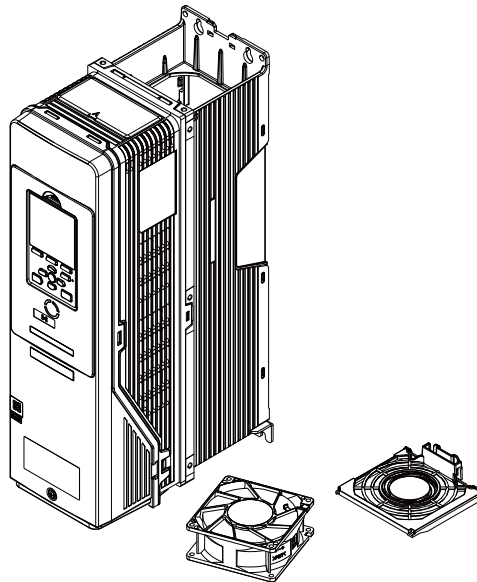


YASKAWA AC Drive Fan Replacement Procedure

Applicable Drive Model CIPR-HV6xxxxxxxxxx
CIPR-FP6xxxxxxxxxx

To properly use the product, read this manual.



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1 Overview

This manual shows you how to replace the cooling fans on Yaskawa HV600 and FP605 drives.

2 Explanation of Signal Words

⚠ WARNING Read and understand this manual before you install, operate, or do maintenance on the drive. Install the drive as specified by this manual and local codes. The symbols in this section identify safety messages in this manual. If you do not obey these safety messages, the hazards can cause serious injury, death, or damage to the products and related equipment and systems.

These identifier words categorize and emphasize important safety precautions in these instructions.

⚠ DANGER This signal word identifies a hazard that will cause serious injury or death if you do not prevent it.

⚠ WARNING This signal word identifies a hazard that can cause death or serious injuries if you do not prevent it.

⚠ CAUTION This signal word identifies a hazard that can cause minor or moderate injuries if you do not prevent it.

NOTICE This signal word identifies a property damage message that is not related to personal injury.

3 Section Safety

⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

⚠ DANGER *Electrical Shock Hazard. Disconnect all power to the drive and wait for the time specified on the warning label before you remove covers. Check the drive for dangerous voltages before servicing or repair work. If you do work on the drive when it is energized and there is no cover over the electronic circuits, it will cause serious injury or death from electrical shock. The drive has internal capacitors that stay charged after you de-energize the drive.*

⚠ WARNING *Electrical Shock Hazard. The motor will run after you de-energize the drive. PM motors can generate induced voltage to the terminal of the motor after you de-energize the drive. If you touch a motor that is moving or energized, it can cause serious injury or death.*

⚠ WARNING *Electrical Shock Hazard. Do not wear loose clothing or jewelry when you do work on the drive. Tighten loose clothing and remove all metal objects, for example watches or rings. Loose clothing can catch on the drive and jewelry can conduct electricity and cause serious injury or death.*

⚠ CAUTION *Burn Hazard. Do not touch a hot drive heatsink. De-energize the drive, wait for a minimum of 15 minutes, then make sure that the heatsink is cool before you replace the cooling fans. If you touch a hot drive heatsink, it can burn you.*

NOTICE *Damage to Equipment. When you touch the drive and circuit boards, make sure that you observe correct electrostatic discharge (ESD) procedures. If you do not follow procedures, it can cause ESD damage to the drive circuitry.*

NOTICE *Use the instructions in this manual to replace the cooling fans. When you do maintenance on the fans, replace all the fans to increase product life. If you install the fans incorrectly, it can cause damage to the drive.*

4 Cooling Fans and Circulation Fans by Drive Model

◆ HV600

Table 4.1 Cooling Fans and Circulation Fans for IP20/UL Open Type and IP20/UL Type 1 Drives

Model	Cooling Fan	Circulation Fan	Replacement Procedure	Reference
4005 - 4008	-	-	-	-
2011 - 2031 4011 - 4034	1	-	Procedure A	8
2046, 2059 4040 - 4052	1	-	Procedure B	16
4065	1	1		
2075 - 2114 4077 - 4124	2	-	Procedure C	24
2143 - 2273 4156 - 4240	2	-	Procedure D	30
4302	2	1	Procedure E	34

Table 4.2 Cooling Fans and Circulation Fans for IP55/UL Type 12 Drives

Model	Cooling Fan	Circulation Fan	Replacement Procedure	Reference
4005	-	-	-	-
2011, 2017 4008 - 4014	1	-	Procedure A	8
2024, 2031 4021 - 4034	1	1		
2046, 2059 4040 - 4065	1	1	Procedure B	16
2075 - 2114 4077 - 4124	2	1	Procedure C	24
2143, 2169 4156	2	1	Procedure J	75

Table 4.3 Cooling Fans and Circulation Fans for IP55/UL Type 12 Drives with Main Switch

Model	Cooling Fan	Circulation Fan	Replacement Procedure	Reference
4005	-	-	-	-
2011, 2017 4008 - 4014	1	-	Procedure A	8
2024, 2031 4021 - 4034	1	1		

Model	Cooling Fan	Circulation Fan	Replacement Procedure	Reference
2046, 2059 4040 - 4065	1	1	Procedure B	16
2075 - 2114 4077 - 4096	2	1	Procedure C	24
4124	2	1	Procedure K	83
2143, 2169 4156	2	1	Procedure J	75

◆ FP605

Table 4.4 Cooling Fans and Circulation Fans for IP20/UL Open Type and IP20/UL Type 1 Drives

Model	Cooling Fan	Circulation Fan	Circuit Board Cooling Fan	Replacement Procedure	Reference
4005, 4008	-	-	-	-	-
2011 - 2031 4011 - 4034	1	-	-	Procedure A	8
2046, 2059 4040 - 4052	1	-	-	Procedure B	16
4065	1	1	-		
2075 - 2114 4077 - 4124	2	-	-	Procedure C	24
2143, 2169 4156	2	-	-	Procedure D	30
2211, 2273 4180 - 4302	2	-	-	Procedure F	42
4361	2	1	-	Procedure G	45
2343, 2396 4414	3	1	-		
4477 - 4590	2	1	2	Procedure H	53
4720	3	1	2	Procedure I	65

Table 4.5 Cooling Fans and Circulation Fans for IP55/UL Type 12 Drives

Model	Cooling Fan	Circulation Fan	Replacement Procedure	Reference
4005	-	-	-	-
2011, 2017 4008 - 4014	1	-	Procedure A	8
2024, 2031 4021 - 4034	1	1		

Model	Cooling Fan	Circulation Fan	Replacement Procedure	Reference
2046, 2059 4040 - 4065	1	1	Procedure B	16
2075 - 2114 4077 - 4124	2	1	Procedure C	24
2143, 2169 4156	2	1	Procedure J	75

Table 4.6 Cooling Fans and Circulation Fans for IP55/UL Type 12 Drives with Main Switch

Model	Cooling Fan	Circulation Fan	Replacement Procedure	Reference
4005	-	-	-	-
2011, 2017 4008 - 4014	1	-	Procedure A	8
2024, 2031 4021 - 4034	1	1		
2046, 2059 4040 - 4065	1	1	Procedure B	16
2075 - 2114 4077 - 4096	2	1	Procedure C	24
4124	2	1	Procedure K	83
2143, 2169 4156	2	1	Procedure J	75

5 Replace Cooling Fans and Circulation Fans

⚠ CAUTION Injury to Personnel. Some fan units are not easily accessible from a standing position. Make sure that you can safely and comfortably remove and replace the fan. If you try to remove a fan that you cannot easily access, the fan unit can fall and cause minor to moderate injury.

NOTICE Use the instructions in this manual to replace the cooling fans. When you do maintenance on the fans, replace all the fans to increase product life. If you install the fans incorrectly, it can cause damage to the drive.

◆ Fan Replacement (Procedure A)

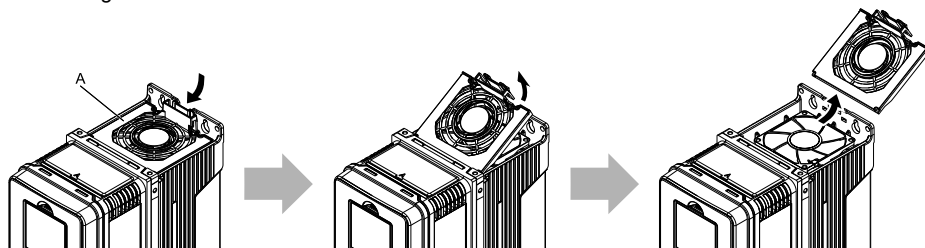
⚠ DANGER Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.

⚠ CAUTION Burn Hazard. Do not touch a hot drive heatsink. De-energize the drive, wait for a minimum of 15 minutes, then make sure that the heatsink is cool before you replace the cooling fans. If you touch a hot drive heatsink, it can burn you.

NOTICE Use the instructions in this manual to replace the cooling fans. When you do maintenance on the fans, replace all the fans to increase product life. If you install the fans incorrectly, it can cause damage to the drive.

■ Fan Removal

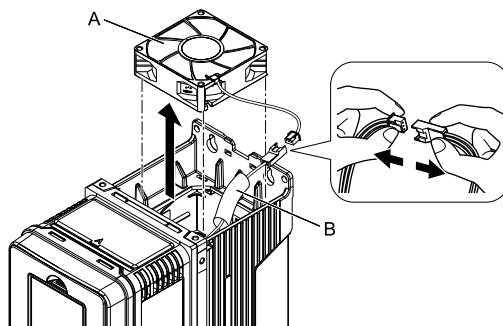
1. Push the tab on the back side of the fan finger guard and pull up to remove the fan finger guard from the drive.



A - Fan finger guard

Figure 5.1 Remove the Fan Finger Guard

2. Pull the cooling fan straight up from the drive. Remove the protective tube on the relay connector and disconnect the connector to remove the fan from the drive.



A - Cooling fan

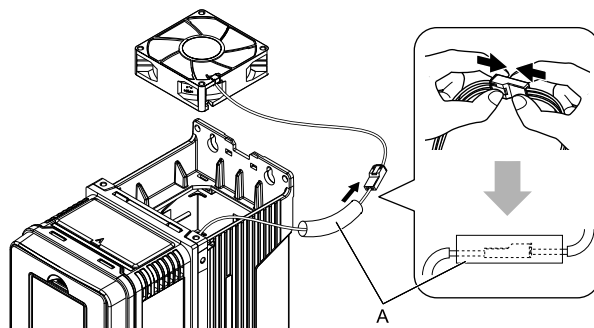
B - Protective tube

Figure 5.2 Remove the Cooling Fan

■ Fan Installation

Reverse the removal procedure for fan installation.

1. Connect the relay connector between the drive and cooling fan, and attach the protective tube.



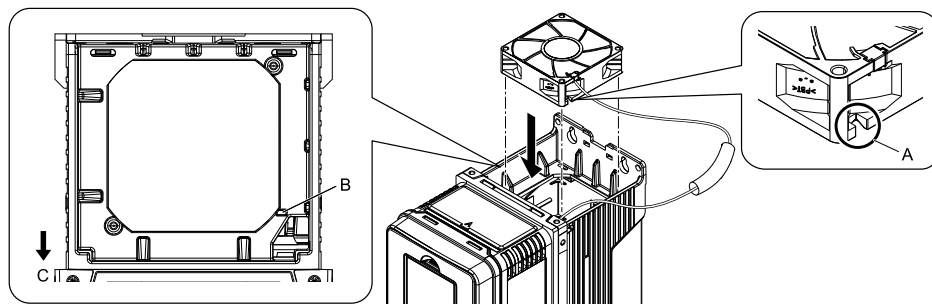
A - Protective tube

Figure 5.3 Connect the Relay Connector

2. Align the notches on the fan with the pin on the drive and install the cooling fan in the drive.

Note:

The positions of notch on the fan and alignment pin on the drive are different for different drive models. Use these figures to make sure that you use correct positions for your drive.

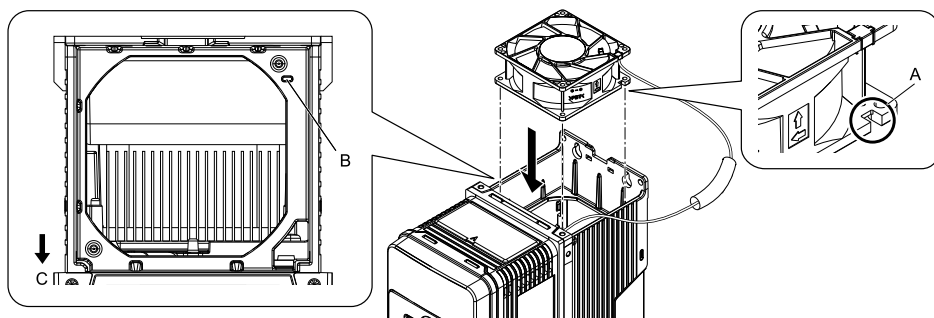


A - Notch on fan

B - Alignment pin on drive

C - Front of drive

Figure 5.4 Install the Cooling Fan (Drive Models: 2011, 2017, 4006xV, 4008xV/T, 4011, 4014)



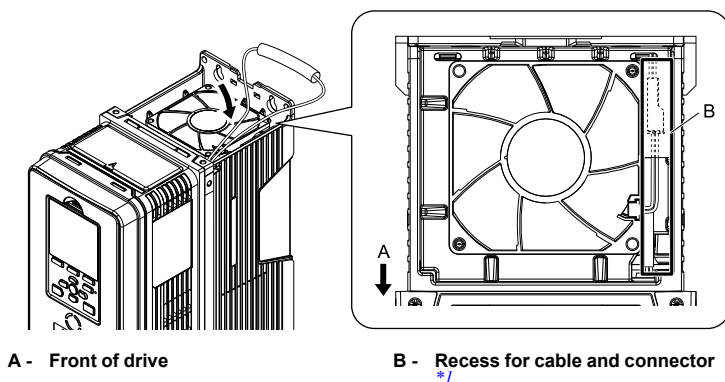
A - Notch on fan

B - Alignment pin on drive

C - Front of drive

Figure 5.5 Install the Cooling Fan (Drive Models: 2024, 2031, 4021 to 4034)

3. Put the cable and connector in the recess of the drive.



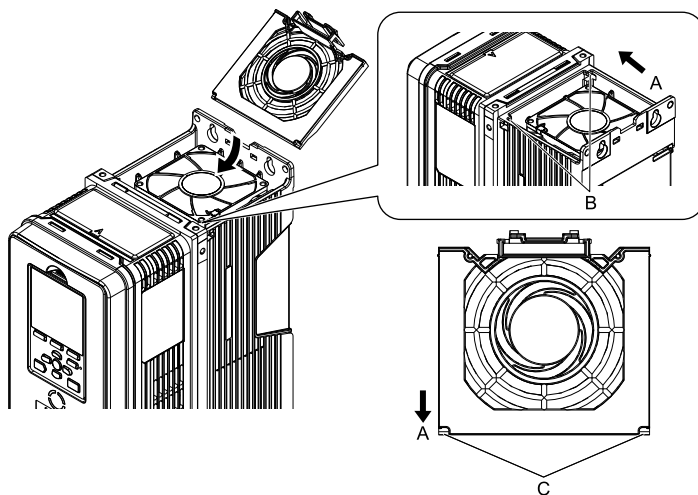
A - Front of drive

B - Recess for cable and connector

Figure 5.6 Put the Cable and Connector in the Drive Recess

- *1 Make sure that the cable and connector are in the correct space.

4. Hold the fan finger guard at an angle and put the connector tabs on the fan finger guard into the holes on the drive.



A - Front of drive
B - Drive holes

C - Connector tabs

Figure 5.7 Install the Fan Finger Guard

5. Push the tab on the back side of the fan finger guard and click it into place on the drive.

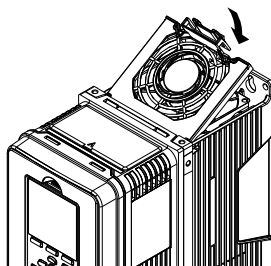


Figure 5.8 Install the Fan Finger Guard

6. Energize the drive and set o4-03 = 0 [*Fan Operation Time Setting = 0 h*] to reset the fan operation time.

■ Circulation Fan Removal

Note:

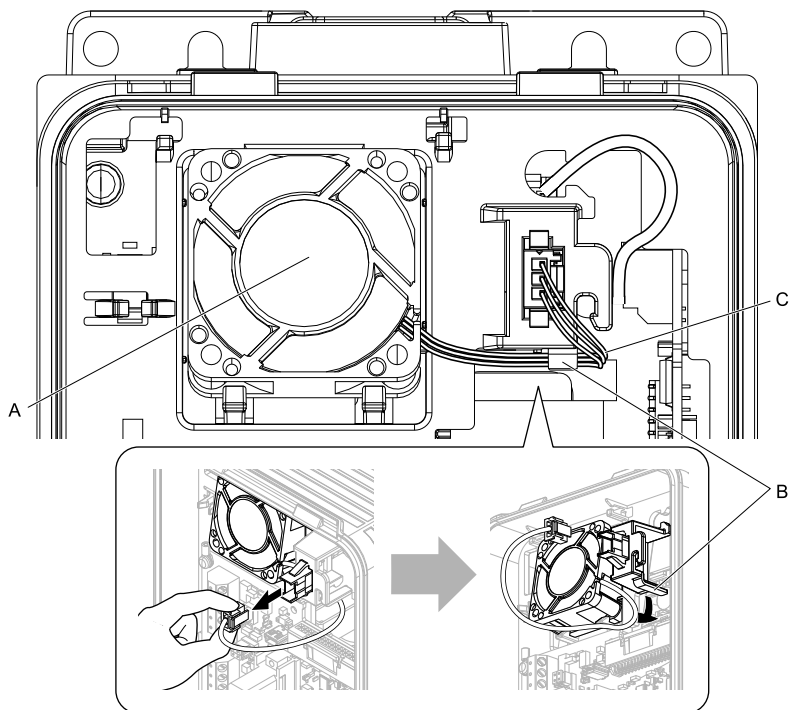
Use this procedure only when you use one of these drive models:

- 2024xV, 2031xV
- 4021xV to 4034xV
- 2024xT, 2031xT
- 4021xT to 4034xT

Remove the drive cover before you start this procedure.

⚠ CAUTION Crush Hazard. Loosen the cover screws. Do not fully remove them. If you fully remove the cover screws, the terminal cover can fall and cause moderate injury.

1. Disconnect the connector and remove the fan cable from the hook.



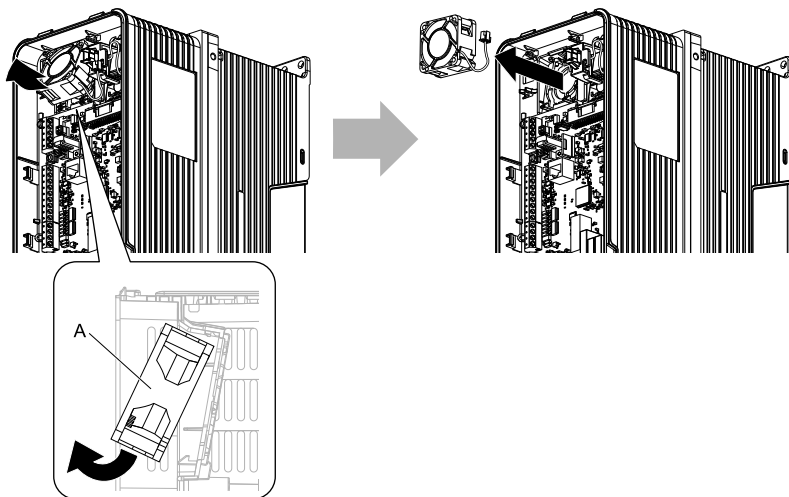
A - Circulation fan

C - Fan cable

B - Hook

Figure 5.9 Disconnect the Connector and Remove the Fan Cable

2. Pull the bottom of the fan forward to remove it from the drive.



A - Circulation fan

Figure 5.10 Remove the Circulation Fan

■ Circulation Fan Installation

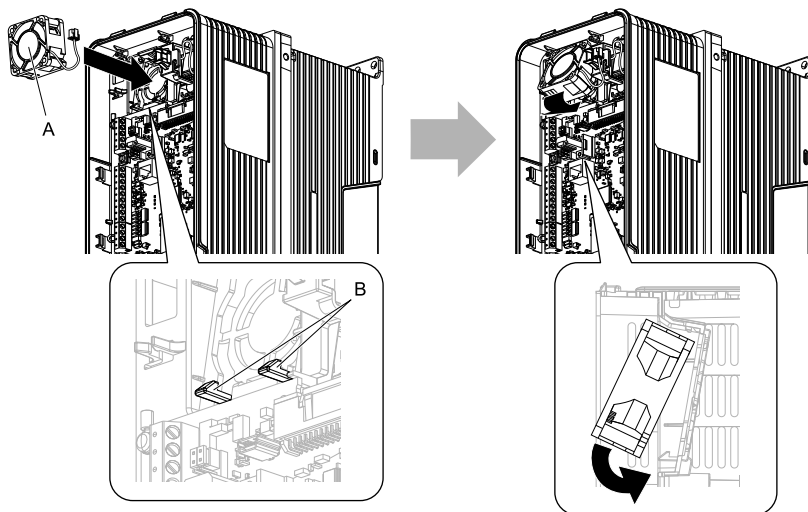
Note:

Use this procedure only when you use one of these drive models:

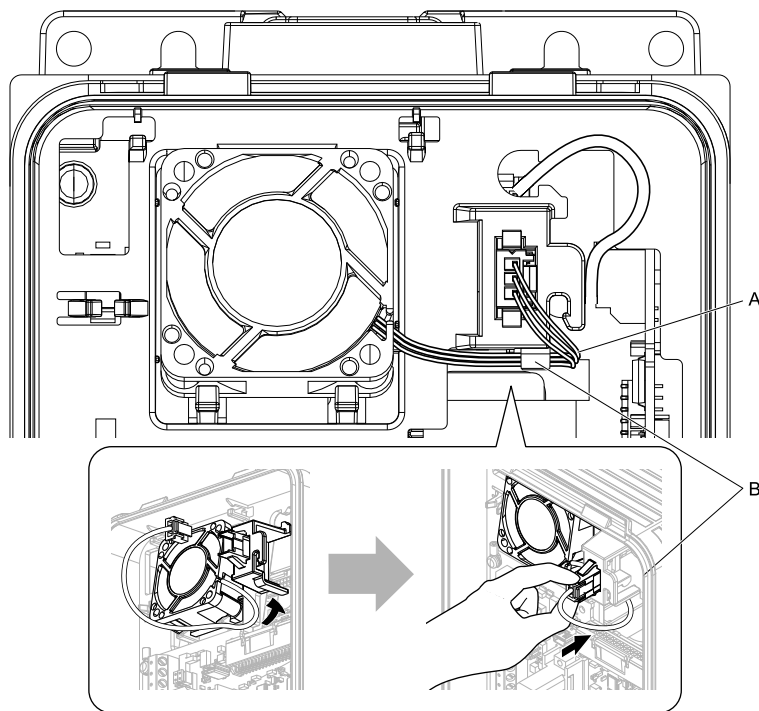
- 2024xV, 2031xV
- 4021xV to 4034xV
- 2024xT, 2031xT
- 4021xT to 4034xT

Reverse the removal procedure for circulation fan installation.

