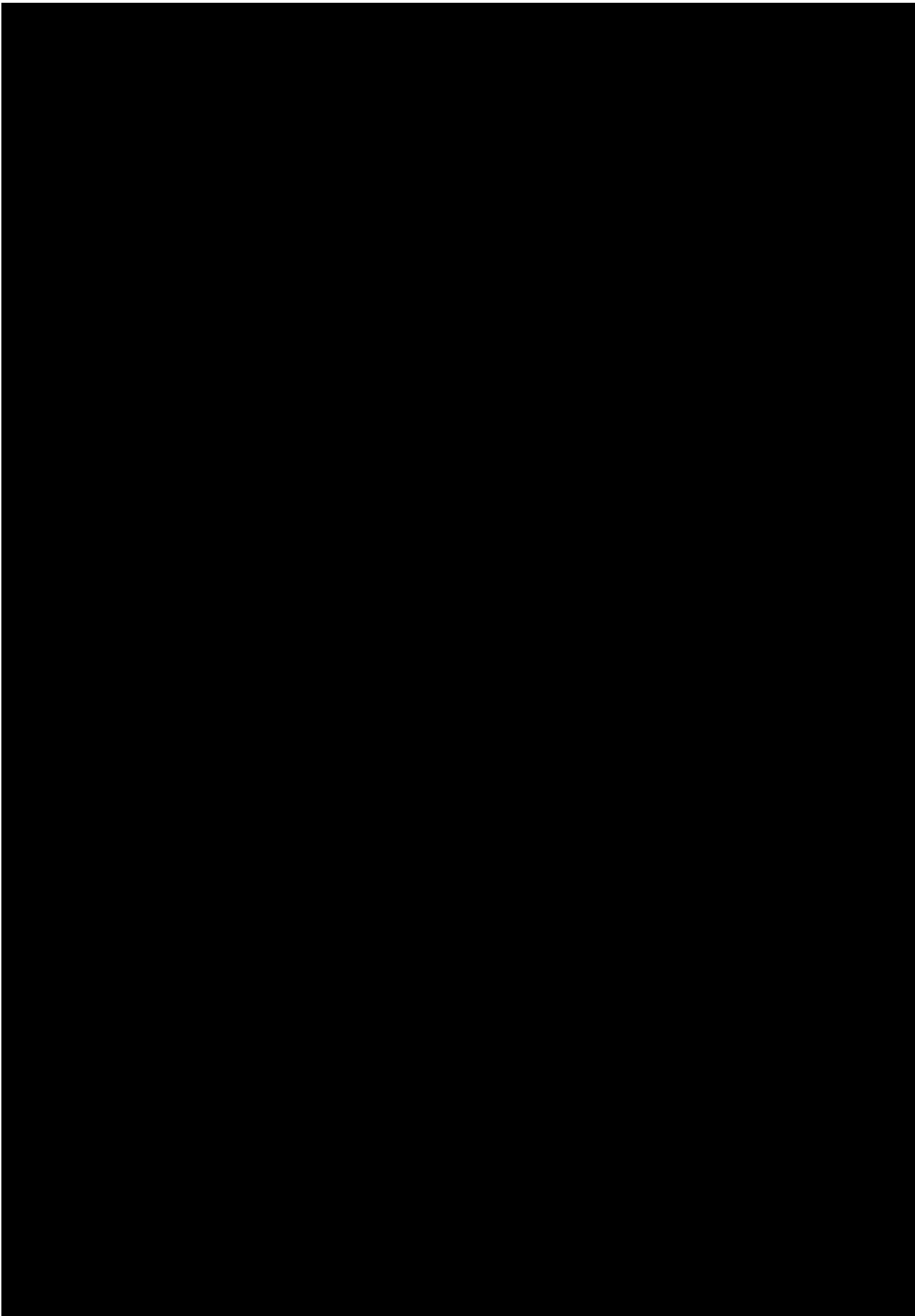


Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour	Code	Colour
RD	Red	RD/BK	Red/Black								
BK	Black	RD/BU	Red/Blue								
GN	Green	RD/WH	Red/White								
BU	Blue	RD/YE	Red/Yellow	CN/BU	Green/Blue	BU/WH	Blue/White	WH/OG	White/Orange	OG/BK	Orange/Black
WH	White	BK/RD	Black/Red	CN/WH	Green/White	BU/YE	Blue/Yellow	WH/VT	White/Violet	OG/BU	Orange/Blue
YE	Yellow	BK/GN	Black/Green	CN/YE	Green/Yellow	BU/OG	Blue/Orange	YE/RD	Yellow/Red	GI/RD	Grey/Red
OG	Orange	BK/BU	Black/Blue	CN/OG	Green/Orange	BU/GI	Blue/Grey	YE/BK	Yellow/Black	GI/GN	Grey/Green
GI	Grey	BK/WH	Black/White	CN/GI	Green/Grey	BU/BN	Blue/Brown	YE/CA	Yellow/Green	GI/WH	Grey/White
BN	Brown	BK/YE	Black/Yellow	CN/BN	Green/Brown	BU/VT	Blue/Violet	YE/BU	Yellow/Blue	GI/YE	Grey/Yellow
VT	Violet	BK/OG	Black/Orange	CN/VT	Green/Violet	WH/RD	White/Red	YE/WH	Yellow/White	GI/OG	Grey/Orange
PK	Pink	BK/VT	Black/Violet	GN/VT	Blue/Violet	WH/BK	White/Black	YE/GI	Yellow/Grey	BN/BK	Brown/Black
LG	Light Green	CN/RD	Green/Red	BU/BK	Blue/Black	WH/BU	White/Blue	YE/BN	Yellow/Brown	BN/WH	Brown/White
LB	Light Blue	GN/BK	Green/Black	BU/GN	Blue/Green	WH/YE	White/Yellow	YE/VT	Yellow/Violet	BN/YE	Brown/Yellow

Approval level	Security level	M31		Chongqing Gaokun Industry Co., Ltd.
Approval level	Security level	M31		Chongqing Gaokun Industry Co., Ltd.
Electrical system drawing				Designed by
				Verified by
				Reviewed by
				Drawn by
				Checked by
				Approved by
Quality Scale 1:1				00080-M31A-0000-T
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1 Sheet in Total				Sheet 1





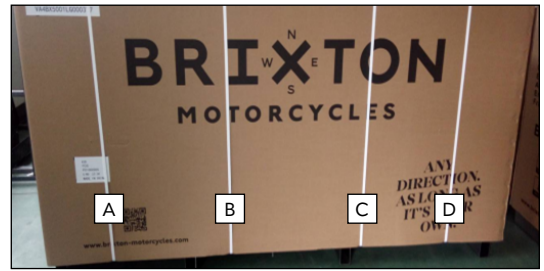
BRIXTON
MOTORCYCLES

Cromwell 1200

PRE-DELIVERY INSPECTION

1. Removal of the carton

- 1.1 Cut off the straps (A, B, C and D) to take off the carton box.



- 1.2 Take off the carton.



2. Removing and unpacking the accessory boxes

- 2.1 Cut off the nylon cable tie and take out the accessory boxes.
- Accessory box (A): Battery, Mirrors, Vehicle tools, Standard Parts
 - Accessory box (B): Left main and passenger pedal assembly, Right main and Passenger pedal assembly
 - Accessory box (C): Muffler (Details are attached below)



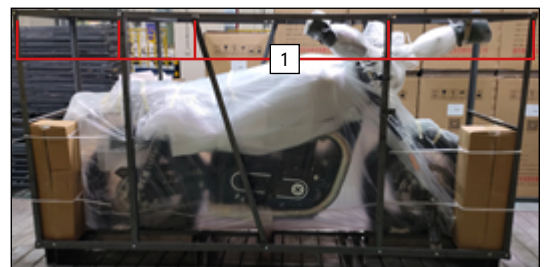
- 2.2
- Remove the nylon ties of the handlebar switch on the left.
 - Remove the iron wire ties for the handle tube(front/rear each one) remove the handle hoop bolt M8*20 (2).
 - Remove the connecting plate bolts (2 locations). Loosen the M8*20 bolts (a total of 10 locations, 5 locations on each side), Remove the upper frame cover assembly.



3. Removing the upper part of the scaffolding

- 3.1
- Loosen the 10 M8*20 bolts (1) (5 bolts on each side).
 - Remove the bolts (1).
 - Remove the upper frame of the scaffolding.

WARNING: Before removing the upper frame completely, make sure that the connecting rods between the lower and upper parts of the frame are fixed so that they do not cause any damage to the motorbike after removing the upper frame part.

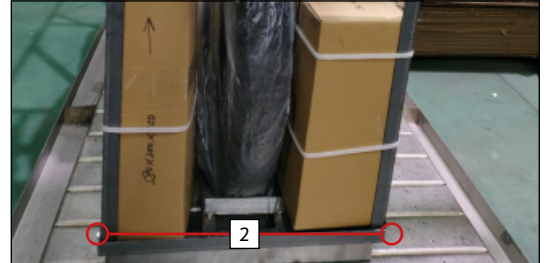
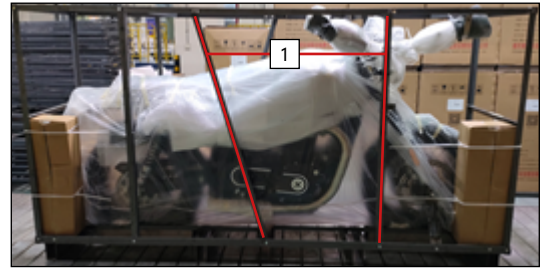


4. Removal of the connecting rods and oblique supports

- 4.1 Loosen the M8*20 bolts (1) at the lower end of the connecting rods and oblique supports and remove the left and right connecting rods and oblique supports.

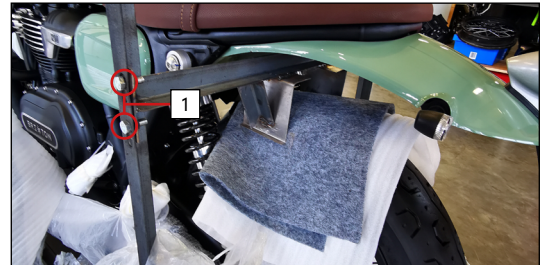
NOTE: Prevent the oblique supports from falling to the side of the vehicle when it is dismantled, and scratching the body parts.

- 4.2
- Loosen the M8*20 bolts (2) on the left/right and front/rear side of the scaffolding.
 - Remove the front and rear connecting rods.



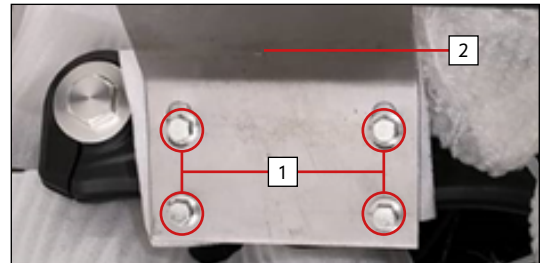
5. Removal of the rear wheel fixing rod

- 5.1
- Loosen the 4 M8*20 bolts (1) on both sides of the scaffolding's rear wheel fixing rod.
 - Remove the rear wheel fixing rod.



6. Removing the steering-riser connecting plate

- 6.1
- Loosen the 4 bolts M8*16 (1) of the steering-riser connecting plate.
 - Take off the connecting plate (2).

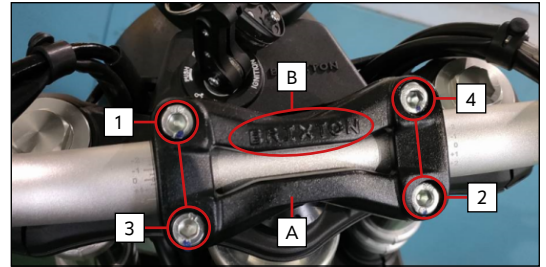


7. Mounting the handlebar

- 7.1
- Remove the bubble wrap.
 - Make sure that the brake line is stretched without twisting.
 - The left side of the handlebar has to be turned from bottom to top.
 - Place the handlebar on the riser.
 - Align the marked point (X) on the left side of the handlebar with the marking on the left edge of the handlebar-riser.
 - Place the handlebar clamp (A) on top (The Brixton lettering (B) must be readable from the driver's position).
 - Mount the clamp with 4 M8*25 allen bolts (23±2 Nm) (4).



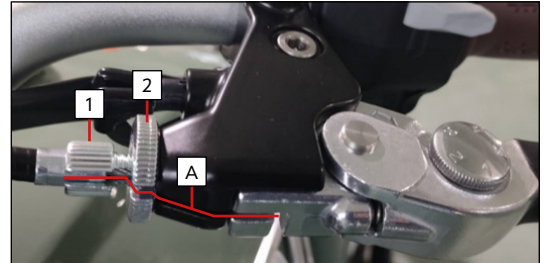
NOTE: First put all 4 screws in place, then fasten the 4 screws crosswise (See picture for sequence)



8. Assembly of the clutch cable

8.1

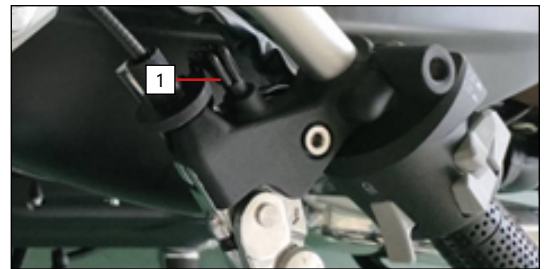
- Turn the adjusting nut (1) and the fixing nut (2) until the gap (A) is accessible.
- Now insert the coupling cable into this gap.
- Hook the end of the clutch cable into the receptacle of the clutch lever.
- Adjust the clutch play using the adjusting nut (1) so that there is a play of 10-20 mm and fix the setting using the fixing nut (2).



NOTE: The distance between the adjusting nut (1) and the fixing nut (2) should be between 2-6 mm.

8.2

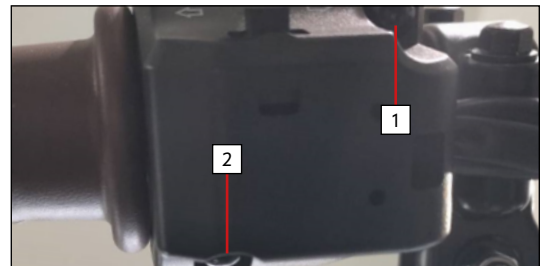
Plug in the connector (1).



9. Installing the left handlebarswitch

9.1

- Use an size 3 allen key to tighten the two screws M5*20 (1) and M5*16 (2).



10. Wire harnesses

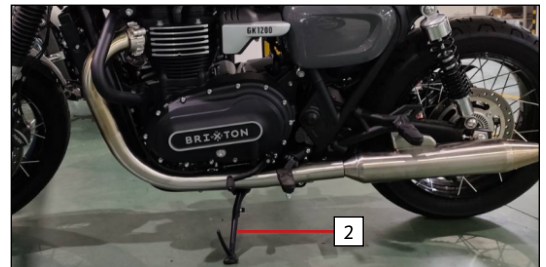
10.1

CAUTION: Make sure that the wire harnesses on the left and right side (1) are in the correct brackets without any twisting after the handlebar is mounted.



11. Removing the vehicle from the transport rack

- 11.1
- Remove the support plates (1) at both sides of the front wheel axle and take the bike off the pallet.
 - Put it up with the side stand (2).



12. Rear-view mirrors

- 12.1
- Mount the rear-view mirrors (1) in the corresponding receptacles.
 - After the rear-view mirrors are properly adjusted, tighten the Bolts M10 with a wrench.

NOTE:

- Left mirror = left-hand thread (Counterclockwise)
- Right mirror = left-hand thread (Counterclockwise)

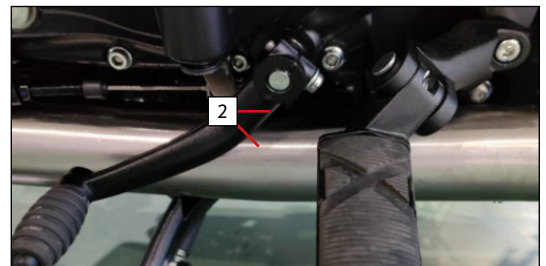


13. Installation of the left driver and passenger footrests and gear lever

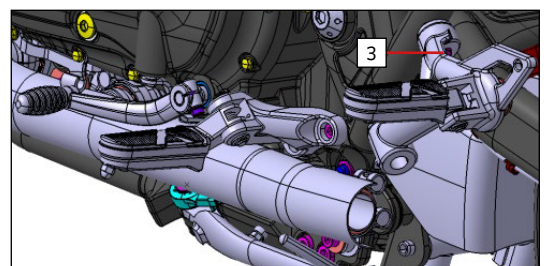
- 13.1
- ### Gear lever
- Align the upper edge of the opening of the gear lever with the marked point on the engine shift arm and install it.
 - Tighten the allen screw M6*25 (1) with a tightening torque of 12 ± 1 Nm.



- 13.2
- ### Left driver footrest
- Pre-tighten first the 2 socket head cap screws M8*25 (2) and then fully tighten them with a torque of 23 ± 2 Nm.



- 13.3
- ### Left passenger footrest
- Pre-tighten first the socket head cap screw M8*25 (3) and then fully tighten it with a torque of 23 ± 2 Nm.



14. Installation of the right driver footrests

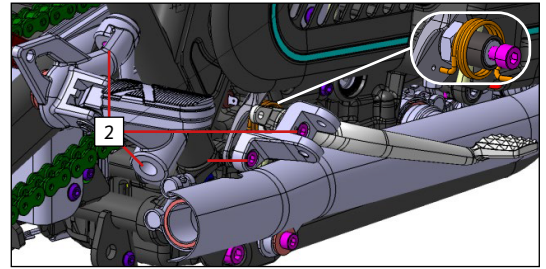
14.1

Right driver footrest

- Align the right driver footrest with the frame. Install and fasten 1 piece M8*30 (1) socket head cap screw, 3 pieces M8*25 (2) socket head cap screws. The tightening torque is 23 ± 2 Nm.

NOTE:

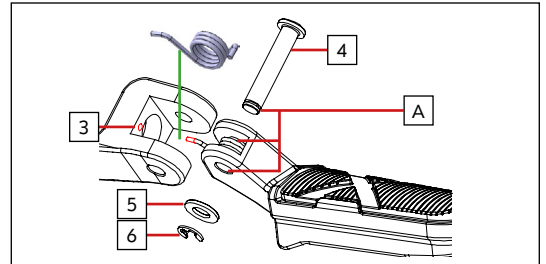
When installing the driver footrest, insert the short end of the rear brake reset torsion spring into the installation board, and the brake arm combination should be pre-installed as shown in the figure.



14.2

Install the pedal pin shaft

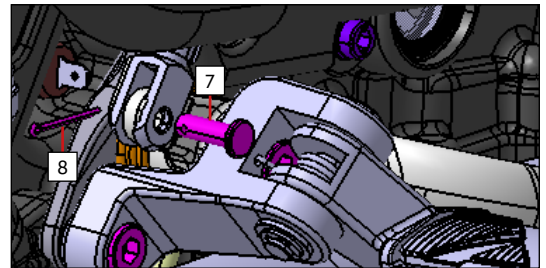
- Take the driver footrest return spring (3) and install it into the driver footrest, then insert the pedal pin shaft (4) and assemble the washer (5) and retaining ring (6) in place.



14.3

Install the brake arm

- Snap the brake arm into the U-shaped groove of the rear brake pump. After the holes are aligned, insert the pin (7) and then snap the 1.0x18 R-type lock pin (8) into the pin hole.

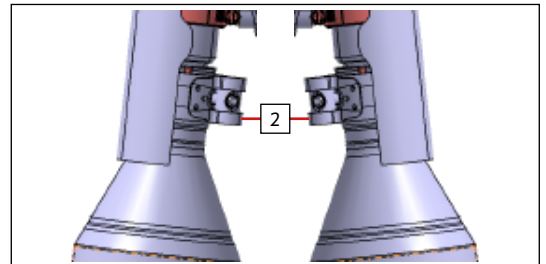
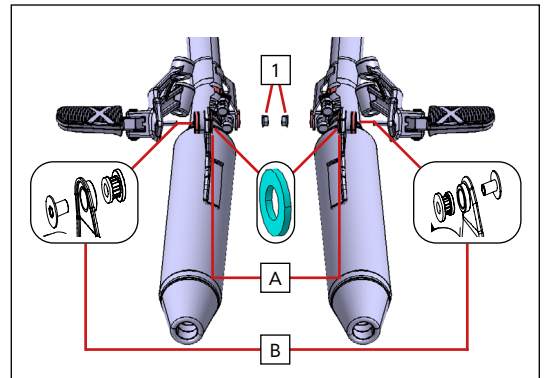


15. Installation of the left and right muffler combination

15.1

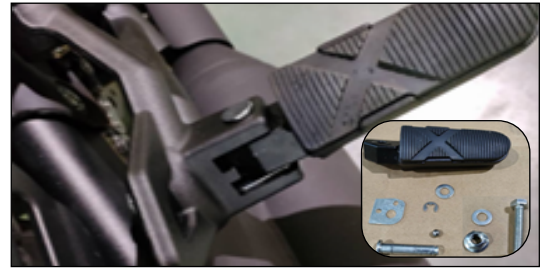
- Make sure that the two washers (A) are not left behind.
- First remove the 2 left and right liner assemblies (B).
- Then install the front end of the muffler part onto the exhaust pipe.
- Confirm that it is in place and install the rear hanging hole onto the pedal bolt.
- Install the liner combination (B) and pre-bring on the nut M8 (1).
- Adjust the muffler hoop shaft and radial position (2) then tighten it thoroughly. The tightening torque is 14 ± 1 Nm.
- Tighten the nut screw M8 (1) with a torque of 24 ± 4 Nm.

Check whether there is an air leakage at the connection point between the muffler and the exhaust pipe.



16. Installation of the left passenger footrests

- 16.1 After installing the muffler with bolts M8*40, flat washers and nuts M8, place the upper limit plate, clamp the steel ball, install the right passenger pedal, insert the pedal pin, install the flat washer and then clamp the stopper Circle.



17. Installation of the battery, ECU-Support box, Rollover-Sensor combination and On-board toolkit

17.1 Installation of the battery

- Put the battery into the battery box.
- First connect the positive pole of the main cable with the positive pole of the battery and then connect the negative pole.

NOTE:

After the first installing the battery, don't operate the refueling handle and other parts within 10 seconds, and after the first startup, don't operate the refueling handle and other parts within 10 seconds.

17.2 Installation of the ECU-Support box

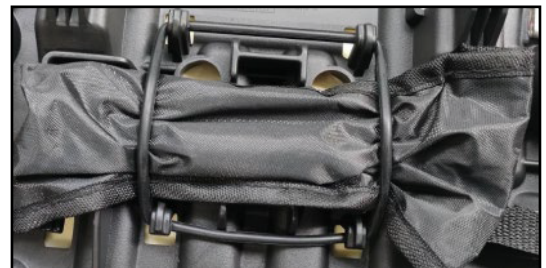
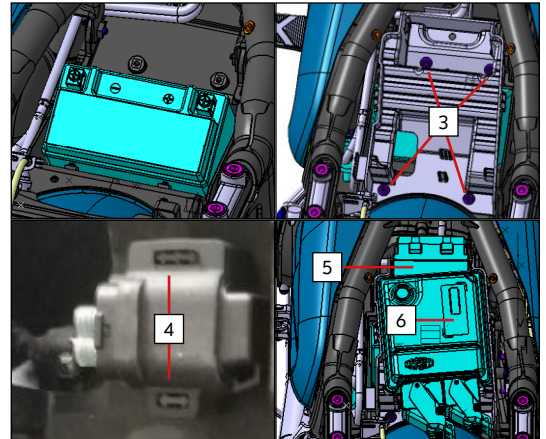
- Arrange the pipelines on the ECU support box.
- Screw in the bolts M6*12 (3).
- The tightening torque is 9 ± 2 Nm.

17.3 Installation of the Rollover-Sensor combination

Fix the rollover sensor (4) in the direction shown in the figure, then fix the fuse box (5) and the ECU control components (6) in place.

17.4 Installation of the On-board toolkit

Place the on-board toolkit flat on the inner side of the seat cushion bottom plate and fix the toolkit on the four hooks of the seat cushion bottom plate with a rubber band.





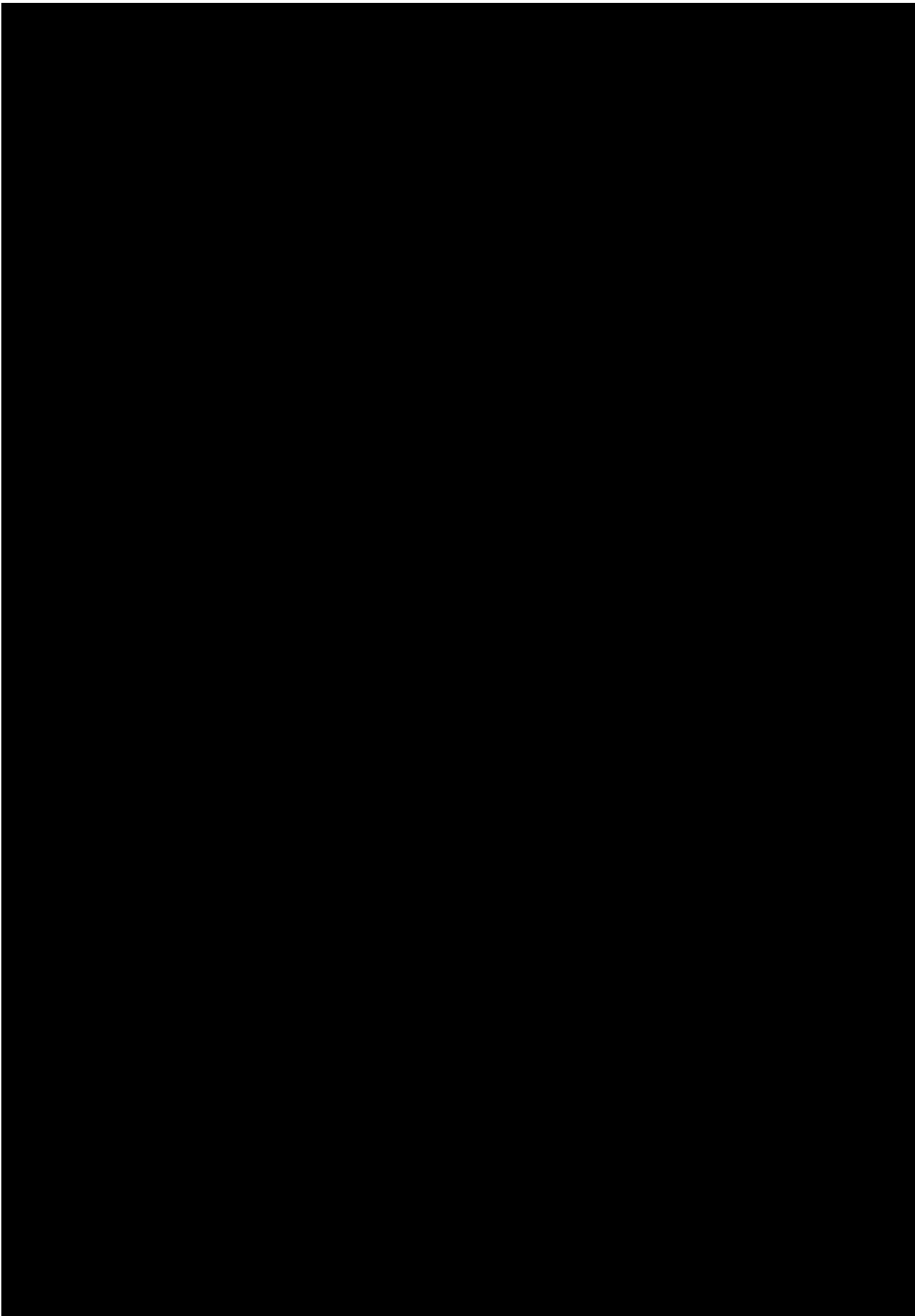
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BRIXTON
MOTORCYCLES

Cromwell 1200

USER MANUAL
ENGLISH

This user manual contains important safety information and instructions. Please read it carefully before operating the motorbike. The operating instructions are considered an integral part of the motorbike and must be supplied with the motorbike if it is resold or passed on.

THINGS TO KNOW ABOUT BREAKING IN THE MOTORBIKE

The first 1,600 km of riding a new motorbike play the most important role in its entire service life. During this time, proper break-in can not only ensure the longest service life, but also fully utilise the new motorbike's performance. The motorbike's components are made from high quality materials through careful machining. Running in allows the surfaces of the parts to match each other for smooth engagement.

Careful and patient break-in can ensure that the motorbike runs stably and performs to its full potential. It is especially important during break-in to avoid operations that can cause the engine components to overheat, such as riding at high speed for long periods of time.

For the specific break-in method, see the section "Breaking in a new motorbike".

IMPORTANT INFORMATION ABOUT THE USER MANUAL

DANGER / WARNING / NOTICE

Please read the contents of these instructions carefully and observe the essential points. The words "Danger", "Warning" and "Note" are used to emphasise the importance of the instructions. Please understand the definitions carefully.

DANGER

The points marked with this word concern the personal safety of the rider and their non-observance may result in injury.

WARNING

Items marked with this word refer to instructions for operating the motorbike to avoid damage to the motorbike.

NOTE

Items marked with this word are special explanations intended to simplify maintenance or to clarify important instructions.



Dealer stamp

Thank you for choosing one of our motorbikes. We design, test and manufacture this motorbike model using the latest technology to provide you with happy, interesting and safe riding. After familiarising yourself with the basics contained herein, you will find that riding a motorbike is one of the most exciting sports while enjoying the true fun of riding.

The user manual will show you the correct repair and maintenance methods for your motorbike. If you follow the instructions, your motorbike will function for a long time without any faults. Maintenance shop representatives, with their trained technicians and extensive tool and equipment inventory, can provide you with quality maintenance services at all times.

All data, illustrations, pictures and technical data contained herein have been prepared on the basis of the latest products at the time of publication of the manual. However, due to continuous product improvements and changes in other areas, there may be inconsistencies between your motorbike and this manual. Our authorised dealers will always be able to provide you with correct instructions. We reserve the right to make changes at any time.

Please note that the parameters contained herein cover and explain models of all configurations. Therefore, your model may differ from the standard configuration described here.

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SAFETY INSTRUCTIONS

Accessories

Various accessories are available on the market for fitting to your motorbike. However, we are not in a position to directly check the quality and suitability of all accessories available on the market. Unsuitable accessories may even endanger the rider. Therefore, please choose accessories with special care. While it is not possible to check the suitability of every accessory sold on the market, your specialist dealer can help you select good quality accessories available on the market and install them correctly.

For the careful selection of accessories and installation, we have developed general guidelines for you to know the specifications of the accessories and how to install them.

DANGER
Improper installation of accessories or modification of the motorbike may alter the manoeuvrability of the motorbike and cause accidents. Never use unsuitable accessories and ensure that all accessories are correctly installed. All accessories and components used must be original products of our company. The accessories and parts must be installed correctly. In case of problems, please contact the authorised dealers or workshops designated by our company.

- All accessories with additional weight or accessories that are easily exposed to the wind must be mounted as close as possible to the frame and centre of gravity of the motorbike and as low as possible. The luggage carrier and the parts attached to it must be carefully checked to ensure that they are firmly installed. Otherwise, the centre of gravity will shift, which can be a hazard. When mounting accessories, pay particular attention to the balance between the left and right sides and to the strength of the mounting.
- Check that the ground clearance and the angle of inclination of the installed accessories are appropriate. Improper installation will reduce both safety factors. Improper installation of accessories will cause difficulties in manoeuvring and even hazards when driving. The size of the accessory has a direct effect on air resistance and stability when manoeuvring. Special care must be taken not to interfere with the normal operation of the shock absorption, steering, control, etc. functional systems.
- If accessories are fitted to the steering grips or front fork, this will result in severe imbalance, reduced steering flexibility and vibration of the front wheel and unstable handling. Accessories attached to the steering grips and front fork must be as light as possible.
- Parts such as the windscreen, the backrest, the saddle and the luggage rack are accessories against the wind that easily cause riding instability, which is particularly evident when the motorbike encounters crosswinds or large vehicles. If accessories are installed improperly or poorly designed, riding safety is compromised.
- Some accessories cause the rider's seating position to deviate from the normal position, which not only limits the rider's range of motion, but also the rider's ability to manoeuvre.
- Additional electrical accessories may overload the electrical system. A severe overload can damage the wiring, stop the engine while riding or even set the motorbike on fire.

When transporting goods, they must be secured as low as possible and as close to the frame as possible. If the goods are not properly secured, the centre of gravity will increase, which is dangerous and makes it difficult to check the motorbike. The size of the items affects the aerodynamic drag and manoeuvrability of the motorbike. Please balance the goods on both sides of the motorbike and secure the goods.

Modification

Arbitrary modification of the motorbike or removal of original parts cannot guarantee the riding safety of the motorbike and is also illegal. Modification causes the user to lose the right to quality assurance.

Safe driving

Motorcycling is a very interesting and exciting sport. However, it also requires some special precautions to ensure the safety of the rider and the passenger. These precautions are as follows:

Safety helmet

The first step is to choose a helmet that meets safety and quality standards to protect the rider. Head injury is the most serious motorbike accident. Always wear a safety helmet and goggles when riding a motorbike.

Clothing

Loose and exotic clothing is uncomfortable and unsafe. When riding a motorbike, choose clothing that is as high quality and tight-fitting as possible.

Before operation

Carefully read the instructions in the section "Checks before operation". Check the items one by one according to the instructions and never forget, as this can ensure the safety of the driver and passenger.

Familiarise yourself with your motorbike

Your riding skills and mechanical knowledge are the basis for safe riding. Please practice in an open area with little traffic until you are fully familiar with the mechanical characteristics and operation of the motorbike. Please remember that practice makes perfect.

Knowledge of your driving skills

Always ride a motorbike within the limits of your abilities. Know the limits of your riding ability and never ride beyond your capabilities to avoid accidents.

Wet road conditions

Be extra careful in rainy weather and remember that the braking distance is twice as long as on sunny days. Avoid driving on lane markings, well-lit and oily lanes to avoid skidding. Take extra care when passing level crossings, metal barriers and bridges. Slow down if you cannot clearly judge the road conditions.

SAFETY INSTRUCTIONS

Driving strategies

Most motorbike accidents occur when a vehicle rear-ends the motorcyclist in front while turning. A smart riding strategy is to make yourself visible to other drivers.

Wear conspicuous clothing with reflective material, even on wide roads during the day. Do not ride in the blind spot of other drivers.

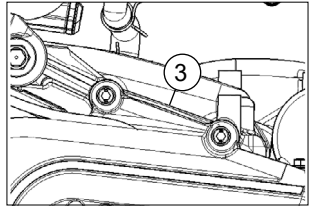
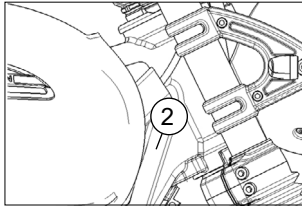
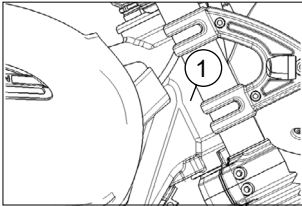
VEHICLE IDENTIFICATION NUMBERS

1. The vehicle identification number (VIN) (1) is stamped on the steering head.
2. The identification plate (2) is located on the lower right side of the frame.
3. The engine number (3) is engraved on the left side of the crankcase.

Vehicle identification number

Type plate

Engine number



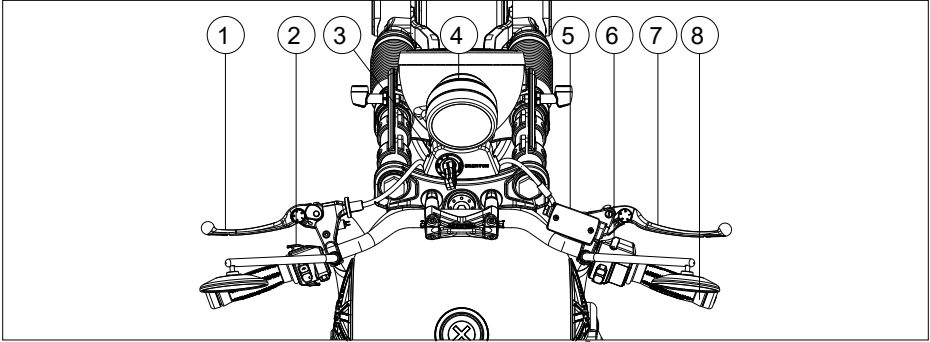
1. Vehicle identification number:

2. Type plate:

3. Engine number:

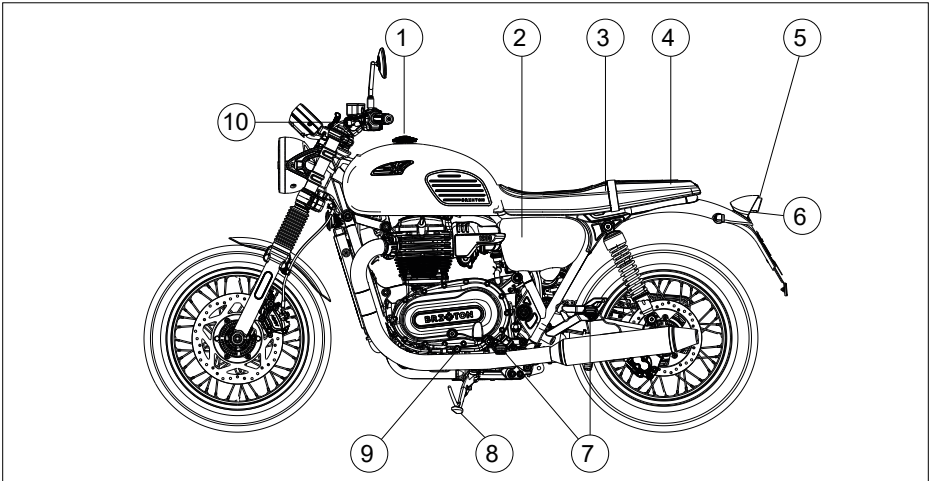
DESCRIPTION OF THE VEHICLE

OVERVIEW OF THE COCKPIT



- | | |
|----------------------------------|--------------------------------|
| 1. Clutch lever | 5. Front brake fluid reservoir |
| 2. Left handlebar switch | 6. Right handlebar switch |
| 3. Ignition switch (main switch) | 7. Front brake |
| 4. Instrument cluster | 8. Throttle grip |

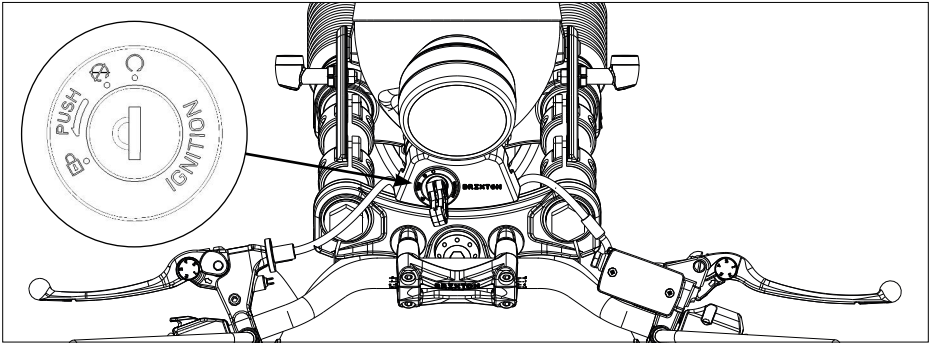
SIDE VIEW



- | | |
|-------------------------|----------------------------------|
| 1. Tank lock | 6. Number plate light |
| 2. Air filter | 7. Rider and passenger footrests |
| 3. Fuses / Battery | 8. Side stand |
| 4. On-board tools | 9. Gear lever |
| 5. Brake and tail light | 10. Clutch lever |

IGNITION KEY

The motorbike has two keys. Please keep one of them properly as a spare key. A small number plate is enclosed with the key. Please note the number on the plate for reference.

IGNITION SWITCH (MAIN SWITCH)**" I " - (On)**

The ignition circuit is connected and the engine can be started at any time. The key cannot be removed when the switch is in this position.

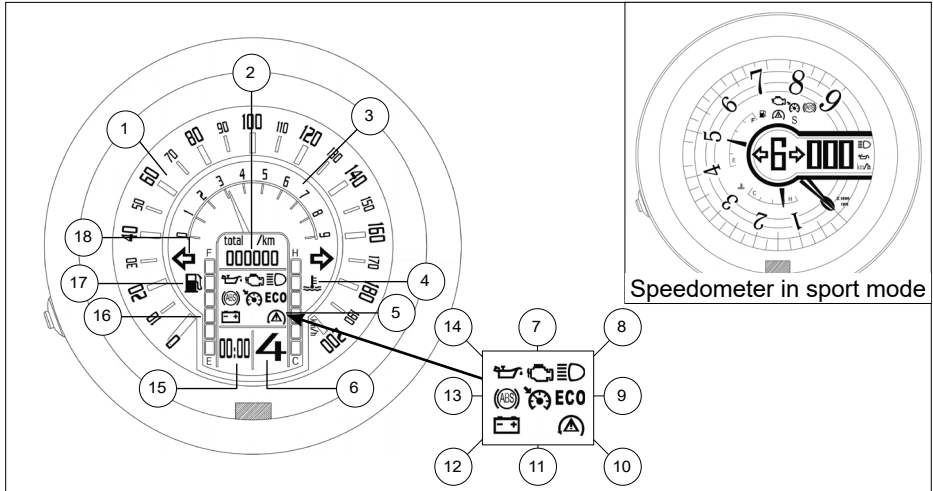
" II " - (Off)

The ignition circuit is interrupted and the engine cannot be started. The key can be removed.

" III " - (Steering lock)

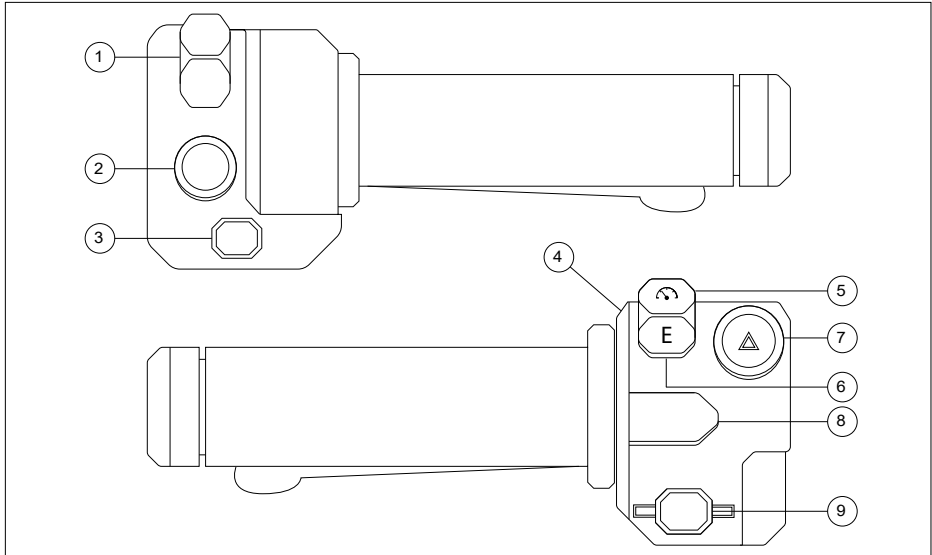
To lock the steering, you must first turn the handlebars fully to the left, turn the key to position " II " press and then turn it anticlockwise to the position " III " turn. The key can be removed. All circuits are open.

INSTRUMENT CLUSTER



- | | |
|--------------------------|--------------------------------|
| 1. Speed display | 10. ASR check |
| 2. Odometer | 11. Cruise control |
| 3. Engine speed | 12. Charge level control |
| 4. Coolant warning | 13. ABS indicator light |
| 5. Coolant temperature | 14. Oil level check |
| 6. Gear indicator | 15. Time |
| 7. EOBD - Engine control | 16. Fuel level |
| 8. High beam control | 17. Fuel level indicator light |
| 9. ECO mode | 18. Direction indicator |

The motorbike has two riding modes: Standard and Sport, with different instrument displays for the different riding modes.

HANDLEBAR SWITCH

- | | |
|--------------------------|---------------------------|
| 1. Stop-start switch | 6. Mode switch |
| 2. ASR switch | 7. Emergency light switch |
| 3. Headlight switch | 8. Horn switch |
| 4. Dimmer switch | 9. Indicator switch |
| 5. Cruise control switch | |

Lighting control

- Daytime running lights, marker lights and number plate lights are switched on when the headlight switch is turned off.
- The daytime running lights are off and the high/low beams, front and rear position lamps and number plate lights come on when the headlamp switch is turned on.
- When the headlamp switch is on, switching between the low beam and high beam positions in the dimmer switch means switching between low beam and high beam.
- Press the headlight flasher on the left handlebar switch and the high beam will come on.
- When the high beam is on, the high beam indicator on the instrument will be constantly lit.
- When the hazard warning flasher switch is pressed, the left and right indicator lights flash.
- The corresponding indicator lights flash when the indicator switch is pressed.
- When the indicators are flashing, the left turn signal indicator and the right turn signal indicator on the instrument flash accordingly; the brake light comes on when the front and rear brakes are applied.

WARNING

- If one of the turn signals is damaged or not mounted properly, the other will flash more frequently.
- If not all lights light up, check if the fuse of the light is damaged.
- If the control unit is not fitted, the brake light does not come on.
- The brake light does not come on if the rear brake is applied without brake fluid.

Traction Control System (TCS)

TCS prevents the drive wheel from spinning when the motorbike is travelling on roads with a low grip coefficient, mainly by limiting torque.

- TCS is on by default.
- Press and hold the TCS switch for more than three seconds to turn it off and the TCS indicator on the instrument will flash; then press and hold the TCS switch for three seconds after turning it off to turn it on.
- If TCS is not turned off, the system will limit torque output if it detects a large difference between the speeds of the front and rear wheels, and the TCS indicator on the instrument will light steadily.

WARNING

Please switch off TCS with caution.

Cruise control system

The motorbike is equipped with cruise control, which must be activated before use.

The activation method is as follows:

Turn on the main switch, the stop switch is in drive mode, press and hold the cruise control switch for 3 seconds and the cruise control indicator on the instrument will be steady orange, then the cruise control is successfully activated. By default, the cruise control is inactive.

Using the cruise control function

When cruise control is activated, the vehicle speed is in the range 30-160 km/h and first to sixth gear is engaged, briefly press the cruise control switch.

When the motorbike is in drive mode, turn the electronic throttle grip and the motorbike will accelerate; when the electronic throttle grip is returned, the motorbike will drive at the previously set speed.

The cruise control function is deactivated and enters passive mode when one of the following actions is performed:

- Brakes
- Shifting gears
- Engaging the clutch switch
- Briefly pressing the cruise control switch
- REV pointer at the limit of the red range
- TCS to check torque output
- Electronic throttle signal error
- Speed of motorbike above cruise control speed of 30 km/h

Switching off the cruise control system:

- Press and hold the cruise control switch for 3 seconds.
- The motorbike has tipped over. (sensor)
- Turn off the main switch (the ignition switch) or leave the stop switch in the "off" position.

WARNING

- Only use the cruise control in good road conditions.
- There is a tolerance range of up to 3 km/h for the cruising speed.
- It is recommended to keep the speed between 2000 and 5000 rpm.

Switching the driving mode:

The motorbike is available in two riding modes (standard/sport) with different instrument screens.

- ECO - symbol displayed on the instrument in standard mode
- S - symbol is displayed on the instrument in sport mode.
- Press and hold the mode switch for 3 seconds to change the mode.

Instrument cluster display

The instrument cluster currently has two displays, with the display being selected automatically depending on the operating mode.

Turn signal indicators

The turn signal indicators are displayed in green and flash simultaneously with the turned on turn signals.

Oil pressure alarm indicator

The oil pressure alarm indicator is displayed in red.

- The indicator lights up continuously when the motorbike is not started.
- Under normal conditions, the oil pressure warning indicator goes off when the motorbike is started.
- If the oil pressure is low and the motorbike is started, the oil pressure warning light will be on continuously.

WARNING

- Check the oil condition immediately if the oil pressure warning indicator lights up after starting.
- If the oil pressure warning indicator still lights up after starting, even though the oil meets the operating requirements, check whether the cable is damaged.

Engine speed control

The engine speed is displayed with a pointer in both standard and sport modes, with 0-6.500 rpm as the normal REV range and 6.500-9.000 rpm in the red range.

WARNING

It is recommended that the motorbike be operated within the normal speed range.

Fuel injection control

- The electronic fuel injection fault indicator lights up yellow.
- The indicator lights up continuously when the motorbike is not started.
- The indicator goes out when the motorbike is started.
- The indicator lights steadily after the motorbike is started to indicate a malfunction of the electronic fuel injection system.
- When the indicator flashes, it indicates that the system is performing an automatic flywheel adjustment.

WARNING

- | |
|--|
| <ul style="list-style-type: none">• If there is an anomaly in the electronic fuel injection system, please contact customer service for troubleshooting.• The flywheel self-learning function only occurs when the control unit is first fitted. When the water temperature reaches 80°C, pull up the REV and return to idle speed, and repeat the procedure three times before the flywheel auto-learning is complete. |
|--|

Speed display

The motorbike speed indicator in standard mode is displayed with a pointer and ranges from 0-200 km/h in the metric system and 0-140 mph in the imperial system; and the motorbike speed indicator in sport mode is displayed with three digits.

High beam control

The high beam indicator is displayed in blue and lights up continuously when the high beam is on.

WARNING

Do not switch on the main beam when there are oncoming vehicles or when you are following a vehicle.
--

Trip meter

The trip/odometer record is displayed with six digits in standard mode, with the trip/odometer record displayed with one decimal place and the trip/odometer symbol displayed on the instrument; the kilometre record is displayed with a single digit and the total is displayed on the instrument; and no trip/odometer record is displayed in sport mode.

Coolant control

In standard mode, the coolant temperature is displayed in a grid. In sport mode, the coolant temperature is displayed with a pointer.

- In standard mode, the coolant control indicator is white and between 0 and 4 grid dots light up.
 - The coolant control indicator lights up red as soon as 5 grid dots light up.
 - The coolant level indicator flashes together with the grid dots as soon as all 6 grid dots light up.
 - If the coolant temperature signal is lost, the coolant control indicator flashes while the grid dots 1-6 flash step by step.
-
- In sport mode, the coolant level indicator is white.
 - The coolant control indicator lights up red as soon as the coolant temperature indicator reaches 5 grids.
 - The coolant control indicator flashes if the temperature continues to rise.
 - If the coolant temperature signal is lost, the coolant control indicator flashes and the coolant temperature pointer fluctuates between C-Cold and H-Hot.

WARNING

If the coolant temperature indicator lights up, it indicates a problem with the motorbike's cooling system. Stop the motorbike immediately to check the coolant and the operation of the cooling fan and seek service as soon as possible.

Driving mode indicator

Standard mode is displayed as an ECO symbol in green. Sport mode is displayed as an S symbol in orange. The mode is switched automatically according to the current mode of the motorbike.

Traction Control System (TCS indicator)

The TCS indicator lights up yellow. When it is constantly lit, it indicates that the TCS is controlling the torque delivered by the drive wheels. If it flashes, it means that the TCS is switched off.

Gear indicator

The symbol of neutral gear N is displayed in green. The symbols of the other gears 1-6 are displayed in white.

Cruise control display

When cruise control is active, the indicator lights up constantly orange; when cruise control is on, the indicator lights up constantly green.

Anti-theft device

The anti-theft device indicator lights up red. The anti-theft device indicator flashes if the anti-theft device calibration fails or the anti-theft device is not calibrated. If the anti-theft device calibration is successful, the indicator goes out. The immobiliser indicator flashes within 24 hours after the key is turned off. The anti-theft device indicator stops flashing 24 hours after the key is turned off.

WARNING

- If the alignment of the anti-theft device is not successful, the motorbike cannot be started.
- There is a connection between the anti-theft device and the chassis number. Therefore, if the key needs to be replaced, it must be matched with the chassis number.
- It is recommended to use only one key to avoid reading errors caused by the other key.

Time display

In standard mode, the time is displayed on a 24-hour basis. In sport mode, no time is displayed.

Charge level indicator (battery)

In standard mode, the low battery voltage alarm indicator is shown in red. The indicator lights up continuously when the battery voltage is below 11 V. In sport mode, no low battery alarm indicator is displayed.

WARNING

- The motorbike cannot be started when this symbol is displayed.
- If this symbol appears while riding, it indicates that there is an abnormality in the charging system and that the motorbike must be checked immediately by a service agent.

ABS alarm indicator

The ABS alarm indicator lights up yellow. When the key switch is on, the ABS alarm indicator lights up continuously. The ABS alarm indicator goes off when the speed of the motorbike is more than 5 km/h. The ABS alarm indicator lights up constantly if there is a fault in the ABS system while riding. If there is a large difference in speed between the front and rear wheels, the system automatically switches off the ABS and the ABS alarm indicator lights up constantly.

WARNING

- If there is a malfunction in the ABS system, please visit a customer service centre in good time for a check.
- Burning tyres can cause the ASB system to switch off.

Fuel level indicator / fuel level alarm

- In standard mode, the fuel level is displayed in grids (6 grids). In grids 2-6, the fuel level alarm indicator lights white; when the motorbike continues to be used, the fuel level is displayed in grid 1 and the fuel level alarm indicator changes to amber, with the actual amount of fuel in the tank being approximately 4 l; and when the motorbike continues to be used, the fuel level alarm indicator flashes together with grid 1, with the actual amount of fuel in the tank being approximately 2 l.
- In sport mode, the fuel level is displayed with a pointer (5 grids). In grids 2-5, the fuel level alarm indicator is white; when the motorbike continues to be used, the fuel level is displayed in grid 1 and the fuel level alarm indicator changes to amber, with the actual amount of fuel in the tank being approximately 4 l; and when the motorbike continues to be used, the fuel level alarm indicator flashes together with grid 1, with the actual amount of fuel in the tank being approximately 2 l.

Setting the instrument functions**Switch between metric and imperial system:**

Turn off the ignition and press and hold the key switch (for more than 2 seconds) to switch between the metric and imperial systems. After the instrument has dimmed for a while and the switch-on animation appears.

Switch between trip and total odometer:

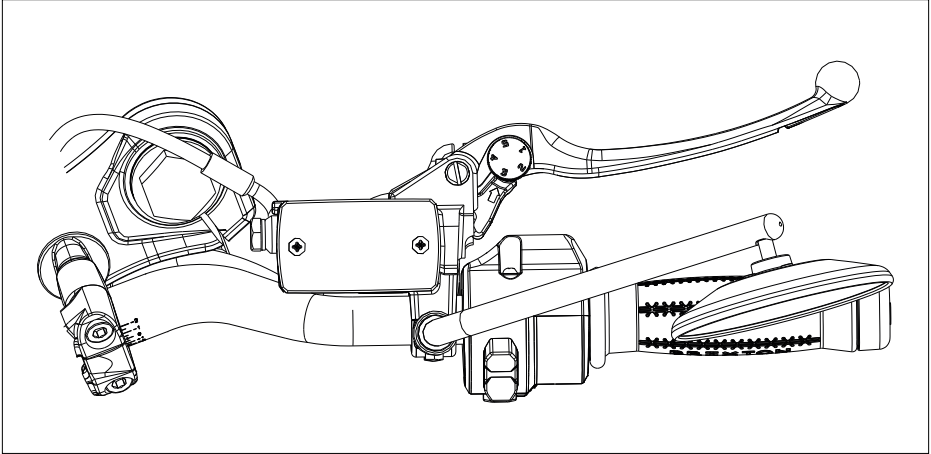
Switch on the ignition and toggle by briefly pressing the key switch (for 1 second) if you are not in the time setting mode. The trip symbol stands for the daily kilometre record, the total symbol for the kilometre record.

Delete the trip record:

Turn on the ignition and press and hold the key switch for more than 2 seconds in trip recording mode to delete the recording.

Setting the clock:

Turn on the ignition, press and hold the button (while the total kilometres are displayed) for more than 3 seconds, the hour segment starts flashing to enter the hour setting mode, and press the button briefly (for 1 second) to make settings; press and hold the button for more than 3 seconds after releasing the button to enter the minute setting mode, and press the button briefly (for 1 second) to make settings; and if there is no operation for a long time during the time setting, the system exits the time setting and keeps the current setting.

Front brake lever

Hold the brake lever to activate the front brake; the brake light comes on. A hydraulic disc brake is used for the front wheel brake and does not require much grip force to brake.

Front brake lever adjustment

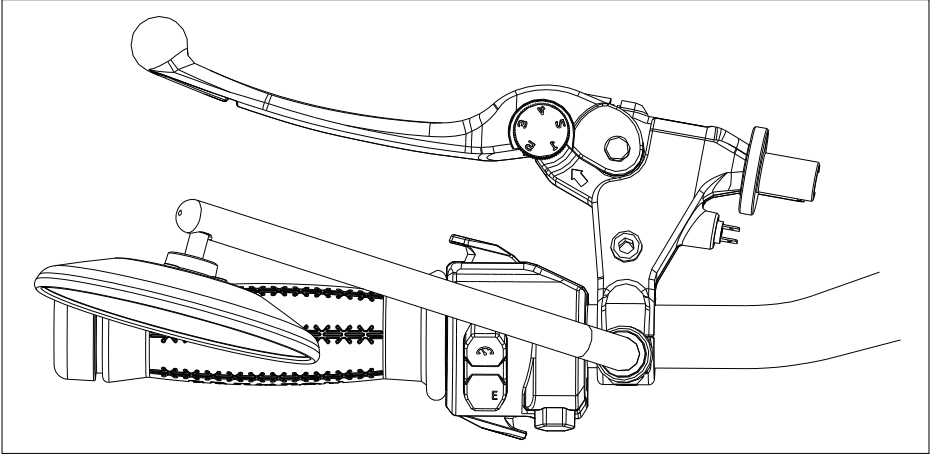
The distance between the throttle grip and the front brake lever can be adjusted with the knob. Adjust the knob, push the front brake lever forward and turn the adjuster to the appropriate position. When changing the position of the front brake lever, ensure that the adjuster stops in the correction position; the shoulder plane of the grip must be aligned with the adjustment plane.

DANGER

It is very dangerous to adjust the front brake lever while riding. Taking your hands off the handlebars reduces the controllability of the motorbike. Always keep your hands on the handlebars while riding.

Throttle grip

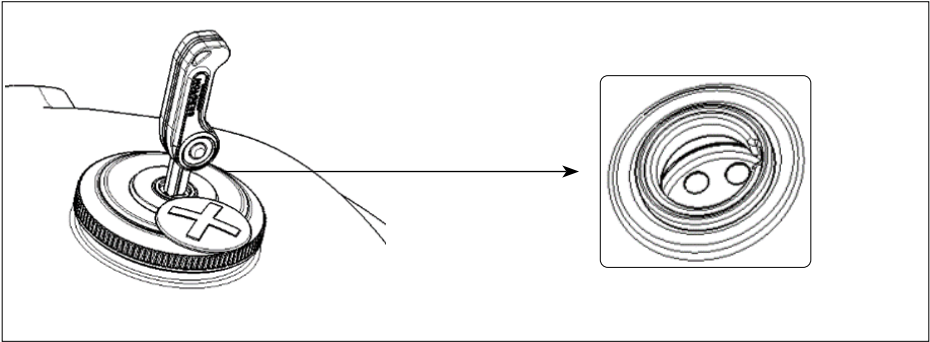
The throttle grip is used to control the engine speed. Turn it backwards to accelerate and forwards to decelerate.

Clutch lever

Hold the clutch lever when starting the engine, braking or shifting gears to disengage the clutch friction disc and interrupt the power transmission.

NOTE

The clutch lever is equipped with a clutch switch. When using the electric starter, the user must hold the lever to start successfully.

Fuel tank

The fuel tank is located in front of the seat. To open the fuel tank cap, turn the cover that covers the keyhole, insert the key into the keyhole and turn the key clockwise until it stops, then remove the fuel tank cap together with the key. To insert the cap, insert the cap with the key into the fuel tank filler neck and press it along the slot until you hear a "click" sound. The key cannot be removed until you have turned it back to its original position. Then turn the cap to cover the keyhole.

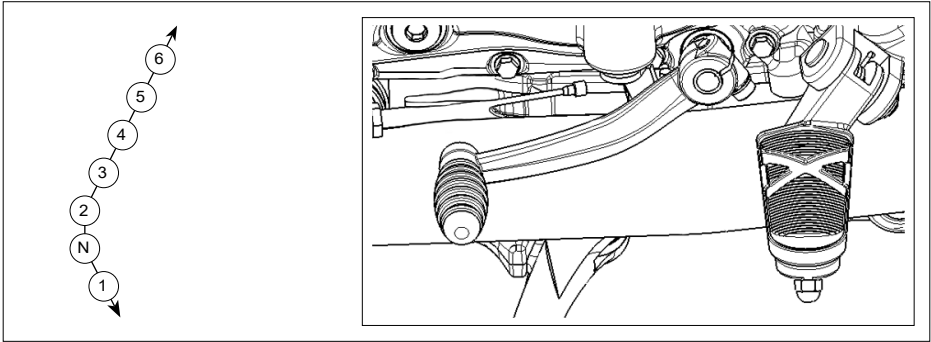
DANGER

- Do not top up too much fuel to avoid the spilled fuel flowing into the highly heated engine. The level of the refilled fuel must not go beyond the bottom of the fuel tank as shown in the illustration. Otherwise, the fuel will leak due to thermal expansion and damage the motorbike's components.
- When refilling, switch off the engine and turn the ignition switch to the position "⊗". Do not get near smoke and fire.
- Reliable protective measures must be taken when refilling fuel. Otherwise, a fire may occur or the user may inhale the fuel fumes. Refill fuel in a ventilated area and make sure that the engine is turned off to avoid fuel leakage. Do not smoke and make sure there is no source of heat or fire nearby. Avoid inhaling fuel vapours. Keep children and pets away from refuelling.

NOTE

Do not rinse the fuel filler cap with high-pressure water to prevent water from entering the fuel tank.

Gearshift pedal

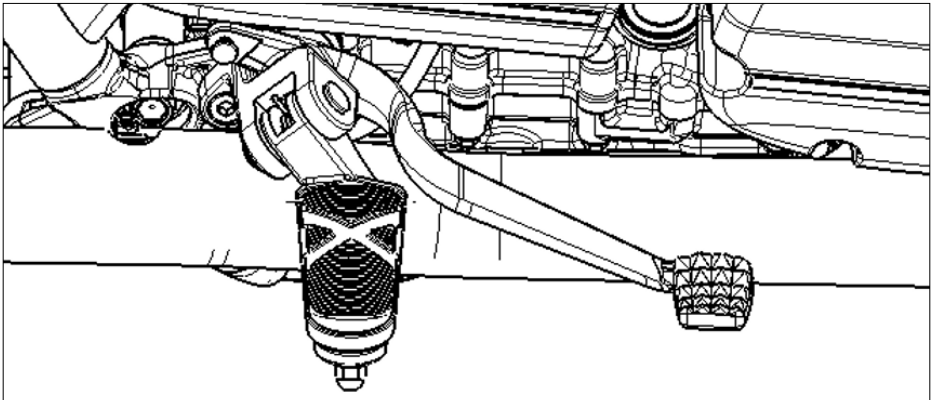


The motorbike is equipped with a six-speed gearbox, the operation of which is shown in the illustration. After a gear is engaged, the gearshift plane automatically returns to its original position to shift to the next gear. Before shifting to a lower gear, reduce the speed of the motorbike or increase the engine speed; before shifting to a higher gear, increase the speed of the motorbike or reduce the engine speed to avoid unnecessary wear of the transmission system elements and the rear wheel.

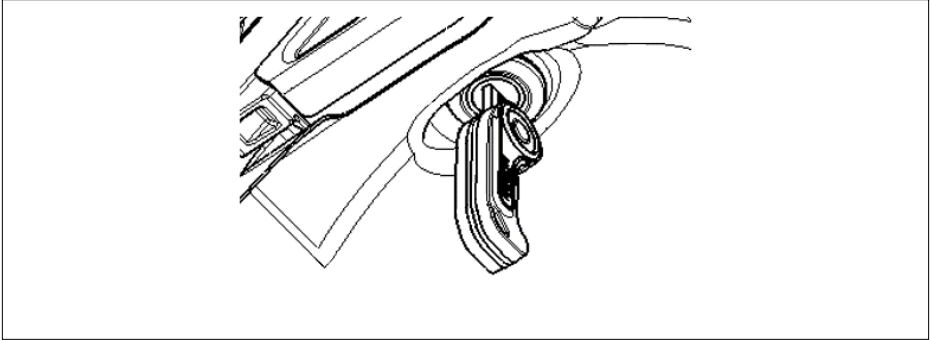
NOTE

When the gear is in neutral and the neutral indicator is lit, slowly release the clutch lever to check if the gear is really in neutral.

Rear brake pedal



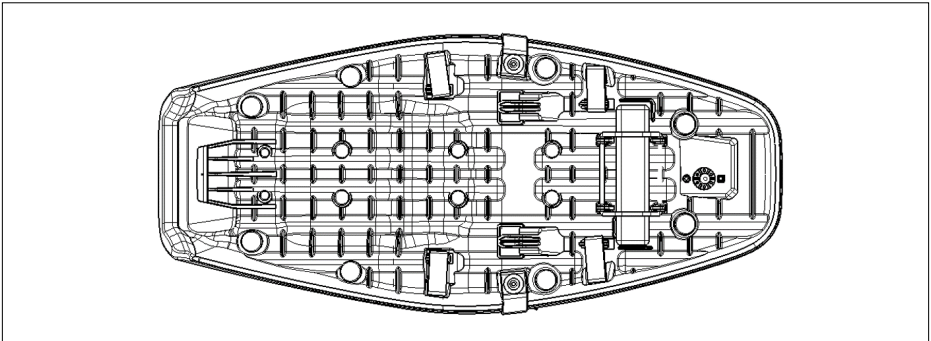
Step on the rear brake pedal to activate the rear brake.

Seat lock

Insert the key into the keyhole and turn it clockwise to unlock the seat, then it can be removed. To install the seat, insert the two pins in the front part of the seat into the corresponding slots and then press on the rear of the seat until a "click" sound is heard, which means that the seat is locked.

DANGER

If the seat is not installed correctly, it may slip and the rider may lose control of the motorbike. Ensure that the seat is securely locked in the correct position.

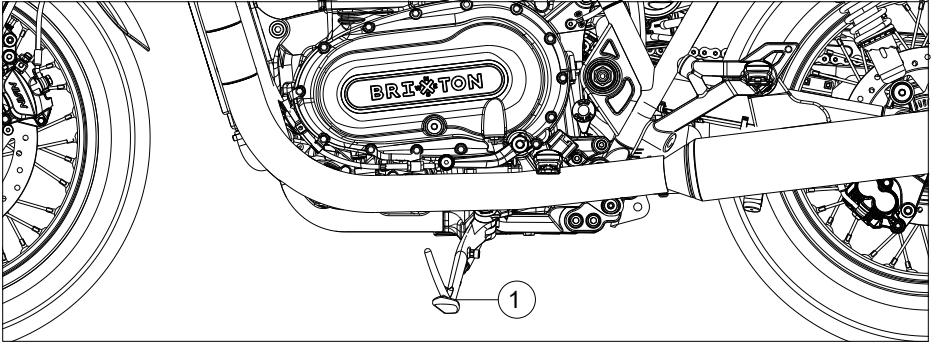
Helmet holder

The helmet holders are located under the seat. To use the helmet holders, you must remove the seat and take out the free end of the helmet holder. Now bring them to the outside of the fixed end, hang the helmet on the bracket with the strap and reinstall the seat.

DANGER

Hanging the helmet on the helmet hanger while driving impairs the rider's ability to control the helmet. Do not use the helmet hanger to wear the helmet. If you need to wear another helmet, please attach it to the rear part of the seat cushion.

Side stand



The motorbike is equipped with a side stand (1). Turn the side stand with the foot to the extreme lower position and ensure that the motorbike is stably supported before riding off.

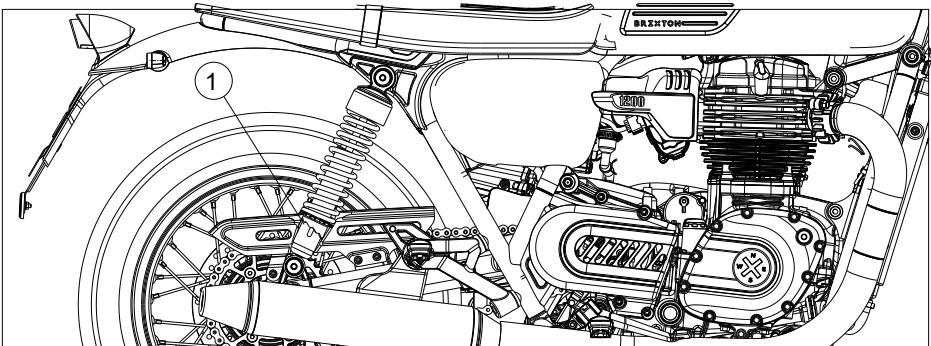
DANGER

Before riding, check that the side stand is turned to the extreme top position or that the connection is loose. Never leave the side stand in other positions.

WARNING

Park the motorbike on a firm and level surface to avoid a rollover. If you need to park the motorbike on a slightly sloping terrain, please park it facing uphill and engage first gear to reduce the possibility of a rollover due to the rotation of the side stand.

Rear shock absorber



The spring preload pressure of the rear shock absorber (1) can be adjusted according to the driver, load, driving style and road conditions. Turn the adjustment spring plate clockwise to increase the shock absorber spring preload pressure and anticlockwise to decrease it. Optimum comfort of the suspension system is achieved by repeated adjustment.

USE OF FUEL, ENGINE OIL AND COOLANT

Fuel

Please use only clean unleaded petrol 95 - 97. Unleaded petrol can extend the life of the spark plug and silencer. If, based on your experience, you find that knocking noises occur, you can use higher octane petrol or other brands, as there are differences between the various brands.

WARNING

Leaded petrol, low grade fuel and oil will damage the components of the electronic fuel injection system and shorten the life of the spark plug and catalytic converter in the muffler. Do not use unclean fuel as it will clog the fuel line and cause engine malfunctions.

Engine oil

Using good quality four-stroke engine oil can extend the life of the engine. Please use API SJ or higher grade "four-stroke motorbike engine oil".

ATTENTION

Please dispose of the used oil properly and avoid environmental pollution. It is recommended to put the used oil in a sealed container and send it to the local recycling centre. Do not pour it into a dustbin or directly onto the ground.

Coolant

Please use the coolant suitable for aluminium radiators. The coolant is a mixture of ethylene glycol and water.

DANGER

Engine coolant is harmful or fatal if swallowed or inhaled and is toxic to animals. Do not drink antifreeze or coolant. If swallowed, immediately contact the Poison Control Centre or a hospital. Avoid inhaling coolant vapours or hot fumes; if inhaled, do not promote vomiting and move immediately to a ventilated area with fresh air. If the coolant gets into your eyes, flush them with clean water and seek medical attention. Wash hands thoroughly after work and keep children and pets away from coolant.

WARNING

Spilled coolant can damage the paint surface of the motorbike. When filling the coolant, be careful not to spill it. If coolant is spilled, wipe it off immediately.

Coolant consumption quantity

Coolant quantity: approx. 1.5 L

BREAK-IN

Proper running-in of a new motorbike can extend the life of the motorbike and bring out its full performance. The correct methods for running-in are as follows.

Recommended maximum engine speed

The recommended maximum engine speed during the break-in period is shown in the table below.

First 800 km	Below 3,000 rpm
Up to 1.600 km	Below 4,000 rpm
Over 1.600 km	Below 6,000 rpm

Gears and engine speed

Change gears and engine speed from time to time and do not run the engine in a particular gear and at a particular speed all the time. During the break-in period, the throttle can be increased accordingly to fully break-in the engine.

Running in new tyres

Like the engine, new tyres require an appropriate break-in period to ensure their optimum performance. For the first 160 km of a new tyre, gradually increase the lean angle of the corner to allow the tyre surface to contact the ground for optimum performance. Avoid rapid acceleration, sharp turns and emergency braking during the first 160 km of a new tyre.

DANGER

Insufficient tyre run-in will cause slippage and loss of control. Be especially careful after replacing with a new tyre. Carry out correct tyre running-in according to the instructions in the current section and avoid rapid acceleration, sharp turns and emergency braking for the first 160 km of a new tyre.

Avoiding running at a fixed low speed

Running at a fixed low speed (under light load) will aggravate wear on the parts, resulting in a poor fit. As long as you do not exceed the recommended throttle opening (i.e. not more than 3/4 throttle opening), you can run the engine at different speeds. However, for the first 500 kilometres you should not open more than 3/4 throttle.

Circulate oil before driving

Regardless of whether the engine is warm or cold, let it idle for a sufficient time before starting to allow the oil to flow to all lubricating parts.

First maintenance

Maintenance after the first 1,000 km is the most important. By then, all engine parts have been run in. Therefore, during this maintenance, all parts and components must be readjusted, all fasteners tightened and the oil contaminated by wear parts replaced. Careful maintenance after the first 1,000 km will ensure the best performance from your motorbike and extend its life.

INSPECTION BEFORE COMMISSIONING

CHECKS BEFORE COMMISSIONING

Make sure you check the following items before riding. Never neglect the importance of these checks and carry out all checks and necessary maintenance before driving.

CHECKPOINTS	TO BE CHECKED
Fuel	<ul style="list-style-type: none">• Check the fuel level in the tank.• If necessary, top up with fuel.• Check the fuel lines for leaks.
Engine oil	<ul style="list-style-type: none">• Check the engine oil level.• If necessary, top up the engine oil (with the correct specifications) to the maximum level.• Check the entire vehicle for leaks.
Front and rear brake	<ul style="list-style-type: none">• Check the function of the brake• If the resistance feels soft or spongy, have the brake system bled by the dealer.• Check the brake pads for wear.• Replace if necessary.• Check fluid level in reservoir.• If necessary, top up recommended brake fluid to the specified level.• Check hydraulic system for leaks.
Throttle grip	<ul style="list-style-type: none">• Check the ease of movement of the throttle twist grip.• Check the throttle twist grip for excessive play.• If necessary, have a dealer adjust the play of the throttle twist grip and lubricate the throttle cable.
Wheels and tyres	<ul style="list-style-type: none">• Check the tyres and wheels for damage.• Check the tyre condition and tread depth.• Check the tyre pressure.
Brake lever and pedal	<ul style="list-style-type: none">• Check the smooth running of the components. If necessary, lubricate the pivot points.
Side stand	<ul style="list-style-type: none">• Check the ease of movement. If necessary, lubricate the pivot points.
Screw connections	<ul style="list-style-type: none">• Make sure that all nuts and bolts are properly tightened. Tighten them if necessary.
Instruments, lights, indicators and switches	<ul style="list-style-type: none">• Check the components for function and replace the bulbs if necessary.

BASIC INFORMATION ON MOTORCYCLING**DANGER**

- If you are riding such a motorbike for the first time, you should practice on a non-public road until you are familiar with the controls and operation of the motorbike.
- It is very dangerous to ride the motorbike with only one hand. Hold the handles firmly with both hands and place your feet on the rider's footrests. Do not take both hands off the handles under any circumstances. Slow down to a safe speed before turning.
- On wet and slippery roads, tyre friction decreases and braking and turning ability decreases accordingly, so you must reduce speed in advance.
- Crosswinds always occur when overtaking a tunnel exit, a valley or a large vehicle from behind. Be careful, calm down and slow down.
- Please observe the traffic rules and speed limits.

Starting the engine

Check whether the motor stop switch is in the position "Q" stands. Insert the key into the keyhole of the ignition switch and turn it clockwise to the position "Q" (On). When the motorbike is in neutral, the idle indicator lights up.

DANGER

Ensure that you put the motorcycle in neutral, return the throttle lever to its original position and hold the clutch lever before starting the engine. Otherwise, the motorbike will run forward when the engine is started with the gear engaged.

ATTENTION

- When starting, you must hold the clutch lever or let the engine idle. Do not forget to raise the side stand.
- If the motorbike rolls over, the rollover sensor will turn off the power and cut off the fuel supply to bring the motorbike to a stop. To restart the motorbike, turn off the ignition switch and one minute later turn on the ignition switch and start the engine.

Starting with cold engine

1. Fold up the side stand.
2. Turn the throttle grip to the idle position (turn off the throttle).
3. Press the electric start button to start.
4. After starting, let the engine continue to run until it has warmed up completely.

NOTE

The colder the weather, the longer it takes for the engine to warm up. Driving after the engine is fully warmed up can reduce engine wear.

If it is difficult to start the cold engine

1. Opening the throttle valves.
2. Fold up the side stand.
3. Press the electric start button while opening the throttle 1/8.
4. After the engine has started, keep it running until it has warmed up completely.

Starting with warm engine

1. Fold up the side stand.
2. Turn the throttle grip to the idle position (turn off the throttle).
3. Press the electric start button to start.

If it is difficult to start the warm engine

1. Fold up the side stand.
2. Press the electric start button while opening the throttle 1/8.

DANGER

Do not start the engine in a poorly ventilated area or an unventilated room as the exhaust fumes are toxic. Do not leave the engine running unattended. Do not start the motorbike if it is low on fuel or oil.

WARNING

If the motorbike does not run, do not run the engine at too high an engine speed or idle for too long. Overheating of the engine caused by idling too long will damage the internal parts and cause discolouration of the exhaust and muffler.

RIDING THE MOTORBIKE

Fold up the side stand, tighten the clutch lever and step on the gear lever to shift into first gear. Turn the throttle grip in the direction of acceleration and slowly release the clutch lever to drive the motorbike. To shift to a higher gear, you must gradually open the throttle, release the throttle, pull the clutch lever and lift the shift lever to shift to a higher gear; then release the clutch lever and gradually open the throttle to accelerate. You can shift to the highest gear using this method.

DANGER

- Before starting the motorbike, ensure that the side stand is in the uppermost position and do not stop in any other position.
- Wear a helmet, goggles and conspicuous clothing before riding.
- Do not ride a motorbike after drinking alcohol or taking medication.
- Slow down when the road is slippery or visibility is poor.
- Excessive speed easily leads to loss of motorbike control and accidents. Ride the motorbike at the speed prescribed in national regulations. Choose the correct speed according to the terrain, visibility and riding environment. Drive the motorbike within the limits of your abilities. Know the limits of your riding ability and do not ride beyond your capabilities. Never exceed your speed.
- It is very dangerous to ride the motorbike with only one hand. Hold the handles firmly with both hands and place your feet on the footrests. Do not let your hands off the grips under any circumstances.
- Crosswinds occur whenever there is a tunnel exit, a valley or a large vehicle overtaking from behind. Be careful, calm down and slow down.

Shifting the transmission

The use of the gearbox allows the engine to run smoothly in the normal speed range. The gear ratio is carefully matched to the engine characteristics. The driver must select the most appropriate gear for the driving conditions and never run the engine at high speed in a low gear. At no time should speed be controlled by half-engaging the clutch. Before shifting to a lower gear, reduce the motorbike speed or increase the engine speed; before shifting to a higher gear, increase the motorbike speed or reduce the engine speed.

DRIVE MODE

DANGER

Downshifting at very high engine speed causes the rear wheel to brake and can lead to accidents. Downshifting when turning will cause the rear wheel to brake, resulting in loss of control of the motorbike. Reduce the speed of the motorbike and downshift before entering corners.

WARNING

Do not let the engine spin in any gear. It is forbidden to coast in any gear or to engage the clutch by yourself. Over-revving the engine will damage the engine.

Driving uphill

- When going uphill, the motorbike slows down due to lack of power. The user must downshift to keep the engine running in the normal power range. In such a case, the user must shift quickly to avoid excessive braking of the motorbike.
- When going downhill, the user can use the engine brake by shifting to a lower gear to assist braking. If the brake is constantly applied, it will overheat, reducing braking power.
- Please remember not to over-rev the engine, otherwise the internal parts of the engine can easily be damaged.

WARNING

Do not switch off the ignition or the engine stop switch when driving down a slope to avoid shortening the life of the catalytic converter in the muffler.

Braking and parking

1. Release the throttle grip to allow the throttle lever to return fully.
2. Use the front brake lever and the rear brake pedal to brake.
3. Shift to a lower gear when the speed is low enough and reduce the speed of the motorbike.
4. Hold the clutch lever firmly (disengage the clutch), let the motorbike idle and then stop it completely. The idle indicator on the instrument will illuminate after the motorbike has been shifted into neutral.
5. If you wish to park the motorbike with the side stand on a slight incline, please shift to a low gear and try to park the motorbike facing uphill to avoid tipping over due to the rotation of the side stand. However, make sure you shift back into neutral before starting again.
6. Turn the ignition switch to the " ⌘ " (off) position to stop the engine.
7. Lock the steering wheel lock to ensure safety.
8. Remove the key.

WARNING

If you brake only with the rear brake, the braking system wears out faster and the braking distance increases.

DANGER

- The braking distance will increase accordingly if the speed of the motorbike is too high. Ensure that the distance to the vehicle or object in front is large enough to slow the motorbike down, otherwise rear-end collisions may occur.
- It is dangerous to apply only the front or rear brake as this may cause skidding and loss of control. Operate the braking system carefully and gently on slippery roads and in curves. Full braking on uneven or slippery roads may result in loss of control of the motorbike.
- Full braking when turning may result in loss of control of the motorbike. Brake before turning and reduce the speed of the motorbike.
- The muffler is hot when the engine is running or has just been turned off. Please do not touch the muffler to avoid burns.

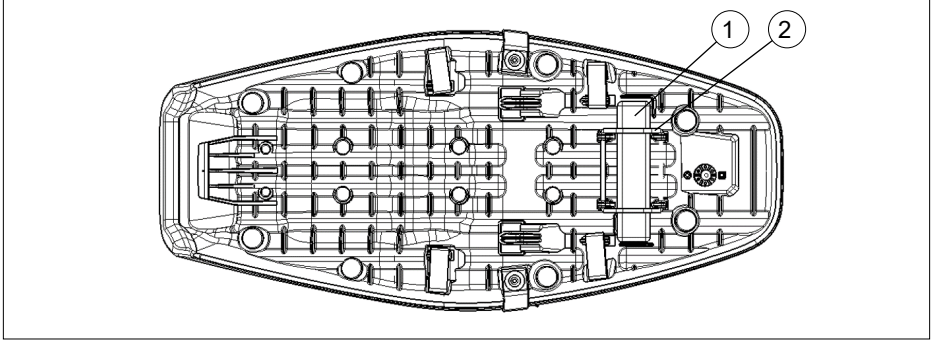
WARNING

If you brake only with the rear brake, the braking system wears out faster and the braking distance increases.

NOTE

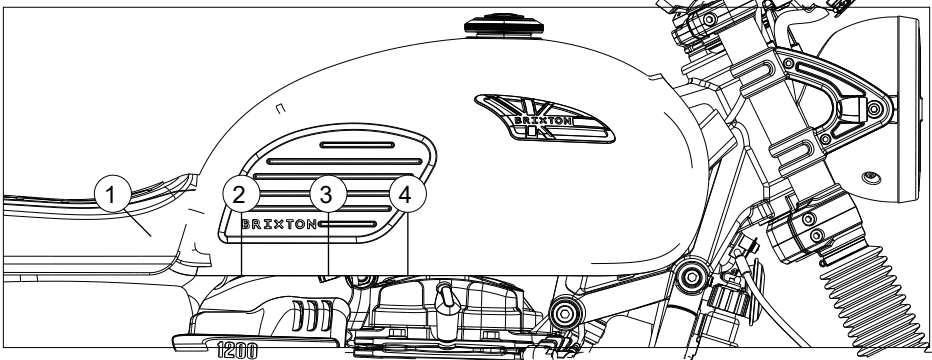
If another anti-theft device is used, such as a U-lock, brake disc lock and chain lock to prevent theft, the anti-theft device must be removed before driving.

TOOL KIT



The toolbox (1) is attached to the seat. You can see it by unlocking the seat and taking it out. You can remove the tool kit by loosening the fastening strap (2).

Quick guide to removing and installing the fuel tank



1. Park the motorbike with the side stand and unlock the seat to remove it.
2. Remove the fuel tank fixing screw (1).
3. Disconnect the fuel pump connector (4). Loosen the fixation and remove the fuel line (3). Remove the vent line (2) and the overturning valve.

