

Section VI — Overhaul (cont.)

C. Drive Reversal (cont.)

TABLE 8. CARTRIDGE KIT BUSHING LOCATIONS AND KIT ROTATION SETUP

(location of bushing in cartridge kit, assuming a right hand rotation shaft)

R = right hand rotation kit

L = left hand rotation kit

Pump	Shaft End Kit	Center Kit	Cover End Kit
25, 35, 45 Single & Thru-Drive (R)	Inlet Plate (R)	—	—
2525 Double (R)	No Bushing (R)	—	Outlet plate (L)
3525 Double (R)	Inlet Plate (R)	—	No Bushing (L)
4525 Double (R)	Inlet Plate (R)	—	No Bushing (L)
4535 Double (R)	Inlet Plate (R)	—	No Bushing (L)
352525 Triple (R)	Inlet Plate (R)	No Bushing (L)	Outlet Plate (L)
453525 Triple (R)	Inlet Plate (R)	Outlet Plate (L)	No Bushing (L)

*Note: The opposite rotating kits would be used in a (L) pump.

See figures 12 - 20 for a pictorial explanation.

1. Once the cartridge kit has been removed from the housing, place the kit on a clean flat bench, outlet support plate down. (Figure 12)

2. Remove the two socket head cap screws holding the kit together. Note the location of the two screws in the inlet plate. When the kit is reassembled in the opposite direction, these screws will be installed in the opposite set of inlet plate holes. (Figure 13)

3. Slide the inlet support plate off of the inlet wafer plate. (Figure 14)

4. Remove the inlet wafer plate, cam ring, rotor, vanes, and outlet wafer plate as one unit from the outlet support plate. (Figure 15)

5. Rotate this group of components 180 degrees and place it back on the outlet support plate. The etched arrow in the ring should be pointing the opposite direction as before. Do not attempt to remove the

vanes. They should be contained between the wafer plates as the 180° rotation is performed. (Figure 16)

6. Align the inlet windows of the wafer plates to the inlet windows of the outlet support plate. Place the inlet support plate back on the rotating group, aligning its inlet windows with the rest of the kit. Reinstall and finger tighten the socket head cap screws in the opposite set of holes as before. In order for the kit to fit back in the housing, it must first be aligned. This can be done by placing the kit on its side and rolling it on a hard, flat, clean bench. While the kit is on its side, tighten the SCHS snug. Finally, place the kit upright and tighten the screws to the torque specs below (Figures 17-20):

25 VMQ → 20 in.lb. (2.28 Nm)

35 VMQ → 20 in.lb. (2.28 Nm)

45 VMQ → 40 in.lb. (4.55 Nm)

D. Inspection and Repair

All parts must be thoroughly clean and kept clean during inspection and assembly.

1. Remove the shaft seal(s), O-rings, back-up rings and seal pack subassemblies. Use a new seal kit for reassembly. Refer to the VMQ parts catalog for kit numbers.

2. If the pump has demonstrated poor performance or loud noise, the cartridge kit must be replaced. These problems were a result of a poor system condition. Check inlet conditions, fluid cleanliness, and other system components that may be faulty before installation

of a new cartridge kit.

NOTE:

Pre-assembled replacement cartridge kits are available. If the old cartridge is worn extensively, a new kit should be used.

3. Rotate the bearing while applying pressure to check for wear, looseness and pitted or cracked races.

4. Inspect seal and bushing mating surfaces on shaft for scoring or wear. Replace the shaft if marks cannot be removed by light polishing.



Figure 13



Figure 14



Figure 15



Figure 16

Section VI — Overhaul (cont.)

E. Assembly

Basic pump: Clamp the body in a vise or place on 2 x 4 wood blocks to facilitate assembly. See figures 10 and 11.

1. Lubricate primary shaft seal with petroleum jelly and place in position within the body, garter spring up. See Figure 6 for seal arrangements.

2. Press the seal into the body until it bottoms out.

NOTE:

Two shaft seal arrangements are available in the VMQ pump series. See Figure 6 and Table 1 – 3. If the pump model code (Table 1–3) indicates that a secondary seal is required, perform the following step.

3. Lubricate secondary seal with petroleum jelly and place the seal in position opposite of the seal previously installed in the body (Figure 6). Use a small hardwood block to drive the seal into the body. Installation is complete when the seal face is flush with the front of the body. *Do not* drive the seal past flush as it can block the body drain opening.

NOTE:

If shaft bearing was defective, install a new bearing as follows:

4. Press shaft into the new bearing with an arbor press while supporting the bearing inner race. Install a small snap ring behind the bearing.

5. Use a “bullet” or plastic tape over the end to prevent damage to the seal(s). Lubricate the “bullet” with petroleum jelly and carefully push the shaft through the seal(s) until the bearing is within the body. Install the large spiralox ring into the body

snap ring groove behind the bearing.

6. Install the O-rings and back-up ring on the cartridge outlet support plate hub.

7. Check the rotor for bind by inserting your index finger through the shaft opening of inlet support plate. Hold the cartridge kit in a horizontal shaft position and lift the rotor with your finger. The rotor should move freely back and forth within the cartridge. If the rotor binds, open the kit, clean and stone all possible areas of bind, then reassemble using the aforementioned procedure. The rotor *must* move freely within the cartridge when assembled.

8. Carefully install the cartridge into the body so the torque pin in the cartridge kit lines up with the hole in the cover housing. The kit should always be oriented so the inlet windows of the kit line up with the inlet port of the housing.

NOTE:

VMQ Cartridge kits are manufactured with shaft bushings located in the inlet plate or outlet plate depending on the configuration of the pump. See Table 8 for application details.

9. Lubricate and install the housing O-rings.

10. Install the cover housing in position; move back and forth until the cartridge pin drops into the cover hole.

11. Oil and install the housing bolts. Torque to the value noted in Figure 9.

12. Turn the pump shaft by hand to verify freedom of the cartridge.



Figure 17



Figure 18



Figure 19



Figure 20