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Top 10 Tier IV Engine Differences

1. **ECU (Electronic Control Unit)** – The engine has a “brain”, which electronically controls all the engine functions. This ECU will record all faults, which will be assessible by the dealer. Some faults will de-rate the engine running performance. Current faults will be shown on the dash display, and the dealer should be contacted with the DTC (Diagnostic Trouble Code). Due to this ECU, please DO NOT WELD on this forklift without disconnecting the battery, as damage to the ECU will occur.
2. **Fuel System** – The fuel system is now a high pressure, common rail design with pressures often over 20,000 psi. Due to this high pressure, do not crack lines on fuel injectors when trouble shooting on the engine. Replacement of fuel injectors must be done by an authorized dealer, as these are electronically controlled and must be programmed into the engine ECU. ULSD (Ultra low sulfur diesel) is required; however, this is not an issue in the United States and Canada. Caution should be taken in other countries to ensure the proper fuel is used.
3. **Pressure Washing** – Care must be taken when high pressure washing the engine. There are many electronic sensors on and around the engine, as well as the engine ECU. None of these should be sprayed directly.
4. **Air Intake Filter** – This filter must be checked/cleaned daily. There is also, a dirty filter indicator light on the dash of the forklift to let the operator know the filter must be serviced.
5. **DOC (Diesel Oxidation Catalyst)** – This is a filter with a catalytic coating on the filter media. The DOC is a flow-through device, forcing the exhaust over a honeycomb ceramic structure coated with precious metal. The catalyst on a DOC chemically changes carbon monoxide, hydrocarbons, diesel particulates and other pollutants to carbon dioxide and water. The DOC is considered “maintenance free”, since it does not need cleaning or replacement for the life of the engine. An additional muffler is not required.
6. **Engine Oil** - The new DOC technology also requires the use of low-ash oil. These are designated as CJ-4 on the label, on the containers, or spec sheets.
7. **Wiring** – This engine has many more electrical connections than previous models. The wiring harness should not be spliced into or modified in any way. This could lead to ECU failure and therefore, the engine not being able to run properly, or at all.
8. **Fuel/Water separator** – This engine includes a fuel/water separator. The element must be changed regularly, and fuel must be insured to be clean and water-free. There is a sensor to notify the user if water is detected in the fuel.
9. **Oil/Water separator** – This engine includes an oil/water separator. The filter element must be checked and cleaned regularly. The maintenance period will be shorter in high humidity areas or when engine is run at low load cycles.
10. **EGR (Exhaust Gas Recirculation) Valve and Cooler** – This EGR circuit takes a portion of the exhaust gas and recirculates it with fresh intake air. The exhaust air reduces the amount of oxygen in the combustion chamber. When this oxygen-reduced air ignites on the compression stroke, the resulting exhaust contains less NOx, so emissions are lowered.

NOTE: Please refer to the Operator’s and Owner’s manuals provided with the forklift for more information.

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