ZERO DS™
ZERO DSR™
ZERO DSR/X™



ZERO MOTORCYCLES
SERVICE MANUAL

8811933-AM

DS, DSR, DSR/X 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



DSRX0662

Left side of motorcycle.



DSRX0663

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
lb·ft	pounds-feet
in-lb	inch-pound
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.

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. See *Steering Stem, page 40.1.* 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 45.3.*
- Kickstand switch - Check operation. See *Kickstand Switch, page 70.20.*
- 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 45.3.*
- 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 70.20.*
- 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 30.31.*
- Swingarm pivot bearings - Check for smooth operation. Replace if necessary. See *Swingarm, page 40.14*.

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.

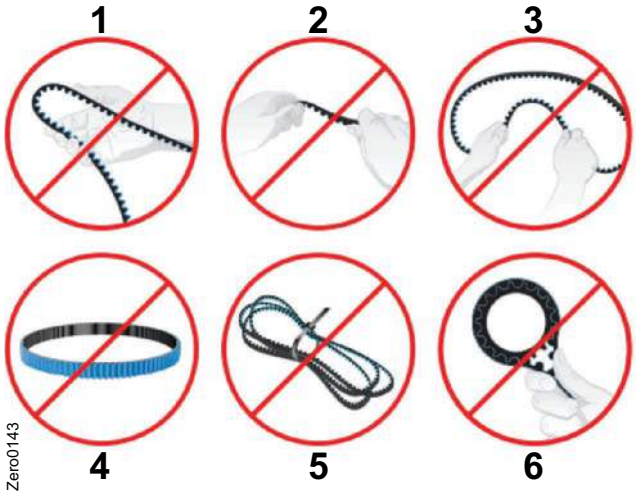
7. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
8. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*

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 30.31.* 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.

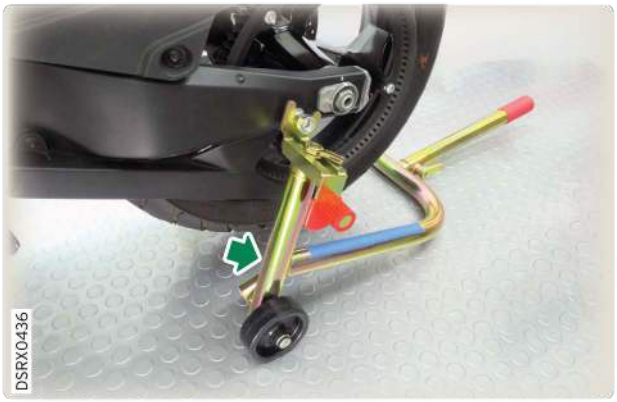
Drive Belt - Adjust

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. Remove rear fender. See *Rear Fender, page 60.20.*



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



5. 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.



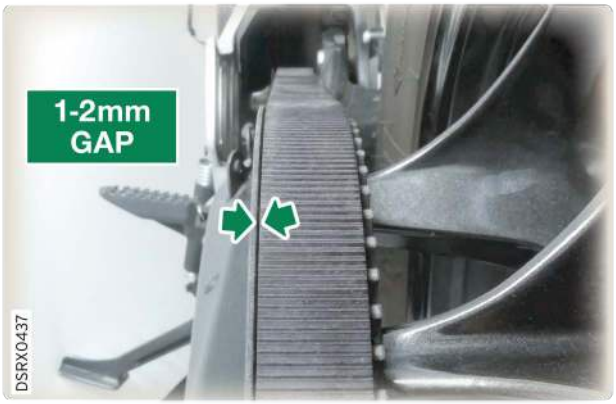
6. Turn the left (and right) belt tension adjustment bolts a 1/4 turn at a time until the belt adjustment is within specification. Tool: T45



7. 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.

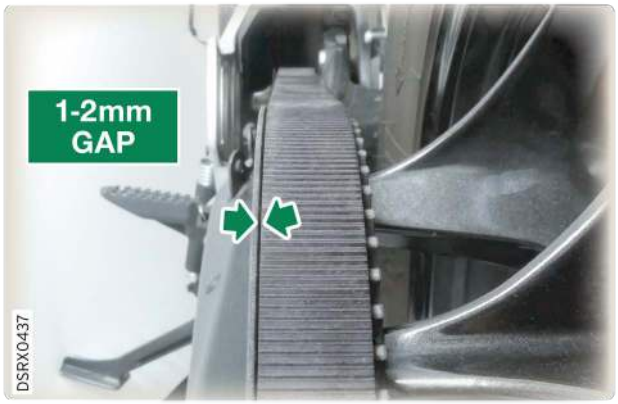
NOTICE: Rotating the ***tire*** two full revolutions isn't enough to normalize the belt on the two sprockets, so be sure to rotate the ***belt*** two full revolutions by counting the number of times the printing on the belt passes by the rear outer fender arm. Failing to follow this instruction could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



8. 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.



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



10. 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.



11. 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 84 Hz.
12. Tighten the left (and right) belt tension adjustment bolts. Torque: 4 lb·ft (5 Nm).
13. Install rear fender. See *Rear Fender, page 60.20.*
14. Test ride motorcycle.



15. 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

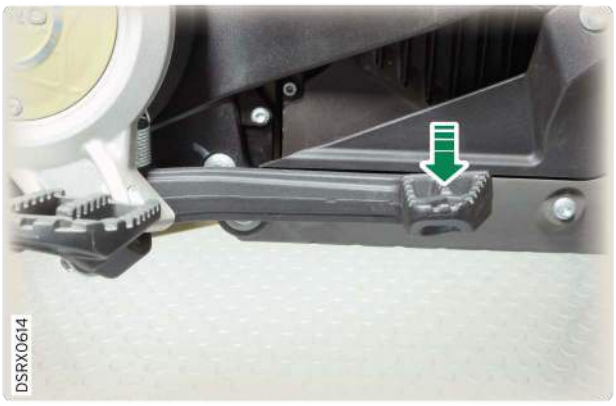


1. Fill the rear master cylinder brake fluid reservoir with DOT4 brake fluid. Keep the reservoir full during this procedure.

   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. Perform the following steps to ensure proper braking friction.**

Process

1. Begin at 40 mph (64 km/h) and gradually apply the brake to reduce speed to 10 mph (16 km/h). Avoid locking the tires 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.

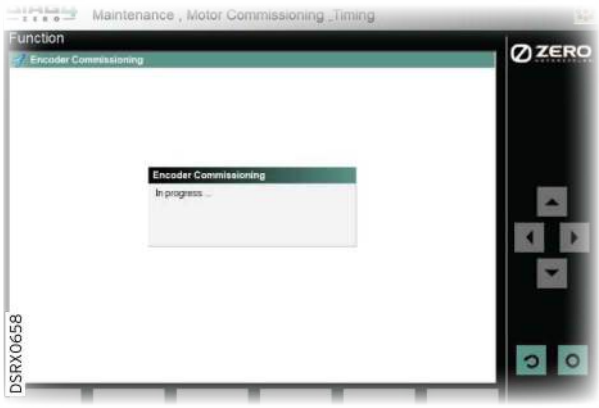


6. Check that the rear wheel is off of the ground before proceeding to the next step. After selecting **OK**, the wheel will start spinning slowly.



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.

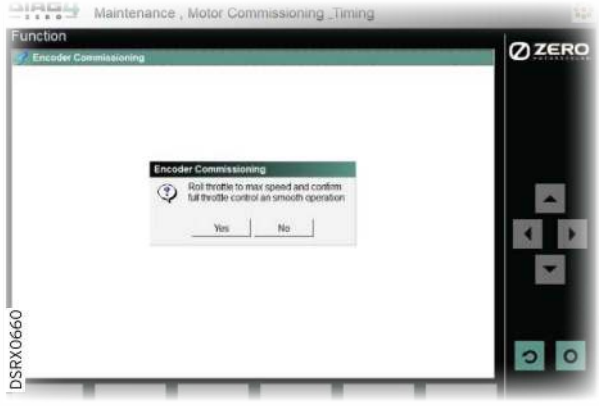
   Note: If the kill-switch or kickstand is not in the correct position, this popup screen will be displayed again.



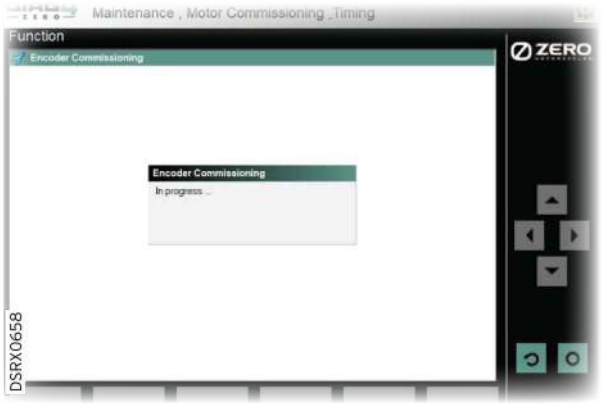
8. During this process, the rear wheel will turn and calibrate.



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

Battery Management Unit (BMU) Status Indicator and Reset Switch

Note: To view the Battery Management Unit (BMU) status indicator the Service Cover needs to be removed. See See Service Cover, page 20.2.

Status Indicator



1. The status LED indicator illuminates as follows:
   - Flashing Green - system is idle/standby (awake but contactor is open)
   - Solid Green - system is operational (contactor closed)
   - Flashing Orange is precharging (startup or selfcheck process)
   - Flashing Orange - precharging (startup or selfcheck process)
   - Solid Red - fault detected. Try resetting the system.

Resetting the System



1. If a Red fault status is indicated, press the switch away from the LED indicator to reset the system.

   Note: If fault is still shown after resetting the system, contact Zero Motorcycles.

Battery Management Unit (BMU)

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):

- 3 mm hex socket
- T25
- T30
- 2 mm hex wrench
- 3/16" standard screwdriver
- 10 mm socket and ratchet

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove service cover. See *Service Cover, page 20.2.*



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



5. Disconnect harness connectors (x2) from BMU.
6. 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. When installing the BMU, take care to engage all tabs (x4) in the underside of the power pack top cover.
4. Insert BMU at an angle to engage rear clips.
5. Apply vertical pressure and push BMU rearwards to fully engage front grommets.

Service Cover

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

Removal



1. Remove bolts (x2) securing service cover to power pack. Tool: T25. Torque: 2.5 lb·ft (3.5 Nm).
2. Remove service cover.

Installation

1. Installation is the reverse of removal procedure.

Front Cover

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.**

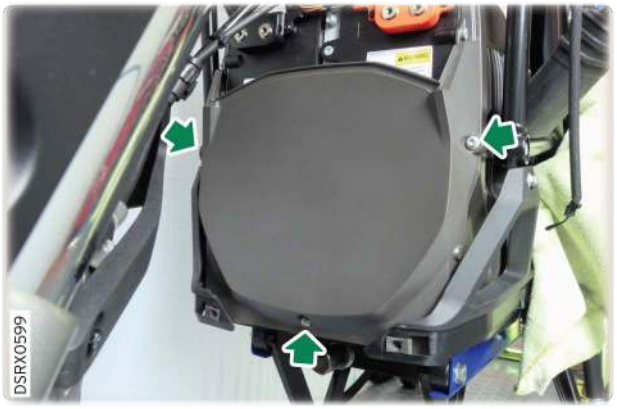
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 2 mm hex wrench
- 3/16" standard screwdriver
- 10 mm socket and ratchet

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove service cover. See *Service Cover, page 20.2.*
4. Remove skid pan. See *Skid Pan, page 60.19.*



5. Remove T25 bolts (x3) securing front cover to power pack. Torque: 2.5 lb·ft (3.5 Nm).
6. Remove front cover.

Installation

1. Installation is the reverse of removal procedure.

Rear Cover

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):

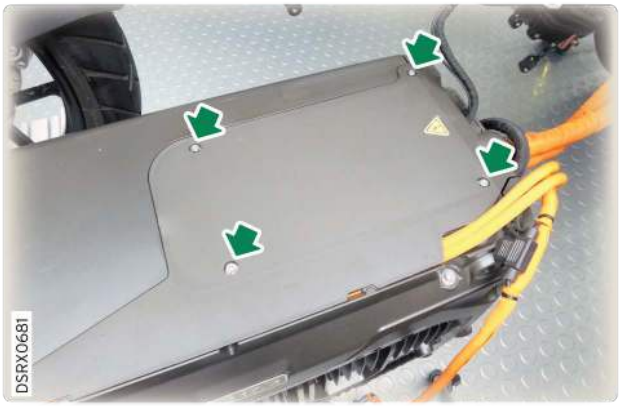
- Heavy duty scissor jack
- Heavy duty support blocks
- Motorcycle stand
- T25
- T30
- T50
- 22 mm 6pt socket
- 3/16” standard screwdriver
- 2 mm hex
- 10 mm socket and ratchet
- Side cutters
- Non-marking trim removal tool

New Fasteners Required:

- Cable ties (x4)
- Tape

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove power pack. See *Power Pack, page 20.20.*



4. Remove bolts (x4) securing inner top cover to power pack and collect flat washers (x4). Tool: 3 mm hex. Torque: 12 in·lb (1.4 Nm).

   Note: Clean mating surfaces thoroughly before re-installation
5. Remove inner top cover.



6. Remove bolts (x2) securing positive power cable to BCB main BUS set. Tool: 18 mm 6-point socket. Torque: 10 lb·ft (13.5 Nm).
7. Remove positive power cable.



8. Remove bolts (x2) securing negative power cable to BCB main BUS set. Tool: 18 mm 6-point socket. Torque: 10 lb·ft (13.5 Nm).
9. Remove negative power cable.



10. Release sheathed harnesses (x4) from power pack rear cover.



11. Remove bolts (x2) securing rear cover to power pack. Tool: T25. Torque: 2.5 lb·ft (3.5 Nm).
12. Remove rear cover.

Installation

1. Installation is the reverse of the removal procedure.

Mid Pack Protection Unit

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):

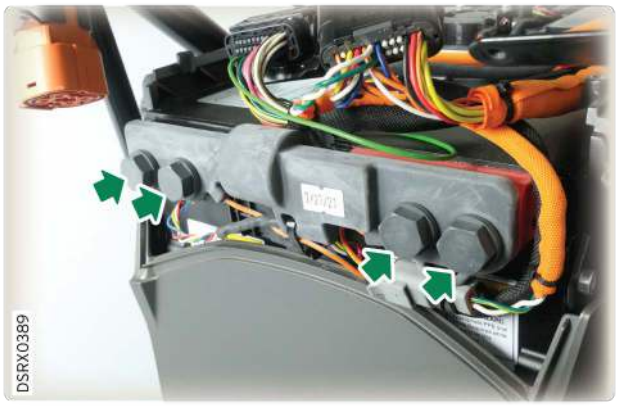
- 3 mm hex socket
- T25
- T30
- 2 mm hex wrench
- 3/16" standard screwdriver
- 10 mm socket and ratchet

New Fasteners Required:

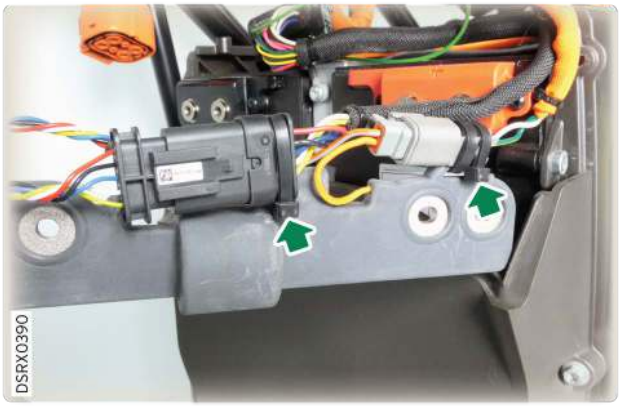
- Cable ties (x2)

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove service cover. See *Service Cover, page 20.2.*



4. Remove bolts (x4) securing mid pack protection unit. Tool: 18 mm 6-point socket. Torque: 10 lb·ft (13.5 Nm).

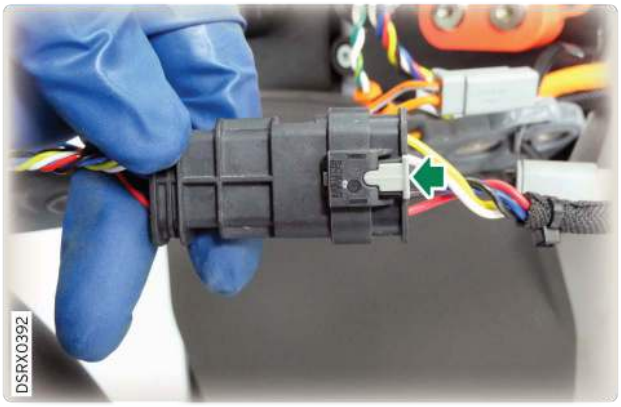


5. Cut cable ties (x2) securing harness connectors to mid pack protection unit.

   Note: Replace cable ties (x2) during the installation process.



6. Disconnect gray mid pack protection unit harness connector.



7. Unlock gray tab and disconnect black mid pack protection unit harness connector and collect 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

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.

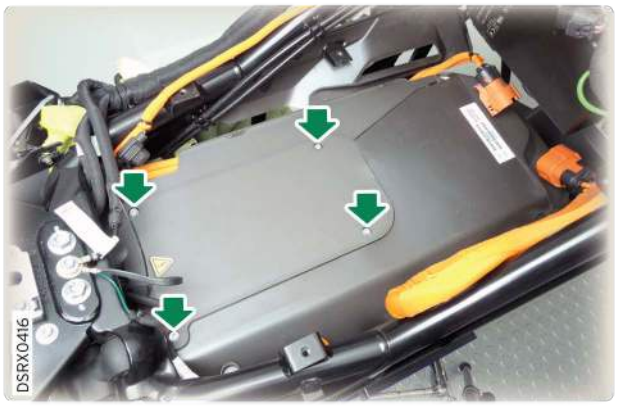
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- 3 mm hex socket
- T25

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove charger. See *Charger - 6KW, page 25.1*.



4. Remove bolts (x4) securing inner top cover to power pack and collect flat washers (x4). Tool: 3 mm hex. Torque: 12 in·lb (1.4 Nm).

   NOTE: Clean mating surfaces thoroughly before re-installation.

5. Remove inner top cover.



6. Release captive charge inlet harness from top cover.



7. Take note of harness located in notch of rear cover.



8. Remove bolts (x2) securing service cover to the power pack. Tool: T25. Torque: 2.5 lb·ft (3.5 Nm).
9. Remove service cover.



10. Remove bolt securing left side of power pack rear cover. Tool: T25. Torque: 2.5 lb·ft (3.5 Nm).



11. Remove bolt securing rear brake reservoir to motorcycle frame. Tool: T25. Torque: 4 lb·ft (5 Nm).



12. Reposition rear brake reservoir to gain access to power pack rear cover.



13. Remove bolt securing right side of power pack rear cover. Tool: T25. Torque: 2.5 lb·ft (3.5 Nm).
14. Move power pack rear cover rearward slightly to give access for removing top cover.



15. Remove rivet/tree fastener securing front of charger cover LH to the frame.



16. Remove rivet/tree fastener securing rear of charger cover LH to the frame.
17. Remove charger cover LH and collect plastic retainer nuts (x2).



18. Remove rivet/tree fastener securing front of charger cover RH to the frame.



19. Remove rivet/tree fastener securing rear of charger cover RH to the frame.
20. Remove charger cover RH and collect plastic retainer nuts (x2).



21. Remove bolts (x4) securing top cover to the power pack. Tool: T25. Torque: 2.5 lb·ft (3.5 Nm).
22. Remove top cover.

Installation

1. Installation is the reverse of the removal procedure.

Contactor

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):

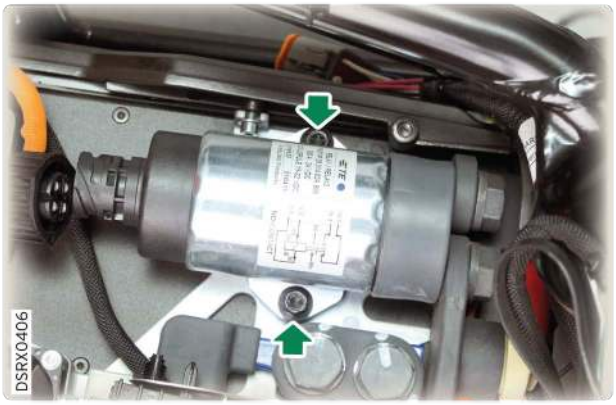
- T25
- T30
- 18 mm wrench
- 2 mm hex wrench
- 3 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove top cover. See *Top Cover, page 20.7.*



4. Disconnect contactor harness connector.



5. Remove bolts (x2) securing contactor to power pack. Tool: T30. Torque: 10 lb·ft (14 Nm).



6. Remove bolts (x2) securing BCB main BUS set to contactor. Tool: 18 mm wrench. Torque: 10 lb·ft (14 Nm).
7. Remove contactor.

Installation

1. Installation is the reverse of the removal procedure.

Cooling Fan

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.

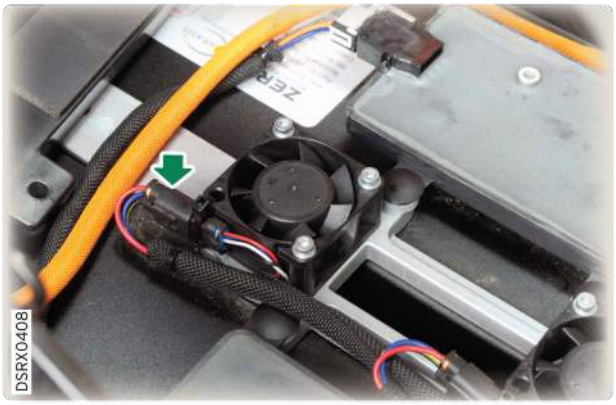
NOTICE: The procedures for the front and rear cooling fan are similar.

Tools Required (includes tools required for parent jobs):

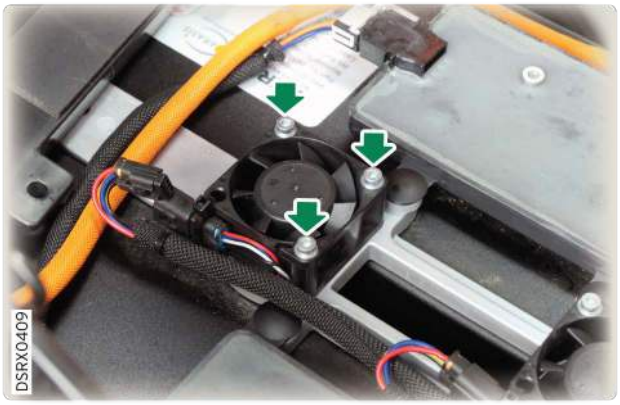
- 3 mm hex socket
- T25
- T30
- 2 mm hex wrench
- 2.5 mm hex wrench
- 3/16" standard screwdriver
- 10 mm socket and ratchet

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove top cover. See *Top Cover, page 20.7.*



4. Disconnect front cooling fan harness connector.



5. Remove bolts (x3) and collect washers (x3) securing the front fan to the power pack. Tool: 2.5 mm hex. Torque: 6.5 in-lb (1 Nm).

Installation

1. Installation is the reverse of the removal procedure.

Cell Management Unit (CMU)

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):

- 3 mm hex socket
- T25
- T30
- 1.5 mm hex wrench
- 2 mm hex wrench
- 3/16" standard screwdriver
- 10 mm socket and ratchet

New Fasteners Required:

- Fir tree clips (x2)
- CP70
- Cavity plugs

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove positive and negative power cables.See *Power Cables - Positive and Negative, page 20.14.*



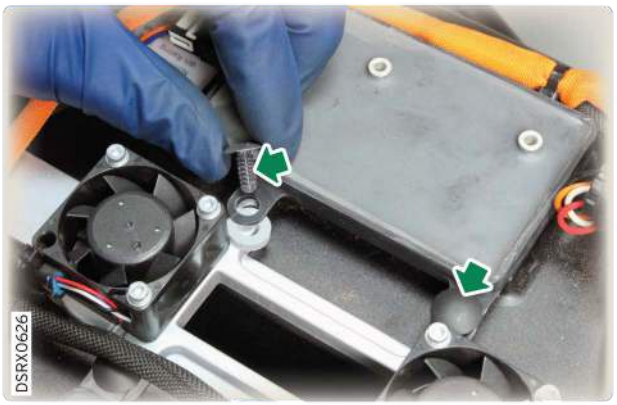
4. Remove and discard cavity plugs covering 1.5 mm hex bolts.

   Note: Do not reuse cavity plugs.



5. 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.



6. Remove fir tree clips (x2) and collect foam washers (x2).

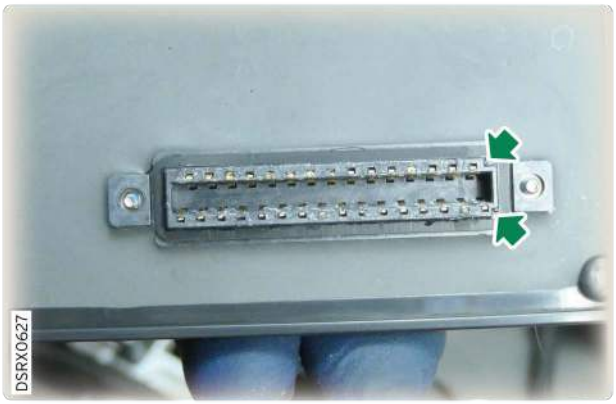
   Note: Discard fir tree clips.



7. Carefully lift the CMU and disconnect harness connector.
8. 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 Cables - Positive and Negative

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
- 18 mm 6pt socket
- 22 mm 6pt socket
- 3 mm hex wrench

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*



3. Remove bolts (x2) securing lower section of tail seat tray to tail frame. Tool: T25. Torque: 2.5 lb·ft (3 Nm).



4. Remove bolts (x2) securing tail controller cover to tail frame. Tool: T25. Torque: 2.5 lb·ft (3 Nm).
5. Remove tail controller cover.
6. Remove top cover. See *Top Cover, page 20.7.*

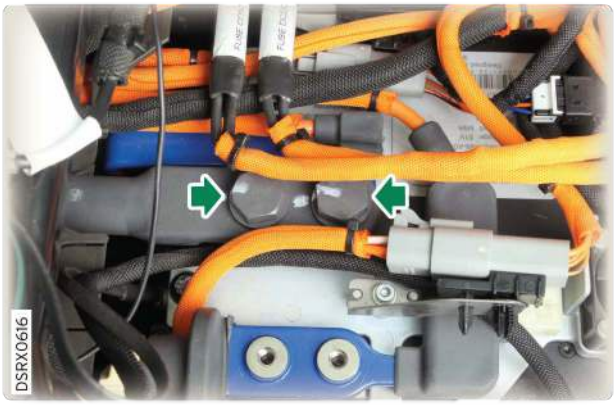


7. Remove bolts (x2) securing positive power cable to BCB main BUS set. Tool: 18 mm 6-point socket. Torque: 10 lb·ft (13.5 Nm).



8. Remove bolt securing positive power cable to the controller. Tool: 22 mm 6-point socket. Torque: 11 lb·ft (15 Nm).

9. Remove positive power cable.



10. Remove bolts (x2) securing negative cable to BCB main BUS set. Tool: 18 mm 6-point socket. Torque: 10 lb·ft (13.5 Nm).



11. Remove bolt securing negative power cable to the controller. Tool: 22 mm 6-point socket. Torque: 11 lb·ft (15 Nm).
12. Remove negative power cable.

Installation

1. Installation is the reverse of the removal procedure.

12 Volt Harness

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):

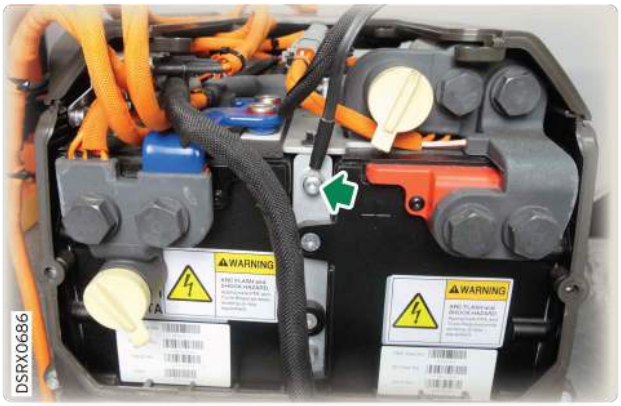
- 18 mm 6pt socket
- Side cutters
- T25
- T30
- 1/4” standard screwdriver
- 3/16” standard screwdriver
- 2 mm hex
- 3 mm hex
- 10 mm socket and ratchet
- 14 mm socket

New Fasteners Required:

- Cable ties (x8)
- Cable tie anchors (x4)

Removal

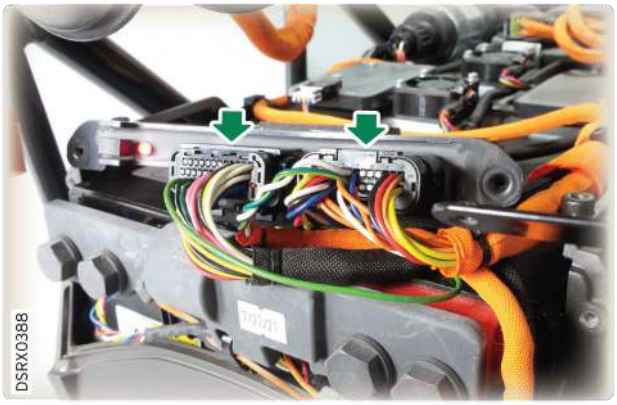
1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove power pack. See *Power Pack, page 20.20.*
4. Remove rear cover. See *Rear Cover, page 20.3.*



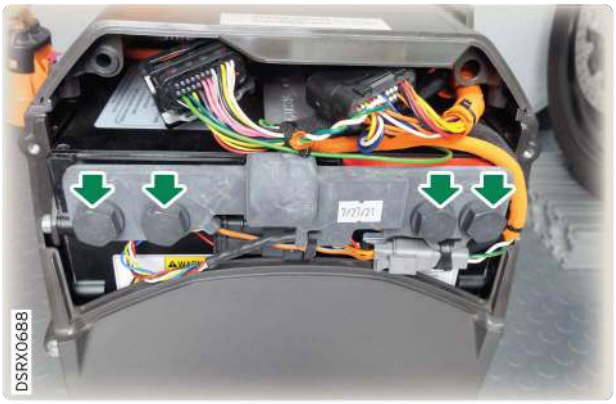
5. Remove bolt securing ground terminal ring to back of power pack. Tool: T25. Torque: 5 lb·ft (7 Nm).



