



# Indoor FDH 3000 Rack Mount Cabinet User Manual

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**Indoor FDH 3000 (864 Port Model)**

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## REVISION HISTORY

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## ABOUT THIS MANUAL

This publication describes the Indoor FDH 3000 Rack-Mount Cabinet, which is available in four models (providing 288, 432, 576, or 864 terminations). Also included are procedures for mounting the cabinet, installing additional splitter modules, installing additional connector panels, storing the splitter output fibers, connecting the splitter output fibers to the distribution fibers, and replacing damaged components.

## RELATED PUBLICATIONS

Listed below are related manuals and their publication numbers. Copies of these publications can be ordered by contacting CommScope at 1-800-366-3891, extension 73475 (in U.S.A. or Canada) or 1-952-917-3475 (outside U.S.A. and Canada).

Title	ADCP Number
Optical Fiber Connector Wet and Dry Cleaning Instructions	<b>90-159</b>

## ADMONISHMENTS

Important safety admonishments are used throughout this manual to warn of possible hazards to persons or equipment. An admonishment identifies a possible hazard and then explains what may happen if the hazard is not avoided. The admonishments — in the form of Dangers, Warnings, and Cautions — must be followed at all times. These warnings are flagged by use of the triangular alert icon (seen below) and are listed in descending order of severity of injury or damage and likelihood of occurrence.



**Danger:** *Danger is used to indicate the presence of a hazard that **will** cause severe personal injury, death, or substantial property damage if the hazard is not avoided.*



**Warning:** *Warning is used to indicate the presence of a hazard that **can** cause severe personal injury, death, or substantial property damage if the hazard is not avoided.*



**Caution:** *Caution is used to indicate the presence of a hazard that **will** or **can** cause minor personal injury or property damage if the hazard is not avoided.*

## GENERAL SAFETY PRECAUTIONS



**Warning:** *Wet conditions increase the potential for receiving an electrical shock when installing or using electrically-powered equipment. To prevent electrical shock, never install or use electrical equipment in a wet location or during a lightning storm.*



**Danger:** *Do not look into the ends of any optical fiber. Exposure to laser radiation may result. Do not assume the laser power is turned-off or that the fiber is disconnected at the other end.*



**Danger:** *Use adequate lifting equipment when moving or installing Fiber Distribution Hub cabinets. Verify that the maximum lift weight rating of the equipment is sufficient to handle the weight of the cabinet.*



**Danger:** *Do not stand under a Fiber Distribution Hub cabinet as it is being hoisted into position for mounting. A failure of the lifting equipment or apparatus could result in serious personal injury and cause significant damage to the cabinet.*



**Warning:** *Before digging, check with all local utilities for the presence of buried cables or pipes. Contact with underground cables or pipes, especially electric power cables and gas service lines, could interrupt local utility service and cause serious personal injury and extensive property damage.*

## STANDARDS CERTIFICATION

**Telcordia:** This equipment complies with the applicable sections of GR-3125-CORE.

## LIST OF ACRONYMS AND ABBREVIATIONS

The acronyms and abbreviations used in this manual are detailed in the following list:

<b>AWG</b>	American Wire Gauge
<b>C</b>	Centigrade
<b>F</b>	Fahrenheit
<b>FDH</b>	Fiber Distribution Hub
<b>FMS</b>	Fiberglass Mounting Sleeve
<b>FTTP</b>	Fiber To The Premises
<b>IFDH</b>	Indoor Fiber Distribution Hub
<b>OSP</b>	Outside Plant
<b>PMF</b>	Pad Mount Frame
<b>PNP</b>	Plug and Play
<b>RBR</b>	Reduced Bend Radius
<b>RMA</b>	Return Material Authorization

## 1 PRODUCT DESCRIPTION

### 1.1 General Description

The IFDH 3000 is a secure indoor fiber optic distribution cabinet designed for Fiber To The Premises (FTTP) distribution network applications. Three versions of the IFDH 3000, shown in Figure 1, are available to accommodate requirements of 288, 432, 576, and 864 terminations.

Each IFDH 3000 consists of a cabinet mounted in a 7-foot by 23-inch network equipment rack. The IFDH 3000 can be used in installations where full front access is available but rear access is limited. Each cabinet is equipped with a single front security door that provides full access to the optical components. The cabinet also has an internal swing frame that can be rotated forward to provide full access to the rear of the cabinet. When mounted as specified, the IFDH 3000 meets the requirements for earthquake zone 4.

The IFDH 3000 is equipped by the factory with ribbon-type IFC (Intra facility Fiber Cable) distribution cable(s). Each distribution cable is secured to the rear side of the equipment rack and routed to a distribution panel. Distribution cables are riser rated for indoor use. The standard distribution cable stub length is 100 feet. The feeder cable must be provided and installed by the customer. The feeder cable must be of ribbon-type construction but may be an Outside Plant (OSP) or an indoor/outdoor cable depending on site requirements. A splice tray is provided for splicing the feeder cable to the splitter input pigtail assembly. A clamping kit is provided for securing the feeder cable to the rear side of the cabinet.

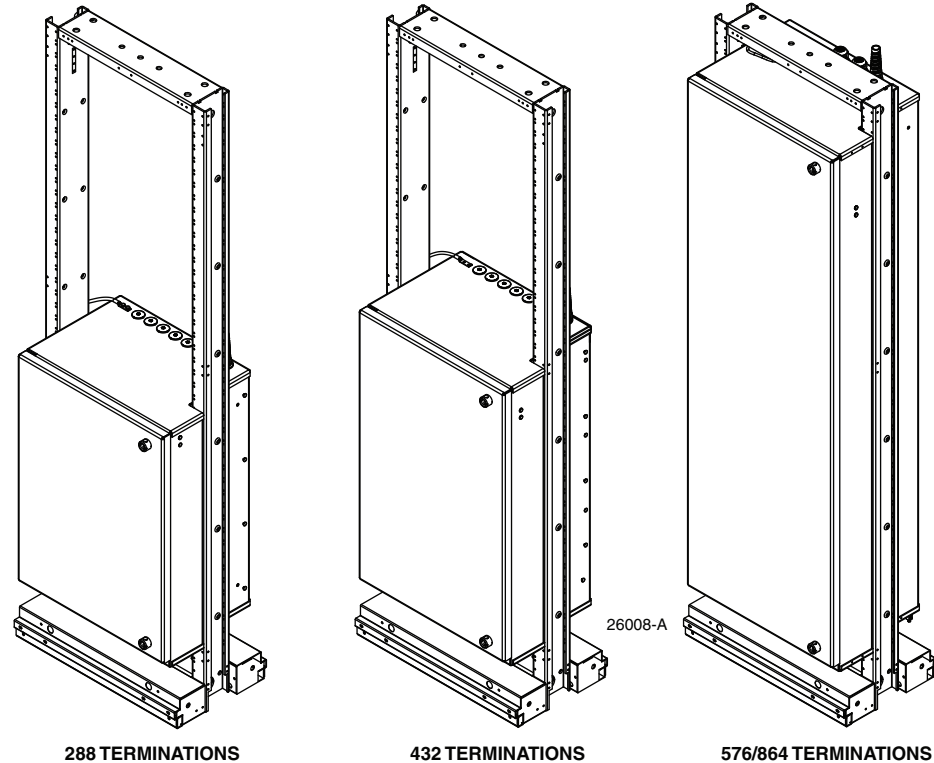


Figure 1. IFDH 3000 Models (288, 432, 576, and 864 Terminations)

## 1.2 Main Components

Figure 2 shows the main components of a typical IFDH 3000 with the swing frame closed. The model shown has the mid-size cabinet with 432 terminations.

The main components are as follows:

- **Equipment Rack**—is the 7-foot by 23-inch network equipment rack that holds the IFDH 3000 cabinet. When mounted as specified, the IFDH 3000 meets the requirements for earthquake zone 4.
- **IFDH 3000**—is the Fiber Distribution Hub (FDH) supporting the components described in this section (except for the equipment rack). The exterior shell of each cabinet is constructed of heavy gauge aluminum and coated with an almond-colored finish.
- **Cabinet Door**—is the front door of the IFDH, which swings outward to provide access to the inner cabinet. The door is equipped with a tamper-resistant security mechanism, stainless steel hinges, and a latch. Access to the cabinet requires a 216B key tool (accessory) to release the security mechanism.
- **Designation Labels**—are used to keep a record of splitter output designations in the distribution network.
- **Splitter Modules**—split the feeder cable signals into multiple outputs. Unused splitter slots can be used for pass-through fibers. The splitters specified for use with the IFDH 3000 cabinet are equipped with reduced bend radius fibers. For a list of the splitter configuration available, see [Table 1 on Page 5](#).
- **Feeder Cable**—is the cable bringing the network signal into the IFDH 3000. The feeder cable enters the cabinet from the top. A set of clamps secure each cable to the inside of the cabinet. A compression fitting secures each cable to the outside of the cabinet and prevents dirt and moisture from entering the cabinet at the cable entry point. Within the cabinet the feeder cable is broken out and spliced to splitter input fibers.
- **Splitter Output Fibers**—is the cable bringing the network signal into the IFDH 3000. Within the cabinet the feeder cable is broken out and spliced to splitter input fibers.
- **Distribution Panels**—provide a point for connecting the splitter output fibers with the terminated distribution cable fibers. Each panel provides mounting spaces for 72 bulkhead adapters.
- **Radius Limiters**—provide a place for storing excess slack from the splitter output fibers.
- **Storage Panel**—provides a temporary “parking lot” for unused splitter output fibers. Each splitter module is equipped with 8-position connector packs (8-packs). The storage capacity of the storage panel is dependent on the cabinet option selected.
- **Swing Frame**—is the front (distribution) section of the cabinet, which swings outward to provide access to the inner (feeder) section of the cabinet.

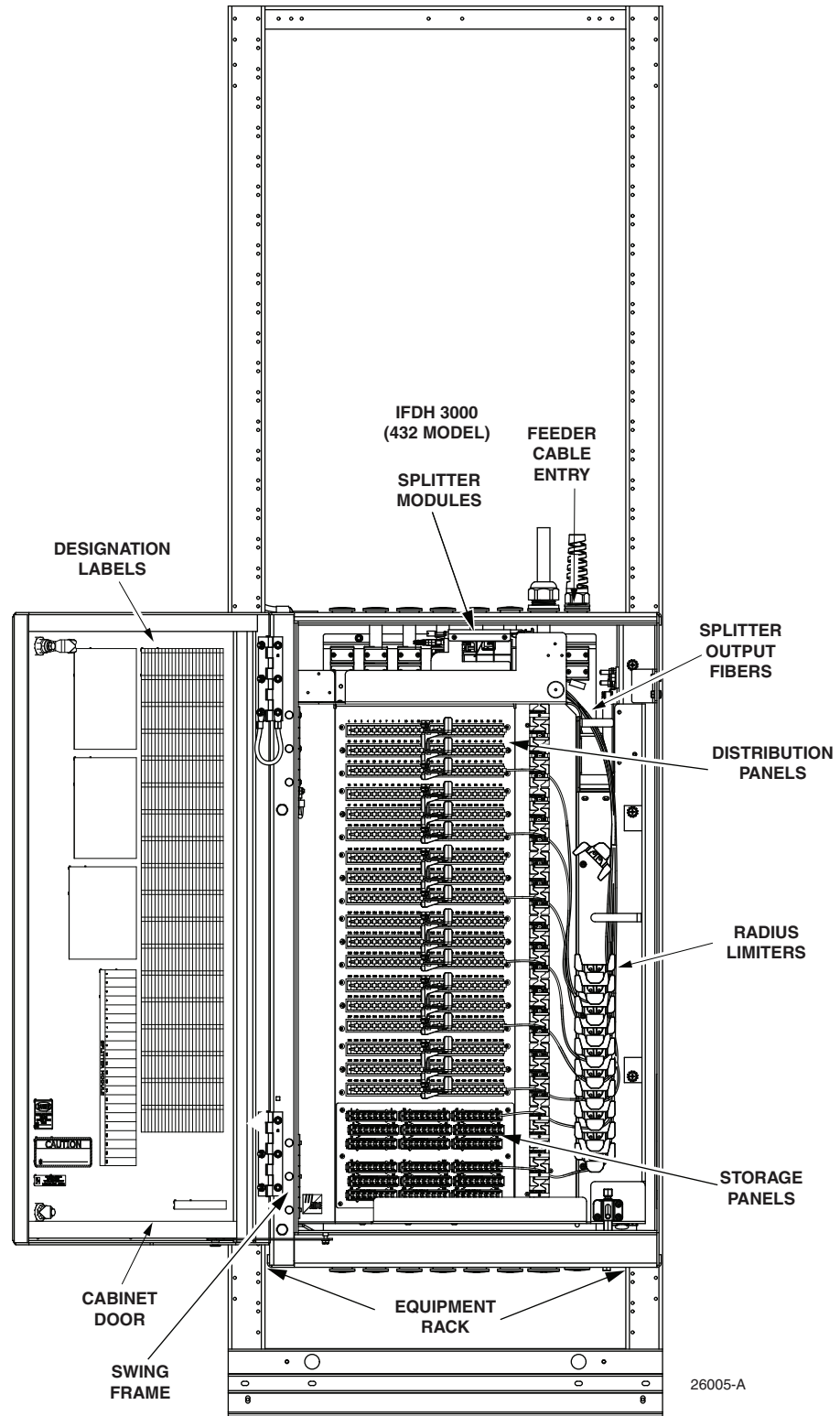


Figure 2. Main Components (Front of Inner 432 Cabinet)

Figure 3 shows the IDFH 3000 alone (without rack) with the cabinet door and the swing frame open. The model shown is the mid-size cabinet with 432 terminations.

- **Fiber Cable Entry**—is the mounting point for feeder cable clamping at the entry of the feeder cable into the cabinet.
- **Fiber Cable Subunits**—are routed to the **Feeder Cable Splice Tray Compartment** for splicing to the **Splitter Input Pigtailed**.
- **Feeder Cable Splice Tray Compartment**—provides space for two 5 x 11.75 inch rectangular splice trays when the feeder cable fibers are spliced to the splitter input pigtailed. The ribbon cable tray holds up to 72 splices.
- **Splitter Input Pigtailed**—carry the feeder cable signals to the **splitter modules** where the signals are split into multiple **splitter output fibers**.
- **Splitter Output Fibers**—carry the splitter output to the distribution panels where the fibers are connected to adapters on the internal side of the swing frame.
- **Pass-Through Patch Panel**—is the termination point for feeder fibers for cross-connections directly to front distribution fibers; provides temporary storage for undesignted splitter input pigtailed until they are assigned to splitter modules.

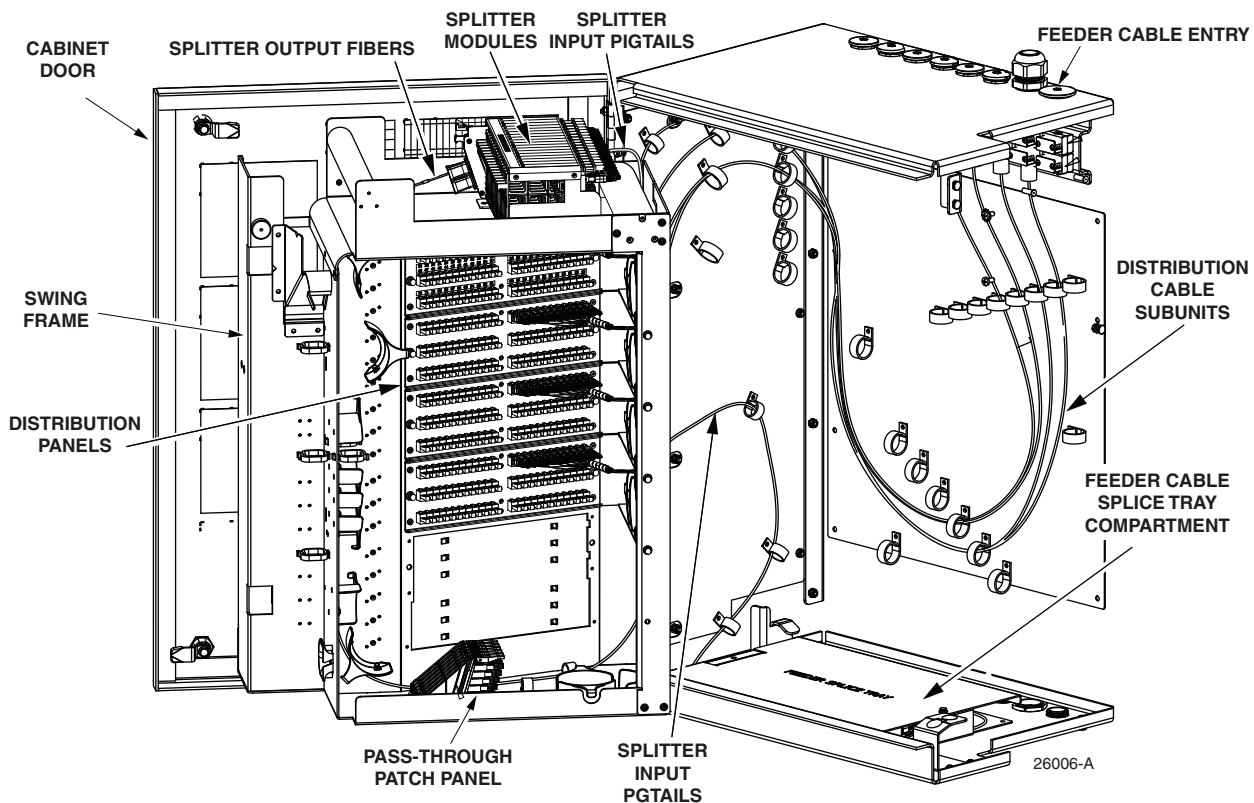


Figure 3. Main Components (With Swing Frame Swung Out)

**Table 1. Indoor FDH 3000 Cabinet Specifications**

PARAMETER	SPECIFICATION
<b>Equipment Rack</b>	
Dimensions (H x W x D)	84 x 25.88 x 14.89 inches (213.36 x 59.58 x 37.82 cm)
<b>288 Cabinet</b>	
Dimensions (H x W x D)	33 x 23.46 x 16.78 x inches (84 x 630 x 43 cm)
Weight (fully loaded on rack)	326 lbs (147.9 Kg)
Certification (pending)	GR-3123-CORE; NEMA-12
Distribution panels (maximum)	4
Distribution ports	Up to 288 with four 72-port distribution panels.
Distribution port adapters/connectors	APC/SC
Splitter compartment splitter capacity	22 splitters
Splitter compartment adapter capacity	44 adapters
Splitter output fiber storage panel capacity (Note: dependent on cabinet options)	144 connectors with 8-pack storage panel
Sliding adapter pack capacity	36 adapters
Feeder splice trays	Up to 2
Splice tray splice capacities Ribbon cable splice trays	Up to 72 splices per tray
<b>432 Cabinet</b>	
Dimensions (H x W x D)	39 x 24.75 x 16.78 x inches (99 x 630 x 43 cm)
Weight (fully loaded on rack)	441 lbs (200.0Kg)
Certification (pending)	GR-3123-CORE; NEMA-12
Distribution panels (maximum)	6
Distribution ports	Up to 432 with six 72-port distribution panels.
Distribution port adapters/connectors	APC/SC
Splitter compartment splitter capacity	24 splitters
Splitter compartment adapter capacity	44 adapters
Splitter output fiber storage panel capacity (Note: dependent on cabinet options)	144 connectors with 8-pack storage panel
Sliding adapter pack capacity	36 adapters
Feeder splice trays	Up to 2
Splice tray splice capacities Ribbon cable splice trays	Up to 72 splices per tray
<b>576/864 Cabinet</b>	
Dimensions (H x W x D)	72.11 x 24.75 x 16.78 x inches (183 x 630 x 43 cm)
Weight (fully loaded on rack)	518 lbs (235.0 Kg)
Certification (pending)	GR-3123-CORE; NEMA-12

**Table 1. Indoor FDH 3000 Cabinet Specifications, continued**

PARAMETER	SPECIFICATION
Distribution panels (maximum)	8 for 576; 12 for 864
Distribution ports	Up to 576 with eight 72-port distribution panels and up to 864 with twelve 72-port distribution panels
Distribution port adapters/connectors	APC/SC
Splitter compartment splitter capacity	44 splitters
Splitter compartment adapter capacity	88 adapters
Splitter output fiber storage panel capacity (Note: dependent on cabinet options)	144 connectors with 8-pack storage panel
Sliding adapter pack capacity	36 adapters
Feeder splice trays	Up to 2
Splice tray splice capacities Ribbon cable splice trays	Up to 72 splices per tray
<b>Splitter Modules</b>	
Splitter module output fibers	Reduced bend radius fiber terminated with UPC/SC or APC/SC connectors
Test bandpass	1260–1360 nm, 1480–1500 nm, 1550–1560 nm
Overall bandpass	1260–1625 nm
Return loss at test bandpass	≥55 dB
Maximum insertion loss at test bandpass	Note: Specification includes the loss from the input and output connectors
1 x 2	4.1 dB with UPC, 4.3 with APC
1 x 4	7.6 dB with UPC, 7.8 dB with APC
1 x 8	10.7 dB with UPC, 10.9 dB with APC
1 x 16	13.9 dB with UPC, 14.1 dB with APC
1 x 32	17.1 dB with UPC, 17.3 dB with APC
1 x 64	20.8 dB with UPC, 21 dB with APC
2 x 16	14.5 dB with UPC, 14.7 dB with APC
2 x 32	17.8 dB with UPC, 18 with APC



## 2 BEFORE INSTALLATION

### 2.1 Installation Overview

Installation of the IFDH 3000 involves the following main tasks:

**Mounting the IFDH 3000** – The IFDH 3000 includes a 7-foot by 23-inch unequal flange network equipment rack which must be anchored to the floor. Mounting hardware for anchoring the rack to a raised floor is available separately. The rack may also be secured at the top depending on local requirements. Various combinations of top support hardware are available to accommodate any existing overhead support structure. Additional recommendations and instructions for installing ADC equipment racks and rack accessories are provided in the Unequal Flange Rack Installation Instructions (ADCP-80-345).

