

LARGE SCALE MODEL RAILWAY ENGINEERING

Some thoughts on building the hand pump and check valves

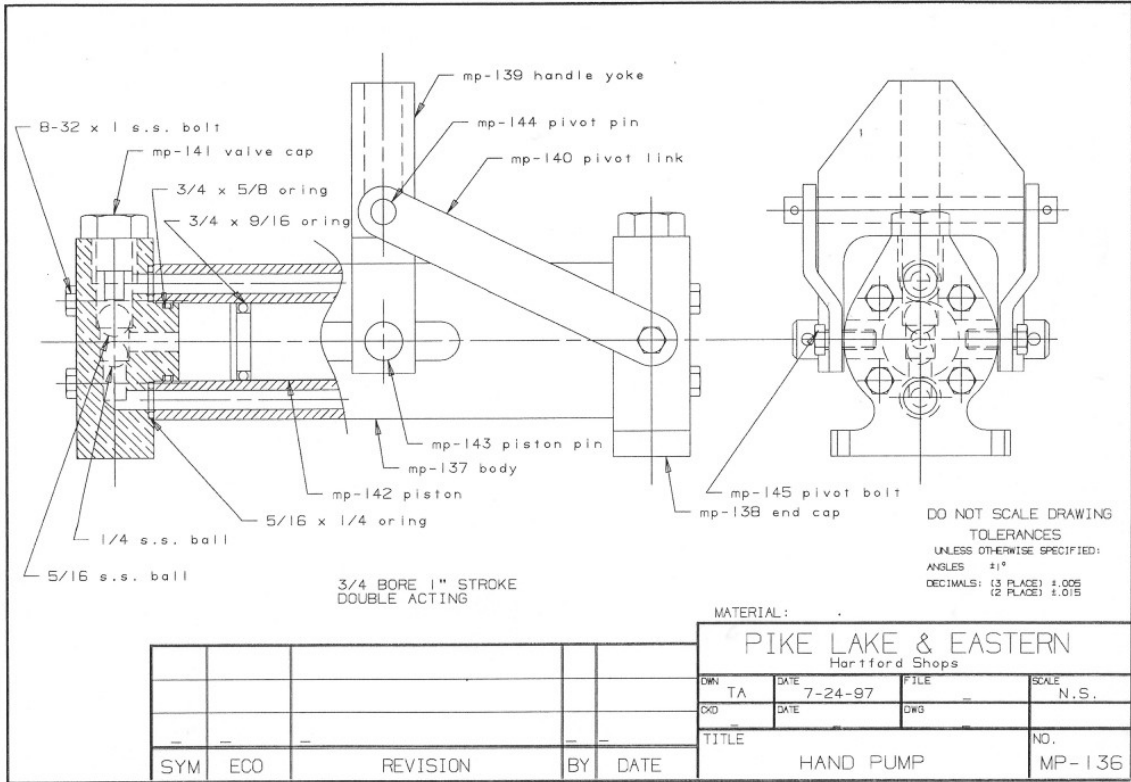
The hand pump that I published drawings for the past couple of months is a 3/4 bore 1" stroke double acting pump. The pump can be mounted inside the tender water compartment or can be mounted outside the water compartment where it is dry. Single suction and output ports allow easy connection to the water supply in either case. A filter screen should be used on the suction side to prevent dirt from entering the pump. Standard practice dictates a check valve be placed in the delivery line at the boiler. The drawings in this months Large Scale Model Railway Engineer series shows how to make a simple but effective boiler check valve.

Building the hand pump is relatively simple, most of the parts being made in the mill and lathe. The pump body is made of brass or bronze bar. Pay close attention to getting a smooth piston bore, I ream mine and then use a cylinder hone to get a smooth finish. This will assure long O-ring life. Probable the most difficult part are the end caps since they contain the check valves and have several O-ring seats. I start with a brass slug about 1 1/4 long and turn a 3/4 diameter x 1/4 inch long boss on one end. I can then use this diameter to chuck the part and turn the .750 diameter and the O-ring groove. Then I do the drilling and sawing to get the final part. When the end cap is complete the 3/4 diameter used for chucking can be cut off and made smooth. I use counterbores to machine the check valve seats assuring concentricity and good finish. The other parts are straight forward and should not present a problem.

