PowerFlex 755TS Products with TotalFORCE Control

Catalog Numbers 20G2, 20GE

Allen-Bradley
by ROCKWELL AUTOMATION

Hardware Service

Original Instructions

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

IMPORTANT Identifies information that is critical for successful application and understanding of the product.

These labels may also be on or inside the equipment to provide specific precautions.

SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.

BURN HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.

ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

The following icon may appear in the text of this document.

Identifies information that is useful and can help to make a process easier to do or easier to understand.

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About This Publication

This manual provides recommended preventative and predictive maintenance information, component inspection guidance and primary component tests, renewal parts replacement procedures, and schematic diagrams for PowerFlex® 755TS products.

This manual is intended for qualified service personnel responsible for PowerFlex 755TS products repairs. You must have previous experience with, and an understanding of, electrical terminology, procedures, required equipment, equipment protection procedures and methods, and safety precautions. See safety-related practices that are contained in the publication NFPA 70E, Standard for Electrical Safety in the Work Place.

For product programming and troubleshooting information that can help you determine if your product requires repairs, see these publications:

- See the PowerFlex Drives with TotalFORCE® Control Programming Manual (firmware revision 10.*xxx* and later), publication 750-PM101, for general programming information.
- See the PowerFlex Drives with TotalFORCE Control Parameters Reference Data, publication 750-RD101, for parameter enumerations and descriptions.
- See the PowerFlex Drives with TotalFORCE Control Conditions Reference Data, publication 750-RD102, for drive fault and alarm information.

Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

Topic	Page
Added 208V/240V and 600V/690V power interface circuit board catalog numbers to the Table 4 - Frame 6 Renewal Kits.	78
Added 208V/240V and 600V/690V AC precharge circuit board catalog numbers to the Table 4 - Frame 6 Renewal Kits.	78
Updated the frame 6 upper stirring fan replacement procedure to include two cable ties.	95
Updated the frame 6 AC Precharge Circuit Board Replacement procedure to include removal of the power interface circuit board and brake bus bar (BR2), if BR2 is installed.	108
Added 208V/240V and 600V/690V power interface circuit board catalog numbers to the Table 5 - Frame 7 Renewal Kits.	127
Added 208V/240V and 600V/690V AC precharge circuit board catalog numbers to the Table 5 - Frame 7 Renewal Kits.	128
Updated the frame 7 AC Precharge Circuit Board Replacement and DC Precharge Circuit Board Replacement procedures to include the removal of an additional screw, when present.	163 and 172
Updated the following schematic diagrams for 200V class and 600V class applications: • PowerFlex 755TS Frame 1 AC Input Drive • PowerFlex 755TS Frames 2...4 AC Input Drives • PowerFlex 755TS Frame 5 AC Input Drive • PowerFlex 755TS Frame 6 AC Input Drive • PowerFlex 755TS Frame 6 DC Input Drive • PowerFlex 755TS Frame 7 AC Input Drive • PowerFlex 755TS Frame 7 DC Input Drive	 184 185 186 187 188 189 190

Download Firmware, Add-on Profile, EDS, and Other Files

Download firmware, associated files (such as Add-on Profile, EDS, and DTM), and access product release notes from the Product Compatibility and Download Center at rok.auto/pcdc.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
PowerFlex 755TS Products with TotalFORCE Control Installation Instructions, publication 750-IN119	Provides the basic steps to install PowerFlex 755TS drives.
PowerFlex 750-Series I/O, Feedback, and Power Option Modules Installation, publication 750-IN111	Provides instructions to install and wire 750-Series option modules.
PowerFlex 755TS Torque Accuracy Module (TAM) Installation Instructions, publication 750-IN120	Provides instructions to install and wire the PowerFlex 755TS torque accuracy module (TAM).
PowerFlex TotalFORCE Firmware Documentation Set: • PowerFlex Drives with TotalFORCE Control Programming Manual, publication 750-PM101 • PowerFlex Drives with TotalFORCE Control Parameters Reference Data, publication 750-RD101 • PowerFlex Drives with TotalFORCE Control Conditions Reference Data, publication 750-RD102	Provides detailed information on: • Startup, control algorithms, and status indicators • Parameters and programming • Faults, alarms, events, and troubleshooting
PowerFlex 755TS Products with TotalFORCE Control Technical Data, publication 750-TD104	Provides detailed information on: • Drive and bus supply specifications • Option specifications • Fuse and circuit breaker ratings
Wiring and Grounding Guidelines for Pulse Width Modulated (PWM) AC Drives, publication DRIVES-IN001	Provides basic information to properly wire and ground PWM AC drives.
EtherNet/IP™ Network Devices User Manual, publication ENET-UM006	Describes how to configure and use EtherNet/IP™ devices to communicate on the EtherNet/IP network.
Ethernet Reference Manual, publication ENET-RM002	Describes basic Ethernet concepts, infrastructure components, and infrastructure features.
System Security Design Guidelines Reference Manual, publication SECURE-RM001	Provides guidance on how to conduct security assessments, implement Rockwell Automation products in a secure system, harden the control system, manage user access, and dispose of equipment.
UL Standards Listing for Industrial Control Products, publication CMPNTS-SR002	Assists original equipment manufacturers (OEMs) with construction of panels, to help ensure that they conform to the requirements of Underwriters Laboratories.
American Standards, Configurations, and Ratings: Introduction to Motor Circuit Design, publication IC-AT001	Provides an overview of American motor circuit design based on methods that are outlined in the NEC.
Safety Guidelines for the Application, Installation, and Maintenance of Solid-state Control, publication SGI-1.1	Designed to harmonize with NEMA Standards Publication No. ICS 1.1-1987 and provides general guidelines for the application, installation, and maintenance of solid-state control in the form of individual devices or packaged assemblies incorporating solid-state components.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, rok.auto/certifications.	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at rok.auto/literature.

Before You Begin Tests, Maintenance, or Repairs

This chapter provides safety-related information about the maintenance and repair of drives.

IMPORTANT Once the product is connected to a power supply, always verify that system power is not present before performing any work on the product. See safety-related practices that are contained in the publication NFPA 70E, Standard for Electrical Safety in the Work Place.

Product Advisories

Read these precautions before you begin to test components, perform maintenance, or repair the drive.

Qualified Personnel

ATTENTION: Only qualified personnel familiar with PowerFlex® 755TS products and associated machinery should plan or implement the installation, startup, and subsequent maintenance of the system. Failure to comply can result in personal injury and/or equipment damage.

Personal Safety

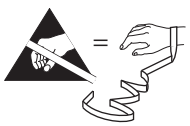
ATTENTION: To avoid an electric shock hazard, verify that the voltage on the bus capacitors has discharged before servicing. Measure the DC bus voltage at the power terminal block by measuring between the +DC and –DC terminals. Also, measure between the +DC terminal and the chassis, and between the –DC terminal and the chassis. The voltage must be zero for all three measurements. See Remove Power from the System on page 10 for terminal locations.

ATTENTION: Potentially fatal voltages can result from improper usage of an oscilloscope and other test equipment. The oscilloscope chassis can be at a potentially fatal voltage if not properly grounded. If an oscilloscope is used to measure high-voltage waveforms, use only a dual channel oscilloscope in the differential mode with X 100 probes. It is recommended that the oscilloscope is used in the A minus B Quasi-differential mode and the oscilloscope chassis is grounded to an earth ground.

Product Safety

ATTENTION: This drive contains ESD (Electrostatic Discharge) sensitive parts and assemblies. Static control precautions are required when you install, test, service, or repair this assembly. Component damage can result if ESD control procedures are not followed.

In this manual, this image identifies Electrostatic Discharge (ESD) sensitive parts. Take static control precautions when you install an assembly that is identified as ESD sensitive.



Remove Power from the System

This procedure must be completed before attempting to service any part of a drive.

ATTENTION: Remove power before you remove or make cable connections. When you remove or insert a cable connector with power applied, an electric arc can occur. An electric arc can cause personal injury or property damage in theses ways:

- An electric arc can send an erroneous signal to system field devices, which can cause unintended machine motion
- An electric arc can cause an explosion in a hazardous environment

Electric arcs cause excessive wear to contacts on both the module and its receiving connector. Worn contacts can create electrical resistance.

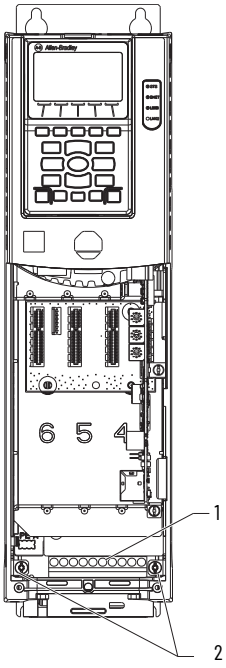
Follow these steps to remove power from a drive.

1. Turn off and lock out all input power, including any external power sources.
2. Wait 15 minutes.
3. Remove the appropriate cover from the drive:
   - For frame 1...5 drives, see these procedures:
     - Remove the Power Terminal Cover, Frames 1...5 on page 31
     - Remove the IP54, NEMA/UL Type 12 Cover, Frames 2...5 on page 33
   - For frame 6 drives, see these procedures:
     - Remove the Cover on page 79
     - Remove the Protective Guard (IP54, NEMA/UL Type 12 Enclosure) on page 80
   - For frame 7 drives, see these procedures:
     - Remove the Cover on page 129
     - Remove the Protective Guard (IP54, NEMA/UL Type 12 Enclosure) on page 130
4. To verify that there is no voltage present, measure the AC input and DC bus voltage:
   - For AC input drives and bus supplies only, measure the AC input terminals R/L1, S/L2, and T/L3, L to L and L to chassis GND (PE).
   - For all products, measure the DC output terminals DC+ and DC–, DC+ to DC–, DC+ to chassis GND (PE), and DC– to chassis GND (PE).

   For terminal locations and identification, see Figure 1 on page 11, Figure 2 on page 12, and Figure 3 on page 13.

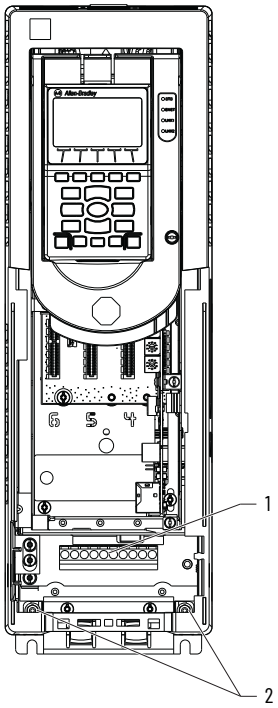
Figure 1 - Frames 1...3 Power Terminal Block and PE Ground Locations

Frame 1

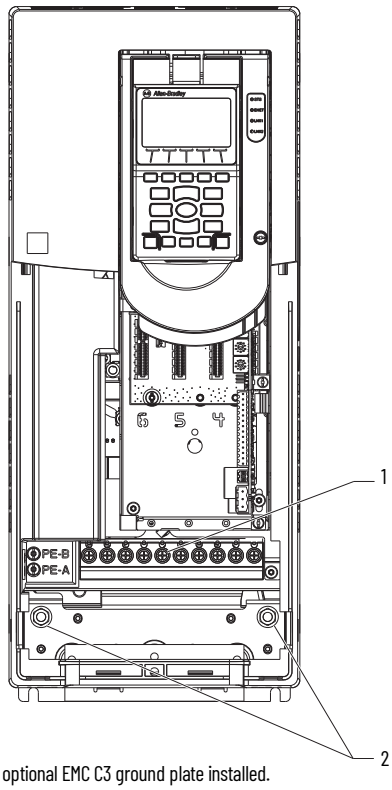


The frame 1 drive is shown without the factory-installed EMC C3 ground plate.

Frame 2



Frame 3

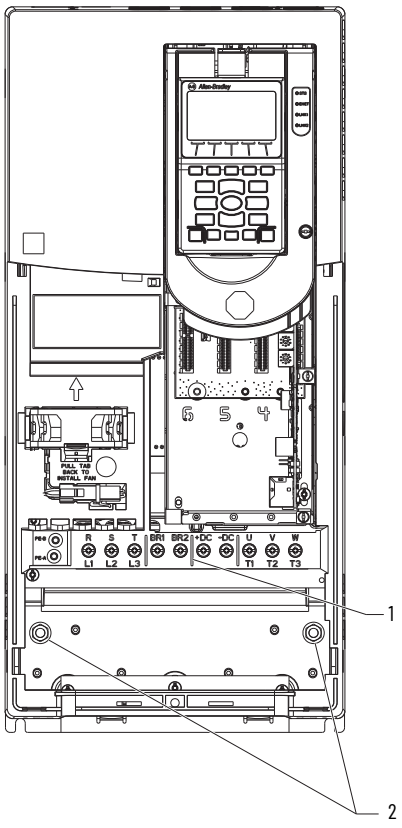


The frame 2 and 3 drives are shown with the optional EMC C3 ground plate installed.

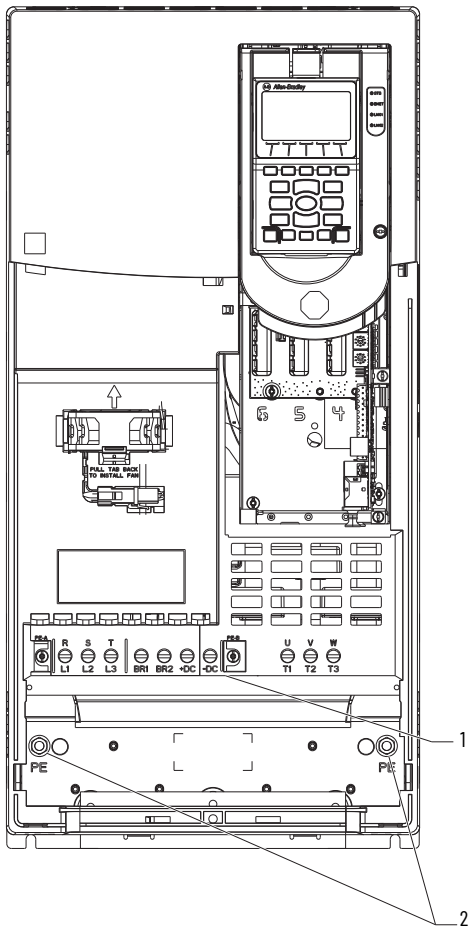
Item	Name
1	R/L1, S/L2, T/L3, BR1, BR2, +DC, –DC, U/T1, V/T2, W/T3
2	PE Ground

Figure 2 - Frames 4 and 5 Power Terminal Block and PE Ground Locations

Frame 4



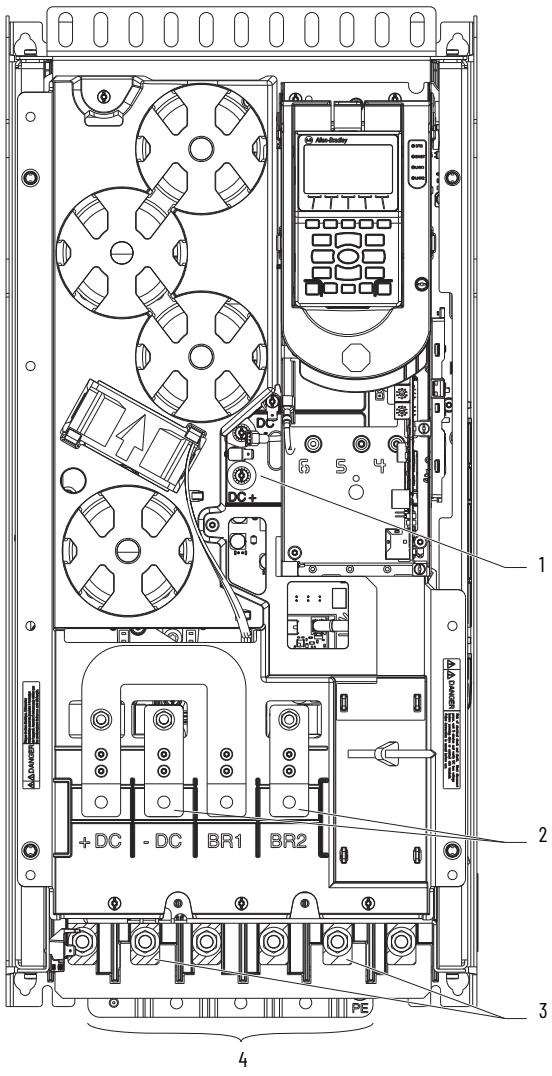
Frame 5



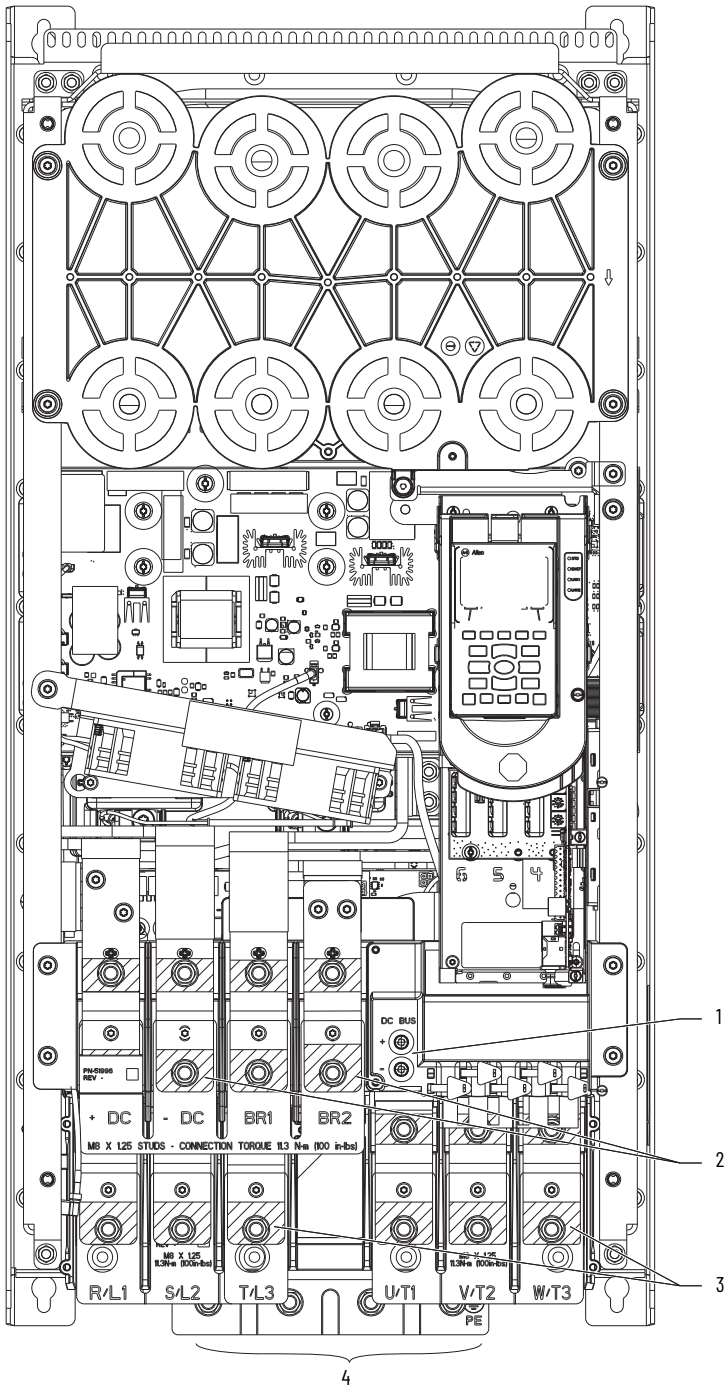
Item	Name
1	R/L1, S/L2, T/L3, BR1, BR2, +DC, –DC, U/T1, V/T2, W/T3
2	PE Ground

Figure 3 - Frames 6 and 7 Power Terminal Block and PE Ground Locations

Frame 6



Frame 7



Item	Name
1	+DC and –DC test points
2	+DC, –DC, BR1, BR2
3	R/L1, S/L2, T/L3, U/T1, V/T2, W/T3
4	PE Ground

Renewal Kits for PowerFlex 755TS Products with Corrosive Gas Protection (XT)

All PowerFlex 755TS product renewal kits with corrosive gas protection (XT) meet the corrosive atmosphere specification as defined by Rockwell Automation. For details on the corrosive atmosphere specification, see the PowerFlex 755TS Products with TotalFORCE® Control Technical Data, publication 750-TD104.

Protective Packaging for Renewal Kits with XT

Renewal kits with XT are shipped in packaging that is designed to protect products while stored at industrial sites that can be exposed to corrosive gas. Do not remove the packaging or protective film from a renewal kit while it is in storage.

Protective Covers on Kits with XT

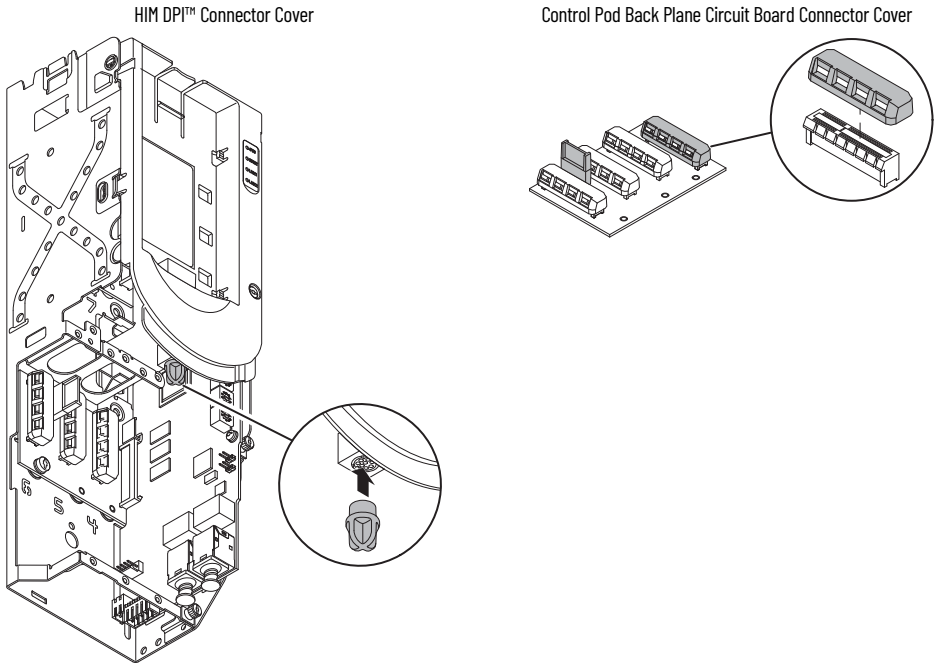
Some renewal kits with XT use protective covers to seal terminal bocks, circuit board connectors, and wire harness connectors. The covers protect against contamination and corrosion in corrosive gas environments. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in or on unused connectors during storage and operation. See Figure 4 for examples of protective covers.

For kits with protective covers:

- Do **not** remove a protective cover from an unused connection or a kit in storage.
- Remove a protective cover when a connection must be made at installation only.

'XT' appears in the kit catalog number to identify a kit that contains protective covers. For example, the catalog number for the main control circuit board with XT is SK-RT-MCB1-PF755-**XT**.

Figure 4 - Examples of Protective Covers on Renewal Kits with XT



Dielectric Grease Application

All printed circuit board renewal kits with XT contain PolySi PST-576 dielectric grease on the edge connectors (where present). The dielectric grease provides corrosion resistance for the edge connector and receiving connector.

'XT' appears in the kit catalog number to identify a circuit board kit that contains dielectric grease on connectors. Greased connectors are always covered on new kits.

To be sure that edge connectors on circuit boards with XT maintain corrosion resistance, do the following:

- Do not touch or remove the dielectric grease from the circuit-board edge connectors. See Protective Cover Removal from Circuit Boards with Dielectric Grease on page 15 for more information.
- Inspect and clean receiving connectors, if necessary, before you install a new or existing circuit board. See Inspect and Clean Circuit Board Connectors on page 16 for details.
- If the grease on a circuit board edge connector becomes contaminated or the edge connector becomes exposed, see Apply Dielectric Grease to an Edge Connector on page 16.

IMPORTANT Edge connectors on circuit boards that are contained in renewal kits with XT contain dielectric grease.

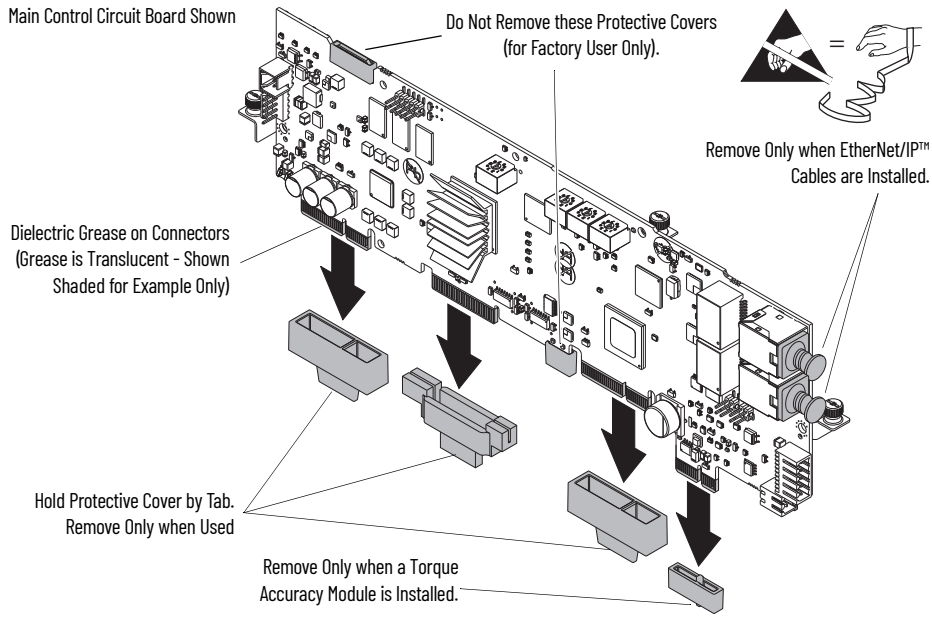
- Do not touch or remove the dielectric grease from circuit board edge connectors. A non-greased edge connector can lead to corrosion.
- Do not allow the grease on the edge connectors to become contaminated with any form of debris or particulate matter. Debris or particulate matter on a greased connector can lead to premature failure of the circuit board.

Protective Cover Removal from Circuit Boards with Dielectric Grease

When you install a new circuit board with dielectric grease on the edge connectors, by holding the protective cover only, carefully remove the covers from the edge connectors on the circuit board. Do not allow the edge connectors to contact surfaces other than the receiving connector.

It is highly recommended that you do not pull the circuit board edge connectors out of the receiving connectors after it has been fully inserted and seated. Removing the circuit board after it has been seated can displace the dielectric grease on the edge connectors.

Figure 5 - Circuit Board with Protective Covers and Connectors with Dielectric Grease Example



Inspect and Clean Circuit Board Connectors

Before you install a new circuit board, or reinstall an existing circuit board, with XT, follow these steps to inspect and clean a receiving connector.

1. Use a bright light to inspect the receiving connector for debris or particulate matter.
2. If there is contamination inside the connector on the receiving circuit board, it is recommended that you replace the contaminated circuit board.
3. If the exterior surface of the receiving connector has contamination, use a lint-free alcohol wipe with 90% or higher alcohol content, remove contamination away from the connector opening.

   IMPORTANT Take care when cleaning the surface of a receiving connector to help prevent any debris or particulate matter from entering the connector.

4. Allow the receiving connector to dry thoroughly before you install the new circuit board or reinstall the existing circuit board.

Apply Dielectric Grease to an Edge Connector

If any of the following conditions exist for an edge connector on a circuit board with XT, do not install the circuit board.

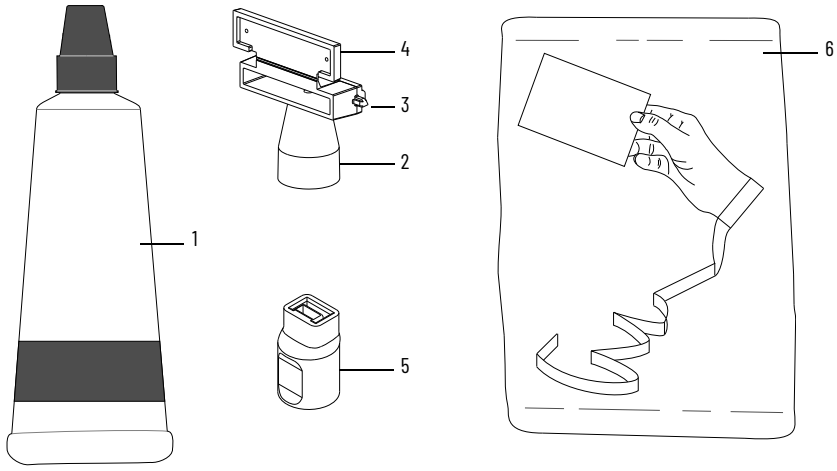
- Debris or particulate matter is present on the greased surfaces of a circuit board edge connector.
- Any of the "gold finger" surfaces on the edge connector are not completely coated with a thin layer of grease.

If the dielectric grease on a circuit board edge connector contains debris or is removed to expose the edge connector before installation, you must thoroughly clean and reapply PolySi PST-576 non-silicone, dielectric grease to the affected connector.

IMPORTANT Only PolySi PST-576 dielectric grease is approved for use on edge connectors of circuit boards with XT.

The grease applicator kit, catalog number SK-RM-GRAPP1, is available to reapply grease to edge connectors on circuit boards and fiber transceivers. The grease applicator kit contains these components.

Figure 6 - Grease Applicator Kit Contents



Item	Description
1	PolySi PST-576 dielectric grease tube
2	Large grease applicator (for circuit board edge connectors)
3	Pin (to pierce the grease tube)

Item	Description
4	Applicator cover (hinged)
5	Small grease applicator (for fiber transceiver edge connector)
6	ESD strap

Regarding grease coverage on edge connectors:

- Complete coverage is more important than the thickness of the grease layer.
- A thicker application of grease does not improve corrosion resistance.

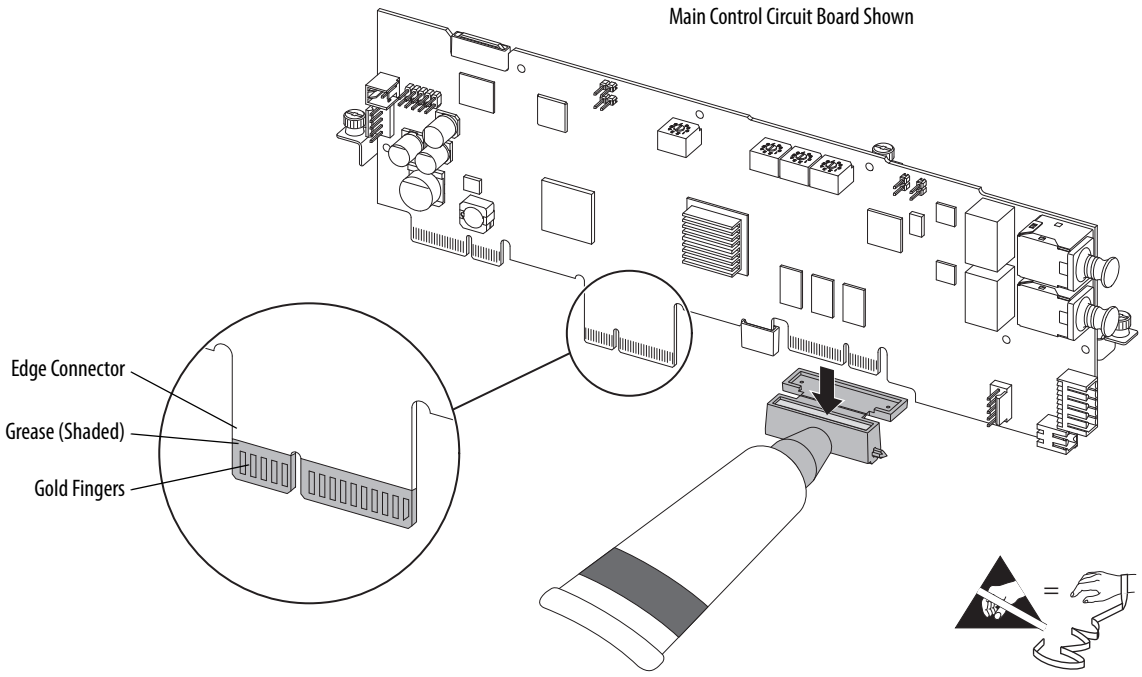
Follow these steps to use the grease applicator kit to apply dielectric grease to an edge connector on a circuit board.

1. By using a lint-free alcohol wipe with 90% or higher alcohol content, remove the contamination and grease from the connector.
2. Before you apply grease, allow the edge connector to dry thoroughly.
3. Open the grease tube and by using the pin on the side of the large applicator, puncture the seal on the end of the tube.
4. Install the large grease applicator on the threaded tip of the tube.
5. Close the applicator cover.
6. Press the tube until the applicator-tip chamber is completely filled with grease.

   The chamber is full when a grease escapes through the small holes on the applicator cover.
7. Open the applicator cover and verify that the chamber is full of grease.
8. If the chamber is not full of grease, repeat steps 5...7.

9. To apply dielectric grease to both sides, insert the edge connector into the center of the applicator tip.

   Be sure that the grease is applied beyond the edge of the gold finger surfaces on the edge connector (ideally in contact with the conformal coating on the board).



10. Repeat steps 5...9 for each affected edge connector.
11. After use, remove the grease applicator from the grease tube.
12. Replace the cap on the grease tube.
13. By using a clean cloth, wipe the remaining grease out of the applicator tip and close the cover.

Commonly Used Tools

This table includes the tools that are needed for test measurements, basic maintenance, and service repairs.

IMPORTANT Care must be taken to be sure that tools and/or hardware components do not fall into open drive assemblies. Do not energize the drive unless all loose tools and/or hardware components have been removed from the drive assemblies and enclosure.

Service Tools

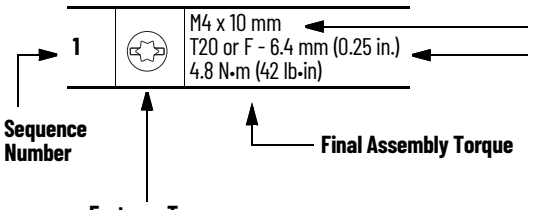
Tool Description	Details
Allen (hex) socket wrench	4 mm
Box wrench	7 mm, 8 mm, 10 mm
Crimp tools	For cable terminals 1.5...240
Current clamp	1000 A (AC, rms), signal output
ESD-protected place of work	Work surface, floor cover, seat, and ground connections
ESD-protective clothing	Wrist wrap, shoes, overall clothing (coat)
Flash light / Task light	For inspections
Flat-nose screwdriver	3 mm (0.12 in.), 5 mm (0.19 in.), 6.4 mm (0.25 in.)
Hexagonal socket wrench	7 mm, 8 mm, 10 mm
Insulation tester	1000V DC
Lift strap	5/16 in. J-hook style, 24 in. long, 1000 lb. min
Multi-meter	Digital multi-meter, capable of AC and DC voltage, continuity, resistance, capacitance measurements, and forward diode bias tests. Fluke model 87 III or equivalent.
Nose pliers	–
Oscilloscope	Portable, digitizing, dual channel scope, with isolation
Torque wrench	1...12 N•m (8.8...106 lb•in)
Torx screw driver/bit	#15, #20, #25, #30
Wire cutter	–

Software Tools

Connected Components Workbench™ software is an application that can be used to upload and download parameter configuration and monitor system parameters. Connected Components Workbench version 15.01 or later is required for use with PowerFlex 755TS products. If the drive is connected to a ControlLogix® or CompactLogix™ controller you can also use Studio 5000 Logix Designer® (version 20 or later).

Hardware Installation Diagrams

The disassembly illustrations throughout this manual contain diagrams (as shown here) that identify the following: sequence number (if necessary), type of fastener, fastener size, tool type and size, and final assembly torque.



F	Flat-nose screwdriver
T*xx*	Torx screwdriver/bit and size
nn mm	Hexagonal socket wrench

Fastener Type

	Flat-head screw
	Hexagonal bolt
	Hexagonal nut or standoff
	Hexagonal screw
	Torx screw
	Slotted Torx screw

Fastener Torque Sequences

ATTENTION: When mounting components to a drive heatsink, component fastener torque sequences and tolerances are crucial to component-to-heatsink heat dissipation.
Components can be damaged if the initial tightening procedure is not performed to specification.

These figures illustrate the initial and final tightening sequences for components that are fastened to a heatsink by using two, four, and six screws. Initial torque is 1/3 (33%) of final torque, except six-point mountings, which require 0.7 N•m
(6 lb•in) initial torque. The numeric illustration labels are for your assistance. Drive components do not contain these labels.

Figure 7 - Two-point Mounting

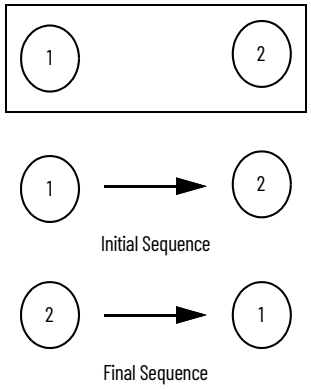


Figure 8 - Four-point Mounting

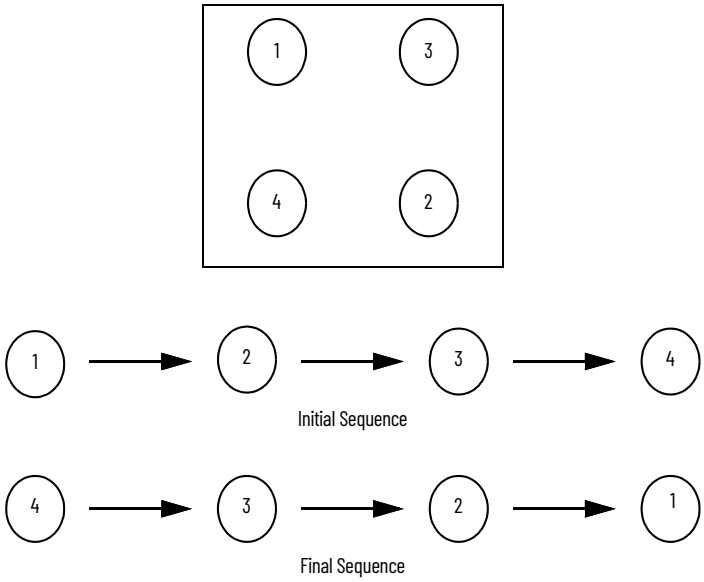
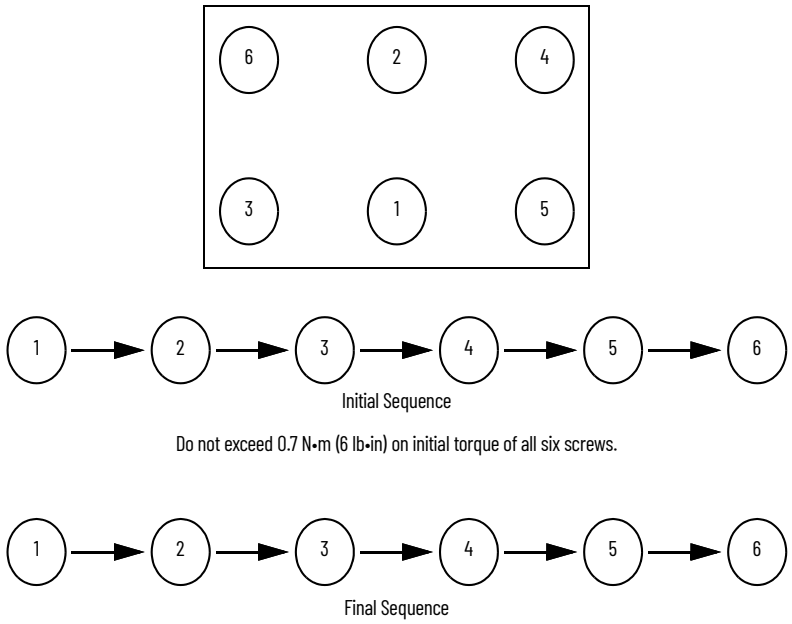


Figure 9 - Six-point Mounting



Notes:

Preventative and Predictive Maintenance

This chapter provides recommended maintenance practices for PowerFlex® 755TS products and components for applications that demand the highest levels of machine availability.

Recommended Preventative Maintenance

To help achieve the highest level of uptime, Rockwell Automation recommends that you follow the maintenance schedule that is provided for your operating environment. For recommended maintenance tasks and schedules, see the PowerFlex 755TS Products with TotalFORCE® Control Installation Instructions, publication 750-IN119.

IMPORTANT	Duty cycle and load profile can greatly affect the reliability of PowerFlex 755TS Products with TotalFORCE Control.

An annual preventative maintenance program includes the following primary tasks:

- A visual inspection of all components accessible from the front of the drive
- Resistance checks on the power components
- Power-supply voltage level checks
- General cleaning and maintenance
- Tightness checks on all accessible power connections

See Chapter 3 on page 27 for additional information on how to perform inspections and tests.

Predictive Maintenance

PowerFlex 755TS Products with TotalFORCE Control contain algorithms for predictive maintenance that are used to improve the uptime of machines, processes, and facilities. These algorithms monitor the lifespan of certain components and display the percentage of remaining life and the number of hours or counts of remaining life in specific parameters or a software interface. These algorithms can be used to alert personnel when the components are nearing the end of their lifespan so the components can be replaced before they fail. For an overview of predictive maintenance, see the Predictive Maintenance section in the PowerFlex 750-Series Products with TotalFORCE Control Reference Manual, publication 750-RM100.

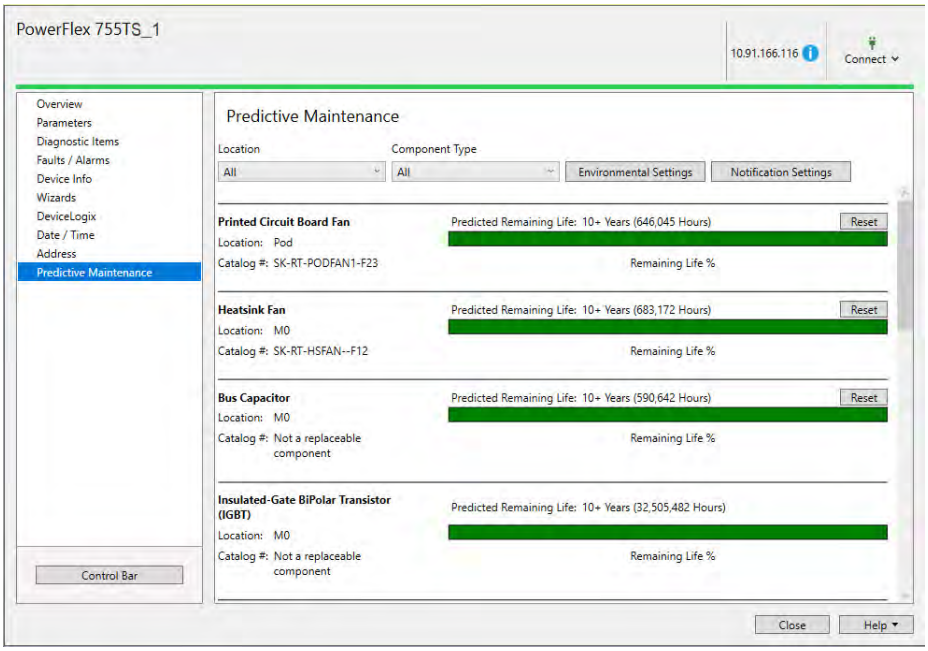
IMPORTANT Failure to address predictive maintenance alarms can cause unexpected downtime or premature product failure.

The predicted remaining life of components appears on the Predictive Maintenance page in these software applications:

- Connected Components Workbench
- Studio Logix 5000 Designer

Figure 10 provides an example of a Predictive Maintenance page for a drive.

Figure 10 - Connected Components Workbench - Predictive Maintenance Page Example



Maintenance of Industrial Control Equipment

ATTENTION: Performing service on energized Industrial Control Equipment can be hazardous. Severe injury or death can result from electrical shock, bump, or unintended actuation of controlled equipment. Recommended practice is to disconnect and lockout control equipment from power sources, and release stored energy, if present. See National Fire Protection Association Standard No. NFPA 70E, Part II and (as applicable) OSHA rules for Control of Hazardous Energy Sources (lockout/tagout) and OSHA Electrical Safety Related Work Practices for safety-related work practices. These publications include procedural requirements for lockout/tagout, and appropriate work practices, personnel qualifications, and required training where it is not feasible to de-energize and lock out or tag out electric circuits and equipment before working on or near exposed circuit parts.

Periodic Inspection - Periodically inspect industrial control equipment. Base inspection intervals on the environmental and operating conditions and adjust the intervals as necessary. An initial inspection within 3 to 4 months after installation is suggested. See National Electrical Manufacturers Association NEMA) Standard No. ICS 1.3, Preventive Maintenance of Industrial Control and Systems Equipment, for general guidelines for defining a periodic maintenance program. Some specific guidelines for Rockwell Automation products are listed here.

Contamination - If inspection reveals that dust, dirt, moisture, or other contamination has reached the control equipment, the cause must be removed. Contamination can indicate an incorrectly selected or ineffective enclosure, unsealed enclosure openings (conduit or other), or incorrect operating procedures. Replace any improperly selected enclosure with one that is suitable for the environmental conditions. See the Industry Installation Guidelines for Pulse Width Modulated (PWM) AC Drives, publication DRIVES-AT003, for guidance on environmental considerations. See NEMA Standard No. 250, Enclosures for Electrical Equipment, or UL 50E Electrical Equipment Enclosures, for enclosure type descriptions and test criteria.

Replace any damaged or cracked elastomer seals and repair or replace any other damaged or malfunctioning parts (for example, hinges and fasteners). Dirty, wet, or contaminated control devices must be replaced. Compressed air is not recommended for cleaning because it can displace dirt, dust, or debris into other parts or equipment, or damage delicate parts.

PowerFlex 755TS products with XT use dielectric grease to protect critical connections from the effects of corrosive gases. When you disconnect or reconnect a greased connection, always inspect for dust, dirt, conductive debris, or other contaminants. If contamination is found, thoroughly clean receiving surfaces and reapply dielectric grease as described in the dielectric grease section. See Dielectric Grease Application on page 15 for details.

Fans - Inspect fans that are used for forced air cooling. Replace any that have bent, chipped, or missing blades, or if the shaft does not turn freely. Apply power momentarily to check operation. If the unit does not operate, check and replace wiring, fuse, or blower or fan motor as appropriate. Clean or change air filters as recommended in the product manual. Also, clean the fins of heat exchangers so convection cooling is not impaired.

Operating Mechanisms - Check for proper function and freedom from sticking or binding. Replace any broken, deformed, or badly worn parts or assemblies according to individual product renewal-parts lists. Check for and re-tighten securely any loose fasteners. Lubricate if specified in individual product instructions. Note: Allen-Bradley® magnetic starters, contactors, and relays are designed to operate without lubrication. Do not lubricate these Allen-Bradley® devices because oil or grease on the pole faces (mated surfaces) of the operating magnet can cause the device to stick in the "ON" mode. Some parts of other devices are factory lubricated – if lubrication during use or maintenance of these devices is needed, it is specified in their individual instructions. If in doubt, consult your nearest Rockwell Automation sales office for information.

Contacts - Check contacts for excessive wear and dirt accumulation. To remove dirt, clean contacts with a soft cloth. Discoloration and slight pitting does not harm contacts. Do not file contacts - this action shortens the life of the contact. Do not use contact spray cleaners because residue on magnet pole faces or in operating mechanisms can cause sticking, and on contacts can interfere with electrical continuity. Replace contacts only after the silver has become badly worn. Always replace contacts in complete sets to avoid misalignment and uneven contact pressure.

Terminals - Loose connections in power circuits can cause overheating that can lead to equipment malfunction or failure. Loose connections in control circuits can cause control malfunctions. Loose bond or ground connections can increase hazards of electrical shock and contribute to electromagnetic interference (EMI). Check the tightness of all terminals and bus bar connections and torque any loose connections properly. Infrared technology can be used to check for loose connections (high resistance/hot spot) during periodic maintenance. Replace any parts or wiring that is damaged by overheating, and any broken wires or bond straps.

Coils - If a coil is overheated (contains cracked, melted, or burned insulation), it must be replaced. To correct possible future coil damage or failure, check for and correct any overvoltage or undervoltage conditions. Be sure to clean any residues of melted coil insulation from other parts of the device or replace such parts.

Pilot Lights - Replace any burned out lamps or damaged lenses.

Photoelectric Switches - The lenses of photoelectric switches require periodic cleaning with a soft dry cloth. Reflective devices that are used with photoelectric switches also require periodic cleaning. Do not use solvents or detergents on the lenses or reflectors. Replace any damaged lenses and reflectors.

Solid-state Devices

ATTENTION: Use of other than factory-recommended test equipment for solid-state controls can result in damage to the control or test equipment or unintended actuation of the controlled equipment. See paragraph titled HIGH VOLTAGE TESTING.

Solid-state devices require little more than a periodic visual inspection. Discolored, charred, or burned components can indicate the need to replace the component or circuit board. Make necessary replacements only at the circuit board or plug-in component level. Inspect printed circuit boards to determine whether they are properly seated in the edge board connectors. Board locking tabs must also be in place. Solid-state devices must also be protected from contamination, and temperature control provisions must be maintained - refer to paragraphs titled CONTAMINATION and COOLING DEVICES. Do not use solvents on printed circuit boards.

High-Voltage Testing - Do not perform high-voltage insulation resistance (IR) and dielectric withstanding voltage (DWV) tests to check solid-state control equipment. When measuring IR or DWV of electrical equipment such as transformers or motors, a solid-state device that is used for control or monitoring must be disconnected before performing the test. Even though no damage is readily apparent after an IR or DWV test, the solid-state devices are degraded and repeated application of high voltage can lead to failure.

Locking and Interlocking Devices - Check these devices for proper working condition and capability of performing their intended functions. Make any necessary replacements only with Allen-Bradley renewal parts or kits. Adjust or repair only in accordance with Allen-Bradley instructions.

Maintenance After a Fault Condition - An open short circuit protective device (such as a fuse or circuit breaker) in a properly coordinated motor branch circuit is an indication of a fault condition in excess of operating overload. Such conditions can damage control equipment. Before power is restored, the fault condition must be corrected and any necessary repairs or replacements must be made to restore the control equipment to good working order. See NEMA Standards Publication No. ICS-2, Part ICS2-302 for procedures. For replacements, use only parts and devices that Rockwell Automation recommends maintaining the integrity of the equipment. Make sure that the parts are properly matched to the model, series, and revision level of the equipment.

Final Check Out - After maintenance or repair of industrial controls, always test the control system for proper function under controlled conditions to avoid a control malfunction hazard. For additional information, see NEMA ICS 1.3, PREVENTIVE MAINTENANCE OF INDUSTRIAL CONTROL AND SYSTEMS EQUIPMENT, published by the National Electrical Manufacturers Association, and NFPA 70B, ELECTRICAL EQUIPMENT MAINTENANCE, published by the National Fire Protection Association.

Component Inspection and Tests

This chapter provides details on how to inspect and test the major components of the drive and includes recommendations for repairs. See the PowerFlex® Drives with TotalFORCE® Control Conditions Reference Data, publication 750-RD102, for information on conditions that can cause a fault or alarm and how to troubleshoot these conditions.

Component Inspection and Maintenance

Visually inspect the major components on the control pod and fans for dirt and damage. Dirt build-up on some components can lead to component damage or failure. Avoid damage to the product by replacing components and/or circuit boards with burn marks, breakage, or foil delamination. Follow the Recommended Preventative Maintenance on page 23 and these inspection and maintenance instructions.

1. Review the Product Advisories on page 9.
2. Remove power from the system. See Remove Power from the System on page 10.
3. Remove the drive cover. See the applicable chapter for your frame size:
   - Frames 1...5 Renewal Kits Installation on page 29
   - Frame 6 Renewal Kits Installation on page 77
   - Frame 7 Renewal Kits Installation on page 127
4. Inspect the fan assemblies for blockage and verify free rotation. Clean or replace as necessary. See these procedures for replacement instructions:
   - Frames 2...5 control pod printed circuit board fan, see page 50.
   - Frames 1...3 heatsink fan, see page 53.
   - Frames 4 and 5 heatsink fan, see page 54.
   - Frames 4 and 5 stirring fan, see page 55.
   - Frame 6 heatsink fan, see page 93.
   - Frame 6 upper stirring fan, see page 95.
   - Frame 6 lower stirring fan, see page 96.
   - Frame 7 heatsink fan, see page 143.
   - Frame 7 stirring fan, see page 145.
5. Inspect all control pod components, including: circuit boards, wire harnesses, and connectors. If any components show evidence of burn marks or breakage, replace the damaged components without further testing.
   - Frame 1, see pages 60 and 72.
   - Frames 2...5, see page 65 and 73.
   - Frame 6, see page 85.
   - Frame 7, see page 135.
6. For Frames 1...5, inspect the power board. If any components, particularly the resistors, show evidence of burn marks or breakage, replace the drive.

7. For frames 6 and 7, inspect the power interface, and AC precharge or DC precharge circuit boards. If any components, particularly the resistors, show evidence of burn marks or breakage, replace the circuit board without further testing.
   - For frame 6 power interface circuit board, see page 102.
   - For frame 6 AC precharge circuit board, see page 108.
   - For frame 6 DC precharge circuit board, see page 119.
   - For frame 7 power interface circuit board, see page 153.
   - For frame 7 AC precharge circuit board, see page 163.
   - For frame 7 DC precharge circuit board, see page 172.

Forward and Reverse Biased IGBT/Diode Tests

Follow these steps to perform forward and reverse biased IGBT/diode tests on the power modules. A failed test indicates damage to the components in the power modules and requires replacement of the drive.

IMPORTANT The actual voltage readings can vary depending upon your equipment. If your readings are not near the indicated values in Table 1 and Table 2 verify that the actual voltage that is measured is consistent for each phase of the power module.

1. Review the Product Advisories on page 9.
2. Remove power from the system. See Remove Power from the System on page 10.
3. Select the "Diode Test" mode on the digital multi-meter and complete the forward and reverse biased diode tests on the power module for your product frame size. See Figure 1 on page 11 and Figure 2 on page 12 for terminal locations and identification.

Table 1 - Forward Biased Diode Tests on the Converter IGBT Assembly

Meter Leads		Nominal Meter Reading
+	-	
–DC	U/T1	0.36V
–DC	V/T2	
–DC	W/T3	
U/T1	+DC	
V/T2	+DC	
W/T3	+DC	

Table 2 - Reverse Biased Diode Tests on the Converter IGBT Assembly

Meter Leads		Nominal Meter Reading
+	-	
U/T1	–DC	".0L" (open circuit)(1)
V/T2	–DC	
W/T3	–DC	
+DC	U/T1	
+DC	V/T2	
+DC	W/T3	

(1) Residual voltage on the DC bus capacitors can affect this reading. If the capacitors are discharged (less than 1 volt), the meter initially shows a low voltage. This voltage reading is the residual bus voltage plus the drop through the low side diodes. The meter gradually charges the bus, and the voltage slowly increases, until eventually the meter switches to ".0L". This increase can take several minutes to occur.

4. If the product fails the measurements that are identified in Table 1 or Table 2, replace the drive.
5. Complete the procedures in Appendix A on page 181 before placing the drive back into service.

Frames 1...5 Renewal Kits Installation

This chapter provides detailed instructions for how to remove and replace PowerFlex® 755TS frames 1...5 product components with renewal kit components.

Frames 1...5 Kits

Table 3 contains the renewal kits available for PowerFlex 755TS frames 1...5 products. 'XT' in the kit catalog number identifies a kit that can contain protective covers and/or dielectric grease on connectors. See Renewal Kits for PowerFlex 755TS Products with Corrosive Gas Protection (XT) on page 14 for details.

Table 3 - Frames 1...5 Renewal Kits

Kit Description	Catalog Number		Frame Size	Instructions
	Standard	XT		
Power Terminal Cover (for IP20, NEMA/UL Open Type, IP20, NEMA/UL Type 1, and Flange, NEMA/UL Type 4X/12 Back Enclosures)	SK-RT-CVR1-F1	SK-RT-CVR1-F1-XT	1	See page 35
	SK-RT-CVR1-F2	SK-RT-CVR1-F2-XT	2	
	SK-RT-CVR1-F3	SK-RT-CVR1-F3-XT	3	
	SK-RT-CVR1-F4	SK-RT-CVR1-F4-XT	4	
	SK-RT-CVR1-F5	SK-RT-CVR1-F5-XT	5	
IP54, NEMA/UL Type 12 Enclosure Cover	SK-RT-CVR12-F2	SK-RT-CVR12-F2-XT	2	See page 36
	SK-RT-CVR12-F3	SK-RT-CVR12-F3-XT	3	
	SK-RT-CVR12-F4	SK-RT-CVR12-F4-XT	4	
	SK-RT-CVR12-F5	SK-RT-CVR12-F5-XT	5	
Chassis (for IP20, NEMA/UL Open Type, IP20, NEMA/UL Type 1, and Flange, NEMA/UL Type 4X/12 Back Enclosures)	SK-RT-CHSS1-F1	SK-RT-CHSS1-F1-XT	1	See page 37
	SK-RT-CHSS1-F2	SK-RT-CHSS1-F2-XT	2	See page 42
	SK-RT-CHSS1-F3	SK-RT-CHSS1-F3-XT	3	
	SK-RT-CHSS1-F4	SK-RT-CHSS1-F4-XT	4	
	SK-RT-CHSS1-F5	SK-RT-CHSS1-F5-XT	5	
Flange Gasket (for Flange, NEMA/UL Type 4X/12 Back Enclosures)	SK-RT-FG1-F2	–	2	See page 45
	SK-RT-FG1-F3		3	
	SK-RT-FG1-F4		4	
	SK-RT-FG1-F5		5	
Control Pod Printed Circuit Board Fan (for All Enclosure Types)	SK-RT-PODFAN1	SK-RT-PODFAN1-XT	2	See page 50
			3	
			4	
			5	
Heatsink Fan (for IP20, NEMA/UL Open Type and IP20, NEMA/UL Type 1 Enclosures)	SK-RT-HSFAN1-F12	SK-RT-HSFAN1-F12-XT	1	See page 53
			2	
	SK-RT-HSFAN1-F3A, SK-RT-HSFAN1-F3	SK-RT-HSFAN1-F3A-XT, SK-RT-HSFAN1-F3-XT	3	
	SK-RT-HSFAN1-F4	SK-RT-HSFAN1-F4-XT	4	See page 54
	SK-RT-HSFAN1-F5A, SK-RT-HSFAN1-F5	SK-RT-HSFAN1-F5A-XT, SK-RT-HSFAN1-F5-XT	5	
Heatsink Fan (for Flange, NEMA/UL Type 4X/12 back and IP54, NEMA/UL Type 12 Enclosures)	–	SK-RT-HSFAN2-F2-XT	2	See page 53
		SK-RT-HSFAN2-F3-XT	3	
		SK-RT-HSFAN2-F45-XT	4	See page 54
			5	

Table 3 - Frames 1...5 Renewal Kits (Continued)

Kit Description	Catalog Number		Frame Size	Instructions
	Standard	XT		
Internal Stirring Fan (for All Enclosure Types)	SK-RT-STIRFAN1-F45	SK-RT-STIRFAN1-F45-XT	4	See page 55
			5	
Control Pod Human Interface Module (HIM) Cradle (for All Enclosure Types)	SK-RT-BZL1	SK-RT-BZL1-XT	2	See page 57
			3	
			4	
			5	
Main Control Circuit Board	SK-RT-MCB1-PF755	SK-RT-MCB1-PF755-XT	1	See page 60
			2	See page 65
			3	
			4	
			5	
Main Control Board to Power Interface Board Ribbon Cable	–	SK-RT-PIC1-F1-XT	1	See page 70
	–	SK-RT-PIC1-F27-XT	2	See page 71
			3	
			4	
			5	
Backplane Circuit Board (Kit Contains 1 Circuit Board)	SK-RT-BKPLN	SK-RT-BKPLN-XT	1	See page 72
			2	See page 73
			3	
			4	
			5	
EMC C3 Ground Plate (400/480V)	SK-RT-EMC3-F1	–	1	(1)
	SK-RT-EMC3-F2		2	
	SK-RT-EMC3-F3		3	
	SK-RT-EMC3-F4		4	
	SK-RT-EMC3-F5		5	

(1) The EMC C3 ground plate and hardware is shipped with the drive from the factory. These renewal kits can be purchased to replace missing or damaged parts for the EMC C3 assembly. For installation instructions, see the PowerFlex 755TS Products with TotalFORCE® Control Installation Instructions, publication 750-IN119.

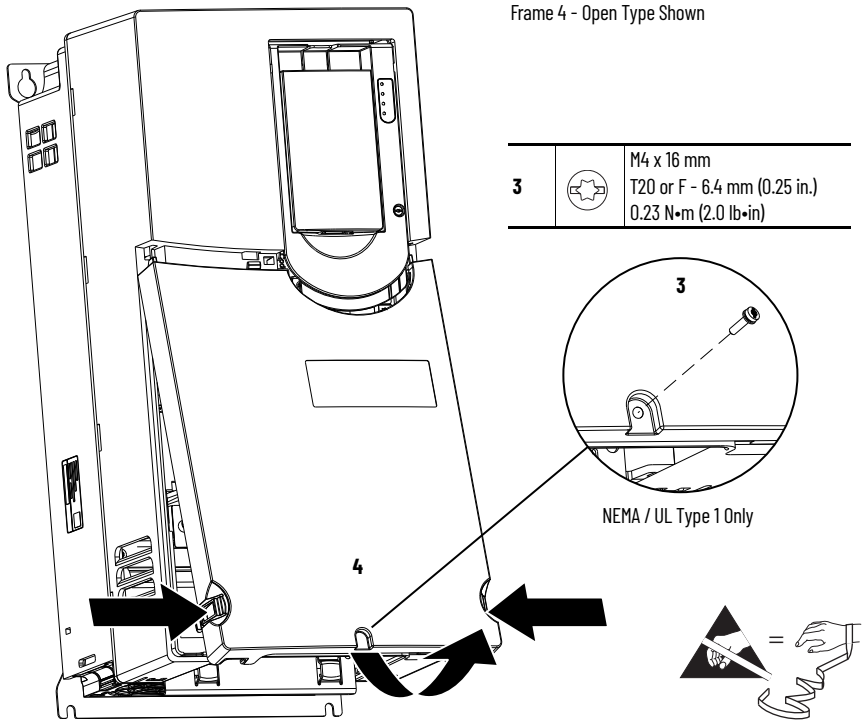
Remove the Power Terminal Cover, Frames 1...5

Remove the power terminal cover to access the power terminals, control pod components, and internal stirring fans (where applicable). The terminal cover is installed on Frame 1...5 drives with IP20, NEMA/UL Open Type, IP20, NEMA/UL Type 1, and Flange, NEMA/UL Type 4X/12 back enclosures.

Remove the Power Terminal Cover, Frames 1...5

Follow these steps to remove the power terminal cover.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. For IP20, NEMA/UL Type 1 enclosures only, remove the M4 x 16 mm slotted-Torx screw that secures the cover to the conduit box. Retain the screw for reuse.
4. Press inward on the two tabs on the lower left and right sides of the terminal cover and rotate the cover out from the bottom of the chassis.

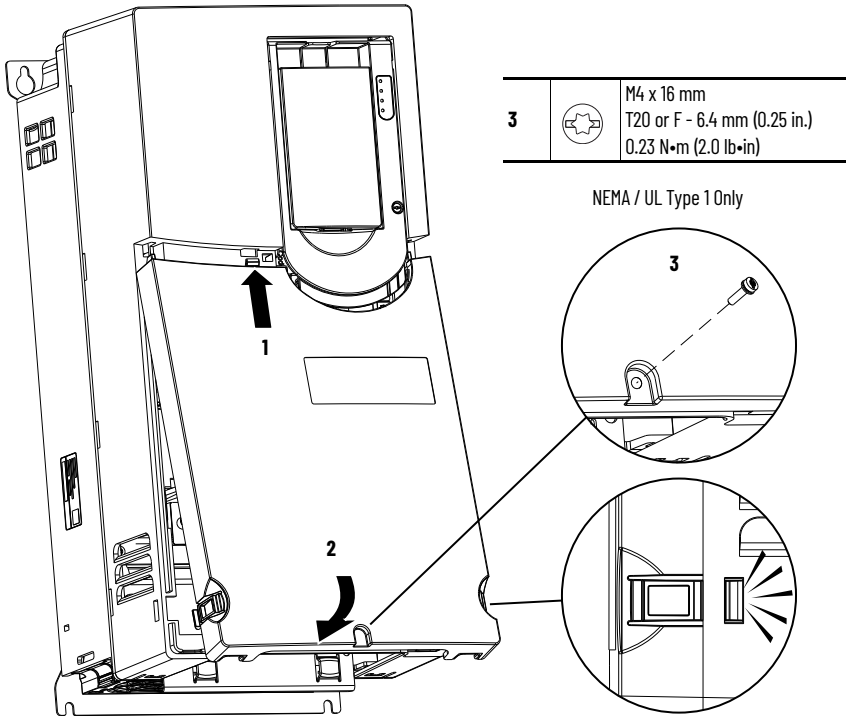


Install the Power Terminal Cover, Frames 1...5

Follow these steps to install the power terminal cover.

1. Place the tab on the cover into the slot or slots on the chassis.
2. Rotate the bottom of the cover inward and press the tabs on the lower sides of the cover into the slots on the chassis.
3. For IP20, NEMA/UL Type 1 enclosures only, replace the M4 x 16 slotted-Torx screw that secures the cover to the conduit box.

Frame 4 - Open Type Shown



3		M4 x 16 mm T20 or F - 6.4 mm (0.25 in.) 0.23 N•m (2.0 lb•in)

Remove the IP54, NEMA/UL Type 12 Cover, Frames 2...5

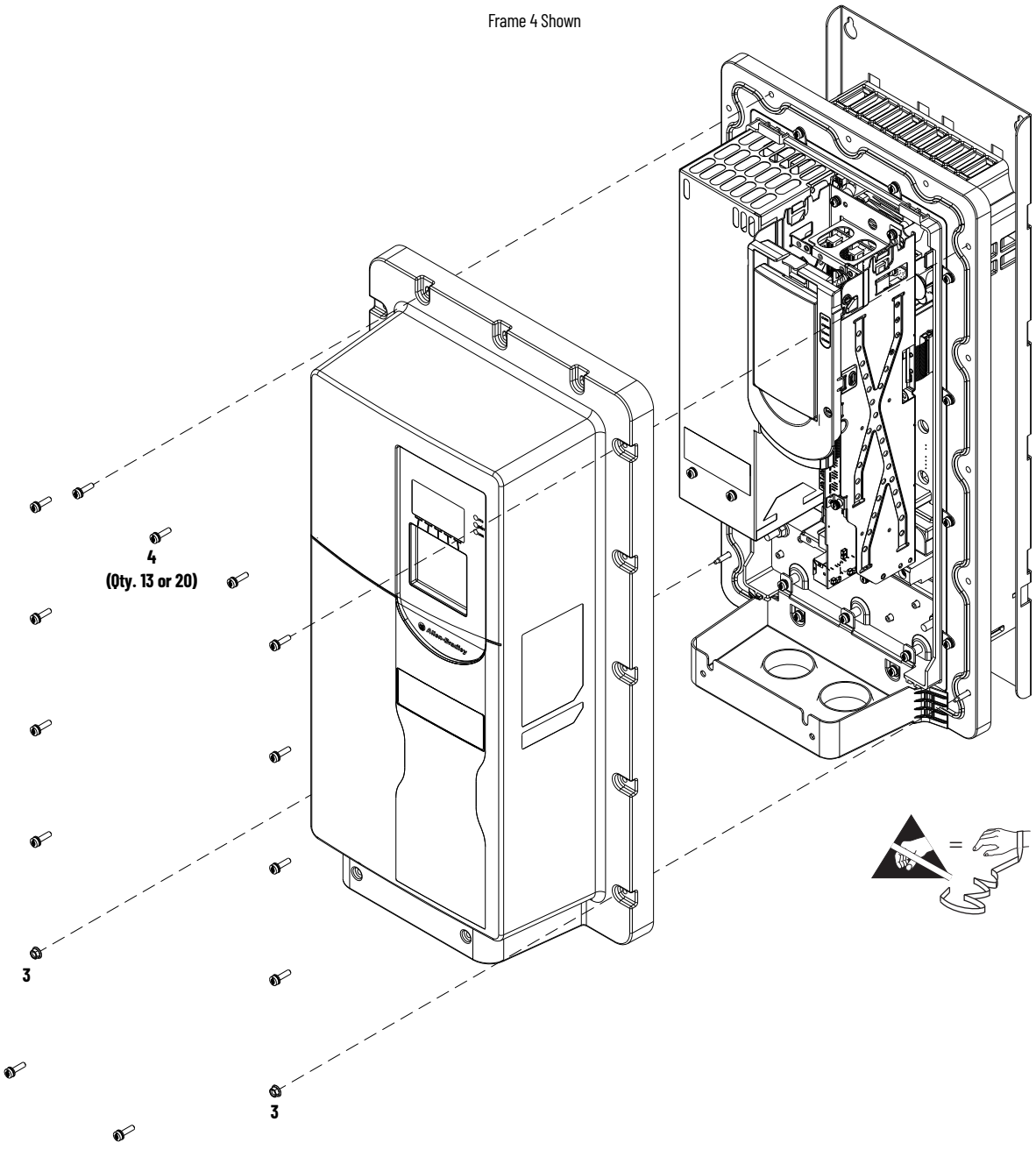
Remove the IP54, NEMA/UL Type 12 cover to access the power terminals, control pod components, and internal stirring fans (where applicable).

Remove the IP54, NEMA/UL Type 12 Cover, Frames 2...5

Follow theses steps to remove the cover.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. For all frame sizes, remove the two M4 hex nuts at the bottom of the drive cover.
4. Remove the slotted-Torx screws:
   - Frames 2...4 - Remove the 13 M4 x 16 mm slotted-Torx screws.
   - Frame 5 - Remove the 20 M4 x 16 mm slotted-Torx screws.

Frame 4 Shown



Install the IP54, NEMA/UL Type 12 Cover, Frames 2...5

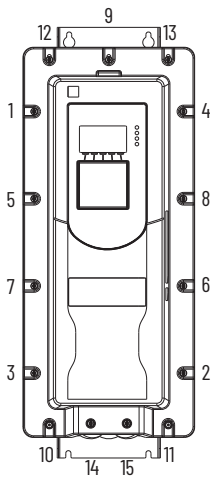
Follow these steps to install the cover.

1. Place the cover on the flange and finger-tighten all hardware.
2. Apply the torque value in the sequence shown.
3. Apply final torque in the sequence shown.

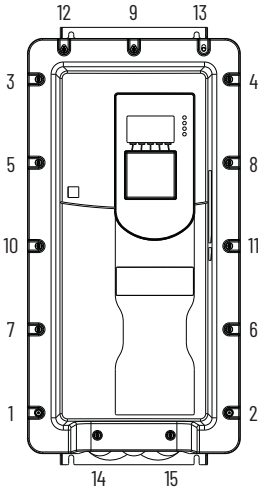
1

2		M4 x 16 mm T20 or F - 6.4 mm (0.25 in.) 0.12 N•m (1.0 lb•in)
		M4 7 mm 0.12 N•m (1.0 lb•in)

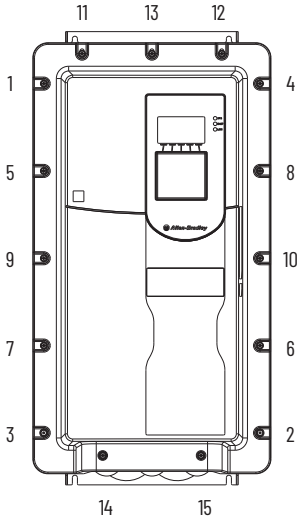
3		M4 x 16 mm T20 or F - 6.4 mm (0.25 in.) 0.23 N•m (2.0 lb•in)
		M4 7 mm 0.23 N•m (2.0 lb•in)



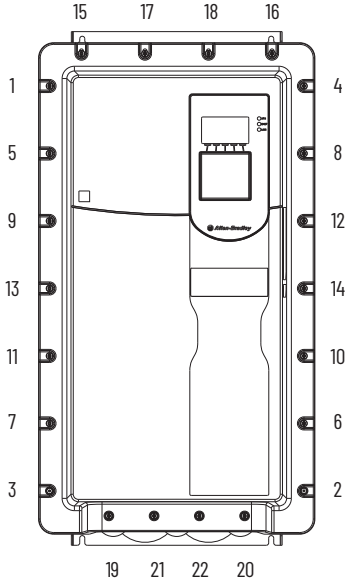
Frame 2



Frame 3



Frame 4



Frame 5

Power Terminal Cover Replacement, Frames 1...5

Replacement kit catalog numbers: SK-RT-CVR1-F1, SK-RT-CVR1-F1-XT, SK-RT-CVR1-F2, SK-RT-CVR1-F2-XT, SK-RT-CVR1-F3, SK-RT-CVR1-F3-XT, SK-RT-CVR1-F4, SK-RT-CVR1-F4-XT, SK-RT-CVR1-F5, SK-RT-CVR1-F5-XT

These kits can be used for IP20, NEMA/UL Open Type, IP20, NEMA/UL Type 1, and Flange, NEMA/UL Type 4X/12 back enclosures.

Remove the Power Terminal Cover, Frames 1...5

Follow these steps to remove the power terminal cover for frames 1...5 drives.

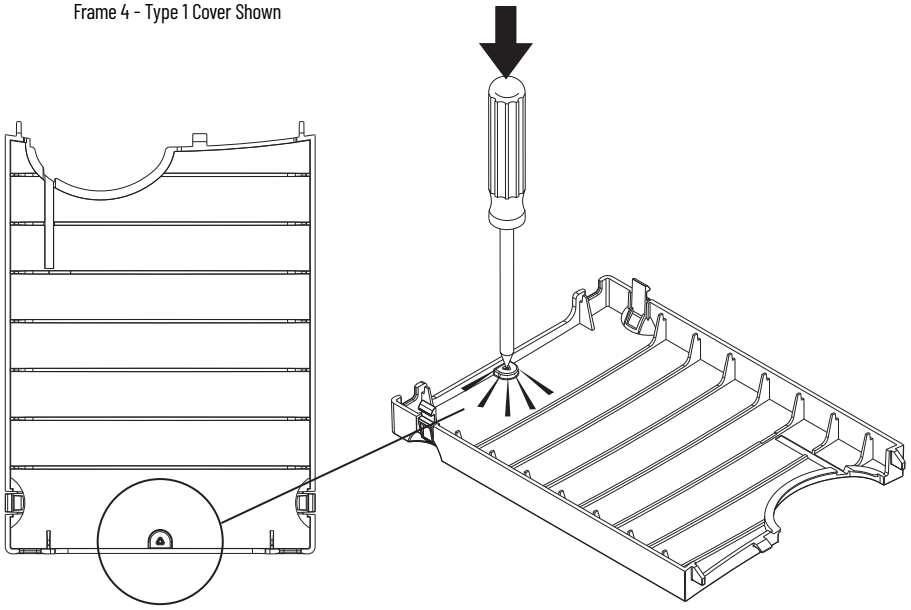
1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10l.
3. Remove the IP20, NEMA/UL Type 1 power terminal cover. See Remove the Power Terminal Cover, Frames 1...5 on page 31.

Install the Power Terminal Cover, Frames 1...5

Follow these steps to install the power terminal cover for frames 1...5 drives.

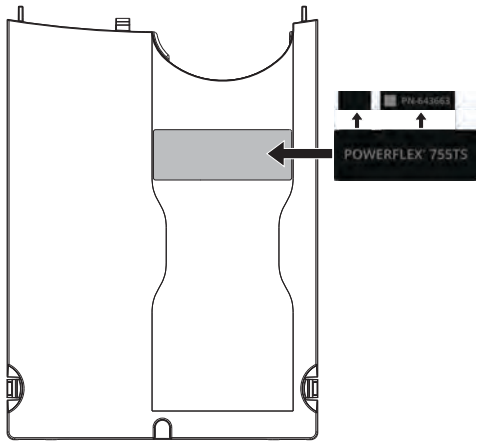
1. For IP20, NEMA/UL Type 1 installations with a conduit box only, on the inside of the new cover, remove the plastic material from the screw hole.

