Auto-Elevate Feature

Auto Elevate - Introduction

- During extended periods of idle, unburned fuel from the combustion process slowly collects in the ATD. This unburned fuel is also referred to as hydrocarbon.

- If too much of hydrocarbon is allowed to accumulate in the ATD, the next drive cycle could result in internal ATD temperatures (as the hydrocarbon oxidizes) that could potentially fail the DPF unit.

- The Auto-Elevate Feature eliminates the hydrocarbon build-up before reaching critical levels by automatically increasing engine RPM. This process results in a temporary increase of exhaust temperatures that effectively oxidizes the hydrocarbon within the ATD.

Auto-Elevate - Operation

- Once the inter-locks have been met; transmission neutral, park brake set, clutch not depressed, VSL=0 mph, and engine at idle the auto elevate timer will start.
- After a predetermined amount of time at idle, DDEC VI will automatically elevate engine RPM, typically 7-8 minutes, in order to raise exhaust temperatures and eliminate hydrocarbon build-up in the ATD.
- Engine speed is slowly elevated from idle to 1200 RPM and is held there for 3-4 minutes. This is followed by an increase in engine speed to 1600 RPM for the remainder of the cycle.
- Once the correct exhaust temperature is achieved, hydrocarbon will be oxidized ("burned-off") from the ATD and the engine will return to normal idle speed.
- When the process of eliminating the hydrocarbon from the ATD is complete, the timer for the Auto-Elevate feature re-sets.
- If the auto-elevate is interrupted by voiding any of the inter-locks
  - Engine will do a fast ramp down to idle rpm.
  - Once all inter-locks have been met again for 4 minutes, auto-elevate will resume (assuming HC oxidation has not yet occurred).

Auto-Elevate – Driver Interactions

- There are now TWO sets of timers that control the DFP lamp.
  1. Soot Regeneration (same as before), always running.
  2. Hydrocarbon Build-up, starts when engine sees vehicle idle state.

- Timer number 2 can start at any time along the normal regeneration cycle.

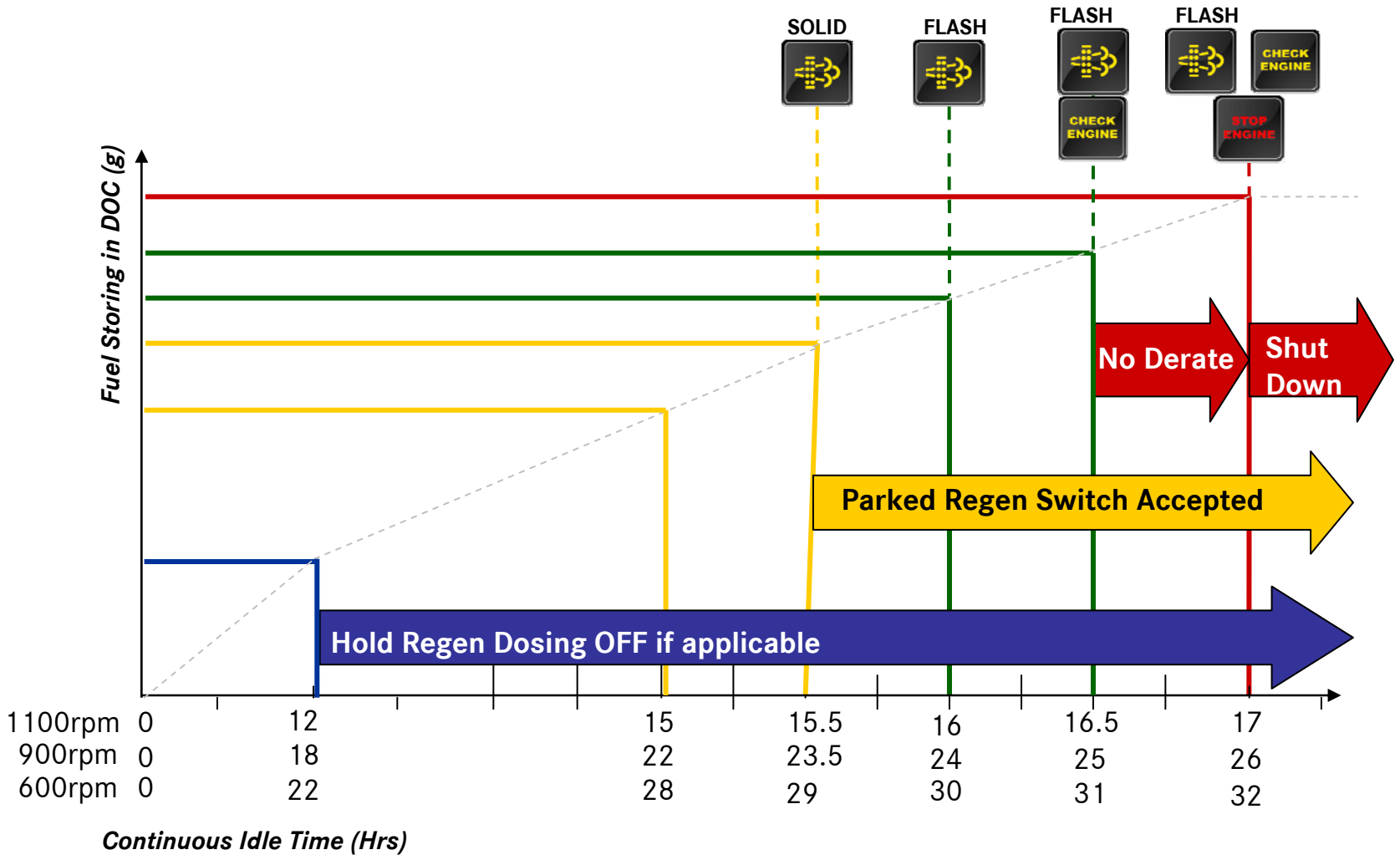
- Driver interaction with the DPF lamp has not changed. Only now he will not know whether it is for soot or hydrocarbon.