The check valves are made from a small piece of 1/2 diameter brass and a standard compression fitting. By cutting the fitting in half both the pipe thread and the compression end of the valve can be made. Notice I leave a small shoulder that can be lightly pressed into the body to hold the parts together for silver soldering. The other area of importance is the surface that the cap seats on. The two surfaces must be square with a fine finish so that the joint will not leak. A half drop of sealant can be used to assure a leak free joint or a thin copper gasket can be used. Check the travel of the ball to assure that the travel is kept to .020 to .030 . Excessive lift will lead to inconsistent ball seating and a leaky valve.

This month I am going to digress a little and do a drawings of a fish belly gondola that is based on my standard gondola design. The design uses modified end castings , side plates and ribs. The end castings are modified by cutting 1 1/2 inches off of the top and notching the inside ribs to clear the top edge angle. An 1 1/2 inch is removed from the sides on each end as is shown on drawing CD-192 and the ribs are shortened according to match the sides. This will complete the gondola series so Ken can get it ready for sale.

For the February meeting I am going to give a presentation on lubricators and in conjunction with the topic I am going to start drawings for my mechanical and displacement lubricator designs. Till next time.



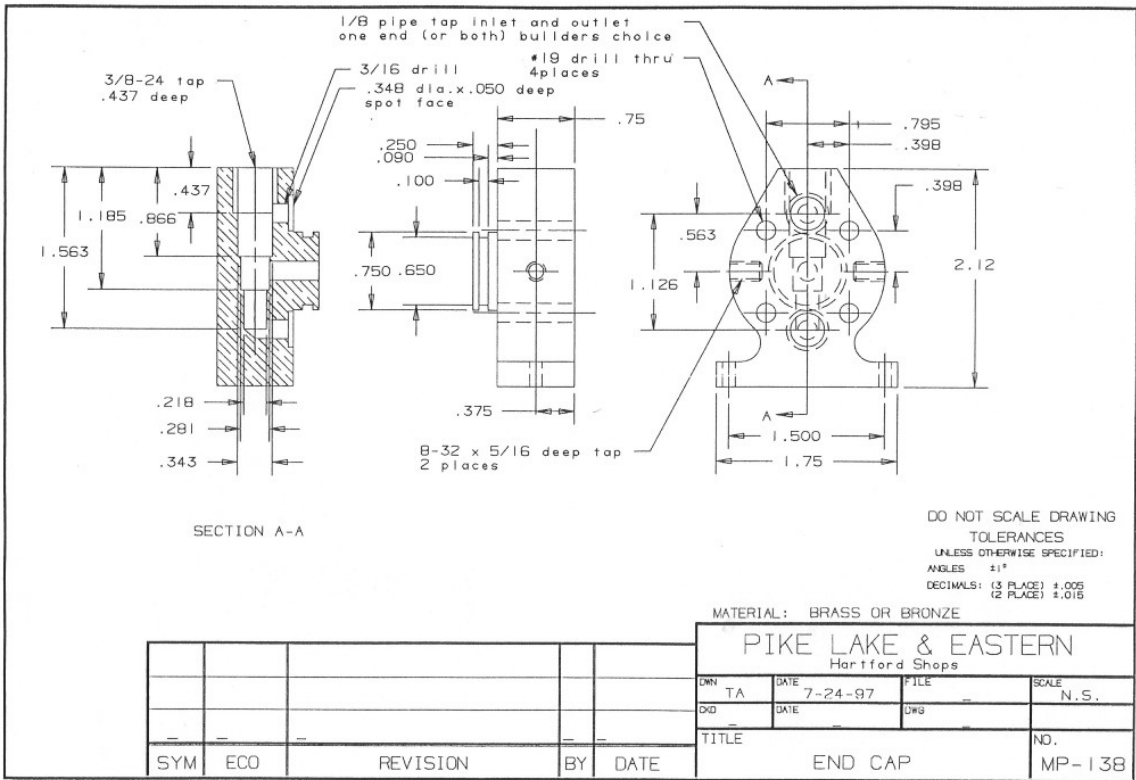
DO NOT SCALE DRAWING
 TOLERANCES
 UNLESS OTHERWISE SPECIFIED:
 ANGLES ±1°
 DECIMALS: (3 PLACE) ±.005
 (2 PLACE) ±.015

