



LINE GUARDS

For use on Tie Top Insulator Supports and minor conductor repair

Be sure to read and completely understand this procedure before applying product. Be sure to select the proper PREFORMED™ product before application.

SUBSET PROCEDURE

1.00 Form the rods into subsets by holding them flat, making sure that no rods are crossed and that the center marks are lined up. Refer to General Notes section for further instructions.



FIGURE 1

2.00 Twist the lay of the rods until the first subset is formed. (Figure 2)



FIGURE 2

3.00 Continue twisting the rods until the subset is completed. (Figure 3)



FIGURE 3

4.00 Completed subset. (Figure 4)



FIGURE 4

HAND APPLICATION

5.00 Start with half or less of the rods in the set per instructions in General Notes section. If preferred, the subset method may be employed. Make certain the rod ends are even, then place the center marks at the center of the insulator and apply at least one wrap. (Figure 5)



FIGURE 5

6.00 Repeat previous step with remaining rods. Make certain that no rods are crossed, then wrap on the rods completely. (Figure 6)



FIGURE 6

- 7.00 With a firm twist, snap the ends into place. Make certain all rods ends are snapped into place completely. (Figure 7)



FIGURE 7

- 8.00 When using the subset method of installation, it is necessary to place a pin or dowel inside the subset to hold it in proper position. Refer to General Note 21.12. (Figure 8)



FIGURE 8

- 9.00 Insert pin into subset, then clamp with hold stick. NOTE: Rod ends are positioned on top of the pin. (Figure 9)



FIGURE 9

- 10.00 Lift the conductor. With the rod ends on the top of the pin as shown in Figure 9, begin the application by applying at least one wrap of the subset. (Figure 10)



FIGURE 10

- 11.00 With the rod ends of the second subset on the bottom of the pin as shown by arrow, the subsets phase properly. Align the center marks and begin the application of the second subset. After both subsets have been started, work them alternately out to the ends. (Figure 11)



FIGURE 11

- 12.00 Complete the application by snapping the rod ends into place with the Applicator Ring as shown. NOTE: Applicator Ring should always be worked perpendicular to the conductor. (Figure 12)



FIGURE 12

- 13.00 Aluminum Line Guard completely applied. (Figure 13)



FIGURE 13

CONDUCTOR PREPARATION FOR ALUMINUM LINE GUARDS WHEN USED AS TAP PROTECTION RODS OR REPAIR RODS

Note: When Line Guards are used to repair damaged aluminum based conductors, or used as Tap Protection Rods, the following application steps will produce optimum long term electrical current transfer:

Step 1: Thoroughly wire brush conductor for the full length of the Line Guard to be applied.

Step 2: Apply a gritted inhibitor to the full length of this area before applying the Line Guard.

Step 3: if used as Tap Protection Rods, wire brush clean and apply an inhibitor to the rods where the Tapping Clamp is to be installed.

14.00 Completed application of Aluminum Line Guards as Tap Protection Rods. (Figure 14)



FIGURE 14

APPLICATION OF ALUMINUM LINE GUARDS WHEN USED AS REPAIR RODS

15.00 Example of damaged conductor. Refer to General Note 21.13 for repair abilities. (Figure 15)

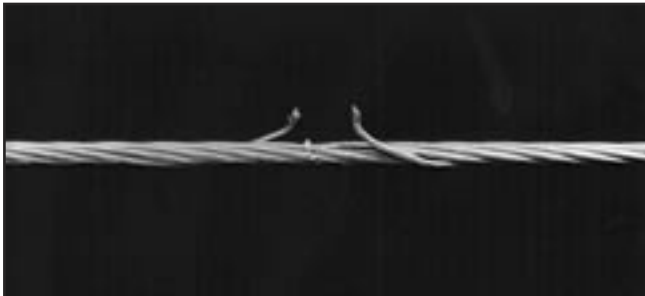


FIGURE 15

16.00 Unwrap damaged strand(s) and use hot-line cutter to carefully remove the distorted strand sections. (Figure 16)



FIGURE 16

17.00 Lay the strand(s) back into the conductor, as shown by arrows. Wire brush and apply a gritted inhibitor over the area to be patched. (Figure 17)

