



2010 MaxxForce® DT, 9, & 10 Engine to Chassis Interface

**Study Guide
TMT-121011**

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Introduction

Welcome to the 2010 MaxxForce® DT, 9, & 10 engine-to-chassis interface program.

The purpose of this program is to familiarize service personnel with how these engines are incorporated into the medium duty trucks and busses.

This course is divided into this introduction and the following 6 modules:

- Remote Oil Filter and Power Steering
- Cooling System
- Fuel and Air Management Systems
- Aftertreatment and Vehicle Air System
- Electronic Control System
- And Instrument Panel

Objective:

Upon completion of this course, you will be able to locate engine related components on the chassis.

This image shows a full page of blank white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page, providing a template for writing or drawing. There are no margins, text, or other markings on the paper.

Remote Oil Filter and Power Steering

Module 1

MaxxForce® 9 and 10 engines are equipped with a remote bypass oil filter. The filter is located on the right front of the chassis above the frame rail.

The filter receives non-filtered oil from a port on the oil filter module. Filtered oil then returns through a drain port on the right side of the crankcase.

A line from the vehicle's air system is attached to the bottom of the filter housing to aid in returning oil to the engine.

The filter element is serviceable and should be changed at every oil change interval.

On applications with an engine-driven air compressor, the power steering pump is located on the left side of the engine, and is driven off the back of the compressor.

On applications without the engine-driven air compressor, the power steering pump is mounted to the front cover and driven directly off the gear train.

“The filter element is serviceable and should be changed at every oil change interval.”

The power steering pump reservoir is located on the left side of the engine compartment behind the cooling package.

NOTES

[illegible]

[illegible]

Cooling System

Module 2

2010 engines with a horsepower rating of 245 and above require a Low Temperature Radiator, or LTR, an LTR thermostat, and an Interstage Cooler.

Engines with a horsepower rating below 245 will only have a conventional radiator.

Cooling packages are configured differently depending on the vehicle model.

The DuraStar® and CE bus are configured with the LTR above the condenser in front of the radiator. The Charge Air Cooler, or CAC, is mounted above the radiator.

The WorkStar® has the condenser, CAC and LTR in front of the radiator.

DuraStar® and CE buses have the LTR thermostat mounted to the right side of the cooling package.

WorkStar® trucks have the LTR thermostat mounted on the left side of the cooling fan shroud.

The heater core is mounted inside the interior module, which is located behind the instrument panel.

“The heater core is mounted inside the interior module.”

“The de-aeration tank is mounted to the left side of the cooling package.”

The heater core receives coolant from the coolant supply housing. Coolant is then returned to the water pump inlet.

The de-aeration tank is mounted to the left side of the cooling package. This tank is used to hold overflow coolant as well as aid in the removal of air from the cooling system.

The engine coolant level sensor is an input to the ECM. The sensor is mounted to the de-aeration tank.

There are a number of hoses that connect the de-aeration tank to components of the cooling system. These components are the radiator, the coolant supply housing, the EGR cooler, and, if equipped, the interstage cooler.

Coolant is returned from the de-aeration tank to the water pump inlet.

2010 Medium duty vehicles with these engines have four fan drive options. These include an air viscous clutch, an electric air viscous clutch, an on/off single belt drive, and an on/off dual belt drive.

NOTES

[illegible]

Fuel and Air Management Systems

Module 3

The fuel system parts on the vehicle include the fuel tank and lines.

The fuel lines are made of plastic and are routed to the left side of the engine where they connect to the fuel filter module.

Fresh air flows through a channel in the hood before entering the air cleaner housing. The mass air flow sensor is located either on the air filter housing, or on some vehicle models the turbo inlet pipe.

“Fresh air flows through a channel in the hood before entering the air cleaner housing.”

[illegible]

Aftertreatment and Vehicle Air System

Module 4

2010 Medium duty vehicles with these engines use downstream injection for the aftertreatment system. The injection process is controlled by the Aftertreatment Control Module, or ACM. This module is mounted either in front of the battery box on the underside of the cab, or behind the battery box on the frame rail.

The aftertreatment system sensors are located on the exhaust system. The sensor connectors are located near the right side frame rail.

“The aftertreatment system sensors are located on the exhaust system.”

Vehicles with hydraulic brakes have a chassis mounted electric air compressor located on top of the right frame rail near the front of the vehicle. The air storage tank is forward of the compressor, inside the frame rail. The compressor is used to supply air to the Exhaust Back Pressure Valve.

With the ignition switch ON, a 20 amp fuse and a relay in the instrument panel supply battery voltage to the tank mounted pressure switch. Power is then delivered from the pressure switch to the compressor motor. The motor is then grounded to a stud on the left side of the crankcase.

[illegible]

Electronic Control System

Module 5

The chassis harness is connected to the engine through a 76-pin connector on the ECM and a 24-pin connector on the engine.

The ECM and actuator power relays are located on the left side of the engine compartment near the cowl.

The optional block and oil pan heaters have a 110 volt connection located under the cab near the left front fender.

The Accelerator Pedal Position sensor, or APP, is attached to the accelerator pedal. This sensor consists of two separate potentiometers.

This sensor provides the ECM with two signals, APP1 and APP2, which indicate the operator's demand for power. The APP1 signal should always be approximately double APP2. The ECM monitors both signals with the key on and compares the values for fault detection.

“The ECM and actuator power relays are located on the left side of the engine.”

[illegible]

Instrument Panel

Module 6

A filter-minder is either located on the air filter housing or on the instrument panel. This is used to indicate air filter restriction.

The High Exhaust System Temperature lamp and DPF lamp have been revised for 2010.

The letters “TEMP” were added to this High Exhaust System Temperature lamp. When this light is illuminated the driver should keep the vehicle away from flammable materials. This lamp does not indicate a failure, only a warning to the operator.

The letters “DPF” were added to the Diesel Particulate Filter lamp. This lamp is used to indicate the soot load of the particulate filter.

The exhaust brake, engine brake, parked Regen, Regen inhibit, and fan override switches are located on the instrument panel. The presence of these switches may vary depending on the vehicle application.

“The High Exhaust System Temperature lamp and DPF lamp have been revised.”

[illegible]

Conclusion

This concludes the 2010 MaxxForce® DT, 9, and 10 engine-to-chassis interface program.

Thanks for your participation.

You are now required to take a post-test.

[illegible]