ZERO XE ™



ZERO MOTORCYCLES
SERVICE MANUAL

8812088-AI

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Identification Numbers

Vehicle Identification Number (VIN)



The VIN is a 17-digit number stamped on the head tube of the frame. Do not alter or remove this number as it is the legal identifier for your motorcycle.

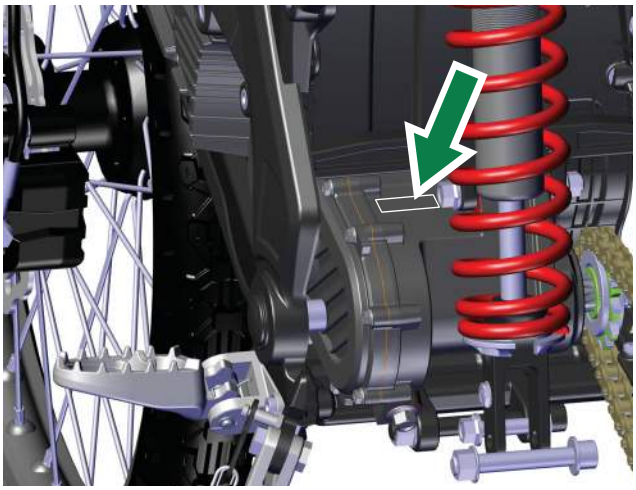
Vehicle Nameplate



The vehicle nameplate is located on the frame just above the battery.

Motor Serial Number

The motor serial number is stamped on the right hand side of the motor housing.

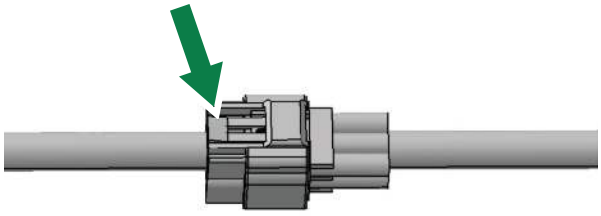


General Maintenance Guidelines

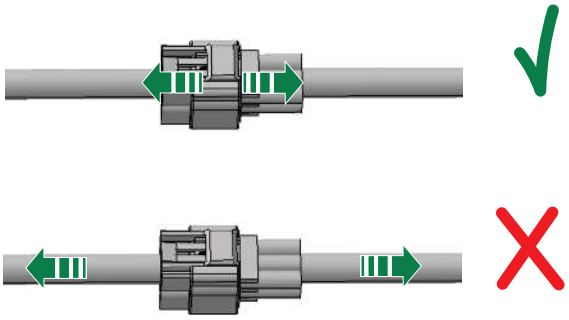
- Parts, accessories, lubricating oil and other auxiliary materials produced by or recommended Zero Motorcycles shall be used when performing repairs. If replacement parts do not meet specifications or requirements, the motorcycle may be damaged.
- When reassembling after a repair, replace any washers, seals and cotter pins that were removed.
- After any parts are disassembled, clean them before inspection and measurement. When cleaning parts, use a non-combustible cleaning agent.
- Before assembly, the sliding surface of parts shall be applied with the specified lubricating oil or grease. The specified or equivalent grease (oil) must be applied or injected at the specified location.
- After assembly, check whether all parts are installed correctly. Check the rotation, movement, and operation of each part that was removed.
- Only use proper tools when repairing the motorcycle.
- When multiple people are performing repairs on the same motorcycle, adhere to proper safety and communication guidelines.
- Always turn the key switch off and remove the key when working on the motorcycle. Only turn the power on when necessary to validate repairs.

Electrical Connector Guidelines

- Firmly mate connectors with their corresponding connector. Make sure that the colors of the harnesses and the connector correspond.



- Release the locking tab before trying to disconnect a connector.



- When disconnecting a connector, hold the connector housings when trying to pull apart. Do not pull on the wiring harnesses.
- Before connecting a connector, inspect the terminals for signs of damage or wear. Make sure all terminals are properly seated in their cavities.
- If any terminals are rusted, clean with emery paper before connecting.
- Ensure that all harnesses are properly secured to the chassis using proper harness ties. Do not allow a harness to interfere with operation in any way.
- Ensure harnesses are clamped in places that are not sharp or heat-producing. Do not route harnesses where the wiring can contact the head and/or front part of bolts and screws.
- Do not pull on harnesses by force. If a wire harness must be in contact with an edge or corner, protect it with sheathing or tape at the contact point.
- Do not damage the coating/sheathing of a wire harness. If a wire harness is damaged, it should be repaired by winding with electrical tape.

- Do not press on wiring harnesses when installing parts or performing repairs.
- Do not twist wiring harnesses, cables or hoses.
- When securing any wiring or hoses from the handlebar, make sure there is sufficient slack to allow full rotation of the handlebar.

Maintenance Intervals

Initial 60 mi (100 km)

- **Drive chain:** Check tension and adjust. Inspect for wear. Refer to Adjusting the Drive Chain, page 30-7.

Initial 1800 mi (3000 km)

- **Gear oil:** Replace. Refer to Gear Oil Replace, page 30-5.

Every 300 mi (500 km)

- **Drive chain:** Check tension and adjust. Inspect for wear. Refer to Adjusting the Drive Chain, page 30-7.

Every 1,250 mi (2000 km)

- **Various hardware:** Check hardware torque. See Component Fastener Torques, page 10-2. Replace hardware as necessary.
- **Sprockets:** Inspect for wear.
- **Wiring harnesses:** Inspect and check that harnesses are properly secured along the bike.
- **Bike tip-over protection:** Check operation.
- **Wheel, steering, suspension linkage and swingarm bearings:** Check bearings for smooth operation. Replace as necessary.

Every 3,100 mi (5000 km)

- **Drive chain:** Replace. Refer to Adjusting the Drive Chain, page 30-7.

Every 4,300 mi (7000 km) or 4 months

- **Gear oil:** Replace. Refer to Gear Oil Replace, page 30-5.

Every 6,200 mi (10000 km) or 12 months

- **Brake fluid:** Replace. Refer to Brake Bleeding - Vacuum Method, page 45-4.
- **Front suspension:** Replace as necessary. Refer to Front Suspension, page 40-4.

Tire Pressure Check

1. Check the tire pressure with a tire pressure gauge to see if it meets the recommended tire pressure requirements.

Note: Check the tire pressure when the tire is at the normal temperature.

FRONT	REAR
32 psi (225 kPa)	32 psi (225 kPa)

2. If the tire pressure is low, check the tire for cuts, embedded nails or other sharp objects.

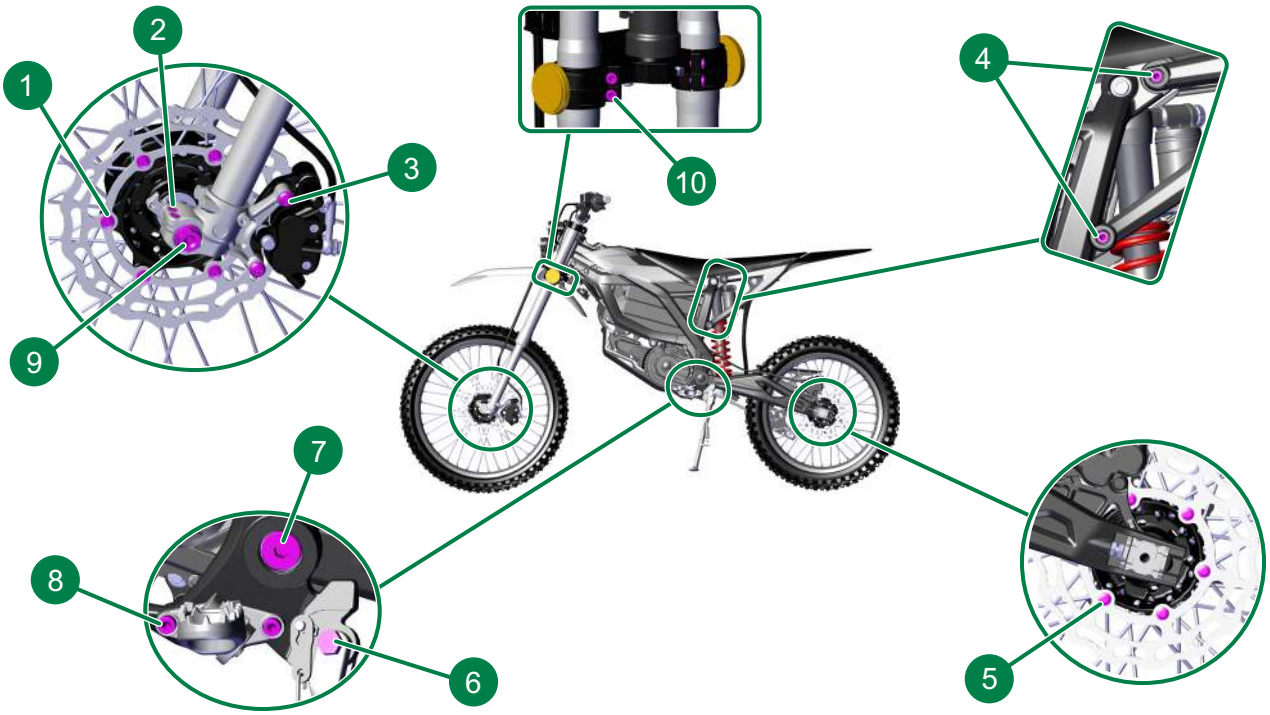
Lubrication Points



1. Steering Bearings - See Steering Column, page 40-2
2. Front Axle - See Front Wheel, page 50-1
3. Drive Chain - See Drive Chain, page 30-6
4. Rear Axle - See Rear Wheel, page 50-2

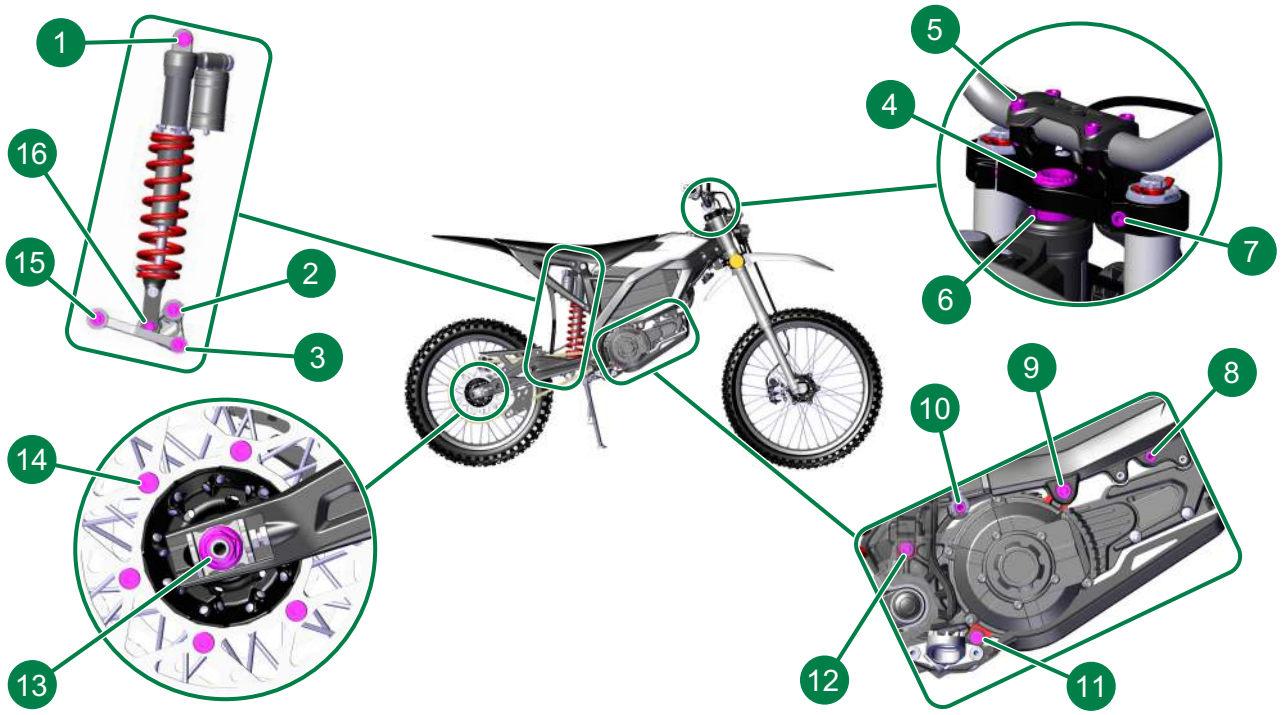
Component Fastener Torques

Left Side of Motorcycle



ITEM	DESCRIPTION	TORQUE
1	Front brake rotor bolts	7 ± 1.5 lb·ft (10 ± 2 Nm)
2	Front axle pinch bolts	7 ± 1.5 lb·ft (10 ± 2 Nm)
3	Front caliper bolts	22 ± 1.5 lb·ft (30 ± 2 Nm)
4	Tail frame to frame bolts	20 ± 2 lb·ft (27.5 ± 2.5 Nm)
5	Rear brake rotor bolts	7 ± 1.5 lb·ft (10 ± 2 Nm)
6	Kickstand bolt	20 ± 2 lb·ft (27.5 ± 2.5 Nm)
	Kickstand nut	9 ± 2 lb·ft (12.5 ± 2.5 Nm)
7	Swingarm to frame	81 ± 7 lb·ft (110 ± 10 Nm)
8	Left and right foot pegs	20 ± 2 lb·ft (27.5 ± 2.5 Nm)
9	Front axle	20 ± 2 lb·ft (27.5 ± 2.5 Nm)
10	Lower triple clamp pinch bolts	12 ± 1.5 lb·ft (16 ± 2 Nm)

Right Side Of Motorcycle



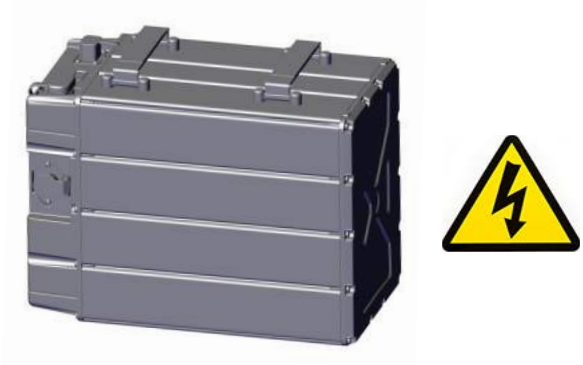
ITEM	DESCRIPTION	TORQUE
1	Rear shock top mount	55 ± 4 lb·ft (75 ± 5 Nm)
2	Wishbone linkage to swingarm	55 ± 4 lb·ft (75 ± 5 Nm)
3	Dogbone to wishbone linkage	55 ± 4 lb·ft (75 ± 5 Nm)
4	Steering shaft bolt	55 ± 4 lb·ft (75 ± 5 Nm)
5	Handlebar clamp bolts	20 ± 2 lb·ft (27.5 ± 2.5 Nm)
6	Steering adjustment nut	See Steering Bearing Check, page 40-1.
7	Upper triple clamp pinch bolts	14 ± 1 lb·ft (19 ± 1 Nm)
8	Front battery support	20 ± 2 lb·ft (27.5 ± 2.5 Nm)
9	Front motor mount	44 ± 4 lb·ft (60 ± 5 Nm)
10	Rear battery support	20 ± 2 lb·ft (27.5 ± 2.5 Nm)
11	Rear (lower) motor mount	22 ± 1.5 lb·ft (30 ± 2 Nm)
12	Rear (upper) motor mount	44 ± 4 lb·ft (60 ± 5 Nm)
13	Rear axle	81 ± 7 lb·ft (110 ± 10 Nm)
14	Rear sprocket screws	22 ± 1.5 lb·ft (30 ± 2 Nm)
15	Dogbone to frame mount	55 ± 4 lb·ft (75 ± 5 Nm)
16	Rear shock lower mount	37 ± 4 lb·ft (50 ± 5 Nm)

Standard Torque Values

Use the following table for hardware that is not specified in the previous table.

