

Bulletin No. 600

# Belt Splicing Instructions

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Engineering Department

**SOUTH BEND LATHE WORKS**

425 East Madison Street

SOUTH BEND 22, INDIANA, U. S. A.

## BELT SPLICING INSTRUCTIONS

The belt supplied with this lathe is of the best quality, and if properly fitted and spliced will give excellent service. Therefore, these instructions for measuring and splicing the belt should be carefully followed.

Sufficient belting is furnished to permit making a cemented endless belt splice, which is recommended; however, several other splices are also explained in this manual.

### CAUTION

- a. Single ply oak tan leather belt—RUN THE SMOOTH SIDE OF BELT AGAINST THE PULLEYS.
- b. Two ply combination chrome (black) leather and oak tan (brown) leather belt—RUN THE BLACK SIDE OF BELT AGAINST THE PULLEYS.
- c. The cemented type belt — MUST BE ASSEMBLED AROUND THE CONE PULLEYS BEFORE CEMENTING.
- d. ALWAYS RELEASE BELT TENSION WHEN LATHE IS NOT IN USE.

### Measuring for Correct Belt Length

Use care in measuring the belt length (See Fig. 1) before cutting so that no initial adjustment is required to tighten the belt when new. This will leave considerable adjustment to compensate for belt stretch after the belt has been in use.

Fig. 1 shows the correct method of measuring the belt using a steel tape. Be sure that belt adjustment is fully retracted as shown in Figs. 2, 3, 4, and 5.

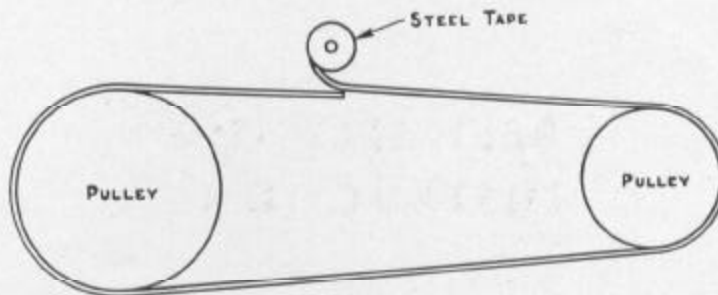


Fig. 1. Correct method of measuring for belt length.

Belts are necessarily pulled tight around the pulleys in order to drive, and for that reason  $\frac{3}{8}$ " is subtracted from the actual measurement around the pulleys as follows:

- a. For cemented endless belt, subtract  $\frac{3}{8}$ " from the measurement obtained, and then add 5" for the splice.
- b. For a laced belt, subtract  $\frac{3}{8}$ " from the measurement obtained, and cut the belt square across the ends.
- c. For hooked belts see "Hooked Belt Splice", Page 11.

#### Adjustments on Horizontal and Underneath Drives

On the 9" horizontal drive, Fig. 2, place the belt tension release lever "C" in down position and adjust the turnbuckle "A" so that the rods are screwed into the turnbuckle as far as possible. Use a steel tape to measure over the corresponding cone pulleys for the correct length. See Fig. 1, and read splicing directions *before* cutting the belt.

On the 9" underneath drive, Fig. 3, place the belt tension release lever "A" in position "T" and adjust turnbuckle "X" so the rods are screwed into the turnbuckle as far as possible. See Fig. 1, and read splicing directions *before* cutting the belt.

On the 10" bench underneath drive lathe, Fig. 4, place the

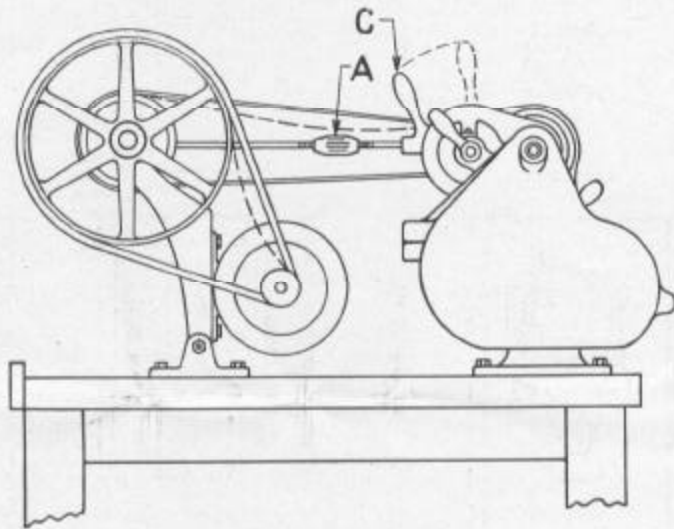


Fig. 2. Setting the drive to get the proper belt measurement on the 9' Horizontal Drive.

