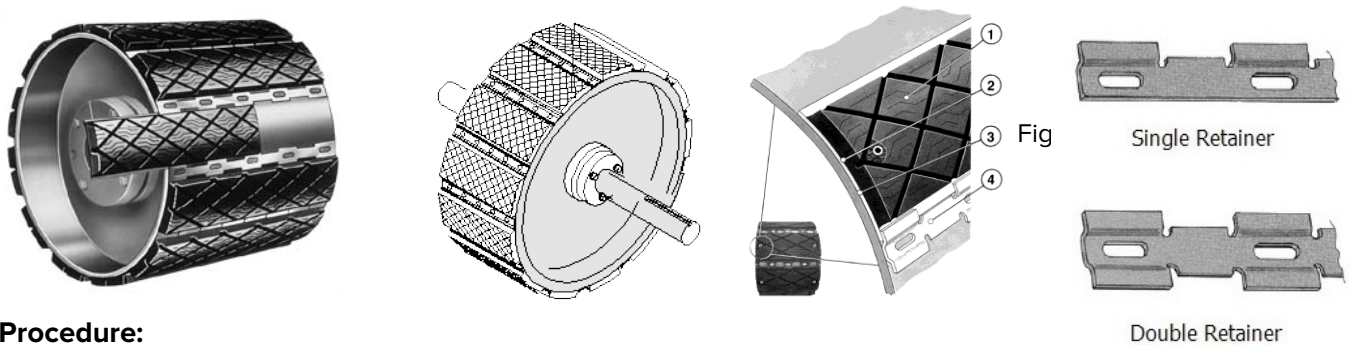


Installation Instructions – Slide-Lag®

Kinder Australia product:	Slide-Lag® Replaceable Pulley Lagging for Drive Pulleys
Product category:	Conveyor Pulleys & Lagging
Issue date:	19.06.2013
Revision:	1

Overview:

Slide-Lag® is a replaceable pulley lagging, which quality rubber is bonded to special traction pads fitting the pulley rim. The pads slide into retainers welded into the pulley rim. New pads can easily be replaced without removing the pulley from the conveyor.



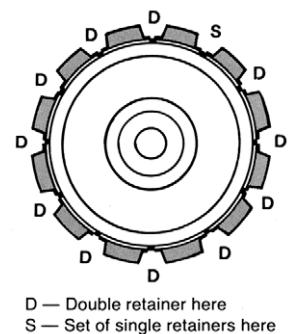
Procedure:

SECTION 1: DISCUSSION

Slide-Lag® is designed to fit pulleys made in even diameters such as 10"(254mm), 18"(457mm), 48"(1219mm), etc. Slide-Lag® installation is accomplished using double retainers between all but the last two pads where two single retainers are used back-to-back (Fig. 1 & 2).

A variation in pulley diameter has a corresponding effect on the pulley circumference and, in turn, on the gap remaining between the last two Slide-Lag® pads to be installed.

Minor variations from standard diameter can be absorbed by making slight adjustments in the spacing between the single retainers. Normal pulley manufacturing tolerances will usually require these small adjustments.



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Undersize pulleys may require narrowing the single retainers by grinding or cutting; on occasion a double retainer may be substituted for the pair of singles.

Pulley diameters which exceed standard or even diameter by more than 5/32"(4mm) will create an excessive gap between the backs of the single retainers. The maximum gap permitted is 17/32"(13.5mm) (36" (914mm) pulley diameter and under) or 1-1/8" (28.5mm) (over 36" (914mm) pulley diameter).

Excessive gap (Fig. 2) will require special installation. Odd or fractional diameters such as 23"(584mm), 39-1/4"(997mm), 48-3/4"(1238mm), etc., and metric diameters, will require special installation. See **Section 7** for details on special installation (this method involves substituting pairs of single retainers for double retainers at various locations on the pulley).

NOTE: ALWAYS CHECK THE ACTUAL PULLEY DIAMETER BEFORE STARTING INSTALLATION TO VERIFY WHETHER SPECIAL INSTALLATION IS REQUIRED.

SECTION 2: STANDARD INSTALLATION

In all cases, the pulley face must be cleaned of all rust and protrusions before starting installation.