Hardware Size	TORQUE
M5 bolts/nuts	4 ± 1 lb·ft (5 ± 1 Nm)
M6 bolts/nuts	7 ± 1.5 lb·ft (10 ± 2 Nm)
M8 bolts/nuts	22 ± 1.5 lb·ft (30 ± 2 Nm)
M10 bolts/nuts	30 ± 4 lb·ft (40 ± 5 Nm)
M5 screws	4 ± 1 lb·ft (5 ± 1 Nm)
M6 screws	6.5 ± 1.5 lb·ft (9 ± 2 Nm)

Battery Guidelines



WARNING

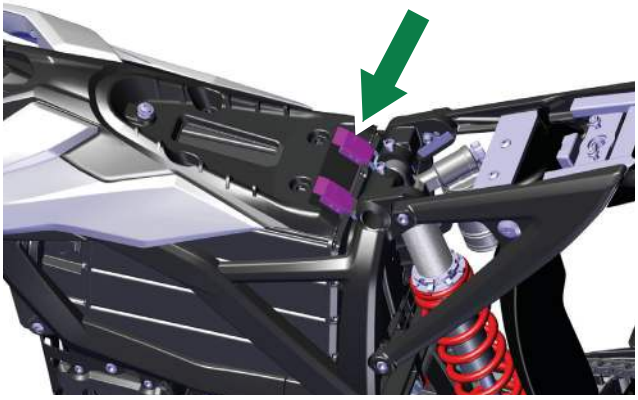
If the battery pack has been dropped or damaged, the waterproof structure of the battery pack may be damaged and the seal affected. To avoid danger in this instance, contact Zero Customer Support. The battery pack is a waterproof battery, but it has high voltage and precision circuits inside. It is strictly prohibited to allow water intrusion and moisture into the battery. Only Zero-trained technicians can service a battery.

1. Due to certain logistical issues, battery power may be insufficient, or the battery power display may be different from the actual power. The motorcycle may have problems such as short battery life, weak power, and inaccurate power display. Fully charge the battery before using.
2. The recommended temperature range for lithium batteries is 5° F to 113° F (-15° C to 45°C) with best performance between 50° F to 86° F (10° C to 30° C). If the ambient temperature is too low or too high, it will affect the performance and service life of the battery. Do not operate the motorcycle while temperatures are beyond the allowable range. Do not charge the battery below 32° F (0° C).
3. When the ambient temperature is too low or too high, battery performance will be affected, as stated above. As temperatures move into the normal operating range, battery performance will automatically recover.
4. Avoid deep discharge of the battery as this will diminish the service life of the battery. Charge the battery when the power indicator is low. The controller on this motorcycle is equipped with an under-voltage protection device. When the charge level is too low, the power drop and under-voltage protection are normal. It will automatically recover after charging.
5. When not in use for long periods of time, charge the battery pack to 40% - 60% and store it in a relatively dry environment at 68° F to 77° F (20° C to 25° C). Charge the battery pack once a month to ensure that the battery pack is in the range of 40% - 60%. Charge the battery pack once a year to 100%, discharge it to less than 10%, and then maintain it regularly according to the above maintenance methods to avoid affecting the performance and life of the battery pack and causing permanent damage.
6. Do not wash the battery pack directly with a pressure washer when washing the motorcycle. High-pressure washing can cause water intrusion into the battery pack causing internal damage. If water intrusion is suspected, do not charge or operate the motorcycle. Doing so may cause safety accidents such as fire, combustion and explosion of the battery pack.

Battery

Removal

1. Remove the seat.



2. Unlatch the battery compartment and rotate the cover assembly upward to gain access to the battery.



3. Disconnect battery communications connector (2).
4. Disconnect discharge connector (1).
5. Vertically lift the battery out of the compartment.

⚠WARNING

Install the battery terminal cover on the battery while the battery is unplugged to avoid any accidental contact.

Installation

1. Installation is the reverse of the removal procedure with the exception of the battery connectors. Install discharge connector (1) first, then install the communications connector (2).

Charging

Charging Guidelines

Check and confirm the following before charging:

- Whether the electrical outlet being used is consistent with the input voltage/amperage range of the charger.
- Whether the socket load power of the AC power grid can meet the power requirements of the charger (above 840W is recommended)
- The battery management system prohibits charging when the internal temperature is high in order to preserve the life of the battery. The maximum allowable charging temperature inside the battery pack is 113° F (45 °C). If it exceeds this temperature, it will not be able to charge. After riding, the battery management system may delay charging if the battery temperature is too hot. Charging will resume when the battery cools to within range.

⚠ CAUTION

Do not use other methods to rapidly heat or cool the battery pack. The battery must be allowed to gradually warm and cool with the ambient temperature.

- The battery management system prohibits charging when the internal battery temperature is at or below 32° F (0° C). Charging will resume when the battery warms to within range. If the battery is too cold to charge, allow the battery to warm naturally without the aid of any heating device.
- Charge the battery pack only with a dedicated charger matched to the original motorcycle or specified by Zero. It is strictly forbidden to use other chargers or accessories to charge this motorcycle. Non-approved equipment may cause battery failure or damage, and can even cause fires.
- Charge the motorcycle in a dry, well-ventilated environment away from combustibles. Do not charge in the rain.
- Disconnect the charger before operating the motorcycle.

⚠ WARNING

If the battery is dropped or damaged during a collision, the housing can become damaged. If the housing is damaged a peculiar smell may be observed during charging and discharging. Excessive heat may also be observed if the housing is damaged. If either occur, stop charging and disconnect the power supply immediately. Do not use the motorcycle. Contact Zero Customer Support.

⚠ WARNING

If the battery pack begins smoking or catches fire, it is necessary to use a (Class D) fire extinguisher to extinguish the fire. It is also advised to contact the fire department.

Charging

Note: The battery can be charged while installed in the motorcycle or while removed. To remove, see Battery, page 20-2.



1. Connect the charger output plug to the battery charging port socket.
2. Connect the charger input plug to the power supply.
3. Make sure the charging indicator on the battery indicates the battery is charging.
4. After the battery is fully charged (solid green light on charger), disconnect the charger from the electrical outlet, first. Then, unplug the charger from the battery charging port on the battery.

Controller



The motor controller is the core component in electric vehicles and is responsible for controlling electric energy conversion and regulation. Its primary functions are to control the operating speed and steering of the electric motor. Its working principle is as follows:

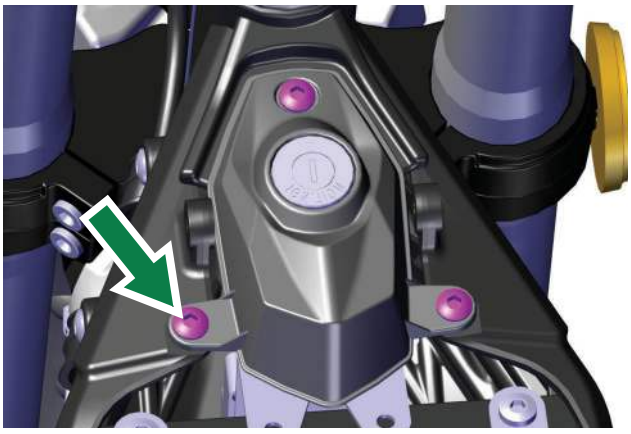
- The controller serves as the control center of the electric vehicle system. It constantly samples sensor signals through different components, processes these signals through logic, and issues operational instructions. It is highly efficient, providing smooth starts and rapid acceleration.
- The main control board within the controller constitutes the main circuit of the electric vehicle, carrying a significant current and generating heat. Therefore, when parking the electric vehicle, avoid exposing it to direct sunlight or prolonged rain exposure to prevent controller malfunctions.
- When operating the throttle, simply turn it lightly and release it gently. There is no need to rotate forcefully.

Removal

1. Remove the battery. Refer to Battery, page 20-2.



2. Remove the two bolts that secure the upper body panels. Lift the assembly off and set aside.



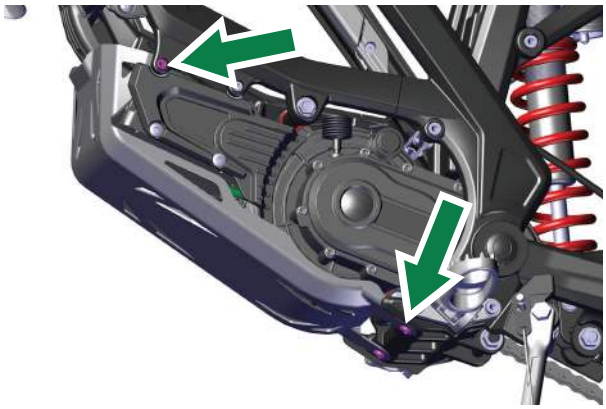
3. Remove the three screws that secure the key switch bezel. Remove the bezel.



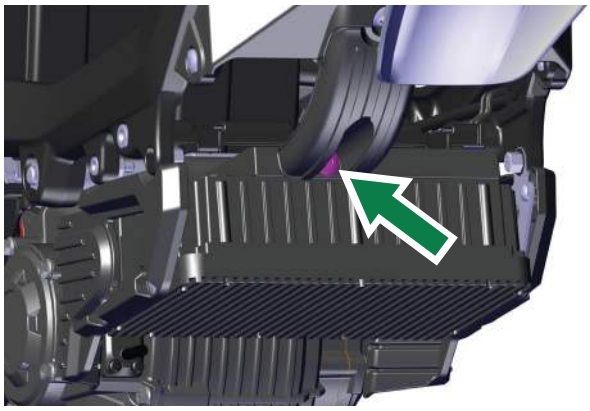
4. Disconnect the key switch connector.



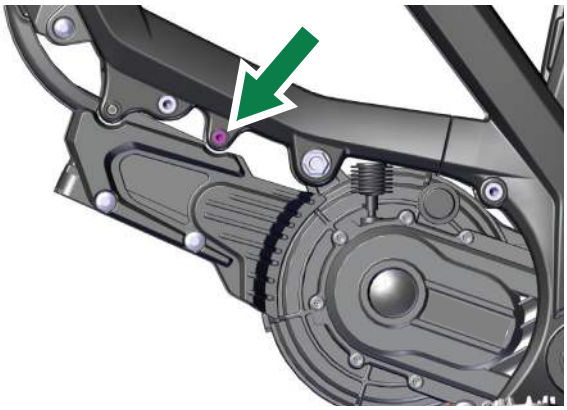
5. Disconnect the encoder connector.



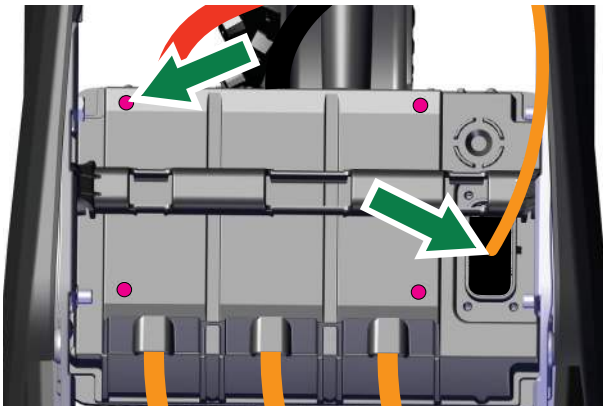
6. Remove the four bolts that secure the skid plate and remove the plate.



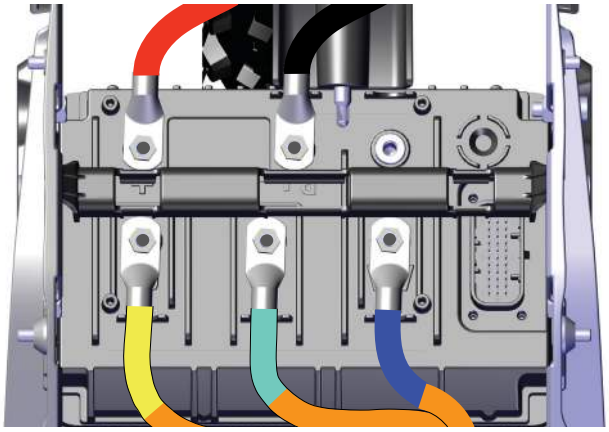
7. Remove the screw that secures the wiring cover at the front of the controller.



