

# Balancing Resistor Kit for 600/690V Frame 13 PowerFlex 700AFE and 600/690V Frame 13 and 14 PowerFlex 700H/700S AC Drives

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## Who Should Use These Instructions

These instructions are intended only for use by qualified Rockwell Automation Field Service personnel. Contact Rockwell Automation Customer Service to arrange for the installation of the kit(s).

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**IMPORTANT** The customer should not attempt to use these instructions to install the kit(s), as this will void the product warranty.

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## Additional Resources

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

Resource	Description
PowerFlex 700AFE Frame 13 Hardware Service Manual, publication 20Y-TG002	Provides detailed hardware service information.
PowerFlex 700S/700H Frame 13 High Performance AC Drive Hardware Service Manual, publication PFLEX-TG005	Provides detailed hardware service information.
PowerFlex 700S/700H Frame 14 High Performance AC Drive Hardware Service Manual, publication PFLEX-TG006	Provides detailed hardware service information.
Product Certifications website, <a href="http://www.ab.com">http://www.ab.com</a>	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at <http://www.rockwellautomation.com/literature/>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

## What the Kit Contains

Description	Quantity
Balancing Resistor Assembly (includes resistors, mounting brackets, and wire harness)	1
Tie Wrap	6
Thermal Grease Packet	1
Label	1

Since multiple kits are required for each power phase unit, repeat the procedures described in these instructions.

## Number of Kits Required

Frame Size	600/690V PowerFlex 700AFE	600/690V PowerFlex 700H/700S AC Drive
13	6 kits	6 kits
14	not applicable	12 kits

**TIP** It is good practice to place removed hardware into the piece that it was removed from to avoid hardware mixups and losing the hardware.

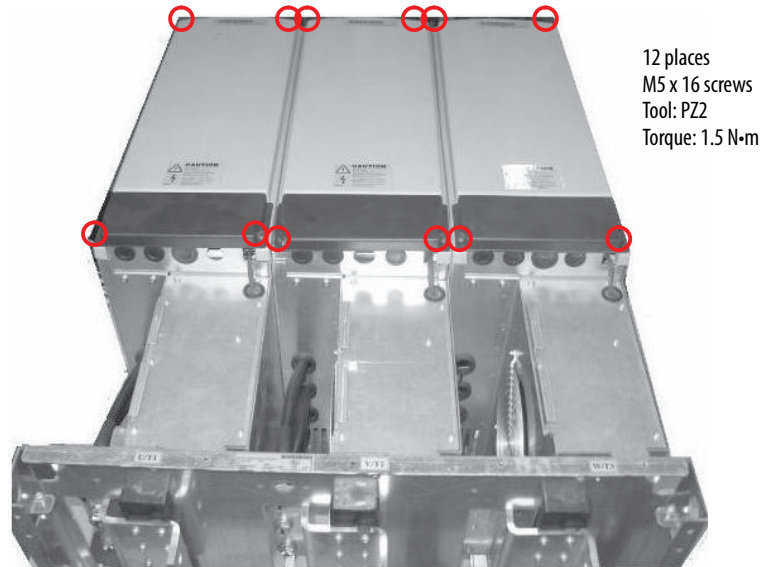
## Arranging for Kit Installation

1. When power structure balancing resistors fail, the customer must contact Rockwell Automation Technical Support.
2. Technical Support will create a code 10 and notify a qualified Rockwell Automation Field Service Engineer (FSE) to field-install the kit(s).
3. The FSE must contact the Rockwell Automation Product Manager to arrange for delivery of the kit/parts to the FSE.
4. The FSE performs on-site installation of the kit(s).

### Step 1: Remove the Power Structure Covers

Unfasten the twelve (12) screws shown in [Figure 1](#) and remove the protective front and terminal covers from the power structure.

Figure 1 - Removing the Protective Front and Terminal Covers



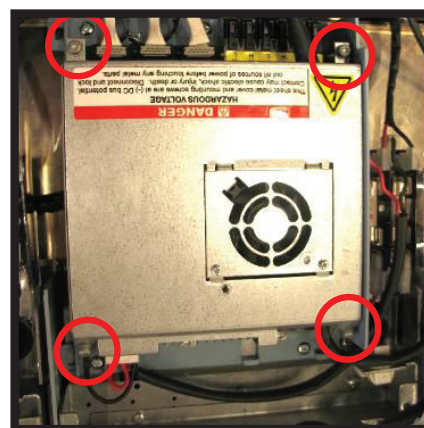
### Step 2: Remove the ASIC-to-Control Pan Cable Set

Disconnect the wire harness from the ASIC board, and remove the wire harness from the power structure. Note the wire harness connectors and board connection identification for reinstallation.

