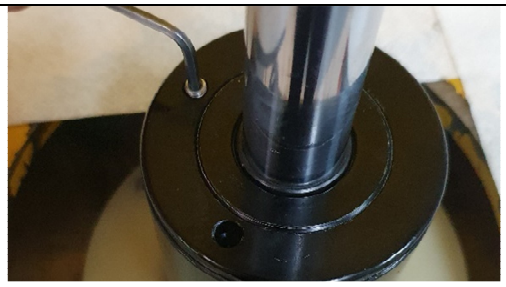
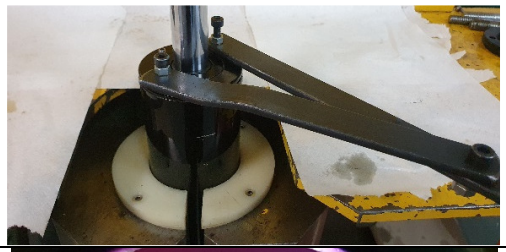
Monotube Shock Rebuild Guide

WARNING: Dobinsons shock absorbers are gas charged at extremely high pressure and are extremely dangerous. This guide is a basic guide for rebuilding MRR, MRA and IMS Monotube shocks. Recommended to only be rebuilt by experienced shock absorber rebuilders. It is the rebuilders responsibility to ensure all relevant safety equipment including safety glasses are used and safe work practices are followed. *Never hold the shock absorber shaft/rod directly in a vice or sharp edge or surface – use only the correct brass or soft aluminum soft jaws with half circle recess's to hold the shaft. To make these simply clamp 2 pieces of brass or aluminium 50 x 25mm or 2 x 1" together with the wider surfaces touching, and drill through the centre of both sections a hole (21mm for 22mm shaft and 17mm for 18mm shafts).*

Monotube Shock absorbers

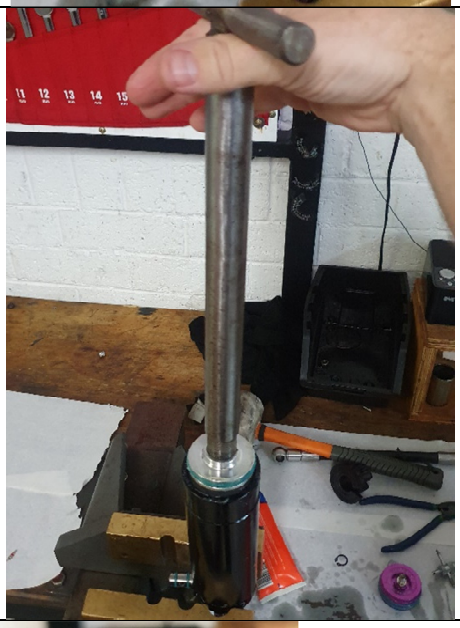
1. Set both compression adjusters fully out (anticlockwise)	
2. Remove dust cap grub screw with2.5mm allen ken and un-screw dust cap with pin spanner.	 
3. DEGASS SHOCK (Shrader Valve or Needle Valve) **IMPORTANT NOTE** If the floating piston D-Ring has failed, the oil chamber may become pressurized making it extremely difficult to open- this is evident by the seal cap popping back up as you try to push it down. In this case you will need to cover one of the hose fittings with a rag and very carefully crack the hose fitting to relieve the pressure. For IMS shocks an assembly machine will be required as well as a cover for the seal assembly end to catch the pressurized oil.	

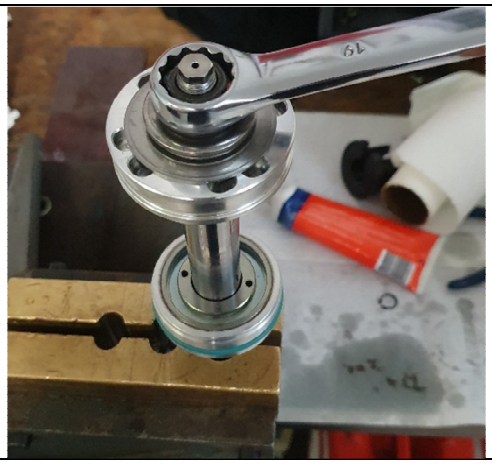
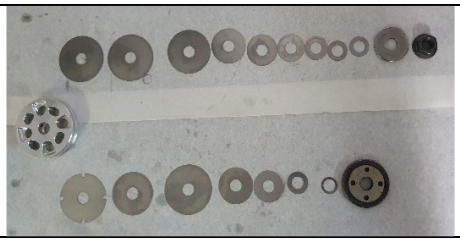
4. Push down seal head assembly. This is often very tight and may require a cut tube spacer between the rod end and seal head assembly while you use a rubber mallet to hammer down the rod end to push down the seal head assembly.
5. Alternatively use the assembly press and relevant tooling to attach to the rod end, install the cut tube spacer between the rod end and seal assembly and press down.

