

Figure 1

1. INTRODUCTION

AMP* LightCrimp SC Ceramic Multimode Connector Kits 503692-1 (simplex) and 503693-1 (duplex) are applied to fiber-optic cable. Read this material thoroughly before starting assembly.

- NOTE** *Coupling Receptacle Kit 502632-[] is used to mate two simplex SC style connectors in free-hanging or panel-mount applications.*
- Coupling Receptacle Kit 502776-[] is used to mate two duplex SC style connectors in free-hanging or panel-mount applications.*

- NOTE** *Dimensions on this sheet are in metric units [with U.S. customary units in brackets]. The figures are for identification only and are not drawn to scale.*

Reasons for reissue are provided in Section 9, REVISION SUMMARY.

2. DESCRIPTION

AMP LightCrimp SC connectors are fully compatible with AMP OPTIMATE* SC connectors and other SC style multimode connectors, without requiring epoxy during assembly of the connector. Figure 1 shows the simplex connector kit which consists of a dust cover,

connector housing, plug assembly, crimp eyelet, strain relief, bare fiber boot, small diameter tubing, and large PVC tubing.

The connectors accommodate buffer sizes 250- μ m (coated fiber) and 900- μ m (tight buffer) and are used with 125- μ m glass fiber cable only.

The large diameter black PVC tubing is used only with cables having a jacket diameter less than 3.0 mm [.12 in.] and greater than or equal to 2.3 mm [.09 in.]. The bare fiber boot is used with 900- μ m tight buffer and 250- μ m coated fiber. The small diameter tubing is used to build up a 250- μ m coated fiber to a 900- μ m diameter. Only the plug assembly, crimp eyelet, inner eyelet, and strain relief boot are needed for cable constructions having a 900- μ m tight buffer, strength members, and a nominal jacket diameter of 3.0 mm [.12 in.].

3. PREPARATION

3.1. Required Tools and Materials

The following AMP tools and materials are required for applying the connectors to optical fibers (corresponding AMP instruction sheets are in parenthesis).

A. Tools

- Cable Preparation Template 503694-1
- Cable Stripper 501198-1 (408-9394)
- Scissors 501014-1
- Micro-Strip Stripper 492109-2, 203- μ m [.008-in.]
- Miller Strip Tool 501554-1
- Hand Tool 503699-1 (includes Die Set 503698-1)
- Cleave Tool Assembly 503705-1
- Polishing Bushing 503787-1, metal or Polishing Bushing 502631-1, plastic
- Polishing Plate 501197-2
- Polishing Pad 504584-1
- Duplex Insertion Tool 492042-1

Optional

- Sapphire Pen Cleave Tool 504064-1 (408-4293)
- Inspection Microscope Kit 502970-1 (408-9801)

B. Consumable Items

- 5- μ m Polishing Film 228433-8
- .3- μ m Polishing Film 228433-5
- Isopropyl Alcohol
- Lint-Free Tissues (such as Wipes 504440-1)

NOTE All of the above items and additional tools are included in Termination Kit 503706-1.

3.2. Preparing Fibers

NOTE These instructions apply only to AMP LightCrimp SC ceramic ferrule connector kits when used with buffered, jacketed, or unjacketed fibers.

DANGER To avoid personal injury, 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 ingestion of glass particles. CAREFULLY DISPOSE OF FIBER ENDS. The fibers create slivers that can easily puncture the skin and cause irritation.

A. Preparing Jacketed Cable

1. If using cable with a jacket diameter less than 3.0 mm [.12 in.], slide the large PVC tubing over the cable jacket. See Figure 2.
2. Slide the strain relief (small diameter end first) over the cable jacket. See Figure 2.
3. Refer to Figure 3 or the cable preparation template, and using the cable stripper, strip the cable jacket to between 44.5 mm [1.75 in.] and 47.0 mm [1.85 in.].
4. Using the scissors, trim the length of the strength members to between 8.89 and 10.2 mm [.35 and .40 in.]. See Figure 3.

