



## Synthetic Blend Heavy Duty Engine Oils

**STARFIRE Synthetic Blend HD Engine Oils** are specially engineered for heavy duty diesel and gasoline engines operating under all service conditions, including today's emission controlled engines with EGR and Diesel particulate filters using Ultra-Low Sulfur Diesel Fuel (ULSD) and Low Sulfur Diesel (LSD). They provide extra protection and performance, compared to conventional engine oil formulations, with excellent oxidation control and soot suspension characteristics to provide outstanding protection for extended drain intervals.

**STARFIRE Synthetic Blend HD Engine Oils** meet or exceeds performance requirements for all naturally aspirated and turbocharged four-stroke diesel engines in which the API CK-4 service category and 15W-40 or 10W-30 grades are recommended. They are formulated for engines operating under severe service and a wide range of cold and hot temperatures. They are also backward compatible for CJ-4 and older API service categories.

### Recommendations

- Mack EOS-4.5, EO-O Premium Plus, EO-N Premium Plus 03, EO-M Plus, and prior
- Volvo VDS-4.5, VDS-4,3,2
- Ford WSS-M2C171-F1, WSS-M2C171-E
- GLOBAL DHD-1
- Detroit Diesel 93K222, 93K218, 93K215, 93K214
- Cummins CES 20086, 20081, 20077, 20076
- Renault RLD-4
- Caterpillar ECF-3, ECF-2, ECF-1a
- Mercedes Benz 228.3, 228.31
- Man 3575, 3275, 270
- MTU 2.1, Type I, Type II
- Volvo VDS-4, VDS-3, DHD-1
- ACEA E9, E7, E4 and E2
- JASO DH-2
- Allison C-4
- Caterpillar TO-2
- CID A-A-52306, MIL-PRF-2104G

PRODUCT DATA	TEST METHOD	15W-40	10W-30
Viscosity: cSt @ 40°C cSt @ 100°C	D445	116.1 15.66	82.06 12.21
Viscosity Index	D2270	143	149
Pour Point, °C (°F)	D97	-36 (-33)	-39 (-38)
Flash Point °C (°F)	D92	224 (435)	220 (428)
Neutralization No., TBN-E	D2896	10	10
Sulfated Ash, wt.%	D874	0.99	0.99
Cold Crank Simulator, cP	D5293	5398/-20°C	6270/-25°C
Pumping Viscosity, cP	D4684	21,600/-25°C	23,000/-30°C
HTHS Vis @ 150°C, cP	D5481	4.2	3.5