ZERO SR/S ™



ZERO MOTORCYCLES
SERVICE MANUAL

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ZERO MOTORCYCLES®

SR/S SERVICE MANUAL

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EMEA (Europe, Middle East, Africa) Disclaimer

This Service Manual has been drawn up by Zero Motorcycles Inc. and is intended for and addressed to technicians authorized by Zero Motorcycles to provide services or to other independent operators that are (in)directly involved and in the repair or maintenance of vehicles, who are in any case properly trained to provide repair and maintenance services and have specialized knowledge of mechanics principles and vehicle fixing techniques and procedures.

The Zero motorcycle contains high voltage components that should be treated with extreme caution. Exposure to high voltage can cause shock, burns, and even death. Operating, servicing and maintaining a Zero motorcycle can expose one to chemicals including engine exhaust, carbon monoxide, phthalates, which can lead to reproductive harm. Zero motorcycles should at all times, and only be serviced by specially trained and skilled technicians.

This Service Manual is not intended for owners. Zero motorcycles' owners are expressly recommended to consult the relevant Owner's Manual accompanying the motorcycle, which is designed to provide owners with a better understanding of the operation, inspection, and basic maintenance requirements of the motorcycle. Damage, malfunctions, or performance problems caused by the failure to follow recommended repair, service and maintenance requirements stipulated in the Owner's Manual, are not covered by the Zero Motorcycles Limited Warranty.

Zero warrants that all original, factory-produced Zero motorcycles are free from defects in material and workmanship, pursuant to the applicable Limited Warranty conditions stipulated in the Owner's Manual accompanying the motorcycle. Zero strongly recommends to have all maintenance and repair services carried out by authorized Zero dealers or service partners. Damage, malfunctions, or performance problems caused to the motorcycle due to or after service or repair by an unauthorized service provider, or due to the improper service, repair or installation of parts/accessories not sold or approved by Zero or altering the motorcycle's specifications from those set by Zero, are not covered by the Zero Motorcycles Limited Warranty.

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How To Use This Manual

General

To assist in the use of this Manual, it is divided into numbered sections (shown on the previous page). Each section starts with a contents page listing the service procedures covered within that section. Each section is numbered from page 1, and the page number is shown at the bottom of each page.

References will be made from within a service procedure to other procedures that should be carried out as part of the main procedure.

The individual actions of the service procedures must be followed in the sequence in which they appear. Annotation numbers on the illustrations refer to the relevant numbered action after the illustration.

For reference purposes, an illustration number is shown in the bottom left hand corner of each illustration.

Important Information Types

The following words are used within this manual to call your attention to specific types of information.

WARNING! An action or information which must be followed precisely to avoid the possibility of injury.

CAUTION: **Calls attention action or information which must be followed to avoid damage to components.**

NOTICE: Information that must be performed before starting the repair procedure.

Note: Gives helpful information.

Dimensions

The dimensions quoted are to design engineering specification. Service limits are included where applicable.

Terminology



ZSM00687

Left side of motorcycle.



ZSM00688

Right side of motorcycle.

Abbreviations and Symbols

AC	Alternating current
Amp (A)	Ampere
AUX	Auxiliary
C	Celsius
CCM	Cellular Connectivity Module
CEL	Check Engine Light
cm	Centimeter
DC	Direct Current
dia.	Diameter
DOT	Department of Transportation
EPA	Environmental Protection Agency
EV	Electric Vehicle
F	Fahrenheit
FRT	Flat Rate Time
HCU	Hydraulic Control Unit
HV	High Voltage
HW	Hardware
in-lb	inch-pound
lb-ft	pounds-feet
LH	Left-Hand
MBB	Main Bike Board
mm	millimeter
Nm	Newton-metre
OAL	Overall Length
OBC	On-Board Charger
SoC	State of Charge
RH	Right-Hand
V	Volt
W	Watt

Important Repair Information

Replacement Fasteners

Replacement fasteners must be the correct part number for that application. Use the correct fastener in the correct location. Fasteners requiring the use of thread-locking compound are specified in the repair procedure; refer to the product manufacturer for proper usage.

One-time Use

Always use new lock nuts, lock washers, crush washers, cotter pins, and cable ties.

Coatings

Do not use paints, lubricants, or corrosion inhibitors on fasteners or fastener contact surfaces unless otherwise specified in the installation procedure notes. Coatings affect fastener torque and clamping force, as well as damage the fastener. Coatings can also affect the operation of electrical components.

Lifting and Supporting the Motorcycle



CAUTION: DO NOT LIFT THE MOTORCYCLE BY JACKING UP THE CONTROLLER! DO NOT SUPPORT THE WEIGHT OF THE MOTORCYCLE BY SUPPORTING THE CONTROLLER! Doing so, will damage the controller and other components.

Repair of Electric Vehicles

Zero Motorcycles are electrically powered vehicles (“e-vehicles”) under which Regulation No. 100 of UNECE [2015/505] applies. In order to safely repair Zero Motorcycles, it is essential that any electrical hazards are eliminated, and damaged motorcycles or electrically hazardous components should be handled and stored safely. All work on Zero Motorcycles and their components must be carried out in compliance with safety instructions supplied by Zero Motorcycles and all applicable local standards and e-vehicle requirements.

Testing After a Repair

Operations covered in this Manual do not include reference to testing the motorcycle after repair. It is essential that work is inspected and tested after completion and if necessary a road test of the motorcycle is carried out. This is of particular importance where safety related items are concerned.

Maintenance Intervals

Initial 100 mile (160 km) service

Perform these tasks after the initial 100 mi (160 km) of motorcycle operation.

- Drive Belt - Check the belt tension. See *Adjust Drive Belt, page 10.4.*

Initial 600 mile (1000 km) service

Perform these tasks after the initial 600 mi (1000 km) of motorcycle operation.

- Wheel Bearings - Check for smooth operation. Replace if necessary.
- Drive Belt - Check the belt tension. See *Adjust Drive Belt, page 10.4.*
- Steering Bearings - Check for looseness. for torque procedure and specifications.
- Front Brake Lever Pivot Shaft - Check operation, apply silicone grease lightly, and service if necessary. See *Brake Lever (Front), page 45.2.*
- Kickstand switch - Check operation. See *Kickstand Switch, page 70.27.*
- Drive Motor - Check commissioning and timing. See *Motor Commissioning, page 10.12.*

Every 8,000 mile (13000 km) or 12 month service

Perform these tasks every 8k mi (13k km) or 12 months of motorcycle operation.

- Brake fluid - Replace the brake fluid.
- Wheels - Check run-out and for damage. Replace if necessary.
- Wheel Bearings - Check for smooth operation. Replace if necessary.
- Drive Belt - Check the belt tension. See *Adjust Drive Belt, page 10.4.*
- Steering Bearings - Check for looseness. See *Steering Stem, page 40.1.* for torque procedure and specifications.
- Chassis fasteners and fittings - Tighten and adjust as needed.
- Front Brake Lever Pivot Shaft - Check operation, apply silicone grease lightly, and service if necessary. See *Brake Lever (Front), page 45.2.*
- Throttle grip - Check operation and free play.
- Kickstand pivots - Check operation and apply silicone grease lightly.
- Kickstand switch - Check operation and replace if necessary. See *Kickstand Switch, page 70.27.*
- Drive Motor - Check commissioning and timing. See *Motor Commissioning, page 10.12.*

Every 16,000 mile (25000 km) service

Perform these tasks every 16,000 mi (25000 km) of motorcycle operation.

- Steering Bearings - Repack with all-purpose grease. See *Steering Stem, page 40.1.*

Every 24,000 mile (37000 km) service

Perform these tasks every 24,000 mi (37000 km) of motorcycle operation.

- Drive Belt - Replace the belt. See *Drive Belt - Replace, page 30.47.*
- Swingarm pivot bearings - Check for smooth operation. Replace if necessary. See *Swingarm, page 40.17*.

Lockout Procedure

WARNING! Risk of injury. There is a risk of electric shock when working on high-voltage components. Work on high-voltage components requires special training, qualifications and tools

WARNING! For your safety and for the safety of others, perform the following steps prior to performing work on the Zero Motorcycle!

Lockout Procedure Steps



1. Set up physical safety barricades around your work area to prevent unauthorized access to the motorcycle. Check local regulations for details.
2. Confirm your work area is equipped with a high voltage safety hook.



3. Always wear electrically insulated gloves to prevent electrocution while working on high-voltage components. Inspect your high-voltage safety gloves to make sure they are not damaged and are properly certified.
4. Check local regulations for other PPE (Personal Protection Equipment) that may be required to be worn.



5. Switch on the ignition key and make sure that the battery symbol goes out. If this indicator remains illuminated, the motorcycle's diagnostic system has detected an error with the 12 volt system (it could be the 12 volt lithium-ion battery and/or the DC-DC converter).

   CAUTION: **Do not proceed with any high-voltage repairs until this error has been resolved.**

6. Turn the ignition key counterclockwise to turn the motorcycle off and disconnect all of the charging cables.

   WARNING! Make sure that the ignition is off and the charging cable is disconnected before performing any repairs.

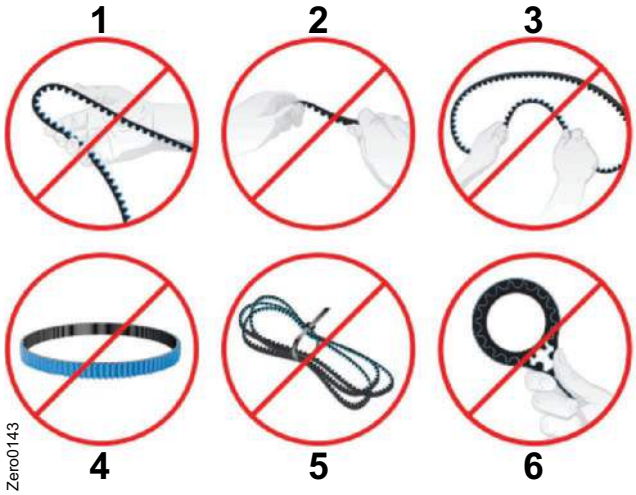
7. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
8. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery (Disconnect), page 70.3.*

Drive Belt Handling Guidelines

Guidelines

CAUTION: Drive belts can fail prematurely if not properly handled and stored. Adhere to the following guidelines to ensure optimal performance and service life.

CAUTION: Do not attempt to install the belt without following the proper procedure. See *Drive Belt - Replace, page 30.47.* for proper instructions.



1. Do not crimp belts during handling or while being stored. Do not bend belts to a smaller radius than the motor sprocket diameter. Do not hang belts in a manner that would cause a tight bend such as on a nail or a hook.
2. Do not twist belts.
3. Do not back-bend belts tightly (smallest diameter approx. 4 in. (100 mm).
4. Do not invert belts.
5. Do not use ties or tape to coil belts into tight bends (see 1).
6. Do not use belts as a wrench or for anything other than their intended use on the motorcycle.

Drive Belt - Adjust

Tools Required (includes tools required for parent jobs):

- T45
- 27 mm socket and ratchet
- Smartphone with Gates® Carbon Drive™ Application
- Motorcycle stand

Removal

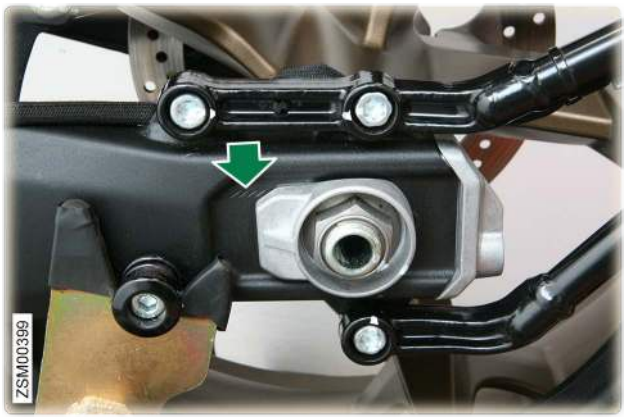
1. Remove the key from the key switch.



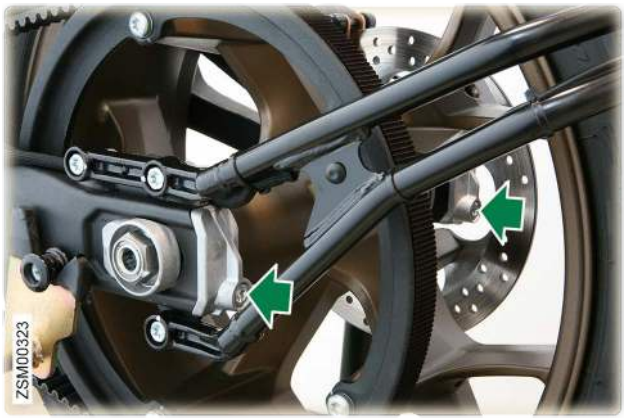
2. Safely raise rear tire off the ground using a motorcycle stand.



3. Loosen rear axle nut. Tool: 27 mm socket



4. The alignment marks stamped on the swingarm are for initial alignment, but are not equal on both sides of the swingarm and should not be used as final adjustment marks.



5. Turn the left (and right) belt tension adjustment bolts a 1/4 turn at a time until the belt adjustment is within specification. Tool: T45



6. Rotate the tire in the ***forward*** direction until the ***belt*** has made two full revolutions.

NOTICE: Rotating the tire in the reverse direction will give a false adjustment. Failing to follow this instruction could cause damage to the drive belt.

NOTICE: Rotating the tire two full revolutions isn't enough to normalize the belt on the two sprockets, so be sure to rotate the ***belt*** two full revolutions by counting the number of times the printing on the belt passes by the rear outer fender arm. Failing to follow this instruction could cause damage to the drive belt.



7. After rotating the drive belt two revolutions and the adjustment bolts are adjusted properly, the belt should have a 1-2 mm gap between the belt-side face of the rear sprocket and the drive belt.



8. Tighten the rear axle nut. Torque 75 lb·ft (102 Nm). Tool: 27 mm socket



9. After the axle is torqued properly, rotate the belt two full turns and confirm that the belt still has a 1-2 mm gap between the belt-side face of the rear sprocket and the drive belt.



10. Using the Gates® Carbon Drive™ application on a Smartphone, confirm the microphone is ON and hold the phone so that the microphone is as close to the drive belt as possible (without touching the belt). Test the belt as close to the center between the front and rear sprocket for best readings. Pluck the belt with your thumb or with a wrench so that the belt vibrates like a guitar string. Check the belt tension range and readjust the belt, if necessary. Recommended belt tension range: 62 Hz to 82 Hz
11. Tighten the left and right belt tension adjustment bolts. Torque: 4 lb-ft (5 Nm).
12. Test ride motorcycle.



13. Recheck the belt adjustment after the test ride and readjust, if necessary.

Brake Bleeding Procedure (Front)

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.

WARNING! Brake fluid is highly toxic; keep containers sealed and out of the reach of children. If accidental consumption of brake fluid is suspected, seek medical attention immediately. If the brake fluid comes into contact with the skin or eyes, rinse immediately with plenty of water.

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.

Tools Required:

- 8 mm hex wrench
- 9 mm hex wrench
- Vacuum bleeder

Fluid Required:

- DOT4 Brake Fluid

Bleeding



1. Fill the front master cylinder brake fluid reservoir with DOT4 brake fluid. Keep the reservoir full during this procedure.

   CAUTION: Do not allow air to enter the system during the bleeding procedure, or the procedure will need to be repeated.



2. Open the front bleed screw. Tool: (9 mm).



3. Slowly pull the brake lever toward the grip and hold it until brake fluid flows out of the bleeder and most of the air is gone. Tighten the bleeder screw while holding the lever toward the grip.



4. Repeat this sequence for the left and right calipers until all the air is out of the system and the lever is firm. Tool: (8 mm).

Brake Bleeding Procedure (Rear)

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.

WARNING! Brake fluid is highly toxic; keep containers sealed and out of the reach of children. If accidental consumption of brake fluid is suspected, seek medical attention immediately. If the brake fluid comes into contact with the skin or eyes, rinse immediately with plenty of water.

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.

Tools Required:

- 9 mm hex wrench
- Vacuum bleeder

Fluid Required:

- DOT4 Brake Fluid

Bleeding

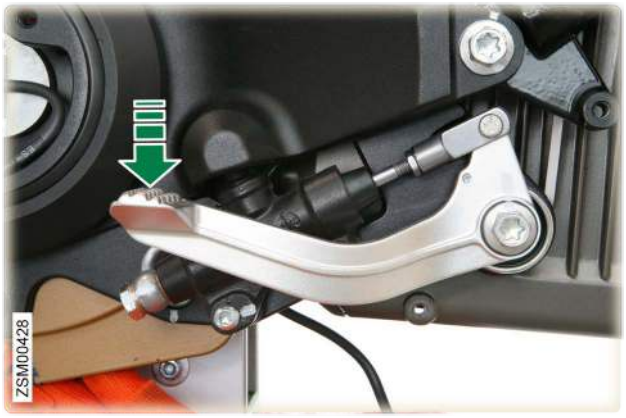


1. Fill the rear master cylinder brake fluid reservoir with DOT4 brake fluid. Keep the reservoir full during this procedure.

   CAUTION: Do not allow air to enter the system during the bleeding procedure, or the procedure will need to be repeated.



2. Open the rear caliper bleed screw (9 mm).



3. Slowly press the brake lever down and hold it until brake fluid flows out of the bleeder and most of the air is gone. Tighten the bleeder screw while holding the brake lever down.
4. Repeat this sequence until all the air is out of the system and the lever is firm.

Brake Bedding

Note: Bedding in new brake systems 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. Gently use the brakes a few times at low speeds (<25 mph) to develop 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 or triggering the ABS, 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.

Key Programming

Items Required:

- Yellow key: quantity 1
- Black keys: quantity 1 or 2

Program

Programming Note: Pause for one second between each key turn.

Note: Only two black keys can be programmed to one motorcycle.

Note: If the yellow key is lost, it is not possible to get a replacement yellow key using the key number.

Note: Each key switch has its own exclusive yellow key. If the yellow key is lost, the entire key switch must be replaced to get a replacement yellow key.



1. Insert the yellow key into the key switch.



2. Turn the yellow key to the ON position and the to the OFF position. This takes motorcycle out of ***programming*** mode.
3. Remove the yellow key.



4. Insert one black key.



5. Turn the black key to the ON position and then to the OFF position.
6. Remove the first black key.



7. Insert the second black key.



8. Turn the second black key to the ON position.



12. Turn the yellow key to the ON position.



9. Turn the second black key to the OFF position.
10. Remove the second black key.



13. Turn the yellow key to the OFF position. This removes the motorcycle from ***programming*** mode.



11. Re-insert the yellow key.

Motor Commissioning

Items Required:

- Laptop (with DIAG4 software)
- CAN cable
- Black key

Important Commissioning Tasks:

- **WARNING! The motorcycle must be on a motorcycle stand with the rear tire raised off the ground and you must stand clear of the rear tire, rear wheel, and drive belt, because the rear will automatically start to rotate at a high rate of speed during the motor commissioning process!**
- Raise rear tire off the ground by using a motorcycle stand.

Procedure



1. Use a motorcycle stand to raise the rear tire off the ground.

   WARNING! The motorcycle must be on a motorcycle stand with the rear tire raised off the ground and you must stand clear of the rear tire, rear wheel, and drive belt, because the rear will automatically start to rotate at a high rate of speed during the motor commissioning process!

2. Connect a laptop (with DIAG4 software loaded) to the motorcycle's OBDII diagnostic connector with CAN cable.



3. Select **DIAG 01 Maintenance**.



4. Select **Motor Commissioning & Timing**.



5. Double click Encoder Commissioning.

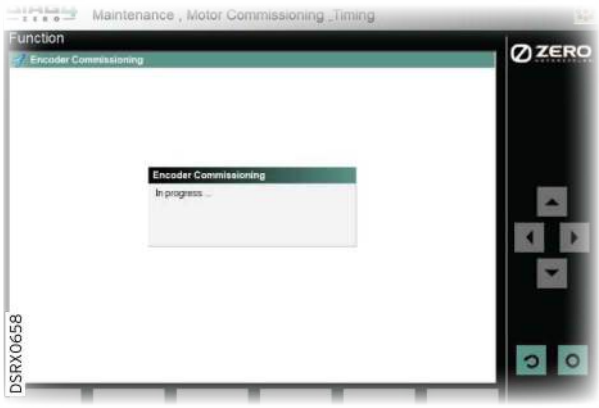


6. Check that the rear wheel is off of the ground before proceeding to the next step. After selecting **OK**, the wheel will start spinning slowly.



7. In this step, check to see that the kickstand is up and the kill-switch is in the run position. Then click **OK**. After accepting, the wheel will start spinning slowly.

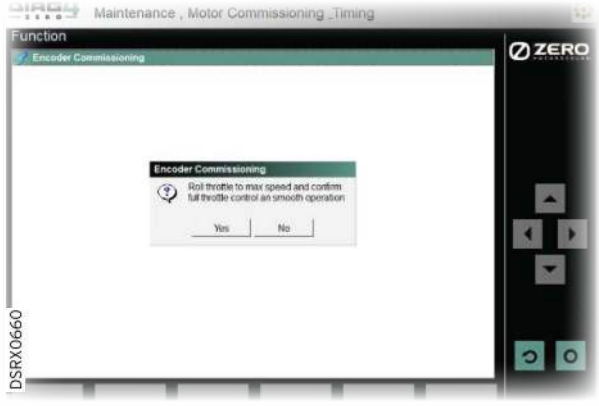
   Note: If the kill-switch or kickstand is not in the correct position, this popup screen will be displayed again.



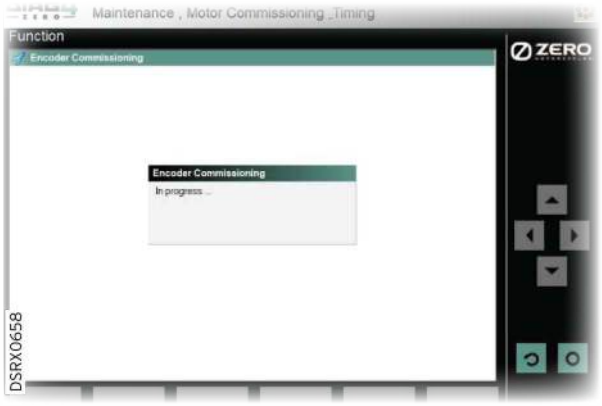
8. During this process, the rear wheel will turn and calibrate.



9. Please turn off the ignition. Turn it on again, and then click **OK**.



10. Test the throttle to maximum speed and confirm full throttle and smooth operation. If the vehicle operates normally, click **Yes**.



11. The system will now start checking the encoder procedure for the second time.



12. When this popup displays, the encoder process was successful.

    CAUTION: **The difference between the old and the new must not be more than 5 degrees. If the difference is greater than 5 degrees, do not return the motorcycle to operation. Contact customer support for instructions on how to proceed.**

    - North America: support@zeromotorcycles.com
    - Zero Motorcycles Europe: service.eu@zeromotorcycles.com

Motor Controller Firmware Update

Process

1. To update the Motor Controller Firmware, contact Zero Motorcycles Customer Service department for assistance.
   - North America: support@zeromotorcycles.com
   - Zero Motorcycles Europe: service.eu@zeromotorcycles.com

Power Pack

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T20
- T25
- T27
- T30
- T40
- 3/16” standard screwdriver
- 2 mm hex wrench
- 7 mm combination wrench
- 10 mm socket and ratchet
- 22 mm 6-point socket
- Non-marring trim removal/pry tool
- O-ring pick
- Scissor jack
- Ratchet straps (x2)
- Hoist

Zero Motorcycles Specialty Tools Required (includes tools required for parent jobs):

- Power Pack fixture

New Seals Required:

- Controller cable seals (quantity: 5)
- Controller cable O-rings (quantity: 5)

New Fasteners Required:

- Cable ties (quantity: 3)
- Double loop cable tie (quantity: 1)

New Parts (for new BCB’s):

- 20-03065 - Foam
- 20-04855 - VHB tape
- 81-08108 - Mesh Screen

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove tank assembly. See *Tank Removal, page 60.9.*
6. Remove charger. See *6KW Charger [22MY Onwards], page 25.13.*
7. Remove controller. See *Motor Controller with Heatsink [22MY Onwards], page 30.46.*
8. Remove the power leads. See *Power Leads - Positive & Negative [22MY Onwards], page 20.34*.



9. Disconnect battery signal harness connector.



10. Remove bolt securing power pack ground strap. Tool: T30. Torque: 5 lb-ft (7 Nm).



11. Take note of the placement and position of harness ground wires, prior to removing bolt.



12. Disconnect DC/DC converter harness connector.



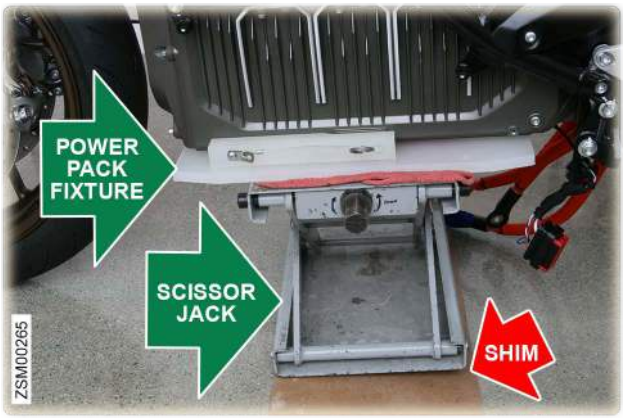
13. Release grey locking clip from the DC/DC converter harness connector. Tool: O-ring pick.



14. Release DC/DC converter harness connector.



15. Route DC/DC converter harness over the top of the rear brake hoses.



16. Support and lift the power pack with a Zero Motorcycle Power Pack Fixture and a scissor jack.

WARNING! If shimming of the scissor jack is necessary to position the power pack fixture and lift evenly, do not shim too much or the power pack could tip over and cause serious injury and/or damage the power pack.

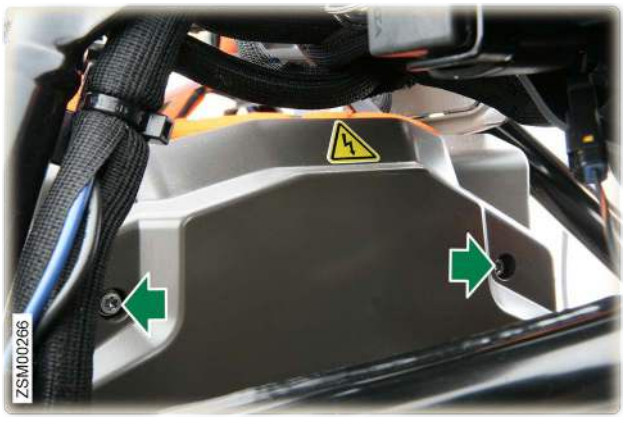
CAUTION: Do not lift the power pack without the proper tool. Do not lift or support the power pack by the power pack side plates. The power pack side plates are not designed to support the weight of the power pack. Disregarding this caution will cause damage to the power pack.



17. Remove bolts (x2) securing the left side of the power pack to the frame. Tool: T40. Torque: 26 lb-ft (35 Nm).



18. Remove bolts (x2) securing the right side of the power pack to the frame. Tool: T40. Torque: 26 lb-ft (35 Nm).



19. Lower the power pack to gain access to the rear cover bolts.
20. Remove bolts (x2) securing the rear cover to the power pack. Tool: T20. Torque: Hand

    Note: Lift rear cover out over the top of the power pack.



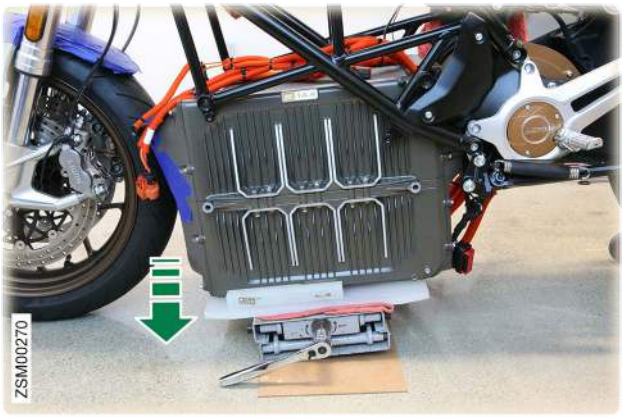
21. Protect the painted surface of the front cover.



22. Lower power pack until right side plate is almost touching the rear brake master cylinder bracket, then move the power pack to the left side to clear the bracket.



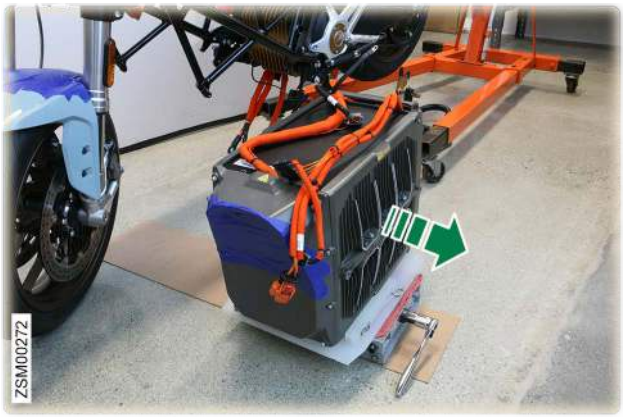
23. Move the motorcycle backward to increase clearance to between the motor and the back of the power pack.



24. With the jack all the way down, the power pack will still not slide out from under the motorcycle.



25. With lift straps around the rear subframe, raise the back of the motorcycle approximately 14” with a hoist.



26. Once the motorcycle has been raised enough, turn the front tire and slide the power pack out from under the motorcycle.

Installation

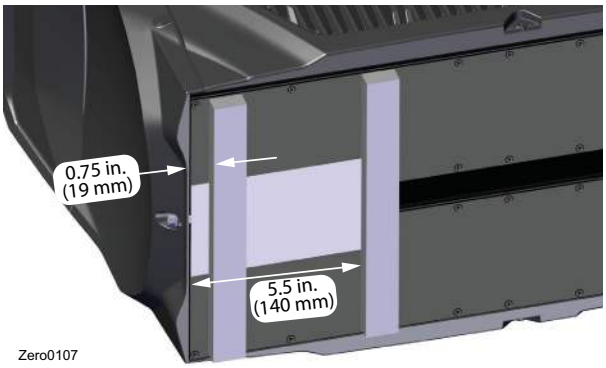
1. Installation is the reverse of the removal procedure.
2. A replacement power pack from Zero Motorcycles should come pre-programmed and ready for use. If this is not the case, email Zero Motorcycles Customer Service department.
   - North America: support@zeromotorcycles.com
   - Zero Motorcycles Europe: service.eu@zeromotorcycles.com

Note: The remaining steps are for BCB’s without mesh tape and foam installed on the bottom of the case.

3. Once installed, clean the bottom of the BCB with isopropyl alcohol.



4. Install the mesh screen (81-08108) evenly at the front edge on the bottom of the BCB using two strips of tape (24-04855).



5. Install the two 9 in. (229 mm) strips of foam at the locations shown.

BMS (Battery Management System) [Before 2022MY]

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T20
- T25
- T27
- T30
- T40
- 3/16” standard screwdriver
- 2 mm hex wrench
- 7 mm combination wrench
- 7 mm socket and ratchet
- 10 mm socket
- 22 mm 6-point socket
- Non-marring trim removal/pry tool
- O-ring pick
- Scissor jack
- Ratchet straps (x2)
- Hoist

Zero Motorcycles Specialty Tools Required (includes tools required for parent jobs):

- Power Pack fixture

New Seals Required:

- Controller cable seals (quantity: 5)
- Controller cable O-rings (quantity: 5)

New Fasteners Required:

- Cable ties (quantity: 3)
- Double loop cable tie (quantity: 1)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*



2. Prior to starting the BMS replacement procedure, obtain the yellow key and both black keys. It is possible to that the keys will need to reprogrammed after replacing the BMS.
3. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
4. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
5. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
6. Sparingly use canned air to remove dirt and debris from around the BMS harness connector before disconnecting it.



7. Remove bolts (x2) securing the corners of the front cover to the left side of the power pack. Bolt: M5x30. Tool: T20. Torque: 18 in-lb (2.3 Nm).

   CAUTION: **Be very careful with the bolt lengths during installation.**



8. Remove bolts (x2) securing the corners of the front cover to the right side of the power pack. Bolt: M5x30. Tool: T20. Torque: 18 in-lb (2.3 Nm).

   CAUTION: **Be very careful with the bolt lengths during installation.**



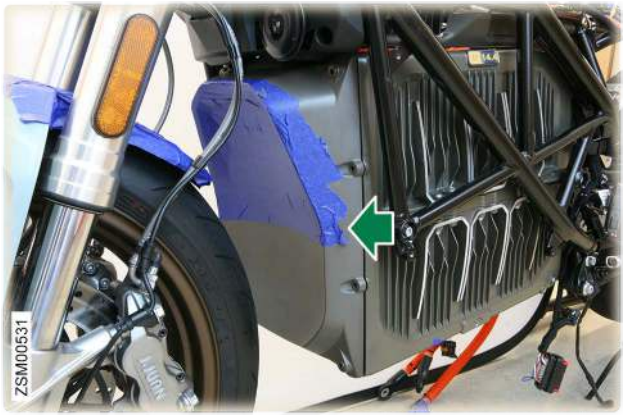
9. Remove bolts (x2) securing the middle of the front cover to the left side of the power pack. Bolt: M5x10. Tool: T20. Torque: 18 in-lb (2.3 Nm).

   CAUTION: **Be very careful with the bolt lengths during installation.**



10. Remove bolts (x2) securing the middle of the front cover to the right side of the power pack. Bolt: M5x10. Tool: T20. Torque: 18 in-lb (2.3 Nm).

    CAUTION: **Be very careful with the bolt lengths during installation.**



11. Remove front cover.



12. Disconnect BMS signal harness connector.



13. Move BMS signal harness connector up.



14. Remove bolts (x2) securing the bottom connector of the BMS. Collect washers (x2). Tool: T20. Torque: 12 in-lb (1.36 Nm).

    Note: If plastic connector cover is loose, remove it.



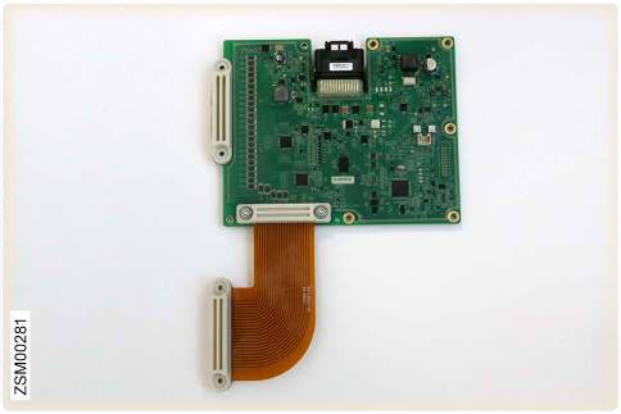
15. Remove bolts (x2) securing the upper connector of the BMS. Collect washers (x2). Tool: T20. Torque: 12 in-lb (1.36 Nm).

    Note: If plastic connector cover is loose, remove it.



16. Remove bolts (x7) securing the BMS to the power pack. Collect flat washers (x6) and star washer (x1). Tool: T20. Torque: 12 in-lb (1.36 Nm).

    Note: Discard BMS attaching bolts and washers. Replace attaching bolts and washers upon installation.



17. Remove BMS.

Installation

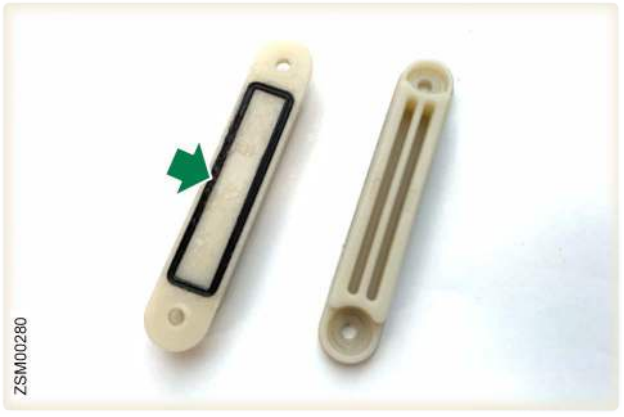
1. Installation is the reverse of the removal procedure, with the exception of the following:



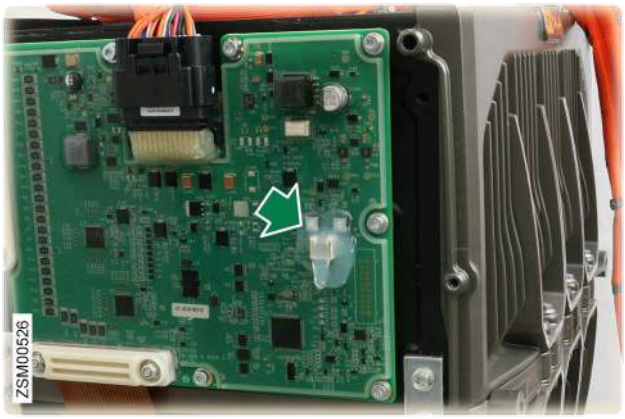
2. Torque BMS bolts with an inch pound torque wrench.



3. Use CP70 sparingly on all gaskets.



4. Clean debris from header clamps, gaskets, and gasket surface. Re-grease gasket surfaces with CP70.



5. Protect test port from corrosion with a liberal amount of CP70.



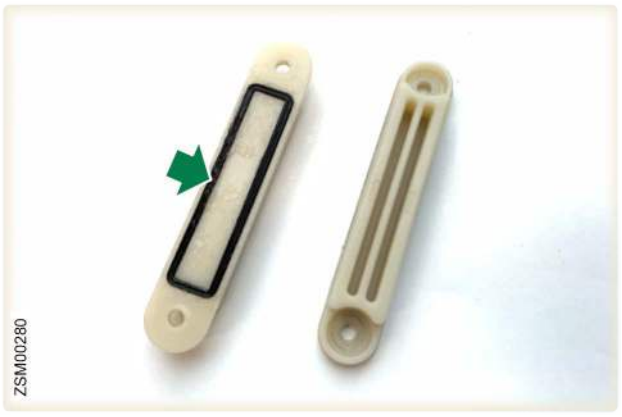
6. Only threading two turns, install middle bolt and flat washer on the right side, securing the BMS to the power pack. Bolt: M4x16.

   Note: Do not tighten bolt yet.

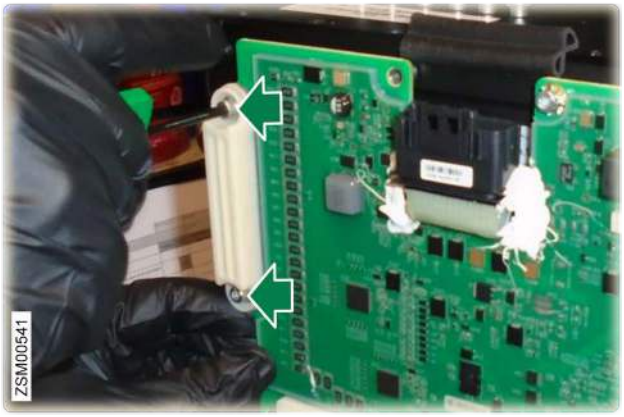


7. Only threading two turns, install middle bolt and star washer on the top, securing the BMS to the power pack. Bolt: M4x16.

   Note: Do not tighten bolt yet.



8. Clean debris from header clamps, gaskets, and gasket surface. Re-grease gasket surfaces with CP70.



9. Begin to fasten the BMS header clamp bolts (x2) with flat washers (x2). Only install bolts two turns.

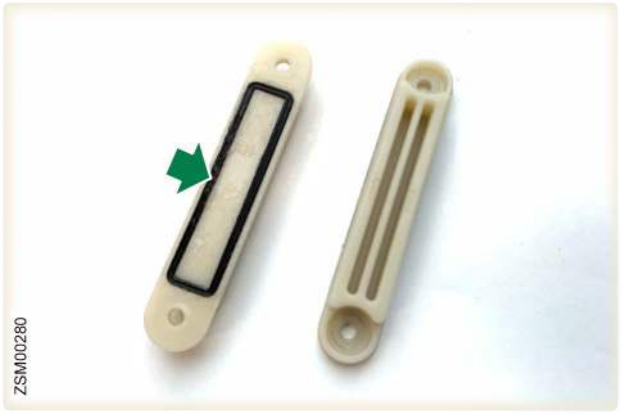
   Note: Do not tighten bolts yet.



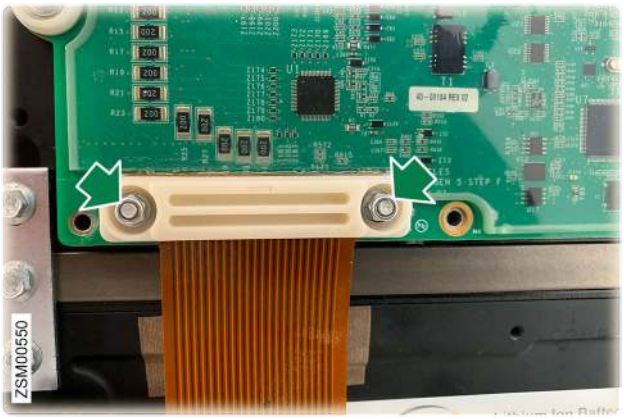
10. Install the last five bolts securing the BMS. Bolt: M4x16. Tool: T20. Torque: 12 in-lb (1.36 Nm).



11. Torque all seven bolts securing the BMS. Bolt: M4x16. Tool: T20. Torque: 12 in-lb (1.36 Nm).



12. If the BMS flex ribbon is not bonded to the BMS, clean debris from header clamps, gaskets, and gasket surface. Re-grease gasket surfaces with CP70.

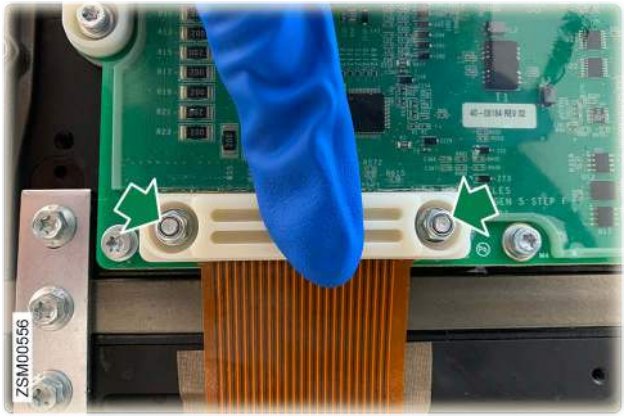


13. If BMS flex ribbon header clamp is not bonded to the BMS circuit board, fasten the header clamp nuts (x2) with flat washers (x2). Tool: 7 mm socket.

Note: You will not be able to put your whole fingers behind the BMS spacer or circuit board.

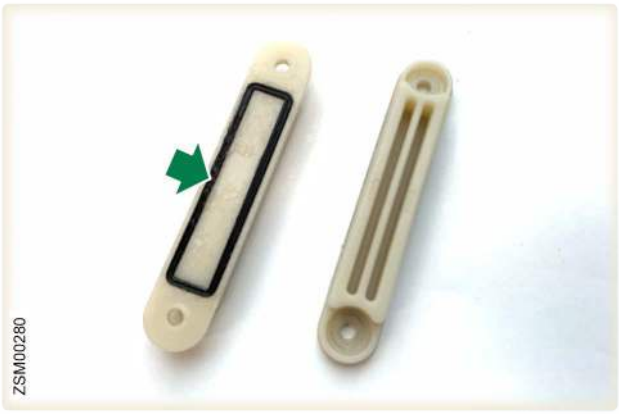
NOTICE: Applying too much force with your finger behind the BMS circuit board may cause damage to the BMS.

Note: Do not tighten bolts yet.



14. Torque the BMS header clamp nuts (x2) and washers (x2). Tool: 7 mm socket. Torque: 12 in-lb (1.36 Nm).

Note: Hold header clamp completely still until both nuts are seated and do not touch the flex ribbon. Seating the pins in a controlled manner is critical.



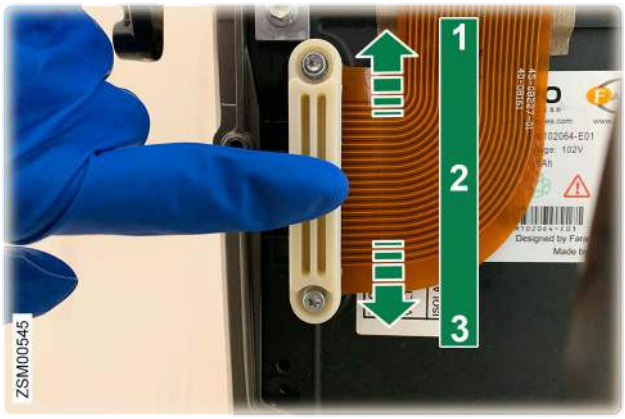
15. If the BMS flex ribbon is not bonded to the BMS, clean debris from header clamps, gaskets, and gasket surface. Re-grease gasket surfaces with CP70.

CAUTION: **Before continuing to the next step, the High Voltage fuses, 12 volt negative battery cable, and signal harness must be disconnected.**



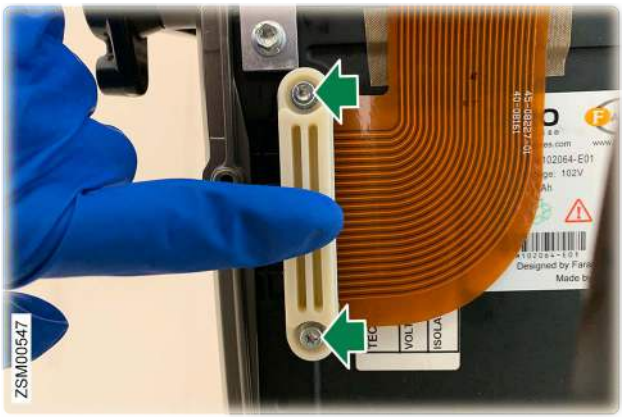
16. Only thread two turns of the bolts (x2) and flat washers (x2) securing the header clamp to the lower battery cell. Tool: T20.

    CAUTION: **Before performing this step, the High Voltage fuses, 12 volt negative battery cable, and signal harness must be disconnected.**



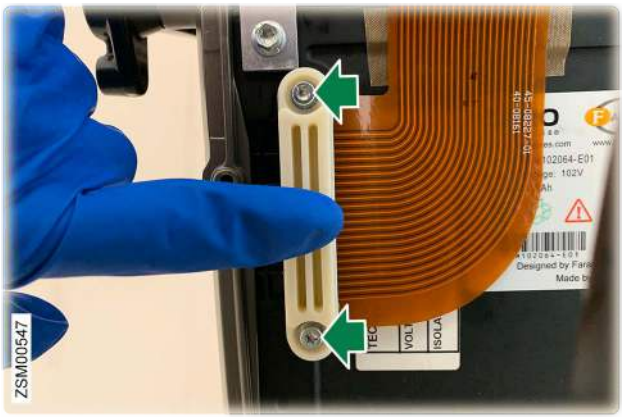
17. The flex ribbon cable pins may require realignment during the installation process. There are three possible positions for the header clamp (1: up, 2: center, and 3: down). Align header clamp and use a finger to hold desired position, then tighten clamp bolts (x2) and flat washers (x2) evenly.

    Note: Tightening bolts evenly keeps the pins aligned.



18. Torque the BMS header clamp bolts (x2) and washers (x2). Tool: T20. Torque: 12 in-lb (1.36 Nm).

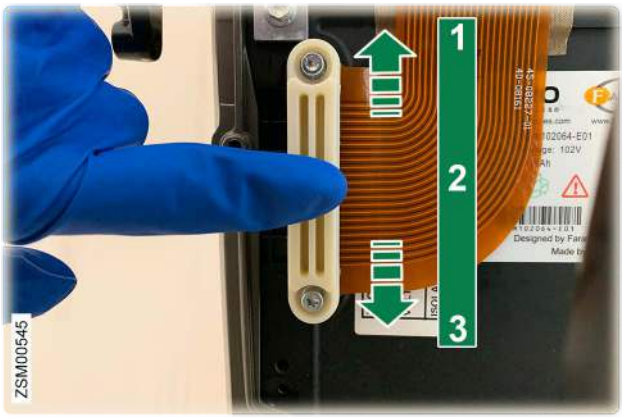
    Note: Hold header clamp completely still until both bolts are seated and do not touch the flex ribbon. Seating the pins in a controlled manner is critical.



19. If the LEDs on the front of the BMS (located under the test port) are blinking red, it is possible that the pins are not seated correctly and may require realignment. If realignment is necessary, loosen the bolts (x2) securing the header clamp and go back to step 17 and pick a new position for the header clamp, ***then hold the reset buttons (located above the TEST port on the BMS) at the same time, for 5 seconds***. Tool: T20.
20. If the BMS works after the installation, go to step 25. If the BMS doesn't work after installation, continue to the following step.



21. Do not remove, but loosen bolts (x2) and flat washers (x2) securing the header clamp to the lower battery cell. Tool: T20.



22. Pick a new position; 1, 2, or 3. The flex ribbon cable pins may require realignment during the installation process. There are three possible positions for the header clamp (1: left, 2: center, and 3: right). Align header clamp and use a finger to hold desired position, then tighten clamp bolts (x2) and flat washers (x2) evenly.

    Note: Tightening bolts evenly keeps the pins aligned.

23. If the BMS doesn't work, go back to step 21 and repeat the process in a different alignment position, or go to the next step.
24. If you've exhausted all 3 positions of the BMS flex ribbon header clamp, email Zero Motorcycles Customer Service department.
    - North America: support@zeromotorcycles.com
    - Zero Motorcycles Europe: service.eu@zeromotorcycles.com
25. A replacement BMS from Zero Motorcycles should come programmed and ready for use. If this is not the case, email Zero Motorcycles Customer Service department.
    - North America: support@zeromotorcycles.com
    - Zero Motorcycles Europe: service.eu@zeromotorcycles.com
26. After installing the BMS, it may be necessary to reprogram the keys to the motorcycle. See *Key Programming, page 10.10.*

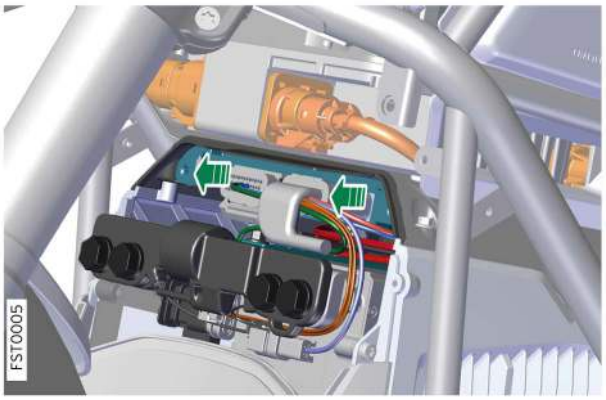
Battery Management Unit (BMU) [22MY Onwards]

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

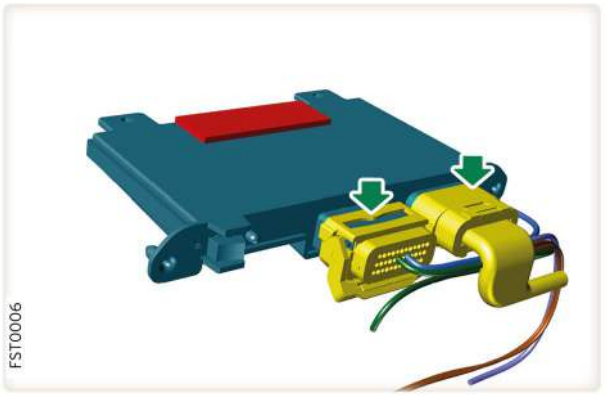
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove service cover. See *Service Cover [22MY Onwards], page 20.28.*



3. Carefully pull BMU to release from grommets (x2).



4. Disconnect harness connectors (x2).
5. Remove BMU.

Installation

1. Installation is the reverse of removal procedure except for the following:
2. Make sure foam is located on top of BMU. This will reduce vibration.
3. Insert BMU at an angle to engage rear clips.
4. Apply vertical pressure and push BMU rearwards to fully engage front grommets.

Power Pack Battery Signal Harness [Before 2022MY]

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T20
- T25
- T27
- T30
- T40
- 3/16” standard screwdriver
- 2 mm hex wrench
- 7 mm combination wrench
- 10 mm socket and ratchet
- 14 mm socket
- 22 mm 6-point socket
- Non-marring trim removal/pry tool
- O-ring pick
- Scissor jack
- Ratchet straps (x2)
- Hoist

Zero Motorcycles Specialty Tools Required (includes tools required for parent jobs):

- Power Pack fixture

New Seals Required:

- Controller cable seals (quantity: 5)
- Controller cable O-rings (quantity: 5)

New Fasteners Required:

- Cable ties (quantity: 6)
- Double loop cable tie (quantity: 1)
- Self amalgamating tape

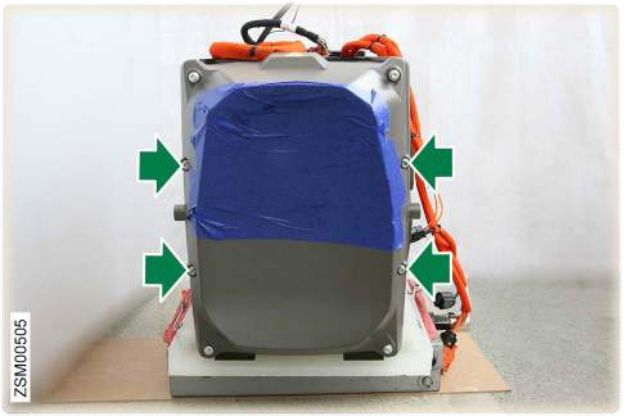
Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove power pack. See *Power Pack, page 20.1.*



6. Remove bolts (x4) securing the four corners of the front cover to the power pack. Bolt: M5x30. Tool: T20. Torque: 18 in-lb (2.3 Nm).

   CAUTION: **Be very careful with the bolt lengths during installation.**

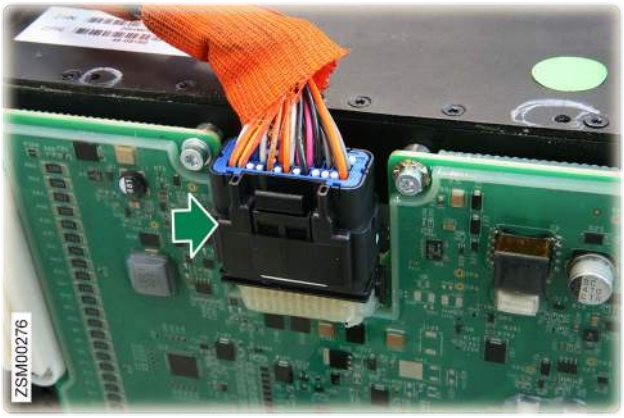


7. Remove bolts (x4) securing center of the front cover to the power pack. Bolt: M5x10. Tool: T20. Torque: 18 in-lb (2.3 Nm).

   CAUTION: **Be very careful with the bolt lengths during installation.**



8. Remove front cover.



9. Disconnect BMS signal harness connector.



10. Remove bolts (x9) securing rear cover to the power pack. Bolt: M5x16. Tool: T20. Torque: 18 in-lb (2.3 Nm).

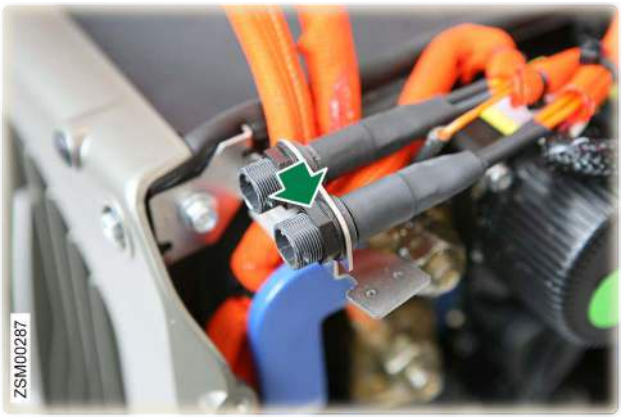
    CAUTION: **Be very careful with the bolt lengths during installation. Accidentally installing the incorrect bolts in the incorrect locations will damage your power pack.**



11. Remove the power pack rear cover.



12. Disconnect contactor harness connector.



13. Remove nut securing the MBB (Main Bike Board)/Contactor fuse holder to the high voltage fuse bracket and capture plastic washer. Tool: 14 mm socket. Torque: Hand



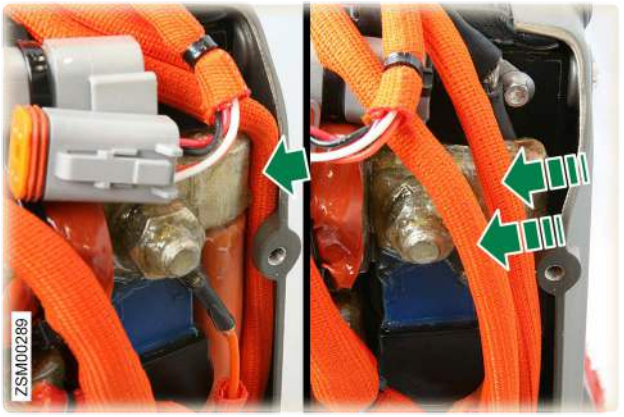
14. Cut cable tie securing the self amalgamating tape (PN: 81-08088) and bead type thermistor to the contactor fuse.

    Note: Replace cable tie during the installation process.

15. Remove self amalgamating tape (PN: 81-08088) securing bead type thermistor to the contactor fuse.

    Note: Replace self amalgamating tape during the installation process.

16. Release bead type thermistor.



17. Release orange sheathed harnesses (x2) from between the B+ buss and upper right heat sink skin.



18. Cut cable ties (x2) securing Battery Signal B- Sense Line to Battery Signal B+ Sense Line harness.

    Note: Replace cable tie during the installation process.