Frame 4 - Type 1 Cover Shown



2. For all covers, apply the product label to the indentation on the cover.

Frame 4 - Type 1 Cover Shown



3. Install the power terminal cover in the reverse order of removal.

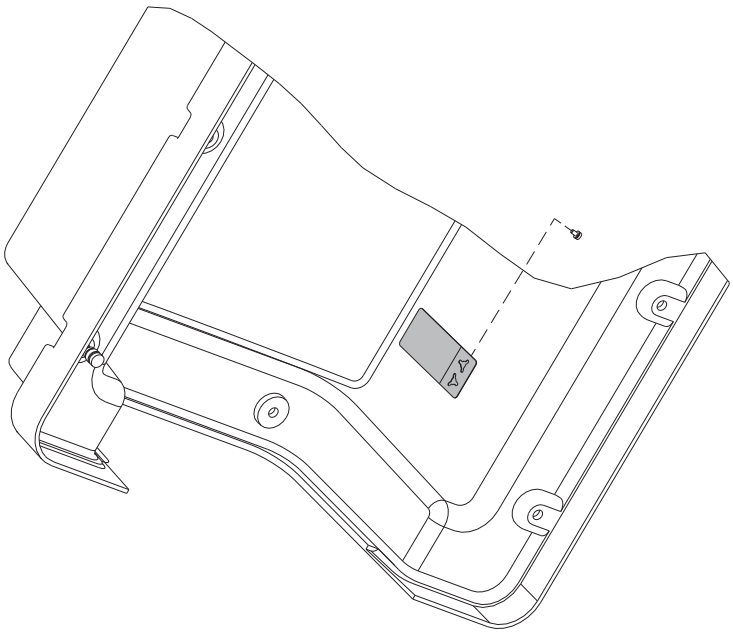
IP54, NEMA/UL Type 12 Cover Replacement, Frames 2...5

Replacement kit catalog numbers: SK-RT-CVR12-F2, SK-RT-CVR12-F2-XT, SK-RT-CVR12-F3, SK-RT-CVR12-F3-XT, SK-RT-CVR12-F4, SK-RT-CVR12-F4-XT, SK-RT-CVR12-F5, SK-RT-CVR12-F5-XT

Remove the IP54, NEMA/UL Type 12 Cover, Frames 2...5

Follow theses steps to remove the cover.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the cover. See Remove the IP54, NEMA/UL Type 12 Cover, Frames 2...5 on page 33.
4. If present, remove any stored PE jumper retainer screws from the PE retainer on the inside of the cover.



Install the IP54, NEMA/UL Type 12 Cover, Frames 2...5

Follow these steps to install the cover.

1. If present, insert any unused PE jumper screws into the PE retainer on the inside of the new cover.
2. Install the IP54, NEMA/UL Type 12 cover in the reverse order of removal.

Chassis Replacement, Frame 1

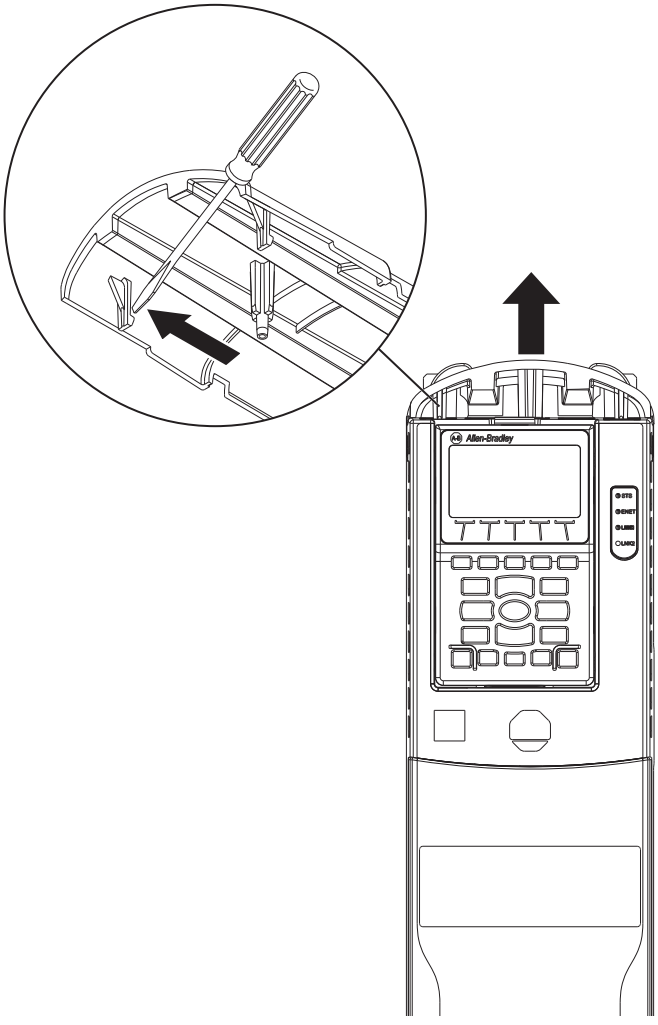
Replacement kit catalog numbers: SK-RT-CHSS1-F1, SK-RT-CHSS1-F1-XT

These kits can be used for IP20, NEMA/UL Open Type, IP20, NEMA/UL Type 1, and Flange, NEMA/UL Type 4X/12 back enclosures.

Remove the Chassis, Frame 1

Follow these steps to remove the chassis.

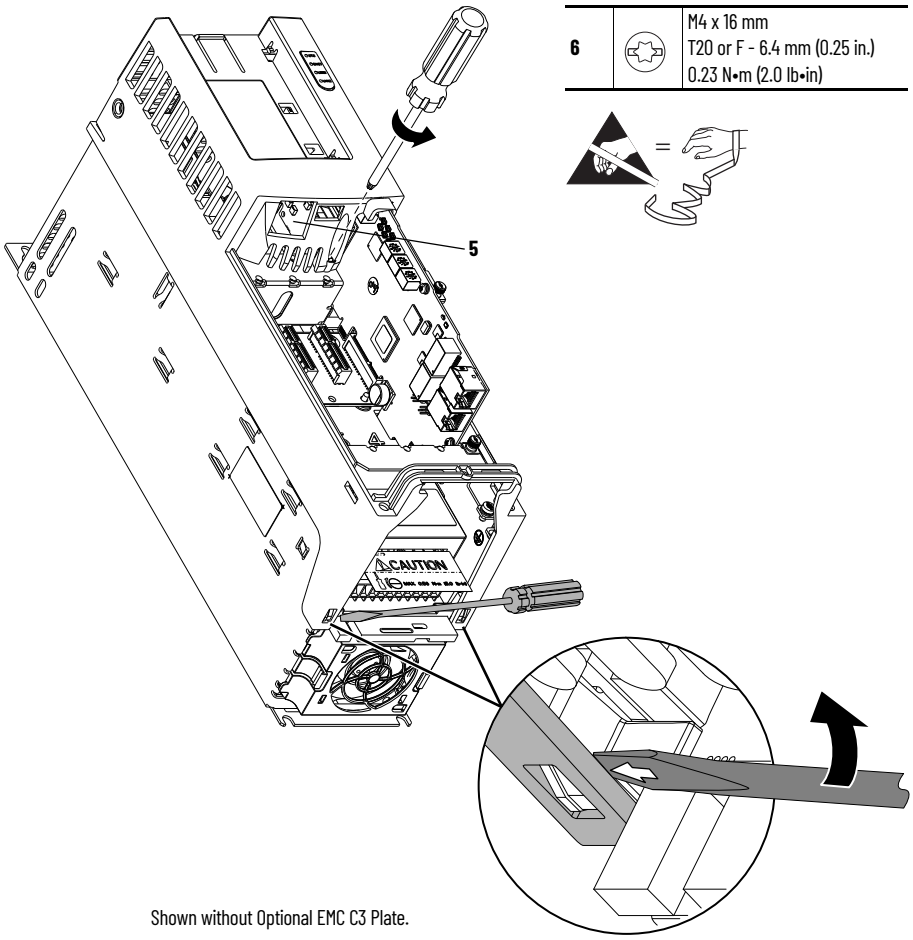
1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page Remove Power from the System on page 10.
3. Remove the power terminal cover. See Remove the Power Terminal Cover, Frames 1...5 on page 31.
4. For IP20, NEMA/UL Type 1 enclosures only, insert a screwdriver under the drip hood, press outward to disengage each clip, and lift the cover off the chassis. Retain the drip hood for reuse.



5. If used, disconnect the DPI™ cable from the connector on the bottom of the HIM cradle.

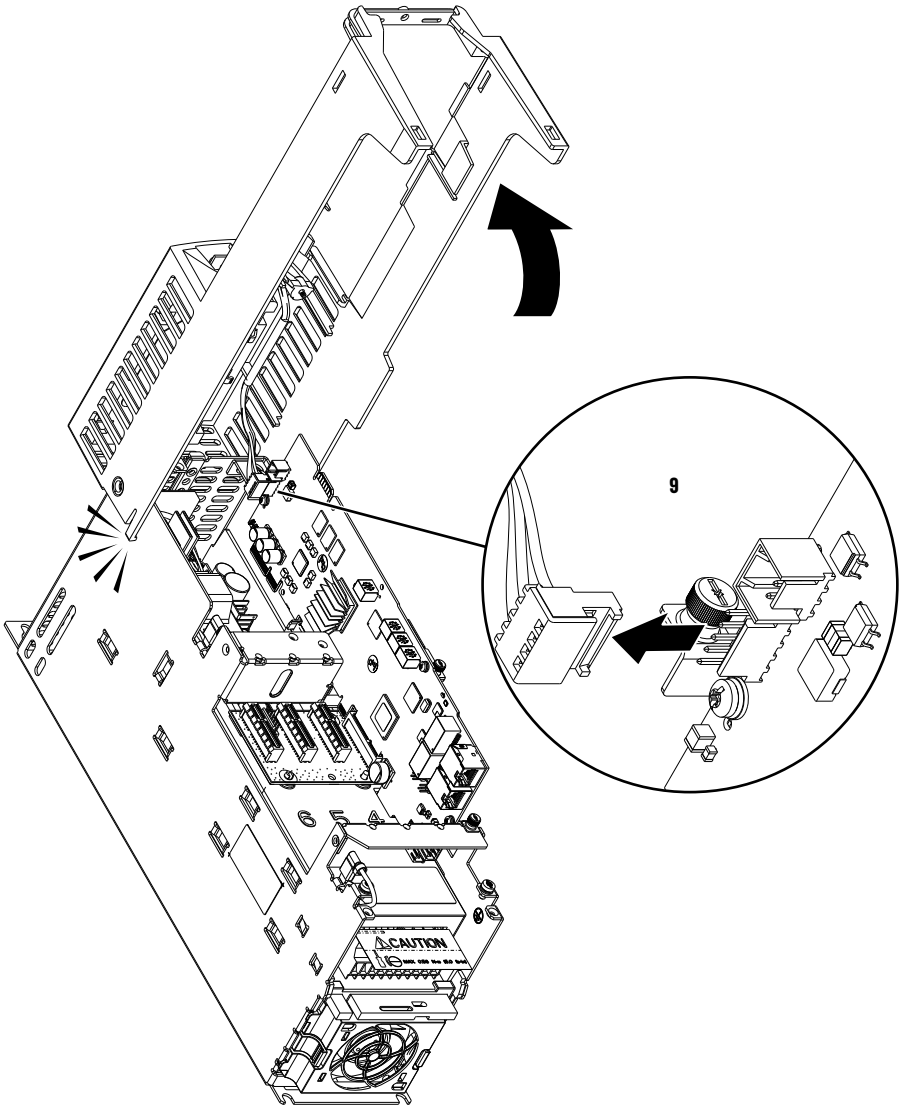
   If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.

6. Loosen the captive M3 Torx screw that secures the plastic chassis to the metal bracket.
7. Use a screwdriver to lift the two slotted-tabs on the bottom of the chassis off the brackets.

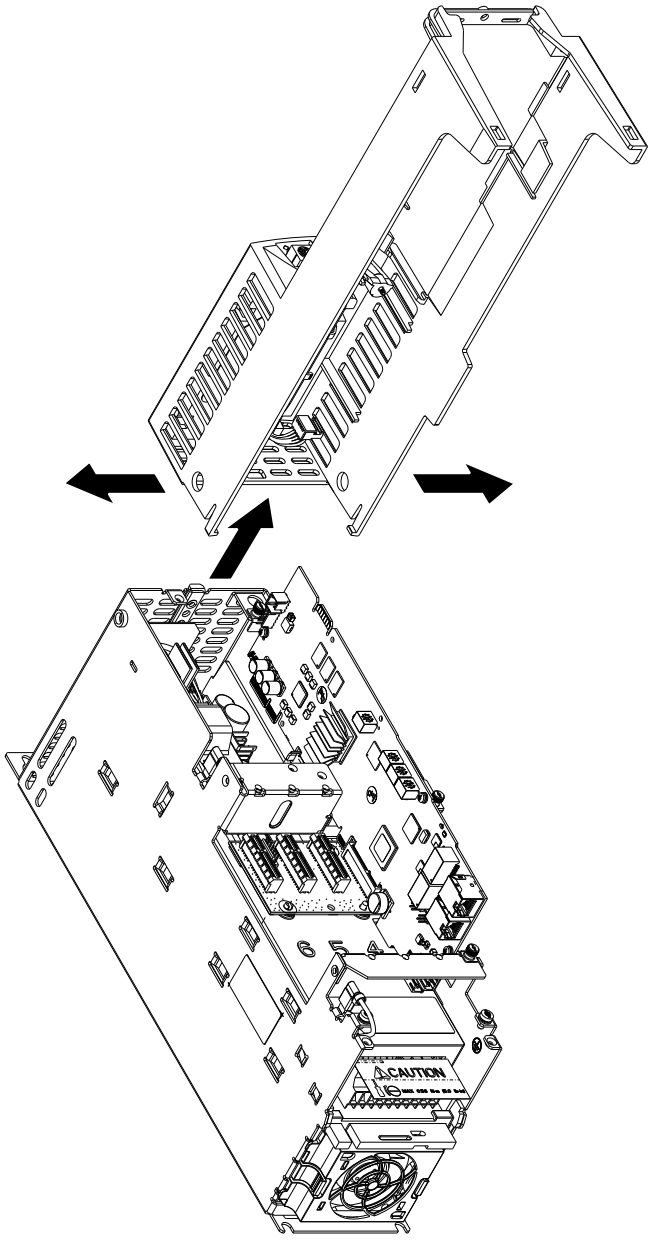


Shown without Optional EMC C3 Plate.

8. Rotate the chassis 90°, until the chassis locks in place.
9. Disconnect the HIM DPI circuit board connector from the main control circuit board.



10. At the top of the plastic chassis, pull outward on the tabs and lift the chassis off the drive.

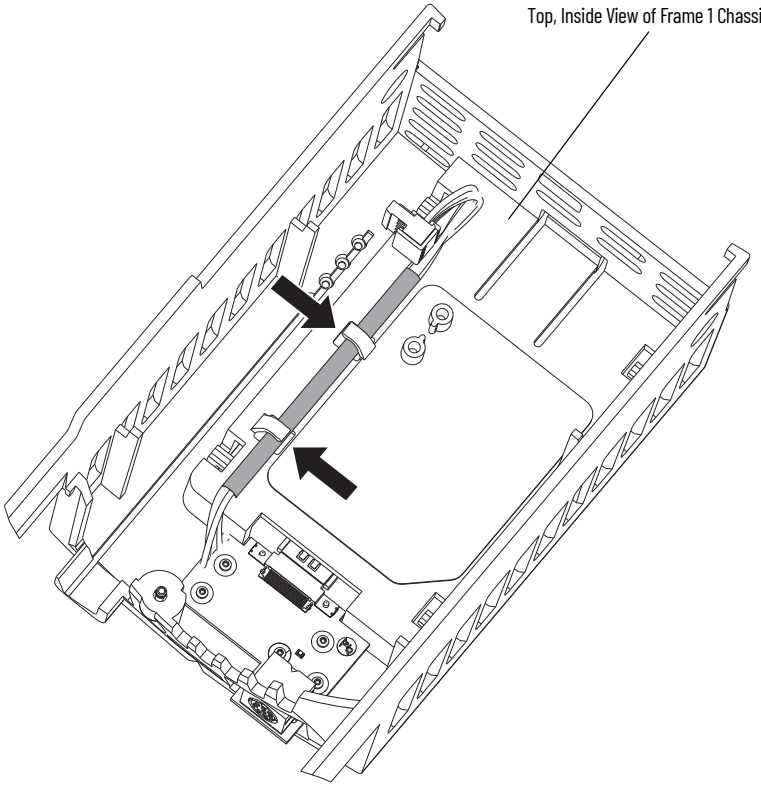


Install the Chassis, Frame 1

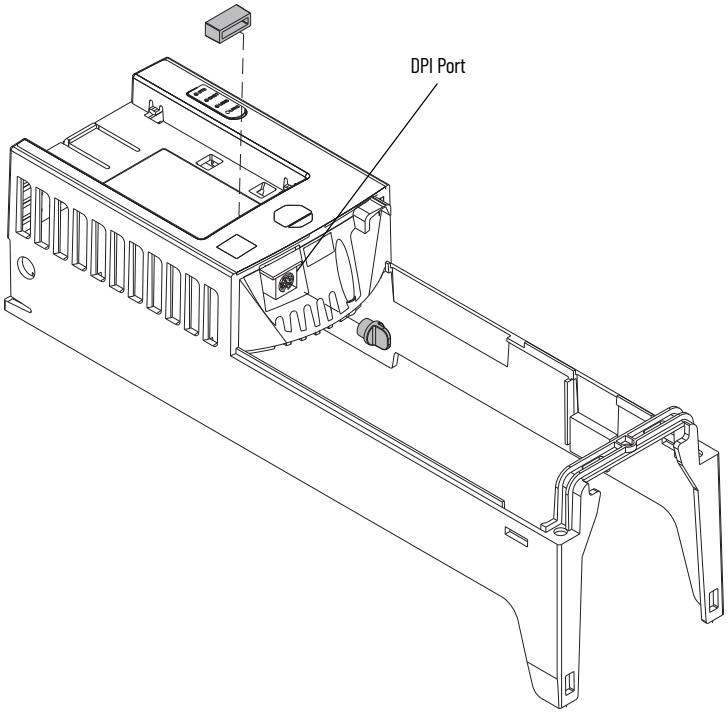
Follow these steps to install the chassis.

1. At the top of the new chassis, pull outward on the tabs and snap the chassis into place on the drive.

2. Verify that the HIM DPI cable is routed and clipped to the plastic chassis.



3. If a HIM and DPI cable is used, remove the protective cover from the HIM and DPI connectors on the chassis.



4. Secure the chassis to the drive in the reverse order of removal.

Chassis Replacement, Frames 2...5

Replacement kit catalog numbers: SK-RT-CHSS1-F2, SK-RT-CHSS1-F2-XT, SK-RT-CHSS1-F3, SK-RT-CHSS1-F3-XT, SK-RT-CHSS1-F4, SK-RT-CHSS1-F4-XT, SK-RT-CHSS1-F5, SK-RT-CHSS1-F5-XT

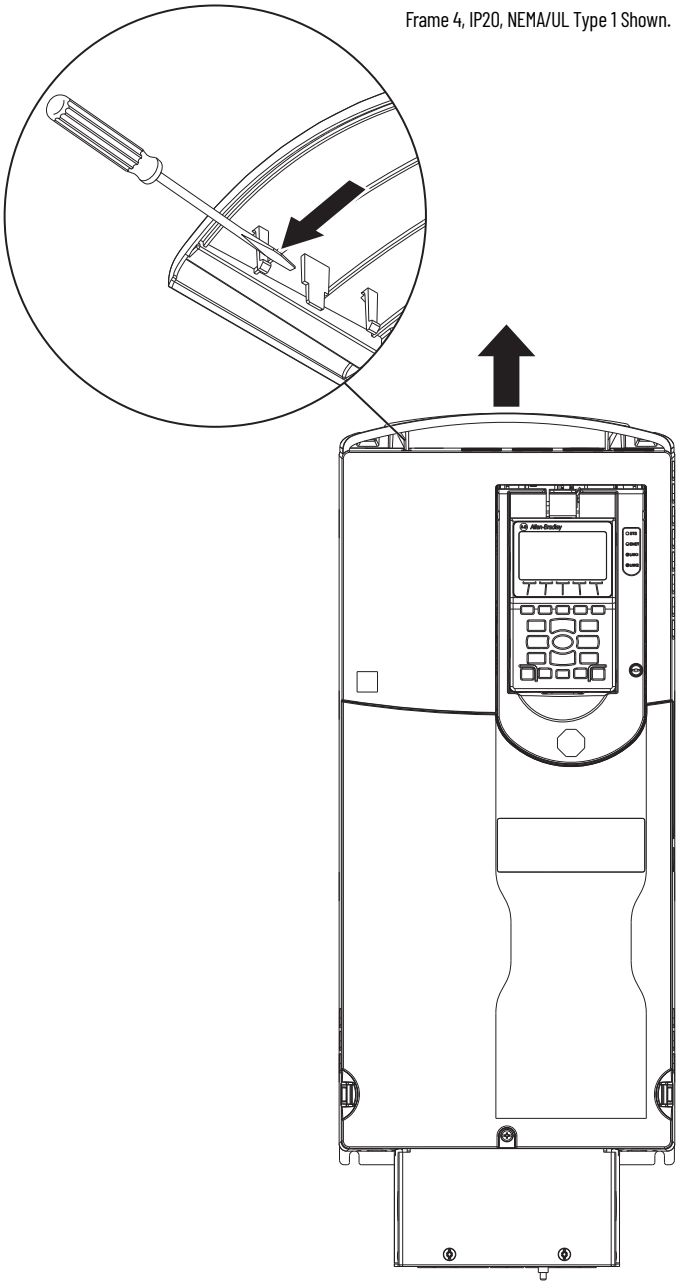
These kits can be used for IP20, NEMA/UL Open Type, IP20, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures.

Remove the Chassis, Frames 2...5

Follow these steps to remove the chassis.

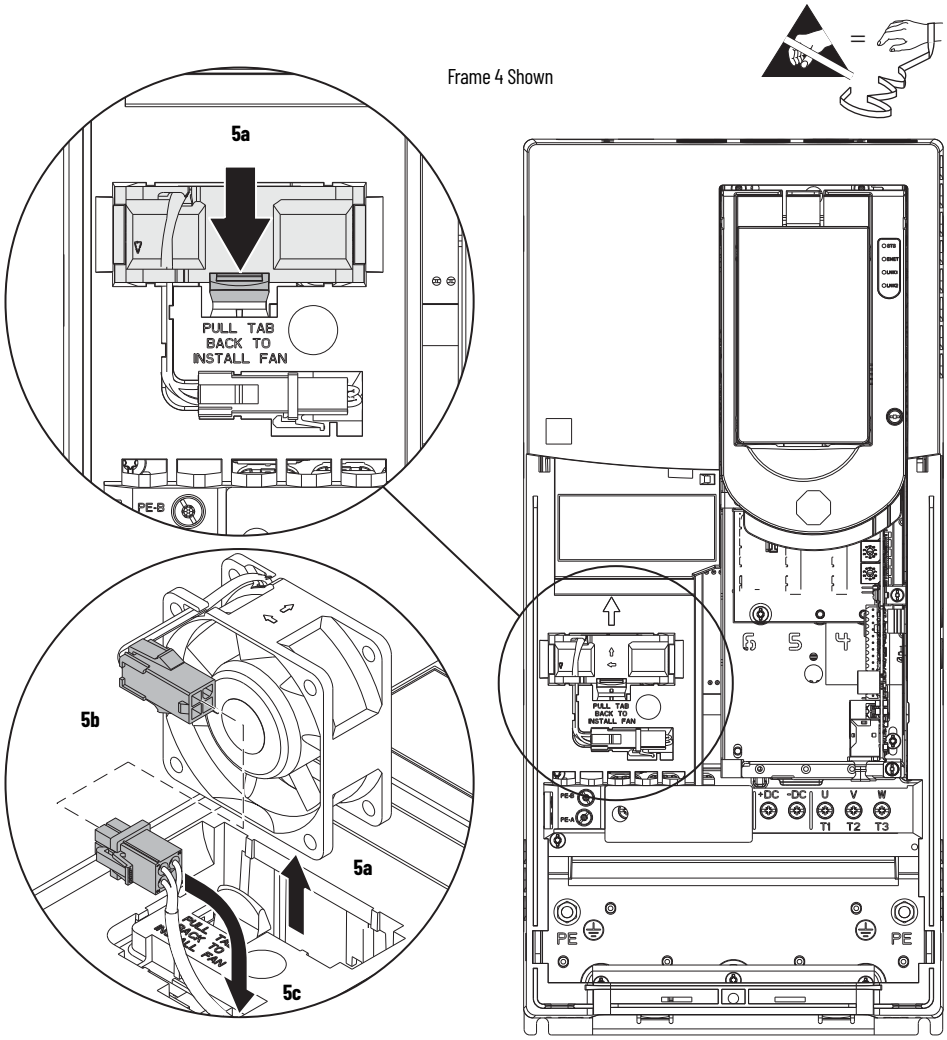
1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. For IP20, NEMA/UL Type 1 enclosures only, insert a screwdriver under the drip hood, press outward to disengage each clip, and lift the cover off the chassis. Retain the drip hood for reuse.

Frame 4, IP20, NEMA/UL Type 1 Shown.

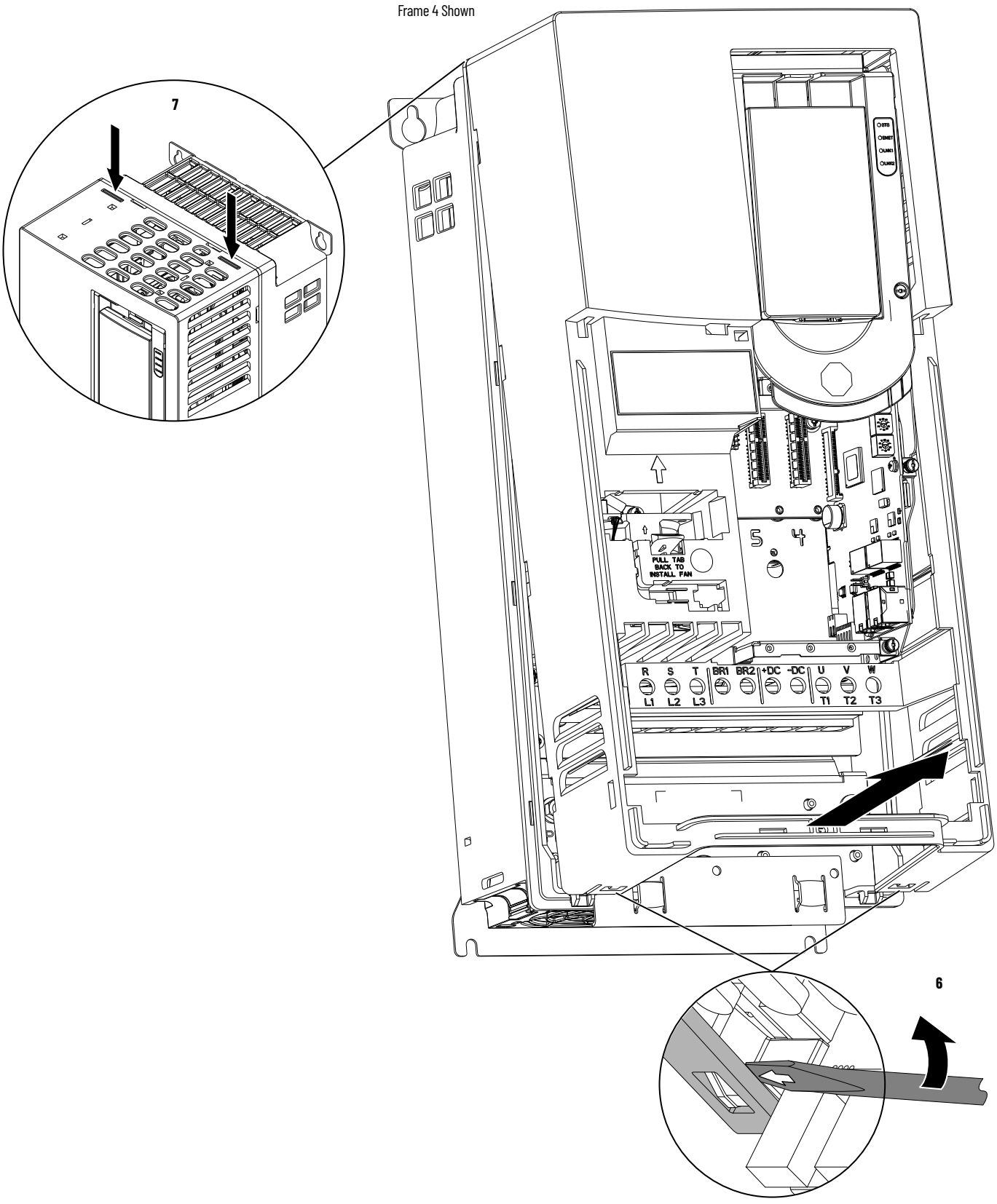


4. Remove the power terminal cover. See Remove the Power Terminal Cover, Frames 1...5 on page 31.

5. For frames 4 and 5 drives only, complete steps a...c:
   a. Pull the tab away from the fan assembly and pull the fan assembly partially out of the chassis.
   b. Disconnect the power wire-harness connector from the stirring fan connector and remove the stirring fan assembly from the chassis. Retain the fan assembly for reuse.
   c. Push the power wire harness through the hole in the chassis.



6. Use a screwdriver to lift the two slotted-tabs on the bottom of the chassis off the brackets.
7. At the top of the drive, lift the chassis off the tabs and remove the chassis.



Install the Chassis, Frames 2...5

Install the chassis in the reverse order of removal.

IMPORTANT For frames 4 and 5 drive, route the stirring fan power wire harness and connector through the back side of the chassis before securing the chassis to the drive frame.

Flange Gasket Replacement, Frames 2...5

Replacement kit catalog numbers: SK-RT-FG1-F2, SK-RT-FG1-F3, SK-RT-FG1-F4, SK-RT-FG1-F5

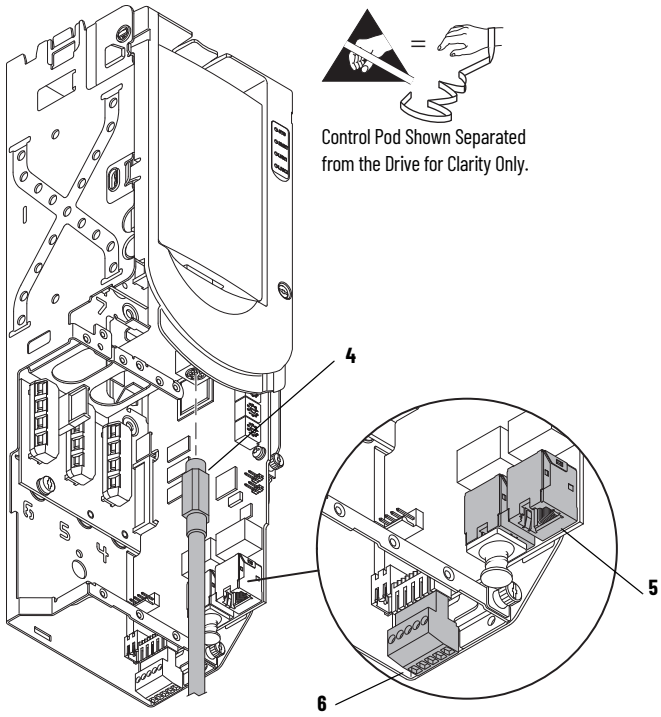
This kit are used for flange, NEMA/UL Type 4X/12 back enclosures only.

Remove the Flange Gasket, Frames 2...5

Follow these steps to remove the flange gasket.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the terminal cover from the drive. See Remove the Power Terminal Cover, Frames 1...5 on page 31.
4. If used, disconnect the HIM DPI cable from the connector (port 2) on the HIM cradle.

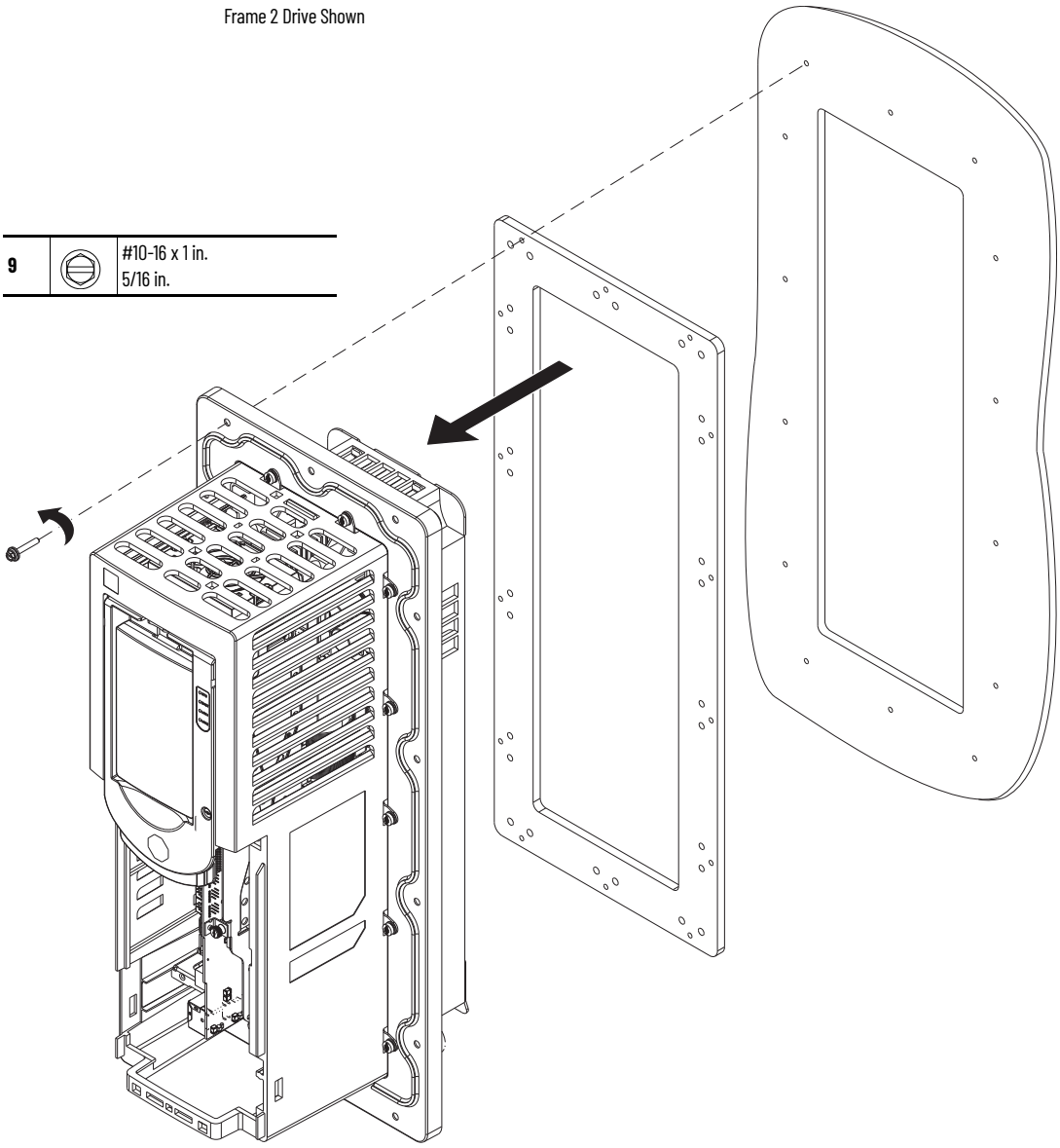
   If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.
5. Disconnect any cables from the Ethernet connectors on the bottom of the main control board in the control pod.
6. If used, disconnect the plug-in terminal block (TB1) on the bottom of the main control board.
7. If an option module is installed, disconnect any I/O wiring terminal blocks (not shown in image).



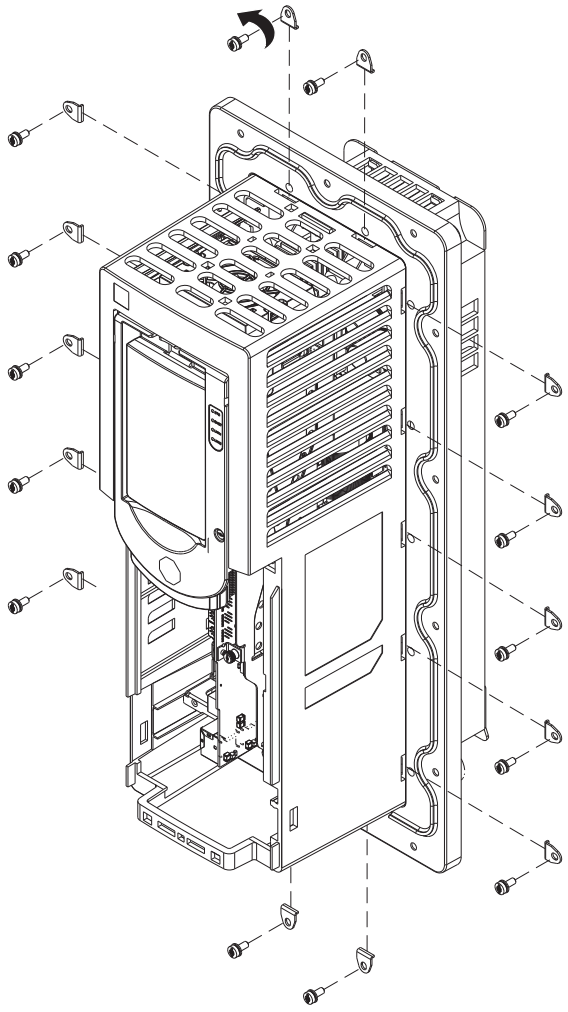
8. Disconnect the power wiring from the power terminals.
9. Remove the #10-16 x 1 in. hexagonal-head screws that secure the flange to the mounting surface and remove the drive and gasket. Discard the gasket.

Frame 2 Drive Shown

9		#10-16 x 1 in. 5/16 in.



10. Remove the M4 x 10 mm slotted-Torx screws that secure the flange to the drive chassis and remove the flange.

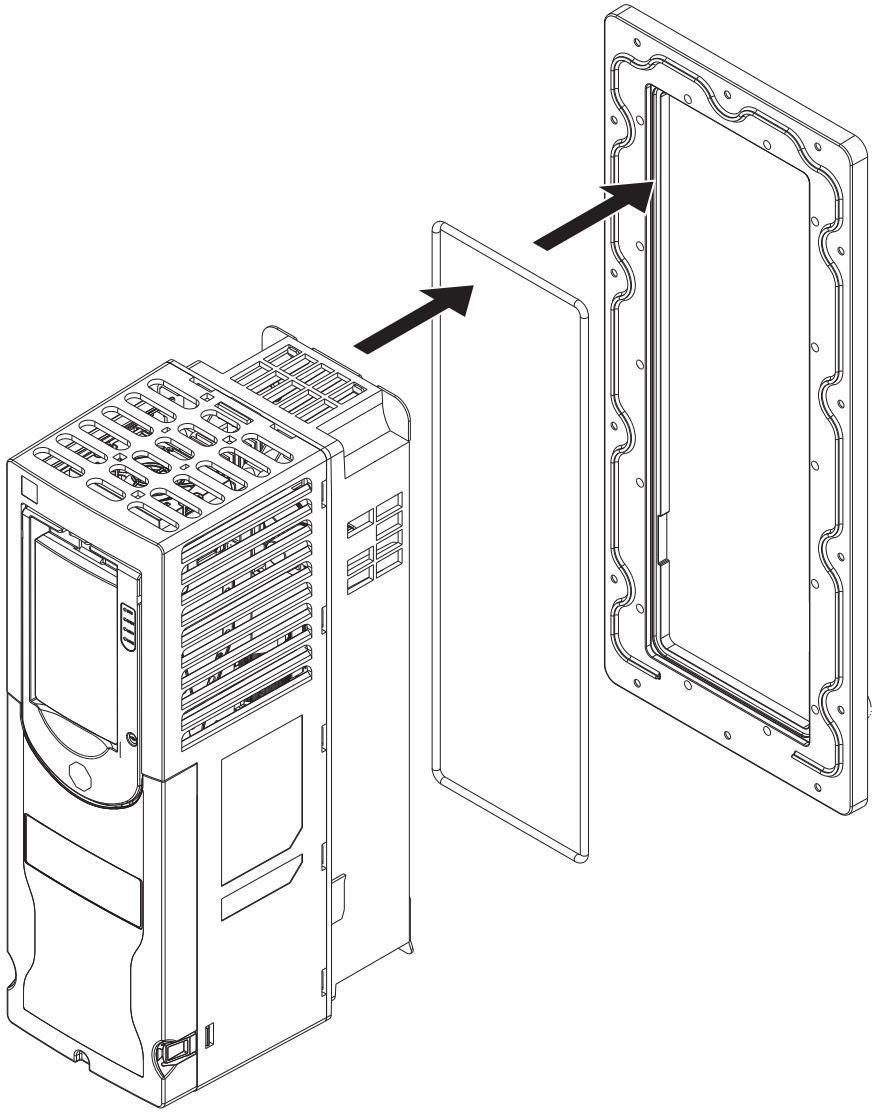


11. Remove the gasket from the flange and discard.

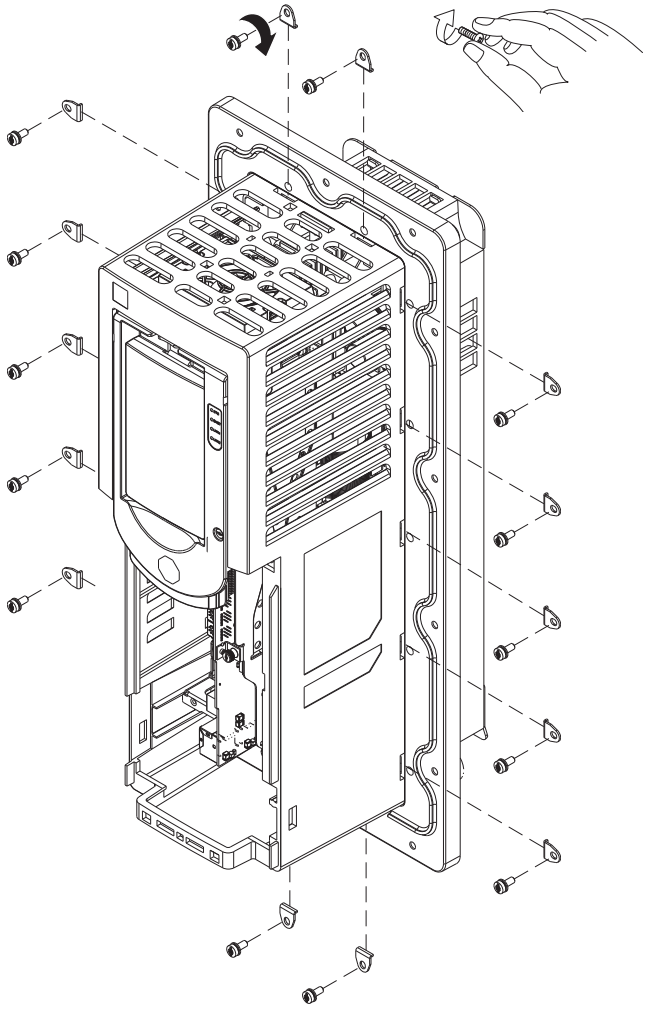
Install the Flange Gasket, Frames 2...5

Follow these steps to Install the flange gasket.

1. Insert the new gasket and drive into the flange.

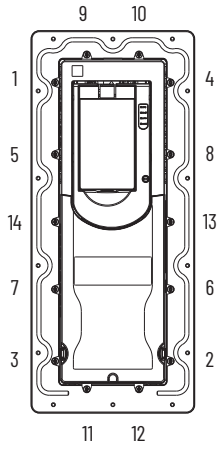


2. Install the screws and clamps to secure the drive chassis to the flange. Finger-tighten the clamps and screws only.

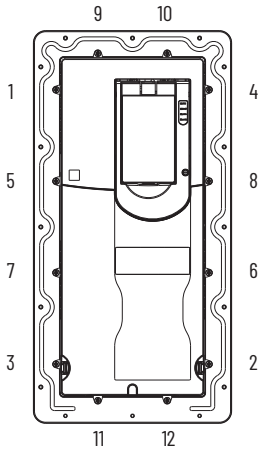


3. To secure the drive to the flange, apply final torque by using the sequence that is shown.

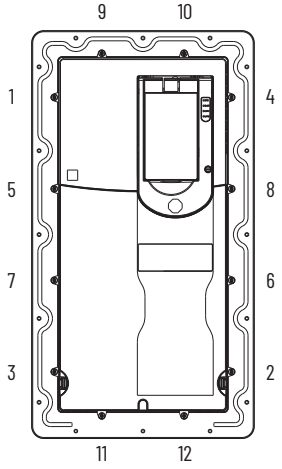
3		M4 x 10 mm T20 or F - 6.4 mm (0.25 in.) 1.8 N•m (16.0 lb•in)



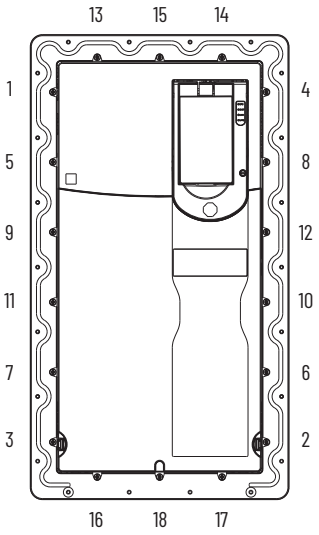
Frame 2



Frame 3

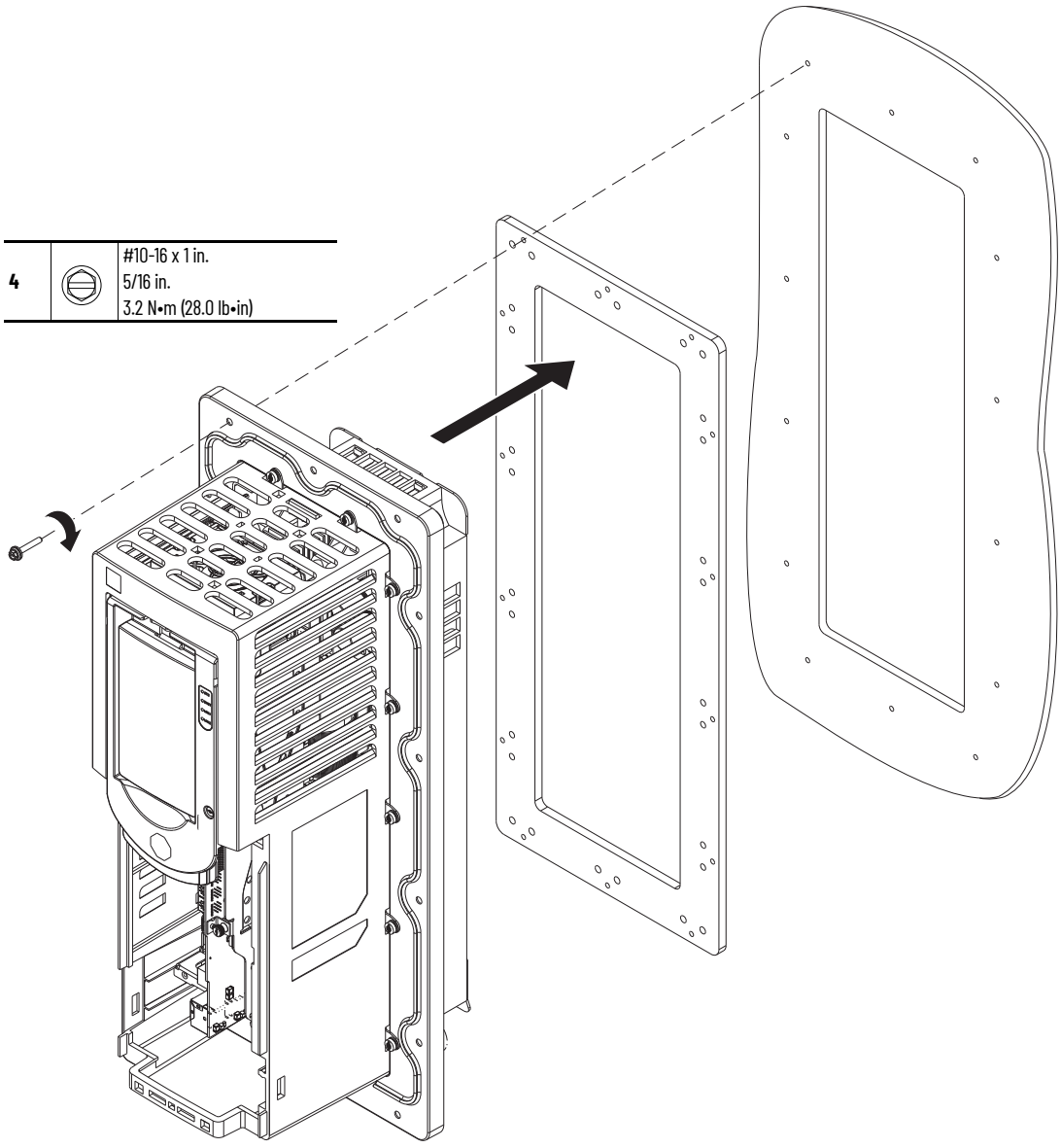


Frame 4



Frame 5

4. Place the gasket on the flange, insert the drive into the mounting surface, and secure the flange and drive to the mounting surface the #10-16 x 1 in. slotted-hex screws.



5. Replace any power wiring, I/O wiring, and communication cables. See pages 11 and 12 for power terminal locations. For power terminal torque specifications, see the PowerFlex 755TS Products with TotalFORCE Control Installation Instructions, publication 750-IN119.

Control Pod Printed Circuit Board Fan Replacement, Frames 2...5

Replacement kit catalog numbers: SK-RT-PODFAN1, SK-RT-PODFAN1-XT. These kits can be used on all enclosure types.

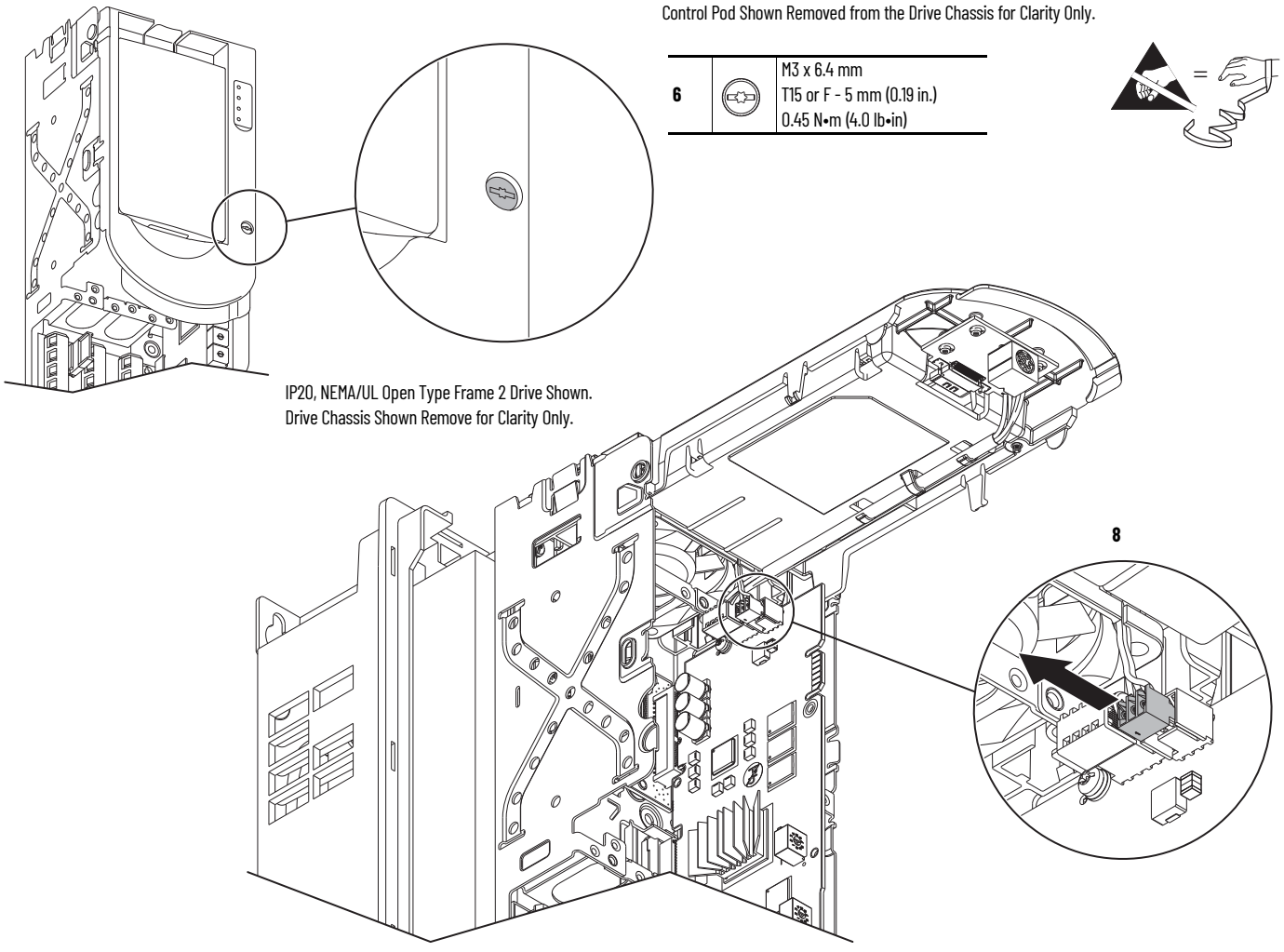
Remove the Control Pod Printed Circuit Board Fan, Frames 2...5

Follow theses steps to remove the control pod printed circuit board fan.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.

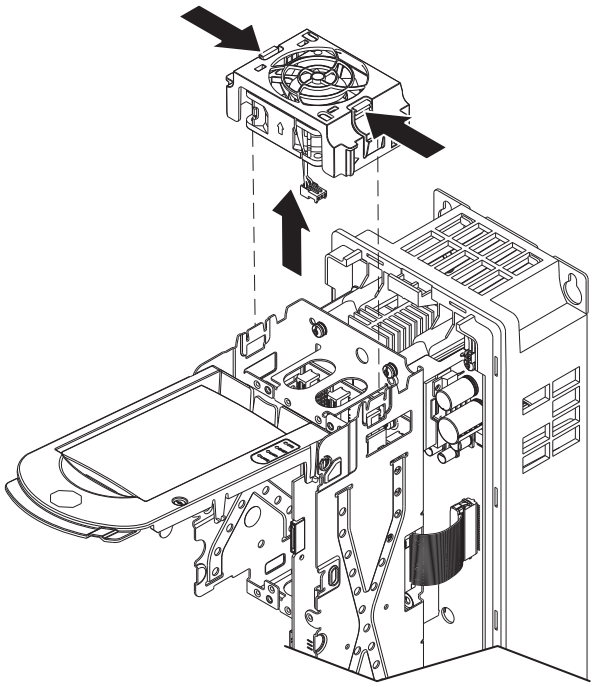
3. Remove the cover:
   - For IP20, NEMA/UL Open Type, IP20, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures, remove the power terminal cover. See Remove the Power Terminal Cover, Frames 1...5 on page 31.
   - For IP54, NEMA/UL Type 12 enclosures remove the cover. See Remove the IP54, NEMA/UL Type 12 Cover, Frames 2...5 on page 33.
4. For IP20, NEMA/UL Open Type, IP20, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures, remove the chassis from the drive. See Remove the Chassis, Frames 2...5 on page 42.
5. If used, disconnect the HIM DPI cable from the connector (port 2) on the HIM cradle.

   If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.
6. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position.
7. If an option module is installed next to the main control circuit board, remove the option module (not shown in this image).
8. Disconnect the fan power wire-harness three-pin connector from the connector on the main control circuit board.

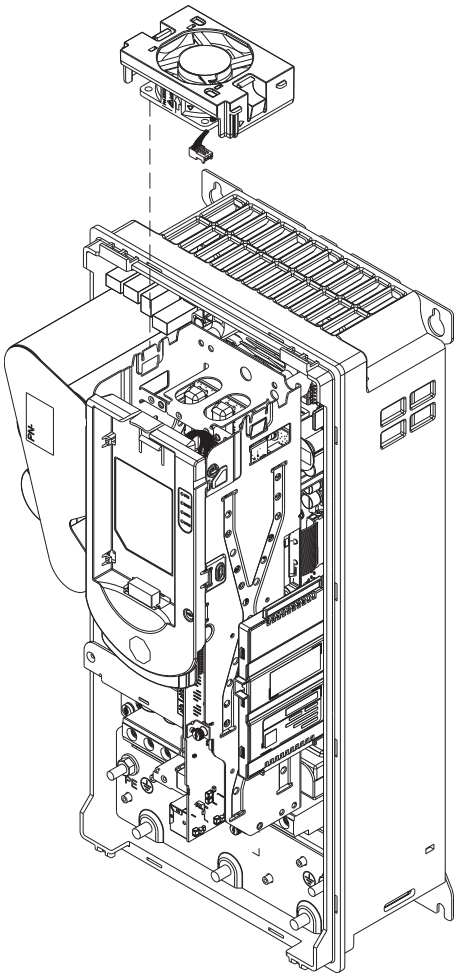


9. Press in on the two tabs on either side of the fan and remove the fan from the chassis.

Frame 2



Frame 4



Install the Control Pod Printed Circuit Board Fan, Frames 2...5

Install the control pod printed circuit board fan in the reverse order of removal.

Heatsink Fan Replacement, Frames 1...3

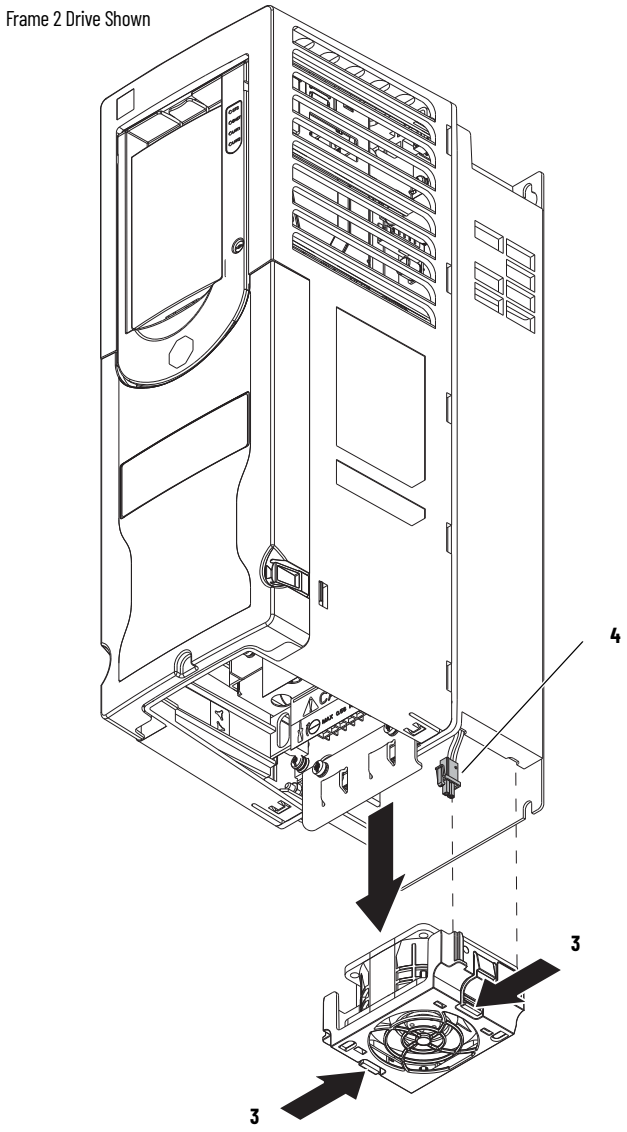
Replacement kit catalog numbers: SK-RT-HSFAN1-F12, SK-RT-HSFAN1-F12-XT, SK-RT-HSFAN1-F3A, SK-RT-HSFAN1-F3A-XT, SK-RT-HSFAN1-F3, SK-RT-HSFAN1-F3-XT. These kits can be used for IP20, NEMA/UL Open Type and IP20, NEMA/UL Type 1 enclosures.

Replacement kit catalog numbers: SK-RT-HSFAN2-F2-XT, SK-RT-HSFAN2-F3-XT. These kits can be used for flange, NEMA/UL Type 4X/12 back and IP54, NEMA/UL Type 12 enclosures.

Remove the Heatsink Fan, Frames 1...3

Follow these steps to replace the heatsink fan.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Press in on the two tabs on either side of the fan and remove the fan partially from the chassis.
4. Disconnect the fan power wire-harness connector from the connector on the fan and remove the fan.



Install the Heatsink Fan, Frames 1...3

Install the heatsink fan in the reverse order of removal.

Heatsink Fan Replacement, Frames 4 and 5

Replacement kit catalog numbers: SK-RT-HSFAN1-F4, SK-RT-HSFAN1-F4-XT, SK-RT-HSFAN1-F5A, SK-RT-HSFAN1-F5, SK-RT-HSFAN1-F5A-XT, SK-RT-HSFAN1-F5-XT. These kits can be used for IP20, NEMA/UL Open Type and IP20, NEMA/UL Type 1 enclosures.

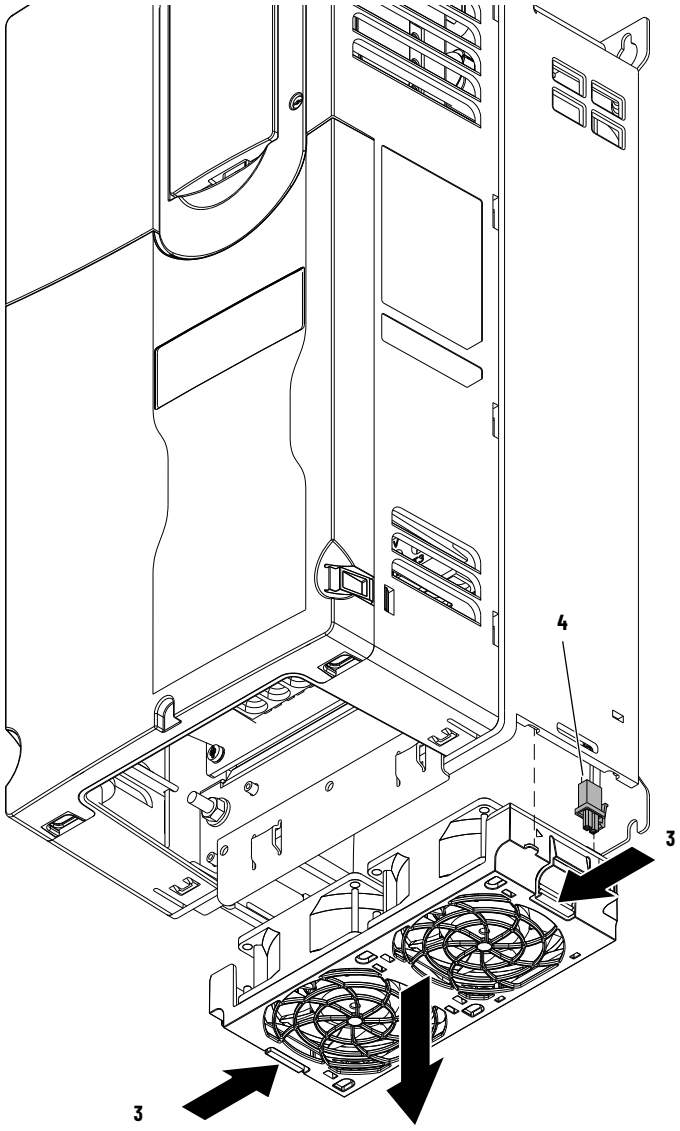
Replacement kit catalog number: SK-RT-HSFAN2-F45-XT. These kits can be used for flange, NEMA/UL Type 4X/12 back and IP54, NEMA/UL Type 12 enclosures.

Remove the Heatsink Fan, Frames 4 and 5

Follow these steps to remove the heatsink fan.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Press in on the two tabs on either side of the fan and partially remove the fan from the chassis.
4. Disconnect the fan power wire-harness connector from the connector on the fan and remove the fan.

Frame 4 Drive Shown



Install the Heatsink Fan, Frames 4 and 5

Install the heatsink fan in the reverse order of removal.

Stirring Fan Replacement, Frames 4 and 5

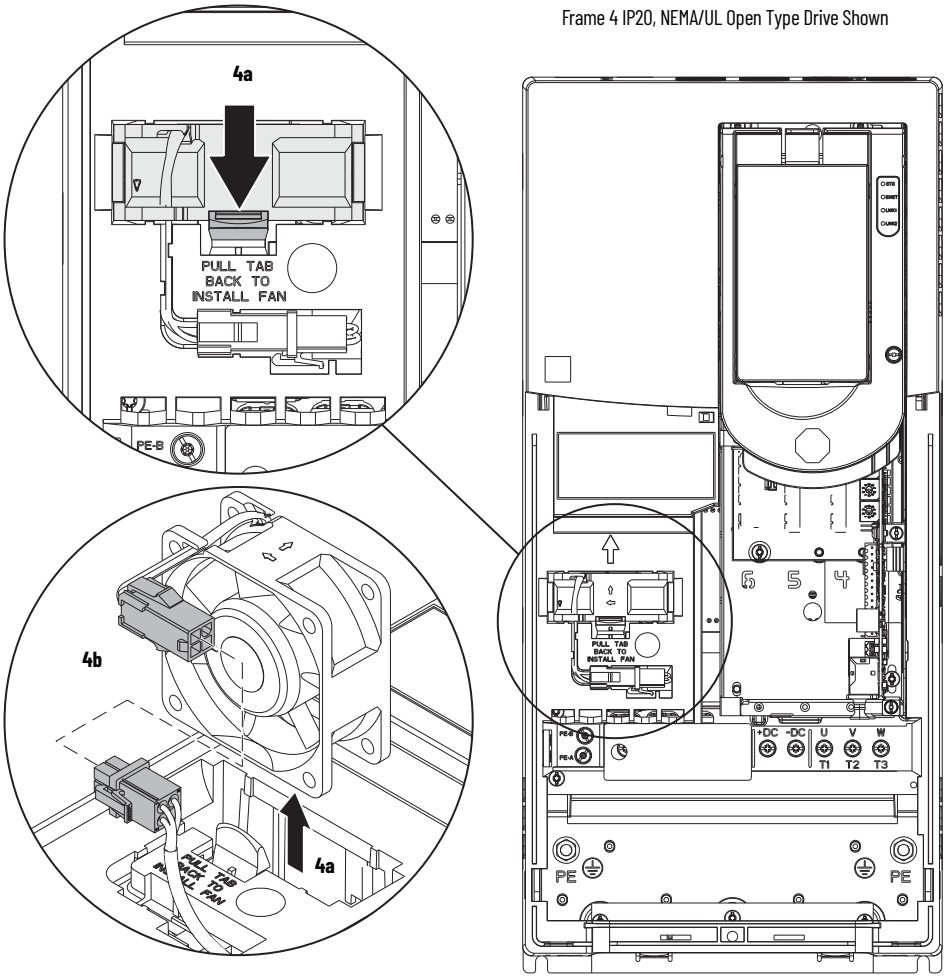
Replacement kit catalog numbers: SK-RT-STIRFAN1-F45, SK-RT-STIRFAN1-F45-XT

These kits can be used for all frame 4 and 5 drive enclosure types.

Remove the Stirring Fan, Frames 4 and 5

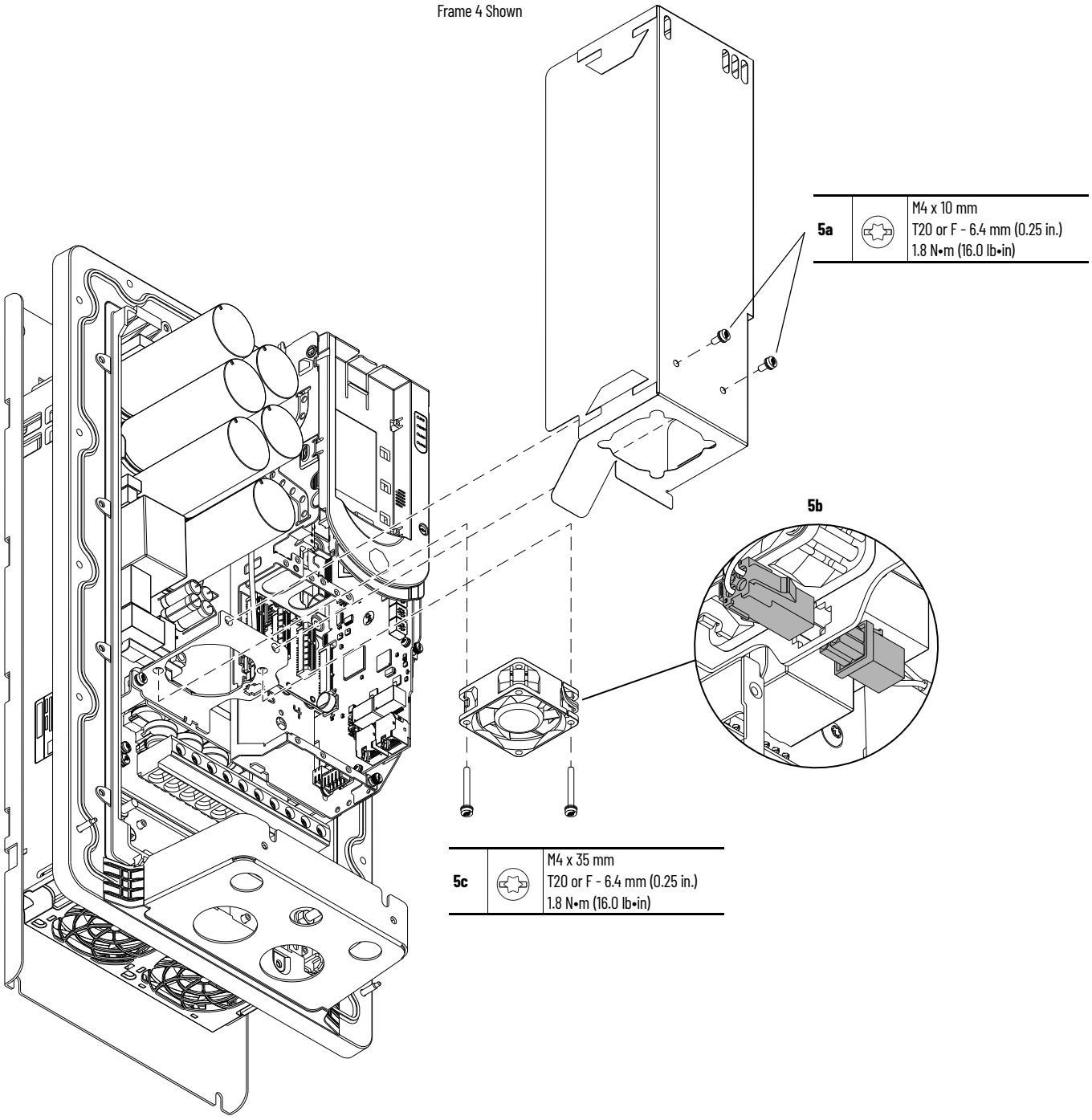
Follow these steps to remove the stirring fan.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the appropriate cover from the drive:
   - For IP20, NEMA/UL Open Type, IP20, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures, remove the power terminal cover. See Remove the Power Terminal Cover, Frames 1...5 on page 31.
   - For IP54, NEMA/UL Type 12 enclosures, remove the drive cover. See Remove the IP54, NEMA/UL Type 12 Cover, Frames 2...5 on page 33.
4. For IP20, NEMA/UL Open Type, IP20, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back, frame 4 and 5 drives only, complete steps a and b:
   a. Pull the tab away from the fan assembly and pull the fan assembly partially out of the chassis.
   b. Disconnect the power wire harness connector from the stirring fan connector and remove the stirring fan assembly from the chassis.



Frame 4 IP20, NEMA/UL Open Type Drive Shown

5. For IP54, NEMA/UL Type 12 enclosures only, complete steps a and c:
   a. Remove the two M4 x 10 mm slotted-Torx screws that secure the touch shield to the drive chassis and remove the touch shield from the drive.
   b. Disconnect the fan power-wire harness connector from the connector on the chassis and remove the fan.
   c. Remove the M4 x 35 mm two slotted-Torx screws that secure the fan assembly to the bracket and remove the fan assembly.



Install the Stirring Fan, Frames 4 and 5

Install the stirring fan in the reverse order of removal.

Control Pod HIM Cradle Replacement, Frames 2...5

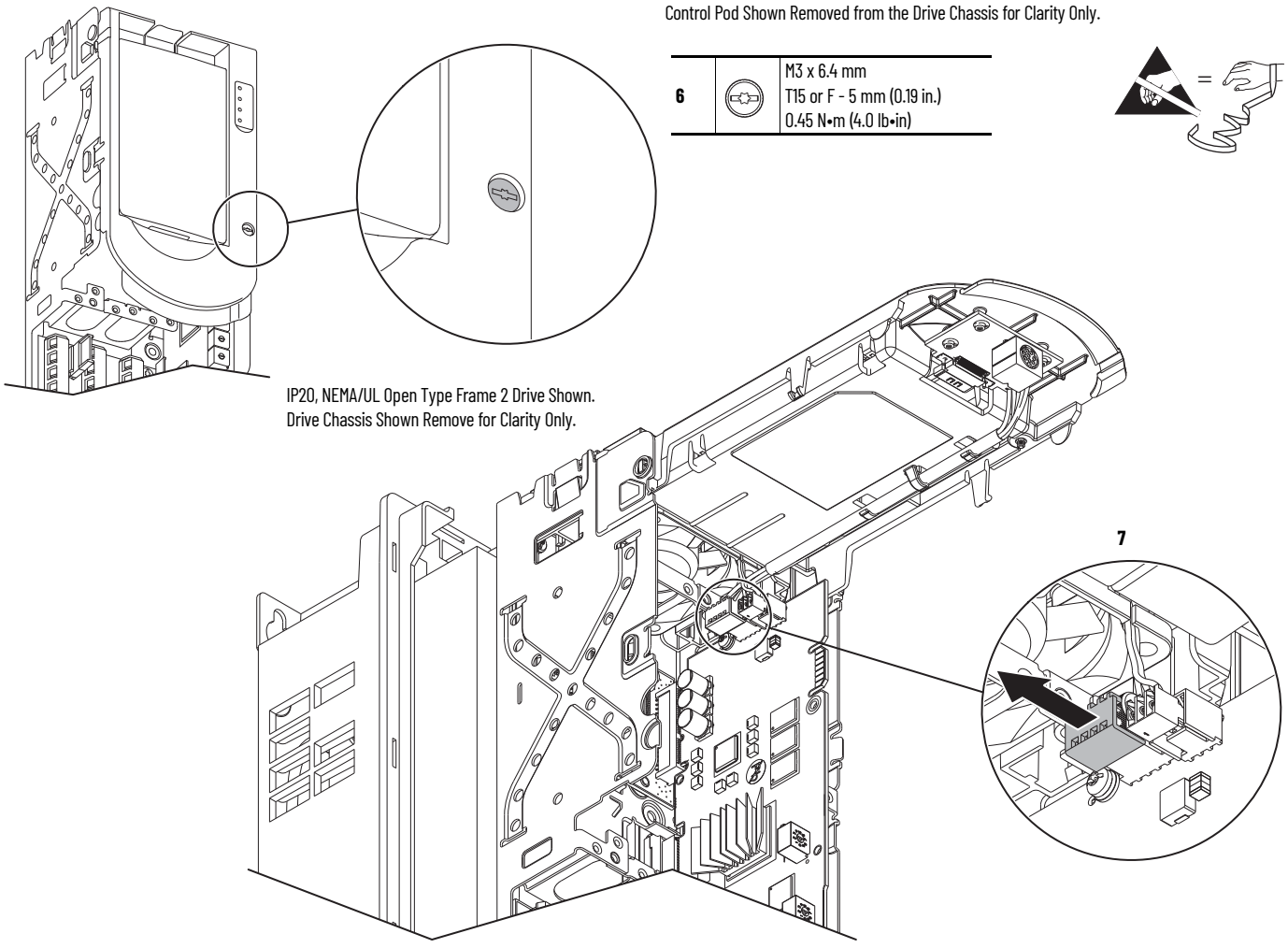
Replacement kit catalog numbers: SK-RT-BZL1, SK-RT-BZL1-XT

Remove the Control Pod HIM Cradle, Frames 2...5

Follow these steps to remove the control pod HIM cradle.