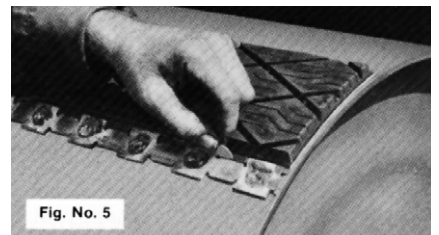
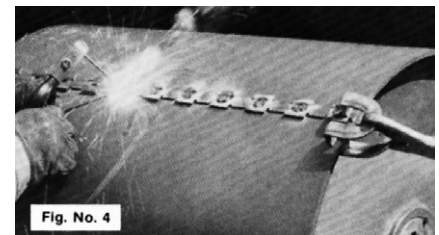
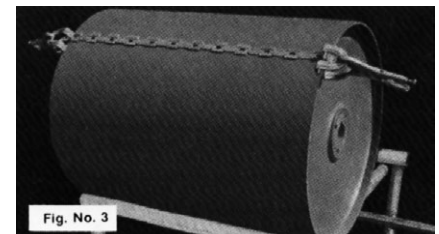
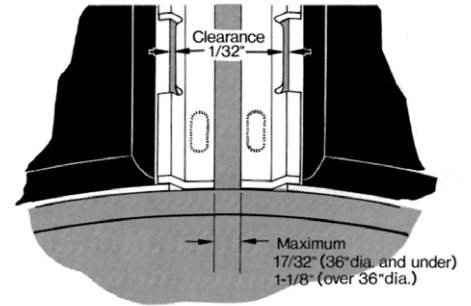
Step 1: Start with Double Retainer

- 1) Start with a double retainer and align it straight across the pulley face and parallel to the shaft. (Fig. 3)
- 2) Clamp the retainer in place, then plug weld through all holes to pulley face. (Fig. 4)

Step 2: Add Pads and Double Retainers

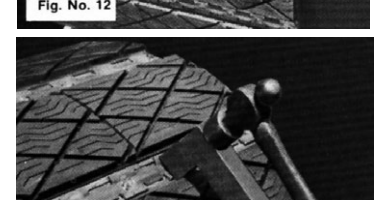
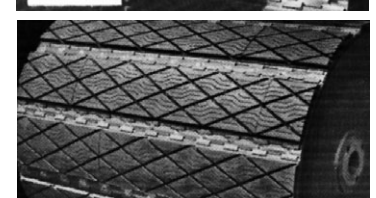
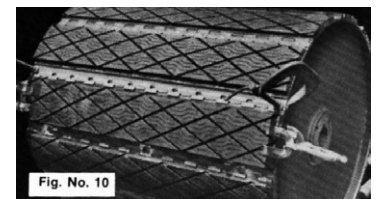
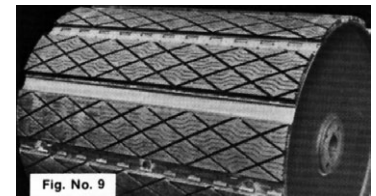
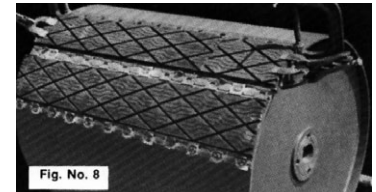
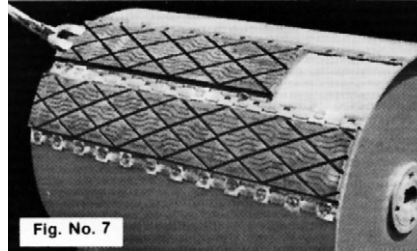
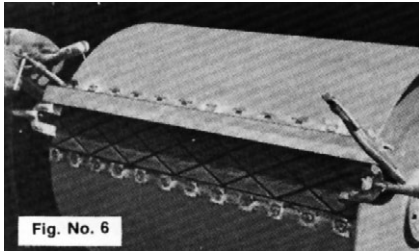
- 1) Position pads under retainer tabs. Allow for slide fit by using 1/32"(0.8mm) clearance on each side of pad. (Fig. 2 and Fig. 5)

Fig. No.2



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- 2) Clamp pad and next retainer in place and plug weld through 3 holes as shown (Fig. 6). The remaining holes may be welded now or completed after all pads are in place. Refer to **Section 3** for specific welding procedures.
- 3) Repeat sequence until all except the last 2 pads are in place.



