Fitting a Dead Leg Lubricator to a Mamod or MSS Locomotive

These Dead Leg lubricators were originally designed & produced by Mike Chaney. They were then produced by IP Engineering, who dropped the drain screw and supplied a syringe instead. Dream Steam took over production from IP Engineering, and has re-introduced the drain screw and supply a hook nosed syringe. Their latest model includes an adjustable fixing plate, although the one supplied to me recently did not have this feature.

The original IP Engineering instructions: -

IPM04 Lubricator for Mamod Steam Locomotive

This lubricator is designed to fit the Mamod steam locomotives, providing correct lubrication to the cylinders. If a regulator kit is to be fitted, the two are best fitted together.

FITTING

The lubricator fits to the right hand side of the smoke box and the fitting at the end of the pipe pushes into the back of the reversing valve block in place of the steam supply pipe.
If the smoke box is not riveted, unscrew it and remove. Remove the complete reversing valve. If the smoke box is not removed, slacken it by removing the chassis screws. Pass the lubricator pipe from the smoke box side position to between the chassis sides. Trial reassemble the reversing valve with the lubricator fitting fully inserted. The steam pipe then fits into the other end of the fitting and will need trimming. Note how much needs trimming, remove the valve, shorten the steam pipe, clean all the parts and reassemble the locomotive. The lubricator body may be screwed to the smoke box side. Ensure the lubricator pipe is not kinked and slopes downwards along its length.

OPERATION

With NO PRESSURE in the boiler, unscrew the brass filler plug and fill with steam oil up to about 3mm from the top, Refit the filler plug. After running steam will have condensed in the lubricator and will require draining by using syringe provided. Refill with steam oil, ready for the next run.

SAFETY Never remove the filler plug when steam can be present. Check that the locomotive is correctly reassembled prior to steam testing.
This product is not intended for and should not be used by children

Rather basic instructions, no illustrations for fitting and no mention of priming the steam pipe.

The Dream Steam instructions: -

Dream Steam

Dead-Leg Displacement Lubricator for Mamod or MSS Side Tank Locomotive

Thank you for purchasing this Dream Steam Dead-Leg Displacement Lubricator for Mamod and MSS Side Tank Live Steam Locomotives.

We hope you enjoy using this upgrade part, which is one of many we offer for the Mamod and MSS railway range. Please see our website and back of this booklet for further details.

Introduction: This lubricator is intended for use with the old Mamod and new MSS side tank live steam locomotives. It provides the correct lubrication to the cylinders, especially when used with 'O' ring pistons. Only use 460 Compound Steam Oil in this lubricator, available separately.

The new revised design now incorporates an adjustable fixing plate so different heights and minor manufacturing variation in loco construction can be compensated for when fitting. A drain screw has also been reintroduced following customer feedback to make emptying easier and a special curved fine tipped syringe is now included to aid filling of oil and drawing off water condensate from the cup.

Instruction for fitting your new Dead-Leg Displacement Lubricator

Priming: Dead-leg displacement lubricators work by allowing steam into the cup via a pipe from the main steam pipe, which then condenses into water. Oil floats on water, so as the cup fills with water, oil rises to the top and is displaced back down the pipe. The action by which this happens is similar to water swirling down a plug hole — as steam comes up the centre of the pipe, oil swirls around the inner surface and down the pipe.

For this to happen effectively, the pipe needs priming with 460 compound steam oil to coat the inner surface. Using the hook nosed syringe or a very fine needle injector, drop oil into the pipe until it emerges from the other end. Once you are happy that oil has coated the entire length of the lubricator pipe inside it is ready for fitting.

Fitting: The lubricator cup fits to the right hand side of the smoke box and the 'T' piece fitting at the end of the pipe pushes into the back of the forward and reverse valve block in place of the steam supply pipe. The steam supply pipe is shortened and then fits into the fitting. If a regulator kit is to be fitted, the two are best fitted together.

1. If the smoke box is not riveted, unscrew it and remove.
2. Remove the complete forward and reverse valve block.
3. If the smoke box is not removed, slacken it by removing the two screws holding it to the chassis in front of the cylinder blocks.
4. Bend the lubricator pipe and pass from the smoke box side position to between the chassis frames with the male end of the 'T' piece pointing towards the front.
5. Ensure the lubricator pipe is not kinked and slopes downward along its length.
6. Try and reassemble the forward and reverse valve block with the 'T' piece pipe fully inserted.
7. The steam pipe then fits into the female end of the 'T' piece but will need trimming.
8. Note how much needs trimming off.
9. Remove the forward and reverse valve, and the steam pipe again.
10. Trim the steam pipe and clean all the parts.
11. Reassemble the loco and screw the lubricator cup to the side of the smoke box using the self tapping screw if not riveted.

