

Fig. 5-3. Tie Rod Reinforcement.

TABLE 1. TIE ROD REINFORCEMENT SCHEDULE - POSITIVE PRESSURE ONLY										
Maximum Positive Static Pressure	Inside Duct Dim., Inches	Type 475 Duct Board			Type 800 Duct Board			Type 1400 Duct Board		
		No.Rods Across Dimension	Maximum Longitud. Spacing	No.Rods Per 4 ft. Section	No.Rods Across Dimension	Maximum Longitud. Spacing	No.Rods Per 4 ft. Section	No. Rods Across Dimension	Maximum Longitud. Spacing	No. Rods Per 4 ft. Section
0 thru ½ in. w.g. (0 - 124 Pa)	0"-36"	*			*			*		
	37"-42"	2	24"	4	2	48"	2	*		
	43"-48"	2	24"	4	2	48"	2	2	48"	2
	49"-60"	3	24"	6	3	48"	3	3	48"	3
	61"-64"	3	24"	6	3	24"	6	3	48"	3
	65"-80"	4	24"	8	4	24"	8	4	48"	4
	81"-96"	5	24"	10	5	24"	10	5	48"	5
Over ½ thru 1 in. w.g. (125 - 249 Pa)	0"-24"	*			*			*		
	25"-30"	1	24"	2	1	48"	1	*		
	31"-32"	1	24"	2	1	24"	2	*		
	33"-36"	2	24"	4	2	24"	4	*		
	37"-48"	2	24"	4	2	24"	4	2	48"	2
	49"-64"	3	24"	6	3	24"	6	3	24"	6
	65"-80"	4	24"	8	4	24"	8	4	24"	8
	81"-96"	5	24"	10	5	24"	10	5	24"	10
Over 1 thru 2 in. w.g. (250 - 500 Pa)	0"-15"	*			*			*		
	16"-18"	1	24"	2	*			*		
	19"-24"	1	24"	2	1	48"	1	*		
	25"-32"	1	16"	3	1	24"	2	1	24"	2
	33"-48"	2	16"	6	2	24"	4	2	24"	4
	49"-60"	3	16"	9	3	24"	6	3	24"	6
	61"-64"	3	16"	9	3	16"	9	3	24"	6
	65"-80"	4	16"	12	4	16"	12	4	24"	8
	81"-96"	5	16"	15	5	16"	15	5	24"	10

*Straight ducts of these dimensions do not require reinforcement. However, fittings of these dimensions may require reinforcement.

NOTES:

1. Tie rods and washers must be no more than 16" (400mm) on centers across duct dimension.
2. Ducts of 48" (1200mm) width and over require use of anti-sag devices. See Figs. 5-3B, page 5-4 and 5-5B, page 5-5.
3. For duct dimensions over 96" (2400mm), maintain tie rod spacing on 16" (400mm) centers across the duct dimension following longitudinal spacing for the design pressure.
4. If dimensions require, tie rods run in both horizontal and vertical directions.

To convert inches to millimeters in the above table multiply by 25.4.

To convert feet to meters in the above table multiply by .3048.

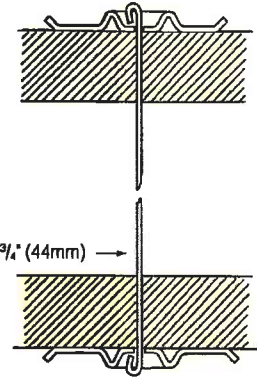
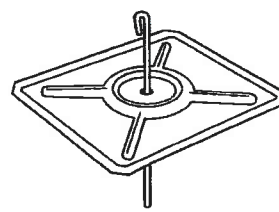
TIE ROD TERMINATION METHODS

1. Fasloop Method - Tools Required:

- Fasloop bending tool* or tool with equivalent performance
- Wire cutter to make square cut (not chisel point)
- Tape measure

Materials Required per tie rod assembly:

- 12 gauge galvanized steel wire $1\frac{3}{4}$ " (44mm) longer than outside duct dimension
- Two washers, $2\frac{1}{2}$ " (64mm) square x 0.028" (0.7mm) (min.) thick galvanized steel, volcano type with beveled edges and 0.150" (4mm) hole in center. 3" (76mm) round washers are acceptable. NOTE: Other types of manufactured flat washers are not suitable for this application. *No other size or shape of loop has been tested by NAIMA, or submitted to NAIMA for testing, to determine compliance with the 50,000 cycle test.