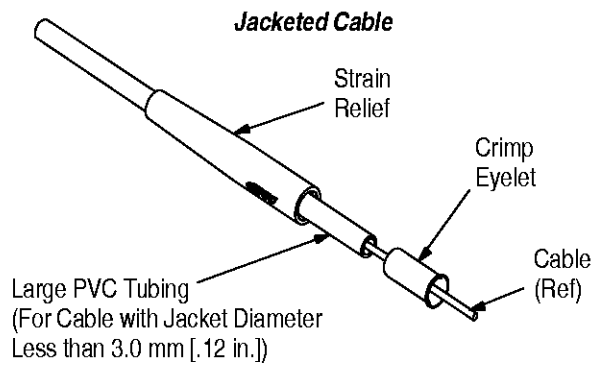
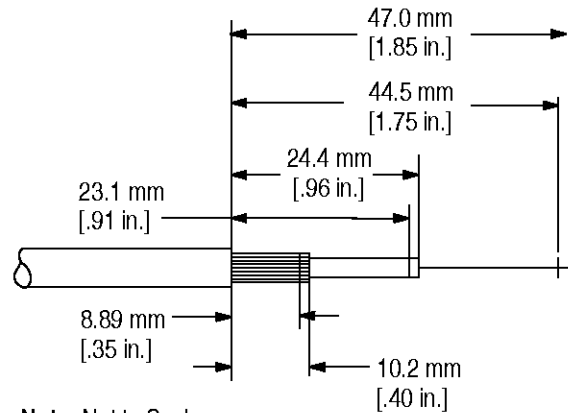


Figure 2



Note: Not to Scale

Figure 3

5. Slide the crimp eyelet onto the buffer. Using the eyelet, push the strength members to one side of the cable jacket. Fold back the strength members and retain them with the crimp eyelet. Refer to Figure 4.
6. Slide the inner eyelet over the buffer and inside the cable jacket and strength members until it bottoms.

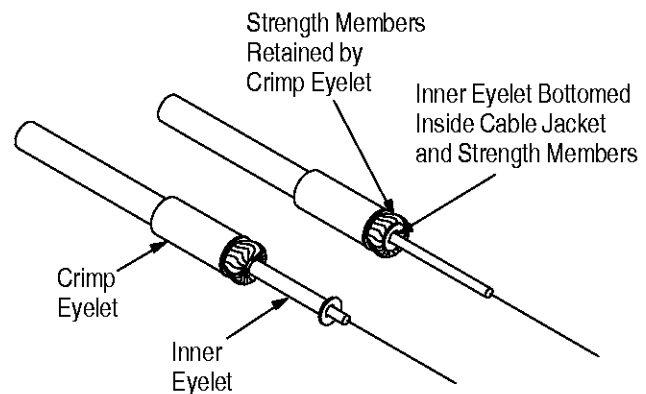


Figure 4

7. Using the micro-strip stripper, mark and strip the fiber buffer to between 23.1 and 24.4 mm [.91 and .96 in.]. See Figure 3. Refer to instructions packaged with the stripper for proper use of the stripper. Several steps may be needed to remove all of the buffer.

CAUTION Make sure that the stripper removes the clear coating on the fiber. If the 250- μ m coating remains on the fiber, the prepared fiber will stub in the connector and will not pass through.

NOTE The buffer material tends to remain in the stripper. A good practice is to tap the stripper on a soft surface to remove debris immediately after stripping the buffer.

8. Remove debris on the fiber by wiping the stripped fiber with a lint-free tissue dampened with isopropyl alcohol.

B. Preparing 900- μ m Buffered Fiber

NOTE Only the plug assembly and bare fiber boot are used to prepare 900- μ m buffered fiber and 250- μ m coated fiber for termination.

1. Slide bare fiber boot onto the 900- μ m buffered fiber as shown in Figure 5.
2. Using the micro-strip stripper, strip the fiber buffer to between 20.32 and 23.4 mm [.80 and .92 in.]. See Figure 6. Refer to instructions packaged with the stripper for proper use of the stripper. Several steps may be needed to remove all of the buffer.

