

Revisions to this document are noted
by a stripe in the left-hand margin

SIL 12-EP-14, Rev. B
September, 2017
Page 1 of 44

SUBJECT: Replacing Current Sensors Inside the Dual Power Inverter Module 2 (DPIM2)

MODELS AFFECTED: H 40/50 EP™ System Equipped With DPIM2

Tools Required

- J-51586 Tab Bending Tool (available at Allison.service-solutions.com)
- J-46708 Multimeter (available at Allison.service-solutions.com) or equivalent
- Electrostatic Discharge Wrist Strap (Tool Number 7744 (available at Allison.service-solutions.com) or equivalent) (Refer to Figure 2)
- Pick or Small Flat Blade Screwdriver
- Torx Plus™ T20 Bit
- Torx Plus™ T25 Bit
- 6mm Hex Key
- 8mm Hex Socket
- 11mm Hex Socket
- Loctite® 242
- Loctite® 425

Parts Required

- Current Sensor and Harness Service Kit P/N 29556287 (refer to following notes)
- NyoGel® 760G Synthetic Lubricant P/N 29559015 (refer to following notes)

Introduction:

This Service Information Letter (SIL) announces the availability of the Current Sensor and Harness Service Kit (Electronic Service Kit P/N 29556287) and includes the procedure to replace the Current Sensors located inside the DPIM2. The availability of these kits eliminates the need for a complete DPIM replacement under certain failure conditions.



NOTE: Components and replacement procedures are the same for Inverter A and Inverter B.

BC / SL7477EN

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Please Note: Allison Transmission Service Information Letters are intended for use by professional, trained technicians, not for the "do-it-yourselfer." They are written to inform those technicians of conditions that may occur on some transmission models (or serial numbers ranges) or to provide information that could assist in the proper servicing of a specific Allison transmission. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do a job properly and safely. If a condition is described, do not assume that the Service Information Letter applies to your transmission, or that your transmission has the condition described. Product evolution and information updates are inevitable. Please see your authorized Allison Transmission service dealer or distributor to understand if your particular transmission may benefit from the information contained within the Service Information Letter.



NOTE: Refer to the attachment at the end of this SIL for information regarding the name and location of components within the DPIM2.



NOTE: Using one kit (P/N 29556287) will provide the parts necessary to replace Current Sensors on either the Inverter A or Inverter B side. When replacing a failed Current Sensor, this kit will include components to replace all Current Sensors and Harnesses (Phase A, B, and C) on ONLY one side of the DPIM (Inverter A or B).



NOTE: NyoGel® 760G (P/N 29559015) is required during current sensor installation. Order one (1) tube of NyoGel® 760G for each Electronic Service Kit ordered.



NOTE: Two kits (P/N 29556287) and two (2) tubes of NyoGel® 760G (P/N 29559015) are required in order to replace all six (6) Current Sensors in the DPIM.

Refer to Table 1 for Current Sensor and Harness Service Kit contents.

Table 1. Current Sensor and Harness Service Kit

Part Name	Part Number	Quantity
Electronic Service Kit	29556287	1
Harness Assembly	29547593	3
Current Sensor	29547591	3
Gasket, Cover	29540714	1
Ty Wrap – 4"	*	10
Ty Wrap – 8"	*	5
* Ty Wrap material to be nylon 6/6 or approved equivalent.		



NOTE: Perform the necessary diagnosis prior to ordering Current Sensor and Harness Service Kit P/N 29556287. Contact Allison TAC at (800) 252-5283 to confirm the Current Sensor failure.



NOTE: The DC lug box cover, lug box cover screws, and lug bolts are available as service parts. Refer to the Parts Catalog PC3717EN for part number information.



NOTE: The DPIM Main Cover EMI Gasket (P/N 29540714 - Qty. 1, included in kit P/N 29556287), the DPIM DC Access Lug Box Cover EMI Gasket (P/N 29540614 - Qty. 1), and the DPIM AC Access Lug Box Cover EMI Gaskets (P/N 29540715 - Qty. 2 Required) should be discarded and replaced with new gaskets whenever the covers are removed.

Warranty Claim Information:

1. When a Current Sensor and Harness Service Kit, P/N 29556287, is utilized to repair a failed DPIM under warranty, use Current Sensor and Harness Service Kit P/N 29556287 as the PFP and claim the kit part number in the Service Parts subsection of the AWAARE claim.
2. The replacement of Current Sensors on a DPIM2 under Allison supplied warranty must be approved by Allison H 40/50 EP™ Service Engineering prior to removing DPIM Main Cover.

Diagnosis:

1. Check if ANY of the following Diagnostic Trouble Codes (DTCs) have been logged:
 - DTC 73-23
 - DTC 74-23
 - DTC 73-24
 - DTC 74-24
 - DTC 73-25
 - DTC 74-25
 - DTC 73-26
 - DTC 74-26
 - DTC 73-34
 - DTC 74-34
 - DTC 73-51
 - DTC 74-51



NOTE: The DTCs listed above will identify which current sensor has failed.

2. Record any DTCs that are logged.
3. If any of the DTCs listed in Step 1 are logged, troubleshoot them per H 40/50 EP System™ Troubleshooting Manual TS5812EN. In addition to troubleshooting the aforementioned DTCs, a DPIM Check List should be completed. (Refer to the DPIM Check List appendix of the troubleshooting manual.) A failed Current Sensor will not cause any of the DPIM Check List measurements to be out of specification. If any one of these measurements are out of specification, additional DPIM components may need to be replaced.



WARNING: DO NOT rely on the High Voltage Interlock Loop (HVIL) or control systems to de-energize the system. Always perform the Electrical Disconnect Verification Procedure to be sure the system is discharged before servicing components.

DO NOT attempt to bypass any High Voltage Interlock for any reason. Tampering with the HVIL may result in injury. Failure to follow proper safety procedures may result in serious personal injury or death.



WARNING: Smoke inside the DPIM contains harmful Copper Oxide. Use proper protective equipment to protect your skin and eyes from contact. Avoid inhalation of smoke.



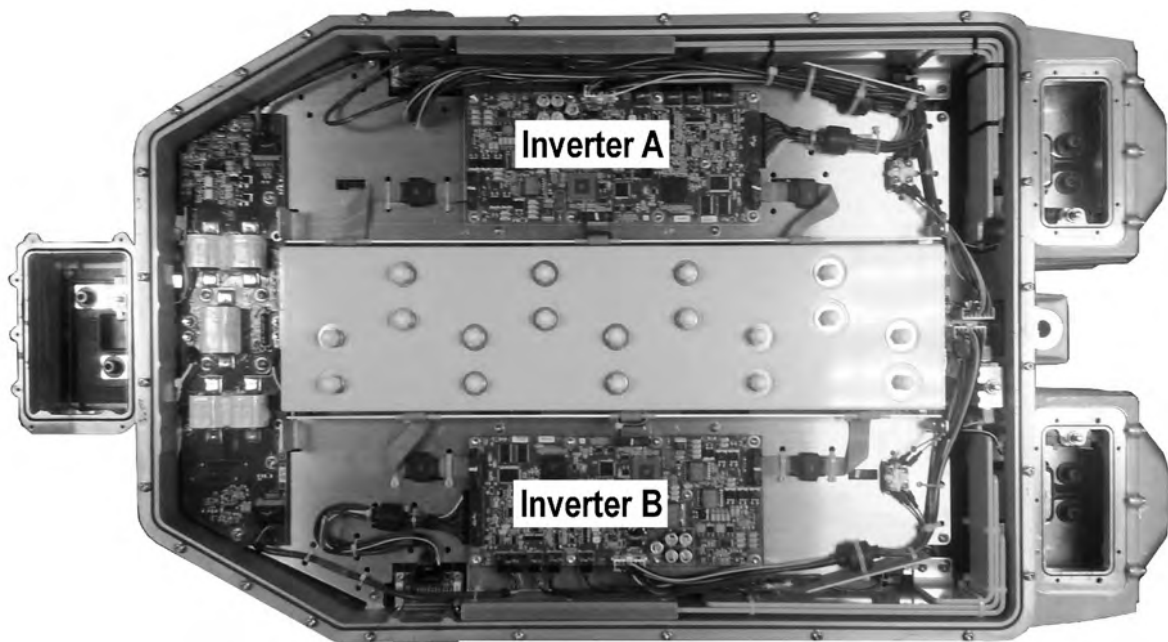
NOTE: Allison Transmission, Inc. requires the removal of the DPIM from the vehicle prior to Current Sensor replacement. Prior to removal of the DPIM, refer to the H 40/50 EP™ System Troubleshooting Manual (TS5812EN) and perform the Electrical Disconnect Verification Procedure.



NOTE: The Current Sensor and Harness replacement should NOT be performed if smoke and/or water damage are present. Photograph the smoke and/or water damage and contact Allison TAC at (800) 252-5283.



NOTE: All cables (AC and DC) must be removed from the DPIM prior to taking measurements shown on the DPIM Check List. For additional information, refer to H 40/50 EP System™ Troubleshooting Manual (TS5812EN).



454519

Figure 1. DPIM2 (Main Cover and Lug Box Covers Removed)

The procedures contained in this SIL are organized into the following sections:

Section 1: Removal of Main Cover and HVIL Circuit Card

Section 2: Removal of BCA Card Mounting Shelf

Section 3: Removal of the AC Busbar Assembly

Section 4: Removal/Installation of Current Sensor (Inverter A Phase C and Inverter B Phase A)

Section 5: Removal/Installation of Current Sensor (Inverter A Phases A and B, and Inverter B Phases B and C)

Section 6: Installation of the AC Busbar Assembly

Section 7: Installation of BCA Card Mounting Shelf

Section 8: Installation of HVIL Circuit Card and Main Cover

Section 1: Removal of Main Cover and HVIL Circuit Card



NOTE: All circuit cards in the DPIM2 are sensitive to electrostatic discharge (ESD). ESD damage can be caused by voltage levels that cannot be felt by humans. When working on the DPIM2, ALWAYS wear an ESD wrist strap to ground any possible electrostatic charge. The strap should be worn around the wrist with the alligator clip securely attached to the DPIM chassis. Refer to Figure 2.



426411

Figure 2. Electrostatic Discharge Wrist Strap (Tool Number 7744 Shown)

1. Using a Torx Plus™ T25 bit, remove twenty-six (26) M5x18mm machine screws that secure the Main Cover to the DPIM Housing (refer to Figure 3). Set the screws aside for reassembly. Remove the Main Cover. Discard the cover gasket.



421911

Figure 3. DPIM Main Cover

2. Exercising care, cut one (1) wire tie at location shown in Figure 4. Do NOT remove any wire ties that pass through the HVIL Circuit Card. Leaving the severed wire ties in place will provide a visual aid for wire tie locations during installation of the replacement circuit card.



422298

Figure 4. HVIL Circuit Card – Wire Tie Location

3. Cut the two (2) wire ties at locations shown in Figure 5 and remove them from the mounts. The wire tie mounts do NOT have to be removed from the DPIM Housing unless they interfere with the removal or installation of the HVIL circuit card.



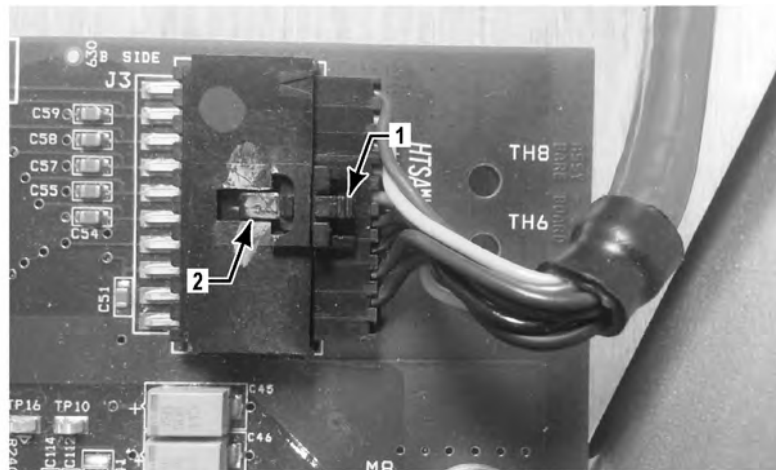
422327

Figure 5. HVIL Circuit Card – Two (2) Wire Tie Locations



CAUTION: Do NOT pull on the wires when removing connectors; doing so may pull the pins out of the connector.

4. When removing connectors, push down on the tab at Location 1 and push the harness out of the connector at Location 2 with a Pick or Small Flat Blade Screwdriver (refer to Figure 6).



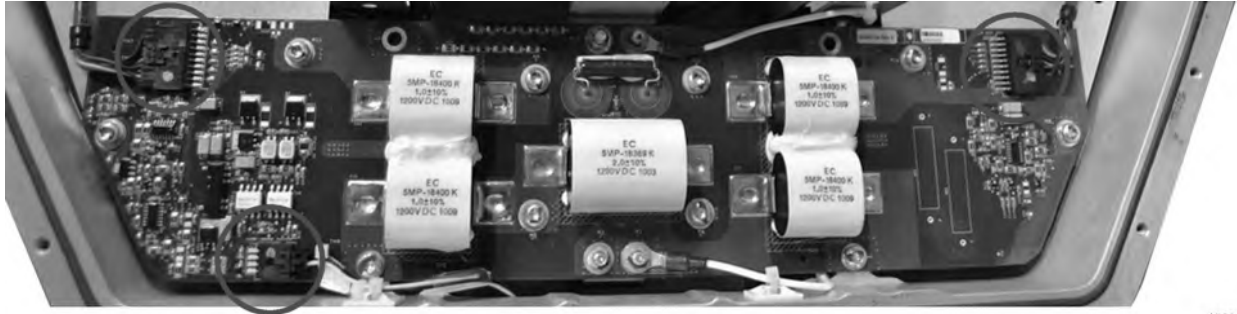
454544

Figure 6. HVIL Circuit Card Connector Removal

5. Remove three (3) wire harness connectors from HVIL Circuit Card surface mount connectors by gently depressing the retaining tab with a pick or small flat blade screwdriver. Refer to Figure 7.



NOTE: Use care to avoid bending or damaging the circuit card connectors.



422350

Figure 7. HVIL Circuit Card – Three (3) Harness Connector Locations



WARNING: Any conductive material (i.e. screws, bolts, nuts, etc.) can cause a short inside the DPIM that will result in permanent and irreversible DPIM damage. All hardware must be accounted for throughout the service procedure.

6. Using an 8mm socket, remove the four (4) M5 nut/washer assemblies as shown in Figure 8. Disconnect the two (2) wire ring terminals from the studs.