1. Put the side of the fan nearest to the top of the drive in first, and push it until the tabs click into position.

**A - Circulation fan****B - Tabs****Figure 5.11 Install the Circulation Fan**

- Put the cable back into its initial position and connect the connector.



A - Fan cable

B - Hook

Figure 5.12 Put the Cable Back into the Drive and Connect the Connector

◆ Fan Replacement (Procedure B)

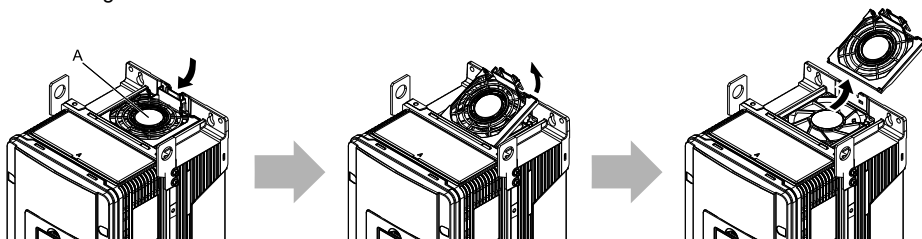
⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

⚠ CAUTION *Burn Hazard. Do not touch a hot drive heatsink. De-energize the drive, wait for a minimum of 15 minutes, then make sure that the heatsink is cool before you replace the cooling fans. If you touch a hot drive heatsink, it can burn you.*

NOTICE *Use the instructions in this manual to replace the cooling fans. When you do maintenance on the fans, replace all the fans to increase product life. If you install the fans incorrectly, it can cause damage to the drive.*

■ Fan Removal

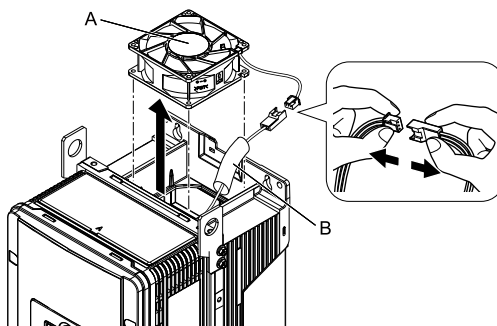
1. Push the tab on the back side of the fan finger guard and pull up to remove the fan finger guard from the drive.



A - Fan finger guard

Figure 5.13 Remove the Fan Finger Guard

2. Pull the cooling fan straight up from the drive. Remove the protective tube on the relay connector and disconnect the connector to remove the fan from the drive.



A - Cooling fan

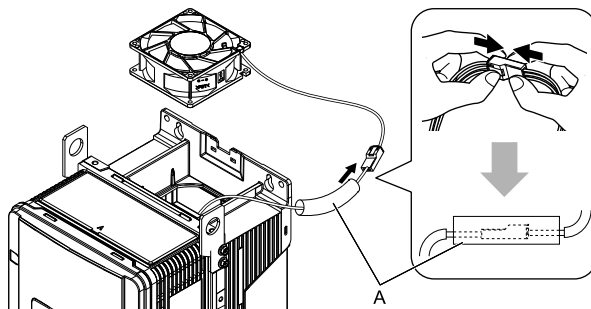
B - Protective tube

Figure 5.14 Remove the Cooling Fan

■ Fan Installation

Reverse the removal procedure for fan installation.

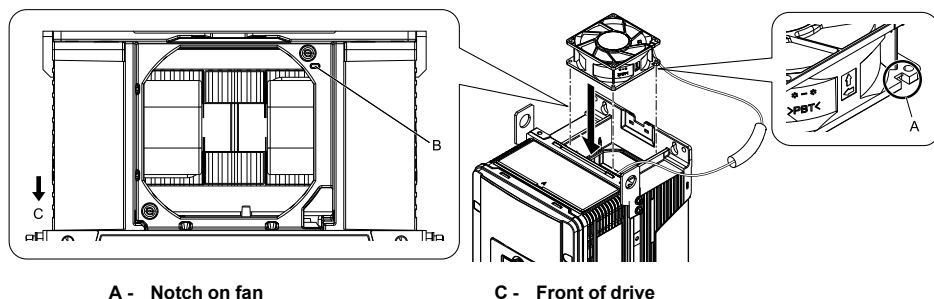
1. Connect the relay connector between the drive and cooling fan, and attach the protective tube.



A - Protective tube

Figure 5.15 Connect the Relay Connector

2. Align the notch on the fan with the pin on the drive and install the cooling fan in the drive.



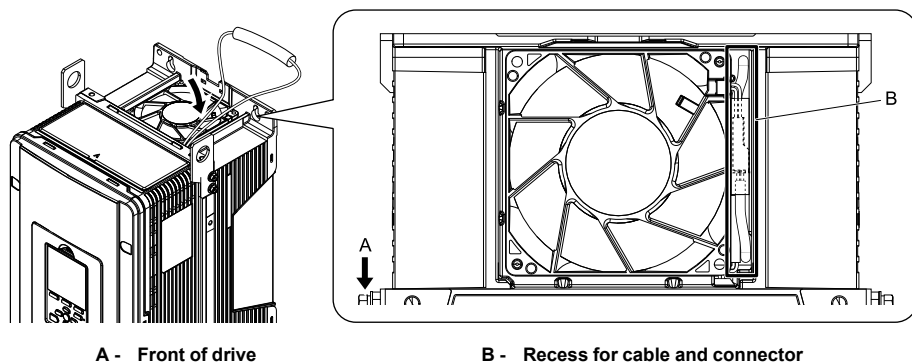
A - Notch on fan

B - Alignment pin on drive

C - Front of drive

Figure 5.16 Install the Cooling Fan

3. Put the cable and connector in the recess of the drive.



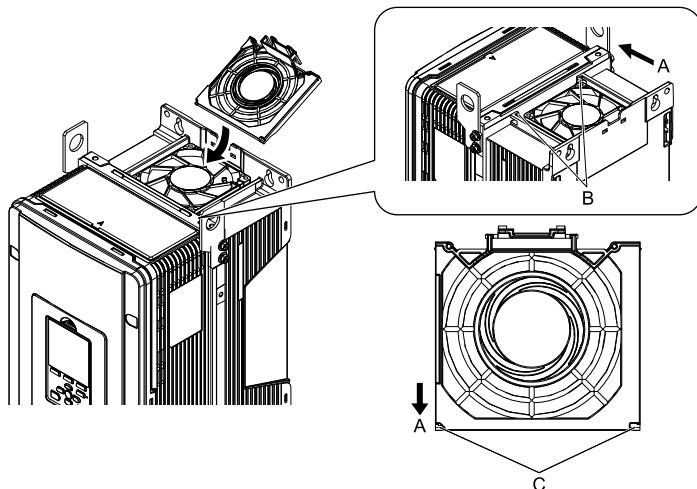
A - Front of drive

B - Recess for cable and connector

Figure 5.17 Put the Cable in the Drive Recess

*1 Make sure that the cable and connector are in the correct space.

4. Hold the fan finger guard at an angle and put the connector tabs on the fan finger guard into the holes on the drive.



A - Front of drive
B - Drive holes

C - Connector tabs

Figure 5.18 Install the Fan Finger Guard

5. Push the tab on the back side of the fan finger guard and click it into place on the drive.

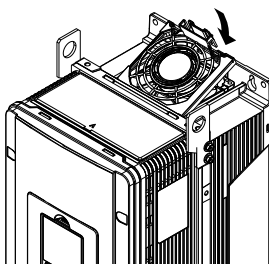


Figure 5.19 Install the Fan Finger Guard

6. Energize the drive and set *o4-03 = 0* [*Fan Operation Time Setting = 0 h*] to reset the fan operation time.

■ Circulation Fan Removal

Note:

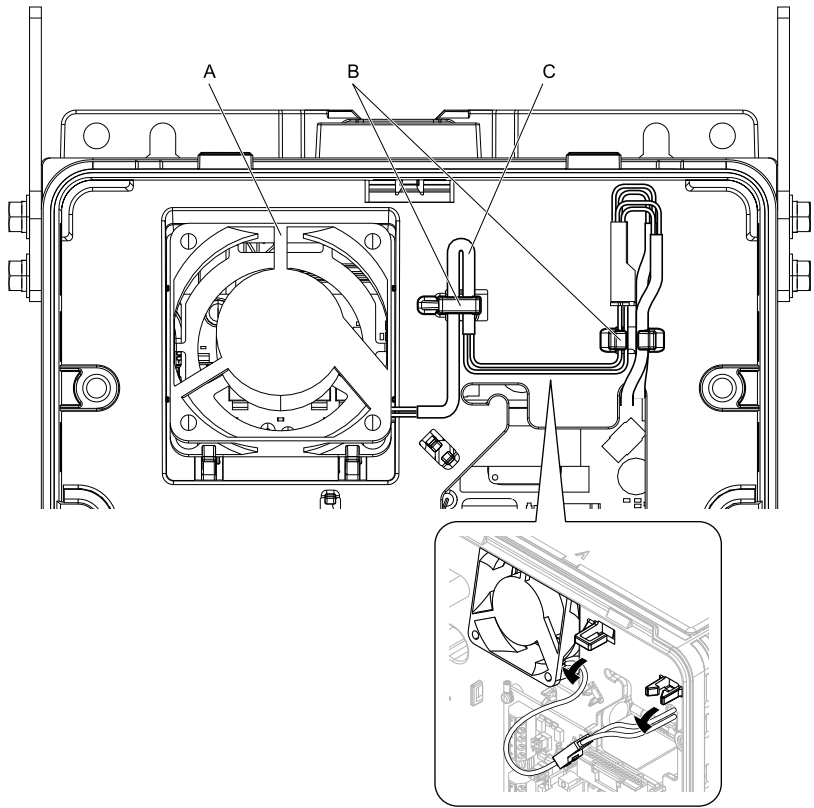
Use this procedure only when you use one of these drive models:

- 4065xF
- 2046xV, 2059xV
- 4040xV to 4065xV
- 2046xT, 2059xT
- 4040xT to 4065xT

Remove the drive cover before you start this procedure.

⚠ CAUTION Crush Hazard. Loosen the cover screws. Do not fully remove them. If you fully remove the cover screws, the terminal cover can fall and cause moderate injury.

1. Remove the fan cable from the hooks.



A - Circulation fan
B - Hooks

C - Fan cable

Figure 5.20 Remove the Fan Cable

2. Disconnect the relay connector.

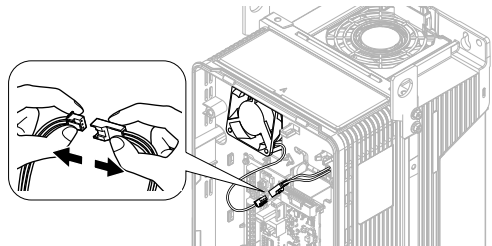
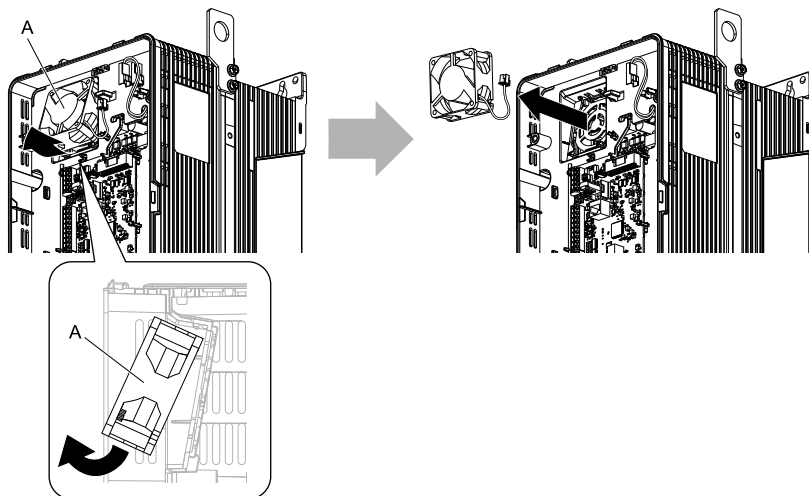


Figure 5.21 Disconnect the Relay Connector

3. Pull the bottom of the fan forward to remove it from the drive.



A - Circulation fan

Figure 5.22 Remove the Circulation Fan

■ Circulation Fan Installation

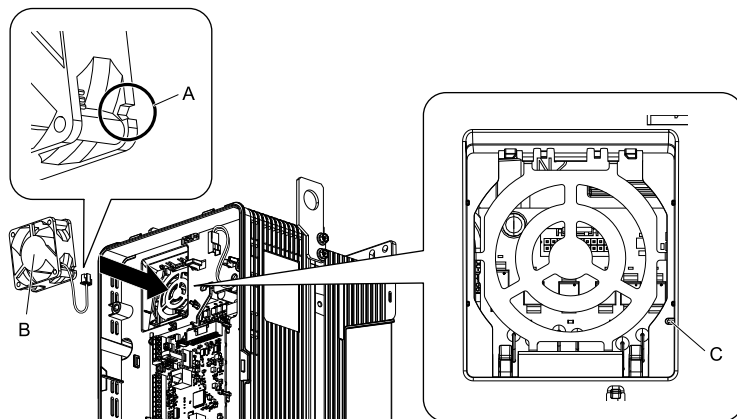
Note:

Use this procedure only when you use one of these drive models:

- 4065xF
- 2046xV, 2059xV
- 4040xV to 4065xV
- 2046xT, 2059xT
- 4040xT to 4065xT

Reverse the removal procedure for circulation fan installation.

1. Align the notch on the fan with the pin on the drive and install the fan in the drive.



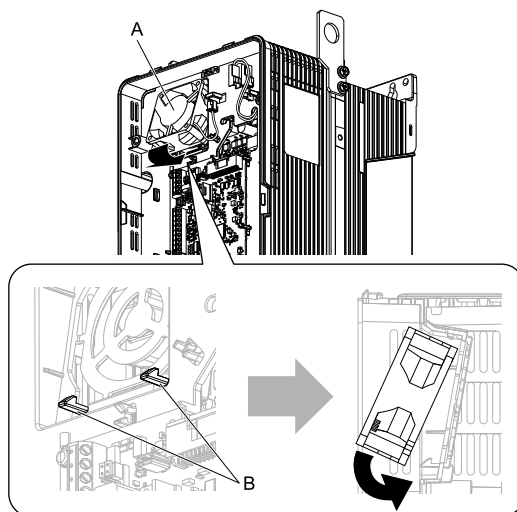
A - Notch on fan

C - Alignment pin on drive

B - Circulation fan

Figure 5.23 Install the Circulation Fan

2. Put the side of the fan nearest to the top of the drive in first, and push it until the tabs click into position.



A - Circulation fan

B - Tabs

Figure 5.24 Install the Circulation Fan

3. Connect the relay connector.

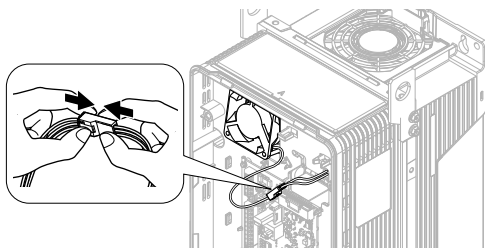
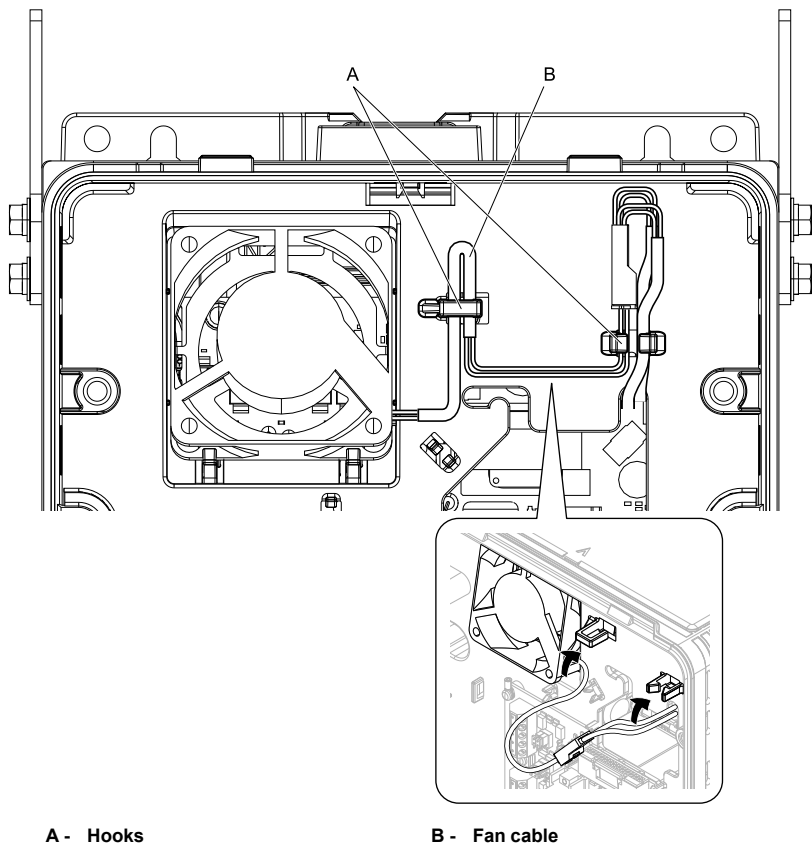


Figure 5.25 Connect the Relay Connector

4. Put the cable and connector back into their initial positions.



A - Hooks

B - Fan cable

Figure 5.26 Put the Cable Back into the Drive

◆ Fan Replacement (Procedure C)

⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

⚠ CAUTION *Burn Hazard. Do not touch a hot drive heatsink. De-energize the drive, wait for a minimum of 15 minutes, then make sure that the heatsink is cool before you replace the cooling fans. If you touch a hot drive heatsink, it can burn you.*

NOTICE *Use the instructions in this manual to replace the cooling fans. When you do maintenance on the fans, replace all the fans to increase product life. If you install the fans incorrectly, it can cause damage to the drive.*

■ Fan Removal

1. Push the tabs on the left and right sides of the fan finger guard and pull up to remove the fan finger guard from the drive.

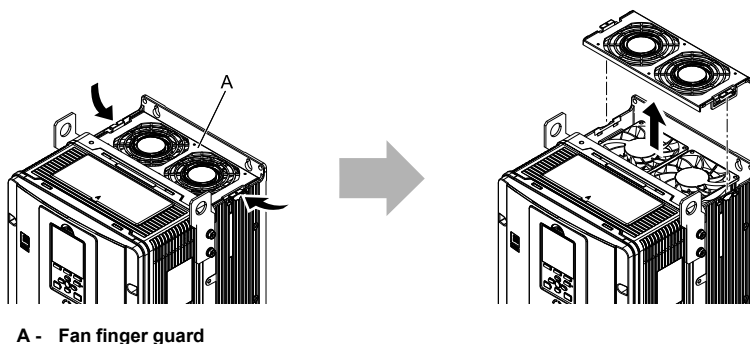


Figure 5.27 Remove the Fan Finger Guard

2. Pull the cooling fans straight up from the drive. Remove the protective tubes on the relay connectors and disconnect the connectors to remove the fans from the drive.

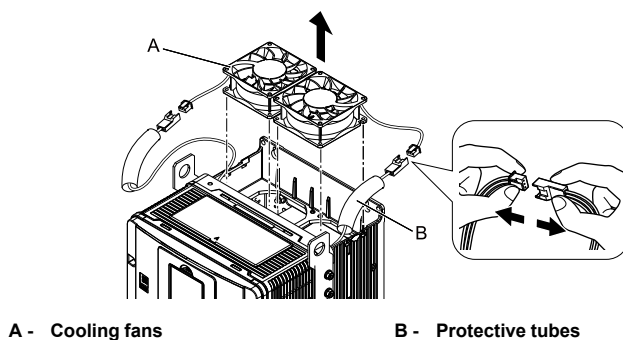
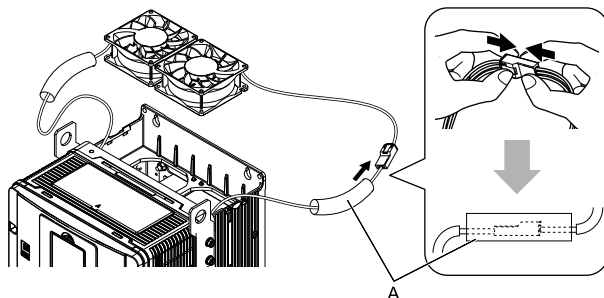


Figure 5.28 Remove the Cooling Fans

■ Fan Installation

Reverse the removal procedure for fan installation.

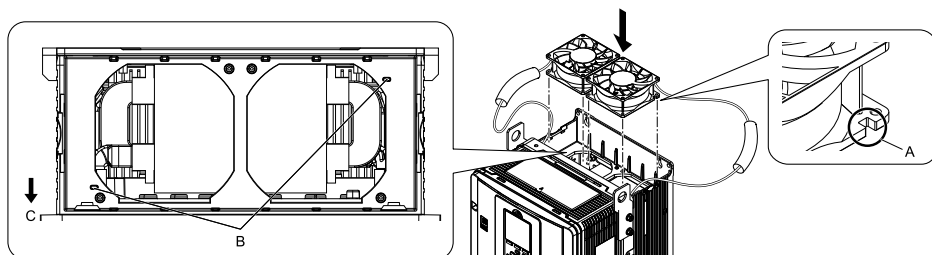
1. Connect the relay connectors between the drive and cooling fans, and attach the protective tubes.



A - Protective tubes

Figure 5.29 Connect the Relay Connectors

2. Align the notches on the fans with the pins on the drive and install the cooling fans in the drive.



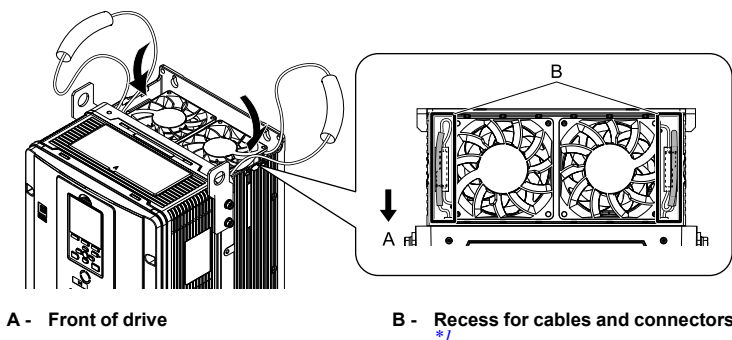
A - Notch on fan

B - Alignment pins on drive

C - Front of drive

Figure 5.30 Install the Cooling Fans

3. Put the cables and connectors in the recess of the drive.



A - Front of drive

B - Recess for cables and connectors
*/

Figure 5.31 Put the Cables and Connectors in the Drive Recess

*1 Make sure that the cables and connectors are in the correct space.