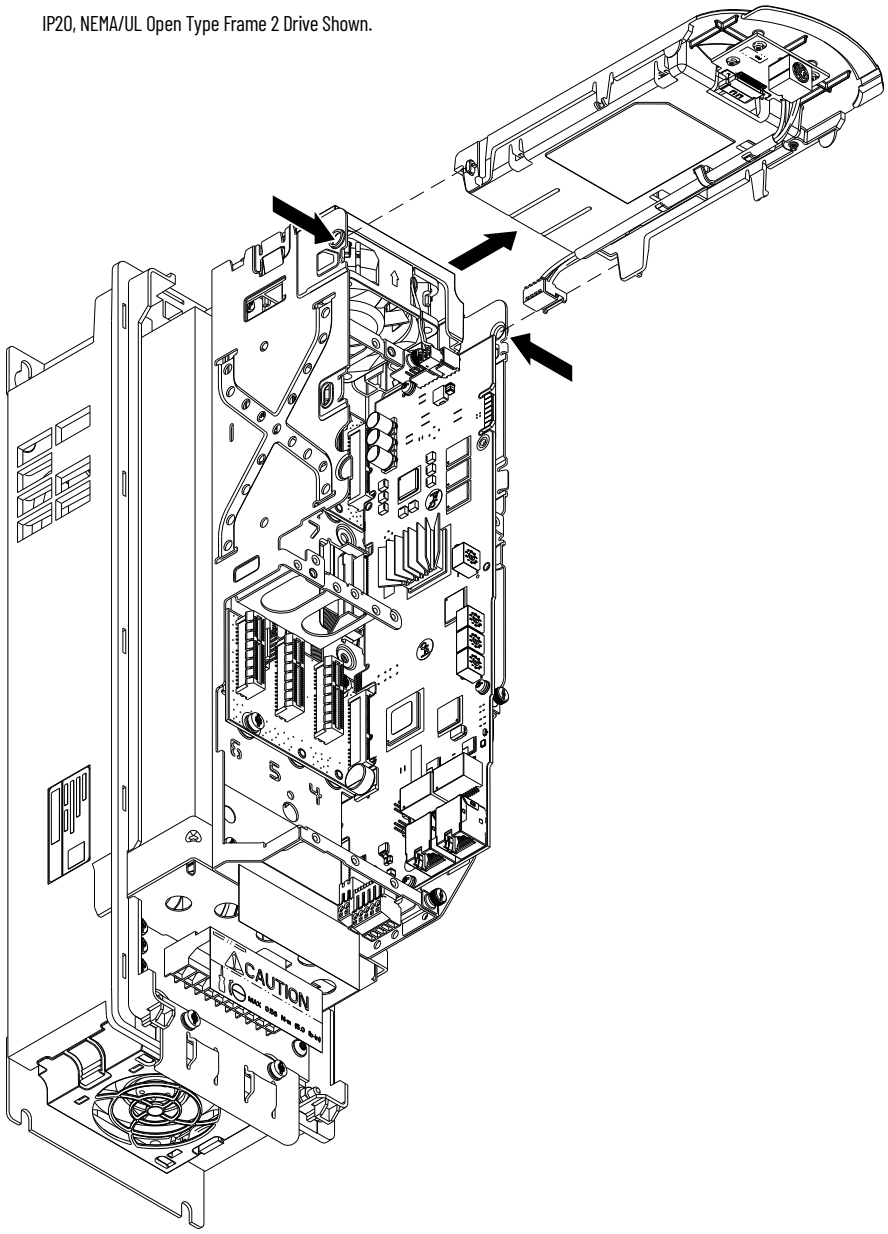
1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the cover:
   - For IP20, NEMA/UL Open Type, IP20, NEMA/UL Type 1 and flange, NEMA/UL Type 4X/12 back enclosures, remove the power terminal cover. See Remove the Power Terminal Cover, Frames 1...5 on page 31.
   - For IP54, NEMA/UL Type 12 enclosures remove the cover. See Remove the IP54, NEMA/UL Type 12 Cover, Frames 2...5 on page 33.
4. If a HIM is installed in the cradle, remove the HIM.
5. If used, disconnect the DPI cable from the connector on the bottom of the HIM cradle.

   If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.
6. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position.
7. Disconnect the HIM wire harness connector from the connector on the main control board.



8. Press in on the tabs at the top of the HIM cradle where it connects to the control pod chassis and release the cradle from the chassis.

IP20, NEMA/UL Open Type Frame 2 Drive Shown.

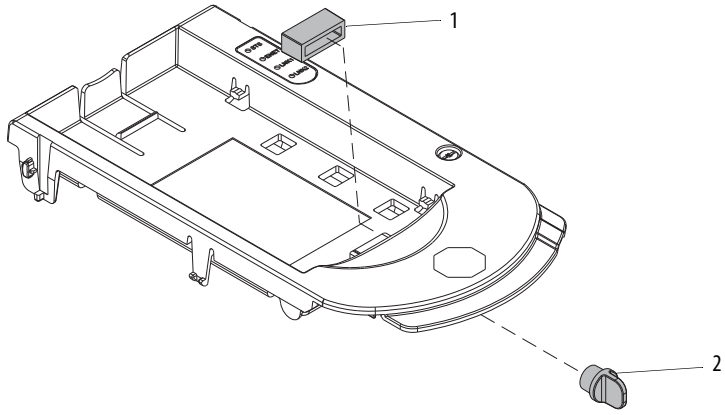


Install the Control Pod HIM Cradle, Frames 2...5

Install the control pod HIM cradle in the reverse order of removal.

IMPORTANT Do not remove protective covers unless used at the time of installation. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation. See Protective Covers on Kits with XT on page 14 for details.

- Do not remove the protective cover from these connectors on the HIM cradle unless a connection is made during reinstallation:



Item	Description
1	HIM connector

Item	Description
2	DPI connector (port 2)

Main Control Circuit Board Replacement, Frame 1

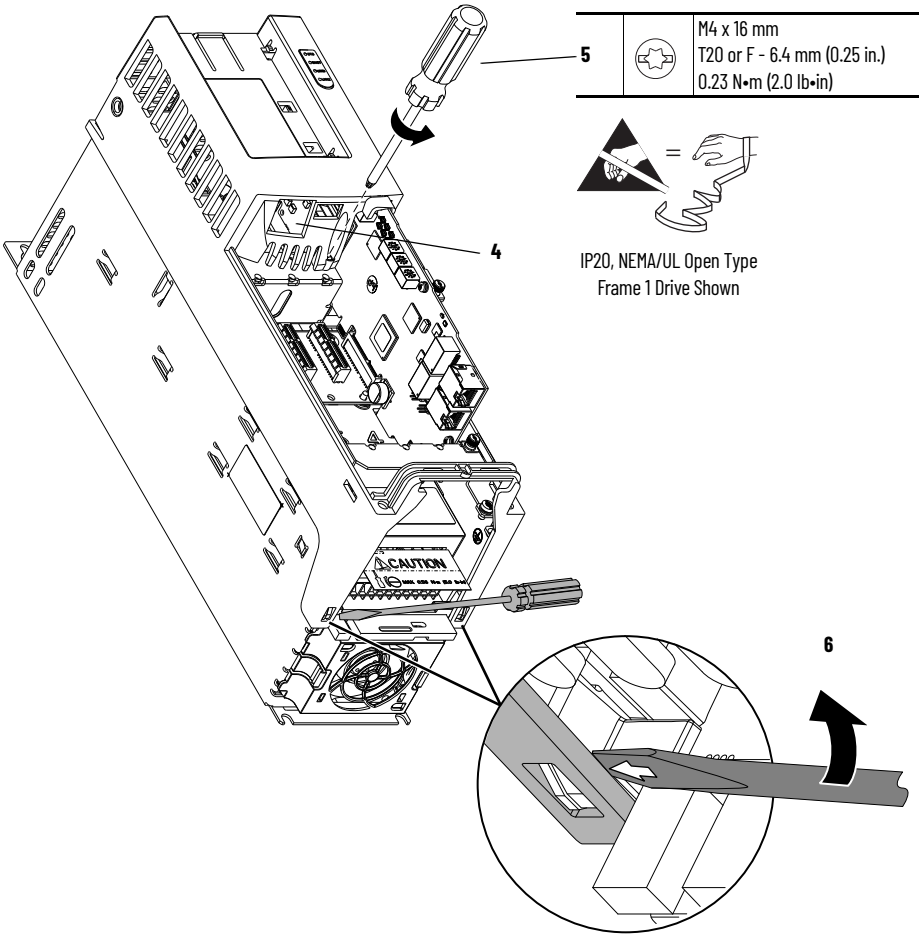
Replacement kit catalog number: SK-RT-MCB1-PF755, SK-RT-MCB1-PF755-XT

Remove the Main Control Circuit Board, Frame 1

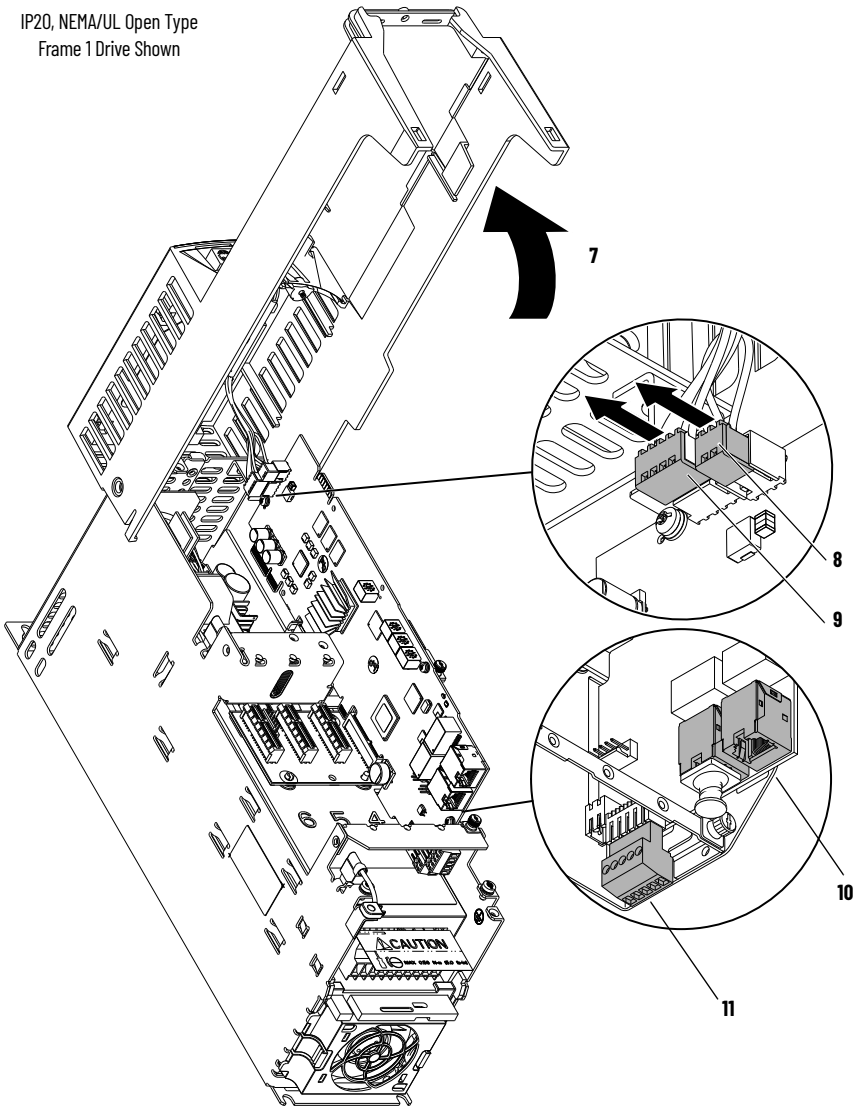
Follow these steps to remove the main control circuit board.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the power terminal cover. See Remove the Power Terminal Cover, Frames 1...5 on page 31.
4. If used, disconnect the DPI cable from the connector on the bottom of the HIM cradle.

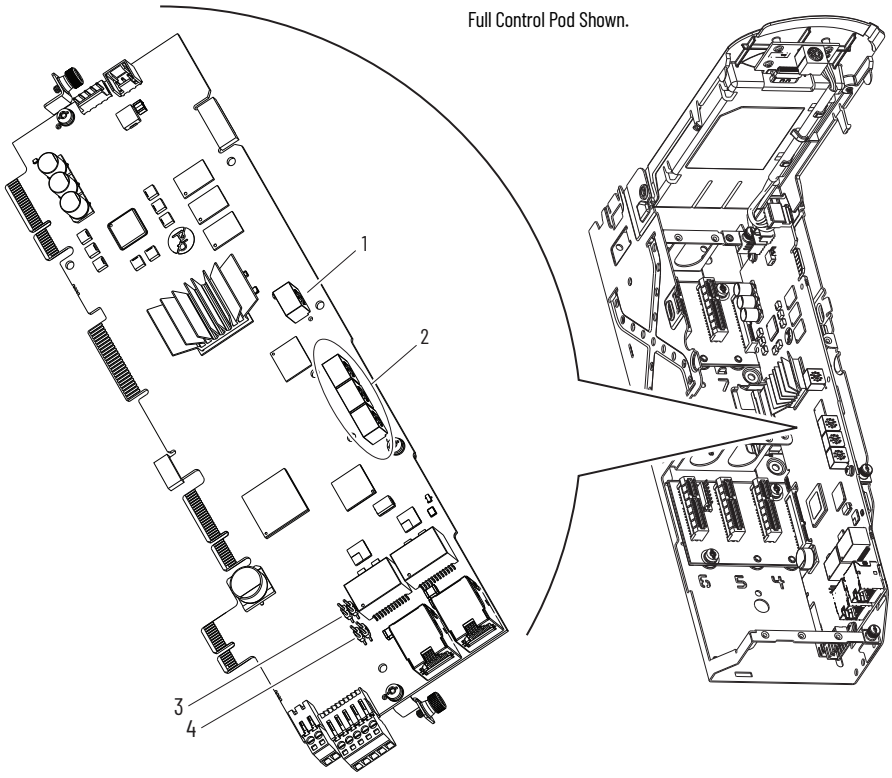
   If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.
5. Loosen the captive M3 Torx screw that secures the plastic chassis to the metal bracket.
6. Use a screwdriver to lift the two slotted-tabs on the bottom of the chassis off the brackets.



7. Rotate the chassis 90°, until the chassis locks in place.
8. Disconnect the jumper J16 from P16 on the main control circuit board. Retain the jumper for reuse with the new main control board.
9. Disconnect the terminal block for the HIM DPI wire harness from the connector on the main control circuit board.
10. Disconnect any cables from the Ethernet connectors on the bottom of the main control board in the control pod.
11. If used, disconnect the plug-in terminal block (TB1) on the bottom of the main control board.
12. If an option module is installed, disconnect any I/O wiring terminal blocks and remove the option module (not shown in this image).



13. Record any application-specific settings on these main control board switches or jumpers (identified in this illustration):

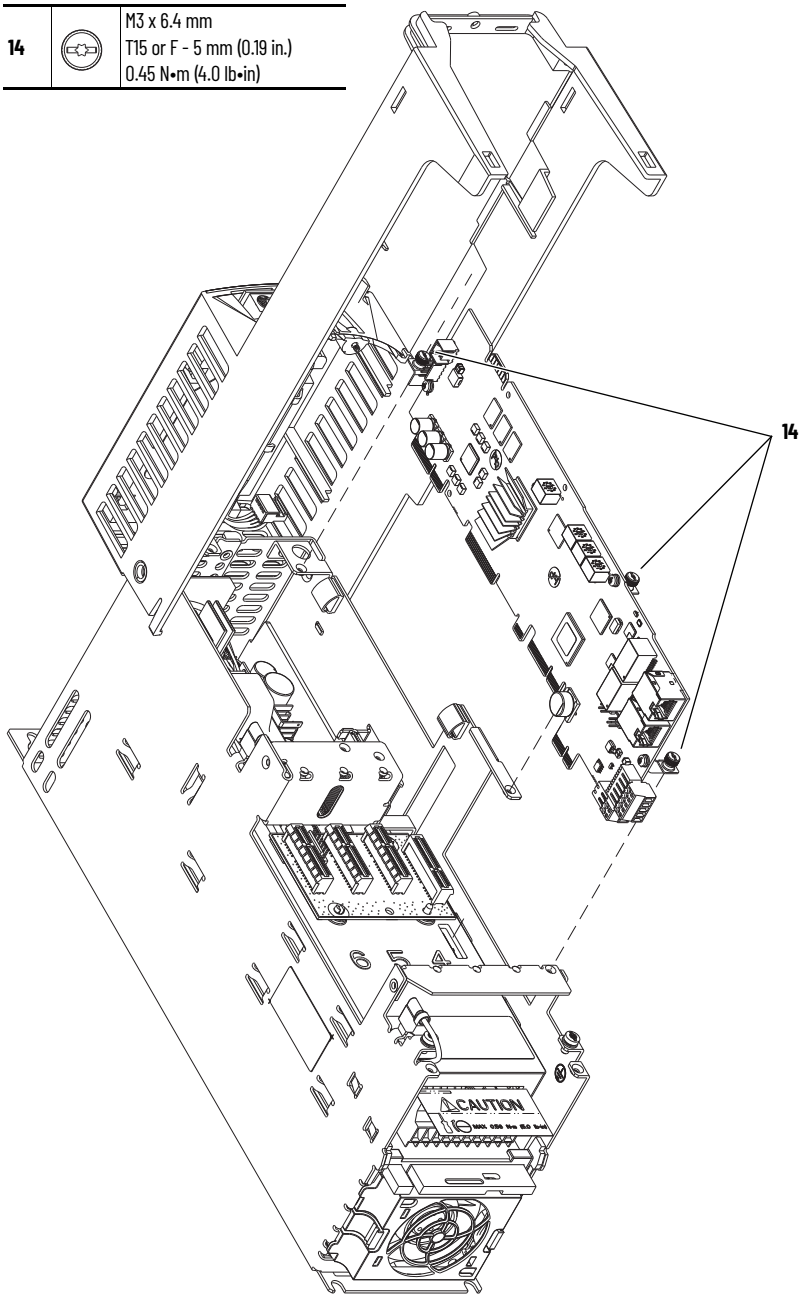


Main Control Circuit Board Details

Item	Name	Description
1	Control selector	Rotary switch for setting the programming mode.
2	Built-in EtherNet/IP address selectors	Rotary switches for setting the lowest octet of an EtherNet/IP address (forces address to 192.168.1.*xxx*). See the PowerFlex Drives with TotalFORCE Control Built-in EtherNet/IP Adapter User Manual, publication 750COM-UM009 for instructions on setting the IP address.
3	ENABLE jumper	Hardware enable jumper (P7). Remove this jumper and place it in the out (parked) position when using Digital Input 0 on TB1 as a dedicated hardware enable.
4	SAFETY jumper	Safety enable jumper (P8). Remove this jumper and place it in the out (parked) position when using a safety option.

14. Loosen the three captive slotted-Torx screws that secure the main control circuit board to the control pod chassis and remove the main control board.

14		M3 x 6.4 mm T15 or F - 5 mm (0.19 in.) 0.45 N•m (4.0 lb•in)

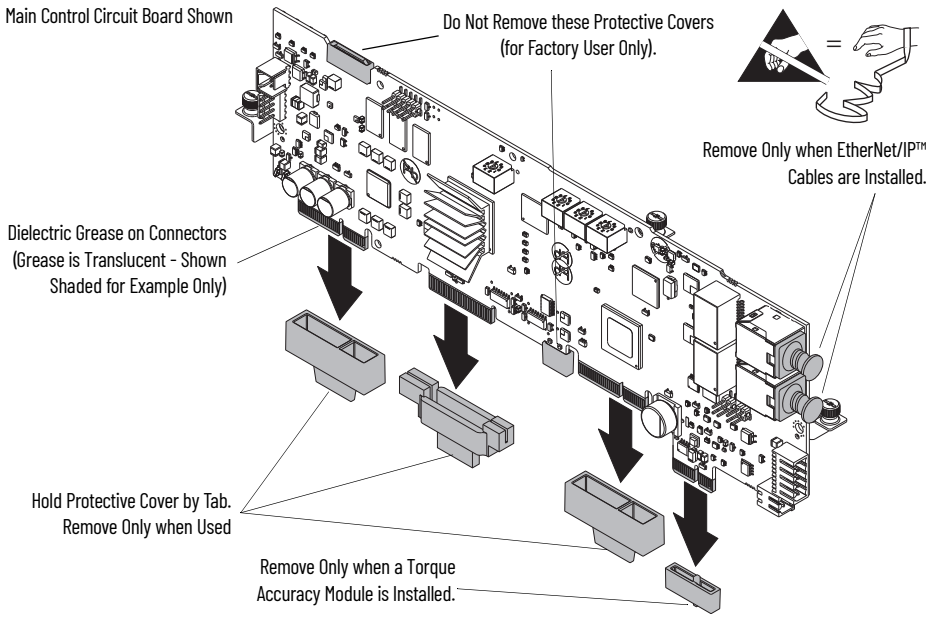


Install the Main Control Circuit Board, Frame 1

Follow these steps to install the main control circuit board.

IMPORTANT Circuit boards that are contained in renewal kits with XT contain dielectric grease on the edge connectors, where present. Do not touch or remove the grease from circuit board edge connectors. A non-greased connector can lead to corrosion.

1. For kit catalog number SK-RT-MCB1-PF755-XT only, hold the tab on the protective cover and carefully remove the cover from the edge connector on the circuit board. Do not touch the edge connector.



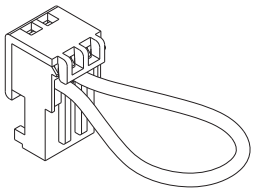
IMPORTANT If before installation, grease is removed from an edge connector or is contaminated, do not install the circuit board. See Apply Dielectric Grease to an Edge Connector on page 16 for instructions on how to clean and grease an edge connector.

2. Install the main control circuit board in the reverse order of removal.

IMPORTANT Do not remove protective covers unless used at the time of installation. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation. See Protective Covers on Kits with XT on page 14 for details.

IMPORTANT

Be sure to install jumper J16 into connector P16 on the main control circuit board. See step 8 on page 61 for details.



3. Make any necessary changes to the settings on these main control board selectors or jumpers:
   - Control switch
   - Embedded EtherNet/IP address switches
   - Hardware enable jumper
   - Safety enable jumper

Main Control Circuit Board Replacement, Frames 2...5

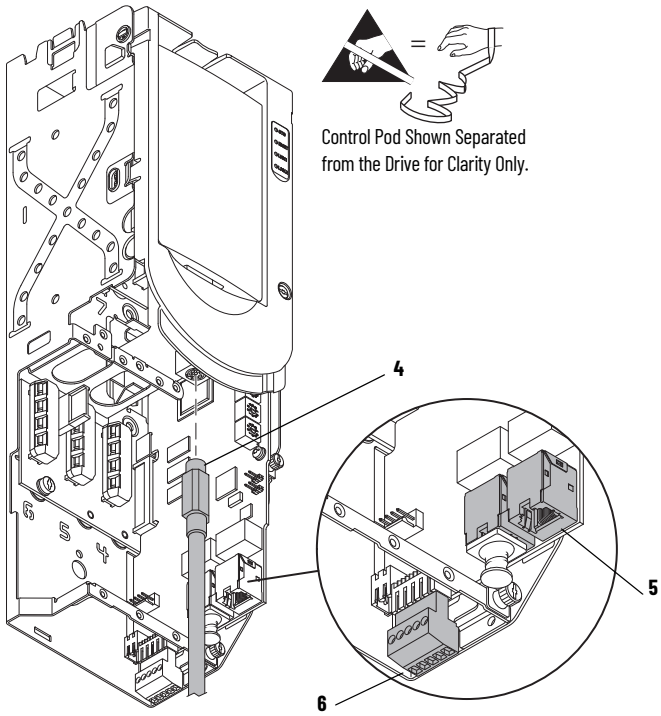
Replacement kit catalog number: SK-RT-MCB1-PF755, SK-RT-MCB1-PF755-XT

Remove the Main Control Circuit Board, Frames 2...5

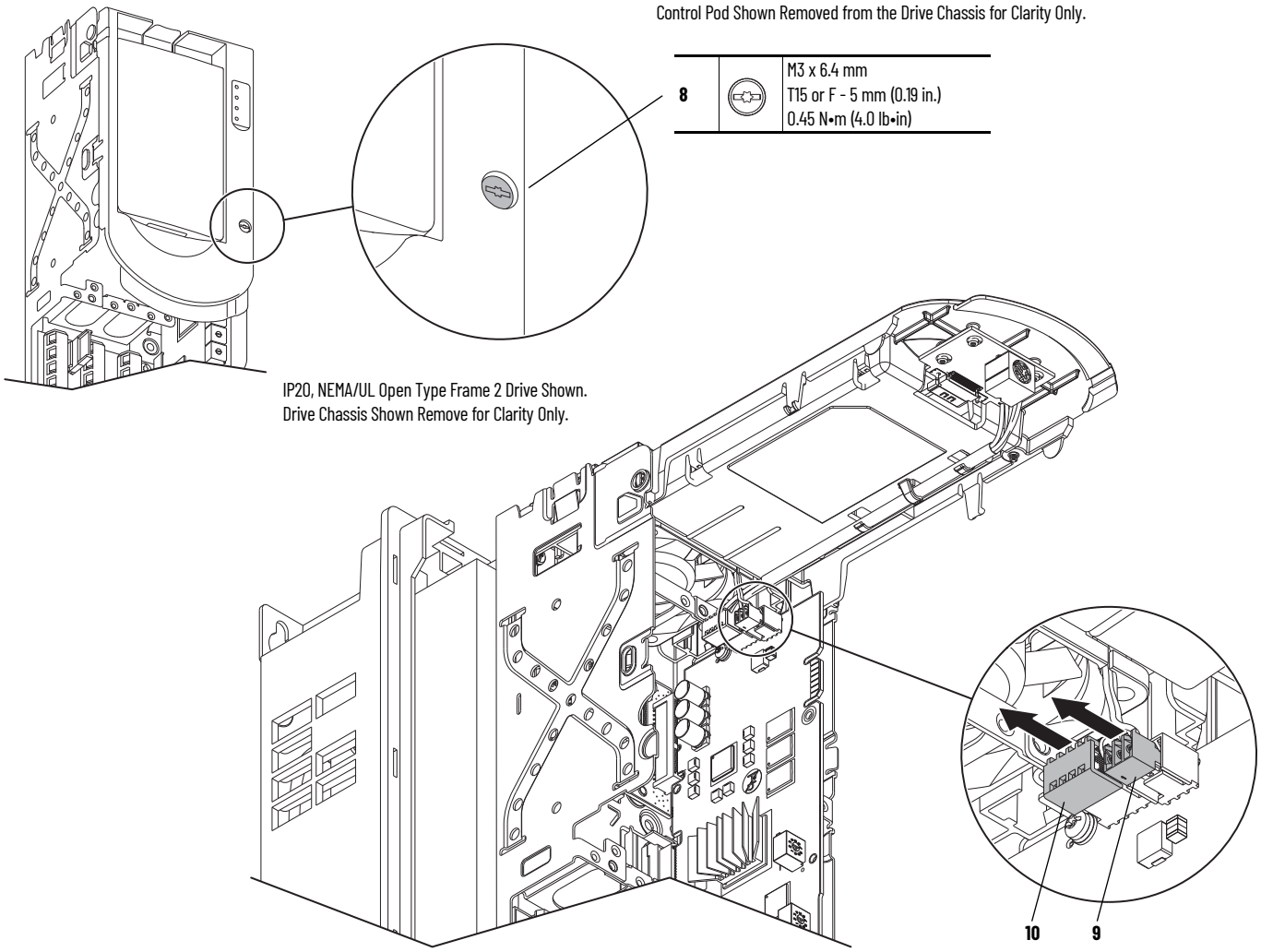
Follow these steps to remove the main control circuit board.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the appropriate cover from the drive:
   - For IP20, NEMA/UL Open Type, IP20, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures, remove the power terminal cover. See Remove the Power Terminal Cover, Frames 1...5 on page 31.
   - For IP54, NEMA/UL Type 12 enclosures, remove the drive cover. See Remove the IP54, NEMA/UL Type 12 Cover, Frames 2...5 on page 33.
4. If used, disconnect the DPI cable from the connector on the bottom of the HIM cradle.

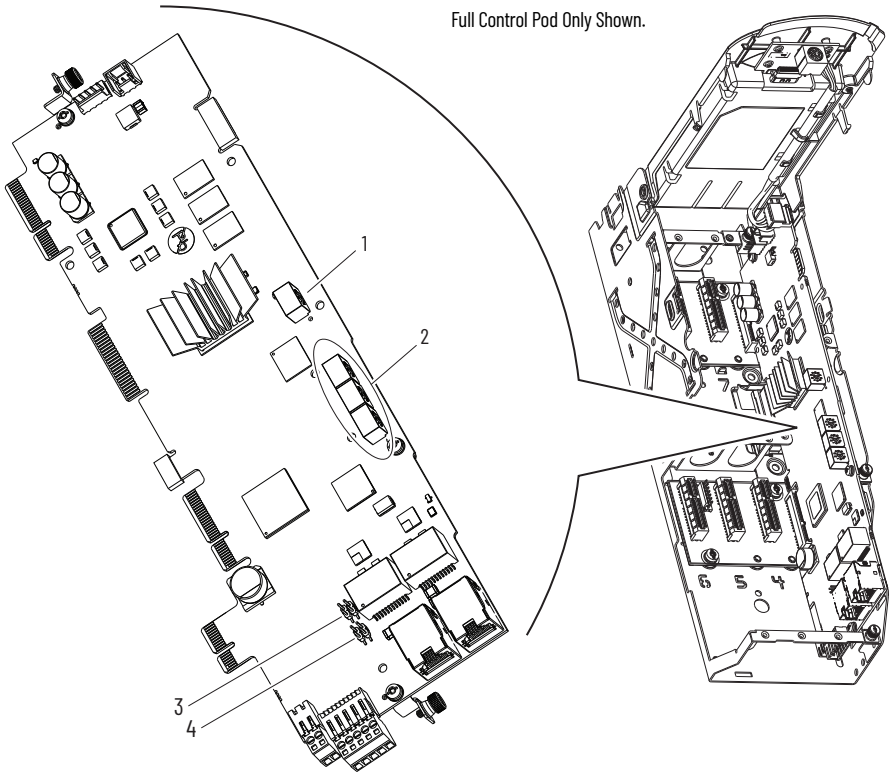
   If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.
5. Disconnect any cables from the Ethernet connectors on the bottom of the main control board in the control pod.
6. If used, disconnect the plug-in terminal block (TB1) on the bottom of the main control board.
7. If an option module is installed, disconnect any I/O wiring terminal blocks and remove the option module (not shown in this image).



8. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position.
9. Disconnect the fan power wire-harness or jumper (frames 4 and 5, IP54, NEMA/UL Type 12 drives only) J16 connector from the connector P16 on the main control circuit board. Retain the jumper for reuse with the new main control board.
10. Disconnect the HIM wire harness connector from the connector on the main control board.



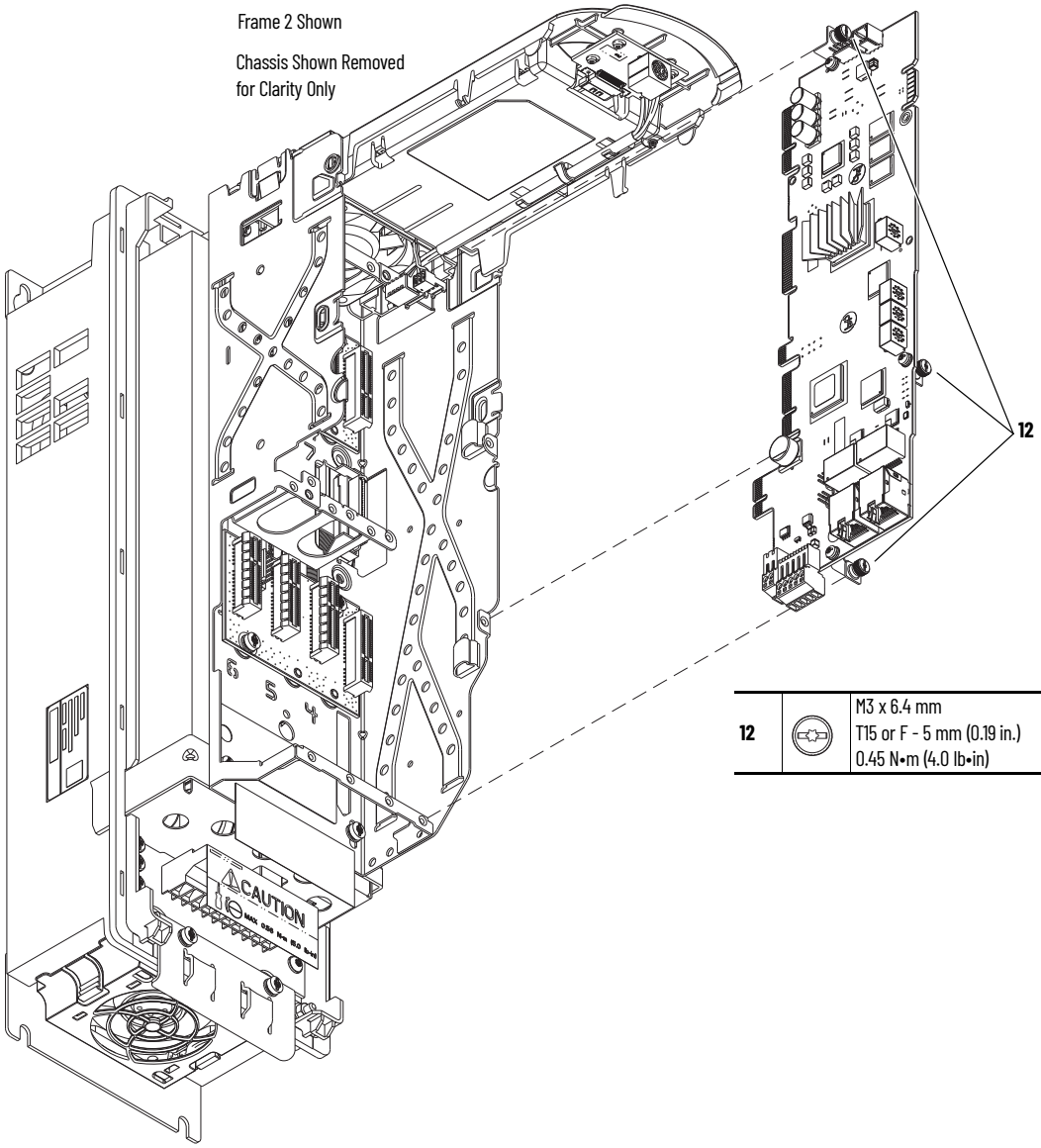
11. Record any application-specific settings on these main control board switches or jumpers (identified in this illustration):



Main Control Circuit Board Details

Item	Name	Description
1	Control selector	Rotary switch for setting the programming mode.
2	Built-in EtherNet/IP address selectors	Rotary switches for setting the lowest octet of an EtherNet/IP address (forces address to 192.168.1.*xxx*). See the PowerFlex Drives with TotalFORCE Control Built-in EtherNet/IP Adapter User Manual, publication 750COM-UM009 for instructions on setting the IP address.
3	ENABLE jumper	Hardware enable jumper (P7). Remove this jumper and place it in the out (parked) position when using Digital Input 0 on TB1 as a dedicated hardware enable.
4	SAFETY jumper	Safety enable jumper (P8). Remove this jumper and place it in the out (parked) position when using a safety option.

12. Loosen the three captive slotted-Torx screws that secure the main control circuit board to the control pod chassis and remove the main control board.



12		M3 x 6.4 mm T15 or F - 5 mm (0.19 in.) 0.45 N•m (4.0 lb•in)

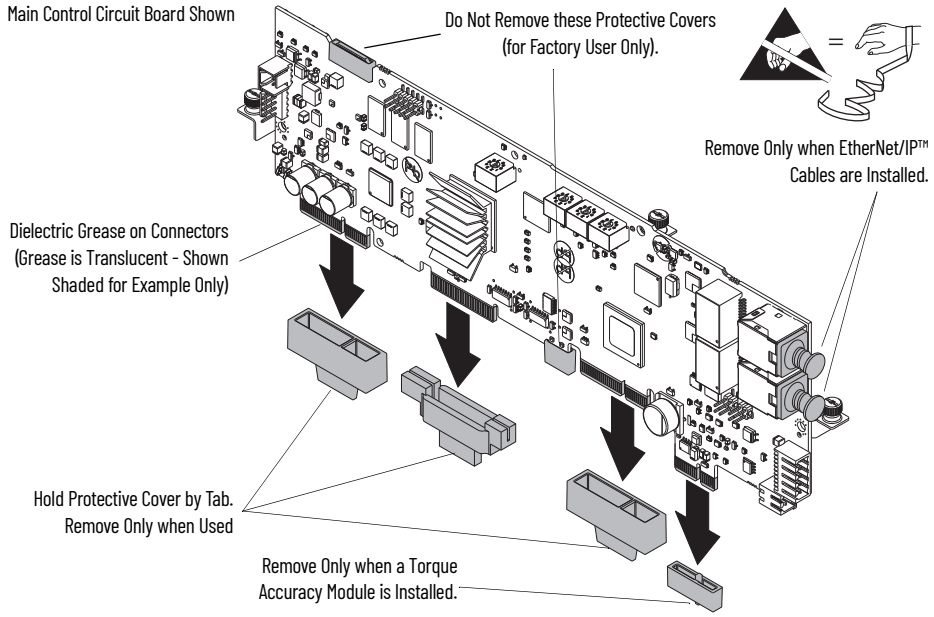
Install the Main Control Circuit Board, Frames 2...5

Follow these steps to install the main control circuit board.

IMPORTANT Circuit boards that are contained in renewal kits with XT contain dielectric grease on the edge connectors, where present. Do not touch or remove the grease from circuit board edge connectors. A non-greased connector can lead to corrosion.

1. For kit catalog number SK-RT-MCB1-PF755-XT only, hold the tab on the protective cover and carefully remove the cover from the edge connector on the circuit board. Do not touch the edge connector.

IMPORTANT If a Torque Accuracy Module (TAM) is not installed, do not remove the protective cover from the edge connector that is identified in the illustration.



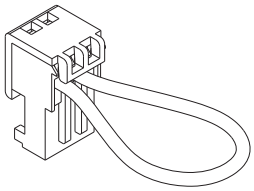
IMPORTANT If before installation, grease is removed from an edge connector or is contaminated, do not install the circuit board. See Apply Dielectric Grease to an Edge Connector on page 16 for instructions on how to clean and grease an edge connector.

2. Install the main control circuit board in the reverse order of removal.

IMPORTANT Do not remove protective covers unless used at the time of installation. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation. See Protective Covers on Kits with XT on page 14 for details.

IMPORTANT

For frames 4 and 5, IP54, NEMA/UL Type 12 drives only, be sure to install jumper J16 into connector P16 on the main control circuit board. See step 8 on page 61 for details.



3. Make any necessary changes to the settings on these main control board selectors or jumpers:
   - Control switch
   - Embedded EtherNet/IP address switches
   - Hardware enable jumper
   - Safety enable jumper

Main Control Board to Power Interface Board Ribbon Cable Replacement, Frame 1

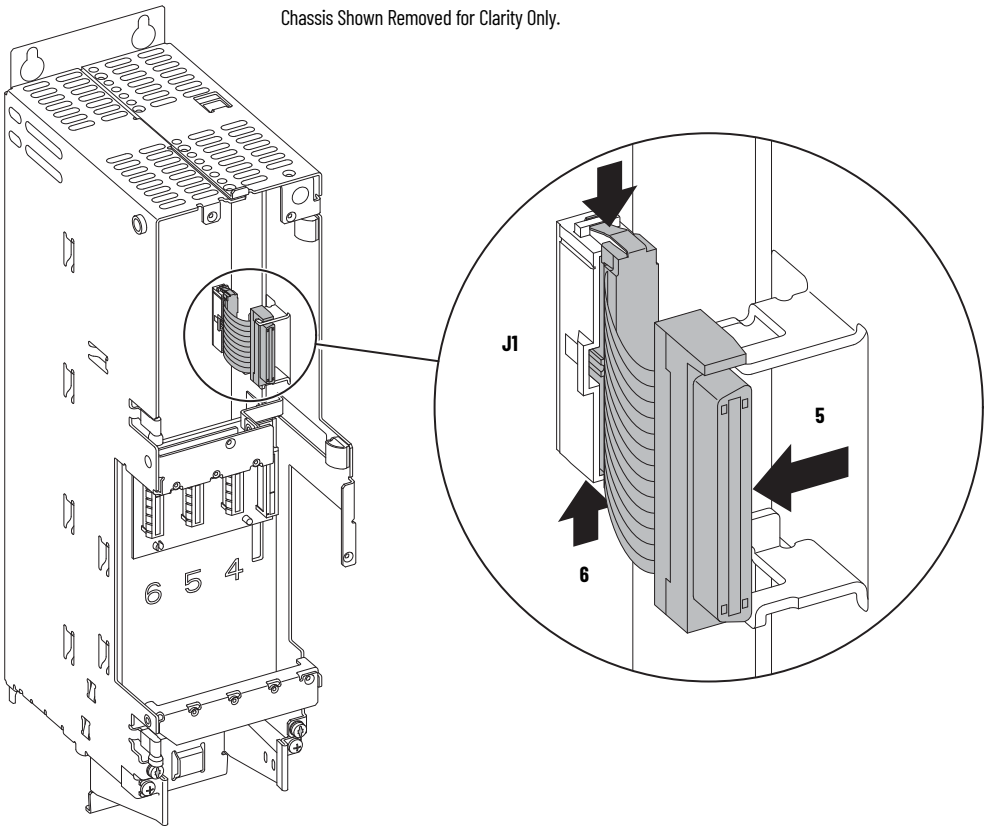
Replacement kit catalog number: SK-RT-PIC1-F1-XT

Remove the Main Control Board to Power Interface Board Ribbon Cable, Frame 1

Follow these steps to remove the main control board to power interface board ribbon cable.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the power terminal cover. See Remove the Power Terminal Cover, Frames 1...5 on page 31.
4. Remove the main control circuit board. See Remove the Main Control Circuit Board, Frame 1 on page 60.

   Retain the main control circuit board for reuse.
5. Pull the ribbon cable off the mounting clip on the side of the drive chassis.
6. Disconnect the ribbon cable connector from connector J1 on the power circuit board, and remove the ribbon cable from the drive.



Install the Main Control Board to Power Interface Board Ribbon Cable, Frame 1

Install the main control board to power interface board ribbon cable in the reverse order of removal.

Main Control Board to Power Interface Board Ribbon Cable Replacement, Frames 2...5

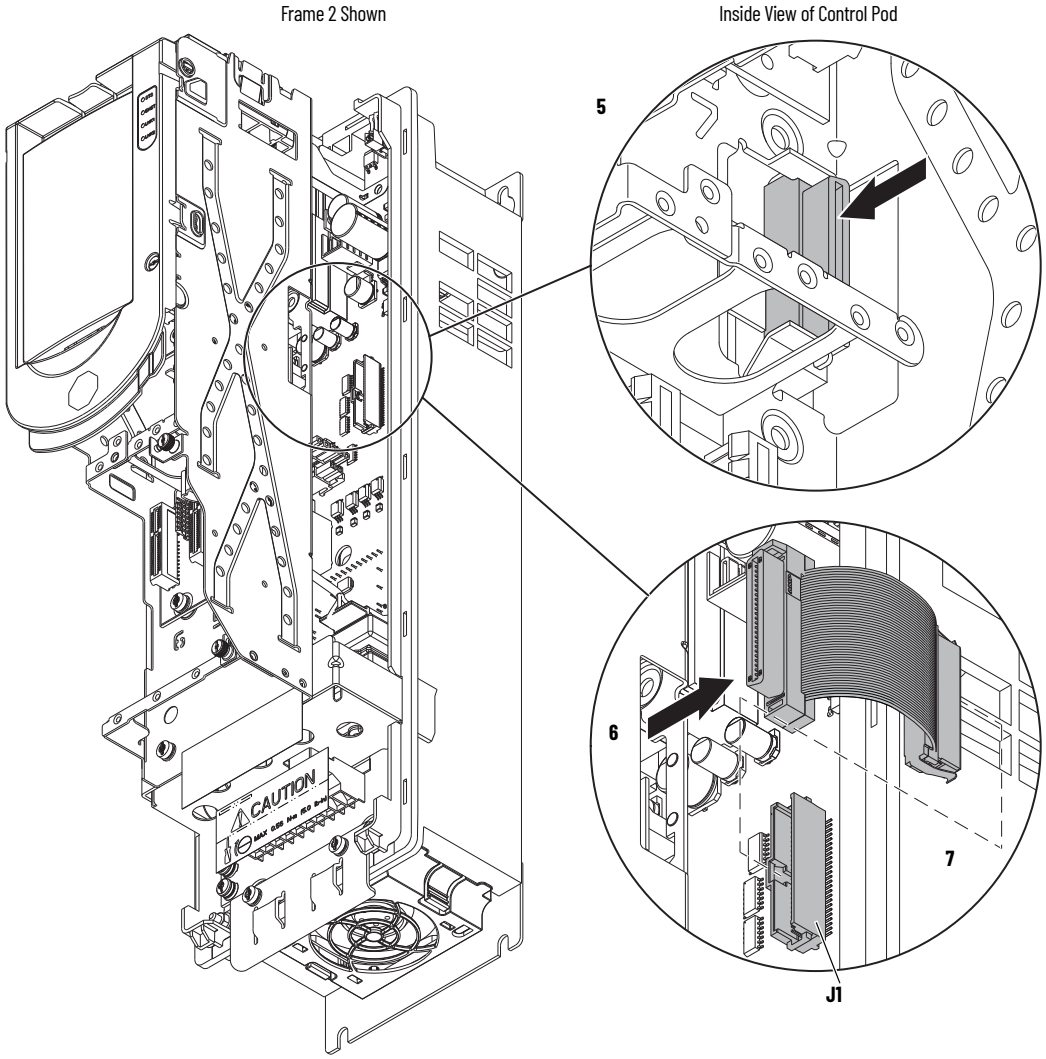
Replacement kit catalog number: SK-RT-PIC1-F27-XT

Remove the Main Control Board to Power Interface Board Ribbon Cable, Frames 2...5

Follow these steps to remove the main control board to power interface board ribbon cable.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the main control circuit board. See Remove the Main Control Circuit Board, Frames 2...5 on page 65.

   Retain the main control circuit board for reuse.
4. Remove the drive chassis. See Remove the Chassis, Frames 2...5 on page 42.
5. Remove the ribbon cable connector from the mounting tab on the inside of the control pod chassis.
6. Pull the cable through the slot in the side of the control pod chassis.
7. Disconnect the ribbon cable connector from connector J1 on the power circuit board, and remove the ribbon cable from the drive.



Install the Main Control Board to Power Interface Board Ribbon Cable, Frames 2...5

Install the main control circuit board ribbon cable in the reverse order of removal.

Backplane Circuit Board Replacement, Frame 1

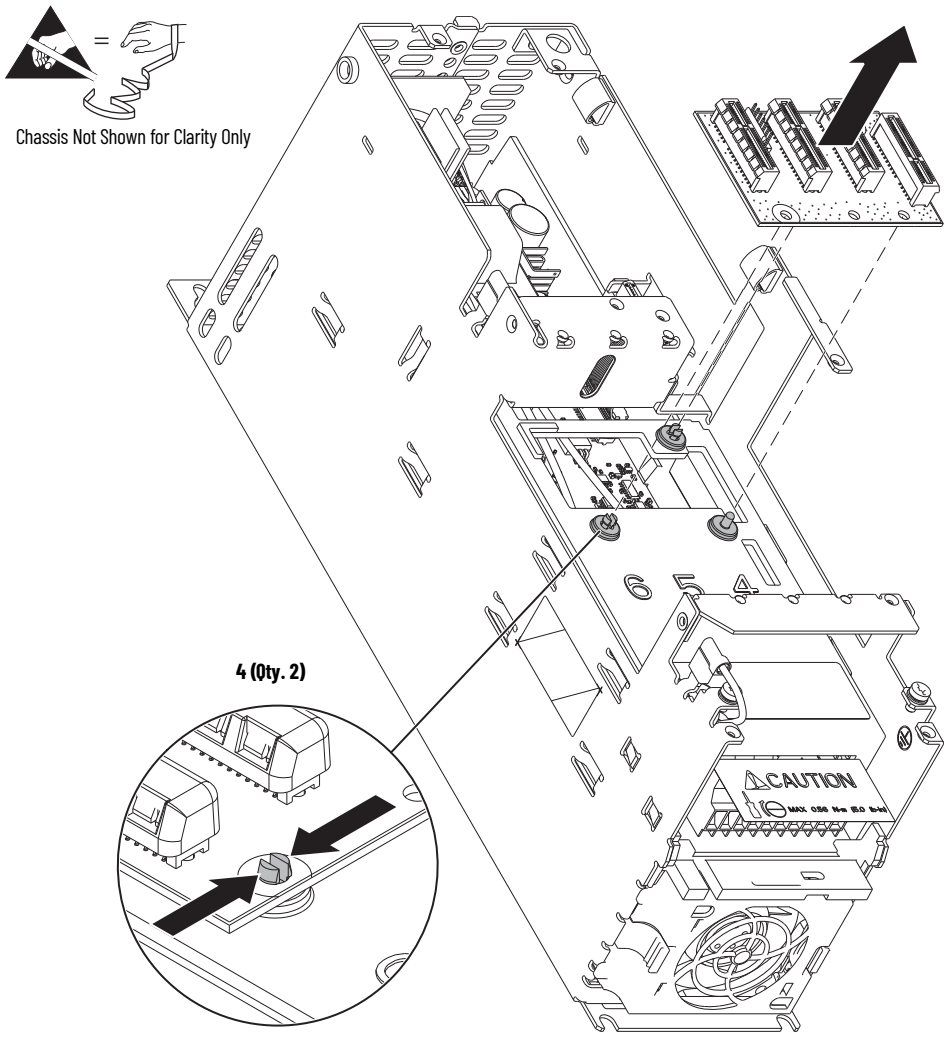
Replacement kit catalog number: SK-RT-BKPLN, SK-RT-BKPLN-XT

Remove the Backplane Circuit Board, Frame 1

Follow these steps to remove the backplane circuit board.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the main control circuit board. See Remove the Main Control Circuit Board, Frame 1 on page 60.

   Retain the main control circuit board for reuse.
4. Compress the mounting two posts that secure the backplane circuit board to the control pod chassis, push the posts through the mounting holes on the board, and remove the board.

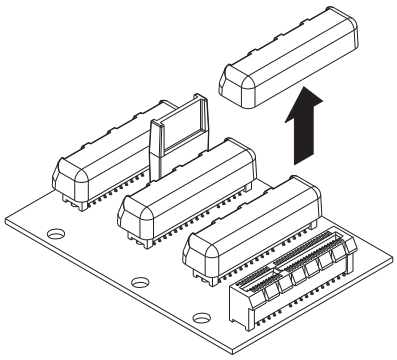


Install the Backplane Circuit Board, Frame 1

Install the backplane circuit board in the reverse order of removal.

IMPORTANT Do not remove protective covers unless used at the time of installation. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation. See Protective Covers on Kits with XT on page 14 for details.

- Do not remove the protective covers from the connectors on the new backplane circuit boards unless a connection must be made during installation.



Backplane Circuit Board Replacement, Frames 2...5

Replacement kit catalog number: SK-RT-BKPLN, SK-RT-BKPLN-XT

This kit contains one circuit board. The frame 2...5 control pod contains two backplane circuit boards. It is recommended that you replace both backplane circuit boards simultaneously.

Remove the Backplane Circuit Board, Frames 2...5

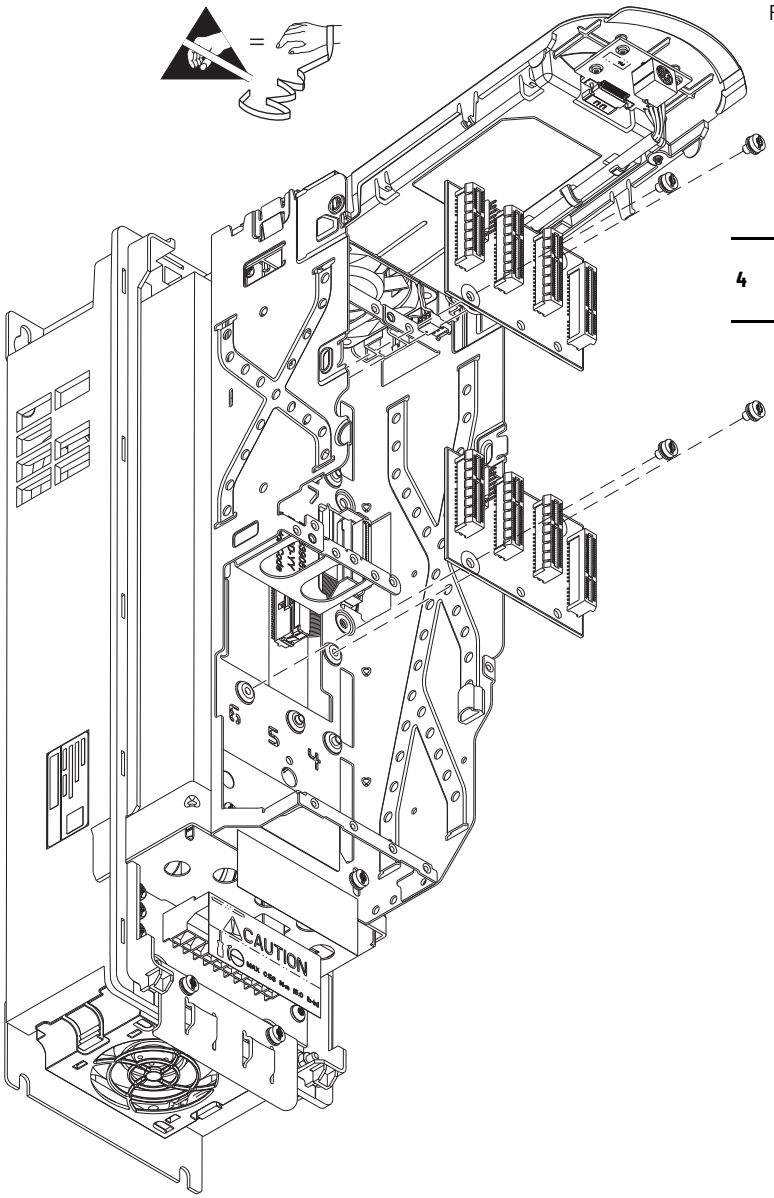
Follow these steps to remove the backplane circuit board.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the main control circuit board. See Remove the Main Control Circuit Board, Frames 2...5 on page 65.

Retain the main control circuit board for reuse.

4. Remove the two M4 x 6 mm Torx screws that secure the backplane circuit board to the pod chassis and remove the board.

Frame 2 Shown



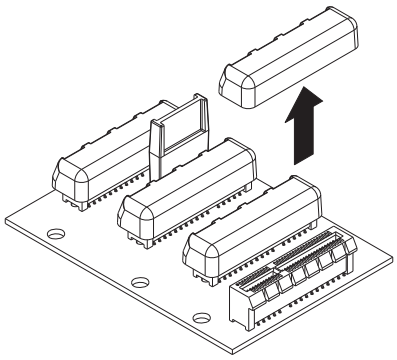
4		M4 x 6 mm T20 or F - 5 mm (0.19 in.) 1.35 N•m (12.0 lb•in)

Install the Backplane Circuit Board, Frames 2...5

Install the backplane circuit board in the reverse order of removal.

IMPORTANT Do not remove protective covers unless used at the time of installation. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation. See Protective Covers on Kits with XT on page 14 for details.

- Do not remove the protective covers from the connectors on the new backplane circuit boards unless a connection must be made during installation.



Notes:

Frame 6 Renewal Kits Installation

This chapter provides detailed instructions for how to remove and replace PowerFlex® 755TS frame 6 product components with renewal kit components.

Frame 6 Kits

Table 4 contains the renewal kits available for PowerFlex 755TS frame 6 products. 'XT' in the kit catalog number identifies a kit that can contain protective covers and/or dielectric grease on connectors. See Renewal Kits for PowerFlex 755TS Products with Corrosive Gas Protection (XT) on page 14 for details.

Table 4 - Frame 6 Renewal Kits

Kit Description	Catalog Number		Instructions
	Standard	XT	
Control Pod Access Cover (for IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and Flange, NEMA/UL Type 4X/12 Back Enclosures)	SK-RT-AD1-F67	SK-RT-AD1-F67-XT	See page 81
Cover (for IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and Flange, NEMA/UL Type 4X/12 Back Enclosures)	SK-RT-CVR1-F6	SK-RT-CVR1-F6-XT	See page 82
Control Pod Human Interface Module (HIM) Cradle (for All Enclosure Types)	SK-RT-BZL1	SK-RT-BZL1-XT	See page 82
Main Control Board	SK-RT-MCB1-PF755	SK-RT-MCB1-PF755-XT	See page 85
Main Control Board to Power Interface Board Ribbon Cable	–	SK-RT-PIC1-F27-XT	See page 90
Backplane Circuit Board	SK-RT-BKPLN	SK-RT-BKPLN-XT	See page 92
Heatsink Fan (for IP00, NEMA/UL Open Type and IP21, NEMA/UL Type 1 Enclosures)	SK-RT-HSFAN1-F6	SK-RT-HSFAN1-F6-XT	See page 93
Heatsink Fan (for Flange, NEMA/UL Type 4X/12 Back and IP54, NEMA/UL Type 12 Enclosures)	–	SK-RT-HSFAN2-F6-XT	See page 93
Upper Stirring Fan (for IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, Flange, NEMA/UL Type 4X/12 Back, and IP54, NEMA/UL Type 12 Enclosures)	SK-RT-STIRFAN1R-F6	SK-RT-STIRFAN1R-F6-XT	See page 95
Lower Stirring Fan Assembly (for IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, Flange, NEMA/UL Type 4X/12 Back, and IP54, NEMA/UL Type 12 Enclosures)	SK-RT-STIRFANL1-F6	SK-RT-STIRFANL1-F6-XT	See page 96
Flange Gasket (for Flange, NEMA/UL Type 4X/12 Back Enclosures)	SK-RT-FG1-F6	–	See page 98

Table 4 - Frame 6 Renewal Kits (Continued)

Kit Description	Catalog Number		Instructions
	Standard	XT	
Power Interface Circuit Board (208V / 240V)			
92 A 208V / 80 A 240V	SK-RT-PIB1-B080	SK-RT-PIB1-B080-XT	See page 102
120 A 208V / 104 A 240V	SK-RT-PIB1-B104	SK-RT-PIB1-B104-XT	
150 A 208V / 130 A 240V	SK-RT-PIB1-B130	SK-RT-PIB1-B130-XT	
177 A 208V / 154 A 240V	SK-RT-PIB1-B154	SK-RT-PIB1-B154-XT	
221 A 208V / 192 A 240V	SK-RT-PIB1-B192	SK-RT-PIB1-B192-XT	
260 A 208V / 260 A 240V	SK-RT-PIB1-B260-F6	SK-RT-PIB1-B260-F6-XT	
Power Interface Circuit Board (400V / 480V)			
104 A 400V / 96 A 480V(1)	SK-RT-PIB1-C104D096	SK-RT-PIB1-C104D096-XT	See page 102
140 A 400V /125A 480V	SK-RT-PIB1-C140D125	SK-RT-PIB1-C140D125-XT	
170 A 400V / 156 A 480V	SK-RT-PIB1-C170D156	SK-RT-PIB1-C170D156-XT	
205 A 400V / 186 A 480V	SK-RT-PIB1-C205D186	SK-RT-PIB1-C205D186-XT	
260 A 400V / 248 A 480V(2)	SK-RT-PIB1-C260D248	SK-RT-PIB1-C260D248-XT	
Power Interface Circuit Board (600V / 690V)			
12 A 600V / 12 A 690V	SK-RT-PIB1-E012F012	SK-RT-PIB1-E012F012-XT	See page 102
18 A 600V / 15 A 690V	SK-RT-PIB1-E018F015	SK-RT-PIB1-E018F015-XT	
23 A 600V / 20 A 690V	SK-RT-PIB1-E023F020	SK-RT-PIB1-E023F020-XT	
24 A 600V / 23 A 690V	SK-RT-PIB1-E024F023	SK-RT-PIB1-E024F023-XT	
28 A 600V / 30 A 690V	SK-RT-PIB1-E028F030	SK-RT-PIB1-E028F030-XT	
33 A 600V / 34 A 690V	SK-RT-PIB1-E033F034	SK-RT-PIB1-E033F034-XT	
42 A 600V / 46 A 690V	SK-RT-PIB1-E042F046	SK-RT-PIB1-E042F046-XT	
53 A 600V / 50 A 690V	SK-RT-PIB1-E053F050	SK-RT-PIB1-E053F050-XT	
63 A 600V / 61 A 690V	SK-RT-PIB1-E063F061	SK-RT-PIB1-E063F061-XT	
77 A 600V / 82 A 690V	SK-RT-PIB1-E077F082	SK-RT-PIB1-E077F082-XT	
99 A 600V / 98 A 690V	SK-RT-PIB1-E099F098	SK-RT-PIB1-E099F098-XT	
125 A 600V / 119 A 690V	SK-RT-PIB1-E125F119	SK-RT-PIB1-E125F119-XT	
144 A 600V / 142 A 690V	SK-RT-PIB1-E144F142	SK-RT-PIB1-E144F142-XT	
AC Precharge Circuit Board, 208V/240V	SK-RT-ACPC-BF6	SK-RT-ACPC-BF6-XT	See page 108
AC Precharge Circuit Board, 400V/480V	SK-RT-ACPC-CDF6	SK-RT-ACPC-CDF6-XT	
AC Precharge Circuit Board, 600V/690V	SK-RT-ACPC-EFF6	SK-RT-ACPC-EFF6-XT	
DC Precharge Circuit Board	SK-RT-DCPC-F67	SK-RT-DCPC-F67-XT	See page 119

(1) Use for drives installed in an IP54 / UL Type 12 enclosure only.
(2) Not used for drives installed in an IP54 / UL Type 12 enclosure.

Remove the Cover

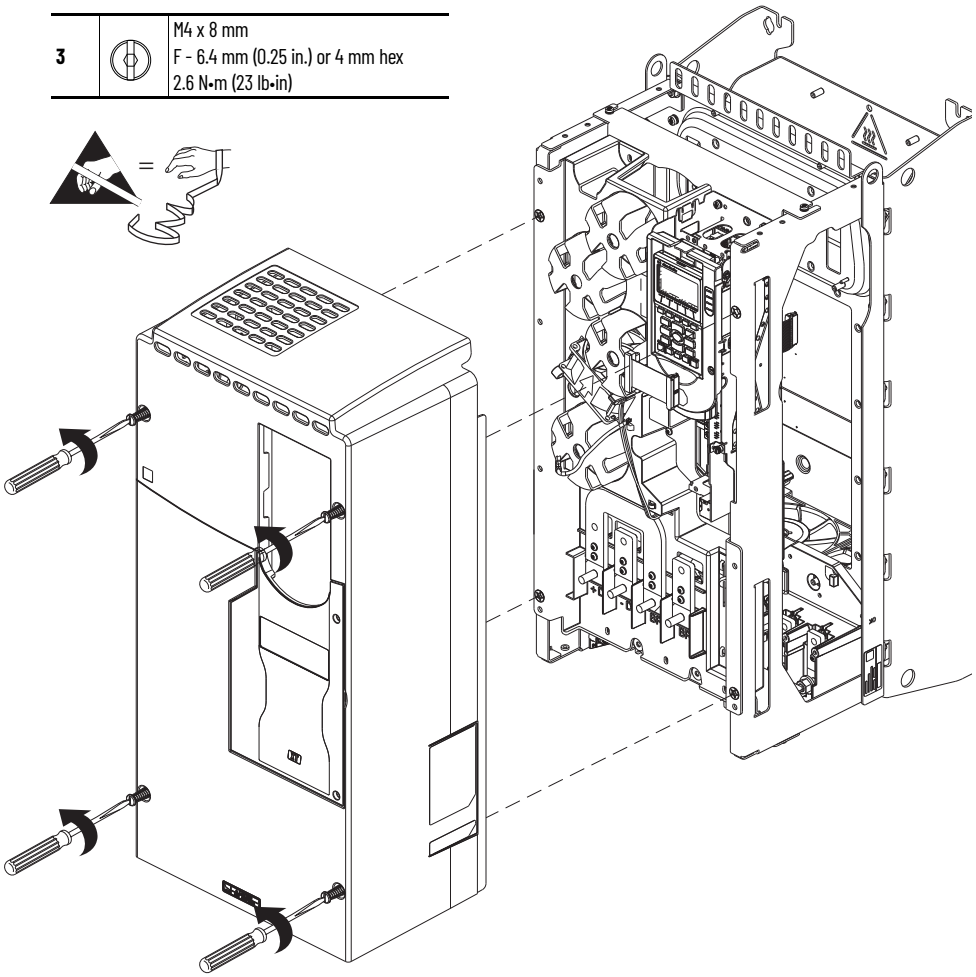
For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures, remove the cover to access internal components in the drive.

Remove the Cover

Follow these steps to remove the cover.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Loosen the four M4 x 8 mm captive screws that secure the cover to the assembly, and remove the cover.

3		M4 x 8 mm F - 6.4 mm (0.25 in.) or 4 mm hex 2.6 N•m (23 lb•in)



Install the Cover

Install the cover in the reverse order of removal.

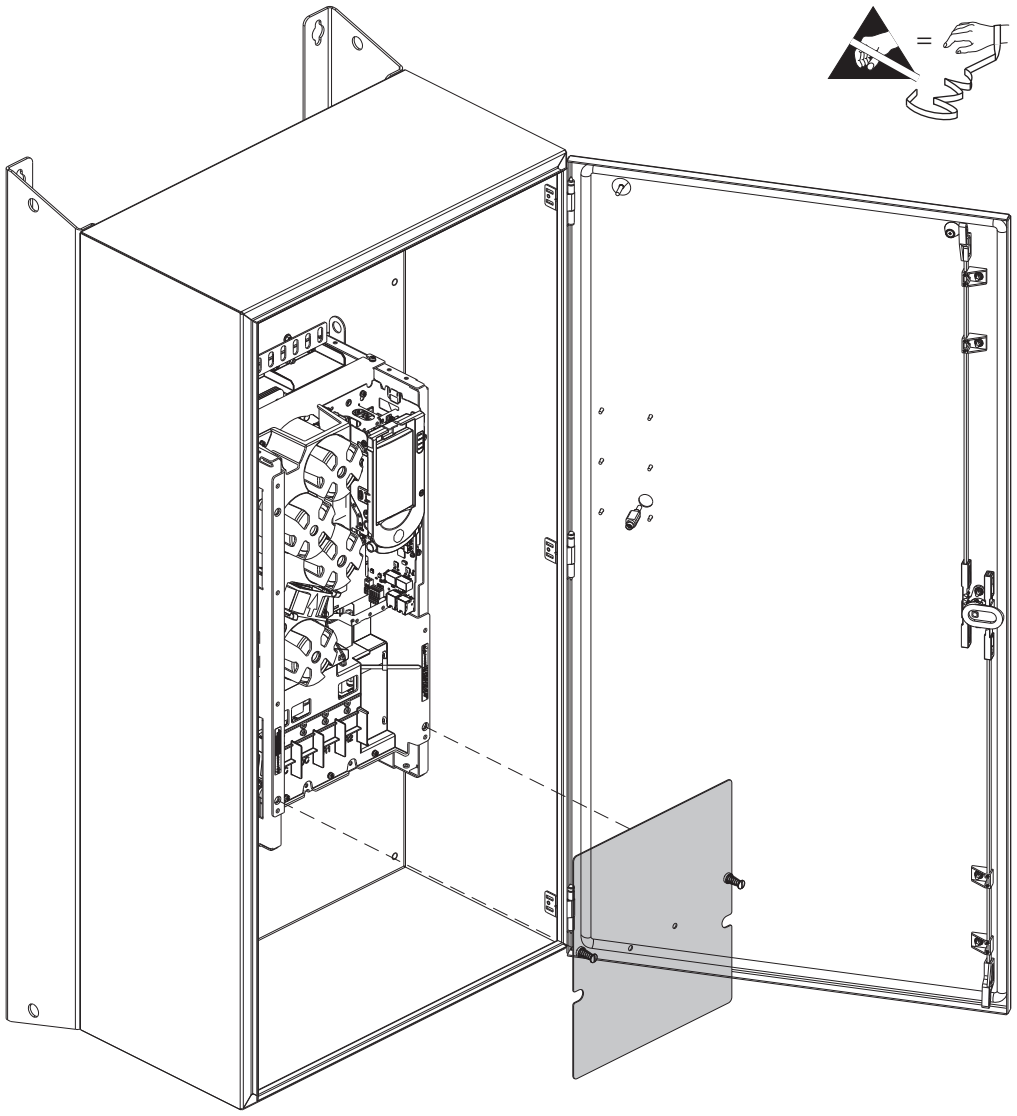
Remove the Protective Guard (IP54, NEMA/UL Type 12 Enclosure)

Remove the protective guard from an IP54, NEMA/UL Type 12 enclosure to access the power terminals, stirring fan, and power interface circuit board.

Remove the Protective Guard (IP54, NEMA/UL Type 12 Enclosure)

Follow these steps to remove the protective guard from an IP54, NEMA/UL Type 12 enclosure.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Loosen the captive screws that secure the protective guard to the drive chassis and remove the guard.



3		M4 x 8 mm F - 6.4 mm (0.25 in.) 2.6 N•m (23 lb•in)

Install the Protective Guard (IP54, NEMA/UL Type 12 Enclosure)

Install the protective guard in the reverse order of removal.

Control Pod Access Cover Replacement

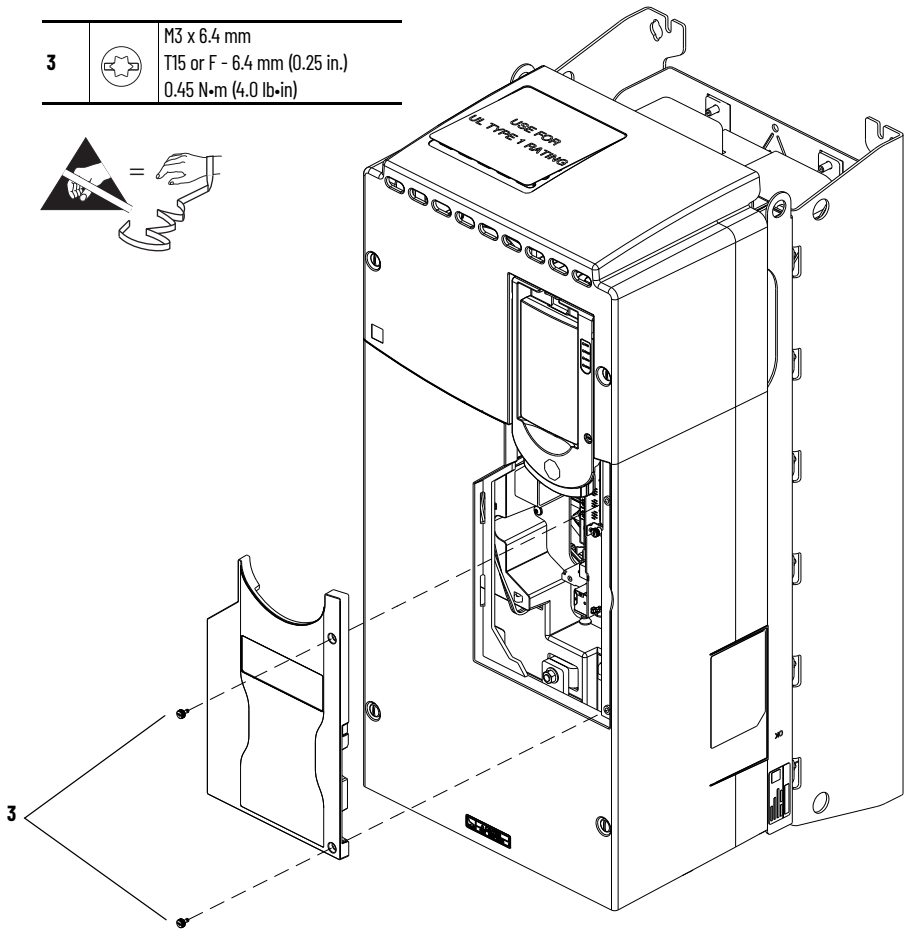
Replacement kit catalog numbers: SK-RT-AD1-F67, SK-RT-AD1-F67-XT

These kits can be used for IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1 and flange, NEMA/UL Type 4X/12 back enclosures.

Remove the Control Pod Access Cover

Follow these steps to remove the control pod access cover.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Loosen the two M3 x 6.4 mm slotted-Torx screws that secure the control pod access cover to the drive cover and remove the access cover.



Install the Control Pod Access Cover

Install the control pod access cover in the reverse order of removal.

Cover Replacement

Replacement kit catalog numbers: SK-RT-CVR1-F6, SK-RT-CVR1-F6-XT

These kits can be used for IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures.

Remove the Cover

Follow these steps to remove the cover.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the control pod access cover. See Remove the Control Pod Access Cover on page 81. Retain the access cover for reuse.
4. Remove the cover. See Remove the Cover on page 79.

Install the Cover

Install the cover in the reverse order of removal.

Control Pod HIM Cradle Replacement

Replacement kit catalog numbers: SK-RT-BZL1, SK-RT-BZL1-XT

These kits can be used for all enclosure types.

Remove the Control Pod HIM Cradle

Follow these steps to remove the control pod HIM cradle.

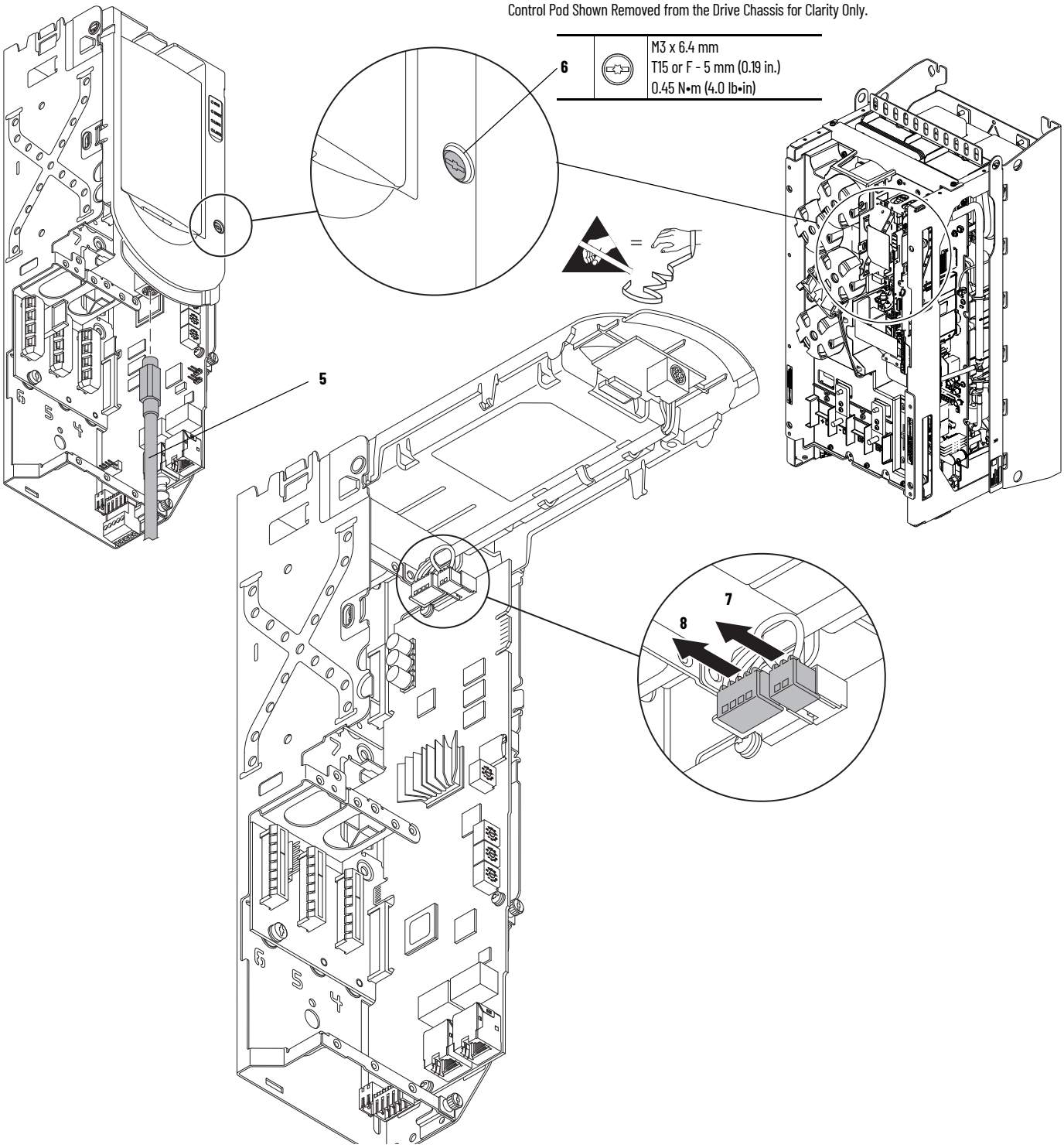
1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Access the drive interior:
   - For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures, remove the drive cover. See Remove the Cover on page 79.
   - For IP54, NEMA/UL Type 12 enclosures, open the enclosure door.
4. If a HIM is installed in the cradle, remove the HIM.

5. If used, disconnect the DPI™ cable from the connector on the bottom of the HIM cradle.

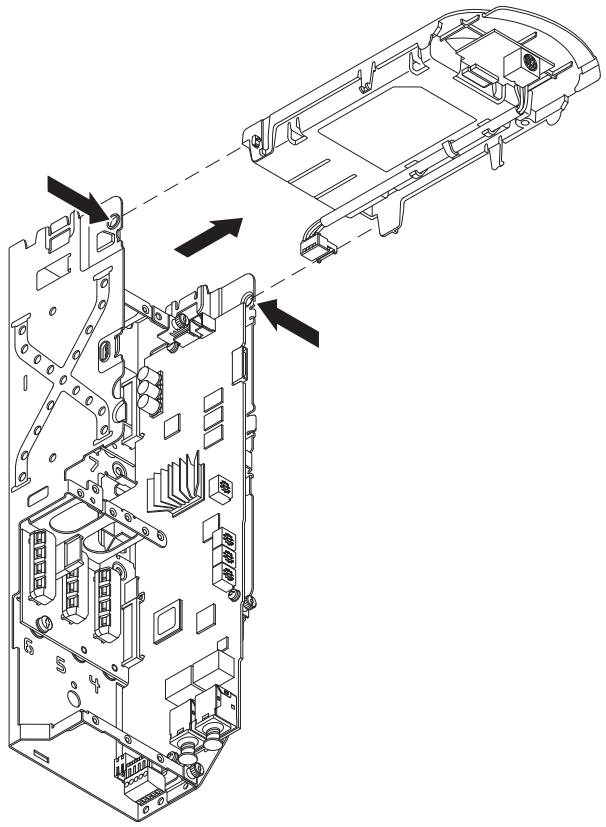
   If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.

6. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position.
7. Disconnect the jumper J16 connector from the connector P16 on the main control circuit board. Retain the jumper for reuse with the new main control board.
8. Disconnect the HIM wire harness connector from the connector on the main control board.