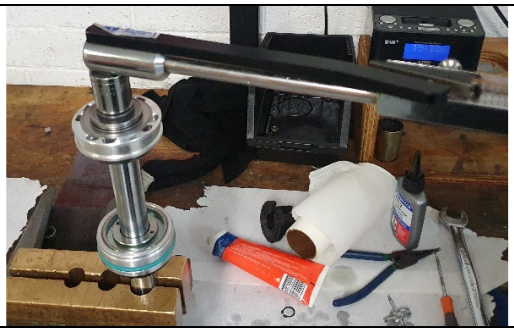
6. Remove circlip with a seal pick. <u>Apply some lubricant into the circlip groove</u>

7. Pull up the rod and seal head assembly together, wriggling as you go and remove from shock. This can also be quite difficult and may require you to pull it up, push it back down, regrease the circlip groove and try again or hold the rod end and shaft in softjaws vice while you tap the body down with a rubber mallet. Alternatively use the assembly machine to very slowly pull up the shaft assembly, wriggling it as you slide it up.	
8. When the main piston is almost out of the shock, remove the top attachment from the machine if using machine, and then slowly pull the piston up by hand, with your fingers around the wear band so it doesn't fall into the shock	
9. Tilt the piston on an angle about 30 or 40 degrees and rotate it around to drain the compression and rebound ports oil back into the shock	
10. If only re-shimming the shock or change the shaft seals or shaft then skip to step 30. Otherwise for other parts and oil replacement see the sections below	
11. Drain oil into suitable waste container, or clean container if re-using.	

12. **IMS ONLY FLOATING PISTON REMOVAL ONLY –** Place a clean rag loosely around the open end of the shock body and cable tie to the shock body – slowly and carefully pressurize the gas chamber until the floating piston pops out into the rag. Change the D-ring on the floating piston as required, ensuring the D Rings are not damaged and are orientated correctly with the round face to the outside. Apply lots of grease to the D rings and body circlip groove. Install the floating piston (large recess hole to the top/shaft side) and push it down the body around half way. Remove the gas valve. **Move to step 30.**	
Remote reservoir Part Replacement Steps 13 – 29. (hose, hose o-rings, floating piston or seals, oil, reservoir seals or end caps). If only re-shimming or changing shaft seals skip to **Step 30**	
13. Sit the reservoir on top of the vice so that the vice supports the hose end of the reservoir. For compression adjustable shocks support the shock by the <u>reservoir end housing</u> on the hose end – **do not put pressure on the low or high speed adjustment knobs**	
14. Remove the shrader valve inner valve core to allow free movement of the end cap and floating piston.	
15. Put a rubber or poly bush or similar on top of the shrader cap housing and tap down with a rubber mallet	
16. Remove circlip and apply lubricant to circlip groove	

17. Very carefully using a shrader valve puller tool remove the end cap. Alternatively use a compressed air gun to gently pressurize and pop the end cap up. TAKE EXTREME CARE. It can be a little difficult to get the D-Rings past the circlip groove – you may have to push the cap down and re-grease a few times, then use the compressed air to slowly bring up the cap whilst you use your hand to keep it square as it slides up.	
18. Regrease the circlip groove and remove the floating piston with a puller tool (22 x 1.5mm thread). Change seals or wear bands if required – inspect D-Ring to ensure it is not damaged.	
19. Change hose or hose fittings as required – use circlip pliers to remove the circlip, pop off the hose. Change the o-rings (the larger inside diameter O ring goes against the body/res and the smaller to the outside. Grease up and refit hose and circlip ensuring circlip is seated. *There are additional small i.d. O rings for use on the high speed adjustment shaft with MRA rebuild kits.*	 Small I.D. 9.8mm Large I.D. 10.7mm
20. Replace end cap seals as required	
21. Clean shock body and reservoir as required	
22. Ensure the floating piston and end cap D Rings are not damaged and are orientated correctly with the round face to	

