Carrier TRANSICOLD

TECHNICAL INSTRUCTIONS

Vector Auxiliary Liftgate Battery Charger (76-02119-00/76-00834-01/76-02163-00)

Models: Vector 8500, 8600MT, 8811MT, 8700, 8800MT, and 8811MT

Serial Number Range: All

Purpose: The intent of this technical instruction is to provide guidelines for installing the liftgate battery charger (auxiliary) option in Vector™ 8000 series TRUs.

Kit Parts

Item	Qty	Part Number	Description
Kit Hardware (76-02163-00)			
1	3	22-01613-81	Clip, Electrical Connector
2	4	34-00944-06	Washer, Flat M6
3	4	34-00945-06	Washer, Lock M6
4	2	34-00967-35	Bolt, M6x35
5	2	34-01152-55	Bolt M6x55
6	2	34-01341-30	Bolt, M6x30
7	3	34-60089-06	Nut, Flange M6
8	6	44-60024-25	Cable Tie, Wide
9	1	44-60163-00	Clamp, Cable Tie
10	2	44-60150-03	Edge Clip, Side Mount
11	4	58-05078-01	Cable Tie, Double Screw Mount
12	1	68-08953-00	Bracket, HV
13	1	22-62185-01	Heat Shrink, 1.00 ID
27	1	22-50122-57	Terminal, Ring M8 6AWG
Kit, Auxiliary Liftgate Battery Charger (76-02119-00) (1) (3)			
14	1	22-04211-00	Harness, Battery Charger Splitter
15	2	68-16775-00	Bracket, Nut Plate
16	1	12-00683-20	Charger, Battery 12 VDC 40A
Kit, Auxiliary Liftgate Battery Charger Installation Kit (76-00834-01) (1) (2) (3)			
20	4	22-04183-04	Heat Shrink, 0.50 ID
21	2	22-03164-00	Harness, Liftgate Battery
22	1	34-01184-106	Nut, Lock M6
23	1	34-01184-108	Nut, Lock M8
24	4	34-00967-25	Screw,Cap HXHD M6x25
25	10	58-00079-02	Cable Tie
26	65	22-04227-01	Cable SOOW 6 AWG
27	1	22-50122-57	Terminal, Ring M8 6AWG
29	1	02-00311-02	Lubricant, Electrical

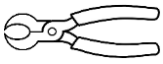
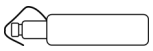
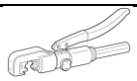
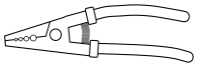
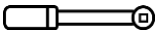
1. 76-02163-00 required with this kit. 2. Included in 76-02119-00 kit 3. Additional parts are included in this kit that will not be used for this installation.

Additional Required Parts

Item	Qty	Part Number	Description
21	2	22-03164-00	Harness, Liftgate Battery (Fuse Holder) [4]
30	AR	Obtain Locally	Tape, Marking
31	AR	02-00067-01	Sika Flex 221

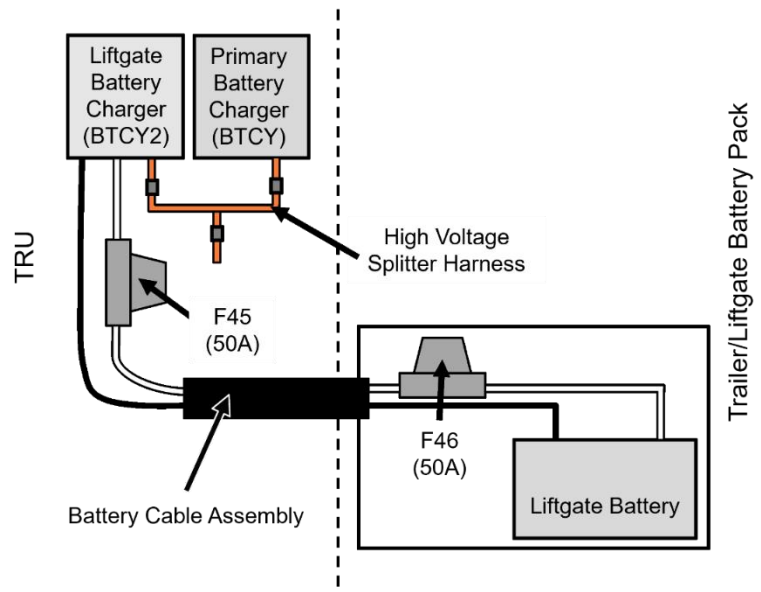
4. New fuse holder may be required for retrofit installations where the cable length needs to be adjusted.

Required Tools

Tool	Part Number	Part Description
	Obtain Locally	10mm Socket
	Obtain Locally	13mm Socket
	Obtain Locally	Wrench 9/16”
	Obtain Locally	Diagonal Cutter
	Obtain Locally	Tape Measure
	Obtain Locally	Cutter, Cable
	Obtain Locally	Stripper, Cable Jacket Adjustable Head
	Obtain Locally	Crimper, Hydraulic Battery Cable (16 mm^2 die)
	Obtain Locally	Stripper, Wire 6 AWG
	07-00487-00	Gun, Heat
	Obtain Locally	Torque Wrench

Unit may start automatically at any time even if switch is in the OFF position. Use proper lockout / tagout procedures before inspection / servicing. All unit inspection / servicing to be performed by properly trained personnel only.

Option Overview



The liftgate battery charger option adds an additional (auxiliary) battery charger to the TRU. The battery charger has 460 VAC input and converts this to a 12 VDC output for the purpose of charging a liftgate battery pack.

This option consists of three major components:

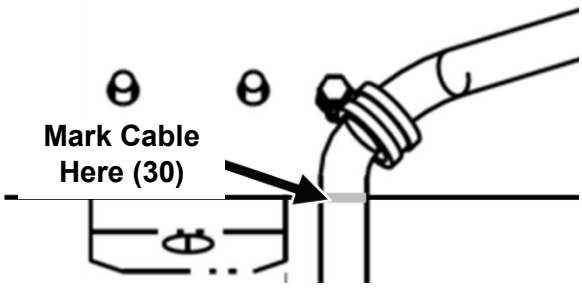
1. Liftgate Battery Charger – Provides 12 VDC power to the liftgate battery pack.
2. High Voltage Splitter Harness – Connects the high voltage input of the primary and liftgate battery chargers to the TRU high voltage harness.
3. Battery Cable Assembly – Connects the liftgate battery charger to the liftgate battery pack.

