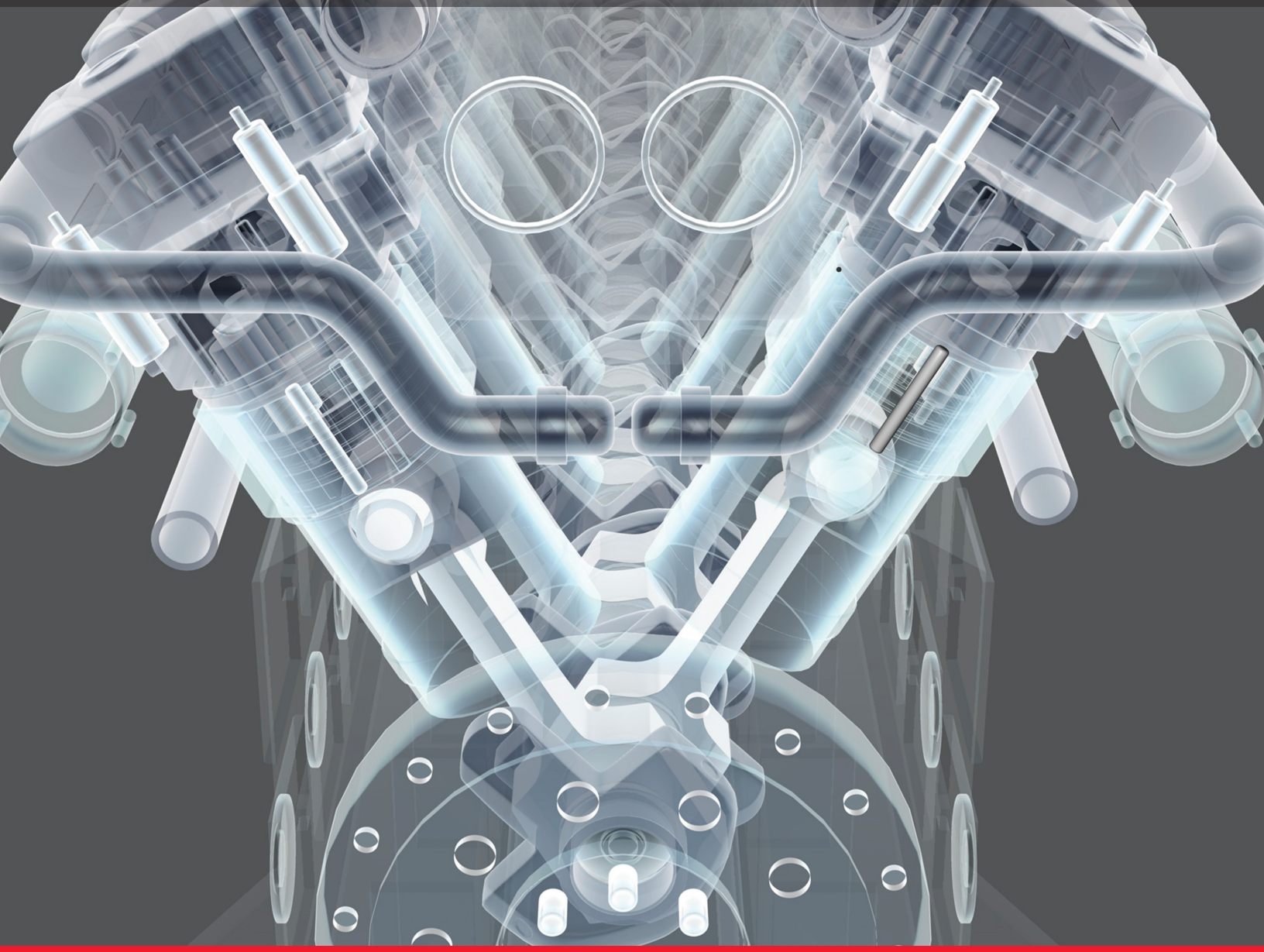
CASTROL DURATEC LFG

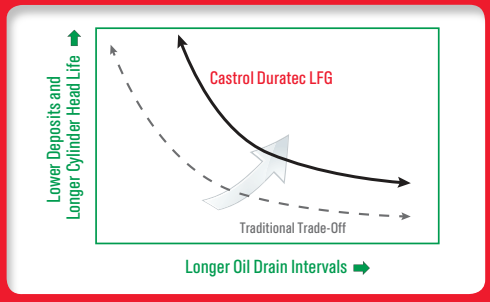
THE LANDFILL GAS ENGINE OIL THAT MAXIMIZES UPTIME

Castrol HEAVY DUTY LUBRICANTS

TRADITIONALLY, LANDFILL GAS ENGINE OPERATORS MADE SERIOUS COMPROMISES WHEN IT CAME TO SELECTING ENGINE OIL. OPERATORS HAD TO CHOOSE BETWEEN AN OIL WITH A HIGH ASH (TBN) PERMITTING LONGER DRAIN INTERVALS OR AN OIL WITH A LOW ASH (TBN) PRODUCING LOWER DEPOSITS TO INCREASE HEAD LIFE.



Castrol Duratec LFG was designed to eliminate the trade-off by increasing drain intervals up to two times versus standard landfill gas engine oils while extending head life up to 70%. Additionally, Castrol Duratec LFG lowers oil consumption by two times versus standard landfill gas engine oils leading to extended time between overhauls and less oil usage.

