

PBX Ballistix Lab LLC



MQ-Valve Assembly and Test Instructions

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Pilot Assembly

1. Degrease flat end of solenoid plunger. Glue urethane dot to flat end of solenoid plunger using cyanoacrylate (superglue). Make sure the smooth side of the dot faces outward and does not get any glue on it.

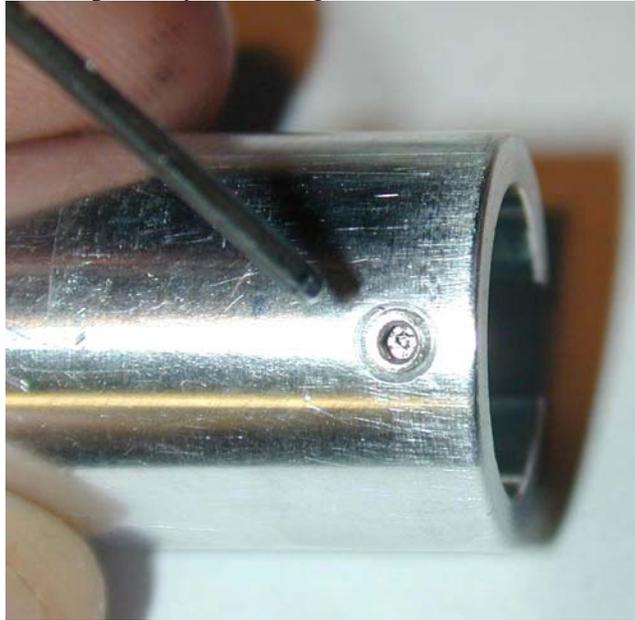


2. Crimp electrical plug onto solenoid leads.
3. Insert solenoid with plunger into the solenoid spacer. The plunger is NOT to have the spring on it. Make sure the solenoid bottoms out in the spacer.



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4. Lock the solenoid in place by threading in the 4-40 set screw.



5. Insert the “nail” spacer into the hole of the orifice plate so the “head” of the “nail” sits on the pointy side of the hole.



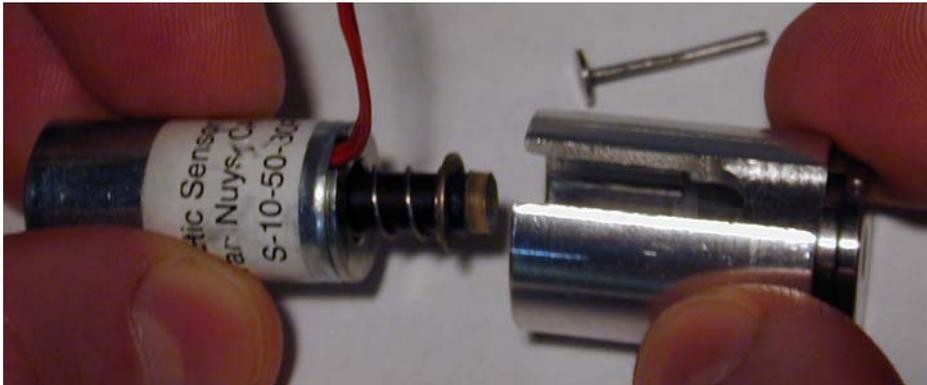
6. Apply a drop of red Loctite or similar high strength thread locking compound to the threads of the orifice plate.

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7. Screw the orifice plate into the solenoid spacer. Tighten until the “nail” spacer bottoms on the urethane dot on the solenoid plunger (the nail will cease to spin freely).



8. Loosen the orifice plate slightly by twisting the “nail” spacer back and forth.
9. Remove the solenoid by loosening the 4-40 set screw.
10. Remove the nail spacer.
11. Put the plunger spring around the solenoid plunger.
12. Insert the completed solenoid assembly back into the spacer / plate assembly and lock it down with the 4-40 set screw.