19. Disconnect battery signal B+ Sense Line grey harness connector.



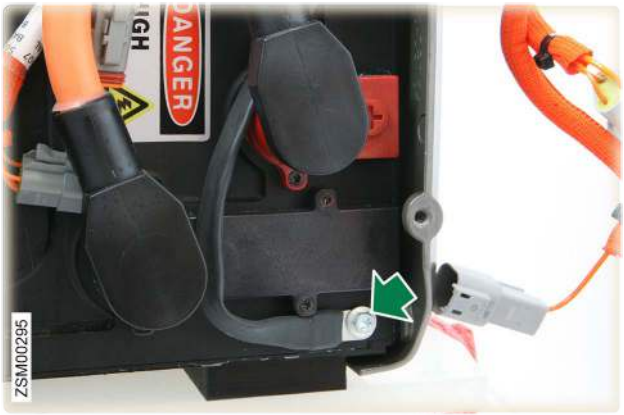
20. Remove bolt securing HV cable retainer. Tool: T25. Torque: 28 in-lb (3.16 Nm).



21. Maneuver both signal wire harnesses out from behind the positive HV battery cable.



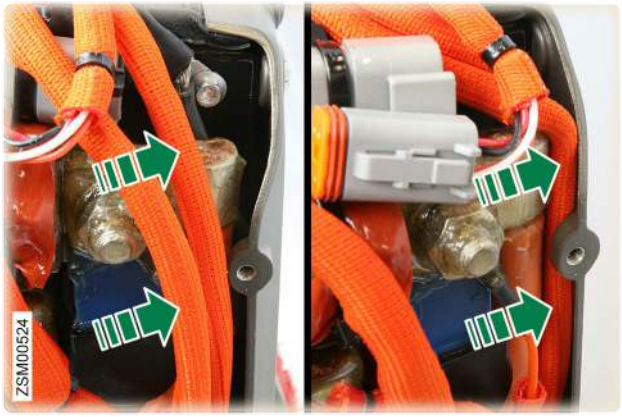
22. Remove bolt securing ground strap to upper battery pack. Tool: T25



23. Remove bolt securing ground strap to lower battery pack. Tool: T25
24. Remove power pack battery signal harness.

Installation

1. Installation is the reverse of the removal procedure, with the exception of the following:



2. Maneuver both (B+ and B-) orange-sheathed signal harnesses between the B+ high voltage battery wire and the power pack heat sink skin.



3. When installing the rear cover, only use proper length bolt in the location shown. Bolt: M5x16.

WARNING! Installing a bolt longer than 16 mm will cut through the insulation of the high voltage wires and cause damage to the components and possible injury.

Power Pack Accessory Power Bus [Before 2022MY]

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T20
- T25
- T27
- T30
- T40
- 3/16” standard screwdriver
- 2 mm hex wrench
- 2.5 mm hex wrench
- 7 mm combination wrench
- 10 mm socket and ratchet
- 14 mm socket
- 22 mm 6-point socket
- Non-marring trim removal/pry tool
- O-ring pick
- Scissor jack
- Ratchet straps (x2)
- Hoist

Zero Motorcycles Specialty Tools Required (includes tools required for parent jobs):

- Power Pack fixture

New Seals Required:

- Controller cable seals (quantity: 5)
- Controller cable O-rings (quantity: 5)

New Fasteners Required:

- Cable ties (quantity: 6)
- Double loop cable tie (quantity: 1)
- Self amalgamating tape

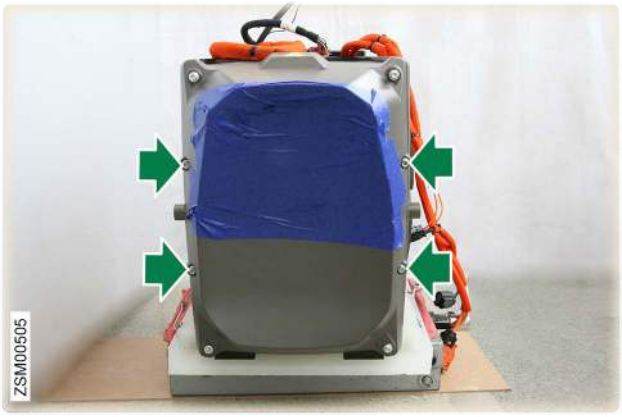
Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove power pack. See *Power Pack, page 20.1.*



6. Remove bolts (x4) securing the four corners of the front cover to the power pack. Bolt: M5x30. Tool: T20. Torque: 18 in-lb (2.3 Nm).

   CAUTION: **Be very careful with the bolt lengths during installation.**

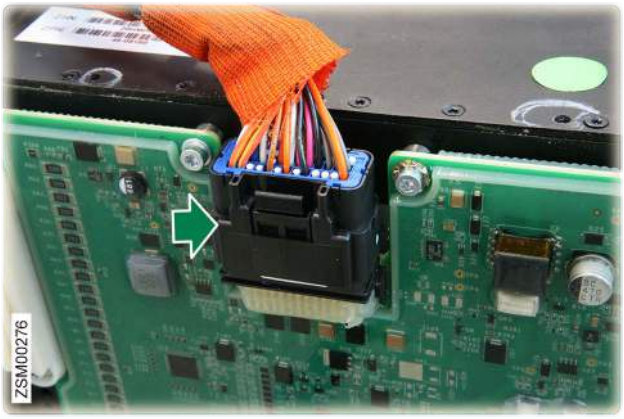


7. Remove bolts (x4) securing center of the front cover to the power pack. Bolt: M5x10. Tool: T20. Torque: 18 in-lb (2.3 Nm).

   CAUTION: **Be very careful with the bolt lengths during installation.**



8. Remove front cover.



9. Disconnect BMS signal harness connector.



10. Remove bolts (x9) securing rear cover to the power pack. Bolt: M5x16. Tool: T20. Torque: 18 in-lb (2.3 Nm).

    CAUTION: **Be very careful with the bolt lengths during installation. Accidentally installing the incorrect bolts in the incorrect locations will damage your power pack.**



11. Remove the power pack rear cover.



12. Remove nut securing the MBB (Main Bike Board)/Contactor fuse holder to the high voltage fuse bracket and capture plastic washer. Tool: 14 mm socket. Torque: Hand



13. Remove nut securing the DC/DC Converter fuse holder to the high voltage fuse bracket and capture plastic washer. Tool: 14 mm socket. Torque: Hand



14. Cut cable tie securing Battery Signal B+ Sense Line harness.

    Note: Replace cable tie during the installation process.



15. Cut cable tie securing Battery Signal B- Sense Line harness.

    Note: Replace cable tie during the installation process.



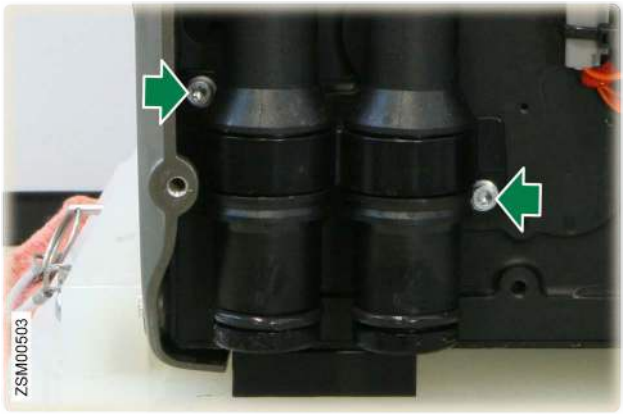
16. Disconnect Battery Signal B+ Sense Line harness connector.



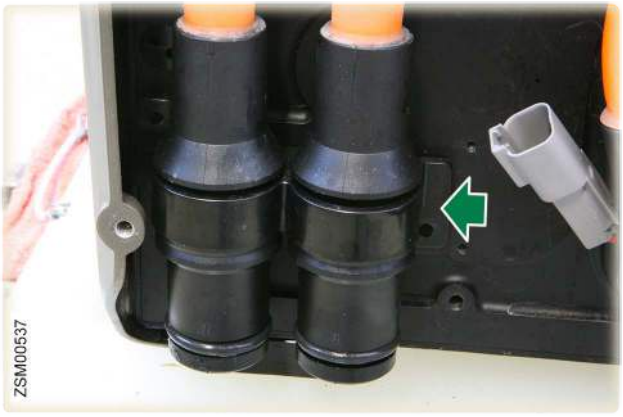
17. Disconnect Battery Signal B- Sense Line harness connector.



18. Disconnect contactor harness connector.



19. Remove bolts (x2) securing battery output radsock connector clamp to power pack and collect flat washers (x2). Bolt: M4x10. Tool: T20. Torque: 12 in-lb (1.36 Nm).



20. Remove radsock connector clamp.



21. Remove bolt securing cable tie to top of power pack. Bolt: M4x16. Tool: T20. Torque: 18 in-lb (2.03 Nm).



22. Cut cable tie securing the self amalgamating tape (PN: 81-08088) and bead type thermistor to the contactor fuse.

    Note: Replace cable tie during the installation process.

23. Remove self amalgamating tape securing bead type thermistor to the contactor fuse.

    Note: Replace self amalgamating tape during the installation process.

24. Release bead type thermistor.



25. Remove bolt securing high voltage wire clamp to power pack. Tool: T25. Torque: 28 in-lb (3.16 Nm).



26. Remove bolt securing high voltage wire clamp to power pack. Tool: T25. Torque: 28 in-lb (3.16 Nm).



27. Disconnect B- radsock connector from the lower battery cell.



28. Disconnect B+ radsock connector from the lower battery cell.



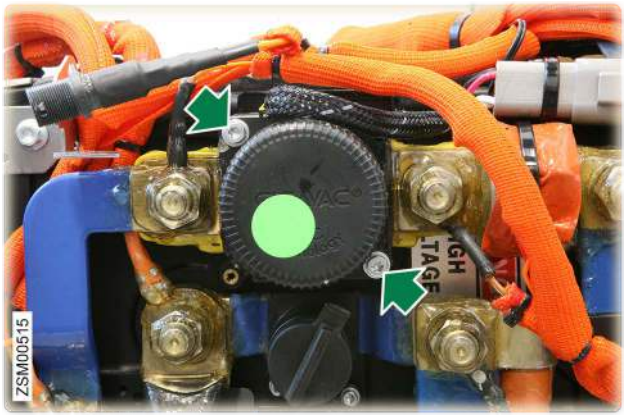
29. Remove bolt securing signal harness ground strap to upper battery cell and collect star washer. Bolt: M5x8. Tool: T25. Torque: 24 in-lb (2.71 Nm).

    Note: Star washer is located between ground strap and battery.

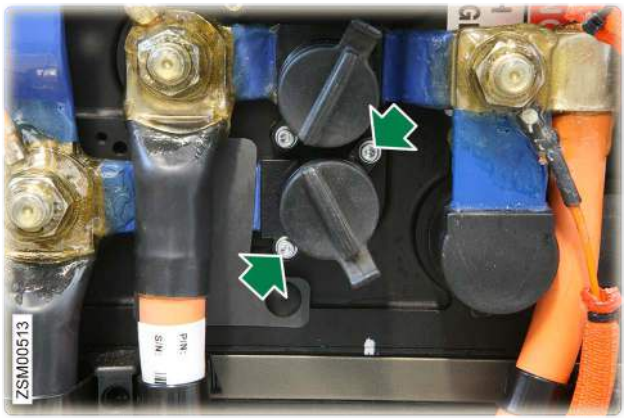


30. Remove bolt securing signal harness ground strap to lower battery cell and collect star washer. Bolt: M5x8. Tool: T25. Torque: 24 in-lb (2.71 Nm).

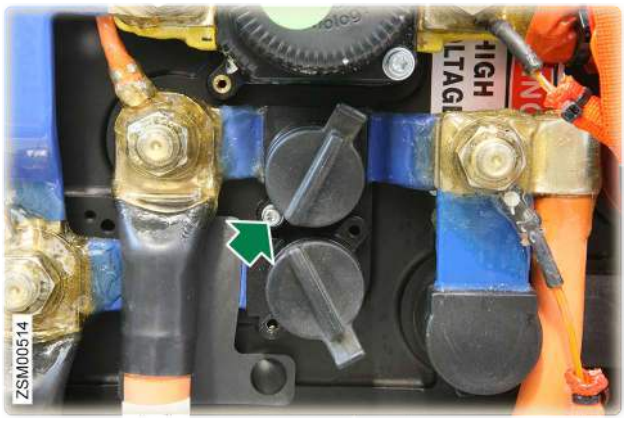
    Note: Star washer is located between ground strap and battery.



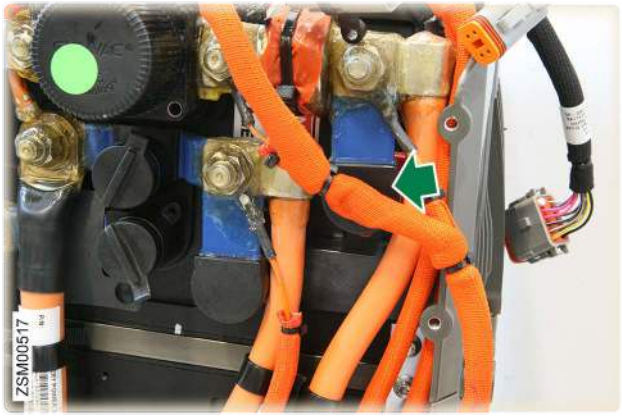
31. Remove bolts (x2) securing contactor to upper battery cell. Collect flat washers (x2) and contactor shim (plastic). Bolt: M4x40. Tool: T20. Torque: 18 in-lb (2.03 Nm).



32. Remove bolts (x2) securing B+ accessory radsock to upper battery cell and collect flat washers (x2). Bolt: M3x16. Tool: 2.5 mm hex wrench. Torque: 12 in-lb (1.36 Nm).

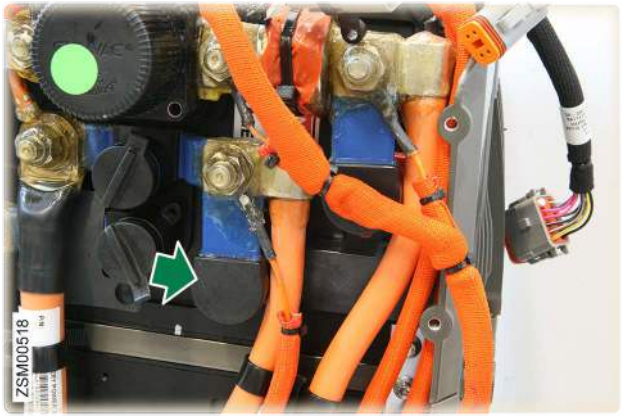


33. Remove bolt securing B- accessory radsock to upper battery cell and collect flat washer. Bolt: M3x16. Tool: 2.5 mm hex wrench. Torque: 12 in-lb (1.36 Nm).



34. Remove B+ radsock from upper battery cell.

    Note: Wiggle radsock connector while pulling as necessary.



35. Remove B- radsock from upper battery cell.

    Note: Wiggle radsock connector while pulling as necessary.



36. Remove the accessory power buss from the power pack.

Installation

1. Installation is the reverse of the removal procedure, with the exception of the following:



2. Before installing the accessory power buss, make sure the orange-sheathed wires are routed behind the bus and under the fuse bracket (see arrow).

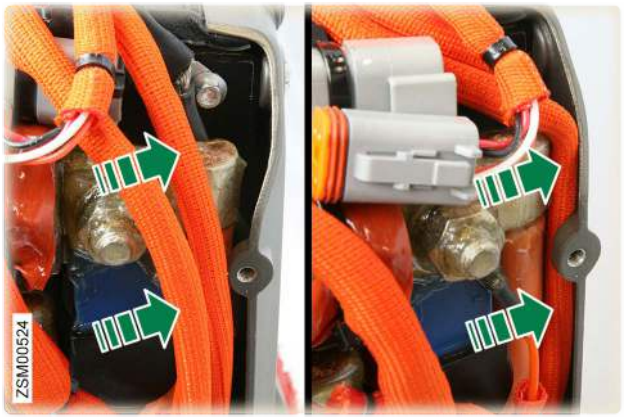


3. While installing the accessory power buss, make sure the plastic shield is placed between the B+ and B- high voltage accessories.

   CAUTION: **The plastic shield protects the high voltage components from each other and it is very important that it is installed properly (as shown) upon reassembly.**



4. Leave all securing bolts loose until all the bolts have been installed, then tighten all bolts to their specified torque.



5. Maneuver both (B+ and B-) orange-sheathed signal harnesses between the B+ high voltage battery wire and the power pack heat sink skin.



6. When installing the rear cover, only use proper length bolt in the location shown. Bolt: M5x16.

   WARNING! Installing a bolt longer than 16 mm will cut through the insulation of the high voltage wires and cause damage to the components and possible injury.

Power Pack Heat Sink Skins [Before 2022MY]

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T20
- T25
- T27
- T30
- T40
- 3/16” standard screwdriver
- 2 mm hex wrench
- 7 mm combination wrench
- 10 mm socket and ratchet
- 22 mm 6-point socket
- Non-marring trim removal/pry tool
- O-ring pick
- Scissor jack
- Ratchet straps (x2)
- Hoist

Zero Motorcycles Specialty Tools Required (includes tools required for parent jobs):

- Power Pack fixture

New Seals Required:

- Controller cable seals (quantity: 5)
- Controller cable O-rings (quantity: 5)

New Fasteners Required:

- Cable ties (quantity: 3)
- Double loop cable tie (quantity: 1)

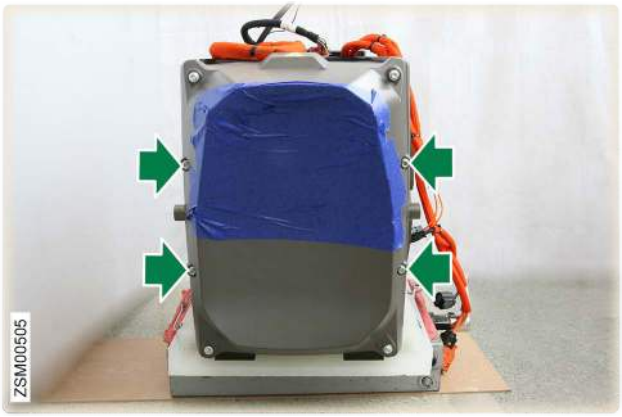
Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove power pack. See *Power Pack, page 20.1.*



6. Remove bolts (x4) securing the four corners of the front cover to the power pack. Bolt: M5x30. Tool: T20. Torque: 18 in-lb (2.3 Nm).

   CAUTION: **Be very careful with the bolt lengths during installation.**



7. Remove bolts (x4) securing center of the front cover to the power pack. Bolt: M5x10. Tool: T20. Torque: 18 in-lb (2.3 Nm).

   CAUTION: **Be very careful with the bolt lengths during installation.**



8. Remove front cover.



9. Remove bolts (x9) securing rear cover to the power pack. Tool: T20. Torque: 18 in-lb (2.3 Nm).

   CAUTION: **Be very careful with the bolt lengths during installation. Accidentally installing the incorrect bolts in the incorrect locations will damage your power pack.**

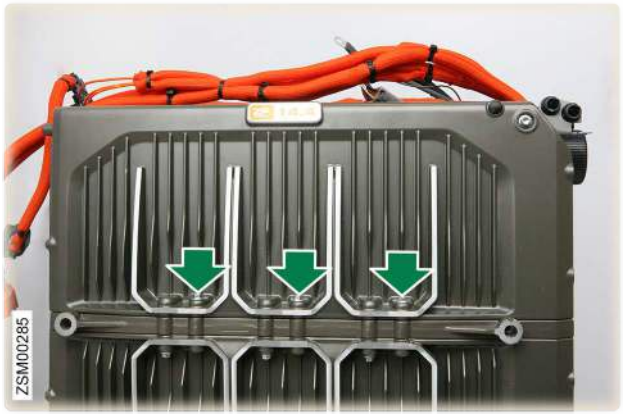


10. Remove the power pack rear cover.



11. Remove bolt securing the side heat sink skin perimeter to the power pack. Tool: T20. Torque: 18 in-lb (2.3 Nm).

    CAUTION: **Be very careful with the bolt lengths during installation. Accidentally installing the incorrect bolts in the incorrect locations will damage your power pack.**



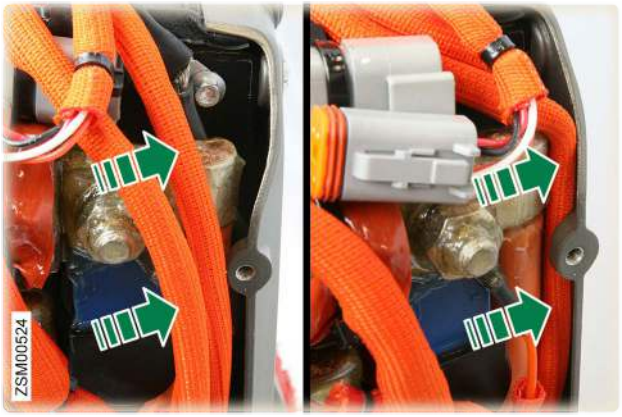
12. Remove bolts (x3) securing the side heat sink skin center to the power pack. Tool: T20. Torque: 30 in-lb (3.4 Nm).

    CAUTION: **Be very careful with the bolt lengths during installation. Accidentally installing the incorrect bolts in the incorrect locations will damage your power pack.**

13. Remove side heat sink skin.

Installation

1. Installation is the reverse of the removal procedure, with the exception of the following:



2. Maneuver both (B+ and B-) orange-sheathed signal harnesses between the B+ high voltage battery wire and the power pack heat sink skin.



3. When installing the rear cover, only use proper length bolt in the location shown. Bolt: M5x16.

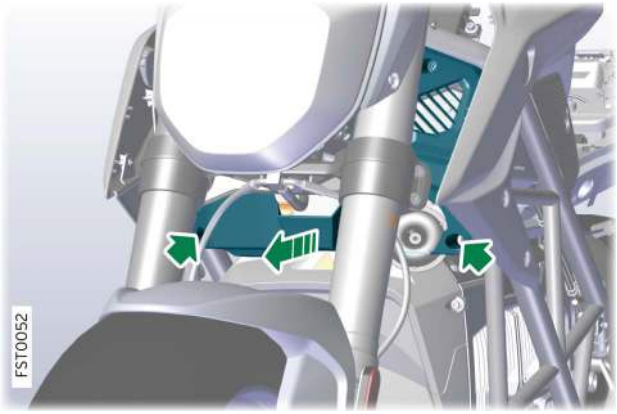
WARNING! Installing a bolt longer than 16 mm will cut through the insulation of the high voltage wires and cause damage to the components and possible injury.

Service Cover [22MY Onwards]

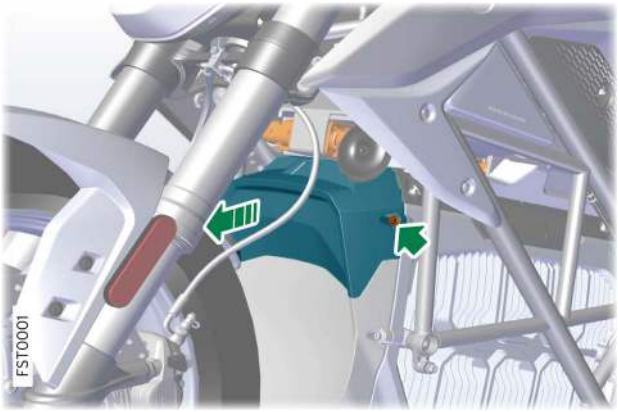
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Removal

1. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
2. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*



3. Remove HCU cover bolts (x4). Torque 3.5 lb-ft (5 Nm).
4. Remove HCU cover.



5. Remove T25 bolts (x2) securing service cover to battery unit. Torque 2.5 lb-ft (3.5 Nm).
6. Remove service cover.

Installation

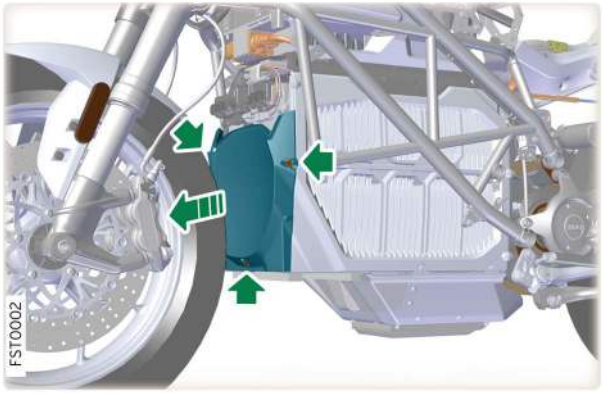
1. Installation is the reverse of removal procedure.

Front Cover [22MY Onwards]

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Removal

1. Remove service cover. See *Service Cover [22MY Onwards], page 20.28.*



2. Remove T25 bolts (x3) securing front cover to battery unit. Torque 2.5 lb-ft (3.5 Nm).
3. Remove front cover.

Installation

1. Installation is the reverse of removal procedure.

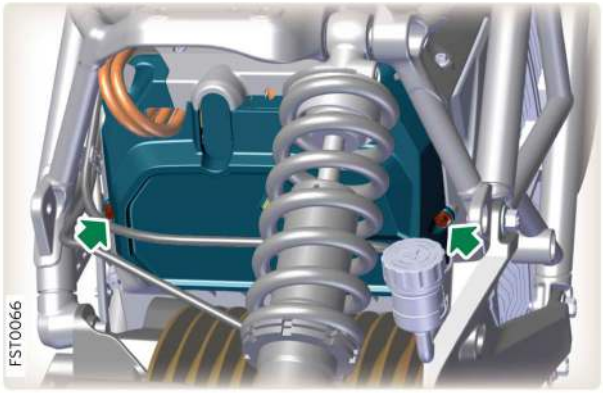
Rear Cover [22MY Onwards]

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove tail. See *Tail Assembly, page 60.33.*



3. Remove T25 bolts (x2) securing rear cover to battery module. Torque 2.5 lb-ft (3.5 Nm).
4. Remove rear cover.

Installation

1. Installation is the reverse of removal procedure.

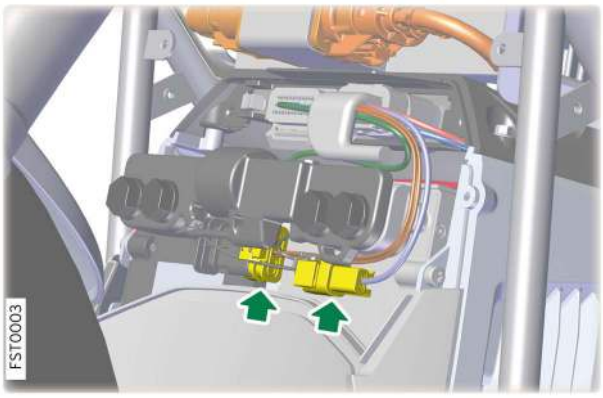
Mid Pack Protection Unit [22MY Onwards]

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

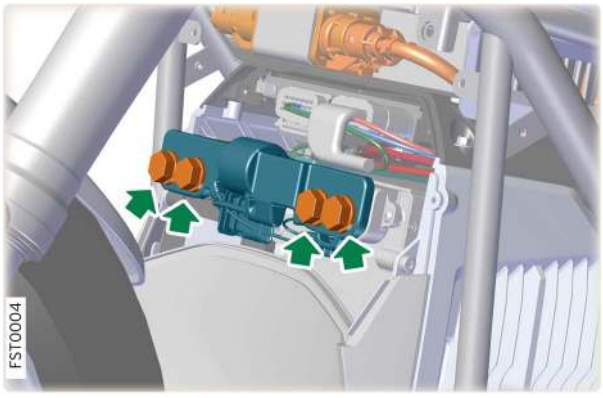
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove service cover. See *Service Cover [22MY Onwards], page 20.28.*
3. Remove zip ties securing harness connectors.



4. Disconnect harness connectors (x2).



5. Remove bolts (x4) securing mid pack protection unit. Torque 10 lb-ft (13.5 Nm).
6. Remove mid pack protection unit.

Installation

1. Installation is the reverse of the removal procedure except for the following:
2. Renew discarded zip ties.

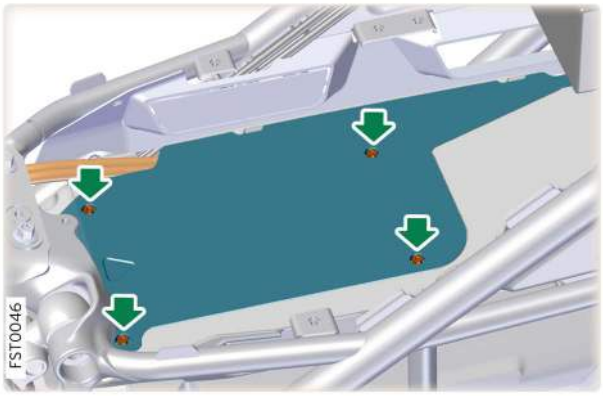
Top Cover [22MY Onwards]

CAUTION: Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

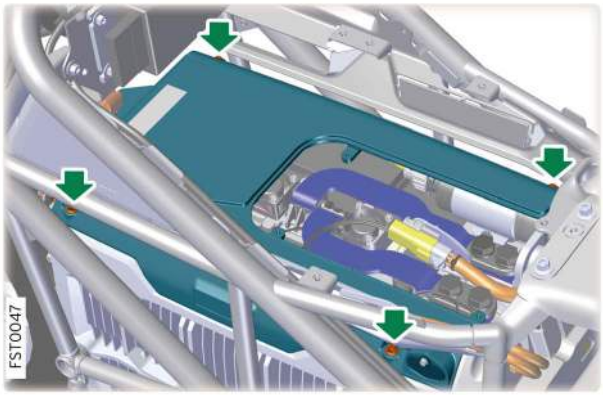
Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove 6kW charger. See *6KW Charger [22MY Onwards], page 25.13.*
3. Remove rear cover. See *Rear Cover [22MY Onwards], page 20.29.*
4. Remove BMU. See *Battery Management Unit (BMU) [22MY Onwards], page 20.13.*



5. Remove bolts (x4) securing inner top cover.
6. Remove inner top cover.

   Note: This will allow the release of the captive charge inlet harness.



7. Remove T25 bolts (x4) securing top cover to battery unit. Torque 2.5 lb-ft (3.5 Nm).
8. Remove top cover.

Installation

1. Installation is the reverse of removal procedure.

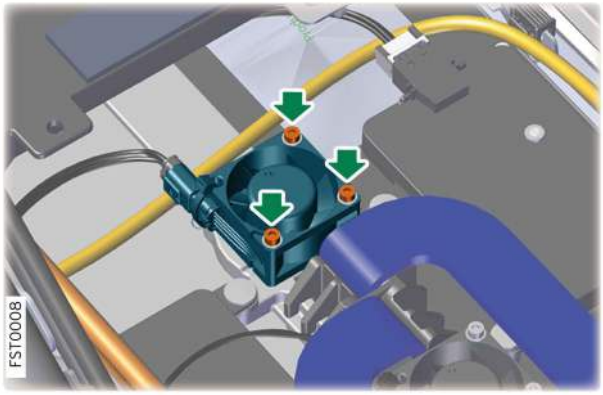
Cooling Fan [22MY Onwards]

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

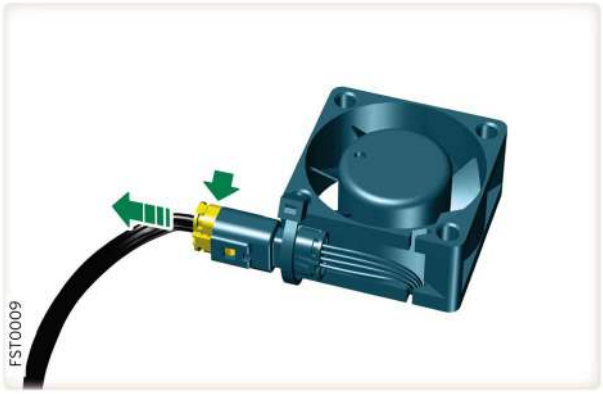
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove top cover. See *Top Cover [22MY Onwards], page 20.31.*



3. Remove 2.5 mm Allen bolts (x3) securing the fan to battery unit. Torque 6.5 lb-ft (9 Nm).



4. Disconnect harness connector from fan.
5. Remove fan.

Installation

1. Installation is the reverse of removal procedure.

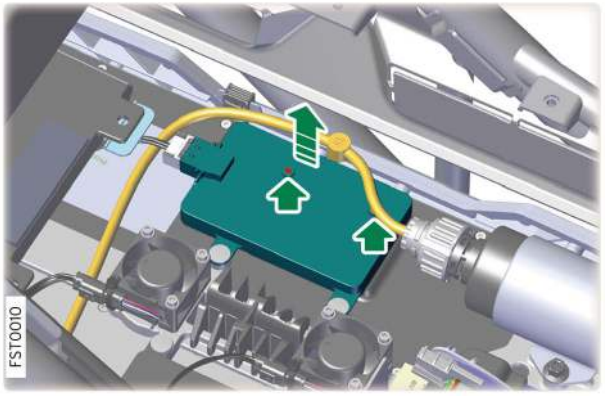
Assembly Cell Management Unit (CMU) [22MY Onwards]

CAUTION: Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Removal

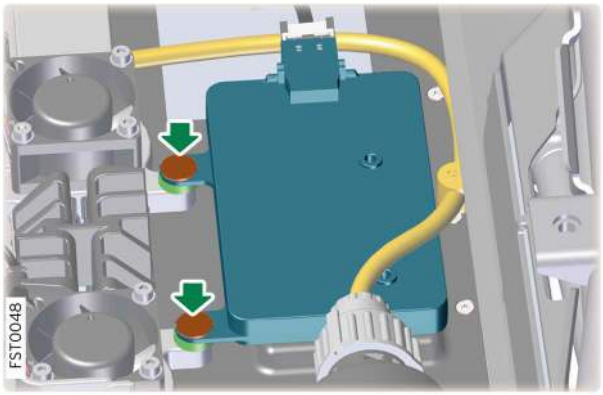
1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove positive and negative power leads. See *Power Leads - Positive & Negative [22MY Onwards], page 20.34.*



3. Remove and discard cavity plugs covering 1.5 mm hex bolts.

   Note: Do Not reuse cavity plugs.
4. Remove 1.5 mm hex bolts (x2) securing CMU to battery unit. Torque 24 in-oz (0.2 Nm).

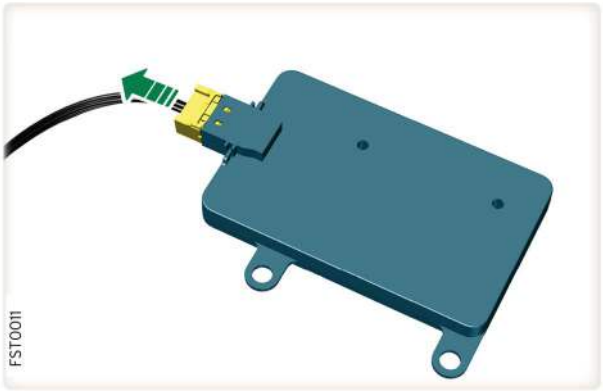
   Note: Be careful not to strip the bolts.



5. Remove fir tree clips (x2) and washers (x2)

   Note: Discard fir tree clips.

   Note: Always record quantity and fitted position of washers.



6. Carefully lift the CMU and disconnect harness connector.
7. Remove CMU.

Installation

1. Installation is the reverse of removal procedure except for the following:
2. Apply gasket to CMU connector.

   Note: Make sure the gasket is correctly aligned. The gasket only installs one orientation.
3. Apply CP70 to terminals of CMU to increase weatherproofing.
4. Make sure foam washers are installed between battery and CMU mounting tabs before installing CMU.
5. Connect harness to CMU.

6. Apply torque incrementally to each fastener.

   Note: Press CMU into battery cell box before installation of fixings.

7. Renew fir tree clips.
8. Apply a small amount of CP70 into the cavities and renew cavity plugs.

   Note: Remove and discard the tabs of the cavity plugs.

Power Leads - Positive & Negative [22MY Onwards]

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

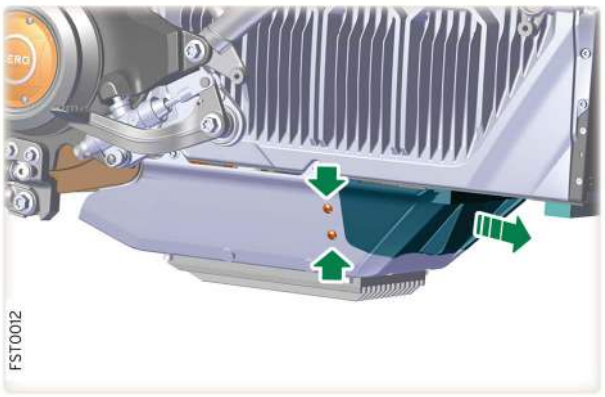
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*



3. Safely support the motorcycle by using a motorcycle stand.
4. Remove lower body panel.



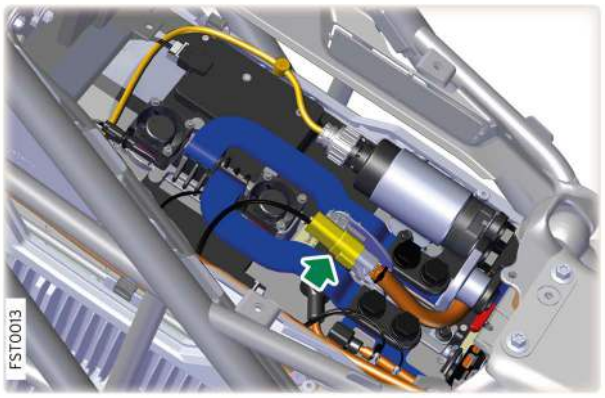
5. Remove bolts (x4) securing controller carrier access panel to controller carrier.
6. Remove controller carrier access panel.



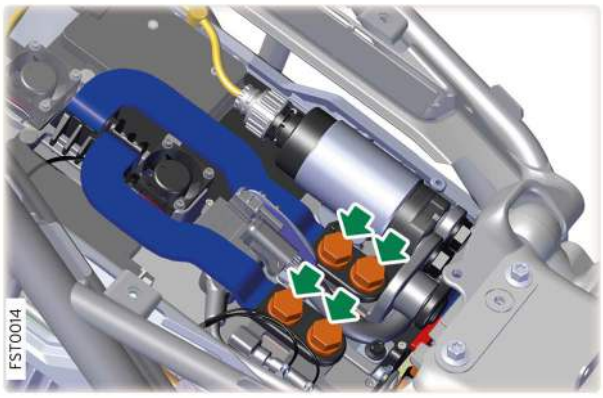
7. Remove bolts (x4) securing positive and negative power leads to controller BUS set. Torque 10 lb-ft (13.5 Nm).

   WARNING: Check the voltage at the BUS set. Reading should be 0 volts DC.

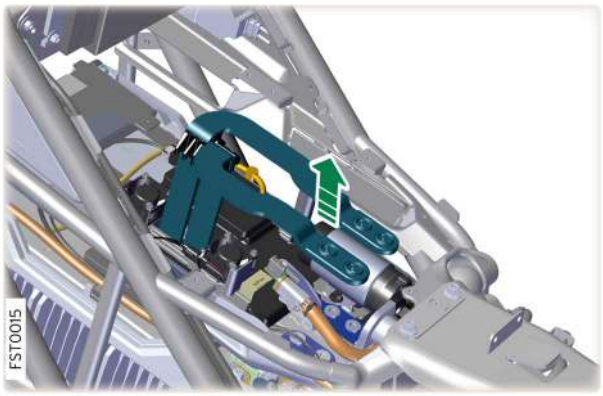
8. Remove inner top cover. See *Top Cover [22MY Onwards], page 20.31.*



9. Disconnect harness connector.



10. Remove bolts (x4) securing positive and negative power leads to BCB main BUS set. Torque 10 lb-ft (13.5 Nm).



11. Remove both positive and negative power leads.

    NOTE: Always record quantity and fitted position of foam spacers.

Installation

1. Installation is the reverse of removal procedure.

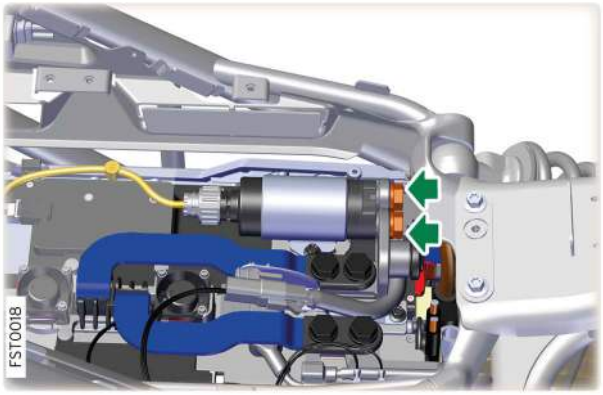
Contactor [22MY Onwards]

CAUTION: Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.

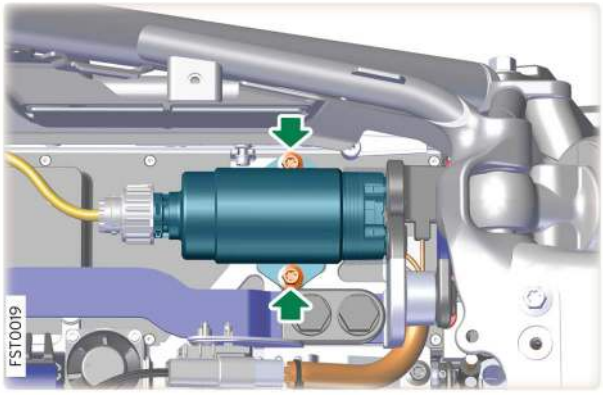
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove top cover. See *Top Cover [22MY Onwards], page 20.31.*



3. Remove bolts (x2) securing BCB main BUS set to contactor. Torque 10 lb-ft (13.5 Nm).



4. Remove bolts (x2) securing contactor to battery unit. Torque 6 lb-ft (8 Nm).



5. Disconnect harness connector.
6. Remove contactor.

Installation

1. Installation is the reverse of the removal procedure.

Controller BUS Set [22MY Onwards]

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

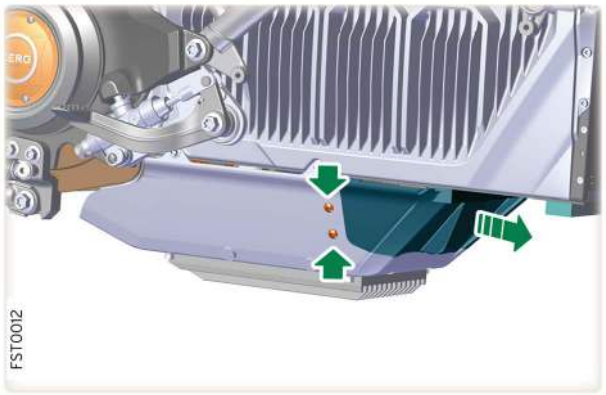
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Removal

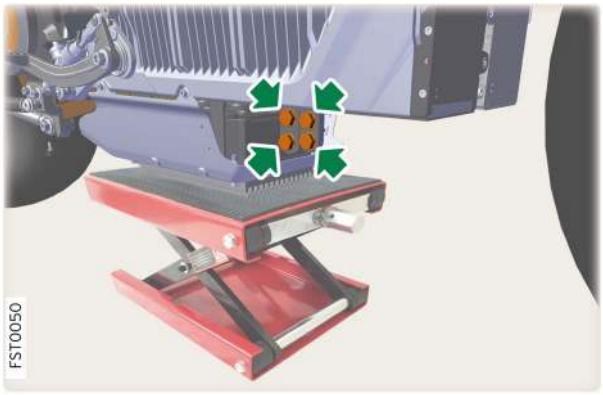
1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*



3. Safely support the motorcycle by using a motorcycle stand.
4. Remove lower body panel.



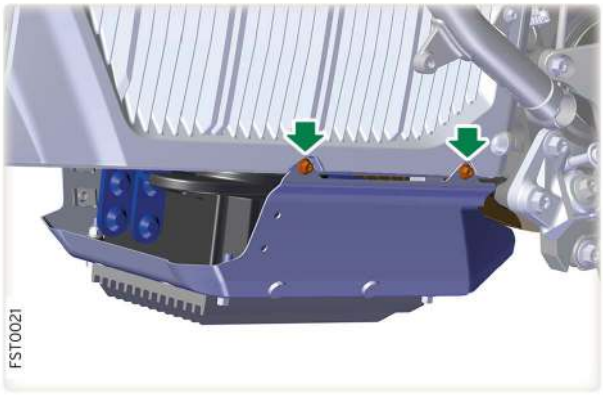
5. Remove 3 mm Allen bolts (x4) securing access panel to controller carrier.



6. Remove bolts (x4) securing controller BUS set. Torque 10 lb-ft (13.5 Nm).

   Note: Support the controller using an adjustable scissor jack.

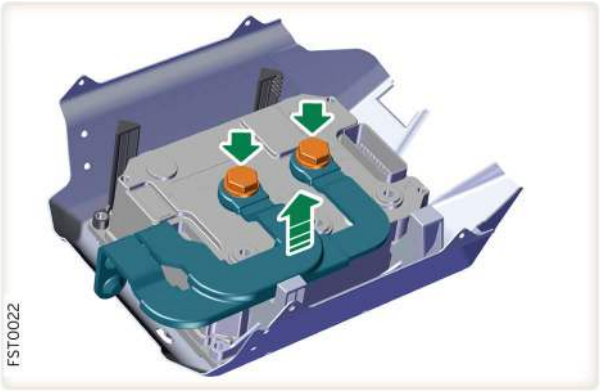
   WARNING: Check the voltage at the BUS set. Reading should be 0 volts DC.



7. Remove T25 bolts (x4) securing controller carrier to battery unit. Torque 3.5 lb-ft (5 Nm).
8. Using support lower the controller carrier.
9. Remove bolts (x3) securing motor leads (x3).

   Note: Dispose of gaskets (x6).

10. Disconnect signal harness connector.



11. Remove bolts (x2) securing controller BUS set to controller. Torque 11 lb-ft (15 Nm).
12. Remove controller BUS set.

Installation

1. Installation is the reverse of the removal procedure except for the following:
2. Renew motor lead gaskets.

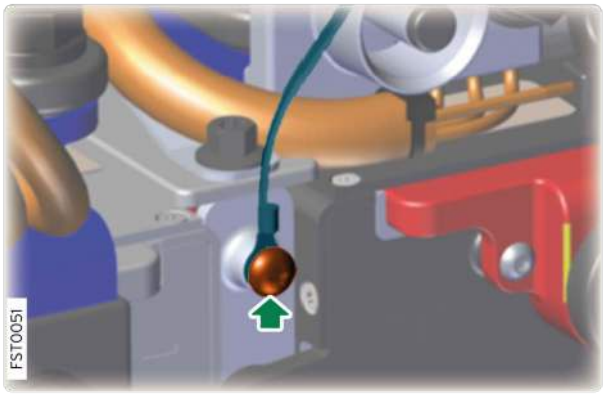
12 Volt Harness [22MY Onwards]

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

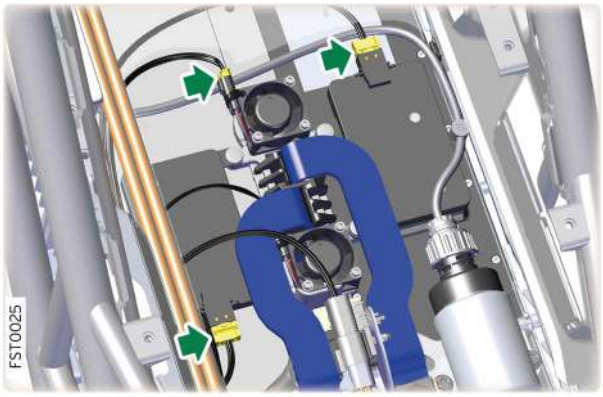
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Removal

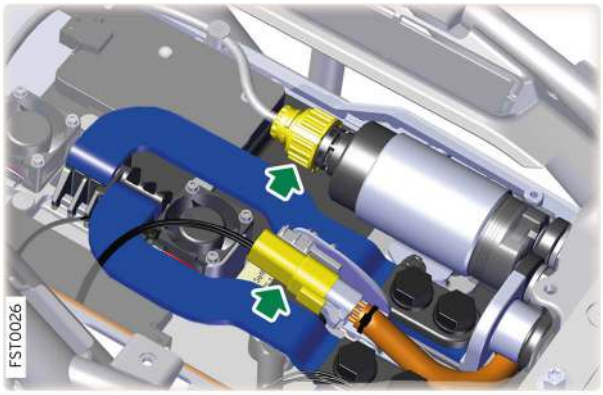
1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove mid pack protection unit. See *Mid Pack Protection Unit [22MY Onwards], page 20.30.*
3. Remove BMU. See *Battery Management Unit (BMU) [22MY Onwards], page 20.13.*
4. Remove top cover. See *Power Pack, page 20.31.*



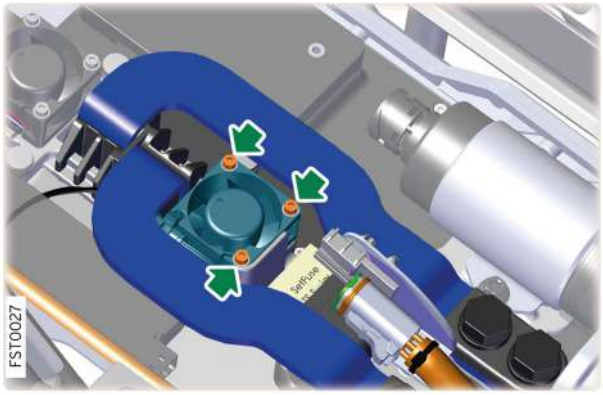
5. Remove bolt securing ground loop from battery cell box.



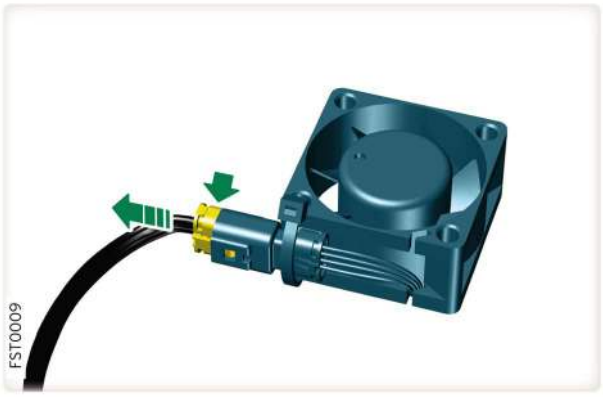
6. Disconnect harness connectors (x3) from fan and both CMU units.



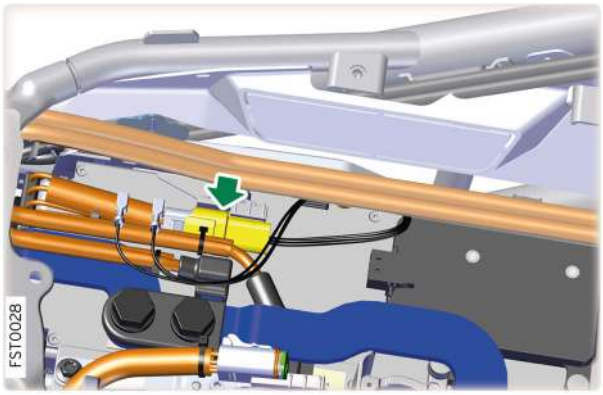
7. Disconnect harness connectors (x2) from contactor and BCB main BUS set.



8. Remove 2.5 mm Allen bolts (x3) securing fan to battery unit. Torque 6.5 lb-in (0.75 Nm).
9. Lift fan to access harness connector.



10. Disconnect harness connectors (x2) from fans (x2).



11. Disconnect harness connector from BCB main BUS set.
12. Disconnect harness from rear module.
13. Remove 12V harness.

Installation

1. Installation is the reverse of removal procedure.

BCB Main BUS Set [22MY Onwards]

CAUTION: Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.

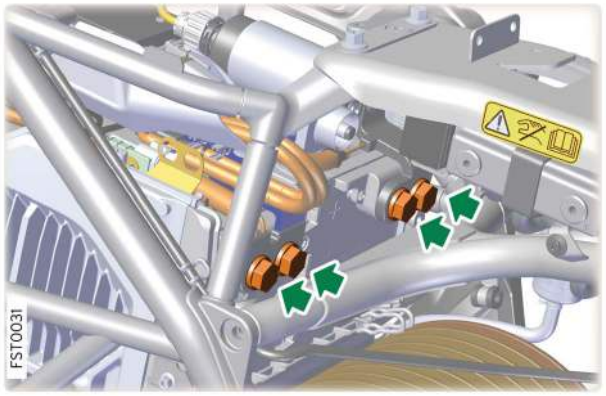
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Removal

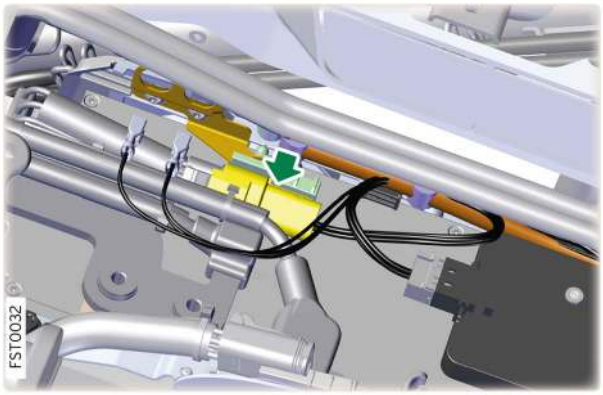
1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove positive and negative power leads. See *Power Leads - Positive & Negative [22MY Onwards], page 20.34.*



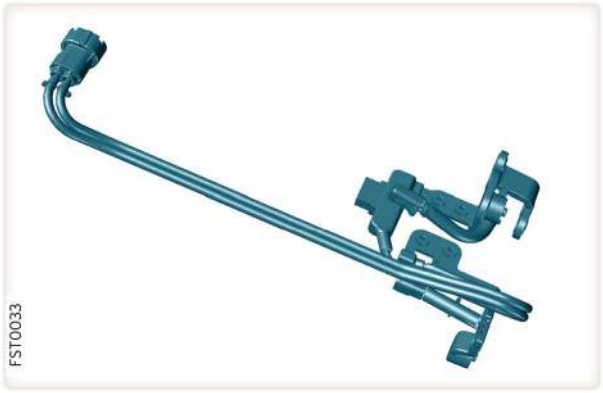
3. Remove bolts (x2) securing BCB main BUS set to contactor. Torque 10 lb-ft (13.5 Nm).



4. Remove bolts (x4) securing BCB main BUS set to battery unit. Torque 10 lb-ft (13.5 Nm).



5. Disconnect harness connector.



6. Remove BCB main BUS set.

Installation

1. Installation is the reverse of the removal procedure.

3KW Rapid Charger (Front) [Before 2022MY]

CAUTION: Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

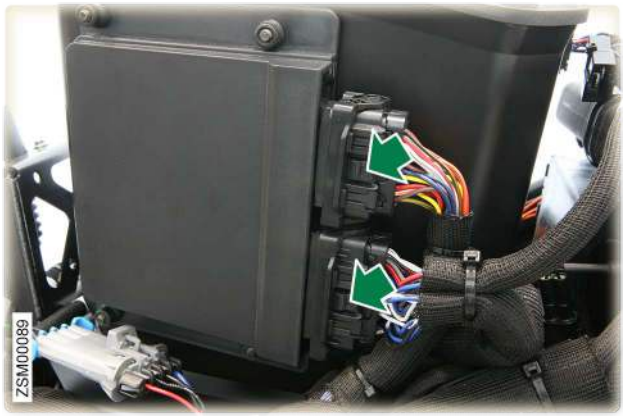
- T20
- T25
- T27
- T30
- T40
- 3/16” standard screwdriver
- 2 mm hex wrench
- 7 mm combination wrench
- 10 mm socket and ratchet
- Non-marring trim removal/pry tool

New Fasteners Required:

- Cable tie (quantity: 3)

Removal

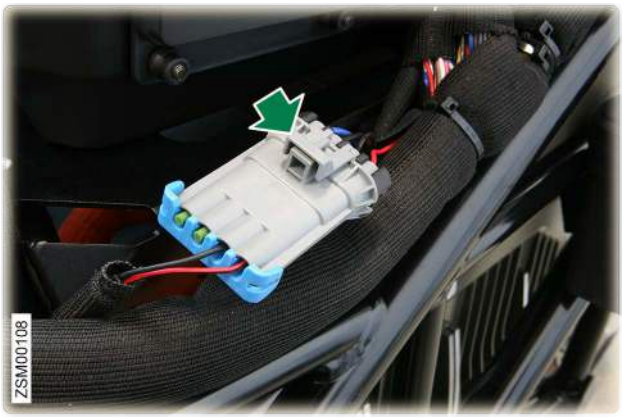
1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove tank assembly. See *Tank Removal, page 60.9.*



6. Disconnect MBB harness connectors (x2).



7. Squeeze tabs to release OBDII connector from tank storage liner.



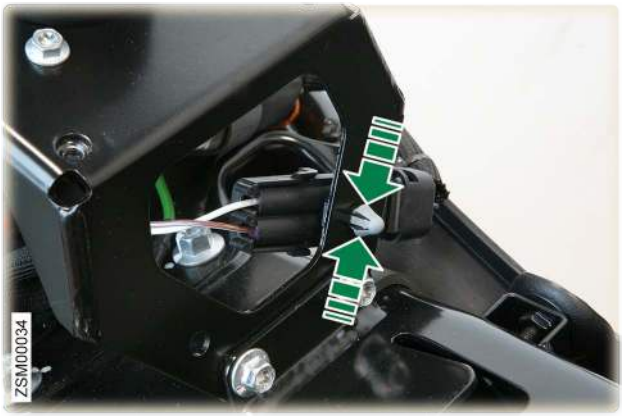
8. Disconnect USB power hub harness connector.



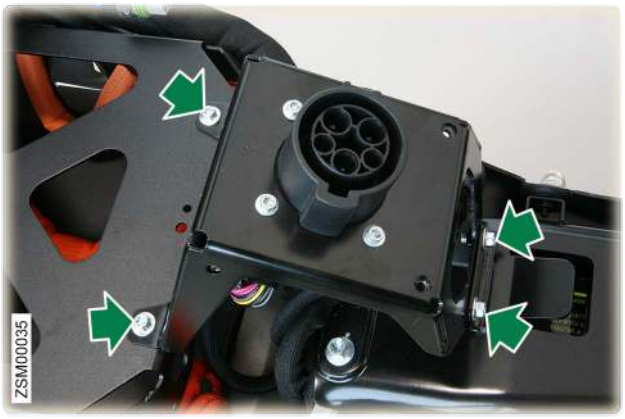
9. Remove bolts (x2) securing tank storage liner to storage liner support. Tool: T27. Torque: 2.5 lb-ft (3 Nm).