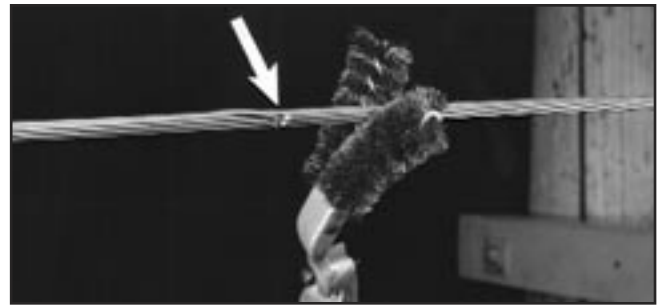


FIGURE 17

18.00 Apply first subset carefully to cover the cut ends of the strand(s). (Figure 18)



FIGURE 18

19.00 Apply second subset, making certain all the rod ends are snapped into place. (Figure 19)



FIGURE 19

20.00 Completed application of Aluminum Line Guards used as Repair Rods. (Figure 20)

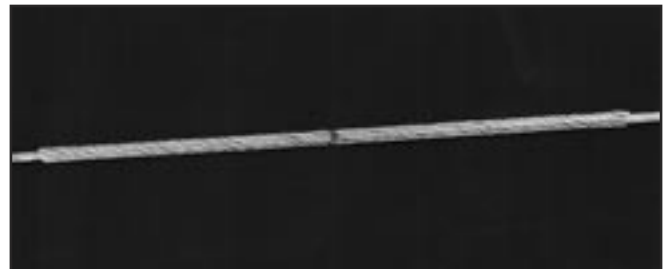


FIGURE 20

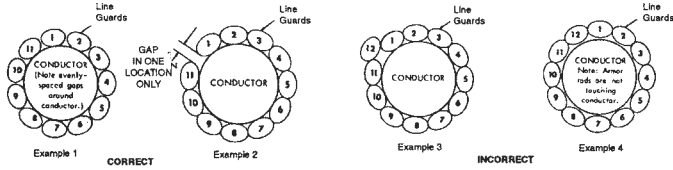
GENERAL NOTES

21.01 Line Guards are not to be reused after initial installation.

21.02 On Aluminum conductor sizes #4 through and including 3/0 (diameter .447"), Line Guard rods may be applied one half set at a time, loose or subset.

21.03 On aluminum conductor sizes 4/0 through and including #636 MCM (diameter .997"), Line Guard rods should not be applied more than four at a time, loose or subset.

21.04 On aluminum conductors over one inch in diameter, Line Guard rods should not be applied more than three at a time, loose or subset.



21.05 If there are 11 rods in the set, apply the rods in groups of 4-4-3, following the same procedures demonstrated above.

21.06 After application of the correct number of rods, a slight gap between the rods should be present. Study the above examples.
 Example 1: Excellent application.
 Example 2: Satisfactory, but may lead to applying an extra unneeded rod.
 Example 3: Extra rod produces bridging condition, potential rod abrasion.
 Example 4: Extra rod, expanded tube condition, affords little protection, allows severe abrasion and other conductor damage. If undecided about adding an extra rod follow this rule: **when in doubt leave it out.**

21.07 Keep ends of tap rods at least six inches away from ends of rods at the support point.

21.08 In applying Line Guards, the alignment of the ends of the rods should be maintained within 3/4".

21.09 TAP ONLY AT THE CENTER OF THE RODS

21.10 Clamp:
 a. Use a compatible spring-loaded clamp.
 b. Groove of the clamp should be well contoured to provide sufficient area contact over the rods.
 c. Make copper-to-aluminum transition in the clamp body itself.

21.11 Make certain that the tap is tight enough to eliminate the possibility of loosening from vibration.

21.12 Wood or steel dowels approximately 20% smaller than the conductor diameter can also be used as Armor Rod Pins.

21.13 Line Guards may be used to repair minor damage to aluminum conductors. The amount of damage Line Guards can repair depends upon the type and standing of the conductor. Refer to the table below or consult PLP.

Total Repairable Number of Broken or Damaged Conductor Wires

Standing	5/1	12/7	18/1	30/7	54/7	7W	19W	37W	61W
Condition Type	6/1 7/1	24/7	26/7	45/7					
ACSR	1	3	4	5	6	-	-	-	-
AAAC	-	-	-	-	-	2	5	-	-
AAC	-	-	-	-	-	1	2	9	12

22.00 SAFETY CONSIDERATIONS

- 22.01** This application procedure is not intended to supersede any company, construction or safety standards. This procedure is offered only to illustrate safe application for the individual. **CAUTION: Failure to follow these procedures and restrictions may result in personal injury or death.**
- 22.02** This product is intended for a single (one-time) use and for the specified application. **CAUTION: DO NOT REUSE OR MODIFY THIS PRODUCT UNDER ANY CIRCUMSTANCES.**
- 22.03** This product is intended for use by trained technicians only. This product **should not be used** by anyone who is not familiar with, and/or not trained in the use of it.
- 22.04** When working in the area of energized lines, extra care should be taken to prevent accidental electrical contact.
- 22.05** For proper performance and personal safety, be sure to select the proper size PREFORMED™ product before application.
- 22.06** PREFORMED products are precision devices. To insure proper performance they should be stored in cartons under cover and handled carefully.



PREFORMED LINE PRODUCTS

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