Cable Length Verification

For new installations proceed to the Battery Charger Installation section of this document.

For existing installations where the liftgate battery cable is being relocated due to the installation of the fuel system kit 76-50188-00/01, the length of the cable must be measured to ensure there is sufficient length.

1

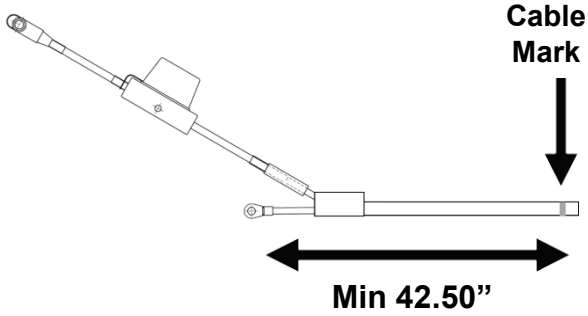


Remove the bottom panel.

Mark the location on the liftgate battery cable jacket with tape (30), where the cable passes the lower edge of the TRU frame.

10

2

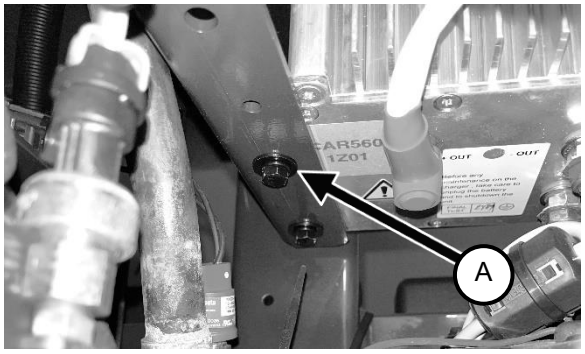
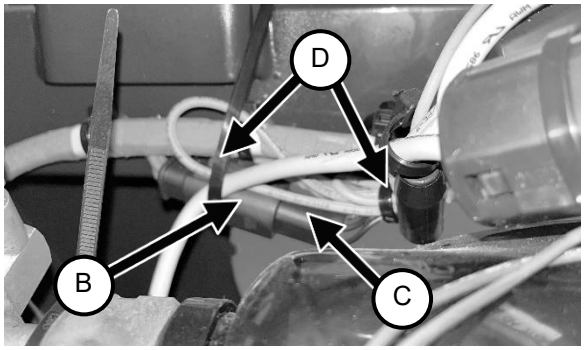
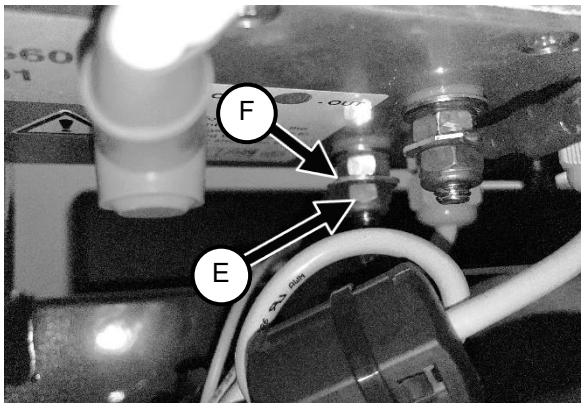
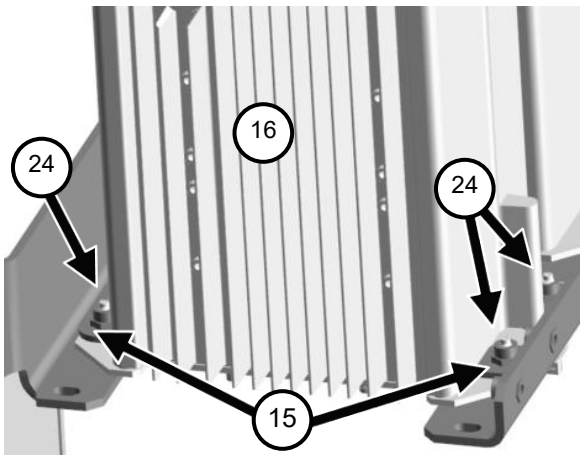


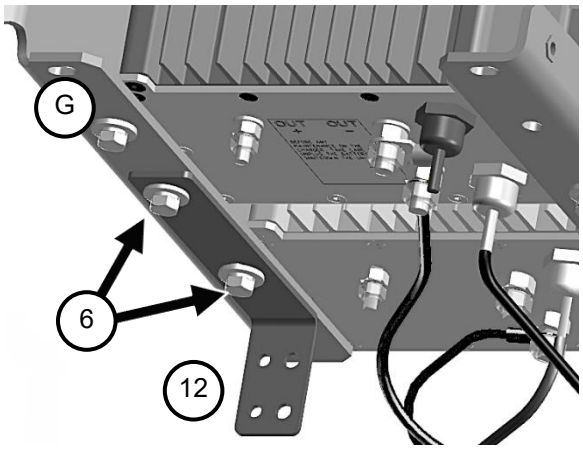
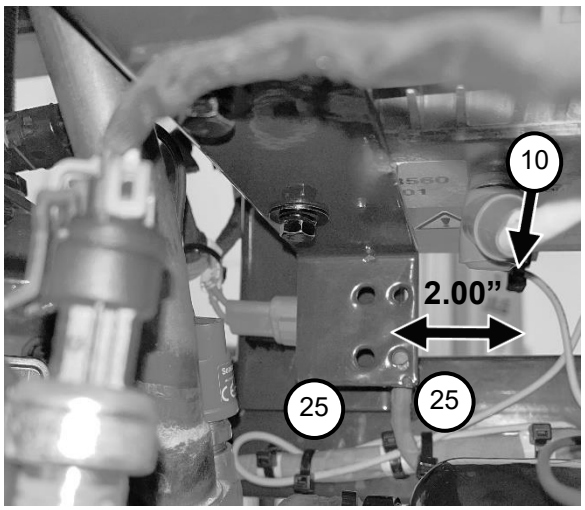
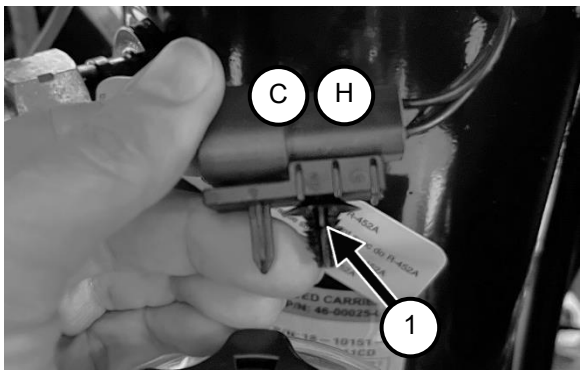
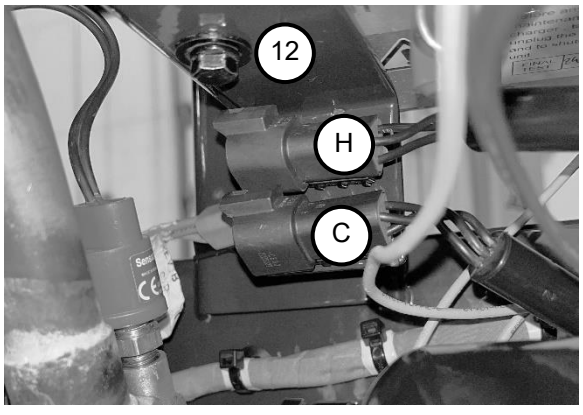
Remove the liftgate battery cable from the TRU.