8. Remove the remaining mounting bolts and lower the controller.



9. Disconnect the controller connector and remove the four screws from the top of the controller.

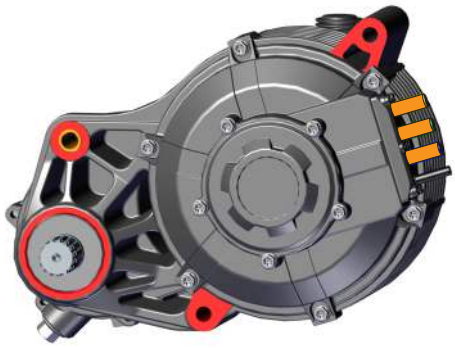


10. Disconnect the three phase cables and the two battery cables. Torque: 7 ± 1 lb·ft (10 ± 1 Nm).
11. Remove the controller.

Installation

1. Installation is the reverse of the removal procedure.
2. If a new controller was installed, calibrate the controller as outlined in Motor/Controller Calibration, page 30-5

Motor



The motorcycle is equipped with a permanent magnet synchronous motor (PMSM) motor, which has the advantages of high efficiency and a stable output.

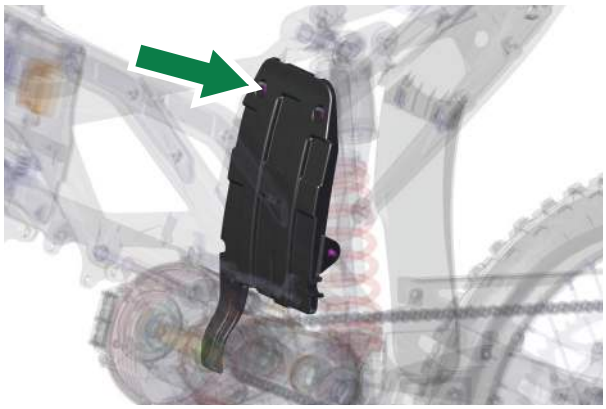
The main characteristics of the motor include a stable speed, energy consumption and a simple structure.

Water intake of the drive motor will cause insulation degradation. After the motor is disassembled and drained, it can be dried by blower or sun drying. Then the motor resistance and position sensor shall be tested and replaced if damaged.

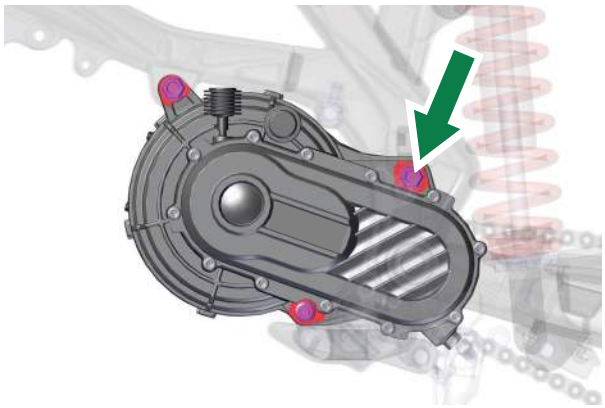
Inadequate battery charging will result in short continuous driving range and lack of power Keep the battery fully charged.

Removal

1. Remove the controller. Refer to Controller, page 30-1.

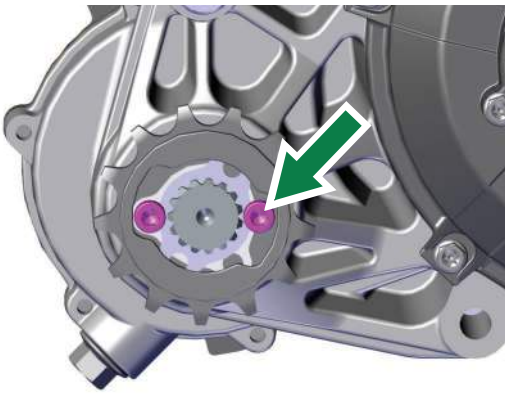


2. Remove the four screws that secure the rear battery support and remove the support.



3. Remove the three motor mounting bolts.

- Front mount - 44 ± 4 lb·ft (60 ± 5 Nm)
- Rear lower mount - 22 ± 1.5 lb·ft (30 ± 2 Nm)
- Rear upper mount - 44 ± 4 lb·ft (60 ± 5 Nm)



4. Remove the two bolts that secure the sprocket to the motor shaft. Torque: 7 ± 1.5 lb·ft (9 ± 2 Nm)

Installation

1. Installation is the reverse of the removal procedure.
2. If a new motor was installed, calibrate the motor as outlined in Motor/Controller Calibration, page 30-5

Motor/Controller Calibration

Perform this procedure after replacing the motor or controller. Enter the learning motor magnetic encoding sensor angle or use the dash to learn the angle.

1. If not already done, lower the kickstand.
2. Raise the rear wheel using a jackstand.
3. Turn off the key switch and ensure the kill switch is in the STOP position.
4. Twist the throttle to full on, apply the RH brake lever and hold.
5. Turn the key switch on and continue holding the throttle and brake lever for 5 seconds, then release.
6. Then, apply the throttle again (fully open) while applying the brake three times. After approximately 5 seconds, the wheel will begin to turn slowly.
7. After the motor/wheel stops rotating, release the throttle and turn off the key switch.
8. Key the motorcycle back on and check for normal motor operation.

Gear Oil Replace



1. Remove the drain plug and drain the gear oil (approx. 6.0 fl oz. (180 ml)).
2. Install the drain plug and new seal washer.
3. Remove the breather from the top of the housing.
4. Fill the housing with 6.0 fl oz. (180 ml) of GL-5 85w-90 gear oil and install the breather.

Drive Chain

Cleaning The Drive Chain

⚠ WARNING

Always wear safety glasses when cleaning the chain to prevent eye injuries.

⚠ WARNING

Never place your hand or any other body part between the chain and sprockets. Work with the chain only in the middle between the two sprockets. Failure to do so could result in serious injury.

⚠ WARNING

Do not allow any of the drive chain cleaner to get on the brake rotors or brake pads. If the brake rotors or brake pads are contaminated with cleaner, it will impair the motorcycle's ability to stop. This could result in serious injury or death.

⚠ WARNING

Never have the motor spinning the wheel during cleaning. Turn the wheel only by hand. Failure to do so could result in serious injury or death.

Follow the manufacturer's instructions for the chain cleaner you

are using; below are the general guideline.

1. Remove the key from the key switch.
2. Set the motorcycle on a stand or lift so the rear wheel is free to spin. While turning the wheel by hand, spray the inside of the entire chain with kerosene and let it sit for a few minutes.
3. Using a brush, fill the bristles with spray from the chain cleaner. Begin gently scrubbing the chain on the top of your swingarm using the brush.

⚠ CAUTION

If soaking the chain, do no soak in kerosene for more than 10 minutes.

4. Do this for the entire length of the chain. Now do the same thing for the inside/bottom of the chain.
5. Using the brush, clean both sides of the rear sprocket. Let this soak for 5 minutes.
6. Using a water hose, rinse the entire chain. Then, using a clean rag, wipe any residual moisture from the chain.

Lubricating The Drive Chain

Lubricate the chain every 300 mi (500 km) of motorcycle travel. Lubricate the chain regardless of mileage after riding in rainy or dirty conditions.

⚠ WARNING

Wear safety glasses when lubricating the chain to prevent eye injuries.

⚠ WARNING

Never have the motor spinning the wheel. Turn the wheel only by hand. Failure to do so could result in serious personal injury.

⚠ WARNING

Never place your hand between the chain and sprockets. Work with the chain only in the middle between the two sprockets. Failure to do so could result in serious personal injury.

⚠ WARNING

Do not allow any of the lubricant to get on the brake rotors or brake pads. If the brake rotors or brake pads are contaminated with lubricant, it will impair the motorcycle's ability to stop. This could result in serious personal injury.

Use ISO grade 32 or 46 engine oil to lubricate the drive chain.

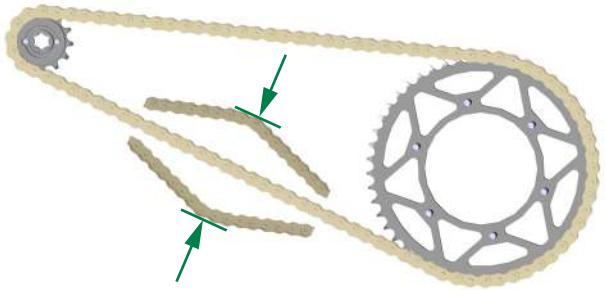
To lubricate the drive chain:

1. Clean the chain as specified. See Cleaning The Drive Chain, page 30-6.
2. Rotate the wheel backwards slowly and spray the inside of the chain on the inside of the links.

3. Rotate the wheel backwards slowly and spray the outside of the chain on the outside of the links.
4. Let the motorcycle stand for 30 minutes to allow the lubricant to penetrate the link rollers.

Inspecting the Drive Chain

When scratches, rust, wear, tight links in the chain, detachment of sealing rings, or abnormal noises during operation occur on the chain and gears, it indicates that the chain is damaged and has reached its usage limit. Replace the chain with a new one and simultaneously replace both the front and rear sprockets.



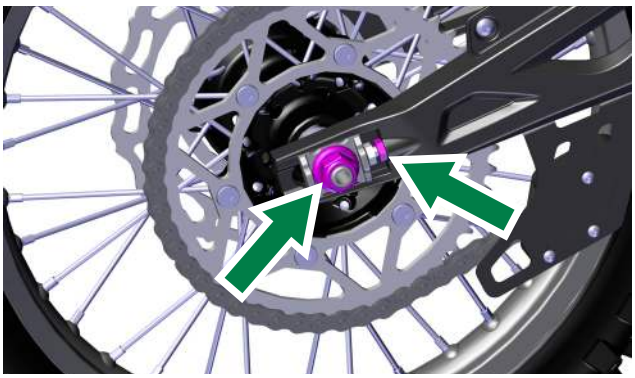
1. Check the cleanliness of the chain and sprocket.
2. Check the wear of the chain and sprocket, as well as the tightness and lubrication level of the chain.
3. Chain sag standard: the upper and lower swings of the chain are between 0.40 - 0.60 in. (10 - 15 mm).

Adjusting the Drive Chain

WARNING

If the chain is not properly adjusted, it can be thrown from the sprockets or break. Ensure the chain is properly adjusted to ensure optimal safety.

1. Remove key from the key switch.



2. Remove the cap and loosen the rear wheel axle nut. Adjust the left and right adjusting bolts to adjust the tension of the chain. When adjusting, keep the left and right chain adjusters in the same position as the mark on the swingarm.

Note: The open end of the clamping spring of the chain joint shall be opposite to the movement direction of the chain.

3. Once properly adjusted, tighten the axle nut to 81 ± 7 lb·ft (110 ± 10 Nm).
4. Test ride the motorcycle.
5. Recheck the chain for proper adjustment after the test ride and readjust, if necessary.

General Troubleshooting

Poor steering behavior

- Steering bearing(s) is damaged
- Insufficient tire pressure
- Damaged tire
- Damaged wheel bearing(s)
- Steering adjusting nut too tight.

Drifting

- Uneven adjustment of left and right shock absorbers
- Bent front fork
- Bent front axle or incorrectly installed wheel
- Damaged wheel bearing

Front wheel vibration

- Deformed rim
- Worn/damaged wheel bearing
- Deformed or loose wheel spokes
- Loose front axle
- Damaged tire

Difficult turning

- Damaged wheel bearing and/or axle sleeve
- Insufficient tire pressure
- Brake malfunction

Suspension too soft

- Worn/weak front fork spring
- Low hydraulic oil level
- Wrong hydraulic oil used

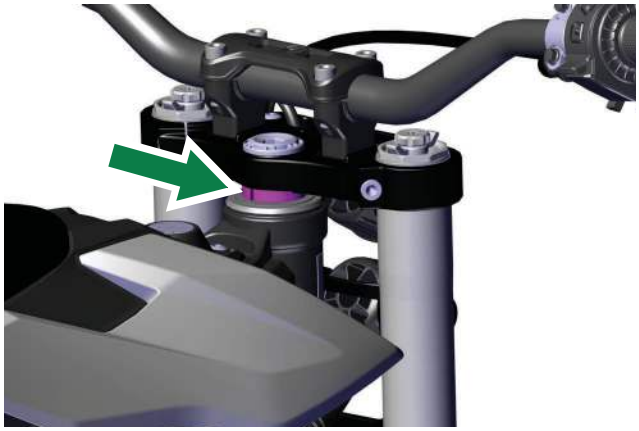
Suspension too hard

- Excessive hydraulic oil
- Wrong hydraulic oil used
- Bent front shock absorber tube
- Blocked front shock absorber

Steering Bearing Check

1. Secure the motorcycle in place and jack the front wheel off the ground.
2. Steer the front wheel from side to side several times. If the steering is smooth with no resistance, no adjustment is needed.
   If the there is resistance, proceed to the next section.

