

## Tuning your locos.

The analysis of a locos running characteristics can be divided in to two fundamental areas. Mechanical induced faults or electrically induced.

Mechanically are mechanical binding ie from side rods on steam locos, wheel quartering, gear related or motor related or mechanical jamming etc. Electrical motor faults or obsolescence ie open frame with DCC or more likely pick up or lack of it. I would think that pick up issues are the most likely problem with any loco.

First part of the process is to accurately determine what is causing the problem. If the loco is a steam model running DC then try it on the track.

1. Is it moving.?
2. Is it wobbling?
3. Is it binding?
4. Is it noisy or is it just dead in the water?

If there is a major electrical problem, then the breaker has already popped and not too large a pawl of smoke hangs over the model.

First thing to do is put the loco upside down in a cradle and connect two wire from you dc supply or DCC and give it some throttle. Running like this if possible is often all that is needed. At this time do not oil. A large number of problems are caused by over oiling so don't add more just yet. If there is binding in the side rods look to see where it occurs and which wheels are affected. The valve gear may be bent and catching if you are lucky . Adjust and try running again in the cradle. If one axle seems to kick on every revolution there is a good chance one of the wheels is out of Quartering. Steam locos with side rods have the cranks set at 90% to the opposite side. If this is not consistent then binding and a kicking action will occur. If it is only a small amount opening up the hole in the side rods will help and often be enough. If it is a large amount then bit the bullet pull the whole thing apart and check all the axels.

Strip out the motor and remove the valve gear and replace one side rod. Using a small straight edge align the connected side so it is completely straight look a the other side and see if the crank pin holes line up. Again the ruler is handy. It should be obvious which axle is out of alignment with the others. Remove the offending axle and twist the wheels to correct. This may be possible but not always and sometimes you may break the insulated wheel tyre of so be careful. If still unsuccessful aligning the cranks then you will have to pull one wheel off the axle and re align it and push it back on. Not easy and only as a last resort. North West Shortline make a quartering devise that helps with the process though it is possible by scratching a mark on the axle end to realign the wheel by eye. A drill press is a good tool to help with this job and at \$90.00 from Aldi you have no excuses for not having one. Using an old broken drill bit is handy way to make and arbour to push out the axle.

Reassemble the mechanism without the motor and push along the track. If it binds at all you are not finished. When you can push the loco frame along the track and it continues

without binding then you can reassemble the motor to the frame. If it had an old open frame motor it is now time to obtain a good can motor. Replace the plastic tube that connects the motor to the gear box with universal joints (North West Short Line). Also the gear box tower will need restraining. It will want to rock back and forth with the motor torque. A simple strap tying it to the frame or blocking it between the frame with styrene or even hard foam between the frame. With a universal joint you do not want the gear tower to rock back and forth. Fix the new motor to the loco using Blue Tack. Wire and test on the cradle. If it now runs perfectly try it on the track. The chances are that it still runs like a dog. Most brass locos have pick up on one side of the loco and one side of the tender passing the current back through an insulated draw bar.

We need to make some proper pickups for the other wheels. Turn the loco upside down, there should be enough room on the chassis to mount a small piece of circuit board with spring wire picking up current from the insulated wheels. Copper clad sleeper strip is the easiest material to use for making the insulated pads. Throw bar material is thinner if required. Use fine wire for each pick up to the correct side of the motor or the DCC decoder. Similar pickups should be added to the tenders insulated wheels. Hard wire the tender to the loco rather than relying on the draw bar. This is a pain as you cannot separate the two and can't put it away in its box if you have to. Simple plug in connectors are rather bulky but you can make your own from circuit board and old DCC plugs and sockets.

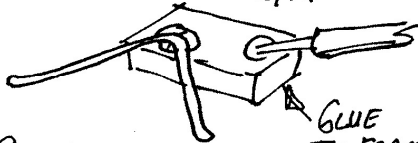
Another area with steam locos to cause problems are the lead and trailing trucks. With the lead or Pony Truck as it's called, the most likely cause is too short a length between the axle and the pivot. Causing it to jamb and hit the cylinders or sometimes lever the driving wheels off the track. Extend the pivot back to the first mounting screw of the keeper plate. Flat brass bar stock glued or screws to the pony truck to extend the length of the pivot.

With a 4 wheel leading truck most are just slotted with a spring to keep them on the track and often they will jamb on sharp curves. Again pivot the truck from the first retaining screw of the keeper plate with a bar that pivots in the centre of the lead truck. Do not use a spring from above. Add lead to the truck frame to assist with tracking of the truck. Changing the wheels to plastic in all lead trucks can save a lot of irritating problems. Often a minor wiping touch to the cylinders will not derail the wheels but it stops the loco dead because it causes a short. Plastic wheels fix this.

Trailing trucks most of the problems with these are caused by the pivot point having no lateral motion and just being a round hole. The effect of this is to extend the rigid wheel base of the loco and force the drivers off the track on curves. Filing the pivot hole in the trailing truck into an oval shape to allow some lateral motion is all that is usually required. In an extreme case it may be necessary to add a pivoting link back to the rear keeper plate fixing screw to allow lateral motion or fabricate a new pivot out of thin sheet brass with a lateral slot for the pivot hole. If all this still has the loco running like a dog pick a nice spot for it to be displayed in your rolling stock display cabinet or a spare roundhouse track!