Auto-Elevate - Indicator Lamps

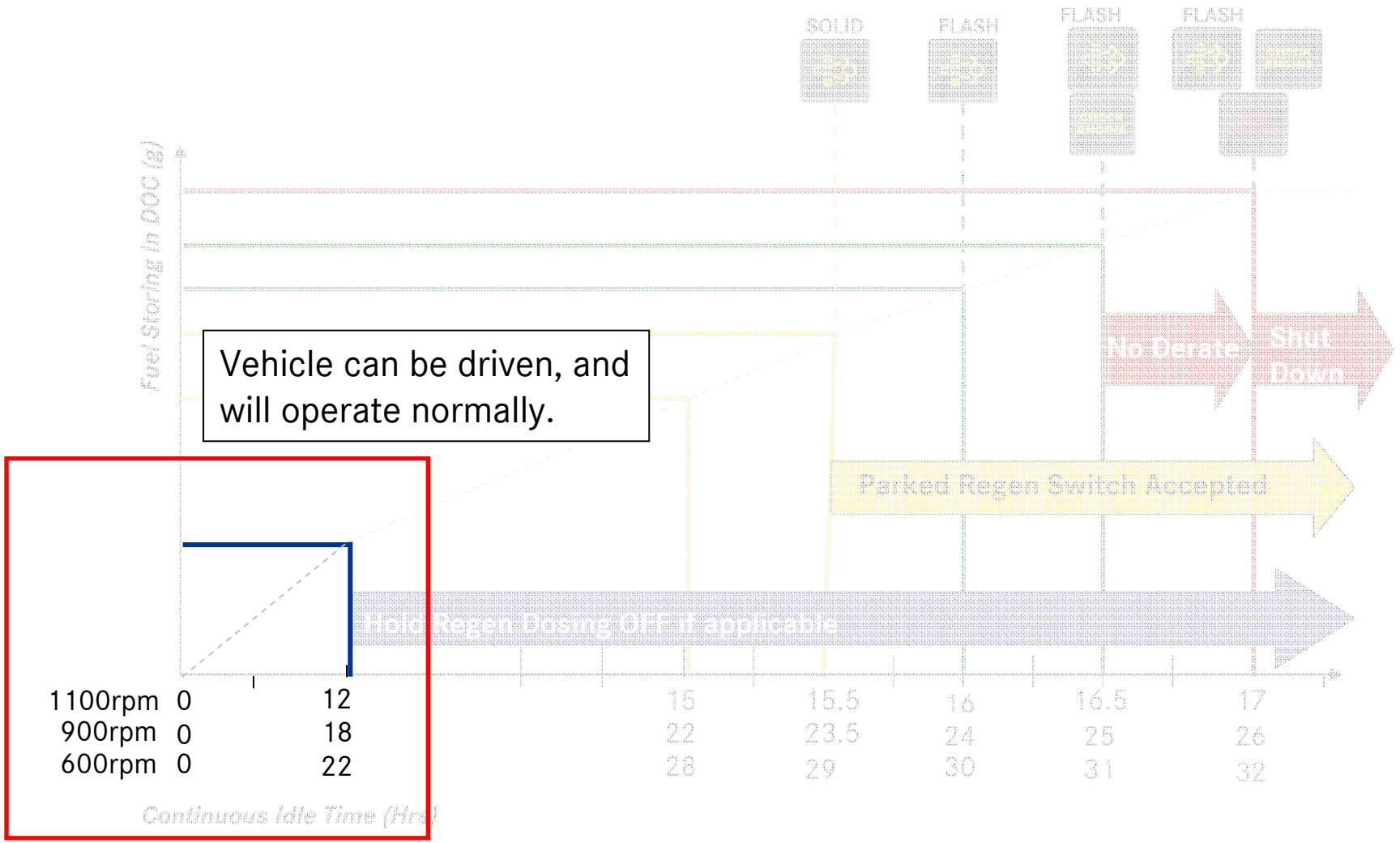
- The only time the driver will see DPF lamp for HC will be if the auto-elevate feature is disabled or interrupted.
- The DPF lamp has been programmed to work with the Auto-Elevate feature. The indicator lamp will work exactly as it does for the Regeneration process (except that the engine will **NOT** de-rate in zone 4).
- If the Auto-Elevate is **NOT** enabled, the following lamp progression holds true:

