

SECURING CABLE AND WIRE
CLIPS, METHOD OF USING

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1. GENERAL

1.1 Scope of Section

1.11 This section covers the methods for securing switchboard cable and wire on cable racks with adjustable flat type clips.

1.2 General Information Pertaining To Arrangement of Tools, Precautions, Verification, Specs and Drawings and Figures

1.21 Refer to Section 1 of this handbook for information pertaining to these items.

2. INSTALLING EQUIPMENT

2.1 The tools and supplies generally used for operations covered in this section are covered in Section 300 of this handbook.

3. STEPS IN ASSEMBLING ADJUSTABLE FLAT TYPE CLIPS

3.1 Mounting Anchor Clips

3.11 Anchor clips are mounted as illustrated and described in Figure 1 Sketches A through D.

NOTE: On cable racks having the substitute pressed steel channel straps (top edges rounded) some anchor clips do not grip the strap securely. Clips that do not fit properly on the rounded strap should be set aside for use on the regular hot-rolled type (top edges square) of strap.

3.12 On Horizontal Resting Runs

3.121 Where practicable, mount the anchor clip so that the vertical tooth is on the right-hand side of the channel when viewed from the side of the rack toward which the cables grow or count.

3.1211 Where cables turn through the rack at a normal clip location, mount the anchor clip so that the tooth is on the side of the cross strap away from the turn.

3.1212 When cables break through the rack on both sides of a cross-strap at a normal clip location, the anchor clip tooth may be on either side of the cross-strap. Cables which are in contact with the toothed portion of the anchor clip should be protected from the clip by placing a wrapping of 1/64" gray sheet fiber around the cable or group of cables.

3.13 In Cable Turning Section

3.131 In cable turning section using the welded multiple cable supports shown in Figure 2, place anchor clips with the tooth portion on either side of the cross-straps as necessary to obtain uniform spacing of clips or as may be required by spacing of channels.

