

VECTRIX VX-2 SERVICE MANUAL



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SECTION A-1: TOOLS NEEDED

For repairing and testing of the VX-2 scooter the following tools are needed:

Tools:

Description	Specification	Using for
Open wrench	5.5mm	Converter
Open wrench/Turned Full-contact (#S02445)	8mm	Speedometer; Cover; Side stand; Horn
Open wrench	10mm	Rear light; Front fender
Open wrench	12mm	Rear shock, top; Main stand; Front brake
Open wrench	13mm	Rear shock; Main stand; Front shock
Open wrench	14mm	Front axle; Battery
Open wrench	16mm	Front shock
Open wrench	17mm	Side stand; Front axle; Battery
Open wrench	18mm	Rear fork
Open wrench	19mm	Rear fork
Open wrench	32mm	Steering nut, top
Open wrench	45mm	Steering nut, bottom
Special tool		Motor nut
Torque wrench	0-20Nm	
Torque wrench	10-100Nm	
Spanner socket	12mm	
Spanner socket	13mm	
Spanner socket	14mm	
Spanner socket	17mm	
Allen key	2.5mm	Accelerator
Allen key	4mm	Plastic rear cover; Brake hose clamp; Motor
Allen key	5mm	Balance weight; Controller
Allen key	6mm	Front brake disc, Rear brake
Phillips screwdriver	#1	Cover
Phillips screwdriver	#2	Cover
Phillips screwdriver	#3	Cover
Screwdriver, flat	4.5mm	Front top cover
Security TORX Screwdriver	TX10	Cover for electronic box

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SECTION B-1: FRONT FAIRING

For safety put a plastic or other soft material onto the fender



Unscrew the 6 Phillips screws 1 to 8 in order as seen on the picture with a Phillips screwdriver PH2

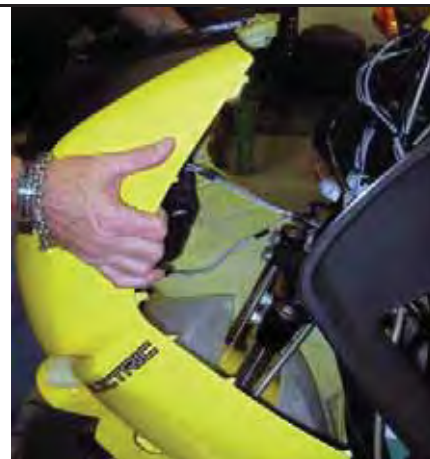
Remark:

While loosening screws 7 and 8 hold the front cover otherwise it drops down and could break!



Remark:

While loosening screws 7 and 8 hold the front cover otherwise it drops down and could break!



Assemble all parts in the other direction

Remark:

For assembling the cover please take care of the noses being in the right position and no edge is standing out. Put in the screws slightly and if all screws and the cover are in the correct positions tighten them.

See also the last picture on the next Section for the right position of the clamp screw.

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Front Fairing Complete Removal

Preparations:

Disassemble Under Board

see Section B-10

Disassemble Front Fender

see Section B-8

Disassemble Front Wheel

see Section B-14

Hold the front cover and loosen all the connectors of the lamps



Assemble all parts in the other direction

Remark: For assembling the cover please take care of the noses being in the right position and no edge is standing out. Put in the screws slightly and if all screws and the cover are in the correct positions tighten them.

Please be sure the clamp nuts are on the right position



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SECTION B-2: FRONT CONSOLE COVER

Preparations:

Disassemble the Front Fairing

see Section B-1

Unscrew the two Phillips screws (left and right position) with a Phillips screwdriver PH2



Slide in a flat screwdriver into the position as seen on the picture. Hold the front cover by hand. Carefully turn the screwdriver counter-clockwise [ccw] (left side) and clockwise [cw] (right side) until the front cover snaps out.



Assemble all parts in the other direction

Remark: For assembling the top cover, please take care the noses are in the right position and no edge is standing out.

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SECTION B-3: SPEEDOMETER COVER

Preparations:

Disassemble Front Fairing

see Section B-1

Disassemble Front Console Cover

see Section B-2

Open the connector from Speedometer



Unscrew the Phillips screw with Phillips screwdriver PH2



Unscrew the Phillips screw with Phillips screwdriver PH2

Remove the plastic part including Speedometer



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SECTION B-4: FRONT VERTICAL PANEL COVER-LOWER

Unscrew the two Phillips screws (up and down position) with a Phillips screwdriver PH2



Unscrew the two Phillips screws (right and left position) with a Phillips screwdriver PH2



Slide a Phillips screwdriver PH2 into the hole and pull out carefully the cover to the left. The fingers holding the cover and pull backwards



Carefully push back the cover more and more



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Now remove the cover backwards



The four Phillips screws are M6x16mm



Assemble all parts in the other direction

Remark: For assembling the cover please take care of the noses being in the right position and no edge is standing out. Put in the screws slightly and if all screws and the cover are in the correct positions tighten them.

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SECTION B-5: FRONT VERTICAL PANEL COVER-UPPER

Preparations:

Disassemble Front Fairing

see Section B-1

Carefully move the cover of Key Switch out



Remove the cover of Key Switch



Side view of the inner backside cover



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Unscrew the two Phillips screws (left and right position)
with a Phillips screwdriver PH2

Remove the cover



Assemble all parts in the other direction

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SECTION B-6: CENTER STEP-THROUGH COVER

Preparations:

Disassemble Seat

see Section B-8

Unscrew the two Phillips screws (left and right position) with a Phillips screwdriver PH2



Slightly press out left and right side of the cover so that they can pass the metal holder



Carefully move the cover forward until the cover can easily be taken out



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Side view of the inner backside cover



The two Phillips screws are M6 x 16mm



Assemble all parts in the other direction

Remark: For assembling the cover please take care of the noses being in the right position and no edge is standing out. Put in the screws slightly and if all screws and the cover are in the correct positions tighten them.

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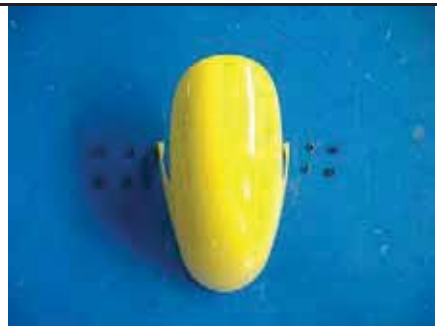
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SECTION B-7: FRONT FENDER

Unscrew the four Phillips screws (left and right side) with a Phillips screwdriver PH2



To unscrew the Phillips screw hold the inner nut with 8mm open wrench.



Assemble all parts in the other direction

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SECTION B-8: SEAT

Unscrew the Phillips screw with a Phillips screwdriver PH2

Hold the seat during unscrewing the second Phillips screw

Remove the seat



The two Phillips screws are M6 x 16mm



Assemble all parts in the other direction

Test if the seat lock works smoothly

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SECTION B-9: UNDER BOARD

Unscrew the two Phillips screws (left and right position) with a Phillips screwdriver PH2

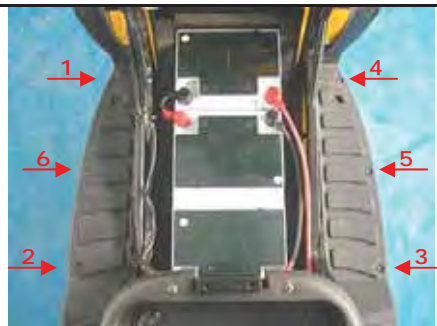


Unscrew the screw (Front position) with a 8mm wrench



Unscrew the 6 Phillips screws in order as seen on the picture with a Phillips screwdriver PH2

While loosening screws 5 and 6 hold the Under board otherwise it drops down and could break!



Assemble all parts in the other direction

Remark:

When assembling the cover, please take care of the noses are in the right position and no edge is outstanding. First, just slightly screw in the screws and if all screws and the cover are in the correct position tighten the screws.

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SECTION B-10: REAR SIDE BODY PANELS + SIDE EMBLEM REPLACEMENT

Unscrew the four Phillips screws (top left and right position) with a Phillips screwdriver PH2



Unscrew the four Phillips screws (left and right position) with a Phillips screwdriver PH2



Carefully pull out left and right side until the cover can easily lift up

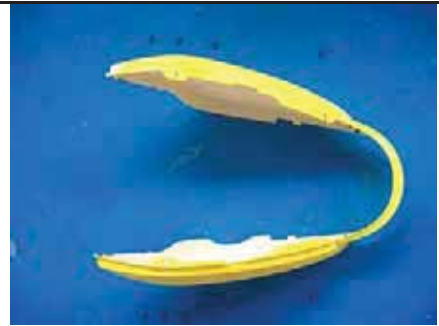
Remark: Be careful for the left side because there is the seat lock



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The four Phillips screws for the top are plate screw 3.5 x 12mm

The four Phillips screws for the side are plate screw 3.2 x 12mm (black)



Assemble all parts in the other direction

Put in the screws slightly and if all screws and the cover are in the correct positions tighten them.

Rear Side Panel Emblem/Nameplate Replacement

S-XC-S00329

Removal Procedure

1. Right side:

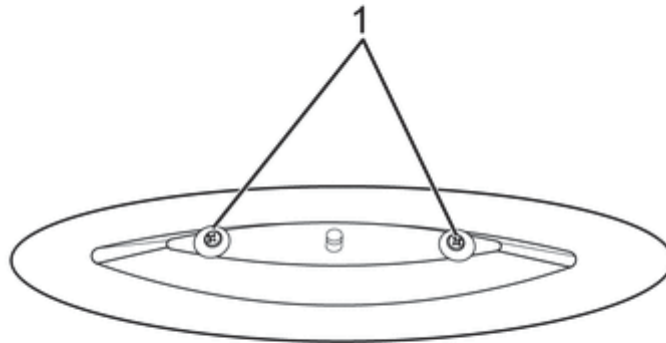
Remove the right rear & cheek panel. Refer to Rear & Cheek Panel Right Replacement in Body Rear End.

Left side:

Remove the left rear & cheek panel. Refer to Rear Cheek Panel Left Replacement in Body Rear End.

2. Remove the 2 screws (1) and remove the Emblem/Nameplate.

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Installation Procedure

1. Align the Emblem/Nameplate and install the 2 screws (1).

2. Right side:

Install the right rear & cheek panel. Refer to Rear & Cheek Panel Right Replacement in Body Rear End.

3. Left side:

Install the left rear & cheek panel. Refer to Rear & Cheek Panel Left Replacement in Body Rear End.

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SECTION B-11: REAR FENDER

Preparations:

Disassemble Side Body Panels + Side Emblems

see Section B-10

Disconnect all connectors of the lights

Unscrew the 3 screws with a 8mm open wrench
and open all the connections



Assemble all parts in the other direction

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SECTION B-12: FRONT BRAKE

Preparations:

Disassemble Front Fairing	see Section B-1
Disassemble Front Console Cover	see Section B-2
Disassemble Speedometer Cover	see Section B-3
Disassemble Front Fender	see Section B-7

Remove hex screw of the hose clamp with 8mm open wrench



Remove the brown cables of the front brake switch and cut all cable clamps



Unscrew both hex screws with an Allen key 5mm



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Parts of complete front brake



Assemble all parts in the other directions

Remark: For assembling the cover please be careful of the noses are in the right position and no edge is outstanding. Put in the screws a little bit and if all screws and the cover are in the correct positions tighten it.

