WIRE JOINING
WITH
3M BRAND MODULAR SYSTEM SPLICING

CONTENTS PAGE

CONTENTS PAGE

Printed in U.S.A.

1.0 General

1.01 This practice describes the MS² Super Mini Module connector series, the splicing rigs used for termination, and the recommended procedures for their use.

The MS² Super Mini Modules are designed to connect and trim off 25 pair of conductors or less at one time, with no stripping of insulation. Super Mini Modules will accommodate a wire range of 22-28 AWG (.6-.32 mm) solid copper conductors that have PIC, pulp, or paper insulation. Wire gauges and insulation types may be varied within an individual connector.

All Super Mini Modules and related components feature individual elements, cutoff blades, and tes entry ports. Each component of the connector has a cut corner to identify proper orientation in the splice head. Covers and/or bases are removable on each connector for reentry.

1.02 Splice Data

Data in these tables was obtained from splices prepared according to the instructions in this practice. When the Bundle O.D. is close to Splice Case or Sleeve I.D., the craftsperson must use extra care not to exceed the maximum O.D. All splice diameters above 1200 pr. are for pulp only. Add 10% for PIC splices.

Two Module In-Line Splice Data

Pair Count	AWG		Recommended Splice Opening		In-Line Splice Dia.	
		mm	in.	mm	in.	mm
400	26	.4	17	432	2.5	64
	24	.5	↓	↓	2.8	71
	22	.6	↓	↓	3.0	76
600	26	.4	↓	↓	3.0	76
	24	.5	↓	↓	3.4	86
	22	.6	↓	↓	3.7	94
900	26	.4	↓	↓	3.5	89
	24	.5	↓	↓	3.9	99
	22	.6	17	432	4.5	114
1100	22	.6	19	483	5.0	127
1200	26	.4	17	432	4.0	102
	24	.5	17	432	4.3	109
1500	26	.4	19	483	4.5	114
	24	.5	↓	↓	4.8	122
1800	26	.4	↓	↓	5.0	127
	24	.5	↓	↓	5.3	135
2100	26	.4	↓	↓	5.4	137
	24	.5	↓	↓	5.7	145
2400	26	.4	↓	↓	5.7	145
2700	26	.4	↓	↓	6.0	152
3000	26	.4	19	483	6.5	165
3600	26	.4	19	483	7.0	178

Two Module Fold-Back Splice Data

Pair Count	AWG		Recommended Splice Opening		Fold Back Splice Dia.	
		mm	in.	mm	in.	mm
400	26	.4	17	432	2.5	64
	24	.5	↓	↓	2.8	71
	22	.6	↓	↓	4.0	102
600	26	.4	↓	↓	3.2	81
	24	.5	↓	↓	3.9	99
	22	.6	↓	↓	4.8	122
900	26	.4	↓	↓	4.1	104
	24	.5	17	432	5.0	127
	22	.6	17	432	5.8	147
1100	22	.6	19	483	6.5	165
1200	26	.4	17	432	4.7	119
	24	.5	17	432	5.0	127
1500	26	.4	19	483	5.4	137
	24	.5	↓	↓	5.7	145
1800	26	.4	↓	↓	6.0	152
	24	.5	↓	↓	6.3	160
2100	26	.4	↓	↓	6.2	157
	24	.5	↓	↓	6.5	165
2400	26	.4	↓	↓	6.5	165
2700	26	.4	↓	↓	7.2	183
3000	26	.4	19	483	7.6	193
3600	26	.4	19	483	8.0	203

2.0 Description

01 The 4000-D (dry) or 4000-C (encapsulated) Super Mini Modules are designed to connect 25 pair or less of conductors for straight splicing. The connector consists of three components; a base, body, and cover. See Figure 1.

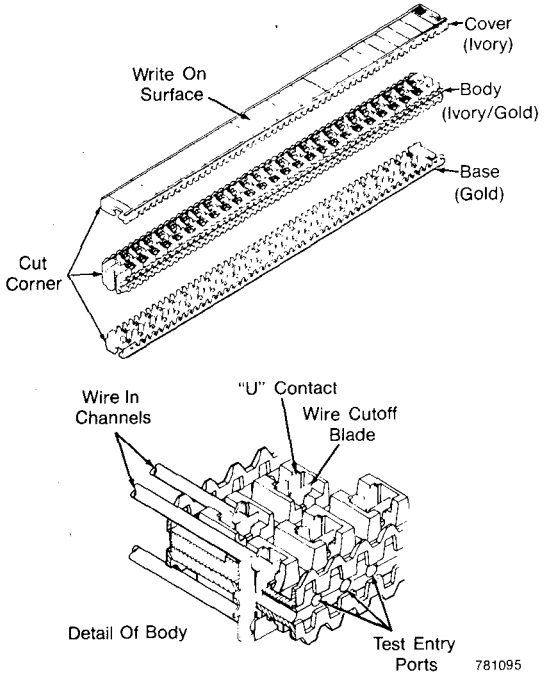


Fig. 1—Super Mini Modules.

2.02 The 4005-D (dry) or 4005-C (encapsulated) Super Mini Bridging Module is designed to add an additional set of conductors to a 4000 Series Module. It consists of three components; a body, cover, and a red protector that is used for pretermination. This connector also contains test entry ports. See Figure 2.

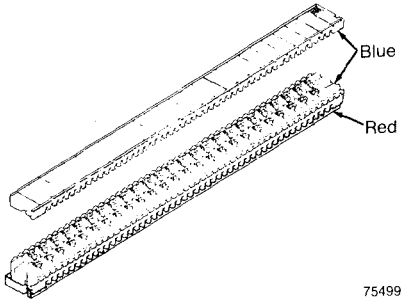


Fig. 2—Super Mini Bridging Modules.

2.03 The 4008-D (dry) or 4008-C (encapsulated) Super Mini Half Tap Modules are designed to tap onto a through cable. The connector consists of three components; a base, body, and cover. The through cable is placed in the base and will not cutoff when crimped. See Figure 3.

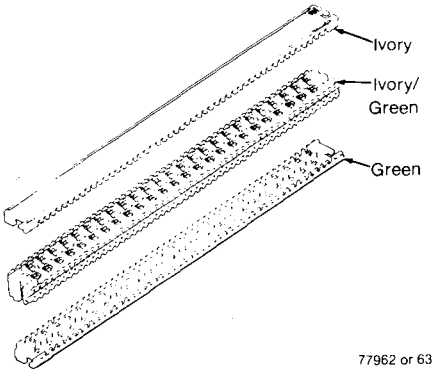


Fig. 3—Super Mini Half Tap Modules.

3.0 Module Terminator (Splice Head)

3.01 Conductors are joined in the modules by using a module terminator splice head. The splice head is used to support the connector components and aid in wire handling during the splicing operation. See Figure 4.

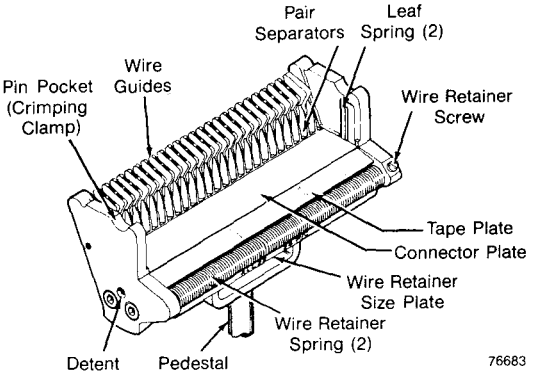


Fig. 4—4041 Splicing Head.

4.0 Crimping Units

4.01 4030 Air/Hydraulic Crimping Unit can be operated from an air cylinder or compressor with an output pressure of 80-100 pounds per square inch (90 is suggested). The pump is factory adjusted to a pressure cutoff of 4400 psi. The clamp will hold until released. See Figure 5.

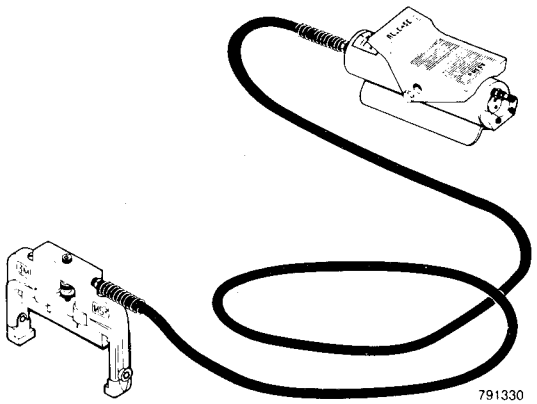


Fig. 5—4030 Crimping Unit.

4.02 4031 Hand/Hydraulic Unit is activated by pumping the handle. The pump is factory adjusted to a pressure cutoff of 4400 psi. The clamp will hold until released. See Figure 6.

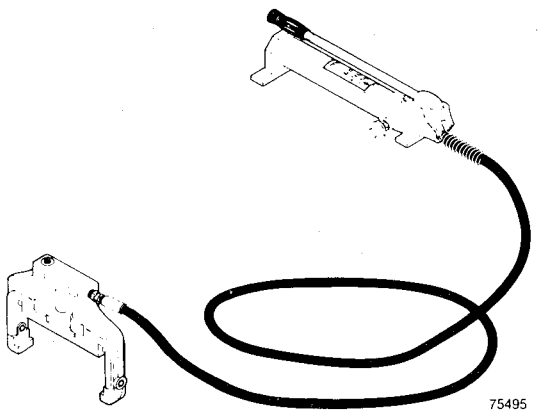


Fig. 6—4031 Crimping Unit.

5.0 Splice Mounting Systems

5.01 Three mounting systems are available to support the splice set up:

a. The 4042 Support Tube Assembly is a 30" (762 mm) straight support tube with buckle hooks on each end that attach directly to the cable. See Figure 7.

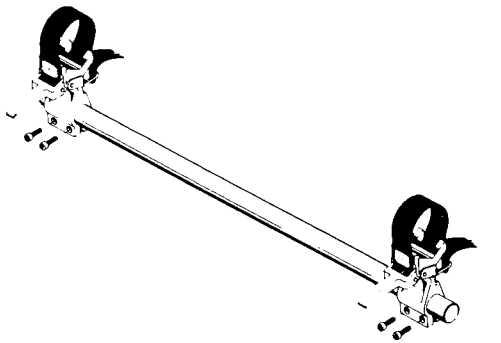


Fig. 7—30" Straight Support Tube.

b. The 4045-K Universal Splicing Head Support Assembly is designed to hold the MS² Splicing Head so it can be used in a variety of locations and positions. The splicing head assembly consists of a head clamp, support tube, and vise. The head clamp holds the splicing head pedestal to the support tube. The vise can be clamped to a round or flat surface. See Figure 8.

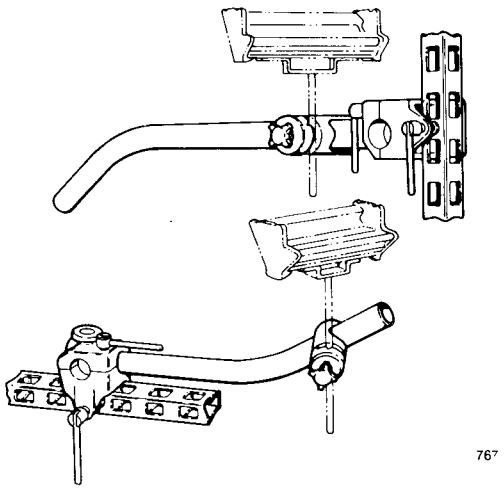
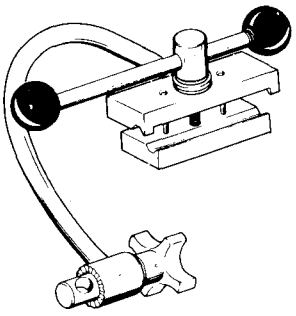


Fig. 8—4045-K Universal Splicing Head Support.

c. The 4035A Aerial Strand Clamp is designed to hold a 4041P Splicing Head in aerial splicing applications. The clamp may be used on regular or self-supporting type strand applications. See Figure 9.

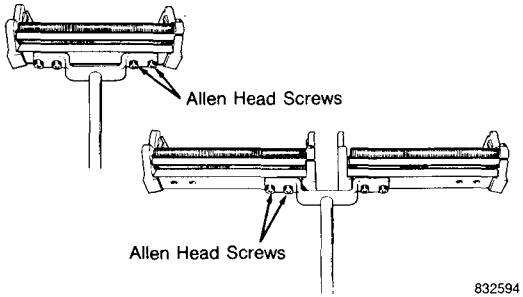


801601

Fig. 9—4035A Strand Clamp.

6.0 Splice Head in Pedestal

6.01 A single splice head or two splice heads may be mounted on one pedestal. See Figure 10.



832594

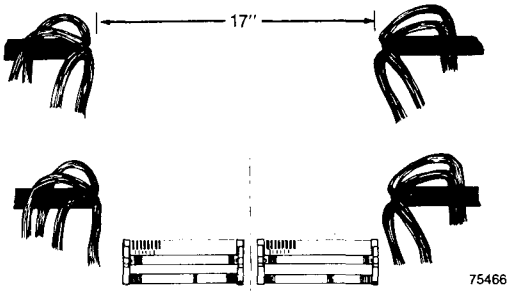
Fig. 10—Pedestal Set-up.

7.0 Inline Splicing (4022 Splicing Rig)

7.01 Cable Preparations:

a. Prepare cable per standard procedure, paying particular attention to the following:

1. Splice opening should be that recommended for closure used, with a minimum of 17″ for a 2 bank splice.
2. Free conductor length from each cable butt must be a **minimum** of one-and-a-half times the splice opening. For example, a 19″ (483 mm) opening requires: 1½ x 19″ = 28½″ **minimum** free conductor length. 1½ x 483 mm = 725 mm.
3. Identify all binder groups and lay groups back along cable. See Figure 11.

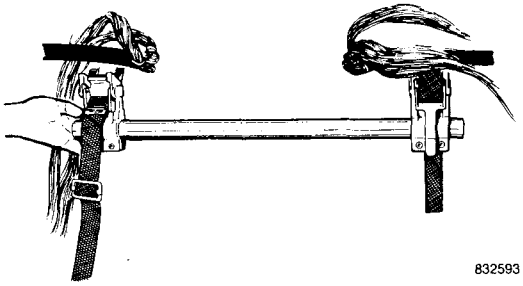


75466

Fig. 11—Straight inline splicing.

