



# KIT DIODE RECTIFIERS ASSEMBLY

100047-2



**Installation and servicing of Danfoss Turbocor® compressors by qualified and product trained personnel only. Follow these instructions and sound refrigeration/electrical/servicing practices relating to installation, commissioning, maintenance and service.**

<p>Consult the appropriate Danfoss Turbocor Compressors Inc. (DTC) Service Manual on <a href="http://turbocor.danfoss.com">turbocor.danfoss.com</a> for detailed service instructions.</p>	<p><b>Never power compressor without covers in place and secured.</b></p> <p><b>Removing the mains input cover will expose you to a voltage hazard of up to 575V. Ensure the mains input power is off and locked out before removing cover.</b></p> <p><b>Before removing top cover, wait at least 20 minutes after isolating AC power to allow the high voltage capacitors to discharge.</b></p>	<p>Always wear appropriately rated safety equipment when working around equipment and/or components energized with high voltage.</p> <p><b>This equipment contains hazardous voltages that can cause serious injury or death.</b></p>	<p><b>Recover all refrigerant from compressor in accordance with local codes and ensure pressure is fully vented before the removal of refrigerant containing components.</b></p>
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1 - Introduction

DIODE RECTIFIERS Removal and installation.

2 - IMPORTANT NOTICE:

These components should only be replaced by technicians trained and competent in Danfoss Turbocor Compressor service techniques/procedures.

Danfoss Turbocor Compressor electrical isolation and ESD protection and personal grounding procedures must be followed. These procedures are found in Sections "Electrical Isolation of the Compressor" and "Handling Electronic Static Devices" of the Service Manual (M-SV-001).

- ⚠ Always wear appropriately rated safety equipment when working around equipment and/or components energized with high voltage. Faulty components can explode and cause serious injury or death.
- ⚠ Care must be taken in removal and installation of the covers to prevent the screws from falling in to the power electronic compartment. Dropping cover screws can cause a short circuit, energized components to explode, and damage to the power electronic parts of the compressor. Place the screws carefully after positioning the covers to minimize the risk of screws falling in to the power electronic areas.

### 3 - DIODE RECTIFIERS Removal:

1. Isolate compressor power as described in Section "Electrical Isolation of the Compressor" of the Service Manual (M-SV-001).
2. Release the four (4) captive screws that secure the Mains Input Cover and remove the cover.
3. Using an appropriately rated volt meter, confirm that the AC voltage is isolated.
4. Wait at least 20 minutes for the DC bus capacitors to discharge.

**DANGER:** Do NOT touch any components when removing the top cover. This is particularly true for compressors with CE covers because they are coated on the outside for the express purpose of being conductive

5. Release the nine (9) captive screws that secure the Top Cover and remove the cover, taking particular care not to touch ANY components underneath.
6. Using an appropriately rated volt meter, check the DC bus bars for voltage level. If the voltage is above 5VDC, wait five (5) minutes and recheck until 5VDC or below is achieved.
7. Disconnect 3 phase mains input wiring. Refer to Figure 1 (Mains Input).

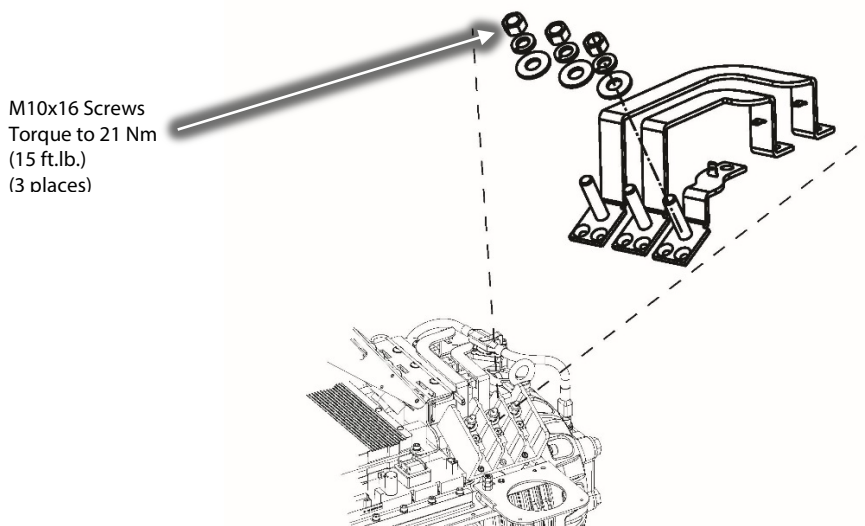


Figure 1 – Mains Input

8. For F Series and later compressors, remove the Soft Start Temperature Harness. Refer to Figure 2 (Soft Start J9 Connector).