Control Pod Shown Removed from the Drive Chassis for Clarity Only.



9. Press in on the tabs at the top of the HIM cradle where it connects to the control pod chassis to release the cradle from the chassis.

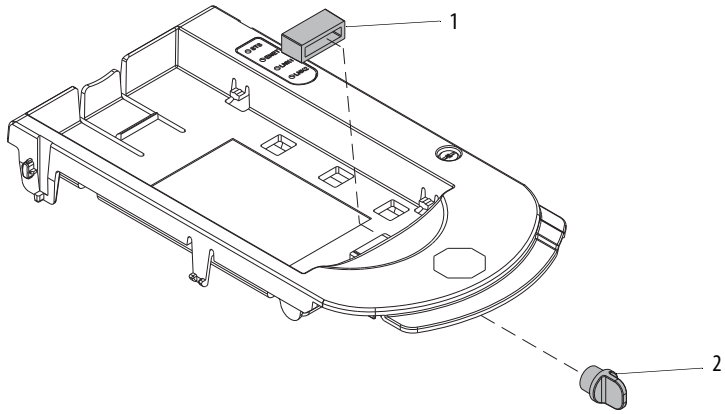


Install the Control Pod HIM Cradle

Install the control pod HIM cradle in the reverse order of removal.

IMPORTANT Do not remove protective covers unless used at the time of installation. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation. See Protective Covers on Kits with XT on page 14 for details.

- Do not remove the protective cover from these connectors on the HIM cradle unless a connection is made during reinstallation:



Item	Description
1	HIM connector

Item	Description
2	DPI connector (port 2)

Main Control Circuit Board Replacement

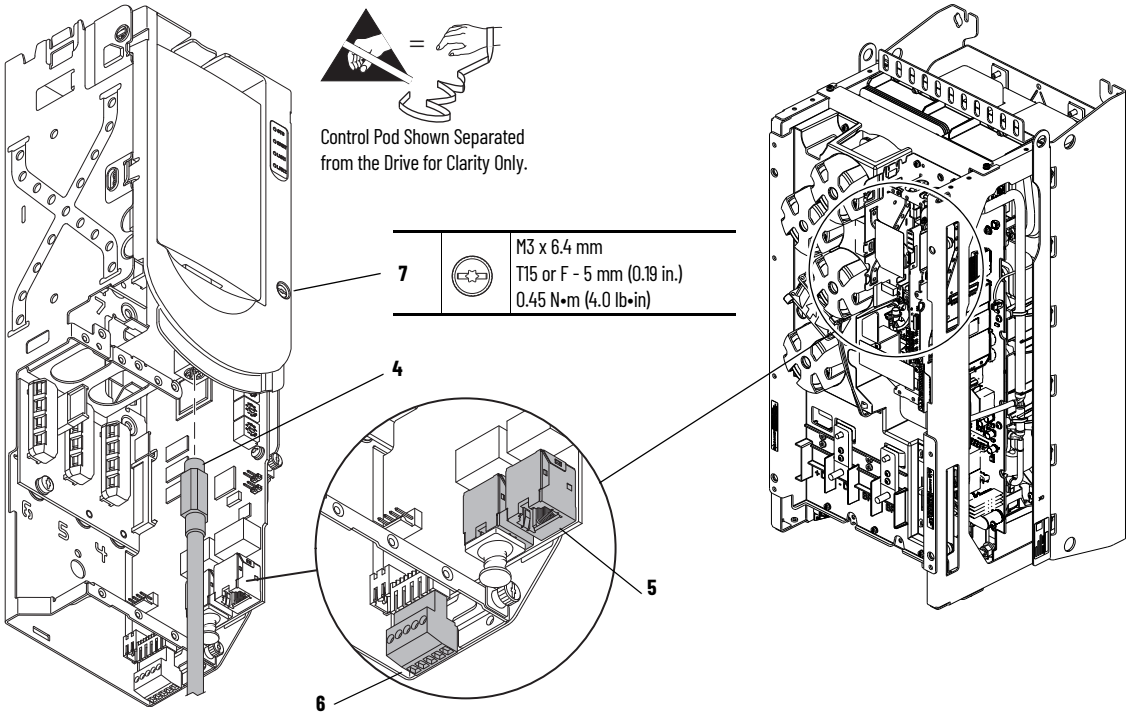
Replacement kit catalog numbers: SK-RT-MCB1-PF755, SK-RT-MCB1-PF755-XT

Remove the Main Control Circuit Board

Follow these steps to remove the main control circuit board.

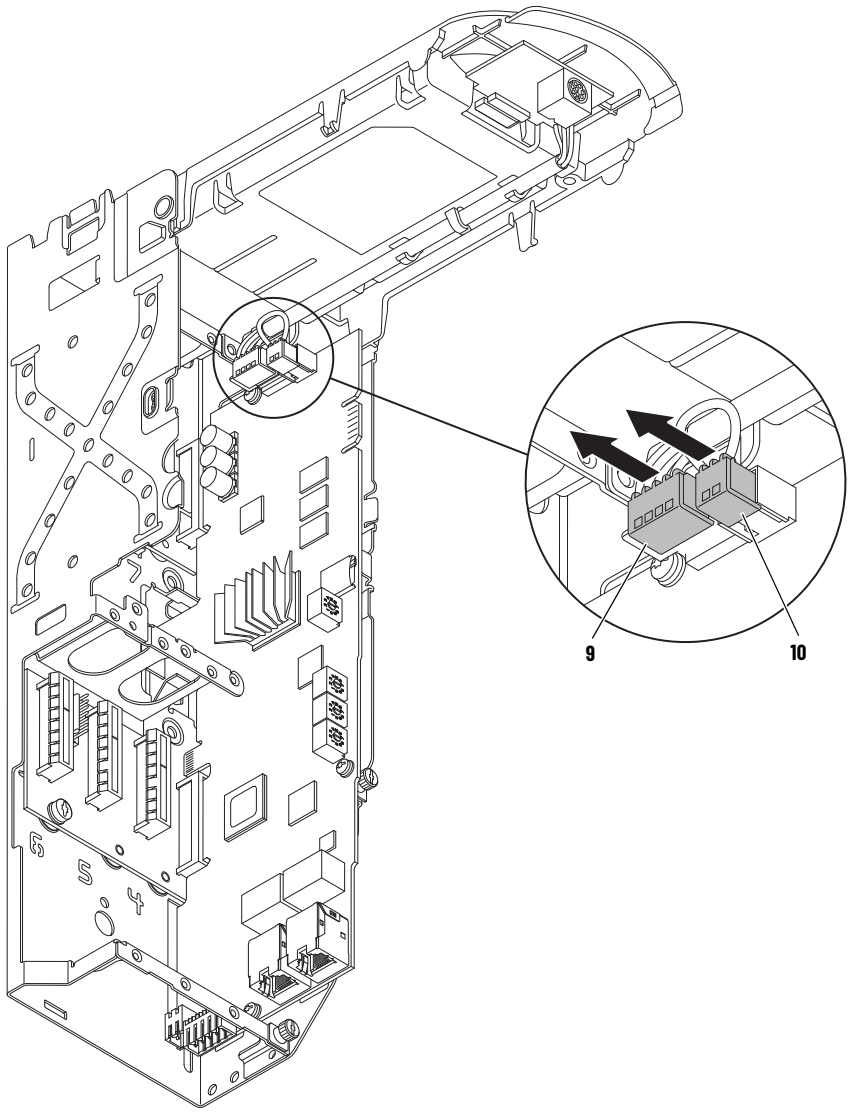
1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Access the drive interior:
   - For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures, control pod access cover. See Remove the Control Pod Access Cover on page 81.
   - For IP54, NEMA/UL Type 12 enclosures, open the enclosure door.
4. If used, disconnect the DPI cable from the connector on the bottom of the HIM cradle.

   If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.
5. Disconnect any cables from the Ethernet connectors on the bottom of the main control board in the control pod.
6. If used, disconnect the plug-in terminal block (TB1) on the bottom of the main control board.
7. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position.
8. If an option module is installed, disconnect any I/O wiring terminal blocks and remove the option module (not shown in this image).

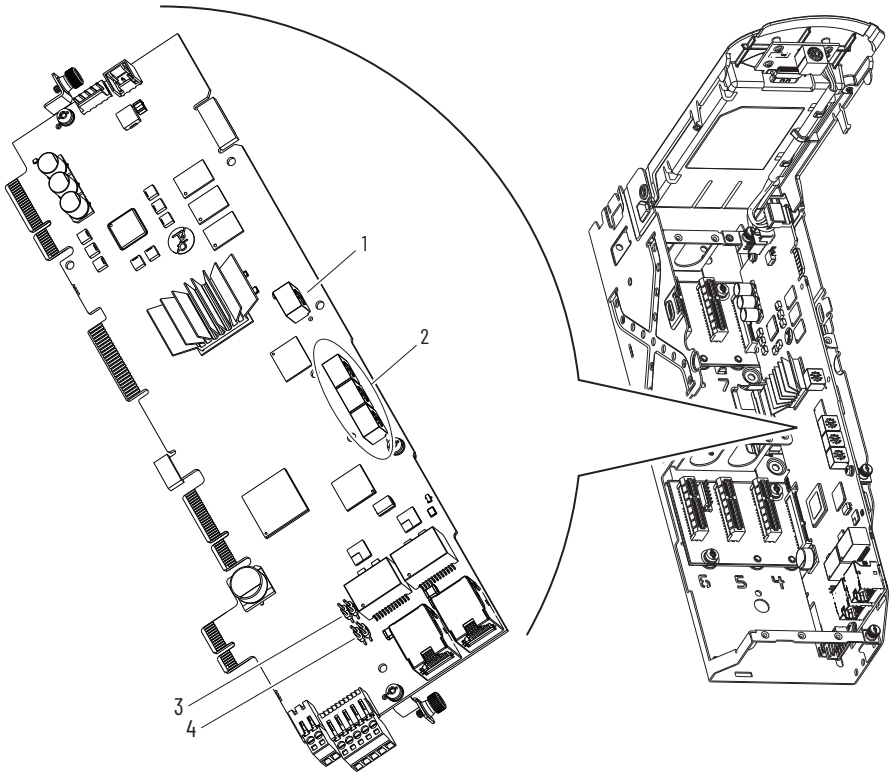


9. Disconnect the terminal block for the HIM DPI wire harness from the connector on the main control circuit board.
10. Disconnect the jumper J16 from P16 on the main control circuit board. Retain the jumper for reuse with the new main control board.

Control Pod Shown Removed from the Drive Chassis for Clarity Only.



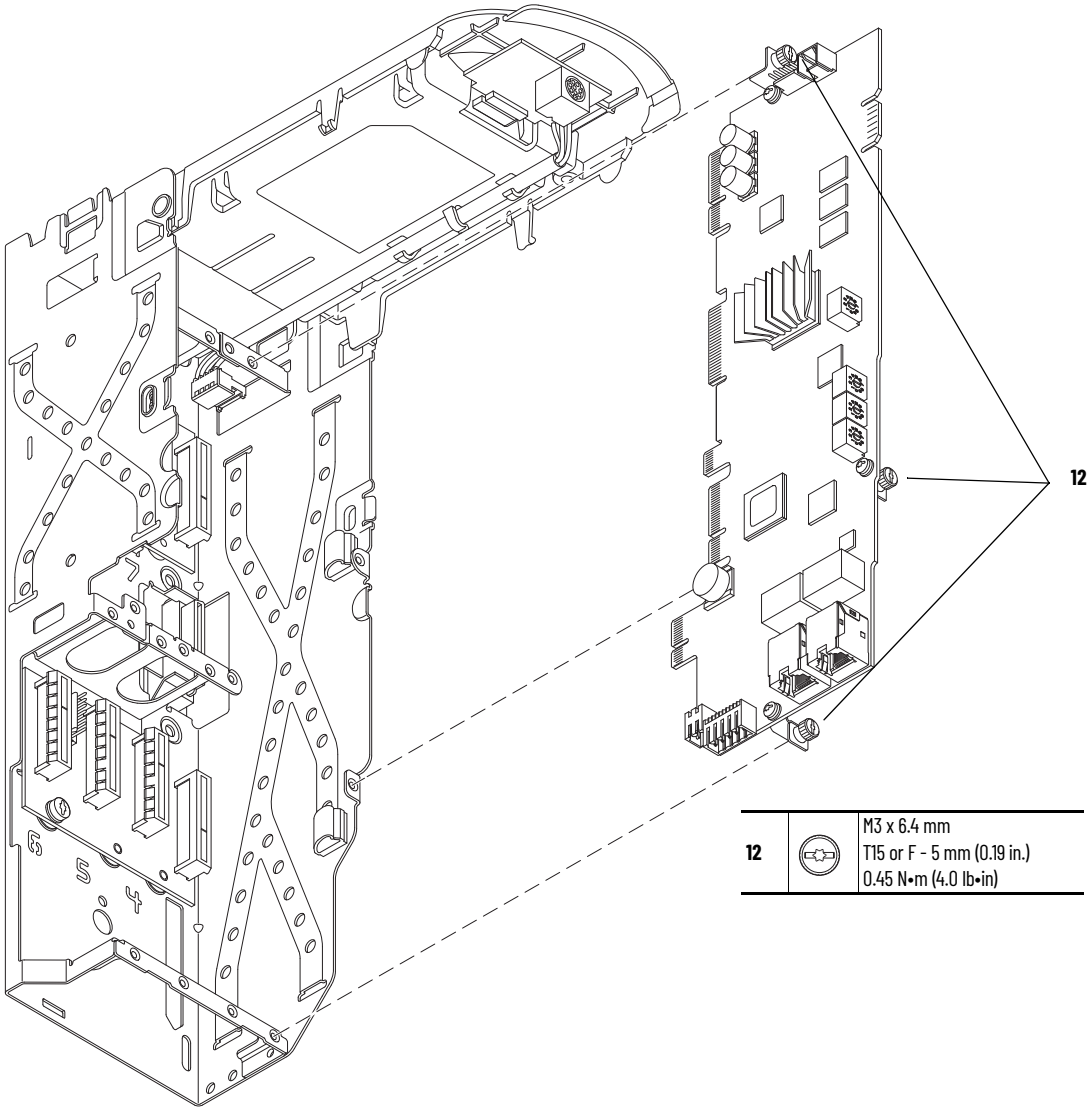
11. Record any application-specific settings on these main control board switches or jumpers (identified in this illustration):



Main Control Circuit Board Details

Item	Name	Description
1	Control selector	Rotary switch for setting the programming mode.
2	Built-in EtherNet/IP address selectors	Rotary switches for setting the lowest octet of an EtherNet/IP address (forces address to 192.168.1.*xxx*). See the PowerFlex Drives with TotalFORCE Control Built-in EtherNet/IP Adapter User Manual, publication 750COM-UM009 for instructions on setting the IP address.
3	ENABLE jumper	Hardware enable jumper (P7). Remove this jumper and place it in the out (parked) position when using Digital Input 0 on TB1 as a dedicated hardware enable.
4	SAFETY jumper	Safety enable jumper (P8). Remove this jumper and place it in the out (parked) position when using a safety option.

12. Loosen the three M3 captive slotted-Torx screws that secure the main control circuit board to the control pod chassis and remove the main control board.



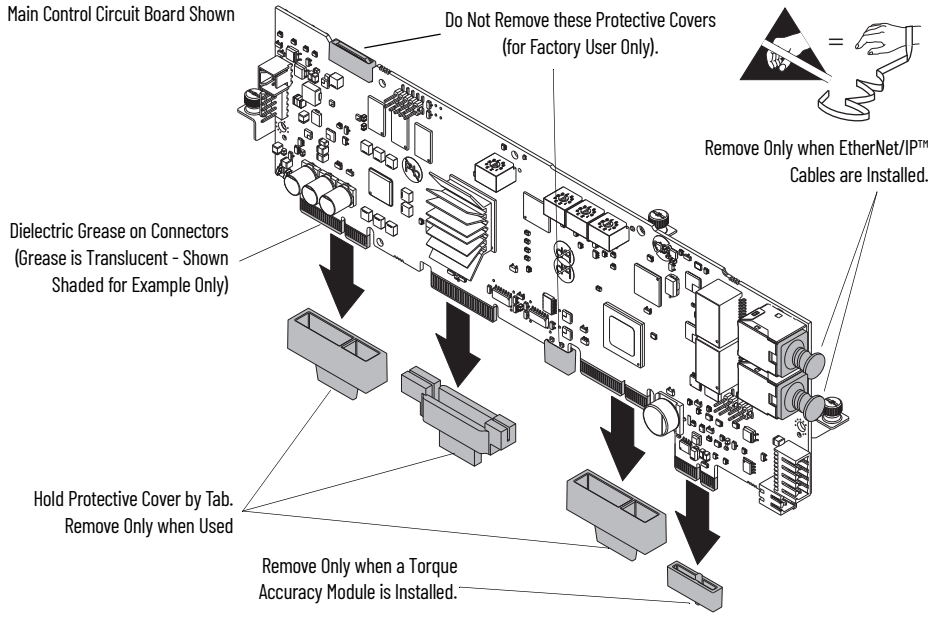
Install the Main Control Circuit Board

Follow these steps to install the main control circuit board.

IMPORTANT Circuit boards that are contained in renewal kits with XT contain dielectric grease on the edge connectors, where present. Do not touch or remove the grease from circuit board edge connectors. A non-greased connector can lead to corrosion.

1. For kit catalog number SK-RT-MCB1-PF755-XT only, hold the tab on the protective cover and carefully remove the cover from the edge connector on the circuit board. Do not touch the edge connector.

IMPORTANT If a Torque Accuracy Module (TAM) is not installed, do not remove the protective cover from the edge connector that is identified in the illustration.



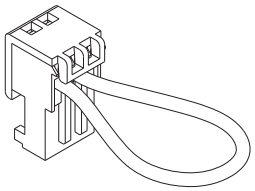
IMPORTANT If before installation, grease is removed from an edge connector or is contaminated, do not install the circuit board. See Apply Dielectric Grease to an Edge Connector on page 16 for instructions on how to clean and grease an edge connector.

2. Install the main control circuit board in the reverse order of removal.

IMPORTANT Do not remove protective covers unless used at the time of installation. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation. See Protective Covers on Kits with XT on page 14 for details.

IMPORTANT

Be sure to install jumper J16 into connector P16 on the main control circuit board. See step 10 on page 86 for details.



3. Make any necessary changes to the settings on these main control board selectors or jumpers:
   - Control switch
   - Embedded EtherNet/IP address switches
   - Hardware enable jumper
   - Safety enable jumper

Main Control Board to Power Interface Board Ribbon Cable Replacement

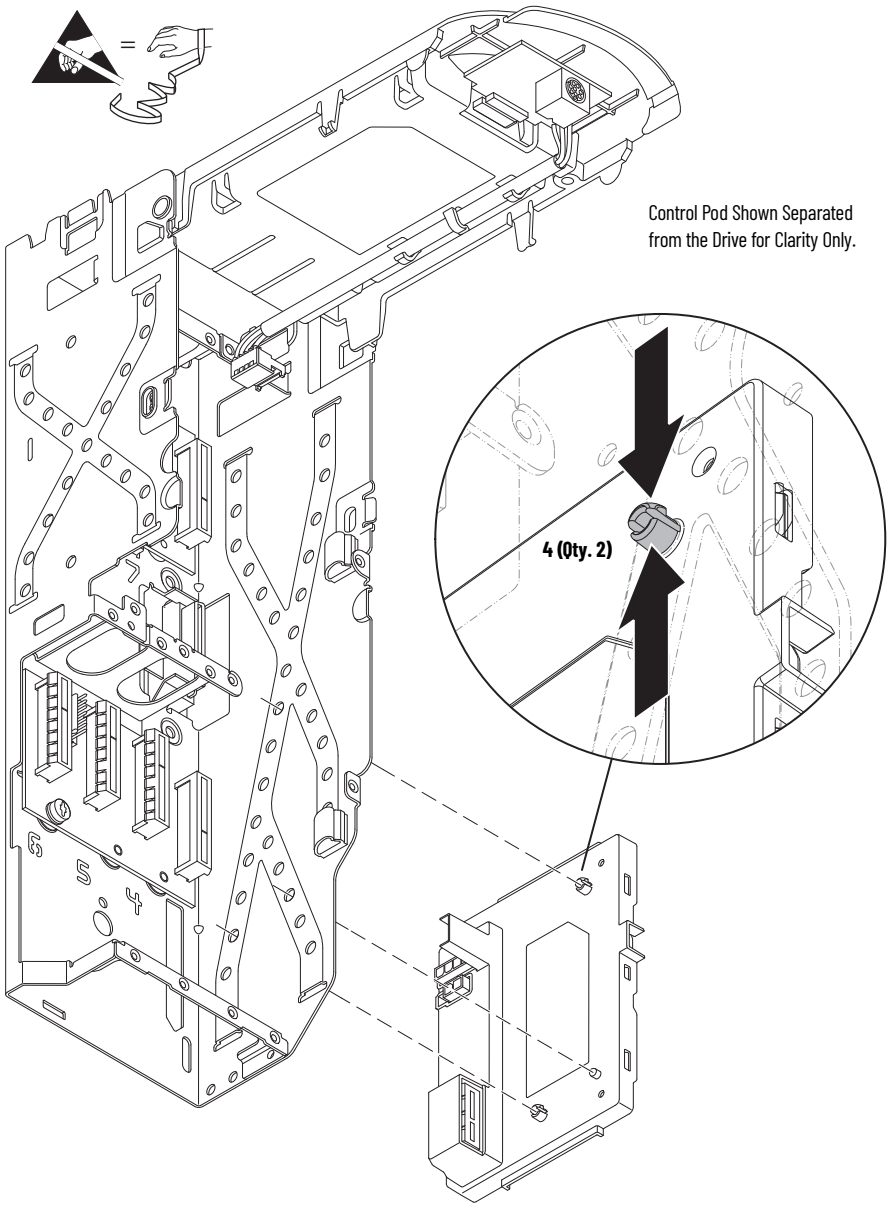
Replacement kit catalog number: SK-RT-PIC1-F27-XT

Remove the Main Control Board to Power Interface Board Ribbon Cable

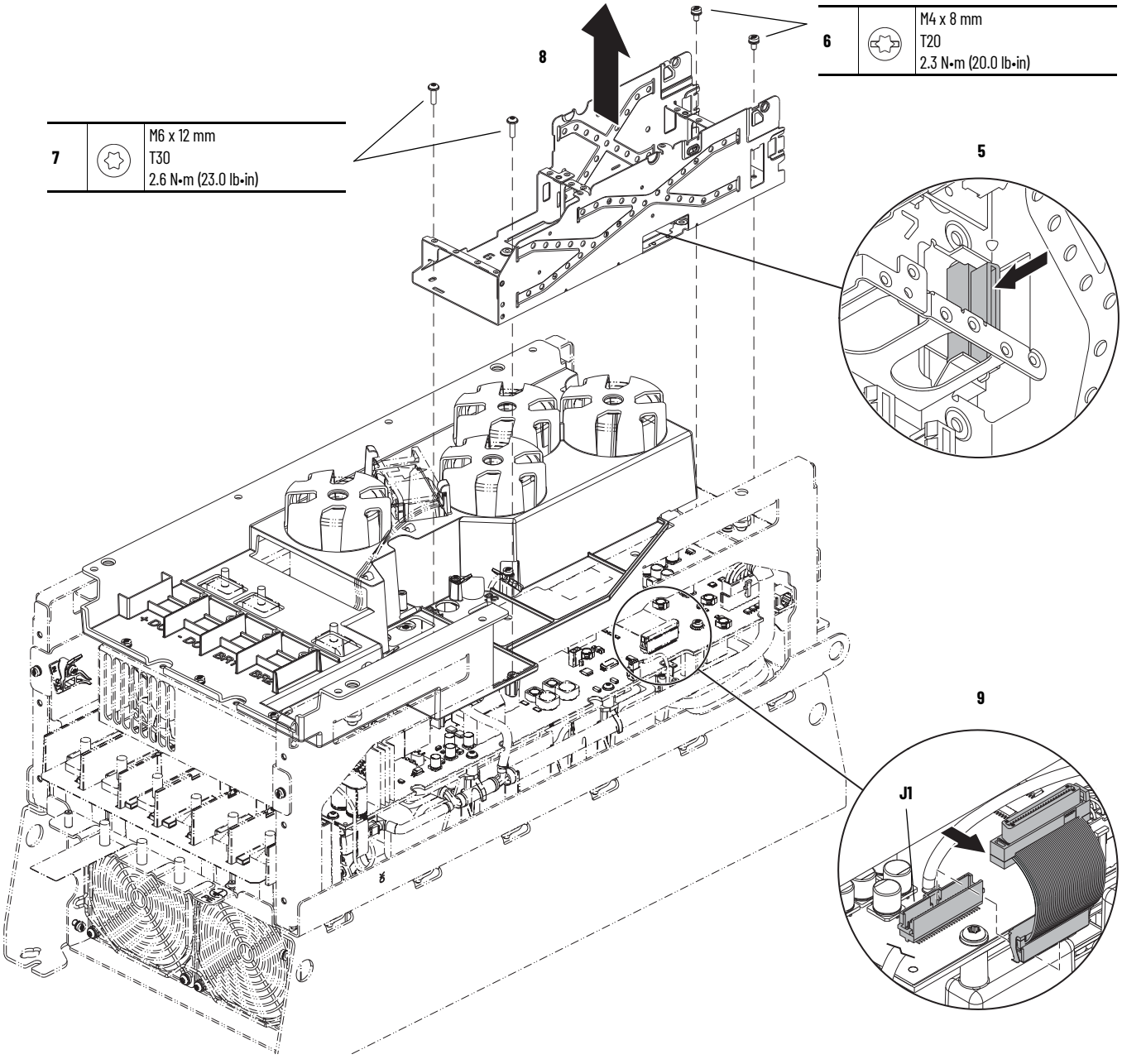
Follow these steps to remove the main control board to power interface board ribbon cable.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the main control circuit board. See Remove the Main Control Circuit Board on page 85.
4. If a torque accuracy module (TAM) is installed, on the interior of the control pod chassis, compress the two posts that secure the TAM to the control pod and push the posts through the mounting holes.

The TAM remains in the drive chassis and connected to the power interface circuit board via a wire harness after the control pod chassis is removed.



5. Remove the ribbon cable connector from the mounting tab on the inside of the control pod chassis and push the cable through the bottom of the chassis.
6. Remove the two M4 x 8 mm slotted-Torx screws that secure the upper control pod chassis to the drive chassis.
7. Remove the two M6 x 12 mm Torx screw that secures the lower control pod chassis to the drive chassis.
8. Remove the control pod carefully from the drive and remove the ribbon cable from the opening in the back of the control pod chassis.
9. Disconnect the ribbon cable from the power interface circuit board below the control pod.



Install the Main Control Board to Power Interface Board Ribbon Cable

Install the main control board to power interface board ribbon cable in the reverse order of removal.

Backplane Circuit Board Replacement

Replacement kit catalog number: SK-RT-BKPLN, SK-RT-BKPLN-XT

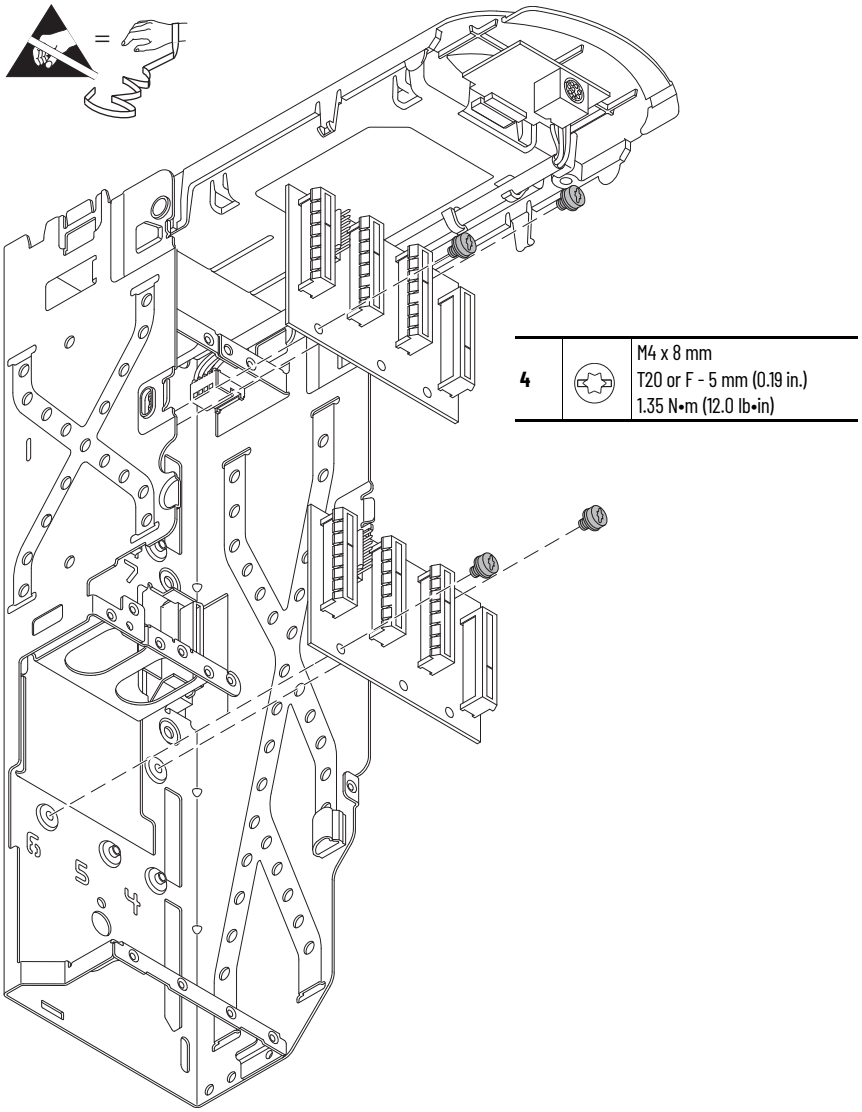
This kit contains one circuit board. The frame 6 control pod contains two backplane circuit boards. It is recommended that you replace both backplane circuit boards simultaneously.

Remove the Backplane Circuit Board

Follow these steps to remove the backplane circuit board.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the main control circuit board. See Remove the Main Control Circuit Board on page 85.

   Retain the main control circuit board for reuse.
4. Remove the two M4 x 8 mm Torx screws that secure the backplane circuit board to the pod chassis and remove the board.



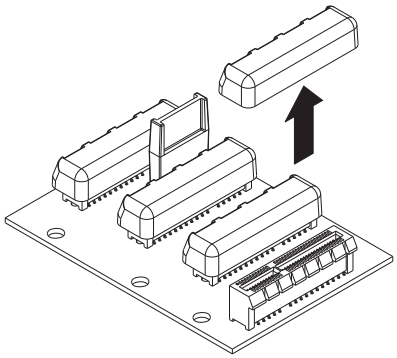
Install the Backplane Circuit Board

The backplane circuit board kit (cat. no. SK-RT-BKPLN or SK-RT-BKPLN-XT) contains two M4 x 6 mm Torx screws. Discard the old M4 x 8 mm Torx screws and install the new M4 x 6 mm Torx screws.

Install the backplane circuit board in the reverse order of removal.

IMPORTANT Do not remove protective covers unless used at the time of installation. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation. See Protective Covers on Kits with XT on page 14 for details.

- Do not remove the protective covers from the connectors on the new backplane circuit boards unless a connection must be made during installation.



Heatsink Fan Replacement

Replacement kit catalog numbers: SK-RT-HSFAN1-F6, SK-RT-HSFAN1-F6-XT. These kits can be used for IP00, NEMA/UL Open Type and IP21, NEMA/UL Type 1 enclosures.

Replacement kit catalog number: SK-RT-HSFAN2-F6- XT. This kit can be used for flange, NEMA/UL Type 4X/12 back and IP54, NEMA/UL Type 12 enclosures.

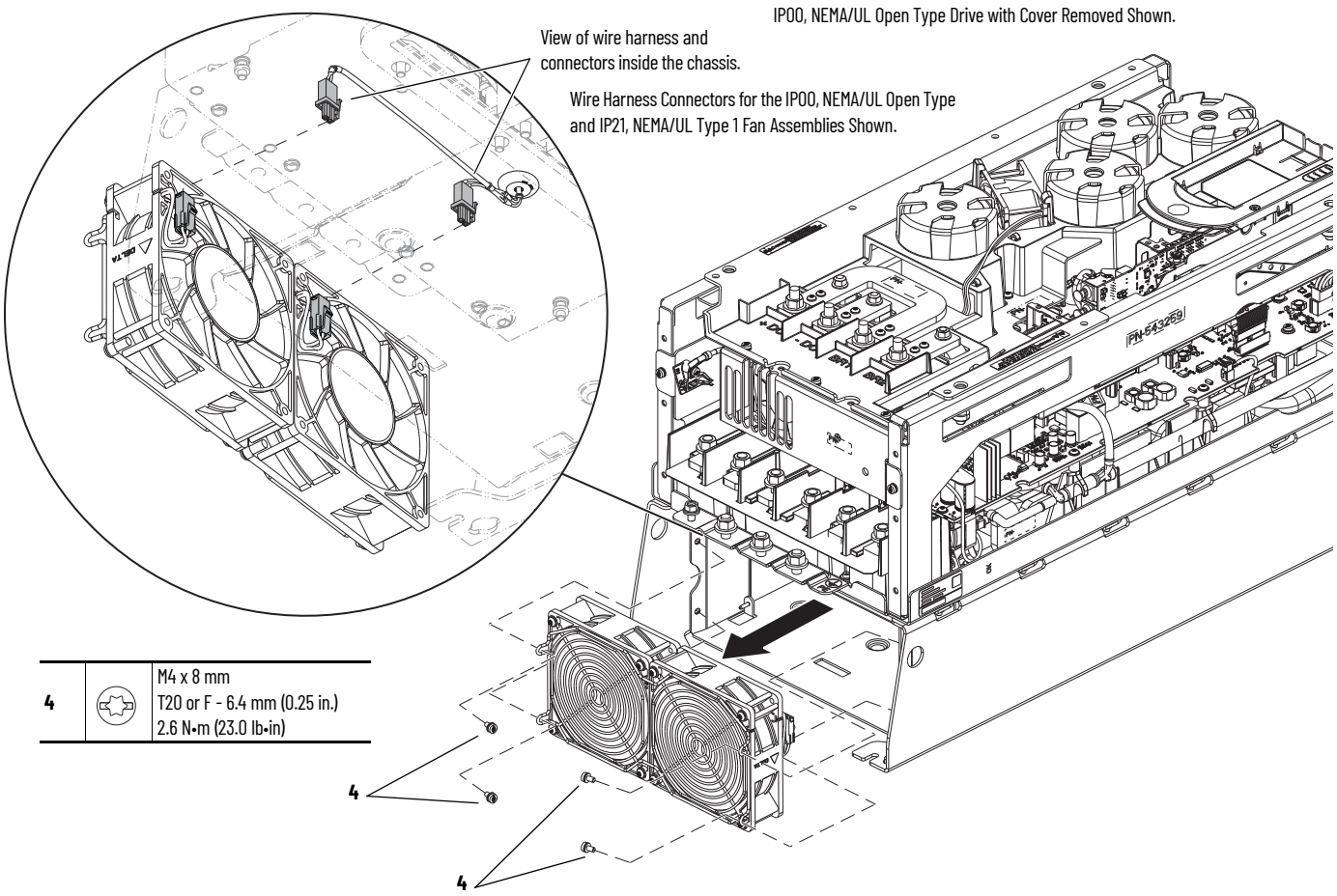
Remove the Heatsink Fan

Follow these steps to remove the heatsink fan.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. For IP54, NEMA/UL Type 12 enclosures, open the enclosure door and remove the protective guard. See Remove the Protective Guard (IP54, NEMA/UL Type 12 Enclosure) on page 80.

IMPORTANT The fan assembly cannot be removed from the drive chassis completely, until the fan power harnesses are disconnected.

4. Remove the four M4 x 8 mm slotted-Torx screws that secure the fan assembly to the chassis and remove the fan partially.
5. Disconnect the fan power wire-harness connectors from the fan assembly connectors and remove the fan assembly.



4		M4 x 8 mm T20 or F - 6.4 mm (0.25 in.) 2.6 N•m (23.0 lb•in)

Install the Heatsink Fan

Install the heatsink fan in the reverse order of removal.

IMPORTANT Before installation, remove the protective covers from the fan assembly wire harness connectors.

Upper Stirring Fan Replacement

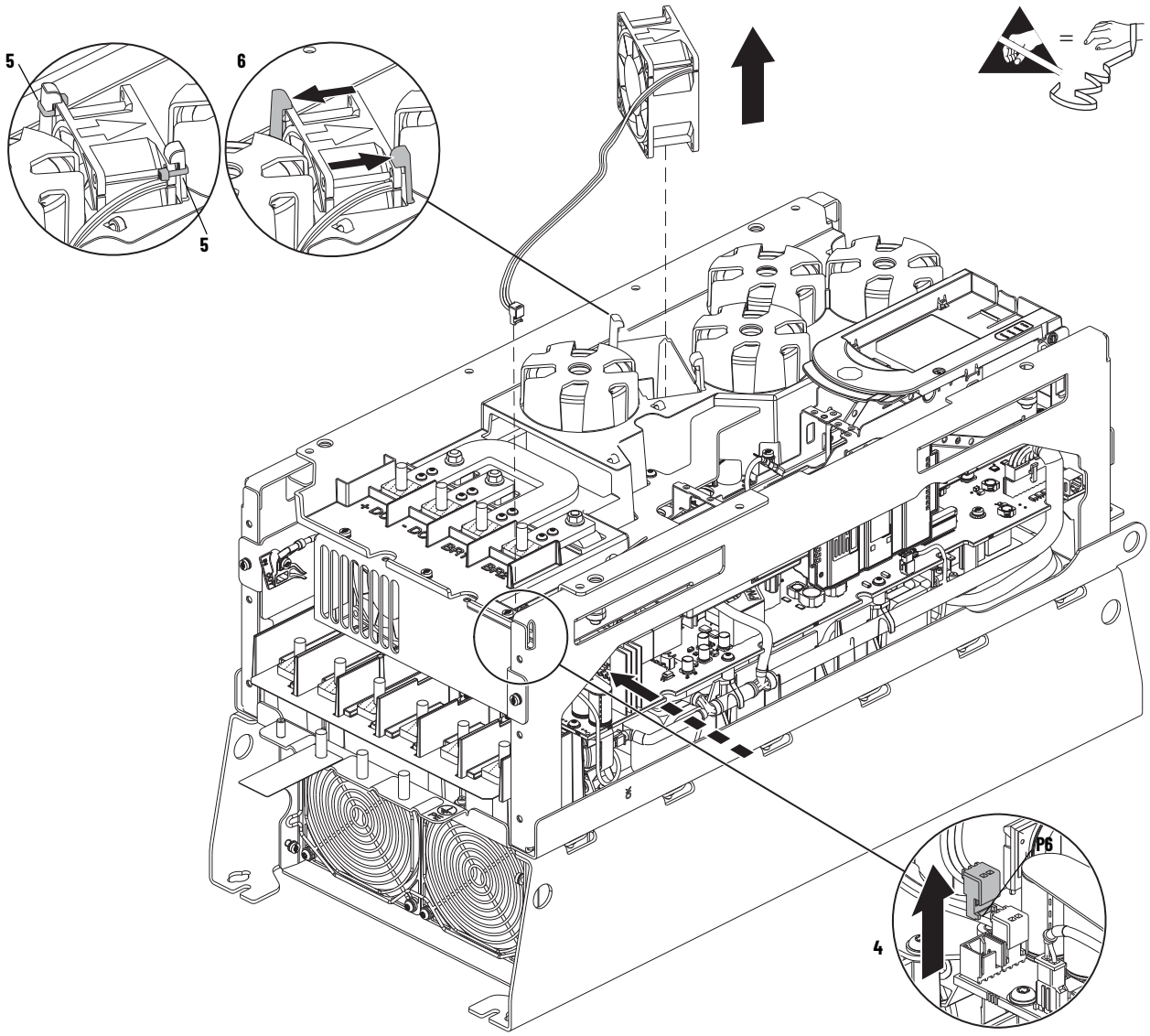
Replacement kit catalog numbers: SK-RT-STIRFANR1-F6, SK-RT-STIRFANR1-F6-XT.

These kits can be used for all enclosure types.

Remove the Upper Stirring Fan

Follow these steps to remove the upper stirring fan.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Access the drive interior:
   - For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures, remove the drive cover. See Remove the Cover on page 79.
   - For IP54, NEMA/UL Type 12 enclosures, open the enclosure door and remove the protective guard.
4. Reach through the right lower-side of the chassis and disconnect the fan power wire-harness connector P6 from J6 on the power interface circuit board.
5. Cut the two cable ties that secure the fan to the plastic tabs.
6. Pull the two plastic tabs away from the fan assembly and lift the fan out of the chassis.



Install the Upper Stirring Fan

Install the upper stirring fan in the reverse order of removal.

IMPORTANT	Verify that the stirring fan harness is inserted into the two wire harness clips on the chassis. Verify that the stirring fan is secured to the two plastic tabs on the chassis by using two cable ties.

Lower Stirring Fan Assembly Replacement

Replacement kits catalog numbers: SK-RT-STIRFANL1-F6, SK-RT-STIRFANL1-F6-XT.

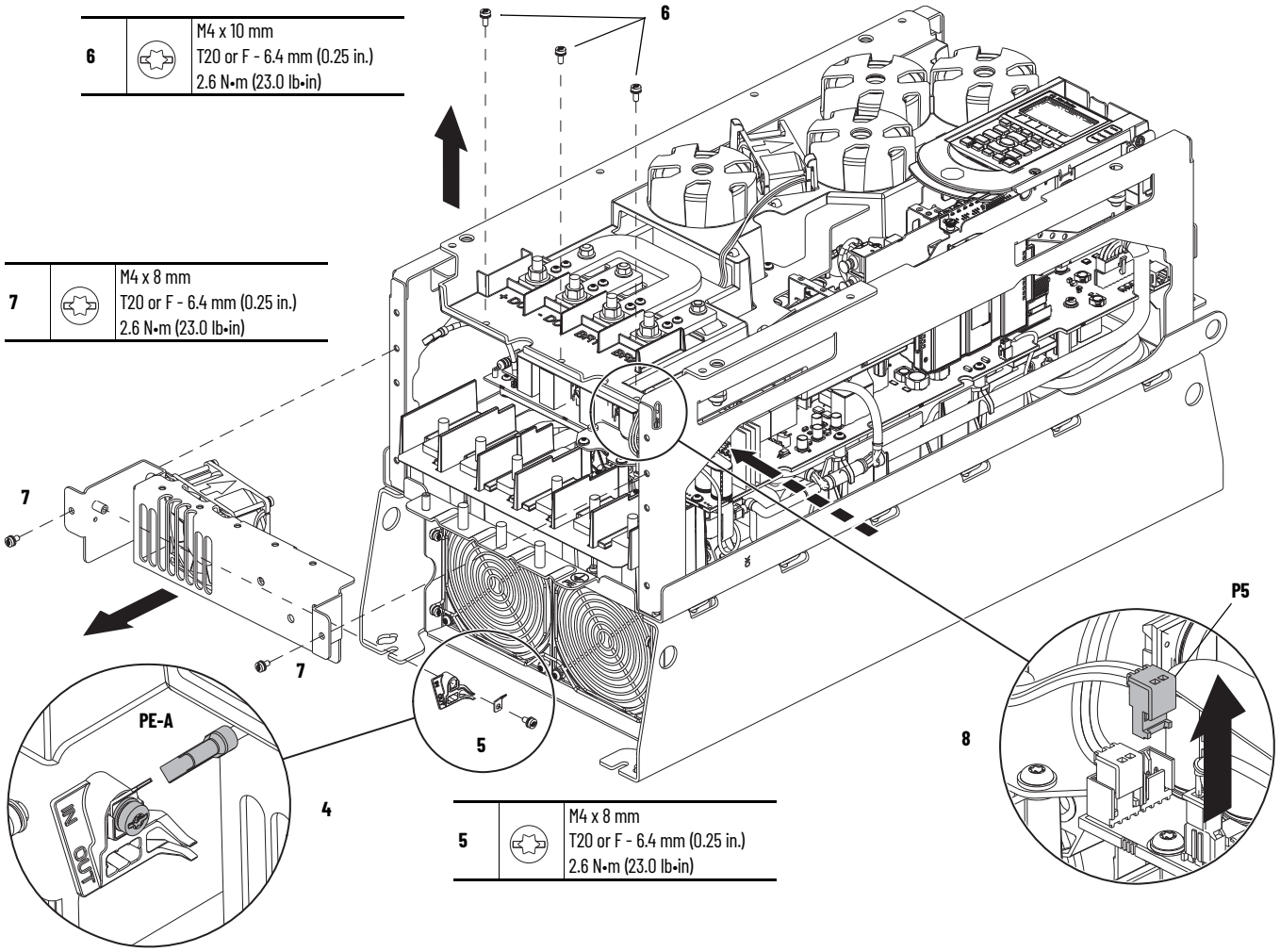
These kits can be used for all enclosure types.

Remove the Lower Stirring Fan Assembly

Follow these steps to remove the lower stirring fan assembly.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Access the drive interior:
   - For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures, remove the drive cover. See Remove the Cover on page 79.
   - For IP54, NEMA/UL Type 12 enclosures, open the enclosure door and remove the protective guard.

4. For AC input drives, record the PE-A jumper position and remove the PE-A jumper wire from the jumper assembly.
5. Remove the M4 x 8 mm slotted-Torx screw that secures the PE-A jumper assembly to the bracket and remove the jumper assembly.
6. Remove the three M4 x 10 mm slotted-Torx screws that secure the fan assembly to the chassis.
7. Remove the two M4 x 8 mm slotted-Torx screws that secure the fan assembly to the chassis and remove the fan assembly, partially.
8. Disconnect the fan power wire-harness connector P5 from J5 on the power interface circuit board and remove the fan assembly.



Install the Lower Stirring Fan Assembly

Install the lower stirring fan assembly in the reverse order of removal.

IMPORTANT Verify that the PE-A jumper wire harness is reconnected in the same position as before removal.

Flange Gasket Replacement

Replacement kit catalog number: SK-RT-FG1-F6

This kit is used for flange, NEMA/UL Type 4X/12 back enclosures only.

Flange, NEMA/UL Type 4X/12 back drive weight: 48 kg (105 lb).

IMPORTANT Due to the drive weight, a crane or hoist and lifting hardware is recommended for removing the drive from the panel mount surface.

All lifting equipment and components (hooks, bolts, lifts, slings, chains, and so forth) must be properly sized and rated to lift and hold the weight of the equipment safely.

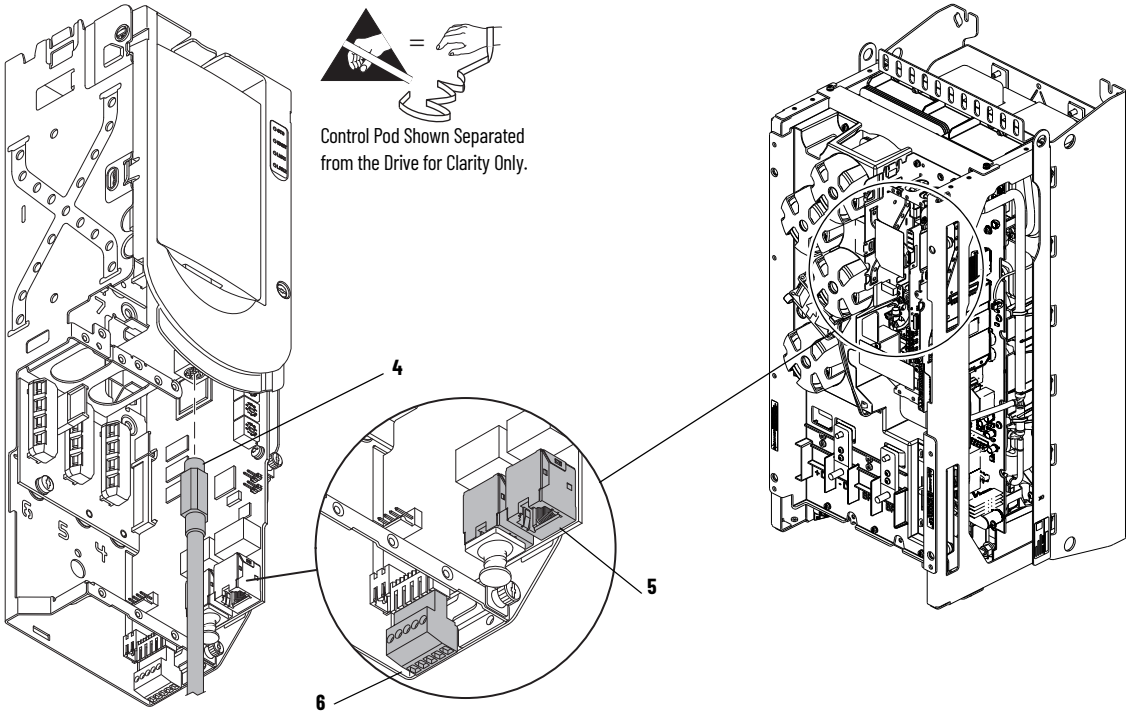
When lifting and handling these products, follow all applicable local, national, and international codes, standards, regulations, or industry guidelines for safe practices.

Remove the Flange Gasket

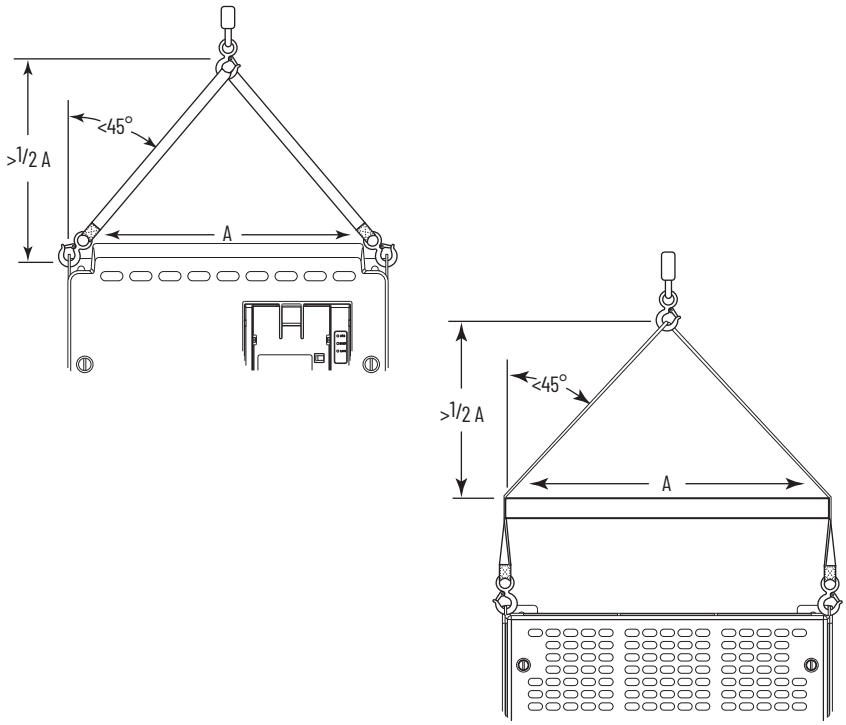
Follow theses steps to remove the flange and gaskets.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the cover. See Remove the Cover on page 79.
4. If used, disconnect the HIM DPI cable from the connector (port 2) on the HIM cradle.

   If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.
5. Disconnect any cables from the Ethernet connectors on the bottom of the main control board in the control pod.
6. If used, disconnect the plug-in terminal block (TB1) on the bottom of the main control board.
7. If an option module is installed, disconnect any I/O wiring terminal blocks (not shown in image).



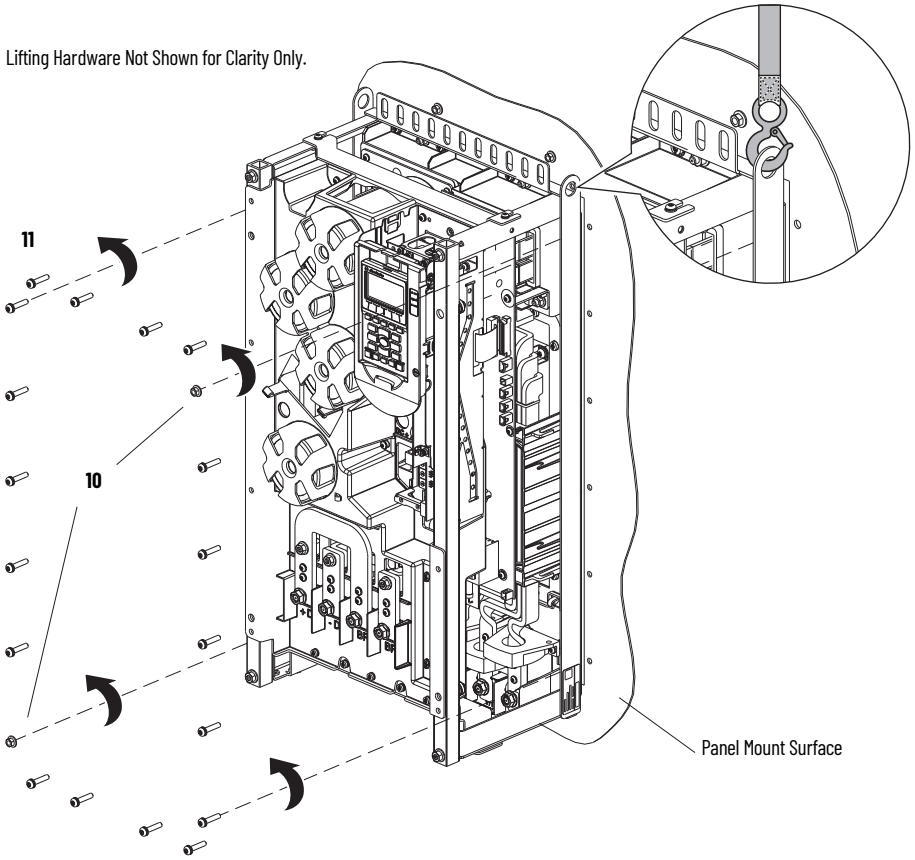
8. If installed, disconnect the power wiring from the power terminals.
9. Attach the lifting hardware and equipment to the drive according to this illustration.



10. Remove the two M5 x 0.8 hexagonal nuts that secure the drive chassis to the flange.
11. Remove the 18 M5 x 25 mm slotted-Torx screws that secure the drive chassis to the flange.

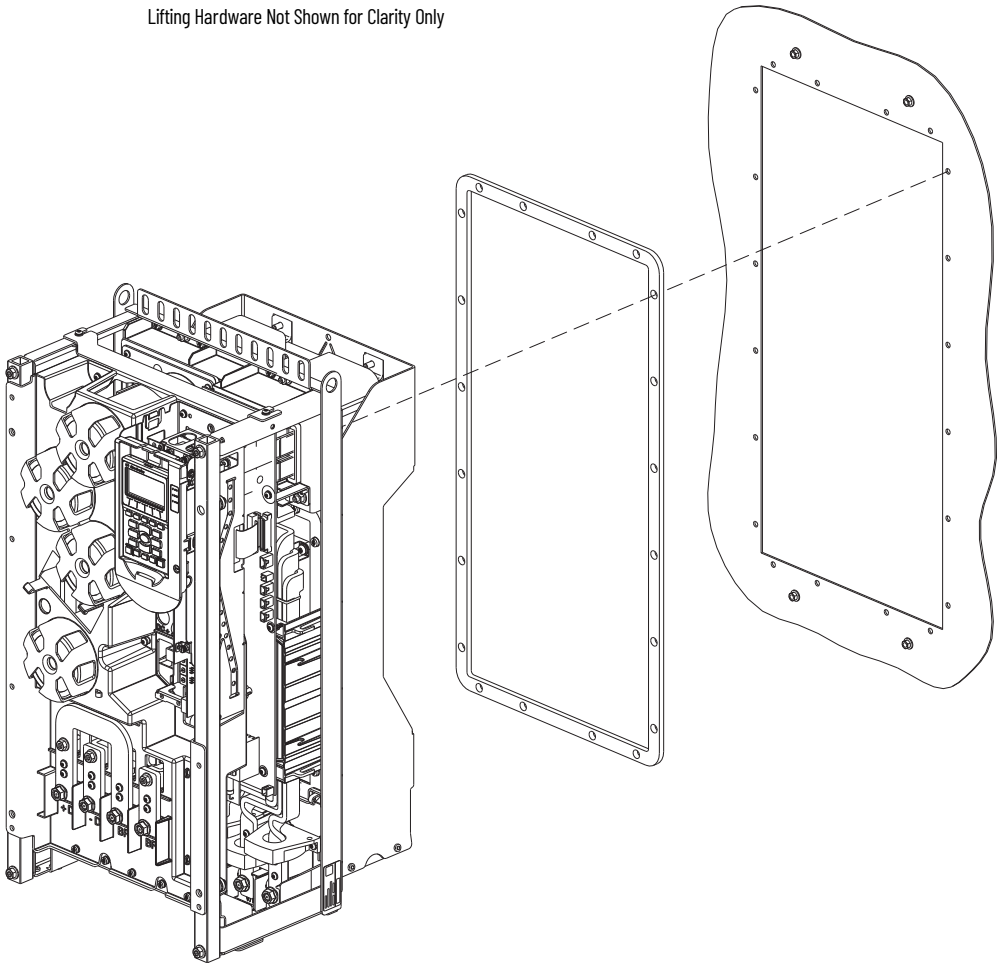
11		M5 x 25 mm T25 4.5 N•m (40.0 lb•in)

10		M5 x 0.8 8 mm 4.5 N•m (40.0 lb•in)

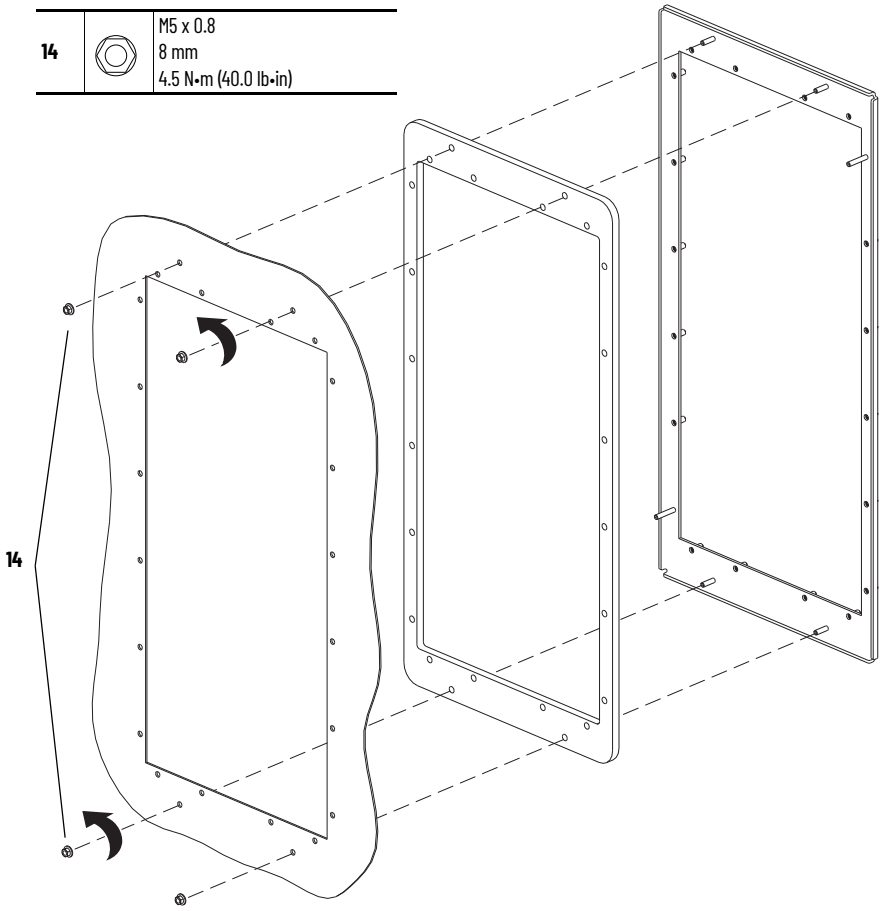


ATTENTION: To guard against possible personal injury or equipment damage:
- Inspect all lifting hardware for proper attachment before lifting the equipment.
- Do not allow any part of the equipment to contact electrically charged conductors or components.
- Do not subject the equipment to high rates of acceleration or deceleration while moving the drive.
- Do not allow personnel or their limbs directly underneath the equipment when lifting or mounting the drive.

12. Lift the drive out of the mounting surface, carefully.
13. Remove and discard the drive-side flange gasket.



14. Remove the four M5 x 0.8 hexagonal nuts that secure the rear gasket and flange to the panel mount surface, and remove the gasket and flange. Discard the gasket.



Install the Flange Gasket

Install the flange and gaskets in the reverse order of removal.

Power Interface Circuit Board Replacement

Replacement kit catalog numbers are based on the drive normal duty power rating:

208V/240V Power Interface Circuit Board Renewal Kits

Drive Rating	Power Interface Circuit Board Catalog Number	
	Standard	XT
92 A 208V / 80 A 240V(1)	SK-RT-PIB1-B080	SK-RT-PIB1-B080-XT
120 A 208V / 104 A 240V	SK-RT-PIB1-B104	SK-RT-PIB1-B104-XT
150 A 208V / 130 A 240V	SK-RT-PIB1-B130	SK-RT-PIB1-B130-XT
177 A 208V / 154 A 240V	SK-RT-PIB1-B154	SK-RT-PIB1-B154-XT
221 A 208V / 192 A 240V	SK-RT-PIB1-B192	SK-RT-PIB1-B192-XT
260 A 208V / 260 A 240V(2)	SK-RT-PIB1-B260-F6	SK-RT-PIB1-B260-F6-XT

(1) Drives installed in an IP54, NEMA/UL Type 12 enclosure only.
(2) Not used for drives installed in an IP54, NEMA/UL Type 12 enclosure.

400V/480V Power Interface Circuit Board Renewal Kits

Drive Rating	Power Interface Circuit Board Catalog Number	
	Standard	XT
104 A 400V / 96 A 480V(1)	SK-RT-PIB1-C104D096	SK-RT-PIB1-C104D096-XT
140 A 400V /125A 480V	SK-RT-PIB1-C140D125	SK-RT-PIB1-C140D125-XT
170 A 400V / 156 A 480V	SK-RT-PIB1-C170D156	SK-RT-PIB1-C170D156-XT
205 A 400V / 186 A 480V	SK-RT-PIB1-C205D186	SK-RT-PIB1-C205D186-XT
260 A 400V / 248 A 480V(2)	SK-RT-PIB1-C260D248	SK-RT-PIB1-C260D248-XT

(1) Drives installed in an IP54, NEMA/UL Type 12 enclosure only.
(2) Not used for drives installed in an IP54, NEMA/UL Type 12 enclosure.

600V/690V Power Interface Circuit Board Renewal Kits

Drive Rating	Power Interface Circuit Board Catalog Number	
	Standard	XT
12 A 600V / 12 A 690V	SK-RT-PIB1-E012F012	SK-RT-PIB1-E012F012-XT
18 A 600V / 15 A 690V	SK-RT-PIB1-E018F015	SK-RT-PIB1-E018F015-XT
23 A 600V / 20 A 690V	SK-RT-PIB1-E023F020	SK-RT-PIB1-E023F020-XT
24 A 600V / 23 A 690V	SK-RT-PIB1-E024F023	SK-RT-PIB1-E024F023-XT
28 A 600V / 30 A 690V	SK-RT-PIB1-E028F030	SK-RT-PIB1-E028F030-XT
33 A 600V / 34 A 690V	SK-RT-PIB1-E033F034	SK-RT-PIB1-E033F034-XT
42 A 600V / 46 A 690V	SK-RT-PIB1-E042F046	SK-RT-PIB1-E042F046-XT
53 A 600V / 50 A 690V	SK-RT-PIB1-E053F050	SK-RT-PIB1-E053F050-XT
63 A 600V / 61 A 690V	SK-RT-PIB1-E063F061	SK-RT-PIB1-E063F061-XT
77 A 600V / 82 A 690V	SK-RT-PIB1-E077F082	SK-RT-PIB1-E077F082-XT
99 A 600V / 98 A 690V	SK-RT-PIB1-E099F098	SK-RT-PIB1-E099F098-XT
125 A 600V / 119 A 690V	SK-RT-PIB1-E125F119	SK-RT-PIB1-E125F119-XT
144 A 600V / 142 A 690V	SK-RT-PIB1-E144F142	SK-RT-PIB1-E144F142-XT

Remove the Power Interface Circuit Board

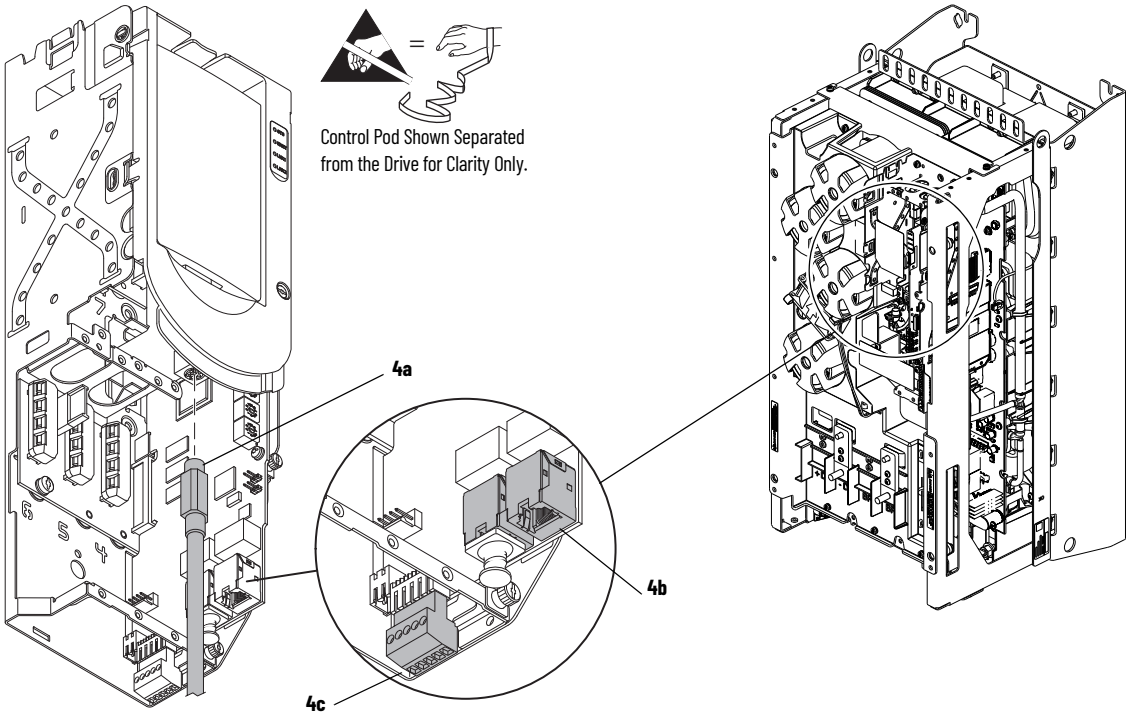
Follow these steps to remove the power interface circuit board.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Access the drive interior:
   - For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures, remove the drive cover. See Remove the Cover on page 79.
   - For IP54, NEMA/UL Type 12 enclosures, open the enclosure door and remove the protective guard. See Remove the Protective Guard (IP54, NEMA/UL Type 12 Enclosure) on page 80.

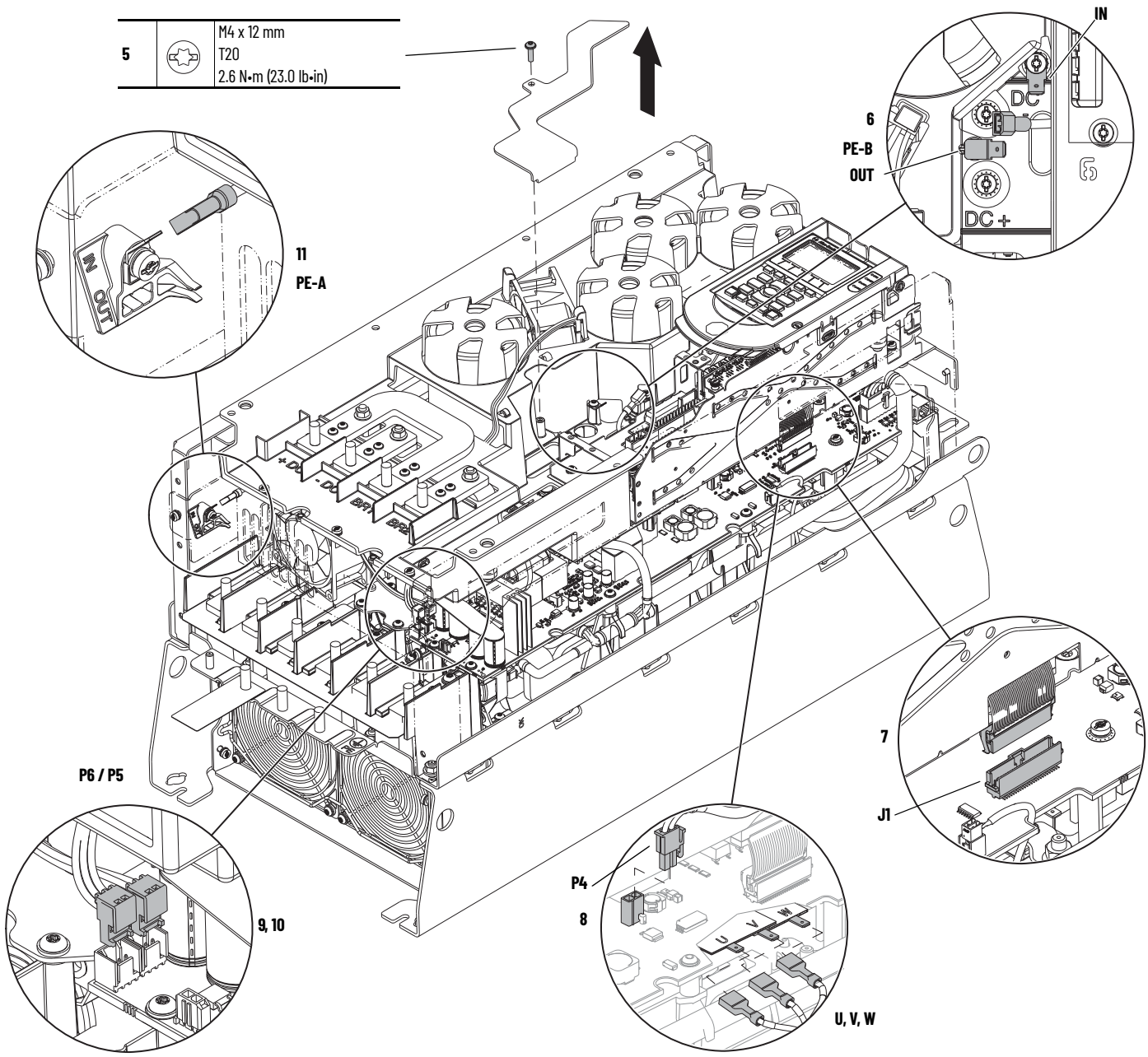
4. To prepare the control pod for removal from the drive, complete these steps:
   a. If used, disconnect the HIM DPI cable from the connector (port 2) on the HIM cradle.

      If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.

   b. Disconnect any cables from the Ethernet connectors on the bottom of the main control board in the control pod.
   c. If used, disconnect the plug-in terminal block (TB1) on the bottom of the main control board.
   d. If an option module is installed, disconnect any I/O wiring terminal blocks (not shown in image).



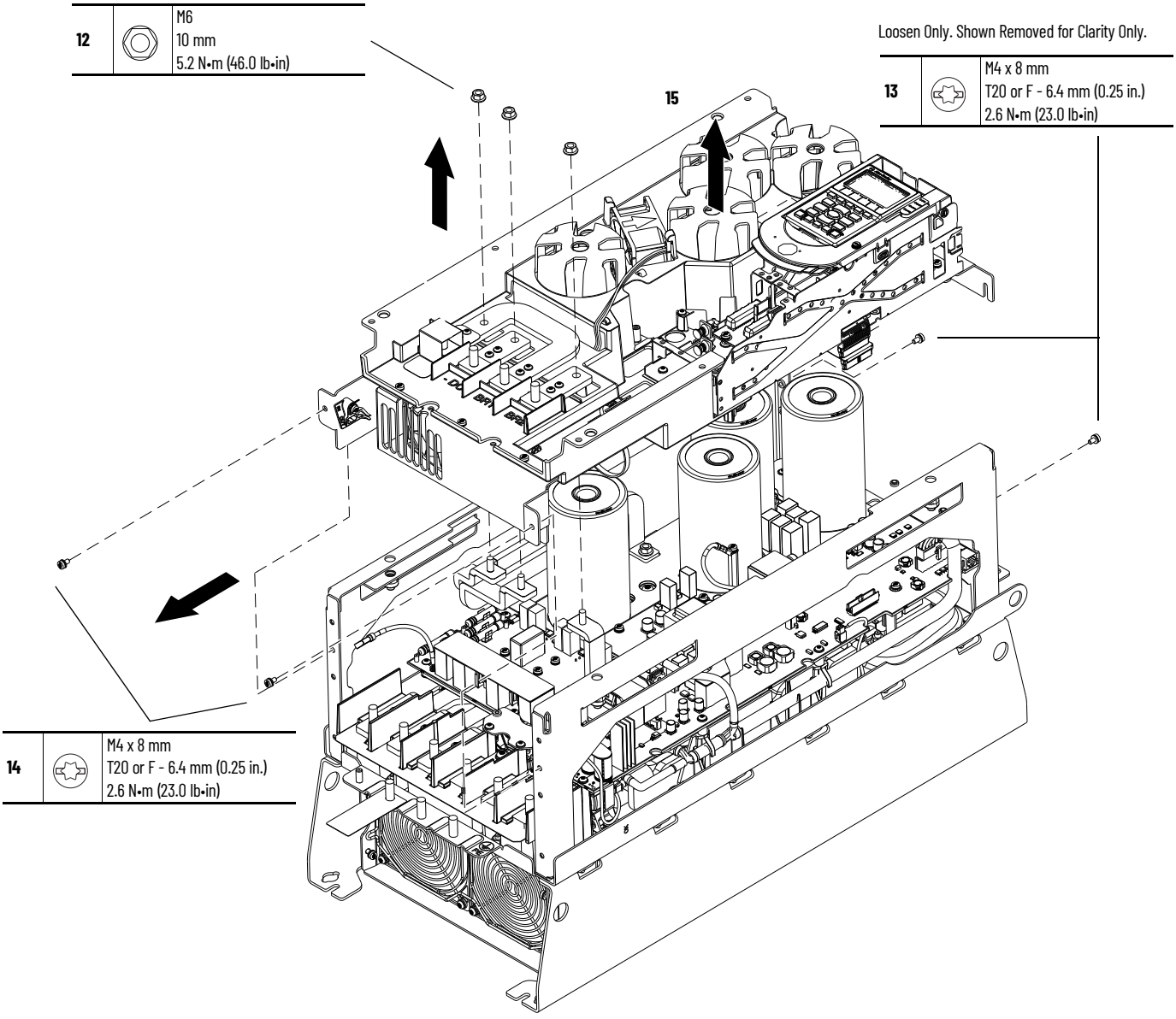
5. Remove the M4 x 12 mm Torx screw that secures the PE-B jumper cover to the capacitor cover and remove the jumper cover.
6. Note the PE-B jumper position and if the PE-B jumper is in the OUT position, remove the jumper wire from the connector on the power interface circuit board.
7. Below the control pod, disconnect the ribbon cable connector from connector J1 on the power interface circuit board.
8. If a torque accuracy module (TAM) is installed, complete steps a and b.
   a. Disconnect the wire harness connector P4 from J4 on the power interface circuit board.
   b. Disconnect the wires from connectors U, V, and W on the power interface circuit board.
9. Disconnect the lower stirring fan power wire-harness connector P5 from J5 on the power interface circuit board.
10. Disconnect the upper stirring fan power wire-harness connector P6 from J6 on the power interface circuit board.
11. For AC input drives, note the PE-A jumper position and remove the PE-A jumper wire from the jumper assembly.


