

# Eaton®

## Biodegradable Oil (Vegetable) Guidelines

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### Technical Data

Product Line	Rating With Biodegradable Oil	Comments
Heavy Duty Piston Pumps and Motors	80% of normal pressure rating listed for mineral oils Eaton Publications No. 5-410.	80° C (176° F) max fluid temp (unit) 70° C (158° F) max fluid temp (reservoir)
Medium Duty Piston Pumps and Motors	80% of normal pressure rating.	80° C (176° F) max fluid temp (unit) 70° C (158° F) max fluid temp (reservoir)
Light Duty Transmissions, Pumps, and Model 1150 Transaxle	90% of normal pressure or torque rating listed for mineral oils in Eaton Publications Nos. 11-880 and 11-873.	60° C (140° F) max fluid temp (unit)
Models 751, 851, 771, and 781 Transaxles	90% of 16:1 drive ratio torque rating, 75% of 19:1 drive ratio torque rating, and 60% of 23:1 drive ratio torque rating listed for mineral oils in Eaton Publication No. 11-888	60° C (140° F) max fluid temp (unit)
Series 2030 Motor Axles	60% of normal pressure rating listed for mineral oils Eaton Publication No. 11-878 for 2000 Series Disc Valve Motors	60° C (140° F) max fluid temp (unit)
Disc and Spool Valve Motors	60% of normal pressure rating listed for mineral oils Eaton Publication Nos. 11-878 and 11-885.	60° C (140° F) max fluid temp (unit)
Steering Valves, Control Valves, and Cylinders	100% of standard Eaton catalog or product pressure rating.	Maintain unit fluid temperature between 18° C (0° F) and 80° C (176° F)
Gear Pumps and Motors	80% of normal pressure rating.	80° C (176° F) max fluid temp (unit) 70° C (158° F) max fluid temp (reservoir)

#### ADDITIONAL NOTES:

- Viscosity and ISO cleanliness requirements must be maintained as outlined on the next page..
- Based on limited product testing to date, no reduction in unit life is expected when operating at the pressure ratings indicated above.
- Vegetable oil is miscible with mineral oil. However, only the vegetable oil content is biodegradable. Systems being converted from mineral oil to vegetable oil should be repeatedly flushed with vegetable oil to ensure 100% biodegradability.
- Specific vegetable oil products may provide normal unit life when operating at pressure ratings higher than those indicated above.

## Viscosity Requirements

Product Line	* Minimum	Optimum Range	Maximum	ISO Cleanliness Requirements	Comments
Heavy Duty Piston Pumps and Motors	45 SUS [6 cSt]	60 - 180 SUS [10 - 39 cSt]	10,000 SUS [2158 cSt]	18/13	
Medium Duty Piston Pumps and Motors Charged Systems	45 SUS [6 cSt]	60 - 180 SUS [10 - 39 cSt]	10,000 SUS [2158 cSt]	18/13	
Medium Duty Piston Pumps and Motors Non-charged Systems	45 SUS [6 cSt]	60 - 180 SUS [10 - 39 cSt]	2,000 SUS [432 cSt]	18/13	
Light Duty Transaxles, Transmissions, Pumps and Series 1150 Transaxles	60 SUS [10 cSt]	80 - 180 SUS [16 - 39 cSt]	10,000 SUS [2158 cSt]	18/13	Automotive multi-viscosity oils and ATF are not recommended
Series 2030 Motor Axles	70 SUS [13 cSt]	100 - 200 SUS [20 - 43 cSt]	10,000 SUS [2158 cSt]	18/13	Automotive multi-viscosity oils and ATF are not recommended
Char-Lynn J, R, and S Series Motors, and Disc Valve Motors	70 SUS [13 cSt]	100 - 200 SUS [20 - 43 cSt]	10,000 SUS [2158 cSt]	18/13	
Char-Lynn A Series and H Series Motors	100 SUS [20 cSt]	100 - 200 SUS [20 - 43 cSt]	10,000 SUS [2158 cSt]	18/13	
Char-Lynn Steering Control Units, Priority and Control Valves	55 SUS [9 cSt]	100 - 200 SUS [20 - 43 cSt]	8,000 SUS [1900 cSt]	18/13	When emergency manual steering is required, maximum viscosity is 2,000 SUS [450 cSt]
Gear Pumps and Motors, and Cylinders	45 SUS [6 cSt]	60 - 200 SUS [10 - 43 cSt]	10,000 SUS [2158 cSt]	18/13	

\*MINIMUM VISCOSITY APPLIES AT INTERMITTENT CONDITION OF 10% OF EVERY MINUTE.

### Additional Notes:

- Products using fluids exceeding the maximum viscosity limits in cold weather start-ups will cause pump cavitation and possible damage. Motor cavitation is typically not a problem during cold start-ups, but can cause high case pressures which may exceed motor shaft seal rating.
- When choosing a hydraulic fluid, all the components in the system must be considered and the optimum viscosity range adjusted accordingly. For example, when a medium duty piston pump is combined with a disc valve motor the optimum viscosity range becomes 100 - 180 SUS [20 - 39 cSt] and viscosity should never fall below 70 SUS [13 cSt].
- If the natural color of the fluid has become black it is possible that an overheating problem exists.
- If the fluid becomes milky, water contamination may be a problem.
- Take fluid level reading when the system is cold.
- Contact your Eaton representative if you have specific questions about the fluid requirements of Eaton hydraulic components.

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