



Dirt Pickup in Truck Tanks

FUEL INJECTOR AND PUMP WEAR

A number of truck operators have been experiencing excessive and abnormal abrasive wear in fuel injection components. The problem is significant in Western Australia with road train operators, but reports of similar problems are widespread across the country. This particular problem apparently only affects late model electronic management systems.

VERY FINE AIRBORNE PARTICLES ARE BEING DRAWN INTO TANKS

Experience of similar problems with mining equipment led us to look at the possible ingress of abrasive particles into the breather hose of truck running tanks. Samples were siphoned from a number of truck tanks after refueling and again prior to the next fill. The distance traveled between fills was around 600 kms. **The fuel tank breathers in this fleet were all short lengths of hose that terminated below the chassis, in an area exposed to dusty conditions.**

The size of the particles of concern were those that would pass through a standard fuel filter that tend to be in the range of 5-10 micron.

The fuel samples were then tested to determine the particulate contamination. The number of particles of each material and the particle size distribution was determined. The materials investigated include a wide range of elements:

- silicates
- sodium chloride
- silicon oxide
- calcium sulphate
- iron oxide
- zinc
- tin
- aluminium

Most of these were in the form of compounds as found in rock and ore bodies.

TEST RESULTS

There was clear evidence of the ingress of fine particles during each trip monitored. Some particles were large enough to be collected by the fuel filter but the majority would pass through to the injection system.

DISCUSSION

The normal techniques for determining dirt contamination are misleading when investigating a problem such as this because the nature of this contamination changes over time. Usually, one litre of fuel is filtered through a 0.45 micron filter. The filter paper is then dried and weighed. The particulate content is then reported as milligrams/litre (mg/L).

Typical contamination found will be mainly rust particles, dust, lint and some hydrocarbon sediment. There may be some dead fungal material if the system has been contaminated with fungus.

The interesting thing found in this project is that the fuel in the truck tank has the above particles filtered out over time as fuel is recirculated. At the same time the content of fine abrasive particles grew from virtually zero as dirt was ingested through the tank breather. The total mass of contaminants did not change significantly.

CONCLUSIONS

Ensure that the fuel tank breather does not allow the ingress of fine dirt particles. To date, the above fleet has not experienced a repeat of the previous problems since the breathers were relocated and filters added.

**For further information, please call the BP Lubricants and Fuel
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