

Service Manual Trucks

Group **38**

Instrument Cluster Control Module (MID 140) Diagnostic
Trouble Code (DTC), Guide
From build date 1.2010



Foreword

The descriptions and service procedures contained in this manual are based on designs and methods studies carried out up to February 2010.

The products are under continuous development. Vehicles and components produced after the above date may therefore have different specifications and repair methods. When this is believed to have a significant bearing on this manual, supplementary service bulletins will be issued to cover the changes.

The new edition of this manual will update the changes.

In service procedures where the title incorporates an operation number, this is a reference to a Labor Code (Standard Time).

Service procedures which do not include an operation number in the title are for general information and no reference is made to a Labor Code (Standard Time).

Each section of this manual contains specific safety information and warnings which must be reviewed before performing any procedure. If a printed copy of a procedure is made, be sure to also make a printed copy of the safety information and warnings that relate to that procedure. The following levels of observations, cautions and warnings are used in this Service Documentation:

Note: Indicates a procedure, practice, or condition that must be followed in order to have the vehicle or component function in the manner intended.

Caution: Indicates an unsafe practice where damage to the product could occur.

Warning: Indicates an unsafe practice where personal injury or severe damage to the product could occur.

Danger: Indicates an unsafe practice where serious personal injury or death could occur.

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Repl:

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Design and Function

MID 140 Instrument Control Unit

The manufacturer diagnostic tool is the preferred tool for performing diagnostic work. Contact your local dealer for more information or visit "www.premiumtechttool.com".

System Overview

The instrument cluster is used to provide the operator with information via gauges, indicator lamps and a display.

Via the three connectors on the rear of the instrument cluster module, information from the whole vehicle is received.

Some information is received from sensors directly connected to the instrument panel, and some is received across the SAE 1587 data link. The data link permits other control modules in the vehicle to send messages to the instrument panel. The instrument panel receives these messages, processes them and then presents the information in a suitable form to the operator.

The operator can use a control stalk on the steering column to cycle through a set of menus to gain a more detailed picture of the vehicle status.

For more information about the control stalk, refer to the truck Operator's Manual.

Troubleshooting

MID 140 Instrumentation, Fault Codes

The manufacturer diagnostic tool is the preferred tool for performing diagnostic work. Contact your local dealer for more information or visit "www.premiumtechttool.com".

The control modules on the SAE J1587 data link communicate according to the SAE J1587 standard. The standard has been extended with Mack's supplement (PPID, PSID). The fault codes set by the control modules contain information that is described by the following SAE J1587 abbreviations.

MID	Message Identification Description: Identification of a control module.	SID	Subsystem Identification Description: Identification of a component.
PID	Parameter Identification Description: Identification of a parameter (value).	PSID	Proprietary Subsystem Identification Description Volvo: Unique identification of a component.
PPID	Proprietary Parameter Identification Description Volvo: Unique identification of a parameter (value).	FMI	Failure Mode Identifier: Identification of fault types.

Some control modules communicate on the SAE J1939 data link for diagnostics. All modules that communicate on the SAE J1939 data link communicate according to the SAE J1939 standard. The following abbreviations are used in the SAE J1939 standard.

SA	Source Address: Identification of a control module.
SPN	Suspect Parameter Number: Identification of a parameter (value).
FMI	Failure Mode Identifier: Identification of fault types.

SAE J1587 FMI Table

FMI	SAE Text
0	Data valid, but above the normal work range
1	Data valid, but below the normal work range
2	Data erratic, Intermittent or incorrect
3	Voltage above normal or shorted high
4	Voltage below normal or shorted low
5	Current below normal or open circuit
6	Current above normal or grounded circuit
7	Mechanical system not responding properly
8	Abnormal frequency, pulse width or period
9	Abnormal update rate
10	Abnormal rate of change
11	Failure mode not identifiable
12	Bad intelligent device or component
13	Out of calibration
14	Special instructions
15	Reserved for future assignment by SAE Data Formal Subcommittee

MID 140 Control Module, Fault Tracing

PID

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“MID 140 PID 84, Road Speed”, page 7

“MID 140 PID 96, Fuel Level”, page 8

“MID 140 PID 116, Application Air Pressure”, page 8

“MID 140 PID 117, Air Brake Pressure, Front”, page 8

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PPID

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SID

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PSID

- “MID 140 PSID 47, Switch Display, Escape”, page 12
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- “MID 140 PSID 201, Communication Interference, Data Link, Vehicle ECU”, page 13
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MID 140 PID 77, Forward Rear Axle Temperature

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 5	<ul style="list-style-type: none"> Abnormally low current or open circuit 	<ul style="list-style-type: none"> Sensor resistance above 40 kOhm 	<ul style="list-style-type: none"> Gauge needle moves to zero position Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty outdoor temperature sensor
FMI 6	<ul style="list-style-type: none"> Abnormally high current or short circuit to ground 	<ul style="list-style-type: none"> Sensor resistance below 5 Ohm 	<ul style="list-style-type: none"> Gauge needle moves to zero position Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty outdoor temperature sensor