7.02 Attach 4042 Support Tube Assembly

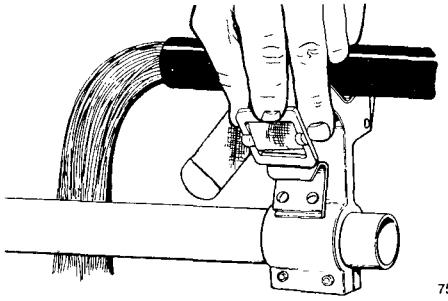
a. Attach support tube to cable by placing assembly under cables and centering it on splice opening. Buckle hooks should be towards rear (clamping handle toward craftsperson). See Figure 12.



832593

Fig. 12—Locating support tube on cable.

b. Place the strap over the cable, and adjust the buckle until it can be easily slipped over the buckle hook. See Figure 13.



75418

Fig. 13—Attaching buckle.

c. With the latch in the up position, pull most of the slack from the strap, and push the latch down to lock and secure the support tube to the cable. See Figure 14.

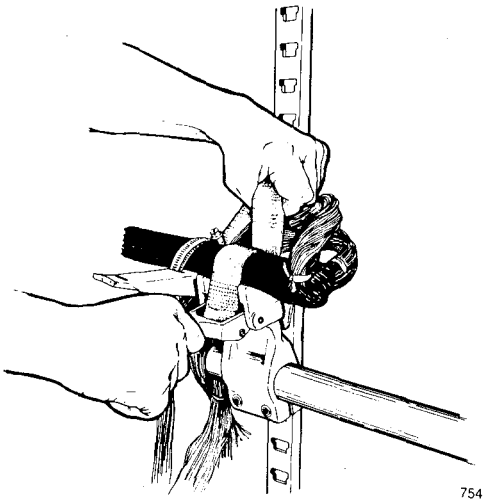


Fig. 14—Tightening strap.

7.03 Attach traverse clamp assembly with the SHORT assembly bar. See Figure 15.

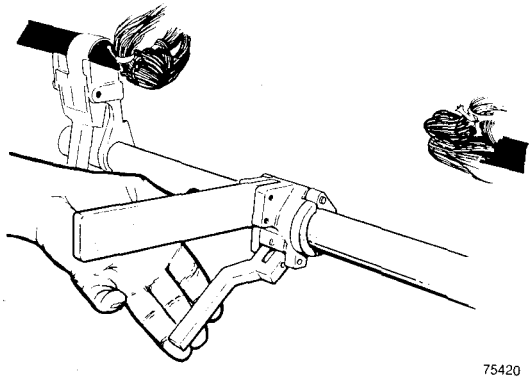


Fig. 15—Attach traverse clamp assembly.

7.04 Slide the head clamp onto the traverse bar. See Figure 16. The knurled tightening knob should be on the right.

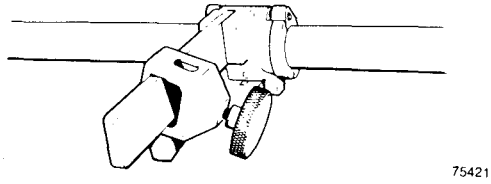


Fig. 16—Slide head clamp onto traverse bar.

7.05 Insert pedestal with two splice heads into head clamp and center in splice opening. Tighten knob. See Figure 17.

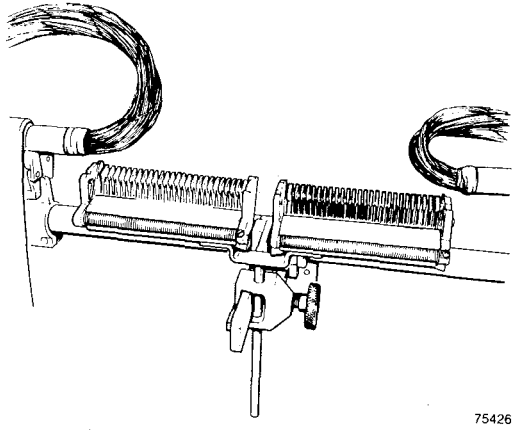
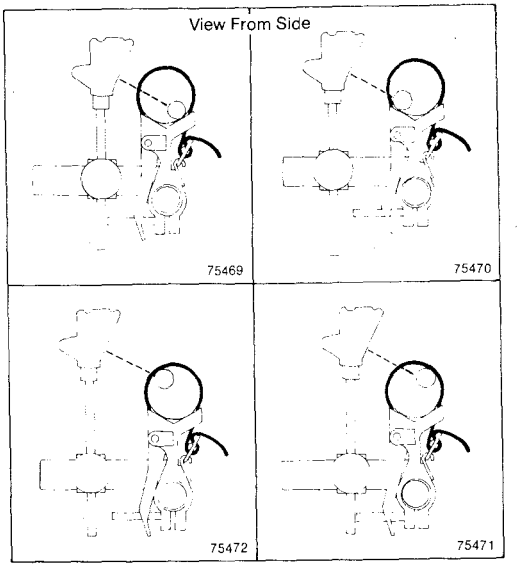


Fig. 17—Insert pedestal into head clamp.

a. Adjustments to head position can be made as follows:

   1. Sliding head clamp in or out on traverse bar; and
   2. Sliding head up or down through head clamp.

b. Start with the back bottom group. Position the splice head to allow 4″ (101 mm) of slack in group between the cable butt and connector. Adjust for each group. See Figure 18.



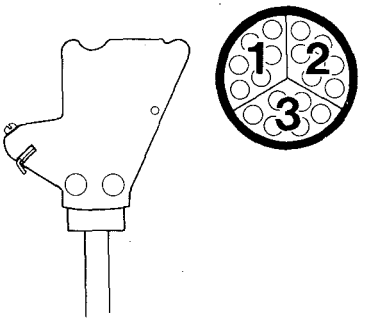


Fig. 18—Positioning splice heads.

c. To prevent conductors from lifting out of wire channels before modules are crimped, and to assure easy removal of modules from heads after crimping, heads should be positioned slightly higher than the group to be spliced. Wires should run at a slight angle up into splicing heads.

d. Make sure wire retainer spring is set to proper gauge. To change, loosen wire retainer screw and turn spring assembly to proper size as indicated on the tape and spring face plates. See Figure 19.

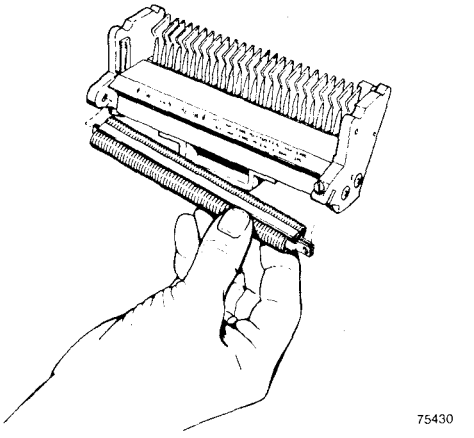


Fig. 19—Set retainer spring to proper wire gauge.

e. The Module Splice Adapter MUST be in place before splicing with the Super Mini Module. See Figure 20.

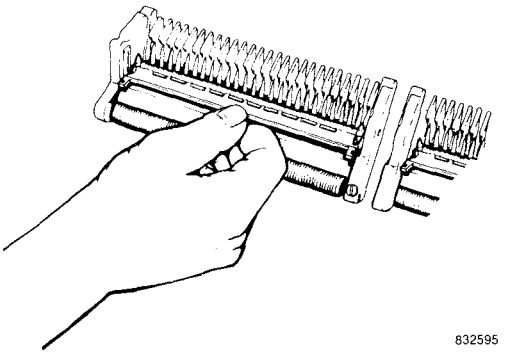


Fig. 20—Adapter in place.

8.0 Wire Handling

8.01 General

The conductors are joined in 25 pair groups. Pairs from a binder group are placed in the module base; a module body is placed over the base and the pairs from the matching binder group placed in the body. A module cover is put over the body and when the module is crimped the conductors are connected and the excess wire cut off.

For future identification, the conductors from the central office side of the splice should always be placed in the module base.

Important: The Super Mini Module consists of three components:

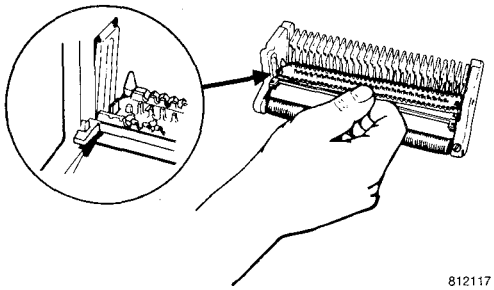
Base: in which the central office conductors are laid.

Body: placed over the central office conductors and in which the field conductors are laid.

Cover: placed over the field conductors.

To more readily identify the mating sequence of each component, the base and the lower body section (body/bottom) are gold in color while the cover and the upper body section (body/top) are yellow. Each component has a cut corner and it must be located to the left rear when placed in the splice head.

8.02 Place gold base in splice head onto adapter with cut corner to left rear of splice head. See Figure 21.



812117

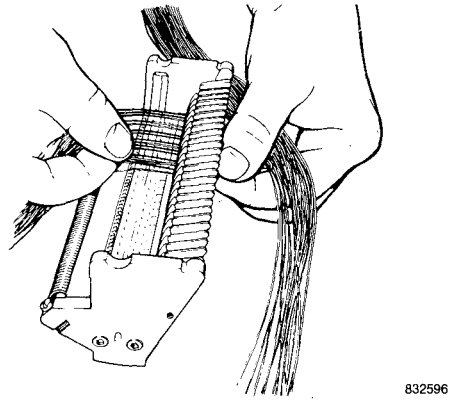
Fig. 21—Install base in adapter.

8.03 PIC Cables:

The 4041 Splicing Head wire guides are color coded to enable speed and accuracy. Pairs can be laid randomly into their proper position as they come from the group.

a. Starting with the back bottom group from central office cable end, lay pairs from group to be spliced into module base on central office side of splice opening. Place each pair in wire guide to the right of its matching color with "TIP" left and "RING" right. Use the pair separator to remove twists.

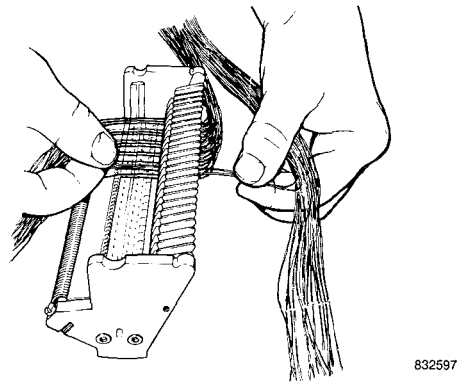
b. Hold thumb and forefinger of guide hand **close** to back of head. Once pair is separated, "TIP" left, "RING" right, draw pair taut into wire channels in the base and down into the wire retainer spring. See Figure 22.



832596

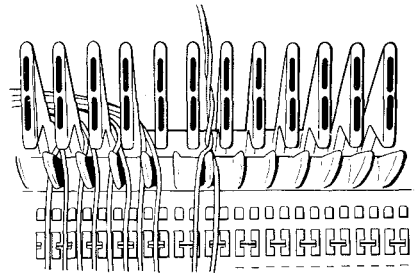
Fig. 22—Place wires into module base.

Note: DO NOT hold guide hand too far from splice. See Figure 23. The twist in paired conductors could jam behind the separator and cause "shiners". See Figure 24.



832597

Fig. 23—WRONG-Guide thumb too far from rear of head.



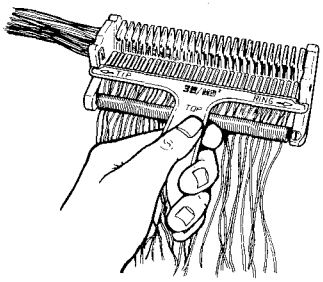
75436

Fig. 24—Twist in paired conductors could cause "shiners".

c. Select next back bottom group from central office cable and lay pairs into module base on field cable side of splice opening.

d. After 50 pair are in place in the bases, check the conductors for wire order with the 4052 Check Comb.

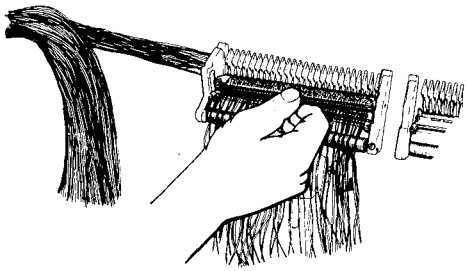
1. Place the comb over the base and slide it to the left: Only TIP conductors should show. Slide the comb to the right: Only RING conductors should show. Also check for two conductors in one channel and for vacant channels. See Figure 25.



832602

Fig. 25—Check TIP and RING conductors with check comb.

e. Place bodies gold side down into leaf spring tracks of both splice heads with cut corners to left rear of splice heads. See Figure 26.



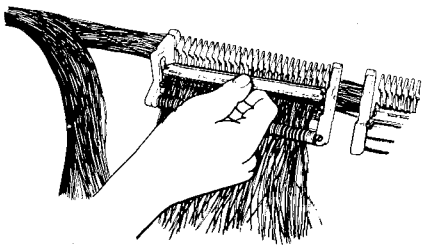
832601

Fig. 26—Place body into splice head.

f. Take matching binder groups and lay wires into channels in body. Follow same procedure as with base, i.e., "TIP" left and "RING" right, matching color code on wire guides.

g. After these 50 pair are in body channels, check wiring order with check comb.

h. Place covers into leaf spring tracks of splicing heads with cut corner to left rear of splice head. See Figure 27.



832600

Fig. 27—Place cover into splice head.

8.04 Non-Color Coded Cable (Pulp, Paper, etc.):

a. The splice preparation is the same as with PIC cable.

b. Grasp 50 pair or less of the group to be spliced.

c. Working away from the central office cable butt, lay pairs in successive wire channels in base with "TIP" left and "RING" right. Continue until both bases of the double head setup are filled.

d. Check conductors for proper wire order with check comb.

e. Place bodies — refer to Section 8.03 e. through h.

8.05 Three and Four Bank Inline Splice

The following procedures can be used when a smaller splice diameter is necessary and the opening can be extended.

a. Three Bank Splicing:

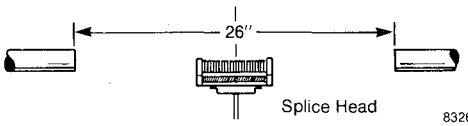
1. Prepare cable for 26″ (660 mm) minimum splice opening.