5
M4 x 12 mm
T20
2.6 N•m (23.0 lb•in)
IN
6
PE-B
OUT
DC
DC +
11
PE-A
7
J1
P6 / P5
9, 10
P4
8
U, V, W

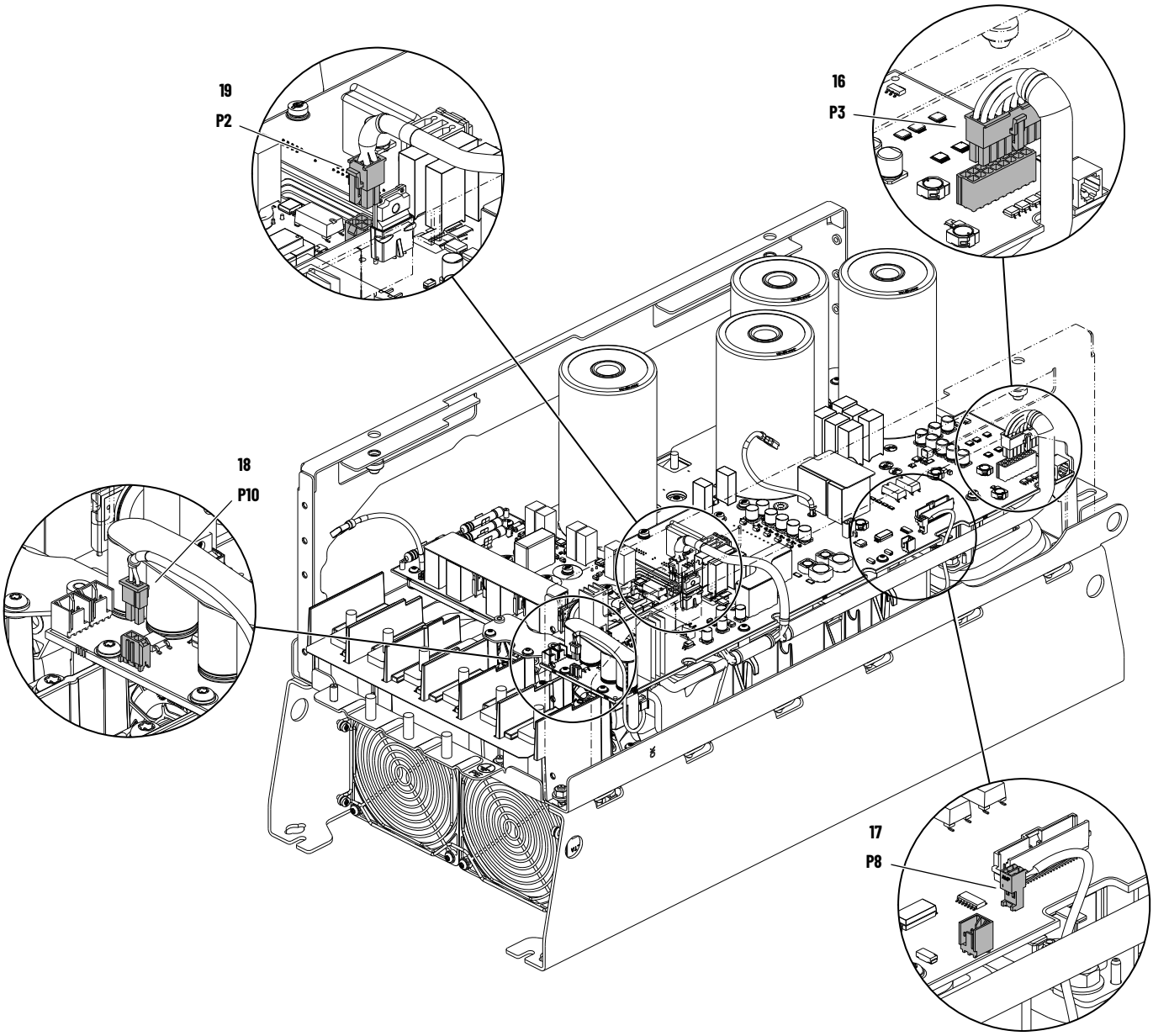
12. For drives with DC bus bars or a dynamic brake option installed, remove the applicable M6 hexagonal nuts from the bus bar terminals.
13. Loosen the two M4 x 8 mm slotted-Torx screws that secure the upper chassis bracket to the chassis and remove the bracket.
14. Remove the two M4 x 8 mm slotted-Torx screws that secure the lower stirring fan assembly to the chassis.

IMPORTANT An edge connector on the main control circuit board in the control pod is connected to the power interface circuit board below with a ribbon cable. The ribbon cable fits through an opening in the back of the control pod chassis.

15. Lift the bus capacitor cover, upper support bracket, and lower stirring fan assembly off the drive, partially.

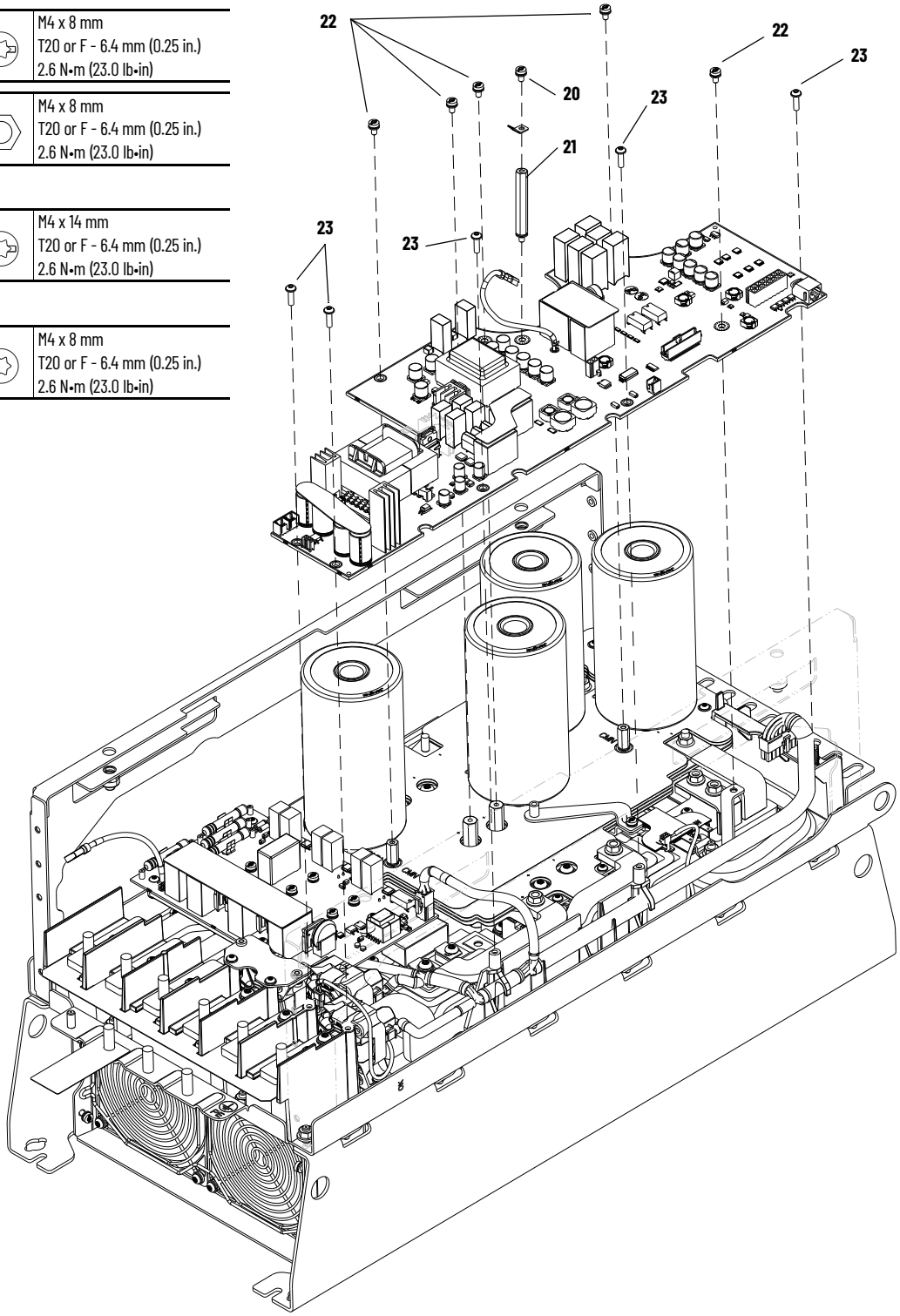


16. Disconnect the current transformers and AC or DC precharge circuit board wire harness connector P3 from the connector J3 on the upper, right side of the power interface circuit board.
17. Disconnect the NTC wire harness connector P8 from connector J8 on the right, center of the power interface circuit board.
18. Disconnect the heatsink-fans power wire harness connector P2 from connector J2 at the bottom of the power interface circuit board.
19. Disconnect the precharge wire harness connector P10 from connector J10 on the AC or DC precharge circuit board.



20. Remove the M4 x 8 mm slotted-Torx screw and metal tab from the M4 standoff on the power interface circuit board.
21. Remove the M4 standoff from the power interface circuit board.
22. Remove the five M4 x 14 mm slotted-Torx screws from the power interface circuit board.
23. Remove the five M4 x 8 mm Torx screws that secure the power interface circuit board to the standoffs on the chassis and remove the board.

20		M4 x 8 mm T20 or F - 6.4 mm (0.25 in.) 2.6 N•m (23.0 lb•in)
21		M4 x 8 mm T20 or F - 6.4 mm (0.25 in.) 2.6 N•m (23.0 lb•in)
22		M4 x 14 mm T20 or F - 6.4 mm (0.25 in.) 2.6 N•m (23.0 lb•in)
23		M4 x 8 mm T20 or F - 6.4 mm (0.25 in.) 2.6 N•m (23.0 lb•in)

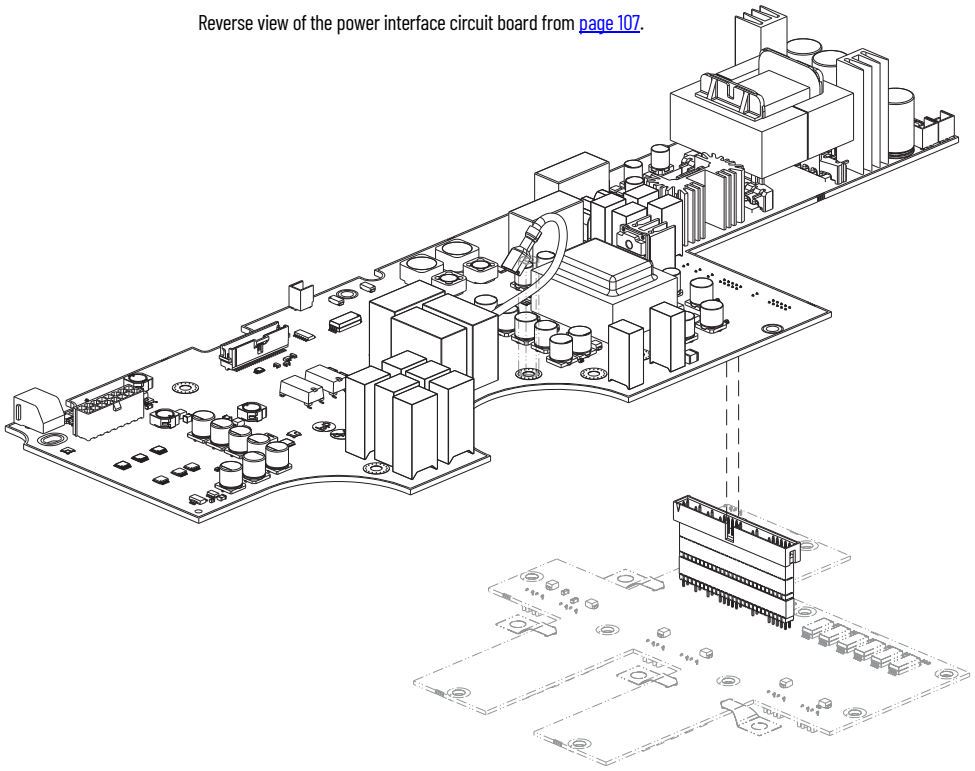


Install the Power Interface Circuit Board

Install the power interface circuit board in the reverse order of removal.

IMPORTANT Take care to connect the connector on the back of the power interface circuit board to the connector on the top of the gate driver circuit board carefully.

Reverse view of the power interface circuit board from page 107.



AC Precharge Circuit Board Replacement

Replacement kit catalog numbers are based on the drive voltage class:

Voltage Class	AC Precharge Circuit Board Catalog Number	
	Standard	XT
208V/240V	SK-RT-ACPC-BF6	SK-RT-ACPC-BF6-XT
400V/480V	SK-RT-ACPC-CDF6	SK-RT-ACPC-CDF6-XT
600V/690V	SK-RT-ACPC-EFF6	SK-RT-ACPC-EFF6-XT

Remove the AC Precharge Circuit Board

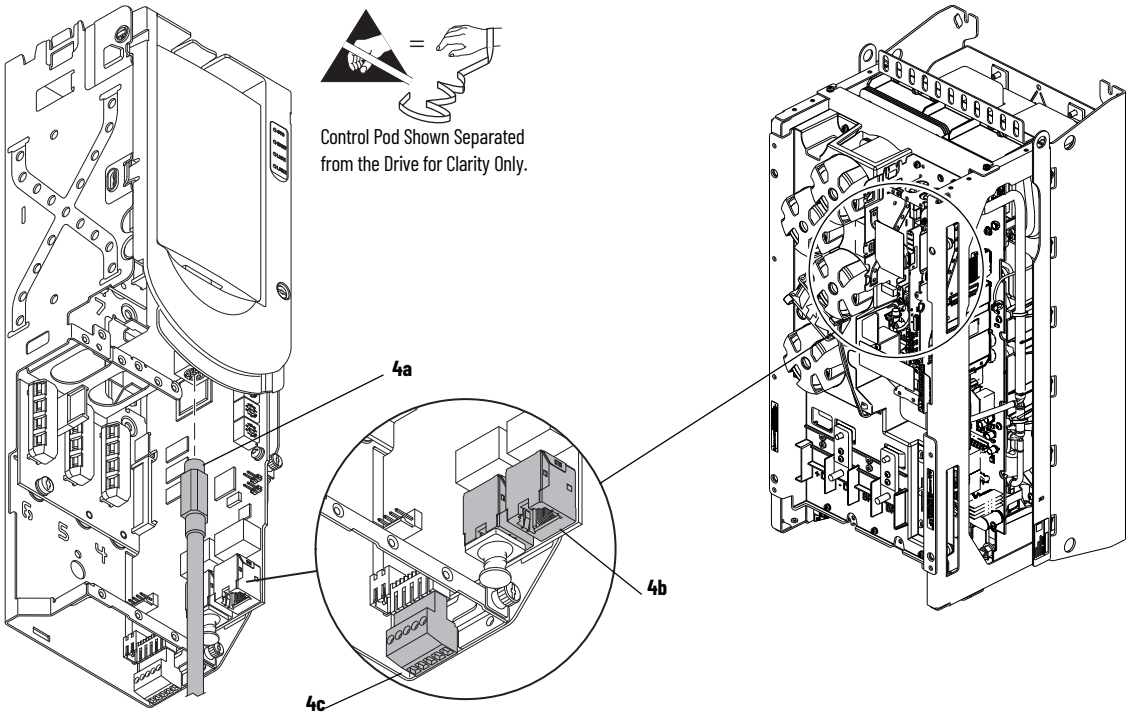
Follow these steps to remove the AC precharge circuit board.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Access the drive interior:
   - For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures, remove the drive cover. See Remove the Cover on page 79.
   - For IP54, NEMA/UL Type 12 enclosures, open the enclosure door and remove the protective guard. See Remove the Protective Guard (IP54, NEMA/UL Type 12 Enclosure) on page 80.

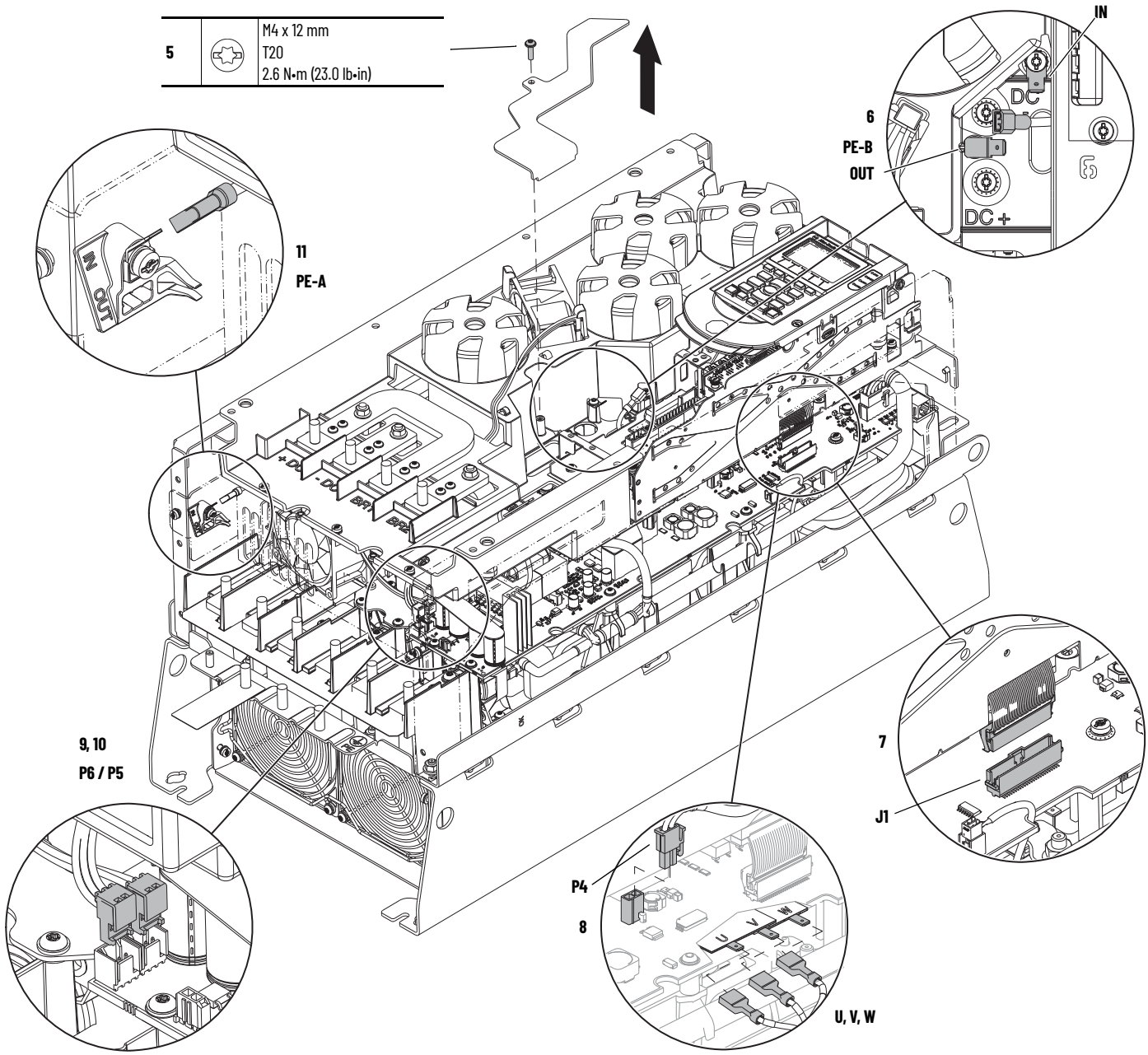
4. To prepare the control pod for removal from the drive, complete these steps:
   a. If used, disconnect the HIM DPI cable from the connector (port 2) on the HIM cradle.

      If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.

   b. Disconnect any cables from the Ethernet connectors on the bottom of the main control board in the control pod.
   c. If used, disconnect the plug-in terminal block (TB1) on the bottom of the main control board.
   d. If an option module is installed, disconnect any I/O wiring terminal blocks (not shown in image).



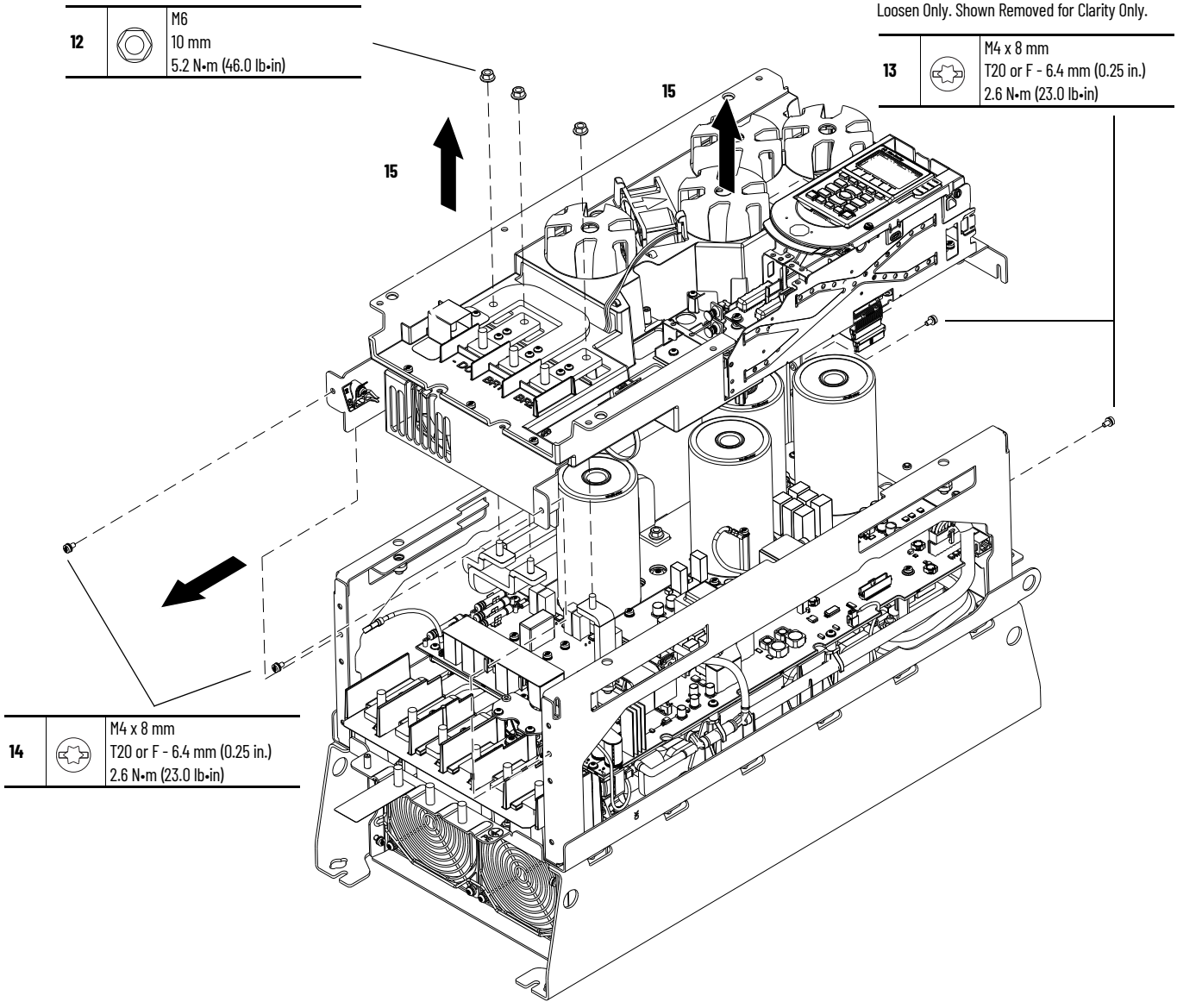
5. Remove the M4 x 12 mm Torx screw that secures the PE-B jumper cover to the capacitor cover and remove the jumper cover.
6. Note the PE-B jumper position and if the PE-B jumper is in the OUT position, remove the jumper wire from the connector on the power interface circuit board.
7. Below the control pod, disconnect the ribbon cable connector from connector J1 on the power interface circuit board.
8. If a torque accuracy module (TAM) is installed, complete steps a and b.
   a. Disconnect the wire harness connector P4 from J4 on the power interface circuit board.
   b. Disconnect the wires from connectors U, V, and W on the power interface circuit board.
9. Disconnect the lower stirring fan power wire-harness connector P5 from J5 on the power interface circuit board.
10. Disconnect the upper stirring fan power wire-harness connector P6 from J6 on the power interface circuit board.
11. Note the PE-A jumper position and remove the PE-A jumper wire from the jumper assembly.



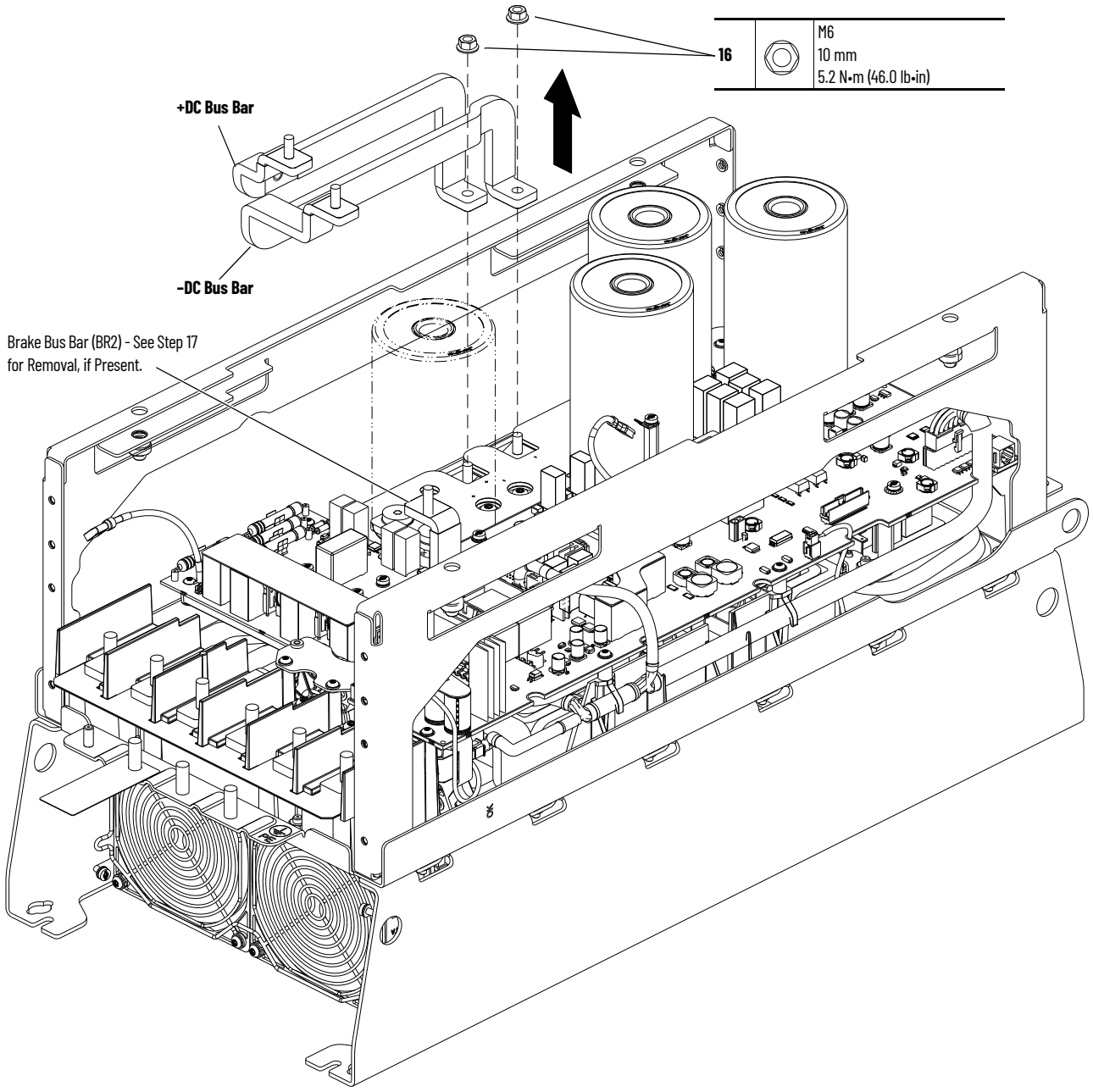
12. For drives with DC bus bars or a dynamic brake option installed, remove the applicable M6 hexagonal nuts from the bus bar terminals.
13. Loosen the two M4 x 8 mm slotted-Torx screws that secure the upper chassis bracket to the chassis and remove the bracket.
14. Remove the two M4 x 8 mm slotted-Torx screws that secure the lower stirring fan assembly to the chassis.

IMPORTANT An edge connector on the main control circuit board in the control pod is connected to the power interface circuit board below with a ribbon cable. The ribbon cable fits through an opening in the back of the control pod chassis.

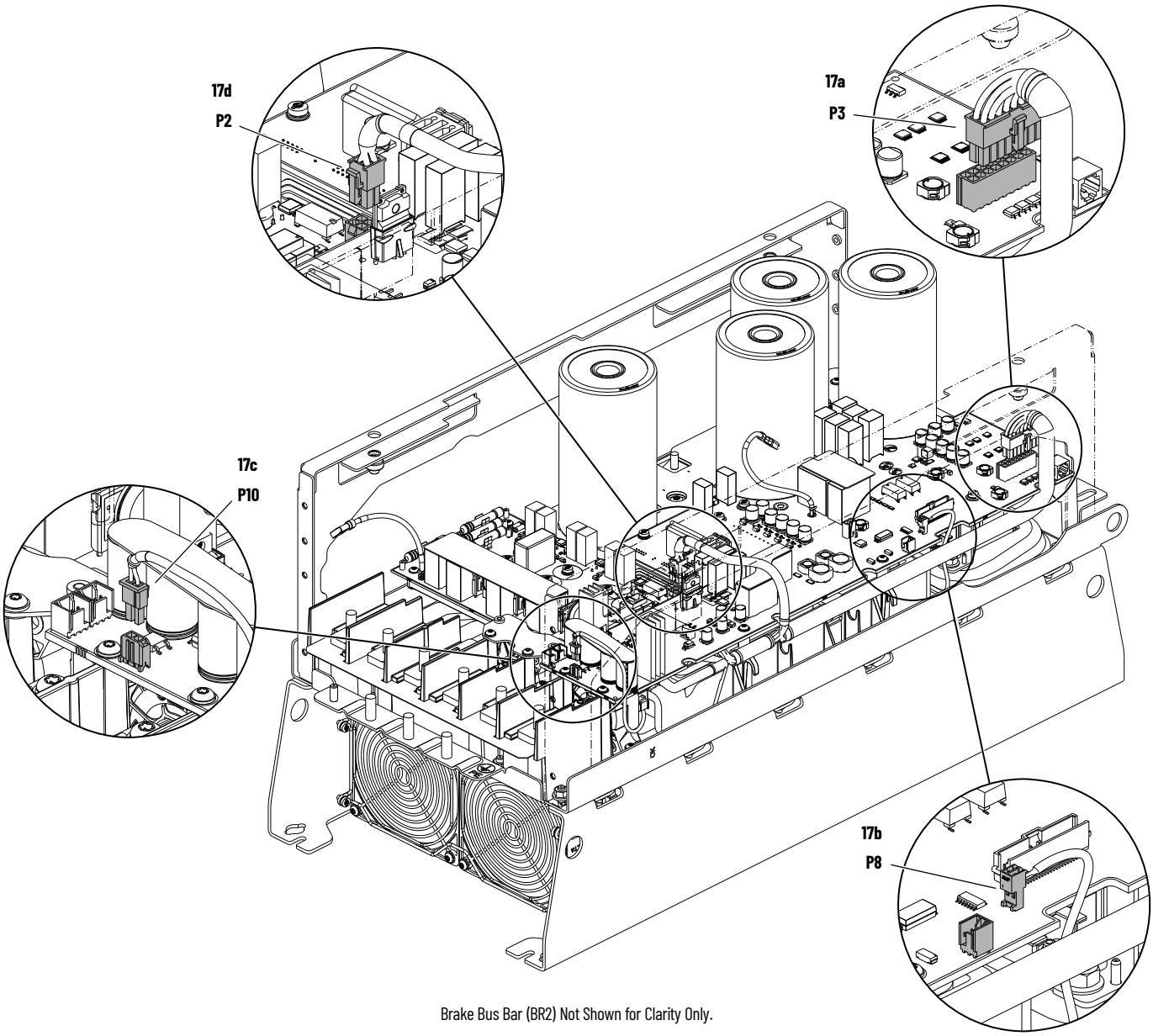
15. Lift the bus capacitor cover, upper support bracket, and lower stirring fan assembly off the drive.



16. If the DC bus bars are installed, remove the two M6 hexagonal nuts that secure the DC bus bars to the laminated bus.



17. If a brake bus bar is installed, complete steps a...i to remove the power interface circuit board.
    a. Disconnect the current transformers and AC or DC precharge circuit board wire harness connector P3 from the connector J3 on the upper, right side of the power interface circuit board.
    b. Disconnect the NTC wire harness connector P8 from connector J8 on the right, center of the power interface circuit board.
    c. Disconnect the heatsink-fans power wire harness connector P2 from connector J2 at the bottom of the power interface circuit board.
    d. Disconnect the precharge wire harness connector P10 from connector J10 on the AC or DC precharge circuit board.



Brake Bus Bar (BR2) Not Shown for Clarity Only.

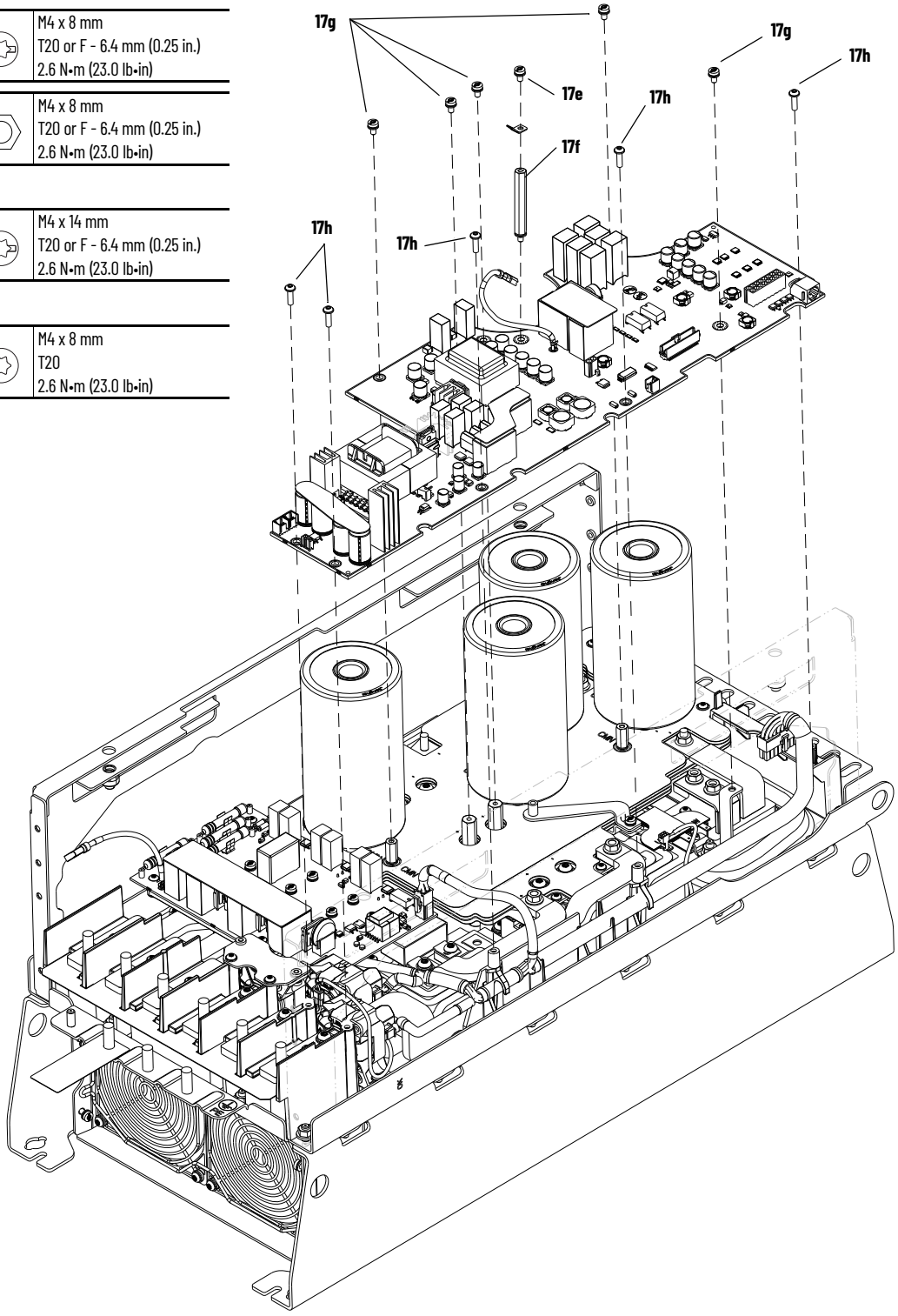
e. Remove the M4 x 8 mm slotted-Torx screw and metal tab from the M4 standoff on the power interface circuit board.

f. Remove the M4 standoff from the power interface circuit board.

g. Remove the five M4 x 14 mm slotted-Torx screws from the power interface circuit board.

h. Remove the five M4 x 8 mm Torx screws that secure the power interface circuit board to the standoffs on the chassis and remove the board.

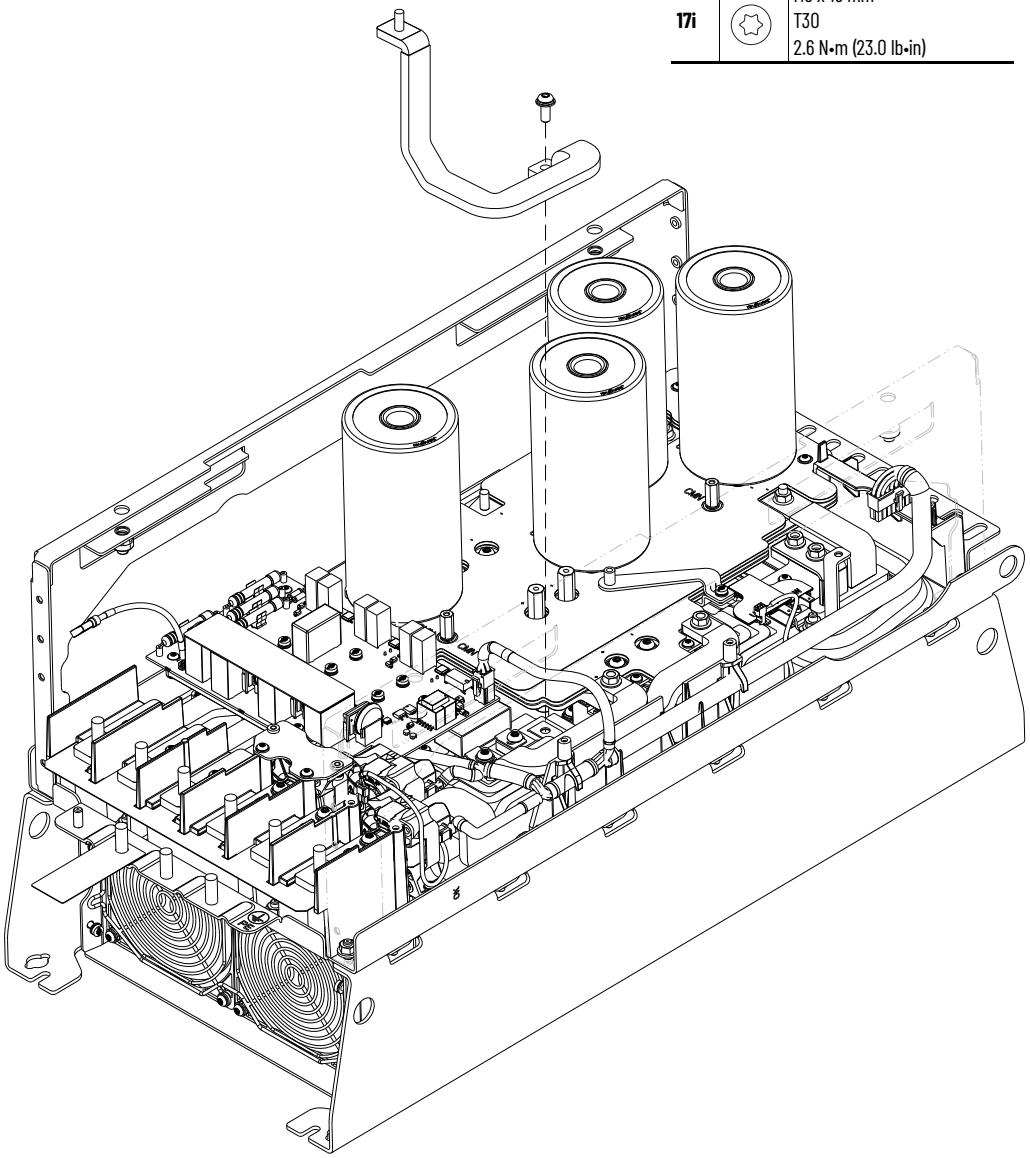
17e		M4 x 8 mm T20 or F - 6.4 mm (0.25 in.) 2.6 N•m (23.0 lb•in)
17f		M4 x 8 mm T20 or F - 6.4 mm (0.25 in.) 2.6 N•m (23.0 lb•in)
17g		M4 x 14 mm T20 or F - 6.4 mm (0.25 in.) 2.6 N•m (23.0 lb•in)
17h		M4 x 8 mm T20 2.6 N•m (23.0 lb•in)



Brake Bus Bar (BR2) Not Shown for Clarity Only.

i. Remove the M6 x 16 mm Torx screw that secures the brake bus bar to the chassis and remove the brake bus bar.

17i		M6 x 16 mm T30 2.6 N•m (23.0 lb•in)

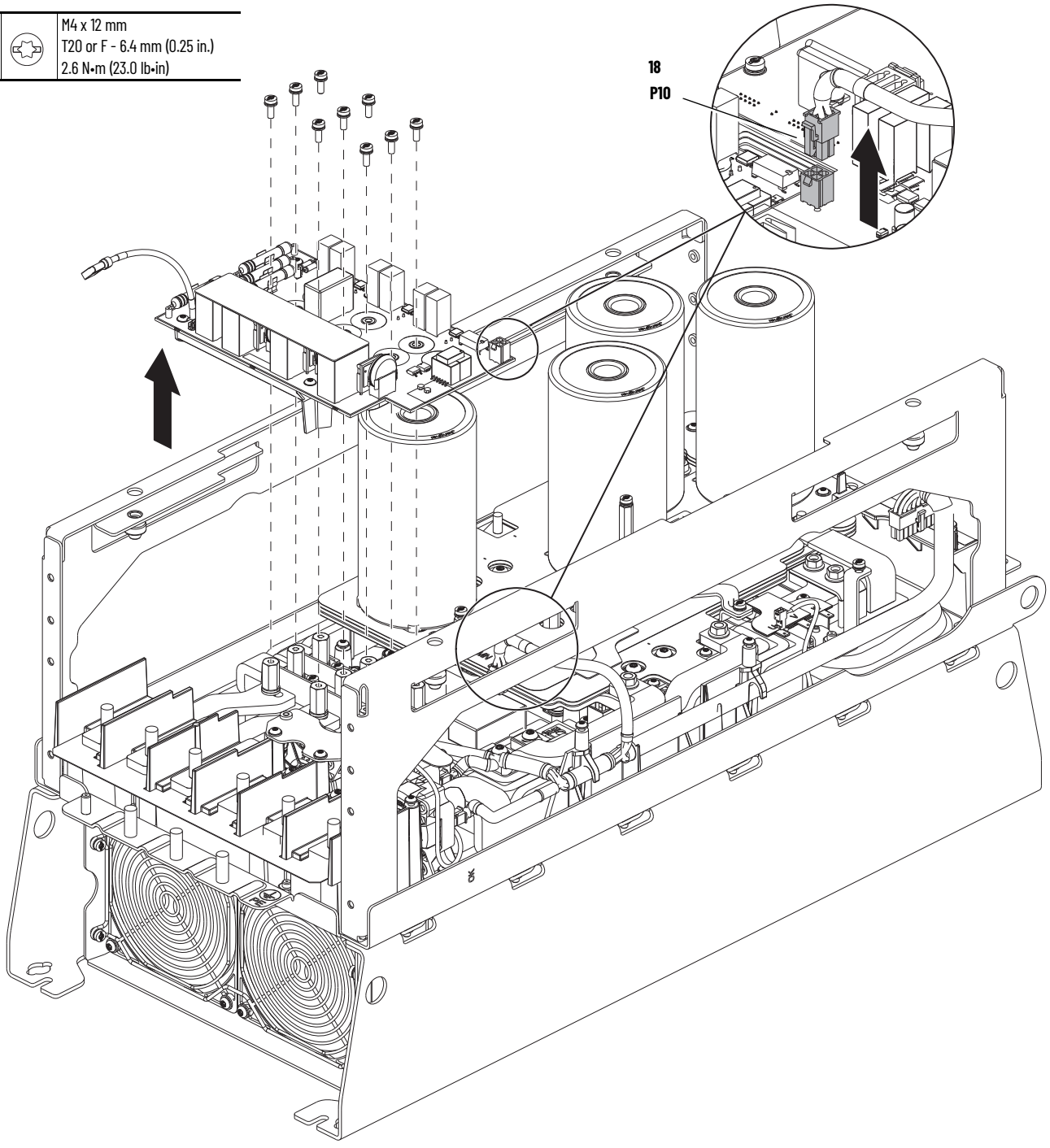


18. Disconnect the precharge wire harness connector P10 from connector J10 on the AC precharge circuit board.

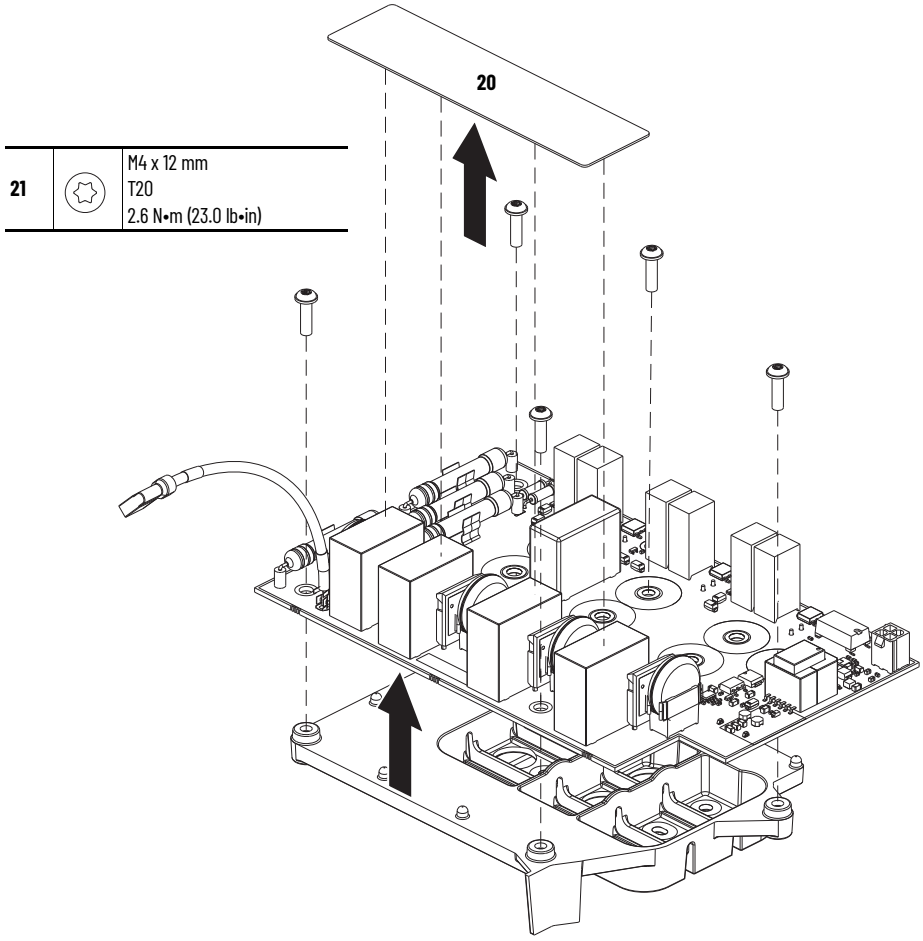
IMPORTANT The back side of the AC precharge circuit board contains solid gate lead connectors that connect to the IGBTs below the board.

19. Remove the nine M4 x 12 mm slotted -Torx screws and remove the board and plastic board support.

19		M4 x 12 mm T20 or F - 6.4 mm (0.25 in.) 2.6 N•m (23.0 lb•in)



20. Remove the circuit board stiffener from the capacitors on the board.
21. Remove the five M4 x 12 mm Torx screws that secure the board to the plastic support. Retain the plastic support for reuse.

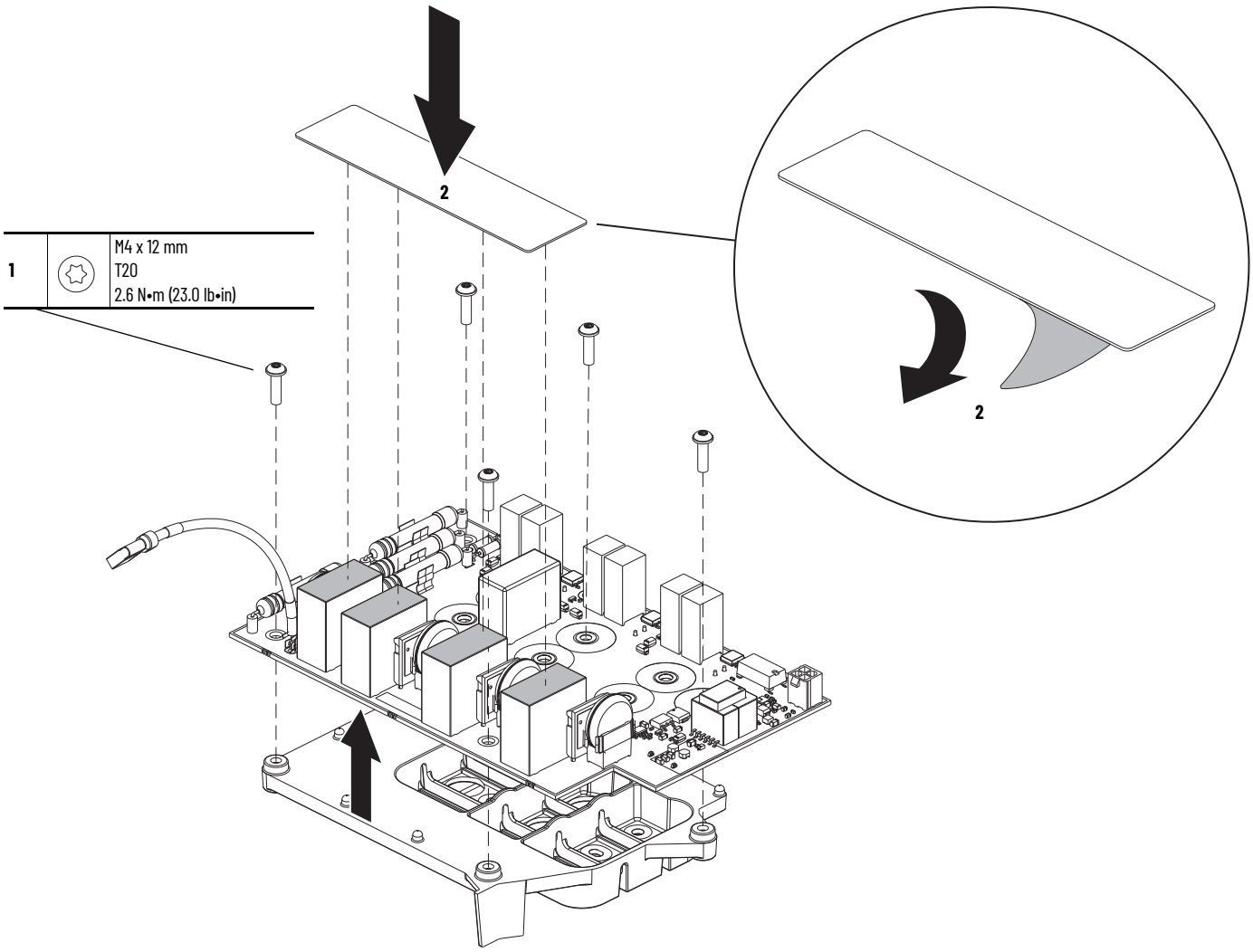


Install the AC Precharge Circuit Board

Install the AC precharge circuit board.

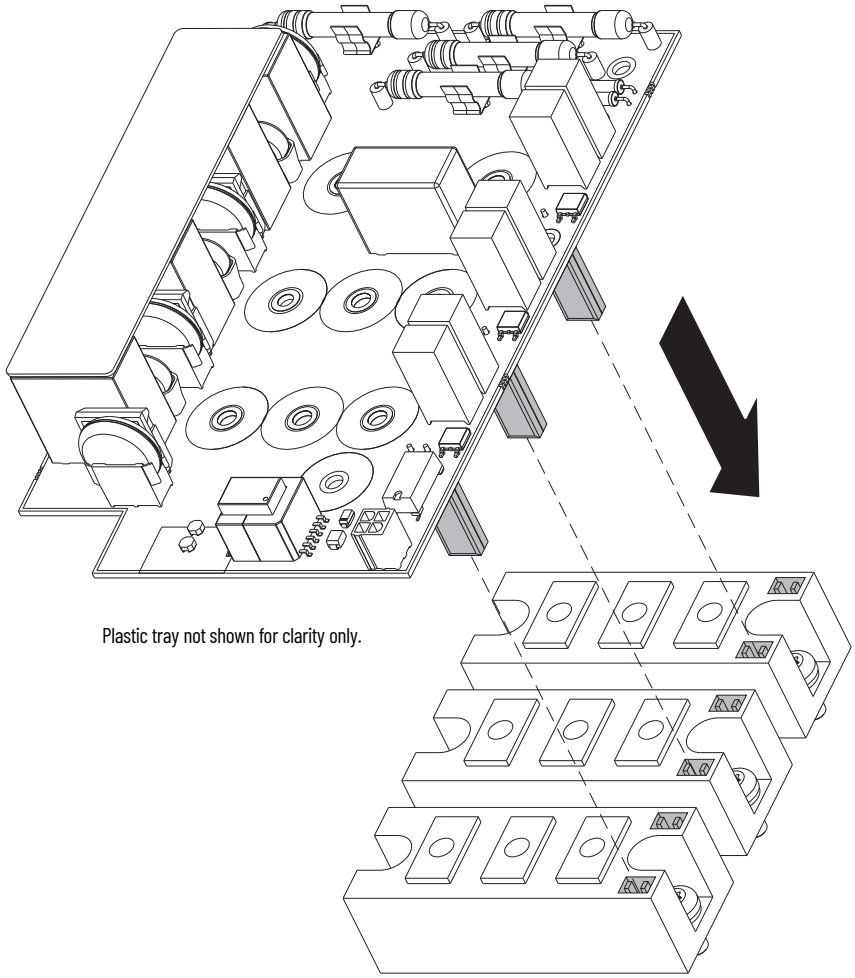
1. Secure the AC precharge circuit board to the plastic support by using the five M4 x 12 mm Torx screws.
2. Peel the protective sheet off the back of the circuit board stiffener and apply the stiffener to the tops of the four capacitor components as shown.

IMPORTANT Verify that the stiffener is securely fastened to all four capacitors.



3. Insert the AC precharge circuit board gate lead connectors into the connectors in the IGBTs.

IMPORTANT Take care to connect the gate lead connectors on the back of the AC precharge circuit board to the connectors on the IGBTs carefully.



4. Install the AC precharge circuit board in the reverse order of removal.

DC Precharge Circuit Board Replacement

Replacement kit catalog number: SK-RT-DCPC-F67

Remove the DC Precharge Circuit Board

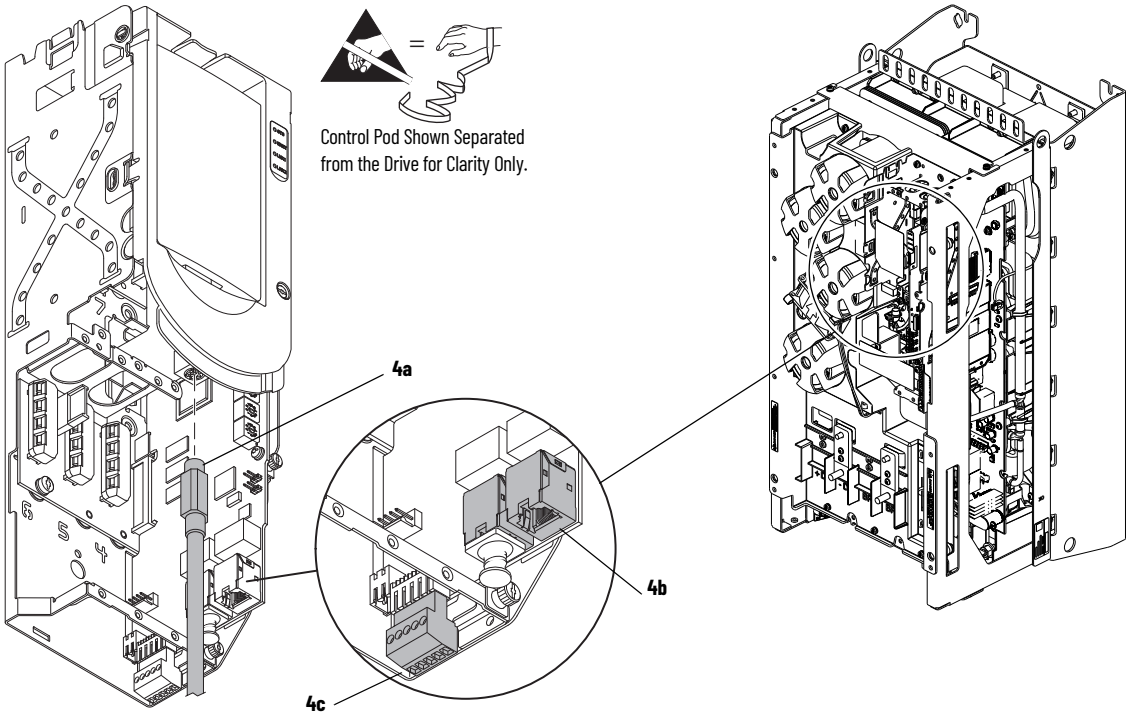
Follow these steps to remove the DC precharge circuit board.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Access the drive interior:
   - For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures, remove the drive cover. See Remove the Cover on page 79.
   - For IP54, NEMA/UL Type 12 enclosures, open the enclosure door and remove the protective guard. See Remove the Protective Guard (IP54, NEMA/UL Type 12 Enclosure) on page 80.

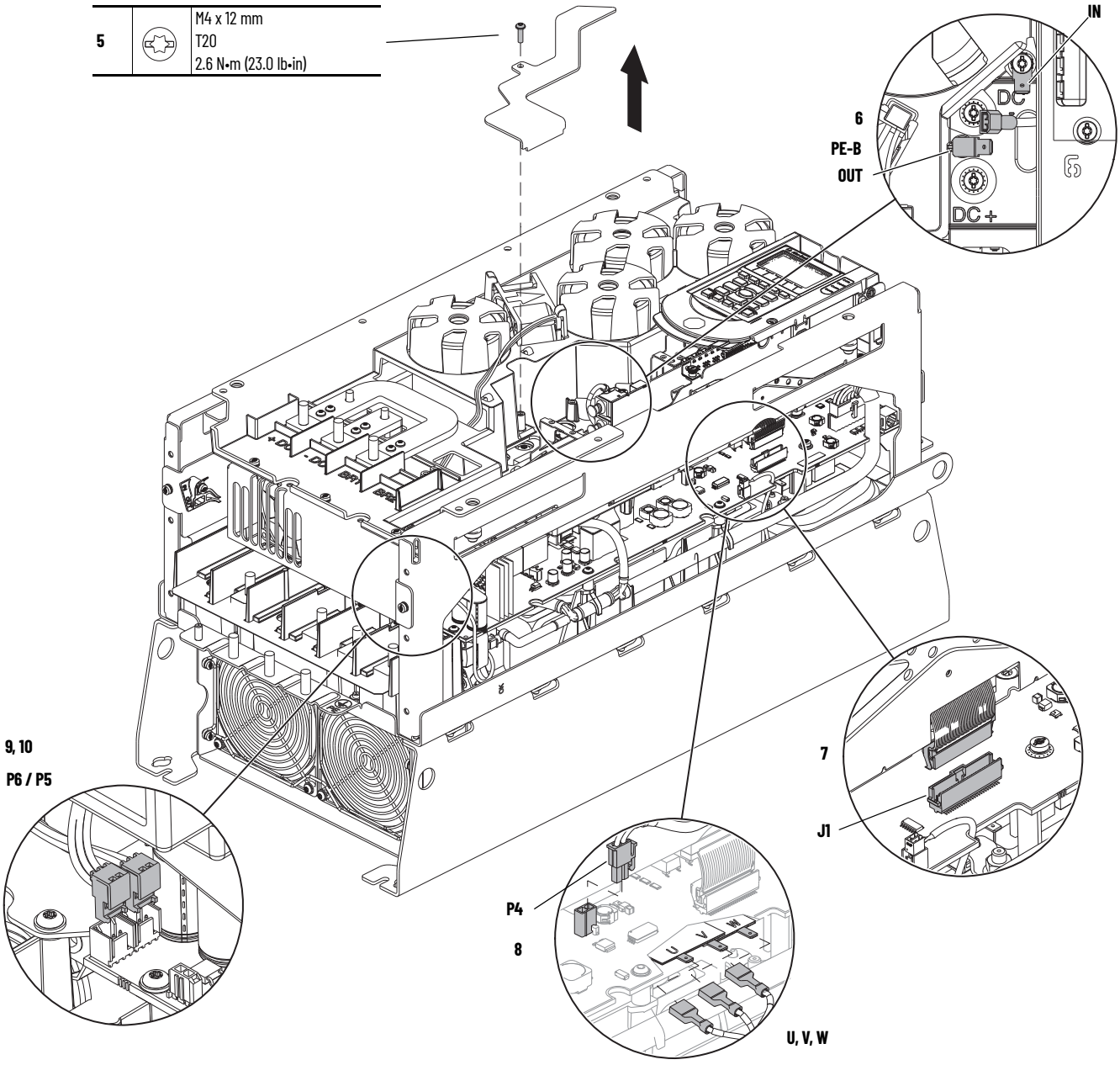
4. To prepare the control pod for removal from the drive, complete these steps:
   a. If used, disconnect the HIM DPI cable from the connector (port 2) on the HIM cradle.

      If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.

   b. Disconnect any cables from the Ethernet connectors on the bottom of the main control board in the control pod.
   c. If used, disconnect the plug-in terminal block (TB1) on the bottom of the main control board.
   d. If an option module is installed, disconnect any I/O wiring terminal blocks (not shown in image).



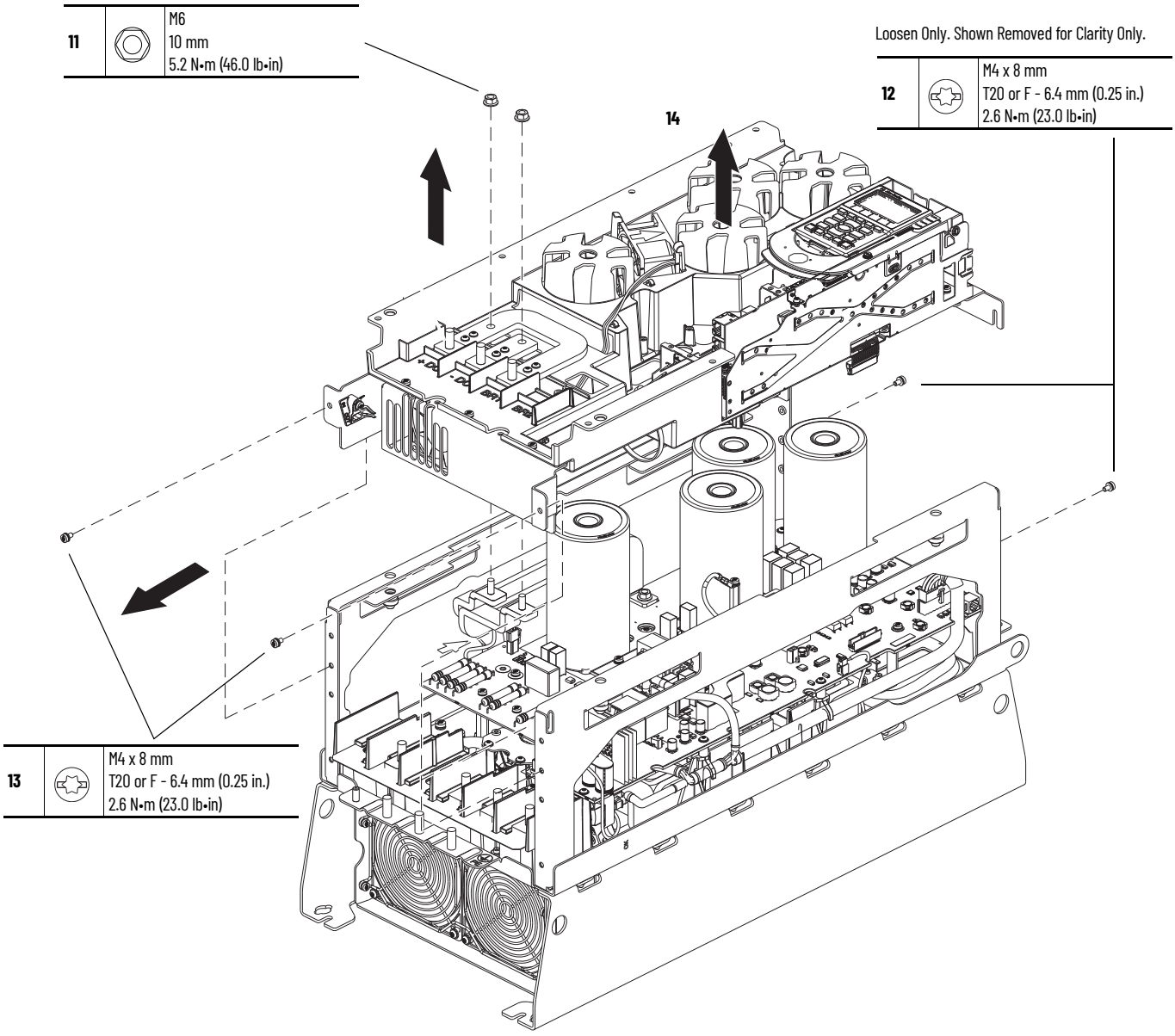
5. Remove the M4 x 12 mm Torx screw that secures the PE-B jumper cover to the capacitor cover and remove the jumper cover.
6. Note the PE-B jumper position and if the PE-B jumper is in the OUT position, remove the jumper wire from the connector on the power interface circuit board.
7. Below the control pod, disconnect the ribbon cable connector from connector J1 on the power interface circuit board.
8. If a torque accuracy module (TAM) is installed, complete steps a and b.
   a. Disconnect the wire harness connector P4 from J4 on the power interface circuit board.
   b. Disconnect the wires from connectors U, V, and W on the power interface circuit board.
9. Disconnect the lower stirring fan power wire-harness connector P5 from J5 on the power interface circuit board.
10. Disconnect the upper stirring fan power wire-harness connector P6 from J6 on the power interface circuit board.



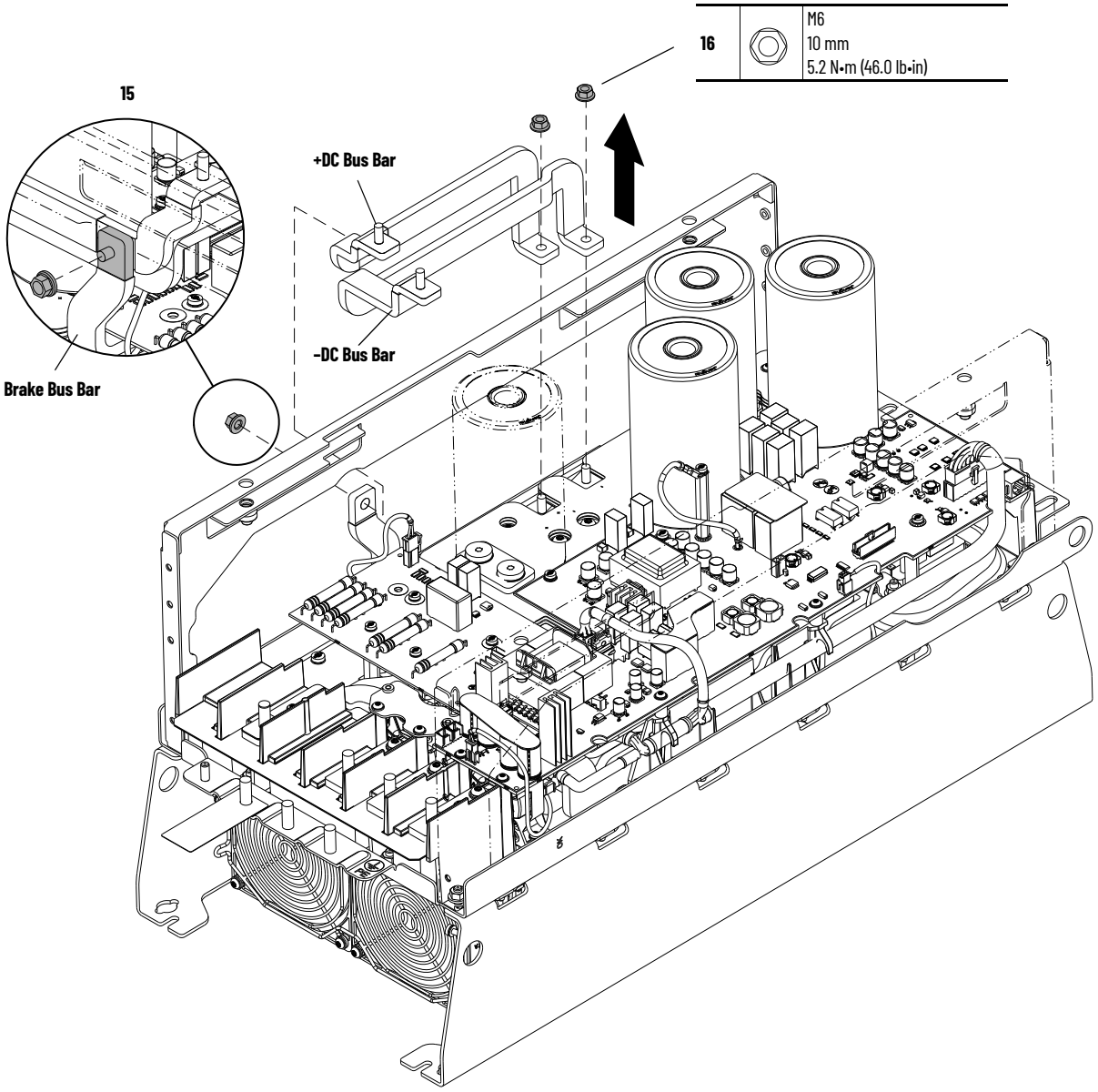
11. Remove the M6 hexagonal nuts from the DC bus bar terminals.
12. Loosen the two M4 x 8 mm slotted-Torx screws that secure the upper chassis bracket to the chassis and remove the bracket.
13. Remove the two M4 x 8 mm slotted-Torx screws that secure the lower stirring fan assembly to the chassis.

IMPORTANT An edge connector on the main control circuit board in the control pod is connected to the power interface circuit board below with a ribbon cable. The ribbon cable fits through an opening in the back of the control pod chassis.

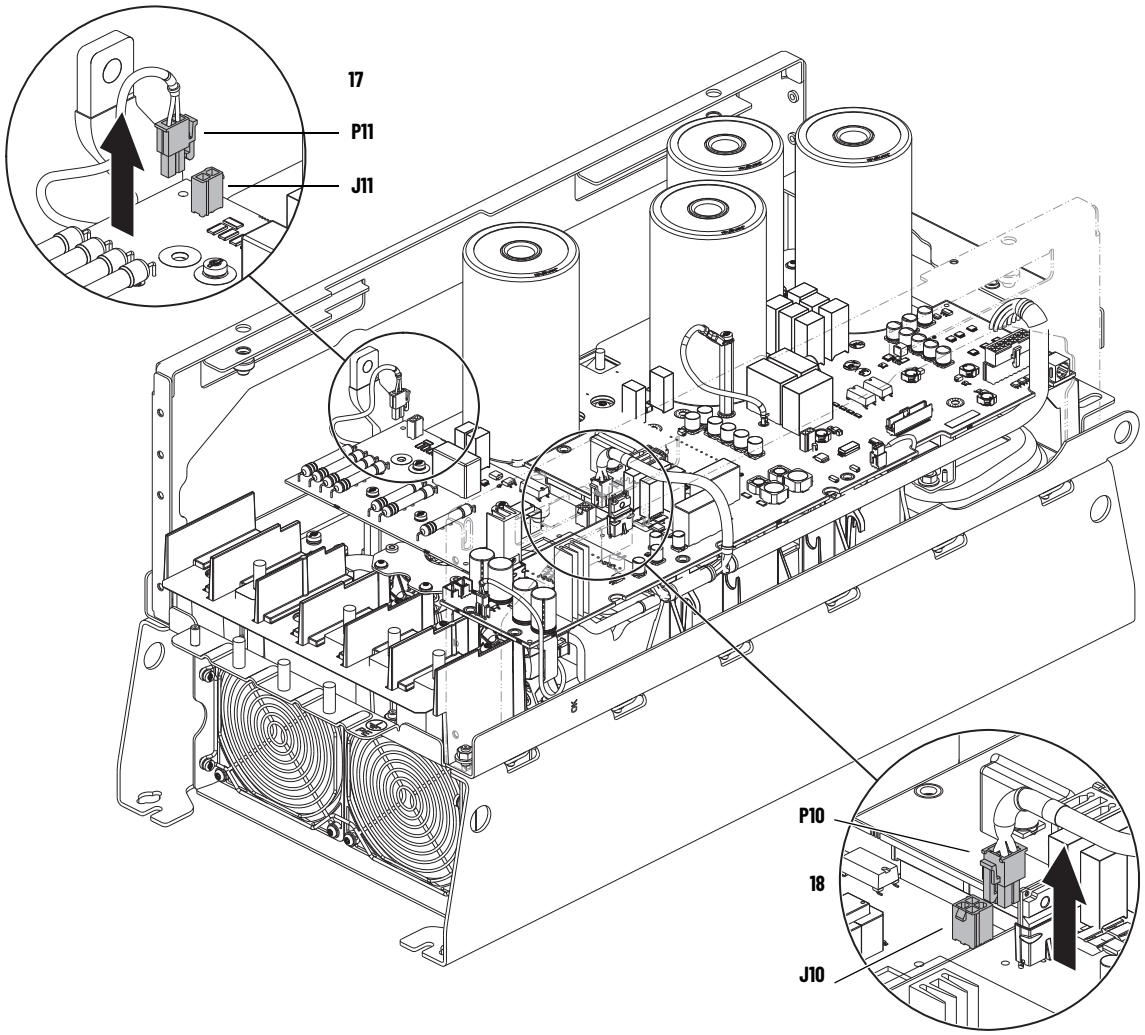
14. Lift the bus capacitor cover, upper support bracket, and lower stirring fan assembly off the drive.



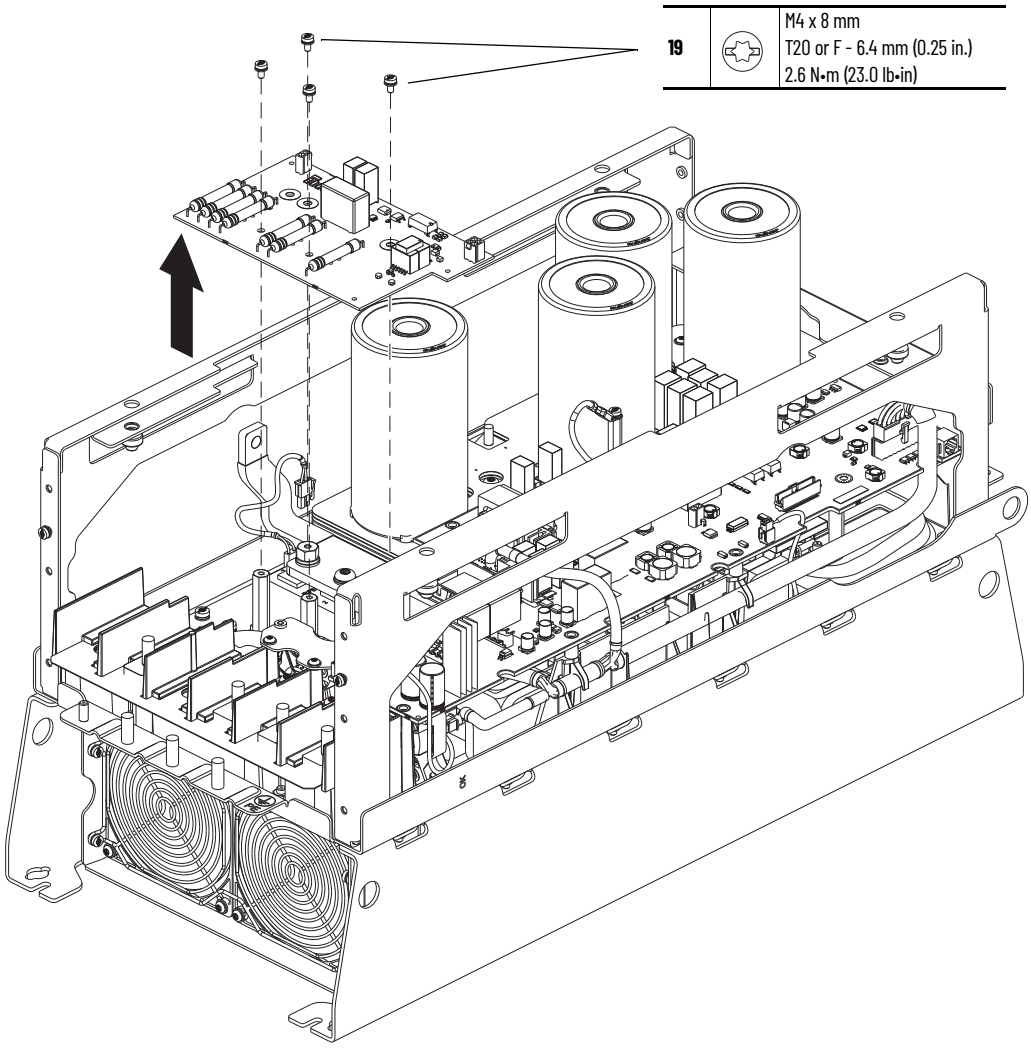
15. For DC input drives with a dynamic brake option installed, remove the M6 hexagonal nut that secures the brake bus bar to the +DC bus bar.
16. Remove the two M6 hexagonal nuts that secure the DC bus bars to the laminated bus.