CAUTION Make sure the stripper removes the clear coating on the fiber. If the 250- μ m coating remains on the fiber, the prepared fiber will stub in the connector and will not pass through.

NOTE The buffer material tends to remain in the stripper. A good practice is to tap the stripper on a soft surface to remove debris immediately after stripping the buffer.

3. Remove debris on the fiber by wiping the stripped fiber with a lint-free tissue dampened with isopropyl alcohol.

C. Preparing 250- μ m Coated Fiber

When using this type of fiber, various fiber preparations and terminations are possible. If a breakout kit is used where the 250- μ m coated fiber is inserted into a breakout cable with strength members, follow Paragraph 3.2,A. In place of stripping the buffer, remove the fiber coating using the micro-strip stripper and insert the small diameter tubing into the plug assembly before inserting the fiber.

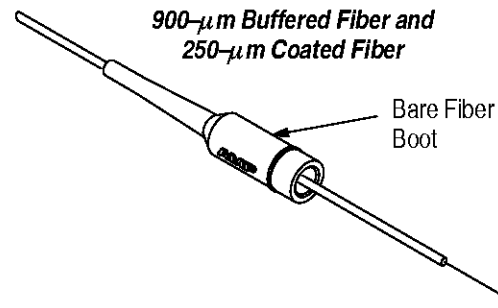
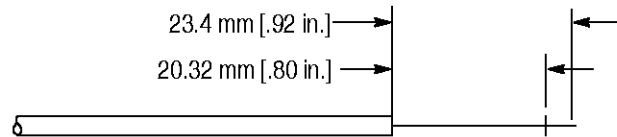
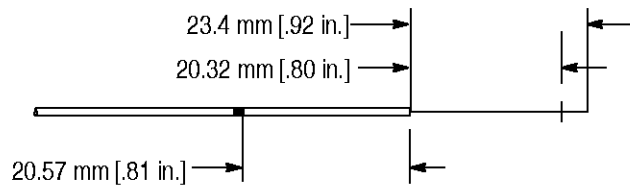


Figure 5

For 900- μ m Buffered Fiber



For 250- μ m Coated Fiber



Note: Not to Scale

Figure 6

NOTE For terminating 250- μ m coated fiber when no breakout kit is used, the fiber end and terminations should be housed in a limited-access protective enclosure.

1. Slide bare fiber boot onto the 250- μ m coated fiber as shown in Figure 5.
2. Refer to Figure 6, and using the Miller strip tool, strip the fiber coating to between 20.32 and 23.4 mm [.80 and .92 in.].
3. Place a mark on the 250- μ m coating 20.57 mm [.81 in.] behind the fiber/coating interface. See Figure 6.
4. Insert the small diameter tubing into the plunger of the plug assembly until it protrudes 18 mm [.07 in.] from the knurled end of the plug assembly. See Figure 7.

NOTE If the tubing protrudes more than the recommended dimension, re-insert the tubing into the plunger. When the first obstruction is felt, move the tubing rapidly inward and outward until the tubing protrudes 18 mm [.07 in.] from the knurled end of the plug assembly.

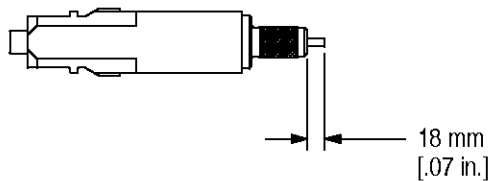


Figure 7

5. Remove debris on the fiber by wiping the stripped fiber with a lint-free tissue dampened with isopropyl alcohol. On gel-filled cables, all gel must be removed by wiping with a suitable cleaning material.

4. TERMINATION PROCEDURES

CAUTION

Hand Tool 503699-1 and Die Set 503698-1 must be used to terminate this product. Make sure that the proper tooling is used by verifying the part number stamped on the tool and die set.