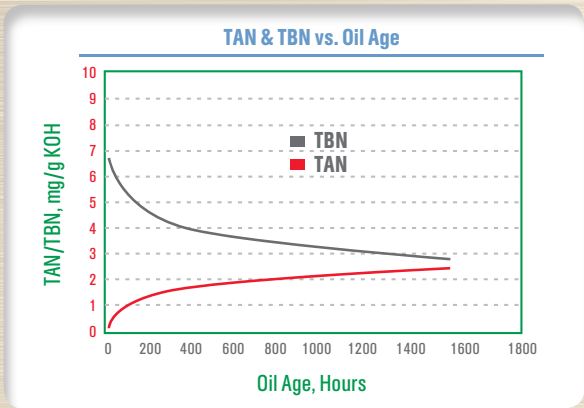


SAFELY EXTEND DRAIN INTERVALS WITHOUT SACRIFICING PROTECTION

Castrol Duratec LFG combines an exclusive low-ash additive package with hydrocracked basestocks that safely extends drain interval without sacrificing wear and performance. In field trials, Castrol Duratec LFG has increased the drain intervals two times the previous oil drain interval while effectively neutralizing harmful acids, suppressing oxidation and nitration, and decreasing wear rates.

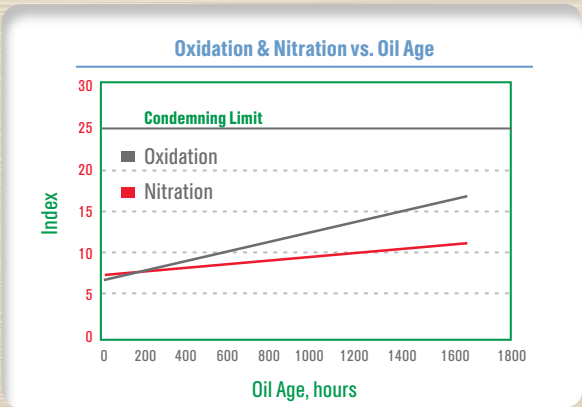
OUTSTANDING ACID NEUTRALIZATION

Impurities in landfill gas like sulfur and chlorine form strong acids that attack metallic surfaces during combustion. Castrol Duratec LFG's proprietary additive package neutralizes acids throughout extended drain intervals, suppressing damage from acid formation.



