

Figure 1

## 1. INTRODUCTION

MT-RJ fiber optic connector kits (reference part number 6278398-2) are available for multimode and singlemode applications. The kits, shown in Figure 1, are designed to be applied to 2.8-mm DUALAN cable and 1.8-mm mini zipcord cable. Refer to Figure 1.

Read this material thoroughly before starting assembly.

**NOTE** All numerical values in this instruction sheet are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Figures are not drawn to scale.

Reasons for reissue of this instruction sheet are provided in Section 6, REVISION SUMMARY.

## 2. DESCRIPTION (See Figure 1)

Each connector kit consists of a connector housing, ferrule, pin keeper, compression spring, spring push, crimp eyelet, strain relief, and dust cover. The connector kits are available with or without guide pins.

## 3. REQUIRED TOOLS AND MATERIALS

The following tools and materials are required for applying these fiber optic connector kits to optical fibers (applicable instruction sheet is in parenthesis).

### 3.1. Tools

- cable clamp 1278625-1
- shears 1278637-1
- cable preparation template 1278626-1
- fiber optic combination strip tool 1278947-1 (orange handles) (408-4577)
- MT-RJ plug cure fixture assembly 1278624-1
- fiber optic sapphire scribe tool 504064-1 (408-4293)
- PRO-CRIMPER\* III hand tool assembly 1278632-1 (includes MT-RJ plug die set 1278627-1)
- dual-crimp die set 492025-1
- heat cure oven assembly 502134-5 (120V) and includes curing block 502222-1 (408-9460)
- 200× microscope kit 1754767-1
- MT-RJ plug adapter 1754768-1

### 3.2. Consumables

- EPO-TEK 353-ND epoxy 504035-1
- epoxy applicator kit 501473-3
- cleaning swab 1278817-1 (bag of 10)
- masking tape
- isopropyl alcohol

## 4. ASSEMBLY PROCEDURE

### 4.1. Preparing Fibers

#### A. Kits for DUALAN Fiber Optic Cable Assembly

**DANGER** ALWAYS wear eye protection when working with optical fibers. NEVER look into the end of terminated or unterminated fibers. Laser radiation is invisible but can damage eye tissue. NEVER eat, drink, or smoke when working with fibers. This could lead to the ingestion of glass particles.

**DANGER** Be careful to dispose of fiber ends properly. The fibers create slivers that can easily puncture the skin and cause irritation.

1. Place the cable clamp approximately 180 [7.0] from the end of the cable.
2. Slide the strain relief and crimp eyelet onto the cable. See Figure 2.
3. Mark the end of the cable for stripping. See Figure 3.
4. Using the combination strip tool, strip the outer jacket to the SECOND mark. See Figure 4.

