# 132 Helpsheet

GDS INSTRUMENTS LIMITED

*World Leaders in Computer Controlled Testing Systems for Geotechnical Engineers and Geologists*

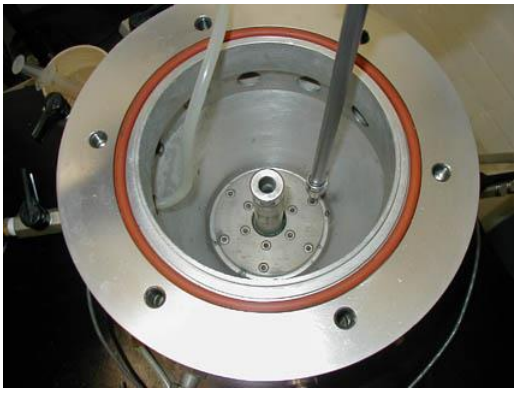
Harware

MINIDyn & MAXIDyn systems

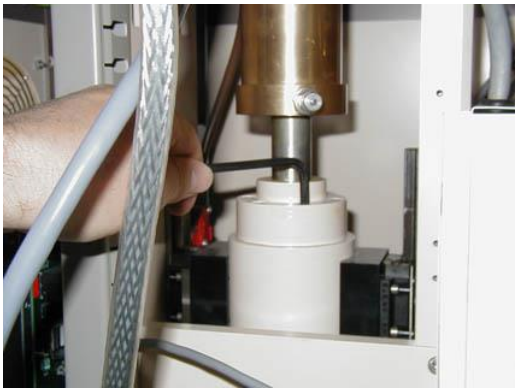
Removing Balanced Ram

## 1. Removing the Ram – older Brass style

1.1. For safety reasons, first make sure your machine is switched off and that all connections to mains electricity are removed. The 6 M5 ram retaining screws inside the cell base should then be individually loosened and then removed completely. Extreme care must be taken if the bolts have been in place for some time. In this case the bolt heads may have to be rinsed with clean water to remove any excess dirt.



1.2. Next remove the 6 retaining nuts attaching the ram to the main machine actuator. The front and possibly rear cover panels will need to be removed to access these bolts (note different machines will have slightly different access arrangements depending on specification).



1.3. Now remove the 1/8 inch swagelock stop-end. Water remaining in the balanced ram will flow out, so be careful to collect this water in a small collecting pot or jar. Once drained, the connector and associated washers should be removed completely.

1.4. The ram can now be completely removed through the top of the machine.

## 2. Disassembling the Ram (Brass Style)

2.1. First remove the bolt from the lower end of the ram assembly. Note, this will be Loctited in place so may be difficult to remove.

2.2. It should now be possible to remove the ram coupling.

2.3. Next remove the 6 retaining nuts holding the ram collar in place. When doing this be careful not to touch the piston. The piston should remain completely smooth to provide a good sealing surface.

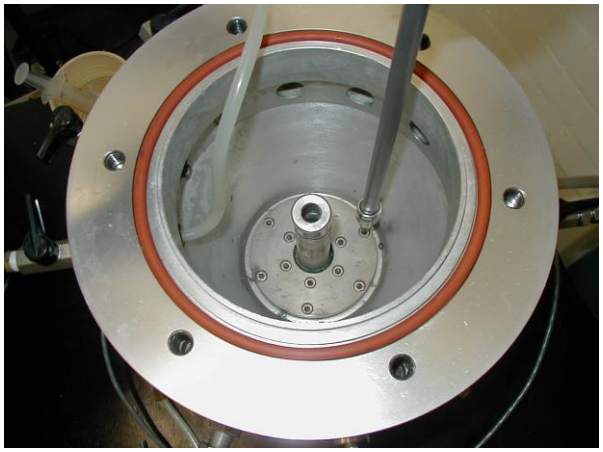
2.4. The ram collar and piston may now be removed completely from the balanced ram itself.

2.5. Before replacing the piston back into the balanced ram, all seals and o-rings should be carefully checked, cleaned and lubricated using silicone grease.

2.6. To replace the balanced ram back into the MINIDyn/MAXIDyn, please follow the instructions in reverse order. Upon reaching stages 1.2 and 1.1, initially only replace the nuts to 'finger tight'. Then, using the GDS software, run the ram to the top and then bottom of its travel twice. This will ensure the ram is nicely aligned before the screws in 1.1 and 1.2 are finally tightened.

