Dear Volvo Owner

Congratulations on your new truck and thank you for your confidence! We hope you will derive great satisfaction and benefit from your truck for many years to come.

This driver's manual contains information tailored to your particular truck. It covers the truck's equipment, care and maintenance, as well as tips for safe and fuel-efficient driving. To help you get the most out of your truck we recommend that you take advantage of our advice and tips.

If you have any questions or want to know more about your truck, please contact your authorized Volvo dealer.

Volvo Trucks North America
Greensboro, NC USA

Service and Assistance

Volvo Action Service (VAS)

If you break down on the road, simply call 1-800-528-6586 [or (800) 52-Volvo].

VAS offers:

Delivery Assurance - If you need roadside assistance, VAS can arrange for load forwarding or equipment rental.

Personal Assurance - Trained staff for handling any vehicle problems.

Uptime Assurance - VAS will locate the nearest service provider and assist for the payment process so you can get on the road as soon as possible.

Price Assurance - VAS audits service and parts billing to ensure guaranteed labor rates and preferred parts pricing for Volvo components.

All services described as part of VAS are available based on an active subscription. If the subscription expires, it can always be purchased in the after market.

Questions and Concerns

Your satisfaction is our most important concern.

If questions or complaints arise, first discuss the matter with the service manager at the Volvo facility involved. If you are not satisfied with the service manager's response, contact the branch manager, principal or general manager of the distributorship. If assistance is required at a service dealer, contact the owner of the establishment.

If, for any reason, you need further assistance after dealing with the personnel at a Volvo subsidiary or distributor, contact the regional service manager at the nearest Volvo regional service office. The regional service manager has the responsibility and the authority to recommend action in most cases and (with the aid of relevant district service personnel) will make every effort to conduct a fair review of the situation.

Reporting Safety Defects

United States

If you believe that your vehicle has a defect which could cause a crash, injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA), in addition to notifying Volvo Trucks North America.

If NHTSA receives similar complaints, it may open an investigation and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your distributor, or Volvo Trucks North America.

To contact NHTSA, either call the U.S. Government's Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153); go to http://www.NHTSA.gov; or write to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, DC 20590.You can also obtain other information about motor vehicle safety from the Vehicle Safety Hotline.

Canada

Canadian customers who wish to report a safety-related defect to Transport Canada — Defect Investigations and Recalls, may telephone the toll free hotline at 1-800-333-0510, or contact Transport Canada by mail at Transport Canada, ASFAD, Place de Ville Tower C, 330 Sparks Street, Ottawa ON K1A 0N5. For additional road safety information, please visit the Road Safety website at http://www.tc.gc.ca/roadsafety/menu.htm.

Mexico

Volvo Trucks de Mexico, S.A. de C.V. should be informed immediately if you believe the vehicle has a defect that could cause a vehicle accident, injury or death. Contact Volvo Trucks de Mexico by calling 011-52-55-50-81-68-50 or by writing to: Volvo Trucks de Mexico, S.A. de C.V., Prol. Paseo de la Reforma 600, 1er. Piso — 121, Col. Santa Fe Pena Blanca, C.P. 01210, Mexico, D.F. Within Mexico, call 01 (800) 90 94 900.

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01

INTRODUCTION

Read the Driver's Handbook

This driver's handbook contains information specific to the truck's equipment, systems, and functions based on its VIN (Vehicle Identification Number). It is recommended to read the manual before driving the truck for the first time to understand and utilize its functions and equipment properly. The table of contents provides an overview of chapters, while the alphabetical index allows direct searching for specific characteristics or functions.

Premium Tech Tool™ (PTT)

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Premium Tech Tool™ (PTT) is a Windows-based diagnostic application specially designed to test, calibrate and program engine parameters. This software supports all Volvo trucks.

You can find more information about purchasing PTT and other hardware & software components at www.premiumtechtool.com.

PTT Technical Support

For Technical Support (help with using the software, problems encountered while using the software, communication issues, etc.), please call 877-978-6586.

Part and Service

For Parts and Service information needs please visit our eMedia center on the web at www.volvo.com.

Special Texts

The driver’s handbook uses the following levels of observation and warning texts.

⚠ CAUTION
Indicates a potentially dangerous situation that unless avoided may lead to minor or moderate personal injury or damage to the product.

ⓘ NOTE
Indicates a situation, use or circumstance that should be emphasized.

Menu Text

When the text refers to any of the menus the search path is shown in a table.

Digital Information Display

Main menu 1
↳ Submenu 2
↳ Submenu 3

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Tell-Tales

A tell-tale is a display that indicates the activation of a device, a correct or defective condition, or a failure to function. Tell-tale symbols are shown in the instrument cluster.

Colors

To promote visual recognition internationally, specific colors for tell-tales have been established. Unless governmental regulations (in the area where the vehicle is to be used) or engineering directives specify otherwise, the standard colors are:

- Steady Blue — high-beam headlights
- Flashing Green — turn signals
- Flashing Red — hazard condition involving the safety of personnel
- Steady Green — system in operation
- Steady Red — warning, immediate action required
- Amber — early warning, such as low fuel or Anti-Lock Brake System (ABS) malfunction

Event Data Recording Devices

This vehicle is equipped with a device generally referred to as an "event data recorder" or "EDR". The EDR on the vehicle records vehicle speed, engine rpm, time and date, plus a variety of pedal and switch positions, both before and after an event. Sudden vehicle deceleration or the occurrence of certain other vehicle operational characteristics will define (trigger) an "event".

For answers to any questions pertaining to the EDR, please contact a certified Volvo dealer or regional service office.

Electronic Logging Device (ELD)

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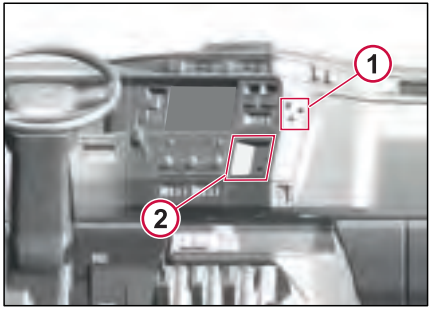
1. Telematics Gateway (TGW)
2. Android/Windows device
3. Back office Server
4. Driver connects TGW using hotspot
5. Driver request for username/password
6. ELD connected to TGW

ELD is intended to create a safer work environment for drivers and makes it easier and faster to accurately track, manage and share data during driving and off duty time.

The ELD is a regulatory requirement for Fleet companies/drivers to meet. Your vehicle is equipped with a WiFi Compatible TGW unit, which can be used for ELD compliance.

ELD Installation

ELD is required by law as a mandate to be used in vehicles. If ELD Mounting is required, there is a dedicated and reinforced mounting location on the dash for a typical ball mount. The mounting location is to the right of the dashboard switch panel so that the mounting base will not block the view of the road. Contact an authorized Volvo dealer to mount the ELD device.



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ELD Installation Location

1 Mounting Location on Trim Panel

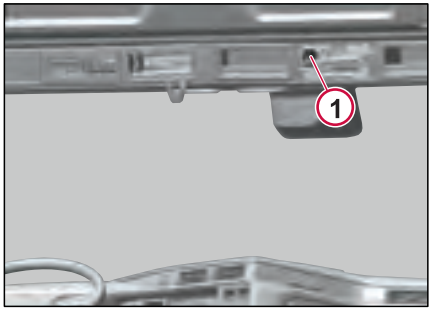
2 Mounting Location on Storage Pocket

The three grommets are provided for ELD installation using a RAM mount.

Vehicle Accessory Connector

Your vehicle is equipped with two TMC RP1226 vehicle accessory connectors. One connector is located inside the dashboard, and another one is on the overhead panel. The connectors are used to connect the aftermarket Fleet Management devices. Examples of these include telematics devices, data logging equipment, tire pressure monitors and electronic logging devices (ELDs) used for hours-of-service recording.

Note: The accessory connectors do not replace the OBD (On-Board Diagnostics) connector functions.



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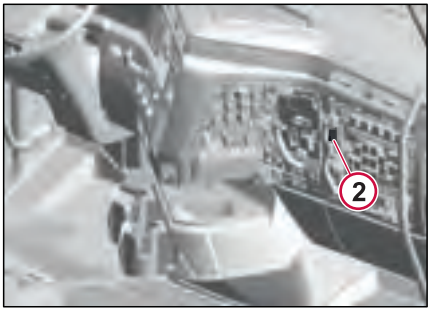
1. Vehicle Accessory Connector (Overhead Panel)



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2. Vehicle Accessory Connector (Dashboard)

Open Source Software

Your Volvo truck contains various software programs. Some of those programs are open-source software, where you can get access to the relevant source code. This depends on the license terms for the respective software, as agreed between the Volvo Group and the respective licensors. For further information, please visit **www.opensource.volvotrucks.com**.

Remote Diagnostics and Remote Programming

> **NOTE**
>
> Do not run any electrical accessories or inverter during remote software update operation.

Your vehicle is equipped with a telematics device associated with Volvo's Connected Vehicle Services. These services, detailed at **www.volvotrucks.us.com**, offer cost-effective maintenance and repair management. The telematics device collects and transmits vehicle data like speed, fuel consumption, location history, diagnostics, and error codes. It can store historical data, remotely update software, and communicate with a central system. Volvo may access and use this information, including the VIN, to understand vehicle operation, facilitate maintenance, and improve performance. A Telematics Subscription Agreement is required to access these services, and declining or canceling it won't stop data transmission or Volvo's data collection. Volvo periodically purges Telematics Data from its systems.

Emergency Call Service (E-Call)

The emergency call feature allows for an automated call to be made if the truck has been involved in an accident resulting in a truck airbag deployment or truck rollover event. These events will trigger an automated call made to the emergency services 911 operator and will share that an accident has occurred along with location information.

> **NOTE**
>
> The E-Call service function will only make this automated call to the 911 operator if the truck has been involved in a rollover event or if the airbag has been deployed.

The optional SOS switch will allow the driver to make an emergency call. To avoid unintentional calls to emergency services (911), the driver needs to press and hold the SOS switch for a minimum of 3 seconds before the call is initiated to emergency services.

- After holding the switch for 3 seconds, the green light on the switch blinks while call is being initiated.
- The light on the switch will turn to a solid green light once the call is connected to emergency services.

IMPORTANT INFORMATION

- If the call cannot be connected or was ended, the light on the switch will be off.

NOTE

When an emergency call is initiated or cannot be made, the status notification is displayed in the instrument cluster.

J466457

On-vehicle emergency call function relies on mobile network connectivity, similar to calling 911 with a mobile phone.

When E-Call is activated, it connects to a PSAP (Public Safety Answering Point) using the TGW (Telematics Gateway) telephone service. This allows the driver and passenger(s) in the vehicle to communicate with the PSAP operator.

NOTE

Volvo Trucks doesn't assume the responsibility of the E-CALL (E911) service delivery in case of the following scenarios:

- The vehicle's electrical systems are not intact
- The 911 Call system software or hardware is not functioning as a result of the crash or for any other reason
- The vehicle battery loses power or becomes disconnected as a result of the vehicle crash or for any other reason
- Poor or no wireless connectivity or GPS signals for the location.

NOTE

Volvo Trucks doesn't assume the responsibility for the actions or inaction of the emergency services, including without limitation the PSAP operator or any responding emergency personnel.

NOTE

A functioning TGW is required for the call to be initiated and the service to be rendered. The vehicle owner is responsible for ensuring that that vehicle has a communicating and functioning TGW. Volvo Trucks does not assume any responsibility for the 911 call not being initiated or the PSAP operator not being able to call the vehicle due to a non-functioning TGW, regardless of the cause.

NOTE

The service will send an auto-generated email to the email address in the vehicle's customer profile notifying the recipient that the E-Call service was activated. The vehicle owner is responsible for ensuring that the Volvo Trucks fleet profile is always current. To update your fleet profile, please contact your local Dealer Representative.

Notifications

If your vehicle is involved in an incident causing airbag deployment or in a rollover event, the vehicle attempt to contact Emergency Services. Alternatively, if the driver manually activates the emergency call, the display will show a notification indicating the call.

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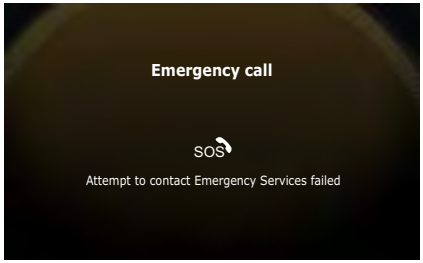
If the call cannot be connected, the display will show 'Attempt to contact Emergency Services failed'.

When the call is initiated, the SOS switch LED light blinks green.



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If the call is connected to Emergency Services, the display will show the duration of the call along with the latitude and longitude of the vehicle's location.

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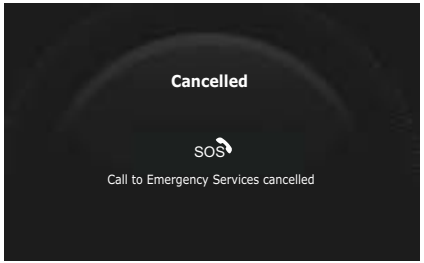
The driver can manually cancel the call by using the SOS switch.



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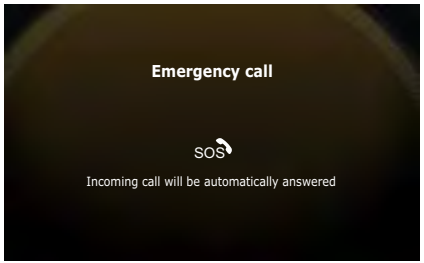
In a situation requiring contact with the driver after a previously completed emergency call, Emergency Services initiate a callback by dialing the truck's own phone system, rather than the driver's phone. This incoming call is automatically answered by the system for a specified time period following an outgoing emergency call.



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Volvo Connect (Customer Connect Portal)

Customer Connect is Volvo Trucks' all-in-one interface for digital services, offering customers a single login and view to connect critical aspects of their business. It empowers customers with access to industry-leading services in a clean and intuitive interface, providing an overview of important information and detailed insights with just a few clicks.

Customer Connect Portal

Customer Connect Portal is the central control hub for our customers' organizations, offering role-based access to truck owners, fleet managers, drivers, dispatchers, and administrators. It provides a personalized dashboard with relevant information and services, making daily operations easier and more efficient for everyone involved.

Marketplace

Marketplace is the convenient Digital Services Store where customers can access and order digital services from Volvo Trucks and selected partners, enabling them to easily activate the services they need.

Developer Portal

The Developer Portal fosters continuous improvement of Volvo Connect by welcoming and enabling the development of new, innovative services from selected specialist partners and others.

MY Truck App

The "My Truck" app provides customers with remote access to their Volvo truck, allowing them to monitor the vital parameters, including the remaining range, fluid levels and cab temperature.

Benefits of the “My Truck” app:

- Improves the operational readiness of the customer’s vehicle and makes it easier to plan perform a pre-trip inspection, as the app can check
  - Fuel, DEF and engine oil levels. It will also alert of low coolant and washer fluid levels.
  - Lights conditions. (Note that the driver still needs to check lights visually.)
- More comfort - Cab heating and AC can be set and programmed with the app, keep the driver's cab temperature always as pleasant as possible.

Breaking In a New Vehicle

To ensure many years of reliable, trouble-free operation, the following break-in procedures are recommended.

Refer to the preventive maintenance schedules for recommended change intervals for the following items:

- Gear oil (transmission, rear axle carrier[s], front drive axle carrier, transfer case, flywheel PTO)
- Engine oil
- Oil filters
- Fuel filters
- Coolant conditioner

During the First 5000 Kilometers (3000 Miles)

- After the first 125 miles (200 km), retorque the wheel nuts using an accurately calibrated torque wrench. Recheck this torque again after 500 miles (800 km).
- Check oil and coolant levels frequently.
- Check brake and clutch adjustments per the recommended maintenance schedule, and adjust as needed.
- Observe the instruments often, and shut down the engine at the first sign of any abnormal readings.
- Report all leaks, loose fasteners, unusual noises, etc., to the service representative at the nearest Volvo dealership so they can be checked and corrected.

Initial Valve Adjustment Intervals

Refer to the Maintenance and Lubrication section for detailed information concerning the Initial Valve Adjustment Interval.

Temporary Loss of Power Output

Under challenging driving conditions (e.g., high engine speeds and/or heavy loads causing higher temperature), the exhaust system temperature may rise abnormally, triggering the engine's protection system. This temporarily reduces power output, which returns to normal once the temperature decreases. If power output is not restored, please contact an authorized Volvo workshop for assistance.

Noise Emissions

Volvo warrants this vehicle, from the first purchaser to subsequent buyers, that it conforms to all applicable U.S. EPA Noise Control Regulations at the time it left Volvo's control. The warranty covers defects in design, assembly, or any part of the vehicle that caused noise emissions exceeding Federal standards. It applies to the entire vehicle for its entire life.

Noise Control System, Operator Inspection and Maintenance Requirements

Use the Noise Control System Maintenance Log to record all maintenance related to the Noise Control System, whether it's from a specific inspection or identified during general

maintenance. If additional log space is needed, add entries on a separate sheet and keep them with the main log. Retain copies of all noise emissions-related maintenance invoices. The provided inspection and maintenance instructions have suggested intervals but may require adjustment based on vehicle usage. These instructions pertain to Noise Emissions only and don't modify general vehicle maintenance requirements.

The following elements make up the Noise Control System:

• Noise Shielding and Insulation Devices

• Cooling System

• Exhaust System /Aftertreatment DPF System

• Intake/Air System

• Engine Control, EGR and Fuel Systems

Tampering with Noise Control System

Federal law prohibits the following acts or the causing thereof:

(1) The removal or rendering inoperative by any person, other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use; or

(2) The use of the vehicle after such a device or element of design has been removed or rendered inoperative by any person.

Among the acts that constitute tampering are the acts listed below:

• Removal, or rendering inoperative, of any exhaust components, including mufflers, heavy or double-wall exhaust tubing, flexible tubing or exhaust pipe clamping.

• Removal, or rendering inoperative, of the temperature-modulated cooling fan system.

• Removal of the cooling fan shroud.

• Removal, or rendering inoperative, of the air cleaner or air intake in-line muffler.

• Removal of the sound deadening material from the hood or cab tunnel.

• Removal, or rendering inoperative, of the engine speed governor so as to allow engine speed to exceed the manufacturer's specifications.

• Removal of splash shields located inside the wheel housings.

• Removal of engine block shields.

• Removal of engine crankcase shields or insulation.

• Removal of insulated rocker arm covers.

• Removal of transmission noise shields.

Noise Shielding and Insulation Devices

Maintenance

Check sound shielding and insulating devices for damage. Inspect key components such as the hood, engine compartment insulation, splash shields, cab skirts, fender shields, and body panels for noise-related issues. Examine fasteners, brackets, and clamps for any damage or looseness.

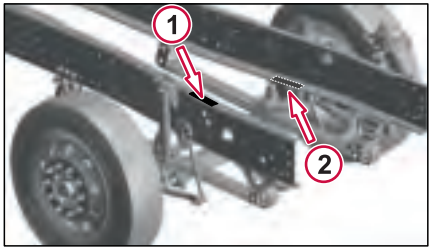
Regulatory Compliance

Tampering with Noise Shielding and Insulation Devices includes:

- Removing or disabling engine and/or transmission noise-deadening panels, shields, or insulation.
- Removing or disabling sound insulation components and/or shields mounted on the vehicle body (such as cab or fender shields, skirts, wheel housing splash shields, etc.).

VIN Locations

Vehicle Identification Number (VIN) is marked in five locations. The VIN is stamped on the outside bottom flange of left frame rail and on the outside top flange of right frame rail. The VIN is also marked on the incomplete or complete Vehicle Label, Serial Number Label and GHG emission label (if equipped), which are located on the cab door and cab door frame. The 17-digit VIN must be identical in all locations.



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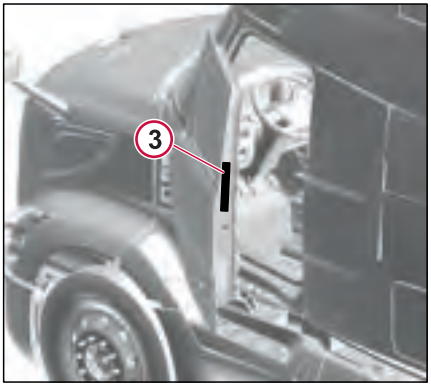
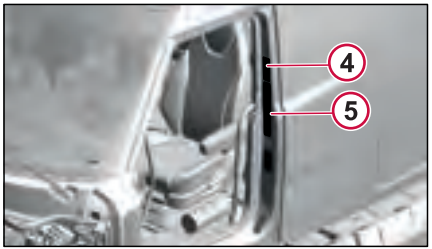
1 Vehicle Identification Number, Top of Right Frame Rail

2 Vehicle Identification Number, Bottom of Left Frame Rail



J475922

3. Serial Number Label

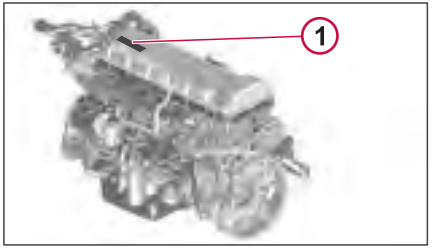


J476199

4. Vehicle Emission Control Information, GHG (Green House Gas) Label (If Equipped)
5. Complete/Incomplete Vehicle Label

Engine Identification

In compliance with Federal and California emission requirements, an engine information label is affixed to all diesel engines. This label, which is located on the cylinder head cover at the front of the engine, gives basic engine identification information (engine model, serial number, etc.), advertised horsepower at rated speed, inlet and exhaust valve lash setting. The Engine family “AVPTH12.8S0” can be used to identify the emission standard under which the engine was certified.



J301690

1 Engine Identification Label

⚠ CAUTION

To maintain compliance with emission regulations, engine settings should not be changed from those specified on the engine information label.

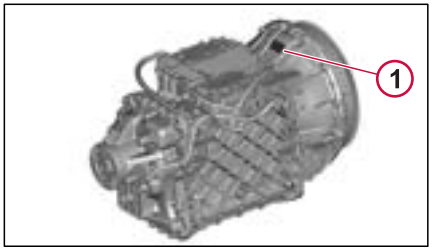
IDENTIFICATION LABELS

> **NOTE**
>
> Both the U.S. EPA and California Air Resources Board requires that each engine be identified with the proper engine label as shown above. Should this engine label be defaced, destroyed, or removed from the valve cover, it must be replaced immediately. To order a replacement label, please contact Specifications or Parts Interpretations department at 1–800–888–9878, Option 2, who will assist you in obtaining the correct label for your engine.

Transmission Identification

I-Shift Transmission

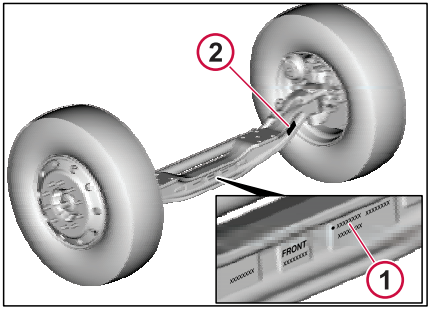
The Volvo I-Shift transmission serial number is located on the clutch housing.



J303369

1 Transmission Identification Label

Front Axle Identification



J412197

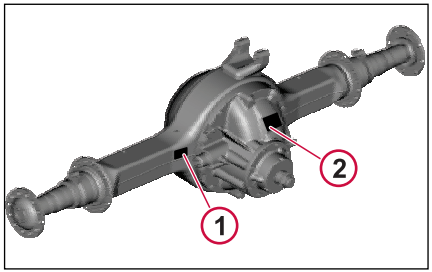
1 Front axle part number (marked on the center of axle member)

2 Front axle part number (marked on the left-hand side of axle member)

The part number of a front axle is marked on the center of a front axle member or the left-hand side of a front axle member. The location of the part number depends on the axle model.

Rear Axle Identification

Solo Axle



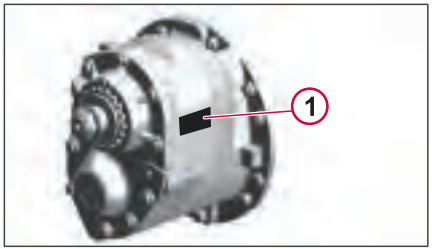
J423609

1 Rear Axle Identification Label

2 Differential Carrier Identification Label

Tandem Axle

The Meritor carrier assembly serial number is located on the left side of the forward carrier, and the top of the rear carrier.

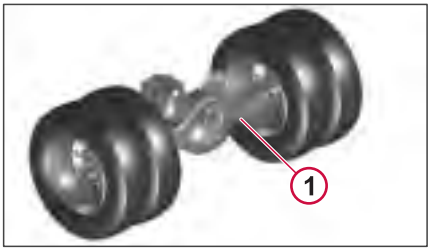


J472555

1 Carrier Identification Label

Rear Axle Identification Label

The Meritor rear axle identification tag is located on the left or right rear of the rear axle housing, next to the carrier.



J300855

1 Rear Axle Identification Label

Clean Idle Engines

The California Air Resources Board (CARB) requires that the vehicles be equipped with engines having tamper-resistant software, which limits the time at which the engine can idle at speeds above low idle (550–700 rpm). At speeds above low idle, and without a PTO engaged, idle time will be limited to five minutes, after which the engine will revert to low idle. Vehicles equipped with a Clean Idle engine are identified by a label, which is affixed to the vehicle.

J301066

California Proposition 65

⚠ WARNING

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel

Safety Statement and Labels

Volvo cannot anticipate every possible occurrence, which may involve a potential hazard. An accident can be avoided by recognizing potentially hazardous situations before a dangerous situation occurs. Correctly performed service procedures are critical for technician safety and safe, reliable operation of the vehicle.

⚠ DANGER

Do not operate the engine in an enclosed area. All internal combustion engines give off various fumes and gases while running. Inhalation of exhaust fumes can cause death.

⚠ DANGER

Do not sit in a parked vehicle for any extended amount of time with the engine running if there are leaks in the exhaust system. Exhaust fumes could leak into the cab area and death can result. On a regular basis inspect the exhaust system for leaks and repair any leakage.

⚠ DANGER

Driver attitude is the most important part of any effective vehicle safety system. Volvo strongly encourages all drivers and passengers to use their seat belts, drive defensively, remain alert and respect the speed limits. Many accidents can also be avoided through regular vehicle maintenance.

⚠ DANGER

To prevent serious injury, avoid servicing engine-driven components while the engine is running. Keep body parts and loose clothing away from these powerful components. Stay mindful of the PTO's engagement status and always disengage it when not in use.

⚠ WARNING

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
• Always start and operate the engine in a well-ventilated area.
• If in an enclosed area, vent the exhaust to the outside.
• Do not modify or tamper with the exhaust system.
• Do not idle the engine except as necessary.
For more information go to www.P65warnings.ca.gov/diesel

⚠ WARNING

For safety, avoid climbing on the vehicle for tasks like washing or cleaning the windshield due to its height. Use brushes and squeegees on extension poles from the ground. When additional access is needed, secure sturdy ladders with assistance from someone on the ground, especially for tasks like washing the cab roof.

⚠ WARNING

Secure loose objects. Loose objects in the cab or sleeper can be dangerous in a sudden stop or on bad roads. Secure any appliance added to the vehicle, such as a refrigerator or a radio.

⚠ WARNING

Keep clear of fan when engine is running. Fan may start to rotate at high speed without warning.

Labels

Safety Certification Label

National Highway Traffic Safety Administration (NHTSA and Transport Canada) regulations require a certification label on vehicles. It's placed on the hinge pillar, door latch post, or door edge near the driver's seat. If not possible, it can be on the left side of the instrument panel or driver-side door's inward surface. Your Volvo has this safety label in an approved location, either Incomplete or Completed Vehicle label.

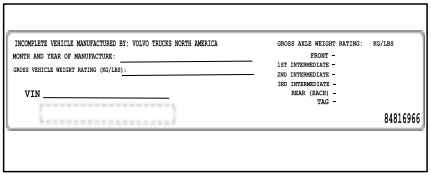
Incomplete Vehicles

A chassis-cab is an incomplete vehicle with a completed occupant compartment that requires the addition of cargo-carrying, work-performing or load-bearing components to perform its intended functions.

When the vehicle is completed the chassis-cab manufacturer must affix a final stage manufacturer certification label to the complete vehicle in one of the approved locations listed above.

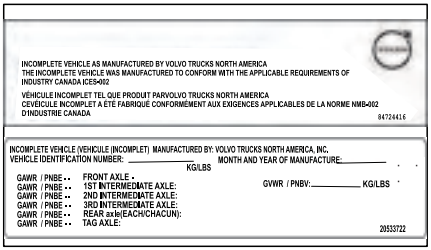
This label indicates that the chassis cab was completed and complies with the applicable Motor Vehicle Safety Standards (MVSS). This label is required to contain the same information as shown below for a completed vehicle.

Incomplete Vehicle Certification Label (USA)



J472284

Incomplete Vehicle Certification Label (Canada)



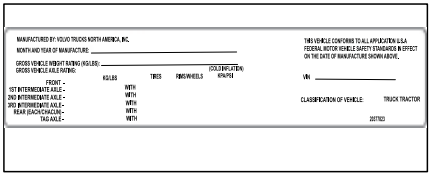
J476224

Completed Vehicles

In addition to the label supplied by Volvo as the chassis-cab manufacturer, a Completed Vehicle certification label, supplied by the body manufacturer, is affixed in the same general location. This label provides information pertaining to Gross Vehicle Weight Rating (GVWR), Gross Axle Weight Rating (GAWR), tire and rim information, etc.

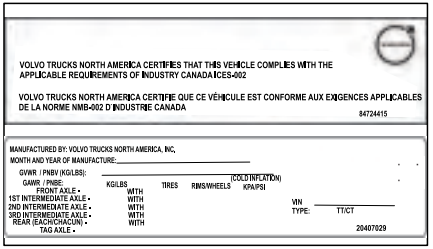
On Volvo-completed vehicles, this label contains the date of manufacture, VIN, GVWR, GAWR, and tire and rim data. It is found in one of the approved locations listed above.

Complete Vehicle Certification Label (USA)



J476198

Complete Vehicle Certification Label (CANADA)

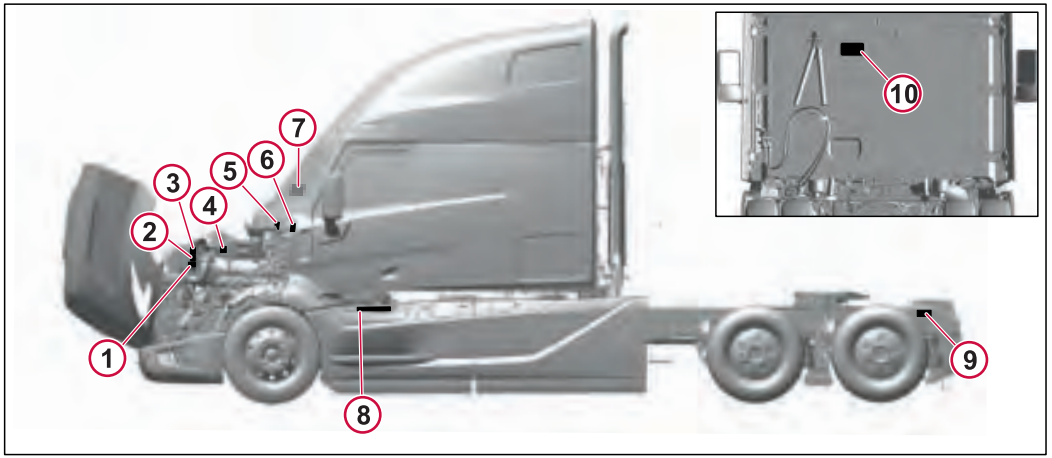


J472296

GENERAL SAFETY INFORMATION

Advisory Labels On Vehicle

Advisory labels involve Danger, Warning, Caution, Note, and Service Hint labels. These labels, found throughout the vehicle and in this handbook, warn about potential risks. Labels are specific to your vehicle model and serve as important reminders for safety. Review this section for label details, locations, and explanations. Replace any damaged labels.



J472329

1 Expansion Tank Decal
2 Warning Label
3 Volvo XLC Extended Life Decal
4 Danger Decal
5 SRS Decal
6 Air Conditioning Decal
7 SRS Decal
8 NO STEP Decal
9 Do Not Weld or Drill Warning Decal
10 Trim Tab Decal

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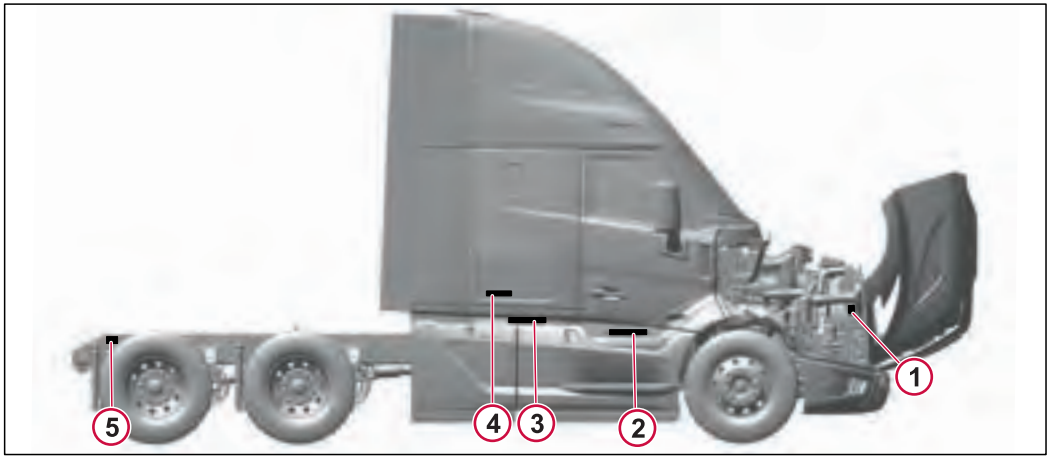
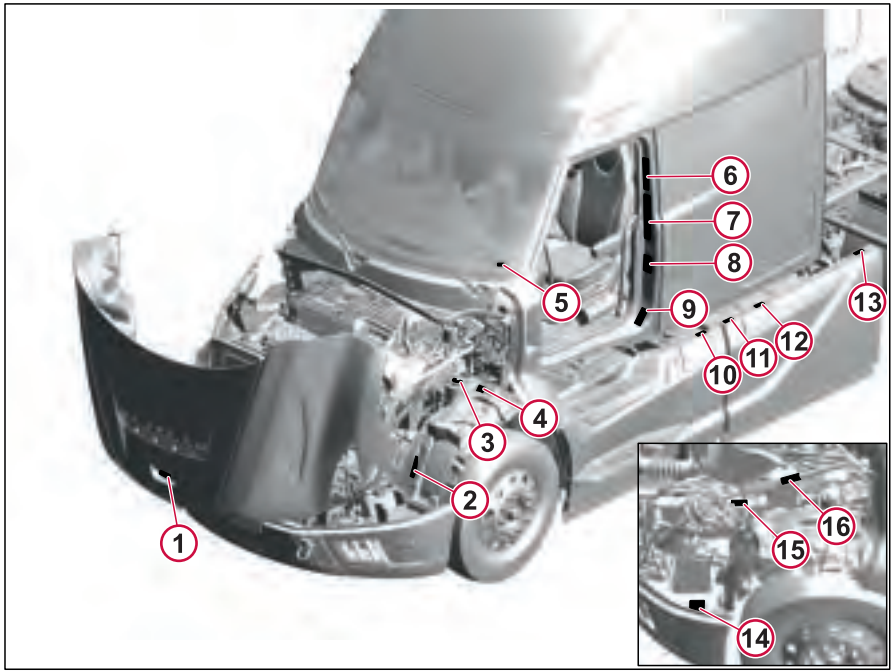


J472380

1 Fan Belt Decal
2 Lock Fairing Warning Decal
3 Hot Exhaust Fairing Warning Decal
4 Parking Cooler No idle Decal
5 Do Not Weld or Drill Warning Decal

GENERAL SAFETY INFORMATION



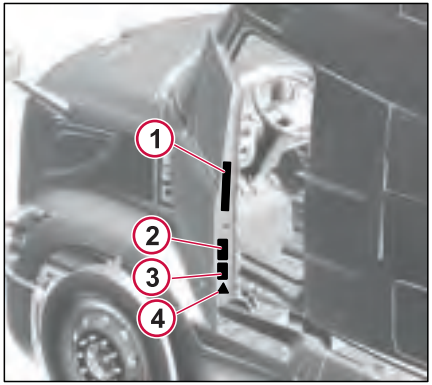
J472534

1 Hood Prop Decal
2 A/C Charge Decal
3 Power steering Decal
4 Airbag Decal
5 Airbag Decal Windshield
6 GHG Decal
7 Complete/Incomplete Vehicle Label
8 Towing Caution Decal
9 Engine Exhaust Warning Label
10 DEF Only Decal
11 DEF Only Decal
12 Diesel Only Decal
13 DEF Only and Release Handle Decal
14 Bumper Lock Decal
15 Clutch Fan Warning Decal
16 No Step Decal

270346_1

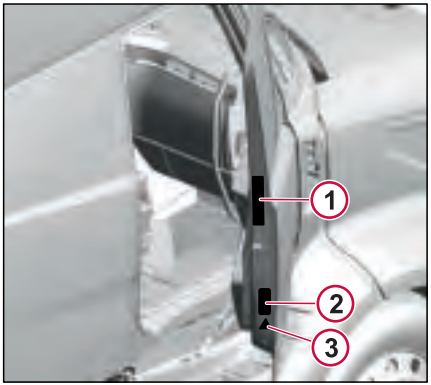
Filter summery to long to be displayed.

Advisory Label On Door



J472519

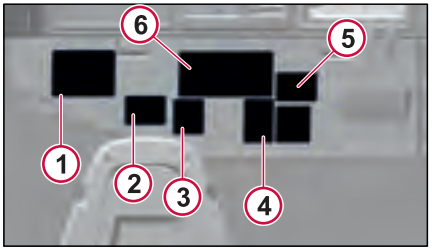
1 Serial Number Decal
2 Exterior Noise Decal
3 Ingress/Egress Decal
4 Reflective Decal



J473338

1 Complete/Incomplete Decal (French)
2 Ingress/Egress Decal
3 Reflective Decal

Advisory Labels On Driver-Side Sun Visor

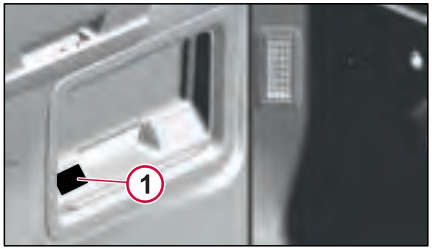


J472393

1 I-Shift Decal
2 Airbag Decal
3 Exhaust Temperature Decal
4 ESP Decal
5 Ether Start Decal
6 Remote Diagnostics Decal
7 DEF/DPF Information Decal

GENERAL SAFETY INFORMATION

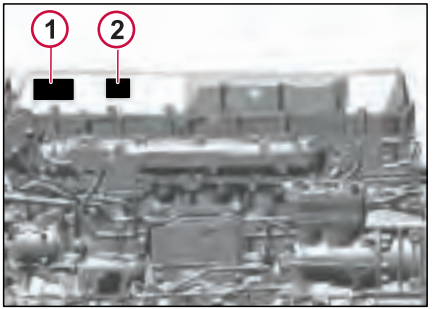
Advisory Label On Windows



J473337

1 Window Warning Label

Advisory Labels On Engine



J472395

1 Emission Control Information Decal

2 Serial Number Decal

Warranty Information

This chassis is equipped an exhaust aftertreatment system (Diesel Particulate Filter). Use of Ultra Low Sulfur Diesel (ULSD) fuel and VDS-5 specification high performance diesel engine oil is required in this vehicle.

> ⓘ NOTE
>
> Note: Use of improper or unapproved fuel or engine oil will void the engine and aftertreatment system warranty.

Air Brake System

The Volvo Standard Vehicle Warranty applies to the air brake system, as set forth in the Warranty, but only if the air brake system has not been subjected to unauthorized additions, deletions or modifications. If any such unauthorized additions, deletions or modifications are performed, Volvo disclaims any and all liability for any loss or damage arising out of a malfunction of the air brake system.

The air brake system was designed and built to conform to all applicable federal motor vehicle safety standards in effect at the time of manufacture.

Tractor air systems are designed for operation as a tractor only, and truck air systems are designed to be operated as a truck only. If a tractor is going to be converted for operation as a truck, the air brake system must be reconfigured to that of a truck. Conversely, if a truck is going to be converted for operation as a tractor, the air brake system must be reconfigured to that of a tractor. Consult your local Volvo distributor for additional information.

If any unauthorized additions, deletions or modifications are made to any portion of the air brake system, which is required by Federal Motor Vehicle Safety Standards, Volvo makes no representation as to conformity with the Standards.

For complete warranty information, refer to the documentation provided with each vehicle.

Federal and Canadian Emission Control System Warranty Statement

This section covers the requirement of the United States Clean Air Act, which states: “The manufacturer shall furnish with each new motor vehicle or motor vehicle engine such written instructions for the maintenance and use of the vehicle or engine by the ultimate purchaser as may be reasonable and necessary to assure the proper functioning of emission control devices and systems.” This section also covers the requirements of the emissions regulations promulgated under the Canadian Environmental Protection Act, 1999.

Manufacturer's Warranty Coverage

Volvo warrants the Emission Control Systems on each new Volvo diesel engine in a new Volvo truck to comply with all United States Federal and Canadian emissions regulations applicable at the time of manufacture of the engine. To be free from defects in material and workmanship under normal use and service up to 60 months, or 100,000 mi (161,000 km) for EPA certified engines and 60 months, 350,000 miles (563,270 km) for CARB certified engines, whichever occurs first, provided that all maintenance

requirements are followed as described in this manual. All warranty periods are calculated from the date-in-service of the new vehicle. The repair or replacement of defective parts will be made without charge for the cost of parts and if repairs are made at an authorized Volvo dealership, there will be no charge for labor.

Volvo's obligation under this warranty is limited to the repair or replacement, at Volvo's option, of any part(s) of the Emission Control Systems of such engine and/or vehicle found to be defective upon examination by Volvo and provided that such part(s) were returned to Volvo or its nearest authorized Dealer within a reasonable period.

> ⓘ NOTE
>
> Note: For emission control systems information on engines other than Volvo, refer to the engine vendor’s publication.

Tampering With Emission Control Systems Prohibited

The Federal Clean Air Act prohibits the removal or rendering inoperative of any device or element of design installed on or in a motor vehicle in compliance with Federal Emission Regulations by:

1. Any person prior to its sale and delivery to the ultimate purchaser, or
2. Any manufacturer or distributor after its sale and delivery to the ultimate purchaser, or
3. Any person engaged in the business of repairing, servicing, selling, leasing, or trading motor vehicles or motor vehicle engines following its sale and delivery to the ultimate purchaser, or
4. Any person who operates a fleet of motor vehicles following its sale and delivery to the ultimate purchaser.

> ⓘ NOTE
>
> Note: For specifics of the prohibited vehicle/engine modifications refer to the Volvo Body Builders documentation.

California Emission Control Warranty Statement

The California Air Resources Board and Volvo are pleased to explain the emission control system warranty on your vehicle. In California, new motor vehicle engines must be designed, built and equipped to meet the State’s stringent anti-smog standards. Volvo must warrant the emission control system on your engine for the period of time listed below provided there has been no abuse, neglect, or improper maintenance of your engine. Your emission control system may include parts such as the fuel-injection system, turbocharger assembly, electronic control unit and other emission-related assemblies. If an emission-related part of your engine is defective, the part will be repaired or replaced by Volvo. This is your emission control system DEFECTS WARRANTY.

Manufacturer's Warranty Coverage

(Applicable only to vehicles and/or engines certified for sale and registered in the State of California)

Volvo warrants the Emission Control Systems on each new Volvo diesel engine in a new Volvo truck to comply with all State of California emissions regulations applicable at the time of manufacture of the engine, and to be

free from defects in material and workmanship under normal use and service up to 60 months, or 100,000 mi (161,000 km), whichever occurs first, provided all Volvo maintenance requirements are followed as described in this manual. All warranty periods are calculated from the date-in-service of the new vehicle. The repair or replacement of defective parts will be made without charge for the cost of parts and, if repairs are made at an authorized Volvo dealership, there will be no charge for labor.

Volvo's obligation under this warranty is limited to the repair or replacement, at Volvo's option, of any part(s) of Emission Control Systems of such engine and/or vehicle found to be defective upon examination by Volvo and provided that such part(s) were returned to Volvo or its nearest authorized Dealer within a reasonable period of time.

Owner's Warranty Responsibilities

As the motor vehicle engine owner, you are responsible for the performance of the required maintenance listed in this manual. Volvo recommends that you retain all receipts covering maintenance of your vehicle, but Volvo cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance listed in other manuals which were supplied with your vehicle. You are responsible for presenting your motor vehicle engine to a Volvo dealer as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days. As the motor vehicle engine owner, you should also be aware that Volvo may deny you warranty coverage if your vehicle or a part has failed due to abuse, neglect, improper maintenance, or unapproved modifications. If you have any questions regarding your warranty rights and responsibilities, you should contact Volvo Warranty Activities P.O. Box 26115, Greensboro, NC 27402-6115, or the California Air Resources Board at 9480 Telstar Avenue, El Monte, California 91731.

Federal, Canadian and California Emission Control Warranty Statement

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES AND REPRESENTATIONS OR CONDITIONS, STATUTORY OR OTHERWISE, EXPRESSED OR IMPLIED INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

The engine components are covered by the supplemental emissions control system warranty policy as required by the Code of Federal Regulations, California Code of Regulations, and the regulations under the Canadian Environmental Protection Act, 1999.4

See the "Standard Engine Warranty Certificate" and "Standard Emissions Component Warranty Certificate" provided in the manual for the list of components covered.

The emission warranty for the diesel particulate filter (DPF) and SCR System covers defects in workmanship only. Normal maintenance, such as cleaning ash from the filter at regular maintenance intervals and cleaning the aftertreatment fuel injector on Diesel oxidation catalyst

(DOC) DPF systems, is not covered by the emission warranty.

> ⓘ NOTE
>
> In response to customer requests, Volvo may build vehicles with engines supplied by other manufacturers. In these cases, each engine manufacturer through its service organization, is responsible for emission control systems warranty on all parts of the engine assembly, as furnished.

> ⓘ NOTE
>
> Any unauthorized adjustments to the emission control components can cause severe damage to the engine.

1 Repairs by Volvo Dealers, Sub-Dealers and Service Dealers

Repairs covered by the Emission Control Systems Warranty will be performed by any authorized Volvo repair facility with no charge for parts and labor (including diagnosis), using Volvo parts for any part of the emission control systems covered by this warranty and found defective.

2 In an Emergency

In an Emergency where an authorized Volvo facility is not available, repairs may be performed at any available service establishment, or by the owner, using any replacement part, within the limitations of paragraphs 3 and 4 in this section. An emergency condition exists under this section if, after 30 days, repairs have not been completed or parts are not yet available. Volvo will reimburse the owner for such repairs that are covered under this warranty, including diagnosis, not to exceed Volvo's suggested retail price for parts replaced and labor charges based on Volvo's recommended time allowance and geographically appropriate hourly labor rate. Replaced parts and paid invoices must be presented at a Volvo facility as a condition of reimbursement for emergency repairs performed elsewhere.

3 Repairs by Non-Volvo Facilities

Owners may elect to have maintenance, replacement, or repair of emission control systems performed by any repair facility, and may elect to use parts other than Volvo parts without invalidating the warranty on other components, but the cost of such service or parts will not be covered by Volvo under its warranty.

4 Use of Non-Volvo Facilities

Use of replacement parts which are not the equivalent of Volvo parts may impair the effectiveness of emission control systems. If other than Volvo parts are used, the owner should obtain assurances that such parts are warranted by their manufacturer to be the equivalent of Volvo parts in performance and durability. Volvo assumes no liability under this warranty with respect to parts other than Volvo parts; however, the use of non-Volvo parts does not invalidate the warranty on other components unless non-Volvo parts cause damage to warranted parts.

5 Maintenance and Maintenance Records

The vehicle owner is responsible for the performance of all required maintenance specified in this manual. Volvo will not deny a warranty claim solely because there is no record of maintenance; however, Volvo may deny a warranty claim if failure to perform required maintenance results in the failure of a warranted part. Receipts or other records covering the performance of scheduled maintenance should be retained to answer questions that may arise concerning maintenance. Maintenance records should be transferred to subsequent owners if the vehicle is sold.

6 Items Not Covered

• Malfunctions caused by misuse, improper adjustments, modification, alteration, tampering, disconnection, improper or inadequate maintenance and use of improper diesel fuel.

• Damage resulting from accident, acts of nature or other events beyond the control of Volvo.

• Inconvenience, loss of use of the vehicle, commercial loss of any kind including, but not limited to, consequential or incidental damages.

