

LocoGear

John D.L. Johnson
 3879 Woods Walk Blvd.
 Lake Worth, FL 33467-2359
 jjohnson@LocoGear.com
 www.LocoGear.com

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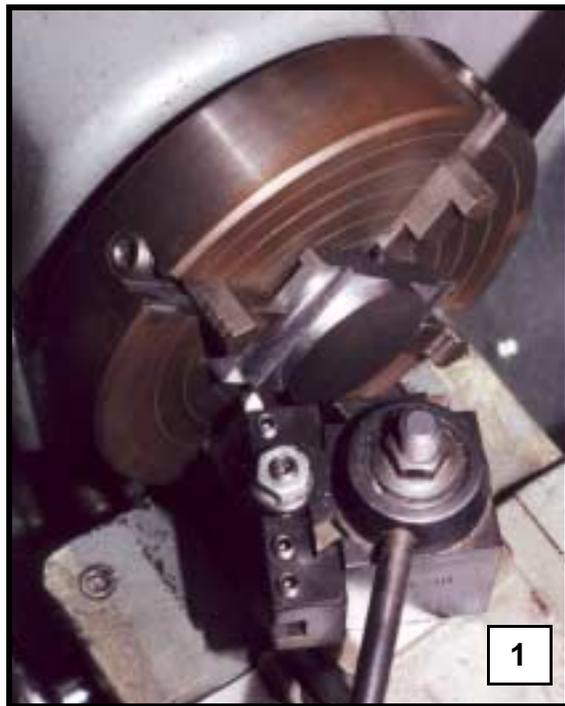
Machining Instructions for Truck Center Plates Lima Card Number 932-AB-5221

The following instructions are for machining the Truck Center Plates (Lima Card Number 932-AB-5221) which were used on both the **Greenbrier, Cheat & Elk Railroad #12** (Revision Line "A") and the **Western Maryland Railway #6** (Revision Line "B"). Three of these Truck Center Plates were originally used on both Shays. The **GC&E #12** had a fourth truck added to it in 1933 requiring a fourth Truck Center Plate at that time, which the GC&E made in their own foundry at Cass, W. Va. These center plates are attached to the Top Truck Bolsters (Lima Card Number 933-A-5068 for **GC&E #12** and 933-A-5170 for **WM #6**) and are the load bearing points between the trucks and the engine and tender frames.

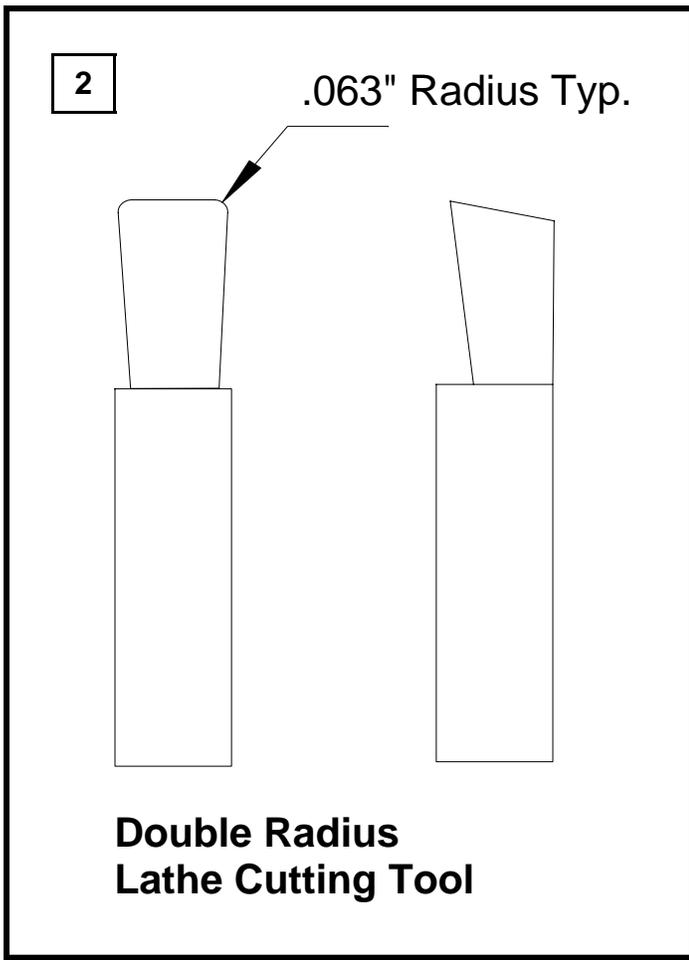
A scale drawing of this part is on page four. Lima originally made the Truck Center Plate as a steel casting (Lima Pattern Number 93-697), but for the live steam model, this part can be machined from steel bar stock.