422390

Figure 8. HVIL Circuit Card – Four (4) Mounting Nut/Washer Locations (M5)

7. Using a Torx Plus™ T25 bit, remove the four (4) M5x30mm screws securing the HVIL Circuit Card as shown in Figure 9.



422540

Figure 9. HVIL Circuit Card – Four (4) Mounting Screw Locations (M5x30mm)

8. Using a Torx Plus™ T25 bit, remove the two (2) M5x14mm screws securing the HVIL Circuit Card as shown in Figure 10.



422564

Figure 10. HVIL Circuit Card – Two (2) Mounting Screw Locations (M5x14mm)

9. Using a Torx Plus™ T25 bit, remove the four (4) M5x22mm screws securing the HVIL Circuit Card as shown in Figure 11.



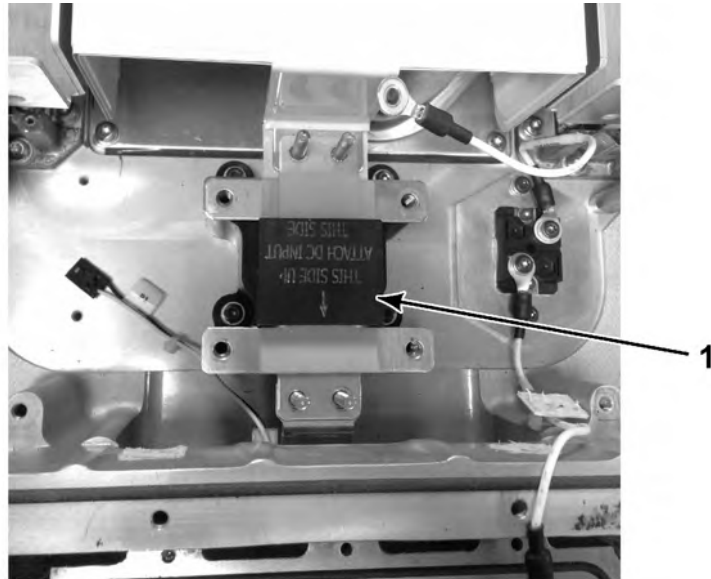
422586

Figure 11. HVIL Circuit Card – Four (4) Mounting Screw Locations (M5x22mm)

10. Lift the HVIL Circuit Card straight up and remove it from the DPIM Housing.
11. Verify that the choke is in place as shown in Figure 12.



NOTE: The choke may have adhered to the underside of the HVIL Circuit Card when it was removed. If this has occurred, reinstall choke to its proper location as shown in Figure 12. The choke must be installed with the arrow pointing toward the DC lug box.



437484

(1) – Choke

Figure 12. Verification of Choke Installation

Section 2: Removal of BCA Card Mounting Shelf

1. As required, carefully cut and remove the wire ties retaining the wire harnesses (refer to Figure 13).

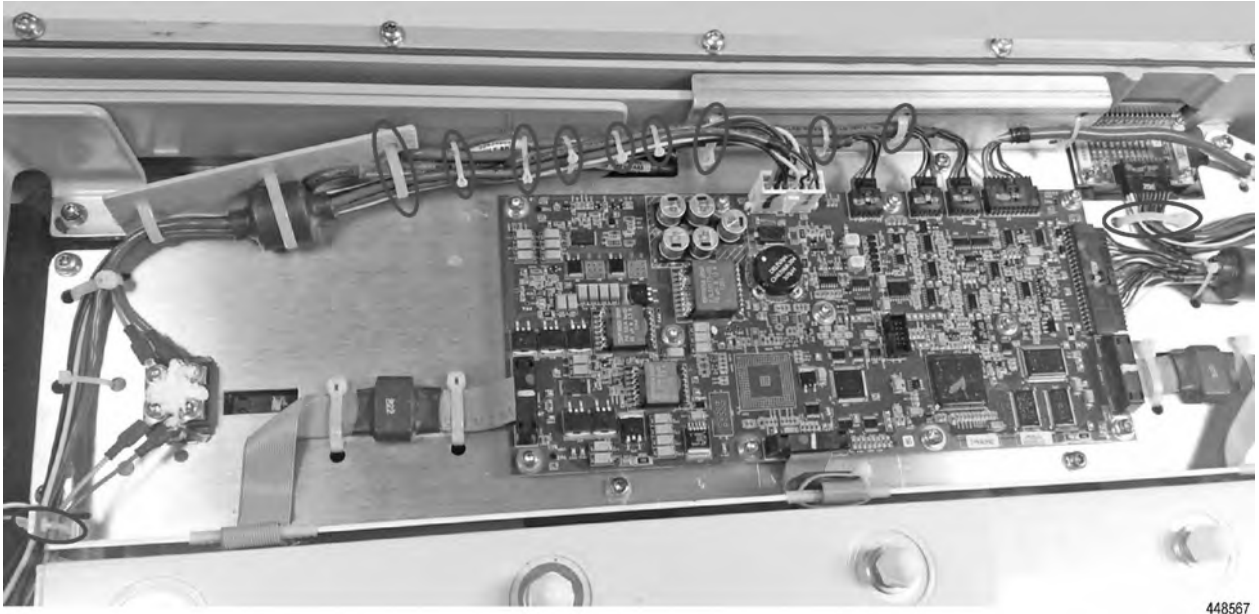


Figure 13. Wire Tie Locations

2. Remove five (5) wire harness connectors from circuit card surface mount connectors by gently depressing the retaining tab with a pick or small flat blade screwdriver (refer to Figure 14 and Figure 15).



NOTE: Use care to avoid bending or damaging the circuit card connectors.

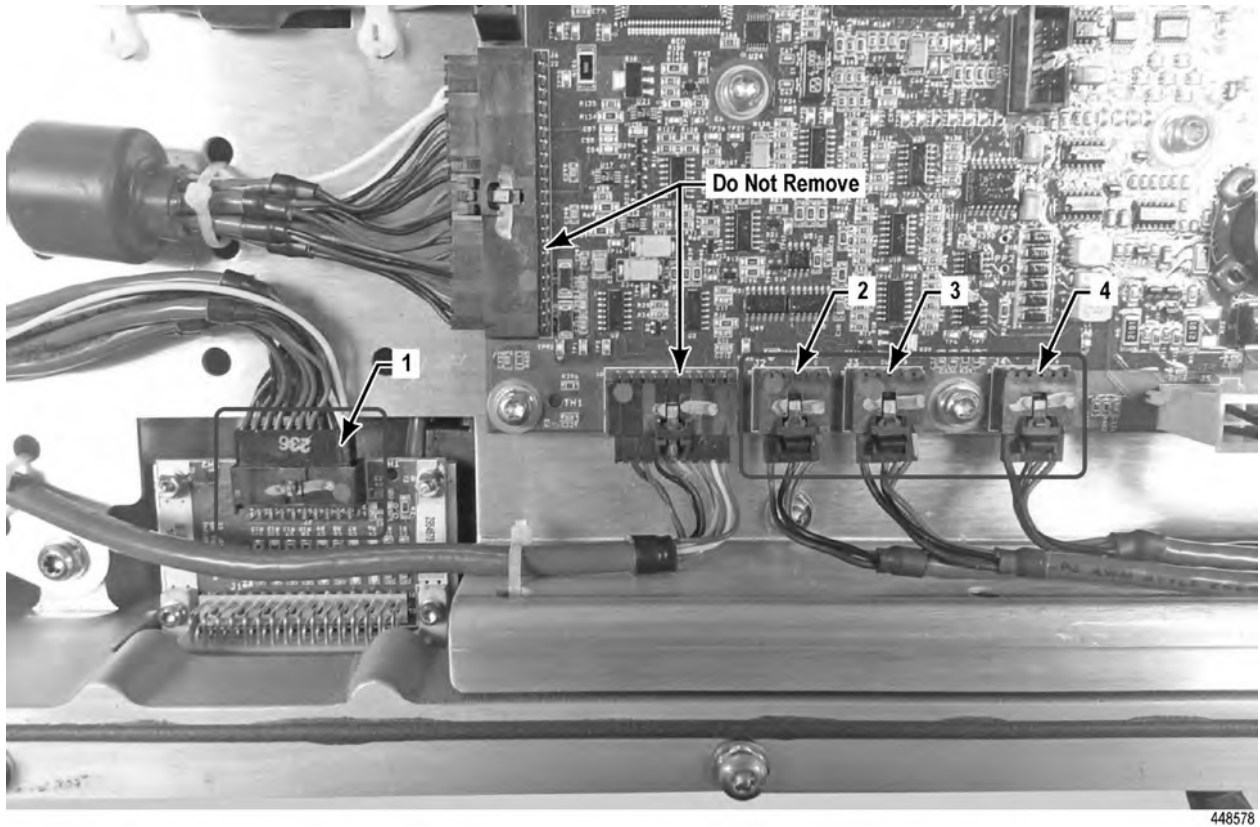


Figure 14. Wire Harness Connector Removal (4 Locations)

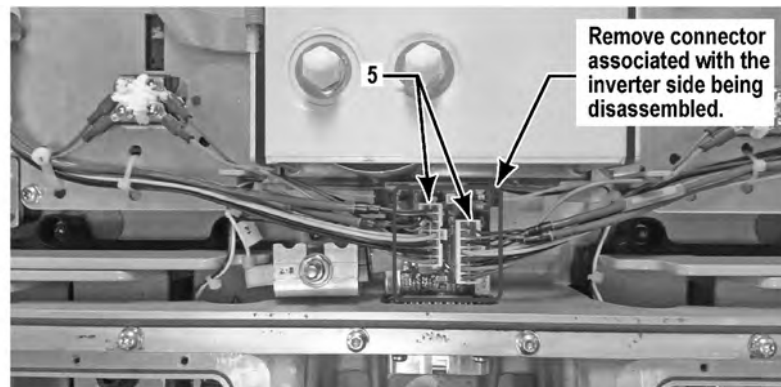


Figure 15. Wire Harness Connector Removal

3. Using a Torx Plus™ T25 bit, remove the seven (7) M5x14mm screws securing the BCA Mounting Shelf (refer to Figure 16).

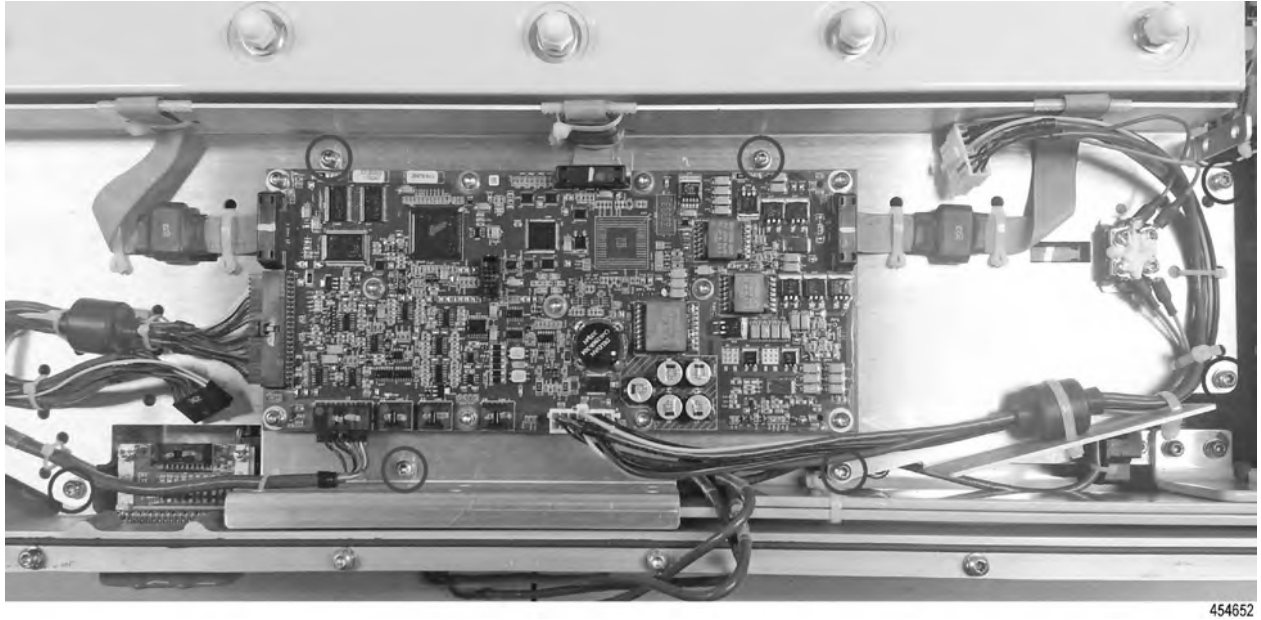


Figure 16. BCA Mounting Shelf Fastener Locations

4. Carefully lift the BCA Mounting Shelf and set in on the side of the chassis as shown in Figure 17.



NOTE: Three (3) harnesses are still connecting the BCA Card to the GATE Drive Cards. Do NOT relocate the BCA Mounting Shelf any farther than as shown in Figure 17.

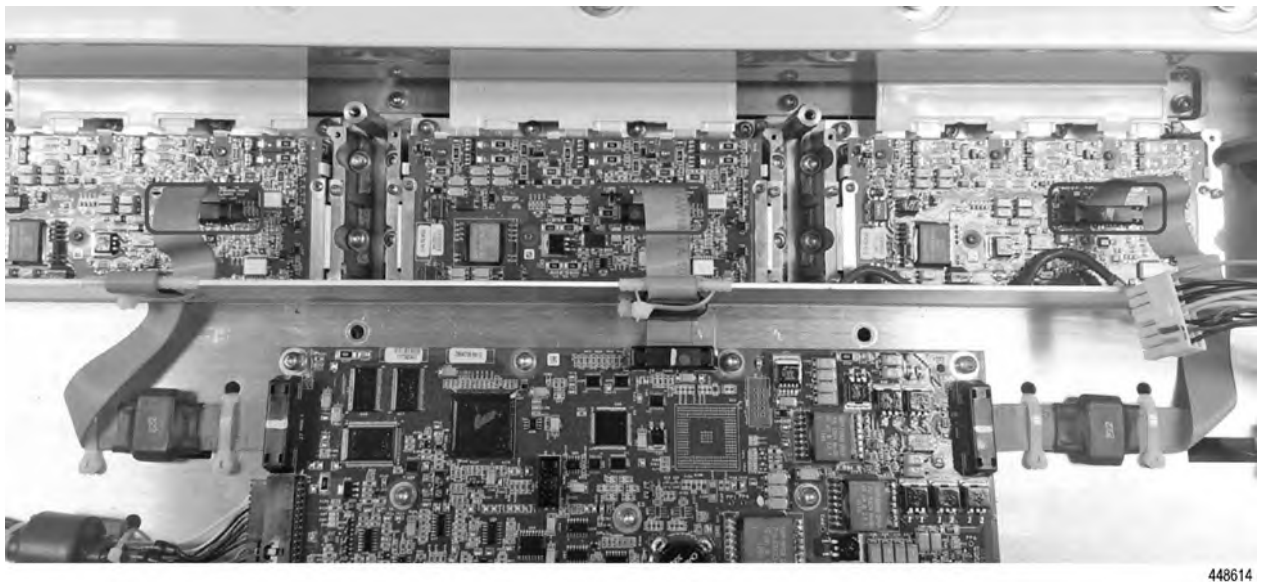
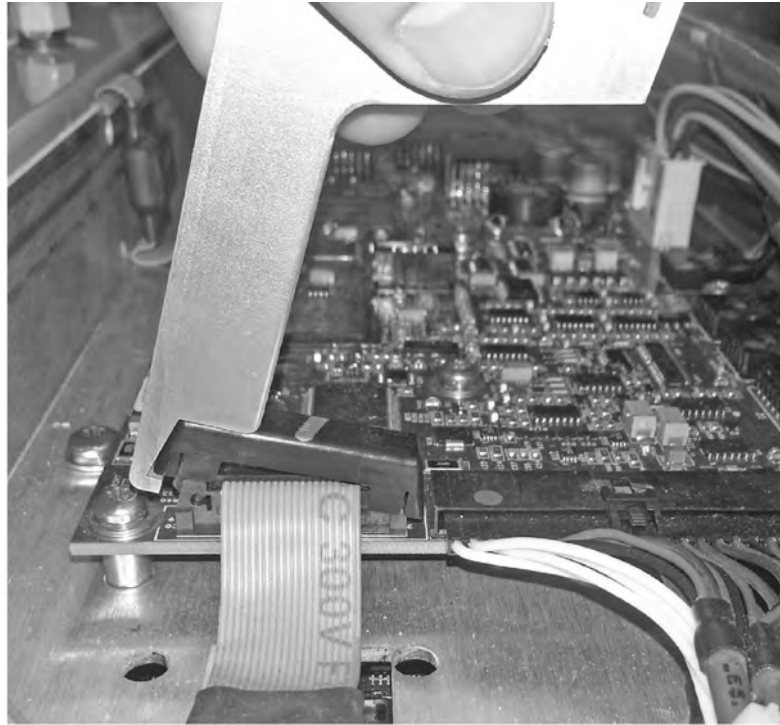


