

Petro-Canada TechData



VULTREX™ OPEN AND ENCLOSED GEAR LUBRICANTS

Introduction

Petro-Canada's VULTREX Line of grease-based open gear lubricants (OGL) and enclosed gear fluids (EGF) are advanced "Solution Provider" products containing synthetic fluids to provide excellent protection for handling the harshest operating conditions that can be encountered – from severe winter cold to extreme summer heat and from very wet to dusty environments.

Vultrex OGL's ability to extend shovel component life (derived from actual operating data) may provide customers with reduced operating costs and savings. Vultrex OGL Synthetic 2200 outperforms leading competitive products by meeting the strict P&H 520 standard.

Vultrex greases are designed to lubricate large, heavy duty open and enclosed gear drives, as well as bushings and bearings found on mining and off-highway machinery. Vultrex greases are formulated with aluminum complex soaps, taking advantage of their flow and shear properties to protect and extend equipment life. Vultrex OGLs meet the P&H, Bucyrus International (including Marion), Terex O&K, and

Komatsu (including Demag) requirements for gear lubricants and are used in the following industries: Mining, Forestry, Pulp and Paper, Construction and General Manufacturing.

Features and Benefits

- **Extends Shovel Component Life**
 - VULTREX OGL technology extends electric shovel component life
 - P&H 4100 shovel component life increased by an average of 20,000 hours
 - Bucyrus 395B shovel component life increased by an average of 25,000 hours
 - VULTREX OGL technology extends hydraulic shovel component life
 - RH 200 shovel component life increased by an average of 15,000 hours
 - RH 400 shovel component life increased by an average of 4,500 hours

What is the HT difference?

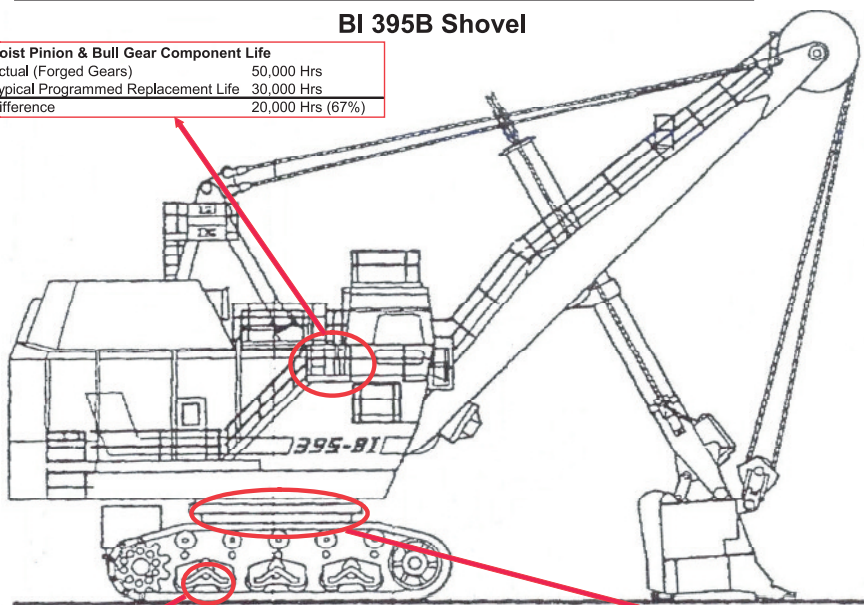
Petro-Canada starts with the HT purity process to produce water-white, 99.9% pure base oils. The result is a range of lubricants, specialty fluids and greases that deliver maximum performance for our customers.



Petro-Canada's VULTREX OGL technology extends BI 395B shovel component life by an average of 25,000 hours

BI 395B Shovel

Hoist Pinion & Bull Gear Component Life	
Actual (Forged Gears)	50,000 Hrs
Typical Programmed Replacement Life	30,000 Hrs
Difference	20,000 Hrs (67%)



Lower Roller Pin Component Life	
Actual	20,000 Hrs
Typical Programmed Replacement Life	15,000 Hrs
Difference	5,000 Hrs (33%)

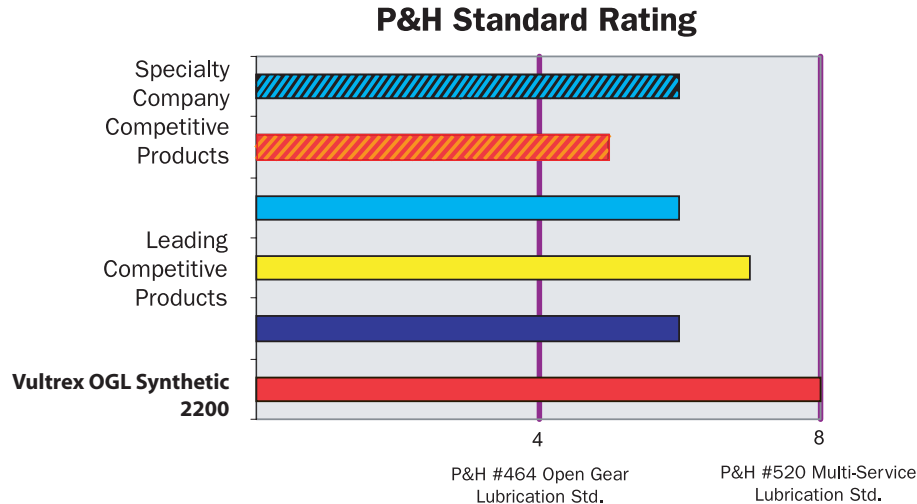
Swing Gear Component Life	
Actual	100,000 Hrs
Typical Programmed Replacement Life	50,000 Hrs
Difference	50,000 Hrs (100%)

*Results are from actual operation on a Bucyrus 395B electric shovel at customer location. Similar results have been documented on other OEM electric & hydraulic shovels.

