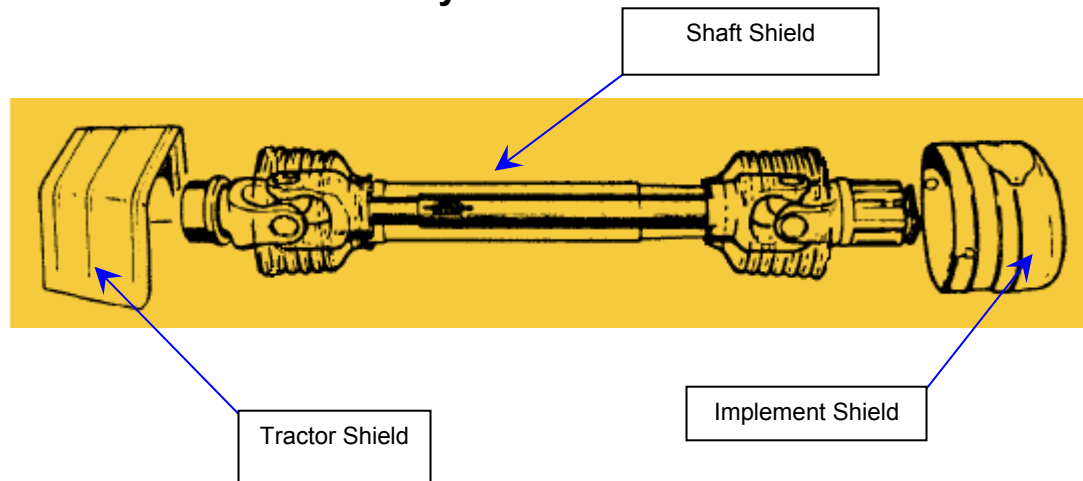


PTO Guarding Guidebook

PTO Shield: A 3-Shield System



Tractor shield: The tractor or master shield covers the tractor PTO stub shaft as well as the connection end of the implement input driveline (IID) shaft. The PTO master shield is attached to the tractor and extends over and around the PTO stub on three sides. It is designed to protect from the PTO stub and the front joint of the drive shaft of the connected implement.

Implement shield: The implement shield is very similar to the master shield. It is attached to the implement and encloses the area connecting the PTO shaft to the implement.

Shaft Shield: An IID shaft guard completely encloses the shaft. These plastic or metal tube-like guards are mounted on bearings so the guard rotates with the shaft but will stop spinning if a person comes in contact with the guard.

What to do in case of a missing/damaged driveline guard

The driveline guard is usually the one that needs to be replaced because of wear and tear. It is also the one that comes to mind when referring to a PTO shield. Three types of parts make the PTO driveline guard: (1) the tube, (2) the bell, and (3) the bearing (**Figure 1**). To obtain the telescopic guard, two of each type of parts are matched together.

- (1) Tube: The tube is the cylindrical part that covers the shaft. On a PTO shield, one tube fits into the other tube to provide the telescopic feature. The tube is also referred to as the sleeve.
- (2) Bell: The bell is the conical part that covers the universal joint of the PTO shaft. It is integral to the tube on some shield types, but can also be a separate part. The bell is also referred to as the cone.
- (3) Bearing: The bearing is the part that rides in the universal joint yoke groove and that makes the shield free to rotate independently from the shaft. The bearing is also called the bushing.

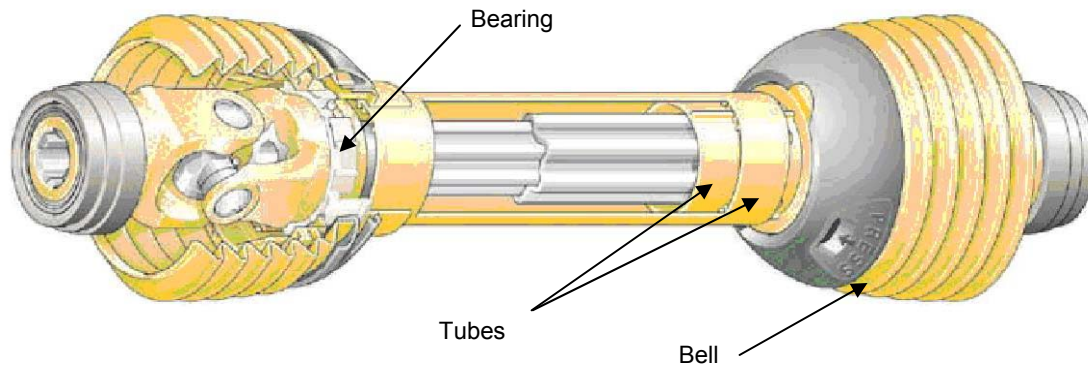


Figure 1. Components of a PTO Driveline Guard (source: <http://www.walterscheid.com>).

