

Installation Instructions

Heat Sink Fan Replacement for D1h–D8h Drives

VLT[®] FC Series FC 102, FC 103, FC 202, FC 302

1.1 Description

The heat sink fan kit includes all parts required to replace the mixing fan in D1h–D8h drives.

1.1.1 Kit Ordering Number

Kit number	Kit description
176F3164	Heat sink fan DC 172x51

Table 1.1 Ordering Number for Heat Sink Fan Kit

1.1.2 Items Supplied

The heat sink fan replacement kit contains the following:

- 1 fan
- Installation instructions

1.1.3 General Torque Tightening Values

For tightening fasteners, use the values listed in *Table 1.2*. Use a torque wrench to ensure that correct torque is applied.

Shaft size	Torx/hex drives size	Class A Nm (in-lb)	Class B Nm (in-lb)
M4	T20/7 mm	1.2 (10)	0.8 (7)
M5	T25/8 mm	2.3 (20)	1.2 (10)
M6	T30/10 mm	3.9 (35)	2.3 (20)
M8	T40/13 mm	9.6 (85)	3.9 (35)
M10	T50/17 mm	19.1 (169)	9.6 (85)
M12	–/18 mm or 19 mm	37.9 (335)	–

Table 1.2 Torque Values Standard Thread

Class A: Clamping metal

Class B: Clamping PCA or plastic

1.2 Safety Information

Only qualified, Danfoss authorized personnel are allowed to install the parts described in these installation instructions. Handling of the drive and its parts must be done in accordance with the corresponding *operating guide*.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

VLT[®] FC series drives contain dangerous voltages when connected to mains voltage. Improper installation, and installing or servicing with power connected, can cause death, serious injury, or equipment failure.

To avoid death, serious injury, or equipment failure:

- Only use qualified electricians for the installation.
- Disconnect the drive from all power sources before installation or service.
- Treat the drive as live whenever the mains voltage is connected.
- Follow the guidelines in these instructions and local electrical safety codes.

