



Volvo Chassis - Fuel Level Sending Unit Specification Information



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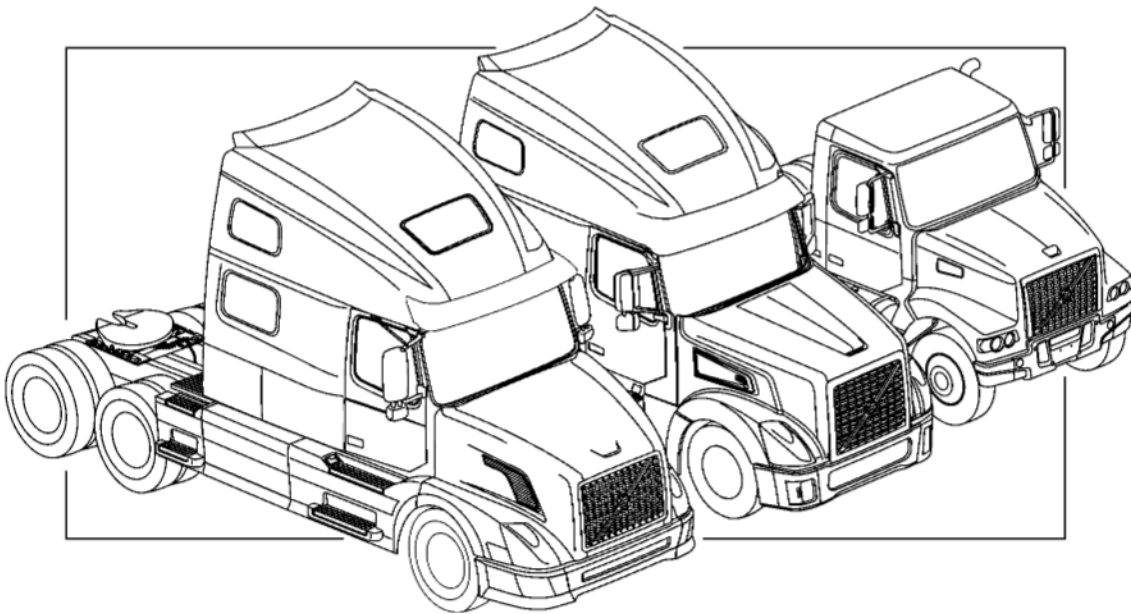
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SERVICE INFORMATION

Trucks

Group **38**

Fuel Level Sending Unit
VN, VHD, VT, VAH



Foreword

The descriptions and service procedures contained in this manual are based on designs and technical studies carried out through August 2013.

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 deemed to have a significant bearing on this manual, an updated version of this manual 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 an V.S. T. (Volvo Standard Times).

Service procedures which do not include an operation number in the title are for general information and no reference is made to an V.S.T.

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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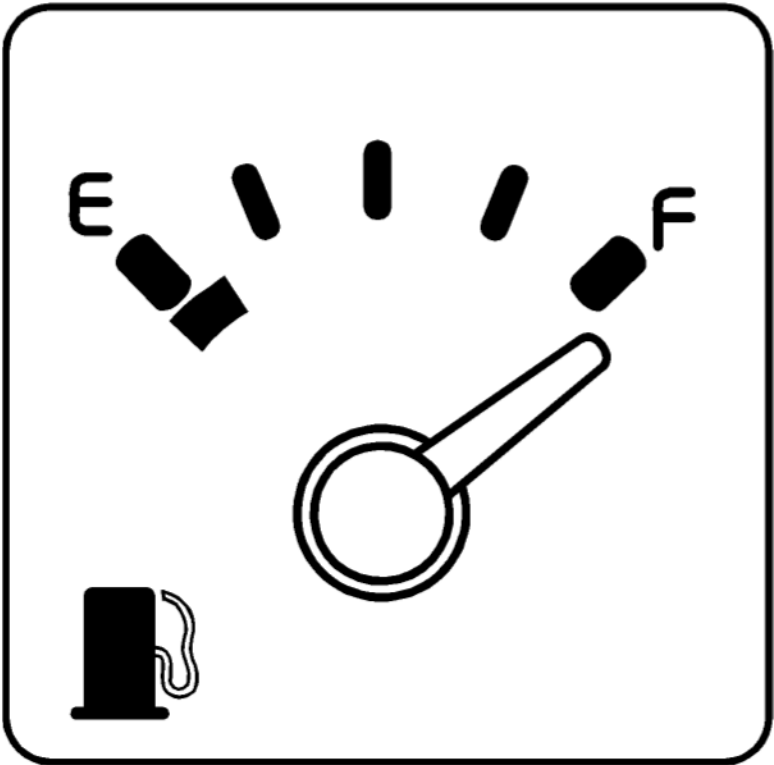
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Fuel Level Sending Unit



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Specifications

Fuel Level Sending Unit

Note: Use specifications in conjunction with the float level test.