NOTE
Make sure that no fuel leaks when you remove the fuel line.

4. Removing the fuel tank
 - The fuel tank is unstable during removal. It is recommended that 2 people work together when removing the fuel tank.
 - Do not pull the fuel tank too hard or bend the fuel line to prevent the fuel line from kinking.
 - Be careful not to damage the end of the fuel line when removing or inserting the fuel tank.

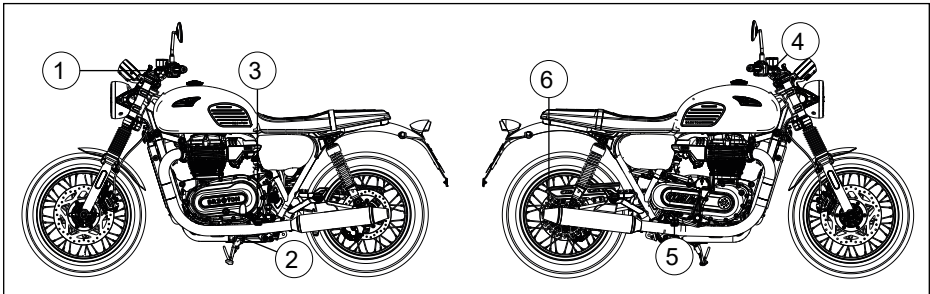
DANGER

Fuel leaking from the fuel line may cause a fire. Switch off the engine before removing the fuel line. Keep away from fire, sparks and heat sources. Do not smoke. Collect the fuel in a container and dispose of it properly.

Installation of the fuel tank

Install the fuel tank as described above in reverse order. Place the fuel tank in the correct position. Connect the pipe properly. Have the end of the hose clamp facing outwards when connecting the absorption hose. When installing the fuel line, prevent foreign objects from entering the fuel line.

LUBRICATION POINTS



- | | |
|-------------------------------------|---|
| 1. Clutch lever shaft | 4. Brake lever shaft |
| 2. Side stand shaft and spring hook | 5. Brake pedal shaft and footrest shaft |
| 3. Footrest shaft | 6. Drive chain |

To ensure safe riding, the functional parts should be well lubricated to ensure smooth operation and prolong service life. The motorbike must be lubricated after it has been used in rough conditions, stood in the rain or washed. The lubrication points are as follows.

BATTERY

The battery is completely maintenance-free and sealed and does not need to be checked regularly for fill level and specific gravity of the electrolyte. However, the charging performance must be checked regularly.

DANGER

The battery terminals and related components contain lead or lead compounds that can harm your health if they enter the bloodstream. Please wash your hands after handling parts containing lead. The sulphuric acid in the battery can injure the eyes and burn the skin. Please wear protective goggles and gloves. If you are injured by sulphuric acid, rise with plenty of water and seek medical attention immediately. Keep children away from the battery.

PERIODIC MAINTENANCE AND INSPECTIONS

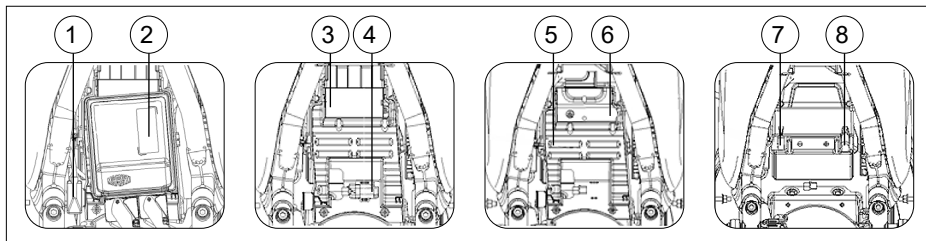
WARNING

- Please dispose of the used battery and electrolyte properly to avoid environmental pollution. It is recommended that you send the used battery and electrolyte to a local recycling centre. Do not throw them in a dustbin or directly on the ground.
- Check the battery regularly and recharge the battery when the voltage is below 11.5 V.

NOTE

Overcharging will shorten the life of the battery. Do not overcharge them.

Battery removal



Proceed as follows to remove the battery:

1. Park the motorbike with the side stand.
2. Unlock the seat to remove it (see Fuel Tank Removal).
3. Remove the ECU (1) and OBD diagnostic interface (2).
4. Remove the tilt sensor and fuse box.
5. Remove the four M6 flange screws to remove the ECU support plate.
6. Remove the protective cap to dismantle the negative terminal (-).
7. Remove the protective cap to dismantle the positive (+) terminal.
8. Remove the battery.

Battery installation

Install the battery in reverse order to that described above.

- Connect the battery terminals correctly.

WARNING

When connecting the battery, first connect the red cable to the positive terminal and then the black cable to the negative terminal. Incorrect connection will damage the electrical parts.

NOTE

- Please choose a MF battery of the same model when replacing the battery.
- The battery should be recharged every 3 months if it is not used for a long period of time.



Pb

The symbol on the battery indicates that the used battery must be collected separately from normal household waste. The chemical symbol "Pb" indicates that the battery contains more than 0.004% lead.

The waste battery must be properly disposed of or recycled, otherwise it will have a negative impact on the environment and human health. Recycling materials can protect natural resources. Contact your dealer if you have any questions about the correct disposal and recycling of waste batteries.

WARNING

The battery terminals and related components contain lead or lead compounds that can harm your health if they enter the bloodstream. Wash your hands after handling parts containing lead. The sulphuric acid in the battery can injure the eyes and burn the skin. Please wear protective goggles and gloves. If you are injured by sulphuric acid, rise with plenty of water and seek medical attention immediately. Keep children away from the battery.

AIR FILTER

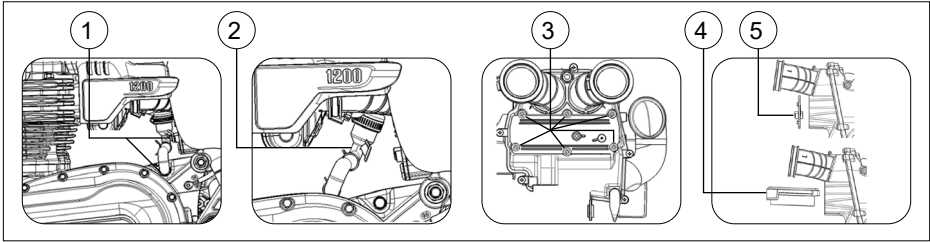
The air filter is located under the fuel tank. If the air filter is clogged with dust, the intake resistance will increase, resulting in reduced power output and increased fuel consumption. If the motorbike is operated in a dusty environment, the air filter element must be cleaned or replaced more frequently. Check and clean the air filter using the following steps.

WARNING

If the motorbike is operated in a dusty environment, the air filter element must be cleaned or replaced more frequently. It is very dangerous to operate the engine without the air filter. If the element in the air filter is not blocked, the engine flame will burn back from the engine into the air filter intake chamber. Dirt can get into the engine and damage it. Do not run the engine without the air filter.

NOTE

If the motorbike is frequently used in a dirty, wet and muddy environment without regular inspection, the motorbike may be damaged. Under such conditions, the air filter will become clogged, causing damage to the engine. Check the air filter after riding in harsh environments and clean or replace it as necessary. If water enters the air filter, clean it immediately.



Steps for replacing the filter element:

1. Remove the clamp of the vent pipe (1) and the fastening screw of the fuel and vapour separator housing.
2. Disconnect the fuel and vapour separator combination (2) and remove the screws of the filter cover (3).
3. Remove the filter cover (4) and the filter insert (5).
4. Carefully clean the air filter element with compressed air.

WARNING

A broken air filter can allow dirt to enter the engine, which can cause engine damage. If the filter element is broken, please replace it with a new filter element. When cleaning the air filter, check whether the filter element is broken.

5. Install the cleaned filter element or a new one in reverse order. Ensure that the filter element is installed in the correct position and properly sealed.

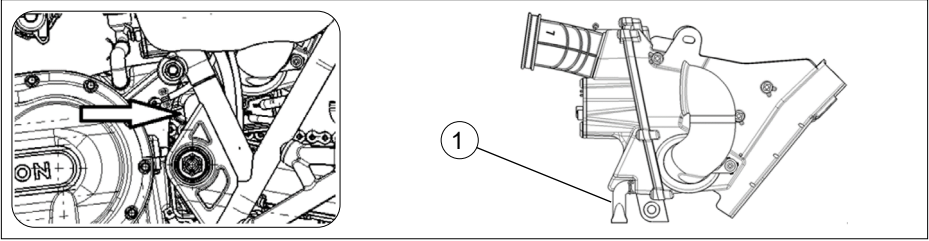
WARNING

- If the air filter element is not installed correctly, dust can bypass the filter element and enter the engine, causing damage to the engine. Ensure that the filter element is installed in the correct position.
- If the motorbike is operated in dusty conditions, the interval for checking and replacing the filter element must be shortened. If you notice a blockage, damage or dust leaking from the filter element, an obvious reduction in engine performance, increased fuel consumption or similar conditions, please replace the filter element immediately and do not wait until scheduled maintenance. If you start the engine without the filter element, the wear of the engine will increase. Please check the filter element regularly, as this component always influences the service life of the engine.

NOTE

Make sure that no water gets into the air filter when washing the motorbike.

Drain hose

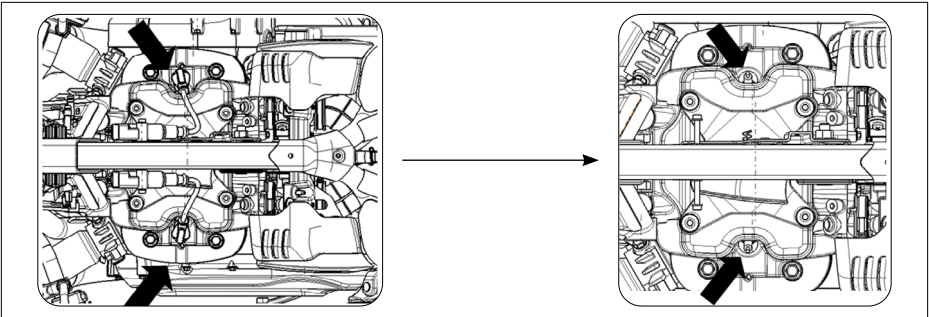


Remove the drain hose (1) to drain the fuel residues inside during regular maintenance.

NOTE

- The inspection frequency must be increased accordingly in case of high humidity.
- Make sure to reinstall the drain pipe after operation.

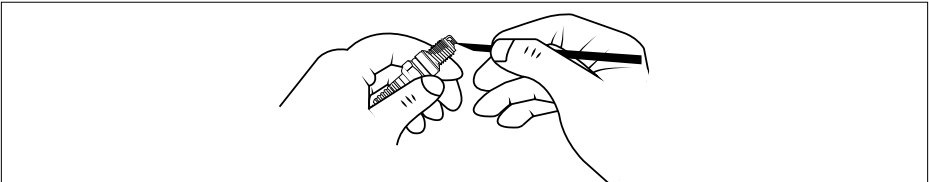
SPARK PLUG



Proceed as follows to remove the spark plug:

1. Remove the spark plug connectors.
2. Remove the spark plug with a spark plug spanner.

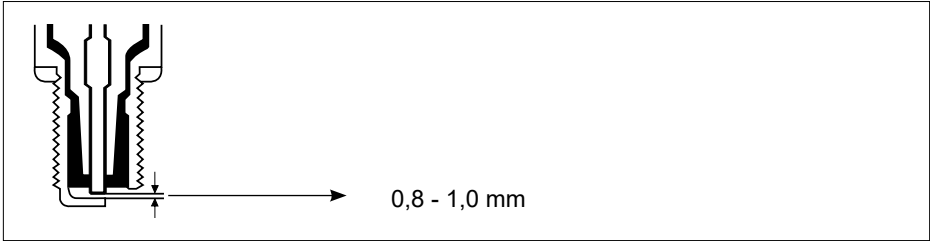
Spark plug inspection



WARNING

Dirt can enter the engine through the mounting hole of the spark plug and damage the engine. Please cover the mounting hole of the spark plug after removing the spark plug.

Clean the carbon deposit on the spark plug with a hard iron wire or steel needle, then check the spark plug electrode gap with a feeler gauge and adjust the electrode gap to 0.8 - 1.0 mm.



Replacing the spark plug

WARNING

The heat value range of an unsuitable spark plug is not suitable for the running engine. This will cause damage to the engine which cannot be claimed. Please use the spark plug for the model specified below.

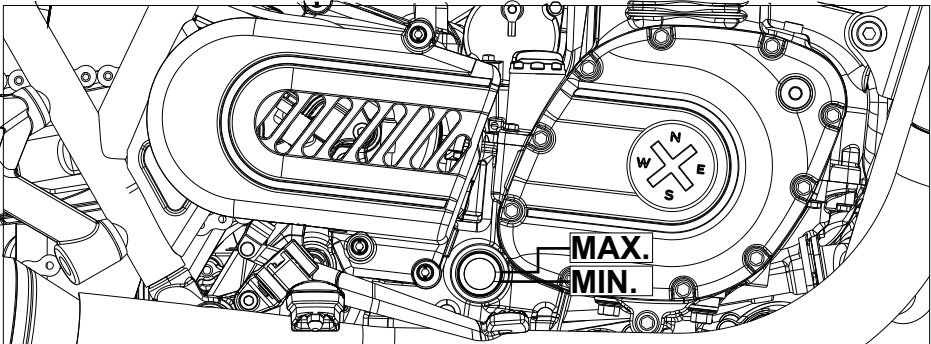
The spark plug must be replaced according to the regular maintenance schedule. The removal and installation of the spark plug must be carried out by the specialist dealer.

Spark plug model: LMAR8A-9 (NGK)
Electrode gap: 0,8 - 1,0 mm
Tightening torque: 12 Nm

MOTOR OIL

Selecting a good quality oil and changing the engine oil regularly are very important for the durability of the engine. Checking the oil level daily and changing the oil regularly are two important tasks to be performed as part of the maintenance schedule.

Oil level check



Proceed as follows to check the oil level in the engine:

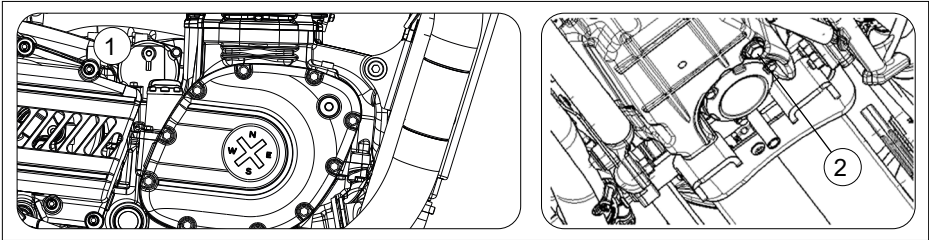
1. Park the motorbike with the side stand on a flat surface.
2. Start the engine and let it run for 3 minutes.
3. Switch off the engine and wait for 3 minutes.

4. Raise the side stand and keep the motorbike moving. Then check the engine oil level through the oil level inspection window on the right side of the engine. The oil level must be between the "F" line and the "L" line.

WARNING

Running the engine with too much or too little engine oil will damage the engine. Park the motorbike on a level surface. Check the oil level through the oil level inspection window. The oil level must be above the "L" line and below the "F" line.

Oil change



Change the engine oil at every maintenance cycle. Change the oil when the engine is warm to drain the used oil more thoroughly. The steps are as follows:

1. Park the motorbike on the side stand.
2. Remove the oil filler plug.
3. Place a drain pan under the drain plug.
4. Remove the drain plug and drain the used oil.

WARNING

- The engine oil and the exhaust pipe of the muffler can burn people. Wait until the drain plug and exhaust pipe have cooled down before draining the used oil.
- Children and pets may be harmed if they accidentally drink the oil. Repeat: Long-term exposure to engine oil can cause skin cancer. Short-term contact with engine oil can irritate the skin. Keep children and pets away from engine oil. When changing engine oil, please wear long-sleeved clothing and protective gloves (e.g. washing gloves) to avoid skin irritation. If the skin comes into contact with engine oil, please wash it thoroughly with soap and water. Wash the clothes and cloth soiled with engine oil. Recycle and dispose of used engine oil properly.

PERIODIC MAINTENANCE AND INSPECTIONS

NOTE

Recycle and dispose of used engine oil properly.

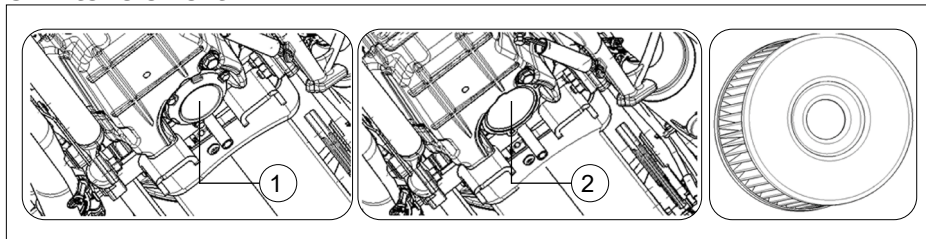
5. Replace the drain plug and its washer. Tighten the drain plug with a spanner.
6. Refill approx. 3,200 ml of new API SJ or higher grade "four-stroke motorbike engine oil" via the oil filler neck. (If the engine oil filter element is replaced at the same time, approx. 3,400 ml of new engine oil must be refilled).

WARNING

If the prescribed engine oil is not used, the engine may be damaged.

7. Insert the oil filler plug.
8. Run the engine for 3 minutes at different speeds. Check if there are any leaks from the reinstalled parts while the engine is running.
9. Switch off the engine and wait for 3 minutes. Check the engine oil level through the oil level check window while the motorbike is running. If the engine oil level is below the "L" line, add new oil up to the "F" line. Check again to see if there is a leak.

Oil filter element



Replace the engine oil filter element at every maintenance cycle. The engine oil filter element must be replaced when draining the engine oil.

The steps are as follows:

1. Thoroughly drain the used engine oil as described in the section "Changing the oil".

DANGER

Children and pets can be harmed if they accidentally drink the oil. Repeat: Long-term exposure to engine oil can lead to skin cancer. Short-term contact with engine oil can irritate the skin. Keep children and pets away from engine oil and the used oil filter element. Wear long-sleeved clothing and protective gloves (such as wash gloves) when changing the engine oil to avoid skin irritation. If the skin comes into contact with engine oil, please wash it thoroughly with soap and water. Wash the clothes and cloth soiled with engine oil. Recycle and dispose of the used engine oil and oil filter element properly.

NOTE

Recycle and properly dispose of the used engine oil and oil filter element.

2. Remove the oil filter element (2) by turning it anticlockwise with a special cap tool (1) or a special belt tool of a suitable size.
3. Use a rag to wipe the mounting surface of the oil filter element on the engine.

4. Apply a little new oil to the sealing ring of the new oil filter element.

WARNING

Replacing it with an incorrect oil filter element or an oil filter element with an incorrect thread can damage the engine. The original parts from our company must be used.

5. If you install the oil filter element with a special tool, tighten it to the specified torque.

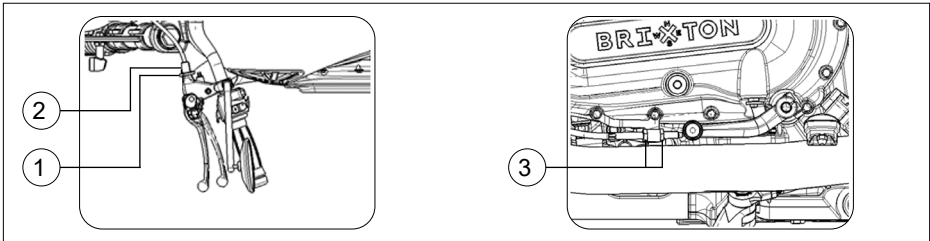
The torque for installing the oil filter element is: 20 Nm

6. Install the drain plug with its washer and fill with new engine oil according to the section "Changing the oil". Fit the oil filler plug. Run the engine to check for leaks. Check the oil level after running the engine.

NOTE

If the special tool for the oil filter insert is required, please contact the workshops designated by our company.

FREE PLAY OF THE CLUTCH LEVER



Measure the play at the end of the clutch lever, which should be in the range of 10~15mm. If the play is outside this range, please adjust it as follows.

Small adjustment

1. Loosen the clutch cable lock nut (1).
2. Turn the clutch cable adjuster (2) to achieve adequate play.
3. Tighten the clutch cable lock nut (1).

Large adjustment

1. Loosen the lock nut (3) of the clutch adjuster.
2. Adjust the clutch position to achieve adequate play.
3. Tighten the lock nut (3).

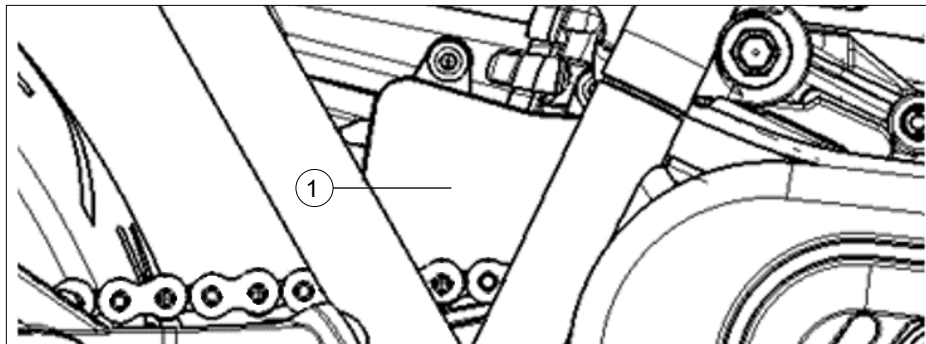
IDLE SPEED

The engine idle speed must be checked when the engine is warm. The engine idle speed must be in the range of 1000 ± 100 rpm.

NOTE

If the idle speed is not within the specified range, please have the motorbike checked by the workshops designated by our company.

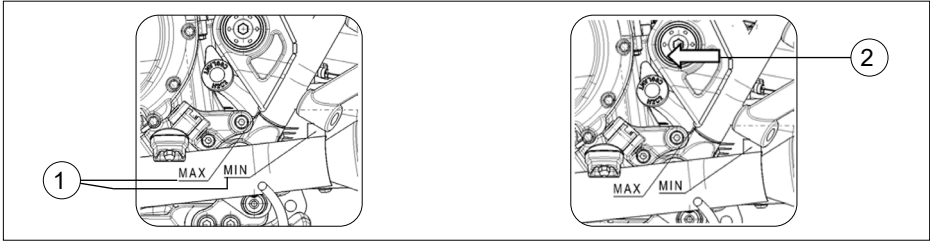
EVAPORATIVE EMISSION CONTROL SYSTEM (EVAP)



The motorbike is equipped with a control system that prevents fuel from evaporating into the atmosphere. The following items must be checked regularly (every 10,000 km or every 30 months). (1) Check that all piping is reliably connected; (2) check for any cracks or damage to any piping or the charcoal canister (1) and replace if necessary; and (3) check for any clogged piping or the charcoal canister (1) and clean or replace if necessary.

COOLANT

Coolant level



The coolant level in the coolant reservoir must be between the "MIN" and "MAX" lines (1) at all times. Please check the coolant level regularly under the operating conditions of the motorbike. If the coolant level is below the "L" line, please top up with suitable coolant using the following method.

1. Park the motorbike on the side stand.
2. Open the coolant reservoir and top up with suitable coolant to the "F" line (2). The contents of the section "Instructions for use of fuel, oil and coolant" may be consulted.

NOTE

- Check the coolant level when the engine is cold.
- If the coolant tank is empty, please check the cooling system immediately and top up coolant.

DANGER

The coolant is harmful, even fatal, if swallowed or inhaled, and is toxic to animals. Do not drink antifreeze or coolant. In case of ingestion, do not induce vomiting and immediately call the Poison Control Centre or a doctor. In case of inhalation, move to a place with fresh air. If the coolant gets into the eyes, rinse with clean water and seek medical attention. Wash hands thoroughly after work. Keep children and pets away from antifreeze and coolant.

Replacing the coolant

Change the coolant every 2 years.

NOTE

To replace the coolant, you must add approx. 1,500 ml of coolant to the reservoir and the radiator.

FUEL LINE

Lift the fuel tank to check if the fuel line is damaged or leaking. If a problem occurs, the fuel line must be replaced.

NOTE

Do not lift the fuel tank by force.

PERIODIC MAINTENANCE AND INSPECTIONS

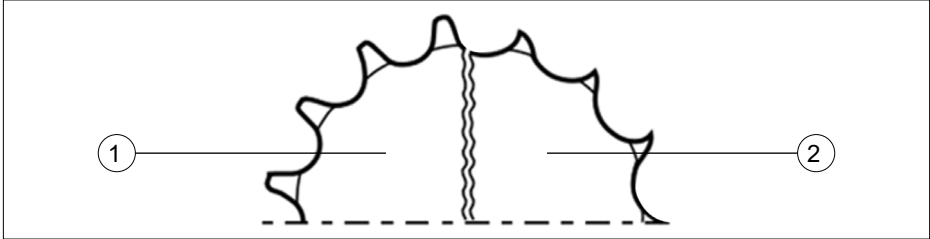
DRIVE CHAIN

The motorbike model is equipped with a circular drive chain made of special materials instead of a drive chain with a split locking ring. The drive chain has a special ring in which grease is sealed. Check and adjust the motorbike's drive chain before each ride. Check and service the drive chain using the following method.

DANGER

To ensure safety, the drive chain must be checked and adjusted before each journey.

Drive chain inspection



When inspecting the drive chain, check for the following problems:

- Loose chain pin
- Damaged pin roller
- Dry or rusty chain link
- Inflexible chain links
- Excessive wear
- Improper adjustment of the chain

If you notice a problem with the drive chain or if the drive chain is incorrectly adjusted, please contact one of the workshops designated by our company. Wear of the drive chain always indicates that the sprocket is also worn. Please check if there is any of the following problems with the sprocket:

- If the sprocket is excessively worn
- If a tooth of the sprocket is broken or damaged
- If one of the sprocket retaining nuts is loose

If you have noticed any of the above problems with the pinion, please visit one of the workshops designated by our company.

NOTE

When replacing the drive chain, check the wear of the front and rear sprockets and replace the sprockets at the same time if necessary.

DANGER

It is very dangerous if the replaced drive chain is installed improperly or a split ring type drive chain is used. A drive chain that is not riveted tightly or a drive chain with a split locking ring may be loose, resulting in accidents or engine damage. Do not use a drive chain with a split locking ring. Special tools and a good quality non-split lock ring drive chain are required to replace the drive chain. Please leave the replacement to the repair workshops designated by our company.

Cleaning and lubricating the drive chain

Clean and lubricate the drive chain regularly according to the following method:

1. Remove dirt and dust from the chain, taking care not to damage the sealing ring.
2. Wash the chain with sealing ring chain cleaner or with water and neutral detergent.

WARNING

- Improper cleaning of the chain can damage the sealing ring and break the chain.
- Do not use volatile solvents such as paint thinner and petrol.
- Do not use a high-pressure cleaner to clean the chain.
- Do not use a wire brush to wash the chain.

3. Use a soft brush to wash the chain. Be careful not to damage the sealing ring even if a soft brush is used.
4. Wipe off the water and neutral detergent and air dry the chain.
5. Lubricate the chain and the inner and outer plates with special chain oil for motorbike chains.

WARNING

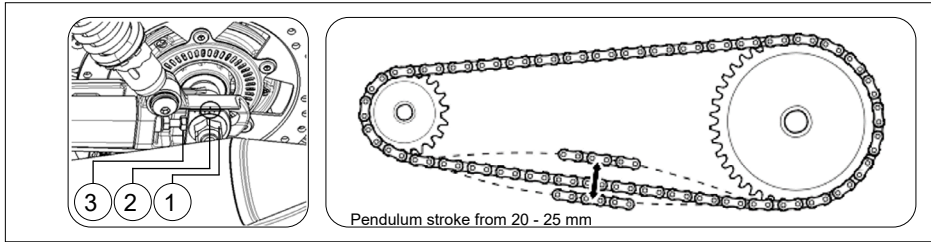
Some chain lubricants contain solvents and additives that can damage the sealing ring, so please use special chain oil for ring chains.

6. After lubricating the chain completely, wipe off excess chain oil.

NOTE

If no special chain oil for ring chains is available, the high-viscosity gear oil SAE 90 can be used.

Adjusting the drive chain



Adjust the drive chain slack to the appropriate range. Increase the adjustment frequency of the drive chain according to the driving conditions.

DANGER

If the drive chain is too loose, the chain may jump off the sprocket and cause an accident or serious engine damage. Check and adjust the drive chain before riding the motorbike.

Adjust the drive chain using the following steps:

DANGER

The hot muffler can burn you. Sometimes the muffler is still hot after the engine is switched off and can burn you. Wait until the muffler has cooled down to avoid burns.

1. Park the motorbike with the side stand.
2. Loosen the wheel axle nut (1).
3. Turn the adjustment screw (3) to adjust the drive chain slack. To ensure alignment of the front and rear sprockets, set the marks on the left and right sides to the same position using the marks (2) on the adjuster and bracket.
4. Tighten the wheel axle nut (1).
5. Check the drive chain slack again and adjust if necessary.

Tightening torque of the rear wheel axle nut: 80 - 90 Nm

WARNING

The motorbike's drive chain is made of special raw materials. The original product from our company must be used to replace the drive chain (endless chain DID520, 102 links). The use of other drive chains may cause premature damage.

BRAKE SYSTEM

Both the front and rear wheels of the motorbike are equipped with a disc brake. A properly functioning brake system is very important for safe riding. Remember to have the brake system checked regularly by qualified workshops.

DANGER

- The brakes are very important for the rider's personal safety. You must check and adjust the brakes regularly and clean the sludge on the brake calipers regularly to prevent it from obstructing the piston movement.

DANGER

- If maintenance of the brake system is required, you should contact qualified workshops. They have complete tools and professional expertise and can do the job in the safest and most economical way.
- Failure to check and maintain the brake system increases the risk of an accident. Ensure that you check the brake system before each journey according to the section "Checks before driving". Maintain the brake system according to the regular maintenance table.

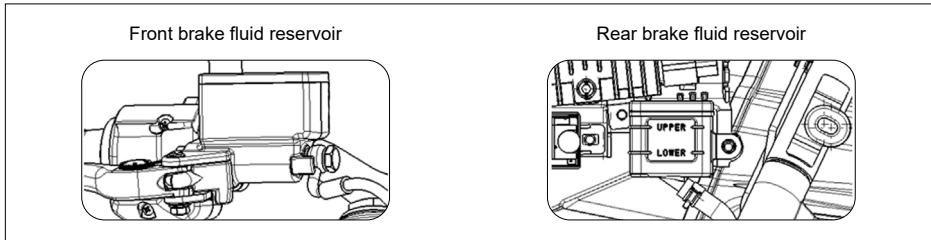
Check the brake system using the following points:

- Check the level of the brake fluid reservoir.
- Check for signs of leaks in the front and rear brake systems.
- Check if the brake fluid hose is leaking or broken.
- Check the wear of the brake discs and brake pads.
- Operate the front and rear brakes to check that they are flexible and effective.

WARNING

The disc brake system operates with a high pressure brake. To ensure safety, the brake fluid hose or brake fluid replacement cycle must not exceed the duration specified in the "Inspection and Maintenance" section.

Brake fluid



Check the brake fluid level in the front and rear brake fluid reservoirs. If the level is below the "LOWER" mark, check if the brake pads are worn and brake fluid is leaking.

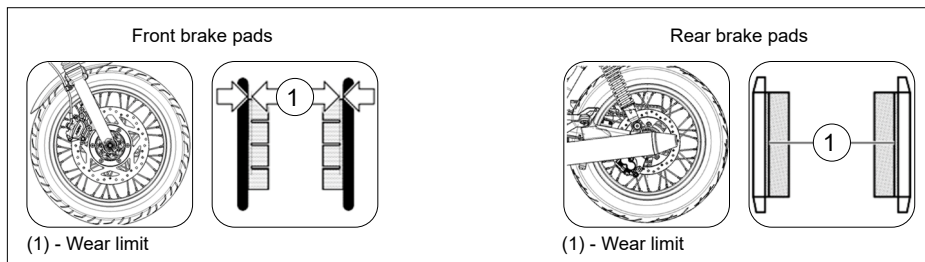
DANGER

Do not flush the brake fluid reservoirs directly with water under high pressure. If the brake fluid is swallowed, it is harmful or even fatal to the human body. The brake fluid is harmful in contact with skin and eyes and toxic to animals. If the brake fluid is swallowed, do not induce vomiting and contact the Poison Control Centre or a hospital immediately. If the brake fluid gets into the eyes, rinse them with clean water and seek medical attention. Wash your hands thoroughly. Keep children and pets away from the brake fluid.

WARNING

Do not mix the brake fluid (DOT4) used by the motorbike with dust, impurities, silicates or petroleum fluids as this will cause severe damage to the brake system. Do not use brake fluid stored in open containers. Do not use brake fluid left over from the last service. Only special brake fluid for motorbikes may be used. Spilled brake fluid can attack the surface of paint or plastic.

Brake pad



Check whether the front or rear brake pads have reached the wear limit. If the wear limit is reached, please have the front and rear brake pads replaced at the same time at the workshops designated by our company.

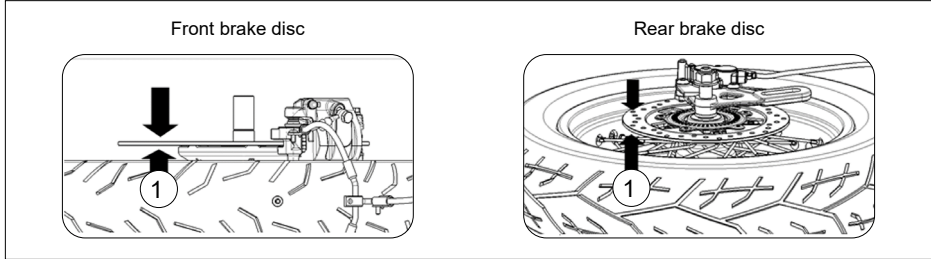
DANGER

- If the brakes are not inspected and serviced regularly or are not replaced in a timely manner even though replacement is recommended, the risk of an accident increases. If the brake disc needs to be replaced, please contact the workshops designated by our company. Check and service the brake pads according to the recommended method.
- If you do not operate the brake lever or brake pedal several times before riding the motorbike after servicing the brake system or replacing the brake pads, the braking effect will deteriorate, which may cause accidents. After servicing the brake system or replacing the brake pads, operate the brake lever or brake pedal several times until the brake pads can press normally on the brake discs and the hydraulic resistance of the brake lever and brake pedal returns to normal.

WARNING

- If only one of the two brake pads is replaced, this will result in an unbalanced braking effect. Please replace both brake pads at the same time.
- Do not operate the brake lever or brake pedal if the brake pad is in an incorrect position. When the brake lever or the brake pedal is actuated, it is difficult for the piston to return and brake fluid to leak out.

Brake disc



- The most important point when checking the front brake disc is: Check if the thickness (1) of the brake disc is less than 4.5 mm. If the thickness is less than 4.0 mm, replace it with a new brake disc.
- The most important point when checking the rear brake disc is: Check if the thickness (1) of the brake disc is less than 4.5 mm. If the thickness is less than 4.0 mm, replace with a new brake disc.

DANGER

- Do not ride the motorbike immediately after replacing new brake discs or brake pads. Hold and release the brake lever several times until the brake discs and pads fit completely to restore normal gripping force and allow the brake fluid to circulate stably.
- After new brake discs or brake pads have been replaced, the braking distance may be longer than the original braking distance. Optimum braking efficiency can be achieved when the brake discs and pads are fully run in after about 300 km, and before that, sufficient braking distance must be maintained while driving.

PERIODIC MAINTENANCE AND INSPECTIONS

TYRES

DANGER

- If you do not observe the following points, accidents may occur due to tyre damage. The tyres are very important because they connect the motorbike to the ground. Please observe the following rules: Check the tyre condition and tyre pressure and adjust the tyre pressure before each ride. Avoid overloading the motorbike. Replace the tyre when it has reached the wear limit or if it shows cracks and damage on the tyre surface. Always use tyres with the sizes and specifications given here. Balance the tyres after mounting. Read this section carefully.
- Insufficient tyre run-in will result in tyre slippage and loss of control. Be especially careful when riding the motorbike with a new tyre. Perform tyre break-in according to the instructions in the "Breaking in New Tyres" section and avoid rapid acceleration, sharp turns and emergency braking for the first 160 km of a new tyre.

Tyre pressure and load

The correct tyre pressure and tyre load are important factors. Overloading will cause tyre failure and make the motorbike uncontrollable.

- Check the tyre pressure each time before riding the motorbike to ensure that the tyre pressure and load are as specified in the table below. Check and correct the tyre pressure before riding. After riding, the tyre becomes hot and the tyre pressure increases.
- Too low tyre pressure makes it difficult to turn in and leads to accelerated tyre wear. Excessive tyre pressure reduces the contact area between the tyre and the ground, which can easily lead to skidding and loss of control.

Recommended tyre pressures at room temperature:

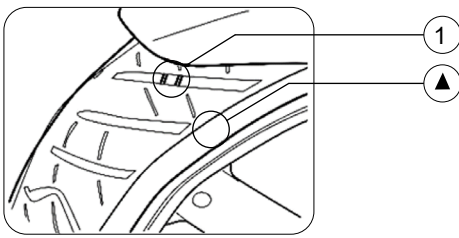
Tyre load capacity	Driver only	Driver and passenger
Front wheel	2,2 bar	2,2 bar
Rear wheel	2,2 bar	2,5 bar

NOTE

- Check the tyre pressure regularly and the tyre pressure must not be below the above criteria.
- If you notice that the tyre pressure drops, check if the tyre is pierced by a nail, has a small hole or is damaged on the rim side. Tubeless tyres will deflate gradually if they have small holes.

Tyre condition and specifications

Incorrect tyre condition and specifications will affect the performance of the motorbike. Damage and scratches to the tyres lead to tyre failures and make the motorbike uncontrollable. Excessively worn tyres lead to punctures resulting in loss of control of the motorbike. Tyre wear also affects the appearance of the tyre and alters the tyre's operating performance. Check the condition and pressure of the tyres before each use. If the tyre shows a lot of obvious damage such as cracks and scratches or reaches the wear limit, the tyre must be replaced.

	<p>NOTE</p> <p>Tread wear is indicated by a triangular mark. When the tread wear touches the ground, it means that the tyre has reached the wear limit. The tyre must be replaced.</p>
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When replacing the tyre, ensure that the size and model of the new tyre matches the specifications in the table below. If tyres of different sizes or models are replaced, the motorbike's handling will be affected and you may lose control of the motorbike.

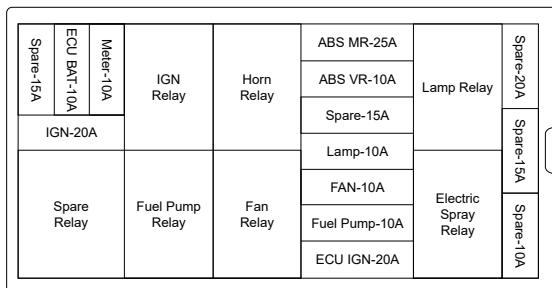
<p>DANGER</p> <p>The use of tyres other than the standard tyres may cause problems. We therefore strongly advise you to use the standard tyres.</p>
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After repair or replacement, the tyres must be balanced. It is very important to balance the tyres to avoid unstable contact between tyre and ground and uneven wear.

<p>DANGER</p> <ul style="list-style-type: none"> • If tyres are not properly balanced after repair or fitting, the motorbike will go out of control and tyre life will be shortened. Refer servicing, replacement and balancing of tyres to the workshops designated by our company, as they have the necessary tools and experience. Mount the tyres according to the direction indicated on the side of each tyre. • Failure to maintain tubeless tyres according to the following instructions may result in accidents. The maintenance methods for tubeless tyres and tyres with inner tubes are different. The contact area between the rim and bead of a tubeless tyre is sealed. To avoid a puncture, special tools and a special tyre changer are needed to remove and fit tubeless tyres to protect the rim and bead. To repair a small hole in a tubeless tyre, the tyre must be removed and patched from the inside. Do not patch from the outside, as the patch may become loose due to the centrifugal force of the tyre as it rotates. • The motorbike must not be driven faster than 80 km/h within 24 hours after tyre repair and not faster than 130 km/h thereafter. If the speed exceeds the limits, the greatly increased heat generated by the tyres may render the patches ineffective and result in flat tyres. If the tyre sidewall is damaged or the damaged part is larger than 6 mm, the tyre cannot be repaired and used further. • Tyre pressure and surface condition are very important for the function and safety of the motorbike. Please check the tyre pressure and surface regularly.

PERIODIC MAINTENANCE AND INSPECTIONS

FUSES AND RELAYS



Designation	Explanation
IGN-Relay	Indicates ignition switch relay
Horn-Relay	Indicates horn relay
Lamp-Relay	Indicates lamp relay
Fuel Pump-Relay	Indicates fuel pump relay
Fan-Relay	Displays fan relay
Electric Spray-Relay	Displays ECU relay
Spare-Relay	Displays the spare relay

Designation	Amp.	Explanation
IGN-20A	20 A	Ignition switch power supply
ECU BAT-10A	10 A	ECU power supply
Meter-10A	10 A	Power supply to instrument lighting and USB socket
ABS MR-25A	25 A	Power supply to the ABS pump housing
ABS VR-10A	10 A	ABS valve body power supply
Lamp-10A	10 A	Headlamp power supply
Fan-10A	10 A	Fan power supply
Fuel Pump-10A	10 A	Fuel pump power supply
ECU IGN-20A	20 A	ECU power supply
Spare-10A	10 A	Indicates a spare fuse
Spare-15A	15 A	Indicates a spare fuse
Spare-15A	15 A	Displays a spare fuse
Spare-20A	20 A	Displays a spare fuse

WARNING

- Do not use fuses other than those specified and do not connect them directly without a fuse. Otherwise, this may have serious effects on the electrical system, even cause fires, burn the motorbike or lose engine power.
- If the fuse is still damaged after replacing it with a replacement fuse, this indicates a fault in the electrical system and the motorbike must be checked immediately by a service agent.

TROUBLESHOOTING

The troubleshooting content can help you find the causes of common problems.

WARNING

Improper maintenance and adjustment will cause damage to the motorbike and make it difficult to determine the causes of faults. Such damage is not covered under the three warranties (for repair, replacement and return). If you are unsure of how to operate the motorbike correctly, please contact our company's designated repairers. Before troubleshooting, it is best to first contact the workshops designated by our company. The workshops will solve the problems for you.

If the engine will not start, you should determine the causes by carrying out the following check.


IGNITION SYSTEM INSPECTION

1. Remove the spark plug and connect the spark plug connector.
2. Insert the spark plug into the engine; turn the ignition switch to position "Q" and set the motor stop switch to the position "Q"; shift the gear to the neutral position and release the clutch (hold the clutch lever firmly). Press the start button. If the ignition system works normally, a blue spark will appear between the electrodes of the spark plug. If there is no spark, please contact the repair workshops designated by our company to correct the fault.

WARNING

- Do not attach the spark plug around the spark plug hole to perform the above inspection as the combustible mixture in the cylinder may be ignited by the spark.
- To reduce the risk of electric shock, it is better to place the metal part of the spark plug housing near the unpainted metal part of the engine housing.
- To avoid the possibility of electric shock, which may cause accidents, the inspection must not be carried out by persons with heart diseases or pacemakers.

THE MOTOR DOES NOT WORK

1. Ensure that there is enough fuel in the fuel tank.
2. When the symbol  is displayed, it means that the system has problems. Please send the motorbike to the repair shops designated by our company. The meaning of the display can be explained from the contents of the ECU diagnostic interface.
3. Check if the ignition system is working normally.
4. Check the idle speed. The correct idle speed is 1.000 ± 100 rpm.

STORAGE

If your motorbike has not been used for some time and requires special maintenance, special materials, equipment and techniques are required. It is therefore recommended that you instruct one of our company's designated workshops to carry out such maintenance. If you wish to carry out the maintenance yourself, please proceed as follows:

Motorbike

Clean the motorbike thoroughly. Park the motorbike with the side stand on a flat surface. Turn the handlebars to the left, lock the front end and remove the key.

Fuel

Drain the fuel from the fuel tank into a suitable container using a siphon or other suitable method.

Motor

1. Remove the spark plug and fill a spoonful of new oil into each spark plug hole, then reinsert the spark plugs and run the engine crankshaft a few times.
2. Drain the engine oil thoroughly and fill new oil into the crankcase.
3. Cover the intake opening of the air filter and the exhaust opening of the muffler with rags containing new oil to prevent moisture from entering.

Batterie

1. Remove the battery as described in the section "Battery".
2. Clean the surface of the battery with neutral soapy water to remove rust and corrosion from the terminals and cable connections.
3. Store the battery in a room above 0°C.

Tyres

Set the tyre pressure to the specified pressure.

Surface of the motorbike

- Spray the rubber protectant on the surfaces of the resin and rubber parts.
- Spray rust preventive paint on the surfaces of parts without surface treatment.
- Coat the painted surface with car wax.

Maintenance during storage

Charge the battery once a month. Standard charging method: 8-10 hours at 0.1C.

Use of the motorbike after storage

1. Clean the motorbike thoroughly.
2. Remove the rags covering the air filter inlet opening and the muffler outlet opening.
3. Drain the engine oil. Replace the oil filter and fill with new engine oil according to the instructions in this manual.
4. Remove the spark plugs. Run the engine a few times. Replace the spark plugs.
5. Reinstall the battery as described in the "Battery" section.
6. Make sure the motorbike is properly lubricated.
7. Carry out the checks as specified in the "Checks before start-up" section.
8. Start the motorbike as specified in this section.

RUST PREVENTION

Carefully maintain the motorbike and pay attention to the rust protection so that the motorbike still looks like a new one after many years.

Important points on rust formation

Factors that lead to rust damage:

- Accumulation of salt on salty roads, dirt, moisture and chemicals.
- Damage to the surface of painted parts from small stones or gravel or from impact and scratches.
- Salty roads, sea breezes, industrial pollution and high humidity can cause rusting.

To prevent rusting

- Wash the motorbike at least once a month. Keep the motorbike clean and dry as much as possible.
- Remove dirt from the surface of the motorbike. Salty roads, chemicals, asphalt, tree sap, bird droppings and industrial fumes can damage your motorbike, so remove the dirt as soon as possible. If it is difficult to clean the motorbike with water, you can clean it with a cleaning agent, but you must comply with the requirements for the cleaning agent.
- Repair any damage as soon as possible. Carefully inspect the damage to the motorbike's paint surface. If you find a burr or scratch, remove it immediately to prevent further damage. If the burr or scratch extends through the entire surface of the part, please have it repaired by the workshops designated by our company.
- Park the motorbike in a dry and ventilated place. If you frequently clean your motorbike and park it in the garage, the garage will become very humid. The high humidity favours the formation of rust. If the space is poorly ventilated, the wet motorbike will rust even in hot temperatures.
- Cover the motorbike. Protect the motorbike from the midday sun, as sunlight causes discolouration of paint and plastic parts and fading of the colour of the instruments. Using a quality breathable cover can protect the motorbike from the ultraviolet rays of sunlight and reduce the accumulation of dirt and air pollutants on the motorbike. Our company's dealers can help you choose the right cover for your motorbike.

CLEANING**Washing the motorbike**

Wash the motorbike according to the following instructions:

1. Wash off the dirt and mud on the surface of the motorbike with cold water. You can use a soft sponge or brush to clean the motorbike. Using hard materials will scratch the optical parts.
2. Wash the motorbike thoroughly with neutral detergent or car soap, gauze or a soft cloth. The gauze or soft cloth must be dipped in detergent frequently.

NOTE

If the motorbike is used on a salty road or by the sea, it must be washed with cold water immediately after use. Make sure that cold water is used, as hot water accelerates corrosion.

Avoid spraying the motorbike to prevent water from flowing to the following points:

- Ignition switch
- Spark plug
- Fuel tank cap
- Fuel injection system
- Brake fluid reservoir

WARNING

The high-pressure water from the coin-operated washer can damage the motorbike and also cause rust, corrosion and accelerated wear. The parts washer can damage the motorbike. Do not wash the motorbike with high pressure water. Do not use the parts washer to clean the throttle body and fuel injector.

3. After cleaning the dirt on the surface of the motorbike, rinse off the remaining detergent with running water.
4. After rinsing thoroughly, wipe the motorbike with a damp soft leather or cloth and leave it to dry in the shade.
5. Carefully inspect the damage to the paint surface. If there is damage, repair the damaged surface with repair material using the following procedure:
 - a. Wash the damaged area and let it dry.
 - b. Mix the repair material and apply it carefully to the damaged area with a brush.
 - c. Allow the repaired area to dry thoroughly.

NOTE

When the motorbike is in operation after a motorbike wash or a rain shower, water mist forms in the headlight. The mist gradually disappears after the headlight is switched on. Remove the mist by switching on the headlight before starting the engine to avoid over-discharging the battery.

WARNING

Do not wash the motorbike with alkaline or acidic cleaning agents. Do not use petrol, brake fluid or other solvents that may damage the motorbike. Wash the motorbike with a soft cloth and warm water with neutral detergent.

CARE AND STORAGE

After waxing and cleaning, it is recommended to wax the motorbike, which not only protects the parts but also makes them more beautiful.

- Use high-quality car wax and polish.
- Follow the precautionary instructions for the use of car wax and polish products.

Check after cleaning

To prolong the life of the motorbike, please lubricate it as described in the section "Lubrication".

WARNING

The high-pressure water from the coin-operated washer can damage the motorbike and also cause rust, corrosion and accelerated wear. The parts washer can damage the motorbike. Do not wash the motorbike with high pressure water. Do not use the parts washer to clean the throttle body and fuel injector.

Check for problems that occur after use by referring to the section "Checks before use".

TRANSPORT

Fuel must be drained before transporting the motorbike as fuel is highly flammable and can cause explosions under certain conditions. Draining, storing or refilling fuel must be done in places without open fire and in well ventilated places after the engine has been stopped. When draining fuel, the following steps must be followed.

1. Stop the engine and remove the ignition switch key.
2. Drain the fuel from the fuel tank into a suitable container using a siphon or other suitable methods.

WARNING

- Ensure that you thoroughly drain the fuel in the fuel tank before transporting the motorbike.
- Keep the motorbike in normal operating condition during transport to avoid oil leakage.

INSTRUCTIONS FOR USING THE BATTERY

1. Using a new battery

- 1.1 Check the appearance of the battery, that the battery case is not scratched or cracked, the battery cover is not loose and the terminals are not crooked or deformed.

2. Insert

- 2.1 Connect the positive (+) cable (red cable) first and then the positive (-) cable. Be careful not to reverse the poles, otherwise the controlled rectifier and other electrical parts will be damaged.
- 2.2 After tightening the bolts, apply butter or Vaseline to the bolts, nuts and clamps to avoid bad contact due to rust.

3. Use and maintenance

- 3.1 The starting time must not exceed 5 seconds at a time. If the engine still does not start after several attempts, please check the fuel supply, the starting system and the ignition.
- 3.2 The following conditions will cause the battery to over-discharge or under-discharge, shortening the battery life.
 - a. Frequent electric starting and short driving distances.
 - b. Driving at low speed for a long time.
 - c. Hold the brake lever while driving so that the brake light is always on.
 - d. Install additional electrical accessories or replace with a higher wattage bulb.
- 3.3 Recharge immediately when the starter speed decreases, the lights dim and the horn sound stops.
- 3.4 If the motorbike will not be used for a long period of time, charge the battery before storage and once a month thereafter.

4. Recharge

- 4.1 Please use a special charger for the motorbike battery. Do not remove the battery cover during charging; keep the area well ventilated and avoid open fire during charging.
- 4.2 Charging methods include standard charging and fast charging. Except in emergencies, try to use standard charging to prolong the life of the battery.

5. Precautions

- 5.1 Do not remove the battery cover or add electrolyte or water at any time.
- 5.2 Do not stay near open fire while using or charging the battery. Avoid short-circuiting between the positive and negative terminals and disconnecting the positive and negative terminals to prevent the battery from exploding.
- 5.3 The electrolyte contains strong acids, so avoid spilling it on your skin, clothes or in your eyes. If you come into contact with it, you must get up immediately with plenty of water and then go to hospital. If accidentally swallowed, go to hospital immediately.
- 5.4 Keep the electrolyte out of the reach of children.
- 5.5 The installation of an additional burglar alarm system has a certain impact on the battery. It is recommended to use the burglar alarms recommended by our company. The use of other alarm systems may cause a malfunction of the circuit or even damage the battery, the regulated rectifier and other electrical parts.

TECHNICAL SPECIFICATIONS

Dimensions	
Length	2.180 mm
Width	800 mm (860 mm)
Height	1.115 mm (1.155 mm)
Wheelbase	1.450 mm
Seat height	800 mm

Weights	
Tare weight (ready to drive)	235 kg
Maximum permissible total weight	455 kg
Maximum permissible weight - front axle	172 kg
Maximum permissible weight - rear axle	283 kg
Maximum payload	220 kg

Engine	
Number of cylinders	2
Cylinder arrangement	Vertical
Displacement	1,222 cm ³
Bore x stroke	98.6 mm x 80 mm
Compression	10:1
Cylinder numbering	From left to right
Consecutive cylinder number	1-2
Firing order	1-2
Starting system	Electric starter
Maximum power	61 kW @ 6.550 min-1
Maximum torque	108 Nm @ 3.100 min-1
Power-to-weight ratio	0,26 kW/kg

Ignition system	
Ignition system	Digital-inductive
Spark plug type	NGK LMAR8A-9
Electrode gap	0,9 mm +/- 0,1 mm

Fuel system	
Fuel type	RON/ROZ min. 95 (lead-free)
Injection	Electronic fuel injection
Fuel pump	Submersible pump, electronic

TECHNICAL SPECIFICATIONS

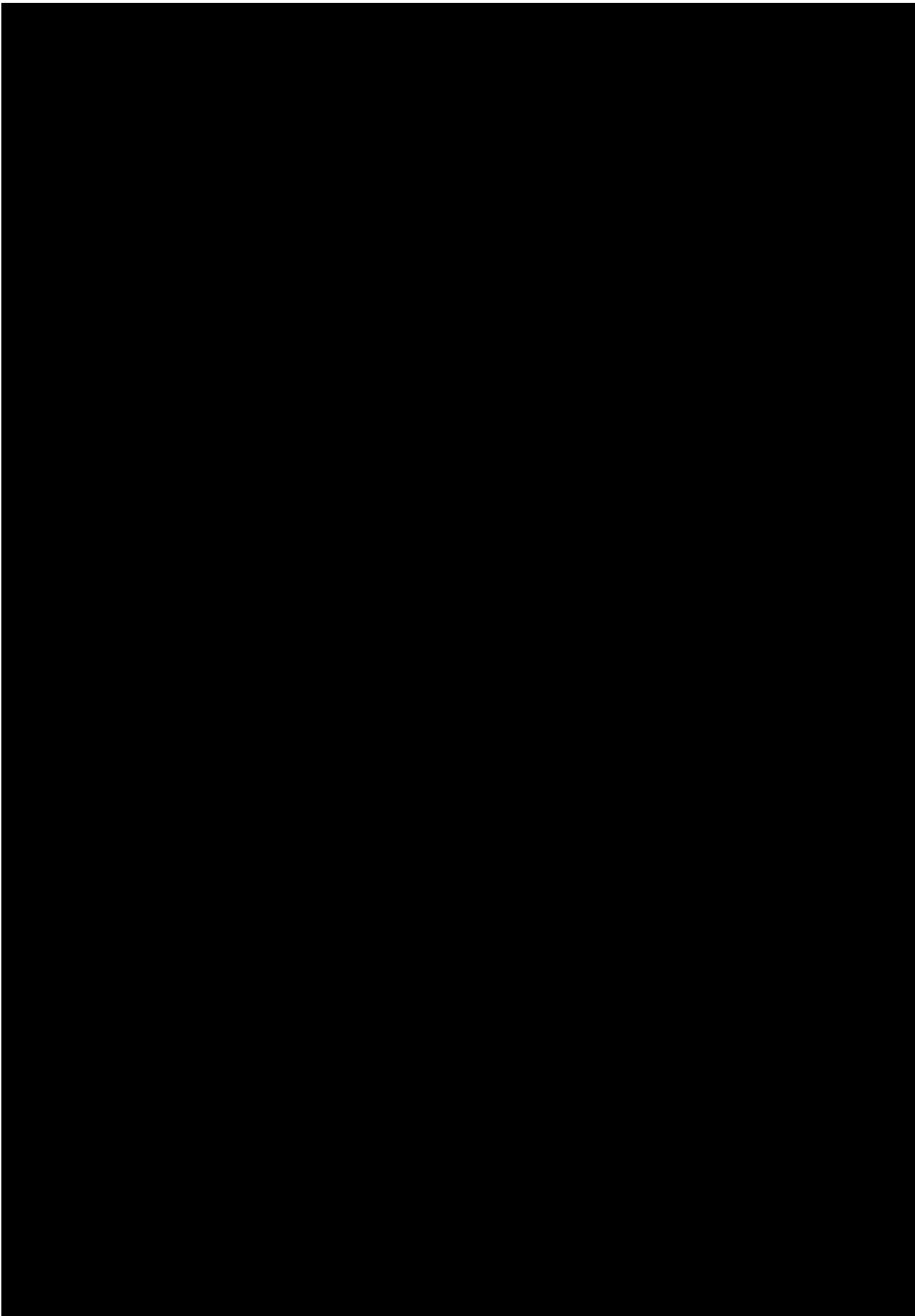
Gearbox & Clutch		
Gearbox type	Manual 6-speed gearbox	
Gear ratio	1st Gear	4,396
	2nd Gear	3,143
	3rd Gear	2,325
	4th Gear	1,860
	5th Gear	1,629
	6th Gear	1,473
Axle ratio	2,412	
Coupling type	Multi-disc clutch in oil bath	
Liquids & Lubricants		
Engine oil specification	Semi or fully synthetic motorbike Engine Oil - 10W/40	
Lubrication system	Wet sump lubrication	
Cooling system	Liquid-cooled	
Water/coolant ratio	50/50 if not premixed!	
Thermostat opens at	88°C +/- 2°C	
Coolant composition	Ethyl hydroxide: 85% Additives: 10% Water: 5%	
Wheels & Tyres		
Front tyres	Opt.1: 100/90-18 M/C 56H	Opt.4: 110/80-R18 M/C 58H
	Opt.2: 100/90-18 M/C 56H	Opt.5: 110/80-ZR18 M/C 58W
	Opt.3: 110/80-R18 M/C 58H	Opt.6: 110/80-ZR18 M/C 58W
Rear tyres	Opt.1: 150/70R17 M/C 69H	Opt.4: 160/60-ZR17 M/C 69W
	Opt.2: 160/60ZR17 M/C 69W	Opt.5: 150/70-R17 M/C 69H
	Opt.3: 150/70R17 M/C 69H	Opt.6: 160/60-ZR17 M/C 69W
Front rim	MT2,50 x 18	
Rear rim	MT4,25 x 17	
Tyre pressure front and rear	2,2 - 2,5 bar	
Chassis & Suspension		
Frame type	Steel tube frame	
Front suspension	Telescopic suspension fork (Max.: 815,8 mm / Min.: 694 mm)	
Rear suspension	2 height adjustable shock absorbers (Max.: 349 mm / Min.: 262 mm)	

TECHNICAL SPECIFICATIONS

Brake system	
Front brake	Double disc: \varnothing 310 mm 2 x 2-Kolbenbremszange
Rear brake	Bremsscheibe: \varnothing 260 mm 2- piston brake caliper
Auxiliary system	ABS
Brake fluid specification	DOT 4

Electrics	
System voltage	12V
Battery	12V 12Ah (~4,6 kg)
Indicator	LED: 12V / 1W
Low beam	LED: 12V / 15W
High beam	LED: 12V / 30W
Daytime running light	LED: 12V / 15/4,6W
Rear light	9 x LEDs: 12V / 3,7W
Brake light	10 x LEDs: 12V / 3,7W
Number plate light	12V 0,6W

Driving performance	
Exhaust emission standard	EURO 5
Stationary noise	89 dB(A) @ 3.275 min-1
Driving noise	76 dB(A)
Top speed	198 km/h
Fuel consumption	4,6 l/100km
CO2 emissions	105 g/km
Seating capacity	2
Maximum gradient	$\geq 30^\circ$
Turning circle	~ 5 m
Fuel tank capacity	16 l





BRIXTON
MOTORCYCLES

Cromwell 1200

PRE-DELIVERY INSPECTION
ENGLISH

Dealer and vehicle data

Content

Dealer and vehicle data	1
Checklist for the delivery inspection	2
Delivery Inspection Guide	3
Space for notes	6

- Check the motorbike for any damage while it is unpacked in the transport cage.
- If any damage is found, submit a warranty claim with supporting documentation (photos, etc.).
- Carry out ALL the listed work according to the delivery inspection checklist.
- Thoroughly test the motorbike for performance.
- Please ensure that the motorbike is in a sound, clean condition at the time of delivery to the customer.

WARNING

Note that the motorbike is being moved for the first time. Exercise extreme caution when applying the brakes. Avoid abrupt braking manoeuvres. Apply the front and rear brakes slowly, evenly and initially with very little pressure. Avoid strong acceleration and abrupt turning. Carry out the test drive conscientiously and professionally.

NOTE

If any anomalies, damage, defects, critical problems or noise, etc. are found during the delivery inspection, submit a warranty claim with supporting documents (photos, etc.).

Trader name:

Location:

Manufacturer / Model:

Vehicle identification number (VIN):

Engine number:

Manufacturing date tyres (DOT Nr.):

Checklist for the delivery inspection

No.	Assembly group	Components	Measures	Note	Comment	✓
1.	Aesthetics	Fuel tank	Leakage, no damage	Leakage, damage, paint damage		
		Mounting of both rear view mirrors	Checked and correctly adjusted			
		Mudguard/fender	Visual inspection	Scratches, paint defects, matt, dent		
		Side panel	Visual inspection	Scratch, paint defect, matt, dent		
		Powder coated parts	Visual inspection	Scratch, paint defect, matt, detachment		
		Coated parts	Visual inspection	Scratch, lacquer defect, matt, detachment		
		Polished parts	Visual inspection	Scratch, Matt, Dent		
2.	Liquids	Check oil level	Engine oil quantity: 3.2 L SAE 10W-40 API SJ or better	Refill/drain as required		
		Check coolant level	Coolant quantity: 1.5 L Frost-proof up to -45°C	Refill/drain as required		
3.	VIN	Vehicle identification number	Check according to invoice	Different, Same		
4.	Front and rear wheel	Surface of front & rear brake discs	Visual inspection	Porous, Damage		
		Rear brake pedal	Clearance 1.0 - 4.5 mm	Too much, too little play		
		Brake fluid between min and max level front and rear	Between min and max level	Too much, too little brake fluid		
		Chain sag	Clearance 40 mm	Too tight, too loose		
		Front & rear wheel free to rotate	Ensure that front and rear wheel can rotate freely	Sluggish, noise		
		Tyre pressure front & rear	Without co-driver: Front 2.2 bar Rear 2.5 bar With passenger: Front 2.2 bar Rear 2.7 bar	Tyre pressure too low, too high		
5.	Electrics	Battery voltage	12.6 V battery voltage (quiescent voltage)	No conservation of charge, does not charge		
		Operation of electric switches	Operating the switches	Function, loose mounting		
		Front headlights, indicators, rear/brake lights	Actuating the switches	Function		
		Vehicle horn	Actuating the switch	Function		
6.	Locks	Ignition lock & handlebar lock, tank & seat lock	Check the locking mechanism by operating the key	Sluggish / loose, Function		
7.	Digital instrument cluster	Neutral light	Visual check	Function		
		Check trip odometer (TRIP)	Visual check	Function		
		Check kilometre / mile switch	Switch between miles & kilometres	Function		
		Check instrument lighting	Visual check	Function		
		Indicator lights incl. ABS check	Visual check	Function		
		Low fuel indicator light	Fill with at least 2 litres of petrol	Function		
		Charge level indicator light	Visual inspection	Function		
		Side stand indicator	Visual inspection	Function		
8.	Clutch	Clutch lever operation	Smooth running, frictionless			
		Clutch lever	Play 10 - 15 mm	Too much, too little play		
9.	Handlebar	Steering movement	Handlebar position	Sluggish, noises		
10.	Test drive	Engine start (electric start)	Easy start, idling 1200 ± 120 rpm	Starting difficulties, noises		
		ABS/engine indicator light	Check ABS/engine indicator light	ABS/engine control light comes on		
		Vibrations	Chassis vibrations	Exceptional vibrations		
		Telescopic suspension fork	Noise	No noise/light noise		
		Engine power	Subjective	Noise, vibration, starting difficulty, smoke, leakage		
		Gear shift	Smooth running	Noise, vibration, sluggish		
11.	Other	Operating instructions, on-board tools	Visual check	Not present		
		Spare fuse in fuse holder	Visual inspection	Not present		

I hereby confirm that I have inspected the above-mentioned vehicle in accordance with the aforementioned points:

.....
First and last name

.....
Place, date

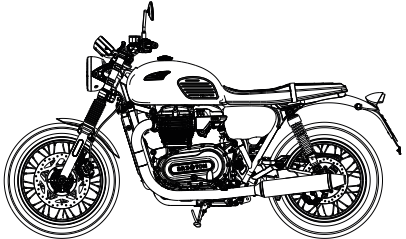
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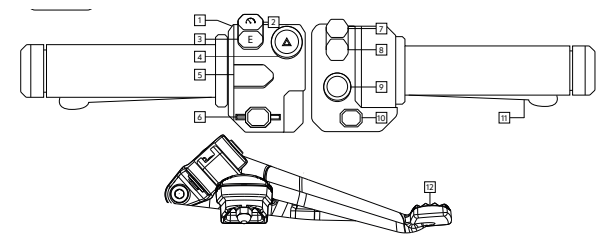





Guideline - Delivery Inspection

Carry out all work according to the following instructions.

NOTE

If any anomalies, damage, defects, critical problems or noise, etc. are found during the delivery inspection, submit a warranty claim with supporting documents (photos, etc.).

No.	Assembly group	Component	Measure	Inspection
1.	Aesthetics	Complete vehicle	<p>Check the following components:</p> <ul style="list-style-type: none"> • Front & rear mudguards • Fuel tank • All frame parts and brackets • Mirror mountings on both sides • Sticker left/right • Support tubes, frame • Coated parts • Exhaust, silencer • Alignment of indicators • Check that fuel label is attached near fuel filler cap • Rear view mirror 	
2.	Liquids	Engine oil	<ol style="list-style-type: none"> 1. Check engine oil level 2. Check engine oil filter 3. Top up engine oil <p>Top up or drain the engine oil as required. The engine oil level must be between the minimum and maximum markings.</p> <p>Engine oil quantity (initial filling): 3.5 L Engine oil quantity (oil change with filter): 3.2 L Engine oil quantity (oil change without filter): 3.0 L Engine oil grade: SH or higher Engine oil viscosity: 10W/40 Engine oil type: Semi-synthetic or synthetic Engine oil filter torque: 10 Nm Oil drain plug torque: 25 Nm</p>	<p>Change the engine oil and the filter:</p> <ol style="list-style-type: none"> 1. Preheat the engine completely and turn it off. 2. Place an oil pan under the engine. 3. Remove the oil drain plug and washer. 4. Park the motorbike on a flat surface so that the oil can drain better. Use the special filter tool to remove the oil filter. 5. Apply a layer of clean oil to the sealing ring of the new oil filter. 6. Insert the new filter with the special tool and tighten it to 10 Nm. 7. Fit a new washer on the oil drain plug. 8. Insert the oil drain plug and tighten it to 25 Nm. 9. Open the filler plug and fill new oil into the engine. 10. Start the engine and let it idle for 30 seconds. 11. The oil pressure warning light must go out after starting the engine. 12. Stop the engine and check the oil level; if necessary, adjust it.
		Coolant	<p>Coolant quantity: 1.5 L</p>	<p>Filling method: Remove the lid and slowly fill in the coolant with a funnel until the level is close to the upper mark. Then put the lid back on.</p> <p>The ratio of antifreeze and water in the coolant must be 50:50. Do not fill in only one of the two agents. Use a funnel when filling, otherwise the coolant may leak. Check whether the coolant pipe of the coolant tank is leaking or damaged. If this is the case, replace it. If the coolant tank is empty, check the coolant level in the radiator. Unscrew the radiator cap anticlockwise and check whether or not the coolant level has reached the bottom of the filler neck. If there is too little coolant, top up the coolant in good time.</p>
		Brake fluid	<p>Check that the brake fluid level is between the minimum and maximum markings. If this is not the case, top up with the required amount.</p> <p>Brake fluid specification: DOT4</p>	<p>Check that the fluid level is above the minimum mark. If the fluid level is below „LOWER“, top up with DOT 4 brake fluid until the level reaches „MAX“.</p> <p>Do not overfill !</p> <div style="border: 1px solid black; padding: 5px;"> <p>WARNING</p> <p>Do not mix the brake fluid (DOT4) used by the motorbike with dust, impurities, silicates or petroleum fluids as this will cause severe damage to the brake system. Do not use brake fluid stored in open containers. Do not use brake fluid left over from the last service. Only special brake fluid for motorbikes may be used. Spilled brake fluid can attack the surface of paint or plastic.</p> </div>
3.	Vehicle identification number	Stamped on the right side of the steering head	Check the correctness in relation to the documents	

4.	Front and rear wheel	Rear brake pedal	Free play of the brake pedal: 1,0 - 4,5 mm	Check that the free play of the brake pedal is within the range.
		Function of the front and rear brake light switch	Check the operating status of the brake light.	Check the operating status of the brake light by operating the brake pedal and lever.
		Brake Disc Front & Rear	Visual inspection: <ul style="list-style-type: none"> Scratches Other damage 	
		Drive chain	The sag of the chain is to be adjusted according to the specification. Chain sag / slack (Unloaded): 20- 25 mm	Measure the free play of the drive chain on the upper run of the chain. To adjust the chain tension and free play, loosen the axle nuts and adjust the adjusting nuts left and right until the sag is correct.
5.	Electrics	Check the function of various electrical switches	Check the following switches and buttons for their function. <ol style="list-style-type: none"> Light horn button Cruise control switch Driving mode switch Hazard warning lights switch Horn button Indicator switch Emergency stop switch Electric starter TCS button Light switch Brake light switch (front) Brake light switch (rear) 	
		Battery charge	Open-circuit voltage: min. 12,6 V Engine idling or with increased speed: min: 13,5 V	Check the battery voltage using a multimeter or other suitable tool.
6.	Ignition lock & Locks	Operation and control of: <ul style="list-style-type: none"> Ignition lock with handlebar lock Fuel tank cap Seat lock 	All locks must open and close smoothly.	<p>Ignition lock with handlebar lock:</p> <p>„“ - (On) The ignition circuit is connected and the engine can be started at any time. The key cannot be removed when the switch is in this position.</p> <p>„“ - (Off) The ignition circuit is interrupted and the engine cannot be started. The key can be removed.</p> <p>„“ - (Steering lock) To lock the steering, you must first turn the handlebars fully to the left, turn the key to position „“ press and then turn it counterclockwise to the position „“ turn. The key can be removed. All circuits are open.</p> <p>Fuel tank cap: To open the fuel tank cap, turn the cover that covers the keyhole, insert the key into the keyhole and turn the key clockwise until it stops, then remove the fuel tank cap together with the key. To insert the cap, insert the cap with the key into the fuel tank filler neck and press it along the slot until you hear a „click“ sound. The key cannot be removed until you have turned it back to its original position. Then turn the cap to cover the keyhole.</p> <p>Seat lock: Insert the key into the keyhole and turn it clockwise to unlock the seat, then it can be removed. To install the seat, insert the two pins in the front part of the seat into the corresponding slots and then press on the rear of the seat until a „click“ sound is heard, which means that the seat is locked.</p>

Guideline - Delivery Inspection

7.	Instrument cluster	<p>The instrument cluster must be checked for the following functions:</p> <ul style="list-style-type: none"> • Indicator indicator lamp left • Indicator lamp right • Fuel indicator light • Rev counter • Speed indicator • Idling indicator light • High beam indicator light • Odometer • Clock • Oil pressure indicator light • Charge level indicator light • Fuel gauge • ABS indicator light • Coolant temperature indicator light • Engine indicator light • Coolant temperature indicator light • Adjustment knob • Gear indicator • Cruise control • Driving mode 	For the operation of the functions, please refer to the operating instructions from the chapter „Instruments and operation“.	
8.	Clutch	Clutch operation	<p>Hold the handlebars in a straight position and operate the clutch lever 5 times to check for ease of movement.</p> <p>Clutch lever free play: 10-15 mm</p>	<p>Movement play of the clutch lever: Measure the play at the end of the clutch lever, which should be in the range of 10-15mm. If the play is outside this range, please adjust it as follows.</p> <p>Small setting</p> <ul style="list-style-type: none"> • Loosen the clutch cable lock nut. • Turn the clutch cable adjuster to achieve adequate play. • Tighten the clutch cable lock nut. <p>Great setting</p> <ul style="list-style-type: none"> • Loosen the lock nut of the clutch sear adjuster. • Adjust the clutch position to achieve adequate play. • Tighten the lock nut.
9.	Handlebar	Handlebar position		<p>Assembly</p> <ul style="list-style-type: none"> • Place the handlebar on the carrier. • Align the marked point (X) on the left side of the handlebar with the mark on the left edge of the handlebar carrier. • Fit the handlebar clamp (the Brixton lettering must be legible from the rider's position). • Mount the clamp with 4 M8*25 Allen screws (23±2 Nm).
10.	Test drive	<p>At least 10 - 15 km test drive</p> <ul style="list-style-type: none"> • Starting (electric start) • Idling speed • Gear shift / Lever position to footrest / Noises • Motorbike vibrations • Front and rear wheel wobble • Fork noises • Brake effectiveness • Engine performance • Check ABS and check engine light • Check for rattling and squeaking noises 	<ul style="list-style-type: none"> • Start the engine and check the operation. • Check throttle response by increasing engine speed to 1600 rpm. • Check for noise while driving by shifting gears. • At a speed between 80 - 100 km/h, check if there are any unusual vibrations. • When test driving, check whether the front or rear wheel runs unsteadily. • When riding, check whether noises are perceptible from the fork. • By lightly applying the brakes while riding, check the effectiveness of the brakes and whether the braking sensation is spongy or hard. • Check the engine running for unusual noises. • Check the ABS and check engine light indication. • Check for unusual rattling and squeaking noises on uneven roads. 	
11.	Miscellaneous	Fuse holder	The fuse holder is located under the driver's seat. Unlock the driver's seat and remove it. Open the fuse holder cover and check that the fuses are complete.	For a detailed list of the installed fuses, please refer to the section „Fuses and relays“ at the end of the chapter „Regular maintenance and inspection“ in the user manual.
		User manual & contents of the on-board tool kit	Check that the on-board tool kit is present and ensure that it is placed under the driver's seat. Also check that the user manual is present and complete in the required language.	<p>Contents on-board tool kit:</p> <ul style="list-style-type: none"> • Allen key 4 / 5 / 6 mm • Open-end spanner 10-12 / 13-15 mm



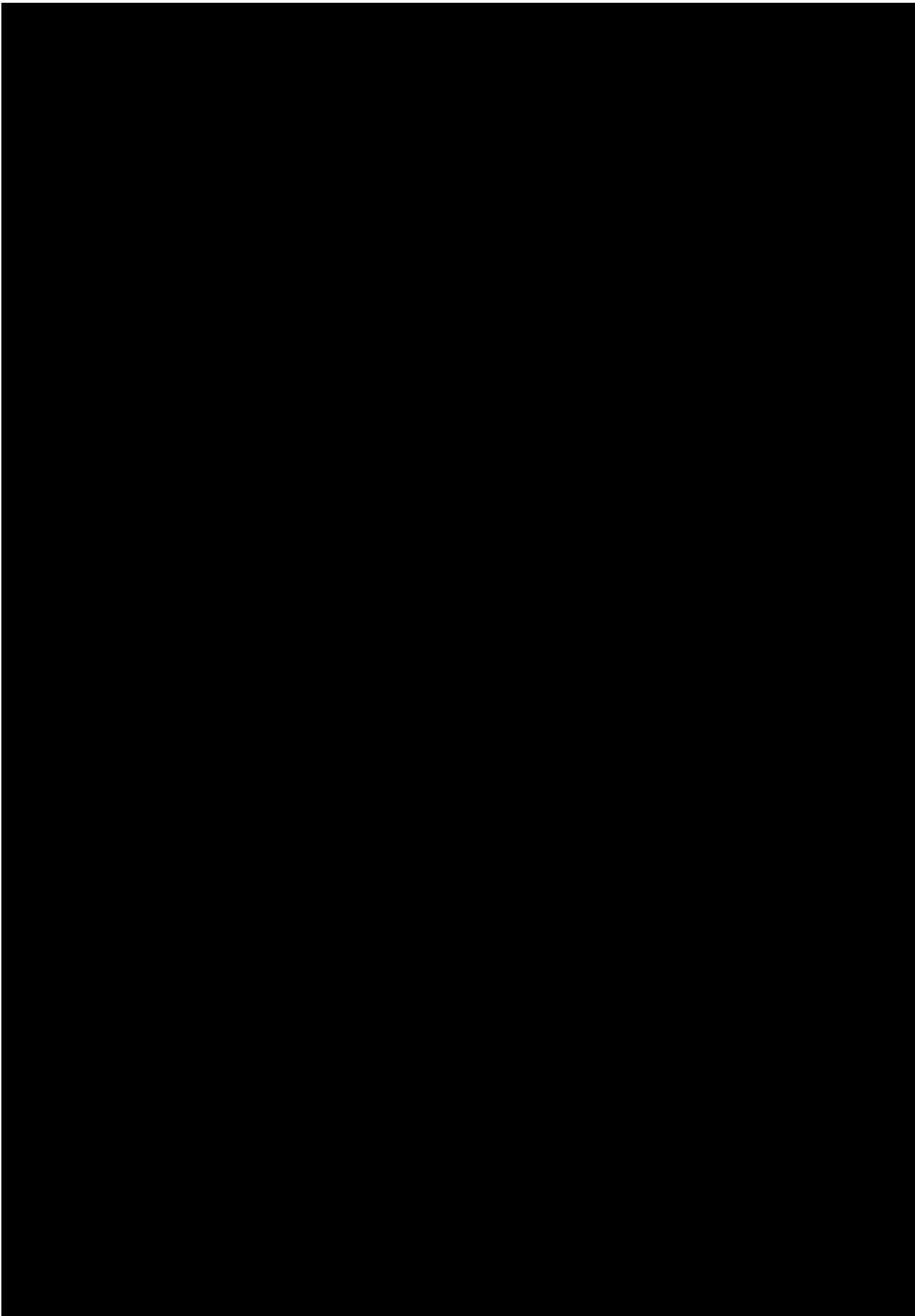
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*Product and specifications are subject to change without notice.





ENGINE

Liquid-cooled, two-cylinder, four-stroke in-line engine with four valves per cylinder, crankshaft transverse to the direction of travel, balance shaft, one overhead camshaft, controlled catalytic converter

Bore	98,6 mm
Stroke	80,0 mm
Displacement	1222 cm ³
Compression ratio	10 : 1
Fuel	Unleaded petrol, RON/ROZ min. 95
Mixture preparation	Electronic fuel injection
Maximum power	61 kW @ 6.550 min ⁻¹
Maximum torque	108 Nm @ 3.100 min ⁻¹
Power to weight ratio	0.26 kW/kg
CO ₂ -Emissions	105 g/km
Exhaust emission standard	Euro X
Lubrication system	Pressure lubrication
Ignition system	ECU
Starter	Electric starter
Stationary noise	89 dB(A) @ 3.275 min ⁻¹
Driving noise	76 dB(A)

TRANSMISSION

Clutch type	Multi-disc oil bath clutch
Clutch characteristic	Anti-Hopping
Gearbox	6-speed manual transmission

CHASSIS

Frame type	Tubular steel grinding frame
Front suspension	Telescopic suspension fork (KYB)
Standpipe diameter	41 mm
Compression and rebound damping	Not adjustable
Rear suspension	Double strut (KYB)
Spring preload	Adjustable
Compression and rebound damping	Not adjustable
Swing type	Two-arm swing arm
Steering head angle	26°
Caster	115 mm
Front suspension travel	120 mm
Rear suspension travel	87 mm

BRAKE SYSTEM

Safety system	ABS (BOSCH)
Front brake disc	Two brake discs, perforated, Ø 310 mm
Front brake caliper	Two-piston floating caliper (NISSIN)
Rear brake disc	One brake disc, perforated, Ø 260 mm
Rear brake caliper	Two-piston floating caliper (NISSIN)

WHEELS

Front rim type	Spoked rim
Front rim size	2.50 x 18
Front tire size	100/90-18
Rear rim type	Spoked rim
Rear rim size	4.25 x 17
Rear tire size	150/70-17
Standard tires	Pirelli Phantom Sports Comp

DIMENSIONS

Length	2.180 mm
Width	800 mm
Height	1.115 mm
Wheelbase	1.450 mm
Seat height	800 mm
Ground clearance	140 mm

WEIGHTS

Unladen weight ready to drive	235 kg
Maximum permissible front axle load	172 kg
Maximum permissible rear axle load	283 kg
Maximum permissible total weight	455 kg
Maximum permissible payload	220 kg

DRIVING PERFORMANCE

Maximum speed	198 km/h
Fuel tank capacity	16,0 L
Fuel consumption	4,6 L/100 km
Range	~ 340 km
Gradeability	30%
Number of seats	2

FEATURES

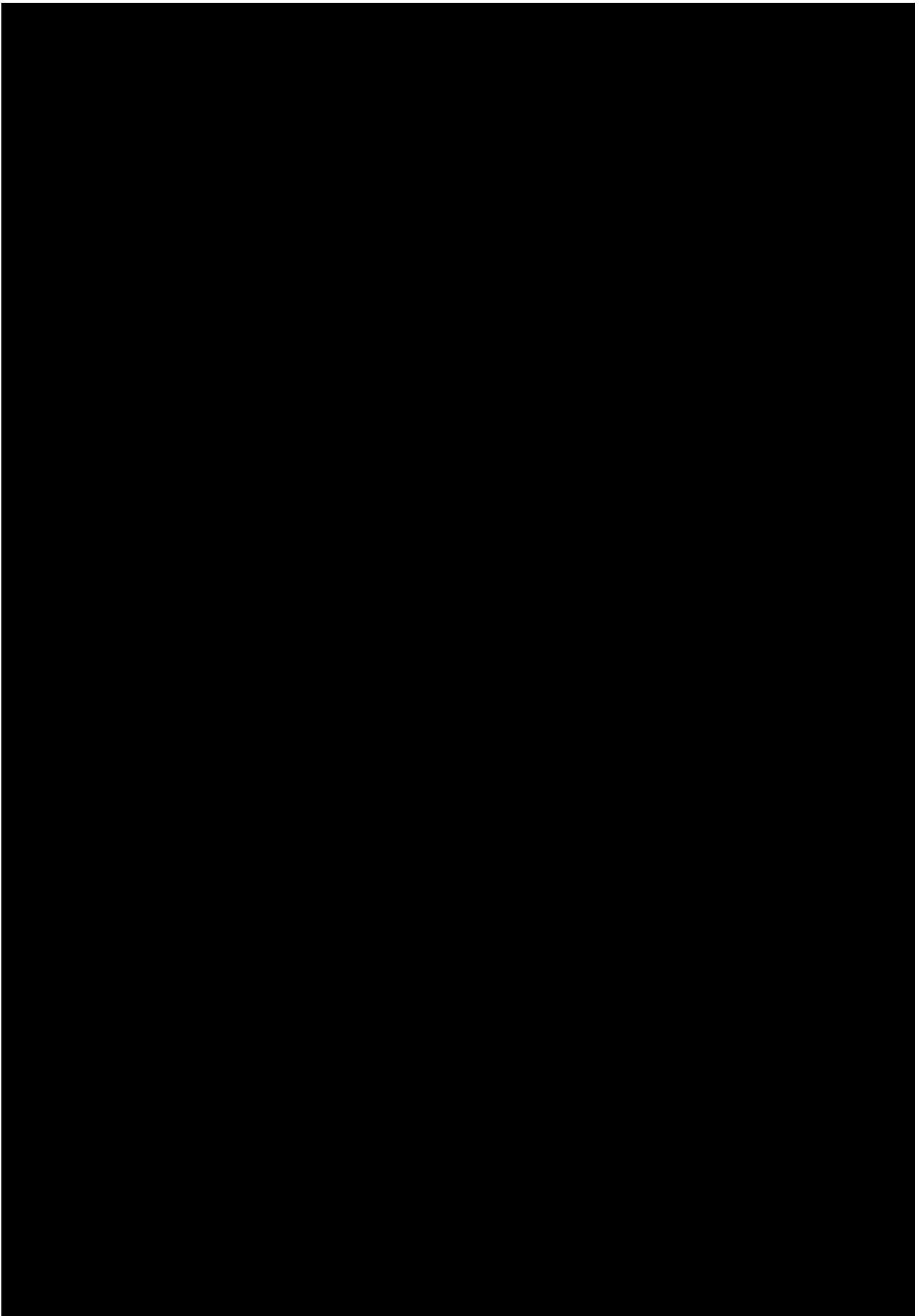
LED turn signals; LED main headlights and daytime running lights; LED taillights; TFT display; Two pre-programmed driving modes („Sport“ and „Eco“)

AVAILABLE COLORS

Backstage Black, Cargo Green, Timberwolf Grey

APPROVAL OPTIONS

Vehicle class	L3e-A3
Homologation number	e9*168/2013*01351*00
Variant	0
Version	0



English



BRITON
MOTORCYCLES

Cromwell 1200

SERVICE BOOKLET

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VEHICLE TAKEOVER

I hereby confirm that I have taken delivery of this vehicle with the chassis number (VIN) stated below in proper condition. I further confirm that I have read, understood and accepted the warranty and guarantee guidelines. The advice in the owner's manual has been clearly explained to me. The vehicle was delivered to me in perfect condition according to the manufacturer's criteria. By signing this document, I confirm that I accept the maintenance intervals confirmed with the seller at the time of delivery of the vehicle. A current version of the owner's manual and a spare key as well as the tool kit have been handed over to me. Furthermore, I agree to have all warranty and maintenance work carried out only by an authorised specialist dealer. Failure to do so may result in loss of warranty. Only original spare parts may be used during the warranty period.

