



LE PRODUCTS
MANUFACTURED
UNDER AN ISO
9001:2000
CERTIFIED
QUALITY SYSTEM

8800 MONOLEC ULTRA® ENGINE OIL

Long-drain SAE 15W-40 engine oil designed for year-round extended drain service in diesel and gasoline engines for fleet and industrial use.

LE's 8800 MONOLEC ULTRA® Engine Oil provides the most desired features and benefits for heavy-duty service in diesel and gasoline engines. Through a unique formulation available only from Lubrication Engineers®, Inc., 8800 MONOLEC ULTRA® Engine Oil offers exceptional service.

The dependable 15W-40 viscosity range is made possible by a shear-stable viscosity modifier developed and proven by LE through years of research and actual field experience. LE's 8800 MONOLEC ULTRA® Engine Oil contains MONOLEC®, LE's exclusive wear reducing additive and select 100% paraffinic base oils. *No other brand of petroleum lubricating oil, regardless of price, will be found superior in condition to LE's MONOLEC ULTRA® Engine Oil at the end of any given period of use.*



WHAT IS MONOLEC®?

MONOLEC® is LE's exclusive wear-reducing additive which has proven its extraordinary performance in thousands of applications. It is an invaluable component in LE's engine oils, industrial oils and other lubricants bearing the MONOLEC® trademark.

MONOLEC® creates a singular molecular lubricating film on the metal surface, vastly increasing film strength without affecting tolerances. MONOLEC® allows opposing surfaces to slide by one another, greatly reducing friction heat and wear.



- ⓁE Safe extended drain intervals of up to 100,000 miles in diesel engines and up to 25,000 miles in gasoline engines with specified filter changes and periodic scheduled oil analysis.
- ⓁE All-season, all-weather performance affords minimal drag during startup at low temperatures, while effectively lubricating at high temperatures.
- ⓁE Superior anti-wear protection through two anti-wear agents which work together to reduce wear to an absolute minimum.
- ⓁE Reduced oil consumption. 8800 MONOLEC ULTRA® Engine oil has continuously cut oil consumption up to 60% in field tests and even more in actual usage. Individual results vary with engine and operating conditions.
- ⓁE Improved fuel mileage was proven in tests to increase fuel efficiency up to 2.5%, with greater increases being realized by many users.
- ⓁE Long service life comes from oxidation inhibitors combined with select 100% paraffinic base oil which prevents excessive thickening or deposit formation.
- ⓁE Heavy-duty detergents and dispersants keep engine parts clean and keep contaminants in suspension until removal by draining the oil.
- ⓁE Nonfoaming in service to provide smooth engine performance.
- ⓁE Improved fleet reliability and uptime. No fleet can afford unscheduled downtime. LE's 8800 MONOLEC ULTRA® Engine Oil is the only choice for dependable service in all conditions.

**LUBRICATION
ENGINEERS®, Inc.**

Leaders in Lubricants



ENGINE OILS TESTED	FALEX PIN & VEE BLOCK WEAR TEST (ASTM D-2670)	TFOUT (ASTM D-4742)
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Index Number	Pass/Fail	Teeth of Wear	Minutes
A	Pass	9	150
B	Pass	7	289
C	Pass	11	135
D	Fail		141
E	Pass	12	179
F	Pass	18	275
G	Pass	13	125
H	Pass	12	829*
I	Pass	2	229
J	Pass	17	905*
K	Pass	15	193
L	Pass	5	172
M	Pass	16	374
N	Pass	8	169
O	Pass	5	162
P	Fail		136
Q	Pass	6	701*
R	Pass	6	225
S	Pass	16	174
T	Pass	19	133
U	Pass	11	142
V	Fail		235
W	Fail		217
X	Fail		192
Y	Pass	20	182
Z	Pass	5	132
LE's 8800 MONOLEC ULTRA® Engine Oil	Pass	3	311

FALEX PIN & VEE BLOCK WEAR TEST (ASTM D-2670)

In the Falex Pin & Vee Block Wear Test (ASTM D-2670), a rotating steel pin is compressed between two steel blocks with a V shaped groove in each. The test specimens are immersed in the test oil. The blocks are loaded against the pin with a force of 350 lbs. for a five minute break-in period. After the break-in period the load on the rotating pin is increased to 600 lbs. The load is maintained at this level for 15 minutes. At this point, the wear on the pin and blocks is evaluated by counting the number of "teeth" on the wheel used to apply the load. A wear depth of 0.001 inch corresponds to 14.410 teeth on the loading wheel. The test is started at ambient temperature and the sample oil temperature increases from frictional heating. This is somewhat like "cold engine start," which produces the highest engine wear rates.