   Note: During installation, do not snug storage liner bolts until tank is installed.

10. Remove storage liner.



11. Release harness connector anchor from charger port stand.



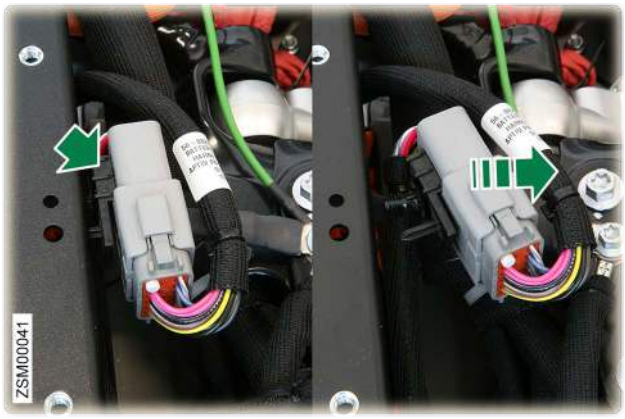
12. Remove bolts (x4) securing charger port stand. Tool: T30. Torque: 7.6 lb-ft (10 Nm).



13. Disconnect harness connector.



14. Protect and secure charger port stand to the side of motorcycle.



15. Release BMS signal harness connector anchor from tank storage liner support. Tool: Non-marring trim removal/pry tool.



16. Cut cable tie securing high voltage harness to harness anchor on left side of storage liner support.

    Note: Replace cable tie during the installation process.



17. Position the released high voltage harness aside to gain access to storage liner support bolts on left side.

18. Remove bolts (x2) securing left side of storage liner support to frame. Tool: T30. Torque: 7.8 lb-ft (11 Nm).



19. Position harnesses aside and remove bolts (x2) securing right side of storage liner support bolts to frame. Tool: T30. Torque: 7.8 lb-ft (11 Nm).



20. Remove bolts (x2) securing left side of front closeout panel to frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).

    Note: Protect rear portion of front fender and front closeout panel surfaces to reduce the possibility of scratching their surfaces.



21. Remove bolts (x2) securing right side of front closeout panel to frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).
22. Remove front closeout panel.

    Note: Position front suspension straight forward to allow access for removing front closeout panel downward in front of power pack.



23. Remove bolt securing horn to motorcycle frame. Tool: T40. Torque: 8 lb-ft (11 Nm).

    Note: Tie horn aside.



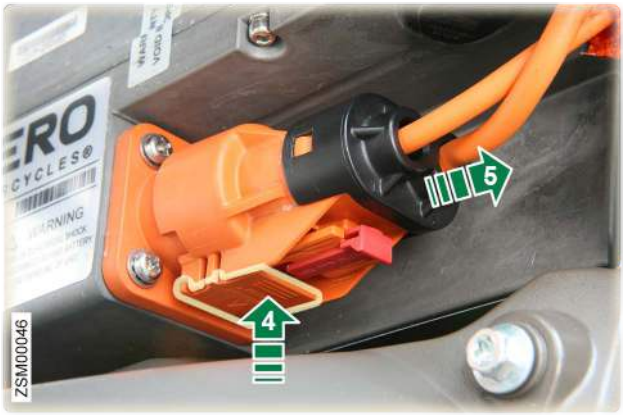
24. Disconnect left front high voltage connector from charger.



25. Slide connector lock to unlock.



26. Push tab upward to release connector and slide.



27. Push secondary tab and disconnect connector from charger.



28. Following the same connector disconnecting process, disconnect right front high voltage connector from charger.



29. Remove bolt securing charger to left front charger bracket. Tool: T20. Torque: 4.5 lb-ft (6 Nm).



30. Remove bolt securing charger to right front charger bracket. Tool: T20. Torque: 4.5 lb-ft (6 Nm).



31. Remove bolts (x2) securing rear of charger to rear charger brackets. Tool: 7 mm wrench. Torque: 4.5 lb-ft (6 Nm).



32. Remove charger from motorcycle.

Installation

1. Installation is the reverse of the removal procedure.

3KW Rapid Charger (Front and Rear) [Before 2022MY]

CAUTION: Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

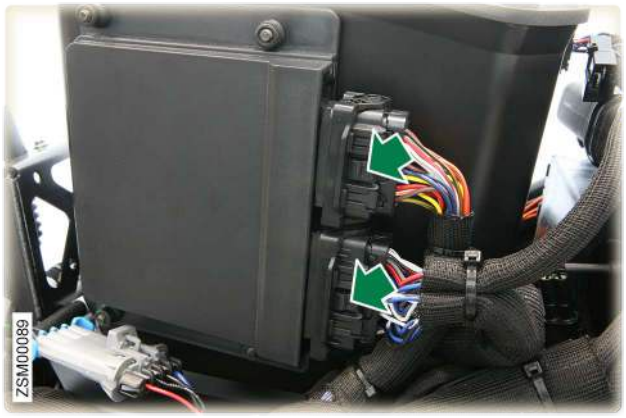
- T20
- T25
- T27
- T30
- T40
- 3/16” standard screwdriver
- 2 mm hex wrench
- 7 mm combination wrench
- 10 mm socket and ratchet
- Non-marring trim removal/pry tool

New Fasteners Required:

- Cable tie (quantity: 3)

Removal

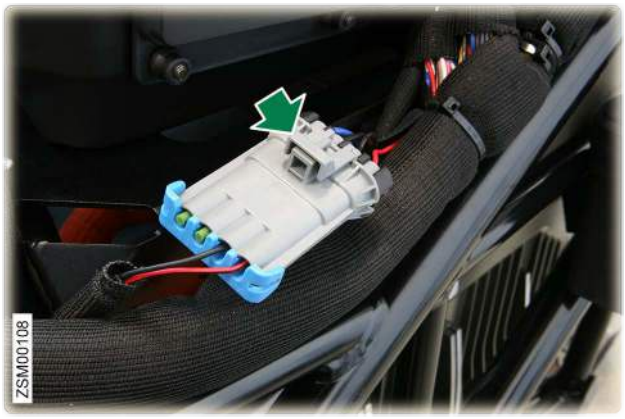
1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove tank assembly. See *Tank Removal, page 60.9.*



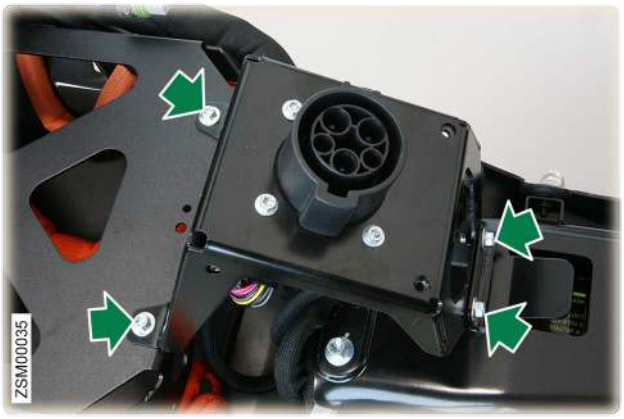
6. Disconnect MBB harness connectors (x2).



7. Squeeze tabs to release OBDII connector from tank storage liner.



8. Disconnect USB power hub harness connector.



12. Remove bolts (x4) securing charger port stand. Tool: T30. Torque: 7.6 lb-ft (10 Nm).



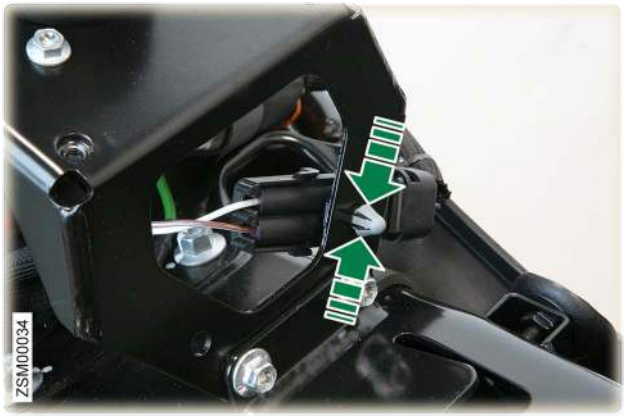
9. Remove bolts (x2) securing tank storage liner to storage liner support. Tool: T27. Torque: 2.5 lb-ft (3 Nm).

   Note: During installation, do not snug storage liner bolts until tank is installed.

10. Remove tank storage liner.



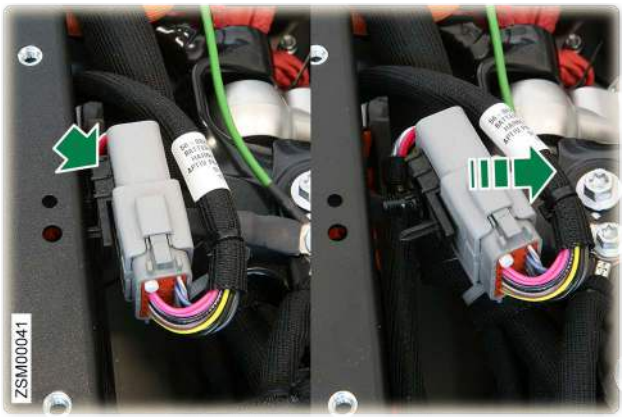
13. Disconnect harness connector.



11. Release harness connector anchor from charger port stand.



14. Protect and secure charger port stand to the side of motorcycle.



15. Release BMS signal harness connector anchor from tank storage liner support. Tool: Non-marring trim removal/pry tool.



16. To gain access to the left front bolt securing tank storage liner support to motorcycle frame, move the brake hoses toward the tank storage liner support.



17. Remove left front bolt securing tank storage liner support to motorcycle frame. Tool: T30. Torque: 7.8 lb-ft (11 Nm).



18. Cut cable tie securing high voltage harness to harness anchor on left side of storage liner support.

    Note: Replace cable tie during the installation process.



19. Position the released high voltage harness aside to gain access to storage liner support bolts on left side.



20. Remove left rear bolt securing storage liner support to frame. Tool: T30. Torque: 7.8 lb-ft (11 Nm).



21. Position harnesses aside and remove bolts (x2) securing right side of storage liner support bolts to frame. Tool: T30. Torque: 7.8 lb-ft (11 Nm).



22. Due to the brake hose routing (on left side), right side of tank liner support/rear charger assembly has to come out first.



23. Slightly rotate the tank liner support/rear charger assembly clockwise to reduce interference between the mounting tabs and the motorcycle frame.



24. Once the assembly is unobstructed, tilt the front upward to gain access to the charger harness connectors.



25. Disconnect left high voltage connector from charger.



26. Slide connector lock to unlock.



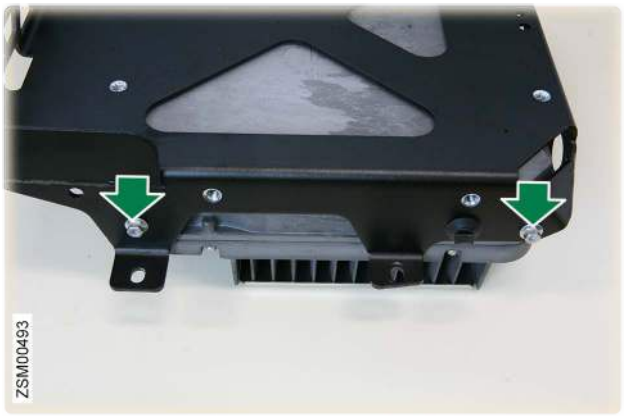
27. Push tab upward to release connector and slide.



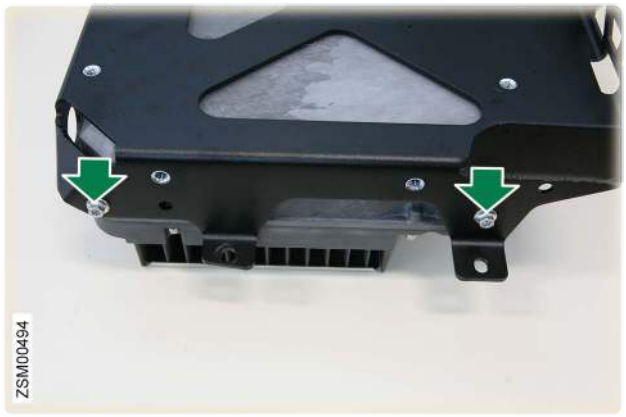
28. Push secondary tab and disconnect connector from charger.



29. Following the same process for disconnecting the high voltage connector from the right side of the charger.
30. Remove rear charger assembly.



31. Remove bolts (x2) securing rear charger to the left side of the tank liner support bracket. Tool: T25. Torque: 4.5 lb-ft (6 Nm).



32. Remove bolts (x2) securing rear charger to the right side of the tank liner support bracket. Tool: T25. Torque: 4.5 lb-ft (6 Nm).



33. Remove bolts (x2) securing left side of front closeout panel to frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).

    Note: Protect rear portion of front fender and front closeout panel surfaces to reduce the possibility of scratching their surfaces.



34. Remove bolts (x2) securing right side of front closeout panel to frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).
35. Remove front closeout panel.

    Note: Position front suspension straight forward to allow access for removing front closeout panel downward in front of power pack.



36. Remove bolt securing horn to motorcycle frame. Tool: T40. Torque: 8 lb-ft (11 Nm).

    Note: Tie horn aside.



37. Disconnect left front high voltage connector from charger.



38. Slide connector lock to unlock.



39. Push tab upward to release connector and slide.



40. Push secondary tab and disconnect connector from charger.



41. Following the same connector disconnecting process, disconnect right front high voltage connector from charger.



42. Remove bolt securing charger to left front charger bracket. Tool: T20. Torque: 4.5 lb-ft (6 Nm).



43. Remove bolt securing charger to right front charger bracket. Tool: T20. Torque: 4.5 lb-ft (6 Nm).



44. Remove bolts (x2) securing rear of charger to rear charger brackets. Tool: 7 mm wrench. Torque: 4.5 lb-ft (6 Nm).



45. Remove charger from motorcycle.

Installation

1. Installation is the reverse of the removal procedure, with the exception of the following installation note:



2. When installing the rear charger, route the charger harness behind the tank liner support front bracket tabs.

6KW Charger [22MY Onwards]

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

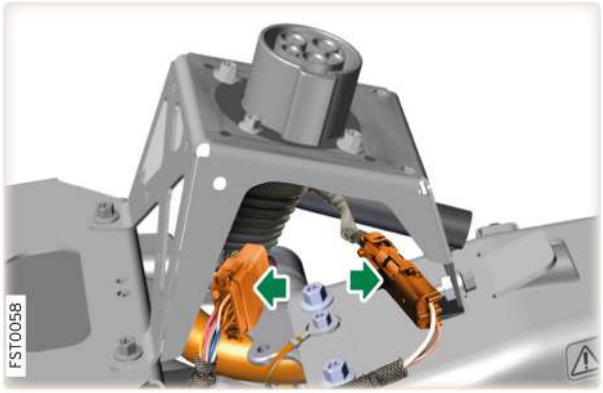
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Removal

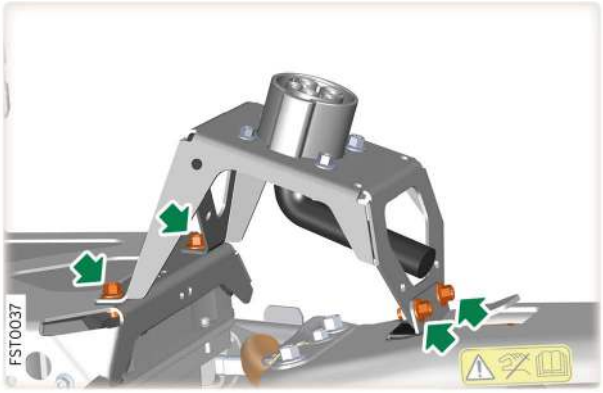
1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove tank assembly. See *Tank Removal, page 60.9.*
6. Remove mid pack protection unit.



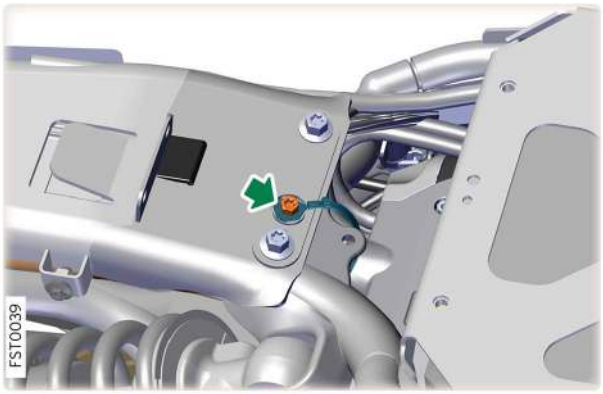
7. Remove T30 bolts (x2) securing tank unit to bike frame. Torque 2.5 lb-ft (3.5 Nm).
8. Move bucket to the right side of the bike.



9. Disconnect charge inlet harness connector.
10. Disconnect battery signal harness connector.

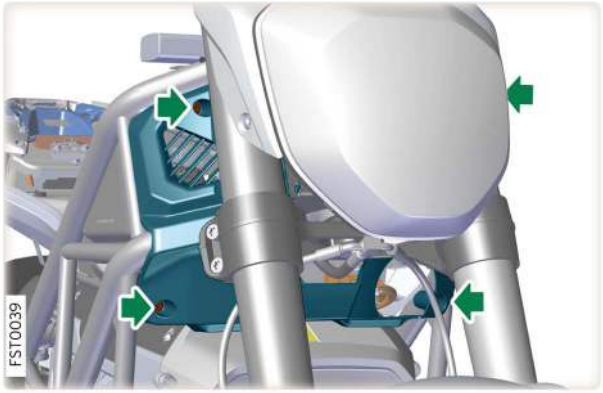


11. Remove T30 bolts (x4) securing charging plug. Torque 8 lb-ft (11 Nm).
12. Remove zip ties securing harness to frame.

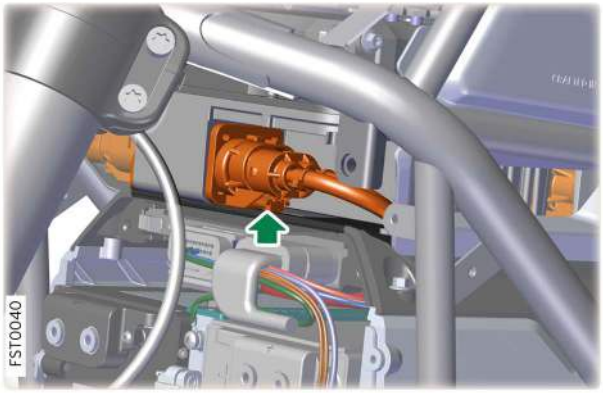


13. Remove T30 bolt securing ground straps (x3). Torque 5 lb-ft (7 Nm).

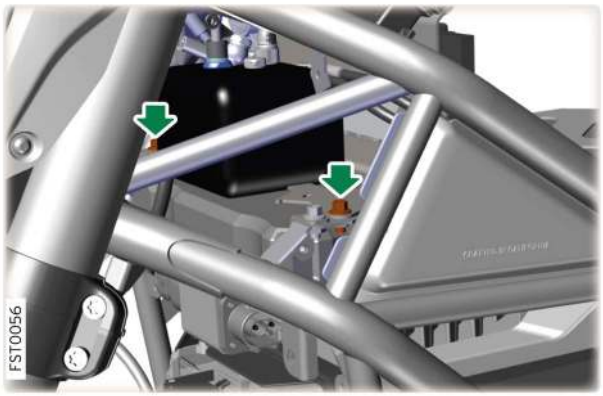
    Note: Stack crimp side up for best contact.



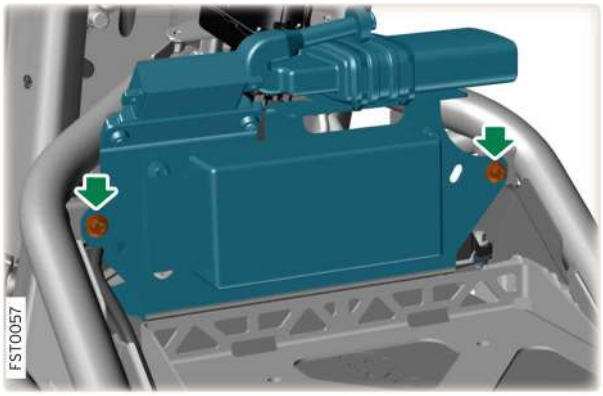
14. Remove T25 bolts (x4) securing HCU cover to frame. Torque 3.5 ft-lbs (5 Nm).
15. Remove shroud.
16. Remove T40 bolt securing horn. Torque 8 lb-ft (11 Nm).
17. Disconnect wires (x2) from horn.
18. Remove horn.



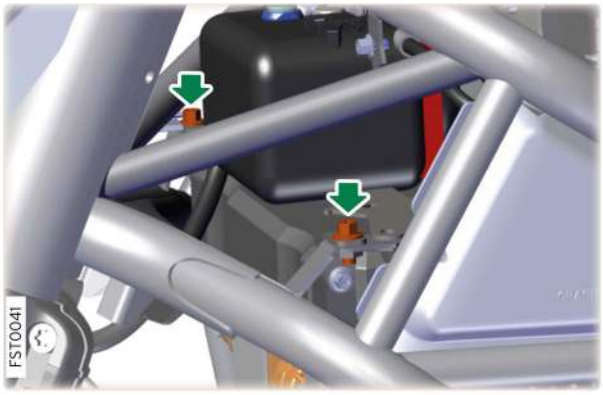
19. Disconnect charge outlet connector.



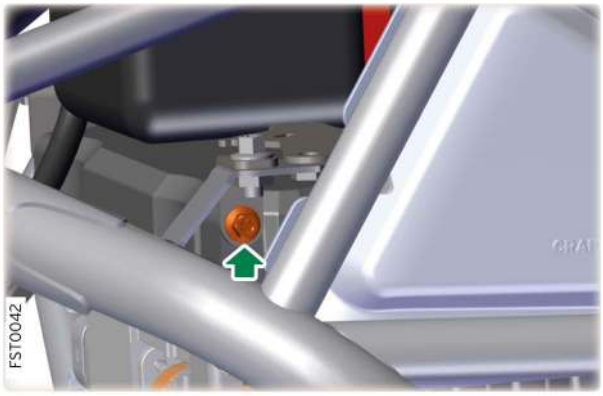
20. Remove T30 bolts (x2) securing HCU bracket. Torque 6 lb-ft (8 Nm).



21. Remove T30 bolts (x2) securing HCU bracket. Torque 6 lb-ft (8 Nm).



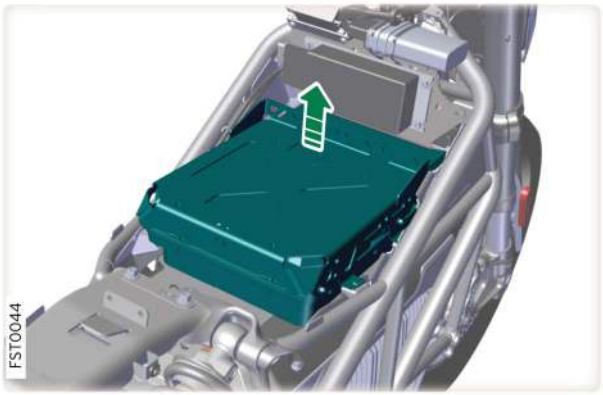
22. Loosen T30 bolts (x2) securing charger connector brackets. Torque 6 lb-ft (8 Nm).



23. Remove T25 bolt from each side of the charger mount. Torque 6 lb-ft (8 Nm).



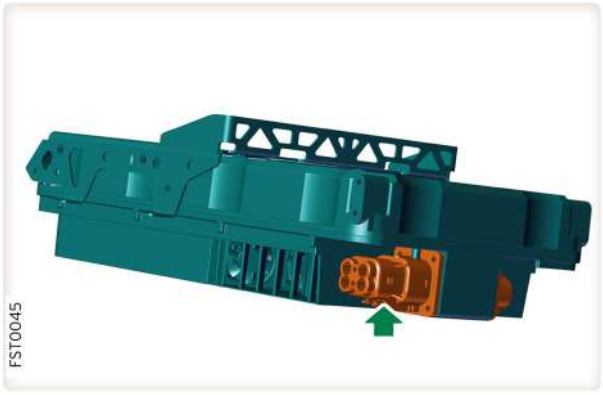
24. Remove T30 bolts (x4) securing the charger support bracket to frame. Torque 8 lb-ft (11 Nm).



25. Lift and remove the charger and bracket.

    CAUTION: **Take care to not damage brake lines when removing charger.**

    Note: Move brake lines to allow removal of charger.



26. Disconnect charge inlet harness connector from right side of charger.
27. Remove charger.

Installation

1. Installation is the reverse of the removal procedure.

Charge Inlet Harness

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T27
- T30
- T40
- 3/16” standard screwdriver
- 2 mm hex wrench
- 7 mm combination wrench
- 8 mm socket and ratchet
- 10 mm socket
- Non-marring trim removal/pry tool

New Fasteners Required:

- Cable ties (quantity: 4)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove tank assembly. See *Tank Removal, page 60.9.*
6. Remove charger. See *3KW Rapid Charger (Front) [Before 2022MY], page 25.1.* See *6KW Charger [22MY Onwards], page 25.13.*



7. Remove bolt securing charge inlet ground wire eyelet. Tool: T30. Torque: 5 lb-ft (7 Nm).

   Note: Take note of all ground wire eyelets for quantity and order so they can be reinstalled properly upon reassembly.



8. Cut cable tie securing charge inlet harness to main harness.

   Note: Replace cable tie during the installation process.



9. Disconnect grey harness connector.



10. Remove nuts (x4) and bolts (x4) securing charge inlet to the charge port stand and collect washers (x4). Tool: T25 & 8mm socket. Nut Torque: 4.5 lb-ft (6 Nm).

    Note: During installation, do not snug storage liner bolts until tank is installed.

11. Remove charge inlet from the charge port stand.
12. Remove charge inlet from the motorcycle.

Installation

1. Installation is the reverse of the removal procedure.

DC/DC Converter

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

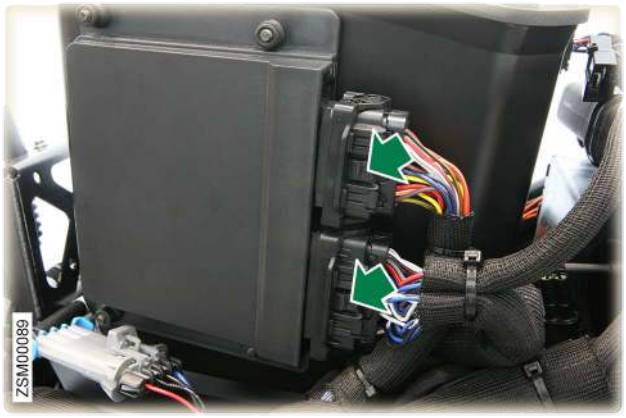
- T25
- T27
- T30
- T40
- 3/16” standard screwdriver
- 2 mm hex wrench
- 7 mm combination wrench
- 10 mm socket and ratchet
- Non-marring trim removal/pry tool

New Fasteners Required:

- Cable tie (quantity: 2)

Removal

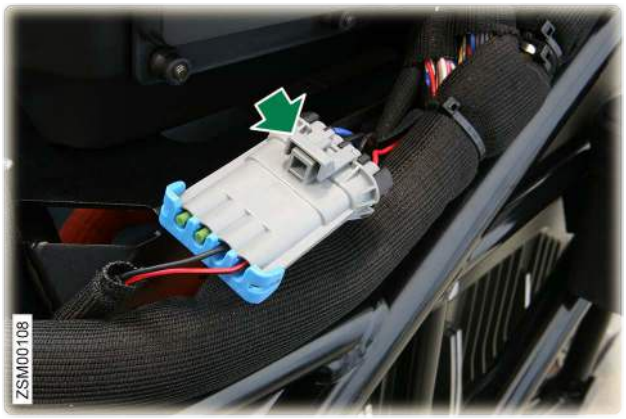
1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove tank assembly. See *Tank Removal, page 60.9.*



5. Disconnect MBB harness connectors (x2).



6. Squeeze tabs to release OBDII connector from tank storage liner.



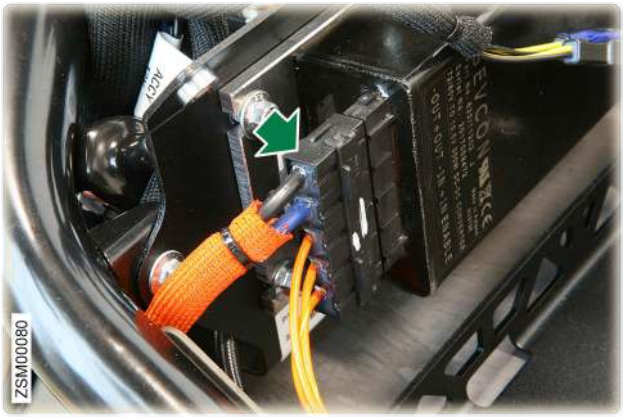
7. Disconnect USB power hub harness connector.



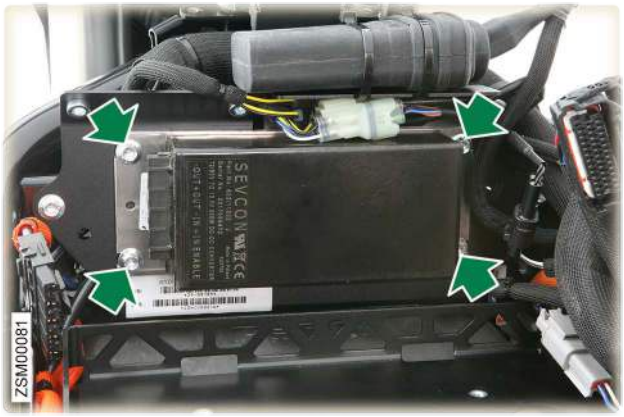
8. Remove bolts (x2) securing storage liner to storage liner plate. Tool: T27. Torque: 2.5 lb-ft (3 Nm).

   Note: During installation, do not snug storage liner bolts until tank is installed.

9. Remove storage liner.



10. Disconnect DC/DC converter harness connector.



11. Remove bolts (x4) securing DC/DC converter to the HCU bracket. Tool: T30. Torque: Hand
12. Remove DC/DC converter.

Installation

1. Installation is the reverse of the removal procedure.

Motor

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T20
- T25
- T30
- T40
- T45
- T50
- 3/16” standard screwdriver
- 2 mm hex wrench
- 10 mm socket and ratchet
- 13 mm socket
- 17 mm socket
- 22 mm 6-point socket
- 27 mm socket
- 13 mm wrench
- Non-marring trim removal/pry tool
- Motorcycle stand
- Hoist
- Ratchet straps (x2)
- Scissor jack

New Fasteners Required:

- Cable tie (quantity: 4)
- Double loop cable tie (quantity: 1)
- License plate harness anchor (quantity: 1)

New Seals Required:

- HV cable seals (quantity: 5)
- HV cable O-rings (quantity: 5)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove motor controller. See *Motor Controller [Before 2022MY], page 30.31.*



6. Tape the swingarm to keep the brake caliper from damaging the painted surfaces.



7. Safely raise rear tire off the ground using a motorcycle stand.



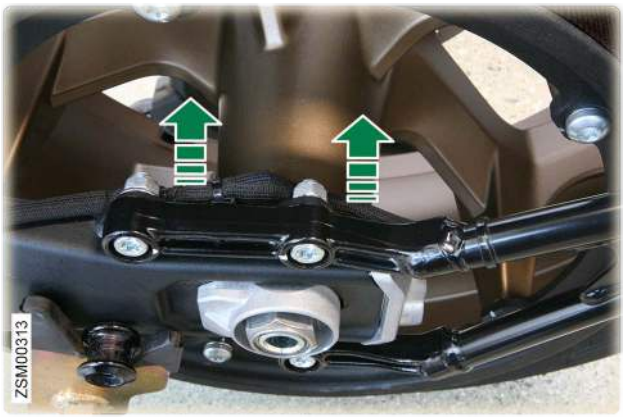
8. Remove bolts (x2) securing the rear inner fender to the rear swingarm. Tool: T25. Torque: 3.5 lb-ft (5 Nm).



9. Center bolt secures the rear shock ground wire eyelet and star washer underneath it.



10. Remove bolt securing the rear inner fender to the rear swingarm. Tool: T25. Torque: 3.5 lb-ft (5 Nm).
11. Remove the rear inner fender.



12. Rotate tucked license plate harness up to gain access to cable ties.

    Note: Neatly tuck harness back in place during reinstallation process to protect harness from damage while riding.



13. Release license plate harness anchor securing the license plate light harness to the swingarm. Tool: Non-marring trim removal/pry tool

    Note: Replace single-use harness anchor during the installation process.



14. Remove bolts (x3) securing the rear fender arm to the swingarm. Collect the nuts (x3) and washers (x3). Tool: T45and 13 mm socket. Torque (in sequence shown): 25 lb-ft (34 Nm).
15. Set ROF arm (with license plate light harness still attached) aside where it won't get damaged during the repair procedure.



16. Remove rear axle nut and collect the rear axle adjuster. Tool: 27 mm. Torque: 75 lb-ft (102 Nm).



17. Remove left adjuster bolt and collect the left swingarm end cap. Tool: T45



18. Remove left adjuster bolt and collect the right swingarm end cap. Tool: T45



19. Slide rear axle forward.



20. Slip belt off of the rear sprocket.



21. Place rag over rear caliper to protect painted surfaces.



22. Lift rear tire slightly and slide rear axle out of the swing arm.



23. Raise rear tire and remove rear WSS (wheels speed sensor) and set aside.

    Note: Make sure the WSS is supported and not straining the WSS harness.

24. Lower the rear tire carefully to keep from damaging painted surfaces.



25. Place rag over the left side of the swingarm between the rear sprocket and the swing arm to protect painted surfaces.
26. Roll rear tire forward.



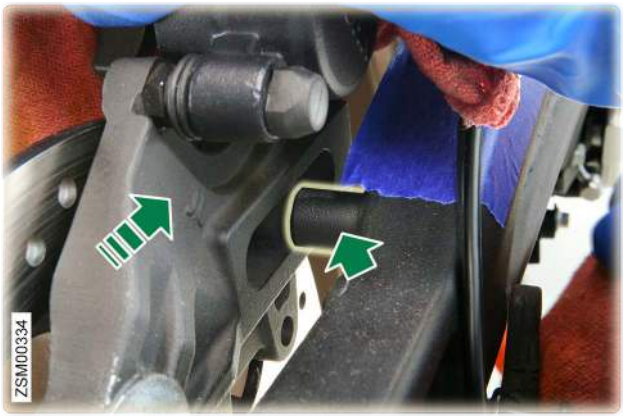
27. Release rear brake hose from the metal retaining clip.



28. Position the rear brake hose on top of clip.



29. Tip the top of the rear tire to the left.



30. Slide rear caliper assembly toward wheel and slide caliper bracket off of the bracket alignment pin.



31. Tie caliper up to the foot peg bracket.

    Note: Make sure the brake caliper is hung up and not straining the brake hose.

32. Roll the rear wheel out of the swing arm.



33. **DO NOT LIFT THE MOTORCYLE BY JACKING UP THE CONTROLLER! DO NOT SUPPORT THE WEIGHT OF THE MOTORCYCLE BY SUPPORTING THE CONTROLLER! Doing so, will damage the controller and other components.**



34. Route ratchet straps through rear subframe in order to lift the rear of the motorcycle with a hoist.

    CAUTION: **Use two ratchet straps to distribute the load. Using a single ratchet strap is unsafe, due to being a single point of failure.**



35. Raise rear of bike by the rear subframe with the hoist just enough to remove the load from the rear shock.



36. Remove bolt securing shock to swingarm. Collect nut, flat steel washer, and composite washers (x2). Tools: T50 and 17 mm socket. Torque: 52 lb-ft (71 Nm).



37. Remove bolt securing shock to motorcycle frame. Tool: T50. Torque: 52 lb-ft (71 Nm).



38. Protect painted surfaces with shop cloths.



39. Remove bolt securing ground wire to bottom of rear shock and collect star washer (between wire eyelet and shock body). Tool: T20. Torque: 2 lb-ft (3 Nm).

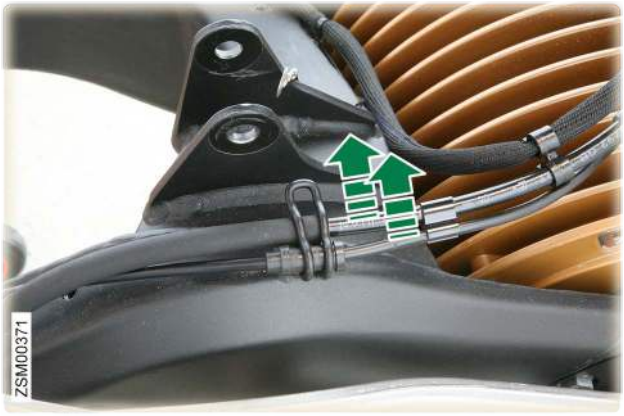


40. Remove bolt securing ground wire to bottom of rear shock and collect star washer (between wire eyelet and shock body). Tool: T20. Torque: 2 lb-ft (3 Nm).

41. Remove rear shock.



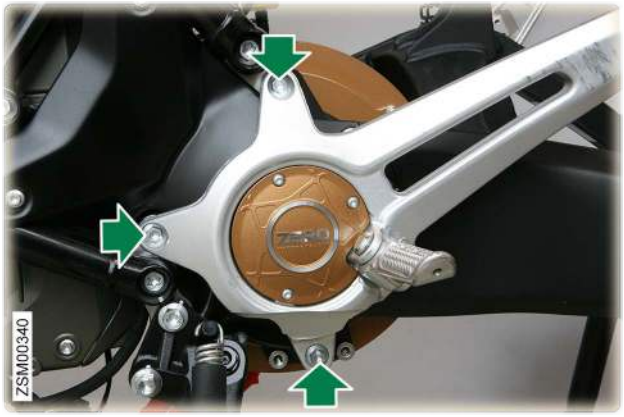
42. Release rear WSS harness from metal retaining clip.



43. Release brake hose and rear WSS harness from metal retaining clip.



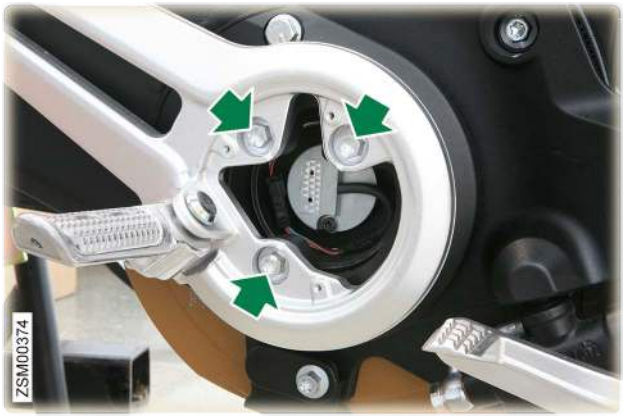
44. Tie rear brake caliper (wrapped in a rag to protect painted surfaces) and WSS to the side of the motorcycle frame.



45. Remove bolts (x3) securing left foot peg bracket to the left doubler plate. Tool: T40. Torque: 20 lb-ft (27 Nm).
46. Remove foot peg bracket.

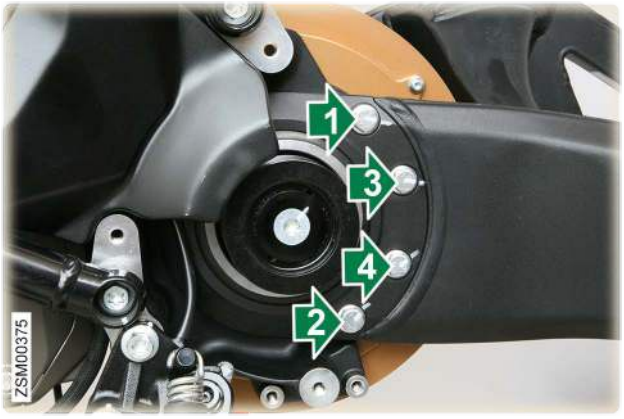


47. Remove bolts (x3) securing encoder cover plate from right foot peg bracket. Tool: T20. Torque: 2 lb-ft (2.7 Nm).
48. Remove encoder cover.



49. Remove bolts (x3) securing right foot peg bracket to right doubler plate. Tool: T40. Torque: 20 lb-ft (27 Nm).

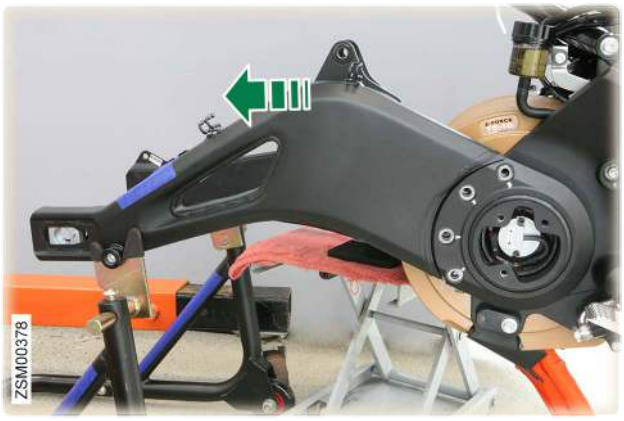
50. Remove right foot peg bracket.



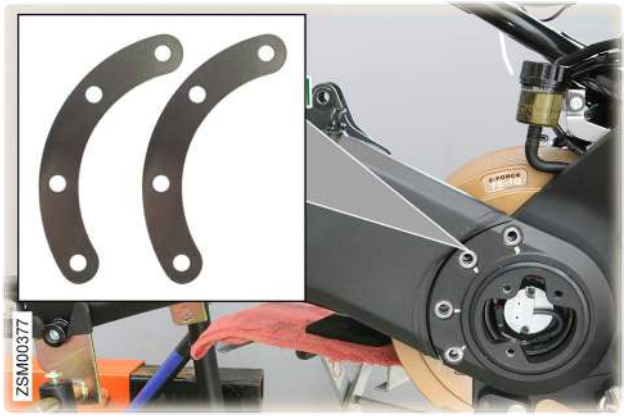
51. Remove bolts (x4) securing swingarm to left outer bearing cover. Tool: 13 mm socket. Torque: 25 lb-ft (34 Nm).



52. Remove bolts (x4) securing swingarm to right outer bearing cover. Tool: 13 mm socket. Torque: 25 lb-ft (34 Nm).



53. Remove swingarm.



54. Collect the shims located between the right outer bearing cover and the swingarm.



55. Cut cable tie securing the kickstand harness to the left doubler plate.

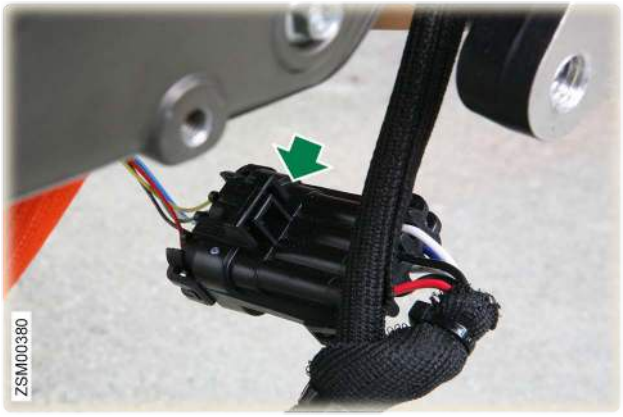
    Note: Replace cable tie during the installation process.



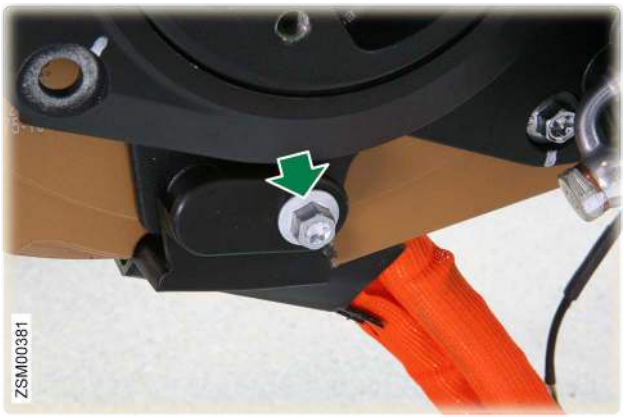
56. Remove bolts (x2) securing kickstand to the left doubler plate. Tool: T50. Torque: 25 lb-ft (34 Nm).
57. Tie kickstand aside.



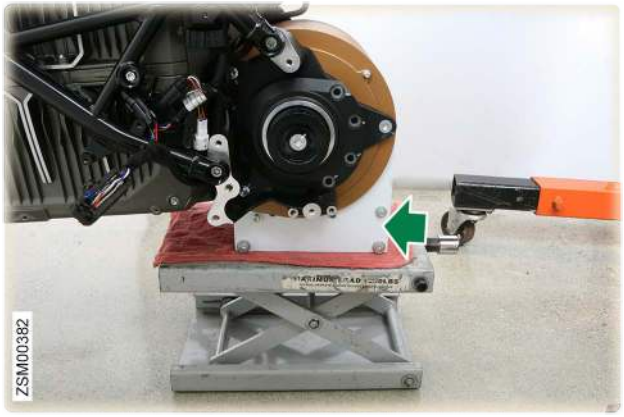
58. Remove bolt securing rear brake master cylinder reservoir and clamp to the right doubler plate. Tool: T25. Torque: 2 lb-ft (2.7 Nm).
59. Tie up rear brake master cylinder reservoir and brake hose.



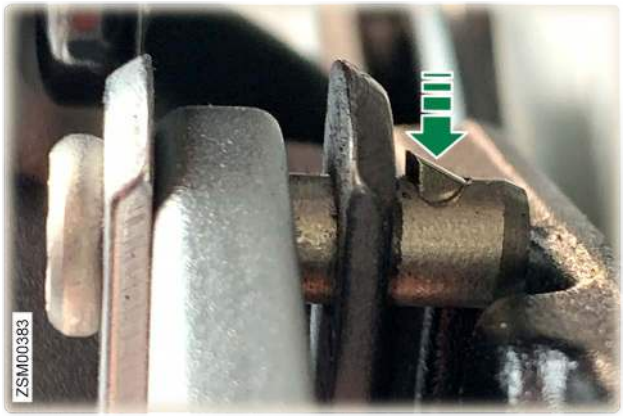
60. Disconnect thermistor harness connector.



61. Remove bolt securing HV cable guard to right doubler plate. Tool: T40. Torque: 9 lb-ft (12 Nm).
62. Remove HV cable cover.



63. Support motor to keep it from rolling off the scissor jack.



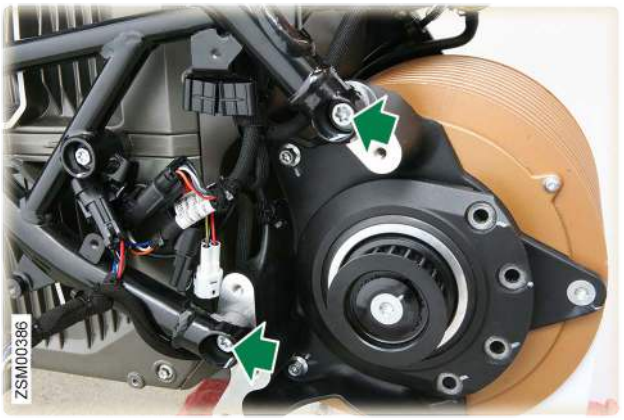
64. Depress locking pin to release rear master cylinder engagement pin.



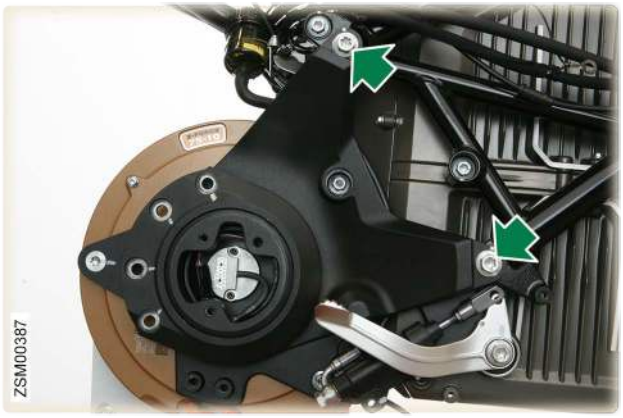
65. Remove rear master cylinder engagement pin (while depressing locking pin).



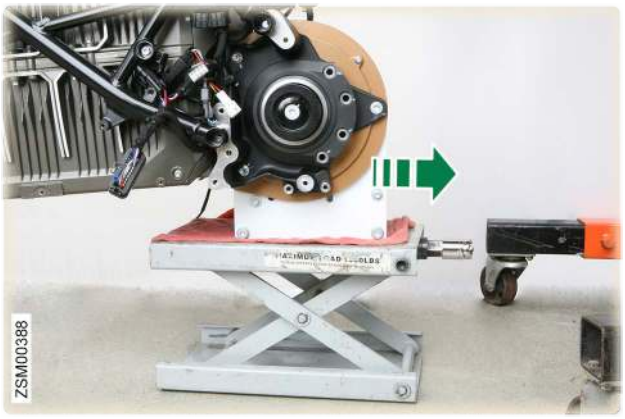
66. Raise brake pedal to access bolts. Remove bolts (x2) securing rear master cylinder to master cylinder bracket. Tool: T30. Torque: 7 lb-ft (9 Nm).



67. Remove bolts (x2) securing left doubler plate to the motorcycle frame. Tool: T50. Torque: 30 lb-ft (41 Nm).



68. Remove bolts (x2) securing right doubler plate to the motorcycle frame. Tool: T50. Torque: 30 lb-ft (41 Nm).



69. Move motor toward rear, far enough to gain access to the rear brake bracket bolts.



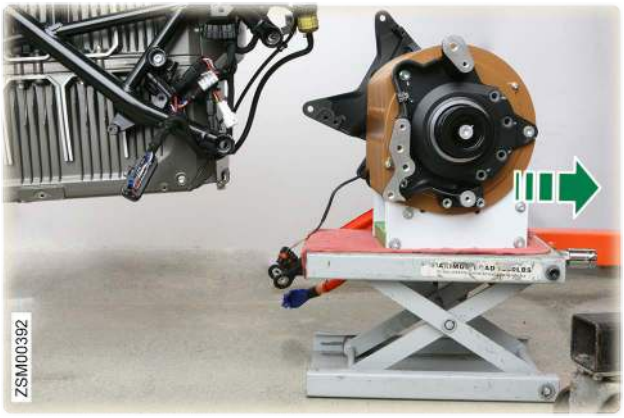
70. Remove outer countersunk bolt securing the rear master cylinder bracket to the right doubler plate. Tool: T40. Torque: 19 lb-ft (26 Nm).



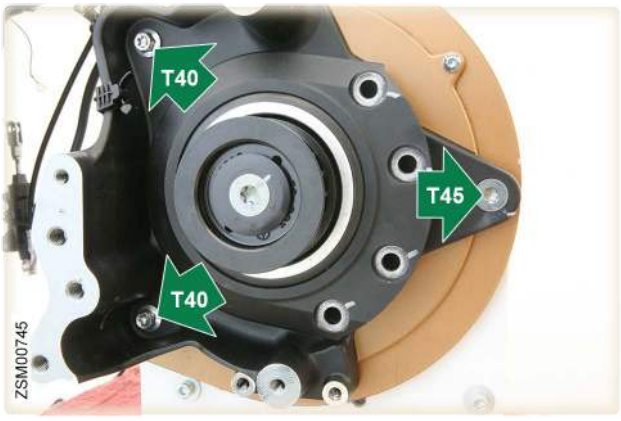
71. Remove inner countersunk bolts (x2) securing the rear master cylinder bracket to the right doubler plate. Tool: T40. Torque: 19 lb-ft (26 Nm).
72. Remove rear brake pedal assembly.



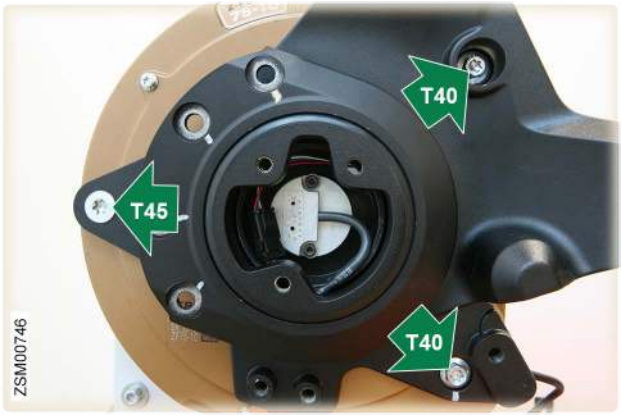
73. Tie up rear master cylinder.



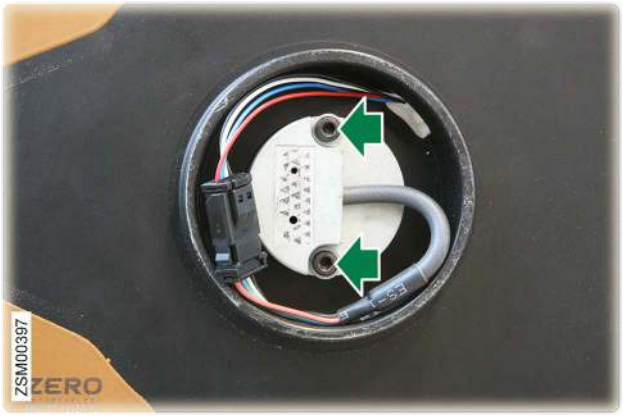
74. Move motor assembly towards rear and away from the motorcycle.



75. Remove bolts (x3) securing left doubler plate to the motor. Tool: T40. Torque: 25 lb-ft (34 Nm). Tool: T45. Torque: 26 lb-ft (35 Nm).



76. Remove bolts (x3) securing right doubler plate to the motor. Tool: T40. Torque: 25 lb-ft (34 Nm). Tool: T45. Torque: 26 lb-ft (35 Nm).



77. Remove bolts (x2) securing encoder to the motor. Tool: 3 mm hex wrench. Torque: 2.5 lb-ft (3 Nm).

78. Remove encoder from the motor.

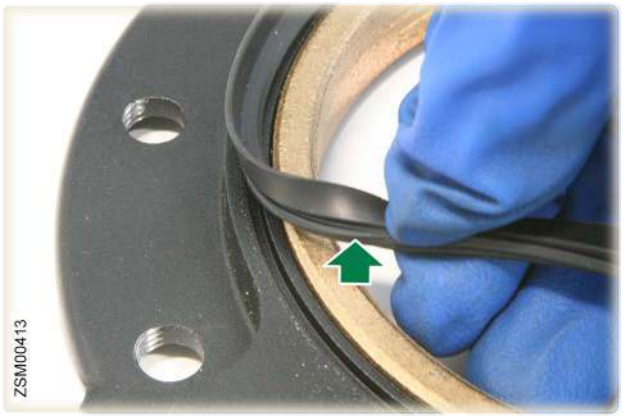
Installation

1. Installation is the reverse of the removal procedure, but take note of the following installation steps.

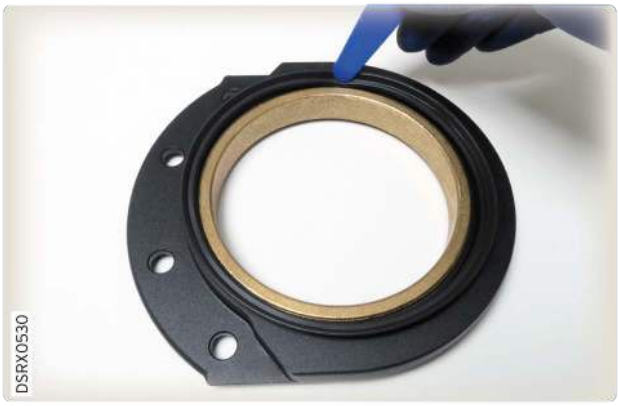


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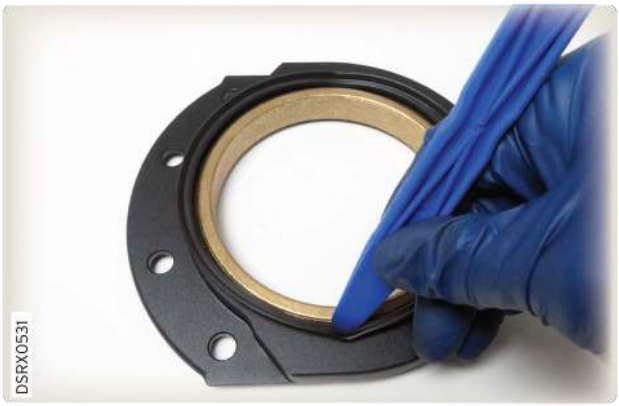
2. If a new doubler is being installed, clean the grease from the doubler before installation.



3. The inside seal for the outer bearing cover has a rib (see arrow) on one side that must be pressed into the seal groove in the outer bearing cover. It must be pressed in evenly to seal properly.



4. Thinking of the outer bearing cover as an analog clock face, use a blunt tool to press the seal into the groove in the cover at the 12 o'clock position.



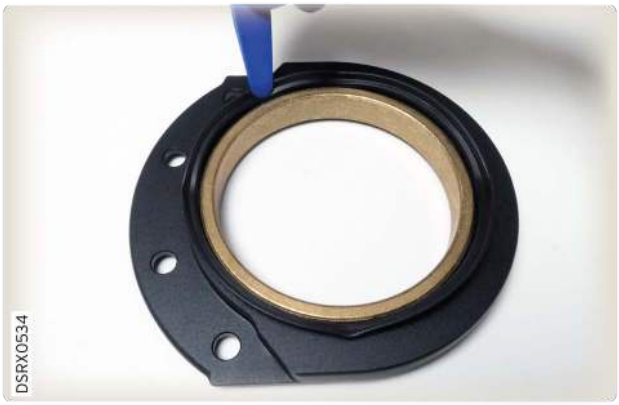
5. Press the seal into the groove at the 6 o'clock position.