Dealer stamp

VIN:.....

Model:.....

Colour:.....

Takeover date:

Signature of the customer:

WARRANTY

We warrant to the purchaser that the vehicle described in this manual will be free from manufacturing defects for a period of 24 months from the date of purchase.

WARRANTY CONDITIONS

If a defect occurs within the warranty period which is judged to be due to a manufacturing fault, the manufacturer will, at its discretion, arrange for the necessary parts to be repaired or replaced at no cost to the end user. This can be carried out by any authorised dealer.

WARRANTY EXCLUSION

The manufacturer accepts no responsibility if, in the opinion of an authorised dealer, one or more parts require repair as a result of:

1. Changes to standard specifications that affect the performance, durability or safety of the product, its components or original accessories, e.g.:
 - a. Fitting non-original spare parts or accessories unless these have been recommended or approved in writing by the manufacturer.
 - b. Modifications or adjustments not recommended or approved in writing by the manufacturer.
3. The use of lubricating oils, fuels or other fluids (including cleaning materials) that do not comply with the recommendations in the operating instructions.
4. Improper use, improper repair (this includes the fitting of non-original or replica parts), damage caused by accident or fire and contamination by water.
5. Damage due to normal wear and tear. Routine maintenance adjustments or normal replacement of maintenance materials or items (e.g. oils, fluids, spark plugs and filters) or wear parts are excluded from the warranty. However, these parts are included in the warranty if replacement is required as a result of a manufacturing or material defect.
6. Damage caused by racing or participation in competition-like events is expressly excluded from this warranty.
7. Any damage or consequential damage caused by accident or by the negligence or misuse of the vehicle owner or driver.
8. Improper storage or interference by the forces of nature. The warranty may be voided if:
 - a. Regular maintenance is not carried out by an authorised dealer in accordance with the specified maintenance intervals of the relevant owner's manual or other maintenance instructions (by time or mileage, whichever is reached first). Upon request, proof of such maintenance must be provided at the time of notification of the warranty claim. It is the owner's responsibility to ensure that the service and warranty booklet is updated by the authorised dealer who carries out the maintenance. It is also advisable to keep copies of all maintenance and repair invoices in case this booklet is lost.
 - b. A problem is not reported to an authorised dealer within a reasonable time or the motorbike is not properly inspected by that dealer. Once a problem is identified, the owner must take all possible steps to prevent further damage. Any consequential damage due to the continued use of the product after the problem has been detected may be excluded from this warranty.

WARRANTY POLICY

THE FOLLOWING PARTS ARE NOT COVERED BY THE WARRANTY:

- Cables/Trains
- Batteries
- Brake and clutch components
- Bearings
- Seals
- Fork oil seals
- Drive chains or drive belts
- Tyres
- Light bulbs
- Starter batteries
- Accessories
- Damage to the vehicle paint or other vehicle parts due to age or use (e.g. colour deviations, colour fading, corrosion)

BREAKDOWN

In the event of a breakdown, the owner is responsible for taking the product to an authorised dealer for inspection. The manufacturer is not responsible for the cost of retrieval or any other costs associated with transporting a product to an authorised dealer.

TRANSFER OF THE WARRANTY CLAIM

The warranty claim is transferable free of charge to private subsequent owners of the product covered by the warranty. To transfer this warranty, the new owner should contact an authorised dealer who can make the transfer for him in his online system.

WARRANTOR:

KSR Group GmbH
Im Wirtschaftspark 15
3494 Gedersdorf
Österreich

PERIODIC MAINTENANCE

On the next page you will find the maintenance table, which specifies the required maintenance work for periodic maintenance. This maintenance work is to be carried out after a certain mileage or after a certain period of time, whichever comes first. Even if the vehicle is only moved a few kilometres per year, maintenance must be carried out every year.

Only maintenance that is applicable to your vehicle is to be carried out (e.g. checking and replacing the gearbox oil **ONLY** on vehicles that also have gearbox oil).

WARNING

The warranty can only be granted if the vehicle has been maintained in accordance with the maintenance table and has not been subjected to exceptional loads. The vehicle must be checked continuously for rust formation. The vehicle owner himself is responsible for rust prevention.
--

NOTE

When adding fluids, use only recommended fluids. Hydraulic lines should be replaced every 4 years.
--

NOTE

The inspection intervals must be observed, otherwise the warranty claim will expire.
--

On the next pages you will find the maintenance table and the service booklet.

MAINTENANCE TABLE

Nr.	Activities	Initial inspection after 1,000 km	After 10,000 km	After 20,000 km	Every Year	All 2 years
Lubrication						
1	Engine - check for leaks	Check	Check	Check	Check	Check
2	Engine oil - change	Replace	Replace	Replace	Replace	Replace
3	Engine oil filter - change	Replace	Replace	Replace	Replace	Replace
Fuel system and engine management						
4	Fuel system - check for leaks, chafing etc.	Check	Check	Check	Check	Check
5	Throttle body plate (valve flap) - check/clean	Check	Check	Check	Check	Check
6	Air filter - change	Check	Check	Replace	Check	Replace
7	Fuel filter - change	/	/	/	/	/
8	Throttle valve units - alignment	/	/	/	/	/
9	Fuel hoses - renew	/	/	/	/	/
10	Evaporation hoses - renew	/	/	/	/	/
Ignition system						
11	Spark plugs	Check				
Cooling system						
12	Cooling system - check for leaks	Check	Check	Check	Check	Check
13	Cooling system - check hoses for chafing, cracks, damage. Replace if necessary	Check	Check	Check	Check	Check
14	Coolant level - check/adjust	Check	Check	Check	Check	Check
15	Coolant - change	Replace every 40000 km or 2 years				
Motor						
16	Clutch cable - check for function and adjust if necessary.	Check	Check	Check	Check	Check
17	Valve clearance - check	Check	Check	Check	Check	Check
18	Timing	Check	Check	Check	Check	Check
Wheels and tyres						
19	Tyre wear/tyre damage - check	Check	Check	Check	Check	Check
20	Tyre pressure - check/adjust	Check	Check	Check	Check	Check
21	Wheels - check for damage	Check	Check	Check	Check	Check
22	Wheels - check for broken or damaged spokes and spoke strength (spoke wheel models only)	Check	Check	Check	Check	Check
23	Wheel bearings - check for wear/smooth running	Check	Check	Check	Check	Check
Steering and suspension						
24	Steering - check for free movement	Check	Check	Check	Check	Check
25	Front and rear suspension - check for damage/leaks/smooth running	Check	Check	Check	Check	Check
26	Fork oil - change	/	/	/	/	/
27	Steering head bearings - check/adjust	Check	Check	Check	Check	Check
28	Steering head bearings - lubricate	Check	Check	Check	Check	Check
Brakes						
29	Brake pads - check extent of wear	Check	Check	Check	Check	Check
30	Brake master cylinder - check for leaking brake fluid	Check	Check	Check	Check	Check
31	Brake calipers - check for leaking brake fluid and stuck pistons	Check	Check	Check	Check	Check
32	Brake fluid level - check	Check	Check	Check	Check	Check
33	Brake fluid - change					Replace
Drive chain						
34	Chain sag - check/adjust	Check	Check	Check	Check	Check
35	Drive chain - wear check	Check	Check	Check	Check	Check
36	Drive chain - lubricate	Lubricate every 500 kilometres, check and clean every 1000 kilometres				

MAINTENANCE TABLE

Nr.	Activities	Initial inspection after 1,000 km	After 10,000 km	After 20,000 km	Every Year	All 2 years
37	Drive chain grinding protection - check	Check	Check	Check	Check	Check
Electrics						
38	Check all lights, instruments and electrical systems	Check	Check	Check	Check	Check
General						
39	Instruments and engine ECM - check with diagnostic device for latest software status.	Check	Check	Check	Check	Check
40	Fasteners - visual inspection for tight fit	Check	Check	Check	Check	Check
41	Pitch indicators - visual check for wear	Check	Check	Check	Check	Check
42	Side stand/main stand - lubricate/check function	Check	Check	Check	Check	Check
43	Side stand bearing bolts - clean/grease	Check	Check	Check	Check	Check
44	Carry out all outstanding service bulletin and warranty work	Perform				
45	Carry out test ride	Perform				
46	Complete service booklet and reset inspection indicator (if applicable)	Perform				

SERVICE RECORD

IMPORTANT: The warranty can only be granted if the vehicle has been serviced in accordance with the maintenance schedule and it has been entered here.

Delivery inspection
Date:
Km:
Dealer stamp Signature

After the first 1,000 km
Date:
Km:
Dealer stamp Signature

1 st inspection
Date:
Km:
Dealer stamp Signature

2 nd inspection
Date:
Km:
Dealer stamp Signature

3 rd inspection
Date:
Km:
Dealer stamp Signature

4 th inspection
Date:
Km:
Dealer stamp Signature

IMPORTANT: The warranty can only be granted if the vehicle has been serviced in accordance with the maintenance schedule and it has been entered here.

5th inspection
Date:
Km:
Dealer stamp Signature

6th inspection
Date:
Km:
Dealer stamp Signature

7th inspection
Date:
Km:
Dealer stamp Signature

8th inspection
Date:
Km:
Dealer stamp Signature

9th inspection
Date:
Km:
Dealer stamp Signature

10th inspection
Date:
Km:
Dealer stamp Signature

SERVICE RECORD

IMPORTANT: The warranty can only be granted if the vehicle has been serviced in accordance with the maintenance schedule and it has been entered here.

11 th inspection
Date:
Km:
Dealer stamp Signature

12 th inspection
Date:
Km:
Dealer stamp Signature

13 th inspection
Date:
Km:
Dealer stamp Signature

14 th inspection
Date:
Km:
Dealer stamp Signature

15 th inspection
Date:
Km:
Dealer stamp Signature

16 th inspection
Date:
Km:
Dealer stamp Signature

IMPORTANT: The warranty can only be granted if the vehicle has been serviced in accordance with the maintenance schedule and it has been entered here.

17th inspection
Date:
Km:
Dealer stamp Signature

18th inspection
Date:
Km:
Dealer stamp Signature

19th inspection
Date:
Km:
Dealer stamp Signature

20th inspection
Date:
Km:
Dealer stamp Signature

21st inspection
Date:
Km:
Dealer stamp Signature

22nd inspection
Date:
Km:
Dealer stamp Signature

SERVICE RECORD

IMPORTANT: The warranty can only be granted if the vehicle has been serviced in accordance with the maintenance schedule and it has been entered here.

23 rd inspection
Date:
Km:
Dealer stamp Signature

24 th inspection
Date:
Km:
Dealer stamp Signature

25 th inspection
Date:
Km:
Dealer stamp Signature

26 th inspection
Date:
Km:
Dealer stamp Signature

27 th inspection
Date:
Km:
Dealer stamp Signature

28 th inspection
Date:
Km:
Dealer stamp Signature



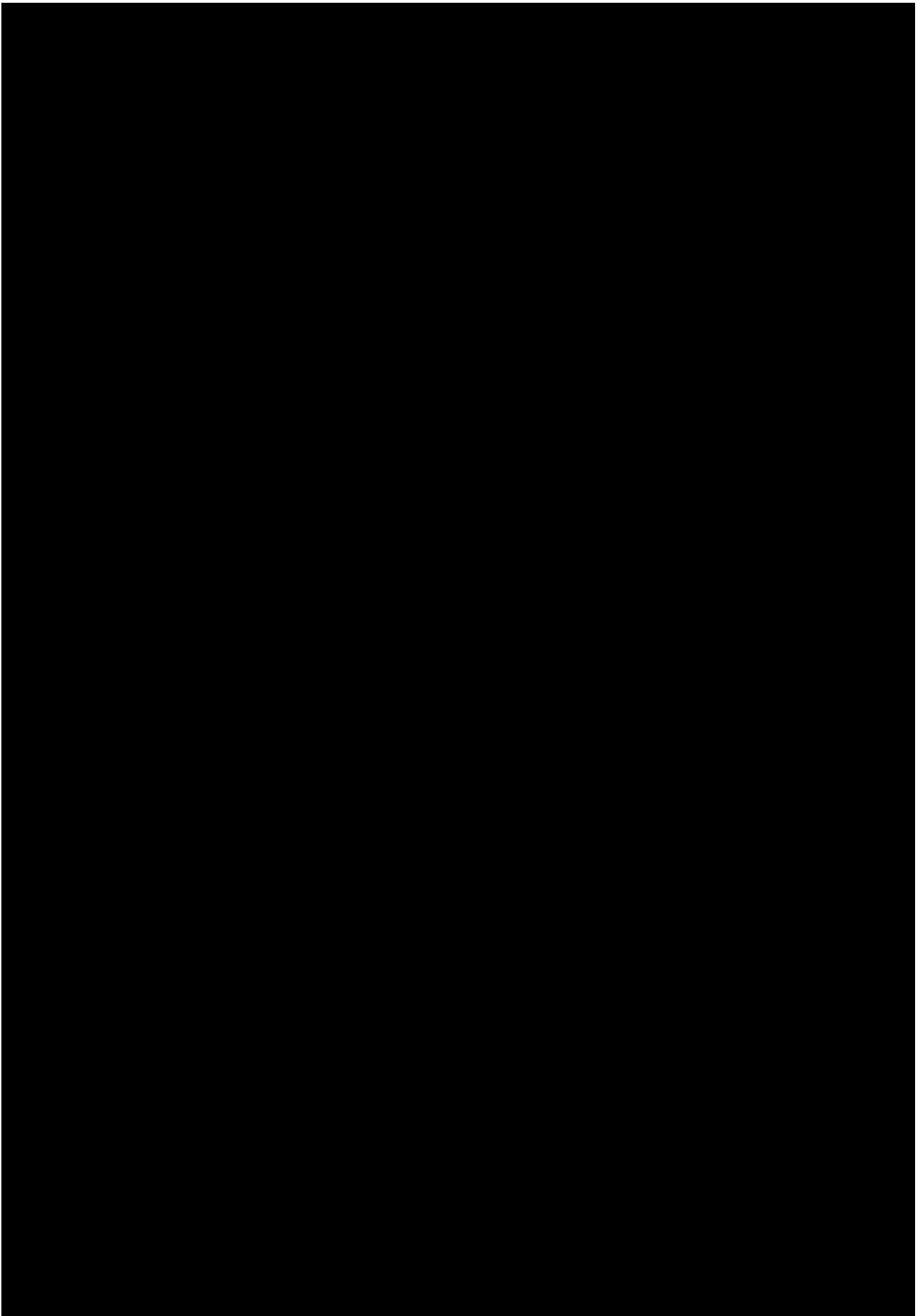
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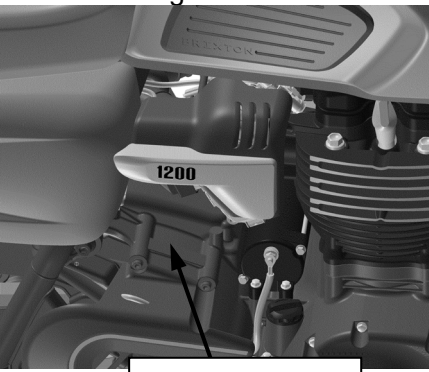
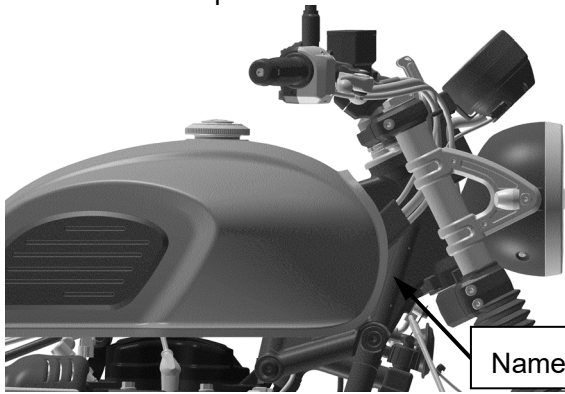
*Product and specifications are subject to change without notice.



1 General

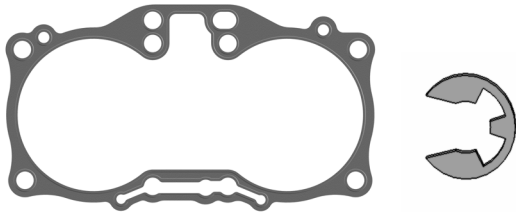
Positions of Numbers	Maintenance Plan
Precautions for Maintenance	Wiring Diagram
Main Performance Parameter	Symbols
Standard Torques	

Positions of Numbers

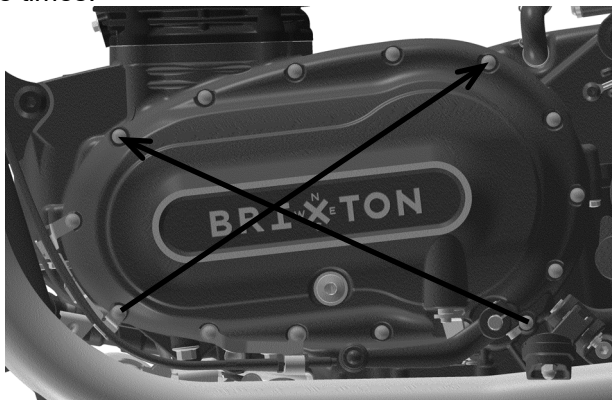
<p>Motorcycle:</p> 	<p>Position of VIN:</p>  <p>VIN</p>
<p>Position of engine number:</p>  <p>Engine number</p>	<p>Position of nameplate:</p>  <p>Nameplate</p>

Notes for Maintenance

1. Please use the parts, components, lubricant and other auxiliary materials produced or recommended by Chongqing Gaokin Industries Co., Ltd. The unqualified ones may damage the motorcycle.
2. The washers and split pins of sealing elements shall be replaced when 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.

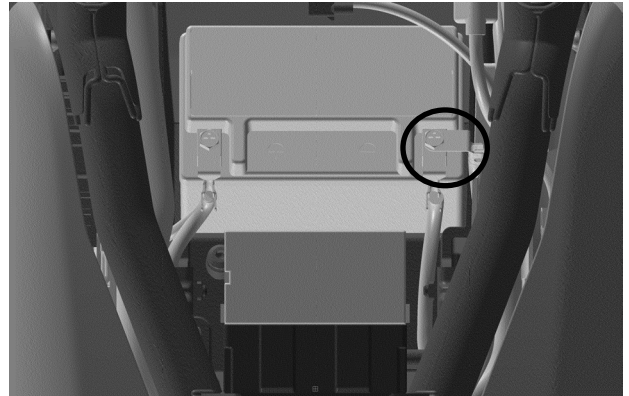
Only aphlogistic cleaning agent or that with a high fire point can be used.

Smear lubricant on the sliding surface of parts as required before assembly.

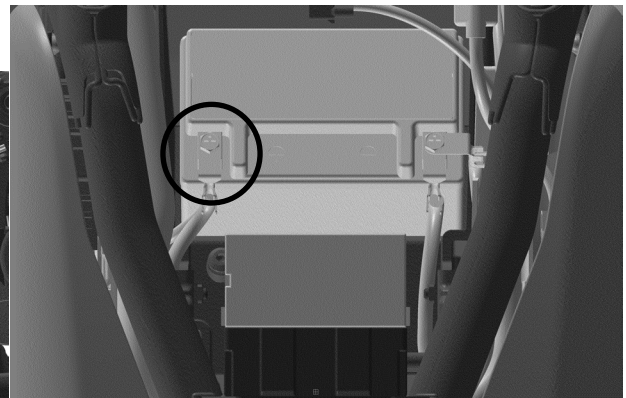
Check the installation, rotation, movement and operation status of parts after assembly.

5. Do follow the tool operation requirements when disassembling and assembling motorcycle.
6. Do smear or inject qualified or equivalent lubricant at the required positions.
7. When two men work together, pay attention to safety and cooperate with each other.
8. Disassemble the negative electrode of battery

before operation. Spanner and other tools cannot contact the frame.



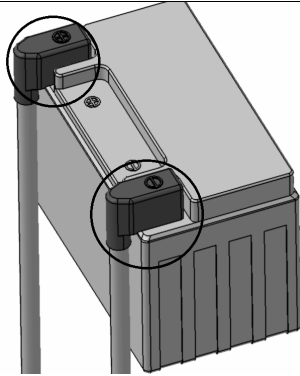
Re-check whether all parts are connected or fixed or not. If the battery is disassembled, connect the positive electrode first.



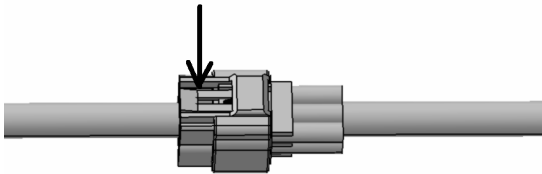
9. If the fuse is burned out, find out the cause and replaced a new one with equivalent capacity.

Spare-15A	ECU BAT-10A	Meter-10A	IGN Relay	Horn Relay	ABS MR-25A	Lamp Relay	Spare-20A
	IGN-20A				Spare-15A		
Spare Relay	Fuel Pump Relay	Fan Relay	Fuel Pump Relay	Fan Relay	Lamp-10A	Electric Spray Relay	Spare-15A
					Fan-10A		Spare-10A
					Fuel Pump-10A		
					ECU IGN-20A		

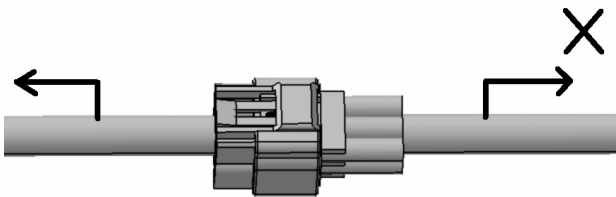
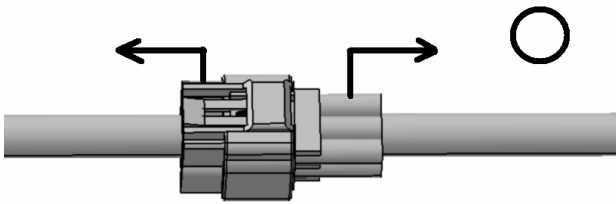
10. The covers shall be fixed on the ends after operation.



11. When disassembling connector joint with lock, do unlock it first.



When disassembling the connector joint, hold the connector and do not pull the harness.



Before connect the connectors, make sure that the terminals are not broken.

and make sure that the terminals are not bent, over length or disconnection affecting the insertion of connectors.

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

The clip shall fix the harness.

The clip shall fix the harness which shall not contact with high-temperature part.

Besides, the clip shall fix the harness which shall not contact with edge and sharp part.

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

The harness shall not be loose or pulled heavily.

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

The outer layer shall not be damaged.

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

Do not press harness when installing parts and components.

It also shall not be bent.

13. When the handle is rotated to the end, the harness shall not be tightened or loose. Make sure that there is no obvious bending, pressure or interference.

14. For the application of test instrument, do understand the operating instruction first and following the guidance in maintenance manual.

15. Do not loss 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.

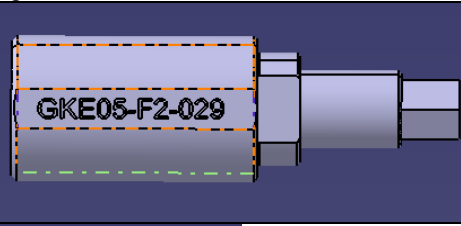
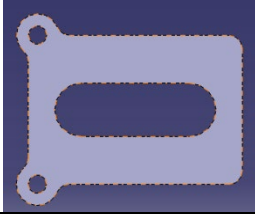
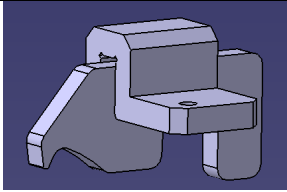
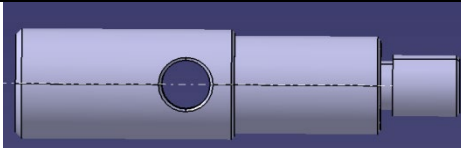
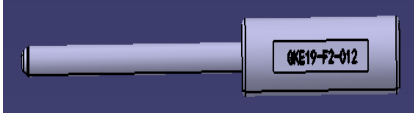
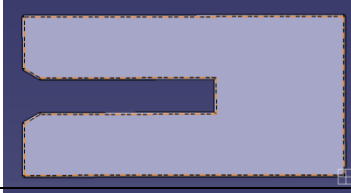
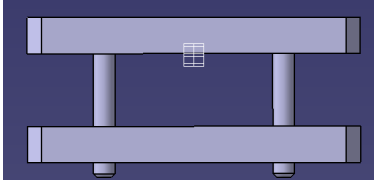
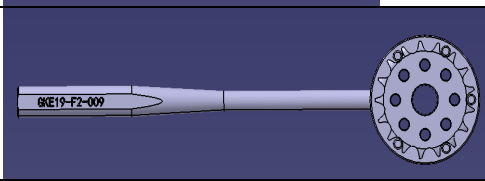

17. Do not bend cables violently. Deformed or damaged cable may cause running problem.

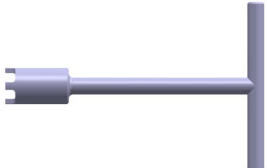
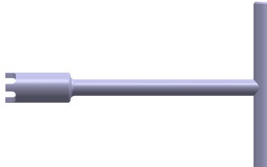
Main Performance and Technical Data

	Item	Data
Dimension and weight	Total length	2180mm
	Total width	800mm
	Total height	1115mm
	Wheelbase	1450mm
	Minimum ground clearance	150mm
	Total weight	Unloaded weight: 223kg, curb weight: 235 kg, Fully loaded weight: 455kg
Body	Frame Type	Steel tube
	Caster angle of front suspension	26°
	Front suspension	Hydraulic spring, composite shock absorption
	Rear suspension	Hydraulic spring, composite shock absorption (spring preload, adjustable)
	Front tire size	100/90 - 18 M/C(56H)
	Rear tire size	150/70 R 17 M/C(69H)
	Front wheel pressure	One person: 220kPa, two persons: 220kPa
	Rear wheel pressure	One person: 220kPa, two persons: 250kPa
	Front brake	Disc diameter Φ 310mm
	Rear brake	Disc diameter Φ 260mm
	Fuel tank capacity	16L
Fuel grade	95#	
Engine	Type	2-cylinder, 4-stroke, water cooling
	Cylinder diameter \times stroke	98.6mm \times 80mm
	Displacement	1222cc
	Compression ratio	10:1
	Maximum power	61kw / 6550rpm
	Maximum torque	108N·m / 3100rpm
	Valve clearance (cold state)	IN: 0.1 \pm 0.03, EX: 0.15 \pm 0.03
	Valve drive mechanism	Chain drive
	Air filter	Paper filter
	Cooling method	Water cooling
	Filling capacity of cooling water	1.5L
	Crankshaft balance mode	Balance shaft
	Lubrication method	Splash and forced lubrication, replaceable oil filter
	Oil pump type	Rotor
	Engine oil grade	SAE 10W/40 (SJ grade)
	Filling capacity of engine oil	3.2L/3.4L (filter element replaceable)
	Engine oil filter element	Paper filter element, replaceable
	Starting method	Motor
Idle speed	1000 \pm 100r/min	
Net weight of engine	87kg	


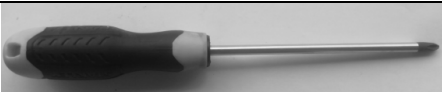

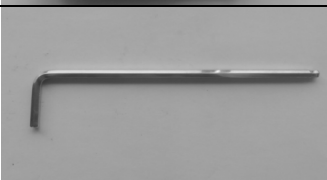
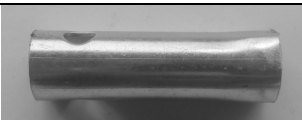


	Item	Data
Driving system	Clutch	Multi-disk oil-bath clutch
	Clutch operation system	Manual mechanical clutch
	Transmission	6 speed constant mesh
	Primary reduction ratio	1.257
	Gear ratio	I 3.50 II 2.50 III 1.850 IV 1.480 V 1.296 VI 1.172
	Final reduction ratio	2.412
	Shift type	Left foot operated gearshift Sequence I—N—II—III—IV—V—VI
Electrical and electric injection system	Generator	520w/5000rpm, permanent magnet AC magneto
	Battery capacity	12V12A.h
	Power supply system	DC power supply; the generator only charges the battery
	Fuse protector	25A*1, 20A*2, 10A*6
	Spark plug	Model: NGK LMAR8A-9
	Spark plug clearance	0.8~1.0mm
	Anti-theft device type	Type 2; the ignition switch can lock the steering column and cut off the ignition circuit
	Fuel supply method	Electric injection, ECU control
	Ignition mode	Electric injection
	Headlight	12V30W/15W
	Turn signal light	Front: 12V1W Rear: 12V1W
Brake light/taillight	12V3.7W/3.7W	



Special tools

S/N	Name	Figure
1	Rotor puller	
2	Camshaft fixing tool	
3	Fixing tool of upper crankcase balance shaft	
4	Fixing tool of lower crankcase balance shaft	
5	Crankshaft fixing tool	
6	Cylinder block assembly tool	
7	Fixing tool of timing idler gear main and auxiliary gear	
8	Fastening tool of clutch/rotor	
9	Assembly tool of gear shift shaft oil seal	

<p>10</p>	<p>Rear fork shaft regulating solenoid tool</p>	
<p>11</p>	<p>Engine regulating solenoid tool</p>	

Standard tool

S/N	Name	Specification	Figure		
1	Wrench	10			
		12			
		13			
		14			
		15			
		16			
		17			
18				18	
				19	
		21			
		27			
2	Screwdriver	Six-angle			
		Straight			
3	Inner hex.	3			
		4			
		5			
		6			
		8			
4	Spark plug sleeve	/			
5	Ratchet spanner	/			
6	Sleeve	10			
		13			
		14			

		15	
		16	
		17	
		21	
		24	
		27	
7	Extension bar	/	
8	T-sleeve	10	
		13	
		15	

Standard Torques

Engine

Item	Qty.	Thread diameter mm	Torque N·m
Five-star switch-plate bolt	1	8	21~25
Positioning bolt of shifter arm	1	/	25~29
Bolt of magneto rotor	1	/	138~142
Spark plug	2	/	14~18
AB bolt	6	9	46~50
Rock shaft bolt	2	12	13~17
Oil outlet screw plug	1	12	28~32
Closing bolt M8×105	1	8	15N*m, and then tighten 120°
Closing bolt M10	1	10	37~41
Closing bolt M8	10	8	22~26
Mounting bolt of driving sprocket	1	10	52~56
Clutch nut	5	/	126~130
Nut of connecting rod cap	4	8	33~35
Bolt of isolator	6	8	27~31
Bolt of primary driving gear	1	16	103~105
Mounting bolt of oil pressure sensor	1	/	23~27
Fuel pressure sensor	1	/	10~14
Mounting bolt of gear display	2	4	2~4
Joint of fine filter tube	1	/	16~20
Fine filter	1	/	8~12
Water temperature sensor	1	12	14~16
Bolt of clutch lifting plate	5	6	11~13
Nut of positive wire of starter motor	1	6	8~12
Bolt of camshaft bracket	12	6	10~14

Body

Item	Qty.	Thread diameter mm	Torque N·m
Install the front suspension of engine	2	12	70~85
Install the front upper suspension of engine	2	12	70~85
Install the upper suspension of engine	1	12	70~85
Install the rear upper and right suspensions of engine	2	12	70~85
Install the front shock absorber, steering column and front shock absorber	6	8	21~25
Handle tube and raiser	4	8	21~25
Front wheel	1	18	80~90
Rear wheel	1	18	80~90
Upper mounting point on rear shock absorber and frame	2	8	28~32
Mounting point of rear shock absorber and rear fork	2	8	28~32
Connecting point of main frame and sub-frame	4	10	55~65
Connection between frame and rear fork	1	14	96~100
Connection between brake disc and wheel hub	17	8	28~32
Shock absorber and sprocket	6	8	28~32
Front brake caliper and front shock absorber connection	4	8	28~32
Mounting bracket of rear brake caliper	2	10	50~54
Connecting point of brake hose	4	10	28~32
Brake oil pipe and ABS connection	4	10	18~22
The rear brake main pump is connected with the rear brake main cylinder block mounting plate	2	8	20~30
Gear shift arm assembly	1	6	11~13

Apart from the above required torques, please refer to the following torque range of other standard fasteners

Name and Size	Torque N·m
5mm bolt and nut	4~6
6mm bolt and nut	8~12
8mm bolt and nut	18~25
10mm bolt and nut	30~40
5mm screw	4~6
6mm screw	7~11
6mm disc bolt and nut	10~14
8mm disc bolt and nut	20~30
10mm disc bolt and nut	30~40

Maintenance Schedule

Inspection item \ Inspection period	Km	First 1000	Every 10000	Every 20000	Every 30000
	Months	First 3	Every 12	Every 24	Every 36
Air filter (filter element)		–	Check	Replace	Check
* bolt and nut of silencer		Fasten	Fasten	Fasten	Fasten
* Valve clearance (check under cold state) IN: 0.1±0.03mm/EX: 0.15±0.03mm		Check	Check	Check	Check
Spark plug		–	Check	Check	Check
Engine oil		Replace	Replace	Replace	Replace
Engine oil filter element		Replace	Replace	Replace	Replace
Free stroke of clutch handle		Check	Check	Check	Check
* Throttle		Check	–	Check	–
Idle speed		Check	Check	Check	Check
Fuel evaporation pollutant control system		–	–	Check	–
* Coolant	Replace it every 40,000km or every 24 months				
Rubber tube of radiator		–	Check	Check	Check
Fuel pipe		–	Check	Check	Check
Transmission chain		Check	Check	Check	Check
	Lubricate once every 500km and clean once every 1000 km				
* Brake		Check	Check	Check	Check
* Brake liquid hose		–	Check	Check	Check
	Replace it once every 4 years				
Brake fluid		–	Check	Check	Check
	Replace it once every 2 years				
Tire		–	Check	Check	Check
* Steering mechanism		Check	Check	Check	Check
* Front fork		–	Check	Check	Check
* Rear shock absorber		–	Check	Check	Check
* Bolts and nuts for body and engine installation		Fasten	Fasten	Fasten	

Note:

Check in line with the listed items. If necessary, further clean, lubricate, adjust or replace part or component.

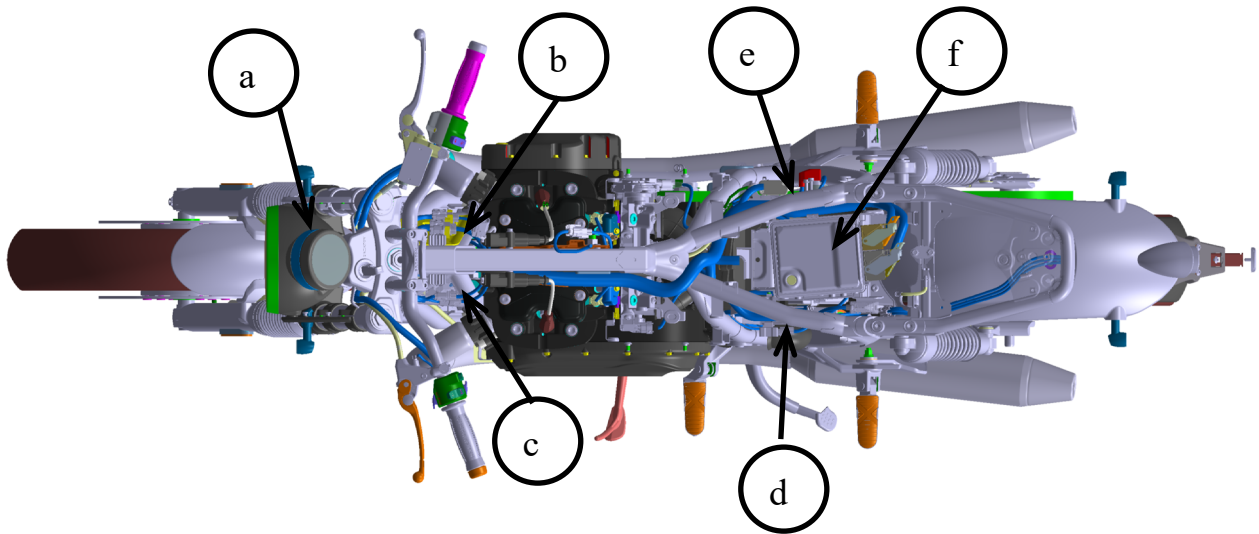
Note:

Check more frequent when the road condition is bad or the motorcycle runs at a high power for a long time.

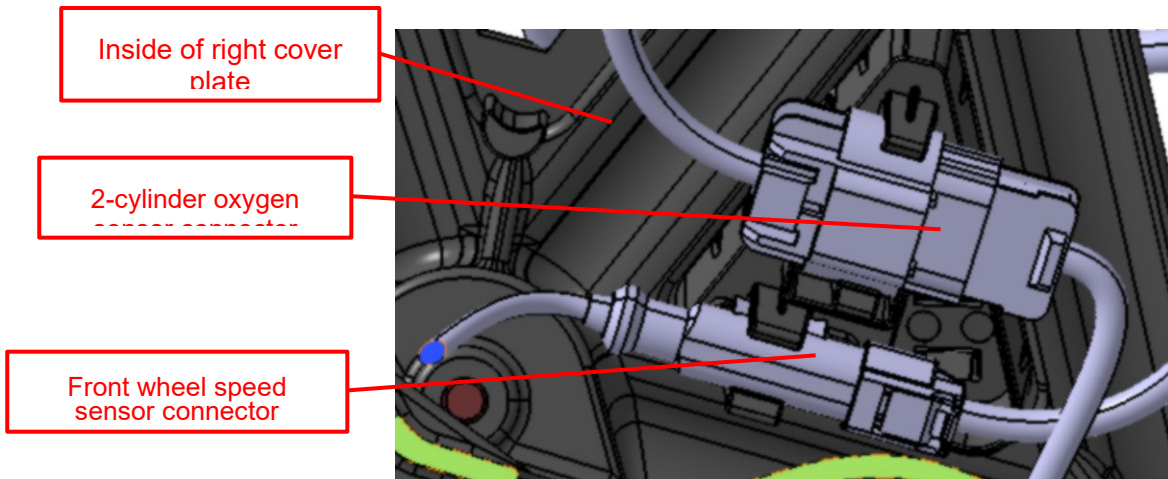
Note:

The item with a “*” shall be carried out at licensed repair shop.

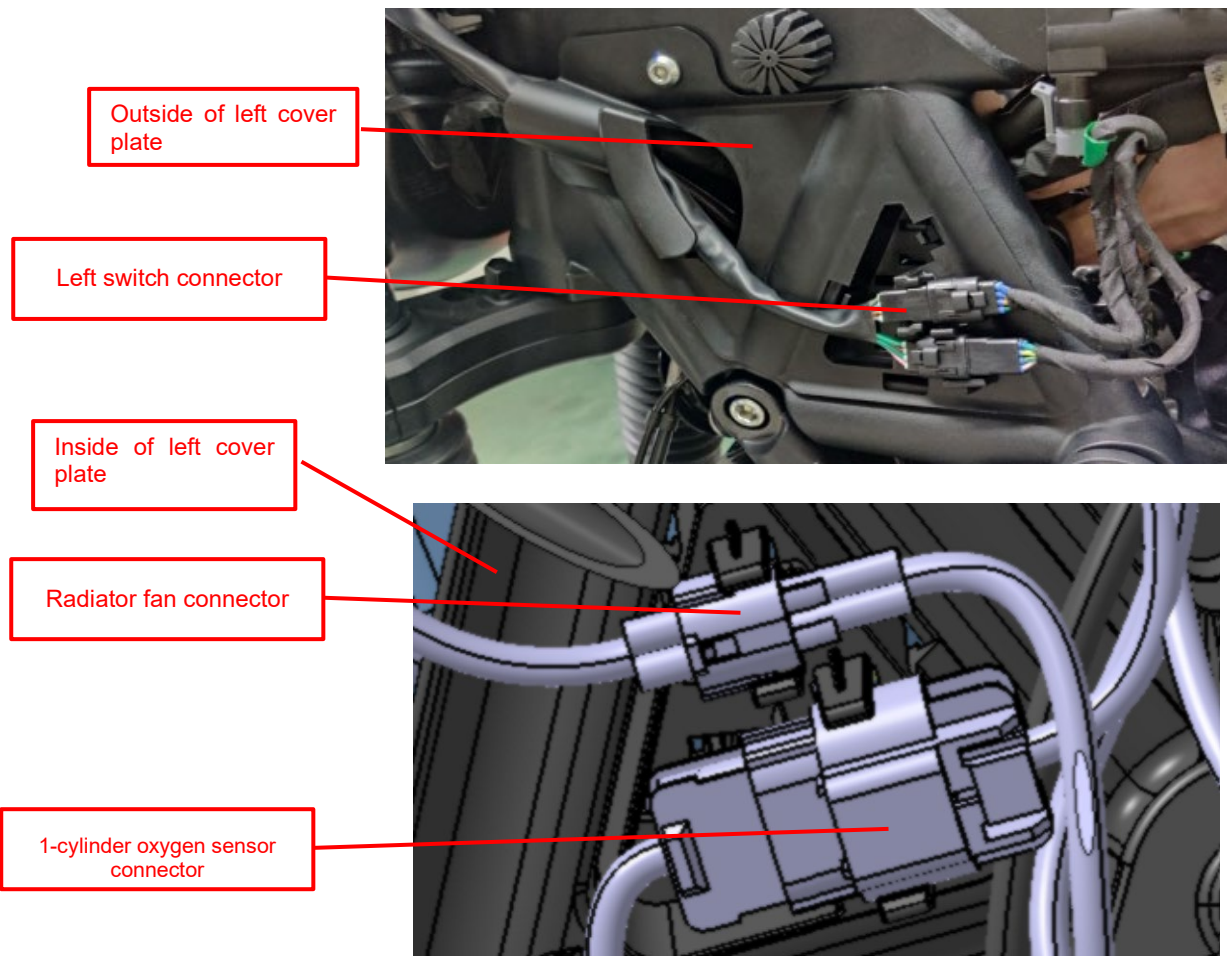
Wiring Diagram



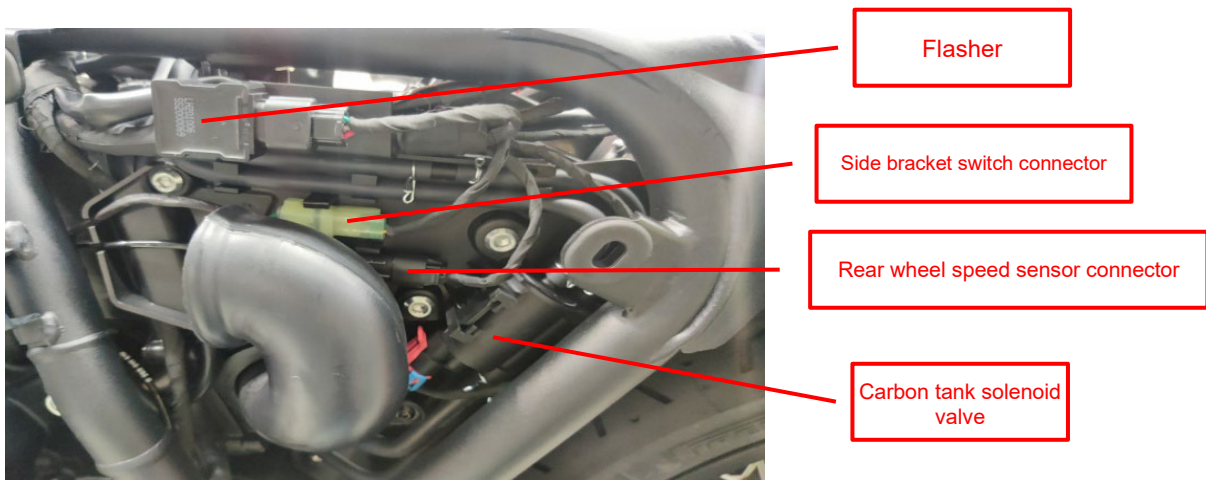
Position b: right cover plate



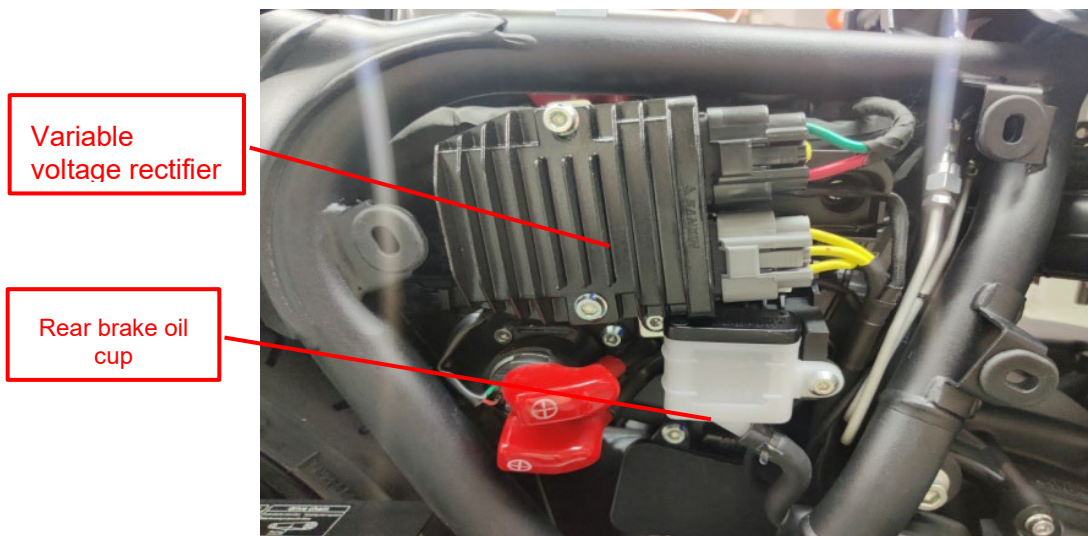
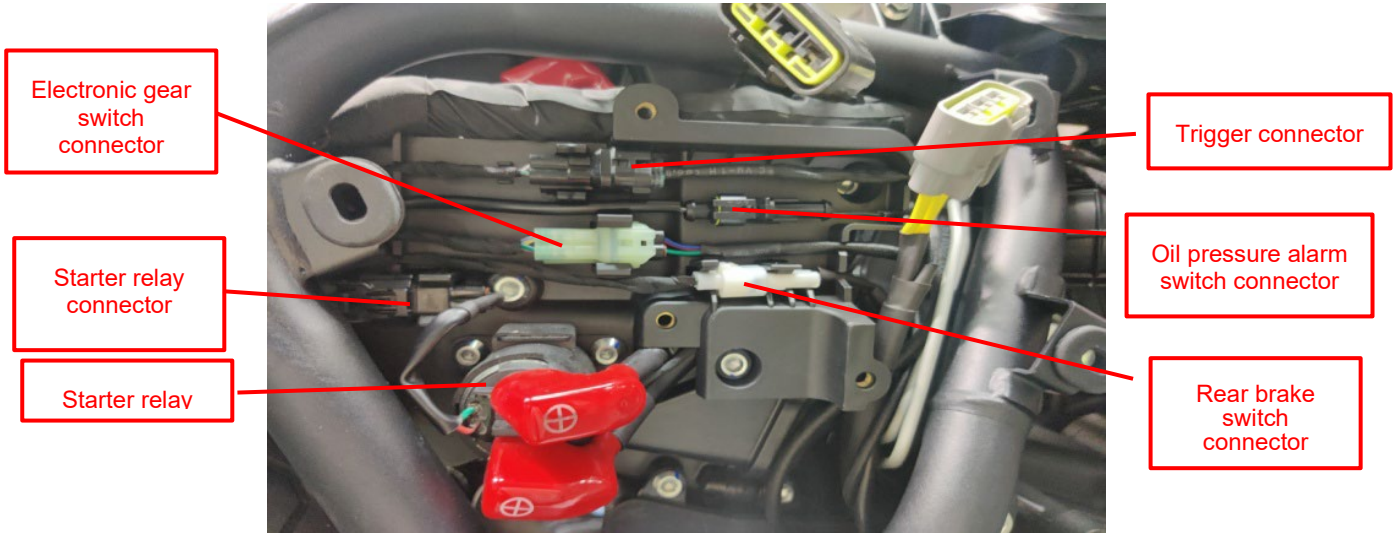
Position c: left cover plate



Position d: left side cover



Position e: right side cover



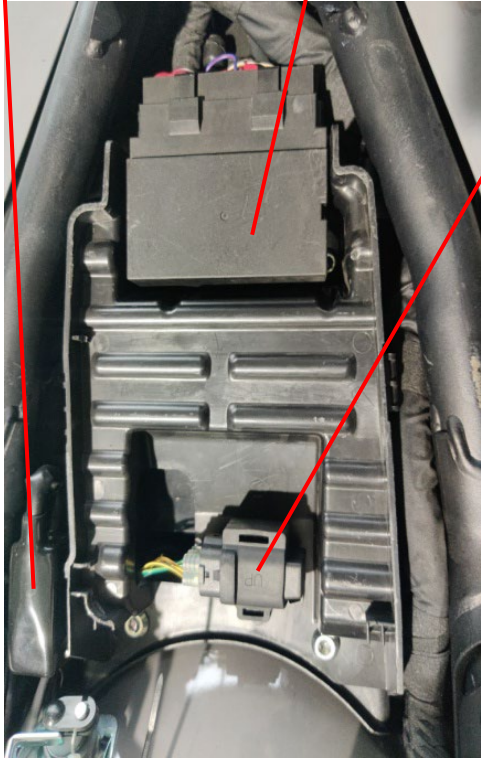
Position f: under the seat

OBD diagnosis interface

Fuse control box

Rollover sensor

ECU part



Symbols

Meanings of the symbols herein are as follows:



Description:

Measures to be noted during operation, inspection and maintenance.










Note:

Special instructions or treatment measures proposed to prevent certain damage to the vehicle.



Warning:

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

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

Lubrication System

Maintenance Notice	Replacement of Engine Oil
Maintenance Criteria Table	Oil Pressure Alarm Switch
Engine Oil	Oil-water Pump
Oil Running Chart	

Maintenance Notice

This section introduces the check and replacement of engine oil and the cleaning of primary filter mesh and filter,

Engine oil is critical for the performance and service life of engine. Do choose it as required and do not use ordinary engine oil, gear oil, vegetable oil or others. The 10W/40 engine oil is used for this engine when it is sold and shipped from the factory. Discharge the engine oil in crankcase before oil replacement. Clean the crankcase and refill it as required.

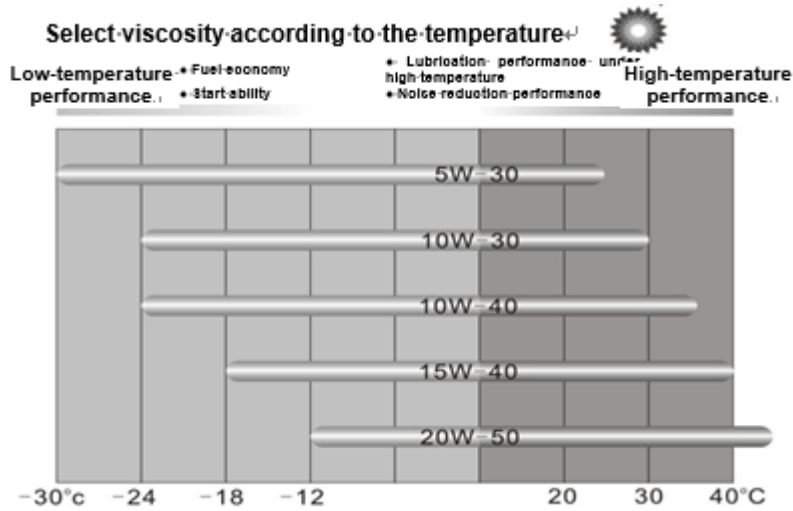
Discharge the oil in the engine first before check and cleaning the oil system.

Lubrication System Technical Specification and Maintenance Criteria

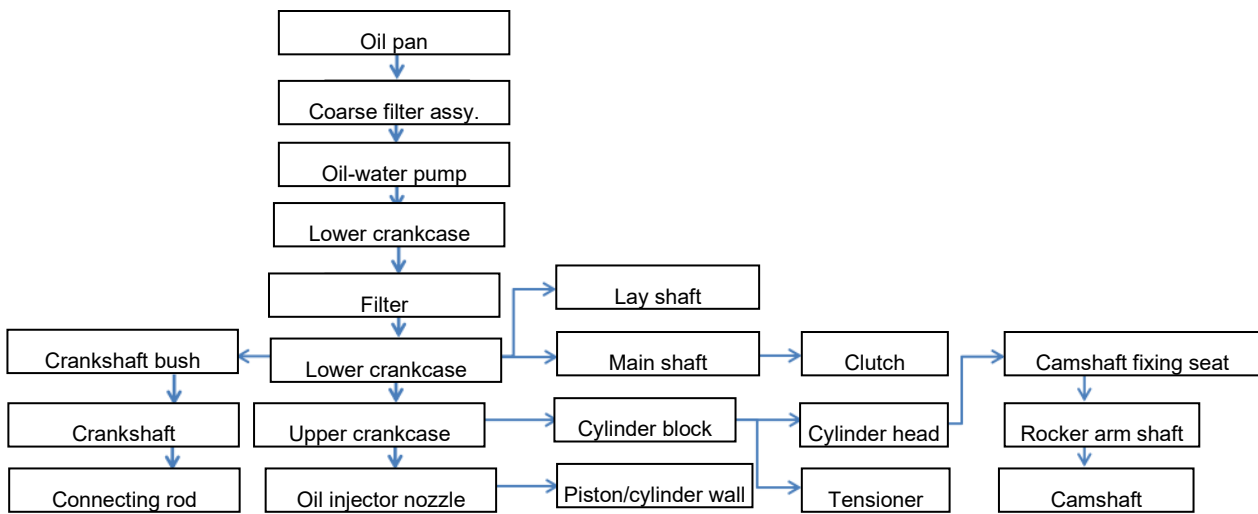
Oil capacity (newly-installed)	3.5 L
Oil capacity (oil and filter element replaced)	3.2 L
Oil capacity (oil replaced)	3.0 L
Oil grade	SH or higher
Oil viscosity	10W/40
Oil type	Semi-synthetic or synthetic
Oil pressure (main oil duct)	3.00~3.60 bar at 3500 rpm
Clearance between inner and outer rotor tips	0.15mm (standard value)
	0.20mm (limit value)
Clearance between outer rotor and pump body	0.15~0.24mm (standard value)
	0.37mm (limit value)

Engine Oil

Semi-synthetic or synthetic 10W/40 motorcycle engine oil is recommended, and the oil grade is SH or higher. The oil viscosity can be adjusted appropriately to suit the local ambient temperature. Please refer to the chart below for the correct oil viscosity for your area.



Oil Running Chart



Oil duct:

The oil in the oil pan is sucked into oil pump through the coarse filter assembly, and to provide pressure oil to the oil duct through the rotor assembly in the oil pump. Oil duct includes main oil duct and driving system oil duct.

Main oil duct:

Pressure oil firstly enters into the pressure relief valve in the oil pump, and the said valve controls the maximum pressure in the oil duct. The pressure relief valve is set at 5.0 bar when turned on, and then the pressure oil will relieve pressure accordingly. Then the pressure oil will flow through the filter, and then to oil galleries on the lower crankcase.

- A part of oil will flow and supply to the main bearing bush through the oil duct below the crankcase, and flow to the connecting rod big end bearing bush through the oil hole on the crankshaft.
- A part of oil will supply oil to oil nozzle through the oil duct over the crankcase, and inject oil to piston, cylinder hole and connecting rod small end through the nozzle.
- A part of oil will flow through the oil duct of the upper crankcase to the cylinder block to supply oil to the tensioner.
- A part of oil will flow from the oil duct of the upper cylinder to the cylinder head. The oil is divided into two parts from the crankcase and passes up through the cylinder block into the cylinder head, with the one into the left camshaft fixing seat and the other into the right camshaft fixing seat. It flows into the camshaft journal and rocker arm shaft through grooves and bolt holes in the camshaft fixing seat.

Driving system oil duct:

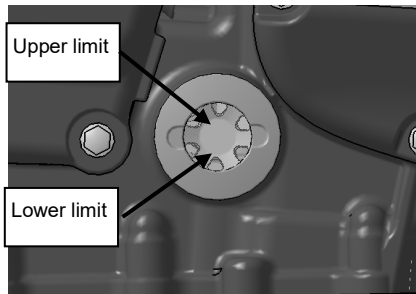
The pressure oil flows to main shaft assembly, lay shaft assembly and clutch through the lower crankcase. The oil flows from each oil hole of the shaft, and lubricates the bearing and gears by splashing. The oil of transmission hub is splashed from the drive gear.

Replacement of Engine Oil

Check of engine oil liquid level:

To ensure the normal operation of the engine, keep the engine oil at a proper level, and replace the oil and oil filter as per the maintenance requirements.

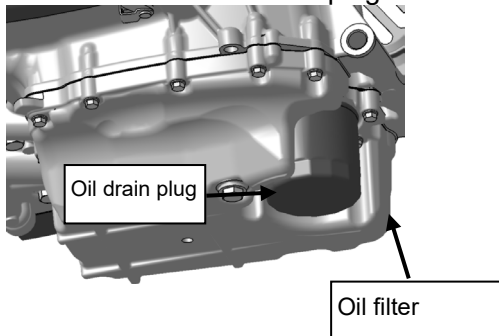
1. Start and keep engine at idle speed for about 5 minutes.
2. Stop the engine and wait for at least 3 minutes so that the oil can deposit.
3. Note the oil level via the oil level window.
4. Watch the oil level between the upper and lower limit of the oil level window.



5. When filling oil, fill a small amount of oil for several times until the oil level in the window is in the correct position.
6. After finishing filling, install filler plug and O-ring and tighten them.

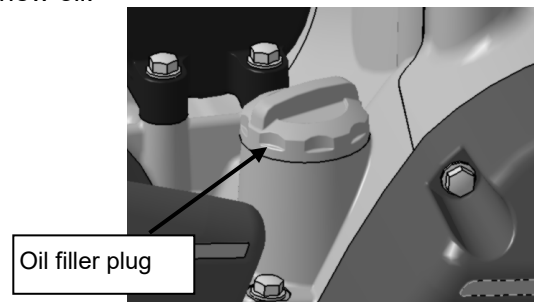
Replacement of engine oil and filter:

1. Completely pre-heat the engine and turn off it.
2. Place an oil tray below the engine.
3. Remove the oil drain plug and washer.



4. Park the motorcycle on a flat road surface so that the oil can be discharged more thoroughly.

5. Use the special tools for filter to remove the oil filter.
6. Apply a layer of clean oil onto the sealing ring of the new oil filter.
7. Use the special tools to install the new filter and tighten it to 10N·m.
8. Install a new washer onto the oil drain plug.
9. Install the oil drain plug and tighten it to 25N·m.
10. Open the filler plug and fill up the engine with new oil.



11. Start the engine and keep it at idle speed for 30s.
12. The oil pressure alarm light shall be off after the engine starts.
13. Stop the engine and check the oil level; and if necessary, adjust it.



Note:

Frequent and long-term contact with engine oil may cause dry and irritant skin and dermatitis. In addition, the used oil contains harmful pollutants that may cause cancer, so please avoid direct contact with it.



Note:

Do not dump waste oil on the ground, sewers or drains to prevent water pollution.



Note:

The currently used oil is very hot, so direct

contact with hot oil can cause scalds or burns to skin.

**Note:**

Before the oil reaches all parts of the engine, the engine should not run at a high speed, otherwise it will cause the engine to be damaged or stuck. Only after the engine idles for 30s can the engine speed be increased so that the oil can be fully circulated.

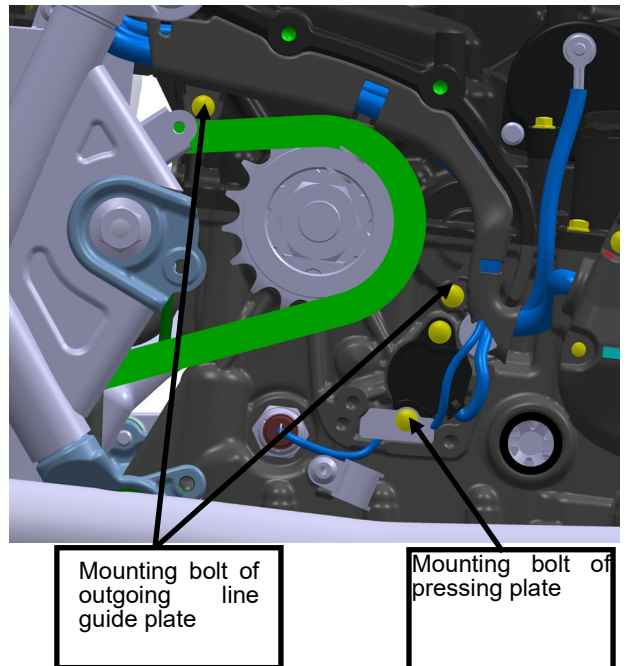
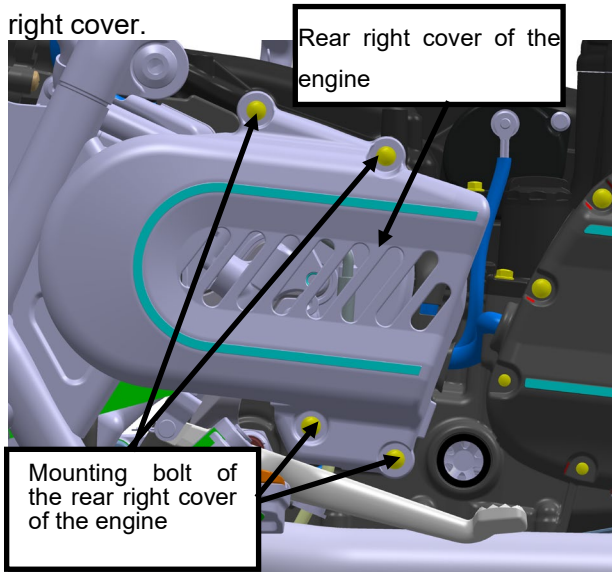
**Note:**

If the engine oil pressure is too low, the oil pressure alarm light will be on, now immediately stop the engine and find out the cause. Operation of the engine at a low oil pressure can cause engine damage.

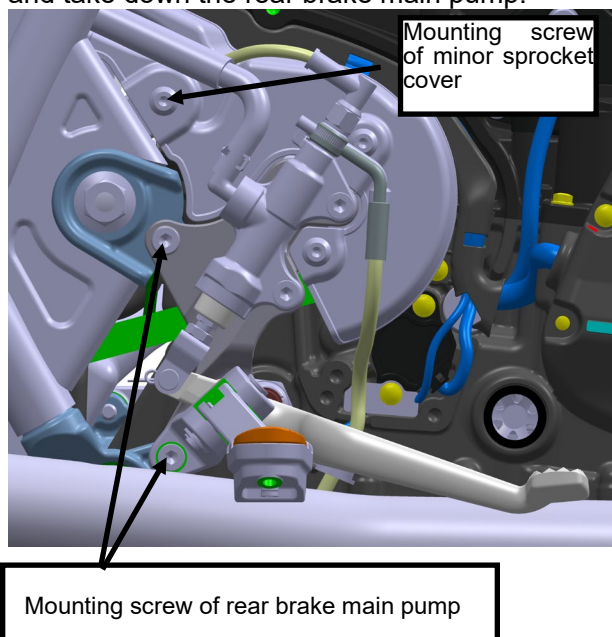
Oil Pressure Alarm Switch

Removal of oil pressure alarm switch

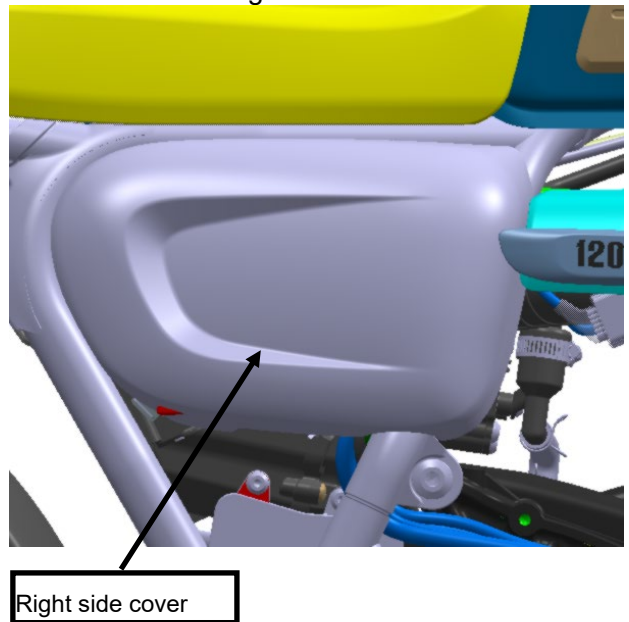
1. Remove the mounting bolt of the rear right cover of the engine, and take down the rear right cover.



2. Remove the mounting screws of rear brake main pump and minor sprocket cover, and take down the rear brake main pump.

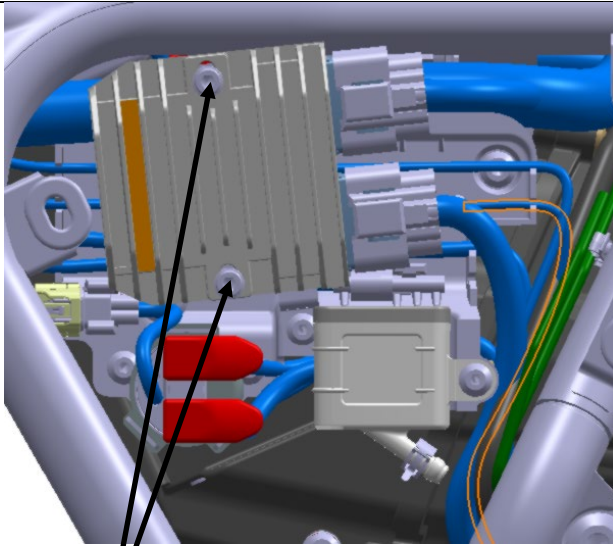


4. Take down the right side cover



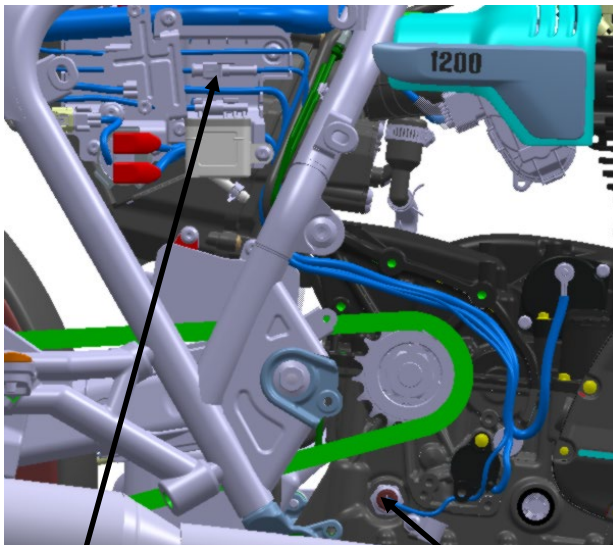
3. Remove the mounting screws of pressing plate and outgoing line guide plate, and take down the pressing plate and outgoing line guide plate.

5. Take down the mounting screw of variable voltage rectifier



Mounting screw of variable voltage rectifier

6. Take down the connector between the oil pressure sensor and main cable, and remove the oil pressure sensor



Connector between oil pressure sensor and main cable

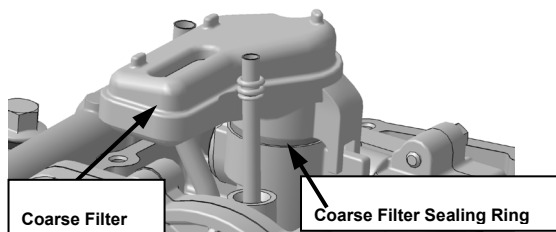
Oil pressure sensor

Oil-water Pump

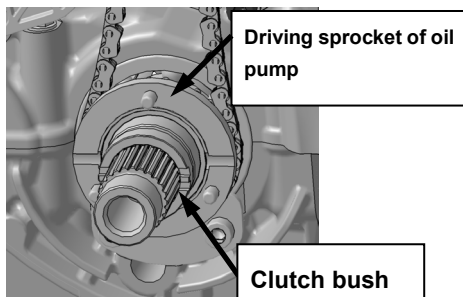
Removal of oil-water pump

- Discharge coolant.
- Drain engine oil.
- Remove oil pan.
- Dismantle clutch.

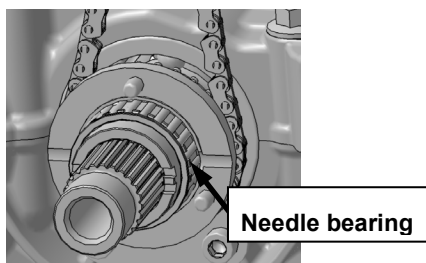
1. Take down the coarse filter.
2. Take down the coarse filter sealing ring.



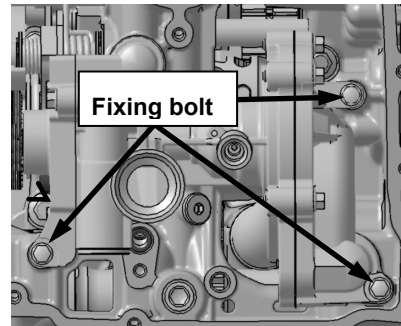
3. Move the driving sprocket of oil pump, and take out roller bearing.



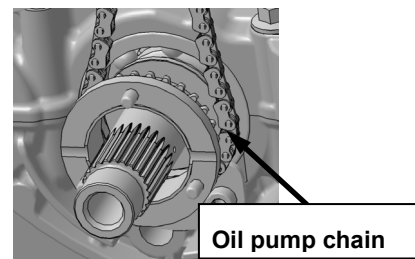
4. Support the driving sprocket of oil pump, carefully remove clutch bush and needle bearing, and pay attention to their direction.



5. Take down and replace the fixing bolts of oil-water pump.



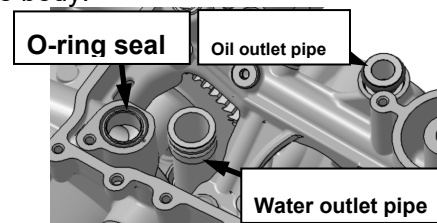
6. Remove the chain from the driving sprocket of oil pump.



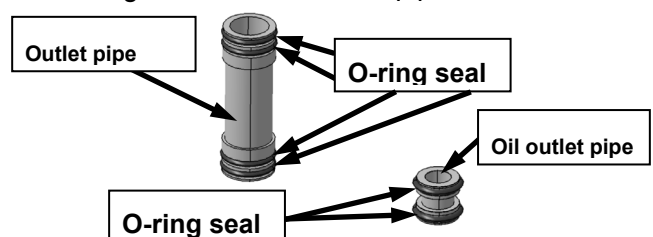
7. Carefully remove oil-water pump from the body.

Note: The O-ring seal between oil-water pump and the body may fall from.

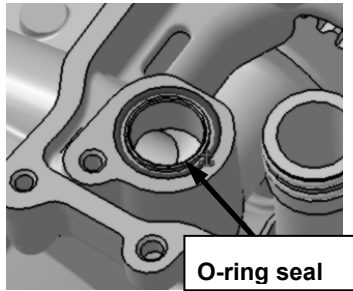
8. Remove water outlet pipe and oil outlet pipe from the body.



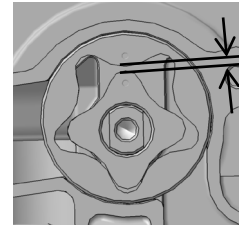
9. Remove and replace four O-ring seals from the water outlet pipe, and then remove and replace two O-ring seals from oil outlet pipe.



10. Remove and discard the O-ring seal from the body.



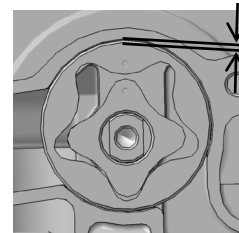
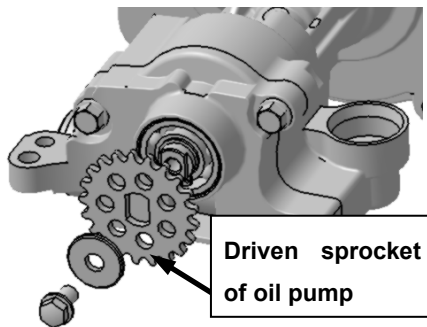
pump



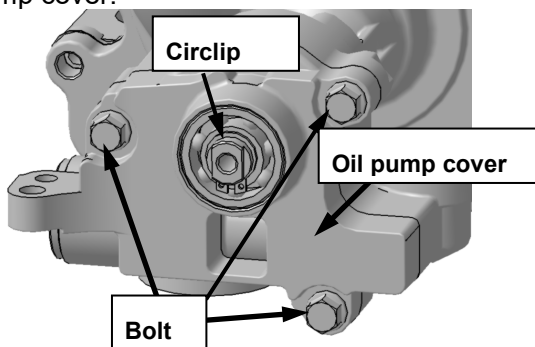
5. Check the clearance between oil pump outer rotor and oil pump body.

Disassembly of oil pump:

1. Take down the driven sprocket of oil pump from the oil pump shaft.

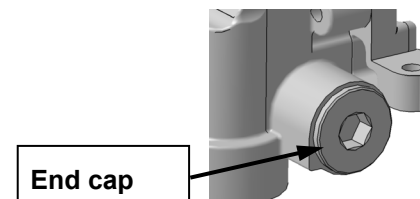


2. Take down the circlip on the oil pump shaft, and 3 fixing bolts on oil pump cover, and open the oil pump cover.



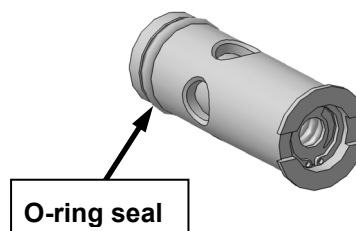
Removal of oil pressure relief valve:

1. Remove the end cap.



2. Take down the pressure relief valve from the oil pump body.

3. Remove and replace the O-ring seal from the pressure relief valve.



Check of oil pump:

1. Check the sprocket and chain. In case of any wear or damage, replace it.
2. Check the sides and ends of oil pump shaft and bearing. In case of any obvious wear, replace the pump.
3. Check if there is any leakage from oil pump ends and oil seal. In case of any obvious leakage, replace the pump.
4. Check the clearance between rotor tips in oil

Installation of oil pressure relief valve:

The installation and disassembly sequences are reverse.

Tighten the end cap to 10N·m.

Installation of oil-water pump:

The installation and disassembly sequences are reverse.

Tighten all the bolts to 10N·m.

3

Check and Adjustment

Maintenance Notice	Idle Speed
Spark Plug	Brake System
Timing Phase	Running System
Lubricant	Clutch Control Cable
Coolant	Driving Chain
Cylinder Pressure	Battery
Tension of Timing chain	Headlight Dimming
Valve Clearance	Steering Bearing of Stem
Air Filter and Oil Collector	Suspension System
Accelerator Control	Bolt, Nut and Fastener

Maintenance Notice

This section introduces the check and adjustment of BX1200 motorcycle, and the related technical requirements.



Description:

Unless otherwise specified or it is indicated in the maintenance plan, please check and adjust the BX1200 motorcycle before each operation.

Technical Specification

Engine

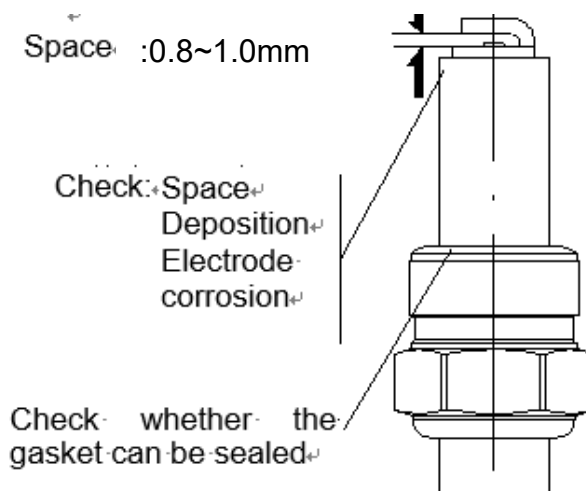
Spark plug	NGK LMAR8A-9
Spark plug clearance	0.8~1.0mm
Valve clearance (cold state)	IN: 0.1±0.03mm EX: 0.15±0.03mm
Idle speed	1000 r/min±100r/min
Cylinder pressure	≥0.5MPa/300rpm

Body

Free play of accelerator handle	1~2mm
Free play of clutch handle	10~20mm
Free play of front brake handle	12~18mm
Free play of rear brake pedal	5~10mm
Relaxation of driving chain	20~25mm
Tire pressure	front wheel one person: 220kPa, two persons: 220kPa rear wheel one person: 220kPa, two persons: 250kPa
Tire size	front wheel 100/90-18 M/C (56H) rear wheel 150/70 R 17 M/C(69H)

Spark Plug

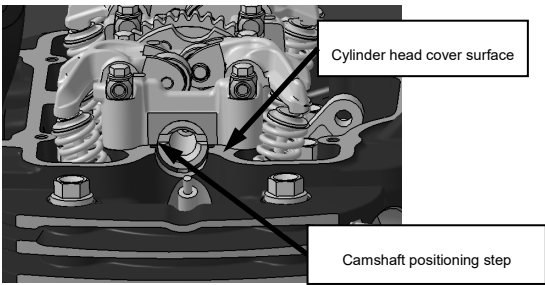
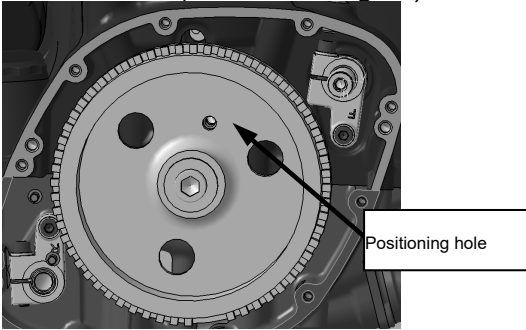
Take down the spark plug. Then take down the spark plug with a sleeve spanner. Visually check the spark plug insulator for damage and the electrode for ablation. In case of this, replace it. Check the electrode clearance with a plug gauge. The electrode clearance of spark plug is **0.8~1.0mm**. Adjust the clearance prudently. Clean the carbon deposit and dirty with a cleaner or steel wire. Check the status of spark plug sealing gasket. To install the spark plug, manually screw the spark plug firstly, then tighten it with a sleeve spanner. Install the spark plug cap finally.



Timing Phase

This shall be carried out for a new motorcycle or when the timing phase has suspected fault.

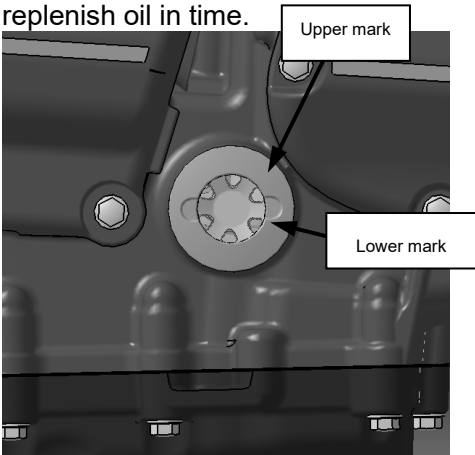
- ① Take down the front right cover and rotate the fastening bolt of rotor clockwise so as to align the hole on the rotor with the positioning hole on the upper crankcase;
- ② Remove the cylinder head cover and check whether the camshaft positioning step is flush with the cylinder head cover surface (as shown in figure).



Lubricant

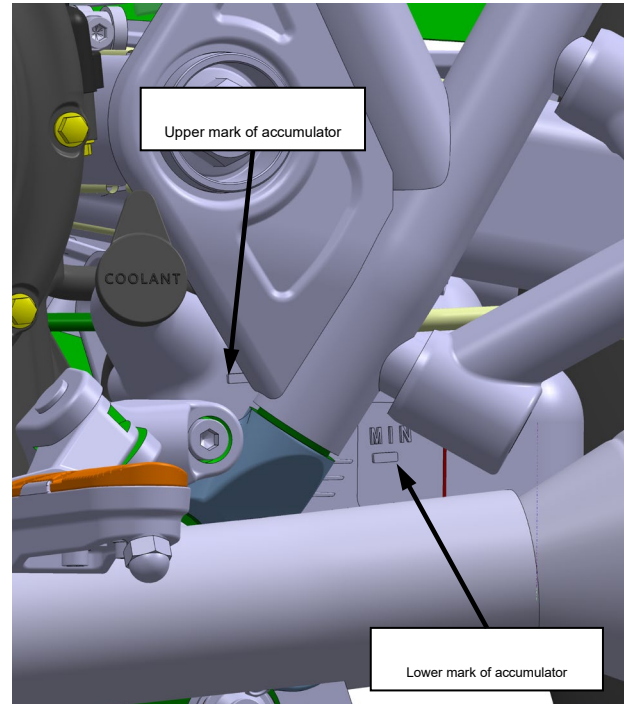
Fix the motorcycle on a flat ground with special fixture and keep the engine horizontal and stable. Visually check the oil level from the window on the lower crankcase below the right front cover. (When the engine is hot, it should stand for 3-5 minutes after stopping and then be checked again).

If the oil level cannot be observed via the window, replenish oil in time.