4. Install the fan finger guard straight until the tabs click into place.

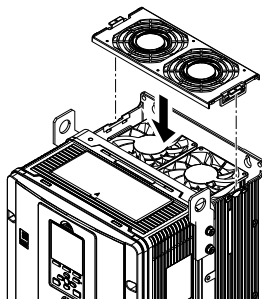


Figure 5.32 Install the Fan Finger Guard

5. Energize the drive and set $\alpha 4-03 = 0$ [Fan Operation Time Setting = 0 h] to reset the fan operation time.

■ Circulation Fan Removal

Note:

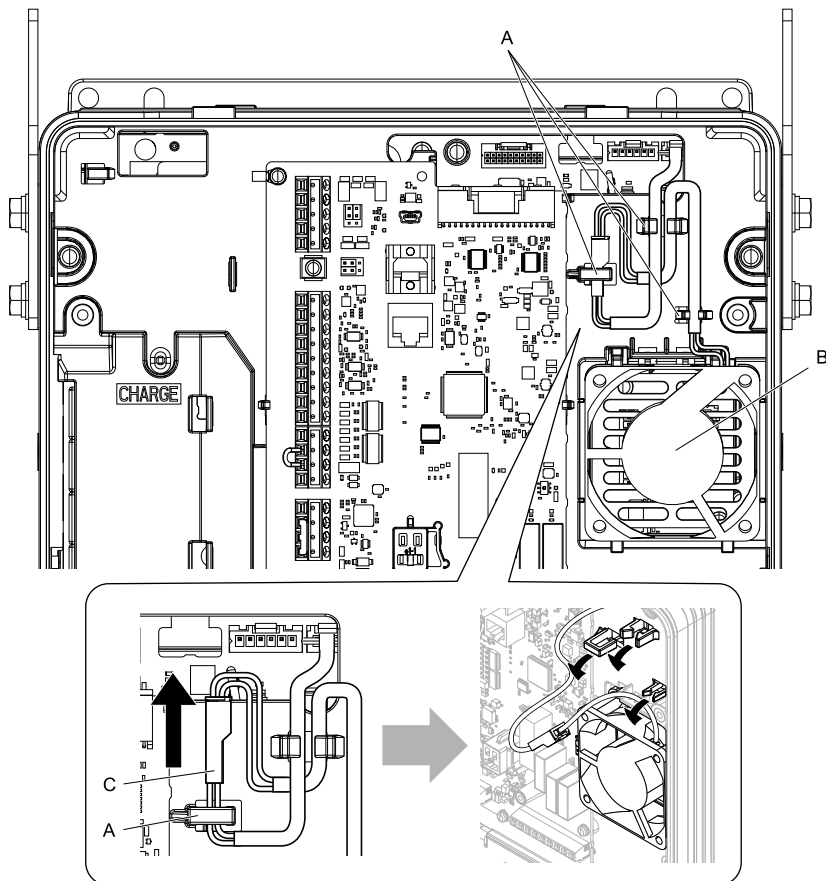
Use this procedure only when you use one of these drive models:

- 2075xV to 2114xV
- 4077xV to 4124xV
- 2075xT to 2114xT
- 4077xT, 4096xT

Remove the drive cover before you start this procedure.

⚠ CAUTION *Crush Hazard. Loosen the cover screws. Do not fully remove them. If you fully remove the cover screws, the terminal cover can fall and cause moderate injury.*

1. Pull the relay connector toward the top of the drive to remove from the hook then remove the cable from the hooks.



A - Hooks

B - Circulation fan

C - Relay connector

Figure 5.33 Remove the Cable

2. Disconnect the relay connector.

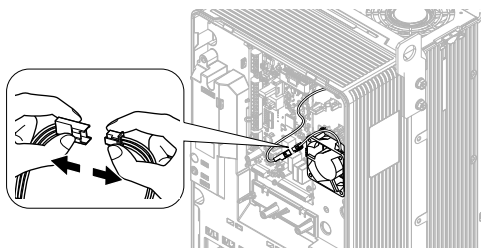
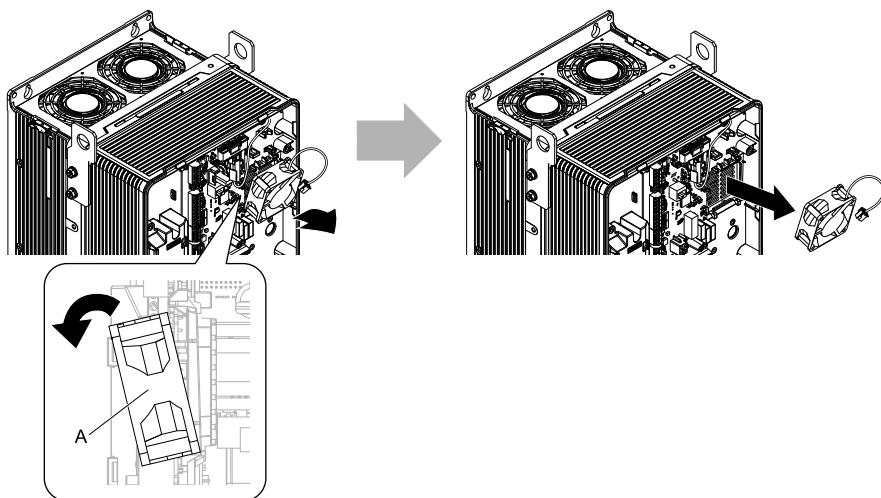


Figure 5.34 Disconnect the Relay Connector

3. Pull the top of the fan forward to remove it from the drive.



A - Circulation fan

Figure 5.35 Remove the Circulation Fan

■ Circulation Fan Installation

Note:

Use this procedure only when you use one of these drive models:

- 2075xV to 2114xV
- 4077xV to 4124xV
- 2075xT to 2114xT
- 4077xT, 4096xT

Reverse the removal procedure for circulation fan installation.

1. Put the bottom of the fan on the tabs in position A then push the fan until the tabs in position B click into position to put the fan back into the drive.

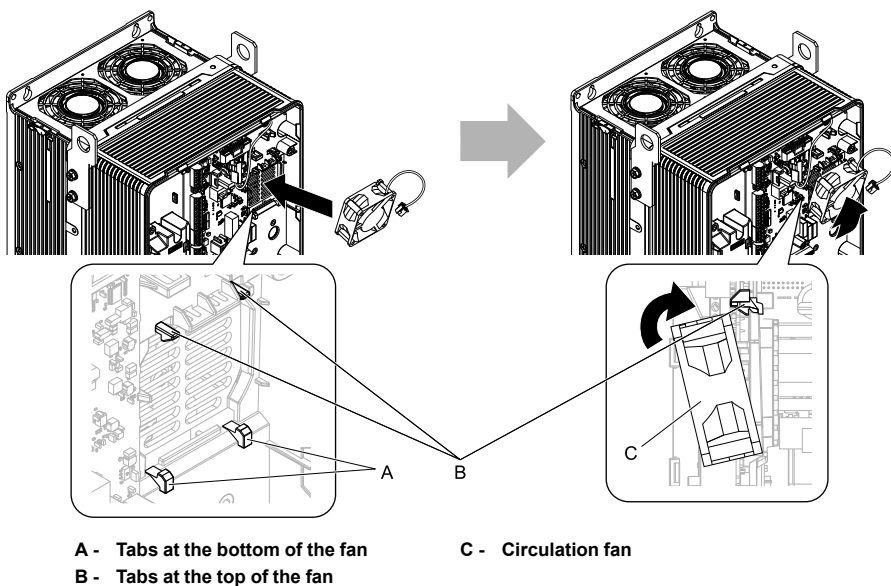


Figure 5.36 Install the Circulation Fan

2. Connect the relay connector.

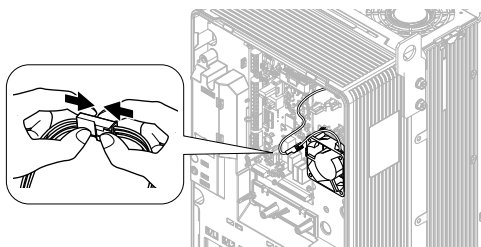


Figure 5.37 Connect the Relay Connector

3. Put the cable and relay connector back into their initial position.

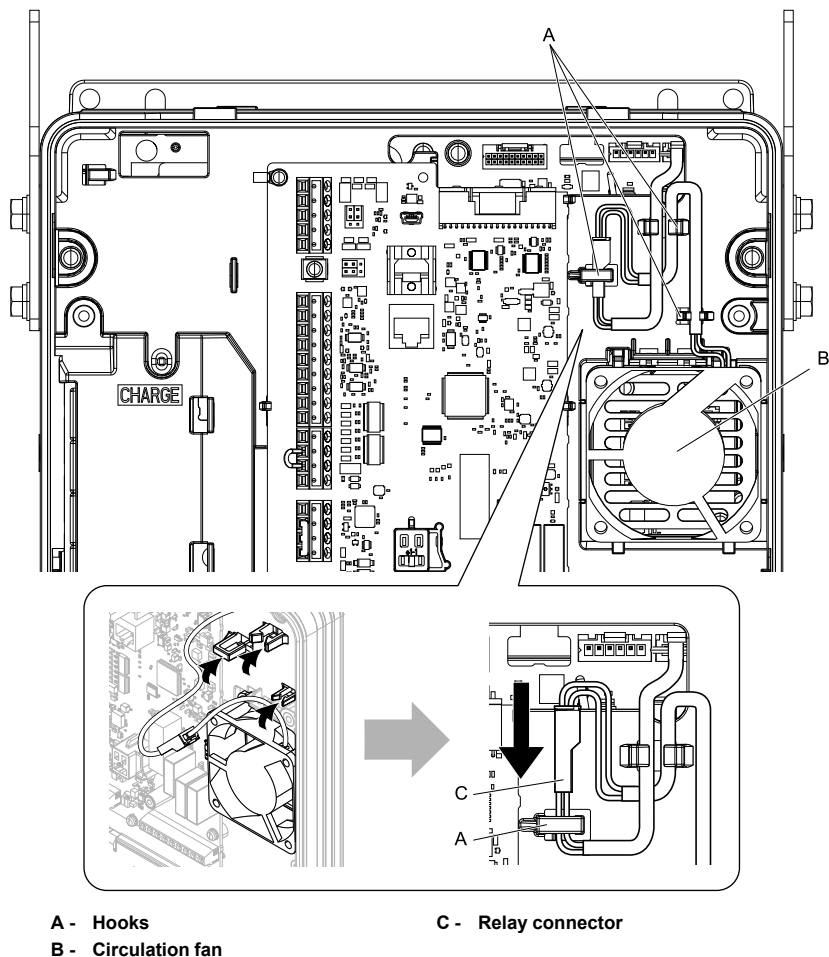


Figure 5.38 Put the Cable and Relay Connector Back into the Drive

◆ Fan Replacement (Procedure D)

⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

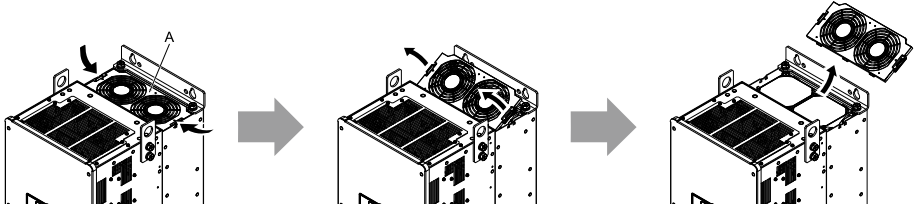
⚠ CAUTION *Burn Hazard. Do not touch a hot drive heatsink. De-energize the drive, wait for a minimum of 15 minutes, then make sure that the heatsink is cool before you replace the cooling fans. If you touch a hot drive heatsink, it can burn you.*

NOTICE

Use the instructions in this manual to replace the cooling fans. When you do maintenance on the fans, replace all the fans to increase product life. If you install the fans incorrectly, it can cause damage to the drive.

■ Fan Removal

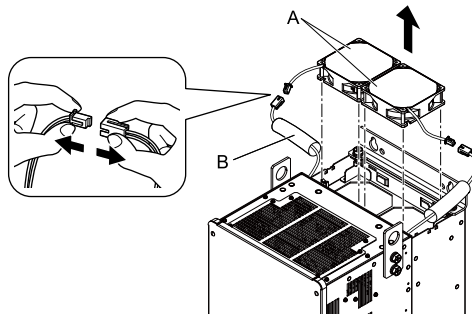
1. Push the tabs on the left and right sides of the fan finger guard and pull up to remove the fan finger guard from the drive.



A - Fan finger guard

Figure 5.39 Remove the Fan Finger Guard

2. Pull the cooling fans straight up from the drive. Remove the protective tubes on the relay connectors and disconnect the connectors to remove the fans from the drive.



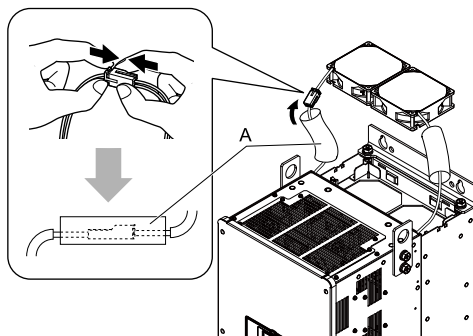
A - Cooling fans

B - Protective tubes

Figure 5.40 Remove the Cooling Fans**■ Fan Installation**

Reverse the removal procedure for fan installation.

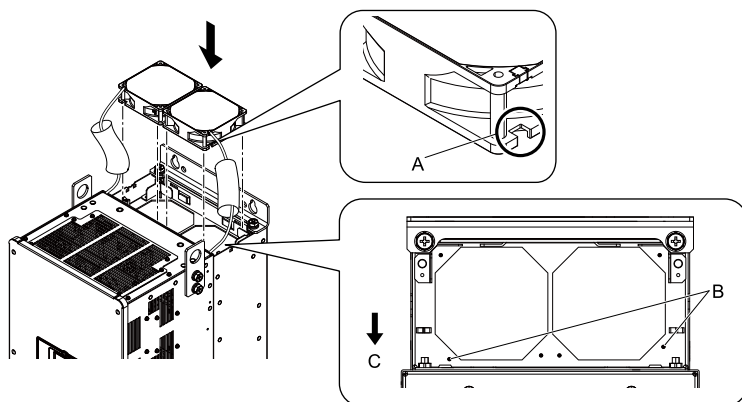
1. Connect the relay connectors, and attach the protective tubes.



A - Protective tubes

Figure 5.41 Connect the Relay Connectors

2. Align the notches on the fans with the pins on the drive and install the cooling fans in the drive.



A - Notch on fan

B - Alignment pins on drive

C - Front of drive

Figure 5.42 Install the Cooling Fans

3. Put the cables and connectors in the recess of the drive.

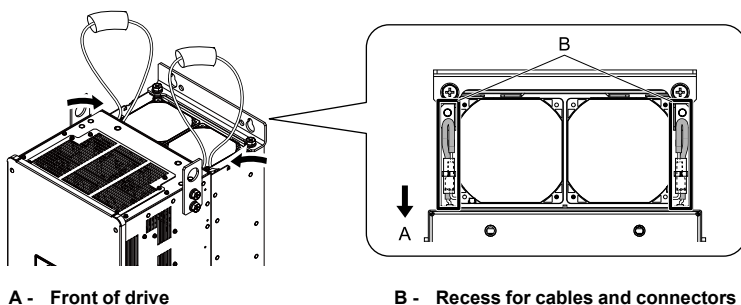


Figure 5.43 Put the Cables and Connectors in the Drive Recess

*1 Make sure that the cables and connectors are in the correct space.

4. Hold the fan finger guard at an angle and put the connector tabs on the fan finger guard into the holes on the drive.

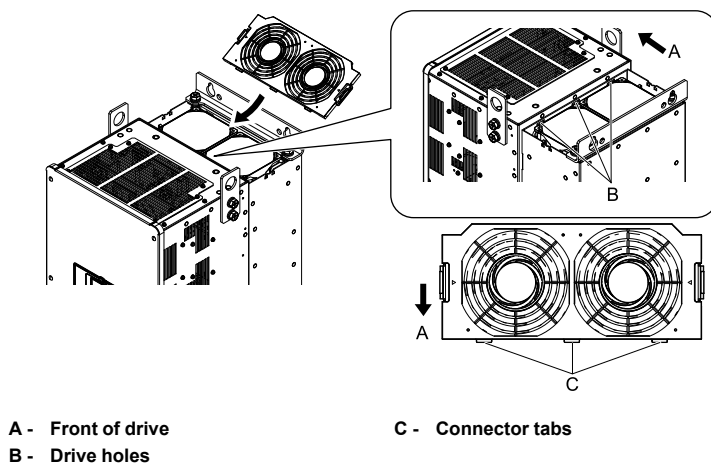


Figure 5.44 Install the Fan Finger Guard

5. Push the tabs on the left and right sides of the fan finger guard and click into place on the drive.

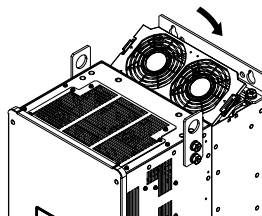


Figure 5.45 Install the Fan Finger Guard

6. Energize the drive and set $\alpha 4-03 = 0$ [Fan Operation Time Setting = 0 h] to reset the fan operation time.

◆ Fan Replacement (Procedure E)

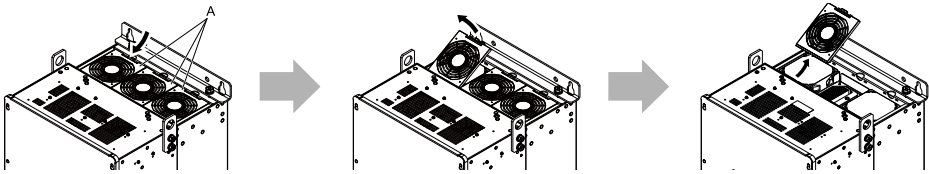
⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

⚠ CAUTION *Burn Hazard. Do not touch a hot drive heatsink. De-energize the drive, wait for a minimum of 15 minutes, then make sure that the heatsink is cool before you replace the cooling fans. If you touch a hot drive heatsink, it can burn you.*

NOTICE *Use the instructions in this manual to replace the cooling fans. When you do maintenance on the fans, replace all the fans to increase product life. If you install the fans incorrectly, it can cause damage to the drive.*

■ Fan Removal

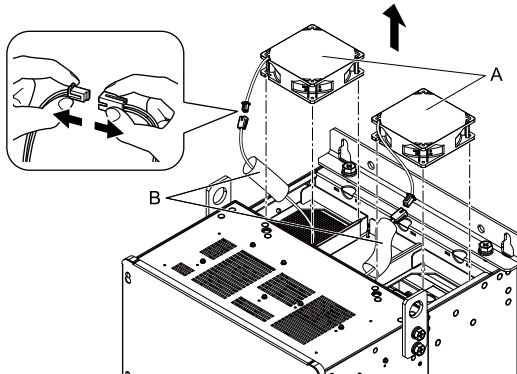
1. Push the tab on the back side of each fan finger guard and pull up to remove the fan finger guards from the drive.



A - Fan finger guards

Figure 5.46 Remove the Fan Finger Guards

2. Pull the cooling fans straight up from the drive. Remove the protective tubes on the relay connectors and disconnect the connectors to remove the fans from the drive.



A - Cooling fans

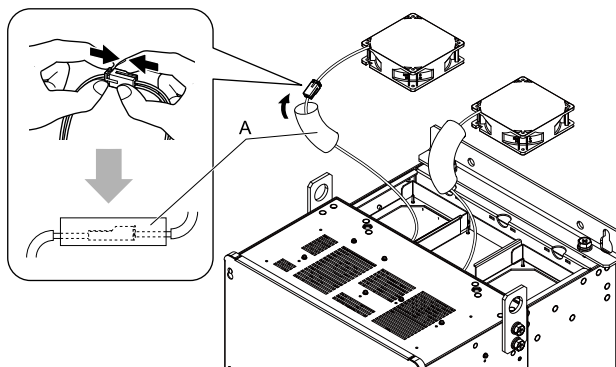
B - Protective tubes

Figure 5.47 Remove the Cooling Fans

■ Fan Installation

Reverse the removal procedure for fan installation.

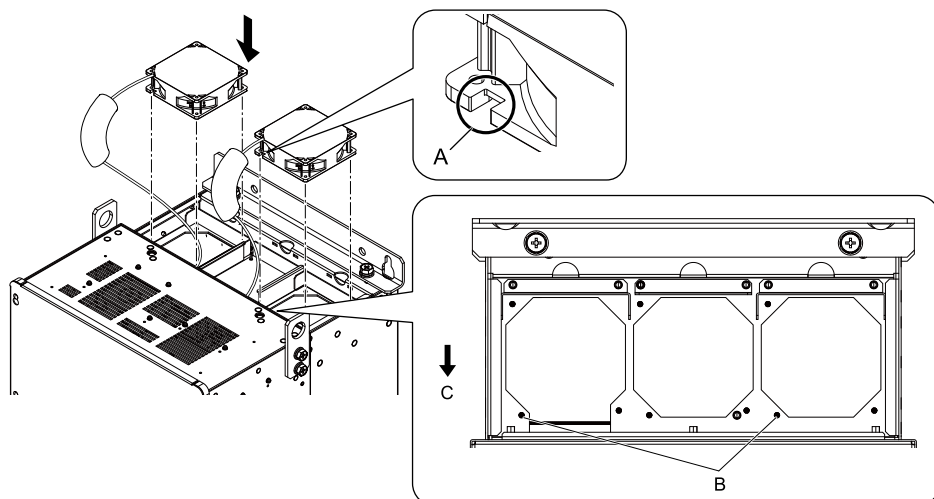
1. Connect the relay connectors, and attach the protective tubes.



A - Protective tubes

Figure 5.48 Connect the Relay Connectors

2. Align the notches on the fans with the pins on the drive and install the cooling fans in the drive.



A - Notch on fan

B - Alignment pins on drive

C - Front of drive

Figure 5.49 Install the Cooling Fans

3. Put the cables and connectors in the recess of the drive.

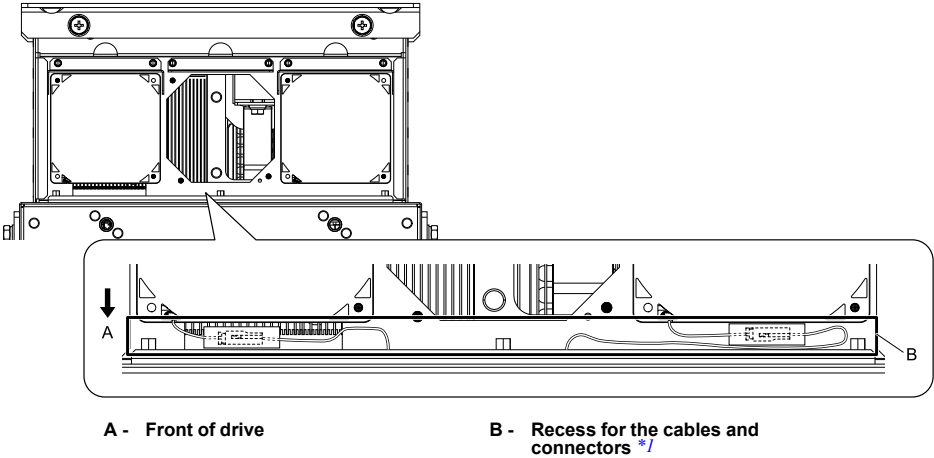


Figure 5.50 Put the Cables and Connectors in the Drive Recess

*1 Make sure that the cables and connectors are in the correct space.