► **Note:** It is recommended that at least **two** persons be allocated for positioning and mounting the equipment rack.

**Installing the Feeder Cable** – The customer-supplied feeder cable must be routed into the IFDH 3000 cabinet and spliced to the splitter input pigtail assembly. A fiber cable with 48-, 72-, or 96 - fiber ribbon construction should be used for the feeder cable.

**Installing Splitters** – The IFDH 3000 cabinet is shipped with two splitters installed. If additional splitters are required, they must be ordered separately. All splitter modules that are ordered separately must be installed in the splitter compartment.

**Connecting Splitter Output Fibers** – Service is enabled by connecting the splitter output fiber connectors to the subscriber distribution ports. Unused output fibers may be temporarily stored in a parking lot location underneath the distribution field until service is needed.

### 2.2 Unpacking and Inspection

Use the following procedure to unpack and inspect the cabinet and all accessories:

1. Open the shipping carton(s) and carefully unpack the IFDH 3000 and any accessories from the protective packing material.
2. Open the IFDH 3000 cabinet doors (requires 216B key tool) and check for missing ship-along parts (see installation drawing provided with cabinet) or broken parts. If there are damages, contact ADC (see [Section 10](#)) for an RMA (Return Material Authorization) and to reorder if replacement is required.

## 2.3 Feeder Cable Installation Hardware

Verify that the parts specified in [Table 2](#) are received.

**Table 2. Feeder Cable Installation Hardware**

ITEM	QUANTITY
Cable clamp assembly (feeder)	2
Cable clamp mounting bracket	1
12-24 x 0.5 screws	4

## 2.4 Tools and Materials Recommended for Installation

The following tools and additional materials are recommended for cabinet installation:

- 216B key tool (accessory - required to open cabinet door)
- #2 Phillips screwdriver
- Wire cutter
- Tools for removing the feeder cable sheath and breaking out fibers
- Cable ties
- Fiber break-out kit (recommended for ribbon fiber cable)
- Cable grounding kit (if cable has metallic elements)
- Tape measure
- Pen or marker
- Splicing equipment
- Hardware to anchor the rack to the floor
  - Concrete Floor: Catalog# RINST-FLR
  - Raised Floor: Catalog# FDF-ACC146
- Hardware to top-anchor the rack (if required)
- Frame grounding system (per local requirements)
  - Grounding Kit: Catalog# E-501-L37
  - H-Tap Kit: Catalog# E-501-L166
- Tools to install the rack anchoring system and grounding system

### 3 INSTALLING THE EQUIPMENT RACK

The IFDH 3000 is composed of an indoor FDH cabinet factory-mounted within an unequal flange network equipment rack. The 7-foot by 23-inch equipment rack must be securely anchored to the floor. Mounting hardware for securing the rack to either a concrete or raised floor is available separately. The rack may also be anchored from the top depending on local requirements.

Various combinations of top support hardware are available to accommodate any existing support structure. Additional instructions for installing ADC equipment racks and rack accessories are provided in the CommScope publication, Unequal Flange Rack Installation Instructions (ADCP-80-345). The sections that follow provide instructions for mounting the IFDH 3000 on either a concrete floor or a raised floor. Instructions for securing the rack from an overhead support are provided in ADCP-80-345. Refer to the sections that apply to the installation.



**Danger:** *When placing the IFDH 3000 in position for mounting, use lifting techniques and equipment that are appropriate for the weight of the cabinet and equipment rack. Improper lifting methods could result in severe personal injury or equipment damage. It is recommended that at least **two** persons be allocated for positioning and mounting the equipment rack.*



**Warning:** *Do not open the swing frame until the IFDH 3000 is securely anchored to the floor. Opening the cabinet swing frame before the IFDH 3000 is properly secured could cause the IFDH 3000 to tip over resulting in personal injury or equipment damage.*



**Caution:** *Handle the fiber optic cable stubs with care throughout the installation procedure to avoid kinking or damaging the cable.*



**Note:** It is recommended that at least **two** persons be allocated for positioning and mounting the equipment rack.

#### 3.1 Dimensions and Space Requirements

The dimensions for the IFDH 3000 are shown in the following illustrations below:

- [Figure 4](#) shows the IFDH 3000-288 dimensions.
- [Figure 5](#) shows the IFDH 3000-432 dimensions.
- [Figure 6](#) shows the IFDH 3000-576/864 dimensions.

The IFDH 3000 is designed to mount flush against a wall if necessary so only a minimal amount of clearance is required at the back. To allow full opening of the cabinet doors and swing frame, allow a minimum of 22 inches (55.9 cm) of clearance at the front side of the cabinet.

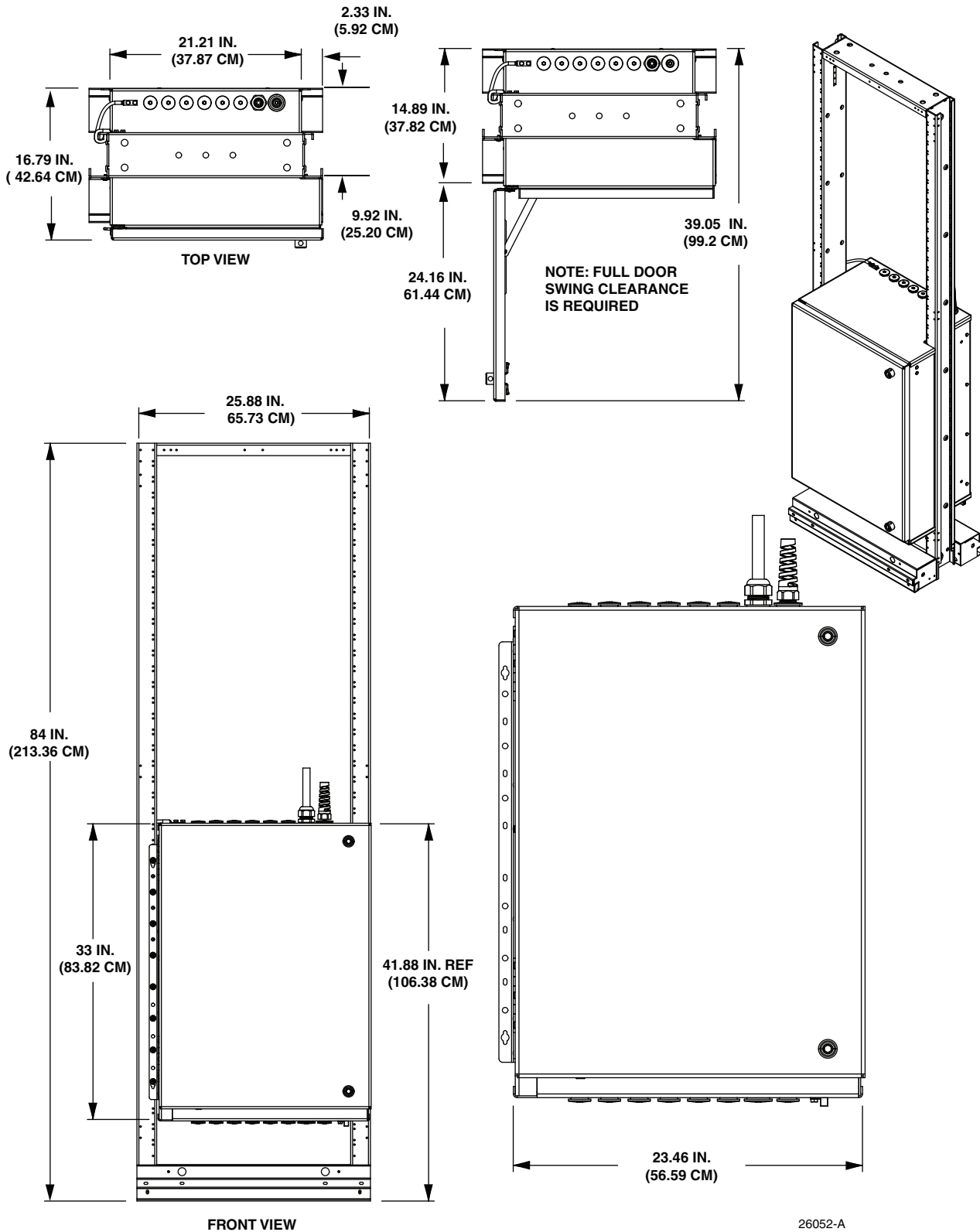


Figure 4. IFDH 3000-288 Dimensions

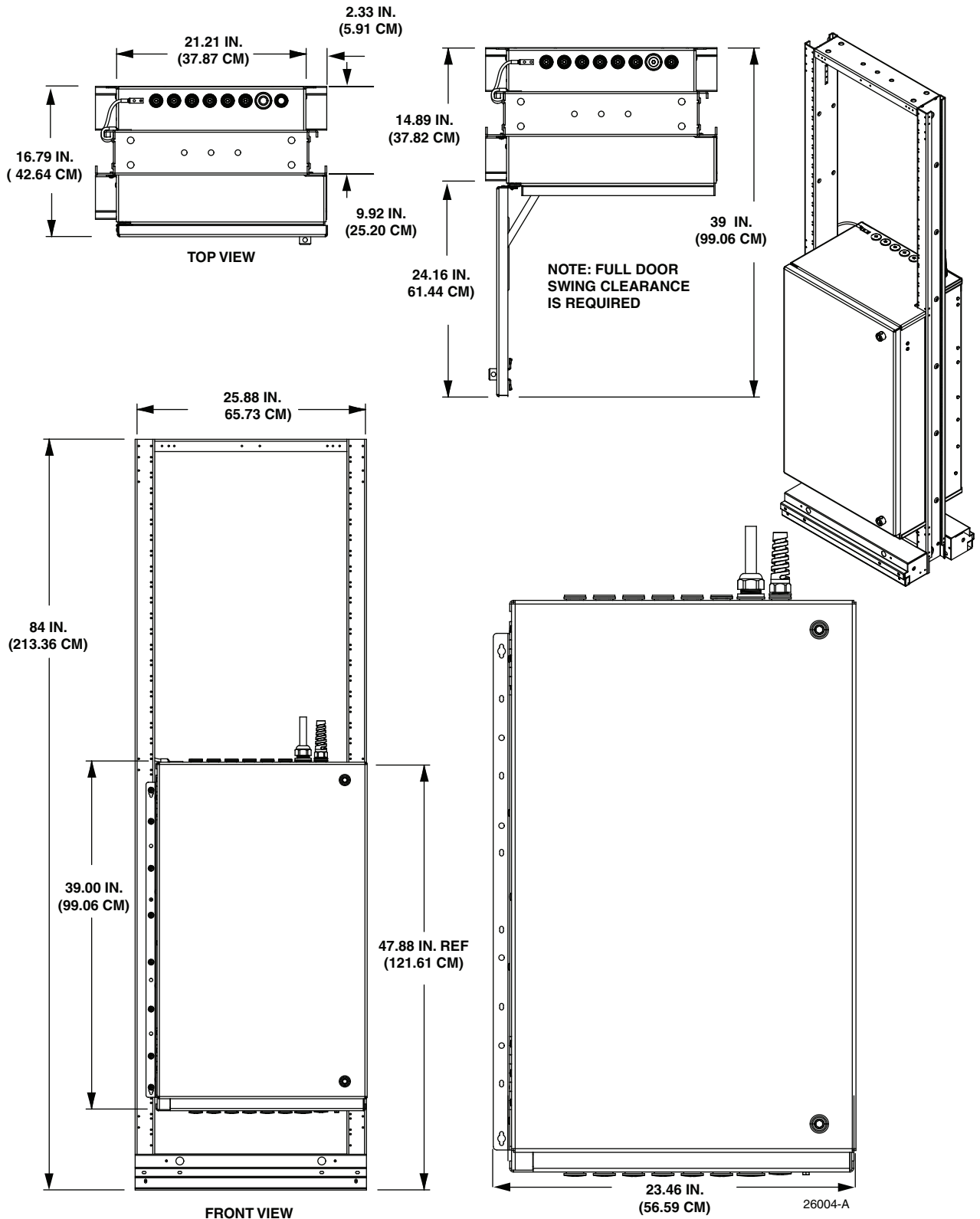


Figure 5. IFDH 3000-432 Dimensions

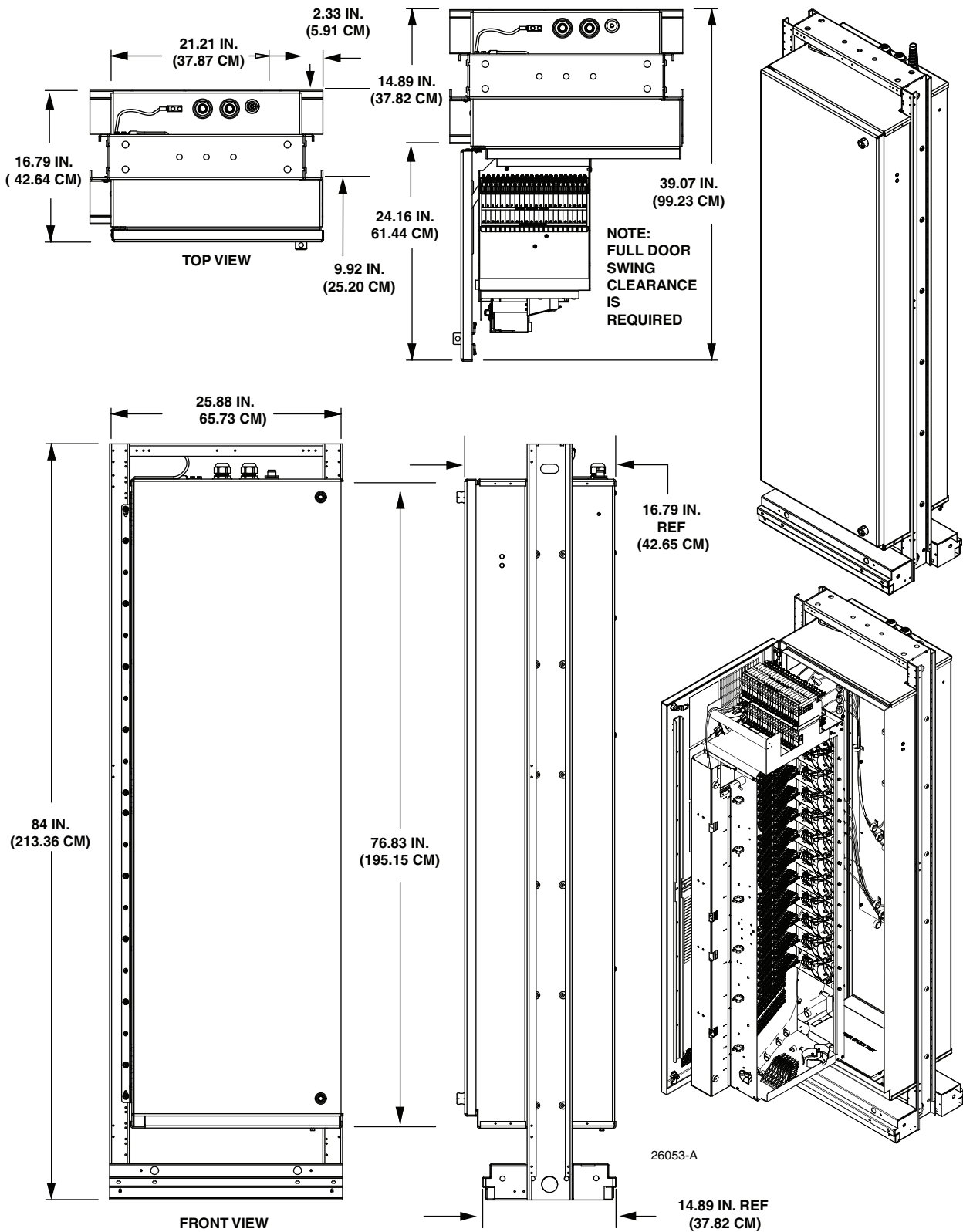


Figure 6. IFDH 3000-576/864 Dimensions

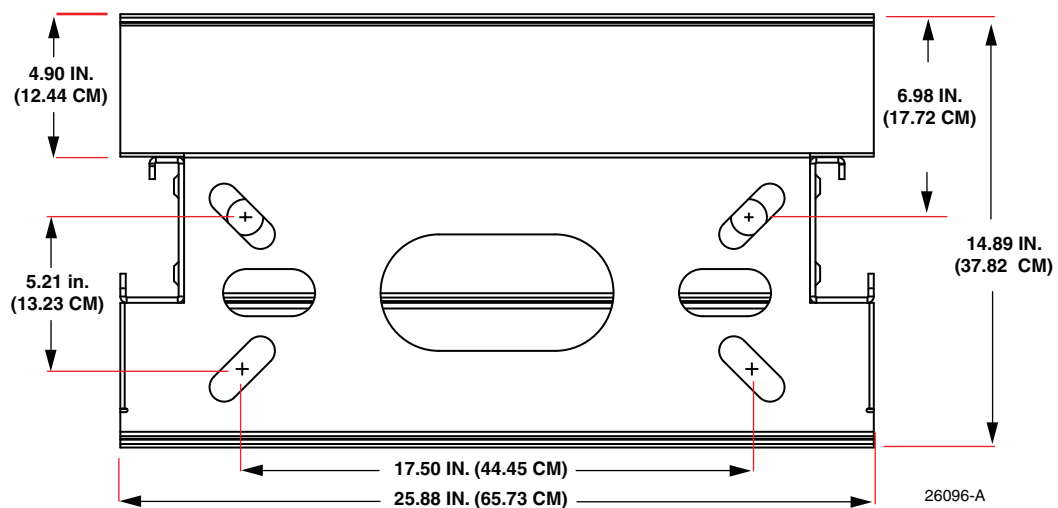
### 3.2 Concrete Floor Mounting

Verify that the appropriate mounting hardware (such as catalog# RINST-FLR) and tools are available for concrete floor mounting. Typically, four anchors are used when a rack is floor mounted. Two anchors may be used when the rack is supported from overhead.

In earthquake zones, always use four floor anchors. CommScope anchors include a breakaway cap that separates when the proper torque is reached. When mounted according to these instructions using the specified mounting hardware, the IFDH 3000 meets the requirements for earthquake zone 4.

Use the following procedure to mount the IFDH 3000 equipment rack on a concrete floor:

1. Place the rack in the location designated for mounting. Figure shows hole locations.



**Figure 7. Rack Mounting Hole Location**

2. Temporarily secure the top of the rack to any available supporting structure to prevent the rack from falling over.
3. Remove the front guard box from the base of the rack as shown in [Figure 8](#) and set it aside.