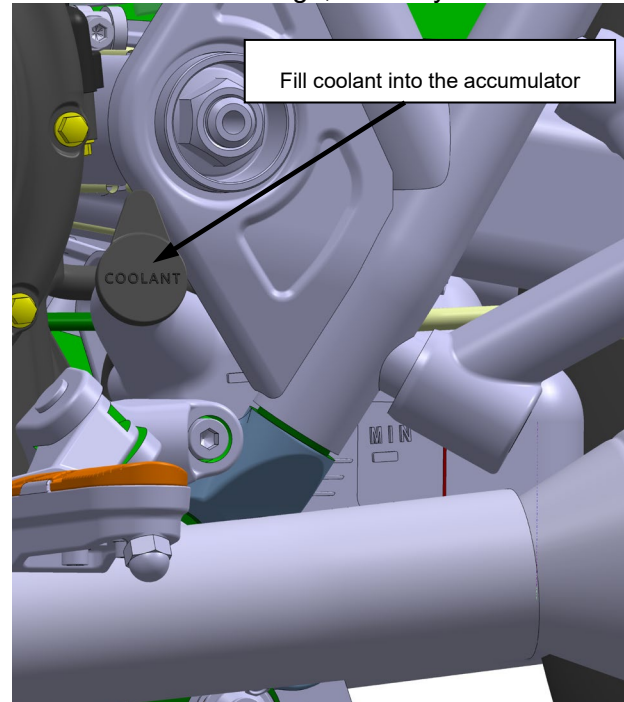


Coolant

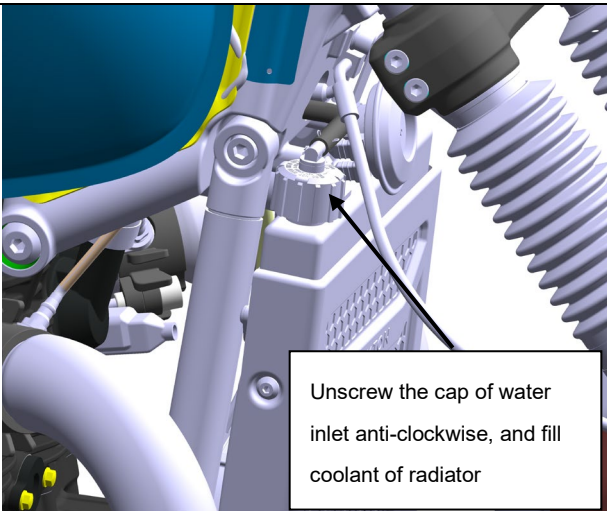
Fix the motorcycle on a flat ground with special fixture and check the coolant in the accumulator.



Check if the coolant volume is within the limit lines. In case of shortage, fill timely.



Filling method: take down the pot cap and fill coolant slowly with a funnel until the level is near to the upper mark. Then install the cap.



The ratio of anti-freezing agent and water in the coolant shall be 50%:50%. Do not add only one of them.

Do use a funnel when filling, or the coolant may flow out. Check whether the water pipe of accumulator is leaky or damaged. In case of this, replace it.

If the accumulator is empty, check the coolant level of radiator. Unscrew the radiator cap anti-clockwise and check whether the coolant level has reached the bottom of filler opening neck or not. In case of shortage, fill coolant timely.



Warning:

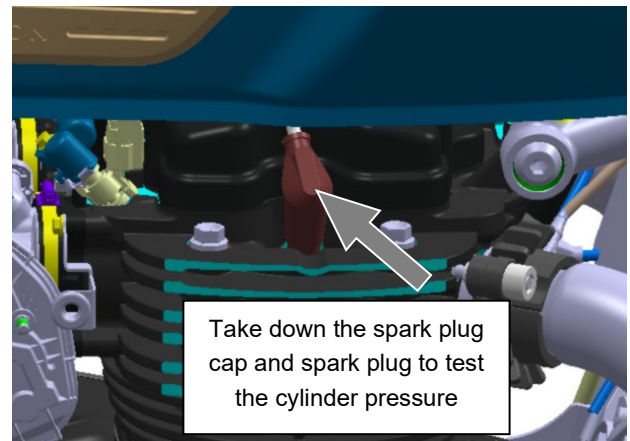
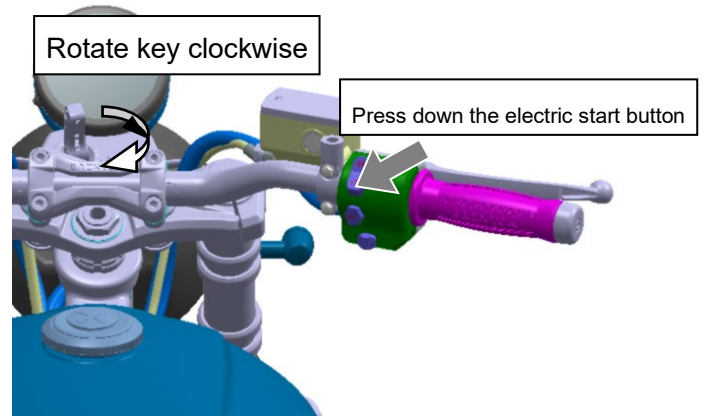
Make sure that the engine and radiator are cooled before opening radiator cap, otherwise, the injected coolant may cause serious scald.

Cylinder Pressure

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: $\geq 0.5\text{MPa}/300\text{rpm}$.

When testing the cylinder pressure, take down the spark plug and install a pressure gauge. Start the engine, and check the airtightness of pressure gauge connection parts. Reset the pressure gauge and re-started the engine; stop when the pressure gauge reading is stable. The maximum reading normally reaches after one or two cycles. The maximum reading is the cylinder pressure. Install the spark plug after test.



Low cylinder pressure is normally caused by the following reasons:

- The adjustment of valve clearance is improper
- The valve airtightness is poor
- The sealing pad of cylinder head is burnt
- The piston ring or cylinder is abraded
- The piston is abraded

High compressing force is normally caused by the following reason:

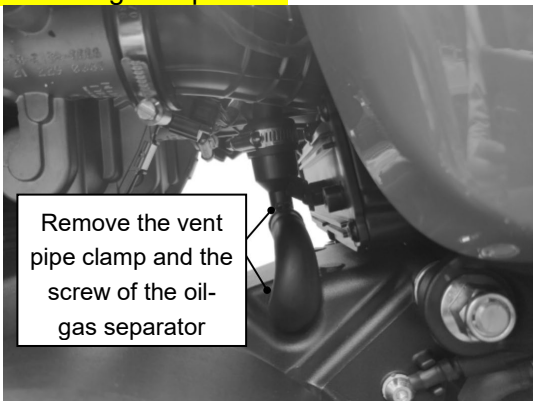
- There is carbon deposit in the combustor or

piston head

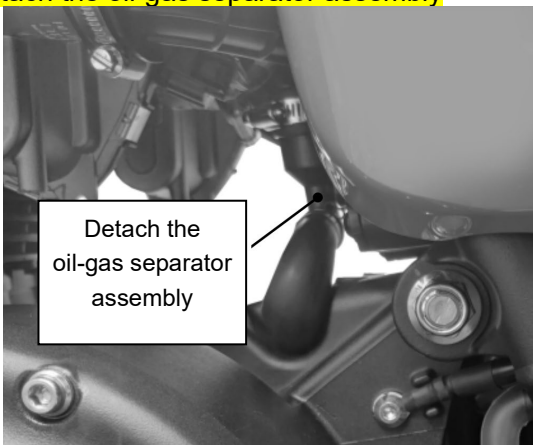
Air Filter

Cleaning and replacement of air filter element

1. Remove the vent pipe clamp and the mounting bolt of the oil-gas separator.



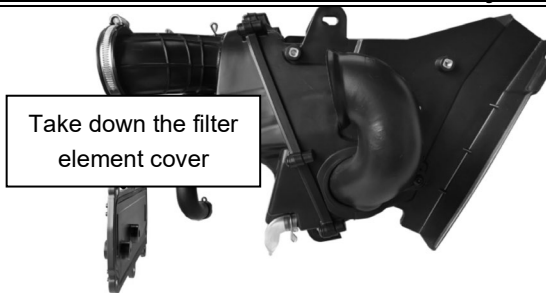
2. Detach the oil-gas separator assembly



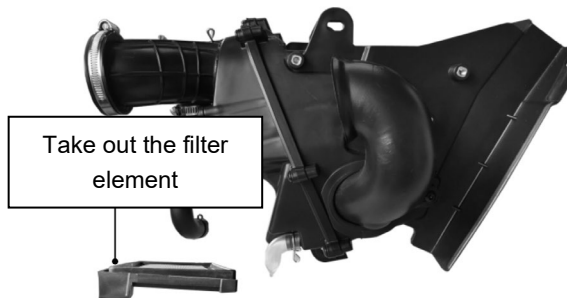
3. Take down the screws of filter element cover



4. Take down the filter element cover



5. Take out the filter element



6. Carefully clean the air filter element with compressed air

7. Install the cleaned filter element or install a new filter element in reverse order. Make sure that the filter element is properly installed and sealed.

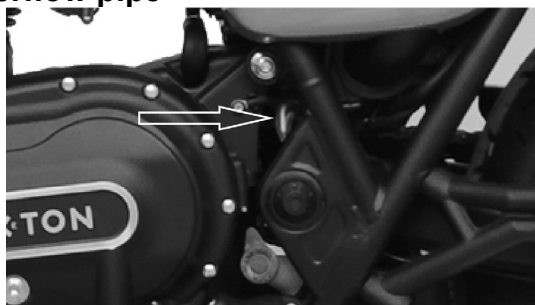


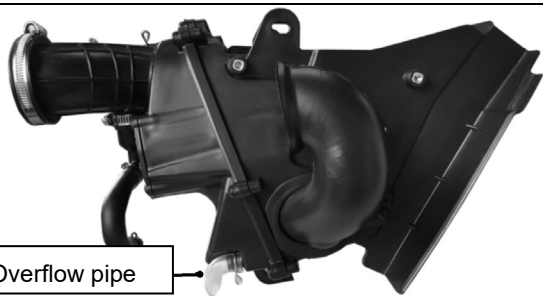
Description:

1. Take down and check the filter element. If it is a paper one, blow it with compressed air. If it is too dirty, cracked or damaged, replace it;
2. The cleaning and replacement period shall be shortened when driving at dusty areas;
3. Keeping the air filter clean can improve the engine efficiency and prolong the service life.

After the filter element is cleaned or replaced, assemble the motorcycle in the reverse sequence.

Overflow pipe





During regular maintenance, remove the overflow pipe and discharge the waste oil inside.

Notes:

1. When the air humidity is high, the frequency of inspection should be appropriately increased.
2. After operation, be sure to reinstall the overflow pipe.

Idle Speed



Note:

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

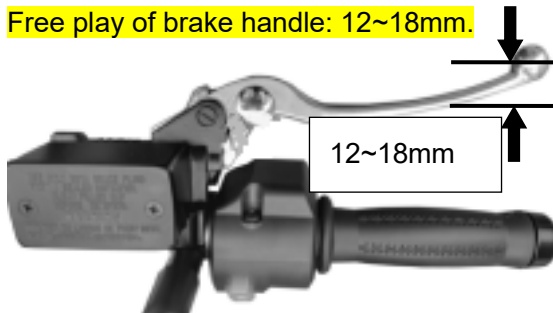
The idle speed is controlled by ECU. The air intake flow of throttle under idle speed has been adjusted when delivering. Do not adjust the adjusting screw. When the idle speed is unstable, there is no idle speed or the idle speed is high, find out the cause in line with the EMS troubleshooting.

Idle speed 1000r/min±100r/min

Brake System

Check the free stroke of front brake handle.

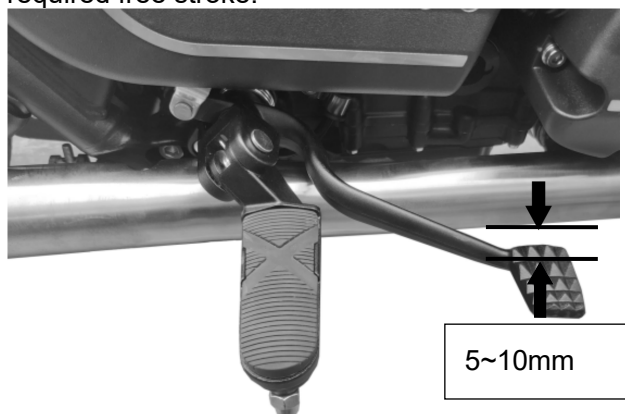
Free play of brake handle: 12~18mm.



Check the free stroke of rear brake handle.

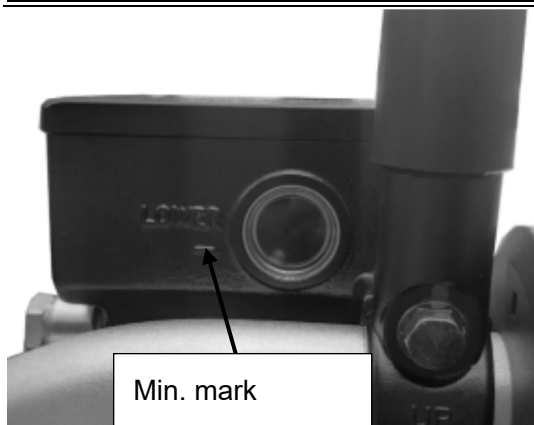
Free stroke of rear brake pedal: 5~10mm.

To adjust it, rotate the adjusting nut to get the required free stroke.

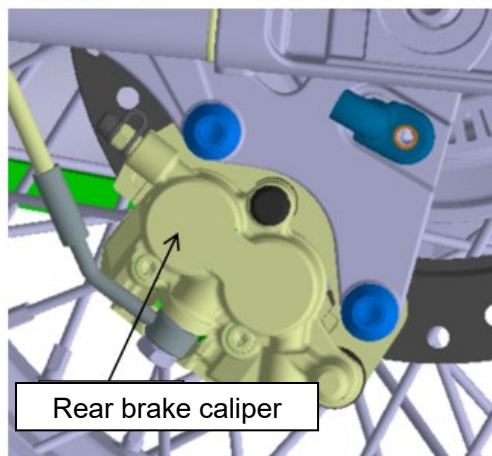
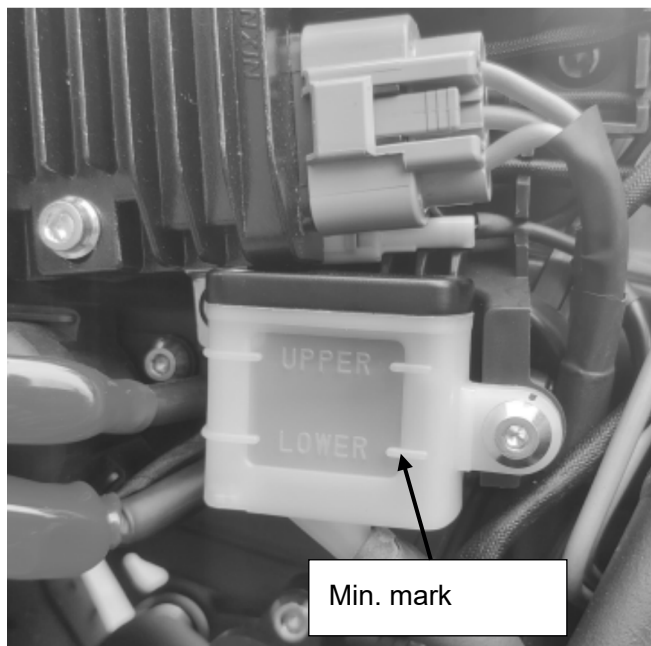
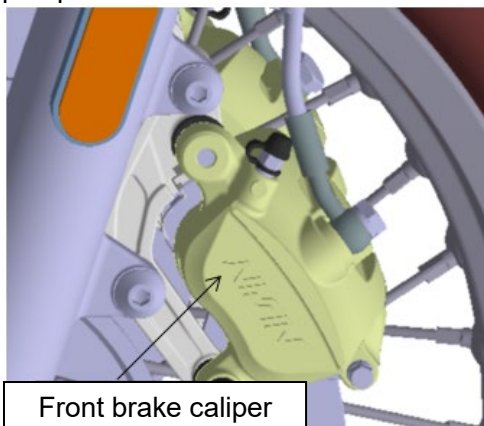


Check the level of brake liquid:

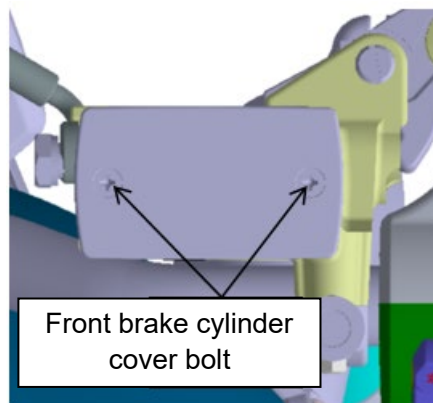
Check the level of brake liquid in the front brake cylinder. If it is under the lower mark, fill **DOT 4**.



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



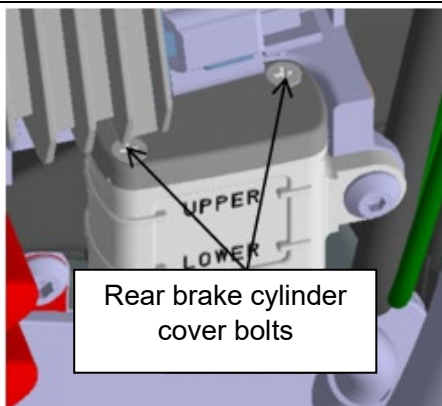
2. Open the brake cylinder cover and fill brake liquid.



If the brake liquid is feculent or there is impurity, discharge the liquid completely to refill it. Please refer to the vacuum filling method below.
If the brake liquid pot in front and rear brake cylinders are empty, exhaust air at brake caliper with a vacuum pump and fill liquid then. Please refer to the vacuum filling method below.

Vacuum filling method:

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



3. Operate the brake handle or pedal to discharge air in the brake caliper.
4. When the air is discharged completely, pump out the brake liquid and pinch the handle tightly or step the pedal to the end, then screw the exhaust bolt quickly with a torque of **7~9 N·m**.
5. Install the brake cylinder cover. The sealing washer shall be flat. Replace it if necessary.
6. Check the oil cup, hydraulic brake hose and the 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 go for a doctor.

Running System

Tire specification 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 specification and suggested pressure:


Tire specification	Front tire	Rear tire
	100/90-18 M/C(56H)	150/70R 17 M/C(69H)

Pressure of cold tire	One person		Two persons	
	Front tire	Rear tire	Front tire	Rear tire
	220kPa	220kPa	220kPa	250kPa

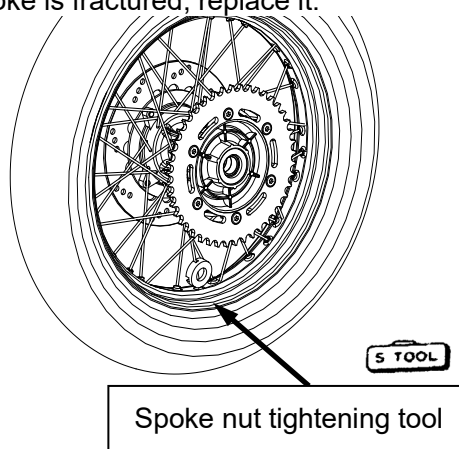
In case of under-pressure, check the tire for cut, iron nail or other sharp articles.

Spoke

Check whether the wheel spoke is loose or fractured.

Tighten the loose spoke to the required torque with spoke nut tightening tool . Torque of spoke nut is **2.45~4.9N·m**.

If the spoke is fractured, replace it.



Clutch Control Cable

Check the free play of clutch handle.
Free play of clutch handle: 10~15mm
Adjustment method:
Minor adjustment: loosen the locknut and rotate the adjusting nut to get the required free play. Then tighten the locknut.
If the free play is still unsatisfied, take down the clutch cable to adjust the end connecting engine.
Major adjustment: take down the control cable, then the clutch lever connecting engine. Rotate the lever to an appropriate angle and install it. Then install the control cable and perform minor adjustment.



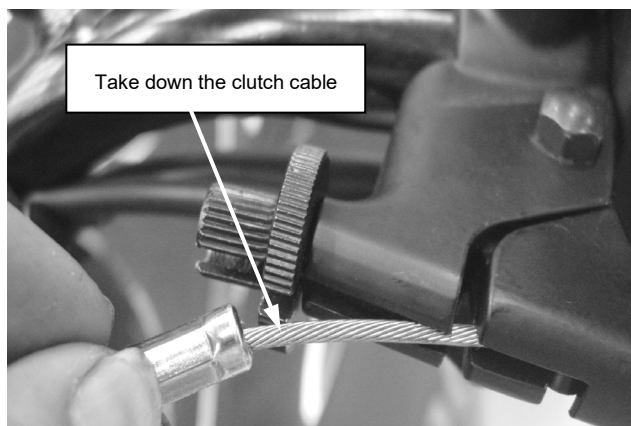
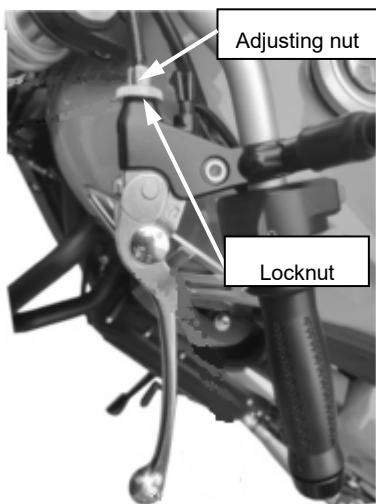
Note:

Make sure that the free play of clutch handle is appropriate! If it is too loose, the clutch discs cannot be separated; if it is too tensive, the clutch mesh is poor and the clutch may

be damaged.



Loosen the nuts and adjust the length of clutch cable



Driving Chain

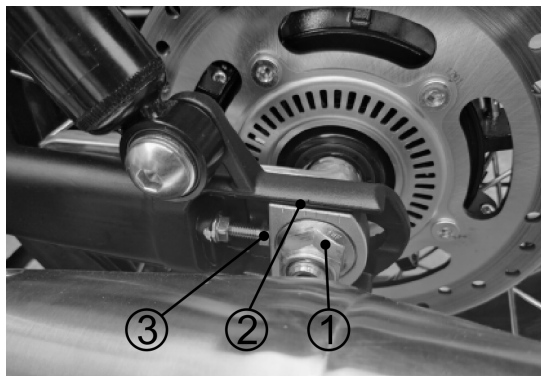
Check of driving chain relaxation

Place the motorcycle on a flat ground and put down the bracket. Keep the transmission at N gear. Check the relaxation of driving chain by pressing the chain up and down and observing the displacement of lower chain.

Vertical displacement of driving chain: **20~25mm**. If the chain is too loose or tight, adjust it.

Adjustment method:

Loosen the nut ① of rear wheel shaft and rotate the adjustable bolt ③ on the chain regulator. After reaching the required relaxation, tighten the nut of rear wheel shaft and check the rear wheel rotation and the uniformity of front and rear wheels.





Note:

The marks ② on two chain regulators shall be aligned.



Warning:

Nut of the rear wheel shaft shall be tightened. The tightening torque is 80-90N·m.

Cleaning and check of chain

Clean the driving chain with cleaning agent, remove dust and soil, dry it and check it for abrasion or fracture. In case of damage, replace the chain. Install the chain and smear special lubricant;

Check the abrasion of big and small sprocket. If the gear is abraded seriously, or there is loss or fracture, replace it.



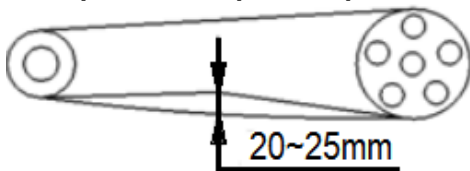
Note:

The motorcycle adopts oil-sealed chain. The cleaning agent shall not corrode the oil seal. When assembling chain, smear special lubricant.



Note:

The locking plates are not directly connected. They are riveted when assembling. The chain shall be replaced at repair shop.

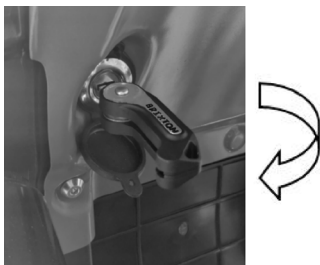


Vertical displacement

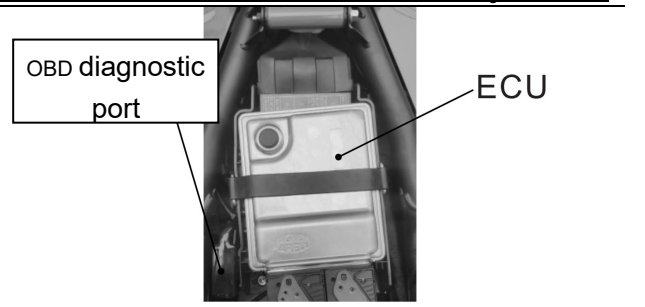
Battery

Disassembly of battery

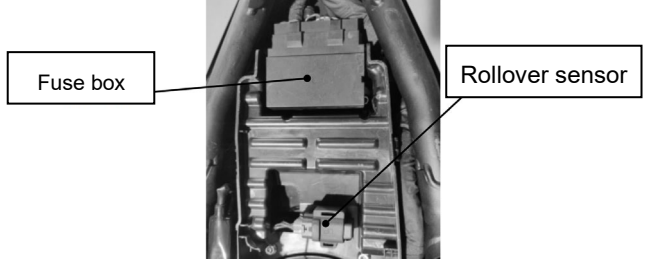
1. Park the motorcycle on the side parking rack, and unlock the seat lock to remove the seat



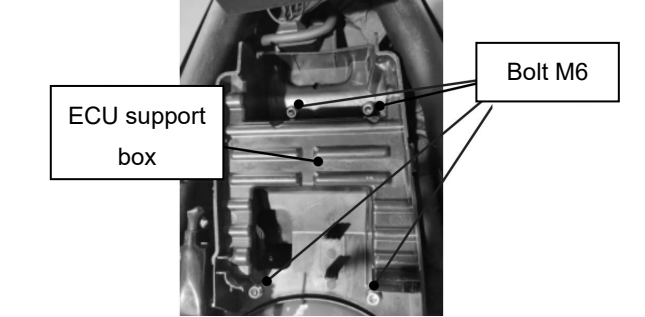
2. Remove the ECU and OBD diagnostic port



3. Remove the rollover sensor and fuse control box



4. Remove the four boss bolts M6 and remove the ECU support box



5. Remove the negative pole of the battery, then remove the positive pole of the battery to take out the battery.



Clean the electrode connections and outer surface.

Installation of battery

Install the battery in the reverse sequence. Do connect the positive electrode first.



Note:

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

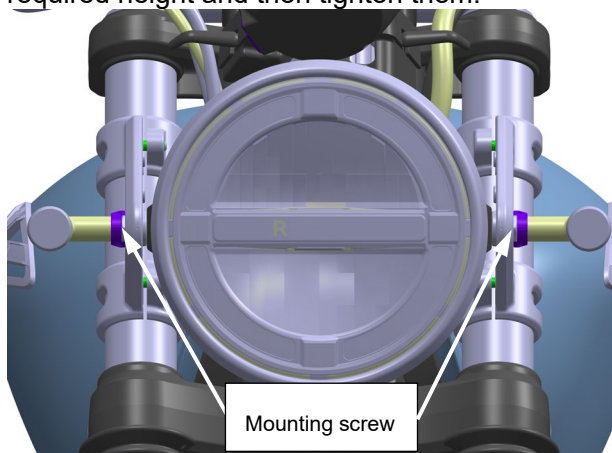
Headlight Dimming

Check the headlight direction before driving.

It can be adjusted vertically.

Adjustment method:

Use an inner hex spanner to loosen the mounting bolts of headlight; rotate the headlight up and down to bypass the limit slot. Adjust the bolts to required height and then tighten them.

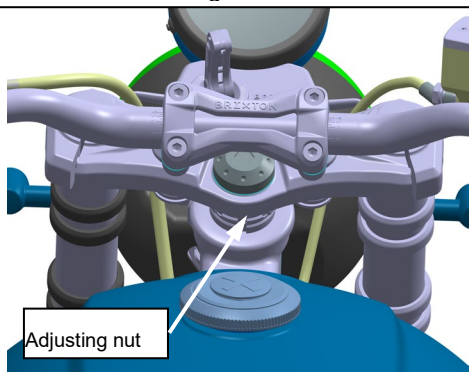


Steering Bearing of Stem

Support the motorcycle with a jack or others and make the front wheel off ground. Check the rotation of steering handle. If it cannot rotate balanced, or there is axial displacement or jam, adjust the nut of front fork stem.



The motorcycle shall be held up by a jack to keep the front wheel off the ground



Suspension System

Front suspension

Activate the front brake and press down the front fork several times to check the work of front suspension. If there is abnormal noise or click, check all fasteners and tighten them to the required torques.

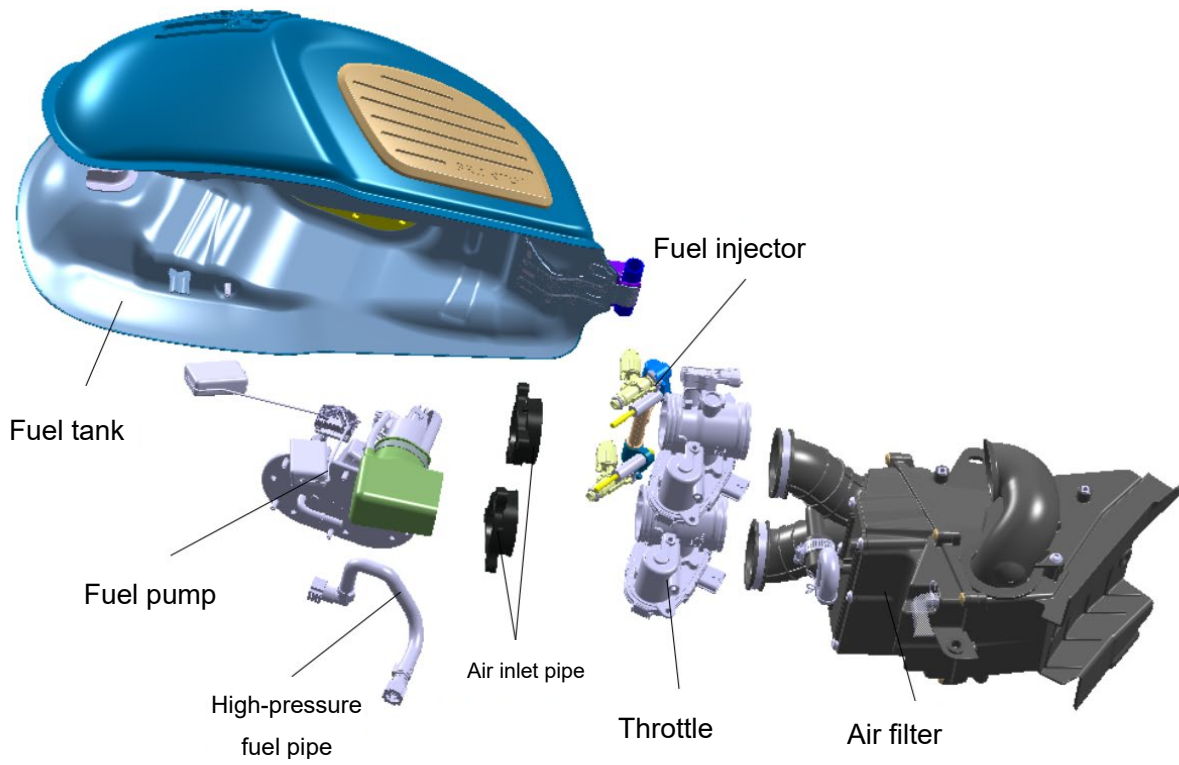
Rear suspension

Press down the rear part of seat strongly and check the rear fork shaft sleeve for abrasion or damage. In case of damage, replace it. Check the whole suspension assembly for fixture, damage and deformation.

Bolt, Nut and Fastener

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

Fuel System



4 Fuel System

Maintenance Notice	Replacement of Fuel Filter
Troubleshooting	Removal and Installation of Air Filter Element
Removal and Installation of Fuel Tank	Removal and Installation of Throttle
Disassembly and Assembly of Fuel Tank	

Maintenance Notice

This section introduces the fuel system.



Warning:

Do avoid fire during gasoline processing!

Pay attention to the installation positions of sealing elements when disassembling the components and parts of fuel system. New sealing elements shall be used during assembly.

Do not further disassemble the throttle.

Technical Specification

Opening diameter	Φ46mm equivalent
Idle speed	1000r/min±100 r/min
Free play of accelerator handle	1~2mm

Troubleshooting

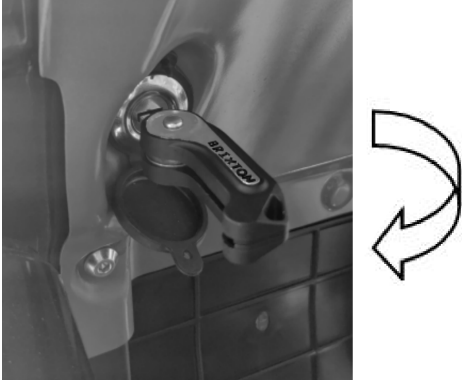
∞ **The engine can be ignited but cannot be started.**

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. There is no fuel or the fuel is insufficient; 2. Fuel in the cylinder is too much; 3. The air filter is blocked; 4. The ignition of spark plug is discontinuous; | <ol style="list-style-type: none"> 5. Fuel in the pipe is blocked; 6. Fuel quality (there is water); 7. The fuel has been stored for a long period; 8. The fuel pump is faulted; 9. The fuel injector is faulted (blocked). |
|--|--|

Removal&Installation of Fuel Tank

Disassembling steps:

1. Park the motorcycle on the side parking rack, and unlock the seat lock to remove the seat.



2. Remove the mounting bolt of fuel tank.



3. Remove the connector ① of fuel pump. Remove the fuel pipe ②. Take down the breather pipe ③ and dump valve.



③ ② ①

4. Take down the fuel tank.

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

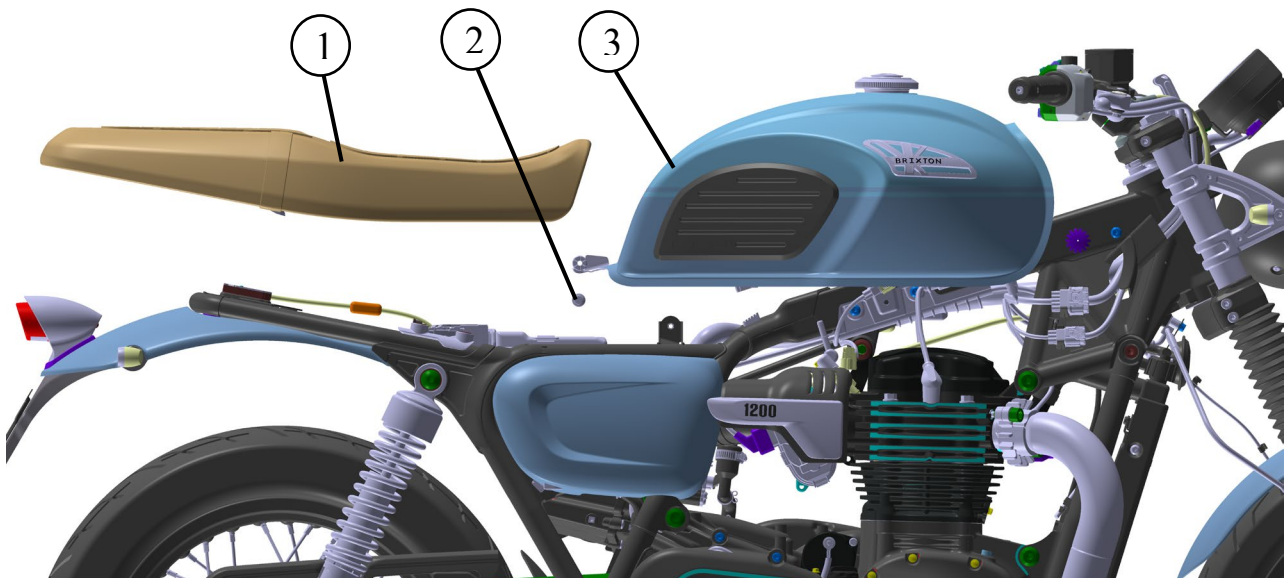
The fuel tank is not fixed. It is suggested that two persons shall work together when disassembling the fuel tank.

Installation steps:

Install the fuel tank in the reverse sequence.

Do follow the layout during installation. Avoid pollution of fuel supply pipe.

Removal/Installation of Fuel Tank

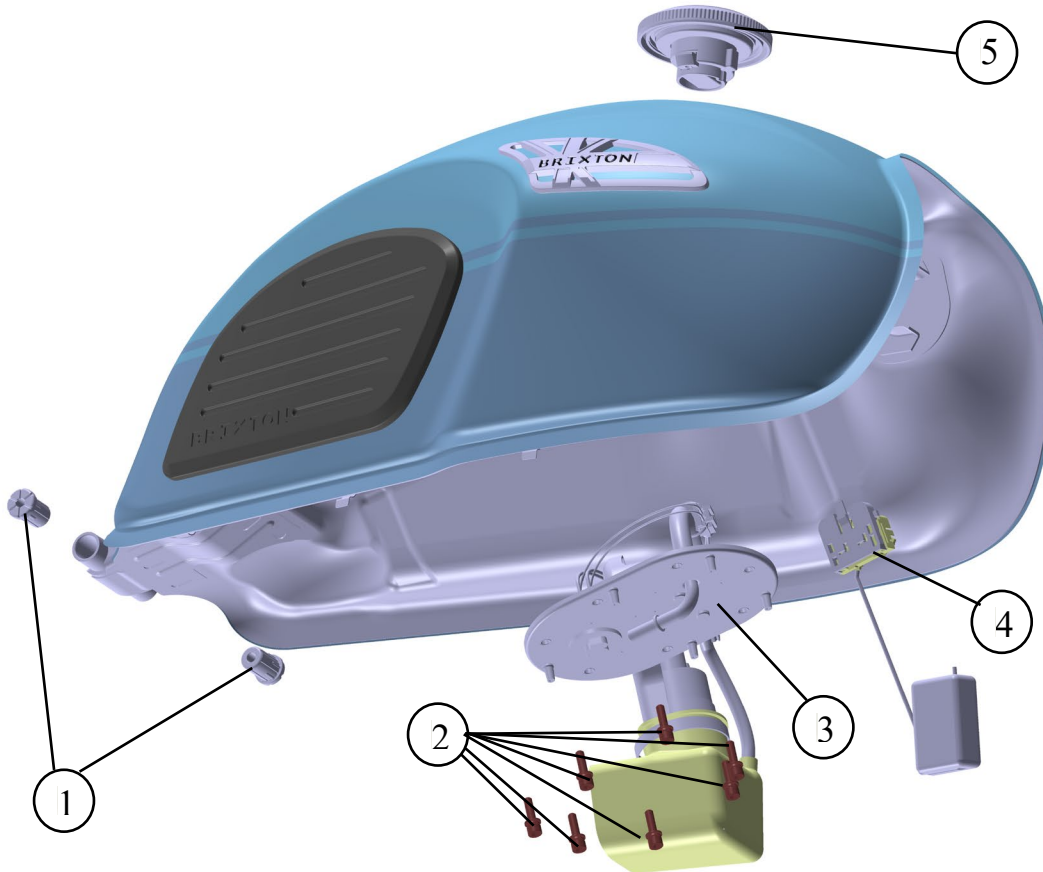


Sequence	Step	Quantity	Remark
	Disassembly sequence		The installation and disassembly are in a reverse sequence.
1	Seat	1	
2	Bolt M6×90	1	
3	Fuel tank assembly	1	
4			
5			
6			
7			

Disassembly and Assembly of Fuel Tank

Please refer to the following figure for the disassembly and assembly of fuel tank. The assembly and installation sequences are reverse during assembly,

Keep the fuel output at the front of fuel tank during assembly.



Sequence	Step	Quantity	Remark
	Disassembly sequence		The installation and disassembly are in a reverse sequence.
1	Mounting sleeve of fuel tank	2	
2	Bolt and washer assembly M5×20 8.8 S4 N	7	
3	Fuel pump component	1	
4	Fuel level sensor	1	
5	Fuel tank cover assembly	1	

Replacement of Fuel Filter

Replacement period: driving 15,000km.

Tool: straight screwdriver.

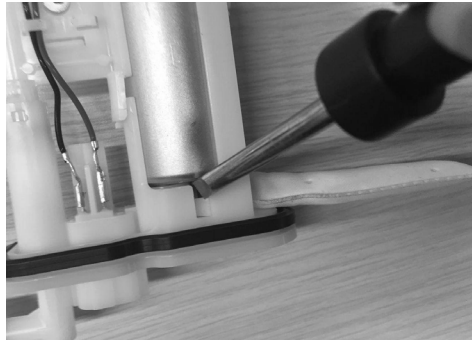


Note:

Do not pull the level sensor and float rod assembly up hard.

Disassembling steps of filter:

Press the filter clip and take out the filter.

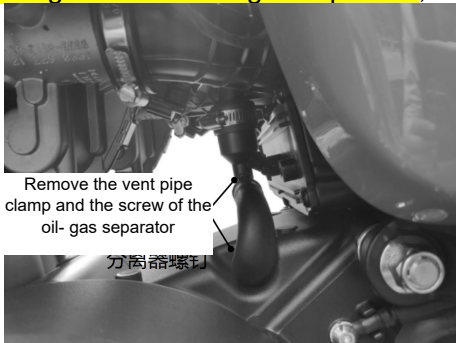


Removal and Installation of Air Filter Element

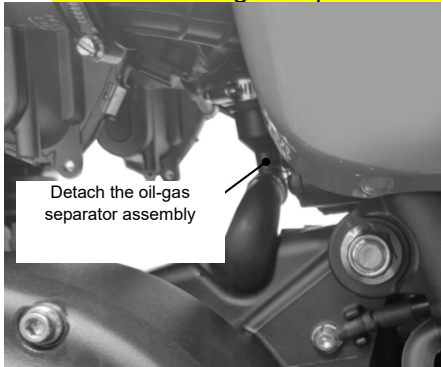
After taking out the air filter, the upper and lower parts can be disassembled. Then take out the filter element to clean or replace it.

Disassembling steps:

1. Remove the vent pipe clamp and the mounting bolt of the oil- gas separator;



2. Detach the oil-gas separator assembly;



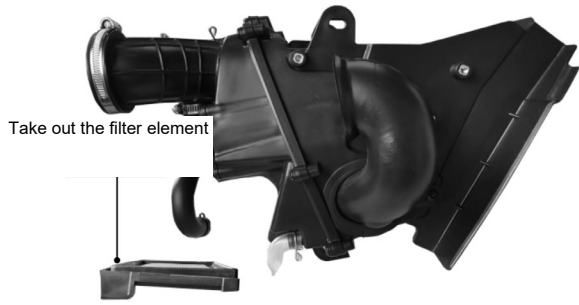
3. Take down the screws of air filter element cover;



4. Take down the filter element cover

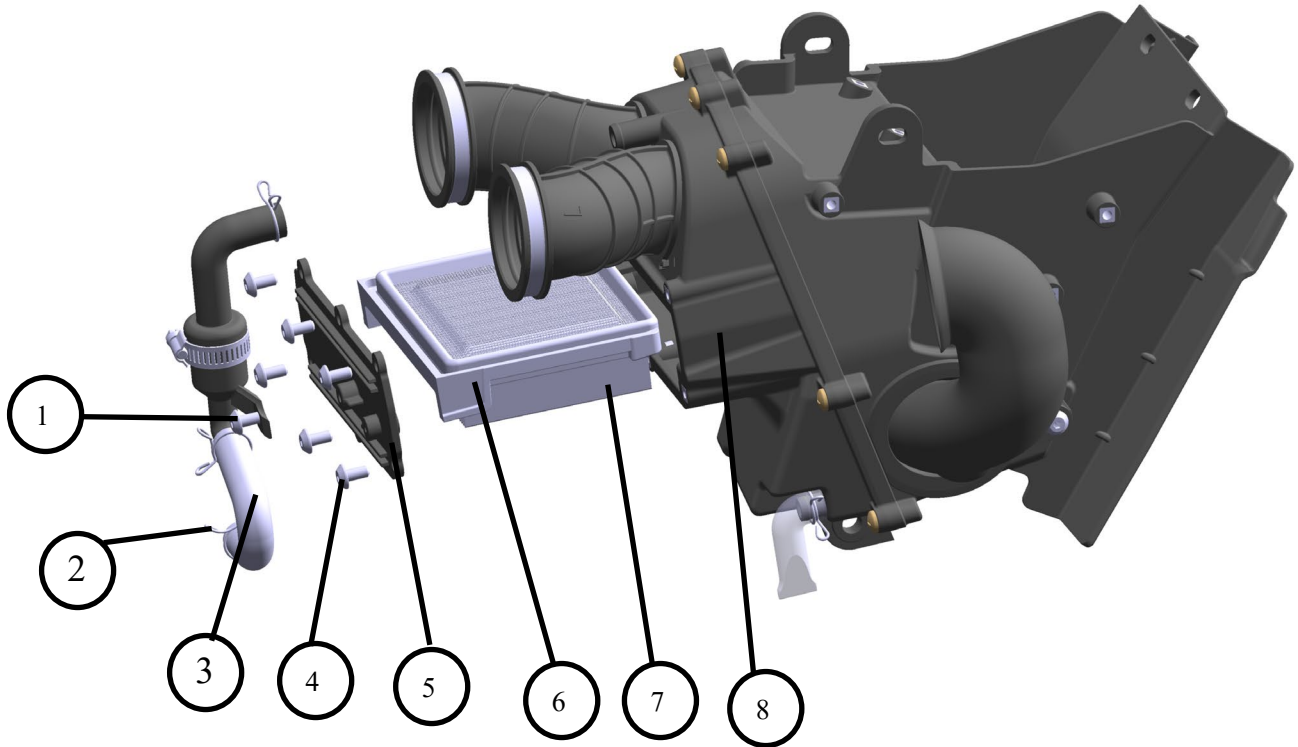


5. Take out the filter element



Removal/Installation of Air Filter Element

The installation and disassembly sequences are reverse.

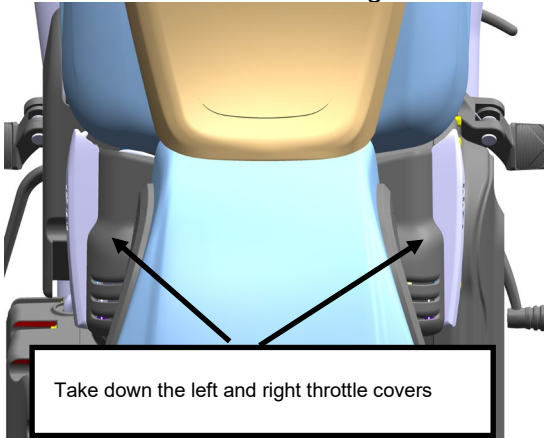


Sequence	Step	Quantity	Remark
	Disassembly sequence		The installation and disassembly are in a reverse sequence.
1	Mounting bolt of the oil-gas separator	1	
2	Clamp	3	
3	Breather pipe and oil-gas separator	1	
4	Screw of filter element cover	6	
5	Filter element cover	1	
6	Filter element support	1	
7	Filter element	1	
8	Air filter body	1	

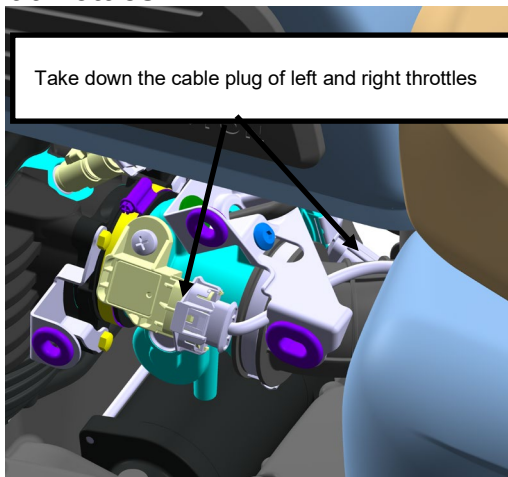
Removal and Installation of Throttle

Disassembly sequence

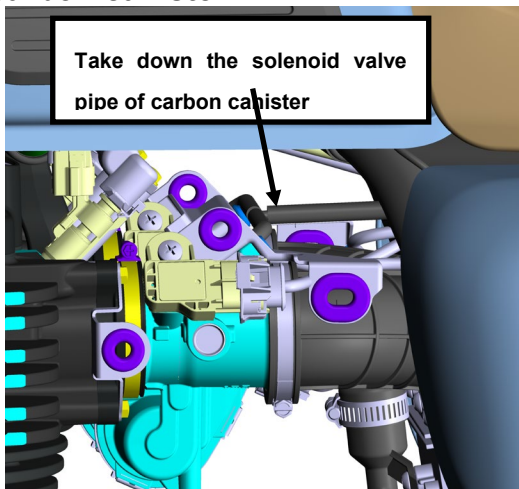
1. Take down the left and right throttle covers



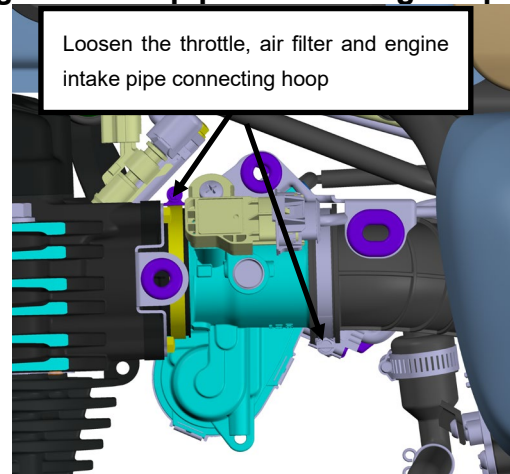
2. Take down the cable plug of left and right throttles



3. Take down the solenoid valve pipe of carbon canister



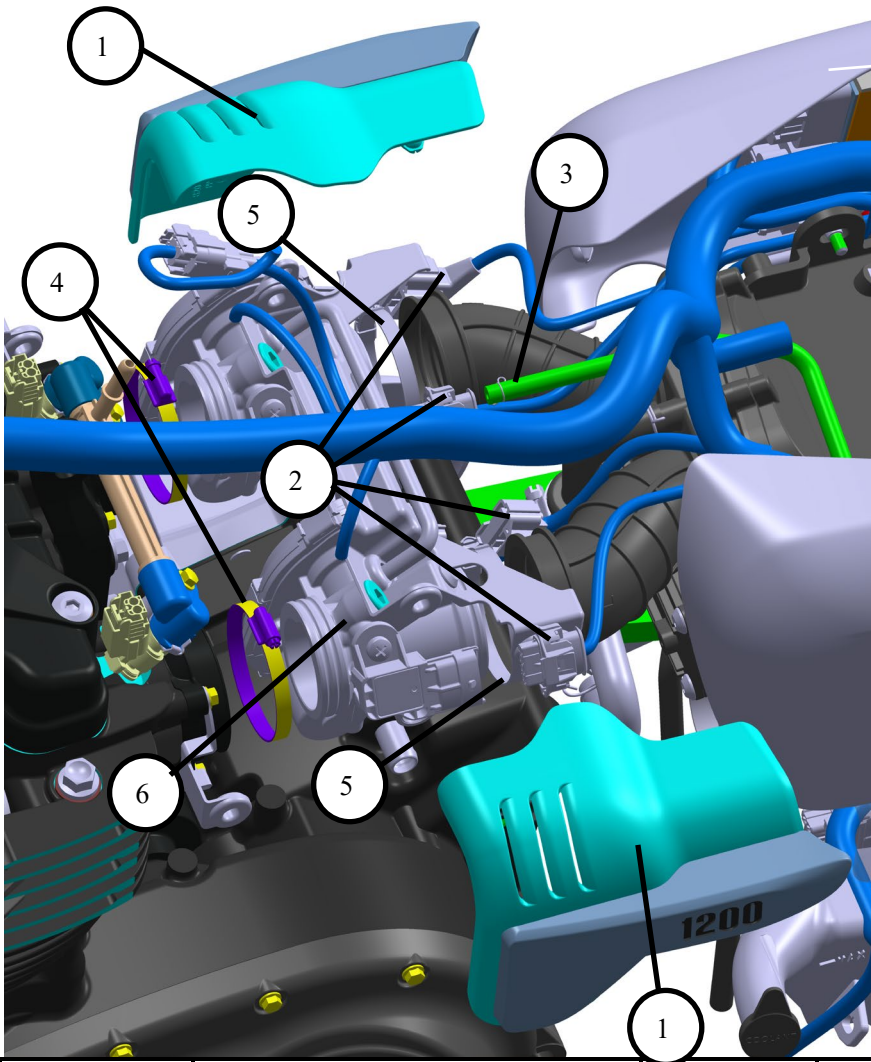
4. Loosen the throttle, air filter and engine intake pipe connecting hoop



5. Take down throttle

Installation steps:

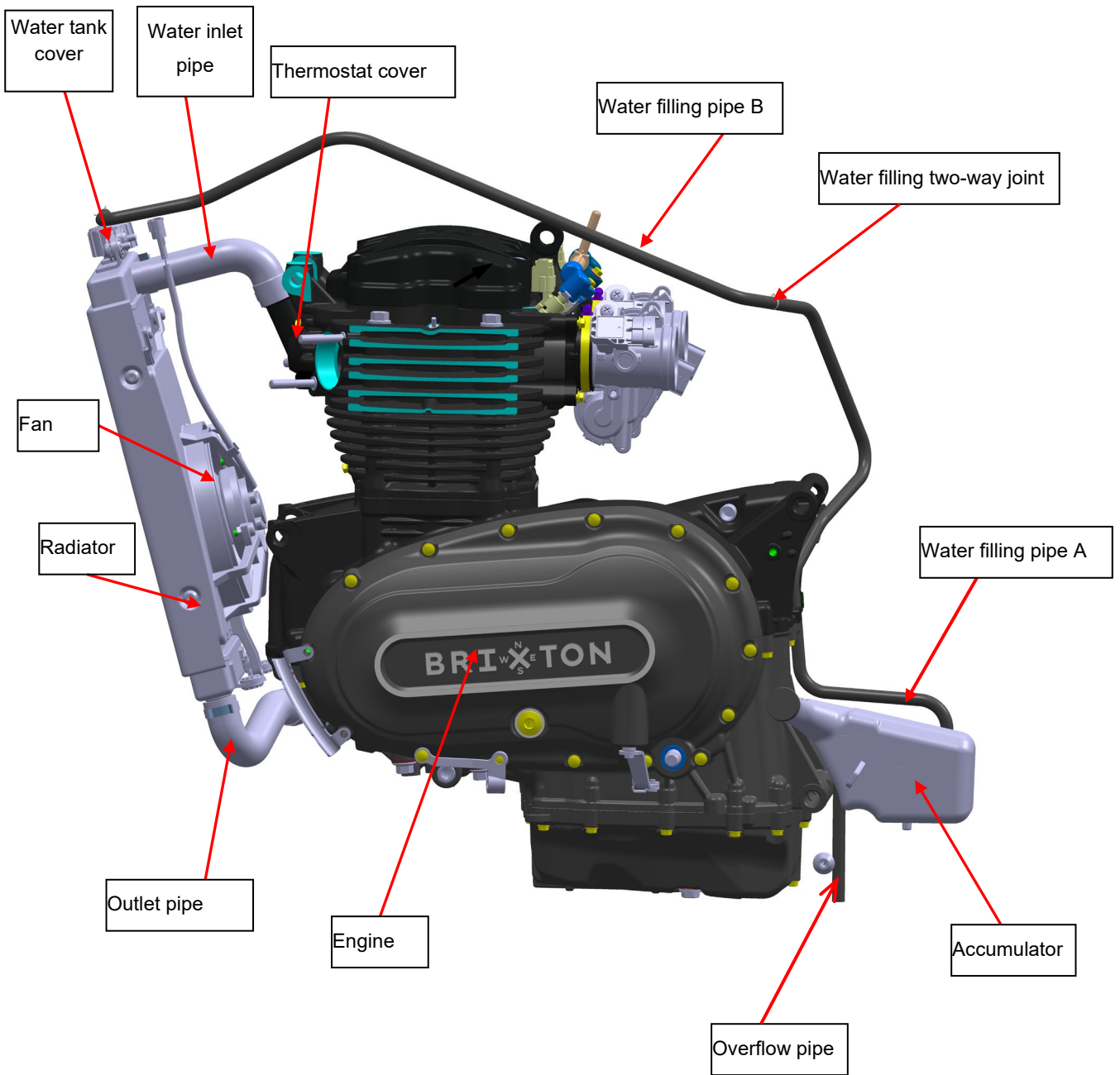
The installation and disassembly sequences are reverse.



Sequence	Step	Quantity	Remark
	Disassembly sequence		The installation and disassembly are in a reverse sequence.
1	Remove throttle left and right covers assembly	1 time/each	
2	Remove throttle cable plug	4	
3	Take down the solenoid valve pipe of carbon canister	1	
4	Loosen the throttle and engine intake pipe connecting hoop	2	
5	Loosen the throttle and air filter connecting hoop	2	
6	Take down the throttle	2	

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

Cooling System



5 Cooling System

Maintenance Notice	Oil-water pump
Troubleshooting	Thermostat
Performance Inspection	Cooling and Electrical System
Radiator	

Maintenance Notice

The maintenance shall be carried out at an environment with low temperature.

The maintenance shall be carried out on the vehicle.

Coolant is refilled through the fluid pot. The radiator cover can only be disassembled when refilling coolant after the cooling system is disassembled or the radiator is taken out.

Before inspection and maintenance, check all joints and sealing parts with a radiator detector for water leakage.



Warning:

When the coolant temperature is above 100°C, if the radiator cover is open, pressure decrease will cause boiling. Do not open the cover in this case.



Note:

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

Maintenance criteria

Item	Standard value	Limit
Buffering pressure of radiator cover	108KPa	108-133KPa
Open temperature of thermostat	Initially open	88°C
	Fully open	About 100°C
	Fully open (100°C)	8mm
Boiling temperature of coolant (Mixing ratio 50%)	Atmospheric pressure	107.7°C
	108kPa pressed	125.6°C
Coolant capacity	1.5L	/

Mixing ratio of coolant

The lowest temperature	Mixing ratio	Antifreeze (ml)	Pure water (ml)
-9°C	20%	300	1200
-16°C	30%	450	1050
-25°C	40%	600	900
<u>-37°C</u>	<u>50%</u>	<u>750</u>	<u>750</u>
-44.5°C	55%	825	675

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

Please fill coolant as required by Gaokin.

Do not mix with other coolants.

The coolant is toxic and cannot drink.

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 switch of fan is in poor contact;
2. The radiator cover is faulted;
3. The thermostat is faulted;
4. The coolant volume is insufficient;
5. The water pipe or sleeve is blocked;
6. The radiator blades are blocked;
7. The radiator is blocked;
8. The oil-water pump is faulted;
9. The cable circuit is short.

☞ **No or little temperature rise**

1. The switch of fan is in poor contact;
2. The thermostat is faulted;
3. The cable circuit is short.

☞ **There is water leakage**

1. Mechanical sealing is not good;
2. The O-ring is degraded or in poor contact;
3. The water pipe is damaged or degraded.

Performance Inspection

Check of radiator cover



Warning:

Open the cover after the coolant is completely cooled.

Install the radiator cover on the detector to raise the pump pressure. If the pressure can be maintained within the required scope for 6 seconds, you can open the cover.



Note:

Apply water on the sealing surface when installing cover on the detector.

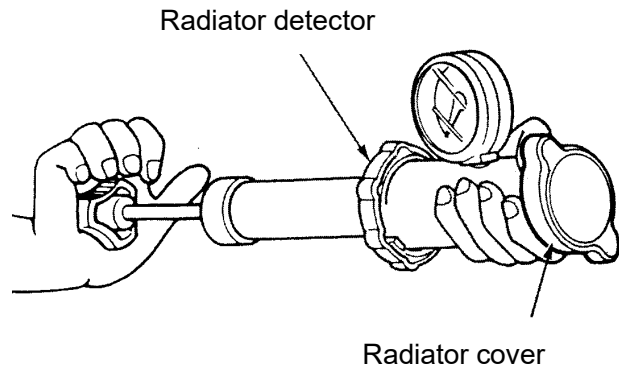
Open pressure of radiator cover valve: 108-133KPa.

Check of radiator pressurization

Install the radiator detector on the radiator to raise the pump pressure. Check that whether the pressure can be maintained with the required scope for 6 seconds or not.

Stipulated pressure: 111.4-136.4KPa.

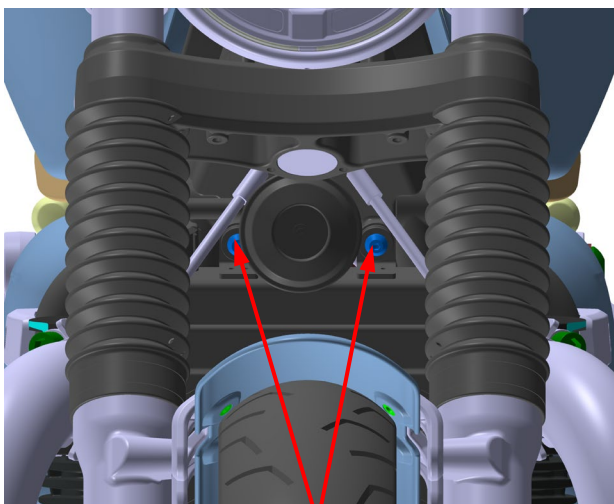
Check if any leakage on the water pipe and joints. Do not over-pressurize or the radiator and the joints may be damaged.



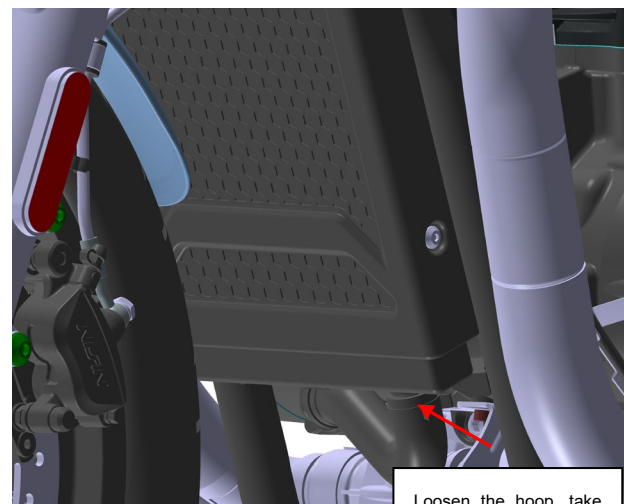
Radiator

Disassembly of radiator

1. Place the motorcycle on a flat ground and disassemble the radiator fixing bolts.
2. Loosen the hoop, take out water outlet pipe and discharge the coolant.

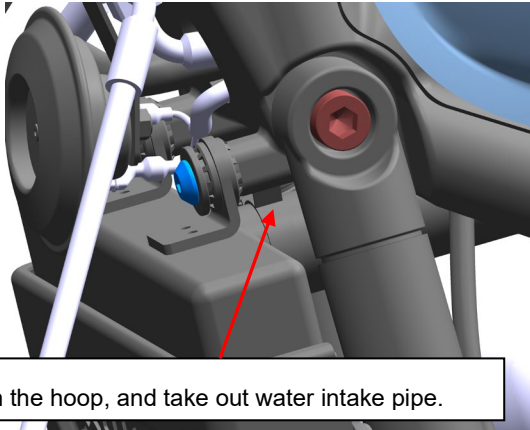


Remove the radiator fixing bolts



3. Loosen the hoop, and take out water intake pipe.

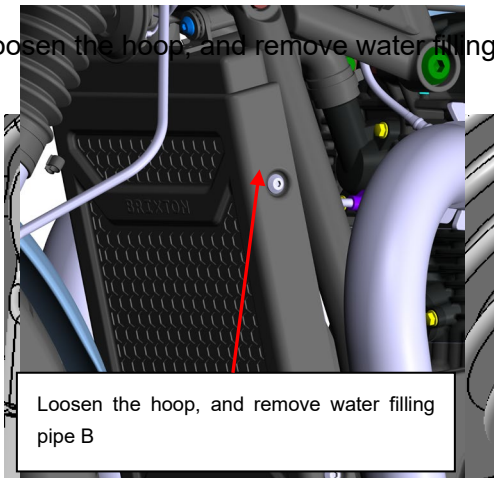
Loosen the hoop, take out water outlet pipe and discharge the coolant.



Loosen the hoop, and take out water intake pipe.

6. Take down the radiator in the direction shown by the arrow.

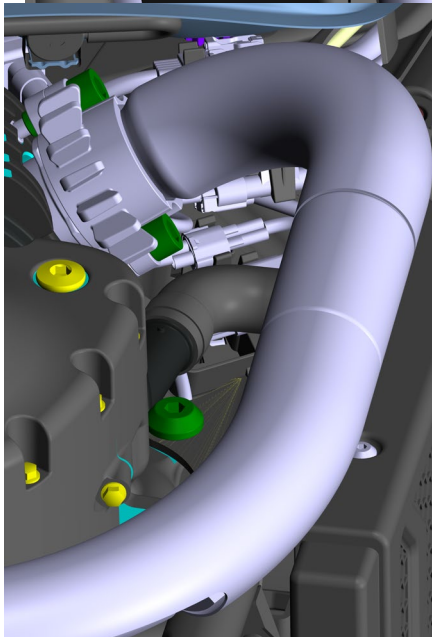
4. Loosen the hoop, and remove water filling pipe B.



Loosen the hoop, and remove water filling pipe B

Take down the radiator in the direction shown by the arrow.

5. Remove the connector of fan power line.

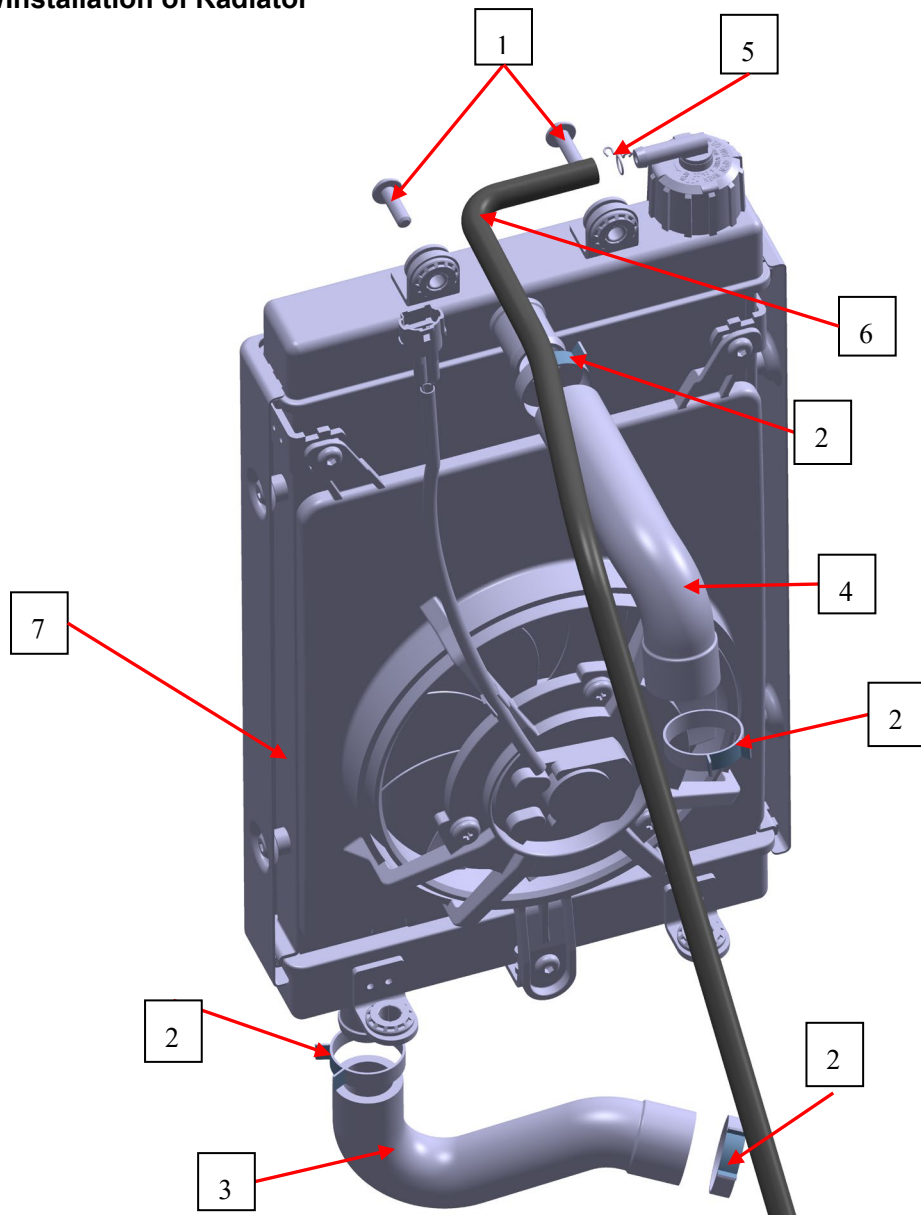


Power line of fan

Installation of radiator

The installation is reverse to the disassembly sequence. Do not damage the blade. Fill coolant after installation and check the joints for leakage

Removal/Installation of Radiator

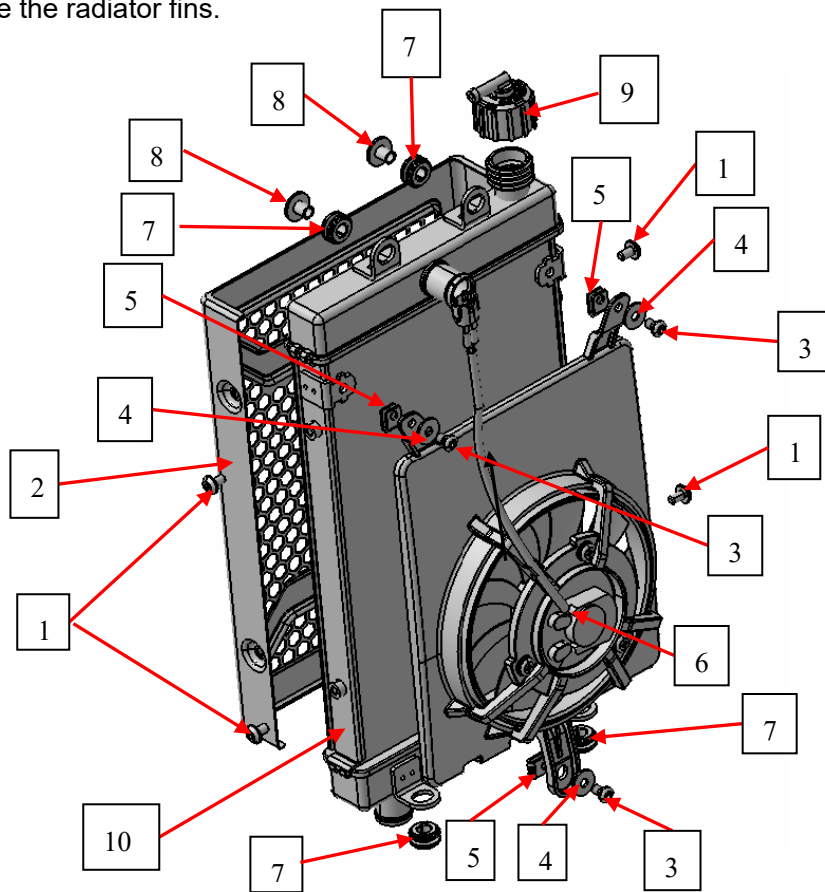


Sequence	Step	Quantity	Remark
	Disassembly sequence		The installation and disassembly are in a reverse sequence.
1	Bolt M6×20	2	Mounting torque 10N·m
2	Hoop 32	4	
3	Outlet pipe	1	
4	Water inlet pipe	1	
5	Clip 9.5	1	
6	Water filling pipe B	1	
7	Radiator component	1	

Disassembly/assembly of radiator components

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

Do not damage the radiator fins.



Sequence	Step	Quantity	Remark
	Disassembly sequence		The assembly and disassembly are in a reverse sequence.
1	Bolt M6×10	4	
2	Radiator front cover	1	
3	Bolt M6×12	3	
4	Washer 6	3	
5	U-shaped nut clamp	3	
6	Fan component	1	
7	Shock pad	4	
8	Bushing	2	
9	Water tank cover	1	
10	Radiator body assembly	1	

Oil-water Pump

If the oil oil-water pump is faulted, take it down for repair or replacement.

The following contents are included:

Disassembling steps and diagram of oil-water pump;

Installation steps of oil-water pump;

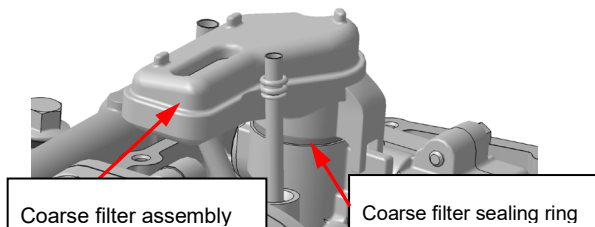
Disassembly and assembly of oil-water pump, and so on.

Note: Oil pump and water pump are an assembly, and they cannot be disassembled.

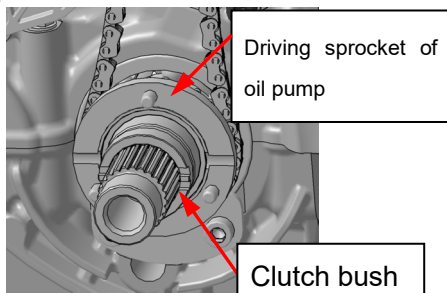
Disassembling steps and diagram of oil-water pump:

- Discharge coolant.
- Drain engine oil.
- Remove oil pan.
- Dismantle clutch.

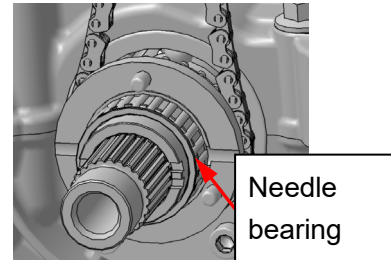
1. Take down coarse filter assembly.
2. Take down coarse filter assembly sealing ring and discard it.



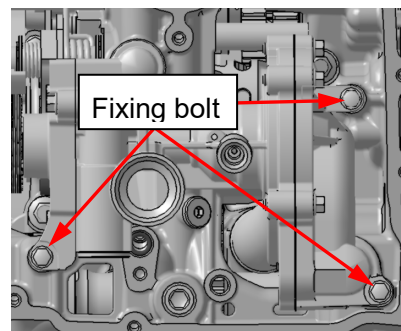
3. Move the driving sprocket of oil pump, and take out roller bearing.



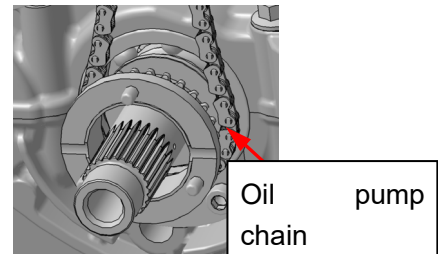
4. Support the driving sprocket of oil pump, carefully remove clutch bush and needle bearing, and pay attention to their direction.



5. Take down and replace the fixing bolts of oil-water pump.

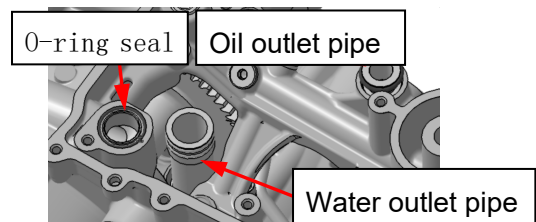


6. Remove the chain from the driving sprocket of oil pump.



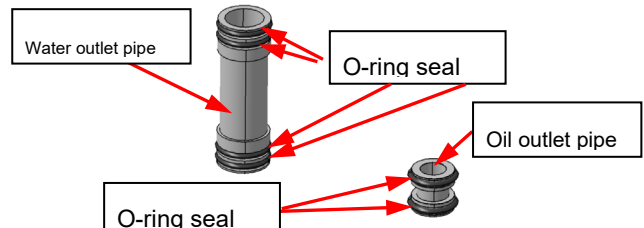
7. Carefully remove oil-water pump from the body.
Note: The O-ring seal between oil-water pump and the body may fall from.

8. Remove water outlet pipe and oil outlet pipe from the body.

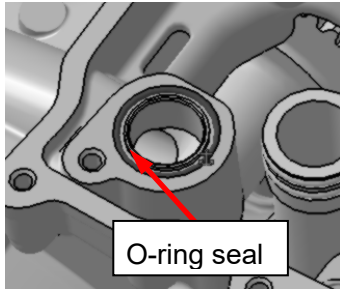


9. Remove and replace four O-ring seals from the water

outlet pipe, and then remove and replace two O-ring seals from oil outlet pipe.

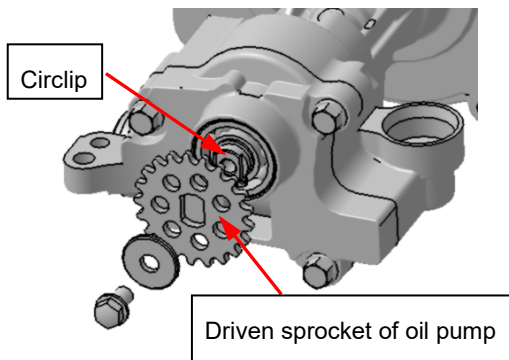


10. Remove and discard the O-ring seal from the body.

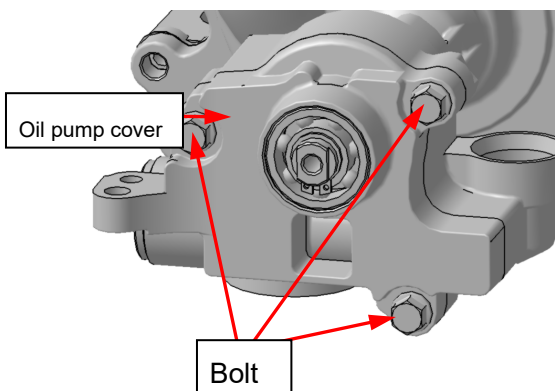


Disassembly of oil pump:

1. Take down the driven sprocket of oil pump from the oil pump shaft.



2. Take down the circlip on the oil pump shaft, and 3 fixing bolts on oil pump cover, and open the oil pump cover.

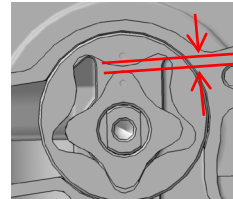


Check of oil pump:

1. Check the sprocket and chain. In case of any wear or damage, replace it.
2. Check the sides and ends of oil pump shaft and

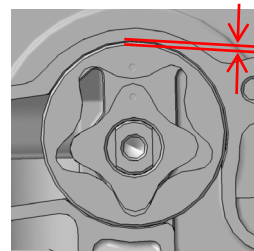
bearing. In case of any obvious wear, replace the pump.

3. Check if there is any leakage from oil pump ends and oil seal. In case of any obvious leakage, replace the pump.
4. Check the clearance between rotor tips in oil pump.



Standard value: 0.15mm
Limit value: 0.20mm

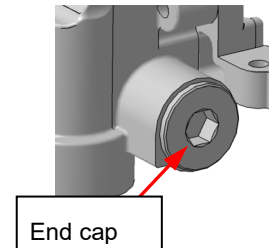
5. Check the clearance between oil pump outer rotor and oil pump body.



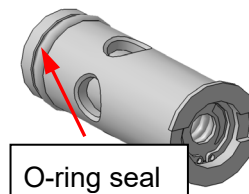
Standard value: 0.15-0.24mm
Limit value: 0.37mm

Removal of oil pressure relief valve:

1. Remove the end cap.



2. Take down the pressure relief valve from the oil pump body.
3. Remove and replace the O-ring seal from the pressure relief valve.



Installation of oil pressure relief valve:

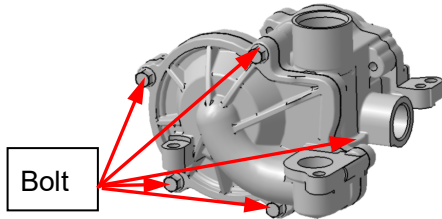
The installation and disassembly sequences are reverse.

Installation of oil-water pump:

The installation and disassembly sequences are reverse.

Disassembly of Water Pump:

Take down 5 bolts of water pump cover.

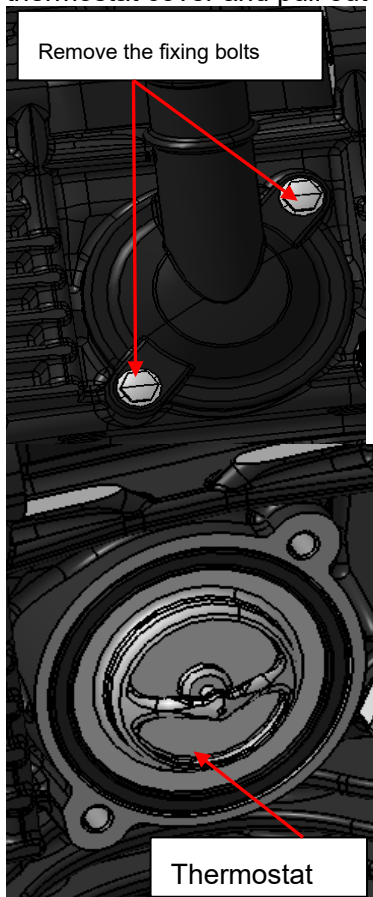


Check of water pump:

1. Take down water pump cover to check if there is any corrosion and incrustation around impeller and in the

Disassembly and installation of thermostat

Use a tool to loosen the fixing bolts. Remove the thermostat cover and pull out the thermostat.



Install it in the reverse sequence.

water pump. In case of any obvious leakage, replace the pump.

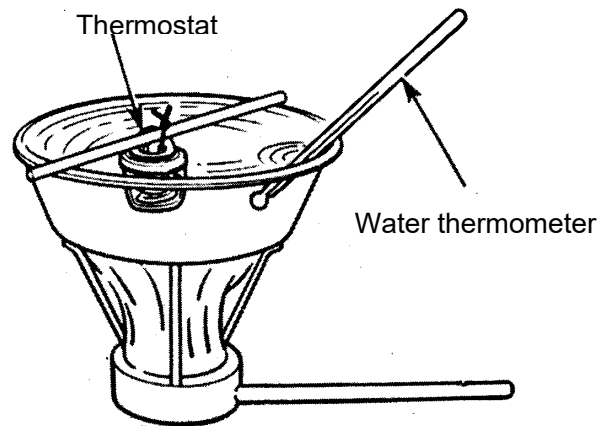
2. Check the sides and ends of water pump shaft and bearing. In case of any obvious wear, replace the pump.

3. Check if there is any leakage from water pump ends and water seal. In case of any obvious leakage, replace the pump.

Thermostat

Check of thermostat

Put the thermostat in the detector container, then raise the water temperature and check the open temperature.



Specification

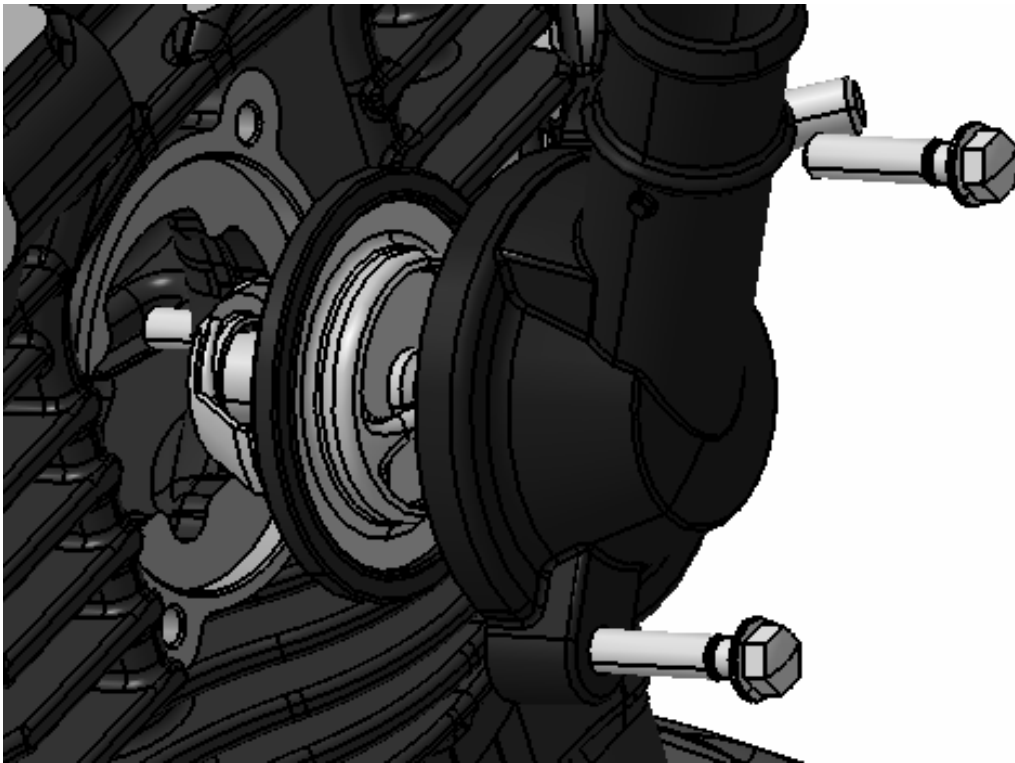
Temperature upon initially open	88°C
Temperature upon fully open	Below 100°C
Fully open degree	8mm



Notes:

The thermostat cannot contact the container.