Measure the distance from the mark on the jacket to the center of the ring terminal on the B- cable (black).

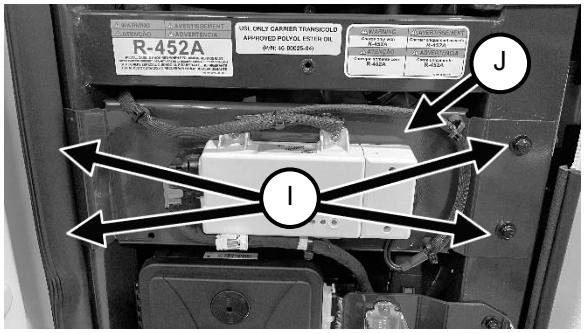
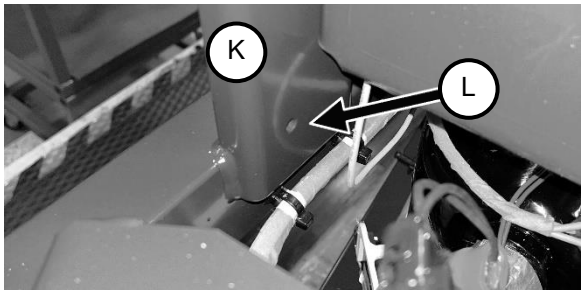
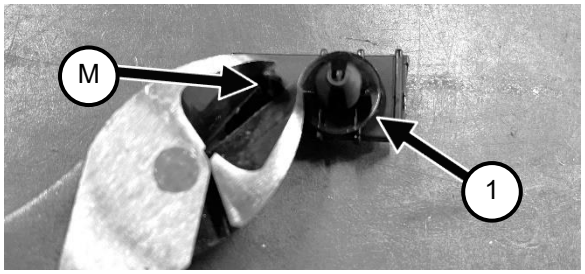
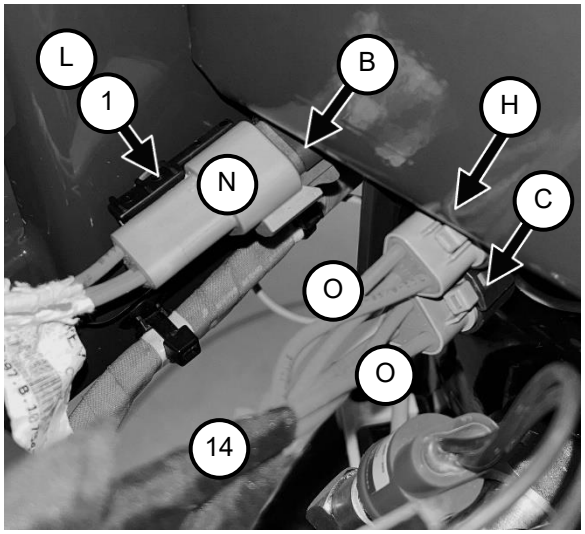
- If the measurement is 42.50” or longer proceed with the installation.
- If the measurement is less than 42.50” the cable between the liftgate battery pack and the TRU must be replaced.

Battery Charger Installation

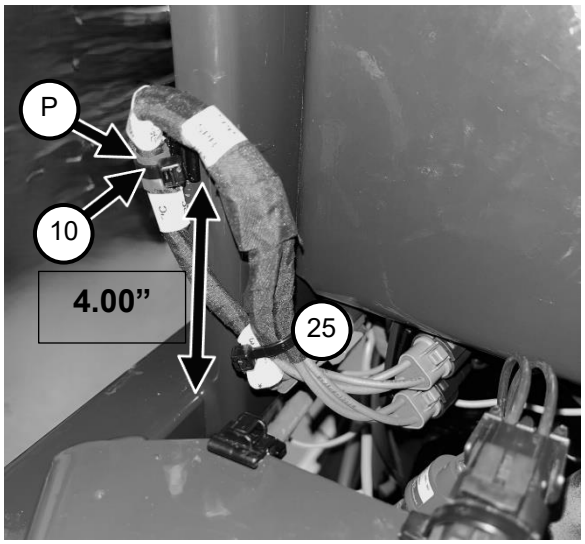
1		Remove the air cleaner housing from the air cleaner support bracket. Remove the front bolt securing the primary battery charger to the left side of the battery charger tray. 10
2		Cut the cable ties securing the 1BC1/BTYC1 connector and ground wires to the frame Separate the 1BC1 (B) to BTCY1 (C) connection. 
3		Remove the nut (E) from the primary battery charger earth ground stud. Remove the one of the ring terminals (F) from the stud. Ensure one earth ground ring terminal is installed on the primary battery charger earth ground stud. Reinstall the removed nut and tighten the nut. The earth ground for the auxiliary battery charger will be installed in a later step. 13 **71 ± 5 in-lb**
4		Position the battery charger nut plates (15) on the auxiliary battery charger (16). Install the auxiliary battery charger in the battery charger tray. Secure with right side and front left with bolts (24). Tighten bolts. 10 **7 ± 0.5 ft-lb**

5		Install the bracket (12) in the orientation shown to the bottom of the left side of the battery charger tray (G) with bolts (6) Tighten bolts. 
6		Install edge clip (10) 2.00” from the edge of the vertical frame tube. Secure the liftgate earth ground wire to the edge clip (10) with the attached cable tie. Secure the primary battery charger earth ground to the harness with cable ties (25). 
7		Install the connector clips (1) on the BTCY1 and BTCY2 (C and H) connector for the primary battery charger and liftgate battery charger in the orientation shown. **Note: When installed correctly there will be an audible “click”.**
8		Push the connector clips (1) into the bracket (12). Position the auxillary battery charger connector (H) in the top position. Position the primary battery charger connector (C) in the lower position.

