

# PANDORA PRODUCTS



## PTOTools PTOHelper

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## **Document Revision History**

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## 1 Introduction

Farm equipment is attached to a tractor either by a pin hitch on the draw bar or to the three point hitch. On some equipment that is all that needs to be done. On others hydraulic lines and/or a PTO shaft must be hooked up. These latter are needed if the device needs more power than the rolling wheels can supply (like a bailer). Hooking up the hydraulic lines is usually quite easy as they plug into sockets. The PTO on the other hand is a slightly more difficult problem. There are two standard PTO connections 1,000 RPM and 540 RPM designated by their shaft speeds. The 1,000 RPM is usually for larger equipment and will not be considered here.

The 540 RPM PTO shaft is a 1 3/8" (34.925 mm) 6 splined shaft. Below is a picture of the broken end of the shaft. Note the slot around the shaft. That is used by the machinery PTO coupler to lock on to the shaft.



Figure 1: 540 RPM PTO Shaft

Attaching the equipment to the shaft means aligning the splines in the coupler with the tractor shaft splines. Sliding the coupler on then depressing a button or collar to retract the locking tab and sliding it over the shaft slot and locking it on. Doing this requires aligning the shaft coupler with the PTO shaft. Sometimes this is easy if the equipment shaft can easily be turned. If not it is difficult to align the tractor shaft as it is hard to turn and the PTO control on the tractor does not give fine control. This is also difficult as you cannot see the splines inside the equipment shaft coupler. In all this usually turns into a greasy, sweaty 10-20 minute hassle.

## 2 PTO Helper Tools - USE

Thus there are two problems for our tools to solve, a) marking the splines on the equipment connector and b) jogging the tractor PTO shaft if necessary.

### 2.1 Marking the splines

This 3D printed stencil is used to mark the splines.

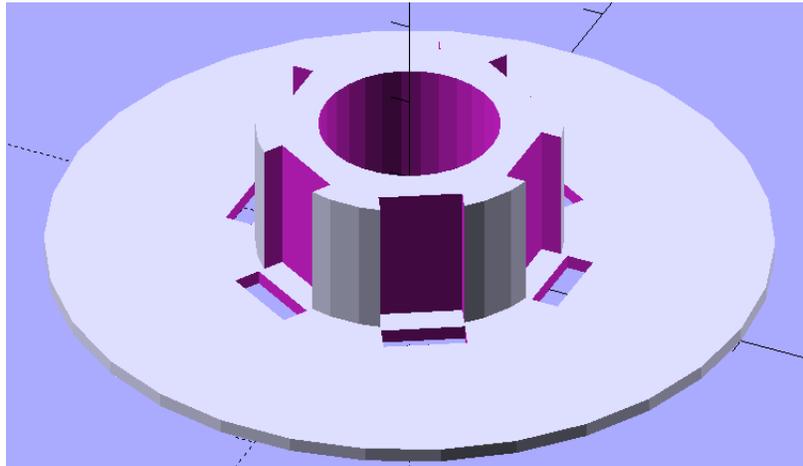


Figure 2: PTO Stencil

It is used as follows::

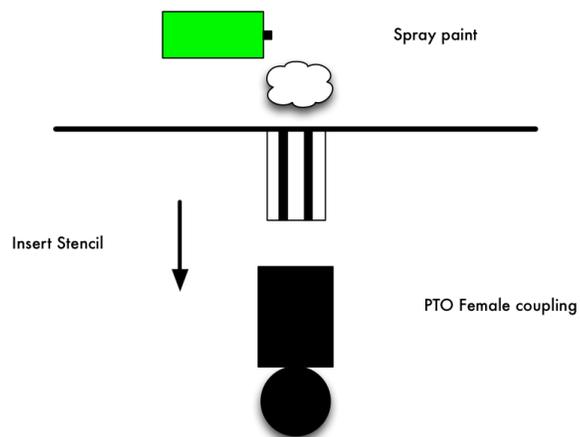


Figure 3: Stencil use

## 2.2 Jogging the PTO shaft

This is done by 3D printing a 1/2" socket that fits the PTO shaft.

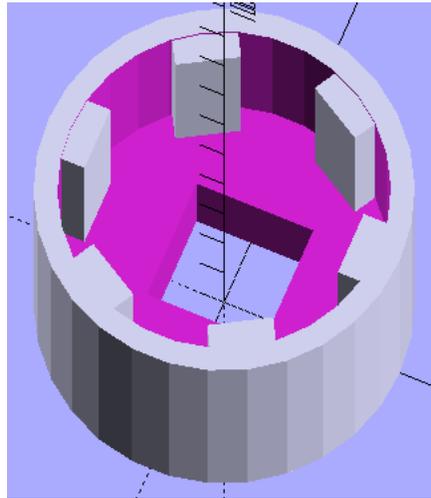


Figure 4: PTO Socket wrench

In use you would attach this to a breaker bar and use that to jog the PTO shaft.



Figure 5: Breaker bar

### 3 PTO Helper Tools - Construction

Both of these tools are 3D printed from PLA. In the files in this archive are two files for each tool. An SCAD file and an STL file. The SCAD file is the original design. It can be opened by the program OPENSCAD ([www.openscad.org](http://www.openscad.org)) that is available for Windows/Mac/Linux. The SCAD file is also a TEXT file and can be opened by any Text editor. The STL file is exported from the SCAD file and is the one sent to a 3D printer.

The PLA is quite strong enough for the stencil and also for the socket.