1. The Truck Center Plates are each made from a piece of 3/4" x 2-1/2" cold rolled steel bar stock rough cut to approximately 3-7/8" long. Clamp the rough cut piece in a milling machine vise with enough stock protruding to square and finish the ends and sides of the bolster plate to 3.750" long and 2.375" wide. Do not finish either the top or bottom surfaces at this time.

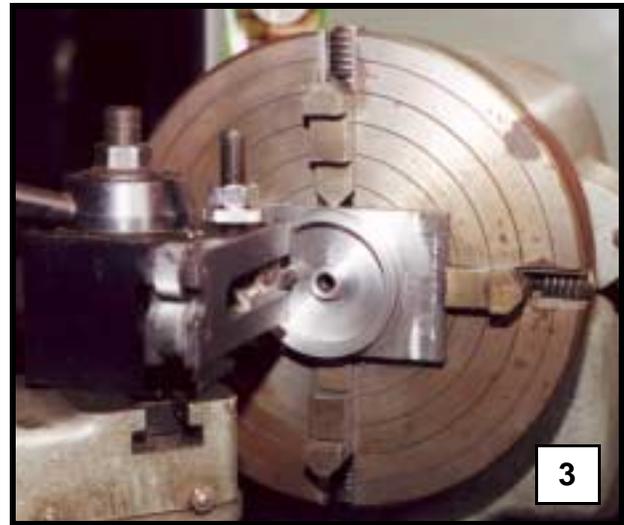
2. The bottom of the Truck Center Plate has a 1.875" wide groove 0.125" deep along its length. This will fit over the Top Truck Bolster. Machine this groove with an appropriately sized end mill.



3. The next step is to machine off the shoulders on either side of the pivot on the top surface of the Truck Center Plate. Turn the piece over and mill the shoulders to 0.375" thick and in 0.625" from each end. This will leave a nearly square section of mate-



and set the dial indicator or DRO to 0.375". This lathe cutting tool should have enough clearance to reach into the center hole to begin its cuts and also to clear the inside of the outside pivot wall. Beginning from the center hole, face cut the top of the pivot to 0.719" above the shoulder surface. Continue to face cut out to the inside of the outside pivot wall to a diameter of 2.000" until the top of the inside pivot is reached at 0.187" above the shoulder surface.



- rial to turn the pivot in the center.
- Turning the center pivot is done using a four-jaw lathe chuck with the Truck Center Plate centered in the chuck. First turn the outside shape of the pivot (photo #1). Take it easy as this is an interrupted cut knocking off the four corners of the remaining material between the shoulders. Note: These corners can be rough cut on the mill to avoid damage to the lathe. The outside diameter of the pivot is the same as the width of the Truck Center Plate (2.375"). If the part is centered in the lathe properly, the pivot should come out even with each side. At the base of the pivot's outside surface is a 1/16" radius fillet. Leave enough material when turning here to finish the fillet with the 1/16" radius cutting tool described in step #6.
 - Begin turning the inside of the pivot by drilling a 5/16" hole through the center of the Truck Center Plate with a drill chuck in the lathe tail stock. Position a standard lathe cutting tool which will be cutting out from the center hole against the shoulder of the Truck Center Plate