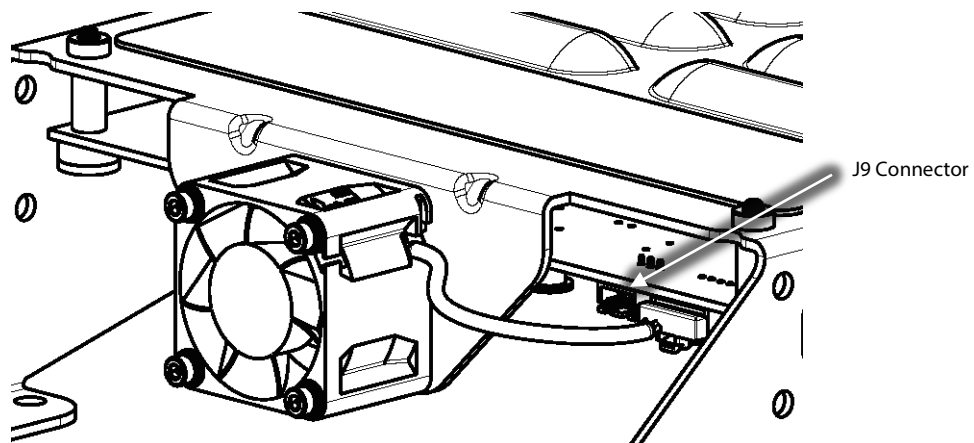


Figure 2 – Soft Start J9 Connector

- Disconnect the Soft Start ground wire by removing the nuts and mains input ground wire from the ground post on the compressor housing at 3 phase connection point. Refer to Figure 3 (Ground Location).

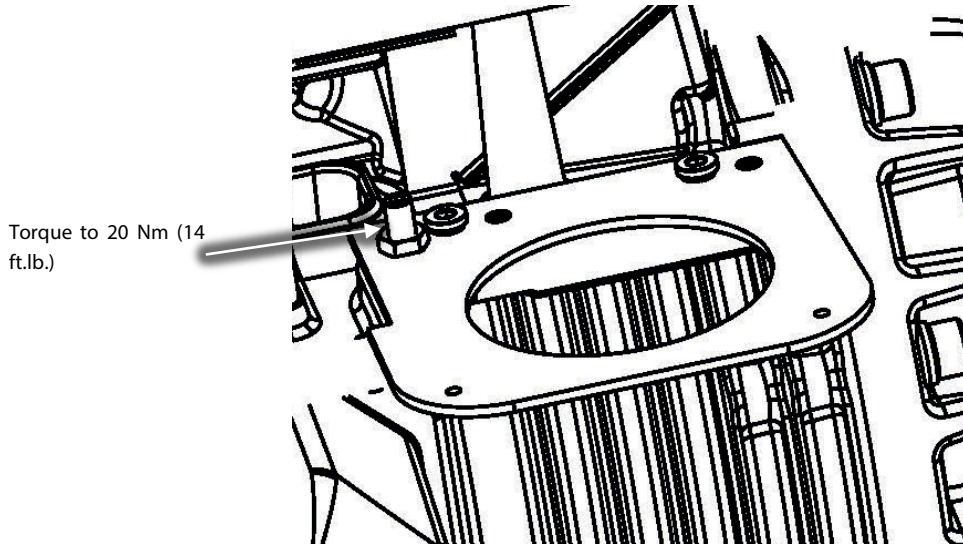


Figure 3 – Ground Location

- Remove the M5x15 fasteners that secure the Soft Start mounting bracket to the compressor. Refer to Figure 4 (Soft Start Mounting Screws).