# 3. Removing the Ram (stainless steel types)

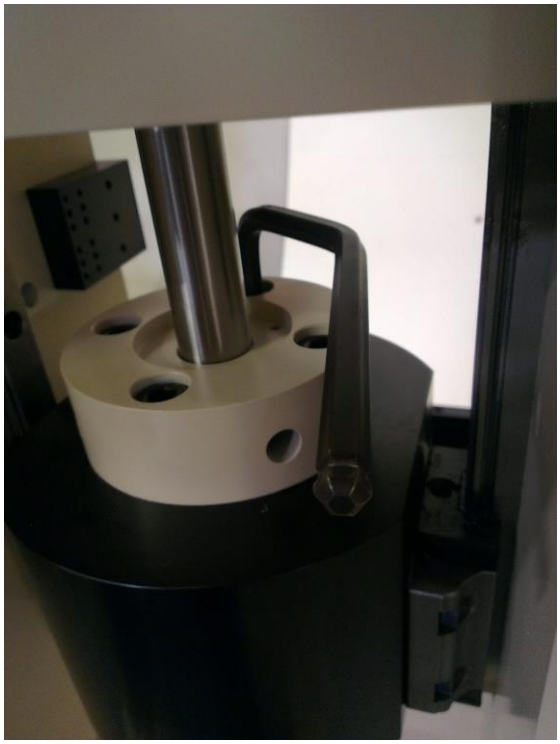
3.1. Power down the MINIDyn and unplug from the mains. Remove the cell top, pedestal and machine front cover.



3.2. Remove the outer set of retaining screws from the upper sealing plate.

3.3. If present in your MINIDyn remove the bolts and cross brace marked with blue arrows to facilitate easy removal of the other ram components.

3.4. Remove the 4 or 6 holding down bolts from the ram lower coupling. The easiest way to do this is to use a bent allen key as shown in the photograph.



3.5. When the bolts are fully removed carefully wind the actuator down by hand (using they grey belt coming from the motor) until you hear the first lower limit switch click. This gives more space for removing the rest of the ram.

3.6. Remove the blanking cap from the Swagelok connector marked by the red arrow on the right. Note, this will allow water to drain from the ram, so a small dish should be used to collect the water as it drains out.


3.7. Pull the ram up from inside the MINIDyn so the lower ram coupling comes away from the main actuator body.

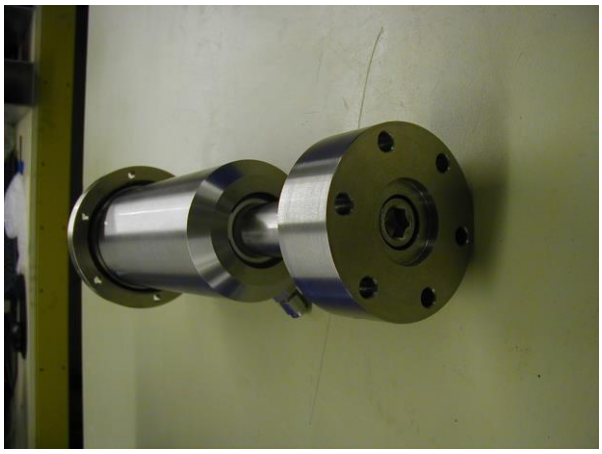
3.8. In the underside of the ram coupling is a single bolt holding the coupling onto the bottom of the ram. Loosen this bolt by using a sharp tap to an allen key with a hammer, then fully remove the bolt and coupling from the machine. Note, the bolt will be loctited in place so may be difficult to remove.

3.9. The remaining ram assembly should then be slid out up through the MINIDyn cell bowl.

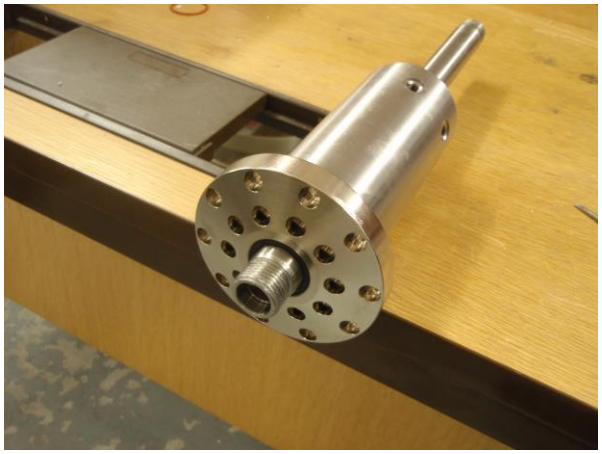
# 4. Dismantling the Ram (stainless steel)

Note: depending on the specification of MINIDyn you may have to remove the cell bowl sealing plate from the top of the ram prior to removing the balanced ram from the machine or you may have removed the lower ram coupling already  Whichever is the case you can follow these instructions but ignore the steps removing the already removed parts.

4.1. First remove the bolt in the bottom of the ram completely.  Note this may be difficult as it will be loctited in place.