the outside. Apply lots of grease to the D rings and reservoir circlip groove.	
23. Hold the reservoir and shock body in a vice loosely with the specific jaws (DO NOT CLAMP THE SHOCK OR RESERVOIR BODY IN A VICE UNLESS YOU USE EXACT SIZE HALF CIRCLE CLAMPING SOFT JAWS AS THIS WILL SQUASH AND DAMAGE THE BODY OR RESERVOIR) or similar so the open ends are upright and they are at roughly the same height with the hose fittings at the bottom and the hose down	
24. Fill the reservoir with oil, it will run slowly down into the body until the reservoir is full to around the circlip groove. The oil in the shock body will also be level with the reservoir.	
25. Carefully install the floating piston – this will require you to work it around in a circular fashion as you push down. Push it down just enough so you can see the circlip groove.	
26. Remove the reservoir from the vice and hang it down, leaving the body in the vice	
27. With the reservoir open end down, and the hose running directly up to the body, push on the floating piston from underneath with the wooden handle end of a hammer to push the oil through the reservoir and hose into the body to bleed out all of the air until it touches the inner end of the reservoir.	
28. Re-install the shrader cap, circlip and shrader valve core.	
29. Fill the shock body with oil so its around 10mm below the circlip groove.	
Re-shimming and shaft seal changes	
30. Hold the shaft in soft jaws in the vice	
31. Remove the shim nut	
32. Carefully remove the nut and rebound stack retaining washer	
33. Remove the rebound shim stack and set down in its correct order on a clean surface	
34. Remove the piston noting the orientation	
35. Remove the compression shim stack and washer and set down in its correct order on a clean surface	

36. If replacing seals - seals A). Remove any aluminium spacers from the shaft B). Slide the seal assembly and dust cap off the shaft C). Install new dust cap if required in correct orientation D). Apply suitable silicone grease to the seals in the seal assembly and carefully re-install to the shaft, very slowly working the seal assembly in a circular motion over the shaft step ensuring it doesn't catch or tear. E). Re-install any aluminium spacers	
37. Change shim stacks as required. Ensure all shims and pistons are perfectly clean – use paper tool to clean if required.	
38. Reinstall the compression washer and compression side shim stack	
39. Re-install the piston NOTE: if using bleed shims ensure the bleed shim slots are aligned with the centre of the compression ports.	
40. Install the rebound shim stack and washer	
41. Apply high strength Red Loctite threadlock or equivalent to nut and reinstall – tighten to 30 ft/lbs	
42. Double check the bleed shim slots are still aligned with the centre of the compression port, adjust if required.	

Resetting Rebound needle position – If the rebound adjustment needle was pushed down to far releasing oil and gas then do the following

A). Hold the shaft in softjaws and remove the rod end jet (piston end) with 10mm spacer

B). Remove, tip upside down and catch the ball bearing and spring – noting the spring orientation (large side to the bearing).

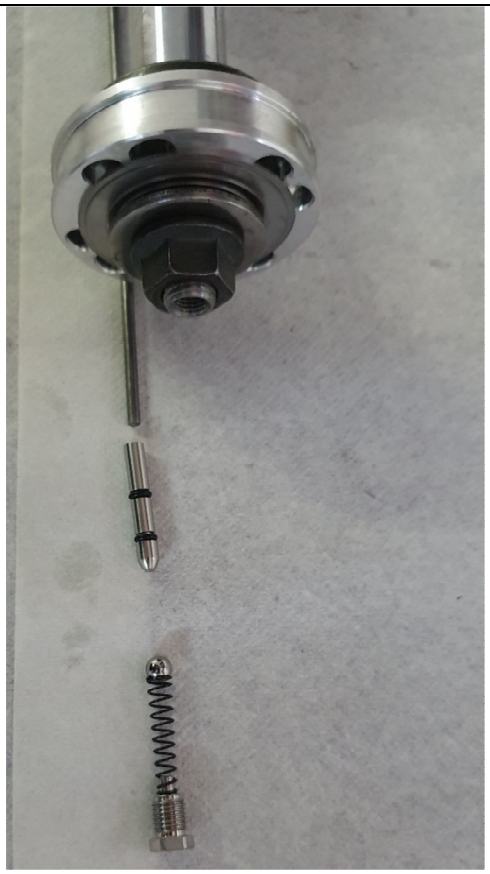
C). From the other end of the shaft push the push rod right in to push the rebound needle out of the piston end of the shaft.