17. Disconnect the SCR wire harness connector P11 from J11 on the DC precharge circuit board.
18. Disconnect the precharge wire harness connector P10 from connector J10 on the DC precharge circuit board.



19. Remove the four M4 x mm slotted -Torx screws that secure the DC precharge circuit board to the standoffs and remove the board.



Install the DC Precharge Circuit Board

Install the DC precharge circuit board in the reverse order of removal.

Notes:

Frame 7 Renewal Kits Installation

This chapter provides detailed instructions for how to remove and replace PowerFlex® 755TS frame 7 product components with renewal kit components.

Frame 7 Kits

Table 5 contains the renewal kits available for PowerFlex® 755TS frame 7 products. 'XT' in the kit catalog number identifies a kit that can contain protective covers and/or dielectric grease on connectors. See Renewal Kits for PowerFlex 755TS Products with Corrosive Gas Protection (XT) on page 14 for details.

Table 5 - Frame 7 Renewal Kits

Kit Description	Catalog Number		Instructions
	Standard	XT	
Control Pod Access Cover (for IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and Flange, NEMA/UL Type 4X/12 Back Enclosures)	SK-RT-AD1-F67	SK-RT-AD1-F67-XT	See page 131
Cover (for IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and Flange, NEMA/UL Type 4X/12 Back Enclosures)	SK-RT-CVR1-F7	SK-RT-CVR1-F7-XT	See page 132
Control Pod Human Interface Module (HIM) Cradle (for All Enclosure Types)	SK-RT-BZL1	SK-RT-BZL1-XT	See page 132
Main Control Board	SK-RT-MCB1-PF755	SK-RT-MCB1-PF755-XT	See page 135
Main Control Board to Power Interface Board Ribbon Cable	–	SK-RT-PIC1-F27-XT	See page 140
Backplane Circuit Board (Kit Contains 1 Circuit Board)	SK-RT-BKPLN	SK-RT-BKPLN-XT	See page 142
Heatsink Fan Assembly (for IP00, NEMA/UL Open Type and IP21, NEMA/UL Type 1 Enclosures)	SK-RT-HSFAN1-F7	SK-RT-HSFAN1-F7-XT	See page 143
Heatsink Fan Assembly (for Flange, NEMA/UL Type 4X/12 Back and IP54, NEMA/UL Type 12 Enclosures)	–	SK-RT-HSFAN2-F7-XT	See page 143
Stirring Fan Assembly (for All Enclosure Types)	SK-RT-STIRFAN1-F7	SK-RT-STIRFAN1-F7-XT	See page 145
Flange Gasket (for Flange, NEMA/UL Type 4X/12 Back Enclosures)	SK-RT-FG1-F7	–	See page 147
Power Interface Circuit Board (208V / 240V)			
260 A 208V / 260 A 240V	SK-RT-PIB1-B260-F7	SK-RT-PIB1-B260-F7-XT	See page 153
359 A 208V / 312 A 240V	SK-RT-PIB1-B312	SK-RT-PIB1-B312-XT	
414 A 208V / 360 A 240V	SK-RT-PIB1-B360	SK-RT-PIB1-B360-XT	
477 A 208V / 477 A 240V	SK-RT-PIB1-B477	SK-RT-PIB1-B477-XT	

Table 5 - Frame 7 Renewal Kits (Continued)

Kit Description	Catalog Number		Instructions
	Standard	XT	
Power Interface Circuit Board (400V / 480V)			
260 A 400V / 248 A 480V	SK-RT-PIB1-C260D248-F7	SK-RT-PIB1-C260D248-F7-XT	See page 153
302 A 400V / 302 A 480V	SK-RT-PIB1-C302D302	SK-RT-PIB1-C302D302-XT	
367 A 400V / 361 A 480V	SK-RT-PIB1-C367D361	SK-RT-PIB1-C367D361-XT	
456 A 400V / 415 A 480V	SK-RT-PIB1-C456D415	SK-RT-PIB1-C456D415-XT	
477 A 400V / 477 A 480V	SK-RT-PIB1-C477D477	SK-RT-PIB1-C477D477-XT	
Power Interface Circuit Board (600V / 690V)			
192 A 600V / 171 A 690V	SK-RT-PIB1-E192F171	SK-RT-PIB1-E192F171-XT	See page 153
242 A 600V / 212 A 690V	SK-RT-PIB1-E242F212	SK-RT-PIB1-E242F212-XT	
289 A 600V / 263 A 690V	SK-RT-PIB1-E289F263	SK-RT-PIB1-E289F263-XT	
AC Precharge Circuit Board, 208V/240V	SK-RT-ACPC-BF7	SK-RT-ACPC-BF7-XT	See page 163
AC Precharge Circuit Board, 400V/480V	SK-RT-ACPC-CDF7	SK-RT-ACPC-CDF7-XT	
AC Precharge Circuit Board, 600V/690V	SK-RT-ACPC-EFF7	SK-RT-ACPC-EFF7-XT	
DC Precharge Circuit Board	SK-RT-DCPC-F67	SK-RT-DCPC-F67-XT	See page 172

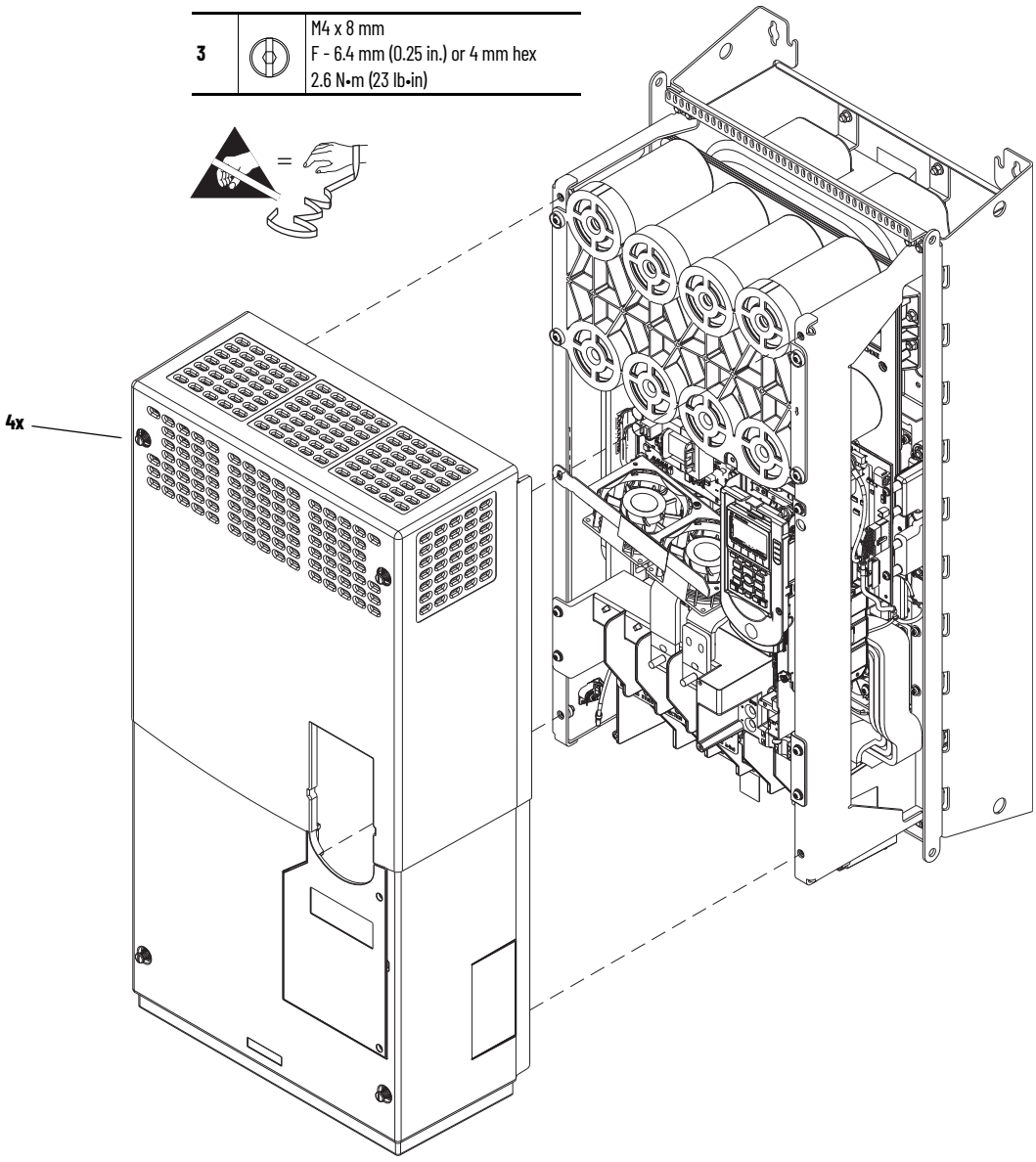
Remove the Cover

For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and IP66, NEMA/UL Type 4X enclosures, remove the cover to access internal components in the drive.

Remove the Cover

Follow these steps to remove the cover.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Loosen the four M4 x 8 mm captive screws that secure the cover to the assembly, and remove the cover.



Install the Cover

Install the cover in the reverse order of removal.

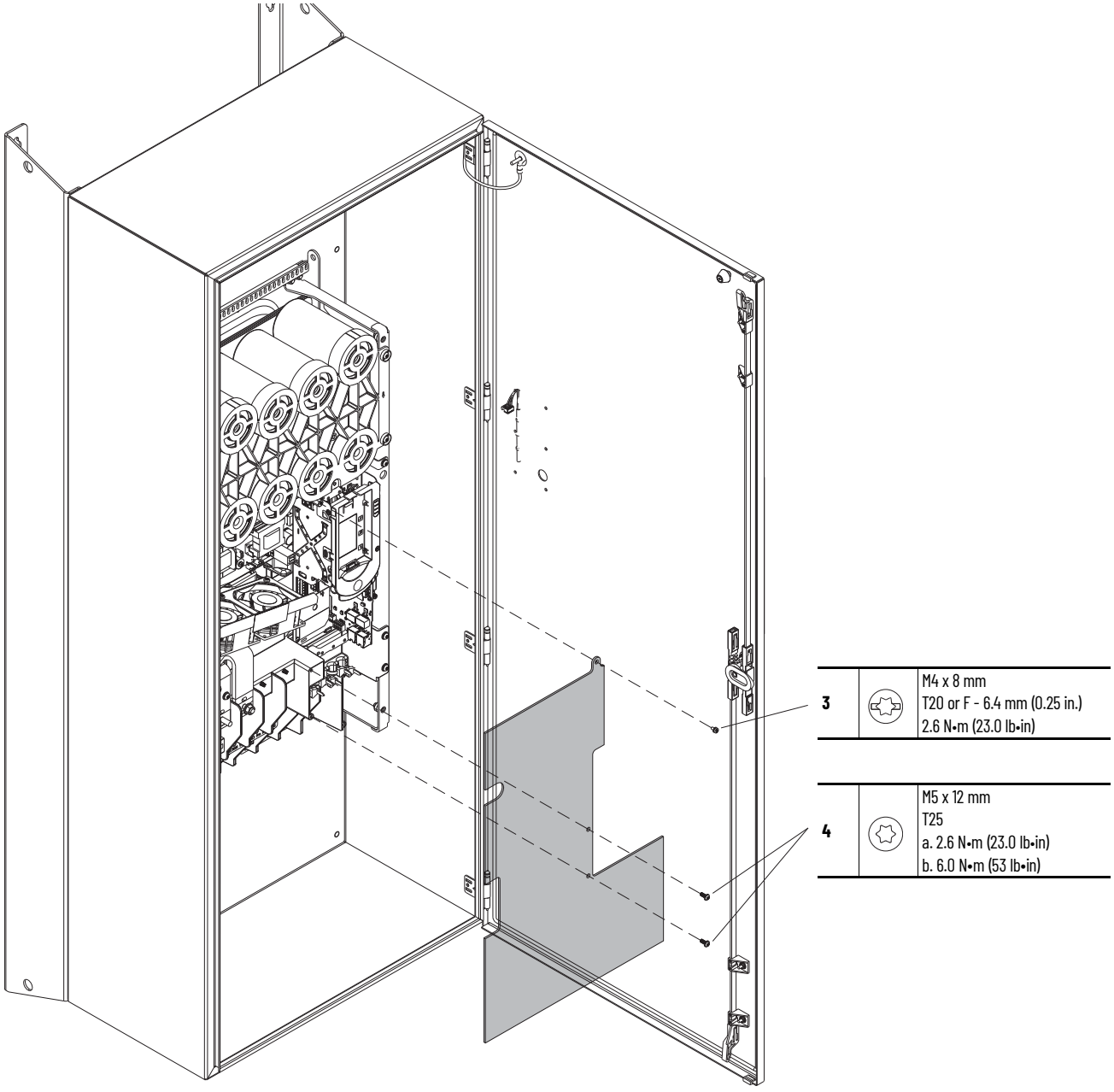
Remove the Protective Guard (IP54, NEMA/UL Type 12 Enclosure)

Remove the protective guard from an IP54, NEMA/UL Type 12 enclosure to access the power terminals, stirring fan, and power interface circuit board.

Remove the Protective Guard (IP54, NEMA/UL Type 12 Enclosure)

Follow these steps to remove the protective guard from an IP54, NEMA/UL Type 12 enclosure.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the M4 x 8 mm slotted-Torx screw that secures the upper guard to the standoff on the drive chassis.
4. Remove the two M5 x 12 mm Torx screws that secure the lower guard to the chassis terminal support bracket and remove the guard.



3		M4 x 8 mm T20 or F - 6.4 mm (0.25 in.) 2.6 N•m (23.0 lb•in)
4		M5 x 12 mm T25 a. 2.6 N•m (23.0 lb•in) b. 6.0 N•m (53 lb•in)

Install the Protective Guard (IP54, NEMA/UL Type 12 Enclosure)

Install the protective guard in the reverse order of removal.

Control Pod Access Cover Replacement

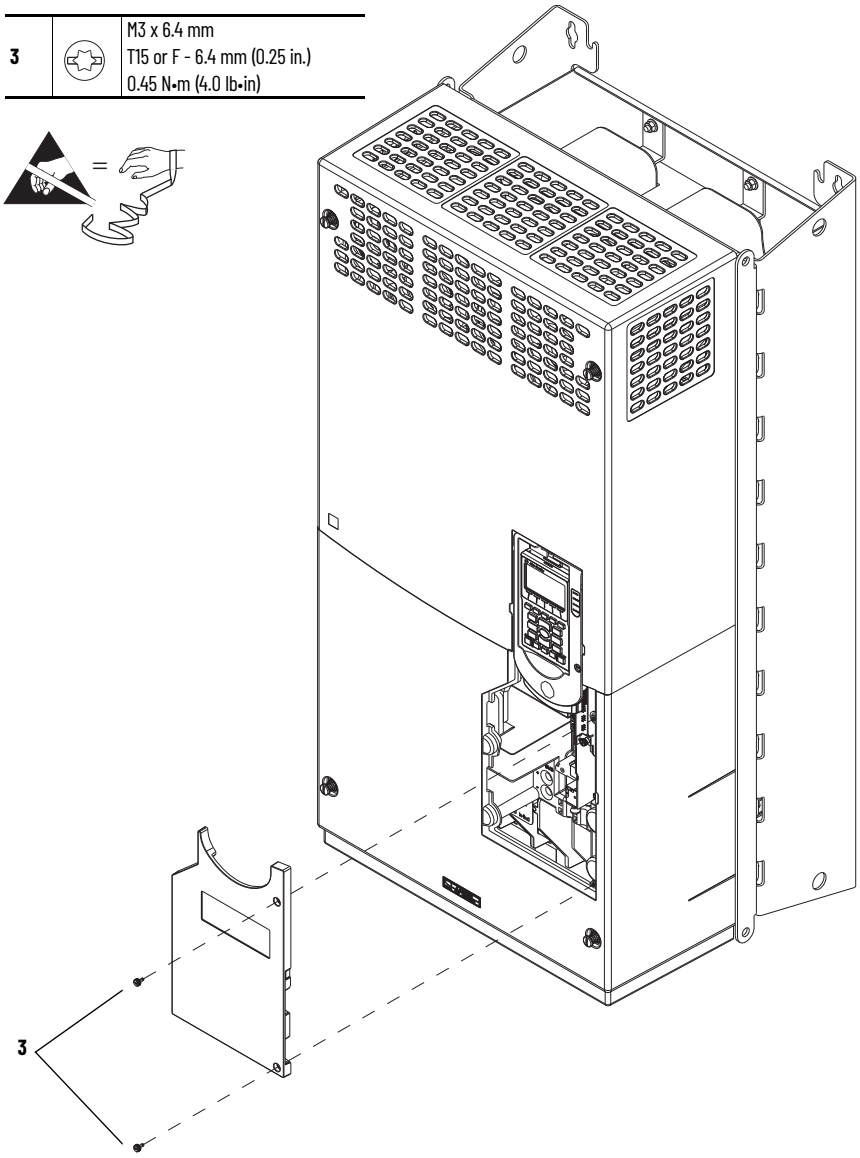
Replacement kit catalog numbers: SK-RT-AD1-F67, SK-RT-AD1-F67-XT

These kits can be used for IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1 and flange, NEMA/UL Type 4X/12 back enclosures.

Remove the Control Pod Access Cover

Follow these steps to remove the control pod access cover.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Loosen the two M3 x 6.4 mm slotted-Torx screws that secure the control pod access cover to the drive cover and remove the access cover.



Install the Control Pod Access Cover

Install the control pod access cover in the reverse order of removal.

Cover Replacement

Replacement kit catalog numbers: SK-RT-CVR1-F7, SK-RT-CVR1-F7-XT

These kits can be used for IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1 and Flange, NEMA/UL Type 4X/12 back enclosures.

Remove the Cover

Follow these steps to remove the cover.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the control pod access cover. See Remove the Control Pod Access Cover on page 131. Retain the access cover for reuse.
4. Remove the drive cover. See Remove the Cover on page 129.

Install the Cover

Install the cover in the reverse order of removal.

Control Pod HIM Cradle Replacement

Replacement kit catalog numbers: SK-RT-BZL1, SK-RT-BZL1-XT

These kits can be used for all enclosure types.

Remove the Control Pod HIM Cradle

Follow these steps to remove the control pod HIM cradle.

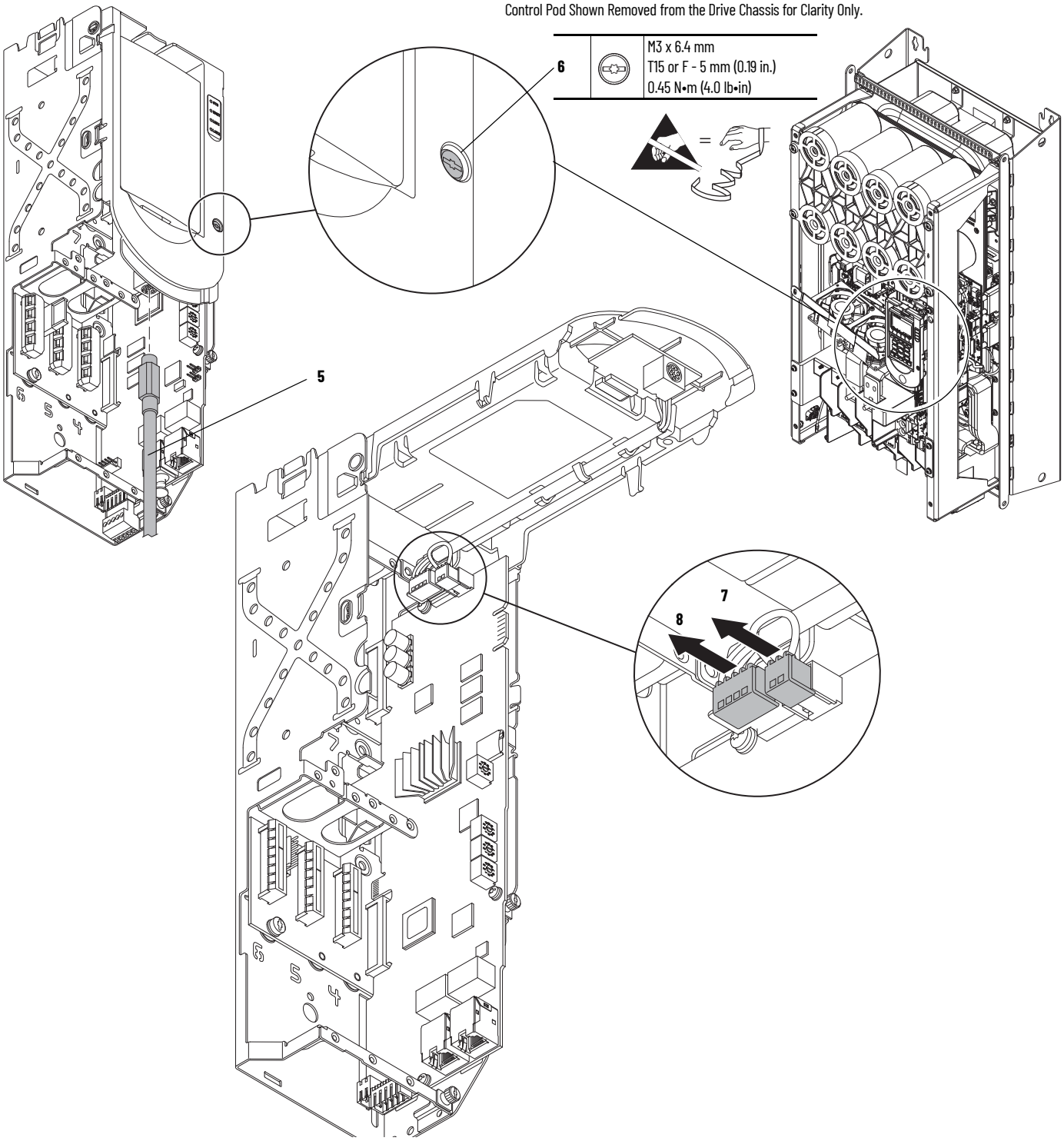
1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Access the drive interior:
   - For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures, remove the drive cover. See Remove the Cover on page 129.
   - For IP54, NEMA/UL Type 12 enclosures, open the enclosure door.
4. If a HIM is installed in the cradle, remove the HIM.

5. If used, disconnect the DPI™ cable from the connector on the bottom of the HIM cradle.

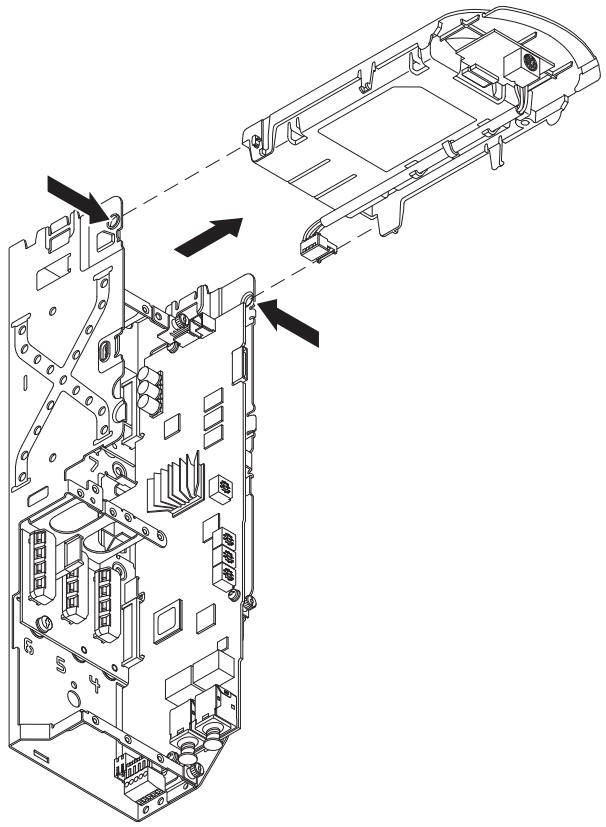
   If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.

6. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position.
7. Disconnect the jumper J16 connector from the connector P16 on the main control circuit board. Retain the jumper for reuse with the new main control board.
8. Disconnect the HIM wire harness connector from the connector on the main control board.

Control Pod Shown Removed from the Drive Chassis for Clarity Only.



9. Press in on the tabs at the top of the HIM cradle where it connects to the control pod chassis to release the cradle from the chassis.

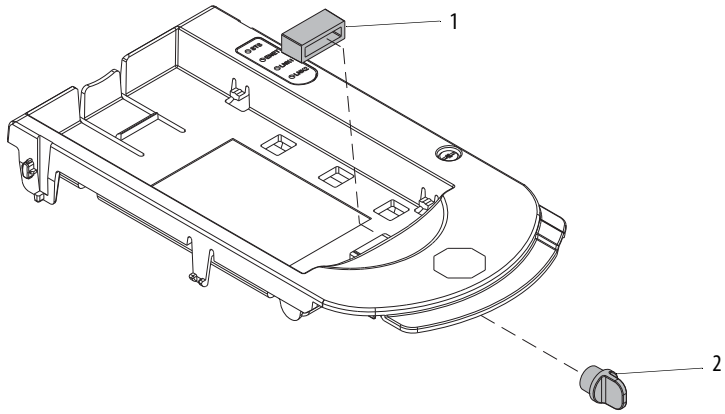


Install the Control Pod HIM Cradle

Install the control pod HIM cradle in the reverse order of removal.

IMPORTANT Do not remove protective covers unless used at the time of installation. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation. See Protective Covers on Kits with XT on page 14 for details.

- Do not remove the protective cover from these connectors on the HIM cradle unless a connection is made during reinstallation:



Item	Description
1	HIM connector

Item	Description
2	DPI connector (port 2)

Main Control Circuit Board Replacement

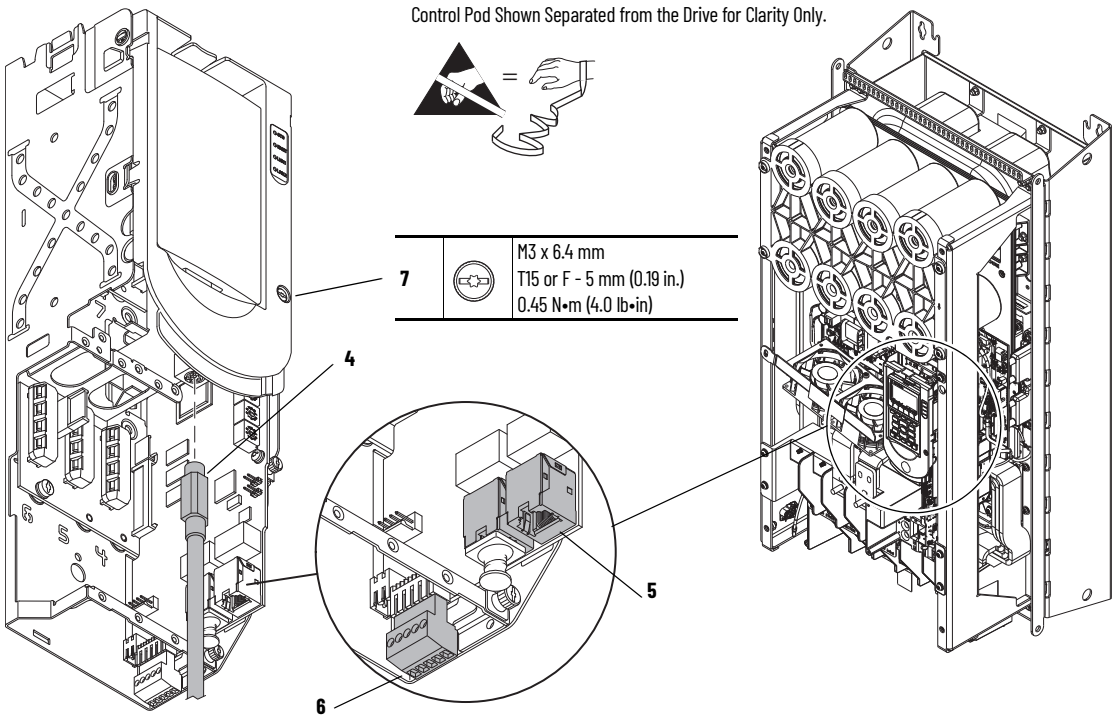
Replacement kit catalog number: SK-RT-MCB1-PF755

Remove the Main Control Circuit Board

Follow these steps to remove the main control circuit board.

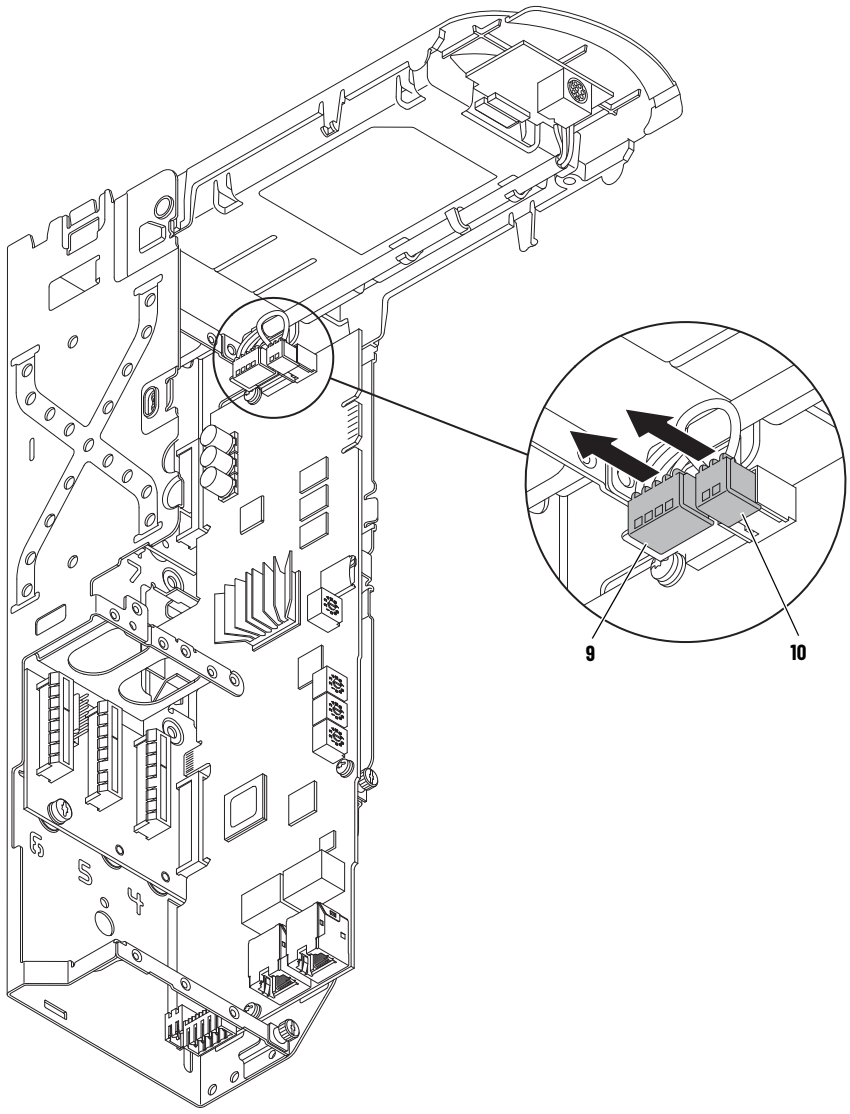
1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Access the drive interior:
   - For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1, and flange, NEMA/UL Type 4X/12 back enclosures, remove the drive cover. See Remove the Cover on page 129.
   - For IP54, NEMA/UL Type 12 enclosures, open the enclosure door.
4. If used, disconnect the DPI cable from the connector on the bottom of the HIM cradle.

   If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.
5. Disconnect any cables from the Ethernet connectors on the bottom of the main control board in the control pod.
6. If used, disconnect the plug-in terminal block (TB1) on the bottom of the main control board.
7. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position.
8. If an option module is installed, disconnect any I/O wiring terminal blocks and remove the option module (not shown in this image).

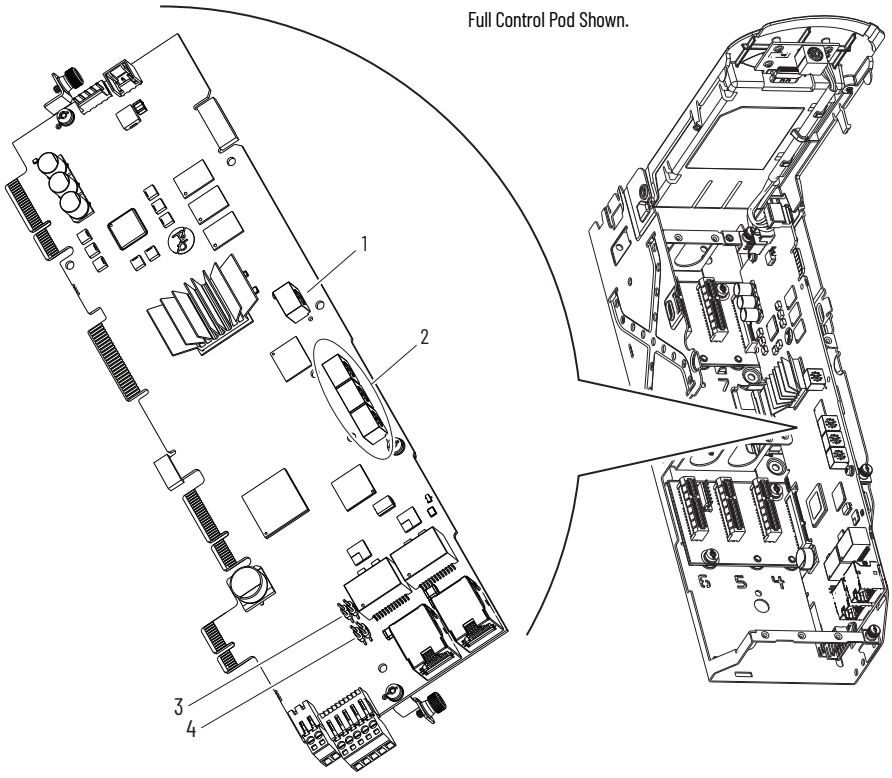


9. Disconnect the terminal block for the HIM DPI wire harness from the connector on the main control circuit board.
10. Disconnect the jumper J16 from P16 on the main control circuit board. Retain the jumper for reuse with the new main control board.

Control Pod Shown Removed from the Drive Chassis for Clarity Only.



11. Record any application-specific settings on these main control board switches or jumpers (identified in this illustration):



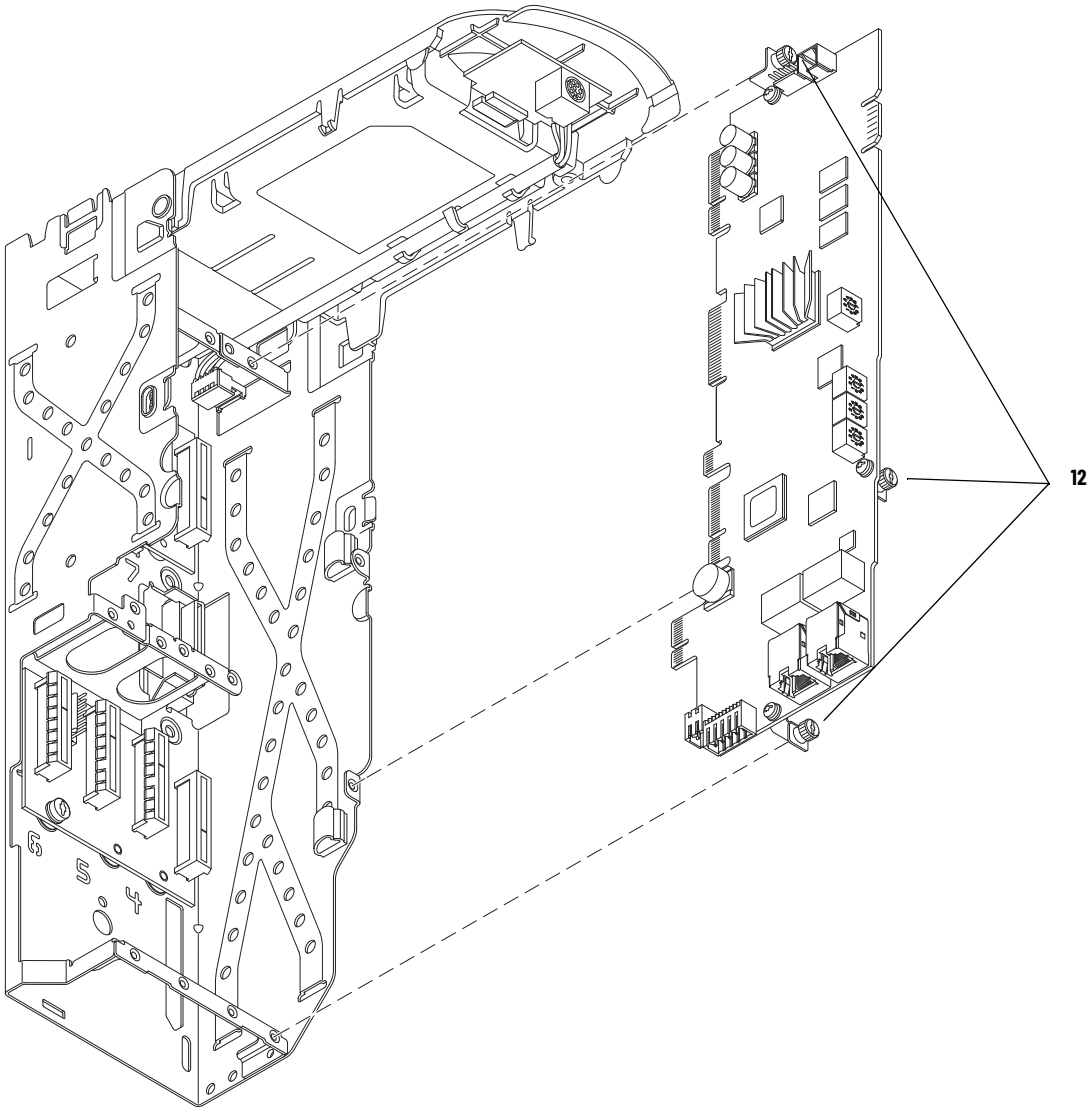
Main Control Circuit Board Details

Item	Name	Description
1	Control selector	Rotary switch for setting the programming mode.
2	Built-in EtherNet/IP address selectors	Rotary switches for setting the lowest octet of an EtherNet/IP address (forces address to 192.168.1.*xxx*). See the PowerFlex Drives with TotalFORCE Control Built-in EtherNet/IP Adapter User Manual, publication 750COM-UM009 for instructions on setting the IP address.
3	ENABLE jumper	Hardware enable jumper (P7). Remove this jumper and place it in the out (parked) position when using Digital Input 0 on TB1 as a dedicated hardware enable.
4	SAFETY jumper	Safety enable jumper (P8). Remove this jumper and place it in the out (parked) position when using a safety option.

12. Loosen the three M3 captive slotted-Torx screws that secure the main control circuit board to the control pod chassis and remove the main control board.

12		M3 x 6.4 mm T15 or F - 5 mm (0.19 in.) 0.45 N•m (4.0 lb•in)

Control Pod Shown Separated from the Drive for Clarity Only.



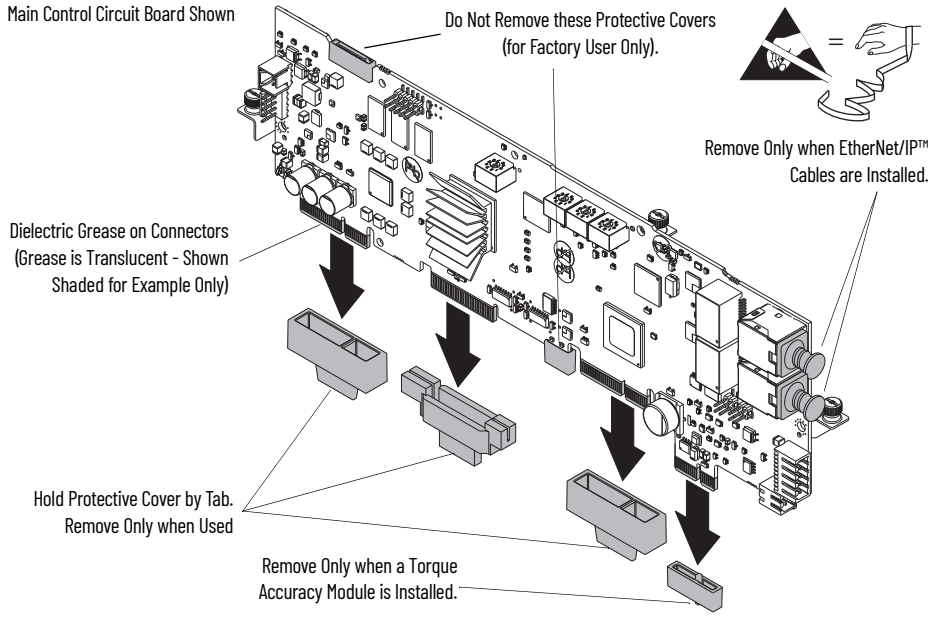
Install the Main Control Circuit Board

Follow these steps to install the main control circuit board.

IMPORTANT Circuit boards that are contained in renewal kits with XT contain dielectric grease on the edge connectors, where present. Do not touch or remove the grease from circuit board edge connectors. A non-greased connector can lead to corrosion.

1. For kit catalog number SK-RT-MCB1-PF755-XT only, hold the tab on the protective cover and carefully remove the cover from the edge connector on the circuit board. Do not touch the edge connector.

IMPORTANT If a Torque Accuracy Module (TAM) is not installed, do not remove the protective cover from the edge connector that is identified in the illustration.



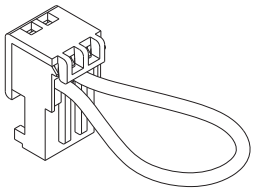
IMPORTANT If before installation, grease is removed from an edge connector or is contaminated, do not install the circuit board. See Apply Dielectric Grease to an Edge Connector on page 16 for instructions on how to clean and grease an edge connector.

2. Install the main control circuit board in the reverse order of removal.

IMPORTANT Do not remove protective covers unless used at the time of installation. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation. See Protective Covers on Kits with XT on page 14 for details.

IMPORTANT

Be sure to install jumper J16 into connector P16 on the main control circuit board. See step 10 on page 136 for details.



3. Make any necessary changes to the settings on these main control board selectors or jumpers:
   - Control switch
   - Embedded EtherNet/IP address switches
   - Hardware enable jumper
   - Safety enable jumper

Main Control Board to Power Interface Board Ribbon Cable Replacement

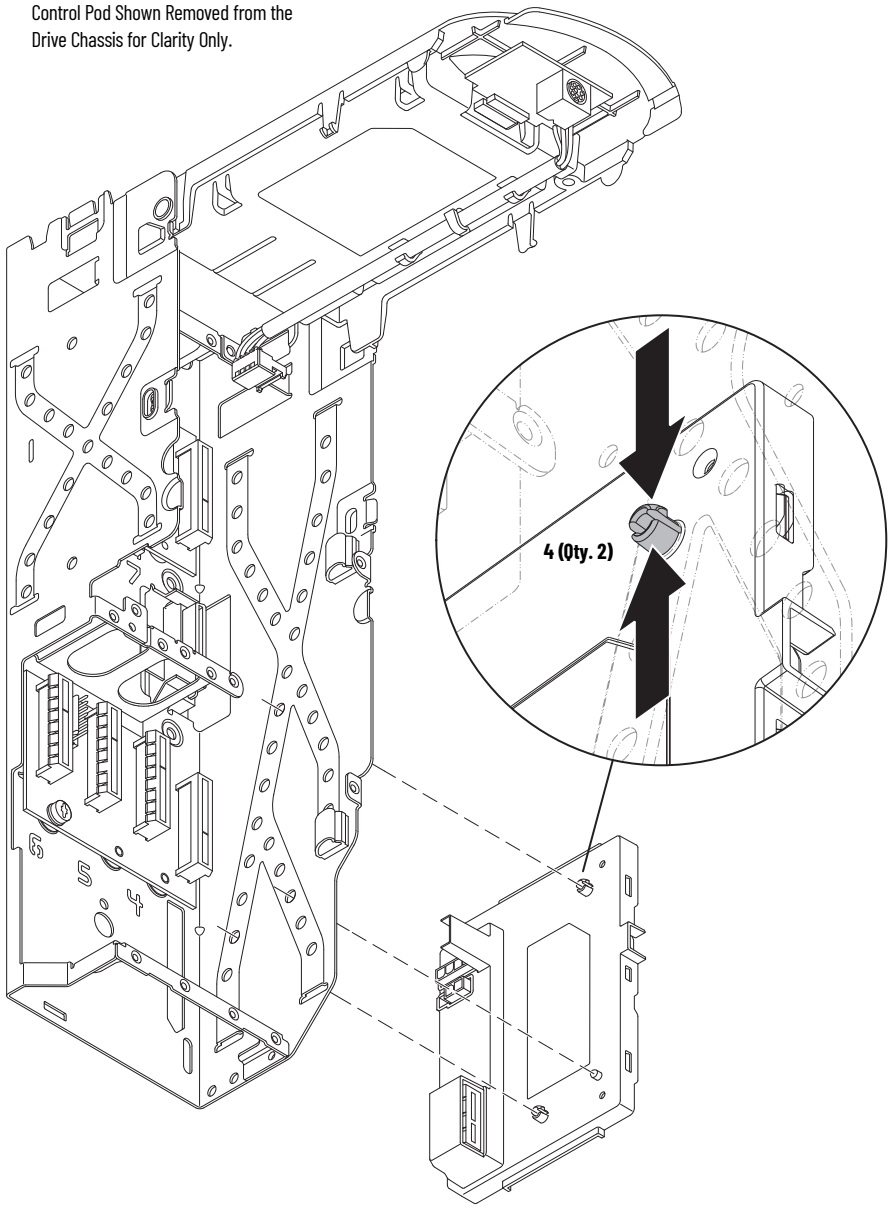
Replacement kit catalog number: SK-RT-PIC1-F27-XT

Remove the Main Control Board to Power Interface Board Ribbon Cable

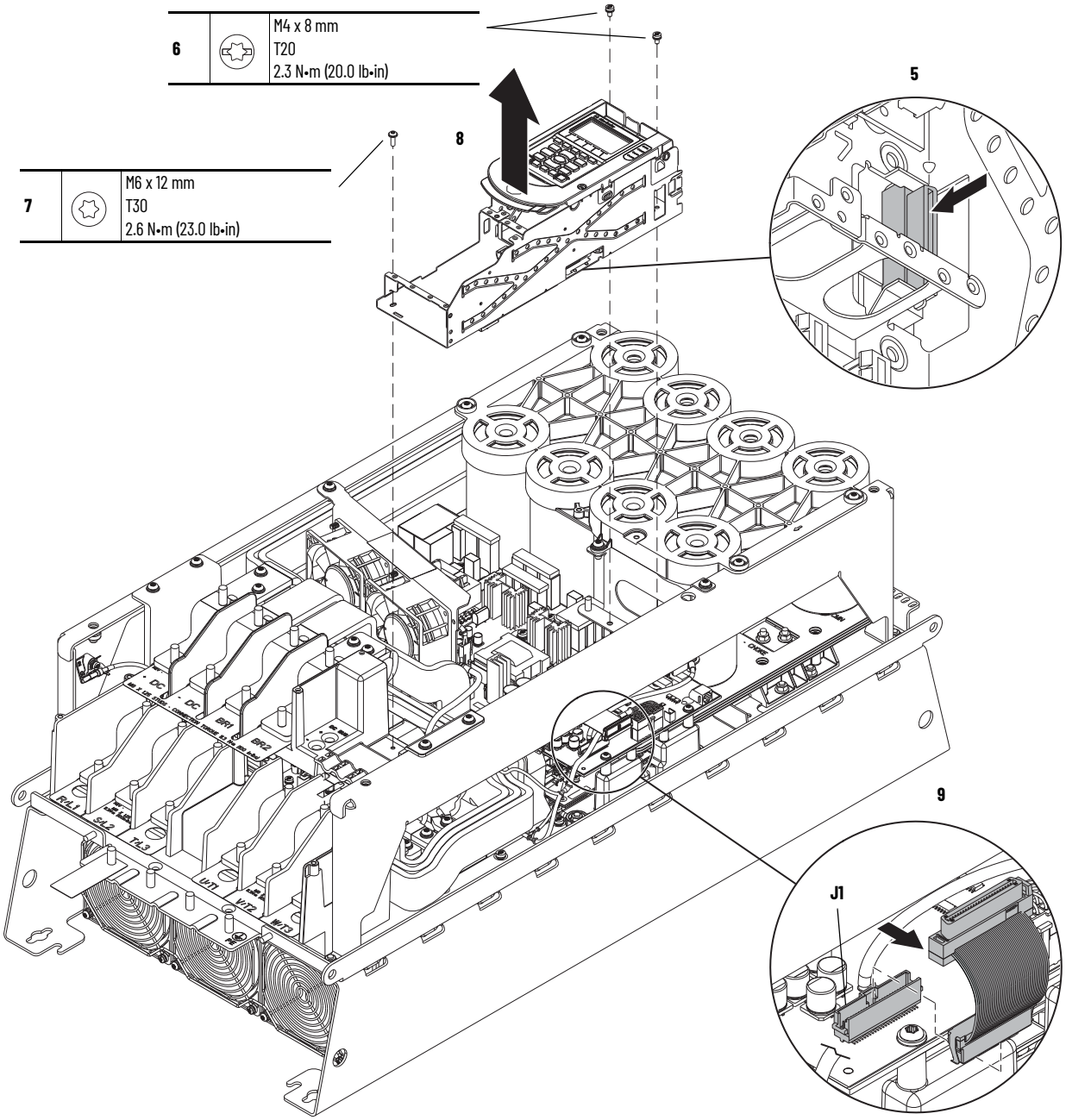
Follow these steps to remove the main control board to power interface board ribbon cable.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the main control circuit board. See Remove the Main Control Circuit Board on page 135.
4. If a torque accuracy module (TAM) is installed, on the interior of the control pod chassis, compress the two posts that secure the TAM to the control pod and push the posts through the mounting holes.

The TAM remains in the drive chassis and connected to the power interface circuit board via a wire harness after the control pod chassis is removed.



5. Remove the ribbon cable connector from the mounting tab on the inside of the control pod chassis and push the cable through the bottom of the chassis.
6. Remove the two M4 x 8 mm slotted-Torx screws that secure the upper control pod chassis to the drive chassis.
7. Remove the M6 x 12 mm Torx screw that secures the lower control pod chassis to the drive chassis.
8. Remove the control pod carefully from the drive and remove the ribbon cable from the opening in the back of the control pod chassis.
9. Disconnect the ribbon cable from the power interface circuit board below the control pod.



Install the Main Control Board to Power Interface Board Ribbon Cable

Install the main control board to power interface board ribbon cable in the reverse order of removal.

Backplane Circuit Board Replacement

Replacement kit catalog number: SK-RT-BKPLN, SK-RT-BKPLN-XT

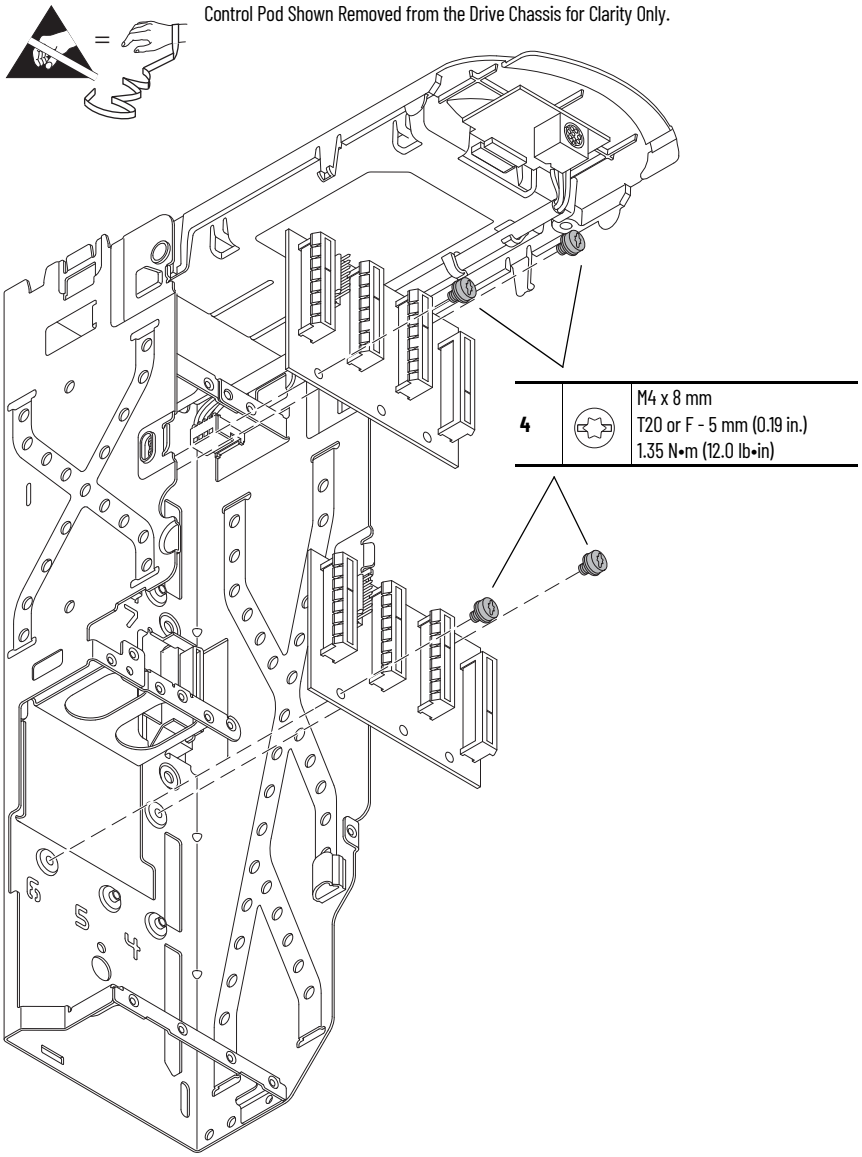
This kit contains one circuit board. The frame 7 control pod contains two backplane circuit boards. It is recommended that you replace both backplane circuit boards simultaneously.

Remove the Backplane Circuit Board

Follow these steps to remove the backplane circuit board.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the main control circuit board. See Remove the Main Control Circuit Board on page 135.

   Retain the main control circuit board for reuse.
4. Remove the two M4 x 8 mm Torx screws that secure the backplane circuit board to the pod chassis and remove the board.



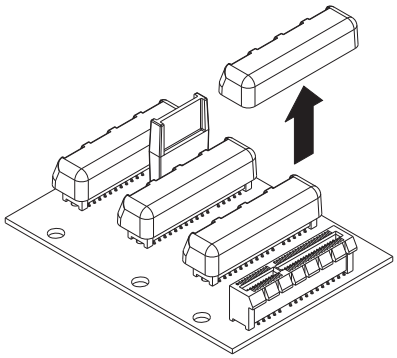
Install the Backplane Circuit Board

The backplane circuit board kit (cat. no. SK-RT-BKPLN or SK-RT-BKPLN-XT) contains two M4 x 6 mm Torx screws. Discard the old M4 x 8 mm Torx screws and install the new M4 x 6 mm Torx screws.

Install the backplane circuit board in the reverse order of removal.

IMPORTANT Do not remove protective covers unless used at the time of installation. For the product to meet the corrosive atmosphere rating, protective covers must remain installed in unused connectors during storage and operation. See Protective Covers on Kits with XT on page 14 for details.

- Do not remove the protective covers from the connectors on the new backplane circuit boards unless a connection must be made during installation.



Heatsink Fan Assembly Replacement

Replacement kit catalog numbers: SK-RT-HSFAN1-F7, SK-RT-HSFAN1-F7-XT. These kits can be used for IP00, NEMA/UL Open Type, and IP21, NEMA/UL Type 1 enclosures.

Replacement kit catalog number: SK-RT-HSFAN2-F7-XT. This kit can be used for flange, NEMA/UL Type 4X/12 back and IP54, NEMA/UL Type 12 enclosures.

Remove the Heatsink Fan Assembly

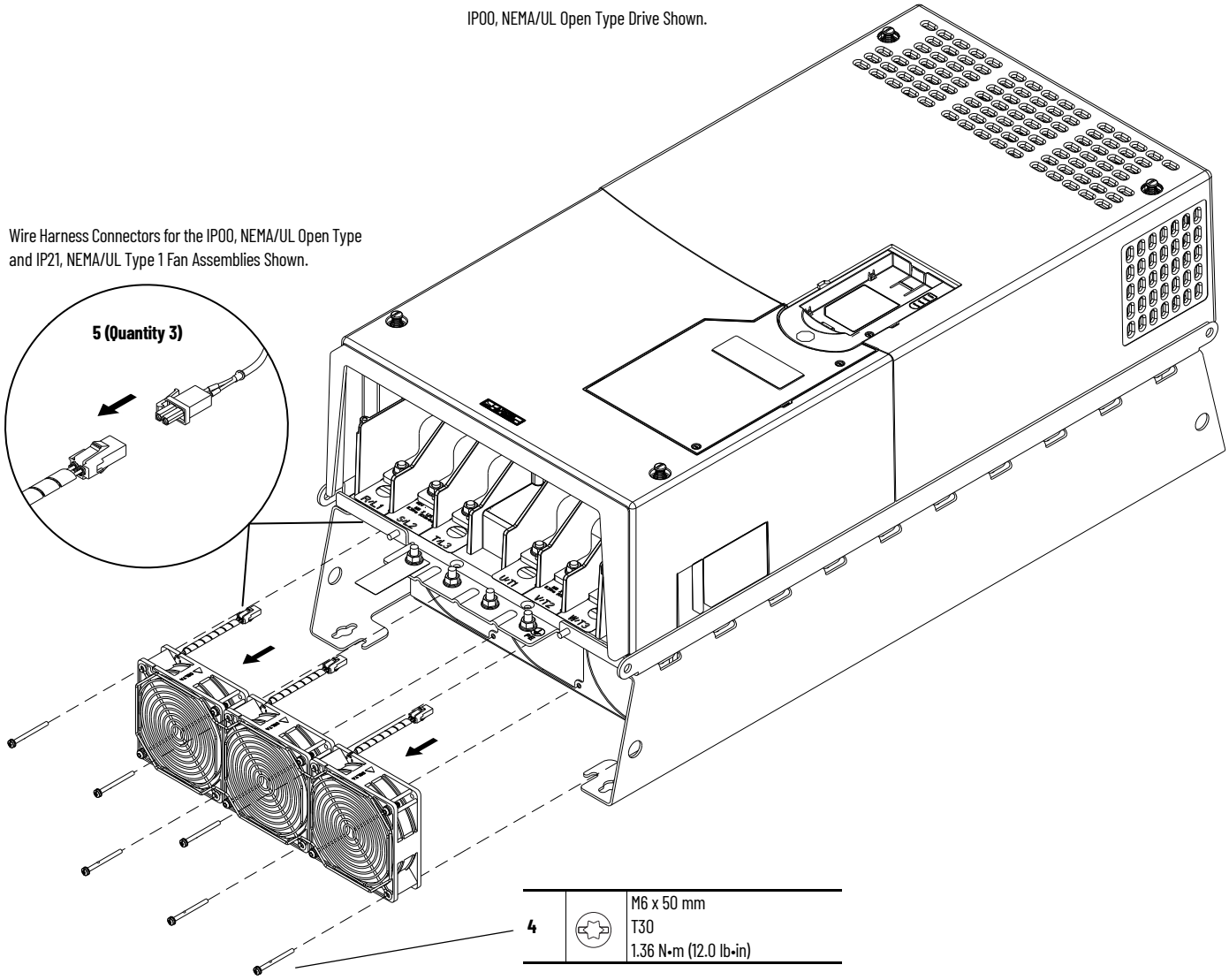
Follow these steps to replace the heatsink fan assembly.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. For IP54, NEMA/UL Type 12 enclosures, open the enclosure door.

4. Remove the four M6 x 50 mm slotted-Torx screws that secure the fan assembly to the chassis and remove the fan assembly partially from the chassis.
5. Disconnect the three fan-assembly power wire harness connectors from the three connectors inside the chassis and remove the fan assembly.

IP00, NEMA/UL Open Type Drive Shown.

Wire Harness Connectors for the IP00, NEMA/UL Open Type and IP21, NEMA/UL Type 1 Fan Assemblies Shown.



4		M6 x 50 mm T30 1.36 N•m (12.0 lb•in)

Install the Heatsink Fan Assembly

Install the heatsink fan assembly in the reverse order of removal.

IMPORTANT Before installation, remove the protective covers from the fan assembly wire harness connectors.

Stirring Fan Assembly Replacement

Replacement kit catalog numbers: SK-RT-STIRFAN1-F7, SK-RT-STIRFAN1-F7-XT

These kits can be used for all enclosure types.

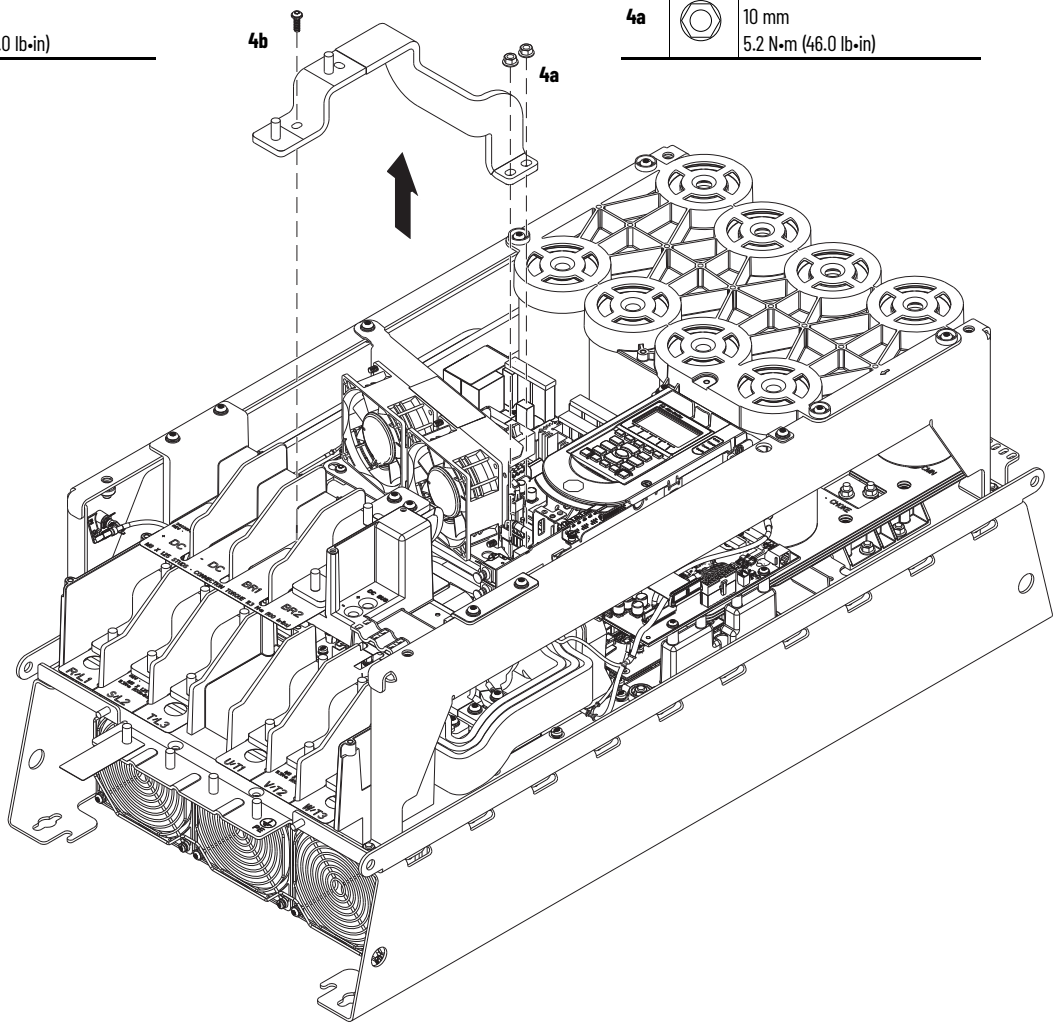
Remove the Stirring Fan Assembly

Follow these steps to replace the stirring fan assembly for a frame 7 drive.

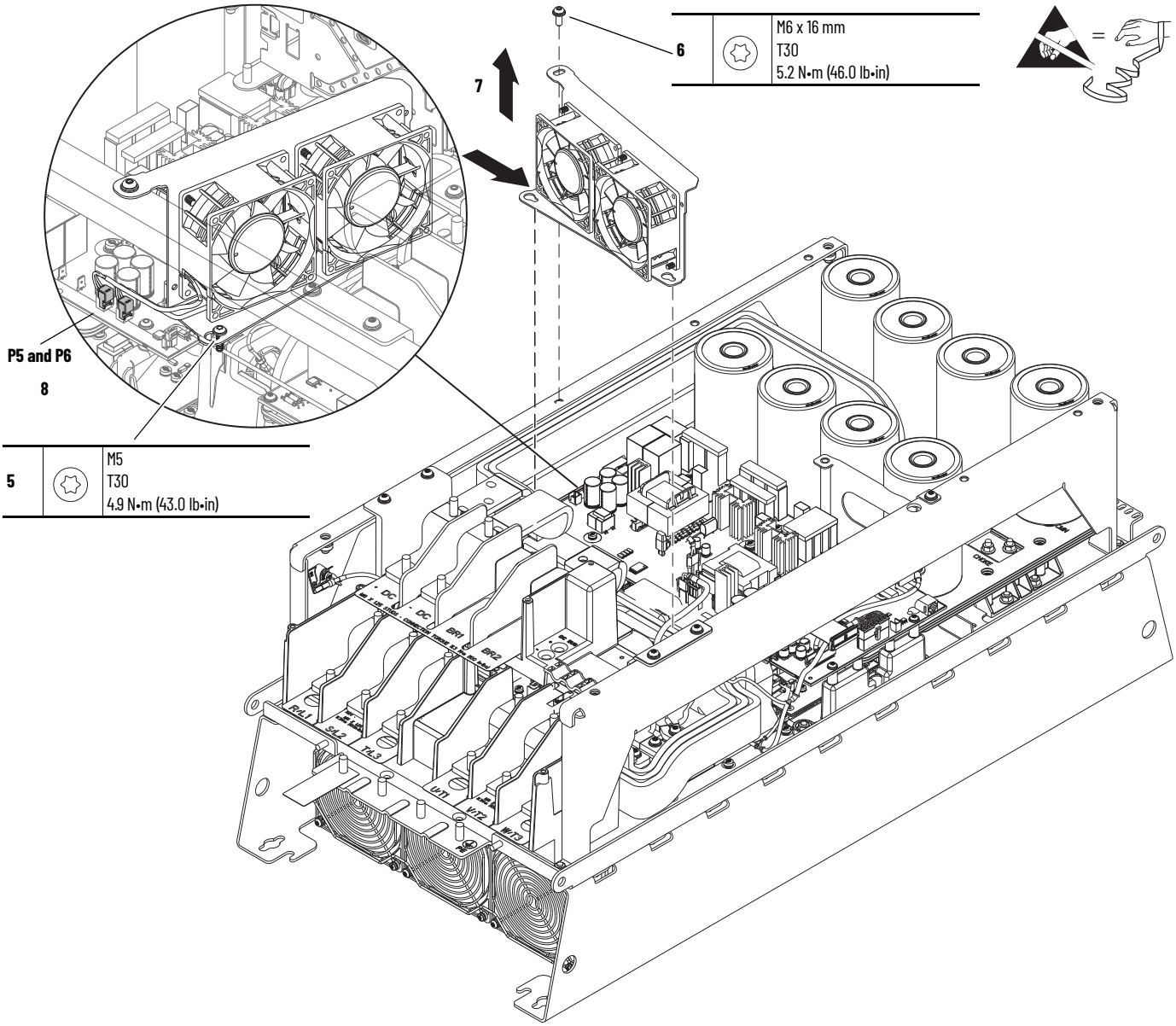
1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Access the drive interior:
   - For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1 and flange, NEMA/UL Type 4X/12 back enclosures, remove the cover. See Remove the Cover on page 129.
   - For IP54, NEMA/UL Type 12 enclosures, open the enclosure and remove the protective guard. See Remove the Protective Guard (IP54, NEMA/UL Type 12 Enclosure) on page 130.
4. If the brake bus bar (BR1) is installed, complete these steps:
   a. Remove the two M6 hexagonal nuts that secure the upper end of the bus bar to the drive.
   b. Remove the M5 x 16 mm Torx screw that secures the lower end of the bus bar to the BR1 terminal and remove the bus bar from the drive.

4b		M5 x 16 mm T25 5.2 N•m (46.0 lb•in)

4a		M6 10 mm 5.2 N•m (46.0 lb•in)



5. Loosen the two lower M5 Torx screws on the stirring fan assembly.
6. Remove the upper M6 x 16 mm Torx screw on the stirring fan assembly.
7. Slide the fan assembly to the right, lift the fan assembly off the screws, and remove the assembly.
8. Disconnect the fan-assembly power wire harness connectors P5 and P6 from connectors J5 and J6, respectively, on the power interface circuit board (left side of the fan assembly).



Install the Stirring Fan Assembly

Install the stirring fan assembly in the reverse order of removal.

Flange Gasket Replacement

Replacement kit catalog numbers: SK-RT-FG1-F7

This kit is used for flange, NEMA/UL Type 4X/12 back enclosures only.

Flange, NEMA/UL Type 4X/12 back drive weight: 82 kg (180 lb).

IMPORTANT Due to the drive weight, a crane or hoist and lifting hardware is recommended for removing the drive from the panel mount surface.

All lifting equipment and components (hooks, bolts, lifts, slings, chains, and so forth) must be properly sized and rated to lift and hold the weight of the equipment safely.

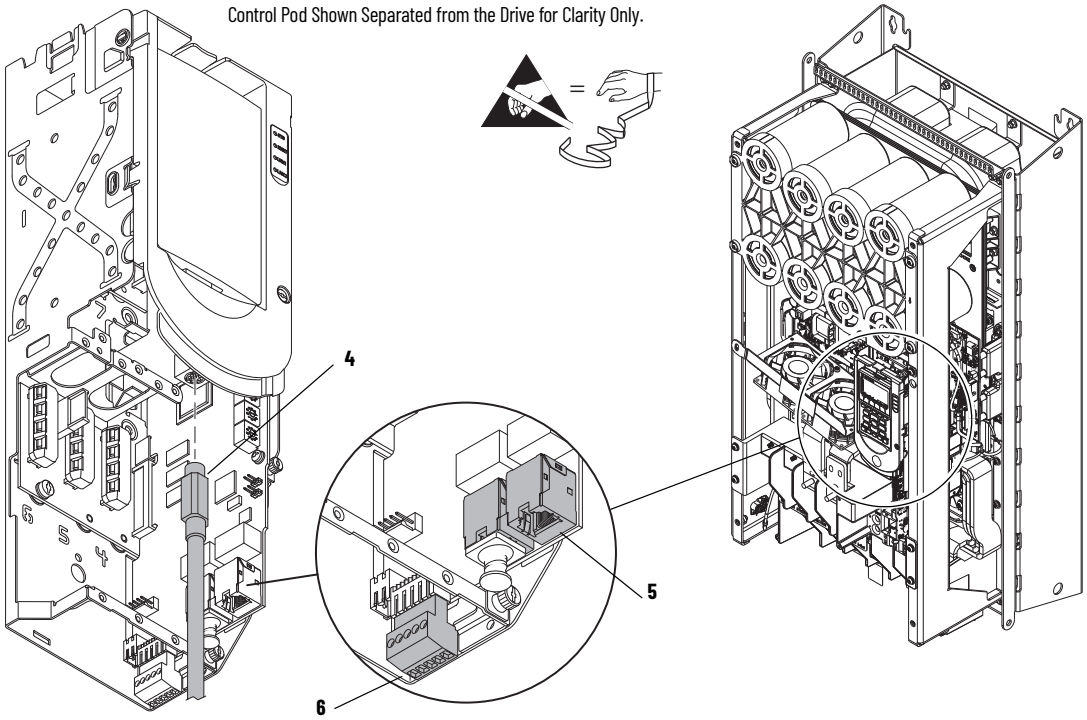
When lifting and handling these products, follow all applicable local, national, and international codes, standards, regulations, or industry guidelines for safe practices.

Remove the Flange Gasket

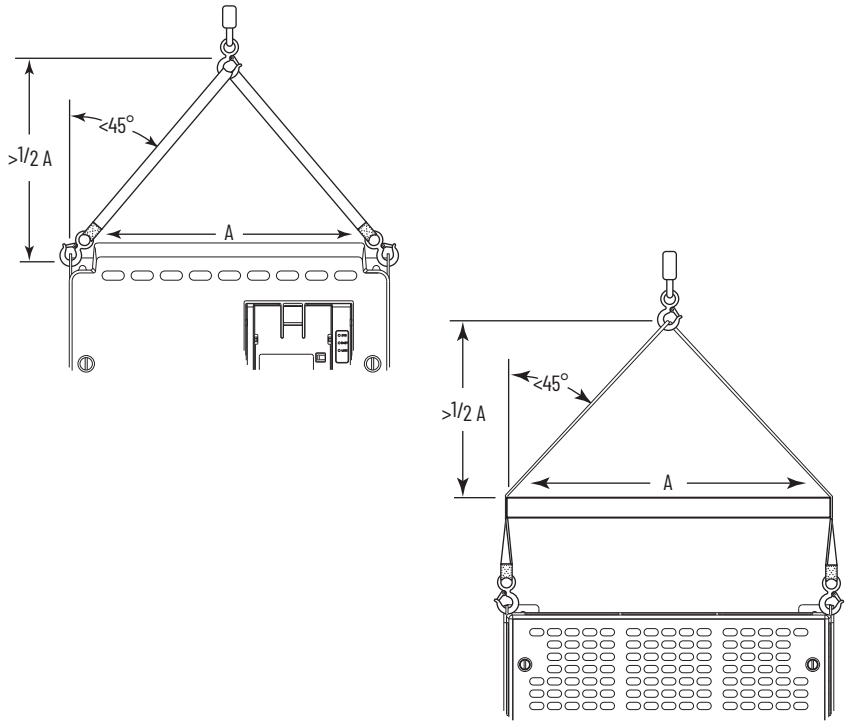
Follow theses steps to remove the gaskets, support brackets, and flange.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Remove the cover. See Remove the Cover on page 129.
4. If used, disconnect the HIM DPI cable from the connector (port 2) on the HIM cradle.

   If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.
5. Disconnect any cables from the Ethernet connectors on the bottom of the main control board in the control pod.
6. If used, disconnect the plug-in terminal block (TB1) on the bottom of the main control board.
7. If an option module is installed, disconnect any I/O wiring terminal blocks If an option module is installed, disconnect any I/O wiring terminal blocks and remove the option module (not shown in this image).



8. If installed, disconnect the power wiring from the power terminals.
9. Attach the lifting hardware and equipment to the drive according to this illustration.