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SECTION B-13: FRONT WHEEL

Preparations:

Disassemble Front Fender

see Section B-7

Remove both plastic covers from the screw



Open the two Hex screw with open wrench
12 mm and remove the brake



Put the scooter on a supporter and lift up the scooter until
the front wheel is moves freely

Unscrew the nut of the right side by using open wrench
17mm and hold the screw with open wrench 14mm



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Remove screw (axle) and the other parts and the wheel



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SECTION B-14: FOOT REST

Preparations:

Disassemble Center Step-Through Cover

see Section B-6

Disassemble Under Board

see Section B-9

Open the two screws 1 + 2 and the two screws for the side shields with PH2 screw driver

Same procedure for the other side if necessary



Assemble all parts in the other direction

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SECTION B-15: SIDE COVER

Unscrew the 4 screws by using a Phillips screwdriver 2



Unscrew the 3 screws by using a Phillips screwdriver 2
(1 screw is covered by the main stand)



Assemble all parts in the other direction

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SECTION B-16: REAR BRAKE

Note: To replace the Rear Brake Rotor see Motor Replacement Procedure C-16

Unscrew the two inner hexagon bolts by using an Allen key 6mm



Disassemble the rear brake

Now it is possible to exchange the brake pads

Remark:

It is not necessary to disassemble the side cover of the rear fork as seen on the picture



Assemble all parts in the other direction

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Preparations: (for complete removal)

Disassemble Left Foot Rest

see Section B-14

Disassemble Rear Suspension

see Section B-18

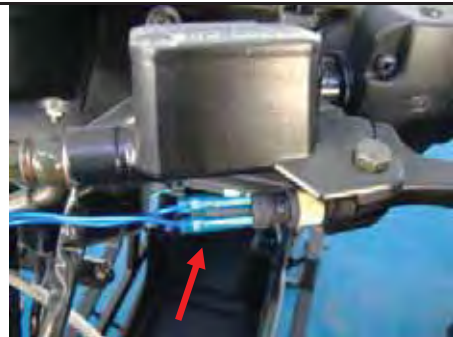
Remove the connector from the Speedometer

Remove the two cross screws by using a Phillips screwdriver #2 and remove the complete Speedometer cover



Remove the two connectors from the brake switch

Remove all strips for cable and brake hose



Remove the two inner hex cap screws from the brake lever assembly by using an Allen key 5mm

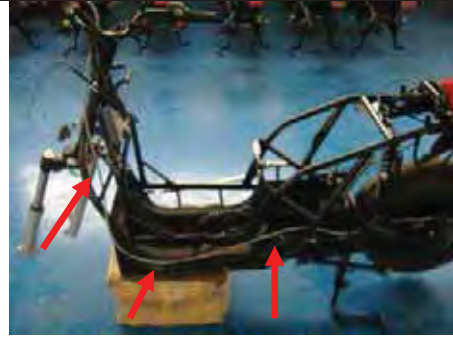


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Move the brake hose including the complete brake lever assembly through the frame

Attention:

Do not open the brake system inside the scooter. The brake liquid could damage the paint or other parts.



Move the brake hose including the complete brake lever assembly through the frame and rear suspension



Complete removed rear brake assembly



Assemble all parts in the other directions and tighten the bolts and the nut according to the regulated torque, see Section F-4

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SECTION B-17: REAR SHOCK

Preparations:

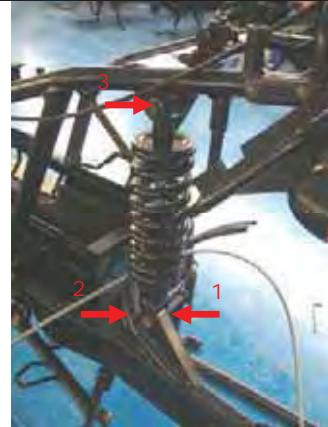
Disassemble Left Side Body Panel

see Section B-10

Unscrew the nut #1 by using a open wrench 14mm
Unscrew the bolt #2 by using a open wrench 13mm
Unscrew the bolt #3 by using a open wrench 12mm and
remove rear shock

Remark:

For disassembling of the rear shock it is not necessary
to remove the motor and the side cover



All parts of removed rear shock



Assemble all parts in the other directions and tighten the bolts and the nut according to the
regulated torque, see Section F-4

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SECTION B-18: REAR SUSPENSION

Preparations:

Disassemble Motor

see Section C-16

Unscrew 3 inner hex cap bolts and nuts by using an Allen key 4mm and an open wrench 10mm

Remove the Plastic cover, rear suspension

Remark:

Put up the back of the battery case on a supporter



Unscrew the nut #1 by using a open wrench 14mm

Unscrew the bolt #2 by using a open wrench 13mm and remove the bolt

Remark:

It is not necessary to remove any covers or battery



Unscrew the two nuts and hexagon bolts by using 18mm and 19mm open wrench and remove the rear suspension

Remark:

It is not necessary to remove any covers or battery



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All parts of rear suspension



Assemble all parts in the other direction and tighten the bolts and nuts according to the regulated torque, see Section F-4

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SECTION B-19: HANDLEBAR

Preparations:

Disassemble Front Console Cover

see Section B-2

Disassemble Front Vertical Panel-Lower

see Section B-4

Disassemble Front Vertical Panel-Upper

see Section B-5

Open the connector from the Speedometer

Remove the two cross screws by using a Phillips screwdriver #2 and remove the complete Speedometer cover



Remove all parts of the handlebar

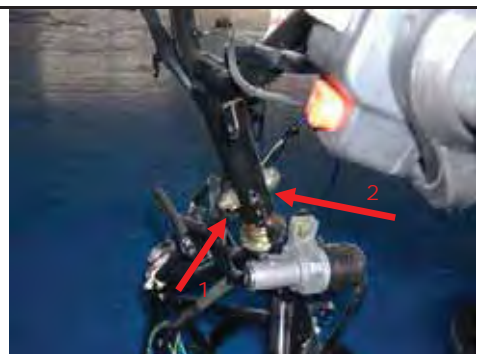
- Left- and right switch assembly
- Left- and right brake handle assembly
- Accelerator
- Left side grip

Remark:

It is not necessary to remove any covers



Unscrew the nut #2 by using a open wrench 13mm
Unscrew the bolt #1 by using a open wrench 13mm and remove the bolt



Assemble all parts in the other direction and tighten the bolts and nuts according to the regulated torque, see Section F-4

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SECTION C-1: SPEEDOMETER

Preparations:

Disassemble Front Fairing

see Section B-1

Disassemble Front Console Cover

see Section B-2

Remove connector from Speedometer



Unscrew the Phillips screw with Phillips screwdriver PH2



Unscrew the Phillips screw with Phillips screwdriver PH2

Remove the plastic part with Speedometer



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Unscrew both nuts with 8mm open wrench



Remove the plastic bracket

Remark: On the underside of the plastic bracket there are two plastic noses which fit into two holes of the plastic cover. These noses fixed the Speedometer in the right position.



Carefully remove the Speedometer out of the plastic cover



Assemble all parts in the opposite directions

Test functions of speedometer

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SECTION C-2: THROTTLE

Preparations:

Disassemble Front Fairing	see Section B-1
Disassemble Front Vertical Panel-Lower	see Section B-4
Disassemble Front Vertical Panel-Upper	see Section B-5
Disassemble Front Console Cover	see Section B-2

Lower Regen Throttle Box Replacement

S-XC-S00077

Tools Required:

PH #2
8mm Turned Full-contact Hexagonal Socket (S02445)

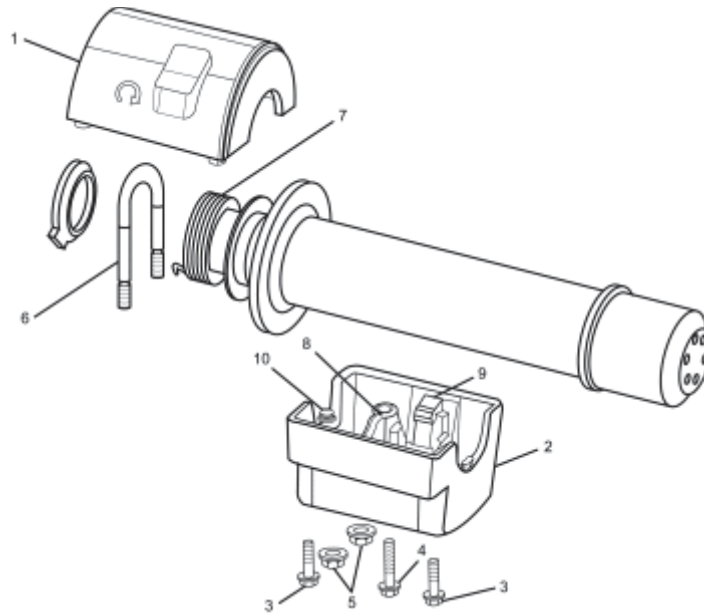
Removal Procedure

1. Turn ignition key to the off position.
2. Remove three screws (3,4) from the lower throttle box assembly.
3. Lift the kill switch housing (1) up and away from lower box.
4. Using 8mm Hexagonal Socket S02445 remove two lower box U-Bolt nuts (5).

Note the orientation of the throttle return spacers and spring for reassembly.

5. Remove the U-Bolt (6). Pull down on the lower box (2) and remove.
6. Slide the throttle assembly off of the handlebar.

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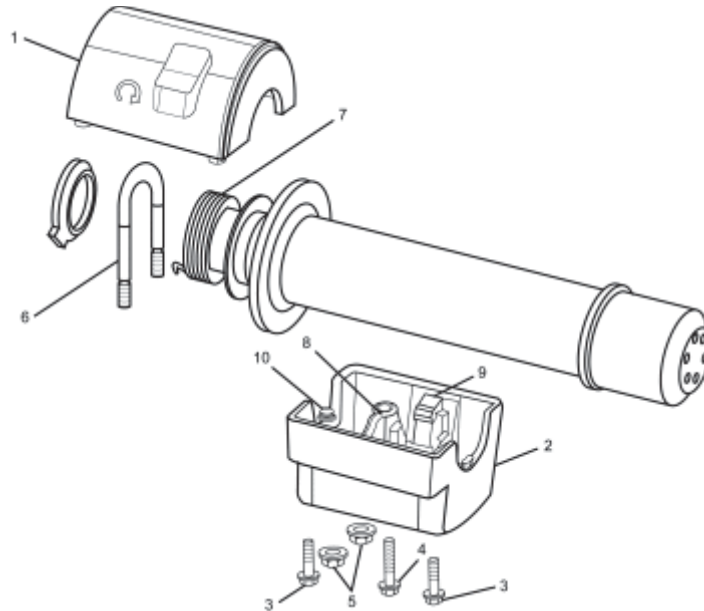


Installation Procedure

1. Install the U-Bolt into the box and start one of the nuts on the first thread of the rear stud of the U-Bolt.
2. Slide the assembly onto the handlebar; ensure that the kill switch harness is installed into the slot of the lower box.
3. With the lower box pivoted away from the handlebar slide the throttle assembly onto the handlebar.
4. Position the return spring (7) onto the spring post (8) of the lower box and twist the throttle until the throttle stop is resting on the lower box throttle stop (9).
5. Ensure that the tab (10) on the bottom of the lower box is into the hole in the handlebar.
6. Using tool 01545, install the other U-Bolt nut and tighten both nuts.
7. Twist the throttle to ensure free movement and that it returns to a neutral position.
8. Using 8mm Hexagonal Socket S02445, install the kill switch cover onto the box and install the 3 screws, tighten. Alternate tightening of the 2 nuts until reaching a torque value of 2 Nm.
9. Check the Regen Throttle adjustment. Refer to Throttle Position Checking Procedure.

Note: If needed, to remove the old throttle position magnet sensor, install the new sensor magnet and screw it in until lightly seated, then back out 1 full turn. Continue to unscrew the throttle position magnet sensor until the throttle is properly aligned.