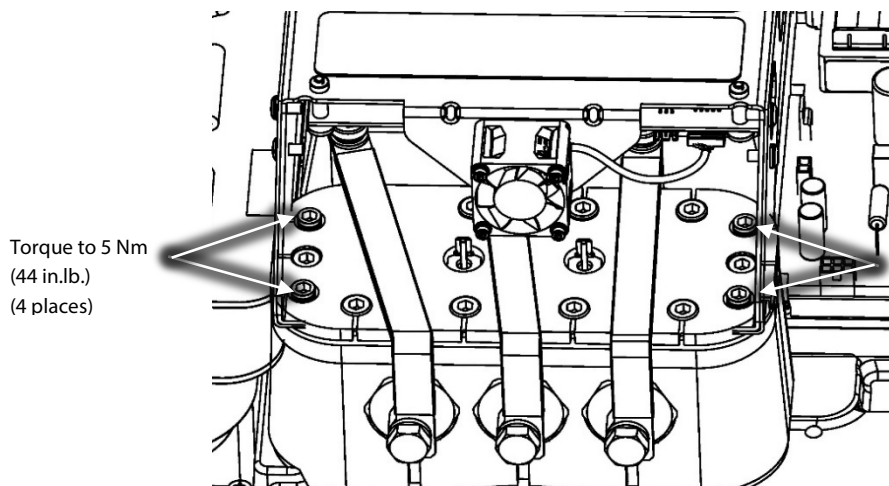


Figure 4 – Soft Start Mounting Screws

11. Lift the Soft Start and turn it over, placing it board-side up on the AC Bus Bars. Refer to Figure 5 (Soft Start Lift).

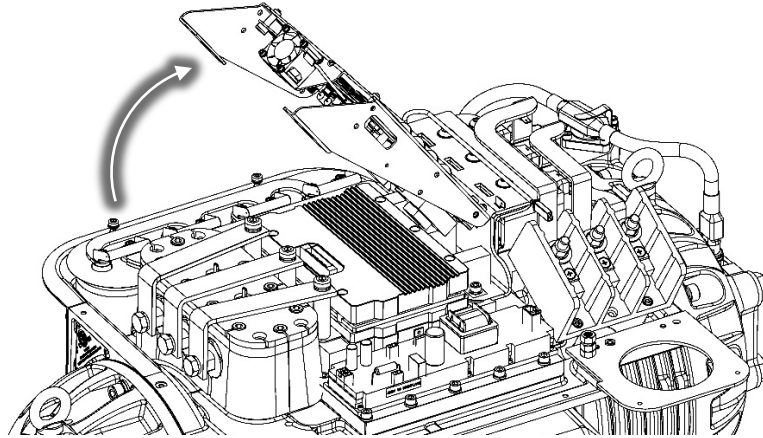


Figure 5 – Soft Start Lift

12. Unplug the cable connectors from the Soft Start board. Refer to Figure 6 (Soft Start Harness Removal).

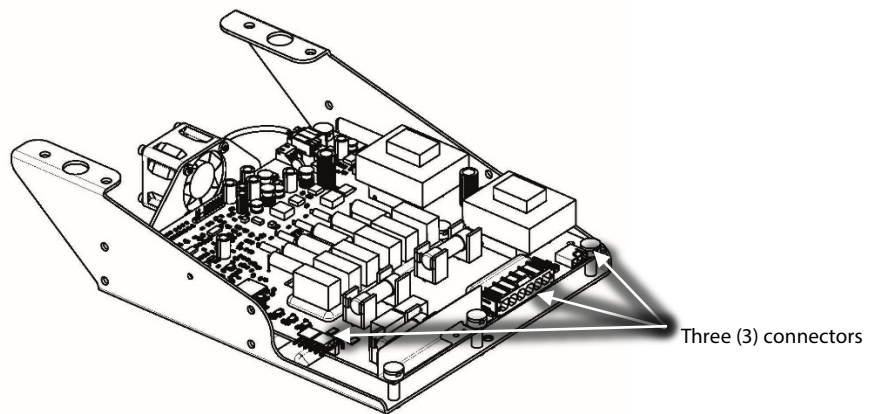


Figure 6 – Soft Start Harness Removal

13. Lift away the Soft Start assembly and place it in a safe location.

14. Remove the Soft Start and AC/DC Cable Harness. Refer to Figure 7 (SCR Gate Cable and AC/DC Harness Connections).
15. Remove the SCR Gate Cables from the SCRs. Refer to Figure 7 (SCR Gate Cable and AC/DC Harness Connections).