6. Press the seal into the groove at the 3 o'clock position.



7. Press the seal into the groove at the 9 o'clock position.



8. Press the seal into the groove at the 11 o'clock position.



9. Press the seal into the groove at the 5 o'clock position.



10. Press the seal into the groove at the 2 o'clock position.



11. Press the seal into the groove at the 8 o'clock position.



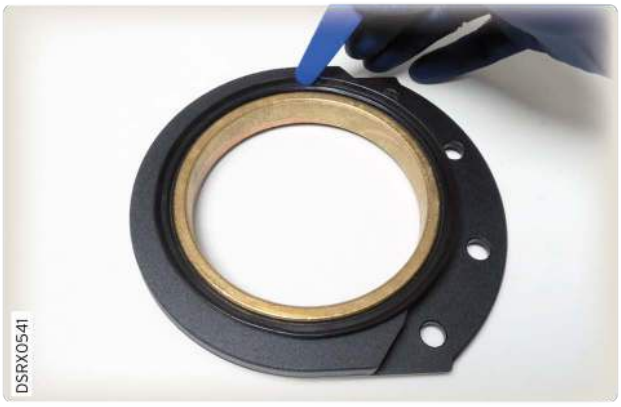
12. Press the seal into the groove at the 10 o'clock position.



13. Press the seal into the groove at the 4 o'clock position.



14. Continue alternating from side to side, pressing the seal into the outer bearing cover evenly. Continue pressing the seal into the groove until the seal is completely seated.



15. Follow the same process to evenly install the seal in the second outer bearing cover.



16. After installing the outer bearing covers (left and right) on the doubler plates and installing the swingarm on the outer bearing plates, then install the outer bearing cover exterior seals

    Note: The exterior seals on the outer bearing covers will pop off the cover during the installation of the swing arm, so install the seals after the outer bearing covers are torqued to the swingarm.



17. The exterior seal for the outer bearing cover has a front and a back side. The part number is only printed on the back of the seal.



18. The seal must be pressed into the seal groove in the doubler plate. It must be inserted into the assembly evenly to seal properly.



19. Start sliding the seal under the edge of the doubler plate.

    Note: The following photos show the doubler plate on a bench for instructional processes only. The seals should be installed after the doubler plate is instead on the motorcycle.



20. Slide the seal around the doubler plate to center the seal over the outer bearing cover and the doubler plate.



21. Thinking of the outer bearing cover as an analog clock face, use a blunt tool to press the seal into the groove in the cover at the 12 o'clock position.



22. Press seal into groove at the 6 o'clock position.



23. Press seal into groove at the 3 o'clock position.



24. Press seal into groove at the 9 o'clock position.



25. Press seal into groove at the 1 to 2 o'clock position.



26. Press seal into groove at the 7 to 8 o'clock position.



27. Continue alternating from side to side, pressing the seal into the outer bearing cover evenly. Continue pressing the seal into the groove until the seal is completely seated.



28. Follow the same process to install the outer seal evenly in the left outer bearing cover.

29. Upon installation of the bare swingarm, pivot the swingarm upwards and allow it to fall. If it binds and doesn't fall, check the condition of the doubler plate bearings and check the correct type and amont of shims are installed.

    CAUTION: **If the swingarm doesn't fall on its own during this test and you've confirmed that both swingarm shims are installed and the bearings are in good condition, contact Zero Motorcycles Customer Service department for assistance:**

    - **North America: support@zeromotorcycles.com.**
    - **Europe: service.eu@zeromotorcycles.com.**



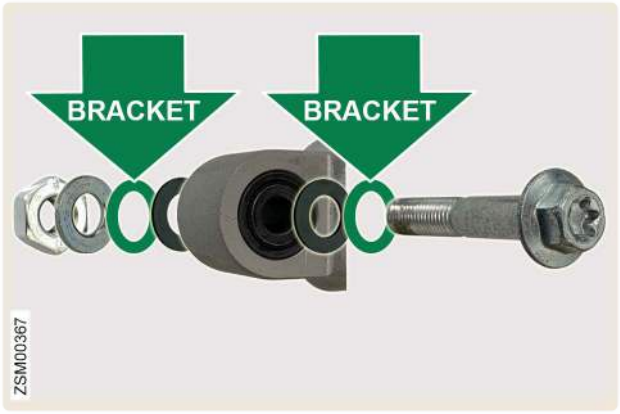
30. Remove plastic bushing from left side (sprocket side) of the wheel.



31. When installing the WSS sensor, make sure the alignment tab is positioned against the top edge of the rear brake bracket as shown.



32. The order of shock ground wire fasteners: bolt, wire eyelet, and steel star washer.



33. The order of fasteners and washers to mount the rear shock to the swingarm.
34. Adjust drive belt. See *Drive Belt - Adjust, page 10.4.*
35. Perform Motor Commissioning. See *Motor Commissioning, page 10.12.*

Motor Sprocket

CAUTION: **Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T45
- T50
- 10 mm socket
- 27 mm socket
- Approx. 20 in. (508 mm) section of old drive belt
- Propane torch
- Motorcycle stand

Consumables Required:

- Loctite® 271™ - Threadlocker
- Loctite® 680™ - Retaining compound
- Cleaning Alcohol
- Cotton Swabs

Preparation

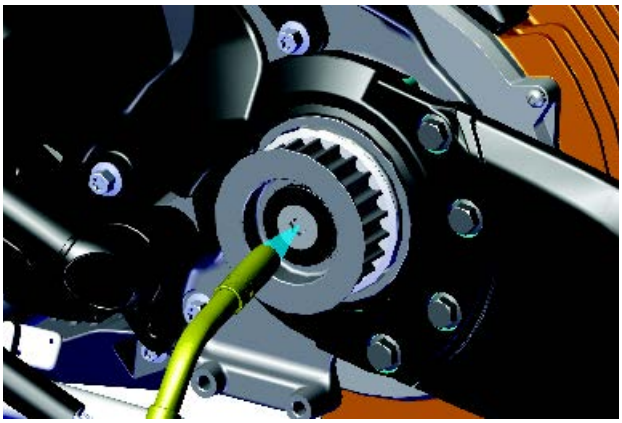


1. Make a “sprocket brake” out of an old section (approx. 20 in. (508 mm)) of belt as shown. This will be used to hold the sprocket stationary during removal and installation.

Removal



1. Remove bolts (x3) securing the left foot peg bracket to the left doubler plate. Tool: 10 mm socket.
2. Remove drive belt. See *Drive Belt, page 30.47*.



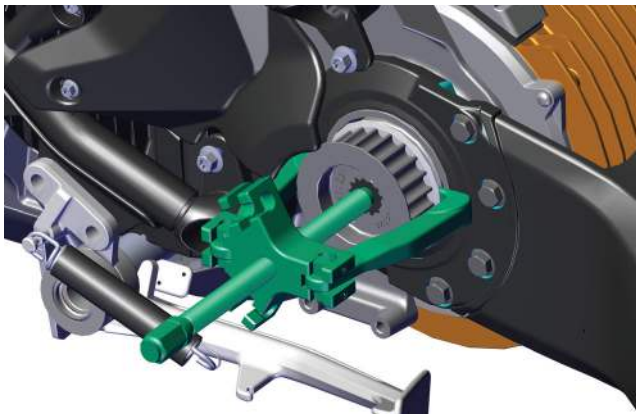
3. Use a propane torch to heat the motor shaft for a minimum of 4 minutes (approx. 500°F {260°C}) to release the threadlocker on the retaining bolt.



Typical example

4. Carefully, install the belt tool using a punch to anchor the belt. Remove the sprocket screw and washer using a hand ratchet. If the sprocket screw can not be easily removed with the ratchet, repeat the heating process.Tool: T50.

   CAUTION: **Do not use an impact wrench of other power tool to remove the sprocket screw. Using an impact can cause permanent damage to the encoder and/or the target magnet resulting in unsafe operation.**



5. Use a jaw puller to remove the sprocket from motor. Slowly turn the puller to gently separate the sprocket from the motor shaft.

   CAUTION: **Prying or hammering on motor shaft can cause permanent damage to the encoder and or target magnet within the motor.**

Installation

1. Clean the motor shaft with alcohol using a cotton swab.
2. Inspect the shaft and splines for damage



3. Apply Loctite 680 to the leading edge on the inside of the motor sprocket. Apply an even bead around the entire circumference.
4. Install sprocket onto the motor shaft. The sprocket should slide easily onto the motor shaft.

   CAUTION: **Prying or hammering on motor shaft can cause permanent damage to the encoder and or target magnet within the motor.**

   Note: Clean any excess Loctite from front of sprocket

5. Apply Loctite 271 to the threads of the sprocket retaining bolt.



6. Install sprocket retaining bolt and tophat washer. Use the belt tool to tighten the sprocket retaining bolt. Tool: T50. Torque: 52 lb·ft (71 Nm).
7. Install drive belt. See *Drive Belt, page 30.47*.
8. Install the left foot peg bracket to the left doubler plate and secure with bolts (x3). Tool: 10 mm socket. Torque: 20 lb·ft (27 Nm).

Motor Stop Switch

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- Tamperproof T25 driver
- T27
- T30
- 3/16” standard screwdriver
- #2 Phillips screwdriver
- 2 mm hex wrench
- 3 mm hex wrench
- 5 mm hex wrench
- 10 mm socket and ratchet
- Non-marring trim removal/pry tool

New Fasteners Required:

- Cable ties (quantity: 5)
- Specialty low-profile cable tie (quantity: 1)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove tank assembly. See *Tank Removal, page 60.9.*
5. Remove headlight inner fairing. See *Headlight Inner Fairing, page 60.3.*



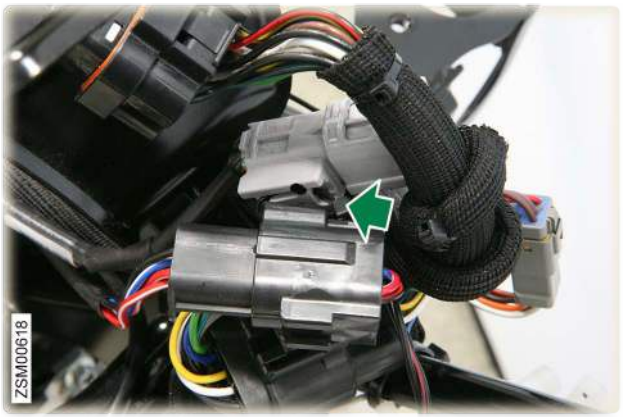
6. Cut cable tie securing the motor stop switch harness, brake switch electrical harness, throttle harness, and front wheel speed sensor to hela bracket harness anchor.

   Note: Replace cable tie during the installation process.



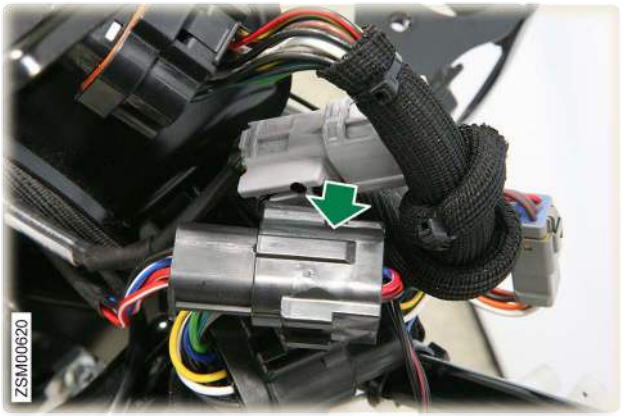
7. Cut cable tie bundling the motor stop switch harness, brake switch electrical harness, and throttle harness.

   Note: Replace cable tie during the installation process.



8. Cut cable tie securing motor stop switch connector to the throttle connector.

   Note: Replace cable tie during the installation process.



9. Disconnect motor stop switch harness connector.

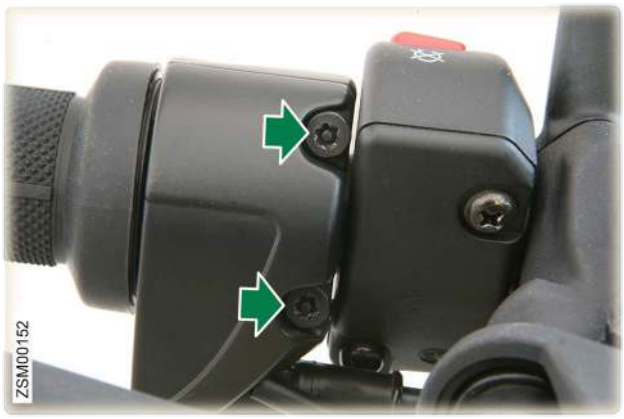


10. Cut cable tie securing harness to the right side of the handlebar.

    Note: Replace cable tie during the installation process.



11. Wrap tape around the handlebar and mark the parting line of the front master cylinder to record its location.



12. Remove bolts (x2) securing the throttle's rear cover to the front cover. Tool: Tamperproof T25



13. Carefully remove the throttle's rear cover from the throttle assembly.

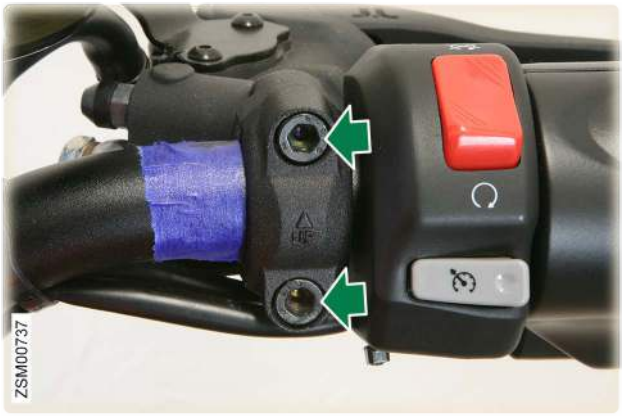
    Note: If you're attempting to keep the throttle spring from being sprung, do not remove the throttle's front cover.



14. Tape the throttle and grip to keep the throttle's front cover from popping off the throttle assembly.



15. Slide the throttle assembly on the handlebar to gain access to the motor stop switch bolts.



16. Loosen the front master cylinder clamp bolts (x2) securing the master cylinder assembly to the handlebar. Tool: 5 mm hex wrench. Torque: 8 lb-ft (11 Nm).

    Note: Rotate front brake master cylinder to gain access to the motor stop switch bottom cover bolts.



17. Remove bolts (x2) securing the bottom cover to the motor stop switch. Tool: #2 Phillips screwdriver
18. Remove the bottom cover to the motor stop switch.
19. Remove the motor stop switch.

Installation

1. Installation is the reverse of the removal procedure.

Throttle (Without Heated Grips)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- Tamperproof T25 driver
- T30
- 3/16” standard screwdriver
- 2 mm hex wrench
- 3 mm hex wrench
- 10 mm socket and ratchet
- Non-marring trim removal/pry tool

New Fasteners Required:

- Cable ties (quantity: 5)
- Specialty low-profile cable tie (quantity: 1)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove tank assembly. See *Tank Removal, page 60.9.*
6. Remove headlight inner fairing. See *Headlight Inner Fairing, page 60.3.*



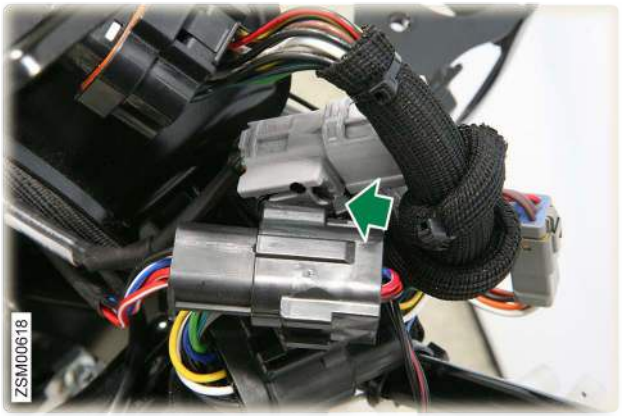
7. Cut cable tie securing the motor stop switch harness, brake switch electrical harness, throttle harness, and front wheel speed sensor to hela bracket harness anchor.

   Note: Replace cable tie during the installation process.



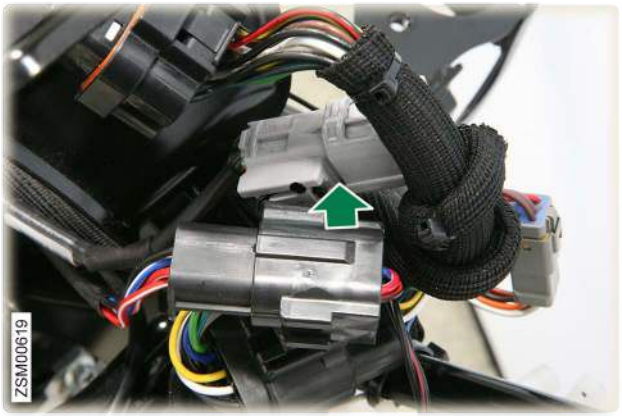
8. Cut cable tie bundling the motor stop switch harness, brake switch electrical harness, and throttle harness.

Note: Replace cable tie during the installation process.



9. Cut cable tie securing motor stop switch connector to the throttle connector.

   Note: Replace cable tie during the installation process.



10. Disconnect throttle harness connector.



11. Cut cable tie securing harness to the right side of the handlebar.

    Note: Replace cable tie during the installation process.

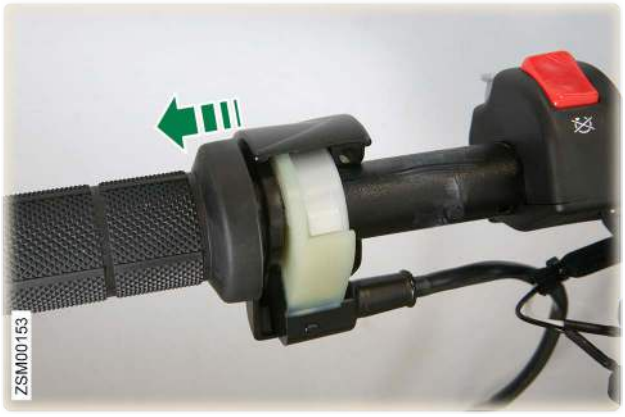


12. Remove bolts (x2) securing the throttle's rear cover to the front cover. Tool: Tamperproof T25

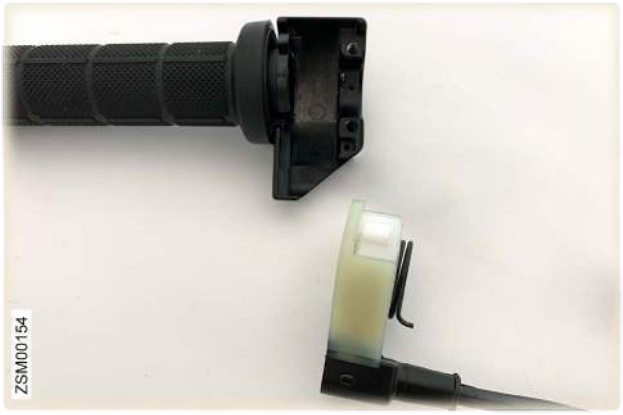


13. Carefully remove the throttle's rear cover from the throttle assembly.

    Note: If you're attempting to keep the throttle spring from being sprung, do not remove the throttle's front cover.



14. Slide the throttle and grip off the end of the handlebar.

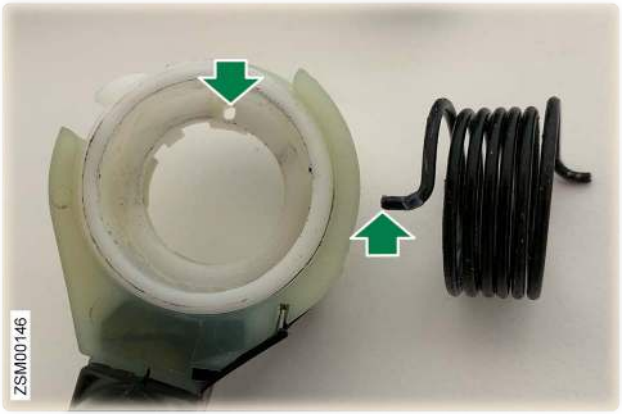


15. Carefully remove throttle assembly from the throttle assembly cover.

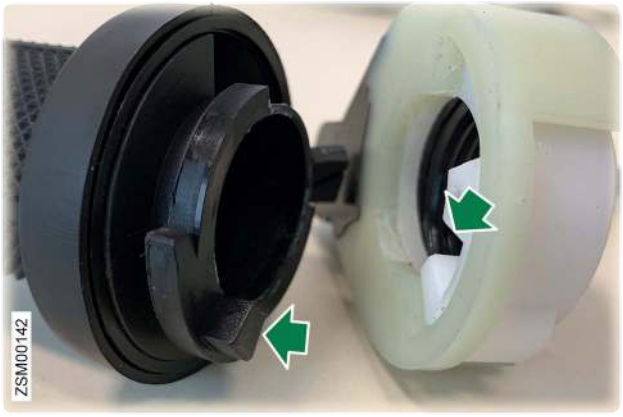
    Note: Take note of the position of the spring on the cover and how the grip assembly interlocks with the throttle assembly

Installation

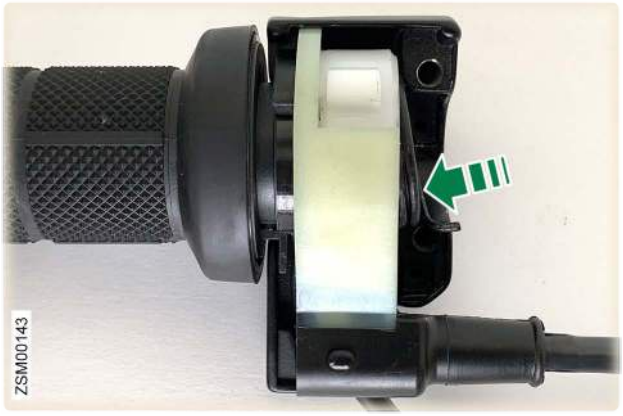
1. Installation is the reverse of the removal procedure, but follow the proceeding steps to install the throttle spring.



2. Insert throttle spring tang into the hole in the throttle mechanism.



3. Align the peg on the throttle grip with the notch of the throttle mechanism.



4. Place the aligned throttle grip and throttle mechanism (with spring inserted) into the throttle cover. Push spring into throttle mechanism, so the assembly will sit down inside the cover.



5. While holding the throttle mechanism from popping out of the throttle cover, use a non-marring trim removal tool to slide the spring tang until the tang drops into the slot. Tool: Non-marring trim removal/pry tool.



6. A properly installed throttle return spring will be preloaded as shown. Take care not to pull the assembly out of the throttle cover during installation.

Throttle (With Heated Grips)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- Tamperproof T25 driver
- T27
- T30
- 3/16” standard screwdriver
- 2 mm hex wrench
- 3 mm hex wrench
- 10 mm socket and ratchet
- Non-marring trim removal/pry tool

New Fasteners Required:

- Cable ties (quantity: 5)
- Specialty low-profile cable tie (quantity: 1)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove tank assembly. See *Tank Removal, page 60.9.*
6. Remove headlight inner fairing. See *Headlight Inner Fairing, page 60.3.*



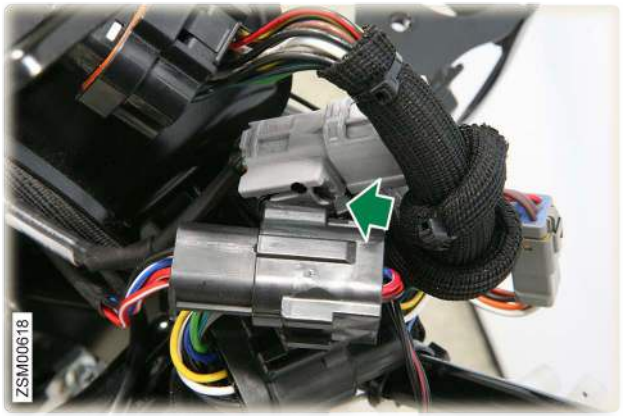
7. Cut cable tie securing the motor stop switch harness, brake switch electrical harness, throttle harness, and front wheel speed sensor to hela bracket harness anchor.

   Note: Replace cable tie during the installation process.



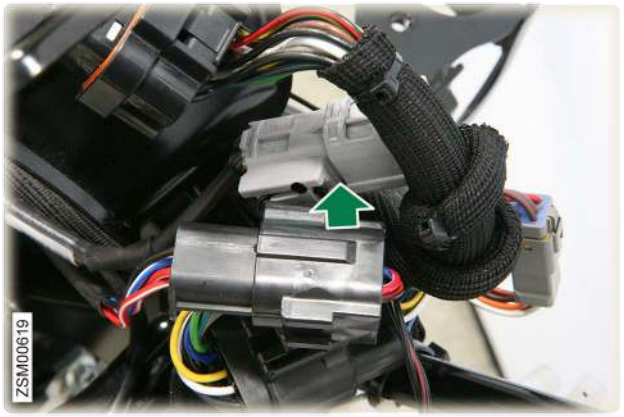
8. Cut cable tie bundling the motor stop switch harness, brake switch electrical harness, and throttle harness.

   Note: Replace cable tie during the installation process.



9. Cut cable tie securing motor stop switch connector to the throttle connector.

   Note: Replace cable tie during the installation process.



10. Disconnect throttle harness connector.



11. Cut cable tie securing harness to the right side of the handlebar.

    Note: Replace cable tie during the installation process.



12. Remove bolts (x2) securing left side of front closeout panel to frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).

    Note: Protect rear portion of front fender and front closeout panel surfaces to reduce the possibility of scratching their surfaces.



13. Remove bolts (x2) securing right side of front closeout panel to frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).
14. Remove front closeout panel.

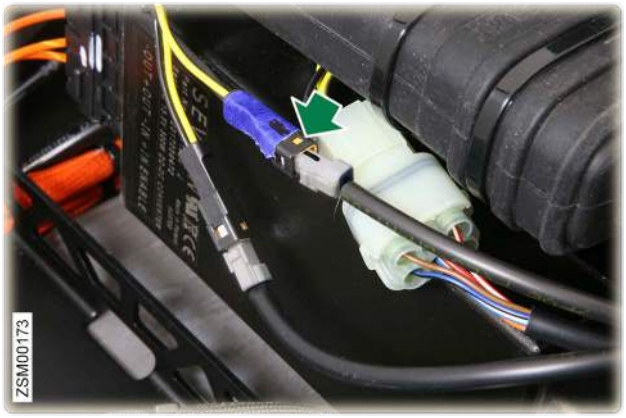
    Note: Position front suspension straight forward to allow access for removing front closeout panel downward in front of power pack.



15. Unhook retaining clip to release tension on harnesses.

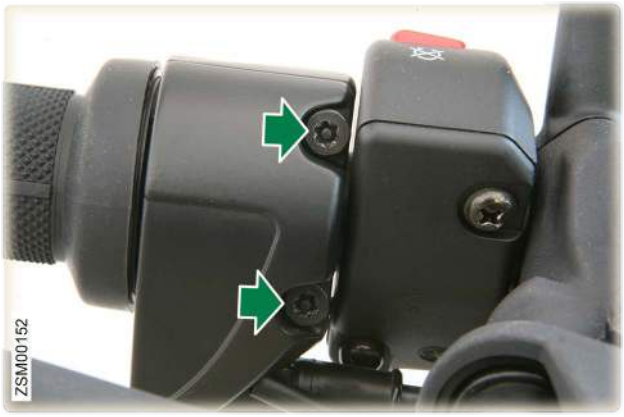


16. Slide key switch harness connector out to gain access to heated grip harness connectors.



17. Disconnect heated grip harness connector.

    Note: Label/mark connector if you're going to disconnect both connectors.



18. Remove bolts (x2) securing the throttle's rear cover to the front cover. Tool: Tamperproof T25

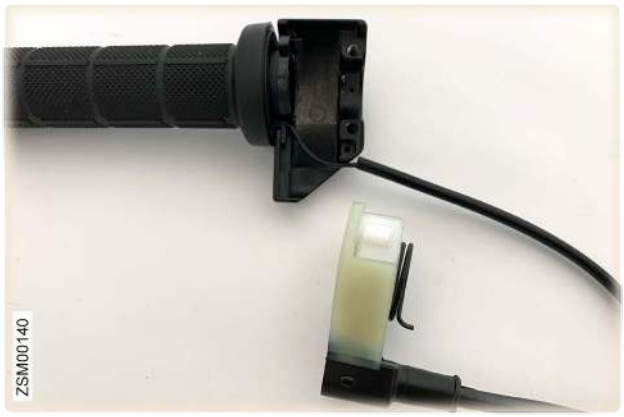


19. Carefully remove the throttle's rear cover from the throttle assembly.

    Note: If you're attempting to keep the throttle spring from being sprung, do not remove the throttle's front cover.



20. Slide the throttle and grip off the end of the handlebar.

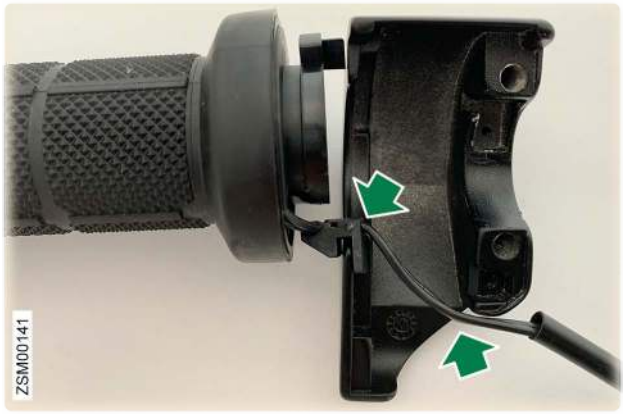


21. Carefully remove throttle assembly from the throttle assembly cover.

    Note: Take note of the position of the spring on the cover and how the grip assembly interlocks with the throttle assembly

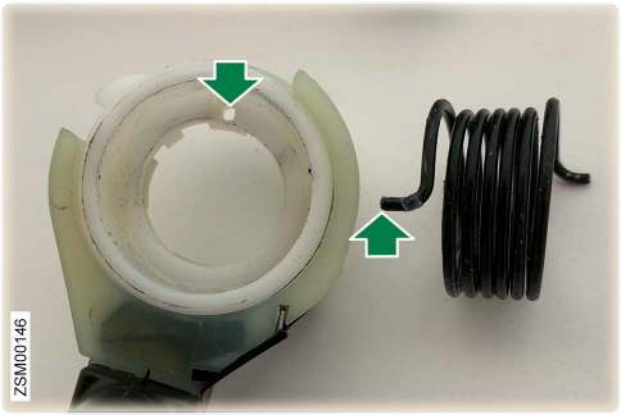
Installation

1. Installation is the reverse of the removal procedure, but follow the proceeding steps to install the throttle spring.

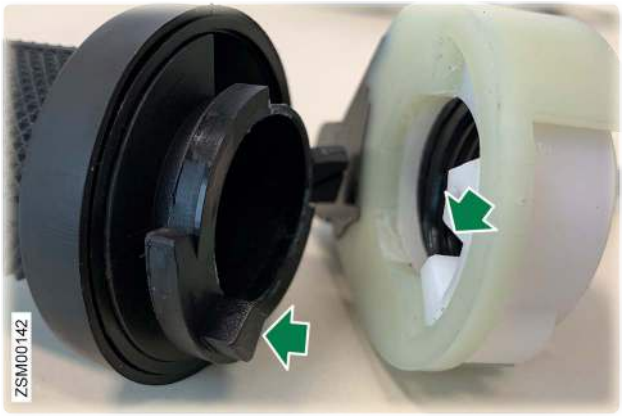


2. If the motorcycle is equipped with heated grips, place the harness alignment tab into the slot in the throttle cover.

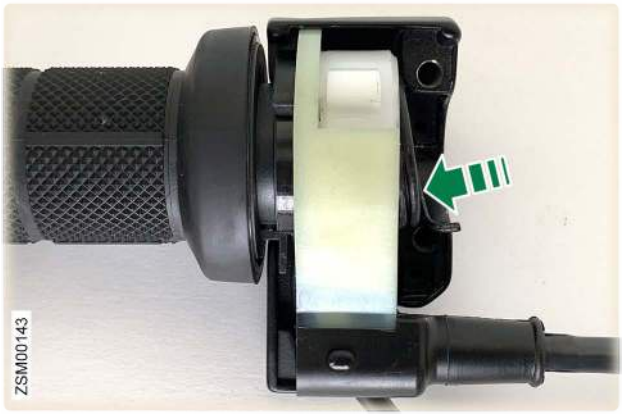
    Note: Make sure the wire harness lead is routed through the bottom opening in the throttle cover.



3. Insert throttle spring tang into the hole in the throttle mechanism.



4. Align the peg on the throttle grip with the notch of the throttle mechanism.



5. Place the aligned throttle grip and throttle mechanism (with spring inserted) into the throttle cover. Push spring into throttle mechanism, so the assembly will sit down inside the cover.



6. While holding the throttle mechanism from popping out of the throttle cover, use a non-marring trim removal tool to slide the spring tang until the tang drops into the slot. Tool: Non-marring trim removal/pry tool.



7. A properly installed throttle return spring will be preloaded as shown. Take care not to pull the assembly out of the throttle cover during installation.

Motor Controller [Before 2022MY]

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 3/16” standard screwdriver
- 2 mm hex wrench
- 3 mm hex wrench
- 10 mm socket and ratchet
- 22 mm 6-point socket
- Non-marring trim removal/pry tool
- Scissor jack

New Seals Required:

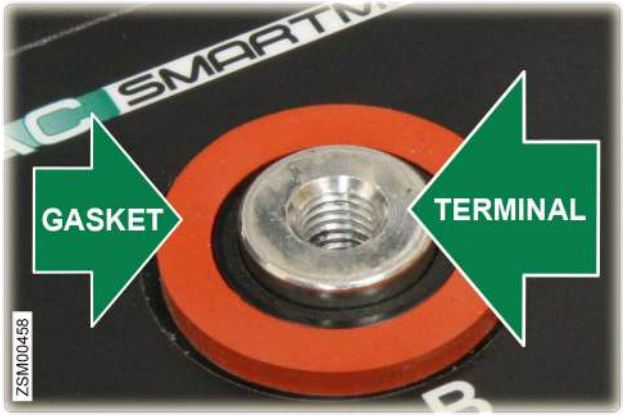
- HV cable seals (quantity: 5)
- HV cable O-rings (quantity: 5)

New Fasteners Required:

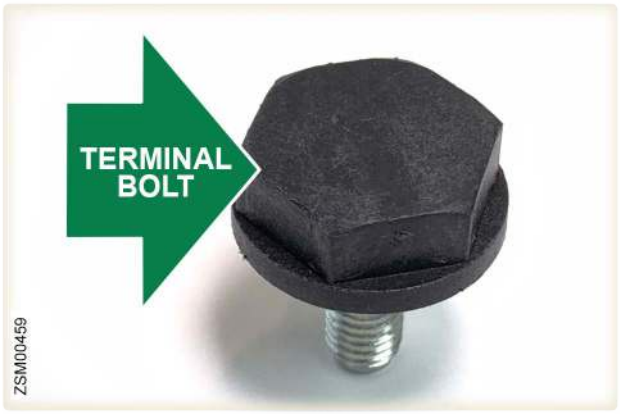
- Cable tie (quantity: 2)
- Double loop cable tie (quantity: 1)

Component Identification

The following important items are identified to assist in understanding the terminology used in the removal and installation procedures of the motor controller.



1. Terminal and terminal gasket.



2. Terminal bolt.



3. Radsock connection cups (on the end of each busbar).



4. Busbars.



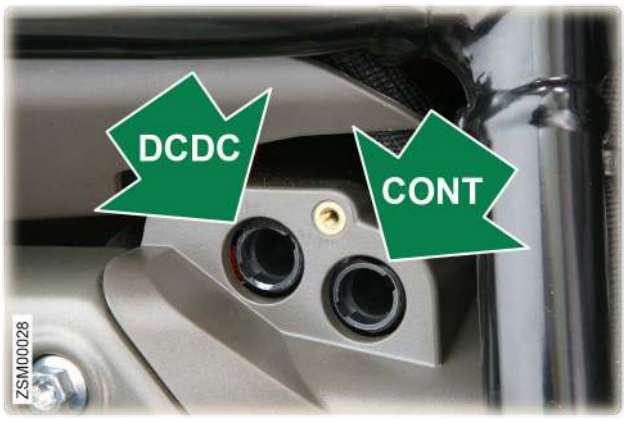
5. Phase leads.



6. Radsock connectors (toward the rear of the power pack, accessed from underneath).

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*



2. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*



3. Unbolt the negative battery terminal eyelet. Cover eyelet with insulating material. Use cable tie to secure negative battery wire to the positive battery cable. See *12 Volt Battery (Disconnect), page 70.3.*

   CAUTION: **Cover/protect battery terminal eyelet to reduce the risk of accidentally contacting the negative battery terminal, which can inadvertently power up the 12 volt system and damage components.**

   CAUTION: **Secure battery terminal wire to reduce the risk of arcing and damaging electrical components.**

4. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*

5. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*

6. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*

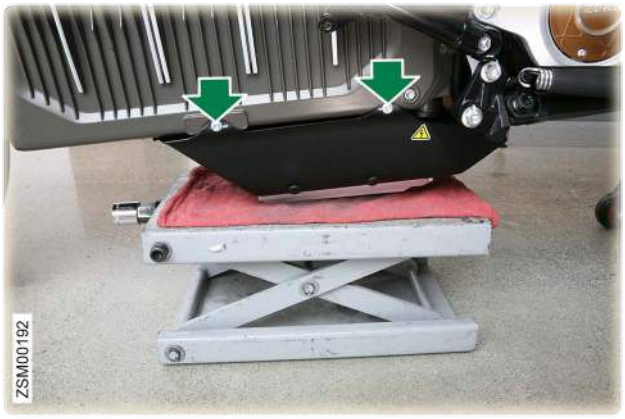


7. Safely support the motorcycle by using a motorcycle stand.
8. Remove lower body panel.



9. Support controller with jack. Tool: scissor jack.

   CAUTION: **Do not lift motorcycle by jacking up the controller. Damage to the controller and the controller carrier will occur.**



10. Remove bolts (x2) securing controller carrier to power pack, left side. Tool: T25. Torque: 3 lb-ft (4 Nm).



11. Remove bolts (x2) securing controller carrier to power pack, right side. Tool: T25. Torque: 3 lb-ft (4 Nm).



12. Lower the scissor jack approximately 1 inch below the controller and carrier assembly.

    Note: The controller assembly will not freely slip off the power pack, but should be supported to reduce strain on the high voltage components.



13. Do not pry on any part of the controller assembly.



14. Pull the controller assembly straight down. It will require a lot of wiggling and pulling to disengage the busbars from the radsock cups.

    Note: This process will take a lot of effort and a few minutes to perform.



15. With the controller assembly released from the power pack, lower the jack to gain access to the phase lead terminal bolts.

CAUTION: Use jack to control the distance the controller assembly drops. Do not allow the controller assembly to hang and stress the signal harness.



16. Remove terminal bolts (x2) securing busbars (x2) to the top of the controller. Discard O-rings (x2). Tool: 22 mm 6-point socket. Torque: 9 lb-ft (12 Nm).

    Note: Replace sealing O-rings upon installation.



17. Remove busbars (x2).



18. Remove busbar guide.

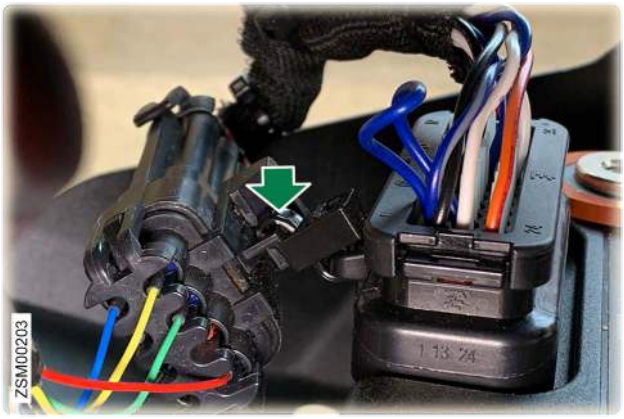


19. Label phase leads to ensure they are re-installed in the correct locations upon reassembly.



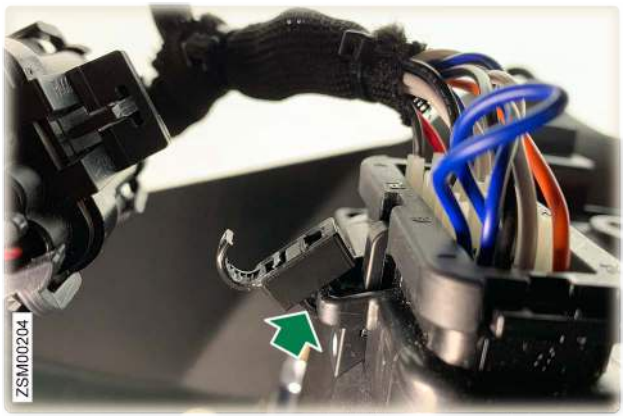
20. Remove terminal bolts (x3) securing phase leads (x3) to the top of the controller. Discard O-rings (x2). Tool: 22 mm 6-point socket. Torque: 11 lb-ft (15 Nm).

    Note: Replace sealing O-rings upon installation.

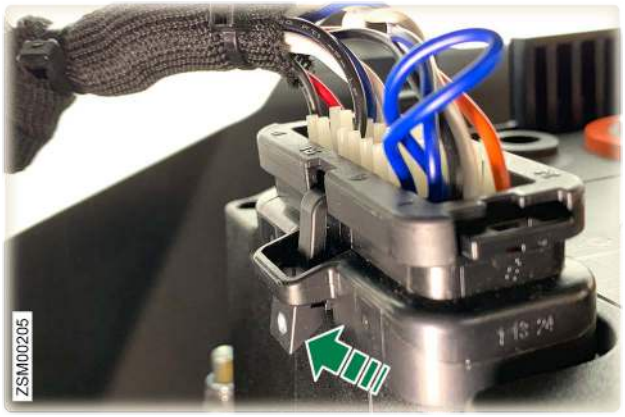


21. Cut double-loop cable tie securing the encoder harness connector to the controller harness connector.

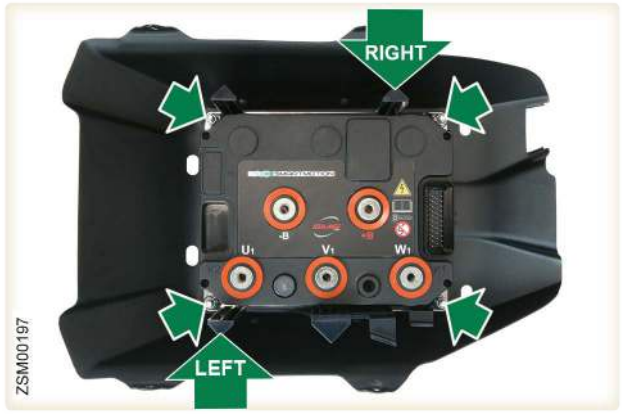
    Note: Replace double loop cable tie upon installation.



22. Cut cable tie section blocking the removal of the controller signal harness connector.



23. Release controller signal harness connector from controller.
24. Remove controller assembly.



25. Remove bolts (x4) and nuts (x4) securing the controller to the controller carrier. Collect the plastic controller safety stands (left and right) and washers (x4). Tools: T30 (bolts) and 10 mm wrench (nuts). Torque: 8 lb-ft (11 Nm).

26. Remove controller carrier from controller.

Cleaning Connectors Before Installation

Note: Prior to installing the controller, check the following connector locations and clean if necessary. Clean with a microfiber cloth and/or cotton swabs. The following images show areas qualified as clean.



1. Inside the 8-pin connector.



2. Inside the 35-pin connector.



3. Inside the controller's 35-pin socket.



4. Inside the power pack's radsock connectors.

Cleaning Controller Before Installation

Note: Prior to reinstalling the existing controller, use the following methods to clean its surfaces. Clean with ISO70 (isopropyl rubbing alcohol 70%), paper towels, and a vacuum cleaner.



1. Place controller off to the side of the motorcycle. This prevents debris from falling inside of the busbar radsocks and 35-pin connector socket during disassembly. Remove the orange terminal gaskets from the terminals.



2. Use a shop vacuum with a brush head attachment to remove as much dust and debris as possible from the top of the controller.



3. This is an example of a vacuumed controller, prior to wiping with ISO70 prepped paper towels.



4. All controller terminals (x5) must be clean and in good condition (no severe pitting or evidence of arcing).



5. Vacuum out the debris around the controller.



6. Apply ISO70 (isopropyl rubbing alcohol 70%) to a paper towel and clean the top of the controller. It is not critical to remove all the dirt inside of the pocket (see arrow).

CAUTION: **Do not spray the ISO70 directly on the controller or terminals. Spray ISO70 on a paper towel and wipe the area clean.**



7. Install new orange terminal gaskets (x5) on the controller terminals.



8. Thoroughly clean all terminal connection surfaces of the phase leads (x3) and busbars (x2) with ISO70 and paper towels.



9. Thoroughly clean the threads and mating surface of the terminal bolts (x5) with ISO70 and paper towels.

   CAUTION: **Clean terminal bolts (x5) completely. DO NOT COAT THE TERMINAL BOLTS PRIOR TO INSTALLATION! Replace any damaged or worn terminal bolts.**



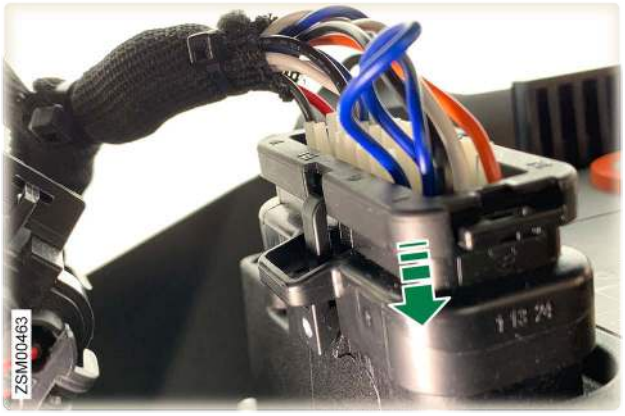
10. Confirm that the radsock cups (x2) do not contain debris.

Installation

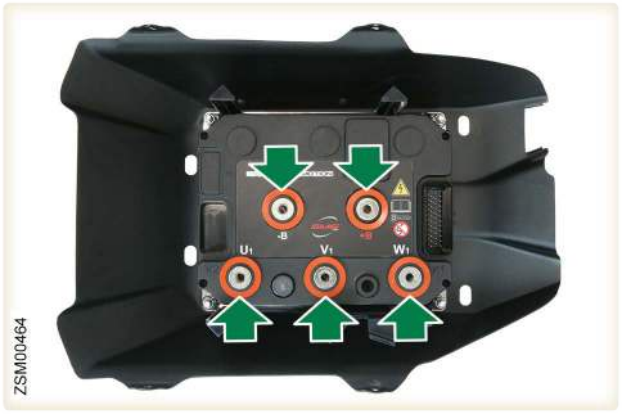
1. Installation is the reverse of the removal procedure.



2. Replace orange terminal gaskets and terminal bolt O-rings prior to installation.
3. Place controller assembly on scissor jack under the power pack.



4. Connect controller signal harness connector.



5. Place new phase lead gaskets (x5) on the controller terminals.



6. Place new phase lead O-rings (x3) on the phase leads.



7. Install proper phase leads onto the controller terminals. The phase leads U1, V1, and W1 will match the corresponding positions listed on the label on the top of the controller.



8. Install terminal bolts (x3). Tool: 22 mm 6-point socket. Torque: 11lb-ft (15 Nm).

   CAUTION: **Install the terminal bolts without any thread locking compound.**

CAUTION: **Install the terminal bolts without any CP70 (or any type of insulating lubricant/gel/paste).**

Note: Phase lead W1 has to be torqued before moving to the next step. It will be unaccessible after the following step.

Note: Confirm that the phase leads are positioned/clocked as shown on top of the controller. Once the terminal bolts are torqued, you will not be able to reposition/ re-clock the phase leads.



9. Place the busbar support on top of the controller (using the locating pin and locating hole).



10. Apply a thin film of CP70 to the terminal inside the Radsock cups on the busbars.



11. Place the B- busbar on to the controller.



14. Place the B+ busbar on to the controller.



12. Place a new O-ring (x3) on the B- busbar.



15. Place a new O-ring (x3) on the B+ busbar.



13. Install terminal bolt. Tool: 22 mm 6-point socket. Torque: 11 lb-ft (15 Nm).

    CAUTION: **Install the terminal bolts without any thread locking compound.**

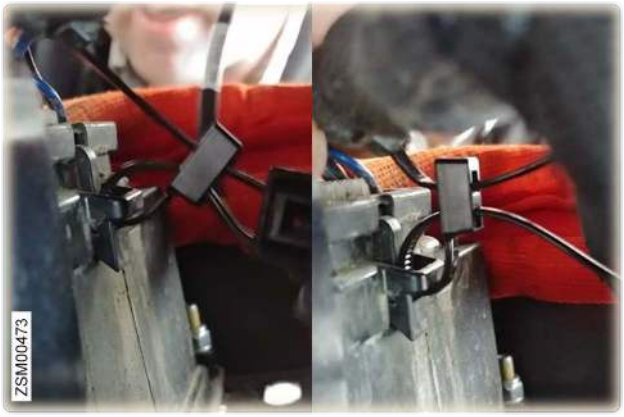
    CAUTION: **Install the terminal bolts without any CP70 (or any type of insulating lubricant/gel/paste).**



16. Install terminal bolt. Tool: 22 mm 6-point socket. Torque: 11 lb-ft (15 Nm).

    CAUTION: **Install the terminal bolts without any thread locking compound.**

    CAUTION: **Install the terminal bolts without any CP70 (or any type of insulating lubricant/gel/paste).**



17. Use a double loop cable tie to anchor the 8-pin harness connector to the loop on the controller.



18. Start by looping the cable tie end through the 8-pin connector tab and then through the first hole in the body of the double loop cable tie.



19. For the second pass, loop the cable tie end through the anchor point on the controller (to the rear of the 35-pin controller signal harness connector) and then through the second hole in the body of the double loop cable tie.



20. **DO NOT PINCH SIGNAL HARNESS OR PHASE WIRES WHILE INSTALLING THE CONTROLLER! Pay close attention to the placement of the cables during the entire installation process.**



21. The controller must be installed parallel to the power pack. If necessary, use a shim to position the controller parallel to the Power Pack.

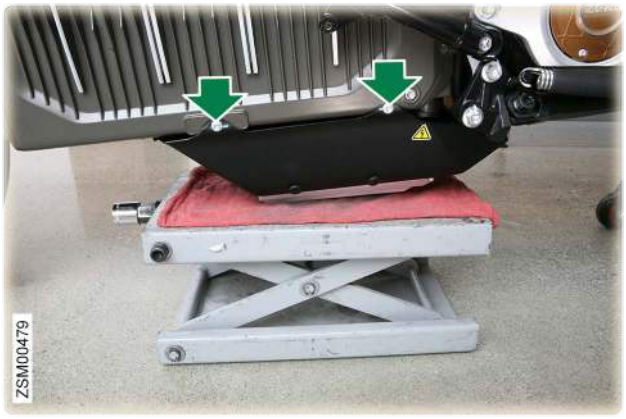


22. Use a scissor jack to raise the controller. Align the busbar radsocks with the power pack radsock connections. If the radsocks are aligned properly, they will insert with ease. The key to proper alignment is making sure the controller assembly is parallel to the power pack.



23. *Note: Once the controller carrier bolt holes are aligned with the power pack side plates, loosely start one bolt at a time. This will allow adjustability for each of the additional bolts.*

    Additional Note: Installing the front bolts may require lifting with force.



24. Install bolts (x2) securing controller carrier to power pack, left side. Tool: T25. Torque: 3 lb-ft (4 Nm).



25. Install bolts (x2) securing controller carrier to power pack, right side. Tool: T25. Torque: 3 lb-ft (4 Nm).
26. After finishing the controller installation, contact Zero Motorcycles Customer Service for assistance for updating the firmware.
    - North America: support@zeromotorcycles.com
    - Zero Motorcycles Europe: service.eu@zeromotorcycles.com

Motor Controller Carrier [Before 2022MY]

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 3/16” standard screwdriver
- 2 mm hex wrench
- 3 mm hex wrench
- 10 mm combination wrench
- 10 mm socket and ratchet
- Non-marring trim removal/pry tool
- Scissor jack

New Fasteners Required:

- Cable tie (quantity: 2)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Safely support motorcycle on motorcycle stand.
3. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
4. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
5. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*

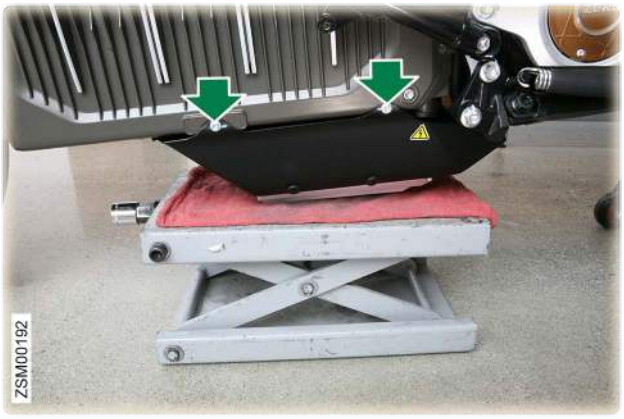


6. Safely support the motorcycle by using a motorcycle stand.
7. Remove lower body panel.



8. Support controller with jack. Tool: scissor jack.

   CAUTION: **Do not lift motorcycle by jacking up the controller. Damage to the controller and the controller carrier will occur.**



9. Remove bolts (x2) securing controller carrier to power pack, left side. Tool: T25. Torque: 3 lb-ft (4 Nm).



10. Remove bolts (x2) securing controller carrier to power pack, right side. Tool: T25. Torque: 3 lb-ft (4 Nm).



11. Lower the scissor jack approximately 1 inch below the controller and carrier assembly.

    Note: The controller assembly will not freely slip off the power pack, but should be supported to reduce strain on the high voltage components.

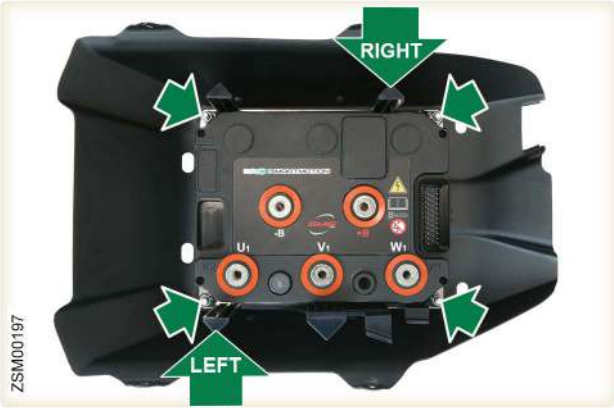


12. Using a non-marring pry tool, carefully pry the controller assembly straight down. Alternate from right to left. Alternating from side to side, carefully pry between the controller carrier and the power pack, to evenly release the controller busbars from the power pack.

    Note: This process will take a few minutes.



13. With the controller assembly released from the power pack, lower the jack to gain access to the fasteners.



14. Remove bolts (x4) and nuts (x4) securing the controller to the controller carrier. Collect the plastic controller safety stands (left and right) and washers (x4). Tools: T30 (bolts) and 10 mm wrench (nuts). Torque: 8 lb-ft (11 Nm).
15. Remove controller carrier from controller.

Installation

1. Installation is the reverse of the removal procedure.

Motor Controller with Heatsink [22MY Onwards]

CAUTION: Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

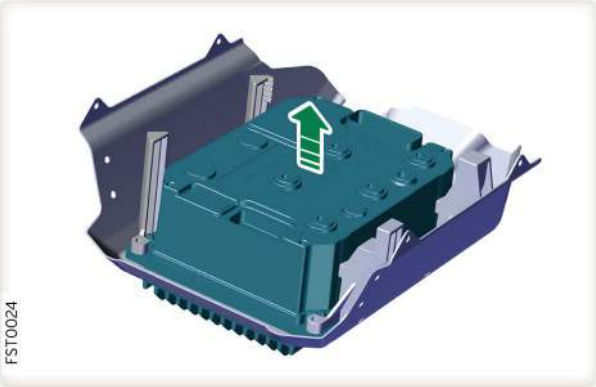
Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove controller BUS set. See *Controller BUS Set [22MY Onwards], page 20.37.*



3. Remove bolts (x4), nuts (x4) and washers (x4) securing controller to carrier. Torque 4 lb-ft (5.5 Nm).

   NOTE: Always record quantity and fitted position of washers.



4. Remove controller.

Installation

1. Installation is the reverse of removal procedure.

Drive Belt - Replace

CAUTION: Do not attempt to install the belt onto the motorcycle without loosening the belt using the axle adjusters. Failure to follow this procedure to release belt tension will cause premature failure of the belt.

