![Detroit logo]

TO: Service Locations

FROM: Service Systems Development

SUBJECT: **EPA10 and Later DD Auto-Elevate Feature**

Note: This document supersedes 10 TS-21, 14 TS-20, and 16 TS-2.

ISSUE

During extended periods at idle speed (slow or fast), unburned fuel from the combustion process slowly collects in the Aftertreatment System (ATS). This unburned fuel is also referred to as hydrocarbon.

If too much hydrocarbon is allowed to accumulate in the ATS, the next drive cycle could result in higher than normal internal ATS temperatures as the hydrocarbon burns off. This could potentially cause a failure of the Diesel Particulate Filter (DPF).

ACTION

The Auto-Elevate feature automatically increases engine rpm to manage hydrocarbon buildup and keep it from reaching critical levels. This process results in a temporary increase of exhaust gas temperatures to effectively control burn-off of the hydrocarbon within the ATS.

If Auto-Elevate feature is enabled, the following safety interlocks must be met for the Auto-Elevate timer to start:
   • Transmission in Neutral
   • Park Brake set to ON
   • Clutch out (not depressed)
   • Road speed = 0
   • Engine at idle speed (slow or fast)

With Auto-Elevate enabled, and after a predetermined amount of idle time, the DDEC Aftertreatment Control Module (ACM) will automatically elevate engine speed to 1100 rpm (EPA10, GHG14), 1250 rpm (GHG17 DD13 & 15) or 1275 rpm (GHG17 DD16) for up to 30 minutes. This will raise exhaust temperatures and eliminate hydrocarbon buildup in the ATS.

The Auto-Elevate feature will only be enabled while the vehicle is not in Power Take Off (PTO) speed control. Specifically, the PTO switch is off (CPC connector 2, pin 9 is not grounded or J1939 (SPN 65264) PTO message for PTO switch is off).

Note: EPA10 engines require the following software to allow PTO to disable Auto-Elevate:
MCM 7.7.1.47 with fuel map ending in ZGS001 or higher.
CPC X22.04
ACM 8.7.107 with fuel map ending in ZGS001 or higher.

GHG14 and GHG17 have had this PTO disable feature since start of production and require no software update.

NOTICE:
Auto-Elevate will rapidly increase engine speed to 1100, 1250 or 1275 rpm, and maintain that speed for up to 30 minutes. Vehicles equipped with a mechanically driven PTO (FEPTO or REPTO), or a non-switched PTO device (without dedicated PTO switch wired to CPC connector 2, pin 9), will be affected by the increase in engine speed. Do not enable Auto Elevate if the PTO equipment cannot accept the increase in engine speed while the PTO switch is in the OFF position.

When the process of eliminating the hydrocarbon from the ATS is complete, the engine returns to idle speed and the timer for the Auto-Elevate feature resets.

DETAILS OF OPERATION

Actual idle time needed to activate the Auto-Elevate process varies with engine platform and Clean Idle status. If Auto-Elevate is not enabled, excessive idle time may result in the following codes:

EPA10:
- SPN 1037/FMI 15: DPF HC Absorption Warning
- SPN 1037/FMI 16: DPF HC Absorption High
- SPN 1037/FMI 0: DPF HC Absorption Very High

GHG14/17
- SPN 5443/FMI 15: DPF HC Absorption Warning
- SPN 5443/FMI 16: DPF HC Absorption High
- SPN 5443/FMI 0: DPF HC Absorption Very High

Continued idling without the Auto-Elevate feature enabled may result in an engine shutdown, similar to soot buildup in DPF Zone 5.

A slight haze may appear out of the exhaust pipe during the Auto-Elevate procedure.

The Auto-Elevate procedure can be stopped at any time by voiding any of the safety interlocks listed earlier. When this happens, the engine will do a fast ramp-down to idle speed. Once all safety interlocks have been met again for four minutes, Auto-Elevate will resume (assuming hydrocarbon burn-off has not yet occurred).