Operation: With NO pressure in the boiler and the drain screw fully screwed in, unscrew the brass filler cap and fill the cup with 460 compound steam oil up to about 3mm from the top and refit the cap.

One cup-full of oil should be enough for two or three runs of 10-20 minutes each. However, some locos will use more whilst others will seem not to use any oil at all and last for longer. If the lubricator pipe has been primed properly, oil should be getting displaced by condensed water.

After running a few times, steam will have condensed in the bottom of the cup and displaced the oil. The water left behind should be either drained by removing the drain screw or sucked out using the fine curved tipped syringe supplied and the cup refilled with fresh 460 compound steam oil.

Fault Fixing: When refitting the drain screw, please do not over tighten as this may damage the thread or distort the small 'O' ring. It should be just nipped tight enough to make a seal so steam, water and oil do not escape. If leaks do occur, a small amount of plumbers PTFE tape lightly wound round the tread of the screw should provide a good seal.

If after three runs of 10 minutes no water has condensed and the oil cup is still full of oil, you may need to try re-priming the lubricator pipe again.

Remove the lubricator and fill the cup to the brim covering the small pipe opening. Ensure no oil has spilt or run down the sides. Leave over night in an upright position with the cap off. In the morning check oil has emerged from the 'T' piece, which will indicate oil has definitely got through the whole length of pipe.

If no oil is present, there may be a kink in the pipe that needs to be bent out to allow oil to flow. To test for kinks whilst the lubricator is removed from the loco and cool; remove any remaining oil and with the cap removed, try holding your finger over the female end of the 'T' piece and blow into the male end. You should hear a little hiss as air escapes from the other end of the pipe in the cup. You can try this with the cup end in some water to double check for air bubbles coming out of the pipe in the oil cup. If no air then the pipe should be straightened until air passes and start again.

Safety: This product is not intended for and should not be used by children. Fitting requires some dismantling and modification to the locomotive and should only be attempted by a competent adult with suitable tools. Checks must be made that the loco is correctly reassembled and steam tested prior to use. A safety valve must be fitted to the locomotive at all times when in use.

Never remove the filler cap or drain screw when steam or pressure may be present.

Only use 460 Compound Steam Oil in this lubricator, available from our website.

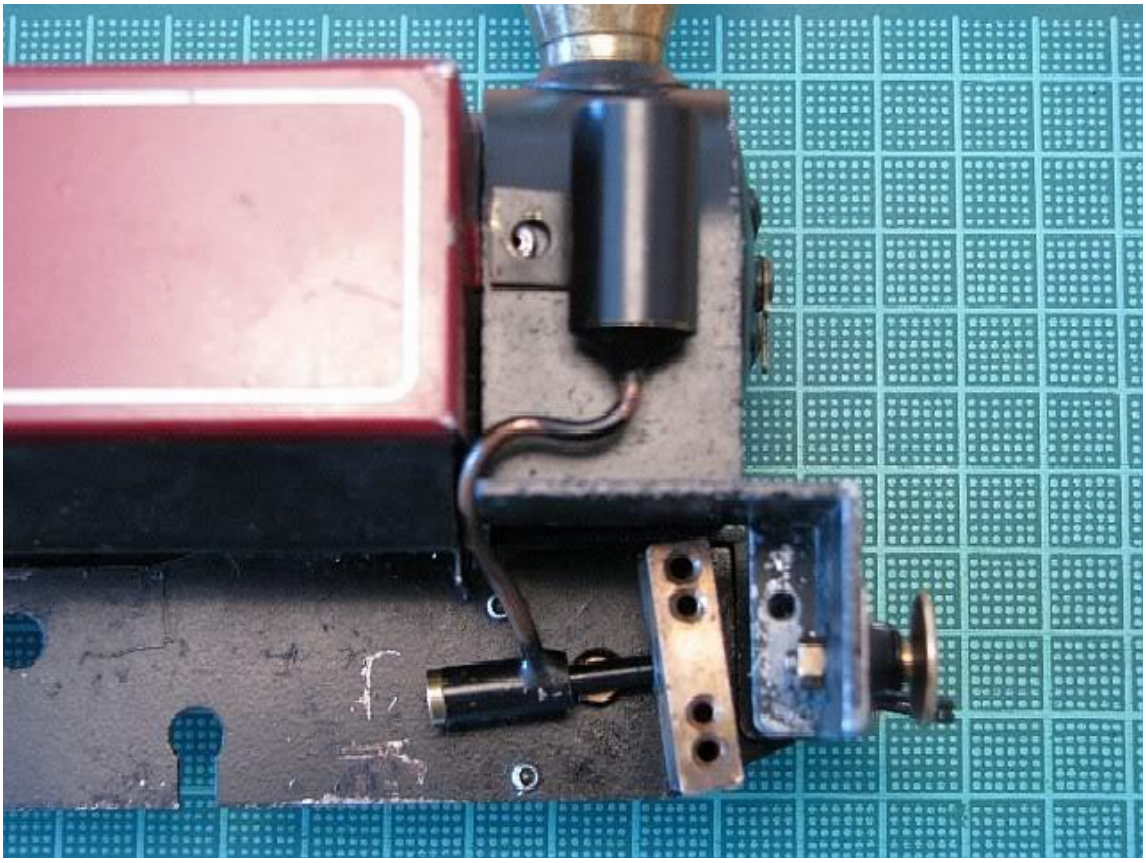
Better instructions, although again no illustrations for fitting, but good instructions on priming the steam pipe and fault finding.

