



Diesel fuel cleanliness is very important, modern fuel injection systems and electronic unit injectors operate at very high pressures and the components have very fine tolerances. At these pressures and at high temperatures the injectors can suffer abrasive wear from water and fine particles of dust that may be present in the fuel.

Contaminants in diesel fuel that can cause injector wear are:

- Water droplets
- Particles of dust and dirt

Fuel Cleanliness

By the time diesel fuel is produced and reaches a seaboard storage terminal the typical level of cleanliness is:

- Water - as dissolved water 0.01%wt by ASTM D1744
- Water and sediment – 0.01% vol by ASTM D2709, the specification is 0.05% vol max
- Particulate matter – up to 3 mg/l by ASTM D2276, which filters diesel through a 0.45 micron filter.
- Cleanliness by ISO 4406 – a typical rating is around 16/12.

From the terminal tank to the diesel engine tank the potential sources of contamination are:

Dust – from the environment through storage tank breathers and engine fuel tank breathers.

Water – from condensation of water vapour entering through storage tank breathers.

Water and dirt – from fungal and bacterial activity due to fungus living in condensed water in the fuel tank.

Rust – from the internal walls of storage tanks.

IMPROVING DIESEL FUEL CLEANLINESS

Between the storage tank and the injector most diesels have a

- A primary filter that is a water trap and coalescer that will remove entrained water and particles of 10 micron and bigger
- A secondary filter, nominally of 2 micron that will remove smaller particles above 2 micron in size.

The following steps can be taken to assist the engine filtration systems and protect vital equipment:

STORAGE TANKS

1) Keep dust out

Airborne dust can get into fuel through the tank breathers in dusty climates; a 2 micron absolute breather filter on the tank will reduce the particulate contamination of the fuel

2) Remove Water

Daily draining of water from a valve at the lowest point of the tank will remove condensed water and dust. The products should be drained into a bucket until crystal clear fuel runs out. At this point some of the fuel should be examined in a clean glass jar. The fuel should sparkle; there must be no haziness or dullness. If fuel is hazy or dull then assistance should be requested to remediate the fuel.

3) Stop tank internal corrosion

Tanks that are not regularly filled to the safe fill level may rust internally. The rust then contaminates the fuel. Keep tanks full to reduce internal corrosion.

VEHICLE SYSTEMS

1) Filtration

A primary filter of 10-15 micron with a water trap of clear material that can be drained while in use will help to remove entrained water and large particles of dirt and will protect the secondary filter.

2) Fuel Tank

A 2 micron breather filter on the fuel tank will reduce dust contamination in the fuel and provide protection for the in line fuel systems. The breather filter should be at the top of the breather pipe, this should extend above the top of the tank and away from any dust generated by the equipment.

**For further information, please call the BP Lubricants and Fuel
Technical Helpline 1300 139 700 local call
or visit www.bp.com.au/fuelnews**