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Technical Bulletin - 03

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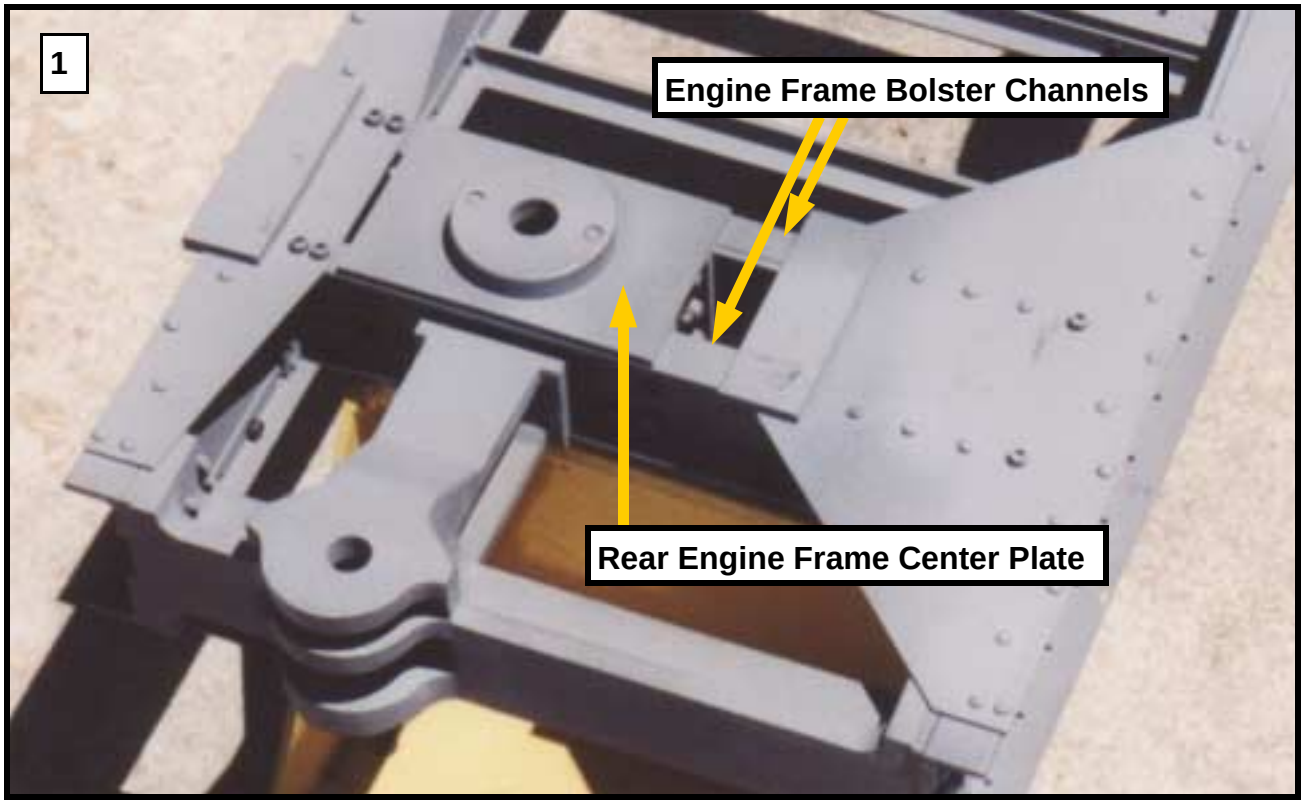
Machining and Fabrication Instructions for the Engine Frame Center Plates - 483-AB-5072