2. Free conductor length from each cable butt must be a **minimum** of the splice opening plus 6″ (152 mm). For example, a 26″ (660 mm) opening requires: 26″ + 6″ = 32″ of free conductor. (660 + 152 = 813 mm)

3. Identify all binder groups.

4. Attach splice rig and use a single head set-up.

5. Mark exact center of splice opening and place center of splice head in center of opening. See Figure 28.



832633

Fig. 28—Center splice head in opening.

6. Splice first connector in this position. See Figure 29.

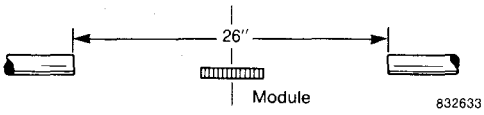


Fig. 29—Splice connector.

7. Adjust head to either right or left of splice center module. See Figure 30.

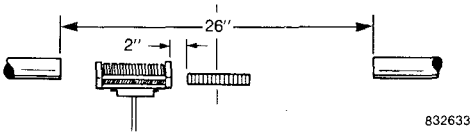


Fig. 30—Adjust head.

8. Measure splice head so module falls 2″ (50 mm) from edge of center connectors. See Figure 31.

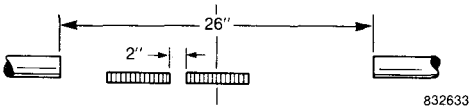


Fig. 31—Measure splice head.

9. Splice connector and repeat procedure until three bank splice is completed. See Figure 32.

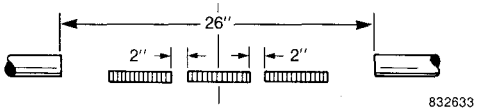


Fig. 32—Completed three bank splice.

b. Four Bank Splice:

1. Prepare cable for 34″ (863 mm) minimum splice opening. See Figure 33.

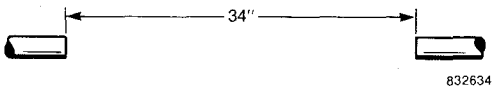


Fig. 33—Splice opening.

2. Free conductor length must be a minimum of the splice opening plus 6″ (152 mm). For example a 34″ (863 mm) opening requires 34″ + 6″ = 40″ of free conductor. (863 + 152 = 1015 mm)
3. Attach rig and use a double head set-up.

Note: This opening will require an extended support tube to attach to the cable butts; or support tube can be attached to a lower adjacent cable. See Figure 34.

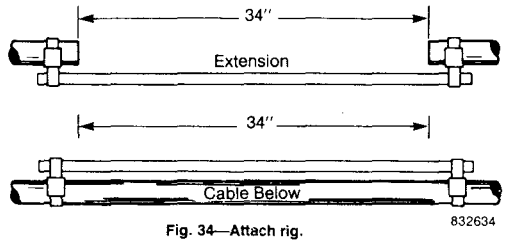


Fig. 34—Attach rig.

4. Place double head so that inside head is 1″ (25 mm) from center of splice. See Figure 35.

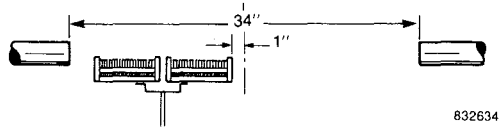


Fig. 35—Head 1″ from center of splice.

5. Splice 100 pair in both heads in this position.
6. Move double heads to opposite side of opening. See Figure 36.

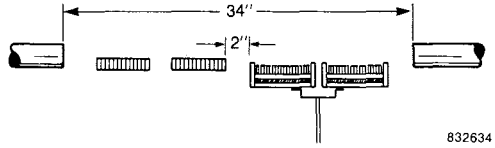


Fig. 36—Move heads to opposite side of opening.

7. Repeat until four bank splice is completed. See Figure 37.

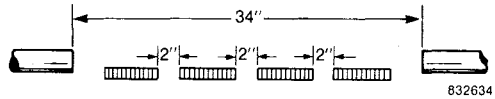


Fig. 37—Completed four bank splice.

9.0 Crimping The Modules

9.01 Modules are crimped by either the 4030 Air/ Hydraulic or 4031 Hand/Hydraulic Crimping Units.

9.02 Place crimping clamp on splice head.

a. Hydraulic hose can face left or right of splice head.

b. Angle legs on clamp toward front of head.

c. Nest pins on inside of clamp in pin pockets on splice head. See Figure 38.

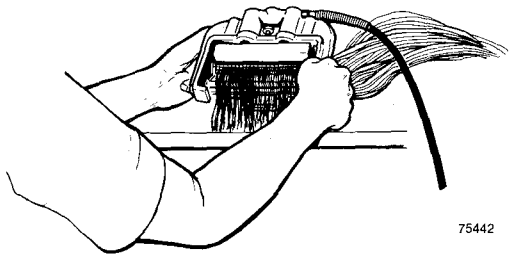


Fig. 38—Position crimp clamp on splice head.

d. Rotate the clamp until it is locked by the detents in an upright position. If the detents are either too tight or too loose they may be adjusted from the side with a screwdriver. See Figure 39.

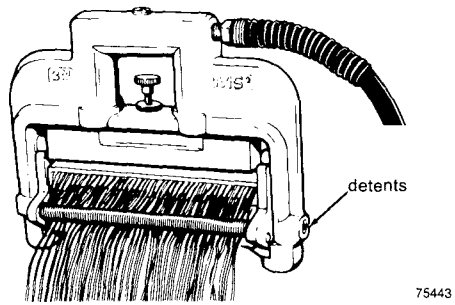


Fig. 39—Rotate clamp to upright position.

03 Crimp.

a. If the air/hydraulic crimping unit is used, operate the PRESS/RELEASE control to the PRESS position and hold until the pressure by-pass is heard to operate. See Figure 40. This signifies a completed crimp. Leave crimping clamp closed until the cut conductors are removed.

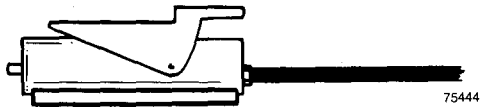


Fig. 40—Operate air/hydraulic crimping unit.

b. If the hand/hydraulic crimping unit is used, close the pressure release valve and operate the pump handle until the audible bypass is heard, then pump two additional times. See Figure 41. Leave the crimping clamp closed until the cut conductors are removed.

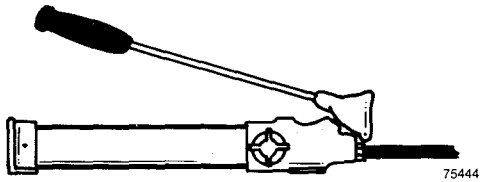


Fig. 41—Operate hand/hydraulic crimping unit.

Note: Both pumps must be properly positioned to operate. The air/hydraulic pump must be positioned so that the output end is level or HIGHER than the rear. The hand/hydraulic pump must be positioned so that the output end is level or LOWER than the rear. This will keep air out of the hydraulic lines.

c. Remove the cut conductors by grasping approximately one-third to one-fourth of the ends lifting them straight up from the retainer spring. See Figure 42. TO AVOID DAMAGING THE RETAINER SPRING, DO NOT ATTEMPT TO REMOVE ALL THE CONDUCTORS AT ONCE.

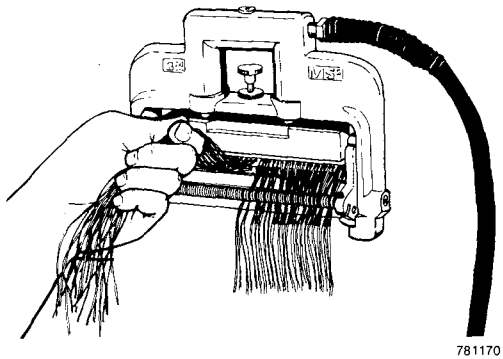


Fig. 42—Remove cut wires.

d. Remove clamp from head by rotating legs of clamp toward front of head and lifting off. See Figure 43.

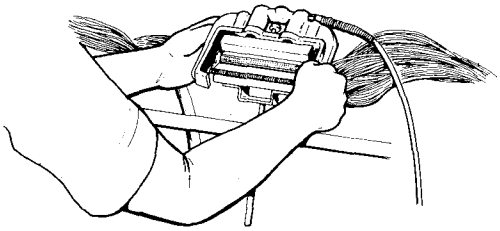


Fig. 43—Remove crimping clamp.

Note: An adjustment screw on crimping clamp can be set to limit return on crimping bar. This screw can be adjusted to reduce number of strokes required for crimping a two-wire splice when using the hand pump, but must be completely backed off for crimping a 3-wire bridge splice. See Figure 44.

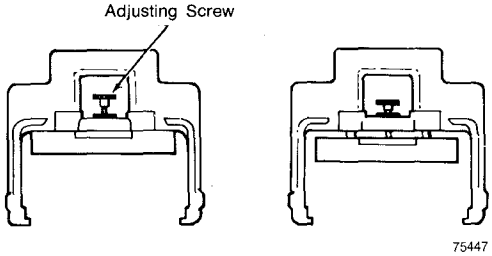


Fig. 44—Adjust crimping bar travel.

e. Remove crimped module from splice head by pushing up and back on front of the connector.

10.0 Splice Bundling

10.01 Tie down splice bundle in center first, working any slack toward both cable butts. See Figure 45.

Fig. 45—Tie down splice bundle.

10.02 Inline Four Bank Splice Bundling, Figure 46 a.

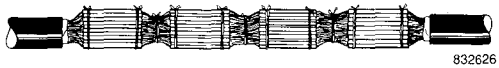


Fig. 46a.

10.03 Three Bank Splice Bundling, Figure 46 b.

Fig. 46b.

11.0 Inline Bridge Splicing

11.01 Minimum of stub free conductor must be 2½ times the splice opening. This will allow slack for future rearrangements.

11.02 Bring stub free conductor to tie point in splice opposite stub entry. See Figure 47.

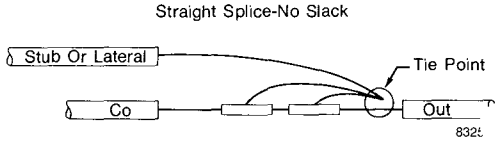


Fig. 47—Adding slack to branch cable entering inline splice.

11.03 Initial Bridge (New 3-Wire):

a. Perform all functions of two-wire splice. DO NOT PLACE COVER ON MODULE.

b. Remove protector (red) from bottom of bridging body. See Figure 48.

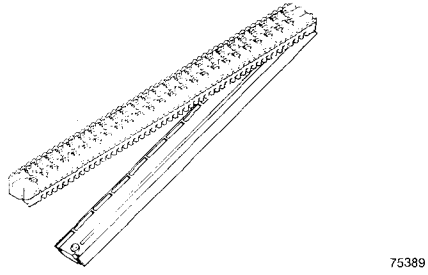


Fig. 48—Remove RED protector.

c. Place bridging module body on top of 4000 module with cut corner to left rear of splice head.

d. Crimp bridging body onto module body. DO NOT place bridging cover onto bridging body for this crimp. Remove cut wire ends.

e. Working away from the stub tie point, lay stub pairs in proper wire channels - "TIP" left, "RING" right until bridge body is filled.

f. Check conductors for proper wire order with check comb.

g. Place cover on module body.

h. Crimp.

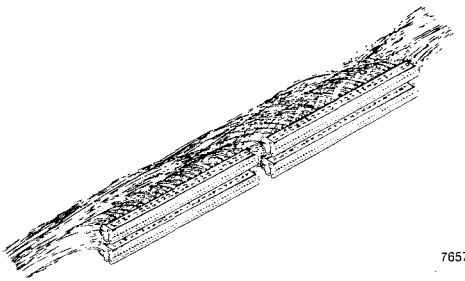
11.04 Adding stub to an Existing Inline Splice (Subsequent Bridge):

a. Open splice.

b. Prepare stub conductors according to Section 11.01 and 11.02.

11.05 Bridging PIC stub to Pulp splice:

a. Tag modules that will receive stub count using the 4079S Tagging Lables. See Figure 49.



76578

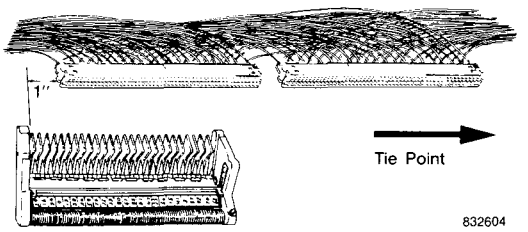
Fig. 49—Tag modules to be bridged.

b. Access to pairs in modules can be made with 4047 or 4048 Test Probes, as illustrated in 91A & 91B.

c. Mount support tube, traverse bar and head clamp assembly. For ease of wire handling, use single head set-up for pretermination.

d. Adjust splice head to same relative position of tagged module.

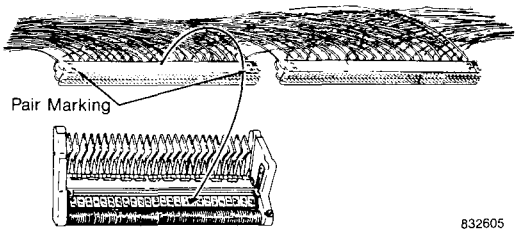
Note: Provide enough slack for ease of handling by positioning the splice head away from tie point 1" (25 mm) beyond tagged module. See Figure 50.



832604

Fig. 50—Positioning splice head.

e. To begin preterminating the stub, remove tagging label from a module in the splice and place it on the tape plate of the splicing head. Immediately identify module from which tagging label was removed by marking the pair on each end of the cover. See Figure 51.

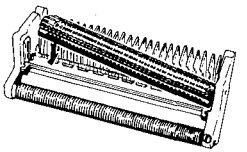


832605

Fig. 51—Remove label from module and place it on tape plate.

f. Splice head adapter MUST be placed into leaf springs on head.

g. Place bridging body with PROTECTOR ATTACHED into the adapter. DO NOT remove red protector from bottom of bridging body. See Figure 52.



76575

Fig. 52—Place body with red protector into adapters.

h. Place PIC wires from stub into bridging body in order of tagging labels. Check with check comb.