Figure 17. BCA Mounting Shelf (GATE Drive Card Cable Connectors Shown Circled)

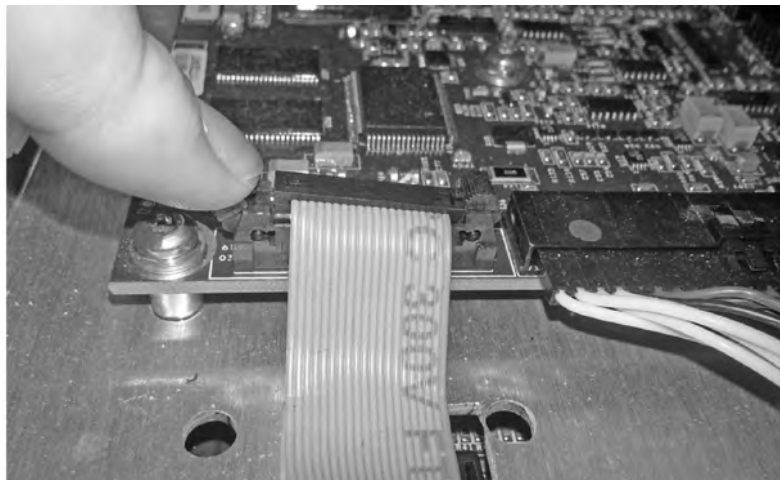
5. Remove three (3) ribbon cable connectors from the GATE Drive Cards (refer to Figure 17) as follows:
 - a. Use the handle of Tab Bending Tool J-51586 to disengage and remove the cable strain relief cap (refer to Figure 18).



448897

Figure 18. Cable Strain Relief Cap Removal (BCA Cable Card Connector Shown for Clarity)

- b. Press the tabs down on both sides of the GATE Drive Card Connector to release the ribbon cable connector (refer to Figure 19).



448879

Figure 19. Releasing the GATE Drive Card Cable Connector (BCA Cable Card Connector Shown for Clarity)

6. Remove the BCA Mounting Shelf from the DPIM to gain access to the three (3) Current Sensors.

Section 3: Removal of the AC Busbar Assembly



NOTE: Refer to Figure 20 for DPIM2 Phase Locations.

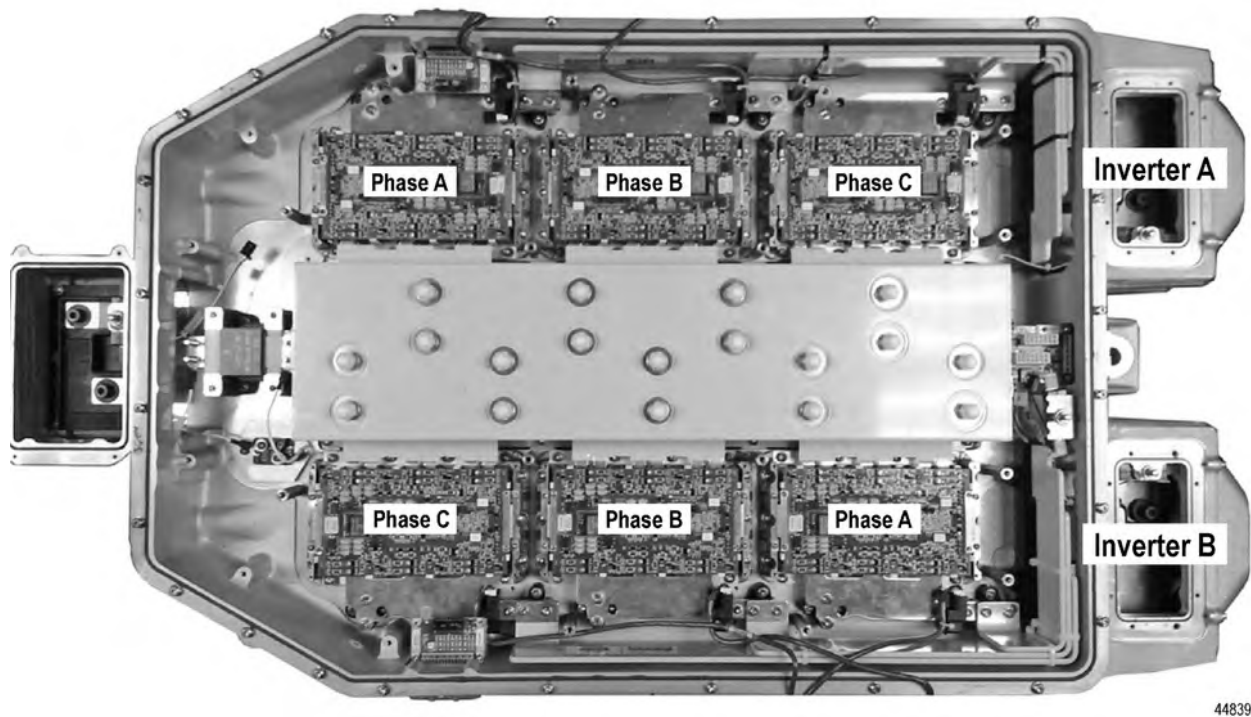
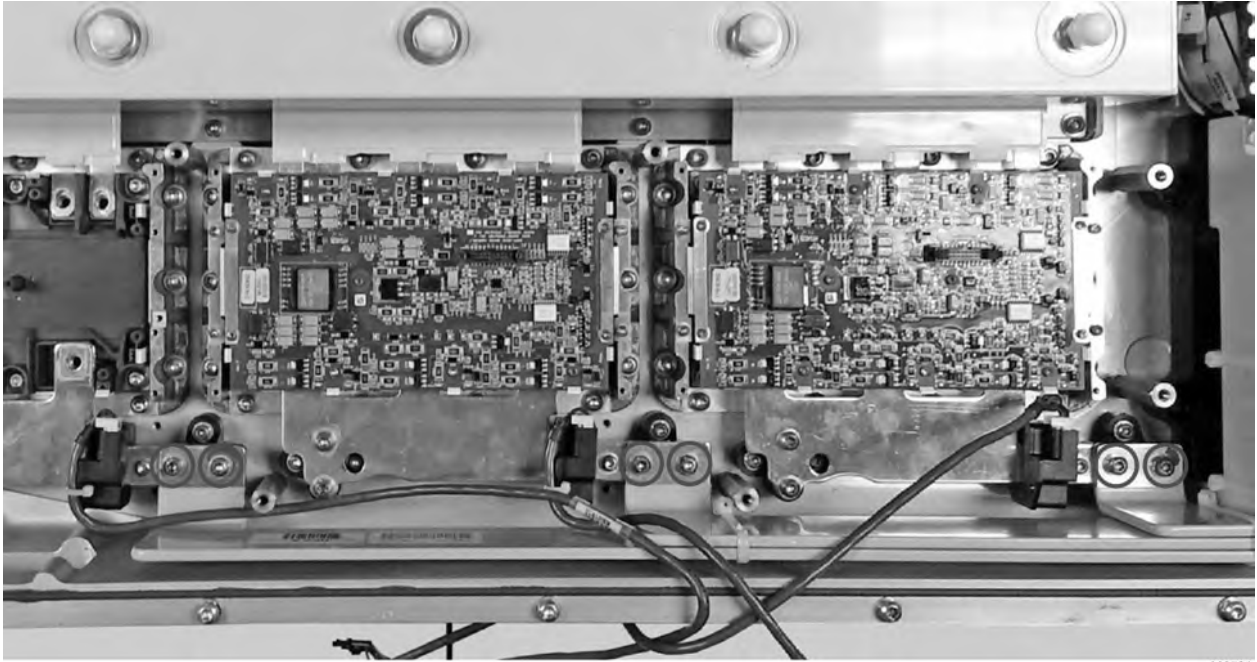


Figure 20. DPIM2 Phase Locations

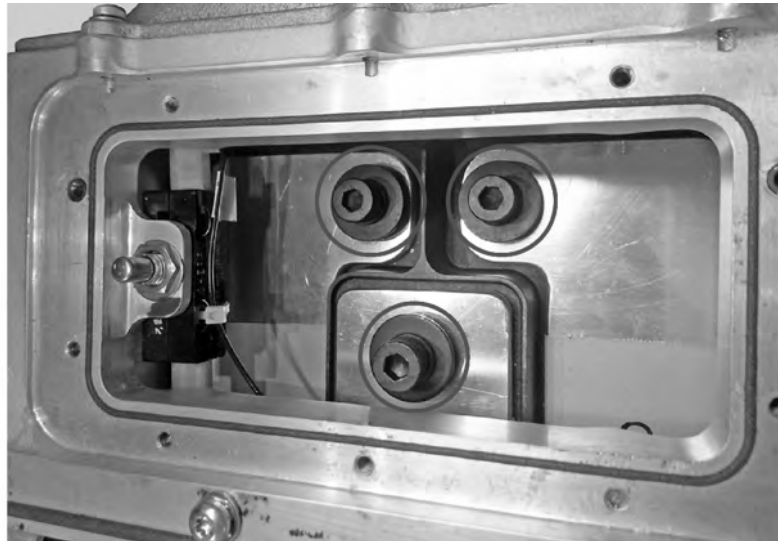
1. Using a Torx Plus™ T25 bit, remove the six (6) M5x22mm screws (refer to Figure 21).



448731

Figure 21. Mounting Screw Locations

2. Using a 6mm hex key, remove the three (3) M8 AC lug bolts (refer to Figure 22).

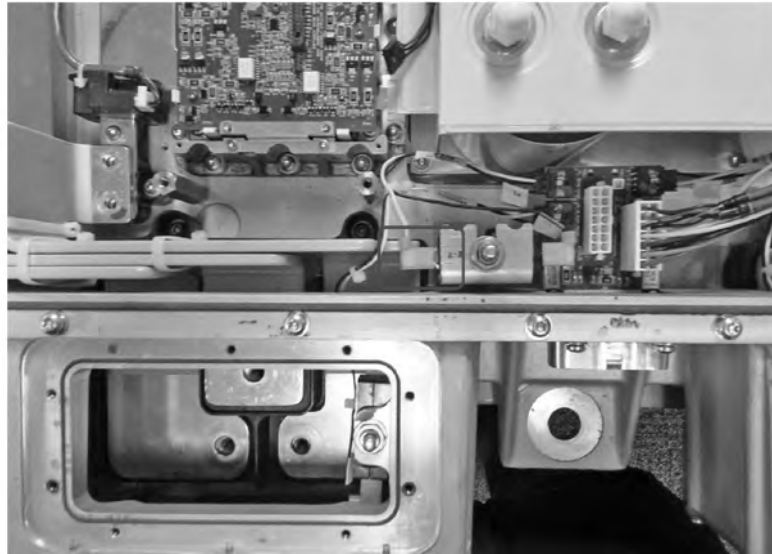


448740

Figure 22. AC Lug Bolts

3. Remove the HVIL switch connector (refer to Figure 23).

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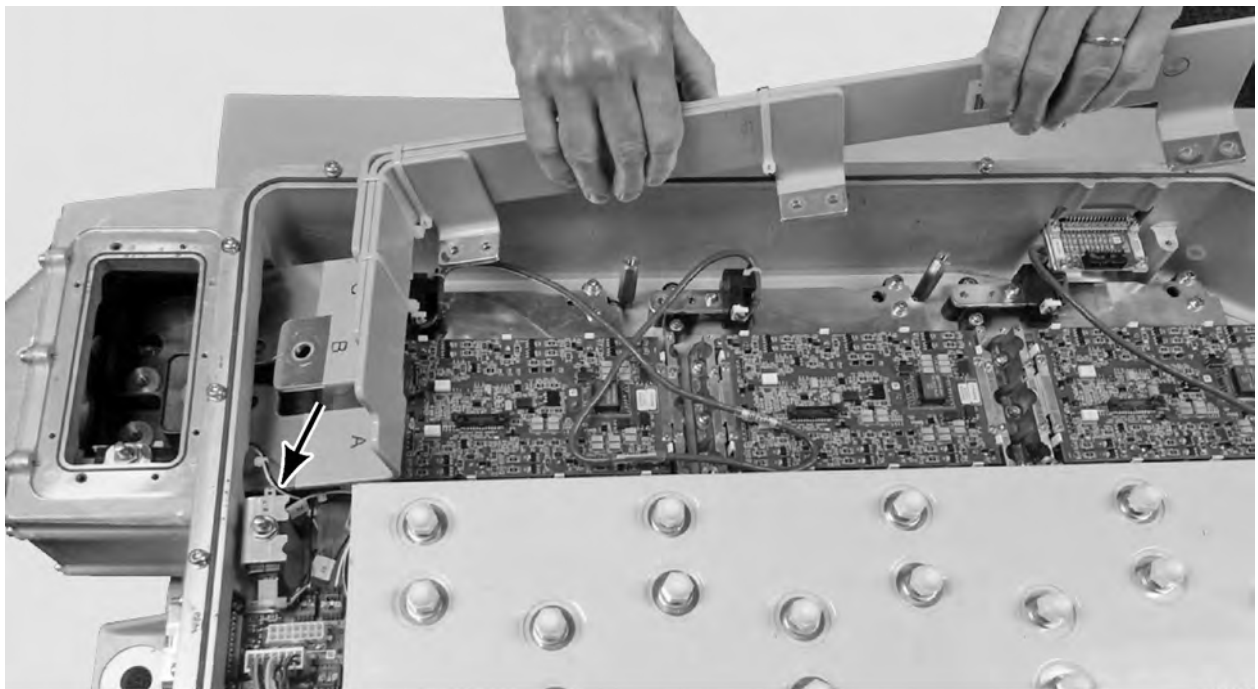
452064

Figure 23. HVIL Switch Location

4. Carefully remove the AC Busbar Assembly by slightly lifting upward then outward from the AC Lug Box (refer to Figure 24).



CAUTION: Do not allow the AC Busbar Assembly to strike the HVIL Switch during the removal process.