<45°
>1/2 A
A
<45°
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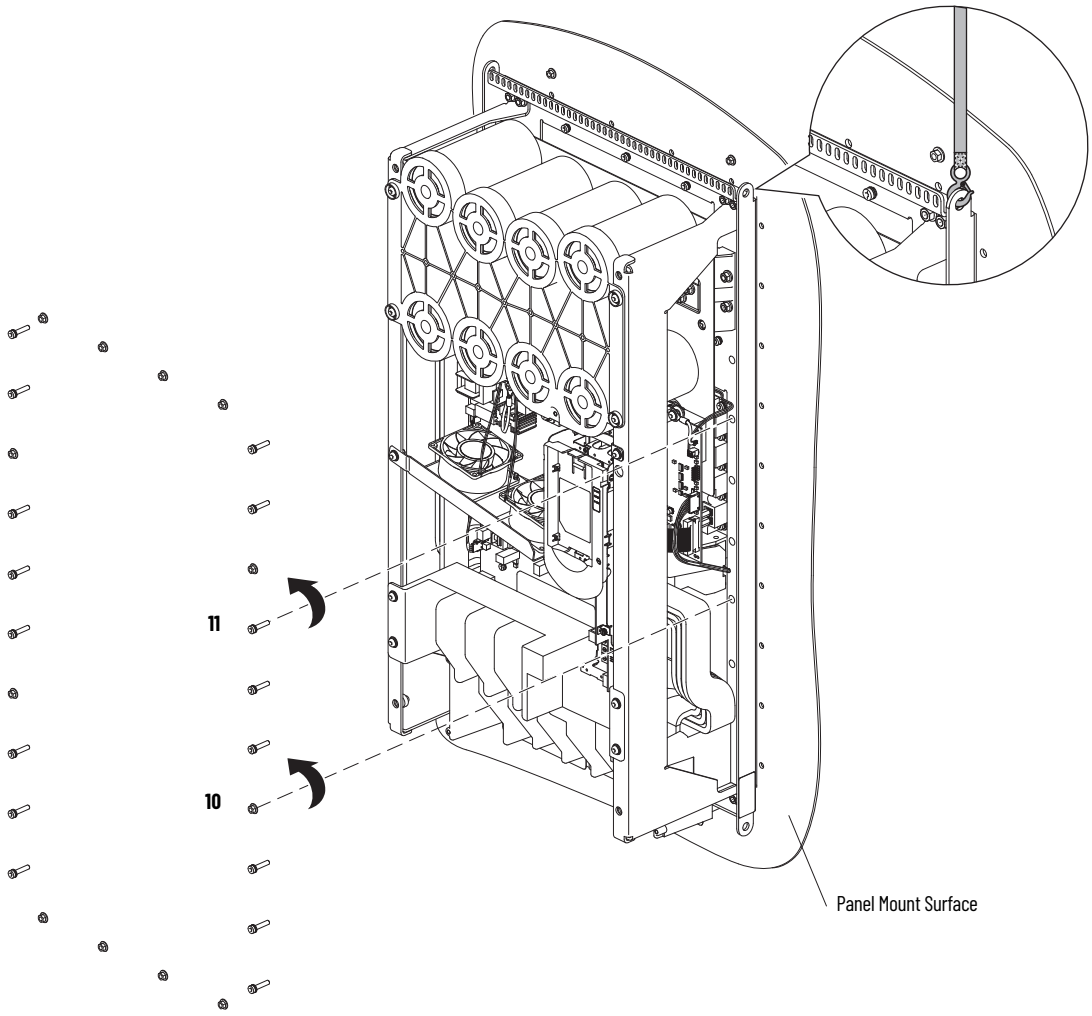
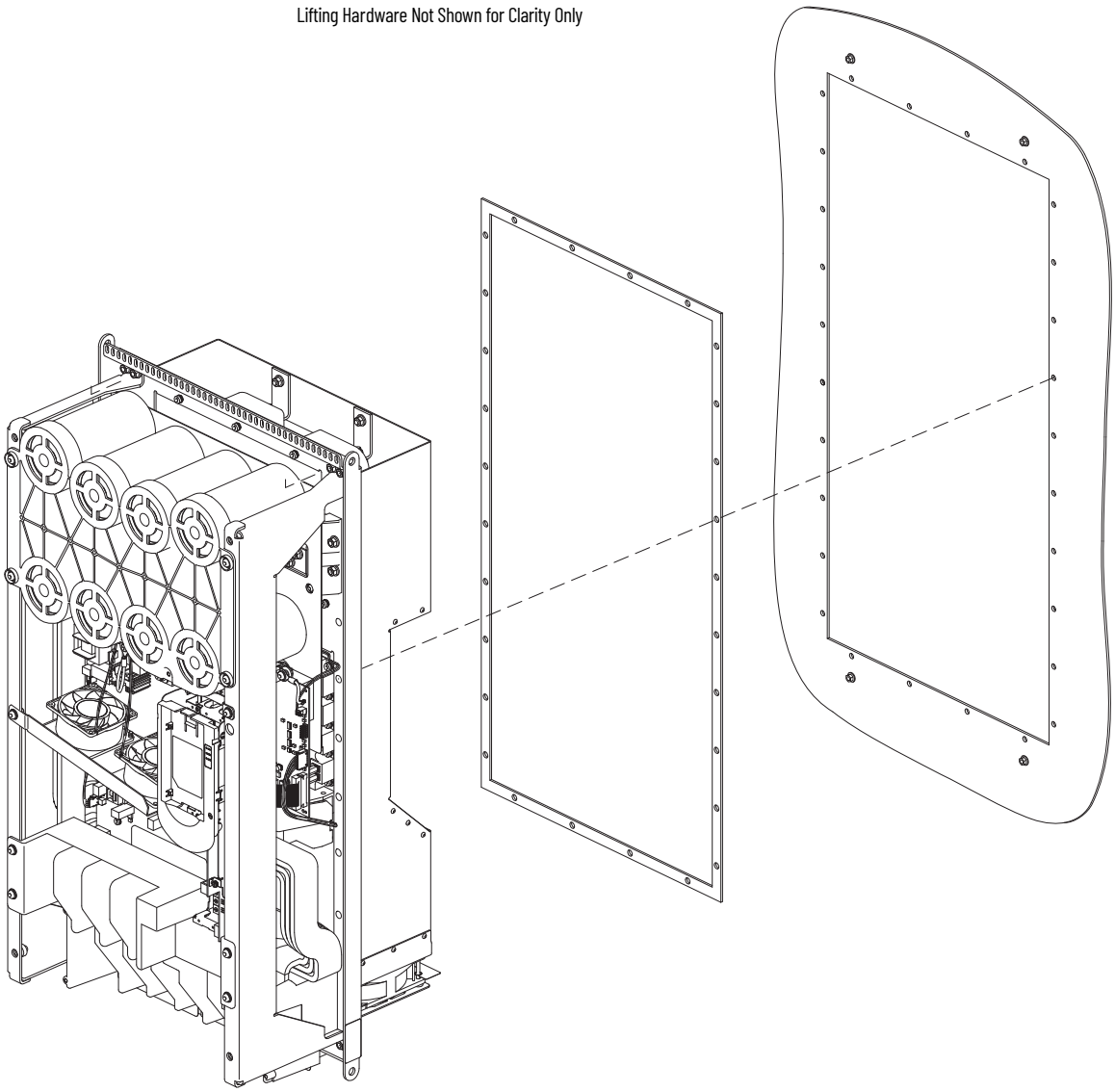
A

10. Remove the 12 M5 x 0.8 hexagonal nuts that secure the drive chassis to the flange.
11. Remove the 16 M5 x 25 mm slotted-Torx screws that secure the drive to the flange.



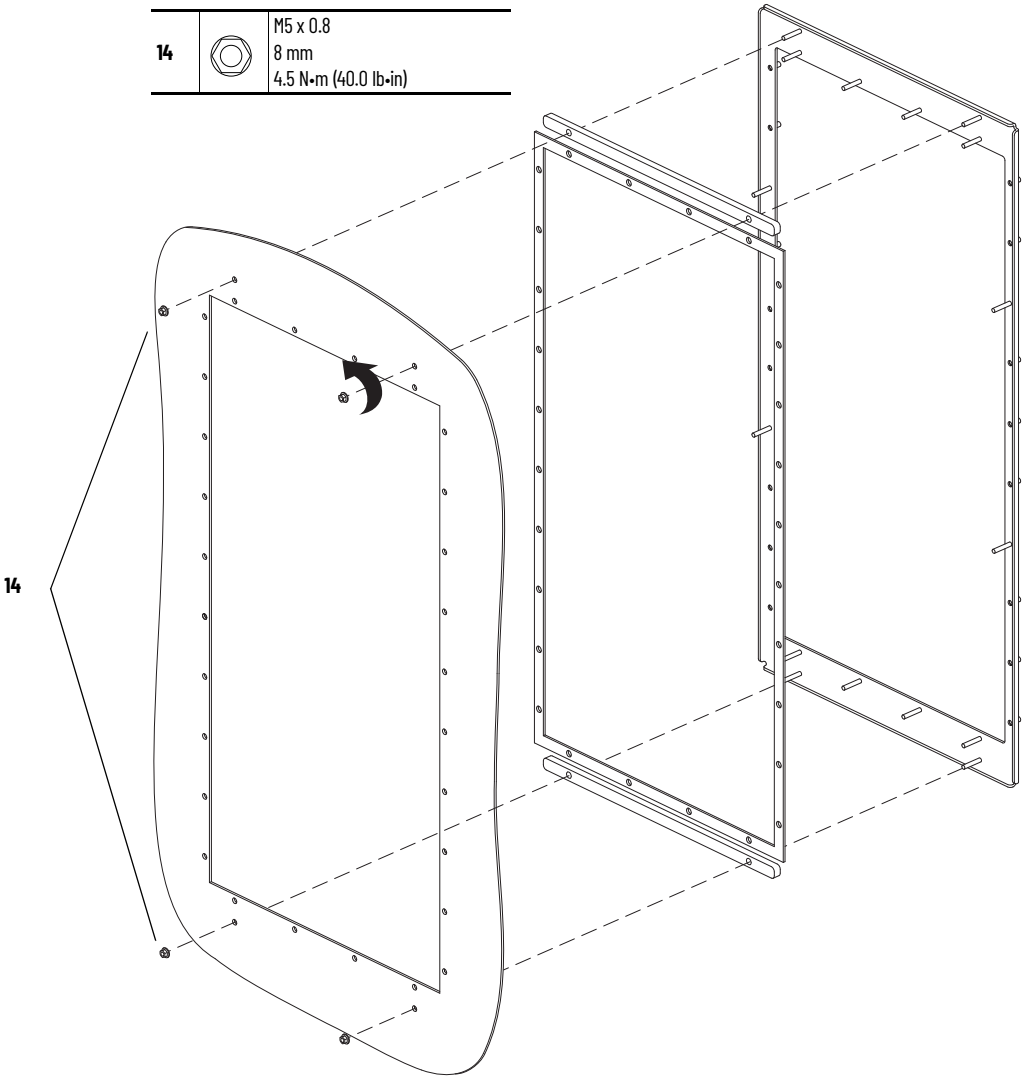
ATTENTION: To guard against possible personal injury or equipment damage:
- Inspect all lifting hardware for proper attachment before lifting the equipment.
- Do not allow any part of the equipment to contact electrically charged conductors or components.
- Do not subject the equipment to high rates of acceleration or deceleration while moving the drive.
- Do not allow personnel or their limbs directly underneath the equipment when lifting or mounting the drive.

12. Lift the drive out of the mounting surface, carefully.
13. Remove and discard the drive-side flange gasket.



14. Remove the four M5 x 0.8 hexagonal nuts that secure the rear gasket, support brackets, and flange to the panel mount surface, and remove the gasket, brackets, and flange. Discard the gasket.

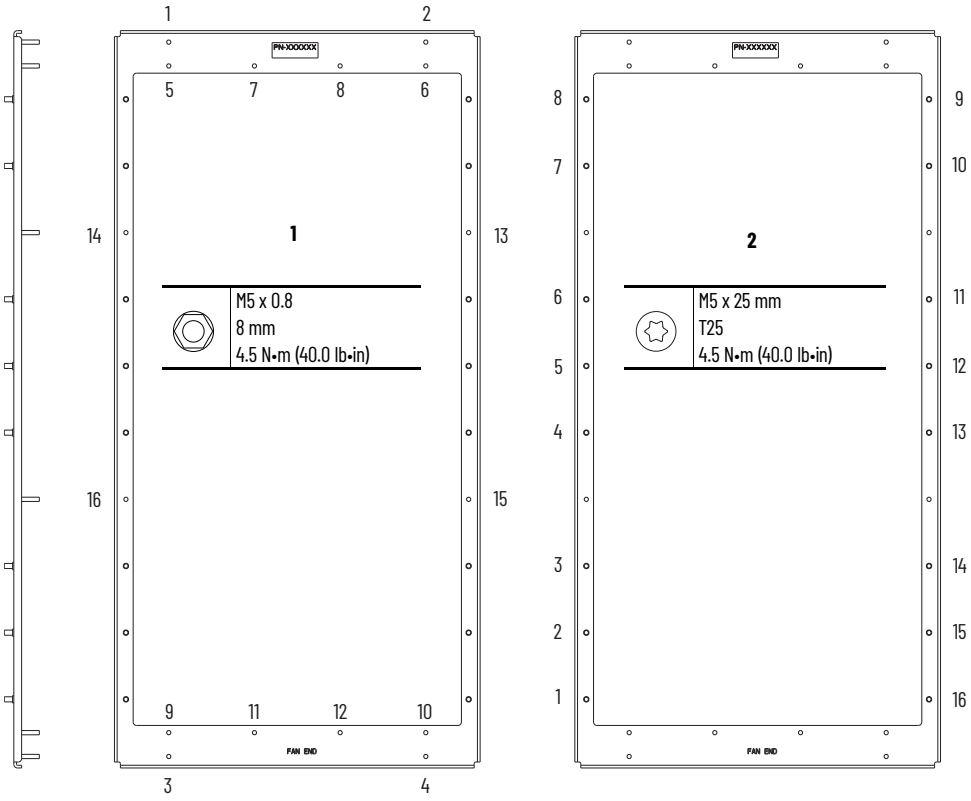
14		M5 x 0.8 8 mm 4.5 N•m (40.0 lb•in)



Install the Flange Gasket

Install the gaskets, support brackets, and flange in the reverse order of removal. Follow these steps to install the hardware that secures the drive chassis to the panel mount surface.

1. Install the M5 x 0.8 hexagonal nuts that secure the drive chassis to the flange in the sequence shown here.
2. Install the M5 x 25 mm slotted-Torx screws that secure the drive chassis to the flange in the sequence shown here.



Power Interface Circuit Board Replacement

Replacement kit catalog numbers are based on the drive normal duty power rating:

208V/240V Power Interface Circuit Board Renewal Kits

Drive Rating	Power Interface Circuit Board Catalog Number	
	Standard	XT
260 A 208V / 260 A 240V(1)	SK-RT-PIB1-B260-F7	SK-RT-PIB1-B260-F7-XT
359 A 208V / 312 A 240V	SK-RT-PIB1-B312	SK-RT-PIB1-B312-XT
414 A 208V / 360 A 240V	SK-RT-PIB1-B360	SK-RT-PIB1-B360-XT
477 A 208V / 477 A 240V(2)	SK-RT-PIB1-B477	SK-RT-PIB1-B477-XT

(1) Drives installed in an IP54, NEMA/UL Type 12 enclosure only.
(2) Not used for drives installed in an IP54, NEMA/UL Type 12 enclosure.

400V/480V Power Interface Circuit Board Renewal Kits

Drive Rating	Power Interface Circuit Board Catalog Number	
	Standard	XT
260 A 400V / 248 A 480V	SK-RT-PIB1-C260D248-F7	SK-RT-PIB1-C260D248-F7-XT
302 A 400V / 302 A 480V	SK-RT-PIB1-C302D302	SK-RT-PIB1-C302D302-XT
367 A 400V / 361 A 480V	SK-RT-PIB1-C367D361	SK-RT-PIB1-C367D361-XT
456 A 400V / 415 A 480V	SK-RT-PIB1-C456D415	SK-RT-PIB1-C456D415-XT
477 A 400V / 477 A 480V(1)	SK-RT-PIB1-C477D477	SK-RT-PIB1-C477D477-XT

(1) Not used for drives installed in an IP54, NEMA/UL Type 12 enclosure.

600V/690V Power Interface Circuit Board Renewal Kits

Drive Rating	Power Interface Circuit Board Catalog Number	
	Standard	XT
192 A 600V / 171 A 690V	SK-RT-PIB1-E192F171	SK-RT-PIB1-E192F171-XT
242 A 600V / 212 A 690V	SK-RT-PIB1-E242F212	SK-RT-PIB1-E242F212-XT
289 A 600V / 263 A 690V	SK-RT-PIB1-E289F263	SK-RT-PIB1-E289F263-XT

Remove the Power Interface Circuit Board

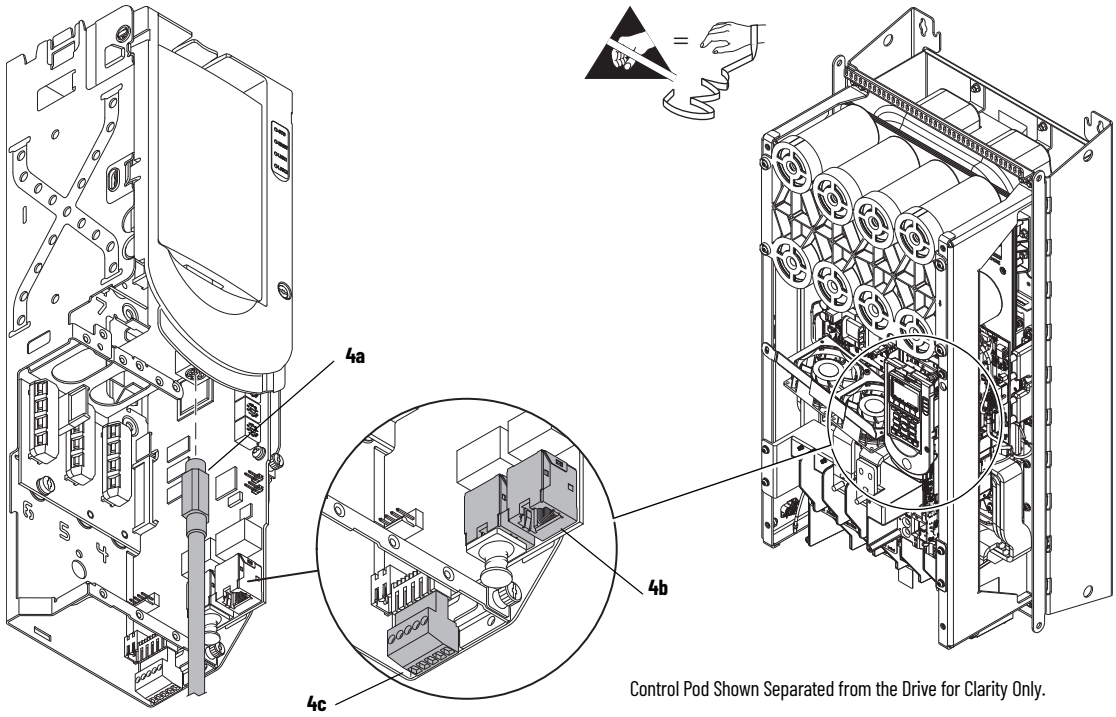
Follow these steps to remove the power interface circuit board.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Access the drive interior:
   - For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1 and flange, NEMA/UL Type 4X/12 back enclosures, remove the cover. See Remove the Cover on page 129.
   - For IP54, NEMA/UL Type 12 enclosures, open the enclosure and remove the protective guard. See Remove the Protective Guard (IP54, NEMA/UL Type 12 Enclosure) on page 130.

4. To prepare the control pod for removal from the drive, complete these steps:
   a. If used, disconnect the HIM DPI cable from the connector (port 2) on the HIM cradle.

      If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.

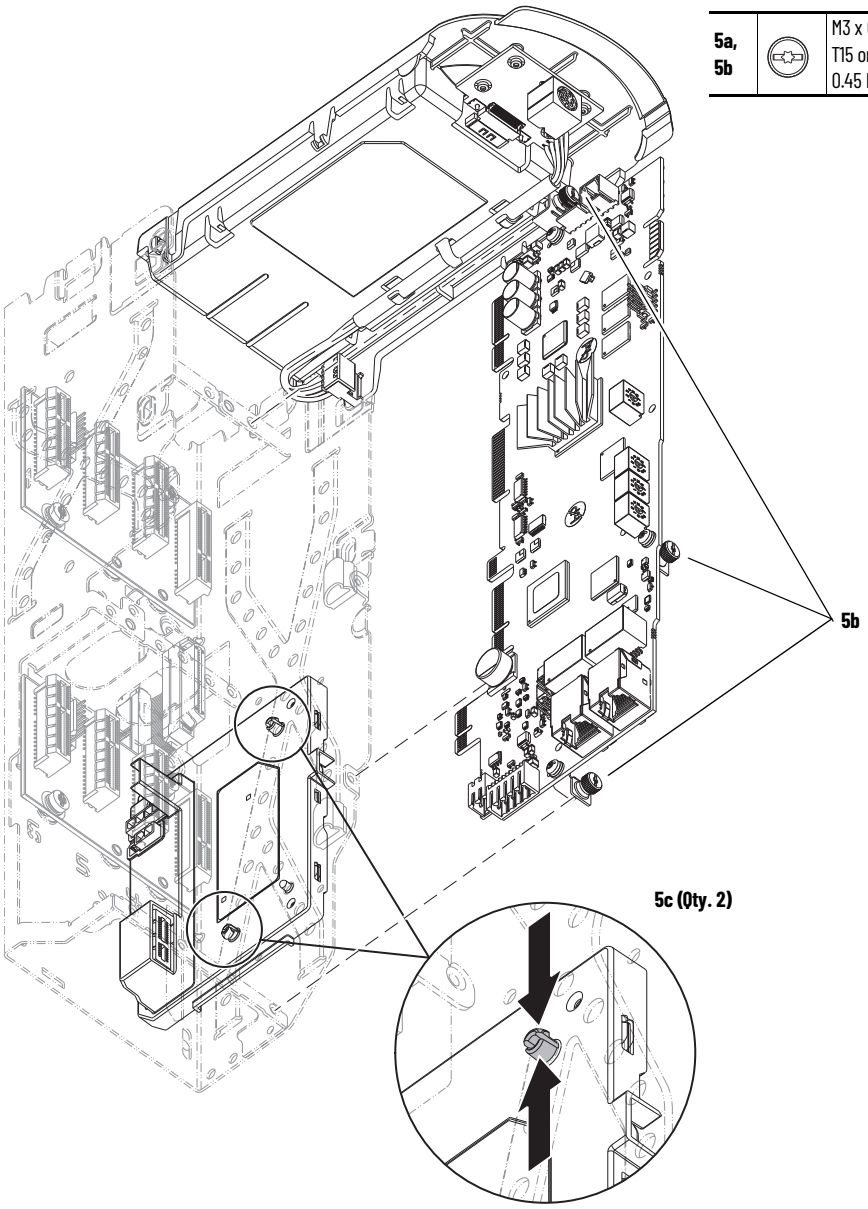
   b. Disconnect any cables from the Ethernet connectors on the bottom of the main control board in the control pod.
   c. If used, disconnect the plug-in terminal block (TB1) on the bottom of the main control board.
   d. If an option module is installed, disconnect any I/O wiring terminal blocks and remove the option module (not shown in this image).



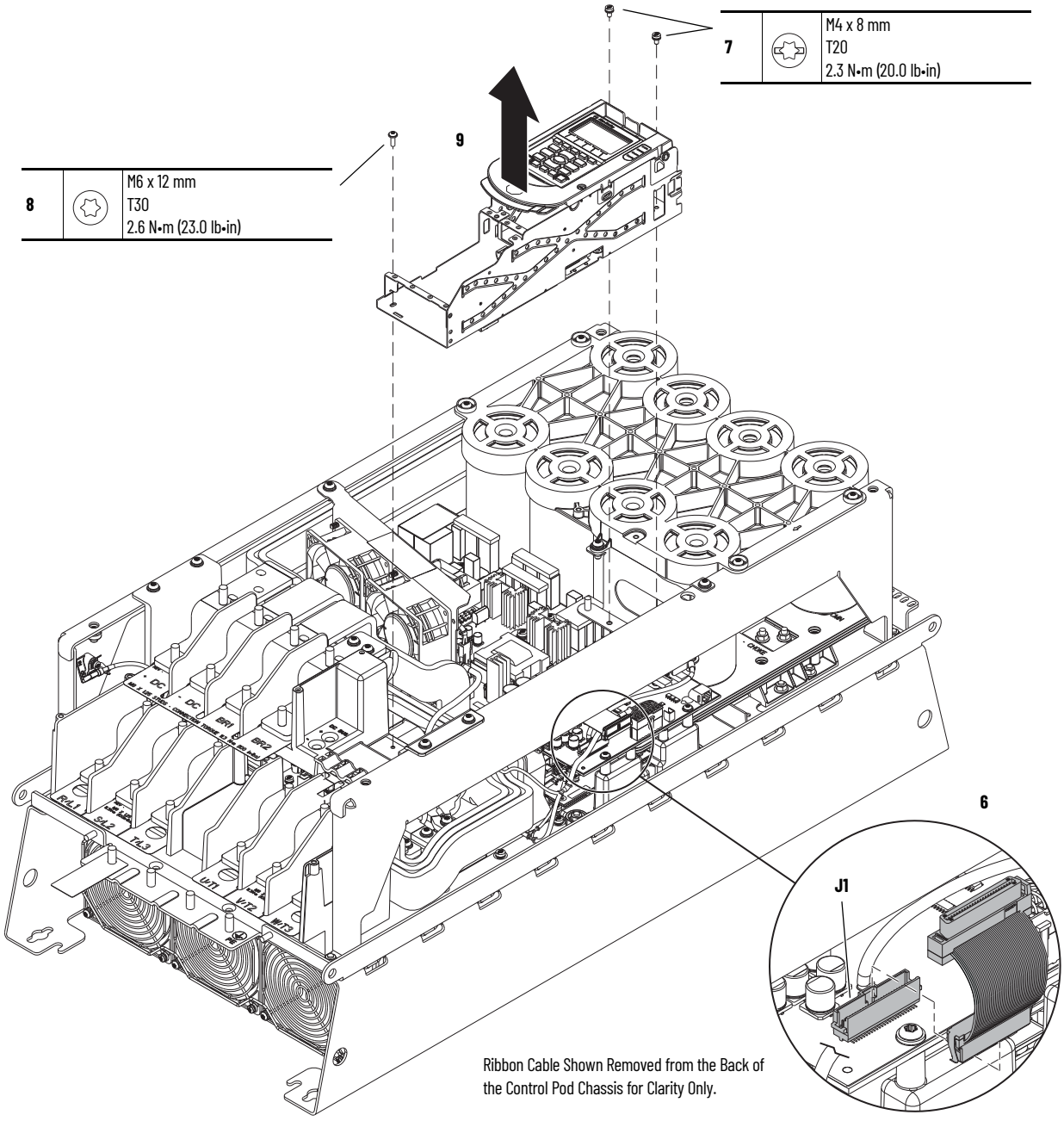
Control Pod Shown Separated from the Drive for Clarity Only.

5. If a torque accuracy module (TAM) is installed, complete steps a and c.
   a. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position (see previous image).
   b. Loosen the three M3 captive slotted-Torx screws that secure the main control circuit board to the control pod chassis and remove the main control board.
   c. On the interior of the control pod chassis, compress the two posts that secure the TAM to the control pod and push the posts through the mounting holes.

The TAM remains in the drive chassis and connected to the power interface circuit board via a wire harness after the control pod chassis is removed.



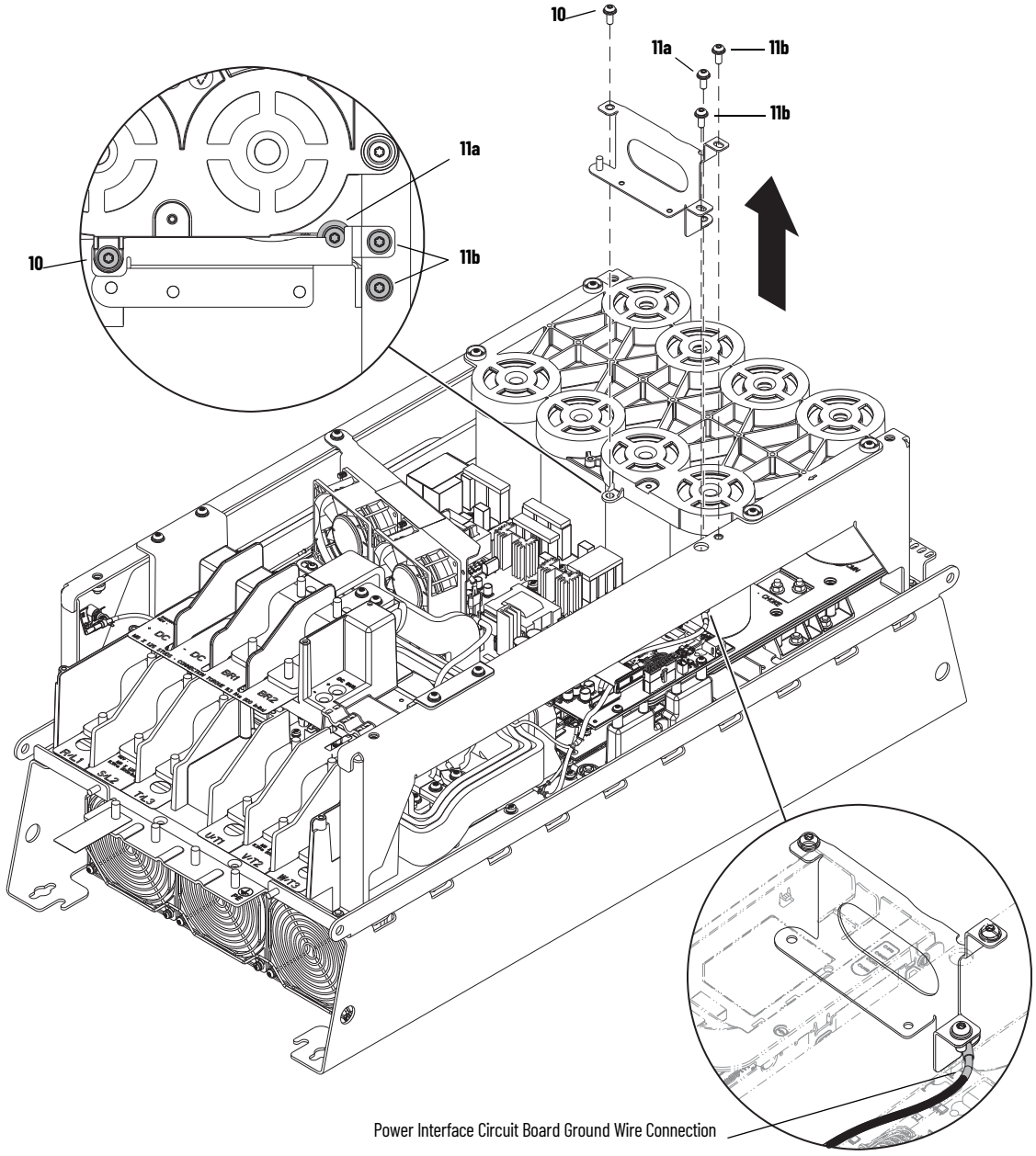
6. Disconnect the ribbon cable from connector J1 on the power interface circuit board below the control pod.
7. Remove the two M4 x 8 mm slotted-Torx screws that secure the upper control pod chassis to the drive chassis.
8. Remove the M6 x 12 mm Torx screw that secures the lower control pod chassis to the drive chassis.
9. Remove the control pod carefully from the drive.



10. Remove the M6 x 16 mm Torx screw that secures the capacitor bank cover to the control pod support bracket.
11. Complete these steps to remove the control pod support bracket:
    a. Remove the M6 x 16 mm Torx screw from the rear, right side of the control pod support bracket.
    b. Remove the two M6 x 16 mm Torx screws from the upper and lower right side of the control pod support bracket and remove the bracket from the chassis.

The power interface circuit board ground wire harness is connected to the screw on the lower right side of the control pod support bracket

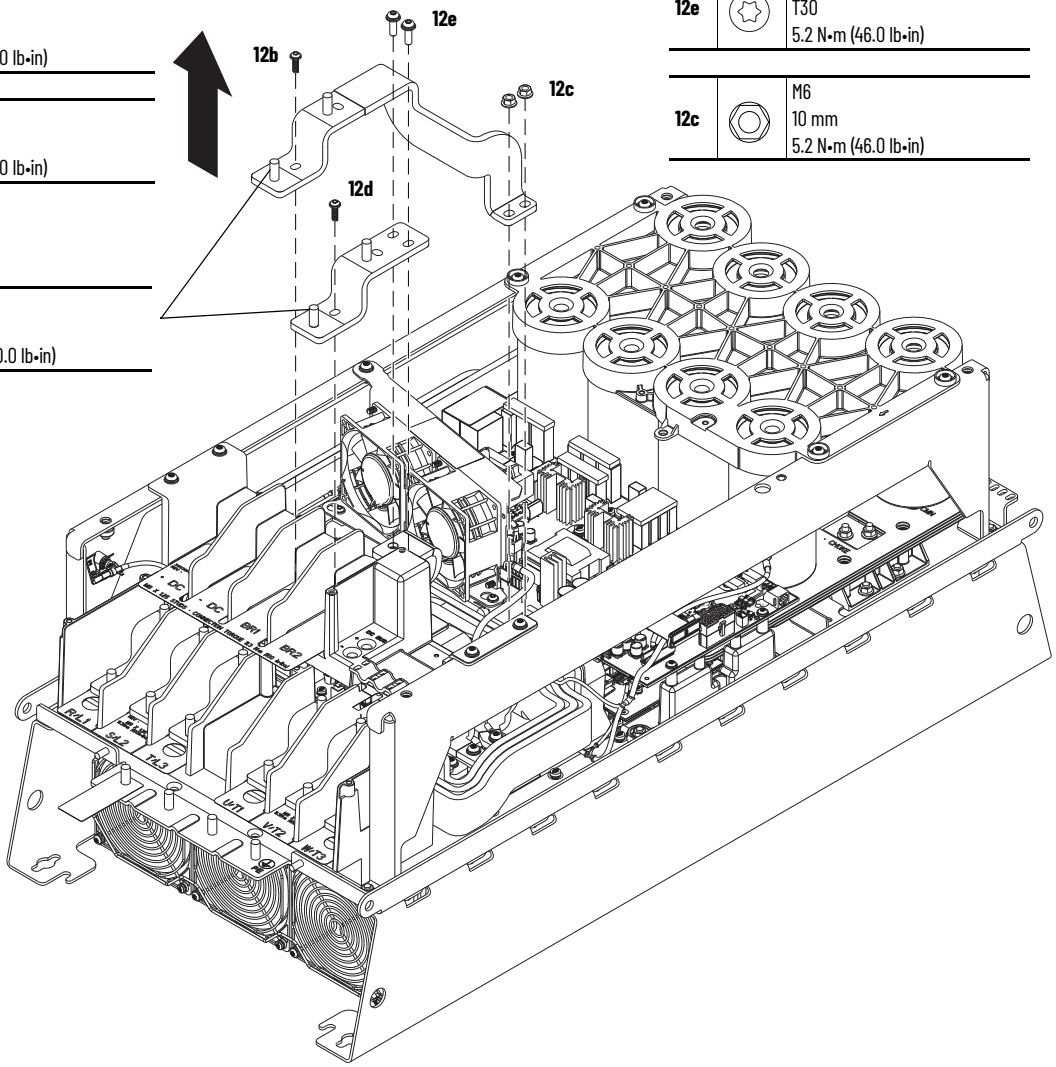
10		M6 x 16 mm T30 6.0 N•m (53.0 lb•in)
11a		M6 x 16 mm T30 2.6 N•m (23.0 lb•in)
11b		M6 x 16 mm T30 6.0 N•m (53.0 lb•in)



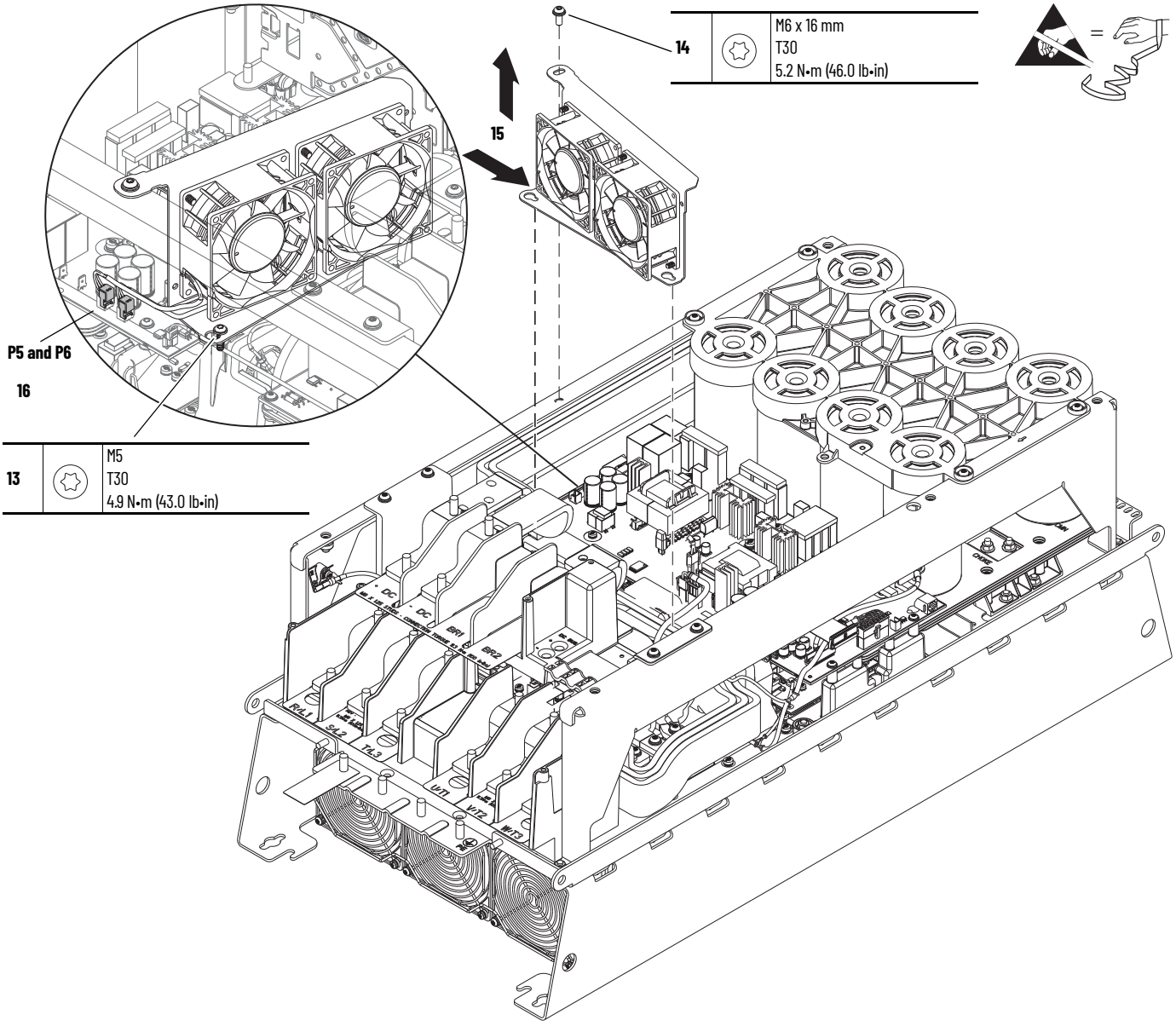
12. If a brake option is installed, complete these steps:
    a. Remove the M8 nuts that secure the power cables to the brake terminals.
    b. Remove the M5 x 16 mm Torx screw that secures the long bus bar to the BR1 terminal and remove the bus bar.
    c. Remove the two M6 nuts that secure the long bus bar (BR1) to the lower bus bars.
    d. Remove the M5 x 16 mm Torx screw that secures the short bus bar to the BR2 terminal.
    e. Remove the two M6 x 20 Torx screws that secure the short bus bar to the BR2 terminal and remove the bus bar.

12b		M5 x 16 mm T25 4.9 N•m (43.0 lb•in)
12d		M5 x 16 mm T25 4.9 N•m (43.0 lb•in)
12a		M8 13 mm 11.3 N•m (100.0 lb•in)

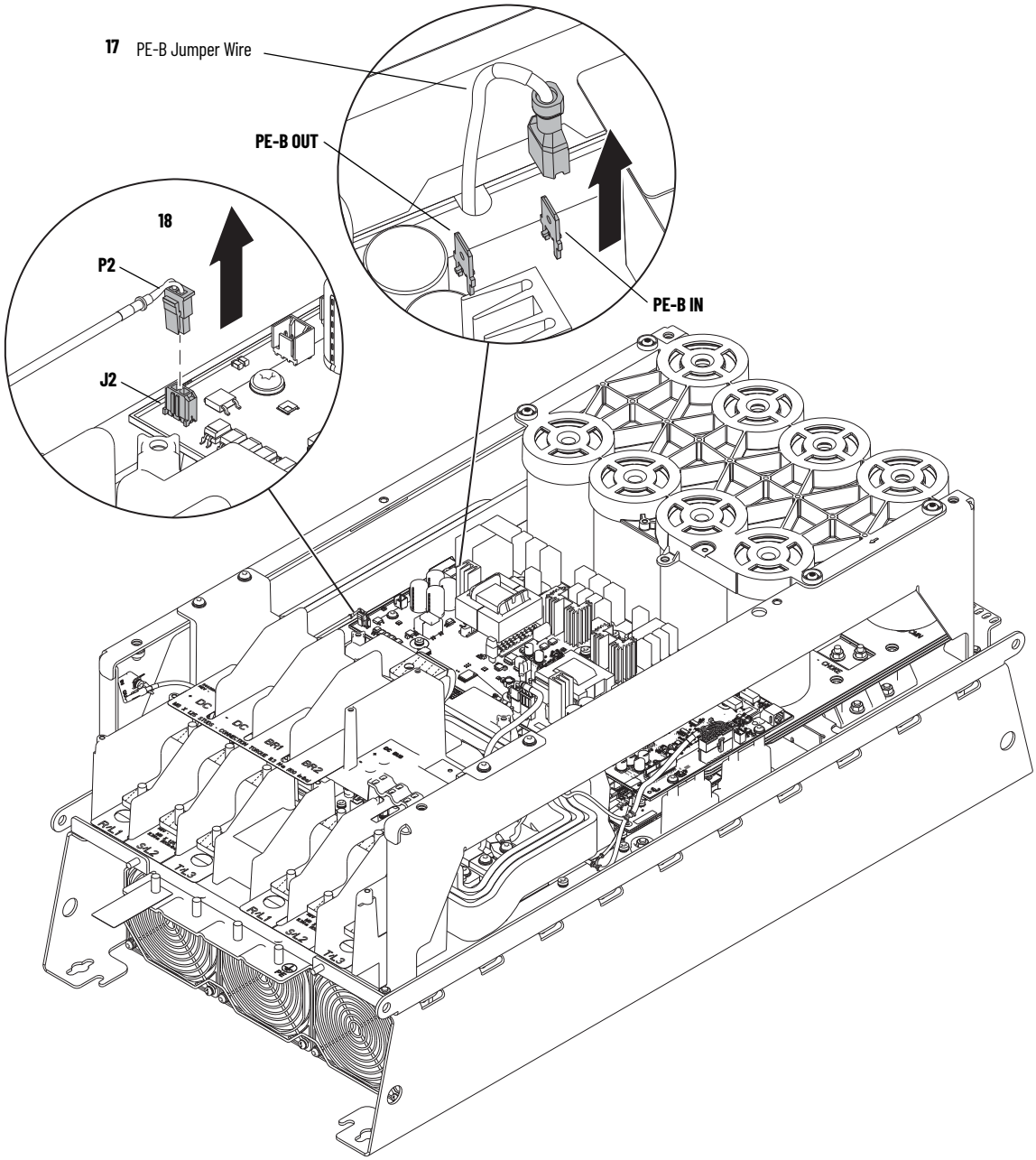
12e		M6 x 20 mm T30 5.2 N•m (46.0 lb•in)
12c		M6 10 mm 5.2 N•m (46.0 lb•in)



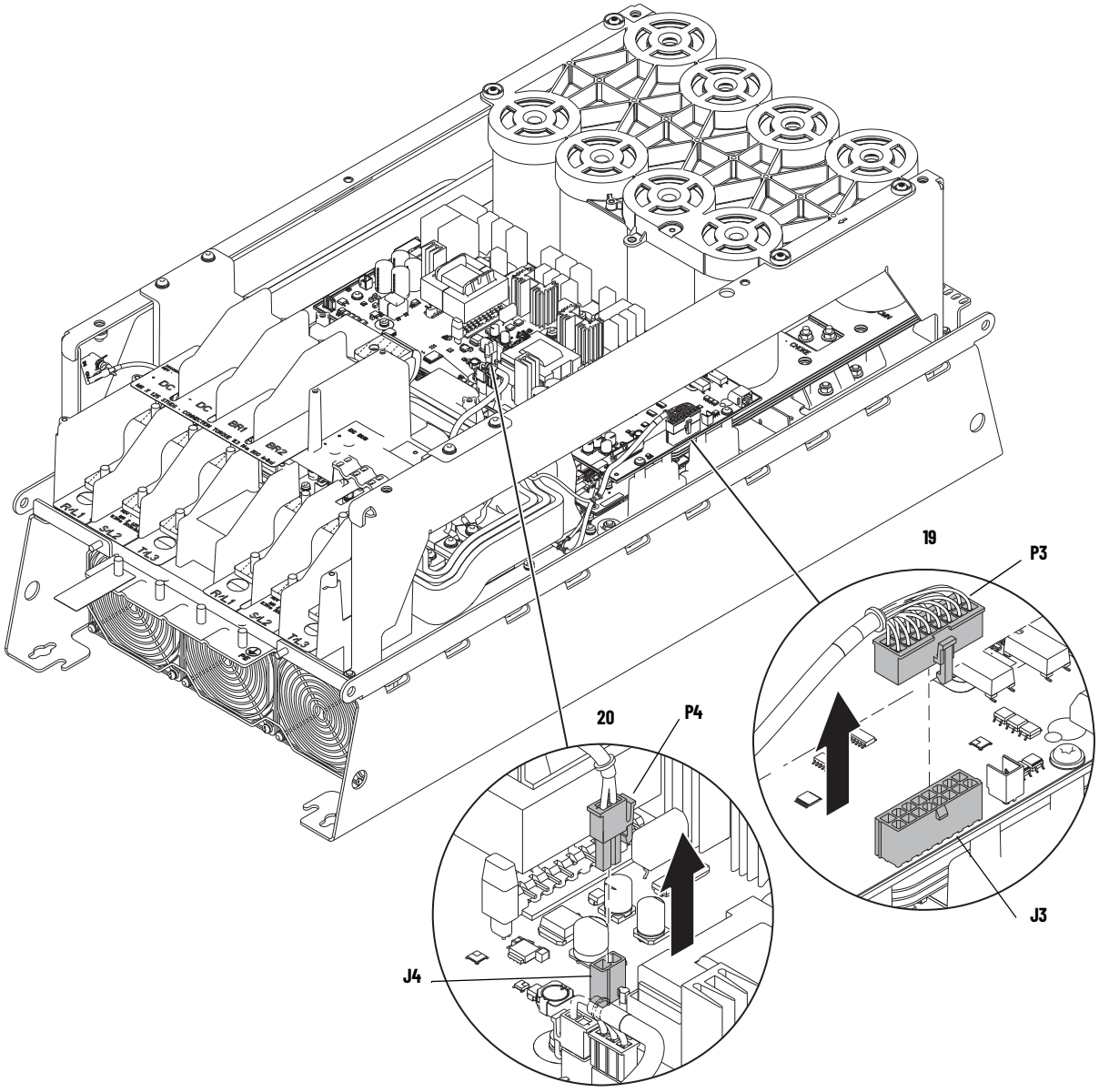
13. Loosen the two lower M5 Torx screws that secure the lower stirring fan assembly to the chassis.
14. Remove the upper M6 x 16 mm Torx screw that secures the upper fan assembly to the chassis side bracket.
15. Slide the fan assembly to the right, lift the fan assembly off the screws, and remove the assembly.
16. Disconnect the fan-assembly power wire harness connectors P5 and P6 from connectors J5 and J6, respectively, on the power interface circuit board (left side of the fan assembly).



17. Disconnect the PE-B jumper wire from the power interface circuit board (top left).
18. Disconnect the heatsink fan power wire-harness connector P2 from connector J2 on the power interface circuit board (bottom left).



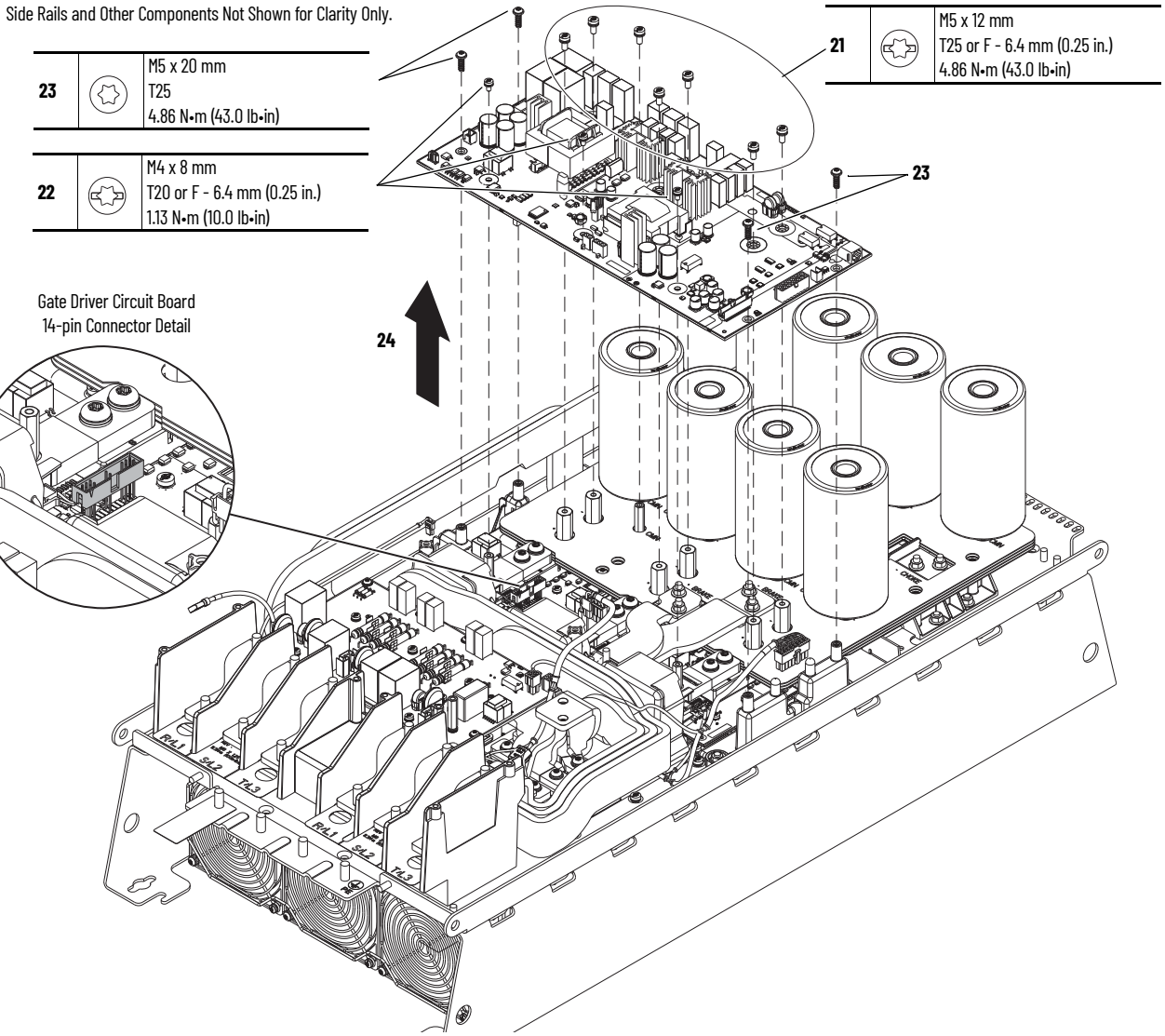
19. Disconnect the current transformer wire-harness connector P3 from J3 on the power interface circuit board (mid right).
20. If a torque accuracy module (TAM) is installed, disconnect the wire harness connector P4 from connector J4 on the power interface circuit board.



21. Remove the seven M5 x 12 mm slotted-Torx screws in the center of the board.
22. Remove three M4 x 8 mm slotted-Torx screws at the bottom edge of the board.
23. Remove the four M5 x 20 mm Torx screws, two at the left and two at the right edge of the board.

IMPORTANT A connector on the back side of the power interface circuit board is connected to a mating connector on the gate driver circuit board.

24. Lift the power interface circuit board carefully off the gate driver board connector (detail shown in this illustration) and remove the power interface circuit board from the drive.



Install the Power Interface Circuit Board

Install the power interface circuit board in the reverse order of removal.

IMPORTANT Carefully align the connector on the bottom-left side of the power interface circuit board to the 14-pin connector on the gate drive circuit board.

IMPORTANT Be sure to install the power interface circuit board ground wire harness to the control pod support bracket. See step 11 on page 157 for location.

AC Precharge Circuit Board Replacement

Replacement kit catalog numbers are based on the drive voltage class:

Voltage Class	AC Precharge Circuit Board Catalog Number	
	Standard	XT
208V/240V	SK-RT-ACPC-BF7	SK-RT-ACPC-BF7-XT
400V/480V	SK-RT-ACPC-CDF7	SK-RT-ACPC-CDF7-XT
600V/690V	SK-RT-ACPC-EFF7	SK-RT-ACPC-EFF7-XT

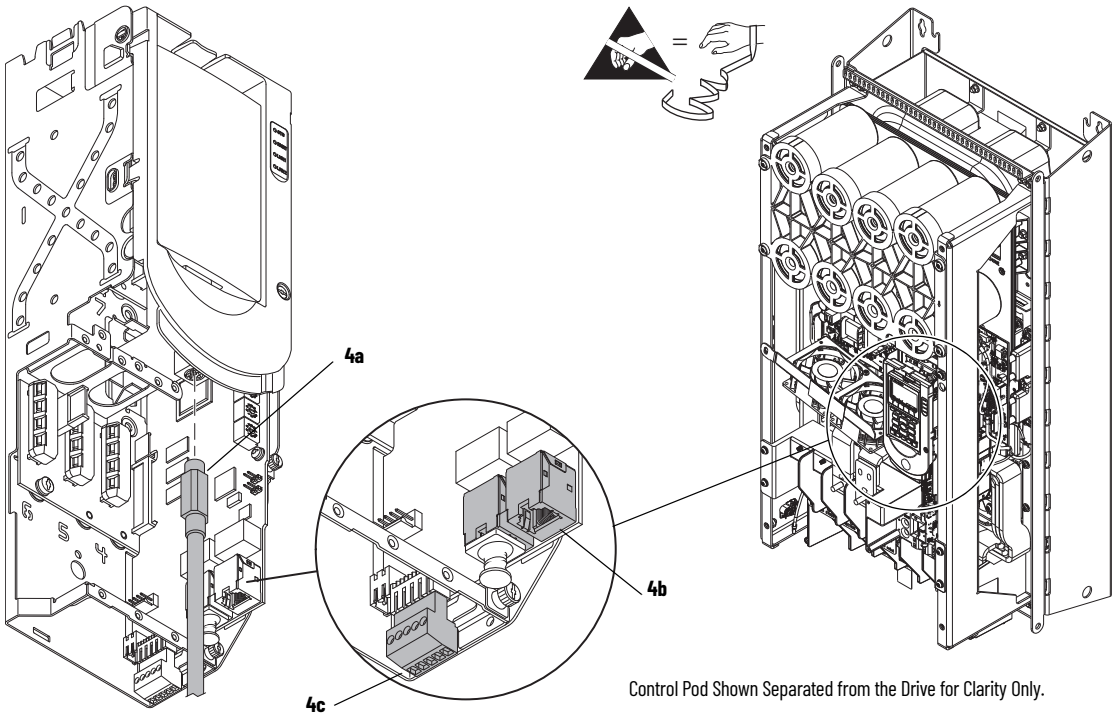
Remove the AC Precharge Circuit Board

Follow these steps to remove the AC precharge circuit board.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Access the drive interior:
   - For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1 and flange, NEMA/UL Type 4X/12 back enclosures, remove the cover. See Remove the Cover on page 129.
   - For IP54, NEMA/UL Type 12 enclosures, open the enclosure and remove the protective guard. See Remove the Protective Guard (IP54, NEMA/UL Type 12 Enclosure) on page 130.
4. Remove these connections from the control pod:
   a. If used, disconnect the HIM DPI cable from the connector (port 2) on the HIM cradle.

      If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.

   b. Disconnect any cables from the Ethernet connectors on the bottom of the main control board in the control pod.
   c. If used, disconnect the plug-in terminal block (TB1) on the bottom of the main control board.
   d. If an option module is installed, disconnect any I/O wiring terminal blocks and remove the option module (not shown in image).

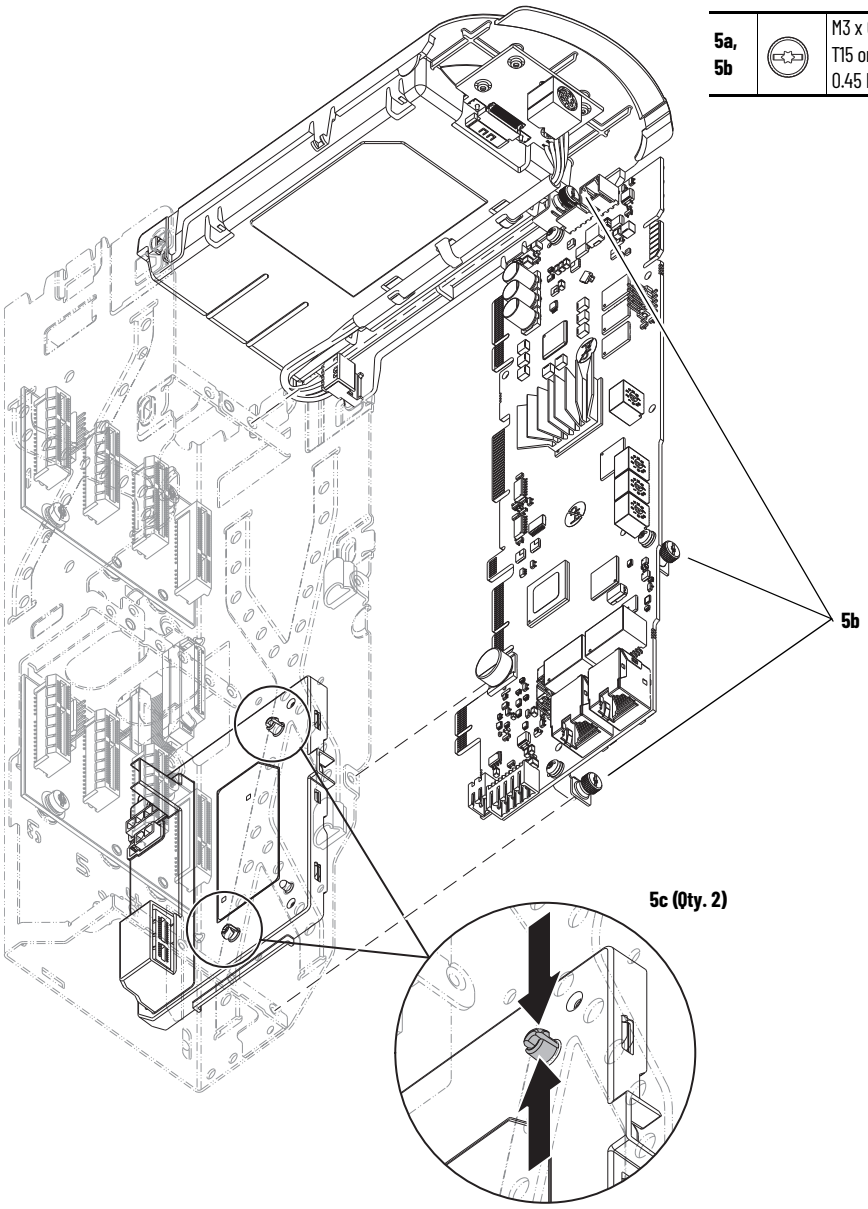


Control Pod Shown Separated from the Drive for Clarity Only.

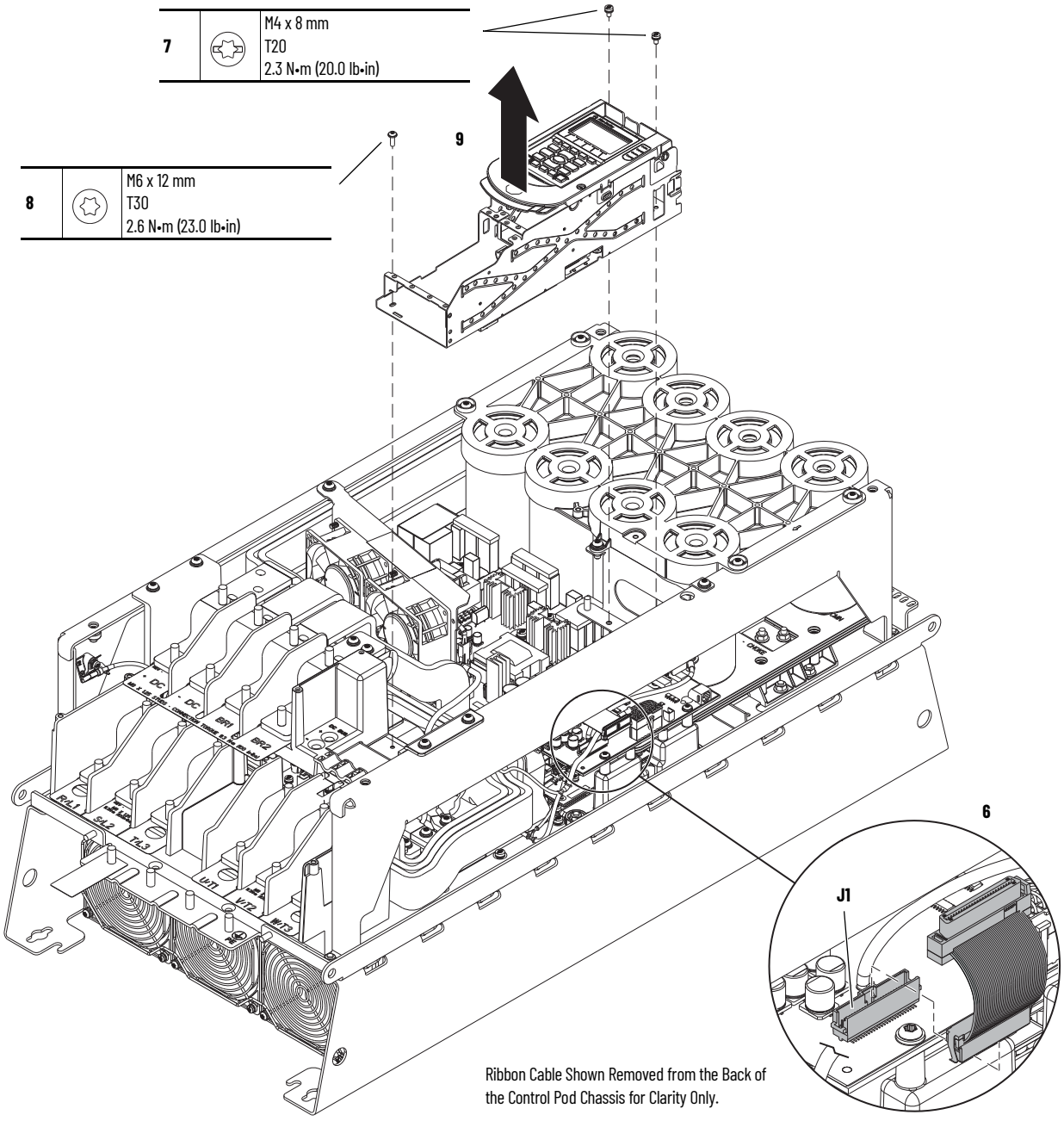
5. If a torque accuracy module (TAM) is installed, complete steps a and c.
   a. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position (see previous image).
   b. Loosen the three M3 captive slotted-Torx screws that secure the main control circuit board to the control pod chassis and remove the main control board.
   c. On the interior of the control pod chassis, compress the two posts that secure the TAM to the control pod and push the posts through the mounting holes.

The TAM remains in the drive chassis and connected to the power interface circuit board via a wire harness after the control pod chassis is removed.

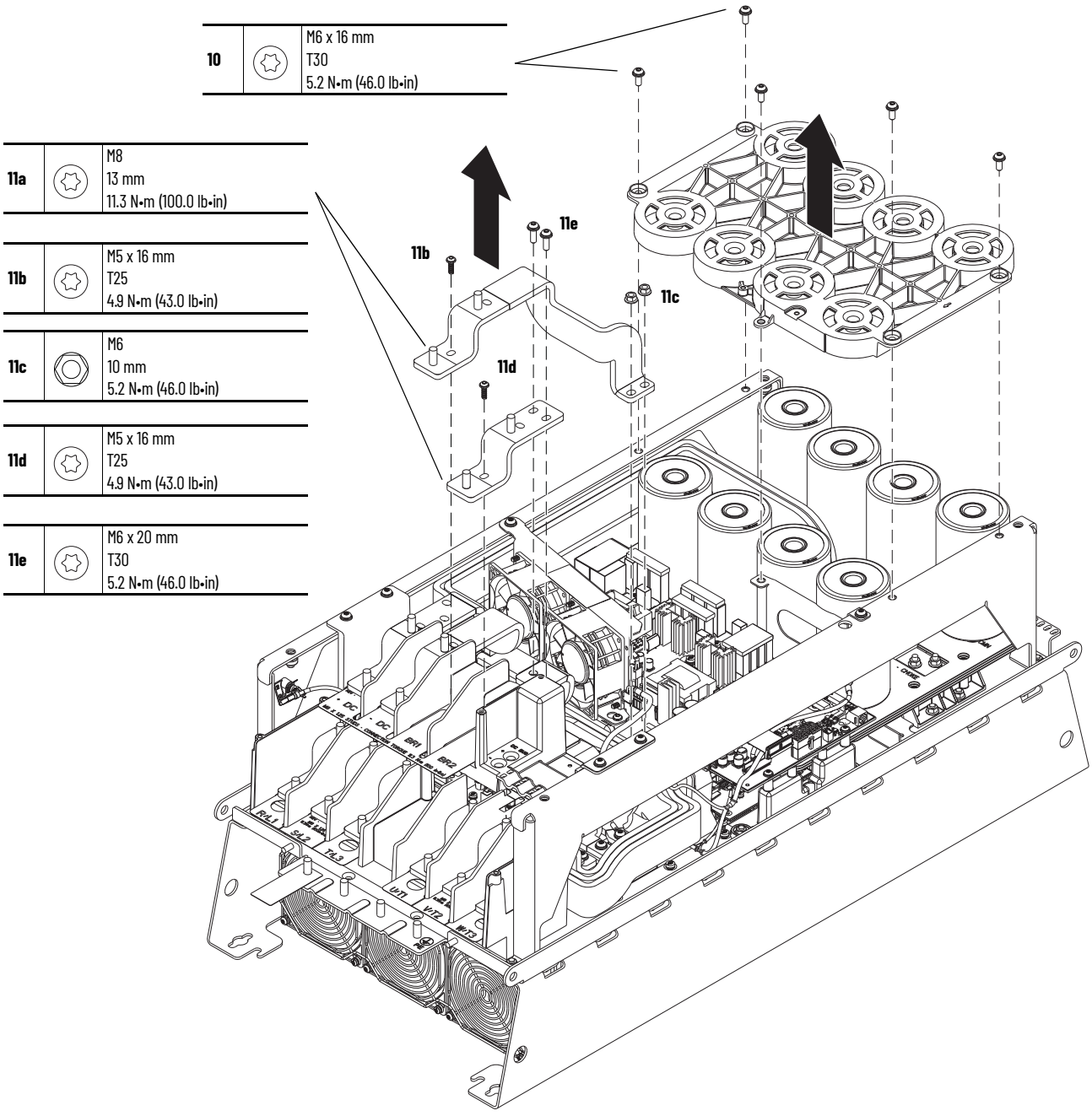
5a, 5b		M3 x 6.4 mm T15 or F - 5 mm (0.19 in.) 0.45 N•m (4.0 lb•in)



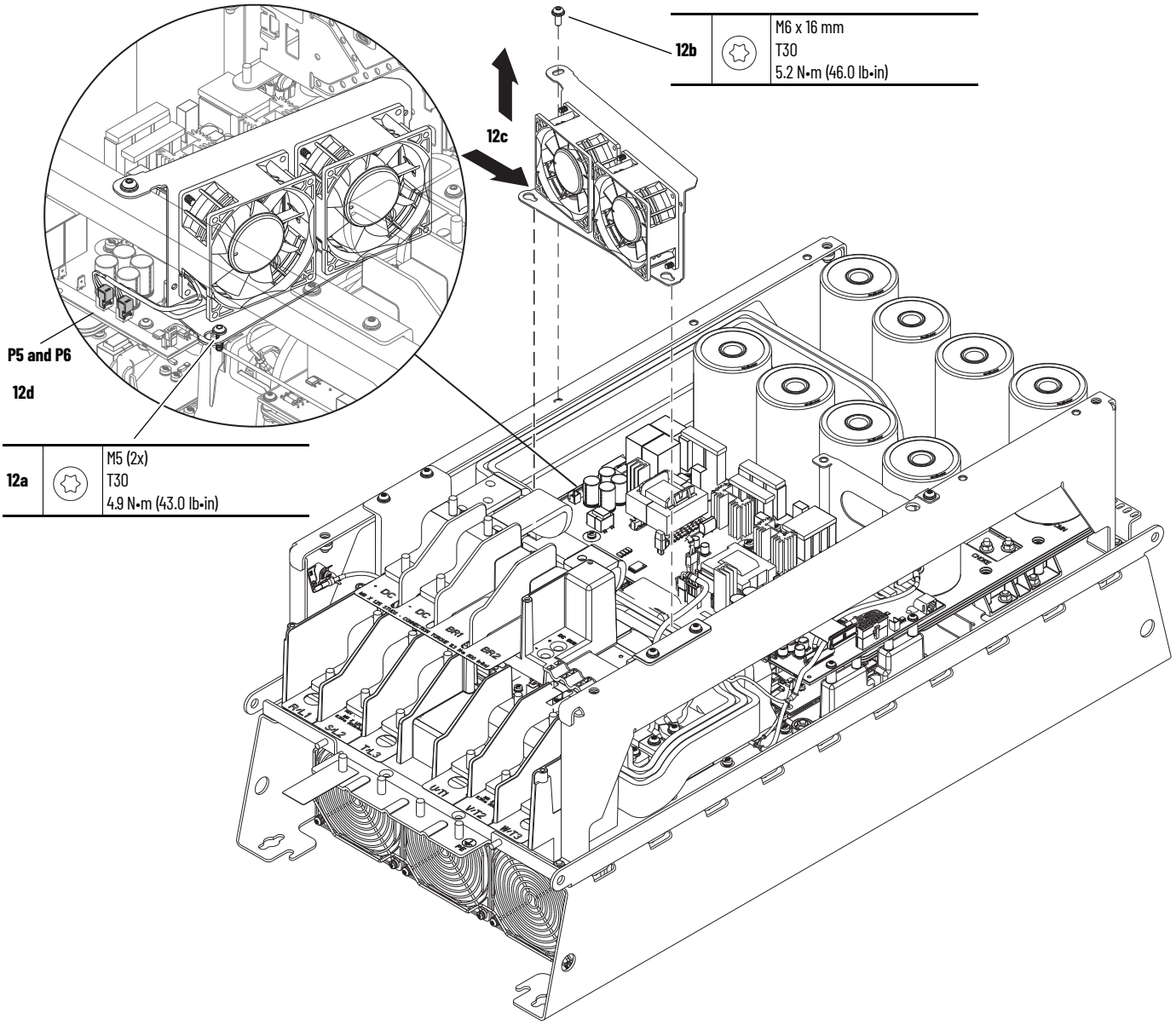
6. Disconnect the ribbon cable from connector J1 on the power interface circuit board below the control pod.
7. Remove the two M4 x 8 mm slotted-Torx screws that secure the upper control pod chassis to the drive chassis.
8. Remove the M6 x 12 mm Torx screw that secures the lower control pod chassis to the drive chassis.
9. Remove the control pod carefully from the drive.



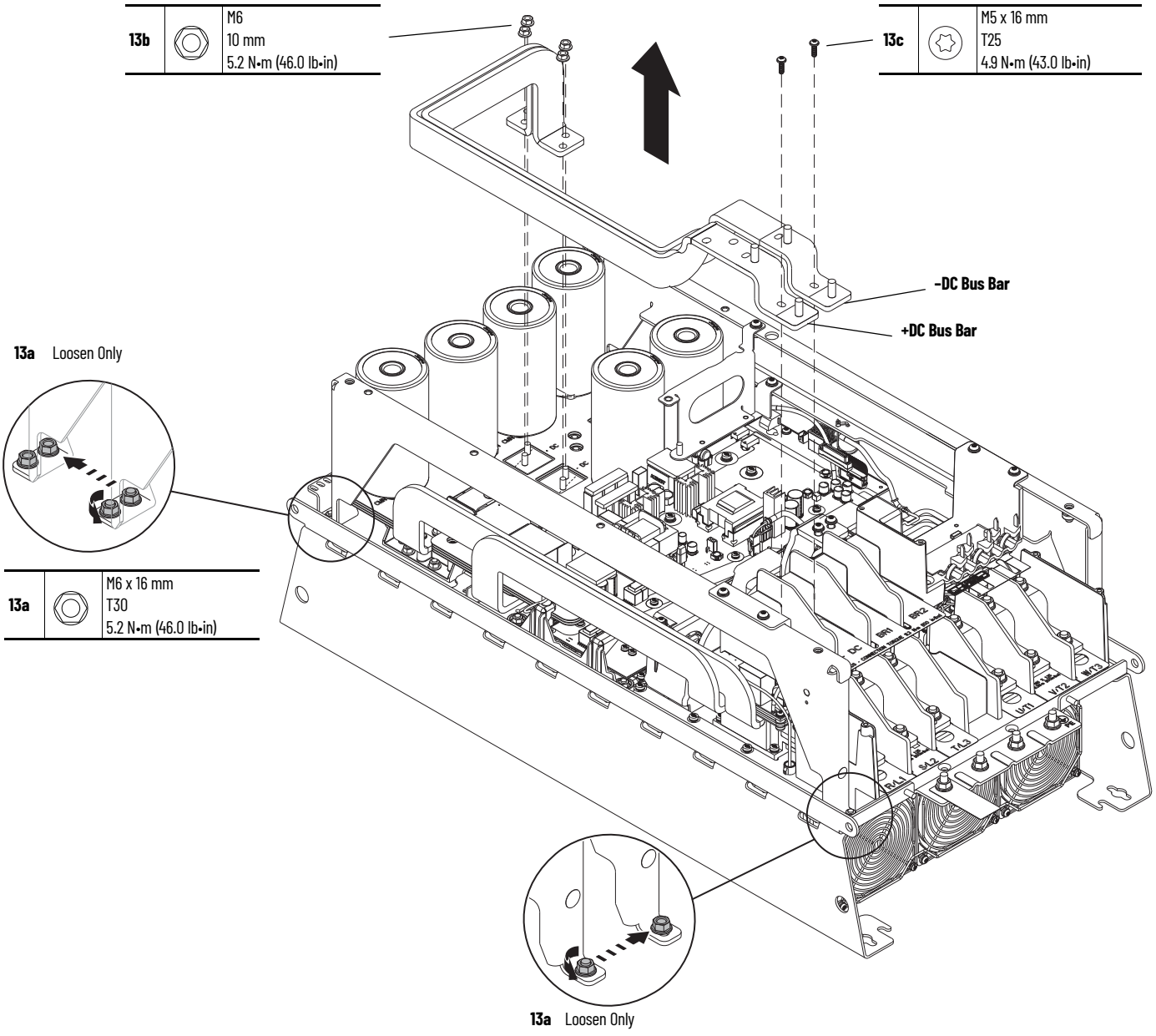
10. If the DC bus bars are installed, remove the five M6 x 16 mm Torx screws that secure the capacitor bank cover to the chassis and remove the cover.
11. If a brake option is installed, complete these steps:
    a. Remove the M8 nuts that secure the power cables to the brake terminals.
    b. Remove the M5 x 16 mm Torx screw that secures the long bus bar to the BR1 terminal and remove the bus bar.
    c. Remove the two M6 nuts that secure the long bus bar (BR1) to the lower bus bars.
    d. Remove the M5 x 16 mm Torx screw that secures the short bus bar to the BR2 terminal.
    e. Remove the two M6 x 20 Torx screws that secure the short bus bar to the BR2 terminal and remove the bus bar.



12. If the DC bus bars are installed, complete steps a...d to remove the stirring fan assembly.
    a. Loosen the two lower M5 Torx screws that secure the lower stirring fan assembly to the chassis.
    b. Remove the upper M6 x 16 mm Torx screw that secures the upper fan assembly to the chassis side bracket.
    c. Slide the fan assembly to the right, lift the fan assembly off the screws, and remove the assembly.
    d. Disconnect the fan-assembly power wire harness connectors P5 and P6 from connectors J5 and J6, respectively, on the power interface circuit board (left side of the fan assembly).