Adjustment

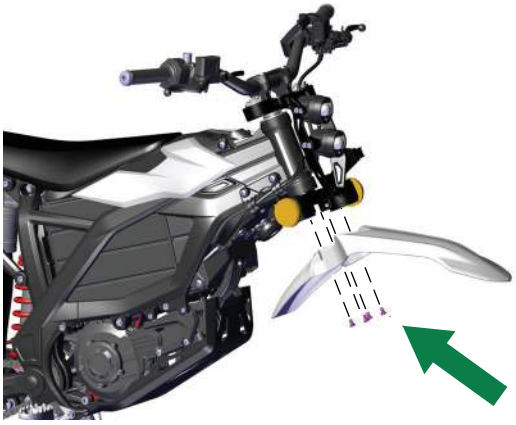


1. Loosen or tighten the adjustment nut as necessary until the steering is smooth and free of any resistance.

Steering Column

Removal

1. Remove the front suspension. Refer to Front Suspension - Removal, page 40-5 for instructions.



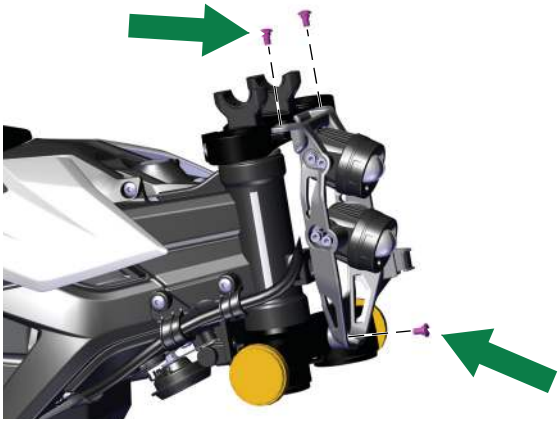
2. Remove the four bolts securing the front fender.



3. Remove the handlebar clamp bolts and the clamp. Set the handlebar out of the way. Torque: 20 ± 2 lb·ft (27.5 ± 2.5 Nm)



4. Remove the steering column lock bolt cover and bolt. Torque: 55 ± 4 lb·ft (75 ± 5 Nm)



5. Remove the three screws that secure the headlight bracket and remove. Set the bracket out of the way.



6. Remove the upper triple clamp.



7. Remove the adjusting nut. washer, dust seal and washer from the shaft.



8. Use a rubber mallet to release the lower triple clamp from the upper bearing.

Note: Be prepared to catch the lower triple clamp once free.



9. Remove the tightening ring and the upper bearing from the head tube.



10. Remove the lower bearing and dust ring from the lower triple clamp.

Inspection

1. Inspect the bearings and associated components. Replace worn components.
2. If the bearings are being replaced, replace the inner races inside the head tube.

Installation

1. Installation is the reverse of the removal procedure.
2. Pack the bearings with lithium grease before installation.
3. Before tightening the steering column adjustment nut, turn the steering column repeatedly to seat the bearings. Tighten the nut to 37 lb·ft (50 Nm). Loosen the nut to hand tight, then tighten to 16 lb·ft (22 Nm).

Front Suspension

Inspection

1. Check the appearance of the front shock absorber for damage, cracks, and oil leakage. Repair as necessary.
2. Hold the front brake firmly to lock the front wheel. Compress the forks by pressing down on the handlebars several times and observe how the fork returns to full extension. Adjust the rebound adjuster dial to achieve smooth and controlled motion when returning to full extension.
3. Make adjustments as necessary.

Rebound Adjustment



- Rotate in the + direction to increase damping. This slows down the rebound speed.
- Rotate in the - direction to decrease damping. This speeds up the rebound speed.

Compression Adjustment



- Rotate in the + direction to increase compression. This makes the shock absorption harder.
- Rotate in the - direction to decrease compression. This makes the shock absorption softer.

Post-Ride Maintenance

1. Clean the surface of each fork immediately after each ride and promptly remove any sediment attached to the surface of the fork tubes.

⚠ CAUTION

When cleaning, do not direct pressurized water or air upwards towards the lip of the fork dust seal (as shown in the figure) Doing so can allow contaminants to enter the chamber causing jamming, wear and oil leakage.



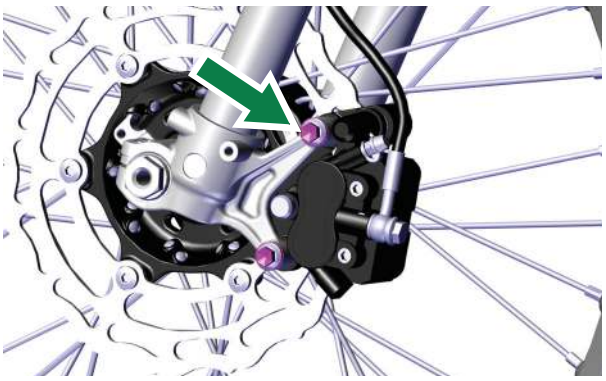
2. After cleaning, use a soft cotton cloth and neutral cleaning agent to clean the surface of the fork tube.

⚠ CAUTION

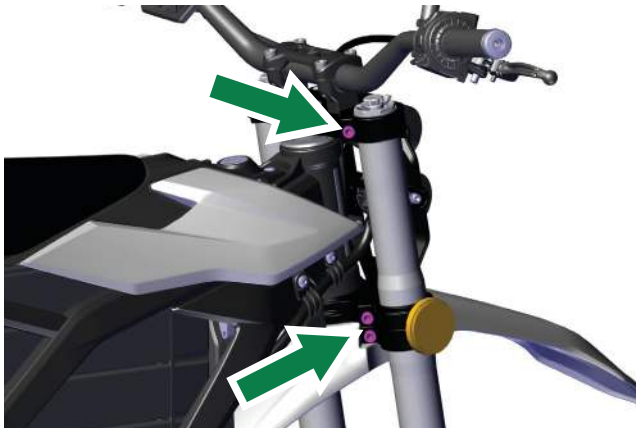
Do not use solvents that are easily soluble or corrosive to avoid damage to the dust seal.

3. Apply a thin layer of multi-purpose grease on the surface of the fork tube after cleaning to keep the fork surface lubricated.

Front Suspension - Removal



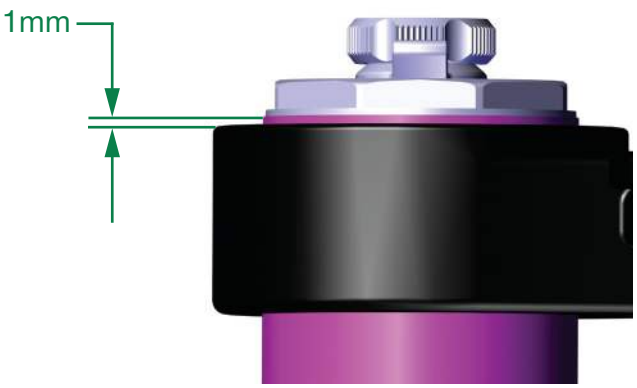
1. Remove the brake caliper if removing the LH fork. Remove the two bolts and use wire to hang the caliper out of the way without stressing or kinking the brake line.
2. Remove the front wheel. Refer to Front Wheel, page 50-1.



3. Loosen the upper and lower clamp bolts on the side to be removed. Support the suspension when loosening the bolts.
   - Upper torque: 14 ± 1 lb·ft (19 ± 1 Nm)
   - Lower torque: 12 ± 1.5 lb·ft (16 ± 2 Nm).
4. Slide the suspension out from the upper and lower mounts.

Front Suspension - Installation

1. Installation is the reverse of the removal procedure.



2. Install each fork so the outer tube is 1 mm above the triple clamp.

Fork Rebuild

Important

The disassembly and assembly instructions in this section only outline the necessary steps to install new seals/bushings and to change the oil.

Tools

-  Top cap socket (42 mm)
-  Fork seal driver (37 mm)
-  Fork bullet (37 mm)

Seals/Oil

- Seal kit - refer to the parts book for the correct part numbers of the seals
- 11.3 Fl oz. (335 ml) - Maxima 5WT fork oil per fork

Disassembly



1. Place the fork in a suitable suspension vise.



2. Use a 42 mm socket to remove the fork bolt.



3. Push up from the bottom of the fork so the cartridge comes up from the outer tube.



4. Dump the fork oil into an appropriate container.



5. Remove the fork guard.



6. Loosen the hex nut at the bottom of the fork bolt.



7. Unscrew the cartridge and remove.



8. Remove the spring.
9. Drain the remaining oil from the fork tube, pull the damper assembly from the tube and set aside.



10. Pry the dust seal from the outer tube.



11. Use a pick to pry the retaining ring from the tube.



12. Separate the slide pipe from the outer tube using a slide-hammer motion.



13. Pry the slide bushing apart and remove the bushing from the slide pipe.



14. Slide the guide bushing and stopper ring from the slide pipe.



15. Install the fork bullet onto the slide pipe.



16. Slide the oil seal and dust seal off the slide pipe.

Assembly



1. Slide new dust seal onto the slide pipe.

Note: Lubricate all seals before installation.



2. Place the retaining ring onto the slide pipe.



3. Slide the new oil seal onto the slide pipe.
4. Remove the fork bullet.



5. Slide the stopper ring onto the slide pipe.



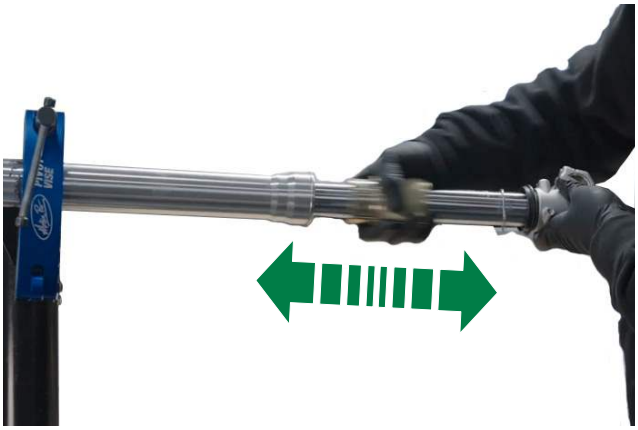
6. Slide the guide bushing onto the slide pipe.



7. Spread the slide bushing and slide into the groove on the slide pipe.



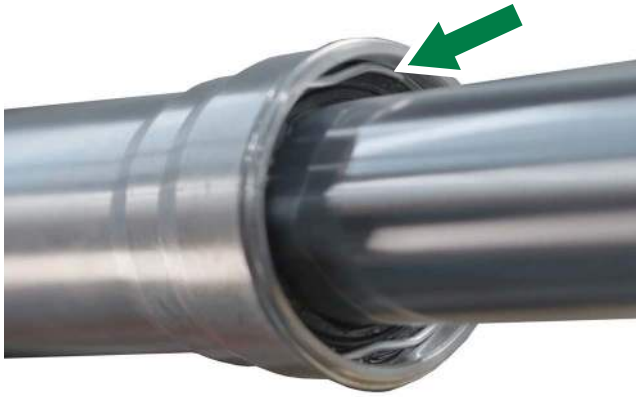
8. Insert the pipe into the outer tube.



9. Slide the dust seal and stopper ring to the bottom of the pipe. Install the seal driver behind the oil seal. Then, slide the tool to seat the oil seal, spacer and bushing into the outer tube. With the seal properly seated, remove the seal driver.

Note: The retaining ring groove will be visible once the seal is properly seated.

10. Reciprocate the slide pipe in and out to make sure everything is properly installed.



11. Install the retaining ring.



12. Use your fingers to push the dust seal into the outer tube until seated.



13. Add oil to the outer tube.
    - **Maxima 5WT fork oil:** 11.3 fl. oz. (335 ml)



14. Install the damper assembly in the outer tube. Slowly raise up and down to draw oil into the piston.



15. Raise the damper up and install the spring over it.



16. Install the fork bolt onto the piston.



17. Tighten the hex nut to 13 ft-lb (18 Nm).



18. Install the fork bolt assembly onto the outer tube and tighten to 13 ft-lb (18 Nm).
19. Install the suspension on the motorcycle and adjust. Refer to Installation, page 40-3.
20. Adjust the suspension as outlined in Front Suspension, page 40-4.

Rear Suspension

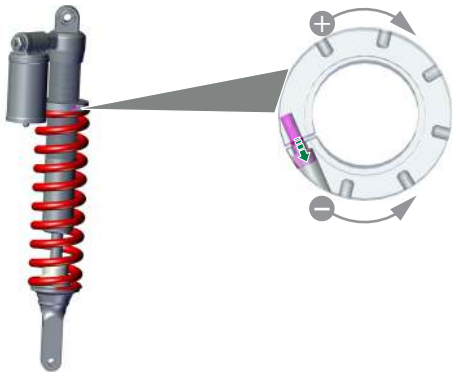
A shock has two main actions: compression when the shock gets loaded, and rebound when the shock returns back to full length. Compression damping is the adjustment that determines how fast or slow the suspension compresses. Rebound damping is the adjustment that determines how fast or slow the suspension rebounds.

Obtaining the correct rear spring preload is critical for proper handling. The spring preload must be set to match the weight of the rider.

Inspection

1. Check the appearance of the rear shock absorber for damage, cracks, or oil leakage. Repair as necessary.
2. Sit on the motorcycle to check the preload setting. Adjust as necessary. See Preload Adjustment, page 40-13.
3. Press down on the seat several times while observing compression (resistance to compression) and rebound (speed of return from compressed position). Check whether the rebound is smooth. Adjust as necessary. See Compression Adjustment, page 40-13 and Rebound Adjustment, page 40-13.

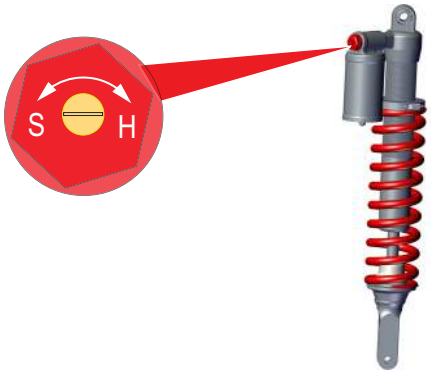
Preload Adjustment



Obtaining the correct rear spring preload (sag) is critical for proper handling. The preload must be set to match the weight of the rider. Loosen the pinch bolt to adjust. (Torque: 4 lb-ft (5 Nm)

- Rotate in the + direction (clockwise) to increase preload.
- Rotate in the - direction (counter-clockwise) to decrease preload.