• Any vehicle in which the odometer has been altered or damaged so that mileage cannot be readily determined.

7 Customer Assistance

Volvo wishes to assure that the Emission Control Systems Warranty is properly administered. In the event that owners do not receive the warranty service to which they believe they are entitled under the Federal, Canadian, or California Emission Control Systems Warranty, they should contact the nearest Volvo Regional Office for assistance.

The address and telephone number for each Regional Office can be found at the front of this driver's handbook.

NOTE

In the event that damage results from unauthorized adjustments to any emission control system components, as evidenced by settings other than as specified, or broken fastener seals, the cost of repairing such damage WILL NOT BE COVERED under warranty

Emission Green House Gas Component Warranty

Volvo warrants certain individual greenhouse gas (GHG) components and controls of each new Volvo vehicle certified to the requirements of Chapter 40 of the United States Code of Federal Regulations, Part 1037. Volvo GHG certified vehicles are warranted to be designed, built, and equipped so they conform at the time of sale to the ultimate purchaser to the requirements of the Part and to be free from defects in material and workmanship which, under normal use and service, would cause the vehicle to fail to conform to the requirements of the Part up to the periods specified, provided all Volvo maintenance and inspection requirements are followed. See your local authorized Volvo dealer for recommended maintenance and inspection procedures. All warranty periods are calculated from the date in service of the vehicle. All coverage is 100% for parts and labor subject to the qualifications, limitations and exclusions as noted.

LIMITATIONS AND EXCLUSIONS TO THIS WARRANTY APPEAR ON THE FOLLOWING PAGES.THESE LIMITATIONS AND EXCLUSIONS ARE

WARRANTY INFORMATION

IMPORTANT AND MUST BE READ AND UNDERSTOOD.

This warranty applies to new Volvo vehicles certified to the requirements of 40 CFR part 1037. Volvo reserves the right to make any changes in design, or make additions to or upon its products, without incurring any obligations to install the same changes on vehicles previously built.

Emissions Components Coverage, Vehicle

Not Covered by the Emissions Control System Warranty:

• Malfunctions caused by misuse, improper adjustment, modification alteration, tampering, disconnection, improper or inadequate maintenance and use of improper diesel fuel or DEF.

• Damage resulting from accident, act of nature or other events beyond the control of Volvo.

• Inconvenience, loss of use of the vehicle, commercial loss of any kind including, but not limited to consequential or incidental damages.

• Any vehicle in which the odometer has been altered or damaged so that mileage cannot be readily determined.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES AND REPRESENTATIONS OR CONDITIONS, STATUTORY OR OTHERWISE, EXPRESSED OR IMPLIED INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE

Tires, Drive and Steer Only

Drive and steer tires only are warranted to be free from defects in materials and workmanship for the first 24 months or 24,000 miles (38,624 km) of vehicle operation, whichever occurs first, and applying only to the first set of tires on the vehicle when delivered to the ultimate purchaser.

Emissions-related warranty coverage only, refer to the specific tire manufacturer's warranty policy for other term lengths.

Source of Parts and Repair

A repair shop or person of the owner's choosing may maintain, replace, or repair emission control devices and systems.

Replacement of Tires that are GHG Certified

The original equipment tires installed on this vehicle at the factory were certified to the U.S. EPA Greenhouse Gas (GHG) and NHTSA Fuel Efficiency regulations. Replacement of these tires should be with a tire of equal or lower rolling resistance levels (TRRL or CRR). Please consult your tire supplier(s) for appropriate replacement tires.

Maintaining a GHG Certified Tire

In order to maintain the certified rolling resistance of the tires, which optimize fuel economy, the maintenance procedures provide by the tire manufacturer must be followed.

All Vehicle Components

Emission controls are warranted to 60 months or 100,000 Miles (160,934 km), whichever occurs first.

Other Vehicle Components

60 months or 100,000 Miles (160,934 km), whichever occurs first.

Emission Control System Warranty

Vehicles sold for use in California must have the Operator's Manual in the vehicle which contains the California Emission System Warranty.

Coverage

Exterior Components: Highway Tractors Only

Chassis Fairings, Ground Effect Extensions, Roof Deflectors, Cab Side Deflectors, Adjustable Roof Extensions, Side Deflector Extensions, Bumper Deflectors, A-pillar Deflectors

60 Months or 100,000 Miles (160,934 km), whichever occurs first.

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Air Conditioning Components: Only those vehicles certified as “Tractors” according to the requirements of Chapter 40 of the Code of Federal Regulations, Part 1037.

Hoses, Compressor to Condenser Hoses, Condenser to Drier Hoses, Drier to Climate Unit Hoses, Climate Unit to Compressor Hoses, Bunk Climate Unit receiver dryer, Spring Loaded 12 cubic in. A/C Compressor, A/C Condenser, A/C Pressure Switches, and Transducers Main Climate Unit, Bunk Climate Unit

60 Months or 100,000 Miles (160,934 km), whichever occurs first.

WARRANTY CERTIFICATES

Standard Chassis Warranty Certificates

Volvo Group North America LLC, d/b/a Volvo Trucks North America (“Volvo Trucks”), warrants certain individual components of the new Volvo truck to be free from defects in material and workmanship under normal use and service up to the periods as specified, provided all Volvo Trucks’ maintenance and inspection requirements are followed. See your local authorized Volvo Trucks dealer for recommended maintenance and inspection procedures. All warranty periods are calculated from the date in service of the vehicle. All coverage is 100% for parts and labor subject to the qualifications, limitations, and exclusions as noted.

LIMITATIONS AND EXCLUSIONS TO THIS WARRANTY APPEAR ON THE FOLLOWING PAGES OF THIS CERTIFICATE. THESE LIMITATIONS AND EXCLUSIONS ARE IMPORTANT AND MUST BE READ AND UNDERSTOOD.

This warranty applies to **Model Year 2025** trucks manufactured by Volvo Trucks North America operated in the United States and Canada, equipped with EPA 24 / CARB 24 and newer engines. Specific coverage is based on the application and weight class as described in the following chart:

	Standard Normal Duty	**Standard Heavy Duty**	**Standard Severe Duty**
Typical Vocation	Line / Long Haul, Short Haul, or Pickup & Delivery	Heavy Line Haul, Construction, Refuse, Fire or Rescue Service	Heavy Construction, Heavy Refuse, Off-Road, Heavy Haul, Mining, Logging, or Oil Field
Weight Class Qualifications	Vehicle must have GVWR ≤ 63,000 lbs. (≤ 28 metric tons) or GCWR ≤ 110,000 lbs. (≤ 50 metric tons)	Vehicle must have GVWR ≤ 80,000 lbs. (≤ 36 metric tons) or GCWR ≤ 143,000 lbs. (≤ 65 metric tons)	Vehicle must have GAWR > 52,000 lbs. (> 23.5 metric tons) or GVWR > 80,000 lbs. (> 36 metric tons) or GCWR > 143,000 lbs. (> 65 metric tons)
Basic Coverage *	12 months or 100,000 miles (160,934 km)	12 months or 100,000 miles (160,934 km)	12 months or 100,000 miles (160,934 km)

	Standard Normal Duty	Standard Heavy Duty	Standard Severe Duty
Chassis Towing	Towing/Road Service coverage is limited to 90 days or 5,000 miles (8047 km), whichever occurs first, limited to the truck (less trailer), and to a single tow per incident to the nearest authorized Volvo Trucks service center. Charges in excess of $1,000.00 are not covered unless Volvo Action Service is contacted and approves additional amounts prior to tow.		Not Applicable
Air Conditioning	Air conditioning (sealed system only) is covered for 12 months with no mileage limitation.		
Engine / Emission	Not covered under this warranty certificate. See respective engine manufacturer's warranty certificate. See paragraph 19 under Exclusions.		
Transmission, Driveline, Rear Axle, Front Non-Drive Steer Axle	36 months or 350,000 miles (563,270 km) Covered Components are as follows: • Manual Transmission – Transmission Assembly • Driveline – Bearings, Hangers and Shafts • Rear Axle – Differential Carrier Assembly and Axle Housing • Front Non-Drive Steer Axle – Axle Beam, Steering Knuckle, and Tie Rod		12 months or 100,000 miles (160,934 km)
	Allison Automatic Transmissions are not covered under this warranty certificate. See paragraph 19 under Exclusions.		
I-Shift Transmission	60 months or 750,000 miles (1,207,008 km): I-Shift and I-Shift for Severe Duty	I-Shift: 36 months or 250,000 miles (402,336 km) I-Shift for Severe Duty: 36 months with no mileage limitation	I-Shift: 12 months or 100,000 miles (160,934 km) I-Shift for Severe Duty: 24 months with no mileage limitation
I-Shift Clutch	36 months or 350,000 miles (563,270 km): I-Shift and I-Shift for Severe Duty	36 months or 250,000 miles (402,336 km): I-Shift and I-Shift for Severe Duty	I-Shift: 12 months or 100,000 miles (160,934 km) I-Shift for Severe Duty: 24 months or 250,000 miles (402,336 km)
I-Shift Transmission Towing	Towing/Roadside Assistance on warrantable failures are covered for 24 months or 250,000 miles (402,336 km) whichever occurs first, limited to the truck (less trailer), and to a single tow per incident to the nearest authorized Volvo Trucks service center. Charges in excess of $1,000.00 are not covered unless Volvo Action Service is contacted and approves additional amounts prior to tow.		Not Applicable

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	Standard Normal Duty	Standard Heavy Duty	Standard Severe Duty
Cab Structure	60 months or 500,000 miles (804,672 km)	60 months or 500,000 miles (804,672 km)	36 months or 250,000 miles (402,336 km)
Internal Cab Corrosion	60 months or 500,000 miles (804,672 km)	60 months or 500,000 miles (804,672 km)	48 months or 350,000 miles (563,270 km)
	Covered only where metal is perforated from the inside to the outside. See paragraph 18 under Exclusions.		
Frame Rail / Crossmembers	72 months or 750,000 miles (1,207,008 km)	60 months or 500,000 miles (804,672 km)	36 months or 250,000 miles (402,336 km)
Noise Emission	LIFE OF VEHICLE: Volvo Trucks North America warrants to the first purchaser of this vehicle for purposes other than resale, and to each subsequent purchaser, that this vehicle was designed, built and equipped to conform, at the time of sale to such first purchaser, with all applicable U.S. EPA noise control regulations. This warranty is not limited to any vehicle particular part, component, or system of the vehicle. Defects in the design, assembly or any part, component or system of the vehicle which at the time of sale to such first purchaser, caused noise emission levels to exceed Federal standards are covered by this warranty for the life of the vehicle. EXCLUSIONS: Failures which arise as a result of tampering rather than from defects in the design, assembly, or any part, components, or system of the vehicle are not covered by this warranty.		
* Covered for 30 Days: Fluorescent Lights or Ballast, Light Bulbs, Fuses, Wiper Blades, and all Filters (Oil, Fuel, Air, etc.). * Covered for 90 Days: Loose Fasteners, Leaking Fittings, or Loose Hose Clamps.			

THESE LIMITATIONS AND EXCLUSIONS ARE IMPORTANT AND MUST BE READ AND UNDERSTOOD.

LIMITATIONS – Volvo Trucks North America's obligation is limited to, at its sole option, repair or replacement of parts which are acknowledged by it to be defective. The defective parts or assemblies replaced shall become the property of Volvo Trucks North America. Warranty repairs performed by an authorized Volvo dealer in accordance with the terms of the warranty set forth herein are free of charge. Warranty consideration can only be given if the deficiency is brought to the attention of an authorized Volvo dealer upon discovery and the vehicle must be made available, in a timely fashion during the coverage period, for repair.

EXCLUSIONS:
1. REPAIR: In the case of acknowledged defective Covered Parts, exchange with factory remanufactured parts may occur. Warranty repairs do not constitute an extension of any warranty period for any vehicle, component or part.
2. DAMAGES: Damages due to misapplication, misuse, accidents, negligence, improper operations, alterations, storage or transport, operation at excessive speeds, loading beyond the factory rated load capacity, failure to follow Volvo Trucks' recommended inspection, maintenance, and service procedures, and improper or insufficient maintenance services are not covered.

3. **PROGRESSIVE DAMAGE:** Damages due to failure of operator to take reasonable precautions to mitigate damage are not covered. Damages to a Covered Part due to failure of non-covered part are not covered. Coverage is limited to failure of a Covered Part directly causing failure of a non-covered part, where reasonable precautions were taken to mitigate damages.
4. **APPLICATION:** The selling dealer is responsible for designating the correct application and/or specification for a vehicle sold to a customer. Damages due to misapplication, including but not limited to, failures of component parts of vehicles being operated in excess of factory rated load capacities, or the use of a vehicle, component or part for a purpose for which it was not intended are not covered.
5. **ALTERATIONS:** Any vehicle, component or part repaired, altered, or inspected in any way, so as to adversely affect, in Volvo Trucks' sole judgment, its stability, durability, or reliability, is not covered.
6. **NON-ORIGINAL EQUIPMENT:** Any part of the vehicle that fails, malfunctions, or does not perform as a result of improper conversion or installation of bodies or equipment by other manufacturers or suppliers is not covered.
7. **MAINTENANCE AND PARTS CONSUMED:** Maintenance and inspection requirements found in the Operator's Manuals and service manuals/instructions, including, but not limited to, engine tune-up, fuel system cleaning, replacement of lubricants and filter elements, adjustments of the engine injection pump/transmission/brakes/linkages, as well as diagnosis, test time and all other adjustments must be followed and are not covered. Parts which are normally consumed or worn out during the vehicle's normal service life and customarily replaced during usual maintenance service, including, but not limited to, mud flaps and brackets, brake linings, clutch brake, and clutch linings, are not covered.
8. **PERFORMANCE COMPLAINTS:** Performance complaints are not covered (including, but not limited to, low power and/or poor fuel economy). Coverage is limited to defects in material and workmanship of a Covered Part directly causing the performance issue.
9. **WEAROUT:** Volvo Trucks does not cover normal wear of Covered Parts. Failures attributable to wear are excluded. For example and without limitation, the wear rate of parts in any engine or transmission, and especially those parts within the combustion area and clutch housing area, will vary depending upon operating conditions and environment. Conditions, such as load, trailer configuration, road speed and road conditions, as well as the quality of fuel, lubrication oil, and all filters bear a direct relationship to the wear rate and resulting life of parts. Depending upon the severity of these various conditions, parts wear and resulting failure could occur within the time limit of the coverage.
10. **NON-GENUINE PARTS:** Any failure of any vehicle, component or part caused by the use of parts and accessories, or major assemblies and exchange units, which do not meet factory standards is not covered.
11. **ODOMETER READING:** Any vehicle on which the actual mileage or hours cannot readily be determined, or on which the odometer, hour meter, or Electronic Control Unit has been disconnected, disabled, or altered, may not be covered by this warranty.
12. **ACCESS TO INFORMATION:** Owner must allow Volvo Trucks full access to all data stored in all Electronic Control Modules; failure to do so may result in the loss of warranty coverage.
13. **LABOR:** Labor to remove and install a Covered Part is included only if a Volvo Trucks authorized dealer originally installed the Covered Part. Labor for overtime and/or shift differential is not covered. Excessive labor for a warrantable repair due to the prior installation of equipment or body is not covered.

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14. **MISC. EXPENSE:** Meals, lodging, communications charges, travel time and expense, loss of cargo, downtime, loss of profit/ revenue, rental vehicles, driver's wages and other miscellaneous expenses are not covered. Shop supplies, lube oil, lubricants, sealers, anti-freeze, filter elements and labor performed by a non-approved location are not covered.
15. **ADDITIONAL COMPONENTS:** Components or parts that are not installed by Volvo Trucks, including winches, power take-offs, dumper, mixer and refuse assemblies, hoists and bodies or other special equipment are not covered. During a warrantable repair, additional time to remove any customer installed components will not be covered under warranty. Volvo Trucks' factory manufacturing records will be determinative as to factory installed components.
16. **TOWING:** Unless expressly provided in this Warranty Certificate, expenses for towing or road service are not covered. Failures caused by improper towing technique are not covered.
17. **SUSPENSION PARTS:** Suspension parts, including but not limited to rubber bushings, torque rod bushings, spring pins and bushings, and greased lubrication points that fail due to improper maintenance, abnormally severe service or abuse are not covered.
18. **CAB STRUCTURE AND CORROSION:** Cab structural defects or cab corrosion that occurs in areas of the cab that previously were damaged, repaired, altered or modified are not covered. Cab corrosion where metal is perforated from the outside to the inside is not covered.
19. **VENDOR ENGINES, ALLISON AUTOMATIC TRANSMISSIONS and ALTERNATE FUEL STORAGE AND DELIVERY SYSTEMS:** Vendor engines, Allison automatic transmissions and alternate fuel (CNG/LNG/DME) fuel storage/delivery components used in Volvo trucks are warranted by their respective manufacturers and not by Volvo Trucks. Refer to the manufacturers' warranty statements.
20. **OIL CONSUMPTION:** Before a claim based upon excessive oil consumption will be considered, the owner must provide proof that all recommended maintenance has been performed and submit adequate documentation to show that oil consumption exceeds Volvo Trucks' published standards. Under no circumstances will warranty pay for repairs related to excessive oil consumption after the earlier of 24 months, 250,000 miles, 402,000 kilometers.
21. **ENVIRONMENTAL DAMAGE:** Parts made out of cloth, leather, wood, rubber, synthetics, paint or chrome which have been affected by exposure to the elements or chemical influence including, but not limited to, road salts/chemicals, industrial fall-out or the use of improper cleaners, polishes and/or waxes are not covered.
22. **ALIGNMENT:** Alignment of axle(s), balance of tires, changing of axle camber, caster, toe and thrust angle are not covered.
23. **GLASS:** Glass breakage and scratches are not covered unless physical proof of manufacturing responsibility is established.
24. **TIRES:** Except as expressly provided in warranty certificates covering Green House Gas (GHG) components, tires are covered only under warranties provided by the tire manufacturer.
25. **CHANGES:** Volvo Trucks reserves the right to make any changes in design, or make additions to or upon its products, without incurring any obligations to install the same changes on vehicles previously built.

THIS WARRANTY IS MADE EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, REPRESENTATIONS OR CONDITIONS, STATUTORY OR OTHERWISE, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY OTHER OBLIGATION OR

LIABILITY ON THE PART OF THE MANUFACTURER INCLUDING, WITHOUT LIMITATION OF THE FOREGOING, CONSEQUENTIAL, INDIRECT, AND INCIDENTAL DAMAGES. MANUFACTURER NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF VEHICLES, COMPONENTS OR PARTS.

WARRANTY CERTIFICATES

Standard Engine Warranty Certificate

(EPA 24 / CARB 24 and Newer)

Volvo Group North America LLC, d/b/a Volvo Trucks North America, ("Volvo Trucks") warrants certain individual components of each new **Volvo D13 EPA 24 / CARB 24 and newer emission engine** in a new Volvo truck to be free from defects in material and workmanship under normal use and service up to the periods specified, provided all Volvo Trucks maintenance and inspection requirements are followed. See your local authorized Volvo Trucks dealer for recommended maintenance and inspection procedures. All warranty periods are calculated from the date in service of the vehicle. All coverage is 100% for parts and labor subject to the qualifications, limitations, and exclusions as noted.

LIMITATIONS AND EXCLUSIONS TO THIS WARRANTY APPEAR ON THE FOLLOWING PAGES OF THIS CERTIFICATE. THESE LIMITATIONS AND EXCLUSIONS ARE IMPORTANT AND MUST BE READ AND UNDERSTOOD.

This warranty applies to only **new Volvo D13 engines** meeting **EPA 24 / CARB 24 and newer emission requirements** in new Volvo trucks operated in the United States and Canada installed in Model Year 2025 trucks.

Standard Volvo Engine Components Coverage: 24 months or 250,000 miles (402,336 km), whichever occurs first, unless otherwise noted.

Major Components Coverage: 60 months or 500,000 miles (804,672 km), whichever occurs first.

USE OF IMPROPER OR UNAPPROVED FUEL OR ENGINE OIL WILL VOID THE ENGINE AND AFTERTREATMENT SYSTEM (DIESEL PARTICULATE FILTER) WARRANTIES. EPA 24 EMISSION VOLVO ENGINES REQUIRE THE USE OF VOLVO SPECIFICATION VDS 5 HIGH PERFORMANCE DIESEL ENGINE OIL AND ULTRA LOW SULFUR DIESEL (ULSD) FUEL.

USE OF FLUIDS OTHER THAN API CERTIFIED DIESEL EXHAUST FLUID (DEF) WILL COMPROMISE AFTERTREATMENT SYSTEM PERFORMANCE, INCREASE EMISSIONS, AND MAY IMPACT THIS TRUCK'S PRODUCT WARRANTIES.

SEE FOLLOWING TABLE FOR SPECIFIC COVERAGES:

Covered Standard Components List: 24 Months or 250,000 Miles (402,336 km)	Qualifications and Limitations
Air Compressor	Includes: Sprocket and Mounting Bolts
Bearings	All internally lubricated bearings and bushings only.
Camshaft, Caps, and Bolts	Failures resulting from the Valve and Injector Adjustments not being maintained properly are NOT covered. Normal maintenance adjustments are NOT covered.
Connecting Rods, Caps, and Bolts	

Covered Standard Components List: 24 Months or 250,000 Miles (402,336 km)	Qualifications and Limitations
Coolant Duct Cover	
Crankcase Ventilation Assembly	
Crankshaft	
Crankshaft Hub	
Cylinder Block	Includes: Casting, Main Caps, and Bolts
Cylinder Block Heater	
Cylinder Head	Includes: Assembly, Casting, Bolts, Plugs, and Sleeves
Diesel Particulate Filter Assembly (DPF) / Diesel Oxidation Catalyst (DOC) / Selective Catalytic Reduction (SCR)	Includes: Aftertreatment Hydrocarbon Injector (AHI), Aftertreatment Wiring Harness, Aftertreatment Control Module, Diffuser Pipe (AHI Mounting), Fuel Lines to AHI Injector, AHI Shutoff Valve, AHI Fuel Pressure Sensor, Pre-Catalyst Temperature Sensor, Post-Catalyst Temperature Sensor, downstream DPF Temperature Sensor, Differential Pressure Sensor, Particulate Matter (PM) Sensor, SCR Assembly, DEF Pump Assembly (Pump Reverting Valve, Pump Pressure Sensor), DEF Injector, DEF Tank Heating Control Valve, NOx Sensor (SCR Inlet and Outlet), T4 Sensor
EGR (Exhaust Gas Recirculation) Components	All components including Clamps, Control Valve, Controller Area Network (CAN) EGR Valve, Cooler, Fittings, Gaskets, Mixer, Pipes, Charge Air Cooler Temperature Out (CAC Out) Sensor, EGR Venturi and EGR Venturi Differential Pressure Sensor and EGR Wiring Harness.
Electrical EA Harness Supplied with Engine	From EECU to Sensors and Injectors and Actuators
Engine Electronic Control Unit (EECU)	
Engine Brake Mechanism	Factory Installed Only.Includes: Control Valve and Rocker Arms, Turbo Compound (TC) Engine: Closed Loop Butterfly (CLB)
Exhaust Manifold	Includes: Casting, Joint Seals, Rings, and Wraps
Fan Belt Tensioner Assembly and Bracket	Excludes: Fan Belt
Flywheel	Includes: Housing and Ring Gear
Fuel Filter Housing	Excludes: Filters
Fuel Injector System	Includes: Injectors, Common Rail Assembly (Electronic Fuel Pressure Regulator and Pressure Sensor)

WARRANTY CERTIFICATES

Covered Standard Components List: 24 Months or 250,000 Miles (402,336 km)	Qualifications and Limitations
Fuel Transfer Pump	
Gaskets, Seals, O Rings, and Silicon Sealant	
Gears	All internally lubricated gears only (Timing and Idler Gears)
Hoses and Lines Supplied with Engine	Fluid carrying. Engine to engine mounted
Idler Pulleys	
Intake Manifold and Throttle Assembly	
Ladder Frame	
Oil Cooler	Engine Oil Cooler Only
Oil Fill Tube and Cap	
Oil Filter Housing	Excludes: Oil Filters. Includes: All control valves and sensors contained in the Oil Filter Housing.
Oil Pan	
Oil Pump	
Piston Assembly	Includes: Cooler Nozzles, Liners, Pistons, and Rings
Pneumatic Control System	TC Engine: Air Valve Unit, Buffer Valve Unit, and Check Valve
Power Steering Pump	
Pre-Heater	Factory Installed Only. Includes: Preheat Relay, Terminals, and Power Cables
PTO Drive / REPTO (Rear engine mounted PTO Drive)	Factory Installed Only. Excludes all Pumps or Driven Gears
Rocker Arm Assembly and Shafts	Includes: Rockers and non-brake Rockers. Failures resulting from the Valve and Injector Adjustments not being maintained properly are NOT covered. Normal maintenance adjustments are NOT covered.
Sensors (On Engine)	Includes: Coolant Temperature, Crankcase Pressure, Crankshaft (Engine Timing), EGR Temperature and Pressure, Engine Oil Level and Temperature, Engine Oil Pressure, Engine Position (Camshaft), Fuel Pressure and Temperature, Intake Boost Pressure and Temperature, and Inlet Manifold Air (Temperature and Pressure)

Covered Standard Components List: 24 Months or 250,000 Miles (402,336 km)	Qualifications and Limitations
Starter Motor	
Telematics Gateway	TGW Unit and Associated Hardware (Antenna, Cab Overlay Harness, Antenna Cables)
Thermostat (Coolant)	Includes: Thermostat Side Cover
Timing Gear Cover and Mounting Plate	
Towing	Towing/Road Service on warrantable engine failures is limited to 24 months or 250,000 miles (402,336 km), whichever occurs first, limited to truck (less trailer), and to a single tow per incident to the nearest authorized Volvo Trucks service center. Charges in excess of $1,000.00 are not covered unless Volvo Action Service is contacted and approves additional amounts prior to tow.
Turbocharger Assembly	Includes: VGT Actuator Module and Turbo Compound (TC) Assembly, if included
Valve Assembly	Includes: Guides, Keepers, Rotators, Seats, Springs, and Valves. Failures resulting from the Valve Adjustments not being maintained properly are NOT covered. Normal maintenance adjustments are NOT covered.
Valve Cover	
Valve Yokes (Bridge) and Pins	Failures resulting from the Valve Adjustments not being maintained properly are NOT covered. Normal maintenance adjustments are NOT covered.
Vibration Dampers and Bolts	
Water Pump Assembly	

Covered Major Engine Components List: 60 Months or 500,000 Miles (804,672 km)	Qualifications and Limitations
Camshaft, Caps, and Bolts	Failures resulting from Valve & Injector Adjustments not being maintained properly are NOT covered. Normal maintenance adjustments are NOT covered.
Connecting Rods, Caps, and Bolts	
Crankshaft Forging	
Cylinder Block Casting, Main Caps, and Bolts	
Cylinder Head Casting and Bolts	
Exhaust Manifold Casting	

WARRANTY CERTIFICATES

Covered Major Engine Components List: 60 Months or 500,000 Miles (804,672 km)	Qualifications and Limitations
Flywheel Housing	
Gears	All internally lubricated Gears only (Timing and Idler Gears)
Intake Manifold Housing	
Ladder Frame	
Thermostat Housing	
Timing Gear Mounting Plate	Excludes: Timing Gear Cover

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LIMITATIONS – Volvo Trucks North America's obligation is limited to, at its sole option, repair or replacement of parts which are acknowledged by it to be defective. The defective parts or assemblies replaced shall become the property of Volvo Trucks North America. Warranty repairs performed by an authorized Volvo dealer in accordance with the terms of the warranty set forth herein are free of charge. Warranty consideration can only be given if the deficiency is brought to the attention of an authorized Volvo dealer upon discovery and the vehicle must be made available, in a timely fashion during the coverage period, for repair.

EXCLUSIONS:
1. REPAIR: In the case of acknowledged defective Covered Parts, exchange with factory remanufactured parts may occur. Warranty repairs do not constitute an extension of any warranty period for any vehicle, component or part.
2. DAMAGES: Damages due to misapplication, misuse, accidents, negligence, improper operations, alterations, storage or transport, operation at excessive speeds, loading beyond the factory rated load capacity, failure to follow Volvo Trucks' recommended inspection, maintenance, and service procedures, and improper or insufficient maintenance services are not covered.
3. PROGRESSIVE DAMAGE: Damages due to failure of operator to take reasonable precautions to mitigate damage are not covered. Damages to a Covered Part due to failure of non-covered part are not covered. Coverage is limited to failure of a Covered Part directly causing failure of a non-covered part, where reasonable precautions were taken to mitigate damages.
4. APPLICATION: The selling dealer is responsible for designating the correct application and/or specification for a vehicle sold to a customer. Damages due to misapplication, including but not limited to, failures of component parts of vehicles being operated in excess of factory rated load capacities, or the use of a vehicle, component or part for a purpose for which it was not intended are not covered.
5. ALTERATIONS: Any vehicle, component or part repaired, altered, or inspected in any way, so as to adversely affect, in Volvo Trucks' sole judgment, its stability, durability, or reliability, is not covered.
6. NON-ORIGINAL EQUIPMENT: Any part of the vehicle that fails, malfunctions, or does not perform as a result of improper conversion or installation of bodies or equipment by other manufacturers or suppliers is not covered.

7. **MAINTENANCE AND PARTS CONSUMED:** Maintenance and inspection requirements found in the Operator's Manuals and service manuals/instructions, including, but not limited to, engine tune-up, fuel system cleaning, replacement of lubricants and filter elements, adjustments of the engine injection pump/transmission/brakes/linkages, as well as diagnosis, test time and all other adjustments must be followed and are not covered. Parts which are normally consumed or worn out during the vehicle's normal service life and customarily replaced during usual maintenance service, including, but not limited to, mud flaps and brackets, brake linings, clutch brake, and clutch linings, are not covered.
8. **PERFORMANCE COMPLAINTS:** Performance complaints are not covered (including, but not limited to, low power and/or poor fuel economy). Coverage is limited to defects in material and workmanship of a Covered Part directly causing the performance issue.
9. **WEAROUT:** Volvo Trucks does not cover normal wear of Covered Parts. Failures attributable to wear are excluded. For example and without limitation, the wear rate of parts in any engine or transmission, and especially those parts within the combustion area and clutch housing area, will vary depending upon operating conditions and environment. Conditions, such as load, trailer configuration, road speed and road conditions, as well as the quality of fuel, lubrication oil, and all filters bear a direct relationship to the wear rate and resulting life of parts. Depending upon the severity of these various conditions, parts wear and resulting failure could occur within the time limit of the coverage.
10. **NON-GENUINE PARTS:** Any failure of any vehicle, component or part caused by the use of parts and accessories, or major assemblies and exchange units, which do not meet factory standards is not covered.
11. **ODOMETER READING:** Any vehicle on which the actual mileage or hours cannot readily be determined, or on which the odometer, hour meter, or Electronic Control Unit has been disconnected, disabled, or altered, may not be covered by this warranty.
12. **ACCESS TO INFORMATION:** Owner must allow Volvo Trucks full access to all data stored in all Electronic Control Modules; failure to do so may result in the loss of warranty coverage.
13. **LABOR:** Labor to remove and install a Covered Part is included only if a Volvo Trucks authorized dealer originally installed the Covered Part. Labor for overtime and/or shift differential is not covered. Excessive labor for a warrantable repair due to the prior installation of equipment or body is not covered.
14. **MISC. EXPENSE:** Meals, lodging, communications charges, travel time and expense, loss of cargo, downtime, loss of profit/ revenue, rental vehicles, driver's wages and other miscellaneous expenses are not covered. Shop supplies, lube oil, lubricants, sealers, anti-freeze, filter elements and labor performed by a non-approved location are not covered.
15. **ADDITIONAL COMPONENTS:** Components or parts that are not installed by Volvo Trucks, including winches, power take-offs, dumper, mixer and refuse assemblies, hoists and bodies or other special equipment are not covered. During a warrantable repair, additional time to remove any customer installed components will not be covered under warranty. Volvo Trucks' factory manufacturing records will be determinative as to factory installed components.
16. **TOWING:** Unless expressly provided in this Warranty Certificate, expenses for towing or road service are not covered. Failures caused by improper towing technique are not covered.

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17. **SUSPENSION PARTS:** Suspension parts, including but not limited to rubber bushings, torque rod bushings, spring pins and bushings, and greased lubrication points that fail due to improper maintenance, abnormally severe service or abuse are not covered.
18. **CAB STRUCTURE AND CORROSION:** Cab structural defects or cab corrosion that occurs in areas of the cab that previously were damaged, repaired, altered or modified are not covered. Cab corrosion where metal is perforated from the outside to the inside is not covered.
19. **VENDOR ENGINES, ALLISON AUTOMATIC TRANSMISSIONS and ALTERNATE FUEL STORAGE AND DELIVERY SYSTEMS:** Vendor engines, Allison automatic transmissions and alternate fuel (CNG/LNG/DME) fuel storage/delivery components used in Volvo trucks are warranted by their respective manufacturers and not by Volvo Trucks. Refer to the manufacturers' warranty statements.
20. **OIL CONSUMPTION:** Before a claim based upon excessive oil consumption will be considered, the owner must provide proof that all recommended maintenance has been performed and submit adequate documentation to show that oil consumption exceeds Volvo Trucks' published standards. Under no circumstances will warranty pay for repairs related to excessive oil consumption after the earlier of 24 months, 250,000 miles, 402 000 kilometers.
21. **ENVIRONMENTAL DAMAGE:** Parts made out of cloth, leather, wood, rubber, synthetics, paint or chrome which have been affected by exposure to the elements or chemical influence including, but not limited to, road salts/chemicals, industrial fall-out or the use of improper cleaners, polishes and/or waxes are not covered.
22. **ALIGNMENT:** Alignment of axle(s), balance of tires, changing of axle camber, caster, toe and thrust angle are not covered.
23. **GLASS:** Glass breakage and scratches are not covered unless physical proof of manufacturing responsibility is established.
24. **TIRES:** Except as expressly provided in warranty certificates covering Green House Gas (GHG) components, tires are covered only under warranties provided by the tire manufacturer.
25. **CHANGES:** Volvo Trucks reserves the right to make any changes in design, or make additions to or upon its products, without incurring any obligations to install the same changes on vehicles previously built.

THIS WARRANTY IS MADE EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, REPRESENTATIONS OR CONDITIONS, STATUTORY OR OTHERWISE, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY OTHER OBLIGATION OR LIABILITY ON THE PART OF THE MANUFACTURER INCLUDING, WITHOUT LIMITATION OF THE FOREGOING, CONSEQUENTIAL, INDIRECT, AND INCIDENTAL DAMAGES. MANUFACTURER NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF VEHICLES, COMPONENTS OR PARTS.

Standard Emissions Component Warranty Certificate

Volvo Group North America LLC, d/b/a Volvo Trucks North America ("Volvo Trucks"), warrants certain individual components of the Emission Control System in a new Volvo truck equipped with a **new Volvo D13 EPA 24 / CARB 24 and new emission engine** in a new Volvo truck to be free from defects in material and workmanship under normal use and service up to the periods specified, provided all Volvo Trucks' maintenance and inspection requirements are followed. See your local authorized Volvo Trucks dealer for recommended maintenance and inspection procedures. All warranty periods are calculated from the date in service of the vehicle. All coverage is 100% for parts and labor subject to the qualifications, limitations, and exclusions as noted.

LIMITATIONS AND EXCLUSIONS TO THIS WARRANTY APPEAR ON THE FOLLOWING PAGES OF THIS CERTIFICATE. THESE LIMITATIONS AND EXCLUSIONS ARE IMPORTANT AND MUST BE READ AND UNDERSTOOD.

This warranty applies to new Volvo D13 engines meeting **EPA 24 / CARB 24 and newer emission requirements** in new Volvo trucks operated in the United States and Canada.

Emission Control System Warranty: Engine emission controls manufactured by Volvo Trucks North America are warranted to 60 months or 100,000 miles (160,934 km), whichever occurs first. Vehicles sold for use in California and other opt-in states, with a CARB emissions label certification, are covered for 60 months or 350,000 miles (563,270 km), whichever occurs first.

USE OF IMPROPER OR UNAPPROVED FUEL OR ENGINE OIL WILL VOID THE ENGINE AND AFTERTREATMENT SYSTEM (DIESEL PARTICULATE FILTER) WARRANTIES. VOLVO ENGINES REQUIRE THE USE OF VOLVO SPECIFICATION VDS 5 HIGH PERFORMANCE DIESEL ENGINE OIL AND ULTRA LOW SULFUR DIESEL (ULSD) FUEL.

USE OF FLUIDS OTHER THAN API CERTIFIED DIESEL EXHAUST FLUID (DEF) WILL COMPROMISE AFTERTREATMENT SYSTEM PERFORMANCE, INCREASE EMISSIONS, AND MAY IMPACT THIS TRUCK'S PRODUCT WARRANTIES.

SEE FOLLOWING TABLE FOR SPECIFIC COVERAGES:

WARRANTY CERTIFICATES

Covered Emission Components List: EPA: 60 Months or 100,000 Miles (160,934 km) CARB: 60 Months or 350,000 Miles (563,270 km)	Qualifications and Limitations
Aftertreatment Control Module (ACM)	Includes: Software and Dataset
Aftertreatment Diesel Particulate Filter (DPF) with Aftertreatment Diesel Oxidation Catalyst (DOC)	Includes: DPF Module (Substrate), DOC Module (Substrate), Aftertreatment Hydrocarbon Injector (AHI), AHI Shutoff Valve, AHI Fuel Pressure Sensor, AHI Fuel Line, Diesel Dosing Valve, Pre-Catalyst Temperature Sensor, Post-Catalyst Temperature Sensor, Downstream DPF Temperature Sensor, DPF Differential Pressure Sensor
Aftertreatment Wiring Harness (DPF)	
Aftertreatment Wiring Harness (SCR)	Includes: Jumper to AHI Pressure Regulator, ACM Power Supply, Heater NOx Care, DEF Tank
California Certified Engines (CARB) Equipped with these Chassis Parts	Includes: 48V Power Cable, 48V Ground Cable, Exhaust Piping, 48V Li-on Battery, Heater Control Unit, Cooling Fan
California Certified Engines (CARB) Equipped with these Exhaust Aftertreatment System (EATS) Parts	Includes: 48V EATS e-Heater, EATS harness, EATS Power Cable, EATS Ground Cable
California Certified Engines (CARB) Equipped with these Engine Parts	Includes: 48V P1 Machine, FEAD – Belt, FEAD – Idler (2) OAD Pulley, Engine Harness, Inlet Manifold
Charge Air Cooler (CAC)	
Common Rail Assembly	Includes: Rail, Rail Injectors, Rail Pressure Release Valve
Controller Area Network (CAN) EGR Valve	
Crankcase Ventilation (CCV) Assembly	
Crankcase Tubing and Hoses before Separator	
EGR Assembly	Includes: Cooler, Mixer/Mixing Chamber, EGR Cooler to Intake Manifold (cold side) Piping, EGR Piping Exhaust Manifold to EGR Cooler (hot side), EGR Valve, EGR Valve Control, EGR Venturi (Intake Manifold Heater, Diffuser Pipe, Intake Throttle Valve
Engine Electronic Control Unit (EECU)	Includes: Software and Dataset. For the failure to be covered, the failure must affect the emissions of the unit.
Engine Turbocharger Assembly: Variable Geometry Turbo (VGT) or Turbo Compound (TC)	Includes: Variable Geometry Turbo (VGT) Actuator

Covered Emission Components List: EPA: 60 Months or 100,000 Miles (160,934 km) CARB: 60 Months or 350,000 Miles (563,270 km)	Qualifications and Limitations
Exhaust Gas Piping	From Turbocharger to Aftertreatment System
Fuel Control Module	Includes: Fuel Filter Housing, Diesel Low Pressure Pump, Fuel Pressure Regulating Valve
Injectors	
Instrument Cluster	Limited to Repair of Microprocessor, MIL, Real Time Clock, DEF Gauge, DEF Lamp
Intake Manifold Throttle Assembly	
Pre-Heater	
Selective Catalytic Reduction (SCR)	SCR Assembly: SCR Module (if applicable) (Substrate); Insulation Blanket (where applicable); DEF Pump Assembly: Pump Reverting Valve, Pump Pressure Sensor; DEF Injector; DEF Heated Hoses; DEF Tank; DEF Tank Heating Control Valve; DEF Tank Heater / Sender: DEF Tank Temperature Sensor, DEF Level Sensor, DEF Tank Heater; Downstream SCR Temperature Sensor; DEF Quality Sensor
Sensor, NOx (SCR Inlet and Outlet)	
Sensor, Ambient Air Temperature Sensor	
Sensor, Charge Air Cooler Outlet Temperature	
Sensor, Downstream SCR Temperature (T4)	
Sensor, EGR Temperature	
Sensor, EGR Valve Position	
Sensor, EGR Venturi Differential Pressure	
Sensor, Engine Timing / Speed (Flywheel)	
Sensor, Engine Oil Level/Temperature	
Sensor, Engine Oil Pressure	
Sensor, Engine Position (Camshaft)	
Sensor, Exhaust Manifold Pressure	
Sensor, Fuel Pressure (Common Rail)	

WARRANTY CERTIFICATES

Covered Emission Components List: EPA: 60 Months or 100,000 Miles (160,934 km) CARB: 60 Months or 350,000 Miles (563,270 km)	Qualifications and Limitations
Sensor, Fuel Temperature	
Sensor, Particulate Matter (PM)	
Sensor, Temperature – Coolant (Engine)	
Sensor, Temperature and Pressure – Inlet Manifold Air	
Sensor, Turbo Compressor Outlet	
Sensor, Turbocharger Speed	
Thermostat, Coolant	
Vehicle Electronic Control Unit	Includes: Software and Dataset. For the failure to be covered the failure must affect the emissions of the unit.
Water Pump Assembly, Engine Coolant	
Wiring Harness, Engine Electrical EA Harness Supplied with Engine	

GHG Covered Component 24 Months or 24,000 Miles (38,624 km)	Qualifications and Limitations
Tires	Drive and steer tires only are warranted to be free from defects in materials and workmanship for the first 24 months or 24,000 miles (38,624 km) of vehicle operation, whichever occurs first, and applying only to the first set of tires on the vehicle when delivered to the ultimate purchaser. Emissions related warranty coverage only, refer to the specific tire manufacturer's warranty policy for other term lengths.

GHG Covered Components 60 Months or 100,000 Miles (160,934 km)	Qualifications and Limitations
Exterior Components	Limited to: Chassis Fairings, Ground Effect Extensions, Roof Deflectors, Cab Side Deflectors, Adjustable Roof Extensions, Side Deflector Extensions, Bumper Deflectors, A-pillar Deflectors; Factory Installed Aerodynamic Devices
Air Conditioning Components	Limited to Refrigerant Leakage of: A/C Compressor; A/C Condenser; A/C Pressure Switches and Transducers; Bunk Climate Unit; Hoses (Compressor to Condenser, Condenser to Drier, Drier to Climate Unit, Climate Unit to Compressor, Bunk Climate Unit); Main Climate Unit; Receiver Drier

THESE LIMITATIONS AND EXCLUSIONS ARE IMPORTANT AND MUST BE READ AND UNDERSTOOD.

LIMITATIONS – Volvo Trucks North America's obligation is limited to, at its sole option, repair or replacement of parts which are acknowledged by it to be defective. The defective parts or assemblies replaced shall become the property of Volvo Trucks North America. Warranty repairs performed by an authorized Volvo dealer in accordance with the terms of the warranty set forth herein are free of charge. Warranty consideration can only be given if the deficiency is brought to the attention of an authorized Volvo dealer upon discovery and the vehicle must be made available, in a timely fashion during the coverage period, for repair.

EXCLUSIONS:
1. REPAIR: In the case of acknowledged defective Covered Parts, exchange with factory remanufactured parts may occur. Warranty repairs do not constitute an extension of any warranty period for any vehicle, component or part.
2. DAMAGES: Damages due to misapplication, misuse, accidents, negligence, improper operations, alterations, storage or transport, operation at excessive speeds, loading beyond the factory rated load capacity, failure to follow Volvo Trucks' recommended inspection, maintenance, and service procedures, and improper or insufficient maintenance services are not covered.
3. PROGRESSIVE DAMAGE: Damages due to failure of operator to take reasonable precautions to mitigate damage are not covered. Damages to a Covered Part due to failure of non-covered part are not covered. Coverage is limited to failure of a Covered Part directly causing failure of a non-covered part, where reasonable precautions were taken to mitigate damages.
4. APPLICATION: The selling dealer is responsible for designating the correct application and/or specification for a vehicle sold to a customer. Damages due to misapplication, including but not limited to, failures of component parts of vehicles being operated in excess of factory rated load capacities, or the use of a vehicle, component or part for a purpose for which it was not intended are not covered.
5. ALTERATIONS: Any vehicle, component or part repaired, altered, or inspected in any way, so as to adversely affect, in Volvo Trucks' sole judgment, its stability, durability, or reliability, is not covered.
6. NON-ORIGINAL EQUIPMENT: Any part of the vehicle that fails, malfunctions, or does not perform as a result of improper conversion or installation of bodies or equipment by other manufacturers or suppliers is not covered.

WARRANTY CERTIFICATES

7. **MAINTENANCE AND PARTS CONSUMED:** Maintenance and inspection requirements found in the Operator's Manuals and service manuals/instructions, including, but not limited to, engine tune-up, fuel system cleaning, replacement of lubricants and filter elements, adjustments of the engine injection pump/transmission/brakes/linkages, as well as diagnosis, test time and all other adjustments must be followed and are not covered. Parts which are normally consumed or worn out during the vehicle's normal service life and customarily replaced during usual maintenance service, including, but not limited to, mud flaps and brackets, brake linings, clutch brake, and clutch linings, are not covered.
8. **PERFORMANCE COMPLAINTS:** Performance complaints are not covered (including, but not limited to, low power and/or poor fuel economy). Coverage is limited to defects in material and workmanship of a Covered Part directly causing the performance issue.
9. **WEAROUT:** Volvo Trucks does not cover normal wear of Covered Parts. Failures attributable to wear are excluded. For example and without limitation, the wear rate of parts in any engine or transmission, and especially those parts within the combustion area and clutch housing area, will vary depending upon operating conditions and environment. Conditions, such as load, trailer configuration, road speed and road conditions, as well as the quality of fuel, lubrication oil, and all filters bear a direct relationship to the wear rate and resulting life of parts. Depending upon the severity of these various conditions, parts wear and resulting failure could occur within the time limit of the coverage.
10. **NON-GENUINE PARTS:** Any failure of any vehicle, component or part caused by the use of parts and accessories, or major assemblies and exchange units, which do not meet factory standards is not covered.
11. **ODOMETER READING:** Any vehicle on which the actual mileage or hours cannot readily be determined, or on which the odometer, hour meter, or Electronic Control Unit has been disconnected, disabled, or altered, may not be covered by this warranty.
12. **ACCESS TO INFORMATION:** Owner must allow Volvo Trucks full access to all data stored in all Electronic Control Modules; failure to do so may result in the loss of warranty coverage.
13. **LABOR:** Labor to remove and install a Covered Part is included only if a Volvo Trucks authorized dealer originally installed the Covered Part. Labor for overtime and/or shift differential is not covered. Excessive labor for a warrantable repair due to the prior installation of equipment or body is not covered.
14. **MISC. EXPENSE:** Meals, lodging, communications charges, travel time and expense, loss of cargo, downtime, loss of profit/ revenue, rental vehicles, driver's wages and other miscellaneous expenses are not covered. Shop supplies, lube oil, lubricants, sealers, anti-freeze, filter elements and labor performed by a non-approved location are not covered.
15. **ADDITIONAL COMPONENTS:** Components or parts that are not installed by Volvo Trucks, including winches, power take-offs, dumper, mixer and refuse assemblies, hoists and bodies or other special equipment are not covered. During a warrantable repair, additional time to remove any customer installed components will not be covered under warranty. Volvo Trucks' factory manufacturing records will be determinative as to factory installed components.
16. **TOWING:** Unless expressly provided in this Warranty Certificate, expenses for towing or road service are not covered. Failures caused by improper towing technique are not covered.