4.1. Jacketed Cable

1. Insert fiber optic cable through the knurled end of the plug assembly. A slight rotating motion may be necessary to center the fiber in the plug assembly. While slightly rotating the plug assembly, gently push the fiber through the knurled end until it protrudes from the ferrule face, and the buffer bottoms in the plug assembly. Approximately 12.7 mm [.50 in.] of fiber should protrude from the ferrule face of the plug assembly.

2. Squeeze tool handles until the ratchet releases. Open the tool handles fully.

3. Close tool gently until you hear one click from the ratchet.

CAUTION

To prevent the fiber from breaking, be careful when positioning the plug assembly in the dies.

4. Position the plug assembly in the dies so that the glass fiber is oriented in the same direction as the arrow on the die set. Carefully insert glass fiber into the long slot of the die set. The knurled end of the plug assembly is positioned in the larger width slot of the die set. See Figure 8.

5. Squeeze tool handles together while gently pushing on the cable to ensure that it follows the insertion of the plunger. Squeeze the tool handles until the ratchet releases. Open the tool handles fully while holding the plug assembly. Remove the plug assembly by sliding the knurled end out of the die set. *Be careful not to break the exposed fiber.*

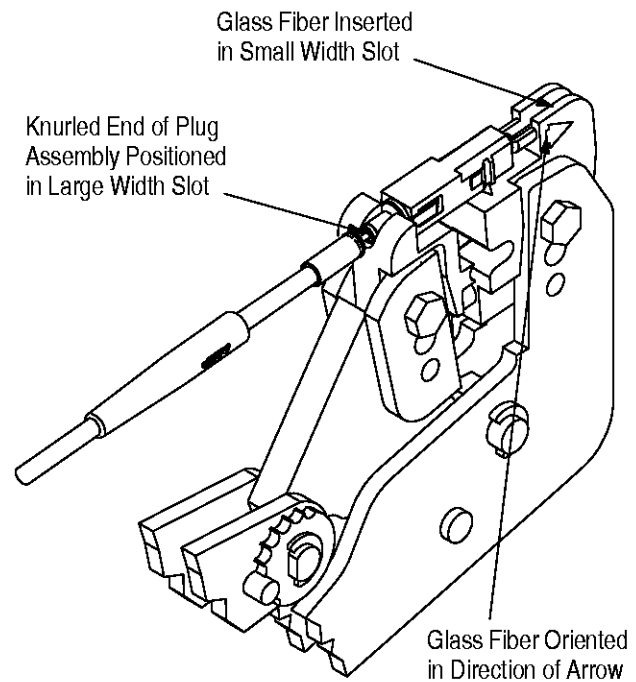


Figure 8

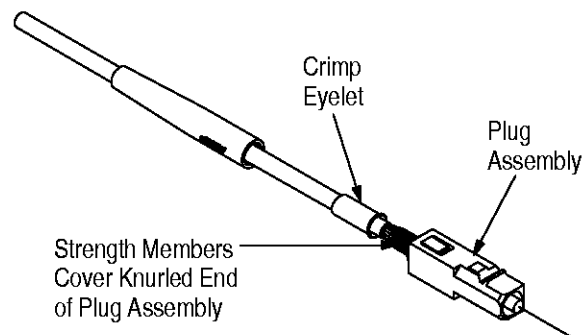


Figure 9

6. Slide crimp eyelet away from the plug assembly so that the strength members are exposed. Gently push on the plug assembly so the gap between the knurled end of the plug assembly and the cable jacket is small enough to allow the strength members to completely cover the knurled end on the plug body. See Figure 9.

7. Slide crimp eyelet forward over the strength members, retaining the strength members against the knurled end of the plug assembly.

8. Insert crimp eyelet and plug assembly into the dies as shown in Figure 10. The plug assembly is properly oriented if the glass fiber is positioned in the same direction as the arrow located on the recessed area of the die set. See Figure 10.