### Step 3: Remove ASIC Board Cover

Unfasten the four (4) screws shown in [Figure 2](#) and remove the ASIC board sheet metal cover.

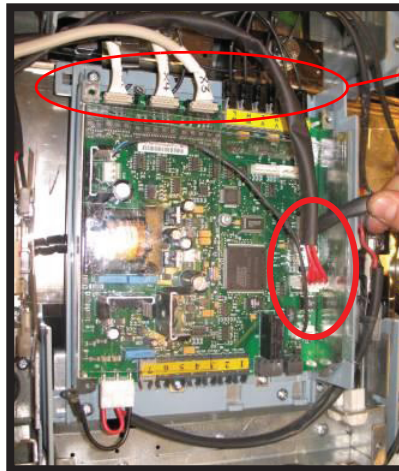
Figure 2 - Removing ASIC Board Cover



### Step 4: Remove Wires and Cabling from ASIC Board

Remove the wires, plastic shield, and cables shown in [Figure 3](#) and [Figure 4](#).

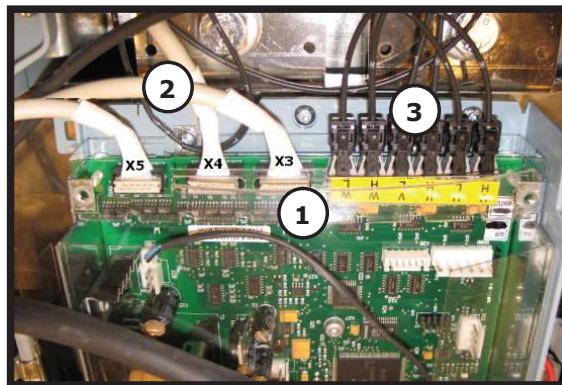
Figure 3 - Removing Wires from ASIC Board



Plastic Shield

Note the wire harness connectors and board connection identification for reinstallation.

Figure 4 - Removing Plastic Shield and Cables from ASIC Board

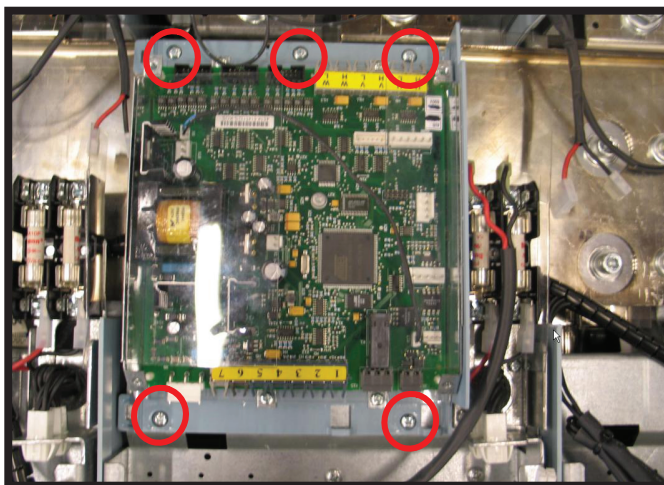


- 1. Remove plastic shield.
- 2. Remove flat cables.
- 3. Remove fiber cables.

### Step 5: Remove ASIC Board Assembly

Unfasten the five (5) screws shown in [Figure 5](#) and remove the ASIC board assembly.