17. **SUSPENSION PARTS:** Suspension parts, including but not limited to rubber bushings, torque rod bushings, spring pins and bushings, and greased lubrication points that fail due to improper maintenance, abnormally severe service or abuse are not covered.
18. **CAB STRUCTURE AND CORROSION:** Cab structural defects or cab corrosion that occurs in areas of the cab that previously were damaged, repaired, altered or modified are not covered. Cab corrosion where metal is perforated from the outside to the inside is not covered.
19. **VENDOR ENGINES, ALLISON AUTOMATIC TRANSMISSIONS and ALTERNATE FUEL STORAGE AND DELIVERY SYSTEMS:** Vendor engines, Allison automatic transmissions and alternate fuel (CNG/LNG/DME) fuel storage/delivery components used in Volvo trucks are warranted by their respective manufacturers and not by Volvo Trucks. Refer to the manufacturers' warranty statements.
20. **OIL CONSUMPTION:** Before a claim based upon excessive oil consumption will be considered, the owner must provide proof that all recommended maintenance has been performed and submit adequate documentation to show that oil consumption exceeds Volvo Trucks' published standards. Under no circumstances will warranty pay for repairs related to excessive oil consumption after the earlier of 24 months, 250,000 miles, 402 000 kilometers.
21. **ENVIRONMENTAL DAMAGE:** Parts made out of cloth, leather, wood, rubber, synthetics, paint or chrome which have been affected by exposure to the elements or chemical influence including, but not limited to, road salts/chemicals, industrial fall-out or the use of improper cleaners, polishes and/or waxes are not covered.
22. **ALIGNMENT:** Alignment of axle(s), balance of tires, changing of axle camber, caster, toe and thrust angle are not covered.
23. **GLASS:** Glass breakage and scratches are not covered unless physical proof of manufacturing responsibility is established.
24. **TIRES:** Except as expressly provided in warranty certificates covering Green House Gas (GHG) components, tires are covered only under warranties provided by the tire manufacturer.
25. **CHANGES:** Volvo Trucks reserves the right to make any changes in design, or make additions to or upon its products, without incurring any obligations to install the same changes on vehicles previously built.

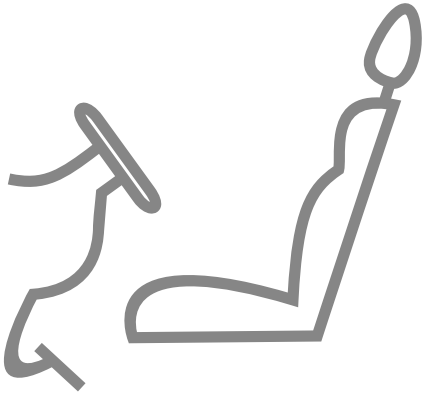
THIS WARRANTY IS MADE EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, REPRESENTATIONS OR CONDITIONS, STATUTORY OR OTHERWISE, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY OTHER OBLIGATION OR LIABILITY ON THE PART OF THE MANUFACTURER INCLUDING, WITHOUT LIMITATION OF THE FOREGOING, CONSEQUENTIAL, INDIRECT, AND INCIDENTAL DAMAGES. MANUFACTURER NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF VEHICLES, COMPONENTS OR PARTS.

02

DRIVING TIPS

DRIVER ENVIRONMENT

- *Always wear a seat belt*
- *Adjust the driver's seat and mirrors for a good driving position*
- *Use the cab's storage compartments*



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Driving a truck is demanding work. Long work shifts, difficult driving conditions, and tight driving schedules place high demands on the equipment. An organized driver environment makes things easier and helps you to drive efficiently and safely.

Always Wear a Seat Belt

For your safety at work, always wear a seat belt. Remember that it is a legal requirement.

Driving Position

It is important that you sit comfortably and have good visibility while you are driving. Arms and back must have a restful, natural posture. So take the time to adjust mirrors, steering wheel, and seat to an optimal position before driving.

When driving long distances, change your driving position at regular intervals. Keep the backrest and head restraint upright when driving on uneven road surfaces to avoid back and neck injuries.

Climate System

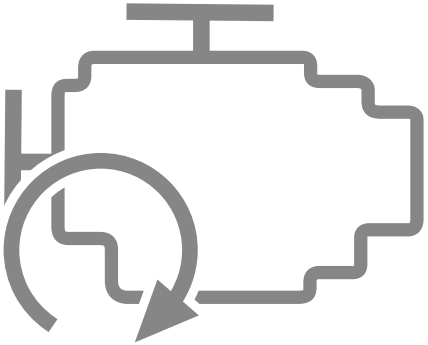
Use the climate control recirculation function. The recirculation function will allow the temperature in the cab to get cooler quicker as it recirculates the air inside the cab and not the outside air.

Adapt Your Cab Environment for Your Comfort

If you are staying in the cab during hot or cold weather, use the Volvo's Integrated Parking Cooler (if equipped) on warmer days, and parking heater on cooler days to save fuel and keeping more comfortable while parked.

STARTING

- Conduct all necessary Pretrip procedures
- Allow the truck to warm up and build full air pressure for both truck and trailer, if connected.
- Check for any driver notification messages in the instrument cluster.
- Always check surroundings for safety before pulling moving.



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When you start your truck there are several things you can do to start smart, save fuel and reduce wear on the truck.

Warm Up the Engine

Avoid cold starting if possible.

Use the engine heater to warm up the engine before starting.

Use the preheating function on your truck if you must start with a cold engine. The engine will then be supplied with preheated air, which results in easier and more environmentally friendly starting.

Never rev a cold engine. Warm up the engine by driving gently at low engine speeds instead of letting it run at idling speed while stationary.

The truck does not need to run at idling speed before driving off. Warm up the engine at low engine speeds. Avoid idling during normal driving as well.

Use a Good Starting Technique

The brake pedal must be pressed whenever you change the gear selector from position N to D, M, or R. It prevents the vehicle from accidentally moving when gear position in N.

DRIVING IN AN URBAN AREA

- *Plan your driving*
- *Adapt your speed*
- *Use the truck's mirrors and turn signals*
- *Be observant around your truck*

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When driving in an urban area there are several tricks for driving as efficiently and economically as possible.

Plan Your Driving

The main rule for driving in an urban area is to plan your driving to avoid unnecessary stops. Reduce speed in good time when approaching a roundabout, intersection or any other obstruction where you may need to stop. In this way, you will be able to maintain more speed on the other side of the obstruction.

Use cruise control sparingly in heavy traffic. If you use it incorrectly, it may lead to unnecessary braking and acceleration, which results in increased energy consumption.

Adapt Your Speed

Adapt your speed to suit surrounding traffic, both on and adjacent to the road (crossing bicycle lanes for example). Excessive speed often leads to unexpected situations that may require stopping or cause other problems. By adapting your speed, you will be able to save energy and reduce the risk of accidents while maintaining or even raising your average speed.

Be Observant Around Your Truck

Many serious accidents occur between trucks and unprotected road users, such as cyclists and pedestrians. Correctly adjusted mirrors give you good visibility around the vehicle but be aware of blind spots behind and in front of the truck as well as on the passenger side.

To prevent accidents when you are reversing, the backup alarm emits a warning signal. For safety reasons, you should always have it activated. The warning signal can however be turned off. Turn off the backup alarm only in a controlled environment and when it is really warranted.

When reversing, use the truck's reversing camera (if equipped) as an aid.

Backup Alarm (If Equipped)

The backup alarm is designed to alert persons in the vicinity of the vehicle that the truck is moving in reverse.

⚠ WARNING

This vehicle is equipped with a Back-Up Alarm.
ALARM MUST SOUND!
Failure to maintain a clear view in the direction of travel could result in serious personal injury or death.
The operator is responsible for the safe operation of this vehicle.

DRIVING ON A HIGHWAY

- *Maintain a steady speed*
- *Use smart acceleration*
- *Reduce resistance*

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Plan your long-distance driving so it is efficient and economical.

Remember that roads with many uphill gradients and bends result in higher fuel consumption.

Maintain a Steady Speed

The truck's cruise control is a good aid for maintaining consistent speed. Maintaining consistent speed is a good way to optimize fuel efficiency but the most innovative fuel saving technologies such as Volvo I-See varies speed to optimize vehicle momentum in rolling terrain.

The adaptive cruise control can assist in maintaining the distance to the vehicle ahead but it is mainly used for driving on highways and major roads.

You can reduce the wear on the truck's service brakes by using the engine brake.

Use Smart Acceleration

The impact on your vehicle's fuel consumption is more significant based on when you choose to accelerate rather than the manner in which you accelerate.

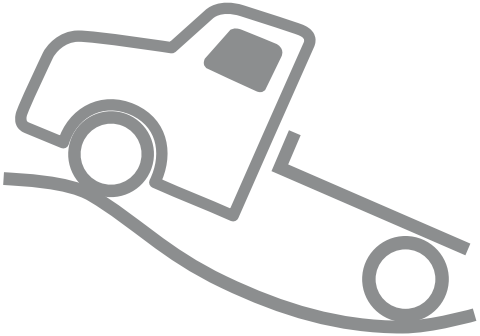
Reduce Resistance

Adapt your speed and do not drive faster than you need. Higher speeds result in increased drag and therefore increased fuel consumption. Remember that higher speed results in higher drag.

Rolling resistance plays a major role in energy consumption. Use the correct tires and make sure they have the right tire pressure.

DRIVING IN HILLY TERRAIN

- *Accelerate in uphill gradients*
- *In downhill gradients, avoid accelerating and let the truck coast when the terrain allows it.*



Your driving technique in hilly terrain can make a major difference to fuel consumption.

Uphill

When approaching an uphill incline you should try to maintain your speed and allow the engine to use the trucks pulling power at low revs to get you up the hill. Release the accelerator pedal just before you reach the summit and coast over it. When you change gear, try to drive according to the tachometer instead of by engine noise.

Downhill

On downhill inclines you should try to avoid accelerating, and instead allow the truck to increase speed by coasting. Regulate the downhill speed with the trucks engine brake. Make it a habit to completely remove your foot from the accelerator pedal while you are coasting.

DRIVING IN THE RAIN

- *Make sure you have good visibility*
- *Adapt your speed*
- *Check the tread depth of the tires*

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Driving in The Rain

When driving in rain, it is important that you have good visibility and maintain a suitable speed. If your truck is equipped with air conditioning, then you can use it to remove moisture from the cab. To remove ice from the windows, use the defroster.

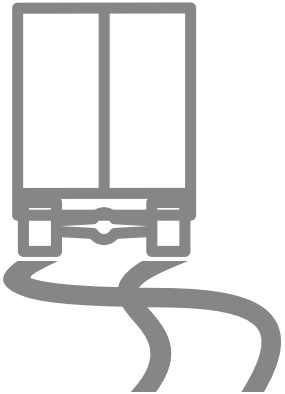
Hydroplaning

The best way to avoid hydroplaning is to:

- Have good tread depth on the tires
- Reduce your speed

DRIVING ON A SLIPPERY ROAD

- *Adapt your speed according to road surface*
- *Use the truck's auxiliary systems on difficult road surfaces*



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Adapt Your Speed

Even though your truck is equipped with different functions to facilitate driving on slippery road surfaces, the most important safety factor is always that you adapt your speed to suit the road conditions.

Use the Truck's Assist Systems

Traction Control

Traction control system is a system that automatically prevents wheelspin during acceleration to give you traction and stability also on slippery surfaces. If you are in a situation where you want to allow the wheels to spin, for example when driving on loose snow or sand, you can set to off-road mode (Mud/Snow function). Traction control system can also be turned off completely.

When off-road mode is no longer needed, remember to turn the traction control system to normal function.

Weight Distributed over Driving Axle (If Equipped)

For a better grip on slippery road surfaces, you can temporarily redistribute the weight on the driving axle.

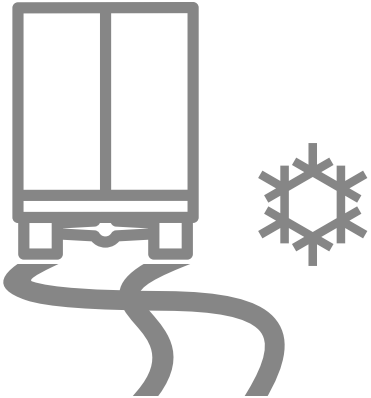
Differential Lock

On an extremely slippery surface, you can engage the differential lock so that the wheels drive at the same speed.

Drive carefully when you have the differential lock engaged. Do not forget to disengage it when you leave the slippery area. If you drive with the differential lock engaged on firm ground, you risk damaging the driven axles and wheels.

DRIVING ON A WINTRY ROAD

- *Keep the windshield clear*
- *Make sure you have good visibility*
- *Adapt your speed*
- *Use snow chains or similar*



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Keep the Windshield Clear

If there is misting or ice on the windows, use the defroster function of the air conditioning system to clear the windows. In snow flurries and similar conditions, set the air distribution only to the floor to avoid melting the snow on the windshield which then may freeze in the headwind.Ice or snow on the outside mirrors is most easily removed by using the mirror heater.

Pay Attention to Road Conditions

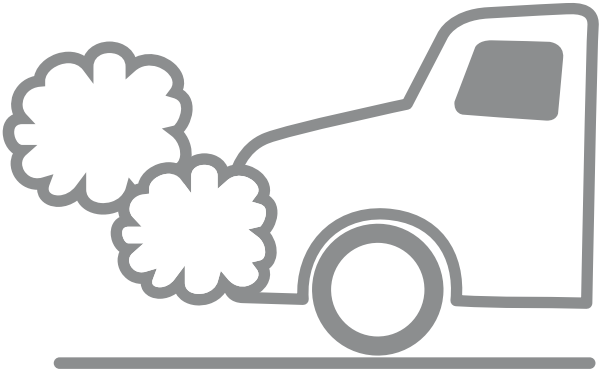
Adapt your speed after current road conditions and visibility. If it is slippery, there are functions that can assist with negotiating the road.

Use Snow Chains When Necessary

If you need to use snow chains remember that snow chains on the front wheel axle should primarily be mounted on the passenger side to avoid damaging the link rod on the driver's side.

DRIVING IN A DUSTY AND SMOKY ENVIRONMENT

- *Use recirculation*
- *Temporarily switch off the smoke detector in the cab*



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Use Recirculation

The Volvo Cab HVAC system has two cabin air filters to block external dust from the driver environment. While these filters are excellent for reducing dust particles, the use of recirculated cab air is also advised when operating in extremely dusty exterior conditions.

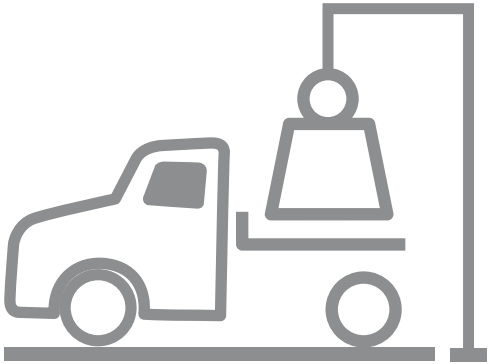
Use recirculation only for a short period of time. Clean the inside windshield with a normal window cleaning agent regularly.

Temporarily Switch Off the Smoke Detector in the Cab

If you are driving in a very dusty environment, you can temporarily switch off the smoke detector in the cab. Remember to turn on the smoke detector when you leave the dusty environment.

LOADING AND UNLOADING

- *Utilize the air suspension.*
- *Secure the load firmly*



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You can make loading and unloading easier and save both time and effort by using the truck's air suspension system.

Utilize the Air Suspension

Alternative ride heights for driving and loading can be pre-programmed in the memory of the air suspension system. If equiped, you can store different heights in order to quickly adapt to the loading docks that you use regularly.

You can also utilize the air suspension to tilt the trailer in a direction that facilitates loading and unloading.

If the air suspension is not correctly adjusted, the wheel suspension may be damaged when quickly loading or unloading a very heavy load, such as a container. When loading, raise the air suspension to its highest level. When unloading, lower the air suspension to its lowest level.

Secure the Load Firmly

Remember to secure your load in order to avoid accidents and damage to goods and vehicles. A rule of thumb is to secure the load at the front with at least the force equal to the full weight of the load. Secure the load at the rear and sides with at least the force equal to half the weight of the load.

PARKING

- *Make sure that the parking brake is applied.*
- *Make sure that the truck is standing safely.*
- *Avoid unnecessary idling.*

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When you stop to park, there are several things you should think about.

Make Sure the Truck is Standing Safely

Use the parking brake.

Always select neutral, N, when the truck is parked or when you leave the truck.

The tires may be hot after a long drive. When parking on inclined winter roads, the hot tires may melt the ice that has accumulated on the surface of the road, and the truck may start to slide. Always try to park on level ground. If you must park on an incline, stop first and allow the tires to cool down for a few minutes. Then move the truck a couple of yards/ meters before parking.

Avoid Unnecessary Idling

In some cases, the truck may have to idle before turning it off. Idling normally accounts for fuel consumption, of which 50-80% is unnecessary idling.

Hard Driving

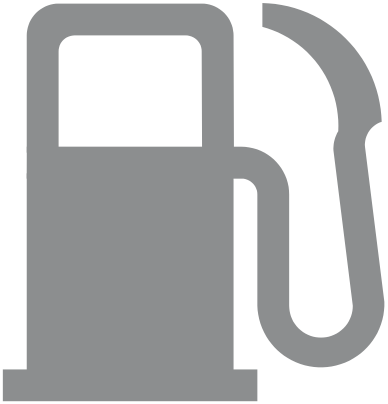
After hard driving, allow the engine to run at idling speed for several minutes while stationary before switching it off in order to reduce exhaust temperature.

DEF Fluid

When driving in colder climates 0 °C (32 °F), idle for at least 90 seconds before turning the vehicle off. This will ensure that all DEF Fluid has exited the system.

REFUELLING

- *Check the tire pressure*
- *Check the level of DEF fluid*



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When you stop to refuel, you should take the opportunity to do the pre-trip inspection and check all functions of your vehicle.

Check the Tire Pressure

Check the tire pressure while refueling. Incorrect tire pressure results in increased fuel consumption and increased tire wear. The trucks driving characteristics can be affected by incorrect tire pressure.

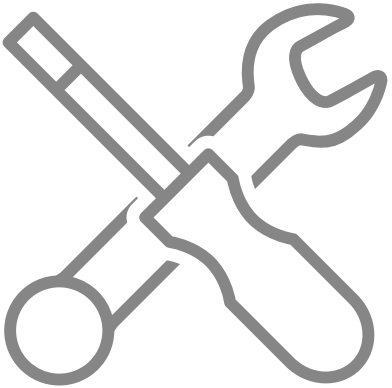
Check the Level of DEF Fluid

Make it a habit to check the DEF Tank fluid level while you are refueling. Running the engine without DEF fluid can damage the exhaust aftertreatment system.

Wipe up any spillage when filling DEF Fluid. The solution reacts with certain metal surfaces. The DEF fluid tank is only intended for DEF fluid. Other fuels or dirt in the tank can damage the engine and the fuel system.

SERVICE AND MAINTENANCE

- *Use the correct fuel for your truck*
- *Follow the service schedule for your truck*



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Service and Maintenance

You can reduce your costs by performing regular maintenance and keeping the truck in good condition.

Ask your authorized Volvo workshop to assist you in drawing up an individual service schedule for your particular truck.

Check the Tires

Check the pressure in the tires at least once every 14 days. Incorrect tire pressure results in increased energy consumption and increased tire wear. The truck's driving characteristics can also be affected by incorrect tire pressure.

Also check tread depth and wear.

Check the Wheel Alignment

Remember to make regular checks of the front wheel alignment and the axles' angles on both tractor and trailer. Wheel alignment is important for keeping fuel consumption low and for reducing wear on the tires. If the tires are unevenly loaded or if they are overloaded, they will wear out faster.

Check the Air Dryer

For the air system in the truck to work properly, it is important to check the function of the air dryer by regularly draining the air tanks. If water comes out from the air tanks, the filter cartridge of the air dryer must be replaced as soon as possible.

During winter, a hissing sound when pressure releases indicate that the heating coil in the air system is operative.

03

SAFETY

Hot components

Heating

The cleaning process for exhaust gases creates a lot of heat. Exhaust gases and components in and around the exhaust system will therefore become very hot. The truck is designed to cope with this. However, there are several things to bear in mind:

- Keep the area around hot components clean.
- Check that no heat sensitive materials are positioned near the exhaust pipe outlet, e.g. during power take-off operation.

Diesel particulate filter

The diesel particulate filter will sometimes carry out an automatic cleaning process called regeneration. In the event of high load, the temperature after the filter may exceed 550° C. A warning symbol will then illuminate in the driver information display. This is quite normal and does not affect driving.

⚠ CAUTION

When the symbol illuminates, avoid stopping the truck in unsuitable locations, such as in a field or in the vicinity of flammable materials or gases.

J246077

Symbol for very high exhaust temperature during regeneration.

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Safety Equipment

Fire Extinguisher and Triangles

Fire Extinguisher

The Federal Motor Carrier Safety Administration requires commercial motor vehicles to be equipped with an appropriate sized fire extinguisher. The fire extinguisher must be located so that it is readily accessible for use. The extinguisher must be securely mounted to prevent sliding, rolling or vertical movement relative to the motor vehicle.

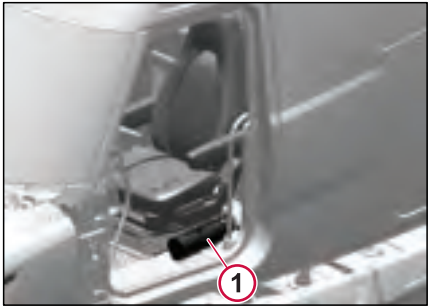
Please refer to Federal Motor Carrier Safety Regulation 49CFR393.95, Emergency Equipment for a complete listing of the requirements.

Fire Extinguishers and compatible mounting hardware are available as optional equipment. They can be ordered through an authorized Volvo dealer. The fire extinguisher can be mounted outboard of the driver's seat using the readily available mounting interface.

270346_1

Contact your authorized Volvo dealer or Volvo Customer Service for guidance if needed. Operators should ensure any fire extinguisher installed in the vehicle is done so appropriately.

For information on compatible fire extinguishers and mounting hardware, please contact your Volvo Customer Service



J455099

1. Fire Extinguisher

The fire extinguisher must be sent for recharging immediately after use, even if it was not completely discharged.

The instructions for handling the fire extinguisher are described on the equipment itself. Keep yourself familiar with the instructions for handling the fire extinguisher so you can use it properly in an emergency situation.

NOTE

The owner is responsible for maintenance of the extinguisher; maintenance must therefore be performed following the manufacturer's instructions. Refer the Extinguisher owner's manual and label for additional information.

SAFETY EQUIPMENT

Warning Triangles

Warning triangle kit is available as optional equipment. The Federal Motor Carrier Safety Administration requires commercial motor vehicles to be equipped with safety warning devices.

The warning triangles must be securely attached to any light-tight, enclosed, and easily accessible compartment. The warning triangle kit is located either behind the passenger seat or in the luggage compartment.

Please refer to Federal Motor Carrier Safety Regulation 49CFR393.95, Emergency Equipment and Federal Motor Vehicle Safety Standard 49CFR571.125, Warning Devices for a complete listing of the requirements.

J455107

1. Warning Triangle Kit (Luggage Compartment)

Safety Belt System

The safety belt system is the main restraint application in the vehicle. All vehicles are equipped with this system.

The safety belt system monitors the seat belt latch and vehicle speed. When the vehicle is started, the seat belt tell-tale displays in the cluster. The icon remains on whenever the vehicle is stationary and the seat belt is unbuckled. Whenever the vehicle is moving and the seat belt is unbuckled, the seat belt warning tell-tale illuminates along with an acoustic warning.

Always wear the seat belt while driving. If you do not use the seat belt, a warning tell-tale illuminates in the instrument cluster. At speeds above 10 mph (15 km/h), an acoustic warning is also activated.

J342596

Seat Belts

Retractable Seat Belts

The locking retractable seat belt is designed to lock (prevent belt travel out of the retractor) only during sudden stops or impacts. This feature allows the operator to move freely under normal conditions.

Seat belts cannot be locked by jerking on the belt, except during sudden stops or harsh bumps.

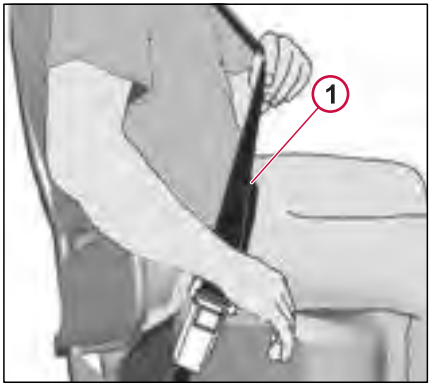
The belt will relock at about one-inch intervals as it rewinds into the retractor. Be sure to pull enough webbing out of the retractor before stopping to insert the end of the belt into the seat belt buckle. Once it is buckled, the retractor will pull up the excess webbing and relock.

Belt Fastening Steps

1. Pull clip so the belt crosses your shoulder and lap and insert it into the buckle until an audible snap is heard.
2. Make sure the clip is securely fastened into the buckle.
3. To tighten the lap portion of the combination belt, pull upward on the shoulder portion until the lap portion fits snugly. The belt should rest as low on your hips as possible.

Belt Unfastening

Push the button to release the belt.

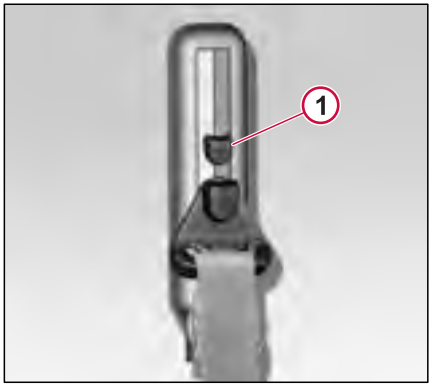


J348452

1 Safety Belt

Adjustable D-Ring Shoulder Belts

When equipped, the shoulder belt portion of the three-point belt is adjustable so that the belt can be adjusted to lay properly and comfortably across the shoulder. To adjust the belt, squeeze the release lock and move the belt to the desired position. The belt locks into place when the lock is released.



J349332

1 D-Ring Adjuster

Comfort Latch System

Seat Belt Assembly

The Track III three-point seat belts installed in this chassis are designed to provide the highest degree of operator safety, comfort and convenience. Additional comfort is provided by the latch mechanism, which is incorporated into the seat belt assembly, and may be used to relieve any discomfort caused by the constant pressure of engaged seat belts.

Seat Belt Operation

To buckle the seat belt, grasp the latch portion of the buckle, bring it across your lap (from outboard to inboard) and insert it into the fixed buckle, which is mounted to the floor or seat (depending on seat type). With the belt properly latched, the pelvic and upper torso restraints will be in place and automatically adjusted to provide a snug fit.

Comfort Latch Feature

If the constant tension of the buckled seat belt causes any discomfort, engage the comfort latch as follows:

Engagement — Pull the webbing of the shoulder belt away from the upper torso, pulling only as much slack as needed while still allowing the belt to exert slight pressure against your chest and shoulder. (Maximum amount of slack should not exceed one inch when measured from the chest to the belt.) While holding the slack, lift the lever located on top of the comfort latch mechanism upward to clamp the webbing in place.

Normal Release — To unfasten the seat belt, simply release the buckle and give the shoulder belt a quick tug to release the comfort latch mechanism. Allow the belt to retract into the retractor.

Emergency Release — In the event of an emergency, release the seat belt buckle. It is not necessary to release the comfort latch in an emergency situation.

⚠ DANGER

Do NOT attempt to engage the comfort latch feature while the truck is in motion.

⚠ DANGER

If forward movement is required while the comfort latch mechanism is latched, the latch automatically releases when you lean against the shoulder portion of the belt. Repeat the above steps to reset the comfort latch, if desired, after forward movement is no longer required.

270346_1

Seat Belt Maintenance

Clean and Inspect

Keep the belt dry. Clean with a mild soap solution and lukewarm water.

Periodically inspect the following areas and replace any inadequate parts:

Buckle and Latchplate — The buckle and latchplate should mate easily with a solid click and release easily and quickly with moderate pressure on the release button. All metal seat belt components should be free of signs of damage, corrosion or rust.

Webbing — The webbing should show no signs of wear, fraying or holes, and it should be reasonably free of dirt, which could find its way into the retracting mechanism.

Retractors — The retractors should function smoothly and maintain an appropriate amount of tension. Loose webbing is an indicator that maintenance is needed; it's likely that a too-loose belt will fail to tighten properly when necessary.

Seat Belt Mounting Components — The tethering should be free of wear and debris; the webbing should show no signs of wear, fraying or holes; and the metal components should be free of signs of damage, corrosion or rust.

SRS Airbag

For added safety, the vehicle may be equipped with an airbag or SRS (supplementary restraint system) as a supplement to the standard three-point anchored safety belt.

⚠ WARNING

The driver and all passengers must always wear seat belts at all times while driving. This is to minimise the risk of severe injury or death in the event of a crash, irrespective of whether the vehicle has an airbag or not.

⚠ WARNING

DEATH or SERIOUS INJURY can occur.

- Sit as far back as possible from the airbag.
- Always use seat belts and child restraints.

The SRS Airbag is designed to reduce the risk of injury to the driver's face and upper part of the body. The SRS airbag is intended to supplement — not replace — the standard safety belt. Together with the safety belt, the airbag helps prevent the driver from being thrown against the steering wheel, windshield or other hard surfaces in the cab.

The Volvo SRS Airbag provides increased protection in frontal collisions, where the vehicle collides with a fixed or heavy object with enough force to activate the sensors, which then activate the airbag. Damage to the vehicle is not always proportional to whether the SRS Airbag deploys or not.

The SRS Airbag is not designed to be activated with:

- Collision from the sides
- Collision from the rear
- Rolling over
- Head-on collisions at low speed or against soft objects such as bushes, snowdrifts, etc.

NOTE

Never attempt to drive with a deployed airbag. With the bag hanging out of the hub of the steering wheel, the truck may be more difficult to steer. In addition, other safety systems may be damaged. Continuous exposure to the smoke and dust created during the deployment of the airbag can cause irritation to the skin and eyes.

The inflatable airbag is folded into the center of the steering wheel. It inflates in the event of a serious collision above a certain level, where the angle of impact, crash severity, speed and nature of the object involved in the collision all play a part in whether or not the airbag is activated.

J477311

The system consists of a gas generator surrounded by the inflatable airbag. In the event of a vigorous collision, a control unit activates the gas generator ignitor and the airbag inflates. To cushion the impact, the airbag deflates when compressed. This also releases some nontoxic smoke into the cab. The entire sequence, from inflation to deflation of the airbag, takes a few tenths of a second.

SRS Control Unit

The SRS system is continually monitored by the control unit. The control unit also contains a standby power unit, which can supply the system with power for a short time, in case the normal supply breaks.

In the event of a problem in the SRS system, the SRS tell-tale is shown in the instrument display.

270346_1

⚠ CAUTION

The vehicle should be taken to an authorized Volvo Trucks dealer immediately if the SRS tell-tale comes on or remains on while the vehicle is being driven.

J304010

SRS Warning Labels

There is no maintenance required for the SRS system.
Never attempt to make any adjustments to SRS components yourself.

If you have any questions about the SRS system, please contact an authorized Volvo Trucks dealer.

Steering shafts and steering wheel should not be removed, adjusted or replaced without following the proper work procedure. Failure to do so can damage the SRS system, which can result in malfunction of the SRS.

A warning label is located on the upper steering shaft.

There is also a label on the inside of the windshield that indicates the inclusion of an airbag to the vehicle safety features.

⚠ WARNING

Never attempt to repair any part of the SRS system. Any interference with the system may cause it to malfunction and result in serious injury or death.

Work on the system may only be carried out by an authorized Volvo Trucks dealer. To allow the SRS system to work as designed:

- Never drive an SRS system equipped vehicle with the hands on the steering wheel pad/airbag module.
- No objects, accessory equipment or stickers may be placed on, attached to or installed near the SRS cover in the center of the steering wheel.

SAFETY RESTRAINTS (SLEEPER BUNKS)

Sleeper Bunk Restraint

A sleeper bunk restraint is provided as a means of preventing ejection of an occupant from the sleeper bunk during deceleration of the vehicle.

⚠ DANGER

To avoid personal injury, DO NOT occupy the sleeper bunk unless the restraint is completely attached.

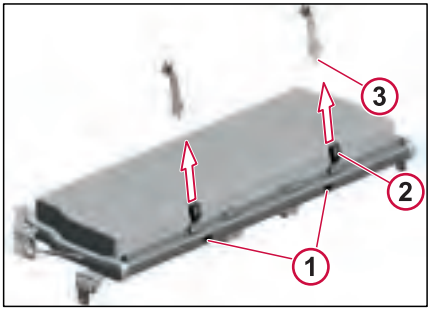
Upper Bunk

Bunk Restraint Operation

The upper bunk comes with an integrated net or restraint with belts that ensures items stored above remain on the bunk. The upper bunk dimensions are based on the sleeper size. The weight capacity of the upper bunk is 250 lb when the truck is in motion and 450 lb when the truck is stationary.

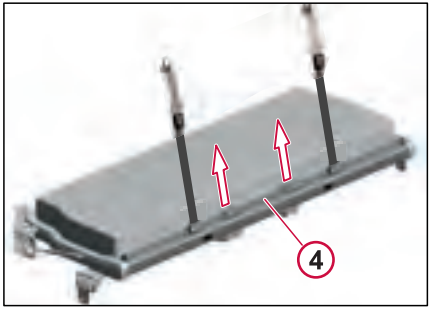
To secure the top bunk restraints to the cab, follow the steps:

1. Press and hold the belt unlock button (1).
2. Pull the buckle (2) while pressing the unlock button and lock it with the tongue (3).



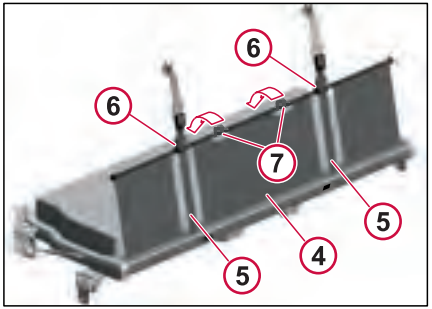
J474779

3. Pull the integrated upper bunk restraint or net (4) to the desired position.



J474782

4. Rotate the handle (7) 90° to lock the integrated net or restraint (4) with the lock (6) to the belts (5).



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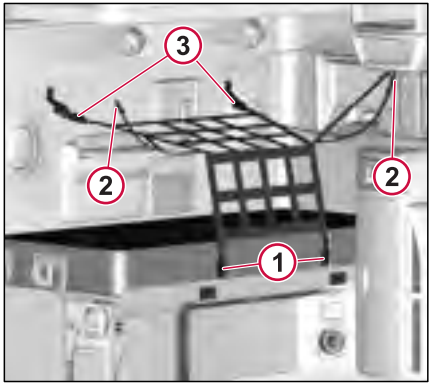
Lower Bunk



J332028

1 *Lower Bunk Restraint Attachment Buckle*

2 *Tenting Buckle*

3 *Bunk Restraints*

Bunk Restraint Operation

To Attach Net Restraint Lower Bunk

- Fasten the two upper restraint buckles to the two tethers on the rear wall.
- Fasten the two lower restraint buckles to the two lower bunk buckles on the front edge of the lower bunk.
- Fasten the two tenting straps to the corresponding buckles on each side of the sleeper and pull the both side straps equally to tighten the net.

Bunk Restraint Maintenance

• Visually inspect the buckles and tongues for any damage which would impair latching or unlatching.

• Check all hardware for breakage, distortion, or excessive corrosion.

• Ensure that fasteners are securely tightened in accordance with specifications.

CARBON MONOXIDE DETECTION

Carbon Monoxide is a by-product of combustion. Carbon monoxide is invisible, tasteless, odorless and is produced by all engines.

⚠ CAUTION

The following symptoms are related to CARBON MONOXIDE POISONING and should be discussed with all passengers:

- Mild exposure: Slight headache, nausea, vomiting and fatigue (often described as “Flu like symptoms”).
- Medium exposure: Severe throbbing headache, drowsiness, confusion, and fast heart rate.
- Extreme exposure: Unconsciousness, convulsions, cardio-respiratory failure, and death.
- Many cases of reported CARBON MONOXIDE POISONING indicate that while victims are aware they are not well, they become so disoriented they are unable to save themselves by either exiting the location or calling for assistance.

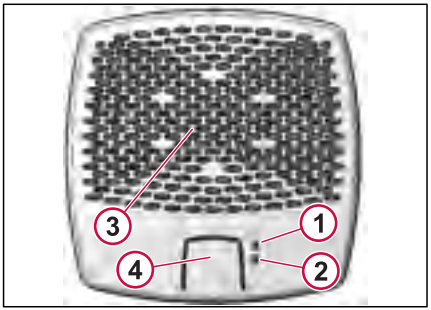
⚠ DANGER

Actuation of this device indicates the presence of carbon monoxide (CO) which can be FATAL. In the event of an alarm, immediately open the cab windows, safely stop the vehicle, shut down the engine and turn off the ignition. Exit the cab and leave the doors and windows open to vent the vehicle.

(!) NOTE

To reduce the risk of carbon monoxide poisoning, test alarm operation when not in use for 10 days or more.

Alarm Unit



J360572

1 *Power Indicator*
2 *Danger Indicator*
3 *Horn*
4 *Test/Silence Button*

Normal Operation - The Green LED, (1) Power Indicator, flashes once every 3 minutes while in normal operation.

Alarm- When the CO enters the danger level, the (2) Danger Indicator, flashes red and the horn beeps four times and pauses 4-5 seconds in a repeat pattern. This indicates that the COHb level has been reached.

System Operation

The carbon monoxide detector has a 12 V power supply from the vehicle battery. The system uses a microprocessor to measure and accumulate CO levels. When a high level of carbon monoxide exists, the system sounds an alarm. However, if small quantities of CO are present or high levels are short-lived, the micro controller accumulates the information and determines when an alarm level has been reached. This feature eliminates nuisance alarms.

The CO alarm conducts a self-diagnosis of critical components every 180 seconds. Should a major component fail, the CO alarm will enter a fault mode. Both audible and visual warning indicators are activated.

The CO alarm circuit board is sealed against moisture and corrosion to withstand the harshest environments and ensure durability.

270346_1

⚠ WARNING

- This carbon monoxide alarm is designed to detect carbon monoxide gas from ANY source of combustion. It is NOT designed to detect smoke, fire or any other gas.
- The alarm system will not detect carbon monoxide that is not in the vicinity of the alarm. Carbon monoxide in other rooms or areas will not be detected. Alarms mounted near obstructions or in 'dead' air spaces will not detect carbon monoxide.
- The alarm system does not guarantee or imply that CO poisoning will not occur. Do NOT use the CO Sentinel as a replacement for ordinary precautions or periodic inspections of equipment. NEVER rely on alarm systems to save your life, common sense is still prudent and necessary.

Nuisance Alarms

Although the system alarm detects only carbon monoxide in a normal environment, studies have found that unusually high concentrations of chemicals and/or vapors may affect the sensor.

The device may be triggered by any number of hydrocarbons at very high levels.

While these may be considered nuisance alarms, levels high enough to create an alarm condition are also hazardous. Treat these "nuisance" alarms as an actual carbon monoxide alarm condition. Evacuate and ventilate the area. Before, during, and immediately after working with any chemicals, make sure enough fresh air ventilation is available.

ⓘ NOTE

- The audible horn on the alarm system meets UL requirements; however, the horn may not be heard in remote areas.
- The nature of an alarm system is to produce an irritating and loud noise. The audible signal of the alarm system may shock or startle persons near the alarm. Hearing damage can occur if prolonged exposure to the audible alarm is allowed.
- All electric devices have limited life spans and may fail without warning. Inspect the alarm system on a periodic basis. Do NOT assume that the alarm system will prevent CO poisoning. It is a supplement-warning device only.

⚠ WARNING

Actuation of your CO alarm indicates the presence of Carbon Monoxide (CO), which can kill you.

Unit Alarm Guidelines

If the alarm system sounds follow the guidelines below:

1. Press the test/Silence button to turn off the alarm.

2. Immediately move to fresh-air outdoor spaces. Open the door or window. Evacuate everyone and leave the cab. Do not reenter the premises. Move away from the open door or window until emergency service responders have arrived. Ensure that the premises have been aired out and the alarm remains in its normal condition.

3. Call your emergency services (Fire department OR 911).

4. After following steps 1–3, if the alarm reactivates within a 24-hour period, repeat steps 1–3 and call a qualified appliance technician to investigate for sources of CO from fuel burning equipment and appliances, and inspect for proper operation of the equipment. If problems are identified during this inspection, have the equipment serviced immediately.

CARBON MONOXIDE DETECTION

NOTE

Any combustion equipment not inspected by the technician, consult the manufacturers' instructions, or contact the manufacturers directly, for more information about CO safety and this equipment.

Smoke Detector

The smoke detector gives a warning with a strong acoustic signal in the event of smoke in the cab.

Temporarily switch off the smoke detector

Press the button once.

The smoke detector is switched off for 10 minutes. Use the function when smoking or driving in a dusty environment. The smoke detector can be switched off both when it is silent and when it has been triggered. When the smoke detector is switched off the lamp flashes every 10 seconds. After 10 minutes the smoke detector is reactivated.

J233963

Battery for the smoke detector

The smoke detector is powered by a 9 V (500–600 mAh) standalone battery. When the battery is about to run out a short signal will sound every 60 seconds.

Replace the battery. Use the 9 V, IEC-6LR61 or IEC-6R61 or ANSI-1604A type battery.

Test the smoke detector at least once every month (battery check) and always after holidays or other long periods of absence.

Check the battery by depressing the button for 5–10 seconds. If the battery is in good condition the alarm signal sounds for as long as the button is depressed. When the battery is being checked the smoke detector is switched off for 10 minutes.

The smoke detector should be submitted for inspection every five years. Contact an authorized Volvo workshop.

! NOTE
When the battery is being checked the detector is switched off for ten minutes.

270346_1

Floor mats

⚠ WARNING

Observe the following precautions.
Failure to do so may cause the driver's floor mat to slip, possibly interfering with the pedals while driving. An unexpectedly high speed may result or it may become difficult to stop the vehicle. This could lead to an accident, resulting in death or serious injury.

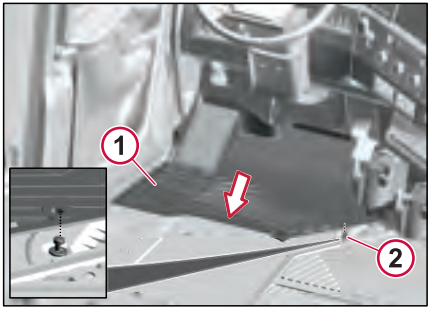
When installing the driver's floor mat

- Do not use floor mats designed for other models or different model year vehicles.
- Only use floor mats designed for the driver's seat.
- Always install the floor mat securely using the retaining pins provided.
- Do not use two or more floor mats on top of each other.
- Do not place the floor mat bottom-side up or upside-down.

Before driving

- Check that the floor mat is securely fixed in the correct place with all the provided retaining pins. Be especially careful to perform this check after cleaning the floor.
- Check the pedal by depressing it to the floor to make sure it does not interferes with the floor mat.

Use only floor mats designed specifically for vehicles of the same model and model year as your vehicle. Fix them properly onto the floor.



J459362

1 Floor Mat

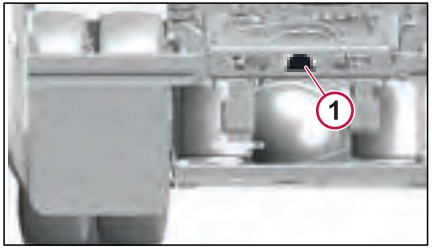
2 Pin (Floor Mat Fixation)

270346_1

Backup Alarm

The backup alarm unit's warning signal alerts the surroundings that a truck is reversing. The warning signal is connected to the truck's reversing light and starts automatically when reverse gear is selected.

The backup alarm can be equipped with variable sound levels. Based on customer requirements, a sound level can be selected.



J457554

04

LOCKS AND ALARM

KEYS/KEY FOB

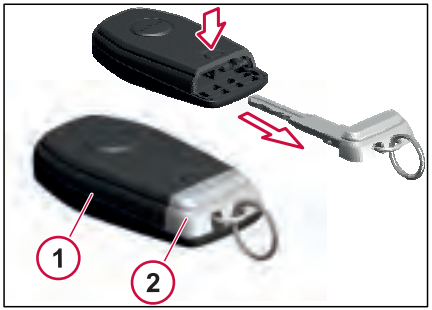
Pairing Keys

New keys and key fobs can be paired to the vehicle only through the Premium Tech Tool. Contact an authorized dealer to pair new keys and key fobs.

> ⓘ NOTE
>
> The vehicle is delivered with two identical key fobs. If more key fobs are needed, order them through your authorized Volvo dealer.

> ⓘ NOTE
>
> Contact an authorised Volvo dealer when the key or key fob is lost.

Keys



J473342

1 Key Fob

2 Back-up Key

Back-up key is used to lock or unlock the door manually when the key fob is not working.

Key Fob

> ⓘ NOTE
>
> Do not place the key fob in the induction charger, even if the induction charger is not used. The inductive charger will block the key fob detection waves by the immobilizer and prevent it from working.

Key fob is used to lock or unlock the doors, to activate the truck's position lights, to activate the panic alarm and to activate the auxiliary features (if equipped).

J458141

Approach Light

J457883

When the approach light is activated, the truck's position lights, courtesy lights, side marker lamps, turn indicators and interior lighting are switched On. Also, the position lights of any connected trailer are switched on.

After a couple of minutes, the approach light goes off automatically. To switch off the light manually, do any of the following:

- Press the button for approach light on the remote control.
- Close the doors.
- Press the starter button to position Accessory or higher.

Long press Approach light button to pre-trip inspection lamp check.

Panic Alarm

J457885

Hold the button on the key fob for two seconds in order to activate the truck's horn and turn indicators.

It is possible to lock or unlock the doors and drive off, even when the alarm is activated.

Double press the panic alarm button to deactivate the panic alarm.

AUX

J457893

Aux-button Short Press:

- **Activation-** A short press on the Aux-button activates the parking climate. The system activates either parking heater or parking cooler based on outdoor temperature.
- **Deactivation-** A subsequent short press turns off the parking climate features.
- **Indicator Lights-** During activation or deactivation, the following lights will blink twice to acknowledge the short-press of AUX button:
  - Day Running Lights
  - Turn Indicators
  - Roof Marker lights
  - Side marker
  - Tail lights (Rear Position Lights)

Aux-button Long Press:

- **Activation-** A long press on the Aux-button activates remote engine start and cab climate features. It also activates the following functions:
  - Pre-cool/pre-heat cab
  - Defrost windows.
  - Mirror heaters
- **Deactivation**- A subsequent long press deactivates these features.
- **Indicator Lights-** The following lights will blink twice and stay on for the next 10 minutes to be indicated the long press is activated:
  - Headlamps
  - Fender marker lights
  - Front overhead lights
  - Side turn signal repeater
  - Tail lights

KEYS/KEY FOB

Battery Replacement

J458008

1 Battery, positive (+) side down

Under normal use, the key fob battery lasts approximately two years. When battery replacement becomes necessary, use a Panasonic 3 volt, type CR2032, or equivalent. Replace the battery as follows:

1 Open the transmitter between the two halves of the key fob case.
2 Remove the battery.
3 Install a new battery with the (+) side down.
4 Align the transmitter case halves, then snap the case together.
5 Check the operation of the transmitter.

Locking and Unlocking from Outside of the Cab

The cab doors can be locked and unlocked from the outside of the cab using:

- Door Lock
- Key Fob

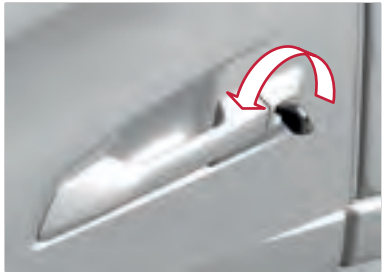
Door Lock

The truck has the central locking function. From the driver's side or passenger side door, you can lock both the driver-side door and passenger-side door simultaneously. But the doors cannot be unlocked simultaneously.

The key in the outside door lock will only unlock the door that it is in.

Insert the key into the door lock cylinder to lock and unlock the cab doors.

Unlocking from the Driver Side Door



J457755

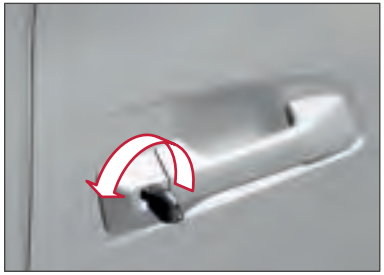
Turn the key anti-clockwise to unlock the driver side door.

Locking from the Driver Side Door

J473341

Turn the key clockwise direction (once) to lock both the driver and passenger side doors.

Unlocking from the Passenger Side Door



J473369

Turn the key anti-clockwise direction to unlock the passenger side door.

Locking from the Passenger Side Door

J473340

Turn the key clockwise direction (once) to lock both the driver and passenger side doors.

LOCKING AND UNLOCKING

Key Fob

Locking

J457762

Lock Button Functions:

- **Press Once:**
  - Locks both driver and passenger doors
  - One flash of front/rear turn indicators, side repeaters and brake lights to confirm the locking. No horn chirp.
- **Press Twice:**
  - One flash of front/rear turn indicators, side repeaters and brake lights. No horn chirp.
- **Press Thrice or more:**
  - One flash of front/rear turn indicators, side repeaters and brake lights with short horn chirp.