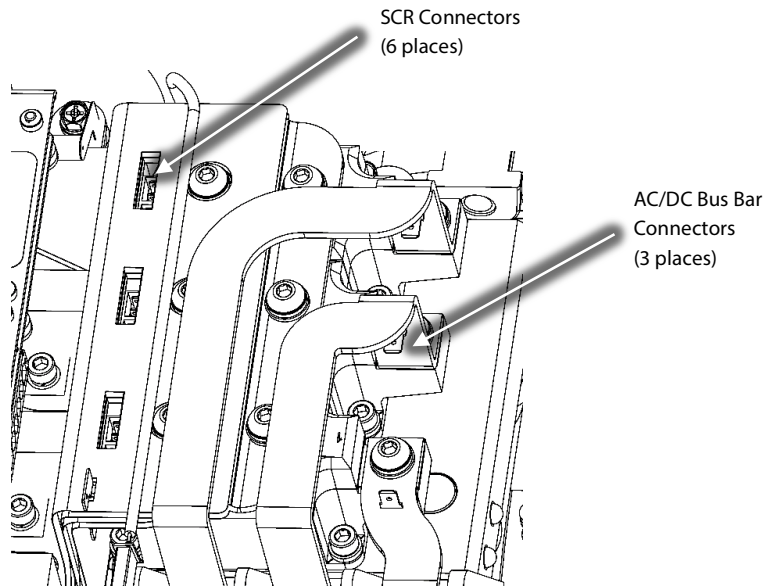


Figure 7 – SCR Gate Cable and AC/DC Harness Connections

16. Remove the AC mains input terminals and bus bars. Refer to Figure 8 (AC Mains Input Terminals and Bus Bar Removal).

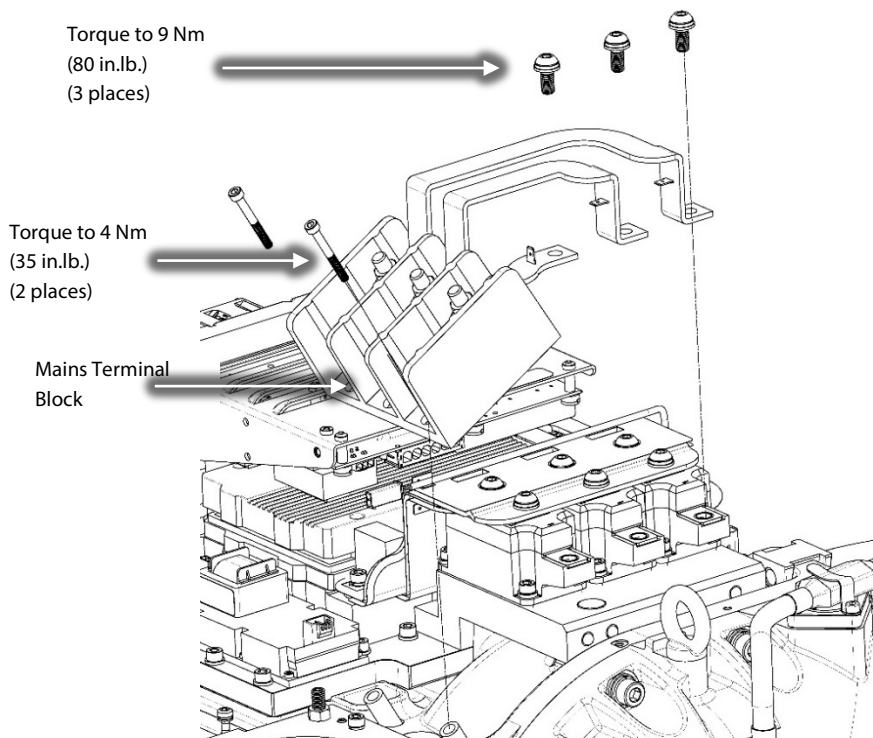


Figure 8 – AC Mains Input Terminals and Bus Bar Removal

17. Disconnect the snubber capacitors from the Inverter noting the leg orientation of one leg is longer than the other. Refer to Figure 9 (Snubber Capacitor Removal). (TT300 Shown).