I have examples of these Dead Leg Lubricators from all 3 manufacturers, and have produced an illustrated guide to fitting the IP Engineering Lubricator to a Mamod SL3 (applies to all 3 types).

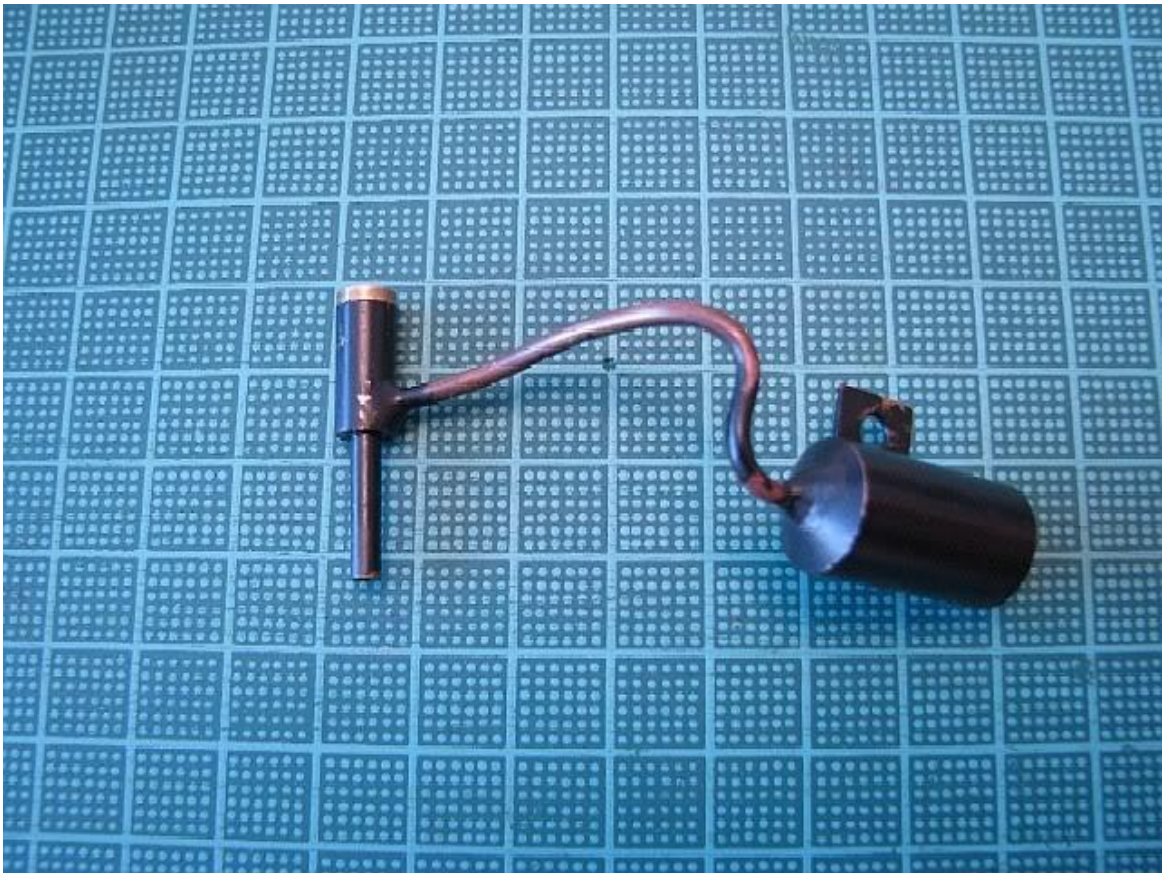
Firstly the IP Lubricators came pre-bent, but they still require further bending to fit properly (Dream Steam lubricators are supplied straight).