TFOUT (ASTM D-4742)

The Thin Film Oxygen Uptake Test (TFOUT ASTM D-4742) tests the oxidative stability of oils. The TFOUT utilizes the standard Rotary Bomb Oxidation Test equipment. An aluminum insert is placed in the bomb to reduce its volume. A small beaker is placed on top of the insert which contains 1.5 grams of the test oil. This small sample results in a very thin film of the oil. Added to the sample is 5 weight percent of soluble metal catalysts, 5 weight percent oxidized fuel components and 2 percent water. The soluble metals, oxidized fuel and water simulate the contaminants that an oil is exposed to in an engine from wear debris, blow-by and condensation. The oxygen bomb is then reassembled, purged with oxygen and pressurized to 90psi. The bomb is placed in an oil bath where it rotates to provide agitation. The end of the test is the time, minutes, from placing the bomb in the bath to the point where the bomb chart recorder shows a continuous drop in pressure. The period is referred to as the induction time for the onset of oxidative degradation. The longer the induction time, the better the oxidation resistance of the oil.

* No inflection point noted. Time to 25.4 psi pressure drop reported.

LE's MONOLEC ULTRA® Engine Oil Outperforms the Competition in Wear Protection and Oil Life.

Formulated to Extend Drain Intervals Without Sacrificing Engine Life.

Today's heavy-duty applications are pushing fleet vehicles to new levels of endurance. To stand up to these grueling conditions, it takes the strength of 8800 MONOLEC ULTRA® Engine Oil.

This exclusive formula is a synergistic blend of 100% paraffinic base oils and a high-performance, heavy-duty additive system featuring MONOLEC® – LE's proprietary, wear-reducing additive that boosts oil film strength and minimizes metal-to-metal contact. So now, you can safely lengthen

drain intervals while cutting operating costs and prolonging engine life.

Proven Success in Test After Test.

Friction and heat might overpower lesser lubricants. But 8800 MONOLEC ULTRA® Engine Oil consistently turns in a superior performance in a range of fleet applications, including industrial, agricultural and governmental uses.

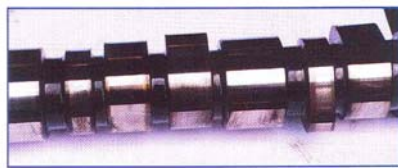
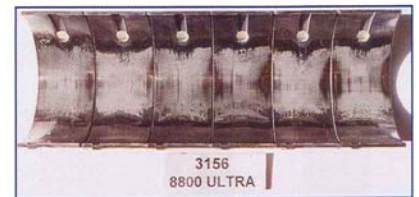
15 Million Mile Fleet Test

Using 8800 MONOLEC ULTRA® "stay in

grade" Engine Oil, a cross section of a general merchandising fleet of 3,500 vehicles was monitored at two terminals. The vehicles traveled a total of 15 million miles with extended oil drain intervals of 64,000 miles. Vehicles were checked at 16,000-mile intervals. In all cases, viscosity increase was minimal – less than 16 cSt at 100°C. Total Base Number (TBN) measurements confirmed better than 50% alkalinity retention. Extremely low wear levels were noted in used oil analysis and in engine teardown inspections.

Protection Provided by 8800 MONOLEC ULTRA® Engine Oil for 650,000 Miles Using 64,000-Mile Oil Drain Intervals.

Teardown Inspection Results



Camshaft Bearings & Camshaft

The camshaft bearings were in excellent condition. In fact, the cam was in such good shape that it was reused, even after 650,000 miles.



Bearings

The connecting rod bearings were in excellent condition.



Adjusting Screw Buttons

Wear on all injector, intake and exhaust buttons was very light. The mushroom end of the adjusting screw showed no noticeable wear.



Oil Pan & Rocker Cover

The sludge in the oil pan was minimal. The oil pan and rocker cover were cleaner than engines using commercial grade oils, with half the mileage at standard drain intervals.

PHYSICAL CHARACTERISTICS – TYPICAL:

SAE Grade	15W-40
Gravity, °API	29.7
Viscosity,	
SUS @ 100°F	628.2
SUS @ 210°F	83.53
cSt @ 40°C	122.4
cSt @ 100°C	16.10
cP @ -15°C, ASTM D-5293	3,500 max.
cP @ -20°C, ASTM D-5293	7,000 max.
cP @ -25°C, ASTM D-4684	60,000 max.
HTHS Viscosity @ 150°C, cP, ASTM D-4683	4.3 min.
Viscosity Index	140
Color	Red
Flash Point, °F (°C), min.	420 (215)
Pour Point, °F (°C) max.	-21 (-29)
Total Base Number (TBN), ASTM D-2896	10.0
Sulfated Ash, Mass%, ASTM D-874	1.0

SPECIFICATIONS EXCEEDED:

API CF, CF-2, CH-4/SM	CAT ECF-1
CCMC G-4, D-4, D-5, PD-2	Ford ESE-M2C-906-B
EMA-LRG-1	Ford ESE-M2C-153-E
Caterpillar TO-2	GM 6094-M
Cummins CES 20076	Mack EO-M Plus
Daimler Benz 226.1 and 227.1	MIL-L-2104E & MIL-L-46152E
Allison C-4 fluid	VW 500.00 and 501.01
Manitowoc-Bulletin 152Q	Volvo VDS II
	Detroit Diesel

RECOMMENDATION:

Not for use with silver alloy bearings such as EMD engines (Electro-Motive Division of GM).



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