With the Auto-Elevate feature enabled, there are now TWO timers that control the DPF lamp on the dash.
- Soot regeneration - This timer is always running and the lamps on the dash function as they normally have since the beginning of production for the EPA07 engines.
- Hydrocarbon buildup - This timer starts when the engine sees vehicle idle state (slow or fast). This timer can start at any time along with the normal soot regeneration timer.

Driver interaction with the DPF lamp has not changed if the Auto-Elevate feature is enabled. The driver will not know whether the DPF lamp is for soot buildup or hydrocarbon buildup. The driver will see the DPF lamp for hydrocarbon buildup if the Auto-Elevate feature is disabled or a fault prevents the Auto-Elevate feature from functioning as designed. If the DPF lamp comes on for hydrocarbon buildup, the driver may cycle the necessary switches and activate the dash-

mounted Regeneration switch to start burning off the hydrocarbon buildup per the process mentioned earlier. If the unit is in DPF Zone 2 or higher, it will also perform a full parked regeneration of the ATD.

ENABLING THE AUTO-ELEVATE FEATURE

- It is a programmable feature via DiagnosticLink®.
- It is defaulted to "OFF".
- The parameter to enable/disable this feature is located in the ACM group "PGR005_DPF," and is called "Extended Idle Auto RPM Elevate."
- For new truck orders, the Auto-Elevate feature can be factory-ordered by selecting Freightliner GHG17 Data Book Code 80L-001 ENABLE AUTO ENGINE RPM ELEVATE FOR EXTENDED IDLE.
- For vehicles with Eaton Ultrashift transmission, low idle speed must be set according to Eaton guidelines.
- The Auto-Elevate feature is compatible with Optimized Idle configurations.
- Detroit Diesel recommends the use of the Auto-Elevate feature for non-PTO applications, such as over-the-road trucks with sleeper cabs that regularly idle continuously.
- Thoroughly review this feature with the customer before enabling the Auto-Elevate feature.

FAULT REACTION WITH AUTO-ELEVATE DISABLED

- The DPF lamp is programmed to work with the Auto-Elevate feature. The indicator lamp will work exactly as it does for the Regeneration process (except that the engine will NOT derate in Zone 4).
- The DPF lamp will light for hydrocarbon (HC) if the Auto-Elevate feature is disabled, (example PTO enabled as described above) or unable to function due to a fault.
- The DPF lamp will not light for HC if the Extended Idle Auto RPM Elevate option is enabled and Auto-Elevate is not interrupted.
- If Auto-Elevate is NOT enabled, the following lamp progression holds true:

Indicator Lamps	Description
SOLID	Occurs after approximately 10 hours* of idling. No code is logged. Bring vehicle to highway speeds to allow for an Automatic Regeneration OR Perform a Parked Regeneration
FLASHING	Occurs approximately 1 hour* after the DPF lamp illuminates solid. Code 5443/15 is logged. Bring vehicle to highway speeds to allow for an Automatic Regeneration OR Perform a Parked Regeneration as soon as possible.
FLASHING AND CHECK ENGINE	Occurs approximately 1 hour* after the DPF lamp starts to flash. Code 5443/16 is logged. Vehicle must be parked and a Parked Regeneration OR Service Regeneration must be performed. PARKED REGENERATION REQUIRED.
FLASHING AND CHECK ENGINE AND STOP	Occurs approximately 1 hour* after the DPF lamp (flashing) and Amber Warning Lamp (solid) illuminate. Code 5443/0is logged. Vehicle must be parked and a Parked Regeneration OR Service Regeneration must be performed. PARKED REGENERATION REQUIRED — ENGINE SHUTDOWN.

* Time intervals are controlled by an algorithm in the software and are approximations based on ideal conditions. Factors, such as the engine rpm at idle and the zone the DPF is in when idling commences, will affect the length of time before the lamp progression starts.

CONTACT INFORMATION

Please contact the Detroit Customer Support Center at 800-445-1980 or email csc@daimler.com if you have any questions.