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HYDRAULIC SEAL FAILURE

We get an occasional inquiry from a dealer or farmer regarding the causes of hydraulic motor seal failure in the ACE hydraulically driven centrifugal pump. Sometimes a failure can occur shortly after the pump has been placed in service; this indicates that there may be a problem other than the pump (such as incorrectly synchronized remote shut-off valves on the tractor). To assure our quality, every pump is tested after assembly. The assembly person checks each pump for hydraulic seal and mechanical seal leakage in both maximum load and maximum pressure conditions.

Hydraulic seal failure has three causes: Excessive Back Pressure, Overspeeding, or a Pressure Spike. Here's what you can do to correct and prevent these problems.

Always hook up the hydraulic lines so that the hydraulic lever in the tractor cab turns the pump ON in the "lower" position (forward quadrant), and turns the pump OFF in the "float" position (forward most quadrant). This prevents excessive back pressure from being trapped in the return hydraulic line. The pressure rating on the return side of the ACE hydraulic motor with a quad ring shaft seal is 100 psi continuous and 200 psi intermittent. The new -L cartridge seal is rated at 250 psi continuous and 500 psi intermittent.

Another way to prevent excessive back pressure is to route the hydraulic return hose directly to a low pressure return port instead of going back through the remote port. Older tractors may require a ported filter cover while newer tractors are equipped with special porting for seeder fan motors and pumps. The low pressure return reduces the back pressure on the motor and minimizes heat build up in the hydraulic oil. Consult your tractor dealer for information on the low pressure return and the best place to return oil on your tractor.

On large open center systems you can reduce hydraulic back pressure by increasing the size of the hydraulic hose from 1/2" to 3/4" inside diameter. Minimizing the length of hydraulic hoses will also reduce back pressure and heat buildup.

Overspeeding is another cause of hydraulic seal failures. At hydraulic motor speeds over 5000 rpm, the sealing surfaces will experience premature wear.

To determine proper hydraulic motor speed, install a pressure gauge on the discharge port of the pump. Next, shut off the boom, agitation, and bypass valves so that no liquid can get back to the tank or to the boom. This condition is referred to as "shut-off". The shut-off pressure shown on the pressure gauge should be below the maximum listed below.

MAXIMUM SHUT-OFF PRESSURE:
100 PSI for FMC-HYD Series
120 PSI for FMC-150-HYD-206
80 PSI for FMC-200-HYD-210
120 PSI for FMC-200-HYD-304
CAUTION: DO NOT EXCEED THE MAXIMUM SHUT-OFF PRESSURE

A more complete description of these procedures can be found on pages 4 and 5 of the ACE Operating Instructions for Hydraulic Motor Driven Centrifugal Pumps (Form# HYD-MAN) which is provided with each new ACE hydraulically driven centrifugal pump.

Finally, pressure spikes can cause motor seal failures. Pressure spikes can occur as a result of the return line quick coupler becoming dislodged during operation. This problem may be prevented by making sure the return hose is firmly attached in the return coupler.

Improper remote valve synchronization will also result in pressure spikes. This occurs when the return valve shuts off an instant before the supply valve, sending a spike back through the motor from the return side. This type of spike can be avoided by properly adjusting the valve synchronization or using a low pressure return.