

Altivar® 61/71

Adjustable Speed Drives

Heatsink Fan Kits

VZ3V1212 and VZ3V1216

Instruction Bulletin

30072-452-48

Retain for future use.



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Hazard Categories and Special Symbols

The following symbols and special messages may appear in this document or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

A lightning bolt or ANSI man symbol in a “Danger” or “Warning” safety label on the equipment indicates an electrical hazard which, as indicated below, can or will result in personal injury if the instructions are not followed.

The exclamation point symbol in a safety message in a manual indicates potential personal injury hazards. Obey all safety messages introduced by this symbol to avoid possible injury or death.

Symbol	Name
	Lightning Bolt
	ANSI Man
	Exclamation Point

⚠ DANGER
DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING
WARNING indicates a potentially hazardous situation which, if not avoided, can result in death or serious injury.

⚠ CAUTION
CAUTION indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.

CAUTION
CAUTION , used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, can result in property damage.

Product Support

For support and assistance, contact the Product Support Group. The Product Support Group is staffed from Monday through Friday, 8:00 am until 6:00 pm Eastern time, to assist with product selection, start-up, and diagnosis of product or application problems. Emergency phone support is available 24 hours a day, 365 days a year.

Toll free: 888-SquareD (888-778-2733)
 E-Mail: drive.products.support@us.schneider-electric.com
 Fax: 919-217-6508

Before You Begin

Read and follow these precautions before performing any procedure with this drive.

The word “drive” as used in this bulletin refers to the controller portion of the adjustable speed drive as defined in the National Electrical Code (NEC).

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Read and understand this manual before installing or operating the Altivar 61 or 71 drive. Installation, adjustment, repair, and maintenance must be performed by qualified personnel.
- The user is responsible for compliance with all international and national electrical code requirements with respect to grounding of all equipment.
- Many parts of this drive, including the printed circuit boards, operate at the line voltage. **DO NOT TOUCH.** Use only electrically insulated tools.
- **DO NOT** touch unshielded components or terminal strip screw connections with voltage present.
- **DO NOT** short across terminals PA/+ and PC/- or across the DC bus capacitors.
- Before servicing the drive:
 - Disconnect all power, including external control power that may be present.
 - Place a “DO NOT TURN ON” label on all power disconnects.
 - Lock all power disconnects in the open position.
 - **WAIT 15 MINUTES** to allow the DC bus capacitors to discharge. Then follow the “Bus Voltage Measurement Procedure” on page 8 to verify that the DC voltage is less than 42 V. The drive LED is not an indicator of the absence of DC bus voltage.
- Install and close all covers before applying power or starting and stopping the drive.

Failure to follow these instructions will result in death or serious injury.

Introduction

This instruction bulletin contains replacement procedures for the Altivar® 61 and 71 heatsink fan kits. Read and understand the instructions in this document and other referenced documents before installing the kit.

Table 1: Heatsink Fan Kits

Drives:		Heatsink Fan Kits:	
Catalog Number	Frame Size	No. of Fans in Drive	Catalog Number
ATV71HC11N4 ATV61HC13N4	10	1	VZ3V1212
ATV71HD75M3X ATV61HD90M3X	10	1	VZ3V1216
ATV71HC13N4 ATV61HC16N4	11	1	VZ3V1212
ATV71HC16N4 ATV61HC22N4	12	1	
ATV71HC20N4 ATV71HC25N4 ATV71HC28N4 ATV61HC25N4 ATV61HC31N4	13	2	
ATV71HC31N4 ATV71HC40N4 ATV61HC40N4 ATV61HC50N4	14	3	
ATV71HC50N4 ATV61HC63N4	15	4	

Related Documentation

For drive installation instructions, refer to the following documents:

- *Altivar® 61 Installation Manual 0.5 to 100 HP*, module no. 1760643
- *Supplementary Instructions to ATV61 Variable Speed Drives Installation Manual—Low Horsepower*, document no. 30072-451-50
- *Altivar® 61 Installation Manual 75 to 800 HP*, module no. 1760655
- *Addendum to ATV61 Variable Speed Drives Installation Manual—High Horsepower*, document no. 30072-451-57
- *Altivar® 71 Installation Manual 0.5 to 100 HP*, module no. 1755843
- *Altivar® 71 Installation Manual 75 to 700 HP*, module no. 1755849

All documentation referenced in this bulletin is provided with the drive or on the CD-ROM included with the spare parts kits. You can also download the documentation from the Technical Library at www.schneider-electric.us.

Preliminary Recommendations

Before beginning the installation procedures, read and understand all the information in this section.

Qualified Personnel

For the protection of personnel and equipment, a qualified person must perform the procedures detailed in this instruction bulletin.

A qualified person is one who has skills and knowledge related to the construction and operation of this electrical equipment and the installation, and has received safety training to recognize and avoid the hazards involved. Refer to the most current release of NFPA 70E®, "Standard for Electrical Safety in the Workplace," for safety training requirements.

In addition, the person must be:

- Able to read, interpret, and follow the instructions and precautions in this instruction bulletin and the other documentation referenced.
- Able to use the required tools listed in this instruction bulletin in a safe and correct manner.

Working Procedures

Observe the following working procedures:

- Use only the components provided with the kits listed in Table 1 on page 6. Do not attempt to repair the drive with other spare parts or equipment.
- If the part being replaced includes labels, ensure that the labels are applied to the replacement part. If the labels are not available in the kit, contact your Schneider Electric representative.
- Mount the spare parts only in the locations specified in the installation procedures.
- Route and position the wires as shown in the instructions. Use the wires and cables provided with the spare parts kits or with the drive. Do not modify the wires and cables. Do not route wires and cables outside of the drive enclosure.
- Replace the power terminal shields as specified in the installation procedures.
- Observe the hardware and torque requirements specified in the installation procedures. Do not substitute hardware. Carefully segregate and label all removed hardware and parts for use in reassembly of the drive.
- Replace all covers as specified in the installation procedures.

Tools Required

- Torque wrench, 0–15 N•m (0–150 lb-in)
- Voltmeter, 1–1000 Vdc
- Driver bits:
 - T-20 Torx® driver
 - Magnetic tip Phillips, size 2
 - Magnetic tip Phillips, size 3
- Socket wrenches:
 - 7 mm
 - 13 mm
 - 10 mm

Installation Procedures

Power Removal and Bus Voltage Measurement

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Read and understand the precautions in "Before You Begin" starting on page 5 before performing this procedure.

Failure to follow these instructions will result in death or serious injury.

The DC bus voltage can exceed 1,000 Vdc. Use a properly rated voltage-sensing device when performing this procedure. To measure the DC bus voltage:

1. Disconnect all power.
2. Wait 15 minutes to allow the DC bus to discharge.
3. Measure the voltage of the DC bus between the PA/+ and PC/- terminals to ensure that the voltage is less than 42 Vdc. These terminals are clearly labeled on each drive.
4. If the DC bus capacitors do not discharge completely, contact your local Schneider Electric representative. Do not repair or operate the drive.

