

Hornby Live Steam

A4 Mallard dismantled



HORNBY'S LIVE STEAM MALLARD IS DISMANTLED

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Introduction

Hornby live steam locomotives are unique in the world of 00 gauge railway modelling. If you remove the detailed body shells you reveal a superbly engineered steam power plant that drives the locomotive.

For those Hornby live steam enthusiasts who may not have the confidence to dismantle their locos, for whatever reason, to fault find or to simply find out how they work and how they are put together, here's a step by step method using pictures on how to do it.

In dismantling your locomotive you will find that they are beautifully constructed and, in some cases, over engineered. But you can consider this as being Hornby's commitment to producing a quality and 'engineered' product for which they should be commended.

Sadly, Hornby have ceased producing and trading their live steam range for the time being.



Eric Fenwick November 2011



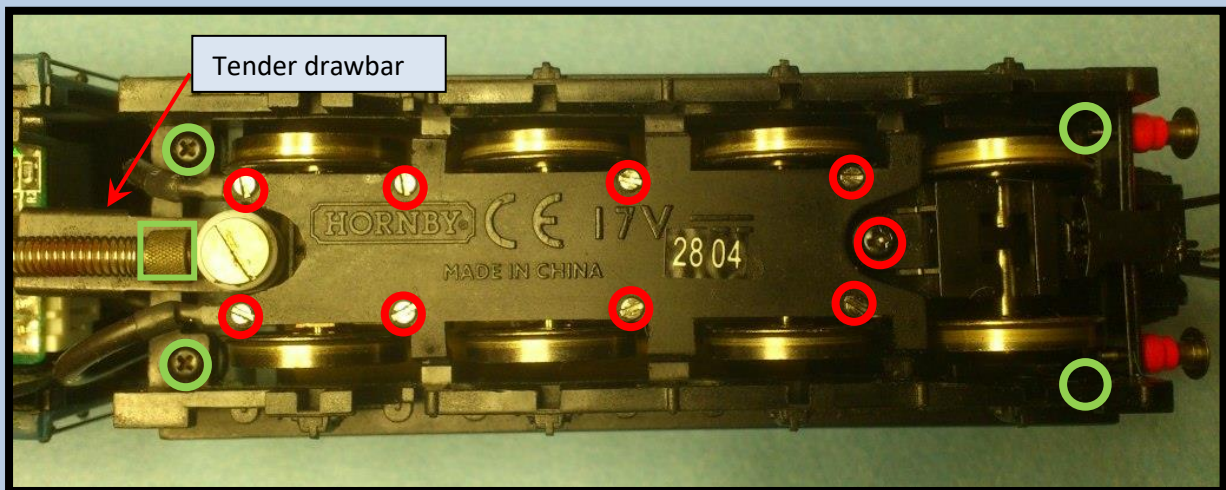
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Dismantling the tender

Removing the four screws circled in green will allow you to remove the tender body from the boiler and chassis assembly.

Unscrew the knurled nut and pull off the steam pipe from the banjo coupling on the boiler. Remove the screw from the tender drawbar. The tender is then separated from the loco.



Removing the eight screws circled in red gives access to the wheel and chassis assemblies after the black plastic wheel housing.



The wheel sets have two square bronze trunions on the axles; these locate in brass housings that are fixed to the boiler.

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The boiler with one wheel set in situ.



The heater can be extracted from the boiler tube after the wires and black plastic insulator have been disconnected. The wires are screwed to the power collectors.

On the top of the boiler is the water filling point and the secondary pressure relief valve.

All parts dismantled from the boiler.

This assembly acts as the chassis for the tender wheels, the forks on the thin copper strips contact with the wheels and act as power collectors.

When the black plastic insulator is unscrewed from the boiler the thermistor is revealed. This acts to cut the power supply to the heater when the boiler has no water.

Note the square sections in the brass side strips. This is where the bronze trunions of the tender wheels are located.