Splitter Harness Installation

1		Remove the four bolts (I) securing the Lynx module bracket (J) to the frame. Support the bracket (J) to prevent strain on the harness. 10
2		Inspect the vertical frame member behind the battery charger tray to verify how many holes are present. If there is one hole, proceed to step 3 If there are two holes, proceed to step 4.
3		Trim the alignment dowel flush on one of the connector clips (x). 
4		Attach the connector clip (1) to the 1BC1 female end (N) of the splitter harness (14) in the orientation shown. Insert the connector clip (1) in the hole in the frame (L). Connect the unit harness 1BC1 connector (B) to the 1BC1 female end (N) of the splitter harness (14). Connect the BTYC male ends (O) of the splitter harness (14) to the BTCY1 (C) AND BTCY2 (H) connectors.

5



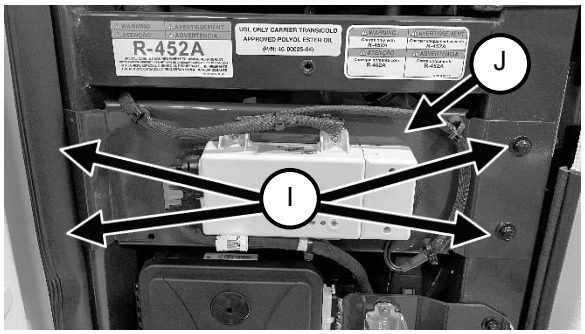
Install edge clip (10) on the vertical edge of the frame 4.00” from the horizontal horizontal frame member.

Secure the splitter harness at the red tape mark (P) with the cable tie that is attached to the edge clip.

Secure the three legs of the splitter harness together with cable tie (25). Position the cable tie on the cloth tape.

Trim the cable tie ends.

6

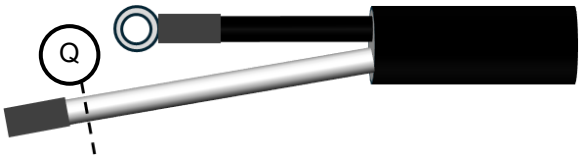


Install the four bolts (I) to secure the Lynx module bracket (J) to the frame.

6 ± 1.0 ft-lb

Battery Cable Preparation

1



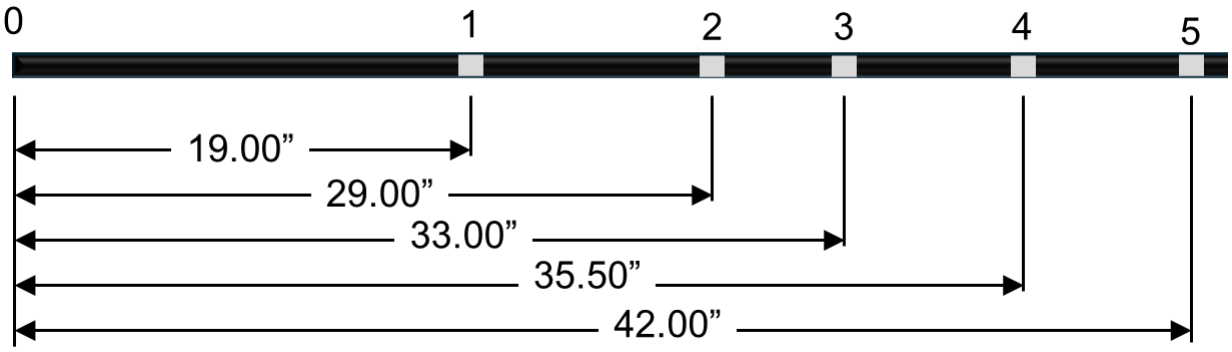
For existing installations the length of the white wire B+ will need to be adjusted.

Cut the wire near the butt splice/heat shrink (Q)

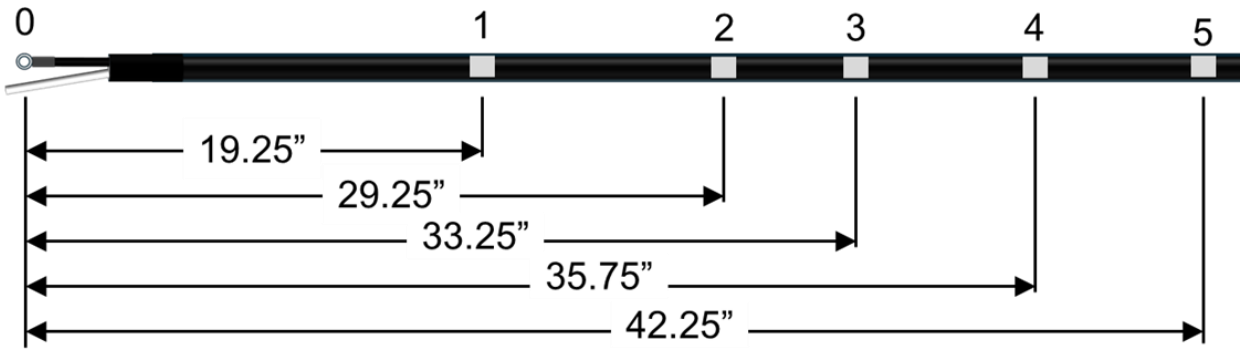
2

Mark the TRU end of the liftgate battery charger cable (26) with tape (30) according to the dimensions shown.

New installation, measure from the end of the cable jacket (0).



Existing installation, measure from the center of the of the B- ring terminal.

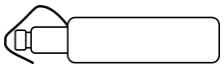


3

Trim the outer sheath of the cable (26) at position 1 with cable jacket trimmer.

NOTICE

Take care not to nick or cut the wires inside the cable.