5. Using the shears, trim the aramid strength members back to the cable jacket. See Figure 5.

**CAUTION** Be careful not to damage the fibers.

6. Strip the outer jacket to the FIRST mark. See Figure 6.

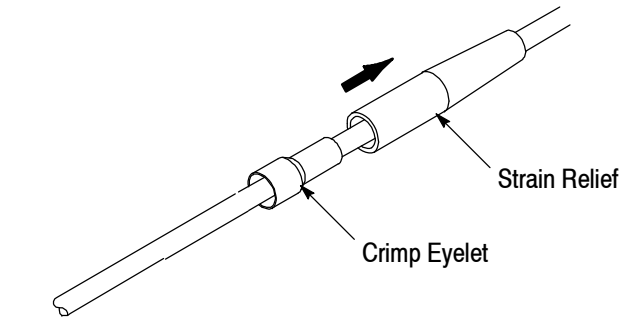


Figure 2

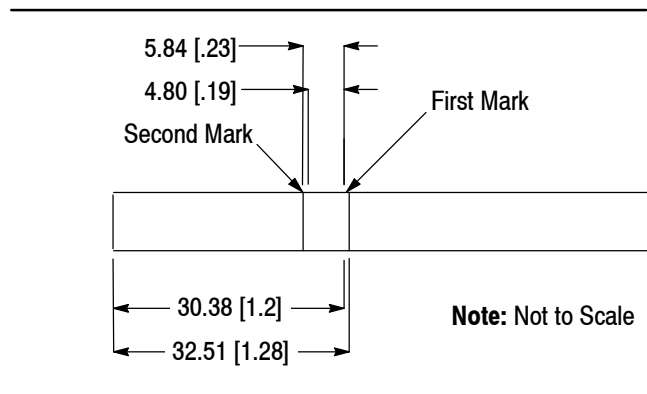


Figure 3

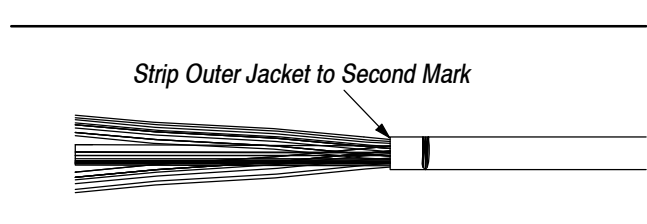


Figure 4

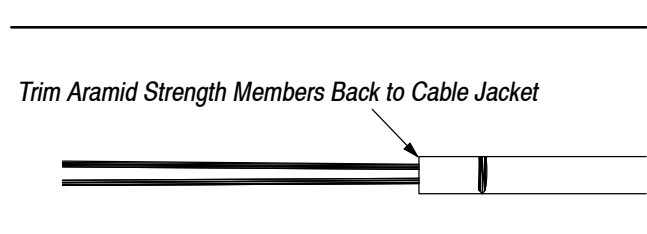


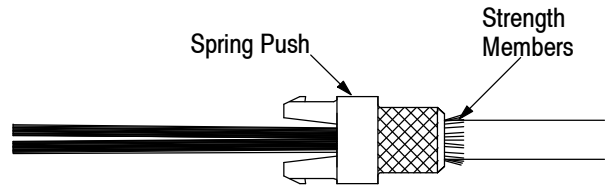
Figure 5



Figure 6

EPO-TEK is a trademark.

7. Slide the spring push over the buffered fibers. Fan the strength members over the knurled portion of the spring push and with the aramid pulled back, position the spring push over the cable jacket. See Figure 7.



**Note:** Masking tape may be used to temporarily hold the spring push in position.

Figure 7

8. Using the combination strip tool, strip both buffered fibers according to the dimensions shown in Figure 8.

**NOTE**

*This operation will expose the glass cladding.*



To remove any coating residue, clean the glass cladding with an alcohol pad or lint-free tissue dampened with isopropyl alcohol.

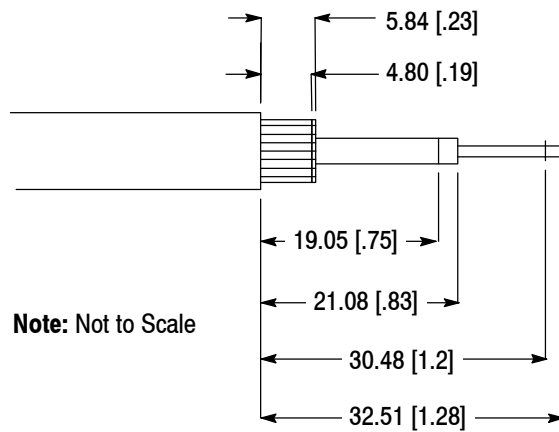


Figure 8

9. Place the compression spring over the fibers. See Figure 9.

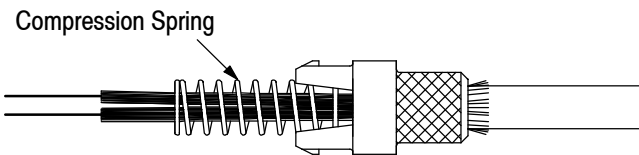


Figure 9

**B. Kits for Mini Zipcord Cable**

**DANGER**



*ALWAYS wear eye protection when working with optical fibers. NEVER look into the end of terminated or unterminated fibers. Laser radiation is invisible but can damage eye tissue. NEVER eat, drink, or smoke when working with fibers. This could lead to the ingestion of glass particles.*

**DANGER**



*Be careful to dispose of fiber ends properly. The fibers create slivers that can easily puncture the skin and cause irritation.*