⚠ CAUTION

IMPROPER DRIVE OPERATION

- If the drive is not turned on for a long period, the performance of its electrolytic capacitors will be reduced.
- If the drive is stopped for a prolonged period, turn the drive on every two years for at least 5 hours to restore the performance of the capacitors, then check its operation.
- Do not connect the drive directly to line voltage. Increase the voltage gradually using an adjustable AC source.

Failure to follow these instructions can result in injury or equipment damage.

Discharging Stored Energy in Capacitors

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- When the controller is damaged, voltage may remain on certain energy storage capacitors after de-energization of the controller and discharge of the main capacitor bank.
- Before working on or near assemblies containing energy storage capacitors, verify that the capacitor voltages are less than 42 Vdc.
- The following assemblies have energy-storing capacitors:
 - Filter board
- Always check for the presence of voltage using a voltmeter set to the 1000 Vdc scale. When voltage is present, allow the voltmeter to discharge the capacitor's stored charge.

Failure to follow these instructions will result in death or serious injury.

Capacitors are used throughout the drive as energy storage devices. Some of the capacitors can store potentially lethal amounts of energy during normal controller operation.

When power is removed from an undamaged controller, the stored energy in these capacitors is automatically discharged to nonhazardous levels. However, the discharge mechanisms in a damaged controller may not be operating properly, and stored energy may be present on printed circuit boards.

Do not touch traces on printed circuit boards, such as the line filter board, unless you have first checked for voltage with a voltmeter!

To discharge the filter board capacitors, use a voltmeter set to the 1000 Vdc scale. It will take approximately 6.6 minutes for a 10 megohm input impedance voltmeter to discharge a 10 microfarad capacitor from 700 V to less than 42 V. It will take approximately 40 seconds for a 1 megohm input impedance voltmeter to discharge a 10 microfarad capacitor from 700 V to less than 50 V.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Do not use a voltmeter to discharge stored energy on the DC bus capacitors.
- If the energy on the DC bus capacitors remains greater than 42 Vdc after 15 minutes, contact Product Support.

Failure to follow these instructions will result in death or serious injury.

Frame Size 10

**ATV71HD75M3X, ATV71HC11N4,
ATV61HD90M3X, ATV61HC13N4**

IMPORTANT: Label and retain all removed hardware and cables for use in reassembly.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

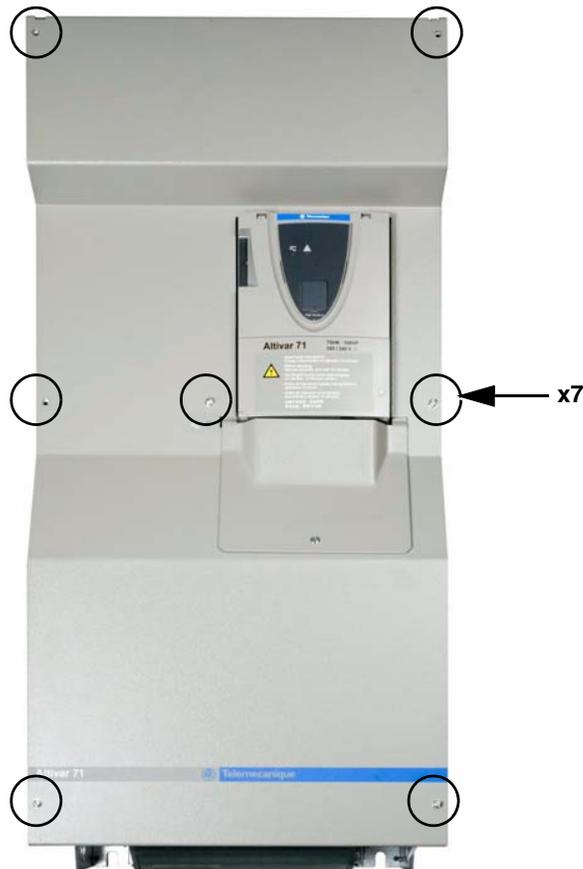
- Read and understand the precautions in “Before You Begin” starting on page 5 before performing this procedure.
- Before working on this equipment, turn off all power supplying it and perform the DC bus voltage measurement procedure on page 8.

Failure to follow these instructions will result in death or serious injury.

Remove the Front Cover

1. Using a size 2 Phillips driver, remove seven screws and take off the front cover of the drive. See Figure 1.

Figure 1: Front Cover, Frame Size 10

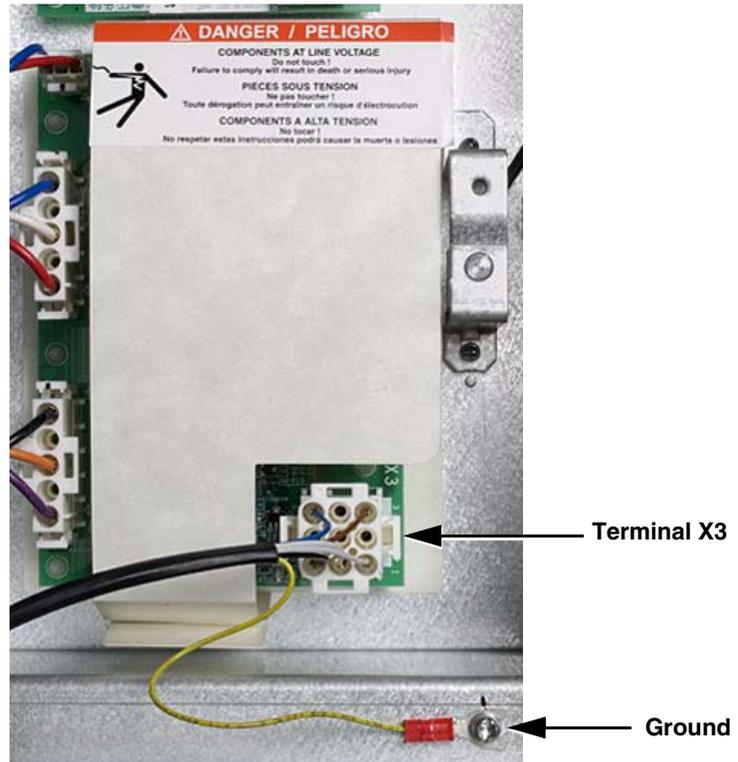


Remove the Fan Connections

Remove the fan connection as follows.

1. Remove the 9-pin connector from terminal X3 of the fan control board.
2. Using a T-20 Torx driver, remove the yellow ground wire from the control module plate.

Figure 2: Fan Connections, Frame Size 10



Replace the Fan

Table 2: Torque Table, Frame Size 10

Hardware	Torque Range	
	N•m	lb-in
10 mm mounting nut	4.2–5.1	37.2–45.1
T-20 Torx ground wire screw	1.1–1.7	9.7–15.0
Size 2 Phillips cover screw	1.1–1.7	9.7–15.0

1. The cable connecting the heatsink fan to the fan control board has a rubber grommet to secure it to the bottom terminal plate. See Figure 3 on page 12. Remove the grommet from the plate by pushing it through the cutout. Feed the 9-pin connector through the cutout and remove the cable and connector from the drive.
2. Using a 10 mm socket wrench, remove two nuts securing the fan to the back plate of the drive and remove the fan from the drive. See Figure 4 on page 12.
3. Position the new fan over the standoffs on the back plate of the drive. Using a 10 mm socket wrench, secure the fan with two nuts. Tighten the nuts to the torque value specified in Table 2.
4. Feed the 9-pin connector and cable through the cutout in the bottom terminal plate and secure the rubber grommet into the cutout. Route the cable up through the drive as illustrated in Figure 3.
5. Plug the 9-pin connector into terminal X3 of the fan control board.
6. Using a T-20 Torx driver, secure the yellow ground wire from the 9-pin connector to the control module plate with one screw. Tighten the screw to the torque value specified in Table 2.
7. Using a size 2 Phillips driver, replace the front cover as illustrated on page 10. Tighten the screws to the torque value specified in Table 2.