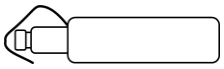


4

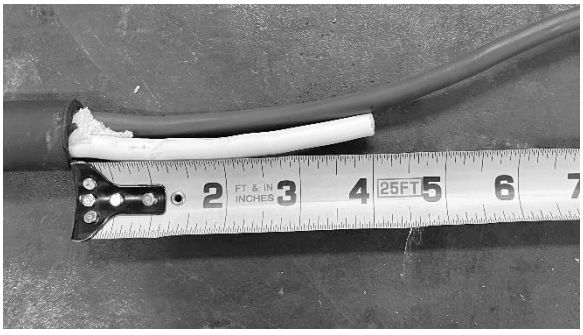
Adjust the head on the cable stripper so that the blade is parallel to the cable jacket. Trim the jacket from position 1 to the TRU end of the liftgate battery charger cable (26).

NOTICE

Take care not to nick or cut the wires inside the cable.

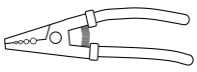


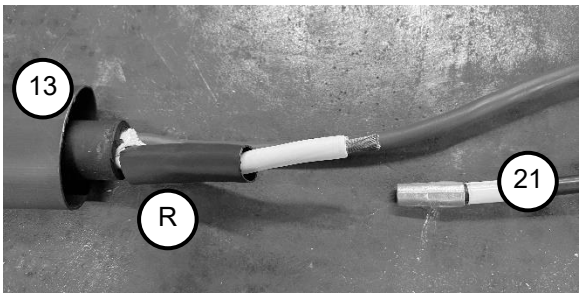
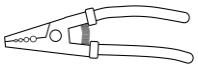
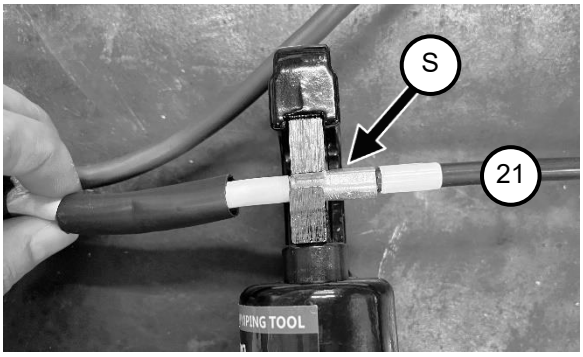
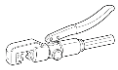
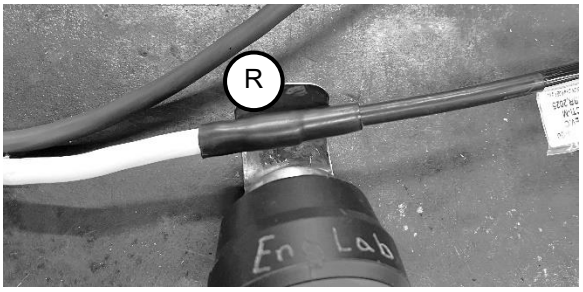
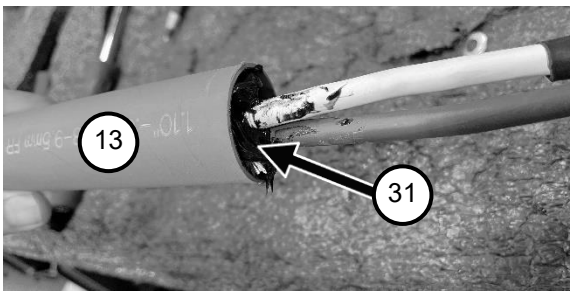
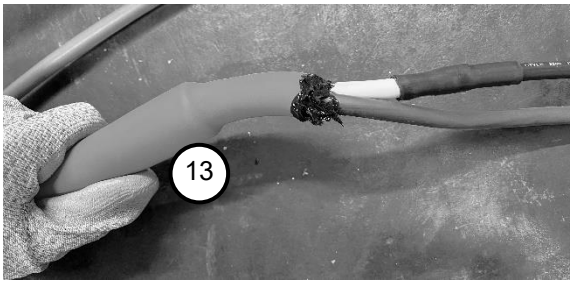
5

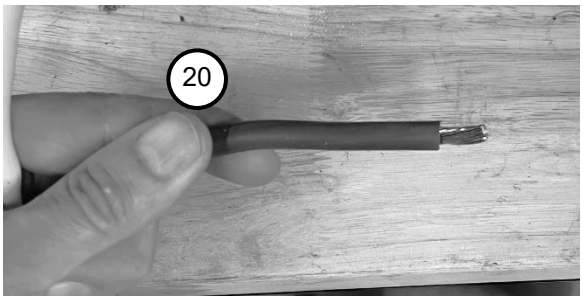
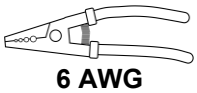
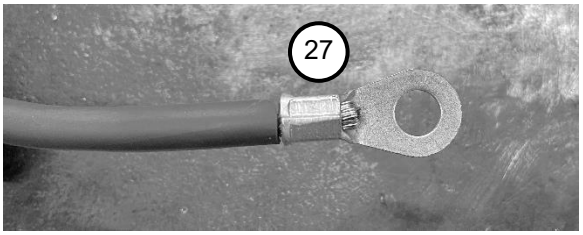
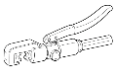
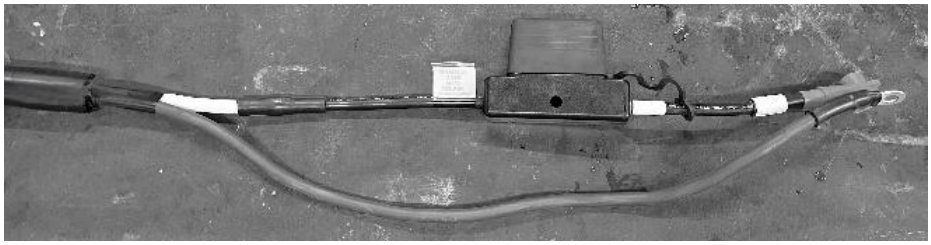


Trim the string filler flush with the end of the jacket.

Cut the white wire 4.00” from the end of the jacket.



