

## **Service Instructions – MARMAC Hydraulic Cylinders**

### **Packing**

Marmac hydraulic cylinder packing consists of multiple layers of “V” packing rings located in a machined stuffing box. The rings are supported at the top and bottom with machined metal adaptors conforming to the shape of the rings to maintain alignment at all times. Constant pressure is maintained at all times on the packing stack by the action of compressible “O” ring tubing located under the bottom metal adapter. This ensures good sealing action at low pressures. At high pressures, the “V” rings spread to seal positively.

Refer to Form 175 or 176 which are typical drawings showing the general arrangement of packing. You will note the packing is held in place by the formed groove in the gland ring. The wiper ring, located in a groove machined in the top of the gland ring, wipes any foreign matter off the ram as it returns into the cylinder.

### **To Replace Packing**

Raise platform high enough to permit you to get under it easily. Place adequate supports under platform, and lower onto the supports. In all cases, support any load to prevent build-up of pressure in the cylinder during the time when the packing is being removed. After the load is supported, bleed off any excess oil pressure back to the oil reservoir, and then close all valves to ensure that no oil will bleed from the tank to the cylinder during the repacking operation. Shut off power to pump and any electric valves. Prior to starting the dismantling, clean off the top of the cylinder and surrounding area to ensure that no dirt will get into the cylinder....THIS IS A MUST

Remove all gland screws and raise wiper retaining ring to a position high enough on the ram to permit you to work and support same. Caution...do not score the ram. Remove gland ring from top of the cylinder by prying under the outer edge with a screw driver or other similar tool. Raise it to a position similar to the wiper retaining ring. The packing is now exposed.

Remove all rings, one at a time, by using a sharp instrument such as the point of an ice pick or a short length of 1/8” wire sharpened and formed with a short curve on one end. Examine the bottom adaptor ring for any evidence of damage. The pressure ring, underneath the adapter ring, is not subject to wear and should, in most circumstances, be satisfactory. Inspect the new packing set thoroughly and arrange to place in packing box so the joints are staggered about 120 degrees from the proceeding one. Rings may be continuous....if so, cut at a 45 degree angle and fit around ram.

Each ring may be pulled apart to fit easily around the ram. When inserting rings, exercise caution against twisting, making sure edges seat firmly against side of plunger and machined surface of gland housing. Use smooth wood dowel or brass pin for tapping rings into position. Place a film of SAE 30, or heavier, lubricating oil between each ring of packing when inserting. **THE RINGS SHOULD BE SMOOTH ON TOP, NO GAPS OR OVERLAPS AND SHOULD LIE STRAIGHT...NOT TWISTED.** Replace gland ring over packing and pull down evenly until tight all around. Remove wiper ring and inspect for wear. Replace if required.

**BEFORE PLACING UNIT BACK IN SERVICE, REMOVE ANY SCRATCHES, SCORE MARKS OR ANY OTHER DEFECTIVE AREAS ON THE RAM BY CAUTIOUSLY USING FINE EMERY PAPER...FINISHING UP WITH CROCUS CLOTH OR SIMILAR MATERIAL. INSOFAR AS POSSIBLE, DO NOT PUT FLAT PLACES ON THE RAM AS THESE MAY CAUSE OIL SEEPAGE. WIPE CLEAN BEFORE LOWERING LIFT.**

After the above has been completed, raise platform by normal means and operate up and down several times to check seal and until smooth operation is secured.

## **Service Instructions – MARMAC Hydraulic Cylinders (Continued)**

### *Loose Packing*

This is generally indicated by a leak around the ram and may be corrected by placing more pressure on the packing stack. To do this, proceed as mentioned above...remove the gland ring... inspect the packing arrangement for any apparent misalignment...place another ring of packing over the ones presently in the stuffing box...drop the gland ring into place and tighten as before.

### *Tight Packing*

This is generally indicated by chattering or jerky action when lift is being lowered or by an excessively slow platform lowering rate when small loads are on the platform. This can usually be corrected by loosening the packing gland screws approximately one turn. (If the foregoing does not correct the lowering speed, check for restrictions in the return line...a small valve, or incorrect operation of same...small lines or too long a pipe run with too many fittings...oil viscosity too heavy, (remember cold weather will cause oil to flow slower)...elevation of the power unit, this should be at the same level, or below the platform, not next to the ceiling or on the wall higher than cylinder.

### *Scored Ram*

This is caused by dirt, etc., getting against the polished ram surface. This surface must be smooth to prevent damage to the edge of the packing rings. Whenever scores are present, polish out immediately with crocus cloth before damage is done to the packing. Do not make flat places on the ram. It is usually necessary to remove only that portion of the score mark that projects outward, like a burr. It is of prime importance when installing the hydraulic system that all dirt is removed from the oil lines and all the pipe joints are brushed to prevent metal chips from getting into the cylinder. Scoring most frequently occurs when a system is first placed into operation. Prompt attention to the score marks at this time will frequently save a packing job later on.