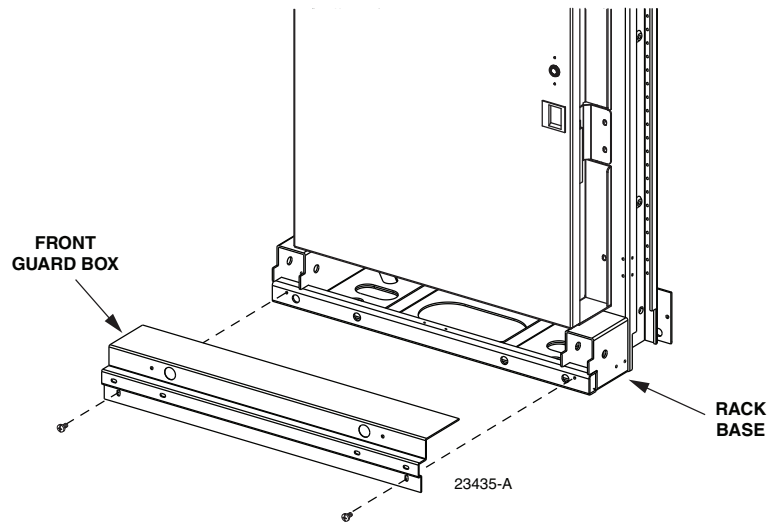


Figure 8. Front Guard Box

4. Remove the stud, flat washer, and torque nut from each anchor as shown in [Figure 9](#).

► **Note:** Do not tighten the top section of the anchor or it may be difficult to insert the anchor into the hole

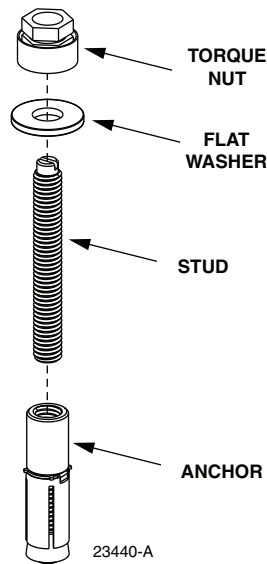
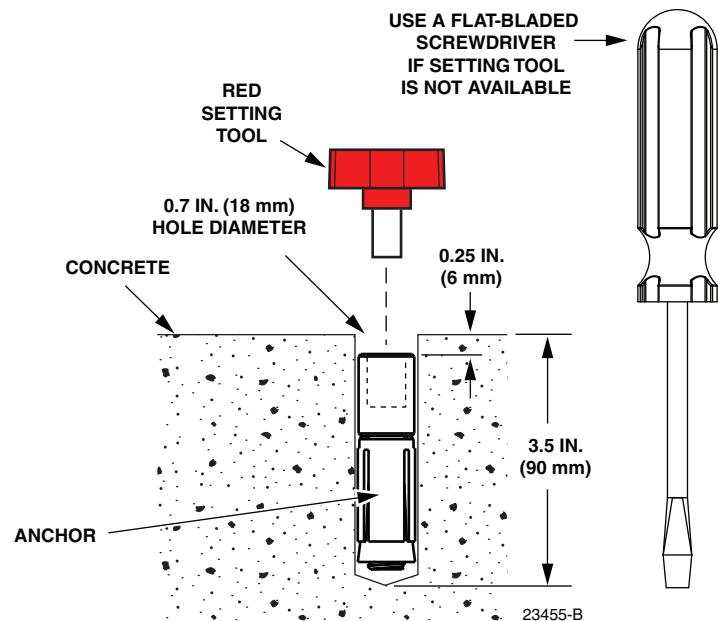


Figure 9. Anchor Assembly

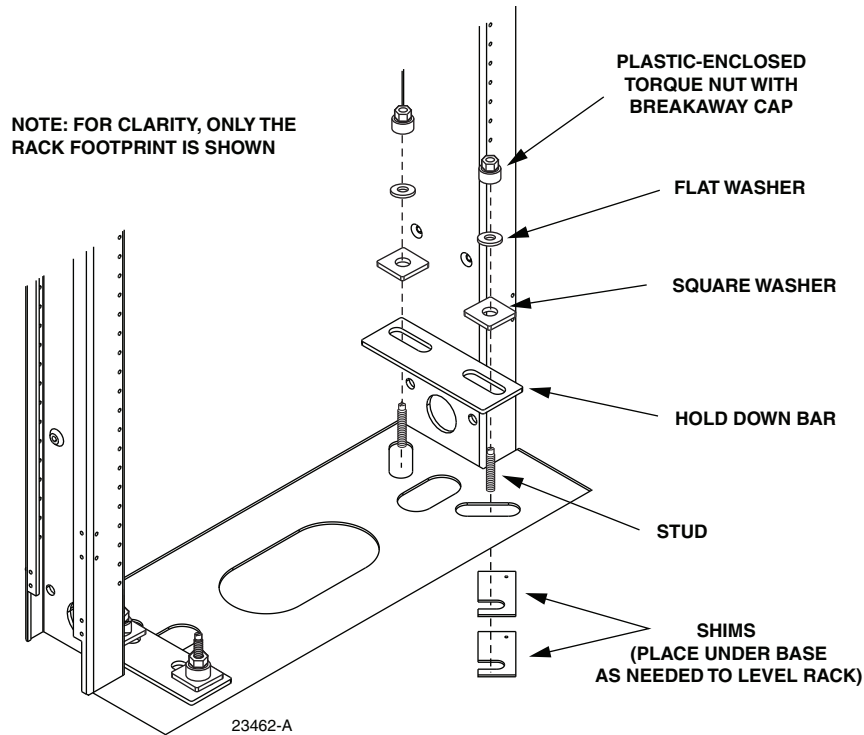
5. Insert an anchor into each one of the mounting holes as shown in [Figure 10](#). Using a hammer, tap each anchor into the hole until the top of the anchor is even with the floor.



6. Insert the setting tool (see [Figure 10](#)) into the top of the first anchor. Use a flat-bladed screwdriver if a setting tool is not available. Align the blade of the setting tool or screwdriver with the slot in the anchor.
7. Using a hammer, tap the anchor into the hole until the setting tool is flush with the surface of the concrete. If using a screwdriver, tap the screwdriver until the top of the anchor is 6 mm (0.25 inches) below the surface of the concrete.
8. Turn the setting tool or screwdriver clockwise until the anchor is snug in the mounting hole.
9. Repeat steps 10 through 12 for each of the remaining anchors.
10. Place the rack over the anchors and in position for mounting. Temporarily secure the top of the rack to any available supporting structure to prevent the rack from falling over when the IFDH 3000 swing frame is opened.
11. If the floor is uneven, level the rack using shim plates as shown in [Figure 11](#).



**Figure 10. Set Anchor into Floor**



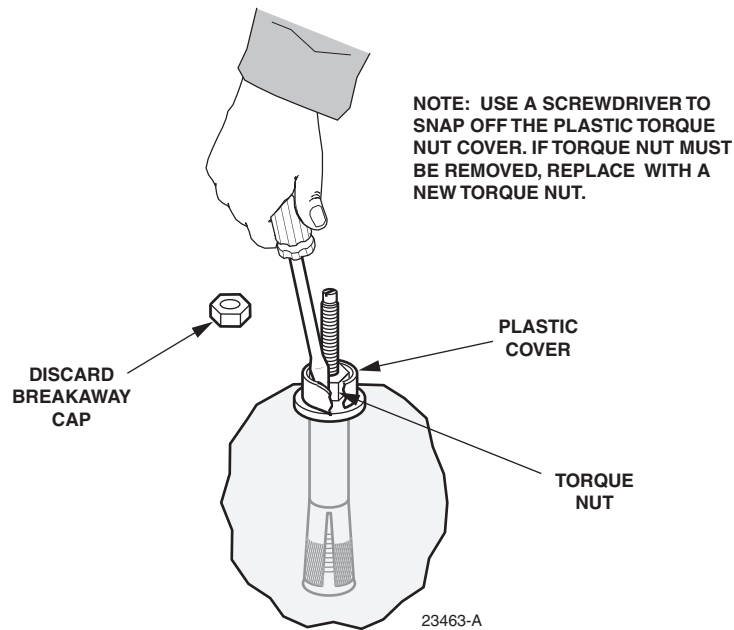
**Figure 11. Installing Rack Shims and Anchoring Hardware**

12. Thread a stud into each of the installed anchors and hand-tighten until the stud reaches bottom.
13. Install a hold-down bar and square washers on each pair of anchor studs and then reinstall the flat washers and torque nuts.
14. Using a 19 mm box-end wrench, tighten each torque nut until the breakaway cap breaks away indicating that the anchor is properly set. Remove the breakaway cap from the stud and discard.



**Warning:** *The torque nut shears off suddenly at approximately 77 Ft-Lbs (104 Nm) of torque. Wear heavy protective gloves to prevent possible injury.*

15. To allow removal of the torque nut at some future time, snap off the plastic cover that protects the torque nut as shown in [Figure 12](#).
16. Reinstall the front guard box cover on the base of the rack (see [Figure 8](#)).



**Figure 12. Snap Plastic Cover Off Torque Nut**

### 3.3 Raised Floor Mounting

Various methods are available for mounting equipment racks on a raised floor. Consult with local staff and agencies for regulations regarding raised floor mounting of equipment racks. The method described in this section uses mounting hardware that is available in a kit from CommScope.

Table 3 lists the components that are provided with the raised floor mounting kit. Verify that the specified items were received before starting the installation. The length of the threaded rod required for installation is dependent on the height of the raised floor above the regular floor. The threaded rods provided with the CommScope kit are 30 inches long.

Because of the complexity of mounting the IFDH 3000 frame on a raised floor, there are two sections that cover the mounting procedure. The first section covers how to locate and secure two sections of Unistrut metal framing to the floor below the raised floor. The second section covers how to secure the mounting base of the rack to the raised floor.

**Table 3. Raised Floor Mounting Kit (FDF-ACC146) Contents**

ITEM	QUANTITY
Unistrut framing	10 ft
Flat washer – 0.625 in.	12
Lock washer – 0.625 in.	12
Square washer - 0.625 in	4
Insulating shoulder washer (optional)	4
Threaded rod 5/8-11 × 30 in.	4

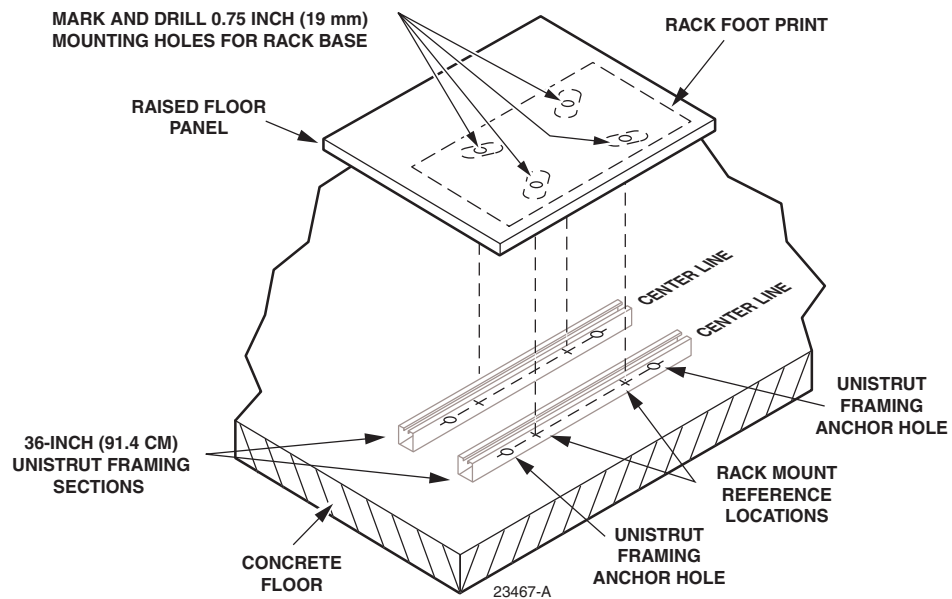
**Table 3. Raised Floor Mounting Kit (FDF-ACC146) Contents, continued**

ITEM	QUANTITY
Hex nut (5/8-11)	12
Spring nut (5/8-11)	4
Anchor kit (with 4 concrete anchors)	1

### 3.3.1 Securing Unistrut Framing Sections To The Floor Below the Raised Floor

Use the following procedure to secure the Unistrut framing sections to the floor below the raised floor:

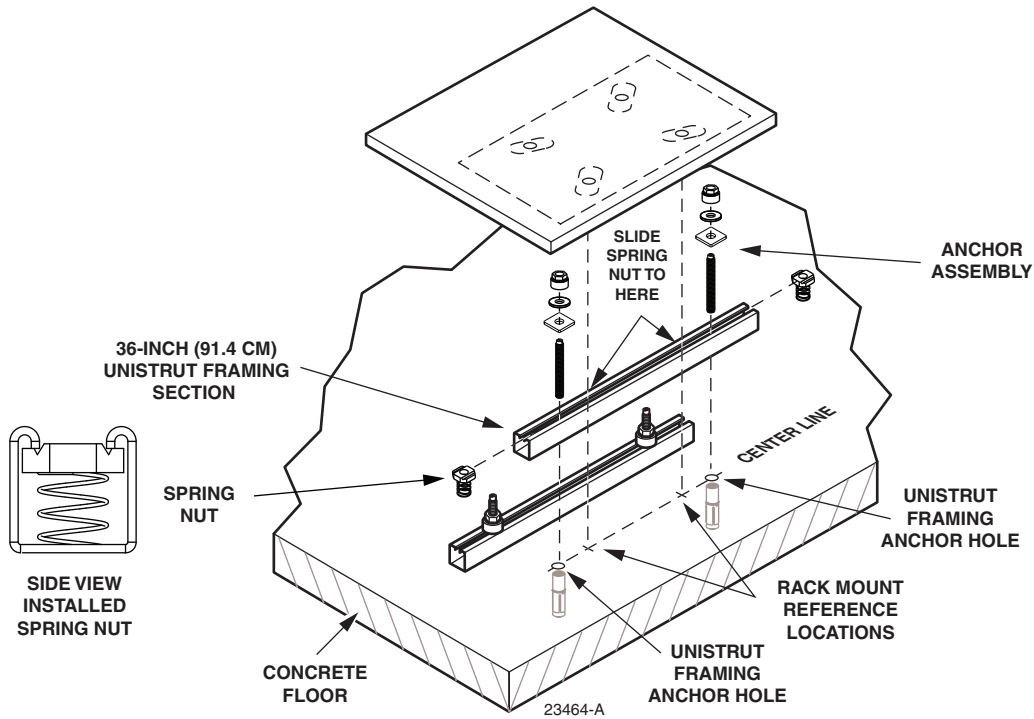
1. Place the rack in the location designated for mounting.
  2. Temporarily secure the top of the rack to any available supporting structure to prevent the rack from falling over.
  3. Remove the front guard box from the base of the rack (see [Figure 8 on Page 14](#)) and set it aside.
  4. Mark the mounting hole locations (see [Figure 7 on Page 13](#) for the rack footprint) on the raised floor as shown in [Figure 13](#). Holes with the widest spacing will provide the greatest stability.
  5. Move the rack out of the way.
  6. Drill four 0.75 inch (19 mm) clearance holes in the raised floor panel at the points marked in step 5.
  7. Remove any adjacent floor panels as needed to gain access to the area under the panel with the drilled holes.
  8. Using a plumb bob or equivalent tool, mark the concrete floor below the panel (see [Figure 13](#)) with the location of each hole drilled in the raised floor panel.
- **Note:** These marks are for reference only and will not be used for anchoring the Unistrut framing to the concrete floor.
9. Draw a line between the centers of the reference locations marked on the concrete floor.
  10. Cut two 36 inch (91.4 cm) long sections of Unistrut framing from the 10 foot length provided with the kit. File off any rough edges that may be left at the cut-off point.
  11. Place a section of Unistrut framing over each line drawn in step 10 and then center each section (in both directions) over the line.



**Figure 13. Locating and Marking Rack Mounting Holes**

12. Mark the Unistrut framing anchor hole locations on the concrete floor. For each anchor, select a point that is midway between the reference location marked in step 9 (see [Figure 13](#)) and the end of the Unistrut framing section.
13. Move the Unistrut framing sections out of the way and drill an 18 mm (0.7 inch) diameter hole to a depth of 90 mm (3.5 inches) in the concrete at each hole location. Clean out each hole with compressed air (nozzle should reach bottom of the hole) or a blow-out pump. Check the hole depth with a tape measure.
  - ▶ **Note:** To achieve maximum anchor-holding strength, **select the exact drill size specified** when drilling the anchor holes.
  - ▶ **Note:** If a reinforcing bar is encountered while drilling, relocate the hole. Fill the unusable hole with a locally approved filling product.
14. Remove the stud, flat washer, and torque nut (see [Figure 9 on Page 14](#)) from each anchor.
  - ▶ **Note:** Do not tighten the top section of the anchor or it may be difficult to insert the anchor into the hole
15. Insert an anchor (see [Figure 10 on Page 15](#)) into each one of the mounting holes. Using a hammer, tap each anchor into the hole until the top of the anchor is even with the floor.
16. Insert the setting tool (see [Figure 10 on Page 15](#)) into the top of the first anchor. Use a flat-bladed screwdriver if a setting tool is not available. Align the blade of the setting tool or screwdriver with the slot in the anchor.
17. Using a hammer, tap the anchor into the hole until the setting tool is flush with the surface of the concrete. If using a screwdriver, tap the screwdriver until the top of the anchor is 6 mm (0.25 inches) below the surface of the concrete.

18. Turn the setting tool or screwdriver clockwise until the anchor is snug in the mounting hole.
19. Repeat steps 16 through 18 for each of the remaining anchors.
20. Insert two spring-nuts into each of the two 36-inch (91.4 cm) long sections of Unistrut framing as shown in Figure 14. Make sure each spring-nut is placed the segment of Unistrut framing that will be between the two anchor holes.



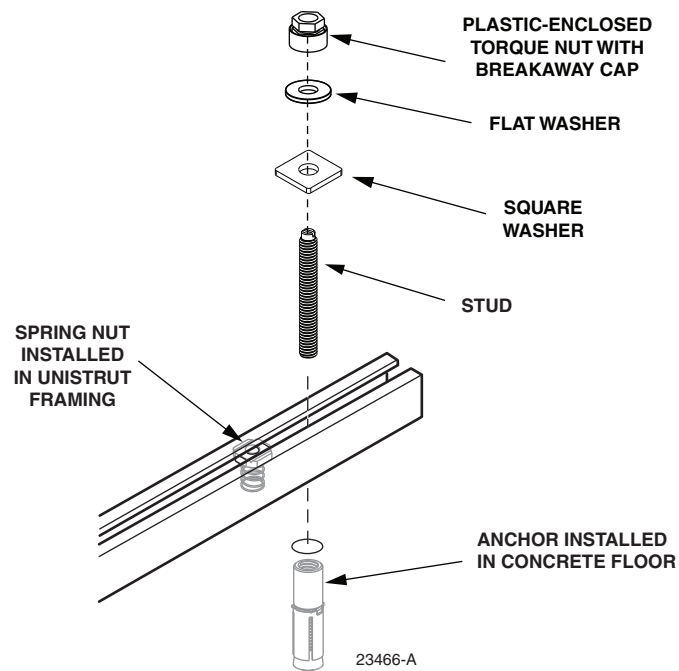
**Figure 14. Unistrut Framing Assembly**

21. Place two 36-inch Unistrut framing sections in position for installation on concrete floor.
22. Thread a stud into each of installed anchors and hand-tighten until the stud reaches bottom.
23. Install a square washer, flat washer, and torque nut on each anchor stud as shown in Figure 15.
24. Using a 19 mm box-end wrench, tighten each torque nut until the breakaway cap breaks away indicating that the anchor is properly set.



**Warning:** *The torque nut shears off suddenly at approximately 77 Ft-Lbs (104 Nm) of torque. Wear heavy protective gloves to prevent possible injury.*

25. Remove the breakaway cap from the stud and discard.
26. To allow removal of the torque nut at some future time, snap off the plastic cover (see Figure 12) that protects the torque nut.