D). Inspect the small orings, replace if required. Grease the o-rings and carefully slide the needle back into the shaft

E). Push the needle full home against the step inside the shaft – you should be able to see a little section through the 4 x rebound path holes above the piston base washer.

F). Re-install the ball bearing, then spring in correct orientation. Hold your finger over the end of the shaft, hold the shaft with the piston side down (the spring and ball will want to fall out) and locate the spring onto the rod end jet. This is critical so the spring locates onto the jet.

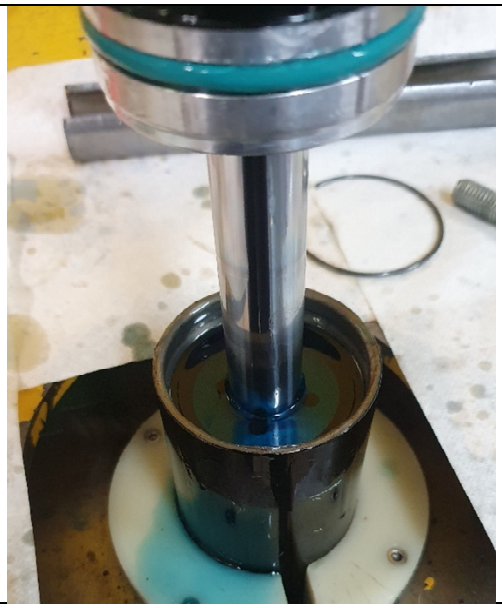
G). With the rod still piston side down and the spring still located on the rod end jet, tighten the rod end jet into the shaft with a bit of Loctite. Re-install the piston push rod into the shaft from the other end ensuring it locates into the needle.