3.14 On Vertical Runs

3.141 On vertical runs place the anchor clips with the toothed portion above the strap except in the following case.

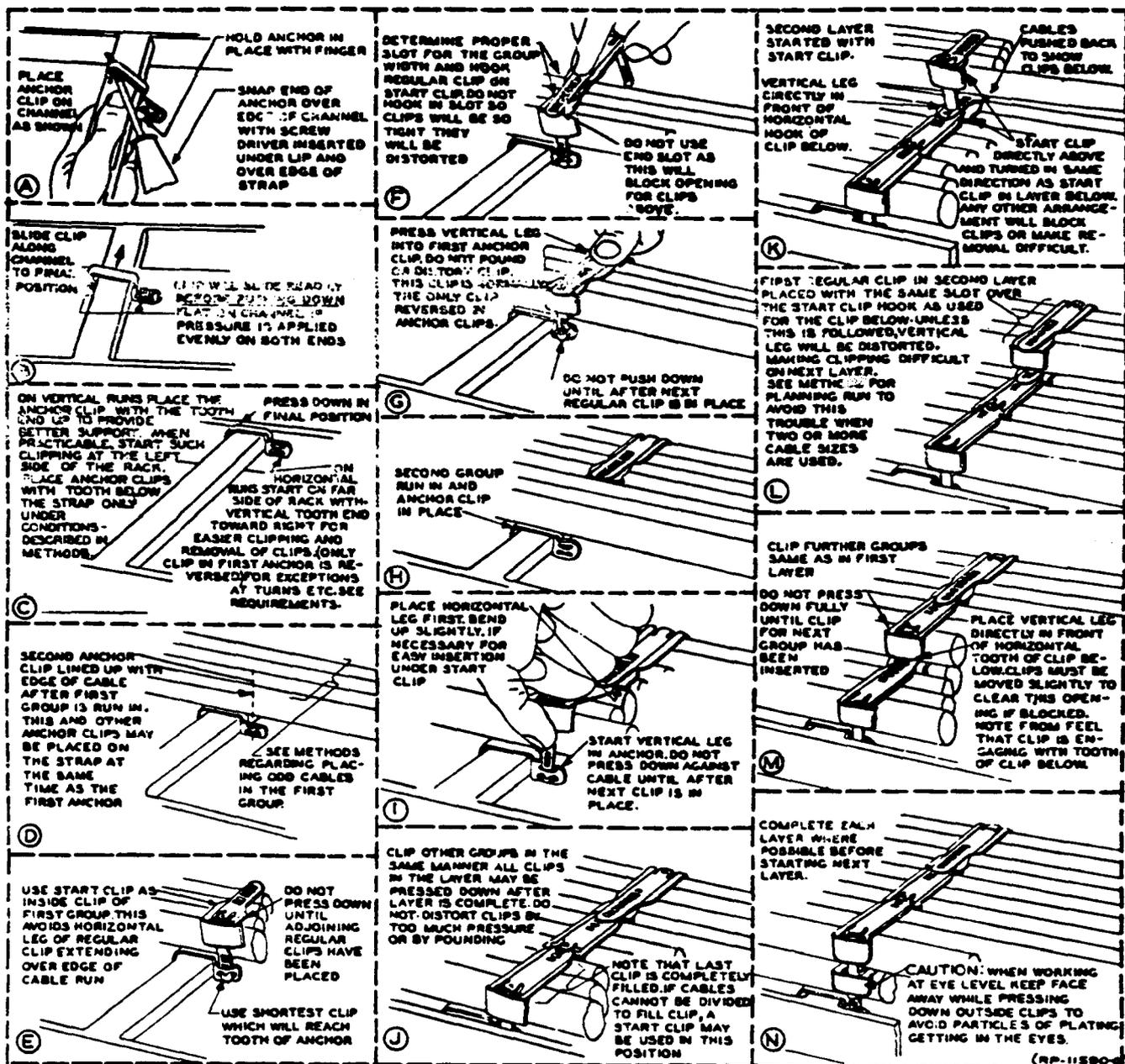


FIG. 1 METHOD OF ASSEMBLING ADJUSTABLE FLAT TYPE CLIPS
(PARS. 3.11, 3.21)

3.1411 Where the initial cables on the run were clipped starting at the center of the strap, or where due to unusual job conditions, cable runs must be started at both sides of the rack, arrange the clips to avoid interference where the cables meet. Placing the anchor clips in opposite directions at each side of the rack will result in clips being on opposite sides of the cable rack strap and will avoid interference. A minimum of space between the two runs will result when the inside anchor clips are placed as illustrated in Figure 3.

3.2 Assembly of Start and Regular Clips

3.21 The various steps in assembling flat type clips are illustrated and described in Figure 1.

3.22 Assembled anchor, start and regular adjustable flat type clips are illustrated in Figure 4. Do not reverse the direction of the clips when proceeding from layer to layer. When adding a layer of cables to an existing layer, place the added clips in the same direction as the existing clips; i.e. where the initial ground of a

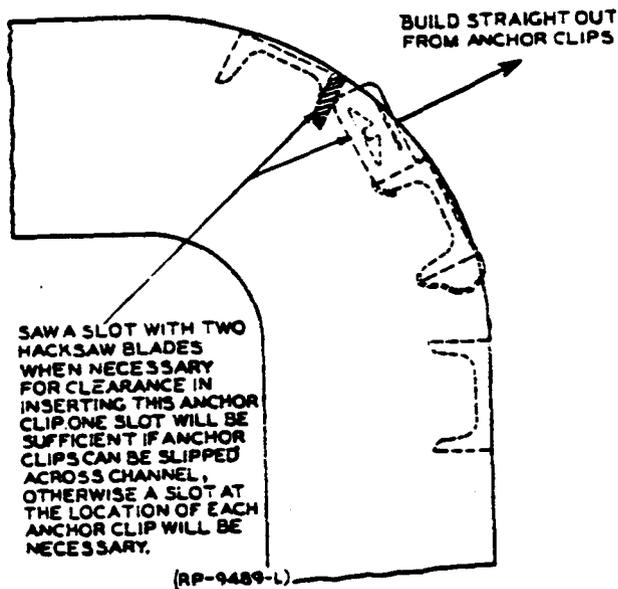


FIG. 2 PLACING ANCHOR CLIPS ON CROSS STRAPS IN CABLE TURNING SECTIONS (PAR. 3.131)