4. Hold the fan finger guards at an angle and put the connector tabs on the fan finger guards into the receiving areas on the drive.

Note:

When you install the cooling fans, make sure that you do not pinch cables between the fan finger guards and the drive.

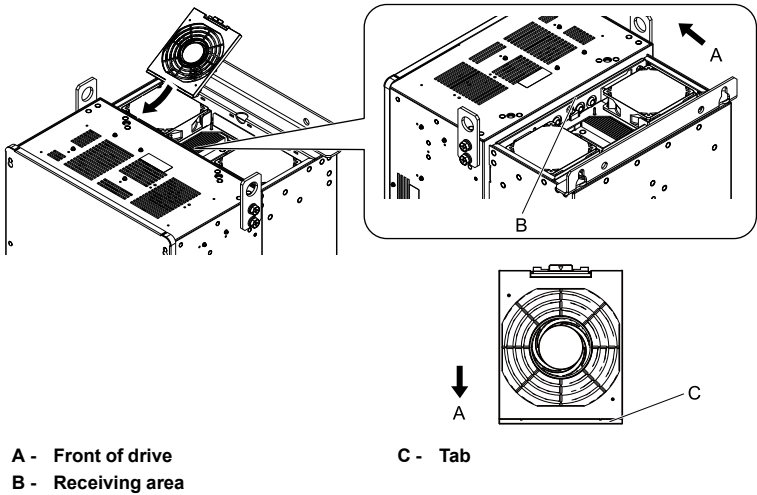


Figure 5.51 Install the Fan Finger Guards

5. Push the tabs on the back side of the fan finger guards and click them into place on the drive.

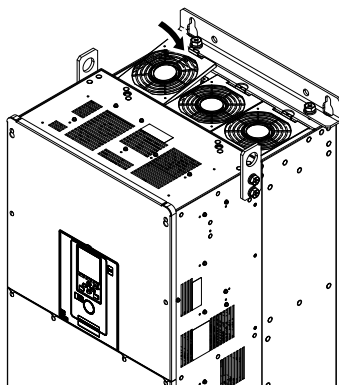


Figure 5.52 Install the Fan Finger Guards

6. Energize the drive and set $\alpha 4-03 = 0$ [Fan Operation Time Setting = 0 h] to reset the fan operation time.

■ Circulation Fan Removal

Remove the drive cover before you start this procedure.

CAUTION Crush Hazard. Loosen the cover screws. Do not fully remove them. If you fully remove the cover screws, the terminal cover can fall and cause moderate injury.

1. Remove the cable from the clamps.

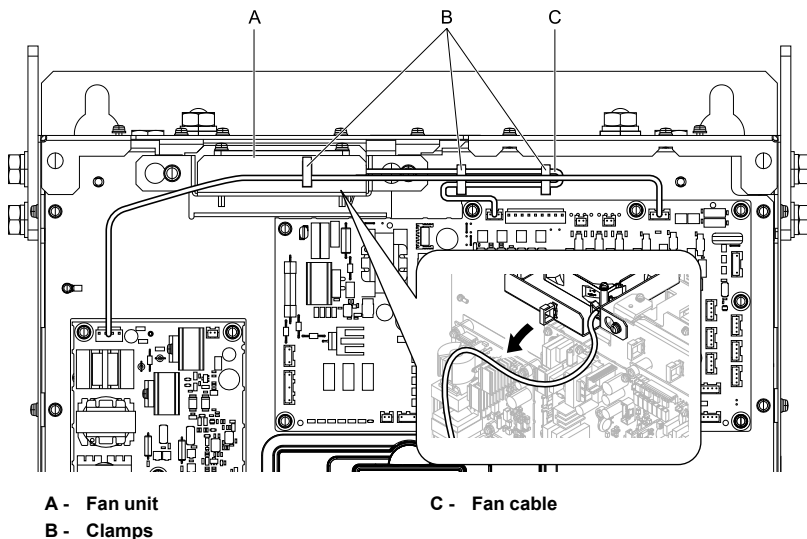
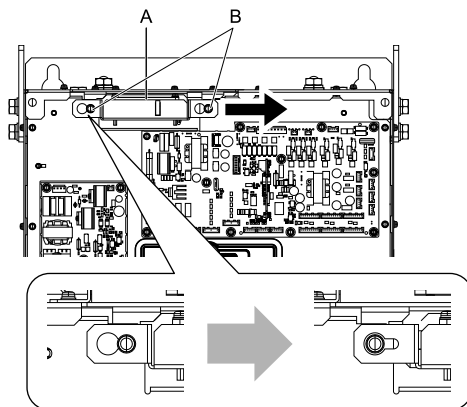


Figure 5.53 Remove the Fan Cable

2. Loosen the screws that attach the fan unit and slide the fan unit to the right.

Note:

To remove the fan unit, it is only necessary to loosen the screws.



A - Fan unit

B - Screws

Figure 5.54 Slide the Fan Unit

3. Disconnect the relay connector and remove the fan unit.

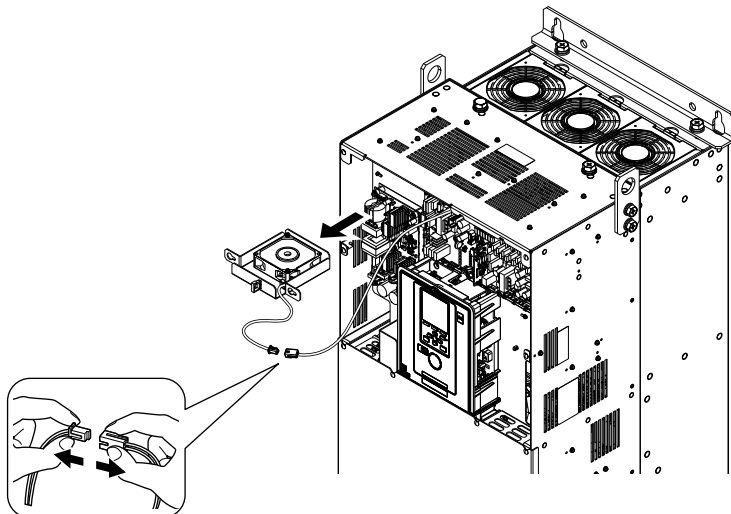
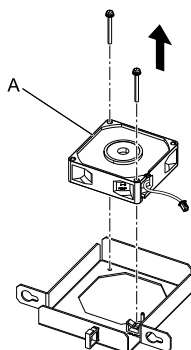


Figure 5.55 Remove the Fan Unit

4. Remove the screws that attach the circulation fan and remove the fan.



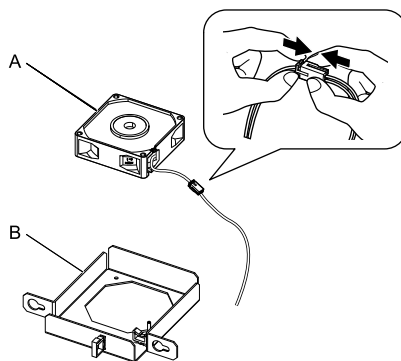
A - Circulation fan

Figure 5.56 Remove the Circulation Fan

■ Circulation Fan Installation

Reverse the removal procedure for fan installation.

1. Connect the relay connector between the drive and circulation fan.



A - Circulation fan

B - Fan unit base

Figure 5.57 Connect the Relay Connector

2. Align the pin on the fan unit base with the notch on the fan and put the fan in the fan unit base, then use the screws to attach it.
Tighten the screws to a tightening torque of 0.98 N·m to 1.33 N·m (8.67 lbf·in to 11.77 lbf·in).

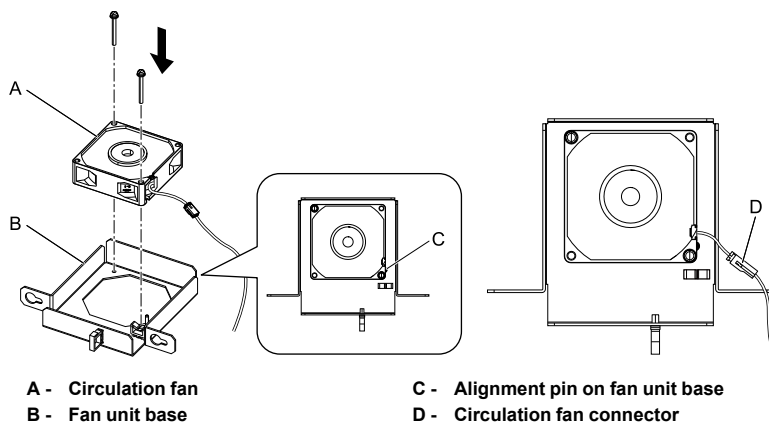
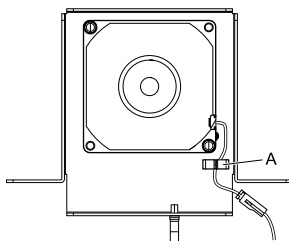


Figure 5.58 Install the Circulation Fan

3. Attach the fan cable through the clamp.



A - Clamp

Figure 5.59 Attach the Fan Cable

4. Put the fan unit into the specified location and slide it to the left, then use screws to attach it to the drive.
Tighten the screws to a tightening torque of 1.96 N·m to 2.53 N·m (17.35 lbf·in to 22.39 lbf·in).

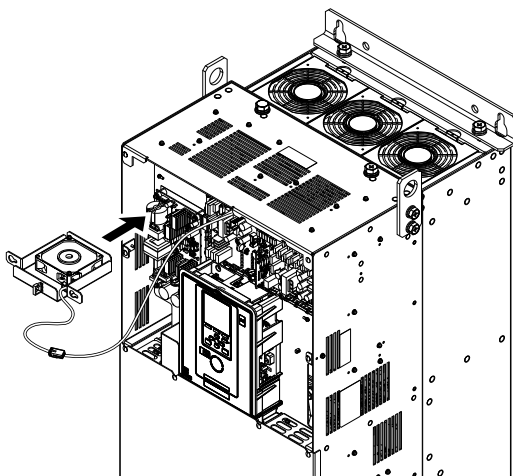


Figure 5.60 Install the Fan Unit

5. Attach the cable through the clamps.

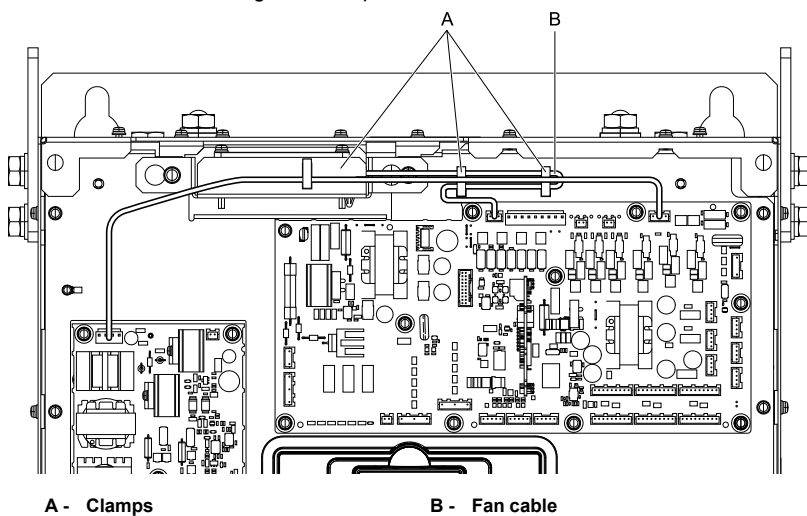


Figure 5.61 Attach the Fan Cable through the Clamps

6. Install the drive cover.
7. Energize the drive and set $o4-03 = 0$ [Fan Operation Time Setting = 0 h] to reset the fan operation time.

◆ Fan Replacement (Procedure F)

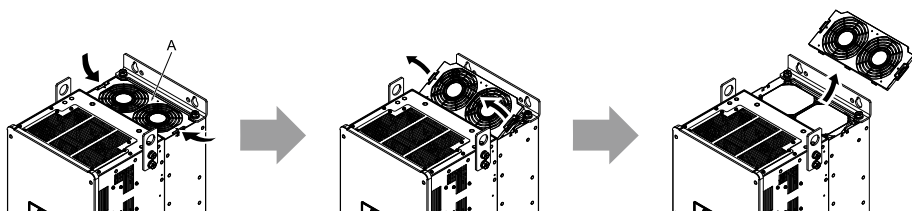
⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

⚠ CAUTION *Burn Hazard. Do not touch a hot drive heatsink. De-energize the drive, wait for a minimum of 15 minutes, then make sure that the heatsink is cool before you replace the cooling fans. If you touch a hot drive heatsink, it can burn you.*

NOTICE *Use the instructions in this manual to replace the cooling fans. When you do maintenance on the fans, replace all the fans to increase product life. If you install the fans incorrectly, it can cause damage to the drive.*

■ Fan Removal

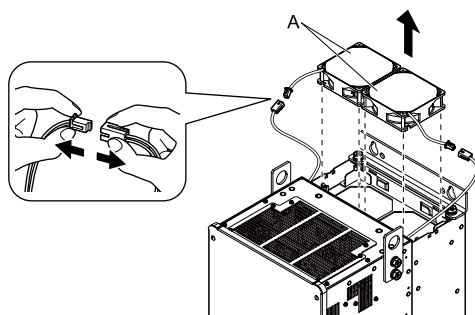
1. Push the tabs on the left and right sides of the fan finger guard and pull up to remove the fan finger guard from the drive.



A - Fan finger guard

Figure 5.62 Remove the Fan Finger Guard

2. Pull the cooling fans straight up from the drive. Disconnect the relay connectors and remove the fans from the drive.



A - Cooling fans

Figure 5.63 Remove the Cooling Fans

■ Fan Installation

Reverse the removal procedure for fan installation.

1. Connect the relay connectors between the drive and cooling fans.

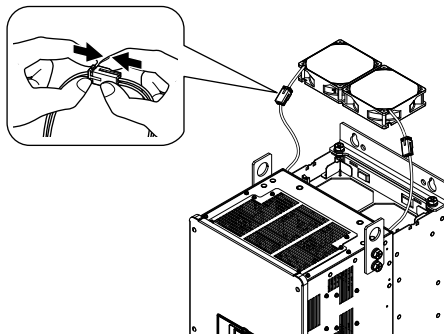
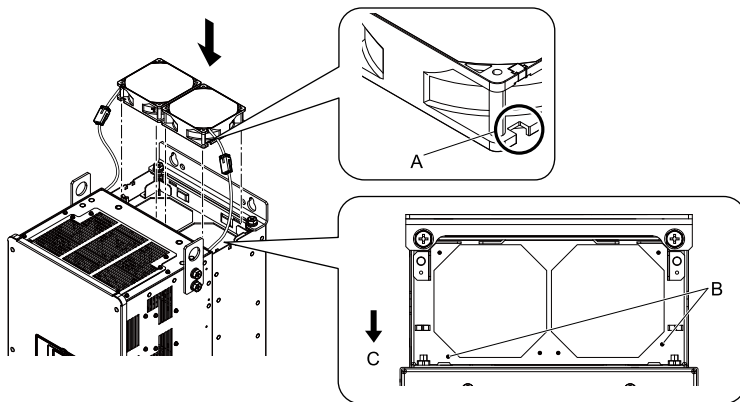


Figure 5.64 Connect the Relay Connectors

2. Align the notches on the fans with the pins on the drive and install the cooling fans in the drive.



A - Notch on fan

B - Alignment pins on drive

C - Front of drive

Figure 5.65 Install the Cooling Fans

3. Put the cables and connectors in the recess of the drive.

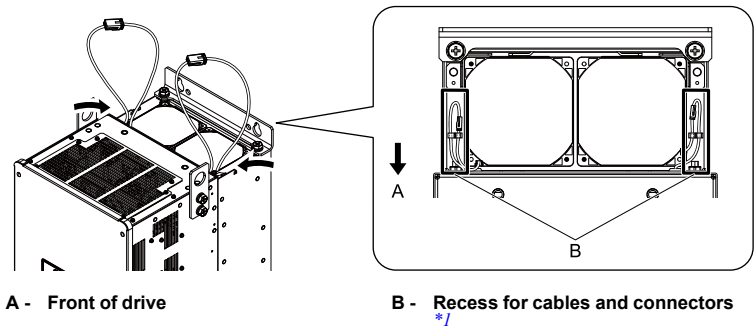


Figure 5.66 Put the Cables and Connectors in the Drive Recess

*1 Make sure that the cables and connectors are in the correct space.

4. Hold the fan finger guard at an angle and put the connector tabs on the fan finger guard into the holes on the drive.

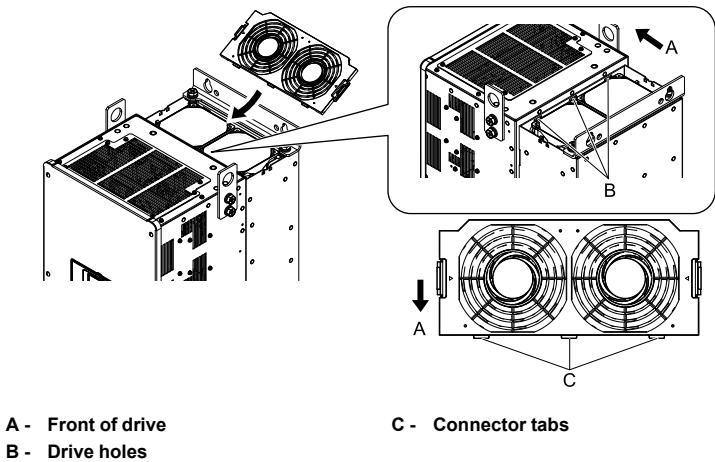


Figure 5.67 Install the Fan Finger Guard

5. Push the tabs on the left and right sides of the fan finger guard and click it into place on the drive.

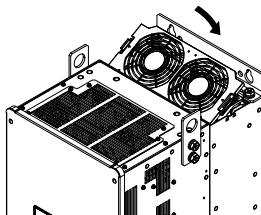


Figure 5.68 Install the Fan Finger Guard

6. Energize the drive and set o4-03 = 0 [Fan Operation Time Setting = 0 h] to reset the fan operation time.

◆ Fan Replacement (Procedure G)

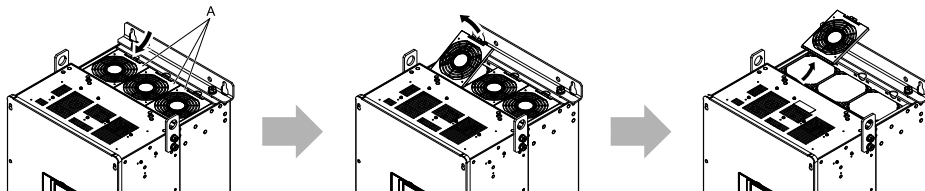
⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

⚠ CAUTION *Burn Hazard. Do not touch a hot drive heatsink. De-energize the drive, wait for a minimum of 15 minutes, then make sure that the heatsink is cool before you replace the cooling fans. If you touch a hot drive heatsink, it can burn you.*

NOTICE *Use the instructions in this manual to replace the cooling fans. When you do maintenance on the fans, replace all the fans to increase product life. If you install the fans incorrectly, it can cause damage to the drive.*

■ Fan Removal

1. Push the tab on the back side of each fan finger guard and pull up to remove the fan finger guards from the drive.



A - Fan finger guards

Figure 5.69 Remove the Fan Finger Guards

2. Pull the cooling fans straight up from the drive. Disconnect the relay connectors to remove the fans from the drive.

Note:

The number of fans is different for different drive models.

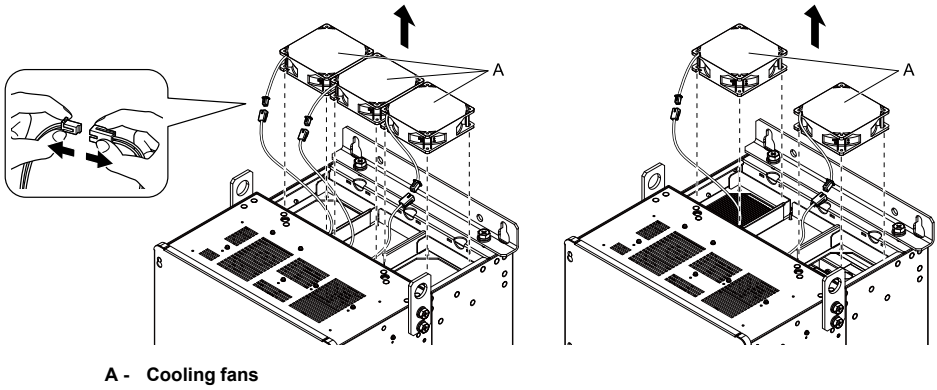


Figure 5.70 Remove the Cooling Fans

■ Fan Installation

Reverse the removal procedure for fan installation.

1. Connect the relay connectors between the drive and cooling fans.

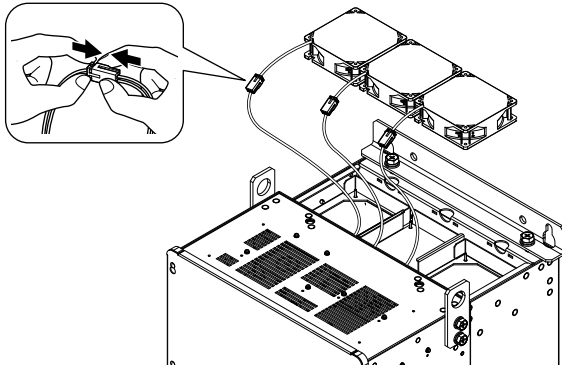


Figure 5.71 Connect the Relay Connectors

- Align the notches on the fans with the pins on the drive and install the cooling fans in the drive.

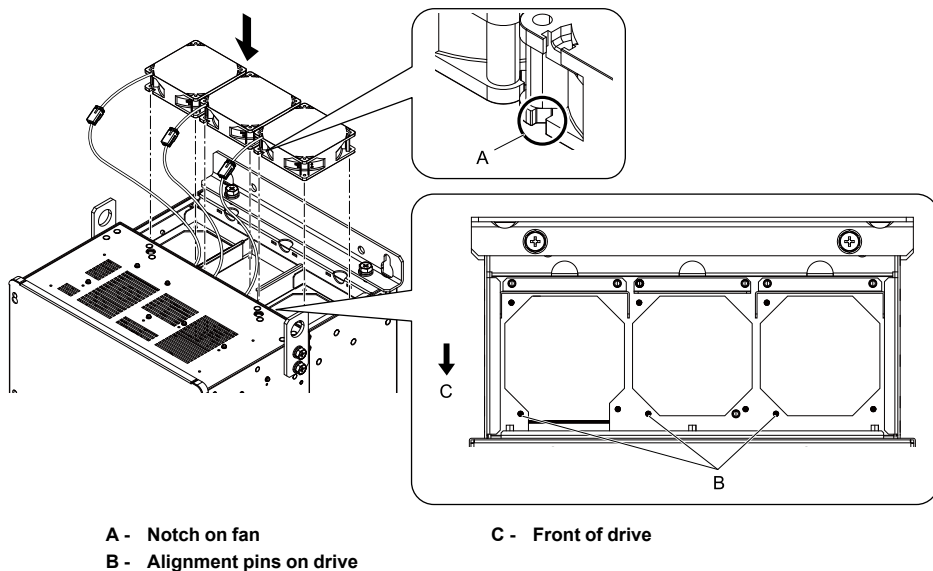


Figure 5.72 Install the Cooling Fans

- Put the cables and connectors in the recess of the drive.