If a replacement is needed:

Option 1: Go to your dealer to get the OEM (original equipment manufacturer) driveline guard.

Option 2: Purchase a generic guard from a farm store or a dealer. Most manufacturers of drivelines and driveline guards have parts that will fit competitors' products. Because most guards have a nylon bearing that rides in the groove of the universal joint yoke on the driveline shaft (**Figure 2**), the only critical dimensions that are required are the diameter of that groove and its width.

Table 1 gives the pros and cons of OEM and generic guards.

Table 1. Comparison of OEM and generic guards.

OEM	Generic
ADVANTAGES	
Guaranteed fit for your application	Cost less (\$80 - \$100) Many sources
DISADVANTAGES	
Costs more (\$140 - \$180)	May not be exact fit: <ul style="list-style-type: none"> • Lubrication • Bell Size • Center Bushing

Fitting a driveline guard on a PTO shaft is usually straightforward and requires only basic shop tools. The installation of the driveline guard is illustrated in **Figures 2 and 3**. Good maintenance and operating practices are essential to ensure the guard functions properly and offers the desired protection:

- Lubricate the driveline and guard as per the instructions included in the operator's manual.
- Do not drop the PTO shaft on the hitch or store it on the ground.
- Before operating a PTO-powered implement, make sure the guard turns and telescopes freely.
- Before doing any maintenance/adjustment/inspection of a PTO driveline, ALWAYS disengage the PTO and shut the tractor engine off.
- Consider the area around a PTO shaft as dangerous and stay away unless absolutely necessary.



Figure 2. The Nylon Bearing Rides in the PTO Yoke Groove; Lubrication is Recommended.

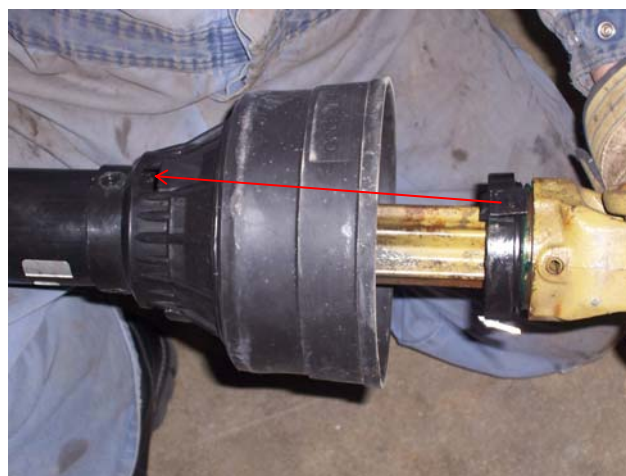


Figure 3. Tabs Around the Circumference of the Nylon Bearing Line Up With Holes Around the Bell; Once the Tabs are Inserted in the Holes, the Tube and the Bell Become Integral With the Bearing.

*Properly Guarded PTOs are very important
PTO injuries are usually very serious, many permanent disabilities or death.*



CAISP data (1990 – 2000) on PTO injuries:

- 371 hospitalized injuries
- 35 fatalities

What to do in case of a missing/damaged tractor shield

- Option 1:** Go to your dealer to get a master shield that will fit your tractor (this is the preferred approach). Retrofits are also available.
- Option 2:** Build your own. Follow the recommendations of the *American Society of Agricultural and Biological Engineers (ASABE)*. Depending on the type of PTO on your tractor, build the shield according to **Figures 4, 5 and 6**.