6. Release BMU from the power pack top cover to gain access to harness connectors (x2).



7. Disconnect harness connectors (x2) from the BMU.
8. Remove the BMU.



9. Remove bolts (x4) securing the mid pack protection unit. Tool: 18 mm 6-point socket. Torque: 10 lb·ft (13.5 Nm).



10. Cut cable ties (x2) securing harness connectors to mid pack protection unit.

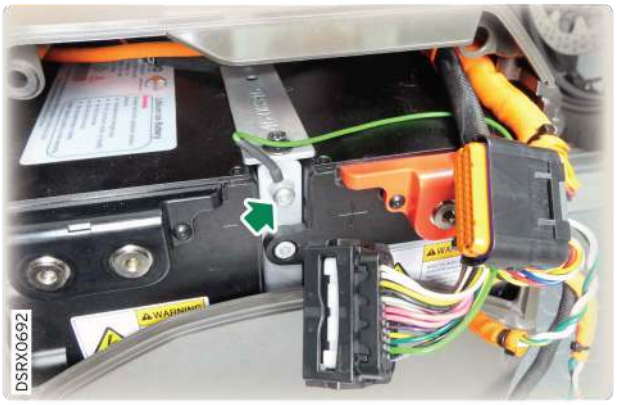
    Note: Replace cable ties (x2) during the installation process.



11. Disconnect gray harness connector.



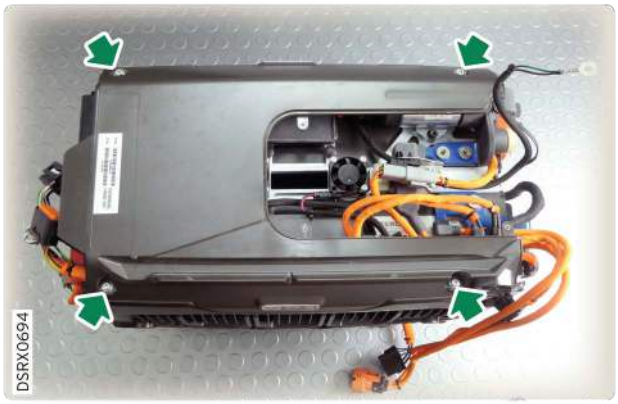
12. Unlock gray tab and disconnect black mid pack protection unit harness connector and collect mid pack protection unit.



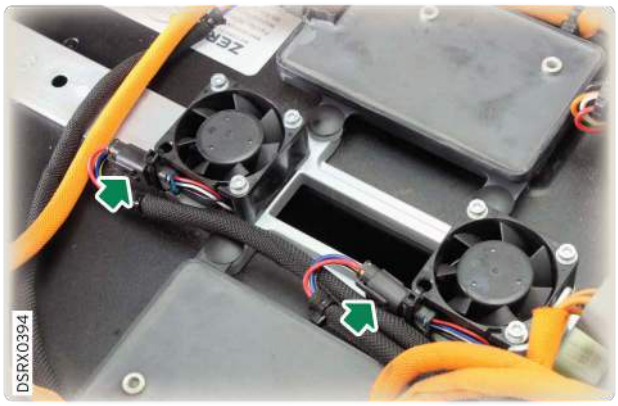
13. Remove bolt securing ground terminal ring to front of power pack. Tool: T25. Torque: 5 lb·ft (7 Nm).



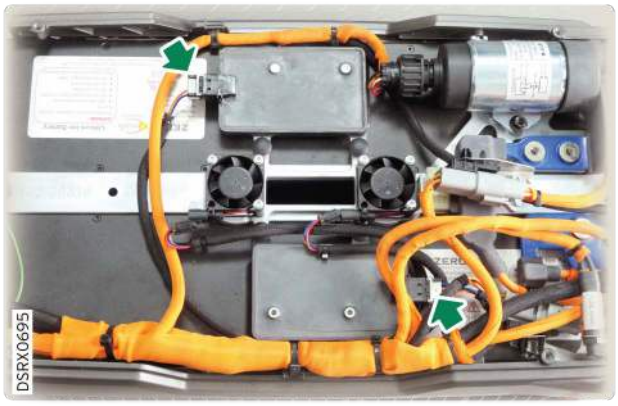
14. Release captive charge inlet harness from top cover.



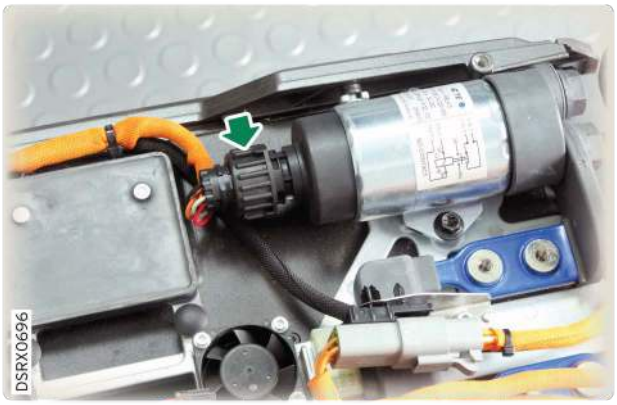
15. Remove bolts (x4) securing top cover to the power pack. Tool: T25. Torque: 2.5 lb·ft (3.5 Nm).
16. Remove top cover.



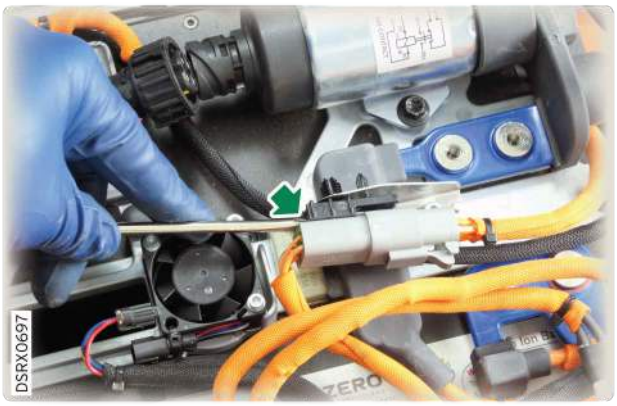
17. Disconnect cooling fan harness connectors (x2).



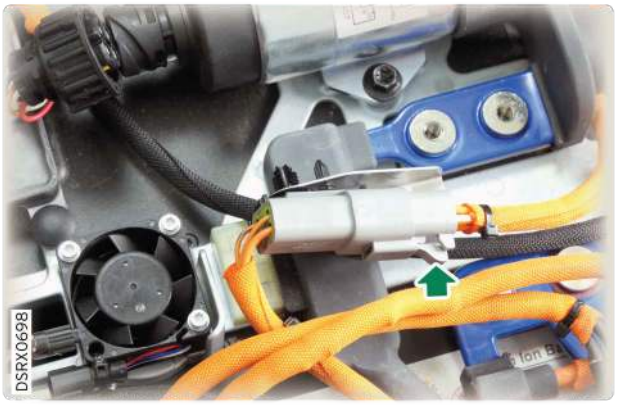
18. Disconnect CMU harness connectors (x2).



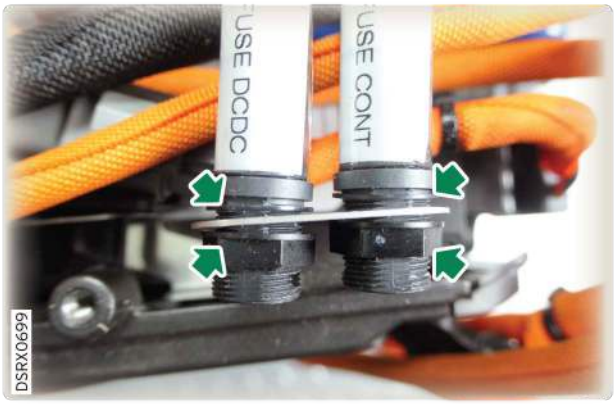
19. Disconnect contactor harness connector.



20. Release gray harness connector from retaining clip. Tool: ¼" standard screwdriver.



21. Disconnect gray harness connector.



22. Remove plastic nuts (x2) securing the CONT (contactor) and DC/DC (converter) fuse holders to the high voltage fuse bracket and capture plastic washers. Tool: 14 mm socket. Torque: Hand.

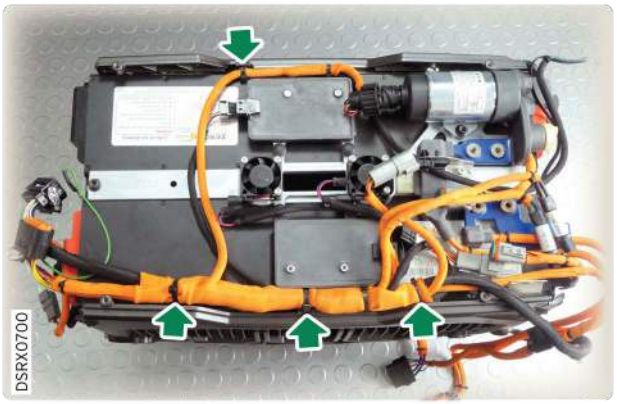
    NOTICE: Ensure the plastic washers are correctly installed between the fuse holders and bracket during installation.



23. Release gray harness connector from retaining clip.



24. Disconnect gray harness connector.



25. Cut cable ties (x4) securing harness to power pack.

    Note: Replace cable ties during installation process.

26. Remove 12 volt harness.

Installation

1. Installation is the reverse of the removal procedure, except for the following:



2. When installing the BMU, take care to engage all tabs (x4) in the underside of the power pack top cover.

Power Pack

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):

- Heavy duty scissor jack
- Heavy duty support blocks
- Motorcycle stand
- T25
- T30
- T50
- 22 mm 6pt socket
- 3/16” standard screwdriver
- 2 mm hex
- 10 mm socket and ratchet
- Side cutters
- Non-marking trim removal tool

New Fasteners Required:

- Cable ties (x4)
- Tape

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove charger. See *Charger - 6KW, page 25.1*.
4. Remove skid pan. See *Skid Pan, page 60.19.*



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



6. Disconnect DC/DC converter harness connector.

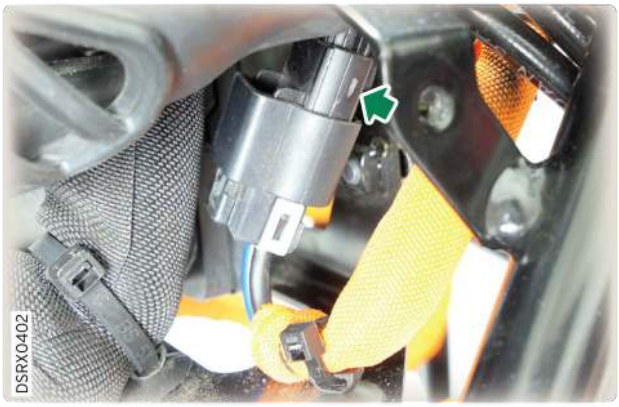


7. Cut cable tie securing lower corner of HCU cover.

   Note: Replace cable tie during the installation process.



8. Remove harness connector lock.



9. Disconnect harness connector.



10. Cut cable tie securing harness to cable tie anchor.

    Note: Replace cable tie during the installation process.



11. Remove bolt securing ground terminal rings to tail frame. Tool: T30. Torque: 5 lb·ft (7 Nm).



12. Remove bolts (x4) securing controller cover to tail frame. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



13. Use a shop vacuum with brush to remove as much dust as possible from the top of the controller.



14. Remove terminal bolts (x2) securing HV cables (-B and +B) to the controller. Tool: 22 mm 6pt socket. Torque: 11 lb·ft (15 Nm).

WARNING: This and subsequent steps require suitable personal protective equipment (PPE) to be worn. Observe relevant legislation regarding high voltage precautions.



15. Label -B and +B leads to ensure they are re-installed in the correct locations upon reassembly.
16. Confirm voltage across -B and +B is at zero.



17. Wrap HV terminals with suitable insulator to protect against arcing.



18. Remove bolts (x2) securing service cover to power pack. Tool: T25. Torque: 2.5 lb·ft (3.5 Nm).



19. Using a heavy duty scissor jack, position it lengthwise under the center of the power pack and raise the motorcycle to place heavy duty blocks under the front tire to position the front tire approximately 3” off the floor.

    Note: This step is performed to level the power pack for easier removal.



20. The skid pan front mount on the motorcycle frame should be approximately 20” off the floor, so the power pack can be maneuvered out from under the motorcycle when it is fully lowered.

    Note: To determine the distance needed between the front skid pan mount and the floor, add the height of your heavy duty scissor jack (the one used is in photos is 4” tall) and he power pack (15” tall).



21. With heavy duty scissor jack levelled under the power pack and applying minimal lifting pressure, remove bolts (x2) securing left side of power pack to the motorcycle frame. Tool: T40. Torque: 26 lb·ft (35 Nm).



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



23. Move power pack 3” forward, so the rear of the power pack will not interfere with the motor when lowering the scissor jack.



24. Lower power pack on scissor jack.

    CAUTION: **While lowering the power pack, make sure that all harnesses and -B and +B power cables are free and do not get snagged or damaged.**



25. With power pack fully lowered, carefully slide it out from under the motorcycle.
26. If a new power pack is being installed, transfer the power cables to the new power pack. See *Power Cables - Positive and Negative, page 20.14.*

Installation

1. Installation is the reverse of the removal process.

Charger - 6KW

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
- T30
- 3/16” standard screwdriver
- 2 mm hex
- 10 mm socket and ratchet
- Side cutters
- Non-marking trim removal tool

New Fasteners Required:

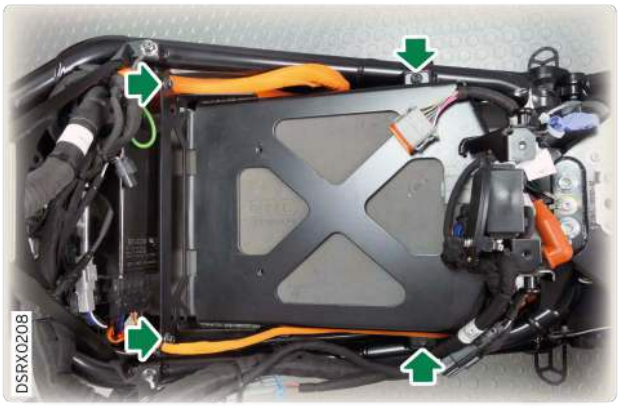
- Cable ties (x2)
- Tape

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove fairing headlight upper. See *Fairing Headlight Upper, page 60.12*.
4. Remove fairing outer.
5. Remove fairing inner left. See *Fairing Side Inner Left, page 60.15*.
6. Remove fairing inner right. See *Fairing Side Inner Right, page 60.17*.
7. Remove tank assembly. See *Tank Assembly, page 60.22.*
8. Remove tank bucket. See *Tank Bucket, page 60.21.*



9. Disconnect battery signal DC/DC harness connector.
10. Remove 12 volt battery and gently disconnect its heater. Lift fuse box off of mounts and place to the riders’ left side.



11. Remove bolts (x4) securing the tank bucket plate to the motorcycle frame. Tool: T30. Torque: 7.8 lb·ft (10 Nm).



12. Remove bolt securing the left front corner of the charger to the storage liner plate. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



13. Remove bolt securing the left rear corner of the charger to the storage liner plate. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



14. Remove bolts (x2) securing the right side of the charger to the storage liner plate. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



15. Lift storage liner plate and flip it to the left side.

    CAUTION: **Protect surfaces to prevent damaging painted surfaces.**



16. Remove bolts (x2) securing HCU cover to motorcycle frame. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



17. Remove HCU cover.

    Note: Take note of brake hose and wheel speed sensor harness routing through HCU cover before removal.



18. Loosen bolt securing left front charger bracket to motorcycle frame. Tool: T30: Torque: 7.8 lb·ft (10 Nm).



19. Loosen bolt securing right front charger bracket to motorcycle frame. Tool: T30: Torque: 7.8 lb·ft (10 Nm).



20. Move charger forward enough to remove brackets from front of charger.



21. Remove bolt securing right front charger bracket to charger and collect bracket. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



22. Remove bolt securing left front charger bracket to charger and collect bracket. Tool: T25. Torque: 4.5 lb·ft (6 Nm).
23. Using the following process, disconnect the Charge Inlet (AC) high voltage connector from the charger.



24. Slide connector lock to unlock.



25. Push tab upward to release connector and slide.



26. Push secondary tab and disconnect connector from charger.



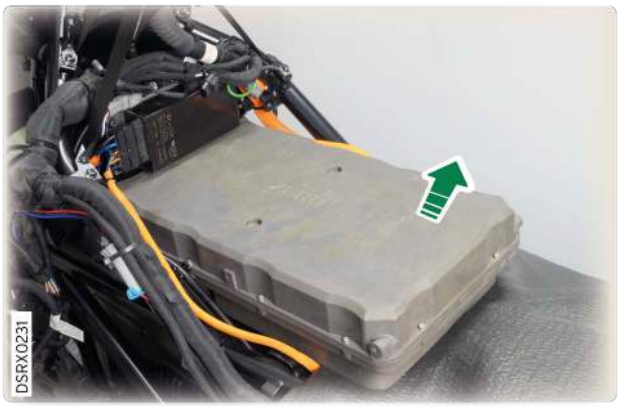
27. Place protective cover over area behind charger.



28. Move charger and tank bucket bracket rearward and upward enough to raise the front of charger.



29. Using the same HV connector disconnect process as for the Charge Inlet (AC) connector, disconnect the Charge Outlet (DC)/Main bus high voltage connector from charger.



30. Remove charger from motorcycle.

Installation

1. Installation is the reverse of the removal procedure.

Charge Inlet Harness

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):

- T20
- T25
- T30
- 3/16” standard screwdriver
- 2 mm hex
- 10 mm socket and ratchet
- Side cutters
- Non-marking trim removal tool

New Fasteners Required:

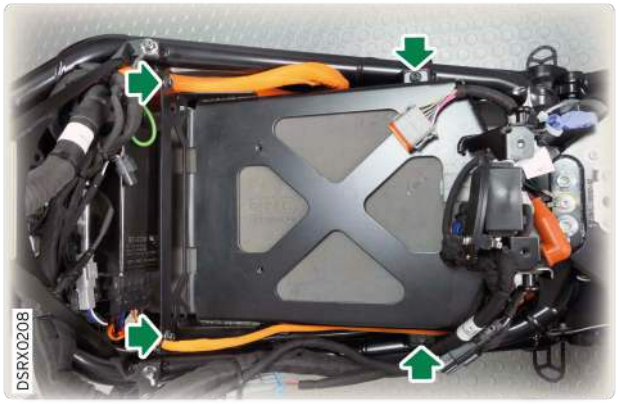
- Cable ties (x4)
- Tape

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove tank bucket. See *Tank Bucket, page 60.21.*



4. Disconnect battery signal DC/DC harness connector.



5. Remove bolts (x4) securing the tank bucket plate to the motorcycle frame. Tool: T30. Torque: 7.8 lb·ft (11 Nm).



6. Remove bolt securing the left front corner of the charger to the storage liner plate. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



7. Remove bolt securing the left rear corner of the charger to the storage liner plate. Tool: T25. 4.5 lb·ft (6 Nm).



8. Remove bolts (x2) securing the right side of the charger to the storage liner plate. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



9. Lift storage liner plate and flip it to the left side.

   CAUTION: **Protect surfaces to prevent damaging painted surfaces.**



10. Disconnect DC/DC converter harness connector.



11. Remove bolts (x2) securing HCU cover to motorcycle frame. Tool: T25. Torque: 3.5 lb·ft (6 Nm).



12. Remove HCU cover.

    Note: Take note of brake hose and wheel speed sensor harness routing through cover before removal.



13. Cut cable tie securing lower right corner of HCU cover to motorcycle frame.

    Note: Replace cable tie during the installation process.



14. Cut cable tie securing lower left corner of HCU cover to motorcycle frame.

    Note: Replace cable tie during the installation process.



15. Remove bolt securing left front charger bracket to motorcycle frame. Tool: T30: Torque: 7.8 lb·ft (10 Nm).



16. Remove bolt securing right front charger bracket to motorcycle frame. Tool: T30: Torque: 7.8 lb·ft (10 Nm).



17. Move charger forward enough to remove brackets from front of charger.



18. Remove bolt securing right front charger bracket to charger. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



19. Remove bolt securing left front charger bracket to charger. Tool: T25. Torque: 4.5 lb·ft (6 Nm).
20. Using the following process, disconnect the Charge Inlet (AC) high voltage connector from the charger.



21. Slide connector lock to unlock.



22. Push tab upward to release connector and slide.



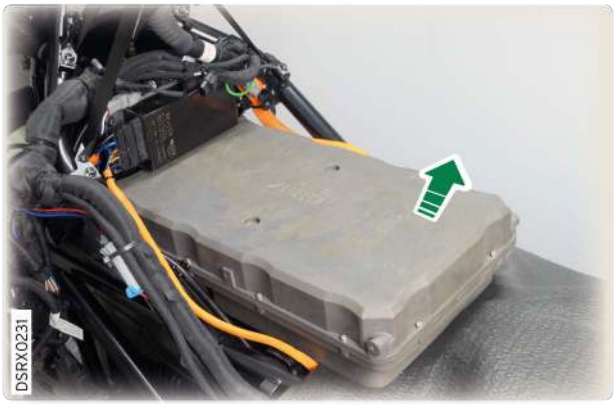
23. Push secondary tab and disconnect connector from charger.



24. Place protective cover over area behind charger.



25. Move charger rearward and upward enough to raise the front of charger.



26. Lift front of charger and place block underneath to gain access to charger connector.



27. Remove bolt securing charge inlet harness ground eyelet to motorcycle frame and collect star washers (x2). Tool: T30. Torque: 7.8 lb·ft (10 Nm).



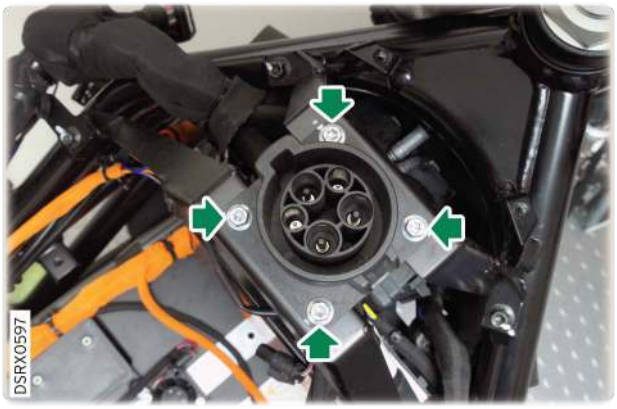
28. Note the placement of star washers. One is located between the ground eyelet and the charge inlet harness bracket. The second star washer is located between the charge inlet harness bracket and the motorcycle frame.



29. Cut cable tie securing charge inlet harness to cable tie anchor.



30. Disconnect charge inlet harness connector.



31. Remove bolts (x4) securing charge inlet harness to bracket. Tool: T25. Torque: 4 lb·ft (5 Nm).
32. Remove charge inlet harness.

Installation

1. Installation is the reverse of the removal procedure.

DC/DC Converter

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):

- T20
- T25
- T30
- 3/16” standard screwdriver
- 2 mm hex
- 3 mm hex
- 10 mm socket and ratchet
- Side cutters

New Fasteners Required:

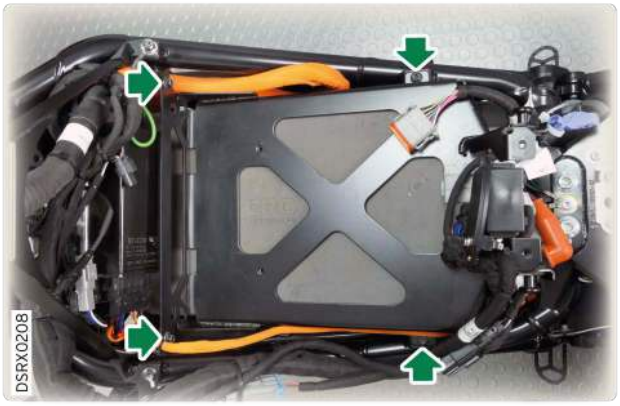
- Cable tie
- Tape

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove tank bucket. See *Tank Bucket, page 60.21.*



4. Disconnect battery signal DC/DC harness connector.



5. Remove bolts (x4) securing the storage liner plate to the motorcycle frame. Tool: T30. Torque: 7.8 lb·ft (10 Nm).



6. Remove bolt securing the left front corner of the charger to the storage liner plate. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



7. Remove bolt securing the left rear corner of the charger to the storage liner plate. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



8. Remove bolts (x2) securing the right side of the charger to the storage liner plate. Tool: T25. Torque: 4.5 lb·ft (6 Nm).

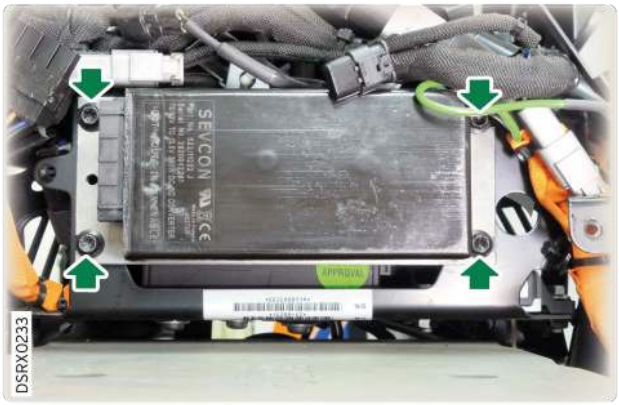


9. Lift storage liner plate and flip it to the left side.

   CAUTION: **Protect surfaces to prevent damaging painted surfaces.**



10. Disconnect DC/DC converter harness connector.



11. Remove bolts (x4) securing DC/DC converter to HCU bracket. Tool: T30. Torque: 6 lb·ft (8 Nm).

Installation

1. Installation is the reverse of the removal procedure.

Throttle

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
- T30
- T45
- Tamperproof T25
- 3/16” standard screwdriver
- 2 mm hex
- 10 mm socket and ratchet
- Side cutters
- Non-marring trim removal/pry tool

New Fasteners Required:

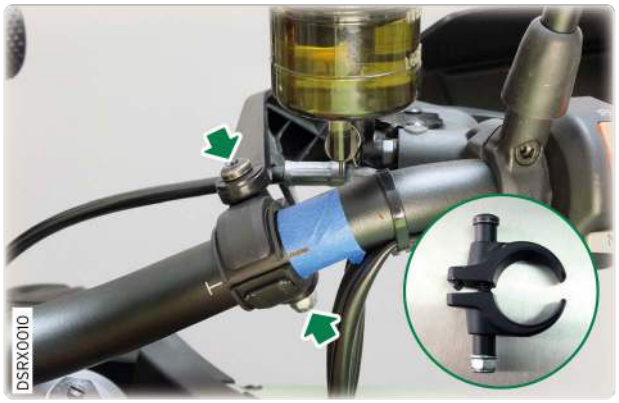
- Cable ties (x6)
- Low profile Cobra cable tie
- Blue threadlocker
- Tape

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove dash cover lower. See *Dash Cover Lower, page 60.1.*



4. Place tape on handlebar to mark the installed location.



5. Remove nut and bolt securing hand guard to handlebar and collect washer, spacers (x2), and clamp halves (x2). Tools: T30 & 10 mm wrench. Torque: 5 lb·ft (7 Nm). Threadlocker: Blue.

   Note: Protect surrounding surfaces and take care not to drop the clamp halves during removal process.



6. Remove handguard mounting gasket from handlebar.



7. Release outer end of handguard from handlebar. Tool: T45. Torque: 12 lb·ft (16 Nm).



8. Cut low profile cobra cable tie securing heated grip and mode switch harnesses to handlebar.

   Note: Replace cable tie during the installation process.



9. Cut cable ties (x2) securing harnesses together.

   Note: Replace cable ties (x2) during the installation process.