 SOLID	Bring vehicle to highway speeds to allow for an Automatic Regeneration **OR** Perform a Parked Regeneration.
 FLASHING	Bring vehicle to highway speeds to allow for an Automatic Regeneration **OR** Perform a Parked Regeneration as soon as possible.
 FLASHING	Vehicle must be parked and a Parked Regeneration **OR** Service Regeneration must be performed. **PARKED REGENERATION REQUIRED**
 FLASHING	Vehicle must be parked and a Parked Regeneration **OR** Service Regeneration must be performed. **PARKED REGENERATION REQUIRED – ENGINE SHUTDOWN**

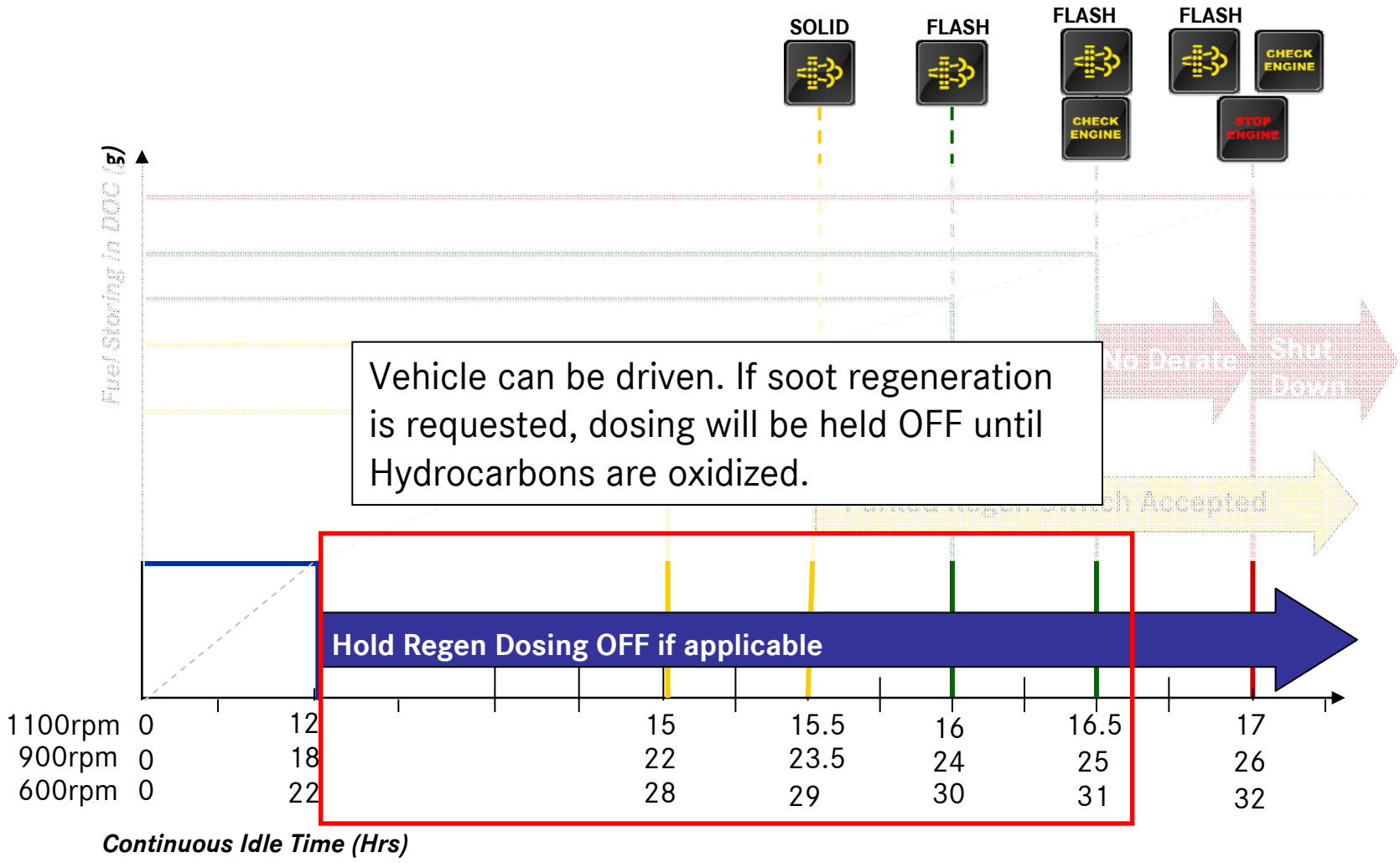
Auto-Elevate – Timing / Indicator Lamps



Auto-Elevate – Timing / Indicator Lamps



Auto-Elevate – Timing / Indicator Lamps

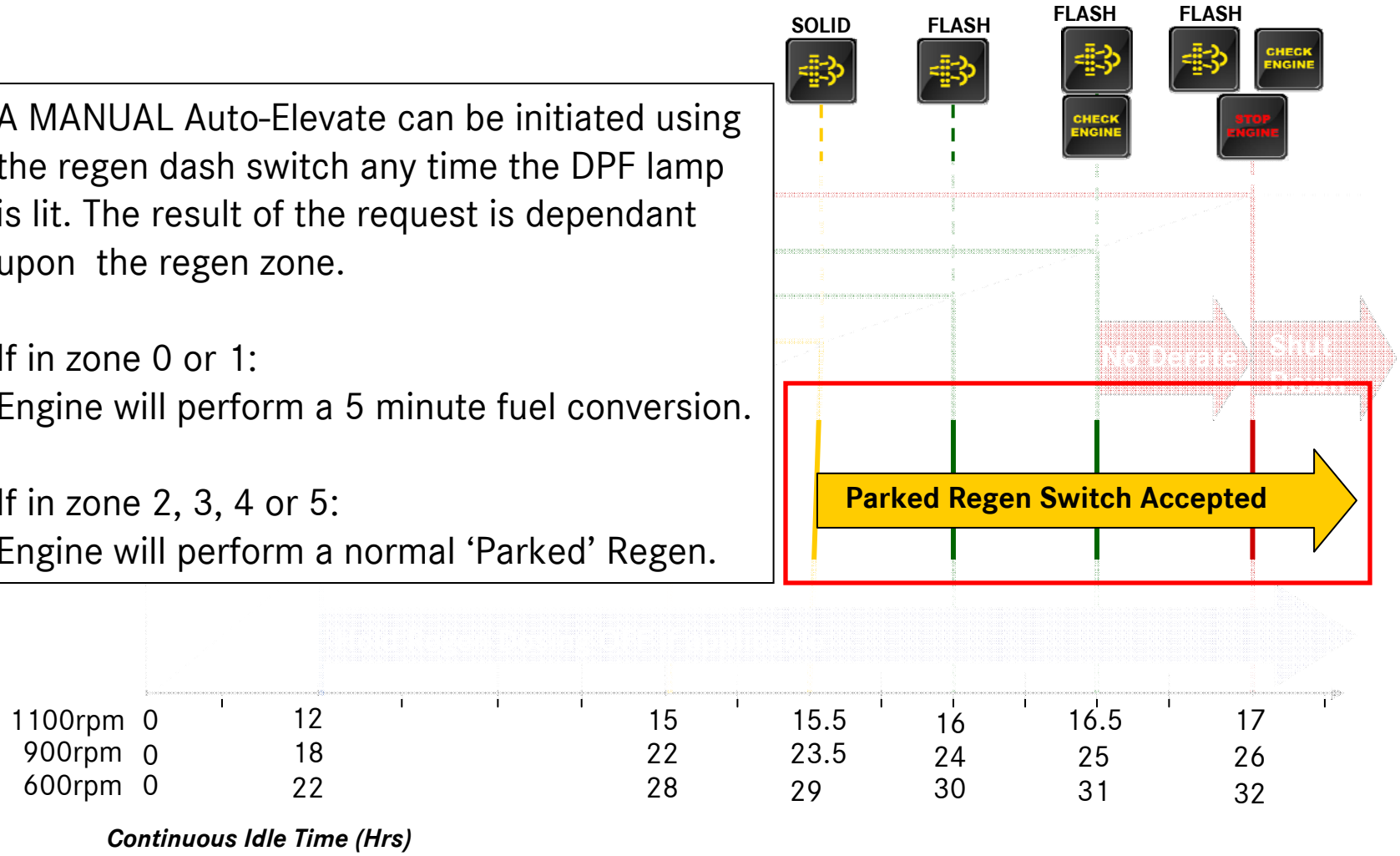


Auto-Elevate – Timing / Indicator Lamps

A MANUAL Auto-Elevate can be initiated using the regen dash switch any time the DPF lamp is lit. The result of the request is dependant upon the regen zone.

If in zone 0 or 1:
Engine will perform a 5 minute fuel conversion.