Tools Required (includes tools required for parent jobs):

- T45
- 27 mm socket and ratchet
- 13 mm wrench
- Motorcycle stand

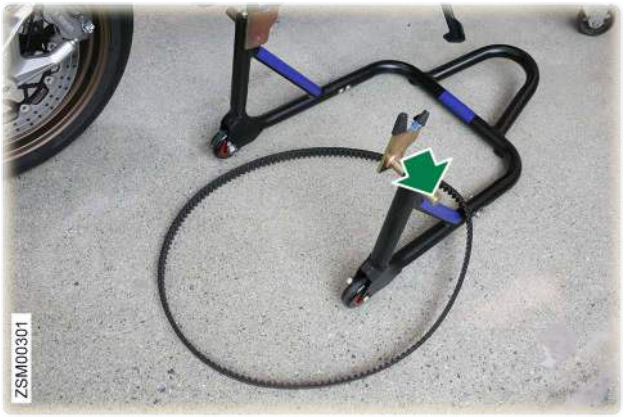
New Fasteners Required:

- Cable tie (quantity: 2)

Removal



1. Tape the swingarm to keep the brake caliper from damaging the painted surfaces.



2. Place the new belt over the left side of the motorcycle stand.



3. Safely raise rear tire off the ground using a motorcycle stand.



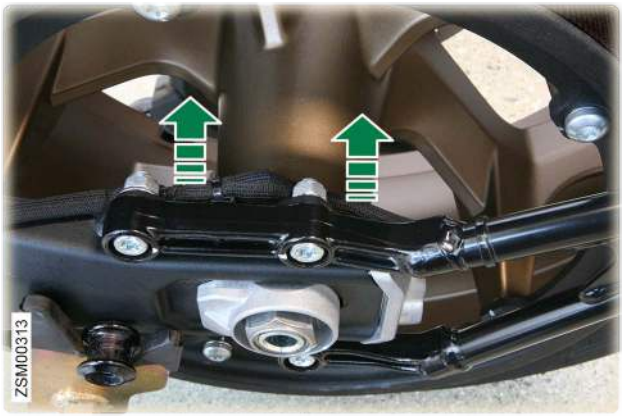
4. Remove bolts (x2) securing the rear inner fender to the rear swingarm. Tool: T25. Torque: 3.5 lb-ft (5 Nm).



5. Center bolt secures the rear shock ground wire eyelet and star washer underneath it.



6. Remove bolt securing the rear inner fender to the rear swingarm. Tool: T25. Torque: 3.5 lb-ft (5 Nm).
7. Remove the rear inner fender.



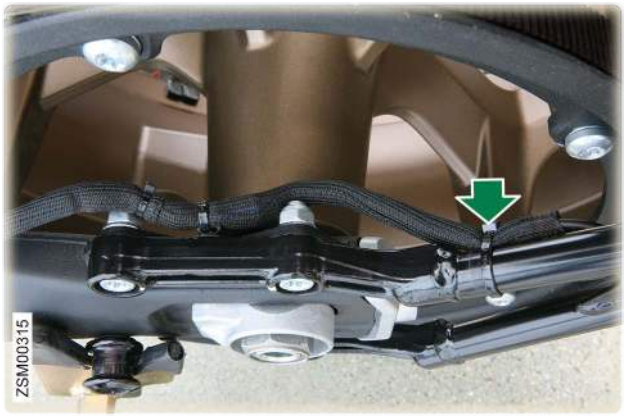
8. Rotate tucked license plate harness up to gain access to cable ties.

   Note: Neatly tuck harness back in place during reinstallation process to protect harness from damage while riding.



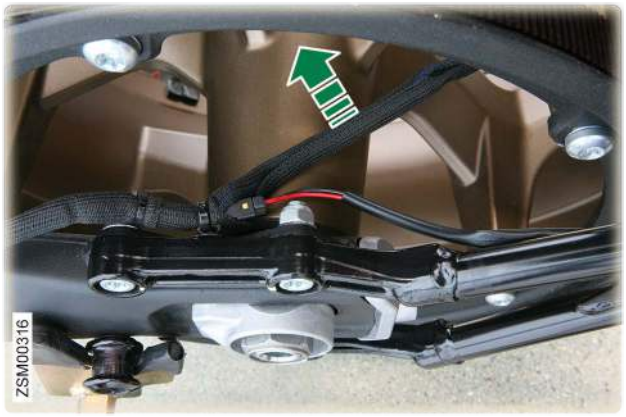
9. Cut cable tie securing the protective sheathing to the license plate light harness.

   Note: Replace cable tie during the installation process.



10. Cut cable tie securing the license plate harness to the ROF (rear outer fender) arm.

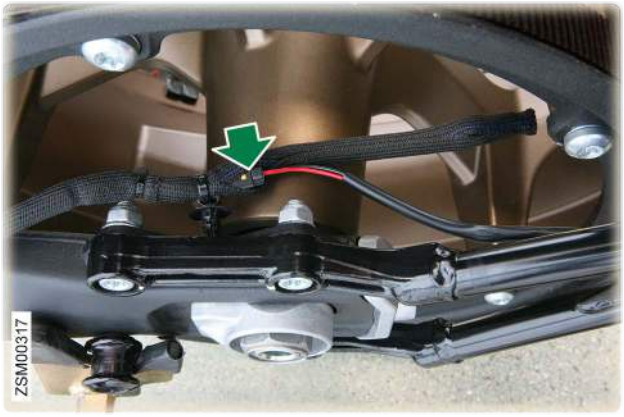
    Note: Replace cable tie during the installation process.



11. Remove the protective sheathing from the license plate light harness.



12. Release harness anchor from the ROF arm.



13. Disconnect license plate light harness connector.



14. Remove bolts (x3) securing the rear fender arm to the swingarm. Collect the nuts (x3) and washers (x3). Tool: T45and 13 mm socket. Torque (in sequence shown): 25 lb-ft (34 Nm).
15. Remove rear fender arm.



16. Remove rear axle nut and collect the rear axle adjuster. Tool: 27 mm. Torque: 75 lb-ft (102 Nm).



17. Remove left adjuster bolt and collect the left swingarm end cap. Tool: T45



18. Remove left adjuster bolt and collect the right swingarm end cap. Tool: T45



19. Slide rear axle forward.



20. Slip belt off of the rear sprocket.

Installation

1. Installation is the reverse of the removal procedure, but take note of the following installation step.
2. Adjust drive belt after installation is complete. See *Drive Belt - Adjust, page 10.4.*

Rear Sprocket

Tools Required (includes tools required for parent jobs):

- T25
- T40
- T45
- 27 mm socket and ratchet
- 13 mm wrench
- Motorcycle stand

New Fasteners Required:

- Cable ties (quantity: 1)

Removal

1. Remove drive belt. See *Drive Belt - Replace, page 30.47.*
2. Remove brake pads from the rear caliper. See *Brake Pads (Rear), page 45.10.*



3. Safely support the motorcycle by using a motorcycle stand.



4. Release rear wheel speed sensor (WSS) harness from plastic retainer.



5. Place rag over rear caliper to protect painted surfaces.



6. Lift rear tire slightly and slide rear axle out of the swing arm.



7. Raise rear tire and remove rear WSS sensor and set aside.

   Note: Make sure the WSS sensor is hung up and not straining the WSS electrical harness.

8. Lower the rear tire carefully to keep from damaging painted surfaces.



9. Place rag over the left side of the swingarm between the rear sprocket and the swing arm to protect painted surfaces.
10. Roll rear tire forward.



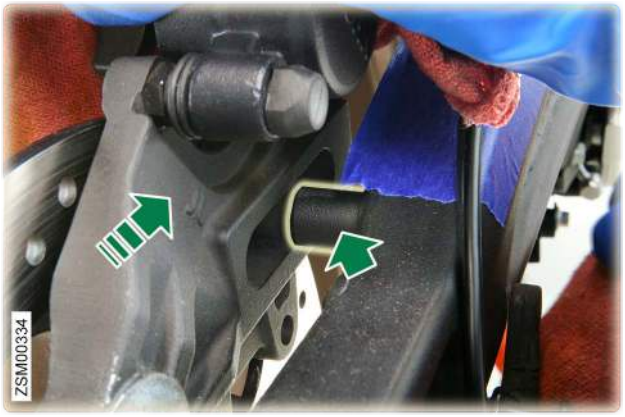
11. Release rear brake hose from the metal retaining clip.



12. Position the rear brake hose on top of clip.



13. Tip the top of the rear tire to the left.



14. Slide rear caliper assembly toward wheel and slide caliper bracket off of the bracket alignment pin.



15. Tie caliper up to the foot peg bracket.

    Note: Make sure the brake caliper is hung up and not straining the brake hose.

16. Roll the rear wheel out of the swing arm.



17. Remove plastic bushing from left side (sprocket side) of the wheel.



18. Remove bolts (x5) securing the brake rotor to the rear wheel. Tool: T45. Torque (in sequence shown): 26 lb-ft (35 Nm).

Installation

1. Installation is the reverse of the removal procedure, with the exception of the following:



2. On the sprocket-side of the rear wheel, inspect the condition of the inner (#1) and outer (#2) bearings and the seal (#3). Replace if necessary.

   Note: The bearings and seal are one-time use parts. Every part removed, will need to be replaced.



3. On the rotor-side of the rear wheel, inspect the condition of the wheel bearing (#1) and the ABS magnet ring (#2). Replace if necessary.

   Note: The bearing is a one-time use parts. If removed, the part will need to be replaced.



4. Install bolts (x5) securing the rear sprocket to the rear wheel. Tool: T45. Torque (in sequence shown): 26 lb-ft (35 Nm).



5. When installing the WSS sensor, make sure the alignment tab is positioned against the top edge of the rear brake bracket as shown.

Steering Stem

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T25
- T30
- T45
- T50
- 3/16” standard screwdriver
- 2 mm hex wrench
- 10 mm socket and ratchet
- 13 mm socket
- 41 mm socket
- Adjustable hook spanner wrench
- Ratchet straps (x2)
- Hoist

New Fasteners Required:

- Cable ties (quantity: 2)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*



2. **DO NOT LIFT THE MOTORCYLE BY JACKING UP THE CONTROLLER! DO NOT SUPPORT THE WEIGHT OF THE MOTORCYCLE BY SUPPORTING THE CONTROLLER! Doing so, will damage the controller and other components.**
3. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
4. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
5. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
6. Remove tank assembly. See *Tank Removal, page 60.9.*
7. Remove headlight inner fairing. See *Headlight Inner Fairing, page 60.3.*
8. Remove front wheel speed sensor (WSS) sensor. See *Wheel Speed Sensor (Front), page 45.25.*



9. Remove bolts (x2) securing left side of front fender to the left front shock. Tool: T25. Torque: 3.5 lb-ft (5 Nm).



10. Remove bolts (x2) securing right side of front fender to the left front shock. Tool: T25. Torque: 3.5 lb-ft (5 Nm).



11. Loosen left front suspension upper clamp bolt. Tool: T45. Torque: 16 lb-ft (22 Nm).



12. Loosen left front suspension lower clamp bolt. Tool: T45. Torque: 16 lb-ft (22 Nm).



13. Slide the left front suspension out through the bottom.



14. Loosen right front suspension upper clamp bolt. Tool: T45. Torque: 16 lb-ft (22 Nm).



15. Loosen right front suspension lower clamp bolt. Tool: T45. Torque: 16 lb-ft (22 Nm).



16. Slide the right front suspension out through the bottom.



17. Remove bolt capturing harness ground wire to the upper triple clamp. Collect star washer located between ground cable eyelet and upper triple clamp. Tool: T30. Torque: 8 lb-ft (11 Nm).



18. Wrap tape around handlebar and mark the parting line of the handlebar clamp, to ensure the handlebars can be re-installed in their original location and angle.



19. Remove handlebar clamp bolts (x4) securing handlebar to upper triple clamp. Tool: T45. Torque: 19 lb-ft (26 Nm).



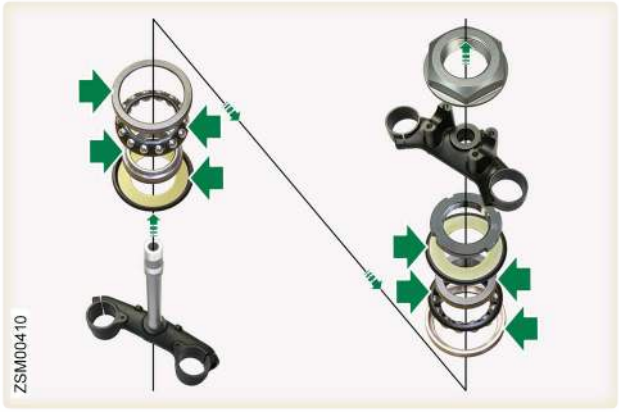
20. Remove stem nut. Tool: 41 mm. Torque: 75 lb-ft (102 Nm).



21. Remove upper triple clamp (shown with stem nut removed - upper triple clamp just sitting on the steering shaft).



22. Remove shaft nut. Tool: Adjustable hook spanner wrench (showing the nut - no tool in photo is acceptable).



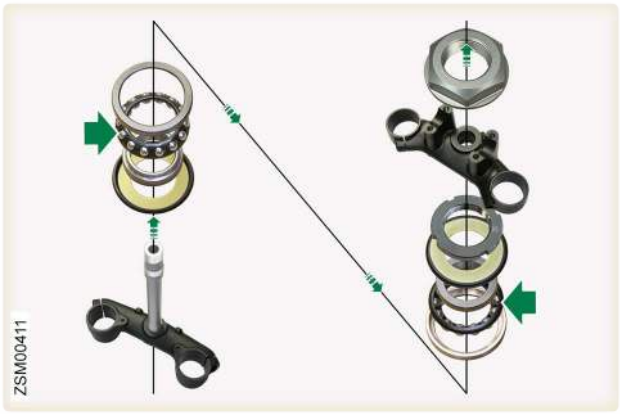
23. Remove lower triple clamp and discard bearings (x2), races (x2), and seals (x2).

    Note: Replace bearings (x2), races (x2), and seals (x2) upon installation.

Installation

1. Assemble the triple clamp in the reverse order.

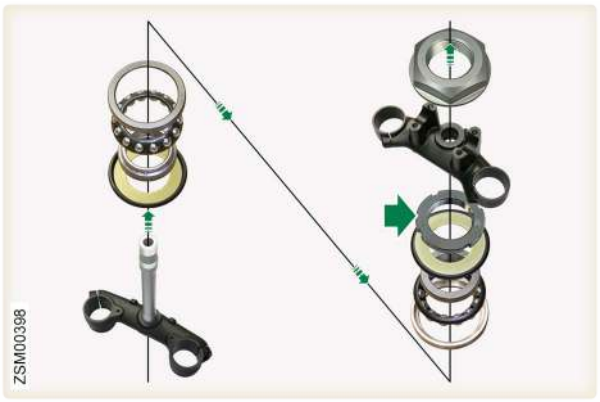
   Pay close attention to the order of installation of the bearings, races, seals, steering stem lock nut.



2. Lubricate the bearings during installation.

   CAUTION: **Lubricate the bearings prior to installation with appropriate bearing packing tool.**

   CAUTION: **Do not lubricate the seals.**

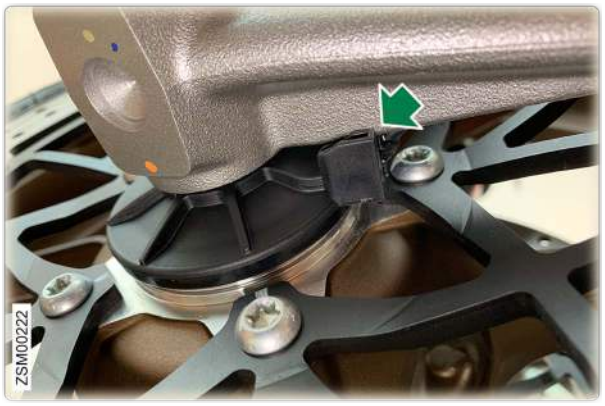


3. Install the steering stem lock nut (located under the upper triple clamp) and tighten to 25 lb·ft (34 Nm).

   CAUTION: **Install the steering stem lock nut with the bevel facing down.**


Zero0118

4. Loosen the nut and then tighten to 25 lb·ft (34 Nm) again.
5. Loosen the nut once again. Then tighten to 11.5 lb·ft (15.5 Nm) for the final torque.
6. Rotate the triple clamp back and forth to check for rubbing or grinding. If the movement is not smooth, remove the parts and inspect. Make sure the parts were assembled in order.
7. Finish the installation.


ZSM00222

8. When installing the front wheel speed sensor, make sure the alignment tab is positioned against the bottom edge of the left front shock as shown.

Fork Rebuild

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

Tool Required:

-  Top cap socket (45 mm)
-  Cartridge tool (43 mm)
-  Fork seal driver (43 mm)
-  Fork bullet (43 mm)

Consumables Required:

- Seal kit - refer to the parts book for the correct part number of the seal kit (1 seal kit for each fork)
- 0.6 Qt (590 ml) - SS47 (10 W) oil per fork

LH Disassembly



Zero0085

1. Place the fork in a suitable suspension vise.


Zero0086

2. Using the top cap socket, loosen the top cap.


Zero0099

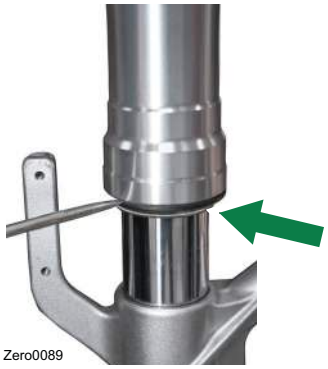
3. Lift the assembly up from the tube and install the cartridge tool over the piston rod. Turn the tool counter-clockwise to loosen the cartridge.


Zero0087

4. Pull the cartridge assembly from the tube.


Zero0088

5. Pull the spring assembly from the outer tube.
6. Loosen the vise and dump the fork oil into a container (approx. 20 fl. oz. (592 ml)).


Zero0089

7. Pry the dust seal from the outer tube.

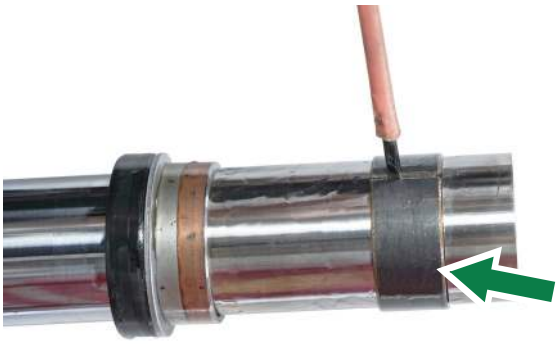

Zero0095

8. Remove the oil seal circlip using snap ring pliers.



Zero0091

9. Separate the slide pipe from the outer tube with a slide-hammer motion.



Zero0092

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



Zero0090

11. Slide the guide bushing, seal spacer, oil seal, circlip and dust seal from the pipe.

LH Assembly

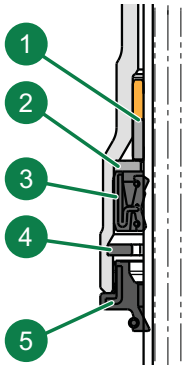


Zero0105

1. Install the fork bullet onto the end of the slide pipe.



Zero0101



1. Guide bushing
2. Seal spacer
3. Oil seal
4. Circlip
5. Dust seal

2. Slide new dust seal (5), the circlip (4), the new oil seal (3), the new seal spacer (2) and the new guide bushing (1) onto the slide pipe.

   Note: Lubricate all seals before installation.

3. Remove the fork bullet.



Zero0093

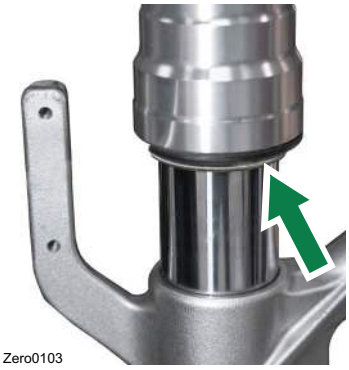
4. Slide the new slide bushing into the groove on the pipe.
5. Insert the pipe into the outer tube.


Zero0094

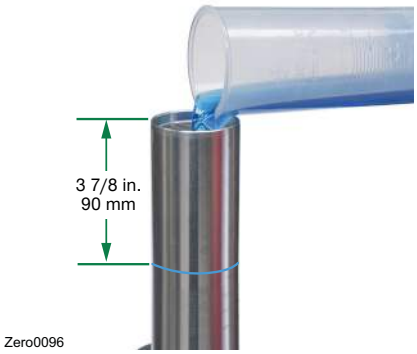
6. Slide the dust seal and circlip to the bottom of the pipe. Install the seal driver below the oil seal. Then, slide the tool to push the oil seal, spacer and bushing into the outer tube. With the seal properly inseated, remove the seal driver.


Zero0095

7. Install the seal circlip in the clip groove.


Zero0103

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

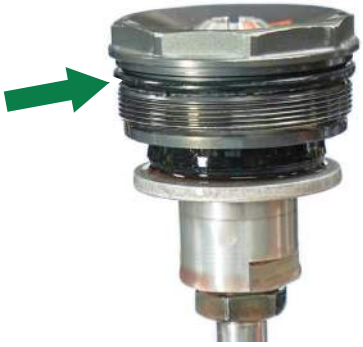


Zero0096

9. Add oil to the outer tube.
   - SS-47 (10 W) oil: 19.7 fl oz (582 ml)
   - Fill to approximately 3 7/8 in. (90 mm) from the top of the tube.


Zero0088

10. Install the spring assembly into the outer tube.


Zero0102

11. Install the new O-ring onto the fork bolt.
12. Install the cartridge assembly into the outer tube.


Zero0099

13. Use the fork cartridge tool to tighten the assembly. Torque: 66 ± 7 lb-ft (90 ± 10 Nm)


Zero0100

14. Tighten the fork bolt. Torque: 26 ± 4 lb-ft (35 ± 5 Nm)
15. Install the fork on the motorcycle.
16. Adjust the suspension as outlined in the Operator Manual.

RH Disassembly



Zero0085

1. Place the fork in a suitable suspension vise.


Zero0086

2. Using the top cap socket, loosen the fork bolt.


Zero0099

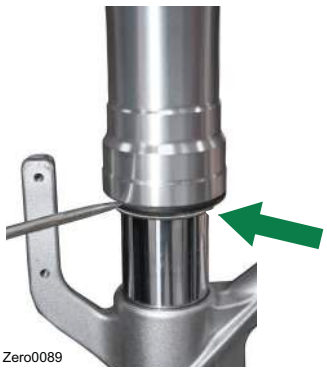
3. Lift the assembly up from the tube and install the cartridge tool over the piston rod. Turn the tool counter-clockwise to loosen the cartridge.


Zero0098

4. Pull the cartridge assembly from the outer tube.


Zero0088

5. Pull the spring assembly from the outer tube.
6. Loosen the vise and dump the fork oil into a container (approx. 20 fl oz. (592 ml)).


Zero0089

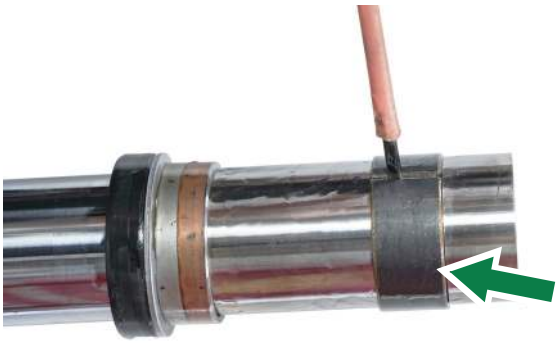
7. Pry the dust seal from the other tube.


Zero0095

8. Remove the oil seal circlip using snap ring pliers.


Zero0091

9. Separate the slide pipe from the other tube with a slide-hammer action.


Zero0092

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


Zero0090

11. Slide the guide bushing, seal spacer, oil seal, circlip and dust seal from the pipe.

RH Assembly


Zero0105

1. Install the fork bullet onto the end of the slide pipe.



Zero0101

1. Guide bushing
2. Seal spacer
3. Oil seal
4. Circlip
5. Dust seal

2. Slide new dust seal (5), the circlip (4), the new oil seal (3), the new seal spacer (2) and the new guide bushing (1) onto the slide pipe.

   Note: Lubricate all seals before installation.

3. Remove the fork bullet.


Zero0093

4. Slide the new slide bushing into the groove on the pipe.

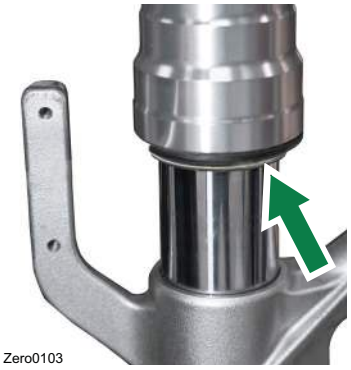
5. Insert the pipe into the outer tube.


Zero0094

6. Slide the dust seal and circlip to the bottom of the pipe. Install the seal driver below the oil seal. Then, slide the tool to push the oil seal, spacer and bushing into the outer tube. With the seal properly seated, remove the seal driver.


Zero0095

7. Install the circlip in the clip groove.


Zero0103

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

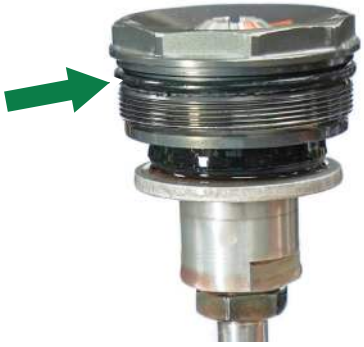


Zero0096

9. Add oil to the outer tube.
   - SS-47 (10 W) oil: 19.1 fl oz (564 ml)
   - Fill to approximately 3 7/8 in. (90 mm) from the top of the tube.


Zero0088

10. Install the spring assembly into the outer tube.


Zero0102

11. Install the new O-ring onto the fork bolt.


Zero0098

12. Install the cartridge assembly into the outer tube.


Zero0099

13. Use the fork cartridge tool to tighten the assembly. Torque: 66 ± 7 lb-ft (90 ± 10 Nm).


Zero0100

14. Tighten the fork bolt. Torque: 26 ± 4 lb-ft (35 ± 5 Nm).
15. Install the fork onto the motorcycle.
16. Adjust the suspension as outlined in the Operator Manual.

Fork Alignment

NOTICE: This procedure ensures the proper alignment and installation of front end parts such as the forks, axle shaft, and brake components. Following this procedure can extend the life of brake pads, calipers and rotors and ensure optimal performance.

Tools Required (includes tools required for parent jobs):

- 17 mm hex bit socket
- 6 mm hex bit socket
- T50

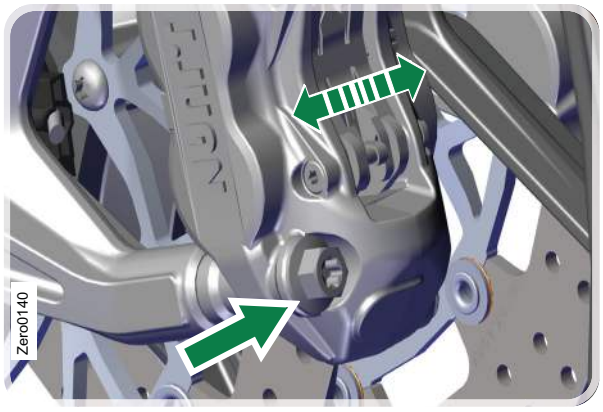
Alignment



1. If not already supported, lift the wheel using a stand or other lifting device. If a stand is used, make sure the stand allows access to tighten the axle shaft.



2. With the pinch bolts on the right fork loose, torque the axle shaft. Tool: 17 mm hex bit socket. Torque: m40 lb-ft (54 Nm).



3. Check and adjust the caliper mounting bolts. The bolts should be just tight enough to allow the caliper to wobble back and forth.

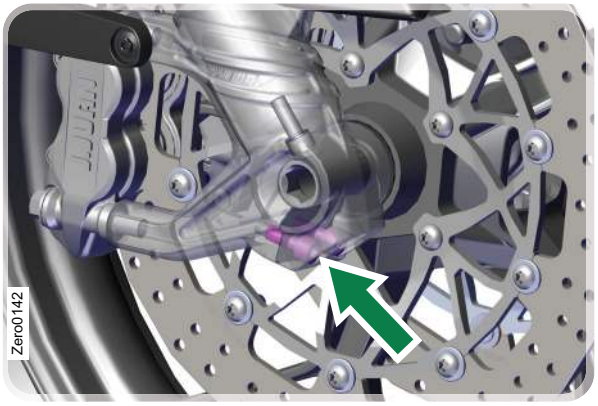


4. Spin the wheel and apply the brakes with the wheel in motion. Repeat about 5 times to properly seat the brake pads.

5. Remove the stand or lifting device to allow the front wheel to rest on the ground.



6. Press down on the top of the bike to reciprocate the forks up and down. This will allow the forks to properly seat on the axle shaft.



7. Tighten the front axle pinch bolts (x2). Tool: 6 mm hex. Torque: 16 lb-ft (22 Nm).
8. Raise the front wheel using the stand or lifting device again.
9. Spin the wheel and apply the brake with the wheel in motion. Do not release the brake lever.
10. With the lever still applied, tighten the brake caliper bolts. Tool: T50. Torque: 30 lb-ft (41 Nm).

Rear Shock

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T20
- T25
- T30
- T50
- 3/16” standard screwdriver
- 2 mm hex wrench
- 10 mm socket and ratchet
- 17 mm socket
- Hoist
- Ratchet straps (x2)

New Fasteners Required:

- Cable ties (quantity: 1)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*



2. Safely raise rear tire off the ground using a motorcycle stand.



3. **DO NOT LIFT THE MOTORCYLE BY JACKING UP THE CONTROLLER! DO NOT SUPPORT THE WEIGHT OF THE MOTORCYCLE BY SUPPORTING THE CONTROLLER! Doing so, will damage the controller and other components.**



4. Route ratchet straps through rear subframe in order to lift the rear of the motorcycle with a hoist.

   CAUTION: **Use two ratchet straps to distribute the load. Using a single ratchet strap is unsafe, due to being a single point of failure.**



5. Raise rear of bike by the rear subframe with the hoist just enough to remove the load from the rear shock.



6. Remove bolt securing shock to swingarm. Collect nut, flat steel washer, and composite washers (x2). Tools: T50 and 17 mm socket. Torque: 52 lb-ft (71 Nm).



7. Remove bolt securing shock to motorcycle frame. Tool: T50. Torque: 52 lb-ft (71 Nm).



8. Protect painted surfaces with shop cloths.



9. Remove bolt securing ground wire to bottom of rear shock and collect star washer (between wire eyelet and shock body). Tool: T20. Torque: 2 lb-ft (3 Nm).



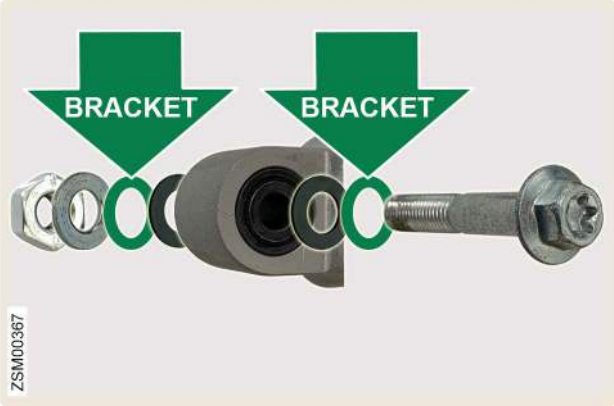
10. Remove bolt securing ground wire to bottom of rear shock and collect star washer (between wire eyelet and shock body). Tool: T20. Torque: 2 lb-ft (3 Nm).
11. Remove rear shock.

Installation

1. Installation is the reverse of the removal procedure, with the exception of the following installation note:



2. The order of shock ground wire fasteners: bolt, wire eyelet, and steel star washer.



3. The order of fasteners and washers to mount the rear shock to the swingarm.

Swingarm

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T20
- T25
- T30
- T40
- T45
- T50
- 3/16” standard screwdriver
- 2 mm hex wrench
- 10 mm socket and ratchet
- 13 mm socket
- 17 mm socket
- 27 mm socket
- 13 mm wrench
- Non-marring trim removal/pry tool
- Motorcycle stand
- Hoist
- Ratchet straps (x2)

New Fasteners Required:

- Cable tie (quantity: 1)
- License plate harness anchor (quantity: 1)

New Seals Required:

- Crush washers (x2)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*



2. Tape the swingarm to keep the brake caliper from damaging the painted surfaces.



5. Center bolt secures the rear shock ground wire eyelet and star washer underneath it.



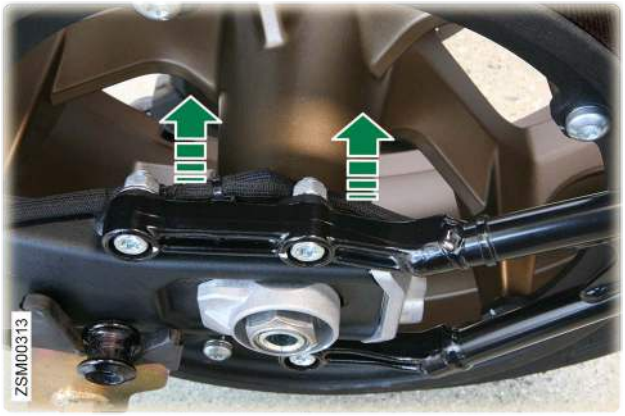
3. Safely raise rear tire off the ground using a motorcycle stand.



6. Remove bolt securing the rear inner fender to the rear swingarm. Tool: T25
7. Remove the rear inner fender.



4. Remove bolts (x2) securing the rear inner fender to the rear swingarm. Tool: T25. Torque: 2 lb-ft (3 Nm).



8. Rotate tucked license plate harness up to gain access to cable ties.

   Note: Neatly tuck harness back in place during reinstallation process to protect harness from damage while riding.



9. Release license plate harness anchor securing the license plate light harness to the swingarm. Tool: Non-marring trim removal/pry tool

   Note: Replace single-use harness anchor during the installation process.



10. Remove bolts (x3) securing the rear fender arm to the swingarm. Collect the nuts (x3) and washers (x3). Tool: T45 and 13 mm. Torque: 25 lb-ft (34 Nm).
11. Set ROF arm (with license plate light harness still attached) aside where it won't get damaged during the repair procedure.



12. Remove rear axle nut and collect the rear axle adjuster. Tool: 27 mm. Torque: 75 lb-ft (102 Nm).



13. Remove left adjuster bolt and collect the left swingarm end cap. Tool: T45



14. Remove left adjuster bolt and collect the right swingarm end cap. Tool: T45



15. Slide rear axle forward.



16. Slip belt off of the rear sprocket.



17. Place rag over rear caliper to protect painted surfaces.



18. Lift rear tire slightly and slide rear axle out of the swing arm.



19. Raise rear tire and remove rear WSS (wheels speed sensor) and set aside.

    Note: Make sure the WSS is supported and not straining the WSS harness.

20. Lower the rear tire carefully to keep from damaging painted surfaces.



21. Place rag over the left side of the swingarm between the rear sprocket and the swing arm to protect painted surfaces.

22. Roll rear tire forward.



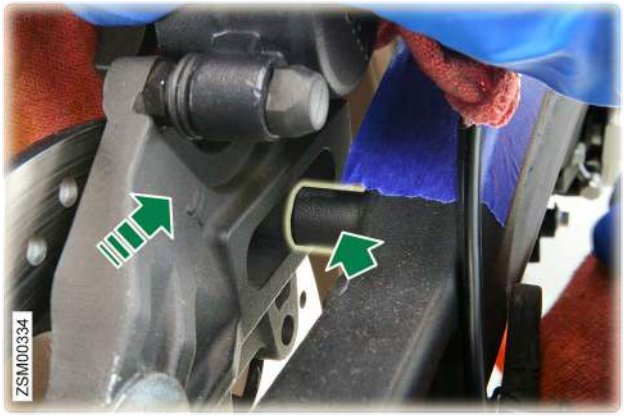
23. Release rear brake hose from the metal retaining clip.



24. Position the rear brake hose on top of clip.



25. Tip the top of the rear tire to the left.



26. Slide rear caliper assembly toward wheel and slide caliper bracket off of the bracket alignment pin.



27. Tie caliper up to the foot peg bracket.

    Note: Make sure the brake caliper is hung up and not straining the brake hose.

28. Roll the rear wheel out of the swing arm.



29. **DO NOT LIFT THE MOTORCYLE BY JACKING UP THE CONTROLLER! DO NOT SUPPORT THE WEIGHT OF THE MOTORCYCLE BY SUPPORTING THE CONTROLLER! Doing so, will damage the controller and other components.**



30. Route ratchet straps through rear subframe in order to lift the rear of the motorcycle with a hoist.

    CAUTION: **Use two ratchet straps to distribute the load. Using a single ratchet strap is unsafe, due to being a single point of failure.**



31. Raise rear of bike by the rear subframe with the hoist just enough to remove the load from the rear shock.



32. Remove bolt securing shock to swingarm. Collect nut, flat steel washer, and composite washers (x2). Tools: T50 and 17 mm socket. Torque: 52 lb-ft (71 Nm).



33. Remove bolt securing shock to motorcycle frame. Tool: T50. Torque: 52 lb-ft (71 Nm).



34. Protect painted surfaces with shop cloths.



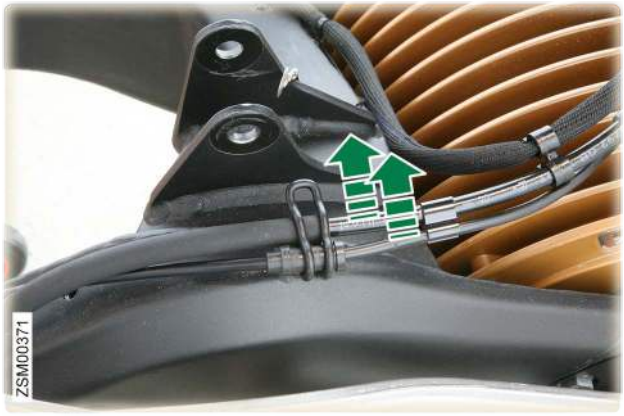
35. Remove bolt securing ground wire to bottom of rear shock and collect star washer (between wire eyelet and shock body). Tool: T20. Torque: 2 lb-ft (3 Nm).



36. Remove bolt securing ground wire to bottom of rear shock and collect star washer (between wire eyelet and shock body). Tool: T20. Torque: 2 lb-ft (3 Nm).
37. Remove rear shock.



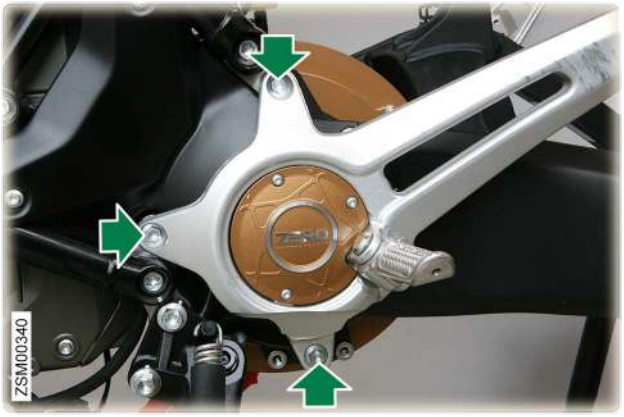
38. Release rear WSS harness from metal retaining clip.



39. Release brake hose and rear WSS harness from metal retaining clip.



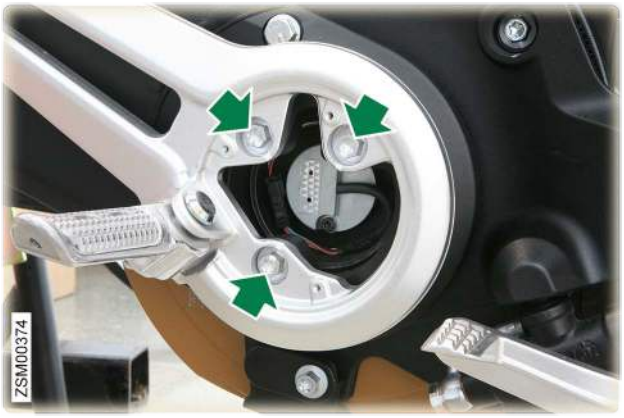
40. Tie rear brake caliper (wrapped in a rag to protect painted surfaces) and WSS to the side of the motorcycle frame.



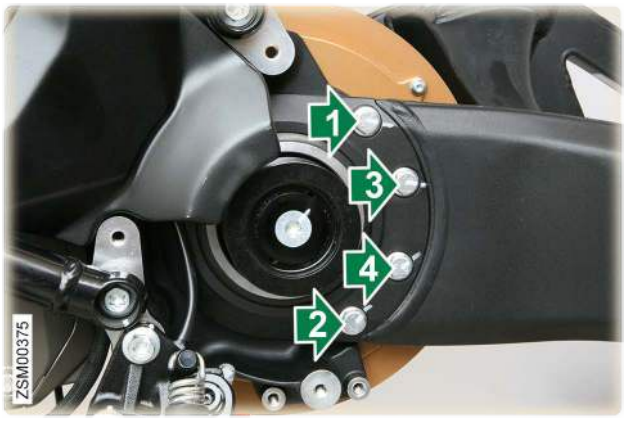
41. Remove bolts (x3) securing left foot peg bracket to the left doubler plate. Tool: T40. Torque: 20 lb-ft (27 Nm).
42. Remove foot peg bracket.



43. Remove bolts (x3) securing encoder cover plate from right foot peg bracket. Tool: T20. Torque: 2 lb-ft (3 Nm).
44. Remove encoder cover.



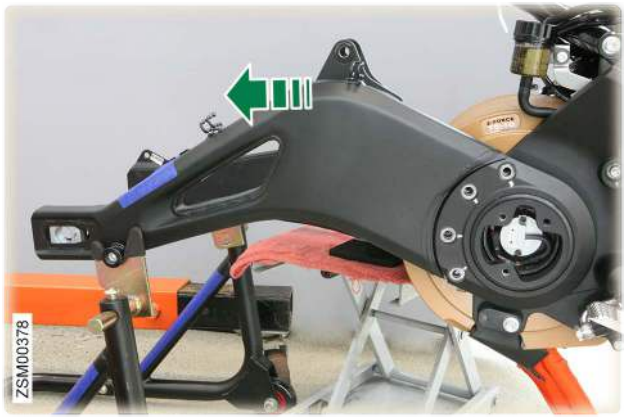
45. Remove bolts (x3) securing right foot peg bracket to right doubler plate. Tool: T40. Torque: 20 lb-ft (27 Nm).
46. Remove right foot peg bracket.



47. Remove bolts (x4) securing swingarm to left outer bearing cover. Tool: 13 mm socket. Torque (in sequence shown): 24.5 lb-ft (33 Nm).



48. Remove bolts (x4) securing swingarm to right outer bearing cover. Tool: 13 mm socket. Torque (in sequence shown): 24.5 lb-ft (33 Nm).



49. Remove swingarm.



50. Collect the shims located between the right outer bearing cover and the swingarm.

    Note: Install the same shims upon reinstallation of the swingarm. The shims are specific to the swingarm.

Installation

1. Installation is the reverse of the removal procedure, but take note of the following installation step.



2. Install bolts (x3) securing the rear fender arm to the swingarm. Collect the nuts (x3) and washers (x3). Tool: T45and 13 mm socket. Torque (in sequence shown): 25 lb-ft (34 Nm).



3. Upon installation of the swingarm (while it's still bare), pivot the swingarm upwards and allow it to fall. If it binds and doesn't fall, check the condition of the bearings and if you installed the correct amount of shims.

   CAUTION: **If the swingarm doesn't fall on its own during this test and you've confirmed that both swingarm shims are installed and the bearings are in good condition, contact Zero Motorcycles Customer Service department for assistance.**

   - **North America:** **support@zeromotorcycles.com**
   - **Zero Motorcycles Europe:** **service.eu@zeromotorcycles.com**



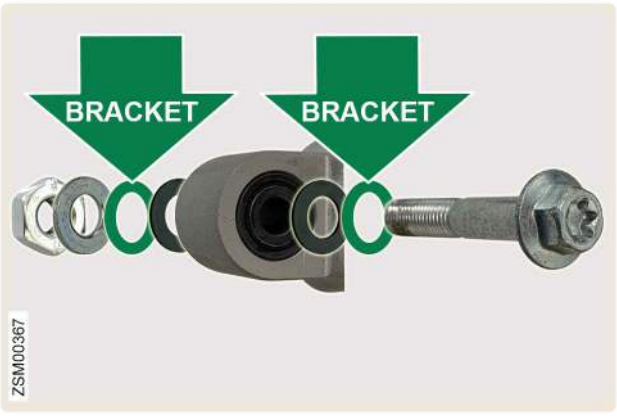
4. Remove aluminum bushing from left side (sprocket side) of the wheel.



5. When installing the WSS sensor, make sure the alignment tab is positioned against the top edge of the rear brake bracket as shown.



6. The order of shock ground wire fasteners: bolt, wire eyelet, and steel star washer.



7. The order of fasteners and washers to mount the rear shock to the swingarm.
8. Adjust drive belt after installation is complete. See *Drive Belt - Adjust, page 10.4.*

Doubler Plate Seals

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T20
- T25
- T30
- T40
- T45
- T50
- 3/16” standard screwdriver
- 2 mm hex wrench
- 10 mm socket and ratchet
- 13 mm socket
- 17 mm socket
- 22 mm 6-point socket
- 27 mm socket
- 13 mm wrench
- Non-marring trim removal/pry tool
- Motorcycle stand
- Hoist
- Ratchet straps (x2)
- Scissor jack

New Fasteners Required:

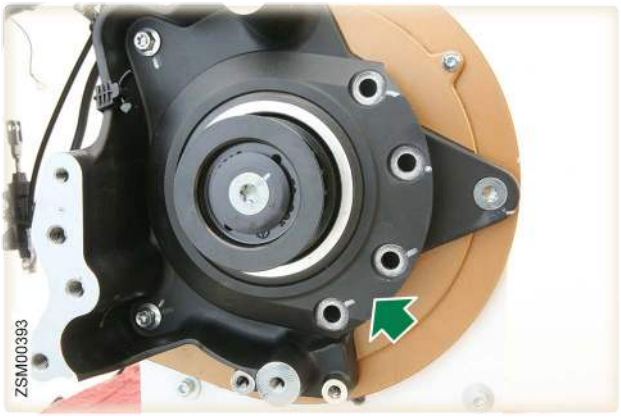
- Cable tie (quantity: 4)
- Double loop cable tie (quantity: 1)
- License plate harness anchor (quantity: 1)

New Seals Required:

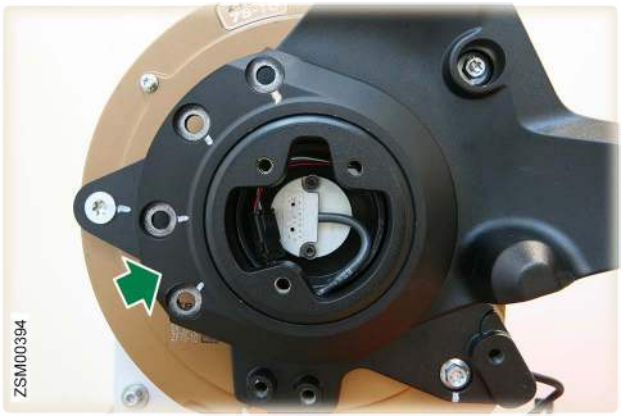
- HV cable seals (quantity: 5)
- HV cable O-rings (quantity: 5)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove motor controller. See *Motor Controller [Before 2022MY], page 30.31.*
6. Remove motor. See *Motor, page 30.1.*



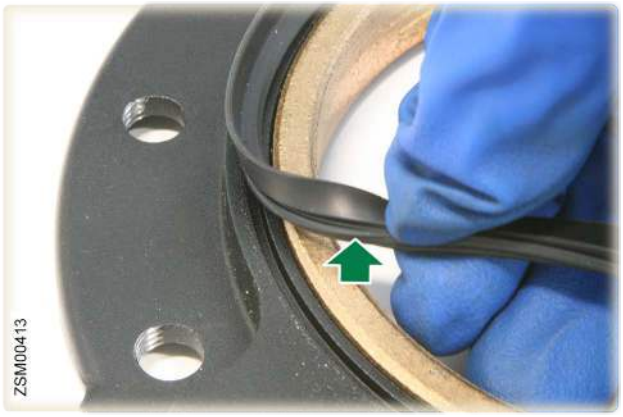
7. Remove left outer bearing cover.



8. Remove right outer bearing cover.

Installation

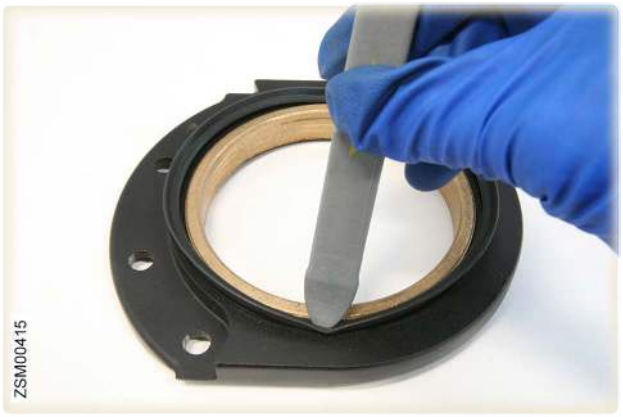
1. Installation is the reverse of the removal procedure, but take note of the following installation steps.



2. The inside seal for the outer bearing cover has a rib (see arrow) on one side that must be pressed into the seal groove in the outer bearing cover. It must be pressed in evenly to seal properly.



3. Thinking of the outer bearing cover as an analog clock face, use a blunt tool to press the seal into the groove in the cover at the 12 o'clock position.



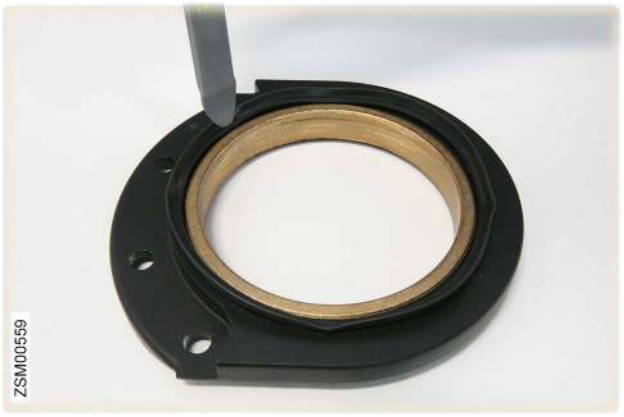
4. Press the seal into the groove at the 6 o'clock position.



5. Press the seal into the groove at the 3 o'clock position.



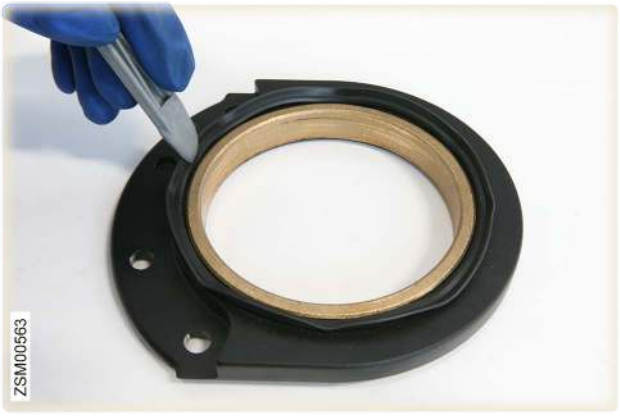
6. Press the seal into the groove at the 9 o'clock position.



7. Press the seal into the groove about the 11 o'clock position.



8. Press the seal into the groove at about the 5 o'clock position.



11. Press the seal into the groove at about the 10 o'clock position.



9. Press the seal into the groove at about the 2 o'clock position.



12. Press the seal into the groove at about the 4 o'clock position.



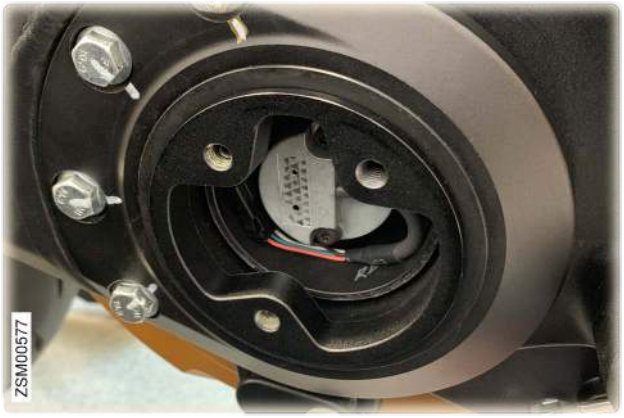
10. Press the seal into the groove at about the 8 o'clock position.



13. Continue alternating from side to side, pressing the seal into the outer bearing cover evenly. Continue pressing the seal into the groove until the seal is completely seated.



14. Follow the same process to evenly install the seal in the second outer bearing cover.



15. After installing the outer bearing covers (left and right) on the doubler plates and installing the swingarm on the outer bearing plates, then install the outer bearing cover exterior seals.

    Note: The exterior seals on the outer bearing covers will pop off the cover during the installation of the swing arm, so install the seals after the outer bearing covers are torqued to the swingarm.



16. The exterior seal for the outer bearing cover has a front and a back side. The part number is only printed on the back side of the seal.



17. The seal must be pressed into the seal groove in the doubler plate. It must be inserted into the assembly evenly to seal properly.

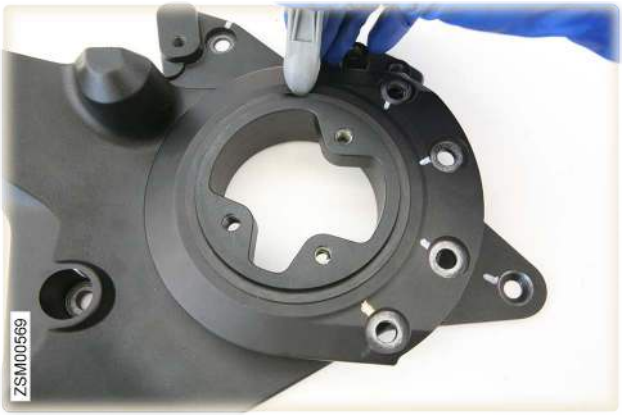


18. Start sliding the seal under the edge of the doubler plate.

    Note: The following photos show the doubler plate on a bench for instructional purposes only. The seals should be installed after the doubler plate is installed on the motorcycle.



19. Slide the seal around the doubler plate to center the seal over the outer bearing cover and the doubler plate.



20. Thinking of the outer bearing cover as an analog clock face, use a blunt tool to press the seal into the groove in the cover at the 12 o'clock position.



21. Press the seal into the groove at the 6 o'clock position.



22. Press the seal into the groove at the 3 o'clock position.



23. Press the seal into the groove at the 9 o'clock position.



24. Press the seal into the groove about the 1 to 2 o'clock position.



25. Press the seal into the groove at about the 7 to 8 o'clock position.



26. Continue alternating from side to side, pressing the seal into the outer bearing cover evenly. Continue pressing the seal into the groove until the seal is completely seated.



27. Follow the same process to install the outer seal evenly in the left outer bearing cover.

Brake Master Cylinder (Front)

WARNING! Do not clamp brake hoses, as they will be damaged and will require replacement.

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

WARNING! Brake fluid is highly toxic; keep containers sealed and out of the reach of children. It accidental consumption of fluid is suspected, seek medical attention immediately. If the brake fluid comes into contact with the skin or eyes, rinse immediately with plenty of water. Brake fluid can damage plastic and painted surfaces. Handle with care and wipe up spills immediately.

CAUTION: **Do not operate the brake lever while the master cylinder, and or brake caliper(s) is/ are removed or while the brake system is disassembled.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- 5 mm hex wrench
- 8 mm hex wrench
- 9 mm hex wrench
- 14 mm flare nut wrench

New Fluid Required:

- DOT 4 brake fluid

New Seals Required:

- Crush washers (x2)

Removal



1. Remove banjo bolt and discard crush washers (x2). Tool: 14 mm flare nut wrench. Torque: 20 lb-ft (27 Nm).

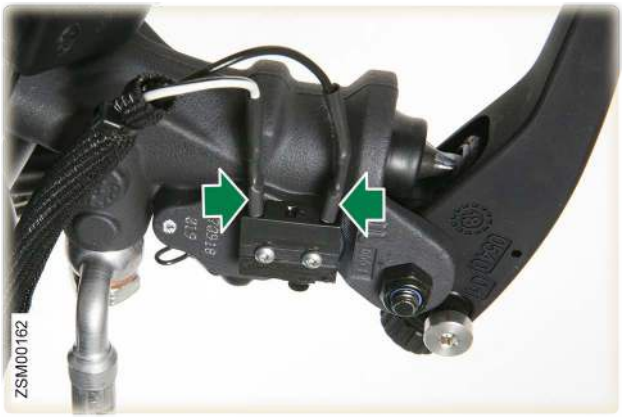
   CAUTION: **Plug all open connections to prevent ingress of moisture and debris.**

   CAUTION: **Brake fluid is extremely harmful to paint, so if brake fluid contacts a painted surface, wash the surface immediately.**

   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.

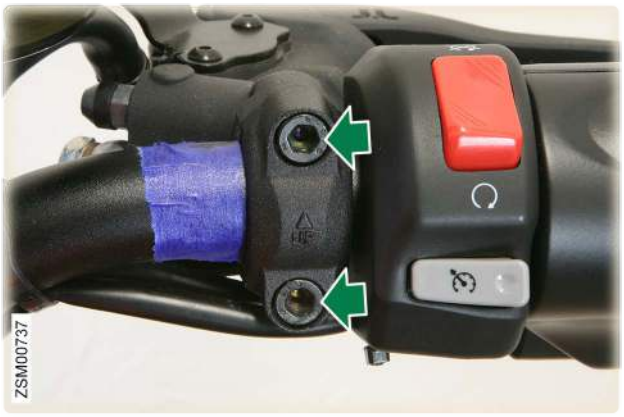


2. Disconnect front brake switch harness wire connectors (x2).

   Note: Document location and color of wires before disconnecting them.



3. Wrap tape around the handlebar and mark the parting line of the front master cylinder to record its location.



4. Remove the front master cylinder clamp bolts (x2) securing the master cylinder assembly to the handlebar. Tool: 5 mm hex wrench. Torque: 8 lb-ft (11 Nm).

   Note: hold front brake master cylinder while removing clamp bolts.

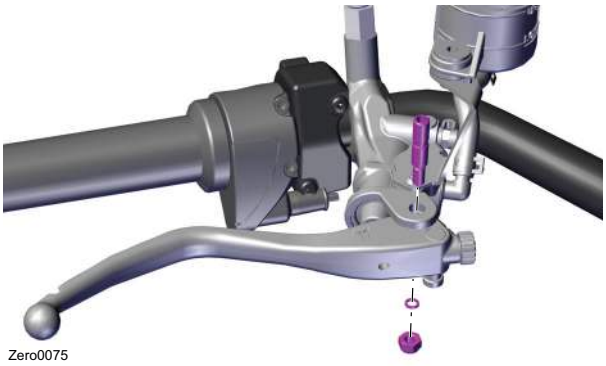
5. Remove the front master cylinder.