MID 140 PID 78, Rear Rear Axle Temperature

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 5	<ul style="list-style-type: none"> Abnormally low current or open circuit 	<ul style="list-style-type: none"> Sensor resistance above 40 kOhm 	<ul style="list-style-type: none"> Gauge needle moves to zero position Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty outdoor temperature sensor
FMI 6	<ul style="list-style-type: none"> Abnormally high current or short circuit to ground 	<ul style="list-style-type: none"> Sensor resistance below 5 Ohm 	<ul style="list-style-type: none"> Gauge needle moves to zero position Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty outdoor temperature sensor

MID 140 PID 84, Road Speed

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 9	<ul style="list-style-type: none"> Abnormal update rate 	<ul style="list-style-type: none"> Signal missing for more than 8 seconds 	<ul style="list-style-type: none"> Gauge needle moves to zero position 	<ul style="list-style-type: none"> Data link fault (SAE J1939)

MID 140 PID 96, Fuel Level

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 5	<ul style="list-style-type: none"> Abnormally low current or open circuit 	<ul style="list-style-type: none"> Sensor resistance above 1 kOhm 	<ul style="list-style-type: none"> Gauge needle moves to zero position Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty fuel level sensor
FMI 6	<ul style="list-style-type: none"> Abnormally high current or short circuit to ground 	<ul style="list-style-type: none"> Sensor resistance below 20 Ohm 	<ul style="list-style-type: none"> Gauge needle moves to zero position Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty fuel level sensor

MID 140 PID 116, Application Air Pressure

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 3	<ul style="list-style-type: none"> Abnormally high voltage or short circuit to higher voltage 	<ul style="list-style-type: none"> Sensor output voltage above 5 V 	<ul style="list-style-type: none"> Gauge needle moves to zero position (Warning with high cluster only) Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty brake pressure sensor
FMI 4	<ul style="list-style-type: none"> Abnormally low voltage or short circuit to lower voltage 	<ul style="list-style-type: none"> Sensor output voltage below 0.25 V 	<ul style="list-style-type: none"> Gauge needle moves to zero position (Warning with high cluster only) Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty brake pressure sensor

MID 140 PID 117, Air Brake Pressure, Front

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 3	<ul style="list-style-type: none"> Abnormally high voltage or short circuit to higher voltage 	<ul style="list-style-type: none"> Sensor output voltage above 5 V 	<ul style="list-style-type: none"> Gauge needle moves to zero position, Warning lamp Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty brake pressure sensor

FMI 4	<ul style="list-style-type: none"> Abnormally low voltage or short circuit to lower voltage 	<ul style="list-style-type: none"> Sensor output voltage below 0.25 V 	<ul style="list-style-type: none"> Gauge needle moves to zero position, Warning lamp Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty brake pressure sensor
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MID 140 PID 118, Air Brake Pressure, Rear

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 3	<ul style="list-style-type: none"> Abnormally high voltage or short circuit to higher voltage 	<ul style="list-style-type: none"> Sensor output voltage above 5 V 	<ul style="list-style-type: none"> Gauge needle moves to zero position, Warning lamp Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty brake pressure sensor
FMI 4	<ul style="list-style-type: none"> Abnormally low voltage or short circuit to lower voltage 	<ul style="list-style-type: none"> Sensor output voltage below 0.25 V 	<ul style="list-style-type: none"> Gauge needle moves to zero position, Warning lamp Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty brake pressure sensor

MID 140 PID 170, Cab Interior Temperature

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 5	<ul style="list-style-type: none"> Abnormally low current or open circuit 	<ul style="list-style-type: none"> Sensor resistance above 38 kOhm 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty sensor
FMI 6	<ul style="list-style-type: none"> Abnormally high current or short circuit to ground 	<ul style="list-style-type: none"> Sensor resistance below 140 Ohm 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty sensor

MID 140 PID 171, Ambient Temperature

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 5	<ul style="list-style-type: none"> Abnormally low current or open circuit 	<ul style="list-style-type: none"> Sensor resistance above 40 kOhm 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty outdoor temperature sensor
FMI 6	<ul style="list-style-type: none"> Abnormally high current or short circuit to ground 	<ul style="list-style-type: none"> Sensor resistance below 130 Ohm 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty outdoor temperature sensor
FMI 9	<ul style="list-style-type: none"> Abnormal update rate 	<ul style="list-style-type: none"> Missing SPN 171 missing from Vehicle Electronic Control Unit (VECU) on data link (SAE J1939) 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Data link fault (SAE J1939)
FMI 12	<ul style="list-style-type: none"> Bad intelligent device or component 	<ul style="list-style-type: none"> Missing PID 171 missing from Vehicle Electronic Control Unit (VECU) on data link (SAE J1587) 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Data link fault (SAE J1587)

MID 140 PID 177, Transmission Oil Temperature

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 5	<ul style="list-style-type: none"> Abnormally low current or open circuit 	<ul style="list-style-type: none"> Sensor resistance above 70 kOhm 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty outdoor temperature sensor
FMI 6	<ul style="list-style-type: none"> Abnormally high current or short circuit to ground 	<ul style="list-style-type: none"> Sensor resistance below 10 Ohm 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty outdoor temperature sensor
FMI 9	<ul style="list-style-type: none"> Abnormal update rate 	<ul style="list-style-type: none"> Missing PID 177 missing from transmission control module (TCM) on data link (SAE J1939) 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Data link fault (SAE J1939)