452074

Figure 24. Removal of AC Busbar Assembly

Section 4: Removal/Installation of Current Sensor (Inverter A Phase C and Inverter B Phase A)

Current Sensor Removal

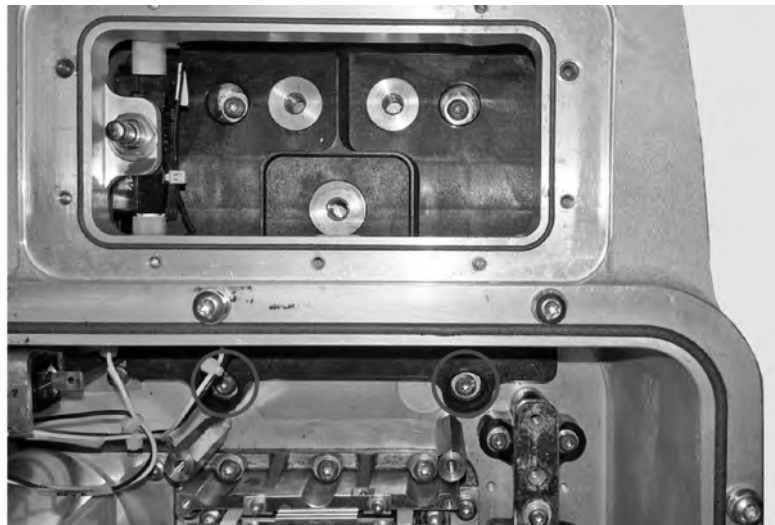
1. Using a Torx Plus™ T25 bit, remove the two (2) M5x22mm screws (refer to Figure 25).



452084

Figure 25. Location of Two (2) M5x22mm Screws

2. Using a Torx Plus™ T25 bit, remove the two (2) M5x18mm screws (refer to Figure 26).



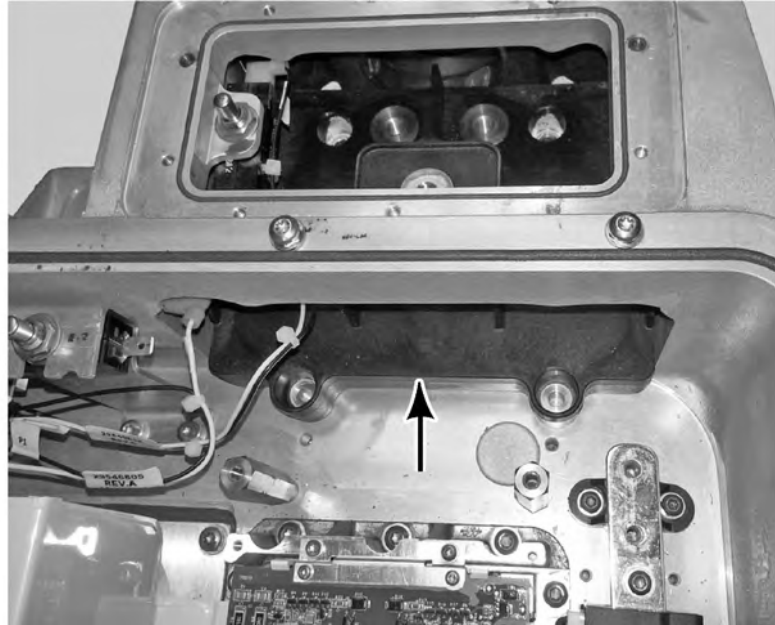
452093

Figure 26. Location of Two (2) M5x18mm Screws

3. Shift the AC Terminal Block farther into the AC Lug Box (refer to Figure 27).



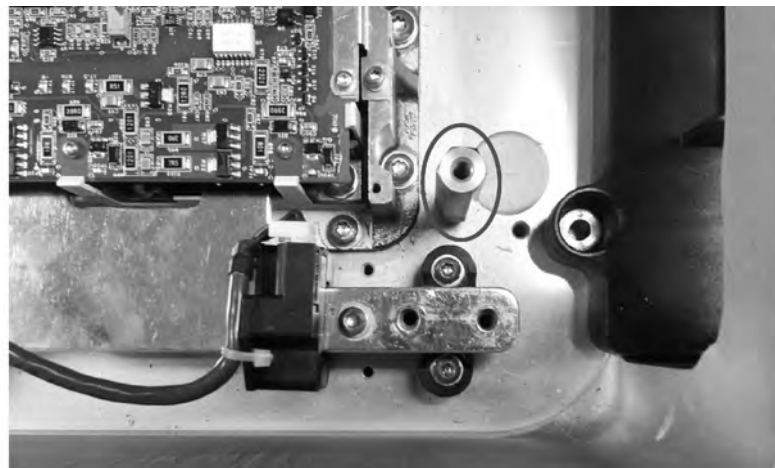
NOTE: Relocating the AC Terminal Block will provide access for the removal of the AC Busbar Support.



452101

Figure 27. Relocating the AC Terminal Block

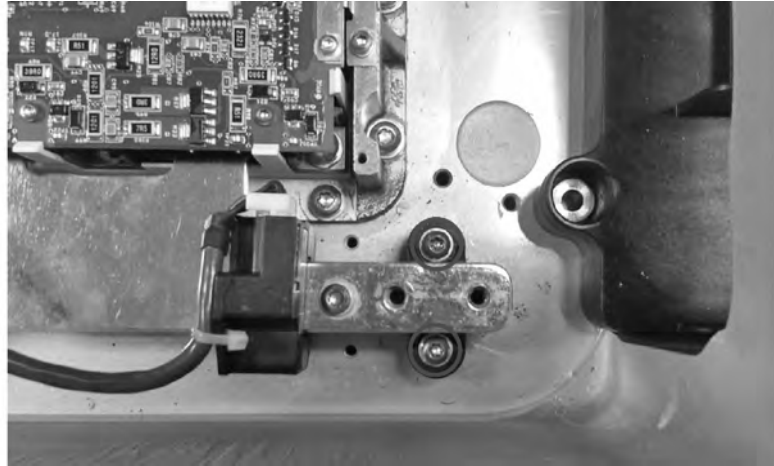
4. Using an 11mm hex socket, remove the one (1) M5 BCA Standoff (refer to Figure 28).



452110

Figure 28. Location of M5 BCA Standoff

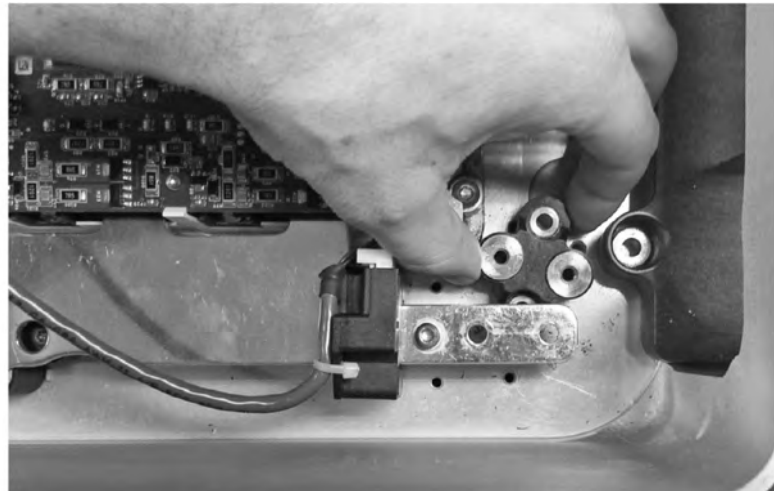
5. Using a Torx Plus™ T20 bit, remove the two (2) M4x22mm screws (refer to Figure 29).



452121

Figure 29. Location of Two (2) M4x22mm Screws

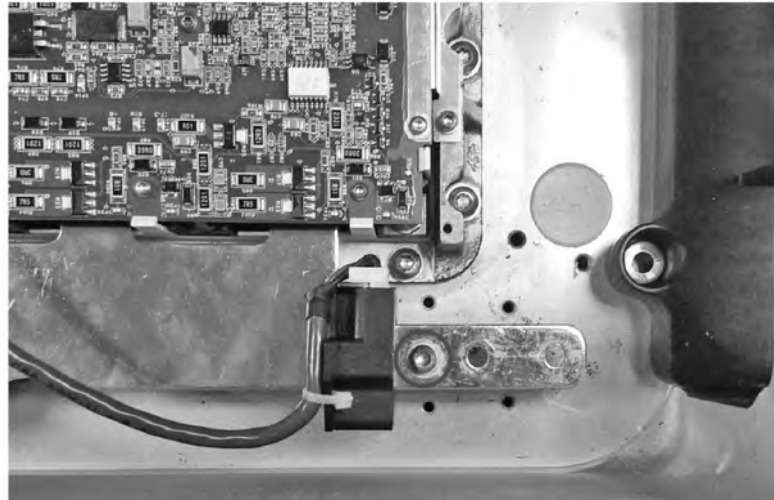
6. Remove the AC Busbar Support by sliding it out from under the AC Busbar (refer to Figure 30).



452131

Figure 30. Removal of AC Busbar Support

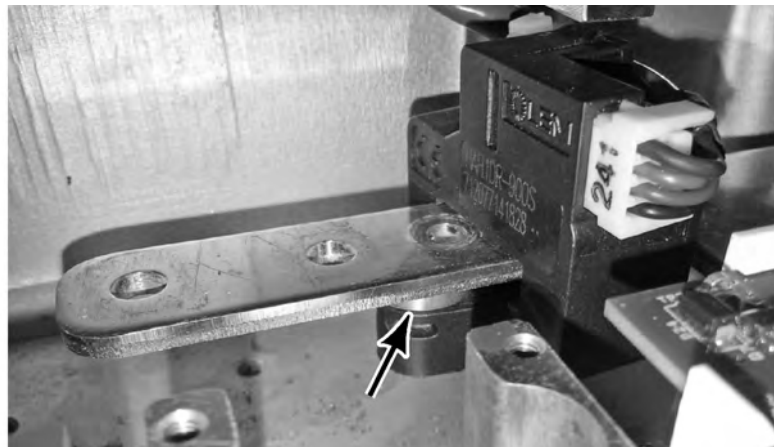
7. Using a Torx Plus™ T20 bit, remove the one (1) M4x19mm screw (refer to Figure 31).



452141

Figure 31. Location of One (1) M4x19mm Screw

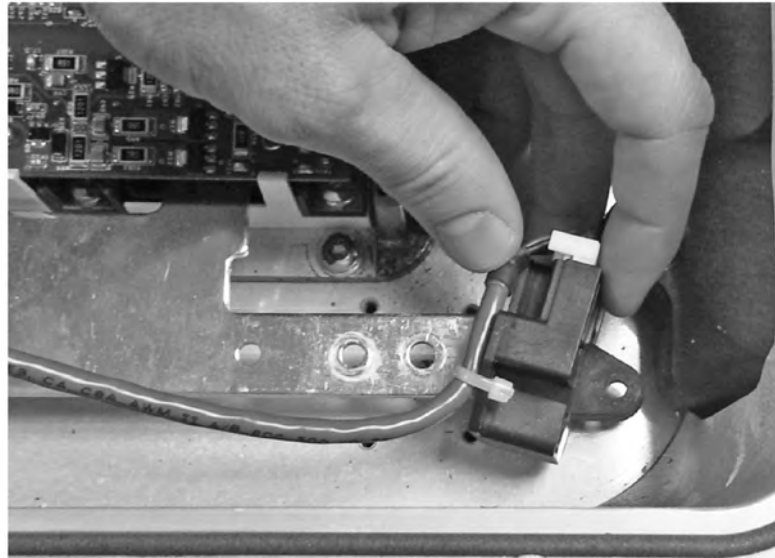
8. Remove the non-magnetic spacer located between the bottom of the Current Sensor and the underside of the AC Busbar (refer to Figure 32).



452150

Figure 32. Non-Magnetic Spacer Location

9. Remove the Current Sensor by sliding it off the end of the AC Busbar (refer to Figure 33).

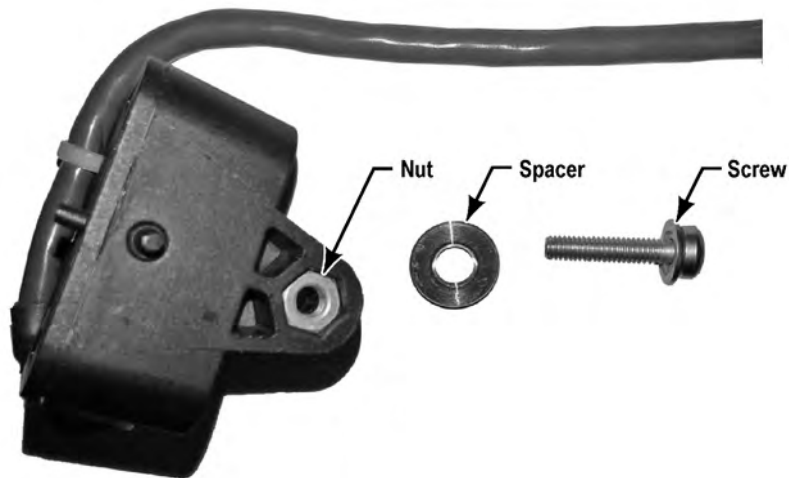


452161

Figure 33. Removal of Current Sensor



CAUTION: Ensure that the screw, spacer and nut have not been left in the DPIM after removing the Current Sensor (refer to Figure 34).



452219

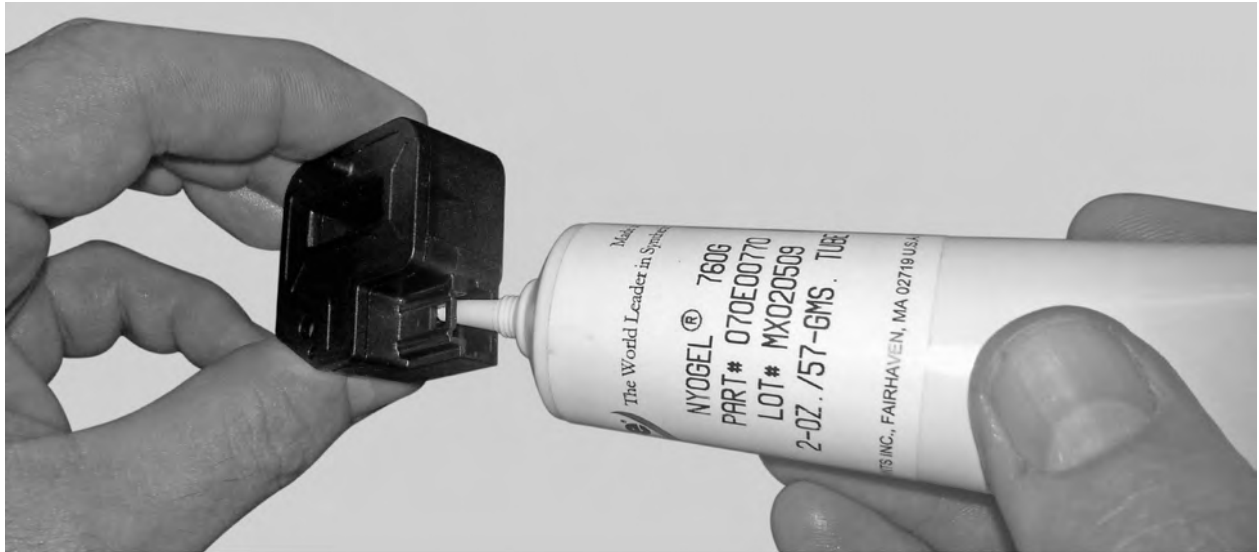
Figure 34. Current Sensor Fasteners



WARNING: Inspect all reuse components for damage or corrosion, clean or replace any components as necessary. A vacuum may be used to clean any debris inside the DPIM chassis. Debris or excessive corrosion can cause isolation faults.