TIE ROD LENGTH = DUCT O.D. + $1\frac{3}{4}$ " (44mm) →

Fig. 5-7A. Tie rod termination, Fasloop style.

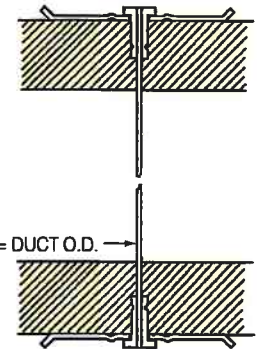
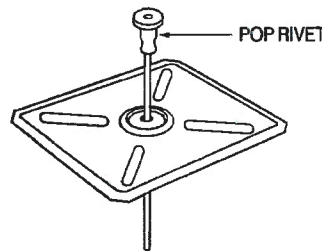
2. Pop Rivet Method - Tools Required:

- 14" (356mm) horseshoe nipper or carpenter's pincers, modified so pincers will close to a gap equal to 18 gauge sheet metal. IMPORTANT: Check tool periodically to ensure that this gap dimension is maintained.

- Wire cutter
- Tape measure

Materials Required per tie rod assembly:

- 12 gauge galvanized steel wire, cut exactly to outside duct dimension
- Two washers, $2\frac{1}{2}$ " (64mm) square x 0.028" (0.7mm) (min.) thick galvanized steel, with beveled edges and $\frac{7}{32}$ " (6mm) diameter center hole
- Two $\frac{3}{16}$ " (5mm) steel pop rivet sleeves, $\frac{3}{8}$ " (10mm) long



TIE ROD LENGTH = DUCT O.D. →

Fig. 5-7B. Tie rod termination, pop rivet and sleeve.

3. Locking Cap Method - Tools Required:

(Not to be used on sloped panels of fittings)

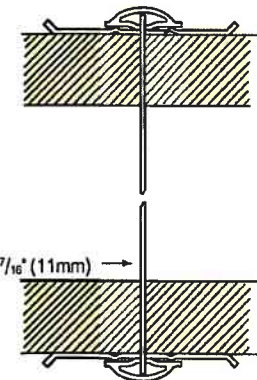
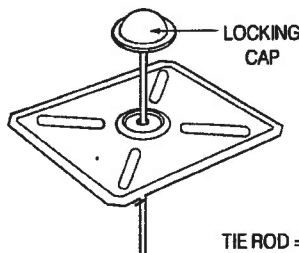
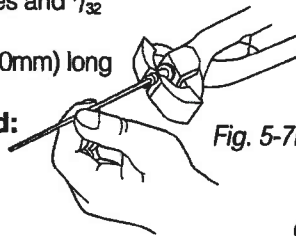
- Wire cutters
- Tape measure

Materials Required per tie rod assembly:

- 12 gauge galvanized steel wire, cut $\frac{7}{16}$ " (11mm) longer than outside duct dimension
- Two washers, $2\frac{1}{2}$ " (64mm) square x 0.028" (0.07mm) (min.) thick galvanized steel, with beveled edges and 0.150" (4mm) hole in center.
- Two locking caps, $\frac{7}{8}$ " (22mm) diameter, having spring steel or stainless steel locking inserts

NOTES:

- An ordinary insulation locking washer does not have sufficient holding power.
- Wire must be free to move within the $2\frac{1}{2}$ " (64mm) square washer.
- Do **not** re-use locking caps.



TIE ROD =
DUCT O.D. + $\frac{7}{16}$ " (11mm) →

Fig. 5-7C. Tie rod termination with locking cap.