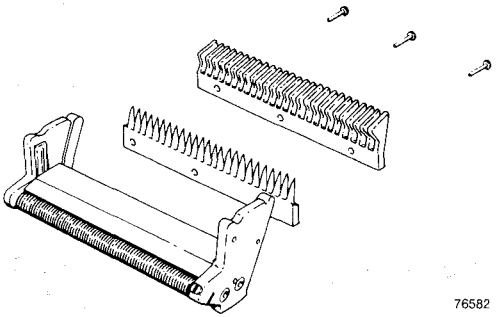
i. Place bridging cover into leaf spring of splicing head and crimp.

j. Remove preterminated module from splicing head.

k. Remove tagging label from tape plate and place label on cover of preterminated module.

l. Repeat steps d. through k. until all stub pairs involved are preterminated. For ease of wire handling, DO NOT preterminate more than 300 pair at one time.

m. "Strip" a splicing head by removing pair separator and wire guide. See Figure 53.

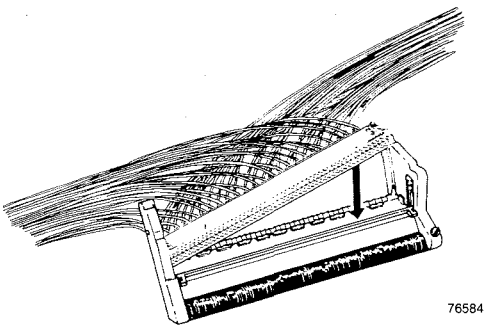


76582

Fig. 53—Strip splice head.

n. Replace adapter in splicing head.

o. Place an existing module into "stripped" splicing head. See Figure 54.



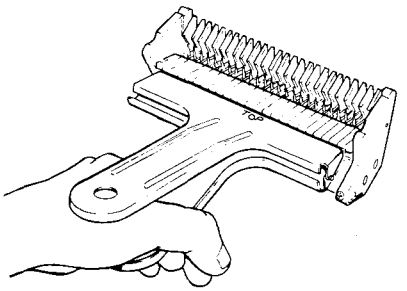
76584

Fig. 54—Place module to be bridged into stripped head.

p. Locate corresponding preterminated bridge module.

q. Remove the cover of the 4000 module in the splice head using the 4053 Cover Removal Tool.

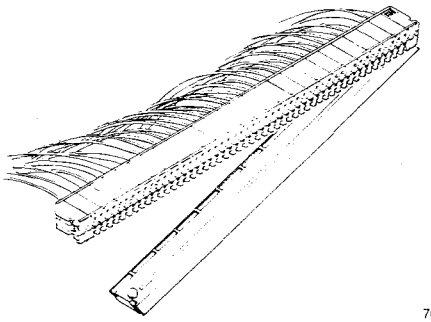
1. Hold lower handle and insert tool into the ring wire ways of the module.
2. Squeeze handles and cover will be "popped" free. See Figure 55.



822407

Fig. 55—Cover removal tool popping cover.

r. Remove red protector from the bottom of the preterminated bridge module. See Figure 56.



76576

Fig. 56—Remove red protector.

s. Place preterminated bridge into leaf springs of splicing head. Crimp.

t. Repeat steps o. through s. for all preterminated modules.

u. Close splice per standard procedure.

12.0 Foldback Splice

12.01 Cable Preparation:

a. Prepare cable per standard procedure, paying particular attention to the following:

1. Splice opening should be that recommended for closure used.

b. Free conductor length from each cable butt must be a **minimum** of TWO TIMES THE SPLICE OPENING PLUS 6" (152 mm). For example, a 19" (483 mm) opening requires: 2 x 19" = 38" + 6" = 44" minimum free conductor length.
(2 x 483 mm = 966 mm + 152 mm = 1118 mm)

c. Identify all binder groups.

d. Starting at lower rear of splice opening, bring a group from one side of splice across opening and foldback along side matching group. See Figure 57.

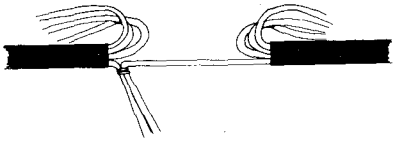


Fig. 57—Prepare core of foldback splice.

Note: For easier group identification, foldback all odd number groups to one side and all even number groups to the other side.

e. Tightly tie matching groups together as close to cable butt as possible. Refer to Figure 57. Continue alternating foldback until entire cable is tied.

f. Tie down core of splice, placing a tie at center and one as close to each cable butt as possible. See Figure 58. Wrap core (polyethylene on PIC, muslin on pulp or paper) per standard procedure.

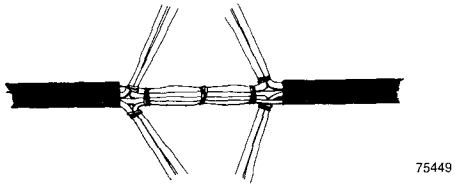


Fig. 58—Tie down core of foldback splice.

g. Make a mark at exact center of splice opening and 1" (25 mm) to each side of center. See Figure 59.

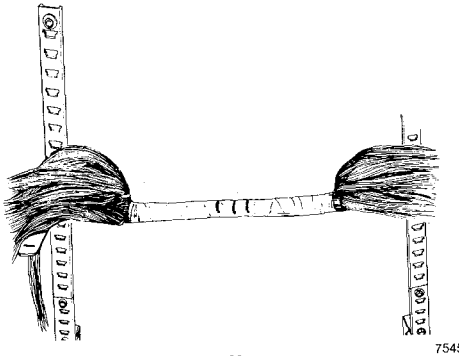


Fig. 59—Mark core.

Note: Use tie markers for PIC cable core.

12.02 Attach 4042 Support Tube Assembly:

a. Attach support tube to cable by placing assembly under cables and centering it on splice opening. Buckle hooks should be towards rear (clamping handle toward craftsperson). See Figure 60.

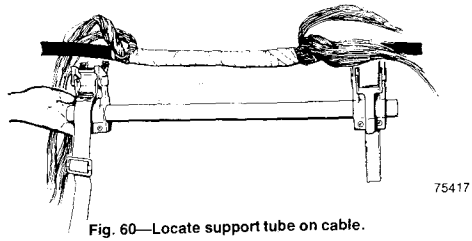


Fig. 60—Locate support tube on cable.

b. Place the strap over the cable, and adjust the buckle until it can be easily slipped over the buckle hook. See Figure 61.

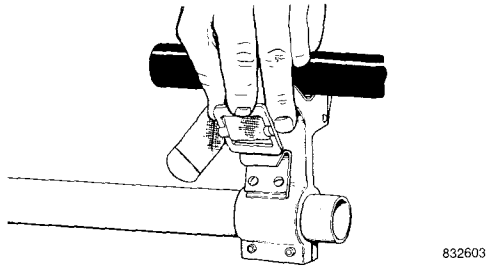


Fig. 61—Attach buckle.

c. With the latch in the up position, pull most of the slack from the strap, and push the latch down to lock and secure the support tube to the cable. See Figure 62.

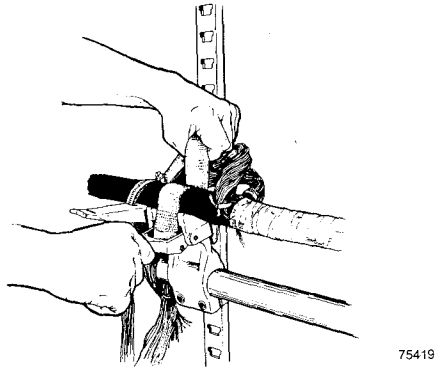


Fig. 62—Tighten strap.

12.03 Set-up for One-Man Foldback Splicing Using One Splice Head:

a. Attach the traverse clamp assembly with the short bar to the support tube. Secure the clamp by squeezing the latch upward. See Figure 63.

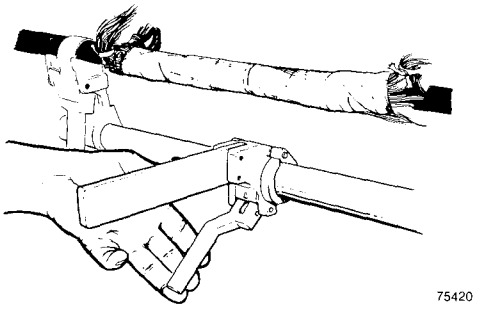


Fig. 63—Attach traverse clamp assembly.

b. Slide the head clamp onto the traverse bar. See Figure 64. The knurled tightening knob should be on the right.

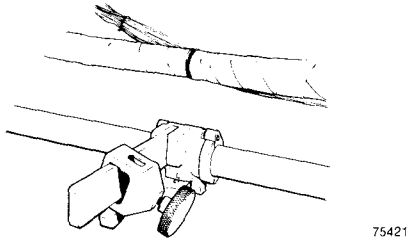


Fig. 64—Place head clamp.

c. Insert splicing head pedestal into head clamp and tighten knob. See Figure 65. Splicing rig is now ready for adjustment for foldback splicing.

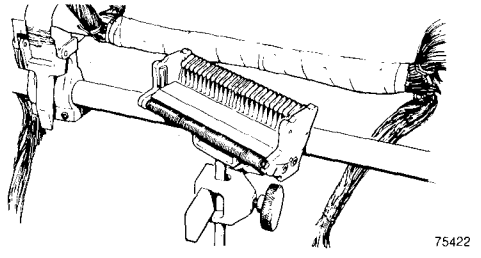


Fig. 65—Splice head in position.

12.04 Splice Head Adjustments:

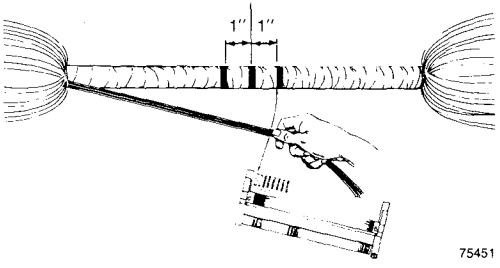
a. Head position will vary depending on group to be spliced. Adjustments to head position can be made as follows:

1. Sliding traverse clamp left or right on support tube;
2. Sliding head clamp in or out on traverse bar; and
3. Rotating head or sliding it up or down through head clamp.

b. THREE BASIC MEASUREMENTS are required to properly locate splicing head for foldback splicing.

1. **Aligning splicing head with marks** to prevent modules from overlapping at center of splice or laying over tie points.

a) Lay first group to be spliced along core close to position in which it will eventually be tied (front group along front of core, back group along back of core, etc.) Position thumb on group to correspond to the 1" (25 mm) mark beyond center. See Figure 66. Holding thumb in place on group, swing group out from cable core. Position head so thumb aligns with edge of head nearest groups origin. See Figure 66.



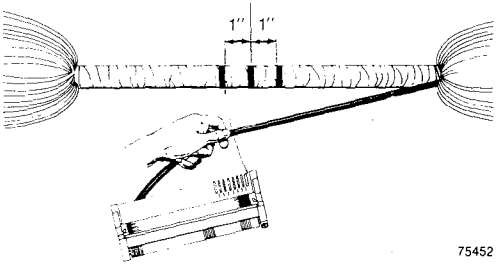


Fig. 66—Align inside edge of splice head with marks on core.

2. **Rotate splicing head** to assure that modules will lay parallel with core.

   Pull group across back of splicing head and rotate head to allow ½" (12 mm) gap between group and edge of head nearest group tie point. See Figure 67.

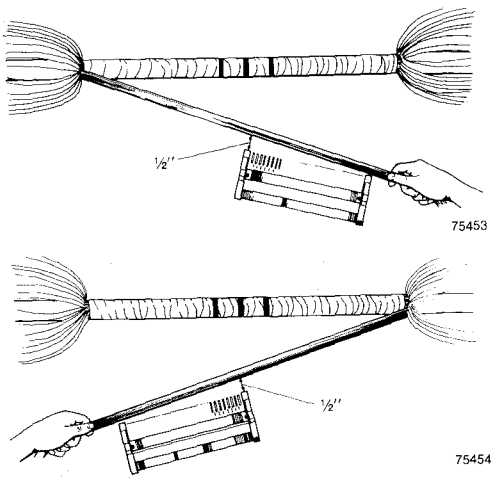


Fig. 67—Rotate splice head to proper position.

3. **Adjust height of splicing head** to prevent conductors from lifting out of wire channels before module is crimped, and to assure easy removal of module from head after crimping.

   Position head slightly higher than origin of group to be spliced so that wires are running at a slight angle up into splicing head. See Figure 68.

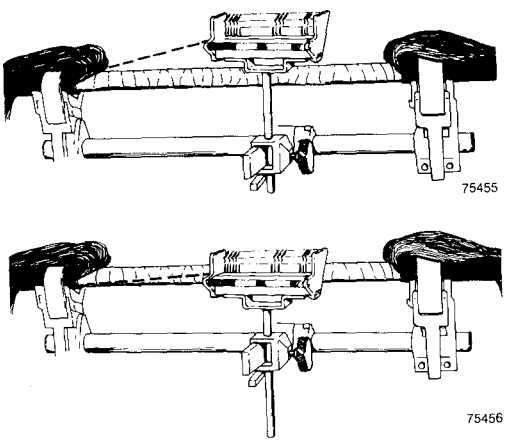


Fig. 68—Adjust height of splice head.

Note: These three basic measurements MUST be repeated for each binder group to be spliced.

4. Check that wire retainer spring is set to proper gauge. To change, loosen wire retainer screw and turn spring assembly to proper size as indicated on the tape plate and on the spring assembly. See Figure 69.

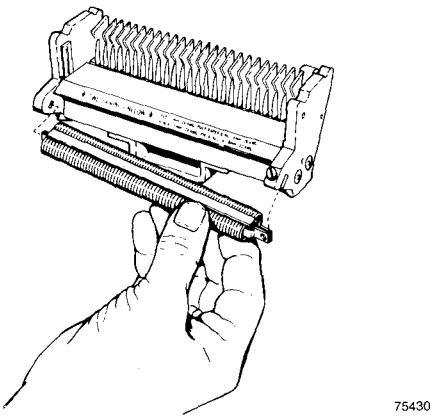


Fig. 69—Set retainer spring to proper wire gauge.

5. Adapter MUST be in place before splicing with the Super Mini Module. See Figure 70.

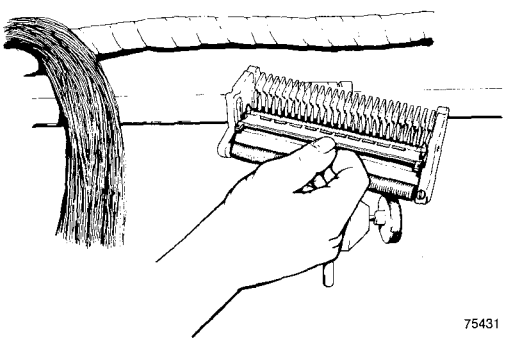


Fig. 70—Place adapter in splice head.