It needs to be bent again just at the bottom of the first bend, so that it will go through the cut out in the chassis frame at the front of the combustion chamber, and then further bent to align the T piece with the steam in port on the regulator/reverser valve.

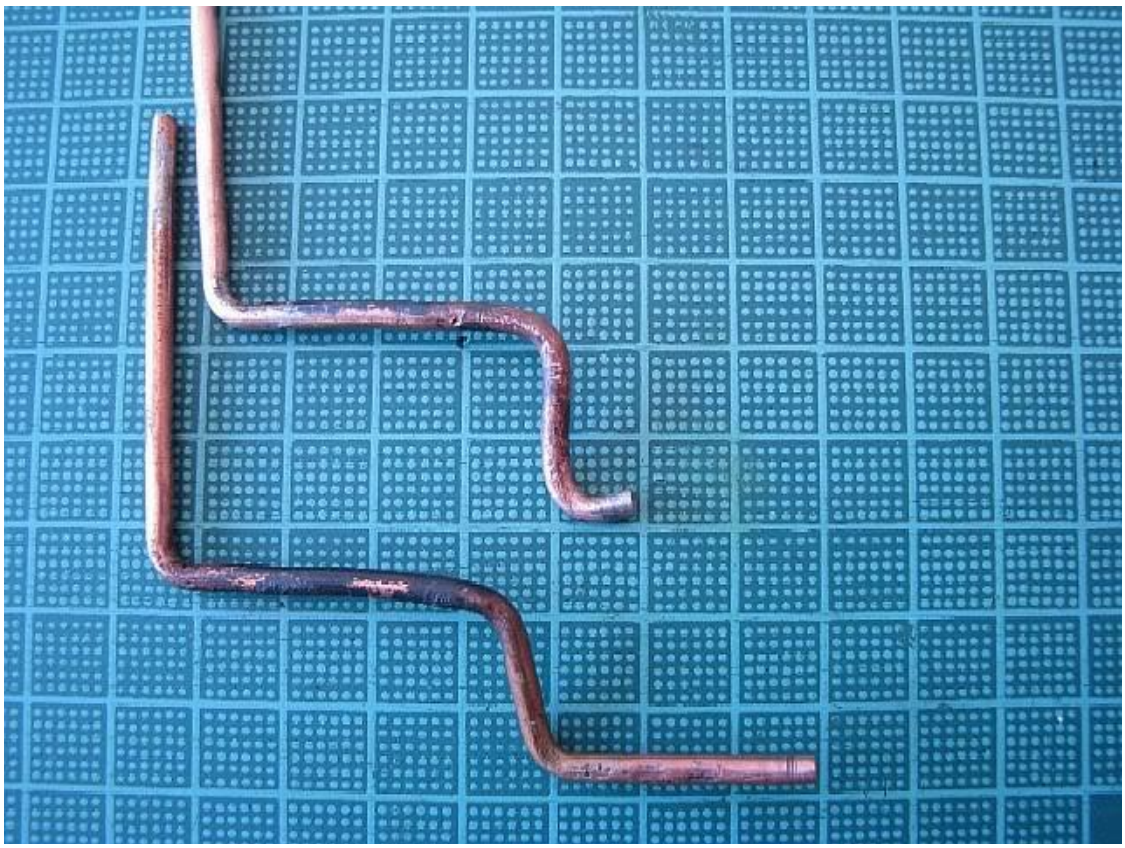
By removing the wheels, steam pipe & 1 chassis frame from an incomplete SL3, you can see this clearer.



