MaxxForce® DT, 9, 10 (2010)

Overview: *Engine Warning & Protection System*

TABLE OF CONTENTS

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 engine speed, temperature, oil pressure and coolant level. This feature will alert the operator using a combination of visual and audible warnings when critical engine parameters have been exceeded. Depending on the severity of the problem, there is an option to allow for reduction in power associated with the warnings.

This document will address the unique EWPS functionality for the MaxxForce® DT, 9, 10.

Description and Operation

Operation

The EWPS feature uses an amber warning lamp (AWL) and a red stop lamp (RSL) 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.

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 AWL turns ON steady

- The gauge cluster sounds 3 short audible beeps

Amber Warning Lamp (AWL)

The AWL turns ON when a warning level fault has been set:

- The engine coolant temperature has exceeded the programmed warning level parameters: Engine Coolant Warning Temperature (7701) and Engine Warning & Protection System Mode (7700) are programmed to 1, 2, 3, 4, or 5.
- The engine coolant level is indicating low engine coolant and Engine Warning & Protection System Mode (7700) is programmed to 1, 2, or 4.

- The engine oil pressure has dropped below the programmed warning level (7706, 7708, 7709, or 5 psi) as selected by the engine speed (7703, 7704, 7705 or < 7703). This detection will always function regardless of the programmed value of EWPS Mode.

2nd Level (Shutdown) – Optional

- The RSL flashes in the gauge cluster

- The gauge cluster sounds a continuous audible beep

▪ The engine shuts down 30 seconds (programmable) after the RSL begins to flash

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

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 as parked as soon as possible.

▪ The engine coolant temperature has exceeded the Engine Coolant Critical Temperature (7702) warning threshold. This detection will always function regardless of EWPS Mode.

▪ The engine coolant level is indicating low engine coolant and Engine Warning & Protection System Mode (7700) is programmed to 2, 3, or 4.

▪ The engine oil pressure has dropped below the programmed warning level (7706, 7708, 7709, or 5 psi) as selected by the engine speed (7703, 7704, 7705 or < 7703). This detection will function when EWPS mode is programmed to 2, 4, or 5.

▪ EWPS Mode is programmed to 4 and a non- plausible Genset Speed Control input signal is indicated.

Feature Interactions

The EWPS feature interacts with the following engine features:

▪ Vehicle Speed Governor – The vehicle over speed warning indication provided by EWPS may occur at different vehicle speeds depending on the vehicle accelerator.

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. This adjustment can be done before or after the original sale. 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
Engine Warning And Protection System Mode (7700)	This parameter determines how the EWPS Feature reacts if critical engine operating limits are exceeded. If set to (1) – The EWPS feature provides a visual and audible indication if critical engine operating limits exceed a threshold. If set to (2) – The EWPS feature provides 2 levels of protection. ▪ (Less Severe) – A visual and audible indication occurs if critical engine operating parameters exceed the 1st threshold. ▪ (More Severe) – The EWPS feature will shut down the engine if critical engine operating parameters exceed the 2nd threshold.	**0: Standard Warning** (Overspeed) **1: 3-way Warning** (Overspeed, Overheat, Low Oil Pressure, Low Coolant) **2: 3-way Protection** (Overspeed, Overheat, Low Oil Pressure, Low Coolant) **3: 2-way Warning** (Overspeed, Overheat, Low Oil Pressure) **4: 4-way Warning** (Overspeed, Overheat, Low Oil Pressure, Genset Speed Control) **5: 2-way Protection** (Overspeed, Overheat, Low Oil Pressure)	YES	Customer Chosen
Engine Coolant Warning Temperature (7701)	Engine Coolant Temperature threshold value for a warning level fault.	90- 127.5 ° C (194 – 261.5°F)	NO	113 ° C (235°F)
Engine Coolant Critical Temperature (7702)	Engine Coolant Temperature threshold value for a critical level fault.	90- 127.5 ° C (194 – 261.5°F)	NO	115.5 ° C (240°F)
Engine Oil Pressure Engine RPM Boundary 1 (7703)	Used to select the Engine Oil Pressure critical level threshold value.	0 to 6,000 RPM	NO	700 RPM
Engine Oil Pressure Engine RPM Boundary 2 (7704)	Used to select the Engine Oil Pressure critical level threshold value.	Low Idle (8202) to High Idle (8203)	NO	1400 RPM
Engine Oil Pressure Engine RPM Boundary 3 (7705)	Used to select the Engine Oil Pressure critical level threshold value.	Low Idle (8202) to High Idle (8203)	NO	2000 RPM
Engine Oil Warning Pressure for Region 1 (7706)	The engine oil pressure warning level threshold value when engine speed is less than Engine Oil Pressure Engine RPM Boundary 2 (7704) but greater than Engine Oil Pressure Engine RPM Boundary 1 (7703). **Note:** When the engine speed is less Engine Oil Pressure Engine RPM Boundary 1 (7703), the warning pressure threshold defaults to 5 psi.	0 to 80 psi	NO	5.0 psi
Engine Oil Warning Pressure for Region 2 (7707)	The engine oil pressure warning level threshold value when engine speed is less than Engine Oil Pressure Engine RPM Boundary 3 (7705) but greater than Engine Oil Pressure Engine RPM Boundary 2 (7704).	0 to 80 psi	NO	10.0 psi

Parameter Value	Description	Possible Values	Cust Pgrm	Recommended Settings
Engine Oil Warning Pressure for Region 3 (7708)	The engine oil pressure warning level threshold value when engine speed is greater than Engine Oil Pressure Engine RPM Boundary 3 (7705).	0 to 80 psi	NO	20.0 psi
Engine Oil Critical Pressure for Region 1 (7709)	The engine oil pressure critical level threshold value when engine speed is less than Engine Oil Pressure Engine RPM Boundary 2 (7704) but greater than Engine Oil Pressure Engine RPM Boundary 1 (7703). **Note:** When the engine speed is less than 7703, the critical pressure threshold defaults to 0 psi.	0 to 80 psi	NO	2.0 psi
Engine Oil Critical Pressure for Region 2 (7710)	The engine oil pressure critical level threshold value when engine speed is less than Engine Oil Pressure Engine RPM Boundary 3 (7705) but greater than Engine Oil Pressure Engine RPM Boundary 2 (7704).	0 to 80 psi	NO	5.0 psi
Engine Oil Critical Pressure for Region 3 (7711)	The engine oil pressure critical level threshold value when engine speed is greater than Engine Oil Pressure Engine RPM Boundary 3 (7705).	0 to 80 psi	NO	12.0 psi
Disable Low Inlet Fuel Pressure Detection (7712)		0: Enable Diagnostic (Default) 1: Disable Diagnostic (for emergency vehicles)	NO	Program 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 with engine shutdown enabled. Both engine protection levels, warning and shutdown, 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
Engine Warning And Protection System Mode (7700)	Set to 2

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.

Definitions/Acronyms

The following terms are referenced in this document:

Acronym	Definition
AWL	Amber Warning Lamp
EWPS	Engine Warning And Protection System
RSL	Red Stop Lamp