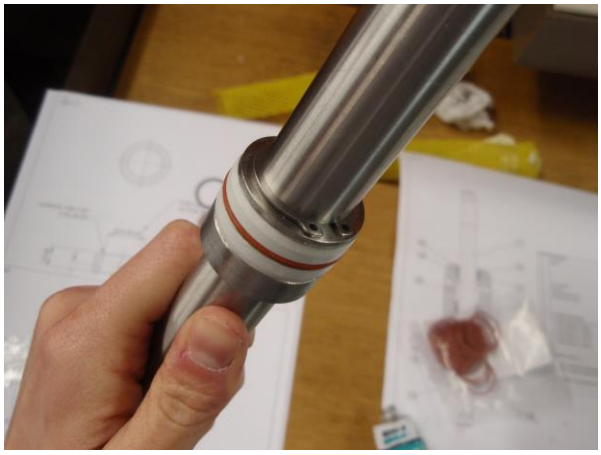


4.2. Next remove the cell bowl sealing plate if still fitted to the ram.  To do this unscrew the 6 inner retaining bolts, then tap the plate gently using a soft hammer to loosen.  Beware not to hit this too hard or drop onto the floor while removing.



4.3. Slide the ram out from the outer cylinder.

4.4. Remove the circlip which holds the ram inner seal in place. Note, we recommend using a circlip removal tool for this to reduce the possibility of breaking the circlip or damaging the ram/seal during removal.



4.5. Remove the stainless steel backing ring and clean this item.

4.6. Remove the ram bearing and inspect. If damage is visible the bearing will need replacing, otherwise clean ready for re-fitting.

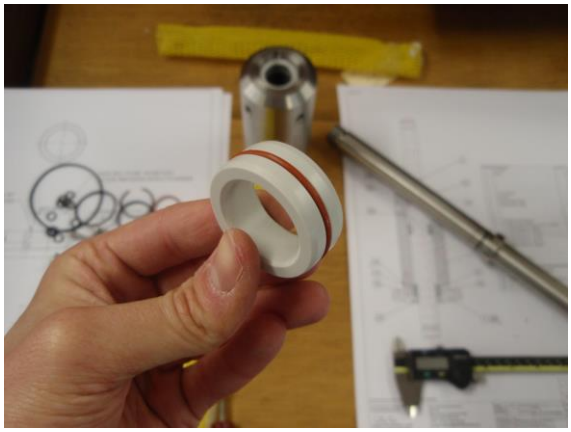
Inspect the outer o-ring and replace as necessary.

4.7. When the bearing is removed an inner o-ring will be visible.

4.8. Remove the o-ring. Inspect the ram for damage such as scouring. It may be necessary to polish out imperfections – contact GDS with clear photos of any damage if you are unsure. Clean and lightly lubricate the ram with silicon grease, then replace the inner o-ring.

4.9. Here a clean, well lubricated bearing and outer o-ring can be seen ready for replacement on the ram.

Fit the bearing with outer silicone o-ring in place onto the ram (over the inner vyton o-ring), then fit the backing ring and circlip.

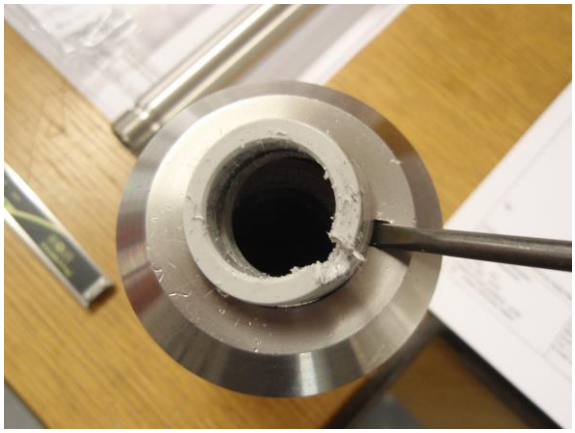


Now move onto the ram cylinder.

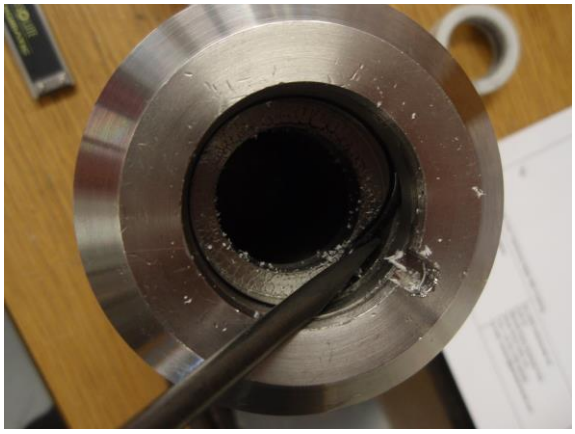
4.10. If required the lower bearing in the outer cylinder can be removed using a small screwdriver.