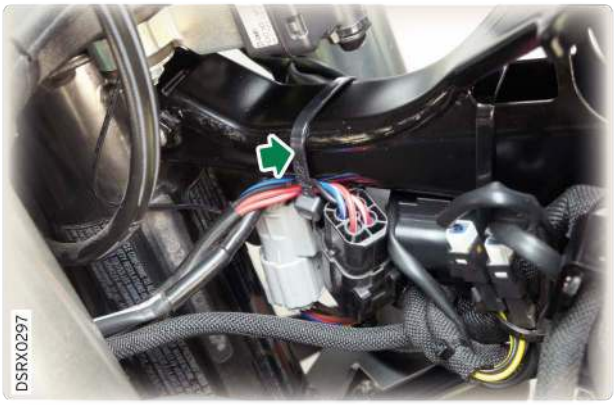
10. Cut cable tie securing harnesses together.

    Note: Replace cable tie during the installation process.



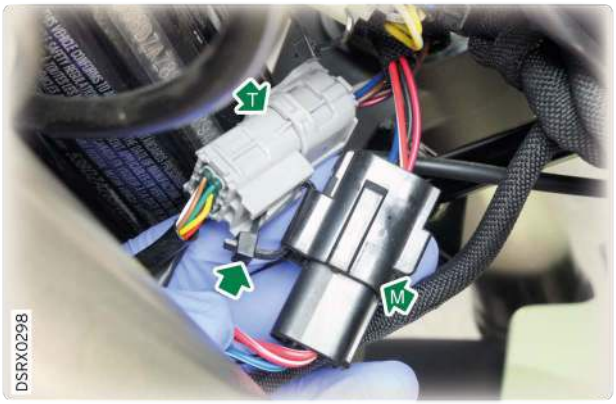
11. Cut cable tie in horizontal position between vertical cable ties (x2).

    Note: Replace cable tie during the installation process.



12. Cut cable tie securing motor stop switch and throttle harness connectors to the headlight mount bracket.

    Note: Replace cable tie during the installation process.



13. Cut loose fitting cable tie connecting the motor stop switch connector (M) to the throttle harness connector (T).
14. Disconnect throttle harness connector (T).



15. Cut cable tie securing heated grip harness connectors to dash harness.

    Note: Replace cable tie during the installation process.



16. Disconnect right heated grip harness connector.

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



17. Remove bolt securing handguard retainer from end of handlebar and collect retainer. Tool: T45. Torque: 12 lb·ft (16 Nm).



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

    Note: We recommend only loosening the bolts sufficiently to allow the rear cover to be separated and allow the throttle assembly to be removed.

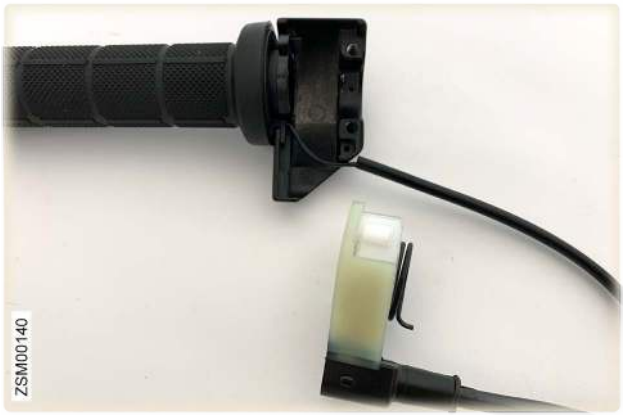


19. Separate the throttle's rear cover from the throttle assembly.

    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 off the handlebar.

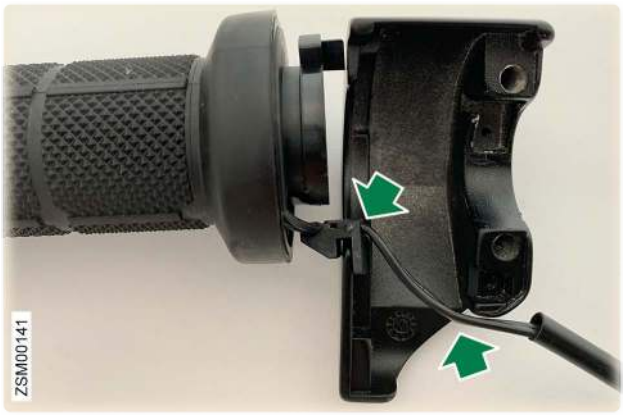


21. Carefully remove throttle assembly from the throttle assembly cover.

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

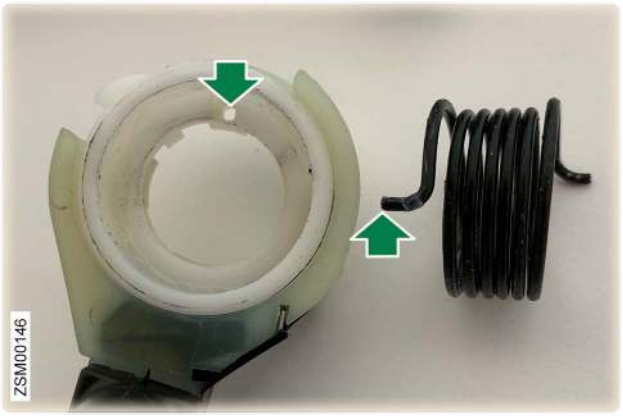
Installation

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

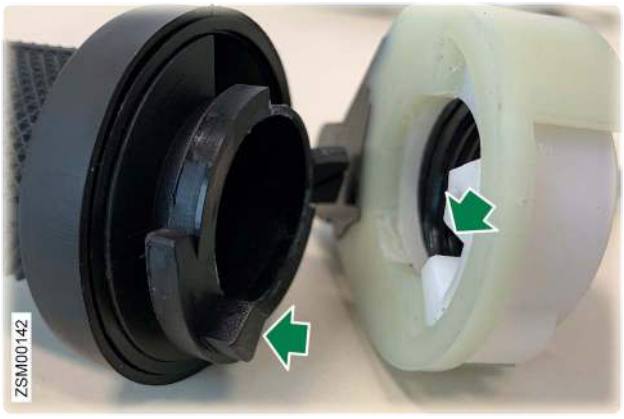


2. If the motorcycle is equipped with heated grips, place the harness alignment tab into the slot in the throttle cover.

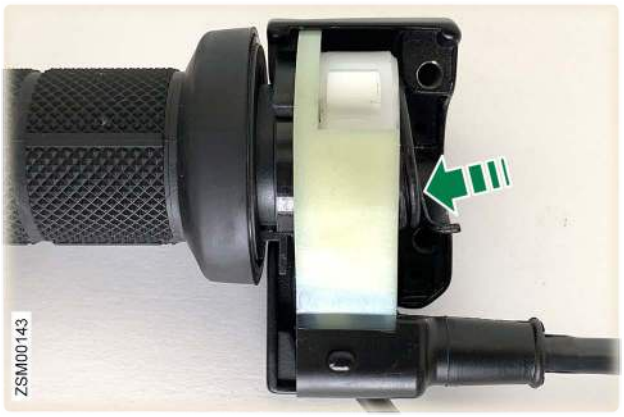
   Note: Make sure the wire harness lead is routed through the bottom opening in the throttle cover.



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 Stop Switch

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):

- T20
- T25
- T30
- T45
- Tamperproof T25
- 3/16” standard screwdriver
- 2 mm hex
- 10 mm socket and ratchet
- Side cutters
- Non-marring trim removal/pry tool

New Fasteners Required:

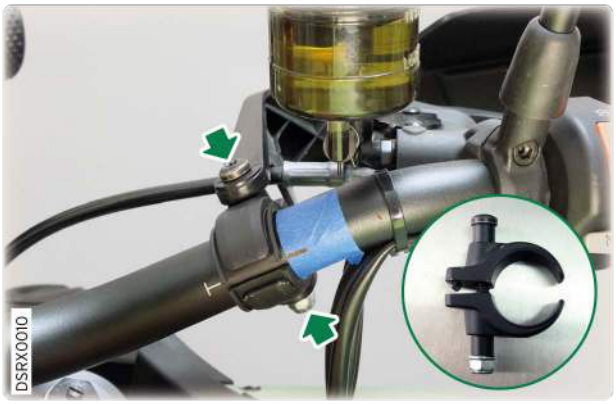
- Cable ties (x6)
- Low profile Cobra cable tie
- Blue threadlocker
- Tape

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove dash. See *Dash, page 70.13.*



4. Place tape on handlebar to mark the installed location.



5. Remove nut and bolt securing hand guard to handlebar and collect washer, spacers (x2), and clamp halves (x2). Tools: T30 & 10 mm wrench. Torque: 5 lb·ft (7 Nm). Threadlocker: Blue.

   Note: Protect surrounding surfaces and take care not to drop the clamp halves during removal process.



6. Remove handguard mounting gasket from handlebar.



7. Release outer end of handguard from handlebar.



8. Cut low profile cobra cable tie securing heated grip and mode switch harnesses to handlebar.

   Note: Replace cable tie during the installation process.



9. Cut cable ties (x2) securing harnesses together.

   Note: Replace cable ties (x2) during the installation process.



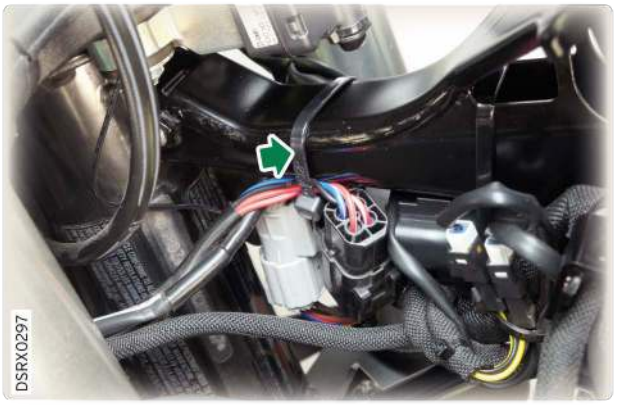
10. Cut cable tie securing harnesses together.

    Note: Replace cable tie during the installation process.



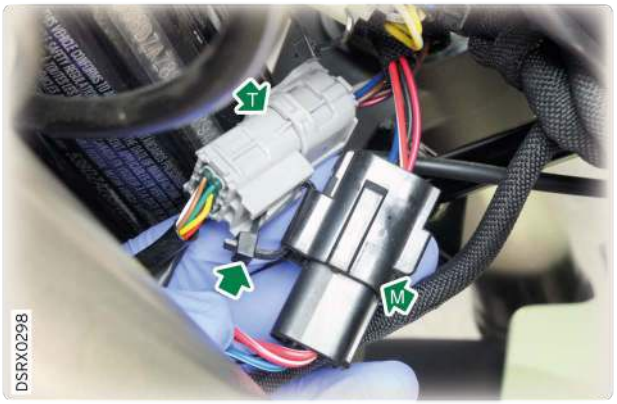
11. Cut cable tie in horizontal position between vertical cable ties (x2).

    Note: Replace cable tie during the installation process.



12. Cut cable tie securing motor stop switch and throttle harness connectors to the headlight mount bracket.

    Note: Replace cable tie during the installation process.



13. Cut loose fitting cable tie connecting the motor stop switch connector (M) to the throttle harness connector (T).
14. Disconnect motor stop switch harness connector (M).



15. Remove bolt securing handguard retainer from end of handlebar and collect retainer. Tool: T45. Torque: 12 lb·ft (16 Nm).



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

    Note: We recommend only loosening the bolts sufficiently to allow the rear cover to be separated and allow the throttle assembly to be removed.

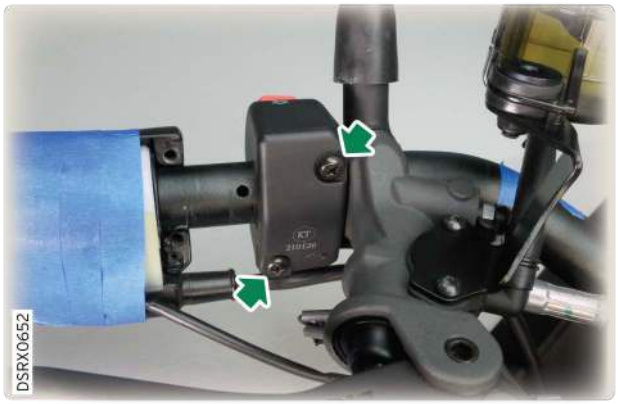


17. Separate the throttle's rear cover from the throttle assembly.

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



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



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

20. Remove the bottom cover to the motor stop switch.
21. Remove the motor stop switch.

Installation

1. Installation is the reverse of the removal procedure.

Motor

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):

- Heavy duty scissor jack
- Motorcycle stand
- Floor jack
- 3/16” standard screwdriver
- 10 mm socket and ratchet
- 13 mm socket
- 15 mm socket
- 22 mm 6pt socket
- 27 mm socket
- T20
- T25
- T30
- T40
- T45
- T50
- 17 mm combination wrench
- 2 mm hex wrench
- 3 mm hex socket
- Non-marring trim removal/pry tool

New Fasteners Required:

- Cable ties (x4)
- Cable anchor
- Rags/cloth

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove rear wheel. See *Rear Wheel, page 50.5.*
4. Remove skid plan. See *Skid Pan, page 60.19.*

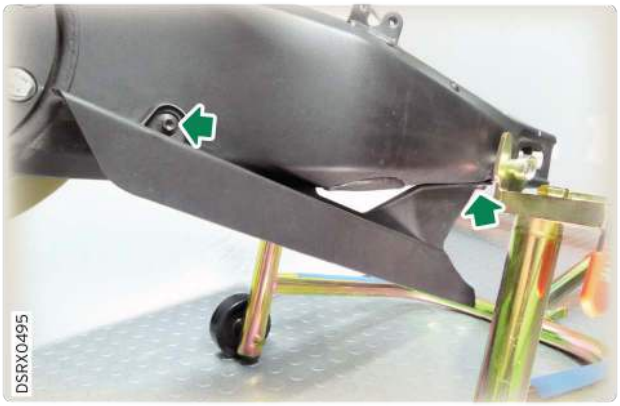


5. Place heavy duty scissor jack under the front of the power pack. Tool: Heavy duty scissor jack.
6. Using the heavy duty scissor jack, position it lengthwise under the front of the power pack and raise the motorcycle until the front tire is about 1.5” off the ground and the tension of the rear suspension is simultaneously partially unloaded.

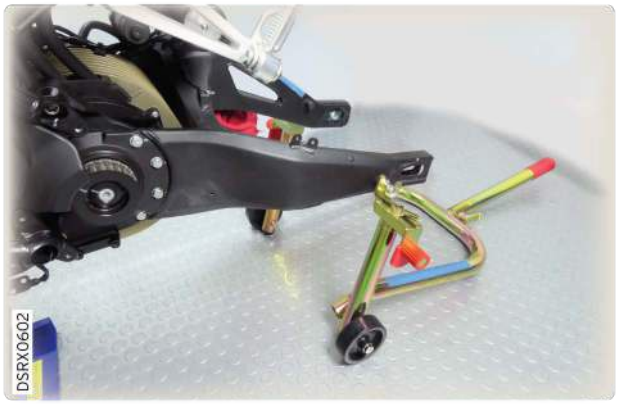
   WARNING! The weight should be distributed with more weight on the rear of the motorcycle, so that removing the heavy motor will not upset the weight balance on the jack. Always check stability of the motorcycle during the process.



7. Remove bolts (x3) securing the left foot peg bracket to the left doubler plate. Tool: 10 mm socket. Torque: 20 lb·ft (27 Nm).

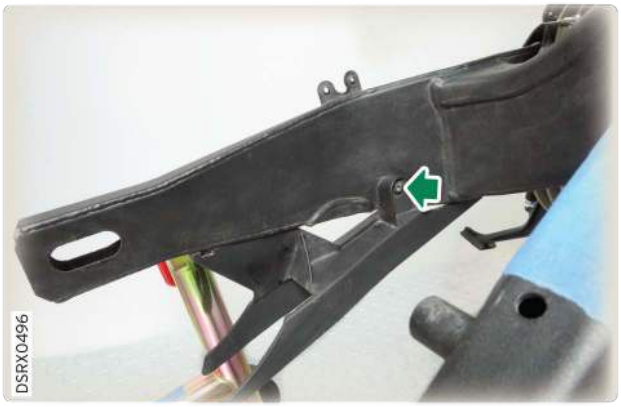


8. Remove bolts (x2) securing belt guard lower to swingarm. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



9. Carefully remove rear motorcycle stand to release spring tension from rear suspension.

   WARNING! Confirm that the motorcycle is supported correctly and stable on the scissor jack, so the motorcycle can’t fall off.



10. Remove inner bolt securing belt guard lower to swingarm. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



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



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



13. Protect painted surfaces with a shop cloth.



14. 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).

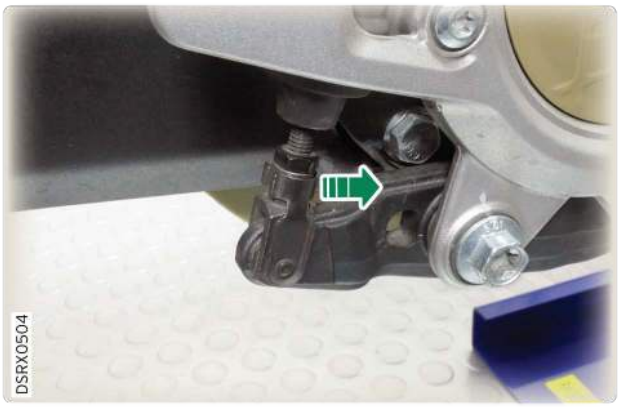


15. Remove bolt securing ground wire to top of rear shock and collect star washer (between wire eyelet and shock body). Tool: T20. Torque: 2 lb·ft (3 Nm).
16. Remove rear shock.

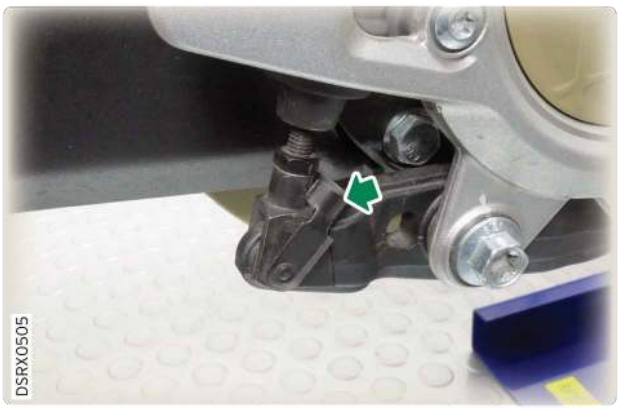


17. Cut cable tie securing brake hose and harnesses to the top of the motor.

    Note: Replace cable tie during installation.



18. Release clip from bottom of rear brake master cylinder.



19. Remove clip from bottom of rear brake master cylinder.



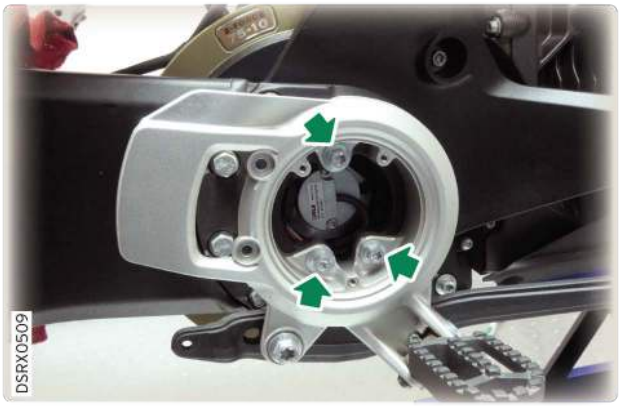
20. Remove bolts (x2) securing rear master cylinder to right foot peg bracket. Tool: T30. Torque: 7 lb·ft (9 Nm).



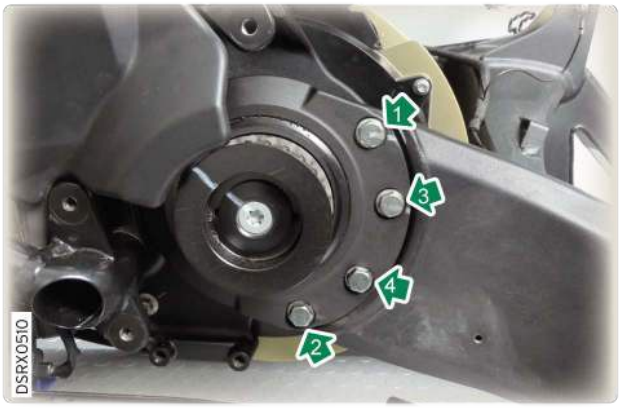
21. Wrap rear master cylinder to protect painted surfaces and tie in to rear foot peg.



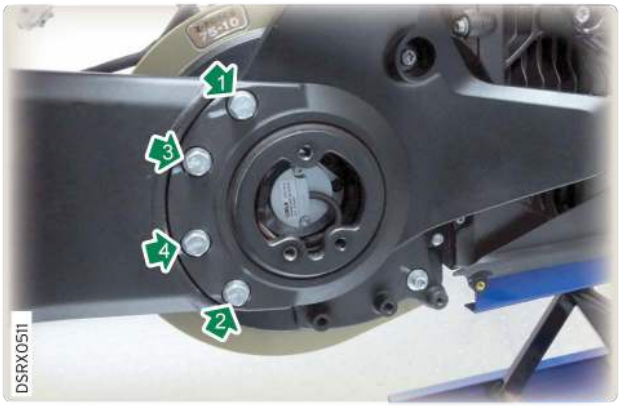
22. Remove bolts (x3) securing encoder cover plate from right foot peg bracket. Tool: T20. Torque: 2 lb·ft (3 Nm).



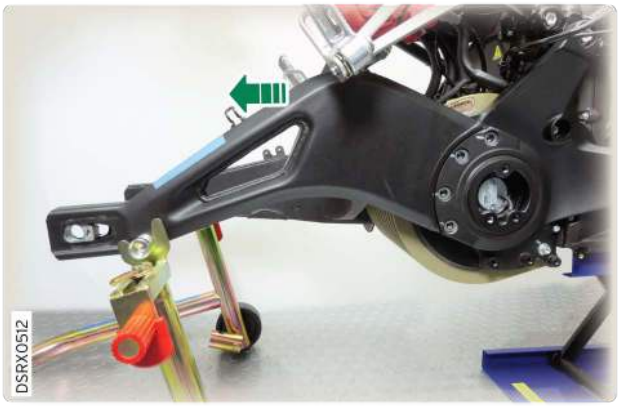
23. Remove bolts (x3) securing right foot peg bracket to right doubler plate and collect foot peg bracket. Tool: T40. Torque: 20 lb·ft (27 Nm).



24. Remove bolts (x4) securing swingarm to left outer bearing cover. Tool: 13 mm socket. Torque (in sequence shown): 24.5 lb·ft (33 Nm).



25. Remove bolts (x4) securing swingarm to right outer bearing cover. Tool: 13 mm socket. Torque (in sequence shown): 24.5 lb·ft (33 Nm).



26. Remove swingarm.
27. Collect the shims located between the right outer bearing cover and the swingarm.

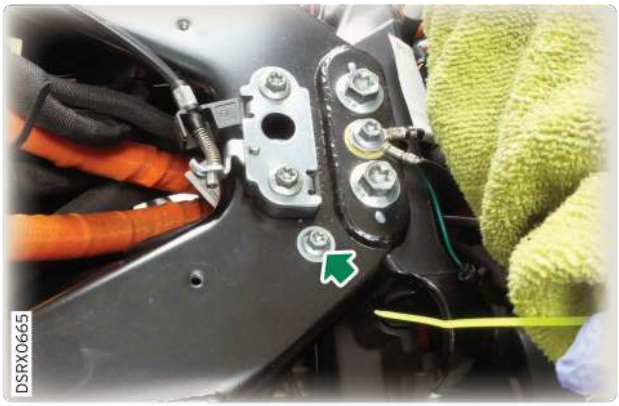
    Note: Install the same shims upon reinstallation of the swingarm. The shims are specific to the swingarm.



28. Remove bolt securing phase lead closeout panel to tank assembly. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



29. Remove bolts (x2) securing motor phase lead cover upper to tail frame. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



30. Remove bolt securing phase lead closeout panel to tail frame and collect washer. Tool: T25. Torque: 4.5 lb·ft (6 Nm).
31. Remove motor phase lead cover upper.



32. Cut cable tie securing thermistor harness connector and tail frame harness to cable tie anchor clip.

Note: Replace cable tie during the installation process.



33. Remove cable tie from the thermistor harness connector locking tab.



34. Disconnect thermistor harness connector.



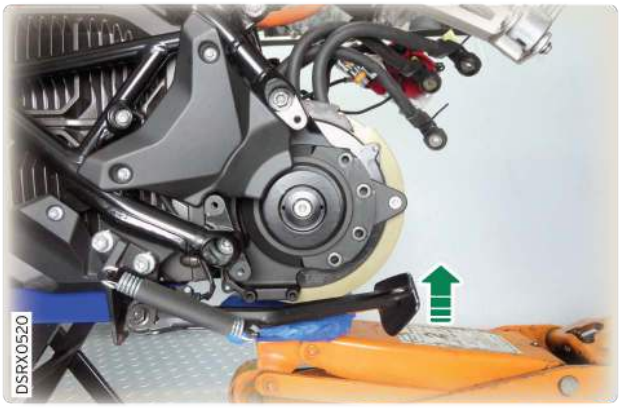
35. Label phase leads (x3) to ensure they are re-installed in the correct locations upon reassembly.



36. Remove bolts (x3) securing phase leads (x3) to the top of the controller. Tool: 22 mm 6pt socket. Torque: 11.1 lb·ft (15 Nm).



37. Reposition phase leads (x3) and thermistor harness below tail frame to allow motor to be removed.



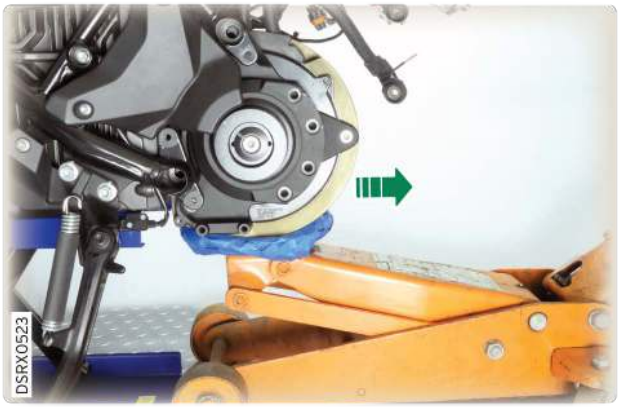
38. Position floor jack under motor with slight lifting pressure.



39. Remove bolts (x2) securing left doubler plate to the motorcycle frame. Tool: 15 mm socket or T55. Torque: 90 lb·ft (122 Nm).



40. Remove bolts (x2) securing right doubler plate to the motorcycle frame. Tool: 15 mm socket or T55. Torque: 90 lb·ft (122 Nm).

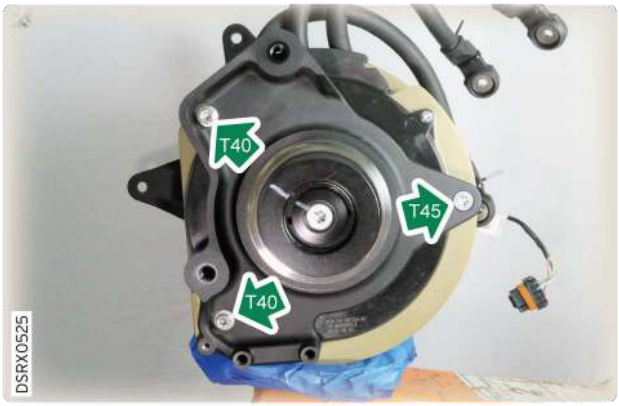


41. Move motor assembly towards rear and away from the motorcycle.

    Note: Make sure to reposition all cables that may bind while removing the motor.



42. Remove left outer bearing cover.



43. 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).
44. Remove left doubler plate.



45. Remove right outer bearing cover.



46. 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).
47. Remove right doubler plate.



48. Disconnect encoder harness connector.



49. Remove bolts (x2) securing encoder to the motor. Tool: 3 mm hex wrench. Torque: 2.5 lb·ft (3 Nm).
50. Remove encoder from the motor.

