EMD MAINTENANCE INSTRUCTION

TYPE B-46 MAGNET VALVES 8089175, 8178755 AND 8211837

DESCRIPTION

The Type B-46 magnet valves, Fig. 1, are used to actuate such electrical devices as power contactors, reversers, brake transfer switches, and traction motor field shunting contactors. They are mounted directly on such devices and operate them by controlling the admission and release of air pressure in response to current flow to the magnet coil.

With but few exceptions that are specifically identified, all information in this bulletin will apply to the three magnet valves 8089175, 8178755 and 8211837. These magnet valves are practically the same in construction with the only major difference being that the latter two feature "O" ring grommets on sealing surfaces, while valve 8089175 is equipped with metal to metal seats.

Fig. 1 - Type B-46 Magnet Valve

OPERATION

When the low voltage coil of the magnet valve, Fig. 2, is energized, the pole plate is magnetically attracted downward. The valve stem is then moved downward, overcoming spring pressure to open the lower seat and close the upper seat. Control air pressure can now flow past the needle valve to the device being actuated.

Upon de-energizing the magnet valve coil the action is reversed with the spring moving the needle valve and valve stem upward to close the lower seat and open the upper seat. The air pressure in the device being actuated is then exhausted through the upper valve seat and air port to atmosphere.

A button is provided on top of the pole plate which can be manually depressed to check operation of the magnet valve and its associated device.

* THIS BULLETIN IS COMPLETELY REVISED AND SUPERSEDES M.I. 636.

MAINTENANCE

For proper performance, all magnet valves should be inspected, disassembled, and cleaned at intervals specified in the Scheduled Maintenance Program, Maintenance Instruction 1704.

INSPECTION

Magnet valves should be inspected electrically and mechanically to insure that they are in acceptable working order. The following items should be observed:

1. Electrical

   Resistance
   at 20° C. - - - - - - 388 ± 10% ohms

   Pickup (with 90 psi
   air pressure) - - - - 48 volts max.

   Dropout (with 90 psi
   air pressure) - - - - 28 volts max.
   5 volts min.

   Pickup and dropout action should be sudden without pause or hesitation.

2. Mechanical

   This inspection consists primarily of checking for air leakage which would indicate poor valve seating. This is done by applying soap water to the exhaust air ports in the magnet valve housing and observing to see if bubbles form with the valve energized and de-energized. The control air pressure should be the required 90 psi for this inspection.

   If bubbles form with the magnet valve de-energized, it indicates that the lower valve seat or "O" ring is defective.

   The upper valve seat can be similarly checked by energizing the coil or by depressing the button on top of the magnet valve, which gives the same effect as having the coil energized. Again apply soap water to the exhaust ports and observe to see if bubbles form which would indicate a defective upper "O" ring or valve seat.