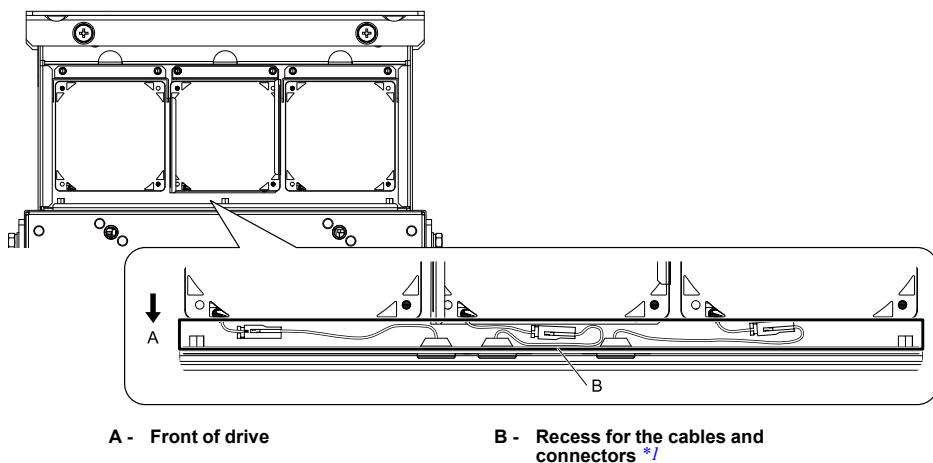


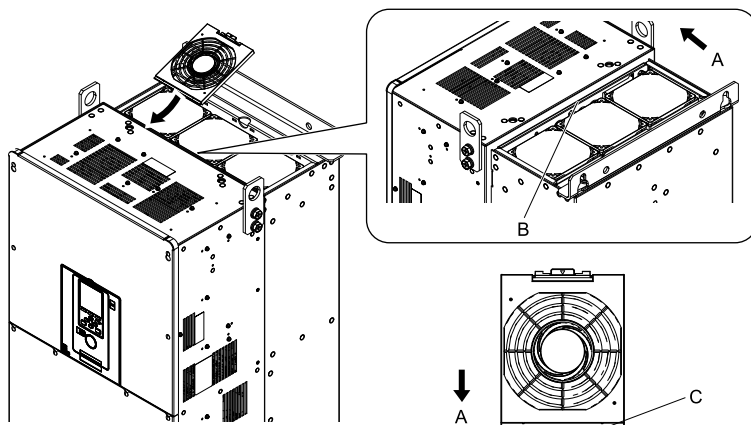
Figure 5.73 Put the Cables and Connectors in the Drive Recess

^{*1} Make sure that the cables and connectors are in the correct space.

4. Hold the fan finger guards at an angle and put the connector tabs on the fan finger guards into the receiving areas on the drive.

Note:

When you install the cooling fans, make sure that you do not pinch cables between the fan finger guards and the drive.



A - Front of drive
B - Receiving area

C - Tab

Figure 5.74 Install the Fan Finger Guards

5. Push the tabs on the back side of the fan finger guards and click them into place on the drive.

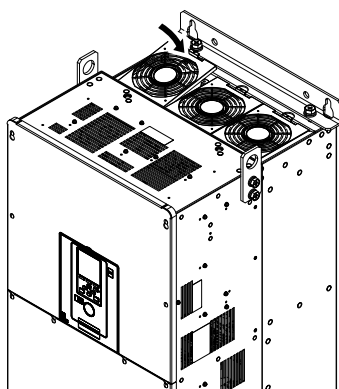


Figure 5.75 Install the Fan Finger Guards

6. Energize the drive and set $\alpha 4-03 = 0$ [Fan Operation Time Setting = 0 h] to reset the fan operation time.

■ Circulation Fan Removal

Remove the drive cover before you start this procedure.

⚠ CAUTION Crush Hazard. Loosen the cover screws. Do not fully remove them. If you fully remove the cover screws, the terminal cover can fall and cause moderate injury.

1. Remove the cable from the clamps.

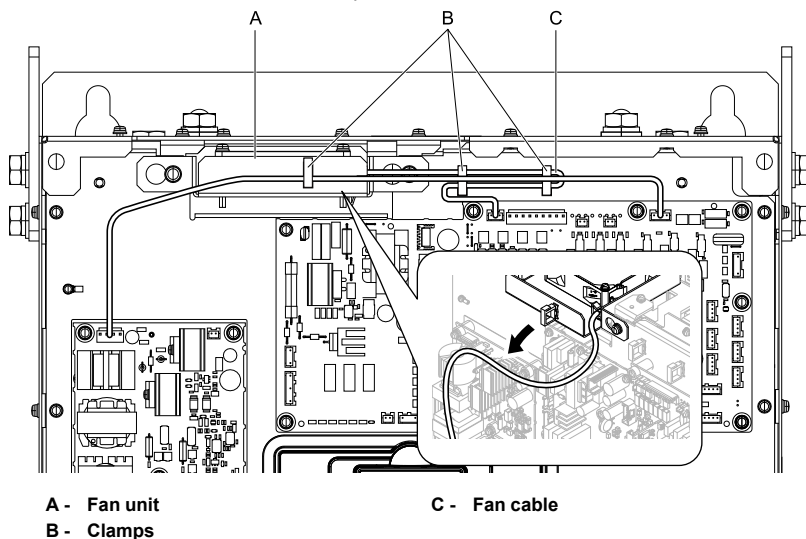


Figure 5.76 Remove the Fan Cable

2. Loosen the screws that attach the fan unit and slide the fan unit to the right.

Note:

To remove the fan unit, it is only necessary to loosen the screws.

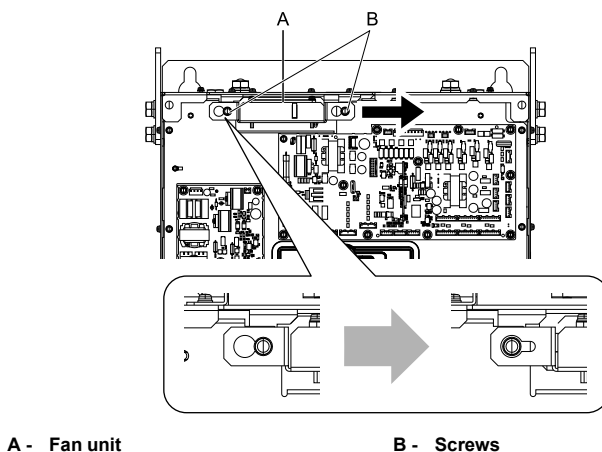


Figure 5.77 Slide the Fan Unit

3. Disconnect the relay connector and remove the fan unit.

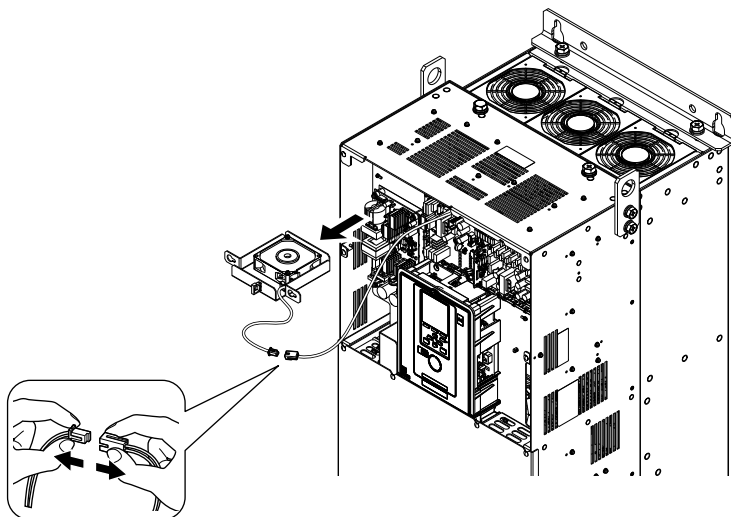
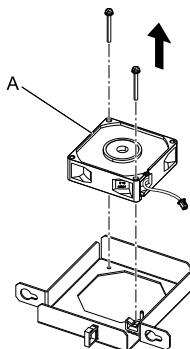


Figure 5.78 Remove the Fan Unit

4. Remove the screws that attach the circulation fan and remove the fan.



A - Circulation fan

Figure 5.79 Remove the Circulation Fan

■ Circulation Fan Installation

Reverse the removal procedure for fan installation.

1. Connect the relay connector between the drive and circulation fan.

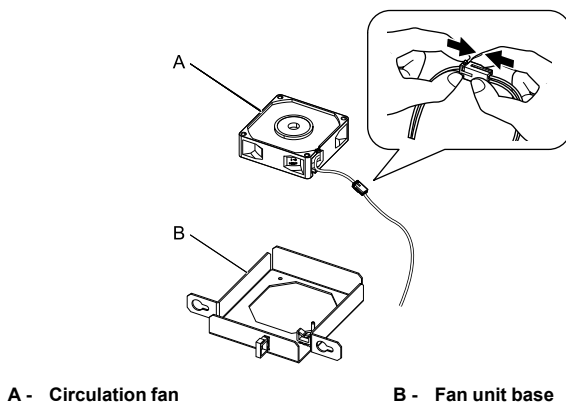


Figure 5.80 Connect the Relay Connector

2. Align the pin on the fan unit base with the notch on the fan and put the fan in the fan unit base, then use the screws to attach it.
Tighten the screws to a tightening torque of 0.98 N·m to 1.33 N·m (8.67 lbf·in to 11.77 lbf·in).

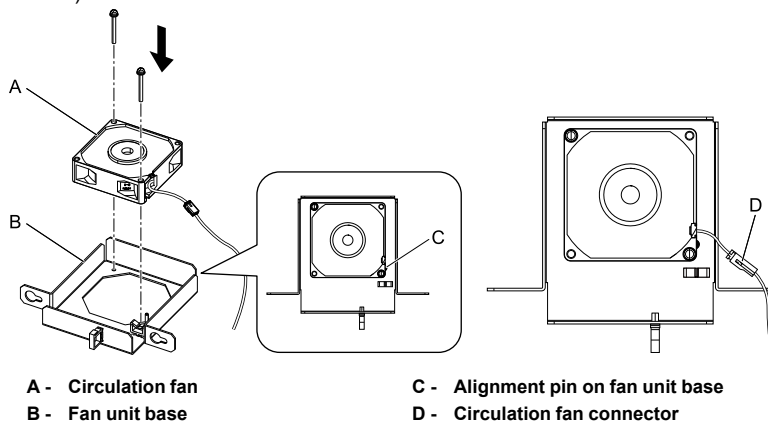
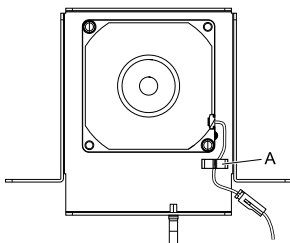


Figure 5.81 Install the Circulation Fan

3. Attach the fan cable through the clamp.



A - Clamp

Figure 5.82 Attach the Fan Cable

4. Put the fan unit into the specified location and slide it to the left, then use screws to attach it to the drive.
Tighten the screws to a tightening torque of 1.96 N·m to 2.53 N·m (17.35 lbf·in to 22.39 lbf·in).

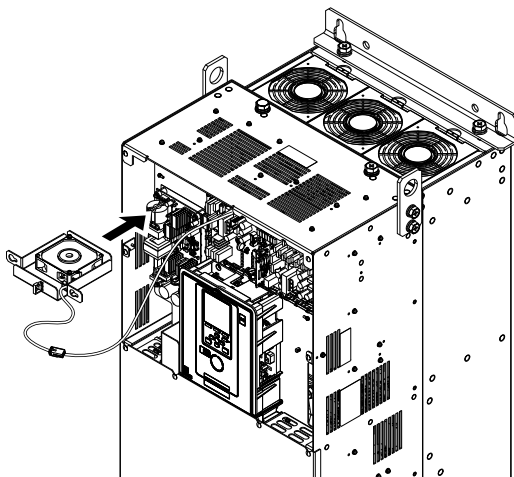


Figure 5.83 Install the Fan Unit

5. Attach the cable through the clamps.

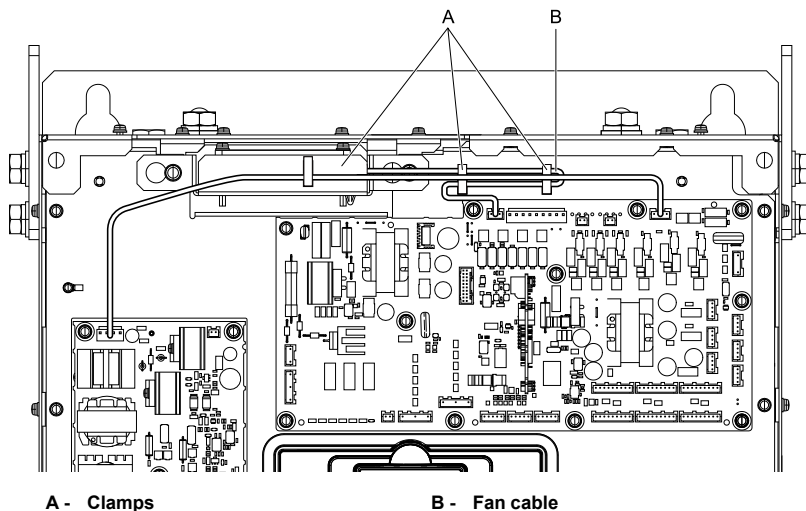


Figure 5.84 Attach the Fan Cable through the Clamps

6. Install the drive cover.
7. Energize the drive and set o4-03 = 0 [Fan Operation Time Setting = 0 h] to reset the fan operation time.

◆ Fan Replacement (Procedure H)

⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

⚠ CAUTION *Burn Hazard. Do not touch a hot drive heatsink. De-energize the drive, wait for a minimum of 15 minutes, then make sure that the heatsink is cool before you replace the cooling fans. If you touch a hot drive heatsink, it can burn you.*

NOTICE *Use the instructions in this manual to replace the cooling fans. When you do maintenance on the fans, replace all the fans to increase product life. If you install the fans incorrectly, it can cause damage to the drive.*

■ Fan Removal

1. Remove the drive cover.

⚠ CAUTION *Crush Hazard. Loosen the cover screws. Do not fully remove them. If you fully remove the cover screws, the terminal cover can fall and cause moderate injury.*

2. Unplug the fan cable from the fan connectors.

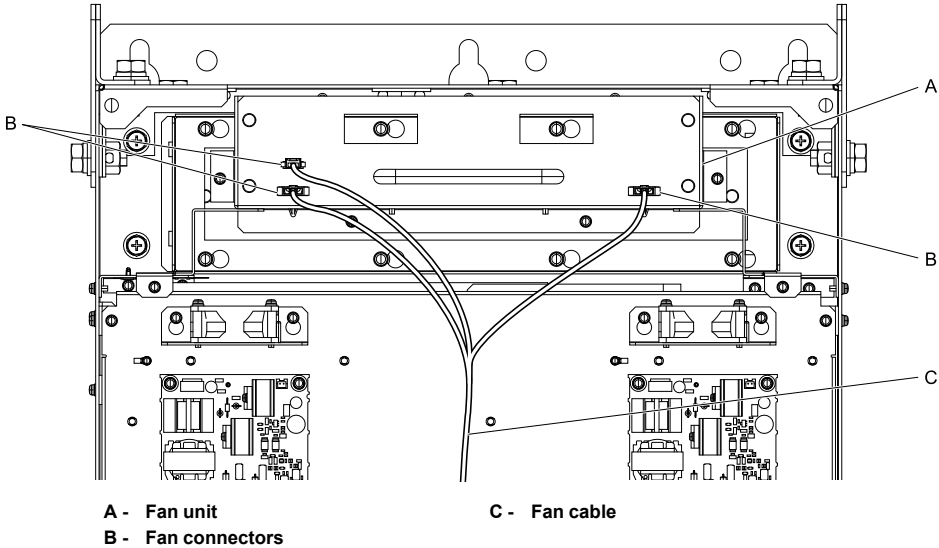


Figure 5.85 Remove the Fan Cable

3. Loosen the screws that attach the fan unit and slide the slide panel to the left.

Note:

- To remove the fan unit, it is only necessary to loosen the screws in position B.
- Remove the screws in position A.

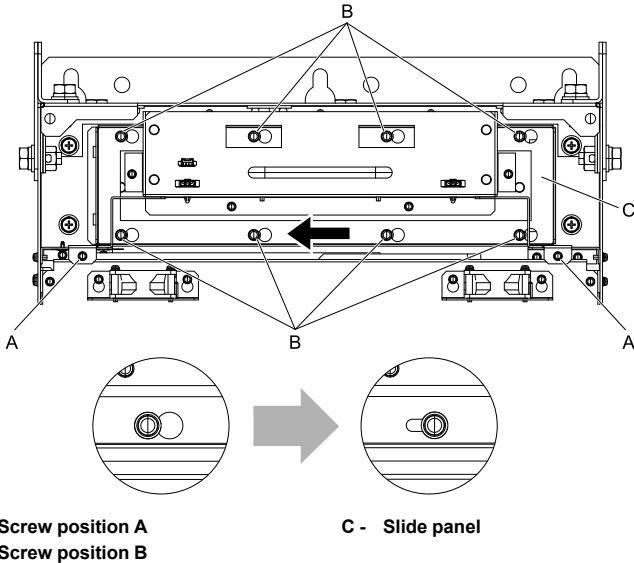


Figure 5.86 Slide the Slide Panel

4. Remove the fan unit and the slide panel at the same time.

Note:

When you remove the fan unit, make sure that it does not fall.

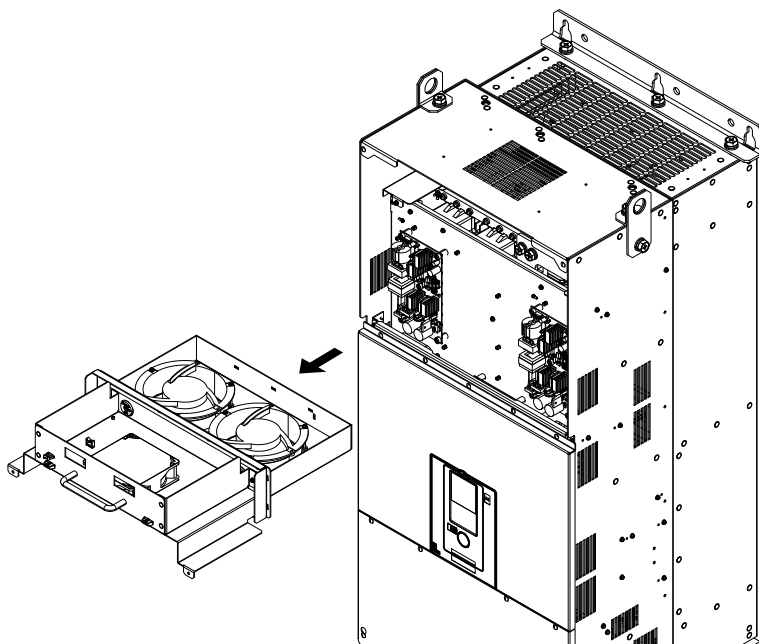
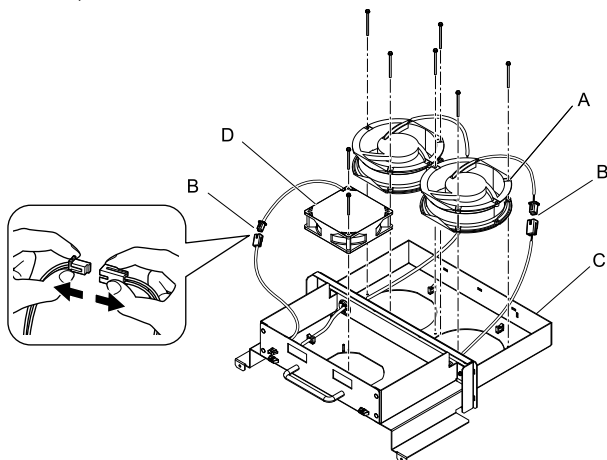


Figure 5.87 Remove the Fan Unit

5. Unplug the relay connectors, remove the screws that attach the cooling fans and circulation fan, and then remove the fans.



A - Cooling fans

B - Relay connectors

C - Fan unit base

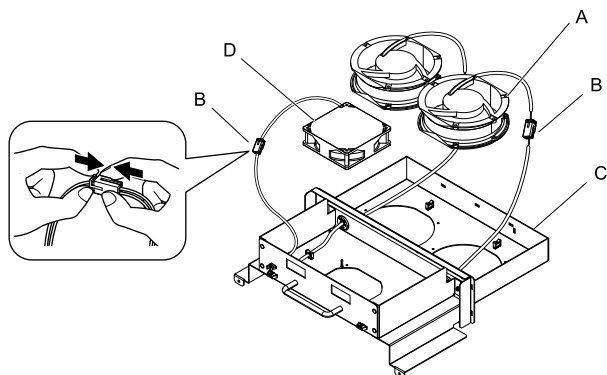
D - Circulation fan

Figure 5.88 Remove the Cooling Fans and Circulation Fan

■ Fan Installation

Reverse the removal procedure for fan installation.

1. Connect the relay connectors on the fan unit base to the cooling fans and the circulation fan.



A - Cooling fans

B - Relay connectors

C - Fan unit base

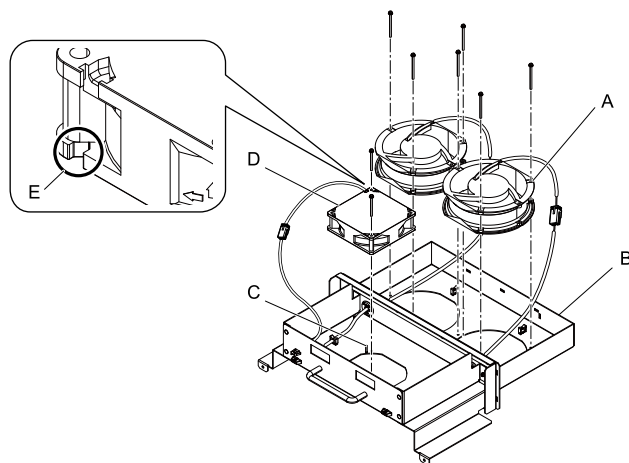
D - Circulation fan

Figure 5.89 Connect the Relay Connectors

2. Align the pins on the fan unit base with the notches on the fans and put the fans in the fan unit base, then use the screws to attach them.
Tighten the M4 screws to a tightening torque of 0.98 N·m to 1.33 N·m (8.67 lbf·in to 11.77 lbf·in).