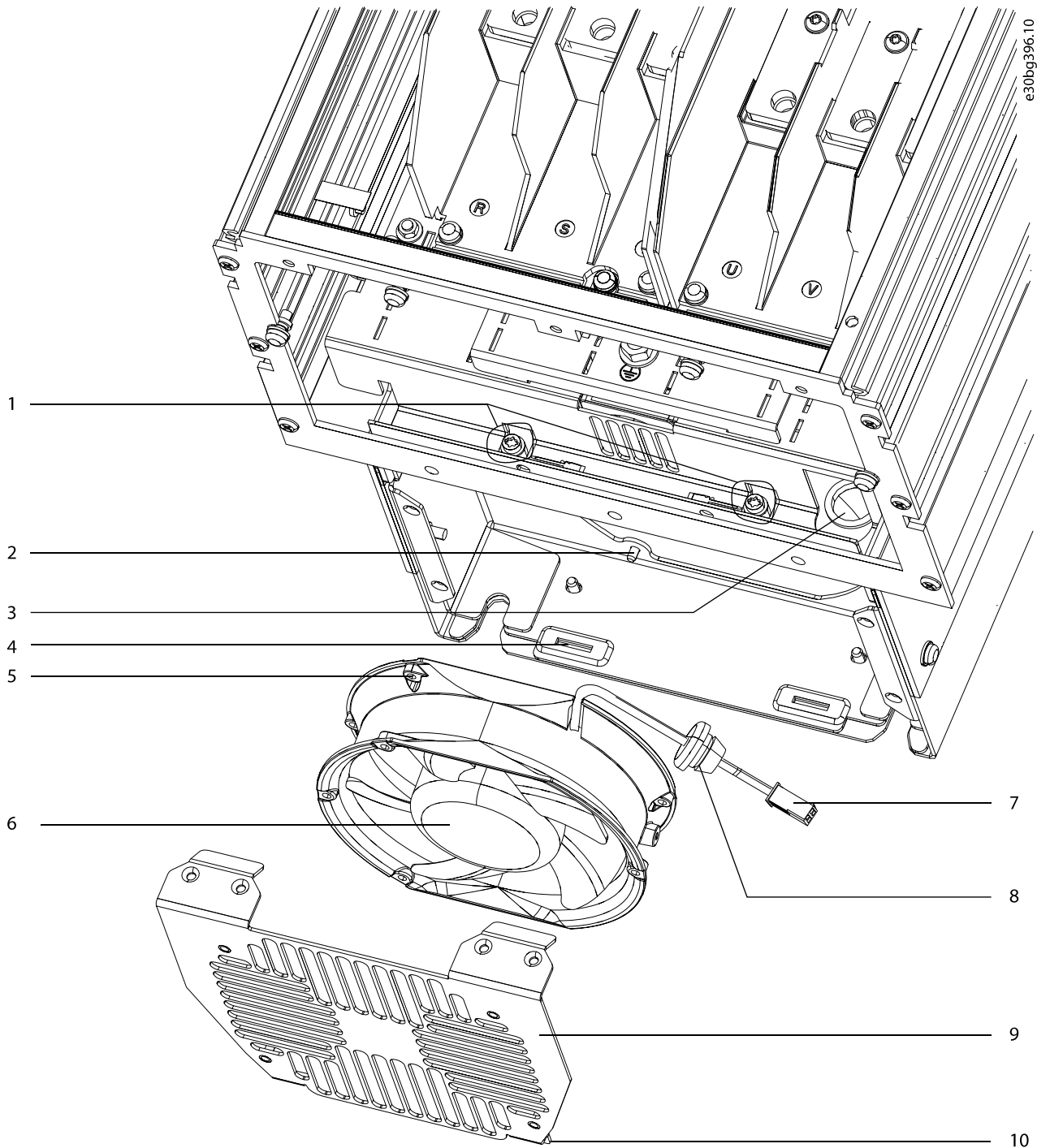
⚠ WARNING

DISCHARGE TIME

The drive contains DC-link capacitors, which can remain charged even when the drive is not powered. High voltage can be present even when the warning LED indicator lights are off. Failure to wait the specified time after power has been removed before performing service or repair work can result in death or serious injury.

- Stop the motor.
- Disconnect AC mains and remote DC-link power supplies, including battery back-ups, UPS, and DC-link connections to other drives.
- Disconnect or lock PM motor.
- Wait for the capacitors to discharge fully. The minimum waiting time is 20 minutes.
- Before performing any service or repair work, use an appropriate voltage measuring device to make sure that the capacitors are fully discharged.

1.3 Installation Instructions



1	Captive screws (T25)	6	Heat sink fan
2	Mounting studs	7	Fan cable connector
3	Hole for cable grommet	8	Cable grommet
4	Slots for fan cover	9	Fan cover
5	Mounting holes	10	Fan cover tabs

Illustration 1.1 Heat Sink Fan in IP21/IP54 (Type 1/Type 12) Drives

1.3.1 Removing the Heat Sink Fan

NOTICE

OPTIONS CABINET OR COOLING DUCT

Extra steps are required to access the heat sink fan when an options cabinet or cooling duct is connected to the drive.

For these configurations, skip to the appropriate procedure listed in *Table 1.3*.

Drive configuration:	Before removing the heat sink fan, go to:
D3h/D4h drive with cooling duct	<i>Chapter 1.3.3 Accessing the Fan in Drives with Telescoping Cooling Ducts</i>
D5h/D6h drive with options cabinet	<i>Chapter 1.3.4 Accessing the Fan in D5h/D6h Drives</i>
D7h/D8h drive with options cabinet	<i>Chapter 1.3.5 Accessing the Fan in D7h/D8h Drives</i>

The heat sink fan is found at the lower end of the drive and directs airflow into the drive to cool the internal components. To remove the heat sink fan, use the following steps. Refer to *Illustration 1.1* or *Illustration 1.2*.

1. Remove the heat sink fan cover by removing 2 captive screws (T25). Take care not to damage wiring inside the drive.
2. Lift the fan off the mounting studs and carefully lift it out of the drive. The fan cable is still connected.