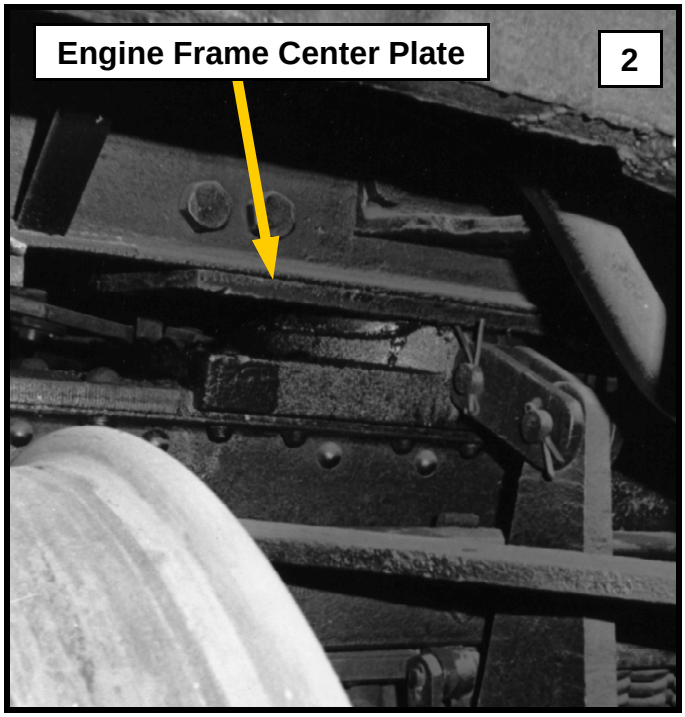
The following instructions are a step by step description of the process for fabricating the two Engine Frame Center Plates used on the **Western Maryland Railway #6.** The Engine Frame Center Plates are part of the engine frame and are the primary load bearing points of contact with the front and center trucks (see photo 1, view from below). A drawing with scale dimensions of these parts is on page three. A prototype photo of the Engine Frame Center Plate on the **Western Maryland Railway #6** is on page two. Lima distinguished the two Engine Frame Center Plates with different Revision Line Codes. The front Engine Frame Center Plate is Lima Card Number 483-A-5072, and the rear (center truck) Engine Frame Center Plate is Lima Card Number 483-B-5072. The only difference between the two are the locations for the bolt holes connecting them with the Engine Frame Bolster Channels.

Lima originally made the Engine Frame Center Plates from steel castings using their