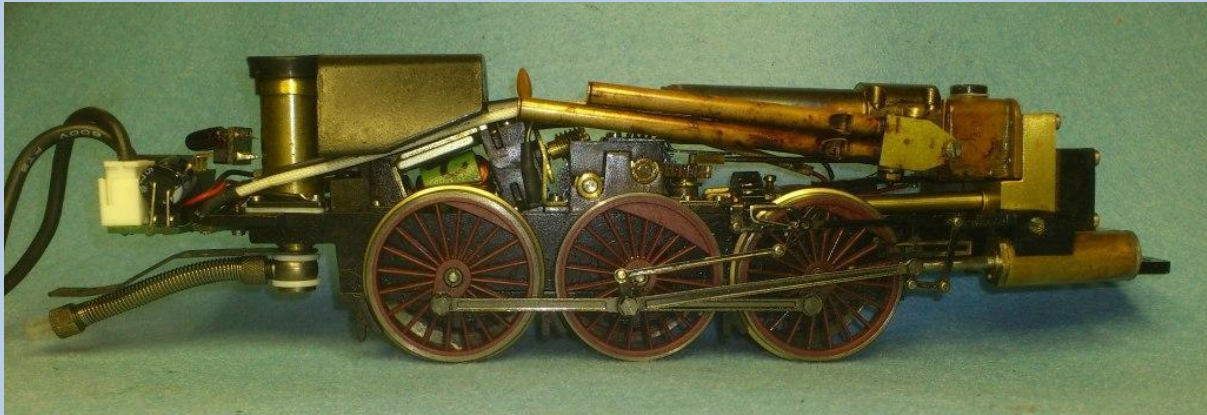


The tender re-assembled

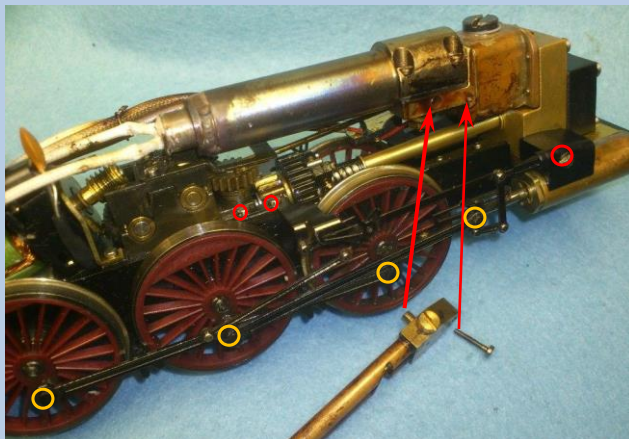
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Dismantling the running gear

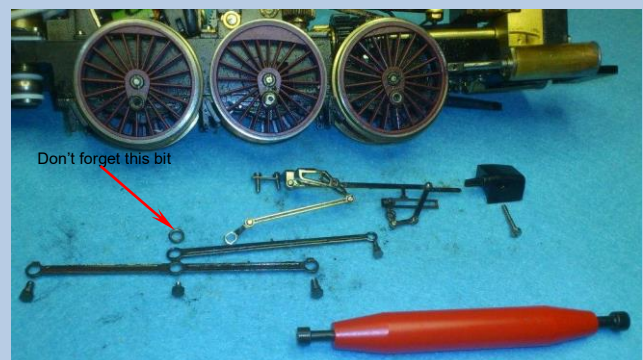


Taking off the whistle pipe makes it easier to access screws for the running gear.



Use the tool supplied by Hornby to remove the screws, circled in yellow, from the connecting rods.

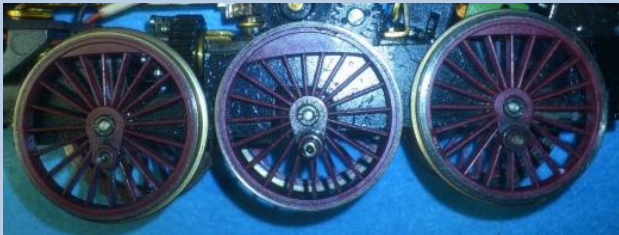
Removing the last three screws, circled in red, allows all the connecting rods to be removed.