Installation

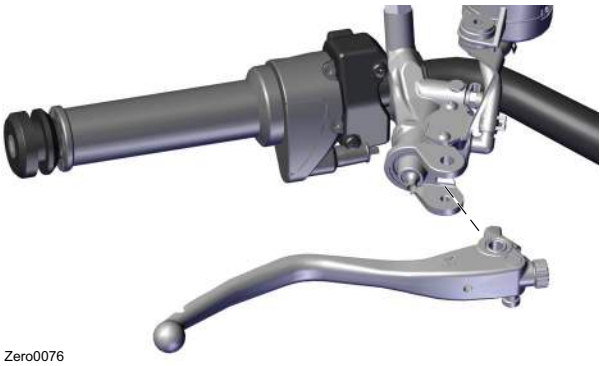
1. Installation is the reverse of the removal procedure, except for the following:
2. Perform brake bleeding procedure. See *Brake Bleeding Procedure (Front), page 10.7.*

Brake Lever (Front)

Removal



1. Remove the pin, nut and washer that secure the brake lever assembly.



2. Remove the lever assembly.



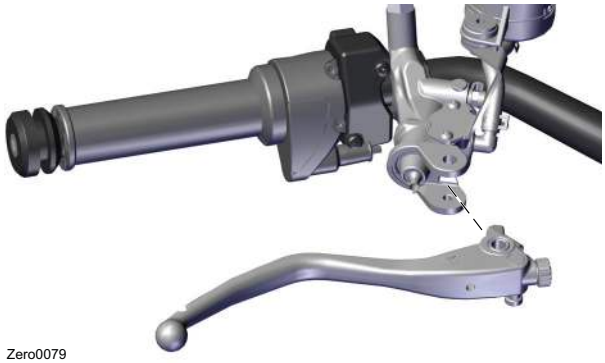
3. Press the bushing from the assembly and separate the pusher and spring from the brake lever. Discard the spring and bushing.

Installation



Zero0078

1. Assemble the pusher, new spring and new brake lever and then press the new bushing into the assembly.



Zero0079

2. Position the brake lever assembly onto the master cylinder assembly.



Zero0075

3. Apply multi-purpose grease to the pin shaft and install the pin, washer and nut.
   Pin torque: 1 lb-ft. (1.5 Nm)
   Nut torque: 4 lb-ft. (5.5 Nm)
4. Verify proper brake lever action. Check to see that the front wheel spins freely and no brake pressure is applied. If there is brake pressure, contact your Zero Dealer for assistance.

Brake Pads (Front)

CAUTION: Do not operate the brake lever while the master cylinder, and or brake caliper(s) is/ are removed or while the brake system is disassembled.

Tools Required (includes tools required for parent jobs):

- T25

Removal



ZSM00184

1. Remove brake caliper pin-bolt clips (x2).



ZSM00185

2. Remove brake caliper pin bolts (x2). Tool: T25. Torque: 6 lb-ft (8 Nm).



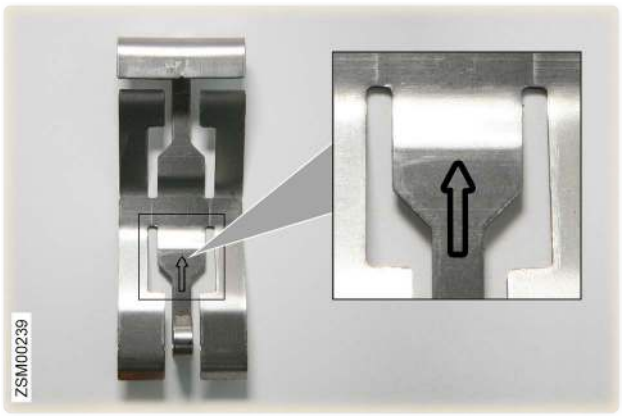
3. Remove brake pad anti-rattle spring plate.



4. Remove brake pads.

Installation

1. Installation is the reverse of the removal procedure, with the exception of the following:



2. The anti-rattle clip is installed with the arrow pointing up.



3. Install the upper brake pad pin (1), capturing the anti-rattle clip first. Install the lower brake pad pin (2), capturing the anti-rattle clip second. Tool: T25. Torque: 6 lb-ft (8 Nm).
4. Align the forks. See *Fork Alignment, page 40.13.*
5. After installing new brake pads, perform the brake pad bedding procedure. See *Brake Bedding, page 10.9.*

Brake Caliper (Front)

CAUTION: Do not operate the brake lever while the master cylinder, and or brake caliper(s) is/ are removed or while the brake system is disassembled.

Tools Required (includes tools required for parent jobs):

- 8 mm hex wrench
- 9 mm hex wrench
- T25
- T50
- 14 mm flare wrench

New Fluid Required:

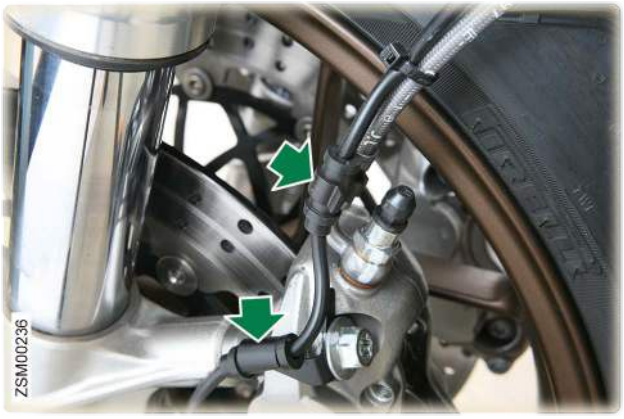
- DOT 4 brake fluid

New Seals Required:

- Crush washers (x2)

Removal

1. Remove front brake pads. See *Brake Pads (Front), page 45.3.*



2. Release wheel speed sensor (WSS) harness from the left front brake hose clips (x2).



3. Remove left front caliper banjo bolt and discard crush washers (x2). Tool: 14 mm flare nut wrench. Torque: 20 lb-ft (27 Nm).

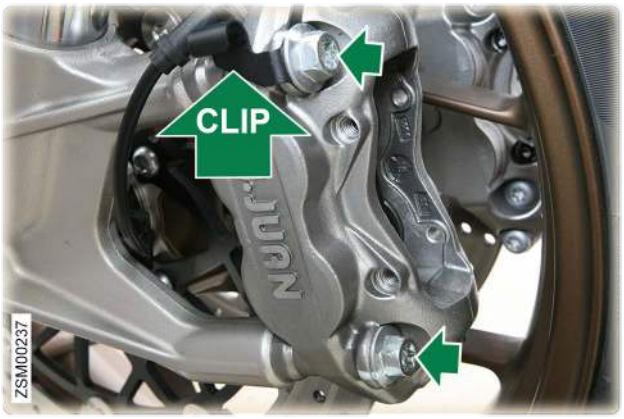
   CAUTION: Plug all open connections to prevent ingress of moisture and debris.

   CAUTION: Brake fluid is extremely harmful to paint, so if brake fluid contacts a painted surface, wash the surface immediately.

   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.



4. Remove left front caliper bolts (x2) and collect retaining clip. Tool: T50. Torque: 30 lb-ft (41 Nm).
5. Remove front brake caliper.

Installation

1. Installation is the reverse of the removal procedure, except for the following:

2. Perform brake bleeding procedure. See *Brake Bleeding Procedure (Front), page 10.7.*
3. Align the forks. See *Fork Alignment, page 40.13.*
4. If new brake pads have been installed, perform the brake pad bedding procedure. See *Brake Bedding, page 10.9.*

Brake Rotor (Front)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T25
- T30
- T40
- T50
- 3/16” standard screwdriver
- 2 mm hex wrench
- 10 mm socket and ratchet
- 13 mm socket
- Ratchet straps (x2)
- Hoist

New Fasteners Required:

- New rotor mounting bolts - 5 per rotor (see parts book)
- Cable ties (quantity: 2)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove tank assembly. See *Tank Removal, page 60.9.*
6. Remove headlight inner fairing. See *Headlight Inner Fairing, page 60.3.*



7. Remove bolts (x2) securing left side of front closeout panel to frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).

   Note: Protect rear portion of front fender and front closeout panel surfaces to reduce the possibility of scratching their surfaces.



8. Remove bolts (x2) securing right side of front closeout panel to frame.Tool: T25. Torque: 3.5 lb-ft (5 Nm).
9. Remove front closeout panel.



10. Release WSS harness from the left front brake hose clips (x4).



11. Remove left front caliper bolts (x2) and collect retaining clip. Tool: T50. Torque: 30 lb-ft (41 Nm).
12. Remove left front caliper from rotor.



13. Wrap left front caliper and tie the caliper to the frame to eliminate strain on the brake hose.



14. Remove right front caliper bolts (x2). Tool: T50. Torque: 30 lb-ft (41 Nm).
15. Remove right front caliper from rotor.



16. Wrap right front caliper and tie the caliper to the frame to eliminate strain on the brake hose.



17. Loosen front axle pinch bolts (x2). Tool: 6 mm hex. Torque: 16 lb-ft (22 Nm).



18. **DO NOT LIFT THE MOTORCYLE BY JACKING UP THE CONTROLLER! DO NOT SUPPORT THE WEIGHT OF THE MOTORCYCLE BY SUPPORTING THE CONTROLLER! Doing so, will damage the controller and other components.**



19. Safely loop straps around the motorcycle frame on the left (shown) and right.



20. Safely hook the ends of the straps to a hoist.



21. Using the hoist, raise the front of the motorcycle until the front tire is slightly off the floor.



22. Remove front axle and collect the front wheel. Tool: 17 mm hex bit socket. Torque: 40 lb-ft (54 Nm).



23. Release the front WSS from the front wheel.



24. Remove bolts (x5) securing the brake rotor to the front wheel. Tool: T40. Torque: 20 lb-ft (27 Nm).

Installation

1. Installation is the reverse of the removal procedure, but take note of the following installation step.
2. Clean the calipers and pistons. Make sure the pistons move freely. If the piston(s) do not move freely, replace the caliper(s).
3. Clean the mating surfaces between the wheel and the brake rotor using a Scotch-brite pad or equivalent. Remove all burrs, rust, and other debris. Use caution to avoid damaging painted surfaces.
4. Remove the old Loctite from the threaded holes using a round brass brush and compressed air.
5. Clean the rotor with brake cleaner and install on the hub.



6. Install new rotor bolts (with Loctite). Tighten by hand in a star pattern. Continue tightening in increments to 20 lb-ft (27 Nm). Do not use an impact wrench for installation.
7. Install the wheel. Refer to the following step for wheel speed sensor alignment.



8. When installing the front WSS, make sure the alignment tab is positioned against the bottom edge of the left front shock as shown.

9. Install both brake calipers. Tighten the caliper bolts so that they are only lightly pressed against the caliper.
10. Then, squeeze the front brake lever repeatedly until the brake pads are fully in contact with the brake rotors.
11. Next, pull the brake lever and secure it in the pulled position on the handlebar with a cable tie. This ensures thath the brake calipers are properly aligned with the brake rotors.
12. Now, tighten the brake caliper bolts to a torque of 30 lb-ft (41 Nm). The brake lever can now be released.
13. Align the forks. See *Fork Alignment, page 40.13.*
14. After replacing a brake rotor, perform the brake pad bedding procedure. See *Brake Bedding, page 10.9.*

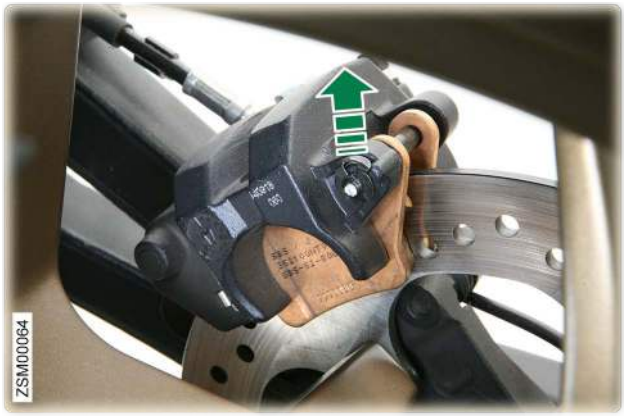
Brake Pads (Rear)

CAUTION: **Do not operate the brake lever while the master cylinder, and or brake caliper(s) is/ are removed or while the brake system is disassembled.**

Tools Required (includes tools required for parent jobs):

- T25

Removal



1. Remove rear brake caliper pin retaining clip.



2. Remove rear brake caliper pin bolt. Tool: T25. Torque: 6 lb-ft (8 Nm).



3. The eyelet end of the brake pads need to drop in order to release it from the caliper.



4. Remove both rear caliper brake pads.

Installation

1. Installation is the reverse of the removal procedure.
2. After installing new brake pads, perform the brake pad bedding procedure. See *Brake Bedding, page 10.9.*

Brake Caliper (Rear)

Tools Required (includes tools required for parent jobs):

- 9 mm hex wrench
- T25
- T40
- T45
- 27 mm socket and ratchet
- 13 mm wrench
- Motorcycle stand

New Fasteners Required:

- Cable ties (quantity: 1)

New Seals Required:

- Crush washers (x2)

Removal

1. Remove drive belt. See *Drive Belt - Replace, page 30.47.*
2. Remove brake pads from the rear caliper. See *Brake Pads (Rear), page 45.10.*



3. Safely raise rear tire off the ground using a motorcycle stand.



4. Remove rear caliper banjo bolt and discard crush washers (x2). Tool: 14 mm flare nut wrench. Torque: 20 lb-ft (27 Nm).

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

   CAUTION: **Brake fluid is extremely harmful to paint, so if brake fluid contacts a painted surface, wash the surface immediately.**

   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.



5. Place rag over rear caliper to protect painted surfaces.



6. Lift rear tire slightly and slide rear axle out of the swing arm.



7. Raise rear tire and remove rear wheel speed sensor (WSS) and set aside.

   Note: Make sure the WSS is supported and not straining the WSS harness.

8. Lower the rear tire carefully to keep from damaging painted surfaces.



9. Place rag over the left side of the swingarm between the rear sprocket and the swing arm to protect painted surfaces.

10. Roll rear tire forward.



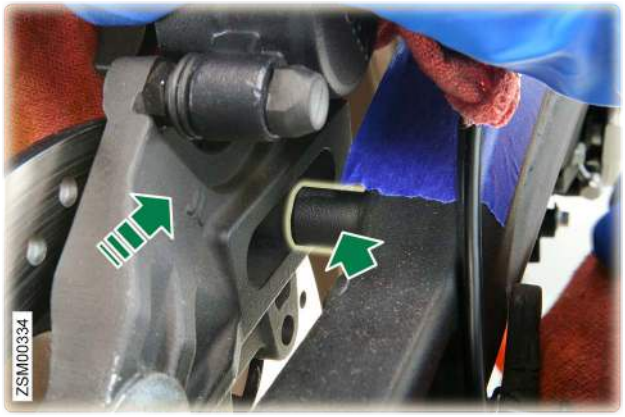
11. Release rear brake hose from the metal retaining clip.



12. Position the rear brake hose on top of clip.



13. Tip the top of the rear tire to the left.



14. Slide rear caliper assembly toward wheel and slide caliper bracket off of the bracket alignment pin.
15. Remove rear brake caliper.

Installation

1. Installation is the reverse of the removal procedure, with the exception of the following:



2. When installing the rear WSS, make sure the alignment tab is positioned against the top edge of the rear brake bracket as shown.



3. Confirm that the aluminum bushing from left side (sprocket side) of the wheel is installed in the seal prior to installation of the wheel.
4. Perform brake bleeding procedure. See *Brake Bleeding Procedure (Rear), page 10.8.*
5. If new brake pads have been installed, perform the brake pad bedding procedure. See *Brake Bedding, page 10.9.*

Brake Rotor (Rear)

Tools Required (includes tools required for parent jobs):

- T25
- T40
- T45
- 27 mm socket and ratchet
- 13 mm wrench
- Motorcycle stand

New Fasteners Required:

- New rotor mounting bolts (see parts book)
- Cable ties (quantity: 1)

Removal

1. Remove drive belt. See *Drive Belt - Replace, page 30.47.*
2. Remove brake pads from the rear caliper. See *Brake Pads (Rear), page 45.10.*



3. Safely raise rear tire off the ground using a motorcycle stand.



4. Release rear WSS harness from plastic retainer.



5. Place rag over rear caliper to protect painted surfaces.



6. Lift rear tire slightly and slide rear axle out of the swing arm.



7. Raise rear tire and remove rear WSS and set aside.

   Note: Make sure the WSS is supported and is not straining the WSS harness.

8. Lower the rear tire carefully to keep from damaging painted surfaces.



9. Place rag over the left side of the swingarm between the rear sprocket and the swing arm to protect painted surfaces.
10. Roll rear tire forward.



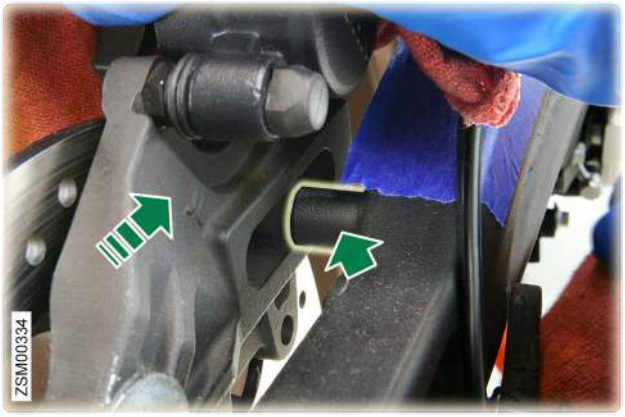
11. Release rear brake hose from the metal retaining clip.



12. Position the rear brake hose on top of clip.



13. Tip the top of the rear tire to the left.



14. Slide rear caliper assembly toward wheel and slide caliper bracket off of the bracket alignment pin.



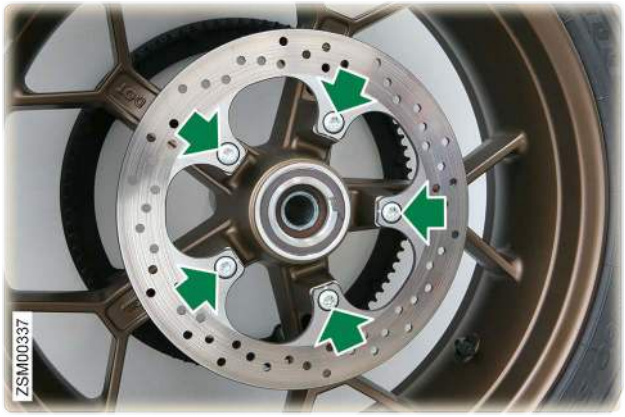
15. Tie caliper up to the foot peg bracket.

    Note: Make sure the brake caliper is hung up and not straining the brake hose.

16. Roll the rear wheel out of the swing arm.



17. Remove aluminum bushing from left side (sprocket side) of the wheel.



18. Remove bolts (x5) securing the brake rotor to the rear wheel. Tool: T40. Torque: 26 lb-ft (35 Nm).

Installation

1. Installation is the reverse of the removal procedure, with the exception of the following:
2. Clean the calipers and piston. Make sure the piston moves freely. If the piston does not move freely, replace the caliper.
3. Clean the mating surfaces between the wheel and the brake rotor using a Scotch-brite pad or equivalent. Remove all burrs, rust, and other debris. Use caution to avoid damaging painted surfaces.
4. Clean the rotor with brake cleaner and install on the hub.
5. Remove the old Loctite from the threaded holes using a round brass brush and compressed air.



6. Install new rotor bolts (with Loctite). Tighten by hand in a star pattern. Continue tightening in increments to 26 lb-ft (35 Nm). Do not use an impact wrench for installation.



7. When installing the rear WSS, make sure the alignment tab is positioned against the top edge of the rear brake bracket as shown.
8. After replacing the brake rotor, perform the brake pad bedding procedure. See *Brake Bedding, page 10.9.*

Rear Master Cylinder

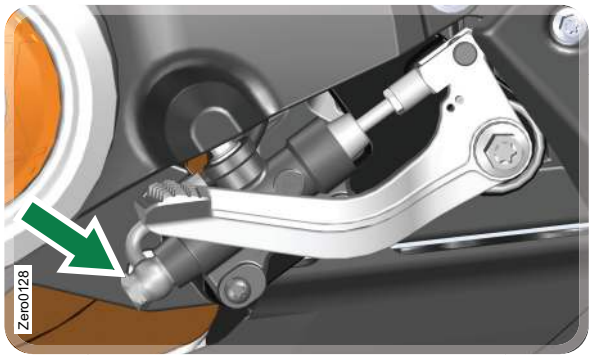
CAUTION: Do not operate the rear brake lever while any brake lines are disconnected and any parts removed.

NOTICE: Before performing any work, remove the key from the key switch.

New Fasteners Required:

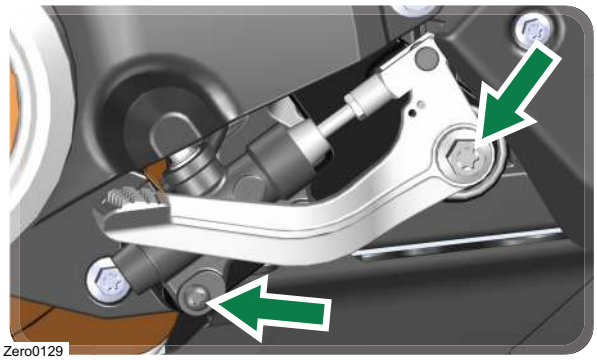
- 2 Crush washers

Removal



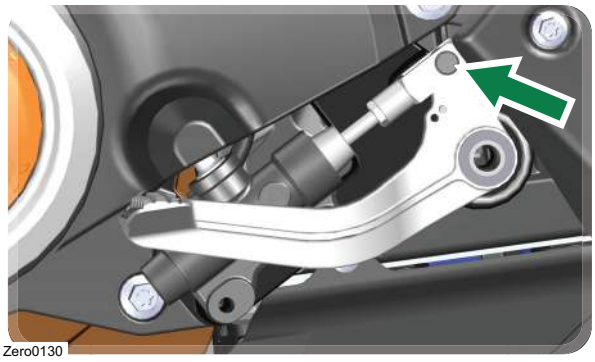
1. Remove the banjo bolt and crush washers from the rear brake line. Torque: 20 lb·ft (27 Nm)
   Discard the crush washers.

   CAUTION: Protect painted surfaces from any brake fluid drip.

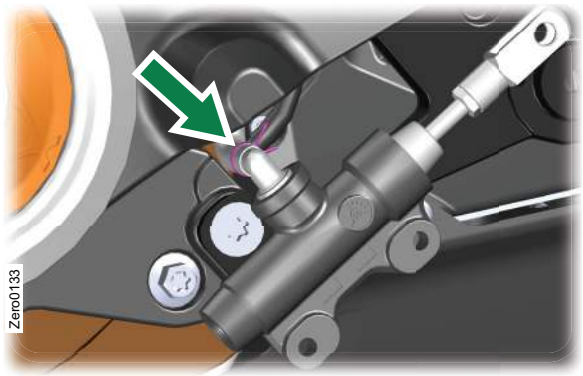


2. Remove the brake pedal screw and the two screws that secure the master cylinder.
   - Master cylinder bolt torque: 7 lb·ft (9 Nm)
   - Pedal bolt torque: 34 lb·ft (46 Nm)

   Note: Note the orientation of the pedal hardware and spring.

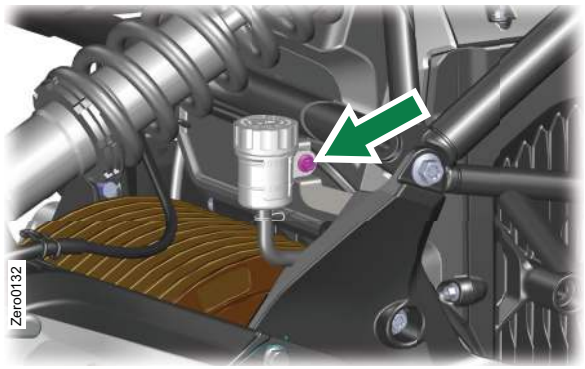


3. Press the spring detent on the end of the pin and remove the pin to separate the cylinder from the brake pedal.



4. Release the clamp and disconnect the hose to the drain the reservoir.

   Note: Remove the cap from the reservoir to allow the fluid to drain.

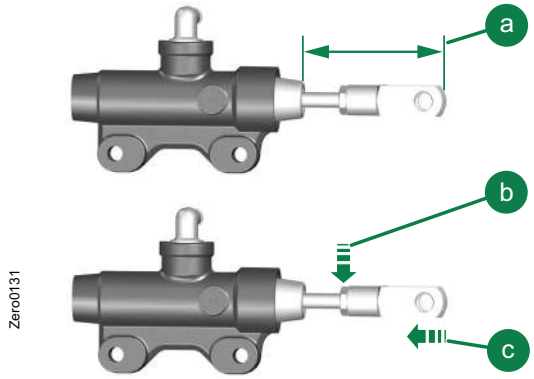


5. Unbolt the rear brake reservoir from the mounting bracket.

Note: Routing the new hose into place is extremely difficult without the removal of the doubler and swingarm. If the hose and/or the reservoir do not need to be replaced, they can be reused to facilitate the repair.

Installation

1. Installation is the reverse of the removal procedure, except for the following:
2. Install new crush washers on the banjo bolt.



3. If replacing the master cylinder, adjust the length of the rod on the new master cylinder.
   a.) Measure the length of the previous master cylinder rod.
   b.) Loosen the locknut.
   c.) Adjust the clevis in or out to match the length of the previous master cylinder rod. Tighten the locknut when the right length is achieved.
4. Perform the brake bleeding procedure. See *Brake Bleeding Procedure (Rear), page 10.8.*.

Hydraulic Control Unit (HCU)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T20
- T25
- T27
- T30
- 3/16” standard screwdriver
- 2 mm hex wrench
- 6 mm hex wrench
- 8 mm hex wrench
- 9 mm hex wrench
- 10 mm socket and ratchet
- 14 mm flare wrench
- O-ring pick

New Fasteners Required:

- Cable ties (quantity: 6)

New Seals Required:

- Crush washers (x8)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove tank assembly. See *Tank Removal, page 60.9.*
6. Remove headlight inner fairing. See *Headlight Inner Fairing, page 60.3.*
7. Tank storage liner. See *Tank Storage Liner, page 60.31.*



8. Remove bolts (x2) securing left side of front closeout panel to frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).

   Note: Protect rear portion of front fender and front closeout panel surfaces to reduce the possibility of scratching their surfaces.



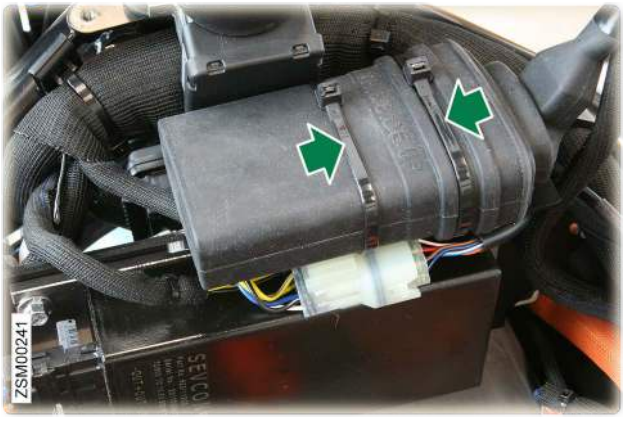
9. Remove bolts (x2) securing right side of front closeout panel to frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).
10. Remove front closeout panel.



11. Remove bolt securing the front WSS harness cushion clamp and front brake hose. Tool: T30. Torque: 5 lb-ft (7 Nm).



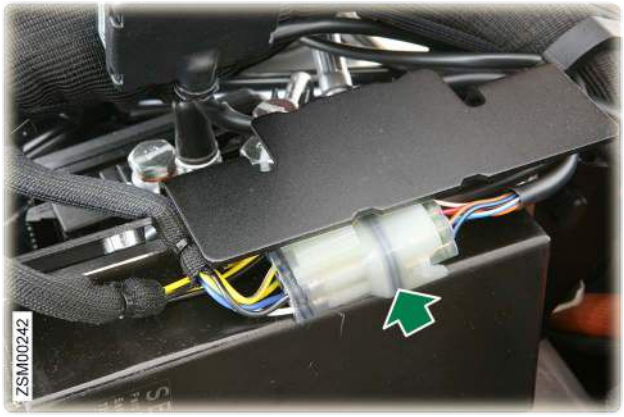
12. Unhook retaining clip to release tension on harnesses.



13. Cut cable ties (x2) securing CCM to the HCU bracket.

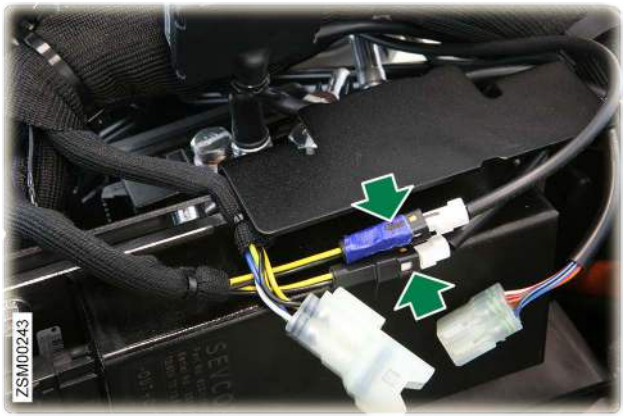
    Note: Replace cable ties (x2) during the installation process.

14. Set CCM aside to gain access to key switch harness connector.



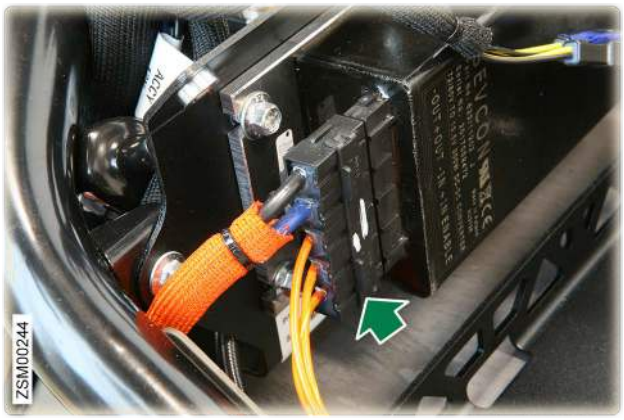
15. Disconnect key switch wiring harness connector.

    Note: Take note of harness routing for installation process.

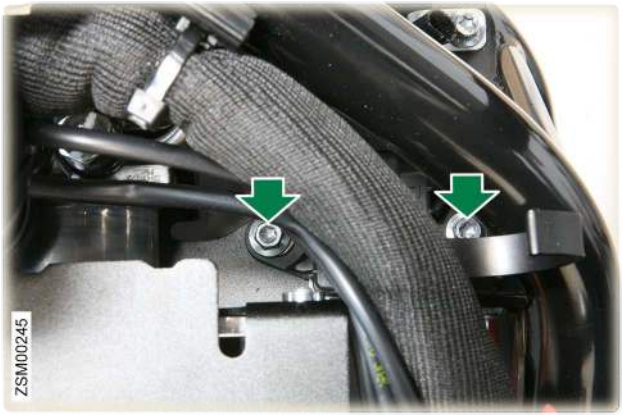


16. Disconnect heated grip harness connectors (if equipped).

    Note: Label/mark connectors.



17. Disconnect DC/DC converter harness connector.



18. Remove bolts (x2) securing IMU to the HCU bracket. Tool: T30. Torque: Hand tight.



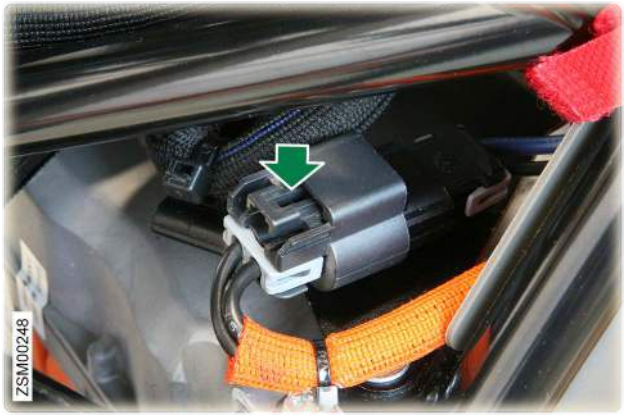
19. Release clip securing IMU harness to HCU bracket. Tool: O-ring pick

    Note: The locking tab is located on the lower portion of the clip.

20. Tie IMU aside.



21. Release grey locking clip from the DC/DC controller harness converter. Tool: O-ring pick.



22. Release DC/DC converter harness connector.



23. Release clip securing the DC/DC controller harness to HCU bracket. Tool: O-ring pick

    Note: The locking tab is located on the lower portion of the clip.

24. Remove right front caliper from rotor.



25. Remove bolt securing left front of HCU bracket to frame. Tool: T30. Torque: 6 lb-ft (8 Nm).



26. Remove bolt securing right front of HCU bracket to frame. Tool: T30. Torque: 6 lb-ft (8 Nm).



27. Remove bolts (x2) securing rear of HCU bracket to frame. Tool: T30
28. Place a shallow tray under HCU bracket.

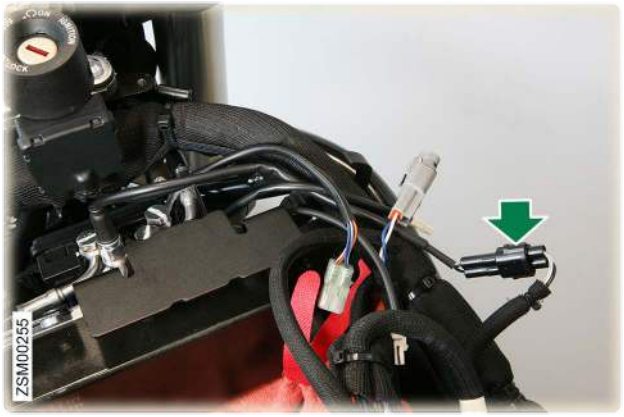


29. Move HCU bracket assembly towards the rear enough to gain access to the fittings on top of the HCU.



30. Make note of the location of brake hoses prior to removing them.

WARNING! Connecting the hoses in the wrong locations will disable the ABS functionality and can be dangerous to the rider.



31. Disconnect ABS pressure switch harness connector.



32. Remove ABS pressure switch and discard crush washers (x2). Tool: 14 mm flare wrench. Torque: 20 lb-ft (27 Nm).

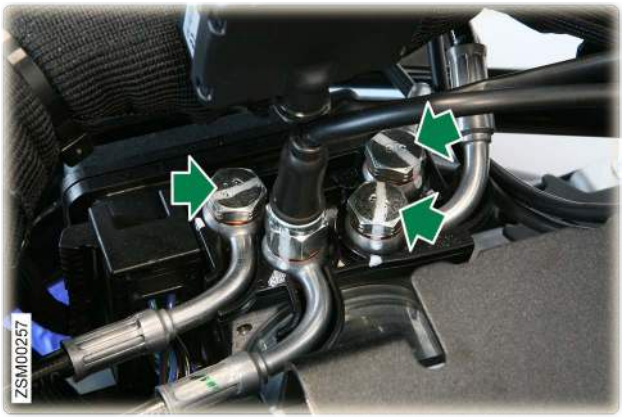
CAUTION: Plug all open connections to prevent ingress of moisture and debris.

CAUTION: Brake fluid is extremely harmful to paint, so if brake fluid contacts a painted surface, wash the surface immediately.

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 (x2) upon installation.



33. Remove brake banjo bolts (x3) and discard crush washers (x6). Tool: 14 mm flare wrench. Torque: 20 lb-ft (27 Nm).

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

CAUTION: Brake fluid is extremely harmful to paint, so if brake fluid contacts a painted surface, wash the surface immediately.

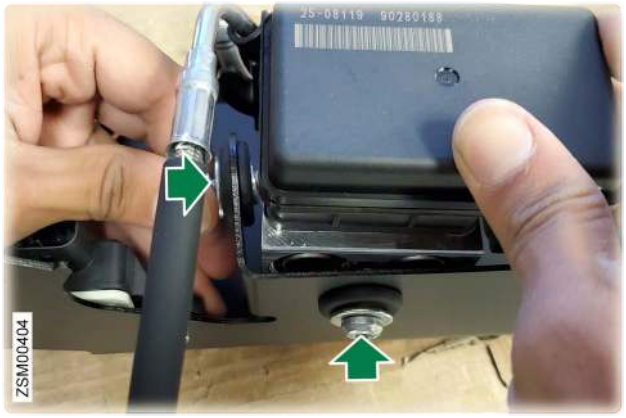
Note: Position a suitable container to contain fluid spillage.

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

Note: Replace crush washers (x6) upon installation.



34. Move HCU bracket assembly towards the rear and disconnect the harness connector.



35. Remove bolts (x2) securing the HCU to the HCU bracket and collect washers (x2). Tool: T30

36. Remove the HCU.

CAUTION: Brake fluid is extremely harmful to paint, so if brake fluid contacts a painted surface, wash the surface immediately.

Installation

1. Installation is the reverse of the removal procedure, but take note of the following installation step.
2. Perform brake bleeding procedure for the front and rear brake systems. See *Brake Maintenance Procedures, page 10.7.*

Wheel Speed Sensor (Front)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T25
- T30
- T50
- 3/16” standard screwdriver
- 2 mm hex wrench
- 10 mm socket and ratchet
- 13 mm socket
- Ratchet straps (x2)
- Hoist

New Fasteners Required:

- Cable ties (quantity: 4)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove tank assembly. See *Tank Removal, page 60.9.*
6. Remove headlight inner fairing. See *Headlight Inner Fairing, page 60.3.*

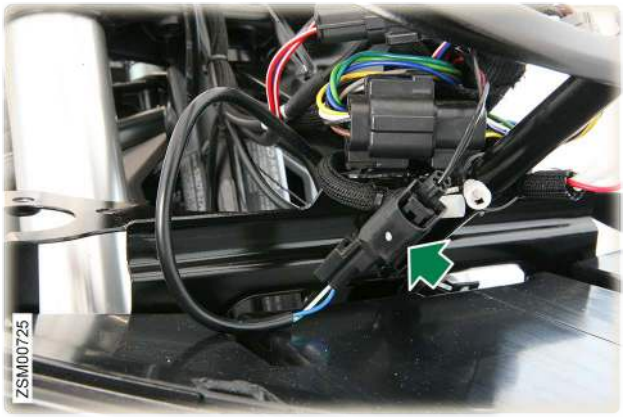


7. Remove bolts (x2) securing left side of front closeout panel to frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).

   Note: Protect rear portion of front fender and front closeout panel surfaces to reduce the possibility of scratching their surfaces.



8. Remove bolts (x2) securing right side of front closeout panel to frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).



9. Disconnect the front WSS harness connector.



10. Cut cable tie securing the motor stop switch harness, brake switch electrical harness, throttle harness, and front wheel speed sensor to hela bracket harness anchor.

    Note: Replace cable tie during the installation process.



11. Release plastic clip retaining the WSS harness to front brake hose.



12. Remove bolt securing the WSS harness cushion clamp and front brake hose. Tool: T30. Torque: 5 lb-ft (7 Nm).



13. Cut cable tie securing the WSS harness to the left front brake hose.

    Note: Replace cable tie during the installation process.



14. Release WSS harness from the left front brake hose clips (x4).



15. Remove left front caliper bolts (x2) and collect retaining clip. Tool: T50. Torque: 30 lb-ft (41 Nm).
16. Remove left front caliper from rotor.



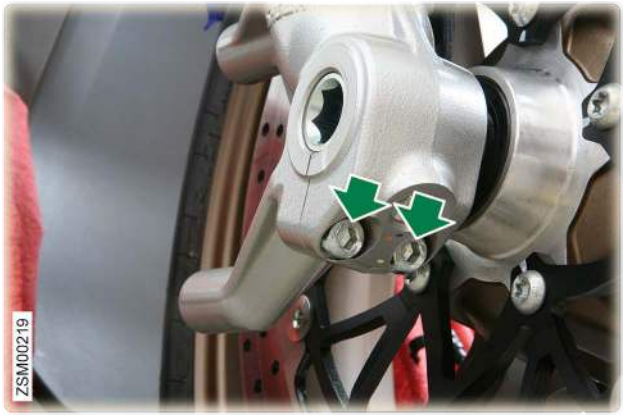
17. Wrap left front caliper and tie the caliper to the frame to eliminate strain on the brake hose.



18. Remove right front caliper bolts (x2). Tool: T50. Torque: 30 lb-ft (41 Nm).
19. Remove right front caliper from rotor.



20. Wrap right front caliper and tie the caliper to the frame to eliminate strain on the brake hose.



21. Loosen front axle pinch bolts (x2). Tool: 6 mm hex. Torque: 16 lb-ft (22 Nm).



22. **DO NOT LIFT THE MOTORCYLE BY JACKING UP THE CONTROLLER! DO NOT SUPPORT THE WEIGHT OF THE MOTORCYCLE BY SUPPORTING THE CONTROLLER! Doing so, will damage the controller and other components.**



23. Safely loop straps around the motorcycle frame on the left (shown) and right.



24. Safely hook the ends of the straps to a hoist.



25. Using the hoist, raise the front of the motorcycle until the front tire is slightly off the floor.



26. Remove front axle and collect the front wheel. Tool: 17 mm hex bit socket. Torque: 40 lb-ft (54 Nm).



27. Release the WSS from the front wheel.

Installation

1. Installation is the reverse of the removal procedure, but take note of the following installation step.



2. When installing the front WSS, make sure the alignment tab is positioned against the bottom edge of the left front shock as shown.

Wheel Speed Sensor (Rear)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T25
- T30
- T40
- T45
- 3/16” standard screwdriver
- 2 mm hex wrench
- 2.5 mm hex wrench
- 27 mm socket and ratchet
- 10 mm socket and ratchet
- 13 mm wrench
- Motorcycle stand

New Fasteners Required:

- Cable ties (quantity: 3)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove drive belt. See *Drive Belt - Replace, page 30.47.*
3. Remove brake pads from the rear caliper. See *Brake Pads (Rear), page 45.10.*



4. Safely raise rear tire off the ground using a motorcycle stand.



5. Release rear WSS harness from plastic retainer.



6. Place rag over rear caliper to protect painted surfaces.



7. Lift rear tire slightly and slide rear axle out of the swing arm.



8. Raise rear tire and remove rear wheel speed sensor (WSS) and set aside.

   Note: Make sure the WSS sensor is supported and not straining the WSS electrical harness.

9. Lower the rear tire carefully to keep from damaging painted surfaces.



10. Place rag over the left side of the swingarm between the rear sprocket and the swing arm to protect painted surfaces.

11. Roll rear tire forward.



12. Release rear brake hose from the metal retaining clip.



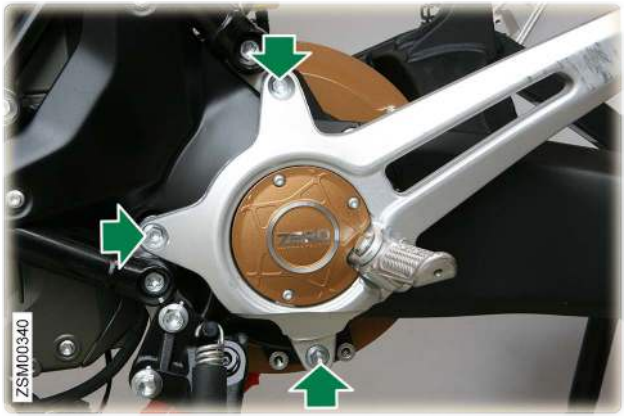
13. Position the rear brake hose on top of clip.



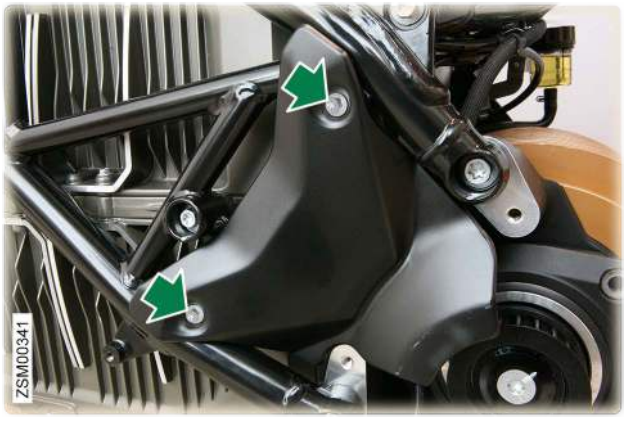
14. Position the rear brake hose on top of clip.



15. Release rear brake hose and rear WSS harness from the metal retaining clip.



16. Remove bolts (x3) securing the left foot peg bracket to the left doubler plate. Tool: T40. Torque: 20 lb-ft (27 Nm).



17. Remove bolts (x2) securing the heel guard to the frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).

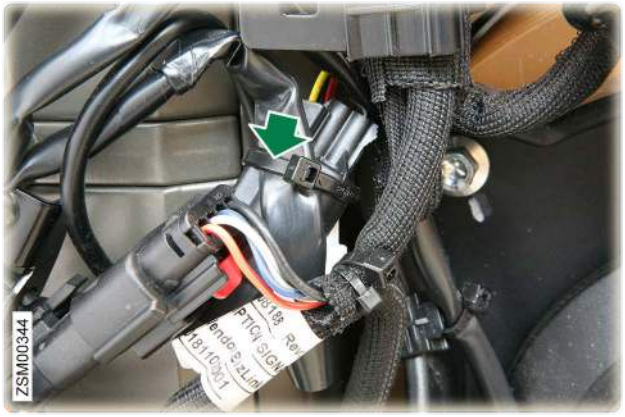


18. Release harness anchor clip from the frame.



19. Cut cable tie securing the rear WSS harness and kickstand harness to the anchor clip.

Note: Replace cable tie during the installation process.



20. Cut cable tie securing kickstand harness to the kickstand harness connector and the WSS harness connector.

Note: Replace cable tie during the installation process.



21. Disconnect rear WSS connector.



22. Release rear WSS harness from the plastic clip securing it to the rear brake caliper hose.



23. Release rear brake master cylinder hose from metal clip.



24. Release WSS harness from metal clip.



25. Release WSS harness from plastic clips (x2).
26. Remove WSS sensor and harness.

Installation

1. Installation is the reverse of the removal procedure, with the exception of the following:



2. When installing the rear WSS, make sure the alignment tab is positioned against the top edge of the rear brake bracket as shown.



3. Confirm that the aluminum bushing from left side (sprocket side) of the wheel is installed in the seal prior to installation of the wheel.

Front Wheel

Tools Required (includes tools required for parent jobs):

- T30
- T50
- 6 mm Allen wrench
- 17 mm hex bit socket and ratchet
- Ratchet straps (x2)
- Hoist

New Fasteners Required:

- Cable ties (quantity: 4)

Removal



1. Release plastic clip retaining WSS harness to front brake hose.



2. Remove bolt securing wheel speed sensor (WSS) harness cushion clamp and front brake hose. Tool: T30. Torque: 5 lb-ft (7 Nm).



3. Cut cable tie securing the WSS sensor harness to the left front brake hose.

   Note: Replace cable tie during the installation process.



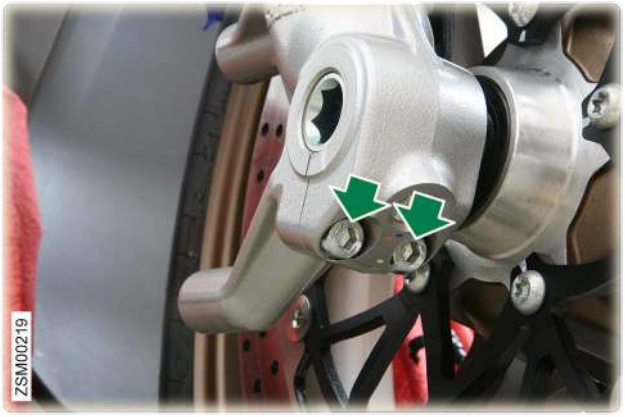
4. Release WSS sensor harness from the left front brake hose clips (x4).



5. Remove left front caliper bolts (x2) and collect retaining clip. Tool: T50. Torque: 30 lb-ft (41 Nm).
6. Remove left front caliper from rotor.



7. Wrap left front caliper and tie the caliper to the frame to eliminate strain on the brake hose.



11. Loosen front axle pinch bolts (x2). Tool: 6 mm hex. Torque: 16 lb-ft (22 Nm).



8. Remove right front caliper bolts (x2). Tool: T50. Torque: 30 lb-ft (41 Nm).
9. Remove right front caliper from rotor.



12. **DO NOT LIFT THE MOTORCYLE BY JACKING UP THE CONTROLLER! DO NOT SUPPORT THE WEIGHT OF THE MOTORCYCLE BY SUPPORTING THE CONTROLLER! Doing so, will damage the controller and other components.**



10. Wrap right front caliper and tie the caliper to the frame to eliminate strain on the brake hose.



13. Safely loop straps around the motorcycle upper triple clamp on the left (shown) and right.



14. Using the hoist, raise the front of the motorcycle until the front tire is slightly off the floor.



15. Remove front axle and collect the front wheel. Tool: 17 mm hex bit socket. Torque: 40 lb-ft (54 Nm).



16. Release the WSS sensor from the front wheel.

Installation

1. Installation is the reverse of the removal procedure, but take note of the following installation step.



2. When installing the WSS sensor, make sure the alignment tab is positioned against the bottom edge of the left front shock as shown.
3. Align the forks. See *Fork Alignment, page 40.13.*

Rear Wheel

Tools Required (includes tools required for parent jobs):

- T25
- T40
- T45
- 27 mm socket and ratchet
- 13 mm wrench
- Motorcycle stand

New Fasteners Required:

- Cable ties (quantity: 1)

Removal

1. Remove drive belt. See *Drive Belt - Replace, page 30.47.*



2. Safely raise rear tire off the ground using a motorcycle stand.



3. Release rear wheel speed sensor (WSS) harness from plastic retainer.



4. Place rag over rear caliper to protect painted surfaces.



5. Lift rear tire slightly and slide rear axle out of the swing arm.



6. Raise rear tire and remove rear WSS sensor and set aside.

   Note: Make sure the WSS sensor is hung up and not straining the WSS electrical harness.

7. Lower the rear tire carefully to keep from damaging painted surfaces.



8. Place rag over the left side of the swingarm between the rear sprocket and the swing arm to protect painted surfaces.
9. Roll rear tire forward.



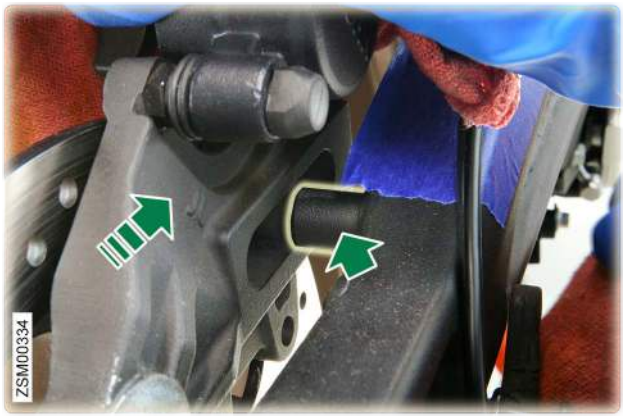
10. Release rear brake hose from the metal retaining clip.



11. Position the rear brake hose on top of clip.



12. Tip the top of the rear tire to the left.



13. Slide rear caliper assembly toward wheel and slide caliper bracket off of the bracket alignment pin.



14. Tie caliper up to the foot peg bracket.

    Note: Make sure the brake caliper is hung up and not straining the brake hose.

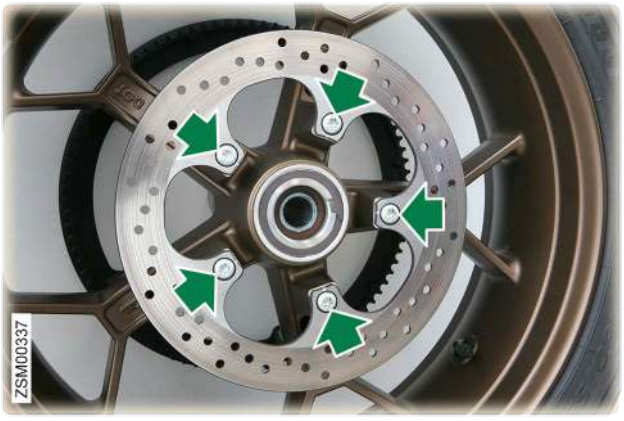
15. Roll the rear wheel out of the swing arm.



16. Remove plastic bushing from left side (sprocket side) of the wheel.



17. Remove bolts (x5) securing the rear sprocket to the rear wheel. Tool: T40. Torque: 26 lb-ft (35 Nm).



18. Remove bolts (x5) securing the brake rotor to the rear wheel. Tool: T40. Torque: 20 lb-ft (27 Nm).

Installation

1. Installation is the reverse of the removal procedure, with the exception of the following:



2. On the sprocket-side of the rear wheel, inspect the condition of the inner (#1) and outer (#2) bearings and the seal (#3). Replace if necessary.

   Note: The bearings and seal are one-time use parts. Every part removed, will need to be replaced.



3. On the rotor-side of the rear wheel, inspect the condition of the wheel bearing (#1) and the ABS magnet ring (#2). Replace if necessary.

   Note: The bearing is a one-time use parts. If removed, the part will need to be replaced.



4. Install bolts (x5) securing the brake rotor to the rear wheel. Tool: T40. Torque (in sequence shown): 20 lb-ft (27 Nm).



5. Install bolts (x5) securing the rear sprocket to the rear wheel. Tool: T40. Torque (in sequence shown): 26 lb-ft (35 Nm).



6. When installing the WSS sensor, make sure the alignment tab is positioned against the top edge of the rear brake bracket as shown.

Rider's Seat

Tools Required (includes tools required for parent jobs):

- T30

Removal



1. Insert the key into the lock and turn it clockwise to release the passenger seat.



2. Remove bolt securing the rider's seat. Tool: T30. Torque: 8 lb-ft (11 Nm).
3. Remove rider's seat.

Installation

1. Installation is the reverse of the removal procedure.

Headlight Upper Fairing

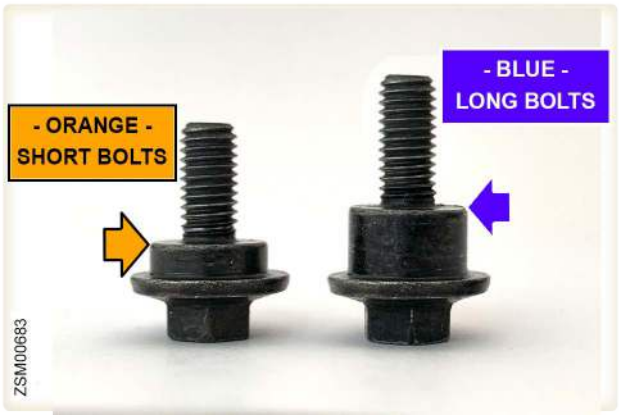
CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T25

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*



2. For this procedure, there will be references shouldered-bolts securing body panels, that are 2 different lengths.

   ***Short bolts**: designated on photos with an orange arrow, attach a single body panel layer.*

   ***Long bolts**: designated on photos with a blue arrow, attach 2 layers of body panels.*



3. Remove **long** bolts (x2) securing headlight upper fairing to the dash center cover. Tool: T25. Torque: Hand tight - Do not over-tighten.



4. Remove **short** bolts (x2) securing bottom of headlight upper fairing to the headlight inner fairing. Tool: T25. Torque: 3 lb-ft (4 Nm).



5. Hold headlight upper fairing securely on both sides (see arrows) while lifting up to release mounting tabs from bodywork.
6. Slide headlight upper fairing toward the headlight to release the fairing from the windscreen.

CAUTION: Headlight upper fairing has an interference fit and requires caution not to drop the panel when it releases from the windscreen.

Installation

1. Installation is the reverse of the removal procedure.

Headlight Inner Fairing

CAUTION: Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 2 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet

New Fasteners Required:

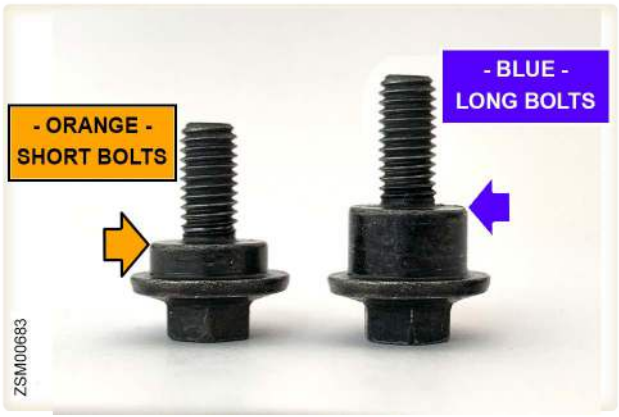
- Cable tie (quantity: 2)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*



3. Remove tank assembly. See *Tank Removal, page 60.9.*



4. For the rest of this procedure, there will be references to shouldered-bolts securing body panels, that are 2 different lengths.