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Regen Throttle Adjustment Procedure

Note: Key must be in “ON” position and Kill Switch in the “OFF” position

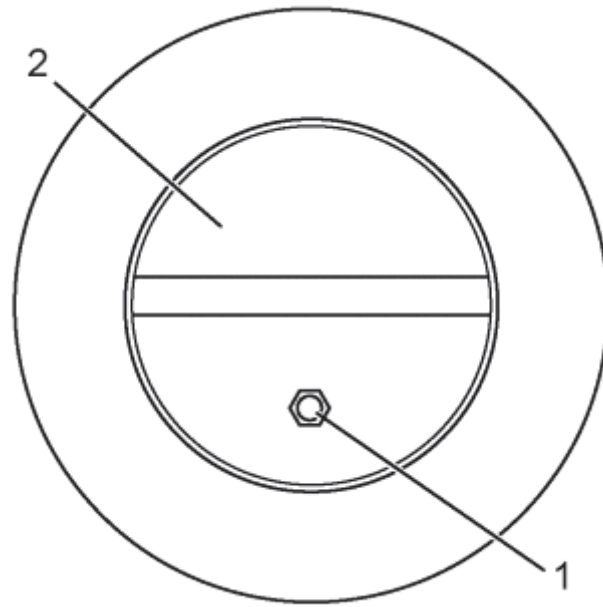
1. Remove the right handlebar end cap. Refer to Handlebar End Cap and Hand Grip Replacement.
2. Slightly loosen the set screw (1).
3. To determine the current position of the Throttle, squeeze the left side brake lever and using a large rubber band or similar device secure the lever in the squeezed position, and observe the needle position.
4. To determine the correct position of the Throttle, squeeze the right side brake lever and observe the reading.

Note: The neutral position of the throttle is 615-639. The ideal setting for this adjustment is 625.

5. Release the right lever and adjust the screw (2) until the readings are the same.
6. Remove the large rubber band or similar to release the left side brake lever.
7. Slightly tighten the set screw; this will secure the screw from moving.
8. Install the right handlebar end cap.

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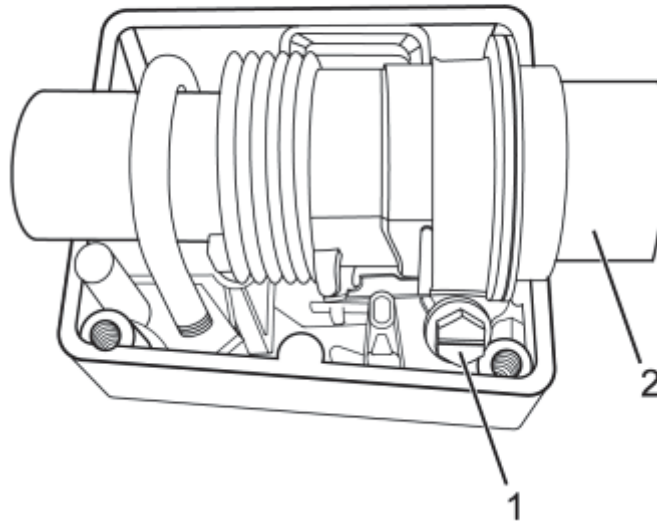
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Regen Throttle Sensor Replacement

S-XC-S00079

Removal Procedure

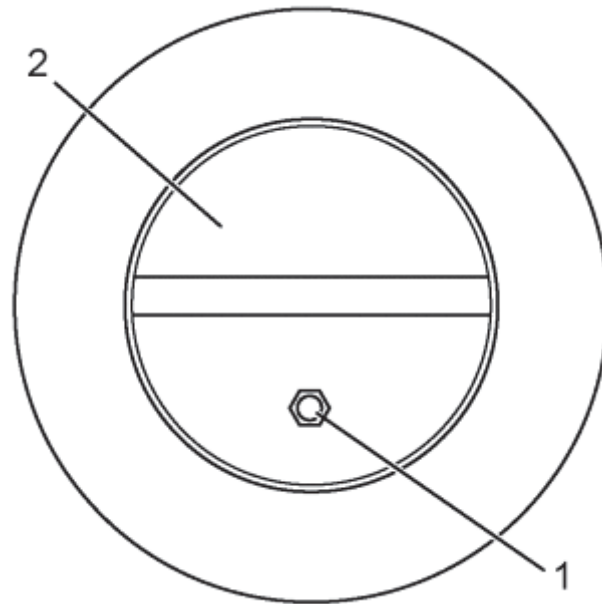
1. Remove the upper handlebar cover. Refer to Front Console Cover Replacement B-2.
2. Remove the right handlebar end cap and hand grip. Refer to Handlebar End Cap and Hand Grip Replacement.
3. Remove the kill switch cover screws.
4. Twist the throttle to gain access to the throttle clamp screw (1) and loosen.
5. Remove the throttle sleeve (2) from the handlebar.



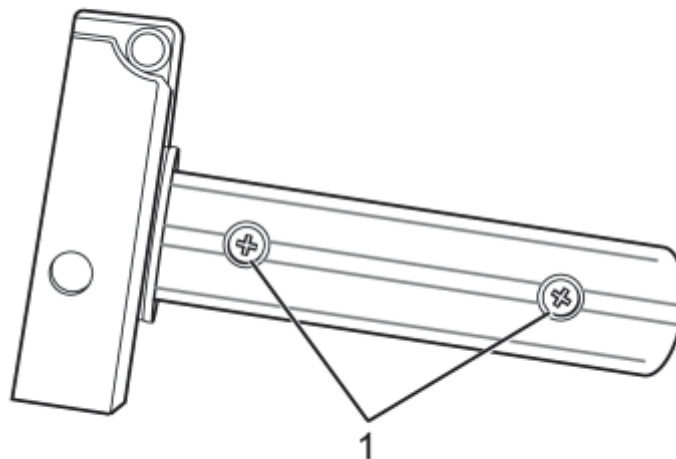
6. Loosen the Throttle set screw (1) and remove the sensor magnet (2).

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7. Remove the screws (1) and slide the insert and sensor out of the handlebar.

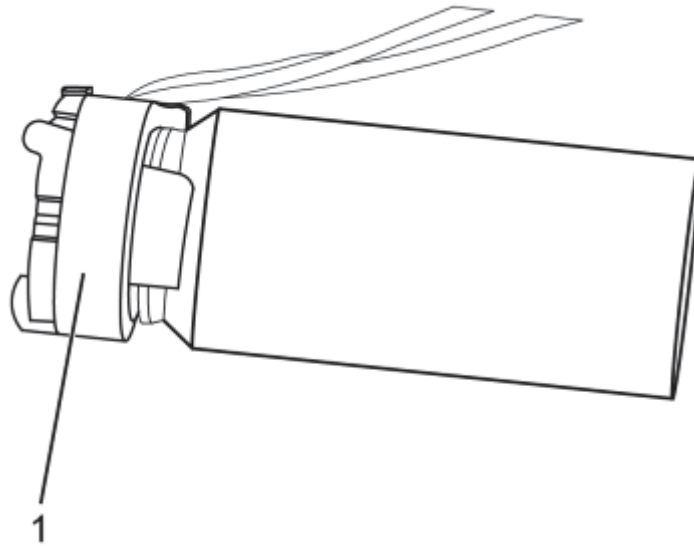


8. Remove the sensor (1) from the insert.

9. Mark and remove the sensor wires from the handlebar connector and remove the sensor.

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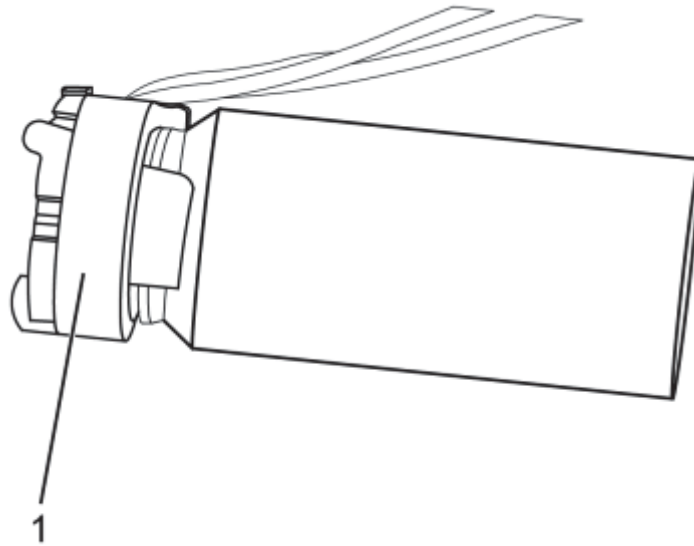


Installation Procedure

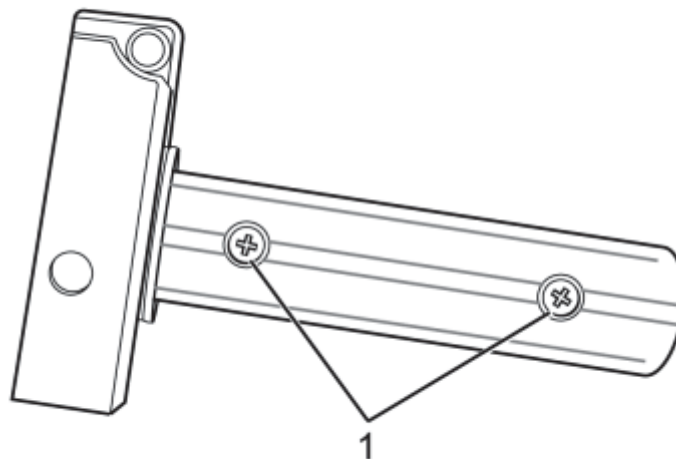
1. Install the sensor wires through the handlebar and out the harness hole.
2. Install the sensor wires into the connector in the same location as removed.
3. Install the sensor (1) onto the insert.

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4. Install the insert and tighten the screws (1).



5. Install the throttle sleeve (2) onto the handlebar and into the plastic sleeve.

Notice: Refer to Fastener Notice in General Information.

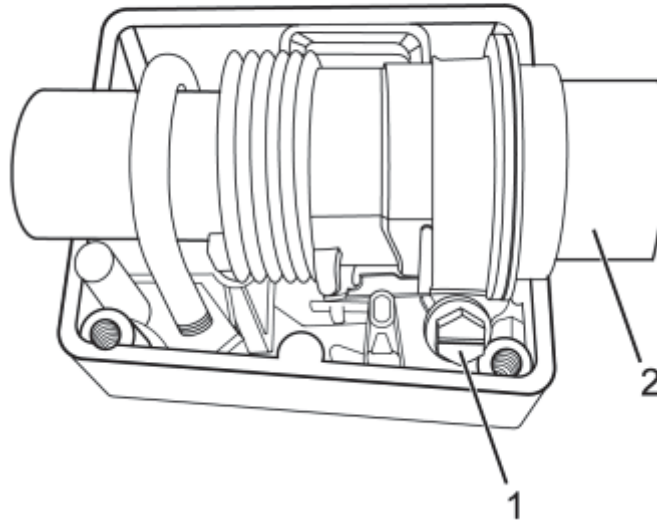
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6. Twist the throttle sleeve into the full Regen position and tighten the throttle clamp screw (1).

Tighten

Throttle clamp screw 2.5 Nm (22 lb in)



7. Install the kill switch cover, and screws and tighten.

8. Verify smoother operation of the throttle.

9. Install the upper handlebar cover. Refer to Front Console Cover Replacement.

10. Install the sensor magnet and screw in until lightly seated then back out 1 full turn.

11. Check the adjustment of the Regen Throttle. Refer to Throttle Position Checking Procedure.

12. Install the right handlebar end cap and hand grip. Refer to Handlebar End Cap and Hand Grip Replacement.

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Regen Throttle Position Checking Procedure

S-RW-100000

Without PC

Note: This procedure is to be used when a PC is not available. This adjustment MUST be verified using the PC method.

1. Place the ignition key in the ON position and the kill switch in the ON (non-run) position.
2. Squeeze the left side brake lever and observe the speedometer needle (1). This reading is the actual setting of the Regen Throttle.
3. Continue to squeeze the left side and then squeeze the right side brake lever and observe the speedometer needle. This is the required setting and what the actual reading in Step 3 must be set to. If the settings are not the same refer to Throttle Adjustment Procedure.