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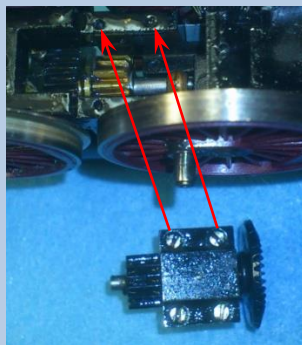
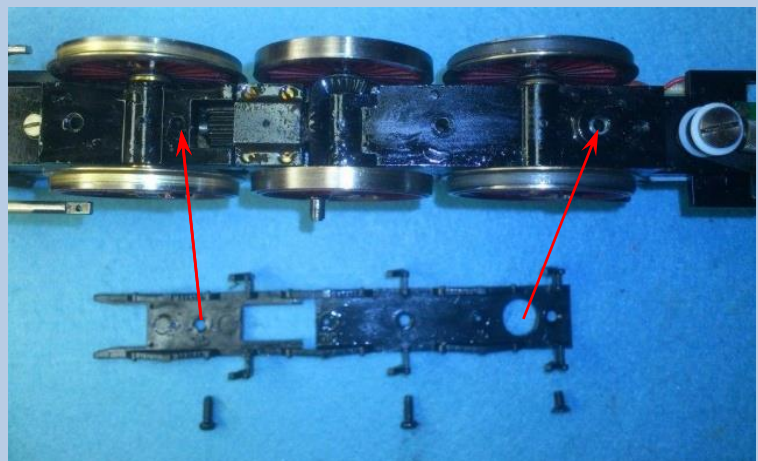
After the driving rods have been removed.



Notice the position of the cranks on the wheels. When the cranks are at bottom dead centre on one side they are 270° on the other side.

On the underside of the loco chassis, remove three screws to release the plastic moulding that details the wheel brakes and suspension.

This part is removed with ease and would make it easier to lubricate the wheel axles.

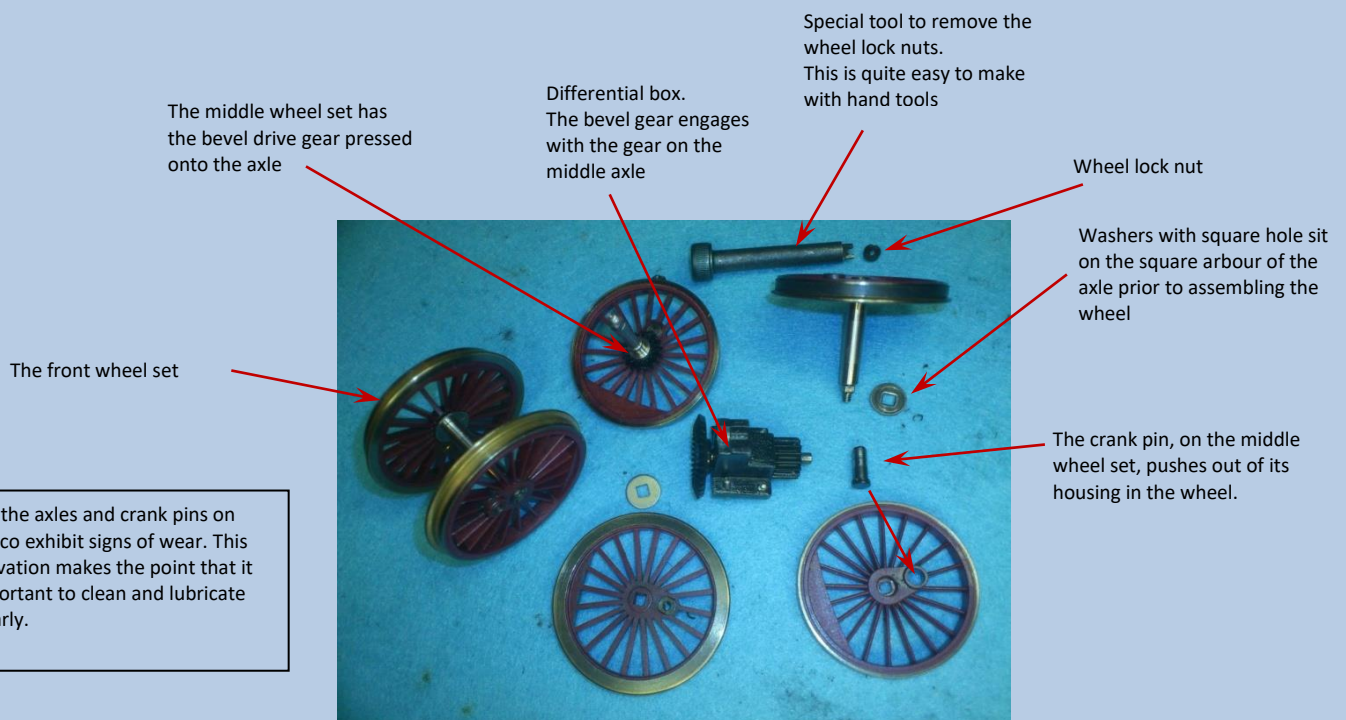


The timing shaft drive pinion and bevel gear housing is retained by four screws.

