Installation Engineering Handbook 30
Western Electric
Service Division

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ALIGNMENT OF FRAMES

DISTRIBUTING AND PROTECTOR FRAMES
COMMON SYSTEMS

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1. GENERAL

1.1 Scope

1.11 This section covers the specific requirements and installing procedures for aligning distributing and protector frames.

1.12 The requirements and installing procedures for erecting and loosely fastening distributing and protector frames are covered in Section 19H.

1.13 The requirements covered in this Section shall be followed except as modified by applicable specifications and drawings. Framework shall be assembled and equipment installed as shown in specified assembly and equipment drawings.

1.2 Associated Information

1.21 Refer to the Table 1 for the location of information to which reference may be necessary when performing operations covered by this section.

1.3 General Information Pertaining to Arrangement of Tools, Precautions, Verification, Specification, Drawings and Figures

1.31 Refer to Section 27A for information pertaining to the above subjects.

2. INSTALLING EQUIPMENT

2.1 Tools

2.11 The tools listed below will be required for the operations covered by this section. Other tools available in the General Tool Kits also may be required.

*R-2806	Handle, Reversible Racket for 1/2" Sq. Drive Wrench Sockets
R-2792	General Use Wrench Set
*R-1313	Line, Fish
*R-1314	Plumb Bob, Steel
*R-2795	Wrench Socket, 1/2" Sq. and 5/8" Hex. Combination
R-1545	Wrench, Socket, Hex. 11/16" Special
R-2819	Wrench, Sockets, Dets. 5 and 6
R-3057	Wrench, Socket, Hex. Pivoted

*These tools are contained in Kits 43 and 48

ASSOCIATED HANDBOOK INFORMATION REFERENCE TABLE 1

Subject	Handbook	Section
General Information	30	1 Series, 20A
Alignment of Frames - Common Requirements and Information	30	27A
Erecting, Placing and Fastening Distributing and Protector Frames	30	19E3

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3. AUXILIARY FRAMING SUPPORTED FRAMES

3.1 Top and Base Angles

3.11 The following aligning operations, to establish the relation between the top and base angles, should be performed before the erection of the frame verticals as covered in Section 19H:

3.111 The base angles should be located with the front edge of the angles on the floor line.

3.112 The top angles should then be aligned with the base angles within a variation of 1/4" in both directions.

(a) Use a R-1314 Plumb Bob suspended from the end holes of the top angles as shown in Figure 1.

(b) Align base and top angles at every tenth vertical location.

(c) Any necessary adjustment should be made in the location of the top and base angles after which the assembly bolts should be securely tightened before the verticals are erected.

(d) Use the R-3057 Double Ended 5/8" - 7/8" Socket Wrench for tightening the 1/2" hexagon nuts on the "V" bolts securing the top angle to auxiliary framing.

(e) Use the R-2806 Reversible Handle and the R-2795 Combination 1/2" Square and 5/8" Hexagon Wrench Socket for tightening the floor angle bolts.

3.2 Single Vertical Units

3.21 As single vertical units are erected, the alignment between the top and base angles should be checked at every tenth vertical.

3.22 The distance between the vertical shown on the assembly drawing should be checked as the verticals are erected and before the assembly screws are finally tightened.

(a) Use the R-2819 Socket Wrench, Det. 6, for tightening the 3/8" nuts on the cap screws at top and bottom of verticals.

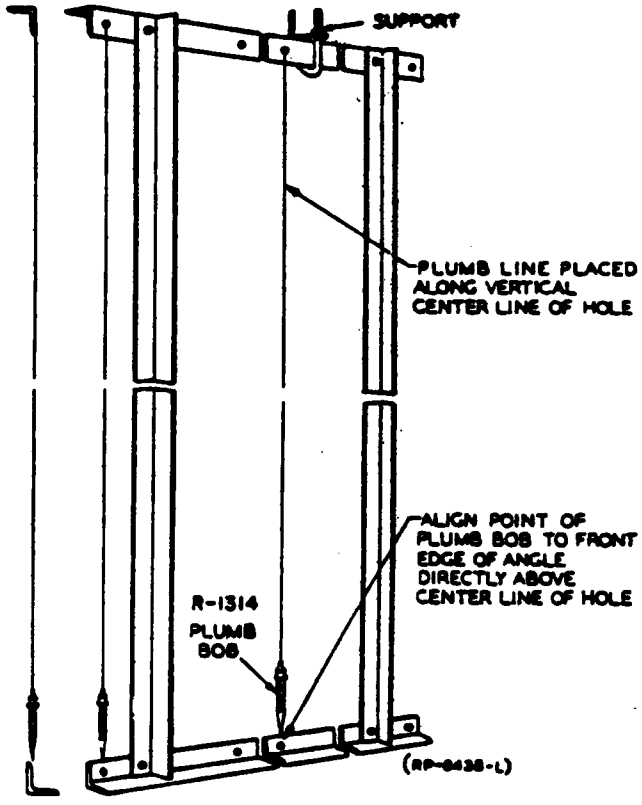

FIG. 1 ALIGNING DISTRIBUTING FRAME ANGLES (PARS. 3.112(a), 3.34, & 5.12)

3.23 Distributing frames may follow the general contour of the floor. However, for appearance reasons, the shelve of distributing frames should not be more than 1/4" above or below a straight reference line extending the full length of the indicated ultimate lineup. This reference line may slope with the floor.

