

International[®] A26 (2017)

Overview: *Engine Warning & Protection
System*

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General Overview: Engine Warning and Protection System

The Engine Warning and Protection System (EWPS) feature is designed to protect the engine from damage by monitoring critical engine data such as vehicle speed, engine speed, coolant temperature, coolant level, oil pressure, oil level, oil temperature and unintended fueling (engine knock). This feature will alert the operator, using a combination of visual and audible warnings, when critical engine parameters have been exceeded.

This document will address the unique engine warning and protection system functionality for the A26.

Description and Operation

Operation

NOTE: Refer to the vehicle operation and maintenance manual, as well as the A26 engine operation and maintenance manual, for additional information on operation and indications.

The EWPS feature uses an Amber warning lamp and a Red stop lamp, as well as other indicators, located in the gauge cluster, for visual display indications that critical engine parameters have been exceeded. An audible beep is provided as an additional EWPS operator warning.

Red Stop Lamp (RSL)

The RSL turns ON when a malfunction occurs which may result in vehicle damage and could affect safe vehicle operation. The vehicle should be safely pulled over and parked as soon as possible.

The EWPS is capable of providing up to two levels of protection. The second level corresponds to the highest severity. It is essential that the operators be trained to recognize and understand the warnings associated with the EWPS feature.

1st Level (Warning)

- The gauge cluster sounds 3 short audible beeps
- The Amber warning triangle light will go on

2nd Level (Shutdown) - Optional

- The RSL flashes in the gauge cluster
- The gauge cluster sounds a continuous audible beep
- Based on protection option, the engine will continue warning, or force to only run at idle , de-rate, or shut down in 30 seconds, after the RSL begins to flash

Engine speed and power may be affected during this event

If the engine shuts down, it can be restarted by cycling the key switch; however, the engine will shut down after 30 seconds if the second level is still being exceeded

Programmable Parameters

The following programmable parameters are available, with the EWPS feature. These parameters should be programmed in a manner, which provides the appropriate level of warning and protection to meet the customer's needs.

Parameters indicated, as customer programmable, can be adjusted differently than the production assembly plant setting, to meet the customer's needs. If the parameter is indicated as non-customer programmable, the parameter setting is preset from the factory and can't be changed without dealer authorization.

Parameter Value	Description	Possible Values	Cust Pgrm	Recommended Settings
ECT Warning and Protection Mode Selection (77781)	<p>This parameter determines how the ECT Warning and Protection Mode Selection Feature reacts if engine coolant temperature operating limits are exceeded.</p> <p>If set to (1) – The ECT Warning and Protection Mode Selection Feature provides a visual and audible indication if critical engine operating limits exceed a threshold.</p> <p>There are 2 levels of warnings:</p> <ul style="list-style-type: none"> ▪ (Less Severe) – A visual Amber triangle light and 3 audible beeps occur if critical engine operating parameters exceed the 1st threshold. ▪ (More Severe) – The Red stop lamp flashes with continues audible beeps if critical engine operating parameters exceed the 2nd threshold. <p>If set to (3) – The ECT Warning and Protection Mode Selection Feature provides 2 levels of protection:</p> <ul style="list-style-type: none"> ▪ (Less Severe) – A visual Amber triangle light and 3 audible beeps occur if critical engine operating parameters exceed the 1st threshold. ▪ (More Severe) – The Red stop lamp flashes with continues audible beeps if critical engine operating parameters exceed the 2nd threshold. The engine will shut-down in 30 seconds. This allows the operator time to safely pull over and park the vehicle. <p>If set to (4) – The ECT Warning and Protection Mode Selection Feature provides 2 levels of protection:</p> <ul style="list-style-type: none"> ▪ (Less Severe) – A visual Amber triangle light and 3 audible beeps occur if critical engine operating parameters exceed the 1st threshold. ▪ (More Severe) – The Red stop lamp flashes with continues audible beeps if critical engine operating 	<p>1: Warning Feature</p> <p>3: Protection Shut- down Feature</p> <p>4: Protection Low Idle feature</p>	YES	4: Protection Low Idle feature