Current Sensor Installation

1. Apply one drop of NyoGel® 760G Synthetic Lubricant to each of the new Current Sensor (P/N 29547591) pins (refer to Figure 35) and one drop to each of the mating harness terminals.



2533567

Figure 35. Applying NyoGel® 760G Synthetic Lubricant to Current Sensor Pins

2. Connect the new Harness Assembly P/N 29547593 to the new Current Sensor P/N 29547591 and secure wiring with new wire ties (refer to Figure 36). Clip excess wire tie length as required.



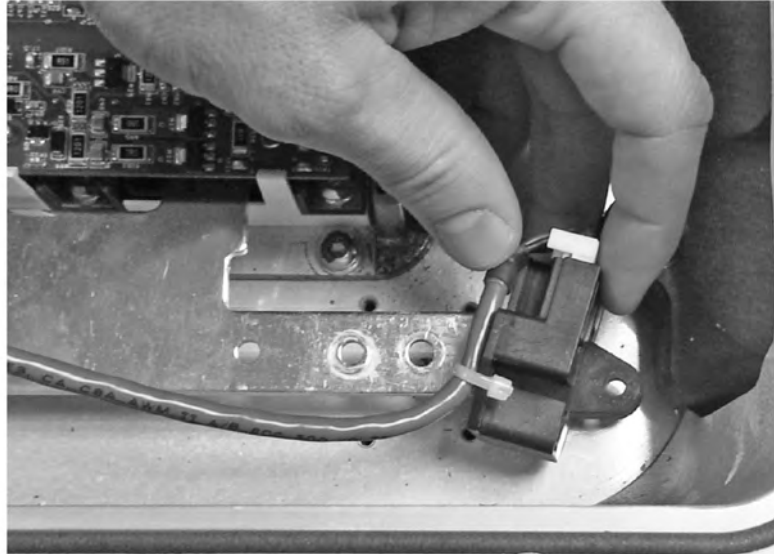
NOTE: The Wiring Harness **MUST** be replaced along with the Current Sensor.



452246

Figure 36. Current Sensor Harness Assembly Wire Tie Location

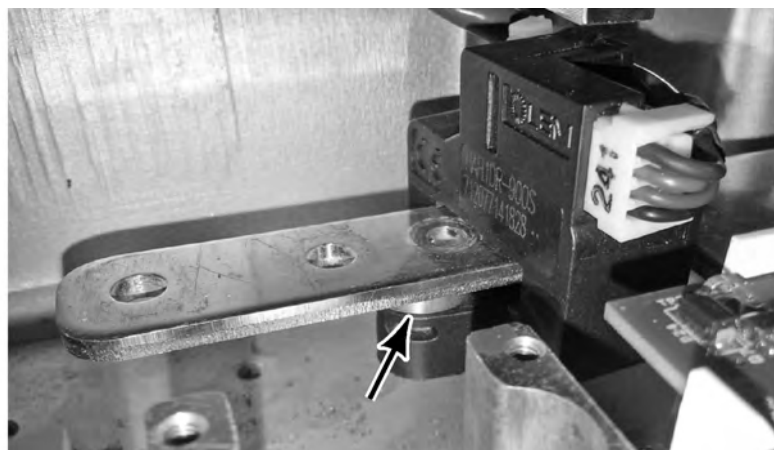
3. Reinstall the nut into the bottom of the new Current Sensor and install the Current Sensor by sliding it over the end of the AC Busbar (refer to Figure 37).



452161

Figure 37. Installation of Current Sensor

4. Install the non-magnetic spacer between the bottom of the Current Sensor and the underside of the AC Busbar (refer to Figure 38).



452150

Figure 38. Non-Magnetic Spacer Location

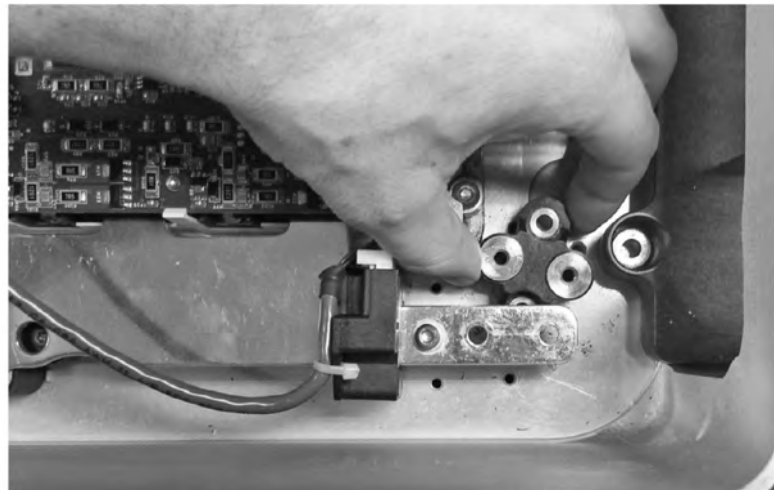
5. Apply one drop of Loctite® 425 thread locking compound to the end of the external threads of the one (1) M4x19mm mounting screw. Using a Torx Plus™ T20 bit, install the one (1) M4x19mm screw (refer to Figure 39). Torque the one (1) M4x19mm screw to 1.2-1.5 N·m (10.6-13.3 lb in.)



452141

Figure 39. Location of One (1) M4x19mm Screw

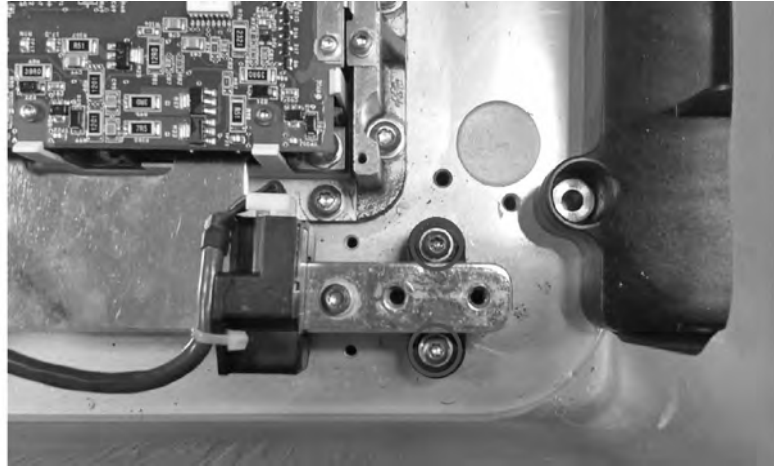
6. Install the AC Busbar Support by sliding it under the AC Busbar (refer to Figure 40).



452131

Figure 40. Installation of AC Busbar Support

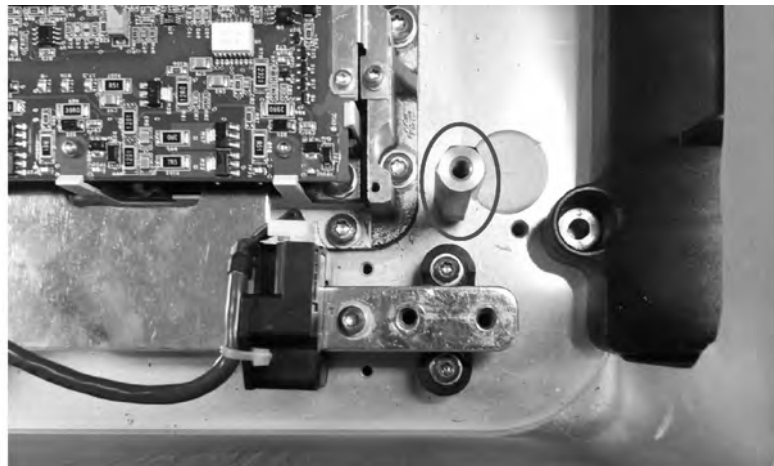
7. Using a Torx Plus™ T20 bit, install the two (2) M4x22mm screws (refer to Figure 41). Torque the two (2) M4x22mm screws to 1.2-1.5 N·m (10.6-13.3 lb in.).



452121

Figure 41. Location of Two (2) M4x22mm Screws

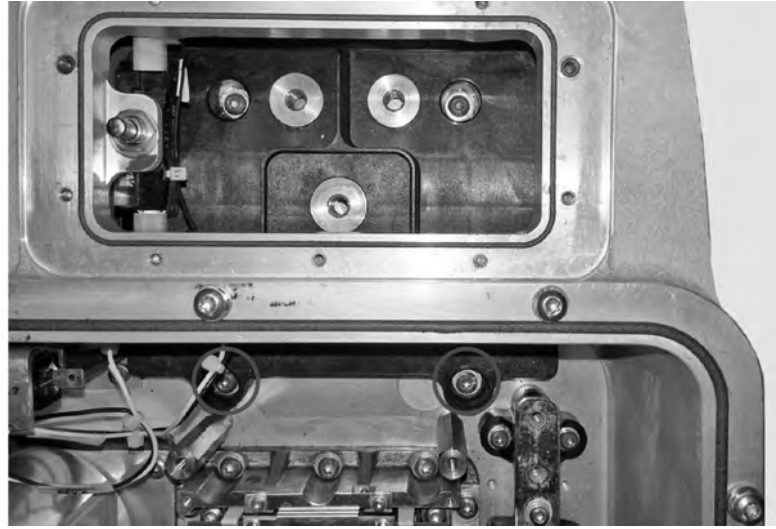
8. Apply one drop of Loctite® 242 thread locking compound to the end of the external threads of the M5 BCA Standoff. Using an 11mm hex socket, install the one (1) M5 BCA Standoff (refer to Figure 42). Torque the one (1) M5 BCA Standoff to 3.1-3.5 N·m (27.4-30.9 lb in.).



452110

Figure 42. Location of M5 BCA Standoff

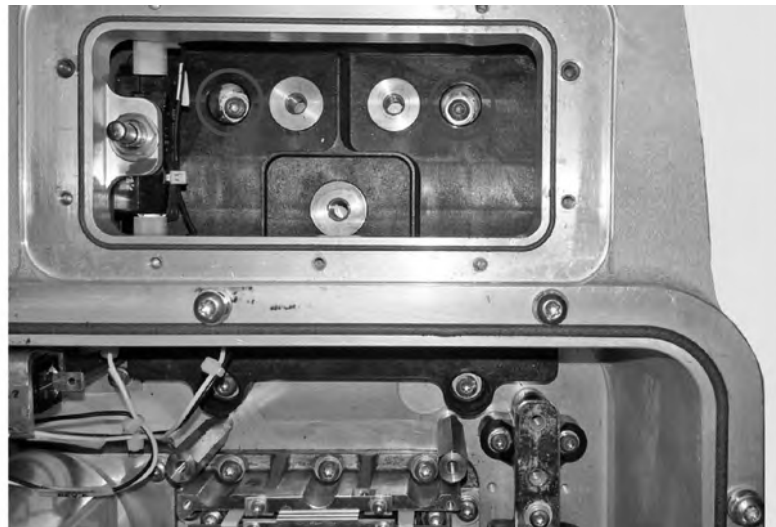
9. Slide the AC Terminal Block back into its proper location. Apply one drop of Loctite® 425 or 242 thread locking compound to the ends of the external threads of the two (2) M5x18mm screws. Using a Torx Plus™ T25 bit, install the two (2) M5x18mm screws (refer to Figure 43). Torque the two (2) M5x18mm screws to 3.1-3.5 N·m (27.4-30.9 lb in.).



452093

Figure 43. Location of Two (2) M5x18mm Screws

10. Using a Torx Plus™ T25 bit, install the two (2) M5x22mm screws (refer to Figure 44). Torque the two (2) M5x22mm screws to 3.1-3.5 N·m (27.4-30.9 lb in.).



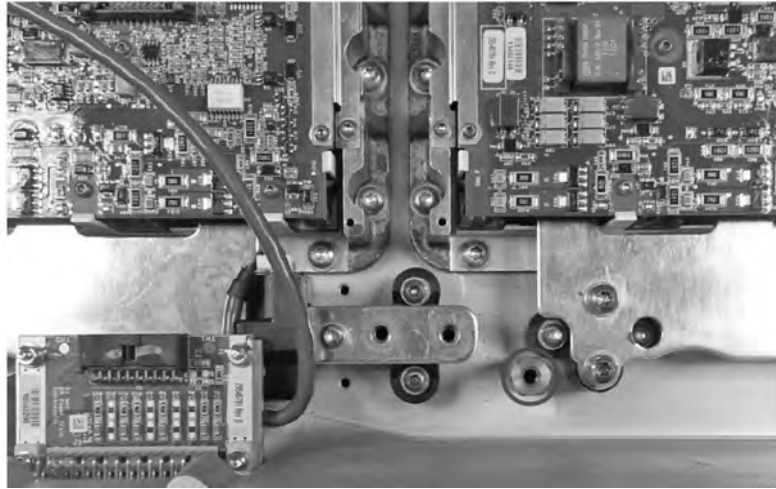
452084

Figure 44. Location of Two (2) M5x22mm Screws

Section 5: Removal/Installation of Current Sensor (Inverter A Phases A and B, and Inverter B Phases B and C)

Current Sensor Removal

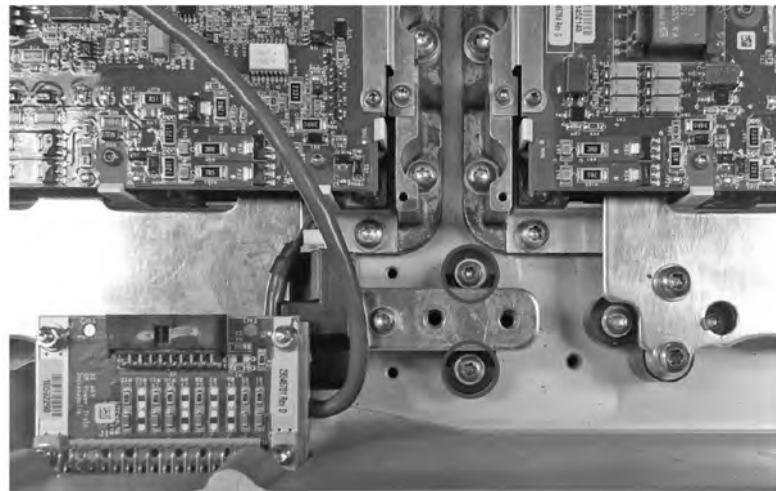
1. Using an 11mm hex socket, remove the one (1) M5 BCA Standoff (refer to Figure 45).