With PC

1. Connect the Diagnostic Hardware. Refer to Diagnostic Hardware Connections.
2. Open the Vectrix diagnostic program, by clicking on the ScooterDiag icon. This will open up the Scooter Diagnostics Summary page.
3. Within the General Information box, click on the “Show Instrument” button. This will open up an instrument cluster page.
4. In the lower center of the page is the throttle setting. This setting color should be in the Green, if the color is Red, the throttle is out of adjustment and must be adjusted. Refer to Throttle Adjustment Procedure.

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SECTION C-3: BRAKE SWITCH

Preparations:

Remove Front Fairing	see Section B-1
Remove Front Console Cover	see Section B-2
Remove Vertical Panel Cover-Lower (for ICM access)	see Section B-4
Remove Vertical Panel Cover-Upper	see Section B-5

Remove all cable strips (1)



Remove connector from the Interface Control Module (ICM)



Disconnect both wires at the brake switch connector and twist out (by hand) the brake switch at the brass coupling



Assemble all parts in the other directions

Test functions of Brake Switch assembly

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SECTION C-4: HANDLEBAR-LEFT SWITCH ASSEMBLY

Preparations:

Disassemble Front Fairing	see Section B-1
Disassemble Front Console Cover	see Section B-2
Disassemble Vertical Panel Cover-Lower	see Section B-4
Disassemble Vertical Panel Cover-Upper	see Section B-5
(If newer VX-2 model) Remove Front Console Cover for ICM	see Section B-2

Remove all cable strips

Open connector CN1 from the Interface Control Module (ICM)

Additional information see Section 1 of F-1



Unscrew the Phillips screw with a Phillips screwdriver PH2



Unscrew the Phillips screw with a Phillips screwdriver PH2

Remove the Left Switch assembly



Assemble all parts in the other direction

Test functions of Left Switch assembly

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SECTION C-5: HANDLEBAR-RIGHT SWITCH ASSEMBLY

Preparations:

Disassemble Front Fairing	see Section B-1
Disassemble Front Console Cover	see Section B-2
Disassemble Vertical Panel Cover-Lower	see Section B-4
Disassemble Vertical Panel Cover-Upper	see Section B-5
(If newer VX-2 model) Remove Front Console Cover for ICM	see Section B-2

Remove all cable strips

Open connector CN3 from the Interface Control Module (ICM)

Additional information see Section 1 of F-1



Unscrew the Phillips screw with a Phillips screwdriver PH2



Unscrew the Phillips screw with a Phillips screwdriver PH2

Remove the Right Switch assembly



Assemble all parts in the other direction

Test functions of Right Switch assembly

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SECTION C-6: IGNITION SWITCH

Preparations:

Disassemble Front Fairing	see Section B-1
Disassemble Front Console Cover	see Section B-2
Disassemble Vertical Panel Cover-Lower	see Section B-4
Disassemble Vertical Panel Cover-Upper	see Section B-5

Remove all cable strips

Open connector



Unscrew the two fasten bolts of Key switch by 10mm socket wrench



Assemble all parts in the other direction

Test function of the Key switch

Remark: The lock for the seat should be changed too. Otherwise 2 different keys are necessary.

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SECTION C-7: HORN

Preparations:

Disassemble Front Fairing	see Section B-1
Disassemble Front Console Cover	see Section B-2
Disassemble Vertical Panel Cover-Lower	see Section B-4
Disassemble Vertical Panel Cover-Upper	see Section B-5

Open the connector of the horn



Unscrew the bolt by 10mm open end wrench



Assemble all parts in the other direction

Test function of Horn

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SECTION C-8: POSITION LIGHT/HEADLAMP ASSEMBLY REPLACEMENT

Preparations:

Disassemble Front Fairing

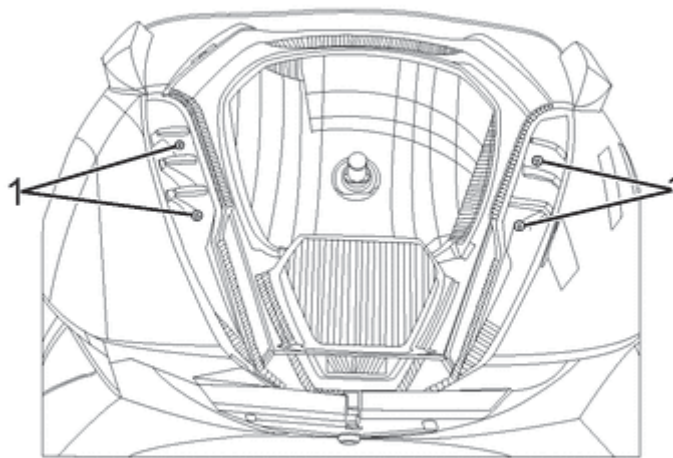
see Section B-1

Headlamp Assembly Replacement

Headlamp Assembly Part #S-XC-S00092

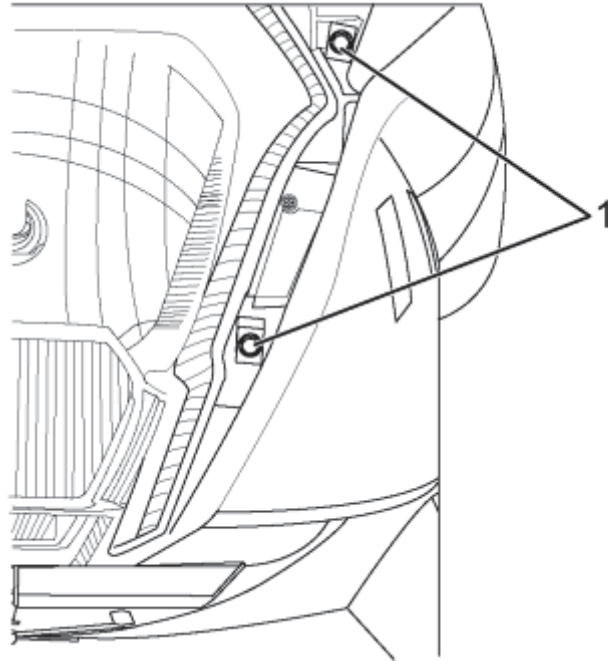
Removal Procedure

1. Remove the right front fairing. Refer to Front Fairing Replacement in Body Front End.
2. Remove the headlamp bolts (1).



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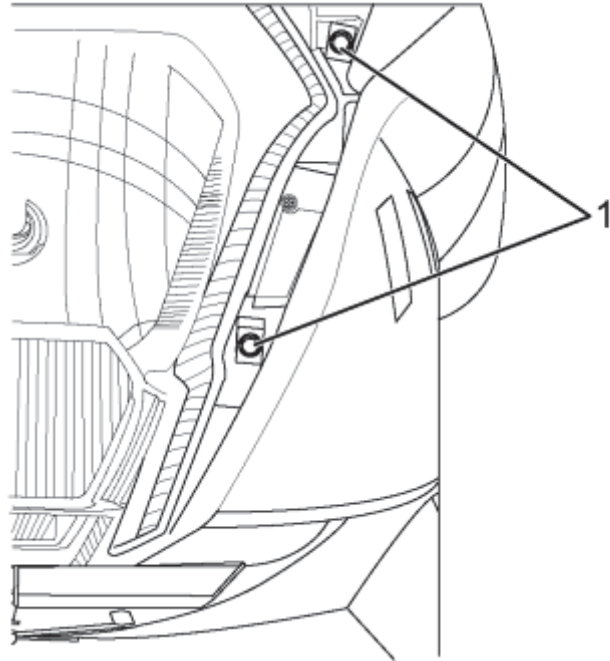
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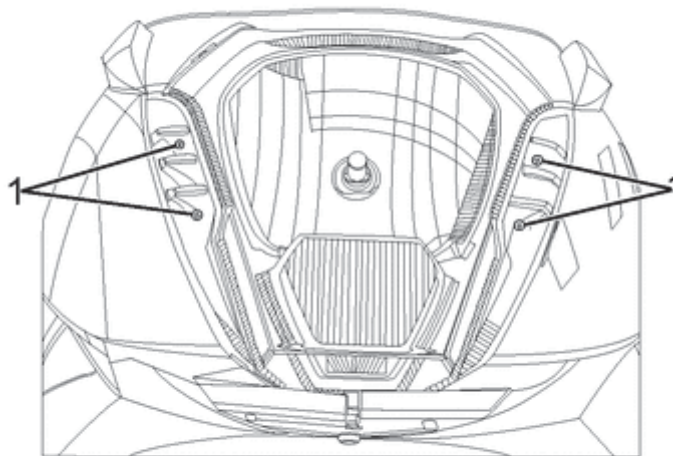
3. Pull the headlamp off the front sub-frame enough to remove the lamp harness connectors.
4. Remove the lower marker lamp bulb connector.
5. Disconnect Headlamp Assembly connectors and replace with new Headlamp Assembly.
6. Connect the headlamp and lower marker lamp connectors.
7. Install the headlamp assembly onto the left front fairing and install bolts (1). Tighten Headlamp bolts to 2 Nm (18 lb in)

Note: Refer to Fastener Notice in General Information.

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9. If the headlamp assembly was replaced aim the headlamp. Refer to Headlamp Adjustment Procedure.



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SECTION C-9: FRONT TURN INDICATOR ASSEMBLY (Both Left and Right)

Preparations:

Disassemble Front Fairing

see Section B-1

Remove all cable strips

Remove connector (2-pins) of the Turn Indicator Light

Remark: Procedure is the same for both Turn Indicator Lights



Unscrew the Nut from the inside with a wrench



Remove entire Front Turn Signal Assembly and pull cord through the hole.

Replace entire Front Turn Signal Assembly

Remark: Since the assembly is LED, you must replace the whole assembly.



Assemble all parts in the opposite directions

Test function of Front Turn Indicator Light Assembly

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SECTION C-10: SIDE STAND SWITCH

Preparations:

Disassemble Center Step-Through Cover see Section B-6

Remove the connector inside of the electronic box
under the seat



Unscrew the bolt by 8mm open end wrench



Assemble all parts in the opposite directions

Test function of Side Stand Switch

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SECTION C-11: REAR TAIL LIGHT ASSEMBLY

Preparations:

Disassemble Left and Right Rear Body Panels

see Section B-10

Remove all cable strips

Open 3-pin connector

Unscrew the two side screws and one middle screw with
Phillips screwdriver



Pull out the Tail Light assembly backwards and disconnect
plug.

Replace entire Tail Light Assembly

Note: Since the Rear Tail Light is LED, you must replace
the whole assembly.



Assemble all parts in the other direction

Test function of Brake **and** Position lights

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SECTION C-12: LICENSE PLATE LIGHT

Preparations:

Disassemble Rear Fender

see Section B-11

Remove all cable strips

Open 2-pin connector

Unscrew the two Phillips screws with a Phillips screwdriver PH2

Pull out the License Plate Light assembly



License Plate Bulb

Unscrew the two Phillips screws with a Phillips screwdriver PH2

Remove plastic cover



Pull out the defect bulb

Remark: Don't touch the glass body of the new bulb with the fingers, use a tissue



Assemble all parts in the other direction

Test function of license light

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SECTION C-13: REAR TURN INDICATOR LIGHT ASSEMBLY

Preparations:

Disassemble Rear Fender

see Section B-11

Remove all cable strips

Open 2-pin connector



Cut the cable of the Rear Indicator Light assembly

Remark: Connector has to be cut because the connector doesn't fit through the hole of the plastic



Remove the nut with an open wrench 14mm

Pull out the Rear Turn Indicator assembly

Remark: Slightly push in the pins into the new connector. Be sure of the right position. Refer to the old connector



Assemble all parts in the other direction

Test functions of Rear Light Assembly

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Rear Turn Indicator Assembly

No disassembly necessary

Replace entire Rear Turn Indicator Assembly

Note: Since the Rear Turn Indicator Assembly is LED, you must replace the entire assembly.