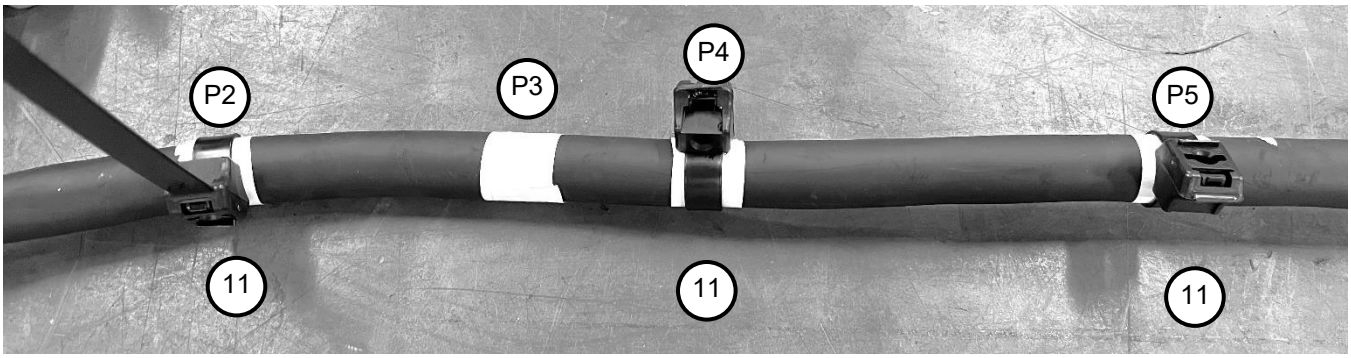
6		Install the large heat shrink (13) over both wires and the cable jacket. Install the small heat shrink (R) over the white wire. This piece of heat shrink is attached to the fuse holder. Strip 0.50” of insulation from the end of the white wire.  **6 AWG**
7		Insert the stripped end of the white wire into the pre-installed butt splice (S) on the fuse holder (21). Crimp the butt splice (S). Pull on the wires to verify the crimp connection.  **16 mm²**
8		Center the heat shrink (R) over the butt splice on the white wire. Center the large heat shrink (13) over the end of the cable and black/white wires. Use heat gun to shrink the heat shrink . 
9	 	Apply sealant (31) around both wires. Center the heat shrink over the end of the cable jacket. Use heat gun to shrink the heat shrink. **Note: Sealant should be visible around and between both wires.** 

10		Cut the heat shrink (20) included in the kit into two equal length pieces. Install one piece of heat shrink (20) on the black wire Strip 0.50” of insulation from the end of the black wire  **6 AWG**
11		Insert the stripped end of the black wire into the ring terminal (27) Crimp the ring terminal. Pull on the wire/terminal to verify the crimp connection  **16 mm²**
12		Position the heat shrink (20) on the black wire so that it contacts the ring terminal. Use heat gun to shrink the heat shrink. 
	 Completed Battery Charger Cable End	

Battery Cable Installation (TRU)

1

Apply cable ties (11) at the position and orientation shown.



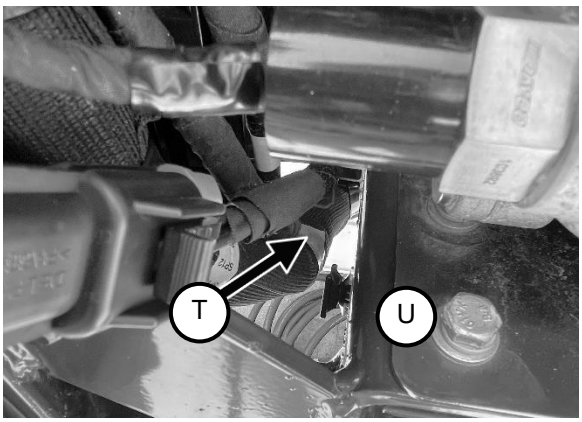
P2 - Cable tie wrapped around cable with radius facing away. Trim end that is wrapped around the cable. Upper cable tie end oriented vertically.

P3 - No cable tie applied

P4 - Cable tie wrapped around cable with radius facing toward. Trim both ends.

P5 - Cable tie wrapped around cable and rotated toward 45°. Trim both ends.

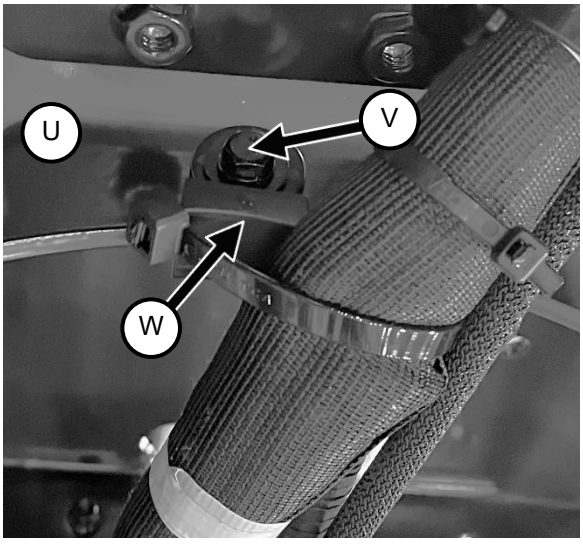
2



Cut the cable tie securing the TRU harness to the left side of the compressor base (U) at fir tree (T).

Remove the fir tree base (T) that held the cable tie from the compressor base.