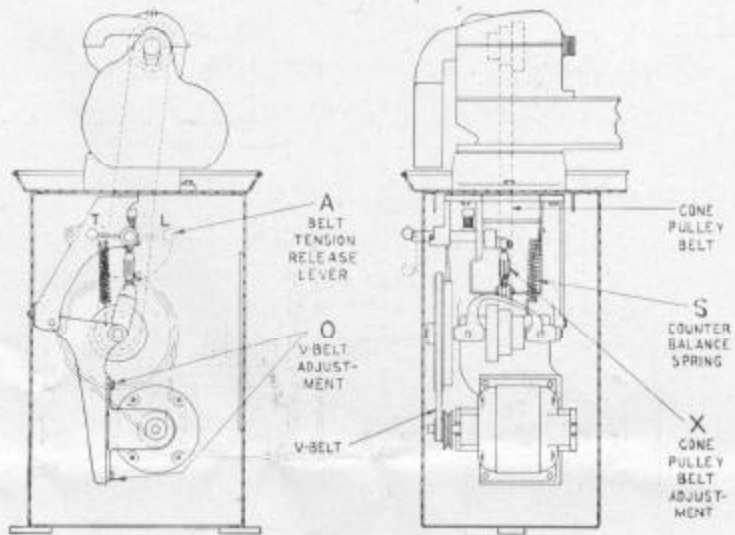


Fig. 3. Setting the drive to get the proper belt measurement on the 9' Underneath Drive.

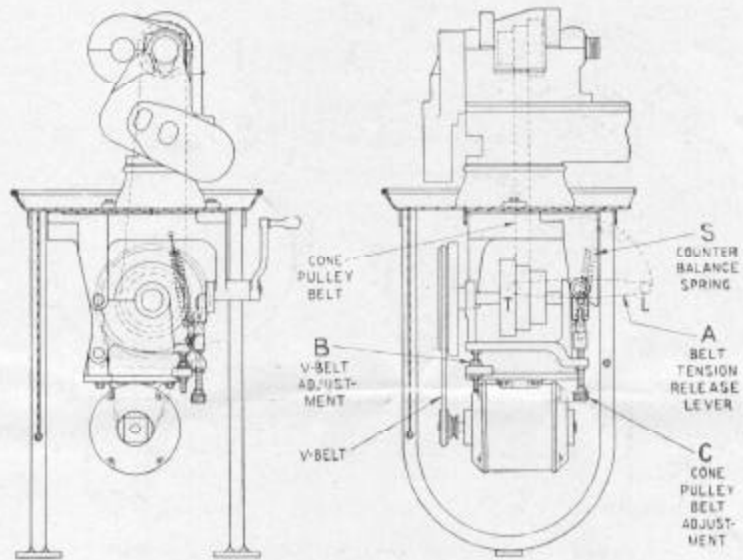


Fig. 4. Setting the drive to get the proper belt measurement on the 10" Bench Underneath Drive.

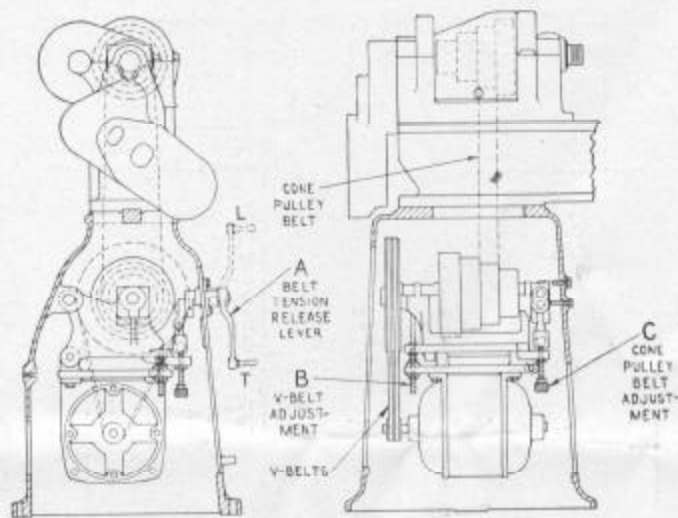


Fig. 5. Setting the drive to get the proper belt measurement on 10", 13", 14 1/2", and 16" Floor Underneath Drives.