If the thermostat opens under the room temperature, it shall be replaced.



The open degree shall be detected after the temperature reaches about 100°C for about 5 minutes.

Disassembly/Installation of Thermostat

Sequence	Step	Quantity	Remark
	Disassembly sequence		The installation and disassembly are in a reverse sequence.
1	Bolt M6×25	2	
2	Thermostat cover	1	
3	Thermostat	1	

3

2

1

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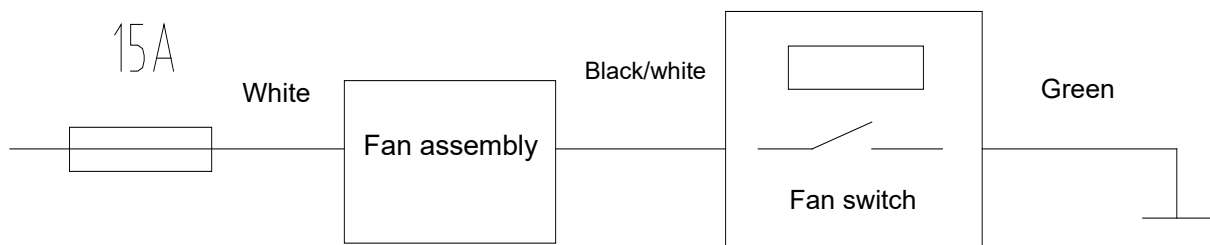
Cooling and Electrical System

Overview

- When the engine temperature reaches a limit, the coolant will circulate through the radiator. When the temperature continues to raise, the radiator fan will be activated through ECU control. The engine hot will dissipate. After the water temperature falls to setting temperature, the fan will be turned off.

Electric schematic diagram

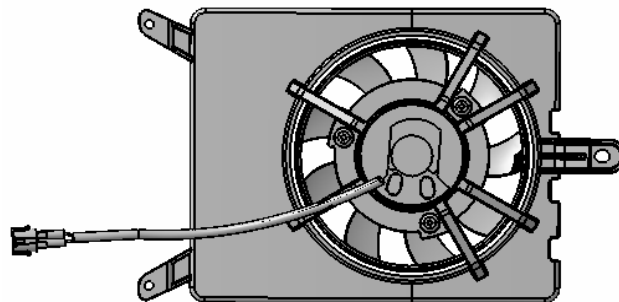
Electric schematic diagram



Introduction to main components and parts

- Fan components

1. Outside view



2. Working principle

The fan components consist of motor, blades and bracket. The cooling fan of radiator is normally axial

fan. Blades are at the air inlet while motor is at the air outlet. The air directions at inlet and outlet are the same. The 12V DC motor is normally used. The blades rotate after motor starts, which causes air circulation, and dissipates heat caused by radiator.

3. Basic parameters

Air output volume of fan $\geq 500\text{m}^3/\text{h}$;

Motor speed (4500 ± 400) r/min;

Rated working current $\leq 4\text{A}$;

Rotation direction of fan: From the view of output shaft, the fan rotates clockwise.

4. Fault mode

The circuit of fan motor is open;

The circuit of fan motor is short;

The blades contact with the bracket during running which causes large noise;

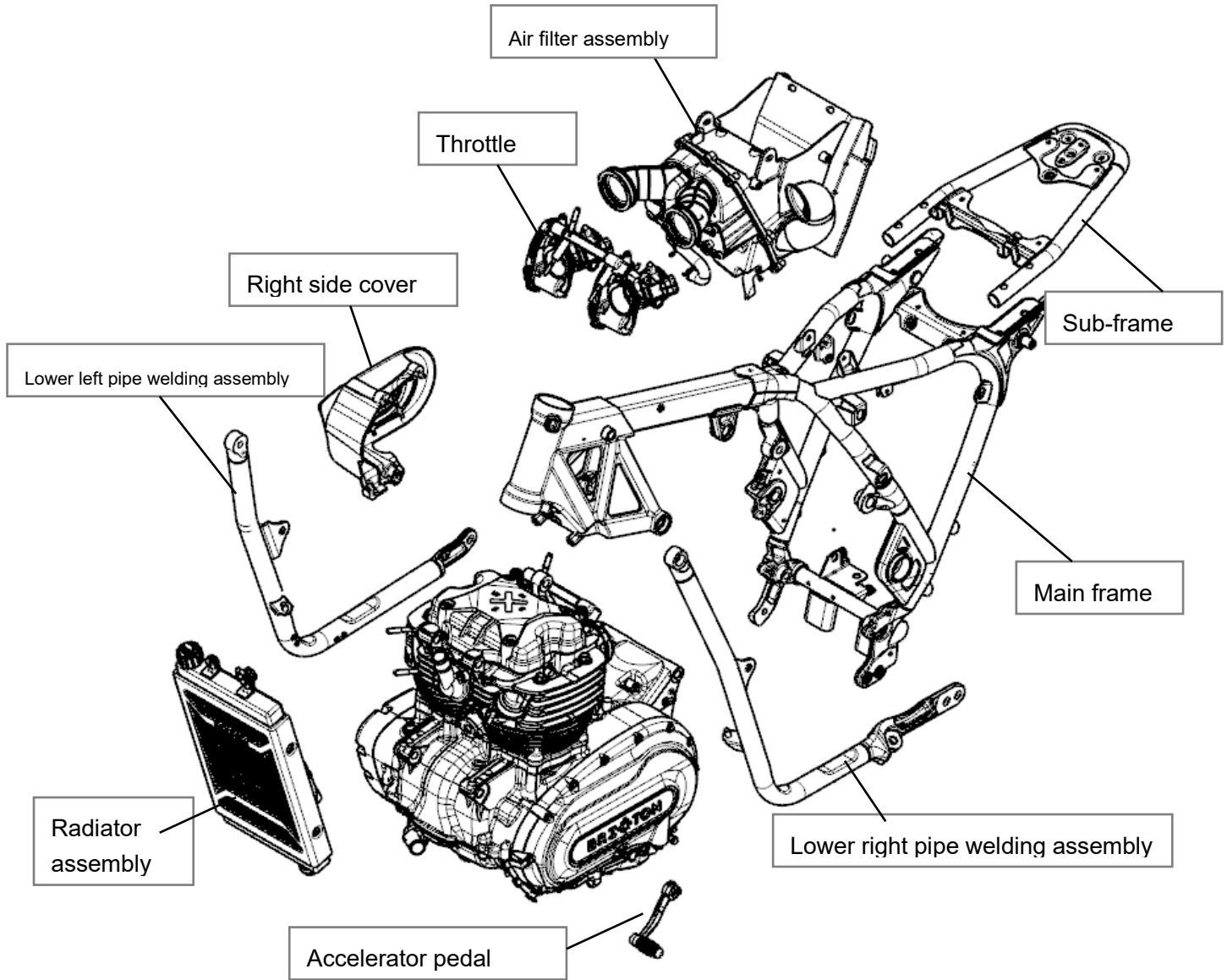
The connecting between blade and motor shaft is slippery;

The bracket is fractured.

Diagnosis of major faults

Fault	Possible cause	Solution
Water thermometer alarms but the fan do not work	The circuit is open; The circuit of fan switch is open; The fan motor is invalid; The blades are stuck or slippery.	Connect the circuit; Replace the fan switch; Replace the fan motor; Check and repair.
The fan is normally on	The circuit is short; The circuit of fan switch is open;	Repair the circuit; Replace the fan switch;
There is large noise during fan running	The blades contact with the bracket; The blades are loose or fractured; The bracket is fractured.	Check and repair; Tighten them or replace them; Replace the bracket.

6 Engine Disassembly and Installation



Engine Disassembly and Installation

Maintenance Notice

Engine Installation

Engine Disassembly

Maintenance Notice

Only disassemble engine when maintaining its crankshaft, balance shaft and transmission part. In other cases, there is no need to disassemble engine.

Before disassembly, place the motorcycle on a flat ground with the side bracket supported. Discharge the water coolant and engine lubricant completely.

To maintain the cylinder head, cylinder, piston and other parts of heat engine, the cover, oil tank, radiator, throttle and others shall be disassembled.

The installation and disassembly are in a reverse sequence.

After maintenance, all wires shall be arranged in line with the wiring diagram and the straps shall be replaced.

Specification

Net weight of engine	87kg
Oil capacity of engine	3.2L
Capacity of water coolant	1.5L

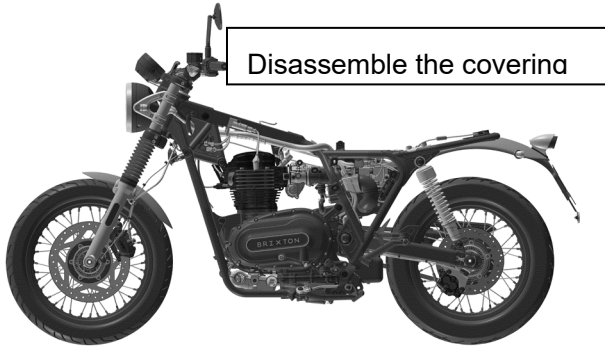
Key torques

Engine Suspension Bolt **M12: 70~85N·m**

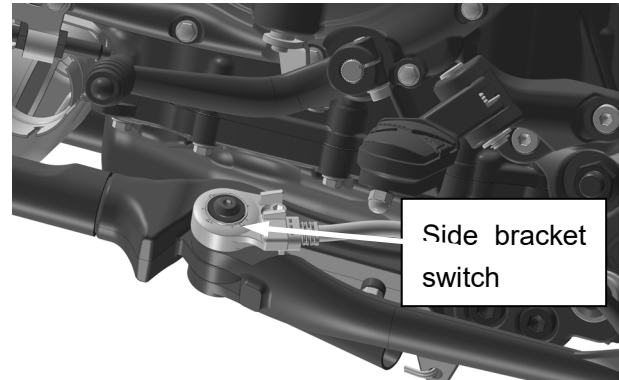
Engine Disassembly

Place the motorcycle on a flat ground. Discharge the water coolant and engine lubricant completely.

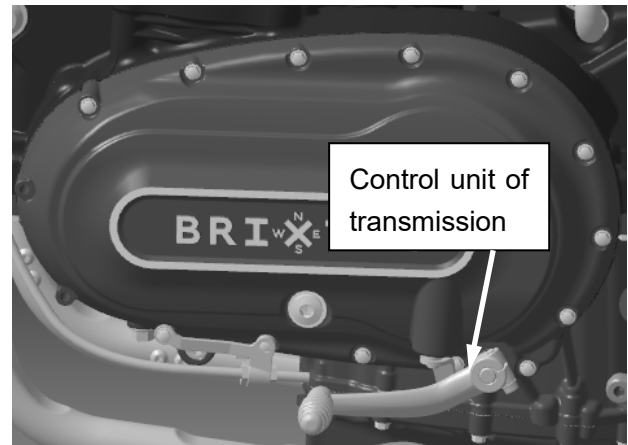
Disassemble the cover, fuel tank, silencer and radiator (please refer to the related contents).



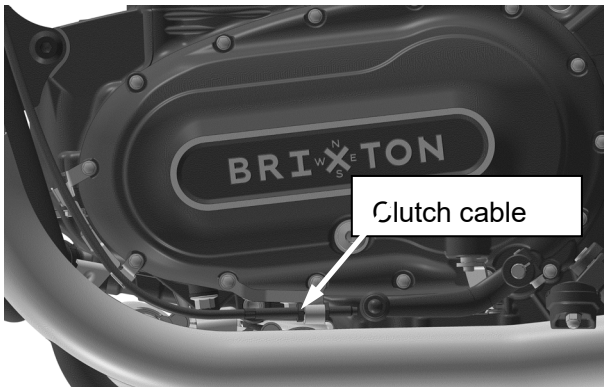
Remove side bracket switch.



Disassemble the control unit of transmission.

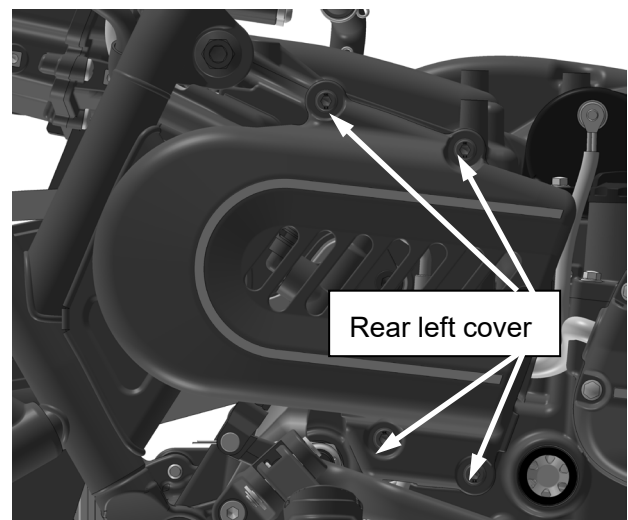
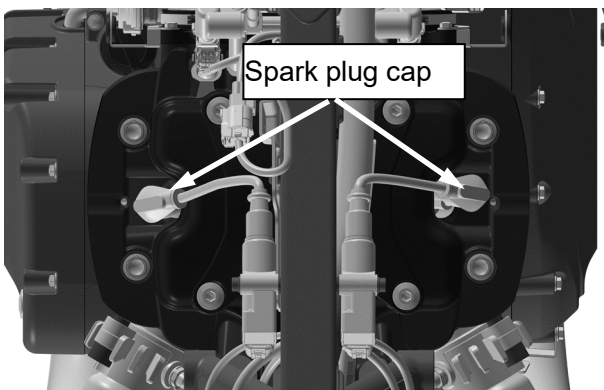


Disassemble the clutch cable

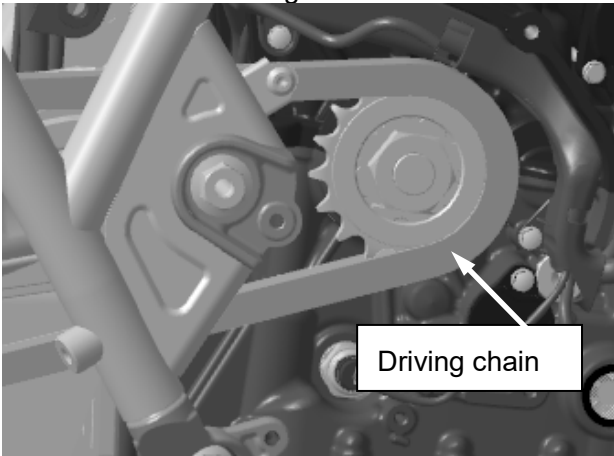


Disassemble the rear left cover.

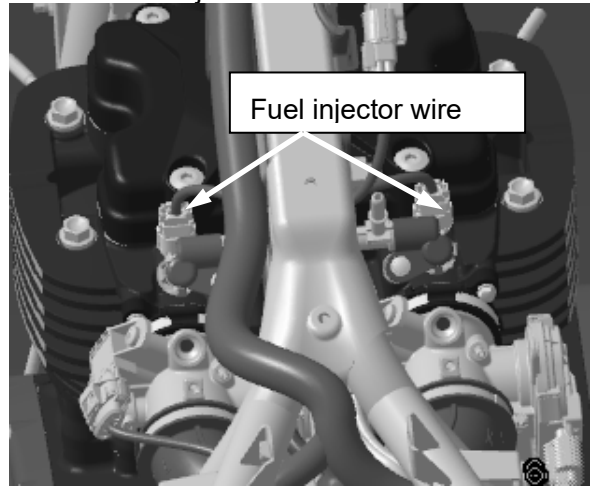
Disassemble the spark plug cap



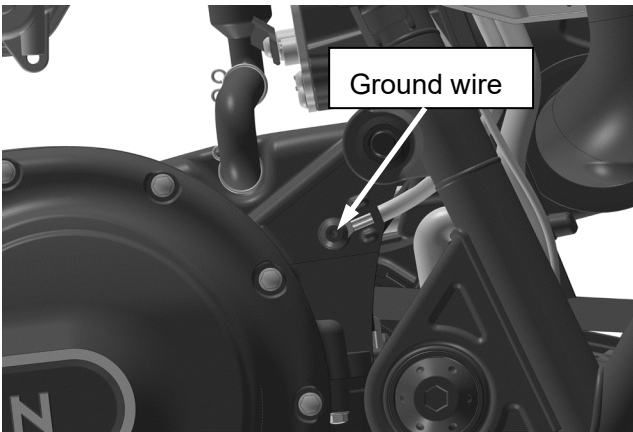
Disassemble the driving chain.



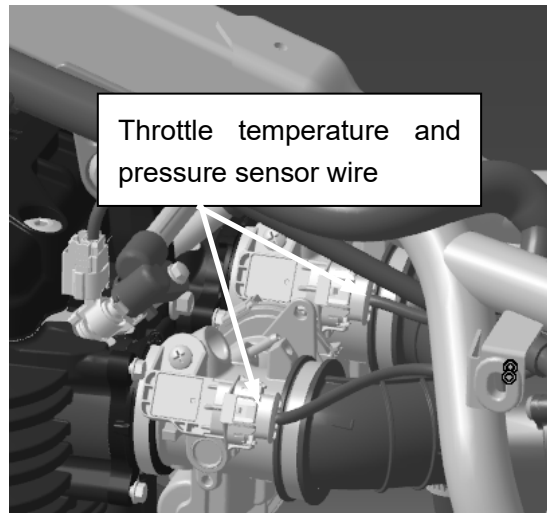
Remove fuel injector wire



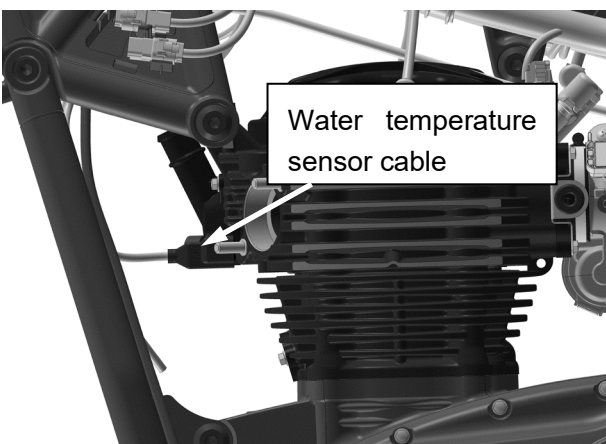
Remove the ground wire



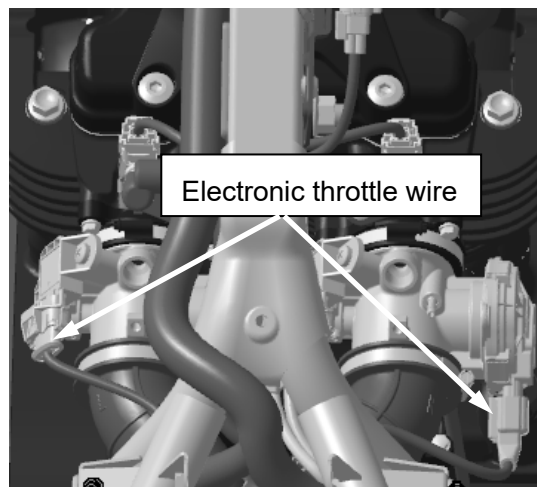
Remove throttle temperature and pressure sensor wire



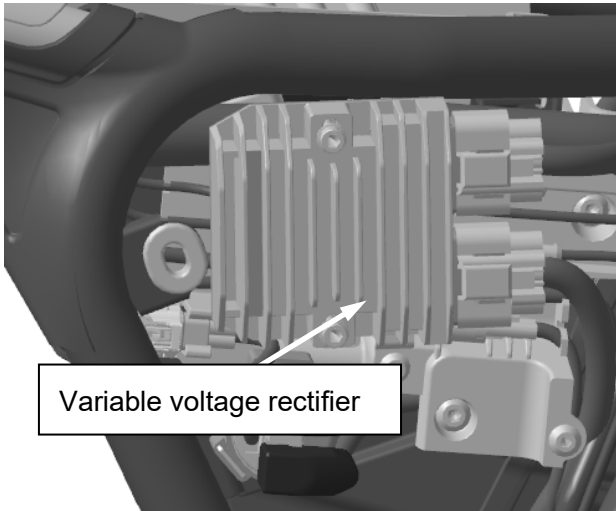
Disassemble the cable of water temperature sensor.



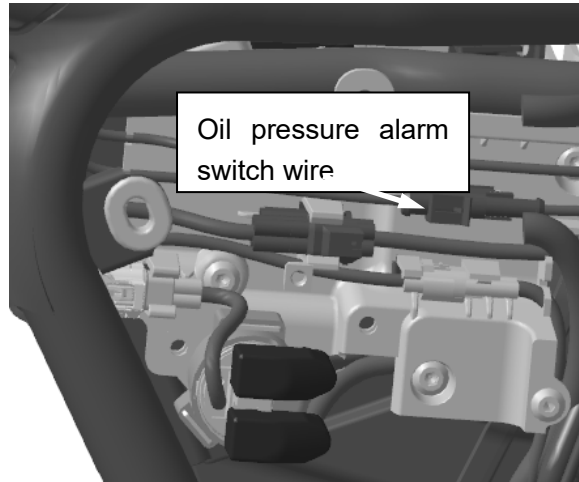
Remove electronic throttle wire



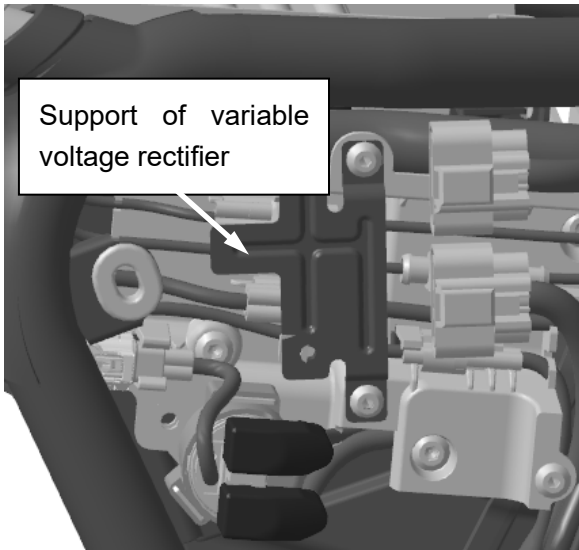
Remove variable voltage rectifier



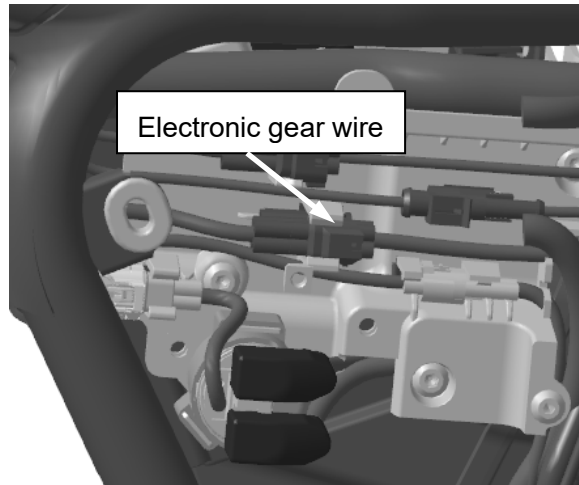
Remove oil pressure alarm switch wire



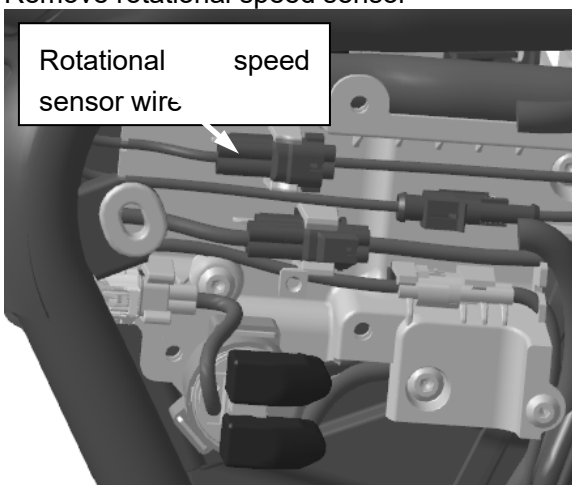
Remove the support of variable voltage rectifier



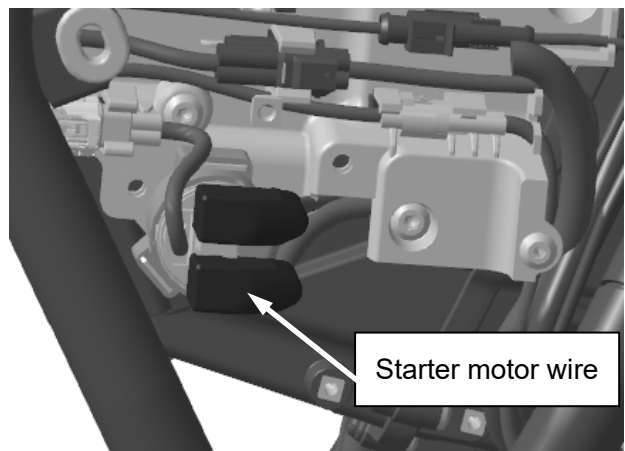
Remove electronic gear wire



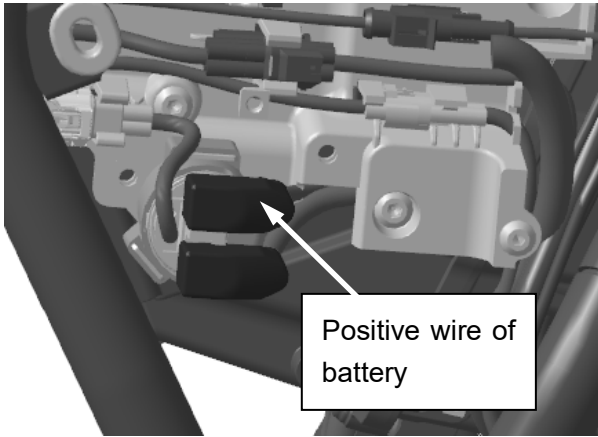
Remove rotational speed sensor



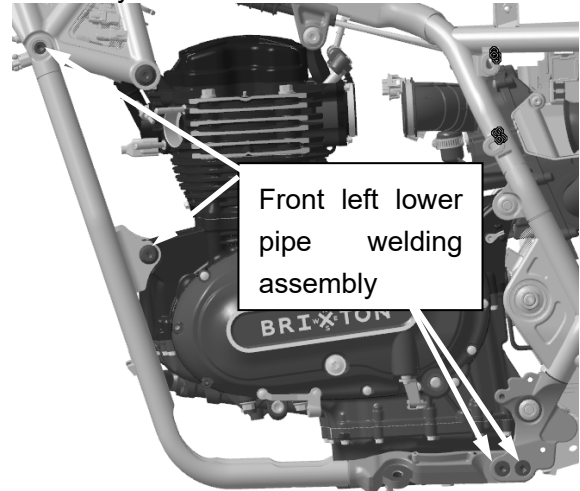
Remove the starter motor wire



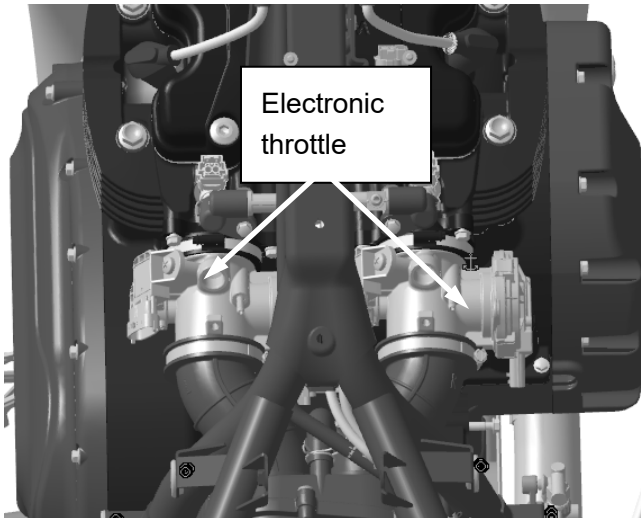
Remove the positive wire of battery.



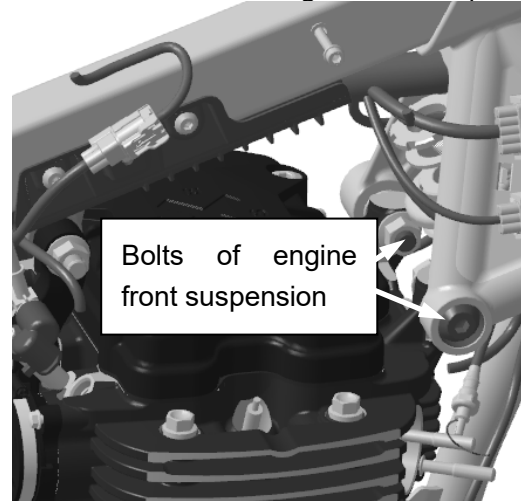
Remove the front left lower pipe welding assembly



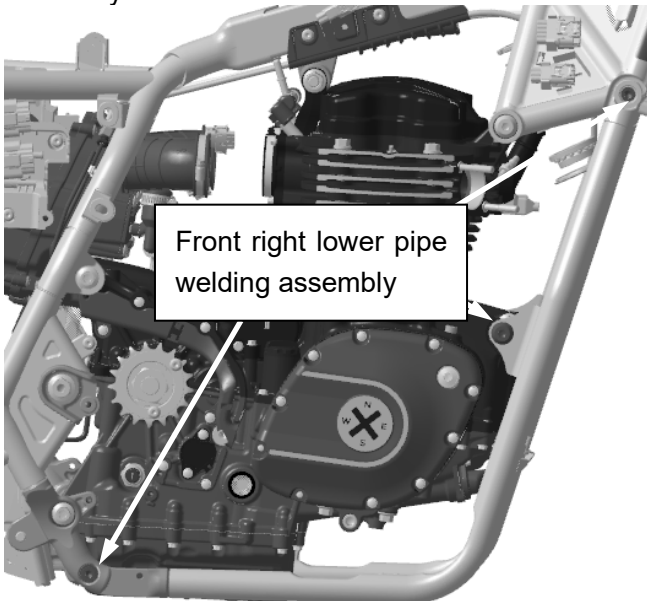
Remove the electronic throttle



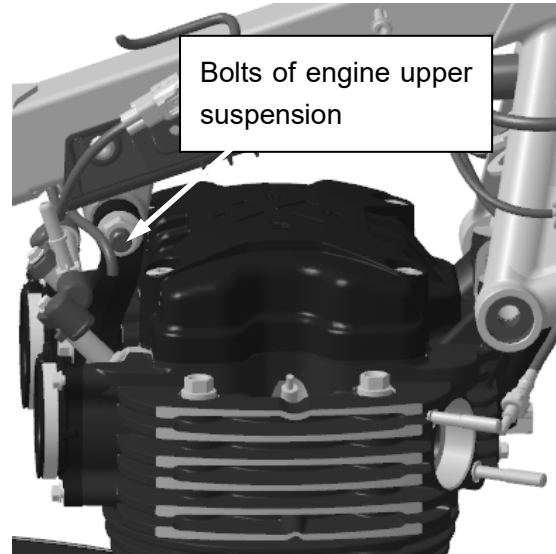
Remove the bolts of engine front suspension



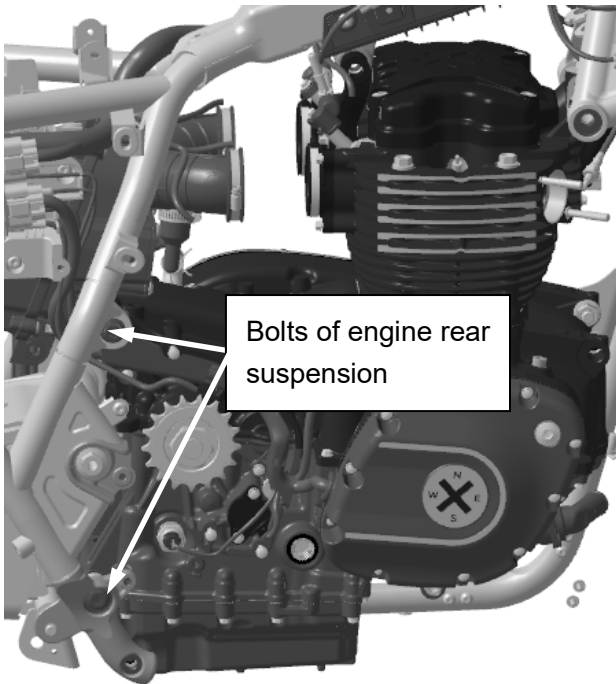
Remove the front right lower pipe welding assembly



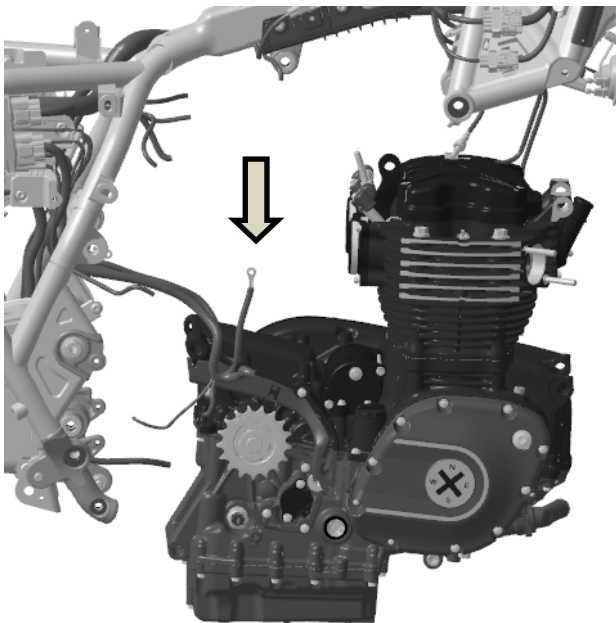
Remove the bolts of engine upper suspension



Remove the bolts of engine rear suspension



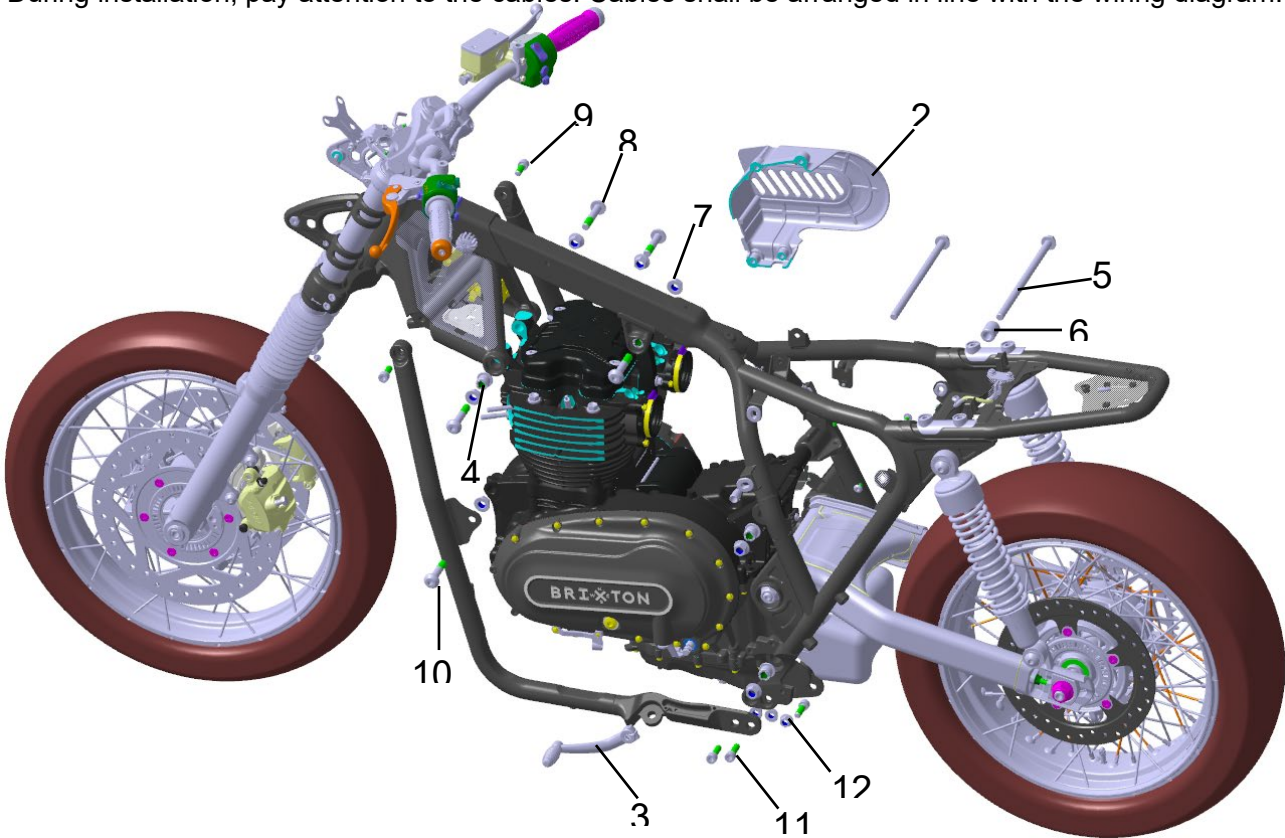
Remove the engine.



Engine Installation

Install the engine in the reverse sequence.

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



Sequence	Step	Quantity	Remarks
	Disassembly sequence		The installation and disassembly are in a reverse sequence
1	Cover, fuel tank, radiator, silencer, air filter and so on		Refer to the related contents
2	Transmission control unit	1	
3	Rear right cover	1	
4	Engine regulating solenoid	3	
5	Bolt M12×1.5×239	2	Required tightening torque: 70~85N·m
6	Rear lower bush of engine	1	
7	Nut M12×1.5	7	Required tightening torque: 70~85N·m
8	Screw M12×1.5×62	3	Required tightening torque: 70~85N·m
9	Bolt M10×1.25×25	2	Required tightening torque: 55~65N·m
10	Screw M12×1.5×55	2	Required tightening torque: 70~85N·m
11	Bolt M10×1.25×30	3	Required tightening torque: 55~65N·m
12	Nut M10×1.25	3	Required tightening torque: 55~65N·m

Cylinder Head System

Maintenance Notice	Camshaft
Table of Maintenance Criteria	Adjustment of Valve Clearance
Tensioner	Cylinder Head
Timing Chain and Timing Idle Gear	Valve
Timing Chain Guide Plate	

Maintenance Notice

During the maintenance in this section, problems usually occur in the engine thermal system, and operations such as replacing the piston and adjusting the valve clearance are needed.

The cylinder head cover and right front cover and other parts need to be removed first.

Before assembling, please check if all the oil ducts are unblocked and clean them.

Clean all components and parts with cleaning agent and dry them with compressed air. Finally, apply oil to the parts which relatively move, such as camshaft diameter and others.

Cylinder Head and Valve Technical Specification and Maintenance Criteria

Cylinder head	Planeness	0.03mm
Diameter of valve rod	Intake	4.975~4.990mm (standard value)
		4.965mm (limit)
	Exhaust	4.970~4.980mm (standard value)
		4.960 mm (limit)
Valve guide aperture	Intake	5.000~5.015mm (standard value)
		5.043mm (limit)
	Exhaust	5.000~5.015mm (standard value)
		5.043mm (limit)
Clearance between valve or valve guide	Intake	0.010~0.040mm (standard value)
		0.078mm (limit)
	Exhaust	0.020~0.045mm (standard value)
		0.083mm (limit)
Matching width of valve and valve retainer	Intake	1.200~1.300mm (standard value)
		1.700mm (limit)
	Exhaust	1.200~1.300mm (standard value)
		1.700mm (limit)
Width of valve retainer		1.50~1.85mm
Valve spring force		214±10N / 39.5mm
Valve clearance	Intake	0.05~0.13 mm
	Exhaust	0.08~0.18 mm

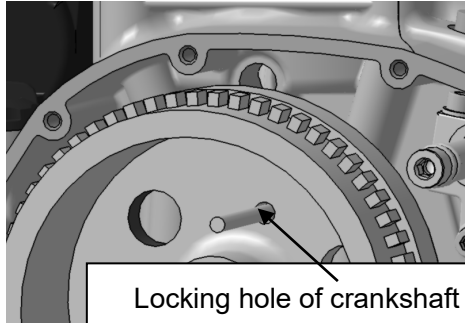
Camshaft Technical Specification and Maintenance Criteria

Camshaft diameter	22.930~22.960mm
Clearance between camshaft diameter and camshaft seat aperture	0.040~0.091mm (standard value)
	0.130mm (limit)
Camshaft seat aperture	23.000~23.021mm
Camshaft displacement	0.05~0.20mm (standard value)
Camshaft run-out	0.015mm (standard value)

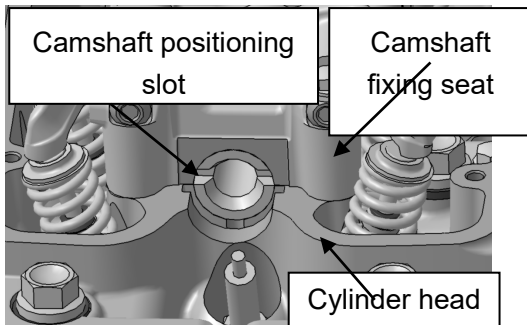
Tensioner

Tensioner disassembly:

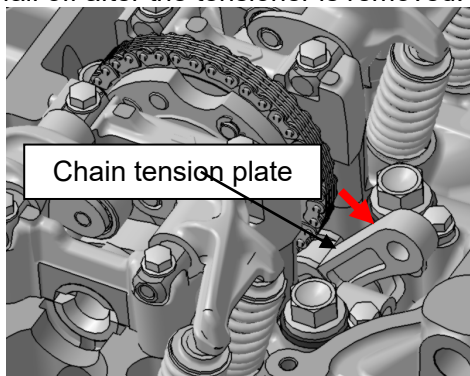
1. Rotate the crankshaft and insert into the upper crankcase and corresponding crankshaft holes from the magneto rotor through hole with a tool.



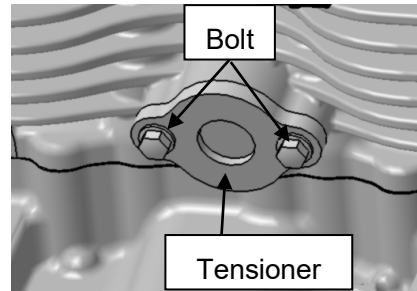
2. Check if the locating slot of camshaft aligns with the cylinder head surface.



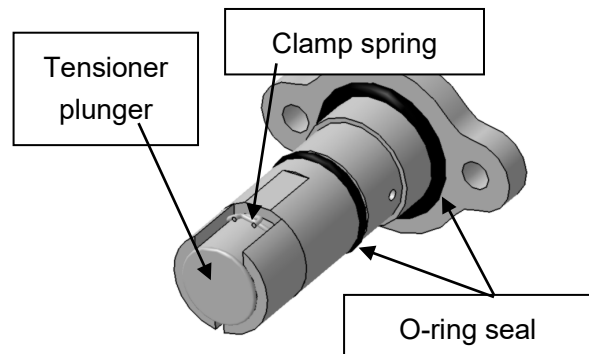
3. An assistant is required to press the chain tension plate backwards so that the timing chain will not fall off after the tensioner is removed.



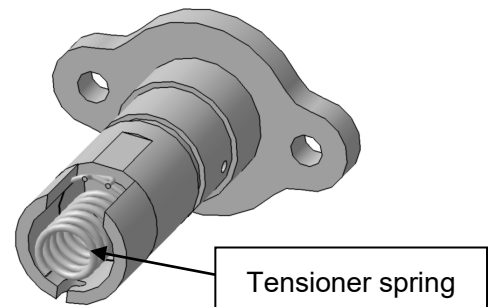
4. Take down 2 fastening bolts of the fastener.



5. Remove the fastener, and take down the O-ring seal on the fastener.



6. Hold both ends of the clamp spring together with a tool to increase the inner diameter of the clamp spring, so as to remove the tensioner plunger and spring.



7. Clean the oil in the tensioner and plunger.

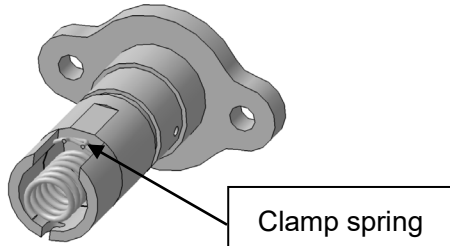
Tensioner check:

1. Check if the spring in the tensioner is deformed or damaged.
2. Check if the front end of the tensioner plunger is worn or damaged.

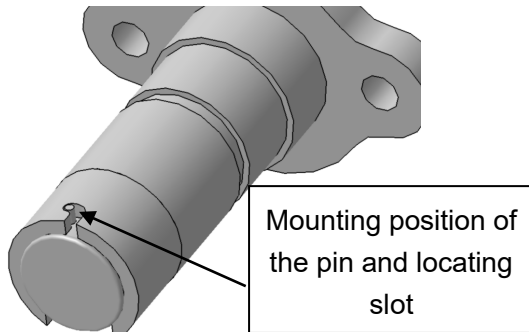
If any, replace the tensioner.

Tensioner Installation:

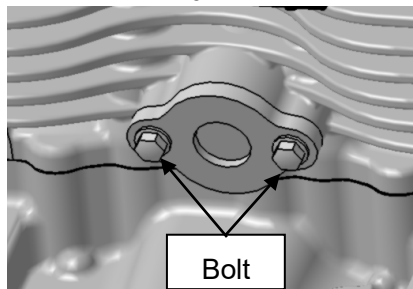
1. Drain the oil in the tensioner and plunger.
2. Install the clamp spring and tensioner spring.
3. Hold both ends of the clamp spring together with a tool to increase the inner diameter of the clamp spring, so as to install the tensioner plunger.



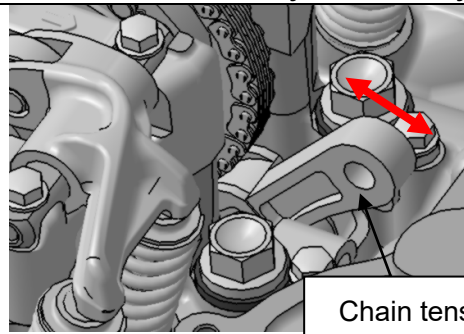
4. Install the upper pin of the plunger into the locating slot of the tensioner so that it will not fall off.



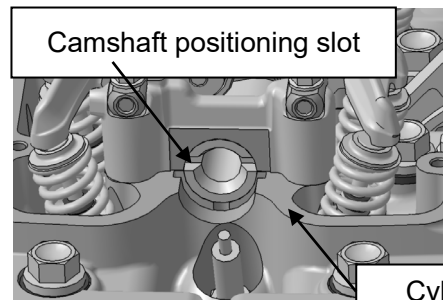
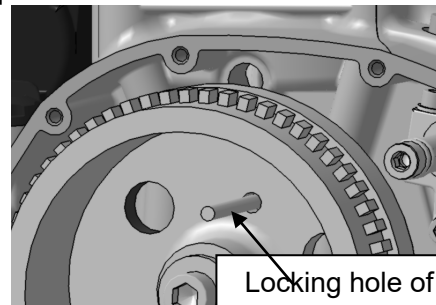
5. Install the new O-ring seal and apply clean oil.
6. Before installation, please ensure that the chain tension plate fully contacts with the timing chain.
7. Before installation, check if the locating slot of the camshaft aligns with the cylinder head surface.
8. Install the tensioner onto the cylinder block, and tighten 2 bolts to 10N·m.



9. Shake the chain tension plate back and forth forcefully until the tensioner plunger pops out.



10. Release the crankshaft locking tool, turn the crankshaft twice, and re-check whether the camshaft positioning slot aligns with the cylinder head surface when the crankshaft coincides with the upper crankcase hole.



Note:

If a new tensioner is to be installed, be careful not to make the plunger pop out before installation.

If an old tensioner is to be installed, drain the oil the tensioner so that the plunger can be smoothly installed into the tensioner.



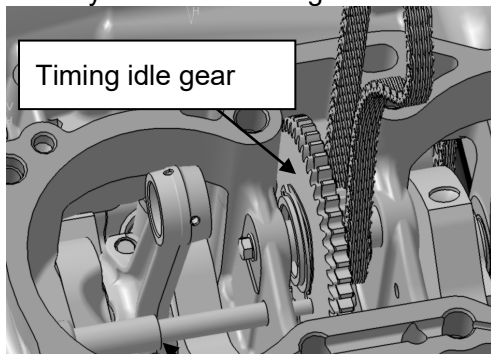
Note:

When the tensioner plunger is contracted, please protect your hands, eyes and face, and be careful of the accidental pop of the plunger, which may cause harm to your body.

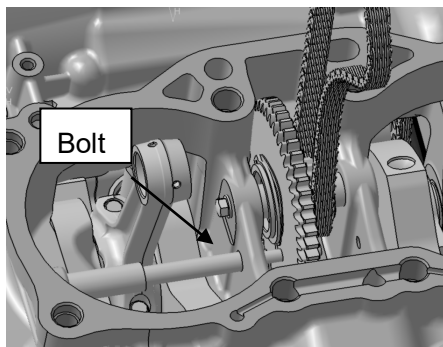
Timing Chain and Timing Idle Gear

Disassembly of timing chain and timing idle gear:

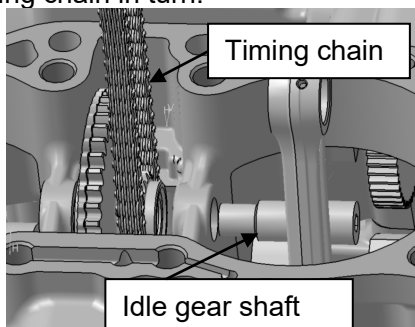
1. Take down the cylinder head and cylinder block.
2. Remove the front right cover and magneto rotor.
3. Rotate the crankshaft so that the locating hole on the timing idle gear aligns with the hole on the upper crankcase. Use a tool to lock the main shaft and lay shaft of the idle gear.



4. Remove the fastening bolts of timing idle gear.



5. Remove the idle gear shaft, timing idle gear and timing chain in turn.

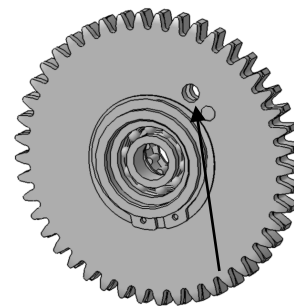


Timing chain check:

1. Check if the chain is discolored due to erosion.
2. Check if all pins are loose.
3. Check outer chain plate for cracks or deep scratches.
4. Check the inner chain plate for severe wear.
5. Check the elongation of the chain if necessary and if possible.

Timing chain and timing idle gear installation:

1. Turn the main and auxiliary gear of the timing idle gear to align their positioning holes, and fix them with tools.



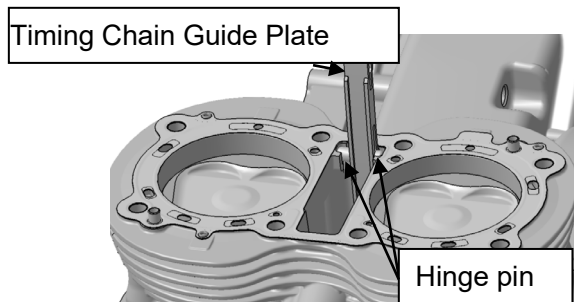
Positioning hole of timing idle main and auxiliary gear

2. Install the timing chain onto the timing idle gear.
3. Install the timing idle gear onto the upper crankcase and install the idle gear shaft, making sure the positioning hole on the idle gear align with the upper crankcase hole.
4. Install the fixing screw and tighten to 10N·m.
5. Remove the fixing tool of timing idle main and auxiliary gear.

Timing Chain Guide Plate

Timing chain guide plate disassembly:

1. Rotate the engine crankshaft to timing position and insert a tool into the positioning hole of the upper crankcase and idle gear.
2. Take down the cylinder head.
3. Directly remove the timing chain guide plate.



Timing chain guide plate check:

Check the guide plate and timing chain movement surface for wear and damage, and replace if necessary.

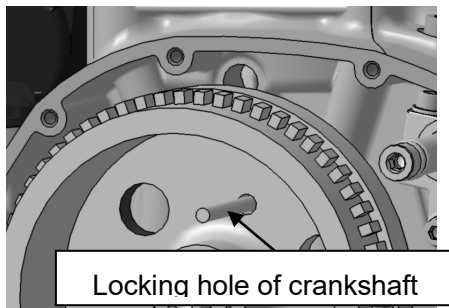
Timing chain guide plate installation:

To install the guide plate, be sure to install the boss on the lower end of the guide plate into the groove of the upper crankcase, and fully install the pins on both ends into the groove of the cylinder block.

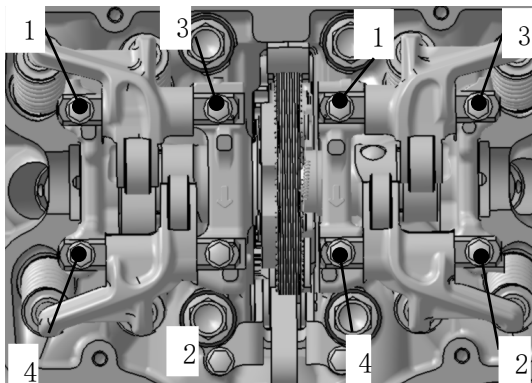
Camshaft

Camshaft disassembly:

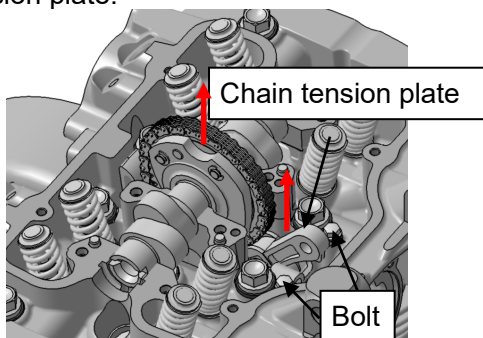
1. Rotate the crankshaft and insert into the upper crankcase and corresponding crankshaft holes from the magneto rotor through hole with a tool.



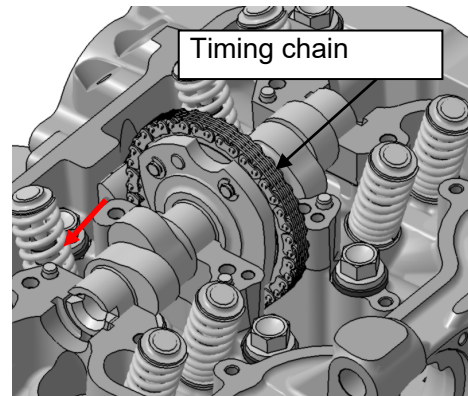
2. Check if the locating slot of camshaft aligns with the cylinder head surface.
3. Disassemble the tensioner.
4. Evenly loosen the fastening bolts in the sequence as shown below.



5. Remove the camshaft fixing seat.
6. Loosen the fixing bolts of chain tension plate.
7. Slightly lift the camshaft, and take down the chain tension plate.



8. Remove the timing chain from the camshaft.
9. Slide the camshaft to the right and remove it from the cylinder head.



10. Fix the timing chain to prevent it from falling into the crankcase.



Note:

In order to avoid damage to the camshaft fixing seat, remove the camshaft as far as possible with the camshaft lobe facing down and the rocker roller on the base circle of the camshaft. Loosen the fastening bolts evenly in strict accordance with the sequence. If the camshaft fixing seat is damaged, the entire cylinder head has to be replaced.



Note:

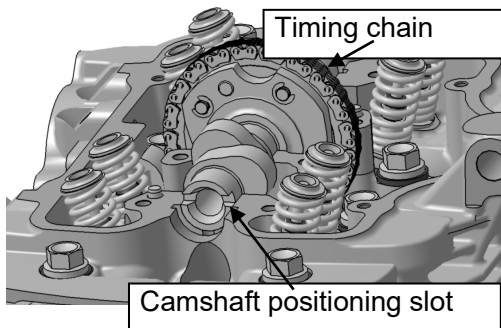
When removing the camshaft fixing seat, note the locating pin on the cylinder head, as it could cause serious engine damage if dropping into the crankcase.

Check of camshaft:

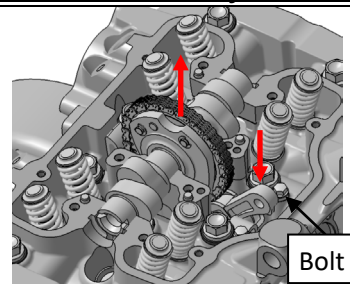
1. Inspect the camshaft driven sprocket for damage, wear or broken gear.
2. Check the surface between the inner hole of the cylinder head and camshaft fixing seat matching with the camshaft. If wear or damage is found, the cylinder head and camshaft fixing seat must be replaced.
3. Check the timing chain for wear.
4. Check whether the camshaft exhaust pressure relief mechanism works normally.
5. Measure the camshaft diameter and the matching hole diameter, and calculate the fit clearance. If the fit clearance exceeds the specified value, replace the whole cylinder head.

Camshaft installation

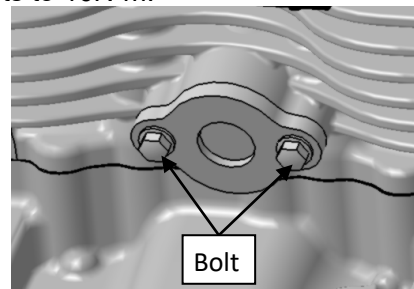
1. Install the positioning pins of crankcase and corresponding holes.
2. Clean camshaft and journal thoroughly, and apply clean oil before installation.
3. To install a new camshaft, remove the retaining bolts of driven sprocket.
4. Place the camshaft from its right side into the cylinder head and attach the timing chain to the driven sprocket.
5. Align the positioning slot of the camshaft end face with the cylinder head surface.



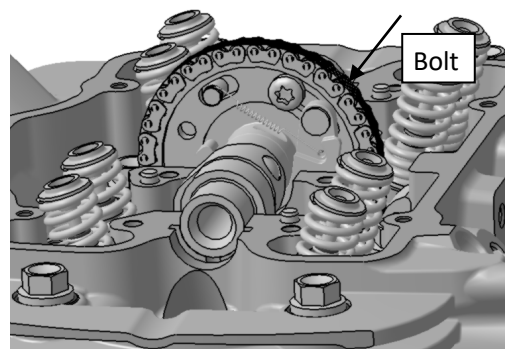
6. Lift the camshaft up slightly, install the chain tension plate into the cylinder head and tighten the bolts to 10N·m.



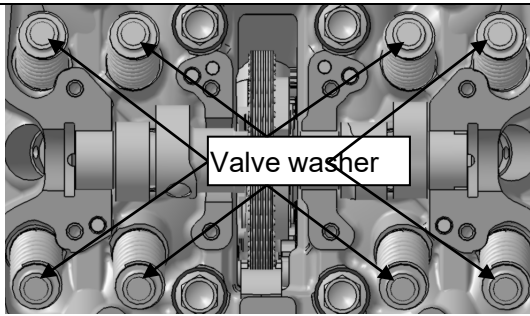
7. After checking the engagement between the timing chain and the timing idle gear, adjust the driven sprocket to make the chain on the engine intake side tight.
8. Install the camshaft fixing tool on the positioning slot of the camshaft end face.
9. Install the tensioner and tighten the fixing bolts to 10N·m.



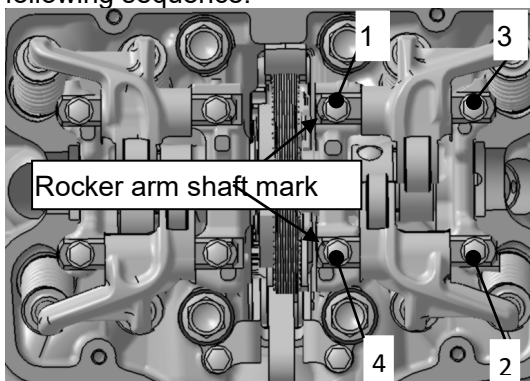
10. Release the tension of the tensioner.
11. Replace and install the fastening bolt of driven sprocket, and tighten it to 22N·m.



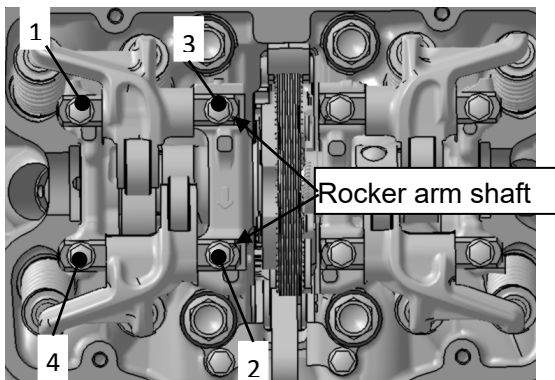
12. Remove the camshaft fixing tool.
13. Remove the fixing pins of the crankshaft and crankcase, rotate the crankshaft once, and install the fixing pins again.
14. Replace and install the other fastening bolt of driven sprocket, and tighten them to 22N·m.
15. Remove the fixing pins of the crankshaft and crankcase, rotate the crankshaft for two rounds, and install the fixing pins again.
16. Check if the locating slot of camshaft end face aligns with the cylinder head upper surface.
17. Install the valve washer with a proper thickness onto the valve.



18. Install the camshaft fixing seat of the left cylinder on the cylinder head, and pay attention to the direction of the rocker arm shaft mounting mark as shown in the figure, and then tighten the bolts to 12N·m in the following sequence.



19. Remove the fixing pins of the crankshaft and crankcase, and rotate the crankshaft once.
20. Install the camshaft fixing seat of the right cylinder on the cylinder head, and pay attention to the direction of the rocker arm shaft mounting mark as shown in the figure, and then tighten the bolts to 12N·m in the following sequence.



21. Check all valve clearances; if necessary, adjust them until the correct clearances are reached.

Adjustment of Valve Clearance

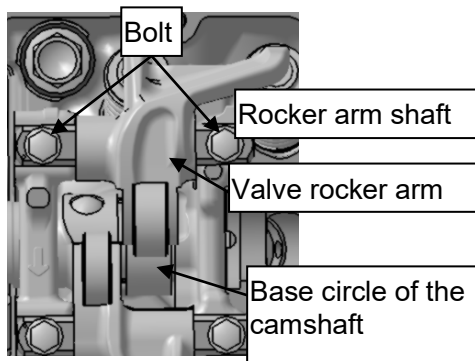
The camshaft, valve, valve washer and valve retainer are worn due to operation, and such wear will change the clearance between rocker arm and valve gasket, resulting in engine noise or abnormal operation. It will also cause permanent damage to the parts in the valve mechanism, thus affecting the engine performance.



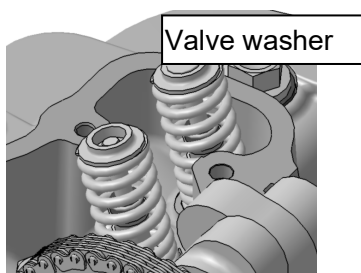
Note:

Valve clearance check and adjustment must be made when the engine is cool.

1. Take down the cylinder head cover.
2. Turn the engine crankshaft until the roller of the valve rocker arm is on the base circle of the camshaft.
3. Measure the valve clearance with a feeler gauge, and record it.
4. Remove the two bolts where valve clearance needs to be adjusted and remove rocker arm shaft and valve rocker arm.



5. Remove the valve washer and measure its thickness.



6. Calculate the thickness of the valve washer required according to the correct valve clearance. If the clearance is too small, the reduce the washer thickness; and if the clearance is too large, increase the washer thickness.
7. Install the selected valve washer onto the valve.
8. Install the rocker arm shaft and valve rocker arm, and tighten the bolt to 12N·m.
9. Repeat the said procedure until all valve clearances to be adjusted are completed.
10. Turn the engine crankshaft for several times so that the valve washer is fully in place.
11. Re-check all valve clearances; if necessary, adjust them.
12. Install the cylinder head cover.



Notes:

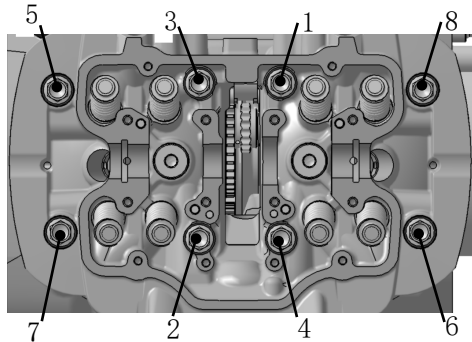
The spark plug can be removed to reduce resistance when the engine crankshaft rotates.

New valve washers shall be marked with thickness, such as “1950” which means the thickness is 1.95mm. Valve washers are available in thicknesses ranging from 1.700mm to 3.100mm with an increment of 0.025mm.

Cylinder Head

Disassembly of cylinder head:

1. Record the mounting position of valve washer, and carefully take down 8 valve washers from the cylinder head.
2. Loosen cylinder head bolts in the sequence as shown below.



3. Remove the cylinder head bolts and prevent their washers from falling into the crankcase.
4. Remove the cylinder head from the cylinder block, and prevent its locating pin from falling into the crankcase.



Note:

If necessary, tap the cylinder head with a rubber hammer to assist in disassembling.

Check of cylinder head:

1. Thoroughly clean the cylinder head surface, and check the combustion chamber for damage or pitting.
2. Use a ruler and a feeler to check for warping of the joint surface with the cylinder block, which may cause the cylinder head washer to fail to seal. If the warping exceeds the planeness required, please replace the cylinder head.
3. Check the valve guide and valve retainer for damage and wear. If the wear exceeds the service limit, please replace the cylinder head.
4. Check the chain guide plate; and in case of any wear or damage, replace it.

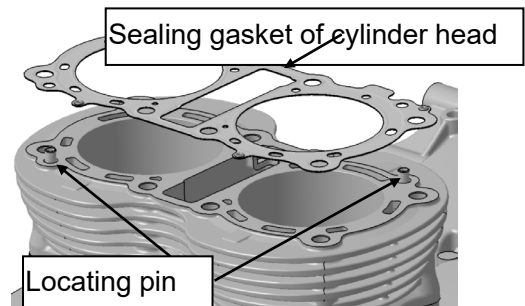


Note:

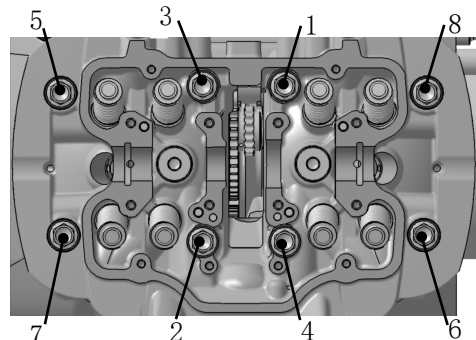
Make sure there is no liquid in the crankcase bolt holes, otherwise severe crankcase damage may occur due to hydraulic pressure during assembly and locking of the cylinder head bolts.

Installation of cylinder head:

1. Thoroughly clean the upper surface of the cylinder block.
2. Install the chain guide plate.
3. Ensure that two locating pins are installed in place onto the cylinder block.
4. Install a new cylinder head sealing gasket on the cylinder block, making sure that all the holes in the sealing gasket coincide with the cylinder block.



5. Install the cylinder head.
6. Place the washer on the cylinder head bolt and lubricate the bolt threads with clean oil.
7. Tighten the cylinder head bolts in turn in the following sequence.
 - Tighten to 20N·m.
 - Tighten to 30N·m.
 - Tighten to 60N·m.

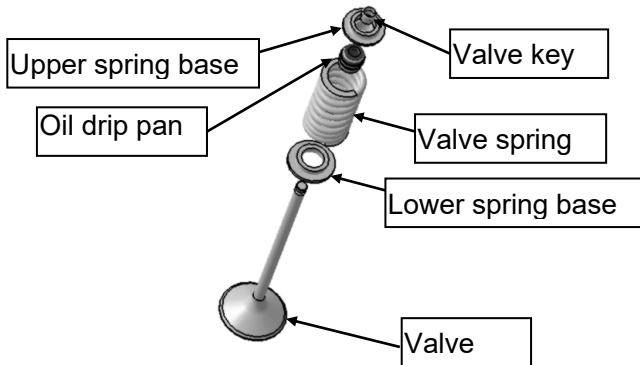


8. Apply the 50% solution of molybdenum disulfide and 50% oil to valve washer and re-install to the original position on each valve.

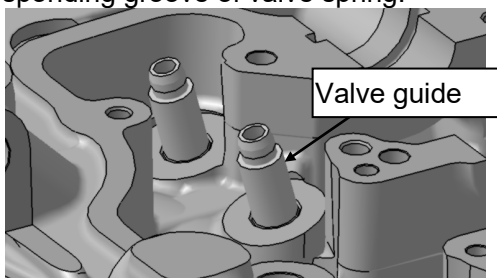
Valve

Valve disassembly and installation:

1. Use special tools to remove the upper valve of the cylinder head.
2. The parts to be disassembled include: valve key, upper spring base, valve spring, valve, oil drip pan and lower spring base.



3. Check if the diameter of valve rod exceeds the service limit; if yes, replace with new valve.
4. Check the contact surface of cylinder head valve retainer and valve, and whether there are cracks or pitting.
5. Apply the 50% solution of molybdenum disulfide and 50% oil to valve rod.
6. Install the valve onto the valve guide.
7. Install the lower spring base into the corresponding groove of valve spring.



8. Install the oil drip pan onto the valve guide, and then use a proper tool to press it downward until that the oil drip pan is correctly installed onto the valve guide.
9. Install the valve spring and ensure that the tight end (namely the colored end) of the spring is facing down (toward the piston).
10. Install the upper spring base, and press it

vertically to prevent from damaging valve and cylinder head.

11. Install the valve key and ensure that valve key is always in the correct position of the valve and upper spring base after the valve spring is returned.



Note:

Improper installation of the oil drip pan will lead to oil burning and blue smoke exhaust from the muffler, so pay special attention to the installation and repeatedly check whether the installation is in place.



Note:

After installing the valve key, check whether it is installed in place. If the valve key is not properly installed, the key may fall off while the engine is running, allowing the valve to come out into contact with the piston, and accordingly causing serious engine damage.

Clutch

Maintenance Notice	Friction Disc and Steel Sheet Inspection
Clutch Parameters	Clutch Disc Assembly Height Inspection
Removal of Clutch	Installation of Clutch

Maintenance Notice

There is no need to disassemble engine from the frame during maintenance. Remove the clutch cable first, then loosen the bolt and take down the bolts of left crankcase cover and take down the left crankcase cover; disassemble clutch from the engine. Cover the left crankcase cover hole connecting case with a piece of clean nonwovens during disassembly, or part may fall into it.

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

To assemble clutch, release clutch spring and smear oil on the friction plate. If a new clutch is used, the friction plate shall be inserted in oil for more than 24h before assembly.

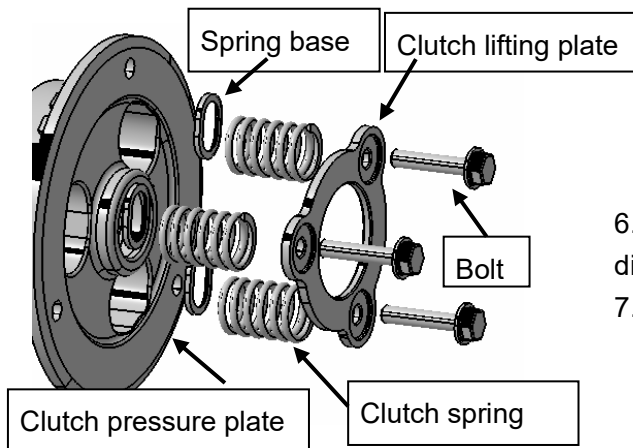
Clutch Parameters

Quantity of friction disc	8
Planeness of clutch plate	0.15mm (limit)
Planeness of friction plate	0.20 mm (limit)
Thickness of friction plate	2.90-3.10mm (standard value)
	2.80 mm (limit)
Clutch disc assembly height	38.00 mm +0.34/-0.66 mm

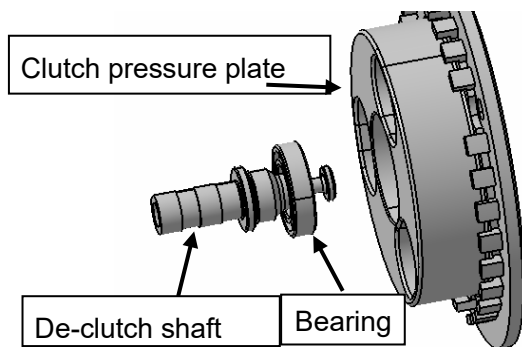
Clutch

Removal of clutch:

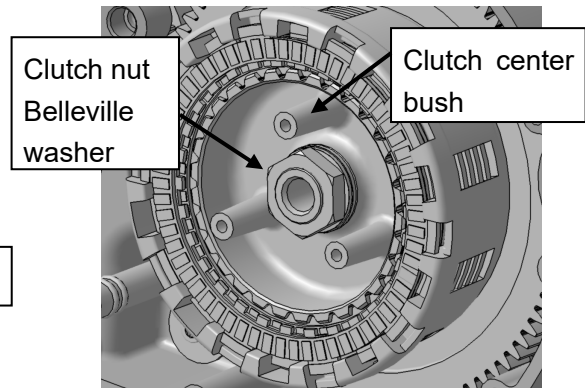
1. Loosen 3 fastening bolts and remove the pressure plate and pressure plate.



2. Remove de-clutch shaft and bearing from the clutch pressure plate.

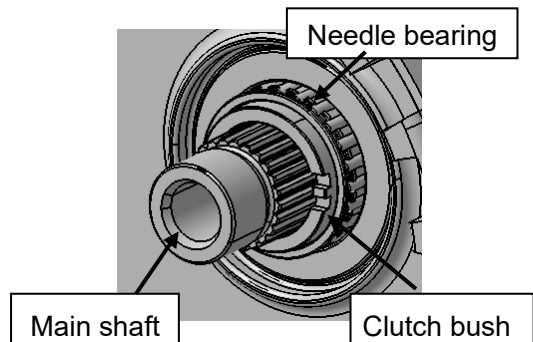


3. Remove the clutch friction disc and steel sheet as well as the disc spring and spring base, and note the direction of each component.
 4. Shift to 6th gear and step on the rear brake pedal to prevent engine from rotating.
 5. Remove clutch nut, disc washer, flat washer, clutch center bush and thrust washer.



6. Move the clutch bush back and forth to displace the needle bearing.

7. Remove needle bearing from the clutch cover.



8. Remove the clutch cover from the main shaft.



Note:

During removal, keep the spring base in the pressing plate.

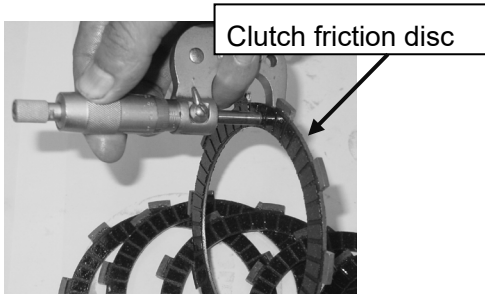


Note:

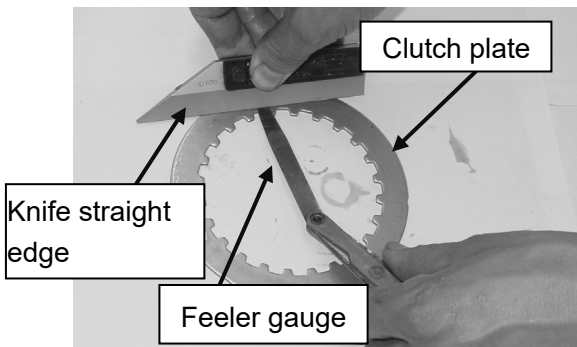
The outermost two friction plates and innermost friction plate are different from the rest, so they shall not be installed in any other position.

Friction disc and clutch plate inspection:

1. Measure the thickness of clutch friction disc. If the thickness of clutch friction disc exceeds the service limit, replace it with a new one.



2. Check the planeness of all clutch plates. Place the clutch plates to be checked on a clean plate, try to pass a feeler gauge of maximum service limit between the knife straight edge and the plate. If the feeler gauge can pass the plate at any point, replace the clutch plate.



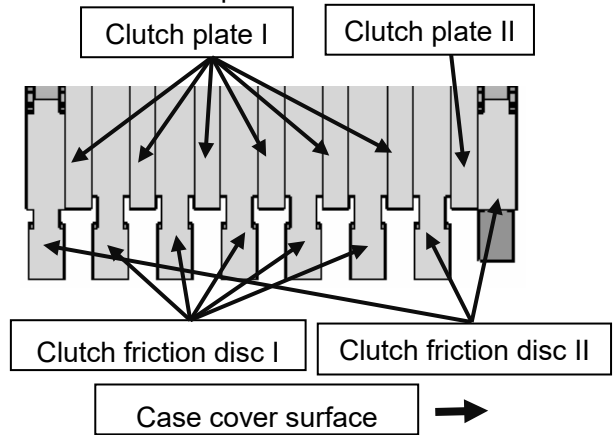
Clutch disc assembly height inspection

Clutch disc assembly height is very important for the smooth operation of the drive system, so the new clutch disc height must be measured.

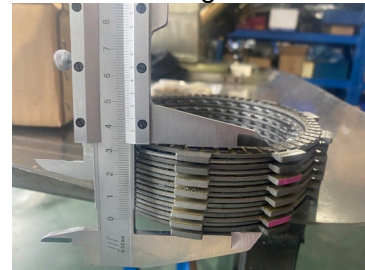
During installation of a new clutch disc, the height must be right. The new clutch disc must include the following parts:

- 3 clutch friction discs II
- 5 clutch friction discs I
- 6 clutch plates I
- 1 clutch plate II

1. As shown as follows, stack the new clutch friction disc and clutch plate.



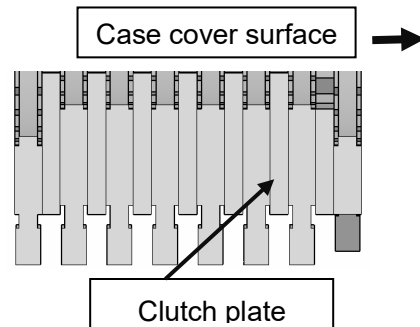
2. Place the assembled clutch assembly on a flat surface and measure its height as shown below:



3. Clutch disc assembly height is specified in the Table of Clutch Parameters.

4. If the clutch disc assembly height is too high, replace the clutch plate in the position shown below with a 1.6mm-thick clutch plate.

5. If the clutch disc assembly height is too low, replace the clutch plate in the position shown below with a 2.3mm-thick clutch plate.



6. Re-check the clutch disc assembly height.



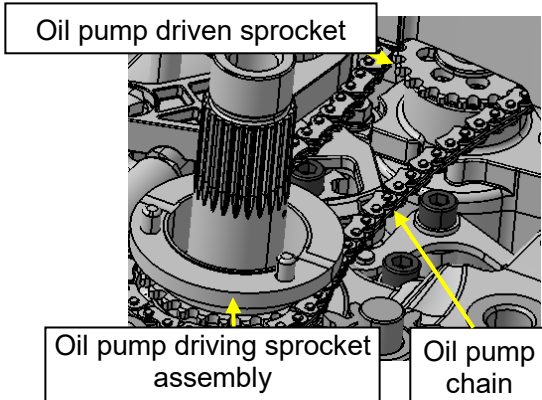
Note:

No more than one 1.6mm-thick clutch plate shall be used in the clutch disc assembly.

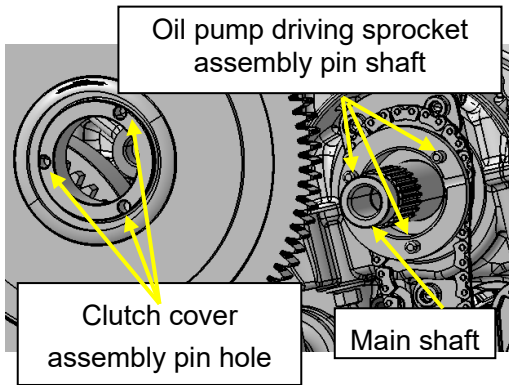
No more than one 2.3mm-thick clutch plate shall be used in the clutch disc assembly.

Installation of clutch

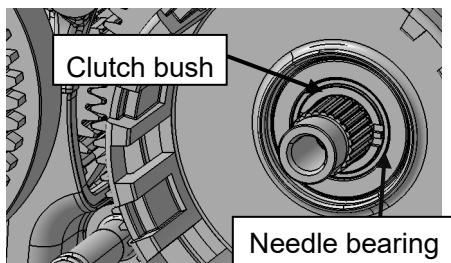
1. Visually check whether the oil pump chain is fully engaged with the oil pump driving and driven sprockets.



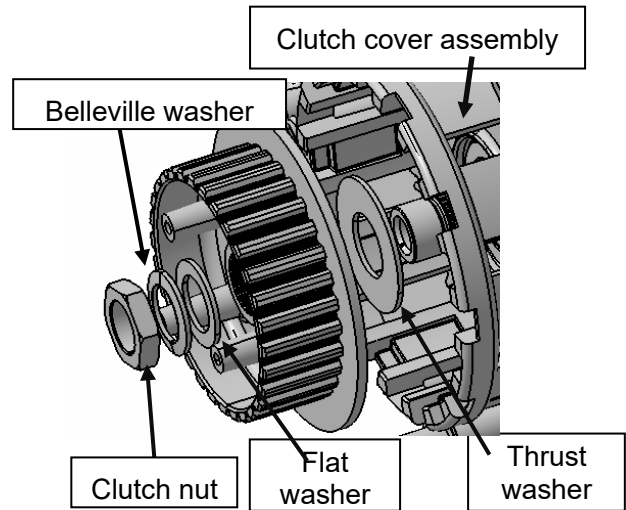
2. Assemble the clutch cover assembly onto the main shaft and align the oil pump driving sprocket assembly pin with the clutch cover pin hole.



3. Assemble the clutch cover assembly in place and ensure that the oil pump drive assembly is engaged correctly. Reinstall the needle bearing. The clutch bush and needle bearings shall be flush with the inner end face of the clutch cover after they are properly installed.

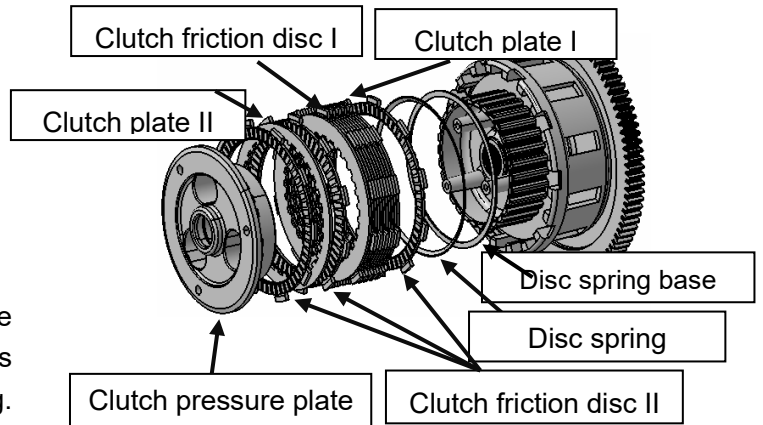


4. Install the thrust washer onto the main shaft.
 5. Install the clutch center bush.
 6. Install flat washer, new disc washer (with the raised face facing outwards) and new nut on the main shaft.