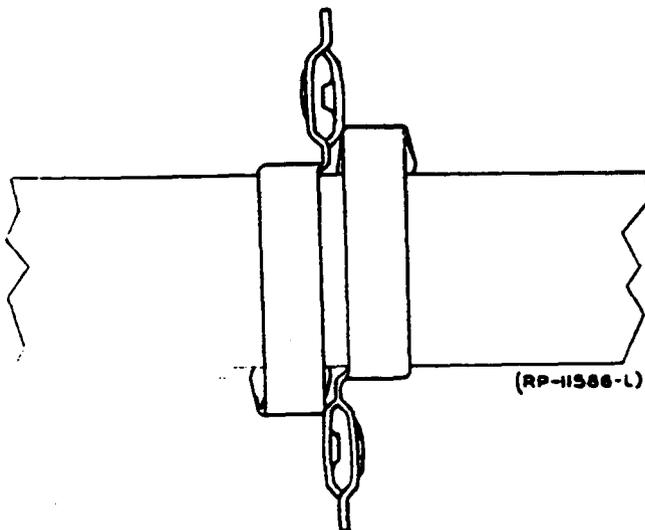


FIG. 3 PLACING ADJACENT ANCHOR CLIPS FOR TWO RUNS ON SAME CABLE RACK (PAR. 4.1411)

layer, with its starting clip, is at the right of a run, the succeeding layer should have its initial group at the right also, as shown in Figure 4, so the clips above will face in the same direction as the clips below.

3.23 Where runs only one clip wide have been placed as above on racks greater than 5' wide, and cables are later added across the rack, a new set of clips should be started for the new cables.

3.3 Fitting of Clips

3.31 Clips should hold the cables securely, but not so tightly as to cause objectionable unevenness of the cable run or damage to the cable covering.

3.311 Be particularly careful not to apply clips so tightly as to deform the cables when clipping Code 720, 721, and 723 cables.

3.32 Since switchboard cables cannot be tested for grounds more care is necessary to avoid excessively tight cable clips which may result in damaged cable sheathing and possible grounded cable conductors. There is no practicable method available for testing cables for grounded conductors during the cabling operations. When such trouble is located during the routine testing operations, it is often difficult and expensive to locate and remove the clip causing the trouble.

3.33 It is particularly important that flat type cable clips be pressed into position by hand and that no tool be used for hammering them.

3.34 When interference occurs with clips, there is danger of injury to the cables if any attempt is made to force obstructed clips into position. In case of doubt, measure vertical leg of clip by placing it against the cables at edge of run.

3.35 Complete each layer of cable groups across cable rack before starting the next layer.

3.36 Cables turned onto a rack should be used to fill out incomplete layers wherever possible in preference to starting new layers at the opposite side of the rack.

3.4 Assembly of Clips at Inverted Sections of Cable Rack

3.41 Cables on an inverted section of cable rack, known as a basket rack, may be clipped when the run is of sufficient depth to warrant this method of securing. Install first layer of cables without securing to straps. Place assembled clips on top of the first layer of cables without use of anchor clips, selecting clips with vertical legs which will not extend below bottom of cables. Run second layer of cables and continue clipping in the usual manner.

3.5 Disposing of Protruding Ends of Clips

3.51 Where the vertical end of a start or regular clip extends more than two slots below the bottom of the toothed portion of the anchor clip, bend the end of the leg against and around the bottom edge of the anchor clip as illustrated in Figure 5 using a pair of pliers R-2195.