Note:

Make sure that you do not pinch cables between the fans and the fan unit base.



A - Cooling fans

B - Fan unit base

C - Alignment pin on fan unit base

D - Circulation fan

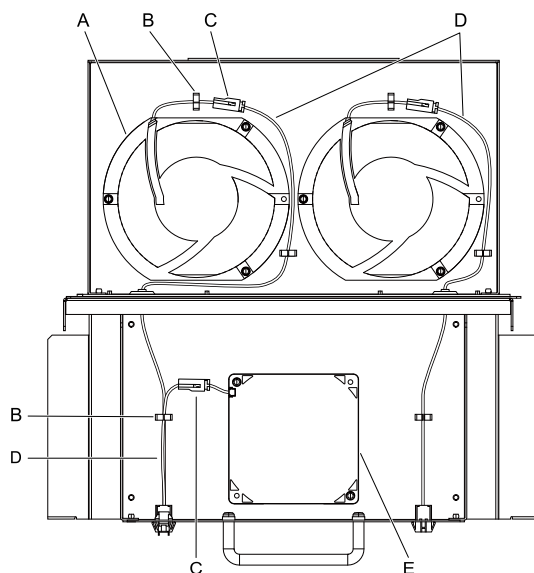
E - Notch on fan

Figure 5.90 Install the Cooling Fans and Circulation Fan

3. Put the cables and connectors in the recess of the drive.

Note:

Attach the relay cables to the hooks.



A - Cooling fans

B - Cable hooks

C - Relay connectors

D - Relay cables

E - Circulation fan

Figure 5.91 Put the Cables and Connectors in the Drive Recess

4. Put the fan unit into the specified location.

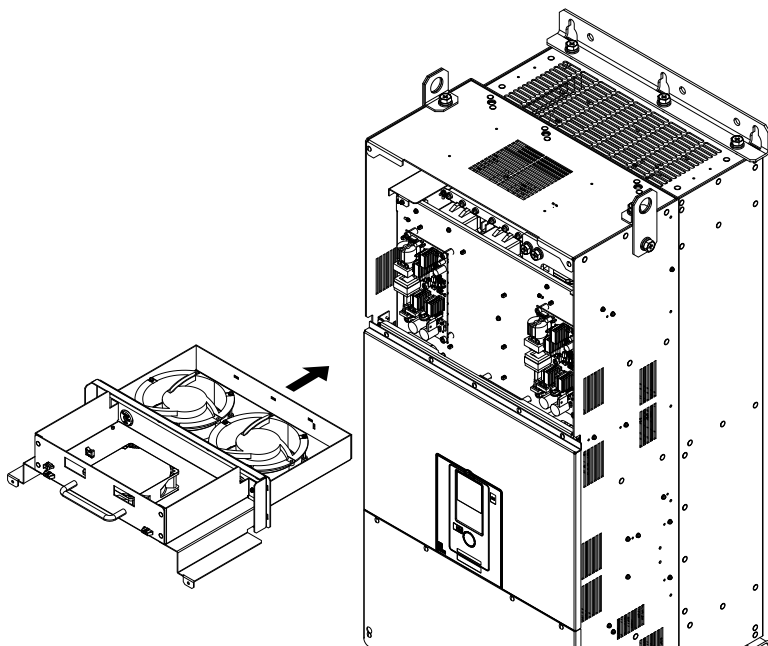
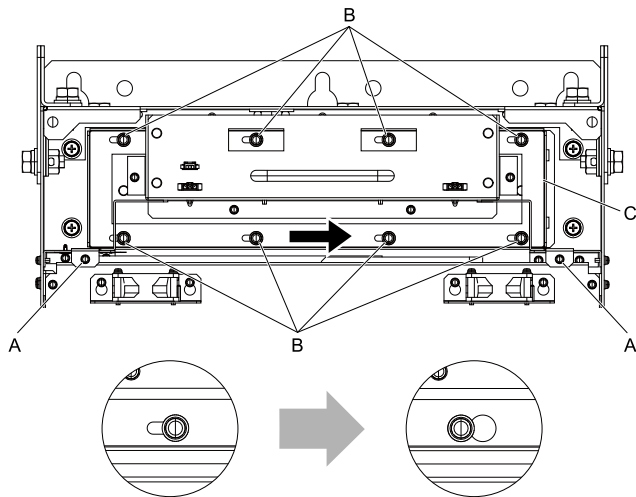


Figure 5.92 Install the Fan Unit

5. Slide the fan unit to the right and use the screws to attach it to the drive.
Tighten the screws to a correct tightening torque:
 - Screws in Position A: 0.98 N·m to 1.33 N·m (8.67 lbf-in to 11.77 lbf-in)
 - Screws in Position B: 1.96 N·m to 2.53 N·m (17.35 lbf-in to 22.39 lbf-in)

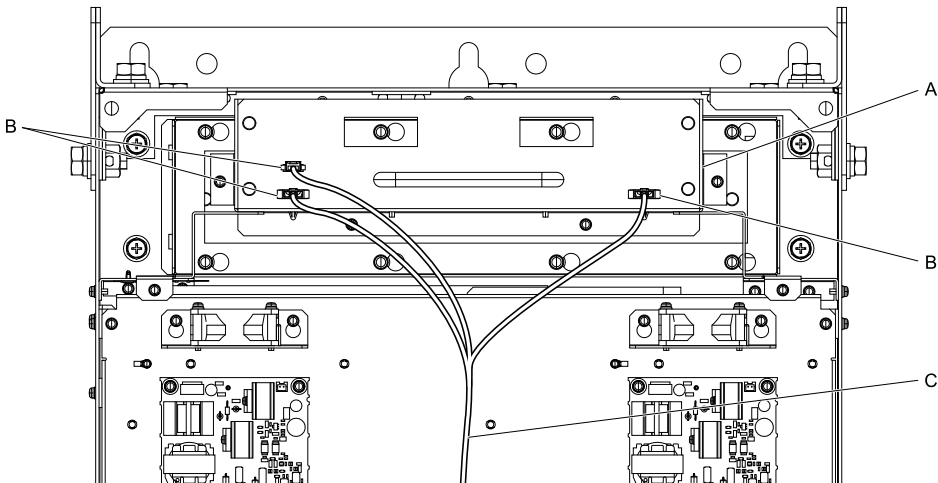


A - Screw position A
B - Screw position B

C - Fan unit

Figure 5.93 Slide the Fan Unit

6. Connect the fan cable to the fan connectors.



A - Fan unit
B - Fan connectors

C - Fan cable

Figure 5.94 Connect Cooling Fan Connectors

7. Install the drive cover.
8. Energize the drive and set $\alpha 4-03 = 0$ [Fan Operation Time Setting = 0 h] to reset the fan operation time.

■ Circuit Board Cooling Fan Removal

Remove the drive cover before you start this procedure.

CAUTION *Crush Hazard. Loosen the cover screws. Do not fully remove them. If you fully remove the cover screws, the terminal cover can fall and cause moderate injury.*

1. Disconnect the relay cables from the fan connectors.

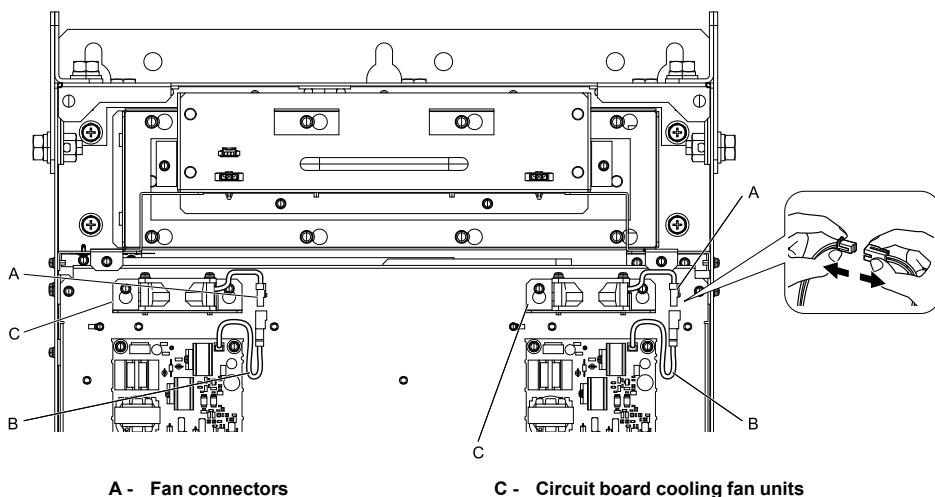
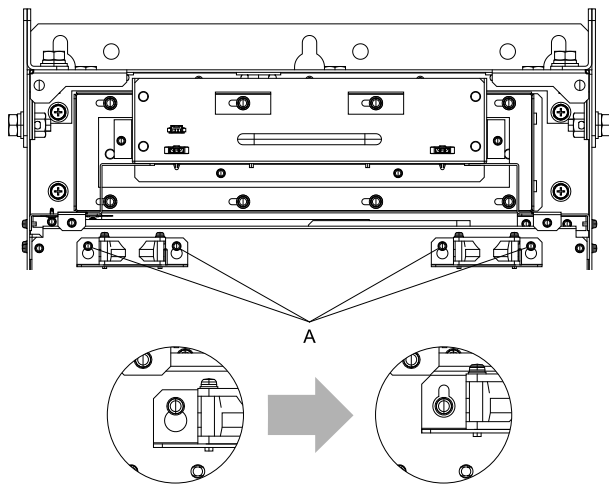


Figure 5.95 Disconnect the Relay Cables

2. Loosen the screws that attach the circuit board cooling fan unit and slide the circuit board cooling fan unit up.

Note:

To remove the fan unit, it is only necessary to loosen the screws.



A - Screws

Figure 5.96 Slide the Circuit Board Cooling Fan Units

3. Remove the circuit board cooling fan units.

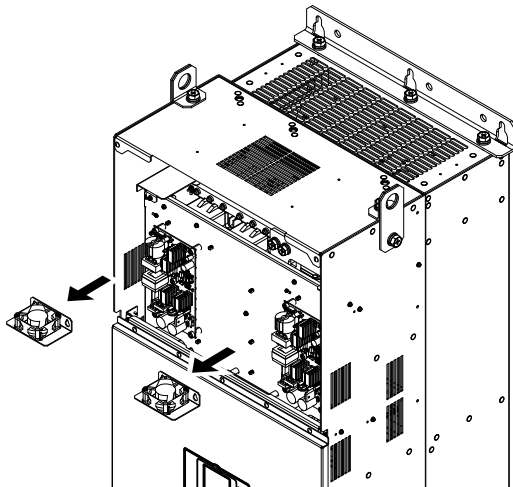
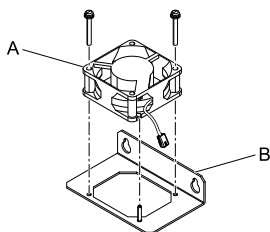


Figure 5.97 Remove the Circuit Board Cooling Fan Units

- Remove the screws that attach the circuit board cooling fans and remove the fans.



A - Circuit board cooling fan

B - Fan unit base

Figure 5.98 Remove the Circuit Board Cooling Fans

■ Circuit Board Cooling Fan Installation

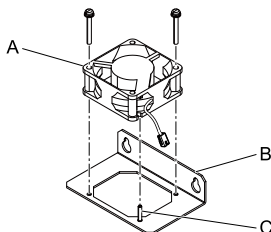
Reverse the removal procedure for fan installation.

- Align the pin on the fan unit base with the notch on the fan and put the circuit board cooling fan in the fan unit, then use the screws to attach the circuit board cooling fan to the fan unit base.

Tighten the screws to a tightening torque of 0.98 N·m to 1.33 N·m (8.67 lbf-in to 11.77 lbf-in).

Note:

Make sure that you do not pinch cables between the circuit board cooling fan and the fan unit base.



A - Circuit board cooling fan

B - Fan unit base

C - Alignment pin on fan unit base

Figure 5.99 Install the Circuit Board Cooling Fan

- Put the circuit board cooling fan unit into the specified location and slide it down, then use the screws to attach it to the drive.

Tighten the screws to a tightening torque of 0.98 N·m to 1.33 N·m (8.67 lbf-in to 11.77 lbf-in).

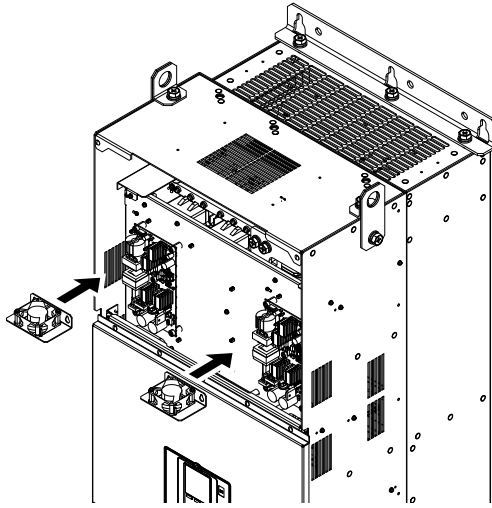
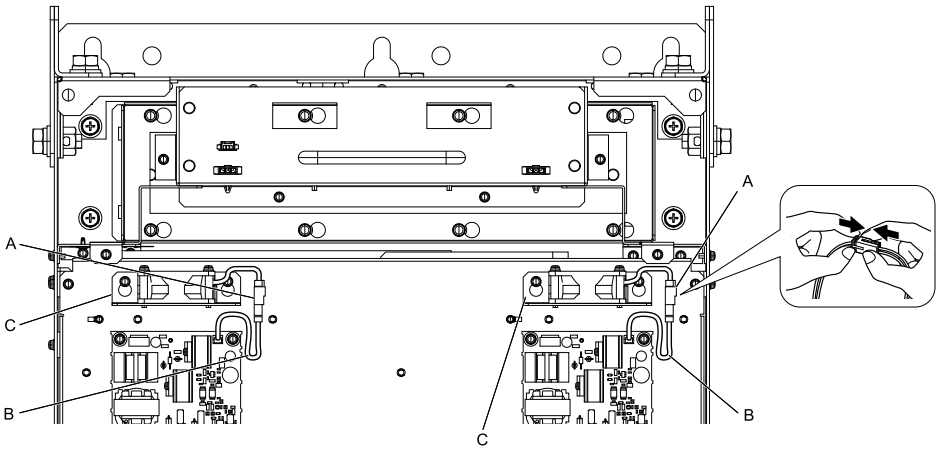


Figure 5.100 Install the Circuit Board Cooling Fan Unit

3. Connect the relay cables to the fan connectors.



A - Fan connectors
B - Relay cables

C - Circuit board cooling fan units

Figure 5.101 Connect the Relay Cables

4. Install the drive cover.
5. Energize the drive and set $\alpha 4-03 = 0$ [*Fan Operation Time Setting = 0 h*] to reset the fan operation time.

◆ Fan Replacement (Procedure I)

⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

⚠ CAUTION *Burn Hazard. Do not touch a hot drive heatsink. De-energize the drive, wait for a minimum of 15 minutes, then make sure that the heatsink is cool before you replace the cooling fans. If you touch a hot drive heatsink, it can burn you.*

NOTICE *Use the instructions in this manual to replace the cooling fans. When you do maintenance on the fans, replace all the fans to increase product life. If you install the fans incorrectly, it can cause damage to the drive.*

■ Fan Removal

1. Remove the drive cover.

⚠ CAUTION *Crush Hazard. Loosen the cover screws. Do not fully remove them. If you fully remove the cover screws, the terminal cover can fall and cause moderate injury.*

2. Unplug the fan cables from the fan connectors.

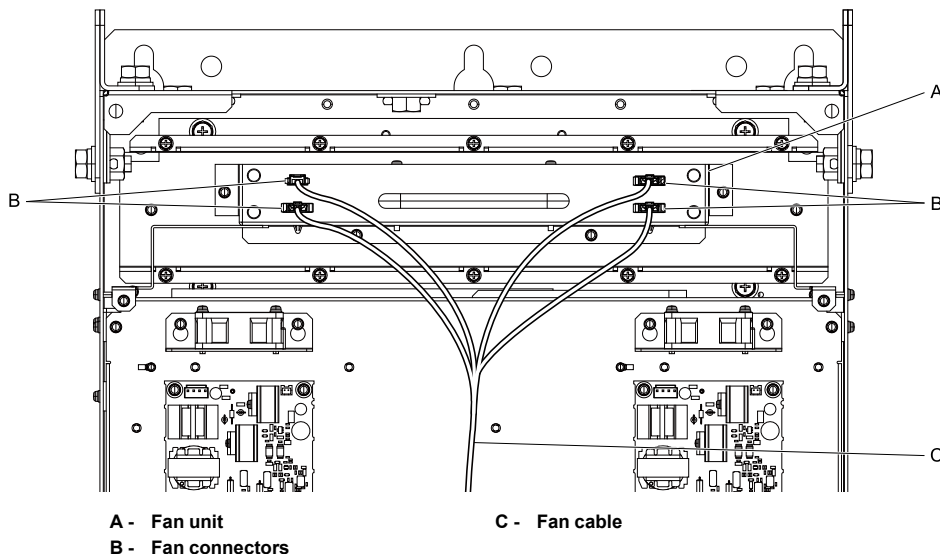


Figure 5.102 Unplug the Fan Cables

3. Loosen the screws that attach the fan unit.

Note:

- To remove the fan unit, it is only necessary to loosen the screws in position B.
- Remove the screws in position A.

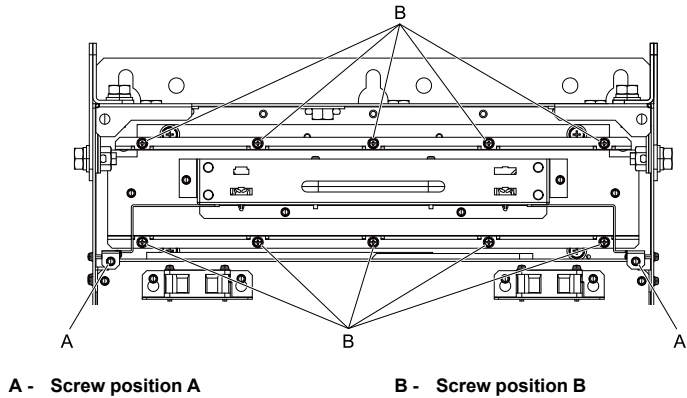
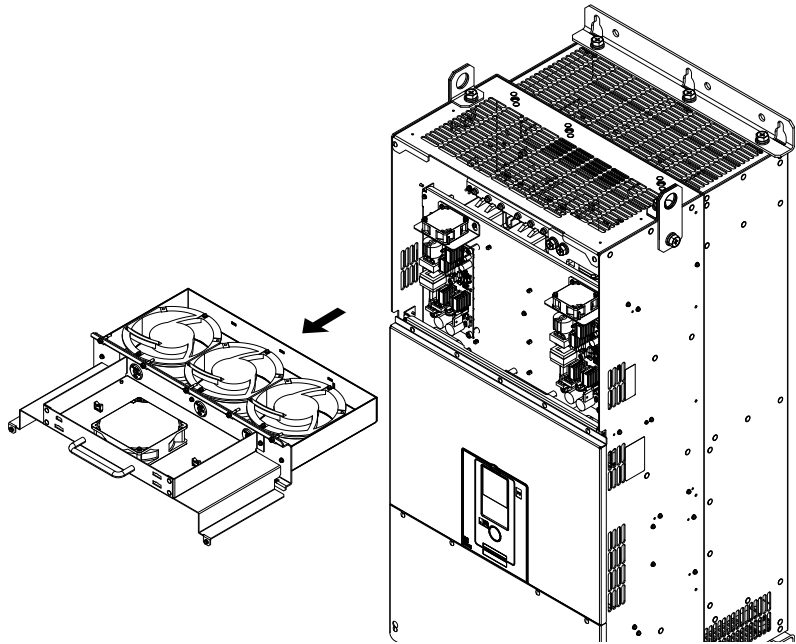


Figure 5.103 Loosen the Screws

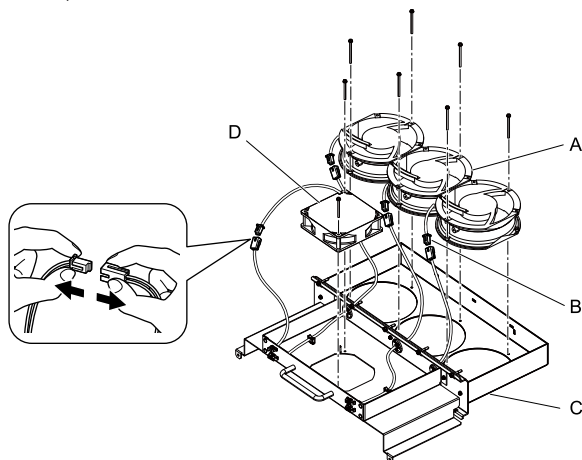
4. Remove the fan unit.

Note:

When you remove the fan unit, make sure that it does not fall.



5. Unplug the relay connectors, remove the screws that attach the cooling fans and circulation fan, and then remove the fans.



A - Cooling fans
B - Relay connectors

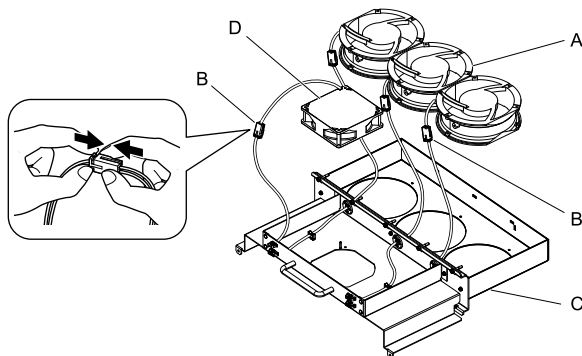
C - Fan unit base
D - Circulation fan

Figure 5.105 Remove the Cooling Fans and Circulation Fan

■ Fan Installation

Reverse the removal procedure for fan installation.

1. Connect the relay connectors on the fan unit base to the cooling fans and the circulation fan.



A - Cooling fans
B - Relay connectors

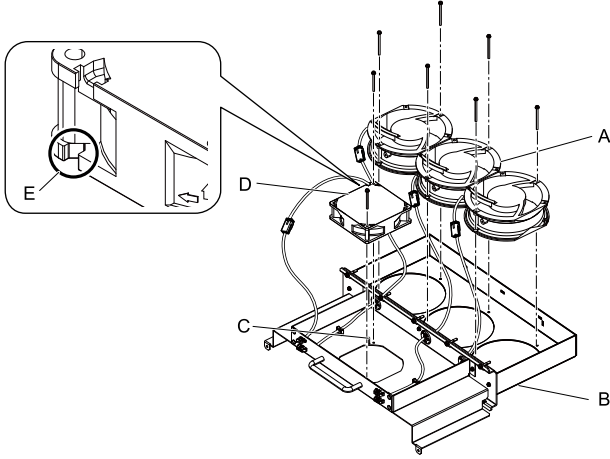
C - Fan unit base
D - Circulation fan

Figure 5.106 Connect the Relay Connectors

2. Align the pins on the fan unit base with the notches on the fans and put the fans in the fan unit base, then use the screws to attach them.
Tighten the M4 screws to a tightening torque of 0.98 N·m to 1.33 N·m (8.67 lbf·in to 11.77 lbf·in).

