Issue 5

SPOTLIGHT ON:
DEF (DIESEL EXHAUST FLUID)

WEST SIDE TECH TIPS

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Although the construction industry has been exposed to final tier 4 engines for several years, many contractors are still adapting to the presence of machines that require DEF (diesel exhaust fluid). DEF is necessary for most current diesel engines to meet NOx requirements by the EPA. In this Tech Tips issue, we'll cover DEF storage and handling, best daily practices, maintenance and service, scenarios to avoid, as well as identification of a system that has been contaminated or mishandled.

Storage and Handling

In low volume applications, the best way to ensure quality DEF is to purchase in 1 or 2.5 gallon containers and discard these containers when emptied. Check locally for availability of recycling for these containers.

For larger operations, bulk containers should be properly outfitted and vigilantly monitored for contamination. If a bulk tank is contaminated, you will need to contact your supplier for recommendations on cleaning or replacing tank depending on application. If transfer from bulk tank to a machine is required, use only DEF approved containers and transfer pumps. These containers should remain dedicated to DEF transfer and not be used for any other fluids. DEF is corrosive to certain metals and may leach metal properties from unapproved transfer devices or tanks. If any leaching occurs, the DEF will be contaminated and should not be used in your application.

DEF should be stored between 14° and 86° F. When DEF is not stored in proper conditions, its shelf life can be significantly reduced. Many operators like to keep a spare container of DEF on the machine. If this practice is followed, be sure to cycle this spare regularly and protect it from extreme heat and direct sunlight.

Responsibly dispose of old or contaminated DEF according to local regulations. Be sure to consult your supplier for more information on storage and disposal in your area.

Best Daily Practices

Step one when filling your DEF tank is to clean the area surrounding the DEF fill port (cap and neck) before removing the cap. The DEF filling port is identified by a blue-colored cap embossed with the DEF symbol.

Do not store chains, bucket teeth, grease etc. in a position where they can allow dirt or other contaminants to enter the DEF tank or damage SCR components mounted on tank.

A general best practice is to fill the DEF tank very time you fuel the machine to maintain correct fluid consumption ratio.

If applicable, be sure to coach operators to allow equipment to completely run maintenance regenerations. The process for NOx reduction creates normal deposits that can be removed by maintenance regenerations (in some applications).

If your piece of equipment is designed with a master disconnect, it will be necessary to wait until the purge process is completed before turning master switch off. If the pump loses power mid-purge, DEF will be trapped in the lines allowing the possibility of freeze expansion to damage the lines, pump or injector. If allowed to purge completely, there will be no opportunity for damage as the tank is designed to handle the freezing and thawing process.

Make an effort to minimize running a machine with low fuel or DEF levels. Running a machine with low tank levels encourages the system to pick up any debris or contaminants that may be sitting on the bottom of the tank.

WEST SIDE TECH TIPS

FINAL TIER 4 EQUIPPED DEF REQUIRED

Routine Maintenance and Service

Change filters on dosing unit and header per recommended intervals in the operator's manual. If system contamination occurs, the intervals will be shortened and filter replacement and flushing procedure should be adjusted accordingly.

Use feedback from your operators to monitor and track total fluid consumption on the machine. If you see a drastic increase in volume of DEF or fuel consume, this may be an indicator of a system fault or imminent failure. Consult your owner's manual or contact your local dealer for service if this scenario occurs with any of your equipment.

Scenarios to Avoid

If the DEF fill cap is lost or damaged, do not run machine without cap. If the cap is not present, the system will allow evaporation, changing the concentration, as well as allowing contaminants to enter the system potentially causing serious damage.

Do not ignore warning alarms and fault codes. The level and severity of fault will determine the machine response to an issue. The machine will give you a limited window of normal operation which is designed for you to move a machine to an area in which it can be serviced. This state is not designed for continued normal operation. A quick response to an emissions related issue can save components from damage and prevent unnecessary downtime.

Do not attempt to adjust the ratio of DEF concentration by adding water or other additives. If the concentration is wrong, drain and refill the system. Attempting to change DEF concentration with unfiltered water will introduce minerals that can be harmful to your SCR system.

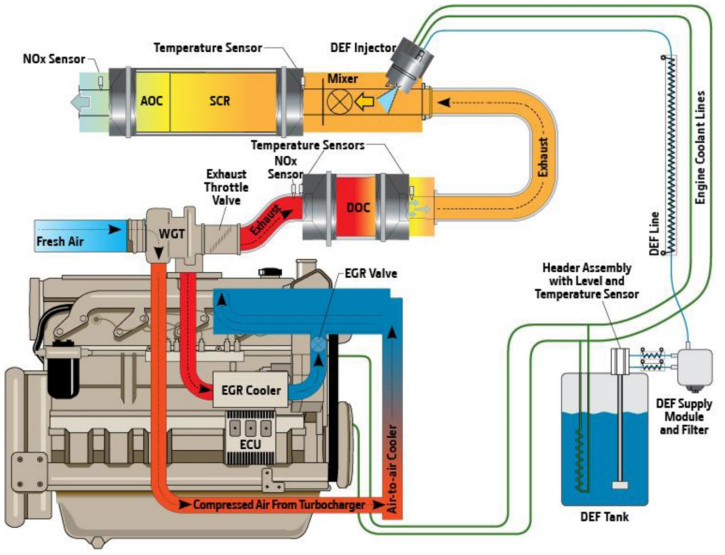
When storing equipment for periods longer than a year, most manufacturers recommend draining the tank and refilling with new DEF before putting the machine back in operation. Once again, the life of the DEF will be directly affected by storage temperature and heat cycling.

Identification of Contaminated DEF System

If the DEF tank gets contaminated, the machine will exhibit various symptoms depending on level of contamination.

Inspect the tank for possible contamination. Remember, some contaminants may not be visible or may be difficult to see in a black tank. If a petroleum contaminant is introduced, it should float on the surface and be visible. DEF should be clear, not murky or cloudy, and can have a slight ammonia smell. Depending on the type and level of contamination, a simple flush using the tank drain may be enough to repair the system. If the system needs further cleaning, the tank may need to be removed and flushed with DEF before being put back into service.

There are several methods to check DEF concentration including using a refractometer or test strips. Post 2017 applications will be equipped with a concentrations sensor that will alert the operator if the concentration is wrong. These tools check concentration of the DEF, but they will not indicate contamination of metals or dirt in the system. If the DEF quality in the tank is questionable, the quickest and easiest solution is to drain the tank and fill it with new DEF.



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