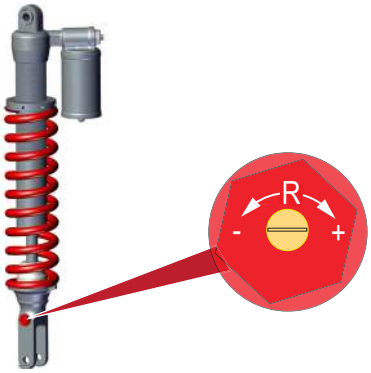
Compression Adjustment



Compression that is set too hard will pack-up (feel harsh over consecutive bumps), while compression that is set too soft causes the shock to bottom out harshly. If the shock is bottoming out, turn the adjuster one click at a time until the bottoming out stops.

- Rotate in the + direction to increase compression. This make the shock absorption harder.
- Rotate in the - direction to decrease compression. This make the shock absorption softer.

Rebound Adjustment



- Rotate in the S direction to increase damping. This slows down the rebound speed.
- Rotate in the F direction to decrease damping. This speeds up the rebound speed.

Post-Ride Maintenance

1. Clean the surface of the shock immediately after each ride and promptly remove any sediment attached to the surface of the shock tube.

⚠ CAUTION

When cleaning, do not direct pressurized water or air upwards towards the lip of the dust seal. Doing so can allow contaminants to enter the chamber causing jamming, wear and oil leakage.

2. After cleaning, use a soft cotton cloth and neutral cleaning agent to clean the surface of the fork tube.

⚠ CAUTION

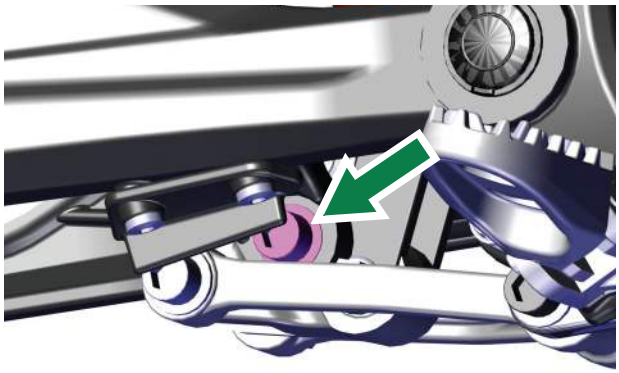
Do not use solvents that are easily soluble or corrosive to avoid damage to the dust seal.

3. Apply a thin layer of multi-purpose grease on the surface of the suspension rod after cleaning to keep the shock lubricated.

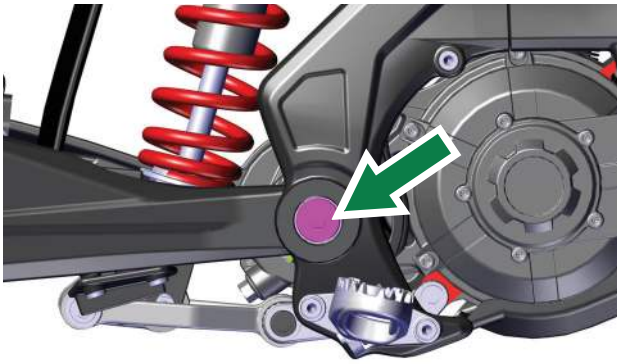
Swingarm

Removal

1. Remove the rear wheel. See Rear Wheel, page 50-2.



2. Remove the bolt securing the suspension linkage to the swingarm. Torque: 55 ± 4 lb·ft (75 ± 5 Nm)



3. Remove the bolt securing the swingarm to the frame. Remove the bolt and separate the swingarm from the frame. Torque: 81 ± 7 lb·ft (110 ± 10 Nm)

Installation

1. Installation is the reverse of the removal procedure.

General Precautions

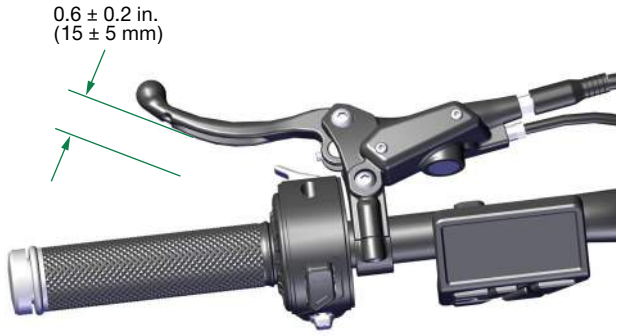
- Soiled brake discs and friction discs may reduce braking performance. Clean soiled brake components and recheck.
- Do not clean brake components with air or a dry brush. Doing so can result in inhalation of brake dust and cause respiratory discomfort.
- Brake fluid can seriously damage painted surfaces, rubber and plastic. Ensure any brake fluid will be properly contained when opening the brake system and/or filling the master cylinders.
- Do not allow contaminants (dirt, water, etc.) to enter the brake system when opened.
- Once the brake system is opened, air in the brake system must be bled.
- DOT4 brake fluid must be used. Do not mix different types of brake fluid.
- Before driving the motorcycle, check for proper operation of the brakes.

General Troubleshooting

SYMPTOM	POTENTIAL CAUSE	POTENTIAL SOLUTION
Poor braking performance.	There is air in the system.	Bleed the system.
	There is leakage in the system.	Inspect for leakage and repair.
	The brake fluid level is low.	Add brake fluid.
	The brake rotor is dirty.	Clean the dirty rotor.
	The piston seal in the master cylinder is faulty.	Replace the assembly.
	The piston in the master cylinder is stuck or worn.	Replace the assembly.
	The brake pads are worn.	Replace the pads.
	Poor surface mating of brake pads and rotor.	Inspect and replace faulty components.
	A brake line is restricted.	Check for restrictions and flush.
	The brake rotor is warped and deformed.	Replace the rotor.
Brake lever does not move freely.	The brake system is restricted.	Check for restrictions and flush.
	The piston of brake caliper is stuck or worn.	Replace the caliper.
	Poor surface mating of brake pads and rotor.	Inspect and replace faulty components.
	A brake line is restricted.	Check for restrictions and flush.
	The piston of main brake pump is stuck and worn.	Replace the assembly.
	The brake lever is bent or damaged.	Replace the brake lever assembly.
Poor braking performance.	Dirty rotor/pads.	Clean dirty parts and check operation.
	The wheels are not balanced.	Check wheel runout and tire balance.
	The brake rotor is warped and deformed.	Replace faulty parts.
	Poor surface mating of brake pads and rotor.	Inspect and replace faulty components.

Brake System Checks

Brake Lever Stroke



1. Check the free stroke of the front and rear brake levers. The free stroke of each brake lever is 0.6 ± 0.2 in. (15 ± 5 mm).
2. If the stroke is not within range, turn the adjusting nut to properly set.

Brake Fluid Inspection

⚠ WARNING

Only use new brake fluid from and airtight container. Fluid from open containers or fluid previously used in the system will have absorbed moisture, which will adversely affect performance and must not be used.

⚠ CAUTION

Brake fluid can damage plastic, as well as painted and coated surfaces. Handle with care and wipe up spills and wash the surfaces immediately.



1. Observe the brake fluid level from the sight glass on each brake lever assembly. Ensure the brake fluid is above the bottom 1/3 of the sight glass. Add fluid as necessary.
   Brake fluid specification: DOT 4.
2. Inspect the appearance of the fluid. If the fluid appears cloudy or infiltrated with dirt and impurities, replace the fluid. Refer to Brake Bleeding - Vacuum Method, page 45-4.

Brake Bleeding - Vacuum Method

Use this procedure to bleed air from the brake system for optimal braking performance.

In instances when the brake fluid in the brake cylinder has been exhausted, use this method for refilling. The process is the same for front and rear.

Tools Required:

- Vacuum bleeder with reservoir

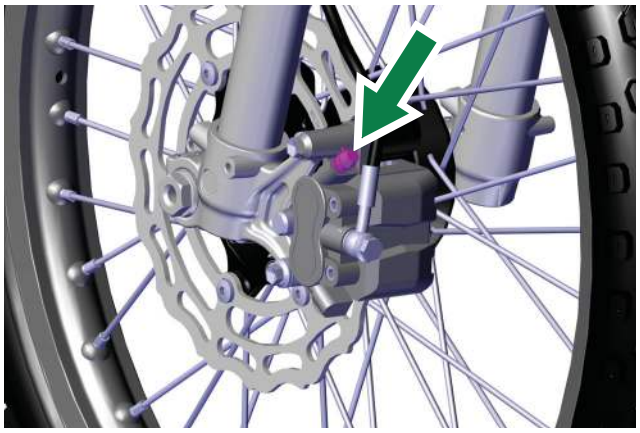
Bleeding

⚠ WARNING

Only use new brake fluid from and airtight container. Fluid from open containers or fluid previously used in the system will have absorbed moisture, which will adversely affect performance and must not be used.

⚠ CAUTION

Brake fluid can damage plastic, as well as painted and coated surfaces. Handle with care and wipe up spills and wash the surfaces immediately.



1. Loosen the bleeder screw then tighten finger tight. Install a vacuum pump onto the brake caliper bleeder screw.



2. Remove the brake reservoir cover and fill with brake fluid. Keep the reservoir full during this procedure.
3. Operate the brake lever until resistance is felt in order to remove air from the system.
4. Install the vacuum hose onto the bleeder screw. Loosen the screw and operate the vacuum pump to purge the system of air. Once a steady stream of fluid flows into the vacuum pump reservoir, close the bleeder screw and remove the hose. Tighten the screw to 6 ± 1 lb-ft (8 ± 1 Nm).
5. Install the brake reservoir cover and gasket. If damaged, replace the gasket with a new one.
6. When complete, check the entire system for leaks.

Brake Bedding

Note: Bedding new brake rotors and/or new pads is recommended to ensure proper brake performance and maximize brake life. Proper bedding improves brake pedal/lever feel and reduces or eliminates brake squeal. Bedding in the brakes is a process of depositing an even layer of pad material on the surface of the brake rotor.

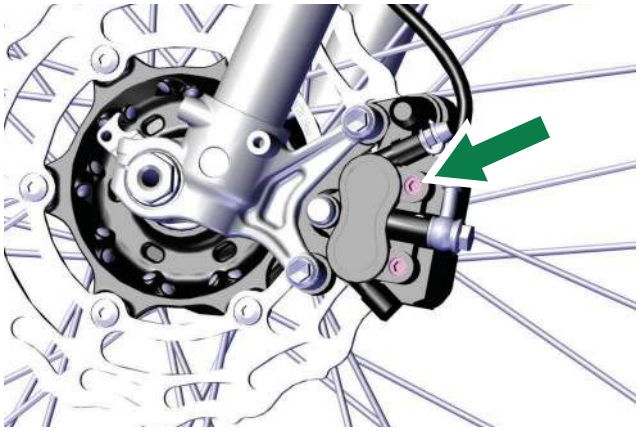
⚠ CAUTION

With new brake systems or just new pads, the first few braking applications will result in very little braking power. Perform the following steps to ensure proper braking friction.

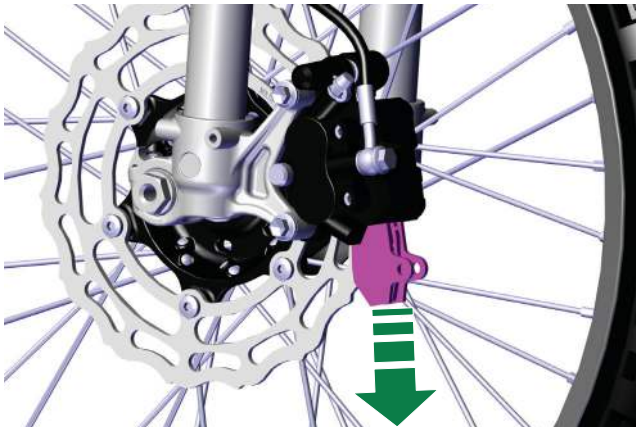
Process

1. Begin at 40 mph (64 km/h) and gradually apply the brake to reduce speed to 10 mph (16 km/h). Avoid locking the tires and do not come to a complete stop to prevent pad material from adhering to the rotor which can cause vibration.
2. Accelerate back to 40 mph (64 km/h) and repeat this process 15-20 times, ensuring you work on the front and rear brakes separately.
3. After completing 15-20 cycles for both the front and rear brakes, take a 10 mile (16 km) ride to allow the braking system to cool down.

Brake Pads - Front



1. Remove the two bolts that secure the brake pads.



2. Remove the bolt and the pads.

Installation

1. Installation is the reverse of the removal procedure.
2. When new pads and/or rotors are installed, bed the brakes to ensure optimal performance. Refer to Brake Bedding, page 45-5.

Brake Caliper - Front

⚠ CAUTION

Plug all open connections to prevent ingress of moisture and debris.

⚠ CAUTION

Brake fluid can damage plastic, as well as painted and coated surfaces. Handle with care and wipe up spills and wash the surfaces immediately.

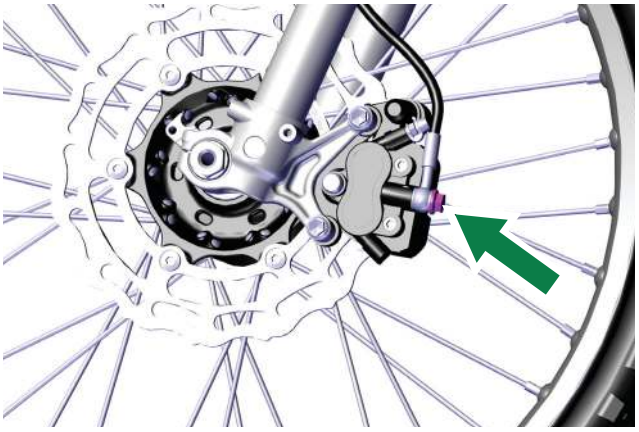
⚠ CAUTION

Do not operate the front brake lever while the brake caliper is removed.