1. Place the cable clamp approximately 180 [7.0] from the end of the cable.

2. Slide the strain relief and crimp eyelet onto the cable. See Figure 10.

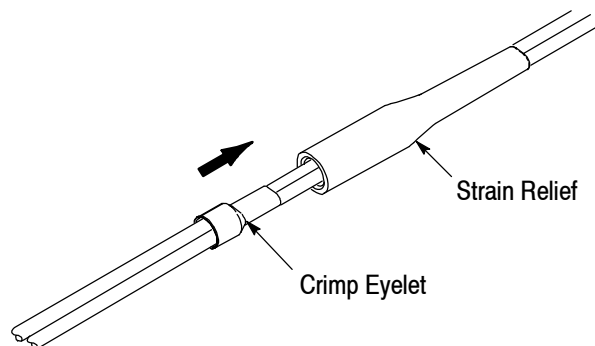


Figure 10

3. Mark the end of the cable for stripping.  
See Figure 11.

4. Using the combination strip tool, strip the outer jacket to the SECOND mark. See Figure 12.

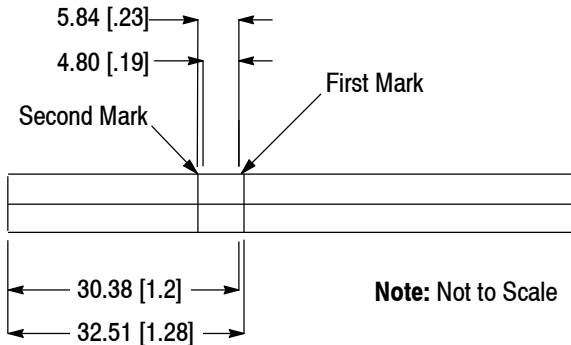


Figure 11

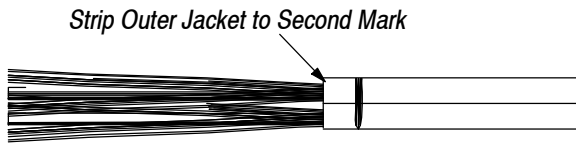


Figure 12

5. Using the shears, trim the aramid strength members back to the cable jacket. See Figure 13.

**CAUTION** Be careful not to damage the fibers.

6. Strip the outer jacket to the FIRST mark. See Figure 14.

7. Slide the spring push over the buffered fibers. Fan the strength members over the knurled portion of the spring push and with the aramid strands pulled back, position the spring push over the cable jacket. See Figure 15.

8. Using the combination strip tool, strip both buffered fibers according to the dimensions shown in Figure 16.

**NOTE** This operation will expose the glass cladding.

To remove any coating residue, clean the glass cladding with an alcohol pad or lint-free tissue dampened with isopropyl alcohol.

9. Place the compression spring over the fibers. See Figure 17.

Trim Aramid Strength Members Back to Cable Jacket

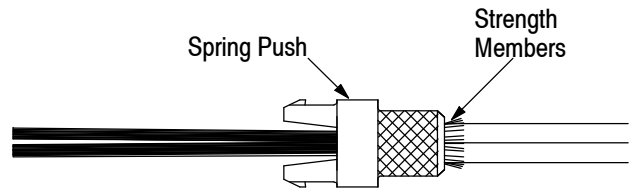


Figure 13

Strip Outer Jacket to First Mark



Figure 14



**Note:** Masking tape may be used to temporarily hold the spring push in position.

Figure 15

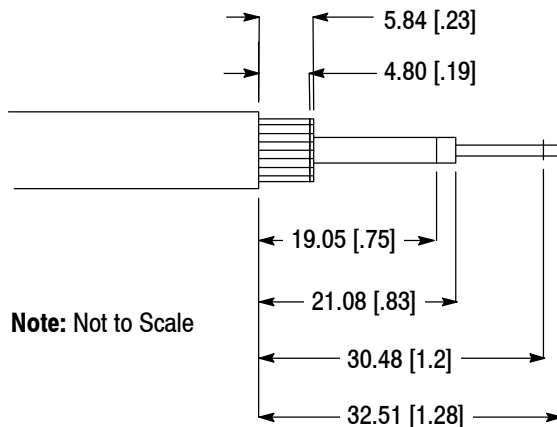


Figure 16

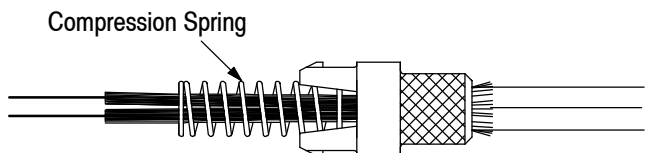


Figure 17

## 4.2. Terminating Fibers

1. Prepare the epoxy according to the package instructions, and fill the applicator from the epoxy applicator kit. Insert and bottom the epoxy applicator into the opening of the ferrule assembly. Slowly begin injecting epoxy into the ferrule. As the window fills, slowly withdraw the applicator while continuing to dispense epoxy. See Figure 18.

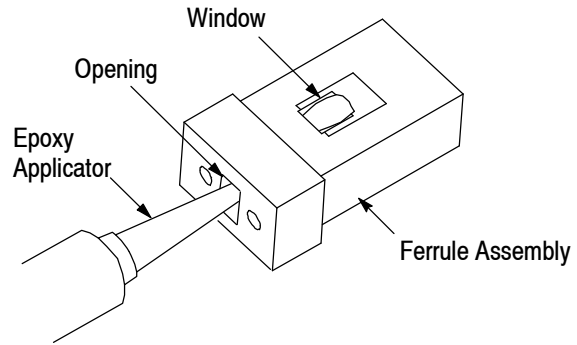


Figure 18

2. With the fibers splayed approximately 0.75 [0.295] apart, insert them into the ferrule. Do not tilt or force the fibers into the ferrule.