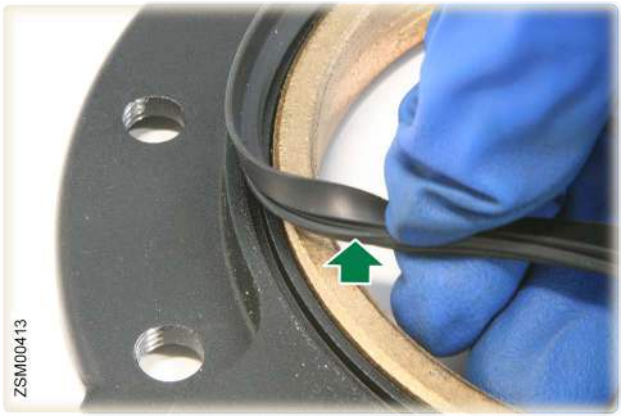
Installation

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

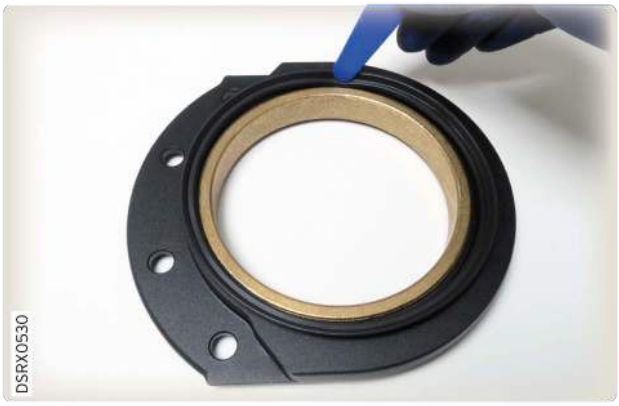


Zero0122

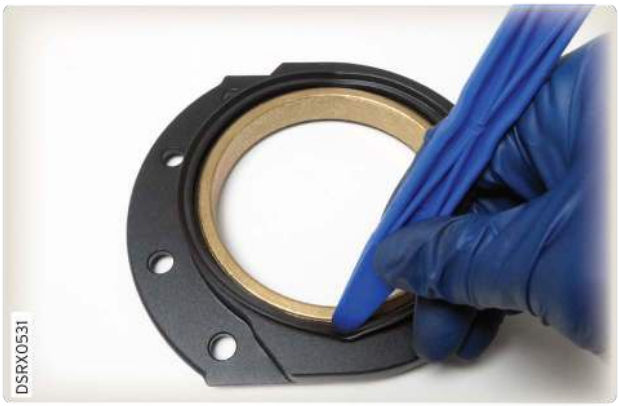
2. If a new doubler is being installed, clean the grease from the doubler before installation.



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.



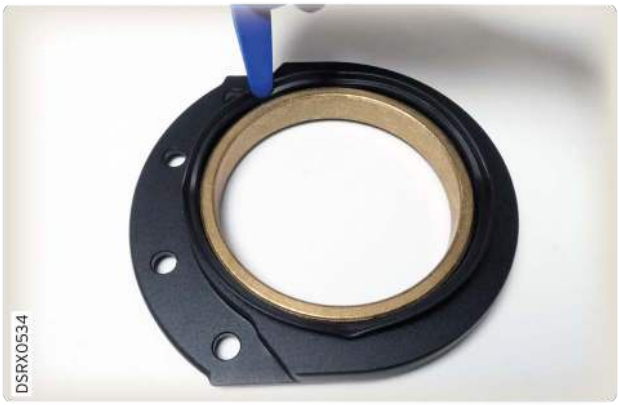
5. Press the seal into the groove at the 6 o'clock position.



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.



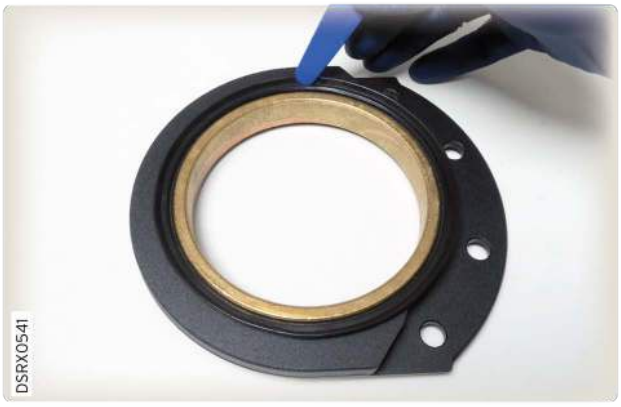
12. Press the seal into the groove at the 10 o'clock position.



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.



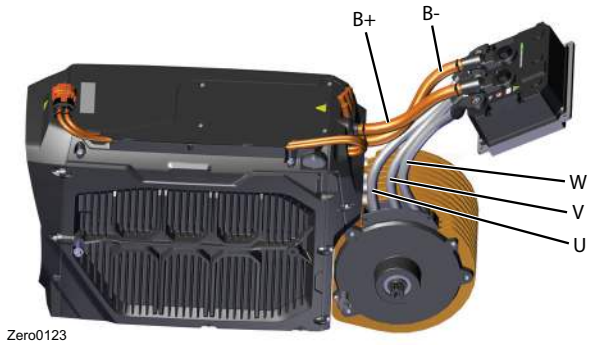
26. Press seal into groove at the 7 to 8 o'clock position.



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.



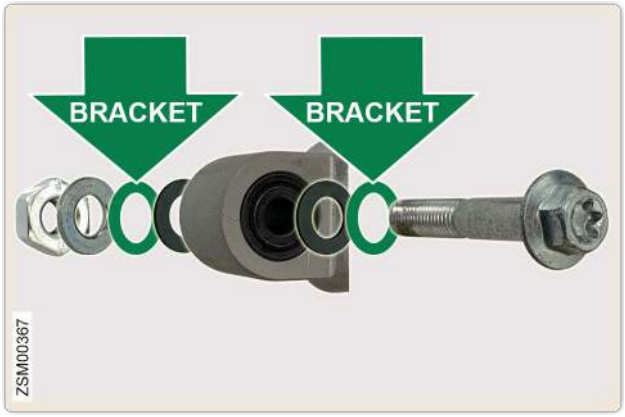
29. Refer to the image for correct cable installation on the controller.
30. Upon installation of the bare swingarm, pivot the swingarm upwards and allow it to fall. If it binds and doesn't fall, check the condition of the doubler plate bearings and check the correct type and amont of shims are installed.

    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.**



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



32. The order of fasteners and washers to mount the rear shock to the swingarm.
33. Adjust drive belt after installation is complete. See *Drive Belt - Adjust, page 10.4.*

Motor Controller

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
- T30
- 2 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet
- Phillips #2 screwdriver
- Shop vacuum
- 22 mm 6 point socket

New Fasteners Required:

- Cable ties (x2)

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove tail seat tray. See *Tail Seat Tray, page 60.25.*



4. Remove bolts (x3) securing license plate bracket to tail pod. Tool: T25. Torque: 2 lb·ft (3 Nm).

   Note: Remove bolts in the following sequence: center, left, then right.
5. Remove license plate bracket.



6. Remove bolts (x3) securing tail pod to motorcycle. Tool: T25. Torque: 0.6 lb·ft (0.8 Nm).
7. Remove tail pod.



8. Disconnect license plate light harness connector.



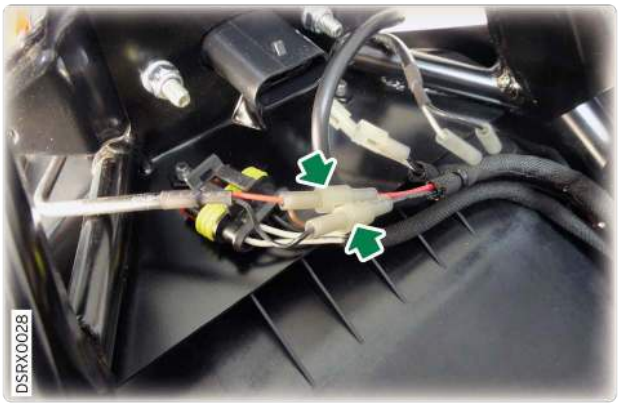
9. Cut cable ties (x2) to release license plate light harness and rear turn signal harness connectors.



10. Disconnect tail light harness connector from tail light.



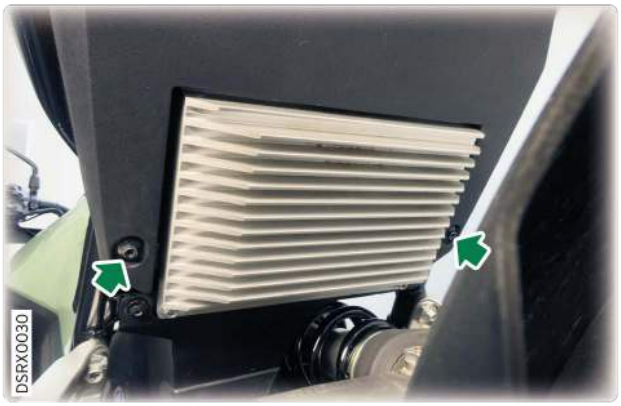
11. Disconnect left rear turn signal harness connectors (x2).



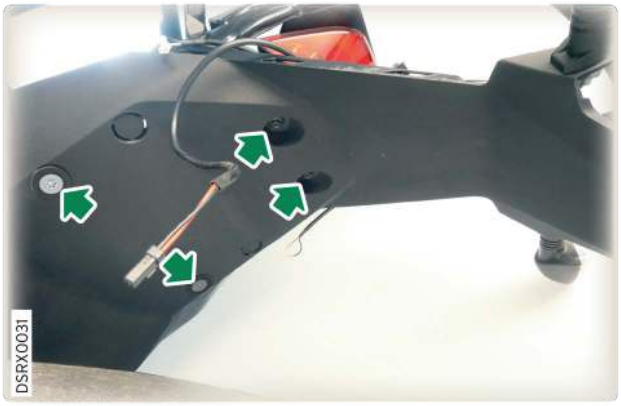
12. Disconnect right rear turn signal harness connectors (x2).



13. Disconnect license plate light harness connector.



14. Remove bolts (x2) securing tail trunk pan to tail frame. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



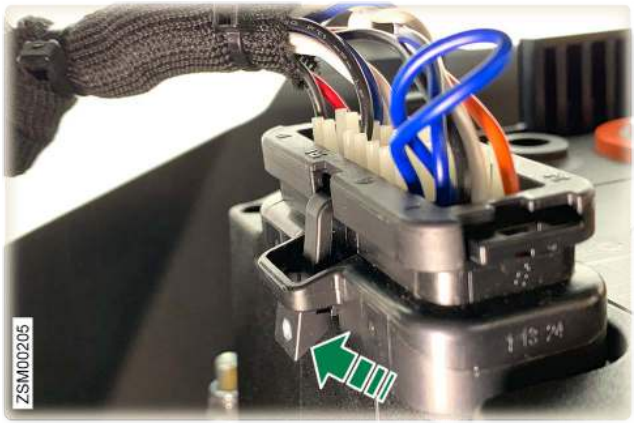
15. Remove bolts (x2) securing tail trunk pan to tail frame. Tool: T25. Torque: 3.5 lb·ft (5 Nm).
16. Remove screws (x2) securing tail trunk pan to tail frame and collect bushings (x2). Tool: T40. Torque: 3.5 lb·ft (5 Nm).
17. Remove tail trunk pan.



18. Remove bolts (x2) securing tail controller cover to tail frame. Tool: T25. Torque: 3.5 lb·ft (5 Nm).
19. Remove tail controller cover.



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



21. Release controller signal harness connector from controller.



22. Lay signal harness end aside.



23. Remove terminal bolts (x2) securing HV cables (-B and +B) to the controller. Tool: 22 mm 6 point socket. Torque: 11 lb·ft (15 Nm).

    WARNING: This and subsequent steps require suitable personal protective equipment (PPE) to be worn. Observe relevant legislation regarding high voltage precautions.

24. Confirm voltage across -B and +B is at zero.
25. Wrap HV terminals with a suitable insulator.



26. Label -B and +B leads to ensure they are re-installed in the correct locations upon reassembly.



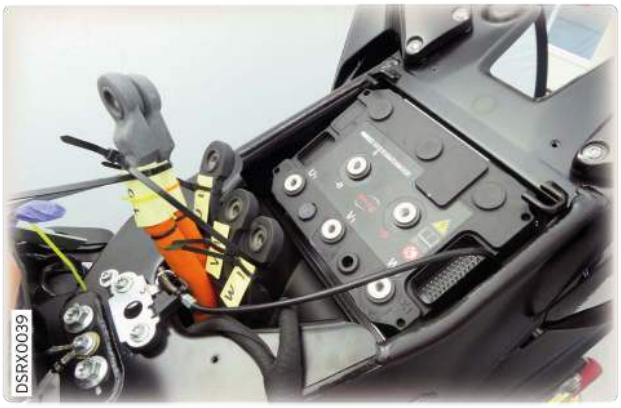
27. Tie -B and +B leads aside.



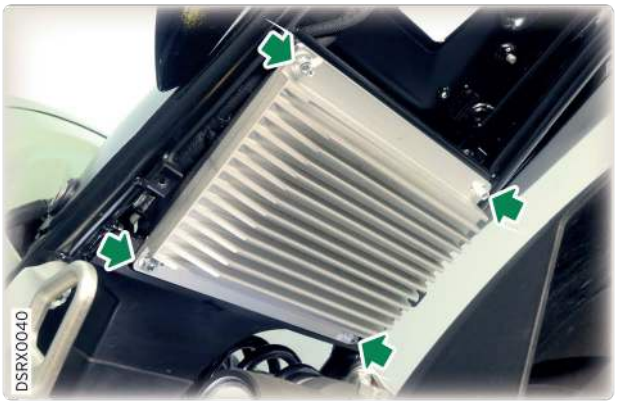
28. Label phase leads to ensure they are re-installed in the correct locations upon reassembly.



29. Remove bolts (x3) securing phase leads (x3) to the top of the controller. Tool: 22 mm 6 point socket. Torque: 11 lb·ft (15 Nm).



30. Tie phase leads back out of the way.



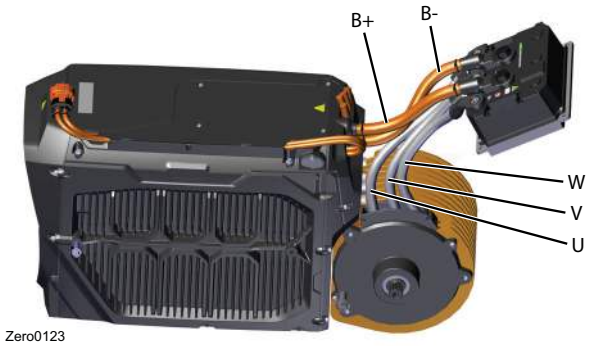
31. Remove bolts (x4) securing controller to the tail frame. Tool: T25. Torque: 8 lb·ft (11 Nm).

    CAUTION: **Support controller while removing bolts.**

32. Remove controller.

Installation

1. Installation is the reverse of the removal procedure.



2. Refer to image for correct cable installation.

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

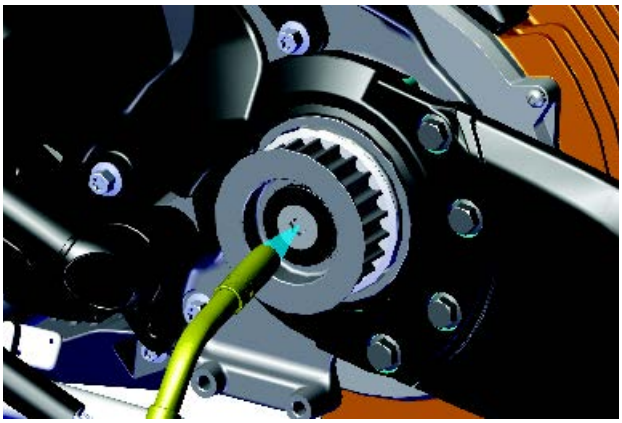


1. Make a “sprocket brake” out of an old section (approx. 20 in. (508 mm)) of belt as shown. This will be used to hold the sprocket stationary during removal and installation.

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 - Replace, page 30.31.*



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 - Replace, page 30.31.*
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).

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.

NOTICE: Before carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T45
- 27 mm socket
- Motorcycle stand

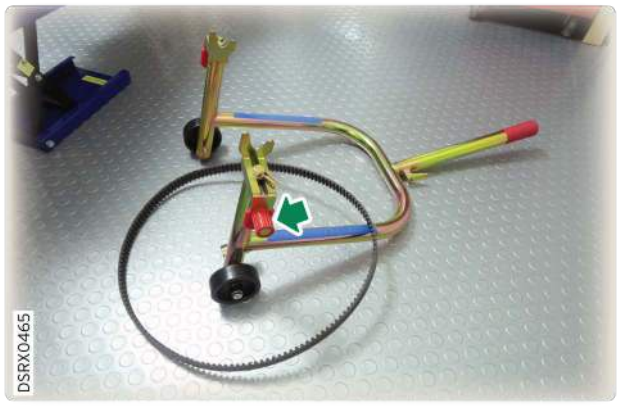
New Parts Required:

- Drive belt
- Tape

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. The forward bolt secures the rear shock ground wire eyelet and star washer underneath it.



6. Remove bolt on right side, 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. Remove rear axle nut and collect the rear axle adjuster. Tool: 27 mm socket. Torque: 75 lb·ft (102 Nm).

   Note: Replace cable tie during the installation process.



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



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



11. Slide rear axle forward.

    Note: Remove the axle from the left swingarm slot to allow extra forward travel of the wheel and sprocket.



12. Slip belt off of the rear sprocket.

Installation

1. Installation is the reverse of the removal procedure, with the exception of the following:
2. Adjust drive belt after installation is complete. See *Drive Belt - Adjust, page 10.4.*

Rear Sprocket

NOTICE: Before carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T40
- T45
- 27 mm socket
- Motorcycle stand

New Fasteners Required:

- Rags/cloth
- Tape

Removal

1. Remove rear wheel. See *Rear Wheel, page 50.5.*



2. Remove bolts (x5) securing the sprocket 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. Install bolts (x5) securing the sprocket to the rear wheel and tighten in the sequence shown. Tool: T40. Torque: 26 lb·ft (35 Nm).

Steering Stem

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
- T30
- T45
- T50
- 3/16” standard screwdriver
- 2 mm hex
- 6 mm hex bit socket
- 17 mm hex bit socket
- 10 mm socket and ratchet
- 7 mm socket
- 41 mm socket
- Wobble extension
- Side cutters
- Adjustable hook spanner wrench
- Heavy duty scissor jack

New Fasteners Required:

- Cable ties (x2)
- Rags/cloth
- Tape

Removal

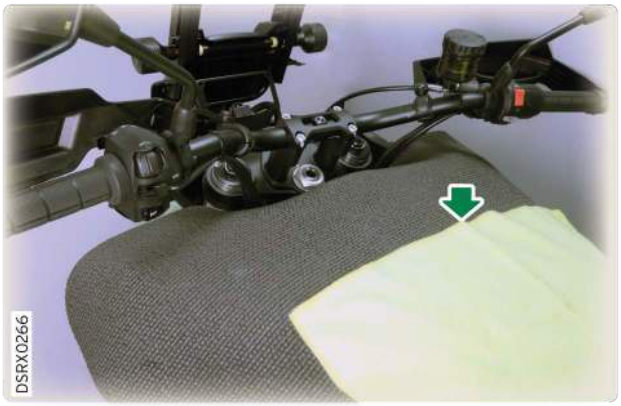
1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove dash cover lower. See *Dash Cover Lower, page 60.1*.
4. Remove skid pan. See *Skid Pan, page 60.19*.



5. Place heavy duty scissor jack under the front of the power pack. Tool: Heavy duty scissor jack.
6. Using the scissor jack, raise front of the motorcycle until the front tire is slightly off the ground.
7. Remove front fender. See *Front Fender, page 60.19*.



8. Disconnect key switch harness connector.



9. Place thick protective material on top of tank surfaces.



10. Confirm alignment of handlebar by viewing the alignment marks printed on handlebar. Vertical lines should be centered between clamps. Horizontal lines should be in line with parting line in handlebar clamp.



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



12. Carefully lower handlebar assembly on material protecting tank assembly.
13. Remove handlebar clamp.

    Note: Take care not to damage surfaces while moving handlebar assembly to gain clearance to work on upper triple clamp.



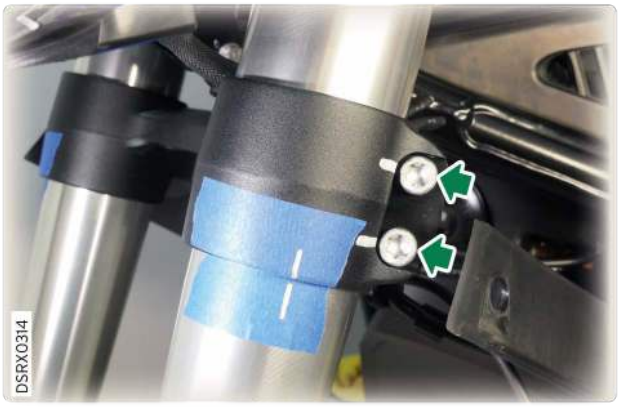
14. Loosen stem nut. Tool: 41 mm socket. Torque: 75 lb·ft (102 Nm).



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



16. Mark the installed alignment of the left front suspension to the left lower triple clamp.



17. Loosen left front suspension lower clamp bolts (x2). Tool: T45. Torque: 16 lb ft (22 Nm).



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



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



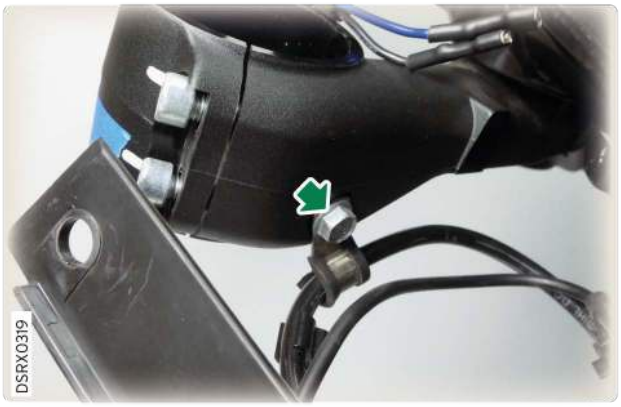
20. Mark the installed alignment of the right front suspension to the right lower triple clamp.



21. Loosen right front suspension lower clamp bolts (x2). Tool: T45. Torque: 16 lb·ft (22 Nm).



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



23. Remove bolt securing brake hose clamp to lower clamp. Tool: T30. Torque: 4 lb·ft (5 Nm).



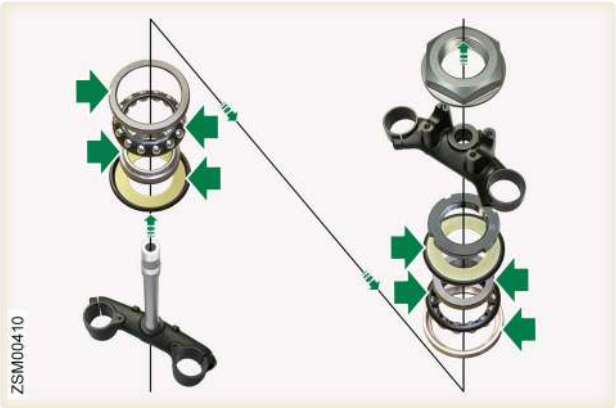
24. Remove bolt capturing harness ground wire to upper triple clamp. Collect star washer located between ground cable eyelet and triple clamp. Tool: T30. Torque: 7.8 lb·ft (11 Nm).



25. Remove stem nut. Tool: 41 mm socket. Torque: 75 lb·ft (102 Nm).
26. Remove upper triple clamp.



27. Remove shaft nut. Tool: Adjustable hook spanner wrench. Torque: 25 lb·ft (34 Nm).



28. 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.

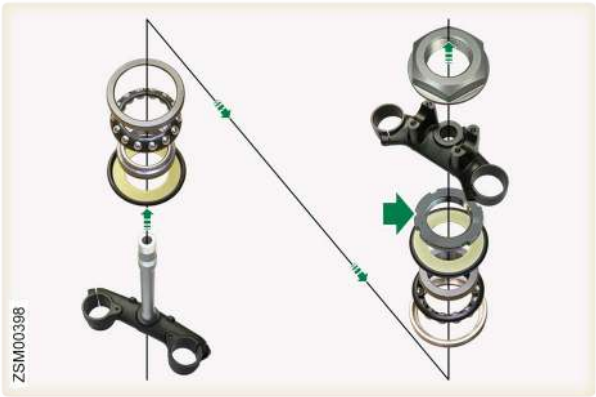
   Pay close attention to the order of installation of the bearings, races, seals, steering stem lock nut.



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.**



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.

Front Suspension

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
- T30
- T45
- T50
- 3/16” standard screwdriver
- 2 mm hex
- 6 mm hex bit socket
- 17 mm hex bit socket
- 10 mm socket and ratchet
- 7 mm socket
- Wobble extension
- Side cutters
- Heavy duty scissor jack

New Fasteners Required:

- Cable tie
- Tape

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove dash cover lower. See *Dash Cover Lower, page 60.1*.
4. Remove skid pan. See *Skid Pan, page 60.19*.



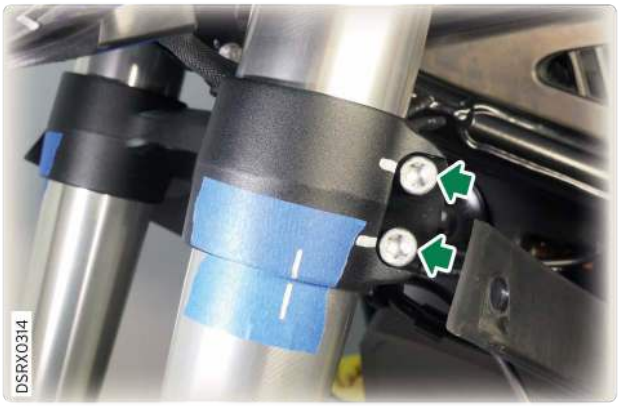
5. Place heavy duty scissor jack under the front of the power pack. Tool: Heavy duty scissor jack.
6. Using the scissor jack, raise front of the motorcycle until the front tire is slightly off the ground.
7. Remove front fender. See *Front Fender, page 60.19*.



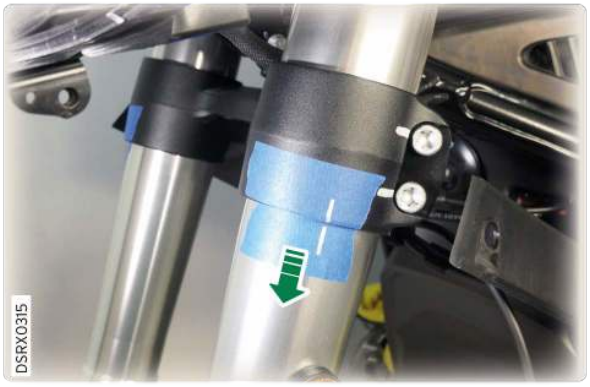
8. Loosen front suspension upper clamp bolt on the side being removed. Tool: T45. Torque: 16 lb·ft (22 Nm).



9. Mark the installed alignment of the front suspension to the lower triple clamp.



10. Loosen front suspension lower clamp bolts (x2). Tool: T45. Torque: 16 lb ft (22 Nm).



11. Slide the front suspension down through the lower clamp.
12. Remove the front suspension.

Installation

1. Installation is the reverse of the removal procedure, except for the following.
2. When installing a new suspension component, transfer the alignment marks to the new component.
3. Align the forks. See *Fork Alignment, page 40.12.*.

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:

-  Fork bullet (48 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/RH Disassembly


Zero0108

1. Place the fork in a suitable suspension vise.


Zero0109

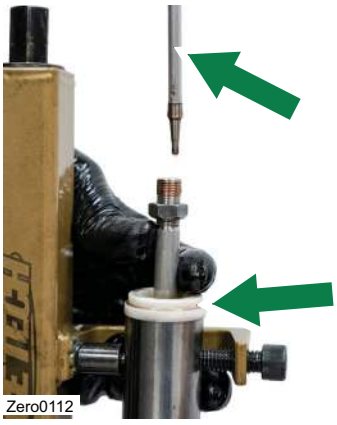
2. Use a 24 mm socket to remove the top cap.


Zero0110

3. Secure the spring collar in a stand, as shown.


Zero0111

4. Use an adjustable wrench to hold the assembly while loosening the hex nut at the bottom of the fork bolt.


Zero0112

5. Pull the fork bolt from the assembly and remove the fork slider from the top of the spring collar.
6. Loosen the vise and dump the fork oil into a container (approx. 22 fl.oz. (650 ml)).



Zero0113

7. Remove the screw from the bottom of the fork.



Zero0114

8. Lift the assembly out of the outer tube.



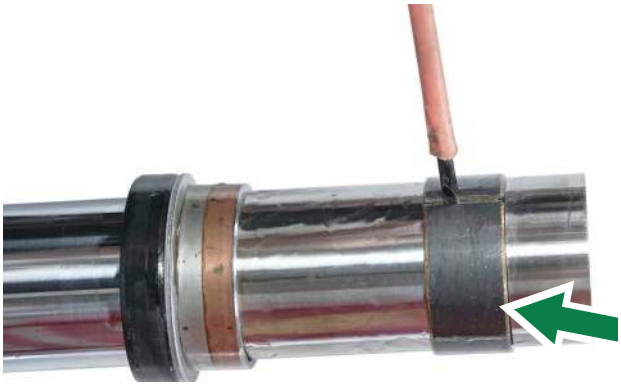
Zero0115

9. Pry the dust seal from the tube.



Zero0116

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



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



Zero0090

12. Slide the guide bushing, seal spacer, oil seal, stopper ring and dust seal from the pipe.

LH/RH Assembly



Zero0134

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



Zero0135

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

2. Slide new dust seal (5), the stopper ring (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.



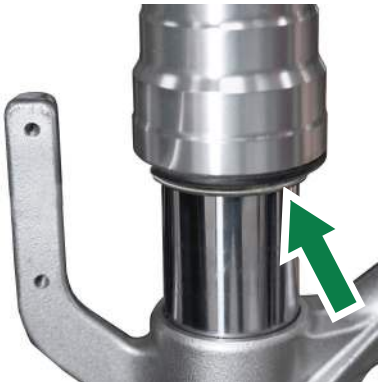
Zero0093

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 stopper ring 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.