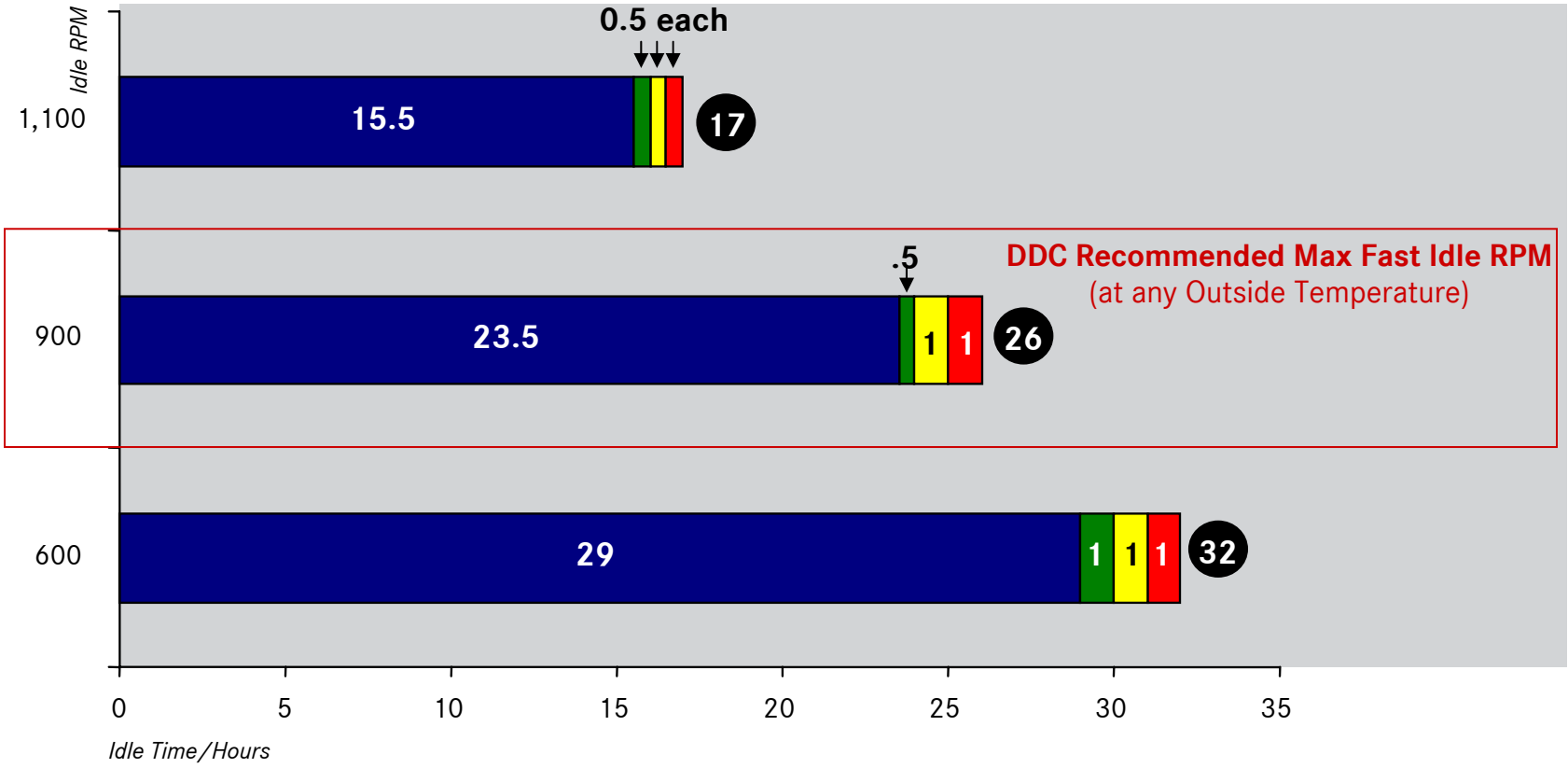
If in zone 2, 3, 4 or 5:
Engine will perform a normal 'Parked' Regen.



Idle Strategy – Auto-Elevate NOT Enabled

Idle Scenario (Overnight):