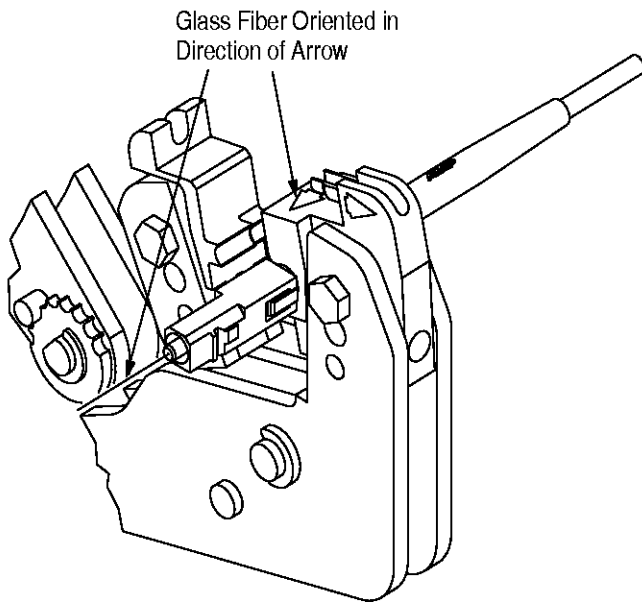


Figure 10

NOTE The crimp eyelet crimping chamber is stepped. Applying an eyelet to an improperly oriented plug assembly can damage the tool and plug assembly. The ratchet can be released without fully closing the handles by gently prying the lever at ratchet area with a probe, such as a screwdriver.

9. Squeeze tool handles together until the ratchet releases. Open the tool handles fully and remove the crimped plug assembly. *Be careful not to break the exposed fiber.*

10. If using cable with a jacket diameter less than 2.3 mm [.09 in.], slide the large PVC tubing and strain relief over the crimp eyelet until the tubing is positioned against the plug assembly.

11. Slide the strain relief boot over the crimp eyelet until it bottoms.

4.2. 900- μ m Buffered and 250- μ m Coated Fiber

1. Insert fiber optic cable through the knurled end of the plug assembly. A slight rotating motion may be necessary to center the fiber in the plug assembly. While slightly rotating the plug assembly, gently push the fiber through the knurled end until it protrudes from the ferrule face and the buffer bottoms in the plug assembly. Approximately 12.7 mm [0.5 in.] of fiber should protrude from the ferrule face of the plug assembly.

NOTE On 250- μ m coated fiber, make sure the mark made on the coating is visible just beyond the edge of the small diameter tubing at the back of the plug assembly.

2. Squeeze the tool handles until the ratchet releases. Open the tool handles fully.
3. Close the handles gently until you hear one click from the ratchet.

CAUTION To prevent the fiber from breaking, be careful when positioning the plug assembly in the dies.

NOTE On multifiber cable, orient all plug assemblies the same way during crimping.

4. Position the plug assembly in the dies so that the glass fiber is oriented in the same direction as the arrow on the die set. Carefully insert the glass fiber into the long slot of the die set. The knurled end of the plug assembly is positioned in the larger width slot of the die set. See Figure 8.

5. Squeeze tool handles together fully until the ratchet releases. Open the tool handles fully while holding the plug assembly. Remove the plug assembly by sliding the knurled end out of the die assembly. *Be careful not to break the exposed fiber.*

6. Slide the bare fiber boot over the knurled end of the plug assembly.

5. CLEAVING THE FIBER (Figure 11)

CAUTION If the cleave tool is not used properly, the diamond blade will be damaged.

CAUTION All screws are factory preset for the cleave tool. Adjustments will result in poor cleaves.

1. Insert plug assembly into the cleave tool so that the protruding fiber is guided through the slot in the tool. See Figure 11.

