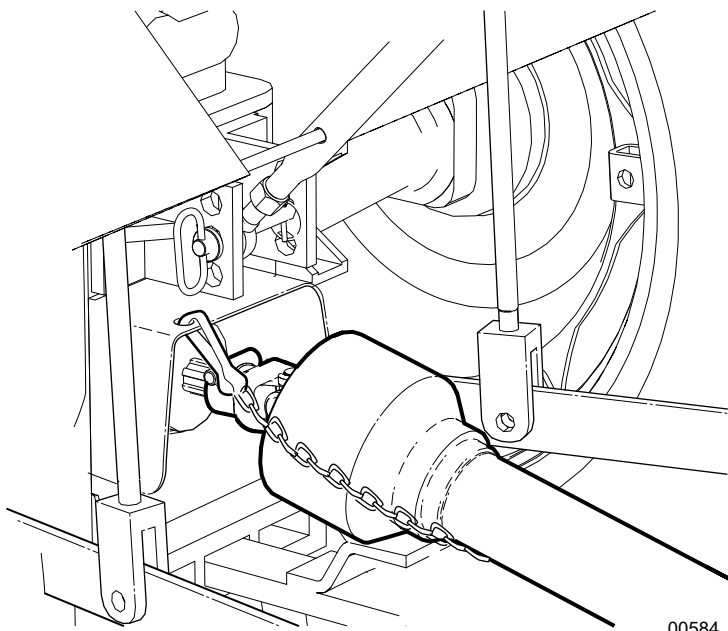


# INSTALLATION INSTRUCTIONS

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## PTO Shaft SIZING AND INSTALLATION

For Tractor-mounted Implements



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Document: Z97844

**IMPORTANT!** The PTO shaft that came with your machine may need to be shortened. A longer shaft is supplied because tractor lift arms vary in length.

The PTO shaft must be free to telescope and not bottom out when going through its working range. It should never completely collapse in use. There should always be 2" (50 mm) of space for retract.


If the shaft bottoms out, the bearings on both ends can be overloaded and could fail causing damage or injury.

### **WARNING!**

Avoid the risk of personal injury or machine damage! Read the operator's manual before using the equipment. Carefully read all safety messages in the manual and follow all safety signs on the machine.

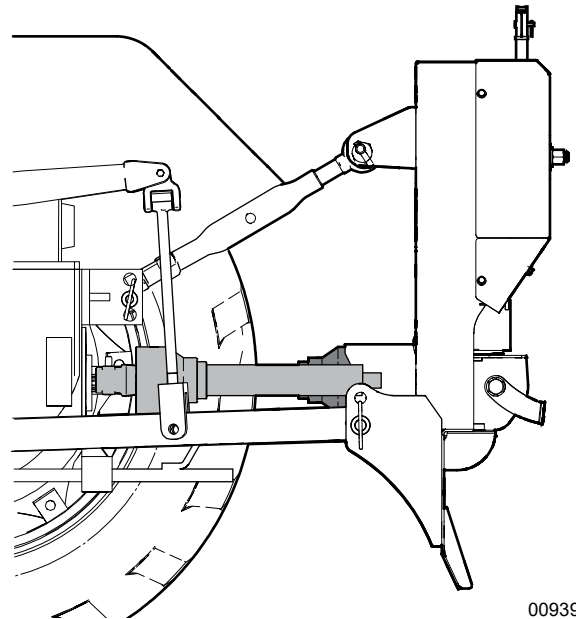
### **CAUTION!**

Wear suitable eye protection when cutting steel tubes.

 **NOTE:** Illustrations show a winch, however the method is the same for all machines.

## Sizing PTO Shaft

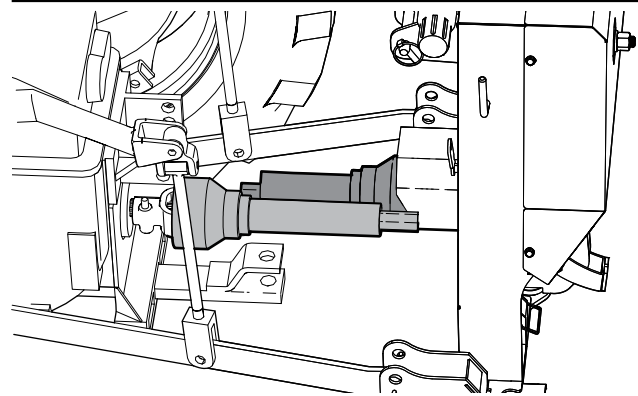
1. Remove the PTO shaft and mount the attachment on the tractor three-point hitch.
2. Start the tractor and raise the three-point hitch up off the ground until the machine's input shaft is level with the tractor PTO output shaft. **This is the shortest distance between the input and output shafts.**
3. Make sure tractor is shut off with parking brake applied.
4. Pull the PTO shaft apart and place one end on the tractor output spline. Place the other on the implement input.