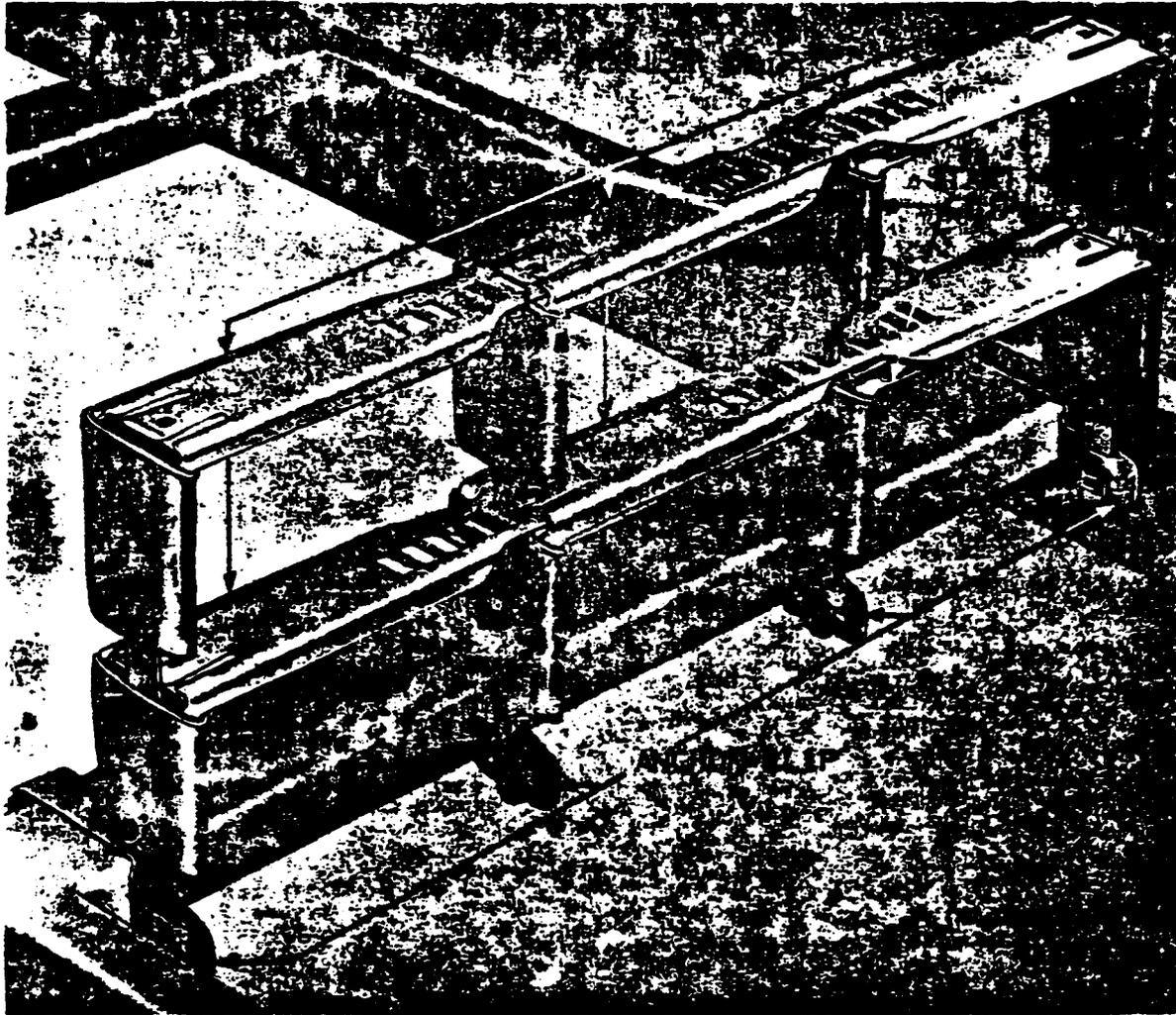


FIG. 4 ASSEMBLED ANCHOR, START AND REGULAR ADJUSTABLE
FLAT TYPE CLIPS (PAR. 3.22)

3.52 Dispose of the excess ends of regular clips on runs only one clip wide, by one of the two following procedures as illustrated in Figure 5.

3.521 When clipping on the top layer (regardless of future cabling) or horizontal runs and on all layers in exposed places of vertical runs.

3.5211 Measure the regular clip to determine the proper slot to place over the hook of the start clip.

3.5212 Cut off end of horizontal leg (if too long to insert in the start clip per View A of Figure 5 using pliers R-2195, leaving one slot beyond that which is placed over the hook.

3.5213 Place the end of the regular clip inside the start clip.

3.5214 Engage the proper slot over the hook, drawing the clip

down.

3.5215 Secure the vertical leg in the regular manner.

3.522 When clipping on other than the top layer of horizontal runs and on vertical runs in unexposed places, press the excess horizontal leg of the regular clip down against the start clip as shown in Figure 5.

3.53 On a horizontal or vertical runs where a single group of cables one clip wide is added over a layer of cables more than one clip wide, the horizontal portion of the regular clip may be bent down as covered in Paragraph 3.522.