## 4 Getting the files

### 4.1 Web site

Got to <http://chiselapp.com/user/jschimpf/repository/PTOHelper> and you will get:

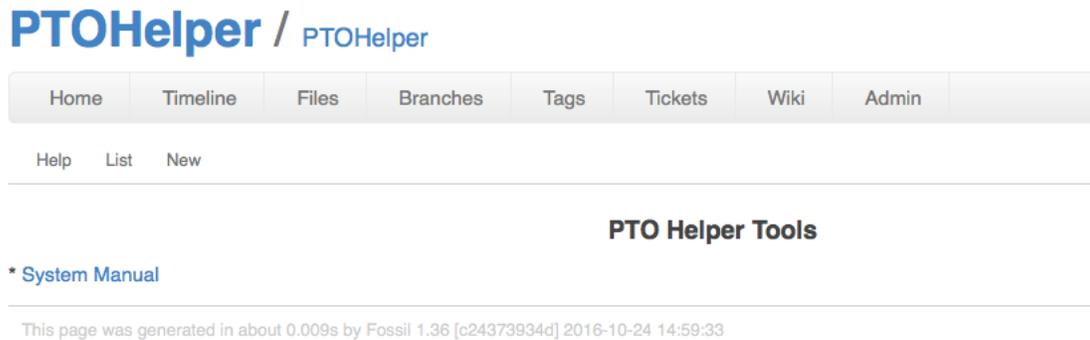


Figure 6: Website

## 5 Getting the files

Pick TimeLine on the top menu and you will get

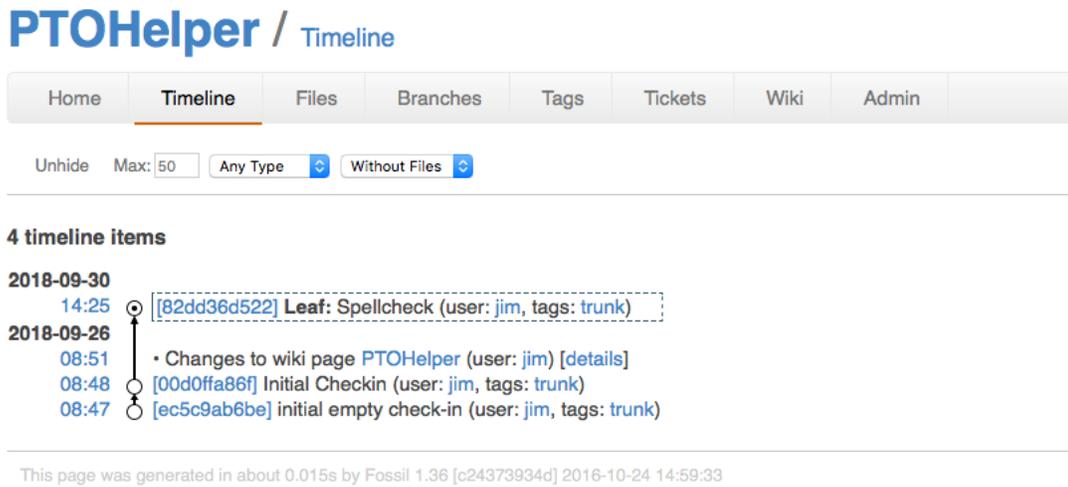


Figure 7: Timeline

Pick the top item in the list, **NOTE** Your screen will be slightly different. You will then get:

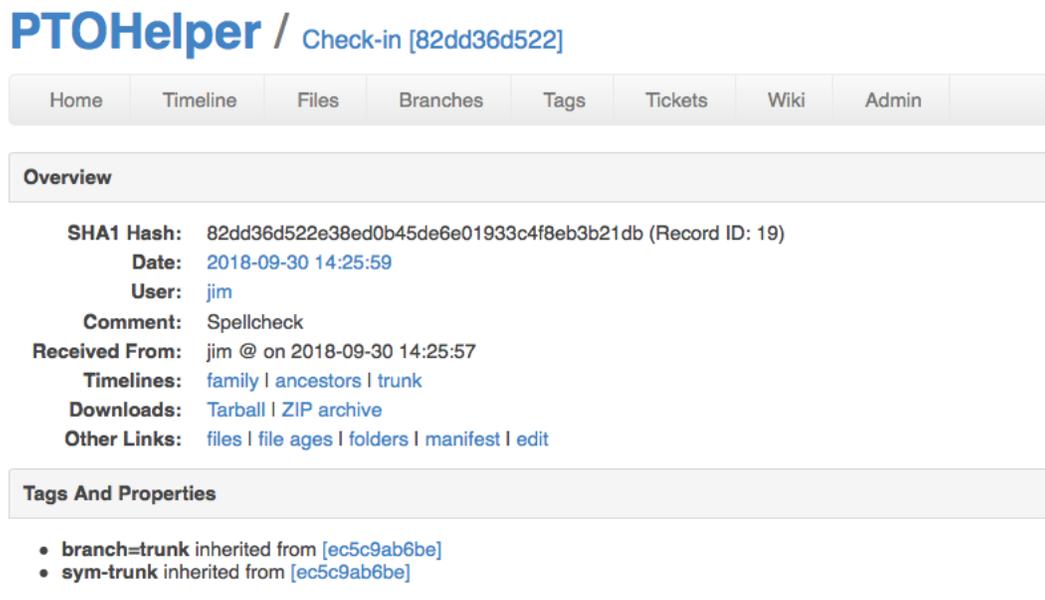


Figure 8: Download screen

Then just pick ZIP archive under the Downloads and you will get all the files as a ZIP file.