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**Fig. 1** – Input shaft and output shaft

5. Lift the shaft ends up so that they are as parallel to each other as possible. Support them with blocking or tie them together. If the shafts are too long or there is not enough room, see Alternate Method on page 4.



**Fig. 2** – Lift shaft ends up parallel

- Using a straight edge, transfer a mark from the end of one tube section to the other section as shown.

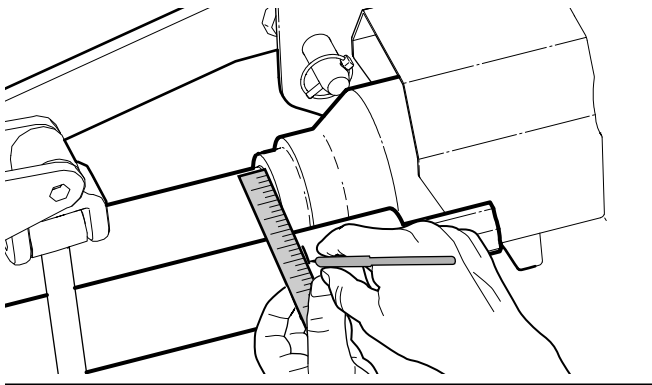


Fig. 3—Transferring the mark

- Add 2 inches (50 mm) to that measurement and place a second mark on the outer plastic tube. This is where the plastic shielding needs to be cut off.

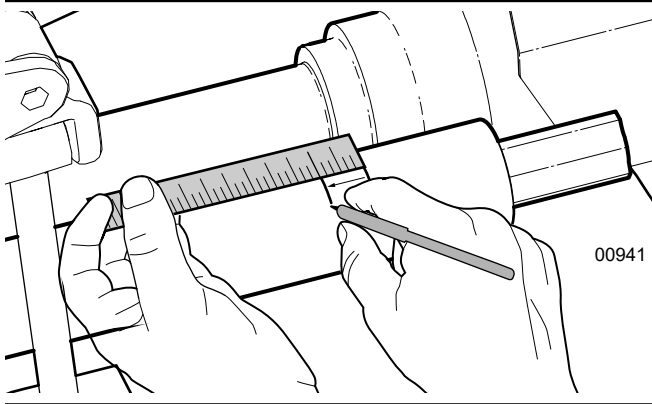


Fig. 4—Place mark to cut plastic tube

- Cut the plastic tube off at the mark, leaving the steel shaft inside.

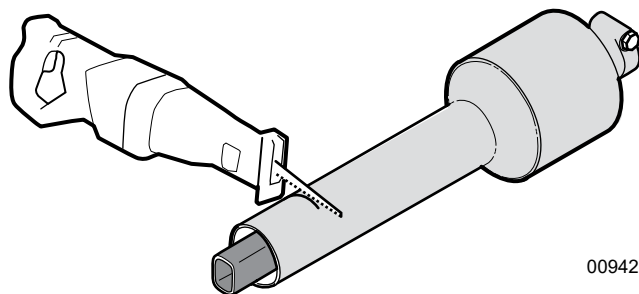


Fig. 5—Cut plastic tube at the mark

- Using the cut-off length of plastic tube as a guide, mark the steel tube. Align the end of the plastic tube with the end of the steel shaft.

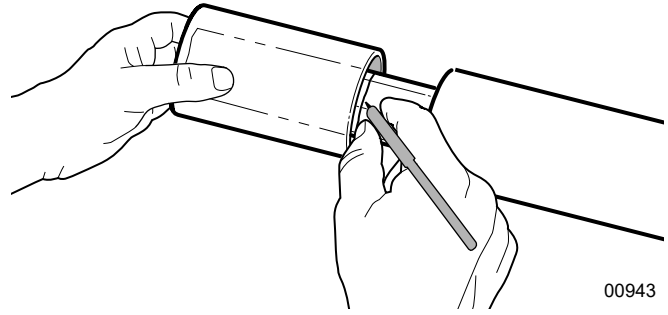


Fig. 6—Marking steel tube.

- Cut the steel tube off at the mark.
- Using the cut-off length of plastic tube to mark the remaining cuts, repeat this process for **BOTH** PTO shaft halves



*Place the end of the steel shaft to be cut off in a vice so it is easier to control your cut.*

- Remove the burrs from the edges of the steel shaft that were cut. Clean the steel shaft halves.
- Grease the inner tube so the tube halves slide together easier.