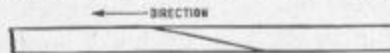
belt tension release lever "A" in position "T" and turn the belt tension adjustment knob "C" until lower cone pulley is in extreme upper position. See Fig. 1, and read splicing directions *before* cutting the belt.

On the 10", 13", 14½", and 16" floor underneath driven lathes, Fig. 5, place the belt tension release lever "A" in position "T" and turn the belt tension adjustment knob "C" until lower cone pulley is in extreme upper position. See Fig. 1, and read splicing directions *before* cutting the belt.

### Splicing

**CEMENTED ENDLESS BELT SPLICE**—A cemented endless belt splice is recommended because, when properly made, it is very durable and will run over the pulleys more smoothly than a laced or hooked splice. Proceed as follows:

- a. Measure around the cone pulleys and subtract  $\frac{3}{8}$ "; then add 5" for the splice. This will be the correct belt length.
- b. Cut the belt accurately to this dimension using a sharp knife guided along the edge of a metal try-square.
- c. Taper the ends smoothly and uniformly for a distance of 5" with a belt shave, small plane, or sharp knife. The tapering must slant opposite on each end so that the belt



will lap as shown above and in Figs. 6 and 7; also note if there are any other splices in the belt, as all splices should slant in the same direction. Smoothing can be accomplished by using a rasp or by drawing a sharp hack saw blade diagonally across the tapered ends.

- d. Place the belt around the cone pulleys, ready for cementing. The outside lap should point in the direction the belt is running, as shown in Figs. 6 and 7. This is to prevent the belt from opening up while running.
- e. Any good belt cement can be used, providing the instructions are carefully followed. Waterproof belt cement is recommended, or a good acetone cement such as airplane model cement. Apply two coats of cement,

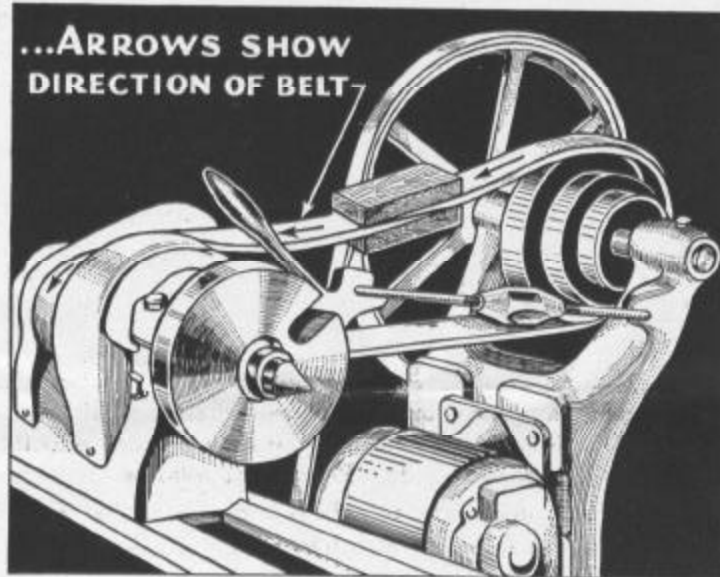


Fig. 6. Direction of splice on a 9" Horizontal Drive.

following the instructions of the manufacturer. Immediately lay the freshly cemented joint on a block of wood and quickly nail the belt to the block with about three small finishing nails to keep the belt from shifting. Place another block of wood on top of the joint and clamp firmly, using "C" clamps as shown in Fig. 8. Allow the cement to dry thoroughly before removing the clamps.

