

INSTRUCTIONS FOR REPLACING DIAPHRAGMS

The diaphragms are molded from a special grade of synthetic rubber to give the required mechanical properties required for standardization. How long they will last before rupturing depends on the nature of the material tested, the average bursting pressure involved, total number of bursts made, and if installed properly.

Whenever diaphragm failure occurs, a new diaphragm can be installed by following the procedure outlined below.

1. Return the pump plunger to starting position. On Model "A" Testers, move the control lever to the right and release it.
2. Lower the tripod by means of the clamp wheel until it is clamped against the diaphragm plate. Apply as much pressure to the plate as would ordinarily be used in clamping a sample.
3. Loosen the diaphragm nut by rotating it counter-clockwise, using the spanner wrench designed for this purpose.
4. Release clamp, remove the tripod, diaphragm nut, diaphragm plate and diaphragm.
5. Check the level of the tester fluid in the cylinder. Add tester fluid as needed to raise the level flush with, or to form a slight meniscus above the surface of the diaphragm seat. Wipe the diaphragm seat and dry, using a dry cloth.

THIS IS IMPORTANT!! Not drying the cylinder can cause the diaphragm to slip and break.

NOTE: The recommended fluid is 99.5% chemically pure glycerine – no other fluid is recommended.

6. Place a new diaphragm (flat side down) on the seat, being careful to center it to the cylinder face. Do not move diaphragm after placing on seat. Diaphragm and seat must be dry, otherwise when it gets wet, it can cause the diaphragm to slip when testing and break.
7. Place the diaphragm plate carefully over the diaphragm, making sure that the pin hole on the underside of the plate is lined up to the upright pin on the cylinder face. **THIS IS IMPORTANT!!** If not aligned, when pressure is applied, the diaphragm will slip and break.
8. Place the diaphragm nut over the plate and screw it down finger tight only.

9. Re-attach the tripod and lower it, applying pressure against the diaphragm plate. Tighten the diaphragm nut, using the spanner wrench.
10. Clamp a piece of heavy cardboard over the diaphragm. This is to immobilize the diaphragm during bleeding, thereby forcing all of the displaced tester fluid into the pressure gauge.
11. Using two (2) wrenches of the correct size, loosen the gauge coupling and rotate the gauge 90 degrees so that the face is toward the left and the bleeder vent is on top of the gauge.
12. Place a cup or dish under the vent to catch the emerging tester fluid. This will also catch the sealing ball in the bleeder (Helicoid Gauges) or the rubber stop (Ashcroft Gauges) if bleeder vent is opened too far.
13. Open the bleeder vent as follows:
 - a. ASHCROFT GAUGE:
Using a 5/8" or 3/8" wrench, remove the nut on the right hand side of the gauge.
 - b. HELICOID GAUGE:
The vent is on the side of the gauge stem. Using a 5/64" Allen type wrench in the center screw, turn counter-clockwise to open the vent.
 - c. STAR MARTIN GAUGE:
The vent is on the backside of the case. Using a 1/8" Allen type wrench in the center screw, turn counter-clockwise to open the vent.
14. Rotate, with the fingers, the coupling between the cylinder and the gear box until the tester fluid begins to flow from the vent tube. With the motor off, place the gear box in gear; start and stop the motor using the toggle switch to apply small amounts of power until the gauge registers 60% of scale. Allow the gauge to bleed until it registers 5% of scale and no air bubbles are visible. If air bubbles still visible, add more pressure until there are no more air bubbles. Close the bleeder vent while the tester fluid is still flowing.
15. Add tester fluid to the tester, to replace the tester fluid spent during the purging procedure. Tester fluid can be easily added to the cylinder by removing the "Filler Plug". Refer to your machine drawing located at the back of the manual.
16. Rotate the gauge to its normal position. **CAUTION: Do not overtighten the gauge connectors as this will cause the connectors to crack and leak.** Repeat Steps 11 through 15, if necessary, until the tester fluid under pressure emerges steadily without air bubbles.

17. a. Follow this step when a diaphragm has been replaced:

Operating the tester in the “forward” position, allow sufficient pressure to raise the diaphragm 11/16” above the diaphragm plate ten (10) times. To facilitate this procedure, it is suggested you use the 11/16” Diaphragm Height Gauge. Repeat the steps outlined in Paragraph 9. Careful adherence to this final step will insure proper seating of the diaphragm, which is essential to accurate testing.

- b. Follow this step when purging air from the tester and gauge:

After the final filling of the cylinder, press down on the diaphragm with the fingers and watch the gauge hand. A properly bled gauge will respond readily to the diaphragm movement.

NOTE: To avoid the necessity of frequent (bleeding) of the tester of air and to ease the procedure when replacing the diaphragm, we suggest the use of the following accessories described on the “Accessories For Use With Mullen® Testers” listing on Pages 13 & 14.

- a) Fluid Injector, Part No. 820214
- b) Two-Gauge Manifold, Part No. 820204
- c) Three-Gauge Manifold, Part 820219
- d) Gauge Coupling Assembly, shown on your tester drawing:

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| Threaded Seat | Part No. 820203 |
| Coupling Nut | Part No. 820204 |
| Connector | Part No. 820205 |