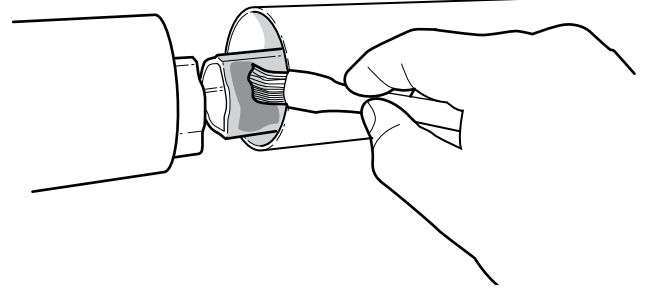


Fig. 7—Grease the inner tube

- Assemble the two halves of the PTO shaft.

**IMPORTANT!** Using a driveshaft not supplied with your machine may result in being assembled out of phase (universal joint yokes are not aligned with each other). Make sure driveshaft is assembled with u-joints in phase otherwise unbalances cause wear and eventually lead to failure.

- Make sure the shaft can telescope freely before installing. If it does not, separate the two parts and inspect for burrs or cuttings on the shaft ends.

**IMPORTANT!** The two halves of the PTO shaft should overlap at least 6" (150 mm).

## Alternate Method

This method can be used if the two ends of the PTO shaft cannot be put close enough together to measure.

1. Install the attachment on the tractor. Lift the attachment up so that the tractor output is level with implement input shaft.
2. Take the PTO shaft that came with your machine, fully collapse it, and measure the distance between the locking yokes. Call this measurement 'A'.

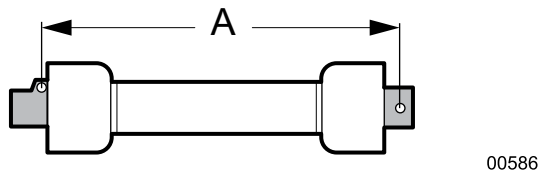


Fig. 8—Measurement A

3. Measure the distance between the grooves for the locking collars on each input. Subtract 2 inches (50 mm) from this measurement. Call this measurement 'B'.

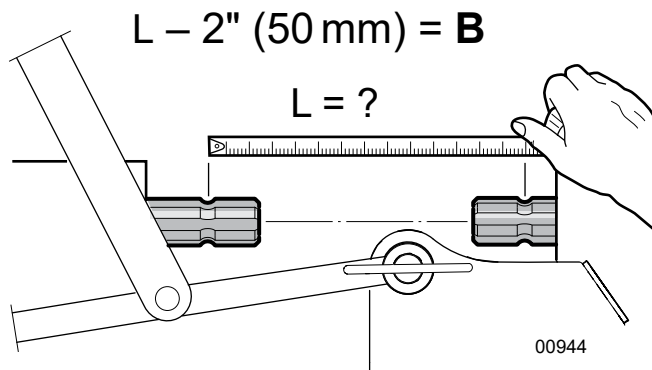


Fig. 9—Measurement B

4. If the collapsed length **A** is longer than measurement **B** from Step 3, the PTO shaft must be shortened.
5. Subtract **B** from the uncut PTO shaft measurement **A**. ( $A - B$ )

The result is how much **BOTH** halves of the PTO shaft need to be shortened. Call this value **C**.

$$A - B = C$$

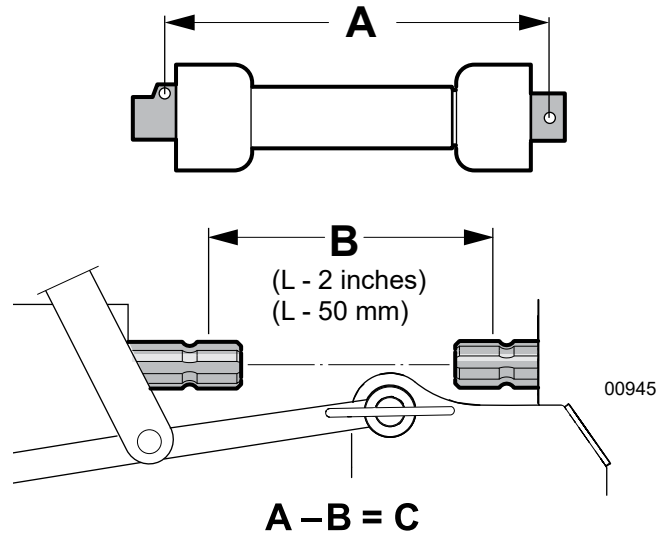


Fig. 10—C = Cut Length

6. Pull the PTO shaft apart, then measure and cut the length **C** from both the outer plastic covers and the inner metal tubes.