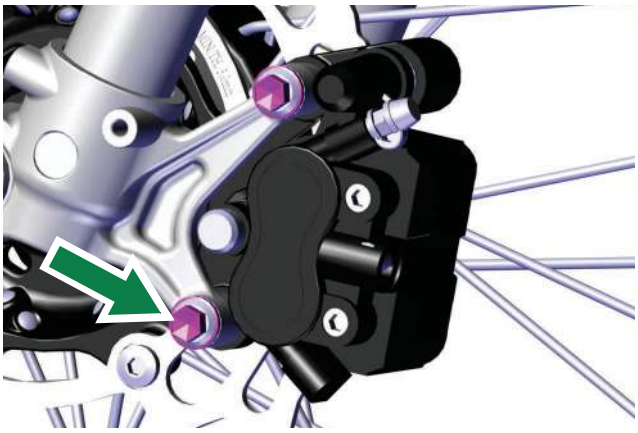
Note: Position a suitable container to contain fluid spillage.

Note: Position absorbent material around affected area to absorb possible fluid spillage.

Note: Replace crush washers upon installation.



1. Remove the banjo bolt securing the brake hose to the front caliper.



2. Remove the two bolts and washers securing the caliper to the fork. Torque: 22 ± 1.5 lb·ft (30 ± 2 Nm)

Installation

1. Installation is the reverse of the removal procedure.
2. Bleed the brake system. Refer to Brake Bleeding - Vacuum Method, page 45-4.

Brake Rotor - Front

1. Remove the front wheel. Refer to Front Wheel, page 50-1.

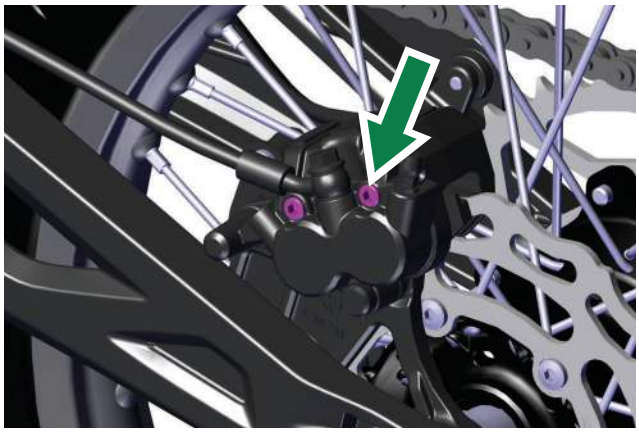


2. Remove the six screws securing the rotor to the front wheel. Torque: 7 ± 1.5 lb·ft (10 ± 2 Nm)
3. Remove the rotor.

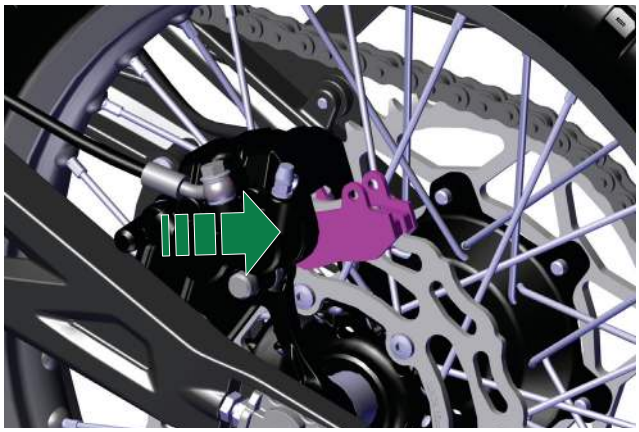
Installation

1. Installation is the reverse of the removal procedure.
2. When new pads and/or rotors are installed, bed the brakes to ensure optimal performance. Refer to Brake Bedding, page 45-5.

Brake Pads - Rear



1. Remove the bolts that secure the brake pads.



2. Slide the pads out from the caliper.

Installation

1. Installation is the reverse of the removal procedure.
2. When new pads and/or rotors are installed, bed the brakes to ensure optimal performance. Refer to Brake Bedding, page 45-5.

Brake Caliper - Rear

⚠ CAUTION

Plug all open connections to prevent ingress of moisture and debris.

⚠ CAUTION

Brake fluid can damage plastic, as well as painted and coated surfaces. Handle with care and wipe up spills and wash the surfaces immediately.

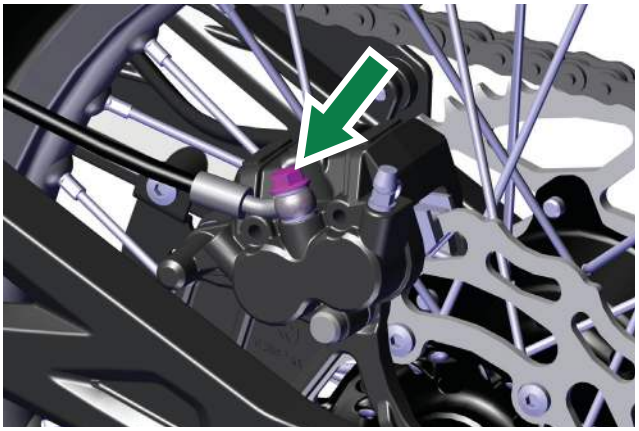
⚠ CAUTION

Do not operate the rear brake lever while the brake caliper is removed.

Note: Position a suitable container to contain fluid spillage.

Note: Position absorbent material around affected area to absorb possible fluid spillage.

Note: Replace crush washers upon installation.



1. Remove the banjo bolt securing the brake hose to the front caliper.
2. Remove the rear wheel. Refer to Rear Wheel, page 50-2.

Installation

1. Installation is the reverse of the removal procedure.
2. Bleed the brake system. Refer to Brake Bleeding - Vacuum Method, page 45-4.

Brake Rotor - Rear

1. Remove the rear wheel. Refer Rear Wheel, page 50-2.



2. Remove the six screws securing the rotor to the front wheel. Torque: 7 ± 1.5 lb·ft (10 ± 2 Nm)
3. Remove the rotor.

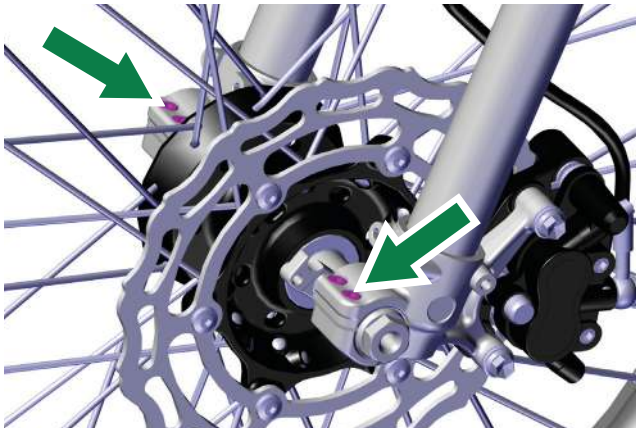
Installation

1. Installation is the reverse of the removal procedure.
2. When new pads and/or rotors are installed, bed the brakes to ensure optimal performance. Refer to Brake Bedding, page 45-5.

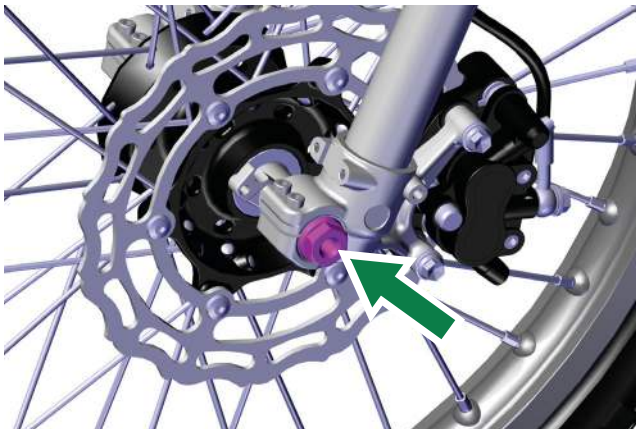
Front Wheel

Removal

1. Remove the key from the key switch.
2. Raise the front wheel off the ground using a jack stand or similar lifting device.



3. Loosen the pinch bolts on both sides of the front axle. Torque: 7 ± 1.5 lb·ft (10 ± 2 Nm)



4. Remove the front axle shaft bolt. Torque: 20 ± 2 lb·ft (27.5 ± 2.5 Nm)
5. Pull the axle shaft out of the wheel from the other side of the motorcycle.



6. Pull on the wheel to dislodge the wheel spacer and remove the wheel.

Installation

1. Installation is the reverse of the removal procedure.
2. Apply lithium grease to the axle and wheel spacers before installation.

Rear Wheel

Removal



3. Remove the nut from the rear axle shaft. Torque: 81 ± 7 lb·ft (110 ± 10 Nm)



4. Use the axle adjusters to loosen tension on the drive chain. Slip the chain off of the rear sprocket.
5. Remove the rear axle shaft.



6. Pull the wheel out and remove the spacers and caliper bracket.

Installation

1. Installation is the reverse of the removal procedure.
2. Apply lithium grease to the axle before installation.
3. Adjust the chain tension. Refer to Adjusting the Drive Chain, page 30-7.

Wheel Spoke Guidelines

- If the spokes are broken, replace the adjacent group of spokes
- Use a spoke torque wrench to check torque
- Spoke torque: 29 ± 7 lb-in. (3.25 ± 0.75 Nm)
- Check that rim runout is 0.08 in. (2 mm) or less

Precautions for Circuit Inspection

1. Before disconnecting or connecting a connector, turn the key switch off to avoid damage to electrical components.
2. When checking a circuit, use a probe that can be inserted from the front and back of the connector and reliably contacted with the terminal.
3. Disconnect the power supply and relevant electrical components during the inspection of the circuit.
4. Ensure the battery is properly charged before doing voltage checks on circuits.
5. When there is a fault in the electrical system, it is generally diagnosed according to the following steps:
   a. Observe the fault performance to locate the faulty subsystem.
   b. Use the elimination method and the wiring diagram to minimize the fault range.
   c. Check the circuits of subsystems for open circuit, short circuit or wrong connection;
   d. Check the relevant components for failure or damage.
6. When investigating a circuit fault, check the place that is easy to dismantle first. Parameter detection method and part replacement method can be adopted, but when using part replacement method, make sure that there is no overload in the circuit to avoid damaging new parts.
7. Understand that most electrical failures are caused by wire connectors or wire failures.

System Principle and Structure

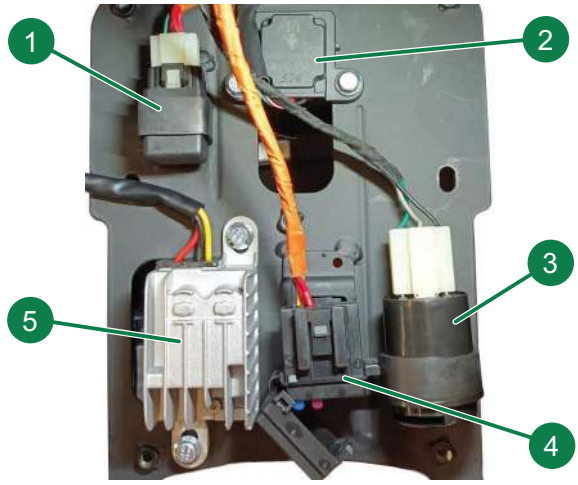
The electrical system is an essential guarantee that the motorcycle can operate normally, safely, reliably and efficiently. It covers a wide range of subjects, including motor, electrical, electronic technology, computer, electro-chemistry, acoustics, optical materials, etc. With the development of electronic technology in particular, the motorcycle electrical system will undergo significant changes. The electrical system is more advanced than traditional motorcycles in that it applies more advanced automotive electronics and is much more complex. It consists of the following subsystems.

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

12 Volt System

SYMPTOM	POTENTIAL CAUSE	POTENTIAL SOLUTION
No power: with the key on, there is no display on the dash and other electrical functions cannot be performed.	The main fuse is blown	Replace the main fuse.
	Poor contact in main fuse circuit	Check the connection.
	Poor contact of the battery cables	Check the connections.
	Battery discharged	Charge or replace.
	Ignition switch failure	Replace.
	Poor connection between ignition switch outgoing line and main cable;	Check the connections.
	Open or short circuit in main harness.	Repair or replace.
Low battery voltage	Charger failure	Replace the charger.
	Batteries failing to store power	Replace the battery. See your Zero Dealer.
	Motorcycle inactive for too long	Charge with DC stabilized voltage charger.
	Motorcycle charging circuit fault	Check the charging circuit.
	Parasitic draw on battery current	Check and repair.
	Decaying battery capacity, battery does not store power, battery self discharge	Replace the battery.
	Poor connection between charger and main harness	Check the connections.
	Open or short circuit of main harness	Repair or replace.
Battery overcharge: The battery has a large deformation damage phenomenon.	Charger failure	Replace.

Electrical Panel Components



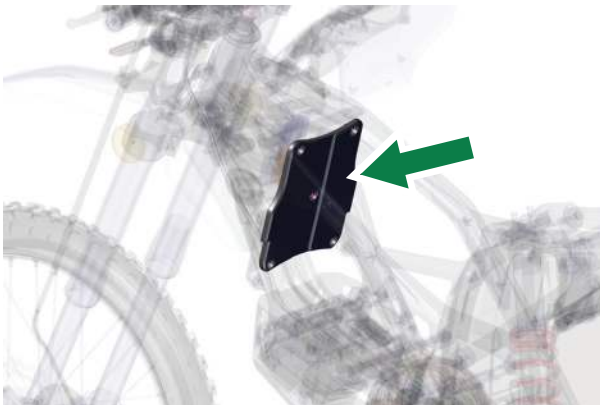
1. DC/DC Converter Relay
2. Tip Over Sensor
3. Turn Signal Relay
4. Fuse Center
5. DC/DC Converter

Fuse Center

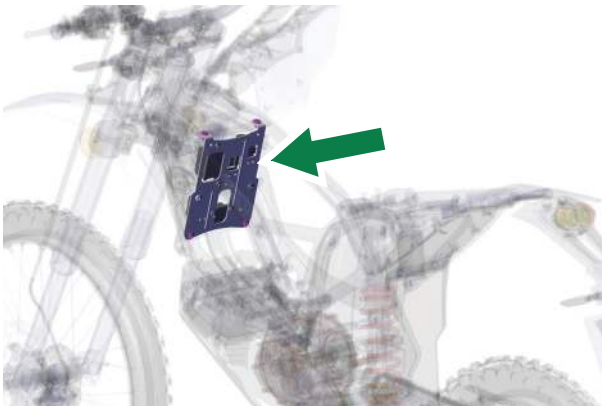
The fuse center contains a 10 amp (red) fuse and a 15 amp (blue) fuse as well as spare fuses. The 10 amp circuit supplies 72 V to the DC/DC converter. The 15 amp circuit supplies 12 V from the DC/DC converter to the various switches and controls. Refer to XE Wiring Schematic, page 80-1 for circuit information.