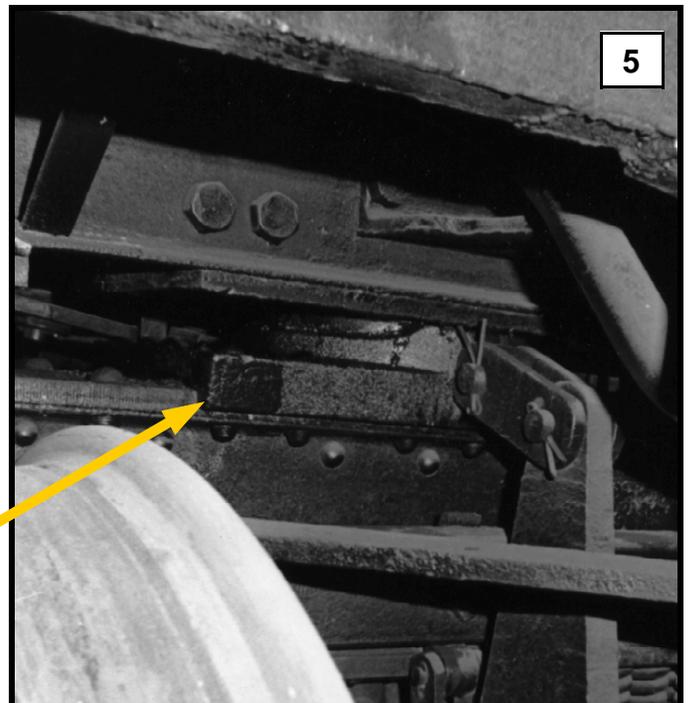
- The remaining plunge cuts should be made with a flat end double radius lathe cutting tool (drawing #2) with a 1/16" radius on each side so that the two 1/16" fillets at the inside base of the outside pivot wall and inside pivot can be made as well as the flat bottom surface (photo #3). Note that this cut was done with the double-radius lathe tool positioned up-side-down and the lathe run in reverse to avoid chatter.
- The truck brake rigging is attached to a tab which extends out from the outside pivot wall of the Truck Center Plate. This tab is made from a 1/2" x 1/2" x 1/8" piece of steel sheet stock. File two adjacent corners to a 1/4" radius and drill a 3/16" hole in the center of the tab. This tab is then brazed onto the side of the outside pivot wall at the center of the Truck Center Plate just below the top of the pivot (photo #4).
- It is recommended that for proper alignment of the rivet holes located throughout the Truck Center Plate that they be drilled in conjunction with the holes in the Top Truck Bolster.



This completes the instructions for machining the Truck Center Plate. The prototype has two further components of its design which are optional for the model in as far as their function (see prototype photo #5 and the drawing on page 4).