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The wheel sets are dismantled from the chassis:

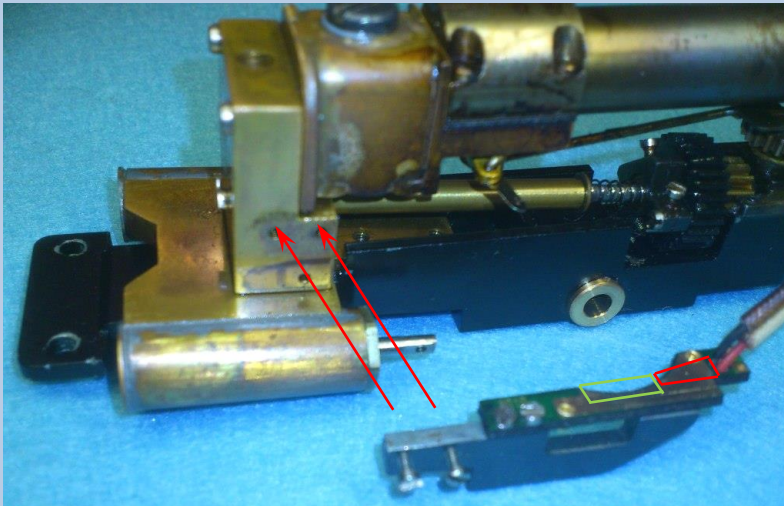


The chassis with the wheel sets removed. The axles are housed in bronze or brass bushes that are pressed into the chassis. There are two for each axle, they are flanged for the front and rear set.

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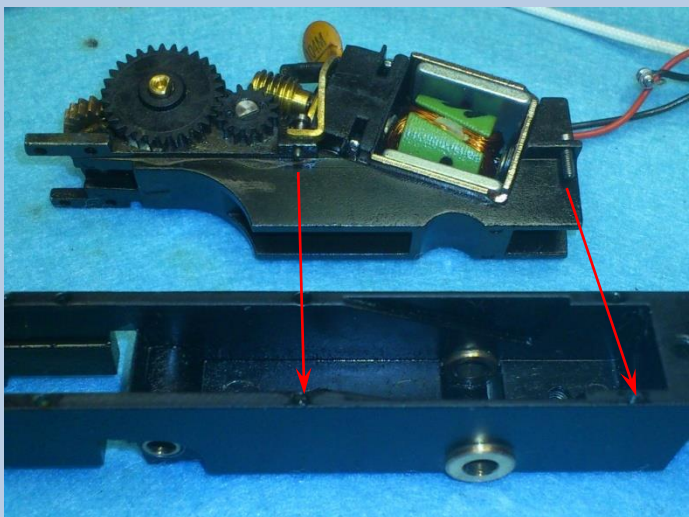


Dismantling the electrical control



The wiper and wiper arm for the indicator lights. The wiper is fixed to the steam chest with two screws.

The wiper arm is connected to the steam regulator mechanism. The position of the wiper arm on the wiper indicates the position of the regulator valve. If set correctly, red means the steam is shut off. Green, the valve is delivering steam to the pistons.



The motor and gearbox assembly have their own mounting that is secured to the loco chassis.

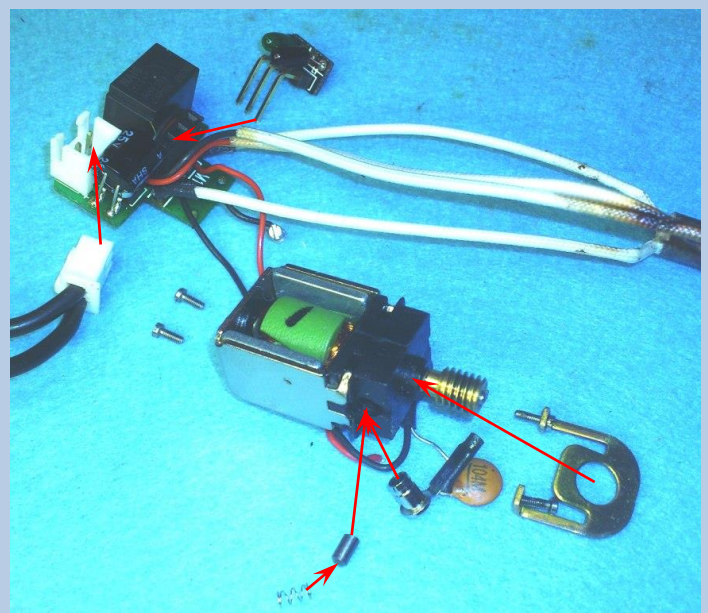
It is held to the chassis with eight screws.