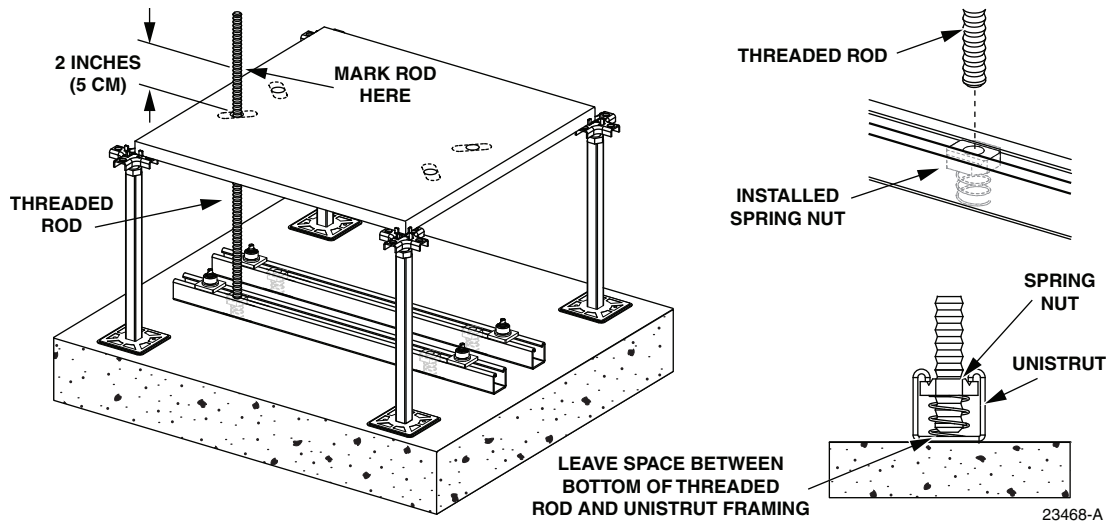


**Figure 15. Securing Unistrut Framing To Floor With Concrete Anchor**

### 3.3.2 Securing Rack Base To Raised Floor

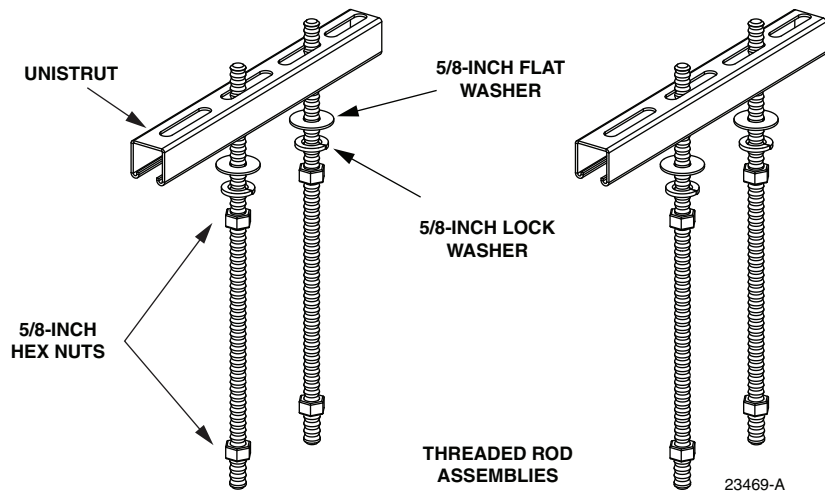
Use the following procedure to secure the rack base to the raised floor:

1. Replace as many floor tiles as possible while still allowing access to the lower floor.
2. Insert a threaded rod through one of the clearance holes in the raised floor and thread it into the corresponding spring nut as shown in [Figure 16](#).
3. Place a mark on the threaded rod at a point that is 2 inches (5 cm) above the top of the raised floor.
4. Remove the threaded rod from the raised floor and then use a hack saw to cut the rod at the point marked in step 3. File off any rough edges that may be left at the cut-off point.
5. Trim each of the remaining three threaded rods to match the length of the rod that was cut in step 4. File off any rough edges that may be left at the cut-off point.
6. Use a hack saw to cut two 12-inch (30.5 cm) long sections of Unistrut framing from the remaining section of Unistrut framing. File off any rough edges that may be left at the cut-off point.
7. Place the rack over the clearance holes in the raised floor and position for mounting. Temporarily secure the top of the rack to any available supporting structure to prevent the rack from falling over when the IFDH 3000 swing frame is opened.



**Figure 16. Cut Threaded Rods to Correct Length**

8. Thread on a 5/8-inch nut at both top and bottom end of each threaded rod (Figure 17).



**Figure 17. Threaded Rod Assemblies**

9. Install a 5/8-inch lock washer and 5/8-inch flat washer on top end of each rod.
10. Insert the top ends of two threaded rods (with lock washer and flat washer) through the slots in one of the 12-inch (30.5 cm) sections of Unistrut framing. Select slots that will allow the distance between the two threaded rods to be adjusted to 5.25 inches (13.3 cm).
11. Position the two threaded rods and the 12-inch section of Unistrut framing directly under the raised floor panel as shown in Figure 18.
12. Insert the top ends of the two threaded rods through the clearance holes in the bottom side of the raised floor. Provide sufficient space between the Unistrut framing sections and the bottom side of the floor panel to allow completion of steps 13 and 14.



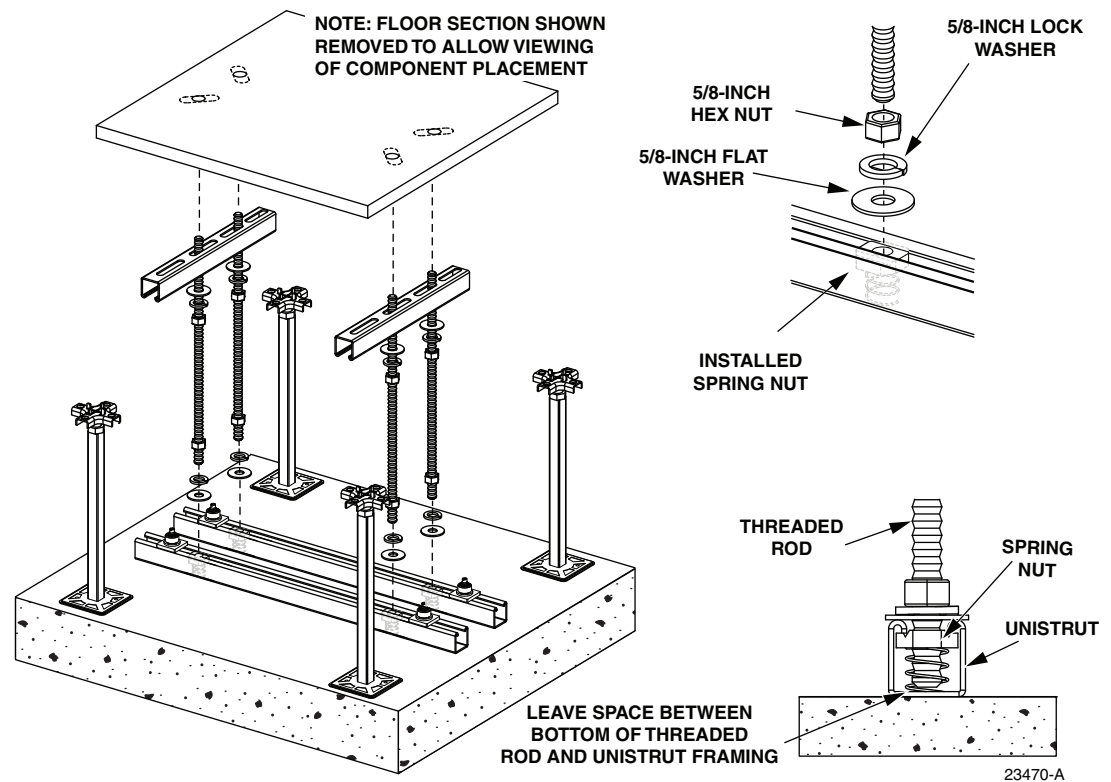


Figure 18. Threaded Rod Installation

13. Install a 5/8-inch lock washer and 5/8-inch flat washer on the bottom end of each rod.
14. Thread the bottom end of each rod into the spring nut until it **almost** touches the bottom of the Unistrut framing.
15. Repeat steps 9 through 14 for the two remaining threaded rods and the remaining 12-inch section of Unistrut framing.
16. Use an open-ended wrench to tighten nuts at bottom of each threaded rod (Figure 19).

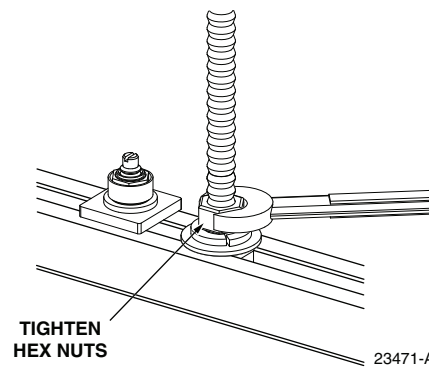
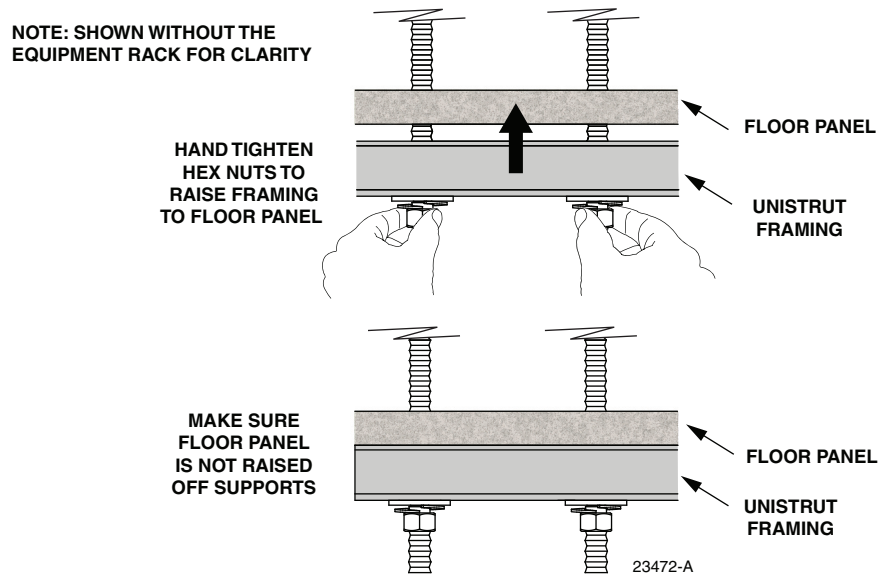


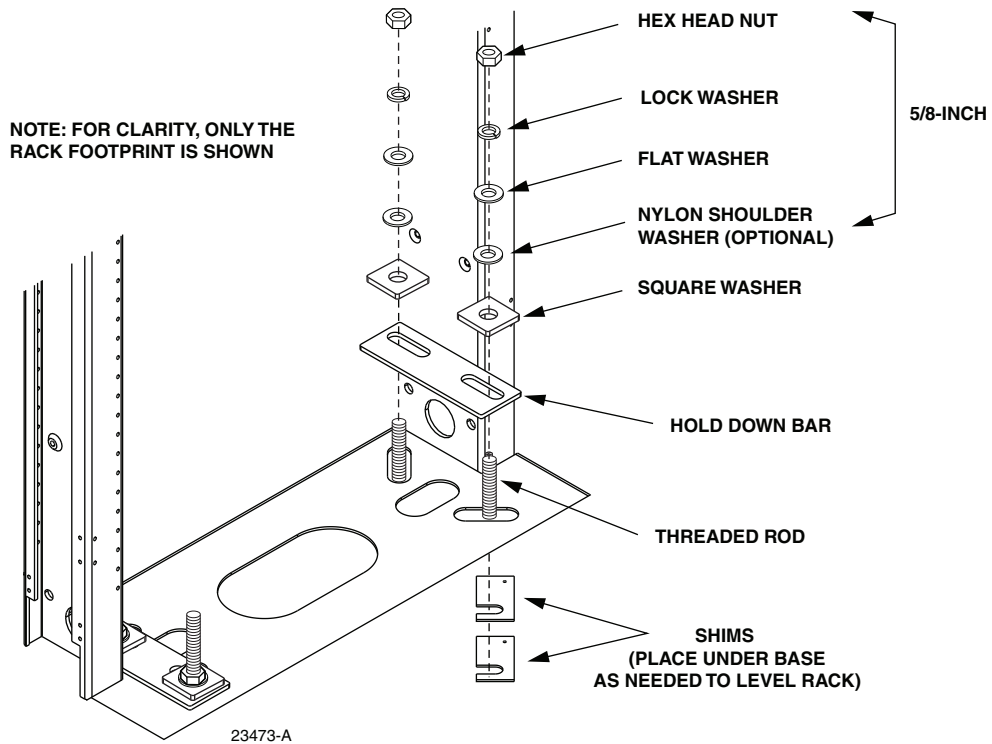
Figure 19. Tighten Nuts At The Bottom Of Each Threaded Rod

17. Hand-tighten the nuts below the floor panel until the Unistrut framing sections are touching the bottom side of the floor panel as shown in Figure 20.



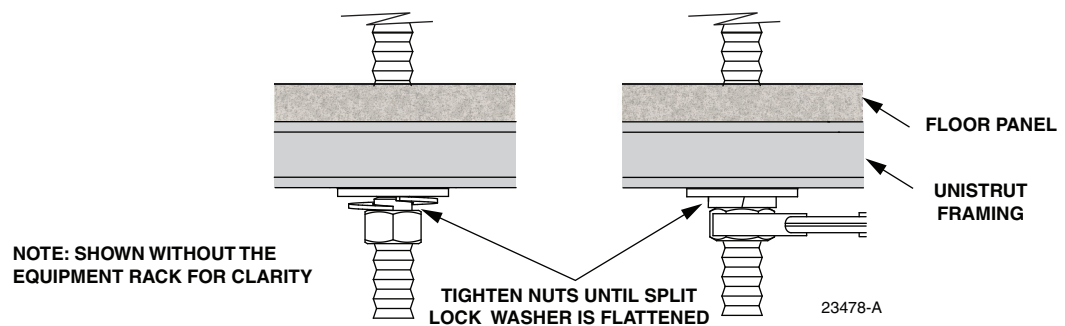
**Figure 20. Raise Unistrut Sections to Bottom of Floor Panel**

18. If the floor is uneven, level the rack using shim plates as shown in Figure 21.



**Figure 21. Level Rack and Secure To Floor Panel**

19. Install a hold-down bar (see [Figure 21](#)) on each pair of threaded rods. Next, install a 5/8-inch square washer, 5/8-inch shoulder washer (optional), 5/8-inch flat washer, 5/8-inch lock washer, and 5/8-inch hex nut on each threaded rod.
- **Note:** The nylon shoulder washers are optional and are usually only installed when it is necessary or desirable to electrically isolate the frame.
20. Hand-tighten the rack base nuts installed in step 20 (four places) to remove the looseness from the stack of washers. Do not fully tighten rack base nuts at this point.
  21. Use an open-ended wrench to tighten the nuts (four places) **below** the floor panel until the split-lock washer is flattened as shown in [Figure 22](#). Do not fully tighten at this point. Make sure the rack remains level and the floor panel is not lifted.



**Figure 22. Split-Lock Washer**

22. Use a socket wrench to **fully tighten** the rack base nuts installed in step 20 (four places).
23. Use an open-ended wrench to **fully tighten** the nuts **below** the floor panel (four places).
24. Reinstall the front guard box cover on the base of the rack (see [Figure 8](#)).

### 3.4 Rack Top Support Systems

Various methods are available for supporting the IFDH 3000 equipment rack from the top. All methods use various means to fasten the top of the rack to an external support including a V-bolt, J-bolt, or a threaded rod with clips.

The external support may be a water pipe, overhead cable racking, or office superstructure such as a ceiling beam. If possible, the overhead support and lineup should be perpendicular to one another since this arrangement provides the most room for cabling.

Refer to the Unequal Flange Rack Installation Instructions (ADCP-80-345) for complete information on installing rack top support systems.

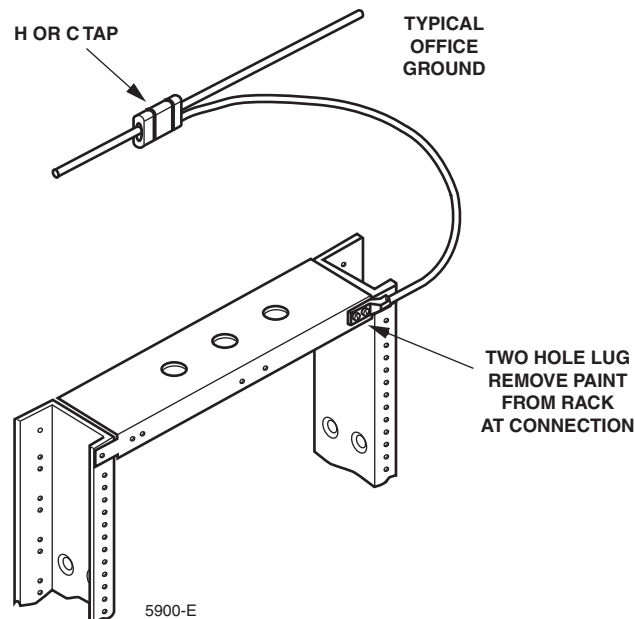
### 3.5 Grounding Wire Connection To Equipment Rack

Grounding kits (such as catalog# E-501-L37 and E-501-L166) are available for connecting the IFDH 3000 equipment rack to an office ground source.

A typical grounding kit consists of a length of #6 copper wire with a two-hole lug attached to one end of the wire. Additional components such as connectors, wire clips, and screws, and may also be included.

Tapped holes are provided on the equipment rack for attaching two-hole lugs. All lug connections to the rack must be made to bare metal to ensure low resistance. Two screws must always be used for securing two-hole lugs to the rack. Use the following procedure to attach a two-hole lug to the rack:

1. Remove the paint from the point on the rack where the two-hole lug will be secured as shown in [Figure 23](#).



**Figure 23. Equipment Rack Grounding Wire**

2. Apply a thin layer of non-oxidizing paste (may not be provided with the kit) on the bare metal surface.
3. Locate the #6 copper wire that is provided for connecting the rack to the office ground source. At least one end of wire will be terminated with a two-hole lug.
4. Use two screws to fasten the grounding wire two-hole lug to the rack. Tighten each screw securely to make good contact with the rack.
5. Route the free end of the grounding wire to an approved earth ground source.
6. Cut the grounding wire to length and connect it to the earth ground source as specified by local code or practice.

## 4 FEEDER CABLE INSTALLATION AND SPLICING

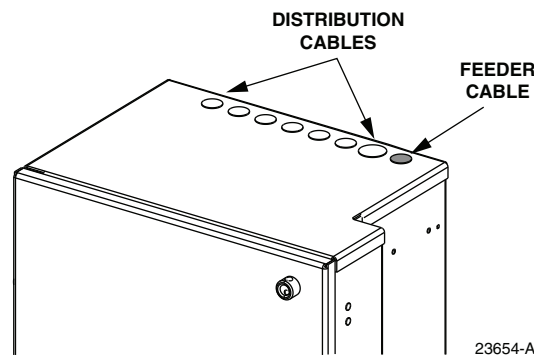
This section describes how to install the OSP feeder cable in cabinets that are not equipped with a pre-installed feeder cable. Also covered are procedures for splicing the feeder cable fibers to the splitter input pigtails. The feeder cable enters/exits the cabinet from the top.

### 4.1 Feeder Cable Installation

A compression fitting is used to secure the feeder cable at the entry/exit point to the cabinet. Within the cabinet, a cable clamp is used to secure the cable to a bracket. Beyond the clamp, the outer sheath of the cable is removed to expose the optical fibers. The feeder cable is typically a 48-, 72-, or 96-fiber cable with ribbon fiber construction. Breakout kits should be installed (subject to local practice) to protect the exposed optical fibers. Grounding kits should be installed on cables with metallic elements. From the clamping point, the optical fibers are routed to splice trays for splicing to the splitter input pigtails.