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



Zero0096

8. Add oil to the outer tube.
   - SS-47 (10 W) oil: 22 fl oz (650 ml)

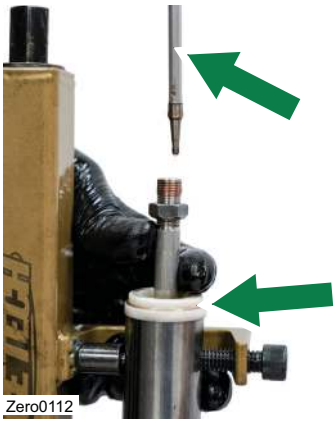
   Note: The oil level should be approximately 3 7/8 in. (90 mm) from the top of the tube.


Zero0114

9. Install the damper assembly into the outer tube.


Zero0113

10. Apply a thread locker to the threads and install the bottom bolt. Tighten to 15 ± 4 lb-ft (20 ± 5 Nm).


Zero0112

11. Install the fork bolt in the assembly and install the fork slider on the top of the spring collar.


Zero0111

12. Tighten the hex nut. Torque: 15 ± 2 lb-ft (20 ± 2.5 Nm)


Zero0136

13. Install the new O-ring on the fork bolt and lubricate.


Zero0109

14. Install the fork bolt assembly onto the outer tube and tighten to 26 ± 4 ft-lb (35 ± 5 Nm).
15. Install the suspension on 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

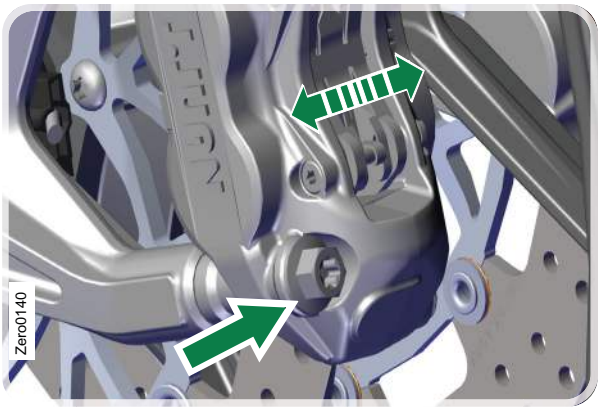
Alignment


Zero0137

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.

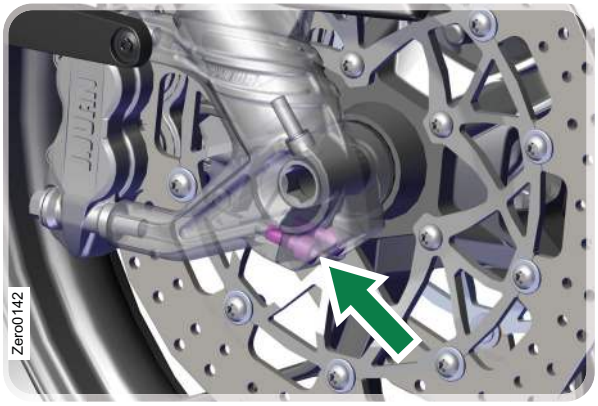


4. Spin the wheel and apply the brakes with the wheel in motion. Repeat about 5 times to properly seat the brake pads.

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).

Swingarm

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 carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- Heavy duty scissor jack
- Motorcycle stand
- 10 mm socket and ratchet
- 13 mm socket
- 27 mm socket
- T20
- T25
- T30
- T40
- T45
- T50
- 17 mm combination wrench
- Side cutters

New Fasteners Required:

- Rags/cloth
- Cable ties (x4)
- Cable anchor

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove skid pan. See *Skid Pan, page 60.19.*

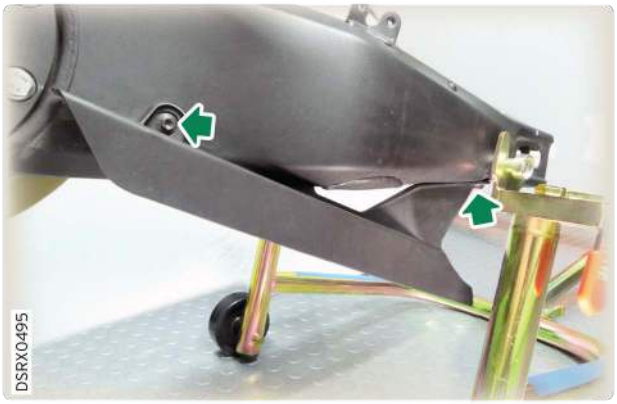


4. Place heavy duty scissor jack under the front of the power pack. Tool: Heavy duty scissor jack.
5. Using the heavy duty scissor jack, position it lengthwise under the front of the power pack and raise the motorcycle until the front tire is about 1.5” off the ground and the tension of the rear suspension is simultaneously partially unloaded.

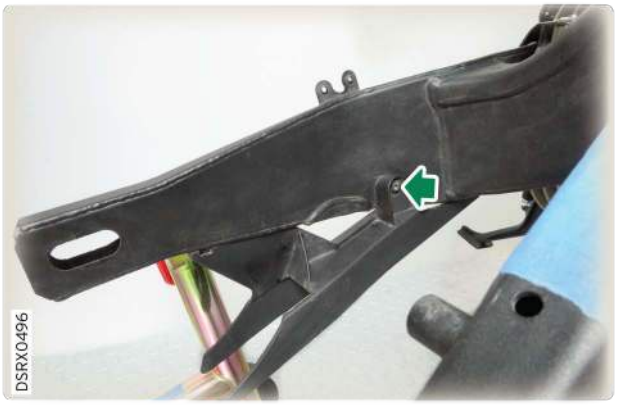
   WARNING! The weight should be distributed with more weight on the rear of the motorcycle, so that removing the heavy motor will not upset the weight balance on the jack. Always check stability of the motorcycle during the process.
6. Remove rear wheel. See *Rear Wheel, page 50.5.*



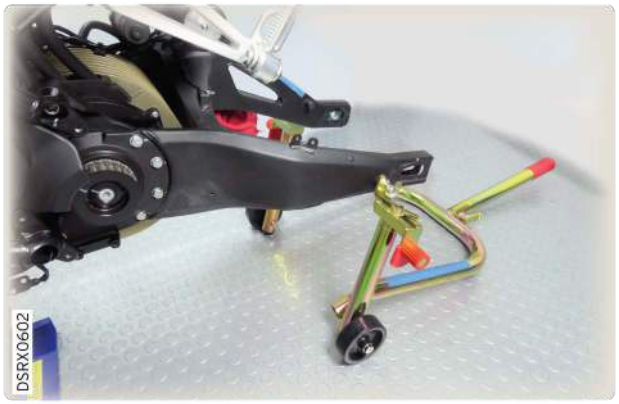
7. Remove bolts (x3) securing the left foot peg bracket to the left doubler plate. Tool: 10 mm socket. Torque: 20 lb·ft (27 Nm).



8. Remove bolts (x2) securing belt guard lower to swingarm.



9. Remove inner bolt securing belt guard lower to swingarm.



10. Carefully remove rear motorcycle stand to release spring tension from rear suspension.

WARNING! Confirm that the motorcycle is supported correctly and stable on the scissor jack, so the motorcycle can't fall off.



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



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



13. Protect painted surfaces with a shop cloth.



14. 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).



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

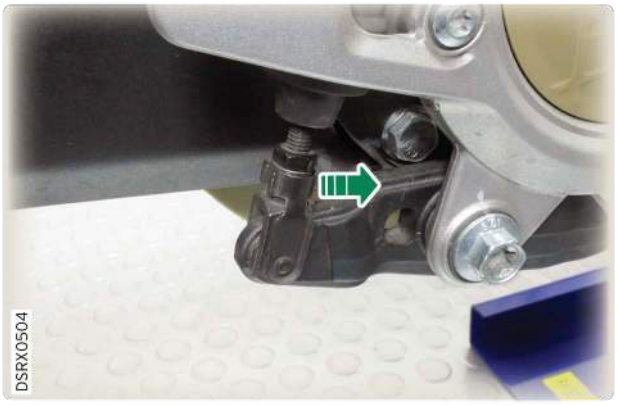


17. Cut cable tie securing brake hose and harnesses to the top of the motor.

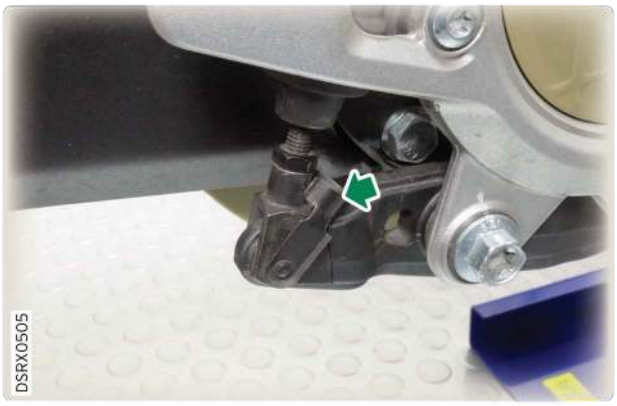
    Note: Replace cable tie during the installation process.



18. Tie rear caliper (wrapped in a rag to protect painted surfaces) and wheel speed sensor to the side of the motorcycle frame.



19. Release clip from bottom of rear brake master cylinder.



20. Remove clip from bottom of rear brake master cylinder.



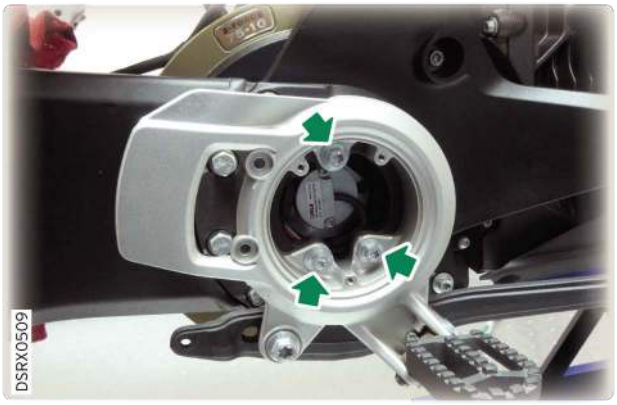
21. Remove bolts (x2) securing rear master cylinder to right foot peg bracket. Tool: T30. Torque: 7 lb·ft (9 Nm).



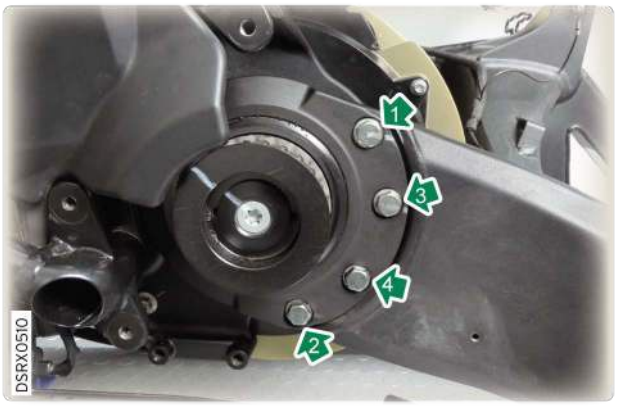
22. Wrap rear master cylinder to protect painted surfaces and tie in to rear foot peg.



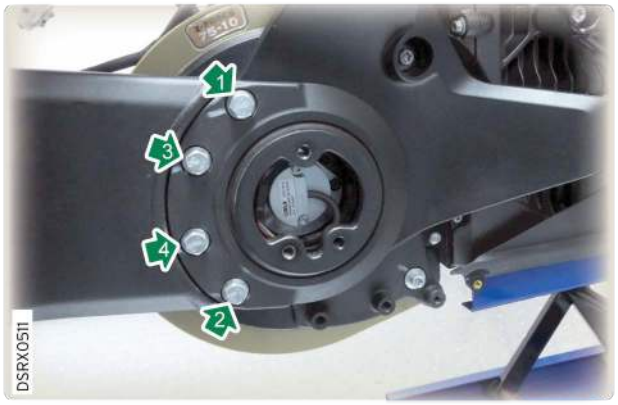
23. Remove bolts (x3) securing encoder cover plate from right foot peg bracket. Tool: T20. Torque: 2 lb·ft (3 Nm).



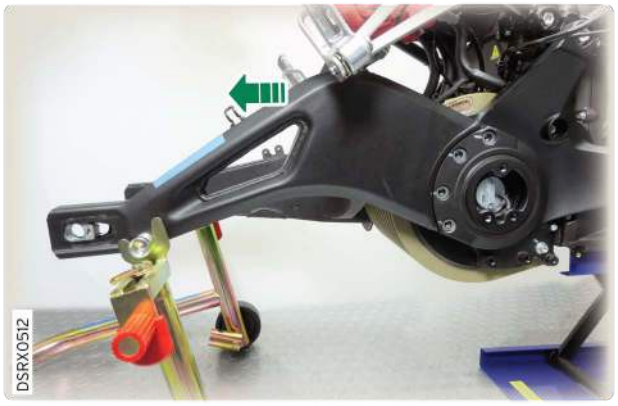
24. Remove bolts (x3) securing right foot peg bracket to right doubler plate and collect foot peg bracket. Tool: T40.



25. Remove bolts (x4) securing swingarm to left outer bearing cover. Tool: 13 mm socket. Torque (in sequence shown): 24.5 lb·ft (33 Nm).



26. Remove bolts (x4) securing swingarm to right outer bearing cover. Tool: 13 mm socket. Torque (in sequence shown): 24.5 lb·ft (33 Nm).



27. Remove swingarm.
28. Collect the shims located between the right outer bearing cover and the swingarm.

    Note: Install the same shims upon re-installation of the swingarm. The shims are specific to the swingarm.

Installation

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



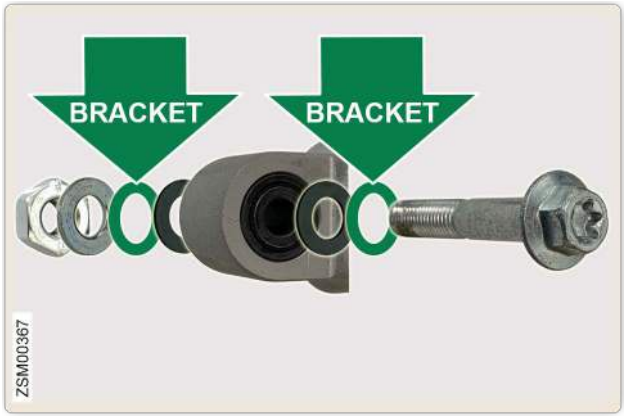
3. When installing the rear wheel speed sensor, make sure the alignment tab is positioned against the top edge of the rear brake bracket as shown.



4. Confirm that the aluminum bushing for left side (sprocket side) of the wheel is installed in the seal prior to installation of the wheel.



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



6. The order of fasteners and washers to mount the rear shock to the swingarm.
7. Adjust drive belt after installation is complete. See *Drive Belt - Adjust, page 10.4.*

Rear Shock

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):

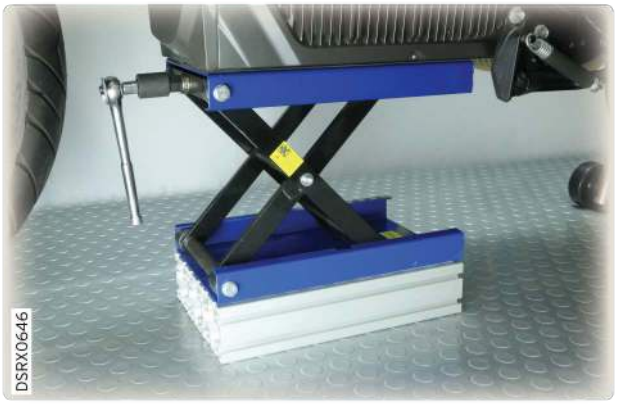
- Heavy duty scissor jack
- 10 mm socket and ratchet
- T20
- T25
- T30
- T50
- 2 mm hex
- 3/16” standard screwdriver
- 17 mm combination wrench

New Fasteners Required:

- Rags/cloth

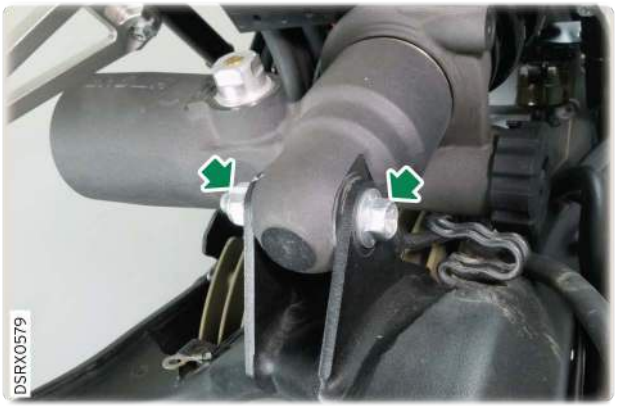
Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove skid pan. See *Skid Pan, page 60.19.*



4. Place heavy duty scissor jack under the power pack on level floor or with enough heavy duty blocking to raise the power pack 14.5” (37 cm) off the floor. Tool: Heavy duty scissor jack.
5. Using the heavy duty scissor jack, position it lengthwise under the power pack (biased towards the front) and raise the motorcycle until the power pack is approximately 14.5” (37 cm) off the floor and the tension of the rear suspension is partially unloaded.

   WARNING! The weight should be distributed with more weight on the rear of the motorcycle, so if removing heavy components from the rear of the motorcycle, (i.e., the motor) will not upset the weight balance on the jack. Always check stability of the motorcycle during the process.



6. Remove bolt securing shock to swingarm. Collect nut, steel washer, and composite washers (x2). Tools: T50 and 17 mm wrench. 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 a shop cloth.



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).



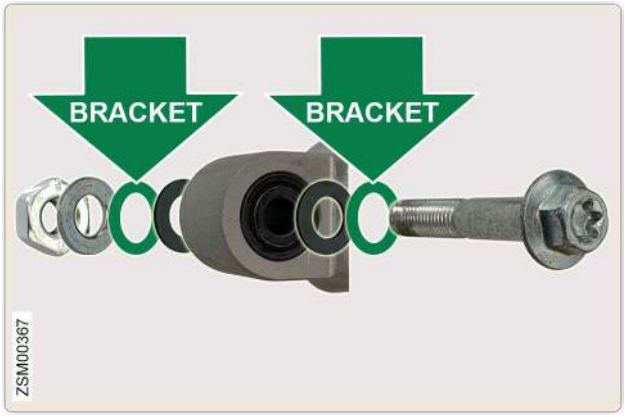
10. Remove bolt securing ground wire to top of rear shock and collect star washer (between wire eyelet and shock body). Tool: T20. Torque: 2 lb·ft (3 Nm).
11. Remove rear shock.

Installation

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



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.

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 carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T30
- 10 mm wrench
- 14 mm flare nut wrench
- 5 mm hex

New Fasteners Required:

- Brake fluid DOT4
- Crush washers
- Blue threadlocker
- Tape

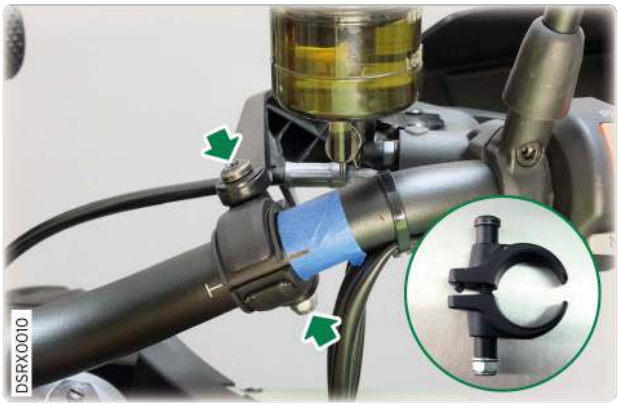
Removal



1. Release outer end of hand guard from handlebar. Tool: T45. Torque: 12 lb·ft (16 Nm).



2. Place tape on handlebar to mark the installed location.



3. Remove nut and bolt securing handguard from handlebar and collect washer, spacers (x2), and clamp halves (x2). Tools: T30 & 10 mm wrench. Torque: 5 lb·ft (7 Nm). Threadlocker: Blue.

NOTE: Protect surrounding surfaces and take care not to drop the clamp halves during removal process.



4. Remove hand guard mounting gasket from handlebar.



5. 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.



6. Disconnect front brake switch harness wire connectors (x2).

   Note: Document location and color of wires before disconnecting them.



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



8. 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.

9. 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 Maintenance Procedures, page 10.7*

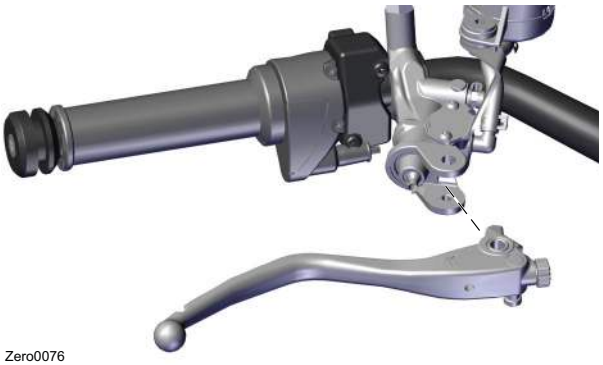
Brake Lever - Front

Removal



Zero0075

1. Remove the pin, nut and washer that secure the brake lever assembly.



Zero0076

2. Remove the lever assembly.



Zero0077

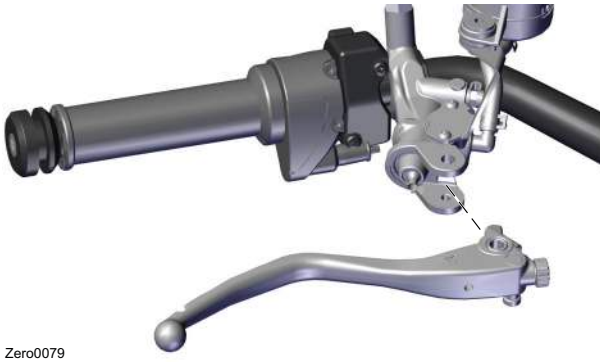
3. Press the bushing from the assembly and separate the pusher and spring from the brake lever. Discard the spring and bushing.

Installation



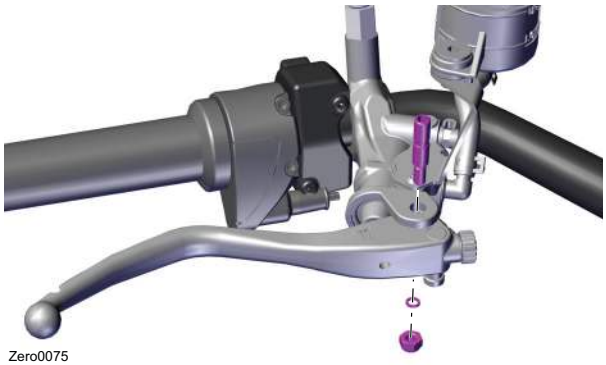
Zero0078

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 you Zero Dealer for assistance.

Brake Pads - Front

NOTICE: Before carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25

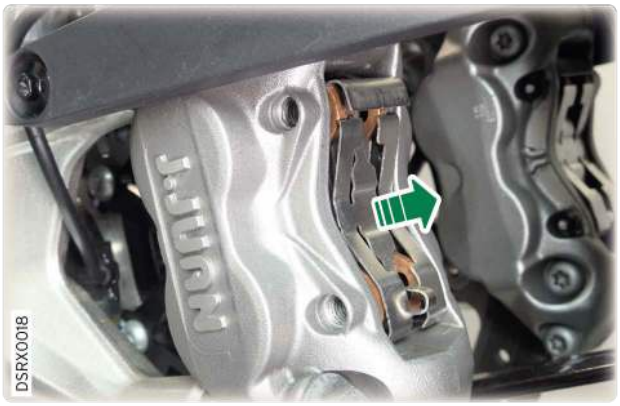
Removal



1. Remove brake caliper pin-bolt clips (x2).



2. Remove brake caliper pin bolts (x2). Tool: T25. Torque: 6 lb·ft (8 Nm).



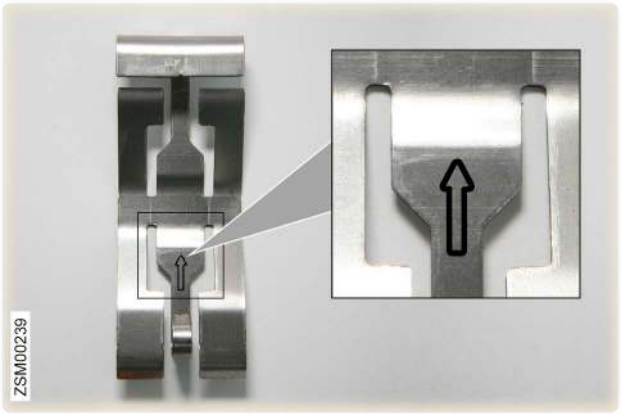
3. Remove brake pad anti-rattle spring plate.



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 40.12.*.
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.

NOTICE: Before carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T50
- 14 mm flare nut wrench

New Fasteners Required:

- Brake fluid DOT4
- Crush washers
- Tape

Removal

1. Remove front caliper brake pads. See *Brake Pads - Front, page 45.5.*



2. Release brake hose from brake hose clip on front fender.



3. Release speed sensor wire from front fender.



4. Remove bolts (x3) securing front fender to left front suspension. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



5. Remove bolts (x3) securing front fender to right front suspension. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



6. Protect surfaces of the fender and front suspension to reduce the chance of scratching these surfaces during the repair process.



7. Release speed sensor rubber isolator bushing from retaining clip.



8. Remove left front caliper banjo bolt and discard crush washers (x2). Tool: 14 mm flare nut wrench. Torque: 20 lb·ft (27 Nm).

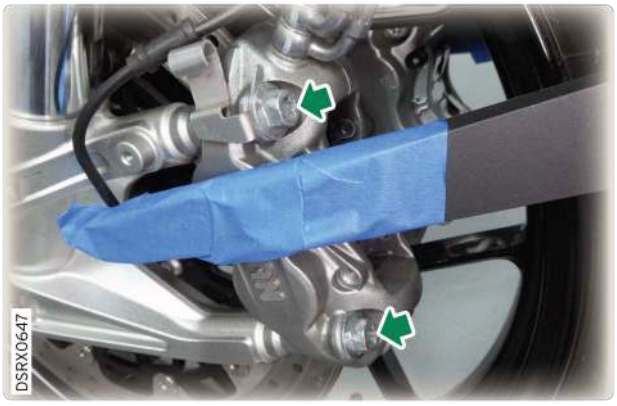
CAUTION: **Plug all open connections to prevent ingress of moisture and debris.**

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.



9. Remove left front caliper bolts (x2) and collect retaining clip. Tool: T50. Torque: 30 lb·ft (41 Nm).
10. Remove left front brake caliper.

Installation

1. Installation is the reverse of the removal procedure, except for the following:
2. Perform brake bleeding procedure. See *Brake Maintenance Procedures, page 10.7*
3. Align the forks. See *Fork Alignment, page 40.12.*.
4. If new brake pads were installed, perform the brake pad bedding procedure. See *Brake Bedding, page 10.9.*

Brake Rotor - 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.

NOTICE: Before carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T40
- 6 mm hex
- 17 mm hex
- Heavy duty scissor jack

New Fasteners Required:

- New rotor mounting bolts - 5 per rotor (see parts book)
- Rags/cloth
- Cable tie
- Tape

Removal

1. Remove front wheel. See *Front Wheel, page 50.1.*



2. 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 steps:
2. Clean the calipers and pistons using brake cleaner. 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 wheel speed sensor, make sure the alignment tab is positioned against the bottom surface of the fork.
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 handlebars with a cable tie. This ensures that 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 40.12.*
14. After replacing a rotor, perform the brake pad bedding procedure. See *Brake Bedding, page 10.9.*.

Brake Pads - Rear

NOTICE: Before carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25

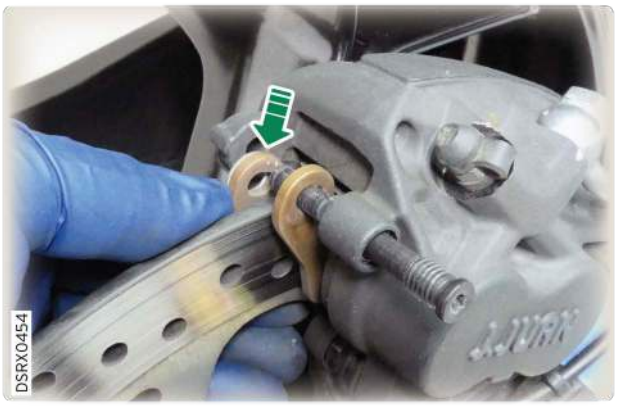
Removal



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.

Brake Caliper - Rear

NOTICE: Before carrying out the following procedure, remove the key from the key switch.