To access the fuse center:

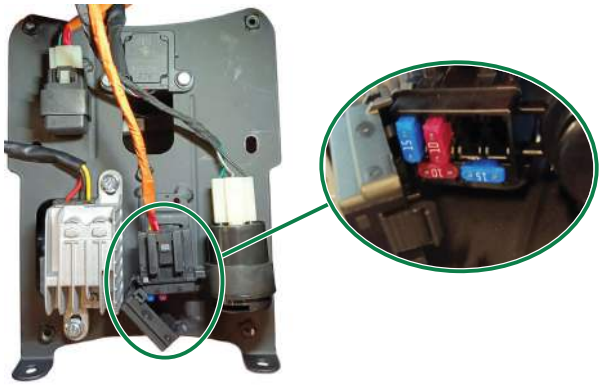
1. Remove the battery. Refer to Battery, page 20-2.



2. Remove five screws that secure the front battery panel. Remove the panel.



3. Remove the four screws that secure the electrical panel.



4. Tilt the panel downward and remove the fuse cover to access the fuses.

Wiring Harness

The main wiring harness consists of wires of various specifications, connector sheaths, terminals, conduit, tapes, fuse and other parts of various specifications through bifurcation, riveting, wrapping and assembly.

Through the connections of the wiring harness, the electrical and electronic equipment of the whole motorcycle can work as intended.

Basic Parameters

- The on-off status of all colored wires shall conform to the electrical wiring diagram.
- Riveting of each branch and terminal shall be firm and connected well.
- The conduit and tape must be tightly wrapped.
- All connectors and corresponding electrical and electronic equipment shall be reliably connected.

Failure Mode

- Terminals and connectors are not properly installed or connected.
- Short circuiting to ground or adjacent wires caused by damaged wire sheathing.
- Corrosion at the splice or other connection, causing an unreliable connection or an open circuit.
- Instantaneous failure and poor contact of wire head or wire (most instantaneous electrical failures are caused by this).
- Poor contact or blown fuse.
- Improper fastening of the wiring harness along the motorcycle causing wire vibration, wear, or poor contact.

Key Switch



When the ignition switch is turned on, a signal is sent to the DC converter to provide 12 V battery power to the motorcycle.

Switch Position	Wire Color	
	Red	Black
	○	○
	○——○	

Do not attempt to repair the switch. If the key does not operate the lock cylinder properly, or the electrical switch is defective, replace the unit.

Lighting and Turn Signal System

The lighting and turn signal system is an important guarantee for the safe operation of motorcycles. The system includes the headlights, turn signals, and horn system.

Note: Turn signals, the tail light and the license plate light are only fitted on bikes sold in the EU.

Headlight System

When the motorcycle is operated at night, it needs the headlight to illuminate the road and notify the surrounding motorcycles and people of the existence of the motorcycle.

Tail Lights and Turn Signals

The tail light and license plate light help increase visibility of the motorcycle from the rear, particularly at night. When braking, the brake light illuminates to alert other vehicles that the vehicle is decelerating. When turning left or right, the left or right turn signals should be activated to notify surrounding vehicles and pedestrians.

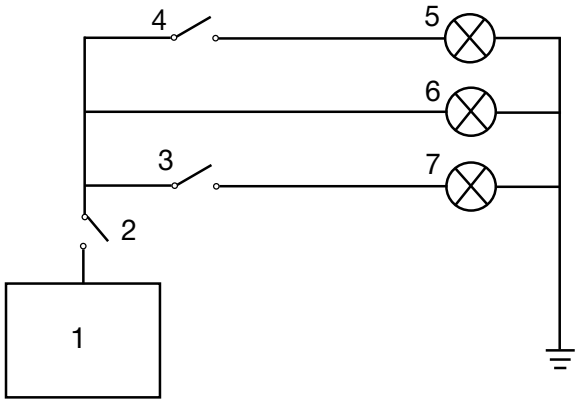
Horn System

If other vehicles or pedestrians are obstructing or may hinder the driving of the motorcycle, the horn can be used to alert others in the area. The operation of the horn is controlled by the horn button.

System Components

- Headlight
- Combined brake/tail light
- Horn
- Front brake switch
- Rear brake switch
- Left and right combination switches

Circuit Diagram



1. Battery
2. Key switch
3. Brake switch
4. Headlight switch
5. Headlight
6. Tail light
7. Brake light

Headlights

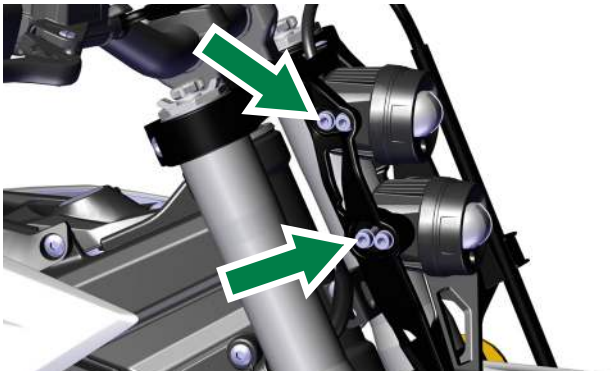
The motorcycle is equipped with a high beam headlight and a low beam headlight.

Headlight Troubleshooting

SYMPTOM	POTENTIAL CAUSE	POTENTIAL SOLUTION
One or both of the headlights do not light.	The corresponding fuse is not connected or has burnt out.	Connect the fuse or replace it.
	The corresponding switch is defective.	Repair or replace the switch.
	LED failure.	Replace the headlight.
	Poor connection.	Check all connections.
	The relevant wires in the main harness are open.	Repair or replace the main harness.
	No battery power/output.	Charge the battery.
	DC converter defective.	Replace the DC converter.
Headlight works intermittently.	Poor contact of the fuse, light contacts or circuit connections.	Check the circuit for loose connections.

Adjustment

Check the projection height of the headlights before driving. Both lights can be adjusted vertically.



1. Loosen the locking bolts and rotate the headlight upwards or downwards to adjust the headlight height.
2. Tighten the bolts to lock the position.

Brake/Tail Light

The combined rear brake/tail light integrates the functions of tail light and brake light. The lens of the tail light and brake light is red. The tail light/brake light bead is a double filament bead, the low power bead is used for the tail light, and the high power bead is used for the brake light.

Rear light specifications: LED 12 V, 3.1W

Tail Light Troubleshooting

SYMPTOM	POTENTIAL CAUSE	POTENTIAL SOLUTION
The brake/tail light doesn't work	The corresponding fuse is not connected or is blown.	Connect the fuse or replace it.
	LED failure.	Replace the LED.
	Poor connection.	Check all connections and repair.
	The relevant wires in the main harness are open.	Repair or replace the main harness.
	No battery power/output.	Charge the battery.
	DC converter defective.	Replace the DC converter.

Horn



When the horn switch is pressed, current passes through the horn coil. The magnetic field from the coil generates suction on the armature, which makes the bass diaphragm and the treble diaphragm move at the same time to create sound.

When the contact is opened, the current is interrupted, and the electromagnetic force disappears. The diaphragm returns by its own elastic force and the sound is stopped.

The contact clearance can be adjusted by the adjustment screw to change the vibration frequency of the diaphragm, so as to change the sound level.

Adjustment

1. Loosen the lock nut and turn the screw clockwise or counter-clockwise to adjust the tone.
2. Sound the horn and readjust until the desired tone is achieved.

Horn Troubleshooting

SYMPTOM	POTENTIAL CAUSE	POTENTIAL SOLUTION
The horn is inoperable.	The corresponding fuse is not installed or is blown.	Install the fuse or replace it.
	Failure of the horn switch.	Repair or replace the left combination switch.
	The horn is defective.	Adjust or replace the horn.
	Poor connection.	Plug in again
	Open circuit in horn wiring.	Repair or replace the effected wiring.
	No battery power/output.	Charge the battery.
	The DC converter is inoperable.	Replace the DC converter.

Brake Switches



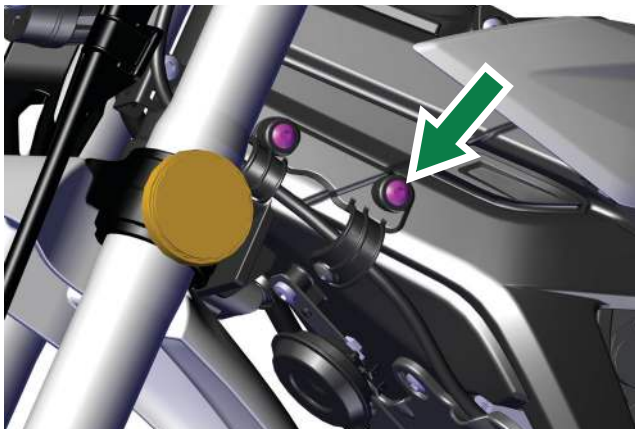
When the brake levers are operated during braking, and the travel of the brake levers exceeds 0.4 ± 0.2 in. (10 ± 5 mm) (from the center of the brake handle ball head), a magnet in the piston generates a magnetic field, causing the reeds in the magnetic reed switch to become magnetized and close, thereby completing the circuit.

When the switch is closed, the brake light illuminates. When the brake handle is released, the two reeds of the magnetic reed switch do not come into contact in the absence of an external magnetic field, breaking the circuit and causing the brake light to turn off.

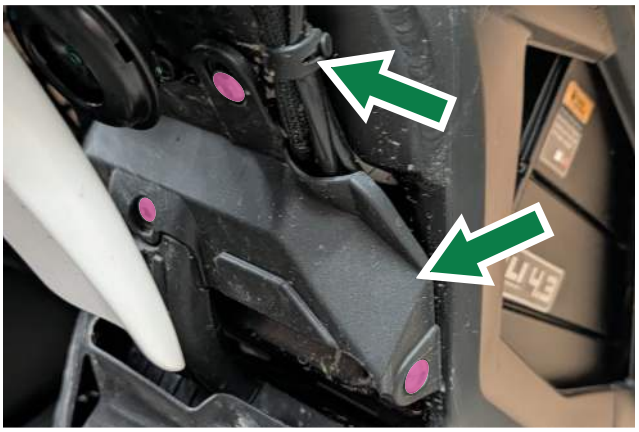
A compression spring on the guide rod forces the contact point to separate from the conductive strip, breaking the circuit and extinguishing the brake light.

Dash

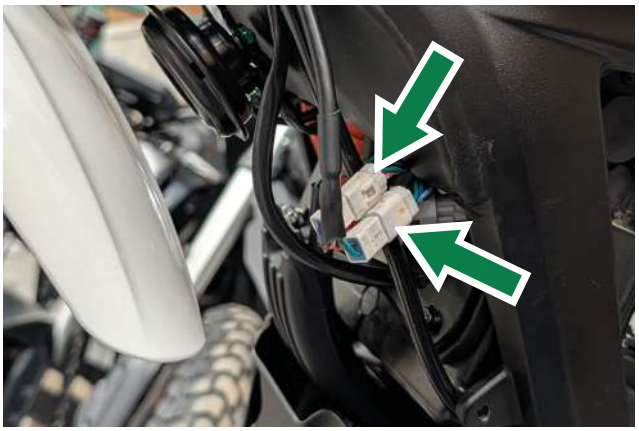
Removal



1. Remove the two screws (5 mm Allen) securing the side clamp to the frame.



2. Remove the rubber clamp from the wiring harness.
3. Remove five screws (5 mm Allen) from the lower cover and remove the cover.



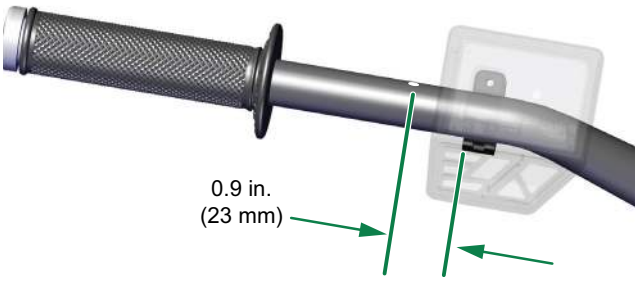
4. Disconnect the dash connectors.



5. Remove the screw (2.5 mm Allen) from the dash clamp and remove the dash from the motorcycle.

Installation

1. Installation is the reverse of the removal procedure.



2. To properly locate the dash on the handlebar, find the dimple on the top of the LH side of the handlebar. Place the dash onto the handlebar and measure 0.9 in. (23 mm) from the dimple to the dash clamp and install the dash clamp screws.

⚠ CAUTION

Do not over-tighten the dash clamp screws.

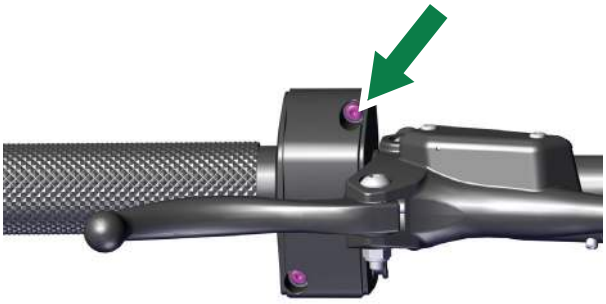
RH Combination Switch

Removal

1. Remove the RH combination switch harness from the front cable straps.
2. Access the switch connector and disconnect. The connectors are located forward of the battery under the key switch bezel.