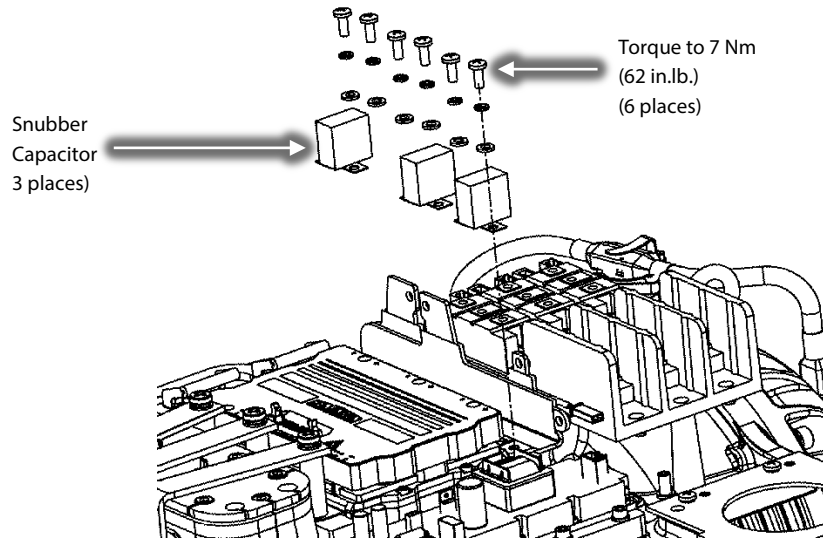


Figure 9 – Snubber Capacitor Removal

18. Remove the three (3) capacitor, IGBT snubbers.
19. Remove the six (6) DC bus screws from the SCRs. Refer to Figure 10 (SCR Bus Screw Removal). Refer to Figure 10 (SCR Bus Screw Removal).

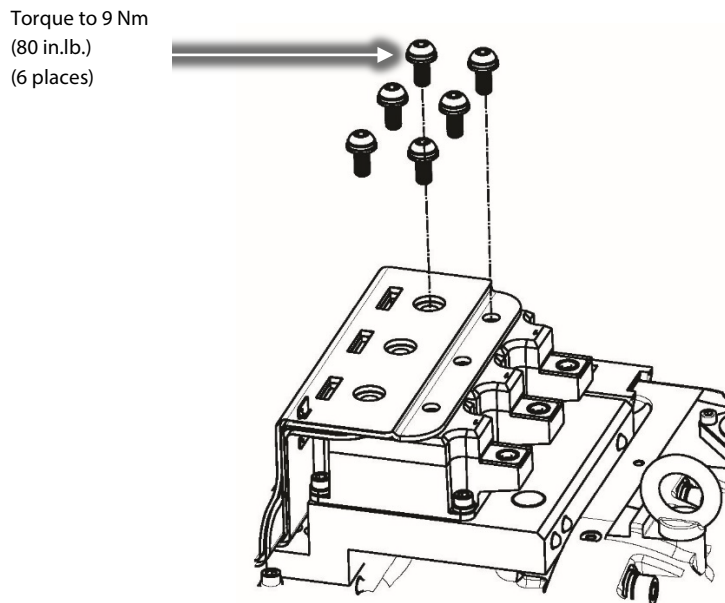


Figure 10 – SCR Bus Screw Removal

20. Remove the nylon nuts and foil at the base of the DC capacitor assembly, under the main compressor housing. Refer to Figure 11 (Capacitor Nut Removal).