Unlocking

J457843

Unlock Button Functions:

- **Press Once:**
  - Unlocks the driver side door
  - Three flashes of front/rear turn indicators, side repeaters and brake lights to confirm the unlocking. No horn chirp.
- **Press Twice:**
  - Unlocks the Passenger side door
  - Three flashes of front/rear turn indicators, side repeaters and brake lights to confirm the unlocking. No horn chirp.

Locking and Unlocking from Inside of the Cab

The cab doors can be locked and unlocked from the inside of the cab using:

- Cab Door Handle
- Door Control Panel
- LECM (Living Environment Control Module)

Door Handle

Unlocking

J457760

Unlock the door by pulling the handle outwards. Note that only the current door will be unlocked.

> **NOTE**
>
> Regardless of how the doors are locked, whether by key, remote control, the driver's control panel, or the door handle, it is always possible to open them from the inside using the door handle.

Door Control Panel

Door Control Panel, Driver Side

J457928

1 Lock

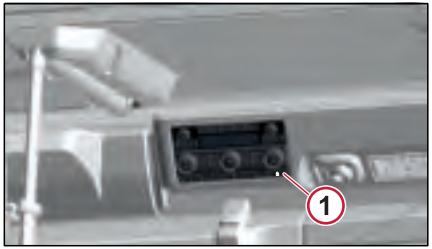
2 Unlock

Door Control Panel, Passenger Side

J457931

1 Lock
2 Unlock

Door Lock Button (LECM)



J457932

1 Door Lock Button

Press the door lock button on the LECM to lock the cab doors.

A green LED on the button lits when the doors are locked

Other Locking and Unlocking Features

Emergency unlocking

Auto-door Unlocking in Case of Crash

The doors are automatically unlocked in case of any crash or accident, so that the rescuers can save the driver or passengers.

Speed Locking Operation

If the truck doors are unlocked when the vehicle speed is lower than 5 km/h, then once the truck's speed is higher than 18 mph (30 km/h), those unlocked doors will be locked.
If a door is unlocked, the speed-locking operation must be inactive until the vehicle speed reaches less than 1 km/h.

> **NOTE**
>
> Doors once automatically locked as a function of vehicle speed will not be unlocked automatically if the vehicle speed falls below the speed locking threshold (18 mph (30 km/h)).

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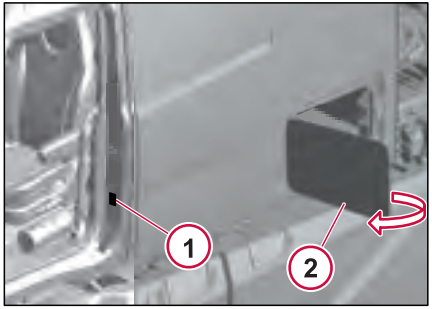
Use the push button located on the door frame (B-pillar) to open the luggage compartment door.

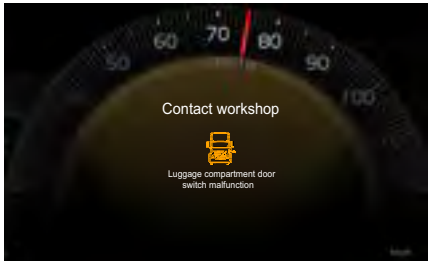


J473346

1 Luggage Compartment Door Button

2 Luggage Compartment Door

If the door remains opened while driving, a notification shall be displayed to indicate it. This notification should be prioritized when the truck is moving.



J473348

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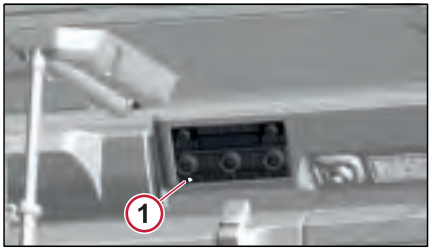
Alarm

Panic Alarm

If there is an emergency, you can use the panic alarm button in the instrument panel to call for attention.

J457999



J457965

1 Panic Alarm Button

Panic alarm button is located on the LECM (Living Environment Control Module). LECM is positioned in the bunk area to provide comfort and entertainment by giving access to the parking climate, audio, interior lights, clock, alarm, Panic during the rest periods.

To activate the panic alarm, Press the button. The red LED light on the button indicated that it is in On condition. The truck's alarm siren and hazard warning lights turn on.

To switch off the panic alarm, press and hold the button again.

Alarm in My Truck App (Option)

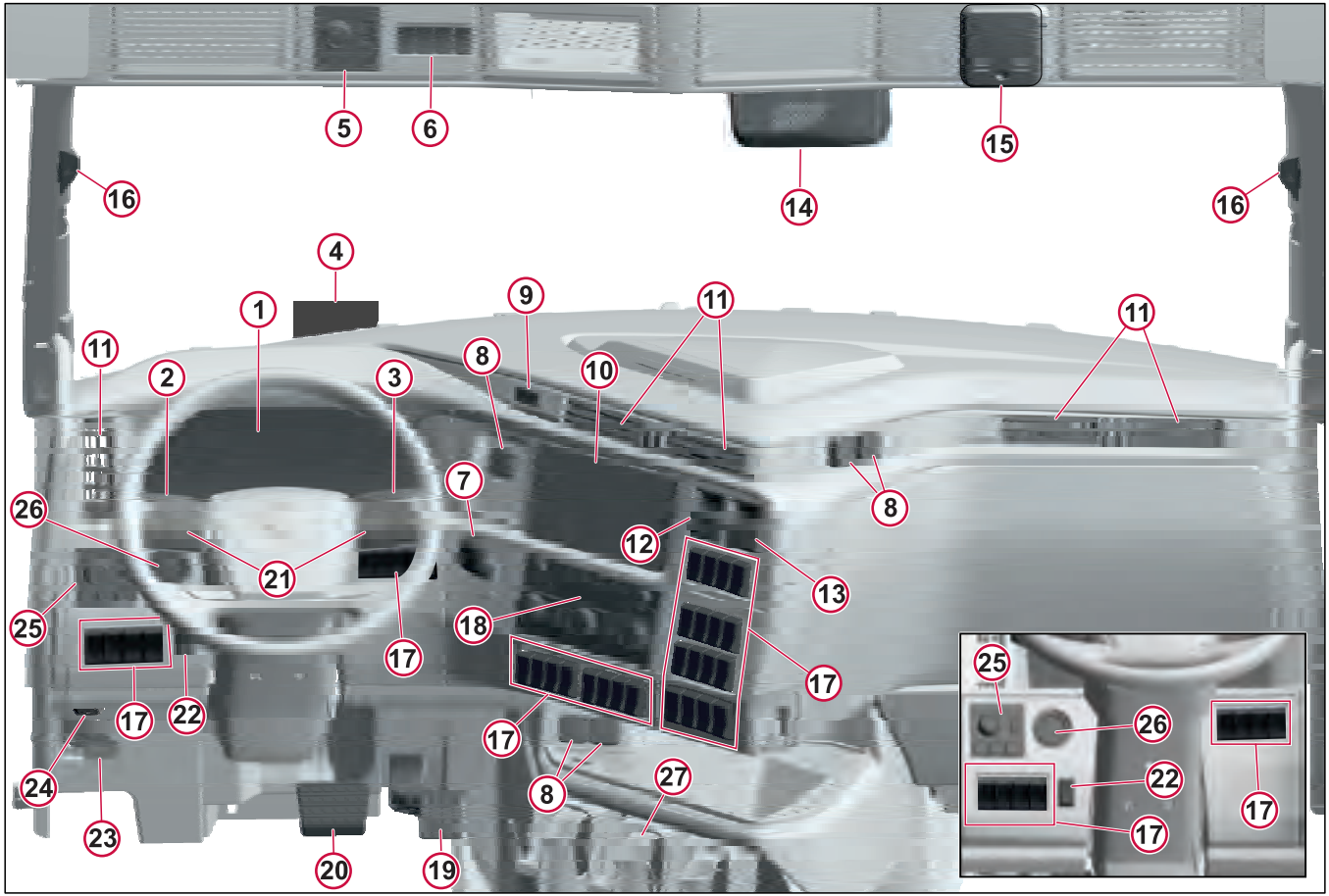
With My Truck, you can monitor functions such as alarms and door locks directly on your mobile phone or tablet. If an alarm has triggered in the truck, My Truck can send you a notification.

You can download the My Truck app free at the iTunes App Store or Google Play.

05

DRIVING ENVIRONMENT

OVERVIEW OF INSTRUMENT



270346_J476930

Filter summery to long to be displayed.

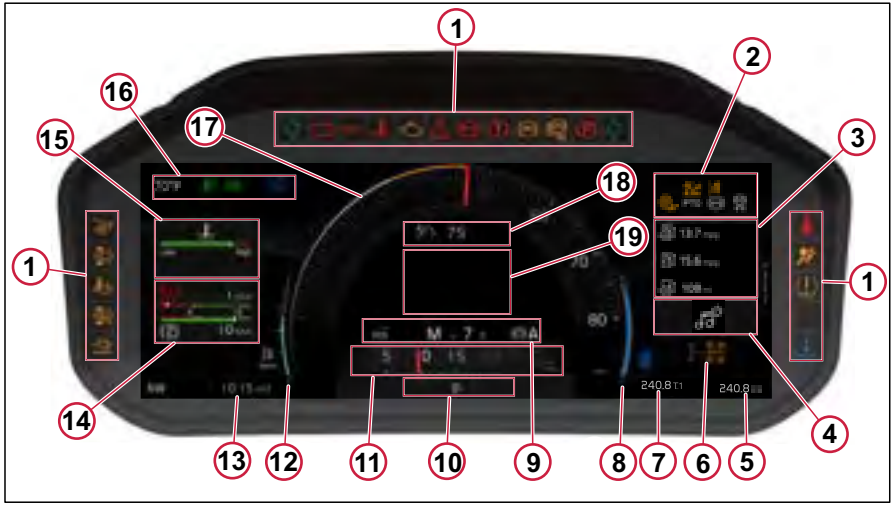
1 Instrument Cluster
2 Stalk Switch Left
3 Stalk Switch Right
4 Head-up Display
5 Interior Lighting Controls (Control panel or Flexible Switch Panel)
6 Overhead Hardwired Switches (E-call assist, Microphones)
7 Trailer handbrake
8 Accessory Power Outlet/USB Port
9 Hazard switch
10 Infotainment Display
11 Air vent
12 Hand Control Unit, Trailer Air Supply (Left)
13 Hand Control Unit, Parking Brake (Right)
14 Forward-Looking Camera
15 Smoke Detector
16 LCS (Lane Change System) Indicator
17 Flexible Switch Panels
18 DECM (Driver Environment Control Unit)
19 Accelerator Pedal
20 Brake Pedal
21 Steering Wheel Switches
22 Battery Saver Switch/Dummy Switch
23 Steering Column Tilt Control Pedal
24 Hood Release Lever
25 Exterior Light Control Panel (ELCP)
26 Ignition Button/Ignition Key Switch
27 Cup Holder

270346_1

OVERVIEW OF INSTRUMENT

Overview of Instrument Cluster

Before driving this vehicle, locate the instruments and controls, and become thoroughly familiar with their operations. After starting and when driving, ensure that the instrument readings are normal.



J476785

1 Hardware Tell-tale
2 Software Left Side tell-tales
3 Fuel Gauges
4 Infotainment Widgets
5 Total Distance Covered Information
6 Widgets for Differential Lock
7 Trip Meter
8 DEF Gauge
9 Drive Modes, Gear Indicators and Auxiliary Brake Mode
10 Notification Bar
11 Tachometer
12 Diesel Gauge
13 Clock
14 Air Gauges
15 Temperature and Pressure Gauges
16 Software Right Side tell-tales
17 Odometer
18 Cruise Control
19 Presentation Area for Vehicle Message

270346_1

Filter summery to long to be displayed.

Tell-tales

A tell-tale is a display that indicates the actuation of a device, a correct or defective condition, or a failure to function. The operator should become familiar with these symbols in order to recognize and react (if necessary) to the indicated condition. Tell-tale symbols are shown in the instrument cluster.

Colors

To promote visual recognition internationally, specific colors for tell-tales are established. Unless governmental regulations (in the area where the vehicle is to be used) or engineering directives specify otherwise, the standard colors are:

- Steady Blue — high-beam headlights
- Flashing Green — turn signals
- Flashing Red — hazard condition involving the safety of personnel
- Steady Green — system in operation
- Steady Red — warning, immediate action required
- Amber — early warning, such as low fuel or Anti-Lock Brake System (ABS) malfunction

Hardware Tell-Tale

Symbol	Meaning
	Turn Signal Indicator Left
	Turn Signal Indicator Right
	Battery
	Engine Oil Pressure
	Coolant Temperature
	Malfunction Indicator Lamp
	Stop
	Air Pressure

Symbol	Meaning
	Brake Failure
	ABS Malfunction Tractor
	ABS Malfunction Trailer
	Parking Brake engaged
	Safety Belts Reminder
	Airbag Indicator
	Tire Pressure Monitoring System (TPMS) Indicator

OVERVIEW OF INSTRUMENT

Symbol	Meaning
	Remote Software Download
	Aftertreatment DEF Tank Low Indicator
	Regeneration Inhibit
	Aftertreatment High Exhaust System Temperature
	Aftertreatment DPF Regeneration
	Preheating Active or Preheating Fault.

Software tell-tales

Symbol	Meaning
	Front Fog Light
	Position Lights
	Automatic High Beam
	High Beam
	Daytime Running Lights
	Low Beam
HOLD	Auto Hold
A	Wiper RainSensor/ Wiper Automatic

Symbol	Meaning
	Road Speed Limiter
	Axle Load Distribution
	Remote Engine Start
	Auto Hold Disable
	Lane Keeping Support
	LCS Malfunction
	Mitigate Forward Collision

Filter summery to long to be displayed.

Symbol	Meaning
	Trailer Air Supply
BRAKE AIR	Air Pressure
	Slippery Road
	Road Vehicle Stability
BRAKE	Brake Warning
	TCS Off
	Tire Pressure Monitoring

Symbol	Meaning
DAS	Driver Alert System
	PTO Splitbox
PTO	PTO Active
	Prohibit Suspension Control
	Suspension Dump
	Road Sign Recognition

270346_1

Filter summery to long to be displayed.

OVERVIEW OF INSTRUMENT

Meters and Gauges

The instrument display contains many meters and gauges, some of them visible all the time, some are not.

J477199

1 Speedometer

2 Gauges
- Engine Oil Temperature
- Battery Status
- Engine Oil Level
- Transmission Oil Temperature
- Transmission Oil Level
- Turbo Boost Pressure
- Engine Coolant Temperature
- Engine Oil Pressure

3 Air Tank Pressure Gauges

4 Fuel Level Gauge

5 Tachometer

6 DEF Level Gauge

7 Fuel Economy Gauges

270346_1

Filter summery to long to be displayed.

Tachometer

The tachometer has two colored fields: green and red. Use the green field for normal driving (1000 - 1600 rpm). Use higher engine speeds for maximum engine brake performance. Never allow the engine to go into the red field (greater than 2200 rpm).

The Tachometer displays the engine's revolution per minute (RPMs).

Speedometer

Speedometer indicates the speed of the Vehicle. The speedometer is driven by the vehicle's electronic system.

Fuel level gauge

The gauge indicates diesel Level. The gauge is connected to a fuel sensor unit in the fuel tank.

Fuel Gauge

Fuel Gauge indicates the information on average miles per gallon (mpg), and ranges remaining indicated in miles.

Air Tank Pressure Gauges

The primary (1) and secondary (2) air pressure gauges display the pressure of the air stored in the primary air tank.

The primary and secondary air pressure gauges should display equal pressures under normal operating conditions.

J477209

1 represents the Primary tank and 2 represents the secondary tank.

If One tank's circuit is less than 100 psi, the tell-tale will appear in yellow color.

If the pressure falls less than 70 psi, the tell-tale will appear in red color.

Gauges

To scroll through the gauges, do as follows:

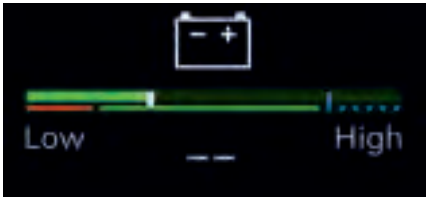
1. If necessary, press the Shift focus key to shift focus in the instrument display.
2. Press the Left key or Right key on the steering wheel keypad.

Engine Oil Temperature

J477280

The coolant temperature gauge indicates engine coolant temperature. If the temperature reaches more than 280° F, the tell-tale appears in red and the notificaion appeares in red, which indicates to stop the vehicle.

Battery Status



J477304

Indicates the battery status. If the battery is low, the tell-tale appears in red.

OVERVIEW OF INSTRUMENT

Engine Oil Level

J477305

Indicates the engine oil level. If the engine oil level is very low, the tell-tale appears in red and the notification indicates to stop the vehicle.

Transmission Oil Temperature

J477306

Indicates transmission oil temperature. If the temperature is too high which is more than 300° F, the tell-tale is indicated in red color and the notification indicates to stop the vehicle.

Transmission Oil Level

J477307

Indicates the engine oil level. If the engine oil level is very low, the tell-tale appears in red and the notification indicates to contact the workshop.

Turbo Boost Pressure

J477308

Indicates the pressure of turbo boost.

Engine Coolant Temperature

J477278

The coolant temperature gauge indicates engine coolant temperature. The normal operating temperature for Volvo engines is 80 to 105° C (176 - 221° F). If the temperature remains below or exceeds the normal temperature range, the cooling system should be checked for problems by an authorized Volvo truck dealer. When coolant temperature is excessive, the red STOP tell-tale will come on and the buzzer will sound. If the engine is at risk, the Engine Control Module may derate the engine power. Stop at the first safe place where the problem can be checked.

Engine Oil Pressure

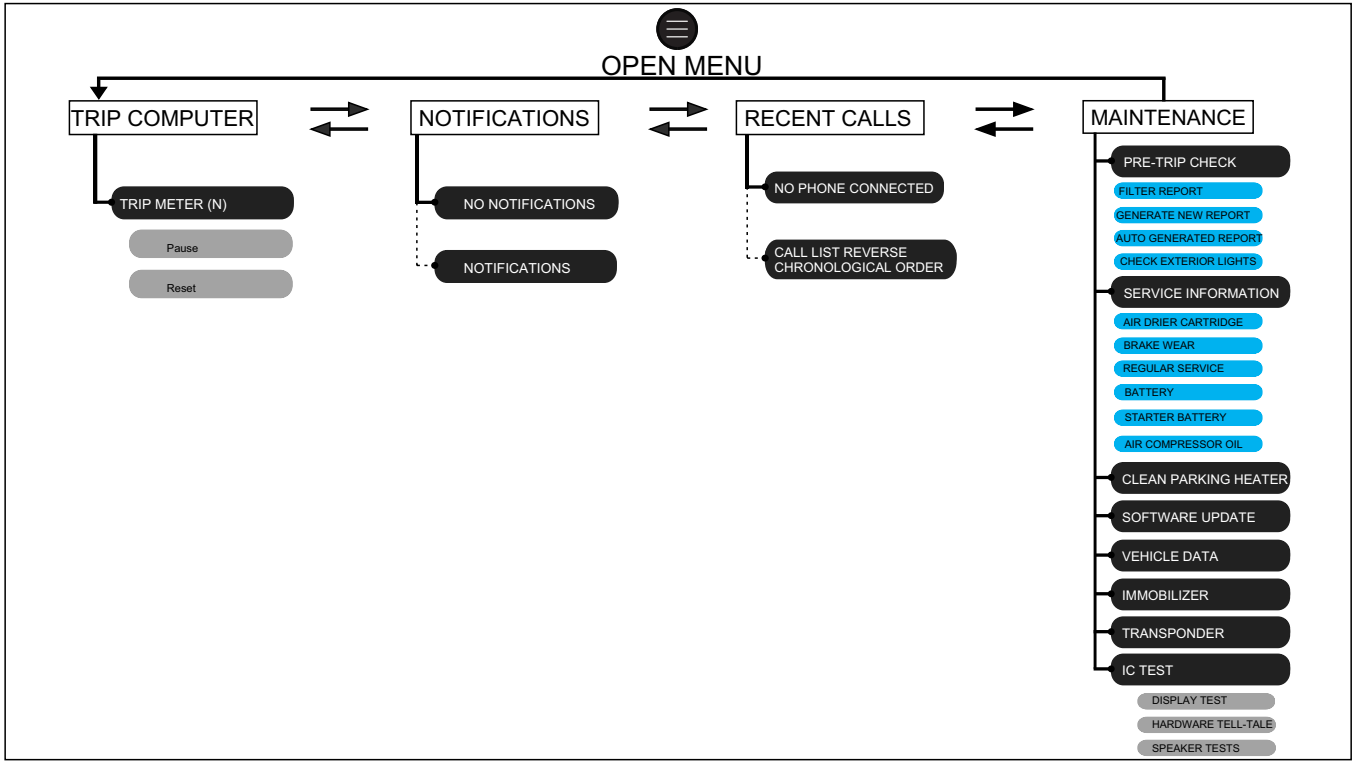
J477279

Indicates engine oil pressure. When the engine oil pressure is too low, the red STOP tell-tale illuminates and the buzzer sounds. If the engine oil pressure becomes low, the engine is at risk. Bring the vehicle to a safe stop where the problem can be checked.

Instrument Cluster Menu Flow

OVERVIEW OF INSTRUMENT

Instrument Cluster Menu Flow



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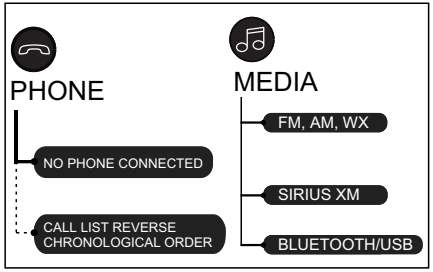


J483732

NOTE

Pressing the Media button from the steering wheel switch will only open media band categories in the instrument cluster. For subcategories and settings, the user must toggle the source from instrument cluster to infotainment display.

Electronic Parking Brake (EPB)

Applying the Parking Brake

Automatic Parking Brake Activation

The parking brake is applied automatically when the following conditions are met:

- Vehicle is in a standstill position.
- The ignition key or button is turned to the OFF position.
- The driver or passenger side door opened.

When the parking brake is engaged, the tell-tale indication in the instrument cluster and the red indicator in the HCU (EPB) illuminate.

If the speed is less than 8 mph (12 km/h) and when the door is opened (driver or passenger side), the parking brake is applied automatically.

If the speed is less than 8 mph (12 km/h), when the HCU (EPB) lever is pulled, the parking brake is applied to decelerate the vehicle.

If the speed is over 8 mph (12 km/h), when the HCU (EPB) lever is pulled, the service brake is applied to decelerate the vehicle.

⚠ CAUTION

Parking brake activation with doors is an extra safety feature and should not be used as the primary way of applying the parking brake.

⚠ CAUTION

If the vehicle has no electrical power, the automatic parking brake activation will not work.

Apply Parking Brake Manually

At standstill, if the driver wants to apply the parking brake manually, pull the EPB lever.

When the parking brake is engaged, the tell-tale indication in the instrument cluster and the red indicator in the EPB lever illuminate.

J476870

J477112

Tell-tale Parking Brake

ⓘ NOTE

Whenever the parking brake is applied (automatically or manually) and if the trailer is coupled, the EPB function applies the parking brake to both the tractor and trailer.

⚠ DANGER

Always check that the symbol in the instrument and the indicator in the lever illuminate before you leave the cab. Failure to check can lead to vehicle movement.

Warning signal

A warning signal sounds if the driver leaves the cab or driver area without applying the parking brake.

ⓘ NOTE

The indicator in the lever will be illuminated for a moment after the key has been removed from the starter switch.

Releasing the Parking Brake

Release Parking Brake Automatically

The parking brake is released automatically when the following conditions are met:

- Doors are closed
- Engine is started
- Stalk switch is in any of the drive positions (D or R)
- Seat belt is fastened

When the parking brake is released, the tell-tale indication in the instrument cluster and the red indicator in the EPB lever turn Off.

When the parking brake is released, the system activates the Auto Hold function until the accelerator pedal is depressed and the transmission provides a sufficient torque to move the vehicle forward. When Auto Hold is active, the Auto Hold tell-tale illuminates in the instrument cluster.

The parking brake will not be released automatically if a door is open. When the parking brake cannot be disengaged automatically, a message is shown in the instrument cluster.

⚠ CAUTION

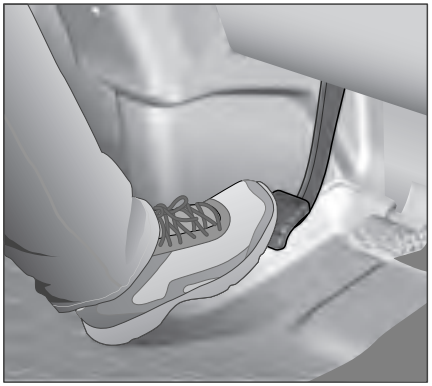
If the parking brake is not disengaged immediately, stop driving and release manually or check the conditions for automatic disengagement. The clutch and power transmission may otherwise be damaged.

Release Parking Brake Manually

To release the parking brake manually:

1. Apply the brake pedal.
2. Push and release the Hand Control Unit (EPB) lever.

When the parking brake is released, the tell-tale indication in the instrument cluster and the red indicator in the EPB lever turn Off.



J247951

J481146

ⓘ NOTE

The parking brake can be disengaged only when the vehicle is in Accessory or higher vehicle mode.

When the gear is engaged and the parking brake is released, the Auto Hold function activates and the auto hold tell-tale iluminates in the instrument cluster. The Auto Hold function will be active until the vehicle gets sufficient torque to move the vehicle forward.

J424432

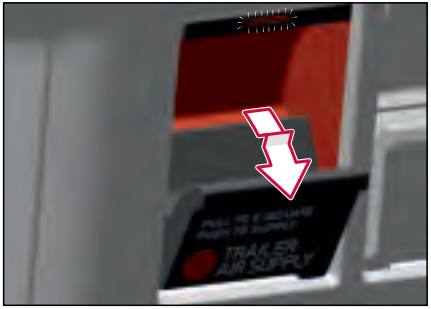
Tell-tale Auto Hold

> **NOTE**
>
> When the parking brake is released and if the trailer is coupled, the system will disengage only the tractor parking brake. To disengage the trailer parking brake, pull the Hand Control Unit (Trailer Air Supply) lever. The trailer braking system is inflated with compressed air and the trailer parking brake disengages.

Trailer Air Supply

When a trailer is coupled with the tractor, the trailer braking system is supplied with compressed air from the tractor. To supply compressed air from tractor to trailer, push the Hand Control Unit (TAS) lever. When the Trailer Air Supply is activated, the red indicator in the Hand Control Unit (TAS) turns Off.

Pull the lever to deactivate the Trailer Air Supply. The system deflates the trailer air supply line.



J476920

Push the lever to activate the Trailer Air Supply. The system inflates the trailer air supply line.

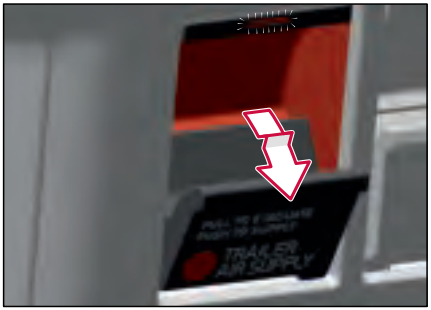
J481145

Parking Brake Operation

Function	Action	Operation/Description	Indication	
Automatic parking brake activation	• Vehicle is in a standstill position. • The ignition key or button is turned to the OFF position. • Door opens (driver or passenger side). **Note:** At standstill, if the seat belt is detached and the doors are not opened, the system activates the Auto Hold function and the Auto Hold tell-tale illuminates in the instrument cluster.	Tractor and Trailer parking brakes are applied. When the parking brake is activated automatically, the system applies tractor parking brake and deflates the trailer supply line that in turn applies Trailer parking brake.	Tractor parking brake Tell-tale Illuminate. Trailer parking brake tell-tale illuminate. Red indicators in the HCU (EPB) and HCU (TAS) illuminate.	 
Automatic Parking Brake Release	• Close the doors. • Start the engine. • Turn the stalk switch to any of the drive positions (D or R). • Fasten the seat belt.	Tractor and trailer parking brake is released. When the stalk switch is turned to drive or reverse, at first, the trailer supply line is inflated if coupled and then the Tractor parking brake is released. Once the parking brake is released, the Auto Hold function is activated. When the accelerator pedal is depressed, the Auto Hold function is deactivated and the vehicle moves forward.	Tractor parking brake Tell-tale turns Off. Red indicator in the HCU (EPB) turns Off.	-

OVERVIEW OF INSTRUMENT

Function	Action	Operation/Description	Indication	
Apply parking brake manually - Pull the HCU (EPB) lever		Tractor and Trailer parking brakes are applied. When the HCU (EPB) lever is pulled, the system applies tractor parking brake and deflates the trailer supply line that in turn applies Trailer parking brake.	Tractor parking brake Tell-tale Illuminate. Trailer parking brake tell-tale illuminate. Red indicator in the HCU (EPB) and HCU (TAS) illuminate.	 
Release parking brake manually - Push the HCU (EPB) lever		Only the Tractor parking brake is released. When the HCU (EPB) lever is pushed, the system releases only the tractor parking brake.	Tractor parking brake Tell-tale turns Off. Red indicator in the HCU (EPB) turns Off.	-

Function	Action	Operation/Description	Indication	
Apply trailer parking brake - Pull the HCU (TAS) Lever		Only Trailer parking brake is applied. When the HCU (TAS) lever is pulled, the system deflates the trailer air supply line and the trailer parking brake applies.	Trailer parking brake tell-tale illuminate. Red indicator in the HCU (TAS) illuminate.	
Release trailer parking brake - Push the HCU (TAS) Lever		Only the Trailer parking brake is released. When the HCU (TAS) lever is pushed, the system inflates the trailer air supply line and the trailer parking brake released.	Trailer parking brake Tell-tale turns Off. Red indicator in the HCU (EPB) turns Off.	-
Note: If the driver pushes the TAS and pulls the EPB levers simultaneously, only the tractor parking brake is applied.				

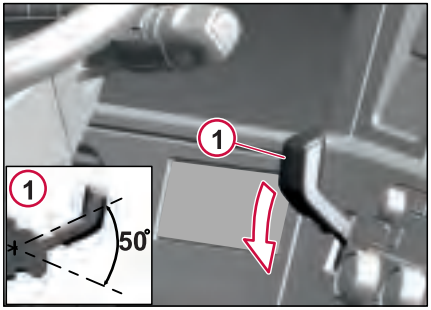
Filter summery to long to be displayed.

Trailer Hand Brake Lever (If Equipped)

The trailer hand brake lever directs compressed air solely to the trailer. This allows the driver to control the trailer brakes independently.

The trailer hand brake lever operates on a maximum of 50-degree arc. In the fully up position, the lever is Off and no air pressure is being used. Lowering the lever past the 15-degree arc position will begin to build up air pressure. By gently tapping the lever in the downward position, the operator can achieve the desired rate of air pressure to obtain smooth trailer braking performance. Trailer brake operation is achieved at approximately 30-35 degrees of arc position.

When the trailer braking is not required, release the lever, it shall return automatically to its resting position.



J481150

1 Trailer Hand Brake Lever

Brake Lights

When the trailer brakes are applied, trailer lights are illuminated and remain On as long as the trailer braking remains activated.

Filter summery to long to be displayed.

Dashboard Switches

General

Switches that may be fitted in your truck are on the following pages. The available switches in your particular truck are dependent on the truck's equipment.

Movable Switches

The location of the majority of the switches can be easily adapted to your requirements. A few switches cannot be moved for safety reasons. Contact an authorized dealership for more information.

Flexible Switch Panels:

A. Steering Wheel Area (Area 1)

B. Center Part of Dashboard (Area 2)

C. Right Side of Dashboard (Area 3)

D. Overhead Shelf (Area 4)

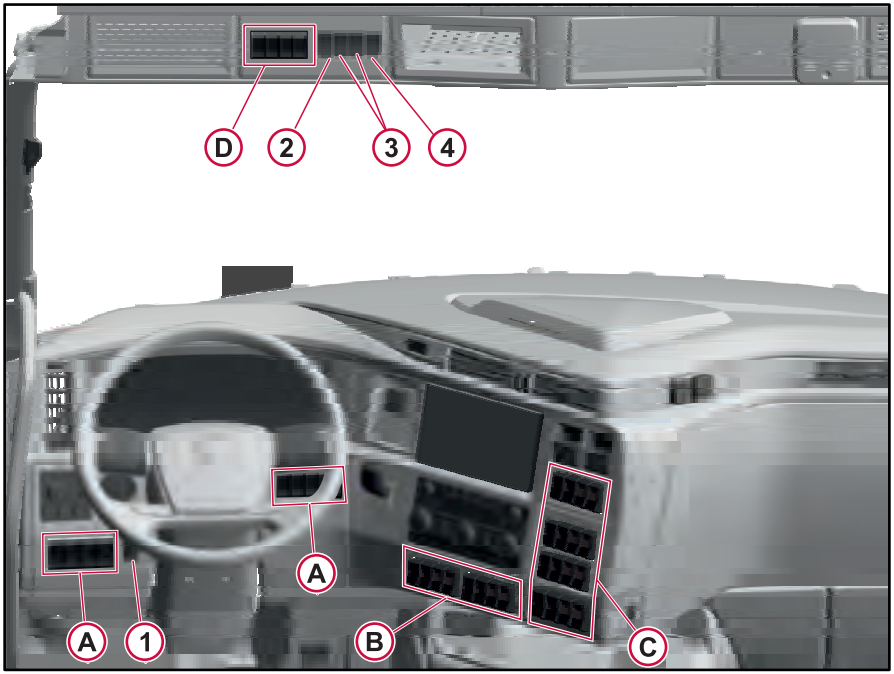
Hardwired Switches:

1. Battery Saver Switch (optional)

2. Volvo Action Service- Assist Switch (Optional)

3. Microphones

4. E-Call Service Switch (optional)

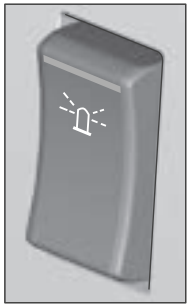


J481441

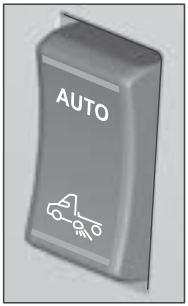
SWITCHES

Flexible Switches Area 1

Flexible Switches	Switch Name
	Engine Stop-Runaway Protection
	Heated Windshield

Flexible Switches	Switch Name
	DRL Override
	Beacon Light

Flexible Switches	Switch Name
	Plow Lamps
	Gearbox PTO 1

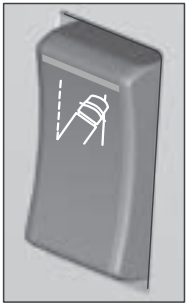
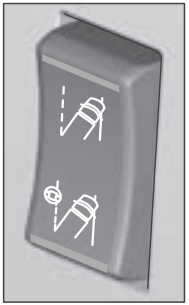
Flexible Switches	Switch Name
	Gearbox PTO 2
	Side Working Light/ Auto

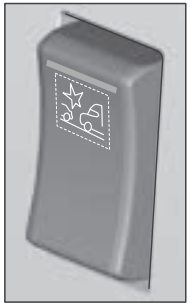
Flexible Switches	Switch Name
	Auto Engine Start/ Stop
	Remote Start Enable

Filter summery to long to be displayed.

SWITCHES

Flexible Switches Area 2

Flexible Switches	Switch Name
	Disable Lane Support System, Departure Warning
	Disable Lane Support System, Depart Warning Continuous Steering

Flexible Switches	Switch Name
	Disable Lane Change Support
	Disable Forward Collision Warning

Flexible Switches	Switch Name
	Disable Driver Alert Support Warning
	Disable Eco-roll

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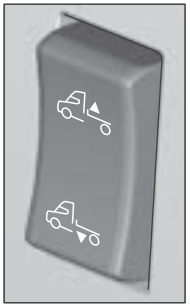
Flexible Switches	Switch Name
	Disable Auto Hold
	Fifth Wheel Slide

Flexible Switches	Switch Name
	Fifth Wheel Unlock
	ATC Mud/Snow + ATC Off

Flexible Switches	Switch Name
	Temporary RSL
	Loading level Adjustment Switch

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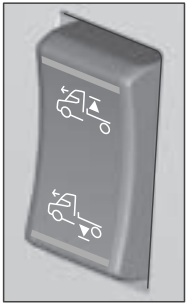
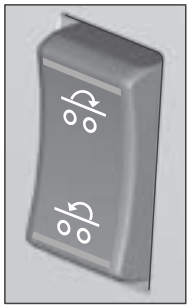
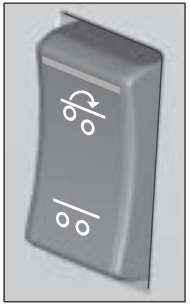
270346_1

SWITCHES

Flexible Switches	Switch Name
	Ride Height Recall Switch (Three Position)
	Ride Height Recall Switch (One Position)

Flexible Switches	Switch Name
	Air Suspension Dump
	ECS Traction Mode Switch (Load Distribution) 6X4

Flexible Switches	Switch Name
	ECS Traction Mode Switch (Load Distribution) 6X2
	Engine Fan Override

270346_1

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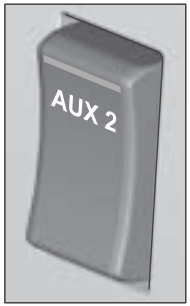
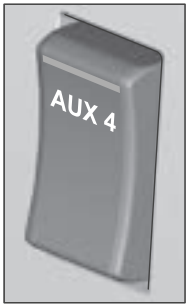
Flexible Switches	Switch Name
	Trailer AUX
	ISO Trailer AUX

Flexible Switches	Switch Name
	AUX1-Momentary
	AUX2-Momentary

Flexible Switches	Switch Name
	AUX3-Momentary
	AUX4-Momentary

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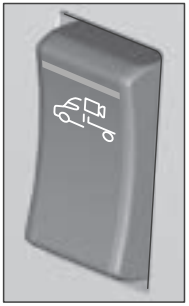
SWITCHES

Flexible Switches Area 3

Flexible Switches	Switch Name
	Vision Cameras
	Diff. Lock Inter-Axle

Flexible Switches	Switch Name
	Diff. Lock Inter-Wheel
	DIff. Lock Inter-Wheel, Front

Flexible Switches	Switch Name
	DIff. Lock Inter-Wheel, Rear

Filter summery to long to be displayed.

270346_1

Flexible Switches Area 4

Flexible Switches	Switch Name
	Cab Dome and Floor
	Door Enable

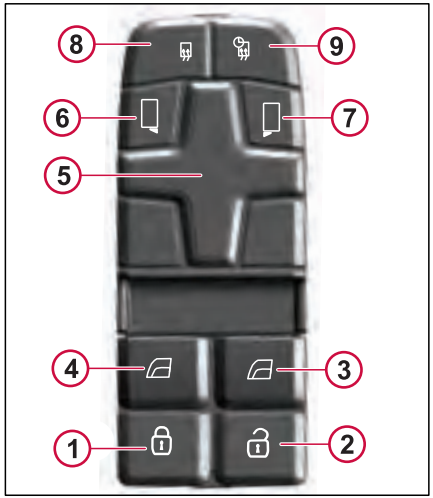
Flexible Switches	Switch Name
	Sleeper Dome

DOOR SWITCHES

Door, Control Panel

Driver's Side Door Control Panel

From the driver's door control panel, you can control functions for both the driver's side and passenger side.



J477411

1. Locking the doors

Lock both doors by pressing the lock button once.

2. Unlocking the doors

Unlock both doors by pressing the unlock button once.

3 and 4. Electric window lifts

The window lifts are operated with buttons 3 and 4.

Opening window: Both window lifts lower automatically to open position with a shorter press on the button.

Closing window: The driver door window lift raises automatically to the closed position with a shorter press on the button. This function has pinch protection.

The passenger door window lift is operated manually to the closed position.

5. Adjustment button for mirrors

Adjust the selected rear view mirror with the joy pad control.

6 and 7. Electrically operated mirrors

Select the mirror to be adjusted with buttons 6 and 7. The lamp illuminates in the button.

Adjust the mirror with the joy pad control (5).

8 and 9. Heated outside mirrors

Press button 8 to start the defroster (heating mirror). Mirror heating will be active until the engine is switched off.

Press button 9 to set the timer for heating the mirror. Mirror heating will be active for 30 minutes.

270346_1

Passenger Side Door Control Panel

J477412

1. Locking the doors

Lock both doors by pressing the lock button once.

2. Unlocking the doors

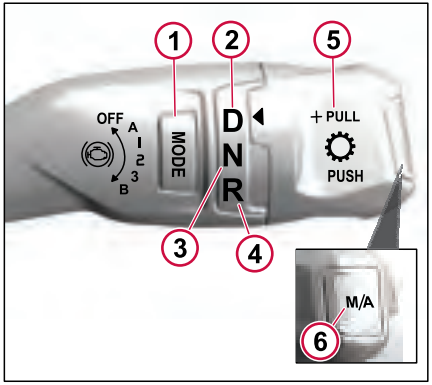
Unlock both doors by pressing the unlock button once.

3. Electric window lift

270346_1

Stalk Switch (Right Side)

Gear Selector



J474778

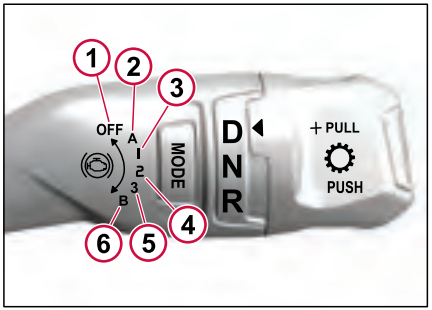
1 Drive
2 Neutral
3 Reverse
4 Manual/Automatic

The gear selector (stalk switch) is in the right-hand side of the steering column. The selector has the gear positions of R (Reverse), N (Neutral), and D (Drive). The selector has the button to switch between M (Manual) and A (Auto). With the selector in the Drive position, the transmission shifts as an automatic performing gear selections and shifting without driver input. When in the manual position, the driver can upshift or downshift the gears using the stalk switch. Pull the stalk switch to upshift and push to downshift. If the manual position is engaged at a stop, the vehicle starts in first gear and holds that gear.

The MODE button on the stalk switch allows you to switch between Fuel Economy modes (Extra Economy->Balanced Economy->Performance->Extra Economy). There is also the performance plus mode or heavy-duty mode supported with the vocational trucks. Long press the MODE button to activate or deactivate the performance plus mode or heavy duty mode.

In situations where the I-Shift is unintentionally left in gear with the parking brake applied, the Transmission Control Module (TCM) will automatically go to neutral when the ignition key is turned to OFF position. This is done to avoid the transmission getting stuck in gear due to driveline “torque up”.

Engine Brake



J463145

1 Off position
2 On or position-A
3 Postion-1 provides 20% to 40% engine braking.
4 Position-2 provides 40% to 70% engine braking.
5 Position-3 provides 70% to 100% engine braking.
6 Position-B provides 100% engine braking plus available downshift

The engine brake can be activated only when the engine is in normal working temperature. The stalk switch position of the engine brake is displayed in the DID status bar.

270346_1

Filter summery to long to be displayed.

The stalk switch has six positions to control the engine brake.

- In the OFF position, the engine brake is turned Off.
- In position-A, the engine brake automatically assists the service brake (brake blending when brake pedal is applied).
- In positions-1, 2 and 3, the engine brake engages automatically when the accelerator pedal is released.
- In position-B, the engine speed is kept on a higher level to maximize available braking torque.

Stalk Switch Left Side

Direction Indicator Stalk Module

J475928

1 Right Turn Direction Indicator (Momentary)

2 Right Turn Direction Indicator (Latched)

3 Left Turn Direction Indicator (Momentary)

4 Left Turn Direction Indicator (Latched)

The left lever has two positions forward and backward. Two positions are spring-loaded and two positions are fixed.

To activate the right turn signal, move the stalk clockwise. For a temporary turn signal (5 flashes), give it a momentary push beyond the detent.

To activate the left turn signal, move the stalk counterclockwise. For a temporary turn signal (5 flashes), give it a momentary push beyond the detent.

J476051

1 Flash-to-Pass

2 Headlamp (Main Beam/Dipped Beam)

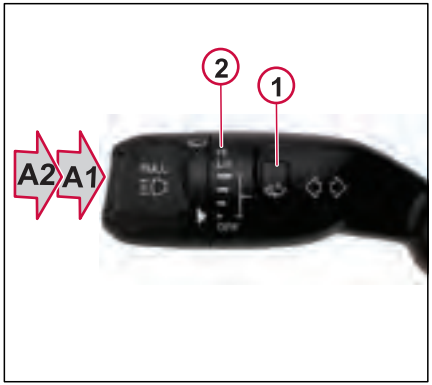
Pull the right lever slightly to flash.

Pull the right lever with a detent to turn On the high beam. Pull the right lever again to switch between high beam and low beam, and vice versa.

STALK SWITCHES

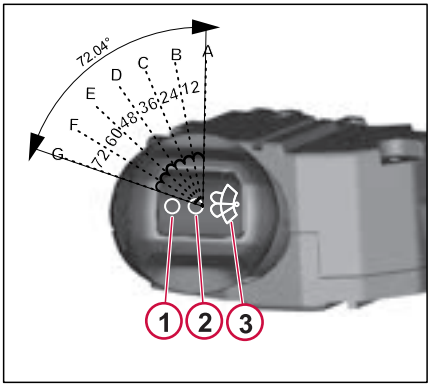
Wiper Functions

The windshield wipers remove rain or moisture from the windshield and along with windshield washing, clean away dirt.



J481355

1. Rain Sensor
2. Intermittent Wiping Position Speed/OFF
A1. Single Wipe/Mist clean
A2. Windshield Wash and Wipe



J481424

Position	Description
A	Wiper Off
B	Delay/sense+++ (10 sec)
C	Delay/sense++ (7 sec)
D	Delay/sense+ (4 sec)
E	Delay/sense (1 sec)
F	Continuous wiping (normal speed)
G	Continuous wiping (high speed)
1	Off
2	Single wipe/mist button
3	Wash/wipe button

Single Wipe - The single-sweep wipe function makes the wiper work at normal speed as long as the wiper stalk switch is held in the single-sweep wipe position.

Intermittent Wiping - The stalk switch module has four intermittent wiping positions. The intermittent wiping is similar to continuous wiping (normal speed), but with a time interval between wiper sweeps. The knob on the stalk switch is used to set any of the intermittent wiping positions when the rain sensor is not actived or deactivated.

Continuous Wiping - In the continuous wiping position, the wiper motor operates continuously without any intervals. The continuous wiping function operates at two different speeds:

- Continuous wiping (normal speed)
- Continuous wiping (high speed)

Automatic Wiping

The automatic wiping is available in the vehicles equipped with the rain sensor. The automatic wiping function activates when the stalk switch is set to any of the intermittent positions and the rain/delay toggle button is in On position.

In automatic wiping, the sweep interval depends on the amount of water falling on the windshield. The automatic wiping

will not consider the intermittent wiping intervals.

If the vehicle is stopped and the doors are opened, the automatic wiping deactivates to prevent injury (for example, when replacing the wiper blades). The automatic wiping activates once all doors are closed and the vehicle reaches the automatic wiping activation speed.

Windshield Washer

The windshield washer function sprays the windshield with washer fluid and sweeps the wipers at low speed. The function is active when the wash/wipe button is pressed on the stalk switch.

Preconditions to windshield washer:

- The stalk switch is in the windshield-washing position.
- Washer fluid level is above minimum.
- Vehicle in Pre-running, Running, Accessory and Cranking Modes

> ⓘ NOTE
>
> When the stalk switch is in any of the intermittent positions and handbrake is engaged, the wiper will wipe with an interval of 10 seconds.

Notifications

The level sensor monitors the level of washer fluid remaining in the reservoir and informs the driver when the level is low by popping up a message in the instrument cluster. The data is used to prioritize the use of the washer fluid for washing the windshield.

If there is any fault in the sensor, the notification pops up to contact the workshop.

J481426

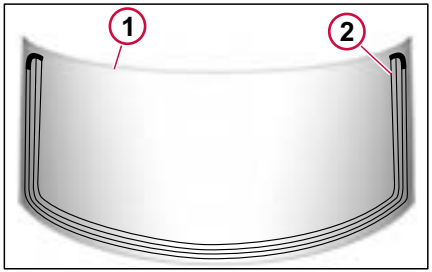
The notification pop up when the sensor detects the washer fluid is low.

J481425

WINDSHIELD HEATER (IF EQUIPPED)

The windshield heater prevents freezing the wiper or build-up of snow or ice at the wiper park location. The operating voltage of the heating element on the windshield is 24 V for better integration and higher heater performance.