22" Fuel Tank, Sending Unit Specifications

Float Level	Signal Reading +/- 5 Ω
481mm (18.9 in) (float all the way up)	27 Ω
400mm (15.7 in)	52.5 Ω
275mm (10.8 in)	88.2 Ω
150mm (5.9 in)	160 Ω
48mm (1.9 in) (float all the way down)	241 Ω

26" Fuel Tank, Straight Shaft Sending Unit Specifications

Float Level	Signal Reading +/- 5 Ω
562mm (22.1 in) (float all the way up)	27 Ω
460mm (18.1 in)	52.5 Ω
315mm (12.4 in)	87.9 Ω
165mm (6.5 in)	159.3 Ω
45mm (1.8 in) (float all the way down)	241.3 Ω

26" Fuel Tank, Angled Shaft Sending Unit with Float Stop

Float Level	Signal Reading +/- 5 Ω
426mm (16.8 in) (float all the way up)	27 Ω
363mm (14.3 in)	57 Ω
258mm (10.2 in)	99.8 Ω
174mm (6.9 in)	143.8 Ω
153mm (6.0 in)	155.8 Ω
48mm (1.9 in) (float all the way down)	240.8 Ω

Design and Function

Fuel Level Sending Unit

The fuel tank sending unit is a variable resistance sending unit. The sending unit provides a fuel level signal to the instrument cluster gauge. Due to road conditions (hills or curves) or typical driving conditions (braking or accelerating), the cluster input or gauge level change is highly dampened.

The sending unit signal is reported in real time; however, due to instrument cluster dampening the gauge will slowly move allowing the fuel in the tank time to stabilize its motion. For instrument cluster fuel gauge real time readings; such as after filling the fuel tank, it is necessary to cycle the ignition key. Failure to do so may lead to a slow rate of change in the fuel gauge.

This slow rate of change may be perceived as a lazy/inaccurate sending unit or another fuel gauge issue, when in fact, it's only the dampening function within the cluster. Whenever the key is cycled the fuel gauge will immediately move to the value the sending unit represents and from that point the gauge movement will be dampened during the drive cycle.

The fuel sending unit is designed to not reach the bottom of the tank, this allows the vehicle to have a measured percentage of fuel left after the gauge displays empty. This is called "reserve capacity" and allows for a measured distance to be traveled after the gauge is on empty.

If Equipped; Due to the float stop used on the angled shaft fuel level sending unit, the fuel level gauge will read full for a longer period of time before moving as compared to a truck equipped with a straight shaft sending units. The amount of time the gauge stays on full can vary as the fuel tank can be filled to a higher level than the float can move, however; the gauge readings from 3/4 to empty is very accurate based on tank volume.

These sending units are used on fuel tanks equipped with anti-siphons and/or cab heater fuel pickups.

Troubleshooting

Fuel Level Sending Unit

Float Level Test

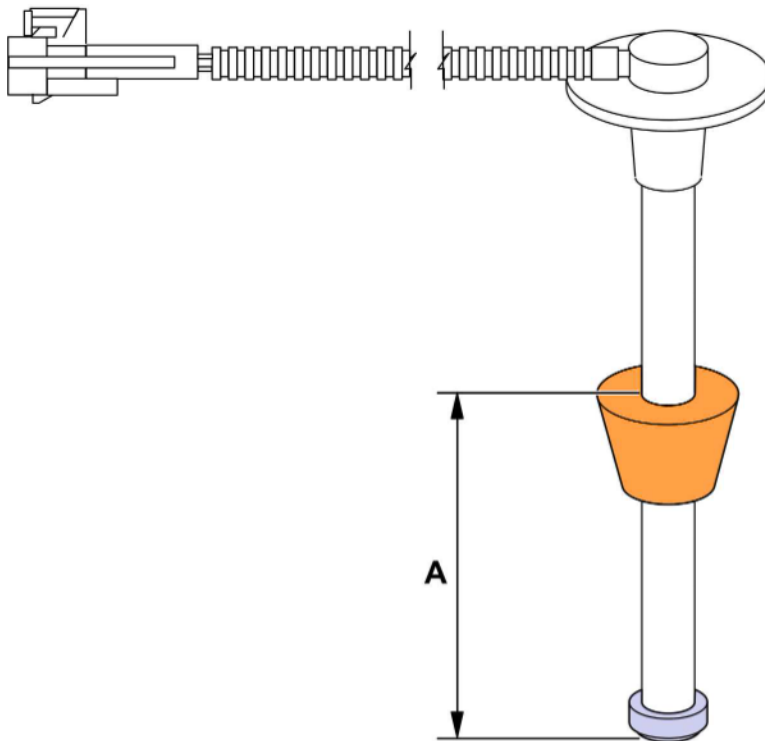
Tools required to perform the float level test are; tape measure and a Volt/Ohm meter.

With the sending unit removed, set the meter to read ohms, connect the meter across the sending unit connector pins.

Position the sending unit float based on the measurements in the tables in Function Group 386 Specification and document the readings in each position.

If the values are within range the sending unit is working as designed.

Note: The distance to be measured is taken from the bottom of the sending unit to the top of the float.



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Fig. 1 Measuring Fuel Sender Float Level

Sending Unit Sweep Test

A Volt/Ohm meter is required for the sending unit sweep test.

With a Volt/Ohm meter set to read ohms and connected across the sending unit connector pins, slowly sweep the float from its highest position to its lowest position.

The ohm reading should change in a linear/consistent manor from 27-241 ohms (+/-5 ohms) with no abrupt changes, signal drops, or erratic reading jumps.

Gauge Accuracy Check

After the sending unit test has been completed and proper operation verified, connect the sending unit to the chassis wiring harness. (Ignition must be turned off)

Note: Do not sweep the sending unit float while the key is on. The gauge will not move due to the dampened feature of the fuel level gauge.

Note: Cycling the key after float movement is necessary for proper readings.

- 1 Place the float in its highest position and then turn the ignition key on. The fuel gauge should move and read full.
- 2 With the ignition key off, place the float in its lowest position and then turn the ignition key on. The fuel gauge should move and read empty.
- 3 With the ignition key off, place the top edge of the float in the middle of its total travel (measurement may be needed) then turn the ignition key on. The fuel gauge should move and read at or near the half way mark on the gauge.



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