Figure 3: Fan Connections, Frame Size 10

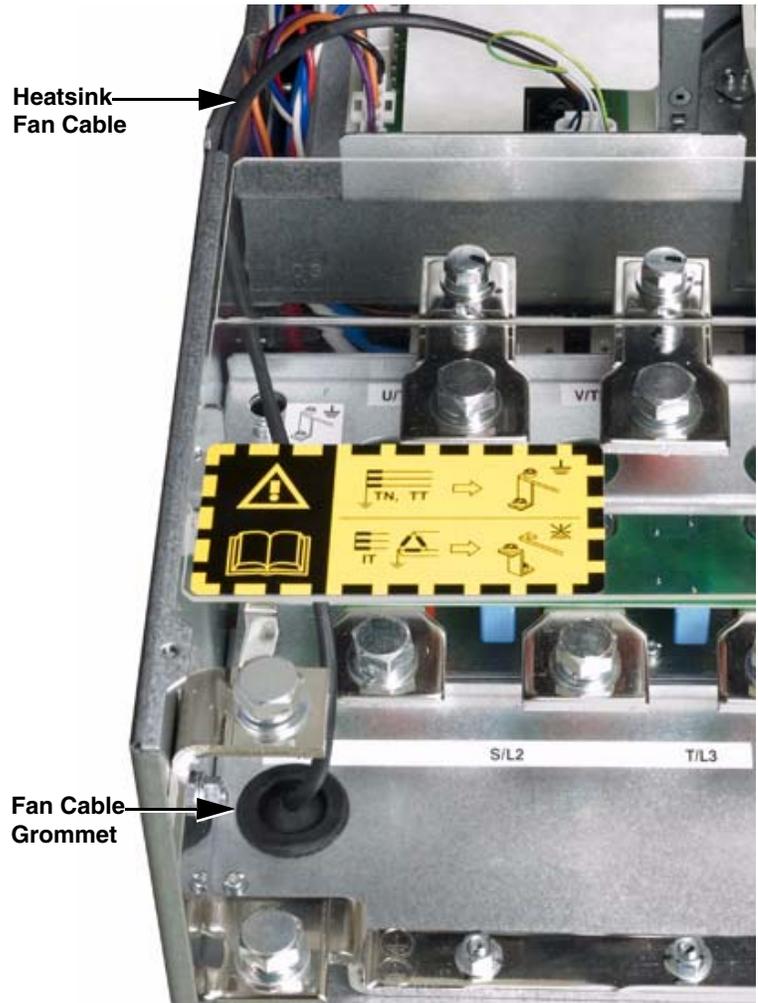


Figure 4: Fan Mounting Nuts, Frame Size 10



Frame Sizes 11 and 12

**ATV71HC13N4, ATV61HC16N4,
ATV71HC16N4, ATV61HC22N4**

IMPORTANT: Label and retain all removed hardware and cables for use in reassembly.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Read and understand the precautions in “Before You Begin” starting on page 5 before performing this procedure.
- Before working on this equipment, turn off all power supplying it and perform the DC bus voltage measurement procedure on page 8.

Failure to follow these instructions will result in death or serious injury.

Remove the Front Cover

1. Using a size 3 Phillips driver, remove nine screws (A) and take off the front cover of the drive. See Figure 5.

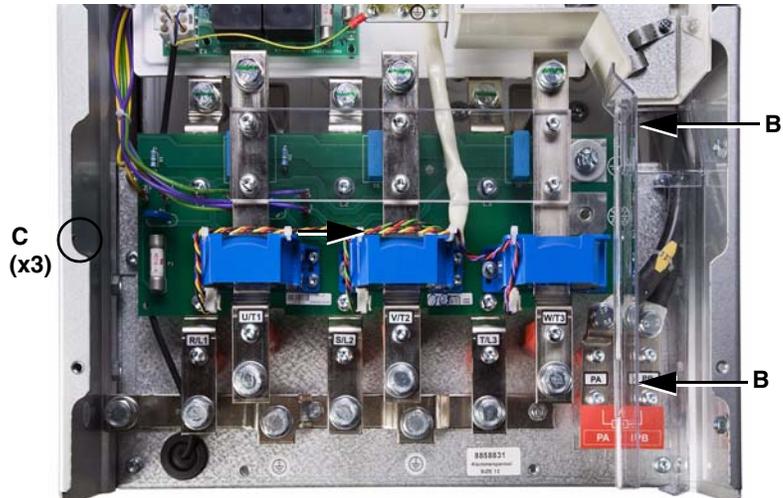
Figure 5: Front Cover, Frame Size 12 Shown



Remove the Terminal Shield

Remove two tabs (B) from the retaining slots in the conduit tray and remove the shield from the three retaining posts (C) on the left side panel.

Figure 6: Terminal Shield, Frame Size 12 Shown



Remove the Fan Connections

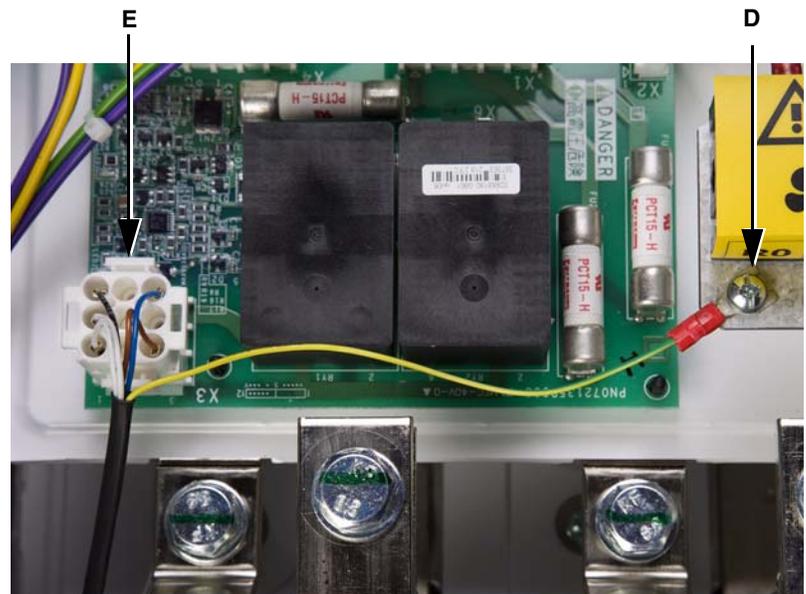
Remove the fan connections as follows. See Table 3 and Figure 7 for connection locations.

1. Using a size 2 Phillips driver, loosen one screw (D) and remove the green and yellow ground wire from the TB1 bracket.
2. Unplug the 9-pin connector (E) from the fan control board.