The heating element can be tuned On or Off using the "Heated Windshield" switch on the dashboard.



J475092

1 Windshield

2 Heating Element

J477630

When the switch is pressed and the windshield heater is turned On, the LED indicator in the switch illuminates. The windshield heater will be active as long as the switch is turned on.

Steering Wheel Adjustment

⚠ DANGER

DO NOT try to make adjustments to the steering wheel while the vehicle is moving. Never operate the vehicle with the steering wheel adjusted to its uppermost position (exiting cab position). Make all adjustments before starting the vehicle, to prevent loss of vehicle control, which can cause personal injury or death.

Neck Tilt Steering Column (Position Perfect™)

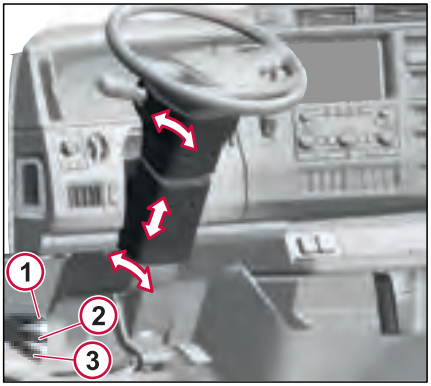
The steering column adjustment is actuated by a pedal on the left side of the floor.
To adjust the steering wheel position:

· With both hands on the steering wheel, fully depress the adjustment pedal so it is in the unlocked position (3).

· Move the steering wheel to the desired location.

· Optional - Release the pedal to the halfway position (2). This allows adjustment of the neck of the column. Tilt the wheel to the desired angle.

· Release the pedal, and allow it to return to the static/locked position (1).



J477483

1 Locked Position

2 Halfway Position

3 Unlocked Position

STEERING WHEEL CONTROLS

Left-Hand Controls

The Left-hand steering wheel switches have controls for the lights, cruise control and volume control.

J477485

1 Increase set speed/Resume Cruise
2 Cruise Control Enable
3 Cruise Over/Under Speed Setting
4 Decrease Set Speed/Resume Cruise.
5 Cancel Cruise
6 ACC Following Distance Time Gap
7 Engine Brake/Downhill Cruise Set
8 Push to Talk/ Voice Call
9 Increase Volume
10 Reduce Volume
11 Marker Lights Interrupt
12 Headlight Interrupt

Light Control

The switches for Light control are mainly to momentarily interrupt the functionality of Headlights and Marker (positional) Lights when pressed.

Volume Control

The volume for the Phone call or Radio can be adjusted via the volume increase and volume decrease button.

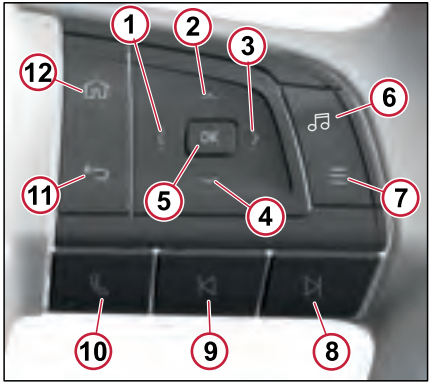
Push to Talk Button

Press the "push to talk button" to use AI assistance.

Cruise Control

For additional information on operating the cruise control, refer to the Cruise Control section.

Right-Hand Controls



J476743

1 Navigate Left
2 Navigate Up
3 Navigate Right
4 Navigate Down
5 Select
6 Media Source Button
7 Open a Menu
8 Previous Selection Button
9 Next Selection Button
10 Accept/Reject Call
11 Back
12 Home

270346_1

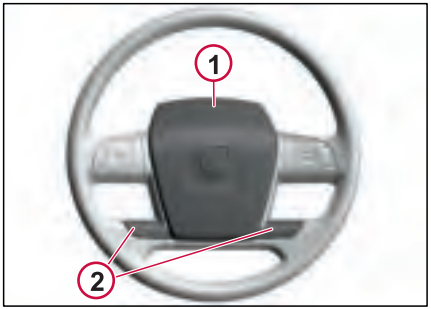
Press the switch left or right to change radio stations. The radio will seek the next station with a strong signal.

For more information, refer to Infotainment section.

Horn Switches

Electric and air horns are standard equipment. They are both operated from the steering wheel or center pad.

The airbag can be pressed down anywhere around the edge to engage the air horn.



J477518

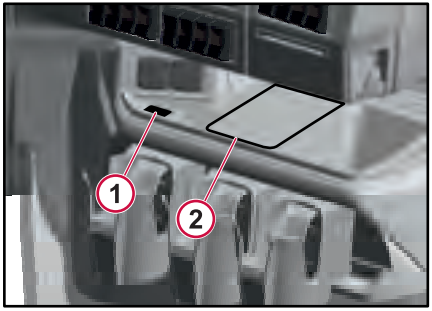
1 *Air Horn*

2 *Electric Horn*

WIRELESS CHARGER

Dashboard Mounted

The wireless charger is located in the lower storage area, referred to as the 'dog house.' The charger comprises a charging pad and a charging indicator lamp. When the charger is actively charging a phone, the charging indicator lamp illuminates.



J481472

1 Charging Indicator Lamp

2 Wireless Charger

NOTE

The wireless charger is compatible only with smartphones that support QI charging. Refer to the smartphone's user manual or the manufacturer's website to check for wireless charging compatibility.
For optimal charging results:

- Remove the phone cover/case before charging
- always place your smartphone in the center of the charging pad.

CAUTION

Ensure that there is no metallic object located between the smarphone and the charging system. Failure to check may lead to damages to thecharger and smartphone.

Seats

General Information

The vehicle seats keep the driver positioned safely behind the wheel. Depending on the configuration of the vehicle, it may be equipped with some of the features or all the feature from the following seat in this section.

The seats have many functions designed to enhance driver comfort. Volvo recommends getting to know these features well before operating the vehicle.

⚠ DANGER

All adjustments are to be made while the operator is seated and the vehicle is stationary. DO NOT adjust the seat position while driving the vehicle. Failure to follow this warning can result in loss of vehicle control, which can result in serious personal injury or death in the event of a vehicle accident.

Seat Adjustment

J477547

1 Track Slider Lever
2 Quick Air Dump Valve
3 Height Control Valve
4 Back Recliner Lever

Track Slider Lever

Pull it to move and adjust the seat front and back.

Quick Air Dump Valve

Push down to lower the seat completely and push up to return the seat to its earlier position. The dump valve facilitates a simpler vehicle exit by rapidly deflating the suspension and also restores the seat to the previously set height upon entry.

Height Control Valve

Push up to increase the height and Push down to decrease the height by venting the air out.

Back Recliner Lever

Pull the lever and back rest can be adjusted.

SEATS

J477486

1 Cushion Slide Lever
2 Tilt Handle
3 Shock Adjustment Button
4 Lumbar Valves
5 Chugger Knob
6 Cushion Bolster Valve
7 Back Bolster Valve
8 Backcycler Toggle Valve
9 Heat Switch

Cushion Slide Lever

This feature allows you to adjust the seat's slider cushion back and forth to find your desired length and optimize comfort.

Tilt Handle (Cushion Tilt)

The tilt handle allows you to adjust the seat cushion tilt, enabling you to tilt it down towards the ground or up for personalized comfort. Use the Tilt Handle to find the perfect angle that suits your preference, ensuring a comfortable and ergonomic seating position during your drive.

Shock Adjustment Button

The shock adjuster regulates the ride quality of the suspension base. Sliding the adjuster forward will increase ride firmness while also decreasing the bounce of the seat. Sliding the adjuster rearward will soften the ride and increase seat bounce.

Lumbar Valves

Fills the air in the middle portion of backrest area and seating area of the seats. To adjust the lumbar zones, Press on the upper side of the button to increase lumbar support. Pressing on the lower side of the button, will deflate the lumbar.

Chugger Knob

This is designed to enhance the ride by reducing forces and vibrations. Rotate counterclockwise to increase the level of isolation in the forward and backward direction. Turn clockwise to decrease the effect and also to disable the chugger feature when firmly tightened.

Cushion Bolster Valve

Push up to fill the air in the bolster region where your leg rests on the seat.

Back Bolster Valve

To adjust the air in the back bolster region where your back rests on the seat. To increase the level of support,

press the upper half of the button; to reduce it, press the bottom half of the button.

Back cycler Toggle Valve

To activate the back cycler feature, completely deflate all lumbar supports. Locate the back cycler button and turn it on. Allow it to cycle two or three times. One complete cycle lasts about 40 seconds. Using the back cycler regularly helps promote blood flow and prevents muscles and ligaments from tightening during long periods of sitting.

Heat Switch

Pressing the rocker button will set the heat to high. Additional presses will reduce the heat to medium, low, and finally off.

Arm Rest

To adjust the armrest position, rotate the arm to the full up position, then fold it down. Slowly raise the arm until you hear a clicking sound. Each click represents a locking position, and there are seven possible armrest positions.

SLEEPER BUNK

The lower bunk is standard while the upper bunk is optional. Upper bunks may be raised and secured to provide more space. When bunks are raised and secured, make sure that both sides are secured properly. For additional information on bunk safety restraints, see "Chapter-4 Safety Restraints (Sleeper Bunks)".

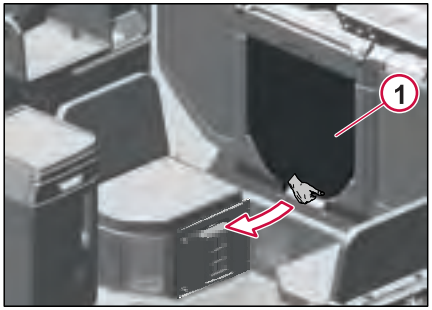
Work Station

The bunk at the rear of the cab can be quickly and easily converted to a workstation with a desk and two seats. The workstation provides easy access to the LECM, and provides a comfortable place for two people to work, eat, or relax.

To convert the bunk into a workstation, the table which is attached to the lower seat can be opened.

Opening of Table

- To unlock the table, press and hold the actuators located behind the front of the table.
- Apply pressure while pulling the table towards the front until you hear an audible confirmation, signaling that the latches are engaged.



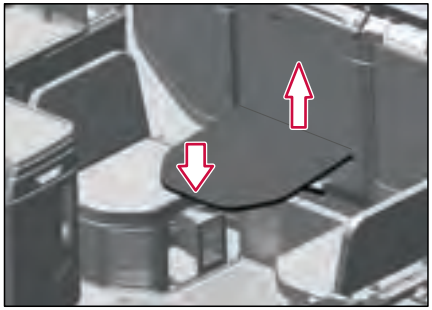
J480250

1 Table

J480318

Closing the Table

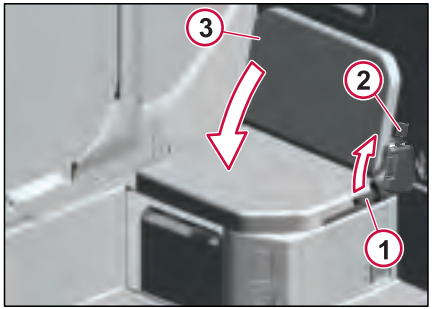
- Press and hold the actuactor under the front of the table.
- Apply pressure downwards near the front of table and upwards from the bottom rear end of table and place it in its position and release the actuator.



J480369

Lower Bunk

To use the lower bunk bed, start by overlapping the retractable seats.



J480371

1 Handle (Locked Position)

270346_1

2 Handle (Unlocked Position)

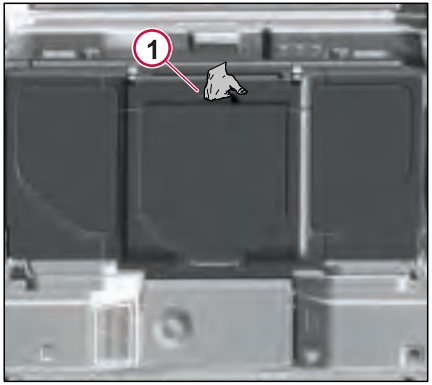
3 Retractable Seat

Pull the handle to vertical position to unlock the retractable seat. Then, push the backrest of the seat until it overlaps with the main seat.

J480588

To Open the Lower Bunk bed,

- Push the actuator located at the top edge of the seat allowing the bed assembly to open towards the operator compartment.



J480592

1 Actuator Hole

Slowely let the bed rests on the supports provided at 90 °.

J480547

Upper Bunk

⚠ DANGER

Always have three limbs (one foot and two hands or two feet and one hand) in contact with the floor, bunk or step at all times when entering or exiting the upper bunk. Failure to follow this procedure can lead to a fall and cause severe personal injury or death.

⚠ WARNING

Support the bunk with one hand while releasing the latches. Failure to support the bunk may lead to the bunk falling without control, causing personal injury.

⚠ WARNING

Support the bunk with one hand while releasing the latches. Failure to support the bunk may lead to the bunk falling without control, causing personal injury.

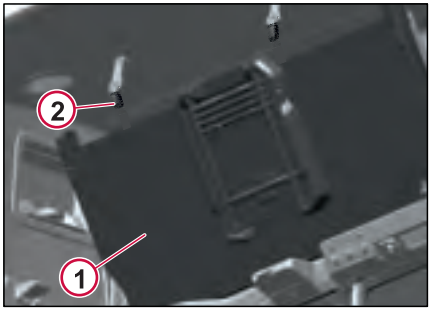
ⓘ NOTE

When the upper bunk bed is not in use, secure it using the upper bunk restraint. While driving, it is not advisable to leave it in the unlocked position.

The weight carrying capacity of the upper bunk is 250 lb when the truck is in

SLEEPER BUNK

motion and 450 lb when the truck is stationary.

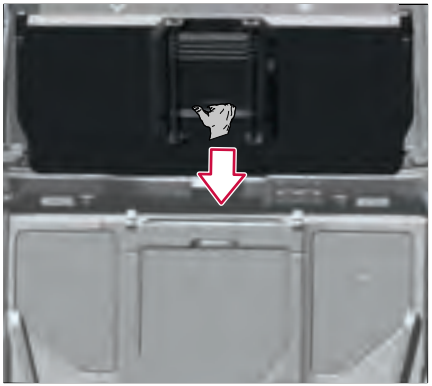


J480593

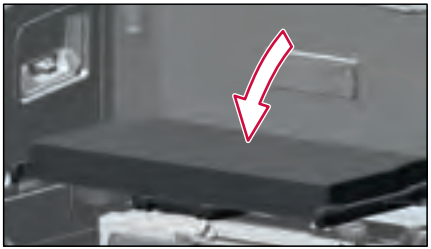
1 Upper Bunk

2 Integrated Upper Bunk Restrain in locked position when it is not used.

To use the upper bunk, unlock the buckle by pressing the unlock button and slowly pull the bunk towards you until it rests on the support.



J480599



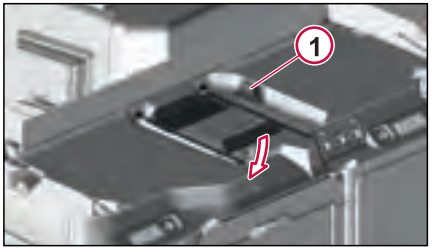
J480602

Ladder

The upper bunk has a telescoping ladder for easy bunk access and storage.

To release the ladder, perform the following:

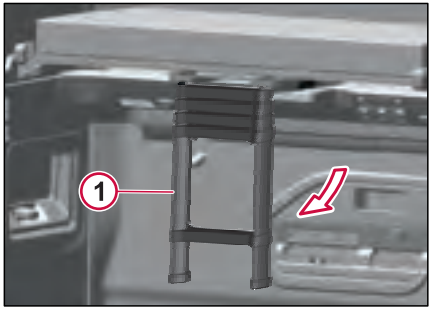
1. Pull the release handle that locks the ladder to the upper bunk.



J480603

1 Latch to Unlock the Ladder

2. The ladder swings down. Grab the lowest ladder rung. Pull the ladder down until the rungs are fully extended.

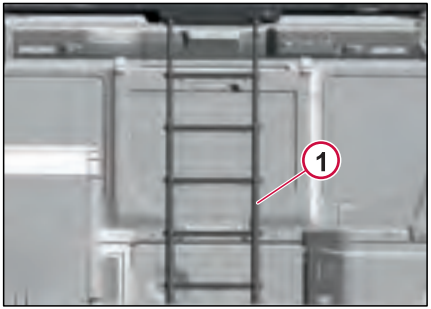


J480641

1 Ladder in Released Position

> **NOTE**
>
> Excessive effort is not needed when releasing the ladder. Pull the release handle.

3. Extend the ladder fully before climbing to the upper bunk.

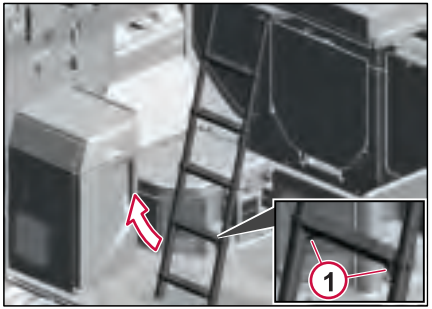


J480642

1 Ladder in Full Extended Position

> **WARNING**
>
> Do not attempt to climb into the upper bunk with the ladder not in the fully extended position. An audible click from each ladder rung will indicate that the rung is locked. Climbing the ladder when it is not fully extended may result in the operator falling, causing personal injury.

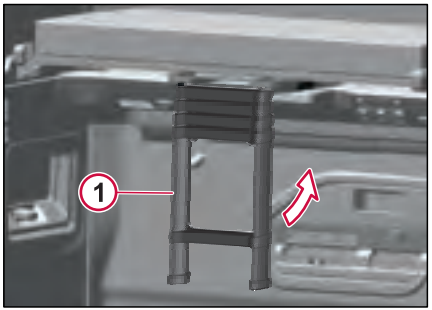
4. To retract the ladder, push the ladder lock tabs on second rung, and then push the ladder rungs up to the collapsed position.



J480650

1 Lock Tabs

5. Push the ladder up toward the upper bunk.

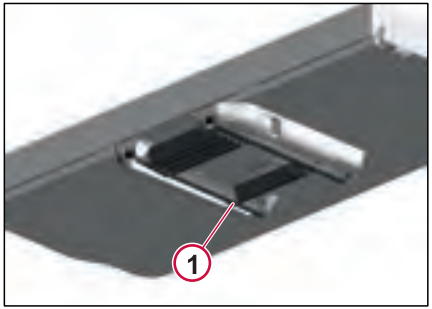


J480649

1 Ladder Going to Secured Position

6. Secure the ladder by pushing it into the locked position, under the upper bunk.

SLEEPER BUNK



J480647

1 Ladder Secured in Locked Position

Climate Control System

> ⓘ NOTE
>
> In climate control systems, after a predetermined number of vehicle starts, the climate unit will recalibrate the positions of the climate unit doors. This process may take several seconds before the airflow returns to the selected distribution mode.

General Information

If at any time there is any question whether fumes are entering the cab, determine the cause of the fumes and have it corrected as soon as possible. If the vehicle must be driven under these conditions, drive only with all windows open. Protect against carbon monoxide entry into the cab. Keep the engine exhaust system, cab and cab ventilation system properly maintained. It is recommended that the exhaust system and cab are inspected by a competent technician:

- At every engine oil change
- Whenever a change is noticed in the sound of the exhaust system.
- Whenever the exhaust system, underbody or cab is damaged.

To ensure the proper operation of the vehicle ventilation system, always keep the inlet grille at the base of the windshield clear of snow, ice, leaves, and other obstructions. DO NOT park the vehicle and let the engine run or idle for more than 10 minutes with the ventilation system control switch in the Off position. Even with the ventilation system On, running the engine while parked or stopped for long periods of time is not recommended.

DO NOT run the engine or parking climate in confined areas, such as garages or next to a building, any more than necessary. The area must be properly ventilated. When the vehicle must be stopped with the engine running for more than a few minutes:

- Adjust the heating or cooling system to force outside air into the cab. Do this by setting the fan to medium or high speed and with the controls set in any position except for recirculation of air inside of the cab.
- Keep the exhaust pipe area clear to help reduce the buildup of exhaust gas under the vehicle.

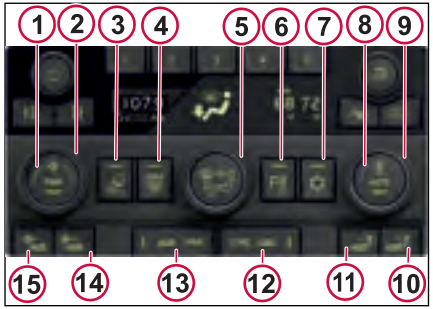
Cab and Sleeper Cimate System are controlled by:

- DECM (Driver Environment Control Module)
- LECM (Living Environment Control Module)

CLIMATE CONTROL SYSTEM

Cab Climate Control Controls

DECM (Driver Environment Control Module)



J476951

1 Power Button for the Front Climate Unit

2 Rotary Knob to Control Blower Speed

3 Button for Cab Air Recirculation

4 Button for Cab Max Defrost

5 Rotary knob to select Vent Mode

6 Button for Parking Climate

7 Button for AC Control

8 Button for Automatic Climate Control

9 Rotary Knob to select Cab Temperature

10 Button for increasing Bunk temperature

11 Button for decreasing Bunk temperature

12 Button for Synchronizing Bunk Climate with Front climate

13 Power Button for the Bunk Climate Unit

14 Button for Increasing Bunk Blower speed

15 Button for decreasing Bunk Blower speed

A/C ON

The LED light on the A/C button will light when A/C function is requested.

Temperature Control Settings

Temperature in the cab can be set by Rotary Knob.

Blower Speed

Blower speed can be adjusted using Rotary Knob.

Recirculation

Press Recirculation button to recirculate the air in the cab and Light illuminates when activated.

Max Defrost

Use the max defrost button to keep the windshield clear. Maximum heat output for fast defrosting can only happen after the engine has reached operating temperature.

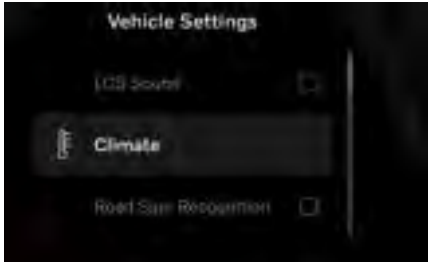
⚠ DANGER

DO NOT attempt to drive with the windshield covered by mist, or fog or frost. The visibility is reduced, which could lead to an accident-causing severe personal injury or death.

270346_1

Climate Settings in Instrument Cluster

- Click on the menu button
- Go to Vehicle Settings and select Climate



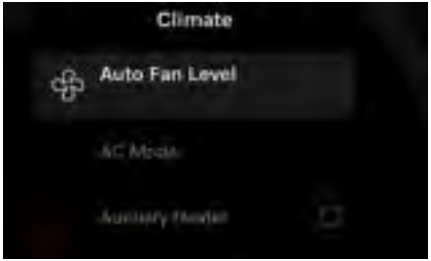
J480674

There are 3 climate control Options

1 Auto Fan level - Select Low, Medium or High option based on Individual preference.

2 AC mode - Select Standard or Economy mode.

3 Auxiliary Heater - Automatic Activation of Heater during driving to improve cab comfort/heat-up performance when enabled.



J480728

Parking Climate

The purpose of parking climate unit is to keep the cab environment at a desired temperature when the engine is switched Off during the parking or resting.
The parking climate control is activated manually by pressing the parking climate button.

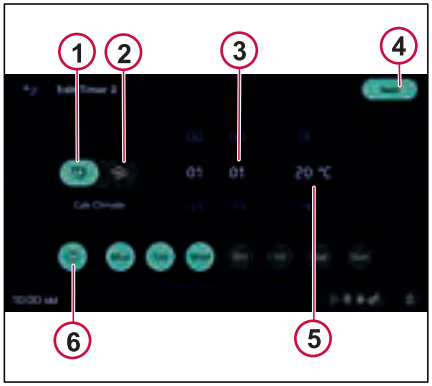
When the parking climate button is pressed, the parking climate options will appear on the infotainment system where the parking climate timer and the required temperature can be set manually.

J477328

The activated timer shows in light blue color.

The edit can be done by pressing the edit button after choosing timer option.

CLIMATE CONTROL SYSTEM



J477324

1 Cab Climate
2 Engine Heater (Optional)
3 Timing
4 Save Button
5 Required Temperature
6 Repeat (every week for selected days / Upcoming week alone)

By clicking on the specific button, we can modify the settings according to the needs and it can be saved by using save button.

To schedule engine heating at specific times, use the "Engine Heater" option in the menu.

J483771

Set the engine heating schedule by choosing time and days, use the "Repeat" button for recurring days, and save your settings.

Parking Cooler

When the parking cooler is activated, it utilizes power from the trucks main battery system. If the battery energy gets low, the truck's main engine will automatically start, recharging the batteries.

The driver has the additional control over the auto start/stop operation by using start/stop switch, located on the dash. If the switch is pressed a green bar will illuminate on the switch, permitting the truck to automatically restart for charging the batteries.

J477468

NOTE

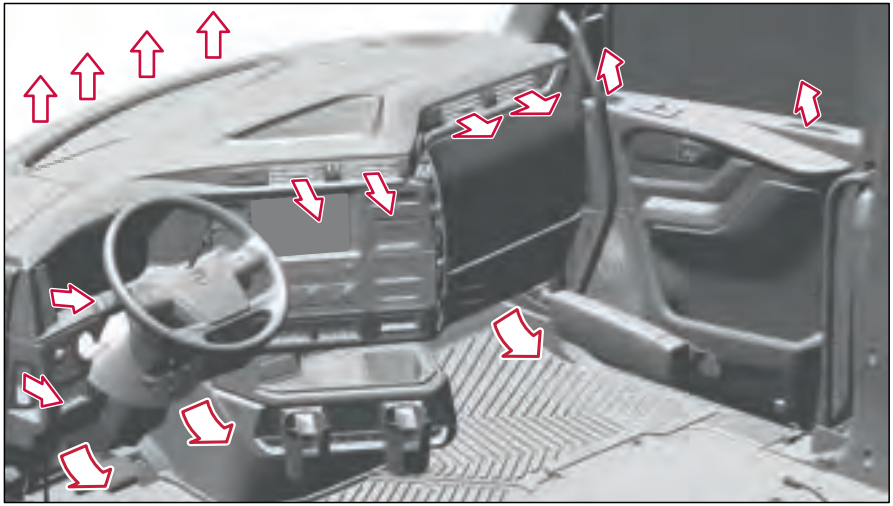
The truck will initiate the engine start only if the cab doors and hood are closed.
Once the cab doors or hood release is pulled, the engine will start and a message will be presented in the instrument cluster indicating this safety stop happened.
However, if the ignition switch is On and the driver starts the truck, this hood/door safety feature will not prevent the truck from starting.

DANGER

Do not keep any items (luggage and other materials) near to the inlet and outlet areas of the parking heater.
Failure to follow may result in a fire hazard and an air heater shutdown.

CLIMATE CONTROL SYSTEM

Air Distribution



J476962

Always allow the dashboard vents to remain open. Irrespective of how the air distribution is set, a small amount of air will always come from the dashboard vents to ensure the temperature in the cab is correct.

NOTE
Floor Mode: Unheated air is leaked to the panel vent to balance the heat rising from the floor.

Living Environment Control Module

J477556

1 Power Or Mute Button
2 Rotary Knob (Volume Control)
3 Display
4 Bulkhead Lamp On/Off Button
5 Dome Lamp On/Off Button
6 Ambient Lamp On/Off Button
7 Ambient Lamp dimmer (Decrease) Button
8 Ambient Lamp dimmer (Increase) Button
9 Media Source Button
10 Rotary Knob (Radio Manual Tuning)
11 Display On/Off Button
12 Media Settings Button
13 Skip or Scan Button (Previous)
14 Skip or Scan Button (Next)
15 Power On/Off Button for Bunk Climate Control
16 Rotary Knob (Fan Speed Control for Bunk Climate)
17 Panic Alarm Button
18 Alarm Menu Button
19 Inverter On/Off Button (Optional)
20 Home Button
21 Menu Selection Button

270346_1

22 Rotary Knob (Menu Navigation)

23 Back Button

24 Front Climate Control Power On/Off Button

25 AC On/Off Button

26 Cab Lock Button

27 Auto Temperature Control On/Off

28 Rotary Knob (Bunk Climate Temperature Control)

The LECM (Living Environment Control Module) controls mainly comfort and infotainment-related functions such as the front (cab) and rear (bunk) climate, interior lighting, alarms, door lock/unlock, inverter and radio. The LECM has the push buttons, indicators and the rotary knobs. The LECM has the LCD (Liquid Crystal Display) to display the status of functions or on-going adjustments and to provide access to different settings.

For interior Lights functionality of LECM, refer to the "Lightings" chapter and for the radio section, refer to the "Infotainment" chapter.

LECM Climate Control Functionalities

Bunk Climate Control

- **Power On/Off Button for Bunk Climate control:**
  - Press once to activate the display.
  - Press twice to turn On the fan in the sleeping region.
  - Use the rotary knob to control the fan speed. Turn clockwise to increase and counterclockwise to decrease the fan speed.
- **Front Climate Control Button:**
  - Press to switch On the front climate control unit. By default it will be in automatic control mode.
  - Use the knob of the menu selection button to set it for auto mode where it automatically sets the temperature or sync mode where both bunk region and front climate temperature will sync.
- **Air Condition On/Off:**
  - Press the Air condition switch to turn it On. The LED turns green. Press again to turn it Off.
- **Auto Set Button:**
  - Press to automatically set the temperature for the bunk region.
  - After pressing the auto set button, Use the knob to manually adjust the temperature.

Menu Navigation

- **Menu Select Button:**
- **Home button:**
- **Return button:**

Cab Lock Button

- Press lock button to lock the cab doors.

Panic Alarm Button

- Panic alarm button is pressed to activate the panic alarm. The red LED light on the button indicates that it is in On condition. The truck's alarm siren and hazard warning lights turn On.
- To switch Off the panic alarm, press and hold the button again.

Alarm Settings

- **Accessing Alarm Settings:**
  - Alarm settings can be accessed either through the "Alarm Menu" button or by navigating through the main menu.
- **Using Alarm Menu Button:**

270346_1

Filter summery to long to be displayed.

- Press the "Alarm Menu" button to directly access the alarm menu on the display.
- **Available Alarm Options:**
  - There are 5 alarm options that can be set.
- **Setting Alarms:**
  - Use the menu button and knob to select the desired alarm.
  - Press "Ok" to confirm the selection.
- **Editing Alarms:**
  - After selecting an alarm, it will prompt to edit.
  - Use the knob to navigate through the options.
  - Press "Ok" to select the desired option.
  - Use the knob again to make edits.
  - Confirm by pressing "Ok".
- **Confirmation:**
  - The system will ask to save or discard the changes.
  - Use the knob and press "Ok" to confirm the edited alarm settings.

Invertor Switch

Invertor On/Off Switch

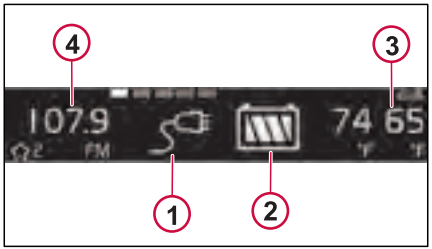
Invertor can be accessed by either menu button or Invertor switch.

In menu button the display shows Battery management. Press OK to do any settings on invertor.

Pressing the invertor button or choosing it from the menu, the led of invertor On/Off button will lit in green color.

Invertor Menu Display

Pressing the invertor button while Grid is connected.



J479944

1 Plugged in Symbol (If the grid is connected)

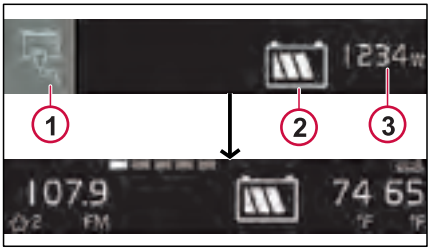
2 Battery Health

3 Temperature

4 FM radio

Pressing the inverter button while disconnected from the grid.

It shows the Battery SOC indicator and then returns to the default Inverter menu.



J479943

1 Inverter

2 Battery SOC in symbol

3 Battery SOC in watts

To turn Off the inverter button, Press the Button, the LED indicator goes off. The display shows a "Off" message and Returns to the default screen.

Auto Load Cutoff

When the grid is not connected and if battery health is low. The display asks to activate power saving mode.

SLEEPER ENVIRONMENT

J479898

If Accept is chosen, Or Back/ Home button is pressed. It will enter into Auto load cutoff state and the screen goes Off.

If Delay is chosen, It will enter into the Delayed state and it will eventually comes to the home screen.

Invertor Faults (Malfunction)

All faults trigger a change in LED from On to Off in the inverter button.

The Popup will appear with the symbol if inverter is,

- Overload
- Over voltage
- Over tempurature

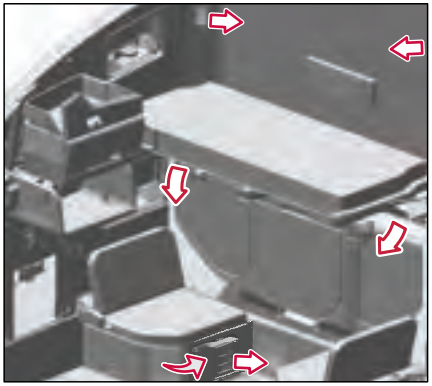
Symbol	Fault Meaning
	Overload
	Over voltage
	Over temperature

Pre-Existing Fault Condition

If the Inverter button is pressed when Inverter is Faulty. The display shows inverter not availaible.

J479969

Air Distribution



J481494

Always allow the air vents to remain open. Irrespective of how the air distribution is set, a small amount of air will always come from the air vents to ensure the temperature in the bunk is correct.

Upper bunk air vents are given only if the truck is equiped with upper bunk.

24 V DC to 120 V AC Converter

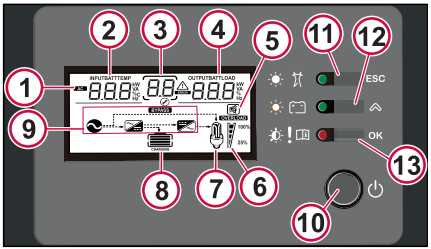
Invertor Control Panel

Use the control panel to turn the power inverter ON or OFF. To turn the inverter ON or OFF, gently push the Power button in for approximately a half second.

The control panel provides the user system status through the LED display. It also allows the user to change the charging setting, inverter mode and additional options related to disabling or enabling the system alarm or adjusting the shutdown settings.

⚠ DANGER

When parked on wet ground, avoid using an external power source to connect the cab power plug. Water is a conductor of electricity. In wet conditions, electrical shock can occur which can result in personal injury or death.

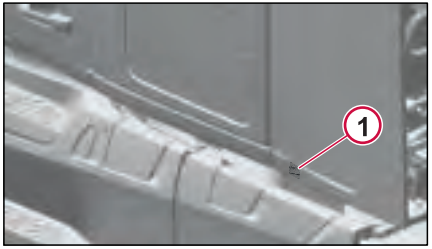


J477557

1 AC IN or AC OUT Indicator
2 Left Part of LCD Display
3 Middle Part of LCD Display
4 Right Part of LCD Display
5 Alarm indicator
6 Load Power Level Indicator
7 Load Indicator
8 Battery Level Indicator
9 Mode Indicator
10 Power Button
11 Return to Default Screen or Exit Setting Mode
12 Scroll to Next Screen or Next Selection
13 To Enter the Configuration Mode or To Confirm the Settings

For more information, refer to the manufacturer manual.

Shore Power Connector and 120 V Power Outlets



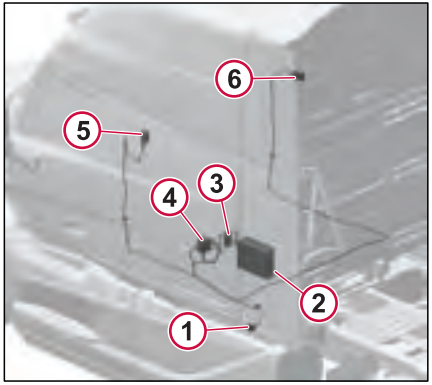
J479740

1 Shore Power Connector

When an external power source (for example, an extension cord) connects to the cab shore power connector, the inverter converts the 24 V DC to 120 V AC and distribute to cab outlets through the distribution box. The distribution box includes a circuit breaker and ON/OFF switch. This is also known as a "load center."

From the distribution box, there are three connections to the cab, which provides 120 V AC current to the outlets. The layout of the wiring varies by truck model.

DC TO AC POWER INVERTER



J479745

1 Shore Power Connector
2 Inverter
3 120 V Power Outlet
4 Distribution Box
5 120 V Power Outlet, Wardrobe
6 120 V Power Outlet

270346_1

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⚠ DANGER

Heavy objects must be stored only in the outside storage areas or secured on the floor. Cabinets and storage compartments are designed for clothing and lighter personal effects only. In the event of a collision, heavy, unsecured objects in overhead storage can come loose and cause severe personal injury or death to the driver or passengers.

⚠ WARNING

All items within the cab must be secured before the vehicle is set in motion. This list includes, but is not limited to, drinks, clothes, books, televisions, and so on. In the event of a collision, loose items could fly around inside the cab. These loose items could cause personal injury.

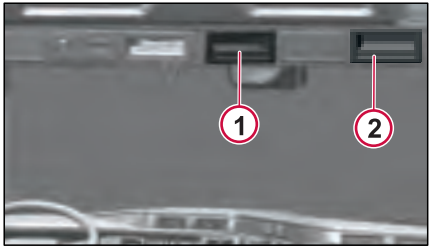
⚠ CAUTION

DO NOT overload the cab suspension. Make sure the weight distribution is equal in the cab. Overloading the suspension leads to poor ride and lowered driving comfort.

Front Overhead Storage

The overhead storage compartment is mounted over the windshield: Five openings with nets, or CB radio, switch panel, and three openings with nets.

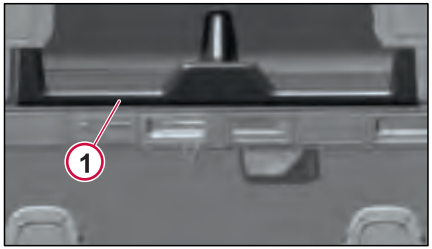
The storage compartments have a maximum storage weight limit of approximately 1.1 kg (2.5 lb) per opening. If evenly distributed, the total storage is 5.6 kg (12.5 lb).



J480109

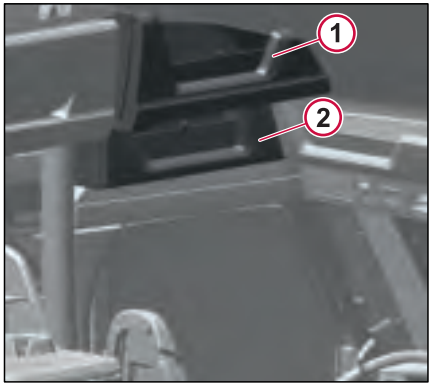
1 Storage bin

2 Radio Box Central Storage Bin



J480119

1 Center Storage Shelf



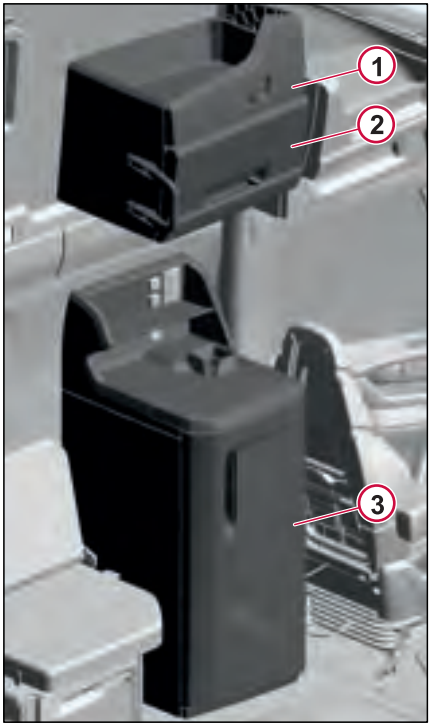
J480113

1 Front Overhead Shelf, Upper

2 Front Overhead Shelf, Lower

STORAGE COMPARTMENTS

Side Wall Storage (Left Side)



J480110

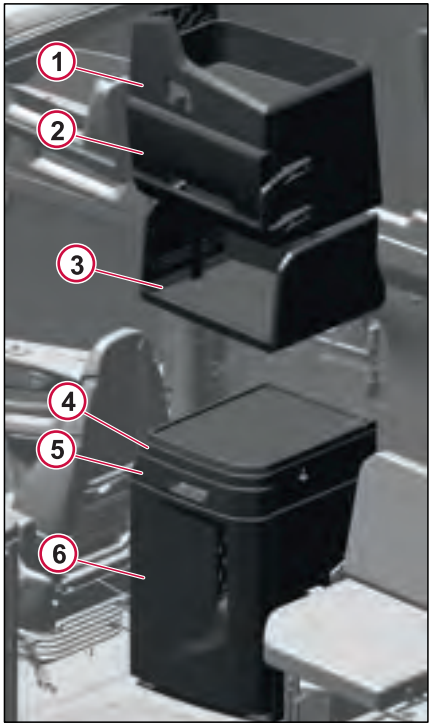
1 Upper Storage Cabinet (Only for High Roof Cab)

2 Middle Storage Cabinet

3 Wardrobe

> **NOTE**
>
> The illustration shown is for the long sleeper. The size of the cabinets and wardrobe are shorter for Medium sleeper.

Side Wall Storage (Right Side)



J480112

1 Upper Cabinet (Only for High Roof Cab)

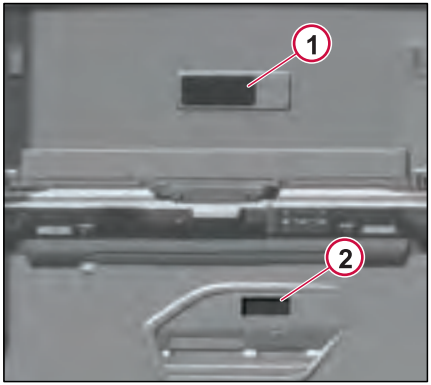
2 Middle Cabinet

270346_1

3 Storage Compartment for Microwave Preparation Kit
4 Table
5 Drawer
6 Refrigerator

> ! NOTE
>
> The illustration shown is for the long sleeper. The size of the cabinets, table, drawer and refrigerator (if equipped) are shorter for Medium sleeper.

Rear Wall Storage



J480117

1 Upper storage, Pocket
2 Pocket

REFRIGERATOR PREPARATION KIT

When installing an aftermarket refrigerator use two ratchet straps in parallel as shown in the illustration. In order to keep equipment secured in the event of an accident, it is recommended to use straps that have a break rating of at least 1500 lbs (680 kg).

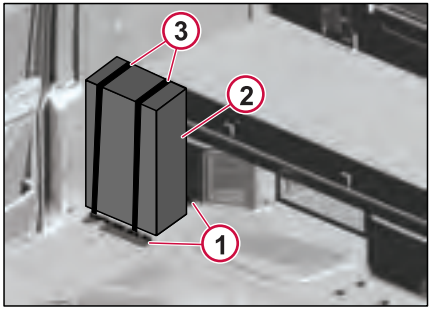
Medium Sleepers

- Maximum load weight 55 lbs (25 kg)
- Maximum height 26 in (66 cm)

Long Sleepers

- Maximum load weight 77 lb (35 kg)
- Maximum height 33.5 in (85 cm)

If the refrigerator is pressing into the flooring material an excessive amount, adding a sheet of stiffer material (plywood for example) will reduce the amount of compression.



J481576

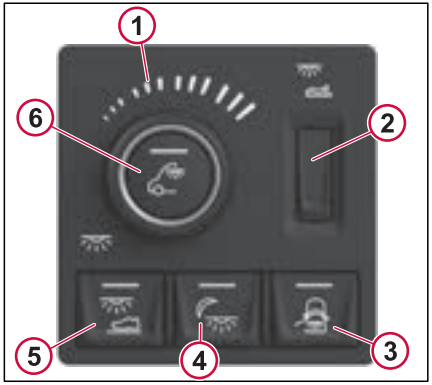
1 Brackets

2 Refrigerator

3 Ratchet Straps

Interior Lightings

Interior Light Control Panel



J476054

1 Dimmer
2 Sleeper Dome Lamp/Light Panel
3 Door Enable Auto Mode
4 Night Lamp
5 Footwell Lamp
6 Cab Dome Lamp/Light Panel

Dimmer: The dimmer function controlling the intensity of the lights in the cab and is managed by a rotary knob without stops with defined stops.
Turning the knob clockwise increases the light intensity, while turning it counterclockwise decreases the light intensity.

Sleeper Dome Lamp Button: Turns On/Off the overhead dome lamp in the sleeper area.

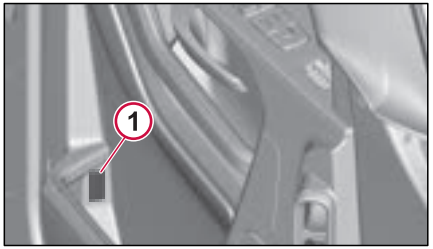
Door Enable Auto Mode: This button provides the option to regulate whether the interior lights can automatically activate when a door is opened. If you turn off this switch, the interior light won't come on by itself when you open a door.

Night Lamp Button: Turns On/Off the LED night lamp in the Light panel

Footwell Lamp Button: Turns On/Off the cab floor lamps

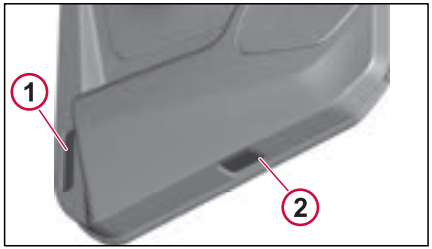
Cab Dome Lamp Button: Turns On/Off the cab dome lamp in the light panel

Door Lamps



J475514

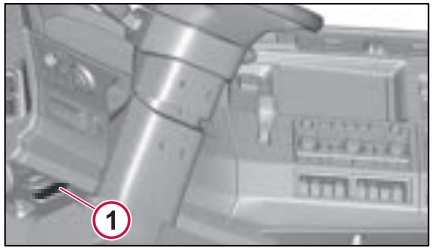
1 Door Pocket Lamp



J475515

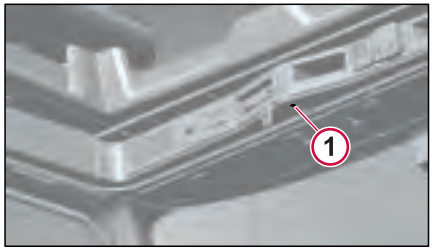
1 Reflector
2 Door Puddle Lamp

Instrument Panel Lamps



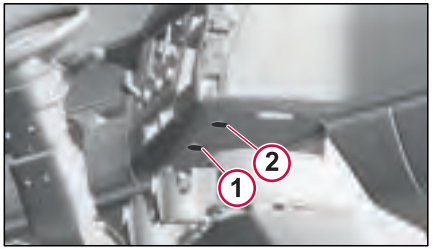
J475565

1 Footwell Lamp



J475594

1 Pin Hole Lamp



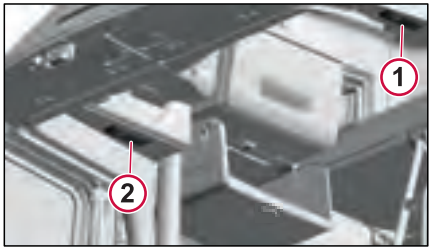
J475593

1 Cup Holder Lamp Left

2 Cup Holder Lamp Right

Headliner Lamps

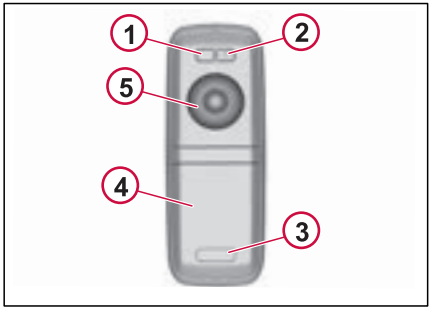
Front Headliner Three-Way Combination Lamp



J475643

1 Three-Way Combination Lamp Right Side

2 Three-Way Combination Lamp Left Side



J476226

1 Spot Lamp On/Off Switch

2 Spot Lamp Mode Switch

3 Flood Lamp Mode Switch

4 Flood Lamp

5 Spot Lamp

1 **Spot Lamp On/Off Switch -** This switch controls the on/off function of the spot lamp.

2 **Spot Lamp Mode Switch -** This switch changes the spot lamp color from bright white to dim red, aqua ambient, or turns it off.