Parameter Value	Description	Possible Values	Cust Pgrm	Recommended Settings
	parameters exceed the 2 nd threshold. The engine will change its' operating mode, to idle, in 30 seconds. This allows the operator time to safely pull over and park the vehicle.			
Engine Coolant Level - Protection Reaction (77682)	<p>This parameter determines how the Coolant Level - Protection Reaction Feature reacts if engine coolant temperature operating limits are exceeded.</p> <p>This parameter determines how the Coolant Level - Protection Reaction Feature reacts if engine coolant level operating limits are exceeded.</p> <p>If set to (1) – The Coolant Level - Protection Reaction Feature provides a visual red stop lamp flashing and audible continues beeping indication occurs if critical engine operating limits exceed a threshold.</p> <p>If set to (2) – The Coolant Level - Protection Reaction Feature provides:</p> <ul style="list-style-type: none"> ▪ A visual Red stop lamp flashing and audible continues beeping indication occurs if critical engine operating parameters exceed a threshold. ▪ The engine will go into a de-rate mode in 30 seconds. This allows the operator time to safely pull over and park the vehicle. <p>If set to (3) – The Coolant Level - Protection Reaction Feature provides:</p> <ul style="list-style-type: none"> ▪ A visual Red stop lamp flashing and audible continues beeping indication occurs if critical engine operating parameters exceed a threshold. ▪ The engine will shut-down in 30 seconds. This allows the operator time to safely pull over and park the vehicle. <p>If set to (4) – The Coolant Level - Protection Reaction Feature provides:</p> <ul style="list-style-type: none"> ▪ A visual Red stop lamp flashing and audible continues beeping indication occurs if critical engine operating parameters exceed a threshold. ▪ The engine will change its' operating mode, to idle, in 30 seconds. This allows the operator time to safely pull over and park the vehicle. 	<p>1: Warning Feature</p> <p>2: Protection Feature (De-rate)</p> <p>3: Protection Shut- down Feature</p> <p>4: Protection Low Idle feature</p>	YES	2: Protection Feature (De-rate)
Engine Oil Pressure Low - Protection Reaction (77702)	<p>This parameter determines how the Oil Pressure Low - Protection Reaction Feature reacts if engine oil pressure is below its' operating limits.</p> <p>If set to (1) – Oil Pressure Low - Protection Reaction Feature provides a visual and audible indication if critical engine operating limits exceed a threshold.</p>	<p>1: Warning Feature</p> <p>3: Protection Shut- down Feature</p> <p>4: Protection Low Idle feature</p>	YES	3: Protection Shut-down Feature

Parameter Value	Description	Possible Values	Cust Pgrm	Recommended Settings
	<p>There are 2 levels of warnings:</p> <ul style="list-style-type: none"> ▪ (Less Severe) – A visual Amber triangle light and 3 audible beeps occur if critical engine operating parameters exceed the 1st threshold. ▪ (More Severe) – The Red stop lamp flashes with continuous audible beeps if critical engine operating parameters exceed the 2nd threshold. <p>If set to (3) – The Oil Pressure Low - Protection Reaction Feature provides 2 levels of protection:</p> <ul style="list-style-type: none"> ▪ (Less Severe) – A visual Amber triangle light and 3 audible beeps occur if critical engine operating parameters exceed the 1st threshold. ▪ (More Severe) – The Red stop lamp flashes with continues audible beeps if critical engine operating parameters exceed the 2nd threshold. The engine will shut-down in 30 seconds. This allows the operator time to safely pull over and park the vehicle. <p>If set to (4) – Oil Pressure Low - Protection Reaction Feature provides 2 levels of protection:</p> <ul style="list-style-type: none"> ▪ (Less Severe) – A visual Amber triangle light and 3 audible beeps occur if critical engine operating parameters exceed the 1st threshold. ▪ (More Severe) – The Red stop lamp flashes with continues audible beeps if critical engine operating parameters exceed the 2nd threshold. The engine will change its' operating mode, to idle, in 30 seconds. This allows the operator time to safely pull over and park the vehicle 			
<p>Engine Oil Temperature - Protection Reaction (77712)</p>	<p>This parameter determines how the Oil Temperature - Protection Reaction Feature reacts if engine oil temperature operating limits are exceeded.</p> <p>If set to (1) – The Oil Temperature - Protection Reaction Feature provides a visual and audible indication if critical engine operating limits exceed a threshold.</p> <p>If set to (3) – The Oil Temperature - Protection Reaction Feature provides 2 levels of protection:</p> <ul style="list-style-type: none"> ▪ (Less Severe) – A visual Amber triangle light and 3 audible beeps occur if critical engine operating parameters exceed the 1st threshold. ▪ (More Severe) – The Red stop lamp flashes with continues audible beeps if critical engine operating parameters exceed the 2nd threshold. The engine will shut-down in 30 seconds. This allows the operator time to safely pull over and park the vehicle. 	<p>1: Warning Feature 3: Protection Shut- down Feature 4: Protection Low Idle feature</p>	<p>YES</p>	<p>1: Warning Feature</p>