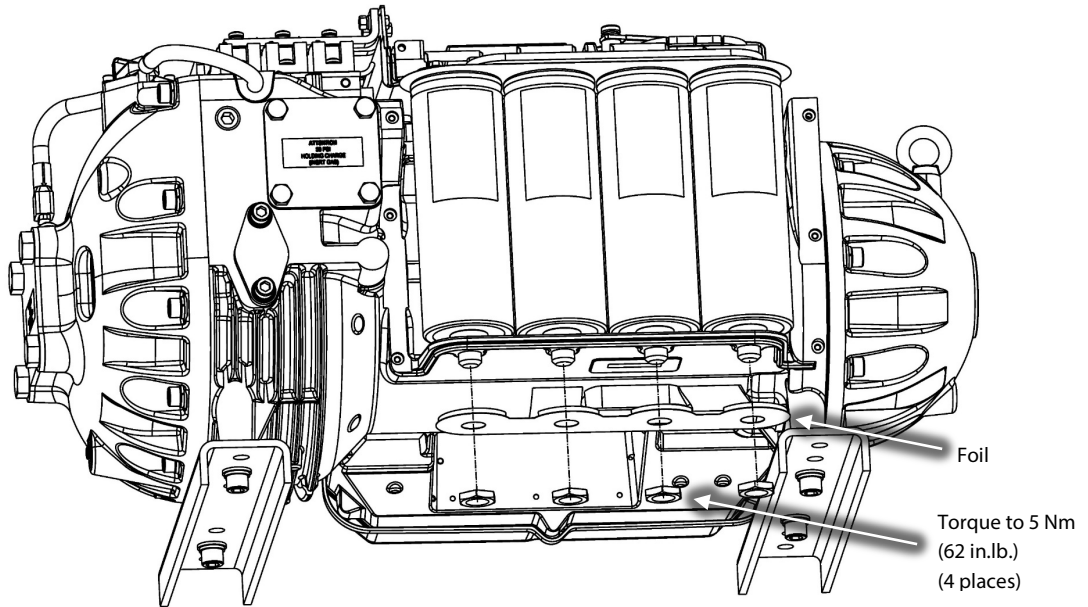


Figure 11 – Capacitor Nut Removal

21. Carefully lift the DC Bus Bars and capacitors out as an assembly. Do not remove the bleed resistors or capacitors from the bus bars. Refer to Figure 12 (Capacitor Assembly Removal) (TT300 Shown).

