

## Technical Service Bulletin

Date: 7/14/2004

Product Description: All Synthetic Motor Oils

Subject: Fuel Dilution Causes and Effects

### DESCRIPTION:

Fuel dilution of motor oil can be very detrimental to an engine and its components. Under normal operation, the motor oil film is keeping metal surfaces and their asperities separated to prevent wear.

All of the following can occur if fuel enters the crankcase and contaminates the motor oil:

- Reduced oil viscosity
- Disrupts the oil film strength causing metal asperities to contact each other promoting engine wear, particularly in the cylinder/ring area
- Increases volatility (in very extreme cases it can lead to a crankcase explosion)
- Weakened lubricant detergency
- Accelerated lubricant oxidation
- Varnish formation
- Acid formation/corrosion
- Low oil pressure

The causes of fuel dilution can be the result of many things:

- Leaking injectors
- Excessive idle time
- Incomplete combustion
- Cool engine operating conditions
- Frequent short trip driving

- Performance chips/engine modifications
- Restricted air filter/bad air to fuel ratio
- Worn piston rings/excessive blow-by
- Incorrect choke settings
- Towing/lugging engine
- Fuel pump/over fueling
- Seals and gaskets
- Improper injector timing

Depending of the application and operating conditions, a cautionary limit of up to 2% fuel dilution may be allowed provided viscosity has not changed. However, it may be recommended to examine the engine and analyze operating conditions. Dilution ranging between 2.5% to 5.0% is considered excessive and requires immediate maintenance action.

If fuel dilution problems occur, it is necessary to correct the root causes of the contamination.

Oil analysis can provide an immediate answer to determine whether there is fuel dilution occurring in the engine. Contact your dealer for oil analysis service from AMSOIL.

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