

Accucraft Cab Forward (AC-12) Upgrade: Cross head and guide

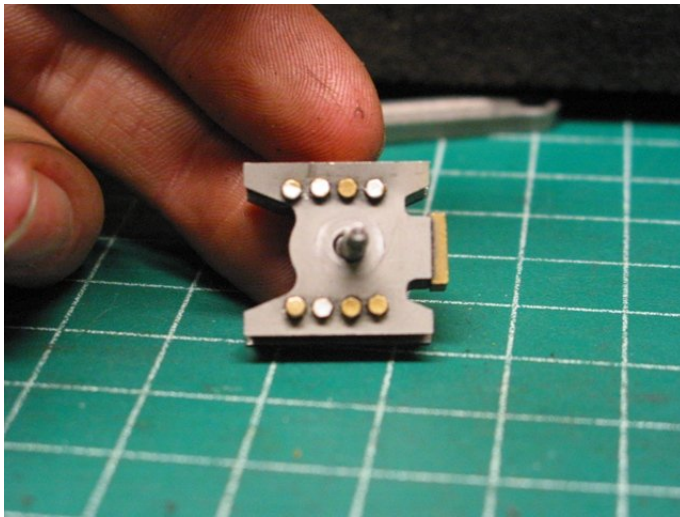
Thanks to the work of Gordon Watson, Ryan Bednarik and Jeff Redeker; this DIY sheet can help owners of the Accucraft AC-12 upgrade their fine steam locomotives in areas that can improve performance and/or prevent premature failures.

There are several mechanical and structural areas on the Accucraft Cab Forward that could be improved. These improvements would be necessary for the betterment of running characteristics, overall functioning and preventative of premature wear and tear. Based on this premise we offer a series of key areas that will enhance your AC-12 for the long term: cross head and guide, rear engine flex joint, combination levers and suspension.

The main reason for upgrading the cross head is to correct the excess play in the crosshead-main rod connection and the lateral play that ensues.

Part Three- Cross head rebuild

The upgrade of the cross head guide will take care of any excess movement that can be confirmed by excessive play and movement when tracking on the guides. The witness marks on the guides indicate uneven wear due to the looseness of parts both connecting the crosshead and the crosshead design itself.



1. Crosshead: The OEM crosshead shows a gap that allows for movement of the pin as evident by the pin shifted to the right. This causes piston and valve events to become off by as much as 10%.



2. Crosshead: Shows the excessive wear caused by the pin not being properly sized in either length, diameter or width.



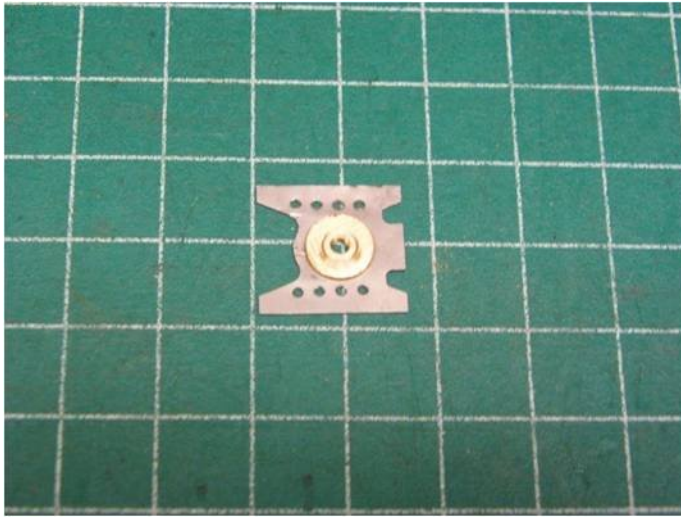
3. Crosshead: The stress of the excessive tolerances and movement stress the back plate as denoted in the two prior photo showing the back caving inwards.



4. Crosshead: The combination of the cross head design and the improper cross head guide alignment problems shows as uneven witness marks (smooth and bright portions) on the guides