Step 3: Assemble Last Two Pads with Two Single Retainers

- 1) Using the two single retainers' back-to-back (Fig. 2, Fig. 9 and Fig. 10) install the last two pads and plug weld each retainer in 3 places. Be sure to maintain the 1/32" (0.8mm) clearance on each side of the pads. (Fig. 2)

The backs of the single retainers may be cut or ground somewhat to allow a proper fit if the pulley is slightly undersize.

- 2) If special installation instructions are being used due to an oversize, odd-size or metric pulley diameter, any additional sets of single retainers used should be installed using these same procedures.

Step 4: Complete Welding of all Remaining Holes

See Fig. 11 and Fig. 12

Step 5: Pressure Set Retainer Tabs

Using flat bar, pound retainer tabs tightly against pad. (Fig. 13)
This is important since looseness will result in metal wear or fatigue.

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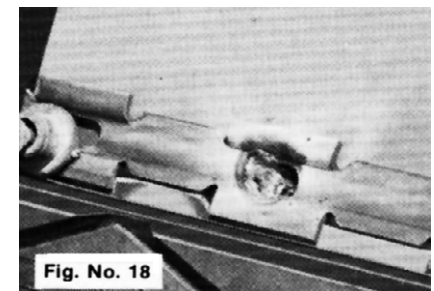
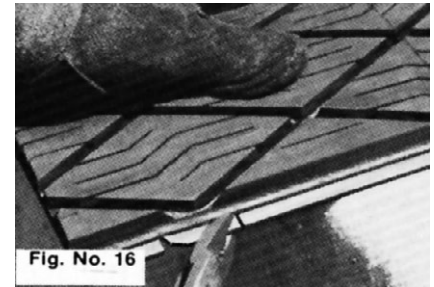
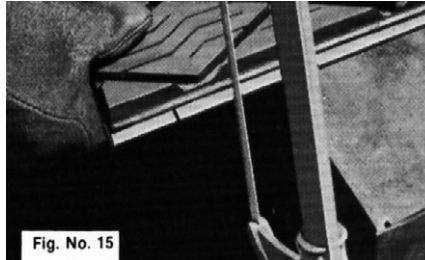
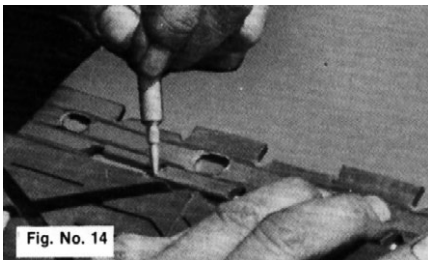
Step 6: Lock Pads in Place

- 1) **PREFERRED METHOD:** Cut two slots in the pad backing plate between two of the retainer tabs. (Fig. 14 and Fig. 15)
During an initial installation the corners of these saw cuts may be turned up with pliers before installing the pad. (Fig. 16)

For a replacement installation, the corners will have to be turned up with a punch after the pads are in place. (Fig. 17)
Be sure to lock all outside pad segments in place if more than one pad length is contained in each row. (Fig. 18)

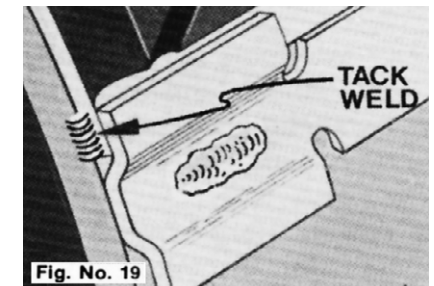
- 2) **ALTERNATIVE METHOD:** Pads may be locked in place by tack welding the backing plate to the pulley shell at the outside edge. (Fig. 19) This weld is easily ground or chiselled later for pad removal.

NOTE: A COMBINATION OF METHODS A. and B. MUST BE USED FOR ALL PULLEYS 36" DIAMETER AND ABOVE, HIGH TENSION BELTS AND SYSTEMS WITH BELT TRAINING PROBLEMS.