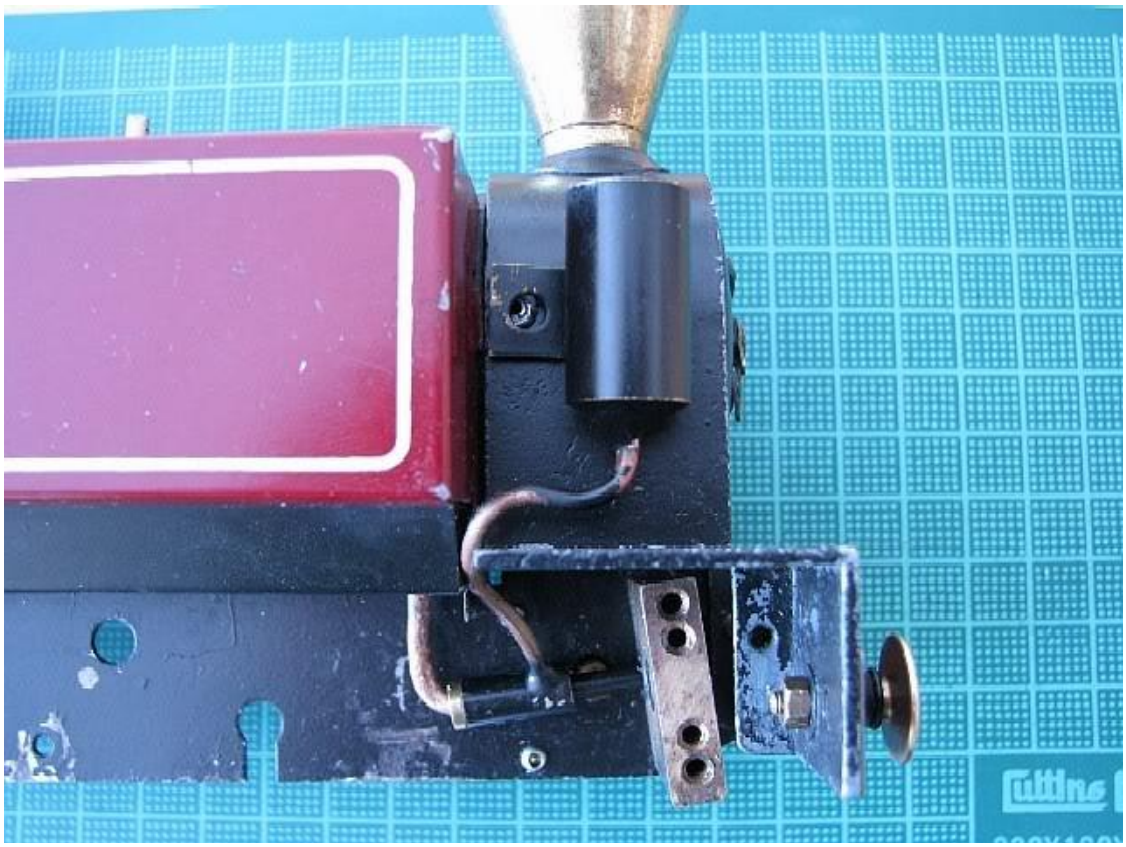
Here is what the final shape of the lubricator looks like.

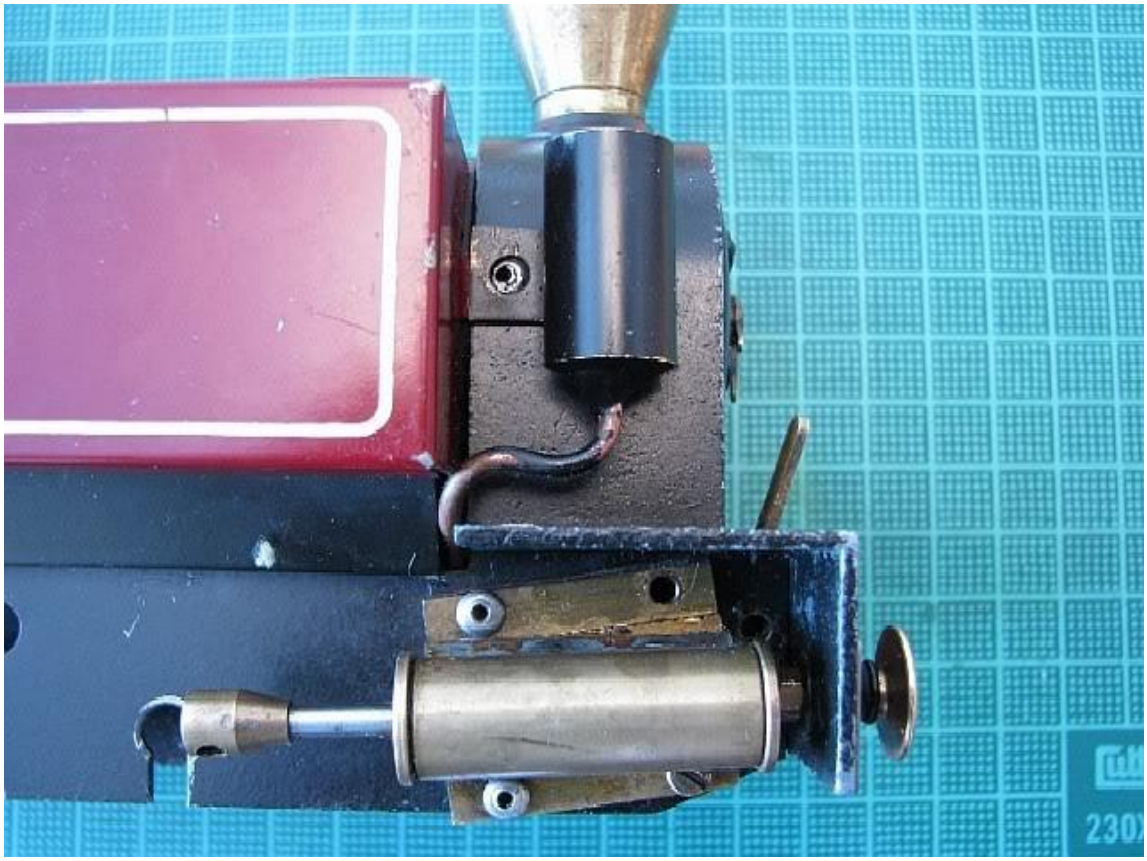


The steam pipe will need shortening by about 22mm (shortened pipe uppermost).