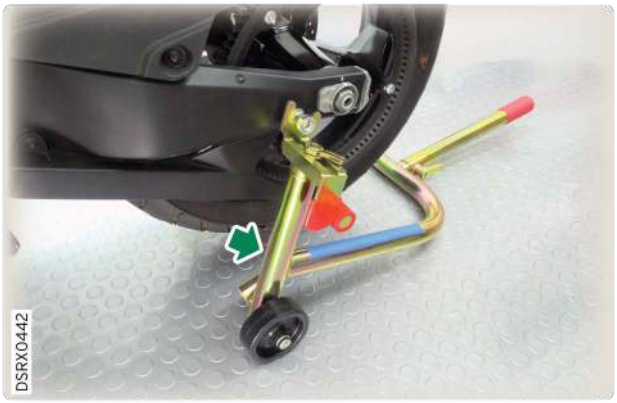
Tools Required (includes tools required for parent jobs):

- 14 mm flare nut wrench
- Motorcycle stand

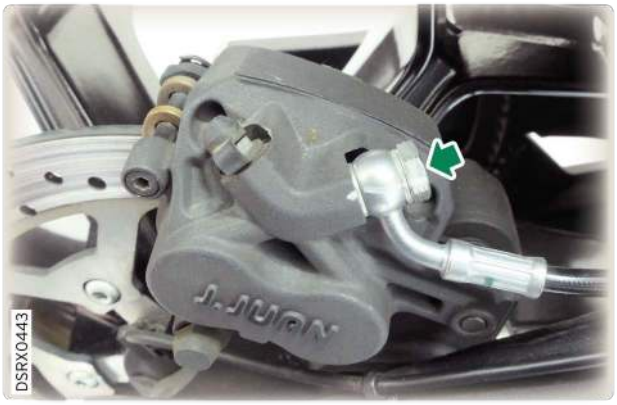
New Fasteners Required:

- Rags/cloth
- Brake fluid DOT4

Removal



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



2. Remove rear caliper banjo bolt and discard crush washers (x2). Tool: 14 mm flare nut wrench. Torque: 20 lb·ft (27 Nm).



3. Place rag over rear caliper to protect painted surfaces of wheel.



4. Lift rear tire slightly and slide rear axle out of the swingarm.



5. Raise the rear tire and remove rear wheel speed sensor and set aside.

   Note: Make sure the wheel speed sensor is supported and not straining the electrical harness.

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



7. Place rag over the left side of the swingarm between the rear sprocket and the swingarm to protect painted surfaces.



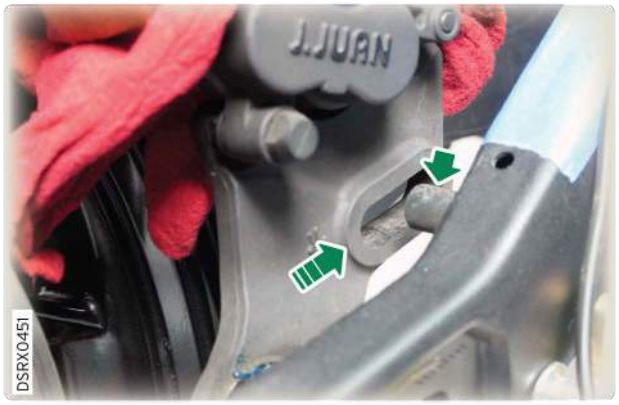
8. Roll rear tire forward.



9. Position the rear brake hose on top of metal retaining clip.



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



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

Installation

1. Installation is the reverse of the removal procedure, except for the following:
2. Perform brake bleeding procedure. See *Brake Maintenance Procedures, page 10.7*.

Brake Rotor - Rear

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
- T40
- T45
- Motorcycle stand
- 27 mm socket

New Fasteners Required:

- New rotor mounting bolts (see parts book)
- Rags/cloth

Removal

1. Remove rear wheel. See *Rear Wheel, page 50.5.*



2. 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 pistons using brake cleaner. Make sure the pistons move freely.
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 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. Confirm that the aluminum bushing for left side (sprocket side) of the wheel is installed in the seal prior to installation of the wheel.



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

9. Adjust drive belt after installation is complete. See *Drive Belt - Adjust, page 10.4.*

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:

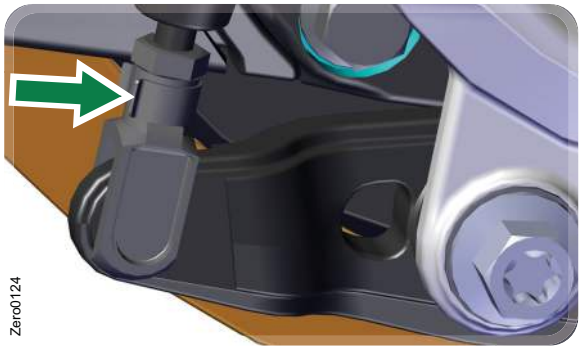
- 2 Crush washers

Removal



1. Remove the banjo bolt and crush washers from the rear brake line. Torque: 20 lb·ft (27 Nm).
   Discard the crush washers.

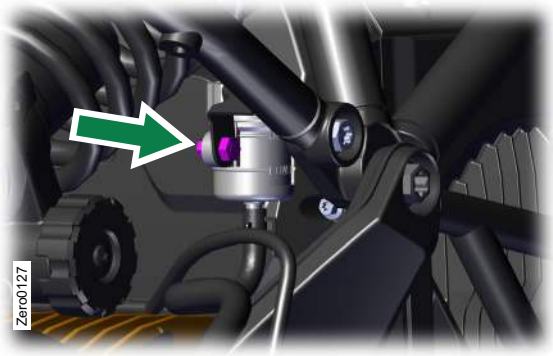
   CAUTION: Protect painted surfaces from any brake fluid drip.



2. Release the clip from the bottom of the rear master cylinder. Remove the pin to separate the cylinder from the brake pedal.



3. Remove the two screws that secure the master cylinder. Torque: 7 lb·ft (9 Nm)

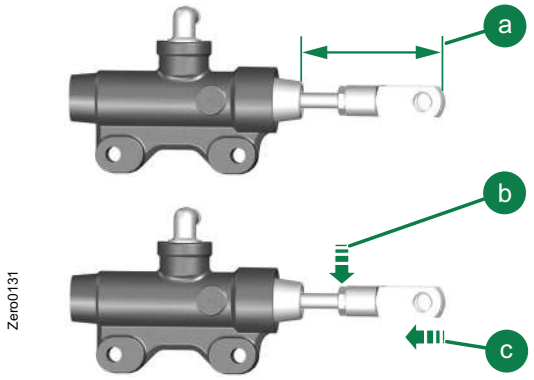


4. Unbolt the rear brake reservoir from the frame and remove the entire assembly.

   Note: Drain the fluid before discarding.

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

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):

- T20
- T25
- T30
- 2 mm hex
- 3 mm hex
- 10 mm socket and ratchet
- 3/16” standard screwdriver

New Fasteners Required:

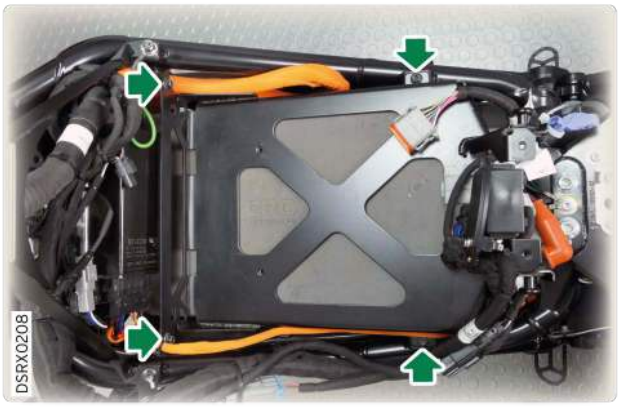
- Tape
- Cable tie

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove tank bucket. See *Tank Bucket, page 60.21.*



4. Disconnect battery signal DC/DC harness connector.



5. Remove bolts (x4) securing the tank support plate to the motorcycle frame. Tool: T30. Torque: 7.8 lb·ft (10 Nm).



6. Remove bolt securing the left front corner of the charger to the storage liner plate. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



7. Remove bolt securing the left rear corner of the charger to the storage liner plate. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



8. Remove bolts (x2) securing the right side of the charger to the storage liner plate. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



9. Lift storage liner plate and flip it to the left side.

   CAUTION: **Protect surfaces to prevent damaging painted surfaces.**



10. Disconnect DC/DC converter harness connector.



11. Remove bolts (x2) securing horn cover to motorcycle frame. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



12. Remove horn cover.

    Note: Take note of brake hose and wheel speed sensor harness routing through horn panel before removal.



13. Remove bolt securing brake hose clamp to horn mount tab. Tool: 4 mm hex or T30. Torque: 4 lb·ft (5 Nm).



14. Cut cable tie securing lower right corner of horn cover to motorcycle frame.

    Note: Replace cable tie during the installation process.



15. Pull back horn cover to gain access to the wheel speed sensor harness connector.

    Note: Take note of position of horn cover flanges so they can be placed in correct position during the installation process.



16. Cut cable tie securing wheel speed sensor harness and connector to the cable tie anchor.

    Note: Replace cable tie during the installation process.



17. Cut cable ties (x2) securing left side of horn cover to motorcycle frame.

    Note: Replace cable ties (x2) during the installation process.



18. Cut cable ties (x2) securing harnesses to left front of HCU bracket.

    Note: Replace cable ties (x2) during the installation process.



19. Disconnect IMU harness connector.



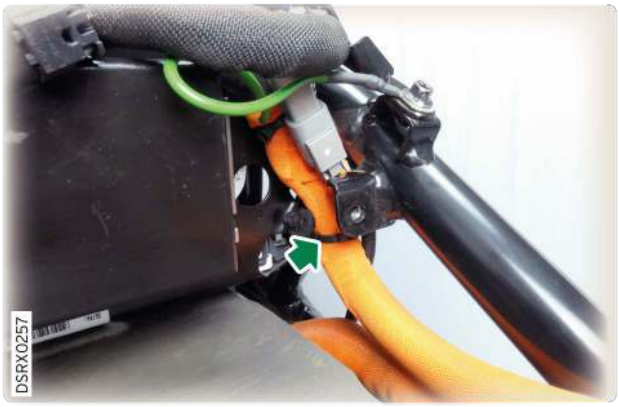
20. Release flat clip securing HCU harness to HCU bracket.



21. Remove bolts (x2) securing right side of HCU bracket to the motorcycle frame. Tool: T30. Torque: Lower bolt - 7.8 lb·ft (10 Nm). Torque: Upper bolt - 6 lb·ft (8 Nm).

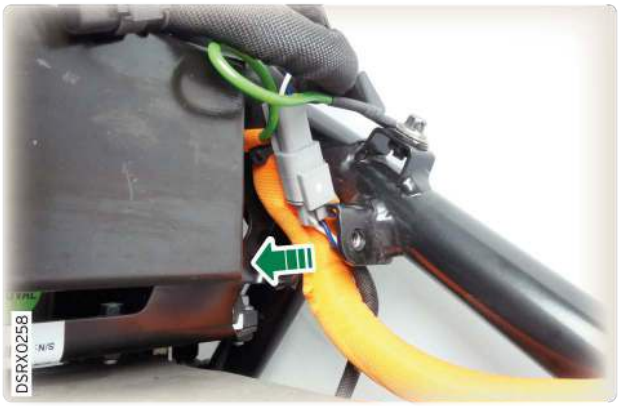


22. Remove bolt securing left side of HCU bracket to the motorcycle frame. Tool: T30. Torque: 6 lb·ft (8 Nm).



23. Cut cable tie securing orange-sheathed charger harness to HCU bracket.

    Note: Replace cable tie during the installation process.



24. Reposition harnesses out from behind the motorcycle frame tab.



25. Reposition HCU bracket and assembly toward the rear of motorcycle enough to gain access to the brake fittings on the HCU.



26. Make note of the location of brake hoses prior to removing them. The HCU cover is marked with RMC for rear master cylinder hose and FMC for front master cylinder hose locations.



27. The HCU cover is marked with RCAL for rear caliper hose and FCAL for front caliper hose locations.



28. Disconnect ABS pressure switch harness connector.



29. Remove ABS pressure switch and discard crush washers (x2). Tool: 14 mm flare wrench. Torque: 12.5 lb·ft (17 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.



30. Remove banjo bolts (x3) and discard crush washers (x6). Tool: 14 mm flare wrench. Torque: 20 lb·ft (27 Nm).

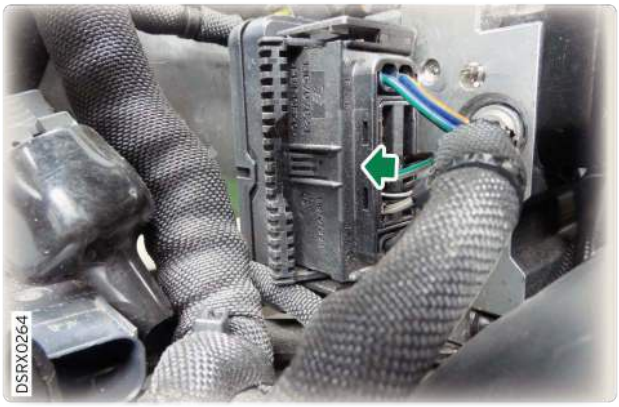
    CAUTION: **Plug all open connections to prevent ingress of moisture and debris.**

    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.



31. Disconnect the HCU harness connector.
32. Remove bolts (x3) securing the HCU to the HCU bracket and collect washers (x3). Tool: T30. Torque: 8 lb·ft (11 Nm).
33. 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 (WSS) - Front

NOTICE: Before carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- T50
- 2 mm hex
- 6 mm hex
- 3/16” standard screwdriver
- 10 mm socket and ratchet
- 17 mm hex bit socket and ratchet
- Heavy duty scissor jack
- Side cutters

New Fasteners Required:

- Cable ties (x4)
- Tape

Removal

1. Remove fairing side inner right. See *Fairing Side Inner Right, page 60.17.*
2. Steer front wheel to full lock right.
3. Remove bolts (x2) securing horn cover to fairing headlight lower. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



4. Remove bolts (x2) securing horn cover to motorcycle frame. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



5. Remove horn cover.

   Note: Take note of brake hose and wheel speed sensor harness routing through horn panel before removal.



6. Cut cable tie securing lower right corner of HCU cover to motorcycle frame.

   Note: Replace cable tie during the installation process.

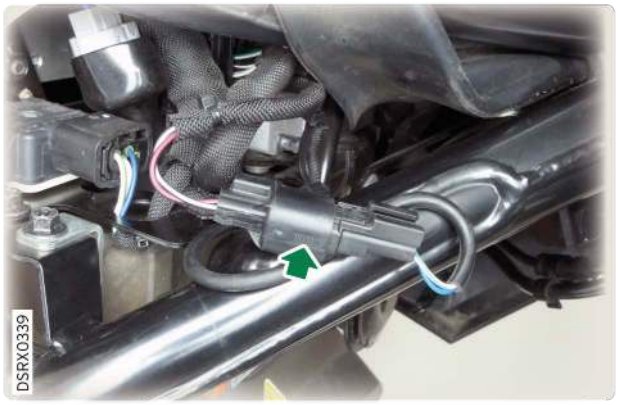


7. Pull back HCU cover to gain access to the wheel speed sensor harness connector.

   Note: Take note of position of HCU cover flanges so they can be placed in correct position during the installation process.



8. Cut cable tie securing wheel speed sensor harness and connector to the cable tie anchor.



9. Disconnect wheel speed sensor harness connector.

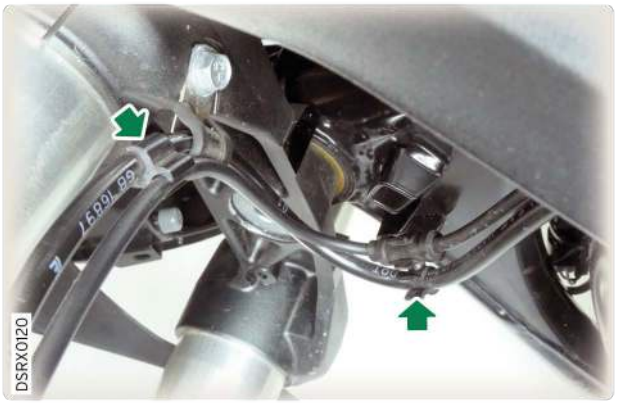


10. Release speed sensor harness from plastic retaining clips (x2).



11. Cut cable tie securing speed sensor harness to brake line.

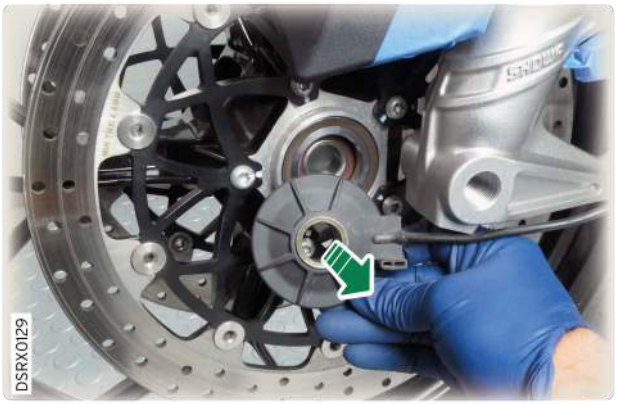
    Note: Replace cable tie during the installation process.



12. Release speed sensor harness from plastic retaining clips (x2).



13. Release speed sensor harness from plastic retaining clip.
14. Remove front wheel. See *Front Wheel, page 50.1.*



15. Release the wheel speed sensor from the front wheel.
16. Remove front wheel speed sensor.

Installation

1. Installation is the reverse of the removal except for the following:
2. When installing the wheel speed sensor, make sure the alignment tab is positioned against the bottom surface of the fork.

Wheel Speed Sensor (WSS) - Rear

NOTICE: Before carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T40
- Motorcycle stand
- Side cutters
- 10 mm socket

New Fasteners Required:

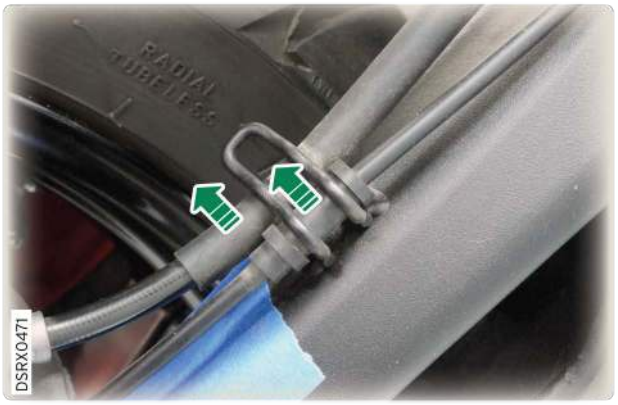
- Rags/cloth
- Cable ties (x4)
- Cable anchor

Removal



1. Remove single-use harness anchor from swingarm and release wheel speed sensor harness from anchor.

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



2. Release rear brake hose and wheel speed sensor harness from the rearmost metal retaining clip.
3. Remove rear wheel. See *Rear Wheel, page 50.5.*



4. Release brake hose and wheel speed sensor harness from the forward metal retaining clip.



5. Cut cable tie securing hose and harnesses to motor.

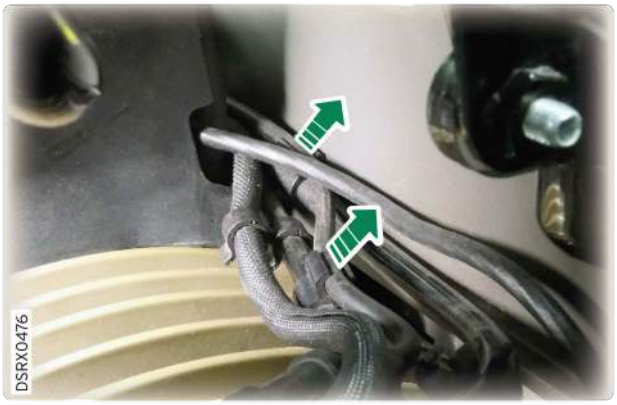
   Note: Replace cable tie during the installation process.



6. Release wheel speed sensor harness from plastic clip.



7. Release wheel speed sensor harness from plastic clip.



8. Release wheel speed sensor harness from plastic clips (x2).



9. Remove bolts (x3) securing the left foot peg bracket to the left doubler plate. Tool: 10 mm socket. Torque: 20 lb·ft (27 Nm).



10. Remove bolts (x2) securing the heel guard to the frame. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



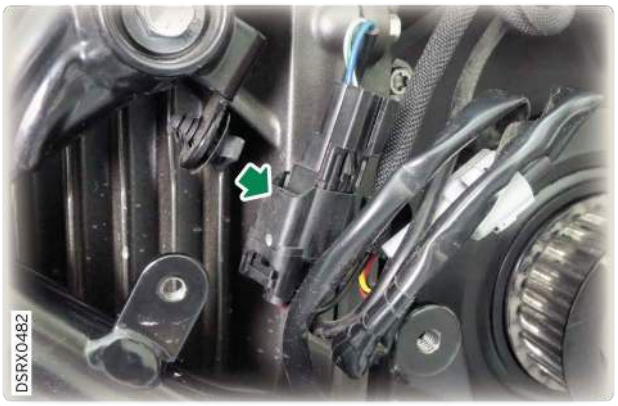
11. Cut cable tie securing the rear wheel speed sensor harness to kickstand harness.

    Note: Replace cable tie during the installation process.



12. Cut cable tie securing the rear wheel speed sensor harness to cable tie anchor.

    Note: Replace cable tie during the installation process.



13. Disconnect rear wheel speed sensor harness connector.
14. Remove rear wheel speed sensor.

Installation

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



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

Front Wheel

NOTICE: Before carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T40
- T45
- 27 mm socket
- Motorcycle stand

New Fasteners Required:

- Rags/cloth
- Tape

Removal

1. Remove skid pan. See *Skid Pan, page 60.19.*



2. Release brake hose from brake hose clip on front fender.



3. Release speed sensor wire from front fender.



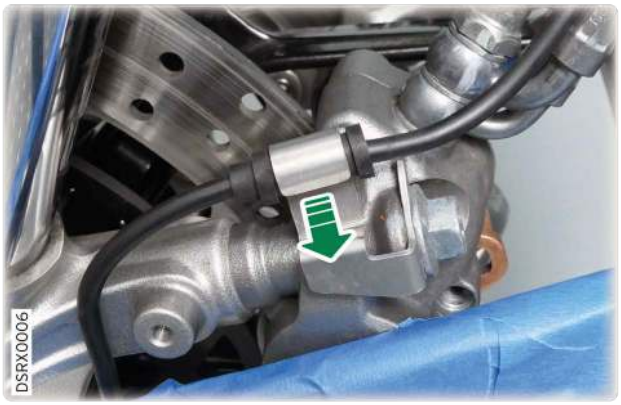
4. Remove bolts (x3) securing front fender to left front suspension. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



5. Remove bolts (x3) securing front fender to right front suspension. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



6. Protect surfaces of the fender and front suspension to reduce the chance of scratching these surfaces during the repair process.



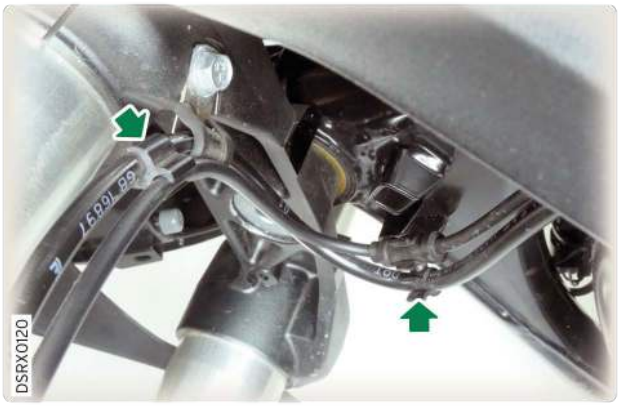
7. Release speed sensor rubber isolator bushing from retaining clip.



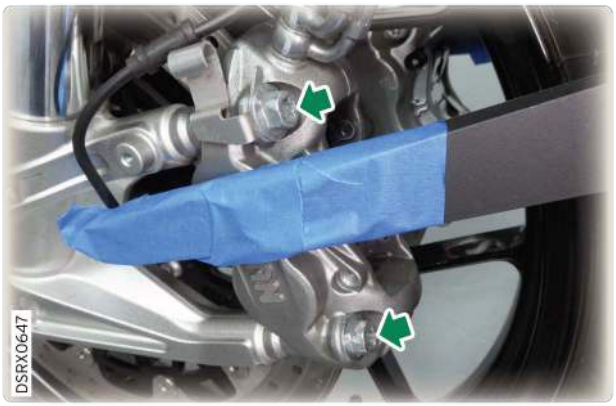
8. Release speed sensor harness from plastic retaining clips (x2).



9. Cut cable tie securing speed sensor harness to brake line.



10. Release speed sensor harness from plastic retaining clips (x2).



11. Remove left front caliper bolts (x2) and collect retaining clip. Tool: T50. Torque: 30 lb·ft (41 Nm).
12. Remove left front brake caliper.



13. Maneuver left front brake caliper out from behind fender arm.



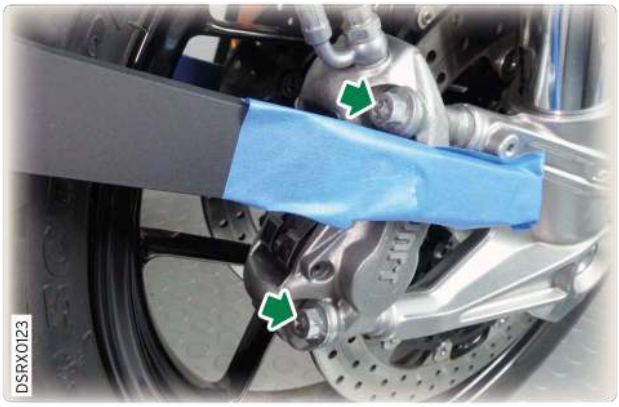
17. Maneuver right front brake caliper out from behind fender arm.



14. Wrap left front caliper and tie caliper to the frame to eliminate strain on the brake hose.



18. Wrap right front caliper and tie caliper to the frame to eliminate strain on the brake hose.



15. Remove right front caliper bolts (x2). Tool: T50. Torque: 30 lb·ft (41 Nm).
16. Remove right front brake caliper.



19. Loosen front axle pinch bolts (x2). Tool: 6 mm hex. Torque: 16 lb·ft (22 Nm).



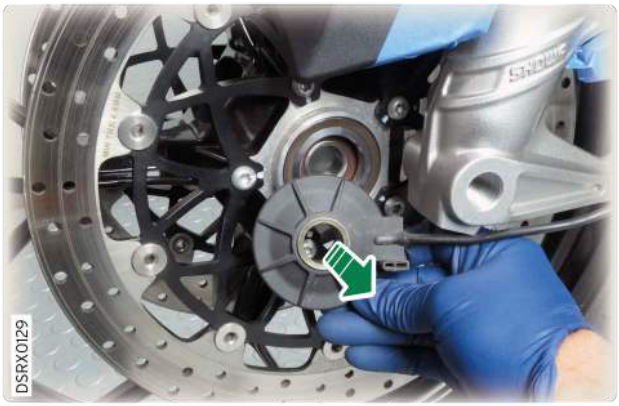
20. Place heavy duty scissor jack under the front of the skid pan. Tool: Heavy duty scissor jack.
21. Using the scissor jack, raise front of the motorcycle until the front tire is slightly off the ground.



22. Tape front fender to the left and right front shocks to keep it elevated.



23. Remove front axle. Tool: 17 mm hex bit socket. Torque: 40 lb·ft (54 Nm).



24. Release the wheel speed sensor from the front wheel.
25. Remove front wheel.

Installation

1. Installation is the reverse of the removal procedure except for the following:



2. When installing the wheel speed sensor, make sure the alignment tab is positioned against the bottom surface of the fork.
3. Align the forks. See *Fork Alignment, page 40.12.*.

Rear Wheel

NOTICE: Before carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

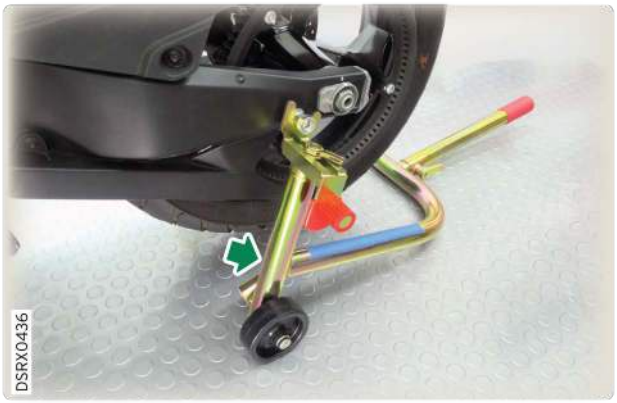
- T25
- T40
- T45
- 27 mm socket
- Motorcycle stand

New Fasteners Required:

- Rags/cloth
- Tape

Removal

1. Remove drive belt. See *Drive Belt - Replace, page 30.31.*
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. Place rag over rear caliper to protect painted surfaces.



5. Place rag over the left side of the swingarm between the rear sprocket and the swingarm to protect painted surfaces.



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



7. Collect axle adjuster inner left and right.

   Note: Adjusters must be installed with arrows pointing upwards and visible through adjustment slots.