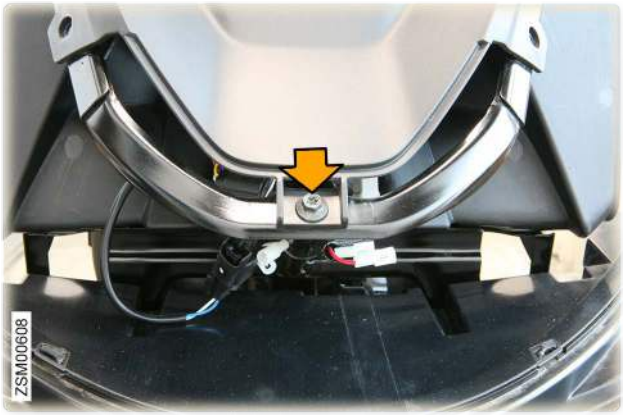
   ***Short bolts**: designated on photos with orange arrows, used to attach a single body panel layer.*

   ***Long bolts**: designated on photos with blue arrows, used to attach 2 layers of body panels.*

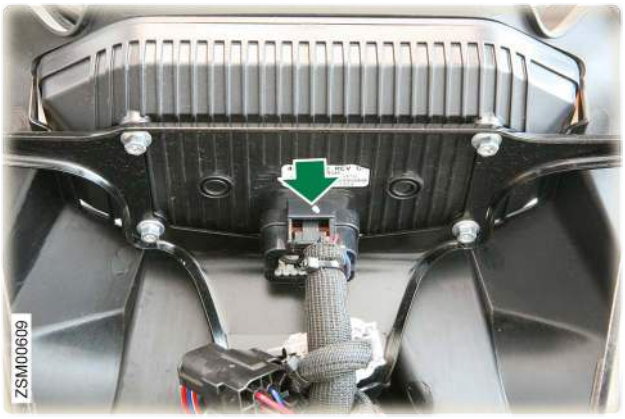
   Note: Non-shouldered body bolts designated with green arrows are present in this procedure.



5. Remove **long** bolts (x4) securing windscreen to the hela bracket. Tool: T25. Torque: 3 lb-ft (4 Nm).
6. Remove windscreen.



7. Remove **short** bolt securing dash center cover to the hela bracket. Tool: T25. Torque: 3 lb-ft (4 Nm).



8. Disconnect dash harness connector from the dash.



9. Remove bolts (x4) securing the dash to the hela bracket. Tool: T25. Torque: Hand tighten - Do not over-tighten.
10. Remove dash display.



11. Remove headlight inner fairing.

    Note: Take note of the wire wiring harness routing prior to removing the headlight inner fairing to assist during the installation process.

    Note: The headlight inner fairing is an interference fit, take care during removal to prevent damage.

Installation

1. Installation is the reverse of the removal procedure.

Hela Bracket

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 2 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet

New Fasteners Required:

- Cable tie (quantity: 5)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*



3. Remove tank assembly. See *Tank Removal, page 60.9.*



4. Remove headlight inner fairing. See *Headlight Inner Fairing, page 60.3.*



5. Cut cable tie securing the mode switch electrical harness to hela bracket.

   Note: Replace cable tie during the installation process.



6. Cut cable tie securing the right handlebar controls electrical harness to hela bracket.

   Note: Replace cable tie during the installation process.

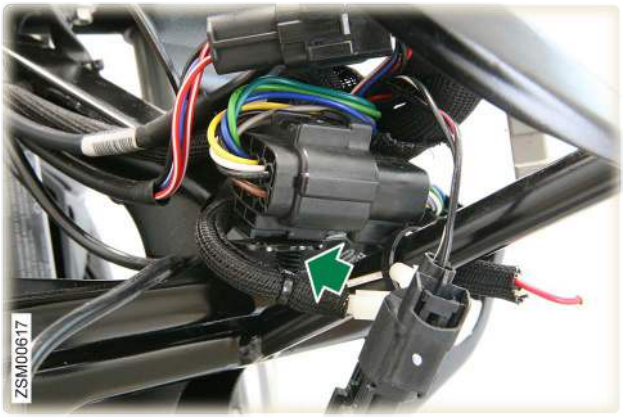


7. Cut cable tie securing the front turn signal electrical harnesses to hela bracket.

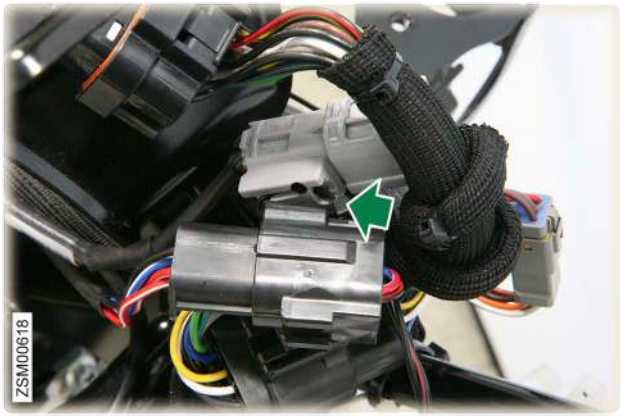
   Note: Replace cable tie during the installation process.



8. Release harness cable tie anchor securing the main electrical harness to the hela bracket.

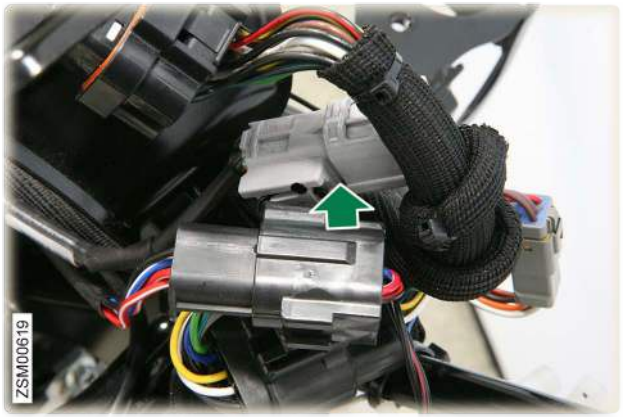


9. Release harness connector anchor securing the mode switch harness connector to the hela bracket.

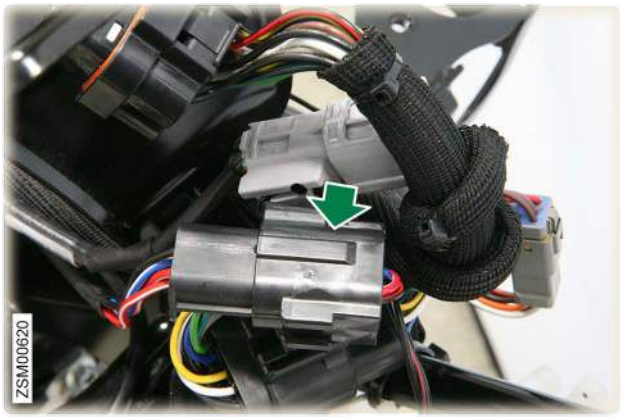


10. Cut cable tie securing the throttle electrical harness connector to the motor stop switch electrical connector.

    Note: Replace cable tie during the installation process.



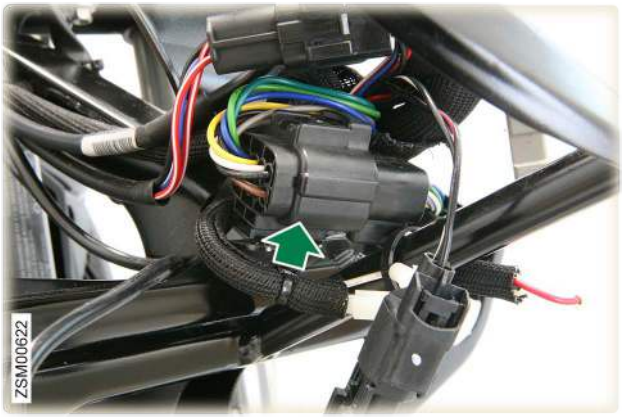
11. Disconnect the throttle electrical harness connector.



12. Disconnect the motor stop switch electrical harness connector.



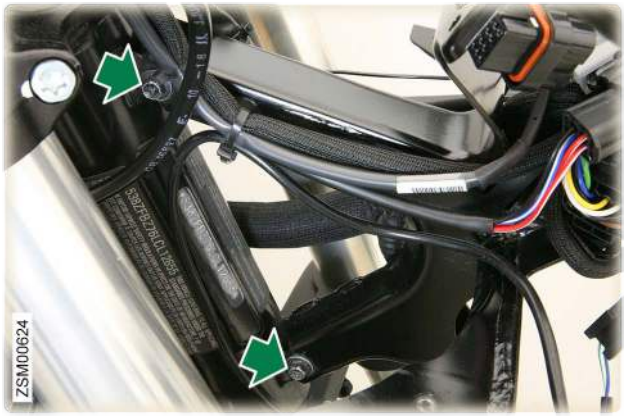
13. Disconnect the headlight switch electrical harness connector.



14. Disconnect the mode switch electrical harness connector.



15. Remove bolts (x2) securing the left side of the hela bracket to the frame head tube. Tool: T30. Torque: 8 lb-ft (11 Nm).



16. Remove bolts (x2) securing the right side of the hela bracket to the frame head tube. Tool: T30. Torque: 8 lb-ft (11 Nm).
17. Remove hela bracket.

Installation

1. Installation is the reverse of the removal procedure.

Tank Removal

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

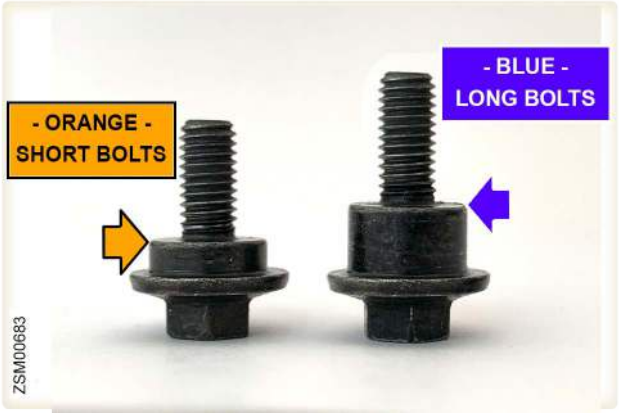
- T25
- T30
- 2 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet

New Fasteners Required:

- Cable tie (quantity: 2)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*



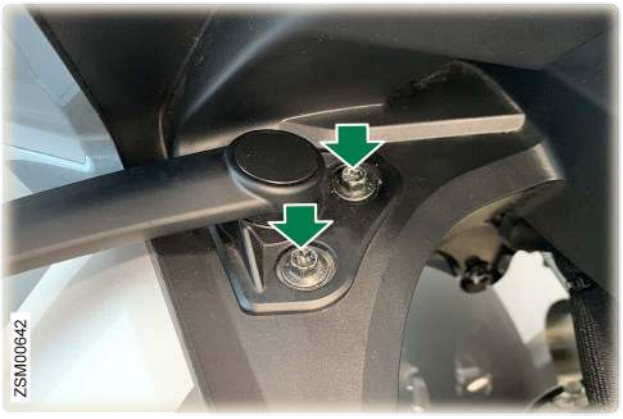
2. For the rest of this procedure, there will be references to shouldered-bolts securing body panels, that are 2 different lengths.

   ***Short bolts**: designated on photos with orange arrows, used to attach a single body panel layer.*

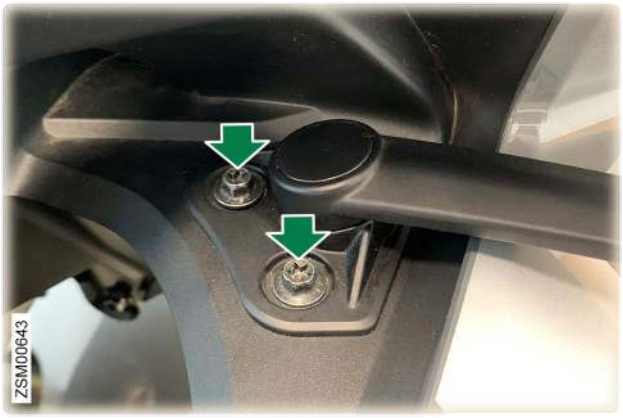
   ***Long bolts**: designated on photos with blue arrows, used to attach 2 layers of body panels.*

   Note: Non-shouldered body bolts designated with green arrows are present in this procedure.

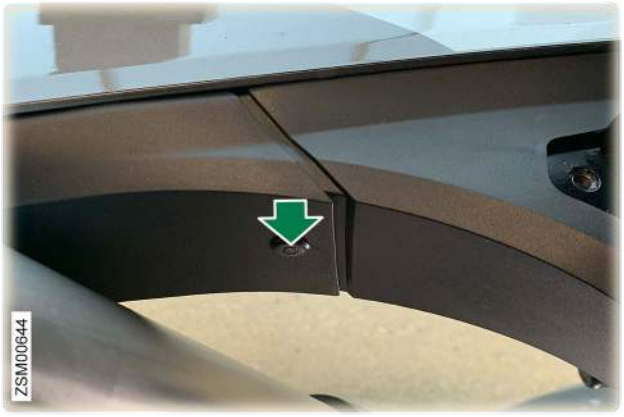
3. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
4. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*



5. Remove bolts (x2) securing left mirror to the motorcycle. Tool: T30. Torque: 5 lb-ft (7 Nm).



6. Remove bolts (x2) securing right mirror to the motorcycle. Tool: T30. Torque: 5 lb-ft (7 Nm).
7. Remove right mirror from motorcycle.



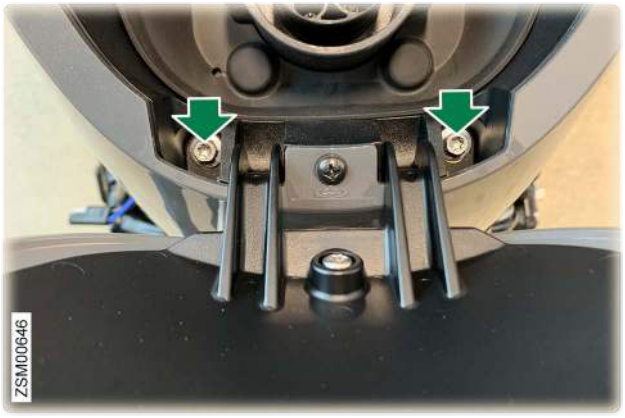
8. Push the center of the panel retainer (securing the left inner fairing arm to the headlight inner fairing) inward to release it.
9. Remove the left panel retainer.



10. Push the center of the panel retainer (securing the right inner fairing arm to the headlight inner fairing) inward to release it.
11. Remove the right panel retainer.



12. Remove bolts (x2) securing tank to key switch bracket. Tool: T25. Torque: 4.5 lb-ft (6 Nm).



13. Remove bolts (x2) securing tank to charger port bracket. Tool: T25. Torque: 4.5 lb-ft (6 Nm).



14. Push charger port rubber boot down around charger port base.



15. ***Slightly spread the outer fairing arms around the headlight during removal to keep from damaging painted surfaces.***
16. Remove tank from motorcycle.

    CAUTION: **Take extra care not to scratch the painted surfaces of the outer fairing arms that are a snug fit around the headlight.**

CAUTION: **Rotate tank assembly to position the outer fairing arms low enough to pass under the handlebars without damaging the painted surfaces.**

Installation

1. Installation is the reverse of the removal procedure, with the exception of the following:



2. ***Slightly spread the outer fairing arms around the headlight during installation to keep from damaging painted surfaces.***



3. Prior to installing the left outer side fairing, install cable tie through the left outer fairing arm cable retainer hole.



4. Prior to installing the right outer side fairing, install cable tie through the right outer fairing arm cable retainer hole.



5. While installing the left turn signal harness, insert it through the cable tie attached to the left outer fairing arm.



6. While installing the right turn signal harness, insert it through the cable tie attached to the right outer fairing arm.



7. After connecting the left front turn signal harness, cinch the cable tie securing the harness to the left outer fairing arm.



8. After connecting the right front turn signal harness, cinch the cable tie securing the harness to the right outer fairing arm.

Side Fairings (Outer)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 2 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet

New Fasteners Required:

- Cable tie (quantity: 2)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*



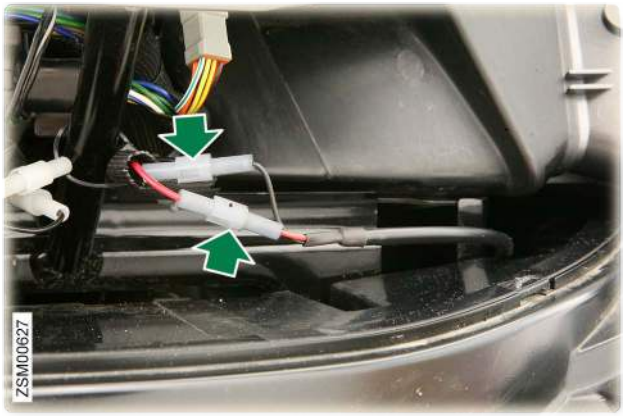
3. Cut cable tie securing left front turn signal electrical harness to the left outer fairing arm.

   Note: Replace cable tie during the installation process.



4. Cut cable tie securing right front turn signal electrical harness to the right outer fairing arm.

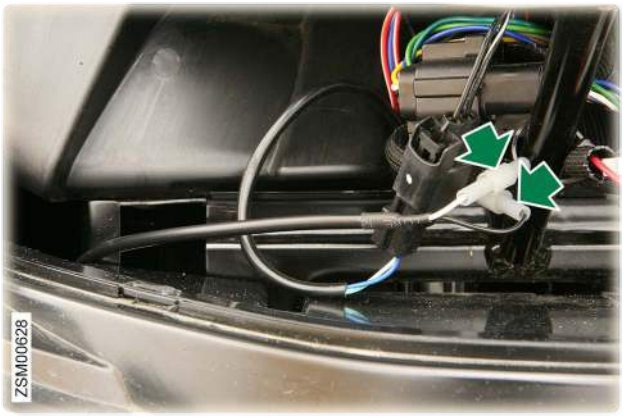
   Note: Replace cable tie during the installation process.



5. Disconnect left front turn signal harness connectors.

   Note: Take note of the wire insulation colors. The turn signal wire colors match the colors of the main wire harness.

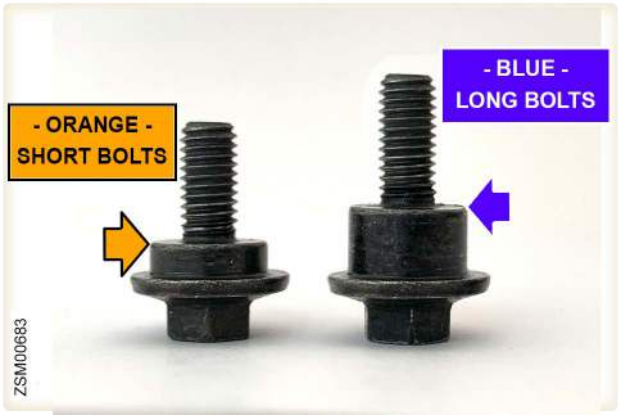
   Left turn signal wire colors: black and red.



6. Disconnect right front turn signal harness connectors.

   Note: Take note of the wire insulation colors. The turn signal wire colors match the colors of the main wire harness.

   Right turn signal wire colors: black and white.

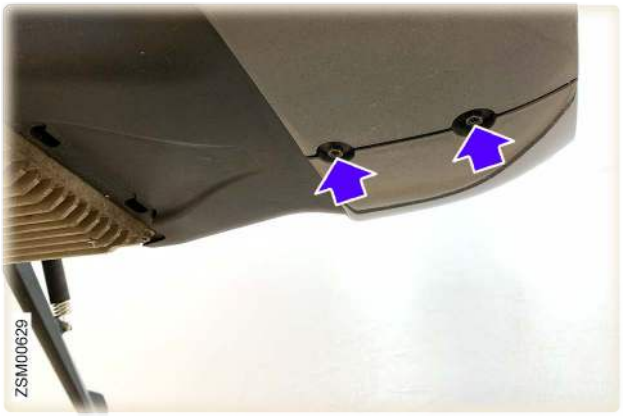


7. For the rest of this procedure, there will be references to shouldered-bolts securing body panels, that are 2 different lengths.

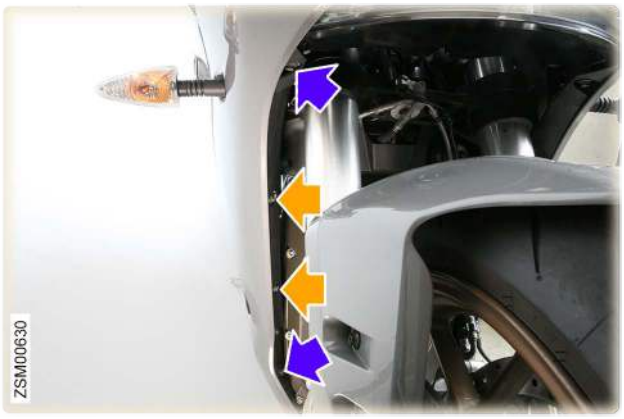
   ***Short bolts**: designated on photos with orange arrows, used to attach a single body panel layer.*

   ***Long bolts**: designated on photos with blue arrows, used to attach 2 layers of body panels.*

   Note: Non-shouldered body bolts designated with green arrows are present in this procedure.



8. Remove **long** bolts (x2) securing bottom of right outer side fairing to bodywork. Tool: T25. Torque: 3 lb-ft (4 Nm).



9. Remove **long** bolts (x2[blue arrows]) and **short** bolts (x2[orange arrows]) securing the leading edge of the right outer side fairing to bodywork. Tool: T25. Torque: 3 lb-ft (4 Nm).

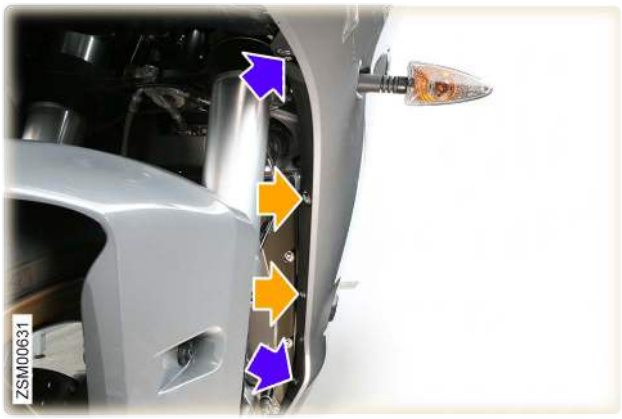
   Note: Take note of length of the bolts.



10. Remove right outer side fairing.



11. While removing right outer side fairing, guide the right front turn signal harness wires through their access hole in the right inner side fairing.



12. Remove **long** bolts (x2[blue arrows]) and **short** bolts (x2[orange arrows]) securing the leading edge of the left outer side fairing to bodywork. Tool: T25. Torque: 3 lb-ft (4 Nm).

    Note: Take note of length of the bolts.



13. Remove left outer side fairing.



14. While removing left outer side fairing, guide the left front turn signal harness wires through their access hole in the left inner side fairing.

Installation

1. Installation is the reverse of the removal procedure, with the exception of the following:



2. Prior to installing the left outer side fairing, install cable tie through the left outer fairing arm cable retainer hole.



3. Prior to installing the right outer side fairing, install cable tie through the right outer fairing arm cable retainer hole.



6. After connecting the left front turn signal harness, cinch the cable tie securing the harness to the left outer fairing arm.



4. While installing the left turn signal harness, insert it through the cable tie attached to the left outer fairing arm.



7. After connecting the right front turn signal harness, cinch the cable tie securing the harness to the right outer fairing arm.



5. While installing the right turn signal harness, insert it through the cable tie attached to the right outer fairing arm.

Side Fairings (Inner)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

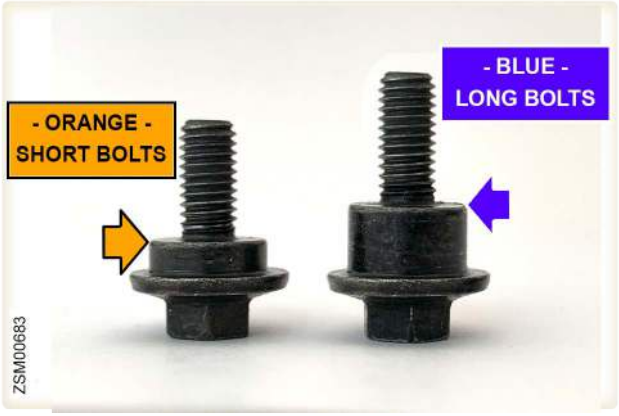
- T25
- T30
- 2 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet

New Fasteners Required:

- Cable tie (quantity: 2)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*



4. For the rest of this procedure, there will be references to shouldered-bolts securing body panels, that are 2 different lengths.

***Short bolts**: designated on photos with orange arrows, used to attach a single body panel layer.*

***Long bolts**: designated on photos with blue arrows, used to attach 2 layers of body panels.*

Note: Non-shouldered body bolts designated with green arrows are present in this procedure.



5. Remove bolts (x3) securing the velocity tube assembly to the left inner side fairing. Tool: T25. Torque: 3 lb-ft (4 Nm).



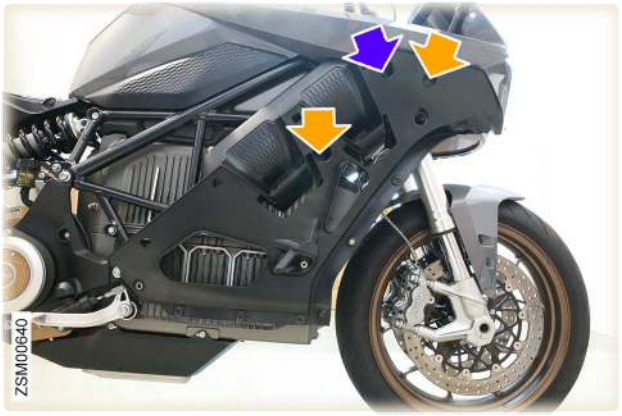
6. Remove bolts (x3) securing the velocity tube assembly to the right inner side fairing. Tool: T25. Torque: 3 lb-ft (4 Nm).
7. Remove the velocity tube assembly.



8. Remove bolts (x2) securing the lower half of the left inner side fairing to the motorcycle frame. Tool: T30. Torque: 3 lb-ft (4 Nm).



9. Remove bolts (x2) securing the lower half of the right inner side fairing to the motorcycle frame. Tool: T30. Torque: 3 lb-ft (4 Nm).



10. Remove **long** bolt (x1[blue arrow]) and **short** bolts (x2[orange arrows]) securing the upper half of the right inner side fairing to the motorcycle frame and bodywork. Tool: T25. Torque: 3 lb-ft (4 Nm).

    Note: Take note of length of the bolts.

11. Remove the right inner side fairing.



12. Remove **long** bolt (x1[blue arrow]) and **short** bolts (x2[orange arrows]) securing the upper half of the left inner side fairing to the motorcycle frame and bodywork. Tool: T25. Torque: 3 lb-ft (4 Nm).

    Note: Take note of length of the bolts.

13. Remove the left inner side fairing.

Installation

1. Installation is the reverse of the removal procedure.

Tank (Disassembly and Reassembly)

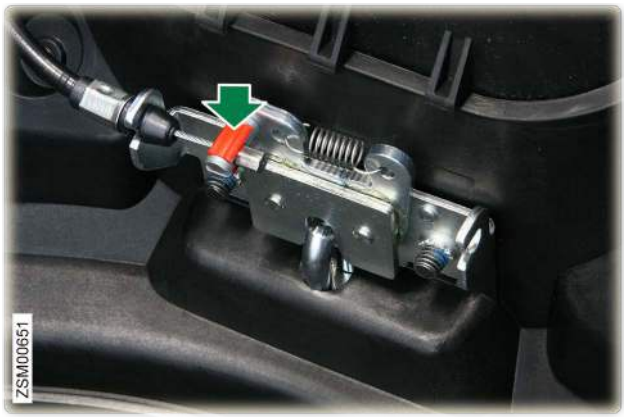
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

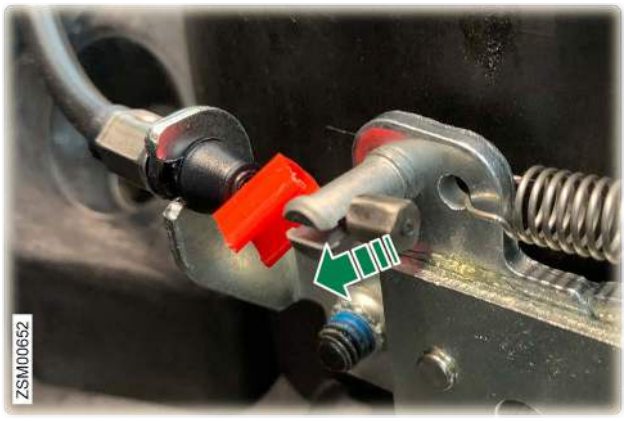
- #2 Phillips screwdriver
- T30

Disassemble

1. Remove the tank assembly. See *Tank Removal, page 60.9.*



2. Release the plastic cable retainer from the tank lock latch mechanism.



3. Release the cable end from the tank lock latch mechanism.



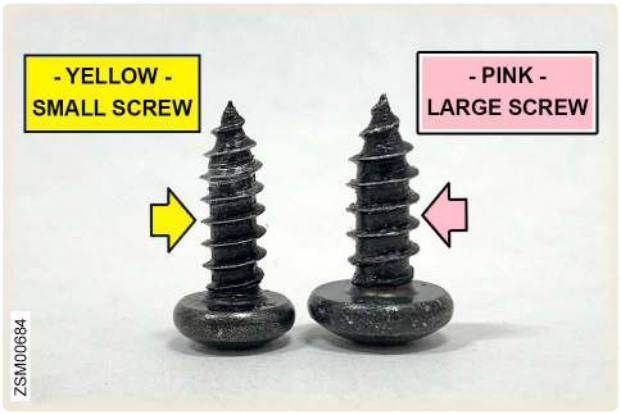
4. Release the lock cable end from the tank collar cable bracket.



5. Release the cable end from the tank collar cable retainer.



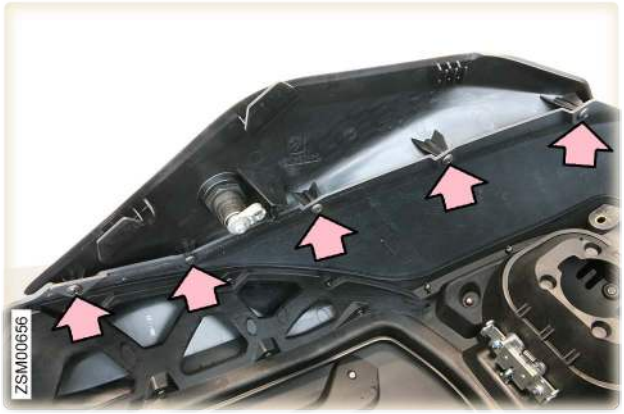
6. Release the cable end from the tank lock bracket.



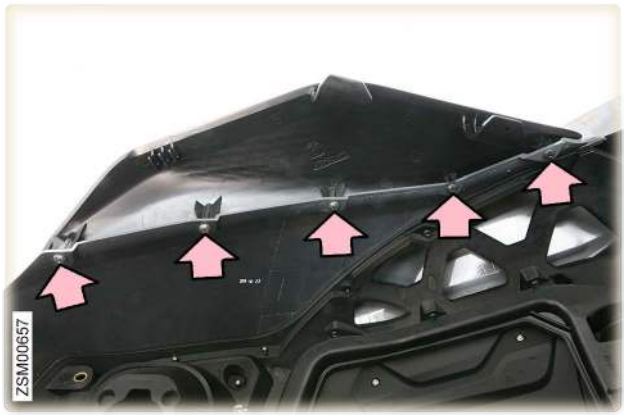
7. For this procedure, there will be references to screws securing body panels, that are 2 different sized screws.

   ***Small screws**: designated on photos with yellow arrows.*

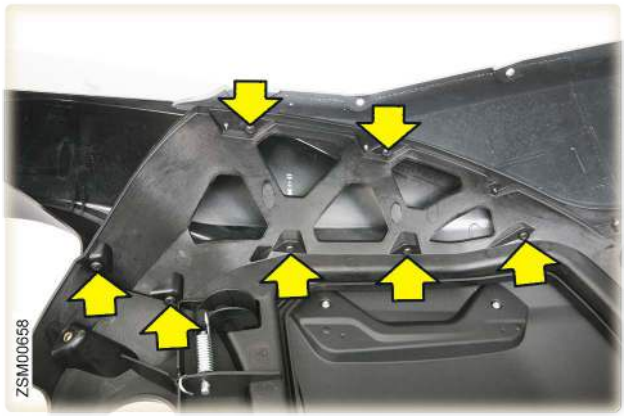
   ***Large screws**: designated on photos with pink arrows.*



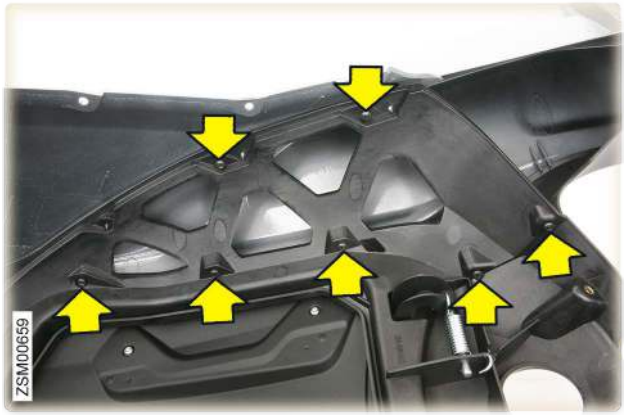
8. Remove **large** screws (x5) securing the left knee grip to the tank collar. Tool: #2 Phillips screwdriver. Torque: Hand tighten - Do not over-tighten.



9. Remove **large** screws (x5) securing the right knee grip to the tank collar. Tool: #2 Phillips screwdriver. Torque: Hand tighten - Do not over-tighten.



10. Remove **small** screws (x7) securing the left fairing arm inner and left fairing arm outer to the tank collar. Tool: #2 Phillips screwdriver. Torque: Hand tighten - Do not over-tighten.



11. Remove **small** screws (x7) securing the right fairing arm inner and right fairing arm outer to the tank collar. Tool: #2 Phillips screwdriver. Torque: Hand tighten - Do not over-tighten.

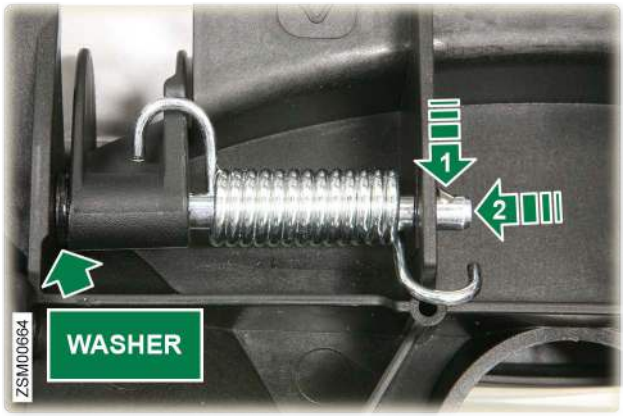


12. Remove **small** screws (x11) securing the tank rear to the tank collar. Tool: #2 Phillips screwdriver. Torque: Hand tighten - Do not over-tighten.
13. Remove tank rear from the tank collar.



14. Place the tank collar on a bench, with the tank lid open (as shown) to remove tank lid hinge pins and springs.

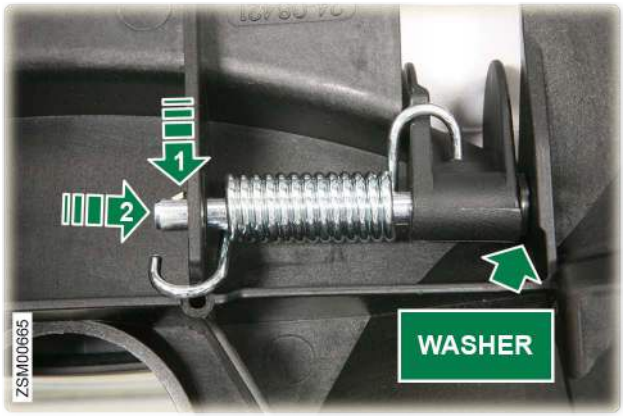
    Note: Place a non-scuff soft cloth on the working surface of your workbench.



15. To remove the left tank lid hinge pin, press locking pin (arrow #1) while pressing hinge pin (arrow #2) out of tank collar. Collect washer secured between the tank lid hinge and the tank collar.

    Note: Hold tank lid spring down (toward top of tank collar) while removing the hinge pin.

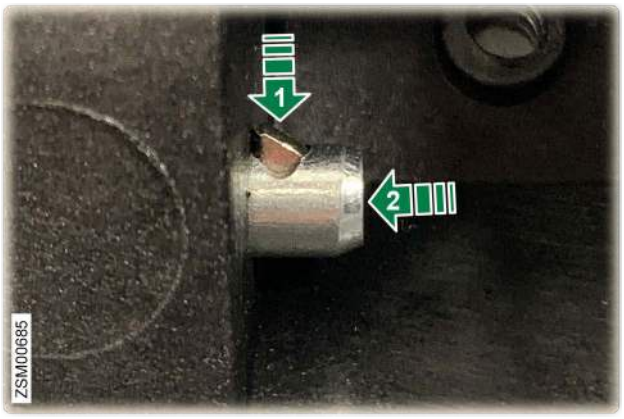
    Note: Take note of hinge spring location, there is a right and a left spring.



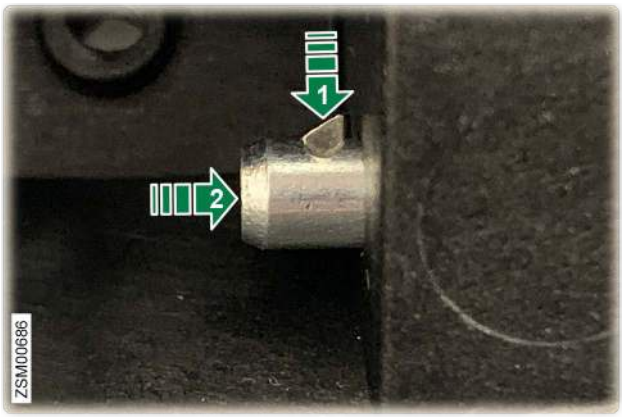
16. To remove the right tank lid hinge pin, press locking pin (arrow #1) while pressing hinge pin (arrow #2) out of tank collar. Collect washer secured between the tank lid hinge and the tank collar.

    Note: Hold tank lid spring down (toward top of tank collar) while removing the hinge pin.

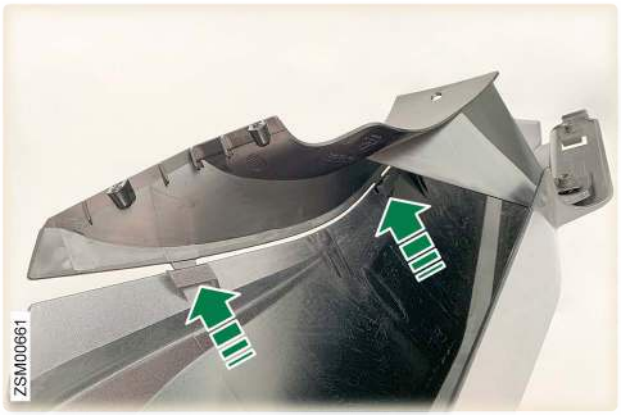
    Note: Take note of hinge spring location, there is a right and a left spring.



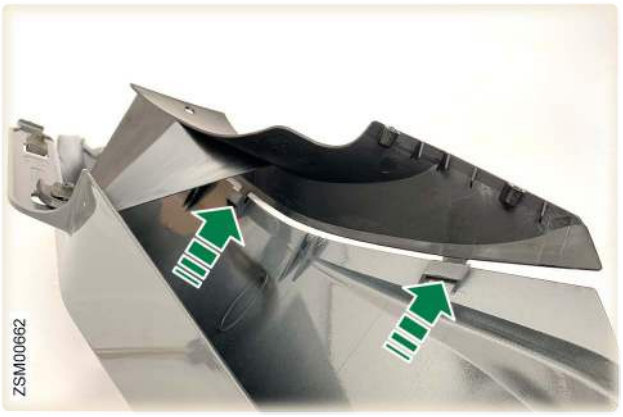
17. To remove the left charge inlet lid hinge pin, press locking pin (arrow #1) while pressing hinge pin (arrow #2) out of tank collar.



18. To remove the right charge inlet lid hinge pin, press locking pin (arrow #1) while pressing hinge pin (arrow #2) out of tank collar.



19. Release locking tabs securing the left fairing arm inner to the left fairing arm outer.



20. Release locking tabs securing the right fairing arm inner to the right fairing arm outer.

Assemble



1. Install bumpers in tank collar.



2. Install bolts (x2) securing the tank lid latch to the tank collar. Tool: T30. Torque: 4.5 lb-ft (6 Nm).



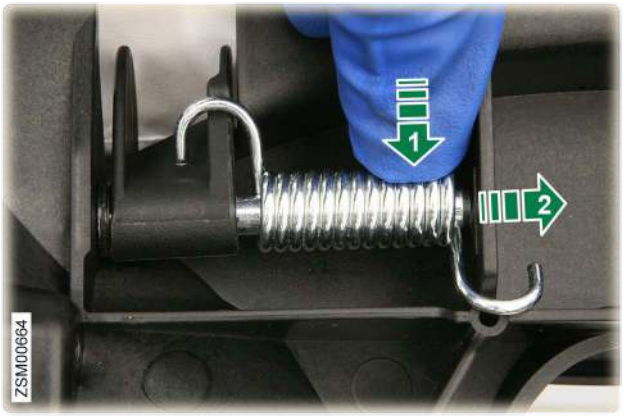
3. Place the tank collar on a bench, upside down so the tank lid can be open (as shown) during installation of the tank lid hinge pins and springs.

   Note: Place a non-scuff soft cloth on the working surface of your workbench prior to assembly.



4. Place washer (arrow #1) between the tank lid hinge and the tank collar, while pressing hinge pin (arrow #2) through hole in tank collar, then install tank lid spring (arrow #3) and slide the pin (arrow #2) far enough to hold the spring (arrow #3) in place.

   Note: There is a left and a right tank lid spring, so confirm (by looking at the photos) that you have the correct spring prior to installation.



5. Apply pressure to the left tank lid spring (arrow #1) while pressing hinge pin (arrow #2) through hole in tank collar.

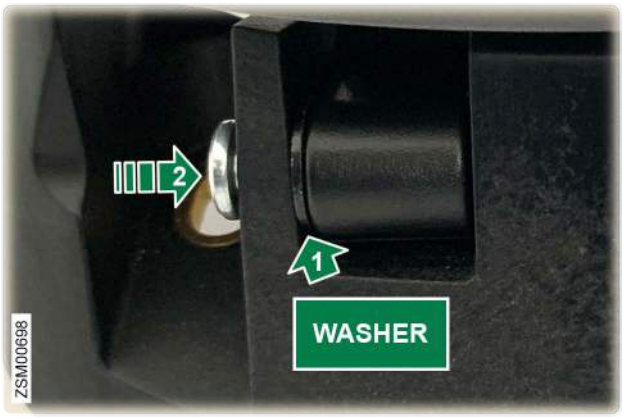


6. Place washer (arrow #1) between the tank lid hinge and the tank collar, while pressing hinge pin (arrow #2) through hole in tank collar, then install tank lid spring (arrow #3) and slide the pin (arrow #2) far enough to hold the spring (arrow #3) in place.

   Note: There is a left and a right tank lid spring, so confirm (by looking at the photos) that you have the correct spring prior to installation.



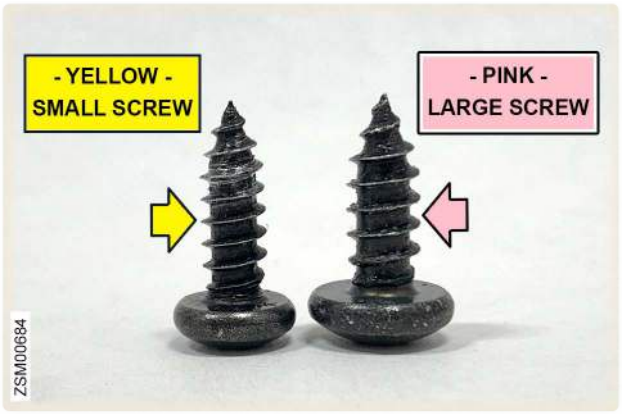
7. Apply pressure to the right tank lid spring (arrow #1) while pressing hinge pin (arrow #2) through hole in tank collar.



8. While installing the charge inlet lid, place washer (arrow #1) between the charge inlet lid hinge and the tank collar, while pressing hinge pin (arrow #2) through hole in tank collar. Slide the pin (arrow #2) far enough that the hinge pin head seats against the tank collar.



9. While installing the charge inlet lid, place washer (arrow #1) between the charge inlet lid hinge and the tank collar, while pressing hinge pin (arrow #2) through hole in tank collar. Slide the pin (arrow #2) far enough that the hinge pin head seats against the tank collar.



10. For this procedure, there will be references to screws securing body panels, that are 2 different sized screws.

    ***Small screws**: designated on photos with yellow arrows.*

    ***Large screws**: designated on photos with pink arrows.*



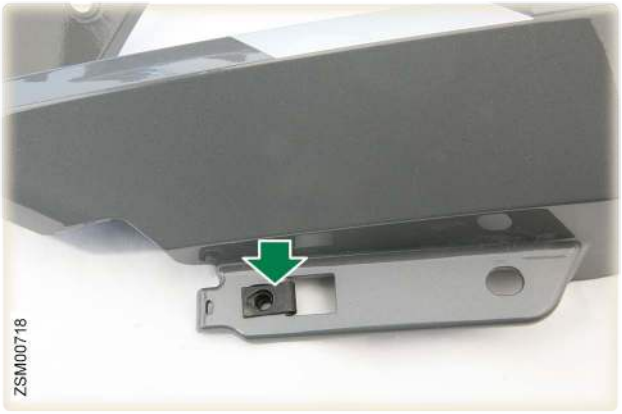
11. Install **small** screws (x11) securing the tank rear to the tank collar. Tool: #2 Phillips screwdriver. Torque: Hand tighten - Do not over-tighten.



12. Install clip-on U-nut onto left inner fairing arm.



13. Install clip-on U-nut onto right inner fairing arm.



14. Install clip-on U-nut onto left outer fairing arm.



15. Install clip-on U-nut onto right outer fairing arm.



16. Insert locking tabs securing the left inner fairing arm to the left outer fairing arm.



17. Insert locking tabs securing the right inner fairing arm to the right outer fairing arm.



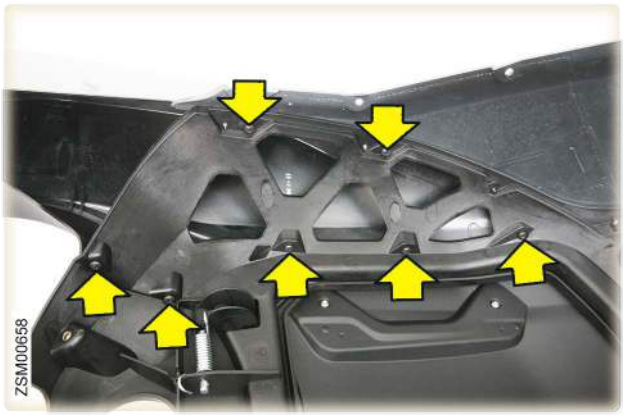
18. Install cable tie through the left outer fairing arm cable retainer hole.



19. Install cable tie through the right outer fairing arm cable retainer hole.



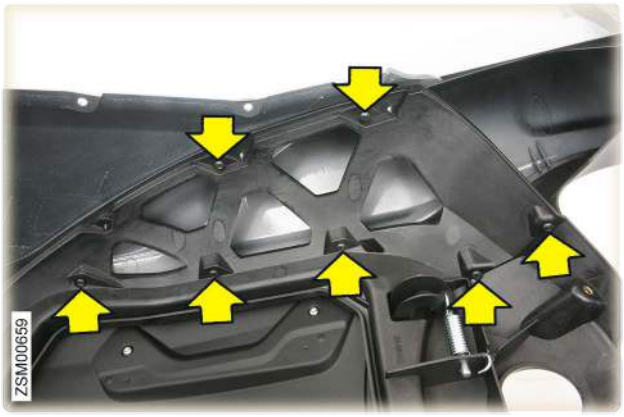
20. While assembling the left outer fairing arm, confirm the alignment tab of the fairing outer arm fits under the edge of the tank rear.



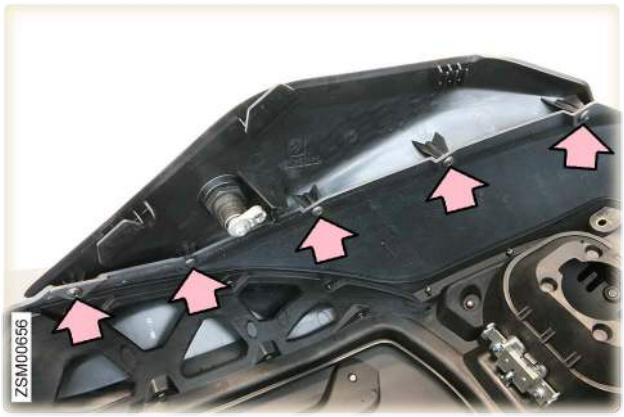
21. Install **small** screws (x7) securing the left fairing arm inner and left fairing arm outer to the tank collar. Tool: #2 Phillips screwdriver. Torque: Hand tighten - Do not over-tighten.



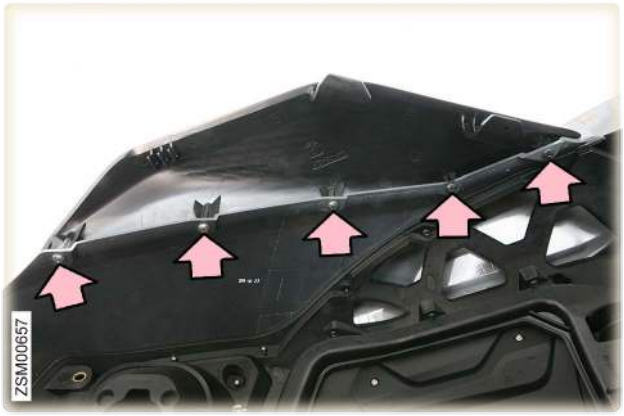
22. While assembling the right outer fairing arm, confirm the alignment tab of the fairing outer arm fits under the edge of the tank rear.



23. Install **small** screws (x7) securing the right fairing arm inner and right fairing arm outer to the tank collar. Tool: #2 Phillips screwdriver. Torque: Hand tighten - Do not over-tighten.



24. Install **large** screws (x5) securing the left knee grip to the tank collar. Tool: #2 Phillips screwdriver. Torque: Hand tighten - Do not over-tighten.



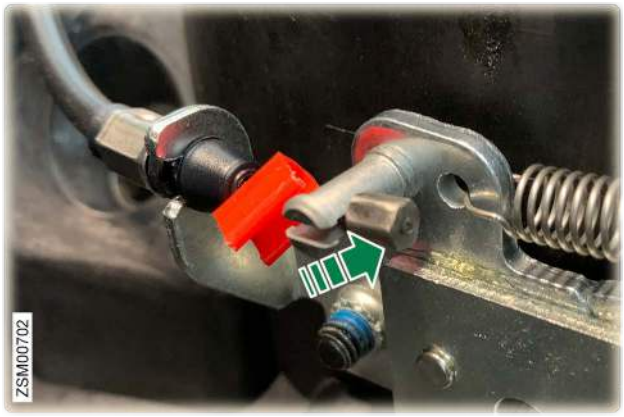
25. Install **large** screws (x5) securing the right knee grip to the tank collar. Tool: #2 Phillips screwdriver. Hand tighten - Do not over-tighten.



26. Release the cable end from the tank lock bracket.



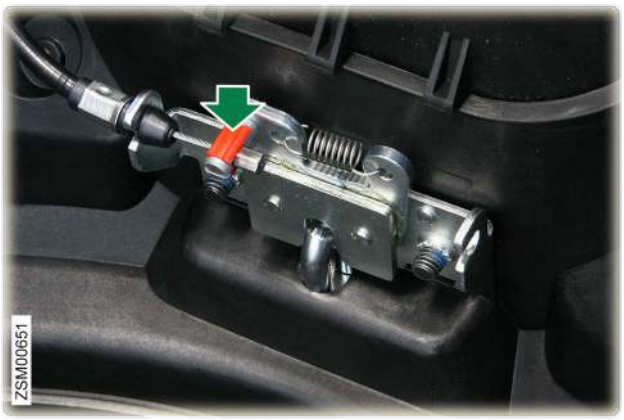
27. Release the cable end from the tank collar cable retainer.



28. Release the cable end from the tank lock latch mechanism.



29. Release the lock cable end from the tank collar cable bracket.



30. Release the plastic cable retainer from the tank lock latch mechanism.

Grab Handles (Right and Left)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 10 mm socket and ratchet

Removal

1. **PERFORM LOCKOUT PROCEDURE:**See *Lockout Procedure, page 10.2.*



2. Insert the key into the lock and turn it clockwise to release the passenger seat.



3. Remove bolts (x2) securing front of seat tray to tail frame assembly. Tool: T25. Torque: 3 lb-ft (4 Nm).



4. Remove bolts (x4) securing rear of seat tray to tail frame assembly. Tool: T30. Torque: 5 lb-ft (7 Nm).
5. Remove seat tray.



6. Remove bolts (x3) securing left grab handle to tail frame assembly. Tool: T30. Torque: 7 lb-ft (9.5 Nm).
7. Remove left grab handle.



8. Remove bolts (x3) securing right grab handle to tail frame assembly. Tool: T30. Torque: 7 lb-ft (9.5 Nm).
9. Remove right grab handle.

Installation

1. Installation is the reverse of the removal procedure.

Tank Storage Liner

CAUTION: Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

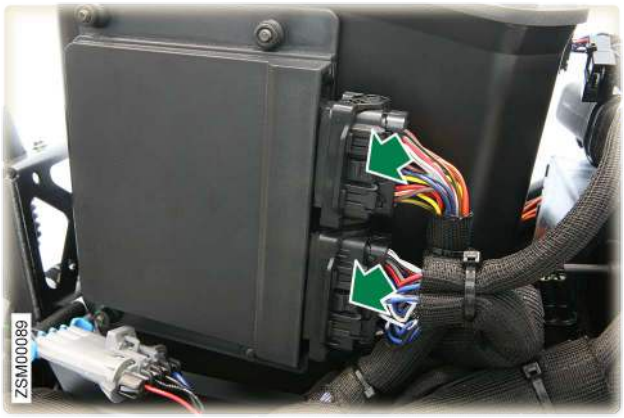
- T20
- T25
- T27
- T30
- 3/16” standard screwdriver
- 2 mm hex wrench
- 6 mm hex wrench
- 10 mm socket and ratchet

New Fasteners Required:

- Cable tie (quantity: 2)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove tank. See *Tank Removal, page 60.9.*



3. Disconnect MBB harness connectors (x2).



4. Remove bolts (x4) securing MBB to the tank storage liner and collect washers (x4). Tool: 6 mm hex

   CAUTION: Replace vibration-resistant rubber isolator nuts if they are damaged or worn.

   Note: Do not over-tighten bolts.

5. Remove MBB.



6. Squeeze tabs to release OBDII connector from tank storage liner.



7. Remove bolts (x2) securing USB power hub to tank storage liner. Tool: T20. Torque: 2 lb-ft (2.7 Nm).



8. Remove bolts (x2) securing storage liner to storage liner plate. Tool: T27. Torque: 2.5 lb-ft (3 Nm).

   Note: During installation, do not snug storage liner bolts until tank is installed.

9. Remove storage liner.

Installation

1. Installation is the reverse of the removal procedure.

Tail Assembly

CAUTION: Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.

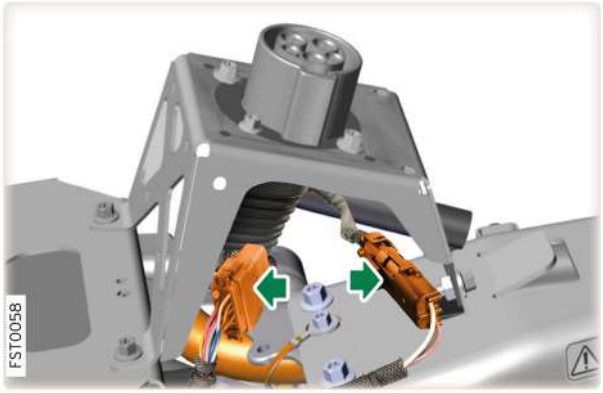
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Removal

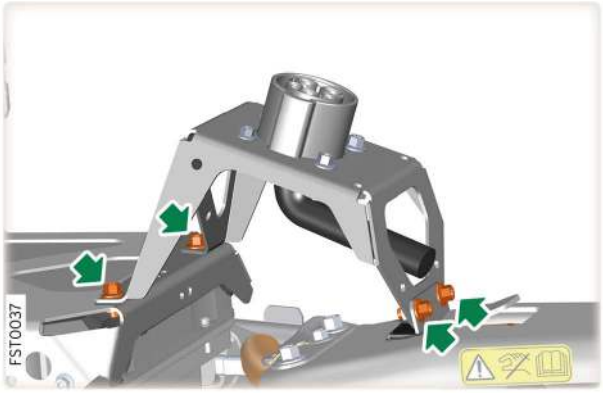
1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove tank. See *Grab Handles (Right and Left), page 60.29.*
3. Remove 12 Volt Battery. See *12 Volt Battery (Removal), page 70.4.*



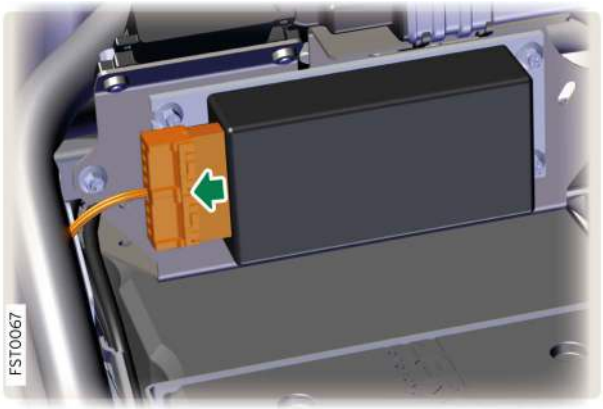
4. Remove T30 bolts (x2) securing tank unit to bike frame. Torque 2.5 lb-ft (3.5 Nm).
5. Move tank unit to right side of bike.