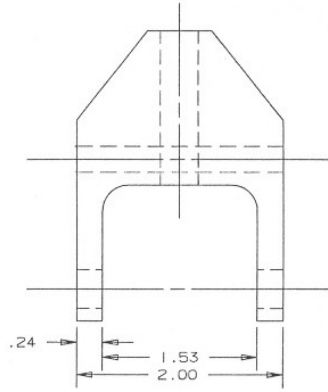
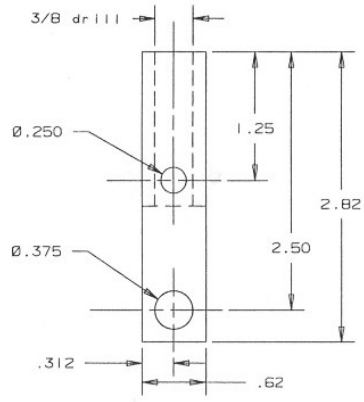
MATERIAL:

PIKE LAKE & EASTERN
 Hartford Shops

SYM	ECO	REVISION	BY	DATE	

DWN	TA	DATE	7-24-97	FILE		SCALE	N.S.
CO		DATE		DWG			
TITLE							NO.
HAND PUMP							MP-136





break sharp edges

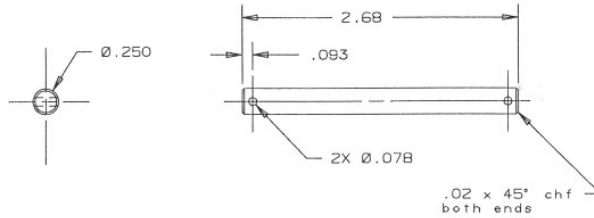
DO NOT SCALE DRAWING
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 DECIMALS: (3 PLACE) ±.005
 (2 PLACE) ±.015

MATERIAL: BRASS OR BRONZE

PIKE LAKE & EASTERN
 Hartford Shops

SYM	ECO	REVISION	BY	DATE

DWN	TA	DATE	7-24-97	FILE	SCALE	N.S.
TITLE						NO.
HANDLE YOKE						MP-139

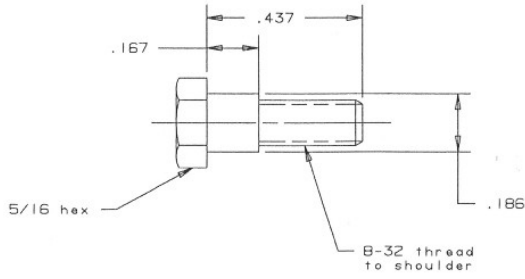


DO NOT SCALE DRAWING
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 ANGLES ±1°
 DECIMALS: (3 PLACE) ±.005
 (2 PLACE) ±.015

MATERIAL: STAINLESS STEEL

PIKE LAKE & EASTERN
 Hartford Shops

					DWN	TA	DATE	7-24-97	FILE		SCALE	N.S.
					CHKD		DATE		DWG			
					TITLE							NO.
					PIVOT PIN							MP-144
					SYM	ECO		REVISION		BY	DATE	



DO NOT SCALE DRAWING
 TOLERANCES
 UNLESS OTHERWISE SPECIFIED:
 ANGLES ±1°
 DECIMALS: (3 PLACE) ±.005
 (2 PLACE) ±.015

MATERIAL: STAINLESS STEEL

PIKE LAKE & EASTERN
 Hartford Shops

					DWG	TA	DATE	7-24-97	FILE	SCALE	N.S.
					DWG		DATE		DWG		
					TITLE						NO.
SYM	ECO		REVISION	BY	DATE	PIVOT BOLT					MP-145