Figure 5 - Removing the ASIC Board Assembly



5 places  
M4 x 8 screws  
Tool: PZ2 – Head  
Torque: 4 N•m

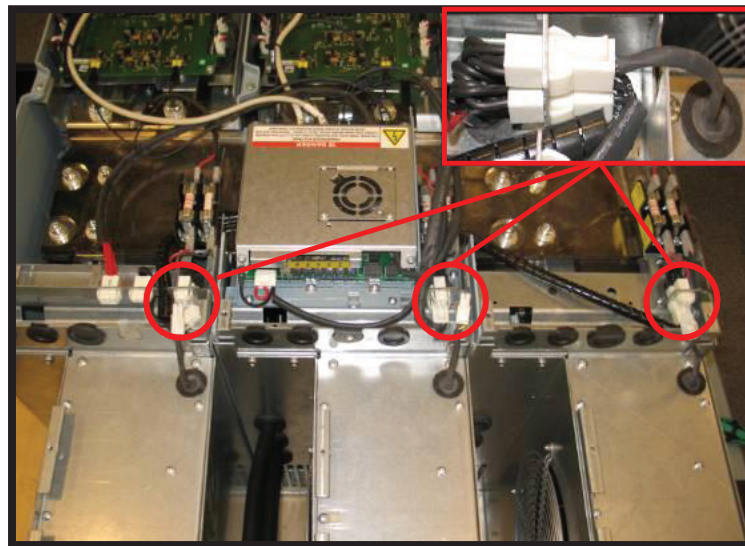
### Step 6: Remove Voltage Feedback Board Sheetmetal Cover (if applicable)

See [Figure 9 on page 6](#) and remove the hardware fastening the voltage feedback board sheetmetal cover (four M4 x 8 screws, use PZ2 – Head). Disconnect and remove the connectors. Then remove the voltage feedback board.

### Step 7: Unplug Main Fan and Fan Inverter Supply Connectors

Unplug the connectors shown in [Figure 6](#) that connect the main fan and fan inverter supply.

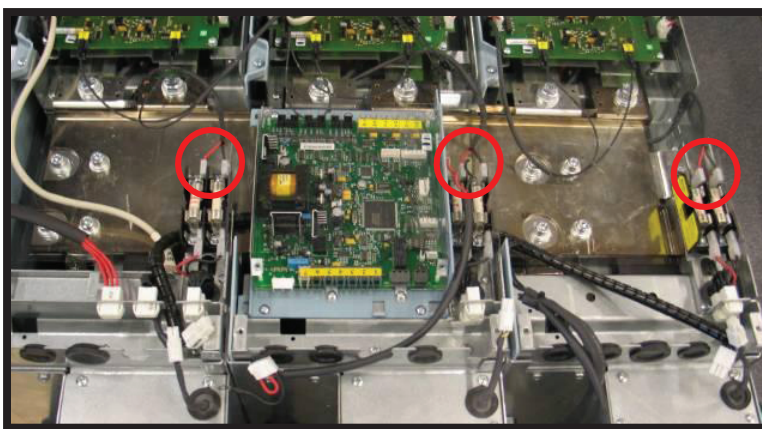
Figure 6 - Unplugging Main Fan and Fan Inverter Supply Connectors



### Step 8: Remove Supply Wires from Fuse Bases

See [Figure 7](#) and remove the supply wires and screws from the fuse sheetmetal bracket. Remove the fuse bracket and insulation sheet (3 places).

Figure 7 - Removing Supply Wires from Fuse Bases

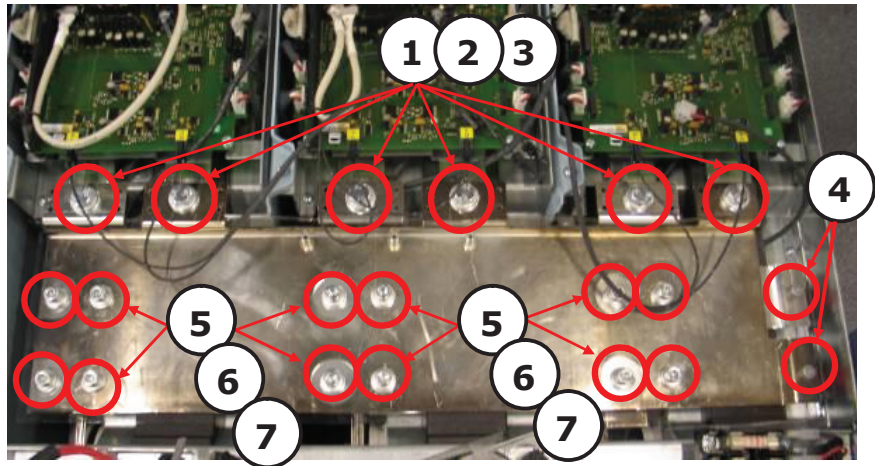


6 places  
M4 x 8 screws  
Tool: PZ2 – Head  
Torque: 4 N•m  
(2 per fuse bracket)

1. Document wire harness routing for reinstallation. Re-dress wire harness with ty-wrap as needed.
2. Be careful not to damage wire harness when removing and reinstalling the fuse brackets.
3. Route the wire harness before reinstalling the fuse brackets.
4. Ensure that fuse wires are black-to-black and red-to-red.