4. REMOVING ADJUSTABLE FLAT TYPE CLIPS

4.1 Removing Start and Regular Clips

4.11 Remove clips using cable clip remover, R-2542, as illustrated in Figure 7.

NOTE: Exercise care to prevent clips from falling when released.

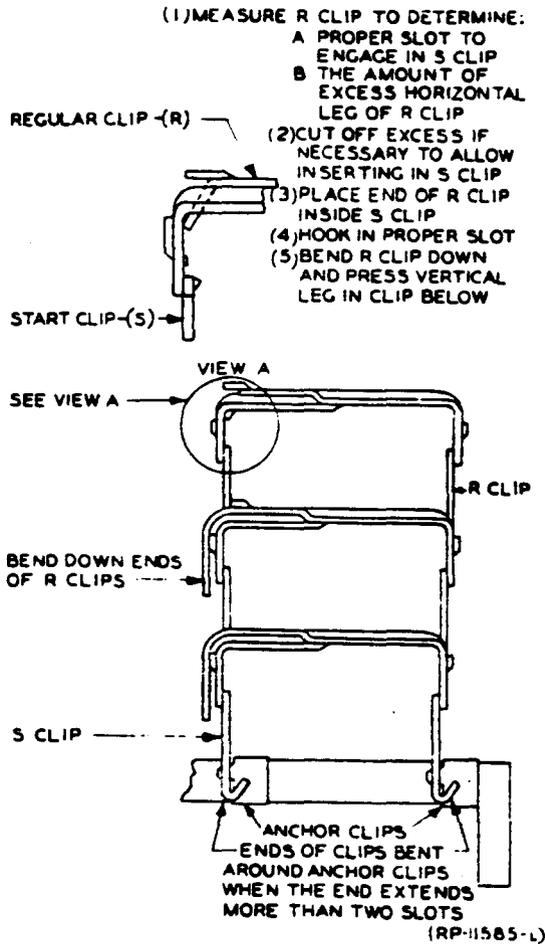


FIG. 5 DISPOSING OF PROTRUDING END OF CLIPS (PARS. 3.51, 3.52, 3.522, 3.5212)

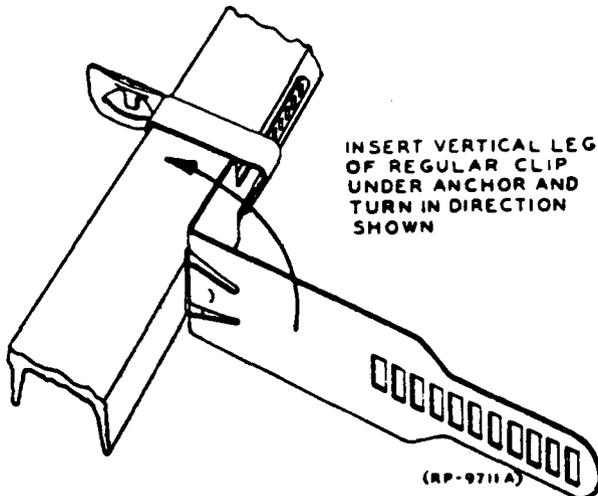


FIG. 6 REMOVING ANCHOR CLIPS (PAR. 4.31)