Table 3: Fan Connections, Frame Size 12 Shown

Frame Size	Connector Location	Terminal Marking
11	Fan control board	X1
12		X3

Figure 7: Fan Connections, Frame Size 12 Shown



Replace the Fan

1. The cable connecting the heatsink fan to the filter board has a rubber grommet (F) to secure it to the bottom terminal plate. See Figure 8. Remove the grommet from the plate by pushing it through the cutout. Feed the connector through the cutout and remove the cable and connector from the drive.
2. Remove two 10 mm nuts (G) and remove the fan from the back plate of the drive.

Figure 8: Fan Mounting Screws, Frame Size 12 Shown

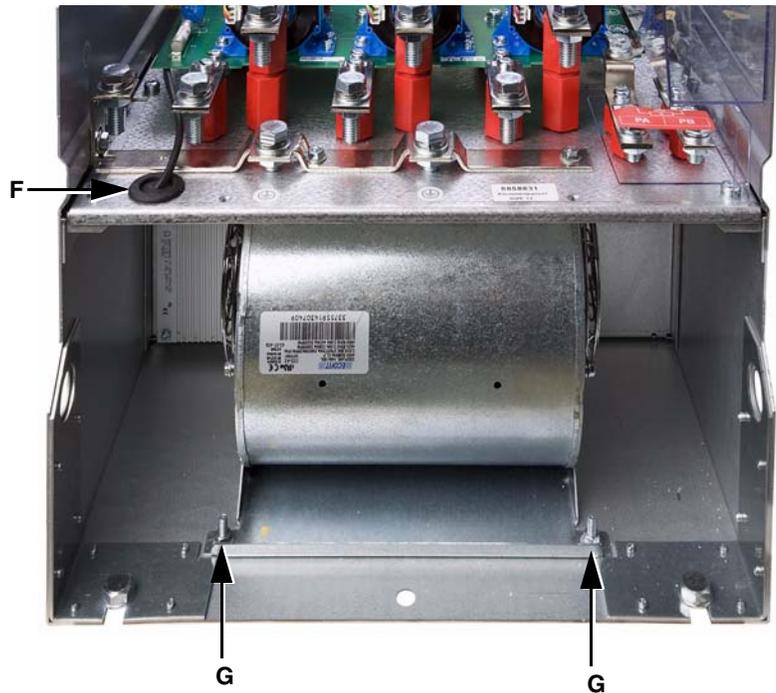


Table 4: Torque Table, Frame Sizes 11 and 12

Item	Description	Torque Range	
		N•m	lb-in
A	Size 3 Phillips cover screw	4.2–5.1	37.2–45.1
D	Size 2 Phillips ground wire screw	1.1–1.7	9.7–15.0
G	10 mm mounting nut	4.2–5.1	37.2–45.1

3. Position the new fan over the standoffs on the back plate of the drive and secure it with two 10 mm nuts (G). Tighten the nuts to the torque value specified in Table 4.
4. Feed the 9-pin connector and cable through the cutout in the bottom terminal plate and secure the rubber grommet (F) into the cutout. Route the cable up through the drive as illustrated in Figure 6.
5. Connect the fan as follows. See Table 3 and Figure 7 on page 14 for connection locations.
 - Plug the 9-pin connector (E) into the fan control board.
 - Using a size 2 Phillips driver, secure the yellow and green ground wire to the TB1 bracket with one screw (D). Tighten the screw to the torque value specified in Table 4.
6. Replace the terminal shields as illustrated on page 14.
7. Using a size 3 Phillips driver, secure the front cover with nine screws (A) as illustrated on page 13. Tighten the screws to the torque value specified in Table 4.

Frame Size 13

ATV71HC20N4, ATV71HC25N4,
ATV71HC28N4, ATV61HC25N4,
ATV61HC31N4

IMPORTANT: Label and retain all removed hardware and cables for use in reassembly.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Read and understand the precautions in “Before You Begin” starting on page 5 before performing this procedure.
- Before working on this equipment, turn off all power supplying it and perform the DC bus voltage measurement procedure on page 8.

Failure to follow these instructions will result in death or serious injury.

Remove the Front Cover

1. Using a size 3 Phillips driver, remove nine screws (A) and take off the front cover of the drive. See Figure 9.

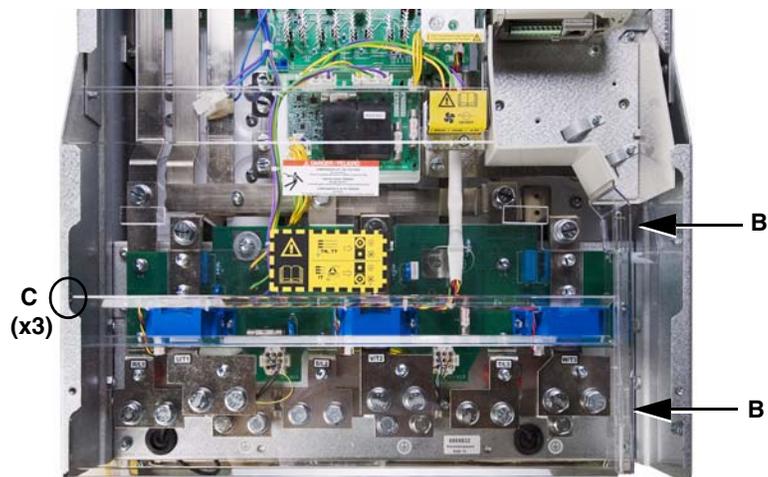
Figure 9: Front Cover, Frame Size 13



Remove the Terminal Shield

Remove two tabs (B) from the retaining slots in the conduit tray and remove the shield from the three retaining posts (C) on the left side panel.

Figure 10: Terminal Shield, Frame Size 13



Remove the Fan Connections

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- When the controller is damaged, voltage may remain on certain energy storage capacitors after de-energization of the controller and discharge of the main capacitor bank.
- Before working on or near assemblies containing energy storage capacitors, verify that the capacitor voltages are less than 42 Vdc.
- The following assemblies have energy-storing capacitors:
 - Filter board. See Figure 11.
- Always check for the presence of voltage using a voltmeter set to the 1000 Vdc scale. When voltage is present, allow the voltmeter to discharge the capacitor's stored charge. Refer to "Discharging Stored Energy in Capacitors" on page 9.

Failure to follow these instructions will result in death or serious injury.

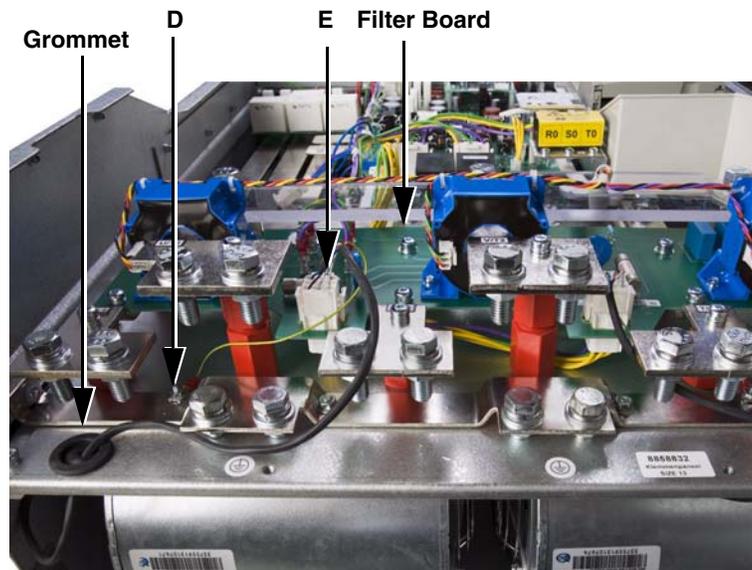
Remove the connections of the fans you are replacing as follows. See Table 5 and Figure 11 for connection locations.