**Step 9: Remove DC Bus Bars** See [Figure 8](#) and remove the DC bus bars and insulators between the bars.

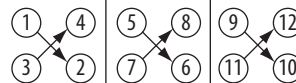
**Figure 8 - Removing DC Bus Bars**



1. Remove screws M10 x 25, 6 places; Tool: hexagonal wrench (size 17); Torque: 20 N-m.
2. Remove flat washers, 6 places.
3. Remove spring washers, 6 places.
4. Remove screws M6 x 12, 2 places; Tool: PZ2 – Head; Torque: 5 N-m.
5. Remove screws M8 x 25, 12 places; Tool: hexagonal socket head (size 6); Torque: 20 N-m.
6. Remove flat washers, 12 places.
7. Remove spring washers, 12 places.

**NOTE:** When reinstalling the DC bus bars, torque the bus bars using the following torque pattern. This diagonal style of tightening the screws evenly secures the bus bars.

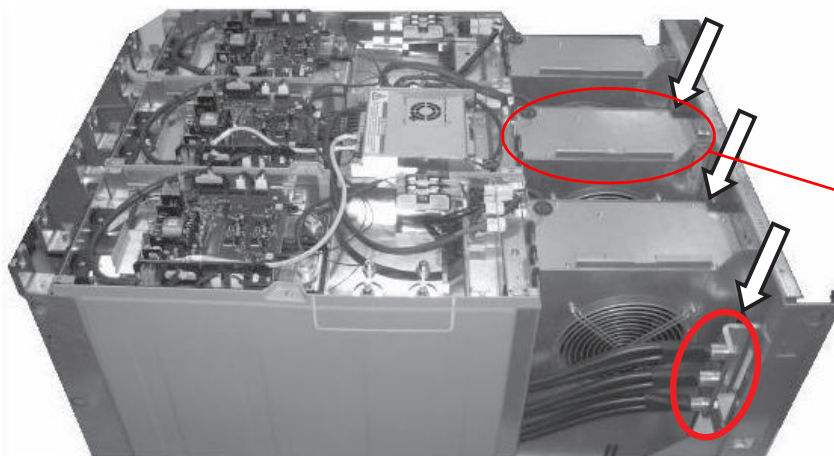
**DC Bus Bar Torque Pattern**



**Step 10: Remove Voltage Supply Cables**

Unfasten the nine (9) screws, spring washers, and flat washers shown in [Figure 9](#) and remove the voltage supply cables.

**Figure 9 - Removing Voltage Supply Cable Screws**



**NOTE:** When reinstalling, re-torque the voltage supply cables from the bottom. An 18 mm wrench may need to be used if the cable starts to twist when re-torquing the cables.

Voltage Feedback Board Location

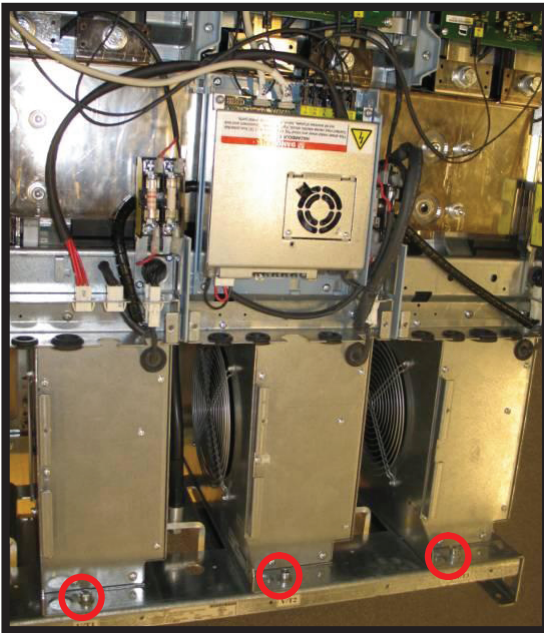
9 places  
M10 x 30 hexagonal screws  
Tool: hexagonal wrench (size 17)  
Torque: 40 N-m