452920

Figure 45. Location of M5 BCA Standoff

2. Using a Torx Plus™ T20 bit, remove the two (2) M4x22mm screws (refer to Figure 46).



452930

Figure 46. Location of Two (2) M4x22mm Screws

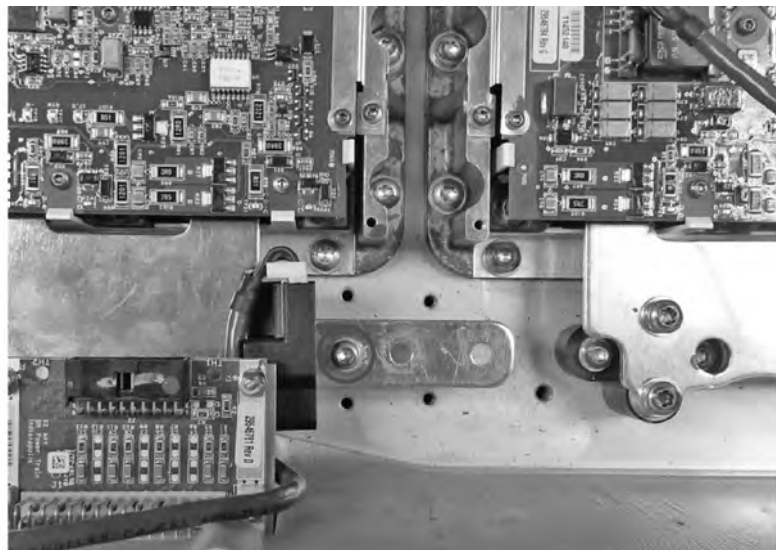
3. Remove the AC Busbar Support by sliding it out from under the AC Busbar (refer to Figure 47).



452939

Figure 47. Removal of AC Busbar Support

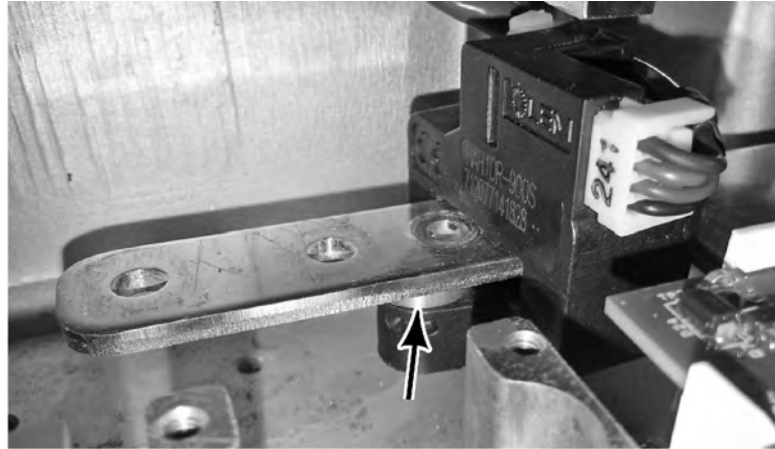
4. Using a Torx Plus™ T20 bit, remove the one (1) M4x19mm screw (refer to Figure 48).



452948

Figure 48. Location of One (1) M4x19mm Screw

5. Remove the non-magnetic spacer located between the bottom of the Current Sensor and the underside of the AC Busbar (refer to Figure 49).



452956

Figure 49. Non-Magnetic Spacer Location

6. Remove the Current Sensor by sliding it off the end of the AC Busbar (refer to Figure 50).

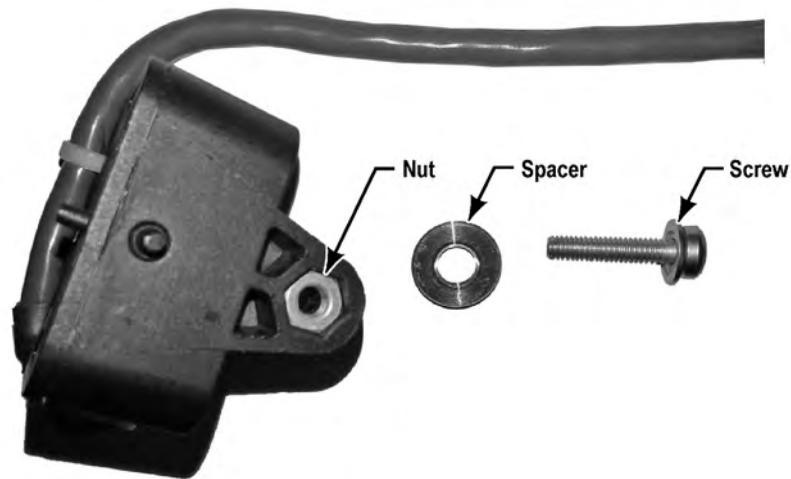


452966

Figure 50. Removal of Current Sensor



CAUTION: Ensure that the screw, spacer and nut have not been left in the DPIM after removing the Current Sensor (refer to Figure 51).



452219

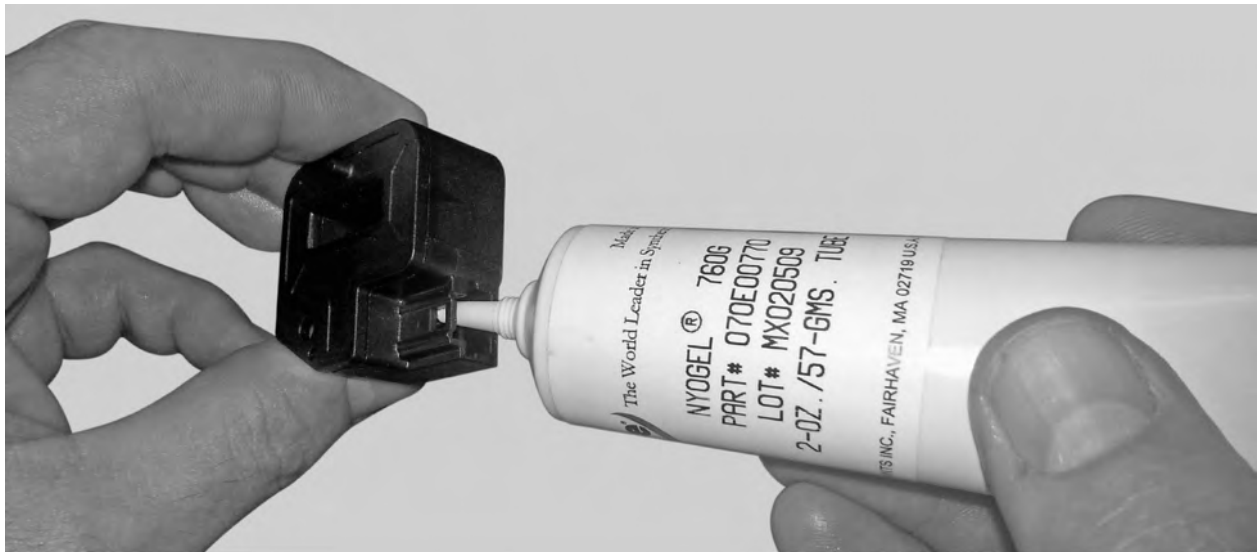
Figure 51. Current Sensor Fasteners



WARNING: Inspect all reuse components for damage or corrosion, clean or replace any components as necessary. A vacuum may be used to clean any debris inside the DPIM chassis. Debris or excessive corrosion can cause isolation faults.

Current Sensor Installation

1. Apply one drop of NyoGel® 760G Synthetic Lubricant to each of the new Current Sensor (P/N 29547591) pins (refer to Figure 52) and one drop to each of the mating harness terminals.



2533567

Figure 52. Applying NyoGel® 760G Synthetic Lubricant to Current Sensor Pins

2. Connect the new Harness Assembly P/N 29547593 to the new Current Sensor P/N 29547591 and secure wiring with new wire ties (refer to Figure 53). Clip excess wire tie length as required.



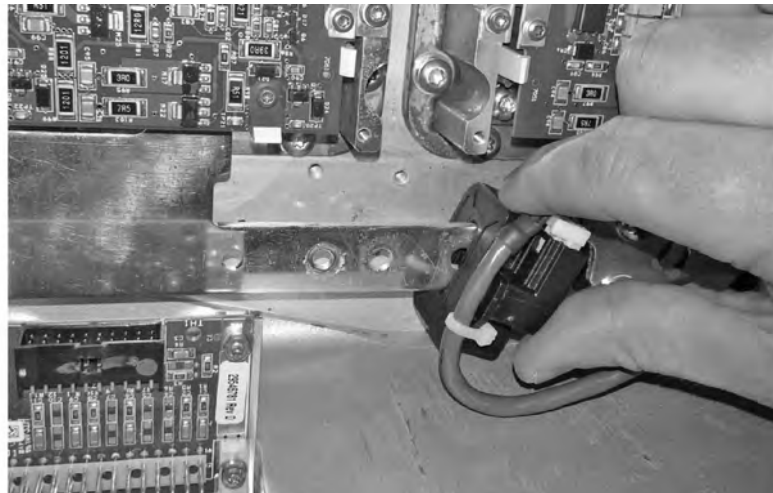
NOTE: The Wiring Harness MUST be replaced along with the Current Sensor.



452246

Figure 53. Current Sensor Harness Assembly Wire Tie Location

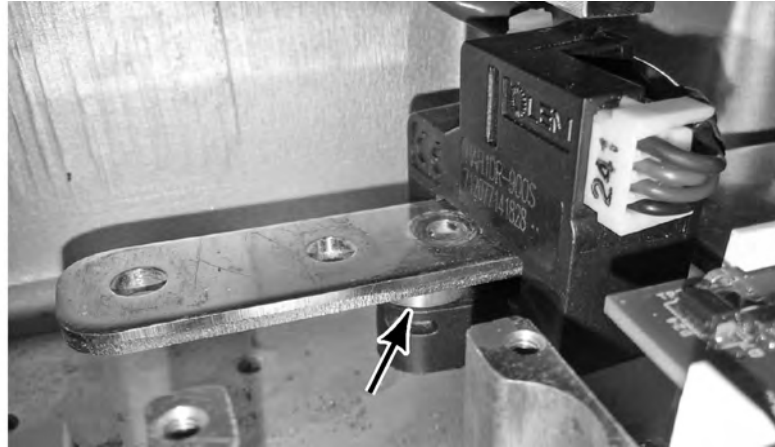
3. Reinstall the nut into the bottom of the Current Sensor and install the Current Sensor by sliding it over the end of the AC Busbar (refer to Figure 54).



452966

Figure 54. Installation of Current Sensor

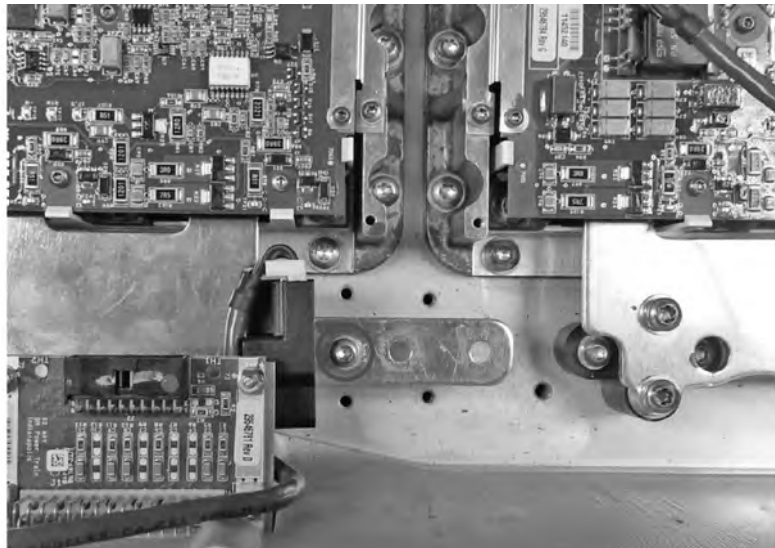
4. Install the non-magnetic spacer between the bottom of the Current Sensor and the underside of the AC Busbar (refer to Figure 55).



452150

Figure 55. Non-Magnetic Spacer Location

5. Apply one drop of Loctite® 425 thread locking compound to the end of the external threads of the one (1) M4x19mm mounting screw. Using a Torx Plus™ T20 bit, install the one (1) M4x19mm screw (refer to Figure 56). Torque the one (1) M4x19mm screw to 1.2-1.5 N·m (10.6-13.3 lb in.).



452948

Figure 56. Location of One (1) M4x19mm Screw

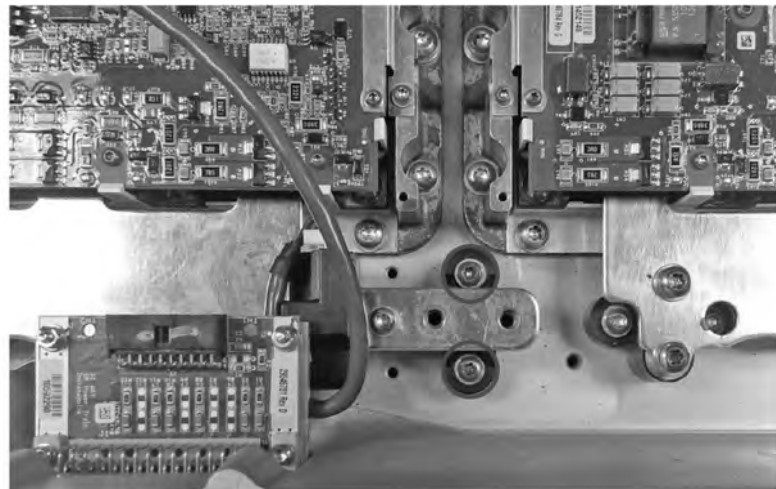
6. Install the AC Busbar Support by sliding it under the AC Busbar (refer to Figure 57).



452939

Figure 57. Installation of AC Busbar Support

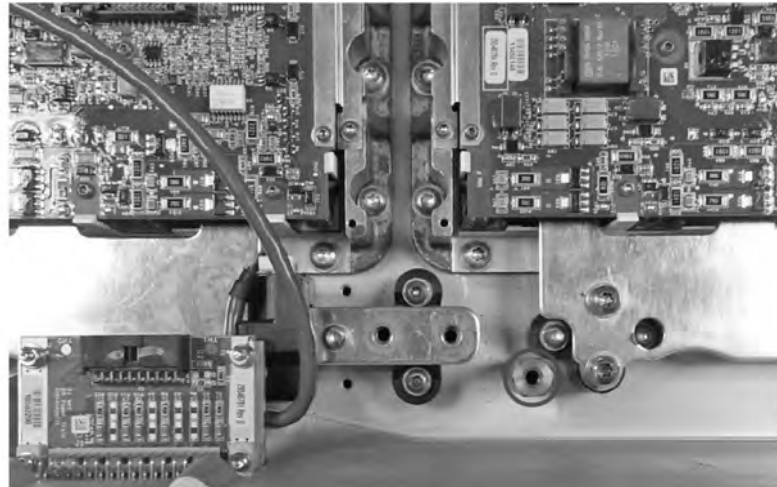
7. Using a Torx Plus™ T20 bit, install the two (2) M4x22mm screws (refer to Figure 58). Torque the two (2) M4x22mm screws to 1.2-1.5 N·m (10.6-13.3 lb in.).