   Any leakage or "blowing" observed will require disassembly of the

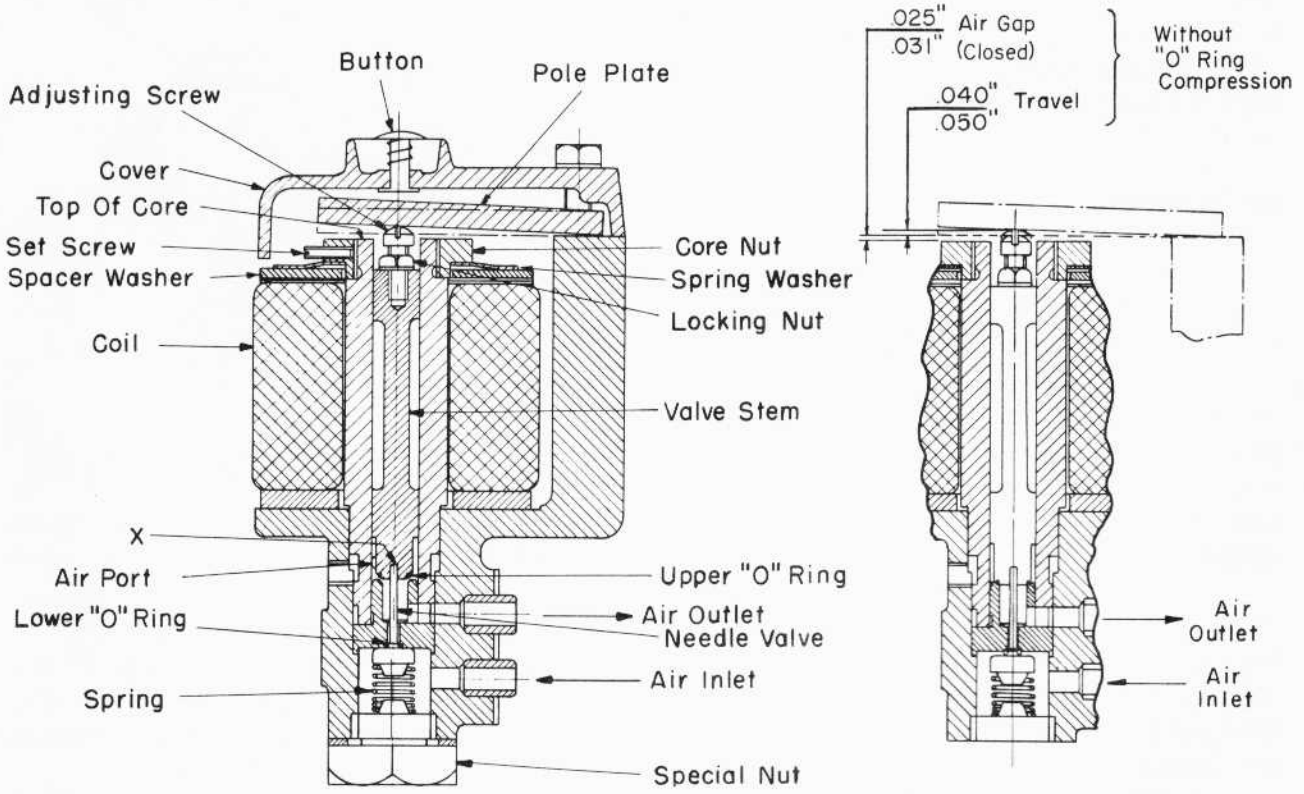

Fig. 2 - Cross-Section Of Magnet Valves 8178755 And 8211837

magnet valve and correction of the defective seating surface.

In addition to checking for air leakage at valve seating surfaces it would be advisable to similarly check for leakage at the gasketed areas between the special nut at the bottom of the valve and the valve connection to the device it actuates.

DISASSEMBLY

The magnet valve can be disassembled for further inspection, cleaning and replacement of worn parts by referring to Fig. 2 and following the procedure below:

1. Remove the two cover cap screws and remove the magnet valve cover.
2. Lift off and remove the pole plate.
3. Pull out the valve stem.
4. Remove the special nut at the bottom of the valve allowing the needle valve and spring to drop out.
5. Loosen set screw and remove the core nut.
6. Remove spring washer and spacer washer.
7. Remove magnet coil.

NOTE: Steps 1 through 4 will be required to perform any work concerning valve seating and replacement of "O" rings. All seven steps are required to replace a magnet coil.

CLEANING

Using a suitable cleaner such as mineral spirits, clean all metal parts and flush the core. Remove the "O" rings before attempting to clean the valve stem and needle valve.

After cleaning, inspect and replace any parts showing wear. The "O" rings may be reused if they are in good condition, however, for best performance it is recommended that they be replaced. Use care in applying "O" rings to prevent twisting or improper seating.

REASSEMBLY

Partially reassemble the magnet valve by replacing the magnet coil (if removed during disassembly), spacer washer and spring washer. Apply core nut and tighten in place with set screw. Lightly coat inside of core with SAE #20 oil to prevent rusting, then insert the valve stem.

The balance of the reassembly is in the reverse order of disassembly and should be done after the valve travel and air gap adjustments (or valve seat grinding on magnet valve 8089175) have been completed as given in the following.

VALVE GRINDING MAGNET VALVE 8089175

If the mechanical inspection revealed air leakage past either the upper or lower seats, the condition can usually be corrected by grinding.

Using Clover 2A or similar grinding compound, apply to upper valve seat on the valve stem, then rotate the valve stem back and forth with a screwdriver as shown in Fig. 3.

Leaving the valve stem in place to serve as a guide, the lower seat on the needle valve can be similarly ground in place.

After grinding, thoroughly clean the parts before reassembly.