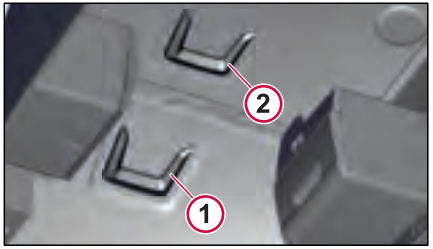
3 **Flood Lamp Mode Switch -** This switch has three positions: Off, on, and door-control for the flood lamp

When both flood lamp mode switches are set to door-control mode, both flood lamps turn on when either the driver-side

270346_1

or passenger-side door is opened. If only one flood lamp mode switch is set to door-control mode, only that flood lamp turns on when the respective door is opened.

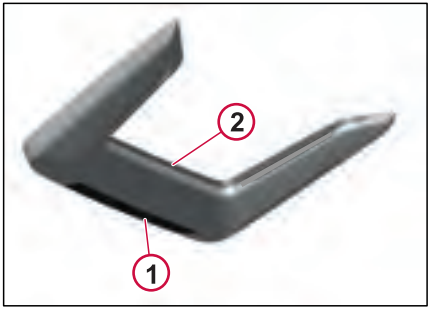
Light Panel (Headliner Mounted)



J475716

1 Cab Front Light Panel

2 Sleeper Rear Light Panel (Comes with an alarm feature)



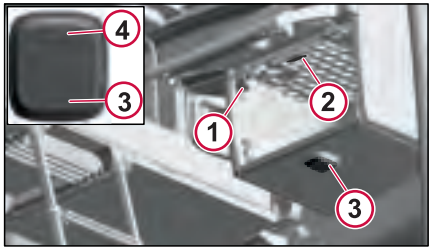
J481704

1 Dome Lamp

2 Night Lamp

Side Wall Storage Cabinet Lamp

Left Side Cabinet Lamps



J475719

1 Plunger Switch Inside of Cabinet

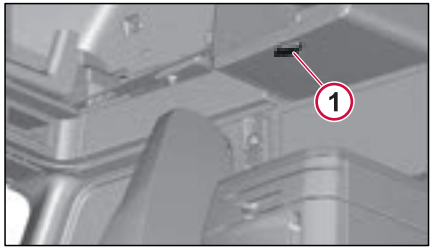
2 Lamp Inside of Cabinet

3 Lamp Outside of Cabinet

4 On/Off Switch

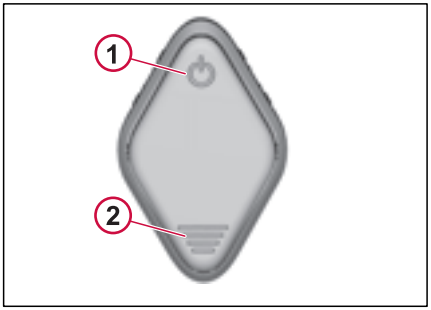
LIGHTINGS

Right Side Cabinet Lamp (With Microwave Preparation Kit)



J475562

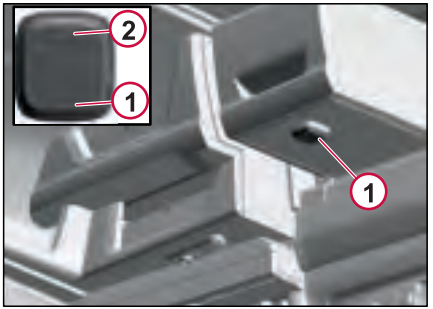
1 Side Wall Cabinet Lamp



J476239

1 Lamp On/Off Switch
2 Dimmer Switch

Right Side Cabinet Lamp (Without Microwave Preparation Kit)

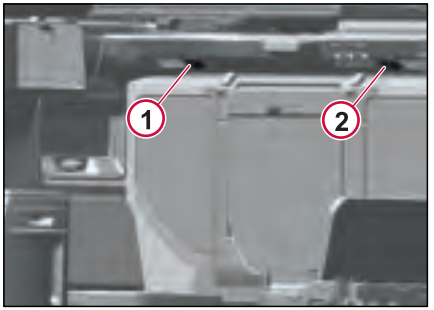


J481574

1 Lamp
2 On/Off Switch

Sleeper Bunk Lamps

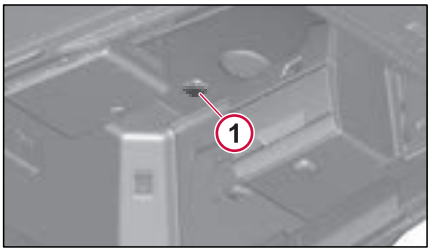
Rear Wall Swivel Spot Lamp



J481770

1 Swivel Spot Lamp, Right Hand Side
2 Swivel Spot Lamp, Left Hand Side

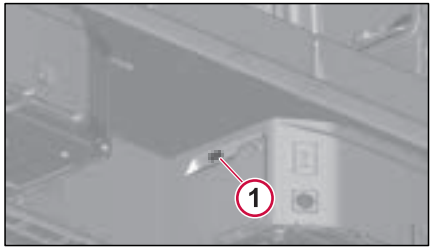
Sleeper Headliner Mounted Lamp



J475645

1 Sleeper Roof Dome Lamp

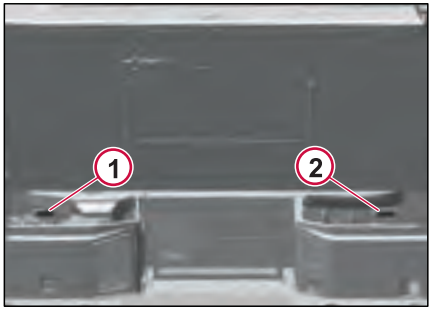
Sleeper Bulkhead Lamps (Lower Bunk)



J475646

1 Sleeper Bulkhead Lamps

Luggage Compartment Lamp



J481761

1 LED Light, Right Hand Side
2 LED Light, Left Hand Side

Exterior Light Control

Headlamp and Marker Interrupt Switches

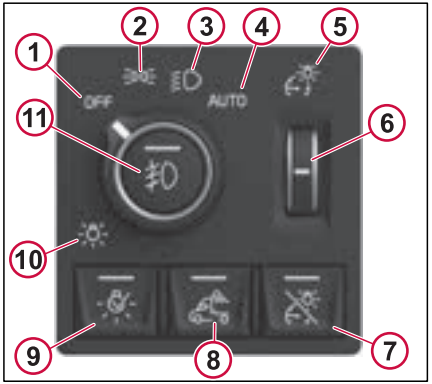
J475998

1 Headlamp Interrupt Switch
2 Marker Interrupt Switch

The "Headlight Interrupt Switch" on the steering wheel is a feature that allows you to temporarily turn off your vehicle's headlights. It's used for brief moments when you want to dim your headlights, such as when signaling to another driver at night. This switch doesn't completely turn off your headlights but rather switches between high beam and low beam settings for a momentary adjustment in brightness.

The "Marker Interrupt Switch" on the steering wheel lets you turn off marker lights for situations when you need less light from your vehicle, like when parked at night.

Exterior Light Control Panel (ELCP)



J475935

1 Off
2 Parking/Position/Marker Lamp
3 Low Beam (Headlamp)
4 Headlamp Automatic (Optional)
5 Dashboard Lamp Control

6 Dashboard Dimmer Control
7 Day/Night Pre-set (Black Panel)
8 Back Of Cab Lamp
9 Pre-trip Insepction
10 ELCP Identifier Symbol
11 Fog Lamp

Turn the rotary knob to control the Off, Park/Position Lights, Low Beams and Auto Option, if equipped.

Turn clockwise to select the exterior lighting modes from left to right and stop at the "Auto" Position. Correspondigly, when rotating the knob in counterclockwise fashion from right to left and finally stop at the "Off" position.

A backlighted hard pointer is for highlighting the selcted function.

Other exterior light functions can be accessible from 4 push buttons.

- The "Black panel" function turns the display into night mode, the dimmer adjust the light of it.
- The "Back of Cab" function turns a light ON/OFF to the rear of the truck.
- The "Pre-trip inspection" function turns the exterior lights ON in order to verify them.
- The "Fog light" function turn the Fog lights ON/OFF.
- The dashboard intensity dimmer is controllable with the thumb wheel.

Direction Indicator Stalk Module

J475928

1 Right Turn Direction Indicator (Momentary)
2 Right Turn Direction Indicator (Latched)
3 Left Turn Direction Indicator (Momentary)
4 Left Turn Direction Indicator (Latched)

The left lever has two positions forward and backward. Two positions are spring-loaded and two positions are fixed.

To activate the right turn signal, move the stalk clockwise. For a temporary turn signal (5 flashes), give it a momentary push beyond the detent.

To activate the left turn signal, move the stalk counter-clockwise. For a temporary turn signal (5 flashes), give it a momentary push beyond the detent.

J476051

1 Flash-to-Pass
2 Headlamp (Main Beam/Dipped Beam)

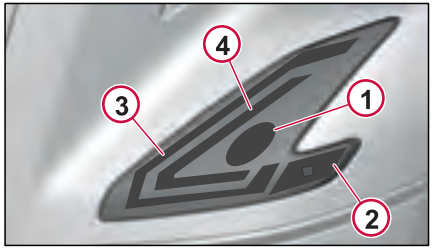
Pull the right lever slightly to flash.

Pull the right lever with a detent to turn on the high beam; pull it again to switch between high beam and low beam, and vice versa.

270346_1

Exterior Lightings

Headlamp



J475046

1 Headlamp (High Beam/Low Beam)

2 Side Marker Lamp, Front

3 DRL (Daytime Running Light) outer/ Turn Signal Indicator Lamp/Parking Lamp (Outer)

4 DRL (Daytime Running Light) inner/ Parking lamp (Inner)

Headlamp Functions

- **High Beam:** It illuminates the road ahead of the vehicle for a long distance.
- **Low Beam:** It distributes forward and lateral illumination of light without causing discomfort to the eyes of other road users. When there are oncoming vehicles ahead or while overtaking, the driver uses the low beam.
- **Side Marker Lamp:** It allows other road users to see the vehicle approaching at an angle at night and stop or slow down in time. Side marker lamp aid in avoiding and lessening the severity of a collision.
- **Turn Signal Indicator:** Used when changing lanes, turning and keeping other road users informed about the driver intention to avoid accidents.
- **Parking Lamp:** Used to notify other road users that the vehicle is stopped or parked.
- **DRL (Daytime running light):** During day driving, the DRL improves the visibility of the vehicle for the other road users.

DRL Override Switch (If Equipped)

J477644

By default, the DRL illuminates when the ignition key or button is in the ON position. In some cases, where the DRL is prohibited, such as at a natural gas filling station, the driver can use the override switch to turn off the DRL.

Automatic Headlamp Switching (AHS)

The AHS functionality switches between DRL and low beam depending on ambient light level, for example, in tunnels or at dusk. The intensity of the ambient light is detected by the ambient light sensor integrated with the rain sensor.

The AHS function activates when the ELCP is set to the "Headlamp Auto" position.

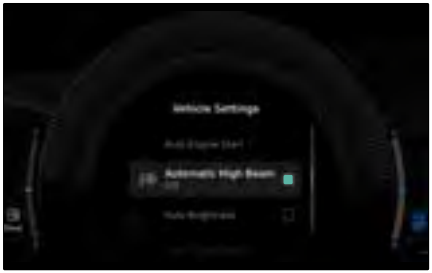
Automatic High Beam Activation (If Equipped)

The automatic high beam function automatically turns off the high beams without any driver intervention upon detecting light from an oncoming vehicle.

The automatic high beam function works only when the headlamp switch in the Auto position. Auto High Beam activation can be turned on or off via the instrument cluster menu.

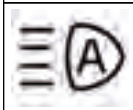
How to Find Automatic High Beam Settings

SETTINGS
↳ Vehicle Settings
↳ Automatic High Beam



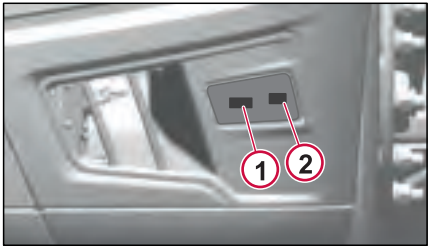
J481754

Tell-tale Indications

When high beam is activated without automatic high beam activation function, the high beam tell-tale illuminates in the instrument cluster	
When high beam is activated with automatic high beam activation function, the automatic high beam and the high beam tell-tales illuminate in the instrument cluster	 

The LED headlamp has to be replaced as a complete assembly only. To replace the headlamp, drive the vehicle to an authorized dealer workshop.

Fog Lamp and Static Cornering Lamp (If Equipped)



J475093

1 Fog Lamp

2 Static Cornering Lamp (if Equipped)

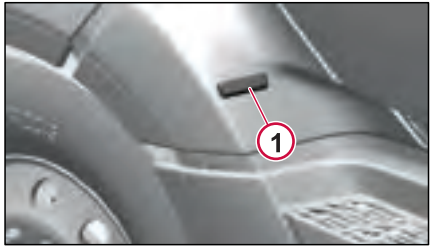
Fog Lamps are only illuminated with low beam headlamps, not high beams.

Cornering Lamps are designed to illuminate the area out to the sides of the truck from the front bumper. These lamps are switched On with the turn signal stalk when moving the steering wheel is turned past a specific point. This would take place only when maneuvering at low speeds.

In addition, the cornering lamp will illuminate in low light conditions when the truck is placed in reverse. This enables the driver to see around the front of the truck when maneuvering. The

lamps remain On until the truck moves past a speed of 6 mph (10 kph).

Side Repeater Lamp (Direction Indicator)

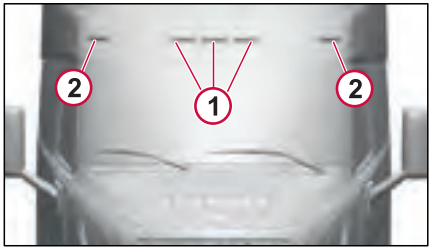


J475324

1 Side Repeater Lamp (Direction Indicator Lamp)

This light is used when changing lanes, turning and keeping other road users informed about the driver intention to avoid accidents.

Clearance/ID Lamps



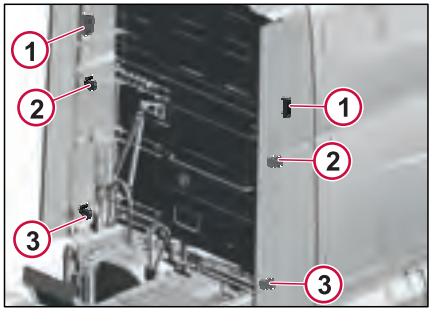
J475329

1 ID Lamps

2 Clearance Lamps

The clearance/ID lamps are located above the windshield, mounted on the sun deflector, they come on when the parking lamps are turned on.

Auxiliary Backup Lamp (If Equipped)



J481796

1 High Mounted Outboard Lamps

2 High Mounted Inboard Lamps

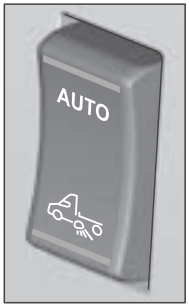
3 Low Mounted Inboard Lamps

NOTE

The truck may be equipped with one of the three auxiliary backup lamp mounting configurations.

The auxiliary backup lamps illuminates when the driver engages reverse gear. These lamps can also be controlled thorugh the dashboard switch.

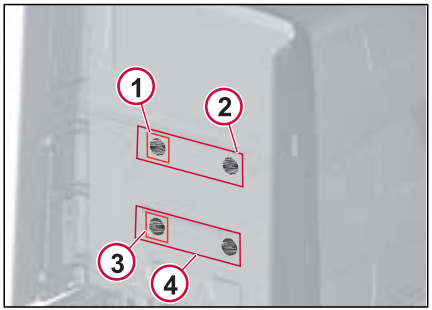
LIGHTINGS



J477633

When the switch is in the AUTO position, the lamps illuminate when the driver engages reverse gear. Pressing the lower part of the switch turns the lamps on manually.

Working Lamps (If equipped)



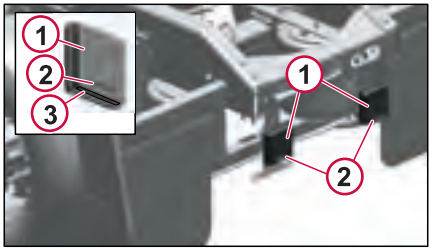
J481797

1 Single High Mounted Work Lamp
2 Dual High Mounted Work Lamp
3 Single Low Mounted Work Lamp
4 Dual Low Mounted Work Lamp

> **NOTE**
>
> The truck may be equipped with one of the four working lamp mounting configurations.

The working lamps are bright LED lamps, which can be turned on using a button in the ELCP.

Tail Lamps



J475355

1 Stop/Tail Turn Lamp
2 Reverse/Backup Lamp
3 License Plate Lamp

Hood Operation

⚠ WARNING

Avoid tilting the hood under high or gusty wind conditions. Failure to follow this recommendation may result in the hood unexpectedly closing, which can cause personal injury.

⚠ WARNING

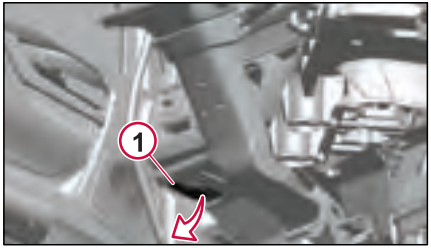
Make sure that no one is in the way of the hood when opening or closing. The hood could injure a person under the hood.

Opening the Hood

⚠ WARNING

Never step on the underrun protection before opening/tilting the hood, as doing so can be fatal to your feet.

The hood release is a part of the steering column lower cover. Pull the handle as shown in the illustration to open the hood. The hood is locked down by two latches. The hood is raised about two inches off its resting position when handle is pulled.



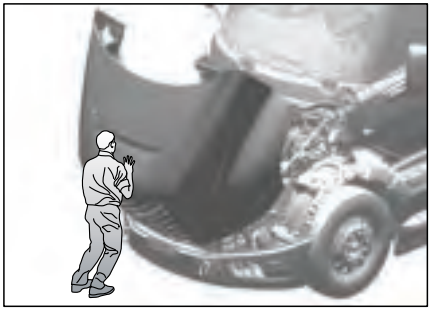
J477414

1 Hood Release Handle

Make sure that the hood can be opened fully without hitting anything. There are two methods for opening the hood.

Method 1

Stand in front of the hood with feet in line with the vehicle. Place feet well apart and grasp the recessed handle in the front part of the hood. Transfer the body weight by leaning away from the hood. Lift the hood until it is past the balance point. Release the hood and let it complete the opening movement unaided.

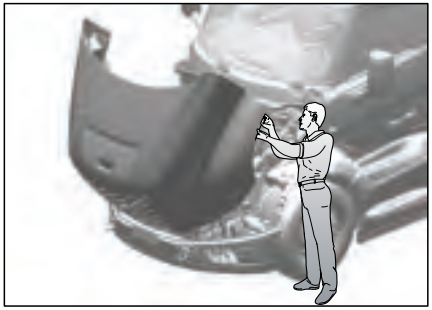


J477415

HOOD OPERATION

Method 2

Stand at the rear fender edge on the driver side of the vehicle. Lift the hood from under the fender, push the hood forward, release the hood and let it complete the opening movement unaided.



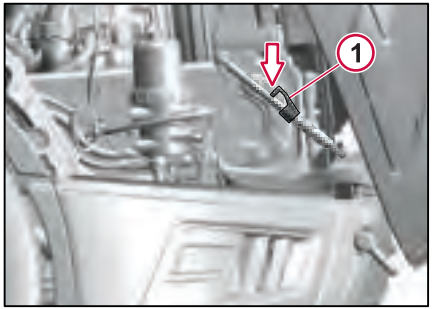
J477416

Two restraint cylinders will engage during the last part of the opening. The cylinders will slow and dampen the hood down to its resting position.

Hood Tilt Safety Lever

The orange colored safety lever that prevents the hood from being accidently closed or blown closed by high winds.

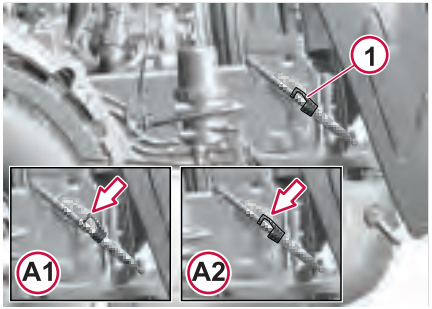
Ensure that the safety lever (located on the passenger side hood spring strut) is not locked when the hood is tilted.



J481467

1 Safety Lever in Unlocked Position

To close the hood, the safety lever must be locked and aligned to the gas strut.



J481468

1. Safety Lever

A1. The safety lever is in unlocked position and is not aligned with the gas strut.

A2. Press the safety lever to lock and align with the gas strut.

Now the hood is ready to close.

Closing the Hood

To close the hood, stand with feet well apart, place hands along the front edge of the hood. Bend the knees and let the leg muscles do the work when lifting. Raise the hood up to the halfway point. Carefully guide the hood down with enough speed that the hood latches lock the hood in place when it comes to its normal resting position.

J477465

Ensure that the hood is locked.

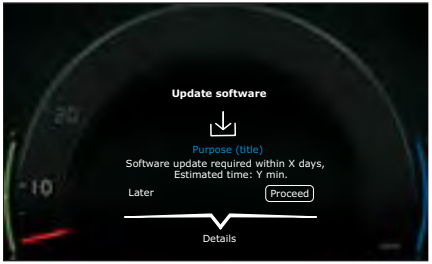
REMOTE SOFTWARE DOWNLOAD

The truck has the option to download and update the truck's software and parameters remotely. When an update becomes available, a message and/or icon may appear in the instrument cluster alerting the operator that a remote software update is available.

The estimated time (1 to 60 minutes) required to update the truck with the new software is shown in the instrument cluster before the update starts.
During the update, the truck may not be used in any way and many functions are disabled. Therefore, plan the update for an appropriate time.
You can start the update either when the message is shown or later. If you want to do the update later, press the Back button on the steering wheel keypad to close the message.

⚠ WARNING

The software update cannot be aborted after it begins. Do not turn Off the key, disconnect the battery, or attempt to start the engine while the update is in progress. Doing so could leave vehicle temporarily inoperable, requiring a repair.



J481353

J477021

Remote Update Available Icon

⚠ CAUTION

The system requires that the truck remain stationary, with the parking brake set, and remain undisturbed for several minutes in order for the update to be able to complete. If you do not think you will able to meet these requirements, it is highly recommended that you delay the update until sufficient time can be allotted.

ⓘ NOTE

During Remote Software Download the vehicle warning lights, gauges or tell-tales may display, sweep or blink. This is normal and does not indicate any system related failures.

ⓘ NOTE

The download icon in the instrument cluster will blink, and the screen will go blank for several minutes, which indicates that the instrument cluster is being programmed.

ⓘ NOTE

If download icon stops blinking, and warning lights illuminate, call support number on visor.

How to Find the Software Update Menu

The Software Update function can be accessed directly through the MAINTENANCE menu while an Update Package is available.

Instrument Cluster

MAINTENANCE
↳ Software Update

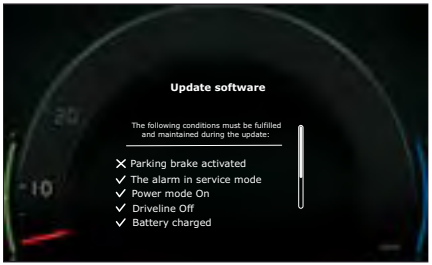
The following conditions must be maintained for the update to succeed:

- Vehicle must be in a safe location on level ground
- Key On/Engine Off
- Battery sufficiently charged
- Parking brake set
- Good cellular network

270346_1

- Sufficient memory
- Turn-Off electrical system accessories (HVAC, wipers, fog/ driving lights, and the inverter)
- Do not interrupt conditions until update is complete.

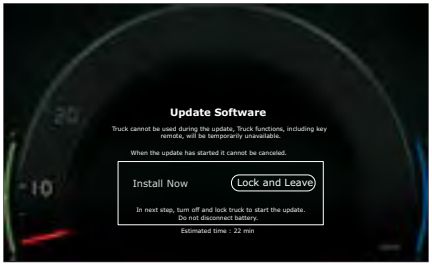
If any preconditions that are not met will be listed and displayed on the screen.



J481354

Once all the preconditions are satisfied, the operator follows a series of simple screens to initiate the installation.

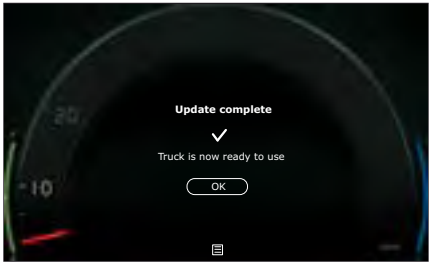
Before the update begins, the estimated time needed for the update to complete will be displayed.



J481357

When the Remote Update is successfully completed, a message is shown in the instrument cluster. Press OK to continue.

The update will then be complete and the vehicle should be ready to drive.



J481356

In the event where an update fails to complete, the onscreen prompt will provide necessary instructions to retry the update. Or, you can call an uptime agent to support with the download. The onscreen prompt will provide the contact number for the agent to help with the operation.

NOTE

This remote programming feature is configured to the truck based on customer request. Authorized personnel can call 1-800-52-VOLVO anytime to make changes to how this feature is configured.

06

STARTING AND DRIVING

DAILY INSPECTION OF THE TRUCK

Check

1 **Lighting**
Headlamps and other lights are working.

2 **Washer fluid**
Windshield cleaning has a tank, which holds about 12.5 liters of washer fluid. Use Volvo branded washer fluid. When the fluid level drops to the lowest alarm level, a pop-up message is displayed in the instrument cluster.

J474369

Filling for washer fluid.

3 **Windows and mirrors**
Windows and outside mirrors must be intact and clean.

4 **Cooling**
The cooling capacity is important. Open the service cover and check that radiator is not clogged. Clean if necessary.

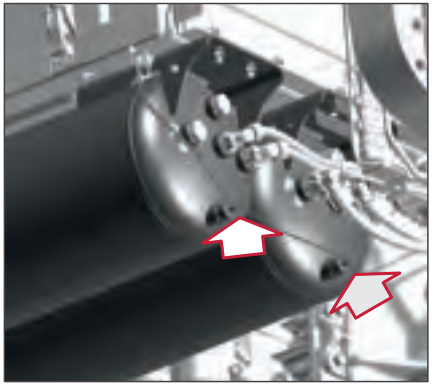
Also check behind the cooling fans for the parking cooler. The bug screen does not cover this part of the cooler.

> **NOTE**
>
> Exercise extreme caution when cleaning so that the cooling plates are not damaged.

5 Check that there are no traces of leaks under the truck.

6 **Tires**
Check that there are no cracks and stones in the tires.

7 **Air tanks**
Pull the air tank valve rings in order to check that there is no condensation in the air tanks. Water in the air tanks is a sign that the air drier is not working.



J474370

Examples of Air Tanks.

8 Check that the load is properly secured.

NOTE

Do not place the key fob in the induction charger, even if the induction charger is not used. The inductive charger will block the key fob detection waves by the immobilizer and prevent it from working.

WARNING

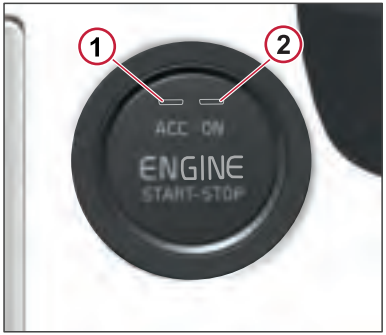
When starting the vehicle, make sure the service brakes are applied. Failure to apply service brakes may result in unexpected vehicle movement.

NOTE

The key fob must be detected inside the cab. If the key fob is not detected or if it is not identified, a message will be displayed on the instrument cluster. Check that the key fob is present in the cab, or replace the key battery. If the fault persists, contact an authorized Volvo dealer.

Starting the Engine

Ignition Button



J470780

1 ACC (Accessories) LED

2 ON LED

When the battery saver switch and functional main switch (if equipped) are closed and the ignition button is pressed, for every short press, the vehicle mode transitions from OFF->ACC->ON->OFF.

To start the engine:

- From any position, long-press (press and hold) the ignition button (START/STOP button) without applying the brake pedal. Or
- From the ON position (Pre-running mode), apply the brake pedal and short press the button.

Ensure that the warning lamps in the instrument cluster go off before starting the engine.

If the gear selector is not in neutral, a starter protection message appears in the instrument display and an audible warning. The transmission gear selector (stalk switch) must be in the N position otherwise the engine will fail to start.

If the air system pressure is less than 448 ± 34 kPa (65 ± 5 psi), a low air pressure message appears in the instrument display. Also, a tell-tale illuminates and an audible warning sounds. Start the engine and allow the air pressure to build in the reservoir. The buzzer shuts off as soon as sufficient air pressure is restored. Wait until the warning message and the tell-tale go Off before attempting to shift the transmission into Drive or Reverse Position.

STARTING AND DRIVING

Drive the Truck

1 Depress the brake pedal.

2 Release the parking brake.

3 Move the gear selector to the Drive position (D) on the Stalk Switch.

Vehicle mode changes from Neutral (N) to Drive (D) and is displayed at the bottom of the instrument display. Vehicle is ready to move, release the brake and accelerate.

If the brake pedal is not applied before moving the gear selector from the N position, the message "Depress Brake Pedal Before Selecting a Gear" is displayed in the instrument cluster.

When the warning indication appears:

1 Move the gear selector back to the N position.

2 Apply the brake pedal.

3 Move the gear selector back to the D or R position.

Turn Off the Engine

To stop the engine:

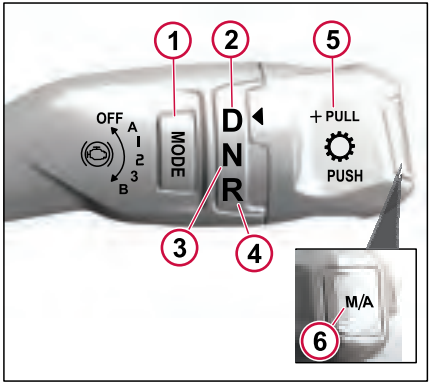
- Long-press (press and hold) the button. Or
- Short-press the button when the vehicle speed is 0 mph and the key fob is detected inside the cab.

Gear Selector

The gear selector (stalk switch) is in the right-hand side of the steering column. The selector has the gear positions of R (Reverse), N (Neutral), and D (Drive). The selector has the M/A button to switch between M (Manual) and A (Auto). With the selector in the Drive position, the transmission shifts as an automatic, performing gear selections and shifting without driver input. When in the manual position, the driver can upshift or downshift the gears using the stalk switch. Pull the stalk switch to upshift and push to downshift. If the manual position is engaged at a stop, the vehicle starts in first gear and holds that gear.

The DRIVE MODE button on the stalk switch allows you to switch between drive modes (Extra Economy->Balanced Economy->Performance->Extra Economy). There is also the performance plus mode or heavy duty mode supported with the vocational trucks. Long press the driver mode button to activate or deactivate the performance plus mode or heavy duty mode.

In situations where the I-Shift is unintentionally left in gear with the parking brake applied, the Transmission Control Module (TCM) will automatically go to neutral when the ignition key is turned to OFF position. This is done to avoid the transmission getting stuck in gear due to driveline “torque up”.



J474778

1 Mode

2 Drive

3 Neutral

4 Reverse

5 Gear selector knob (+ pull/- push)

6 Manual/Automatic

270346_1

Filter summery to long to be displayed.

START/STOP Button Functions

START/STOP Button Position	Button Short-Pressed	Button Long-Pressed
Off Position	A short-press transitions from Off to ACC position.	Long-press cranks the engine
ACC (Accessory) Position	A short-press transitions from ACC to ON (Pre-running) position	Long-press cranks the engine
ON (Pre-running - Engine not running)	1 A short press of the button without applying the brake pedal transitions from the ON (pre-running) to the OFF position. 2 A short press of the button with the brake pedal depressed cranks the engine.	Long-press with the brake pedal depressed or the active parking brake cranks the engine.
ON (Engine Running)	A short press turns off the engine when the vehicle speed is 0 mph and the key fob is detected inside the cab.	Long-pressing the button shuts off the engine.

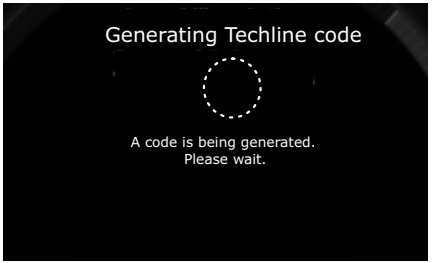
IMMOBILIZER

The key fob is equipped with a transponder that detects the key fob's presence inside the cab. When detected, the starter button is activated to turn on the engine. However, if there's an error with the key fob or the transponder isn't recognized, the Driver Information Display (DID) will show "key not valid."

J480909

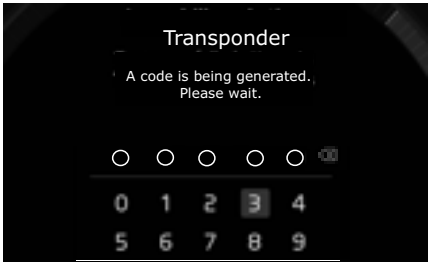
Press OK to start pin code procedure.

After completing the procedure, A code will get generated and the DID will show "Generating Techline code".



J480746

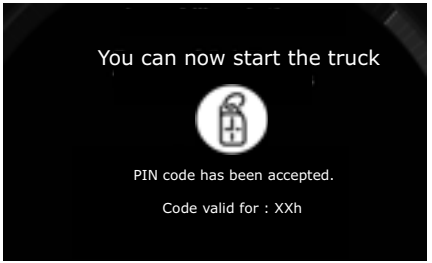
The technline code will appear on the DID, input the code.



J480814

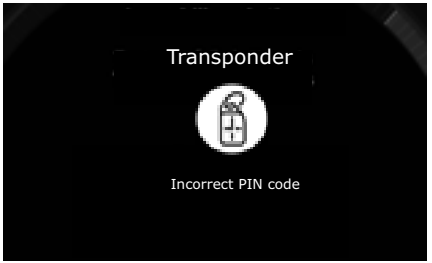
After the code generation and Pin is accepted. The DID shows the notification to start the truck.

Take the Vehicle to the nearest authorized dealership and get the PIN.



J480748

If the entered PIN is incorrect or if there's a communication error, a notification will appear indicating the reason for the error. The screen will then guide you back to the initial notification, prompting you to repeat the procedure.

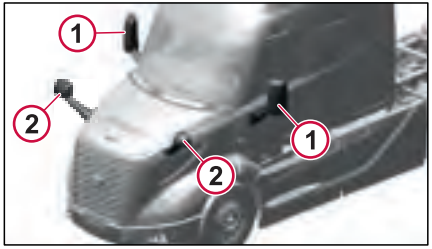


J480813

After receiving an error, you'll need to go through the procedure again. Ensure that, this time, you enter the PIN code carefully and accurately.

Introduction

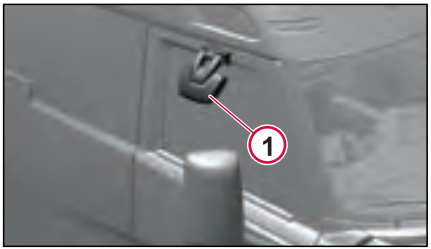
Trucks may have rear-view mirrors, hood mirrors, close-view mirror or combinations of mirrors based on the vehicle configuration to provide a wider range of visibility for the driver. These mirrors often come equipped with features such as mirror adjustment and heating, allowing the driver to customize their view and ensure clear visibility in various weather conditions. Proper usage and maintenance of these mirrors are essential for safe and effective driving.



J465526

1 Rear-view Mirror

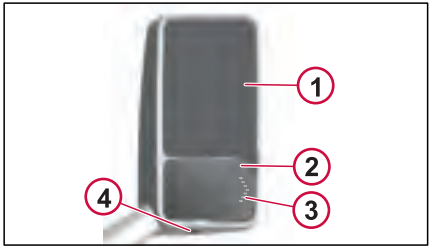
2 Hood Mirror



J479664

1 Close-view Mirror, Passenger Side

Rear-view Mirror



J479661

1 Main Mirror

2 Wide Angle Mirror

3 Turn Indicator (optional)

4 Puddle Light

Mirror Adjustment

The main mirrors are adjusted electrically in both vertical and horizontal direction. Both driver side mirror and passenger side mirror are adjusted independently.

Wide-angle mirrors can only be adjusted manually.

J465542

1 Left Mirror Selection Button

2 Right Mirror Selection Button

3 Joystick to Adjust Mirror and Camera

Use the mirror selector button in the door control panel to choose the mirror that requires the adjustment. After the mirror is selected, use the joystick to move the

OUTSIDE MIRRORS

mirrors horizontally and/or vertically to adjust the mirrors according to the your requirements.

Mirror heating

The main mirrors, wide-angle mirrors and hood mirrors (if equipped) are heated electrically.

J465543

1 Mirror heater button (with timer)

2 Mirror heater button (without timer)

The mirror heating function will be active only when the engine is running. This function has two modes:
Mode 1 - mirror heat for 30-minutes.
Mode 2 - continuous mirror heating until engine is Off.

Mirror heating mode 1

When the mirror heating button (with timer) is pressed, the heating function activates for approximately 30 minutes and then deactivates. When activated, the light on the mirror heating button blinks.

Mirror heating mode 2

When the mirror heating button (without timer) is pressed, the heating function remains active until the engine is turned Off or the driver deactivates the feature. The heater runs with full power for the first 30 minutes, then reduce the power to 70% to maintain the heat. The heating mode is active until the driver deactivates the feature.

The heating function will also be deactivated temporarily whenever other function in the DCP (Door Control Panel) is triggered (for example, window regulator). The heating function will be enabled again once the other function of DCP is no longer active.

Proper engine maintenance and preparation are required for cold-weather operation. If these precautions are performed, ordinary cold weather does not cause difficulty in starting or loss of efficiency.

Cold-weather operation requires changes in operating practices, maintenance procedures, lubrication, and fuel. Additions to the vehicle, such as heated fuel filters, fuel tank heater, engine block heater, and winterfront can make winter operation easier. Contact your authorized Volvo Trucks dealer for the correct accessories and information about installation.

If satisfactory engine temperature is not maintained, increased engine wear will result in higher maintenance cost. Cold weather accessories should be easily disconnected when switching to driving in warmer weather so they do not affect the operation of the engine.

For cold-weather operation, follow these recommendations:

- When starting the engine in temperatures less than 5°F (-15°C), use engine lubricants of lower viscosity.
- When the temperature is anticipated to be below freezing, make sure that the concentration of antifreeze in the coolant is sufficient to prevent freezing.
- During cold weather, pay more attention to the condition of the batteries. Test them frequently to ensure sufficient power for starting. A dead battery can freeze.
- Fuel cloud point is the temperature at which wax crystals become visible, which is generally above the pour point of the fuel. To prevent fuel filter elements from plugging, do not allow the cloud point to be higher than the lowest ambient temperature for engine start.

Ensure the Park Brake is engaged and allow 10 minutes of idle time before departing. Low Idle speed is sufficient for warming up the engine, and you may notice a change in engine noise. Operate at partial load until the coolant temperature reaches 165°F (175°C).

Engine Block Heater (if Equipped)

An electric engine block heater can be installed for keeping the coolant warm when the vehicle is parked. The heater is mounted through the side of the engine block with the heater coils in the coolant jacket. The heater does not interfere with normal operation and can be permanently installed.

The heater runs on 120 V and has an easily accessible plug located beside the driver side door. The plug hooks up to a normal extension cable.

> **NOTE**
>
> Make sure that the extension cord can hold the amp load of the heater.

> **NOTE**
>
> The location of the block heater depends on vehicle model.

J464841

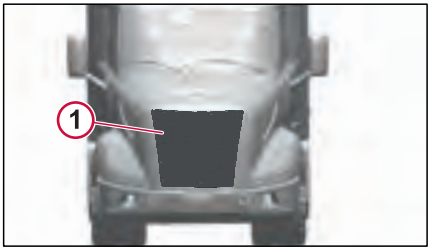
1 Engine Block Heater Plug

COLD-WEATHER OPERATIONS

Winterfront

The winterfront is used during cold-weather operation. It covers the radiator grille to block the cold air entering into the engine compartment when the vehicle is parked and also enables the engine to retain the ideal operating temperature while running the vehicle through the winter weather.

Winterfront for Extreme Cold Condition



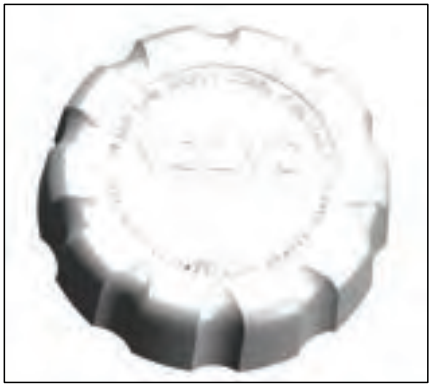
J474634

1 Winterfront, Extreme Cold

Fuel Tank

Fuel Tank Cap

Use a Volvo-approved non-vented cap only. Otherwise, tank damage and/or poor engine performance may result. DO NOT fill to more than 95% of tank capacity.



J463143

Fuelling

⚠ DANGER

DO NOT carry extra fuel containers in the cab. Fuel containers, full or empty, may leak, explode or give added fuel to a fire. Failure to follow this precaution may lead to serious personal injury or death.

⚠ DANGER

DO NOT smoke while fuelling the vehicle. The glow from the cigar/cigarette can ignite the diesel fuel, causing an explosion resulting in serious personal injury or death.

⚠ DANGER

Do not remove the fuel tank cap near an open flame. Diesel fuel vapors are combustible and can cause an explosion or fire, resulting in severe personal injury or death.

⚠ CAUTION

Diesel-powered engines for heavy-duty trucks are designed to operate only with Ultra Low Sulfur Diesel (ULSD) fuel. Improper fuel use will reduce the efficiency and durability of engines, permanently damage advanced emissions control systems, reduce fuel economy and possibly prevent the vehicles from running at all. Manufacturer warranties will be voided by improper fuel use. Additionally, burning Low Sulfur Diesel fuel (instead of ULSD fuel) in diesel-powered cars, trucks and buses is illegal and punishable with civil penalties.

Air is always present inside the fuel tanks, entering mainly through the tank ventilation. With the air being heated and cooled, condensation is formed and water is mixed in the fuel. To avoid condensation when the vehicle is parked for longer period, fill the tanks up to 95% of capacity. Do not fill more than that, as the fuel needs to have room for expansion during the heat of the day.

Fuel Economy

General

The absolute fuel consumption (counted in liters per 100 kilometers or miles per US gallon) is determined by a large number of circumstances, which can be related to one of the following main areas:

- Build specification and equipment
- Service and maintenance
- External environment
- Driving habits

Due to these factors, fuel consumption can vary considerably within what is called "normal fuel consumption". Fuel consumption can vary from over 10 mpg (24 L/100 Km) when driving empty on a nice and dry summer road to 3.5 mpg (67 L/100 Km) while driving with maximum permitted GVW, with vehicle and trailer, on a hilly and slushy winter road.

FUEL TANK AND FUELLING

Build Specification and Equipment

Whenever a vehicle is used for transportation, its build specification, equipment and gross vehicle weight have a decisive effect on both fuel consumption and performance. The factors which have the greatest influence on fuel consumption are primarily: driveline combination, height of trailer or superstructure, use of air fairings, tire type, number of wheels, gross vehicle weight, and accessories.

Driveline Combination

Engine, transmission and final drive must be selected in such a way that the engine can operate within the economic speed range at normal driving speed. This range is defined as where the engine makes the best use of the energy content of the diesel fuel. A poorly selected rear axle ratio, which results in the engine speed being constantly above the optimum speed will increase fuel consumption.

Tires

Heavy duty tires increase rolling resistance considerably. For long haul, choose a smoother, ribbed type tire. Choose a lugged type tire only when the added traction in mud and snow is needed.

The number of wheels (axles) has a direct effect on the rolling resistance and, thereby, the fuel consumption. For volume and/or low weight transports, use of a 4 x 2 instead of a 6 x 4 should be considered.

If the tire pressure is too low, the rolling resistance increases and thereby, increases the fuel consumption. The overall economy is also affected as tire wear increases considerably.

Gross Vehicle Weight

The gross vehicle weight of a vehicle combination has a large impact on the rolling resistance.

Accessories

As a rule, accessories such as roof rack, advertising signs, bug screens, exposed air horns, etc., have a negative effect on fuel consumption.

Service and Maintenance

A modern heavy-duty vehicle requires regular and preventive maintenance to ensure that all its components function as they should. Use the recommended preventive maintenance (PM) program that is developed for the vehicles. This ensures optimal energy efficiency from all components that are important to fuel consumption.

Brakes

Dragging brakes increase fuel consumption. They should be checked regularly. It is important that the release action of the air valves is fast and that the moving parts of the wheel brakes are checked for good adjustment and operation.

Axles

An axle out of alignment increases rolling resistance. Regularly check the front wheel alignment and axles on both the tractor and trailer/semi-trailer. If they are correct, there will be less rolling resistance and therefore, lower fuel consumption. A good sign of an axle or wheel out of alignment is uneven tire wear. Check the tires often.

Engine

Faulty or incorrectly adjusted engine components increase fuel consumption. The list below gives some typical components that can influence fuel consumption:

- Blocked (on the outside) charge air cooler/radiator package
- Faulty thermostat
- Blocked fuel filters
- Blocked air intake filter
- Faulty injectors

- Dirty turbocharger
- Air in fuel system
- Faulty fuel supply pump
- Faulty fuel relief valve
- Faulty fan thermostat/clutch.

External Environment

Under unfavorable conditions, the external environment can have a negative effect on fuel consumption. This can be broken down into two main groups: weather and wind, and the nature of the roads. Rain, snow, icy conditions and headwinds have a large negative impact on fuel economy, as do hilly roads and uneven road surfaces.

Headwinds

Headwinds have a large negative impact on fuel consumption. With tailwinds, fuel saving is only marginal.

Air Temperature

Low ambient temperature contributes to increased fuel consumption.

Rain, Snow and Road Surface

A wet road surface increases rolling resistance and thereby, fuel consumption. Slush will increase consumption even more. In certain cases, the surface structure of the road can also have a negative effect on fuel consumption.

Gradients

A hilly road with many bends demands a higher output from the engine. The difference between flat, straight roads and hilly, winding roads can amount to as much as a 50 percent increase in fuel consumption. When choosing your route, avoid hills, rough roads and frequent stops.

Driving Habits

The way in which a vehicle is being driven is the one factor which has the greatest influence on fuel consumption. Correct driving saves fuel and reduces vehicle wear. To achieve optimal running economy, the driver should always remember to:

- Start the engine correctly (especially important in winter season).
- Maintain an even and correct speed.
- Keep the engine at its optimal speed range.
- Use the correct uphill and downhill driving technique.

Starting the Engine

Start the engine according to the instructions in the operator's manual. A proper start, especially during the cold season, saves fuel and reduces engine wear. Sluggish lube oil in the engine makes cold starting more difficult.

Therefore, it is important to always use engine oil with the correct viscosity. For the sake of the overall fuel economy, it is also important to have the right viscosity of transmission and rear axle oils.

Avoid High Engine Speeds

High engine speeds mean high fuel consumption. Erratic driving also increases fuel consumption when the vehicle is constantly accelerated and slowed down. Avoid a higher consumption by steady and even driving.

Hill Driving Technique

Use the inertia of the vehicle to go over the crest of a hill under reduced power. Use gravity to help with acceleration when going down the hill. Build up speed before reaching the next uphill.

Power Supply

Function Positions

The truck has many systems that might drain the batteries voltage. There are different function modes available allowing the driver to control battery voltage consumption and make sure that the batteries have the necessary energy to start the engine. The function modes are developed to address different situations.

J474373

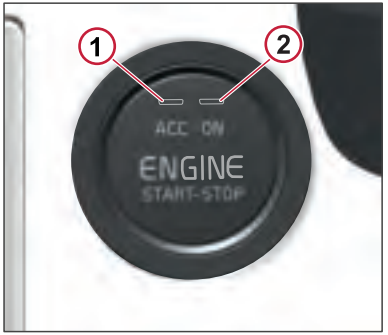
1 Ignition Button

Vehicle Modes

The vehicle mode is designed with specific functions to address specific needs.

Transitions between different vehicles mode happen through switch positions (OFF-ACC-ON-START).

Ignition Button



J470780

1 ACC (Accessories) LED

2 ON LED

When the battery saver switch and functional main switch (if equipped) are closed and the start button is pressed, for every short press, the position transitions from OFF->ACC->ON->OFF.

To start/crank the engine, depress the brake pedal and long-press (press and hold) the start button.

Modes

The vehicle can operate in a number of different modes. The vehicle modes control which functions are available in the truck.

	Vehicle Modes	Ignition Key Position
1	Parked	Start button is in OFF position, Door Locked, and Living to Parker Mode timer elapsed or Functional Main Switch is Open (if equipped)
2	Living	Start button is in OFF position, Door Locked, Living to Parker Mode timer not elapsed and Functional Main Switch is closed (if equipped)
3	Accessory	Start button is in ACC position
4	Pre-running/ Ignition	Start button is in ON position
5	Running	Start button is in ON position (with engine running)

Parked Mode

When the vehicle is in Parked Mode, the system saves the battery power and prevents the battery from draining.