452930

Figure 58. Location of Two (2) M4x22mm Screws

8. Apply one drop of Loctite® 242 thread locking compound to the end of the external threads of the M5 BCA Standoff. Using an 11mm hex socket, install the one (1) M5 BCA Standoff (refer to Figure 59). Torque the one (1) M5 BCA Standoff to 3.1-3.5 N·m (27.4-30.9 lb in.).



452920

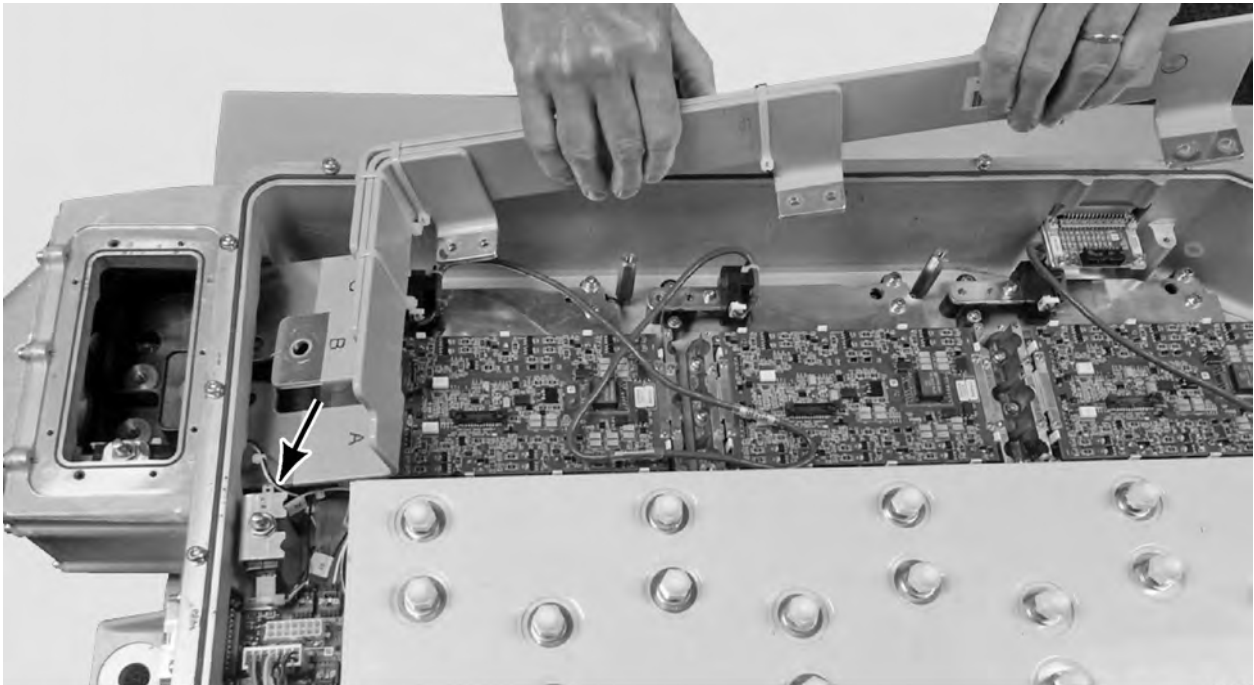
Figure 59. Location of M5 BCA Standoff

Section 6: Installation of the AC Busbar Assembly

1. Carefully install the AC Busbar Assembly into AC Lug Box (refer to Figure 60).



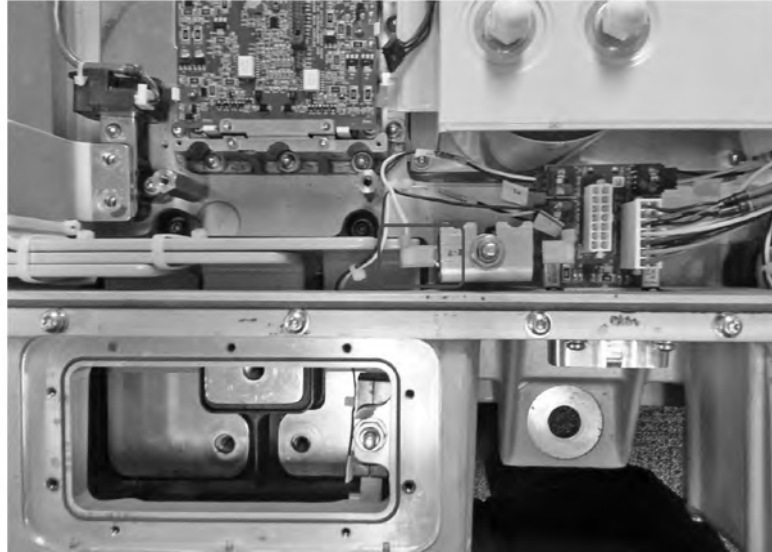
CAUTION: Do not allow the AC Busbar Assembly to strike the HVIL Switch during the installation process.



452074

Figure 60. Installation of AC Busbar Assembly

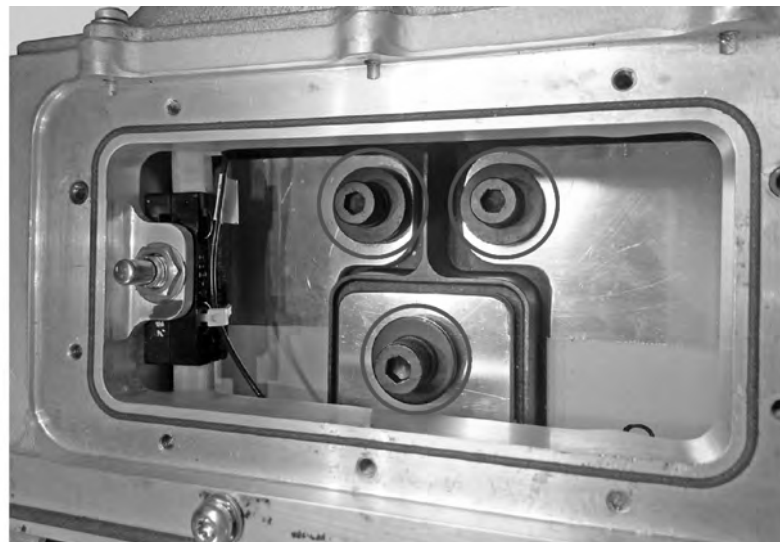
2. Install the HVIL switch connector (refer to Figure 61).



452064

Figure 61. HVIL Switch Location

3. Install and finger tighten the three (3) M8 AC lug bolts (refer to Figure 62).



448740

Figure 62. AC Lug Bolts

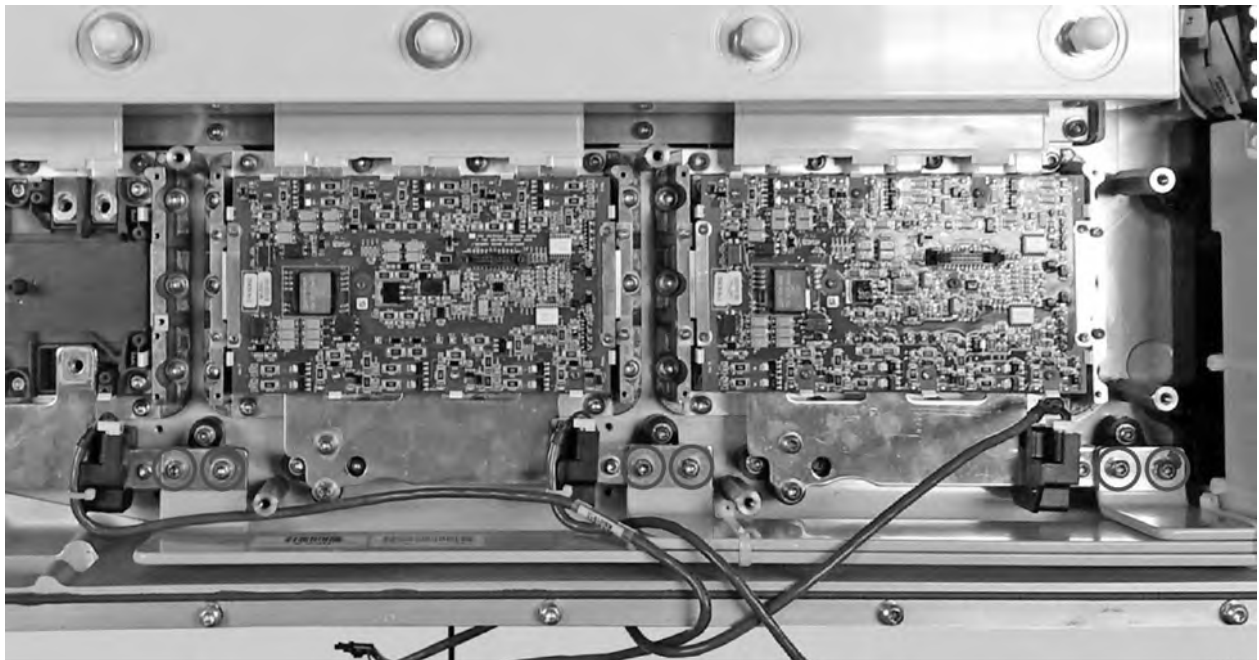
4. Apply one drop of Loctite® 425 or 242 thread locking compound to the end of the external threads of the six (6) M5x22mm screws. Using a Torx Plus™ T25 bit, install the six (6) M5x22mm screws (refer to Figure 63). Torque the six (6) M5x22mm screws to 3.1-3.5 N·m (27.4-30.9 lb in.).



NOTE: Install all screws before torquing to ensure that the holes line up.



NOTE: Exercise special care to not pinch any wires when components are installed and screws are torqued.

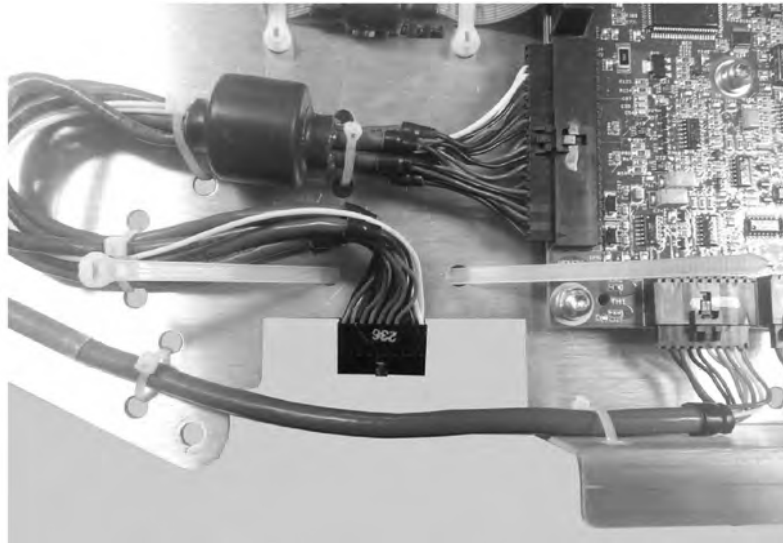


448731

Figure 63. Mounting Screw Locations

Section 7: Installation of BCA Card Mounting Shelf

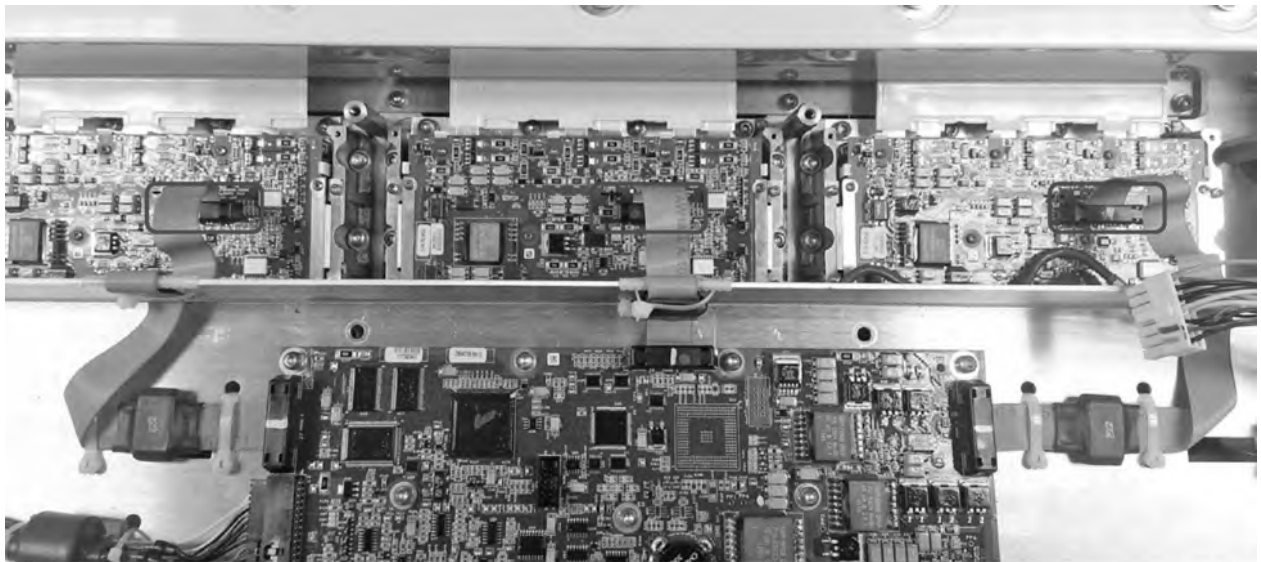
1. Feed all ty wraps through the BCA Card Mounting Shelf (refer to Figure 64).



454668

Figure 64. BCA Card Mounting Shelf Ty Wrap Location

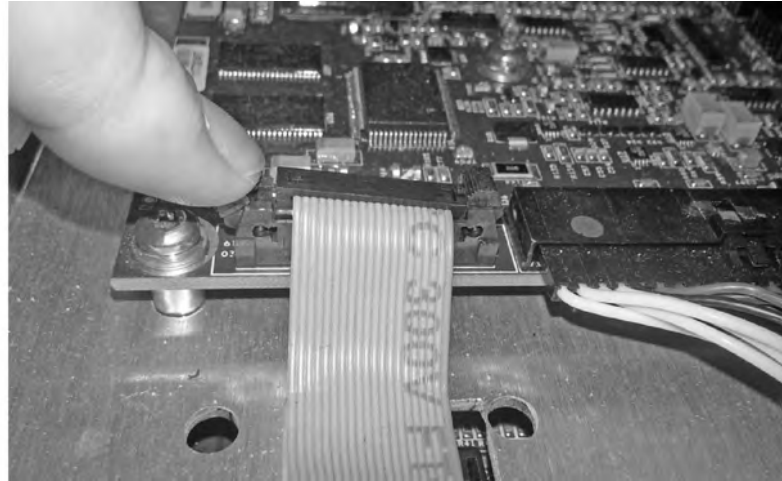
2. Place the BCA Mounting Shelf onto the side of DPIM chassis as shown in Figure 65.