- f. If it is necessary to separate an endless belt, force a small screw driver or pick into the side of the belt on the splice and work toward the end of splice. This must be done on both ends of the splice in order to keep the belt from splitting in the center where the black and tan belts are glued together.

**LACED BELT SPLICE**—Leather belts may be laced with gut or rawhide thongs. Trim the ends of the belt square (using a try-square) and punch or drill  $\frac{1}{8}$ " holes spaced as shown in Figs. 11, 12, and 13.

The proper method of lacing a belt is clearly shown in Fig. 10. Though the picture shows a belt with 5 rows of holes, the method of lacing remains the same, whether there are 3, 5, or 7 rows of holes.

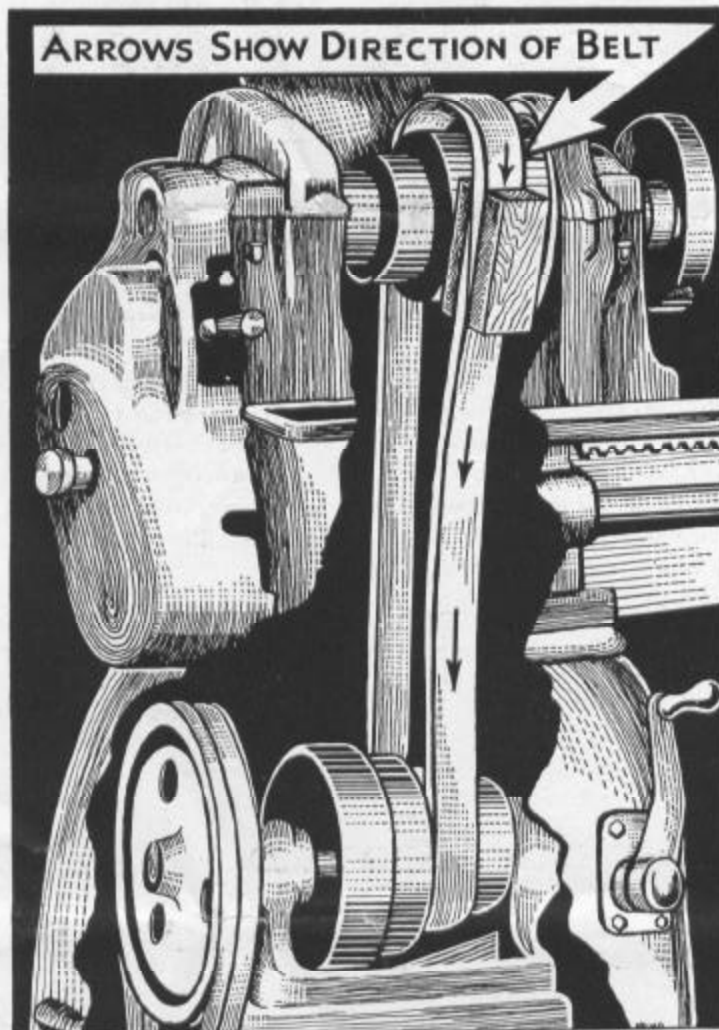


Fig. 7. Direction of splice on all Underneath Driven Lathes.



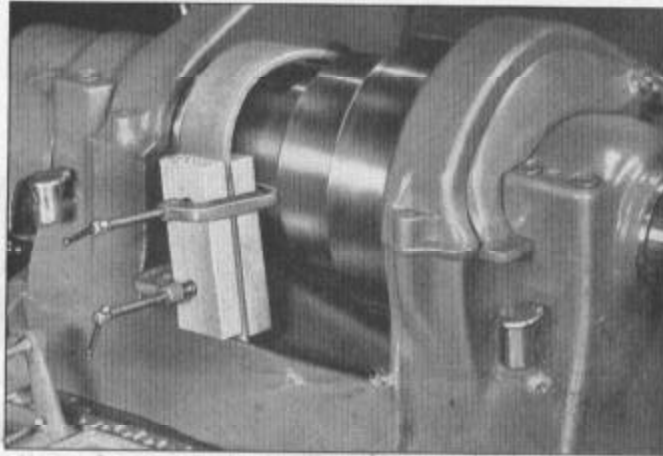


Fig. 8. Clamping a glued joint with "C" clamps.

