

1). REMOVING THE RIGHT SIDE COMPENSATING BEAM – 01 MARCH 2014:



P01 - Most SAR steamers use a compensating beam in their rear suspension, like the red beam seen here. When the bissell axle (Right) is displaced upwards, the weight-bearing pivot (visible just behind the blowdown scuttle) only moves roughly 2/5 to 1/2 the distance upwards in relation to the axles at the other end. Thus, the spring-loaded vertical displacement of the bissell axle that supports the firebox end is reduced relative to the locomotive's frames.



P02 - The other end of that big beam is connected to the rear driver axle suspension through a shackle. This flexes the leaf spring in the opposite way to the Bissell axle – like the opposite end of a see-saw. So, if the back end of the locomotive moves upwards over a bump, the rear driver wheel on the affected side is forced downwards. This keeps the weight evenly distributed on all of the wheels, assisting adhesion and reducing the stress on the frames.



P03 - The center pivot bearing had worn, which meant the beam was standing 'knock-kneed' and leaning inwards at the top. This was bending the stirrup rod between the beam and axle spring. This rod was borrowed from 12A 'Rosie' and it was bent within two trips. (The original had been X-rayed, welded and straightened in the meantime.)



P04 - The first step in the job is to jack up the Bissell end of the beam to overcome the spring pressure on the cap to be able to uncouple the stirrup rod. The other end is then free to pivot upwards for the shackle's cotter pin to be removed from above the springs. This is the easy part of the job!



P05 - Getting the beam out was mainly a support-and-drift job. But the distorted bearing wasn't cooperating – and the hydraulic jack was leaking as well! The drift was initially fed through the ash chute door framing.



P06 - The peril of being one of the small guys - you get sent into the small spaces. Alan is fighting to remove the safety strap that is holding up the rear end of the beam.

2). REBUILDING THE COMPENSATING BEAM – 15 MARCH 2014:



P07 - It took some ingenuity to get this awkwardly-shaped work piece clamped to the drill table! All three of the holes were cleaned out. The spring shackle end received two new bronze bearings – but with a deliberately loose fit.



P08 - The looped safety strap (R) could not be removed without bending it or cutting it away. So it got to hang around and 'come along for the ride!' In the foreground, you can see both new and old pivot bearings on the pin.



P09 - Using the big Asquith-built radial drill, James cleaned and enlarged the oiling hole, which was full of gunk. It had previously been roughly drilled out oversized, so a standard grease nipple would not fit without a lot of extra work.



P10 - The dirty and battered surfaces were causing the drill bit to chatter and snag. James had some extra grinding and chamfering to do before the drill would run true while entering the oil passage.



P11 - Framed by his big green rig, a happy James was starting to puff a bit from reaching over his head to operate the tall machine. He started out with an auto-feed setting but then switched to manual for fear of breaking the drills.



P12 - The finished beam as refitted on 21 March 2014. Although the link to the stirrup rod is actually a closed oval eye, it is still often called a 'camel's paw' by the old boys. It is filled with oil-soaked steel wool to retain oil for the indexed washer beneath. (A system we want to update!)