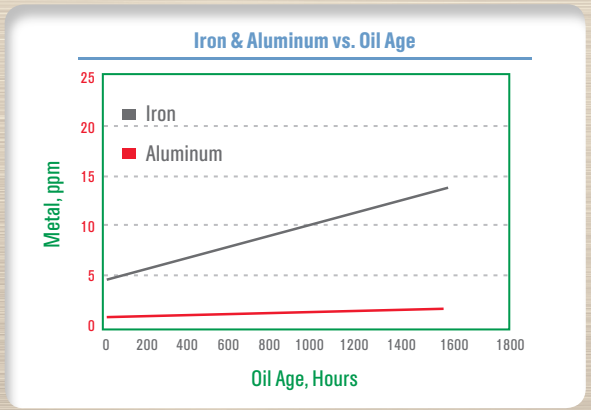
SUPPRESS OXIDATION AND NITRATION

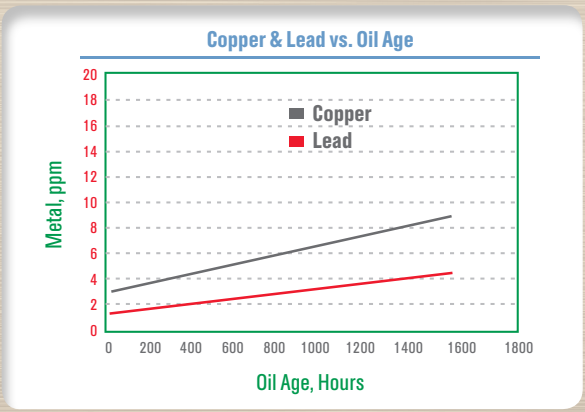
With landfill gas combustion burning hotter than gasoline or diesel, Castrol Duratec LFG suppresses oxidation and nitration throughout extended drain intervals preventing sludging, varnishing, plugged filters, and deposits.



DECREASE WEAR RATES

Protecting engine components throughout a drain interval is essential to safely extending drain intervals. Castrol Duratec LFG's proprietary low-ash additive package protects metal-to-metal contact throughout an extended drain interval.





EXTEND THE TIME BETWEEN OVERHAULS TO IMPROVE YOUR BOTTOM LINE WHILE INCREASING UPTIME

EXCELLENT DEPOSIT CONTROL

Silicon dioxide deposits on valves caused by the impurities in landfill gas demand frequent and expensive top-end rebuilds ($25,000-$40,000). These deposits are thermal insulators which, in the combustion chamber, can allow hot spots to form, leading to pre-ignition, detonation, and knocking. Castrol Duratec LFG protects cylinder heads by effectively suspending and dispersing impurities in the oil. Additionally, these deposits are easier to remove.

CASTROL DURATEC LFG

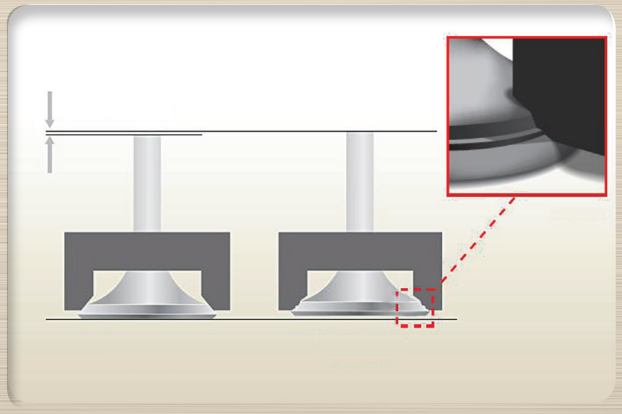
STANDARD LANDFILL GAS OIL

These photographs of two cylinder head fire faces illustrate Duratec LFG's capability of effectively suspending deposits in the oil and keeping valves and valve seats protected from harmful deposits.

EXCELLENT VALVE PROTECTION

Engine valves rely on a thin film of ash from combusted engine oil to protect against wear. Too little ash causes wear and excessive valve recession; too much ash causes valve torching and valve guttering. Castrol Duratec LFG's proprietary low-ash additive package protects valves from excessive recession while preventing valve torching and guttering. Prolonging valve recession increases the time between overhauls (TBO) and maximizes uptime.