**NOTE**

*Be sure to identify the input and output fibers.*



3. In order to coat the fibers with epoxy, use a pistoning motion, gently push the ferrule back and forth at least 10 times. See Figure 19.

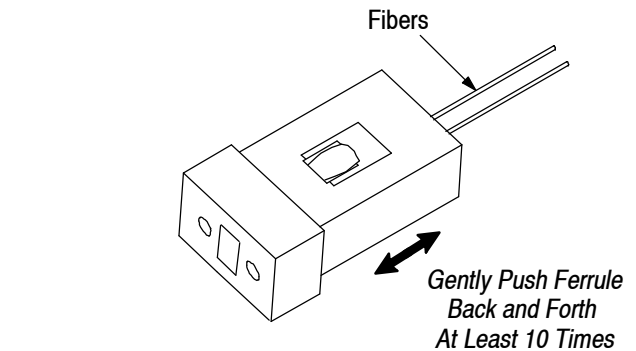


Figure 19

**CAUTION**

*While coating fibers, do not insert the buffer into the ferrule.*



4. Carefully place the buffered fibers into the ferrule opening. The buffer must not be visible through the ferrule window. See Figure 20.

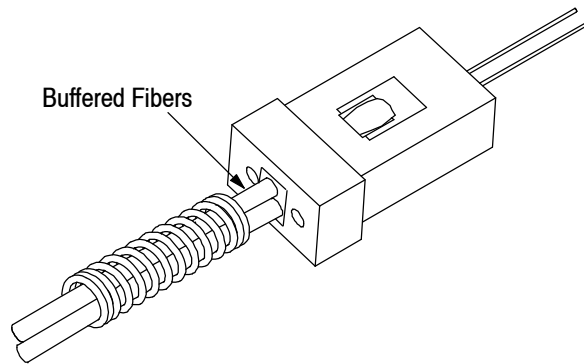


Figure 20

**NOTE**

*If the connector is terminated with 900- $\mu$ m fiber optic cable, the buffered fiber must be inserted diagonally into the ferrule opening.*



5. Rotate the cure fixture lever arm to the LOAD position. See Figure 21.

6. To secure the terminated assembly in the cure fixture:

- Insert the ferrule into its locating pocket.
- Place the spring and spring push into their respective cavities.
- Press the cable jacket into its retaining groove.

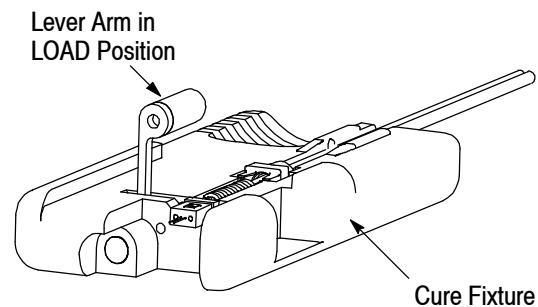


Figure 21



To ensure that the assembly is the proper length, verify that both fibers are fairly straight and the cable jacket has bottomed on the front spring push cavity wall. See Figure 22, Detail A.

d. Rotate the lever arm to the LOCK position. See Figure 22, Detail B.



If masking tape was used to hold the spring push in position, remove it now. However, to ease later assembly, the aramid strands should still be folded under the spring push knurl.

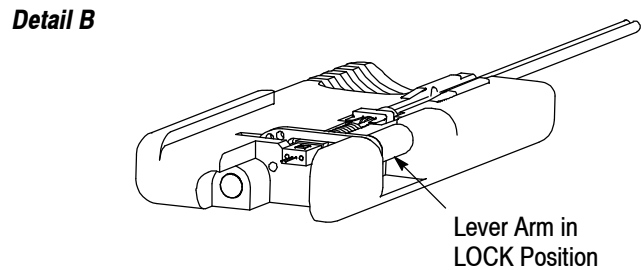
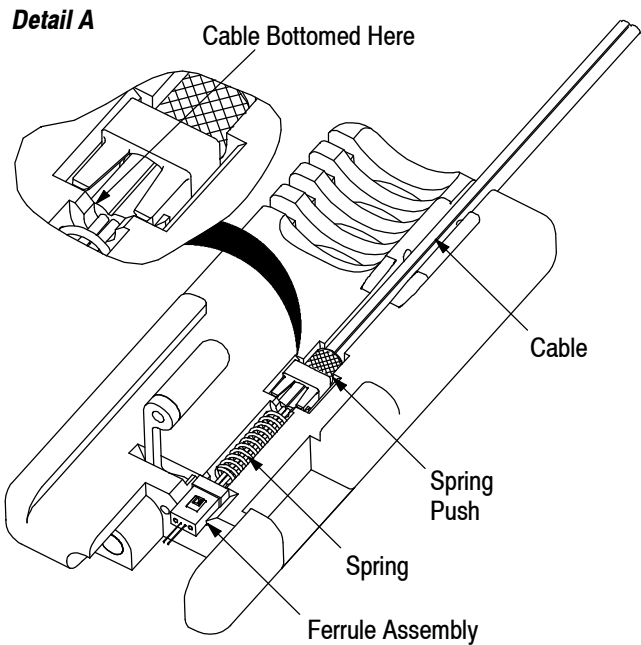