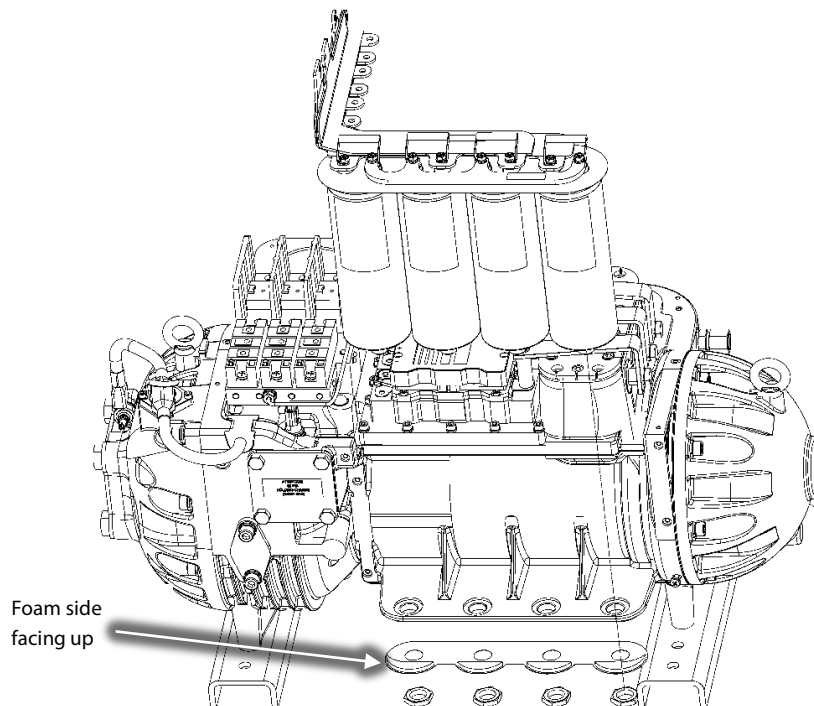


Figure 12 – Capacitor Assembly Removal

22. Remove the 12 M6x16 screws that secure the SCRs to the SCR Cooling Manifold. Refer to Figure 13 (SCR Removal).

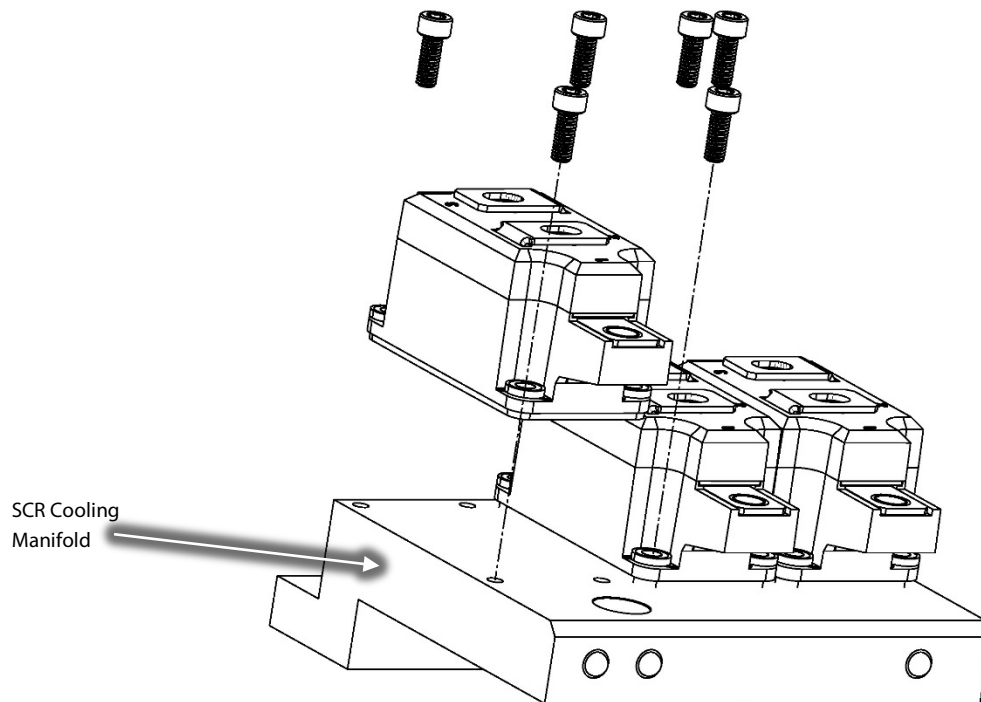


Figure 13 – SCR Removal

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#### 4 - DIODE RECTIFIERS Installation:

1. Ensure that no residue remains on the contact surfaces of SCR Cooling Manifold.
2. Apply a line of Dow Corning Silicone Heat Sink paste (or equivalent) on the top of the SCR Cooling Manifold.
3. Using a Spatula spread the paste evenly into a complete masking film. Refer to Figure 14 (SCR Cooling Manifold Thermal Paste Application).

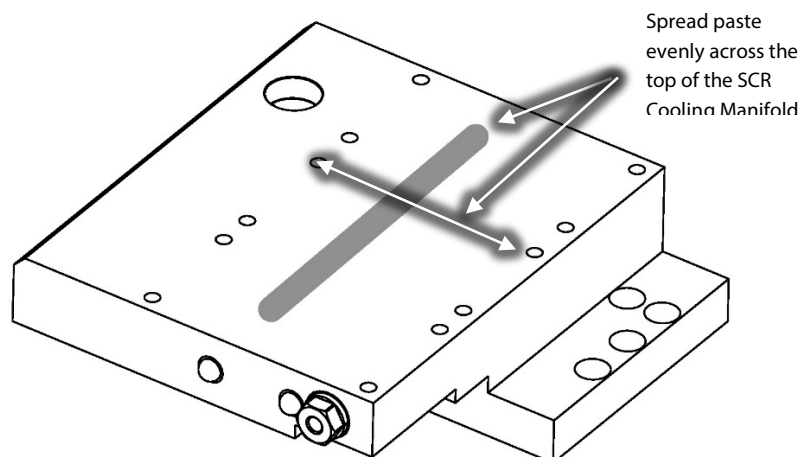




Figure 14 – SCR Cooling Manifold Thermal Paste Application

4. Apply the heat sink paste to each new SCR in the same manner as illustrated for the SCR Cooling Manifold. Refer to Figure 15 (SCR Thermal Paste Application).

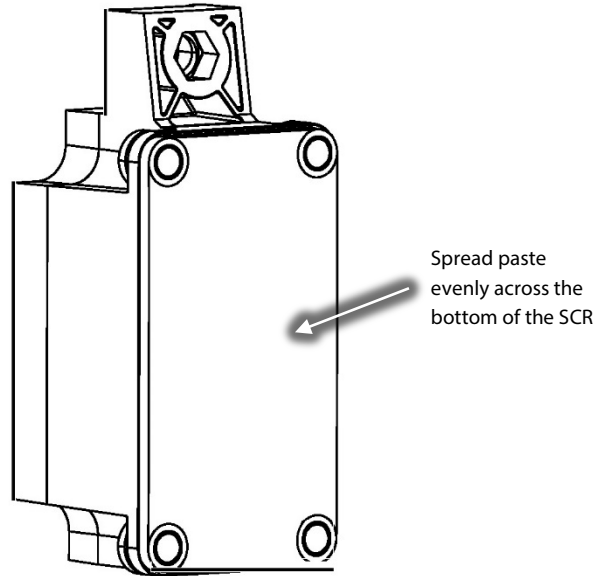


Figure 15 – SCR Thermal Paste Application

5. Using the 12 M6x16 Screws, install the three (3) SCRs. Finger-tighten and then, according to Refer to Figure 16 (SCR Installation) and Figure 17 (SCR Torque Sequence), tighten in a crisscross pattern in two (2) stages.
  - Stage 1: Tighten to 2 Nm (18 in.lb.)
  - Stage 2: Tighten to a final torque of 5 Nm (44 in.lb.)