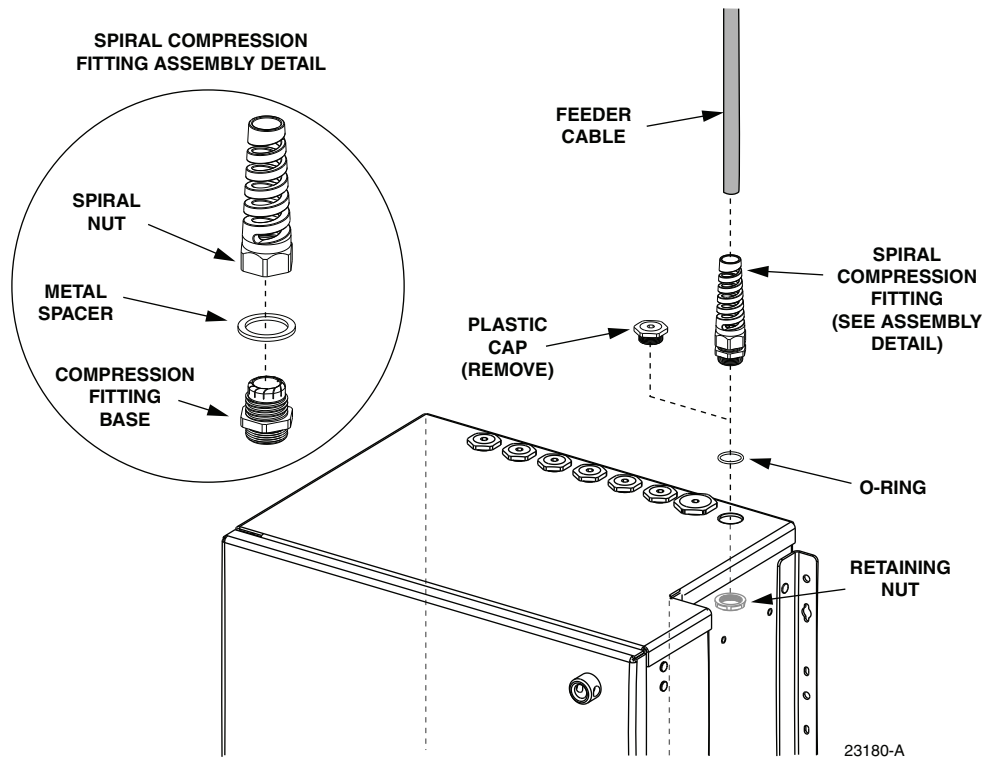
Use the following procedure to install the feeder cable:

1. Locate the cable entry/exit hole (on top of the cabinet) that is specified for feeder cable installation as shown in [Figure 24](#).



**Figure 24. Cable Entry/Exit Holes**

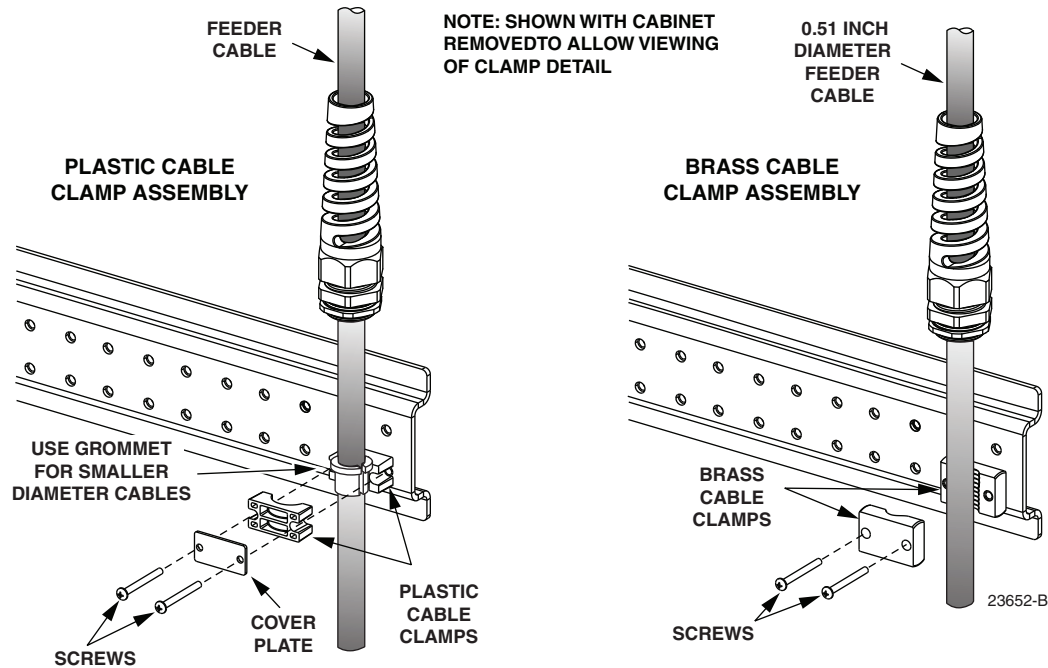
2. Open the cabinet door and swing frame to provide access to the interior of the cabinet.
  3. Remove the plastic cap and retaining nut from the feeder cable entry/exit hole as shown in [Figure 25](#). Save the retaining nut for reuse.
  4. Locate the spiral compression fitting that is shipped with the cabinet and loosely assemble the fitting components (see [Figure 25](#)).
- **Note:** The spiral compression fitting provided with the cabinet can be used with feeder cables that are 0.35 to 0.63 inches in diameter. For cables that are 0.64 to 0.71 inches in diameter, order kit FD3-ACCMSPCLMP.
5. Slide the spiral compression fitting and O-ring over the end of the feeder cable. Loosen the spiral nut if the compression fitting does not slide freely over the cable.
  6. Insert the end of the feeder cable into the cable entry/exit hole and pull through about **14 feet** (4.3 meters) of cable slack.



**Figure 25. Plastic Cap Removal and Compression Fitting Installation**

7. Slide the retaining nut (saved in step 3) over the end of the feeder cable and move it up to the cable entry/exit hole.
8. Insert the threaded end of the compression fitting into the cable entry/exit hole and secure it to the cabinet with the retaining nut.
9. Strip back the feeder cable sheath **157 inches** (399 cm) to expose the fiber subunits or fiber ribbons.
10. Install breakout and cable grounding kits as required by local practice. Follow the installation instructions provided with each kit.
  - **Note:** A breakout kit is recommended when installing OSP ribbon cable. The breakout kit includes plastic tubes that protect the fiber ribbons and prevent damage. Instructions for trimming the plastic tubes to length are provided in [Section 4.3](#). A grounding kit is required if the cable is equipped with metallic shields or strength members. Install the cable grounding kit prior to securing the cable to the cabinet.
11. Adjust cable to remove any excess slack from the cabinet interior and then tighten the spiral nut to secure the feeder cable at the cable entry/exit hole.
12. Depending on the cabinet option, either a plastic or brass clamp will be provided with the cabinet. Assemble the cable clamp on the feeder cable as shown in [Figure 26](#).

- **Note:** If a brass cable clamp is provided with the cabinet, the diameter of the feeder cable must be **0.51 inches** or the brass clamp will not retain the cable properly.



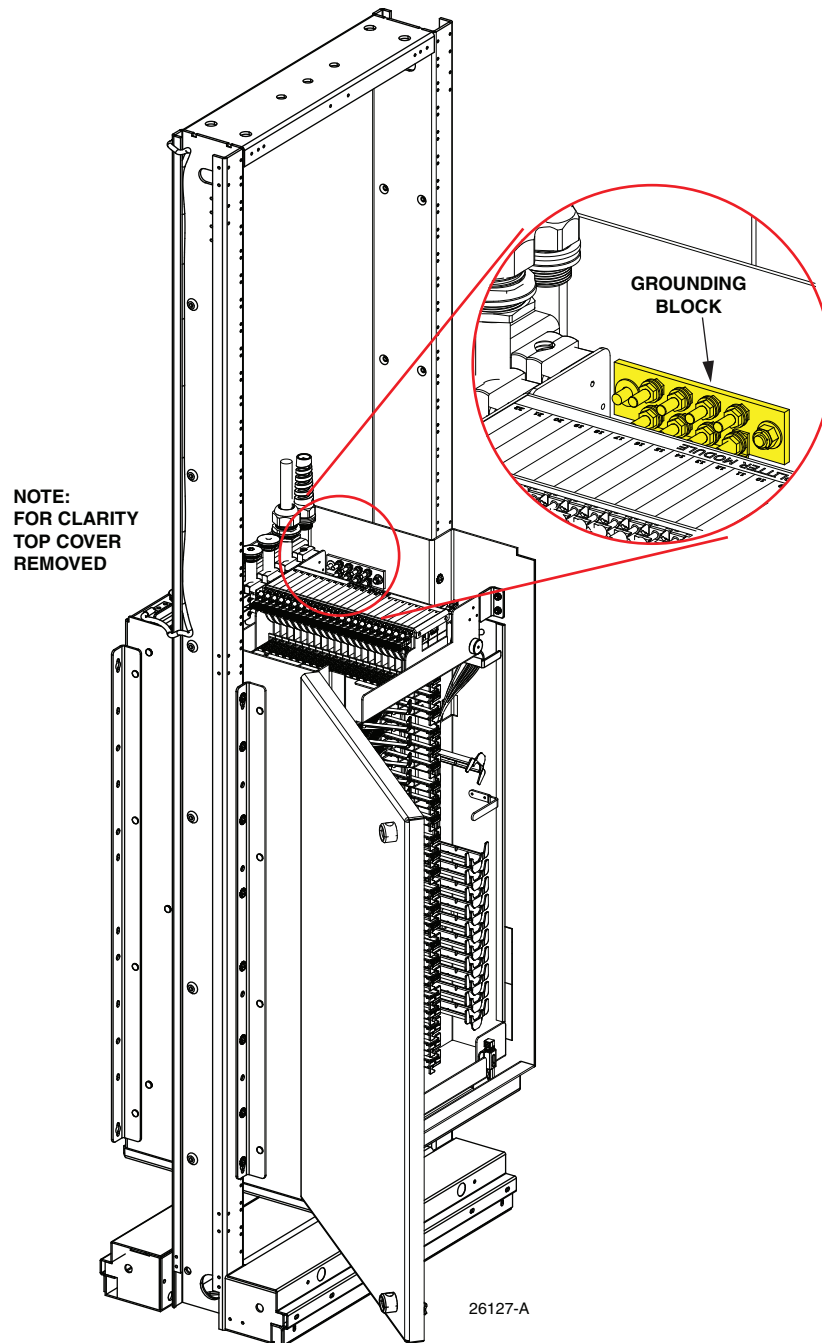
**Figure 26. Assembling Feeder Cable Clamp**

13. Use the cable clamp to secure the cable to the mounting bracket inside the cabinet. Tighten both clamp screws evenly. If the cabinet is equipped with a brass cable clamp, tighten clamp screws until both halves of the cable clamp are touching.
14. Carefully coil the exposed feeder cable fibers around the bottom of the cabinet where they will be out of the way until ready to begin splicing.
15. If a grounding kit was installed on the feeder cable, refer to [Section 4.2](#) for instructions on connecting the grounding wire to the cabinet grounding block. If a grounding kit was not required, refer to [Section 4.3](#) for the splicing procedure.

## 4.2 Grounding Cables with Metallic Members

Cables equipped with metallic shields or strength members must be grounded. A grounding kit is required for properly installing cables that require grounding. If a cable grounding kit was installed in the previous section, connect a #6 copper grounding wire to the cable and then attach the grounding wire to the grounding block using the following procedure.

1. Locate the grounding block in the upper right corner of the cabinet; refer to [Figure 27](#).
2. Route the cable grounding wire to the grounding block. The grounding block provides eight 10-32 grounding studs for the attachment of grounding wires.
3. Crimp a ring terminal (not provided) onto the end of the cable grounding wire.



**Figure 27. Location of Grounding Block**

4. Remove the protective plastic cap, nut, and flat washer from one of the grounding studs on the grounding block as shown in [Figure 28](#).
5. Use the nut and flat washer removed in step 3 to secure the grounding wire ring terminal to the grounding block.
6. Tighten the grounding stud nut to 40 lbs-force inches (4.52 N m) of torque.



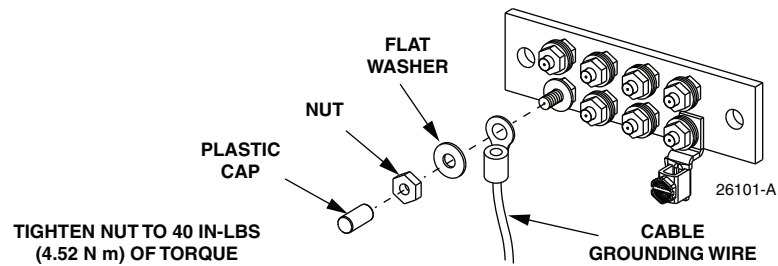


Figure 28. Connecting Grounding Wire to Grounding Block

### 4.3 Splicing the Feeder Cable Fibers to the Splitter Fibers - Ribbon Fiber

A single splice tray for splicing the feeder cable fibers to the splitter fibers is mounted on the bottom of the cabinet. The tray can hold up to 72 splices. Use the following procedure.

1. Locate the feeder splice tray assembly mounted at the bottom of the cabinet, as shown in [Figure 29](#), and locate the splitter input fibers which are routed to the feeder splice tray.

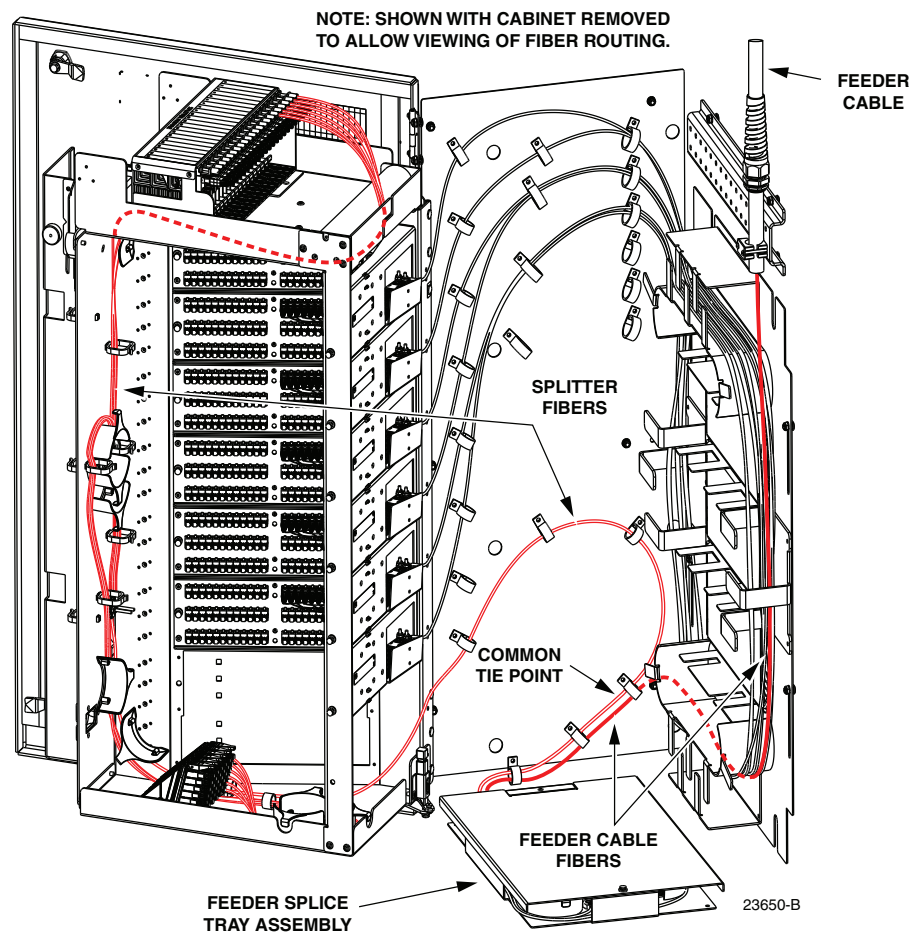
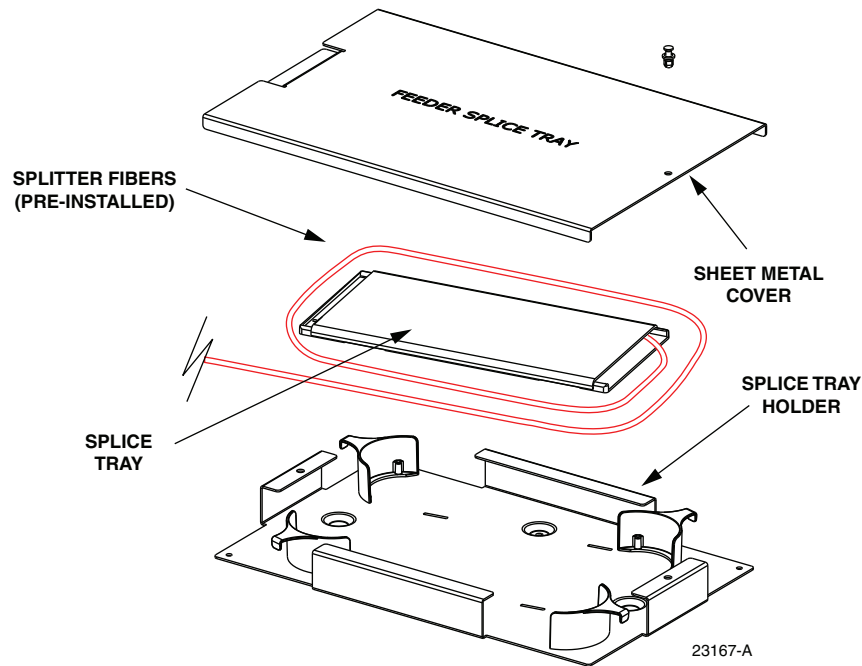


Figure 29. Feeder Splice Tray and Feeder/Splitter Fiber Routing

- Lift the sheet metal cover away from the splice tray holder as shown in Figure 30.



**Figure 30. Feeder Slice Tray Assembly**

- Unfasten the hook and pile strips that secure the tray in place and unwind the attached splitter fiber tubes from around the splice tray holder.
- Beginning at the feeder cable ribbon breakout point shown in Figure 31, route the protective tube or ribbon subunit to the intersect point with the splitter fibers.



**Caution:** Always allow sufficient fiber length to permit routing without severe bends. Non reduced bend radius fibers may be permanently damaged if bent or curved to a radius of less than 1.5 inches (3.81 cm).

- Create a common tie point by securing the protective tube or ribbon subunit (use lacing or a cable tie) to the splitter fibers at the intersect point.
- Route the protective tube or ribbon subunit to the splice tray and then remove the clear plastic cover from the splice tray.
- Cut the protective tube or the ribbon subunit tube (don't cut the fiber ribbons) to the **same length** as the splitter fiber tubes attached to the splice tray.
- Use lacing or cable ties to secure the protective tube or ribbon subunit to the splice tray and verify that the feeder protective tube is the same length as the attached splitter fiber tubes. Adjust as needed to make the lengths equal.



**Caution:** Improper handling can damage fiber optic cables. Do not over tighten cable ties or lacing as this can cause damage or attenuation. Do not compress the fibers or allow them to kink.

- From the tie point on the splice tray, trim the **feeder fibers** to a cut length of 28 inches (71 cm) and the **splitter fibers** to a cut length of 36 inches (92 cm).

