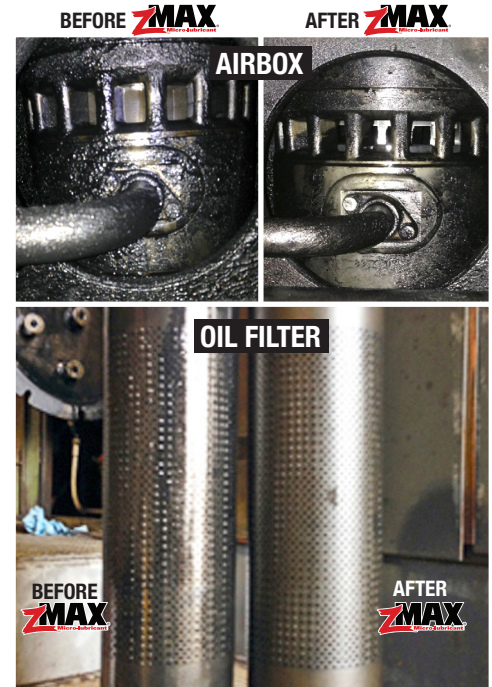




zMAX BENEFITS FOR LOCOMOTIVE ENGINES

- Improved Cylinder Combustion Efficiency Resulting in Reduced Oil/Fuel Consumption and Increased Horsepower
- Improved Lubrication and Cleaner Surfaces: Airbox, Top Deck, Piston Rings, etc.
- Reduced Emissions: Less Oil and Carbon Particulates Out Exhaust Stack
- Reduced Oil Puddling out Airbox Drain
- Stable Oil Viscosity and Reduced Soot Level
- Longer Part Life
- Improved Reliability and Performance
- Decreased Operating Costs



CASE STUDIES USING zMAX

Western Shortline Railroad

Locomotive Model: GP 35, Engine: EMD 645-16
 First Application Date: 2013

1

Benefits of Using zMAX:

- Cleans piston ring lands allowing rings to seal better, controlling oil usage. Experienced 30% reduction on oil make-up use.
- Cleans exhaust stacks and turbos by controlling oil usage and carbon build-up under load and idle conditions.
- Keeps mechanical injectors from sticking.
- Helps save and free up frozen turbo clutches and related equipment by keeping internal high tolerance parts clean and lubricated.
- Helps control crankcase pressures by ring control. Usually drops crankcase pressure observed by 1.5 to 2.0 inches of vacuum, when treated at 7% by oil volume on first application and 5% during every 92-day service.
- Helps air compressors controlling oil leakage into the clean air system, removing glazing effect most WBO compressors have. Using zMAX every 92 days helps break down any carbon/varnish build-up, keeping compressors in optimum running condition.
- Reduces fuel consumption in routine daily operations.

OmniTrax

Locomotive Model: SD 50
 Engine: EMD 16 645F3B
 Locomotive Model: GP 40-2
 Engine: EMD 645E3B
 Locomotive Model: GP 38-2
 Engine: EMD 16 645E
 Locomotive Model: GP 38-3
 Engine: EMD 16 645E
 First Application Date: 2015

2

Benefits of Using zMAX:

- Souping issue resolved.
- Reduced oil consumption.
- Oil stays cleaner longer.
- Oil viscosity remains stable.
- Engines are much cleaner.
- Soot levels dropped 20 points.
- Extra protection during start-up.
- Better protected components by zMAX oil film on metal surfaces.
- More pliable seals, sealing better.

GATX Locomotive Leasing

Locomotive Model: SW 1500
 Engine: EMD 645
 Locomotive Model: MP 1500 AC
 Engine: EMD 645 E
 First Application Date: 2017

3

Benefits of Using zMAX:

- Much cleaner top decks.
- Mechanics noted easier to perform routine maintenance.
- Cleaner air boxes.
- Cleaner exhaust stacks.
- Greatly improved reduction in particulates emitting from exhaust.
- Reduced grass fires with no reported incidents.
- Reduced souping.