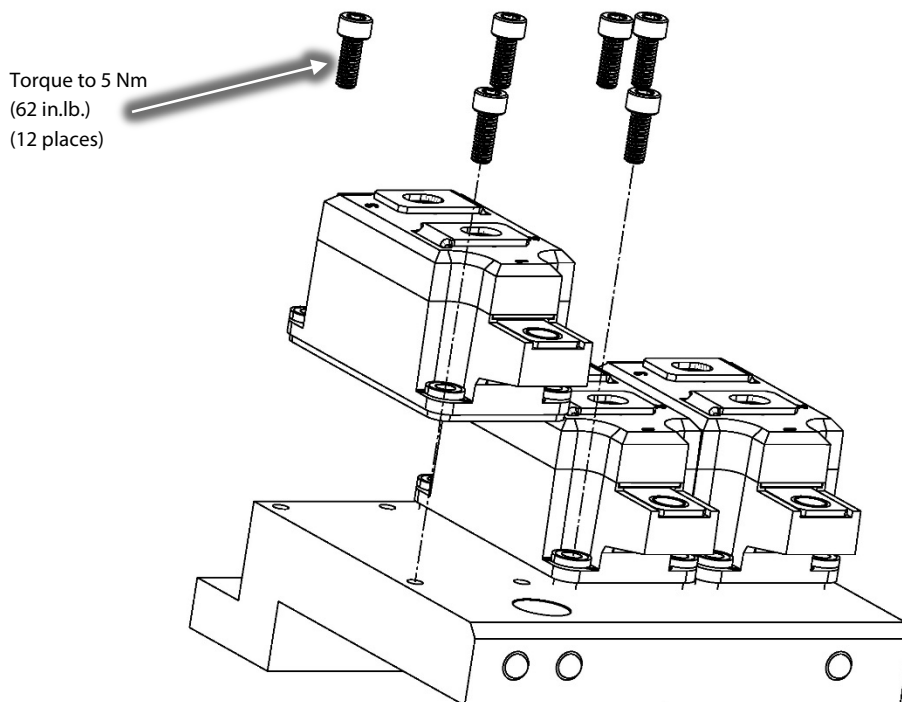


Figure 16 – SCR Installation

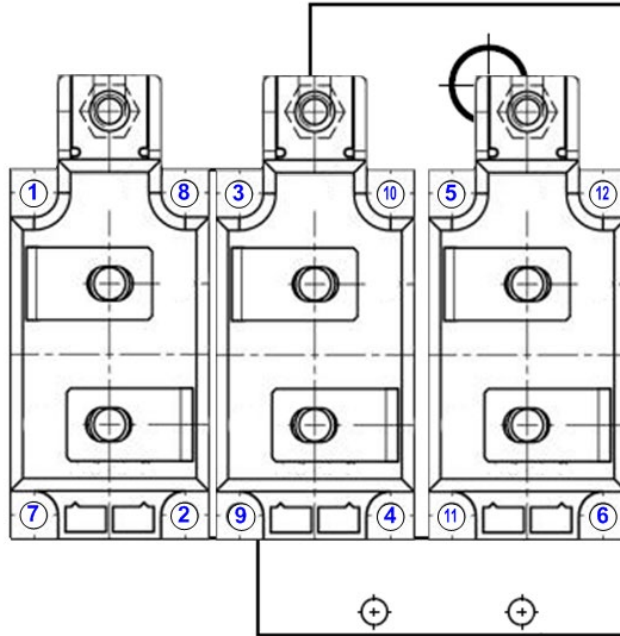


Figure 17 – SCR Torque Pattern

**NOTE:** The screws should be tightened up again three (3) hours later as the thermal compound spreads out under the mounting pressure.

- Reverse Steps 1-21 of the removal procedure and start the compressor.

5 - Kit Contents

QTY	Part(s) Description	Picture(s)
3	DIODE RECTIFIER MODULE	
12	SCREW M6x16 SOCKET HEAD CAP SCREW	
9	SCREW M8x20, BUTTON HEAD CAP, DBL SEMS	



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