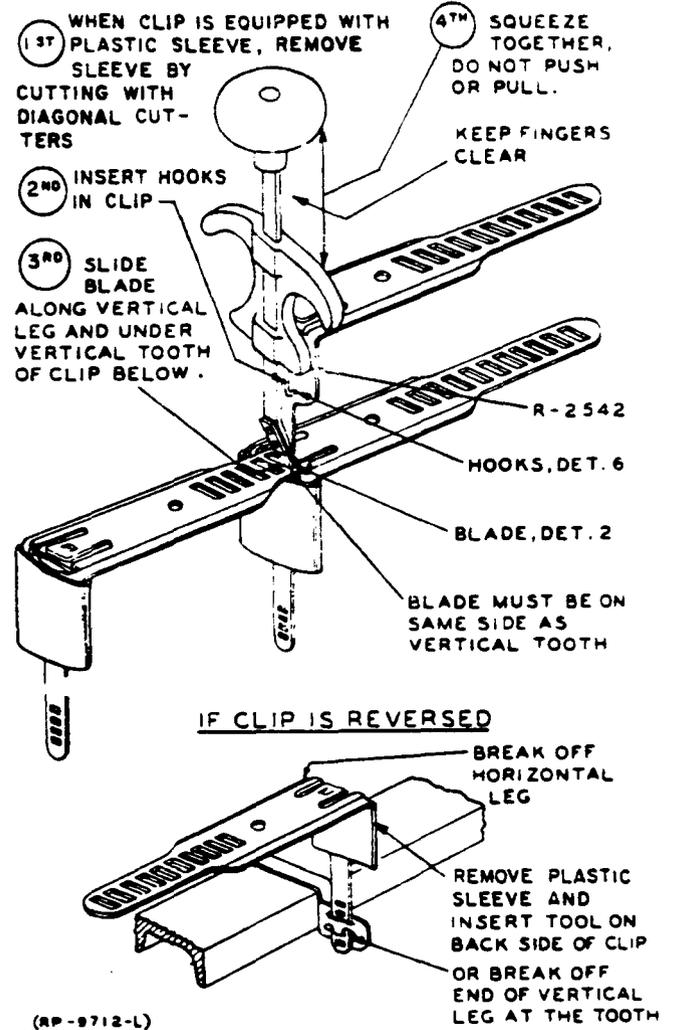


FIG. 7 REMOVING START AND REGULAR CLIPS (PARS. 4.11, 4.21)

4.111 If the blade should get caught, it may be worked into position by moving slightly from side to side while holding it tightly against the clip vertical leg. Exercise care not to break the blade.

4.112 Clips secured to anchor clips are removed by breaking off the vertical leg at the anchor clip tooth.

4.113 To remove sleeved clips it is necessary to first cut the sleeve from the clip with diagonal cutters.

4.114 After the sleeve is taken off, the clip should be removed in the standard manner.

4.2 Removing Clips in Reverse Position

4.21 Clips in reverse position such as the regular clip used with a start clip, cannot be removed by the clip remover tool. These clips are removed as indicated in Figure 7.

4.3 Removing Anchor Clips

4.31 Anchor clips can be removed by placing a screwdriver or the vertical leg of a regular clip under the anchor and turning in the direction shown in Figure 6.

4.4 Deformed Clips

4.41 Deformed clips should be removed and replaced.

5. VERIFICATION

VERIFICATION ITEMS AND BRIEF STATEMENT OF REQUIREMENTS	REFERENCE	
	Par. No.	Fig. No.
5.1 Mounting Anchor Clips		
5.11 Anchor clips are mounted as illustrated and described in Figure 1 Sketches A through D.	3.11	1
5.12 On horizontal resting runs where practicable, mount the anchor clip so that the vertical tooth is on the right-hand side of the channel when viewed from the side of the rack toward which the cables grow or count.	3.121	
5.121 At a normal clip location, anchor clips placed so that tooth is on the side of the cross strap away from the turn.	3.1211	
5.1211 When cables break through rack on both sides of cross strap, cable in contact with toothed portion of anchor clip protected with 1/64" fiber.	3.1212	
5.13 Anchor clips mounted on vertical runs with toothed portion above straps (except where cables are clipped from both sides of the rack and on special cable rack assemblies such as C.T.S.).	3.131 3.141 3.1411	2 3
5.2 Fitting of Clips		
5.21 All clips holding cables firmly, but not so tight as to damage cable covering.	3.31	
5.3 Disposing of Protruding Ends of Clips		
5.31 Vertical leg of adjustable flat type clip extending more than two slots below the bottom of the toothed portion of the anchor clip, bent against and around bottom end of anchor clip.	3.51	5
5.311 Protruding end of flat type regular clips bent down against adjacent clip, except on top layer.	3.52 to 3.53	5
5.312 On top layer ends of clips cut off if required and reinserted in start clips.	3.52 to 3.53	5

No arrows are shown due to extensive changes.

Vertical line at side of paragraphs indicates requirements.

Superintendent, Installation Engineering

Reason for Issue:
As part of the General Revision of Handbook 8 to include information formerly covered in Section 5B.