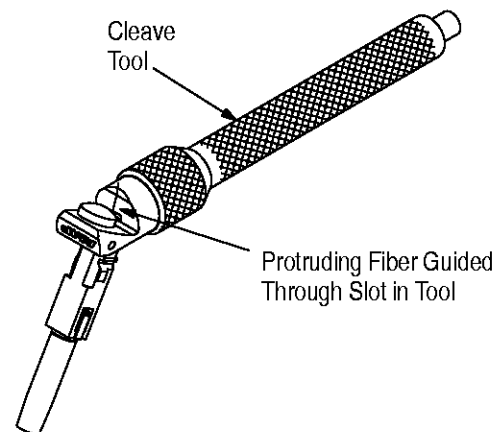


Figure 11

2. Make sure that the fiber extends beyond the edge of the cleave tool. If it does not, scribe the fiber using the sapphire pen scribe tool.

CAUTION

Gently brush the blade across the fiber at a 3 to 5° angle, about one fiber diameter from the ferrule surface. See Figure 12. Do not apply force on the fiber with the blade while scribing, since excessive force may fracture the fiber inside of the ferrule, making the connector unusable. Grasp the protruding fiber lightly between the thumb and forefinger; then pull in line with the connector. If the fiber does not scribe easily, re-scribe the fiber and try again. A proper scribe, close to the ferrule surface, is essential for obtaining a successful fiber polish.

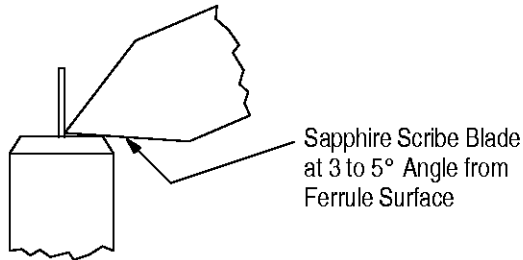


Figure 12

3. Push the plug assembly ferrule into the bore until the ceramic ferrule stops at the panhead screw.
4. Gently depress the tool actuator button to cleave the fiber.

DANGER

To avoid personal injury, hold the plug assembly away from your face when pushing the actuator button.

CAUTION

To safely dispose of the cleaved fiber, invert the cleaving tool and plug assembly over a container, or use a piece of masking tape (with the sticky side facing up) to catch the fiber.

5. Place the dust cap onto the plug assembly ferrule if the fiber is not polished immediately.

6. POLISHING THE FIBER**NOTE**

Initially, the polishing plate has protective paper covering both sides. Remove the paper from both sides of the polishing plate. The resilient pad is backed with adhesive. Remove the backing from the pad and place it on the polishing plate. Smooth the pad by hand rubbing.

1. Cut a small piece (50 by 50 mm [2 by 2 in.]) of the 5- μ m polishing film.
2. Hold one end of the polishing film between the index and middle fingers, and hold the other end between the thumb and ring finger with the

abrasive side of the paper facing up. Pull the film taut and air polish the connector tip by gently rubbing the tip of the connector in small circles (or figure-8 pattern) until the protruding stub of the cleaved fiber no longer makes scratches on the film. See Figure 13.

CAUTION

During the initial stages of polishing, be careful to avoid breaking off the fiber inside of the ferrule, thereby making the connector unusable.

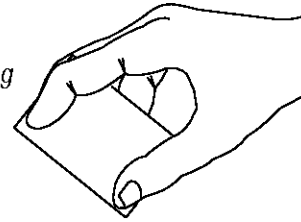
Method of Holding
Polishing Film

Figure 13

3. Place a piece of the .3- μ m polishing film on top of the resilient pad.
4. Gently insert connector into the polishing bushing (the connector will snap into place).
5. Place the plastic polishing bushing onto the polishing film and move the bushing in a figure-8 pattern while supporting the weight of the bushing for the first three figure-8 patterns to prevent the fiber from breaking or scoring the film.

CAUTION

Scored film should be replaced immediately to prevent fiber breakage.

CAUTION

Do not wet the polishing film with water. These connectors require a dry polish.

6. Using gentle pressure on the bushing, continue polishing for 25 to 30 more figure-8 patterns.
7. Remove the connector from the polishing bushing and clean it with a lint-free cloth or tissue. Dabbing the ferrule end face on a resilient piece of tape will remove any stubborn polishing grit. Using a lint-free cloth lightly dampened with isopropyl alcohol will remove any tenacious debris from the end face.