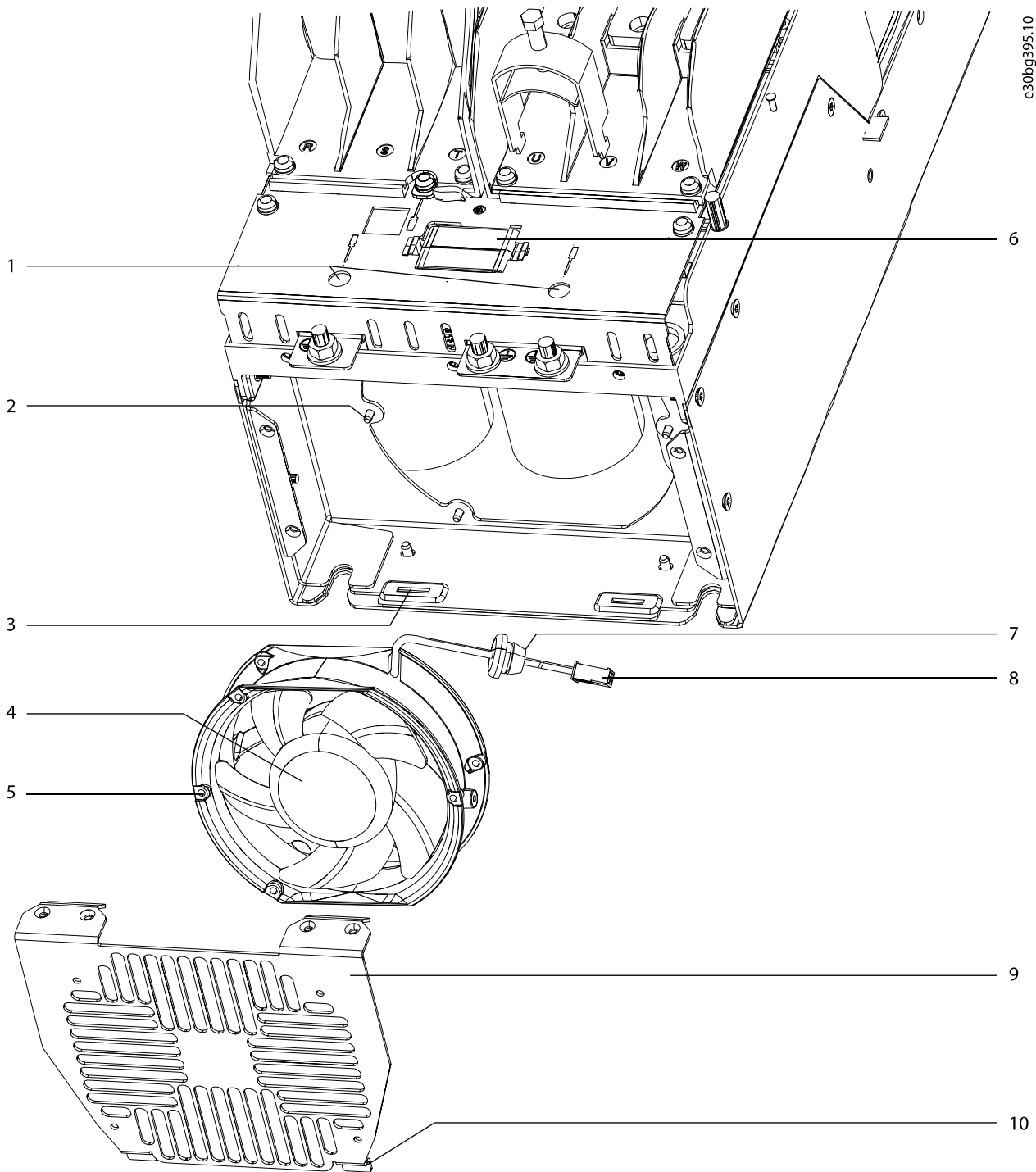
3. Squeeze together the top portion of the black rubber cable grommet until it pops through the hole, releasing the fan cable.
4. Disconnect the heat sink fan cable connector. To avoid dropping the end of the cable into the drive, affix the loose cable to the drive with adhesive tape.

1.3.2 Installing the Heat Sink Fan

To install the new heat sink fan, use the following steps. Refer to *Illustration 1.1* or *Illustration 1.2*.

1. Attach the heat sink fan cable connector to the fan cable.
2. Feed the fan cable back through the access hole. Press together the top of the rubber fan grommet until it pops into place in the hole.
3. Place the heat sink fan over the mounting studs.
4. Replace the heat sink fan cover by securing 2 captive screws (T25). Torque to 2.3 Nm (20 in-lb).