The holes must be evenly spaced and each hole must be directly opposite the corresponding hole in the other end of the belt. If a round gut lace is used, cut straight grooves on the pulley side, as shown in Fig. 9. This will prevent the lace from cutting and allow the belt to run smoothly over the pulleys. Never cross the lacing on the pulley side. Be careful not to kink the lacing.

After the holes are punched or drilled, place the belt around the lathe cone pulleys. Mark the center of lace and place the marked midpoint at "A" as shown in Fig. 10. Start toward "B" and thread half of the lace in the direction of the arrowheads

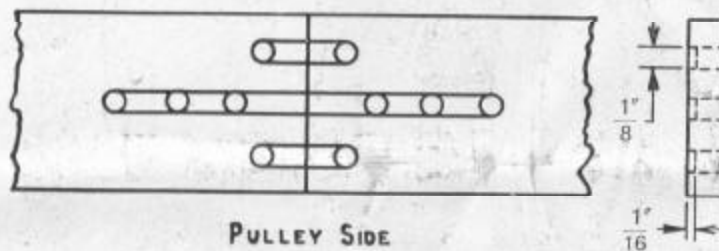


Fig. 9. Grooves must be cut in the pulley side of the belt for a round belt lacing.

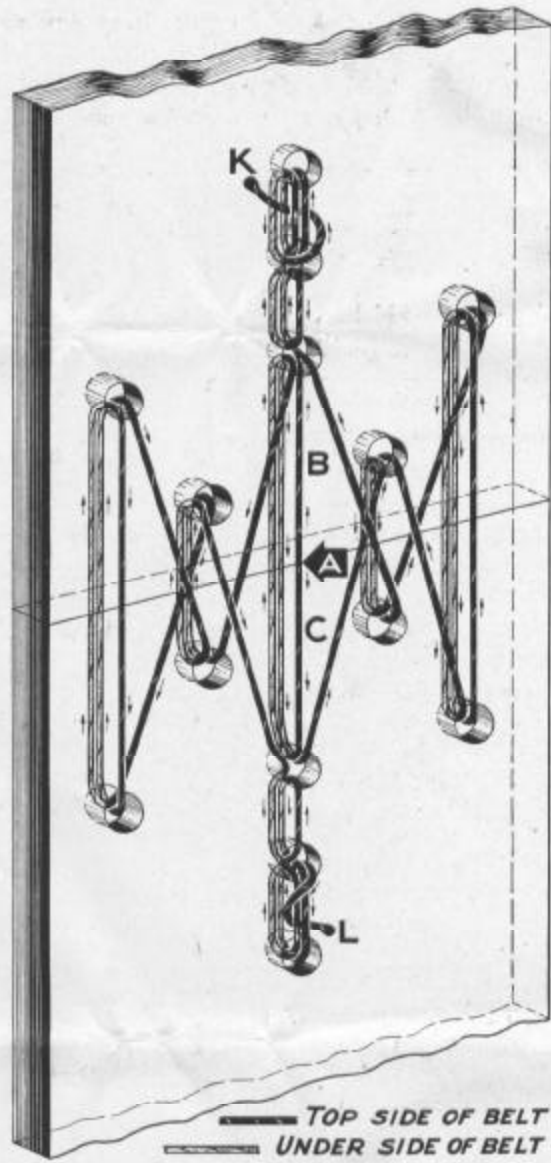


Fig. 10. Correct method of lacing a leather belt.

and finish at "K". Repeat with other half of lace starting toward "C" and ending at "L". Fasten the ends as shown and burn the ends close with a match to prevent them from pulling out.

**HOOKED BELT SPLICE**—There are a number of good belt hooks on the market that can be used for fastening belt ends

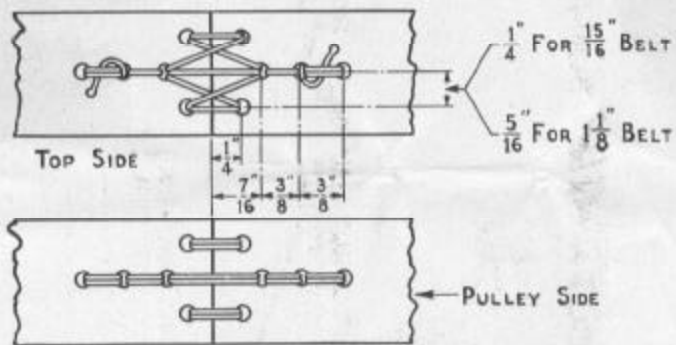


Fig. 11. Spacing of holes for  $15/16$ " and  $1\frac{1}{8}$ " belts.