Figure 22

7. Apply a small bead of epoxy (approximately 600- $\mu$ m in diameter) to the base of each protruding fiber. If needed, dispense additional epoxy into the ferrule window. The fibers must be covered; however, the epoxy must not protrude above the ferrule exterior surface. See Figure 23.

8. Hang the assembly down in the heat cure oven, and cure the epoxy for 15 minutes at 115°C [239°F].

9. After curing, use the cable to gently lift the assembly out of the heat cure oven.



Upon removal from the heat cure oven, the assembly will be HOT. Allow sufficient time for the assembly to cool.

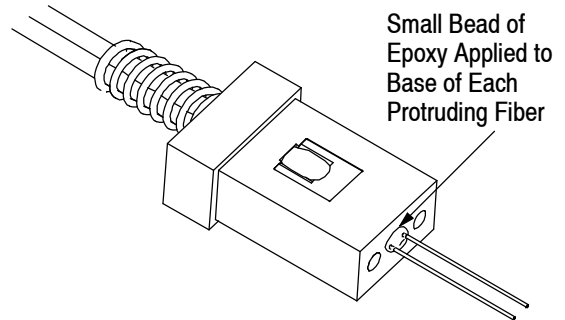


Figure 23

10. Rotate the cure fixture lever arm to the EJECT position and carefully remove the assembly. See Figure 24.

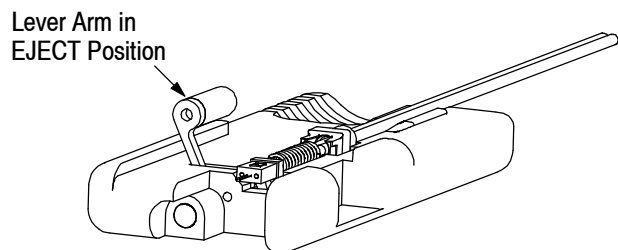


Figure 24

11. Place the scribe tool directly above the epoxy and lightly draw the beveled edge across each fiber. See Figure 25. After scoring the fiber, pull it straight away from the connector to complete the cleaving operation.



*Safely dispose of excess fiber.*



*Do not saw or cut off fiber with the scribe tool. This could fracture the fiber, making the connector unusable. Also, do not allow the scribe tool to contact the epoxy. This may damage the sapphire tip.*

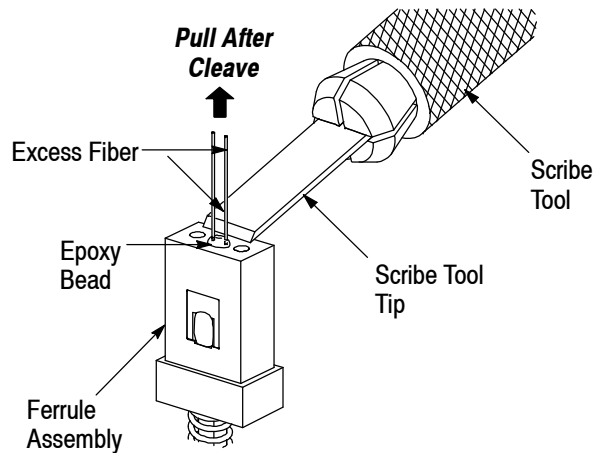


Figure 25

### 4.3. Polishing

Due to the inconsistencies of hand polishing multiple fibers, it is recommended that a polishing machine be used. Refer to the polishing machine manufacturer for instructions.