- **First to meet P&H 520 Standard**

- To meet the P&H 520 standard, a product has to meet a series of ASTM test requirements
- VULTREX OGL Synthetic 2200 meets the P&H 520 Standard, which leading competitive products fail to meet

VULTREX OGL Synthetic 2200 Meets P&H 520 Standard



* The results of four tests (Timken OK Load, Timken Retention, Four Ball Weld and Four Ball Wear) are compared against the P&H 464 and P&H 520 standard. For each test, 1 point is assigned if it meets the requirements of P&H 464, and 2 points if it meets P&H 520.

Meets the Bucyrus International SD4713 specification

- VULTREX OGL Synthetic 2200, VULTREX OGL Synthetic All Season 680, VULTREX OGL Synthetic Arctic, VULTREX OGL Heavy 3600 and VULTREX OGL Heavy 6200 all meet the Bucyrus International SD4713 open gear lubricant specification. VULTREX OGL Heavy 3600 and VULTREX OGL Heavy 6200 both meet the additional requirements of the Bucyrus International SD4713 specification for electric mining shovel hoist drum gear lubrication.

- **With the 5 VULTREX OGL products, outstanding protection against wear and surface damage on gears and slides**

- Continuous lubricating film as there is no solvent to wash off
- Good spreadability and coverage
- Surfaces are protected against rust and corrosion
- Helps prevent against scoring and spalling of gear teeth under heavy loads
- Formulated with solid lubricants to protect surfaces and minimize gear wear.

- **Wide range of operating temperatures**

- VULTREX OGL Synthetic All Season 680 has a wide operating temperature of -40°C to 40°C (-40°F to 104°F)
- VULTREX OGL Synthetic 2200 has an operating temperature from -30°C/-22°F to +50°C/122°F
- VULTREX OGL Synthetic Arctic is pumpable down to -50°C/-58°F and up to +10°C/50°F
- VULTREX OGL Heavy 3600 has an operating temperature range from -10 °C/23 °F to + 50 °C/+122 °F.
- VULTREX OGL Heavy 6200 has an operating temperature range from -5°C/23°F to 60°C/140°F.
- In most climates, VULTREX OGL Synthetic All Season 680 will be the only product required.

- **Outstanding adhesive properties**

- Highly resistant to water wash-off in rain, snow and sleet conditions
- Resists being thrown off from rotating parts

- Adheres tenaciously on surfaces to maintain proper film thickness to lubricate equipment
- **Free of solvents (including citrus and chlorinated solvents), and heavy metals such as lead**
- Reduced lubricant consumption

Applications

All VULTREX lubricants are formulated for use in either automated spray systems or by direct application onto gear teeth, slides or other lubricated surfaces. Major applications for VULTREX include:

- Mining and construction shovels
- Draglines
- Ball mill and grinding mill gears
- Kiln drives
- Drills
- Wire ropes
- Large bearings turning at low speeds
- Slides, dipper sticks and racks
- Bushings
- Propel systems

VULTREX OGL SYNTHETIC 2200 is a solvent-free, synthetic open gear lubricant designed to provide excellent open gear lubrication performance. VULTREX OGL Synthetic 2200 provides excellent wash-off resistance from the shovel stick under all weather conditions and has a lower temperature limit of -30°C/-22°F. VULTREX OGL Synthetic 2200 meets the P&H 520 and P&H 464 specifications, and the Bucyrus International SD4713 specification.

VULTREX OGL SYNTHETIC ALL SEASON 680 is a solvent-free synthetic open gear lubricant suitable for year round use in many climates, with a minimum operating temperature of -40 °C. VULTREX OGL Synthetic All Season 680 meets the P & H 464 open gear lubricant specification, and the Bucyrus International SD4713 open gear lubricant specification.

VULTREX OGL SYNTHETIC ARCTIC is a solvent-free synthetic open gear lubricant. It is intended for use at the very low temperatures encountered in sub-arctic locations during the winter season. It has a proven track record of performance under such conditions, and is recommended for use in these low temperature applications. VULTREX OGL Synthetic Arctic meets the P & H 464 open gear lubricant specification, and the Bucyrus International SD4713 open gear lubricant specification.