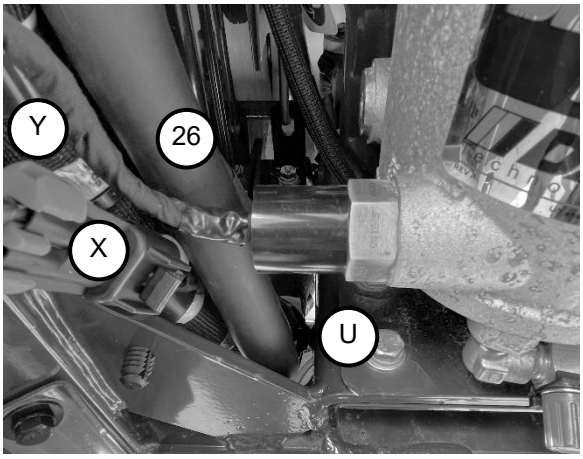
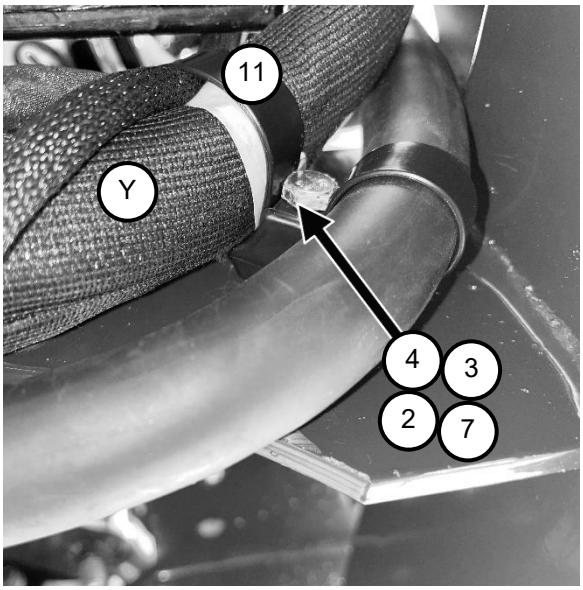
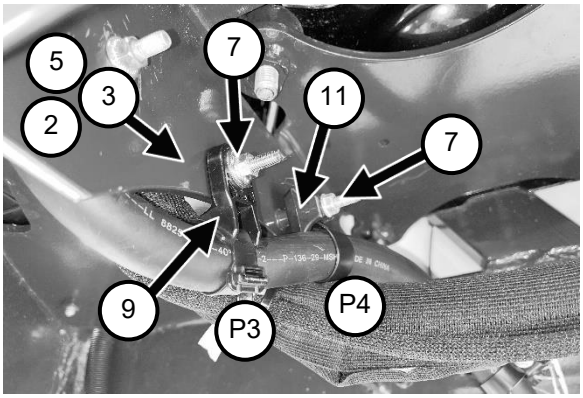
3

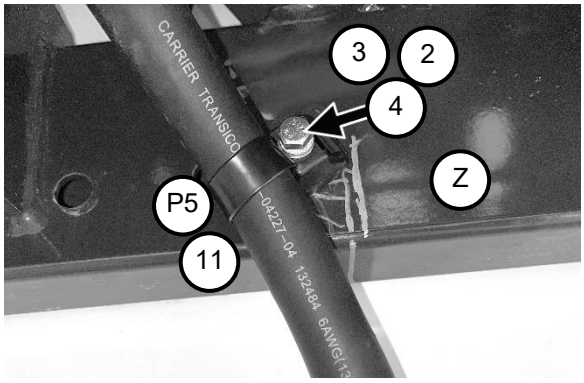
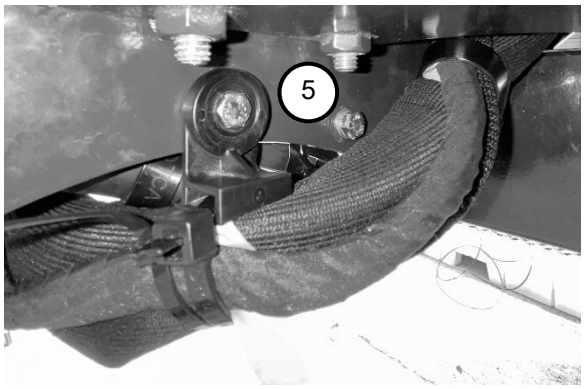
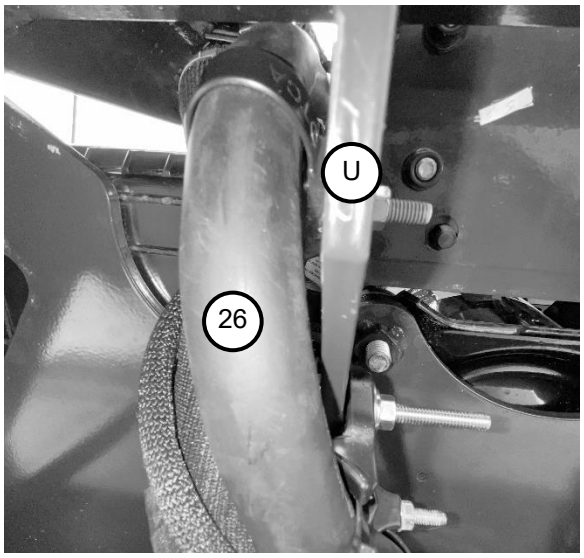


Remove the bolt (V) securing the harness support (W) to the left side of the compressor base.

Resecure harness support (W) with bolt (5) , lock washer (3), and flat washer (2).