After polishing, using the microscope kit or magnifier, refer to Figure 26, and check the end face for the following:



*NEVER inspect or look into the end of terminated or unterminated fibers. Laser radiation is invisible but can damage eye tissue.*

- small chips in the outer ring are permissible (large chips or chips in the center of the fiber mean that the polish is unacceptable; therefore, re-polishing or re-termination is necessary)
- deep scratches or large pits indicate that the ferrule must be re-polished
- epoxy residue left on the end face is unacceptable and the ferrule should be re-polished

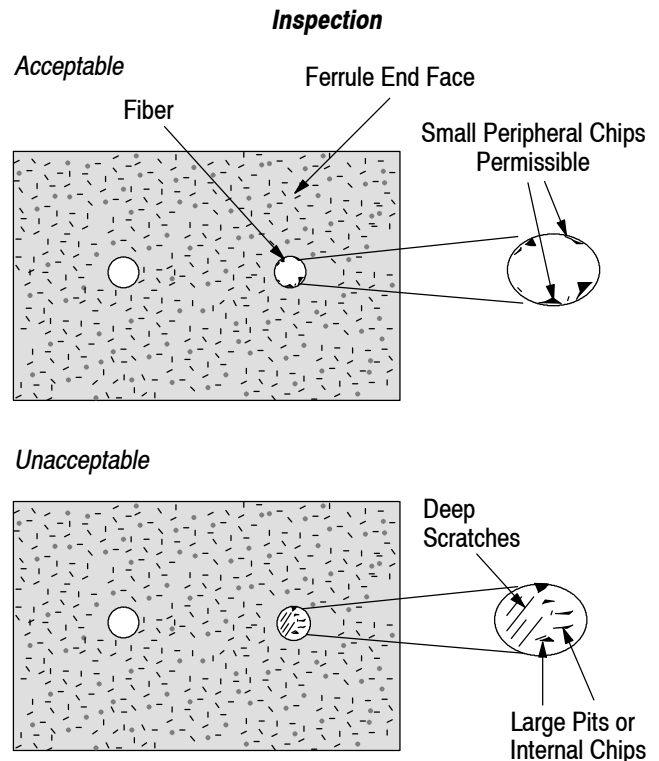


Figure 26

#### 4.4. Connector Assembly

##### A. Kits for DUALAN Fiber Optic Cable Assembly

1. Install the pin keeper behind the ferrule. Keep the recessed pocket facing toward the spring. See Figure 27.

**NOTE**  
 The compression spring may need to be compressed to allow clearance.

##### Kits for DUALAN Fiber Optic Cable Assembly

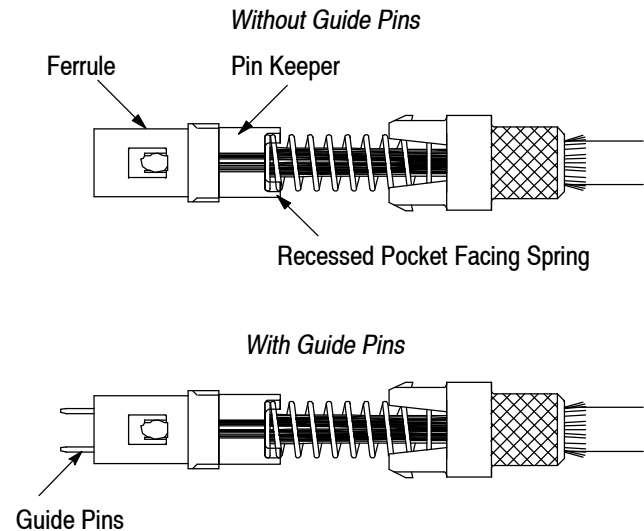


Figure 27

2. First, slowly insert the assembly into the housing (see Figure 28, Detail A) until the ferrule protrudes through the front of the housing (see Figure 28, Detail B). Second, insert the spring push into the rear of the housing until the latches engage. This is denoted by an audible “click” (see Figure 28, Detail B). If the spring push was previously taped in place, remove the tap before insertion.

**CAUTION**  
 Do not force the ferrule into the housing.

**NOTE**  
 Be sure to identify the input and output fibers.

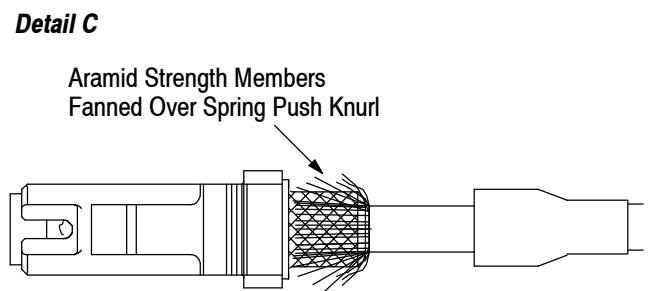
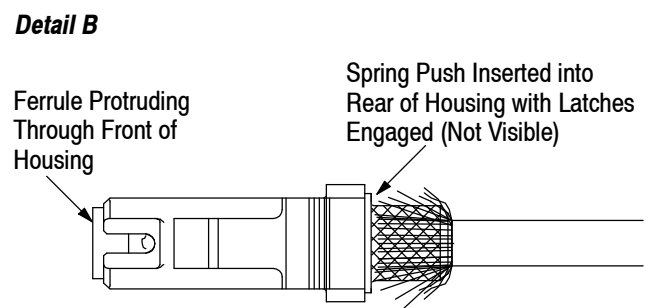
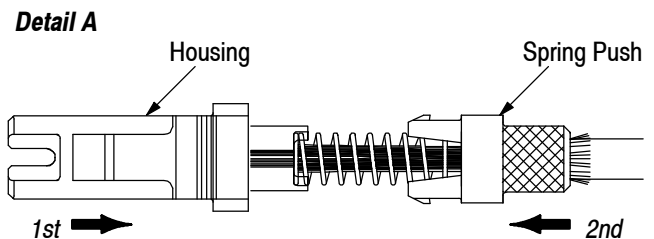