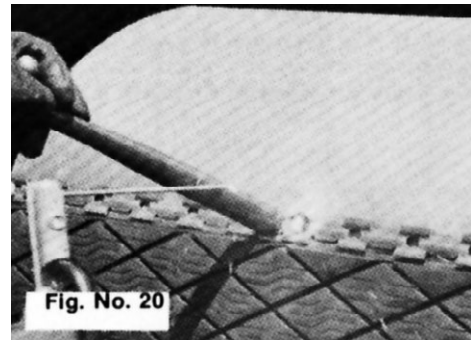
SECTION 3: WELDING PROCEDURES

- 1) Excessive heat from welding can cause failure of the rubber-to-metal bond on the pads. Reduce heat build-up by plug welding only one half of each hole at a time and skipping from hole to hole and retainer to retainer until welding is completed.
- 2) Protect the rubber on the pads during welding by placing a piece of angle iron or similar material over the pad edge. (Fig. 6 and Fig. 11)



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- 3) Excessive heat from welding can cause failure of the rubber-to-metal bond on the pads. Reduce heat build-up by plug welding only one half of each hole at a time and skipping from hole to hole and retainer to retainer until welding is completed.
- 4) Protect the rubber on the pads during welding by placing a piece of angle iron or similar material over the pad edge. (Fig. 6 and Fig. 11)
- 5) When using welding rod, always stay with 3/32" (2.4mm) diameter to avoid too much heat build-up and burn through.
- 6) Since the retainers are fabricated from A-570 steel, low-hydrogen AWS E7018 rod is recommended.
- 7) MIG and TIG welding may be used for retainers.
- 8) Use AWS E309-15, 16 welding rod for attaching stainless steel retainers to steel pulleys.
- 9) Retainers may be welded to cast iron pulleys by using a rod meeting AWS A5.15-69.
- 10) Good contact with the pulley surface is essential for proper welding. (Fig. 20)



SECTION 4: RETAINER BOLTING PROCEDURES

Slide-Lag® retainers may be bolted to the pulley surface if desired, however, following guidelines will apply. Care should be exercised to ensure that the bolts do not work loose and damage the belt. A proper inspection program will ensure that the lagging pads are replaced when the rubber has worn down to the bolt heads.

1. GENERAL

- 1) Retainers may be attached with bolts in every other hole.
- 2) Whenever possible, place pad butt seams at bolt locations.
- 3) Bolt torque requirements should be to manufacturer's specifications.

2. FOR PULLEYS WITH ACCESS TO INSIDE SURFACE (USUALLY CAST IRON)

Use 3/8 to 16, hex head cap screws, grade 5, finished, 15/64" (5.95mm) high head with a self-locking nut on the inside. Where inside access is limited due to spokes, drilling and tapping or self-threading bolts are suitable.

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3. FOR PULLEYS WITH NO ACCESS TO INSIDE SURFACE

- 1) A minimum shell thickness of 1/4" (6.4mm) is required for bolting.
- 2) Self-tapping or roll forming 3/8" to 16, min. grade 5, hex head bolts are acceptable.

- 3) Ensure that bolt thread engagement is sufficient by using proper length bolts.

- 4) If drilling and tapping installation is chosen, use self-locking bolts.

4. POWDER ACTUATED FASTENING

These types of fasteners offer several advantages over welding or standard bolting.

SECTION 5: GENERAL INFORMATION

- 1) All Slide-Lag® pads should be replaced prior to wearing down to the top of the retainer. For standard thickness, grooved pads, this is about the bottom of the grooves.
- 2) Retainers should be inspected periodically, and especially when pads are replaced, to locate possible damage. Damaged retainers should be replaced.
- 3) For standard centre crown pulleys, use standard installation, except when the diameter indicates otherwise. Pads may be initially installed in one piece by flexing them over the crown. Replacement pads must be installed with a butt-seam at least at the pulley centre line.
- 4) To replace worn pads that have accumulated rust, a flat thin bar driven between the pad and the pulley will readily pop the pad free. After cleaning

the pulley, the new pad can be slid into place from the end. Be sure to inspect the retainers, making replacements where necessary.

- 5) For centre crowned pulleys, where the crown exceeds accepted standards, special attention is necessary since the difference between the diameter at the crown and the diameter at the pulley ends may possibly result in inadequate overlap of the retainer lips in the centre area.

The easiest installation method for these applications is to use two half-lengths of pads instead of full-length pads, butting the halves together at the pulley crown. Full length pads must have the backing plate partially cut.