MID 140 PID 358, Air Suspension #2 Pressure

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 3	<ul style="list-style-type: none"> Abnormally high voltage or short circuit to higher voltage 	<ul style="list-style-type: none"> Sensor output voltage below 0.25 V 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty sensor
FMI 4	<ul style="list-style-type: none"> Abnormally low voltage or short circuit to lower voltage 	<ul style="list-style-type: none"> Sensor output voltage above 5 V 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty sensor

MID 140 PPID 278, Aftertreatment Reagent Level

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 9	<ul style="list-style-type: none"> Abnormal update rate 	<ul style="list-style-type: none"> Missing Diesel Exhaust Fluid (DEF) message from Engine Control Module (ECM) on data link (SAE J1939) 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Data link fault (SAE J1939)

MID 140 SID 216, Other ECUs Have Fault Codes Effecting Operation

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 15	<ul style="list-style-type: none"> Reserved for future assignment by SAE Data Formal Subcommittee 	<ul style="list-style-type: none"> Active fault on the adaptive cruise control (ACC) module 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Check the faults on ACC

MID 140 SID 250, SAE J1587 Data Link

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 9	<ul style="list-style-type: none"> Abnormal update rate 	<ul style="list-style-type: none"> Message/s not received on SAE J1587 data link 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Data link fault (SAE J1587)

MID 140 PSID 47, Switch Display, Escape

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 12	<ul style="list-style-type: none"> Faulty unit or component 	<ul style="list-style-type: none"> Active signal (button) for more than 60 seconds 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty stalk switch

MID 140 PSID 48, Switch Display, Enter

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 12	<ul style="list-style-type: none"> Faulty unit or component 	<ul style="list-style-type: none"> Active signal (button) for more than 60 seconds 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty stalk switch

MID 140 PSID 49, Switch Display, Up

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 12	<ul style="list-style-type: none"> Faulty unit or component 	<ul style="list-style-type: none"> Active signal (button) for more than 60 seconds 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty stalk switch

MID 140 PSID 50, Switch Display, Down

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 12	<ul style="list-style-type: none"> Faulty unit or component 	<ul style="list-style-type: none"> Active signal (button) for more than 60 seconds 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Faulty stalk switch

MID 140 PSID 53, Buffered Engine Speed Output

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 3	<ul style="list-style-type: none"> Abnormally high voltage or short circuit to higher voltage 	<ul style="list-style-type: none"> Fault when engine speed stays high 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Engine control module (ECM)
FMI 4	<ul style="list-style-type: none"> Abnormally low voltage or short circuit to lower voltage 	<ul style="list-style-type: none"> Fault when engine speed stays low 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Engine control module (ECM)

MID 140 PSID 54, Buffered Vehicle Speed Output

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 3	<ul style="list-style-type: none"> Abnormally high voltage or short circuit to higher voltage 	<ul style="list-style-type: none"> Fault when vehicle speed stays high 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Engine control module (ECM)
FMI 4	<ul style="list-style-type: none"> Abnormally low voltage or short circuit to lower voltage 	<ul style="list-style-type: none"> Fault when vehicle speed stays low 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Faulty harness Engine control module (ECM)

MID 140 PSID 200, Communication Interference, Data Link, Engine Control Module (ECM)

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 9	<ul style="list-style-type: none"> Abnormal update rate 	<ul style="list-style-type: none"> DM1 missing on data link 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Data link Fault (SAE J1939)

MID 140 PSID 201, Communication Interference, Data Link, Vehicle ECU

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 9	<ul style="list-style-type: none"> Abnormal update rate 	<ul style="list-style-type: none"> Expected VECU message/s not received 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Data link fault (SAE J1939)

MID 140 PSID 204, Communication Interference, Data Link, Brake Control Module

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 9	<ul style="list-style-type: none"> Abnormal update rate 	<ul style="list-style-type: none"> Expected ABS message/s not received 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Data link fault (SAE J1939)

MID 140 PSID 205, Communication Interference, Data Link, Transmission Control Module

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 9	<ul style="list-style-type: none"> Abnormal update rate 	<ul style="list-style-type: none"> Expected transmission control module (TCM) message/s not received 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Data link fault (SAE J1939)

MID 140 PSID 211, Data Link, Adaptive Cruise Control

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 9	<ul style="list-style-type: none"> Abnormal update rate 	<ul style="list-style-type: none"> DM1 missing on data link 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Data link fault (SAE J1939)

MID 140 PSID 239, Data Link, MID 142 (Road Connect)

Type of fault:	FMI Description:	Fault Condition:	Possible Symptoms:	Possible Cause:
FMI 12	<ul style="list-style-type: none"> Bad intelligent device or component 	<ul style="list-style-type: none"> PID 44 missing on SAE J1587 data link 	<ul style="list-style-type: none"> Electronic malfunction lamp illuminated 	<ul style="list-style-type: none"> Data link fault (SAE J1587)



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