e30bg395.10



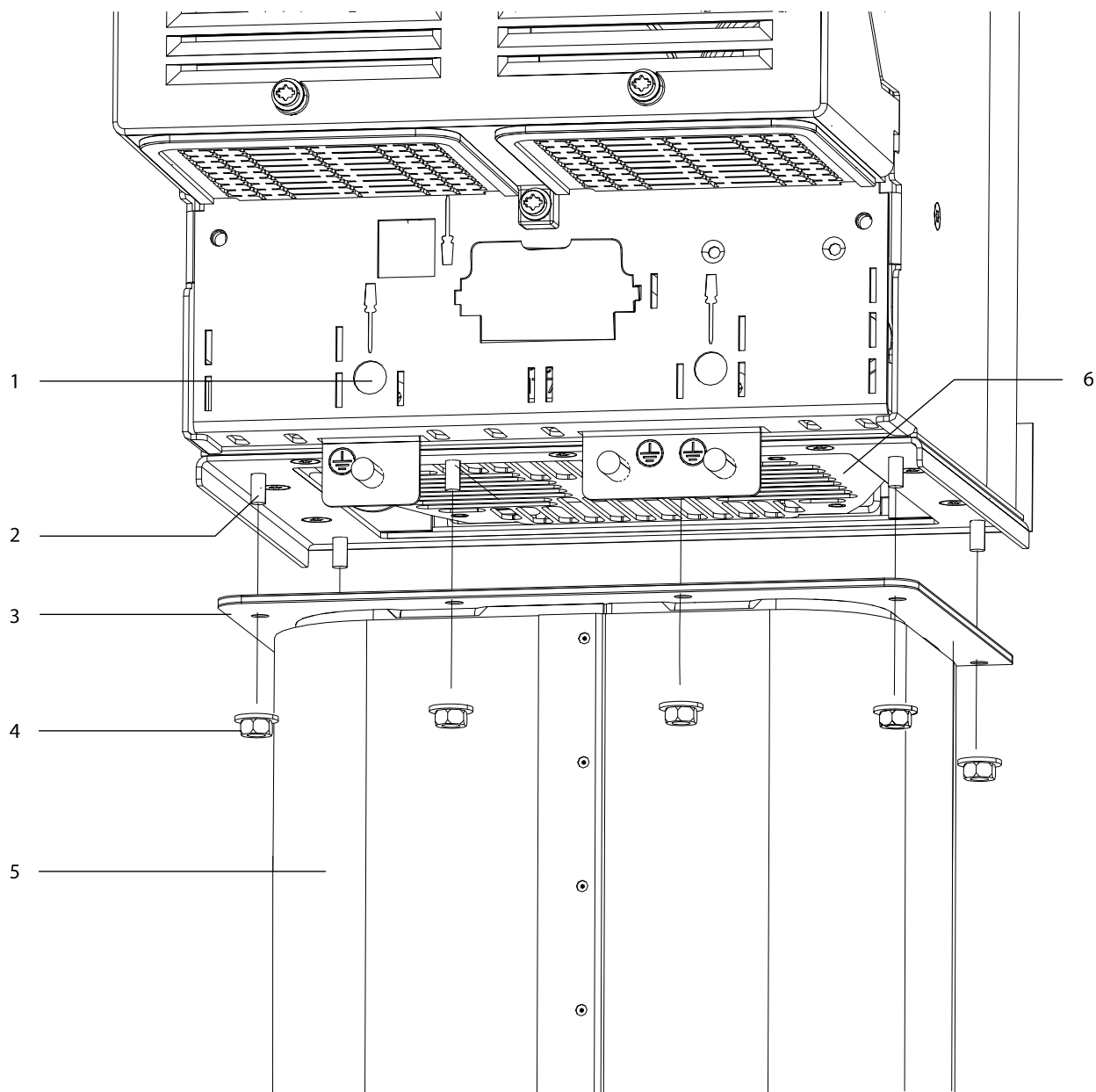
1	Screwdriver access holes for captive screws (T25)	6	Mixing fan
2	Mounting studs	7	Cable grommet
3	Slot for fan cover	8	Fan cable connector
4	Heat sink fan	9	Fan cover
5	Mounting holes	10	Fan cover tabs

Illustration 1.2 Heat Sink Fan in IP20/Chassis Drives

1.3.3 Accessing the Fan in Drives with Telescoping Cooling Ducts

To remove the heat sink fan from a D3h/D4h drive with a telescoping cooling duct, use the following steps.