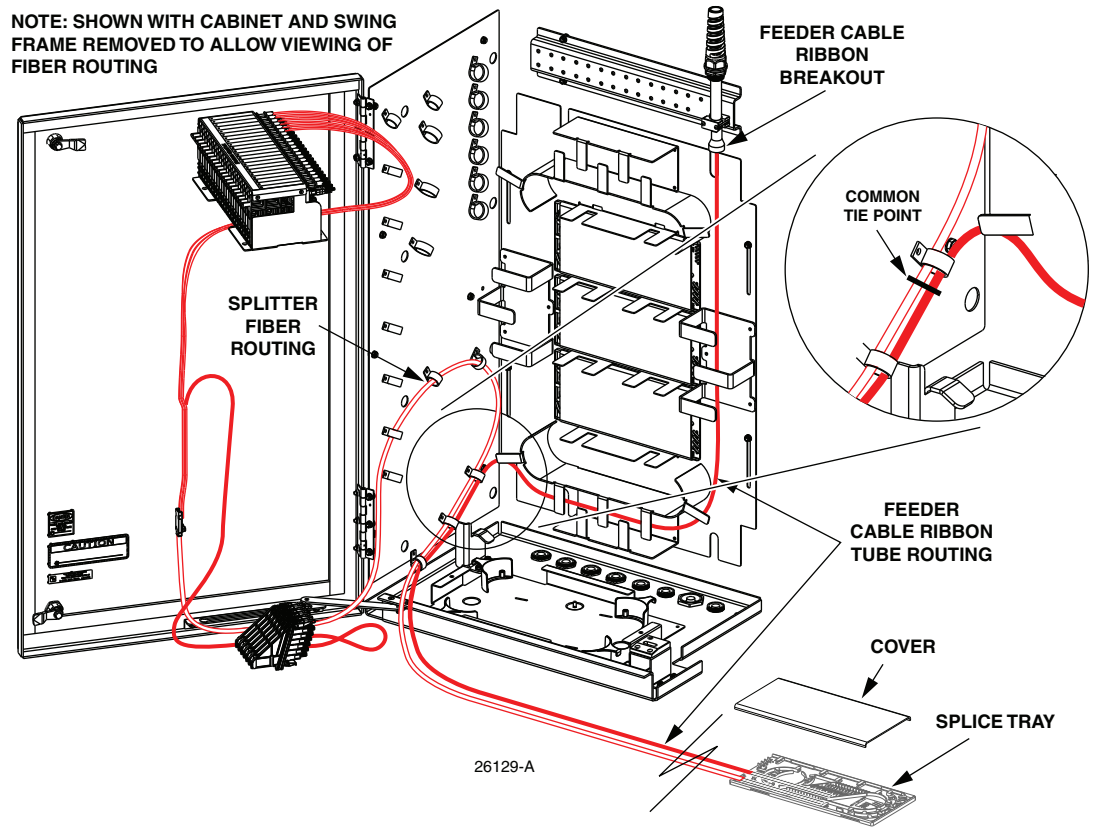


Figure 31. Feeder Fiber Routing to Splice Tray - Ribbon Cable

- Splice the feeder cable fibers to the appropriate splitter fibers. Adjust and route the fibers within the splice tray as in Figure 32.

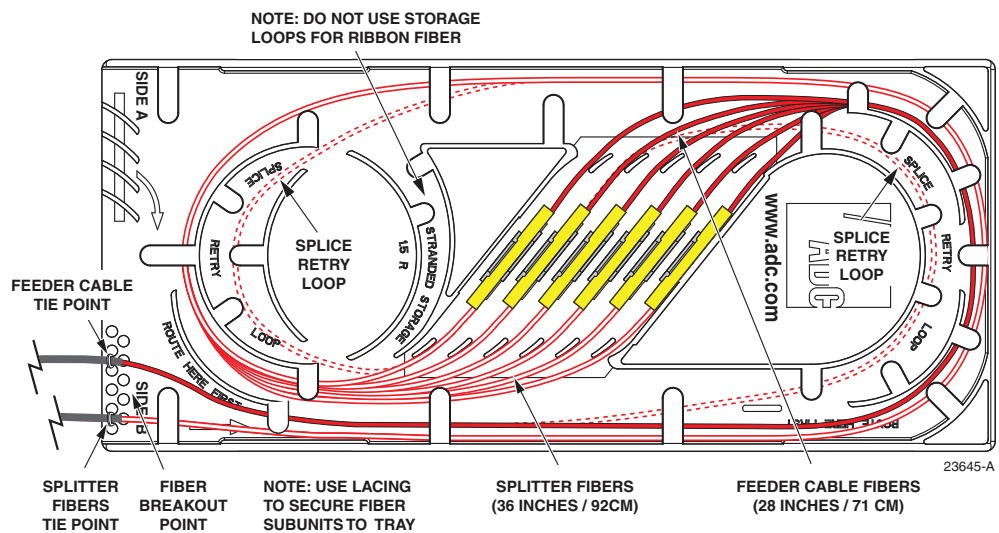


Figure 32. Ribbon Fiber Splice Tray - Feeder Cable Splicing

11. For splitter fiber configuration, refer to the appropriate table below:
- Refer to [Table 4](#) when installing a 48-fiber cable in IFDH 288.
  - Refer to [Table 5](#) when installing a 72-fiber cable in IFDH 432.
  - Refer to [Table 6](#) when installing a 96-fiber cable in IFDH 576 or 864.

**Table 4. Splitter & Pass Through Fiber Designations for 48-Fiber Feeder Cables (IFDH 288)**

RIBBON/SUBUNIT	COLOR SCHEME	FIBER NUMBER	SPLITTER PORT	PASS THROUGH	RIBBON/SUBUNIT	FIBER NUMBER	FIBER	SPLITTER PORT	PASS THROUGH
1	1 (Blue)	1	1	–	2	1 (Blue)	13	13	–
	2 (Orange)	2	2	–		2 (Orange)	14	14	–
	3 (Green)	3	3	–		3 (Green)	15	15	–
	4 (Brown)	4	4	–		4 (Brown)	16	16	–
	5 (Slate)	5	5	–		5 (Slate)	17	17	–
	6 (White)	6	6	–		6 (White)	18	18	–
	7 (Red)	7	7	–		7 (Red)	19	–	19
	8 (Black)	8	8	–		8 (Black)	20	–	20
	9 (Yellow)	9	9	–		9 (Yellow)	21	–	21
	10 (Violet)	10	10	–		10 (Violet)	22	–	22
	11 (Rose)	11	11	–		11 (Rose)	23	–	23
	12 (Aqua)	12	12	–		12 (Aqua)	24	–	24
3	25	1 (Blue)	–	25	4	37	1 (Blue)	–	37
	26	2 (Orange)	–	26		38	2 (Orange)	–	38
	27	3 (Green)	–	27		39	3 (Green)	–	39
	28	4 (Brown)	–	28		40	4 (Brown)	–	40
	29	5 (Slate)	–	29		41	5 (Slate)	–	41
	30	6 (White)	–	30		42	6 (White)	–	42
	31	7 (Red)	–	31		43	7 (Red)	–	43
	32	8 (Black)	–	32		44	8 (Black)	–	44
	33	9 (Yellow)	–	33		45	9 (Yellow)	–	45
	34	10 (Violet)	–	34		46	10 (Violet)	–	46
	35	11 (Rose)	–	35		47	11 (Rose)	–	47
	36	12 (Aqua)	–	36		48	12 (Aqua)	–	48

**Table 5. Splitter & Pass Through Fiber Designations for 72-Fiber Feeder Cables (IFDH 432)**

RIBBON/ SUBUNIT	COLOR SCHEME	FIBER NUMBER	SPLITTER PORT	PASS THROUGH	RIBBON/ SUBUNIT	FIBER NUMBER	FIBER	SPLITTER PORT	PASS THROUGH
1	1 (Blue)	1	1	–	2	1 (Blue)	13	13	–
	2 (Orange)	2	2	–		2 (Orange)	14	14	–
	3 (Green)	3	3	–		3 (Green)	15	15	–
	4 (Brown)	4	4	–		4 (Brown)	16	16	–
	5 (Slate)	5	5	–		5 (Slate)	17	17	–
	6 (White)	6	6	–		6 (White)	18	18	–
	7 (Red)	7	7	–		7 (Red)	19	19	–
	8 (Black)	8	8	–		8 (Black)	20	20	–
	9 (Yellow)	9	9	–		9 (Yellow)	21	21	–
	10 (Violet)	10	10	–		10 (Violet)	22	22	–
	11 (Rose)	11	11	–		11 (Rose)	23	–	23
	12 (Aqua)	12	12	–		12 (Aqua)	24	–	24
3	1 (Blue)	25	–	25	4	37	1 (Blue)	–	37
	2 (Orange)	26	–	26		38	2 (Orange)	–	38
	3 (Green)	27	–	27		39	3 (Green)	–	39
	4 (Brown)	28	–	28		40	4 (Brown)	–	40
	5 (Slate)	29	–	29		41	5 (Slate)	–	41
	6 (White)	30	–	30		42	6 (White)	–	42
	7 (Red)	31	–	31		43	7 (Red)	–	43
	8 (Black)	32	–	32		44	8 (Black)	–	44
	9 (Yellow)	33	–	33		45	9 (Yellow)	–	45
	10 (Violet)	34	–	34		46	10 (Violet)	–	46
	11 (Rose)	35	–	35		47	11 (Rose)	–	47
	12 (Aqua)	36	–	36		48	12 (Aqua)	–	48
5	49	1 (Blue)	–	49	6	61	1 (Blue)	11*	–
	50	2 (Orange)	–	50		62	2 (Orange)	12*	–
	51	3 (Green)	–	51		63	3 (Green)	13*	–
	52	4 (Brown)	–	52		64	4 (Brown)	14*	–
	53	5 (Slate)	–	53		65	5 (Slate)	15*	–
	54	6 (White)	–	54		66	6 (White)	16*	–
	55	7 (Red)	–	55		67	7 (Red)	17*	–
	56	8 (Black)	–	56		68	8 (Black)	18*	–
	57	9 (Yellow)	–	57		69	9 (Yellow)	19*	–
	58	10 (Violet)	–	58		70	10 (Violet)	20*	–
	59	11 (Rose)	9*	–		71	11 (Rose)	21*	–
	60	12 (Aqua)	10*	–		72	12 (Aqua)	22*	–

► **Note:** \*Splitter port numbers marked with asterisk are in bottom row of splitter cage.

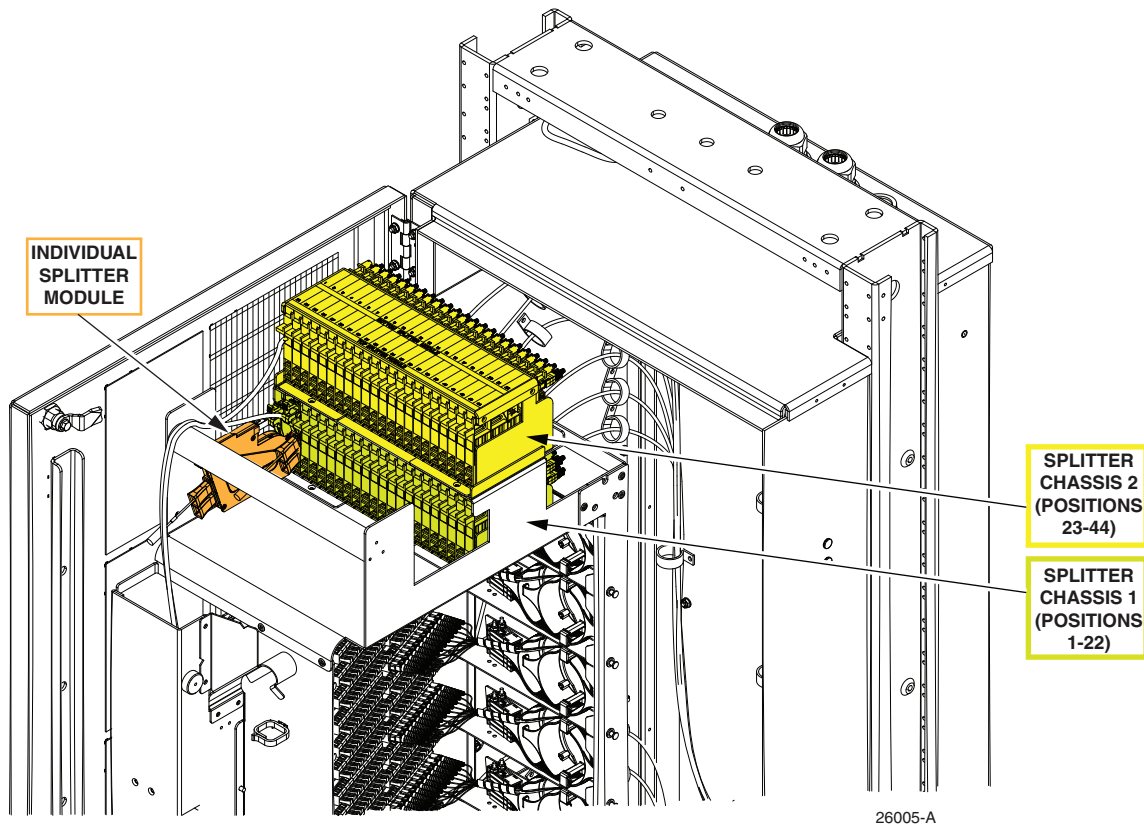
**Table 6. Splitter & Pass Through Fiber Designations for 96-Fiber Feeder Cables (IFDH 576 or 864)**  
**(For Splitter Cage Location and Number, refer to [Figure 33](#))**

RIBBON/ SUBUNIT	COLOR SCHEME	FIBER NUMBER	CAGE NUMBER/ SPLITTER PORT	PASS THROUGH	RIBBON/ SUBUNIT	FIBER NUMBER	FIBER	CAGE NUMBER/ SPLITTER PORT	PASS THROUGH
1	1 (Blue)	1	1/1	–	2	1 (Blue)	13	1/13	–
	2 (Orange)	2	1/2	–		2 (Orange)	14	1/14	–
	3 (Green)	3	1/3	–		3 (Green)	15	1/15	–
	4 (Brown)	4	1/4	–		4 (Brown)	16	1/16	–
	5 (Slate)	5	1/5	–		5 (Slate)	17	1/17	–
	6 (White)	6	1/6	–		6 (White)	18	1/18	–
	7 (Red)	7	1/7	–		7 (Red)	19	1/19	–
	8 (Black)	8	1/8	–		8 (Black)	20	1/20	–
	9 (Yellow)	9	1/9	–		9 (Yellow)	21	1/21	–
	10 (Violet)	10	1/10	–		10 (Violet)	22	1/22	–
	11 (Rose)	11	1/11	–		11 (Rose)	23	2/23	–
	12 (Aqua)	12	1/12	–		12 (Aqua)	24	2/24	–
3	1 (Blue)	25	2/25	–	4	37	1 (Blue)	2/37	–
	2 (Orange)	26	2/26	–		38	2 (Orange)	2/38	–
	3 (Green)	27	2/27	–		39	3 (Green)	2/39	–
	4 (Brown)	28	2/28	–		40	4 (Brown)	2/40	–
	5 (Slate)	29	2/29	–		41	5 (Slate)	2/41	–
	6 (White)	30	2/30	–		42	6 (White)	2/42	–
	7 (Red)	31	2/31	–		43	7 (Red)	2/43	–
	8 (Black)	32	2/32	–		44	8 (Black)	2/44	–
	9 (Yellow)	33	2/33	–		45	9 (Yellow)	–	45
	10 (Violet)	34	2/34	–		46	10 (Violet)	–	46
	11 (Rose)	35	2/35	–		47	11 (Rose)	–	47
	12 (Aqua)	36	2/36	–		48	12 (Aqua)	–	48
5	49	1 (Blue)	–	49	6	61	1 (Blue)	–	61
	50	2 (Orange)	–	50		62	2 (Orange)	–	62
	51	3 (Green)	–	51		63	3 (Green)	–	63
	52	4 (Brown)	–	52		64	4 (Brown)	–	64
	53	5 (Slate)	–	53		65	5 (Slate)	–	65
	54	6 (White)	–	54		66	6 (White)	–	66
	55	7 (Red)	–	55		67	7 (Red)	–	67
	56	8 (Black)	–	56		68	8 (Black)	–	68
	57	9 (Yellow)	–	57		69	9 (Yellow)	–	69
	58	10 (Violet)	–	58		70	10 (Violet)	–	70
	59	11 (Rose)	–	59		71	11 (Rose)	–	71
	60	12 (Aqua)	–	60		72	12 (Aqua)	–	72

**Table 6. Splitter & Pass Through Fiber Designations for 96-Fiber Feeder Cables (IFDH 576 or 864)  
(For Splitter Cage Location and Number, refer to Figure 33)**

RIBBON/ SUBUNIT	COLOR SCHEME	FIBER NUMBER	CAGE NUMBER/ SPLITTER PORT	PASS THROUGH	RIBBON/ SUBUNIT	FIBER NUMBER	FIBER	CAGE NUMBER/ SPLITTER PORT	PASS THROUGH
7	73	1 (Blue)		73	8	85	1 (Blue)	2/33*	
	74	2 (Orange)		74		86	2 (Orange)	2/34*	
	75	3 (Green)		75		87	3 (Green)	2/35*	
	76	4 (Brown)		76		88	4 (Brown)	2/36*	
	77	5 (Slate)		77		89	5 (Slate)	2/37*	
	78	6 (White)		78		90	6 (White)	32/8*	
	79	7 (Red)		79		91	7 (Red)	2/39*	
	80	8 (Black)		80		92	8 (Black)	2/40*	
	81	9 (Yellow)	2/29*			93	9 (Yellow)	2/41*	
	82	10 (Violet)	2/30*			94	10 (Violet)	2/42*	
	83	11 (Rose)	2/31*			95	11 (Rose)	2/43*	
	84	12 (Aqua)	2/32*			96	12 (Aqua)	2/44*	

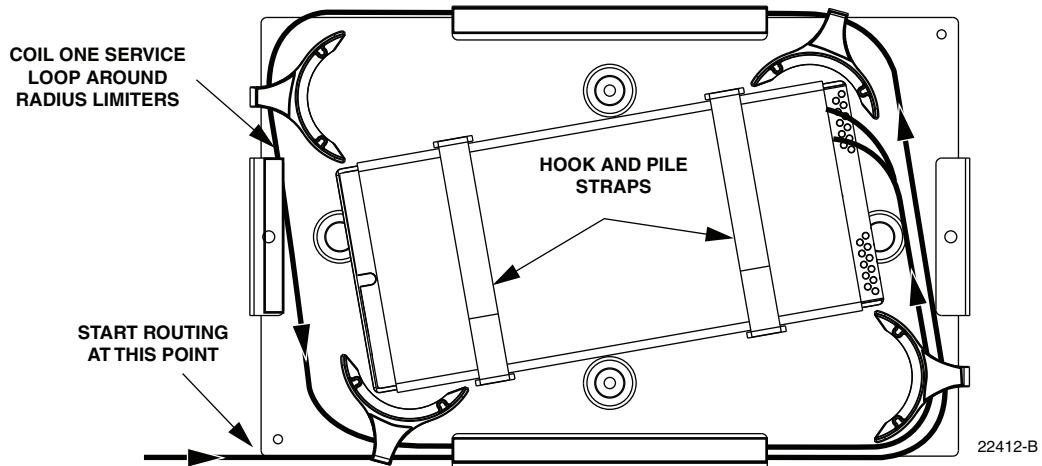
► **Note:** \* Splitter port numbers marked with asterisk are in bottom row of splitter cage.



**Figure 33. Splitter Cage Location and Numbers in IFDH 576/864**



12. After splicing is completed, re-install the clear plastic cover on the splice tray.
13. To replace the splice tray, route the attached tubes around the splice tray holder radius limiters (there should be two service loops) as shown in [Figure 34](#). Avoid twisting or kinking the fiber tubes. Maintain a 1.5-inch (3.81 cm) minimum bend radius for all non reduced bend radius fiber.



**Figure 34. Feeder Splice Tray Replacement**

14. Secure the splice tray to the splice tray holder using the hook and pile strips.
15. Re-install the sheet metal cover on the splice tray holder.
16. Close swing frame and the cabinet door when splicing is finished.

## 5 DISTRIBUTION CABLING

The distribution cables for the IFDH 3000 cabinets are configured as shown in [Figure 35](#). All versions of the IFDH 3000 are equipped with pre-installed ribbon-type IFC distribution cables. The cable stub ends must be spliced to the network distribution cables at a separate splice enclosure (not provided). The cable stub ends are 100 feet (30.5 meters) in length. Distribution cables are riser rated for indoor use.

Either one or two distribution cables may be present depending on the number of terminations supported by the cabinet. One distribution cable is routed to each distribution panel. The fiber count of the cable is equal to the number of terminations provided by the panel.

Each distribution cable is secured to the rear side of the cabinet with a clamp. Beyond the clamp, the outer sheath of the cable is removed to expose the optical fiber ribbons. The fiber ribbons are routed to the distribution panel. Each ribbon is fanned out into 12 individual fibers, each of which is terminated with an SC/APC connector.