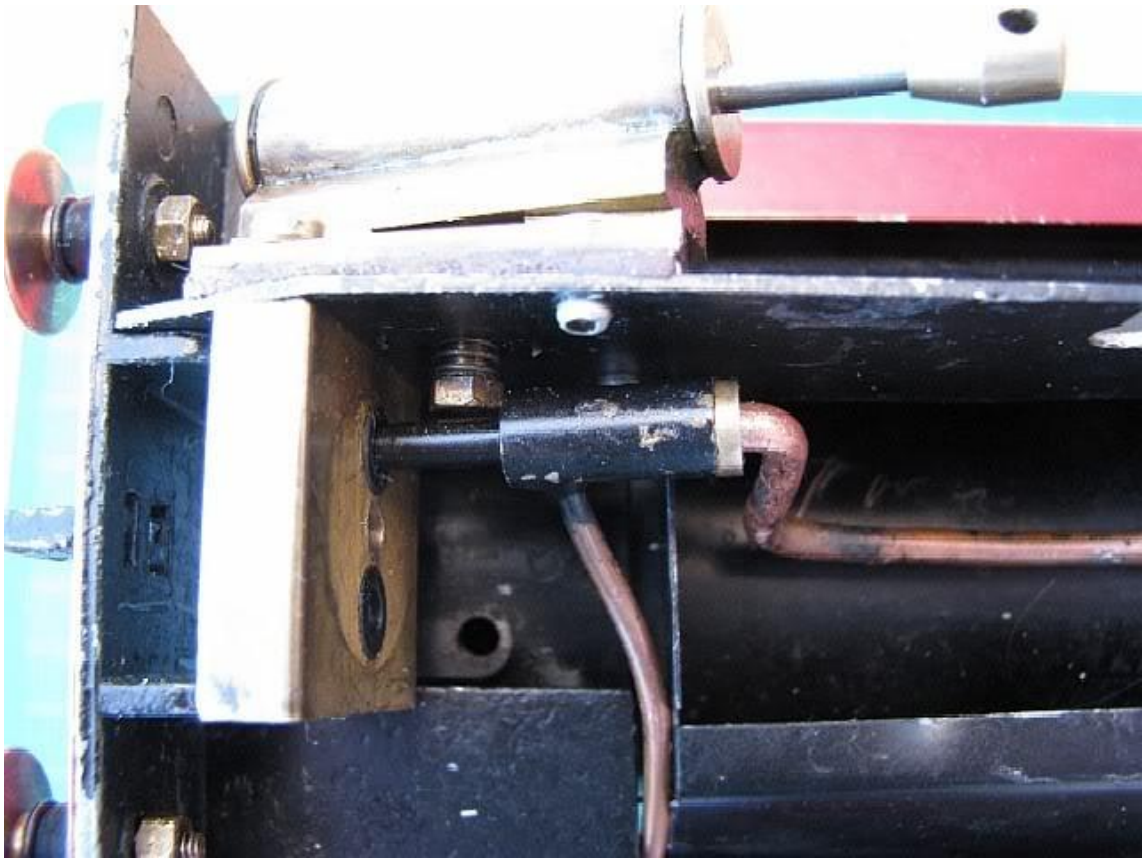


And here is how this shortened pipe & lubricator fit.