1. Remove 6 M5 nuts (T25) from the duct flange that attaches the duct to the bottom of the drive.
2. Lower the telescoping duct so that the heat sink fan cover is accessible.
3. Remove the heat sink fan. See *chapter 1.3.1 Removing the Heat Sink Fan*.



e30bg420.10

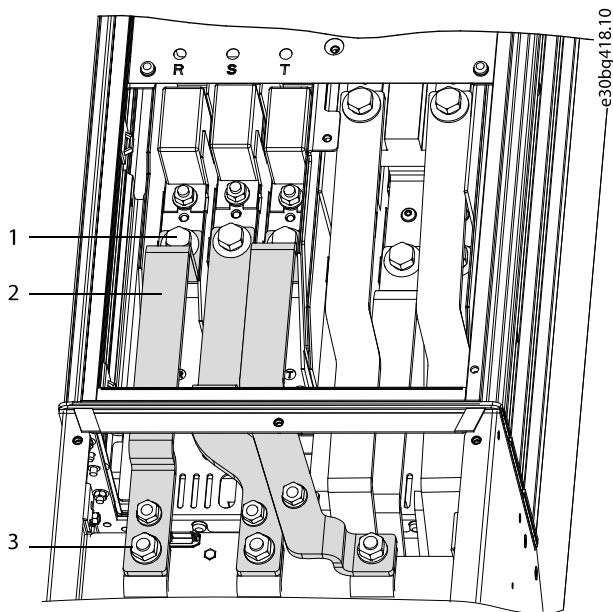
1	Screwdriver access holes for captive screws (T25)	4	M5 nut
2	Threaded stud	5	Telescoping duct
3	Duct flange	6	Heat sink fan cover

Illustration 1.3 Heat Sink Fan Access with Telescoping Cooling Duct

1.3.4 Accessing the Fan in D5h/D6h Drives

D5h and D6h drives include an options cabinet mounted below the heat sink fan. To access the heat sink fan in D5h/D6h drives, remove the busbars between the main enclosure and the options cabinet using the following steps. In drives with different option configurations, the busbars can vary slightly from the busbars pictured.

1. Remove the air baffle covering the interior components.
2. Remove the EMC shield by removing 2 screws (T25).
3. Remove the 3 mains input jumper busbars (R, S, and T) between the main enclosure and the options cabinet. Refer to *Illustration 1.4*:
 - 3a Remove 3 screws (17 mm) from the top of the mains input jumper busbars, 1 per busbar.
 - 3b Remove 3 nuts (13 mm) from the bottom of the mains input jumper busbars, 1 per busbar.

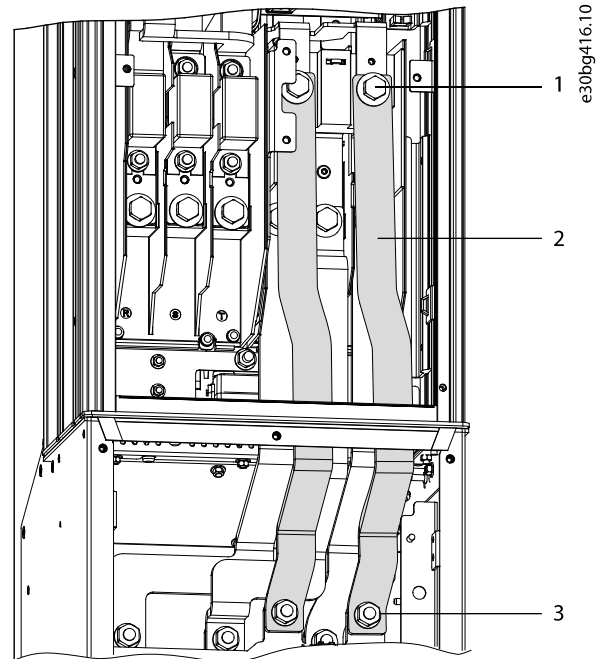


1	Screw (17 mm)
2	Mains input jumper busbars
3	Nut (13 mm)

Illustration 1.4 Mains Input Jumper Busbars in D5h/D6h Drives

4. If optional brake is present, remove the 2 brake jumper busbars between the main enclosure and the options cabinet. Refer to *Illustration 1.5*:

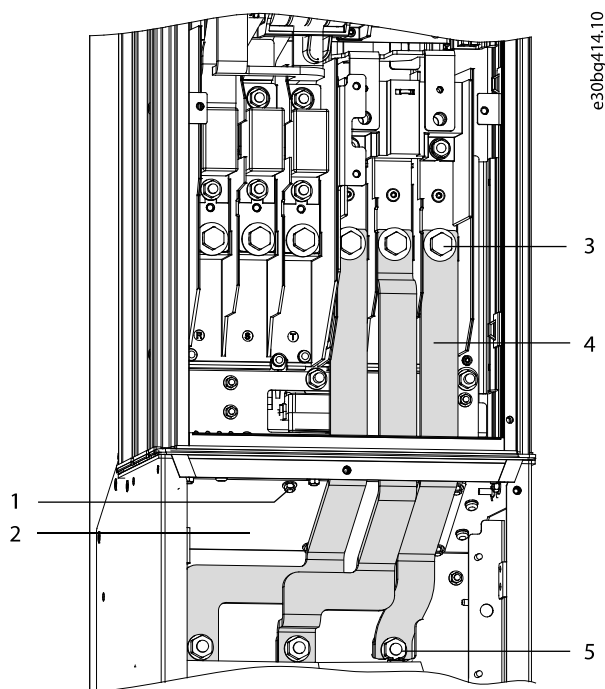
- 4a Remove 2 nuts (17 mm) from the bottom end of the brake jumper busbars, 1 per busbar.
- 4b Remove 2 screws (17 mm) from the top end of the brake jumper busbars, 1 per busbar.



1	Screw (17 mm)
2	Brake jumper busbars
3	Nut (13 mm)

Illustration 1.5 Brake Jumper Busbars in D5h/D6h Drives

5. Remove the 3 motor output jumper busbars (U, V, and W) between the main enclosure and the options cabinet. Refer to *Illustration 1.6*:
 - 5a Remove 3 nuts (13 mm) at the bottom of the motor output busbars, 1 per busbar.
 - 5b Remove 3 screws (17 mm) from the top of the motor output busbars, 1 per busbar.



1	Nut (8 mm)
2	Fan access panel
3	Screw (17 mm)
4	Motor output jumper busbars
5	Nut (13 mm)

Illustration 1.6 Motor Output Jumper Busbars in D5h/D6h Drives

6. Access the heat sink fan cover by removing 6 nuts (8 mm) from the fan access panel.
7. Lift the fan access panel from the options cabinet.
8. Remove the heat sink fan. See *chapter 1.3.1 Removing the Heat Sink Fan*.

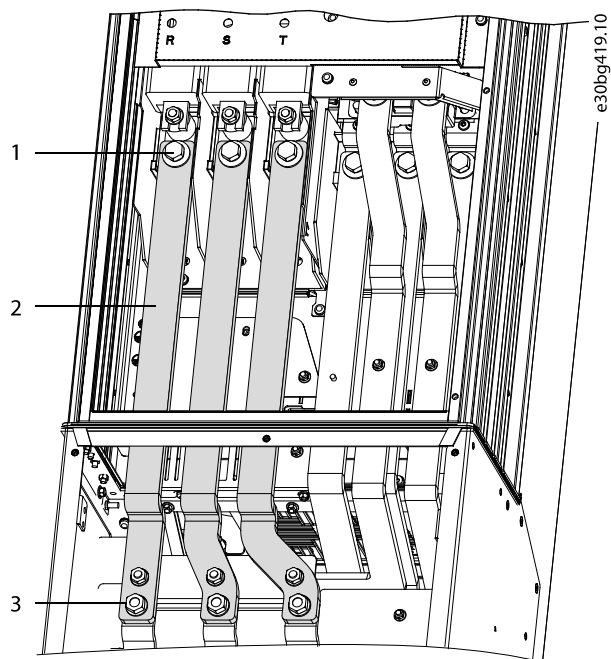
Reinstall in reverse order of this procedure. Tighten hardware according to *chapter 1.1.3 General Torque Tightening Values*.

1.3.5 Accessing the Fan in D7h/D8h Drives

D7h and D8h drives include an options cabinet mounted below the main enclosure. To access the heat sink fan in D7h/D8h drives, remove the busbars between the main enclosure and the options cabinet using the following steps. In drives with different option configurations, the busbars can vary slightly from the busbars pictured.