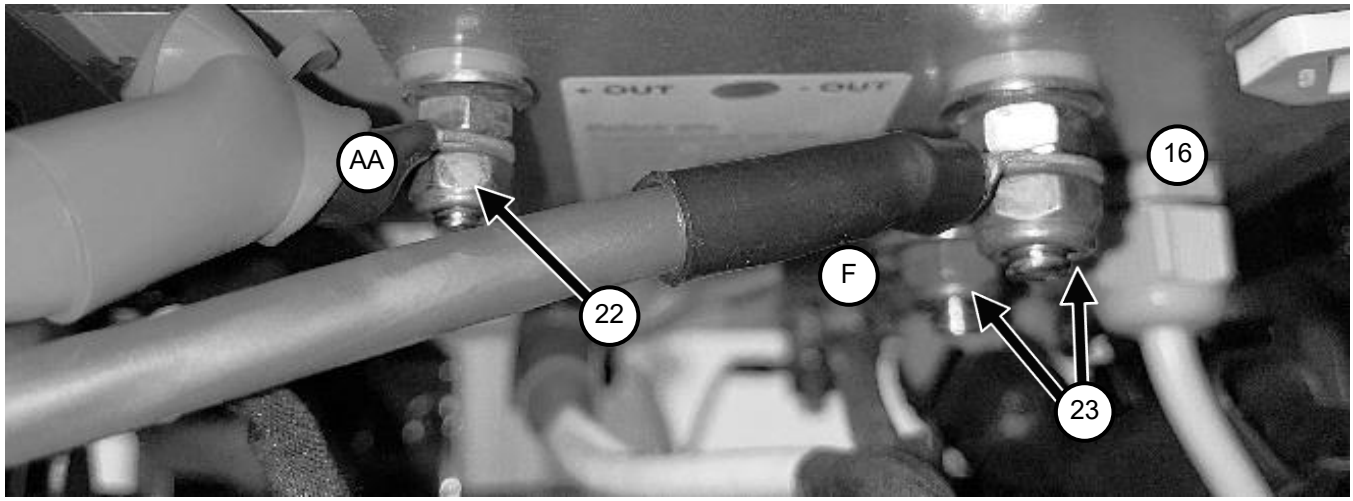
5 ± 1.0 ft-lb

4		Cut the cable tie securing the FH connector (X) to the TRU harness (Y) if equipped with fuel heat option. Route the cable (26) between the compressor base (U) and TRU harness (Y). **Note: Route the black and white wires one at a time through this area. Removing the fuse cover and fuse will also make it easier to route the cable in this area.** 
5		Attached the unused cable tie (11) for position 2 around the tape mark on the TRU harness (Y) that was removed in step 2 of this section. Trim the end of the cable tie flush with the mount. Secure the mount with bolt (4), lock washer (3), flat washer (2), and nut (7).  **5 ± 1.0 ft-lb**
6		Install the cable tie mount (11) P4 on the bolt (5) installed in step 3. Secure cable tie mount with nut (7) and tigthen. Install bolt (5), lock washer (3), and flat washer (2) into the frame insert on the left side of the compressor base . Install cable clamp (9) over the frame insert so that the curved part faces toward the battery. Secure cable clamp (9) with nut (7) and tighten. Secure cable location P3 to support with cable tie (8).  **5 ± 1.0 ft-lb**

7		Install bolt (4), lock washer (3), flat washer (2) in the cable tie mount (11) P5. Install bolt in the frame insert on the horizontal frame tube (Z). Adjust the angle of the cable so that it will exit the opening in the bottom panel when installed. Tighten the bolt. 10 **5 ± 1.0 ft-lb**
Inspection		Inspect the TRU harness on the left side of the compressor base to verify that the bolt head (5) does not contact the TRU harness. If the bolt does contact the harness, cut the cable tie securing the TRU harness to the cable support. Adjust the position of the harness so the harness does not contact and install new cable tie (25)
Inspection		Inspect the liftgate battery charger cable (26) to verify that the cable does not contact the edge of the compressor base (U). If the cable does contact the edge of the compressor base, adjust the cable clamp position to remove the contact.

Battery Charger 12 VDC Connections.

1



Install the ring terminal for the black wire on the - Out post on the liftgate battery charger (16).

Secure with nut (23) and tighten.

Install ring terminal (AA) (part of the fuse assembly) on the + Out post on the liftate battery charger.

Secure with nut (22).

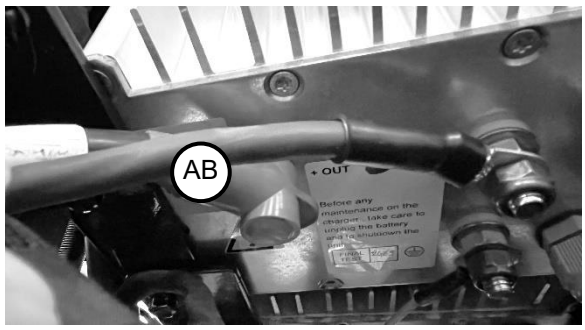
Install the earth ground ring terminal (F) on the ground post of the liftgate battery charger.

Secure with nut (23) and tighten.

Note:It may be necessary to adjust the rotation of the ring terminals so that they do not intefere with the other wires or battery charger posts. Make adjustments before tightening nuts.

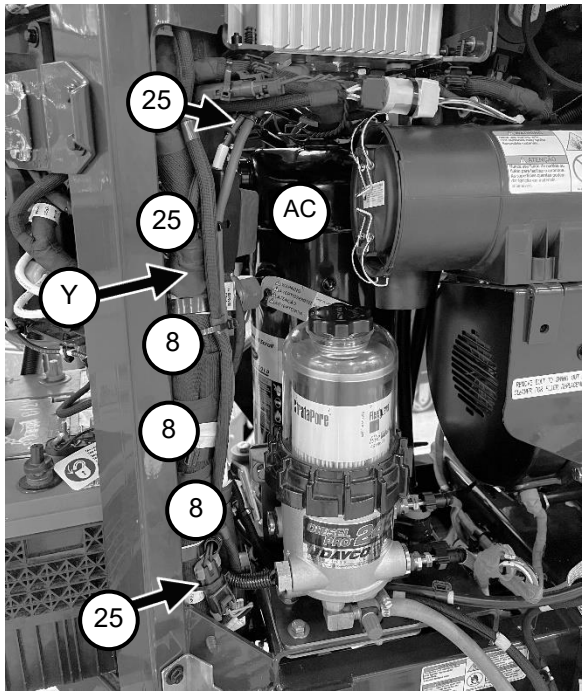
10	13
31 ± 5 in-lb	**71 ± 5 in-lb**

2



Apply dielectric grease (29) to + Out post/nut.

Position boot (AB) over the B+ ring terminal and + Out post.

3		Secure the battery cable (26) to the TRU harness (Y) with cable ties (8) at the yellow tape marks on the TRU harness. Secure the FH connector to the TRU harness with cable tie (25). Secure fuse holder (AC) to TRU harness using the mounting hole with cable tie (25). Secure black and white wires together with cable tie (25) 4.00” from charger connections. Remove the fuse cover and fuse. Apply dielectric grease to fuse holder terminals. Install fuse and fuse cover. 

Cable Installation and Connection (Liftgate Battery Pack)

1	Route the liftgate battery charger cable from the TRU to the liftgate battery pack. • Avoid routing the cable over sharp edges, pinch points, or heat sources. • Install the appropriate size gromet where the cable passes through panels or crossmembers. • Secure the cable every 12.00” (mm) and at the beginning and end of each bend. • Fuse holder must be installed and located inside battery pack enclosure.
2	Prepare the battery pack end of the cable using the same method used in the Battery Cable Preparation section of this document. **⚠ CAUTION** **Fuse holders supplied in the kit must be installed at the TRU and liftgate battery ends of the cable.** The cable cut lengths will need to be adjusted depending on the number of batteries and configuration. Note: The B- ring terminal used at the liftgate battery has a larger mounting hole diameter than the one used at the battery charger.
3	Connect the ring terminals to the battery pack according to the battery pack manufacturer recommendations. Secure the fuse holder inside the battery pack with cable ties or hardware using the fuse mounting hole.
4	Remove the fuse cover and fuse. Apply dielectric grease (29) to fuse holder terminals. Install fuse and fuse cover.

Final Checks and Operation Verification

1	Reinstall the air cleaner housing if removed.
2	Reinstall the bottom panel. Refer to 98-02526.
3	Remove LOTO.
4	Verify battery charger operation. Refer to section 62-11640 Section 8.9.11.