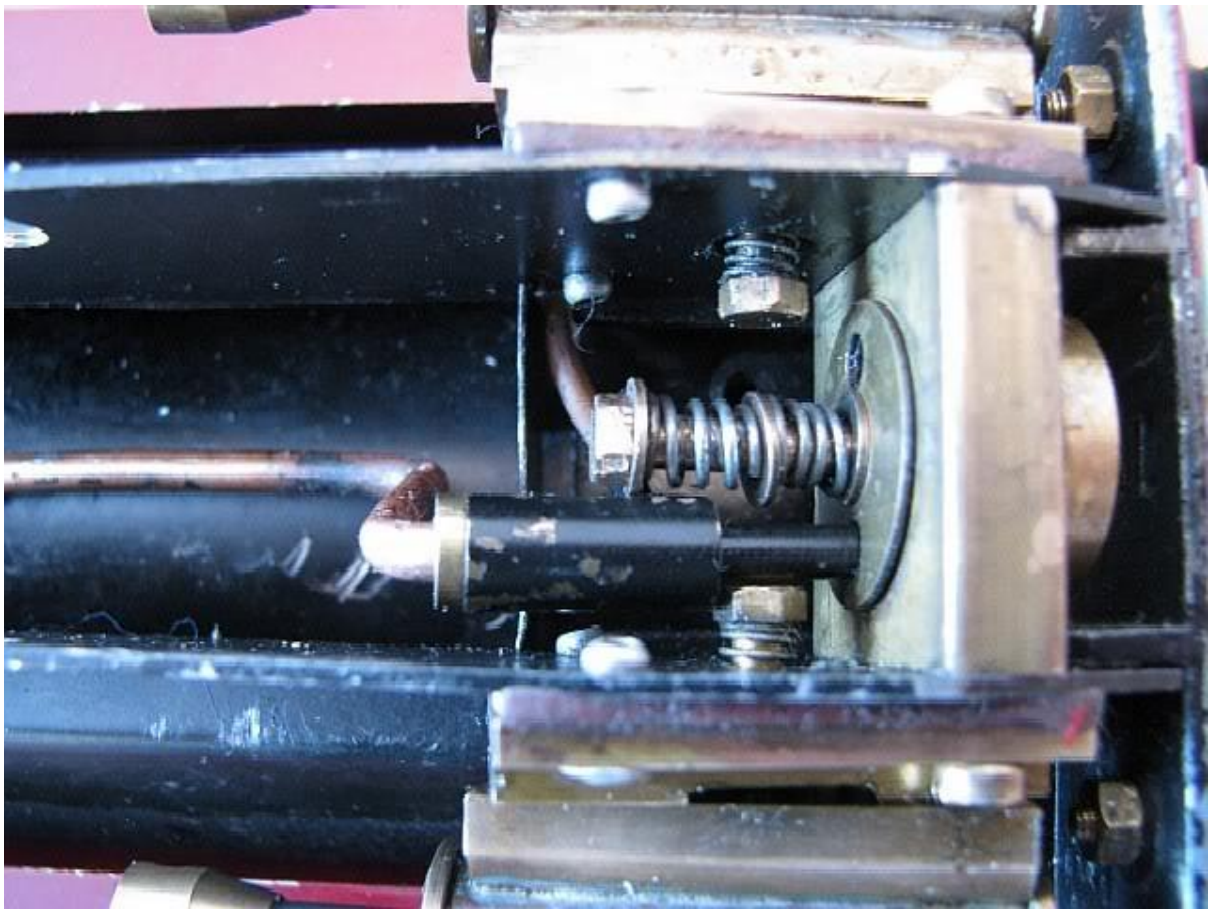




The T piece portion of the lubricator can foul the cylinder pivot screw and the regulator/reverser valve pivot screw as well.



In this photo my regulator pivot screw has been modified with the addition of a 2nd spring & washers.