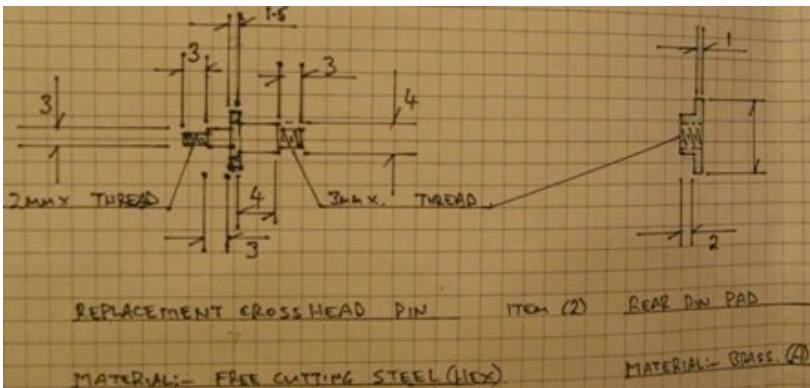
New cross head pin above the OEM pin



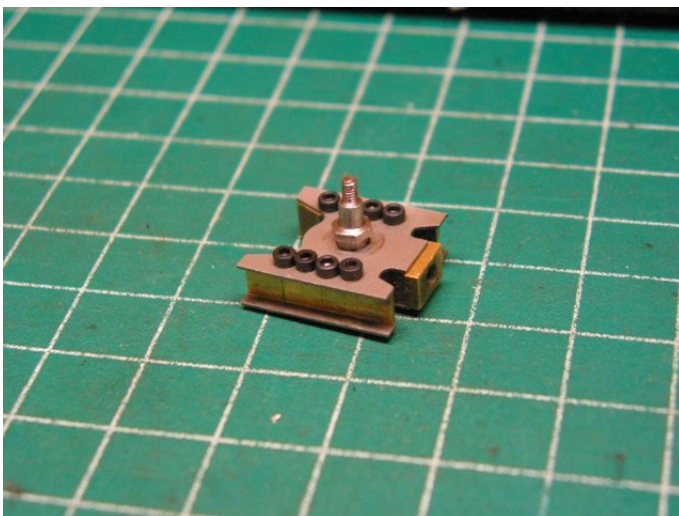
Rear pin backing plate and pad, where the new pin screws into the crosshead.



5. The main components of the redesign are: pin, and the rear pin pad



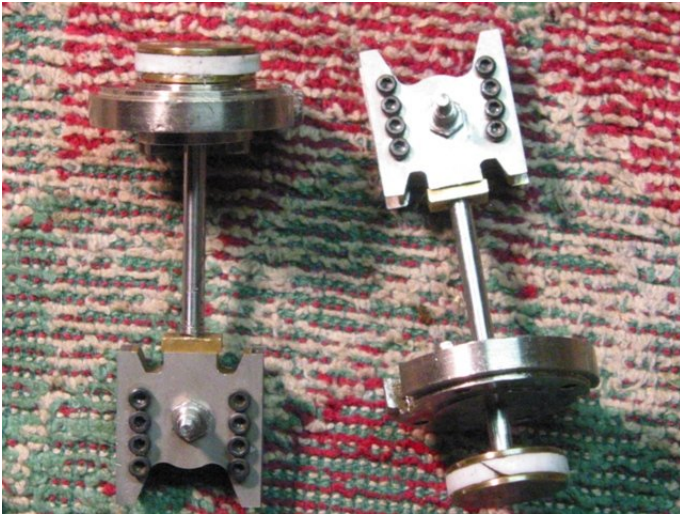
6. The drawings are from Gordon Watson who designed the upgrades for the crosshead components



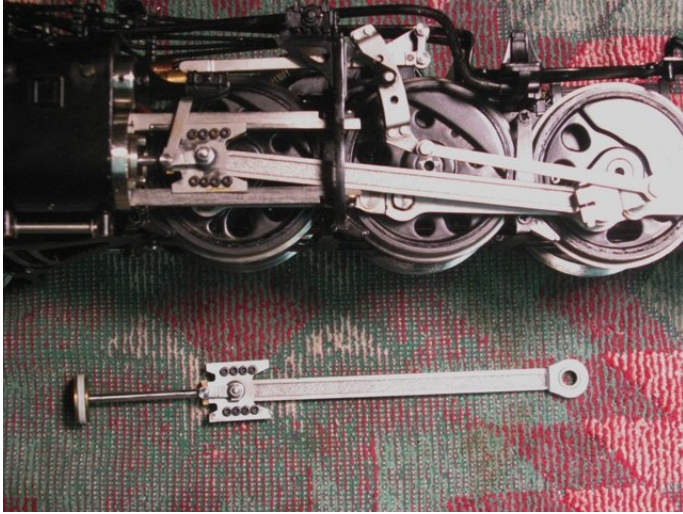
7. The components of the upgraded crosshead were buttoned up with stainless steel fasteners (1.7mm and 2mm sizing according to OEM specifications)



8. The final product with the main rod now attached to the crosshead. Tolerances are within +/- 0.1mm



9. The connection with the crosshead and piston rods. On the piston is a new Teflon PTFE compression ring. The rings resulted in much less resistance in the movement to the point that one could easily roll with one finger versus the OEM rings. Since that single ring design we have now developed and utilize dual rings.



10. The final setup reinstalled on the AC-12