1. Using a 7 mm socket wrench, loosen one nut (**D**) and remove the green and yellow ground wire from the terminal plate.
2. Unplug the 9-pin connector (**E**) from the filter board.

Table 5: Fan Connections, Frame Size 13

Fan position	Connector Location	Terminal Marking
Left	Filter board	X11
Right		X12

Figure 11: Fan Connections, Frame Size 13



Replace the Fan

1. The cable connecting the heatsink fan to the filter board has a rubber grommet to secure it to the bottom terminal plate. See Figure 11 on page 18. Remove the grommet from the plate by pushing it through the cutout. Feed the connector through the cutout and remove the cable and connector from the drive.
2. Remove one 10 mm nut (**F**) and one 13 mm nut and washer (**G**) and remove the fan from the back plate of the drive.

Figure 12: Fan Mounting Screws, Frame Size 13

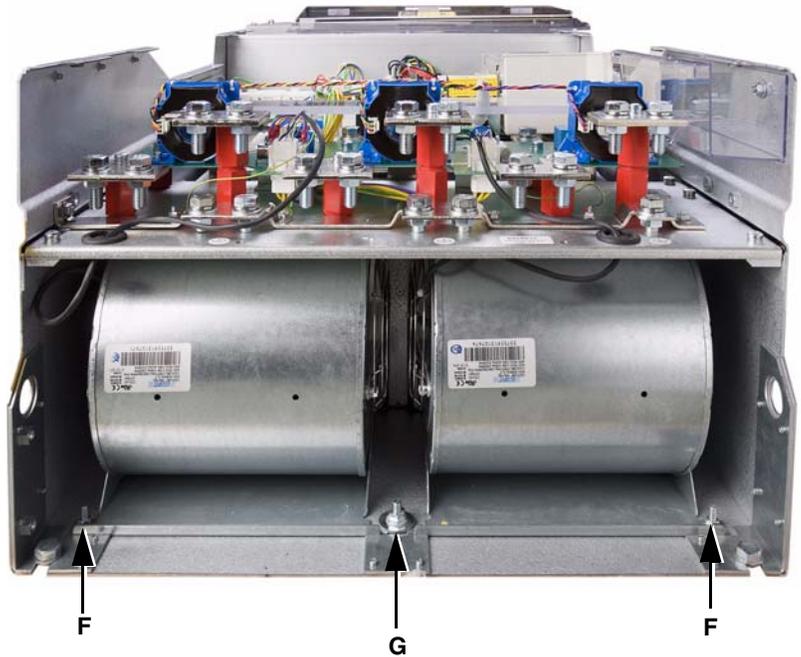


Table 6: Torque Table, Frame Size 13

Item	Description	Torque Range	
		N•m	lb-in
A	Size 3 Phillips cover screw	4.2–5.1	37.2–45.1
D	7 mm ground wire screw	1.1–1.4	9.7–12.4
F	10 mm mounting nut	4.2–5.1	37.2–45.1
G	13 mm mounting nut	10.0–13.5	88.5–119.5

3. Position the new fan over the standoffs on the back plate of the drive and secure it with one 10 mm nut (**F**) and one 13 mm nut and washer (**G**). Tighten the nuts to the torque values specified in Table 6.
4. Feed the 9-pin connector and cable through the cutout in the bottom terminal plate and secure the rubber grommet into the cutout. Route the cable up through the drive as illustrated in Figure 11.
5. Connect the fan as follows. See Table 5 and Figure 11 on page 18.
 - Plug the 9-pin connector (**E**) into the corresponding terminal on the filter board.
 - Using a 7 mm socket wrench, secure the yellow and green ground wire to the terminal plate with one nut (**D**). Tighten the nut to the torque value specified in Table 6.
6. Replace the terminal shields as illustrated on page 17.
7. Using a size 3 Phillips driver, secure the front cover with nine screws (**A**) as illustrated on page 16. Tighten the screws to the torque value specified in Table 6.

Frame Size 14

**ATV71HC31N4, ATV71HC40N4,
ATV61HC40N4, ATV61HC50N4**

IMPORTANT: Label and retain all removed hardware and cables for use in reassembly.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

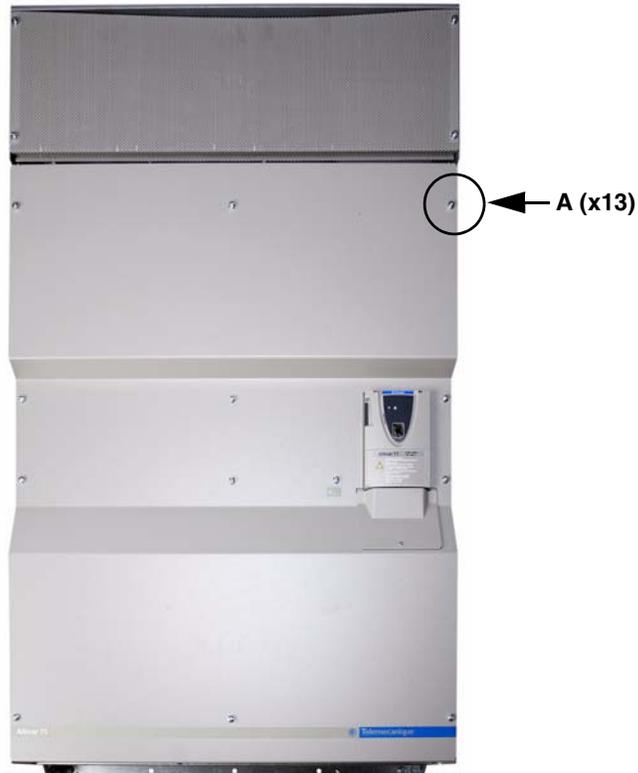
- Read and understand the precautions in “Before You Begin” starting on page 5 before performing this procedure.
- Before working on this equipment, turn off all power supplying it and perform the DC bus voltage measurement procedure on page 8.

Failure to follow these instructions will result in death or serious injury.

Remove the Front Cover

1. Using a size 3 Phillips driver, remove 13 screws (A) and take off the front cover of the drive. See Figure 13.

Figure 13: Front Cover, Frame Size 14



Remove the Terminal Shields

1. To remove the right terminal shield, remove two tabs (B) from the retaining slots in the conduit tray, and remove two tabs (C) from the retaining slots in the middle crossbrace. See Figure 14.
2. To remove the left terminal shield, remove two tabs from the retaining slots in the middle crossbrace (D) and remove the shield from the three retaining posts (E) on the left side panel. See Figure 15.