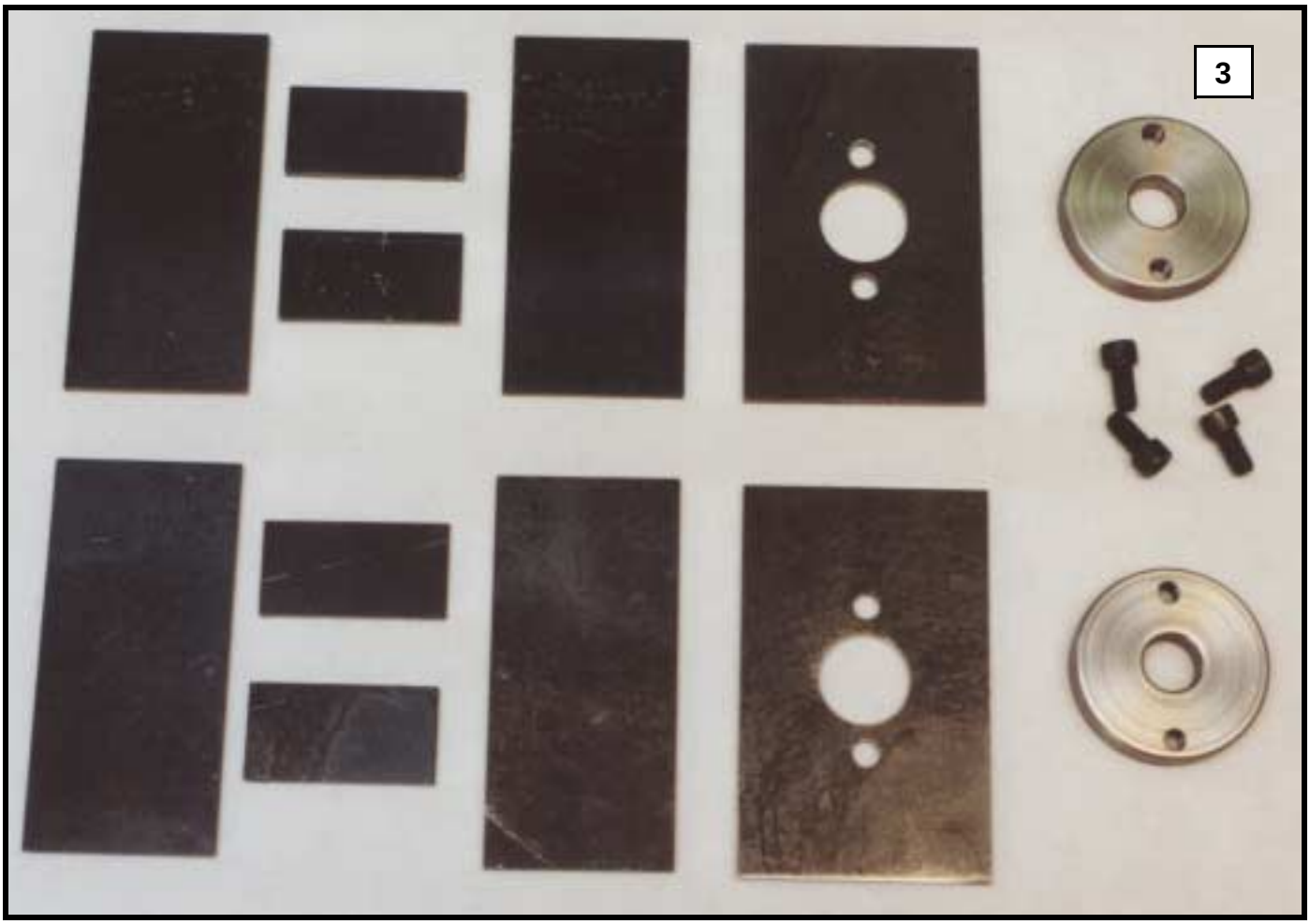


Pattern Number 48-722, but for the live steam model, these parts can be fabricated from 1/8" plate steel and 2" diameter cold rolled steel bar stock.

1. To start, both center pivots will be made together by mounting a piece of 2" diameter cold rolled bar stock in the three-jaw lathe chuck extending out about 1½". Face off the end of the bar stock giving it a smooth finish. Then turn the outside diameter to 1.969" and about 1.250" from the end. Next center drill a hole with a 1/2" drill about 1.250" deep. Then mount a boring bar in the tool post and bore out the center hole to 0.563" and about 1.250" deep. Next mount a 1/16" round over end mill and turn a radius on the outside corner of the turned bar stock and the inside edge of the center hole.
2. The next step is to part off the two center pivots from the turned bar stock. They are each to be 0.375" thick. Depending on how accurate your parting off technique is, you may want to part off a greater amount say 1/2", and then remount the pivot later and face off the back to



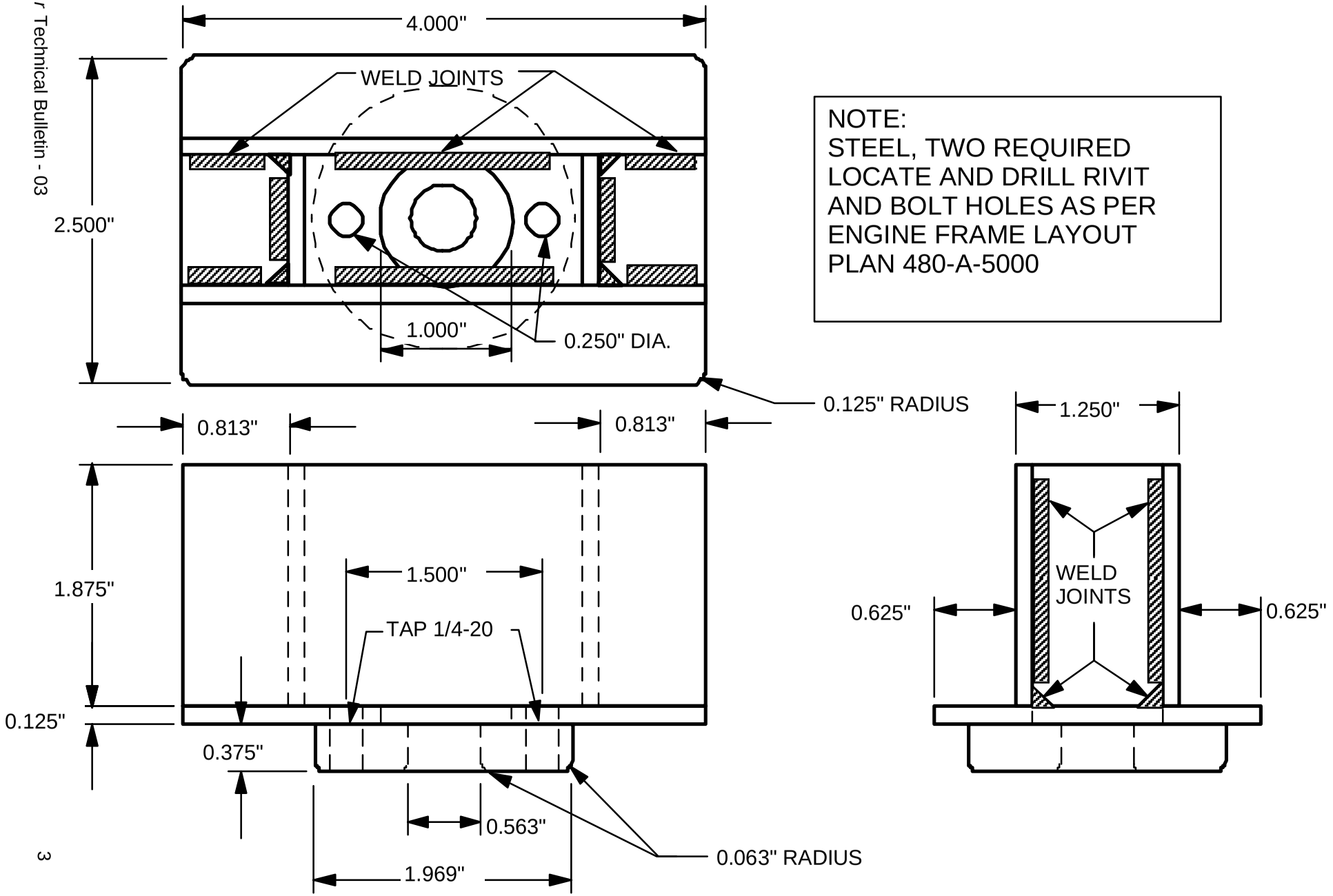
(Above) This prototype photo shows the Engine Frame Center Plate on the center truck of the **Western Maryland Railway #6**.
Photo by Jim Salmons.