12.05 For wire handling and crimping in the foldback splice, refer to Sections 8.0 and 9.0

12.06 Bundling:

a. Bundling of modules should be done during splicing.

1. Plan first module location.
2. Splice first group at proper location. Mark each module with binder group number for identification. Use indelible marker on matte-finish of module cover.
3. Place tie around group near modules for ease of bundling and group identification. See Figure 71.

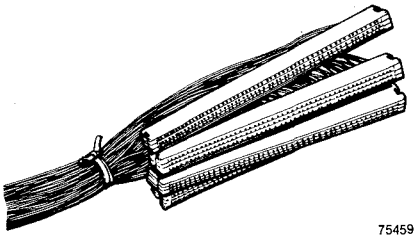


Fig. 71—Tie each group of modules.

4. Lay group against core and bundle. See Figure 72.

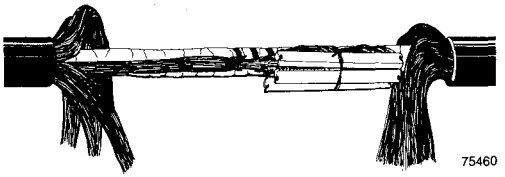


Fig. 72—Tie first group to core.

5. Move head to other side. Plan second group location.
6. Splice second group, identify and bundle to core. See Figure 73. Repeat above, alternating left and right until splice is complete.

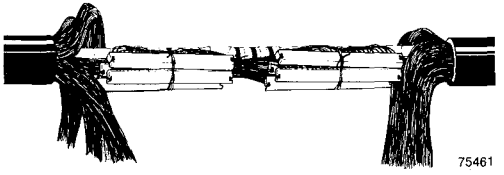


Fig. 73—Tie second group to core.

12.07 Two Person Foldback Splicing:

Two person foldback splicing is done using two splicing head assemblies.

a. Put **long traverse bars** on two traverse clamps. A 3/16" Allen wrench is supplied. See Figure 74.

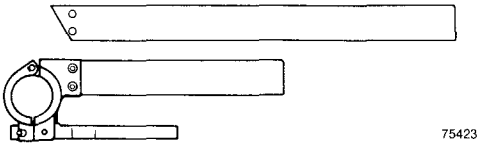


Fig. 74—Change traverse bars.

b. Attach both traverse clamp assemblies onto support tube. Traverse bars should be towards craftsperson with latches underneath bars.

c. Mount splice heads. See Figure 75.

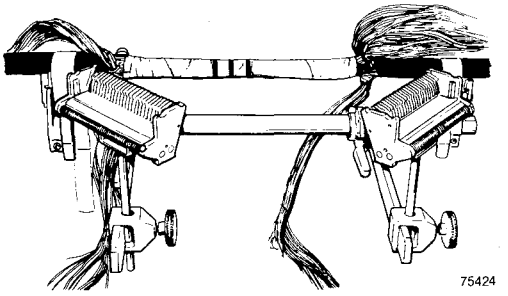


Fig. 75—Set-up for two man foldback splicing.

d. Each craftsperson will splice from one side, making sure of the three basic measurements. Refer to Section 12.04 b. The modules spliced on the left will swing to the right of center and vice versa. See Figure 76.

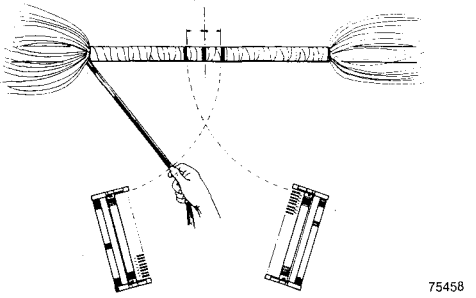


Fig. 76—Top view two man splicing.

e. Follow standard bundling techniques for foldback. Refer to Section 12.06.

12.08 Vertical Foldback Splicing:

a. Mount support tube assembly to vertical cable.

b. Mount long traverse bar in top holes of traverse clamp with 3/16" Allen Wrench supplied. See Figure 77.

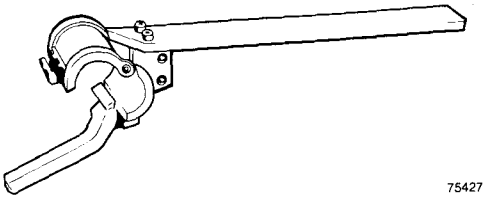


Fig. 77—Traverse bar on top of clamp for vertical splicing.

c. Attach traverse clamp assembly, head clamp and splicing head assembly onto support tube. See Figure 78.

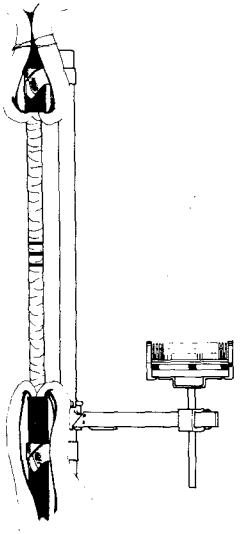


Fig. 78—Set-up for vertical splicing.

d. Measure a lower binder group so modules will fall above the upper 1" (25 mm) line. See Figure 79.

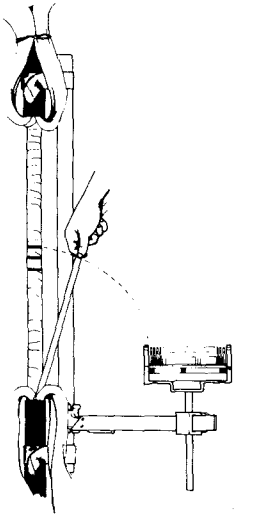


Fig. 79—Position head for lower groups.

e. Measure an upper binder group so modules will fall below the lower 1" (25 mm) mark. See Figure 80.

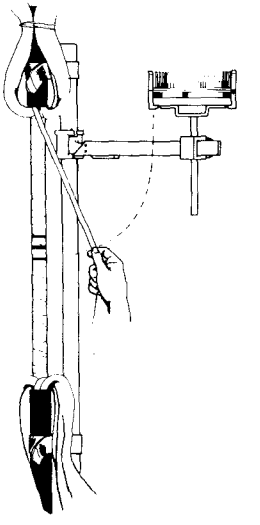


Fig. 80—Position head for upper groups.

f. Adjust rotation and height of splicing head.

g. Wire handling techniques are the same as those used for standard foldback splicing.

Note: Adapter MUST be in place before splicing with Super Mini module.

h. Bundling of modules should be done while splicing.

12.09 Three Bank Foldback Splicing:

This procedure can be used when a smaller splice diameter is necessary and the opening can be extended.

a. Prepare cable for a 26" (660 mm) minimum splicing opening.

b. Free conductor length from each cable butt must be a **minimum** of TWO TIMES THE OPENING PLUS 6" (156 mm). For example, a 26" (660 mm) opening requires:
$2 \times 26'' = 52'' + 6'' = 58''$
$(2 \times 660 = 1320 + 156 = 1472$ mm)
of free conductor.

c. Identify all binder groups.

d. Wrap core. Use polyethylene on PIC cable and muslin on paper or pulp cable.

e. Attach splicing rig.

f. Mark exact center of splice opening.

g. Lay first binder group to be spliced (from either side) along core and mark center line with thumb.

Swing binder group out to **center** of splicing head. See Figure 81. Adjust either or both traverse clamp and head clamp until thumb is reasonably close to center of head. These adjustments locate the first group that will fall directly into the center of the splicing opening and should be used to start any Three-Module Foldback Splice.

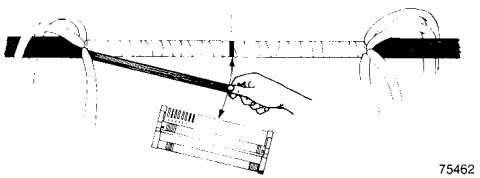


Fig. 81—Position head for first group of three bank splice.

Note: Adapter MUST be in place before splicing with Super Mini Module.

h. Adjust rotation and height of splicing head.

i. Splice first group at center location. Mark each module with binder group number for identification. Use indelible marker on matte-finish or module cover.

j. Place tie around group near modules for ease of bundling and group identification.

k. Lay against core and bundle. See Figure 82.

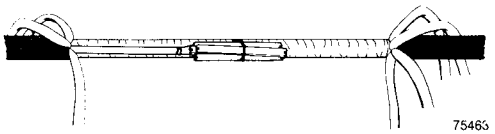


Fig. 82—First group bundled to core.

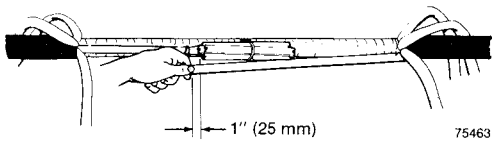


Fig. 83—Measuring second group location.

l. Adjust head to either right or left of center modules. Pick a binder group from opposite side and swing an arc so that the module will fall approximately 1" (25 mm) from farthest edge of the center modules. See Figures 83 and 84.

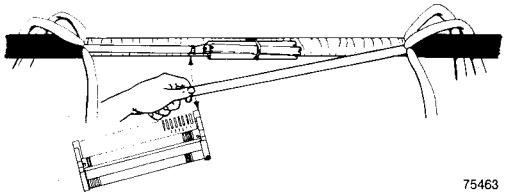


Fig. 84—Position head for second group.

m. Again, adjust rotation and height of splicing head.

n. Splice second group, identify and bundle to core. See Figure 85.

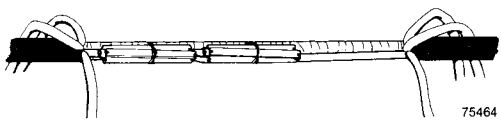


Fig. 85—Bundle second group to core.

o. Adjust head to opposite side and repeat procedures as outlined in steps l., m., and n.

p. When making Three-Module Foldback Splices bundle while splicing. Splice a group in one position, bundle to core; repeat procedure in another position and fit modules into vacant locations. Splice so that approximately an equal number of modules fall in each of the three positions. See Figure 86.

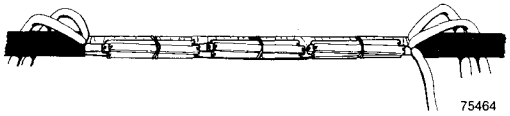


Fig. 86—Completed Three-Module Foldback Splice.

13.0 Bridged Foldback Splice (New Three-Wire)

13.01 A bridged splice is made with a base, body, bridging body (blue), and bridging cover (blue). The procedures that follow assume that the craftsperson is familiar with the wire handling, crimping, etc., found in the respective sections of this bulletin.

13.02 Foldback Bridge Splice Stub Preparation:

a. When preparing a bridging splice, tie the binder groups from the branch cable so that slack for future transfers is available. See Figure 87.

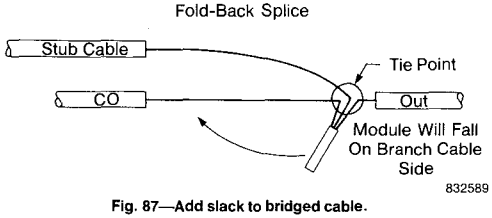


Fig. 87—Add slack to bridged cable.

b. To provide slack for the modules falling opposite the bridge cable side of splice, either double-foldback these groups (see Figure 88) or tie them in the center. See Figure 89.

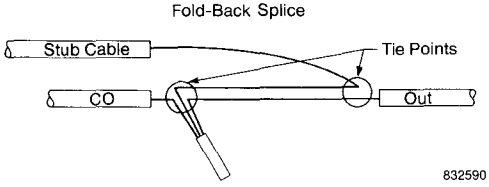


Fig. 88—Add slack to bridge cable with double foldback method.

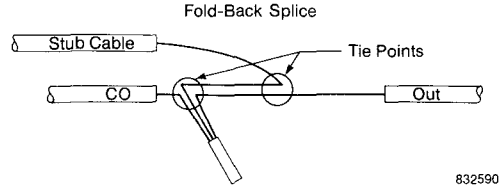


Fig. 89—Alternate method for adding slack.

13.03 Initial Bridge (New 3-Wire):

a. Perform all functions of a two-wire splice. DO NOT PLACE COVER ON MODULE.

b. Remove red protector from bottom of bridging body. See Figure 90.

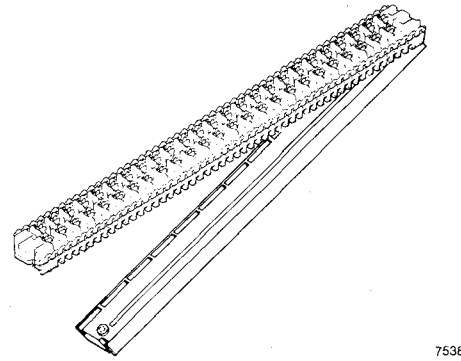


Fig. 90—Remove red protector.

c. Place bridging body into leaf springs of splicing head with cut corner to left rear of splice head.

d. Crimp bridging body onto module body. DO NOT place bridging cover onto bridging body for this crimp. Remove cut wire ends.

e. Working away from the stub tie point, lay pairs in proper wire channels — TIP left, RING right, until bridge body is filled.

f. Check with check comb.

g. Place cover on module.

h. Crimp.

13.04 Adding Stub to an Existing MS² Foldback Splice (subsequent bridge):

a. Preparation:

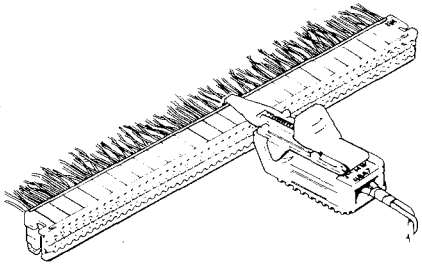
1. Open splice.

2. Prepare stub according to Section 13.02 a. and b.

13.05 Bridging PIC Stub to Pulp Splice:

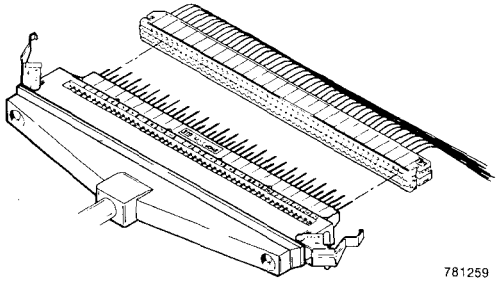
a. Tag modules that will receive stub count using 4079S Tagging Labels.