*Tip: Use the cut off piece of outer shielding to mark the inner tube. Leave the steel center tubes longer than the plastic outer tubes, otherwise they can be harder to put back together.*

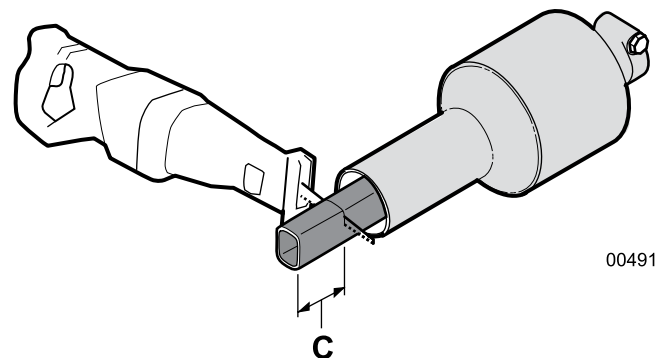


Fig. 11—Cut off the Length C from both PTO Shaft halves

## Installing PTO Shaft

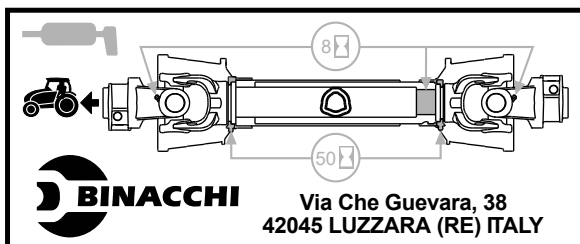
The implement must be mounted to the tractor, and fully lowered to the ground. Make sure tractor is shut off with parking brake applied.

Check to make sure the shielding on the PTO shaft is in good condition and able to turn freely, independent of the PTO shaft.

Make sure the PTO yoke ends are clean. Adding a small amount of lubricant on the splines can help them slide on.

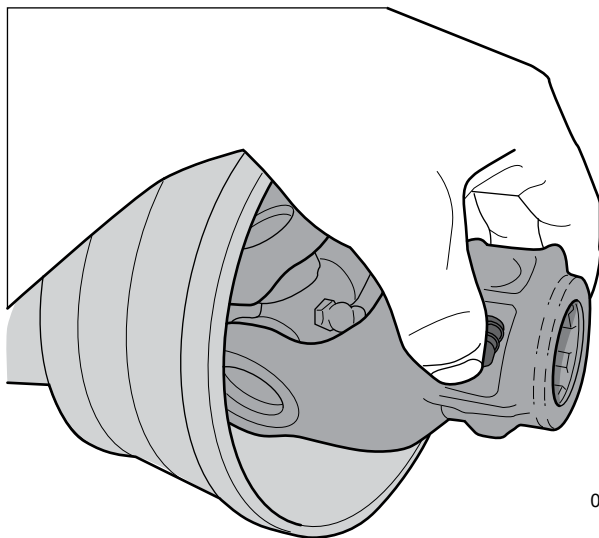


A decal on the shielding indicates the tractor-end of the driveshaft.



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1. Install the PTO shaft on the implement first. Press the locking pin button and push the shaft end onto the input PTO. Connect the safety chain to the implement so that the shielding does not turn during operation.



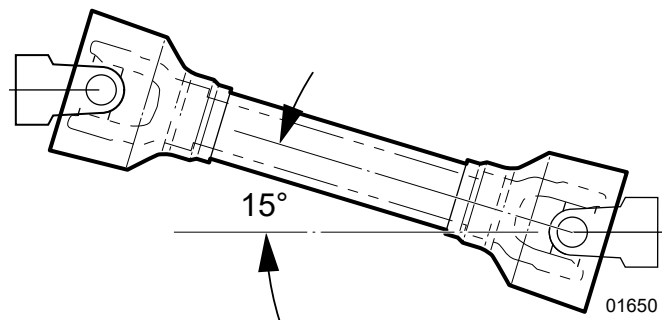
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Fig. 12—Locking Pin Button

2. Slide out the end of the PTO shaft up to the tractor output PTO, aligning the two shaft splines. Press the locking pin button and push the shaft end onto output PTO.
3. Once started, slide the shaft all the way on. You might hear a click and your button should retract to the original position.

4. To check that the shaft lock is fully seated, pull back on the shaft with your hands off the button.
5. Start the tractor and raise / lower the attachment to check clearances. A correctly sized shaft should never bottom out or come apart.

**IMPORTANT! Check driveshaft alignment. During operation, the working angle should not be greater than 15° between the tractor and the implement. Misalignment can cause premature wear and eventually failure.**



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Fig. 13—Driveshaft Alignment

6. Check the rotation direction. A decal on the machine indicates correct rotation.



**WALLENSTEIN**