VALVE AND VALVE SEAT RECESSION



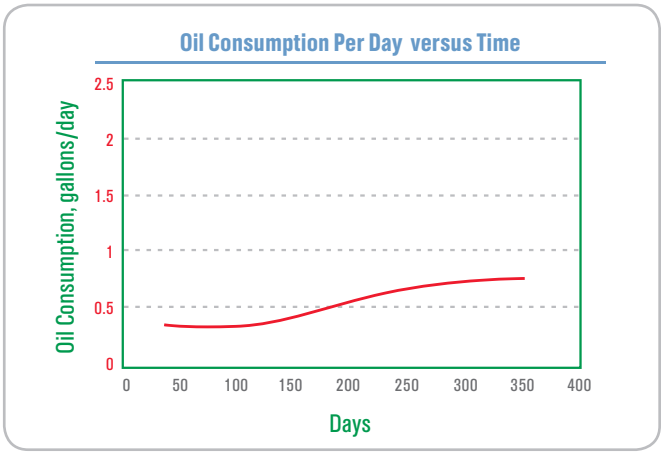
NOTICE EXHAUST VALVES AFTER 8,000 HOURS WITH DURATEC LFG

LOWER OIL CONSUMPTION WHILE EXTENDING ENGINE LIFE

Castrol Duratec LFG's formulation decreases oil consumption while maximizing uptime and increasing time between overhauls (TBO). Castrol Duratec LFG helps prevent oil from entering the combustion zone by decreasing the amount of liner deposits like varnish and lacquer, leading to less oil burn-off and cleaner engines.

MINIMAL OIL CONSUMPTION

Elevated daily oil consumption rates increase operating costs and lead to reduced engine life. Castrol Duratec LFG is designed to minimize daily oil consumption while improving the bottom line. In field trials, Castrol Duratec LFG minimized oil consumption in a severe landfill application CAT G3516 engine to very low levels averaging 0.6 gallons consumed per day.

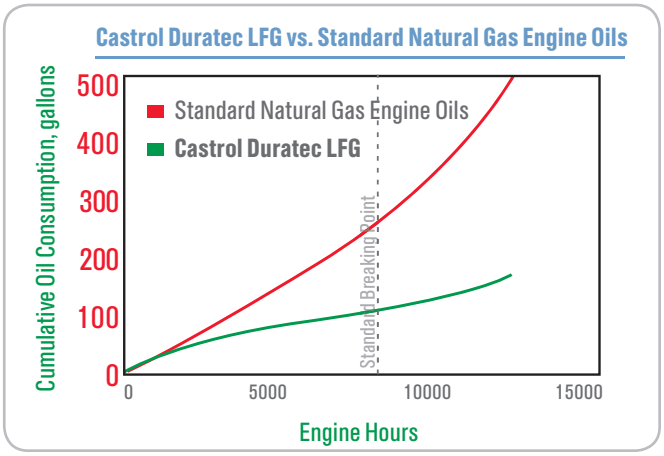


DECREASE CARBON DEPOSITS

Carbon depositing in engines results from excessive oil burn-off and low quality engine oils. Carbon depositing can also lead to decreased engine life. Castrol Duratec LFG reduces carbon deposits left on ports and valves from volatized oil thus extending time between top-end overhauls (TBO).

EXTEND THE "BREAKING POINT"

In field trials, Castrol Duratec LFG extends the "breaking point" of engine oil consumption from 9,000 total engine hours to up to 17,000 hours, further increasing the time between overhaul (TBO). The breaking point for natural gas engine oils occurs when oil consumption spikes and can reach to 10 times the original value per day due to accumulated liner deposits that smooth the liner to a point where a channel is created for oil to flow freely into the combustion zone.



CASTROL DURATEC LFG: FROM THE PROVEN EXPERTS IN OPERATIONAL EFFICIENCY FOR MAXIMUM PROTECTION, OPTIMUM PERFORMANCE.

FEATURES	ADVANTAGES	BENEFITS
Excellent deposit control	Maintains wear protection in hostile landfill gas conditions including the presence of siloxanes by keeping engine surfaces clean.	Increased life of engine components, reduced wear, and increased oil life.
Select hydrocracked base stocks	Resists oil breakdown while maintaining viscosity control.	Maximum protection, extending engine and fluid life.
Outstanding TBN retention	Extends drain intervals and suppresses acid formation.	Trouble-free operation with extended drains.
Proprietary additive technology	Extends the "breaking point" of engine oil consumption while reducing carbon deposits. Resists thermal degradation from oxidation and nitration.	Increased life of engine components, reduced wear, and increased oil life.
Excellent oxidation and nitration control	Resists thermal degradation from oxidation and nitration that thickens engine oil.	Increase life of engine components, and increases oil life.

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