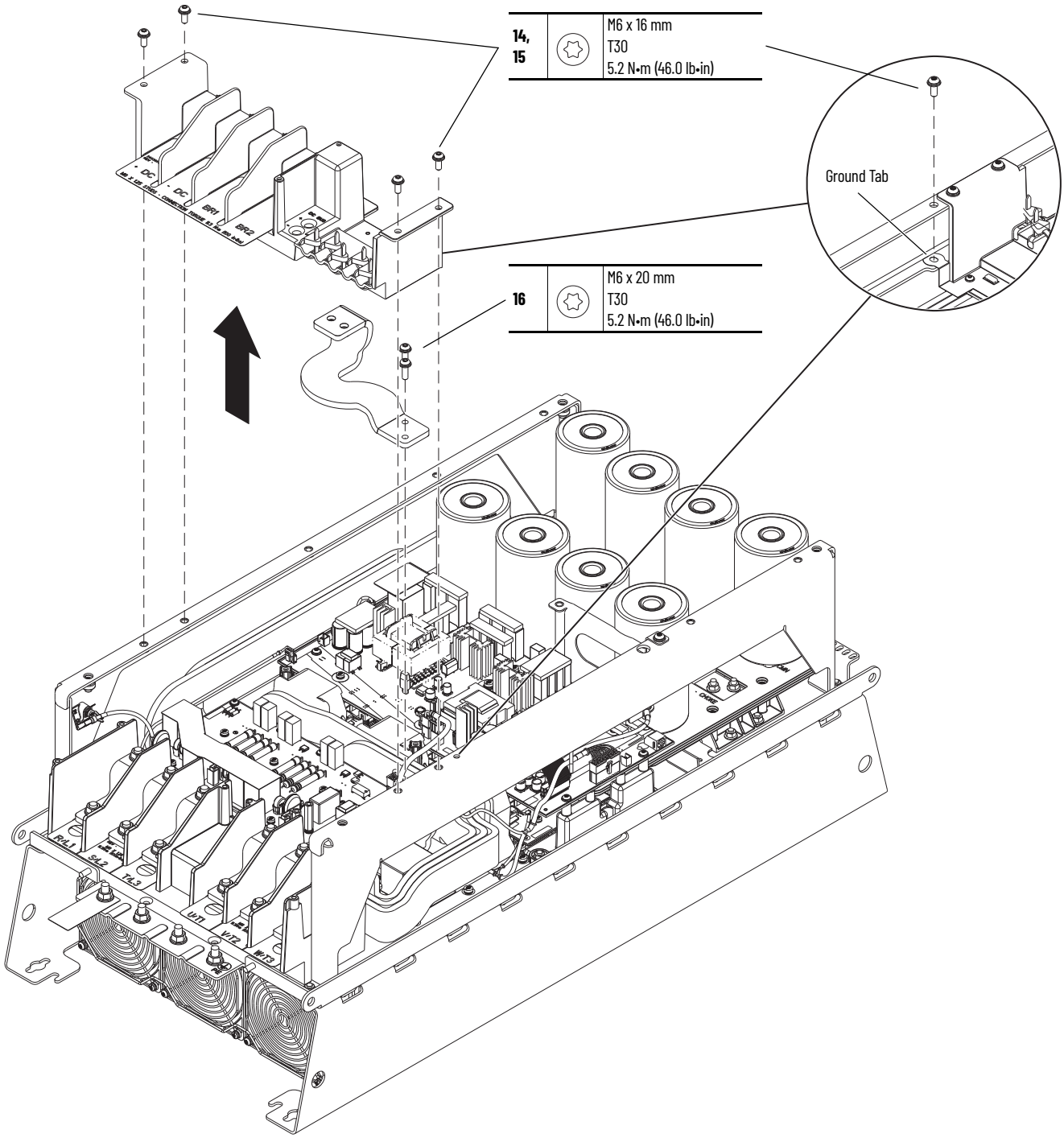


13. If the DC bus bars are installed, complete steps a and b.
    a. To allow room to remove the DC bus bars, loosen the three M6 nuts that secure the left side-rail to the chassis.
    b. Remove the four M6 hexagonal nuts that secure the bus bars to the laminated bus.
    c. Remove the two M5 x 16 mm Torx screws that secure the bus bars to the terminal support and remove the bus bars.

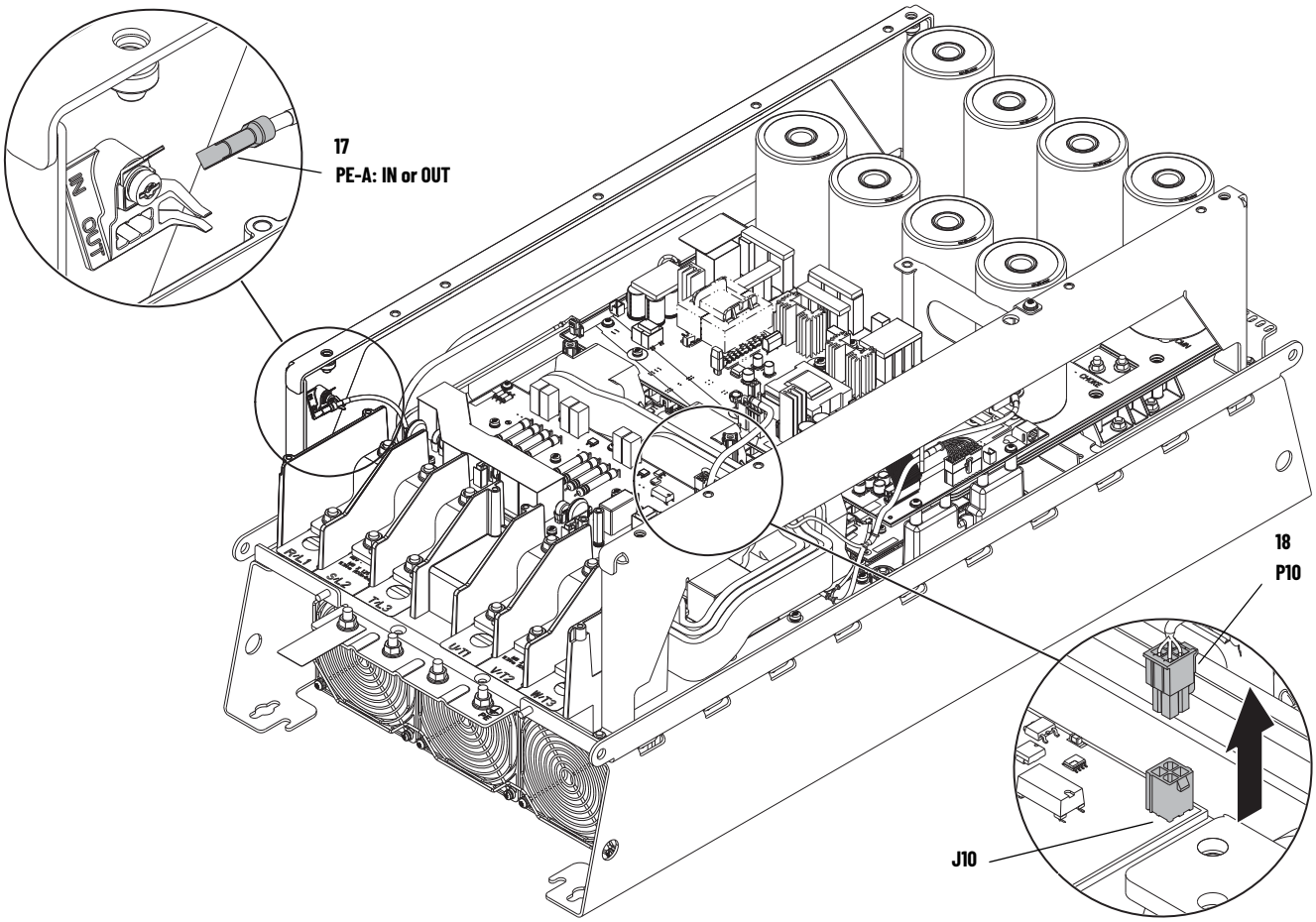


If present, the ground tab on the upper terminal block support is adhered to the chassis. To remove the tab, lift up on the tab gently.

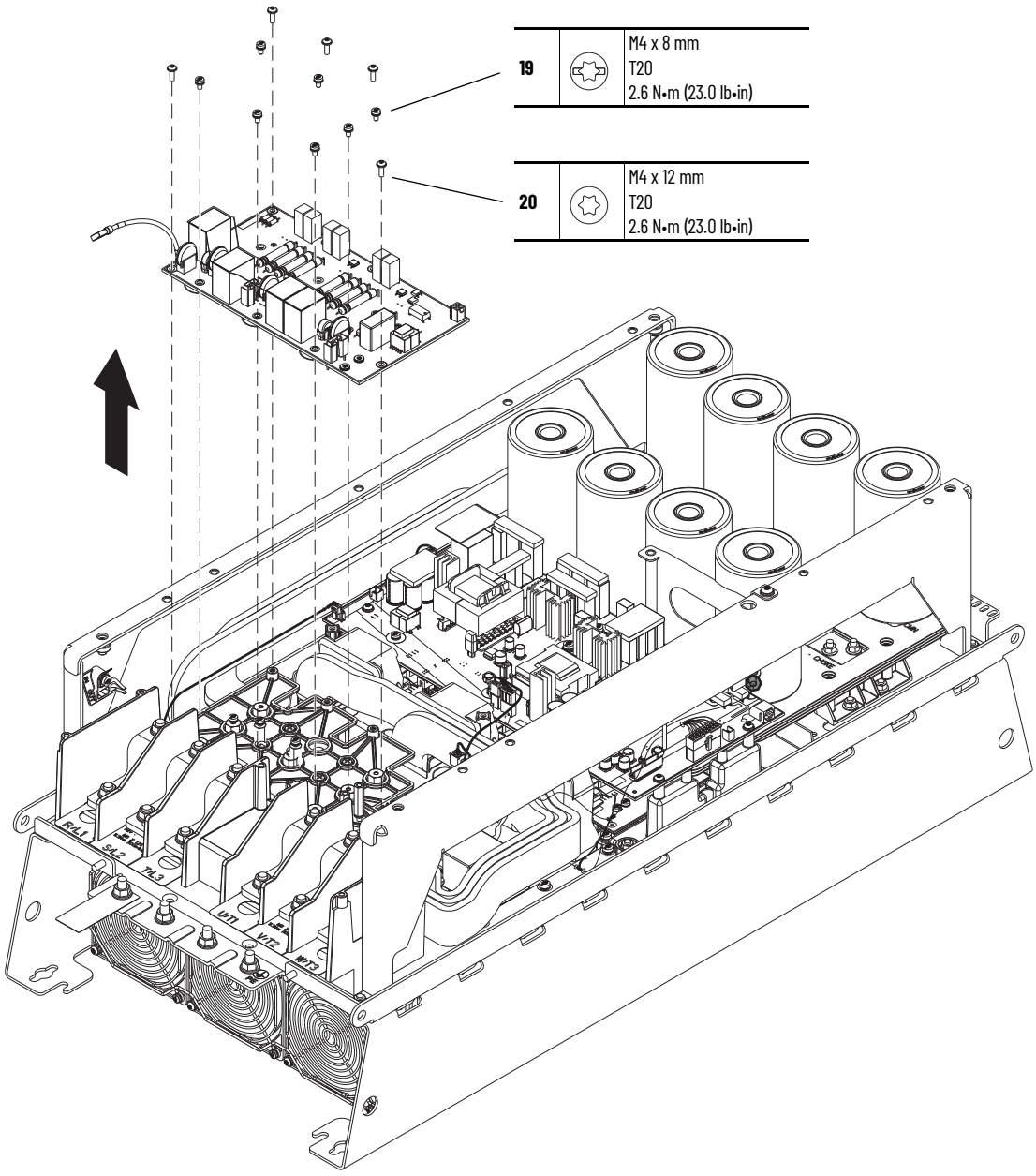
14. If present, remove the M6 x 16 mm Torx screw that secures the ground tab to the drive chassis. Retain the screw for reuse.
15. Remove the four M6 x 16 mm Torx screws that secure the upper terminal block support to the chassis and remove the support.
16. Remove the two M6 x 20 mm Torx screws that secure the lower dynamic-brake bus bar to the brake module and remove the bus bar.



17. Note the PE-A jumper position and remove the PE-A jumper wire from the jumper assembly on the chassis.
18. Remove the wire harness connector P10 from connector J10 on the right side of the AC precharge circuit board.



19. Remove the nine M4 x 8 mm slotted-Torx screws that secure the board to the standoffs.
20. Remove the five M4 x 12 mm Torx screws that secure the board to the plastic support tray, and remove the board.



Install the AC Precharge Circuit Board

Install the AC precharge circuit board in the reverse order of removal.

DC Precharge Circuit Board Replacement

Replacement kit catalog number: SK-RT-DCPC-F67

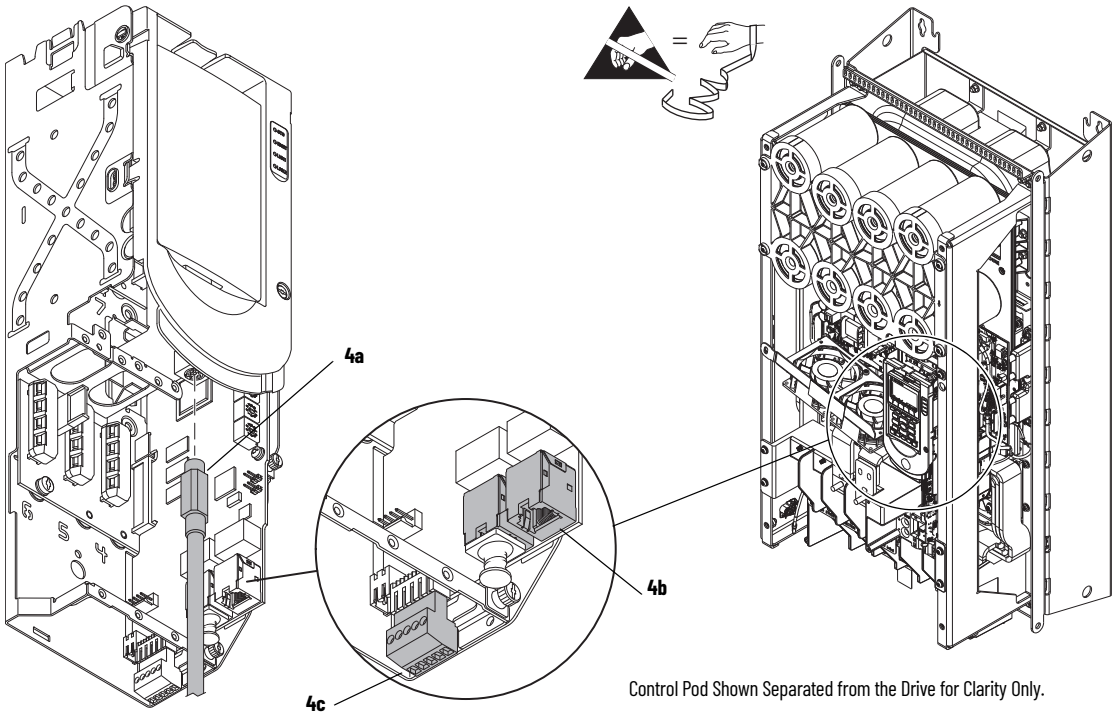
Remove the DC Precharge Circuit Board

Follow these steps to remove the DC precharge circuit board.

1. Review the Product Advisories on page 9.
2. Turn off and lock-out incoming power. See Remove Power from the System on page 10.
3. Access the drive interior:
   - For IP00, NEMA/UL Open Type, IP21, NEMA/UL Type 1 and flange, NEMA/UL Type 4X/12 back enclosures, remove the cover. See Remove the Cover on page 129.
   - For IP54, NEMA/UL Type 12 enclosures, open the enclosure and remove the protective guard. See Remove the Protective Guard (IP54, NEMA/UL Type 12 Enclosure) on page 130.
4. Remove these connections from the control pod:
   a. If used, disconnect the HIM DPI cable from the connector (port 2) on the HIM cradle.

      If a cable is not connected to the DPI port on the HIM cradle, be sure to leave the protective cover installed.

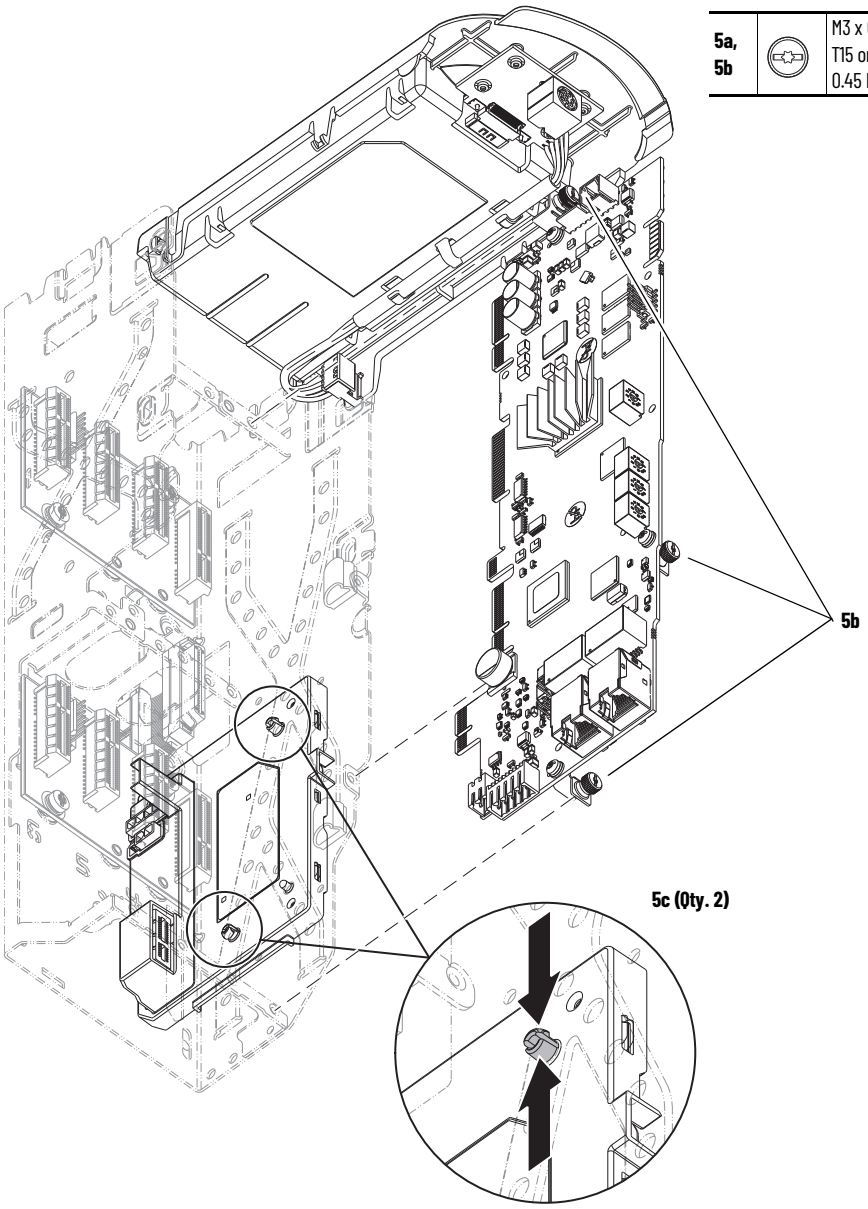
   b. Disconnect any cables from the Ethernet connectors on the bottom of the main control board in the control pod.
   c. If used, disconnect the plug-in terminal block (TB1) on the bottom of the main control board.
   d. If an option module is installed, disconnect any I/O wiring terminal blocks and remove the option module (not shown in this image).



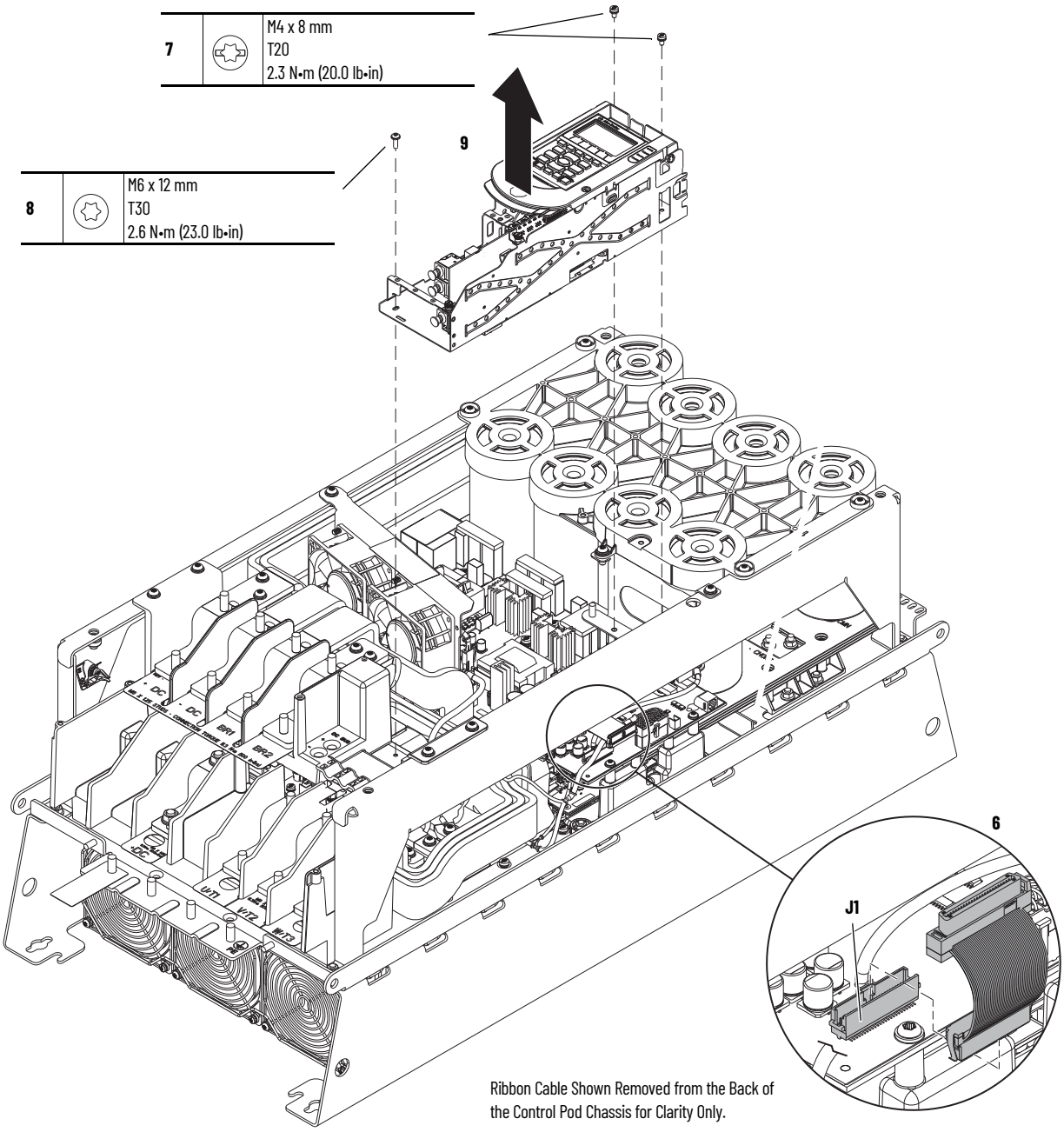
Control Pod Shown Separated from the Drive for Clarity Only.

5. If a torque accuracy module (TAM) is installed, complete steps a and c.
   a. Loosen the screw that secures the HIM cradle to the pod chassis, and rotate the cradle up to a 90° horizontal position (see previous image).
   b. Loosen the three M3 captive slotted-Torx screws that secure the main control circuit board to the control pod chassis and remove the main control board.
   c. On the interior of the control pod chassis, compress the two posts that secure the TAM to the control pod and push the posts through the mounting holes.

The TAM remains in the drive chassis and connected to the power interface circuit board via a wire harness after the control pod chassis is removed.



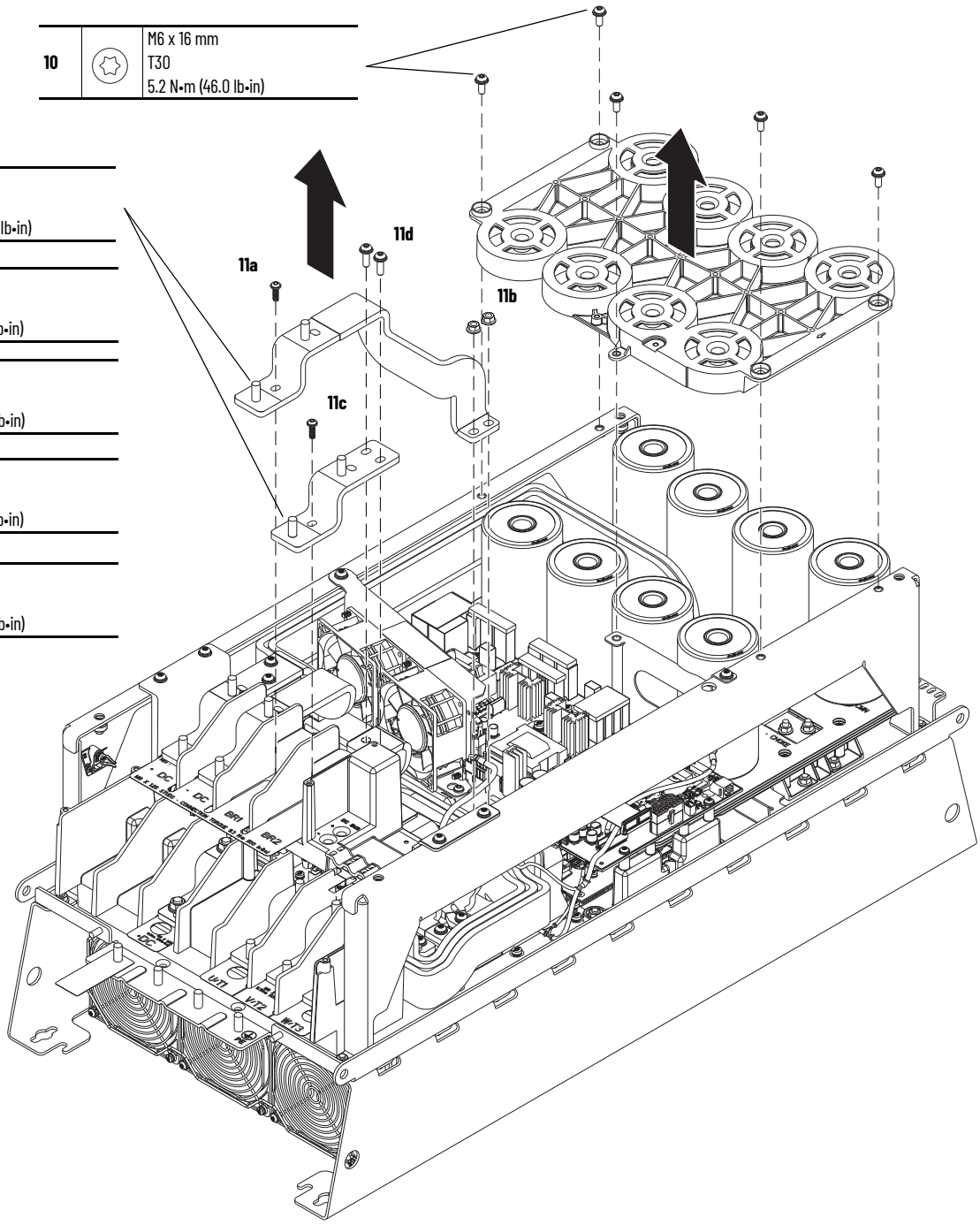
6. Disconnect the ribbon cable from connector J1 on the power interface circuit board below the control pod.
7. Remove the two M4 x 8 mm slotted-Torx screws that secure the upper control pod chassis to the drive chassis.
8. Remove the M6 x 12 mm Torx screw that secures the lower control pod chassis to the drive chassis.
9. Remove the control pod carefully from the drive.



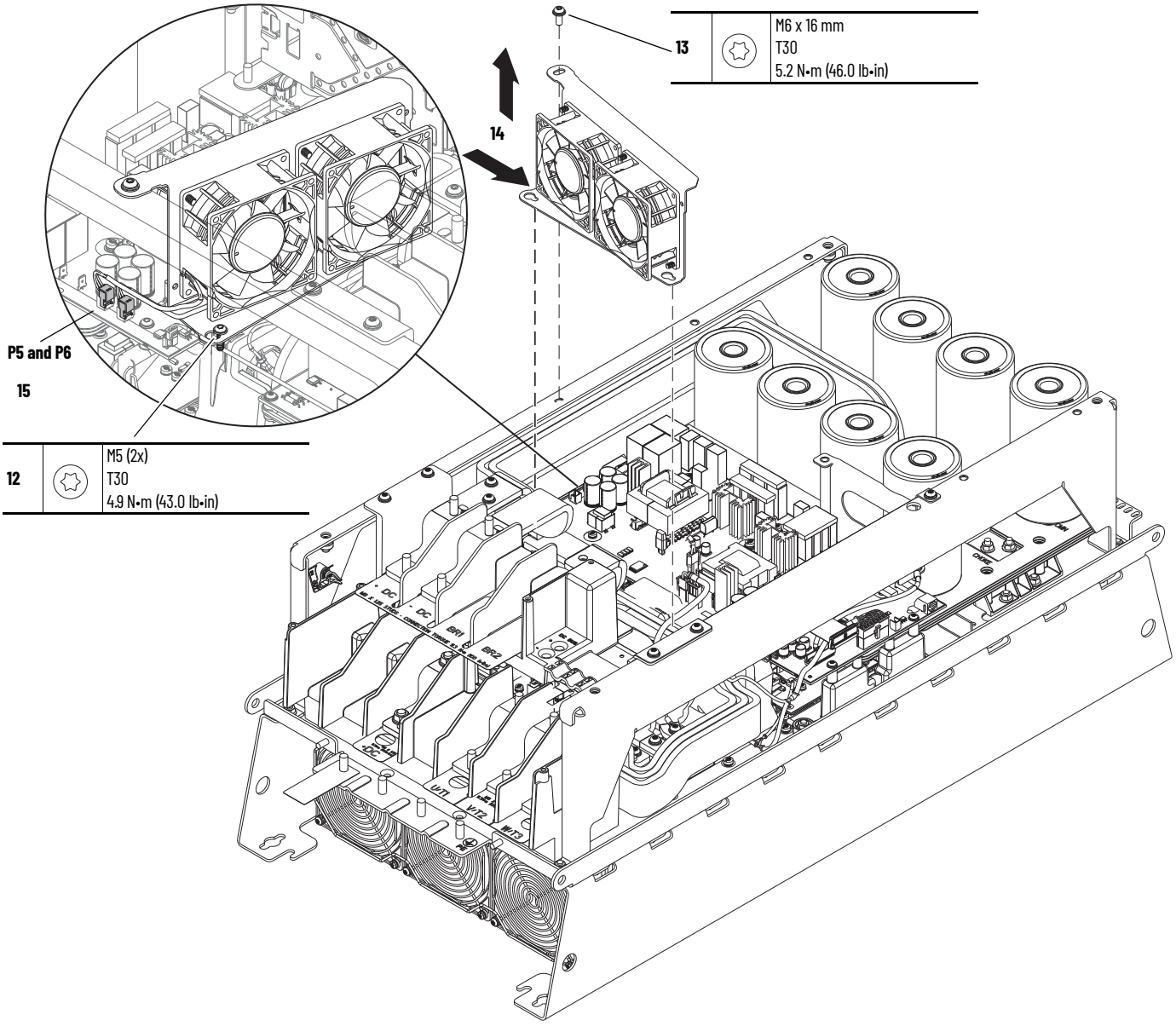
10. Remove the five M6 x 16 mm Torx screws that secure the capacitor bank cover to the chassis and remove the cover.
11. If a brake option is installed, complete these steps:
    a. Remove the M8 nuts that secure the power cables to the brake terminals.
    b. Remove the M5 x 16 mm Torx screw that secures the long bus bar to the BR1 terminal and remove the bus bar.
    c. Remove the two M6 nuts that secure the long bus bar (BR1) to the lower bus bars.
    d. Remove the M5 x 16 mm Torx screw that secures the short bus bar to the BR2 terminal.
    e. Remove the two M6 x 20 Torx screws that secure the short bus bar to the BR2 terminal and remove the bus bar.

10		M6 x 16 mm T30 5.2 N•m (46.0 lb•in)

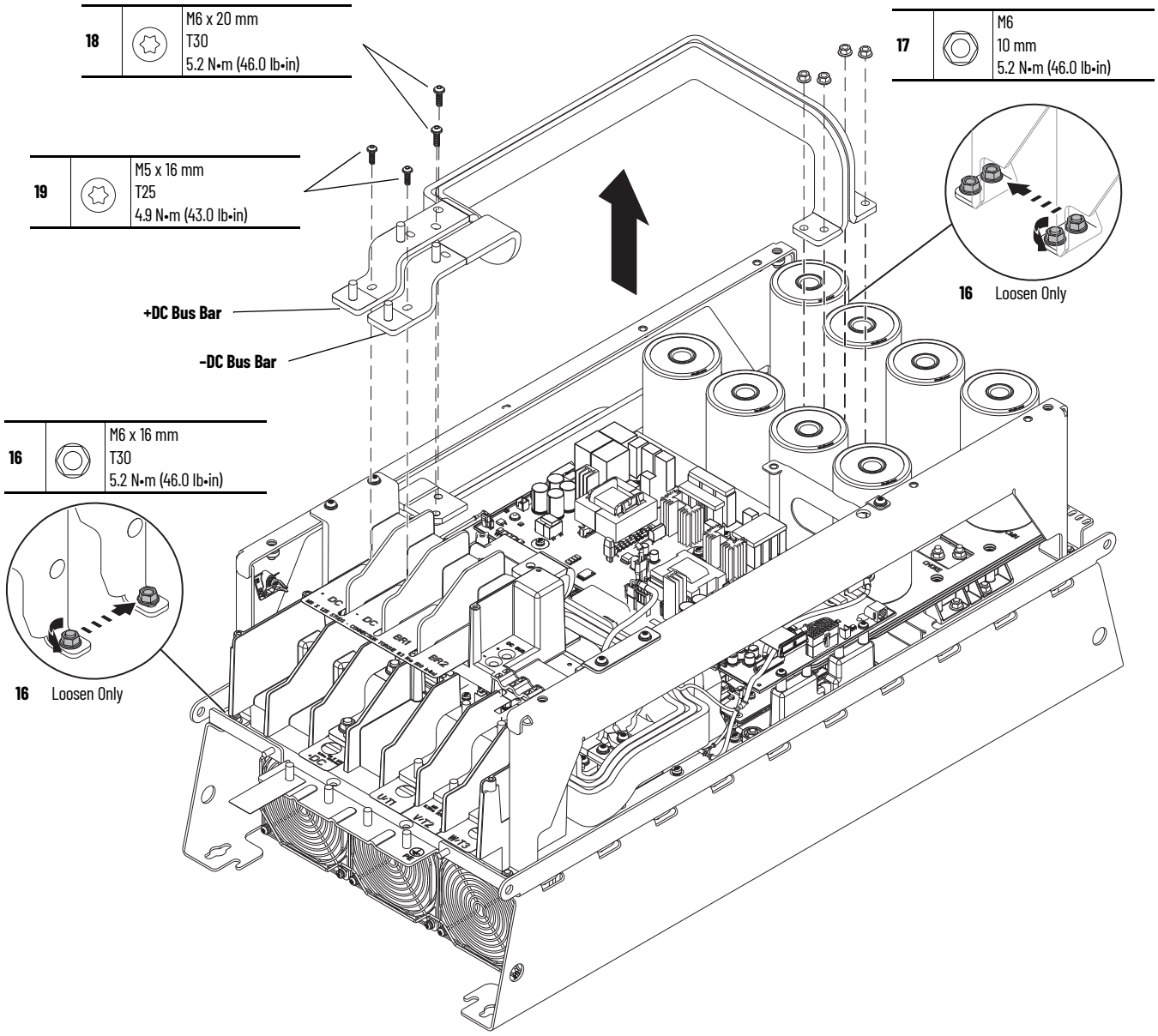
11a		M8 13 mm 11.3 N•m (100.0 lb•in)
11b		M5 x 16 mm T25 4.9 N•m (43.0 lb•in)
11c		M6 10 mm 5.2 N•m (46.0 lb•in)
11d		M5 x 16 mm T25 4.9 N•m (43.0 lb•in)
11e		M6 x 20 mm T30 5.2 N•m (46.0 lb•in)



12. Loosen the two lower M5 Torx screws that secure the lower stirring fan assembly to the chassis.
13. Remove the upper M6 x 16 mm Torx screw that secures the upper fan assembly to the chassis side bracket.
14. Slide the fan assembly to the right, lift the fan assembly off the screws, and remove the assembly.
15. Disconnect the fan-assembly power wire harness connectors P5 and P6 from connectors J5 and J6, respectively, on the power interface circuit board (left side of the fan assembly).

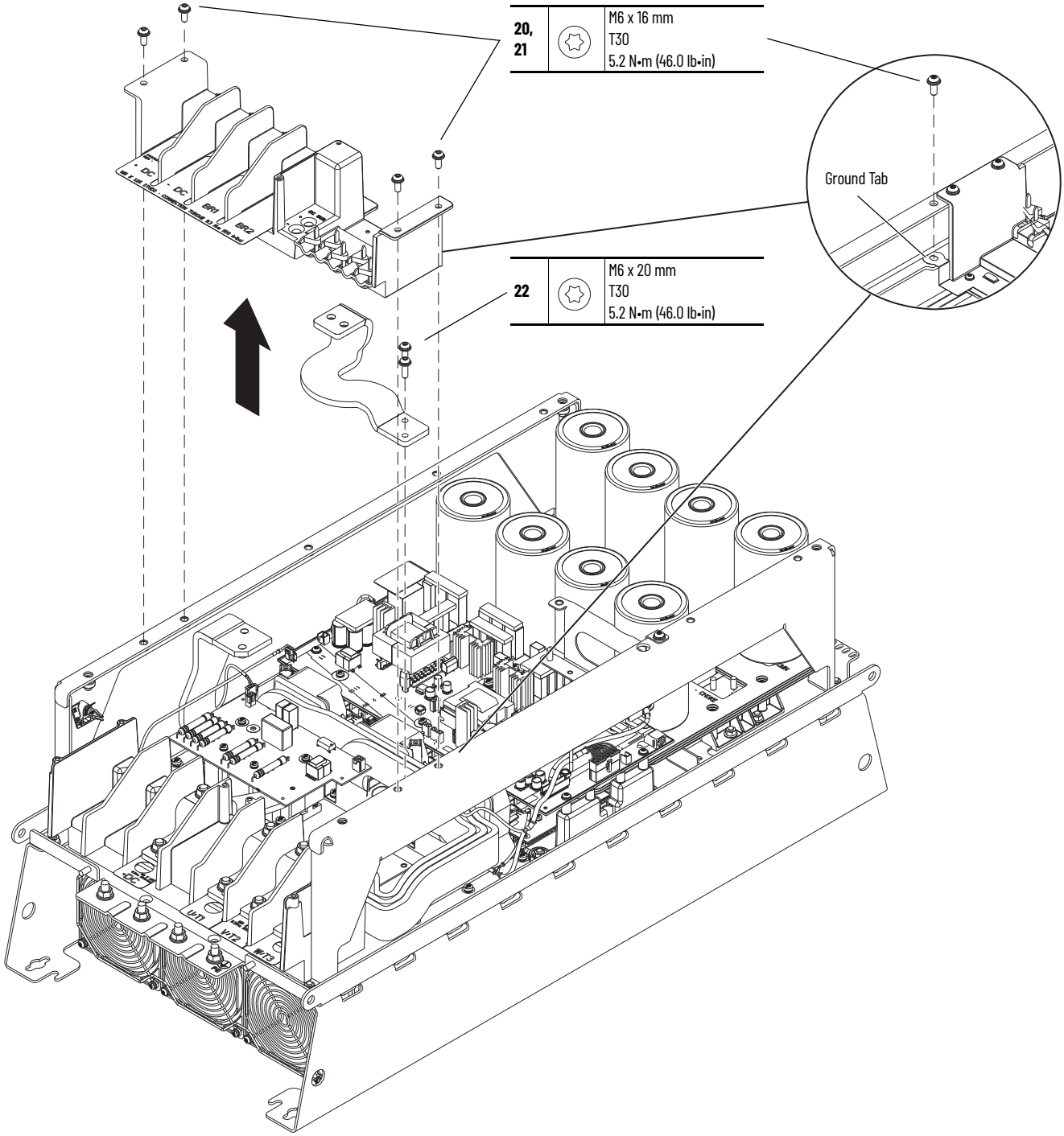


16. To allow room to remove the DC bus bars, loosen the three M6 nuts that secure the left side-rail to the chassis.
17. Remove the four M6 hexagonal nuts that secure the DC bus bars to the laminated bus.
18. Remove the two M6 x 20 mm Torx screws that secure the DC bus bar to the lower connecting DC brake bus bar.
19. Remove the two M5 x 16 mm Torx screws that secure the DC bus bars to the terminal support and remove the bus bars.

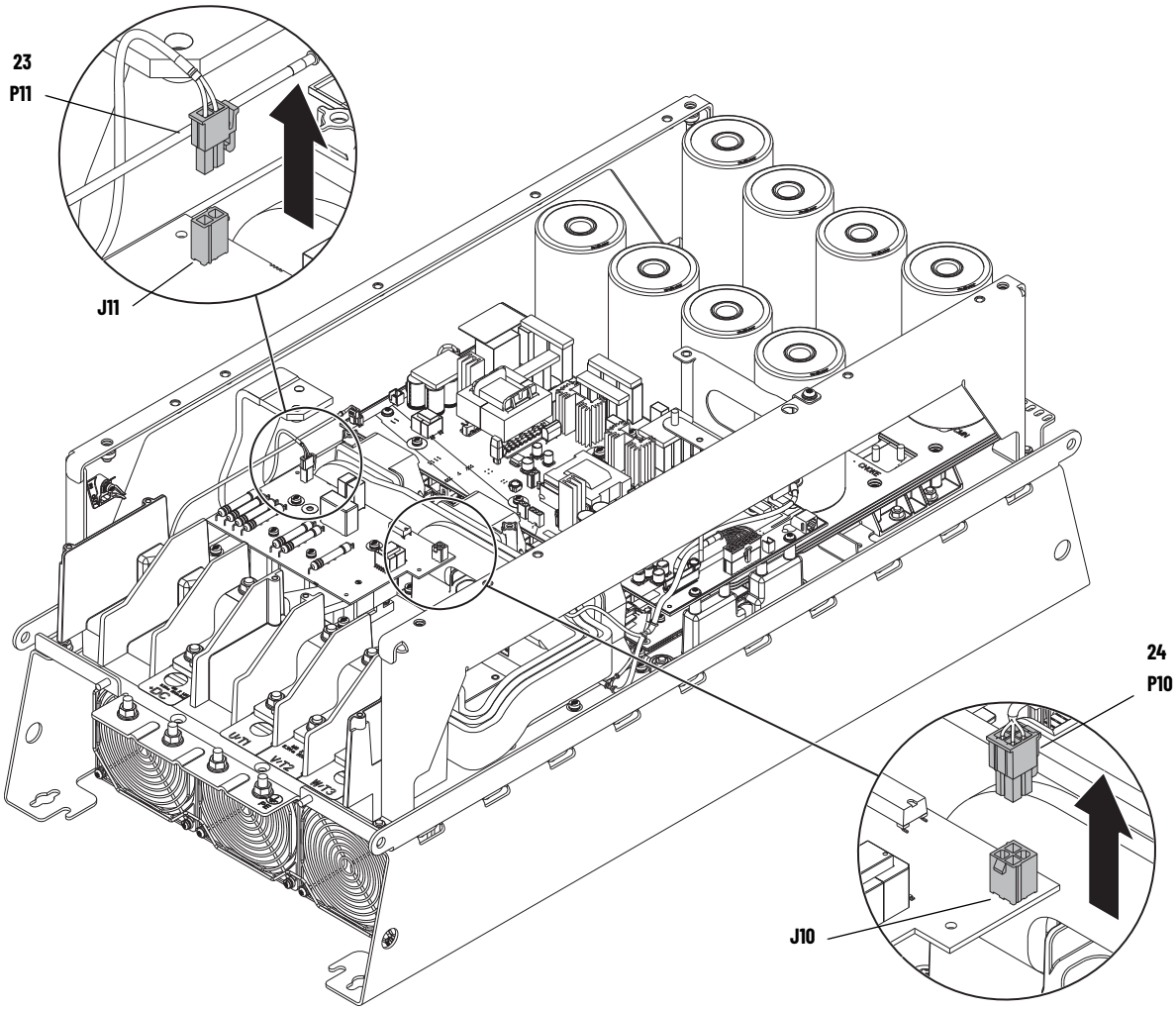


If present, the ground tab on the upper terminal block support is adhered to the chassis. To remove the tab, lift up on the tab gently.

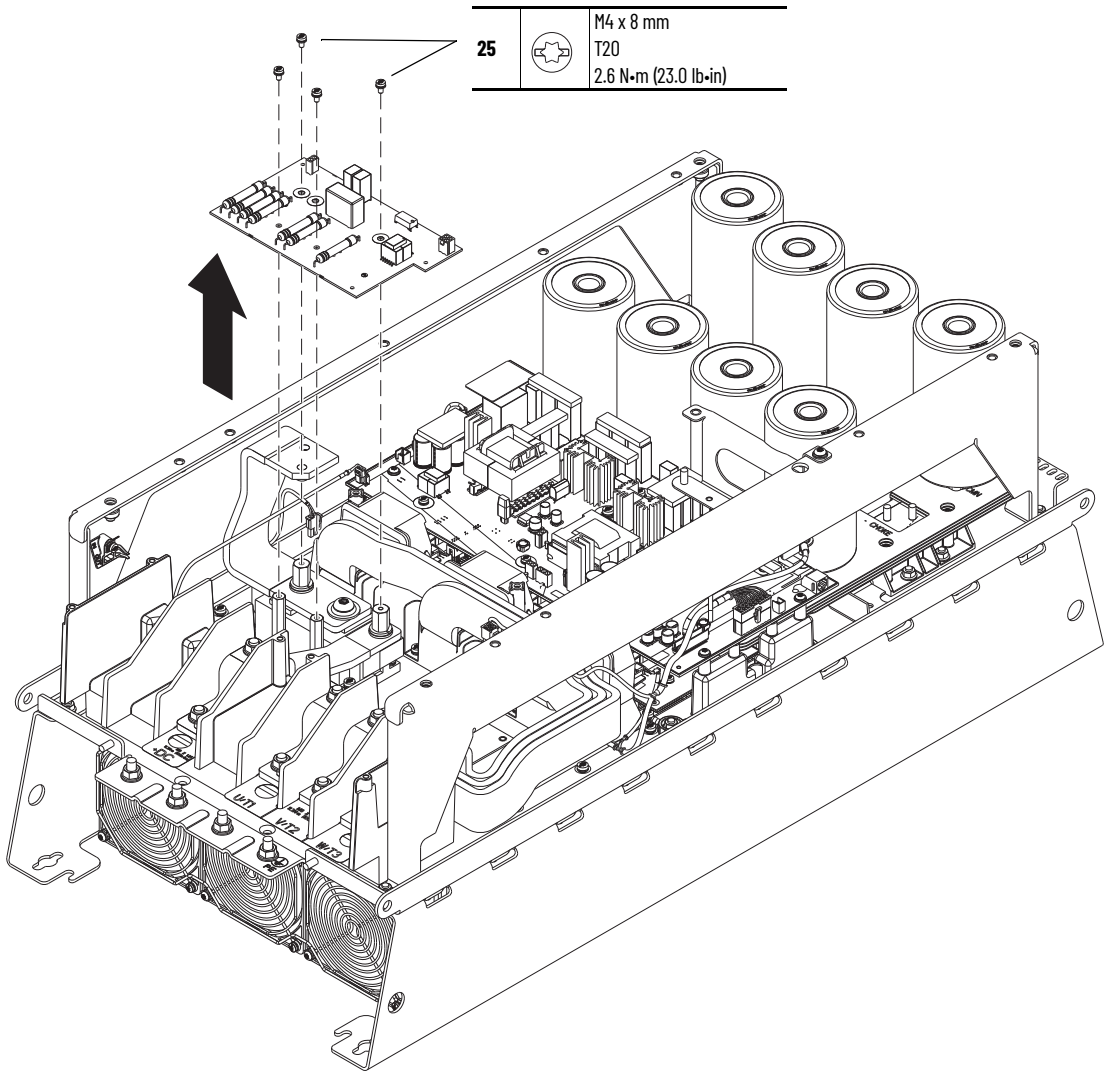
20. If present, remove the M6 x 16 mm Torx screw that secures the ground tab to the drive chassis. Retain the screw for reuse.
21. Remove the four M6 x 16 mm Torx screws that secure the upper terminal block support to the chassis and remove the support.
22. Remove the two M6 x 20 mm Torx screws that secure the lower dynamic-brake bus bar to the brake module and remove the bus bar.



23. Remove the IGBT wire harness P11 from connector J1 on the left side of the AC precharge circuit board.
24. Remove the wire harness connector P10 from connector J10 on the right side of the AC precharge circuit board.



25. Remove the four M4 x 8 mm slotted-Torx screws that secure the DC precharge circuit board to the standoffs and remove the board from the drive.



Install the DC Precharge Circuit Board

Install the DC precharge circuit board in the reverse order of removal.

Start Up After Repairs

This chapter provides detailed instructions for starting up a PowerFlex® 755TS drive after you have completed repairs and before power has been applied.

For power terminal locations, see:

- Frames 1...3 - Figure 1 on page 11
- Frames 4 and 5 - Figure 2 on page 12
- Frames 6 and 7 - Figure 3 on page 13

Before You Apply Power to the Drive

Before you place a drive back into operation, complete these instructions.

ATTENTION: To avoid an electric shock hazard, verify that there is no AC input and DC bus voltage by taking these measurements:
- Verify that there is no AC input voltage present by using the R/L1, S/L2, and T/L3 terminals and measuring L to L and L to chassis GND (PE).
- Verify that there is no DC bus voltage present by using the +DC to –DC terminals and measuring +DC to –DC, +DC to GND, and –DC to GND.

1. To verify that there is no voltage present, measure the AC input and DC bus voltage at the following terminals.
   - Use the R/L1, S/L2, and T/L3 terminals to measure L to L and L to chassis GND (PE).
   - Use the +DC and –DC terminals to measure +DC to –DC, +DC to chassis GND (PE), and –DC to chassis GND (PE).
2. Perform phase to ground resistance tests to verify that there are no shorts on the following locations:
   - Use terminals R/L1, S/L2, and T/L3 to measure L to chassis GND (PE).
   - Use terminals +DC and –DC to measure +DC to chassis GND (PE), and –DC to chassis GND (PE).
   - Use terminals U/T1, V/T2, and W/T3 to measure L to chassis GND (PE).
3. If the measured value of any resistance test is less than 1 kΩ, troubleshoot to find the short, correct the problem, and repeat step 2.
4. For any fan or circuit board that has been removed and re-installed, complete the following:
   - Verify that all hardware connections have been replaced and are properly torqued.
   - Verify that all interconnection wire harnesses are connected at both ends and properly supported by cable ties along their entire length where applicable.
5. When service has been completed on the control pod, verify that all control power and I/O wires are connected and properly secured and supported by using cable ties along their entire length when necessary.
6. Continue with No-load DC Bus Voltage and Output Current Measurements on page 182.

No-load DC Bus Voltage and Output Current Measurements

Follow theses steps to measure the DC bus voltage and output current and diagnose problems without connecting the motor to its mechanical load.

1. Verify that the input power and ground wires are connected to the proper terminals.
2. Verify that the AC line power at the disconnect device is within the rated value for the drive.
3. Verify that the control power voltage is correct.
4. Verify that the motor cables are connected to the proper terminals.
5. Verify that the motor load is disconnected.
6. Energize the system.
7. Measure the DC bus voltage and verify that the measured value is displayed in port 0, parameter 3 [DC Bus Volts].
8. Start the system and increase the speed from zero to base speed.
9. Measure the system output current and verify that the measured value is displayed in port 10, parameter 3 [Output Current].
10. Stop the system.
11. Reconnect the load to the motor before proceeding with drive startup.

For startup information see the PowerFlex Drives with TotalFORCE® Control Programming Manual (firmware revision 10.*xxx* and later), publication 750-PM101.

Schematics

This chapter provides on-line schematic drawings for PowerFlex® 755TS drives.

List of Drive Schematics

Figure 11 - PowerFlex 755TS Frame 1 AC Input Drive

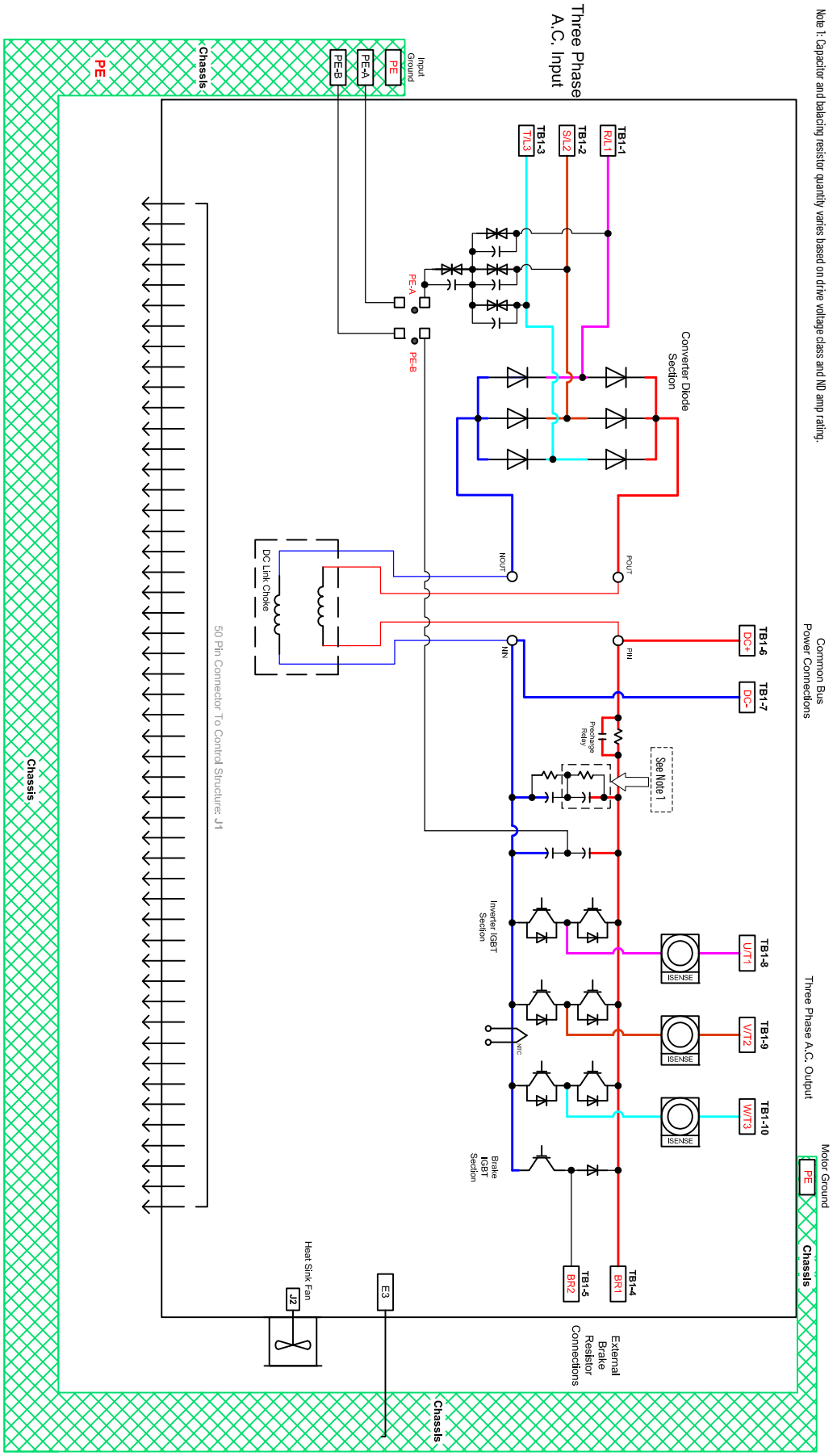


Figure 12 - PowerFlex 755TS Frames 2...4 AC Input Drives

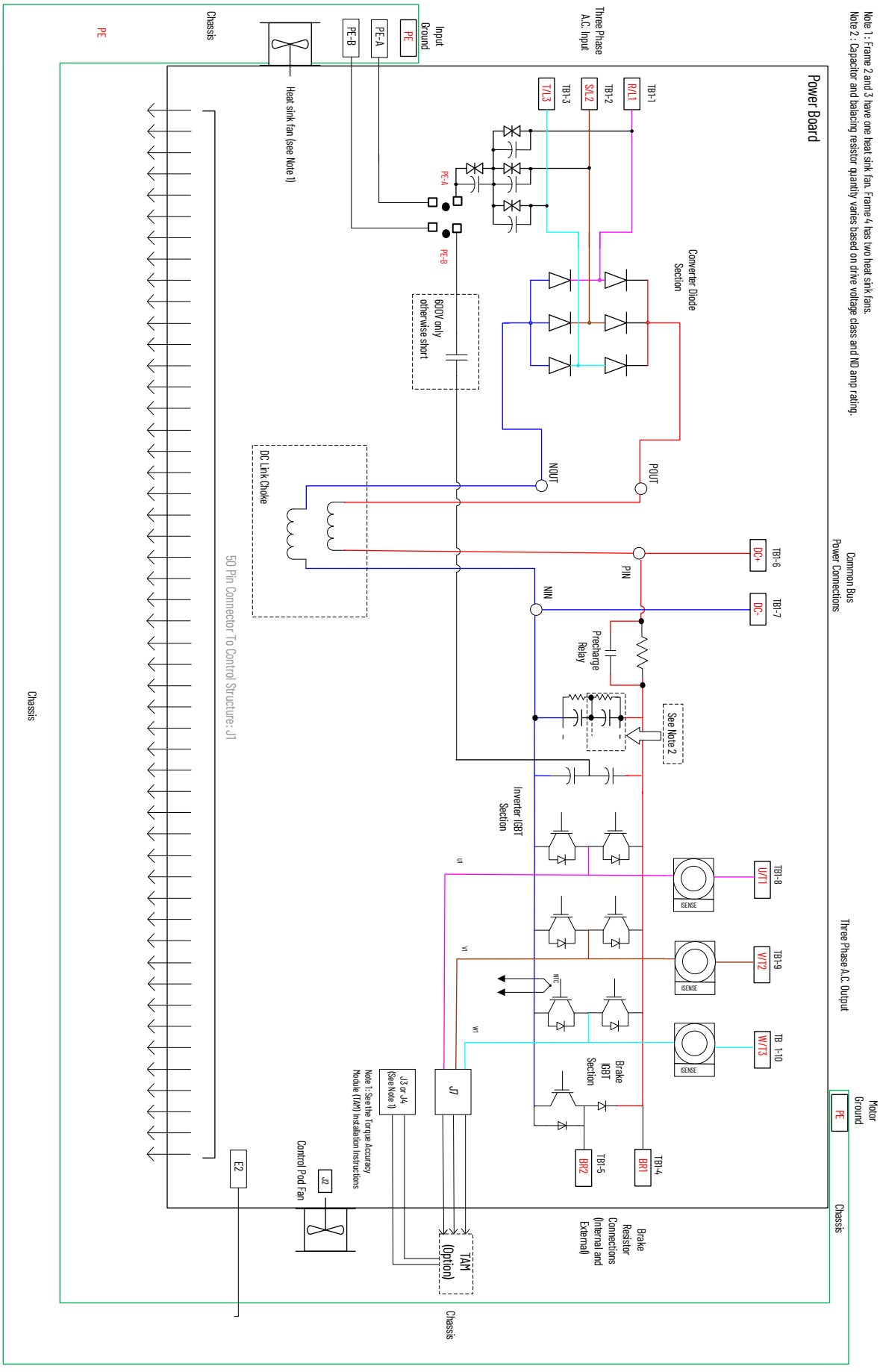


Figure 13 - PowerFlex 755TS Frame 5 AC Input Drive

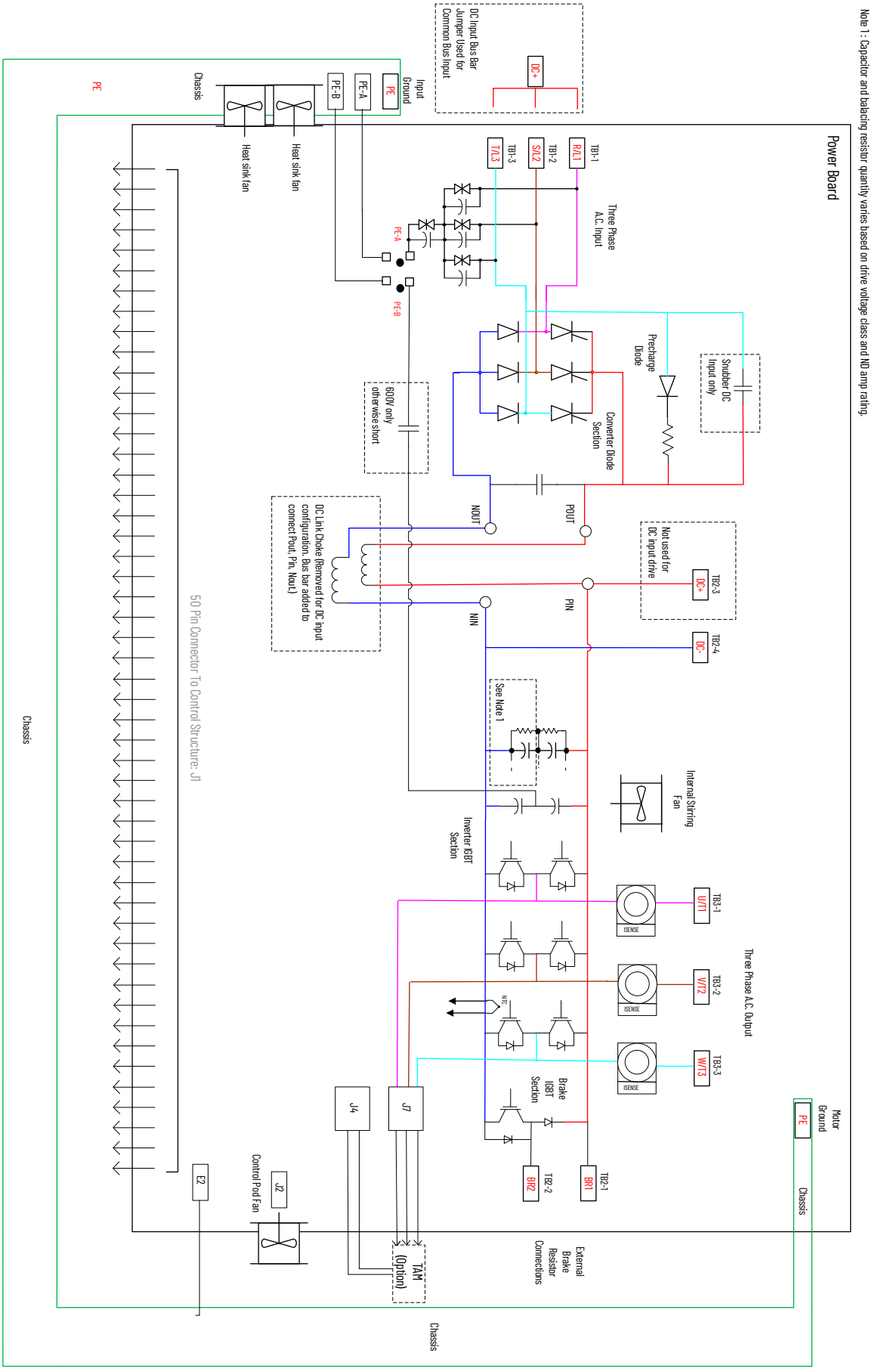


Figure 14 - PowerFlex 755TS Frame 6 AC Input Drive

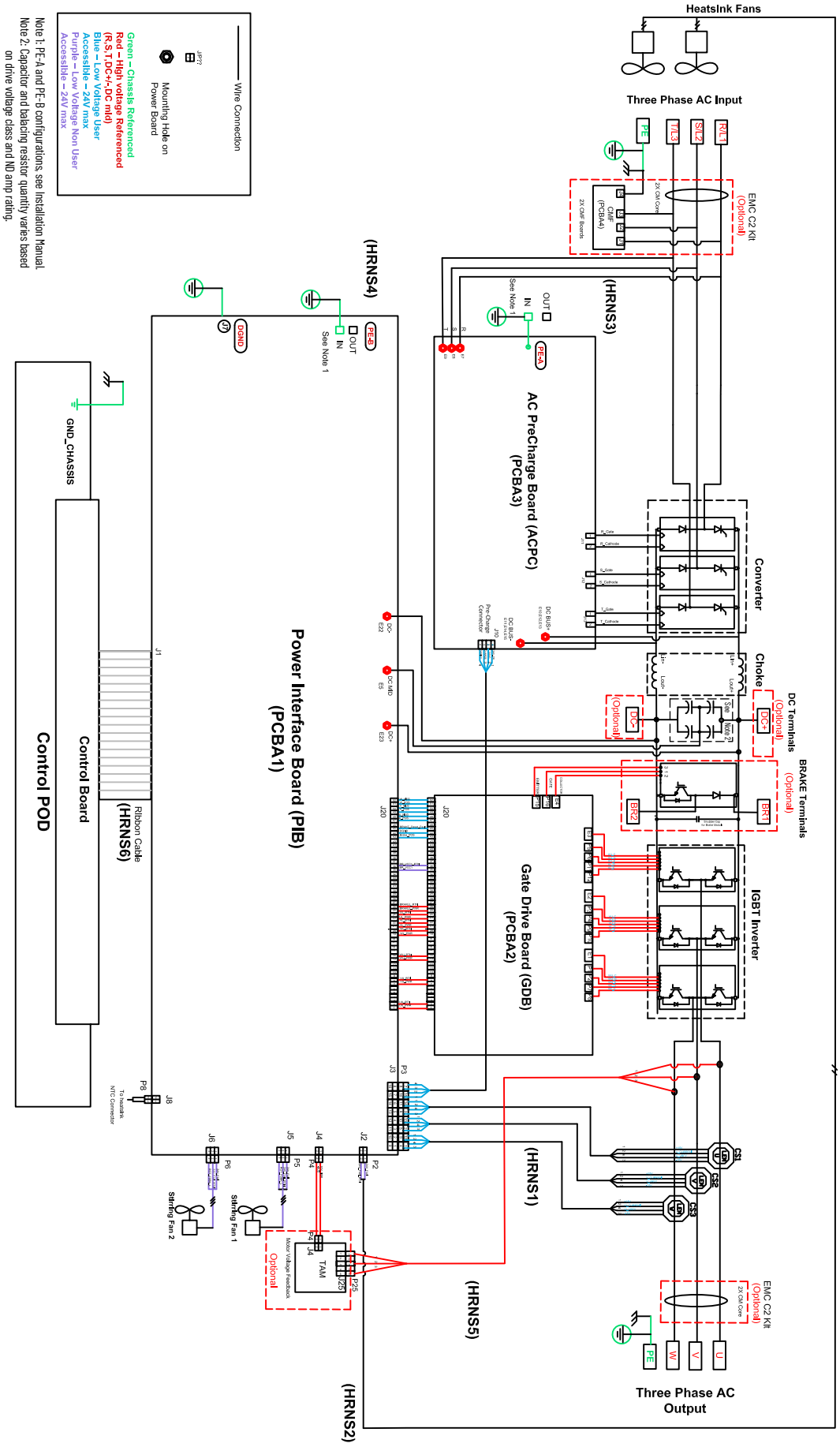


Figure 15 - PowerFlex 755TS Frame 6 DC Input Drive

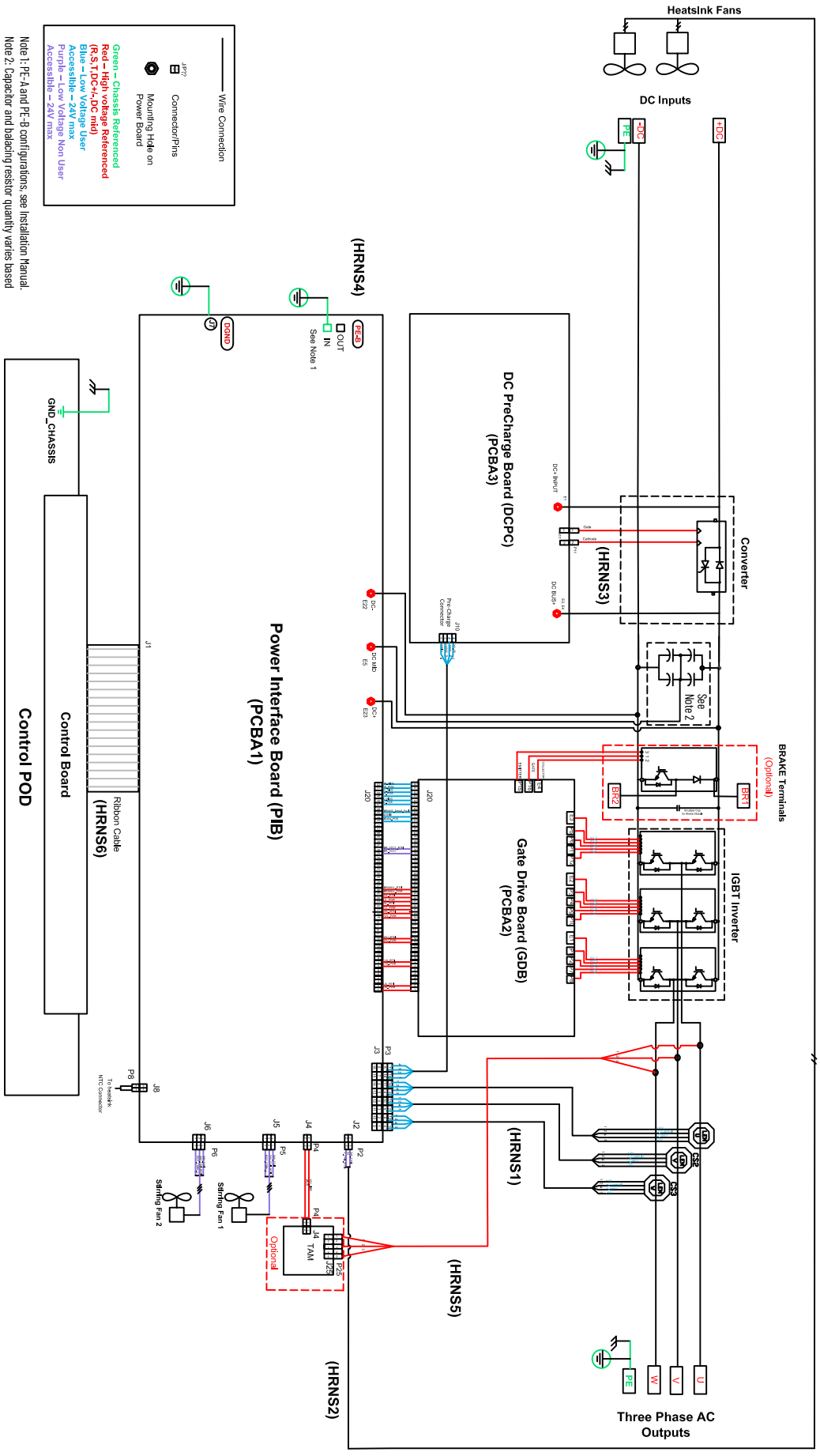


Figure 16 - PowerFlex 755TS Frame 7 AC Input Drive

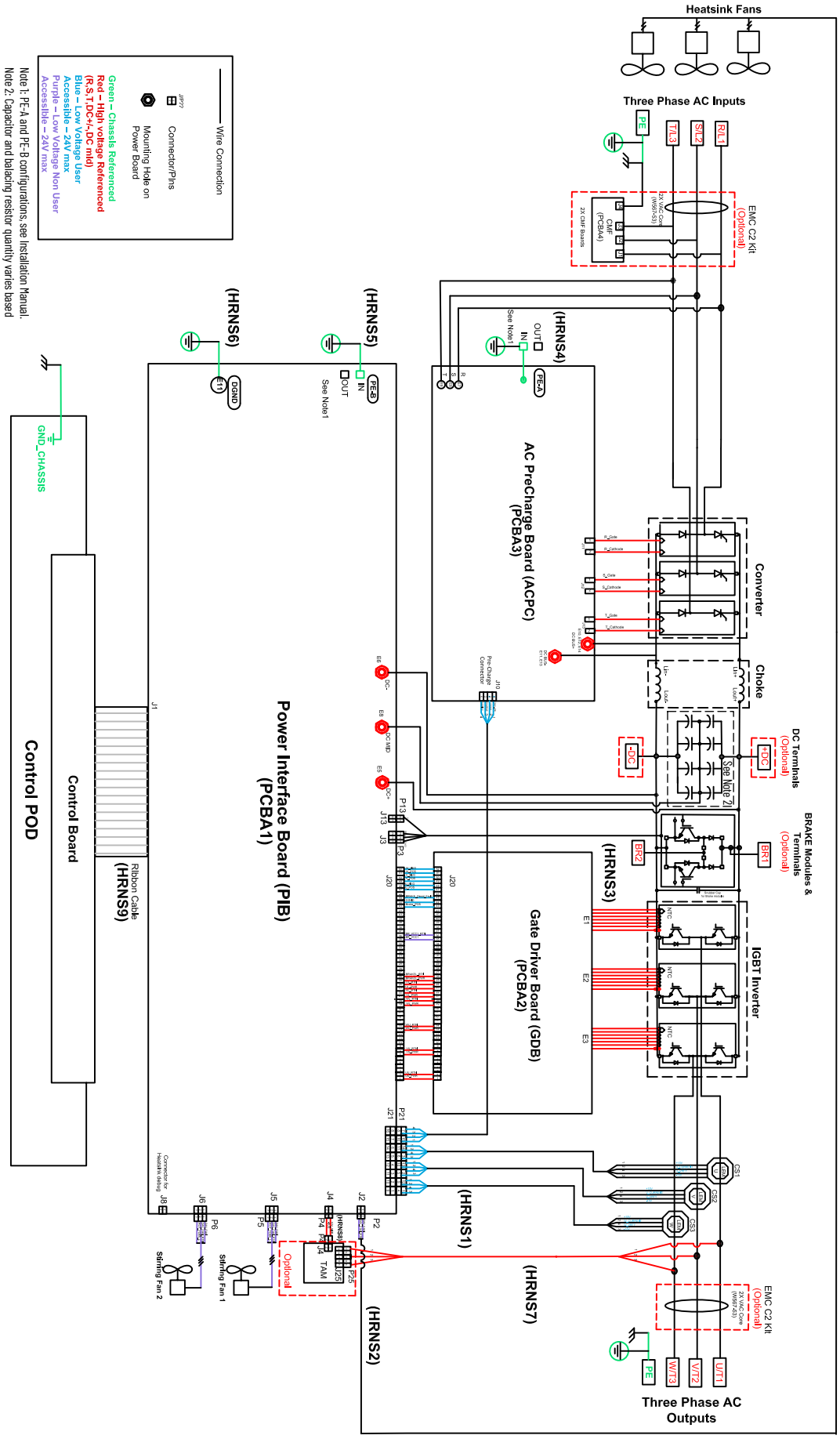
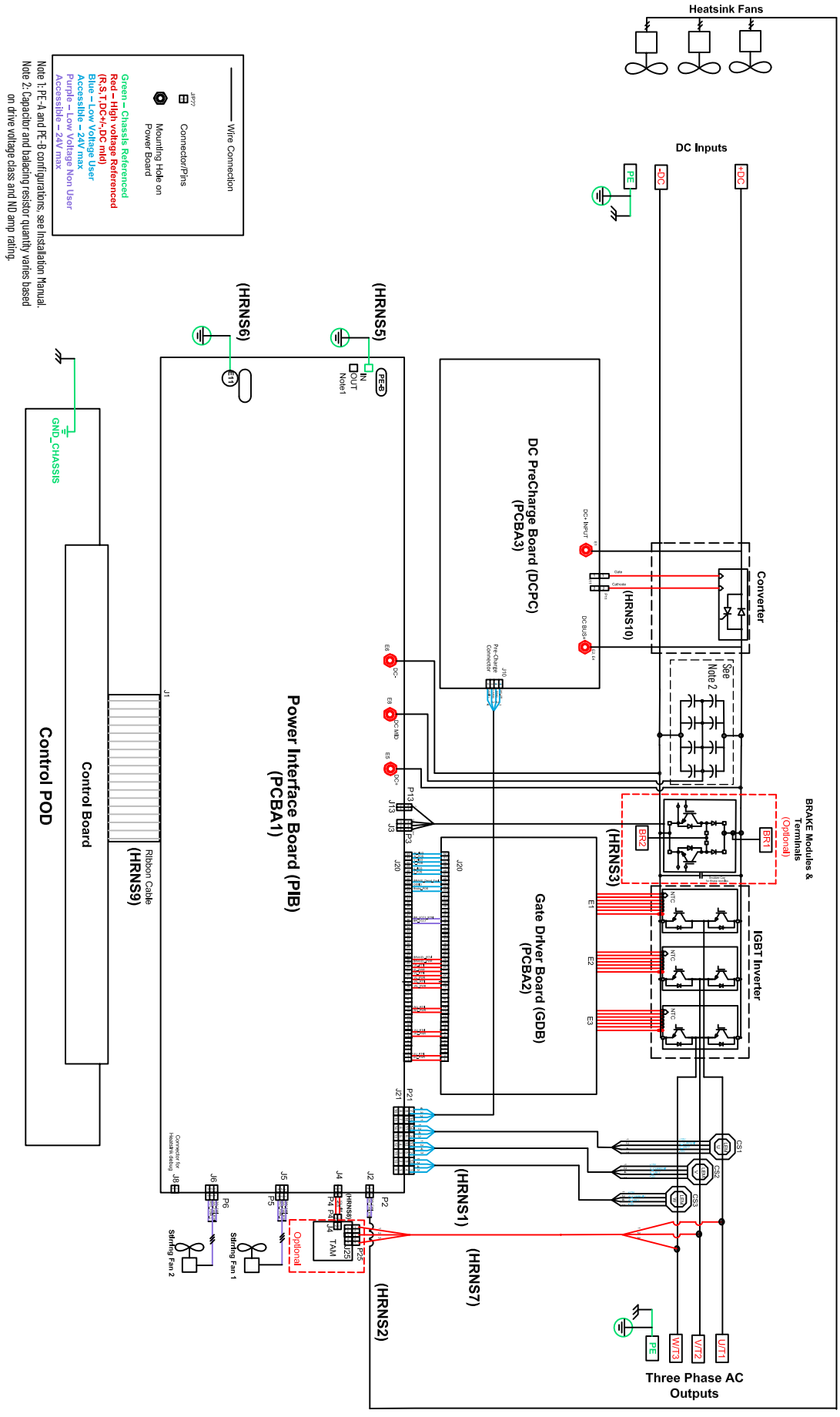


Figure 17 - PowerFlex 755TS Frame 7 DC Input Drive



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Notes:

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

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Waste Electrical and Electronic Equipment (WEEE)

At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental compliance information on its website at rok.auto/pec.

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