448614

Figure 65. BCA Mounting Shelf (GATE Drive Card Cable Connectors Shown Circled)

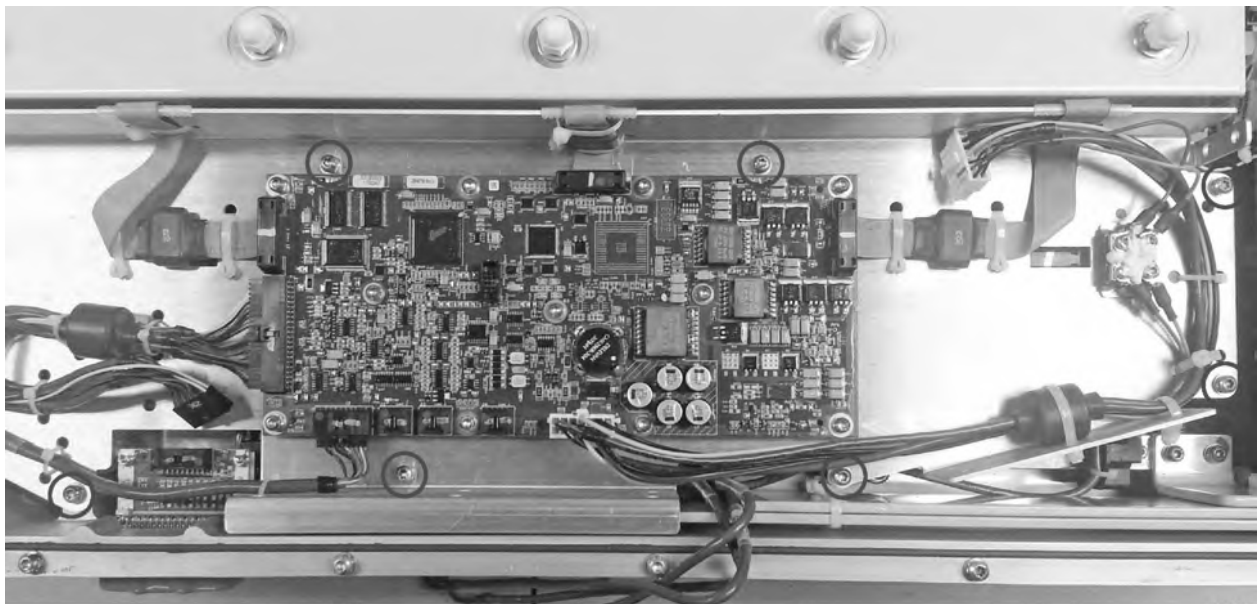
3. Connect three (3) GATE Drive Card Connectors to three (3) GATE Drive Cards (refer to Figure 66) and install the cable strain relief caps.



448879

Figure 66. GATE Drive Card Cable Connector Installation (BCA Card Cable Connector Shown for Clarity)

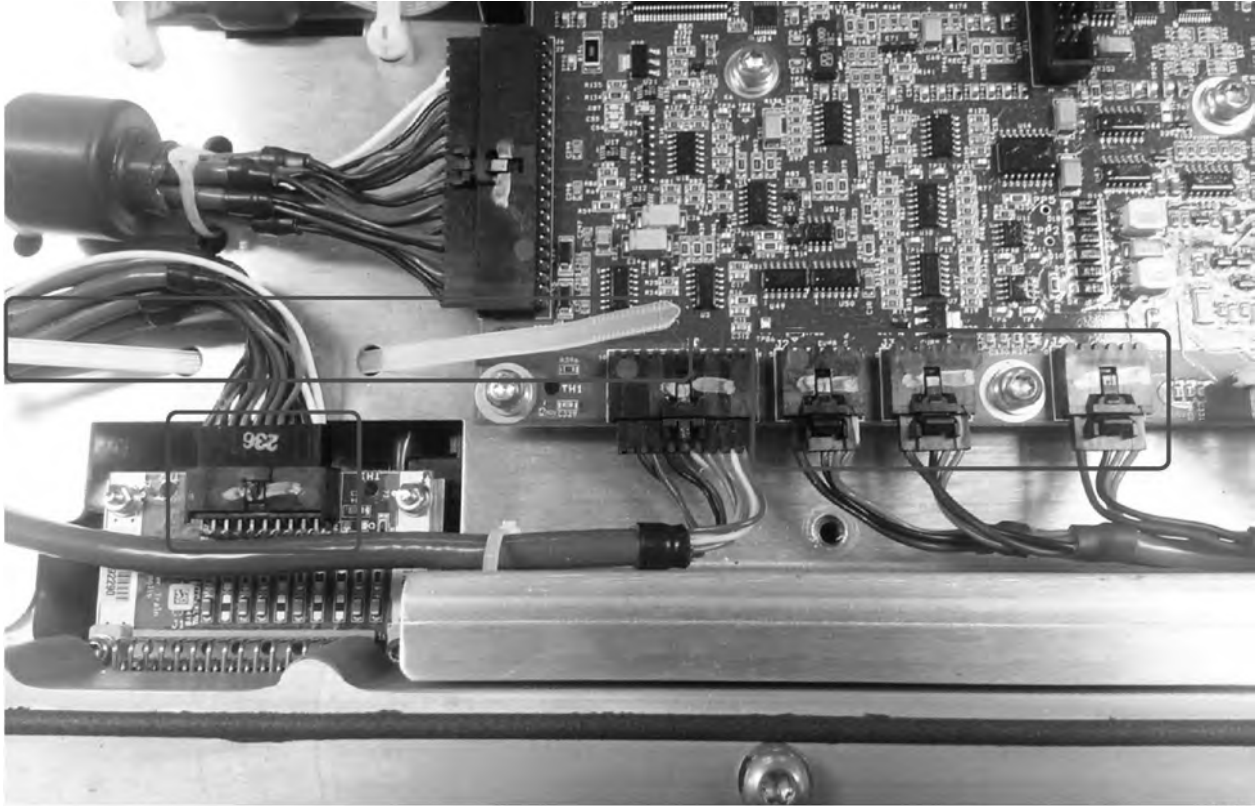
4. Move BCA Mounting Shelf to its final location. Using a Torx Plus™ T25 bit, install the seven (7) M5x14mm screws that secure the BCA Mounting Shelf (refer to Figure 67). Torque the seven (7) M5x14mm screws to 3.1-3.5 N·m (27.4-31.0 lb in.).



454652

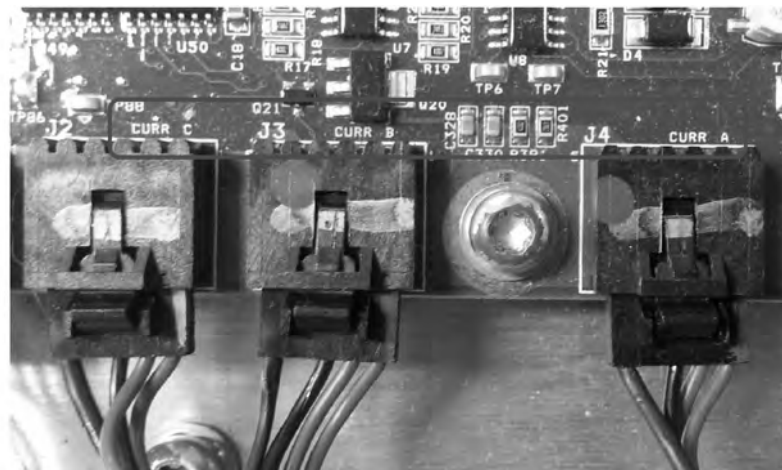
Figure 67. BCA Mounting Shelf Fastener Locations

5. Install five (5) wire harness connectors to circuit card surface mount connectors (refer to Figure 68, Figure 69, and Figure 70).



455457

Figure 68. Wire Harness Connector Installation (4 Locations)



453707

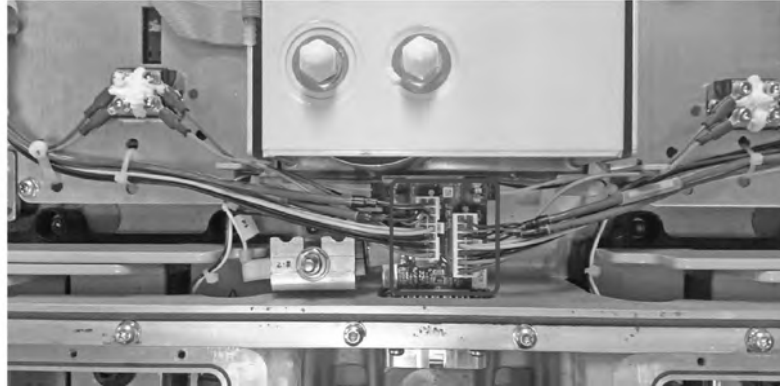
Figure 69. Current A, Current B, and Current C Locations



NOTE: Each current sensor phase (A, B, and C) **MUST** be plugged into the appropriate connector (CURR A, CURR B, CURR C).



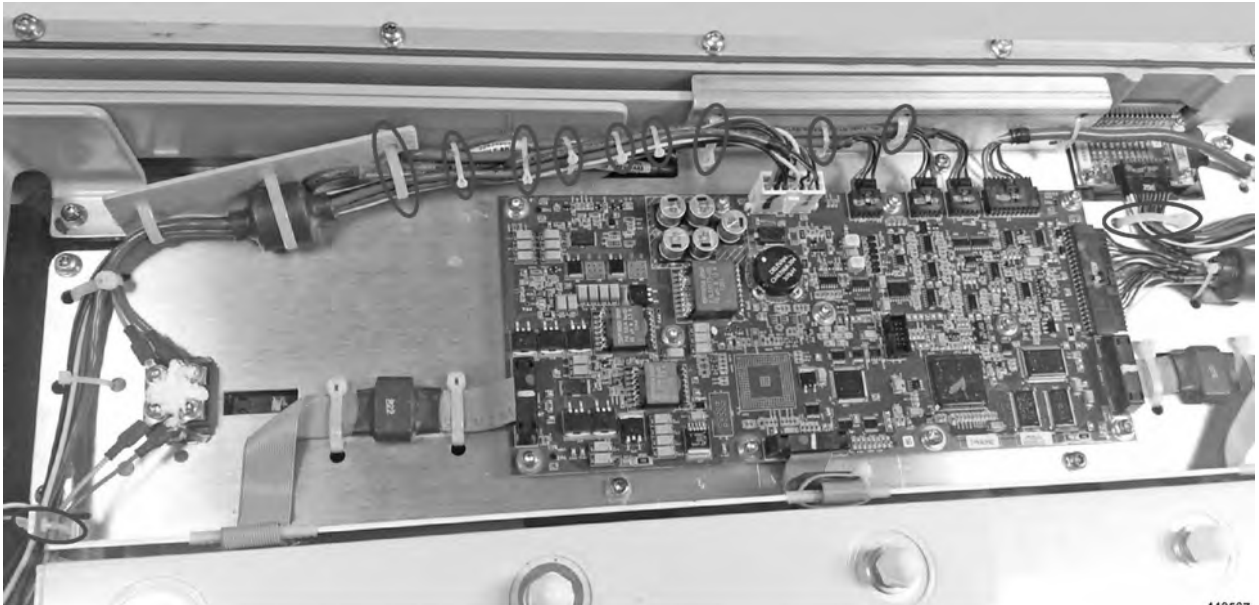
CAUTION: Permanent damage to the H 40/50 EP™ Drive Unit or DPIM can occur if the current sensor harnesses are plugged into the wrong connectors.



448591

Figure 70. Wire Harness Connector Installation

6. Install NEW wire ties as required to retain the wire harnesses (refer to Figure 71).



448567

Figure 71. Wire Tie Locations

Section 8: Installation of HVIL Circuit Card and Main Cover

1. Insert one (1) new wire tie into the new HVIL Circuit Card at the same location as shown in Figure 72.



NOTE: To ease assembly, the new wire tie must be inserted through the hole in the circuit card prior to installation in the DPIM Housing.



422298

Figure 72. HVIL Circuit Card – Wire Tie Location

2. Install HVIL Circuit Card into the DPIM Housing.



NOTE: Ensure that the wire harnesses and individual wires are NOT pinched under the circuit card during installation.

3. Connect the three (3) wiring harness connectors at locations shown in Figure 73.



422350

Figure 73. HVIL Circuit Card – Three (3) Harness Connector Locations

4. Using a Torx Plus™ T25 bit, install and finger tighten the ten (10) M5 screws that secure the HVIL Circuit Card to the DPIM Housing. Torque all M5 screws to 3.1-3.5 N·m (27-31 lb in). Refer to Figure 74 for fastener sizes and locations.

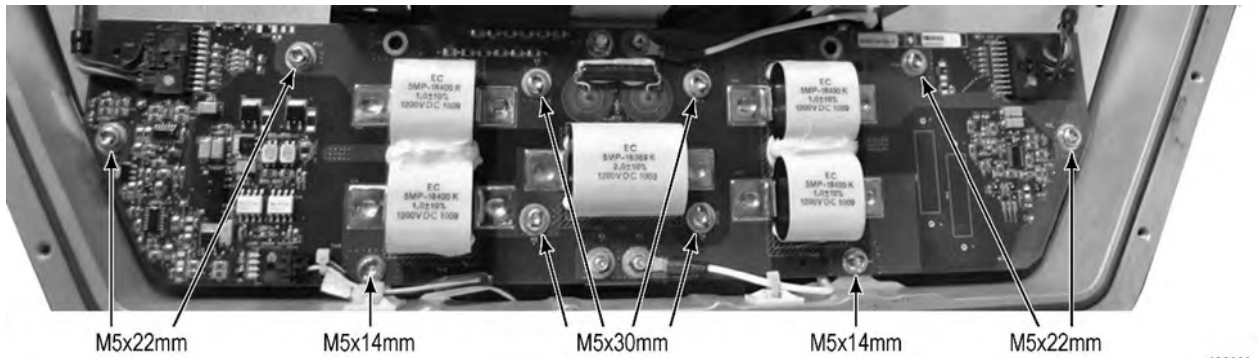


Figure 74. HVIL Circuit Card – Fastener Sizes/Locations

5. Install the two (2) wire ring terminals onto the studs at locations shown in Figure 75. Using an 8mm socket, install four (4) M5 nut/washer assemblies onto the studs as shown in the same figure. Torque the nuts to 3.1-3.5 N·m (27-31 lb in).



Figure 75. HVIL Circuit Card – Four (4) Mounting Nut/Washer Locations (M5)

6. Secure wiring with new wire ties and clip excess length as required. Refer to Figure 72 and Figure 76 for wire tie locations.



Figure 76. HVIL Circuit Card – Two (2) Wire Tie Locations



NOTE: Verify that all eighteen (18) white protective caps are installed over the capacitor studs in the center of the DPIM. Reinstall or replace any missing caps as necessary.

7. Install new Cover Gasket P/N 29540714, included in Current Sensor and Harness Service Kit P/N 29556287. Using a Torx Plus™ T25 bit, install and finger tighten the twenty-six (26) M5x18mm machine screws that secure the Main Cover to the DPIM Housing as shown in Figure 77. Torque the screws to 3.1-3.5 N·m (27-31 lb in).



421911

Figure 77. DPIM Main Cover



NOTE: For additional information refer to H 40/50 EP™ System Service Manual SM3602EN Appendix E.

NOTE: This illustration is to be used for identifying the name and location of components within the Dual Power Inverter Module 2 (DPIM2). It is not intended to be used for disassembly and assembly procedures.

DPIM2

Levels of Assembly