Assemble all parts in the other directions

Test functions of Rear Turn Indicator Assembly

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SECTION C-14: SEVCON MOTOR CONTROLLER

Preparations:

Disassemble Seat

see Section B-8

Disassemble Left and Right Rear Body Panels

see Section B-10

Open the seat and remove Cover of electronic box by using

- Phillips screwdriver (old version)
- Special secure Torx screwdriver (new version)



Turn Key Switch in "ON" Position



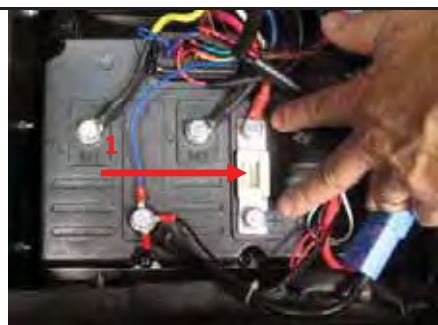
Unplug blue Battery Main Connector



Turn Key Switch in "OFF" Position

Disconnect Positive Terminals first and remove Main Fuse (1)

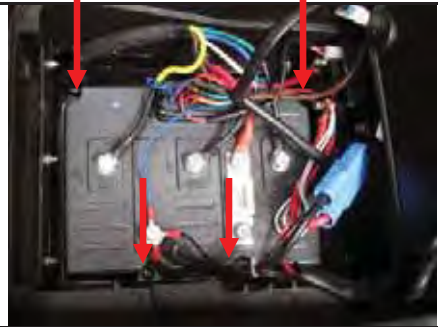
Then disconnect remaining (Negative) cables and wiring harness



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Unscrew the four Phillips bolts at the base of the Motor Controller to remove the Motor Controller



Install new Motor Controller and re-secure with four Phillips bolts

Reconnect Negative Cables and Wiring Harness first

Then replace Main Fuse and Positive Cables next

Reconnect the blue Battery Connection Cable



Test functions of Sevcon Motor Controller

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SECTION C-15: MOTOR

Preparations:

Disassemble Side Cover

see Section B-15

Disassemble Rear Brake

see Section B-16

Note: This is the same procedure to replace the Rear Brake Rotor

Open the seat and remove Cover of electronic box by using

- Phillips screwdriver (old version)
- Special secure Torx screwdriver (new version)



Turn Key Switch in "ON" Position



Unplug blue Battery Main Connector



Turn Key Switch in "OFF" Position

Disconnect Positive Terminals first and remove Main Fuse (1)

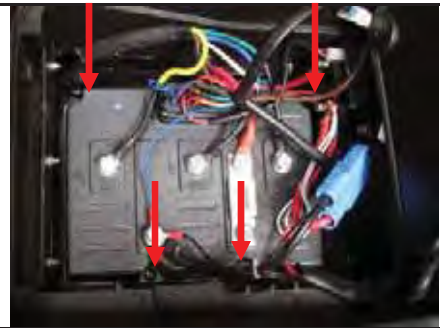


Disconnect Remaining (Negative) Cables and Wiring Harness

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Unscrew the four Phillips bolts at the base of the Motor Controller to remove the Motor Controller



Unscrew the hexagonal nut by using a 8mm open wrench and remove the cable clamp

Pull out the motor cable slightly of the electronic box

Remark:

It is not necessary to remove the parts as it can be seen on the picture



Unscrew the motor nut with a special open wrench tool or the Vectrix EM-90400 Special spanner socket



Take out the motor in the direction of the arrow on the picture.



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All parts of removed motor



Assemble all parts in the other direction

Test function of Motor

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SECTION C-16: BATTERY

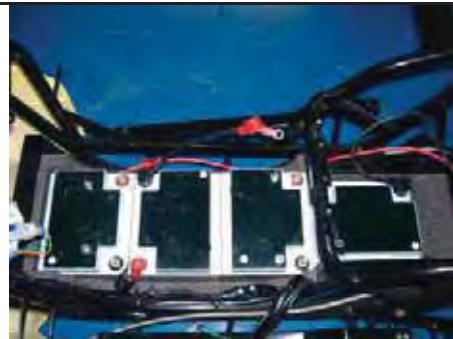
Preparations:

Disassemble Blue Battery Cable Connection

see Section C-15

Note: Photos in this section show the Sevcon Motor Controller Housing removed which makes the procedure easier to complete but is not necessary if only the Step-Through panel is removed.

Unscrew the hexagon bolts from Battery #1 und #3



Lift up battery #2 and remove it

Remark:

Batteries are fixed to the battery case with strong velcro. Move the batteries sideways to loosen them from the velcro before remove.



Lift up battery #3 and remove it



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Lift up battery #1 and remove it



Lift up battery #4 and remove it



Empty battery case for 60AH



Assemble all parts in the other direction

After assembling:

- Measure the voltage of each battery. It should be higher than 12.0 VDC.
- Charge the battery **before** use!

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SECTION C-17: BATTERY CHARGER

Preparations:

Open Under Seat Storage

Put Key into key hole on the side of the VX-2 to open Under Seat Storage Area.



Turn Key to open Under Seat Storage Area



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Remove Battery Charger from Under Seat Storage Area



Plug blue Battery Charger male connector cord into on-board blue Battery Charger female connection.

Plug Battery Charger AC connector into a AC main.



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Turn on Battery Charger Unit power switch.



Recharge until Battery Charger Output LED reaches 100% (Yellow).

Note: Recharge process can be discontinued and re-started at any time during the charge cycle



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SECTION D-1: MIRRORS ADJUSTMENT

If mirrors are not tightened, remove Left and Right mirrors (refer to Section C, Section C-1) and tighten the nut by using a 14mm open wrench



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Coarse adjustment:

Turn the mirror in the correct position by using the mirror housing

The movement should be done with some force, otherwise proceed as figure before



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Fine adjustment:

Move the mirror in the correct position



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SECTION D-2: HEADLAMP/POSITION LIGHT ADJUSTMENT

Headlamp Aiming

S-ST-100000

Properly aim the headlamp for maximum road illumination and safety. With halogen headlamps, proper aiming is very important. The increased range and power of these lamps make even the slightest variations from the recommended aiming hazardous to approaching motorists.

Observe the following conditions when you inspect or adjust the headlamp aim:

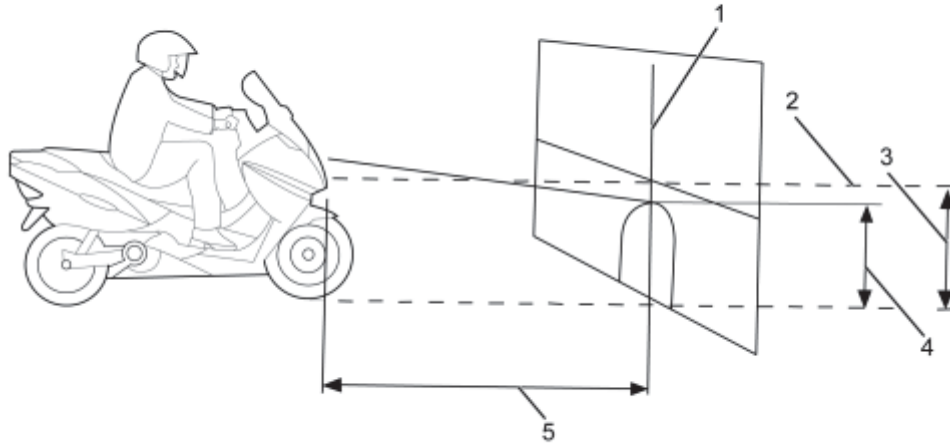
- The scooter is on a level surface.
- The tires are uniformly inflated to the specified pressure.
- One person is sitting on the driver's seat.
- The scooter is in the vertical position.
- Clean the headlamp before aiming.
- Follow your state's requirements for headlamp aiming.

Headlamp Aiming Location

- The aiming area should be darkened and large enough to allow for the scooter and an additional 10 m (33 ft), measured from the face of the headlamp to the front of the screen.
- The floor on which the vehicle rests must be parallel with the bottom of the screen. If the floor is not level, compensate accordingly.

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Headlamp Aiming Procedure



1. Position the scooter square with the screen, with the headlamp directly over the 10 m (33 ft) reference line (5).
2. Ensure that the vehicle is on a level surface.
3. Draw a horizontal reference line (2) that is in the center of the headlamp.
4. Draw a vertical reference line (1) that is in line with the scooter axis.
5. With the headlamp low beam on the height spot (4) should be 9/10th of the headlamp center line (3).

Adjusting the headlamp

1. To adjust the light beam up and down turn the right lower side adjustment screw. Clockwise to raise the beam and counterclockwise to lower the beam.
2. To adjust the light beam side-to-side turn the upper left adjustment screw. Clockwise to move the beam to the right and counterclockwise to move the beam to the left.

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SECTION E-1: INDICATION ON SPEEDOMETER DISPLAY & CONTROLLER LED

Indication on LCD	Controller LED	Reason	Solution
Accelerator turn at power up	1	Accelerator is not in zero position	Release accelerator or turn power "OFF" and then to "ON" or proceed to the Accelerator troubleshooting diagram
Error Accelerator Volt	2	Accelerator voltage too high	Release accelerator or turn power "OFF" and then to "ON" or proceed to the Accelerator troubleshooting diagram
Stop scooter Battery empty!	3	Battery voltage is under 42V permanently	Charge the Battery
Error Overcurrent	4	Controller defect	Exchange controller and check motor for short winding against housing
Error Hall sensor	5	Hall sensor Malfunction of the motor	Proceed to Hall Sensor check Section 4 of Section E
Scooter Disabled	6	This messages comes after Stop scooter	Solve malfunction before this message
Error Voltage too high	7	Battery voltage is over 63V	Use the scooter carefully until message is over, if not, check if the real voltage of the battery is lower than 63V and setting of controller. Or exchange Controller.
Error High temperature	9	Temperature of the controller is >85 °C	Wait until temperature goes down under 85 °C. Or exchange Controller
Stop scooter High temperature	10	Temperature of the controller is >110 °C	Wait until temperature goes down under 110 °C. Or exchange Controller
Low Battery Recharge!	11	Battery voltage is under 42V > 15 seconds	Charge the Battery
Error Sidestand out	6	Side stand switch is active	Check correct function of side stand switch. Exchange Side Stand Switch or controller
System Error 01		Memory of speedometer defect	Exchange Speedometer if message is still there.

The LED on the controller flashes if a malfunction is active.

Example: LED flash 6 times with 1 Hz, LED off for 2 sec. and starts again.
This means: Disable function active

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SECTION E-2: MALFUNCTIONS

- **No Top Speed**
 - Check setting of the controller
 - Check correct function of the accelerator, exchange if needed

- **No function and no indication** on Speedometer
 - Check Fuse 1 (15A) of the converter
 - Check voltage on Controller power in line (red and black thick wire) should be higher than 36 V.

 - Converter broken

- Full function but **no indication** on Speedometer
 - Check connection of the speedometer
 - Speedometer broken

- No indication of the **energy bar** on Speedometer
 - Check Voltage of the battery
 - Check Voltage on Pin 1 of the speedometer connector. Should be the battery Voltage

 - Speedometer or controller broken or wire between controller and speedometer

- No indication of the **consumption bar** on Speedometer
 - Check Voltage of the battery
 - Check Voltage on pin 1 of the Speedometer connector. Should be the battery Voltage

 - Speedometer or Controller broken or wire between Controller and Speedometer

- **No change of battery voltage and mph/kph** on Speedometer
 - Check correct function of MODE switch
 - Mode switch or Speedometer broken

- No indication of **speed** on Speedometer but motor running is okay
 - Check if the Voltage on Pin 5 of the speedometer connector. Should change if Motor is turned by hand.

 - Speedometer or Controller broken or wire between Controller and Speedometer

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SECTION E-3: CHECK OF CHARGER FUNCTION

1. Normal function

If the Charger is connected and the indication led on the charger is at 60%, turn on the scooter and the battery voltage indication of the speedometer should show $59.5\text{ V} \pm 1.0\text{ V}$.

During the charging process at 60%, the current should be $10.0\text{ A} \pm 0.8\text{ A}$, measured with a clamp ampere meter on the brown wire close to the charger DC-plug.