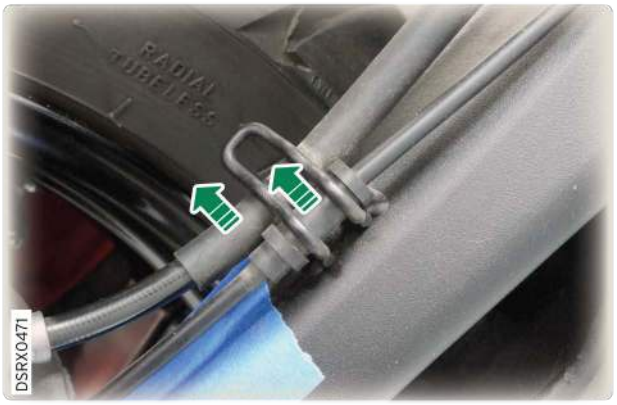


8. Raise the rear tire and remove rear wheel speed sensor and set aside.

   Note: Make sure the wheel speed sensor is supported and not straining the electrical harness.

9.

10. Lower the rear tire carefully to keep from damaging painted surfaces.
11. Roll rear tire forward.



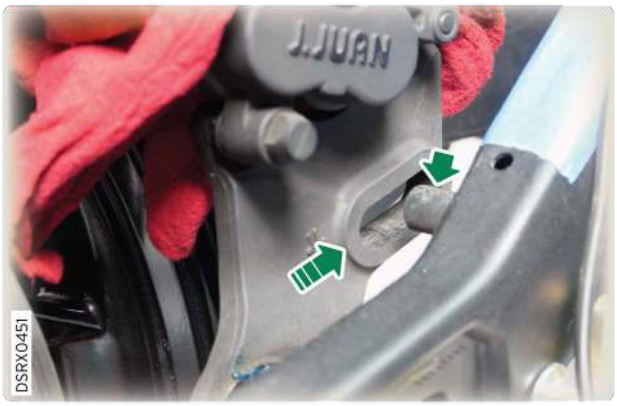
12. Release rear brake hose from the rearmost metal retaining clip.



13. Position the rear brake hose on top of metal retaining clip.



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



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



16. Tie up caliper to the foot peg bracket.

    Note: Make sure the caliper is up without straining the brake hose.

17. Roll the rear wheel out of the swingarm.



18. Remove aluminum bushing from left side (sprocket side) of the wheel.

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.



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

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

4. Install bolts (x5) securing the brake rotor to the rear wheel. Tool: T40. Torque: 26 lb·ft (35Nm).
5. Install bolts (x5) securing the sprocket to the rear wheel. Tool: T40. Torque: 26 lb·ft (35Nm).



6. Confirm that the aluminum bushing for left side (sprocket side) of the wheel is installed in the seal prior to installation of the wheel.



7. When installing the rear wheel speed sensor, make sure the alignment tab is positioned against the top edge of the rear brake bracket as shown.
8. Adjust drive belt after installation is complete. See *Drive Belt - Adjust, page 10.4.*

Dash Cover Lower

NOTICE: Before carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 2 mm hex
- 3/16” standard screwdriver
- 10 mm socket and ratchet
- 7 mm socket
- Wobble extension

New Fasteners Required:

- Cable tie
- Tape

Removal

1. Remove dash. See *Dash, page 70.13.*



2. Disconnect harness connectors (x2) from 12 volt accessory socket.

   Note: For installation, take note of accessory harness connection locations by color of wires.



3. Remove push rivet retainer securing left side of dash cover lower to tank arm inner.
4. Remove push rivet retainer securing right side of dash cover lower to tank arm inner.



5. Remove bolts (x2) securing dash cover lower to headlight mount bracket. Tool: T25 Torque: 3.5 lb·ft (5 Nm).
6. Steer motorcycle to full lock right.
7. Remove dash cover lower.

   CAUTION: **The dash cover lower is a tight fit to the key switch and upper triple. Be careful not to damage panel surfaces that will make contact with adjacent surfaces when flexing panel during the removal process.**

Installation

1. Installation is the reverse of the removal procedure.

Windscreen Adjuster/Headlight Mount Bracket

NOTICE: Before carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T20
- T25
- T30
- 2 mm hex
- 6 mm hex
- 3/16” standard screwdriver
- 10 mm socket and ratchet
- Deep 8 mm socket
- Hammer
- Drift punch
- Non-marking forked trim removal tool

New Fasteners Required:

- Cable ties (x4)
- Tape

Removal

1. Remove headlight. See *Headlight, page 70.6.*
2. Adjust windscreen to highest position and keep it in this position. Keep it in that position for the duration of this process.



3. Remove bolt securing bottom of windscreen to windscreen carrier wing center. Tool: T25. Torque: 4 lb·ft (5 Nm).

   Note: During installation, be careful not to bind rubber grommet.

   Note: Remove bolts in the following sequence: center, left, then right.



4. Remove bolts (x2) securing top of windscreen to windscreen carrier arms. Tool: T25. Torque: 4 lb·ft (5 Nm).

   Note: During installation, be careful not to bind rubber grommet.

5. Remove windscreen.



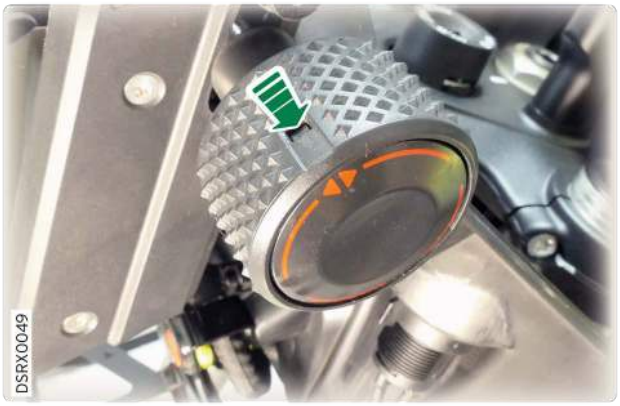
6. Remove windscreen adjuster trim.



7. Remove bolts (x2) securing top of dash cover upper to the headlight mount bracket. Tool: T25. Torque: 3.5 lb·ft (5 Nm).
8. Remove dash upper cover.



9. Remove ball nose spring plunger from headlight mount bracket. Tool: 6 mm hex.



10. Gently push locking tab through access hole of left windscreen adjuster knob cap.



11. Remove left windscreen adjuster knob cap.



12. Remove nut securing left windscreen adjuster knob to windscreen adjuster shaft and collect washer. Tool: Deep 8 mm socket. Torque: 2 lb·ft (3 Nm).
13. Remove left windscreen adjuster knob.



14. Gently push locking tab through access hole of right windscreen adjuster knob cap.
15. Remove right windscreen adjuster knob cap.



16. Remove nut securing right windscreen adjuster knob to windscreen adjuster shaft and collect washer. Tool: Deep 8 mm socket. Torque: 2 lb·ft (3 Nm).
17. Remove right windscreen adjuster knob.



18. Remove left windscreen slider bolt upper. Tool: T25. Torque: 6 lb·ft (8 Nm).



19. Remove right windscreen slider bolt upper. Tool: T25. Torque: 6 lb·ft (8 Nm).



20. Remove left windscreen slider bolt lower. Tool: T25. Torque: 6 lb·ft (8 Nm).



21. Remove right windscreen slider bolt lower. Tool: T25. Torque: 6 lb·ft (8 Nm).



22. Remove bolts (x2) securing left windscreen carrier arm to windscreen carrier wing center. Tool: T20. Torque: 2 lb·ft (3 Nm).



23. Remove windscreen carrier wing assembly.



24. Remove windscreen slider bolt lower bushings (x2) from windscreen carrier wing center.



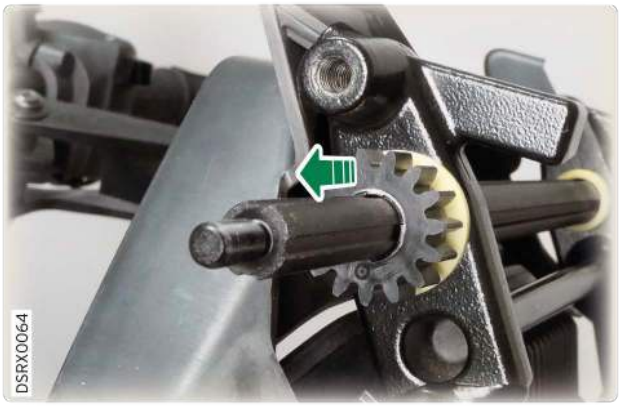
25. Remove bolts (x2) securing left windscreen carrier arm to windscreen carrier wing center. Tool: T20. Torque: 2 lb·ft (3 Nm).



26. Remove windscreen slider bolt bushings (x2) from windscreen carrier arms.



27. Remove left windscreen adjuster drive gear.



28. Remove right windscreen adjuster drive gear.



29. Remove windscreen adjuster shaft.



30. Remove left flanged sleeve bearing. Tool: Hammer and drift punch.



31. Remove right flanged sleeve bearing. Tool: Hammer and drift punch.



32. Disconnect dash harness connector from dash.



33. Remove bolts (x4) securing dash to dash bracket. Tool: T25. Torque: 4.4 lb·ft (6 Nm).
34. Remove dash.



35. Disconnect harness connectors (x2) from 12 volt accessory socket.

    Note: For installation, take note of accessory harness connection locations by color of wires.



36. Remove push rivet retainer securing left side of dash cover lower to tank arm inner.
37. Remove push rivet retainer securing right side of dash cover lower to tank arm inner.



38. Remove bolts (x2) securing dash cover lower to headlight mount bracket. Tool: T25. Torque: 3.5 lb·ft (5 Nm).
39. Steer motorcycle to full lock right.
40. Remove dash cover lower.

    CAUTION: **The dash cover lower is a tight fit to the key switch and upper triple. Be careful not to damage panel surfaces that will make contact with adjacent surfaces when flexing panel during the removal process.**



41. Release clip securing dash harnesses to the left side of headlight mount bracket.



42. Release cable tie retainer securing dash and turn signal harnesses to the right side of headlight mount bracket. Tool: Non-marking forked trim removal tool.



43. Cut cable tie tensioning front and rear cable ties on headlight mount bracket.



44. Cut cable tie securing stacked dash harness connectors (black connectors and gray connectors) to the headlight mount bracket.



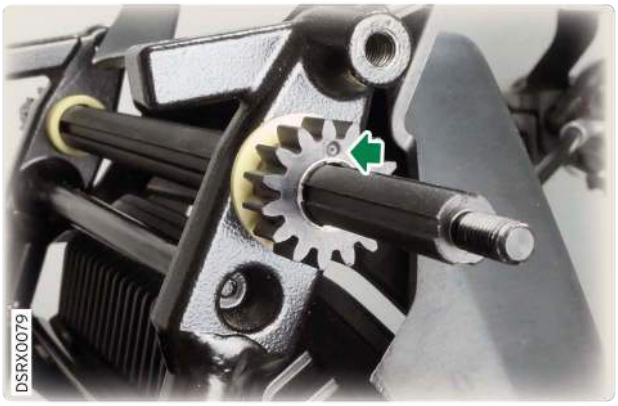
45. Cut cable tie securing harnesses to headlight mount bracket.

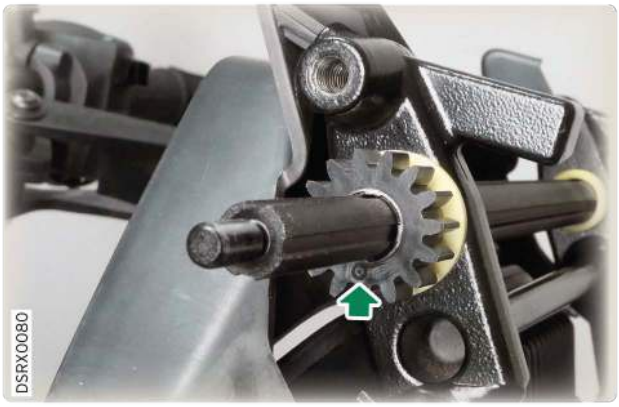


46. Remove bolts (x2) securing headlight mount bracket to head tube. Tool: 8 mm socket. Torque: 10.5 lb·ft (14 Nm).
47. Remove headlight mount bracket.

Installation

1. Install 12 volt Accessory connectors in the same location you removed them from. The black wire connects to the negative terminal. The blue wire connects to the positive terminal.





2. Install windscreen adjuster drive gears 180 degrees out (via the casting dimple).



3. When installing the windscreen carrier arm to the windscreen carrier wing center, confirm that the gap between the windscreen carrier arm and the windscreen adjuster shaft are equal.



4. Thoroughly clean ball nose spring plunger threads of dirt, grease, and oil. Apply lipstick blue Loctite® (Loctite 248) to the threads, starting on the 2nd thread from the hex end of the spring plunger.



5. With windscreen carrier assembly in fully upward position, thread ball nose spring plunger into headlight mount bracket just far enough to keep the assembly from falling from gravity. Tool: 6 mm hex.

CAUTION: **Turning the threaded ball nose spring plunger in too far can damage the unit and scratch the paint on the carrier assembly.**



6. Slide windscreen slider bolt bushings (x2) to the top of the windscreen carrier arms.



7. Temporarily slide one windscreen adjuster knob onto windscreen adjuster shaft.



8. Turn windscreen adjuster knob to operate the windscreen carrier assembly up and down through the detents.

   Note: Articulation of windscreen carrier assembly should be smooth.

9. Remove windscreen adjuster knob.



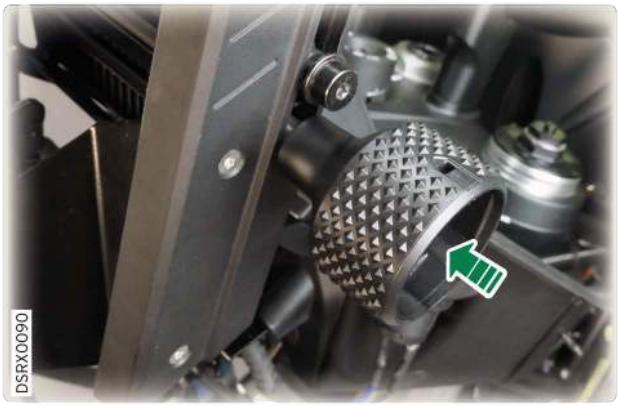
10. Slide windscreen slider bolt bushings (x2) down to align with the bolt holes in the headlight mount bracket.



11. Install left windscreen slider bolt upper. Tool: T25. Torque: 6 lb·ft (8 Nm).



12. Install right windscreen slider bolt upper. Tool: T25. Torque: 6 lb·ft (8 Nm).



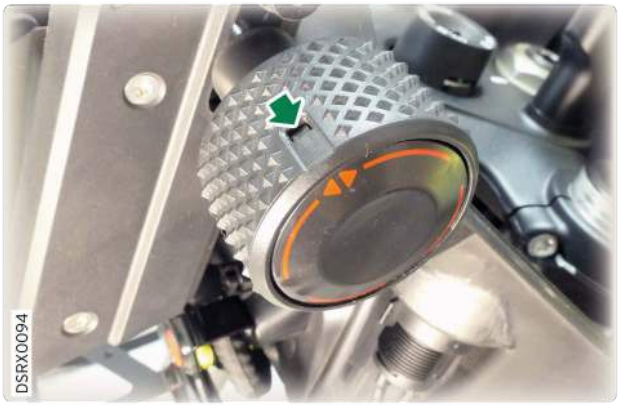
13. Slide left windscreen adjuster knob onto windscreen adjuster shaft with cap tab hole facing upward.



16. Install right windscreen adjuster knob washer and nut. Tool: Deep 8 mm socket. Torque: 2 lb·ft (3 Nm).



14. Slide right windscreen adjuster knob onto windscreen adjuster shaft with cap tab hole facing upward.



17. Install left windscreen adjuster knob cap.

    Note: Confirm locking tab completely engaged with the service access hole.



15. Install left windscreen adjuster knob washer and nut. Tool: Deep 8 mm socket. Torque: 2 lb·ft (3 Nm).



18. Install right windscreen adjuster knob cap.

    Note: Confirm locking tab completely engaged with the service access hole.

Fairing Headlight Upper

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

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*



3. Remove bolts (x2) securing fairing side outer left to fairing side inner left. Tool: T25. Torque: 4 lb·ft (5 Nm).



4. Remove bolt securing fairing headlight upper to fairing side inner left. Tool: T25. Torque: 4.6 lb-ft (6 Nm).



5. Remove bolts (x2) securing fairing side outer right to fairing side inner right. Tool: T25. Torque: 4 lb-ft (5 Nm).



6. Remove bolt securing fairing headlight upper to fairing side inner right. Tool: T25. Torque: 4.6 lb-ft (6 Nm).



7. Remove bolts (x2) securing dash cover lower to fairing headlight upper. Tool: T25. Torque: hand tight.



8. Remove bolt securing center of dash cover upper to fairing headlight upper. Tool: T25. Torque: 3.6 lb·ft (5 Nm).



9. Lift left and right rear of fairing headlight upper to release rear mounting tabs.



10. Slide fairing headlight upper toward front to release from headlight and gain access to turn signal wiring harnesses.

    Note: Protect surfaces to prevent damage.



11. Cut cable tie securing front turn signal harness connectors.

    Note: Replace cable ties upon installation.



12. Disconnect left front turn signal harness connectors (x2).



13. Disconnect right front turn signal harness connectors (x2).
14. Remove fairing headlight upper panel.

Installation

1. Installation is the reverse of the removal procedure.

Fairing Headlight Lower

Tools Required (includes tools required for parent jobs):

- T25

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*



3. Remove bolts (x2) securing front of fairing side inner left to fairing headlight lower. Tool: T25. Torque: 4.6 lb·ft (6 Nm).



4. Remove bolts (x2) securing front of fairing side inner right to fairing headlight lower. Tool: T25. Torque: 4.6 lb·ft (6 Nm).
5. Steer front wheel to full lock left to gain access to bolts.



6. Remove bolts (x2) securing fairing headlight lower to horn cover. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



7. Push left rear of fairing headlight lower up toward headlight and pull the right rear down and remove fairing headlight lower.

Installation

1. Installation is the reverse of the removal procedure.

Fairing Side Inner Left

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):

- T20
- T25
- T30
- 2 mm hex
- 3/16” standard screwdriver
- 10 mm socket and ratchet
- Non-marking trim removal tool

New Fasteners Required:

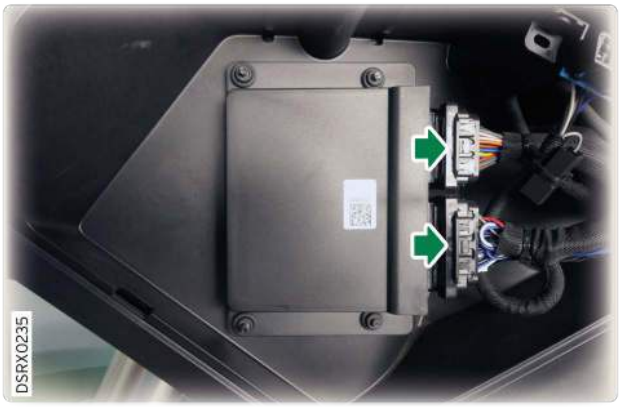
- Bungee cord
- Cable ties (x3)

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*



3. Remove bolts (x2) securing fairing side outer left to fairing side inner left. Tool: T25. Torque: 4 lb·ft (5 Nm).



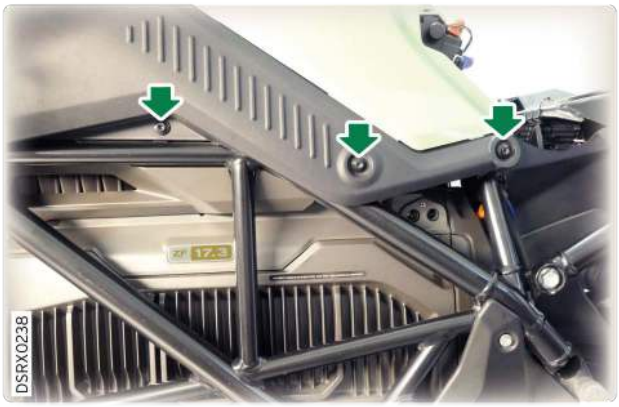
4. Disconnect MBB harness connectors (x2).



5. Using a trim removal tool, release plastic fasteners (x2) securing OBD diagnostic connector to fairing side inner left. Tool: Trim removal tool.



6. Remove bolts (x2) securing front of fairing side inner left to fairing headlight lower. Tool: T25. Torque: 4.6 lb·ft (6 Nm).



7. Remove bolts (x3) securing rear of fairing side inner left to tank assembly. Tool: T25. Torque: left and center bolts - 4.6 lb·ft (6 Nm). Torque: right bolt - 3.5 lb·ft (5 Nm).

   Note: The center bolt shown is a longer shouldered bolt.



8. While supporting the fairing side inner left, remove bolts (x4) securing panel to tank assembly. Tool: T25. Torque: 4.6 lb·ft (6 Nm).



9. Support fairing side inner left from handlebar without creating tension on CCM harness.



10. Cut cable ties (x2) securing CCM to fairing side inner left.

    Note: Replace cable ties upon installation.



11. Cut cable tie securing antenna to cable tie anchor on fairing side inner left panel.

    Note: Replace cable ties upon installation.

12. Remove fairing side inner left panel.

Installation

1. Installation is the reverse of the removal procedure.

Fairing Side Inner Right

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
- T30
- 2 mm hex
- 3/16” standard screwdriver
- 10 mm socket and ratchet

New Fasteners Required:

- Tape
- Cable tie

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove headlight upper panel. See *Fairing Headlight Upper, page 60.12*.



4. Remove bolts (x2) securing fairing side outer right to fairing side inner right. Tool: T25. Torque: 4 lb·ft (5 Nm).

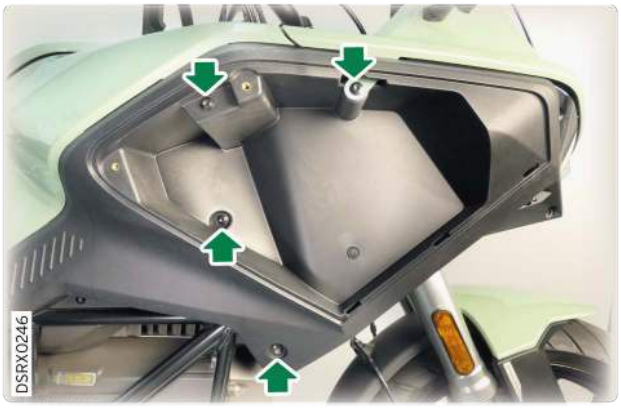


5. Remove bolts (x2) securing front of fairing side inner right to fairing headlight lower. Tool: T25. Torque: 4.6 lb·ft (6 Nm).



6. Remove bolts (x2) securing rear of fairing side inner right to tank assembly. Tool: T25. Torque: Torque: 4.6 lb·ft (6 Nm).

   Note: The left bolt shown is a longer shouldered bolt.



7. While supporting the fairing side inner right, remove bolts (x4) securing panel to tank assembly. Tool: T25. Torque: 4.6 lb·ft (6 Nm).
8. Remove fairing side inner right panel.

Installation

1. Installation is the reverse of the removal procedure.

Skid Pan

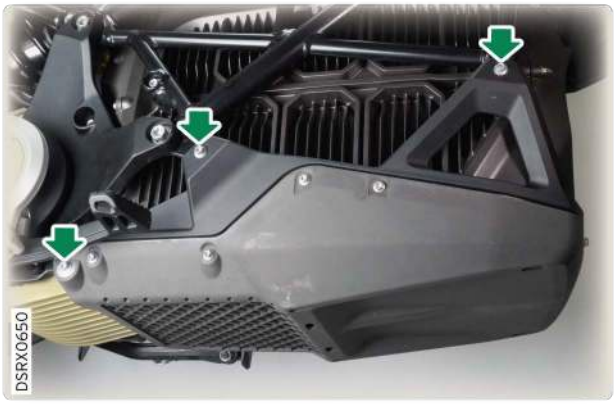
Tools Required (includes tools required for parent jobs):

- T30

Removal



1. Remove bolts (x3) securing left side of skid pan to the motorcycle. Tool: T30. Torque: 8 lb·ft (11 Nm).



2. Support skid pan and remove bolts (x3) securing right side of skid pan. Tool: T30. Torque: 8 lb·ft (11 Nm).
3. Remove skid pan.

   Note: Clearance between kickstand assembly and skid pan is tight. Lower front of skid pan first, for ease of removal.

Installation

1. Installation is the reverse of the removal procedure.

Front Fender

Tools Required (includes tools required for parent jobs):

- T25
- T50
- 6 mm hex
- 17 mm hex
- Heavy duty scissor jack

New Fasteners Required:

- Tape

Removal

1. Remove front wheel. See *Front Wheel, page 50.1.*



2. Remove tape holding front fender to front suspension and remove fender.

Installation

1. Installation is the reverse of the removal procedure.

Rear Fender

Tools Required (includes tools required for parent jobs):

- T25

Removal



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



2. The forward bolt secures the rear shock ground wire eyelet and star washer underneath it.



3. Remove bolt securing the right side of the rear fender to the rear swingarm. Tool: T25. Torque: 3.5 lb·ft (5 Nm).
4. Remove the rear fender.

Installation

1. Installation is the reverse of the removal procedure.

Tank Bucket

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):

- T20
- T25
- T30
- 2 mm hex
- 3 mm hex
- 3/16” standard screwdriver
- 10 mm socket and ratchet

New Fasteners Required:

- Cable tie

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove tank assembly. See *Tank Assembly, page 60.22.*



4. Remove bolts (x2) securing USB power hub to tank bucket. Tool: T20. Torque: hand tight.



5. Remove bolts (x2) securing storage liner to storage liner plate. Tool: 3 mm hex or T30. Torque: 2.5 lb·ft (3 Nm).
6. Remove tank bucket.

Installation

1. Installation is the reverse of the removal procedure.

Tank Assembly

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):

- T20
- T25
- T30
- 2 mm hex
- 3/16” standard screwdriver
- 10 mm socket and ratchet

New Fasteners Required:

- Cable tie
- Tape

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove fairing side inner left. See *Fairing Side Inner Left, page 60.15.*
4. Remove fairing side inner right. See *Fairing Side Inner Right, page 60.17.*
5. Remove fairing headlight upper. See *Fairing Headlight Upper, page 60.12.*



6. Remove push rivet retainer securing left side of dash cover lower to tank arm inner.



7. Remove push rivet retainer securing right side of dash cover lower to tank arm inner.



8. Remove bolts (x2) securing tank assembly to the tank support bracket. Tool: T25. Torque: 4.6 lb·ft (6 Nm).



9. Remove bolts (x2) securing tank inner arm to motorcycle frame. Tool: T25. Torque: 4.6 lb·ft (6 Nm).



10. Tape front areas of tank assembly to protect against damaging the painted surfaces.



11. Push charger port bracket rubber boot down to release it from the tank collar



12. Remove tank assembly.

    Note: The tank is a tight fit between the handlebar accessories and the charge port.

Installation

1. Installation is the reverse of the removal procedure.

Rider's Seat

Removal



1. Insert key into the lock and turn it clockwise to release the rider's seat.
2. Remove rider's seat.

Installation

1. Installation is the reverse of the removal procedure.

   WARNING: Confirm the rear of the seat is properly engaged on the mounts located forward of the tail tray.

Tail Seat Tray

NOTICE: Before carrying out the following procedure, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- #2 Phillips screwdriver

New Fasteners Required:

- Blue threadlocker

Removal



1. Remove screws (x4) securing tail seat tray to tail pod. Tool: Phillips #2. Torque: 0.6 lb·ft (0.8 Nm).



2. Remove bolts (x4) securing upper section of tail seat tray to tail frame and collect washers (x4). Tool: T30. Torque: 6 lb·ft (8 Nm). Threadlocker: Blue.



3. Remove bolts (x2) securing lower section of tail seat tray to tail frame. Tool: T25. Torque: 3.5 lb·ft (5 Nm).
4. Remove tail seat tray.

Installation

1. Installation is the reverse of the removal procedure.

Tail Frame

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
- T30
- T40
- T50
- 2 mm hex
- 3/16” standard screwdriver
- #2 Phillips screwdriver
- 10 mm socket and ratchet
- 22 mm 6 point socket
- 27 mm wrench
- Shop vacuum
- O-ring pick
- Side cutters

New Fasteners Required:

- Cable ties (x3)

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Remove 12 volt battery. See *12 Volt Battery - Removal, page 70.4.*
3. Remove motor controller. See *Motor Controller, page 30.24.*



4. Remove nuts (x2) securing tail light to tail frame and collect washers (x2). Tool: 10 mm socket. Torque: 5 lb·ft (7 Nm).
5. Remove tail light.



6. Remove bolts (x2) securing left grab handle to tail frame. Tool: T30 Torque: 7 lb·ft (9 Nm).

   Note: Keep track of the placement of bolts. Front bolts (x2) are different to the rear bolt.
7. Remove left grab handle.



8. Remove bolts (x2) securing left grab handle to tail frame.

   Note: Keep track of the placement of bolts. Front bolts (x2) are different to the rear bolt.

9. Remove right grab handle.



10. Remove bolts (x2) securing left foot peg to tail frame. Tool: T40. Torque: 26 lb·ft (35 Nm).
11. Remove left foot peg.