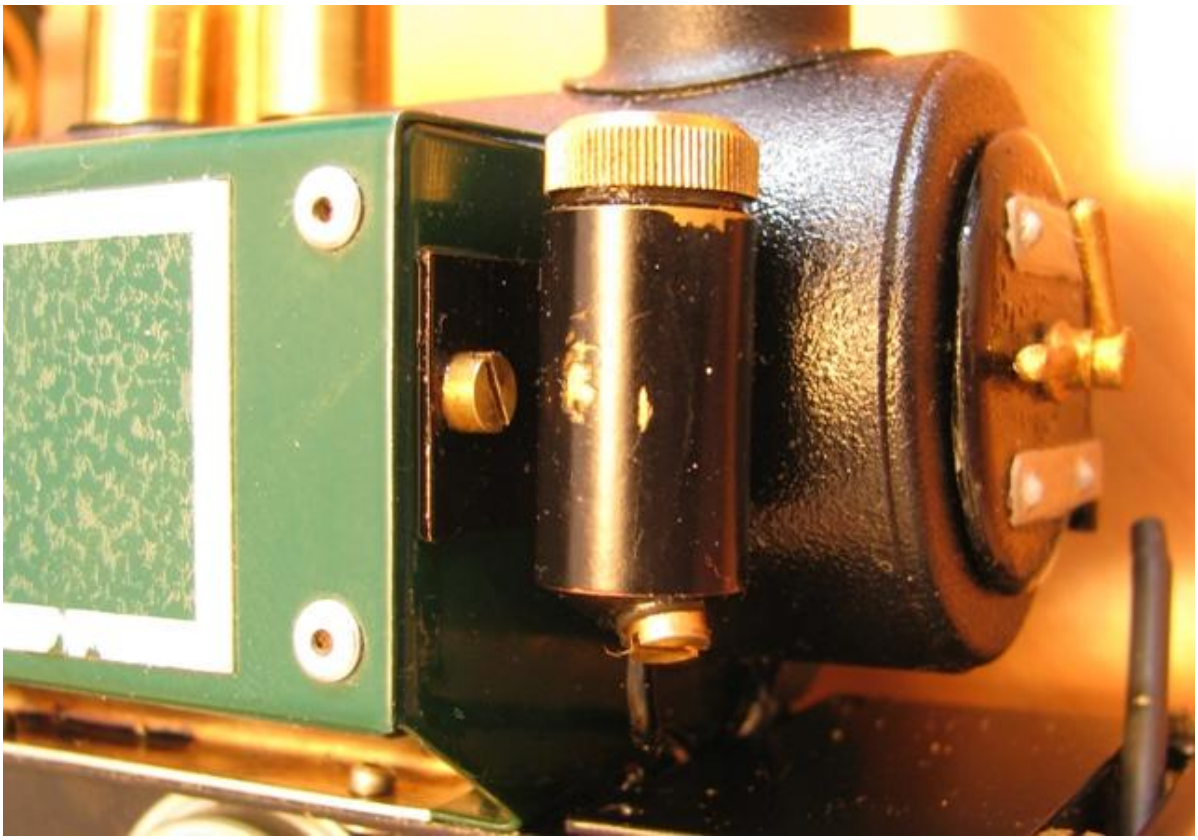


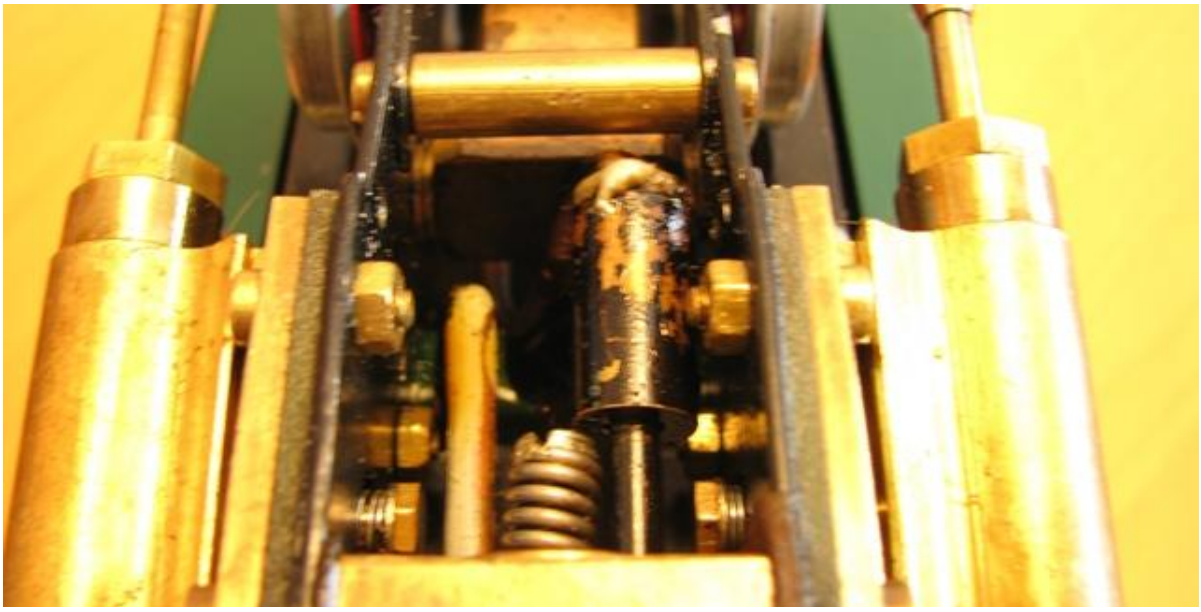
So some filing down of the T piece in these areas should ensure no interference with these pivot screws.

I would also recommend soldering up the steam pipe into the T piece to prevent another possible source of steam leaks.

What you are not told in the IP Engineering instructions is that you need to prime the steam pipe coming into the lubricator with steam oil. By doing this each time you refill the lubricator I have found they work OK, although in comparison with the Roundhouse style of inline displacement lubricator that other owners fit, they use a lower rate of oil.

I have also successfully fitted a Dream Steam Lubricator into the New Mamod Locomotive Mark 1.





Chris Cairns, Glasgow, 05 June 2012.