

Mechanical Department Report

September 6, 2017

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So far things are looking good for the overall mechanical well being of the fleet at least from my standpoint. While there is quite a lot that I would have liked to have completed by this time there were quite a few things that cropped up or took longer to complete than we would have liked. Regardless of those issues, some of which will be mentioned, I think we managed to get more things inspected this season and in doing so finally made some positive diagnosis of persisting issues in a few pieces of equipment that will now allow us to move forward with the proper corrective measures. Our progress wasn't limited to the rail equipment either. I think most importantly of all the department has set up a plan for some of the needed repairs for several of the pieces of equipment particularly WP2001 and WP707. We've also gotten to the point where we are hampered by the lack of certain tooling but have started to rectify that; more of which will be discussed later in the report.

If there are any particular issues or details that people have questions about we can probably answer with the Annual Inspection forms that I'll probably cart into the meeting with me. The first half of the report will be dealing with the two "hanger queens" that sat in the shop most of the season seeing as questions and rumors persist around their status and well being.

WP2001

While we've long known that there was lube oil issues plaguing 2001 with fuel oil dilution being the most likely cause not much had been done for the better part of a decade; longer depending on whom you ask. The last few of seasons the dilution of the lubricating oil was quite obvious and the odor of diesel left little to the imagination and the main issue became that of the source of contamination. This season the oil was so diluted that the mechanical department decided not to release it for service until all the contaminated oil had been wholly replaced with good oil, and that new oil would not be put in until the source of contamination had been found and rectified. The three main areas to check for fuel contamination like we had would be leaks at the fuel manifolds, injectors, or the jumpers that connect them; though a damaged injector tip could be the cause none were found in that state. We quickly found that the leaks were indeed at the injectors, though thoughts on where on the injectors varied from person to person and time to time. It took a couple months before we found that the issue is the seal between the injector nut and the body. Parts were bought and the plan was to try and get the injectors resealed by RR Days but the arrival time of the parts along with the overall logistical challenges put that idea to bed and the 2001 was placed on display in the shop. After some more discussion it would at this time be more beneficial and time effective to purchase new injectors; more on that later. There is still issue of replacing the oil though there is a plan for that and lube oil will be discussed later as well.

Getting WP2001 operational requires

- Injectors: New, UTEX or resealed in-house. The injectors will also need to be timed and set and the needed tooling will need to be purchased.
- Lube oil: A sixteen cylinder 567 takes about 200gal and we currently have roughly four 55gal drums. Two barrels were bought specifically for the WP501 by a member working on that project, though we might be able to buy two more barrels later when the 501 is ready and get the 2001 up sooner or just buy the barrels for 2001. That is also dependant on budget.

WP707

The annual inspection for 707 started a little later than I think we would have liked though it went fairly quickly with little issue. The control stands have some issues because of the long time accumulation of water in the air system. It would be advantageous to replace the control stands and control valves, though that statement can easily be applied to any of our locomotives. The mystery issue with the locomotive not building up enough air was never truly solved though I suspect it is related to the issues we had with the control stands. Just before RR Days the right side stand had to be cleaned again and at that time the air pressure wouldn't go beyond about 90psi, and once the stand was cleaned, re-lubed and reassembled the issue went away again.

There was also an issue with fuel leaks at the injectors found on 707. Luckily there were fewer leaking injectors (by one) and most of them were very slight leaks. It was decided that 707 could be placed into limited use for RR Days with little risk of causing major fuel contamination of the lube oil. That said there is minor fuel contamination of the oil and the loss of viscosity is noticeable. With the injectors in their current state 707 was pulled from operation at the end of RR Days and will remain in that status until the injectors are dealt with. A sample needs to be taken for analysis to determine the level of contamination. It would not be surprising if we need to do an oil change on 707 like with 2001. Because the 707 isn't as contaminated the oil would be perfect for flushing the lubrication systems of our other units or for use in initial testing of the units we want to get running that currently have no oil.

The other stuff

Now come the other issues. There are some decisions to be made yet for a few courses of action in which budget and spending play a rather large role. For now these are pretty much limited to fuel injectors, lube oil and a few specific tools needed not just for the reasons outlined above but for general maintenance as well.

Fuel Injectors

Between the 2001 and 707 we are looking at needing to deal with 32 injectors. It would be easiest to replace them though that will require some coin which is why we've been calling around for price quotes and comparing our options. While we could reseal the injectors with the parts recently purchased that currently has the issue of time and capability; we need a specialized clamp to properly hold the injectors for disassembly and wouldn't solve any other issues that may be present with the old injectors. This issue goes beyond the two mentioned units and likely effects our other EMD units; I've noticed thinning of the oil in WP917 which will likely come back with fuel dilution in the oil sample analysis. Below are the prices of remanufactured injectors reflecting UTEX (unit exchange) pricing with core return already credited.

	Hatch & Kirk	Power Rail
5229510...For 567D2	\$165.89 ea	\$135.95 ea
5229295...567-567BC	\$165.89 ea	\$135.95 ea

That puts total cost to replace all injectors of a 16 cylinder engine at \$2654.24 or \$2175.20 depending on which company we order from. I doubt there will be any difference in quality between the two suppliers.

Lubricating Oil

I don't have the latest figure from Habeck on the price of a 55gal drum but I believe it was just under \$900. I'm collecting the last few oil samples from our locomotives and will send the them off as soon as I can. Hopefully we'll get the analysis result back before the next board meeting as they will sort of dictate how we proceed with our consumption and use of oil for the next season or so. With all the issues that seem to be cropping up or are just being noticed with injectors we may have quite a bit of fuel contamination to deal with.

As it stands right now I think the only real need for oil would be two more barrels. That would allow us to complete both the 2001 and 501 projects while leaving us just enough oil to finish off this year and get into the spring but likely leave us without any by the time the 2018 operating season rolls around.

Tooling

The impending injector replacements following which ever means we choose to go with will require the injectors be timed and the control linkage to the injector racks be checked/adjusted. Those are basic procedures for anytime an injector is pulled and another put in its place. In addition to all that I'm sure the timing and rack settings haven't been verified on most of our equipment for quite some time. Luckily tool cost tends to be a onetime thing assuming the tools are properly used, cared for and not damaged or stolen. I've gotten price and availability quotes for both the injector timing tool and the rack setting/adjusting gauge from Power Rail. CMO Jackson got the quotes for them from H&K.

	Power Rail	Hatch & Kirk
8339610...Rack adjusting gauge	\$158.25 ea.....In stock	
8034638...Injector timing gauge	\$ 044.50 ea.....In stock	

I know I've been talking about fabricating some of the tools we need for some time now but I think I'm finally at a point where I can deliver. Hopefully in the next couple of months we'll have a couple of pulling/lifting tools for EMD cylinder liners and heads, some EMD 567 impeller pullers and water pump disassembly tools, as well as some frames and brackets for lifting and working with EMD radiators in addition to some various miscellaneous hand tools.

That pretty well concludes my diatribe.