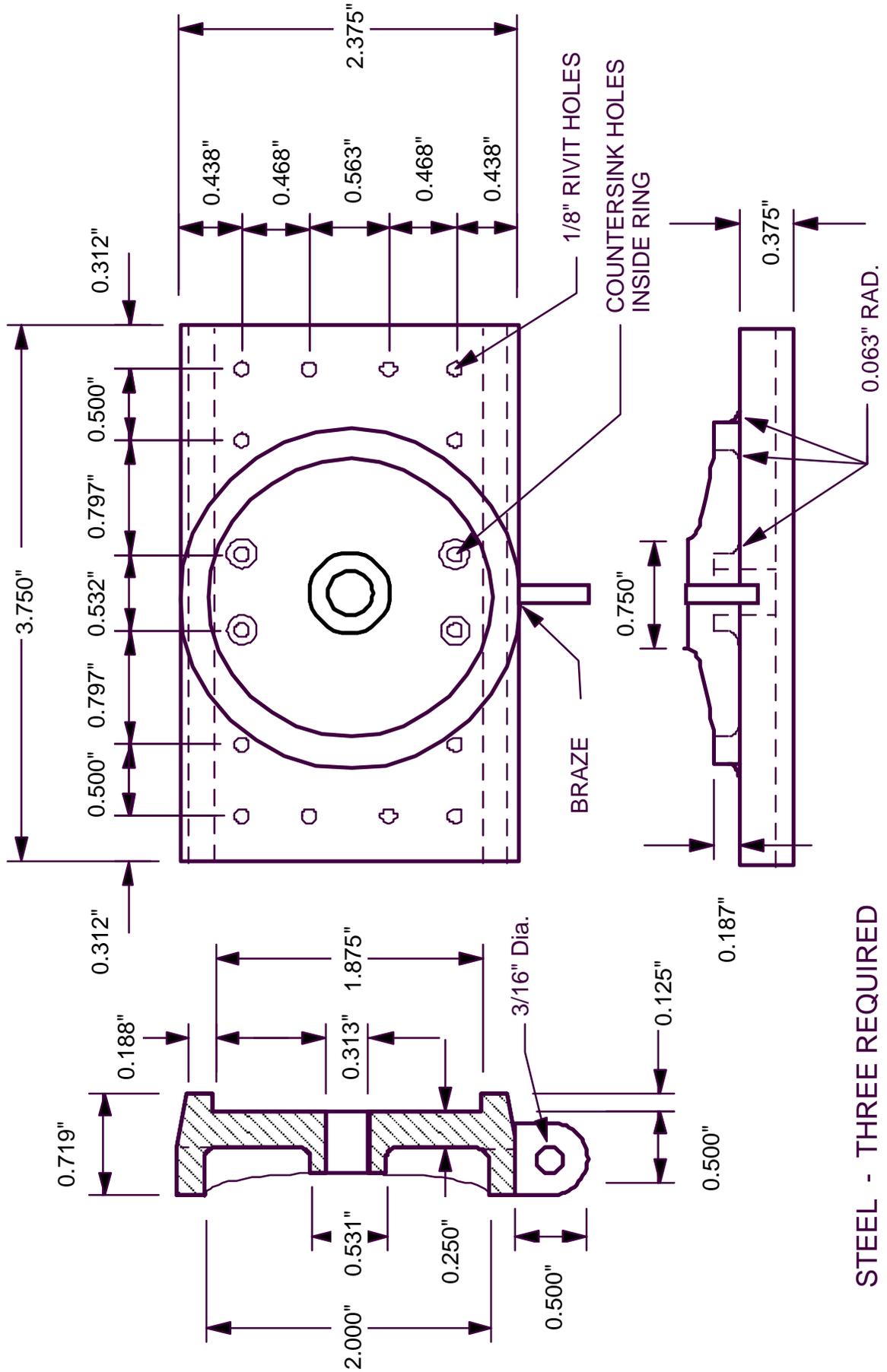
First, the outside pivot wall on the prototype is tapered down to the center on either side. This could possibly be either to allow for the locomotive frame to rock back and forth, or since the greatest strength is necessary at the front and rear of the pivot wall, it may have been tapered to the center just to reduce weight and cost in the casting. In either case this taper may not be necessary on the model.

Second, the base of the Truck Center Plate is tapered from the shoulder to the bottom along both the front and rear edge. This taper was probably just a result of the draft made to the casting pattern rather than any operating function. This feature could also be machined on the Truck Center Plate or left out.



(Right) This prototype photo shows the Truck Center Plate on the center truck of **Western Maryland Ry. #6**. *Photo by Jim Salmons.*

**WESTERN MARYLAND RAILWAY SHAY #6
TRUCK CENTER PLATE - CARD NUMBER 932-B-5221
DRAWN BY JOHN D.L. JOHNSON 2/2/2001**



STEEL - THREE REQUIRED