

NNL 690G FOR GEARS

Power Up **NNL 690G** has been developed to greatly enhance the lubricating properties of extreme pressure gear oils. Changing industry technology dictates improvements and demands specialization. Power Up has met this challenge head on.

Primary Benefits of NNL 690G:

- *Reduced friction*
- *Extremely high film strength*
- *Increased Energy Efficiency*
- *Improved lubrication*
- *Reduced dry starts*
- *Increases component life and equipment availability.*
- *Reduced operating temperatures*
- *Reduced maintenance costs and downtime*

Applications for NNL 690G:

Recommended wherever EP (extreme pressure) oils are used at 3-5% rates. Including but not limited to:

- *Gear Reducers*
- *Bearing Housings*
- *Chain Drives*
- *Standard Transmissions*
- *Bull Gears and Pinions*
- *Mud Pumps*
- *Differentials (except limited slip or positrac)*
- *Final Drives*
- *Low Ash Engines*
- *Cone and Jaw Crushers*
- *Rotary Tables*
- *Tube and Ball Mills*
- *Drop Boxes*

BOUNDARY LUBRICANT FOR GEAR OIL

Power Up **NNL 690G** is specially formulated for use in all types of mobile and industrial equipment where Extreme Pressure (EP) oils are called for (API GL-3 or greater). Specific applications include gear reducers, bearing housings, differentials (except posi-trac or limited slip), cone and jaw crushers, pulverizing equipment, final drives, conveyor drive gear boxes, standard transmissions, drop boxes, rotary tables, tube and ball mills, chain drives, mud pumps, bull gear and pinion sets, etc.



The primary benefit of **NNL 690G** is to reduce the friction caused by asperity (metal to metal) contact in the boundary lubrication regime. It is designed for lubricated systems which call for extreme pressure (EP) oils and engines requiring low ash-content oils.

Secondary Benefits of NNL 690G:

- **Reduces ultrasonic wear noise which relates directly to component wear.**
- **Reduces dry start-ups.**
- **Lowers operating temperatures and slows oil degradation.**
- **Decreases wear in cold temperature applications (conventional EP additives are very dependent upon temperature to chemically react with the wear surfaces). The high film strength protection provided by NNL 690G is less dependent on temperature.**
- **Reduces fuel and/or electrical amperage consumption in gearbox or reducer applications.**
- **Improves filtration efficiency by reducing the generation of large wear particles.**
- **Non toxic.**

"When we did our inspections on our mudpumps prior to using your product we would always find a lot of metal flake on the magnets that we placed in the bottom of our oil reservoirs. Since adding NNL 690G to our gear oil, we have dramatically reduced the amount of these metal particles found thus increasing the life of our mudpumps. The increase in the life of our mudpumps along with an effective oil analysis program to monitor the oil condition changes have saved us thousands of dollars in wear related costs.
Pat Burns, General Manager, Energy Drilling - Natchez, Mississippi



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NNL 690G: INSIST ON THE MOST TECHNOLOGICALLY ADVANCED GEAR LUBRICANT AVAILABLE



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Typical Properties of NNL 690 G		
Property	Method	Result
Appearance		Clear, light amber liquid
Color	ASTM D1500	Less than 1.5
Viscosity @ 40°C (104°F) @ 100°C (212°F)	ASTM D445	70 cSt 10 cSt
Viscosity Index	ASTM D2270	129
Specific Gravity	ASTM D941	0.96 (H2O = 1)
Density @ 68°F (20°C)	ASTM D941	0.96 g/mL
Pour Point	ASTM D97	-31°F (-35°C)
Flash Point	ASTM D92	349°F (176°C)
Acid Number	ASTM D664	1.5 mg KOH/g
Zinc Content, ppm Lead Content, ppm		nil nil
Colloidal Suspension (Solid particles, PTFE, graphite, MoS2)		none

Special Notations on NNL 690G	
Viscosity:	A 5% application of NNL 690G in typical 90 weight gear oil results in little or no change in viscosity or viscosity index.
Pour Point:	NNL 690G is formulated to have a negligible effect on the pour point of typical gear oils.
Ash Content:	Power Up NNL 690G has a very low total ash content (less than 0.2%). It is therefore suitable for use in the crankcase of engines that require a low ash or ashless oil.
Application:	NNL 690G is intended for use in gear boxes using extreme pressure (API GL-3 or greater) oils. It should be added with each oil change at 5% of the gear oil volume. In engine crankcases, NNL 690G should be added at 3% of the oil volume each time the oil is changed. It can also be used in automatic transmissions at an application rate of 1%, power shift transmissions at 3% and in circulating systems at 3% to 5%, depending upon operating conditions. NNL 690G is compatible with all mineral oils and polyalphaolefin and diester based synthetic oils. NNL 690G is not recommended for use with water based fluids, phosphate esters or polyglycol fluids.

Test Data on NNL 690G		
Property	Method	Result
Copper Strip Corrosion (266°F (130°C) x 2 Hours)	ASTM D130	1a
Rust Preventing Characteristics - NNL 690G - 5% NNL 690G in ISO 220 gear oil	ASTM D665	Pass Pass
Foaming Tendency - 5% NNL 690G in ISO 220 gear oil Sequence 1 Sequence 2 Sequence 3	ASTM D892	Nil Nil Nil

Product Application:

NNL 690G is intended for use in all types of mobile and industrial equipment where EP oils are used. NNL 690G should be applied with each oil change at 5% of the gearbox capacity. With gear oils heavier than ISO 320, NNL 690G should be used at 3-5%. In internal combustion engine crankcases using low ash or ashless oils, NNL 690G should be used at 3% of the oil volume with each change. It is also suitable for use in automatic transmissions at an application rate of 1%, in power shift transmissions at 3%, and in circulating systems at 3% or 5%, depending on the severity of service. NNL 690G is compatible with mineral based oils and with synthetic oils based on polyalphaolefins and diesters. At recommended application rates, it will not effect typical gear or engine oil viscosity ratings or seal materials.

Power Up NNL-690G Application Quick Reference Chart	
Component	Amount NNL-690G to Add
Standard Transmissions Using EP Gear oil	3 - 5% (1 oz / qt - 1.7 oz qt)
Standard Transmissions Using ATF	3 - 5% (1 oz / qt - 1.7 oz qt)
Differentials / Transfer cases using EP Gear oil	3 - 5% (1 oz / qt - 1.7 oz qt)
Differentials / Transfer cases using ATF	3 - 5% (1 oz / qt - 1.7 oz qt)
Limited Slip Diffs (NO Friction Modifier)	3 - 5% (1 oz / qt - 1.7 oz qt)
Gear Drives (w/EP Gear Oil)	3 - 5% (1 oz / qt - 1.7 oz qt)

NNL 690G is available in the following convenient sizes:

- 1 Liter (35 oz.) Bottle
- 1 Gallon (128 oz.) Jug
- 20 Liter (5.5 Gallon / 700 oz.) Pail
- 205 Liter (56.05 Gallon / 7,175 oz.) Drum



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