The motor and PCB assemblies dismantled.

The lights are simply plugged into a socket with three prongs.

Two carbon brushes are compressed onto the motor shaft with springs.

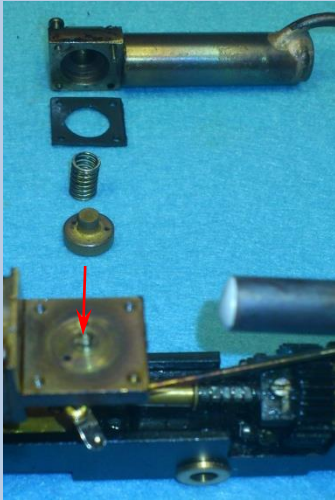
The motor output shaft has the primary drive worm gear for the steam regulator valve.



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Dismantling the steam plant



The super heated steam chamber assembly and the steam regulating valve is held with four screws onto the regulator adjuster housing.



The relief valve chamber. Showing how the tender drawbar, steam pipe and its banjo coupling are assembled onto the relief valve.



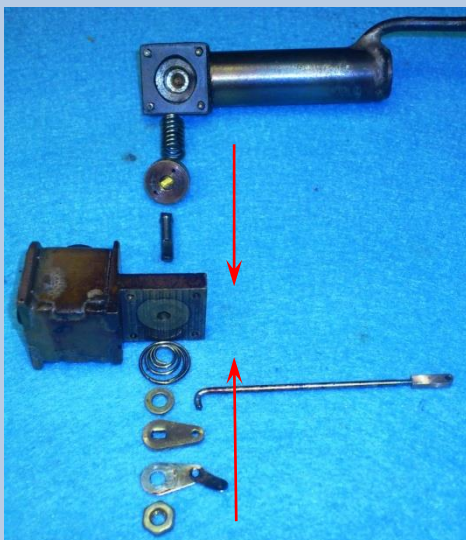
Above shows the relief valve chamber on the right with the super heater chamber on the left both connected with a pipe soldered to each.

Below shows the relief valve dismantled. **This is a safety device.** If you dismantle it you must ensure that all the components are re-assembled correctly.



Elastomer seat

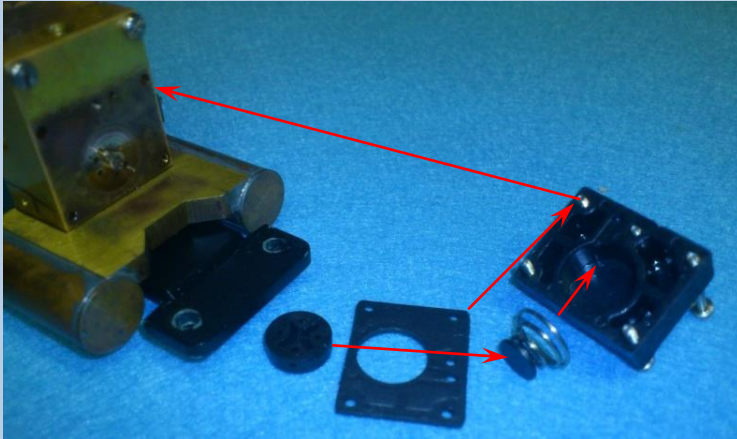
Ensure the plug is screwed fully home into the housing



The regulator assembly with the control arm oil chamber and super heater.

The right side of the control arm is connected to the final drive gear of the steam regulator drive gearbox.