Figure 28

3. Fan the aramid strength members over the spring push knurl. See Figure 28, Detail C.
4. Position the crimp eyelet over the aramid strength members. Crimp the crimp eyelet using the hand tool assembly and dual-crimp die set. See Figure 29.
5. Remove the cable clamp.
6. While holding the connector assembly, slide the strain relief toward the connector until it covers the entire crimp eyelet. See Figure 30.
7. Place the dust cover over the connector.



Connector Assembly in Crimping Chamber Marked 3.0

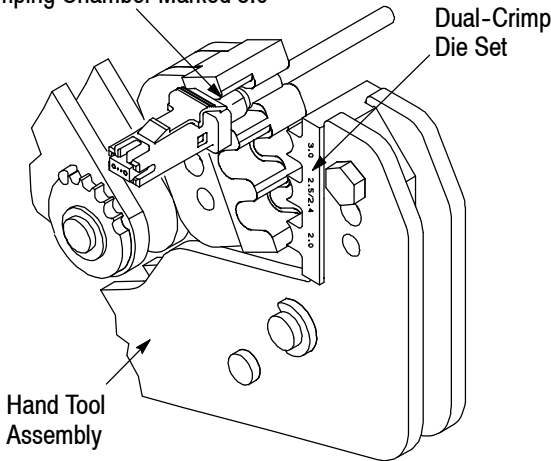


Figure 29

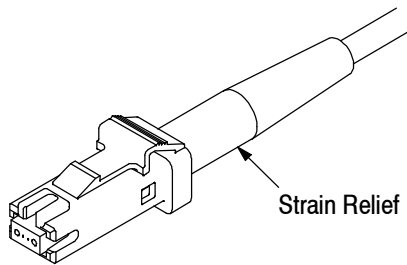


Figure 30

#### 4.5. Kits for Mini Zipcord Cable

1. Install the pin keeper behind the ferrule. Keep the recessed pocket facing toward the spring. See Figure 31.

**NOTE**  
 The compression spring may need to be compressed to allow clearance.

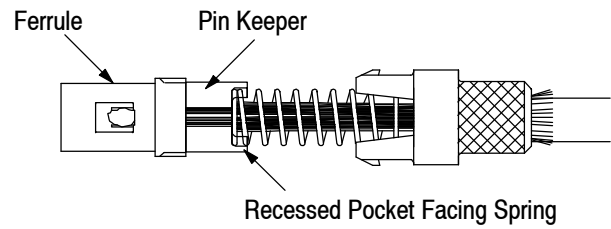
2. First, slowly insert the assembly into the housing (see Figure 32, Detail A) until the ferrule protrudes through the front of the housing (see Figure 32, Detail B). Second, insert the spring push into the rear of the housing until the latches engage. This is denoted by an audible “click”. See Figure 32, Detail B.

**CAUTION**  
 Do not force the ferrule into the housing.

**NOTE**  
 Be sure to identify the input and output fibers.

#### Kits for Mini Zipcord Cable

Without Guide Pins



With Guide Pins

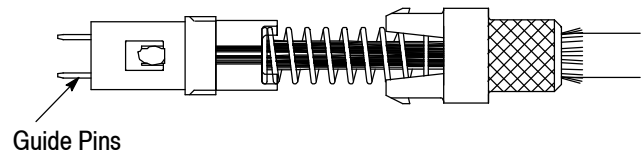
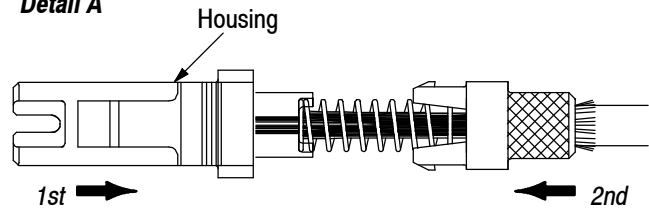