For Vehicle with ignition key, the Parked Mode is automatically activated:

- After 12 hours of Living Mode when the ignition key is in OFF position and not removed from the key switch.
  Or
- After 2 hours of Living Mode when the ignition key is removed from the key switch.

For Vehicle with a start button, the Parked Mode is automatically activated:

- After 12 hours of Living Mode when the start button is in Off position and keyfob is detected inside the cab.
  Or
- After 2 hours of Living Mode when the start button is in Off position and keyfob is not detected inside the cab.

The following functions are active during the Parked Mode:

1 Alarm

2 Pre-heat

3 Park light.

Parked Reduced Mode:

From the Parked Mode or Living Mode, you can switch to Parked Reduced Mode using the functional main switch. The Parked Mode consumes 100 mA of power and the Parked Reduced Mode consumes 70 mA of power from the batteries.

The following functions are active during the Parked Reduced Mode:

1 Alarm

2 Park light.

Living Mode

The Living Mode is one of the most critical modes in terms of battery consumption and is activated when the truck engine is Off or the Ignition button/ ignition key is in Off position.

For vehicle with ignition key, the Living Mode remains active:

- For 12 hours, when the key is in OFF or ACC positon and not removed from the key switch.
  Or
- For 2 hours, when the key is removed from the key switch.

For vehicle with ignition button, the Living Mode remains active:

- For 12 hours, when the start button is in Off or ACC position and the keyfob is detected inside the cab.
  Or
- For 2 hours, when the start button is in Off or ACC position and the keyfob is not detected inside the cab.

The following functions are activated during the Living Mode:

1 Interior lights

2 Audio

3 Fridge

4 Security

5 Comfort/Recreation.

Accessory Mode

This Accessory Mode is used when the driver is preparing for departure and only the necessary functions are active. Place the ignition key in the ACC position to activate Accessory Mode. With an ignition button, press once to activate the Accessory Mode.

1 Climate Controls

2 Power Windows

3 Wipers and washer

4 Mirrors.

Pre-run Mode

Pre-run Mode is used just before starting the engine. It activates the engine subnet and other engine starting aid functions, if necessary. All functions are available except those that require the engine to be running. The Pre-run is activated

when the key is in the On position. With an ignition button, long press the button until the ON light is lit.

This vehicle mode consumes most power. Pre-running is used to prepare the engine for cranking. Do not stay in this mode for more than 10 minutes.

The following functions are activated when the Pre-run is On:

1 Exterior lights
2 Driveline
3 Safety
4 Brakes
5 Steering
6 Suspension
7 Bodybuilder
8 Pre-heat

Cranking Mode

Cranking Mode is used to start the engine. All the functions needed to start the engine are prioritized while some non-essential functions (for example, radio and lights) are disconnected for a short time period.

Hold the key in Start position until the engine is cranked. For a vehicle with an ignition button, after a long press, the system moves into pre-run mode. When pre-heat is completed in pre-run mode, the engine starts automatically.

Following functions are activated:

1 Start control prioritizes
2 Engine start
3 Critical functions.

Run Mode

Run Mode is used for driving and normal operation. The engine is running and the alternator is providing the other electrical components with power as well as charging the batteries. All functions are available.

Functional Main Switch

Functional Main Switch helps in saving battery power by changing from Vehicle Parked Mode to Parked Reduced Mode resulting in reduced power consumption.

There are 3 types of Functional Main Switch (battery saver switch). The Vehicle will have one of the following switches.

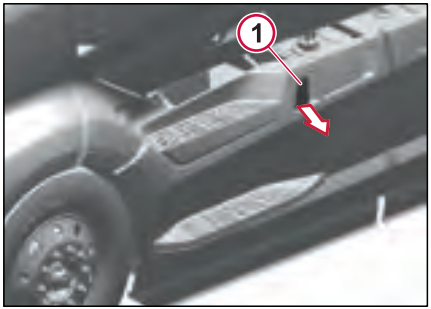
1 Main Switch Basic (MSWI-B)
2 Main Switch Chassis (MSWI-C)
3 Main Switch CAB (MSWI-CAB)
4 Main Switch Remote Controlled (MSWI-R).

Main Switch Basic (MSWI-B)

The base variant truck will not have a battery saver or functional main switch. In the base variant, the truck can have only the timer function. The timer function will automatically switch the vehicle from Living Mode to Parked Mode:
1. When no key is detected for 2 hours.
2. When the key is detected but the vehicle has not moved for 12 hours.

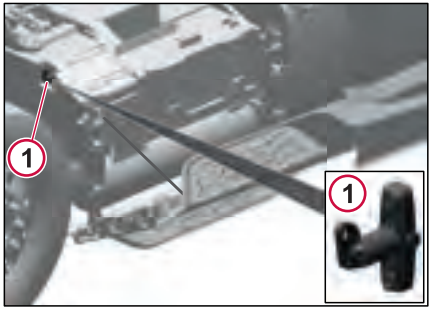
Main Switch Chassis (MSWI-C)

The functional main switch is located on the left hand side of the truck.



J470781

To access the main switch, pull the lever (1) to open the chassis fairing.



J470817

1 Main Switch - Chassis

To switch the vehicle from Living or Parked Mode to Parked Reduced Mode, turn Off the main switch (in the counterclockwise direction).

When the chassis main switch is not used (not turned Off), the timer function will automatically switch the vehicle from Living Mode to Parked Mode:

1 When no key is detected for 2 hours.

2 When the key is detected but the vehicle has not moved for 12 hours.

Main Switch CAB (MSWI-CAB)

J470855

The battery saver switch is located on the dashboard. Press the switch to move the vehicle from the Living or Parked Mode to Parked Reduced Mode.

When the main switch is not used, the timer function will automatically switch the vehicle from Living Mode to Parked Mode:

1 When no key is detected for 2 hours.

2 When the key is detected but the vehicle has not moved for 12 hours.

Main Switch Remote Controlled (MSWI-R)

J457762

To switch the vehicle from Living or Parked Mode to Parked Reduced Mode, long press the lock button on the key fob.

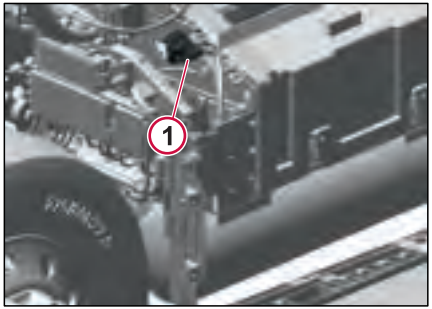
When the main switch is not used, the timer function will automatically switch the vehicle from Living Mode to Parked Mode:

1 When no key/key fob is detected for 2 hours.

2 When the key/key fob is detected but the vehicle has not moved for 12 hours.

POWER SUPPLY

Battery Switch



J470857

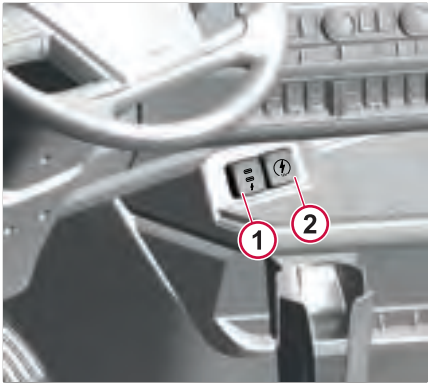
1 Battery Saver Switch

The Battery Saver Switch is used to completely cut off the electrical connection between the vehicle's batteries and its electrical system. This switch is typically used during vehicle storage or maintenance to prevent any drain on the batteries and to ensure safety by preventing unintensional electrical activity. The Battery Saver Switch is a crucial component for preserving battery power and preventing potential electrical hazards.

12 Volt/USB Outlets

The 12 V outlets and USB ports utilize the truck's 12 V network for supplying power to external devices. There are two USB ports and two 12 V outlets (overhead and dashboard).

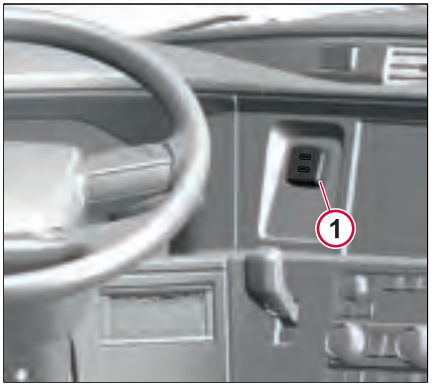
Driver Side Dashboard



J460266

1 Dual USB Outlet

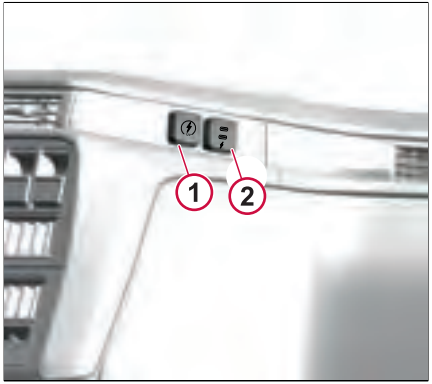
2 12 V Outlet



J460267

1 12 V Outlet

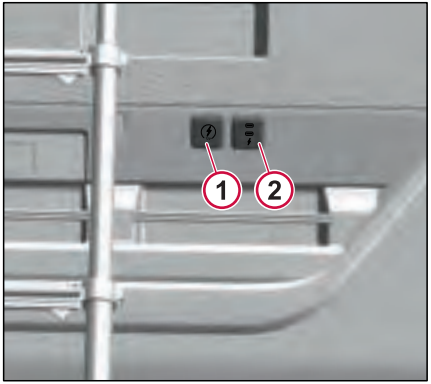
Upper Dashboard



J460269

1 12 V Outlet
2 Dual USB Outlet

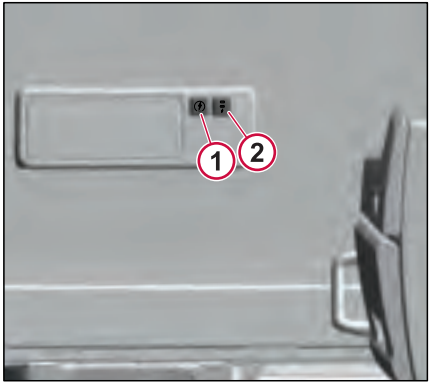
Bunk Region



J460301

1 12 V Outlet
2 Dual USB Outlet

Upper Bunk Region

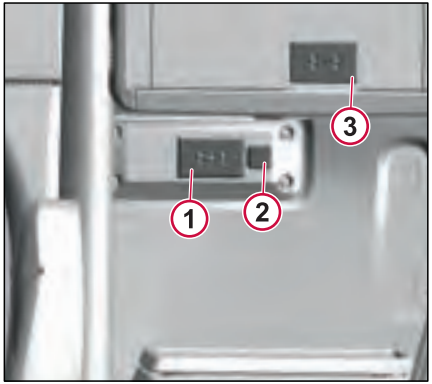


J460312

1 12 V Outlet
2 Dual USB Outlet

POWER SUPPLY

Behind The Passenger Seat (Right-Side)



J460358

1 Electrical outlet (Plug TV)(110 V)

2 12 V Outlet

3 Microwave Electric Outlet (110 V)

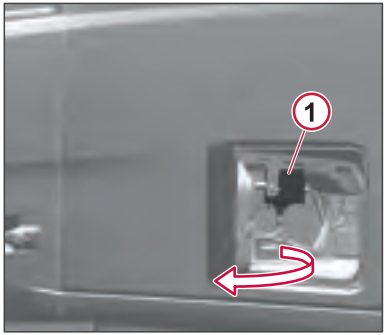
Outlet under Bunk

There is an outlet located under the lower bunk.

J460323

1 Electrical Outlet

Luggage Compartment Outlets



J476381

1 120 V Load Center, Distribution Box

Engine Starting Aid

The purpose of the engine starting aid is to lower the exhaust emission and assist the engine start at very low outdoor temperatures.

The engine starting aid uses the heater element, which is located on the engine inlet manifold for air preheating and after heating.

- Air Preheating - Heater element is activated before starting the engine.
- Air after heating - Heater element is activated after the engine is started.

The heater element is active when the starter key turned to the On position and the engine coolant temperature is less than 12 °C. When the engine coolant temperature is more than 10 °C, the preheating time is 25 seconds. When the engine coolant temperature is less than -10 °C, the preheating time is 50 seconds. The ECM (Engine Control Module) controls the preheating and after heating time.

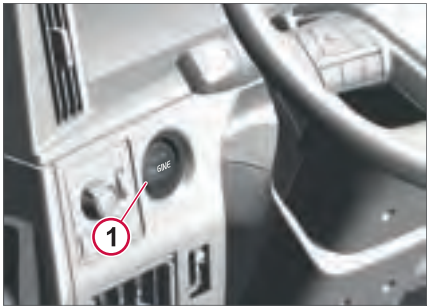
When the starter element is active, the preheating tell-tale is displayed in the instrument cluster.

J477313

Engine Start/Stop Push Button (Passive Start System)

Engine Start

The push button (passive start system) allows the driver to start/stop the engine.



J458156

There are two possibilities to start or crank the engine.

- Start the engine by a long press on the push (start/stop) button (at least for 3 seconds)

  Or

- Start the engine by applying the brake pedal and a short press on the push button.

Engine Stop with Push Button

To stop the engine, there are two possibilities:

1. Long press the push button for 3 seconds when the vehicle speed > 0 km/hr
2. Short press on the push button when the vehicle speed = 0 km/hr

ENGINE

Pre-conditions to Start the Engine

Driver will be notified of conditions when the truck cannot start and the indication can disappear once the condition is cleared.

When Starter Overheated

The notification shows the remaining hours for the starter motor to cool down and then it can be ready to crank the engine.

J477369

When PTO is Active

The notification shows to "Disable PTO".

J477368

When Gear Lever Not in Neutral

The notification indicates to change gear lever position to neutral.

J477367

Idle Shutdown

The purpose of the idle shutdown timer is to shut down the engine when it is in idling too long.

Engine Protection

Engine Protection controls the protective functions that will be used to protect the engine from damage. When some driveline operating critical condition arises (coolant temperature too high, low coolant level, etc.), the engine is temporarily restricted to protect the driveline and to avoid possible damage.

The display will inform when there is a condition that needs attention to protect the engine. It can be either something that the driver can fix rather easily or things that require a visit to the workshop.

The following services are monitored:

- Coolant Temperature (High)
- Coolant Level (Low)
- Engine Oil Temperature (High)
- Engine Oil Level (Low)
- Engine Pressure (Low)
- Engine Overspeed (High)
- Fuel Pressure (Low)

The actions that can be taken when engine protection is activated are listed below:

- Yellow caution lamp
- Red stop lamp
- Reduce maximum torque
- Reduce maximum engine speed
- Reduce maximum road speed
- Force the engine to idle after a certain time
- Shut down the engine after a certain time (the vehicle must be parked).

Notifications

Engine Coolant Temperature

If the engine coolant temperature is high, the instrument cluster shows the notification to drive cautiously.

If the engine temperature is exceeding the normal performing temperature, which is too high, the instrument cluster shows the notification to stop the vehicle.

J476555

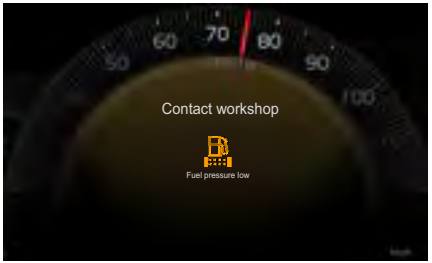
If the engine coolant level is low, the instrument cluster shows the notification to give "Attention".

If the engine coolant level is extremely low, the instrument cluster shows the notification to stop the vehicle.

J476685

Fuel Pressure

When the fuel pressure is low, the instrument cluster notification indicates to contact the workshop.

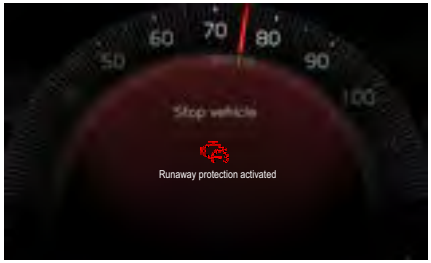


J476734

ENGINE

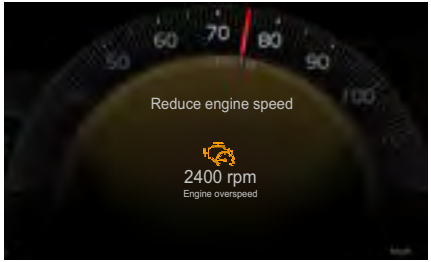
Engine Speed

If the actual engine speed exceeds the adjustable thresholds, the driver is notified regarding the engine overspeed.



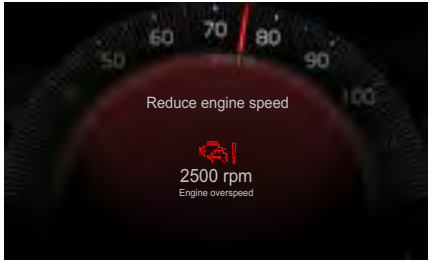
J476733

When the engine speed exceeds more than 2400 rpm, the instrument cluster shows the notification to reduce the engine speed.



J477315

When the engine speed exceeds more than 2500 rpm, the instrument cluster shows the notification to reduce the engine speed.



J477314

Engine Oil Temperature and Pressure

When the engine oil temperature is high, the notification indicates to drive cautiously.

And if the temperature reaches more than operating temperature, the instrument cluster shows a notification to stop the Vehicle.

J477316

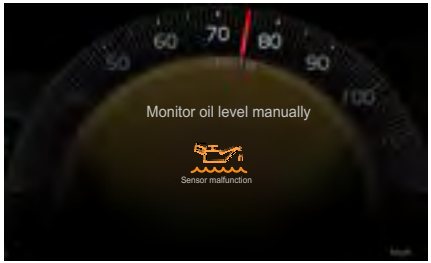
If the engine oil pressure is low, the notification indicates to check the oil pressure.
If the oil pressure is below the operating pressure, the instrument cluster shows a notification to stop the vehicle.

Engine Oil Level

When the engine oil level is low, the notification indicates to give "Attention".

When the engine oil level falls below a certain level, the notification indicates to "Stop vehicle".

When the engine oil level sensor malfunctions, the notification indicates to "Monitor oil level manually".



J477317

Engine Runaway Protection

The engine runaway protection is the engine decompression control function. If there is exposure to flammable vapors and engine component failures such as broken unit injectors, fuel system etc., this function shuts down the engine and prevents engine runaway.

The engine will shut down automatically due to runaway protection after showing the notification in the instrument cluster.

Manual Engine Shutdown

Press the engine stop switch to shut down the engine.

J477318

Proactive Engine Restart

Proactive Engine start is a battery power management feature. This feature allows the engine to restart automatically to charge the battery system when the voltage lowers below the threshold. Once the batteries are charged to the set threshold, the engine stops automatically.

When the vehicle is parked, this feature allows you to use the electrical loads or consumers such as parking cooler, parking heater, refrigerator, TV, and other sleeper accessories with no intervention on monitoring the battery system voltage. The system monitors the safety systems, battery system voltage, and the driver comfort features.

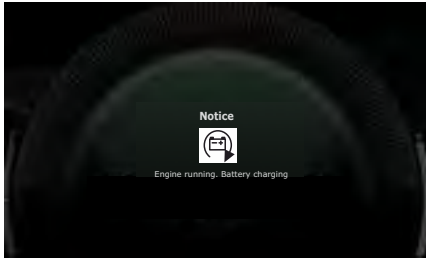
This feature helps:

- To save the batteries life.
- To stop engine idling to avoid unnecessary fuel consumption and emission of CO2/GHG.
- To use energy from the engine effectively.
- To improve fuel efficiency.
- To reduce driver intervention on battery power management.

Use the proactive engine restart switch in the dashboard to enable or disable

this feature. Press the momentary switch once to enable the feature and press again to disable it. When the feature is enabled, the green LED light in the switch turns On.

When this feature restarts the engine to charge the batteries, the instrument display shows a notification to indicate the active status.



J479772

J477468

Auto Engine Start/Stop Switch

Preconditions

The following preconditions need to be monitored and satisfied to enable the function.

- The vehicle mode must be in Living/ Accessory mode.
- For the vehicle with keyfob only, the keyfob must be in the cab.
- For the vehicle with key, the key must be in Off or ACC position.
- The parking brake must be engaged.
- The gear lever must be in neutral.
- The doors (passenger side and driver side) must be closed.
- The hood must be closed.
- The fuel must be >= 12.5%.
- The accelerator pedal is released.

NOTE

The driver must ensure that:

- The windows are closed.
- Sufficient fuel is available in the tank.
- The vehicle is not parked in any restricted zone.

Settings

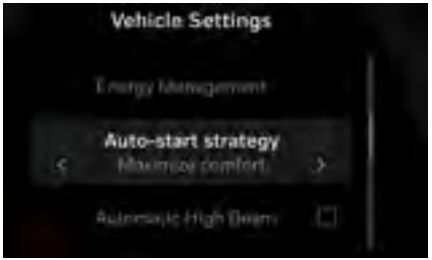
The Proactive Engine Restart is offered with two options:

Option-1: To maximize battery lifetime

Option-2: To maximize driver comfort

You can choose or change the options thorugh the instrument cluster menu. This menu setting must be done when the ignition key or button in ON position (Pre-Run or Running Mode).

J479780



J479794

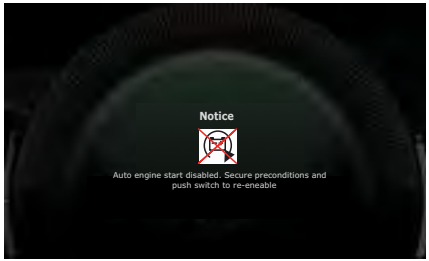
270346_1

Options	Battery SOC at which Engine Restarts	Battery Type
Maximize Battery Lifetime	65%	Flooded 100 Ah
	50%	AGM 100 Ah
Maximize Comfort	56%	Flooded 100 Ah
	40%	AGM 100 Ah

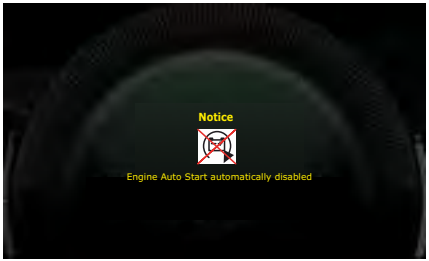
Notifications

Auto Engine Start Disabled

The disabled popup will be shown if any of the preconditions are not met.



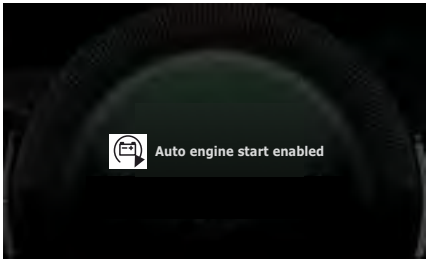
J479771



J479764

Auto Engine Start Enabled

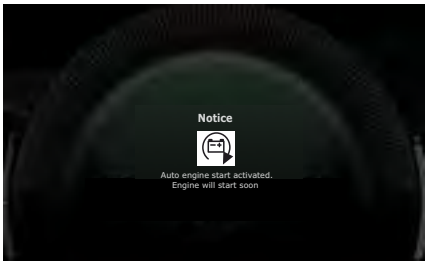
The enabled popup will be shown when the preconditions are satisfied.



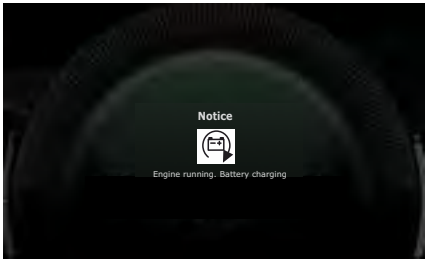
J479778

Engine Start Notifications

The relevant popups will be shown when the engine crank request is sent or engine is running.



J479775



J479772

General information

I-shift

The I-Shift transmission is a single countershaft transmission with 12 forward gears and two reverse gears. Some vehicles may have six reverse gears. The I-Shift is an automated mechanical transmission. The transmitted torque (both engine and braking) is interrupted during gear shifting in both driving and coasting conditions. There is no clutch pedal and the transmission controls gear shifting through the ergonomic gear selector. The I-Shift is available as an overdrive or direct drive transmission.

> **NOTE**
>
> Any vehicle with the crawler gear option can have six reverse gears.

There is a label with operating information about the I-Shift transmission located on the sun visor. It is important that this information is read and understood before the vehicle is operated.

J463258

1 I-Shift Sun Visor Label

Display

The Driver Information Display (DID) in the instrument cluster provides current operating information about the I-Shift transmission.

Current Gear Position

The current gear position gauge is standard with automated transmissions.

- N = Neutral
- R = Reverse
- D = Drive
- M = Manual

J474756

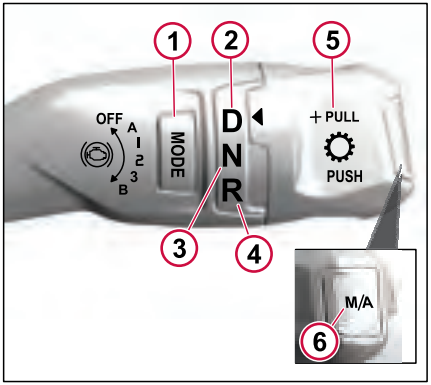
1 Drive Mode
2 Selector Position
3 Gears available for Downshift
4 Active Gear
5 Gears available for Downshift

Gear Selector

The gear selector (stalk switch) is in the right-hand side of the steering column. The selector has the gear positions of R (Reverse), N (Neutral), and D (Drive). The selector has the button to switch between M (Manual) and A (Auto). With the selector in the Drive position the transmission shifts as an automatic, performing gear selections and shifting without driver input. When in the manual position, the driver can upshift or downshift the gears using the stalk switch. Pull the stalk switch to upshift and push to downshift. If the manual position is engaged at a stop the vehicle starts in first gear and holds that gear.

The MODE button on the stalk switch allows you to switch between Fuel Economy modes (Extra Economy->Balanced Economy->Performance->Extra Economy). There is also the performance plus mode or heavy duty mode supported with the vocational trucks. Long press the MODE button to activate or deactivate the performance plus mode or heavy duty mode.

In situations where the I-Shift is unintentionally left in gear with the parking brake applied, the Transmission Control Module (TCM) will automatically go to neutral when the ignition key is turned to OFF position. This is done to avoid the transmission getting stuck in gear due to driveline “torque up”.



J474778

1 Mode
2 Drive
3 Neutral
4 Reverse
5 Gear selector knob (+ pull/- push)
6 Manual/Automatic

Drive Modes

ECO	Extra Economy
PERF	Performance
PERF+	Performance Plus
HVY DUTY	Heavy Duty
ECO PERF	Balanced Economy
DYNO	Dynamometer/roller bench

The drive modes are adapted to give the optimum balance between fuel consumption and performance in different conditions.

TRANSMISSION

Extra economy mode
The Extra Economy Mode is the most fuel-efficient drive mode, where fuel efficiency is prioritised over driveability. Use the extra economy mode when driving under normal conditions.

Balanced Economy Mode
The Balanced Economy Mode balances between fuel consumption and driveability.

Performance Mode
In the Performance Mode, the driveability and the power are prioritised over fuel consumption. Use the performance mode when driving in certain conditions like hilly terrain.

Performance Plus Mode
The performance Plus Mode gives the maximum driveability in difficult conditions, such as on poor roads in forests or at construction sites. In Performance Plus Mode, fuel consumption is not prioritised.

Heavy-duty Mode
The Heavy-duty Mode is optimised for the driveability and comfort at heavy loads.

Dynamometer/Roller Bench Mode
The Dynamometer/Roller Bench Mode is automatically engaged when the truck is on a chassis dynamometer with rolling rear wheels and stationary front wheels. The gearbox detects this difference and after ten seconds, it will automatically engage Dynamometer/Roller Bench Mode. The Dynamometer/Roller Bench Mode will disengage at the next key-off.

Software Package

The installed software package can be modified by adjusting customer parameters in the software. Contact an authorized Volvo dealer for more information about modifying customer parameters and the optional feature packages listed below:

- Comprehensive
- Vocational
- Heavy Haul
- I-Torque (Vehicle with Turbocompound only)
- Progressive Shift (Vehicle with Turbocompound only)

Drive Mode	Software Package				
	Comprehensive	Vocational	Heavy Haul	I-Torque	Progressive Shift
Extra Economy	Standard Offer	Not Applicable	Not Applicable	Standard Offer	Standard Offer
Balanced Economy	Standard Offer	Standard Offer	Standard Offer	Standard Offer	Standard Offer
Performance	Optional	Standard Offer	Standard Offer	Standard Offer	Optional
Performance Plus	Not Applicable	Standard Offer	Not Applicable	Not Applicable	Not Applicable
Heavy Duty	Not Applicable	Not Applicable	Standard Offer	Not Applicable	Not Applicable

Driving

Your truck has several functions that help you save fuel or increase driveability.

I-Roll

I-Roll is a function that automatically engages and disengages the freewheel function to reduce the fuel consumption. Under certain conditions, the driveline is disengaged so the truck can coast freely and the engine is controlled to run at idle speed.

When I-Roll disengages the driveline, N is shown as the selected gear in the instrument display.

Activating I-Roll

I-Roll is activated automatically but the following conditions must be fulfilled:

- Drive program Automatic (A) is selected.
- The gearbox is in gear 7 or higher.
- Cruise control is active **or** the auxiliary brake lever is in position A and the truck's speed is at least 35 mph (55 km/h).
- Drive mode Extra Economy or Balanced Economy is selected.

If cruise control is active, I-Roll is activated automatically when possible.

The truck's current speed, the set overspeed, the set underspeed and the road's gradient is taken into consideration.

If cruise control is **not** active, the truck's speed is at least 35 mph (55 km/h) and the road's gradient is not too steep, I-Roll is activated when the accelerator pedal is released.

The speed threshold for when I-Roll is activated can be changed at an authorised Volvo workshop.

I-Roll is deactivated automatically, so that the limits for overspeed and underspeed are not exceeded. However, at the end of a downhill slope the truck's speed can exceed the set overspeed for a short time.

If any of the conditions for automatic activation of I-Roll are not fulfilled, I-Roll is disengaged. I-Roll is also disengaged if any of the following occur:

- The accelerator pedal is depressed.
- The brake pedal is depressed.
- If cruise control is active and you request auxiliary brake with the stalk switch.
- Brake program (B) is activated.
- The minus (-) on the gear selector (stalk switch) is selected.

Temporarily disengaging I-Roll

The automatic activation of I-Roll that takes places when cruise control is active cannot be switched off. You can however disengage I-Roll so that it is not activated automatically when cruise control is **not** active.

To temporarily disengage I-Roll, press and hold the minus (-) on the gear selector.

To engage I-Roll again, gently depress the accelerator pedal.

I-See

I-See is a set of functions that use information about the road topography ahead of the truck to optimise the gear selection and, as a result, save fuel. It lowers the fuel consumption and improves the driveability when cruise control is active.

When you drive with cruise control active on a road, the truck's GPS system is used to match the truck's position with a map database. The map database contains data about, for example, road topography.

I-See uses these data to save fuel. When you drive with cruise control active on a road, for which data are available, I-See receives the data and can predict when hills and crests will appear. I-See automatically adapts throttle application,

gear strategies and truck speed for more fuel efficient driving.

Activating I-See

I-See is activated automatically when the following conditions are fulfilled:

- The truck is on or is approaching a section of road where the system can predict more efficient driving.
- Cruise control is active at a speed higher than 25 mph (40 km/h).
- Drive program Automatic (A) is selected.
- Drive mode Extra Economy or Balanced Ecomony is selected.

For optimum I-See functionality, it is recommended that you set the overspeed to at least 2 mph (4 km/h).

When I-See is enabled or active, the symbol for I-See is shown in the instrument display.

J372702

The symbol for I-See when the system is enabled.

J426294

The symbol for I-See when the system is active (the mountain in the symbol turns green).

If the truck does not have sufficient data for the road ahead, the symbol disappears from the instrument display.

The functions of I-See

When approaching an uphill slope:

- Increases the truck's speed slightly, to be able to drive in the top gear for longer and to avoid changing down unnecessarily on the uphill slope.
- In some uphills, I-See slightly lowers the limit for changing down, to avoid changing down unnecessarily on the uphill slope.

When approaching a downhill slope:

- Avoids unnecessary acceleration
- Releases engine torque or disengages the driveline just before the truck reaches the downhill slope. Thus, the speed is slightly reduced and the truck can take advantage of the natural acceleration from the slope.

On a downhill slope:

- Dampens the truck's speed on slopes where truck otherwise would accelerate to an excessive speed.

Between a downhill slope and an uphill slope:

- Disengages the driveline at the end of the downhill slope, and lets the truck carry with it more kinetic energy into the uphill slope. The speed can increase slightly over the set maximum speed, but it never increases above the speed shown in the instrument display.

> **NOTE**
>
> Not all functions are activated on all sections of road, but only when necessary, and when cruise control is set at 25 mph (40 km/h) or more.

Locking the gear

In some situations, an automatic gear changing is not desirable. Examples of such situations can be the following:

- The truck approaches the crest of a hill and you want to prevent the gearbox from changing down unnecessarily.
- You drive on an uphill slope that has a flat section and you want to maintain the same gear on the flat section.

- You drive on poor road surfaces, where an unwanted gear changing could reduce the driveability.

To prevent automatic gear changing, move the gear lever from drive program Automatic (A) to drive program Manual (M). The gearbox stays in the current gear.

To return to automatic gear changing, move the gear lever back to drive program A.

The function can be used in all forward gears, including the forward crawler gears.

⚠ CAUTION

When the gear is locked, there is risk for overrevving the engine.

Idle speed driving

The idle speed driving function makes it possible to drive the truck forward with the engine idling, which can be useful when driving in traffic queues.

Activating idle speed driving

When you drive forward at low speed and in a low gear, the function is activated automatically.

With the function active, you can release the accelerator pedal and the truck slowly drives forward with the engine idling. If the driving becomes so heavy that the engine risks stopping or if you depress the brake pedal, the clutch is disengaged and idle speed driving is deactivated. When you press the accelerator pedal again, idle speed driving is reactivated.

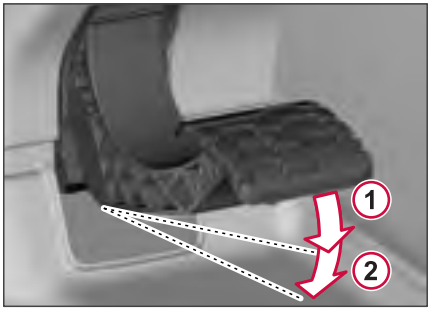
When drive program Automatic (A) is selected, you can adjust the gear up or down during idle speed driving. By adjusting the gear, you can adapt your speed to the traffic. The engine speed is slightly increased to be able to do the gear change.

Use the gear selector (stalk switch) +/- to adjust the gear up or down.

Kickdown

Kickdown is obtained when the accelerator pedal is fully depressed. Kick-down optimises the gear selection and throttle application for maximum acceleration, which often leads to changing down.

Kickdown is available when drive program Automatic (A) and drive mode Extra Economy or Balance Economy are selected.



J234193

1 Full throttle

2 Kickdown

Kickdown optimises vehicle performance at the expense of optimal fuel consumption. For minimum fuel consumption, use kickdown only when necessary. The accelerator pedal always has a kickdown position, but access to the function is an option.

Driving with a gearbox failure

If a failure is detected in the gearbox, the system automatically tries to maintain as many functions and as good drivability as possible. The system may, for example, use an estimated value if a sensor is broken or skip a gear.

Some failures are complemented by a red or yellow notification in the instrument display. Always obey the instruction in the notification.

270346_1

If the problem remains, contact an authorised Volvo workshop.

⚠ CAUTION
Always obey the instruction in the notification.

Gearbox functions

The gearbox has different characteristics and functions depending on which software that is installed. An authorised Volvo workshop can alter the software by, for example, adding optional functions and changing parameters.

On delivery from the factory, your truck had the following functions:

Drive mode selection

Makes it possible to select between the drive modes.

Basic gear selection adjustment

Makes it possible to adjust the gear selection in drive program automatic (A) during engine braking, using the +/− on the gear selector.

Enhanced gear selection adjustment and kickdown

This function allows you to adjust both the automatically selected starting gear and the driving gear when in drive program Automatic (A), using the +/- on the gear selector.
The kickdown function selects the correct gear for maximum acceleration.

Basic shift strategy

Automatic selection of correct starting gear, determined by gross vehicle weight and road gradient.

Enhanced shift strategy

In cooperation with the electronic stability program (ESP) and the electronic braking system (EBS), this function selects the optimum gear for smooth manoeuvering on difficult surfaces. The function also works to give maximum performance from the auxiliary brakes.

Performance shift

Gives faster, gentler shifts.

Heavy start engagement

When starting with high revs in gear position C2 or 1 and in drive mode Performance, this function raises the engine speed, which results in a higher starting torque. Heavy starts are made easier and the function is also useful, for instance, if the truck is stuck in soft ground.

Idle speed driving

Allows the engine to drive the wheels at idle, without the clutch slipping. This is useful, for example, when driving in traffic queues.

Smart cruise control

When possible, the auxiliary brakes are deactivated on downhill stretches, allowing more use of the freewheel function. By only activating the auxiliary brakes when necessary, the fuel efficiency is improved.

TRANSMISSION

I-Roll
I-Roll is a function that automatically engages and disengages the freewheel function to reduce the fuel consumption. Under certain conditions, the driveline is disengaged so the truck can coast freely and the engine is controlled to run at idle speed.

I-See
I-See is a set of functions that use information about the road topography ahead of the truck to optimise the gear selection and, as a result, save fuel. It lowers the fuel consumption and improves the driveability when cruise control is active.

Enhanced construction and timber adaptation
Adds the drive mode Off-road, which gives you maximum driveability in difficult conditions, such as on poor roads in forests or at construction sites.

Basic power take-off functions
Facilitates power take-off operation.

Enhanced power take-off functions
Extra functions that aid in power take-off operation.

Temperature monitoring, transmission oil
You can see the Transmission oil temperature in the instrument display.

NOTE

If the transmission software has been altered, the truck might no longer have the same functions as it had on delivery from the factory. Functions can have been added and/or removed.

EBS (Electronic Braking System)

EBS is a technology advancement of ABS (Anti-lock Braking System). Where the ABS system focuses on preventing wheel lockup and skidding during braking and the EBS system focuses on distributing braking force between the wheels based on the load conditions. The vehicle has these two systems incorporated together to contribute for overall safety and control of the vehicle.

⚠ WARNING

For proper ABS operation, DO NOT change tire sizes. The size of the tires installed during production is programmed into the electronic control unit. Installing different sized tires could result in a reduced brake force, leading to longer stopping distances or accidents.

ABS monitors wheel speed continuously but is not involved in controlling the wheel speed unless there is a wheel lock up situation. In normal braking applications, the standard air brake system is in effect.

There are sensors installed on each axle. These sensors transmit information to the electronic control unit (ECU). The ECU interprets the signals and calculates wheel speed, wheel retarding and a vehicle reference speed. If the calculations indicate a wheel lock-up situation, a signal is sent from the ECU to the appropriate ABS modulator valve to reduce braking pressure. During emergency braking, the modulator valve alternately reduces, increases or maintains air pressure in the brake chamber to prevent wheel lock-up.

During emergency or reduced-traction stops, fully depress the foot brake pedal until the vehicle comes to a safe stop. DO NOT PUMP the brake pedal. With the brake pedal fully depressed, the ABS controls all wheels to provide steering control and a reduced braking distance.

Although the ABS improves vehicle control during emergency braking situations, the operator still has the responsibility to change driving styles depending on the existing traffic, road and/or weather conditions. For example, the ABS cannot prevent an accident if the driver is speeding or following too closely on slippery surfaces.

The electronic control unit contains a self-testing program that is engaged each time the ignition is turned On. The operator can verify the testing by listening for the ABS modulator valves actuating twice in series. To increase the sound, hold down the foot brake pedal when the ignition is turned On.

If any of the ABS malfunction indicator lamps come on during driving or do not go out after a short time after turning On the ignition, take the vehicle to an authorized Volvo Trucks dealer to repair the ABS or brake system. The vehicle can still be driven with a problem in the ABS system. However the ABS is disengaged and the standard braking system operates.

The instrument cluster contains ABS malfunction indicator lamps for the Tractor and the trailer.

J342614

ABS Malfunction Tractor Indicator Lamp

J342615

ABS Malfunction Trailer Indicator Lamp

Engine Brake

⚠ WARNING

Operation of any vehicle on wet or slippery roads requires extreme caution. Engine Brake converts the engine to a retarding device, do not use on wet or slippery roads. Especially do not use the engine brake if the vehicle has a single driving axle or if it has tandem driving axles that are lightly loaded. Use of an engine brake under these conditions can cause the vehicle to skid or a combination vehicle to jackknife.

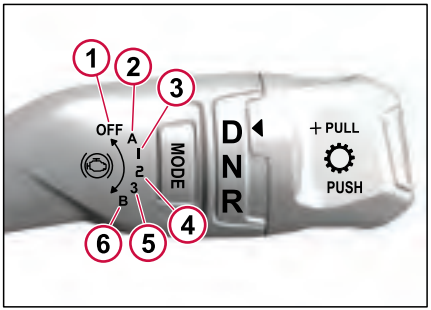
The Volvo Engine Brake + uses engine compression brake and exhaust brake to control the vehicle speed. The engine brake reduces wear on the foundation brakes and helps the driver stay in control of the vehicle. Also, the engine brake works in unison with the vehicle's cruise control system.

The engine brake can be activated using the right-hand stalk switch.

The engine brake can be activated only when the engine is in normal working temperature. The stalk switch position of the engine brake is displayed in the DID status bar.

The stalk switch has six positions to control the engine brake.

- In the OFF position, the engine brake is turned Off.
- In position-A, the engine brake automatically assists the service brake (brake blending when brake pedal is applied).
- In positions-1, 2 and 3, the engine brake engages automatically when the accelerator pedal is released.
- In position-B, the engine speed is kept on a higher level to maximize available braking torque.

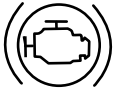


J463145

1 On or postion-A
2 Postion-1 provides 20% to 40% engine braking.
3 Position-2 provides 40% to 70% engine braking.
4 Position-3 provides 70% to 100% engine braking.
5 Position-B provides 100% engine braking plus available downshift

J463242

1 Engine Brake Stalk Switch Position
2 Engine Brake Icon
3 Set Speed
4 Cruise Control (CC) Icon



J474594

Engine/Auxiliary brake icon

The engine/auxiliary brake icon illuminates in 'green' color when it is activated, 'white' when it is enabled and 'dark gray' when it is Off.

270346_1

To enable the engine brake, move the stalk switch to the postion-A or 1 or 2 or 3 or B. The percentage of engine braking power varies based on the position of the stalk switch.

When the stalk switch is in the **position 1 or 2 or 3**, the engine brake activates automatically whenever the accelerator is released.

When the stalk switch is moved to **Position-A**, the vehicle enters into brake blending mode. When the engine brake is in brake blending mode, the engine brake activates automatically whenever the brake pedal is applied.

When cruise control is enabled and the engine brake is in the **position-A**, if the vehicle speed exceeds 3 mph above the set cruise control speed, the engine brake automatically engages. The engine brake engages with infinite control (within the limits of the engine brake) to maintain the set speed.

When the stalk switch is moved to **Position-B**, the Brake Program Function activates. The Brake Program Function requests the transmission to downshift the current gear and increases engine braking force. When the Brake Programming Function is activated, the symbol B is displayed in the instrument cluster. The transmission control unit interacts with the engine brake to provide optimum performance. The brake program function deactivates when the stalk switch is moved to other positions or an accelerated pedal is applied.

To deactivate the engine brake, move the stalk to the **OFF position**.

Mass-Based Engine Braking

If the Vehicle GCW is less than or equal to 24,000 lbs, the position-1 provides 20% of engine braking when the engine brake is engaged. The position-2 provides 40% of engine braking. The position-3 provides 100% of engine braking.

If the Vehicle GCW is between 24,000 lbs to 40,000 lbs, the position-1 provides the variable braking power with extrapolation between 20% to 40% when the engine brake is engaged. The position-2 provides the variable braking power with extrapolation between 40% to 70%. The position-3 provides the variable braking power with extrapolation between 60% to 70%.

If the Vehicle GCW is greater than or equal to 40,000 lbs, the position-1 provides 40% of engine braking when the engine brake is engaged. The position-2 provides 70% of engine braking. The position-3 provides 100% of engine braking.

The engine brake does not operate in the following cases:

- When the EBS is active.
- When the engine speed is too low and the engine brake is Off, it cannot turn On until the engine speed is 950 rpm or more. When the engine brake is On, it will turn Off when the engine speed goes below 900 rpm.
- The engine braking will not be available when the vehicle speed is below 1.5 mph (2.5 km/h). When the vehicle speed is between 1.5–5 mph (2.5–8 km/h), a reduced level of engine braking will be available. Above 5 mph (8 km/h), full engine braking is available.

The compression brake does not operate in the following cases:

- When the engine oil temperature is below 131 °F (55 °C).
- When the coolant temperature is below 161 °F (72 °C).

BRAKES

Engine Brake with Cruise Control

With the stalk switch in the position-A and driving with active cruise control, it is possible to adjust the brake cruise speed. The set speed and brake cruise speed is shown in the instrument cluster.

To activate the engine brake with cruise control, press and release the cruise control switch on the left side of the steering wheel and move the engine brake stalk switch to Position-A.

The Engine Brake Cruise Control can only be activated with the brake stalk switch in Position-A.

The cruise control-set speed and brake cruise speed are shown in the DID. The cruise buttons on the left side of the steering wheel are used to adjust the brake cruise speed.

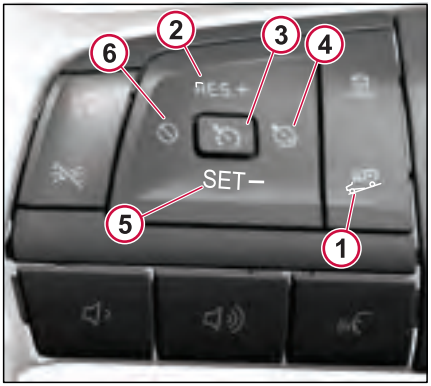
To adjust the brake cruise speed:

1 Ensure or move the stalk switch to position-A.

2 Press and release the Engine Brake Cruise Switch on the left side of the steering wheel.

3 Use the toggle/Enter button on the Left side of the steering wheel to increase or decrease the set speed.

When the stalk is moved to Position-B, the vehicle enters into Engine Brake Performance Mode. When Engine Brake Performance Mode is activated, the symbol B is displayed in the driving mode in the DID and the transmission selects the gear with the highest level of braking. The transmission interacts with the engine brake to provide optimum performance.



J463239

1 Engine Brake Cruise Speed Adjustment Switch

2 Increase set speed/Resume Cruise

3 Cruise Control Enable

4 Cruise Over/Under Speed Setting

5 Decrease Set Speed/Resume Cruise.

6 Cancel Cruise

Engine Brake Fault

Stop using the engine brake immediately if there is an engine brake fault. Have the engine brake serviced by a certified technician before using the component during vehicle operation.

If an error occurs, the following engine brake DID displays. Also, the Check tell-tale displays in the instrument cluster.

J463244

DID shows Contact workshop notification if:

1 Retarder Performance Reduced

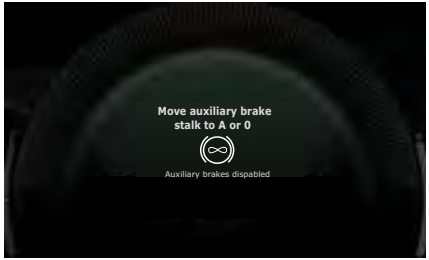
2 Reduced Performance of auxiliary brakes

3 Engine brake malfunction

4 Engine brake failure

5 Retarder malfunction

When the auxiliary brake is disabled, the display shows the notification to move auxiliry brake stalk position to A or 0.



J474599

ESP (Electronic Stability Program)

ESC (Electronic Stability Control) is a stabilizing system that reduces the risk of overturning and skidding.

If the system senses that the truck is about to overturn or skid then throttle application is reduced first of all. If this is not sufficient, the system also uses the wheel brakes individually to reduce the speed of the truck and straighten the vehicle combination. If necessary, the auxiliary brakes are also disengaged.

The system works best when the trailer also has ABS or EBS.

A symbol flashes when the system is engaged.

J342695

Symbol for ESC Engaged.