9 places  
Remove spring washers  
Remove flat washers

## Step 11: Remove Power Phase Units from Assembly Base

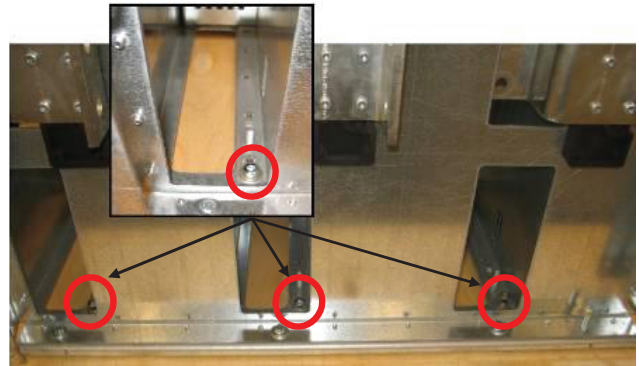
Unfasten the six (6) mounting screws and conical washers shown in [Figure 10](#) and remove the power phase units from the assembly.

**Figure 10 - Removing Screws from Bottom End of Power Phase Units**



3 places  
M8 x 20 socket head cap screws  
Tool: hexagonal socket head (size 6)  
Torque: 20 N·m

**NOTE:** When reinstalling, fasten these screws first to ensure that the power modules are fully seated in the base.

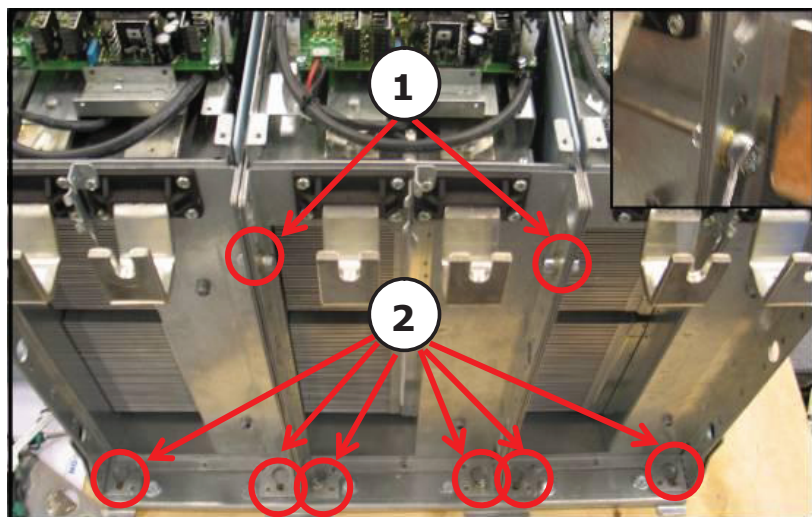


3 places  
M8 x 20 socket head cap screws  
Tool: hexagonal socket head (size 6) - long extension recommended  
Torque: 20 N·m

Remove M8 conical spring washers

Unfasten the eight (8) screws shown in [Figure 11](#) that mount the phase units.

**Figure 11 - Removing Top Head Screws of Phase Units**

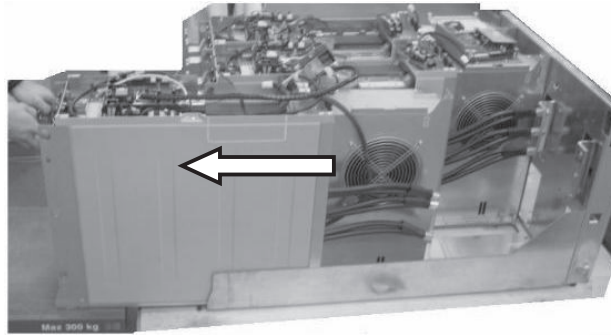


1. Remove screws M8 x 20, 2 places; Tool: hexagonal socket head (size 6); Torque: 20 N·m; and remove M8 nut; Tool: hexagonal wrench (size 13); Torque: 20 N·m
2. Remove screws M8 x 20, 6 places; Tool: hexagonal socket head (size 6); Torque: 20 N·m.