Figure 14: Right Terminal Shield, Frame Size 14

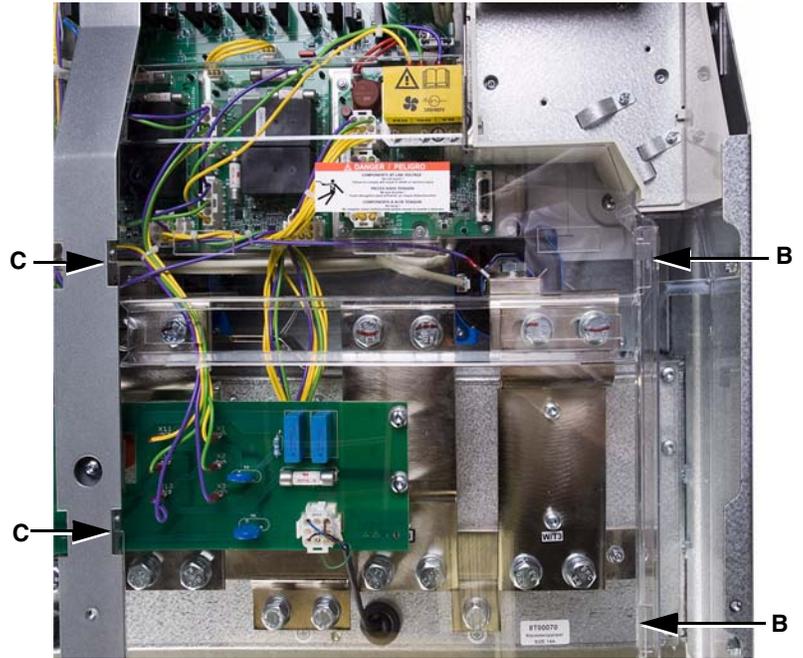
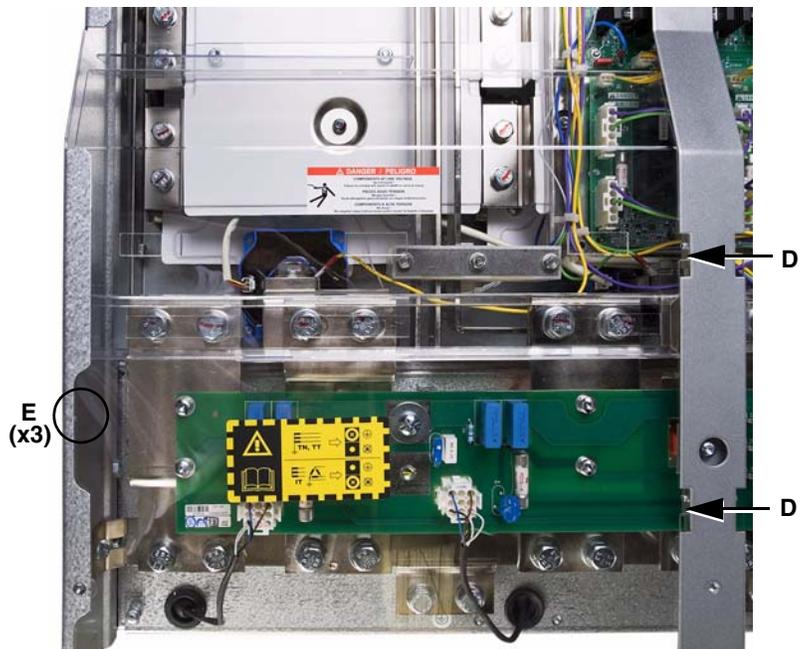


Figure 15: Left Terminal Shield, Frame Size 14



Remove the Fan Connections

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- When the controller is damaged, voltage may remain on certain energy storage capacitors after de-energization of the controller and discharge of the main capacitor bank.
- Before working on or near assemblies containing energy storage capacitors, verify that the capacitor voltages are less than 42 Vdc.
- The following assemblies have energy-storing capacitors:
 - Filter board. See Figure 16.
- Always check for the presence of voltage using a voltmeter set to the 1000 Vdc scale. When voltage is present, allow the voltmeter to discharge the capacitor's stored charge. Refer to "Discharging Stored Energy in Capacitors" on page 9.

Failure to follow these instructions will result in death or serious injury.

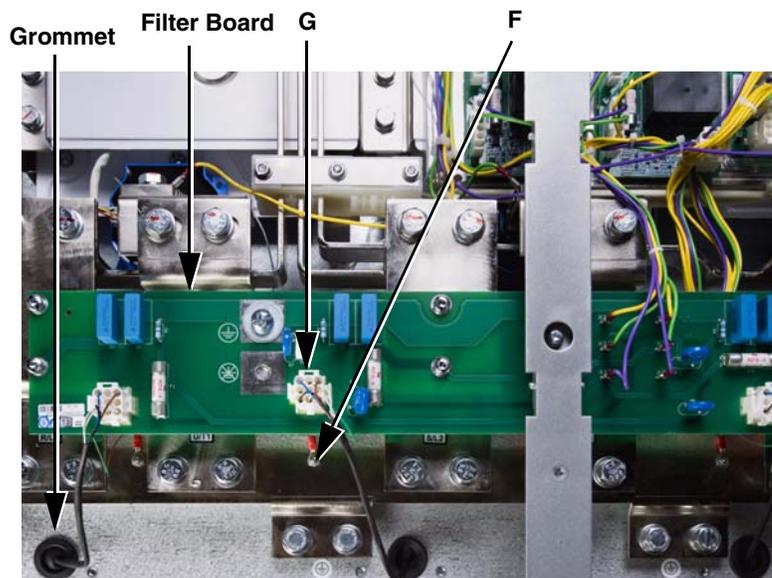
Remove the connections of the fans you are replacing as follows. See Table 7 and Figure 16 for connection locations.

1. Using a 7 mm socket wrench, loosen one nut (**F**) and remove the green and yellow ground wire from the terminal plate.
2. Unplug the 9-pin connector (**G**) from the filter board.

Table 7: Fan Connections, Frame Size 14

Fan Position	Connector Location	Terminal Marking
Left	Filter board	X11
Center		X12
Right		X13

Figure 16: Fan Connections, Frame Size 14



Replace the Fan

1. The cable connecting the heatsink fan to the filter board has a rubber grommet to secure it to the bottom terminal plate. See Figure 16 on page 22. Remove the grommet from the plate by pushing it through the cutout. Feed the 9-pin connector through the cutout and remove the cable and connector from the drive.
2. Remove the fan from the back plate as follows. See Figure 17.
 - Left and right fans: remove one 10 mm nut (**H**) and one 13 mm nut and washer (**J**).
 - Center fan: remove two 10 mm nuts.

