



Department of Public Works  
Operations Division-Fleet Services Section

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To: The Public Works Committee  
From: Jeffrey Tews, Fleet Operations Manager  
Date: October 1, 2013

Re: File 130531 Status of Maintenance and Repair Backlog, Large Vehicles

The following is in response to questions raised regarding time needed to make repairs to larger trucks and equipment, also known as heavy equipment, within the Fleet Services Repair Section.

These larger fleet units are serviced at four locations throughout the City, with basic maintenance and small repairs at the three second shift locations, and more time consuming repairs on first shift at the Central Repair Garage. Fleet Services endeavors to maintain 90% fleet availability for heavy equipment. So far in 2013, we have maintained an average of 88.1%, with a high of 90.5% and a low of 85.0%. These figures are typical, given the relative older age of the heavy equipment fleet, and having six vacancies of 34 allocated vehicle service technicians in heavy repair shops for most of the year.

However, we have noticed a major uptick in specific engine repairs over the past year. These repairs are related to newer trucks that were purchased since 2010, when strict new emission requirements were put in place by the EPA. These "cleaner diesel" engines have new, first generation components including an exhaust gas recirculation (EGR) cooler, a device that helps to cool the high exhaust temperatures using engine coolant, in order to help the engine meet the new emission limits. These EGR coolers have proven to be the foremost contributor to problems and needed engine repairs.

So far in 2013, we have noted 25 major engine failures, mostly on the 2010 and newer trucks. Some of these repairs were covered under warranty. This is much higher than the normal 4-6 engine failures we have seen on average in prior years, on mostly older equipment. We have discovered that most of these recent engine failures were greatly attributed to insufficient coolant in the engines, which created hot spots in the engine that caused cavitation pitting damage to key components such as cylinder liners (*see picture at right*).



Cylinder liner, due to lack of coolant

**Repairs Needed:** There were various levels of repairs needed for these engines, depending on how quickly the problem was discovered, including:

- Replace the EGR cooler at a cost of about \$1,300 - \$1,400. Four hours required, usually completed on second shift.
- In-chassis engine overhaul, at a cost of approximately \$10,000. This repair normally takes 25 hours.

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- Complete engine rebuild or exchange, at \$25,000 - \$30,000, requiring 35-50 labor hours. This repair usually involves 1-2 weeks or more idle time waiting for parts or assemblies to be purchased or rebuilt.

Most of the EGR coolers are replaced by City technicians. About 20% of the in-chassis and complete rebuilds or exchanges are done by City technicians. Outside labor sources such as truck or engine dealerships are utilized for most of the rebuilds, due to their expertise and the necessity of having City technicians available to concentrate on other repairs.

It should be noted, however, that drivers are also responsible for keeping equipment in service. This responsibility includes a daily pre-trip inspection and filed report for their assigned trucks. The driver is responsible to check the vital fluids including engine oil and coolant, and top off fluids as needed before going out on the route.

Drivers are also responsible to note problems that occur, such as the dashboard "Low Coolant" light coming on, or the engine regeneration symbol lighting up. New with the 2010 engines, this "regen" process burns off the soot accumulated in the muffler, and can usually be done while the truck is working. However, each time a driver refuses to allow a regen, the truck's computer will trigger a 2<sup>nd</sup>, 3<sup>rd</sup>, or 4<sup>th</sup> stage regen, and finally reduce the engine power output, or shut the engine down completely to prevent costly damage to the emission system. A 4<sup>th</sup> stage regen needs to be performed by the truck dealership, and usually results in loss of truck use for 2-3 days, and a cost of up to \$500 when towing is required.

What we are Doing: We have a dedicated staff of highly trained and talented technicians and support people that keep Milwaukee's fleet running. When faced with new challenges such as these newer first generation emission system related problems, we deal with them by creating proactive methods to catch problems earlier and effect timely repairs, rather than reactively deal with costly time consuming repairs. We utilize management and our training staff to continually educate drivers on the new systems, and remind them of their daily responsibilities.

In closing, we at Fleet Services thank you for bringing these concerns to the forefront and allowing us to explain the circumstances and the steps we are taking to rectify the situation. These problems are occurring on a national level, not just here in Milwaukee, and we are working with our vendors and peers to responsibly meet these challenges head on and succeed.

Cc: Ghassan Korban  
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