VALVE TRAVEL ADJUSTMENT

The valve travel adjustment may be made by following the procedure below and referring to Fig. 2 for magnet valves 8178755 and 8211837, and Fig. 3 for magnet valve 8089175.

1. Insert the valve stem and move it down until it rests on the upper seat.
2. Loosen the locking nut on the valve stem and turn the adjusting screw up or down until the top of the screw is exactly even with the top of the core.
3. With the special nut at the bottom of the magnet valve removed, insert the

needle valve and press up until the lower valve seats are in contact.

4. Measure the height of the adjusting screw above the top of the core. This should measure:

   8089175 — .031" min. to .045" max.

   8178755
8211837 — .040" min. to .050" max.

5. If the height of the adjusting screw measures more than the maximum listed above, the end of the needle valve marked "x," Fig. 2, should be filed off slightly to bring the valve travel within acceptable limits. Take care not to file off too much since less than the minimum travel indicated will result in improper magnet valve operation.

AIR GAP ADJUSTMENT

After the valve travel has been adjusted, the next step is to adjust the pole plate air gap. This is done by referring again to Fig. 2 for magnet valves 8178755 and 8211837 and Fig. 3 for magnet valve 8089175 and following the procedure below.

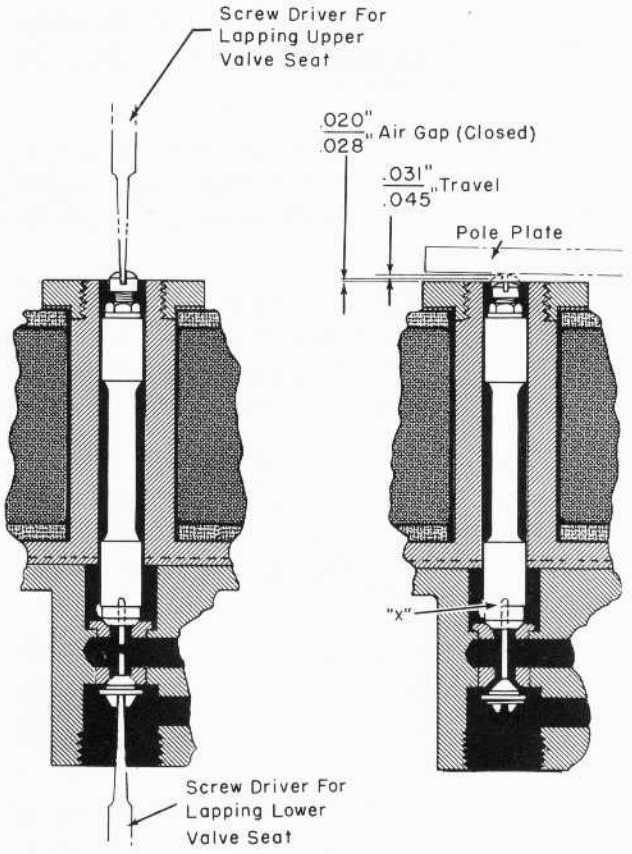

Fig. 3 - Grinding And Adjustment Of Magnet Valve 8089175

1. With the special nut and needle valve removed from the bottom of the magnet valve, insert the valve stem and move it down until it rests on the upper seat.
2. Place the pole plate in position over the valve stem.
3. Using the valve stem adjusting screw set the magnetic air gap between the pole plate and core or core nut to the following dimensions:

   8089175 — .020" min. to .028" max.

   8178755
8211837 — .025" min. to .031" max.

4. After setting has been properly made, lock the adjusting screw by tightening the locking nut.
5. Assemble the magnet valve, leaving the cover off and connect to 90 psi air supply.
6. With the magnet coil de-energized, measure the height of the adjusting screw above the top of the core or core nut. This dimension should be approximately 1/16".
7. Energize the magnet coil and measure the magnetic air gap. This should be a minimum of .020" on both types of magnet valves. This dimension is the minimum setting of magnet valve 8089175 as specified in preceding Step 3. It is less however, than the minimum setting made for the other magnet valves since they are equipped with "O" rings which will be compressed when the coil is energized.
8. Apply cover to complete magnet valve assembly and perform mechanical and electrical inspections as outlined in the preceding to qualify the magnet valve for service.