VULTREX OGL HEAVY 3600 (contains synthetic lubricants) is a solvent-free open gear lubricant with a higher viscosity and thicker consistency than other VULTREX OGL lubricants. It is suited for the most demanding open gear lubrication requirements and high temperature conditions where low temperature pumpability is not a requirement. VULTREX OGL Heavy 3600 meets the P&H 464 specification, and the Bucyrus International SD4713 specification, including the special requirements for electric mining shovel hoist gears. VULTREX OGL Heavy 3600 is not intended for the lubrication of bushings or bearings.

VULTREX OGL HEAVY 6200 (contains synthetic lubricants) is a solvent-free open gear lubricant with a higher viscosity and thicker consistency than other VULTREX OGL lubricants. It is suited for the most demanding open gear lubrication requirements and high temperature conditions where low temperature pumpability is not a requirement. VULTREX OGL Heavy 6200 meets the P&H 464 specification, and the Bucyrus International SD4713 specification, including the special requirements for electric mining shovel hoist gears. VULTREX OGL Heavy 6200 is not intended for the lubrication of bushings or bearings.

VULTREX EGF-1000 (contains synthetic lubricants) is specifically formulated for heavily loaded enclosed gears on draglines, shovels and excavators. It provides exceptional film strength and excellent anti-wear protection. It is intended for gears where the manufacturer specifies viscosities in excess of 1000 cSt or where a semi-fluid grease is used.

VULTREX EGF-1000 has been used successfully as a lubricant in the enclosed gears of electric mining shovels, underground mining locomotives and many other applications. Due to its exceptional fluidity, film strength and wear resistance, VULTREX EGF-1000 has also been applied as ball mill gear lubricant. It also provides excellent results in with worm gears where “yellow” metals are present and sulphur/phosphorus extreme pressure additives cannot be used.

Operational Considerations

Petro-Canada's VULTREX line of greases provides long service life under normal operating conditions up to their maximum recommended temperature. However, actual grease life is dependent upon system design and operating practices.

Typical Performance Data

PROPERTY	TEST METHOD	VULTREX OGL					VULTREX
		Synthetic Arctic	Synthetic All Season 680	Synthetic 2200	HEAVY 3600	HEAVY 6200	EGF 1000
NLGI Grade	D217	—	0/00	0	0	0	000
Dropping Point, °C/°F	D2265	202/396	243/469	238/460	223/433	248/478	205/401
Worked Penetration, 60 strokes	D217	378*	405	376	369	361	451
Copper Corrosion	D4048	1b	1b	1b	1b	1a	1a
Flash Point, °C (Base Fluid)	D92	175	169	213	327	333	203
Base Fluid Viscosity cSt @ 40°C/104°F	D445	251	748	2223	4033	6489	412
Apparent Viscosity** cSt @ 40°C/104°F	D3232	4,230	10,710	20,400	26,800	28,700	5,880
Mobility, g/s @ 0°C/32°F @ -5°C/23°F @ -10°C/14°F @ -20°C/-4°F @ -25°C/-13°F @ -30°C/-22°F @ -35°C/-31°F @ -40°C/-40°F @ -45°C/-49°F @ -50°C/-58°F	PCM 533	- - - - - - - - 0.026 0.009	- - - 0.055 0.023 0.008 -	0.056 0.021 0.009	0.074 0.030	0.147 0.077 -	0.034 0.010
Timken OK Load, Kg/lb	D2509	18/40	18/40	25/55	-	-	23/50
Four Ball Weld Point, kg	D2596	800*****	800*****	800	800	800	400
Four Ball Wear, scar diam, mm	D2266	0.7	0.7	0.6	0.7	0.6	0.6
Lowest Dispensing Temp*** in a Centralized System, °C/°F		-50/-58	-40/-40	-30/-22	-10/23	-5/23	-30/-22
Recommended Operating Temp. Range, °C/°F		-50 to 10/ -50 to 50	-40 to 40/ -40 to 104	-30 to 50/ -22 to 122	-10 to 50/ 23 to 122	-5 to 60/ 23 to 140	-40 to 100****/ -40 to 212

The values quoted above are typical of normal production. They do not constitute a specification.

* Plastic Cone

** Viscosity as applied - Apparent viscosity is the ratio of shear stress to shear rate of a non-Newtonian fluid. This information can be valuable in predicting the ease of pumping and dispensing of greases.

*** Based on pumpability test, but is dependent on the design and type of the dispensing systems, length and diameter of the lines, the mode of application and rate of pressurization.

**** Once the gear case is filled, the gearing system can operate at temperatures as low as -40°C/°F based on actual operation.

***** Measured before the addition of diluent, as per the Bucyrus International SD 4713 specification.

Health and Safety

To obtain Material Safety Data Sheet (MSDS), contact one of Petro-Canada's TechData Info Lines.



TechData Info Lines

To place an order, please call a Customer Order Management Representative at :

Canada (English) Phone 1-800-268-5850
(French) Phone 1-800-576-1686
United States Phone 1-877-730-2369
Latin America Phone +1-416-730-2369
Europe Phone +1-416-730-2389
Asia Phone +1-416-730-2372
China Phone +86 (21) 6362-0066

To learn more about how Petro-Canada lubricants, specialty fluids, oils and greases can help maximize your equipment performance, savings and productivity, please contact us at :

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Beyond today's standards.

