

Power Up Lubricants Application Recommendations

Power Up research and development recognized many years ago that a single product, multi-application approach to lubrication would not meet the ever-increasing demands of engine, differential and transmission developments. Since 1990, we have refined our original **NNL 690** boundary lubricant and have added **NNL 690G** and **Hydra Maxx** to our line of quality boundary lubricants. Each of these products is specifically designed with features that make them more suitable for, and compatible with, the lubricants in different service. The attached chart summarizes the proper applications for the different Power Up Lubricants.

NNL 690, originally recommended as a universal oil additive, was formulated for the gasoline and diesel internal combustion engine crankcase. It contains anti-wear and boundary lubricating additives, acid neutralizers, corrosion inhibitors and metal deactivators, detergents and dispersants and anti-oxidants to provide improved, complete and balanced protection to typical engine oils.

NNL 690G was developed to be more compatible with the chemistry of extreme pressure gear lubricants. As the use of **NNL 690** became more prevalent in EP lubricants, we realized that there are components in **NNL 690** that, while they are important in engines, are not required in gearbox applications. Specifically, the alkaline reserve (acid neutralizers) and detergents needed to control blow-by gases and sludge in engines serve no purpose in gearboxes. **NNL 690G** was therefore formulated to better suit the conditions within gearboxes. The absence of the alkaline reserve component also makes **NNL 690G** virtually ashless making it suitable for use in engines requiring low-ash or ashless oils.

Both **NNL 690** and **NNL 690G** contain components that cause water to be absorbed into the oil. This property helps control moisture from blow-by and condensation and prevents corrosion that might result from free water in a system. Some hydraulic and compressor systems can be adversely affected if the oil absorbs water. Their water coalescing filters may be plugged if the oil and water emulsify. **Hydra Maxx** was formulated to provide the same benefits as **NNL 690** and **NNL 690G**, but to not emulsify or absorb moisture. In fact, **Hydra Maxx** even speeds the separation of water from many hydraulic oils. Cold temperature flow becomes critical at start up for hydraulics, so **Hydra Maxx** also improves the cold flow properties of most hydraulic oils. It is specifically a hydraulic and circulating system treatment for all mobile and stationary systems.



Power Up Product Application

Put the right amount, of the right product,
In the right place and at the right time.

<i>Component</i>	<i>NNL 690</i>	<i>NNL 690G</i>	<i>Hydra Maxx</i>
Gasoline Engines	✓ 3-5%	✓ 3-5%	✗
Diesel Engines	✓ 3-5%	✓ 3-5%	✗
Engines requiring Low-Ash / Ashless Oil	✗	✓ 3-5%	✗
Small, air cooled two-stroke engines *	✓ 3% (in 2-stroke oil)	✓ 3% (in 2-stroke oil)	✗
Small, water cooled two-stroke engines	✗	✓ 3% (in 2-stroke oil)	✗
Automatic Transmissions	✓ 1%	✓ 1%	✓ 1%
Standard Trans. using EP Gear oil	✗	✓ 5%	✗
Standard Trans. using ATF	✓ 5%	✓ 5%	✓ 5%
Standard Trans. using engine oil	✓ 5%	✓ 5%	✓ 5%
Diff's/Transfer cases using EP Gear oil	✗	✓ 5%	✗
Diff's/Transfer cases using ATF	✓ 5%	✓ 5%	✓ 5%
Power Steering Pumps	✓ 3%	✓ 3%	✓ 3-5%
Gear Drives (w/EP Gear Oil)	✗	✓ 5%	✗
Hydrostatic Drives	✓ 5%	✓ 5%	✓ 5%
Powershift trans.	✓ 3%	✓ 3%	✓ 3%
Ag-tractor TDH systems	✗	✓ 3%	✓ 3%
Hydraulic Systems	✓ 3%	✓ 3%	✓ 3-5%
Compressors	✓ 3%	✓ 3%	✓ 3-5%
Hydraulics/Compressors with Water separators	✗	✗	✓ 3-5%

* Many small 2-Stroke engines require low-ash oils. In these NNL 690G should be used!

✓ = Recommended ✓ = Acceptable substitute ✗ = Not Recommended