If not, check the voltage with a digital voltmeter on the Controller power in line (red and black thick wire). The value should be $59.5\text{ V} \pm 1.0\text{ V}$. If yes, exchange speedometer, if not, exchange Charger.

2. Charger didn't start

Using a Digital Multi meter:

- Open the cover seat

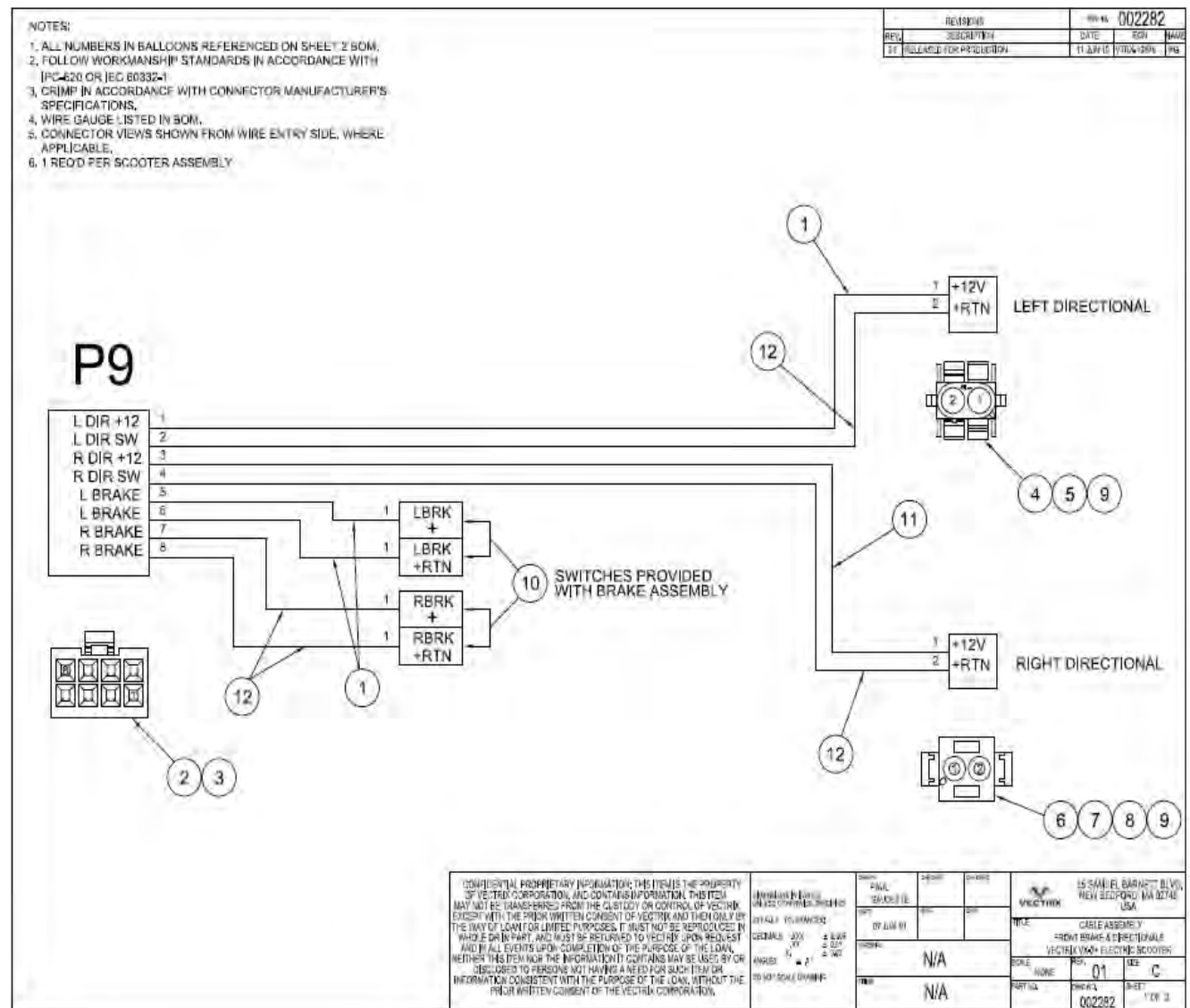
- Measure on the charger connector of the scooter if the voltage is like the battery voltage indication of the speedometer. If the voltage is zero, check the fuse #2 (30A) of the converter or the connection cable. If the voltage is lower than 33 V check the voltage of each battery and exchange the battery which is lower than 10.0V.

- Exchange Charger

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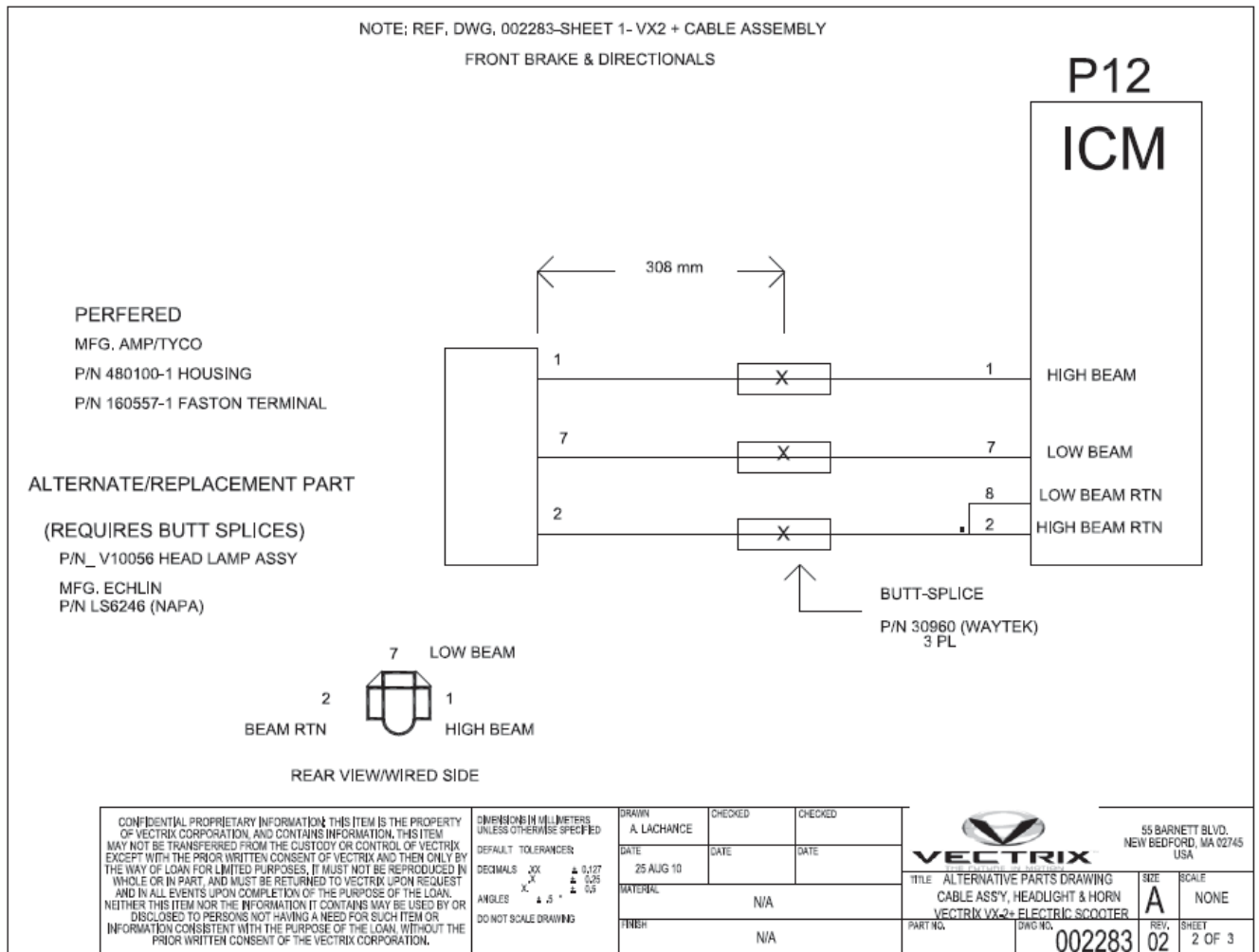
SECTION F-1:

CABLE ASSEMBLY-FRONT BRAKE/INDICATORS + BOM



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SECTION F-2: CABLE ASSEMBLY-FRONT HEADLAMP/HORN + BOM

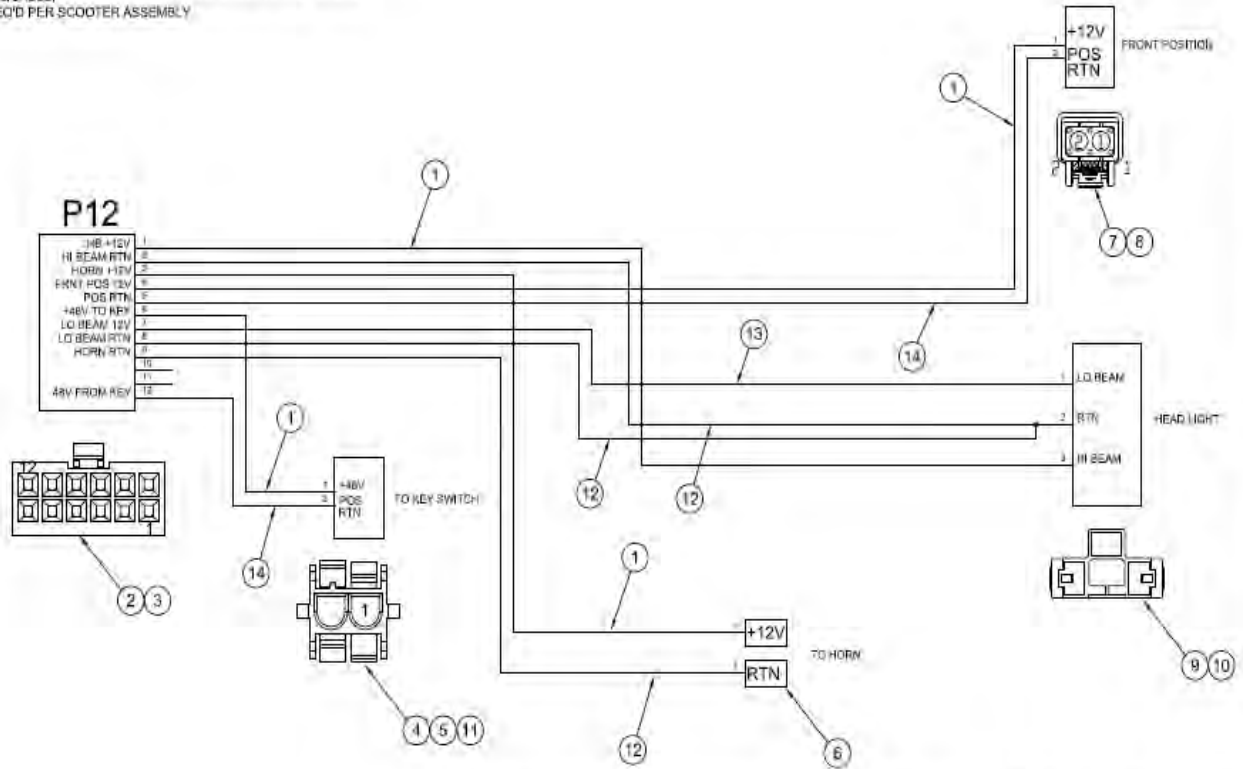


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NOTES:

1. ALL NUMBERS IN BALLOONS REFERENCED ON SHEET 2 BOM.
2. FOLLOW WORKMANSHIP STANDARDS IN ACCORDANCE WITH IPC-620 OR IEC 60332-1
3. CRIMP IN ACCORDANCE WITH CONNECTOR MANUFACTURER'S SPECIFICATIONS.
4. WIRE GAUGE LISTED IN BOM.
5. CONNECTOR VIEWS SHOWN FROM WIRE ENTRY SIDE, WHERE APPLICABLE.
6. 1 REQ'D PER SCOOTER ASSEMBLY