**Note**, in removing the seal it will be destroyed – only remove this seal if instructed to do so by GDS. The seal is usually fitted in place then bored out, rather than fitted as a standalone part requiring it to be returned to GDS.

Where possible it is recommended to remove only the internal o-ring and clean the groove.

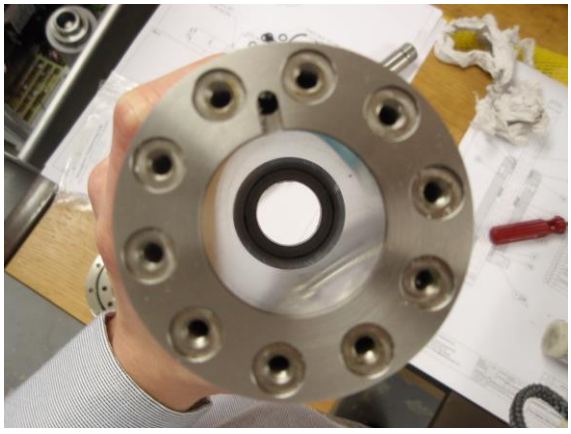


4.11. If the bearing has been removed also remove the outer vyton o-ring that surrounds it.



4.12. Remove all the o-rings from the top of the cylinder.

4.13. Clean the whole cylinder and inspect internal surface for damage. Note, it may be necessary to hone out the internal bore of the cylinder if there is damage present. Take care not to remove too much section or the seals and bearings will not work properly.

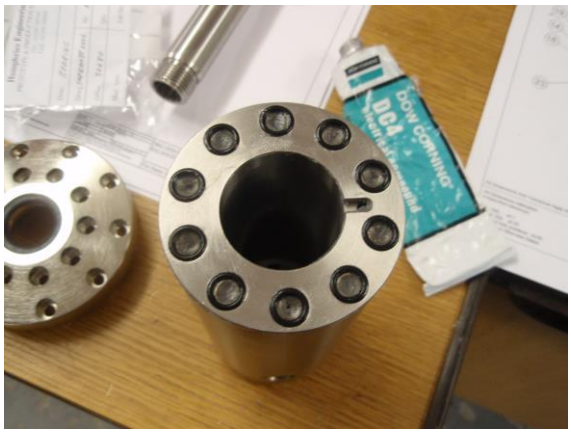


4.14. When the cylinder is clean and ready for re-assembly re-grease the internal bore with silicone grease.

4.15. Replace the outer o-ring and bottom bearing if required, ensuring all are greased correctly. Note, the bearing will likely have to be tapped into place gently. Ensure this is done with the bearing straight, not at an angle.

If just the internal o-ring is to be replaced lubricate and fit this.

4.16. Lubricate and replace the small o-rings on the top surface of the cylinder.

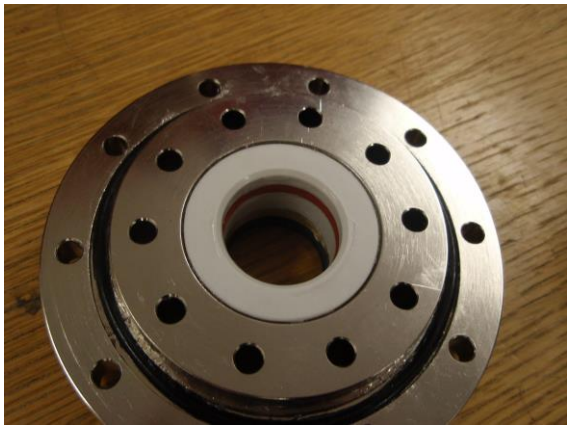



4.17. Carefully slide the ram back into the cylinder.

4.18. Remove the lip seal from the upper surface of the seal plate.

4.19. Remove the o-ring from inside the white bearing.

Clean and inspect the white bearing from the upper seal plate. If damage is visible contact GDS to identify if replacement will be required.



4.20. Remove the remaining o-rings, clean the whole seal plate and replace with new lubricated o-rings. Refit/replace the white bearing if removed. Replace the lip seal on the upper surface.

Replace the balanced ram in the MINIDyn or MAXIDyn in the same way it was removed. Note you may have to bolt the upper seal plate in place before or after replacing the ram, depending on machine specification. Before fully tightening the bolts on the top of the seal plate and those holding the ram coupling onto the actuator manually wind the syteem up and down to the top and bottom of travel a couple of times. This will help to ensure the ram is centrally aligned before tightening the final screws in place.

Finally, re-check all accessable bolts you have adjusted are tightened fully.

For any questions/queries contact GDS using support@gdsinstruments.com including as much information as you can and clear, in focus photographs showing any damage or problems you have encountered.