Under no circumstances should the area immediately around the top of the cylinder be allowed to collect dirt and debris. While the wiper ring is efficient, it will remove only a portion of the dirt present, and scoring marks may take place.

In those circumstances where cylinders must be used in areas where abrasive dust or grit is present, we suggest the use of PROTECTIVE COLLAPSIBLE BOOTS for the rams.

Also, use an oil as listed on Marmac Oil Chart (or equal) that provides lubricity, inhibits rust, and has a viscosity of 100 to 150 SSU at 100 degrees. Thin oil during cold weather, if necessary, to maintain raising and lowering speeds.

## **Miscellaneous Service Issues**

### *Cylinder Will Not Raise*

This is a sign of inadequate pressure in the cylinder. If a load is on the platform, remove same and try to raise unit. If unit will still not raise, check the power source...pump may not be operating in the correct direction....the raising solenoid may not be opening...the pump may be bypassing oil...the pump may not be primed.

### ***Service Instructions – MARMAC Hydraulic Cylinders (Continued)***

Close observation of the situation may indicate which of the foregoing is the cause. If the pump is by-passing at too low a pressure, the by-pass relief valve can be adjusted upward to suit the application, and motor horsepower. If the pump is not primed, make sure there is adequate oil in the reservoir to permit priming. Release any accumulated pressure in the discharge line by opening the lowering valve. Operate the pump unit under "no pressure" condition...this should cause the pump to prime. A slightly different sound will be emitted from the pump when oil is being removed. After the pump is operating satisfactorily and the bypass adjusted to the system pressure, the lift should raise with full load....after it has been operated up and down several times to free-up the packing , etc. If it does not, call the MARMAC Service Department for assistance.

If the system is an air/oil system, the usual fault is inadequate air pressure at the source. Also, check the length of the air lines leading to the lift installation. A gauge may be necessary to check out this pressure...and the gauge should be inserted into the system as close to the air/oil tank as possible. As a further word, a small air receiver on the air compressor soon bleeds down to minimum pressures and the lift will stop before it is completely up. In case the system is exposed to freezing weather in the winter, valves may freeze causing temporary loss of service. Use caution in thawing.

#### ***Cylinder Will Not Lower***

Check all the valving to ensure that the pressure is being adequately relieved to permit lowering. The adjusting screw for regulating the speed of opening and closing of some solenoid valves may need some slight adjustment. (Refer to MARMAC Service Manual for manufacturer's bulletin describing procedure to achieve desirable opening and closing speed.)

In case the cylinder will not lower under light or no load conditions check the valving as before; however in addition to this, check the cylinder packing to ensure that it is not too tight. Relieve the packing pressure, as mentioned in previous items, and check for lowering speed. Do not adjust so far as to cause packing to leak. In the case of air/oil system, perform the same checks as before to ensure proper valve operation.

#### ***Oil Is Being Lost***

Oil is usually readily apparent if it is coming from the packing, valves or pumps. An underground leak is not so readily apparent and this type of leak is serious since its effect is not usually noticed until faulty operation of the lift occurs.

The most danger occurs with an air/oil system, in that the hydraulic cylinder will operate with compressed air. The first noticeable indication of low oil will be the raising and lowering speed when the lift is at the extreme stroke. Since air will move through the oil lines and valves faster than oil, you will notice a sudden "jump" of the cylinder when the oil is exhausted out of the tank and air flows into the cylinder. This is an unsafe condition since the sudden movement may cause the load to fall off the lift. Also, the vertical movement of the lift is impossible to control since air is compressible. In other words, shutting off the valves after compressed air has bled over into the cylinder cavity will not stop vertical movement of the ram instantly as it does when oil only is in the cylinder. There will be some "coasting" until the pressure is equalized for the load or the ram stop is reached. The same thing is true when placing a load on a cylinder that is partially supported on compressed air. The air may compress allowing the cylinder to collapse until the pressure is equalized. In this case, the platform is not stable and accidents may occur.

**Therefore...REGULARLY CHECK THE OIL RESERVOIR- CHECK AND REFILL AS REQUIRED WHEN THE LIFT IS DOWN.**

***Service Instructions – MARMAC Hydraulic Cylinders (Continued)***

The problem is somewhat lessened with electric power units since most units will not seal sufficiently to allow them to pump air in any significant amount. Jerking or coasting, after valves are closed, would indicate low oil...this again should be checked.

LOW OIL SAFETY CONTROLS ARE AVAILABLE. (Marmac cylinders are equipped with an automatic air bleeder that bleeds air during each up and down cycle.)