Note:

Make sure that you do not pinch cables between the fans and the fan unit base.



A - Cooling fans

B - Fan unit base

C - Alignment pin on fan unit base

D - Circulation fan

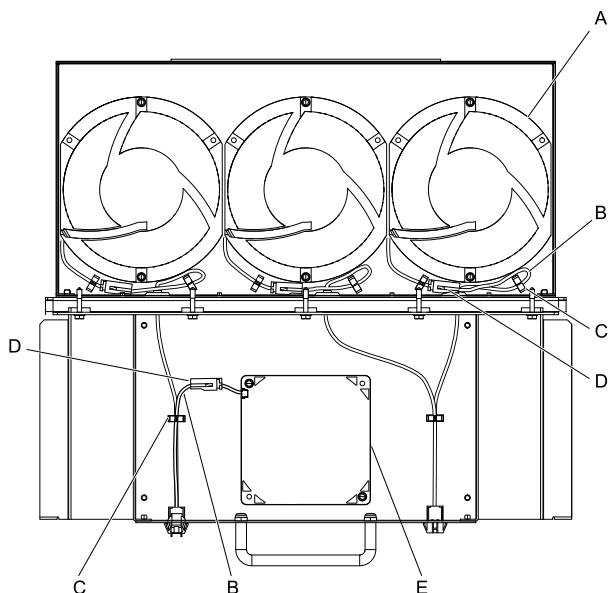
E - Notch on fan

Figure 5.107 Install the Cooling Fans and Circulation Fan

3. Put the cables and connectors in the recess of the drive.

Note:

Attach the fan cables to the cable hooks on the fan unit.



A - Cooling fans

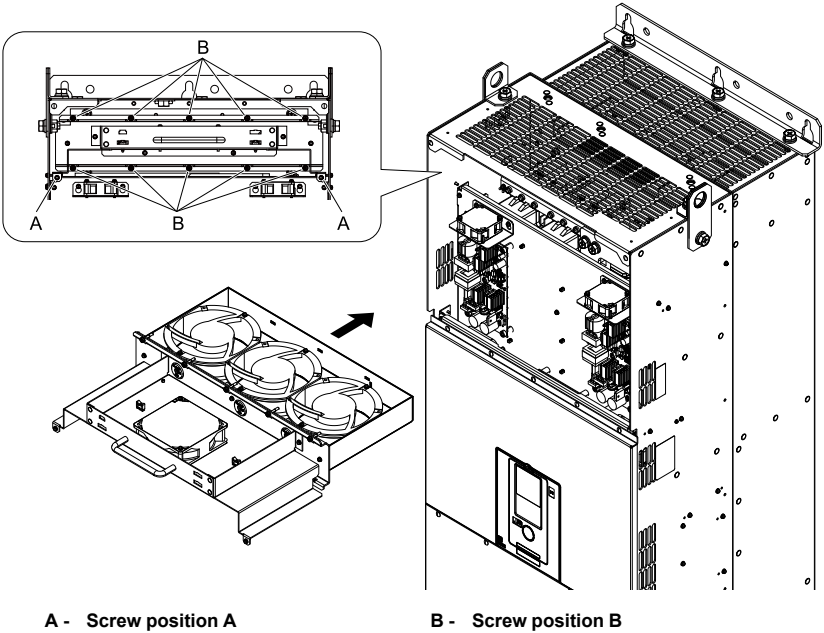
B - Relay cables

C - Cable hooks

D - Relay connectors

E - Circulation fan

4. Put the fan unit into the specified location and use screws to attach it to the drive.
Tighten the screws to a correct tightening torque:
 - Screws in Position A: 0.98 N·m to 1.33 N·m (8.67 lbf·in to 11.77 lbf·in)
 - Screws in Position B: 1.96 N·m to 2.53 N·m (17.35 lbf·in to 22.39 lbf·in)

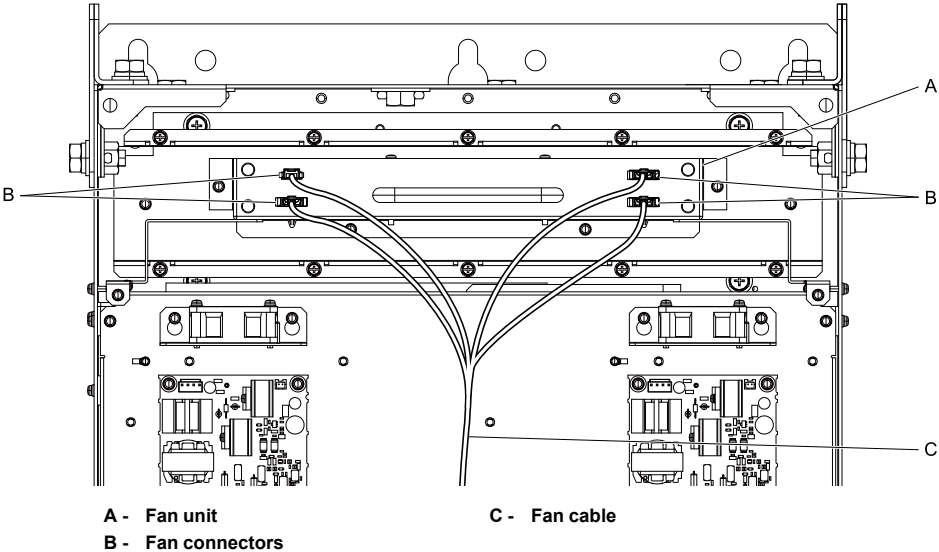


A - Screw position A

B - Screw position B

Figure 5.108 Install the Fan Unit

5. Connect the fan cable to the fan connectors.



A - Fan unit

C - Fan cable

B - Fan connectors

Figure 5.109 Connect Cooling Fan Connectors

6. Install the drive cover.

7. Energize the drive and set $o4-03 = 0$ [Fan Operation Time Setting = 0 h] to reset the fan operation time.

■ Circuit Board Cooling Fan Removal

Remove the drive cover before you start this procedure.

⚠ CAUTION *Crush Hazard. Loosen the cover screws. Do not fully remove them. If you fully remove the cover screws, the terminal cover can fall and cause moderate injury.*

1. Disconnect the relay cables from the fan connectors.

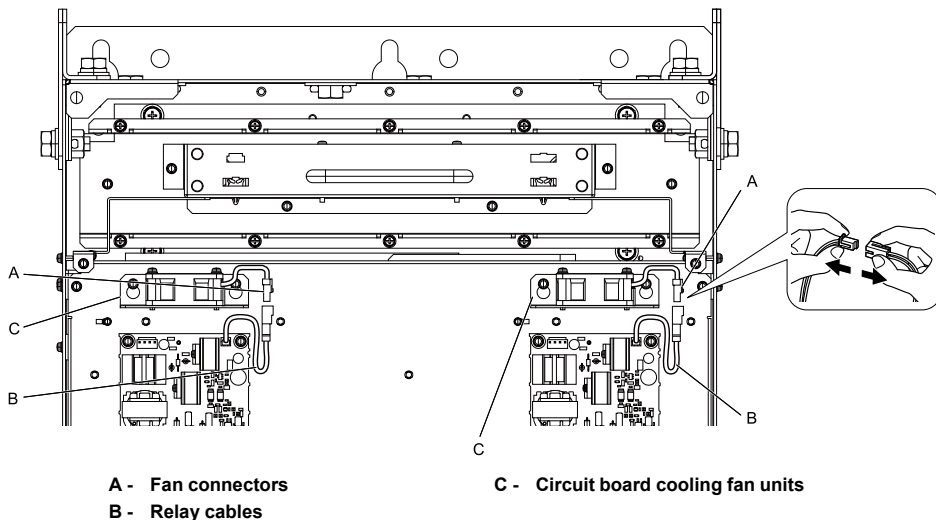
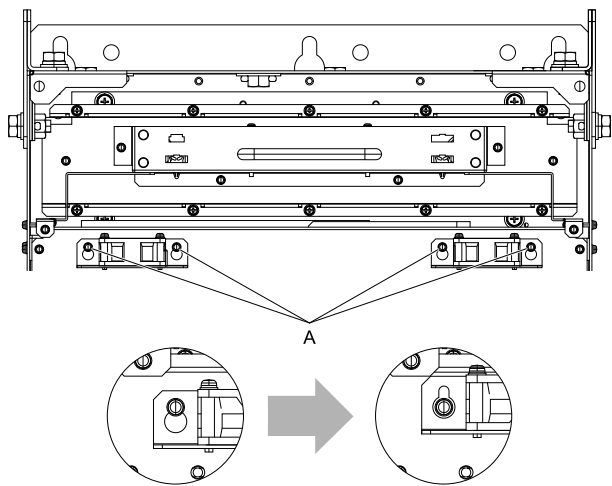


Figure 5.110 Disconnect the Relay Cables

2. Loosen the screws that attach the circuit board cooling fan unit and slide the circuit board cooling fan unit up.

Note:

To remove the fan unit, it is only necessary to loosen the screws.



A - Screws

Figure 5.111 Slide the Circuit Board Cooling Fan Unit

3. Remove the circuit board cooling fan units.

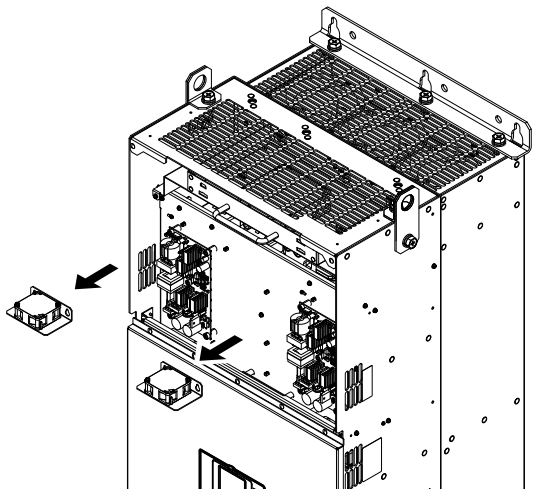
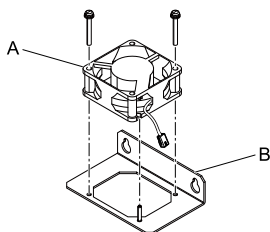


Figure 5.112 Remove the Circuit Board Cooling Fan Units

4. Remove the screws that attach the circuit board cooling fans and remove the fans.



A - Circuit board cooling fan

B - Fan unit base

Figure 5.113 Remove the Circuit Board Cooling Fans

■ Circuit Board Cooling Fan Installation

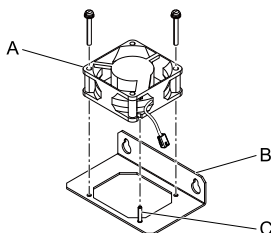
Reverse the removal procedure for fan installation.

1. Align the pin on the fan unit base with the notch on the fan and put the circuit board cooling fan in the fan unit, then use the screws to attach the circuit board cooling fan to the fan unit base.

Tighten the screws to a tightening torque of 0.98 N·m to 1.33 N·m (8.67 lbf·in to 11.77 lbf·in).

Note:

Make sure that you do not pinch cables between the circuit board cooling fan and the fan unit base.



A - Circuit board cooling fan

B - Fan unit base

C - Alignment pin on fan unit base

Figure 5.114 Install the Circuit Board Cooling Fan

2. Put the circuit board cooling fan unit into the specified location and use screws to attach it to the drive.

Tighten the screws to a tightening torque of 0.98 N·m to 1.33 N·m (8.67 lbf·in to 11.77 lbf·in).

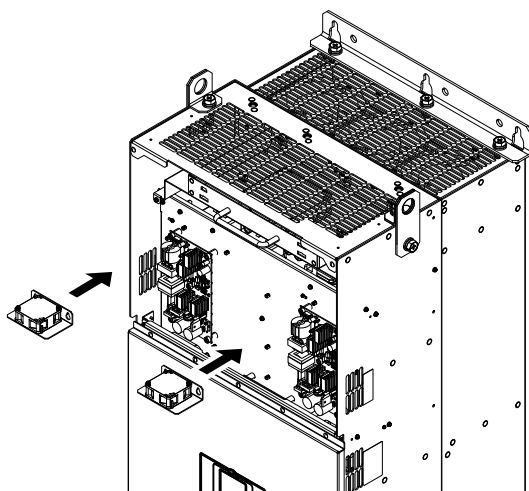
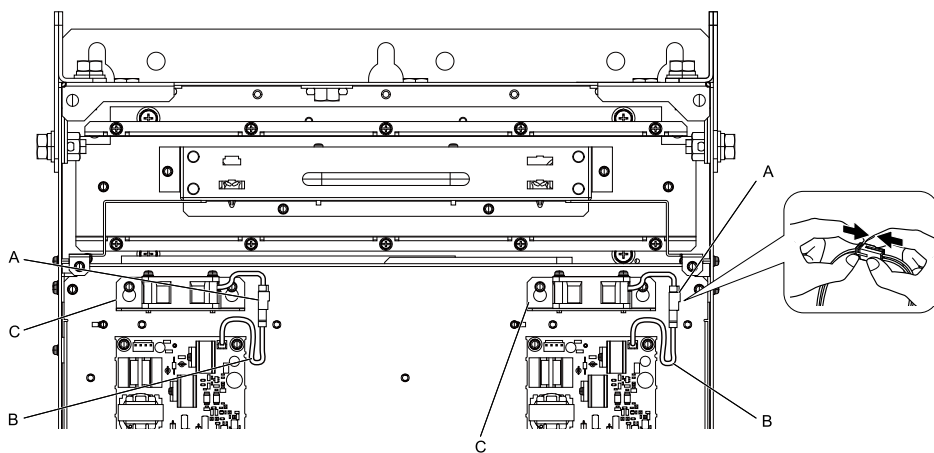


Figure 5.115 Install the Circuit Board Cooling Fan Unit

3. Connect the relay cables to the fan connectors.



A - Fan connectors

B - Relay cables

C - Circuit board cooling fan units

Figure 5.116 Connect the Relay Cables

4. Install the drive cover.
5. Energize the drive and set $\alpha 4-03 = 0$ [Fan Operation Time Setting = 0 h] to reset the fan operation time.

◆ Fan Replacement (Procedure J)

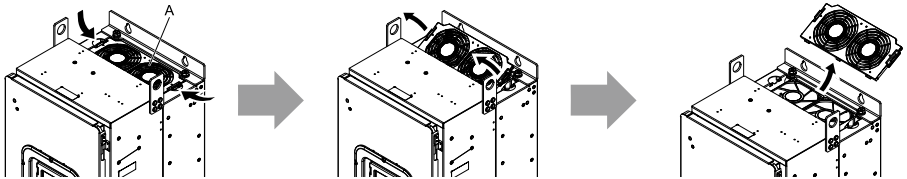
⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

⚠ CAUTION *Burn Hazard. Do not touch a hot drive heatsink. De-energize the drive, wait for a minimum of 15 minutes, then make sure that the heatsink is cool before you replace the cooling fans. If you touch a hot drive heatsink, it can burn you.*

NOTICE *Use the instructions in this manual to replace the cooling fans. When you do maintenance on the fans, replace all the fans to increase product life. If you install the fans incorrectly, it can cause damage to the drive.*

■ Fan Removal

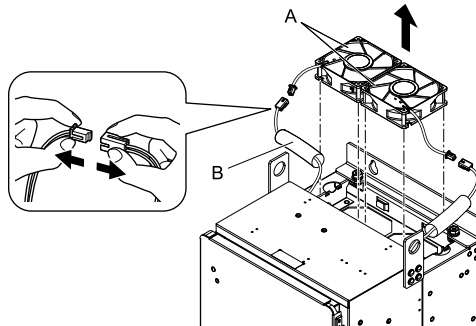
1. Push the tabs on the left and right sides of the fan finger guard and pull up to remove the fan finger guard from the drive.



A - Fan finger guard

Figure 5.117 Remove the Fan Finger Guard

2. Pull the cooling fans straight up from the drive. Remove the protective tubes on the relay connectors and disconnect the connectors to remove the fans from the drive.



A - Cooling fans

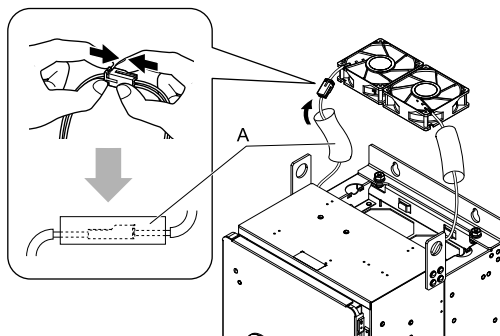
B - Protective tubes

Figure 5.118 Remove the Cooling Fans

■ Fan Installation

Reverse the removal procedure for fan installation.

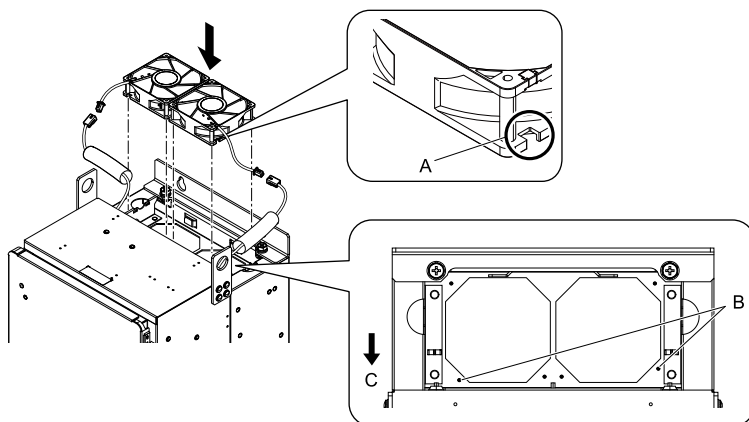
1. Connect the relay connectors, and attach the protective tubes.



A - Protective tubes

Figure 5.119 Connect the Relay Connectors

2. Align the notches on the fans with the pins on the drive and install the cooling fans in the drive.



A - Notch on fan

B - Alignment pins on drive

C - Front of drive

Figure 5.120 Install the Cooling Fans

3. Put the cables and connectors in the recess of the drive.

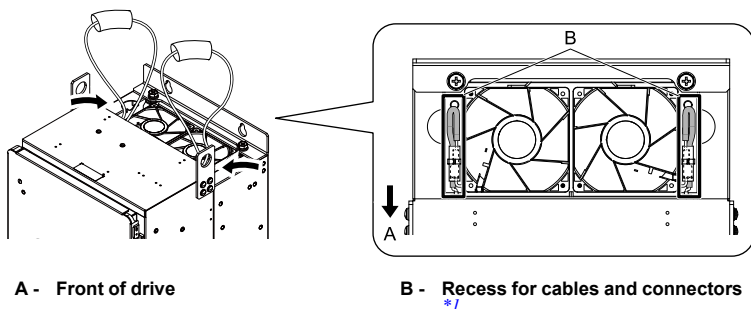


Figure 5.121 Put the Cables and Connectors in the Drive Recess

*1 Make sure that the cables and connectors are in the correct space.

4. Hold the fan finger guard at an angle and put the connector tabs on the fan finger guard into the holes on the drive.

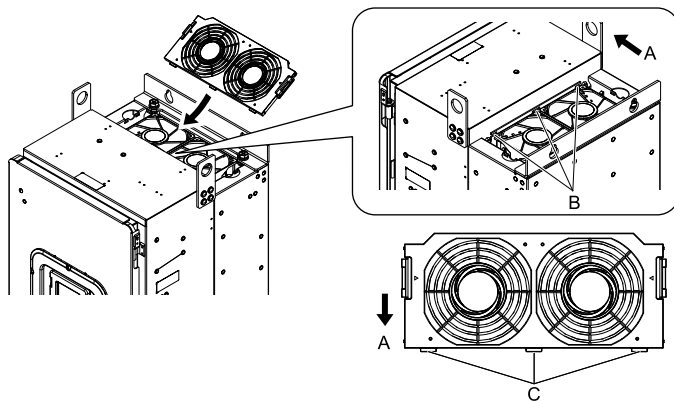


Figure 5.122 Install the Fan Finger Guard

5. Push the tabs on the left and right sides of the fan finger guard and click it into place on the drive.

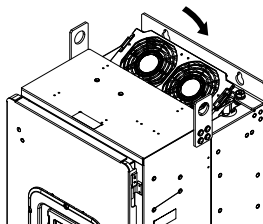


Figure 5.123 Install the Fan Finger Guard

6. Energize the drive and set $\alpha 4-03 = 0$ [Fan Operation Time Setting = 0 h] to reset the fan operation time.

■ Circulation Fan Removal

Open the front door before you start this procedure.

⚠ CAUTION *Crush Hazard. Loosen the cover screws. Do not fully remove them. If you fully remove the cover screws, the terminal cover can fall and cause moderate injury.*

1. Remove the cable from the clamp.

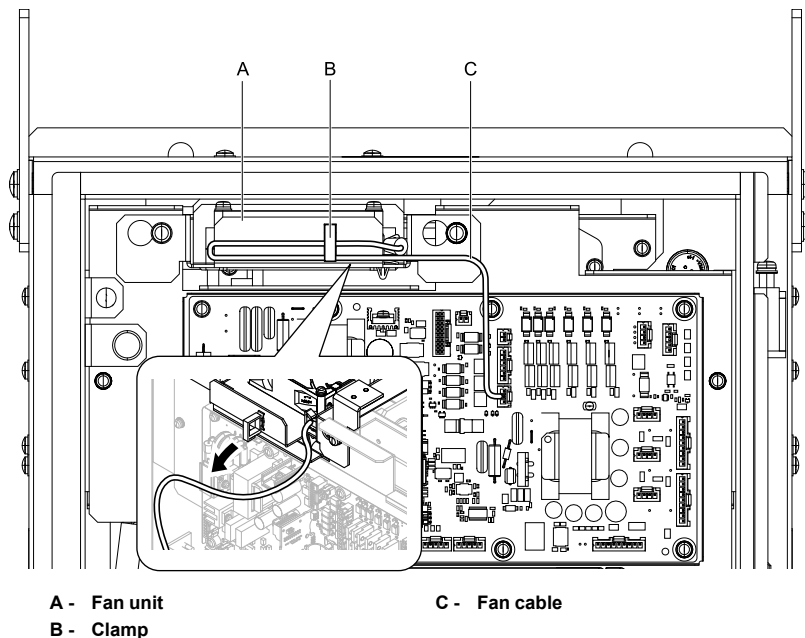
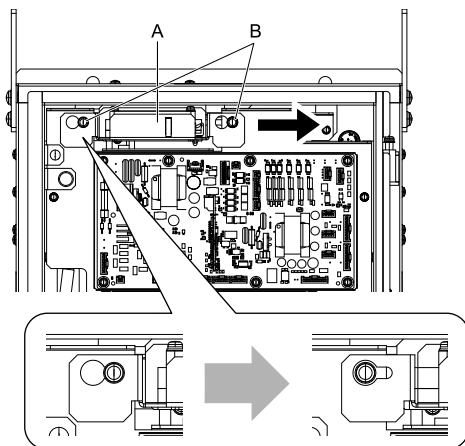


Figure 5.124 Remove the Fan Cable

2. Loosen the screws that attach the fan unit and slide the fan unit to the right.

Note:

To remove the fan unit, it is only necessary to loosen the screws.