In either case, all single retainers (trimmed in width), or double retainers split longitudinally, should be used to

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provide a safe overlap at the pulley centre, as follows:

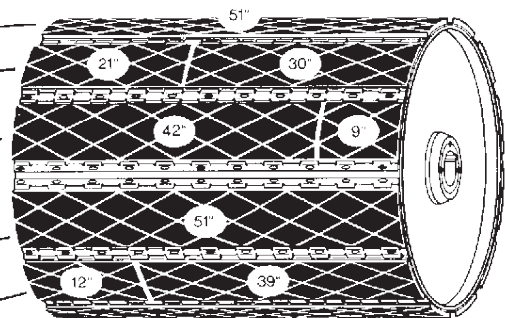
- a) Align and position traction pad (or pads) across pulley face then clamp in place.
- b) Butt a trimmed single retainer (or a split double retainer) to each side of the pad, with a sliding fit at ends of pulley. Plug weld one hole at each end.
- c) Repeat Steps 1 and 2 until the last two pads have been installed. The spacing between the pads must be kept to the same dimension as if standard double retainers were being used.
- d) Apply necessary side pressure to each retainer at the pulley centre, allowing 1/32" (0.8mm) for slide fit and plug weld all holes. Lock all pads in place.

SECTION 6: BUTT SEAM APPLICATION

The butt seam method of application is usually used for Slide-Lag®. This method makes full use of all lengths cut from 72" pads except those 4" or under, which are discarded. The butt seams in each row should be staggered from row to row when possible. The sample installation shown below visually describes this application method. Note that the butt seams are staggered.

EXAMPLE: 51" PULLEY FACE WIDTH

- Pad row 1, cut 51" from 72" length.
- Pad row 2, use the 21" length remaining from above and cut a 30" piece from another 72" length.
- Pad row 3, use the 42" length remaining from above and complete the row with 9" cut from another 72" length.
- Pad row 4, cut 51" from 63" remnant from above and insert in row 4.
- Pad row 5, insert the 12" remnant from above and complete the row with 39" cut from a new 72" length ... and so on, until the pulley is completed.



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SECTION 7: SPECIAL INSTALLATION

The instructions contained in this section are to be used to select the number of rows of Slide-Lag® pads and the quantities of each type of retainer required for installation on oversize, odd-size and metric pulleys. Oversize and odd-size pulleys are those that are more than 5/32"(4mm) larger than an even number diameter.

STEP 1 Verify that the pulley diameter is non-standard and verify the face width. Put the values in blanks <1> and <2> under **Item A** on next page.

STEP 2 Subtract the next smaller even pulley diameter from the actual pulley diameter. This value is the amount that the actual diameter is oversize.

STEP 3 Divide the next smaller even diameter by 2 to establish the initial number of rows of pads needed. This quantity also represents the initial number of rows of retainers needed (one set of singles and the balance doubles).

STEP 4 Multiply the answer from Step 2 by 3.14159 (pi) to determine the amount of additional pulley circumference or surface which has to be covered.

STEP 5 One set of single retainers, back-to-back, requires .5625"(14.3mm) more space than a double retainer. Therefore, substituting a pair

of single retainers for a double retainer will reduce any pulley surface remaining to be covered by that amount. Divide the pulley surface still remaining to be covered obtained in Step 4 by .5625"(14.3mm). The number to the left of the decimal in the answer indicates the quantity of double retainers to be replaced by sets of singles.

Increase this number by one to find the **TOTAL** quantity of single retainer sets needed. Multiply the number to the RIGHT of the decimal by .5625"(14.3mm) and divide by the total quantity of single retainer sets to determine the spacing required between the single retainers in **EACH** set.

Use the figures obtained in this step to fill in blank in item B, blank in item C and in Figure 23.

STEP 6 Reduce the initial quantity of double retainers obtained in **STEP 3** by the quantity of double retainers **REPLACED** by single retainer sets found in Step 5. The resulting value is the final number of double retainers to be used. Fill in blank in **Item B** on next page, with this figure.

Add the number of double retainers and the number of single retainer sets. The total should equal the number of rows of pads. If not, go back and recheck your figures.