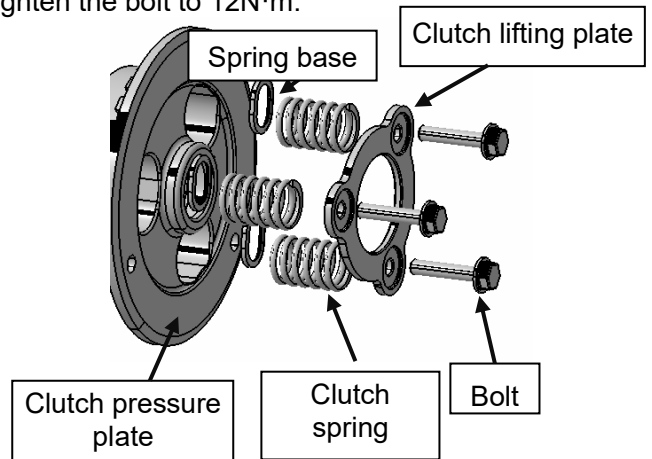


7. Shift to 6th gear and step on the rear brake pedal to prevent engine from rotating, and tighten the nut to 130N·m.

8. Coat the surface of the friction plate, steel sheet, disc spring and disc spring base with clean oil before mounting them to the clutch center bush in the same order as removing them.



9. Reinstall the bearing and de-clutch shaft.
 10. Install the clutch pressure plate and ensure that the spring base is on the pressure plate.
 11. Install the spring and clutch lifting plate, and tighten the bolt to 12N·m.



**Note:**

Ensure that the oil pump chain and the oil pump driven sprocket are engaged properly, otherwise the oil pump cannot work. If the oil-water pump cannot supply oil and water to the engine, the engine will be seriously damaged during operation.

**Note:**

The outermost and innermost friction plates are different from the rest, so they must be distinguished during installation.

The outermost clutch plate is different from the rest clutch plates, so they must be distinguished during installation.

Starting System

Maintenance Notice	Starting Mechanism Inspection
Starting Mechanism Removal	Starting Mechanism Assembly

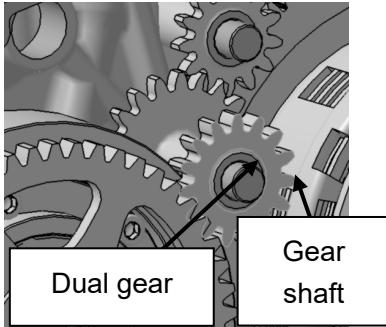
Maintenance Notice

The left crankcase cover must be removed during performing the maintenance in this part. Clean all components and parts with cleaning agent and dry them with compressed air before assembly.

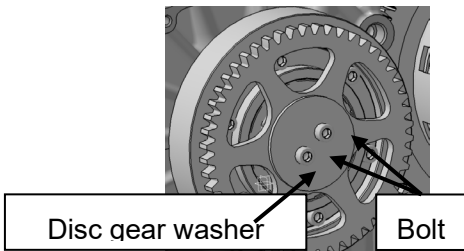
Starting System

Starting mechanism removal:

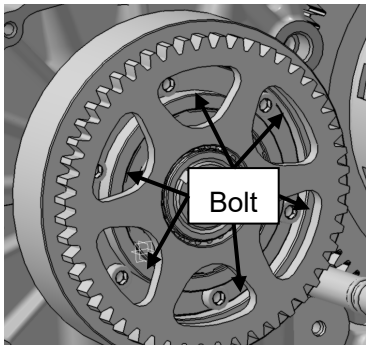
1. Take down the dual gear and gear shaft.



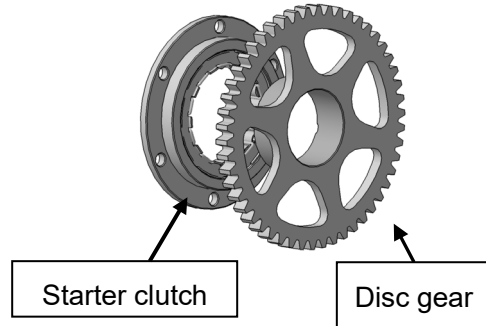
2. Take down the disc gear washer and fixing bolt.



3. Take down the fixing bolts of starter clutch.

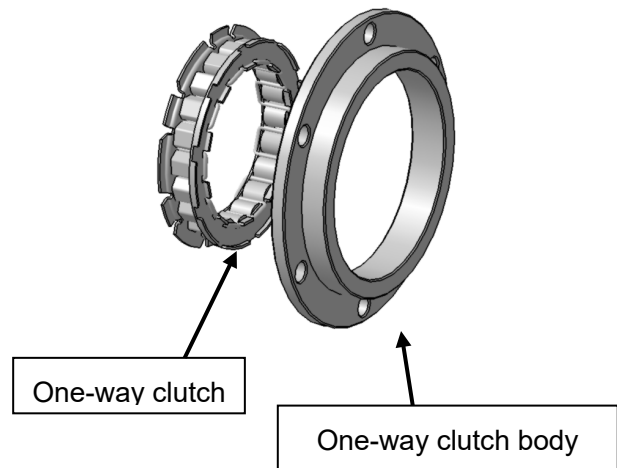


4. Take down the disc gear.



5. Take down the starter clutch.

6. Separate one-way clutch and one-way clutch body from the starter clutch.

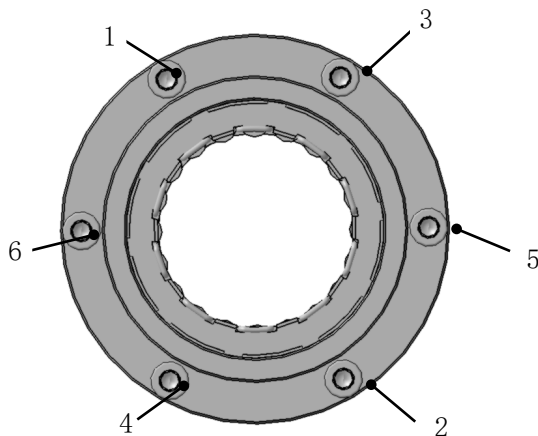


Starting mechanism inspection:

1. Check whether the one-way clutch roller is worn; if yes, replace the one-way clutch.
2. Check if all gears are damaged.
3. When the starter clutch is mounted on the crankshaft, check if it runs smoothly and rotates only in one direction.

Starting mechanism installation:

1. Install the one-way clutch onto the one-way clutch body.
2. Install the starter clutch onto the crankshaft.
3. Apply oil onto the starter clutch roller.
4. Install the disc gear onto the starter clutch, and note the gear inner hole and crankshaft bearing mounting position.
5. Tighten the fixing bolts of starter clutch to 16N·m in the sequence as shown below.



6. Install the disc gear washer and fixing bolt and tighten them to 10N·m.
7. Install the dual gear and gear shaft.

Crankshaft and Crankcase System

Maintenance Notice	Connecting rod
Table of Maintenance Criteria	Bearing Bush Selection
Crankcase	Water Inlet Cover
Crankshaft	Oil-gas Separator Cover

Maintenance Notice

During maintenance mentioned in this section, to repair crankshaft, balance shaft or shift mechanism, the upper and lower crankcases shall be separated, which is called crankcase separation. Before crankcase separation, the following parts and components of engine shall be removed:

1. Left crankcase, clutch and gear shift mechanism;
2. Front right cover;
3. Oil pan, oil-water pump assembly and coarse filter assembly;

The engine can be turned over without dismantling the cylinder head, cylinder block, piston and other parts, and the crankcase can be dismantled with the lower crankcase facing upward.

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

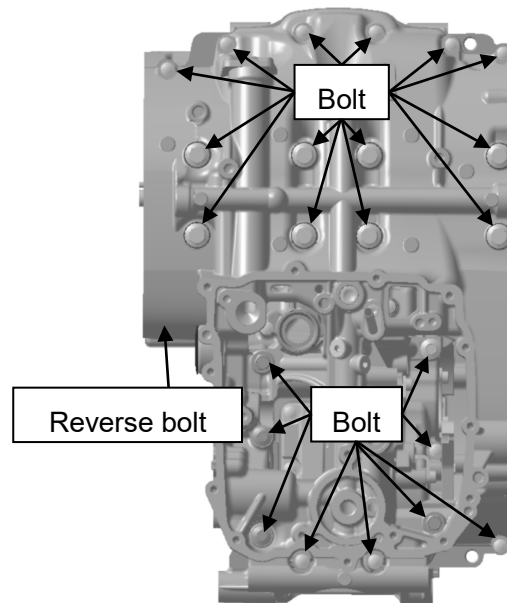
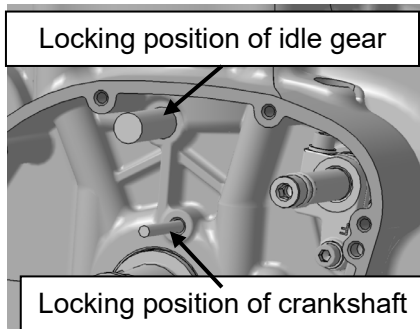
Crankshaft Technical Specification and Maintenance Criteria

Crankshaft connecting rod end diameter	38.000~37.984mm (standard value)
	37.947 mm (limit value)
Crankshaft connecting rod end bearing bush clearance	0.036~0.061mm (standard value)
	0.100 mm (limit value)
Crankshaft main shaft diameter	43.108~43.092mm (standard value)
	43.052 mm (limit value)
Crankshaft main bearing bush clearance	0.018~0.042mm (standard value)
	0.100 mm (limit value)
Crankshaft movement	0.05~0.20mm (standard value)
	0.50 mm (limit value)
Crankshaft run-out	0.02mm (standard value)
	0.035mm (limit value)
Crankshaft connecting rod end hole diameter	41.000~41.009mm (standard value)
Connecting rod end movement clearance	0.15~0.30mm (standard value)
	0.50mm (limit value)

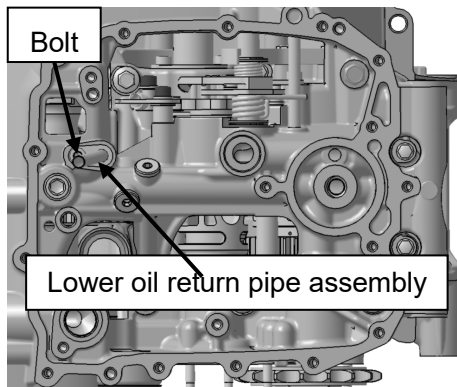
Crankcase

Removal of crankcase:

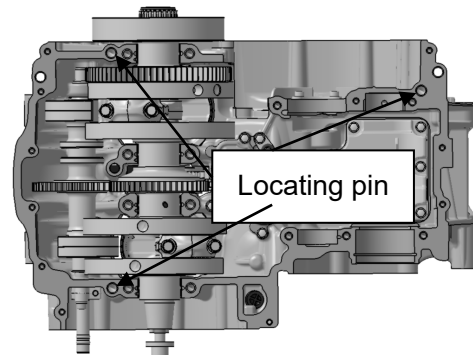
1. From the two through holes of the upper crankcase, lock the position of main and auxiliary gears of the idler wheel and the crankshaft and crankcase respectively with tools.



2. Remove the oil-water pump.
 3. Then remove the lower oil return pipe assembly and bolts, and note the O-ring seal.



5. Separate the crankcase and upper crankcase, and note the position of 3 locating pins on it.



4. Remove the assembling bolts, and note that there is one bolt installed onto the crankcase.

6. After dismantling, the main parts which can be disassembled for inspection include: front balance shaft, rear balance shaft, crankshaft, main shaft and lay shaft, transmission hub and shifter fork, water inlet cover, oil-gas separator cover assembly, oil nozzle assembly, etc.

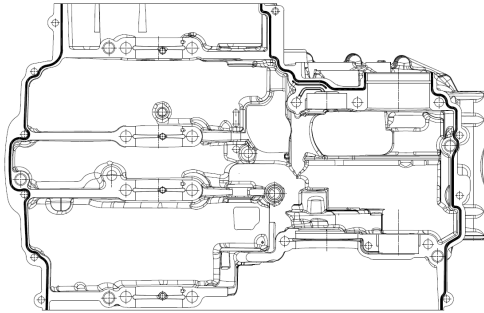


Note:

Do not use screwdriver or similar tools to separate the cases, or the sealing surface will be damaged.

Assembly of crankcase:

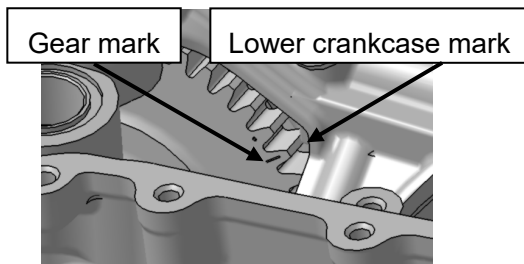
1. Clean the assembling surface of the crankcase with detergent, and wipe it with nonwovens.
2. Set the main shaft and lay shaft as well as transmission hub at neutral gear.
3. Ensure that three locating pins are placed on the upper crankcase.
4. Apply clean oil onto the crankshaft bearing bush.
5. Apply a layer of ThreeBond 1215 with a width about 2mm evenly onto the assembling surface of the lower crankcase as required by the figure.



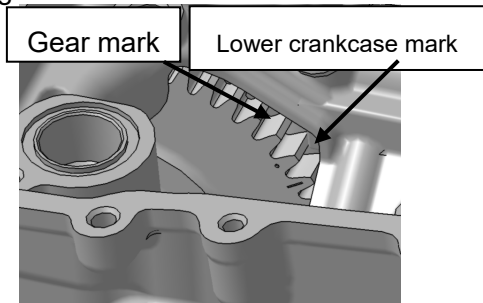
Note:

Do not use excessive sealant, because the excess sealant will get into the crankcase and clog the oil duct, which can cause serious engine damage.

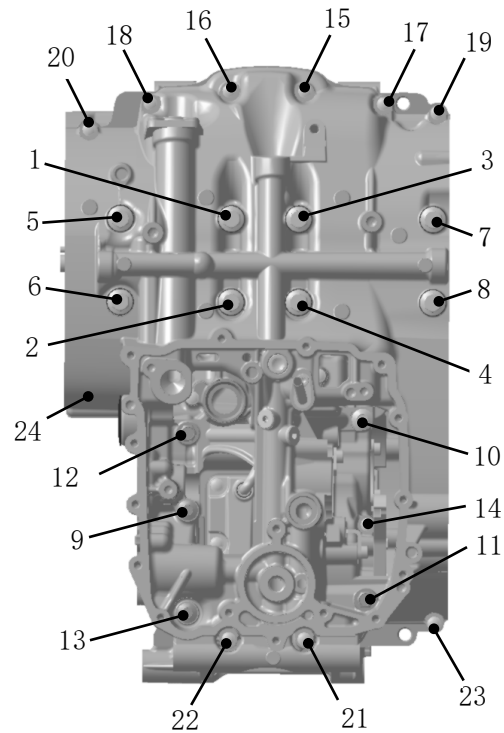
6. Before assembling, firstly check that the line mark on the rear balance shaft gear is aligned with the mark on the lower crankcase.



7. After assembling, the rear balance shaft will rotate for 1 tooth, now the gear point marks should align with the lower crankcase marks.



8. During assembling, an assistant is required to assist in locating the crankcase.
9. Fix the assembling bolts in the sequence as shown below.



- ① Firstly tighten bolts 1-8 to 55N·m by tightening them twice
- ② Then tighten bolts 9-13 to 25N·m
- ③ Finally tighten bolts 14-24 to 10N·m
- ④ Reversely install bolt 24 onto the upper crankcase

10. Install a new O-ring seal onto the lower oil return pipe assembly, install to the lower crankcase, and tighten the fastening bolt to 10N·m.

Crankshaft

Removal of crankshaft:

1. Disassemble the crankcase.
2. Take down the crankshaft from the crankcase according to the dismantling process of front balance shaft.



Note:

When taking down the crankshaft, support the connecting rod to prevent it from damaging other parts and components.

Installation of crankshaft:

1. Select and install the correct crankshaft bearing bush.
2. Apply clean oil onto the crankshaft bearing bush and crankshaft journal.
3. Make sure that the crankshaft oil duct is clean and free from blockage and foreign matter.
4. Install the crankshaft onto the upper crankcase, and ensure that the phase relation among the crankshaft gear and front balance shaft and idle gear.
5. Align the connecting rod big end with the mounting diameter of the crankshaft connecting rod.
6. Install the connecting rod seat, and tighten the connecting rod bolts in a correct order.
7. Assemble the lower crankcase.



Note:

Installation of crankshaft bushing bush with incorrect size can cause serious engine damage.



Note:

Before disassembling the crankshaft, fix the idle gear at the correct position, otherwise the crankshaft gear cannot keep a correct phase relation with the camshaft gear after assembling. If the phase relation is incorrect, if you try to start the engine, it will cause serious damage to the engine.

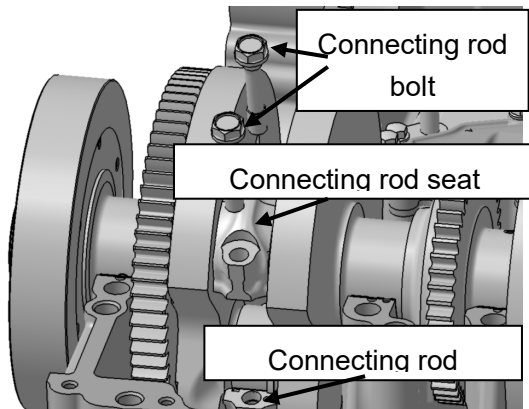
Connecting rod

**Note:**

During installation of connecting rod bolts, apply molybdenum disulphide grease onto the thread areas.

Disassembly of connecting rod:

1. Take down the connecting rod bolts.



2. Put away the disassembled connecting rod seat, piston and connecting rod.

**Note:**

Connecting rod and connecting rod seat shall be used in pair, and they shall be installed in specified direction.

Installation of Connecting Rod:

1. Clean the connecting rod seat.
2. Select and install the correct connecting rod bearing bush.
3. Install the new connecting rod bolts.
4. Fasten the bolts in two stages.
 - ① Tighten to 14N·m
 - ② Then tighten to 45N·m

**Note:**

Repeated use of connecting rod bolts will cause bolt breakage, resulting in damage to the engine.

Bearing Bush Selection

Connecting rod bearing bush selection:

1. Remove connecting rod and connecting rod bearing bush from the crankshaft.
2. Measure the shaft diameter at the connecting rod mounting position on the crankshaft, and record it.
3. Measure the connecting rod big end hole diameter and record it.
4. Select bearing bush as shown in the following table.

Bearing bush color mark	Connecting rod big end hole diameter	Crankshaft mounting diameter
White	41.000 ~ 41.009mm	37.993 ~ 38.000mm
Red	41.000 ~ 41.009mm	37.984 ~ 37.992mm

Crankshaft bearing bush selection:

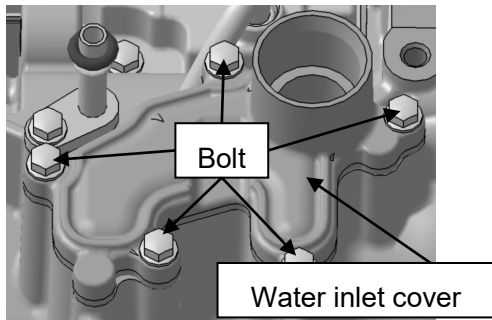
1. Remove the lower crankshaft from the upper crankcase.
2. Measure and record the main shaft diameter of four crankshafts in turn.
3. Measure and record the hole diameter of four crankcases in turn.
4. Select bearing bush as shown in the following table.

Bearing bush color mark	Hole diameter of crankcase	Crankshaft mounting diameter
Red	46.105 – 46.097	43.099 – 43.092
Red	46.114 – 46.106	43.108 – 43.100
Blue	46.114 – 46.106	43.099 – 43.092
Blue	46.123 – 46.115	43.108 – 43.100
Green	46.123 – 46.115	43.099 – 43.092

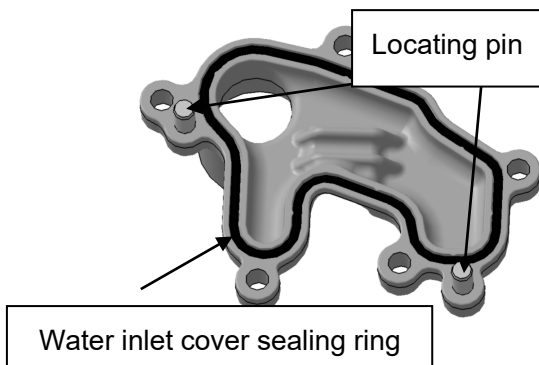
Water Inlet Cover

Disassembly and assembly of water inlet cover:

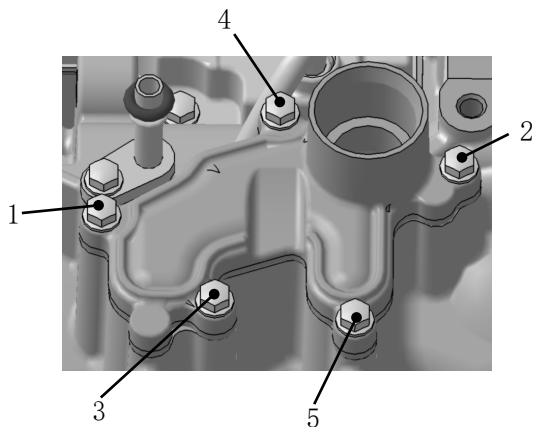
1. Remove the five fastening bolts of water inlet cover from the upper crankcase and remove the water inlet cover.



2. Replace with a new water inlet cover sealing ring.
3. Note the locating pin on the water inlet cover and upper crankcase.



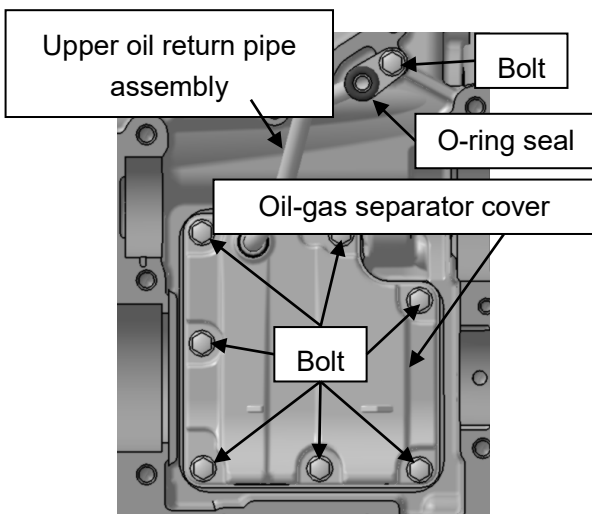
4. Fix the assembling bolts in the sequence as shown below and tighten to 10N·m.



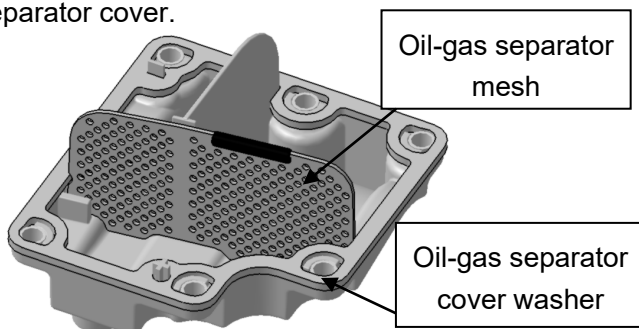
Oil-gas Separator Cover

Disassembly and installation of oil-gas separator cover:

1. Remove one bolt of the upper oil return pipe assembly from the upper crankcase and remove the upper oil return pipe assembly and its O-ring seal.
2. Remove 7 fastening bolts of the oil-gas separator cover, and take down the oil-gas separator cover and oil-gas separator mesh.

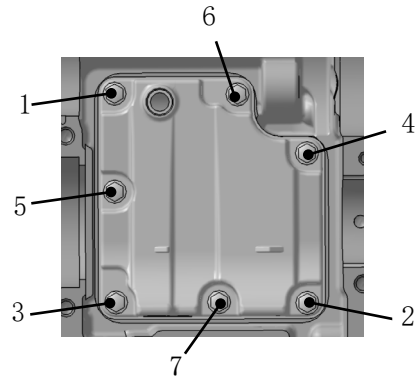


3. Replace with a new oil-gas separator cover gasket.
4. Note that the oil-gas separator mesh is installed at the assembling position of oil-gas separator cover.

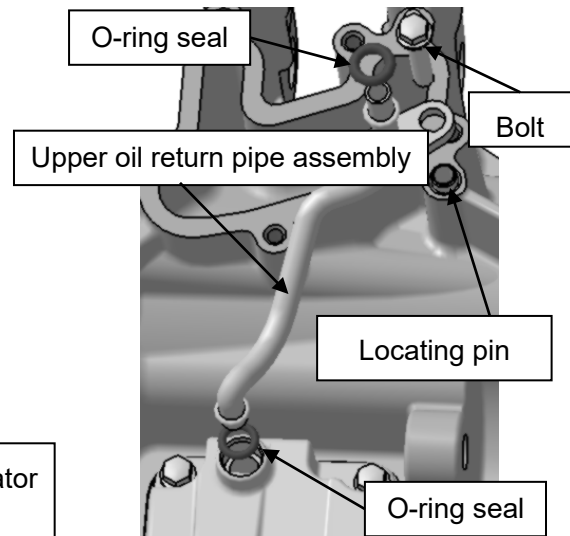


5. Install the oil-gas separator cover onto the upper crankcase.

6. Fix the assembling bolts in the sequence as shown below and tighten to 10N·m.



7. Replace with a new O-ring seal and install the upper oil return pipe assembly, and note the locating pin at the installation position of the upper crankcase.
8. Tighten the bolt to 10N·m.



Driving System

Maintenance Notice	Locating Plate
Table of Maintenance Criteria	Shifter Fork and Transmission Hub
Gear Shifting Arm	Main Shaft Assembly and Lay Shaft Assembly

Maintenance Notice

This section introduces the inspection and replacement methods of driving system. Before inspection, take down the engine, drain engine oil, separate the upper and lower crankcases and then disassemble it.

The transmission parts have a great impact on the engine performance and service life. If any serious wear or other defects are inspected, please replace immediately. If the teeth of the main shaft and lay shaft are worn or damaged, please replace the whole main shaft and lay shaft assembly. **Don't reuse the disassembled circlip, bush and bearing.**

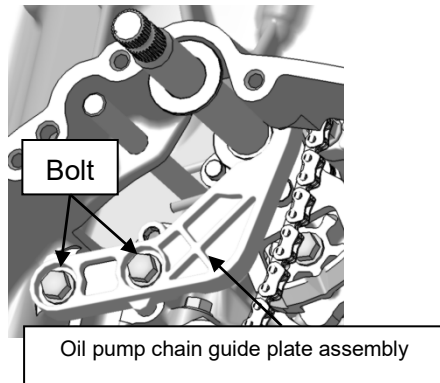
Driving System Specification and Maintenance Criteria

1 st gear transmission ratio	3.50:1 (49/14)
2 nd gear transmission ratio	2.50:1 (45/18)
3 rd gear transmission ratio	1.85:1 (37/20)
4 th gear transmission ratio	1.48:1 (37/25)
5 th gear transmission ratio	1.30:1 (35/27)
6 th gear transmission ratio	1.15:1 (30/26)
Shifter fork width	5.90~6.00mm (standard value)
	5.80mm (limit value)
Gear shifter fork slot width	6.10~6.20mm (standard value)
	6.30 mm (limit value)
Clearance between shifter fork and slot	0.10~0.30mm (standard value)
	0.50mm (limit value)

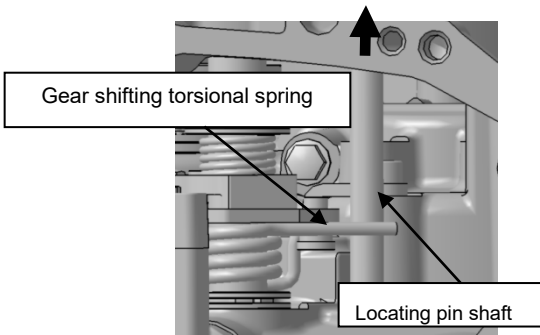
Gear Shifting Arm

Disassembly of gear shifting arm:

1. Remove bolts, and take down oil pump chain guide plate assembly from the crankcase.

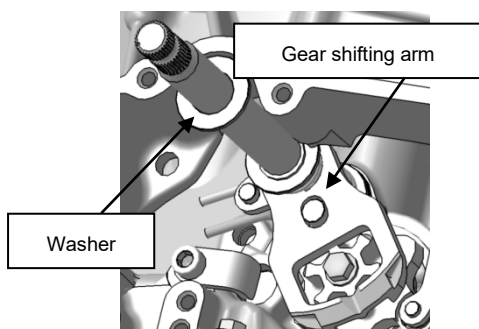


2. Take down the locating pin from the lower crankcase.



3. To prevent the washer on the gear shifting arm from falling off, it should be removed and placed first.

4. Finally take out the whole gear shifting arm.



Check of Gear Shifting Arm:

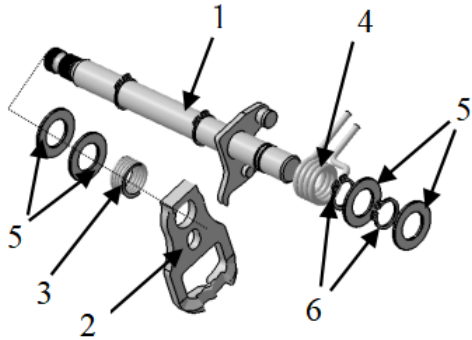
Check whether the gear shifting arm assembly and the spring are damaged or worn, and whether the spring is overextended (i.e. the gap between coils is abnormal). Replace the assembly if necessary.

- 2: Gear shifting switch-plate
- 3: Switch-plate spring
- 4: Gear shifting torsional spring
- 5: Washer 14.3×25×1.5
- 6: Circlip 14

Installation of Gear Shifting Arm:

The installation and disassembly sequences are reverse.

Tighten the bolt to 10N·m.

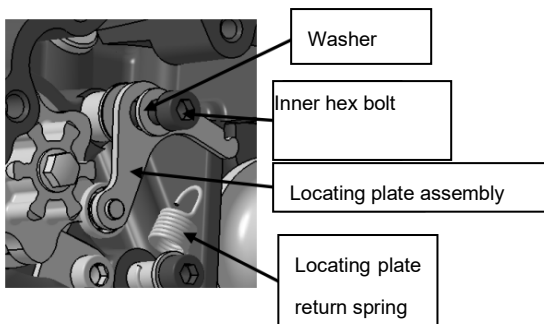


1: Gear shifter arm assembly

Locating Plate

Disassembly of locating plate:

1. Loosen the locating plate return spring.
2. Loosen inner hex, Bolt, and take down bolt and washer.



3. Take down the locating plate assembly.

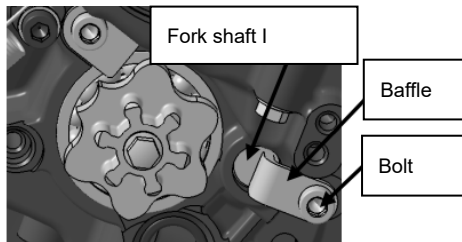
Installation of Locating Plate:

The installation and disassembly sequences are reverse.
Tighten the bolt to 10N·m.

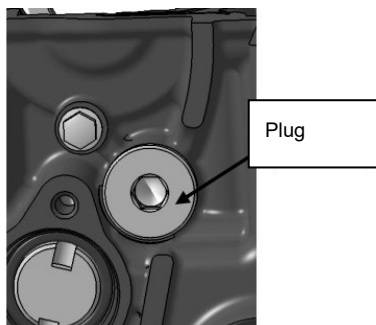
Shifter Fork and Transmission Hub

Disassembly of shifter fork and transmission hub:

1. Remove bolts, and take down fork shaft baffle.

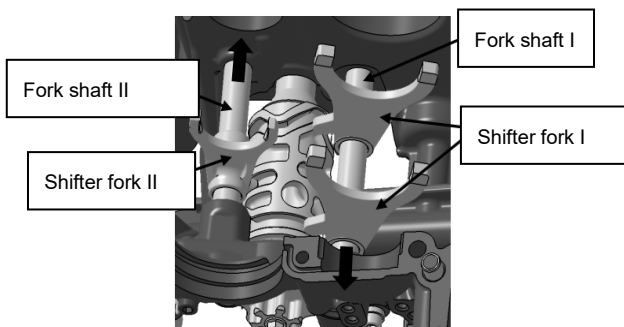


2. Remove bolt M18*1.5.



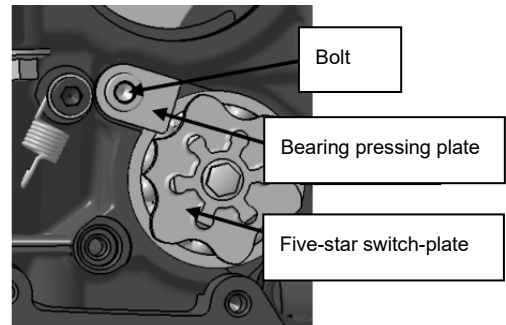
3. Pull out fork shaft I in the direction as shown, and remove two shifter forks I.

4. Pull out fork shaft II in the direction as shown, and remove one shifter fork II.

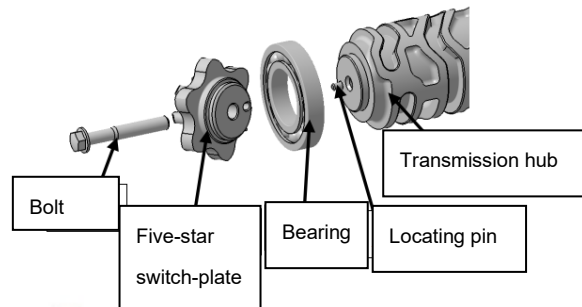


5. Remove bolts, and take down bearing pressing plate.

6. Take out the transmission hub assembly.



7. If necessary, remove bolts from the transmission hub assembly, and take out five-star switch-plate.



Note:

Before taking out fork and fork shaft, mark or record the relative position of each fork in the transmission hub.

Check of shifter fork and transmission hub:

Check if the bearing is damaged or worn; and replace it if necessary.

Check if the fork and transmission hub slot are worn or exceed the service scope; and replace them if necessary.

Installation of shifter fork and transmission hub:

The installation and disassembly sequences are reverse.

Tighten all relevant bolts to 10N·m.

Tighten the plug M18*1.5 to 25N·m.

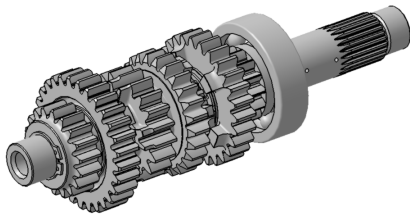
Main Shaft Assembly and Lay Shaft Assembly



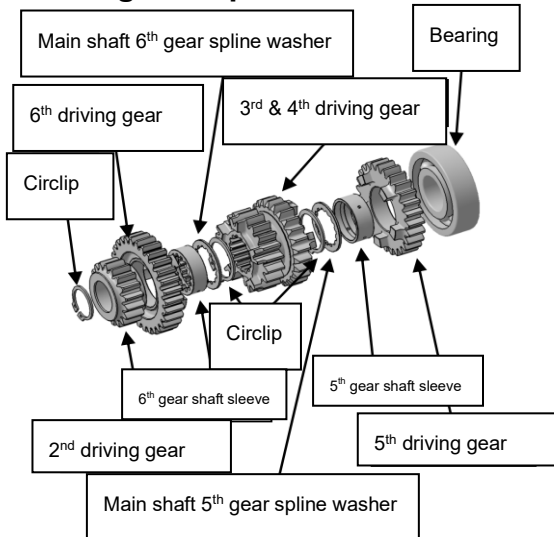
Note:

The gears on the main shaft and lay shaft cannot be completely disassembled or assembled while in use. In case of replacement of gears due to any reasons, the whole main shaft and lay shaft assembly must be replaced.

Main shaft assembly:

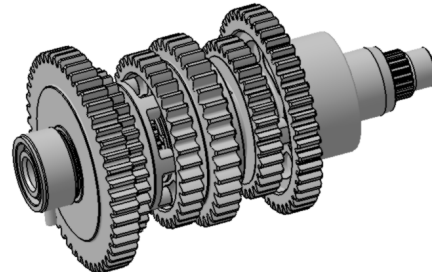


Main shaft gear exploded view:

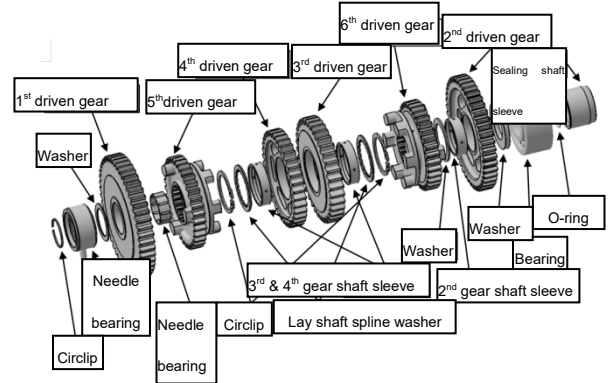


The 2nd driving gear and bearing on both ends of the main shaft are respectively pressed in position, so the parts cannot be disassembled for repairing, and the whole assembly shall be replaced.

Lay shaft assembly:



Lay shaft gear exploded view:



The sealing shaft sleeve of lay shift is pressed in position, so the parts between the 3rd driven gear and sealing shaft sleeve cannot be assembled for repairing, and the remaining parts can be disassembled for repairing.

Check of main shaft assembly and lay shaft assembly:

Check if the gears, bearings, sleeves and circlips are damaged, deformed and exceed the scope of application; and if any, replace them as required.

Cylinder Block and Piston System

Maintenance Notice	Piston ring
Table of Maintenance Criteria	Piston
Cylinder Block	

Maintenance Notice

During the maintenance in this section, problems usually occur in the engine thermal system, and operations such as replacing the piston and cylinder are needed.

The cylinder head and right front cover and other parts need to be removed first.

Before assembling, please check if all the oil ducts are unblocked and clean them.

Clean all components and parts with cleaning agent and dry them with compressed air. Finally, apply oil to the parts which relatively move, such as piston pin.

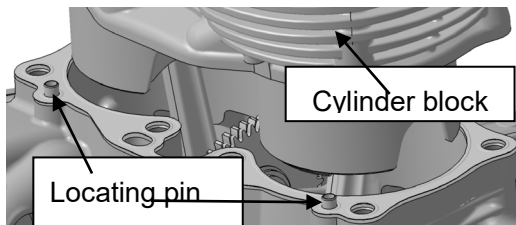
Cylinder Head and Piston Technical Specification and Maintenance Criteria

Piston diameter		98.570~98.580mm (standard value)
		98.530mm (limit value)
Clearance between piston ring and ring groove	Ring A	0.02~0.07mm (standard value)
		0.085mm (limit value)
	Ring B	0.02~0.06mm (standard value)
		0.075mm (limit value)
Width of piston ring groove	Ring A	1.21~1.24mm (standard value)
	Ring B	1.01~1.03mm (standard value)
	Oil ring	2.51~2.53mm (standard value)
Closed piston ring clearance	Ring A	0.183~0.383mm (standard value)
		0.503mm (limit value)
	Ring B	0.353~0.553mm (standard value)
		0.673mm (limit value)
	Oil ring	0.153~0.703 mm (standard value)
		0.843mm (limit value)
Internal diameter of piston ring pin hole		21.004~21.012mm (standard value)
		21.040mm (limit value)
Piston pin diameter		20.995~21.000mm (standard value)
		20.985mm (limit value)
Diameter of the connecting rod pin hole		1.50~1.85mm

Cylinder Block

Disassembly of cylinder block:

1. Clean up the foreign matters (such as carbon deposit) in the cylinder hole to prevent the them from falling into the crankcase when taking the cylinder block.
2. Hold the piston horizontal, and lift the cylinder block up.
3. Remove the cylinder block, and prevent 2 locating pins from falling into the crankcase.



4. Remove the sealing gasket of the cylinder block.



Note:

Do not knock on the radiator fins when removing the cylinder block, because the radiator fins are easily damaged.



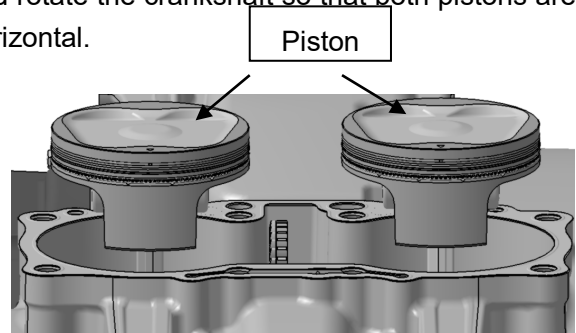
Note:

When removing the cylinder block, support the piston to prevent its surface from striking the crankcase and damaging it.

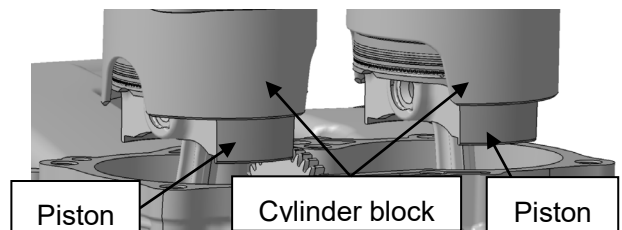
Installation of Cylinder Block:

1. Clean the mating surface of crankcase and cylinder block, and pay attention not to damage the mating surface.
2. Install a new cylinder block sealing gasket.

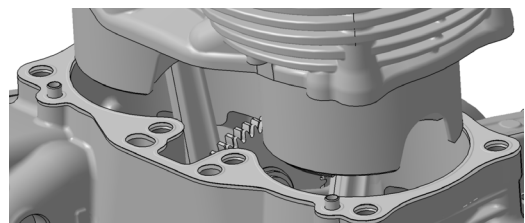
3. Use a suitable tool to support the pistons to prevent them from contacting with the crankcase, and rotate the crankshaft so that both pistons are horizontal.



4. Make sure that the piston ring opening is facing the correct position.
5. Apply clean oil to the piston ring and cylinder block bore hole.
6. With the help of an assistant, carefully put the cylinder block bore hole on the piston, and put the piston ring into the bore hole.
7. Fully insert 3 piston rings into the bore hole and remove the piston support tool.



8. Install 2 locating pins of the cylinder block, and make sure that the cylinder block sealing gasket is installed in place.



9. Continue installing the cylinder block downward to the locating pin.

Piston Ring

Disassembly of piston ring:

1. Expand the piston ring A outward from the opening and remove it from the piston.
2. Remove the piston ring B in the same way.
3. And then remove the oil ring.



Note:

Manually press the piston ring to take it out, control your force, and do not overexert to damage the piston ring.

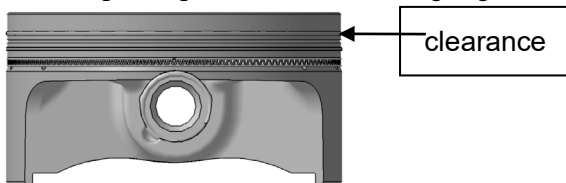


Note:

If the piston ring is to be reused, place the piston and piston ring together to ensure that they can be installed at the original positions.

Check of Clearance Between Piston Ring and Ring Groove:

1. After the piston rings are properly installed on the piston, measure the clearance between each ring and groove with a feeler gauge.



2. When checking the clearance, please refer to the specification table.



Notes:

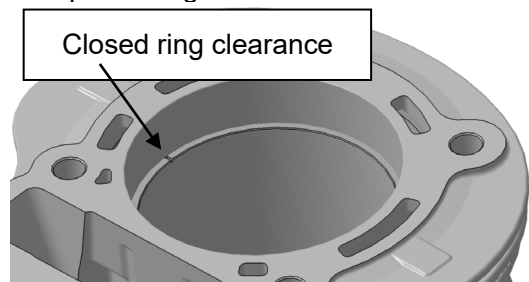
If the clearance is too large, please replace with a new piston ring.

If the clearance is still too large after the new piston ring is stalled, please replace the piston.

If the clearance is too small, carefully check if the piston ring and ring groove are deformed; if necessary, replace the piston, but don't polish the ring groove with a file.

Check of closed piston ring clearance:

1. Place the piston ring on top of the cylinder block bore hole.
2. Use the top of the piston to press the piston ring down into the bore hole until the third ring groove of the piston is flush with the top of the cylinder block.
3. Remove the piston, and use a feeler gauge to measure the clearance between both ends of the piston ring.



4. When checking the closed piston ring clearance, please refer to the Parameters.
5. Repeat the said procedure for the remaining piston rings.



Notes:

If the closed ring clearance is too large, please replace with a new piston ring.

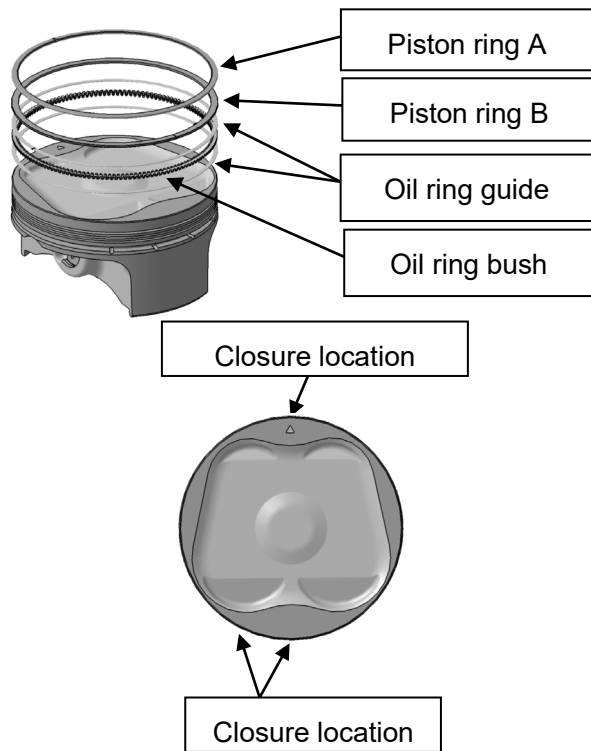
If the clearance is still too large after the new piston ring is stalled, please replace the piston and cylinder block together.

If the clearance is too small, carefully check if the cylinder block bore hole is deformed; if necessary, replace it, but don't polish the piston ring with file.

Installation of piston ring:

1. Clean up the ring groove of the clean piston ring.
2. Install the oil ring bush to the piston, then install the upper and lower oil ring guides (both are identical and reversible).
3. Install piston ring B to the piston, and make sure that its marked side is facing up.
4. Install piston ring A to the piston, and make sure that its marked side is facing up.
5. Make sure that all piston rings move freely in their ring groove.

6. Position piston ring closure as follows.



- * Piston ring A closures' clearance is at 12 o'clock.
- * Piston ring B closures' clearance is at 6 o'clock.
- * The first oil ring guide closures' clearance is at 12 o'clock.
- * The second oil ring guide closures' clearance is at 6 o'clock.
- * Oil ring bush closures' clearance is at 7 o'clock.



Note:

When manually installing the piston ring, control your force, and do not overexert to damage the piston ring.



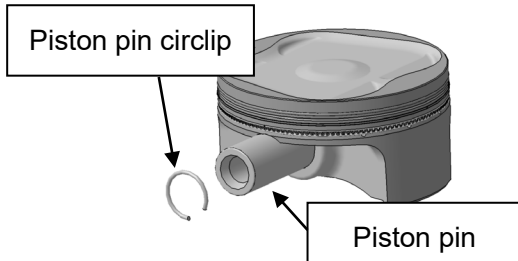
Note:

Piston ring A and piston ring B have different shapes, so they are interchangeable.

Piston

Disassembly of piston:

1. Remove the piston pin circlip from one side of the piston.
2. Push the piston pin towards the side where the circlip is removed and remove it.



3. Remove the piston.
4. Remove the remaining piston pin circlips from the piston.
5. Remove the piston ring.



Note:

Note that the piston pin circlip does not fall into the crankcase, otherwise the engine will be seriously damaged.



Note:

When both pistons are removed, mark left and right and re-install them in the same position.

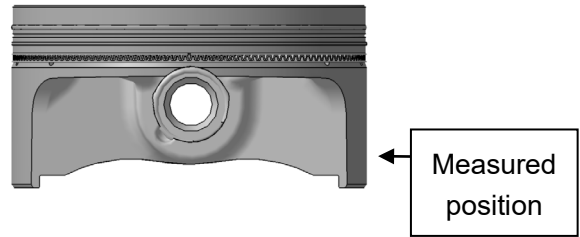


Note:

If the piston pin is found to have difficulty in moving when it is pushed out, check the surface of the piston inner hole for burrs caused by the removal of the piston pin circlip.

Check of piston:

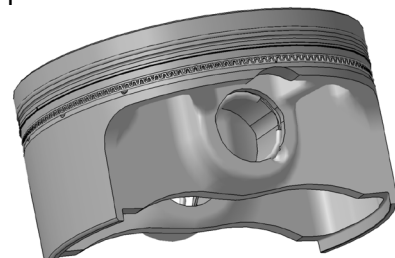
1. Remove carbon deposits from the top of the piston, check the top of the piston for pitting, and check the piston skirt and ring groove for wear. In case of any damage, please replace the piston.
2. Measure the outer diameter of the piston about 10mm upward from the bottom.



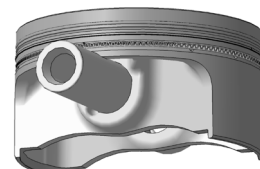
3. Refer to the Technical Specification.
4. If it exceeds the specified scope, please replace the piston and piston ring.

Installation of piston:

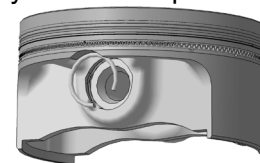
1. Install a new piston pin circlip in the piston pin circlip groove, and ensure that it is fully installed in place.



2. Lubricate the connecting rod small end inner bore and piston pin with clean oil.
3. Align the piston and connecting rod, and make sure that the triangle mark on the top of the piston points towards the front of the engine.
4. Insert the piston pin into the piston and push it fully into the pin hole.



5. Insert the new piston pin circlip into the groove on the other side of the piston, and make sure that it is fully installed in place.



6. Install another piston.

**Note:**

Note that the piston pin circlip does not fall into the crankcase, otherwise the engine will be seriously damaged.

**Note:**

Support the piston to prevent its surface from striking the crankcase and damaging it.

10

Engine Case Cover

Maintenance Notice

Left Crankcase Cover

Oil Pan

Cylinder Head Cover

Front Right Cover

Maintenance Notice

To repair the parts in the engine, remove the corresponding engine case cover for the convenience of repairing.

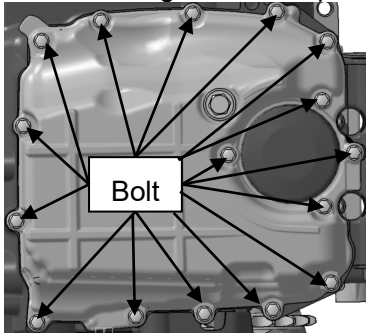
1. Remove the oil pan - for repairing oil-water pump, etc.;
2. Remove the front right cover - for repairing magneto, etc.;
3. Remove the left crankcase cover - for repairing the clutch, etc.;
4. Remove the cylinder head cover - for adjusting valve clearance, etc.;

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

Oil Pan

Disassembly of oil pan:

1. Drain the engine oil, and take down oil filter (refer to the replacement of engine oil and oil filter).
2. Remove the fixing bolts of oil pan.



3. Take down oil pan from the lower crankcase.
4. Take down the drain pipe of water pump.
5. Replace the four O-ring seals on the drain pipe.



Note:

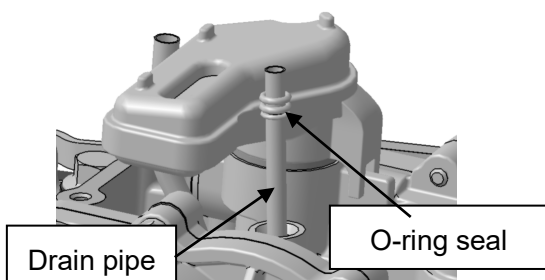
Do not insert screwdriver or similar tools into assembling surface to separate oil pan, or the sealing surface will be damaged.

Check of oil pan:

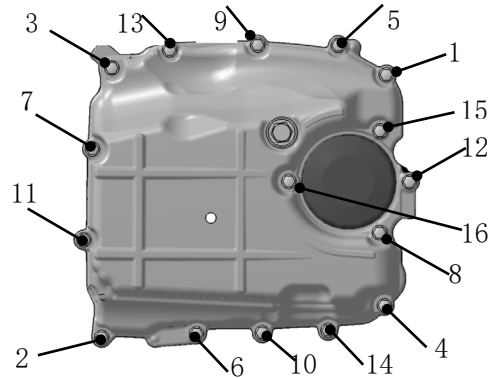
1. Check whether the inside of the coarse filter is blocked. In case of blockage or foreign matter, please remove and clean it.

Installation of oil pan:

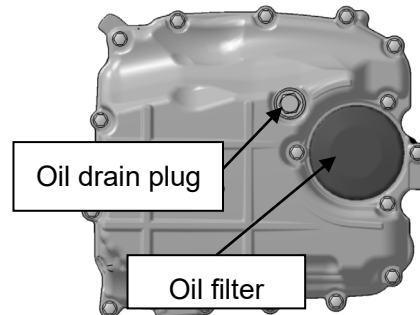
1. Install new O-ring seals (respectively two on both ends of drain pipe), and install the drain pipe onto the oil-water pump.



2. Replace with new oil pan sealing gasket, and locate the oil pan at the mounting position of the lower crankcase.
3. Tighten the fixing bolts of oil pan to 10N·m in the sequence as shown below.



4. Replace with new oil drain bolt washer, re-install the oil drain bolt, and tighten it to 25N·m.
5. Apply a thin layer of clean oil onto the sealing ring of the new oil filter, and use a wrench to tighten to 10N·m.



Note:

Increase engine speed above idle. Before the oil reaches all parts of the engine, the engine should not run at a high speed, otherwise it will cause the engine to be damaged or stuck. Only after the engine idles for 30s can the engine speed be increased so that the oil can be fully circulated.

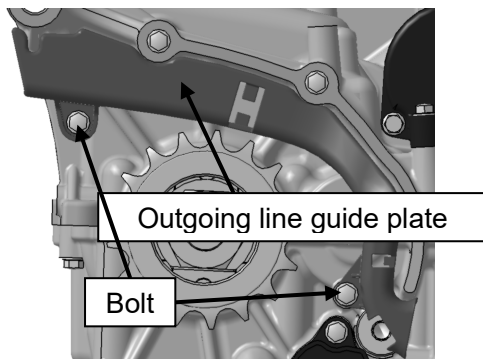
**Note:**

If the engine oil pressure is too low, the oil pressure alarm light will be on; if the light is still on when the engine is running, immediately stop the engine and find out the cause, otherwise the operation of the engine at a low oil pressure can cause engine damage.

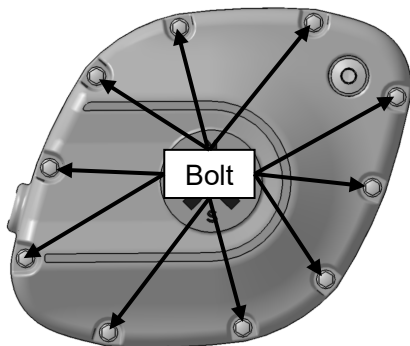
Front Right Cover

Disassembly of front right cover:

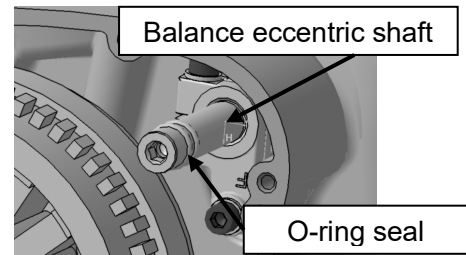
1. Loosen the fixing bolts of guide plate, remove outgoing line guide plate from the crankcase, and discharge magneto line.



2. Place an oil tray below the front right cover to collect oil that may spill during removal.
3. Loosen the fixing bolts of front right cover.



4. Take down the front right cover from the crankcase carefully.
5. Clean the sealing gasket on the crankcase and front right cover.
6. Take down the O-ring seal from the balance eccentric shaft.

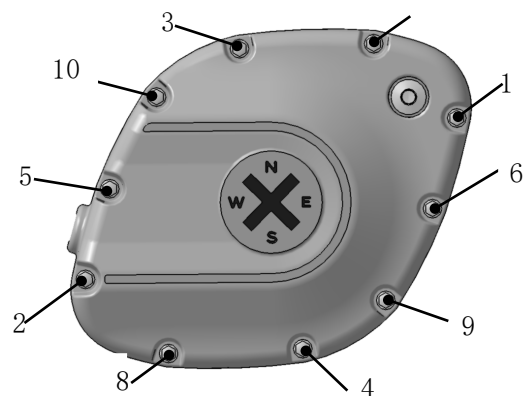


Note:

Do not insert screwdriver or similar tools into assembling surface to separate the front right cover, or the sealing surface will be damaged.

Installation of front right cover:

1. Replace with the new O-ring seal on the balance eccentric shaft.
2. Use new front right cover sealing gasket, and install the front right cover onto the crankcase.
3. Tighten the fixing bolts to 10N·m in the sequence as shown below. 7

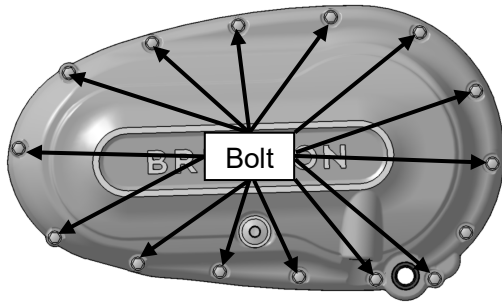


4. Carefully place the magneto outgoing line and other harnesses into the outgoing line guide plate.
5. Install the outgoing line guide plate onto the upper crankcase, and tighten it to 4N·m.

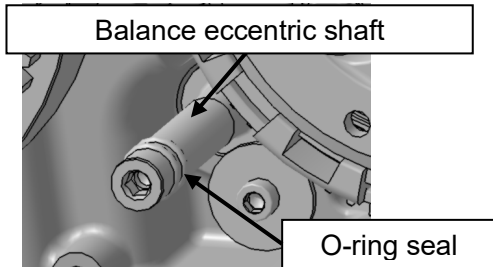
Left Crankcase Cover

Disassembly of left crankcase cover:

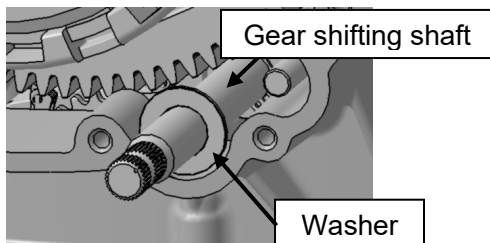
1. Place an oil tray below the crankcase cover to collect oil that may spill during removal.
2. Loosen the fixing bolts of left crankcase cover.



3. Take down the left crankcase cover from the crankcase carefully.
4. Clean the sealing gasket on the crankcase and left crankcase cover.
5. Take down the O-ring seal from the balance eccentric shaft.



6. Note the washer on the gear shifting shaft.

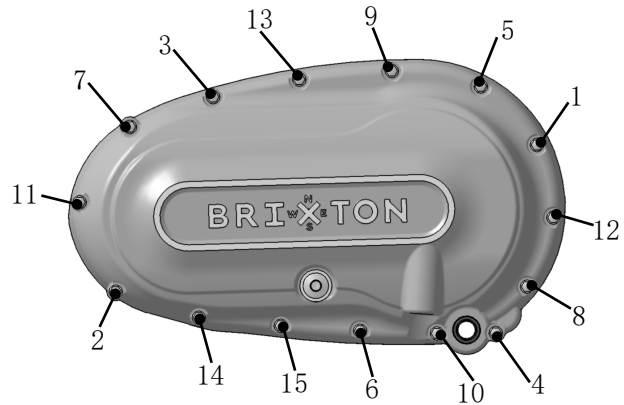


Note:

Do not insert screwdriver or similar tools into assembling surface to separate the left crankcase cover, or the sealing surface will be damaged.

Installation of left crankcase cover:

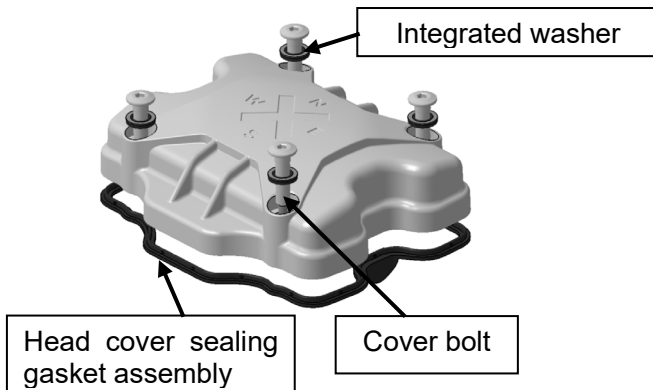
1. Note the washer on the gear shifting shaft.
2. Replace with the new O-ring seal on the balance eccentric shaft.
3. Use new left crankcase cover sealing gasket, and install the left crankcase cover onto the crankcase.
4. Tighten the fixing bolts to 10N·m in the sequence as shown below.



Cylinder Head Cover

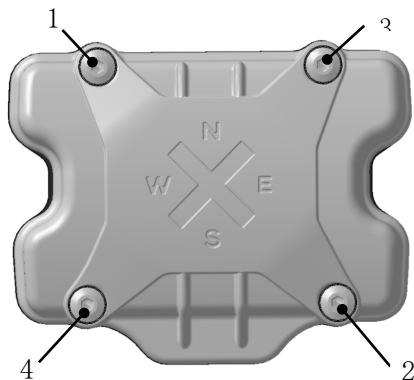
Disassembly of cylinder head cover:

1. Unscrew the cover bolts.
2. Take down the cover from the cylinder head carefully.
3. Take down the integrated washer and head cover sealing gasket assembly.
4. Clean the residual oil on the cylinder head cover.



Assembly of cylinder head cover:

1. Install a new head cover sealing gasket assembly on the head cover, and make sure that the gasket fits properly in the groove of the head cover.
2. Place the head cover onto the cylinder head. Ensure that the sealing gasket is correctly installed at the correct position of cylinder head.
3. Install the new integrated washer.
4. Tighten the cover bolts to 14N·m in the sequence as shown below.



Balance Shaft System

Maintenance Notice	Assembly of Front Balance Shaft
Disassembly of Rear Balance Shaft	Assembly of Rear Balance Shaft
Disassembly of Front Balance Shaft	Balance Shaft Movement Adjustment
Check of Balance Shaft	

Maintenance Notice

During maintenance mentioned in this section, to repair crankshaft, balance shaft or shift mechanism, the upper and lower crankcases shall be separated, which is called crankcase separation. Before crankcase separation, the following parts and components of engine shall be removed:

1. Left crankcase, clutch and gear shift mechanism;
2. Front right cover;
3. Oil pan, oil-water pump assembly and coarse filter assembly;

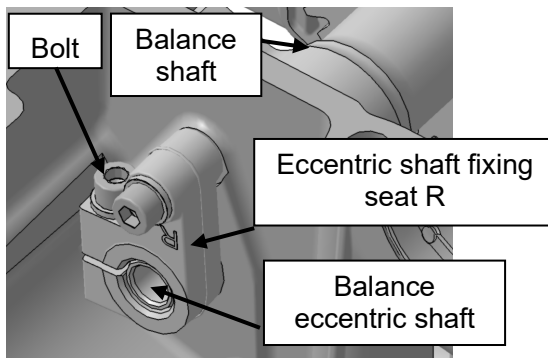
The engine can be turned over without dismantling the cylinder head, cylinder block, piston and other parts, and the crankcase can be dismantled with the lower crankcase facing upward.

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

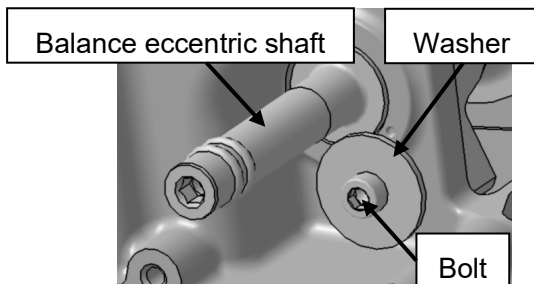
Balance Shaft System

Disassembly of rear balance shaft:

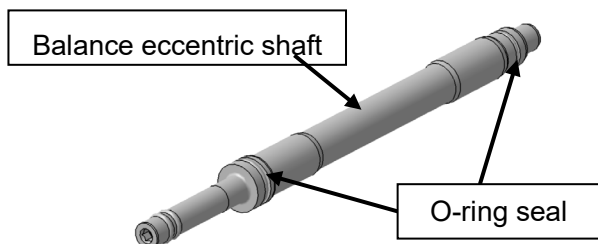
1. Loosen but not remove the fastening bolts of the balance eccentric shaft.



2. Take down the washer and bolt on the lower crankcase as shown in the figure.

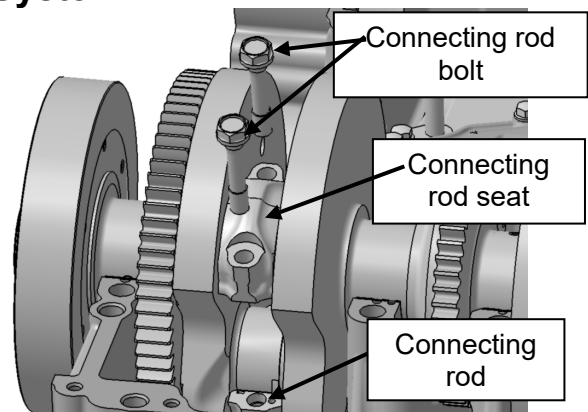


3. Support the balance shaft, and slide the balance eccentric shaft to remove along this direction.
4. Take down the balance shaft.
5. Take down the O-ring seal from the balance eccentric shaft.

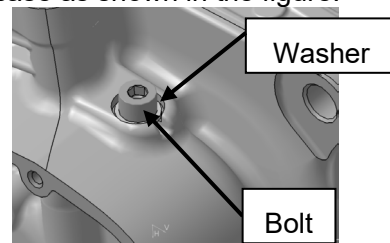


Disassembly of front balance shaft:

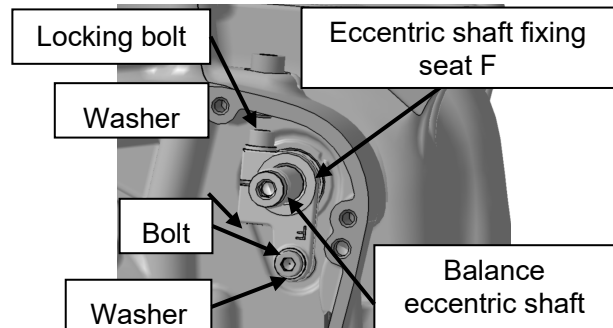
1. Take down the connecting rod bolts.



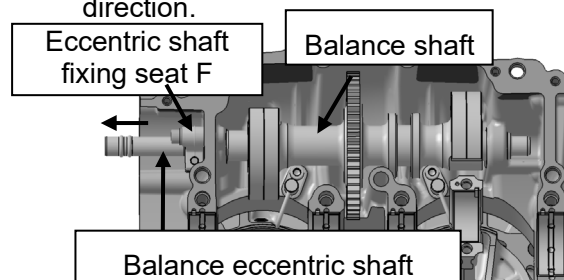
2. Take down the crankcase.
3. Take down the bolt and washer on the upper crankcase as shown in the figure.



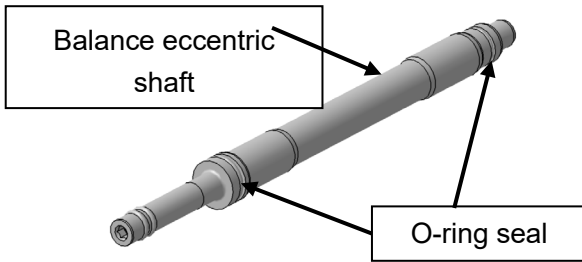
4. Loosen but not remove the fastening bolts of the balance eccentric shaft.



5. Take down the fastening bolt and washer of the eccentric shaft fixing seat F.
6. Support the balance shaft, and slide the balance eccentric shaft to remove along this direction.



7. Take down the balance shaft.
8. Take down the O-ring seal from the balance eccentric shaft.

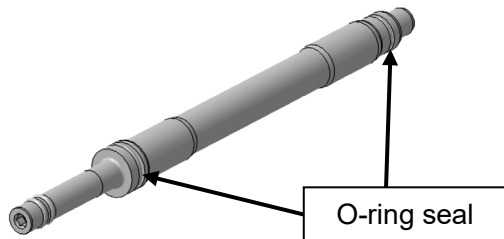


Check of balance shaft:

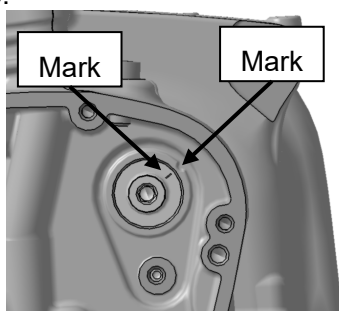
1. Check if all gears are damaged.
2. Check if the upper bearing of the balance shaft is worn or damaged, and if it runs stably without being stuck.

Assembly of front balance shaft:

1. Install the new O-ring seal on both ends of the balance eccentric shaft.

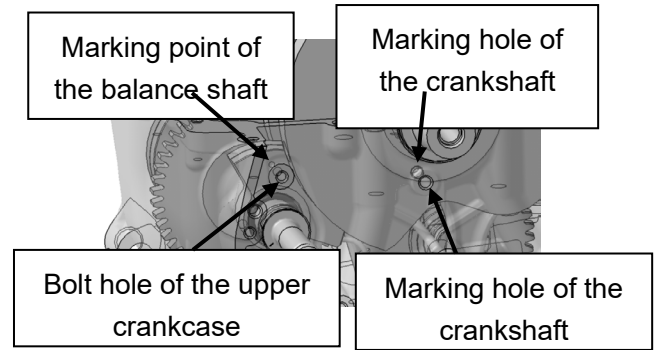


2. Apply clean oil to the O-ring on the balance eccentric shaft and the needle bearing on the balance shaft.
3. In the reverse order of disassembly, support the balance shaft and pay attention to its direction, and install the balance eccentric shaft onto the upper crankcase.
4. Rotate and adjust the balance eccentric shaft to align its mark with that of the upper crankcase.

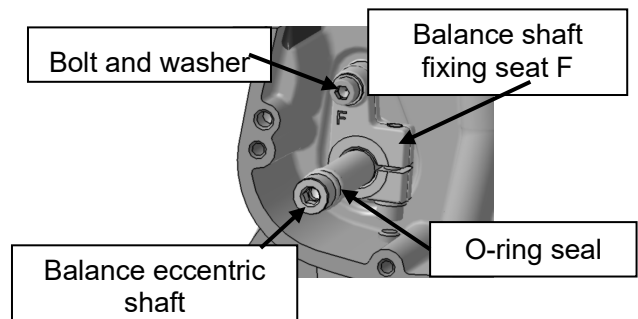


5. Clean the upper crankshaft bearing bush, apply clean oil, and install the crankshaft.
6. Pay attention to the phase relation between the crankshaft and the front balance shaft. When the marking hole of the crankshaft coincides with the marking hole of the upper crankcase, the marking point of the balance shaft coincides with

the bolt hole of the crankcase.

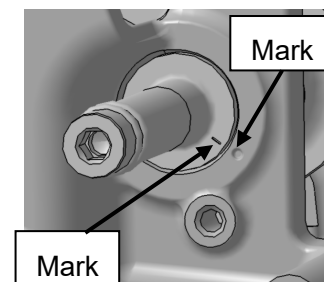


7. Fix the marking hole of the crankshaft and the marking hole of the upper crankcase with tools.
8. Install the balance shaft fixing seat F, install bolt and washer and fasten them to 10N·m.
9. Install two new O-ring seals on the balance eccentric shaft.



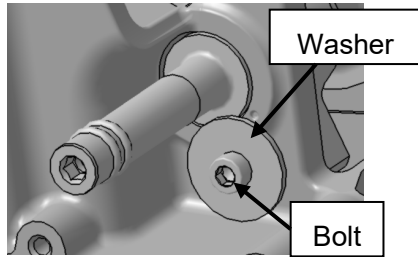
Assembly of rear balance shaft:

1. Install the new O-ring seal on both ends of the balance eccentric shaft.
2. Apply clean oil to the O-ring on the balance eccentric shaft and the needle bearing on the balance shaft.
3. In the reverse order of disassembly, support the balance shaft and pay attention to its direction, and install the balance eccentric shaft onto the lower crankcase.
4. Note that the other end of the balance shaft should be installed into the balance shaft fixing seat R.
5. Rotate and adjust the balance eccentric shaft to align its mark with that of the lower crankcase.

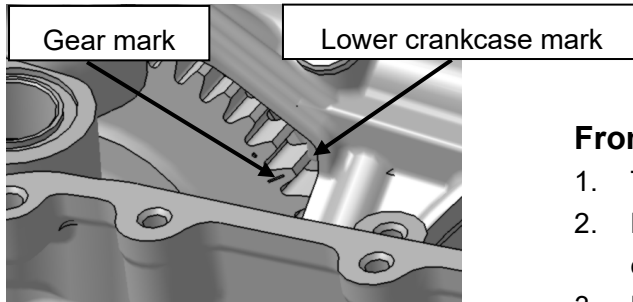


6. Install washer and bolt, and tighten the

bolt to 10N·m.



7. The mark on the rear balance shaft gear shall align with the mark on the lower crankcase.



Balance shaft operating adjustment:



Note:

The engine must reach its normal operating temperature before adjustment of the front and rear balance shafts.

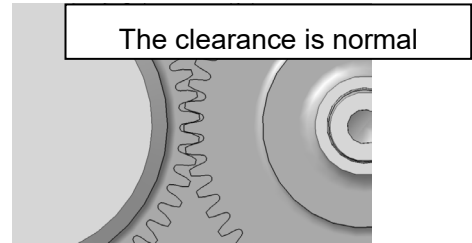
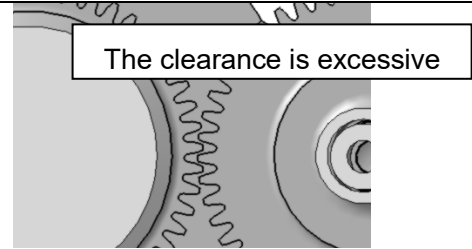
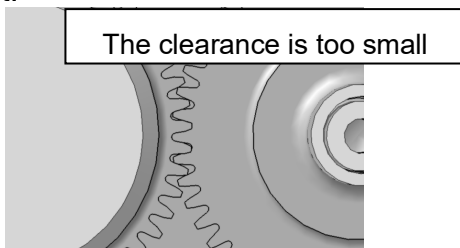


Notes:

If the clearance between the balance shaft gear and the crankshaft gear is too small, the teeth and bearing will make a whine due to the increased load.

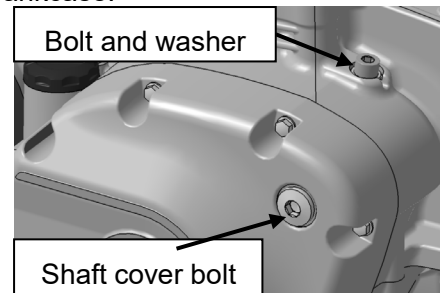
If the clearance between the balance shaft gear and the crankshaft gear is excessive, it will make a rattle due to the increased clearance.

The front and rear balance shafts must be adjusted at the same time. Separate adjustment may cause engine whining or damage to the engine due to unsatisfactory adjustment.

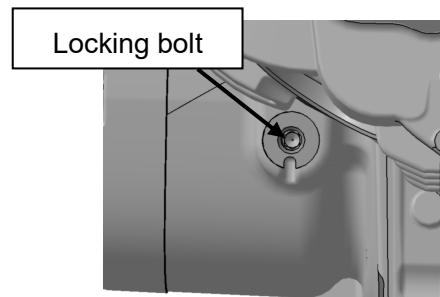


Front balance shaft adjustment:

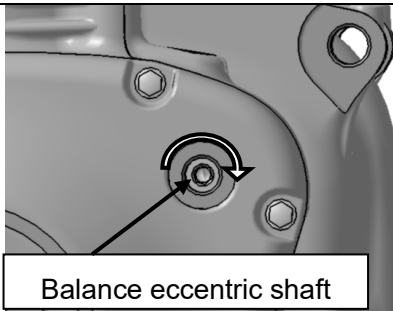
1. Turn off the engine.
2. Remove shaft cover bolt from the right front cover.
3. Remove the bolt and washer from the upper crankcase.



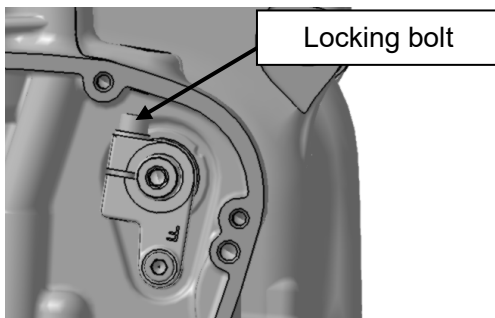
4. Loosen the balance eccentric shaft locking bolt from the bolt hole and rotate it up to two times so that the balance eccentric shaft can rotate smoothly.



5. Install but not tighten the bolt and washer.
6. Start the engine and keep it at idle speed.
7. Gently rotate the balance eccentric shaft clockwise until a whine sound is heard; and counterclockwise rotate the balance eccentric shaft until no longer hear the whine.



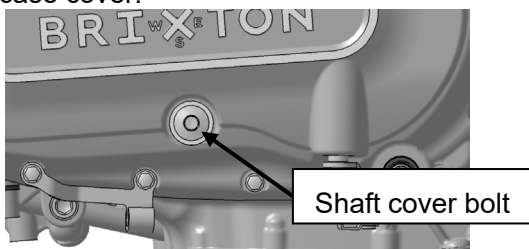
8. Turn off the engine.
9. Remove the bolt and washer from the upper crankcase.
10. Tighten the locking bolt of the balance eccentric shaft to 10N·m.



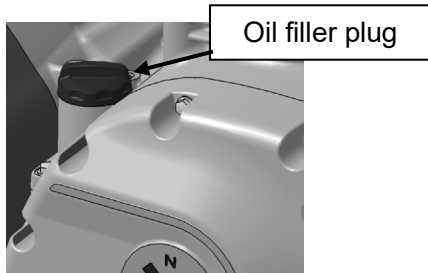
11. Clean up spilled oil around each bolt hole.
12. Install the bolt and washer, and tighten to 23N·m.
13. Install the shaft cover bolt and tighten it to 3N·m.

Rear balance shaft adjustment:

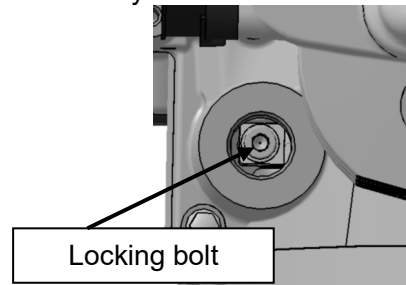
1. Remove shaft cover bolt from the left crankcase cover.



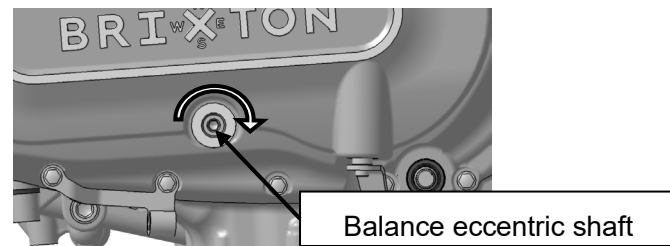
2. Remove the oil filler plug from the upper crankcase, and check if the O-ring seal has to be replaced.



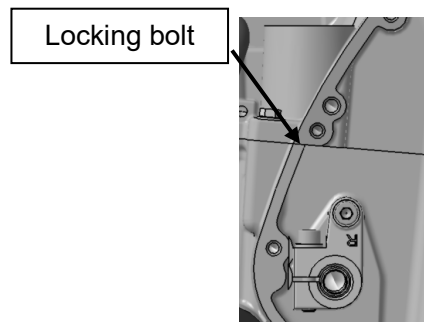
3. Loosen the balance eccentric shaft locking bolt from the oil filler plug hole and rotate it up to two times so that the balance eccentric shaft can rotate smoothly.



4. Install the oil filler plug and O-ring.
5. Start the engine and keep it at idle speed.
6. Gently rotate the balance eccentric shaft clockwise until a whine sound is heard; and counterclockwise rotate the balance eccentric shaft until no longer hear a whine sound.

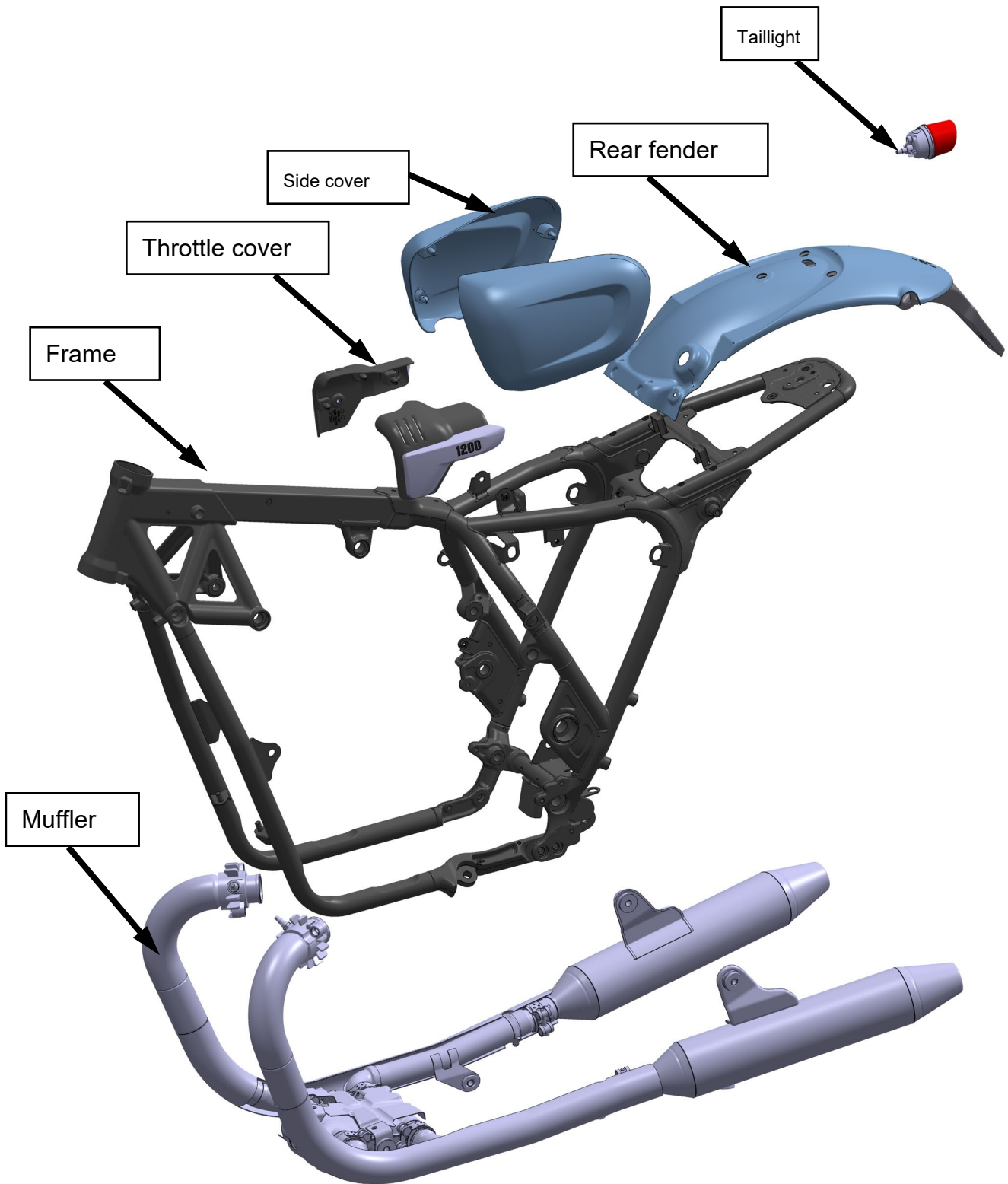


7. Shunt down the engine.
8. Take down the oil filler plug.
9. Tighten the locking bolt of the balance eccentric shaft to 10N·m.