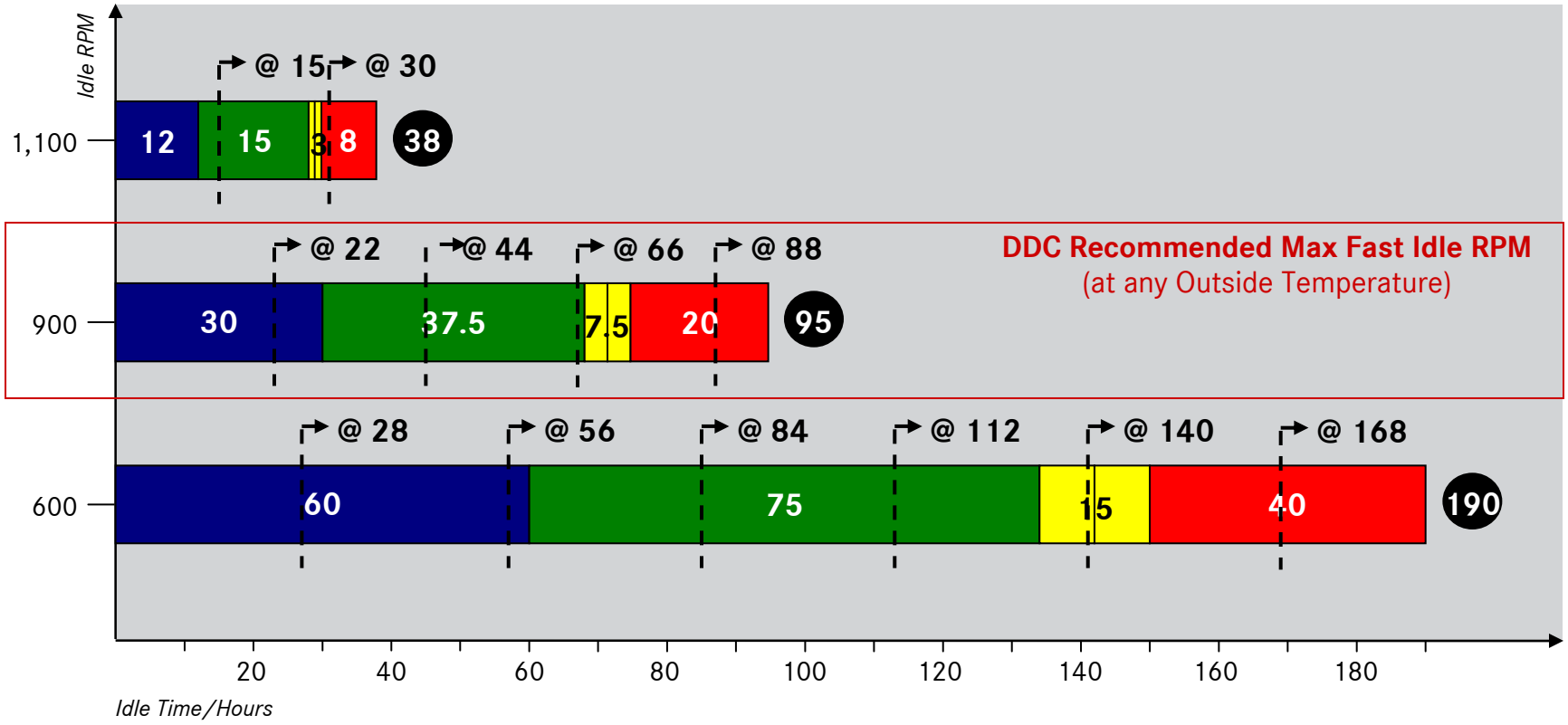
If a truck idles overnight, the unit will be forced to shutdown by the **Auto-Elevate System** by the 17th, 26th, and 32nd hour, respectively.



Idle Strategy – Auto-Elevate Enabled

Idle Scenario (Overnight):

If a truck idles overnight, the Auto-Elevate feature will initiate at the hours indicated by the dotted lines below. As you can see from this slide, the unit will be forced to shutdown by the **Aftertreatment System** by the 38th, 95th, and 190th hour, respectively.



What the customer will see:

Auto-Elevate - Options & Release Date

- The Auto-Elevate feature is a programmable feature (at the customer level).
- The Auto-Elevate feature is defaulted to “off.”
- Customers with extended idle that have interest in the Auto-Elevate feature may enable this feature at any time, as required.
- Production Software Release Dates:
  - S60 V62: May 2008 Service Release
  - S60 V62: July 2008 Production Release
  - MBE / DD15 V11: August 2008 Field Release

Competitive Strategies:

CM871/876/2150
OEM Programming Guide

Particulate Filter Maintenance at Idle – Unexpected Speed Increase

Overview

If the engine is left at idle for significant periods of time without reaching the minimum exhaust operating temperatures, the engine will automatically increase the engine idle speed for several minutes to maintain the condition of the particulate filter. This maintenance event, called "unexpected idle speed increase", is similar to the Fast Idle Warm-up feature used on ISB/ISC/ISL engines. This feature is not OEM programmable.

Operation

Particulate filter maintenance at idle (unexpected idle speed increase) will occur automatically depending on different conditions for different engines. The following table summarizes the basic conditions & requirements:

Unexpected Idle Speed Increase Conditions (Desorb)

Engine	Idle Speed Will Be Increased	Increased Idle Speed
ISB/ISC/ISL	After 4 continuous idle hrs. with exhaust temperature $< 150^0$ C (302^0 F)	1050 rpm for 10 minutes
ISM	After 4 continuous idle hrs. with exhaust temperature $< 250^0$ C (482^0 F)	900 rpm for 15 minutes
ISX	After 4 continuous idle hrs. with exhaust temperature $< 250^0$ C (482^0 F)	800 rpm for 15 minutes

Note: The engine speed will not be changed during PTO operation. All other normal entry conditions for a stationary regeneration will apply, such as 0 vehicle speed, the clutch & brake pedal released, transmission is out of gear, etc.