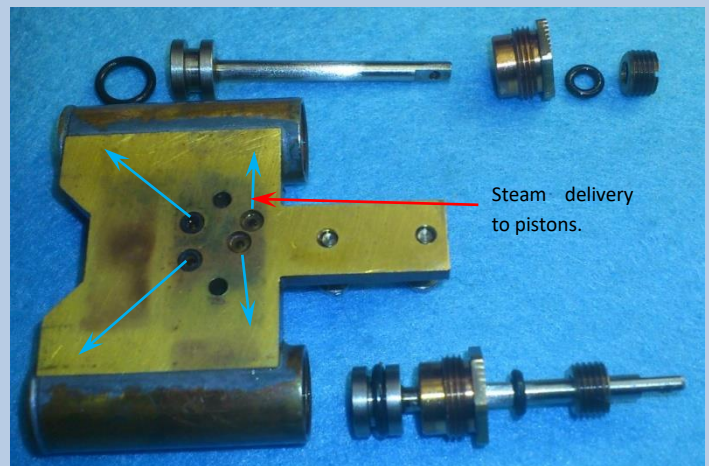
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The steam chest is retained by five screws and houses the rotary valve and a gasket. It is spring loaded to press the rotary valve against its brass housing.

The cylinder set is bolted to the chassis with two screws on the underside. The steam chest is bolted to the cylinder set, also with two screws, and the steam passages are sealed with four small O rings.

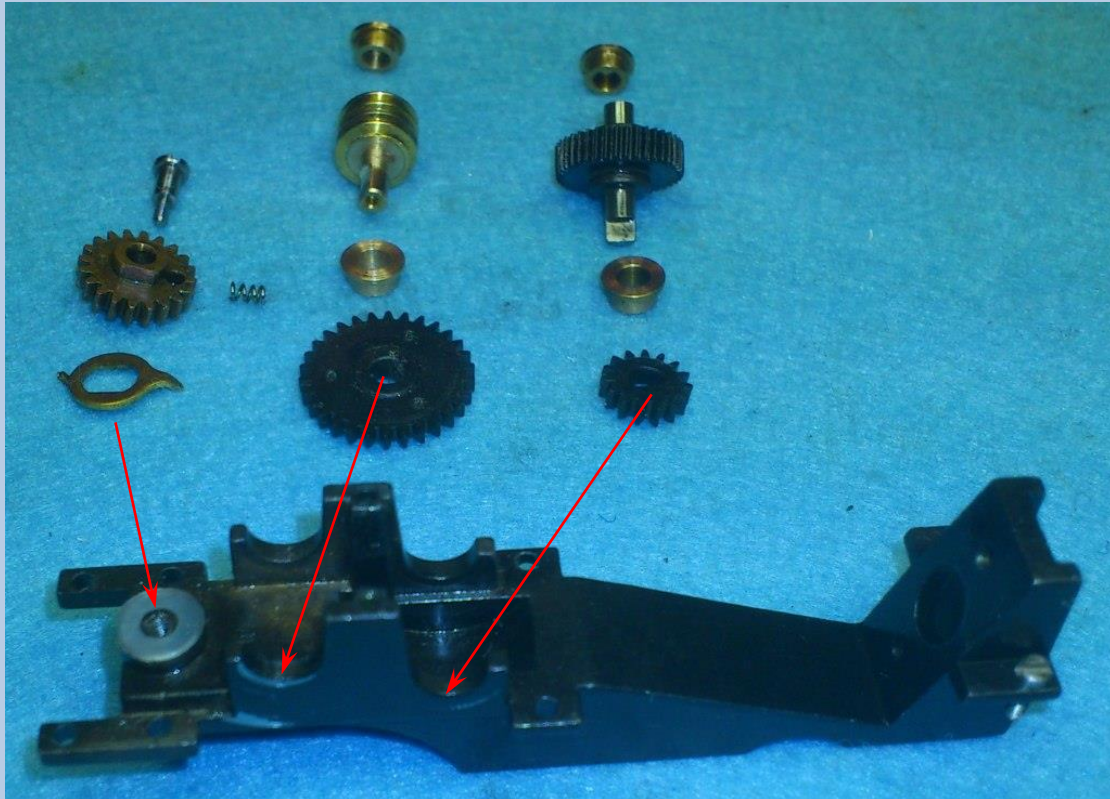
The piston assemblies are shown dismantled. Carefully unscrew the gland housing from the cylinders to extract the pistons. The piston and gland seals are O rings.



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Dismantling the steam regulator gearbox



The steam regulator valve gear train

From the motor output shaft it consists of two worm and wheel sets and one spur gear set. The reduction is about 80:1.

The spur gears are a push fit onto the gear shafts. The gear shafts are run in plain brass bushes. There are no backlash eliminators on the gear train.

On the final drive gear, on the left, the brass pressing under it has a tab that operates the reversing mechanism.

That completes dismantling the loco.

Let's see how many parts are left over after it has been re-assembled.

And let's see if it works.....