Each individual fiber connector is connected to a specified bulkhead adapter at the rear side of the distribution panel. Designation labels are provided on the cabinet doors to record the subscriber information for each distribution port. The labels indicate the fiber number associated with each fiber port. The fiber ribbons are numbered for identification and the individual fibers are color-coded for identification.

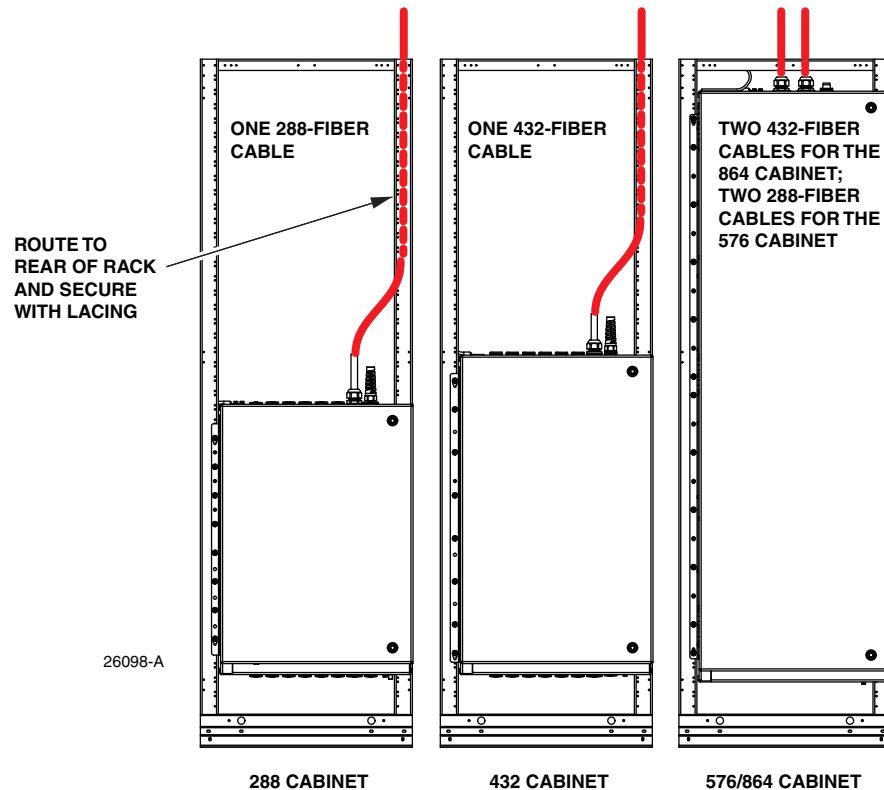


Figure 35. Distribution Cable Configuration

## 6 ROUTING AND CONNECTING THE SPLITTER OUTPUT FIBERS

The splitter modules are mounted at the top of the IFDH 3000 cabinet. When a splitter module is initially installed, the output fibers are routed to the storage panel located at the bottom of the cabinet. At the storage panel, the output fibers are temporarily “parked” until they are needed. Service to a subscriber is enabled by removing an unused output fiber from the parking lot panel, routing it to the appropriate distribution panel, and then connecting it to the subscriber port.

### 6.1 Storing The Splitter Output Fibers

Use the following procedure to store the splitter output fibers (refer to [Figure 36](#)).

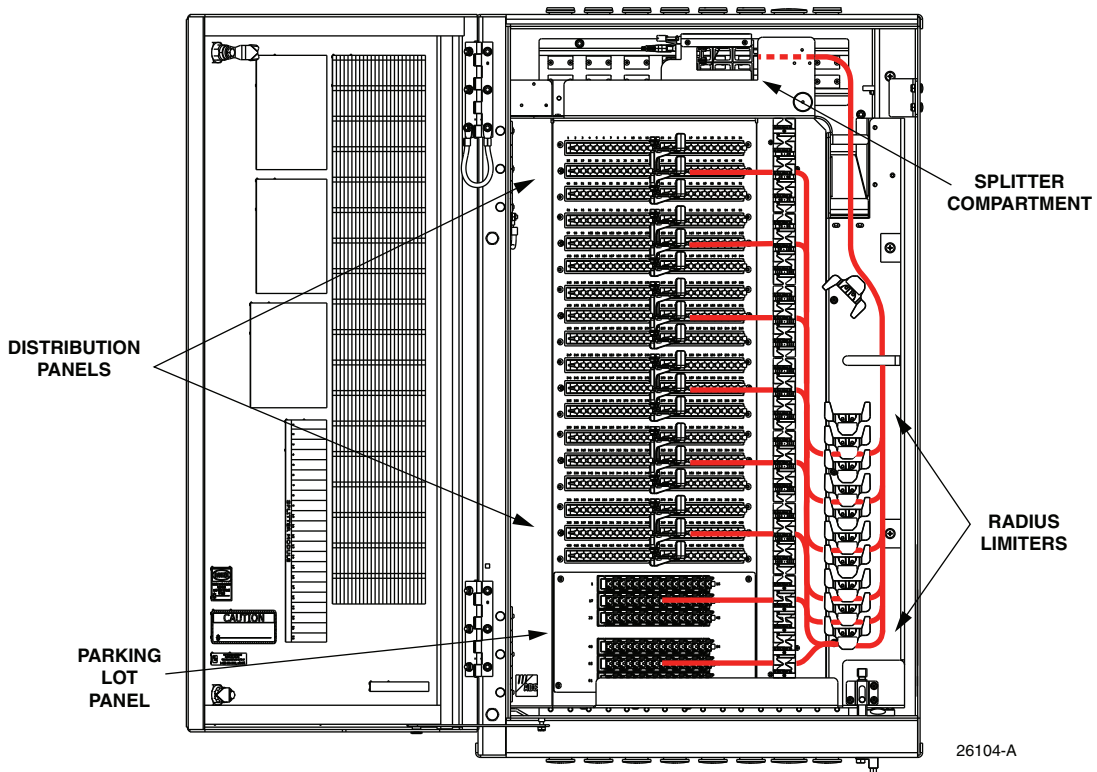
1. Following installation of a splitter module, locate an open connector pack slot in the storage panel at the bottom of the cabinet.

2. Insert the connector pack into the unused slot in the storage panel.
3. Use the radius limiters on the right side of the cabinet to store any excess fiber slack.
4. Remove the ferrule dust cap from the connector and then clean the connector as specified in the Optical Fiber Systems Cleaning and Mating Instructions (ADCP-90-159).



**Warning:** Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the ends of any optical fiber. Do not look directly into the optical adapters or connectors. Exposure to invisible laser radiation may result. An optical power meter should be used to verify active fibers. A protective cap or hood **MUST** be immediately placed over any radiating adapter or optical connector to avoid the potential of dangerous amounts of radiation exposure. This practice also prevents dirt particles from entering the adapter or connector.

5. Connect the splitter output fiber connector to the subscriber port.



**Figure 36. Routing Splitter Output Fibers (432 Cabinet Shown)**

6. Use the radius limiters on the right side of the cabinet to store any excess fiber slack. Refer to [Figure 36](#) for the routing guidelines.

## 6.2 Enabling Service To a Subscriber

Use the following procedure to enable service to a subscriber:

1. Check the designation labels on the cabinet doors to determine the distribution panel and port number that corresponds to the address of the subscriber.
2. Locate the subscriber port on the specified distribution panel and remove both the adapter dust cap and the connector ferrule dust cap.
3. Select and remove an unused splitter output fiber from the storage panel and carefully work it free of any other fibers.



**Warning:** *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the ends of any optical fiber. Do not look directly into the optical adapters or connectors. Exposure to invisible laser radiation may result. An optical power meter should be used to verify active fibers. A protective cap or hood MUST be immediately placed over any radiating adapter or optical connector to avoid the potential of dangerous amounts of radiation exposure. This practice also prevents dirt particles from entering the adapter or connector.*

4. Remove the ferrule dust cap from the connector and then clean the connector as specified in the Optical Fiber Systems Cleaning and Mating Instructions (ADCP-90-159).
5. Connect the splitter output fiber connector to the subscriber port.
6. Use the radius limiters on the right side of the cabinet to store any excess fiber slack. Refer to [Figure 36](#) for the routing guidelines

## 7 PASS-THROUGH ROUTING PROCEDURE

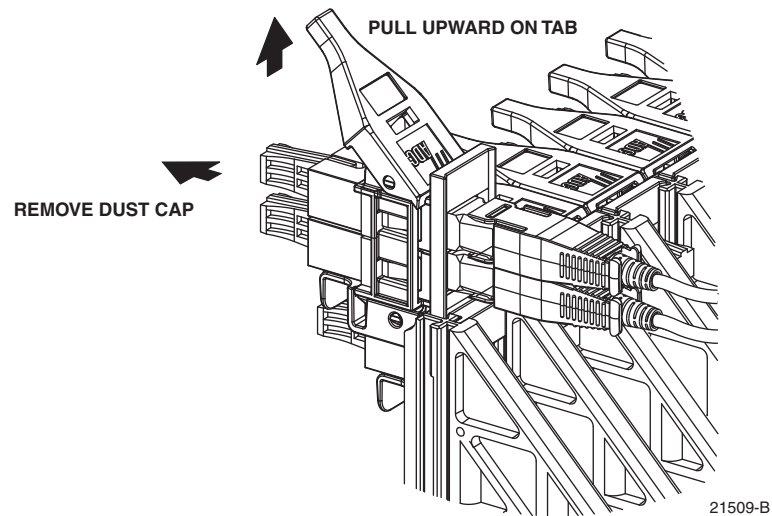
Pass-through routing is used when it is necessary for a feeder cable optical signal to be routed directly to a distribution port. This involves connecting a patch cord between the terminated feeder cable connector and the appropriate distribution port.

Because feeder cable fibers can be terminated at either the pass-through patch panel or the splitter compartment, two pass-through routing procedures are provided.

### 7.1 Sliding Adapter Pack Pass-Through Routing Procedure

Use the following procedure to route a jumper patch cord between the feeder cable pass-through patch panel and one of the distribution panels. Refer to [Figure 37](#) and [Figure 38](#).

1. Locate the appropriate feeder cable connector in the pass-through patch panel.
2. Pull upward on the small tab on top of the adapter pack and lift the adapter pack to the position shown in [Figure 37](#)

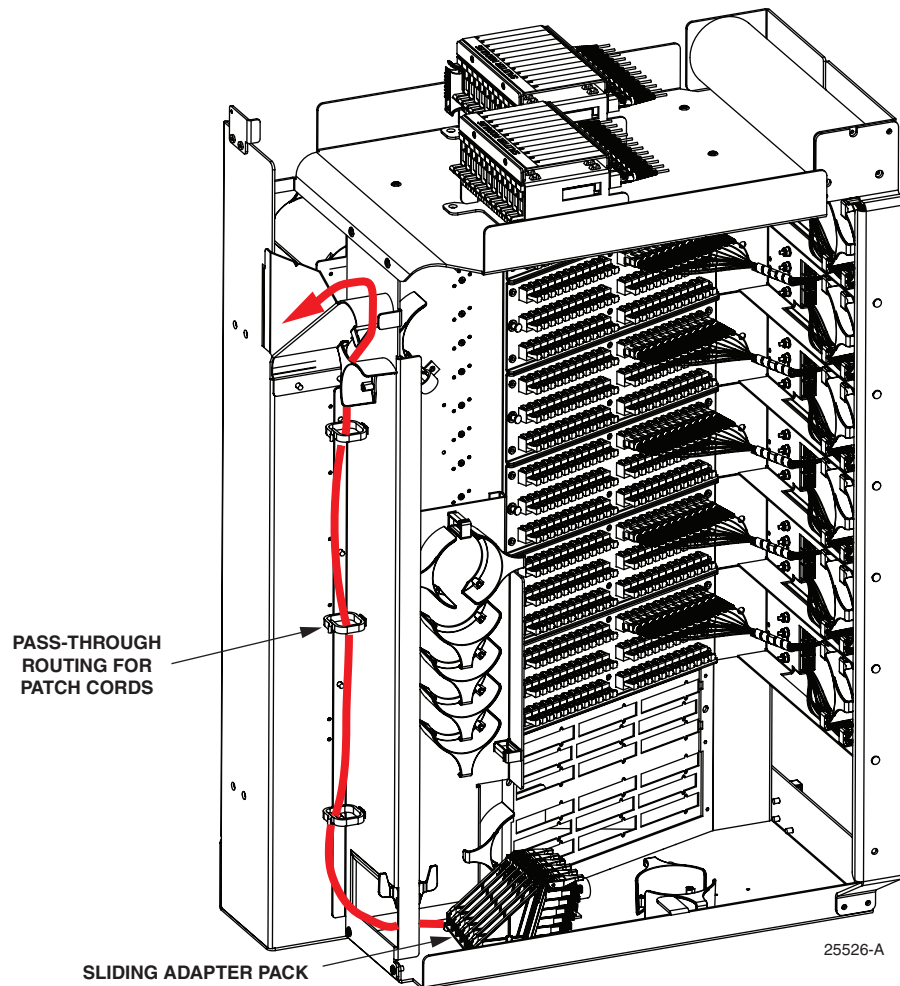


**Figure 37. Typical Adapter Pack Raised to Access Position**



**Warning:** *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the ends of any optical fiber. Do not look directly into the optical adapters or connectors. Exposure to invisible laser radiation may result. An optical power meter should be used to verify active fibers. A protective cap or hood **MUST** be immediately placed over any radiating adapter or optical connector to avoid the potential of dangerous amounts of radiation exposure. This practice also prevents dirt particles from entering the adapter or connector.*

3. Remove the dust cap from the appropriate bulkhead adapter in the sliding adapter pack.
  4. Obtain the optical patch cord (accessory) recommended for the pass-through connection.
- **Note:** The IFDH 432 uses a patch cord of 2.1 M catalog# FPCFW-APSC-P-2.1M for APC/SC connectors. The IFDH 288 uses a patch cord of 1.9 M catalog# FPCFW-APSC-P-1.9M for APC/SC connectors. The IFDH 576/864 uses a patch cord of 4.6 M catalog # FPCFW-APSC-P-4.6M.
5. Remove the ferrule dust cap from one of the patch cord connectors and then clean the connector as specified in the Optical Fiber Connector Wet and Dry Cleaning Instructions (ADCP-90-159) or by locally approved procedures.
  6. Insert the patch cord connector into the bulkhead adapter in the sliding adapter pack.
  7. Slide the adapter pack down into the closed position.
  8. Route the pass-through patch cord to the front side of the swing-out assembly as shown in [Figure 38](#).
  9. Locate the distribution panel and the optical port to which the pass-through patch cord is to be routed.



**Figure 38. Routing Pass-Through Patch Cord From Sliding Adapter Pack**

10. Route the pass-through patch cord to the distribution panel and connect the patch cord connector to the appropriate optical port.
11. Store any slack using the radius limiters at the right of the distribution panel.

## 7.2 Splitter Compartment Pass-Through Routing Procedure

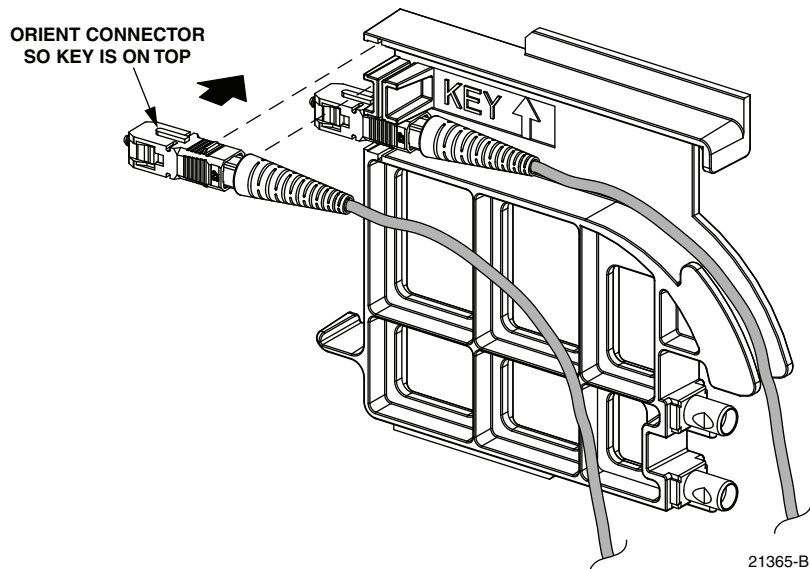
Use the following procedure to route a jumper patch cord between the splitter compartment and one of the distribution panels.

1. Locate an open splitter mounting position.
2. Remove the dust cap assembly from the selected splitter slot.
3. Remove the feeder cable connector from the rear of the splitter compartment (see [Figure 46 on Page 51](#)).



**Warning:** Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the ends of any optical fiber. Do not look directly into the optical adapters or connectors. Exposure to invisible laser radiation may result. An optical power meter should be used to verify active fibers. A protective cap or hood **MUST** be immediately placed over any radiating adapter or optical connector to avoid the potential of dangerous amounts of radiation exposure. This practice also prevents dirt particles from entering the adapter or connector.

4. Clean the feeder cable connector as specified in the Optical Fiber Systems Cleaning and Mating Instructions (ADCP-90-159).
5. Reinstall the feeder cable connector at the rear of the splitter compartment.
6. Obtain the optical patch cord (accessory) recommended for the pass-through connection.
7. Remove the ferrule dust cap from one of the patch cord connectors and then clean the connector as specified in ADCP-90-159 or by locally approved procedures.
8. Install the patch cord connector in the dust cap assembly as shown in [Figure 39](#).



**Figure 39. Installing Patch Cord Connector in Dust Cap Assembly**

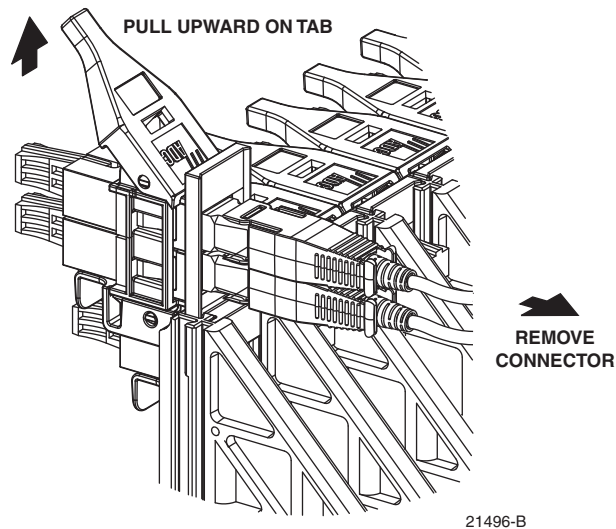
9. Connect the patch cord connector to the feeder cable connector by inserting the dust cap assembly into the splitter slot.
10. Locate distribution panel and optical port to which pass-through patch cord is to be routed.
11. Route the pass-through patch cord to the distribution panel and to connect the patch cord connector to the appropriate optical port.

## 8 FEEDER CABLE PIGTAIL RE-ROUTING PROCEDURE

The feeder cable pigtails may be terminated by the factory at either the sliding adapter pack or at the splitter compartment. Feeder cable pigtails that were terminated at the sliding adapter

pack may sometime require re-termination at the splitter compartment. Use the following procedure to re-route a feeder cable pigtail from the pass-through patch panel to the splitter compartment.

1. At the sliding adapter pack, locate the feeder cable pigtail that requires re-termination at the splitter compartment.
2. Pull upward on the small tab on top of the adapter pack and lift the adapter pack to the position shown in [Figure 40](#).



**Figure 40. Typical Adapter Pack Raised to Access Position**

3. Disconnect the feeder cable connector from the rear side of the sliding adapter pack and place a dust cap over the connector ferrule. This will protect the connector since it will be difficult to prevent the connector from contacting other objects during the re-routing procedure.