1. Access with 4047 and 4048 Test Probes. See Figure 91 a. and b.



76586

Fig. 91a.—4047 Test Probe.



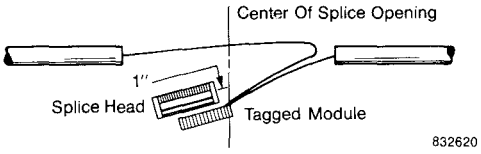
781259

Fig. 91b.—4048 Test Probe.

b. Mount support tube, traverse bar, and head clamp assembly.

c. Adjust splice head to same relative position of tagged module.

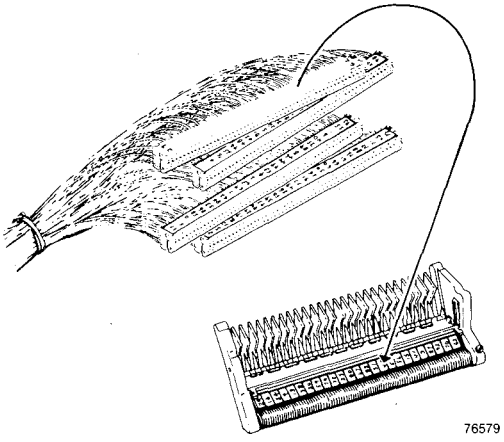
Note: To provide enough slack for ease of handling, position the splice head away from the tie point 1" (25 mm) beyond the tagged module. See Figure 92.



832620

Fig. 92—Add slack to stub cable.

d. To begin preterminating the stub, remove tagging label from a module in the splice and place it on the tape plate of the splicing head. Immediately identify module from which tagging label was removed by marking the pair on each end of the cover. See Figure 93.

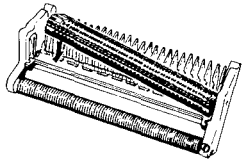


76579

Fig. 93—Remove label from module and place it on tape plate.

e. Splice head adapter MUST be placed into leaf springs on head.

f. Place bridging body WITH PROTECTOR ATTACHED into the adapter. DO NOT remove red protector from bottom of bridging body. See Figure 94.



76575

Fig. 94—Place bridging body with protector into adapter.

g. Place PIC wires from stub into bridging body in order of tagging label. Check with check comb.

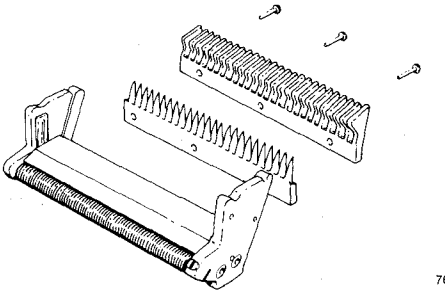
h. Place bridging cover into leaf springs of splicing head and crimp.

i. Remove preterminated bridge module from splice head, leave adapter in place for next bridge module pretermination.

j. Remove tagging label from tape plate and place on cover of preterminated bridge module.

k. Repeat steps d. through j. until all stub pairs involved with the 100 pair pulp group are preterminated.

l. "Strip" splicing head by removing pair separators and wire guides. See Figure 95.

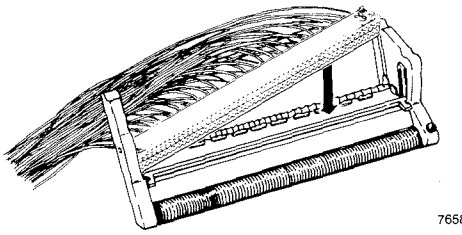


76582

Fig. 95—Strip splice head.

m. Place adapter in "stripped" head.

n. Place existing module (module to be bridged onto) into "stripped" splicing head. See Figure 96.

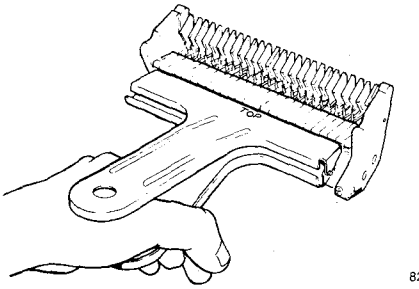


76583

Fig. 96—Place module into stripped head.

o. Find the matching preterminated bridge module.

p. Remove the cover of the existing module in the head using the 4053 Cover Removal Tool. See Figure 97.



822407

Fig. 97—Remove cover.

q. Remove red protector from bottom of bridging module.

r. Place preterminated bridge into leaf springs of splicing head. Crimp.

s. Repeat steps m. through r. for all preterminated modules.

t. Close splice per standard procedure.

13.06 Bridging PIC Stub to PIC Splice:

a. Verify PIC count in existing splice.

b. Following color code, preterminate stub pairs using procedures outlined in Section 13.05.

Note: After PIC cable count is verified the procedures for tagging may be omitted.

13.07 Bridging Pulp Stub to Pulp Splice:

a. Verify cable count in existing pulp splice.

b. Preterminate pulp stub in random order using procedures outlined in Section 13.05. Tagging is normally done at other end of stub.

14.0 *Advanced* MS² Super Mini Module Applications

The following sections of this practice describe procedures for lateral transfers, half tapping, carrier and load coils, slack removal, restoration, clearing and capping of cable ends with the Super Mini Module connector series. Section 21.0 describes splice configurations in pedestals.

Note: The following sections assume the craftsperson is familiar with all splice head functions.

15.0 Transfer of a Bridged 4005 Module

15.01 PIC stub transfer **within** an inline splice.

a. Tag the new modules that the existing stub is transferring to. Use 4079S Tagging Labels.

Note: Verify old and new count of through cable according to standard procedures.

b. Place tagged module into splice head. See Figure 98.

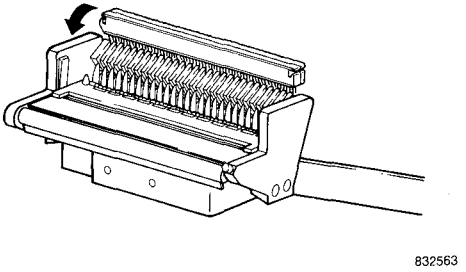


Fig. 98—Place tagged module.

c. Place 4079S Tagging Labels on tape plate.

d. Remove cover with 4053 Cover Removal Tool.

e. Remove red protector from a 4005 Bridging Module.

f. Place 4005 Module on 4000 Module in splice head. See Figure 99.

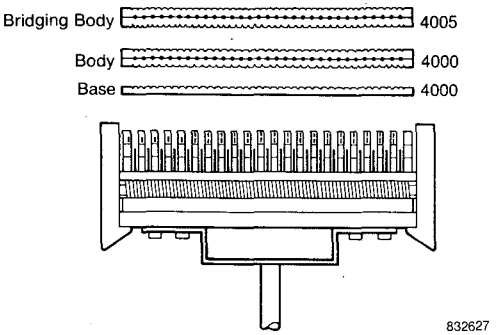


Fig. 99—4005 module on 4000 module.

g. Crimp.

Note: When crimping a bridging body onto working cable pairs, crimping bar must be insulated from elements in top of body. A recommended method for insulating the exposed elements is to trim the latches, both front and back, from a bridging cover and lay it on the body before crimping. Save this insulator for future use. See Figure 100.

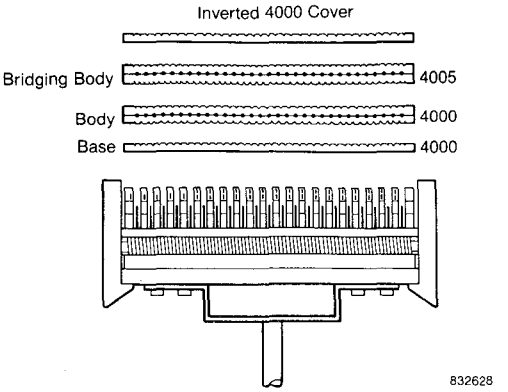


Fig. 100—Insulate with cover.

h. Cut tie point on existing stub to gain slack.

i. Prepare a piece out group of 25 pair PIC with free conductor 2½ times the length of the splice opening. MAKE SURE ENDS ARE CLEAR. Terminate this group into the bridging module according to the count on the tape plate.

j. Place cover, crimp, replace tagging label on 4005 Cover.

k. Place piece out group through tie point back along corresponding group in existing stub. See Figure 101.

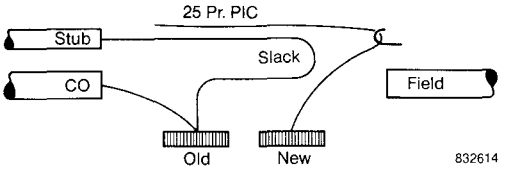


Fig. 101—Place piece out group through tie point.

l. Place existing stub group in color code order in 4000 Base in a splice head. See Figure 102.

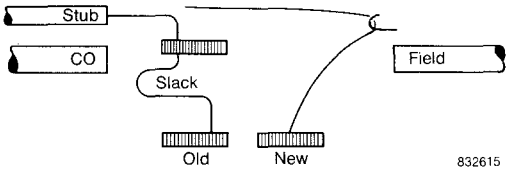


Fig. 102—Place stub group in base.

m. Place 4000 Body on wires in base. Place new stub in body top in color code order. Place cover and crimp.

n. Remove cover from 4005 Bridging Body transferred from and remove conductors. Replace cover with tagging label.

Note: This 4005 Bridging Body may be reused again to add a bridge at another time providing the new bridge conductors are the same gauge, or only change one gauge. **Do Not Attempt To Remove 4005 Body From 4000 Body.**

15.02 Transfer of Complete PIC Stub Within a Splice:

Note: Complete new PIC Stub is used for piece out.

a. Tag the new modules that the existing stub is transferring to. Use 4079S Tagging Labels.

Note: Verify old and new count of through cable according to standard procedures.

b. Move the old PIC Stub aside, cutting tie points. See Figure 103.

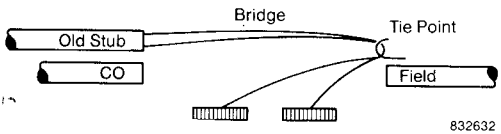


Fig. 103—Move PIC stub.

c. Repeat steps 15.01 b. through h.

d. Open end of new PIC Stub piece out with a minimum free conductor 2½ times the splice opening. Make sure stub ends are clear. Terminate the groups of this stub into the properly tagged modules according to the count on the tape plate. Example:
19″ + 19″ + 9″ = 47″.
482 + 482 + 228 = 1192 mm

e. As each 4005 module is filled, place cover, crimp, and place tagging label on 4005 cover.

f. Place piece out stub through tie point on opposite side of stub entry. See Figure 104.

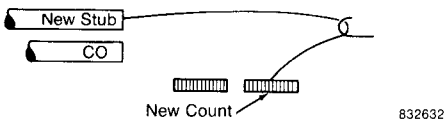


Fig. 104—Place piece out stub through tie point.

g. Make opening on existing stub outside the splice creating a new splice. Expose splice opening plus 10″ of conductors. Example:
Splice opening = 19″ (482 mm)
Slack = 10″ (250 mm)
Exposed Conductor = 29″ (736 mm)
See Figure 105.

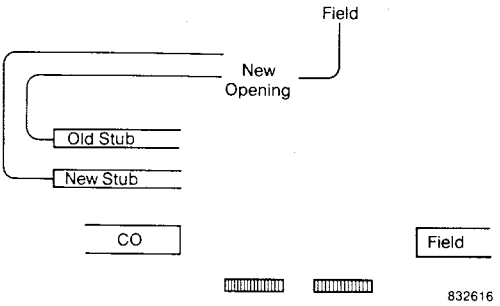


Fig. 105—Make opening.

h. Move cable ends together to create proper splice opening. See Figure 106.

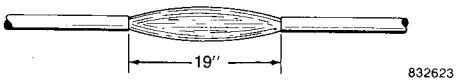


Fig. 106—Move cable ends.

i. Open new stub end with free conductor length a minimum of 1½ times the opening in the existing stub.

j. Use inline splice set-up in stub opening.

k. Place existing stub groups into base of 4000 module in splice head in color code order. **Make sure ends to be cut off are toward the original splice.** See Figure 107.

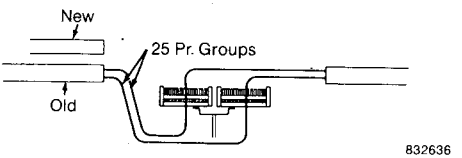


Fig. 107—Place existing stub groups into base.

l. Place 4000 body onto wires in base. Place new stub on body top in color code order. Place cover and crimp.

m. Go back to main splice, remove cover from 4005 module and remove conductors. Replace cover with tagging label.

n. Repeat steps 15.02 a. through m. until stub cut is complete.

o. Remove original stub from bridge splice. See Figure 108.

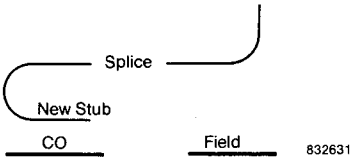


Fig. 108—Remove original stub from bridge splice.

15.03 PIC Stub Transfer Within a Pulp Foldback Splice:

a. Tag modules that the existing stub is going to. Use 4079S Tagging Labels.

b. Cut ties on existing PIC stub counts.

c. Place tagged module into splice head and adjust splice head on traverse bar to remove any slack in group.

d. Place 4079S Tagging Label on tape plate.

e. Remove cover with 4053 Cover Removal Tool.

f. Remove red protector from 4005 Bridging Module.

g. Place 4005 Bridging Module on 4000 module in splice head.

h. Crimp.

Note: When crimping a bridge module onto working pairs the crimp bar must be insulated. The cover removed from the 4000 module may be placed upside down on the top of the bridge module as an insulator. See Figure 109.

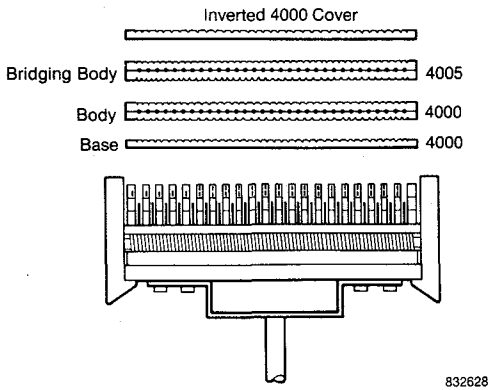


Fig. 109—Cover of 4000 module upside down.

i. Place loop through point at group to be transferred to along core. See Figure 110.