# LOCO TUNING

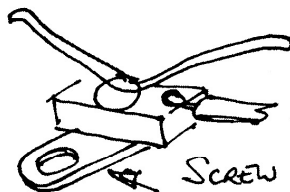
PCB SLEEPER STRIP



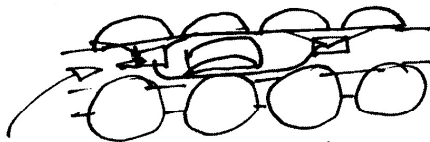
SPRING BRONZE OR N.S. WIRE

H0 10-15 THOU.  
'O' 20-30 THOU

GLUE TO FRAME

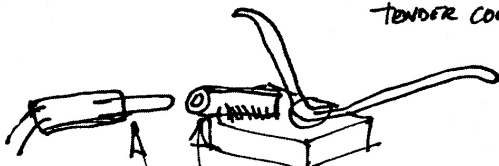


SCREW MOUNTING TAB 5-10 THOU BRASS SOLDERED TO BACK OF PCB



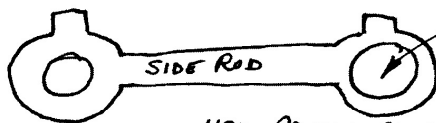
TENDER CONNECTION SEE BELOW

LINK PICK UPS TOGETHER WITH FINE INSULATED WIRE



SOCKET FROM MRA Loco CIRCUIT BOARD

PLUG FROM MRA & PIN PLUG JOIN COVERED WITH SHRINK TUBING

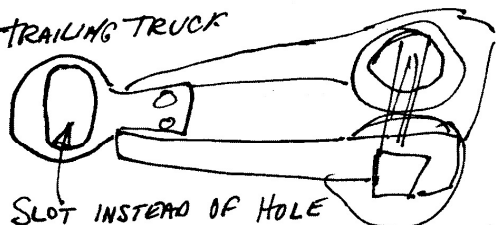


SIDE ROD

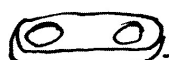
ENLARGE HOLE WITH NEEDLE FILE

USE GREAT CAUTION.

TRAILING TRUCK

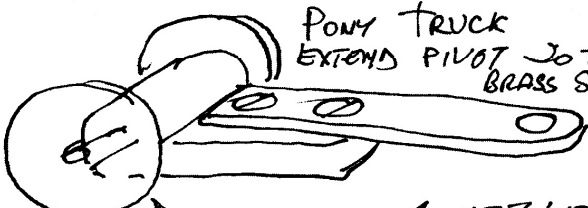


SLOT INSTEAD OF HOLE OR



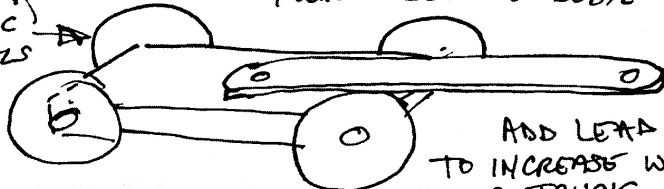
SHORT LINK TO REAR KEEPER PLATE SCREW

PONY TRUCK EXTENDS PIVOT 30 THOU BRASS STRIP



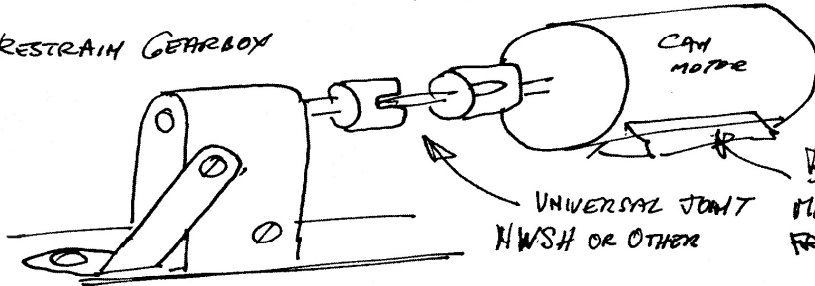
4 WHEEL LEADING BOGIE

PLASTIC WHEELS



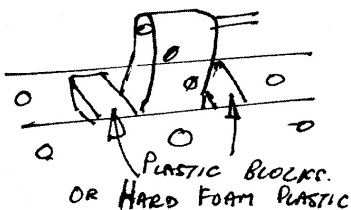
ADD LEAD TO INCREASE WEIGHT OF TRUCK.

RESTRAIN GEARBOX

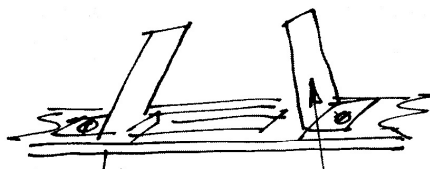


BLUE TACK MOTOR TO FRAME

UNIVERSAL JOINT NWSH OR OTHER



PLASTIC BLOCKS OR HARD FOAM PLASTIC



KEEPER PLATE

BRASS STRIP GEAR BOX RETAINERS