again and reset the stepping motor to eliminate the possibility of lost steps. ③ Check the stepping motor, connectors, and cables.
		B_npstpe	P0511			
		B_sistpe	P0511			
Battery	E_ub	B_npub	P0560	Unreasonable voltage signal of the battery	System Voltage Malfunction	Check the battery and the regulator rectifier
		B_mnub	P0562	Excessively low voltage of the battery	System Voltage Low	Replace the battery
		B_mxub	P0563	Excessively high voltage of the battery	System Voltage High	Replace the regulator rectifier
Engine speed sensor	E_n		P0322	The engine speed sensor pulse signal is missing (open or short circuit)	Ign./Distributor Eng.Speed Inp.Circ. No Signal	① Check the engine speed / phase sensor connector; ② Check the engine speed / phase sensor assembly; ③ Replace the engine speed / phase sensor;
Lean angle sensor	E_dump	B_mndump	P1098	The lean angle sensor is faulted	dump control circuit high	① Check the lean angle sensor connector; ② Check and replace the lean angle sensor; ③ Check and replace the cables;
Canister purge valve	E_teve	B_siteve	P0444	The canister purge valve is open-circuited	canister purge valve Circuit open	① Check the canister purge valve connector; ② Check and replace the canister purge valve; ③ Check and replace the cables;
		B_mnteve	P0458	The canister purge valve is open-circuited to ground	canister purge valve Circuit low	
		B_mxteve	P0459	The canister purge valve is open-circuited to power supply	canister purge valve Circuit high	

Electrical System Diagram

