

LUBE

TECHNI-GRAM



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PROPER WET BRAKE MAINTENANCE

Farm tractors, off-highway machinery, industrial tractors, and related equipment require a variety of lubricants, ranging from engine oil, hydraulic fluids, transmission oils, and wet brake fluids. Today's hydraulic/transmission or tractor fluids lubricate transmissions, final drives, wet brakes and clutches, as well as hydraulic systems, typically from a common fluid reservoir on the tractor. These unique performance characteristics make tractor fluids acceptable for use in both on and off-highway commercial transmissions and high-pressure hydraulic systems. They can also be used in mining equipment.

Brakes in many types of wheeled construction and farm tractors have progressed from drum, to caliper-disc, to wet or dry multi-disc types. The wet multi-disc type...sealed away in the safety of the axle...seems to be the brake of choice in more and more applications. Certainly, wet brake applications are very prevalent within the many industries Southwestern Petroleum services. Enclosing the brakes in the rear axle allows equipment manufacturers to eliminate contact with the dirt and moisture found in construction and agriculture applications. Wet brake oil provides cooling and should exhibit good friction properties. A hydraulic/transmission fluid with ideal friction characteristics combines good stopping power or capacity with smooth engagements and minimal noise or chatter.

The fluid also must be matched with ambient temperature. Consideration must be given to oxidation, contamination, compatibility, and other properties. Use of multiple friction material such as sintered bronze, paper, and composites makes formulation of single oil for all use difficult.

Wet multi-disc brakes are located within a machine's axle and consist basically of a series of friction disc and separator disc, alternately stacked; the more disc, the greater the brakes capacity. When the disc stack is compressed via springs or hydraulic pressure, the axle's output shaft stops, since the discs are splined alternately to the shaft (or its driving member) and to the brakes stationary housing.

Wet multi-disc brakes run in oil, which dissipates the considerable heat generated and keeps the brakes working efficiently. Two types of cooling systems are used. A "sump" cooling system uses non-circulating oil, which can be a special oil sealed in the brake housing, or simply oil that is shared with the differential or final drives.



... to keep it running

A “forced” cooling system uses a circulating system with an external pump, oil cooler, and often a filter. The oil circulated may be the same as that in the differential or final drive; or, it may be a lighter oil contained in a separate circuit, since some gear oils used in axles are not compatible with friction material and seals in wet multi-disc brakes.

The hydraulic actuation system for these brakes may be used either to apply the brake, or, if it is spring applied, to release it. The actuation system typically uses a separate hydraulic circuit, with a pump supplying oil to the foot treadle in the cab, then to the brake. The apply/release circuit, as well as the cooling circuit may sometimes be part of another machine system. In a mining truck, for instance, the hoist system may supply the brakes cooling system, and the steering system the apply/release circuit.

While at one point in time, heavy equipment manufacturers recommended a variety of accepted oils...even engine oils... for use in multi-compartment applications, the advance of multi-disc brakes today requires following the manufacturer’s specific recommendations for oil. The use of fuel-efficient or friction modified engine oils in multi-disc brakes’ system could cause problems such as “stick-slip” which allows equipment to creep down grades. Also, improper oils may damage seals and allow fluids to mix with devastating results.

SWEPCO’s 709 Universal Tractor Transdraulic Oil and 714 Hydraulic Transmission Fluid are especially formulated to provide superior performance in most major manufacturers’ lubricant requirements for hydraulic systems, transmissions, power take-off units, final drives and **wet brake systems**. With SWEPCO 709 & 714, customers can be assured of superior performance and protection in the following areas:

- Formulated to meet the most demanding specifications
- Field-proven performance for
 - Less piston-pump wear and abrasion
 - Increased friction durability
 - Improved deposit control
 - Reduced final-drive wear
- Delivers smoother performance, reduced downtime, and more profitable operation.
- Enhanced compatibility with yellow metal to reduce hydrostatic transmission wear and control friction, promoting dependable efficient operation.
- Selected additives help provide superior protection against foaming, wear, corrosion, rust, sludge, varnish, water contamination, oxidation and brake chatter.