(a) In checking this requirement, use the R-1313 Fish Line drawn tightly under the transverse arms from the ends of the frame lineup.

3.24 The vertical parts of the framework, where the verticals are 9'-0" or over in height, should be plumb to within a deviation of 1/4". See Section 27A for general requirement.

3.25 Use the R-1546 Hexagon Socket Wrench (11/16") for tightening the nuts on cap screws used to secure the tie bars. See Section 19H.

3.3 Single Sided Frames (Unit Type)

3.31 The cable rack over a line distributing frame should be placed before the frame is aligned. The cable rack is secured to the auxiliary framing bars on one side by "2" clips which fit over the "V" bolts used to secure the frame as shown on cabling drawing ED-25341-01.

3.32 Align horizontally and locate base of frame while resting on short pieces of 3/8" bar. The use of the bar facilitates moving the frame when aligning it and permits placing the leveling screws so frame can be lowered as required.

3.33 Use strips of wood, auxiliary framing bars, conduit wired or lashed to the uprights directly above the guard rail to help maintain the alignment of each unit until the frame can be lowered to the floor and bolted in place. Each wooden strip, bar or length of conduit should connect several adjacent framework units.

3.34 Plumb the frame as shown in Figure 1, using the R-1314 Plumb Bob. The frame base should rest on the floor except where it is necessary to raise the frame slightly with leveling screws in order to meet the plumbing requirements and to maintain a satisfactory alignment of the guard rail.

3.35 The vertical parts of the framework should be plumb to within a deviation of 1/4". See Section 27A for general requirement.

3.36 After aligning and locating the base of the frame, insert the leveling screws, remove the short pieces of 3/8" bar and lower the frame to the floor by means of the leveling screws.

(a) Use the R-2806 Reversible Handle and the R-2795 Combination 1/2" Square and 5/8" Hexagon Wrench Socket for adjusting leveling screws and tightening floor bolts.

(b) Use the R-3057 Double Ended 5/8" - 7/8" Socket Wrench for tightening the 1/2" hexagon nuts on the "V" bolts securing the top angle to auxiliary framing.

4. FLOOR SUPPORTED FRAMES

4.1 Floor supported frames 7'-0" or less in height should be plumb within 1/8". Frames 7'-0" to 9'-0" in height should be plumb within 3/16".

4.11 In this requirement the deviation should be measured at the top of the structure. Any acceptable deviation from straightness of the part should be ignored.

4.2 When frame is supported by cable rack, it should be aligned at the same time as the tightening of the "J" bolts fastening the cable rack to the top angle.

5. WALL SUPPORTED FRAMES

5.1 Frames 7'-0" or less in height should be plumb within 1/8". Frames 7'-0" to 9'-0" in height should be plumb within 3/16". See Section 27A for general requirement.

5.11 Wood shims of the proper thickness should be used under the base of frame, when required.

5.12 Use the R-1314 Plumb Bob as shown in Figure 1 when aligning framework.

5.2 Use the R-2806 Reversible Handle and the R-2795 Combination Wrench for tightening floor bolts when "Loxin" expansion shields are used. Use suitable wrench from the General Kit when frame is secured with lag screws.

6. VERIFICATION ITEMS

	VERIFICATION ITEMS AND BRIEF STATEMENT OF REQUIREMENTS	REFERENCE PAR. NO.	REFERENCE FIG. NO.
6.1	Distributing and Protector Frames		
6.11	Auxiliary framing supported frames.		
6.12	Base angles located with front edge of angles on floor line.	3.111	
6.13	Top angles aligned with base angles within variation of 1/4" in both directions.	3.112	
6.14	Frames may follow contour of floor but shelves should not be more than 1/4" above or below straight reference line extending full length of ultimate lineup.	3.23	
6.15	Vertical parts of frame work plumb to within a deviation of 1/4".	3.24 3.35	
6.2	Floor Supported Frames		
6.21	Frames 7'-0" or less in height plumb within 1/8". Frames 7'-0" to 9'-0" in height plumb within 3/16".	4.1	
6.3	Wall Supported Frames		
6.31	Frames 7'-0" or less in height plumb within 1/8". Frames 7'-0" to 9'-0" in height plumb within 3/16".	5.1	
6.32	Wood shims used under base of frame when required.	5.11	

→ Indicates new or changed information.

[Vertical lines at side of paragraph indicate requirements.

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Reason for Reissue:
1. To add Paragraphs 1.2, 1.3 and 6
2. To remove 7200 Plumbing Fixture