Parameter Value	Description	Possible Values	Cust Pgrm	Recommended Settings
	<p>If set to (4) – The Oil Temperature - Protection Reaction Feature provides 2 levels of protection:</p> <ul style="list-style-type: none"> ▪ (Less Severe) – A visual Amber triangle light and 3 audible beeps occur if critical engine operating parameters exceed the 1st threshold. ▪ (More Severe) – The Red stop lamp flashes with continues audible beeps if critical engine operating parameters exceed the 2nd threshold. The engine will change its’ operating mode, to idle, in 30 seconds. This allows the operator time to safely pull over and park the vehicle. 			
Engine Oil Level - Protection Reaction (77722)	<p>This parameter determines how the Oil Level - Protection Reaction Feature reacts if engine oil level operating limits are exceeded.</p> <p>If set to (1) – The Oil Level - Protection Reaction Feature provides a visual Red stop lamp flashing and audible continues beeping indication occurs, if critical engine operating limits exceed a threshold.</p> <p>If set to (2) – The Oil Level - Protection Reaction Feature provides</p> <ul style="list-style-type: none"> ▪ A visual Red stop lamp flashing and audible continues beeping indication occurs, if critical engine operating parameters exceed a threshold. ▪ The engine will go into a de-rate mode in 30 seconds. This allows the operator time to safely pull over and park the vehicle. <p>If set to (3) – The Oil Level - Protection Reaction Feature provides:</p> <ul style="list-style-type: none"> ▪ A visual Red stop lamp flashing and audible continues beeping indication occurs if critical engine operating parameters exceed a threshold. ▪ The engine will shut-down in 30 seconds. This allows the operator time to safely pull over and park the vehicle. <p>If set to (4) – The Oil Level - Protection Reaction Feature provides:</p> <ul style="list-style-type: none"> ▪ A visual Red stop lamp flashing and audible continues beeping indication occurs if critical engine operating parameters exceed a threshold. ▪ The engine will change its’ operating mode, to idle, in 30 seconds. This allows the operator time to safely pull over and park the vehicle. 	<p>1: Warning Feature</p> <p>2: Protection Feature (De-rate)</p> <p>3: Protection Shut- down Feature</p> <p>4: Protection Low Idle feature</p>	YES	3: Protection Shut-down Feature
Oil Level Sensor Enable (99481)	<p>This parameter determines if the Oil Level Sensor input to the engine controller is enabled.</p>	<p>0: Oil Level Sensor Disabled</p> <p>1: Oil Level Sensor Enabled</p>	YES	

Parameter Value	Description	Possible Values	Cust Pgrm	Recommended Settings
EWPS Shutdown Time (77312)	This parameter sets the time from which the Red stop lamp (RSL) begins to flash before the engine shuts down. This allows the operator time to safely pull over and park the vehicle. For example, if set to a value of 30 the engine will shut down 30 seconds after the RSL begins to flash	30 to 3,276 seconds	YES	30 seconds
Vehicle Over Speed Level 1 (77232)	This parameter sets the speed at which the 1 st vehicle over speed warning will occur.	0 to 124 mph	YES	Customer Chosen
Vehicle Over Speed Level 2 (77242)	This parameter sets the speed at which the 2 nd vehicle over speed warning will occur.	0 to 124 mph	YES	Customer Chosen
Crankshaft Acceleration Knock Detection Monitoring Mode (77950) May not be functional at this time.	This parameter sets the mode for Crankshaft Acceleration Knock Detection. This provides engine protection for un-intended fueling it will shut down the engine if the unintended fueling conditions are detected.	0: Disabled 1: All monitoring enabled 2: Stationary monitoring enabled 3: Mobile monitoring enabled	YES	Customer chosen.
Fuel Quantity Knock Detection Mode Enable (77960)	This provides engine protection for un-intended fueling it will shut down the engine if the unintended fueling conditions are detected.	0: Disable 1: Enable	YES	Customer chosen.
Engine warning and protection factor used to calculate warning value (39110)	The oil pressure thresholds can be factored up or down to compensate for auxiliary lube system modifications which may affect normal oil pressure, such as the addition of soot centrifuges.	0 to 1	NO	Engineering Only
Engine warning and protection factor used to calculate shutdown value (39120)	The oil pressure thresholds can be factored up or down to compensate for auxiliary lube system modifications which may affect normal oil pressure, such as the addition of soot centrifuges.	0 to 1	NO	Engineering Only
SCR Faults Reset Request (39171)	This parameter can be set to a value of 1 to clear SCR DTCs	0: 0 1: Reset	NO	Dealer
AESC State to inhibit HC Desorb (39020)	Hydrocarbon DeSorb will increase engine speed, when stationary, attempting to keep the engine exhaust at a temperature that will improve emissions. This may not be desirable for some operation and HC Desorb should be disabled.	0: Inhibit DeSorb when AESC is controlling engine speed 1: Inhibit DeSorb when AESC is in standby or controlling engine speed	NO	Programming Support

Parameter Setup

EWPS Application

This section describes one feature application and how the programmable parameters can be effectively configured for this application. This is not a comprehensive list, and does not include all possible applications that an owner/operator might encounter.

Please review the description and operation section and the programmable parameters for a better understanding of how the various engine parameters might be best configured to the vehicle.

EWPS Example

The customer desires EWPS, for engine coolant temp, with engine shutdown enabled. Engine protection levels, warnings and shutdowns along with a visual warning if a sensor has failed are requested. Set programmable parameters to the values shown in the table below:

Parameter Name	Action Required
ECT Warning and Protection Mode Selection (77781)	Set to 2
EWPS Shutdown Time (77312)	Set to 30

Frequently Asked Questions

Can I restart the engine immediately after the EWPS feature has shut the engine down?

Yes, just cycle the key switch and restart the engine. However, if the critical operating condition is still present then the engine will shut down, again, after 30 seconds (programmable time).

Definitions/Acronyms

The following terms are referenced in this document:

Acronym	Definition
DTC	Diagnostic Trouble Code
HC	Hydro Carbon
ECT	Engine Coolant Temperature
EWPS	Engine Warning And Protection System
RSL	Red Stop Lamp
SCR	Selective Catalyst Reduction