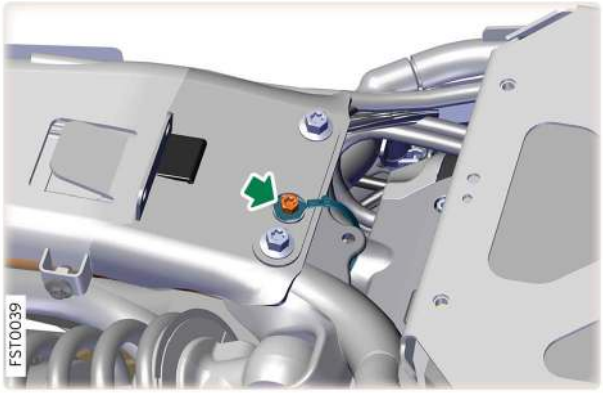
6. Disconnect charge inlet harness connector.
7. Disconnect battery signal harness connector.



8. Remove T30 bolts (x4) securing charging plug. Torque 8 lb-ft (11 Nm).
9. Remove charge inlet bracket.

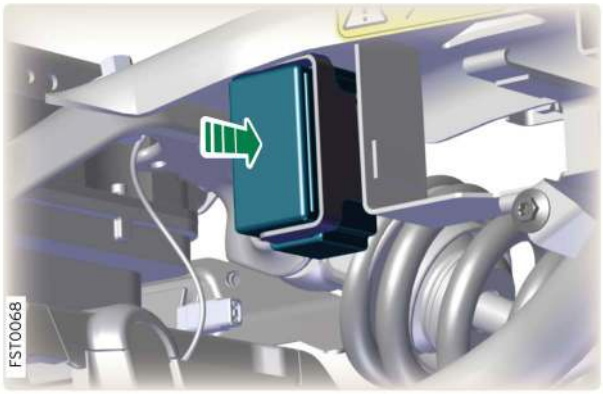


10. Disconnect DC-DC converter.



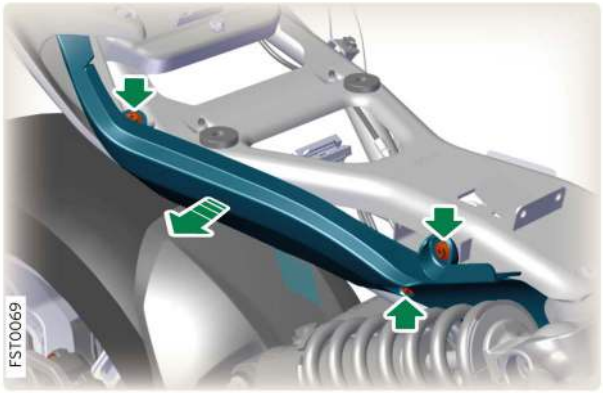
11. Remove T30 bolt securing ground straps (x3). Torque 5 lb-ft (6.5 Nm).

    NOTE: Stack crimp side up for best contact.

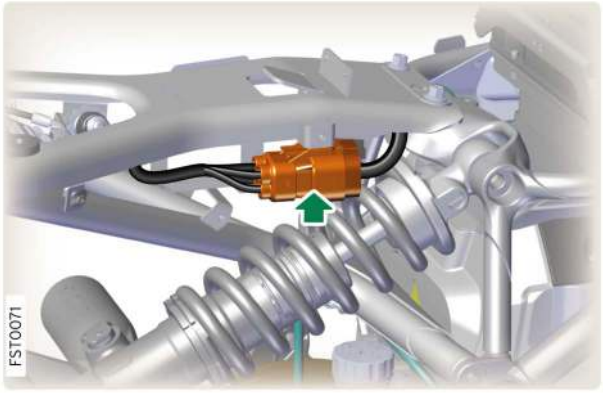


12. Slide fuse box/panel back and off its mounts, then down to remove from frame.

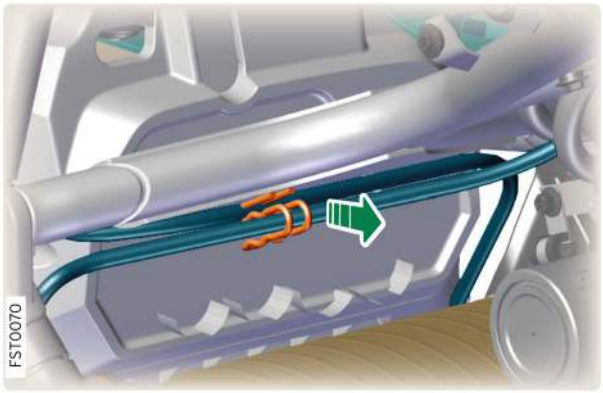
    NOTE: Fuse box will come out with (+) battery lead.Remove bolts (x3) securing frame cover to frame.



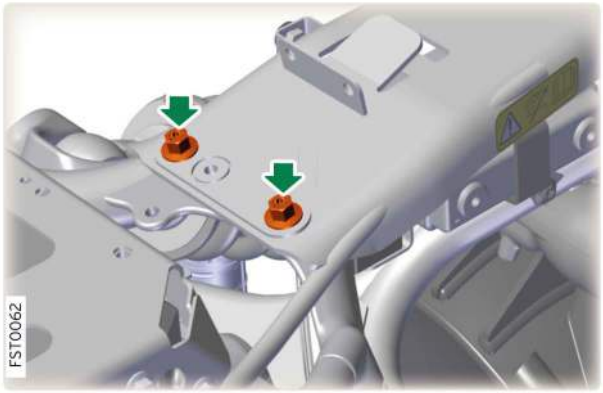
13. Remove frame cover from right hand side of the rider seat.



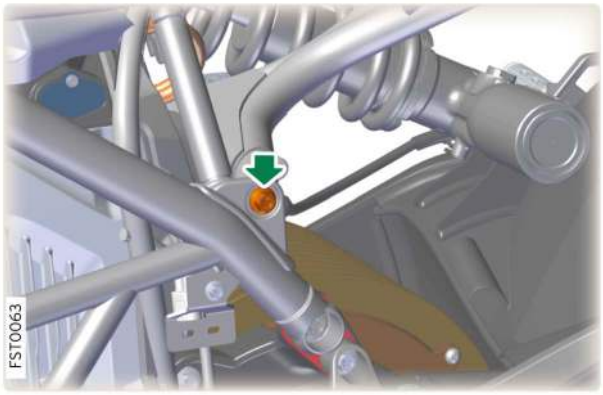
14. Disconnect the tail pod signal harness connector.



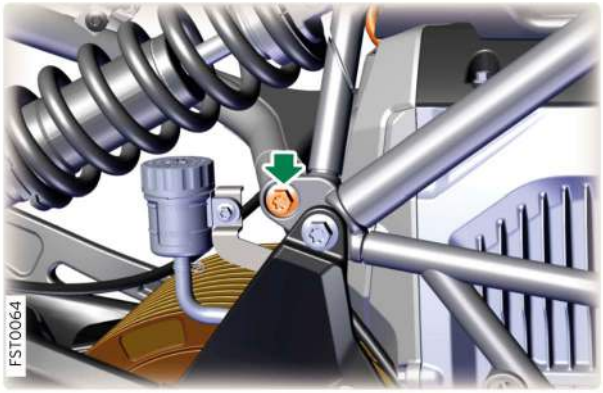
15. Release brake line/WSS wire from clip on tail frame.



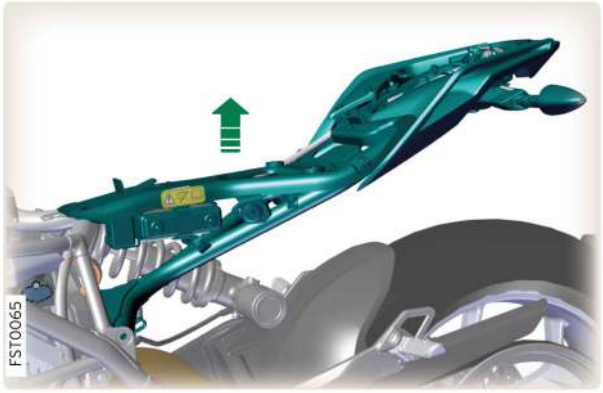
16. Remove T40 bolts (x2) securing tail to bike main frame. Torque 20 lb-ft (27 Nm).



17. Support tail frame and remove T40 bolt securing tail to bike main frame. Torque 20 lb-ft (27 Nm).



18. Support tail frame and remove T40 bolt securing tail to bike main frame. Torque 20 lb-ft (27 Nm).



19. Remove tail structure.

Installation

1. Installation is the reverse of removal procedure.

High Voltage Fuses

CAUTION: Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- 3/16” standard screwdriver
- 2 mm hex wrench

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*



2. Remove screw securing fuse cover. Tool: 2 mm hex wrench



3. High voltage fuses.



4. Insert screwdriver into fuse cap and turn counterclockwise to release high voltage DC/DC (DCDC) converter fuse.



5. Remove high voltage DC/DC (DCDC) converter fuse.



6. Insert screwdriver into fuse cap and turn counterclockwise to release high voltage contactor (CONT) fuse.



7. Remove high voltage contactor fuse.

Installation

1. Installation is the reverse of the removal procedure.

12 Volt Battery (Disconnect)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- 2 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove rider’s seat. See *Rider’s Seat, page 60.1.*



3. Remove bolts (x2) securing battery access closeout panel. Tool: T25. Torque: 3.5 lb-ft (5 Nm).



4. Remove bolt securing negative battery terminal eyelet to battery and collect washer. Tool: 10 mm socket and ratchet. Torque: 4 lb-ft (5 Nm).



5. Cover negative battery terminal eyelet with insulating material.

   CAUTION: **Cover/protect battery terminal eyelet to reduce the risk of accidentally contacting the negative battery terminal, which can inadvertently power up the 12 volt system and damage components.**



6. Use cable tie to secure negative battery terminal eyelet to the positive battery cable.

   CAUTION: **Secure battery terminal wire to reduce the risk of arcing and damaging electrical components.**

Installation

1. Installation is the reverse of the removal procedure.

12 Volt Battery (Removal)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 2 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*



2. Remove bolts (x2) securing battery access closeout panel. Tool: T25. Torque: 3.5 lb-ft (5 Nm).



3. Remove bolt securing the harness wire eyelet to the battery negative battery terminal and collect washer. Tool: 10 mm socket. Torque: 4 lb-ft (5 Nm).



4. Cover negative battery terminal eyelet with insulating material.

   CAUTION: **Cover/protect battery terminal eyelet to reduce the risk of accidentally contacting the negative battery terminal, which can inadvertently power up the 12 volt system and damage components.**

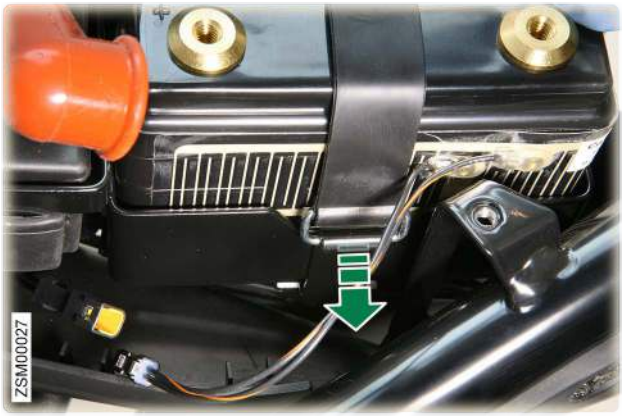


5. Move protective cover to expose the positive terminal bolt. Remove bolt securing the harness wire eyelet to the positive battery terminal and collect washer. Tool: 10 mm socket. Torque: 4 lb-ft (5 Nm).

   CAUTION: **Take note of the larger washer used on the positive battery terminal bolt to secure the protective boot.**



6. Disconnect the battery heater harness connector.



7. Unhook the battery retaining strap.
8. Remove the battery from the frame.

Installation

1. Installation is the reverse of the removal procedure.

Headlight

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 2 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet

New Fasteners Required:

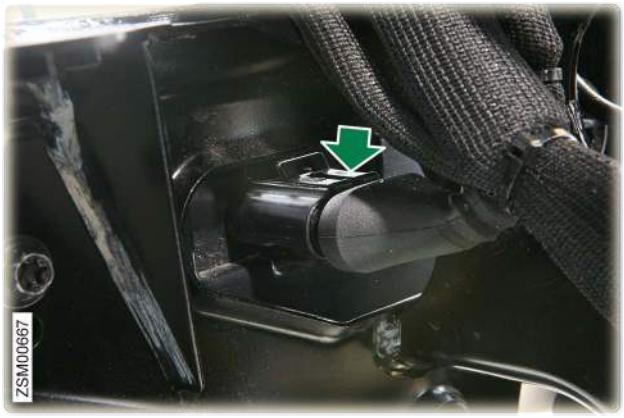
- Cable tie (quantity: 2)

Removal

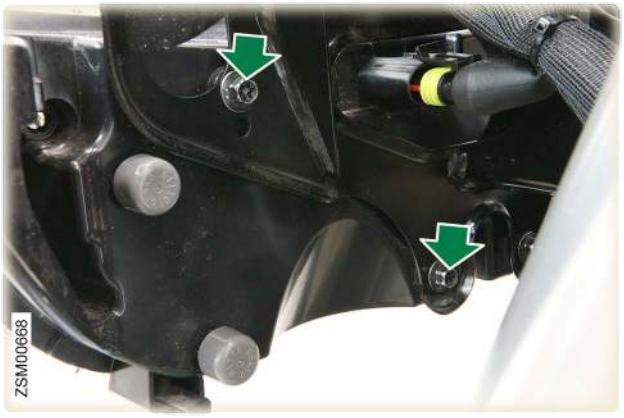
1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove tank assembly. See *Tank Removal, page 60.9.*
6. Remove headlight inner fairing. See *Headlight Inner Fairing, page 60.3.*



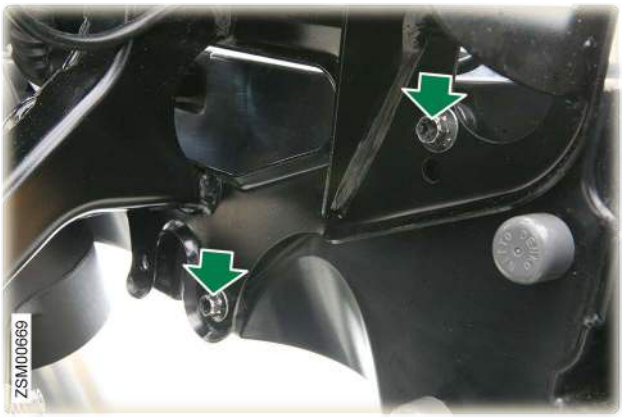
7. Remove head light inner fairing. See *Headlight Inner Fairing, page 60.3.*



8. Disconnect headlight harness connector.



9. Remove bolts (x2) securing left side of the headlight to the hela bracket. Tool: T30. Torque: 3.7 lb-ft (5 Nm).



10. Remove bolts (x2) securing right side of the headlight to the hela bracket. Tool: T30. Torque: 3.7 lb-ft (5 Nm).
11. Remove headlight.

Installation

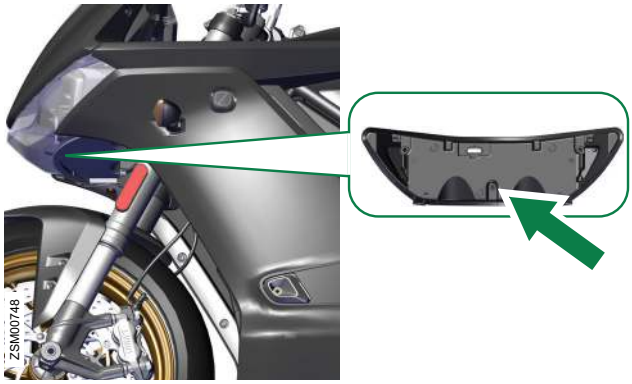
1. Installation is the reverse of the removal procedure.

Headlight - Alignment

NOTICE: The headlight must be aligned any time the suspension sag is adjusted because this affects the headlight alignment. Before the headlight can be aligned, the suspension sag and tire pressure must be correctly adjusted. The headlight can only be adjusted vertically. If the vertical adjustment is off, it causes the beam to point too close to or too far ahead of the motorcycle.

Alignment

1. Switch the headlight on in the low beam position.
2. Sit on the motorcycle and position it perpendicular to the ground.
3. Verify the beam alignment. The motorcycle is shipped with the headlight at a 0.5-2.5% dip.



4. The adjustment screw is located on the back of the headlamp in the center.
5. To adjust the headlight, turn the screw until the correct beam alignment is achieved.

Tail Light

CAUTION: Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 10 mm socket and ratchet

Removal

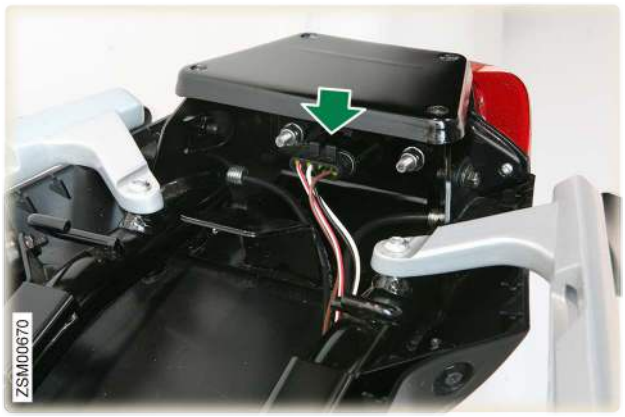
1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove rider's seat. See *Rider's Seat, page 60.1.*



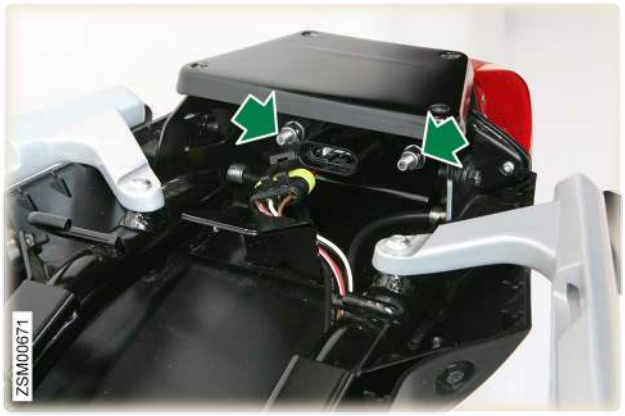
3. Remove bolts (x2) securing front of seat tray to tail frame assembly. Tool: T25. Torque: 3 lb-ft (4 Nm).



4. Remove bolts (x4) securing rear of seat tray to tail frame assembly. Tool: T30. Torque: 5 lb-ft (7 Nm).
5. Remove seat tray.



6. Disconnect tail light harness connector.



7. Remove nuts (x2) securing tail light to tail frame assembly. Tool: 10 mm socket. Torque: 3.5 lb-ft (5 Nm).
8. Remove tail light from tail frame assembly.

Installation

1. Installation is the reverse of the removal procedure.

Turn Signal (Left Front)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 2 mm hex wrench
- 17 mm combination wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet

New Fasteners Required:

- Cable tie (quantity: 2)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*



4. Remove nut securing left front turn signal to the left outer side fairing and collect star washer. Tool: 17 mm wrench. Torque: 8 lb-ft (11 Nm).
5. Remove left front turn signal.

Installation

1. Installation is the reverse of the removal procedure.

Turn Signal (Right Front)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 2 mm hex wrench
- 17 mm combination wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet

New Fasteners Required:

- Cable tie (quantity: 1)

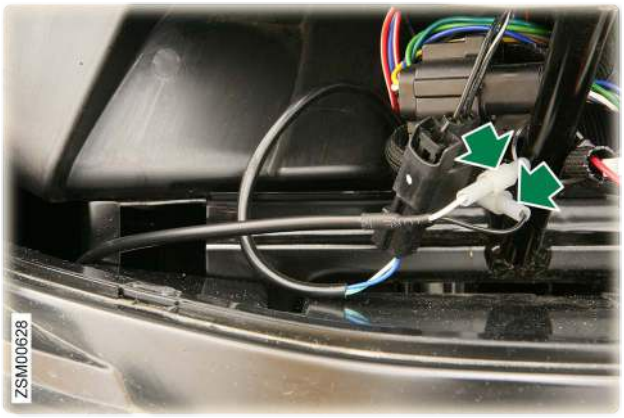
Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*



3. Cut cable tie securing right front turn signal electrical harness to hela bracket.

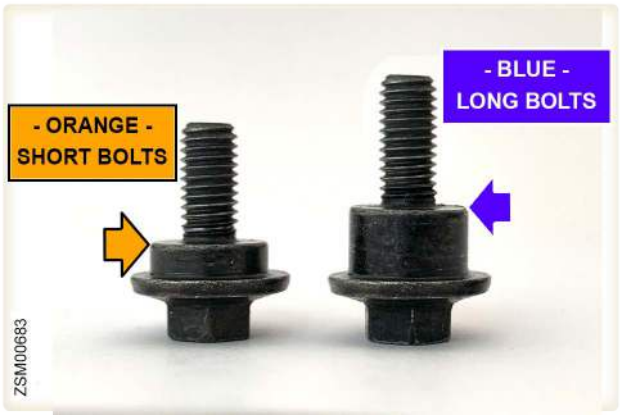
   Note: Replace cable tie during the installation process.



4. Disconnect right front turn signal harness connectors.

   Note: Take note of the wire insulation colors. The turn signal wire colors match the colors of the main wire harness.

   Right turn signal wire colors: black and white.

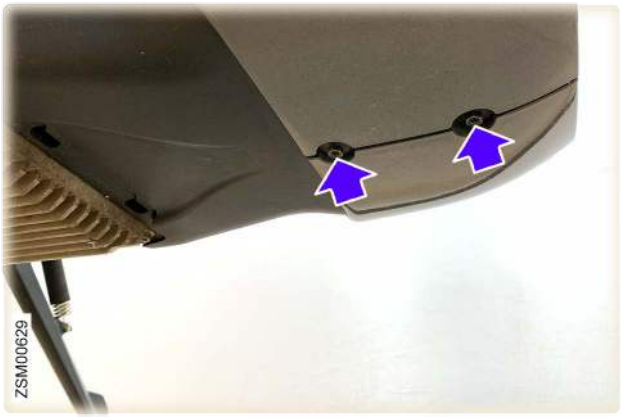


5. For the rest of this procedure, there will be references to shouldered-bolts securing body panels, that are 2 different lengths.

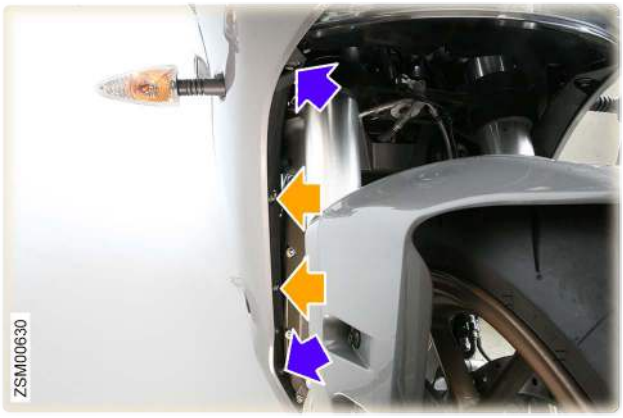
   ***Short bolts**: designated on photos with orange arrows, used to attach a single body panel layer.*

   ***Long bolts**: designated on photos with blue arrows, used to attach 2 layers of body panels.*

   Note: Non-shouldered body bolts designated with green arrows are present in this procedure.



6. Remove **long** bolts (x2) securing bottom of right outer side fairing to bodywork. Tool: T25. Torque: 3 lb-ft (4 Nm).



7. Remove **long** bolts (x2[blue arrows]) and **short** bolts (x2[orange arrows]) securing the leading edge of the right outer side fairing to bodywork. Tool: T25. Torque: 3 lb-ft (4 Nm).

   Note: Take note of length of the bolts.



8. Remove right outer side fairing.



9. While removing right outer side fairing, guide the right front turn signal harness wires through their access hole in the right inner side fairing.



10. Remove nut securing right front turn signal to the right outer side fairing and collect star washer. Tool: 17 mm wrench. Torque: 8 lb-ft (11 Nm).
11. Remove right front turn signal.

Installation

1. Installation is the reverse of the removal procedure.

Turn Signal (Rear)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

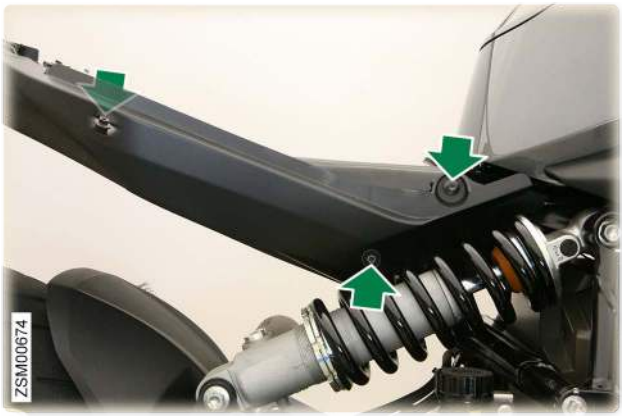
- T25
- T30
- 17 mm combination wrench
- 2 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet

New Fasteners Required:

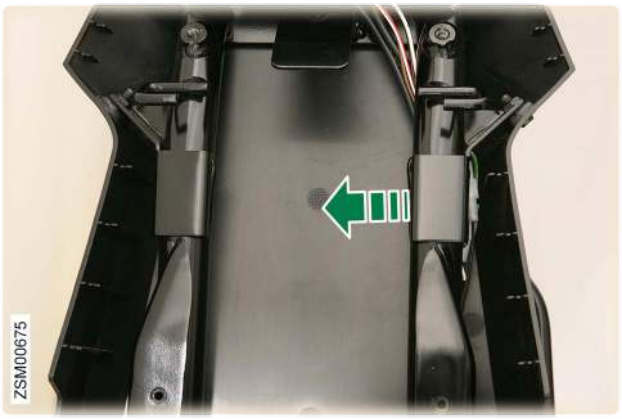
- Cable tie (quantity: 1)

Removal

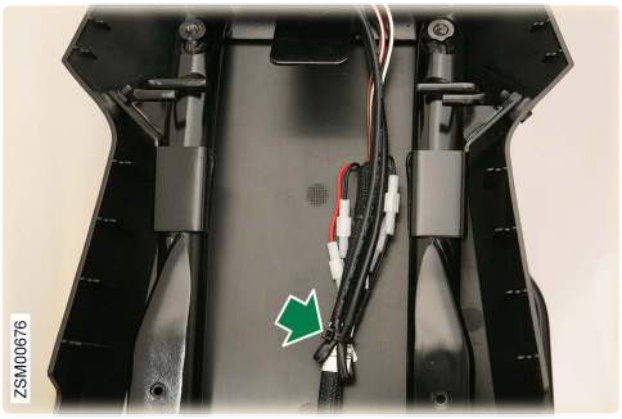
1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove left and right grab handles. See *Grab Handles (Right and Left), page 60.29.*



3. Remove bolts (x3) securing right side cover to tail frame assembly. Tool: T25. Torque: 3.5 lb-ft (5 Nm).
4. Remove the right side cover.

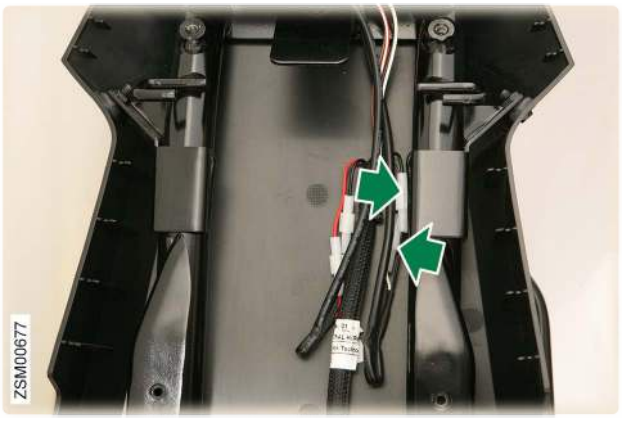


5. Move rear lighting harness to the right, from under tail frame to gain access to the harness connectors.



6. Cut cable tie securing rear turn signal harnesses to the tail light harness.

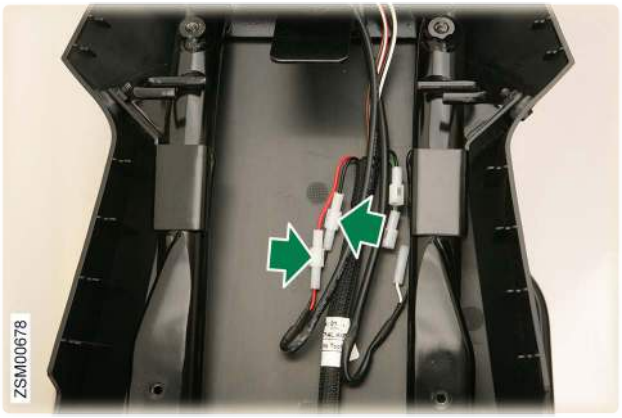
   Note: Replace cable tie during the installation process.



7. Disconnect left rear turn signal harness connectors.

Note: Take note of the wire insulation colors. The turn signal wire colors match the colors of the main wire harness.

Left turn signal wire colors: black and white.



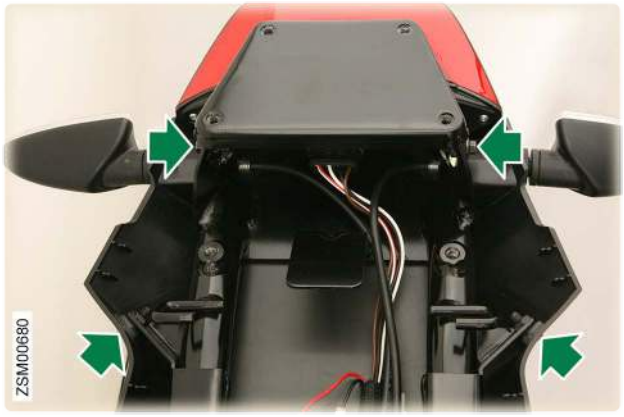
8. Disconnect right rear turn signal harness connectors.

   Note: Take note of the wire insulation colors. The turn signal wire colors match the colors of the main wire harness.

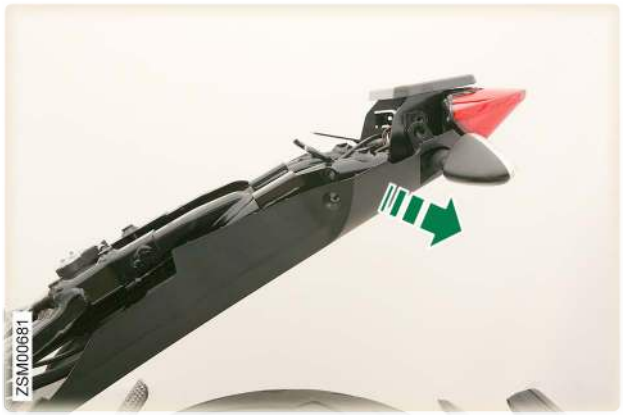
   Right turn signal wire colors: black and red.



9. Remove bolts (x3) securing front of tail trunk pan to tail frame assembly. Tool: T25. Torque: 3.5 lb-ft (5 Nm).



10. Remove bolts (x4) securing rear of tail trunk pan to tail frame assembly. Tool: T25. Torque: 3.5 lb-ft (5 Nm).



11. Remove tail trunk pan to tail frame assembly.

    Note: Carefully maneuver the turn signal harnesses through the harness access holes in the tail frame.



12. Remove nut securing the left rear turn signal. Tool: 17 mm wrench. Torque: 8 lb-ft (11 Nm).
13. Remove nut from left rear turn signal harness and collect star washer.

14. Remove left rear turn signal.
15. Remove nut securing the right rear turn signal. Tool: 17 mm wrench. Torque: 8 lb-ft (11 Nm).
16. Remove nut from right rear turn signal harness and collect star washer.
17. Remove right rear turn signal.

Installation

1. Installation is the reverse of the removal procedure.

Dash

CAUTION: Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.

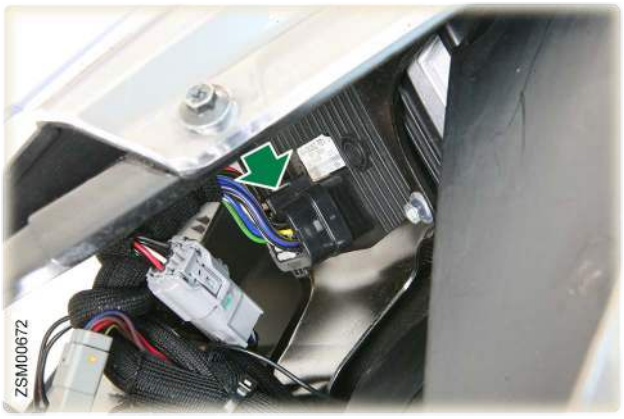
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

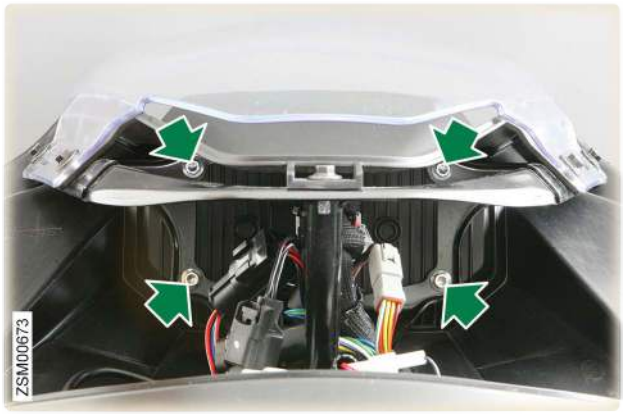
- T25
- T30
- 2 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*



2. Disconnect dash harness connector from the dash.



3. Remove bolts (x4) securing the dash to the hela bracket. Tool: T25. Torque: 4.4 lb-ft (6 Nm).
4. Remove dash display.

Installation

1. Installation is the reverse of the removal procedure.

   Note: Replacement dash panel from Zero Motorcycles will come preloaded with the correct firmware.

Key Switch

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 2 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet
- locking pliers

New Fasteners Required:

- Cable ties (quantity: 4)
- Break away hex bolt set PN: 90-0293701 (quantity: 1 package)

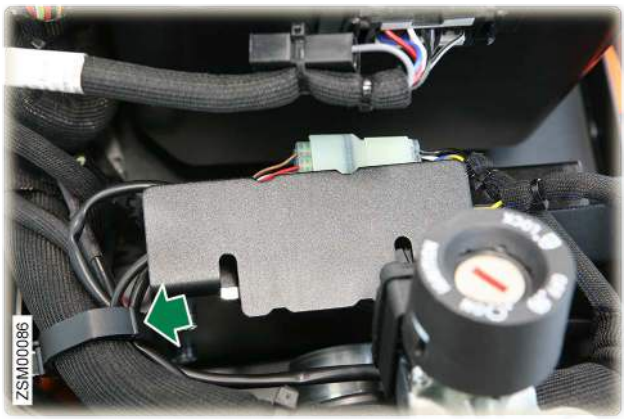
Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove tank assembly. See *Tank Removal, page 60.9.*

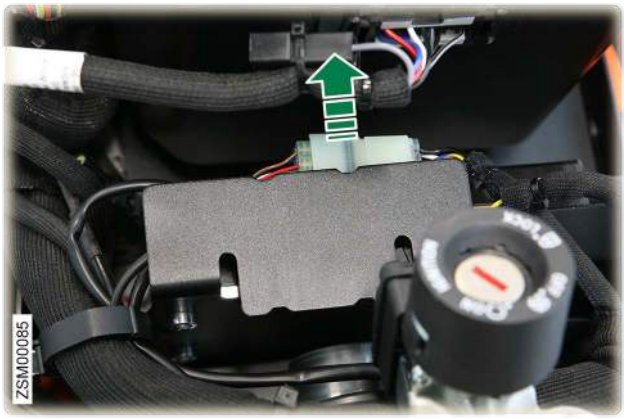


5. Cut cable ties (x2) securing CCM to the HCU bracket.

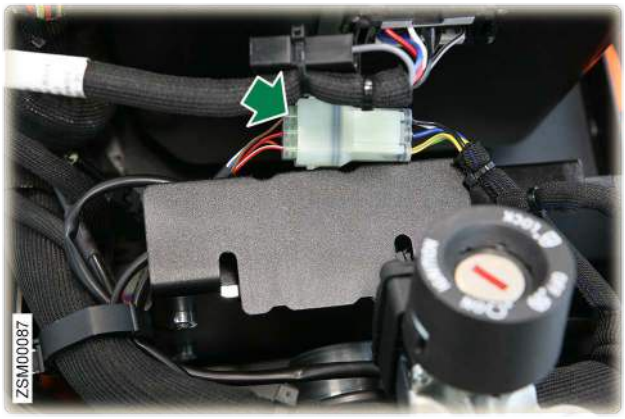
   Note: Replace cable ties (x2) during the installation process.
6. Set CCM aside to gain access to key switch harness connector.



7. Unclip harness retaining clip.

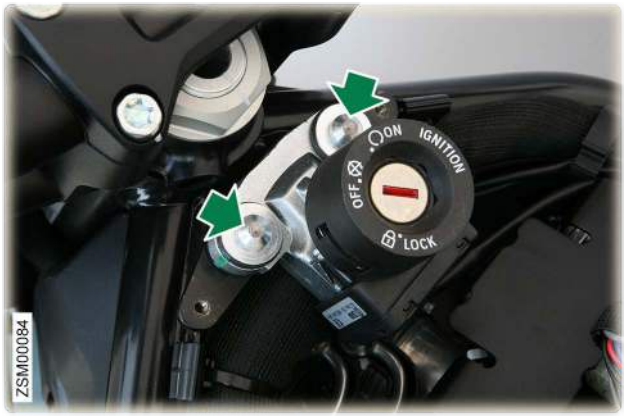


8. Pull key switch harness out from under the HCU bracket.



9. Disconnect key switch wiring harness connector.

   Note: Take note of harness routing for installation process.



10. Remove bolts (x2) securing key switch to the motorcycle frame.

    Note: Use a bolt extractor to extract the breakaway bolts.

    Note: Replace break away bolts (x2) during the installation process.

11. Remove key switch.

Installation

1. Installation is the reverse of the removal procedure.
2. Perform the key programming procedure to program the keys to the motorcycle. See *Key Programming, page 10.10.*

Mode Switch (Without Heated Grips)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 3/16” standard screwdriver
- #2 Phillips screwdriver
- 2 mm hex wrench
- 3 mm hex wrench
- 10 mm socket and ratchet

New Fasteners Required:

- Cable ties (quantity: 3)
- Specialty low-profile cable tie (quantity: 1)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove tank assembly. See *Tank Removal, page 60.9.*
5. Remove headlight inner fairing. See *Headlight Inner Fairing, page 60.3.*

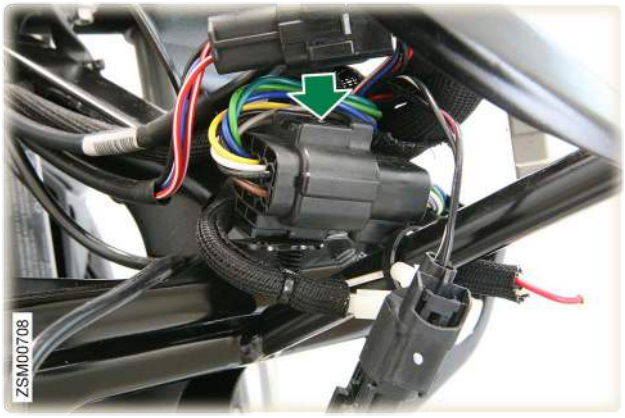


6. Cut cable tie securing the mode switch electrical harness to hela bracket.

   Note: Replace cable tie during the installation process.



7. Disconnect the headlight switch electrical harness connector.



8. Disconnect the mode switch harness connector.

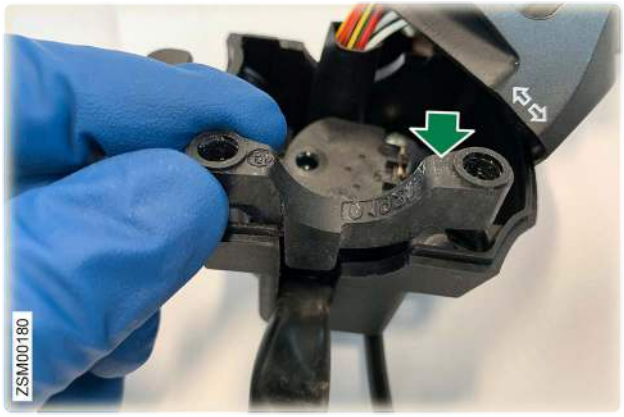


9. Cut cable tie securing mode switch harness to the left side of the handlebar.

   Note: Replace cable tie during the installation process.



10. Remove bolts (x2) securing the mode switch's bottom to the top. Tool: #2 Phillips screwdriver.



11. Remove mode switch assembly from the handlebar.

    Note: Confirm mode switch shim is in place upon installation.

Installation

1. Installation is the reverse of the removal procedure.

Mode Switch (With Heated Grips)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 3/16” standard screwdriver
- #2 Phillips screwdriver
- 2 mm hex wrench
- 3 mm hex wrench
- 10 mm socket and ratchet

New Fasteners Required:

- Cable ties (quantity: 4)
- Specialty low-profile cable tie (quantity: 1)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove tank assembly. See *Tank Removal, page 60.9.*
5. Remove headlight inner fairing. See *Headlight Inner Fairing, page 60.3.*
6. Remove storage liner. See *Tank Storage Liner, page 60.31.*

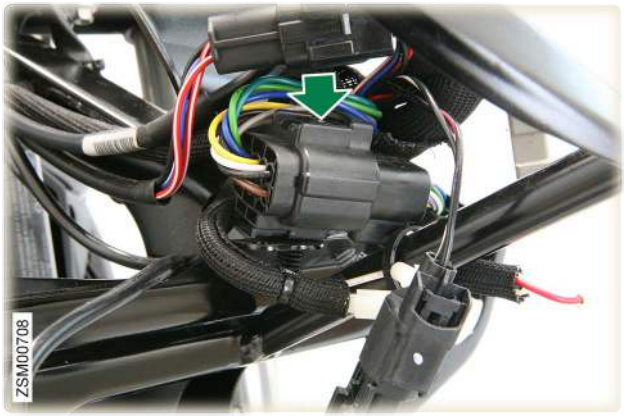


7. Cut cable tie securing the mode switch electrical harness to hela bracket.

   Note: Replace cable tie during the installation process.



8. Disconnect the headlight switch electrical harness connector.



9. Disconnect the mode switch harness connector.



10. Cut cable tie securing mode switch harness to the left side of the handlebar.

    Note: Replace cable tie during the installation process.

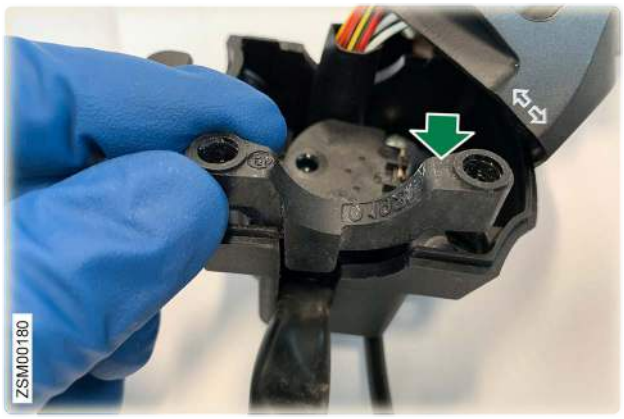


11. Cut cable tie securing left heated grip harness to the bottom of the mode switch assembly.

    Note: Replace cable tie during the installation process.



12. Remove bolts (x2) securing the mode switch's bottom to the top. Tool: #2 Phillips screwdriver.



13. Remove mode switch assembly from the handlebar.

    Note: Confirm mode switch shim is in place upon installation.

Installation

1. Installation is the reverse of the removal procedure.

Heated Grips (Left)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 3/16” standard screwdriver
- #2 Phillips screwdriver
- 2 mm hex wrench
- 3 mm hex wrench
- 10 mm socket and ratchet

New Fasteners Required:

- Cable ties (quantity: 4)
- Specialty low-profile cable tie (quantity: 1)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove left and right inner side fairings. See *Side Fairings (Inner), page 60.17.*
5. Remove tank assembly. See *Tank Removal, page 60.9.*
6. Remove headlight inner fairing. See *Headlight Inner Fairing, page 60.3.*
7. Remove storage liner. See *Tank Storage Liner, page 60.31.*

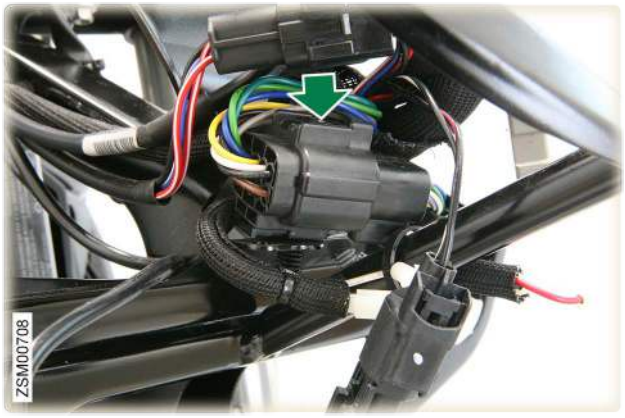


8. Cut cable tie securing the mode switch electrical harness to hela bracket.

   Note: Replace cable tie during the installation process.



9. Disconnect the headlight switch electrical harness connector.



10. Disconnect the mode switch harness connector.



11. Remove bolts (x2) securing left side of front closeout panel to frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).

    Note: Protect rear portion of front fender and front closeout panel surfaces to reduce the possibility of scratching their surfaces.



12. Remove bolts (x2) securing right side of front closeout panel to frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).
13. Remove front closeout panel.

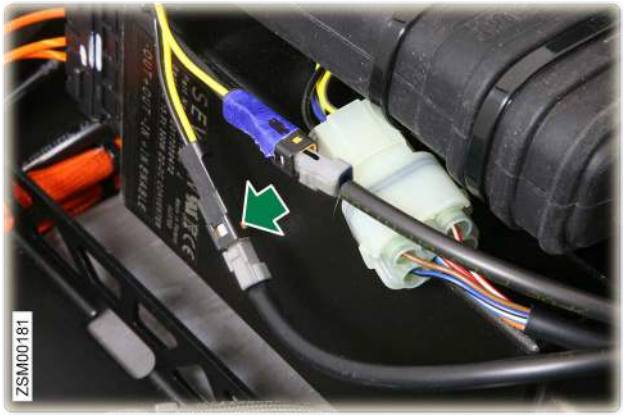
    Note: Position front suspension straight forward to allow access for removing front closeout panel downward in front of power pack.



14. Unhook retaining clip to release tension on harnesses.



15. Slide key switch harness connector out to gain access to heated grip harness connectors.



16. Disconnect heated grip harness connector.

    Note: Label/mark connector if you're going to disconnect both connectors.



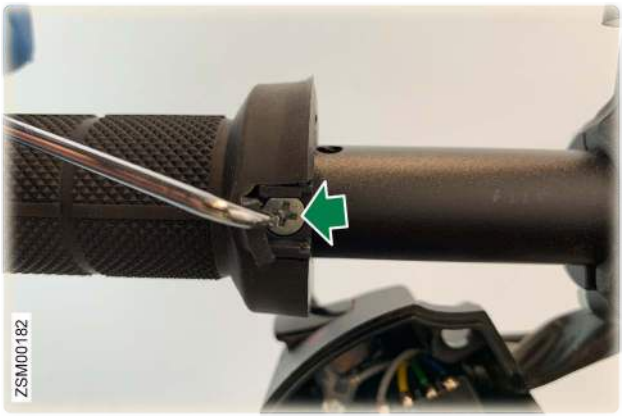
17. Cut cable tie securing mode switch harness to the left side of the handlebar.

    Note: Replace cable tie during the installation process.



18. Cut cable tie securing left heated grip harness to the bottom of the mode switch assembly.

    Note: Replace cable tie during the installation process.



19. Remove bolt securing the left heated grip to the handlebar. Tool: #2 Phillips screwdriver.



20. Remove second bolt securing the left heated grip to the handlebar. Tool: #2 Phillips screwdriver.
21. Remove left heated grip to the handlebar.

Installation

1. Installation is the reverse of the removal procedure.

Kickstand Switch

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

Tools Required (includes tools required for parent jobs):

- T25
- T30
- T40
- T50
- 3/16” standard screwdriver
- 2 mm hex wrench
- 2.5 mm hex wrench
- 10 mm socket and ratchet

New Fasteners Required:

- Cable ties (quantity: 4)

Removal

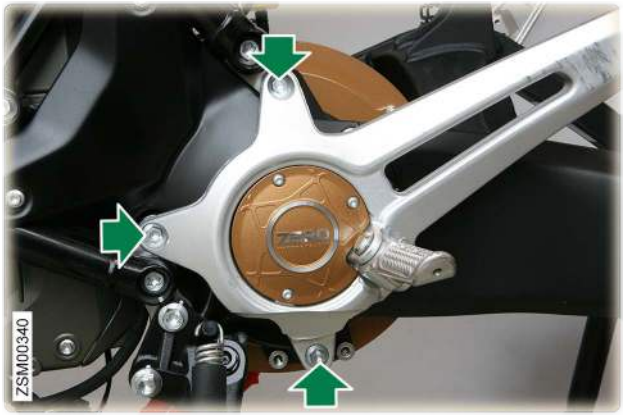
1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*



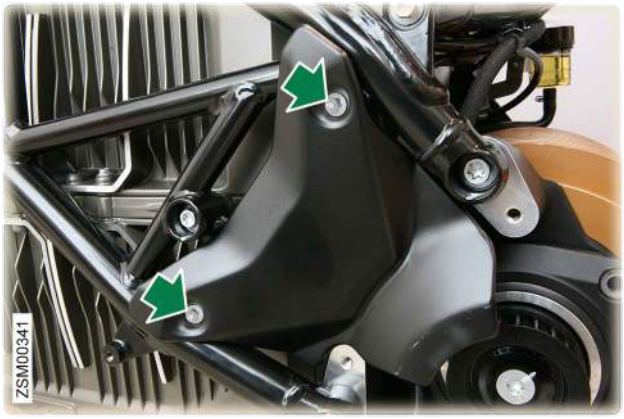
2. Safely raise rear tire off the ground using a motorcycle stand.



3. **DO NOT LIFT THE MOTORCYLE BY JACKING UP THE CONTROLLER! DO NOT SUPPORT THE WEIGHT OF THE MOTORCYCLE BY SUPPORTING THE CONTROLLER! Doing so, will damage the controller and other components.**



4. Remove bolts (x3) securing the left foot peg bracket to the left doubler plate. Tool: T40. Torque: 20 lb-ft (27 Nm).



5. Remove bolts (x2) securing the heel guard to the frame. Tool: T25. Torque: 3.5 lb-ft (5 Nm).



6. Release harness anchor clip from the frame.



9. Disconnect kickstand harness connector.



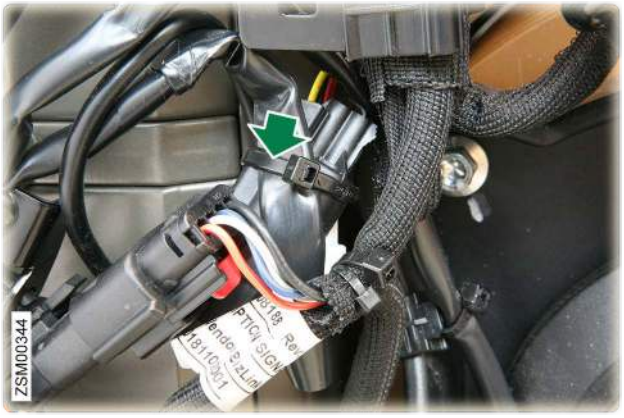
7. Cut cable tie securing the rear WSS harness and kickstand harness to the anchor clip.

   Note: Replace cable tie during the installation process.



10. Cut cable tie securing the kickstand harness to the left doubler plate.

    Note: Replace cable tie during the installation process.



8. Cut cable tie securing kickstand harness to the kickstand harness connector and the WSS harness connector.

   Note: Replace cable tie during the installation process.



11. Remove bolts (x2) securing kickstand to the left doubler plate. Tool: T50. Torque (both bolts): 25 lb-ft (34 Nm).
12. Remove kickstand.



13. Remove bolts (x2) securing the brake stand switch. Tool: 2.5 mm hex wrench. Torque: 2 lb-ft (3 Nm).

Installation

1. Installation is the reverse of the removal procedure.

Cellular Connectivity Module (CCM)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 3/16” standard screwdriver
- 2 mm hex wrench
- 3 mm hex wrench
- 10 mm socket and ratchet

New Fasteners Required:

- Cable ties (quantity: 4)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove tank assembly. See *Tank Removal, page 60.9.*



5. Cut cable ties (x2) securing CCM to the HCU bracket.

   Note: Replace cable ties (x2) during the installation process.



6. Roll the CCM rubber cap down and remove it.



7. Roll the CCM rubber harness cover upward to reveal the harness connector.



8. Turn the CCM over and release the harness connector by pushing the locking tab.
9. Remove CCM.

Installation

1. Installation is the reverse of the removal procedure, but follow the proceeding steps to complete the CCM installation.



2. Insert the CCM harness connector.

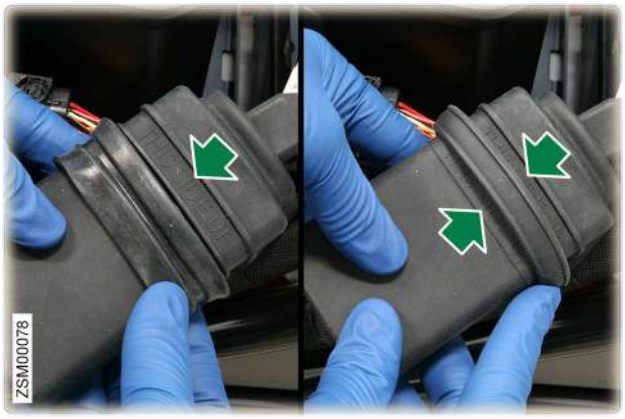


3. Roll the CCM rubber harness cover down over the CCM as far as it will go.

Note: The satellite logo on the CCM is the side that needs to be facing up when installed on the motorcycle. Confirm that the satellite logo and the "THIS SIDE UP" text on the rubber harness cover are facing the same direction.



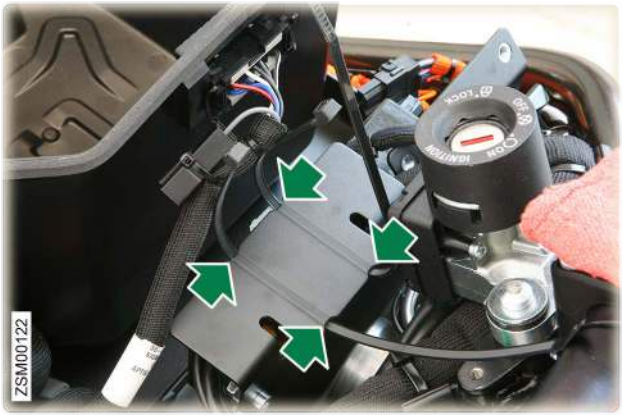
4. Push the CCM rubber end cap on the end of the CCM as far as it will go.



5. The CCM rubber end cap has the text "THIS SIDE UP" printed on it. Confirm that the text on the end cap is also facing the same as the "THIS SIDE UP" on the rubber harness cover.



6. Confirm that both grooves in the CCM end cap are interlocked with both of the ribs on the harness boot cover.



7. Install new cable ties (x2) under the HCU bracket. Line them up with the notches in the bracket.

   Note: Do not capture the wiring harness located under the HCU bracket with the cable ties.



8. Install the CCM back on the HCU bracket with the text “THIS SIDE UP” text facing upward.
9. Follow the rest of the CCM Removal steps (3, 2, and 1) to complete the installation of the CCM.
10. Once the CCM is physically installed, you must email Zero Motorcycles Customer Service department to complete the installation procedure and activate the module. Zero Motorcycles will need the VIN of the motorcycle and additional information to complete the installation.
    - North America: support@zeromotorcycles.com
    - Zero Motorcycles Europe: service.eu@zeromotorcycles.com

Main Bike Board (MBB)

CAUTION: **Always perform the Lockout procedure prior to servicing any High Voltage component or connection. Proper procedures must be followed! To protect electrical components, perform the following tasks in the order given. Do not deviate from the repair procedure processes.**

NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

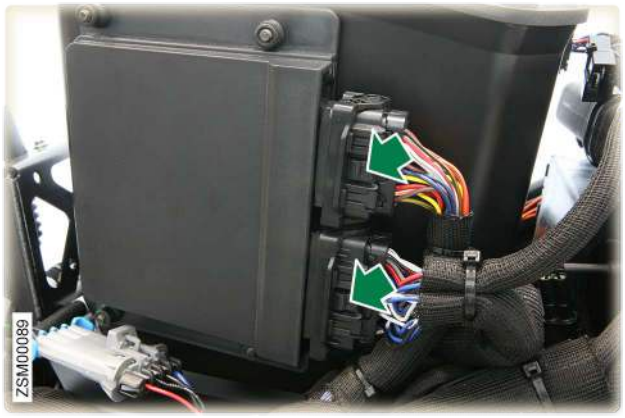
- T25
- T30
- 3/16” standard screwdriver
- 2 mm hex wrench
- 3 mm hex wrench
- 6 mm hex wrench
- 10 mm socket and ratchet

New Fasteners Required:

- Cable tie (quantity: 2)

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Lockout Procedure, page 10.2.*
2. Remove headlight upper fairing. See *Headlight Upper Fairing, page 60.2.*
3. Remove left and right outer side fairings. See *Side Fairings (Outer), page 60.13.*
4. Remove tank assembly. See *Tank Removal, page 60.9.*



5. Disconnect MBB harness connectors (x2).



6. Remove bolts (x4) securing MBB to the tank storage liner and collect washers (x4). Tool: 6 mm hex

   CAUTION: **Replace vibration-resistant rubber isolator nuts if they are damaged or worn.**

   Note: Do not over-tighten bolts.

7. Remove MBB.

Installation

1. Installation is the reverse of the removal procedure.

   Note: After replacing the MBB, the keys must be reprogrammed. Locate your yellow key and black keys and follow the key programming procedure. See Motor Controller Firmware Update, page 10.15.

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