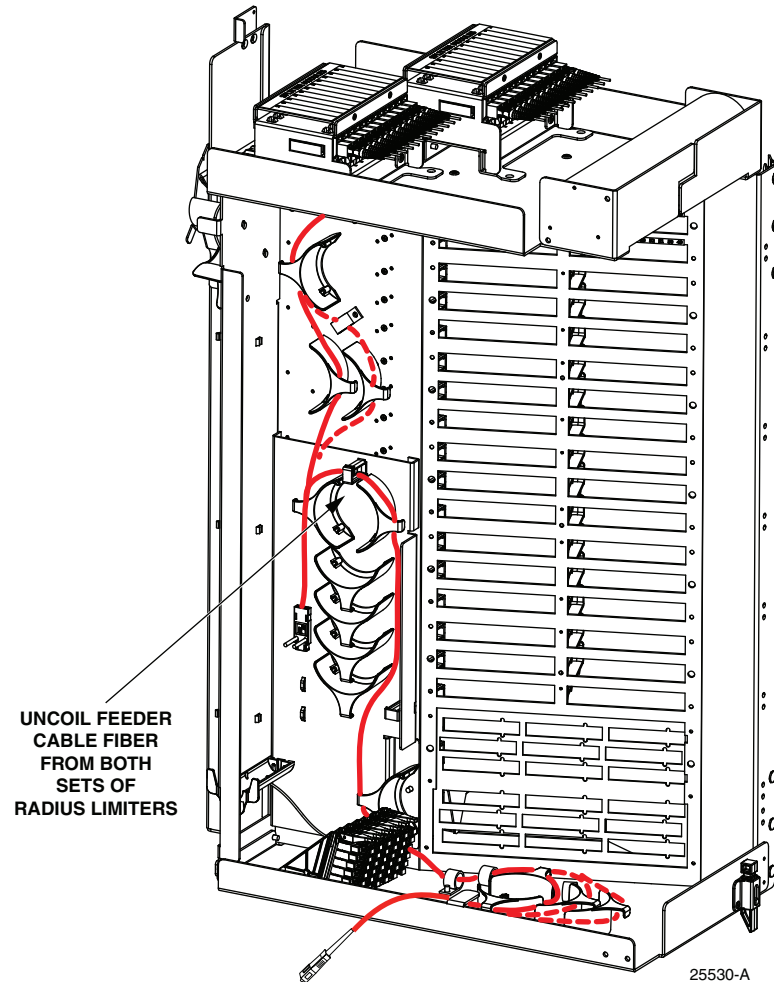


**Warning:** *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the ends of any optical fiber. Do not look directly into the optical adapters or connectors. Exposure to invisible laser radiation may result. An optical power meter should be used to verify active fibers. A protective cap or hood MUST be immediately placed over any radiating adapter or optical connector to avoid the potential of dangerous amounts of radiation exposure. This practice also prevents dirt particles from entering the adapter or connector.*

4. Place a dust cap over the exposed bulkhead adapter and then slide the adapter pack down to the closed position.
5. Carefully unwind the feeder fiber from the radius limiters located on the bottom and on the left side of the swing-out assembly. [Figure 41](#) shows the section of the fiber that will need to be released for re-routing. When necessary, backfeed the fiber to free the connector from the remaining fibers.
6. When the feeder cable connector and fiber are free, pass the connector through the opening located behind the splitter compartment as shown in [Figure 42](#).



7. Remove the ferrule dust cap from the feeder cable connector and then clean the connector as specified in ADCP-90-159) or by locally approved procedures.
8. Insert the feeder fiber connector into the appropriate bulkhead adapter (remove dust cap from adapter) at the rear of the splitter compartment as shown in [Figure 43](#).



**Figure 41. Uncoiling the Feeder Cable Fiber**

- ▶ **Note:** The splitter slot should not be left empty after the feeder fiber is connected to the bulkhead adapter at the rear side of the splitter compartment. Either a dust cap assembly or a splitter should be installed in the mounting slot.
9. Route the feeder fiber over the three supports located at the top of the swing-out assembly.
  10. Store excess slack on the radius limiters located on the left side of the swing-out assembly.



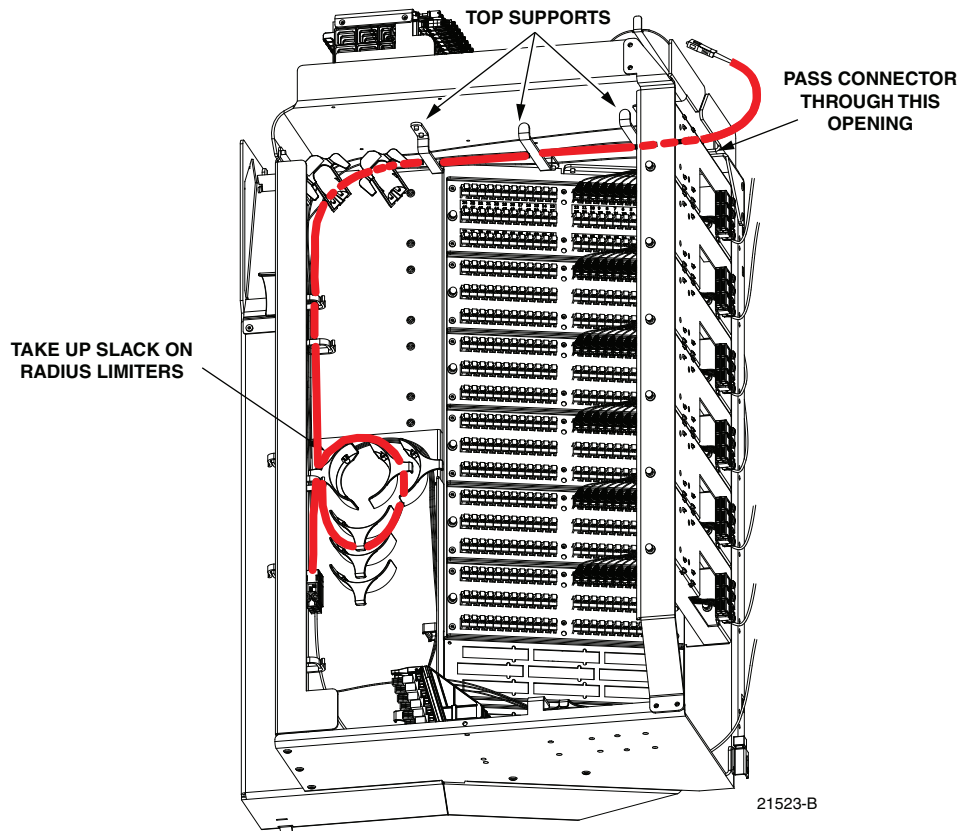


Figure 42. Re-Routing the Feeder Cable Fiber

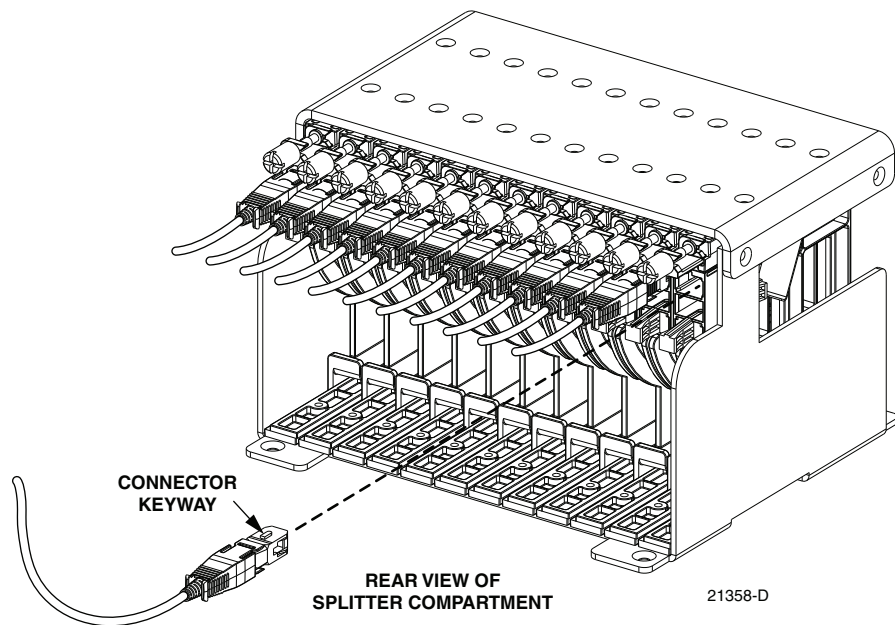


Figure 43. Feeder Cable Connector

## 9 OPERATION METHODS AND PROCEDURES

This section provides instructions for placing the IFDH 3000 into service and procedures that may be required during the operational life of the IFDH 3000.

### 9.1 Safety Precautions and Fiber Handling

Observe the following safety admonishment to avoid possible injury when using the equipment.



**Warning: Avoid Eye Exposure To Unmated Connectors.** *Unmated connectors may emit invisible laser radiation. Do not look directly into the end of a connector or an adapter port. Do not inspect with a magnifying device. To maintain safety and prevent unintentional exposure to laser radiation, keep optical dust caps on unmated connectors at all times.*

Observe the following safety admonishments to avoid accidentally damaging fiber connections and cables.



**Caution: Use Optical Dust Caps.** *Connector plug caps and adapter covers should always be used on unmated connectors and ports. Plug caps should be kept on pre-connectorized pigtails during routing in order to prevent damage to the polished end face on the connector.*



**Caution: Do Not Use Cable Ties On Fiber.** *Cable ties should not be cinched tightly around fiber jumpers because they may cause optical signal loss or even damage the fibers. Cable ties may be used for containment only but not for tight wrapping.*



**Caution: Maintain Fiber Minimum Bend Radius.** *Fiber jumper cables must be arranged in turns, bends, and loops with a bend radius that is not less than the minimum bending radius for the cable. For the individual jacketed jumpers (2 mm) and pigtails (0.9 mm) supplied with the IFDH 3000, the bend radius should not be less than 1.5 inches (38 mm). Outdoor stub cables should not have a bend radius that is less than 20x the cable diameter.*



**Caution: Handle Fiber With Care.** *Do not tug, twist, or tie fiber cables while handling fiber.*

### 9.2 Service Disconnection

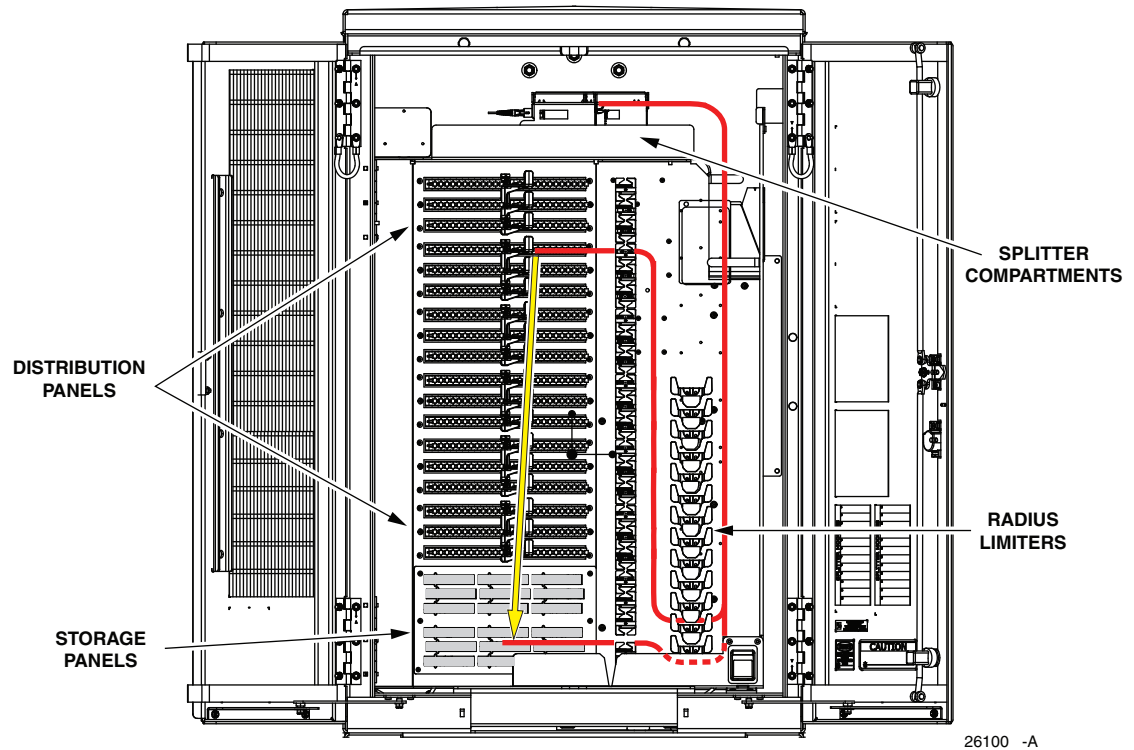
Service is disconnected from a subscriber by removing the appropriate splitter output fiber from the distribution panel, routing it to the splitter module, and then inserting the connector into a storage adapter. Use the following procedure to disconnect service:

1. Use a 216B key tool to release the locking mechanism that secures the cabinet door and then open the door to provide access to the interior of the cabinet.
2. Identify the optical port that corresponds to the subscriber requiring the service disconnection.



**Note:** The distribution panel optical ports are numbered consecutively from top-to-bottom and from left-to-right in a manner similar to how fiber ports are numbered on central office fiber panels.

3. Remove the connector from the appropriate distribution panel optical port and install a ferrule dust cap on the connector.
4. Remove the splitter output fiber from the storage rings below the distribution panel and route it to storage adapters on the front of the splitter module.



**Figure 44. Disconnecting Service**

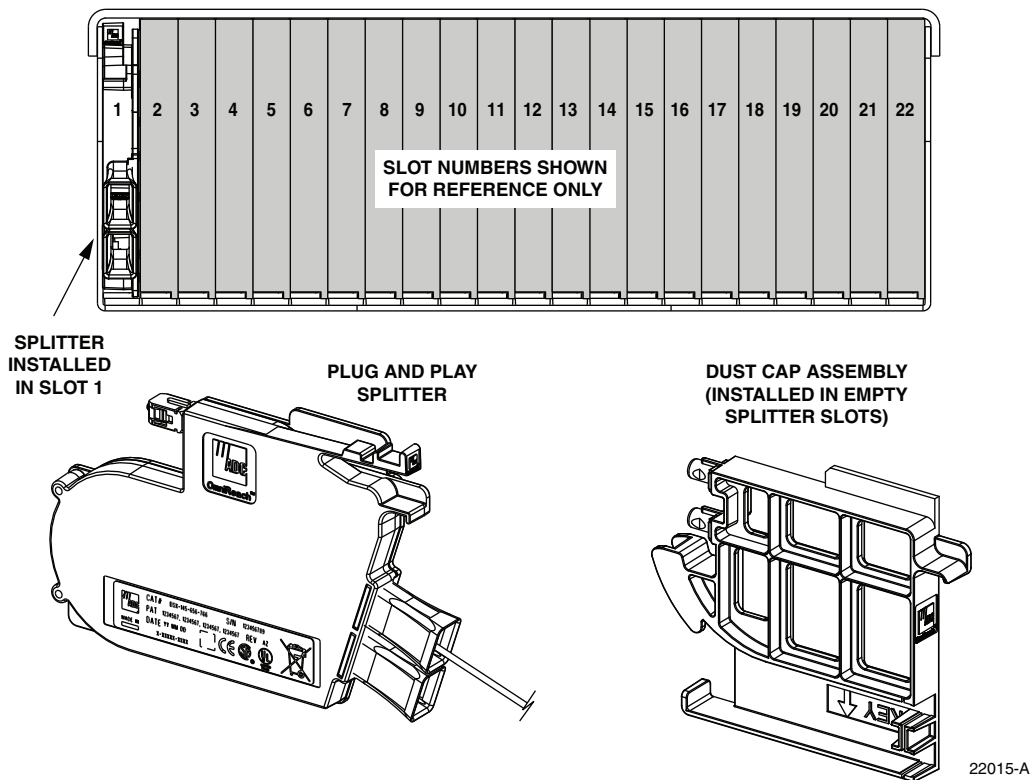
5. Identify the original storage position for the splitter output fiber and remove the dust cap from the corresponding storage adapter.
6. Install the adapter dust cap in the distribution panel optical port that was just vacated.
7. Remove the ferrule dust cap from the splitter output fiber connector and then clean the connector as specified in the Optical Fiber Connector Wet and Dry Cleaning Instructions (ADCP-90-159) or by locally approved procedures.
8. Insert the splitter output fiber connector into the storage adapter on the splitter module
9. Place the splitter output fiber slack into the horizontal rings just below the splitter module.
10. Use the radius limiters on the right side of the cabinet to store any excess fiber slack.
11. Update the information recorded on the Subscriber Termination Field and Splitter Module labels which are attached to the rear side of the cabinet door.
12. Repeat steps 2 though 11 for all service disconnections
13. Close and secure the cabinet door when all service disconnections are completed.

### 9.3 Adding a Splitter Module

The 432 termination indoor FDH 3000 cabinet can accommodate up to 22 single-input mini splitter modules. The 288 termination indoor FDH 3000 cabinet has 18 splitter slots. The 576/864 termination indoor FDH 3000 cabinet has 44 splitter slots. Inserting the splitter into the splitter compartment connects the splitter input connector to the feeder cable connector. Each 1x32 plug and play splitter module is also equipped with up to 32 connectorized output fibers. The splitter output fibers may be either stored for later use or routed to the distribution panels for connection to the distribution ports. Use only splitters equipped with bend-optimized fibers. Use the following procedure to install additional splitters in the cabinet:

► **Note:** The 864 cabinet requires a Plug & Play Splitter Module with 126 inch output pigtail length.

1. Locate the next available splitter mounting position as shown in [Figure 45](#).



**Figure 45. Splitter Module Installation**

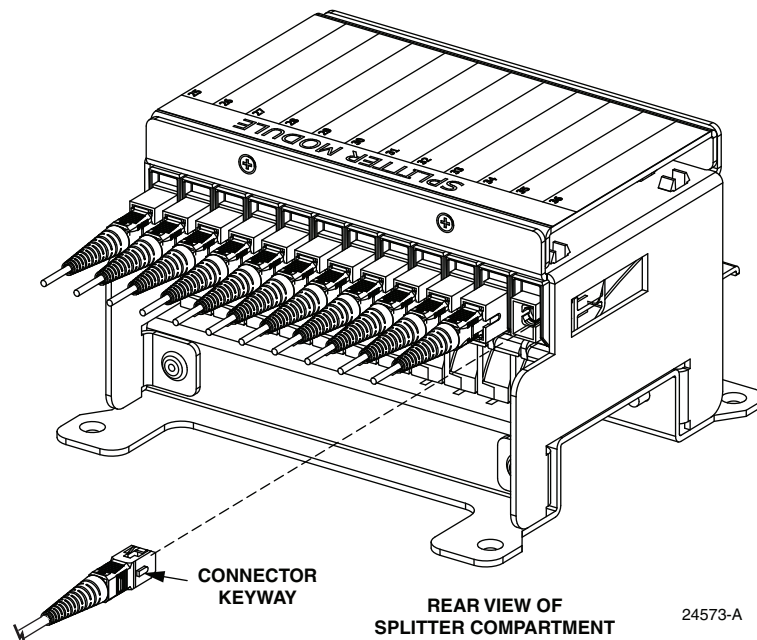
► **Note:** Install splitters in the order shown, beginning on the right side of the splitter compartment and then working toward the left.

2. Remove the dust cap assembly from the selected splitter slot.



**Warning:** *Infrared radiation is invisible and can seriously damage the retina of the eye. Do not look into the ends of any optical fiber. Do not look directly into the optical adapters or connectors. Exposure to invisible laser radiation may result. An optical power meter should be used to verify active fibers. A protective cap or hood MUST be immediately placed over any radiating adapter or optical connector to avoid the potential of dangerous amounts of radiation exposure. This practice also prevents dirt particles from entering the adapter or connector.*

3. Remove the corresponding feeder cable connector from the rear of the splitter compartment as shown in Figure 46.
4. Clean the feeder cable connector per local practice or as specified in the Optical Fiber Systems Cleaning and Mating Instructions (ADCP-90-159).
5. Reinstall the feeder cable connector at the rear of the splitter compartment.
6. Insert the splitter into the mounting slot.
7. Route the splitter output fibers to the connector storage panel or to the designated subscriber port.



**Figure 46. Feeder Cable Connector**

## 10 CUSTOMER INFORMATION AND ASSISTANCE

For CommScope Customer Service, call 1.800.366.3891, extension 73475 (direct 1.952.917.3475). To email for technical service, use *telnet.tac@te.com*. CommScope website address is *www.commscope.com*.