10. Clean up spilled oil around each bolt hole.
11. Install the oil filler plug and O-ring, and tighten to 3N·m.
12. Install the shaft cover bolt and tighten it to 3N·m.

Frame and Exhaust System



11

Frame and Exhaust System

Maintenance Notice	Disassembly/Installation of Rear Fender
Troubleshooting	Disassembly/Installation of Exhaust Muffler
Covering Parts, Headlight and Instrument	Taillight Assembly

Maintenance Notice

When maintaining this part, be careful not to scratch and damage the covering parts, instruments and lights.

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

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

Key torques

Fastening screw of handhold **18-25N·m**

Troubleshooting

∞

Excessive noise

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

∞

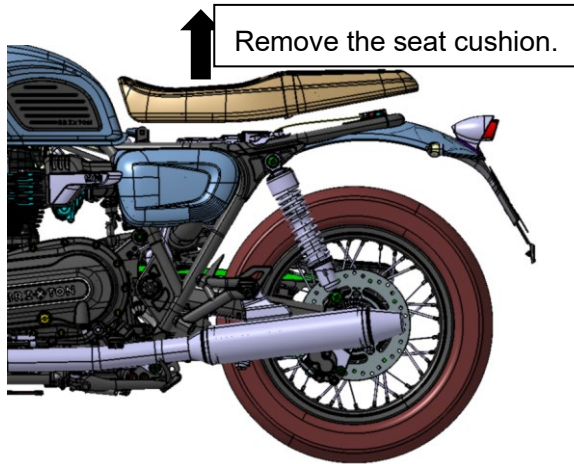
Abnormal operation

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

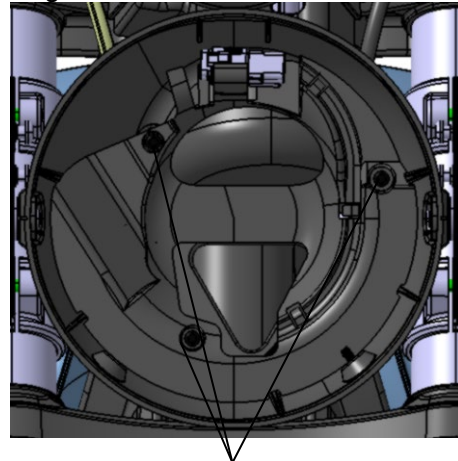
Covering Parts, Headlight and Instrument

Disassembly steps of covering parts, headlight and instrument:

1. Place the motorcycle on a side stand, open the seat lock and remove the seat cushion.



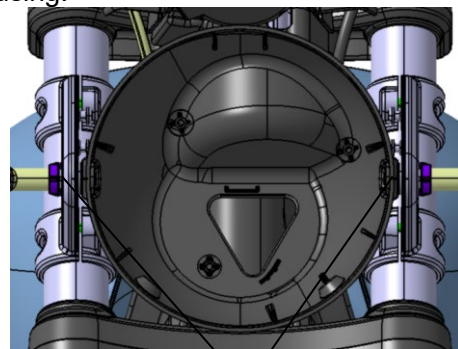
5. Remove self-tapping screws, take down cover, and disconnect the connector in the light housing.



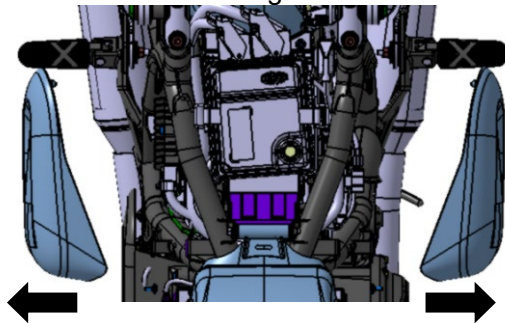
2. Take down the left and right throttle decorating covers.



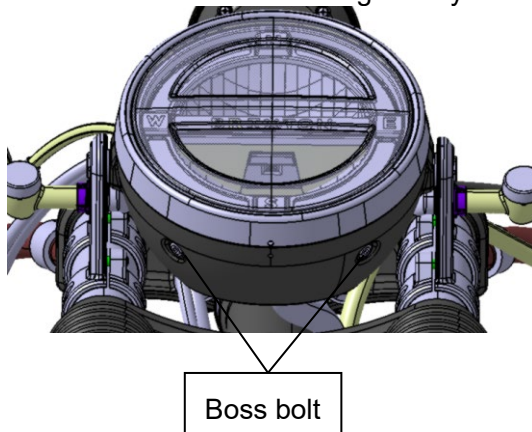
6. Remove the headlight mounting bolts with the inner hexagon tool and remove the light housing.



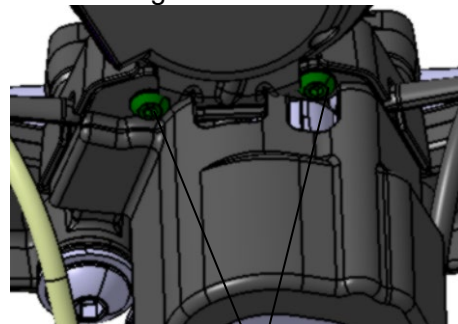
3. Remove the left and right covers



4. Remove the boss bolts with the inner hexagon tool and remove the headlight body.



7. Remove the mounting bolts of ignition switch trim cover with the inner hexagon tool and take down the ignition switch trim cover.

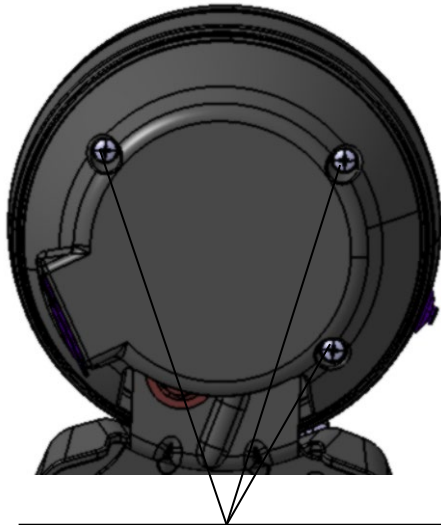


8. Use a tool to remove the mounting bolts of instrument lower cover and take down the instrument lower cover.



Note:

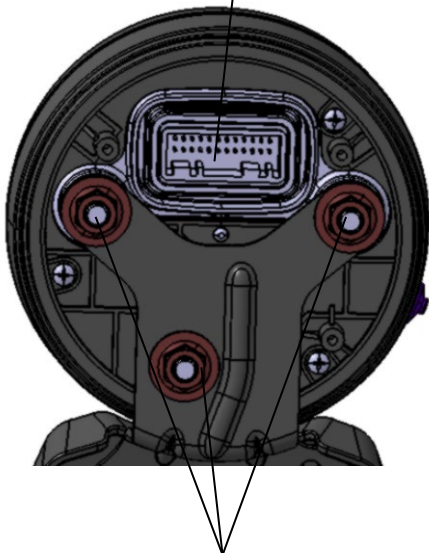
Do not scratch the surface of covering parts and break the buckle during disassembly and installation.



Mounting screw of instrument lower cover

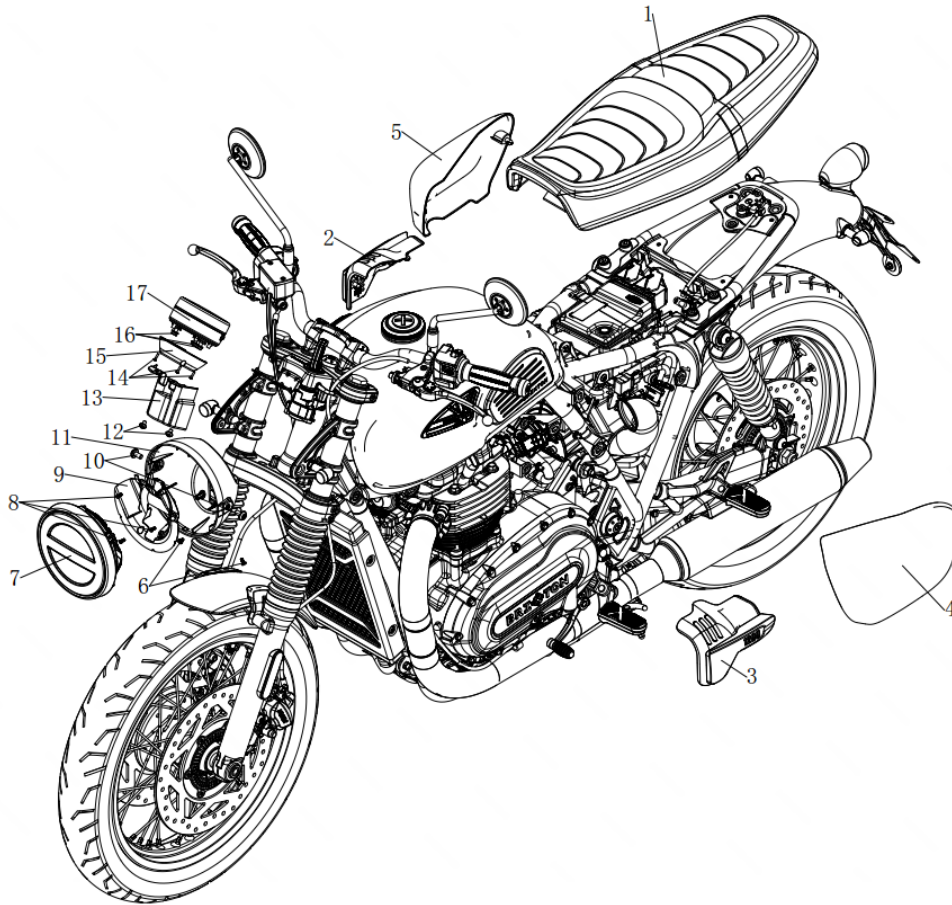
9. Use a tool to remove the mounting nuts of instrument and take down the instrument connector and the instrument.

Instrument connector



Mounting nuts of instrument

The assembly of covering parts, headlight and instrument shall be in the said order.

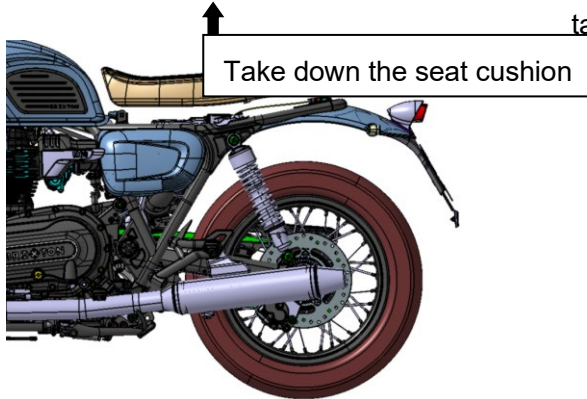


Sequence	Step	Quantity	Remark
	Disassembly sequence		The installation and disassembly are in a reverse sequence.
1	Seat cushion component	1	
2	Right throttle decorating cover	1	
3	Left throttle decorating cover	1	
4	Left cover assembly	1	
5	Right cover assembly	2	
6	M5 boss bolt	2	
7	Headlight body	1	
8	Self-tapping screw	3	
9	Cover plate	1	
10	Headlight mounting bolt M8×16	2	
11	Light housing	1	
12	Mounting bolt of ignition switch trim cover	2	
13	Ignition switch trim cover	1	
14	Mounting screw of instrument lower cover	3	
15	Instrument lower cover	1	
16	Mounting nut of instrument	3	
17	Instrument	1	

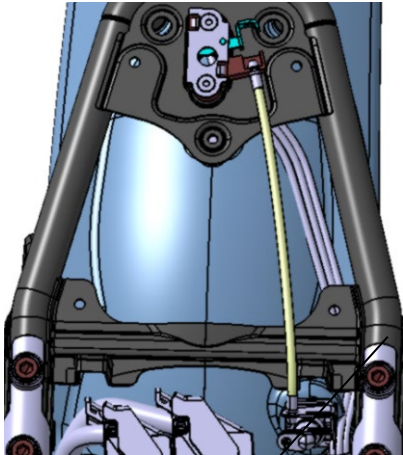
Rear Fender and Taillight Assembly

Disassembly steps of rear fender and taillight:

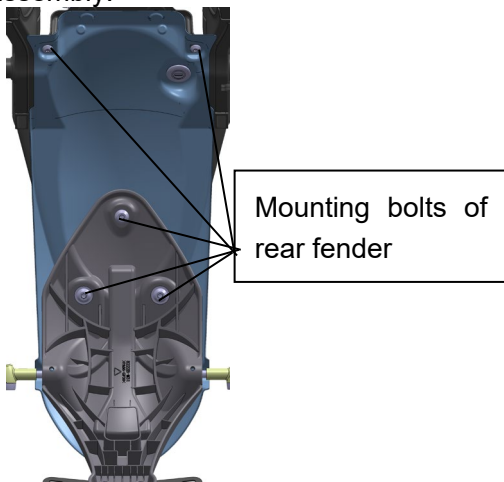
1. Place the motorcycle on a side stand, open the seat lock and remove the seat cushion.



2. Take down the seat cushion lacing wires



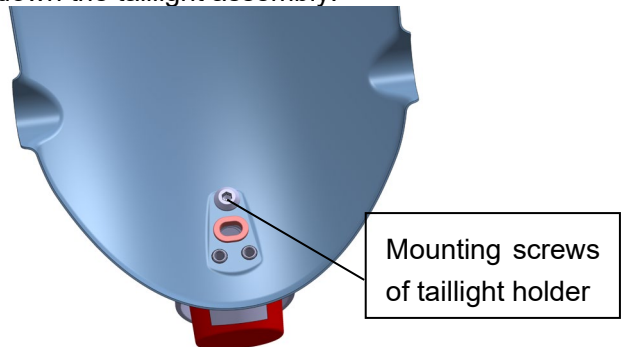
3. Remove the mounting bolts of rear fender with the inner hexagon tool and take down the rear fender assembly.



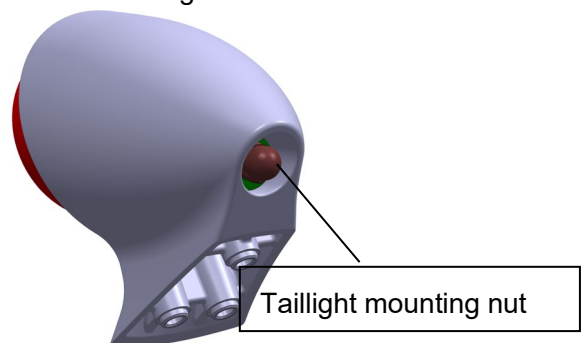
4. Remove the connecting bolts of rear fender rear section taillight holder and rear fender with the inner hexagon tool and take rear down the taillight assembly.



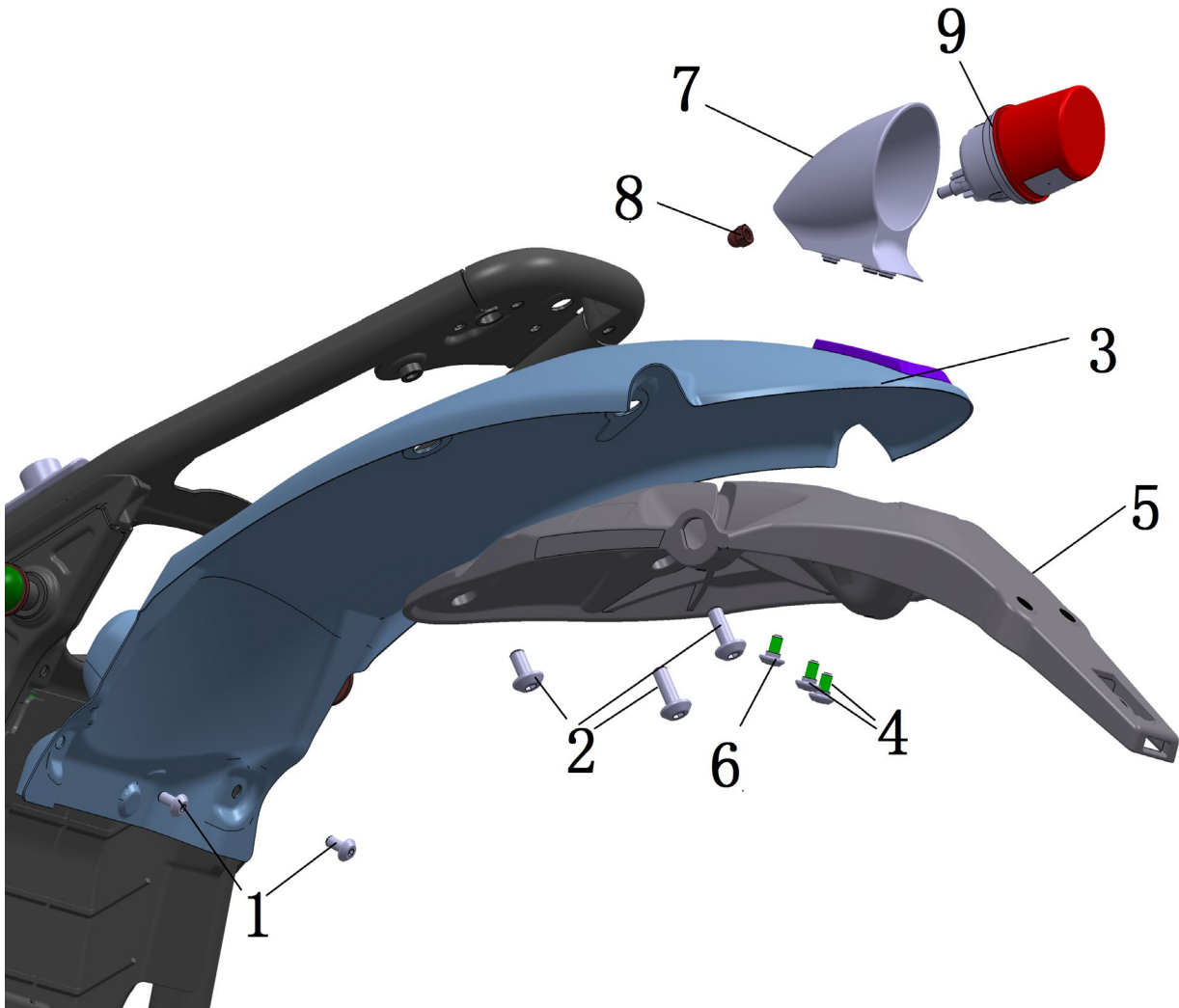
5. Remove the connecting bolts of taillight holder and rear fender with the inner hexagon tool and take down the taillight assembly.



6. Use a tool to remove taillight mounting nuts, and take down the taillight.



Disassembly/Installation of Rear Fender and Taillight

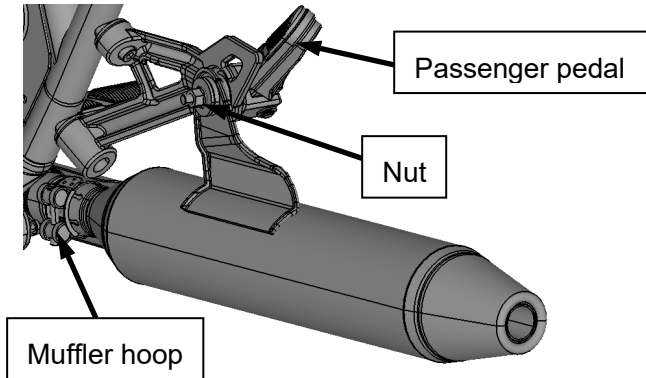


Sequence	Step	Quantity	Remark
	Disassembly sequence		The installation and disassembly are in a reverse sequence.
1	Remove the front assembling bolt of rear fender	2	
2	Remove the rear assembling bolt of rear fender	3	
3	Remove the rear fender assembly	1	
4	Remove the assembling bolt of rear fender rear section	2	
5	Remove the rear fender rear section	1	
6	Remove the fastening screw of taillight holder	1	
7	Remove the taillight holder and taillight assembly	1	
8	Remove the fastening nut of taillight	1	
9	Remove the rear taillight	1	

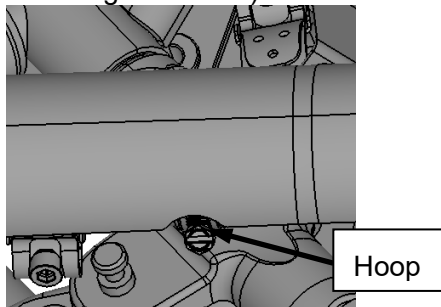
Disassembly/Installation of Exhaust Muffler

Disassembly steps of exhaust muffler:

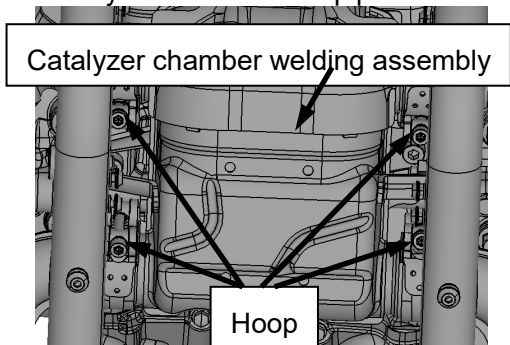
1. Place the motorcycle on a main stand, fold up passenger pedal, remove the muffler fastening nut and loosen the muffler hoop to remove the muffler (same as the left and right mufflers), and be careful of the collision with the rear fork of the frame.



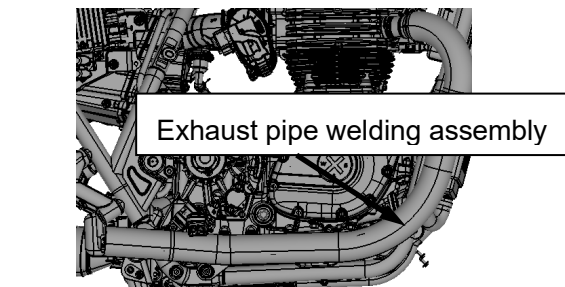
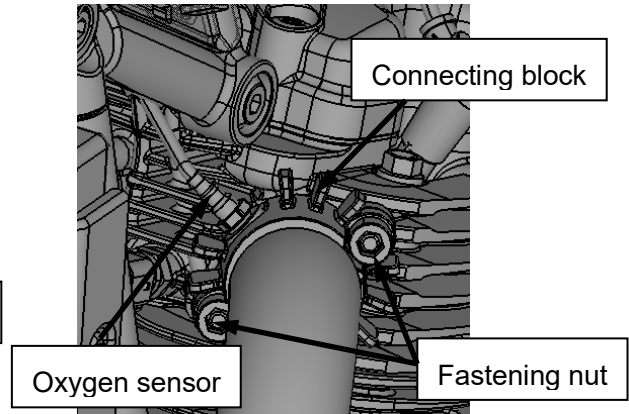
2. Loosen the hoop, and move towards the rear end of the motorcycle until that the insert in the exhaust pipe welding assembly is fully separated (same as the left and right mufflers).



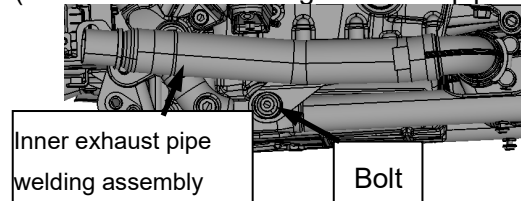
3. Loosen the exhaust pipe hoop at the connection between the catalyzer chamber welding assembly and the exhaust pipe.



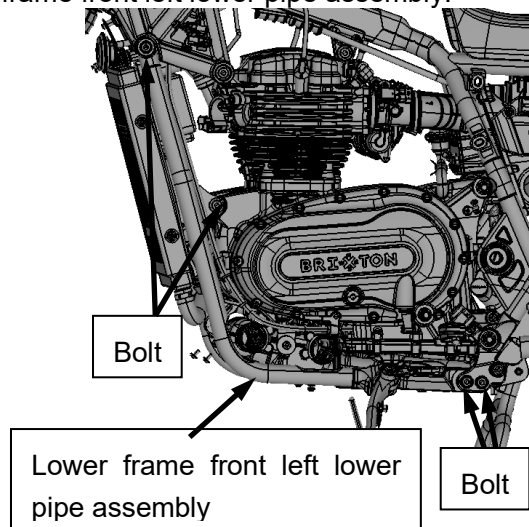
4. Remove the oxygen sensor connector, exhaust pipe fastening nut, connecting block and then exhaust pipe welding assembly (same as the left and right exhaust pipes).



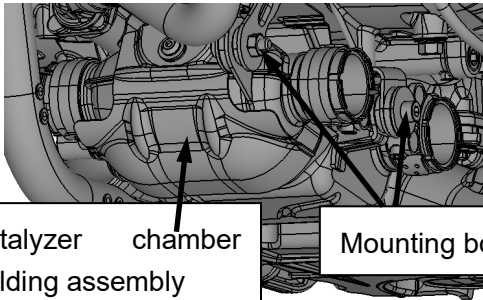
5. Remove the connecting bolts of inner exhaust pipe and frame, and take down the inner exhaust pipe (same as the left and right exhaust pipes).



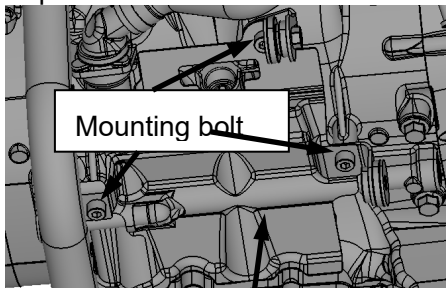
6. If continuing removing the catalyzer chamber, firstly remove the fastening bolts of frame front left lower pipe assembly, and then take down the frame front left lower pipe assembly.



7. Remove the mounting bolts of catalyzer chamber, and remove the catalyzer chamber welding assembly by tilting the left end downward.



8. Remove the mounting bolts of catalyzer chamber suspension plate welding assembly, and then take down the catalyzer chamber suspension plate.



Catalyzer chamber suspension plate welding assembly

Installation steps of exhaust muffler:

Install the rear wheel in the reverse sequence of disassembly.

The exhaust sealing gasket at the exhaust port of the engine, the graphite sealing gasket at the catalyzer chamber and the graphite sealing gasket at the muffler shall be replaced when damaged.

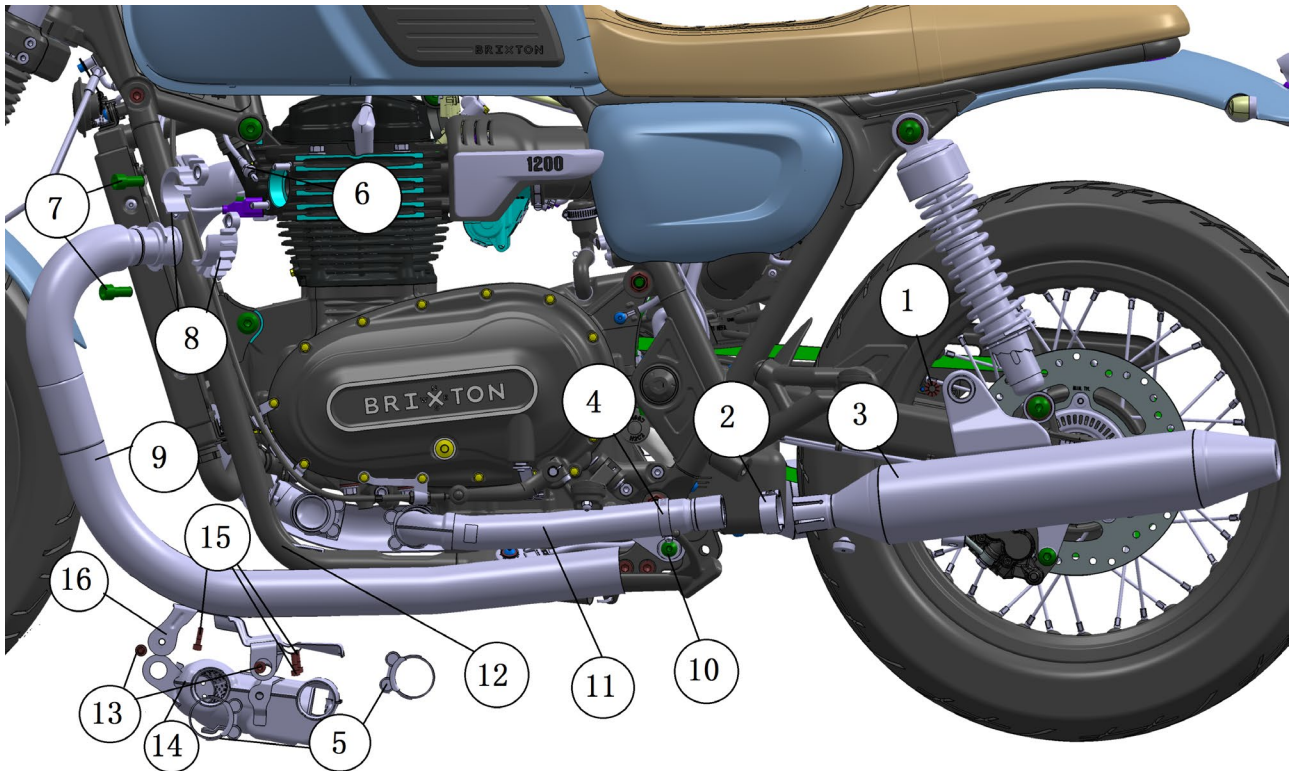
During installation, after exhaust pipe welding assembly and catalyzer chamber welding assembly are pre-installed in position, firstly fasten the fastening nut of exhaust pipe and then fasten the exhaust pipe hoop bolts (position of the hoop on the outer edge; and pay attention to the orientation of the head of hoop bolt), otherwise it will cause air leakage. Muffler hoop shall be fastened to the lining ring of the inner exhaust pipe welding assembly, otherwise the muffler is easy to loose.



Note:

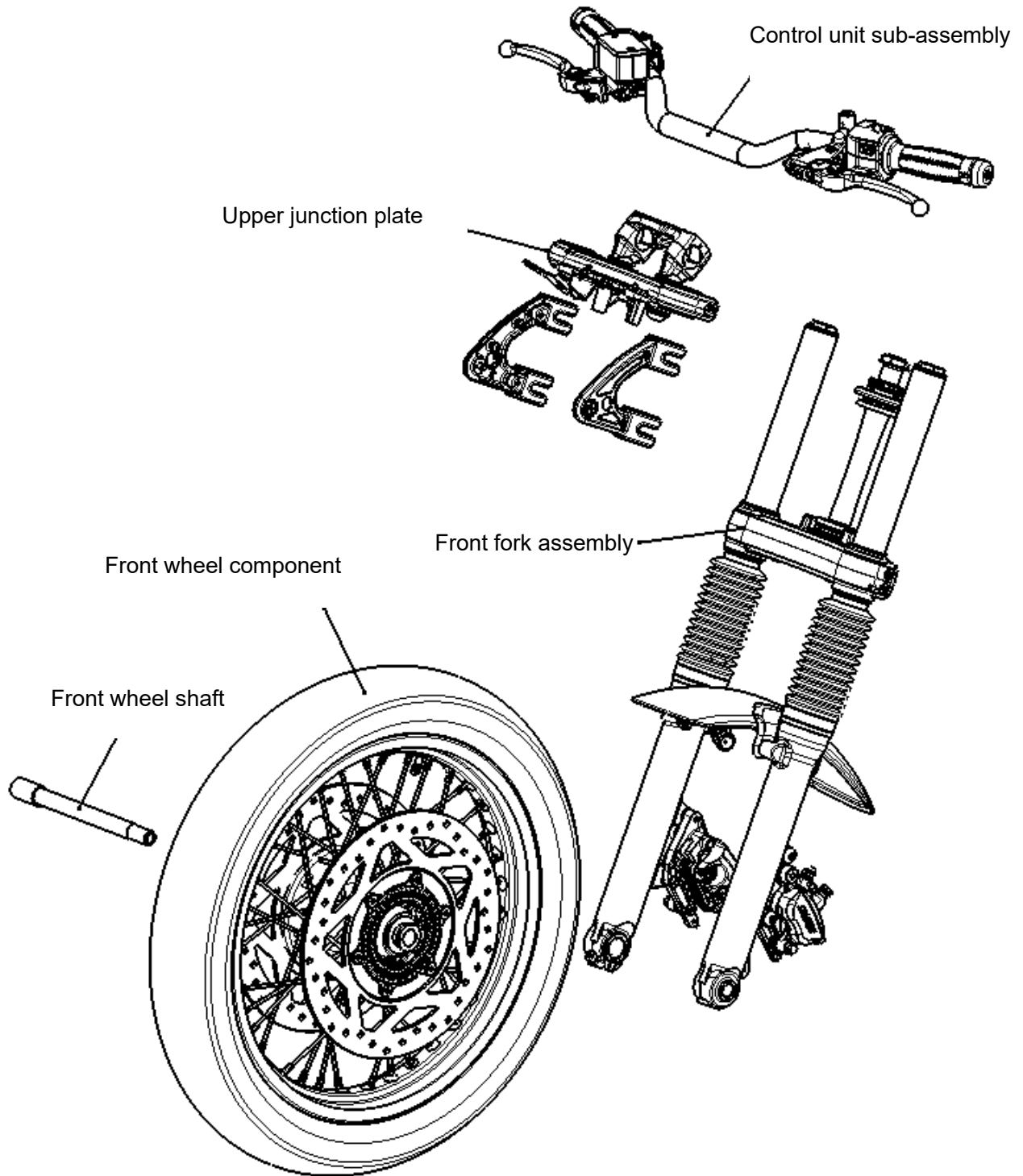
Make sure the muffler is completely cooled before installation, otherwise it could cause burns.

Disassembly/installation of exhaust muffler



Sequence	Step	Quantity	Remark
	Disassembly sequence		The installation and disassembly are in a reverse sequence.
1	Nut M8 (1 for left and right mufflers respectively)	2	
2	Muffler hoop (1 for left and right mufflers respectively)	2	
3	Muffler components (left and right muffler components, including sub-assembly parts such as graphite sealing gasket)	2	
4	Hoop (30-45x12) (1 for left and right exhaust pipes respectively)	2	
5	Exhaust pipe hoop	4	
6	Oxygen sensor (1 for left and right exhaust pipes respectively)	2	
7	Fastening nuts of exhaust pipe (2 for left and right exhaust pipes respectively)	4	
8	Connecting blocks (1 left and right upper connecting blocks respectively, 2 lower connecting blocks)	4	
9	Exhaust pipe welding assembly (left and right exhaust pipes welding assembly)	2	
10	Screw M8x30 (1 for left and right exhaust pipes respectively)	2	
11	Inner exhaust pipe welding assembly (left and right inner exhaust pipes welding assembly)	2	
12	Lower frame front left lower pipe assembly (mounting bolt is as shown on the frame)	1	
13	Screw M8x30 (catalyzer chamber mounting bolt)	2	
14	Catalyzer chamber welding assembly (sub-assembly, including exhaust pipe hoop and graphite sealing gasket, etc.)	1	
15	Screw M8x20	2	
16	Catalyzer chamber suspension plate welding assembly (sub-assembly)	1	

Front Wheel, Front Suspension, Steering Column and Front Brake



12

Front Wheel, Front Suspension, Steering Column and Front Brake

Maintenance Notice	Front wheel
Key Torque Values	Front Suspension
Troubleshooting	Steering Column
Sub-assembly of control unit	Front brake

Maintenance Notice

- When the front wheel is repaired, the motorcycle shall be reliably held up by putting a jack or other support under the engine to keep the front wheel 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 assembly, but go to a professional service shop for repair and maintenance.

Key Torque Values

Front wheel shaft	80~90N·m	Front master brake pump and clutch clip	8~12N·m
Fastening bolt of handle	21~25N·m	Bolt of front fork tube	80~90N·m
Fastening bolt of upper and lower junction plate	21~25N·m	Fastening screw of brake disc	28~32N·m

Troubleshooting

Unstable direction

1. The steering tube bearing is damaged;
2. The tire pressure is insufficient;
3. Tire is damaged;
4. The wheel bearing is damaged;
5. The regulating nut of stem is too tight.

Motorcycle running to one side or not in a 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 wheel spoke is deformed or loose;
4. The front wheel shaft is loose;
5. 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 fork spring is not enough;
2. The hydraulic oil level is too low or the liquid model is wrong.

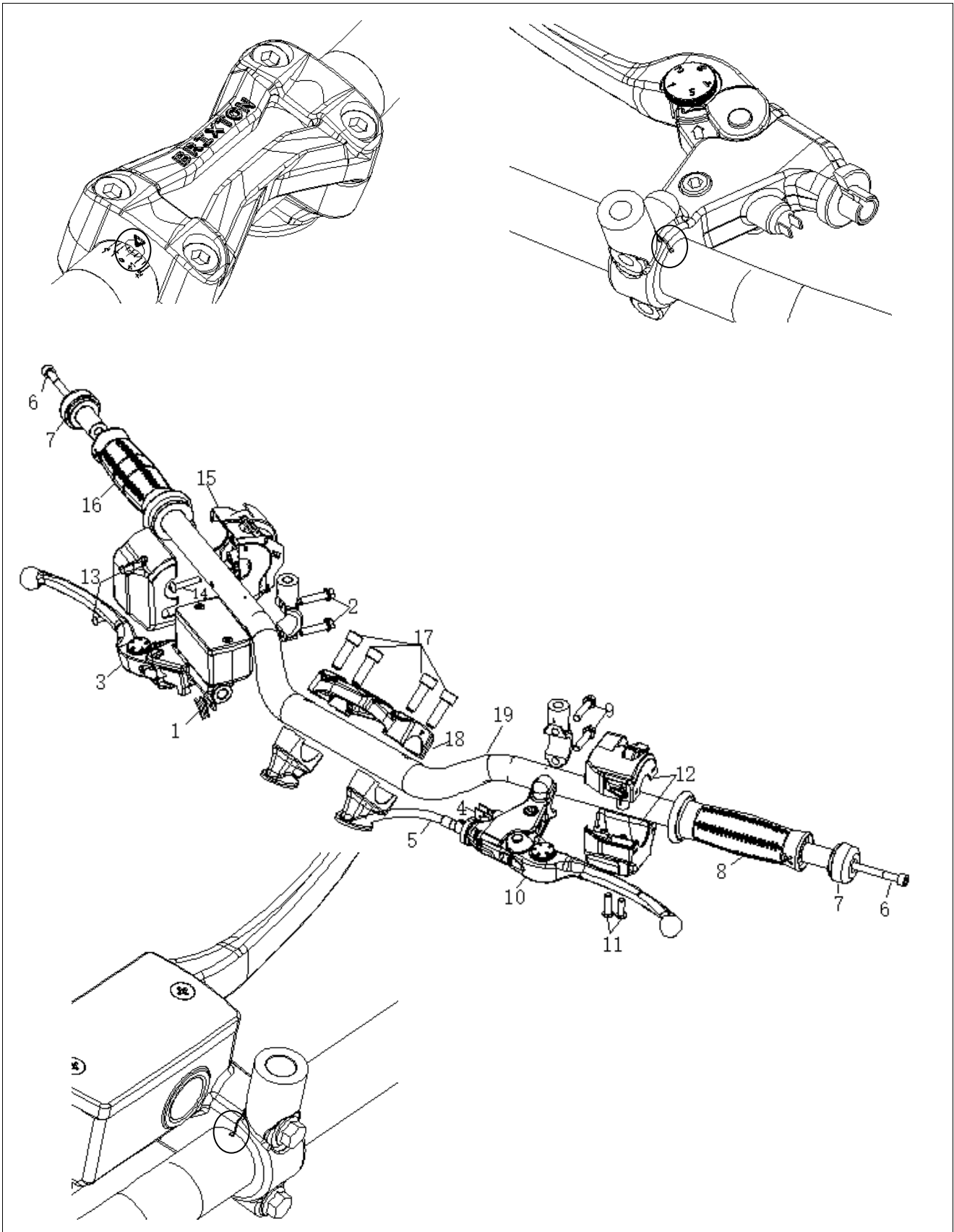
Over-hard of front suspension

1. The hydraulic oil level is too high or the liquid model is wrong.
2. The fork stem of front shock absorber is bended;
3. The damper of front shock absorber is blocked.

Bad performance of brake

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

Disassembly/Installation of Control Unit Sub-assembly



Notes

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, so as to avoid air intrusion into the master cylinder and affecting the braking performance. Do not twist the brake hose.

The opening of clutch handle and front brake cylinder block shall be aligned with the mark of handle tube during installation.

The opening at the back end of the clip shall be aligned with the mark of the handle. The bolts in the front of the clip shall be tightened first, and then the bolts at the back.

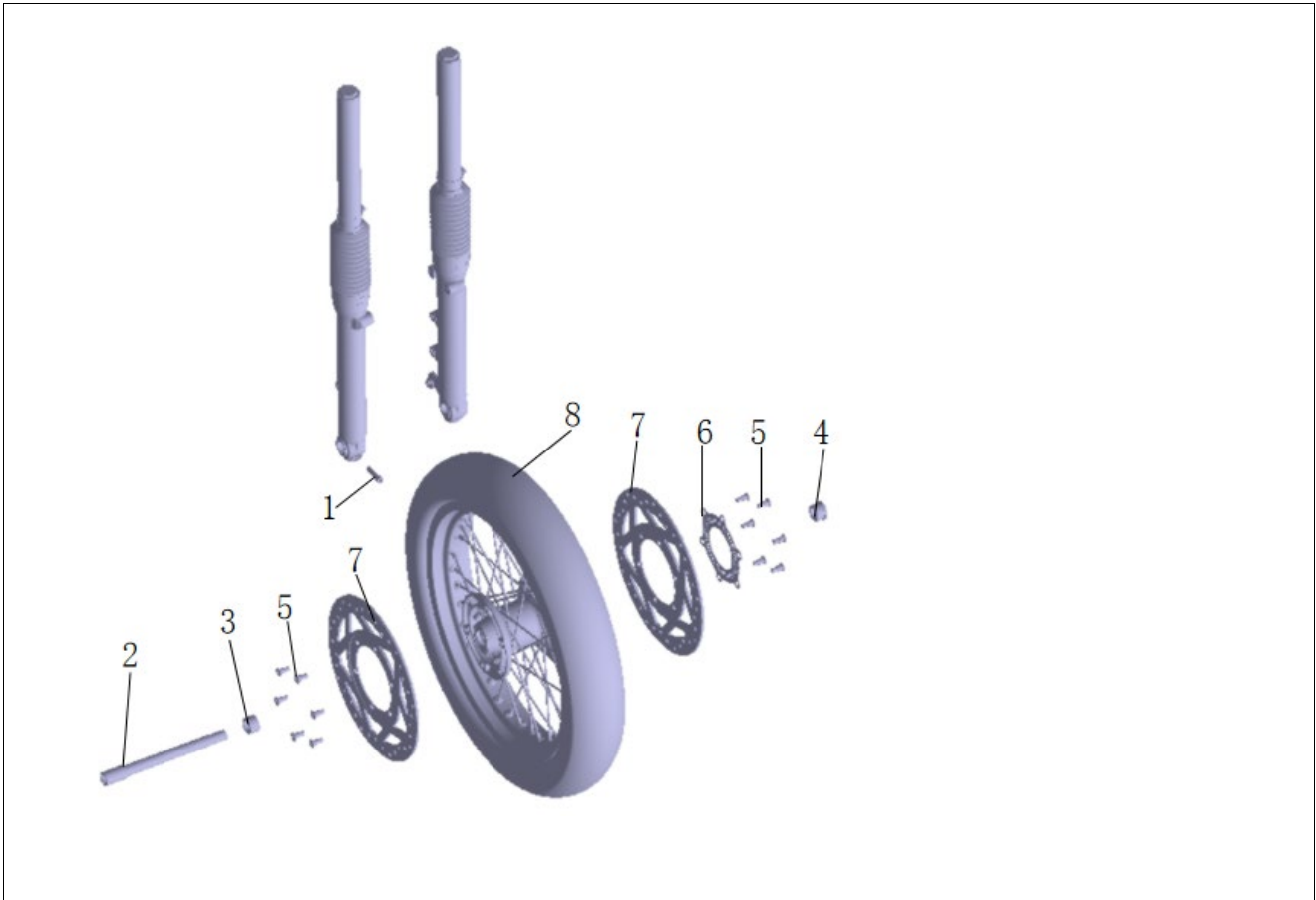
After installation, the control cables of clutch shall be adjusted.

The cables and wiring shall be consistent with the wiring diagram.

Maintenance Requirements

Sequence	Step	Quantity	Remark
Disassembly Sequence		The installation and disassembly are in a reverse sequence.	
1	Plug of brake switch	2	
2	Bolt of clip of front brake master cylinder	2	Notes: 1. Tighten a bolt in the front, then a bolt in the back; 2. The two raised triangle marks on the clip shall face backward.
3	Front brake cylinder block component	1	
4	Plug of clutch switch	2	
5	Clutch cable	1	
6	Bolt of counter weight	2	
7	Counter weight	2	
8	Left handle	1	Align the handle mark with the mark on handle tube
9	Bolt of clutch handle	1	Align the handle opening with the mark on handle tube
10	Clutch handle	1	
11	Screw of left integrated switch	2	Note: First tighten the upper bolt, then the lower bolt.
12	Left integrated switch	1	
13	Screw of right integrated switch	2	Note: First tighten the upper bolt, then the lower bolt.
14	Screw of electronic oil filler	1	
15	Right integrated switch	1	
16	Right handle assembly	1	
17	Bolt of clip	4	Note: First tighten the front bolt, then the rear bolt.
18	Clip	1	
19	Handle tube	1	

Disassembly/Assembly of Front Wheel



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.

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

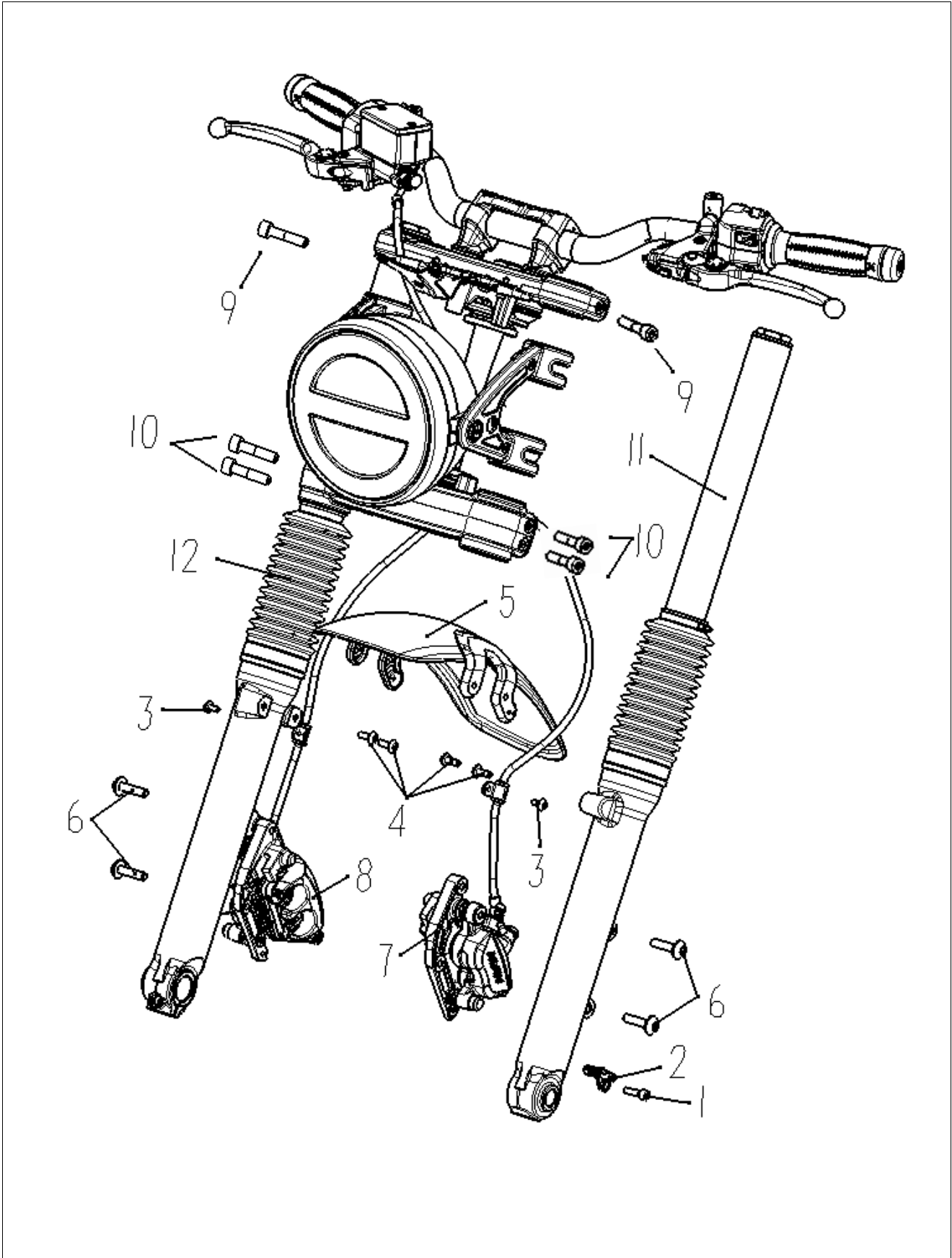
The vehicle bearings shall be replaced in a complete set.

Maintenance Requirements

Sequence	Step	Quantity	Remark
Disassembly Sequence		The installation and disassembly are in a reverse sequence.	
1	Bolt	1	Tightening torque: 21-25N.m
2	Front wheel shaft	1	Tightening torque: 80-90N.m, apply lubricating grease
3	Right shaft sleeve of front wheel	1	Apply lubricating grease during assembly
4	Left shaft sleeve of front wheel	1	Apply lubricating grease during assembly
5	Bolt of front brake disc	12	Tightening torque: 28-32 N·m
6	Front speed signal panel	1	

7	Font brake disc	2	
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Disassembly/Assembly of Front Suspension



Notes

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.

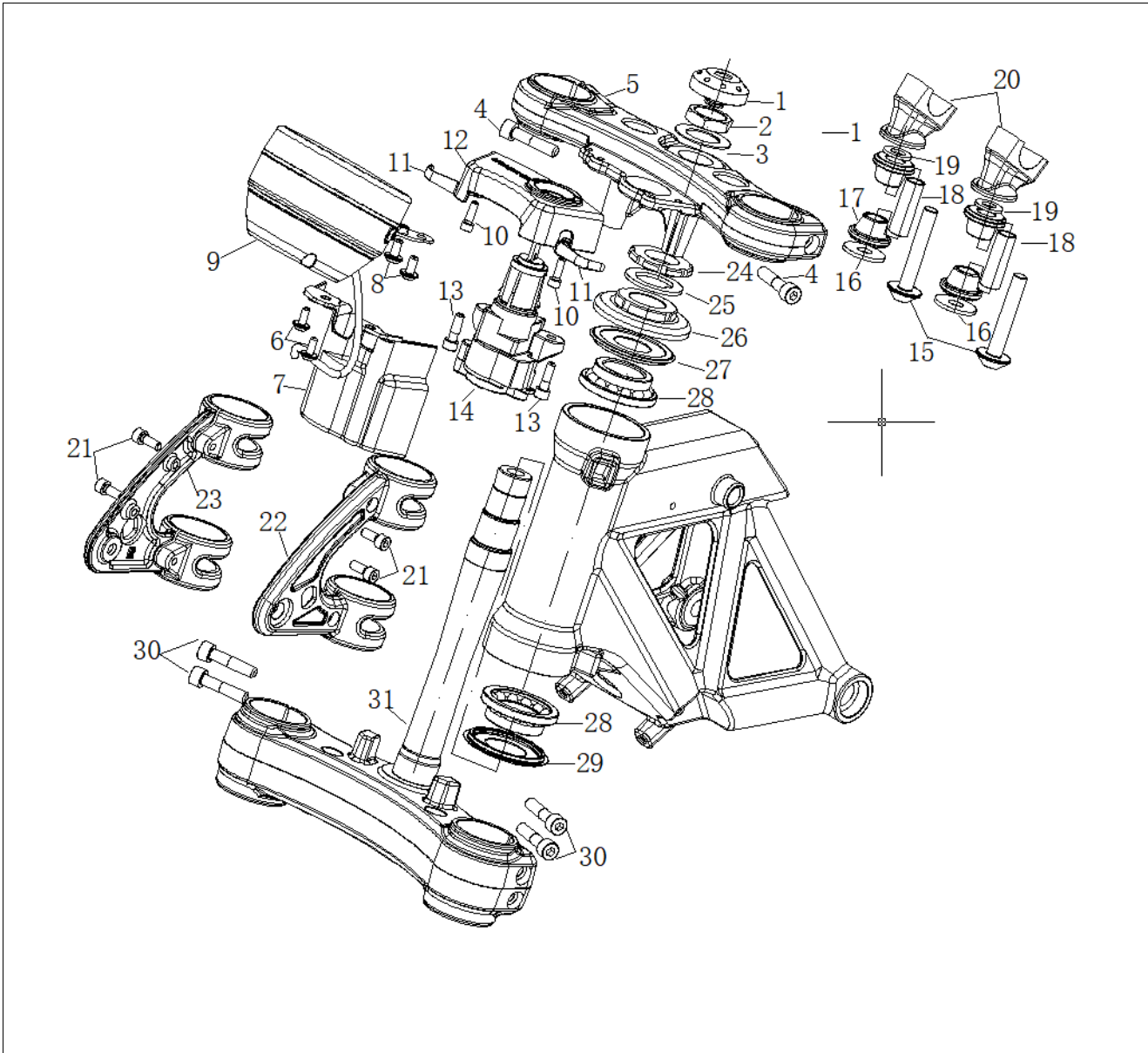
After removing the brake caliper, do not pull the brake handle, otherwise it will be difficult to assemble the front wheel.

Before removing the shock absorber, loosen the lock nut of steering column, but not remove it.

Maintenance Requirements

Sequence	Step	Quantity	Remark
Disassembly Sequence		The installation and disassembly are in a reverse sequence.	
1	Inner hex disc screw M6×20	1	
2	Front wheel speed sensor	1	
3	Fixing screw of brake oil pipe M5×12	2	
4	Mounting bolt of front fender M6×16	4	
5	Front fender	1	
6	Mounting bolt and screw of front brake M8×32	4	Brake torque: 28~32 N·m
7	Front brake caliper assembly (L)	1	Note: The master cylinder of front brake shall be lifted up with steel wire rope and do not twist the brake hose.
8	Front brake caliper assembly (R)	1	Note: The master cylinder of front brake shall be lifted up with steel wire rope and do not twist the brake hose.
9	Mounting screw of upper junction plate M8×30	2	Loose it only and note the falling of shock absorber
10	Mounting screw of lower junction plate M8×35	4	Loose it only and note the falling of shock absorber
11	Front shock absorber (L)	1	
12	Front shock absorber (R)	1	

Disassembly/Assembly of Steering Column



Maintenance Requirements

Sequence	Step	Quantity	Remark
Disassembly Sequence		The installation and disassembly are in a reverse sequence.	
1	Trim cover	1	
2	Steering column nut	1	Assembling torque: 80-90N·m
3	Steering column gasket	1	
4	Mounting screw of upper junction plate	2	
5	Upper junction plate	1	
6	Mounting screw of the trim cover of ignition switch	2	Inner hexangular screw M5×12
7	Trim cover of ignition switch	1	
8	Mounting screw of instrument	2	Inner hexangular screw M6×12
9	Instrument	1	
10	Mounting bolt of anti-theft locking component	2	Inner hexangular screw M5×16
11	Wire hook	2	
12	Anti-theft locking component	1	
13	Mounting screw of ignition switch	2	Screw M2.5×20
14	Ignition switch	1	
15	Raiser base mounting bolt M10X1.25X60	2	Bolt M10×1.25×60, Note: Apply thread sealant during assembly
16	Big washer 10	2	
17	Rubber pad of clip base	4	Note: The rubber pad shall be replaced if aged or cracked.
18	Raiser base liner	2	
19	Flat washer 10	2	
20	Raiser base	2	Note: Apply thread sealant during assembly
21	Mounting screw of headlight bracket	4	Screw M6×16
22	Left headlight bracket	1	
23	Right headlight bracket	1	
24	Regulating nut B	1	Assembling torque: 21-25N·m
25	Regulating nut gasket	1	
26	Regulating nut A	1	Assembling torque: 5-8N·m, rotate the steering column repeatedly during assembly
27	Steering column dust-proof ring A	1	Apply sufficient lubricating grease during assembly
28	Thrust bearing	2	Apply sufficient lubricating grease during

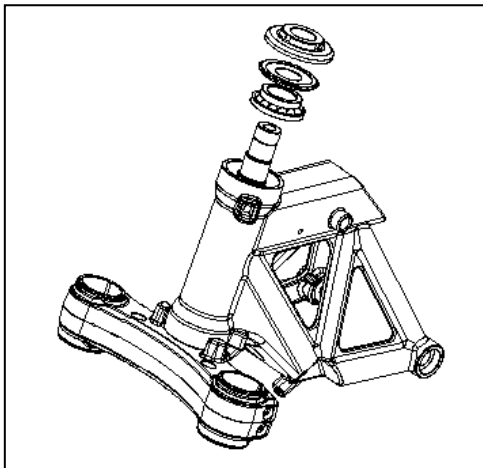
			assembly
29	Steering column dust-proof ring B	1	Apply sufficient lubricating grease during assembly
30	Inner hexangular screw M8×35	4	Tighten repeatedly during assembly
31	Steering column	1	

Assembly of Steering Column

Apply sufficient lithium grease to the surface of bearing roller.

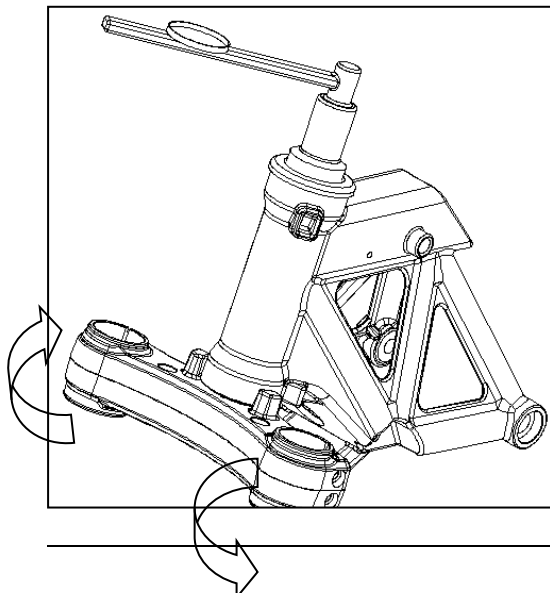
Put the steering column into the frame stem.

Put the bearing and regulating nut A in turn and temporarily tighten the regulating nut A to the torque of 25N·m.



Loosen adjusting nut A to no torque. Then tighten the regulating nut A again to the torque of 5-8N·m.

Tighten the regulating nut A and rotate the steering column repeatedly to match the bearing roller with the seat ring.



Put the bearing and regulating nut B in turn and temporarily tighten the regulating nut B to the torque of 21-25N·m.

Put the upper junction plate and the steering column gasket and then tighten the steering column nut to the specified torque of 80-90N·m. Rotate the column again to make sure that it can turn reliably and smoothly without any external force, without any jamming.

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 assembly, 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 rubber. So, be careful when removing the main 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 other model.
- Before driving a motorcycle, check the braking status.

Troubleshooting

Loose brake

1. There is air in pipeline;
2. The pipeline 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 pipeline is blocked
12. The brake disc is warped or deformed;
13. The pipeline is contaminated.

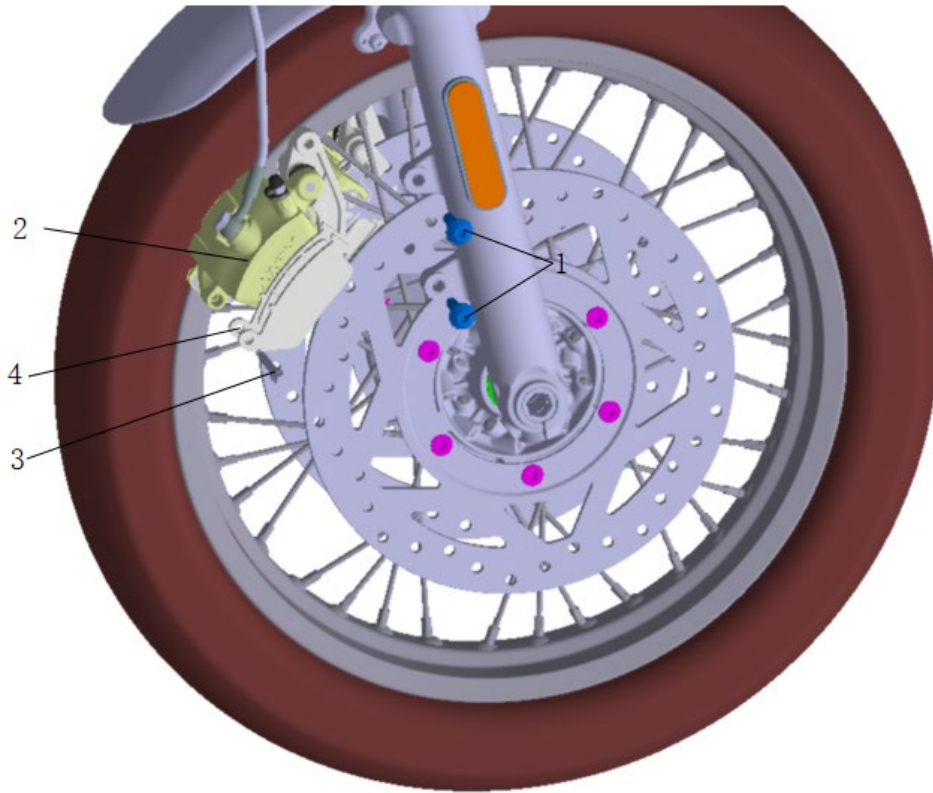
Inflexible brake handle

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

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



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 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.

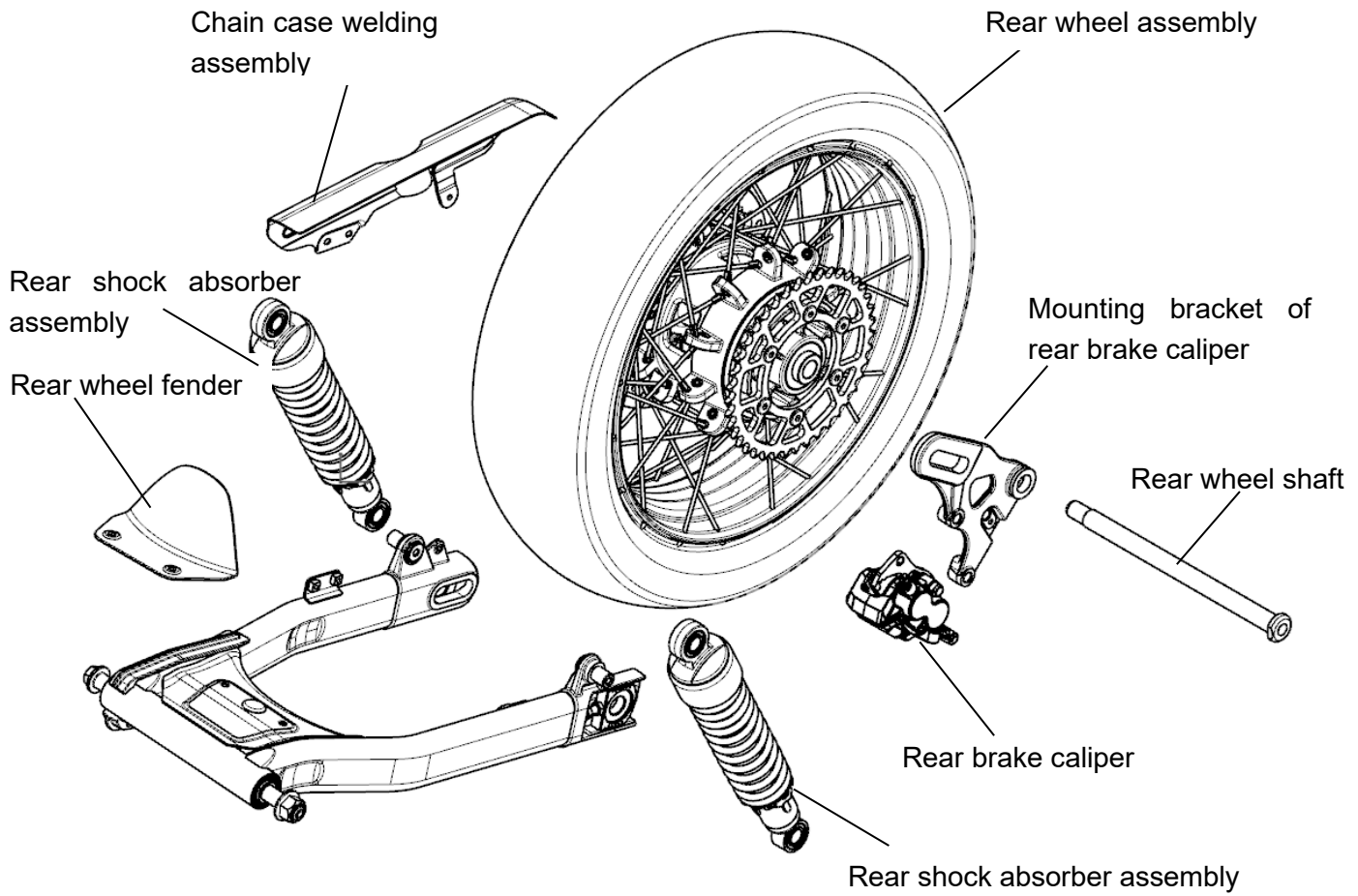
After removing the brake caliper, do not pull the brake handle, otherwise it will be difficult to assemble the front wheel.

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

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

Maintenance Requirements

Sequence	Step	Quantity	Remark
Disassembly Sequence		The installation and disassembly are in a reverse 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 and do not twist the brake hose.
3	Locating pin of friction plate	1	
4	Friction plate	2	



13

Rear Wheel, Rear Brake and Rear Suspension

Maintenance Notice	Rear Fork Assembly
Troubleshooting	Rear Shock Absorber
Rear Wheel	Rear Fork Rocker Assembly
Rear Brake	

Maintenance Notice

This section introduces the disassembly, installation and maintenance of rear wheel, rear brake, rear fork, rear shock absorber and rocker link. When the rear wheel, rear shock absorber and rocker link are repaired, the motorcycle shall be reliably held up by a jack or other support under the engine.

Key Torque Values

Rear wheel shaft nut	80~100N·m
Rear fork shaft nut	60~70N·m
Bot and nut of shock absorbing rocker	34~44N·m
Fastening screw of brake disc	20~30N·m

Troubleshooting

∞ **Swing of rear wheel**

1. The rim is bended;
2. The rear wheel bearing is abraded;
3. The tire pressure is too low;
4. The left and right regulator are inconsistent;
5. The wheel bearing sleeve is damaged.

∞ **Wheel rotation difficulty**

1. The wheel bearing and bearing sleeve are damaged;
2. The wheel is installed incorrectly;
3. The rear wheel shaft is bent.

∞ **Abnormality of suspension**

1. The damping spring is over hard or soft;
2. The rear fork bearing is damaged;
3. The shock absorber is bent.

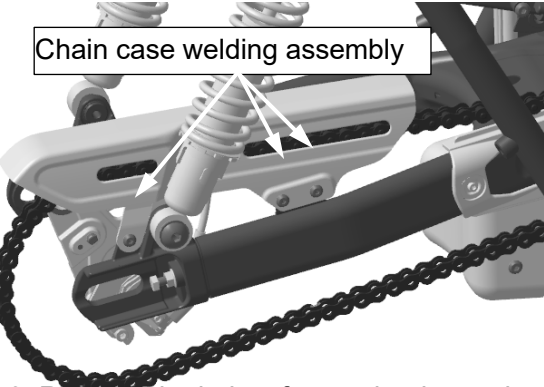
∞ **Abnormal noise**

The fastener is loose.

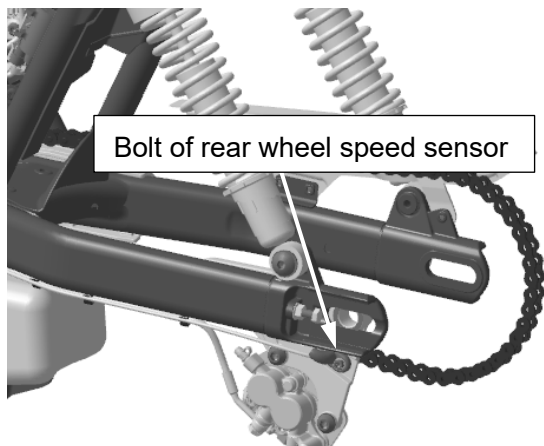
Rear Fork

Disassembly steps of rear fork

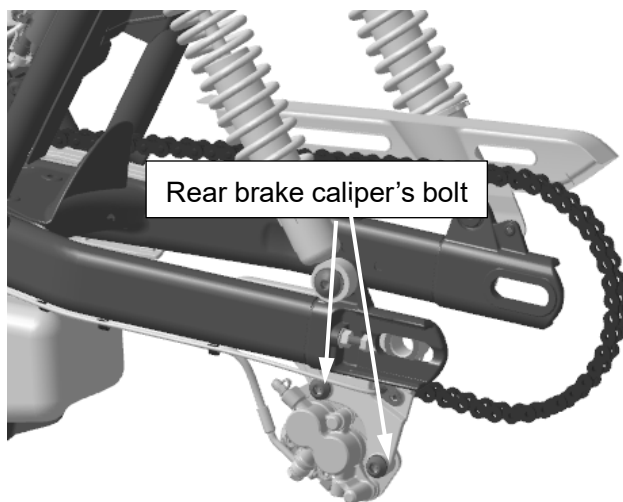
- 1. Remove the rear wheel assembly first (see the disassembly of rear wheel).
- 2. Take down chain case welding assembly



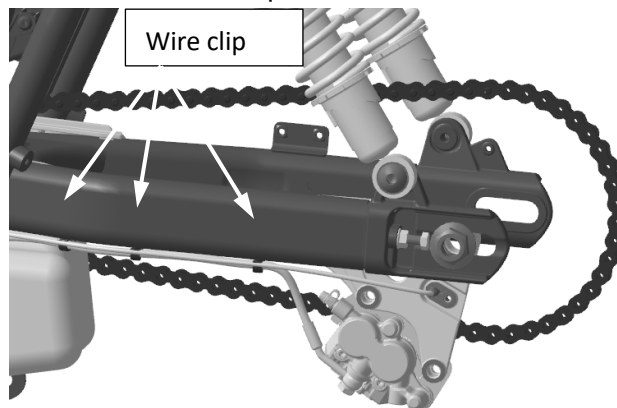
- 3. Remove the bolts of rear wheel speed sensor



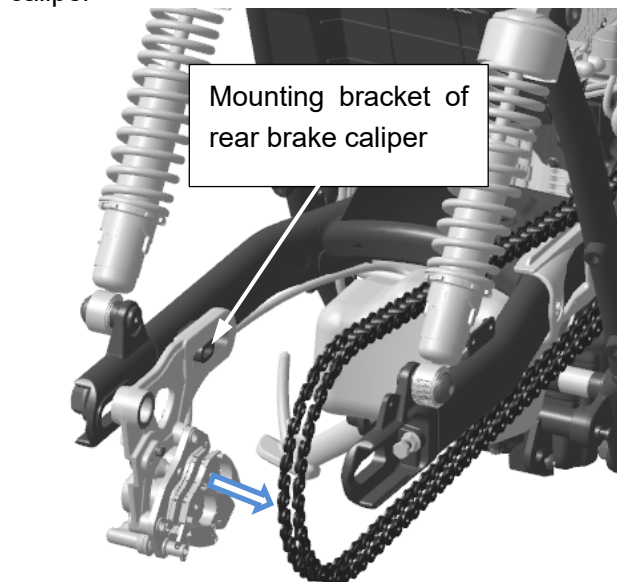
- 4. Take down the rear brake caliper's bolt



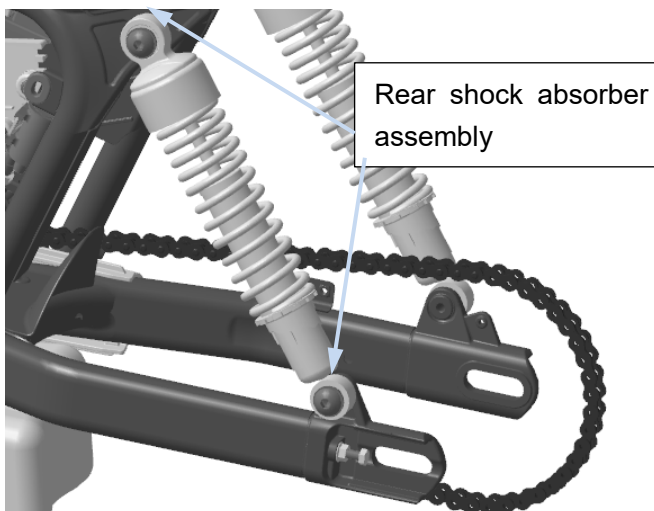
- 5. Take down wire clip



- 6. Take down the mounting bracket of rear brake caliper



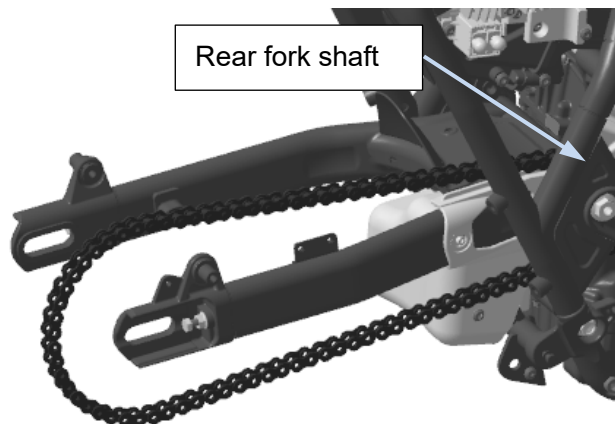
- 7. Remove the left rear shock absorber assembly



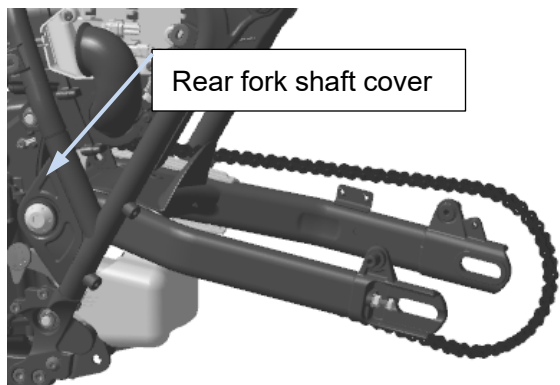
8. Remove the right rear shock absorber assembly



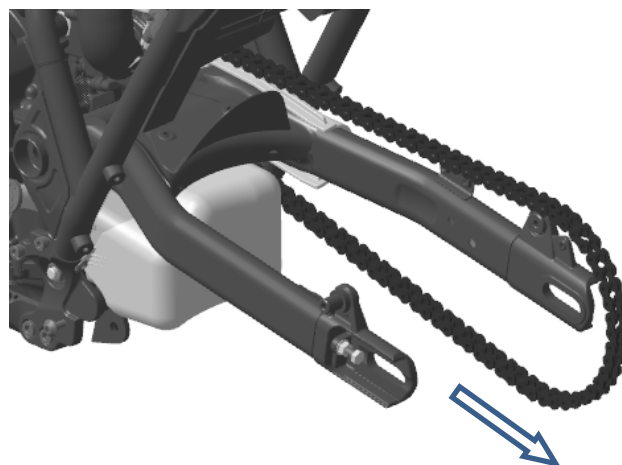
10. Remove the rear fork shaft



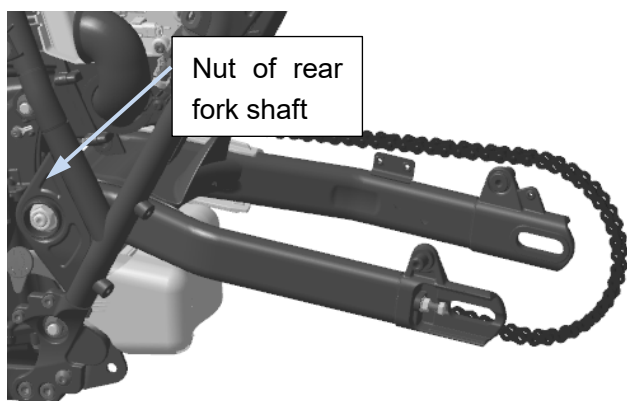
9. Remove the rear fork shaft cover



11. Remove the rear fork assembly.



10. Remove the nut of rear fork shaft



Installation steps of rear fork

Install the rear fork in the reverse sequence of disassembly.
The tightening torque of rear fork shaft nut is 60~70N·m.



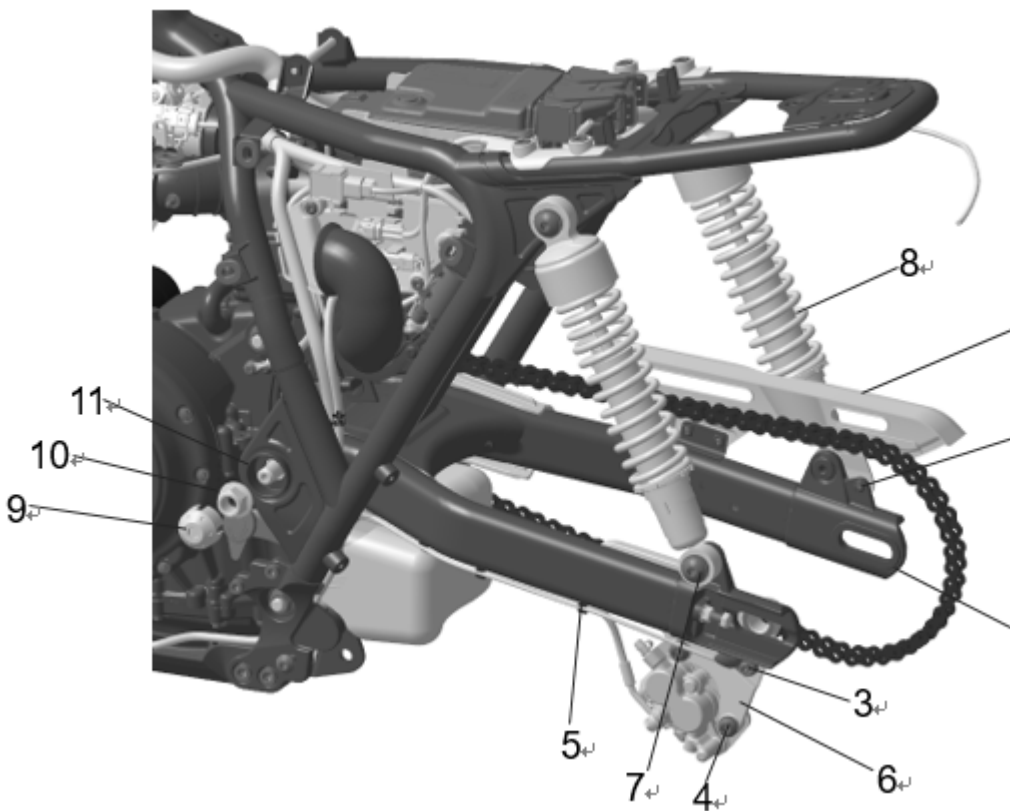
Note:

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 and if there is no need to replace it, do not step on the rear brake pedal.



Warning:

The clamp nut of rear fork shaft shall be tightened to a torque of 60~70N·m.
Disassembly/installation of rear fork



Sequence	Step	Quantity	Remark
	Disassembly sequence		The installation and disassembly are in a reverse sequence.
1	Chain case	1	
2	Screw M6×10	3	Required tightening torque: 8~12N·m
3	Bolt M6×20	1	Required tightening torque: 8~12N·m
4	Screw M10×1.25×27	2	Required tightening torque: 50~54N·m
5	Clip	3	
6	Mounting bracket of rear brake caliper	1	
7	Screw M8X20	4	Required tightening torque: 28~32N·m
8	Rear shock absorber assembly		

9	Rear fork shaft cover	1	
10	Rear fork shaft nut M16×1.5	1	Required tightening torque: 96~100N·m
11	Rear fork shaft	1	Required tightening torque: 96~100N·m
12	Rear fork assembly	1	

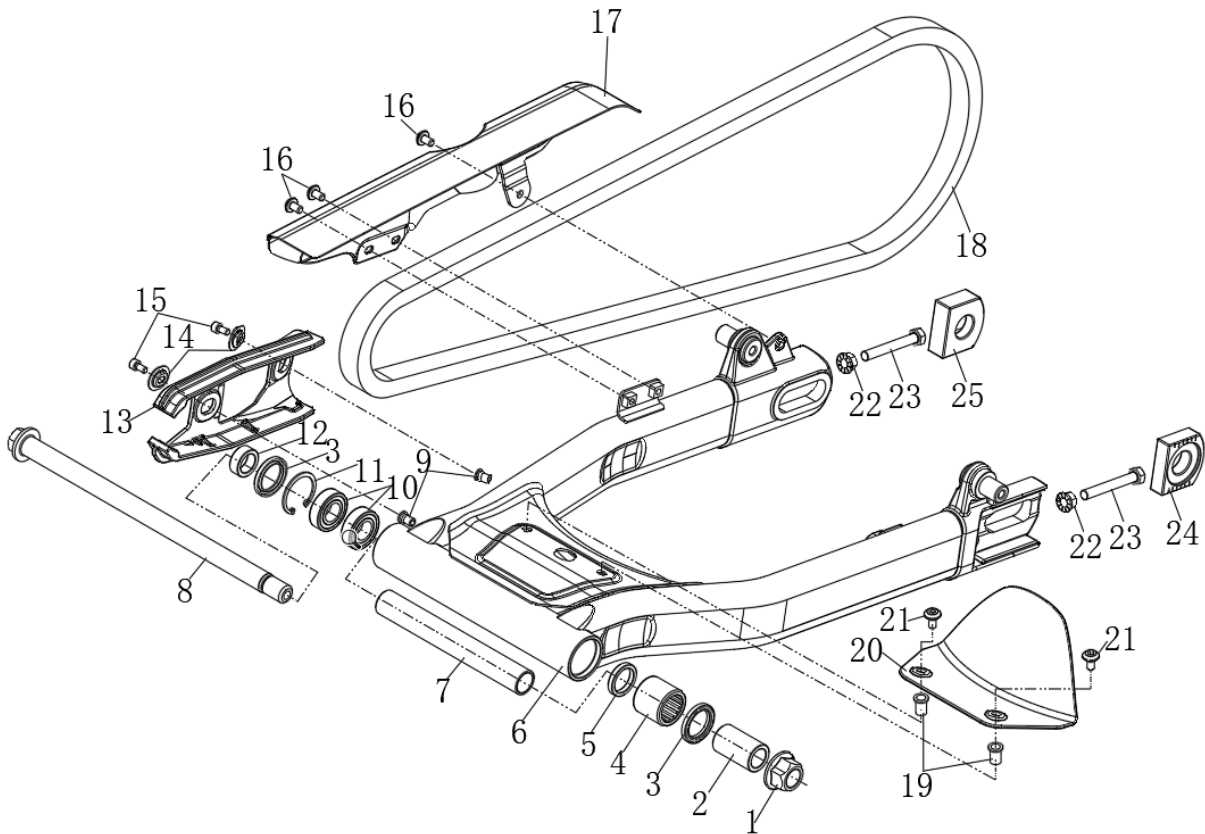
Check of rear fork shaft

Put the rear fork shaft on the V-shaped seat and measure its deflection of with a dial gauge. If the reading is $\geq 0.2\text{mm}$, replace the rear fork shaft with a new one.

Disassembly/assembly of rear fork

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

The seal ring and needle bearing shall be replaced after removed. The installed needle bearing shall be 3mm away from the end face, and lithium grease shall be applied to the needle. Check whether the needle bearing rotates flexibly after installation.



