Section 5.7
Engine Protection

The DDEC10 Engine Protection system monitors all engine sensors and electronic components, and recognizes system malfunctions. If a critical fault is detected, the Amber Warning Lamp (AWL) and Red Stop Lamp (RSL) illuminate. The malfunction codes are logged into the CPC2+'s memory.

The standard parameters which are monitored for engine protection are:

- Low coolant level
- High coolant temperature
- Low oil pressure
- High soot level (DPF)
- DPF Regeneration

Section 5.7.1
Operation

Engine Protection is a vital part of MCM2/CPC2+ programming and software. DDEC10 monitors coolant level, various pressures and temperatures, and compares these parameters against the allowable limits to determine when a critical fault is reached. The AWL is illuminated and a code logged if there is an electronic system fault. This indicates the problem should be diagnosed as soon as possible. The CPC2+ illuminates the AWL and RSL and stores a malfunction code if a potentially engine damaging fault is detected. Once a critical fault is reached, the AWL and RSL are illuminated and a 60 (coolant temp, coolant level, oil level) or 30 (oil pressure or DPF) second timer starts a countdown to the desired level of protection. The AWL will flash for 20 – 30 seconds and the RSL will flash for 10 seconds before the engine shuts down. The flashing will occur only if protection shutdown is enabled. Temperature and pressure limits are established in the engine calibration and may differ slightly from one engine model to another.

Engine Protection consists of different protection levels:

- Warning
- Shutdown

Section 5.7.1.1
Warning

The AWL illuminates when the parameter value falls below the pre-warning level. Speed and/or torque may be limited based on the engine protection parameter. The operation has the responsibility to take action to avoid engine damage. No shutdown will occur.

Section 5.7.1.2
Shutdown

Speed and/or torque may be limited based on the engine protection parameter. The engine shuts down 60 seconds (for coolant level or coolant temperature) or 30 seconds (oil pressure or DPF) after the RSL is illuminated. The AWL will flash 20–30 seconds before the shutdown. The RSL will flash 10 seconds before the shutdown.

Section 5.7.2

Stop Engine Override Option

The Stop Engine Override Switch is used for a momentary override. DDEC10 will record the number of times the override is activated after a fault occurs.

Note: This switch is REQUIRED for all applications except fire truck.

Momentary Override - An SEO switch is used to override the shutdown sequence. This override resets the 60 second (30 seconds for oil pressure) shutdown timer. The switch must be recycled after five seconds to obtain a subsequent override.

Note: The operator has the responsibility to take action to avoid engine damage.

An additional override will occur when a DPF soot load or diagnostic shutdown is in progress and the CPC2+ is requesting a DPF regeneration. This will give a blocked or sooty DPF the chance to be cleared before determining whether to shutdown the engine.

Section 5.7.3
Programming Flexibility

DDEC 10 is programmed with pressure, temperature, and level protection limits for each parameter monitored. Rampdown is always enabled. Shutdown can be configured for certain parameters.

DDEC 10 engine protection system parameters are listed in Table "Engine Protection" .

Parameter Group	Parameter	Description	Options	Default	Access
18	Coolant Temp Eng Protect Shtn	Enable/Disable shutdown for high coolant temperature	0 = Warning 1 = Engine Shutdown	1 = Engine Shutdown	DDDL, DRS, VEPS
18	Coolant Level Eng Protect Shtn	Enable/Disable shutdown for low coolant level	0 = Warning 1 = Engine Shutdown	1 = Engine Shutdown	DDDL, DRS, VEPS
18	Oil Press Eng Protect Shtn	Enable/Disable shutdown for low oil pressure	0 = Warning 1 = Engine Shutdown	1 = Engine Shutdown	DDDL, DRS, VEPS
18	Oil Level Eng Protect Shtn	Enable/Disable shutdown for low oil level	0 = Warning 1 = Engine Shutdown	1 = Engine Shutdown	DDDL, DRS, VEPS

Table 1. Engine Protection

The shutdown times are listed in Table "Shutdown Times" .

Parameter Group	Parameter	Range	Default	School Bus Applications Only	All Other Applications	Access

18	Oil Pressure Shtdn Time	30–60 sec.	30 sec.	60 sec.	30 sec.	DRS, VEPS
18	Eng Protect 1 Shtdn Time	30–60 sec.	30 sec.	60 sec.	30 sec.	DRS, VEPS

Table 2. Shutdown Times