12. Remove bolts (x2) securing right foot peg to tail frame.
13. Remove right foot peg.



14. Cut cable tie securing tail frame harness to tail frame.



15. Loosen nut securing seat lock to tail frame. Tool: 27 mm wrench.



16. Pull seat lock out of tail frame far enough to rotate lock and release seat latch cable from clasp.



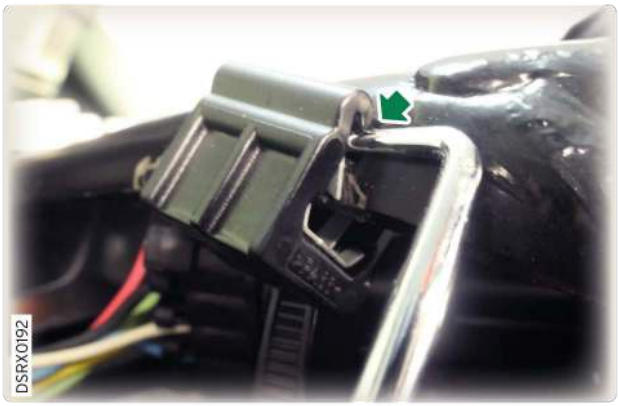
17. With seat latch cable removed from clasp, remove lock assembly from tail frame and collect nut.



18. Slide seat latch cable to the right to release cable from tail frame bracket.
19. Release seat latch cable from tail frame.



20. Remove bolts (x2) securing seat latch to tail frame. Tool: T30. Torque: 7 lb·ft (9 Nm).



21. Use O-ring pick tool to release harness clip from tail frame. Tool: O-ring pick.



22. Disconnect tail harness connector.
23. Remove tail harness.



24. Remove bolt securing phase lead closeout panel to tank assembly. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



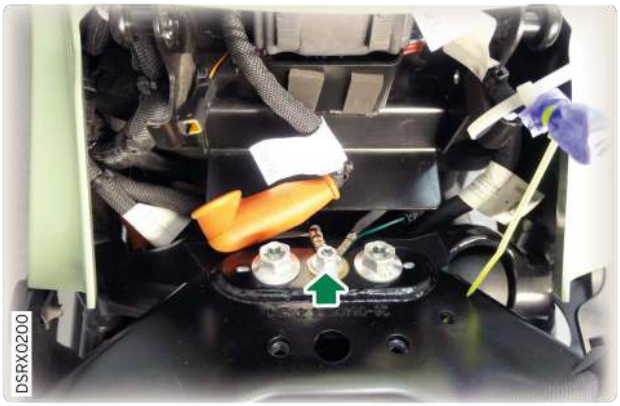
25. Remove bolts (x2) securing phase lead closeout panel to tail frame. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



26. Remove bolt securing phase lead closeout panel to tail frame and collect washer. Tool: T25. Torque: 4.5 lb·ft (6 Nm).



27. Remove bolt securing rear brake reservoir to motorcycle frame. Tool: T25. Torque: 4 lb·ft (5 Nm).



28. Remove bolt securing ground harness leads (x2) to tail frame. Tool: T30. Torque: 5 lb·ft (7 Nm).



29. Remove bolt securing left side of tail frame to the motorcycle frame. Tool: T50. Torque: 52 lb·ft (71 Nm).

    Note: Keep track of bolt length.



30. Remove bolt securing right side of tail frame to the motorcycle frame. Tool: T50. Torque: 52 lb·ft (71 Nm).

    Note: Keep track of bolt length.



31. Support tail frame and remove bolts (x2) securing tail frame to the motorcycle frame. Tool: T40. Torque: 20 lb·ft (27 Nm).

    Note: Keep track of bolt length.



32. Remove tail frame.

Installation

1. Installation is the reverse of the removal procedure.

High Voltage Fuses

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

Tools Required (includes tools required for parent jobs):

- T30
- 3/16” standard screwdriver
- 2 mm hex wrench

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Maintenance Intervals, page 10.1.*



2. Remove screw securing fuse cover. Tool: 2 mm hex wrench. Torque: 2.5 lb·ft (3 Nm).



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

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

Tools Required (includes tools required for parent jobs):

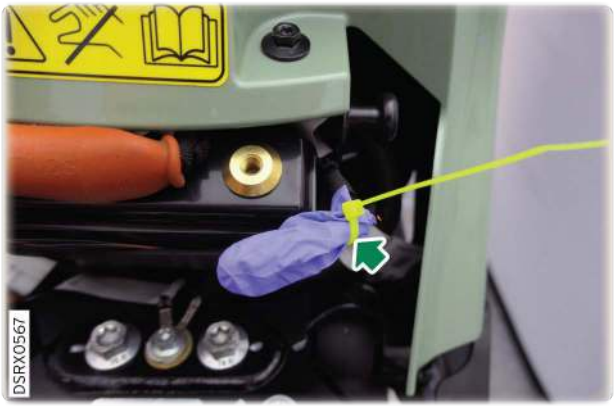
- T25
- T30
- 2 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet

Removal

1. **PERFORM LOCKOUT PROCEDURE:** See *Maintenance Intervals, page 10.1.*
2. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
3. Remove seat. See *Rider’s Seat, page 60.24.*



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 (shown in white) to secure negative battery cable to the battery bracket.

   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

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



3. Disconnect the battery heater harness connector.



4. Unhook the battery retaining strap and collect strap.



5. Move protective cover to expose the positive terminal bolt.



6. Remove bolt securing the positive battery terminal eyelet to the battery and collect washer. Tool: 10 mm socket. Torque: 4 lb·ft (5 Nm).
7. Remove 12 volt battery.

Installation

1. Installation is the reverse of the removal procedure.

Headlight

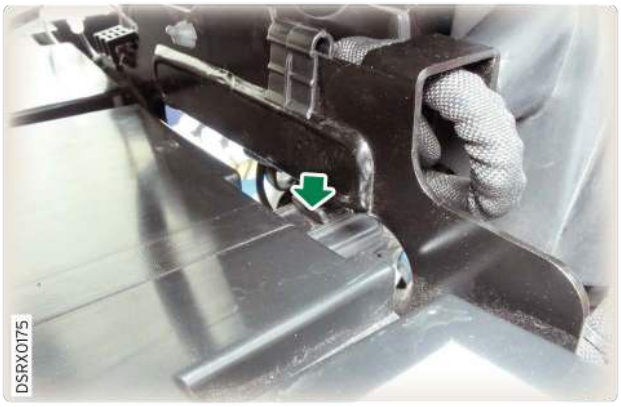
NOTICE: Before performing any work on the electrical system, remove the key from the key switch.

Tools Required (includes tools required for parent jobs):

- T25
- T30
- 2 mm hex wrench
- 3/16” standard screwdriver
- 10 mm socket and ratchet
- 8 mm socket

Removal

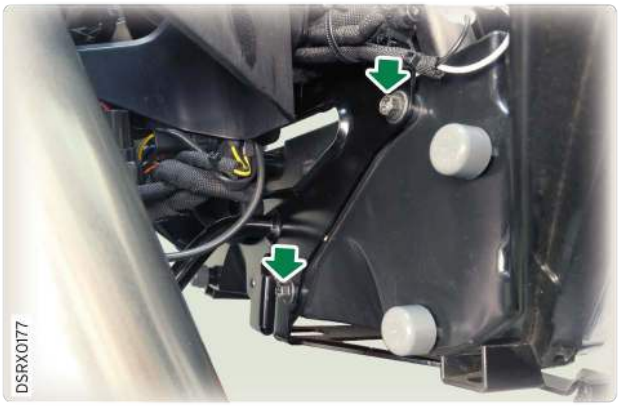
1. Remove fairing side inner left. See *Fairing Side Inner Left, page 60.15.*
2. Remove fairing side inner right. See *Fairing Side Inner Right, page 60.17.*
3. Remove fairing headlight upper panel. See *Fairing Headlight Upper, page 60.12.*



4. Disconnect headlight harness connector from headlight.



5. Remove bolts (x2) securing headlight to left side of headlight mount bracket. Tool: 8 mm socket or T30. Torque: 3.7 lb·ft (5 Nm).



6. Remove bolts (x2) securing headlight to right side of headlight mount bracket. Tool: 8 mm socket or T30. Torque: 3.7 lb·ft (5 Nm).
7. Remove headlight.

Installation

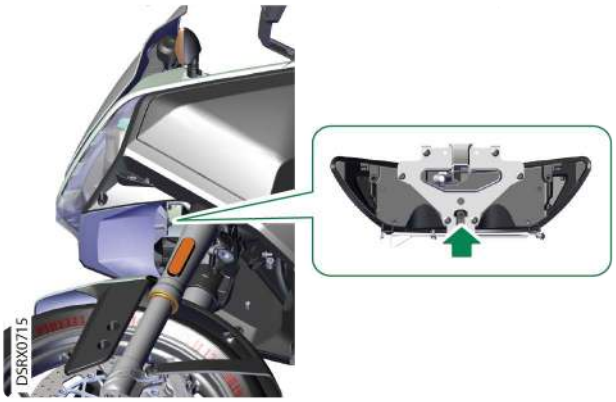
1. Installation is the reverse of the removal procedure.

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 on the left side.
5. To adjust the headlight, turn the screw until the correct beam alignment is achieved.

Tail Light

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 mm hex
- #2 Phillips screwdriver
- 10 mm socket and ratchet

Removal

1. Remove tail seat tray. See *Tail Seat Tray, page 60.25.*



2. Remove bolts (x3) securing license plate bracket to tail pod. Tool: 3 mm hex or T25. Torque: 2 lb·ft (3 Nm).

   Note: Remove bolts in the following sequence: center, left, then right.

3. Remove license plate bracket.



4. Remove bolts (x3) securing tail pod to motorcycle. Tool: T25. Torque: 3.5 lb·ft (5 Nm).
5. Remove tail pod.



6. Disconnect tail light harness connector from tail light.



7. Remove nuts (x2) securing tail light to tail frame and collect washers (x2). Tool: 10 mm socket. Torque: 5 lb·ft (7 Nm).
8. Remove tail light.

Installation

1. Installation is the reverse of the removal procedure.

Turn Signal - Front

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
- T30
- 2 mm hex
- 3/16” standard screwdriver
- 10 mm socket and ratchet
- 17 mm wrench

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove headlight upper panel. See *Fairing Headlight Upper, page 60.12.*



4. Remove nut securing turn signal to fairing and collect washer. Tool: 17 mm wrench. Torque: 3.5 lb·ft (5 Nm).
5. Remove turn signal from headlight upper panel.

Installation

1. Installation is the reverse of the removal procedure.

Turn Signal - Rear

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 mm hex
- #2 Phillips screwdriver
- 17 mm wrench

Removal

1. Remove tail seat tray. See *Tail Seat Tray, page 60.25.*



2. Remove bolts (x3) securing license plate bracket to tail pod. Tool: 3 mm hex or T25. Torque: 2 lb·ft (3 Nm).

   Note: Remove bolts in the following sequence: center, left, then right.

3. Remove license plate bracket.



4. Remove bolts (x3) securing tail pod to motorcycle. Tool: T25. Torque: 3.5 lb·ft (5 Nm).
5. Remove tail pod.



6. Cut cable tie retaining left turn signal harness to tail fender accessory harnesses

   Note: Replace cable tie during the installation process.



7. Disconnect rear turn signal harness connectors (x2).



8. Release license plate light harness from retaining tabs on the left side of tail trunk pan.



9. Release turn signal harness from retaining tabs on the left side of tail trunk pan



10. Remove nut securing turn signal to tail trunk pan and collect washer. Tool: 17 mm wrench. Torque: 3.5 lb·ft (5 Nm).
11. Remove turn signal from tail trunk pan.

Installation

1. Installation is the reverse of the removal procedure.

License Plate Light

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 mm hex
- #2 Phillips screwdriver

New Fasteners Required:

- Cable ties (x2)
- Blue threadlocker

Removal

1. Remove tail seat tray. See *Tail Seat Tray, page 60.25.*



2. Remove bolts (x3) securing license plate bracket to tail pod. Tool: 3 mm hex or T25. Torque: 2 lb·ft (3 Nm).

   Note: Remove bolts in the following sequence: center, left, then right.
3. Remove license plate bracket.



4. Remove bolts (x3) securing tail pod to motorcycle. Tool: T25. Torque: 3.5 lb·ft (5 Nm).
5. Remove tail pod.



6. Disconnect license plate light harness connector.



7. Cut cable ties (x2) to release license plate light harness and rear turn signal harness connectors.



8. Remove license plate harness from retaining tabs on left side of tail trunk pan.



9. Remove bolts (x2) securing license plate light to tail trunk pan. Tool: 3 mm hex. Torque: 2 lb·ft (3 Nm).
10. Remove license plate light.

Installation

1. Installation is the reverse of the removal procedure.

Dash

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
- 3/16” standard screwdriver
- 10 mm socket and ratchet
- 7 mm socket
- Wobble extension

Removal

1. Remove fairing headlight upper. See *Fairing Headlight Upper, page 60.12.*



2. Disconnect dash harness connector from dash.



3. Remove bolts (x4) securing dash to headlight mount bracket. Tool: 7 mm socket or T25 and wobble extension. Torque: 4.4 lb·ft (6 Nm).

   Note: This view shows bolts with fairing headlight upper removed.



Note: This view shows socket extension with fairing headlight upper installed.

4. Remove dash.

Installation

1. Installation is the reverse of the removal procedure.

Key Switch

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
- T30
- T45
- 2 mm hex
- 3/16” standard screwdriver
- 10 mm socket and ratchet
- 7 mm socket
- 41 mm socket
- Wobble extension
- Heavy duty scissor jack
- Stud extractor

New Fasteners Required:

- Rags/cloth
- Breakaway bolts

Removal

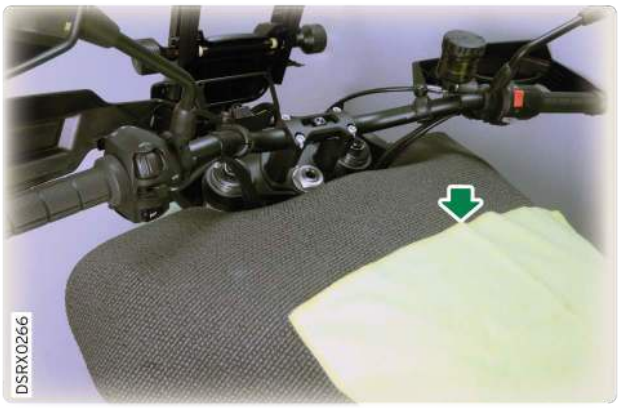
1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove dash cover lower. See *Dash Cover Lower, page 60.1.*



4. Place heavy duty scissor jack under the front of the power pack. Tool: Heavy duty scissor jack.
5. Using the scissor jack, raise front of the motorcycle until the front tire is slightly off the ground.



6. Disconnect key switch harness connector.



7. Place thick protective material on top of tank surfaces.



8. Confirm alignment of handlebar by viewing the alignment marks printed on handlebar. Vertical lines should be centered between clamps. Horizontal lines should be in line with parting line in handlebar clamp.



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

   Note: Carefully lower handlebar assembly on material protecting tank assembly.



10. Remove handlebar clamp.

   Note: Take care not to damage surfaces while moving handlebar assembly to gain clearance to work on upper triple clamp.



11. Remove bolt capturing harness ground wire to upper triple clamp. Collect star washer located between ground cable eyelet and triple clamp. Tool: T30. Torque: 7.8 lb·ft (11 Nm).



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



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



14. Remove stem nut. Tool: 41 mm socket. Torque: 75 lb·ft (102 Nm).
15. Remove upper triple clamp.



16. Remove bolts (x2) securing key switch to upper triple clamp. Tool: Stud extractor. Torque: Breakaway bolts will shear at correct torque.

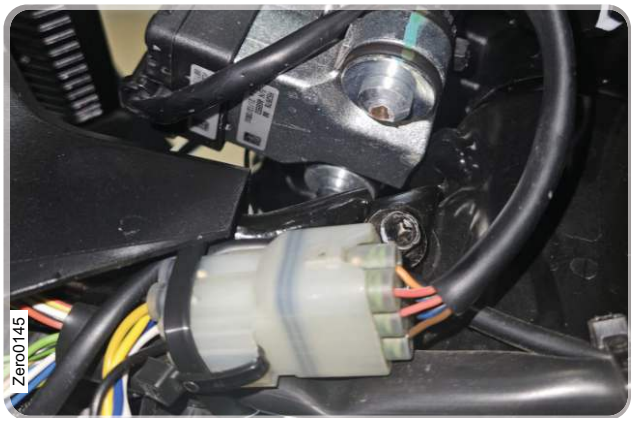
    Note: Use stud extractor.

    Note: Replace breakaway bolts on installation.
17. Remove key switch.

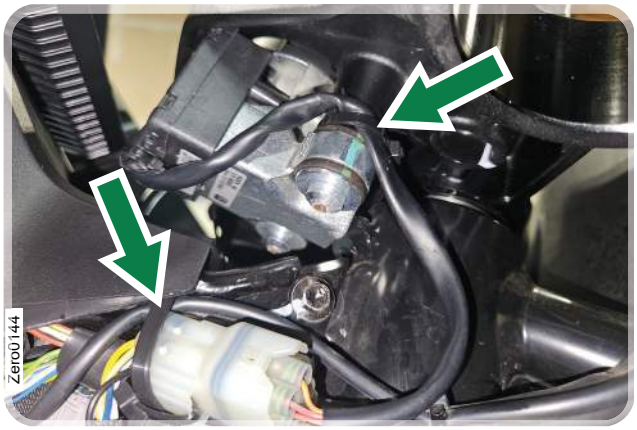
Installation

1. Installation is the reverse of the removal procedure.

   Note: New breakaway bolts are required to fit the key switch to the upper triple clamp.



2. During installation, route the key switch harness to the outside of the motor stop switch harness to eliminate contact with the head tube.



3. Secure the connector in place with a cable tie.
4. Secure the key switch harness to the upper triple clamp while ensuring that all slack is out of the harness before fully tightening the cable tie.

Mode Switch (with heated grips)

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
- T30
- 2 mm hex
- 3/16” standard screwdriver
- #2 Phillips screwdriver
- 10 mm socket and ratchet
- 7 mm socket
- Wobble extension
- Side cutters
- Stud extractor

New Fasteners Required:

- Cable ties (x9)
- Low profile Cobra cable tie

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove dash cover lower. See *Dash Cover Lower, page 60.1.*



4. Cut cable tie securing heated grip harness to bottom of mode switch.

   Note: Replace cable tie during the installation process.



5. Cut low profile cobra cable tie securing heated grip and mode switch harnesses to handlebar.

   Note: Replace cable tie during the installation process.



6. Cut cable ties (x2) securing heated grip harness to mode switch harness.

Note: Replace cable ties (x2) during the installation process.



7. Cut cable tie securing heated grip harness to mode switch harness.

   Note: Replace cable tie during the installation process.



8. Cut cable tie in horizontal position between vertical cable ties (x2).

   Note: Replace cable tie during the installation process.



9. Cut cable tie looped through headlight mount bracket securing connectors (M1 and M2).

   Note: Replace cable tie during the installation process.



10. Cut cable tie looped over headlight mount bracket securing mode switch harnesses.

    Note: Replace cable tie during the installation process.



11. Disconnect gray mode switch harness connector (M1).



12. Cut cable tie looped through mode switch harness connector (M2).

    Note: Replace cable tie during the installation process.

    Note: The already-cut cable tie is the cable tie that was looped over the headlight mount bracket (two steps prior to this one).



13. Remove cut cable tie looped through mode switch harness connector (M2).



14. Disconnect black mode switch harness connector (M2).



15. Cut cable tie securing heated grip harness connectors to dash harness.

    Note: Replace cable tie during the installation process.

16. Disconnect right heated grip harness connector.

    Note: Label/mark connector when disconnecting both connectors.



17. Remove bolts (x2) securing mode switch's bottom to the top. Tool: #2 Phillips screwdriver.



18. 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.

Kickstand Switch

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

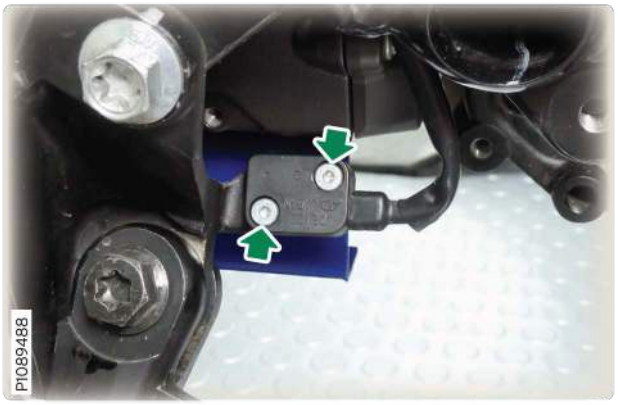
Tools Required (includes tools required for parent jobs):

- 2.5 mm hex socket
- 10 mm socket
- T25
- Side cutters

New Fasteners Required:

- Cable tie

Removal



1. Remove bolts (x2) securing the kickstand switch to the kickstand. Tool: 2.5 mm hex socket. Torque: 2 lb·ft (3 Nm).



2. Remove bolts (x3) securing the left foot peg bracket to the left doubler plate. Tool: 10 mm socket. Torque: 20 lb·ft (27 Nm).



3. Remove bolts (x2) securing the heel guard to the frame. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



4. Cut cable tie securing the rear wheel speed sensor harness to kickstand harness.

   NOTE: Replace cable tie during installation process.



5. Disconnect kickstand switch harness connector.
6. Remove kickstand switch.

Installation

1. Installation is the reverse of the removal procedure.

Heated Grip (Left)

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
- T30
- T45
- 2 mm hex
- 3/16” standard screwdriver
- #2 Phillips screwdriver
- 10 mm socket and ratchet
- 7 mm socket
- Wobble extension
- 10 mm wrench
- Side cutters

New Fasteners Required:

- Cable ties (x6)
- Tape
- Low profile Cobra cable tie
- Blue threadlocker

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*
3. Remove dash cover lower. See *Dash Cover Lower, page 60.1.*



4. Release outer end of handguard from handlebar.



5. Place tape on handlebar to mark the installed location.



6. Remove nut and bolt securing handguard from handlebar and collect washer, spacers (x2), and clamp halves (x2). Tools: T30 & 10 mm wrench. Torque: 5 lb·ft (7 Nm). Threadlocker: Blue.

NOTE: Protect surrounding surfaces and take care not to drop the clamp halves during removal process.



7. Remove handguard mounting gasket from handlebar.



8. Cut cable tie securing heated grip harness to bottom of mode switch.

   Note: Replace cable tie during the installation process.



9. Cut low profile cobra cable tie securing heated grip and mode switch harnesses to handlebar.

   Note: Replace cable tie during the installation process.



10. Cut cable tie securing heated grip harness to mode switch harness, near upper triple clamp.

    Note: Replace cable tie during the installation process.



11. Cut cable ties (x2) securing heated grip harness to mode switch harness.

    Note: Replace cable ties (x2) during the installation process.



12. Cut cable tie securing heated grip harness to mode switch harness, near key switch harness connectors.

    Note: Replace cable tie during the installation process.



13. Disconnect left heated grip harness connector.



14. Cut cable tie securing heated grip harnesses to dash harness.

    Note: Replace cable tie during the installation process.



15. Remove bolt securing handguard retainer from end of handlebar and collect retainer. Tool: T45. Torque: 12 lb·ft (16 Nm).



16. Expose and remove bolt securing the left heated grip to the handlebar. Tool: #2 Phillips screwdriver. Torque: 2.5 lb·ft (3 Nm).



17. Expose and remove bolt securing the left heated grip to the handlebar. Tool: #2 Phillips screwdriver. Torque: 21 lb·ft (28 Nm).
18. Remove left heated grip from handlebar.

Installation

1. Installation is the reverse of the removal procedure.

Cellular Connectivity Module (CCM)

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
- T30
- 2 mm hex
- 3/16” standard screwdriver
- 10 mm socket and ratchet
- Non-marking trim removal tool
- Side cutters

New Fasteners Required:

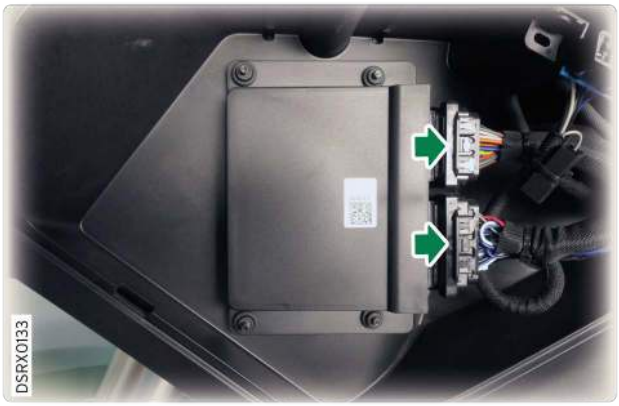
- Cable ties (x2)
- Bungee cord

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*



3. Remove bolts (x2) securing fairing side outer left to fairing side inner left. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



4. Disconnect MBB harness connectors (x2).



5. Using a trim removal tool, release plastic fasteners (x2) securing OBD diagnostic connector to fairing side inner left. Tool: Trim removal tool.



6. Remove bolts (x2) securing front of fairing side inner left to fairing headlight lower. Tool: T25. Torque: 4.6 lb·ft (6 Nm).



7. Remove bolts (x3) securing rear of fairing side inner left to tank assembly. Tool: T25. Torque: left and center bolts - 4.6 lb·ft (6 Nm). Torque: right bolt - 3.5 lb·ft (5 Nm).



8. While supporting the fairing side inner left, remove bolts (x3) securing center the panel to tank assembly. Tool: T25. Torque: 4.6 lb·ft (6 Nm).



9. Support fairing side inner left from handlebar without creating tension on CCM harness.



10. Cut cable ties (x2) securing CCM to fairing side inner left.

    Note: Replace cable ties upon installation.



11. Roll the CCM rubber cap down and remove it.



12. Roll the CCM rubber harness cover upward to reveal the harness connector.



13. Turn the CCM over and release the harness connector by pushing the locking tab.
14. 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 (mostly covered by the decal) 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.



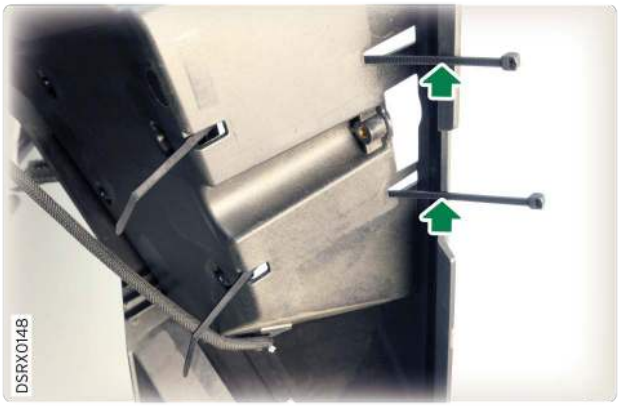
4. Push the CCM rubber end cap on the end of the CCM as far as it will go.



5. The CCM rubber end cap has the text "THIS SIDE UP" molded on it. Confirm that the text on the end cap is also facing the same direction as the "THIS SIDE UP" on the rubber harness cover.



6. Confirm that both grooves in the CCM end cap are interlocked with both the ribs on the harness boot cover.



7. Install new cable ties (x2) through the fairing side inner left panel.



8. Install CCM back on the fairing side inner left panel with the text “THIS SIDE UP” text facing upward.

Main Bike Board (MBB)

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):

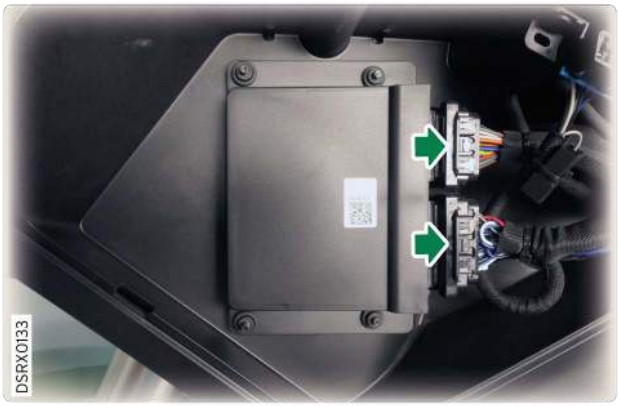
- T25
- T30
- 2 mm hex
- 4 mm hex
- 3/16” standard screwdriver
- 10 mm socket and ratchet

Removal

1. Remove high voltage DCDC and CONT fuses. See *High Voltage Fuses, page 70.1.*
2. Disconnect 12 volt negative battery terminal eyelet. See *12 Volt Battery - Disconnect, page 70.3.*



3. Remove bolts (x2) securing fairing side outer left to fairing side inner left. Tool: T25. Torque: 3.5 lb·ft (5 Nm).



4. Disconnect MBB harness connectors (x2).
5. Steer front wheel to full lock right to gain access to MBB fasteners.



6. Remove bolts (x4) securing MBB to fairing side inner left and collect washers (x4). Tool: 4 mm hex. Torque: hand tight.

   CAUTION: **Replace vibration-resistance rubber isolator nuts if they are damaged or worn.**

7. Remove MBB.

Installation

1. Installation is the reverse of the removal procedure.

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