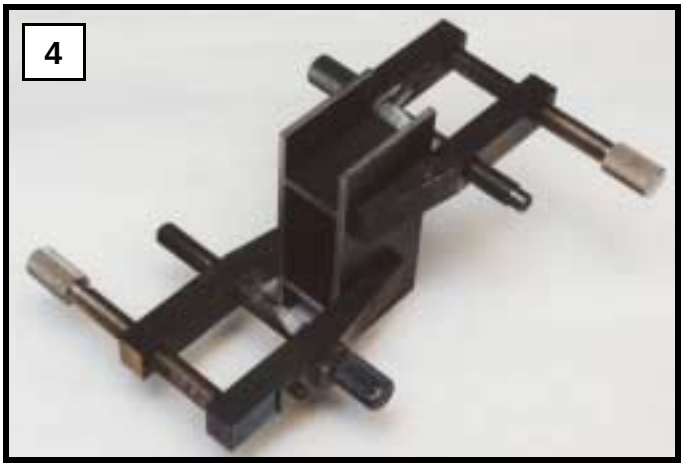
WESTERN MARYLAND RAILWAY SHAY No. 6

FRAME CENTER PLATE - FRONT & CENTER TRUCK - P/N 483-A-5072

DRAWN BY JOHN D.L. JOHNSON - 12/24/1999



NOTE:
STEEL, TWO REQUIRED
LOCATE AND DRILL RIVIT
AND BOLT HOLES AS PER
ENGINE FRAME LAYOUT
PLAN 480-A-5000

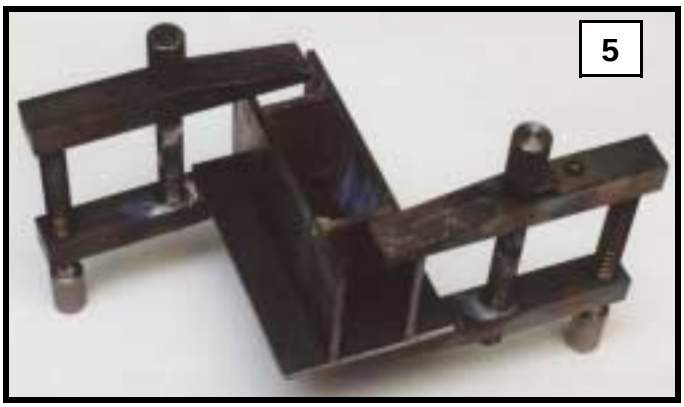


the final 0.375" thickness. Once the first pivot is parted off, the bar stock should be faced off again giving it a smooth finish. Then the 1/16" round over end mill should again be used to round over the outside corner and the inside corner of the center hole. Then the second pivot can be parted off the bar stock. If both pivots were parted off with a depth greater than 0.375", then the can now be mounted individually in the three-jaw lathe chuck and the backs faced off until they are 0.375" thick.

3. The center pivots are held to the rest of the Engine Frame Center Plates with two 1/2" long 1/4"-20 tpi socket head cap screws. Two holes are drilled and taped in each center pivot for these screws as shown on the drawing on page 3.
4. The remaining components of the Engine Frame Center Plates are made of 1/8" steel sheet stock. The following quantities and plate sizes are to be cut and finished (see photo 2):

   2 - 4.000" x 2.500"
   4 - 4.000" x 1.875"
   4 - 1.000" x 1.875"

   Each of the two 4.000" x 2.500" plates have two 1/4" pilot holes for the two socket head cap screws that hold on the center pivots. These should be drilled as shown on the drawing on page 3. All of the plates are welded or brazed together as shown on the drawing on page 3 (see photos 4, 5 and 6).



This completes the fabrication of the Engine Frame Center Plates. The bolt holes that attach the Engine Frame Center Plates should be drilled in conjunction with the Engine Frame Bolsters for proper location.