What to do in case of a missing/damaged implement shield

- Option 1:** Go to your dealer to get the shield that will fit your implement (this is the preferred approach).
- Option 2:** Build your own. Follow the recommendations of the *American Society of Agricultural and Biological Engineers (ASABE)*. Follow these guidelines¹:
- The driveline guard shall overlap the implement shield by a minimum of 50 mm (2 in.) in a straight-line position.
 - The implement shield, if designed as a step, or where that use can be anticipated, shall remain functional if used as a step by a 123 kg (270 lb) person in normal operation or servicing of equipment.

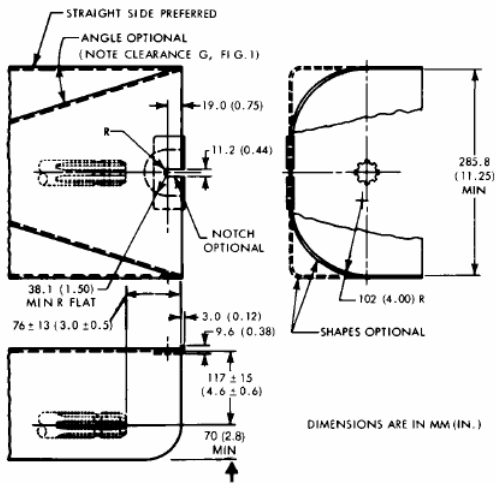


Figure 4. Power-Take-Off shield for Tractor with Types 1 and 2 PTO (source: ASAE S203.14 Front and Rear Power-Take-Off for Agricultural Tractors. St. Joseph, Mich.: ASAE.)

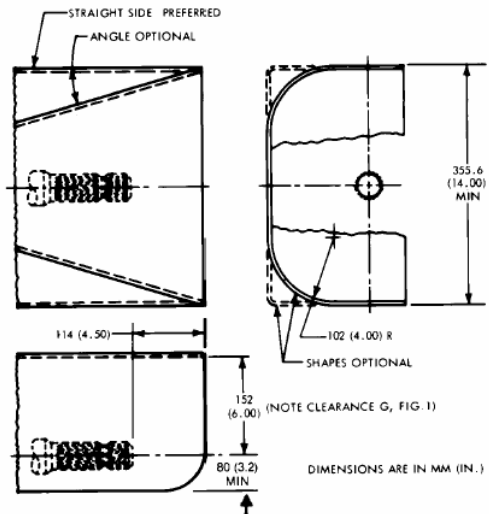


Figure 5. Power-Take-Off Shield for Tractor with Type 3 PTO (source: ASAE S203.14 Front and Rear Power-Take-Off for Agricultural Tractors. St. Joseph, Mich.: ASAE.)

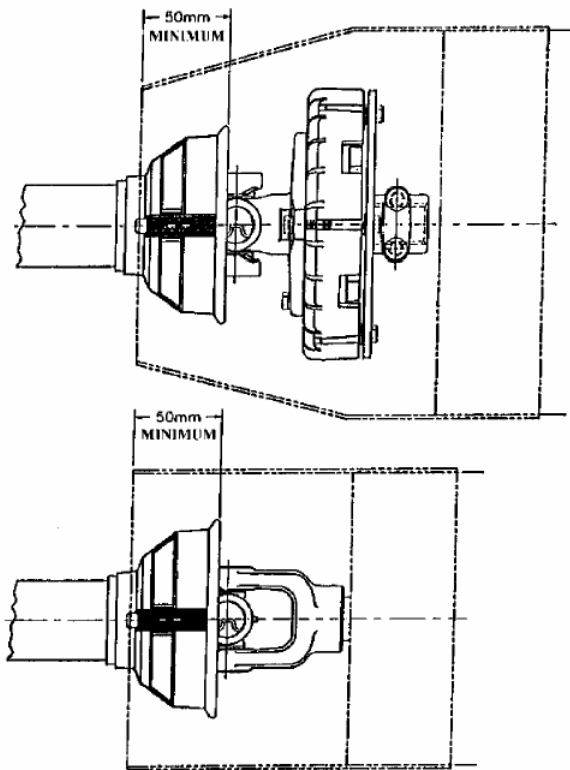


Figure 6. Power-Take-Off Shield on Implement (source: ASAE S318.15 Safety for Agricultural Field Equipment. St. Joseph, Mich.: ASAE.)