Sequence	Step	Quantity	Remark
	Disassembly Sequence		The assembly and disassembly are in a reverse sequence.
1	Nut M16×1.5	1	
2	Left shaft sleeve of rear fork	1	

3	Oil seal 35×25×4	2	Make sure the shaft sleeve rotates flexibly during assembly.
4	Drawn cup needle bearing HK253330	1	Apply lithium grease on the needle during installation.
5	Bearing liner holder	1	
6	Rear fork welding assembly	1	
7	Rear fork shaft liner	1	
8	Rear fork shaft	1	
9	Rivet nut M5×12	2	
10	Deep groove ball bearing 6003-2RS	2	Apply lithium grease on the needle during installation.
11	Hole circlip type A 35	1	
12	Right shaft sleeve of rear fork	1	Make sure the shaft sleeve rotates flexibly during assembly.
13	Chain clamp	1	
14	Flanged washer	2	
15	Screw M5×10	2	
16	Screw M6×12	3	
17	Chain case welding assembly	1	
18	Roller chain 525-102	1	
19	Rivet nut M6×12	1	
20	Small fender	1	
21	Screw M6×12	2	
22	Nut M8	2	
23	Rivet nut M8×60	2	
24	Right locating plate for chain adjustment	1	
25	Left locating plate for chain adjustment	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 components 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 components shall be disconnected during the circuit on-off inspection.
4. When conduct the inspection with voltage, the battery voltage shall be checked 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 line 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. Multi-meter 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. BX1200 electrical system 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
- Cooling system (electrical part)
- Lighting Signal System
- Information Display System

They will be introduced in the following chapters. Since the cooling system is introduced in Chapter 5 and will not be repeated.

19 Battery and Power Supply System

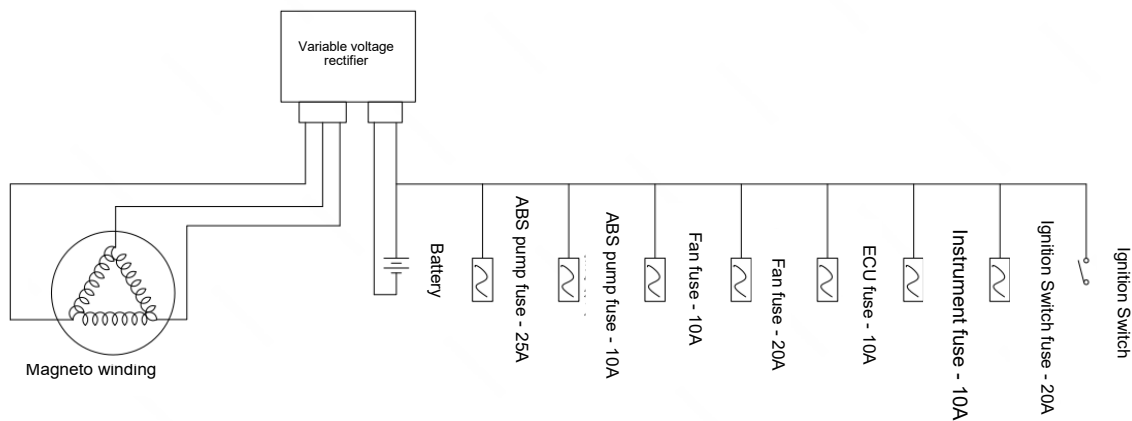
Overview	Introduction to Main Components and Parts
Schematic Circuit Diagram	Main Faults Diagnosis
Parts Arrangement Diagram	

Overview

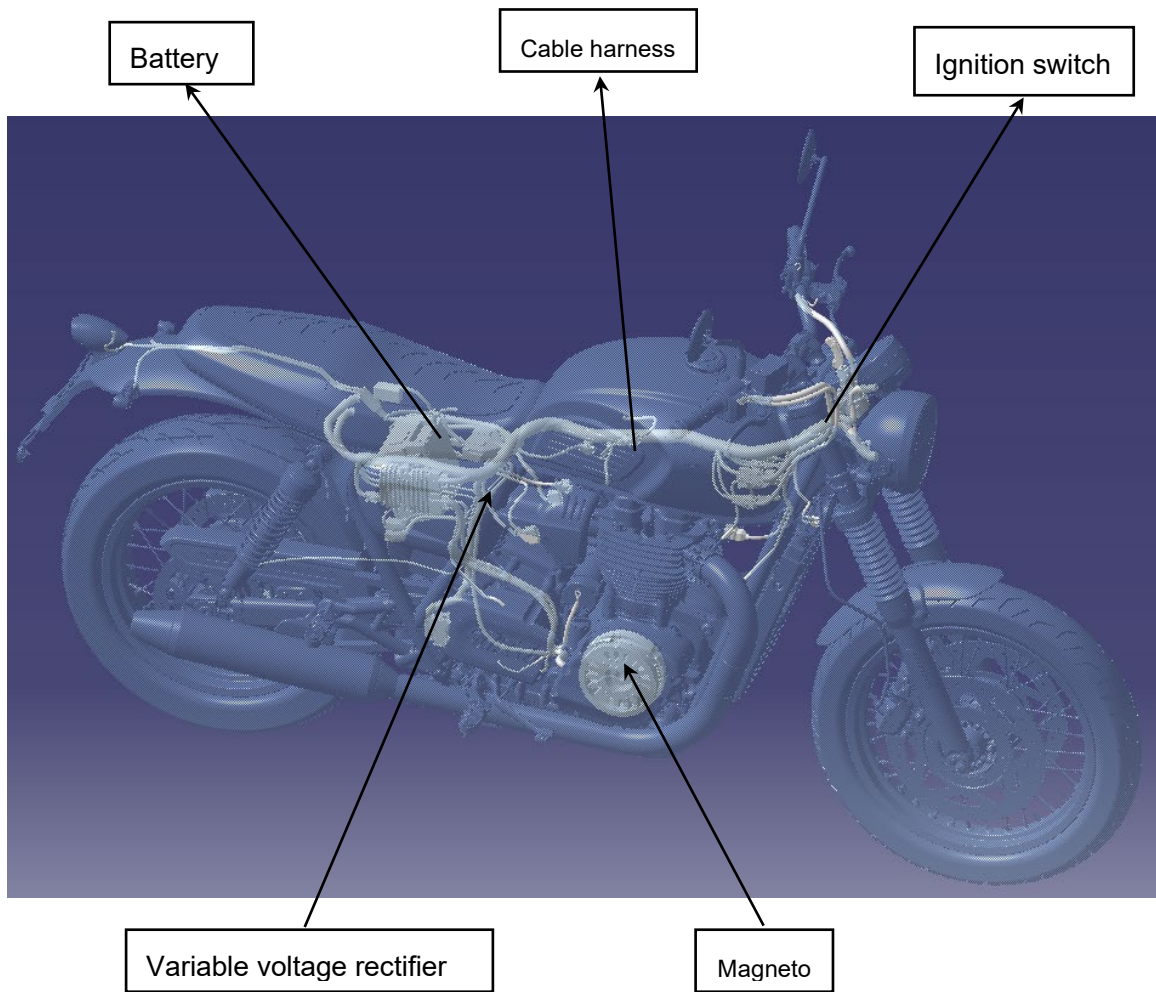
The power supply system is the premise of the running of the whole electrical system, which can provide sufficient electric energy for other electrical sub-systems. Its functions include charging, saving and discharging electricity. BX1200 power supply system is featured by large power supply capacity, which reaches 560W. It consists of the following parts:

- Magneto
- Variable voltage rectifier
- Battery
- Ignition switch
- Fuses

Schematic Circuit Diagram



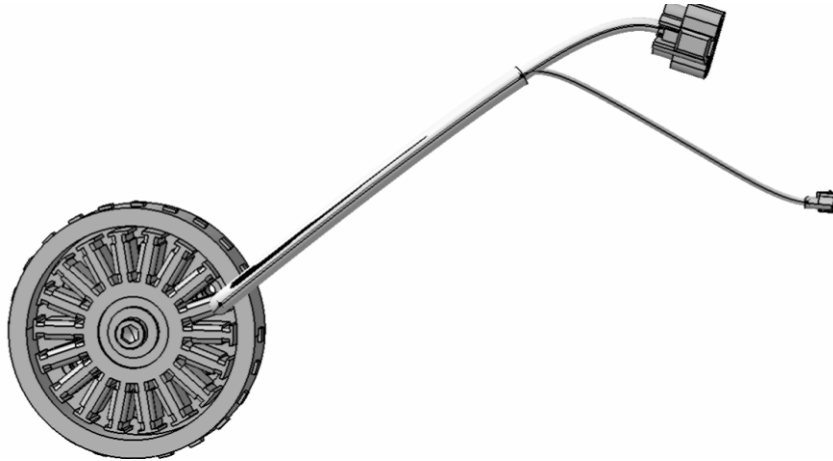
Parts Arrangement Diagram



Introduction to Main Components and Parts

○ 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 six pieces of magnet steels of rotor have 12 poles;

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: 520W/4000r/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;

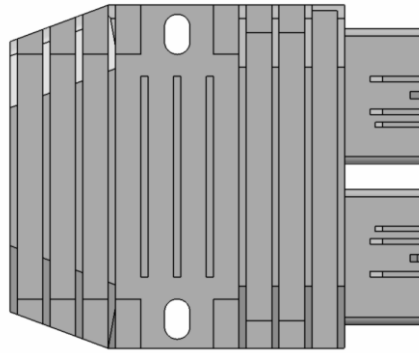
The stator winding suffers turn-to-turn short circuit;

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

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

○ Variable voltage 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: $14.5V \pm 0.3V$;

Maximum operating current: 50A.

4. Fault mode

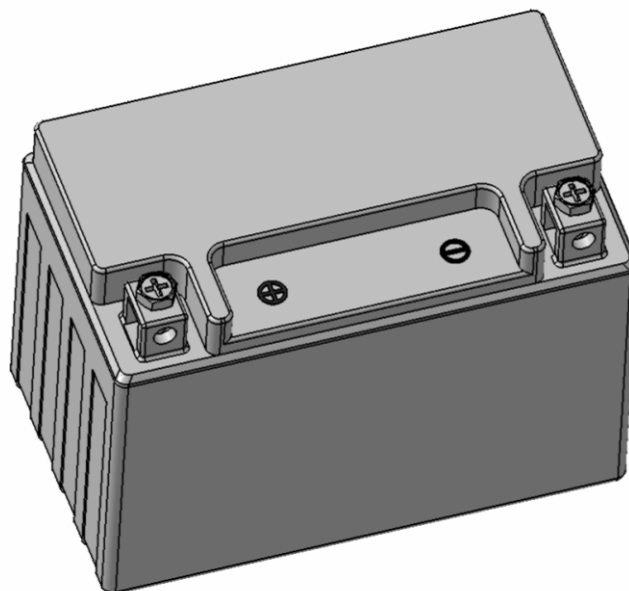
The voltage regulator circuit is out of control and the battery is overcharged;

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 maintenance-free lead-acid battery, model: 12V/12A·h;

Rated capacity of 10HR: 12A·h (25°C±2°C);

High rate discharge performance (-10°C) 120A: duration time longer than 90s; and voltage greater than 8.5v after 5s.

4. Fault mode

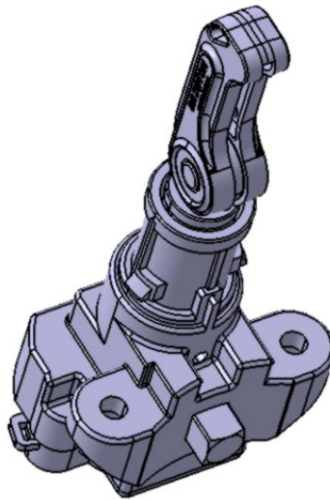
The pole-plate is polarized and the capacity is reduced, which is unable to provide power for starting, and the charging performance is degraded;

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 key with double grooves, 8 tooth profiles and ignition lock cylinder is the master switch of the whole vehicle power supply and combines the locking function of head steering.

3. Basic parameters

Switch function list:

Gear	Wire color		Can the key be pulled out	Latch bolt status
	Red	Black		
			No	Not stretched out
			Yes	Not stretched out
			Yes	Stretched out

Mutual opening rate of switch key shall not be greater than 0.1%;

Rated operational current of switch: 20A.

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;

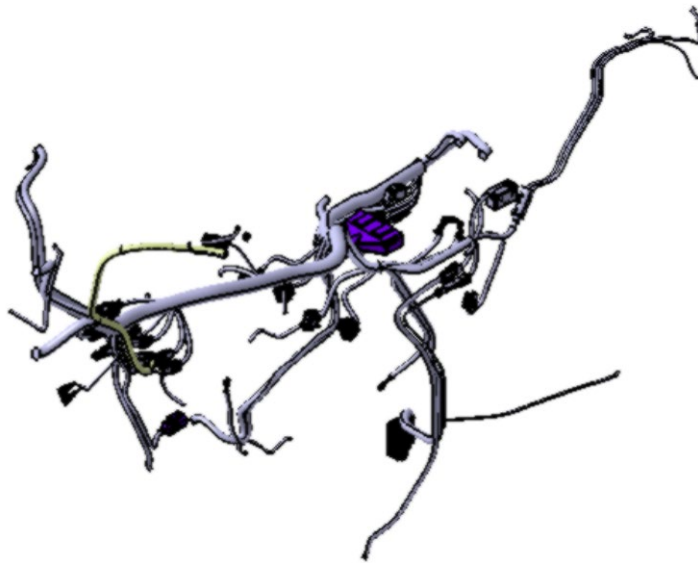
The switch contact is short-circuited in contact with the shell;

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 duct and tape 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.

Main Faults Diagnosis

Fault Phenomenon	Possible Cause	Solution
<p>Power failure of whole motorcycle: The instrument displays nothing and lightings do not work when the key is used.</p>	<p>1. Ignition switch fuse is disconnected or in bad contact; 2. Ignition switch relay is damaged; 3. The battery positive and negative circuits of battery are in bad contact; 4. The battery has no power; 5. The ignition switch is failed; 6. The outgoing line of ignition switch is not connected well with the main cable; 7. The circuits of main cable are open-circuited or short-circuited;</p>	<p>1. Replace the ignition switch fuse; 2. Replace ignition switch relay; 3. Reconnect; 4. Charge the battery or replace it; 5. Repair or replace it; 6. Reconnect; 7. Repair or replace it.</p>
<p>Under-voltage of battery: After turning on the power, the instrument voltage alarm light is on, the voltage of the battery is lower than 11V.</p>	<p>1. The motorcycle has been stored for a long time; 2. The charging line is faulted; 3. The battery capacity attenuates and fails to store energy, and the battery discharges itself.</p>	<p>1. Charge the battery with a 13-14V DC power supply; 2. Check charging line and variable voltage rectifier; 3. Replace the battery.</p>
<p>Battery undercharged: After starting the engine, the voltage of the battery is lower than 14V.</p>	<p>1. The outgoing line of variable voltage rectifier is not connected well with the main cable or magneto; 2. The circuits of main cable are open-circuited or short-circuited; 3. The magneto is failed; 4. The variable voltage rectifier is failed.</p>	<p>1. Reconnect; 2. Repair or replace it; 3. Replace the magneto; 4. Replace the variable voltage rectifier;</p>
<p>Battery overcharged: The battery releases gas or is deformed.</p>	<p>1. The variable voltage rectifier is failed.</p>	<p>1. Replace the variable voltage rectifier and battery.</p>

16 Starting System

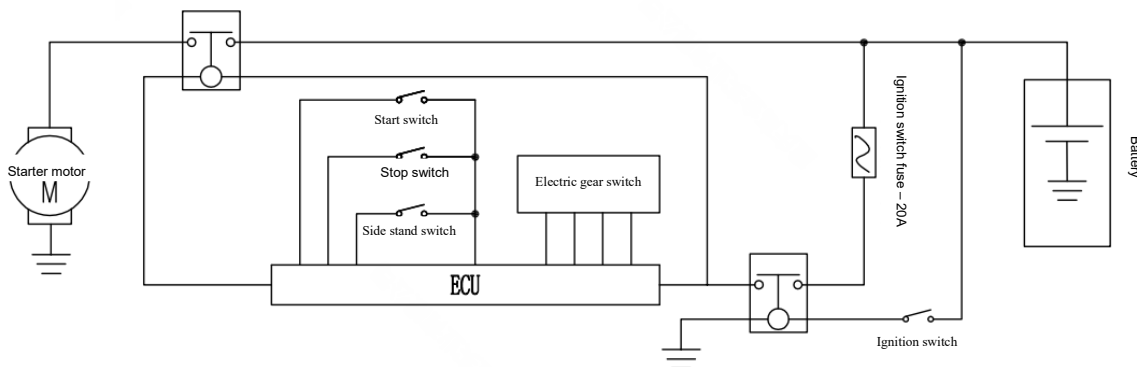
<p>Overview</p>	<p>Introduction to Main Components and Parts</p>
<p>Schematic Circuit Diagram</p>	<p>Main Faults Diagnosis</p>
<p>Parts Arrangement Diagram</p>	

Overview

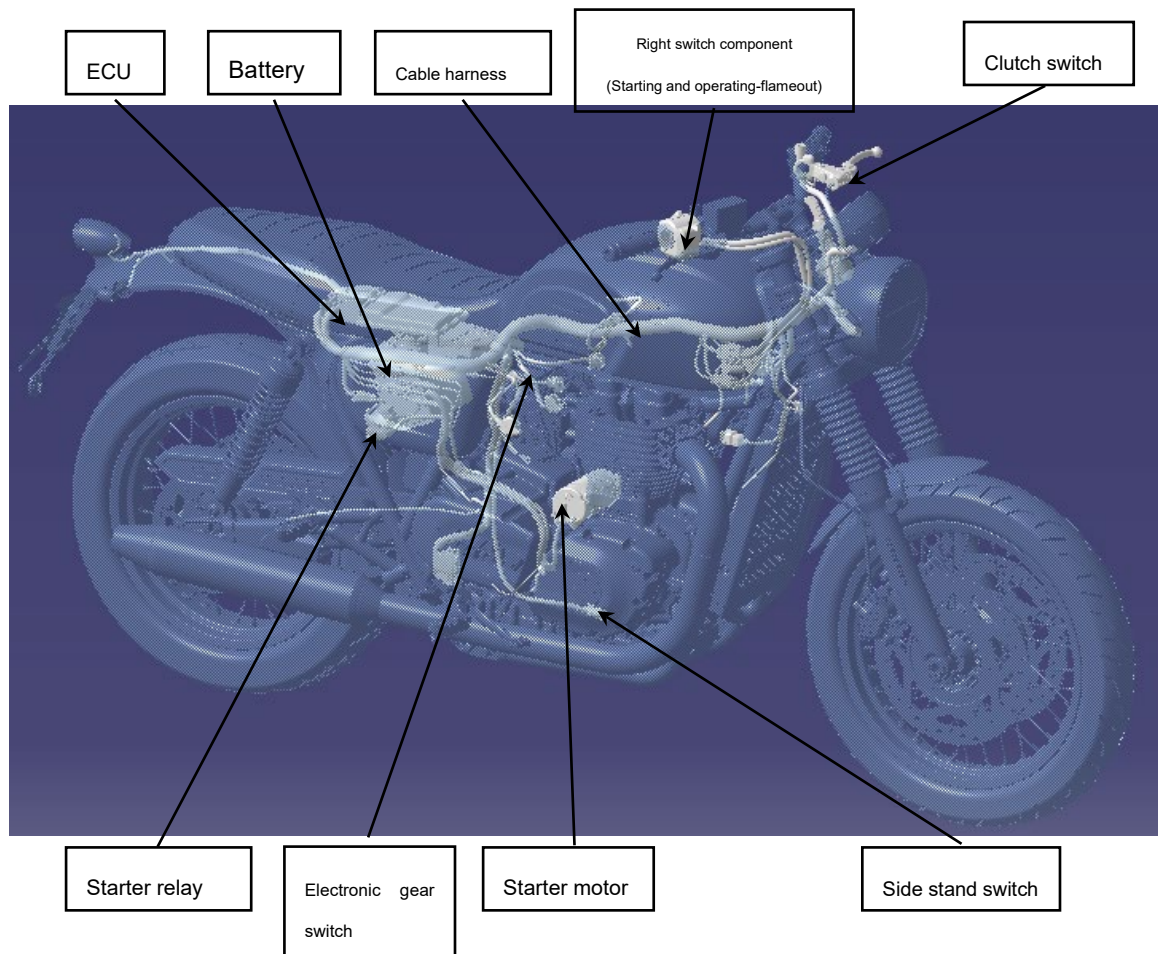
The engine can only be started with the help of external force at the initial and then enter the ignition and fuel supply process, and thus the internal combustion engine can combust and run stably. BX1200 motorcycle is only equipped with an electronic starting system. First, it will meet the starting conditions (setting at neutral gear or unprotect the side stand switch and clutch switch), then press the start button to switch on the start relay and starter motor to drive the middle gear and isolator to make the engine work for ignition and combustion with fuel injection. The system consists of the following parts:

- Starter motor;
- Starter relay;
- Battery;
- Starting switch and operating flame-out switch;
- ECU part
- Electronic gear switch, side stand switch and clutch switch.

Schematic Circuit Diagram



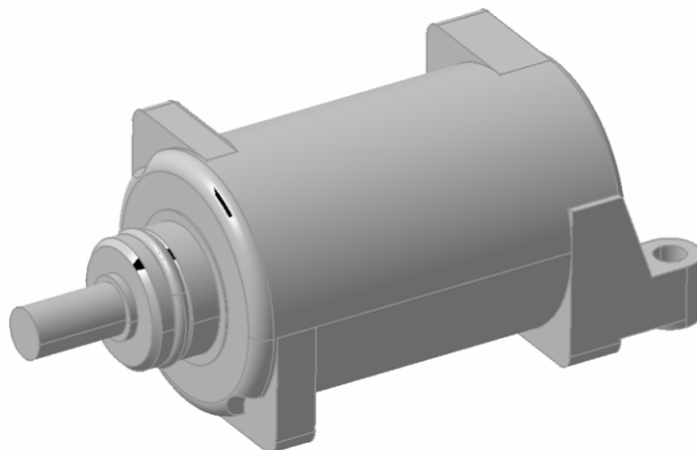
Parts Arrangement Diagram



Introduction to Main Components and Parts

○ 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, isolator and crank.

3. Basic parameters

The four pieces of magnet steels of stator have 4 poles and four carbon brushes;

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

Output characteristics:

Motor Characteristics	State	Voltage V	Current A	Rev speed r/min	Torque N·m
	No-load	11.5	≤40	≥11000	1.5
	With load	9.5	≤190	≥7500	
	Brake	6	≤500		≥4.0

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;

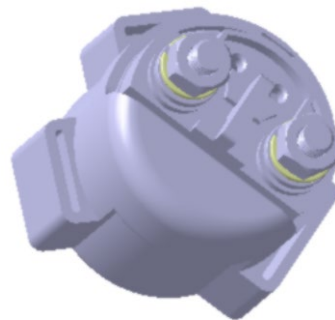
The bearing is failed and the motor generates abnormal noise;

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 with generate an electromagnetic force to connect the movable contact and stationary contact. ECU control relay coil is connected, so that the moving contact is connected with the static contact, the positive pole of the starter motor is connected with the positive pole of the battery, and the starter motor works

3. Basic parameters

Nominal voltage: 12V;

Rated current: DC300A;

Operating voltage: 4-7.5V;

Release voltage: 0.5-3V;

Contact voltage drop: below 0.2V (at 300A);

Coil current: below 4.5A (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;

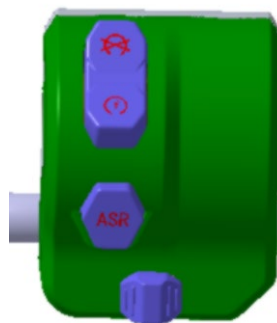
The contact is corrosive or ablativ, and cannot be connected even if closed;

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

The power circuit is open-circuited, which leads to starting failure of motorcycle.

○ **Control switch**

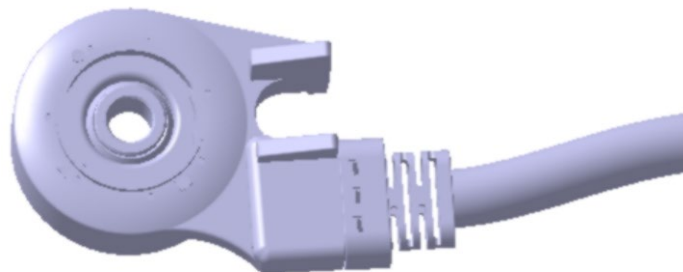
1. Outside view



Right switch component



Left switch component



Side stand switch



Electronic gear switch

2. Switch function

Left switch function

	Gray	Orange	Light blue	Blue yellow	Blue	White	Red white	Light green	Red black	Green white	Black red	Green blue	Pink	Green
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>											
	<input type="radio"/>	<input type="radio"/>												
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>											
				<input type="radio"/>	<input type="radio"/>									
				<input type="radio"/>		<input type="radio"/>								
					<input type="radio"/>		<input type="radio"/>							
							<input type="radio"/>	<input type="radio"/>						
MODE									<input type="radio"/>	<input type="radio"/>				
											<input type="radio"/>	<input type="radio"/>		<input type="radio"/>

Right switch function

	Red	Black white	Yellow red	Red yellow	Green red	Yellow	Blue yellow	Black	Green yellow
	<input type="radio"/>	<input type="radio"/>							
	<input type="radio"/>	<input type="radio"/>							
		<input type="radio"/>	<input type="radio"/>						
ASR				<input type="radio"/>	<input type="radio"/>				
						<input type="radio"/>	<input type="radio"/>		
						<input type="radio"/>	<input type="radio"/>		
Brake								<input type="radio"/>	<input type="radio"/>

Side stand switch function

Up.	<input type="radio"/>	<input type="radio"/>	Engine can be started.
Down.	<input type="radio"/>	<input type="radio"/>	Engine cannot be started.

Electronic gear switch function

	Resistance value $\pm 1\% \Delta$ (room temperature)	Output voltage +0.2V	Magnet	A	B	C	D	F	G	H
Neutral gear	0	0.2	<input type="radio"/>	<input type="radio"/>						
1 st gear	91	0.5	<input type="radio"/>		<input type="radio"/>					
2 nd gear	220	1.0	<input type="radio"/>			<input type="radio"/>				
3 rd gear	470	1.6	<input type="radio"/>				<input type="radio"/>			
4 th gear	1K	2.5	<input type="radio"/>					<input type="radio"/>		
5 th gear	2K	3.3	<input type="radio"/>						<input type="radio"/>	
6 th gear	4.7K	4.1	<input type="radio"/>							<input type="radio"/>

3. Fault mode

- The switch locating pin is broken and it rotates on the handle tube when used;
- The switch cannot be put on or be fully put on;
- The button cannot be 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 side stand switch is abraded, open-circuited or short-circuited;
- The switch suffers abrasion, vibration, water filling, corrosion or fault.

Main Faults Diagnosis

Fault Phenomenon	Possible Cause	Diagnostic Approach	Solution
Closing failure of starter motor: After pressing the start button, there is no closing sound of relay and the starter motor fails to run.	1. the circuits of main cable are open-circuited. 2. The anti-theft matching is failed; 3. Rollover sensor function or failure occurs; 4. At non-neutral gear, the side stand switch is not folded up or the clutch switch is not connected after the side stand switch is folded up; 5. The ECU is faulted;	1. Check whether the voltage at both ends of the starter relay coil changes during starting; 2. The anti-theft indicator on instrument flashes quickly; 3. When it starts after the rollover sensor is removed, rollover sensor function or failure occurs; 4. Fold up the side stand and connect the clutch switch to judge if it can be started; 5. Use the diagnostic unit to judge if there is any fault	1. Replace the relevant circuit; 2. Perform the anti-theft matching again; 3. Replace the rollover sensor; 4. / 5. Solve ECU fault
Running failure of starter motor: The closing sound of motor, but the starter motor fails to run.	1. The battery is under-voltage; 2. The connector of thick wire is loose; 3. The motor suffers open circuit failure; 4. There is open-circuit between the pole contacts of starter relay; 5. The motor suffers short circuit failure; 6. The engine is stuck and the motor is stalled.	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;	1. Charge the battery; 2. Fasten the connector; 3. Replace the motor; 4. Replace the starter relay; 5. Replace the motor; 6. Check the engine.
Starter motor keeps working	Starter relay is damaged	/	Replace the starter relay
Over-low motor speed	1. The voltage or capacity of battery is low; 2. The connector is poorly connected; 3. The starter motor output torque is insufficient; 4. The engine resistance is too high.	/	1. Charge or replace the battery; 2. Fasten the connector; 3. Replace the motor; 4. Check the engine.

17

Lighting Signal System

Overview

Introduction to Main
Components and Parts

Schematic Circuit Diagram

Main Faults Diagnosis

Parts Arrangement Diagram

Overview

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

Headlights system:

The headlights are used for illuminating the road during night driving, letting surrounding vehicles and people to aware the motorcycle. The high beam will be adopted during high speed driving and the anti-dazzle low beam will be used when passing other vehicles. In addition, the dual-light lighting system also requires that when one high beam fails, the other one shall not be on, which needs to be controlled by the headlight controller.

Signal control system:

When the motorcycle is to turn, the turn signal light will flash to draw surrounding vehicles and people's attention to give way. When driving at night, the taillight 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 flicker of the turn signal light is controlled by the switch and the flasher. Other lights are controlled only by the switch.

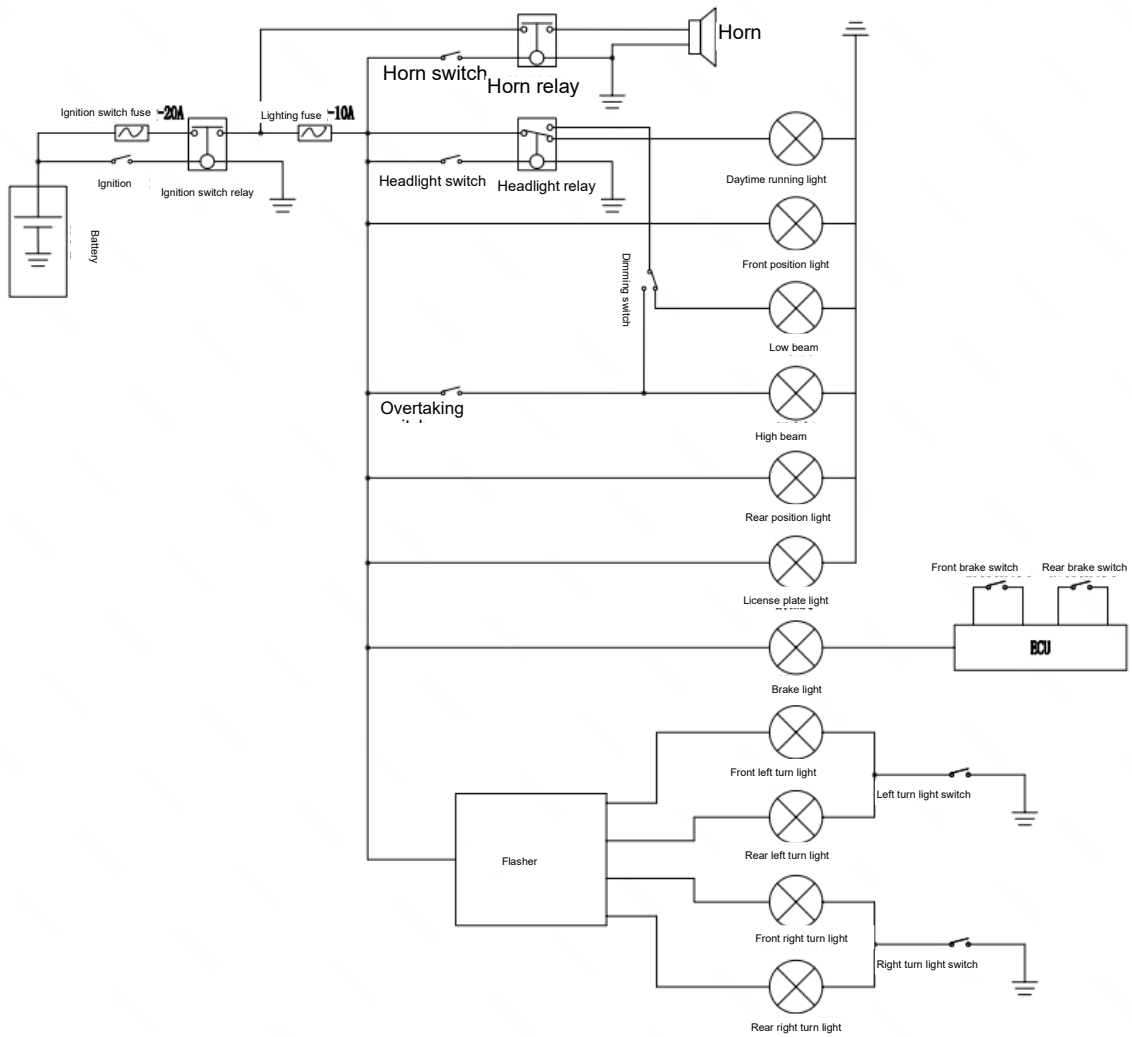
Horn system:

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 driving. The horn is controlled by the horn button.

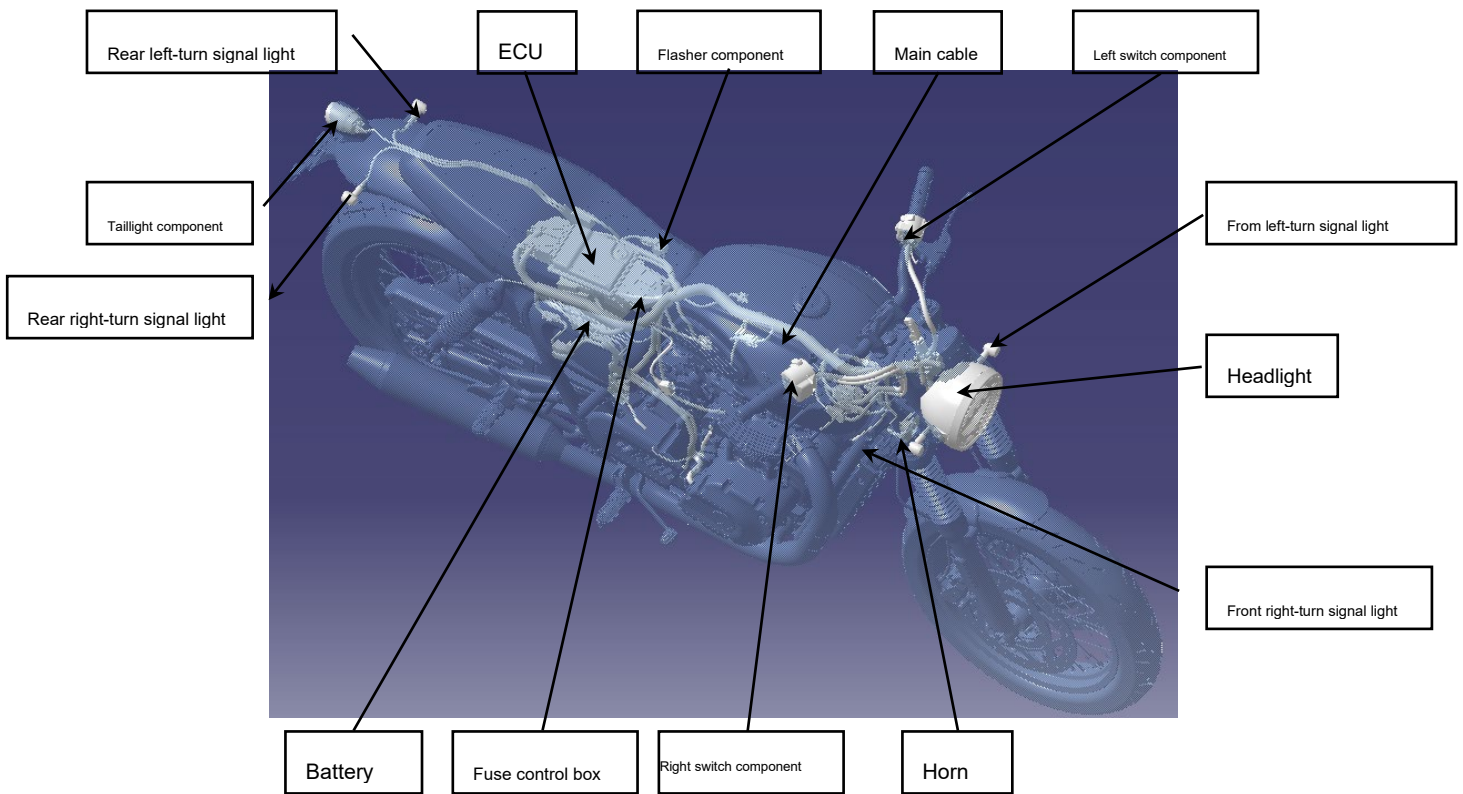
Components:

- Headlights (including daytime running light)
- Taillight
- Turn signal light
- Horn
- Headlight relay
- Flasher
- Front brake light switch
- Rear brake light switch
- Integrated left and right switch
- ECU

Schematic Circuit Diagram



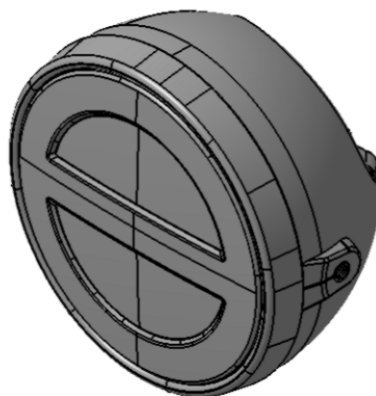
Parts Arrangement Diagram



Introduction to Main Components and Parts

○Headlight

1. Outside view



2. Working principle

The headlight beads 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 light glass, 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 bead, the

ray is dazzle-free.

3. Basic parameters

Headlight bead specification: LED, 20W;

Daytime running light specification: LED, 5W;

Position light specification: LED, 1W;

4. Fault mode

The light bead is failed;

There is water or dust in the light;

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.

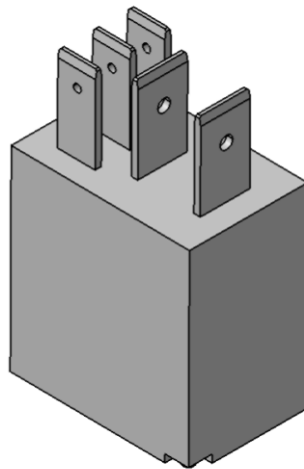
5. Light adjustment

Up and down adjustment: adjust the adjusting screws on the left and right sides of headlight, turn the adjusting screws clockwise to adjust the light to move down, and vice versa.

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

○ Headlight relay

1. Outside view



2. Working principle

The switch between daytime running light and high beam/low beam is realized by the function of relay normally on and normally off

3. Fault mode

The high beam fails to be lit;

The low beam fails to be lit;

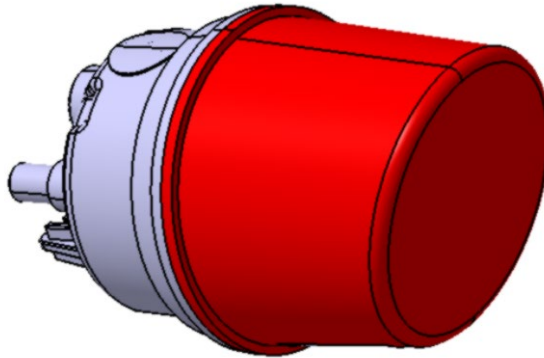
The headlight is lit by mistake;

The headlight is not lit after starting;

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

○ Taillight

1. Outside view



2. Working principle

Taillight integrates the function of rear position light, brake light and license plate light. The rear position light and brake light emit red light, and the rear position light lights up with the license plate light; and when the brake switch is connected, the brake light is on.

3. Basic parameters

Rear position light: LED 12V/3.7W;

Brake light: LED, 12V/3.7W;

License plate light: LED 12V/0.6W.

4. Fault mode

The light bead is failed;

The light holder is loose;

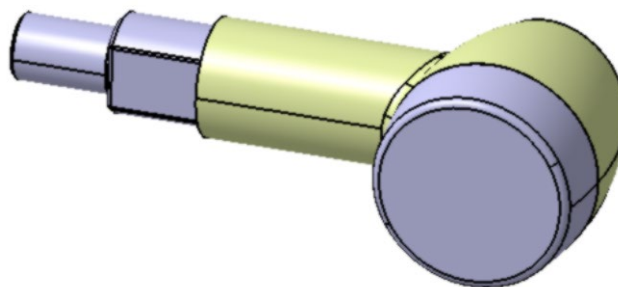
The light wire is open-circuited or short-circuited;

There is water or dust in the light;

The light glass is scratched or damaged;

○ Turn signal light

1. Outside view



2. Working principle

Front turn signal light consists of transparent convex mirror, holder and bead, and the bead gives out amber light through the transparent convex mirror.

3. Basic parameters

Turn signal light bead specification: LED 12V.

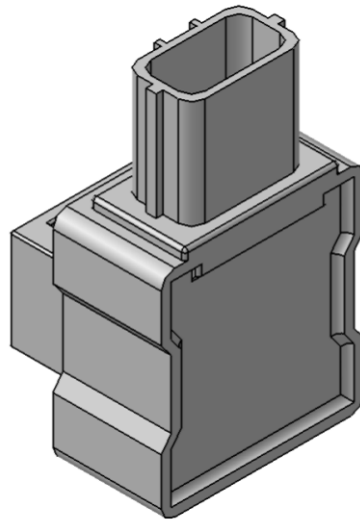
4. Fault mode

The light bead is failed;

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

○ **Flasher**

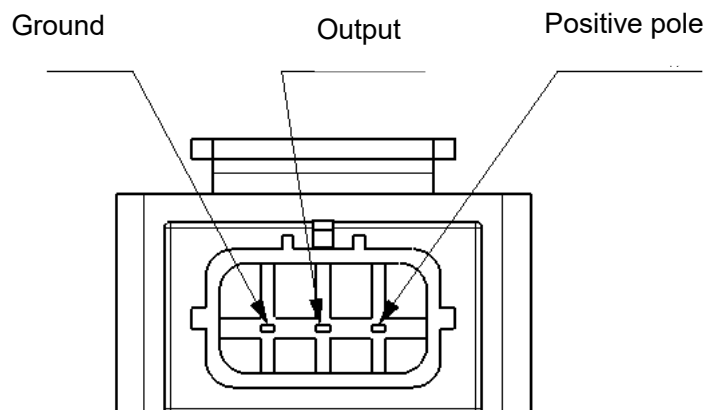
1. Outside view



2. Working principle

The electronic flasher controls the on-off of the high-power field effect tube through an IC chip, and outputs the voltage of a certain frequency to make the turn signal light flicker. If the wire of a turn signal is disconnected, the flash frequency will increase significantly. The flasher also has the self-protection function against short-circuit.

3. Pin function



4. Basic parameters

Flash frequency: (85±10) times/min;

Quick flashing: (160 ± 10) times/min;

5. Fault mode

The turn signal light fails to be lit up;

The turn signal light fails to be flash;

The short circuit protection is triggered due to interference;

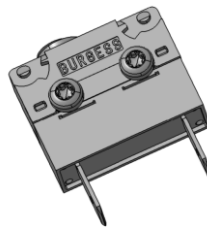
The relay is failed;

If the wire of a turn signal light is disconnected, there is no quick flashing;

The pin is rusty and cannot be connected.

○ Front brake light switch

1. Outside view



2. Working principle

When holding the brake handle tightly to brake, the contact will be in contact with the conductive spring strip under the action of spring force. Thus, the circuit will be connected and the brake light will be on.

When releasing the brake handle, the brake handle against the switch guide rod will compress the spring to make the contact leave the conductive spring strip, and then the circuit will be disconnected and the brake light will go out.

3. Basic parameters

Switch disconnection travel: 2mm; total travel: 4mm.

4. Fault mode

The contacts and spring strip are corroded and the contact is poor;

The switch is stuck and guide rod cannot operate;

The outgoing insert is fractured or rusty.

○ Rear brake light switch

1. Outside view



2. Working principle

The rear brake light switch is hydraulic-type brake switch. When the brake pedal is stepped on and the

pressure in the brake switch reaches a certain value, it will touch the two contact spring strips, the circuit will be connected and the brake light will be on.

3. Basic parameters

The switch is switched on at 0.1-0.5MPa.

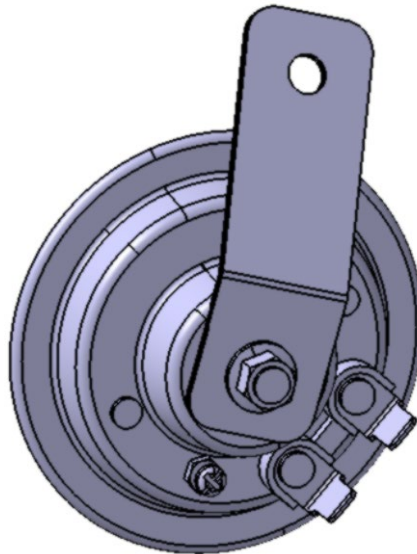
4. Fault mode

Pressure leak

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

○ 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: (430 ± 30) Hz, sound pressure level: (110 ± 5) dB(A).

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 open-circuited or short-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 the loudest sound, and at last tighten the nut.

Main Faults Diagnosis

Fault Phenomenon	Possible Cause	Solution
All lights inside are not lit, and the horn does not ring after the horn switch is pressed;	<ol style="list-style-type: none"> 1. Light fuse is damaged; 2. Relevant parts of lights are short-circuited. 	<ol style="list-style-type: none"> 1. Replace the light fuse; 2. Check the relevant circuit, find out the short-circuited part, and adjust or replace the cable;
Only the high beam and low beam fail to be lit;	<ol style="list-style-type: none"> 1. Headlight connector, high beam and low beam pins are loose or damaged; 2. Dimmer switch is damaged; 3. Headlight relay is damaged; 4. High beam and low beam beads are damaged. 	<ol style="list-style-type: none"> 1. Take down headlight connector to check, repair or replace; 2. Replace the left switch component; 3. Replace the headlight relay; 4. Replace the headlight;
Only daytime running light fails to be lit;	<ol style="list-style-type: none"> 1. Headlight connector, daytime running light pins are loose or damaged; 2. Headlight relay is damaged; 3. Daytime running light beads are damaged. 	<ol style="list-style-type: none"> 1. Take down headlight connector to check, repair or replace; 2. Replace the headlight relay; 3. Replace the headlight;
Only the front position light cannot be lit;	<ol style="list-style-type: none"> 1. Headlight connector, front position light pins are loose or damaged; 2. Front position light beads are damaged. 	<ol style="list-style-type: none"> 1. Take down headlight connector to check, repair or replace; 2. Replace the headlight;
The rear position light and license plate light fail to be lit;	<ol style="list-style-type: none"> 1. Taillight connector, rear position light and license plate light pins are loose; 2. Rear position light and license plate light are damaged; 	<ol style="list-style-type: none"> 1. Take down taillight connector to check, repair or replace; 2. Replace the taillight;
Only the brake light fails to be lit;	<ol style="list-style-type: none"> 1. The taillight and upper brake light circuit is disconnected; 2. Front and rear brake switches are damaged; 3. ECU does not send the lighting command normally. 	<ol style="list-style-type: none"> 1. Check brake light circuit, repair or replace it; 2. Check whether the front and rear brake switches work normally; if they are damaged, replace them; 3. Replace the ECU.
The turn signal light fails to be lit;	<ol style="list-style-type: none"> 1. The flasher is damaged; 2. The switch of turn signal light is damaged; 3. The turn signal light is damaged. 	<ol style="list-style-type: none"> 1. Replace the flasher; 2. Replace the left switch component; 3. Replace the turn signal light.
The horn doesn't work;	<ol style="list-style-type: none"> 1. The horn is damaged; 2. Horn relay is damaged; 3. Horn switch is damaged. 	<ol style="list-style-type: none"> 1. Replace the horn; 2. Replace the horn relay; 3. Replace the left switch component.

18

Information Display System

Overview	Introduction to Main Components and Parts
Schematic Circuit Diagram	Main Faults Diagnosis
Parts Arrangement 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.

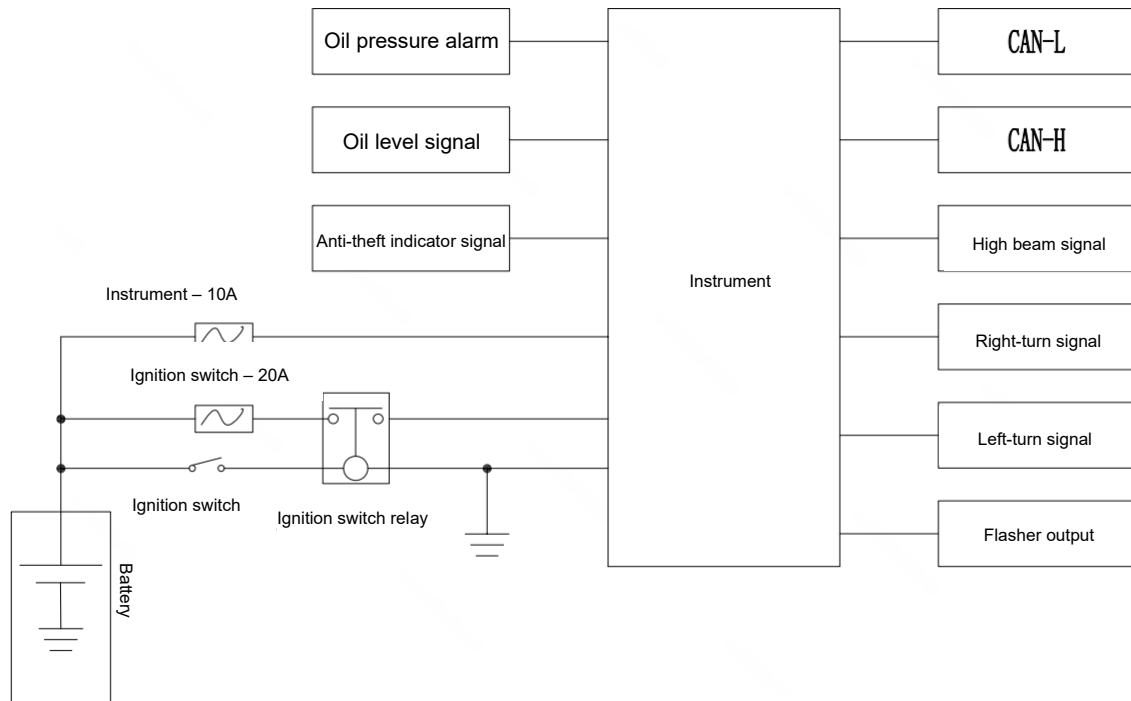
The information display system of BX1200 includes: vehicle speed, engine speed, oil level, gear, voltage alarm, water temperature display and alarm, direction indication, high beam indication, total/sub-total mileage, time, oil level indication and alarm, oil pressure alarm, electronic injection fault indication, ABS alarm indication, mode indication, cruise system indication, traction control system indication and anti-theft indicator.

The signals of BX1200 system are all electronic signals, and the instrument is TFT instrument.

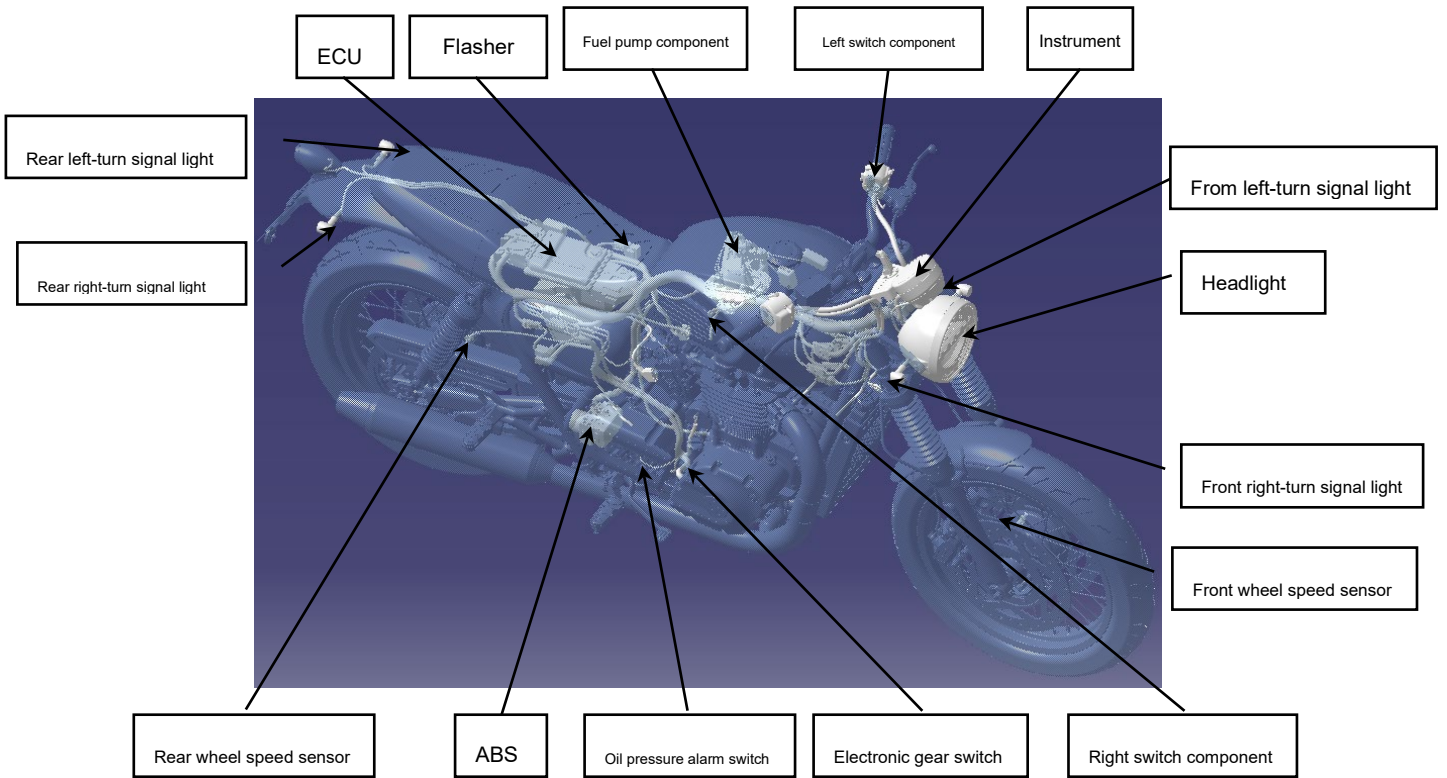
Parts of the system:

- Instrument component
- Running speed sensor
- Oil level sensor
- Electronic gear switch
- Left and right switch components
- Water temperature sensor
- ABS
- ECU

Schematic Circuit Diagram



Parts Arrangement Diagram



Introduction to Main Components and Parts

○Integrated instrument

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 LCD to display information.

3. Pin function table

Pin No.	Function	Pin No.	Function
1		13	
2		14	
3		15	Anti-theft indicator
4		16	Fuel level
5		17	Flasher input
6		18	Left turn signal
7		19	Right turn signal
8		20	High beam indicator
9		21	Oil pressure alarm indicator
10	Ground	22	
11	Live	23	CAN-H
12	Ignition switch power	24	CAN-L

4. Basic function

The display information includes: vehicle speed, engine speed, gear, voltage alarm, water temperature indication and alarm, direction indication, high beam indication, total/sub-total mileage, time, fuel level indication and alarm, oil pressure alarm, electronic injection fault indication, ABS alarm indication, mode indication, cruise system indication, traction control system indication and anti-theft indicator.

5. Fault mode

Part of functions cannot be displayed correctly;
 The time cannot be changed via operating button;
 There is water in the instrument;
 The housing is broken due to mechanical vibration;
 The surface is discolored or scratched.

○ Electronic gear switch

1. Outside view



2. Working principle

Variable speed drum rotation drives the moving contact rotation to output different voltage values by using Hall principle, and represent different gears.

3. Gear function

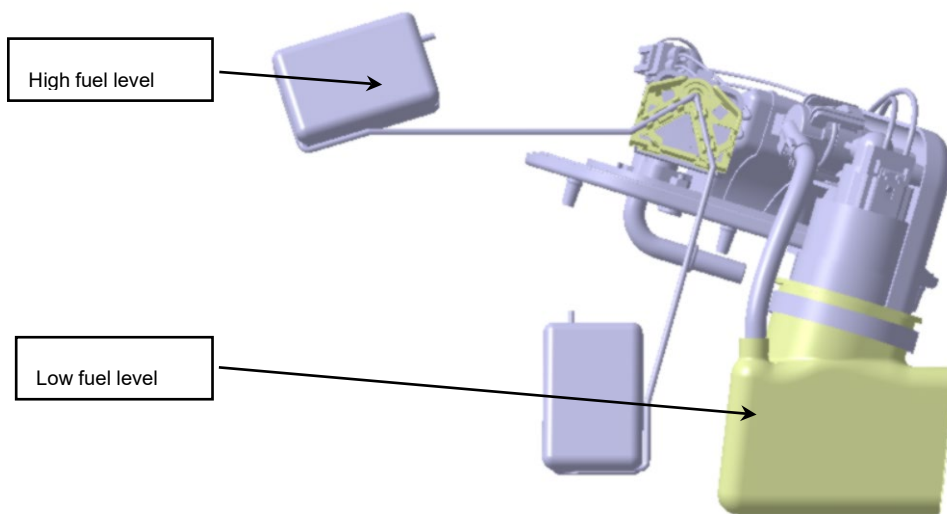
	Resistance value ±1%Ω (room temperature)	Output voltage +0.2V	Magnet position	(A)	(B)	(C)	(D)	(F)	(G)	(H)
Neutral gear	0	0.2	⊖	⊖						
1 st gear	91	0.5	⊖	⊖						
2 nd gear	220	1.0	⊖		⊖					
3 rd gear	470	1.6	⊖			⊖				
4 th gear	1K	2.5	⊖				⊖			
5 th gear	2K	3.3	⊖					⊖		
6 th gear	4.7K	4.1	⊖						⊖	

4. Fault mode

- The magnetic patch is damaged;
- The gear switch is broken by vibration or pressing;
- The gear switch is loose;
- The connector cannot be fully connected;
- The outgoing line is open-circuited or short-circuited.

○ **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

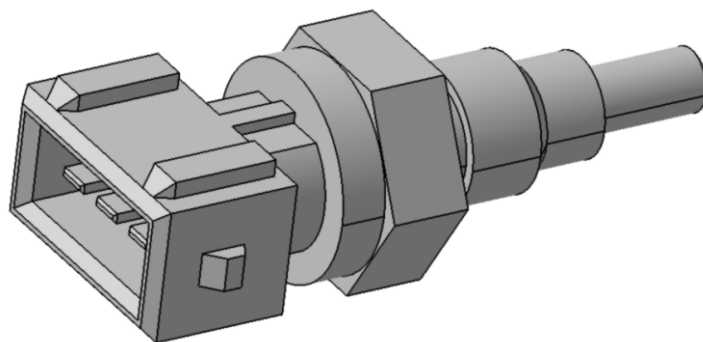
Fuel level parameter	
Fuel sensor resistance (R)	Instrument display requirement
$R > 200$	Fuel level icon flashes, and flashes more frequently from 1 bar to 6 bars
$100 \geq R > 91\Omega$	Fuel displays 1 bar and fuel level alarm icon flashes together
$91 \geq R > 78\Omega$	Fuel display 1 bar, and fuel level icon appears
$78 \geq R > 62\Omega$	2 bars
$62 \geq R > 48\Omega$	3 bars
$48 \geq R > 30\Omega$	4 bars
$30 \geq R > 12\Omega$	5 bars
$12 \geq R > 3\Omega$	6 bars

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 temperature in the water tank changes, and the resistance value of the water temperature sensor changes too. ECU obtains the water temperature signal according to the resistance signal to control the fan and display the water temperature.

3. Corresponding relation of instrument display scale and water level sensor

Temperature °C	Standard resistance (Ω)
45	265.0~323.0
50	216.0~264.0
54	185.0~229.0
60	148.5~180.5
80*	74.6~90.6
90	53.5~66.5
100	40.6~48.6
108	34.0~38.0
110	32.0~36.0
113	30.0~34.0
115*	25.7~31.7
120	23.0~27.0
125	2.05~24.5

Main Faults Diagnosis

Mode display, cruise system display, and traction control system display

Fault Phenomenon	Possible Cause	Solution
Running speed indicator fault: The vehicle speed is not displayed; The vehicle speed is far from the real one;	<ol style="list-style-type: none"> 1. The space between the speed sensor and the signal panel is too large; 2. The vehicle speed sensor is failed; 3. The signal panel is failed; 4. The instrument is failed; 5. The circuit is not connected well or is open-circuited or short-circuited; 6. CAN communication error occurs; 7. ABS fault occurs. 	<ol style="list-style-type: none"> 1. Reduce the space 1-1.5mm; 2. Replace the vehicle speed sensor; 3. Replace the signal panel; 4. Replace the instrument; 5. Reconnect or repair; 6. Use diagnostic tool to find out fault; 7. Troubleshoot ABS fault.
No mileage increase indication for running speed	<ol style="list-style-type: none"> 1. The instrument is failed. 	<ol style="list-style-type: none"> 1. Replace the instrument.
Engine speed indication fault	<ol style="list-style-type: none"> 1. The circuit is not connected well or is open-circuited; 2. The instrument is failed; 3. The ECU is failed; 4. The rotation speed sensor is failed; 	<ol style="list-style-type: none"> 1. Reconnect or repair; 2. Replace the instrument; 3. Replace the ECU; 4. Replace the rotational speed sensor;

ABS fault light is always on when the speed is greater than 5km/h;	<ol style="list-style-type: none"> 1. ABS fault occurs; 2. CAN communication fault occurs; 3. The instrument is failed. 	<ol style="list-style-type: none"> 1. Troubleshoot ABS fault; 2. Use diagnostic tool to find out fault; 3. Replace the instrument.
Fuel level indicator flashes, and it flashes more frequently from 1 bar to 6 bars of the fuel level displayed	<ol style="list-style-type: none"> 1. Fuel sensor failure occurs; 2. Instrument failure occurs; 	<ol style="list-style-type: none"> 1. Replace the fuel sensor; 2. Replace the instrument;
There is no gear indication; Gear indication is wrong.	<ol style="list-style-type: none"> 1. Gear switch is failed; 2. Instrument is failed; 3. CAN communication fault occurs. 	<ol style="list-style-type: none"> 1. Replace the gear switch; 2. Replace the instrument; 3. Use diagnostic tool to find out fault.
Water temperature indicator flashes, and it flashes more frequently from 1 bar to 6 bars of the water temperature displayed	<ol style="list-style-type: none"> 1. Water temperature sensor is faulted; 2. Instrument is failed; 3. CAN communication fault occurs; 	<ol style="list-style-type: none"> 1. Replace the water thermometer sensor; 2. Replace the instrument; 3. Use diagnostic tool to find out fault.
Voltage alarm light is on by mistake	<ol style="list-style-type: none"> 1. The instrument is failed. 	<ol style="list-style-type: none"> 1. Replace the instrument.
Lighting failure of director indicator Lighting failure of low beam indicator	<ol style="list-style-type: none"> 1. The circuit is not connected well or is open-circuited; 2. The instrument is failed. 	<ol style="list-style-type: none"> 1. Reconnect or repair it; 2. Replace the instrument.
Time display fault: There is no time displayed or it cannot be adjusted or there is a serious time error;	<ol style="list-style-type: none"> 1. The instrument is failed. 	<ol style="list-style-type: none"> 1. Replace the instrument.
Oil pressure alarm indicator is constantly on	<ol style="list-style-type: none"> 1. Oil pressure alarm indicator switch is faulted; 2. The instrument is failed. 	<ol style="list-style-type: none"> 1. Replace the oil pressure alarm switch; 2. Replace the instrument.
Function regulating failure of instrument	<ol style="list-style-type: none"> 1. The instrument is failed. 	<ol style="list-style-type: none"> 1. Replace the instrument.
Anti-theft indicator is on abnormally;	<ol style="list-style-type: none"> 1. The anti-theft control is faulted; 2. The instrument is failed. 	<ol style="list-style-type: none"> 1. Replace the anti-theft control; 2. Replace the instrument
Electronic injection fault light, mode display, cruise indicator and traction control system is abnormal	<ol style="list-style-type: none"> 1. The fuel injection system is faulted; 2. The instrument is abnormal; 3. CAN communication abnormality occurs; 	<ol style="list-style-type: none"> 1. Use diagnostic tool to find out fault; 2. Replace the instrument; 3. Use diagnostic tool to find out fault.

Engine Management System

Overview

BX1200 engine management system 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 injection system include: fuel quantity control, ignition timing control and 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. Sensor:

- Intake temperature and pressure sensor, throttle position sensor and electronic oil filler (air density, load, load range, acceleration and deceleration)
- Engine water temperature sensor (engine temperature information)
- Muffler oxygen sensor (Excess air coefficient greater than or less than 1)
- Engine speed sensor (rev, crankshaft position)

2. Actuator:

- Fuel pump
- Fuel injector (fuel supply)
- Ignition coil
- Spark plug (ignition)
- Electronic throttle (intake)

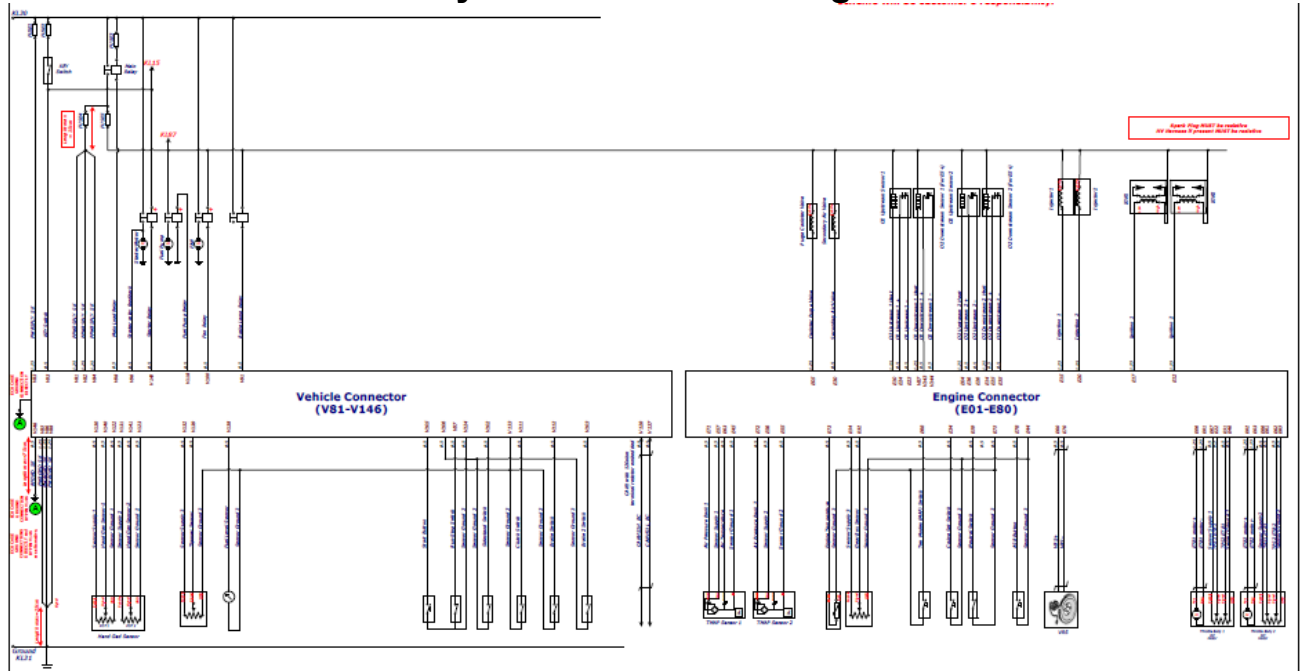
3. Electronic control unit:

- ECU

Notes for Maintenance

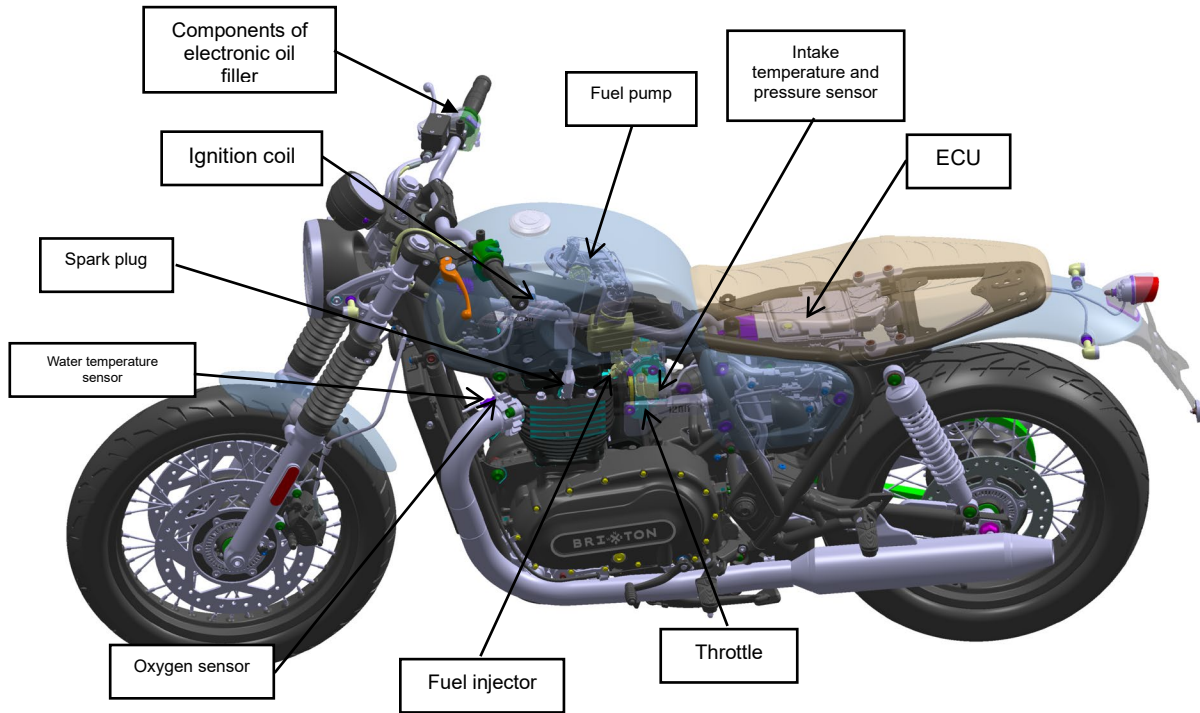
1. The fault of electronic fuel injection system can be diagnosed by the fault indicator on instrument and also by communicating the special diagnostic device with the ECU.
2. When diagnosing fault, it only needs to turn on the lock switch.
3. If any sensor fails, the ECU will continue to run in limping 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 vehicle. Please contact the special maintenance shop immediately repairing.

System Schematic Diagram



Please refer to Annex 1 for details

Parts Arrangement Diagram



Specification for BX1200 After-sales Maintenance and Inspection

I. Vehicle inspection

Check and confirm if the parts of electric circuit, gas circuit and oil circuit are assembled correctly. Add 3-5L fuel to the tank and connect the positive and negative terminals of the battery.

II. Anti-theft matching

1. The vehicle has been completed anti-theft matching upon leaving the factory, and the frame number, key, anti-theft device and ECU of the vehicle have been bound. If you replace any of the components, you need to remake anti-theft matching, otherwise the vehicle cannot be started.

2. For details about anti-theft matching process, see anti-theft key matching operation instructions.

III. ECU self-learning

1. BX1200 Meeting Euro V Emission Standard has finished ECU self-learning upon leaving the factory. In case of replacement of engine or ECU, ECU self-learning needs to be done again.

2. After replacement of a new ECU, use the lock switch to power on, the electric injection fault indicator on the instrument flashes; and when starting the vehicle, the said fault light still flashes. Run it at neutral gear and heat the engine. In this process, you can fill oil normally. Now the engine speed is limited to 7000RPM.

3. In neutral state, when the water temperature reaches above 80°C, pull the throttle until the engine speed reaches 6500RPM and release it; and pull the throttle again until the engine speed reaches 6500RPM and release it when the speed falls back to idle speed. Repeat this process for 4 times so that ECU can perform self-learning. After learning, the electric injection fault indicator is off, so that the ECU is in normal state.

Remark: Only BX1200 Meeting Euro V Emission Standard has to finish ECU self-learning.

IV. Electronic fuel injection inspection

1. Speed limit at neutral gear

After ECU self-learning, at neutral gear, the engine speed limit shall be 3,000RPM when the water temperature is below 80°C; and it shall be 7,000RPM when the water temperature is more than 80°C.

2. Drive mode

There are two drive modes, namely standard mode and power-driven mode. Press left handle switch to perform mode switching.

3. Cruise control

1) Activation: Turn on the lock switch, press the cruise button for 3s to activate; when the instrument cruise indicator shows orange, it means that the cruise function is activated.

2) Cruise:

I. During riding process, when the gear is at 3rd gear or above, and the speed is 50-160km/h, press the cruise button for about 1s, and then release the throttle, the vehicle will cruise at the current speed, and the instrument cruise indicator shows green.

II. When the vehicle is cruising at the current speed, the difference between the over-speed and the current cruising speed is less than 30km/h, and the vehicle is still cruising at the cruising speed before refueling after returning to the throttle.

3) Cruise discharge:

I. During cruising process, when the vehicle is cruising at the current speed, the difference between the over-speed and the current cruising speed is more than 30km/h, the cruise function will be discharged.

II. ECU receives brake, clutch and cruise button signals, engine speed approaching maximum speed, ASR intervention and gear shifting signal, throttle and cruise button fault signal, throttle fault signal, tipping signal and flame-out switch signal, the cruise function will be discharged.

4. ASR traction control

1) By default, the vehicle ASR is normally on, and the instrument does not display ASR indicator. Manually press ASR button for 3s to turn it off. Now the instrument displays that the yellow ASR indicator flashes.

2) When ECU monitors the difference between front and rear wheel speeds, ASR comes into effect. Now the instrument displays that the yellow ASR indicator is on, and the vehicle shows that the engine cannot operate at a high speed upon refueling. It can be confirmed that the rear wheel supported by the main bracket is suspended.

5. Fan control

The fan starts working when the temperature collected by the water temperature sensor is $\geq 93^{\circ}\text{C}$, and stops working when the temperature is $\leq 88^{\circ}\text{C}$.

V. Electric injection fault inspection

Turn on lock switch, connect diagnostic unit and read the fault code to confirm if there is a fault. If no electric injection fault is found, start the engine, check and confirm the following:

1. When the vehicle is idling, the engine idles stably, and there is no flame-out phenomenon. When the electronic throttle is turned, the engine speed rises naturally; and when the throttle is released, the engine speed falls naturally without flame-out.

2. When the engine runs to water temperature above 80°C , the idle speed of the engine is $1,000 \pm 100\text{rpm}$.

3. Check if the battery voltage is $14.5 \pm 0.5\text{V}$ (the engine is running, so it can be determined that whether the magneto charges normally).

4. There are no abnormal phenomena such as weak acceleration, flame-out, shooting and gasping when the vehicle is running at each gear; there is no uncomfortable phenomena in gear switching; and from shifting up in turn and fully opening the throttle to the maximum designed speed, when the throttle is released, the engine speed falls naturally without flame-out.

5. During the said process, in case of any abnormality, the vehicle must be sent for repairing.

Remarks: **1. The lock switch must be kept off for more than 30 seconds before removal of the ECU connector or disconnection of the positive/negative terminal of the battery.**

2. In case of an electronic injection fault, it should be powered on or off first or cleared by diagnostic unit. If the fault is still reported, the relevant parts should be checked again.

Fault code and description:

Fault code	Fault code description	Solutions (for reference)
P0105	Electrical failure happens to the one-cylinder intake pressure sensor	1. Check whether the throttle body is in bad contact with the cable of the vehicle 2. Change the throttle body assembly
P0120	One-way throttle position sensor 1	
P0220	One-way throttle position sensor 2	
P2135	Consistency fault happens to the one-way throttle position sensor	
P0225	Pedal position sensor 1	1. Check whether the electronic throttle is in bad contact with the cable of the vehicle 2. Replace the electronic throttle
P2130	Pedal position sensor 2	
P2140	Consistency fault happens to the pedal position sensor	

P1402	A fault happens to the self-learning mechanical bottom dead center of one-way throttle	1. Check whether the throttle body is in bad contact with the cable of the vehicle 2. Change the throttle body assembly
P1403	A fault happens to the self-learning condition of one-way throttle.	
P1404	A fault happens to the self-learning voltage of one-way throttle	
P0638	A fault happens to the position of one-way throttle	
P1600	Leakage happens to one-cylinder intake	Check if the intake system leaks air
P0115	Coolant temperature sensor	1. Check whether the water temperature sensor is in poor contact 2. Replace the water temperature sensor
P0110	Air temperature sensor	1. Check whether the throttle body is in bad contact with the cable of the vehicle 2. Change the throttle body assembly
P0560	Battery voltage	1. Check if the battery voltage is normal 2. Replace the battery
P0130	An electrical fault happens to 1-cylinder front oxygen sensor	1. Check whether the corresponding oxygen sensor is in bad contact with the cable of the vehicle 2. Replace the corresponding oxygen sensor
P0150	An electrical fault happens to 2-cylinder front oxygen sensor	
P0336	Engine speed sensor	1. Check whether the magneto trigger is in bad contact with the cable of the vehicle 2. Replace the engine stator assembly
P0201	Fuel injector 1	1. Check whether the corresponding fuel injector is in bad contact with the harness 2. Replace the corresponding fuel injector
P0202	Fuel injector 2	
P0351	Ignition coil 1	1. Check whether the corresponding ignition coil is in bad contact with the harness 2. Replace the corresponding ignition coil
P0352	Ignition coil 2	
P0230	Fuel pump relay	1. Check the fuel pump relay circuit in the vehicle cable fuse box 2. Check the fuses in the vehicle cable fuse box 3. Replace the fuel pump relay
P2100	One-way throttle motor	1. Check whether the throttle body is in bad contact with the cable of the vehicle 2. Change the throttle body assembly
P0030	Oxygen sensor heater 1	1. Check whether the corresponding oxygen sensor is in bad contact with the cable of the vehicle 2. Replace the corresponding oxygen sensor
P0050	Oxygen sensor heater 2	
P0914	Gear sensor	1. Check whether the gear sensor is in poor contact 2. Replace the gear sensor
P0480	Fan	1. Check whether the fan and fan relay in bad contact with the cable of the vehicle 2. Check the fuses in the vehicle cable fuse box 3. Replace the fan relay
P0106	A rationality failure happens to the one-cylinder intake pressure sensor	1. Check whether the throttle body is in bad contact with the cable of the vehicle 2. Change the throttle body assembly 3. Check if the intake system leaks air
P2175	One-cylinder intake manifold signal is too	

	low	
P1105	An electrical failure happens to the two-cylinder intake pressure sensor	1. Check whether the throttle body is in bad contact with the cable of the vehicle 2. Change the throttle body assembly
P2120	Two-way throttle position sensor 1	
P2125	Two-way throttle position sensor 2	
P2138	A consistency fault happens to the two-way throttle position sensor	
P0639	A fault happens to the position of two-way throttle	
P210A	Two-way throttle motor	
P0615	Starter relay	1. Check whether the starter relay in bad contact with the cable of the vehicle 2. Check the fuses of the starter relay 3. Replace the starter relay
P1408	A fault happens to the self-learning mechanical bottom dead center of two-way throttle	1. Check whether the throttle body is in bad contact with the cable of the vehicle 2. Change the throttle body assembly 3. Check if the intake system leaks air
P1409	A fault happens to the self-learning condition of two-way throttle	
P1410	A fault happens to the self-learning voltage of two-way throttle	
P1601	An electrical failure happens to the two-cylinder intake manifold	
P0106	A rationality failure happens to the two-cylinder intake manifold	
P2173	Two-cylinder intake manifold signal is too low	
PC426	Immobilizer	1. Check whether the immobilizer is in bad contact with the cable of the vehicle 2. Check if the anti-theft system is matched 3. Replace the immobilizer
P0604	ABS fault	1. Check whether the ECU is in bad contact with the cable of the vehicle 2. Replace the ECU
P0601	EEPROM failure	1. Check whether the ECU is in bad contact with the cable of the vehicle 2. Replace the ECU
PC001	CAN Bus off	1. Check whether the ECU is in bad contact with the cable of the vehicle 2. Replace the ECU 3. Replace parts and components related to CAN communication fault
PC140	Instrument	1. Check whether the instrument is in bad contact with the cable of the vehicle 2. Replace the instrument
P160C	Safety resetting	1. Check whether the ECU is in bad contact with the cable of the vehicle 2. Replace the ECU
P0121	Rationality of one-way throttle potentiometer 1	1. Check whether the throttle body is in bad contact with the cable of the vehicle 2. Change the throttle body assembly
P0221	Rationality of one-way throttle	

	potentiometer 2	
P2121	Rationality of two-way throttle potentiometer 1	
P2126	Rationality of two-way throttle potentiometer 2	
P060C	Safety shutdown	1. Check whether the ECU is in bad contact with the cable of the vehicle 2. Replace the ECU
P1400	A fault happens to the self-learning limp position of one-way throttle	1. Check whether the throttle body is in bad contact with the cable of the vehicle
P1401	A fault happens to the learning scope of one-way throttle	2. Change the throttle body assembly
P1305	Brake light relay fault	1. Check whether the brake light relay is in bad contact with the cable of the vehicle 2. Replace the brake light relay or the brake light
P1406	A fault happens to the self-learning limp position of two-way throttle	1. Check whether the throttle body is in bad contact with the cable of the vehicle
P1407	A fault happens to the learning scope of two-way throttle	2. Change the throttle body assembly
P0512	"Start" button	1. Check whether the right handle switch is in bad contact with the cable of the vehicle 2. Replace the right handle switch
P1405	A fault happens to the learning TRC of one-way throttle	1. Check whether the throttle body is in bad contact with the cable of the vehicle
P1411	A fault happens to the learning TRC scope of two-way throttle	2. Change the throttle body assembly
PC121	ABS node does not exist	1. Check whether the ABS controller is in bad contact with the cable of the vehicle 2. Replace the ABS controller
P0500	Front wheel speed sensor	1. Check whether the corresponding front wheel speed sensor is in bad contact with the cable of the vehicle
P2158	Rear wheel speed sensor	2. Replace the corresponding wheel speed sensor
P0564	Cruise button fault	1. Check whether the left handle switch is in bad contact with the cable of the vehicle 2. Replace the left handle switch
P0443	An electrical failure happens to carbon tank solenoid valve	1. Check whether the carbon tank solenoid valve is in bad contact with the cable of the vehicle 2. Replace the carbon tank solenoid valve
P0111	A rationality fault happens to intake temperature sensor	1. Check whether the 1-cylinder throttle body is in bad contact with the cable of the vehicle 2. Replace the 1-cylinder throttle body assembly
P0685	A rationality fault happens to coolant temperature sensor	1. Check whether the water temperature sensor is in bad contact with the cable of the vehicle 2. Replace the water temperature sensor
P1762	An electrical fault happens to toppling sensor	1. Check whether the toppling sensor is in bad contact with the cable of the vehicle 2. Replace the toppling sensor
P2227	Atmospheric pressure sensor has improper signal	1. Check whether the ECU is in bad contact with the cable of the vehicle 2. Replace the ECU

P0505	Fault of idling and speed control system	<ol style="list-style-type: none"> 1. Check whether the throttle body is in bad contact with the cable of the vehicle 2. Change the throttle body assembly 3. Check if the engine and intake system leak air
P1615	ROM validation failure	<ol style="list-style-type: none"> 1. Check whether the ECU is in bad contact with the cable of the vehicle 2. Replace the ECU
P1309	Flywheel self-learning	Check if ECU self-learning is finished
P2500	Dual mode switch blocking	<ol style="list-style-type: none"> 1. Check whether the left handle switch is in bad contact with the cable of the vehicle 2. Replace the left handle switch
P0133	Front oxygen sensor 1 responses slowly	<ol style="list-style-type: none"> 1. Check whether the corresponding oxygen sensor is in bad contact with the cable of the vehicle 2. Replace the corresponding oxygen sensor
P0153	Front oxygen sensor 2 responses slowly	
P0300	Random/several-cylinder misfire is found	<ol style="list-style-type: none"> 1. Check whether the corresponding ignition coil is in bad contact with the wire of the vehicle 2. Check whether the corresponding ignition coil is in bad contact with spark plug 3. Replace the corresponding ignition coil or spark plug
P0301	1-cylinder misfire 200	
P0302	2-cylinder misfire 200	

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Electrical system Diagram