## Step 12: Remove Phase Units from Mounting Base

See [Figure 12](#) and slide the phase unit off of the mounting base.

Figure 12 - Sliding Phase Unit Off of Mounting Base

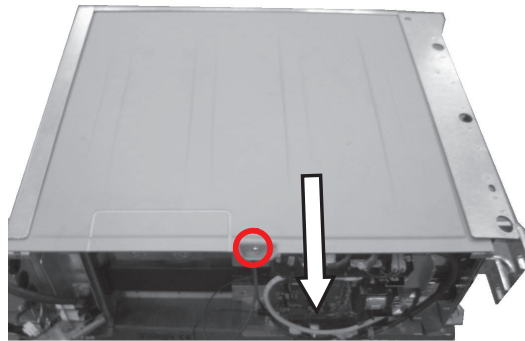


**NOTE:** Be careful when sliding phase unit out/back in so that no wires or harnesses get damaged.

1. Slide phase unit out and onto a lift truck or wood pallet of the same height as the phase unit is in the mounting base.
2. Remove side cover while phase unit is vertical.
3. Place phase unit on its back with side cover up.

Unfasten the screw shown in [Figure 13](#) and slide off the side cover.

Figure 13 - Removing Phase Units Side Cover

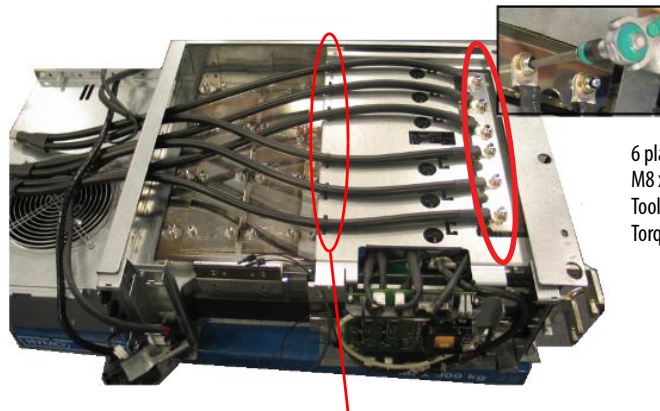


1 place  
M5 x 10 screw  
Tool: PZ2 – Head  
Torque: 3.5 N•m

## Step 13: Remove EMC Shield Unit

Unfasten the six (6) screws shown in [Figure 14](#) that connect the supply cables to the EMC shield unit. **NOTE:** Re-seat the Allen head screws so that they do not get mixed up with other Allen head screws.

Figure 14 - Removing Supply Cable Screws



6 places  
M8 x 20 screws  
Tool: hexagonal socket head (size 6)  
Torque: 20 N•m

**NOTE:** Cut Ty Wraps at six (6) locations.

During reinstallation:

1. Place Ty Wraps with head to side so that cover can slide on.
2. Only hand tighten the Ty Wraps.



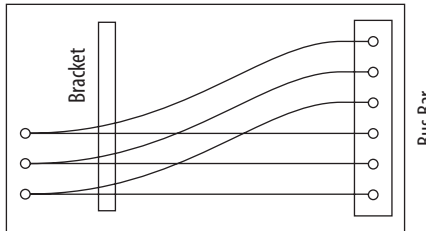
Unfasten the two (2) screws shown in [Figure 15](#) and remove the EMC shield cover.

**Figure 15 - Removing EMC Shield Cover Screws**



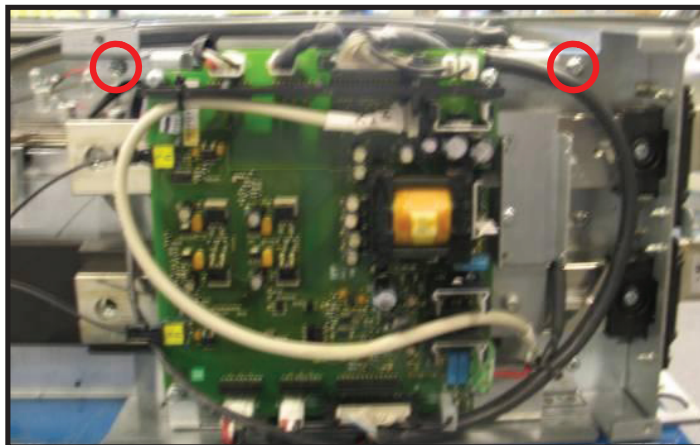
**NOTE:** Mark wires before removing and reinstall as with matching sets.