REVIEWS		DATE	BY	NAME
REV	DESCRIPTION			
01	REV BASED FOR PRODUCTION	17 JUN 10	VTRC-UBTS	PL
02	ADDED SHEET 2 WITH ALTERNATIVE 4/24 MOUNTS W/AS SPECIFIED.	26 AUG 10	VTRW-UBTS	PL



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	<p>REVISIONS</p> <p>DATE: 07 JUN 10</p> <p>BY: N/A</p> <p>APP: N/A</p> <p>SCALE: 1:1</p> <p>DO NOT SCALE DRAWING</p>	<p>DATE: 07 JUN 10</p> <p>BY: N/A</p> <p>APP: N/A</p> <p>SCALE: 1:1</p> <p>DO NOT SCALE DRAWING</p>	<p>VECTRIX</p> <p>85 DANIEL SARNETT BLVD NEW BEDFORD, MA 02745 USA</p> <p>TR-1</p> <p>CABLE ASSEMBLY FRONT HEADLIGHT & HORN VECTRIX VX-2 ELECTRIC SCOOTER</p> <p>REV: NONE</p> <p>REV: 02</p> <p>REV: C</p> <p>REV NO: 002283</p> <p>REV: 7 OF 8</p>
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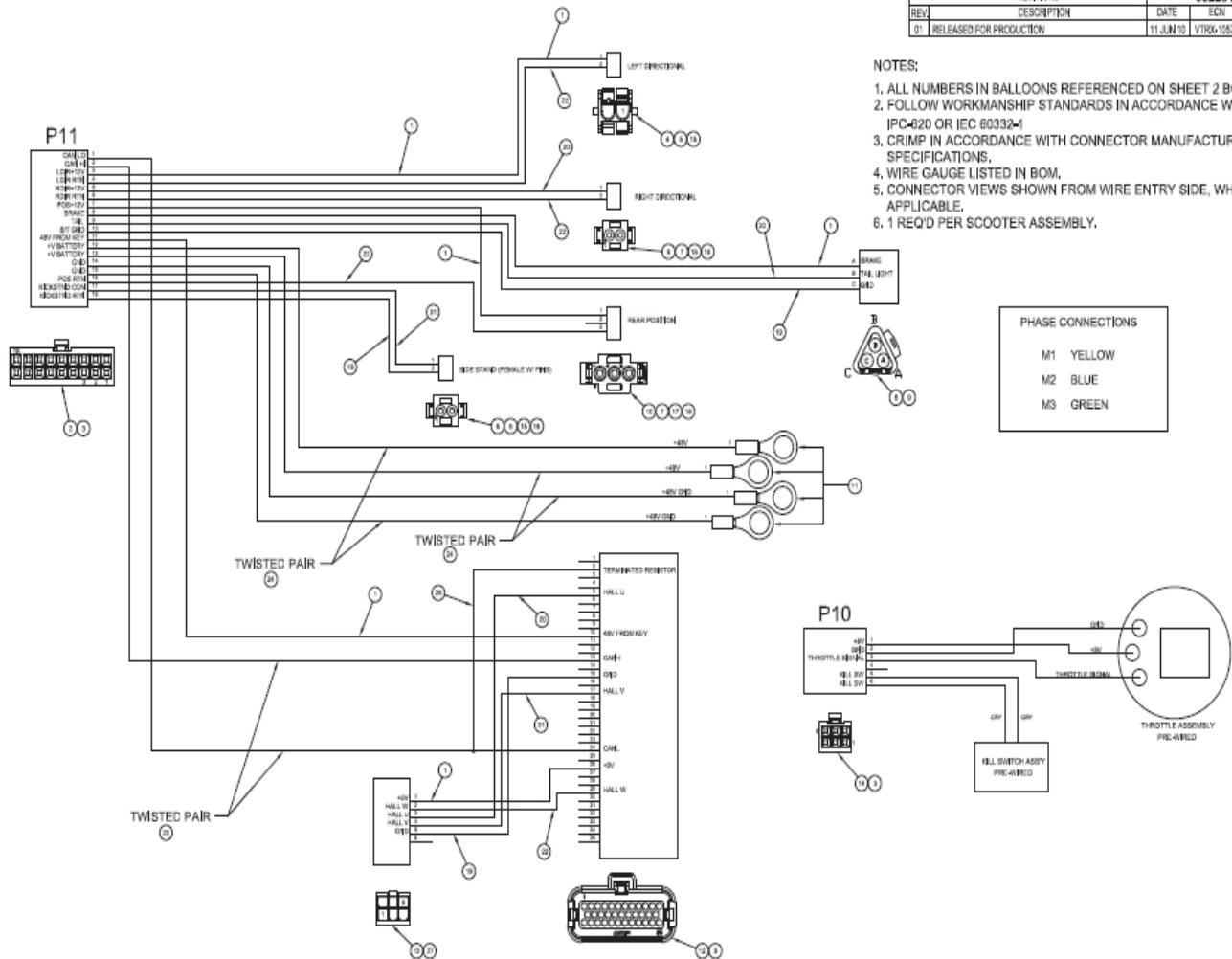
VECTRIX VX-2 SERVICE MANUAL

SECTION F-3: CABLE ASSEMBLY-REAR BRAKE/INDICATORS/TAIL LIGHT/BATTERY/SIDE STAND + BOM

REVISIONS		DWG. NO.	
REV.	DESCRIPTION	DATE	ENR.
01	RELEASED FOR PRODUCTION	11 JUN 10	VTR06-10576

NOTES:

1. ALL NUMBERS IN BALLOONS REFERENCED ON SHEET 2 BOM.
2. FOLLOW WORKMANSHIP STANDARDS IN ACCORDANCE WITH IPC-620 OR IEC 80332-1
3. CRIMP IN ACCORDANCE WITH CONNECTOR MANUFACTURER'S SPECIFICATIONS.
4. WIRE GAUGE LISTED IN BOM.
5. CONNECTOR VIEWS SHOWN FROM WIRE ENTRY SIDE, WHERE APPLICABLE.
6. 1 REQ'D PER SCOOTER ASSEMBLY.



VECTRIX VX-2 SERVICE MANUAL

TITLE				REV.		
BOM-CABLE ASSEMBLY REAR BRAKE, DIRECTIONALS, TAIL LIGHT, BATTERY & SIDE STAND VECTRIX VX-2+ ELECTRIC SCOOTER				01		
LINE No.	REFERENCE DESIGNATION	QTY	PART NO.	PACKAGE	PART DESCRIPTION	MFR
1	1	A/R			WIRE, AWG 18, TINNED, RED, 300V, PVC INSULATION, UL1007 OR EQUAL	ANY SUITABLE MFR.
2	2	1	0039-01-2180		CONNECTOR HOUSING, MINI-FIT Jr., 18 PIN	MOLEX
3	3	18	39-00-0208		TERMINAL SOCKET, FEMALE, AWG 18-24	MOLEX
4	4	1	1-480-899-0		CONNECTOR HOUSING, UNIVERSAL MATE-N-LOK, 2 PIN	TYCO / AMP
5	5	11	350889-1		TERMINAL SOCKET, FEMALE, AWG 18-24	TYCO / AMP
6	6	2	1-480898-0		CONNECTOR HOUSING, UNIVERSAL MATE-N-LOK, 2 PIN	TYCO / AMP
7	7	2	350890-1		TERMINAL PIN, MALE, AWG 18-24	TYCO / AMP
8	8	1	DT08-3S-E003		PLUG ASSEMBLY, 3 WAY	DEUTSCH
9	9	3	1062-16-0122-PS		SOCKET, STAMPED AND FORMED	DEUTSCH
10	10	1	1-480700-0		CONNECTOR HOUSING, UNIVERSAL MATE-N-LOK, 3 PIN	TYCO / AMP
11	11	4	34151		RING AND SPADE TONGUE TERMINAL, M8	TYCO / AMP
12	12	1	776164-1		CONNECTOR HOUSING, PLUG ASSEMBLY, 35 PIN	TYCO / AMP
13	13	1	39-01-3089		CONNECTOR HOUSING, MINI-FIT Jr., 6 PIN, IN-LINE	MOLEX
14	14	1	39-01-2080		CONNECTOR HOUSING, MINI-FIT Jr., 6 PIN	MOLEX
15	15	3	794270-1		WIRE SEAL	TYCO / AMP
16	16	2	794269-1		INTERFACE SEAL	TYCO / AMP
17	17	1	794272-1		WIRE SEAL	TYCO / AMP
18	18	1	794271-1		INTERFACE SEAL	TYCO / AMP
19	19	A/R			WIRE, AWG 18, TINNED, BLACK, 300V, PVC INSULATION, UL1007 OR EQUAL	ANY SUITABLE MFR.
20	20	A/R			WIRE, AWG 18, TINNED, ORANGE, 300V, PVC INSULATION, UL1007 OR EQUAL	ANY SUITABLE MFR.
21	21	A/R			WIRE, AWG 18, TINNED, BLACK/WHITE, 300V, PVC INSULATION, UL1007 OR EQUAL	ANY SUITABLE MFR.
22	22	A/R			WIRE, AWG 18, TINNED, RED/WHITE, 300V, PVC INSULATION, UL1007 OR EQUAL	ANY SUITABLE MFR.
23	23	A/R			WIRE, AWG 22, 2 CONDUCTOR WITH DRAWIN WIRE, WHITE & BLACK, TWISTED PAIR, UL1007 OR EQUAL	ANY SUITABLE MFR.
24	24	A/R			WIRE, AWG 18, TINNED, RED & BLACK, TWISTED PAIR, 300V, PVC INSULATION, UL1007 OR EQUAL	ANY SUITABLE MFR.
25	25				WIRE SPLICE	ANY SUITABLE MFR.
26	26	A/R			WIRE, AWG 22, TINNED, BLACK, 300V, PVC INSULATION, UL1007 OR EQUAL	ANY SUITABLE MFR.
27	27	6	39-00-0121		TERMINAL SOCKET, MALE, AWG 18-24	MOLEX

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SECTION F-4: TORQUE LIST FOR BOLTS/NUTS

Description	Force
Front axle self locking, nut	65 NM
Front brake housing on front shock , bolt	30 NM
Rear brake housing on rear fork, bolt	25 NM
Motor axle, nut	80 NM
Front shock, bolt	70 NM
Brake disc on front rim, bolt	25 NM
Brake disc on motor, bolt	15 NM
Ring on motor, bolt	15 NM
Handle bar, nut	50 NM
Rear fork, left and right nut	80 NM
Front fork, top nut, 32mm	60 NM
Rear shock, top bolt	45 NM
Rear shock, bottom nut	40 NM
Battery, bolt	25 NM
All plastic parts	16 kgf.cm

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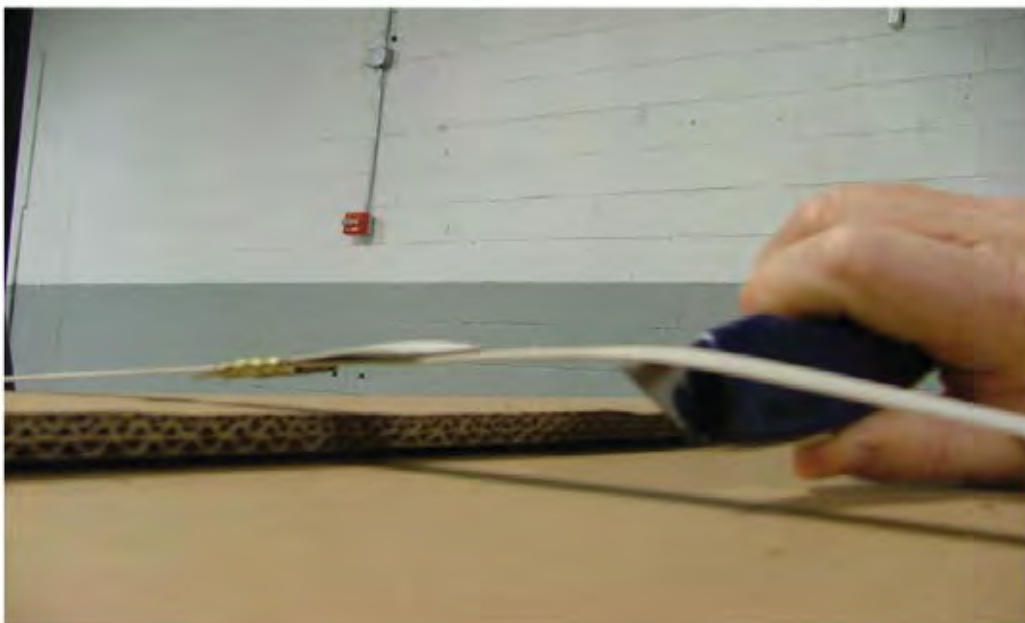
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SECTION G-1: UNPACKING INSTRUCTIONS