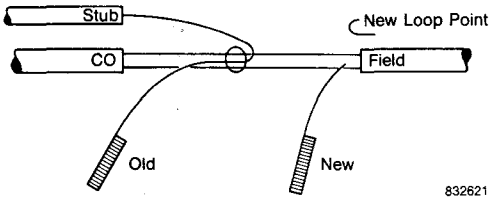


Fig. 110—Place loop through point at group to be transferred.

j. Make up transfer clip with 4047 Pair Test Probe on one end. See Figure 111.

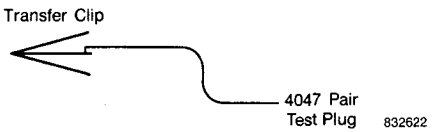


Fig. 111—Make transfer clip.

k. Verify that new pair is good according to standard procedures.

l. Place transfer clip on stub pair near stub sheath. Place 4047 Pair Test Probe in test port holes in existing module. See Figure 112.

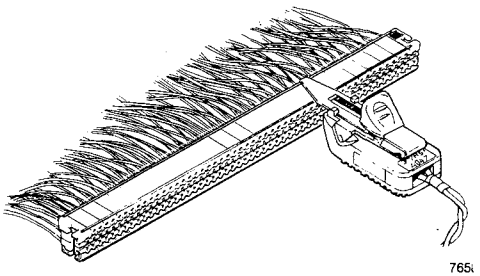


Fig. 112—Place test probe in test port holes.

m. Cut pair, one side at a time, 1″ (25 mm) behind existing bridge module.

n. Pull cut pair through loop point and place in bridge module according to count on tagging label on tape plate. See Figure 113.

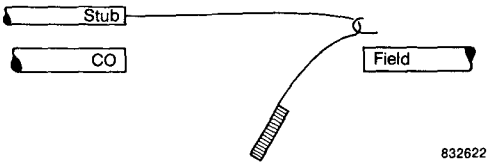


Fig. 113—Place cut pair in bridge module.

o. Working pairs must be inserted in the "U" contacts on the bridge module with the 4051 Wire Insertion Tool. See Figure 114.

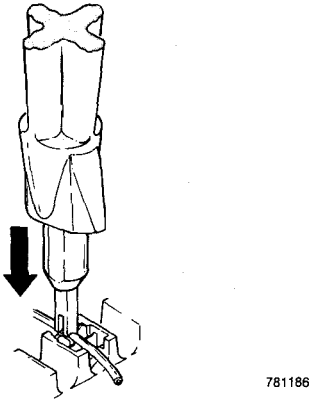


Fig. 114—Using 4051 Wire Insertion Tool.

p. Remove transfer clips.

q. Repeat procedure until entire module is completed.

r. Crimp and place tagging labels on 4005 Cover.

s. Remove cut wires from old 4005 and replace Cover.

t. Repeat steps b. through s. until transfer is completed.

16.0 Half Tapping (4008 Half Tap Module)

The MS² Splicing System can be used to half tap a run or through cable without cutting the conductors by using the 3M Brand 4008 Half Tap Module. The base and body/bottom of the module are colored green and contain no cut-off blades. Through wires placed in the base will be electrically connected by the elements, but not cut-off.

16.01 Recommendations and Suggestions for Cable Slack:

a. Use a **minimum** of 8″ (205 mm) of slack for **through** cables of 600 pair or less.

b. Above 600 pair the **minimum** amount of slack graduates to 14″ (355 mm) for a 1500 pair cable and above.

c. The preferred splicing sequence is to start with the back bottom groups, working up the back side.

Note: **Exception**—Layer cable must be spliced starting with the center groups. This requires a larger opening to assemble the cable in 25 pair groups.

d. When pulling slack, always allow binder groups to fall so that they will be on each side of the support tube when it is mounted. The cable twist will establish the most natural position.

e. It is preferred to lash the Tap Cable on top of the Cable to be removed.

f. Lay run (or through) conductors only in the module base. Use one splicing head.

16.02 Half Tap Splicing Procedures:

a. Open cable sheath and expose conductors the length of the splice closure plus the amount of necessary slack.

Example:
19″ opening + 14″ slack = 33″
(485 + 355 = 840 mm)
See Figure 115.

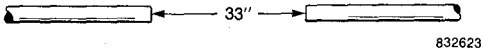


Fig. 115—Open cable sheath.

b. Pull cable slack until sheath ends are at recommended opening for splice closure. See Figure 116.

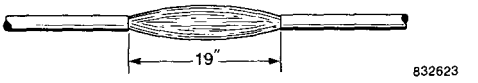
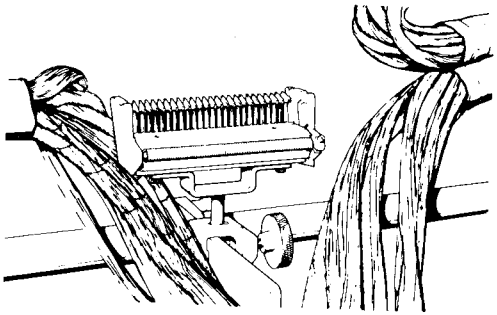


Fig. 116—Pull slack.

c. Identify binder groups.

Note: Layer cable must be counted and identified in 25 pair groups. Verify all spare pairs.

d. Mount splicing rig. Use one splice head on short traverse bar. See Figure 117.



832611

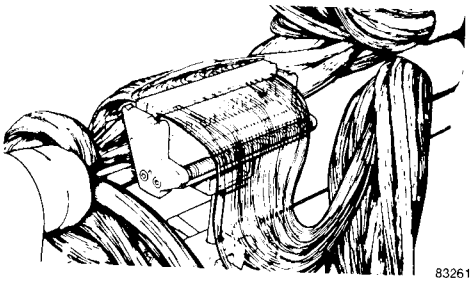
Fig. 117—Mount splicing rig.

e. Splice head should be positioned so that the backs of modules will end up positioned 1" (25 mm) to the left of the center of the opening, and 1" (25 mm) to the right of center.

f. Place adapter in splice head.

g. Place green base onto adapter in splice head.

h. **Always** place run (or through) wires into **base,** making sure to **pull slack toward cable to be removed.** See Figure 118.



832612

Fig. 118—Pull slack toward cable to be removed.

i. Use check comb.

j. Place 4008 Half Tap body into splice head GREEN BODY/BOTTOM SIDE DOWN. This side has no cut off blades.

k. Bring tap cable conductors directly onto body/top — leave no slack.

l. Use check comb.

m. Place cover and crimp. Remove cut wires from body/top and gently lift through wires from retainer springs.

n. Splice 100 pair at this location and bundle while splicing. **Keep slack toward leg to be removed.** On large pair count cables, gently fold the excess slack behind the module while bundling to keep splice diameter and shape as small and as uniform as possible.

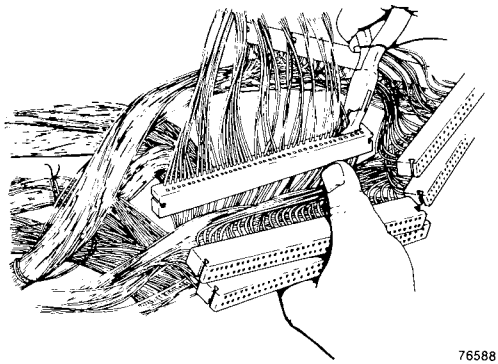
o. Move head to opposite side. Set so that module will be 1" (25 mm) from center. **Slack** will still be pulled **toward leg to be removed.**

p. Connect 100 pair at this location. Bundle.

q. Move back to opposite side and do another 100 pair. Bundle. Repeat above, alternating left and right.

16.03 Removing Half Tapped Cable:

a. Use a flush cut offset pair of pliers to allow one conductor to be cut at a time. Care should be taken not to short against adjacent cut conductors. See Figure 119.

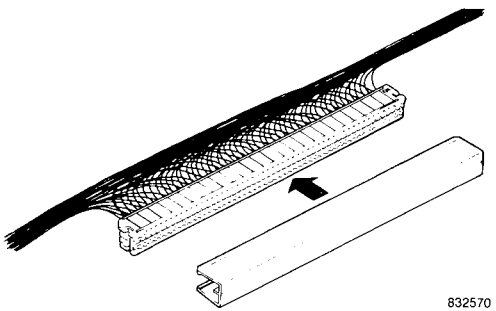


76588

Fig. 119—Cut conductors.

Note: DO NOT USE SNIPS

b. Insulate **pulp** cable cut ends with the 4078C Half Tap Cover. See Figure 120.



832570

Fig. 120—4078-C Half Tap Cover.

c. Insulate all **PIC** cable cut ends used in outside plant with the 4075S Sealant Box.

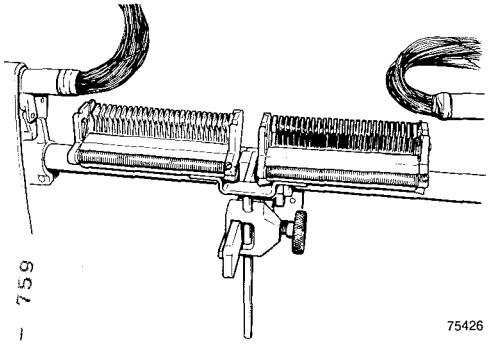
d. Bundle splice.

17.0 Load Coil And Apparatus (Carrier, etc.) That Use A "Feed In" And "Feed Out"

This type splice may be made using the Inline (double head) method or the Foldback (two single heads) method.

17.01 Procedures

a. Prepare the cable following the standard procedure for an inline splice opening. The free conductor length from each **cable** jacket must be a **minimum** of 1½ times the splice opening. See Figure 121.



6834 - 759

Fig. 121—Prepare cable.

b. The conductor length of the **load stub** must be a **minimum** of two times the splice opening plus 6" (152 mm).

c. Attach support tube.

17.02 One Person Splicing:

a. Use short traverse bar and attach a double head set up.

b. For uniformity and ease in removing the load, always place load pairs in module base. See Figure 122.

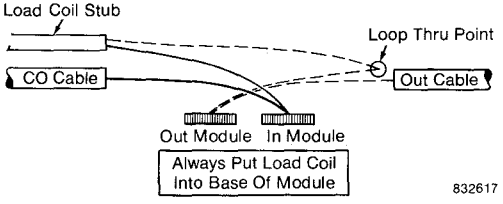


Fig. 122—Place load pairs in module base.

c. Place adapter in splice head.

d. Put a body into each head and lay pairs from C.O. cable into "IN" body. Place "OUT" cable pairs into the "OUT" body.

e. Put on covers and crimp. Note "IN" and "OUT" binder group numbers on covers.

17.03 Two Person Splicing:

a. Use two long traverse bars, each with one splice head attached. See Figure 123.

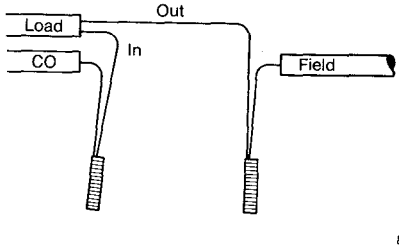


Fig. 123—Mount splice heads.

b. For uniformity and ease in removing the load always place load pairs in module base.

c. Put a body into each head and lay pairs from C.O. cable into "IN" body. Place "OUT" cable pairs into the "OUT" body.

d. Put on covers and crimp. Note "IN" and "OUT" binder group numbers on covers.

Note: When splicing a load coil with quads, separate each quad. Pull "IN" pair into "IN" base and "OUT" pair through "loop through point" and into "OUT" base. Keep in order, first pair at blue-white position, second at orange-white, etc.

17.04 Maintain the same order when using fully color-coded or tagged coils with separate "IN" and "OUT" stubs. This yields a uniform splice which eliminates tagging if load coil is cutout or changed at a later date. See Figure 124.

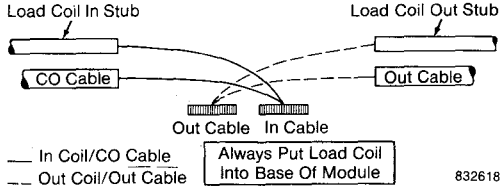


Fig. 124—Maintain same order when using color-coded or tagged coils.

17.05 Cutting Load Coils In Where No Splice Exists:

a. Sheath from through cable should be a **minimum** 19" (482 mm) opening. See Figure 125.

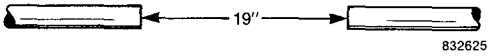


Fig. 125—Sheath opening.

b. Use short traverse bar and attach double head set up.

c. Place adapter in splice head.

d. Place load coil in base/body of 4000 module and crimp. See Figure 126.

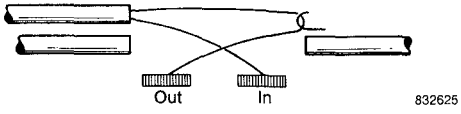


Fig. 126—Place load coil in base/body of module.

e. Verify group to be loaded.

f. Cut first straight through cable pair to be loaded at pair 17 (y/o) of left hand splice head. After pair has been cut, place left cut end in first wire way of body/top (BL/W) of left splice head; place right cut end in first wire way (BL/W) of right splice head. See Figure 127.

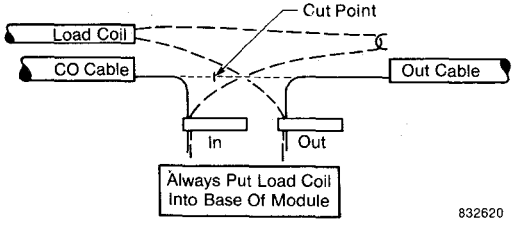


Fig. 127—Place cuts.

Note: If pair is working use bridging clips.

g. Insert conductors in contacts of body/top using 4051 Wire Insertion Tool. See Figure 128.

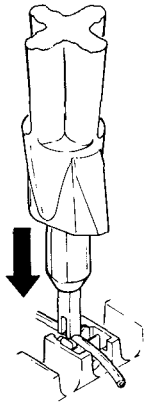


Fig. 128—Using 4051 Wire Insertion Tool.

h. Cut second straight through cable pair to be loaded at pair 18 (Y/GR) of left hand splice head and insert in pair number two (O/W) locations on **each** splice head. Continue cutting each successive pair in the 25 pair group, moving over one pair each time, until both module body/tops are filled. The **last** cut of the 25 pair group will be made at pair number seven (R/O) of the right hand splice head. Refer to Figure 127.