Figure 17: Fan Mounting Screws, Frame Size 14



Table 8: Torque Table, Frame Size 14

Item	Description	Torque Range	
		N•m	lb-in
A	Size 3 Phillips cover screw	4.2–5.1	37.2–45.1
F	7 mm ground wire screw	1.1–1.4	9.7–12.4
H	10 mm mounting nut	4.2–5.1	37.2–45.1
J	13 mm mounting nut	10.0–13.5	88.5–119.5

3. Position the new fan over the standoffs on the back plate of the drive and secure it as follows:
 - Left and right fans: secure the fan with one 10 mm nut (**H**) and one 13 mm nut and washer (**J**). Tighten the nuts to the torque values specified in Table 8.
 - Center fan: secure the fan with two 10 mm nuts (**H**). Tighten the nuts to the torque value specified in Table 8.
4. Feed the 9-pin connector and cable through the cutout in the bottom terminal plate and secure the rubber grommet into the cutout. Route the cable up through the drive as illustrated in Figure 16.
5. Connect the fan to the filter board as follows. See Table 7 and Figure 16 on page 22.
 - Plug the 9-pin connector (**G**) into the corresponding terminal on the filter board.
 - Using a 7 mm socket wrench, secure the yellow and green ground wire to the terminal plate with one nut (**F**). Tighten the nut to the torque value specified in Table 8.
6. Replace the terminal shields as illustrated on page 21.
7. Using a size 3 Phillips driver, secure the front cover with 13 screws (**A**) as illustrated on page 20. Tighten the screws to the torque value specified in Table 8.

Frame Size 15

ATV71HC50N4, ATV61HC63N4

IMPORTANT: Label and retain all removed hardware and cables for use in reassembly.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

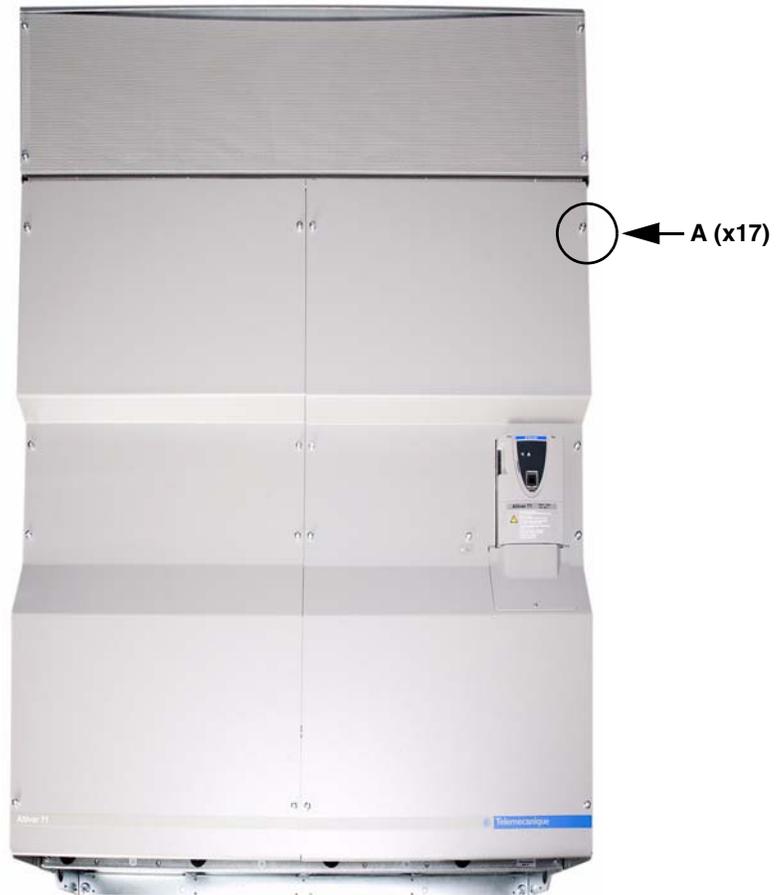
- Read and understand the precautions in “Before You Begin” starting on page 5 before performing this procedure.
- Before working on this equipment, turn off all power supplying it and perform the DC bus voltage measurement procedure on page 8.

Failure to follow these instructions will result in death or serious injury.

Remove the Front Covers

1. Using a size 3 Phillips driver, remove 17 screws (A) and take off the front covers of the drive. See Figure 18.

Figure 18: Front Covers, Frame Size 15



Remove the Terminal Shields

1. To remove the right terminal shield, remove two tabs (B) from the retaining slots in the conduit tray, and remove two tabs (C) from the retaining slots in the middle crossbrace. See Figure 19.
2. To remove the left terminal shield, remove two tabs from the retaining slots in the middle crossbrace (D) and remove the shield from the three retaining posts (E) on the left side panel. See Figure 20.

Figure 19: Right Terminal Shield, Frame Size 15

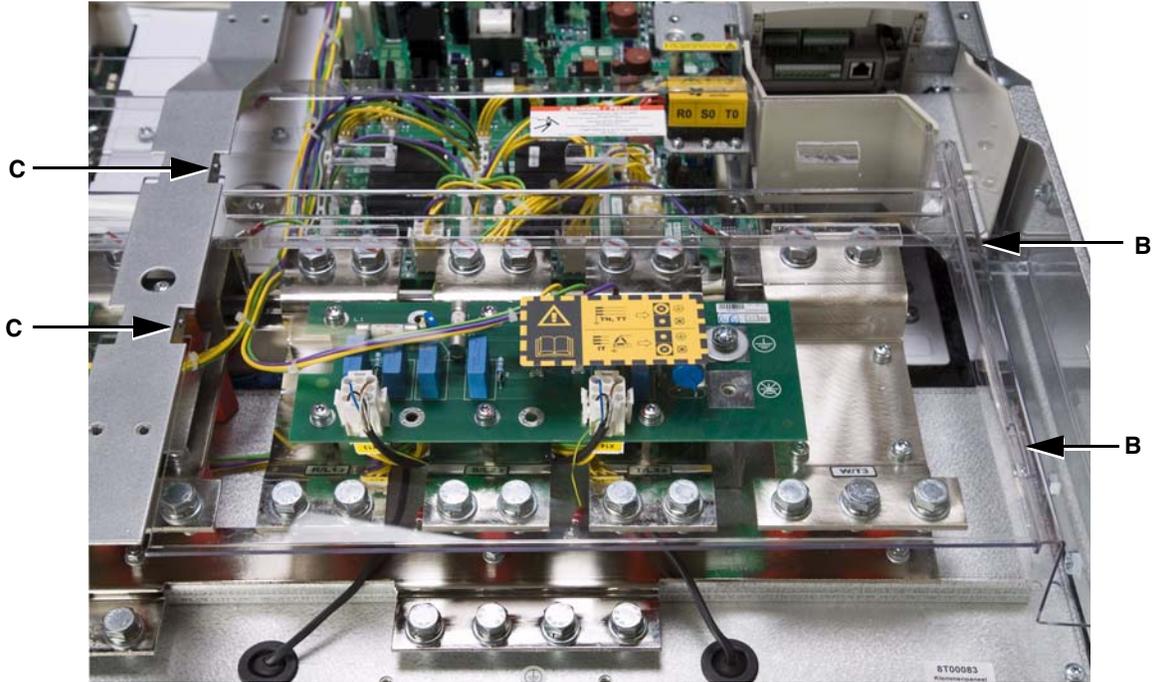
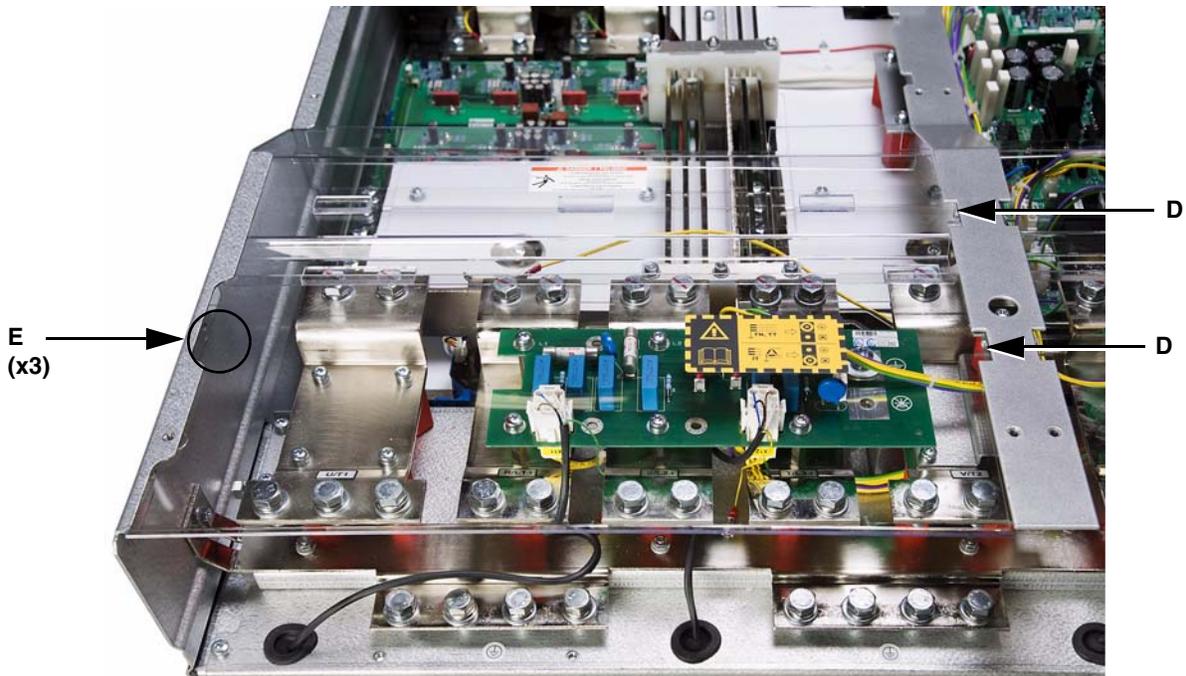