NOTE

A protruding fiber (PF) polish often provides superior connector performance. It is recommended to leave the fiber protruding slightly (approximately 5- μ m [.0002 in.] from the ferrule surface.

8. Place the plug assembly in the appropriate receptacle or place the dust cap onto the plug assembly if the assembly is not used immediately.

7. ASSEMBLING THE CONNECTOR

1. Insert the plug assembly into the connector housing. The key on the housing must be toward the front (fiber side) and must line up opposite to the completely flat side of the plug assembly. The housing aligns with the plug assembly as shown in Figure 1.

2. Push on the base of the plug assembly and the connector housing until the two snap together. The housing should slide back and forth approximately 3 mm [.125 in.] on the plug assembly.

NOTE *If using the duplex connector kit and 250- μ m or 900- μ m fiber, it may be necessary to use the duplex insertion tool to push the plug assembly into the connector housing. Pull the bare buffer boot back, then feed the fiber through the slot in the tool, and push the plug assembly forward until the plug assembly and housing snap together. Push the bare fiber boot forward to protect the fiber.*

8. INSPECTING THE FIBER

DANGER *Disconnect cable from the power signal source before inspecting. The infrared light used, although it cannot be seen, can cause injury to the eye.*

1. Inspect the connector with a 100x microscope. If possible, place the far end of the fiber near a bright light. Compare the fiber end to the examples shown in Figure 14 and take any recommended action.

2. Verify that the fiber is flush (or is protruding by only a few microns) with the ferrule surface by moving the microscope focus control. If the fiber and the ferrule surface come into focus together, the fiber is flush. If the fiber comes into focus before the ferrule surface (when moving toward the end face), the fiber is protruding by too much and additional polishing on the .3- μ m film is required.

9. REVISION SUMMARY

Revisions to this instruction sheet per EC 0990-0684-97 include:

- Added Duplex Insertion Tool 492042-1 to Paragraph 3.1,A
- Added NOTE to Section 7

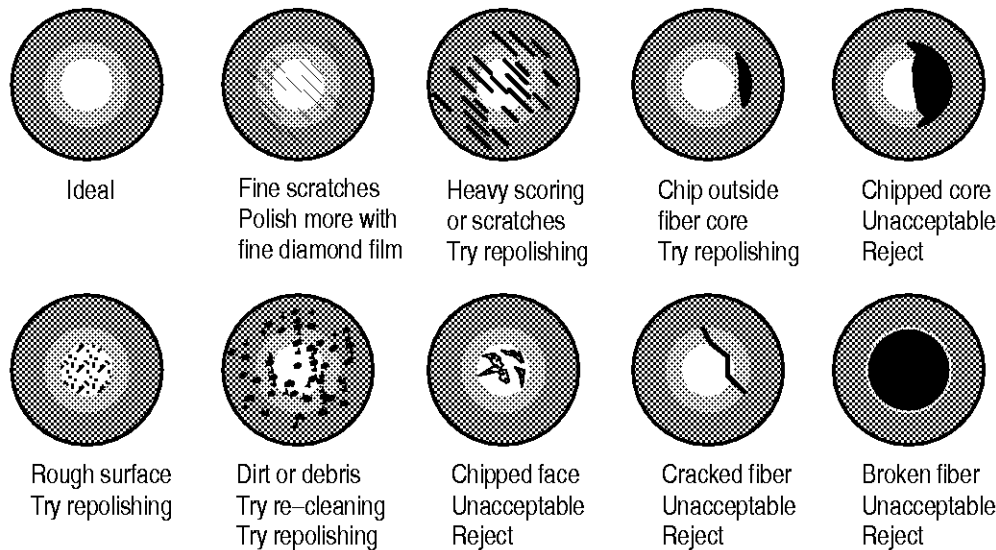


Figure 14