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NOTE: On smaller pulley diameters, these procedures may result in an inordinate number of single retainer sets compared to double retainers; i.e. 6 single sets and 1 double. If this happens, it may be desirable to reduce the quantity of single retainer sets obtained in **STEP 5** (at the same time increasing the number of double retainers from this step) and revising the appropriate calculations. Be careful, however, not to exceed the maximum allowable gap between the single retainers, as shown in Figure 2.

STEP 7 Multiply the pulley face width by the number of rows of pads found in **STEP 3**. Fill in blanks and in **Item B**, Figures 21 and 22 should be filled in next. It is important to note that these diagrams are designed only to help in general positioning of the types of retainers. Once the first retainer is welded in place, the actual positions of the rest are determined by the

Item A. The pulley diameter specified is <1> _____, which is a non-standard size, with a _____ face width of <2> _____.

Item B. This installation will require <3> _____ rows of Slide-Lag® pads, consisting of <4> _____ lineal inches of Slide-Lag® separated by: <5> _____

physical dimensions of the pads and retainers and specific dimensions such as the 1/32" (0.8mm) sliding clearance and the calculated spacing between the backs of the single retainers. (Figure 23)

STEP 8 Divide 360 by the **TOTAL** quantity of double and single sets of retainers obtained in Step 6. This will give you the approximate spacing between retainers, in degrees.

STEP 9 Using the number of sets of single retainers found in Step 5 and the approximate spacing calculated in **STEP 8**; determine an appropriate location for each single set. Note these locations on Figure 22. Remember to space them as equally as possible around the pulley circumference. The remaining retainer locations should all be double retainers.

STEP 10 Complete the remaining blanks in Figures 21 and 22.

double retainers <6> _____ pairs of single retainers.

Item C. Starting at the top of the pulley (0 degrees), the retainers should be installed in the sequence and location indicated in Figures 21 and 22. Where sets of single retainers are indicated by "S", place them back-to-back as shown in Figure 23 separated by a distance of <7> _____.

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Figures 21 and 22 are designed to help in general positioning of the types of retainers. The actual location will be determined by the physical

dimensions of the product and calculated values shown in this paragraph and Figure 23.

Figure No. 22:
End view of pulley showing approximate retainer locations

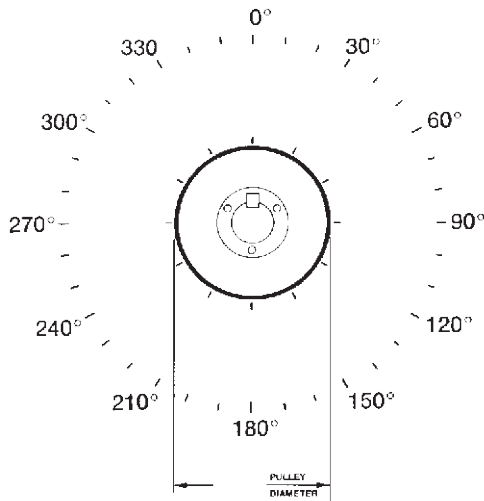


Figure No. 23: Back-to-back spacing of single retainers

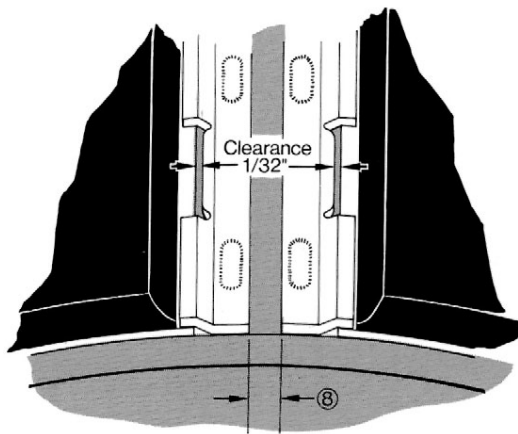


Fig. No. 21:
Sequence for Installing Single & Double Retainers

RETAINER LOCATION	DEGREES FROM STARTING POINT	USE A DOUBLE RETAINER HERE: "D"	USE TWO SINGLE RETAINERS HERE: "S"
#1		()	()
#2		()	()
#3		()	()
#4		()	()
#5		()	()
#6		()	()
#7		()	()
#8		()	()
#9		()	()
#10		()	()
#11		()	()
#12		()	()
#13		()	()
#14		()	()
#15		()	()
#16		()	()
#17		()	()
#18		()	()
#19		()	()
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