VX-2 Unpacking Instructions



Cut & remove the plastic straps



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Remove cardboard cover



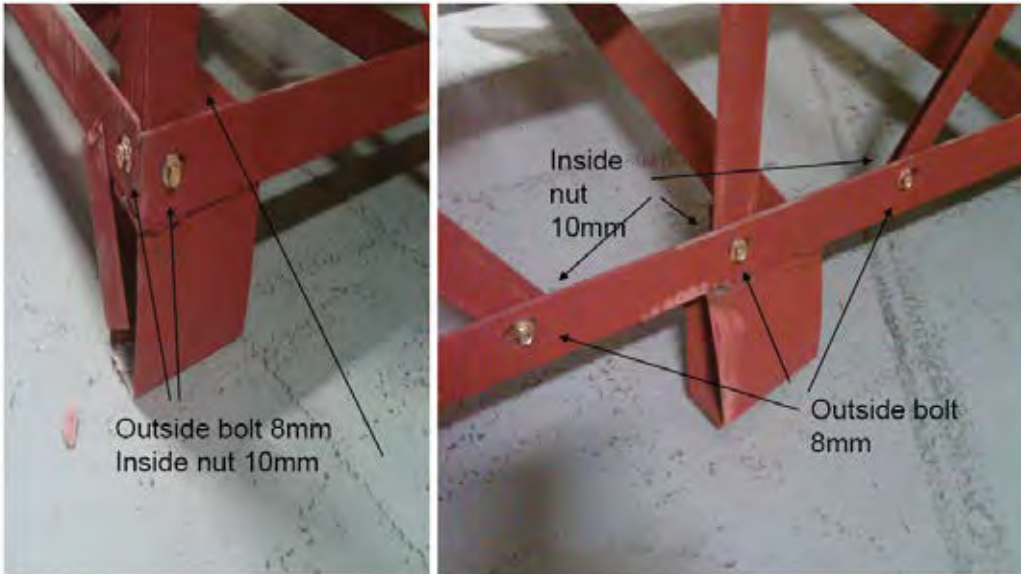
Cage minus cover



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Remove Nuts and Bolts along base of pallet



Remove top cage from pallet



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Stack pallet bases to be used later



Remove straps front & rear, left & right



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Remove bike and protective paper



Add "ELECTRIC" decal to both sides of front panels



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Add "VX-2" decal to both sides of rear "cheek" panels



Add "VECTRIX" decal to back



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SECTION G-2: PREP INSTRUCTIONS

Use ignition key to open trunk



Mirrors, handlebar weights, brow,
and mudder in trunk



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Add mudder to rear as shown



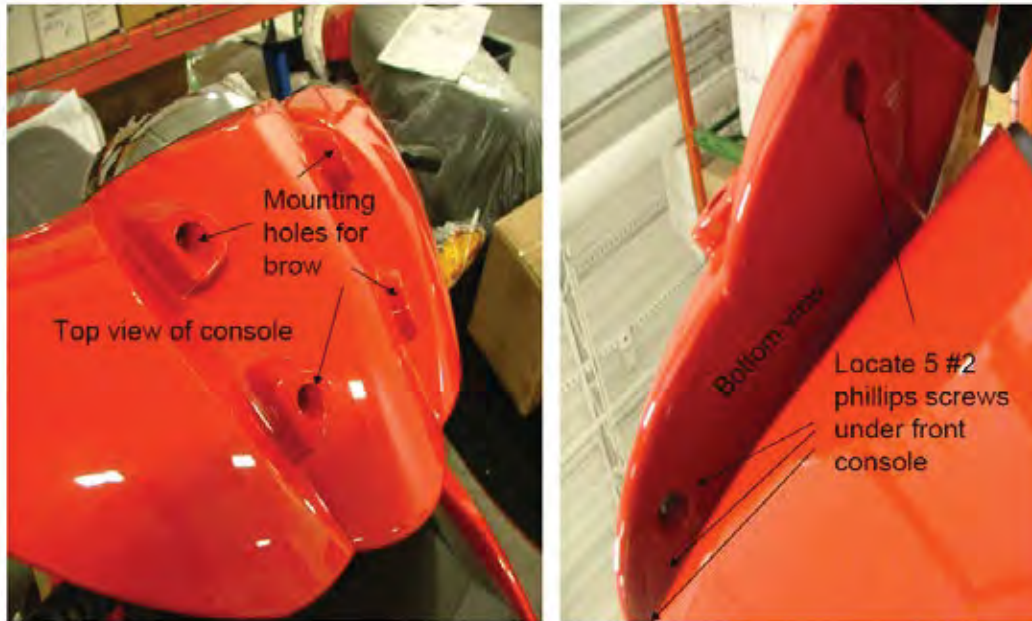
Add handlebar weights and mirrors right and left sides



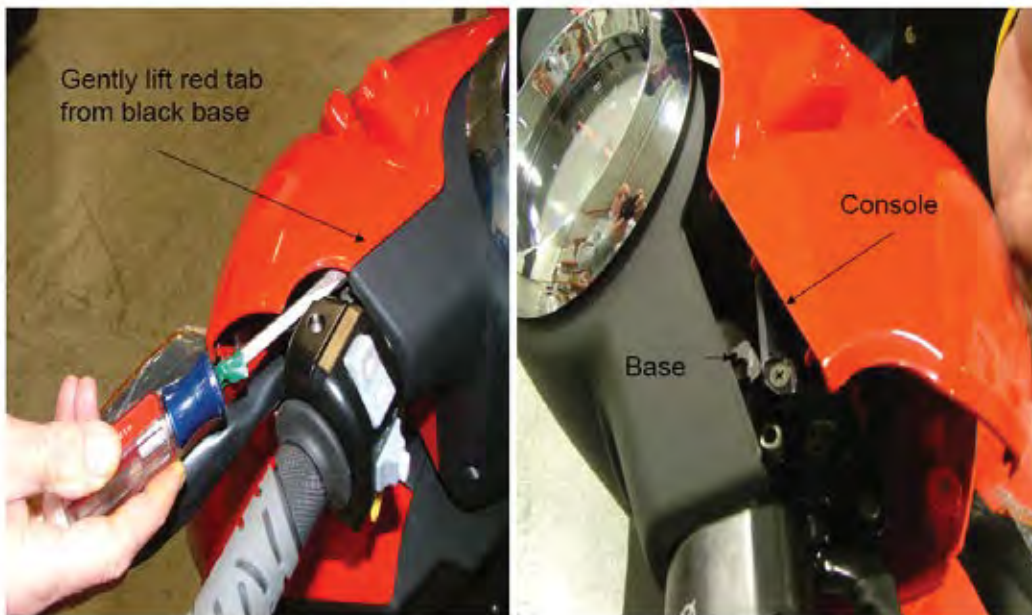
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Remove front console to attach brow



Release 2 "tabs" from side



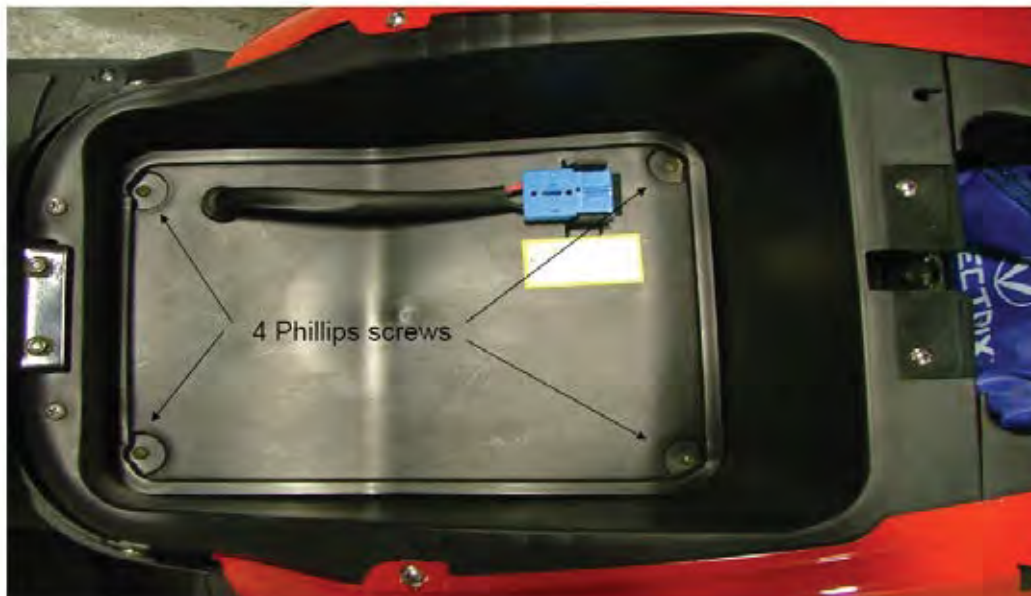
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Attach assembly by inserting top tabs first, then replace 5 bottom screws



Remove trunk liner to connect battery



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Connect blue battery connectors



Battery connected

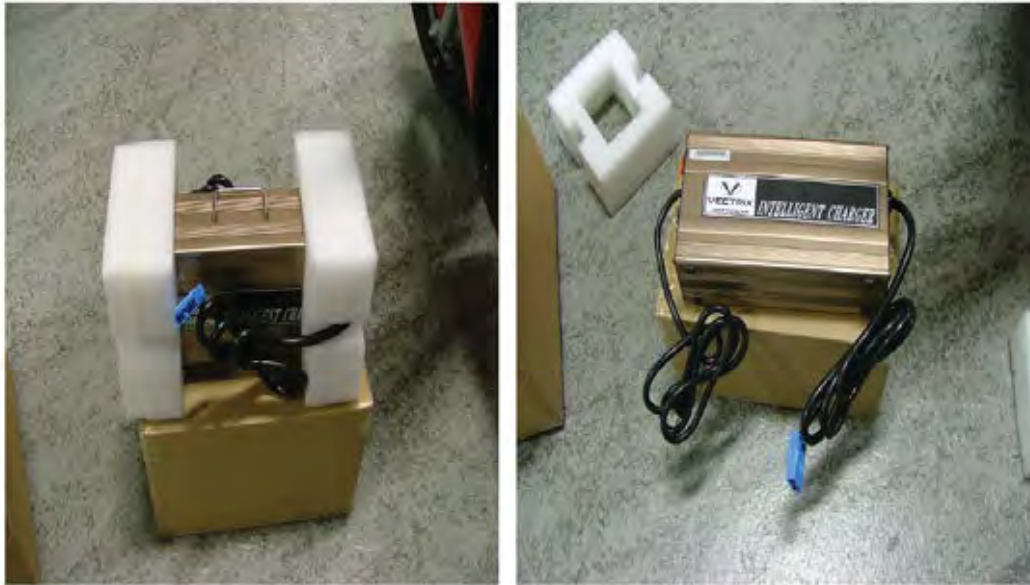
Use caution around battery 48VDC



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Remove charger from box & test



Check tires, blinkers, etc.



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Your VX-2 is ready to roll!



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