HYDRAULICS

TOPICS

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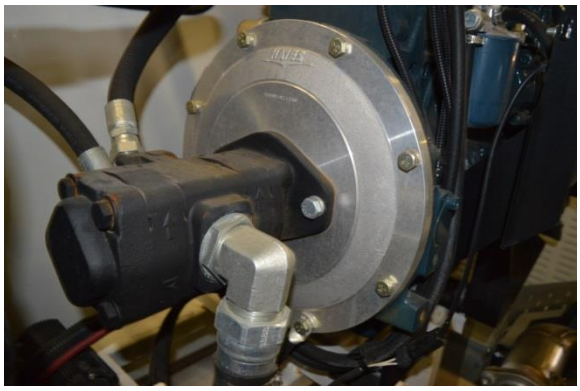
Hydraulic System

The hydraulic system is a very simple system. All the components of this system are common off the shelf parts.

Pump

The StarFire pump that is used is a double section gear pump. This type of pump is very durable and ideal for operating in adverse conditions common to most sweepers. Gear pumps are relatively inexpensive in comparison to load sensing piston pumps that need ideal conditions to operate. Piston pumps are also expensive to repair and even more expensive to replace.



The pump is splined into a flex plate that is bolted to the engine and bolts to the flywheel housing with a 2 bolt B flange. Each section of the pump operates a different manifold. Each section of the pump operates at the pressure required for operating each manifold and is set at the manifold. Each section of the pump produces 12 gpm at 2000 rpm. When the engine is running at full throttle each of these pumps produces over 16 gpm making total pump flow over 32 gpm.

Valves and Manifolds

The hydraulic manifolds used are a universally recognized bolt pattern for valves. The valves that are supplied with the sweeper are standard valves common to the mobile equipment industries and a configuration that could be obtained at most hydraulic shops. The valves and manifolds are common throughout both sweeper lines but may vary in valve arrangement depending on model. Each valve uses electric solenoids to activate and can be operated manually by pushing the brass button at the ends of

the valves. The electrical connection to the solenoid will light up when activated. This is a very handy troubleshooting tool to determine if a problem is hydraulic or electric. The valves mount to the top of the manifold and may have more than one valve stacked on top of each other which depends on the purpose of that particular function.

The manifold is a series/parallel manifold. This requires the manifold to be pressurized from one end only. It will not operate correctly if the pressure is flowing backwards though the manifold. A series/parallel manifold requires more than one valve to be activated for any function to operate. The manifold pressure is set by a relief valve on the back of the manifold. Check the manuals for correct pressure settings for the specific model. At no time should the pressure be set over the specified setting.

Hydraulic Oil Cooler

The hydraulic cooler uses an electric fan to blow air through a core that has oil flowing through it. The electric motor is not thermostatically controlled because should the sensor fail the hydraulics would quickly over heat. It is imperative that this fan works immediately when the auxiliary engine starts.

Hydraulic Motors

The motors are sized to turn the gutter brooms at approximately 80 rpm and the main broom at approximately 110 rpm. The elevator motor would be at the same rpm as the main broom but the elevator is chain and sprocket driven so the speed of the top shaft may vary depending on what sprockets are being used. The motors use a case drain that collects the oil that leaks internally and sends it back to the tank. This prevent the shaft seals from being pressured and eventually leak.

The biggest maintenance issue with motors is material wrapping around the motor shaft. This happens primarily on the gutter broom motors and occasionally on the main broom motor. This does not happen to the elevator motor being that it is up out of the dirt and the shaft is shielded by a drive chain guard. If the motors begin to wrap with material it must be removed immediately or the motor shaft seal could fail.