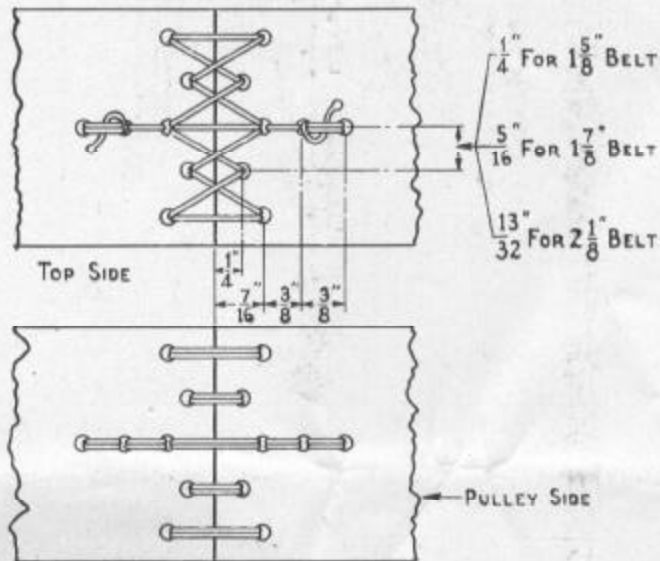


Fig. 12. Spacing of holes for  $1\frac{5}{8}$ ",  $1\frac{7}{8}$ ", and  $2\frac{1}{8}$ " belts.

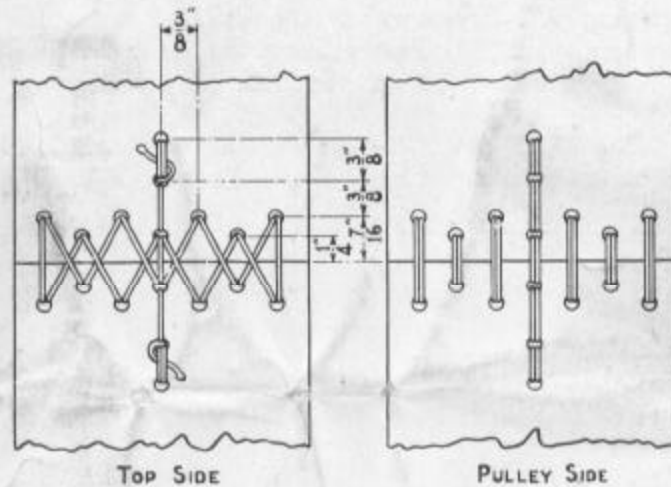


Fig. 13. Spacing of holes for a  $2\frac{7}{8}$ " belt.

together. Belt hooks may be used for belts that are not shifted while in operation, but should never be used on belts that are shifted while the belt is running. A hooked belt is always cut short due to the distance between ends of the belt for the connecting pin, as shown in Fig. 14. An additional  $\frac{3}{8}$ " should be deducted for belt stretch.

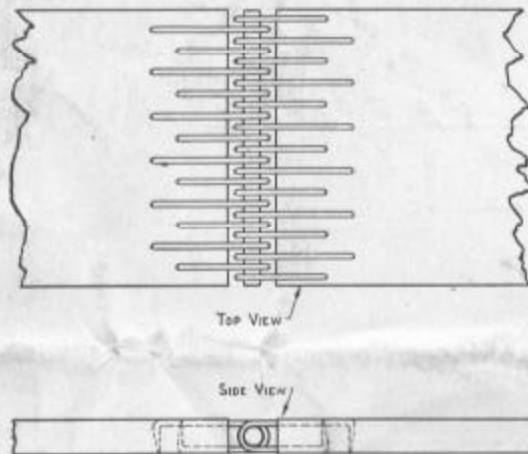


Fig. 14. A hooked belt splice.