LUBRICATION INSTRUCTIONS

HecoGear Inc. planetary speed reducers may be lubricated as a self as a self-contained unit using gear oil, or as an integral part of the hydraulic system where the hydraulic fluid is passed from the hydraulic drive motor to lubricate the speed reducer -- "Flow Through Lubrication" -- as an example is the Charlynn bearingless hydraulic motor.

Self-Contained Units
When installed as a self-contained unit, ensure adequate ventilation is provided to allow for lubrication expansion.

Horizontal Shaft
In applications where the speed reducer is lubricated as a self-contained, horizontal unit, it is recommended that the unit be half-filled with EP oil (see chart for amount and proper grade gear oil).

Vertical Shaft Down
Set the speed reducer on its output shaft and fill it to the center line of the upper planetary gear train.

Vertical Shaft Up
For vertical installations (output shaft up) contact HecoGear Inc.

"Flow Through" Lubrication:
Systems Lubricated by the Hydraulic Motor
In applications where the speed reducer is lubricated by oil flow from the hydraulic motor, a suitable petroleum based hydraulic oil with EP1 additives should be used as system hydraulic fluid. The oil must contain a minimum of .125% Zinc Anti-Wear Additive. Ensure that a minimum case drain oil flow of 2 gpm is maintained and case drain line pressure does not exceed 50 psi. The speed reducer should be completely filled with system hydraulic fluid before assembling the hydraulic motor to the reducer.

Case Drains
No case drain is required when the speed reducer is lubricated by its own gear oil. "Flow Through Lubrication" requires a separate case drain line when the speed reducer/motor combination are connected in series with other components that cause case drain pressure to exceed 50 psi.

The most popular hydraulic motors connected to the Model 16 HecoGear speed reducer that provide "Flow Through" lubrication are the Charlynn 2000 series and the 4000 series bearingless hydraulic motors. The correct location for the drain on these units is:

C/L 2000 Bearingless	Connect case drain to the hydraulic motor
C/L 4000 Bearingless	Connect case drain to the hydraulic motor or to the speed reducer

The case drain should be routed back up to the reservoir above the motor/reducer to maintain the oil level in the speed reducer -- be sure the case drain does not act as a siphon and allow the case drain to deplete the oil in the motor/speed reducer.

Maximum Oil Temperature
140^{0}F (60C) Continuous
170^{0}F (76C) Intermittent
Consult HecoGear, Inc. for higher temperatures.

Viscosity
The viscosity should be between 100-200 SUS, 70 SUS extreme minimum; and 10,000 SUS extreme maximum.

General Maintenance
The oil should be cleaned after the first 50 hours and 100 hours of operation, and every 1000 hours thereafter.

Oil should be drained while the unit is at operating temperature. The unit should be cleaned with flushing oil (use of solvents should be avoided). Note: The importance of a thorough gear case cleaning and proper changing of oil cannot be over emphasized. If the maximum oil operating temperature is exceeded, change the oil immediately.

Extreme Pressure Lubricants
These lubricants are petroleum base liquids with chemical additives, such as sulfur phosphorous or similar materials or soluble compounds which produce a protective film to withstand high gear loading.

Consult HecoGear, Inc. for special oil requirements.

SPECIAL NOTE
* The oil must be compatible with soft metals. (i.e. brass thrust plug). Some oils attack copper and copper alloys like brass.
** Bio-degradable oils cut performance specifications to 60% of the original.

Model 16	Capacity	rpm Out	SAE Gear Oil	ISO #	AGMA #
50 oz	20	0-25	90	220 VG	#5
15 dl	6	25-100	80W	100 VG	#3
105 oz	40	100-200	75W	46 VG	#1
31 dl	12	200+	consult	consult	consult