13. Allow the thread locker to cure.

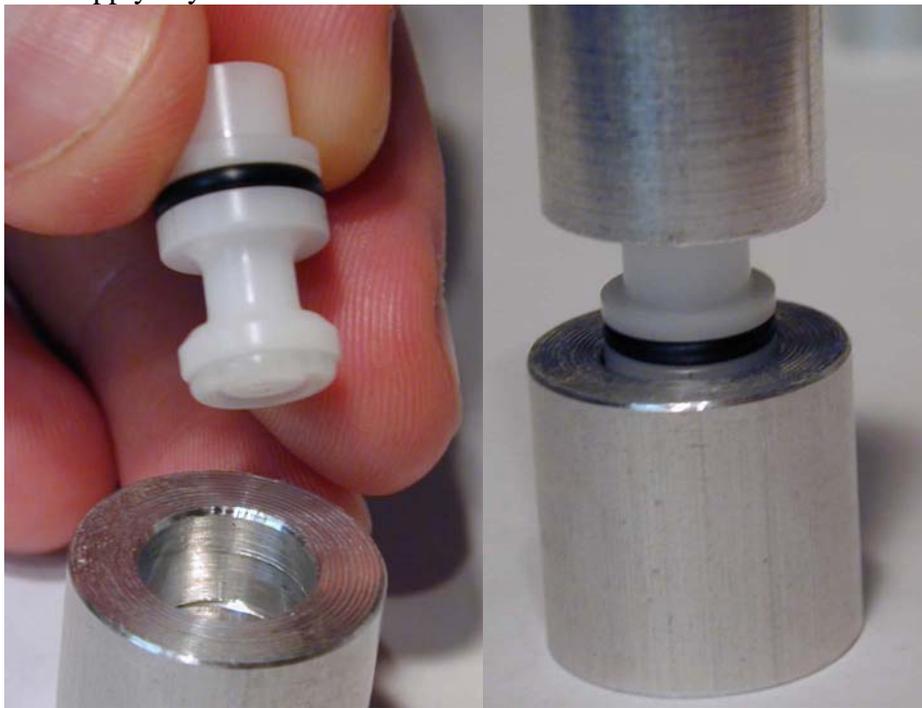
Note: This procedure is used to precisely set the lift and travel of the solenoid plunger in relation to the raised surface of the orifice plate. Once a spacer is set to a particular solenoid it should not be used with a different solenoid since the solenoids bodies vary enough to cause rejects.

Valve Body Assembly

14. Assemble 3/8" OD Buna O-ring onto the body of the poppet.
15. Press a 90 durometer urethane O-ring onto the front of groove of the poppet. This is accomplished by pressing the poppet down over an o-ring placed on a hard surface. The o-ring will not go all the way into the groove, but will stay centered on the end of the poppet.



16. Drop the poppet into the O-ring setting die and drive the urethane o-ring in place by utilizing an arbor press or other significant force. Once the poppet bottoms out, do not apply any additional force.



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17. Inspect to ensure the o-ring is seated evenly in the groove.



18. Lubricate the poppet with Dow 55 all over. The 3/8" buna o-ring (black) must be generously covered with grease.

19. Insert poppet into valve body, urethane o-ring first.



20. Put 1/2" O-ring on the front of the valve body.

21. Press 1/2" O-ring into the recess at the rear of the valve body.

22. Lubricate both the front and rear 1/2" o-rings with Dow 55.

23. Insert poppet spring behind the poppet.



24. Push poppet back and forth inside the valve body to make sure the o-ring does not stick

Test Procedure

1. Insert a complete valve into a gun or lower tube equivalent (a T-handle combination of IVG and Spacer combo can speed this process)
2. Apply 300psi to the gun / test fixture
3. Listen for any major leaks. A small leak in the pilot assembly is acceptable at this point.
4. Apply power to the valve in the form of 4mS, 9V pulses at a rate of 10Hz. A PBX board set to full auto is sufficient for this process.
5. Cycle valve for 2 to 5 seconds. Loud, solid POPs should be heard.
6. Listen for leaks. Any leaks may be stopped by cycling the valve for an additional 5 to 10 seconds. If this action does not stop the leak, reject the valve.
7. Pause then cycle the valve for another second. Listen for leaks.
8. Vent pressure from the gun / test fixture, then apply pressure again. A 3-way valve is helpful. Listen for leaks. Reject if there is a large leak from the valve body. This procedure is to test the urethane o-ring face seal.
9. Cycle the valve for 1 to 2 seconds. Reject the valve if it leaks.
10. Vent pressure from gun / test fixture.