1. Remove the air baffle covering the interior components.
2. Remove the EMC shield by removing 2 screws (T25).
3. Remove the 3 mains input jumper busbars between the main enclosure and the options cabinet. Refer to *Illustration 1.7*:

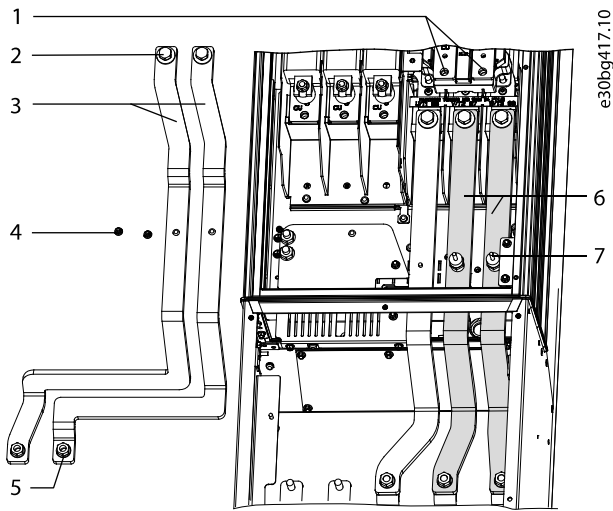
- 3a Remove 3 screws (17 mm) from the top of the mains input jumper busbars, 1 per busbar.
- 3b Remove 3 nuts (13 mm) from the bottom of the mains input jumper busbars, 1 per busbar.



1	Screw (17 mm)
2	Mains input jumper busbars
3	Nut (13 mm)

Illustration 1.7 Mains Input Jumper Busbars in D7h/D8h Drives

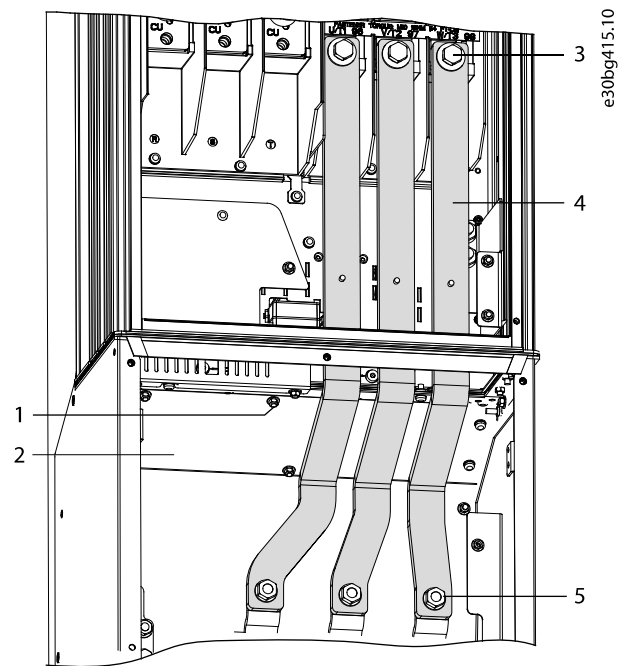
4. If the brake/regen option is present, remove the 2 brake jumper busbars between the main enclosure and the options cabinet. Refer to *Illustration 1.8*:
 - 4a Remove 2 nuts (8 mm) that attach the brake jumper busbars to the standoffs, 1 per busbar.
 - 4b Remove 2 nuts (17 mm) from the lower end of the brake jumper busbars, 1 per busbar.
 - 4c Remove 2 screws (17 mm) from the top end of the brake jumper busbars, 1 per busbar.



1	Brake terminals
2	Screw (17 mm)
3	Brake jumper busbars
4	Nut (8 mm) for standoff
5	Nut (17 mm)
6	Motor busbars (V and W)
7	Standoff

Illustration 1.8 Brake/Regen Jumper Busbars in D7h/D8h Drives

5. Remove the 3 motor output jumper busbars between the main enclosure and the options cabinet. Refer to *Illustration 1.9*:
 - 5a Remove 3 nuts (17 mm) at the bottom of the motor output busbars, 1 per busbar.
 - 5b Remove 3 screws (17 mm) from the top of the motor output busbars, 1 per busbar.



1	Nut (8 mm)
2	Fan access panel
3	Screw (17 mm)
4	Motor output jumper busbars
5	Nut (13 mm)

Illustration 1.9 Motor Output Jumper Busbars in D7h/D8h Drives

6. Access the heat sink fan cover by removing 6 nuts (8 mm) from the fan access panel.
7. Lift the fan access panel from the options cabinet.
8. Remove the heat sink fan. See *chapter 1.3.1 Removing the Heat Sink Fan*.

Reinstall in reverse order of this procedure. Tighten hardware according to *chapter 1.1.3 General Torque Tightening Values*.

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without consequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.