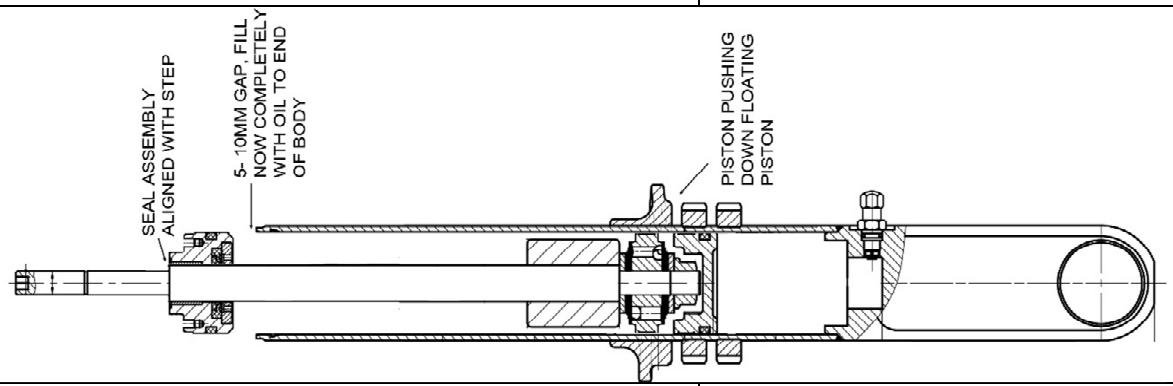
Assembly

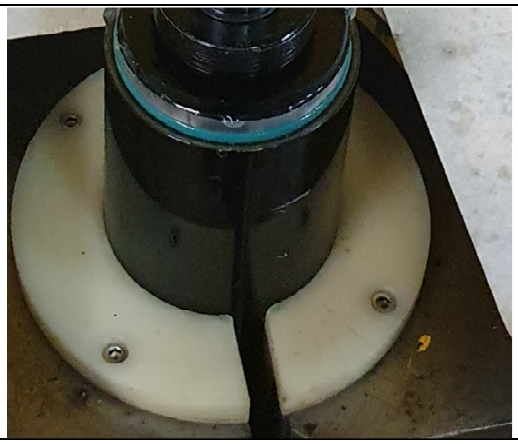
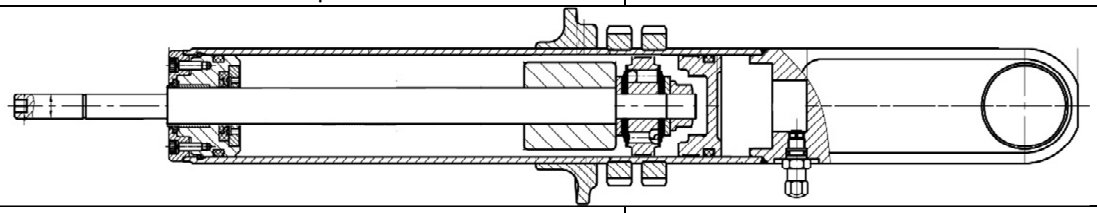
Remote Reservoir shocks – (IMS shocks skip to step 53)

43. Apply lubricant to the body circlip groove and D ring on seal assembly and ensure the D-ring is seated in its correct position – with the half circle face of the D ring to the outside to seal against the inside of the shock body and not twisted or damaged – look closely for tears.
44. Gas the reservoir to push the floating piston against the end of the reservoir and then release the gas pressure
45. Slide the seal assembly upwards out of the way. Hold the wear band around the piston ensuring it seats properly and insert the piston and rod assembly into the shock body so the piston is an inch or 2 under the oil.



46. With the piston a little under the oil, move it up and down a few times a small amount to bleed the air out.

47. Pull the shaft up so that the compression side washer is just under the top of the oil level	
48. Top off the oil so it is around 5mm from the end of the shock	
49. Slide down the seal head assembly into the shock body until you see the circlip groove, a little bit of oil should spill over removing all the air, if not add a little more oil and re-do. This will then push the floating piston back in the reservoir a little into its correct position.	
50. Install the circlip	
51. Charge with nitrogen gas to the desired psi ensuring the seal assembly locates and seats correctly on the circlip and doesn't catch on the edge. Gas until shaft is full extended and hold for 5 seconds for the pressure to equalize.	
52. Check for leaks and clean the oil from the top of the seal assembly, install the dust cap, tighten (this does not need to be overly tight) and install locking grub screw.	
IMS shocks	
53. Install floating piston about half way to ¾ down the shock body	
54. Fill body with oil so the oil is around 2 – 4" (50 – 100mm) above the floating piston	
55. Apply lubricant to the circlip groove and D ring on seal assembly and ensure the D-ring is seated in its correct position – with the half circle face of the D ring to the outside to seal against the inside of the shock body and not twisted or damaged	
56. Install the shaft with the seal assembly installed on the rod – the top of the seal assembly should be pushed against the bottom of the rod end eye, or for pin end shocks it should be parallel with the step in the rod where the first washer goes. This may require screwing the dust cap down onto the seal assembly for eye type shocks. For pin type shocks put a washer on the pin so that it goes down to the step in the shaft and touches the top of the seal assembly. See pictures	
	
57. Push the shaft assembly down by pushing on the rod end for eye type shocks, or by pushing on the washer installed in the step above for pin type shocks	
58. Push the shaft assembly down until it touches the floating piston and then move up and down a few times to bleed out the air. Push down against the floating piston and continue	

pushing down the shaft assembly and floating piston until the bottom of the seal assembly is about 20mm from the top of the shock. Ensure the top of the seal assembly is still level with the step in the shaft or against the base of the rod end	
59. Completely fill the shock with oil	
60. Push the shaft assembly down further until the bottom of the seal assembly is about 1mm from the top of the shock. Use a squirt bottle to top off the oil completely so the shock is completely full and just starting to run over.	
61. Push the rod assembly down further so the seal assembly enters the body and so the Oring/D-ring is about to enter the shock body.	
62. Once the D ring/O ring on the seal assembly starts to enter the body push down only on the seal assembly. You can screw the dust cap up now if required. Install the circlip. This should finish the shock with the floating piston just a few mm away from the end of the shock at full compression as seen below	
	
63. Install the gas valve and gas to 150 psi	