17.06 Cutting Out Load Coils:

a. Jumper Construction;

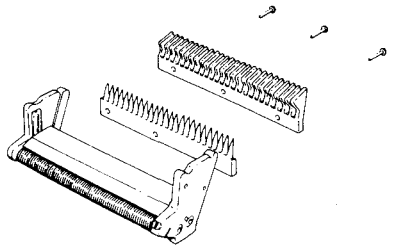
1. Use double head setup.
2. Splice head adapters **must** be placed in splice heads.
3. Place a 4005 Bridging Body with protector in each splice head.
4. Tie one end of 25 pair group firmly and terminate end in bridge body. Place cover and crimp.
5. Remove tied end of group and terminate in adjoining splice head. Place cover and crimp.
6. Remove jumper. See Figure 129.

Fig. 129—Remove jumper.

7. Terminate one set of jumpers for each 25 pair group to be deloaded.

b. Cutting Out Loads;

1. "Strip" **one** splice head. See Figure 130.



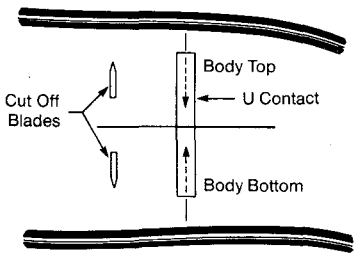
76582

Fig. 130—Strip one splice head.

2. Use splice head adapter.
3. Mark "IN" and "OUT" on 4005 jumper modules corresponding to "IN" and "OUT" sides of load splice and remove red protectors.
4. Mount loaded "IN" module into leaf springs of stripped splice head.
5. Remove cover with cover removal tool.
6. Crimp "IN" module of jumper onto "IN" module.
7. Repeat steps 4, 5, and 6 for "OUT" modules. This will shunt out the load.
8. Remove bases and remove load.
9. Zipper bases back onto body/bottom of 4000 Module.

18.0 Removing Slack From Working Cable With No Service Interruptions

18.01 The 4000 Module is constructed such that the wires are inserted into the "U" contacts, making a connection before they are cut off. See Figure 131.



832629

Fig. 131—4000 module.

a. Remove sufficient sheath so that once slack is removed, the splice opening remaining will accommodate closure to be used.

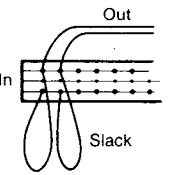
b. Set up splice rig with a single head and adapter.

c. Place 4000 base in splice head and place a 25 pair group in base. Let slack loop fall down in front and below retainer springs.

d. Place body in head.

e. Take conductors from other side of splice opening and place in body top.

Note: Care must be taken to place the same pair of conductors in the body/top wire channels that appear in the body/bottom channels. Pair one on top to match pair one on the bottom. See Figure 132.



832625

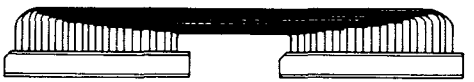
Fig. 132—Match pairs.

f. Fill body/top completely, add cover, and crimp.

19.0 Cutting in Aerial Terminal With No Through Cable Slack

a. Remove sheath from through cable. Use 19" (482 mm) opening.

b. Use double head setup and make up piece out jumpers in the base/body of two 4000 modules. See Figure 133.



832629

Fig. 133—Make up piece out jumpers in base/body.

Note: Make up a piece out jumper for each 25 pair in terminal stub.

c. Use stagger cut method described in Load Section 16.05, steps e., f., and g.

d. Place cover on one connector and crimp.

e. Place 4005 Bridging Module with red protector removed on adjacent 4000 module.

f. Insulate crimp bar before crimping cover.

g. Crimp.

h. Place terminal stub in 4005 module.

i. Crimp.

20.0 Clearing Cable Ends

a. Place base/body on adapter in splice head.

b. Place conductors in body/top, add cover and crimp.

c. Large cables should have odd groups to left, even to the right. See Figure 134.

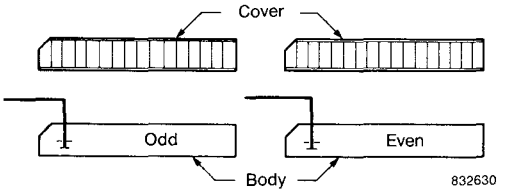


Fig. 134—Odd groups to left, even to right.

Note: A 4075S Sealant Boxes should be used on PIC cable.

21.0 Pedestal Splicing

a. Set up 4045K Universal Rig on pedestal placing splice head perpendicular to pedestal. See Figure 135.

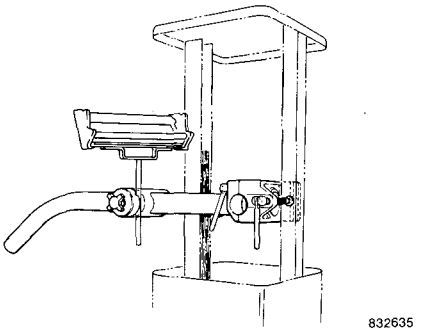


Fig. 135—Set up 4045K Universal Rig.

b. Loop conductors **under** a tie bar in top of pedestal. Use number six ground if no bar is furnished. See Figure 136.

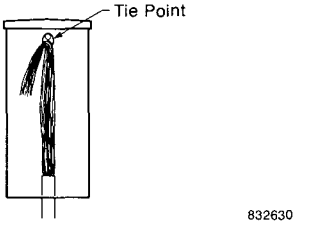


Fig. 136—Loop conductors under tie bar.

c. Splice groups so that the modules fall in a two bank vertical configuration. See Figure 137.

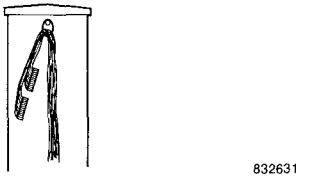


Fig. 137—Two bank vertical configuration.

Note: Sealant boxes should be used in all pedestal applications.

22.0 Maintenance

22.01 Module Reentry

a. Insert the blade side of a pair of snips under the cut corner area of the base or cover. (No latches are in this immediate area.) See Figure 138.

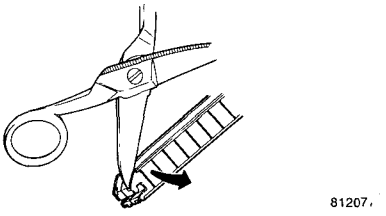
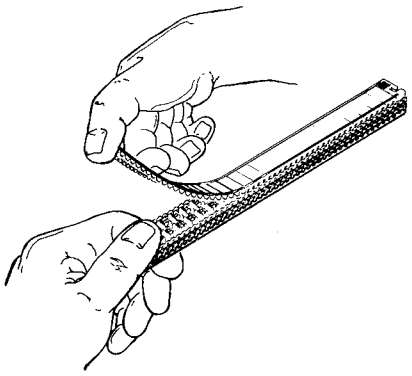


Fig. 138—Insert blade side of snips.

b. Peel cover or base away. See Figure 139.



781194

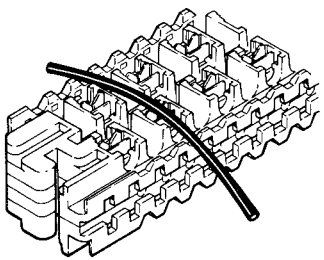
Fig. 139—Peel cover or base away.

c. The 4027 Super Mini Reentry Maintenance Kit can also be used to reenter modules. Refer to Section 23.0.

22.02 Wire Insertion

The 4051 Wire Insertion/Cut off Tool is used to insert wires in to the "U" contact and to cut off excess wire in Super Mini Modules when conductor rearrangements are made inside the module.

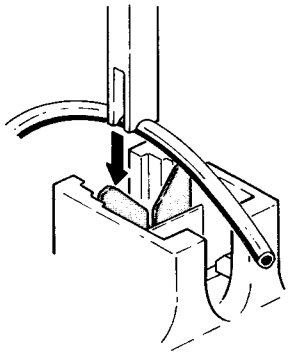
a. Pull wire across top of "U" contact and cut off blade. See Figure 140.



781178

Fig. 140—Place wire.

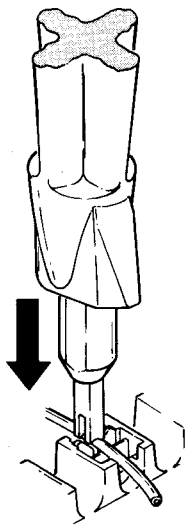
b. Align 4051 Tool with "U" contact and wire. The slot is aligned with the "U" contact and the groove with the wire. See Figure 141.



781186

Fig. 141—Align tool with "U" contact.

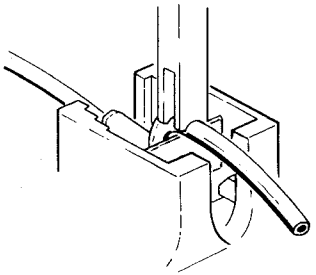
c. Push straight down forcing the conductor into the "U" contact. DO NOT ROCK TOOL BACK AND FORTH. See Figure 142.



781186

Fig. 142—Push straight down.

d. To cut off wire, align slot with cut off blade and groove with wire. Push straight down. Remove excess wire from module. See Figure 143. Do not rock tool back and forth.



781186

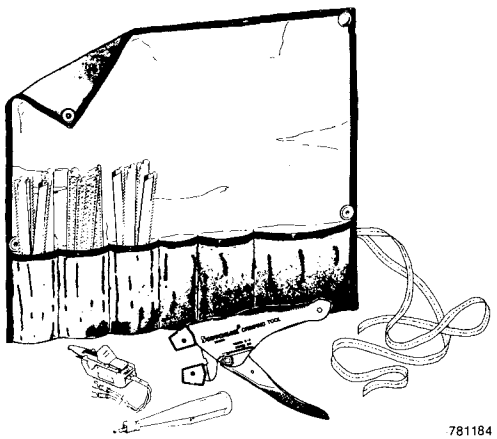
Fig. 143—Align tool with cut off blade.

e. Replace cover or base with an E9BM Crimping Tool.

23.0 Accessories:

The following products are designed to be used with the Super Mini Modules. Refer to their respective instruction bulletins for further information.

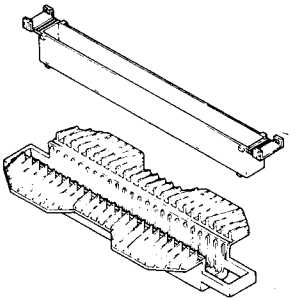
23.01 4027 Super Mini Reentry Maintenance Kit — This kit is designed for maintenance and repair work on Super Mini Module. See Figure 144.



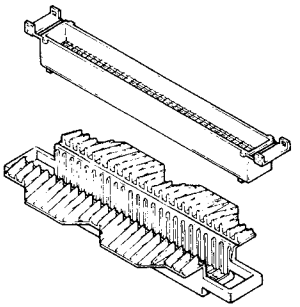
781184

Fig. 144—4027 Kit.

23.02 4075S and 4076S Super Mini Sealant Boxes — Designed for moisture resistance and reentry applications. The boxes can be applied to both foldback and straight-no-slack splices. The 4075S is designed to be used in all 2-wire splice applications. The 4076S is designed to be used in all 3-wire splice applications. See Figure 145.



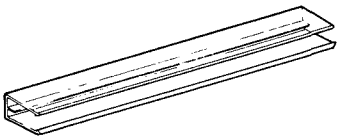
75516



76702

Fig. 145—4075S and 4076S Sealant Boxes.

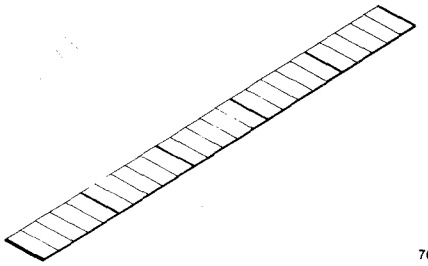
23.03 4078C Half Tap Cover — Used to protect wire ends after the half tap has been cut out of the Super Mini 4008 Half Tap Module in pulp/paper and pressurized PIC cable splices and vault splices. See Figure 146.



832569

Fig. 146—4078C Half Tap Cover.

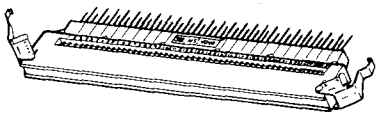
23.04 4079S Super Mini Tagging Labels — Permit easy and accurate recording of pair count during tagging operations. See Figure 147.



76607

Fig. 147—4079S Super Mini Tagging Labels.

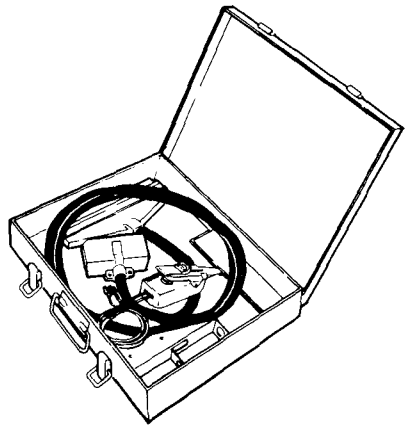
23.05 4048S 25 Pair Pocket Probe — Designed to interface with Super Mini Modules the probe provides access for identification of cable pair. See Figure 148.



832640

Fig. 148—4048 25 Pair Pocket Probe.

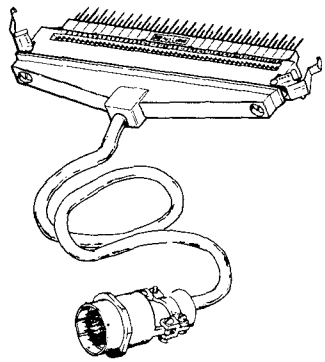
23.06 4048SA-1 Kit Super Mini 25 Pair Probe Assembly — Interfaces with testers and rotary switches with Cinch Jones male plugs, the probe assembly is specially designed for accurate continuity testing and tagging of all Super Mini Modules. See Figure 149.



781276

Fig. 149—4048SA-1 Kit.

23.07 4048SAB-1 Super Mini 25 Pair Probe with Connector — Designed for testing Super Mini Modules with a test set having a bendix connector. See Figure 150.



781229

Fig. 150—4048SAB-1 Probe.