2 places  
M4 x 8 screws  
Tool: PZ2 – Head  
Torque: 3.5 N·m



Unfasten the two (2) screws shown in [Figure 16](#) and remove the EMC shield unit.

**Figure 16 - Removing EMC Shield Unit**

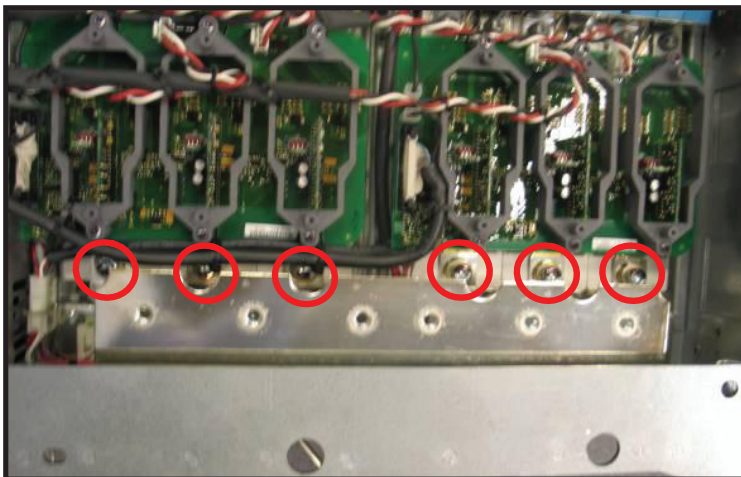


2 places  
M5 x 10 screw  
Tool: PZ2 – Head  
Torque: 3.5 N·m

### Step 14: Remove Supply Bus Bar Screws

Unfasten the six (6) screws shown in [Figure 17](#) from the supply bus bars.

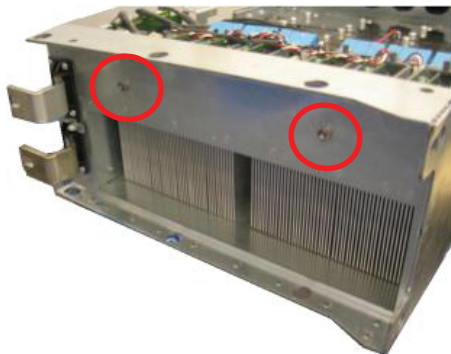
**Figure 17 - Removing Supply Bus Bar Screws**



6 places  
M8 x 20 screws  
Tool: hexagonal socket head (size 6)  
Torque: 14 N•m

See [Figure 18](#) and unfasten the two (2) screws that hold the bus bar support.