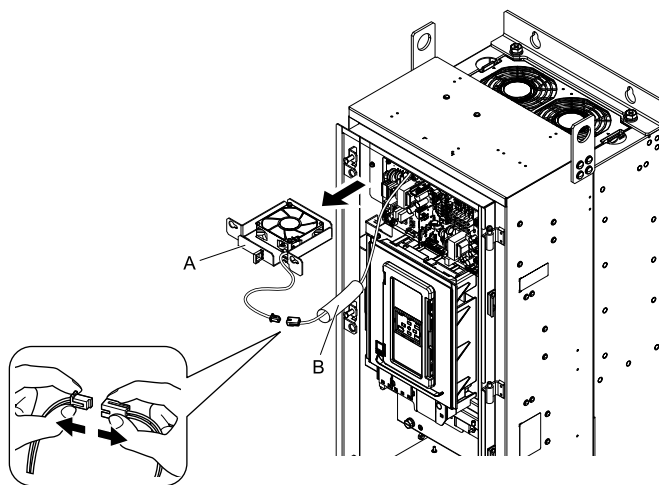


A - Fan unit

B - Screws

Figure 5.125 Slide the Fan Unit

3. Remove the protective tube on the relay connectors and disconnect the connectors to remove the fan unit from the drive.

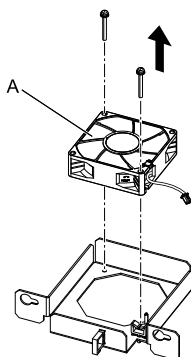


A - Fan unit

B - Protective tube

Figure 5.126 Remove the Fan Unit

4. Remove the screws that attach the circulation fan and remove the fan.



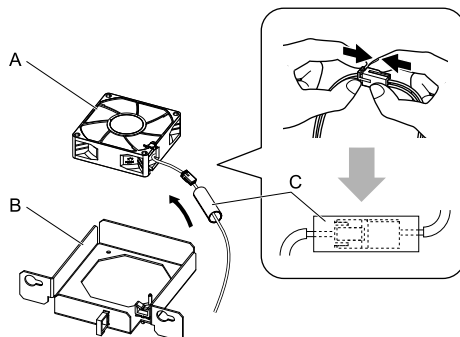
A - Circulation fan

Figure 5.127 Remove the Circulation Fan

■ Circulation Fan Installation

Reverse the removal procedure for fan installation.

1. Connect the relay connector between the drive and circulation fan, and attach the protective tube.



A - Circulation fan

B - Fan unit base

C - Protective tube

Figure 5.128 Connect the Relay Connector

2. Align the pin on the fan unit base with the notch on the fan and put the fan in the fan unit base, then use the screws to attach it.

Tighten the screws to a tightening torque of 0.98 N·m to 1.33 N·m (8.67 lbf·in to 11.77 lbf·in).

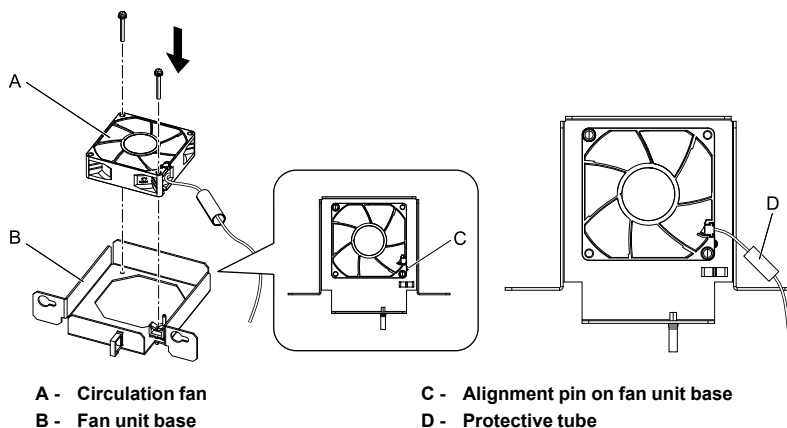


Figure 5.129 Install the Circulation Fan

3. Attach the fan cable through the clamp.

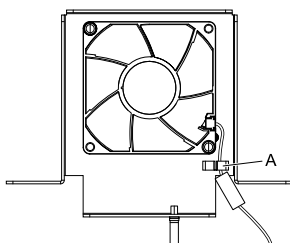


Figure 5.130 Attach the Fan Cable

4. Put the fan unit into the specified location and slide it to the left, then use screws to attach it to the drive.
 Tighten the screws to a tightening torque of 1.96 N·m to 2.53 N·m (17.35 lbf·in to 22.39 lbf·in).

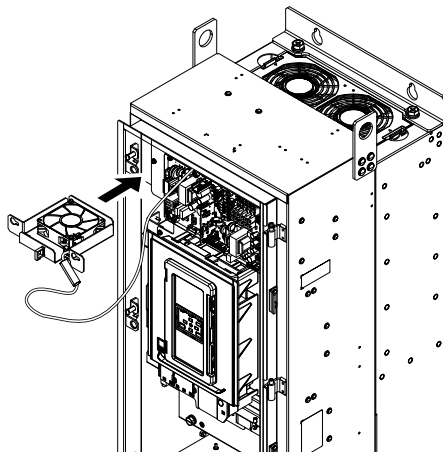


Figure 5.131 Install the Fan Unit

5. Attach the cable through the clamp.

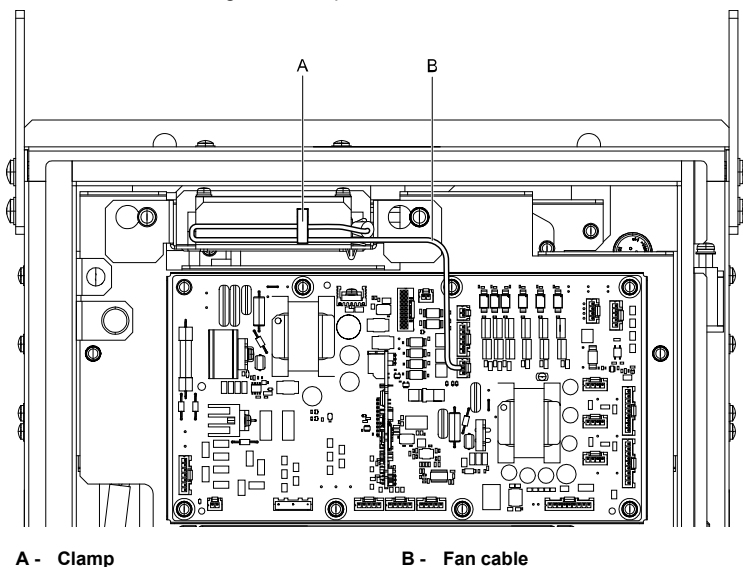


Figure 5.132 Attach the Fan Cable through the Clamp

6. Close the front door.
7. Energize the drive and set o4-03 = 0 [*Fan Operation Time Setting = 0 h*] to reset the fan operation time.

◆ Fan Replacement (Procedure K)

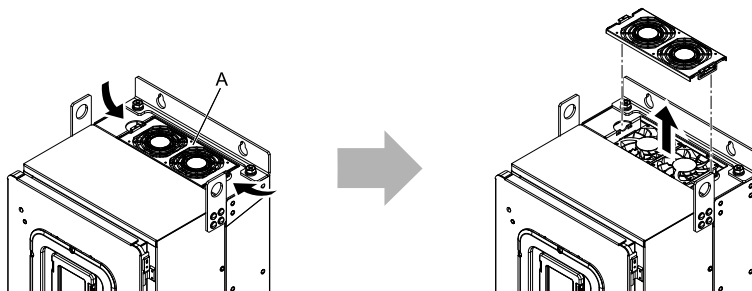
⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, remove the covers before measuring for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

⚠ CAUTION *Burn Hazard. Do not touch a hot drive heatsink. De-energize the drive, wait for a minimum of 15 minutes, then make sure that the heatsink is cool before you replace the cooling fans. If you touch a hot drive heatsink, it can burn you.*

NOTICE *Use the instructions in this manual to replace the cooling fans. When you do maintenance on the fans, replace all the fans to increase product life. If you install the fans incorrectly, it can cause damage to the drive.*

■ Fan Removal

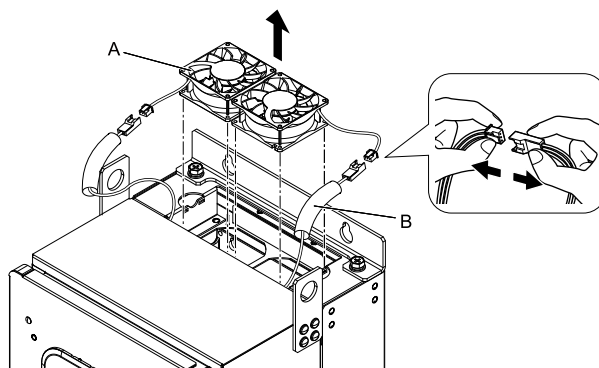
1. Push the tabs on the left and right sides of the fan finger guard and pull up to remove the fan finger guard from the drive.



A - Fan finger guard

Figure 5.133 Remove the Fan Finger Guard

2. Pull the cooling fans straight up from the drive. Remove the protective tubes on the relay connectors and disconnect the connectors to remove the fans from the drive.



A - Cooling fans

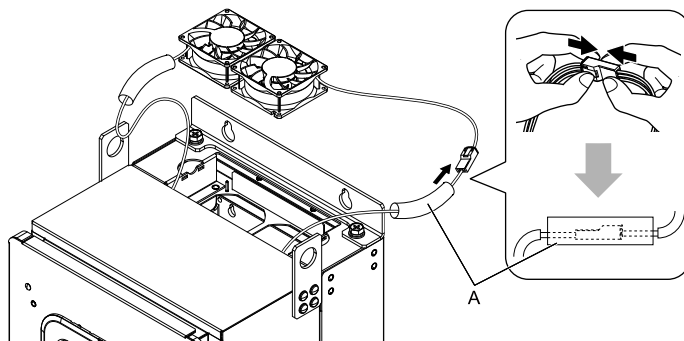
B - Protective tubes

Figure 5.134 Remove the Cooling Fans

■ Fan Installation

Reverse the removal procedure for fan installation.

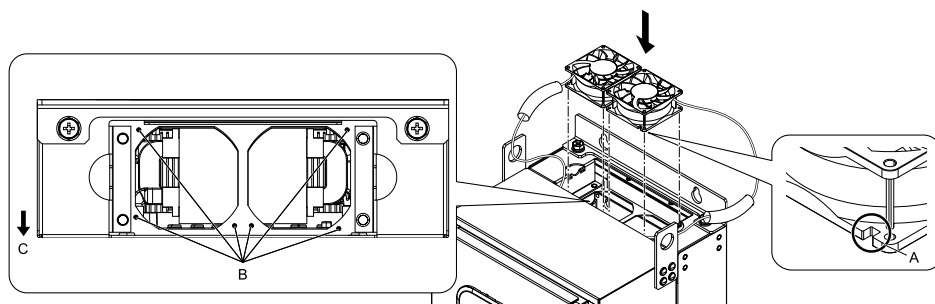
1. Connect the relay connectors between the drive and cooling fans, and attach the protective tubes.



A - Protective tubes

Figure 5.135 Connect the Relay Connectors

2. Align the notches on the fans with the pins on the drive and install the cooling fans in the drive.



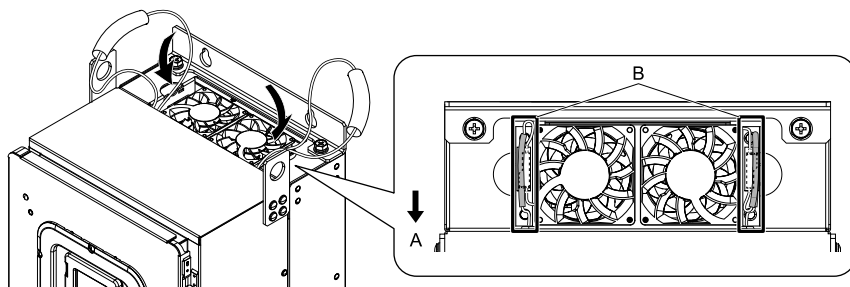
A - Notch on fan

B - Alignment pins on drive

C - Front of drive

Figure 5.136 Install the Cooling Fans

3. Put the cables and connectors in the recess of the drive.

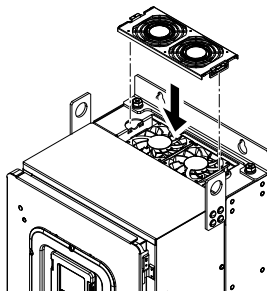


A - Front of drive

B - Recess for cables and connectors
*/**Figure 5.137 Put the Cables and Connectors in the Drive Recess**

*1 Make sure that the cables and connectors are in the correct space.

4. Install the fan finger guard straight until the tabs click into place.

**Figure 5.138 Install the Fan Finger Guard**

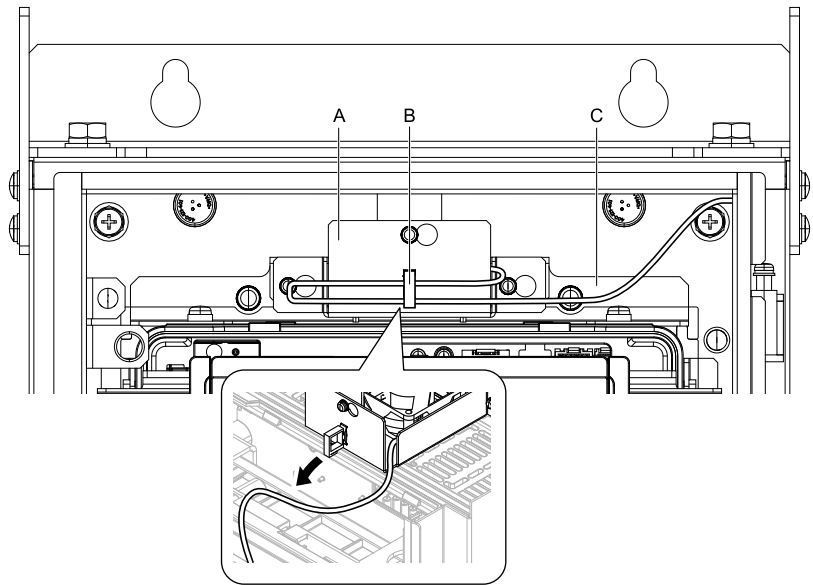
5. Energize the drive and set $\alpha 4-03 = 0$ [Fan Operation Time Setting = 0 h] to reset the fan operation time.

■ Circulation Fan Removal

Open the front door before you start this procedure.

⚠ CAUTION *Crush Hazard. Loosen the cover screws. Do not fully remove them. If you fully remove the cover screws, the terminal cover can fall and cause moderate injury.*

1. Remove the cable from the clamp.

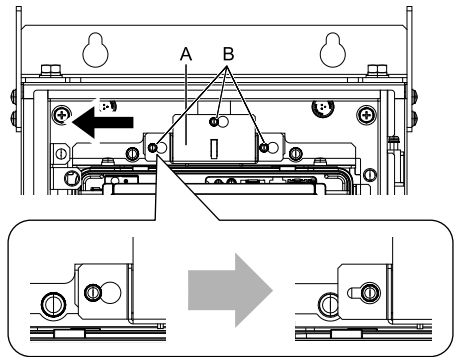


A - Fan unit
B - Clamp

C - Fan cable

Figure 5.139 Remove the Fan Cable

2. Loosen the screws that attach the fan unit and slide the fan unit to the left.

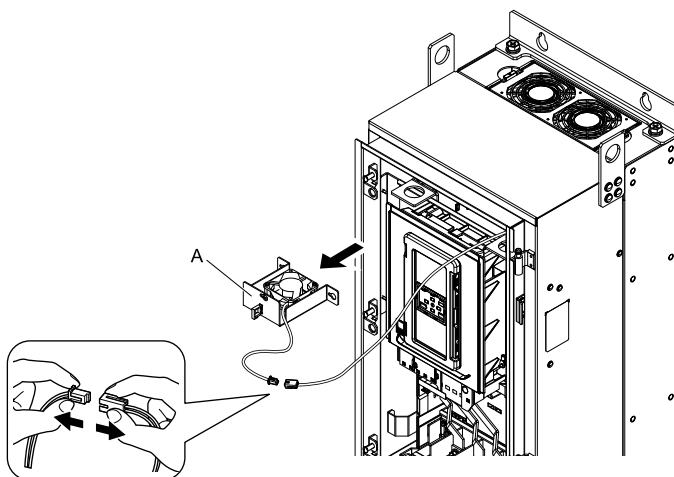


A - Fan unit

B - Screws

Figure 5.140 Slide the Fan Unit

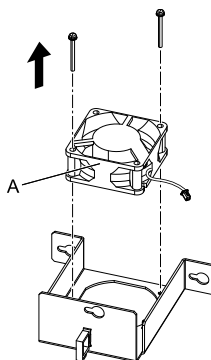
3. Disconnect the connectors to remove the fan unit from the drive.



A - Fan unit

Figure 5.141 Remove the Fan Unit

4. Remove the screws that attach the circulation fan and remove the fan.



A - Circulation fan

Figure 5.142 Remove the Circulation Fan

■ Circulation Fan Installation

Reverse the removal procedure for fan installation.

1. Connect the relay connector between the drive and circulation fan.

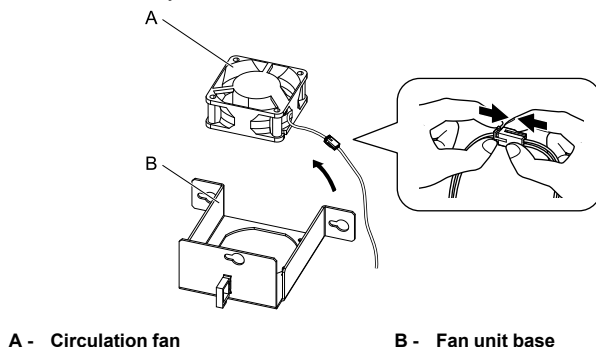


Figure 5.143 Connect the Relay Connector

2. Align the pin on the fan unit base with the notch on the fan and put the fan in the fan unit base, then use the screws to attach it.
Tighten the screws to a tightening torque of 0.98 N·m to 1.33 N·m (8.67 lbf·in to 11.77 lbf·in).

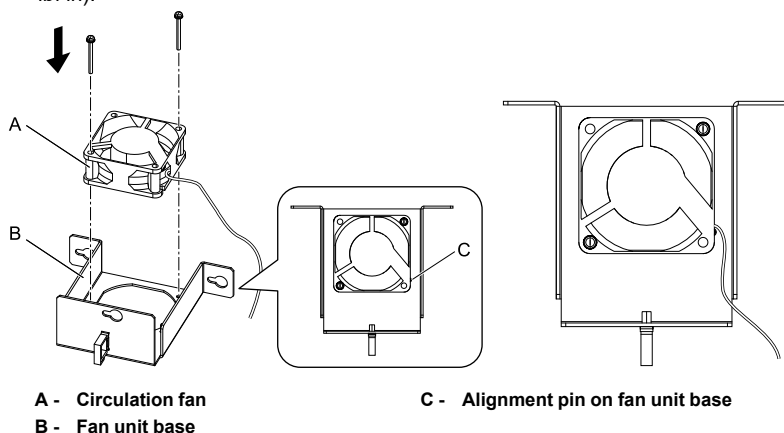


Figure 5.144 Install the Circulation Fan

3. Put the fan unit into the specified location and slide it to the right, then use screws to attach it to the drive.
Tighten the screws to a tightening torque of 1.96 N·m to 2.53 N·m (17.35 lbf·in to 22.39 lbf·in).

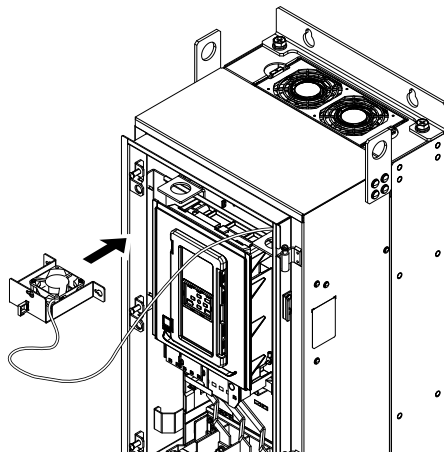


Figure 5.145 Install the Fan Unit

4. Attach the cable through the clamp.

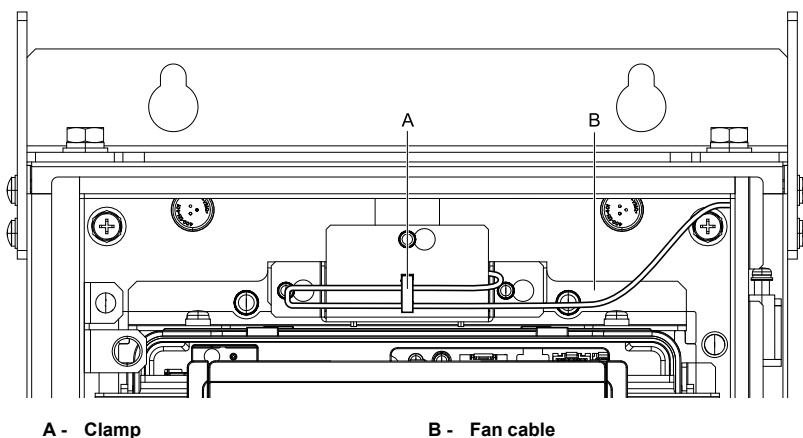


Figure 5.146 Attach the Fan Cable through the Clamp

5. Close the front door.
6. Energize the drive and set $o4-03 = 0$ [Fan Operation Time Setting = 0 h] to reset the fan operation time.

Revision History

Date of Publication	Revision Number	Section	Revised Content
February 2024	3	All	Revision: Reviewed and corrected entire documentation.
		4, 5	Addition: Information on these models: <ul style="list-style-type: none">• HV600: 2143, 2169, 4124, 4156 (IP55/UL Type 12)• FP605: 2143, 2169, 4124, 4156 (IP55/UL Type 12)
June 2021	2	All	Revision: Reviewed and corrected entire documentation.
		4, 5	Revision: Modified documentation because of design changes for these models: <ul style="list-style-type: none">• HV600: 4006 and 4008 (IP55/UL Type 12)• FP605: 4008 (IP55/UL Type 12)
February 2021	1	4, 5	Addition: Information on FP605
December 2019	-	-	First Edition

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