3. Remove the bar end and bolt from the handlebar.



4. Loosen the two screws at the rear of the switch enough to slide the assembly off the handlebar.

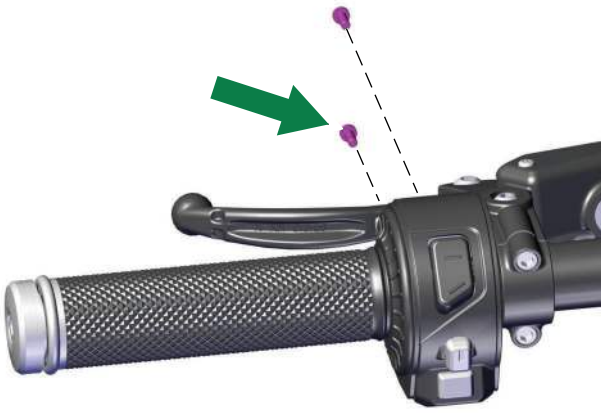
Installation

1. Installation is the reverse of the removal procedure.

LH Combination Switch

Removal

1. Remove the LH combination switch harness from the front cable straps.
2. Access the switch connector and disconnect. The connectors are located forward of the battery under the key switch bezel.



3. Remove the two screws and separate the switch halves. Remove the switch from the handlebar.

Installation

1. Installation is the reverse of the removal procedure.

Fault Codes

If a diagnostic code has been recorded, it can be retrieved from the dash panel. Refer to the following table for a list of fault codes.

CODE	DESCRIPTION	ACTION
b103	Cell differential pressure fault 1	Contact your local Zero dealer.
b110	Discharge monomer under-voltage fault 1	Charge the battery.
b114	BMS charging over-current fault 1	Reduce charging current.
b119	BMS discharge over temperature fault 1	Motorcycle limit level 1 power usage.
b120	BMS charging over temperature fault 1	Limit charging current.
b121	BMS discharge under temperature fault 1	Motorcycle limit level 1 power usage.
b122	BMS charging under temperature fault 1	Reduce charging current.
b130	BMS discharge over-current fault 1	Reduce output current.
b131	Battery insulation fault 1	Contact your local Zero dealer.
b140	Charging unit battery under-voltage fault level 1	Charge the battery.
b141	Uneven temperature fault 1	Contact your local Zero dealer.
b203	Cell differential pressure fault 2	Contact your local Zero dealer.
b210	Discharge monomer under-voltage fault 2	Charge the battery.
b214	BMS charging over-current fault 2	Reduce charging current.
b219	BMS discharge over temperature fault 2	Motorcycle limit level 2 power usage.
b220	BMS charging over temperature fault 2	Limit charging current.
b221	BMS discharge under temperature fault 2	Motorcycle limit level 2 power usage.
b222	BMS charging under temperature fault 2	Reduce charging current.
b230	BMS discharge over-current fault 2	Reduce output current.
b231	Battery insulation fault 2	Contact your local Zero dealer.
b240	Charging unit battery under-voltage fault level 2	Charge the battery.
b241	Uneven temperature fault 2	Contact your local Zero dealer.
b302	Cell failure	Contact your local Zero dealer.
b303	Cell differential pressure fault 3	Contact your local Zero dealer.
b307	BMS internal MOS failure or relay failure	Contact your local Zero dealer.
b309	Total discharge voltage over-voltage fault	Charge the battery.
b310	Discharge monomer under-voltage fault 3	Charge the battery.
b314	BMS charging over-current fault 3	Replace the charger.
b319	MBS discharge over temperature fault 3	Use after the battery temperature decreases.
b320	BMS charging over temperature fault 3	Charge the battery after the temperature decreases.
b321	BMS discharge under temperature fault 3	Use after the battery temperature decreases.
b322	BMS charging under temperature fault 3	Charge the battery after the temperature rises.
b330	BMS discharge over-current fault 3	Contact your local Zero dealer.
b331	Battery insulation fault 3	Contact your local Zero dealer.
b332	Battery short circuit failure	Contact your local Zero dealer.
b333	BMS internal communication failure	Contact your local Zero dealer.
b340	Charging monomer battery under-voltage fault level 3	Charge the battery.
b341	Uneven temperature fault 3	Contact your local Zero dealer.

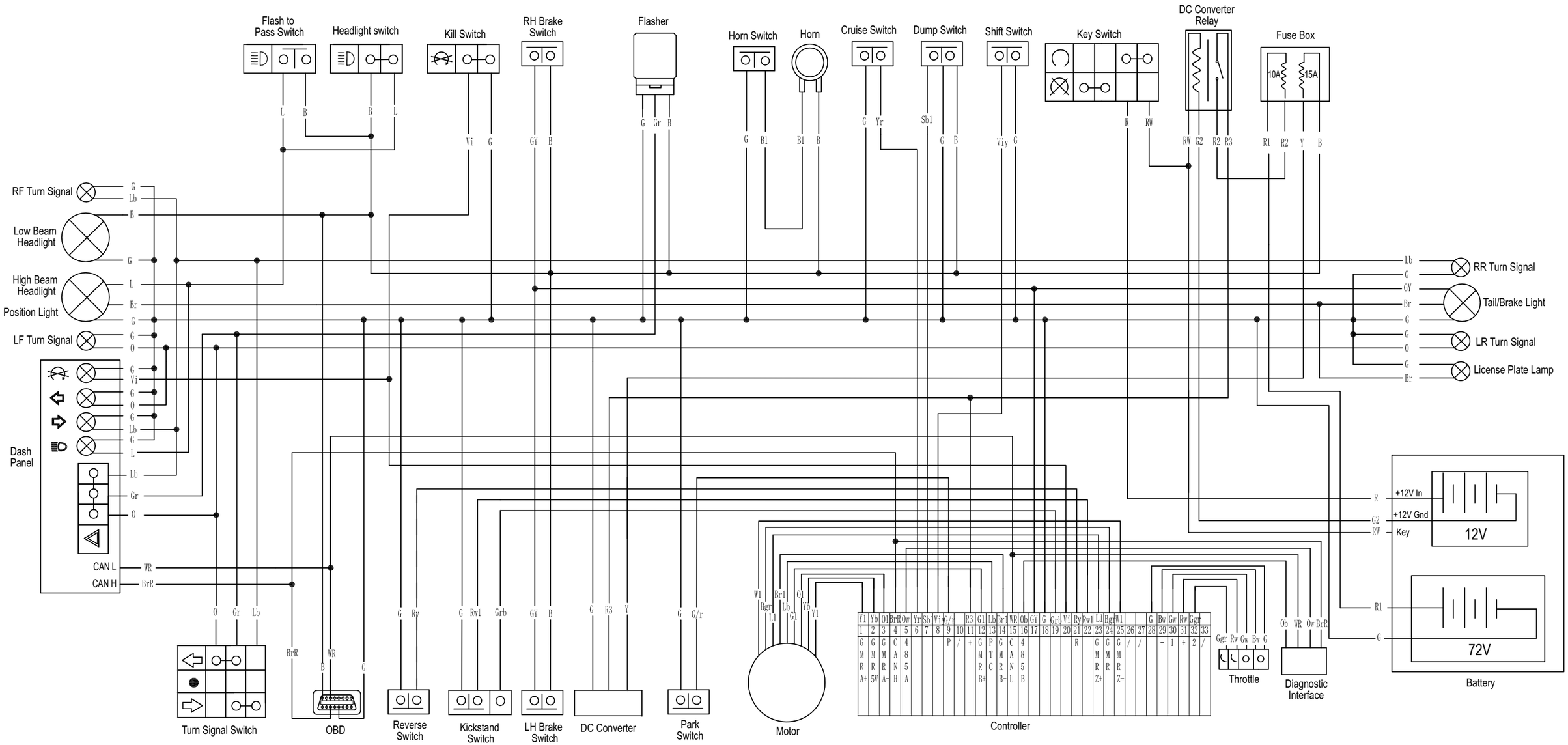
CODE	DESCRIPTION	ACTION
b342	Total charging voltage over-voltage fault	Check the input voltage.
b343	Total discharge voltage under-voltage fault	Check the battery.
b344	Total charging voltage under-voltage fault	Check the input voltage.
b345	Discharge monomer over-voltage fault	Check the battery.
b348	Communication failure	Contact your local Zero dealer.
C101	Charger fault 1	Contact your local Zero dealer.
C106	Temperature fault 1	Reduce charging current.
C107	Input over-voltage protection 1	Check input voltage.
C108	Input under-voltage protection 1	Check input voltage.
C109	Output over-current protection 1	Cycle the key off and on to reset.
C110	Output over-voltage protection 1	Cycle the key off and on to reset.
C111	Output under-voltage protection 1	Cycle the key off and on to reset.
C201	Charger fault 2	Contact your local Zero dealer.
C206	Temperature fault 2	Reduce charging current.
C207	Input over-voltage protection 2	Check input voltage.
C208	Input under-voltage protection 2	Check input voltage.
C209	Output over-current protection 2	Cycle the key off and on to reset.
C210	Output over-voltage protection 2	Cycle the key off and on to reset.
C211	Output under-voltage protection 2	Cycle the key off and on to reset.
C301	Charger fault 3	Contact your local Zero dealer.
C302	Hardware fault 3	Contact your local Zero dealer.
C303	Communication fault 3	Contact your local Zero dealer.
C304	Short circuit protection 3	Contact your local Zero dealer.
C305	Open circuit protection 3	Contact your local Zero dealer.
C306	Temperature fault 3	Charge after the temperature drops.
C307	Input over-voltage protection 3	Check input voltage.
C308	Input under-voltage protection 3	Check input voltage.
C309	Output over-current protection 3	Contact your local Zero dealer.
C310	Output over-voltage protection 3	Contact your local Zero dealer.
C311	Output under-voltage protection 3	Contact your local Zero dealer.
P111	Controller over temperature fault 1	Motorcycle limit level 1 power usage
P112	Electronic TCS malfunction	Contact your local Zero dealer.
P123	Motor controller system fault level 1	Check the controller power cord for looseness.
P124	Motor over temperature fault 1	Motorcycle limit level 1 power usage
P126	Battery imbalance warning prompt level 1	Contact your local Zero dealer.
P211	Controller over temperature fault 2	Motorcycle limit level 2 power usage
P223	Motor controller system fault level 2	Check the controller power cord for looseness.
P224	Motor over temperature fault 2	Motorcycle limit level 2 power usage
P225	Motor temperature sensor failure	Contact your local Zero dealer.
P226	Battery imbalance warning prompt level 2	Contact your local Zero dealer.
P301	Controller over-voltage failure	1. Replace the battery. 2. Replace the controller.
P302	Controller under-voltage failure	Charge the battery.
P303	Controller over-current protection failure	Cycle the key off and on to reset.
P304	Motor locked failure	Cycle the key off and on to reset.
P305	Motor position sensor failure	Contact your local Zero dealer.

CODE	DESCRIPTION	ACTION
P307	Controller phase loss failure	Contact your local Zero dealer.
P309	Braking state	Check the brake switch.
P310	Motor controller self-test failure	Contact your local Zero dealer.
P311	Controller over temperature fault 3	Allow the controller to cool.
P314	Acceleration handle failure	Check if the handle is damaged and if the wiring harness plug is loose
P320	Brake failure	Contact your local Zero dealer.
P321	Communication failure	Contact your local Zero dealer.
P322	Precharge fault	Contact your local Zero dealer.
P323	Motor controller system fault level 3	Contact your local Zero dealer.
P324	Motor over temperature fault 3	Allow the motor to cool.

General Troubleshooting

SYMPTOM	POTENTIAL CAUSE	POTENTIAL SOLUTION
No power with the key on.	Battery connector not fully inserted	Check and properly insert the battery connector.
	Battery low power protection	Charge the battery.
	Battery in low or high temperature protection	Wait for battery temperature to return to normal.
	Main fuse blown	Check the circuit and replace the fuse.
	Poor contact at key switch connector	Firmly insert the connector or replace the key switch.
	DC converter damaged or malfunction	Replace the DC converter.
	Battery malfunction	Replace the battery at a Zero Dealer.
Charger not charging	Battery temperature too low or too high	Charge the battery after the temperature returns to normal.
	Poor contact of charger connector	Re-insert and secure the charger connector.
	Charger malfunction	Replace the charger at a Zero Dealer.
	Battery malfunction	Replace the battery at a Zero Dealer.
Power mode ineffective or reduced power	Low battery charge	Charge the battery.
	Battery temperature too low or too high	Wait for the battery temperature to return to normal.
	Excessively high temperature of motor or controller	Wait until the temperature returns to normal.
	Damaged power mode switch	Replace the switch.
Power supply normal, battery gauge not displaying	Loose connection at battery gauge	Replace the battery at a Zero Dealer.
	Damaged battery gauge	Replace the battery at a Zero Dealer.
Power supply normal, motor not working after power-on	Kickstand switch protection on	Retract the kickstand.
	Brake power-off switch protection	Check the brake switches.
	Motorcycle tip-over switch active	After standing the motorcycle, turn the key off and then back on to reset the switch.
	Throttle not returned to neutral position	Check operation and replace if defective.
	Low battery power protection	Charge the battery.
	Motor overheating protection	Wait for the motor to cool down before use.
	Controller overheating protection	Wait for the controller to cool down before use.
	Damaged kickstand switch	Check kickstand switch connections; replace the kickstand switch.
	Damaged tip-over sensor	Check sensor connections; replace the tip-over sensor.
	Poor contact or damaged throttle	Check throttle connections; replace the throttle.
	Poor contact of controller connector	Inspect and secure the controller connector.
	Poor contact of motor sensor connector	Inspect and secure the motor sensor connector.
	Controller malfunction or motor sensor malfunction	Replace the motor at a Zero Dealer.

XE Wiring Schematic



B = Black	L = Blue	Br = Brown	Lg = Light green
W = White	G = Green	Gr = Gray	O = Orange
Y = Yellow	R = Red	Lb = Light blue	P = Pink
Vi = Violet			