**Figure 18 - Removing Supply Bus Bar Support Screws**

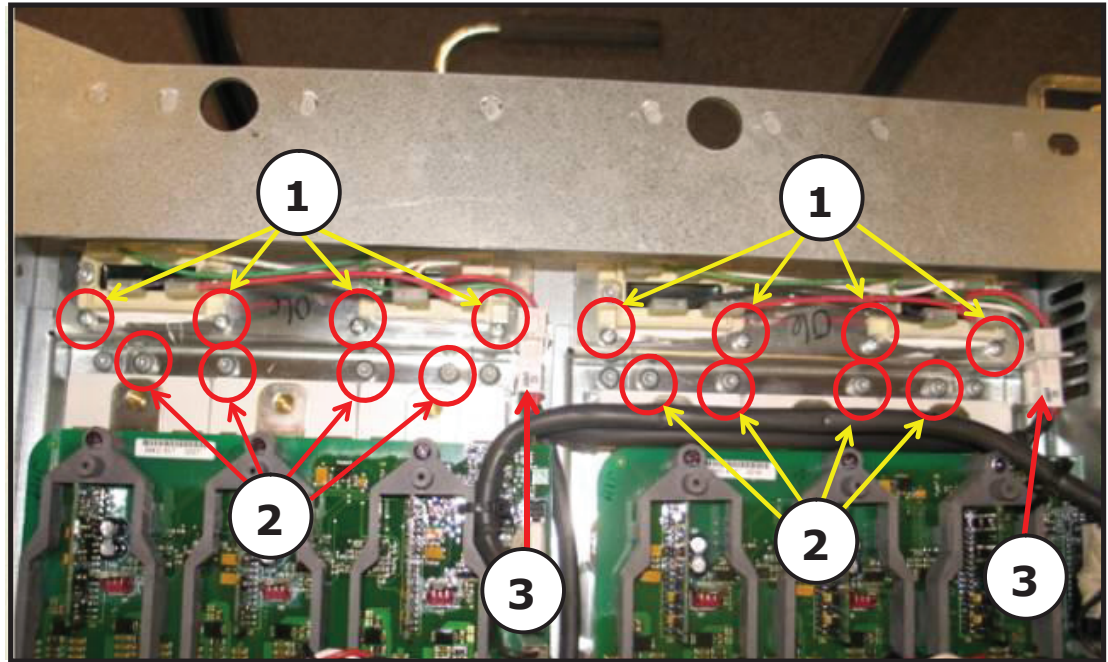


2 places  
M6 x 20 screws  
Tool: PZ3 – Head  
Torque: 5 N•m  
Pivot bus bar assembly and remove.

## Step 15: Access Balancing Resistor Assembly

See [Figure 19](#) and remove the hardware to access the balancing resistor assembly.

Figure 19 - Accessing Balancing Resistor Assembly

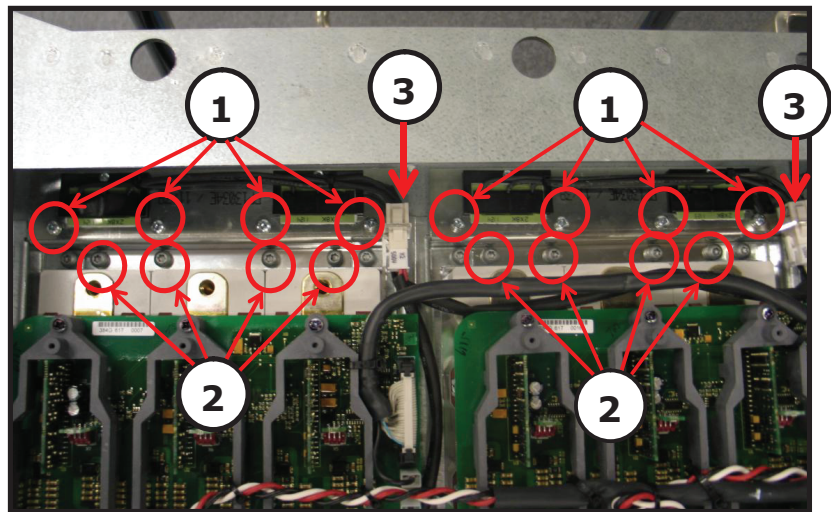


1. Remove screws M4 x 8, 8 places; Tool: PZ2 – Head; Torque: 3.5 N·m
2. Remove screws M5 x 12, 8 places; Tool: TX25 – Head; Torque: 3.5 N·m
3. Unplug balancing resistor connectors and remove the old balancing resistor kit.
4. Properly discard the old balancing resistor assembly.

## Step 16: Install New Spare Parts Kit Components

See [Figure 20](#) and install the new spare parts kit components as described below.

Figure 20 - Installing New Balancing Resistor Assembly Spare Parts Kit Components



1. Fasten screws M4 x 8, 8 places; Tool: PZ2 – Head; Torque: 3.5 N·m
2. Fasten screws M5 x 12, 8 places; Tool: TX25 – Head; Torque: 3.5 N·m
3. Connect balancing resistor connectors.

## Step 17: Re-Assemble the Product

Re-assemble the product in reverse order.

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**IMPORTANT** Follow the Service Manual safety notices and instructions when powering up the unit after repair.

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## Step 18: Attach New Label

On the label provided in the kit, fill in the information shown below. Then attach the label by the inverter data nameplate.

Balancing Resistor Upgrade

Date: \_\_\_\_\_

U.S. Allen-Bradley Drives Technical Support - Tel: (1) 262.512.8176, Fax: (1) 262.512.2222, E-mail: support@drives.ra.rockwell.com  
Online: www.ab.com/support/abdrives

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