Figure 31

Detail A



Detail B

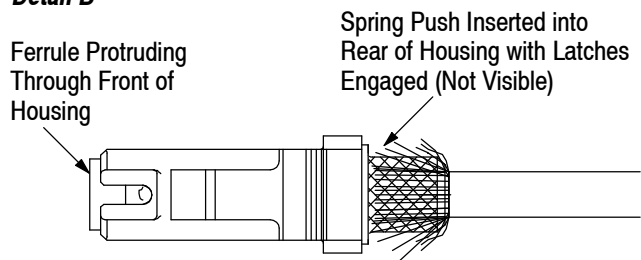


Figure 32

**NOTE**  
 If the spring push was previously taped in place, remove the tape before insertion.

3. Fan the strength members over the spring push knurl, position the eyelet over the strength members, and place the housing into the die alignment guide of the MT-RJ die set. See Figure 33.

**NOTE**  
 To ensure that the eyelet is correctly positioned, it should bottom on the spring push body.

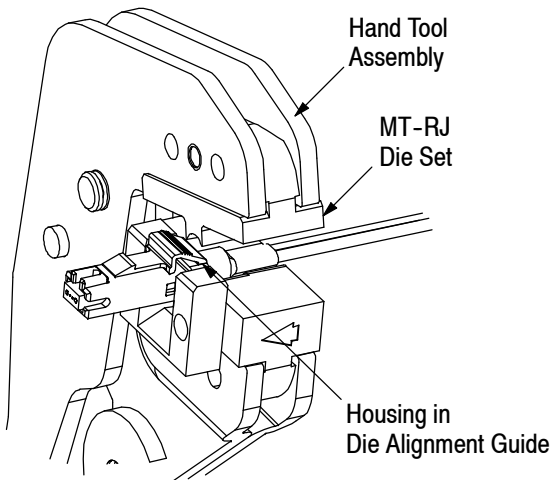


Figure 33



**NOTE** When located in the die alignment guide, the housing latch can be oriented in the 12 or 6 o'clock position.

4. With the eyelet centered in the indenter of the MT-RJ die set, crimp the assembly.
5. Remove the cable clamp.
6. While holding the connector assembly, slide the strain relief toward the connector until it covers the entire crimp eyelet. See Figure 34.
7. Place the dust cover over the connector.

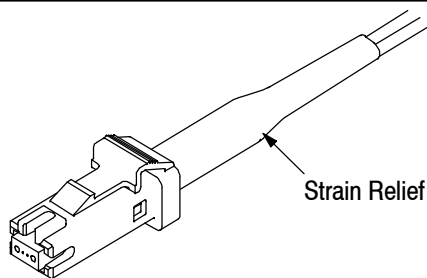
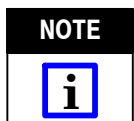


Figure 34

## 5. CLEANING PROCEDURE



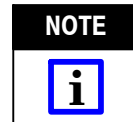
**DANGER** To avoid personal injury, compressed air used for cleaning must be reduced to less than 207 kPa [30 psi], and effective chip guarding and personal protective equipment (including eye protection) must be used.



**NOTE** A connection optical performance is, to a large degree, dependent on the state of cleanliness. Therefore, this documented cleaning procedure should be followed very specifically.

### 5.1. One Connector Removed from Adapter

1. Blow compressed air into the open end of the adapter.
2. With an alcohol moistened swab, wipe completely around the ferrule end face twice.
3. Repeat Step 2 using a dry swab.
4. Blow compressed air across the ferrule end face.

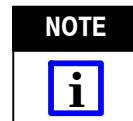


**NOTE** This is the final step before inserting the plug. DO NOT wipe the ferrule or allow it to touch anything before mating the connector.

5. Mate the connector to the adapter.
6. If optical loss is unacceptable, inspect the end face for debris using a microscope, and repeat Steps 1 through 5.
7. If the optical loss is still too high, unmate both connectors, and follow Paragraph 5.2.

### 5.2. Two Connectors Removed from Adapter

1. Blow compressed air through the adapter.
2. With an alcohol moistened swab, wipe completely around the ferrule end face twice.
3. Repeat Step 2 using a dry swab.
4. Blow compressed air across the ferrule end face.



**NOTE** This is the final step before inserting the plug. DO NOT wipe the ferrule or allow it to touch anything before mating the connector.

5. Mate the connector to the adapter.
6. Repeat Steps 2 through 5 with the second plug.
7. If optical loss is unacceptable, inspect the end faces for debris using a microscope, and repeat Steps 1 through 6.

## 6. REVISION SUMMARY

Revisions to this instruction sheet include:

- Removed reference to MT-RJ plug termination kit from Paragraph 3.1
- Removed quick cure adhesive from Paragraph 3.2 and Step 3 of Paragraph 4.4,A