Figure 20: Left Terminal Shield, Frame Size 15



Remove the Fan Connections

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- When the controller is damaged, voltage may remain on certain energy storage capacitors after de-energization of the controller and discharge of the main capacitor bank.
- Before working on or near assemblies containing energy storage capacitors, verify that the capacitor voltages are less than 42 Vdc.
- The following assemblies have energy-storing capacitors:
 - Filter board. See Figure 21.
- Always check for the presence of voltage using a voltmeter set to the 1000 Vdc scale. When voltage is present, allow the voltmeter to discharge the capacitor's stored charge. Refer to "Discharging Stored Energy in Capacitors" on page 9.

Failure to follow these instructions will result in death or serious injury.

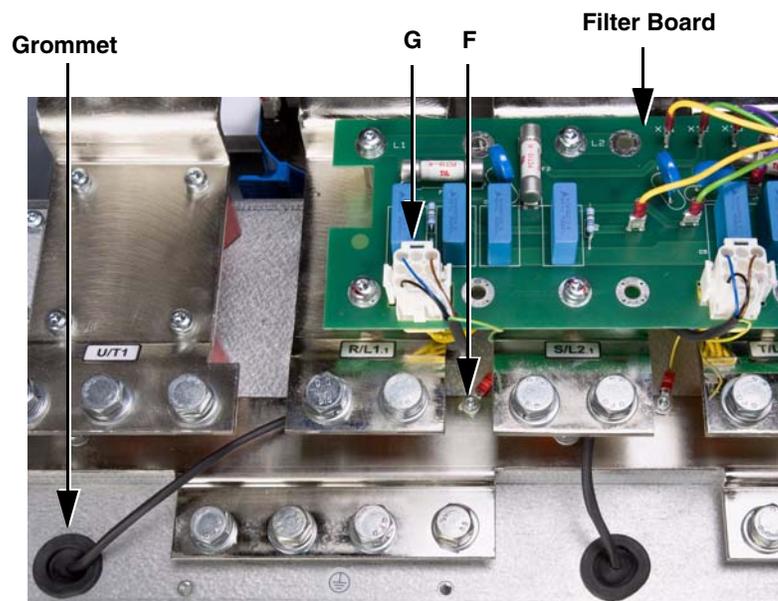
Remove the connections of the fans you are replacing as follows. See Table 9 and Figure 21 for connection locations.

1. Using a 7 mm socket wrench, loosen one nut (**F**) and remove the green and yellow ground wire from the terminal plate.
2. Unplug the 9-pin connector (**G**) from the filter board.

Table 9: Fan Connections, Frame Size 15

Fan Position (Left to Right)	9-Pin Connector Location	Terminal Marking
1	Left filter board	X11
2		X12
3	Right filter board	X13
4		X14

Figure 21: Fan Connections, Frame Size 15



Replace the Fan

1. The cable connecting the heatsink fan to the filter board has a rubber grommet to secure it to the bottom terminal plate. See Figure 21 on page 26. Remove the grommet from the plate by pushing it through the cutout. Feed the 9-pin connector through the cutout and remove the cable and connector from the drive.
2. Remove one 10 mm nut (**H**) and one 13 mm nut and washer (**J**) securing the fan to the back plate of the drive and remove the fan. See Figure 22.

Figure 22: Fan Mounting Screws, Frame Size 15



Table 10: Torque Table, Frame Size 15

Item	Description	Torque Range	
		N•m	lb-in
A	Size 3 Phillips cover screw	4.2–5.1	37.2–45.1
F	7 mm ground wire screw	1.1–1.4	9.7–12.4
H	10 mm mounting nut	4.2–5.1	37.2–45.1
J	13 mm mounting nut	10.0–13.5	88.5–119.5

3. Position the new fan over the standoffs on the back plate of the drive and secure it with one 10 mm nut (**H**) and one 13 mm nut and washer (**J**). Tighten the nuts to the torque values specified in Table 10.
4. Feed the 9-pin connector and cable through the cutout in the bottom terminal plate and secure the rubber grommet into the cutout. Route the cable up through the drive as illustrated in Figure 21.
5. Connect the fan to the filter board as follows. See Table 9 and Figure 21 on page 26.
 - Plug the 9-pin connector (**G**) into the corresponding terminal on the filter board.
 - Using a 7 mm socket wrench, secure the yellow and green ground wire to the terminal plate with one nut (**F**). Tighten the nut to the torque value specified in Table 10.
6. Replace the terminal shields as illustrated on page 25.
7. Using a size 3 Phillips driver, secure the front cover with 17 screws (**A**) as illustrated on page 24. Tighten the screws to the torque value specified in Table 10.

**Altivar® 61/71 Heatsink Fan Kits VZ3V1212 and VZ3V1216
Instruction Bulletin**

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