NOTE

A truck equipped with ESC must only be used together with a single trailer unit. For example, the vehicle combination of semitrailer with a further trailer is not permitted. Such a vehicle combination may lead to incorrect intervention.

WARNING

Drive the truck in the same way as trucks without ESC. ESC reduces the risk of the truck overturning and skidding. However, the truck may overturn if the load has a very high center of gravity, if the wheels hit a curb at high speed or in the event of reckless driving. On a slippery road surface, the truck may skid despite it having ESC.
Do not drive trucks equipped with ESC in steeply banked bends (such as test tracks). This may lead to unnecessary and dangerous ESC intervention. Contact an authorized Volvo workshop if this is necessary.

Panic Brake Function

The function is provided to reach full braking force more quickly in emergency situations. The system detects sudden braking by measuring how quickly the brake pedal is pressed. The brake pressure is then controlled so as to achieve the most effective braking possible.

Equalization of Wear On Brake Linings

If the brake linings wear more on one axle than on the other, then the braking force is changed so that the wear is equalized.

Auto Hold

Auto Hold provides an anti-roll back assistance when the vehicle is transitioning from a parked position to driving. Auto Hold maintains the brake pressure until the transmission generates enough torque to move the vehicle during drive-off. This is done regardless of whether the truck is on a flat road or on an uphill or downhill slope.

Enable Auto Hold

Auto Hold is enabled by default when you start the truck. An icon in the instrument cluster is displayed when the Auto Hold is active with the brake applied.

The system will release the brakes when you press the accelerator pedal and the transmission generates enough torque to move the vehicle.

J424432

> **NOTE**
>
> The parking brake is applied automatically when the Auto Hold lasts for more than four minutes or the cab door opens.

Disable Auto Hold

To disable Auto Hold, press the switch on the dashboard. The LED in the switch will turn Off.

Press the switch again to enable Auto Hold. The LED in the switch illuminates.

J424233

When the Auto Hold is disabled by pushing the rocker switch, the Auto Hold disabled tell-tale is indicated in IC.

J476225

If you disable auto hold or open the door while the function is activated, the parking brake will be applied.

> **NOTE**
>
> When the Auto Hold feature is disabled using the switch, the Auto Hold tell-tale may be indicated in certain scenarios, such as when the parking brake is applied or when ACC (Adaptive Cruise Control) stop and go mode is activated.

TCS (Traction Control System)

Traction Control System (TCS) limits spinning of the driven wheels to increase traction during acceleration without losing lateral stability. The TCS applies the brake on the spinning wheels (low friction side) and transfers the traction force to the other side wheel, where the wheel-to-road friction is high.

The TCS provides improved traction on slippery surfaces by reducing wheel spin. If a drive wheel starts to spin, the system operates automatically as follows:

- The TCS applies air pressure to the brake of the spinning wheel. Doing this transfers engine torque via the axle differential to the wheels that have better traction. Brake control is active at vehicle speed up to 25 MPH.
- The TCS limits engine torque, which in turn, reduces wheel spin to provide improved traction. The driver may override torque control by further pressing the accelerator pedal. Engine torque limitation is active at all vehicle speeds.
- When the TCS automatically becomes active, the TCS indicator lamp flashes to alert the operator.

  The lamp turns Off when the wheel(s) stops spinning.

The TCS is active by default when the vehicle is turned On. Whenever the system detects slippery road conditions, it will activate to mitigate potential dangers and display a 'slippery road' tell-tale indicator.

J476197

TCS can be enabled or disabled using the switch on the dashboard.

The TCS switch has two functions:

- Press the upper portion of the switch to activate the Mud/Snow function. The LED in the switch illuminates when the function is activated.
- Press the lower portion of the switch to turn Off the TCS function. The LED in the switch illuminates when the function is activated.

J463106

The Switch has the following functionality:

- Traction control - Mud / Snow mode

This allows for reduced traction control functionality. Ideally used when stuck in slippery conditions like mud or snow. To allow for some more traction and wheel spin, but not continuous wheel spin that could be detrimental to the traction.

- Traction Control = Off mode:

This will completely turn Off traction control thus no torque limit or brake application to prevent wheel spin in slippery conditions.

Mud/Snow Function

The Mud/Snow function allows for reduced traction control functionality. Ideally used when stuck in slippery conditions like mud or snow. To allow for

TRACTION CONTROL SYSTEM (TCS)

some more traction and wheel spin, but not continuous wheel spin that could be detrimental to the traction.

Also, the TCS tell-tale indicator blinks continuously. The TCS tell-tale indicator stops blinking when the heavy mud/snow mode is turned Off.

TCS Disable

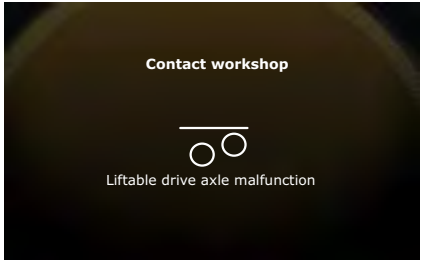
When the TCS function is deactivated using the switch, the TCS disable tell-tale indicator illuminates in the instrument cluster. This is to indicate that the system is not available. The tell-tale indicator will turn Off when the TCS disable mode switch is turned Off. There will not be any torque limitation or brake application to prevent wheel spin in slippery conditions.

J342634

> **NOTE**
>
> The TCS indicator lamp will illuminate at start-up during a system self test. If no problems are found, it will turn Off until a TCS event occurs, or the system is disabled.

Notification

The notification pop ups to contact workshop when Liftable drive axle malfunctions.



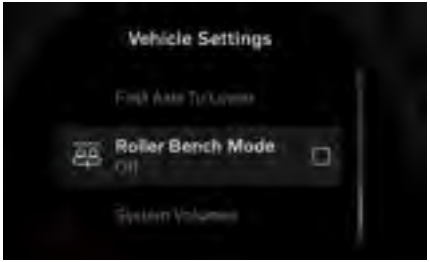
J480962

Roller Bench Mode

The 'Roller Bench Mode' function in your vehicle deactivates the Automatic Traction Control (ATC) algorithm, preventing the detection of wheel spin on the driving wheels. It also inhibits the Electronic Stability Program (ESP) and the wheel speed plausibility check algorithm. This mode is designed for specific testing scenarios, such as when your vehicle is stationary on a roller bench or dynamometer, providing a controlled environment for testing performance, emissions, and diagnostics.

To go to Roller bench mode;

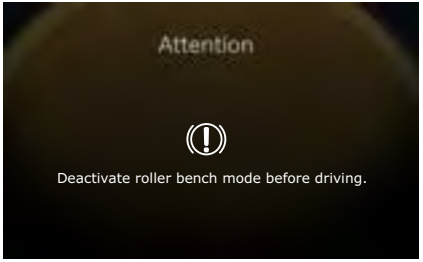
- Press Menu button and go to settings.
- Go to vehicle settings.
- Go to Roller bench mode and press Ok to turn it ON.



J480856

> **NOTE**
>
> Roller Bench Mode is not availaible during driving.

After any kind of testing is done, the notification sends the pop-up to deactivate roller bench mode before diving.



J480958

DIFFERENTIAL LOCKS

⚠ DANGER

DO NOT drive on dry, paved surface with the differential lock engaged. The vehicle strives to maintain a straight line. Taking a curve with the differential lock engaged can cause an accident, leading to serious personal injury or death.

⚠ CAUTION

Never operate the vehicle with the differentials locked any longer than is necessary. This state places a great strain on the axles and can cause rapid tire wear.

Under normal traction conditions, do not engage the differential lock. If possible, do not use the differential lock while taking a curve. With good traction and the differential lock engaged, the vehicle is under steered and therefore tends to drive straight in a curve. When using the lock on good traction surface, drive cautiously and do not exceed 40 Km/h (25 mph). Disengage the lock as soon as possible.

When the differential lock is disengaged, the couplings can be under tension. Disengage the lock by returning the switch to the OFF position. Help with the disengagement by briefly letting up on the accelerator to relieve the torque on the couplings.

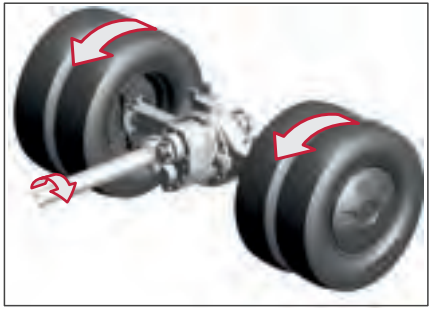
The drive axle can be equipped with the differential lock. The single drive axle only has a wheel differential lock. With tandem drive axles, there could be both wheel differential lock and an inter-axle differential lock.

Use the differential lock on icy or slippery surfaces. When the slippery surface is passed, disengage the differential lock. The differential lock must not, under any circumstances, be engaged when in a wheel-spin situation. Engage the lock ahead of the slippery area. If already slipping, stop the wheels, engage the lock, and then continue. Engaging the differential lock when the wheels are spinning, damages the differential and the rear axle drive unit could possibly fail.

All efforts must be made to avoid spinning the wheels at high speeds on slippery surfaces. This fact is true whether the differential lock is engaged or not. Excessive wheel spin can result in failure of the cluster gears and other components found within the rear axle housing. If unable to obtain traction, engage the differential lock as described. If still unable to move the truck, seek assistance from a qualified tow operator. Engaging the differential locks must always be done as follows:

1. Wait for the drive wheels to stop spinning.
2. Press the switch to engage the differential lock.
3. Engage a suitable gear.

Function



J463316

Firm ground, no differential lock engaged.

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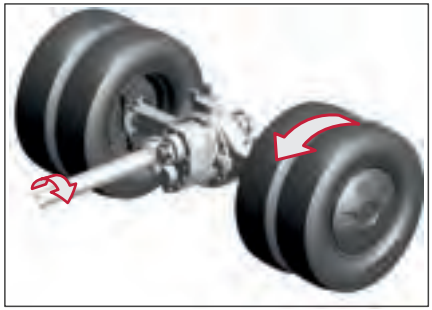
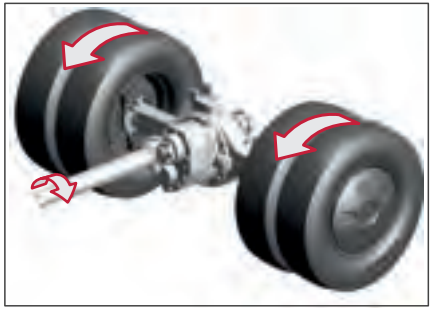


J463333

In the slippery surface, if the differential lock is not engaged, only the wheel on the slippery surface rotates, and the truck is stationary.



J463334

In the slippery surface, if the differential lock engaged, the wheels are forced to rotate at the same speed. Only the wheel on the firm ground is driving. Accelerate carefully so that the gears are not damaged.

Differential Lock Switches

Inter-Axle Differential Lock

J474917

When the inter-axle differential lock is engaged, it connects the front-rear and rear-rear driving axles by locking them together. This ensures that the power is evenly distributed between both axles.

When engaged, power from the engine is sent to both the axles simultaneously. This ensures that all the wheels receive equal torque and traction, which is especially useful in slippery road conditions.

> **NOTE**
>
> For the vehicle with inter-axle differential lock, the inter-axle differential lock must be activated to engage the inter-wheel differential lock.

Inter-Wheel Differential Lock

J474920

When the Inter-wheel Differential Lock switch is engaged, the wheels on the rear-front and rear-rear driving axles lock together ensuring that they rotate at the same speed.

Inter-Wheel Differential Lock, Front

DIFFERENTIAL LOCKS

J474927

When the Inter-wheel Differential Lock, Front switch is engaged, this locks the wheels on the front-rear drive axle together ensuring that they rotate at the same speed.

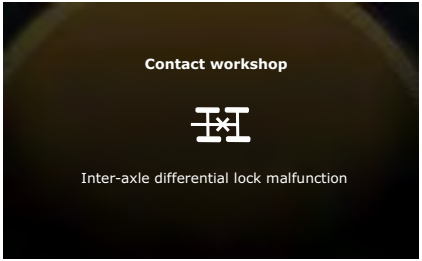
Inter-Wheel Differential Lock, Rear

When the Inter-wheel Differential Lock switch is engaged, the wheels on the rear-rear drive axle lock together ensuring that they rotate at the same speed.

> **NOTE**
>
> Vehicles equipped with both Front and Rear Inter-Wheel Differential Locks allow you to engage and disengage the front and rear differential locks separately for greater control.

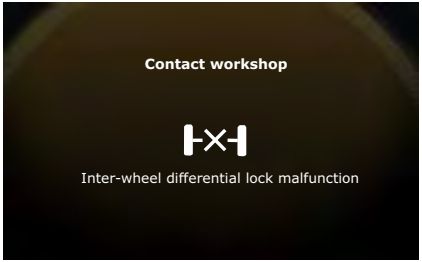
Notifications

The notifications pop-up when the Inter-axle wheel differential lock malfunction.



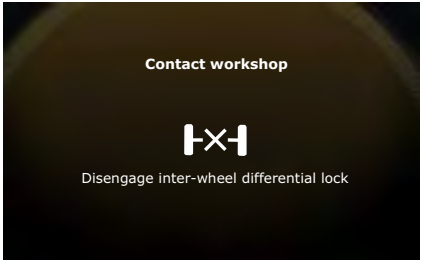
J481086

The notifications pop-up when the Inter-wheel differential lock malfunction.



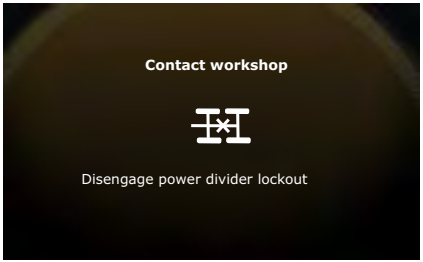
J481085

If the speed is more than the threshold speed when Inter-wheel diff-lock is On, the notification pop-up to disengage inter-wheel differential lock.



J481084

If the speed is more than the threshold speed when Inter-axle diff-lock is On. The notification pop-up to disengage power divider lockout.

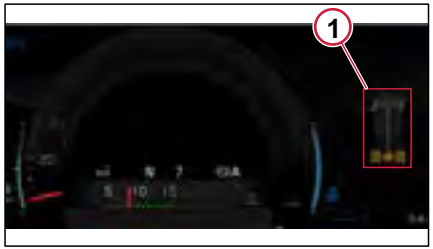


J481077

Widgets

Differential Lock Status

The widgets for the differential locks will be displayed on the instrument panel when they are activated.



J481117

1 Differential Lock Widget just after Activation

The differential lock widget after getting activated, it will move to the lower right corner to indicate it is still active.

Until the differential lock is Off, the widget will remain in that position.

J481118

1 Differential Lock Activated Indication.

POWER TAKE-OFF

⚠ DANGER

Rotating PTO shaft can snag clothes, hands, etc., causing severe personal injury or death. To avoid injury or death:

- DO NOT go near rotating shaft when engine is running.
- STOP engine before attempting to work on PTO, its controls or related equipment.

⚠ CAUTION

It is important to only engage the switch when the PTO is required. Leaving the PTO pump engaged when not needed can lead to poor performance and pump damage.

When the vehicle is parked or moving slowly, the transmission-mounted PTO can be engaged or disengaged. The PTO can be engaged or disengaged using a switch in the dashboard. Based on configuration, a vehicle can have one or two PTO switches.

When the PTO is engaged, the PTO tell-tale displays in the instrument cluster.

J464927

J465251

J465230

PTO Activation

Activate PTO When the Vehicle is Parked

To activate PTO when the vehicle is parked:

- Start the engine.
- Place the gear selector (stalk switch) in neutral position.
- Switch On the PTO switch on the dashboard
- Ensure that the PTO tell-tale indication appears in the instrument cluster.

ⓘ NOTE

Select the neutral gear N1 or N2, before activating the PTO. Once the PTO is engaged, the gear position (start gear) cannot be changed.
When the PTO is active and if you need to change the gear position, turn Off the PTO and then change the gear position. Use the gear selector (stalk switch) to upshift or downshift the gear.

ⓘ NOTE

The PTO can be engaged irrespective of whether the parking brake is engaged or disengaged.

ⓘ NOTE

When the vehicle is parked and the PTO is active, if you want to increase the engine speed, apply the accelerator pedal. The PTO speed is based on the gear ratio (N1 or N2) and the PTO specification.

Activate PTO When the Vehicle is moving/running slowly

To activate PTO when the vehicle is moving/running slowly :

- The gear selector (stalk switch) is in manual (M) or automatic (A) or reverse (R) drive position.
- The gearbox is in any low range gear up to 6th gear or reverse gear R1 or R2.
- The vehicle speed is less than 10 km/hr.
- Switch On the PTO switch on the dashboard.
- Ensure that the PTO tell-tale indication appears in the instrument cluster.

> **NOTE**
>
> Select any low range gear, from 1 to 6, or reverse gear (R1 or R2) before activating the PTO. Once the PTO is engaged, the gear position (start gear) cannot be changed. When the PTO is active and if you need to change the gear position, turn Off the PTO and then change the gear position. Use the gear selector (stalk switch) to upshift or downshift the gear.

> **NOTE**
>
> When the vehicle is running and the PTO is active, I-Shift allows you to change the gear to the neutral position and ignores the automatic (A), manual (M), or reverse (R) drive position.

PTO Deactivation

Deactivate PTO

The PTO can be deactivated when the vehicle is parked as well as in Running mode. Use the switch on the dashboard to disengage the PTO. Ensure that the PTO tell-tale indication is not illuminating in the instrument cluster.

> **NOTE**
>
> The PTO can also disengage automatically when the vehicle speed reaches the PTO deactivation speed (for example: 6 mph (10 km/hr)).

> **NOTE**
>
> Based on vehicle operating conditions, the vehicle speed threshold to disengage the PTO can be edited using diagnostic tool (Premium Tech Tool). Contact authorized Volvo dealer.

Engine Speed Control

You can use the engine speed control to raise the engine speed temporarily.

If there is excessive vibration, for example after bodybuilding you can also permanently adjust the idle speed.

Left-hand keypad

Use the left steering wheel keypad to control the engine speed.

J462432

1 Increase set speed/Resume Cruise
2 Cruise Control Enable
3 Cruise Over/Under Speed Setting
4 Decrease Set Speed/Resume Cruise

5 Cancel Cruise
6 ACC Following Distance Time Gap
7 Downhill Cruise Set

Using the engine speed control at low speeds

Constant engine speed

The engine speed can be temporarily changed to suit the work being carried out.

> **NOTE**
> The engine speed control is only available at low speeds.

J428683

1 Press the Cruise Control Enable button (2). A menu opens in the instrument display.
2 Select Engine control in the menu.
3 Press the SET/- button (4) or Cruise Control Enable button (2) or wait a moment for engine control to be selected.
4 If you want to raise or lower the engine speed, press the RES/+ button (1) or SET/- button (4).
5 To increase the engine speed to a pre-programmed value (normally 1000 rpm), press the RES/+ button (1).

To resume to the original engine speed, press the Cancel Cruise button (5).

To deactivate constant engine speed, press and hold the Cancel Cruise button (5).

> **NOTE**
> During a regeneration of the diesel particulate filter the idling speed will be increased slightly without the possibility to change it.

Filter summery to long to be displayed.

Cruise Control

The cruise control helps you to maintain a steady speed, resulting in a more comfortable driving experience and lower fuel consumption. The cruise control works all the way down to 2.5 mph (4 km/h).

Cruise control uses the auxiliary brake together with an optimized gear selection and the wheel brakes to maintain the set speed.

For a vehicle is equipped with both Cruise Control and Adaptive Cruise Control:

- With standard Cruise Control, you can set a specific speed for your vehicle to maintain speed.
- Adaptive Cruise Control activates when a vehicle is detected in front of you. It automatically adjusts your vehicle's speed to maintain a safe following distance providing a seamless and convenient driving experience.

Steering Wheel Switch, Left

J462432

1 Increase set speed/Resume Cruise
2 Cruise Control Enable
3 Cruise Over/Under Speed Setting
4 Decrease Set Speed/Resume Cruise
5 Cancel Cruise
6 ACC Following Distance Time Gap
7 Downhill Cruise Set

Turn On Cruise Control

To activate Cruise Control:

- Press the "Cruise Control Enable" button (2)
- Apply the accelerator pedal and at a desired speed press the SET button (4).

The cruise control activates only when the vehicle speed reaches the minimum cruise control activation speed and the brake pedal is not applied.

The minimum cruise control activation speed is based on vehicle configuration. The available minimum cruise control activation speed ranges from 2 mph to 35 mph.

When the cruise control is active and the accelerator pedal is applied, the cruise control will not be deactivated. Thus, when the accelerator pedal is released, the vehicle returns to the set speed.

⚠ CAUTION

Do not use cruise control in heavy traffic or on slippery road surfaces.

Adjust the Set Speed

When the cruise control is active, to adjust the set speed, press the RES+ button (1) to increase the set speed or press the SET- button (4) to decrease the set speed.

Turn Off Cruise Control

Cruise Control deactivates temporarily when the "Cancel Cruise" button (5) is short-pressed or the brake pedal is

CRUISE CONTROL

applied. But the cruise control is still enabled; press the SET- button to activate the cruise control at the current speed, or press the RES+ button to resume the previous cruise set speed.

- Auxiliary brake stalk switch is moved to "B" position

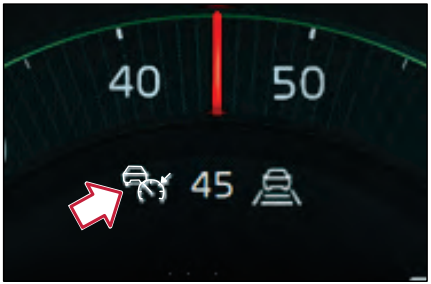
When the cruise control is active and the accelerator pedal is applied, the cruise control will not be deactivated. Thus, when the accelerator pedal is released, the vehicle returns to the set speed.

Cruise Control deactivates permanently when the "Cancel Cruise" button (5) is long-pressed or auxiliary brake stalk switch is moved to "B" position.

To activate Cruise Control again:

- Press the "Cruise Control Enable" button (2)
- Apply the accelerator pedal and at a desired speed press the SET button (4).

When the Cruise Control is enabled, the CC symbol is indicated in white.



J462437

The cruise control is then activated by pressing the set or resume button to the desired speed. The cruise control icon, set speed, and ACC time Gap (if enabled) icons are shown in white.

When the system detects a vehicle moving in front, the adaptive cruise control (ACC) activates. When ACC is activated, the cruise control icon, set speed, and ACC time Gap icons will turn green.

Cruise Over speed and Under speed Setting

When cruise control is active and a speed is set, press the button (3) on the steering wheel switch to set the overspeed and underspeed offset. Use the RES+ button (1) and SET- button (4) to increase or decrease the speed offset values.

When entering under/overspeed setting, the overspeed offset is first adjusted. Pressing the under/overspeed setting button again toggles to the underspeed offset adjustment.

When adjusting the under/overspeed settings, if no action is done on the +/- button within a timeout duration, the system resumes in default set speed adjustment mode.

> **NOTE**
>
> The driver is always responsible for the speed of the truck. When using overspeed, the set speed of the cruise control must be adjusted so that the resulting speed does not exceed the local speed limit.

Downhill Cruise Control

Downhill cruise control helps you to limit the vehicle speed under the set speed while driving downhill. It uses the auxiliary brake together with an optimized gear selection and the wheel brakes to maintain the set speed.

To activate Downhill Cruise control:

- Move the auxiliary brake stalkswitch to the “A” automatic position
- At the desired speed press the Downhill Cruise button on the steering wheel switch

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After the "Downhill Cruise" button is selected, the desired downhill speed limit can be adjusted using the +/- buttons on the steering wheel.

The downhill cruise control allows the driver to set a maximum downhill speed desired so that the engine brake will engage as required to maintain the vehicle set speed.

When the downhill cruise is active, the icon and the set speed are displayed in the instrument cluster.

The Downhill Cruise Control deactivates when any of the following conditions are met:

- The accelerator pedal is applied.
- The Cancel Cruise button is pressed.
- The Cruise Control enable button is pressed.

The downhill cruise control will not be deactivated when the brake pedal is applied.

Cruise Control Fuel Functions

Cruise Acceleration Limiter

The cruise acceleration limiter softens the acceleration up to target cruising speed when driving on cruise control.

Eco-Roll

Eco-Roll is an automatic activation and deactivation of a freewheel function in order to cut fuel consumption, which can be reduced by up to several percent. Eco-Roll is used when neither engine power nor engine braking is needed, for instance on flat roads.
When driving with cruise control, Eco-Roll runs at roughly 1–2 mph below the pre-set speed, which saves fuel. The longer the vehicle drives using Eco-Roll, the more fuel is saved

Soft Cruise

The soft cruise is to save fuel in up hills. The fuel is saved by limiting the vehicle speed in up hills, resulting in lower speed at the top of the hill.

Hill Management

Limit the engine speed in uphills where it is not possible to upshift, because of lack of power on the next gear, and the engine speed is still accelerating.

The aim is to wait to a lower inclination, where the limited engine speed is optimum for the upshift which leads to better fuel consumption.

This function is available from 8th gear on I-Shift.

Adaptive Cruise Control

The Adaptive Cruise Control (ACC) operates using forward looking technology to identify another vehicle ahead of the truck.

When approaching a vehicle moving in the same direction, adaptive cruise controls and adjusts the speed to maintain the time gap to the vehicle in front. If the driver changes the time gap settings while following a vehicle, the Adaptive Cruise Control (ACC) adapts the speed to the new settings.

When the speed reaches or exceeds the cruise control speed limit while following a vehicle or when the vehicle moves out of range, the adaptive cruise control is disabled and the cruise control regains control of the vehicle. When the vehicle in front reduces its speed faster than the adaptive cruise control can adapt, the driver receives a warning.

Whenever adaptive cruise control is activated, the activation status is displayed in the instrument cluster.

ACC should be used mainly when driving on highways or major roads.

⚠ WARNING

ACC can never replace you as a driver! As a driver, you have the ultimate responsibility for maintaining a safe distance behind the vehicle in front.

ⓘ NOTE

If the forward vehicle reduces speed faster than the truck's Adaptive Cruise control system can adapt, the driver is alerted with the forward collision warning system and emergency braking if necessary.

ⓘ NOTE

- In case of system failure, both adaptive cruise control and cruise control are immediately turned Off.
- Increasing the cruise control speed while following a slower vehicle does not affect adaptive cruise control behaviour.

ⓘ NOTE

- If visual contact with the vehicle in front is lost in a curve, adaptive cruise control remains active and limits the acceleration based on the curvature and the current speed.
- If another vehicle enters the space between the vehicles, adaptive cruise control will lower the speed to achieve the selected time gap to the new vehicle in front. But very close cut-ins can cause problems due to sensor limitation.

⚠ WARNING

The system cannot always clearly identify other road users and traffic situations. To avoid an accident, it is important that you are aware of what limitations exist.
The system may, in certain cases:

- Unexpectedly brake the truck
- Give an unnecessary warning
- Not provide a warning
- Not brake when expected
- Unexpectedly accelerate the truck.

Read through all the information about the function before using it. Drive safely and be prepared to brake, in particular if a forward collision warning is issued.

⚠ CAUTION

Extra attention is needed in the following situations:

1 On roads where pedestrians and bicycles could be present
2 On roads with heavy traffic
3 On winding roads with sharp bends
4 On slippery roads
5 In hilly terrain and on steep slopes

Turn On ACC

ACC is enabled by pressing the Cruise Control button on the steering wheel.

Steering Wheel Switch, Left

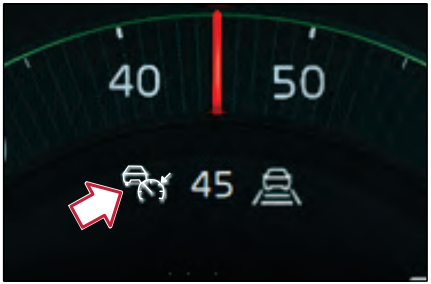
J462432

1 Increase set speed/Resume Cruise

270346_1

2 Cruise Control Enable
3 Cruise Over/Under Speed Setting
4 Decrease Set Speed/Resume Cruise
5 Cancel Cruise
6 ACC Following Distance Time Gap
7 Downhill Cruise Set

When the Cruise Control is enabled, the CC symbol is indicated in white.



J462437

The cruise control is then activated by pressing the set or resumes button at the desired vehicle speed. The cruise control icon, preset speed, and ACC time gap icons are shown in white.

When the system detects a vehicle moving in front, the adaptive cruise control (ACC) activates. When ACC is activated, the cruise control icon, preset speed, and ACC time gap icons will turn green.

Changing Preset Speed

Change the preset speed using the plus and minus keys. A short press will increase/decrease speed by 0.6 mph (1 km/h), a long press increase/decrease speed by 3.1mph (5 km/h).

You can also change the preset speed by using the accelerator pedal and then pressing the Resume Cruise button.

If no preset speed is visible in the instrument display, ACC can only be activated at speeds above 4.9 mph (8 km/h).

J462438

With Adaptive Cruise Control (ACC) engaged, the driver can adjust the following distance from the forward vehicle by pressing the time gap button and adjusting the time gap using the + and – buttons. The changes in the time gap can be observed in the Instrument Cluster display, allowing the driver to

customize the ACC maintained following distance.

The symbol for time gap

J484034

The lines indicate the current time gap, with the minimum setting corresponding to one line, which represents a time gap of 2.5 seconds. Each additional line increases the current time gap to 2.8 seconds, 3 seconds, 3.2 seconds, and the maximum time gap is 3.5 seconds.

Each time the truck is started the time gap distance used at last key-off is automatically restored.

The time gap setting also influences the behaviour of ACC.

A shorter time gap prioritizes quick adaption to the traffic flow.
A longer time gap prioritizes more comfortable and fuel-efficient performance.

> **NOTE**
>
> To save fuel, select a longer time gap.

> **NOTE**
>
> If you activate or resume the adaptive cruise control during braking, it will only come On active if you release the brake within 2 seconds.

If a preset speed is visible and when driving above 8 km/h, you can resume ACC by pressing the Resume key(+ or -).

Using ACC below 4.9 mph (8 km/h)

- A vehicle is detected in front of the truck (only applicable below 3.1 mph (5 km/h)).
- The driver door and the passenger door are closed.
- The driver's seat belt is fastened.
- There are no faults in the system.

Using ACC at low speed

The sensors measure the distance to the lower part of the vehicle in front. If the target vehicle has a protruding load, the sensors might not detect this. Pay special attention to protruding load at low speed when there is a short distance to the targeted vehicle and be prepared to brake or deactivate ACC.

> **CAUTION**
>
> Risk of colliding with protruding loads when using ACC in lowspeed cruising. Be prepared to brake or deactive the ACC system.

Brake to a Standstill and then Drive Away

If the vehicle in front brakes to a standstill, ACC will brake the truck to a standstill and keep it stationary using the wheel brakes or parking brake. If the vehicle in front starts to move within two seconds, ACC will accelerate the truck and follow the vehicle.
If the standstill exceeds two seconds, you can follow the vehicle in front by pressing the accelerator pedal or the Resume cruise button.
The icon for auto hold comes on during the standstill.

J481271

Icon for the auto hold function

Deactivate Cruise Control

To deactivate the adaptive cruise control, do any of the following:
Brake the truck to a speed that is at least 2 km/h lower than the set speed.

Short-press the Cancel Cruise key.
The preset speed is then shown in the instrument display, for example 75.
If any of the conditions for engaging at low speed are not fulfilled, ACC is temporary deactivated.
If the Stretch Brake is used, ACC is deactivated. To return to the preset speed, press the Resume Cruise key. The Stretch Brake is deactivated.
If the standstill lasts for more than 4 minutes, ACC is switched off and the parking brake is applied.
If any other condition is not fulfilled, for example, braking or a door is open the parking brake will be applied and ACC will be switched off.

Switching Off ACC

A long press on Cancel Cruise key switches Off ACC and the ACC symbol disappears from the instrument display.

Speed Adaptation

When ACC is engaged and has detected a vehicle, 'a symbol for time gap' comes on in the instrument display.

The speed is adapted to the vehicle in front

If the vehicle in front is moving slower than the preset speed, ACC will adapt the truck's speed to match it.
In some situations (typically on uphill or in downhill gradients), the distance to the vehicle ahead can temporarily deviate from the set distance to lower the fuel consumption. Be vigilant about following distances with lead vehicles.

When a vehicle in front moves out of the ACC field of view, the Detected Vehicle symbol disappears and the speed increases to the preset speed again.

In a bend, the vehicle in front may temporarily move out of the ACC field of view. In such a case, the truck maintains the reduced speed as long as ACC senses that the truck is in a bend. The radius of the bend will also affect the speed. When the vehicle in front is back in the field of view, it reverts to normal behavior.

> ⚠ CAUTION
>
> ACC may find it difficult to accurately identify vehicles that are laterally displaced, which is why the truck may be unexpectedly braked when overtaking. When overtaking, it is therefore recommended to increase speed with the accelerator pedal or disengage ACC temporarily.

When the truck must be braked manually

If the truck is catching up with a vehicle that is driving slower or that is braking hard, ACC might not brake sufficiently. In this situation, a red light is visible in the windshield to warn about the risk of collision. Use the footbrake to brake the truck.

ACC does normally not react to stationary or very slow moving vehicles. You must brake manually in these situations.

> ⚠ WARNING
>
> ACC does not brake for stationary obstacles or very slow moving vehicles.

Brake protection

To protect the wheel brakes from overheating or overuse, ACC can temporarily switch to reduced mode and use only auxiliary brakes. Reduced mode is indicated by a different ACC symbol color and the "Auxiliary brakes only Adaptive Cruise Control functionality reduced" message is shown in the instrument display.
In reduced mode, the braking capacity may be reduced.
ACC estimates the condition of the brakes and will go into a reduced mode if it determines it is necessary. Once ACC estimates the brakes have recovered from use, normal function is restored.
Reduced mode is only used above 22.3 mph (36 km/h). Below 18.6 mph (30 km/h), the system automatically returns to normal mode.

ADAPTIVE CRUISE CONTROL

CAUTION

In reduced mode, the braking capacity is reduced. Be prepared to brake manually.

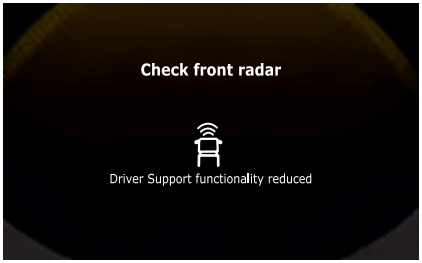
NOTE

Moderate use of ACC on downhill gradients behind slower vehicles reduces the risk of the brake protection being activated and ACC entering reduced mode.

If ACC is not working

ACC does not work if the radar sensor is very dirty or covered with snow or ice. If the camera sensor is covered, the performance is reduced.

If the radar is blocked by dirt, the message "Driver Supporrt functionality reduced" is shown in the instrument display.



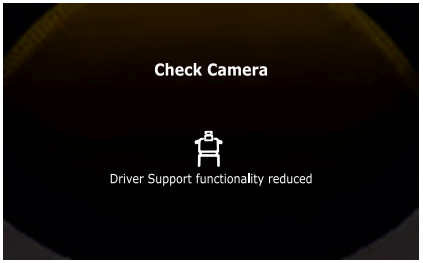
J484291

After the sensor is cleaned, the function is reset after a few minutes of driving, or when starting as normal if the truck is restarted.

WARNING

Do not use high-pressure washing to clean the radar sensor.

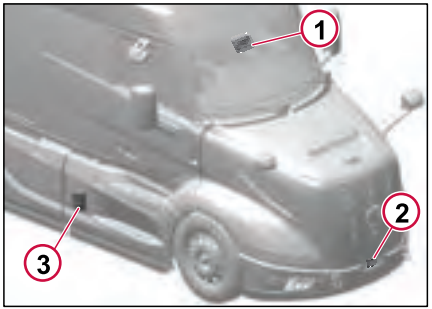
Make sure that you keep the area in front of the camera sensor clean. If the system detects that the camera is blocked, the message "Check camera Driver support functionality reduced" is shown in the instrument display.



J484284

WARNING

Any modifications to the camera installation or to the area in front of the camera may result in the incorrect functioning of the system.



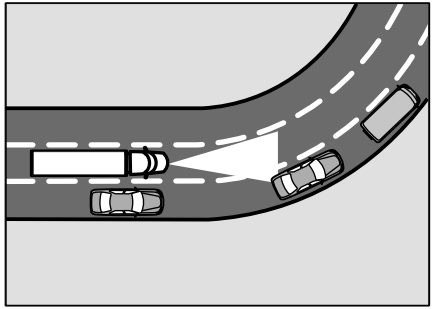
1 Forward Looking Camera (FLC)
2 Forward Looking Radar (FLR)
3 Side Radars

270346_1

Special Driving Situations

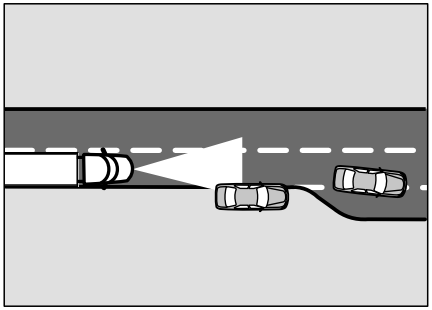
⚠ WARNING

The system can sometimes have difficulty identifying and dealing with certain situations in traffic. It is always the driver's responsibility to maintain an appropriate distance and speed!



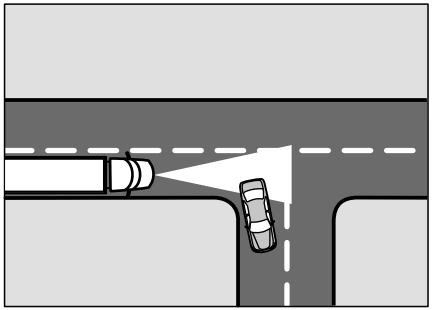
J484292

The system has limited ability to detect vehicles in a bend. This can result in the truck unexpectedly issuing a warning, braking or accelerating.



J484305

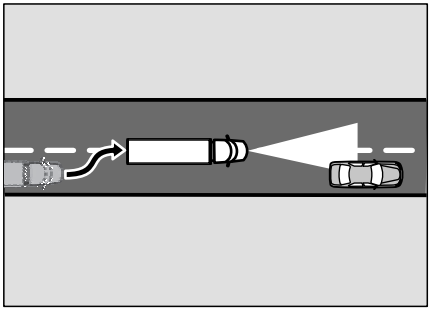
The system has limited ability to detect vehicles travelling in an adjacent lane, or stationary obstacles. This can result in the truck unexpectedly issuing a warning, braking or accelerating.



J484439

The system has limited ability to detect whether the vehicle in front is turning off.

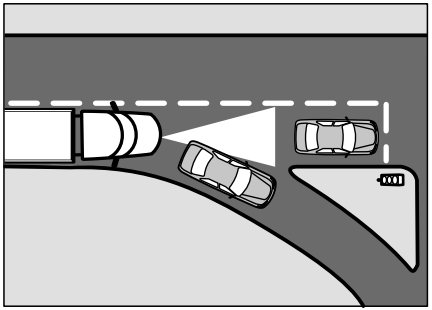
This can result in the truck unexpectedly issuing a warning or braking.



J484452

When overtaking, the system may unexpectedly issue a warning or brake the truck if you drive too close to the vehicle you are overtaking and are in the same lane.

ADAPTIVE CRUISE CONTROL



J484455

The system cannot detect an obstacle or a stationary vehicle in front of the vehicle that the truck is following. This can result in unexpected acceleration.

Cruise Over/Under Speed Setting

Cruise Over/Under speed setting button allows the driver to set an allowable speed over or under the set cruise speed. This feature can come in handy while driving in hilly terrain as it can help your vehicle operate more efficiently by allowing it to build speed at the base of a hill. Additionally, the under speed setting can be used to slow down your vehicle below the set speed before the engine requires additional fuel for acceleration, which can further enhance its fuel efficiency. To use this feature, simply press the Cruise Over/Under speed setting button and adjust the settings according to your driving needs.

J462448

Downhill Cruise Setting

Downhill Cruise setting is utilized when the auxiliary brake stalkswitch is in the “A” automatic position. The Downhill Cruise button allows the driver to set a maximum downhill speed desired so that the engine brake will engage as required to maintain the vehicle set speed. After the "Downhill Cruise" button is selected, the desired downhill speed limit can be adjusted using the +/- buttons on the steering wheel.

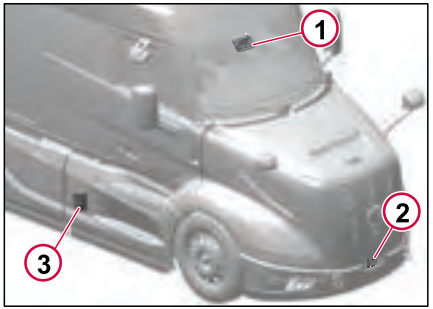
When the downhill cruise is active, the icon and the set speed is displayed in the instrument cluster.

J462542

Overview

VADA is an active safety system feature that includes:

- Driver Alert Support
- Volvo Dynamic Steering
- Lane Change Support (LCS)
- Forward Collision Warning with Heads Up Display (FCW)
- Automatic Emergency Braking (AEB)
- ACC Traffic Stop and Go
- Lane Departure Warning

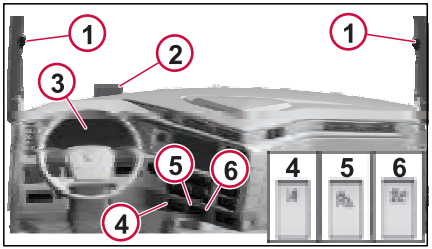


J481480

1 Forward Looking Camera (FLC)

2 Forward Looking Radar (FLR)

3 Side Radars



J481483

1 Lane Change Support (LCS) Indicator

2 Heads-up Display

3 Instrument Cluster

4 Lane Keeping Support (LKS) Switch

5 LCS Switch

6 Forward Collision Warning (FCW) Switch

Driver Alert Support

The DAS is a driver support system that informs about the driver's level of attention on driving. The system attracts the driver's attention if driving ability is impaired, for example, if the driver is falling asleep.

⚠ WARNING

DAS does not work in all driving situations and is a complementary tool. As a driver, you are ultimately responsible for the vehicle being driven in a safe manner.

⚠ WARNING

The system does not actuate the brakes or the steering in the truck. It only sends out acoustic signals via the instrument panel and shows messages in the display.

DAS uses the truck's lane keeping system to determine the driver's level of attention. If the vehicle tends to drift out of the lane or drift between the lane markings repeatedly, the driver will receive a visual and audible alerts via the instrument cluster.

For DAS to work, the following conditions must be met:

- The DAS system is not disabled using the dashboard switch.
- The road has legible lane markings.

VADA (VOLVO ACTIVE DRIVER ASSIST)

- The truck has a speed greater than 37 mph (60 km/h).

The DAS system provides two levels of warnings:

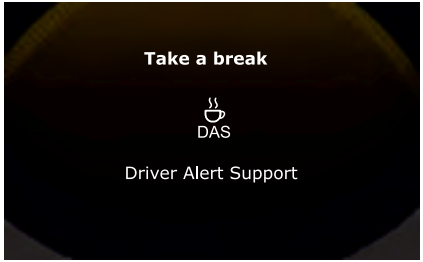
1 First Level of Warning, when the driver shows signs of less attention - "Focus on driving".

2 Second Level of Warning, when the performance is not improved within a set time - the system recommends the driver to take a break.

First Warning

J481348

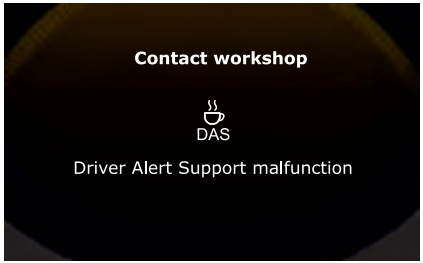
Second Warning



J481484

Malfunction Notification

If the Driver Alert System is malfunctioning, the DID will send a notification to contact the workshop.



J481349

DAS Disable Switch

The DAS disable switch allows the driver to turn Off the DAS warnings when driving through possible construction area with irregular line makings on the road that results in false DAS warnings.

J461291

NOTE

DAS may have limited functionality if there is snow, ice or dirt in the vicinity of the camera. If the system is unavailable or switched off without reason, check that the area in front of the camera is clean so that no dirt or misting obscures the camera on the outside of the windscreen.

Volvo Dynamic Steering (If Equipped)

⚠ WARNING

Removal of steering shaft or adjustment of steering components, and wheel alignment require recalibration of the Steering Sensors.

Volvo Dynamic Steering improves the truck's steering characteristics so that driving becomes safer and more comfortable.

Volvo Dynamic Steering assists in the following situations:

- Steering is made easier at low speeds.
- The physical effort to steer is lower
- Improved directional stability at high speeds
- The system compensates for sudden cross winds, cambered road surfaces, highway crowning, or emergency situations like tire failure to keep the truck tracking correctly.
- The system compensates on uneven road surfaces to stop the steering wheel from shaking too much.
- When reversing, the steering wheel will resume its original position just as when driving forwards.
- During heavy braking, when the braking wheels are on different surfaces, the system strives to steer straight ahead.

Start Up Conditions for Volvo Dynamic Steering

During vehicle start up, dynamic steering will be activated when the below conditions are met.

- Front wheels are straight ahead (not turned at a sharp angle).
- After parking, brake is released.

Power Steering System Protection

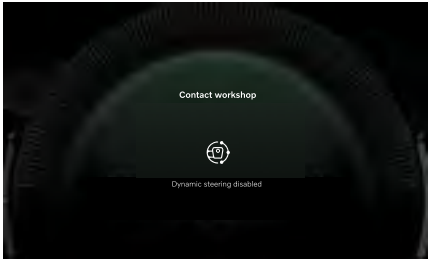
When VDS is active, after 90 seconds without vehicle or steering wheel movement, the system will go into a standby mode. The driver can feel a release of pressure in the steering system through the steering wheel as an indication of the vehicle entering standby mode. The system will resume normal operation when the vehicle or the steering wheel is moved.

System Warning Messages

If there is a fault in the Dynamic Steering system, the electric motor will be switched Off. Steering will then function with the help of hydraulic assistance, like on a normal truck, but with slightly stiffer steering. A fault message "Dynamic Steering Disabled" will display. Contact an authorized Volvo dealer to rectify the fault.

ⓘ NOTE

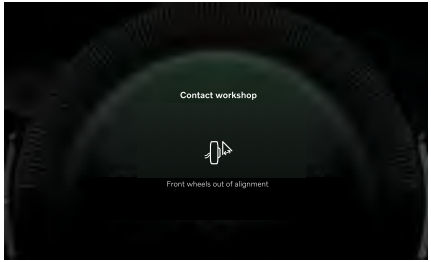
Software calibration is required if a wheel alignment is performed.



J481087

VADA (VOLVO ACTIVE DRIVER ASSIST)

If the system detects that the vehicle is pulling to the side, it may be due to incorrect wheel alignment. A fault message "Front Wheel out of Alignment" will be displayed in the DID. Contact an authorized Volvo dealer to rectify the fault.



J481109

Setting

The Volvo Dynamic Steering (VDS) system vastly improves the driving experience by reducing the amount of effort required to control the vehicle steering.

How to find the Volvo Dynamic Steering menu

All Apps	
	Volvo Dynamic Steering

The engine must be running in order to be able to change these settings.

Select Steering Feel

You can select among five steering feels. Four of them are predefined and one can be adapted.

- “Default” is a factory set, balanced that suit most people.
- “Light” is a light.
- “Responsive” is a sporty.
- “Stable” is a steady.
- “Custom” allows you to customize the steering feel.

The selected steering feel is saved as a personal setting.

Adapted Steering Feel

With “Custom” selected, you can customise the steering feel with four parameters, "Straight Ahead", "Curve", "Return" and "Damping".

- “Straight Ahead” affects the amount of resistance in the steering wheel when driving straight ahead at high speed and when the steering wheel is in its original position. “High” gives high resistance, “Low” gives low resistance.
- “Curve” affects the amount of resistance in the steering wheel when driving around bends and when the steering wheel is moved from its original position. “High” gives high resistance, “Low” gives low resistance.
- “Return” affects the speed at which the steering wheel resumes its original position when driving at low speed. “High” gives a fast response, “Low” gives a slow response.
- “Damping” affects the stiffness of the steering at low and high speeds. “High” gives stiff steering, “Low” gives direct steering.

To customise the steering feel, do as follows:

1. Select "Edit", below Custom.
2. Drag each slider to the desired position.
3. Select "Back" to exit the menu and save your settings.

Tracking

If the truck steers unevenly due to an uneven road surface or constant side wind, the straight ahead position of the steering wheel can be adjusted.

To adjust the straight ahead position of the steering wheel, do as follows:

1 Select the "Angle offset" icon in the top, right-hand corner of the Volvo Dynamic Steering menu.

2 Drag the slider to the desired position.

3 Select "Back" to exit the menu and save your settings.

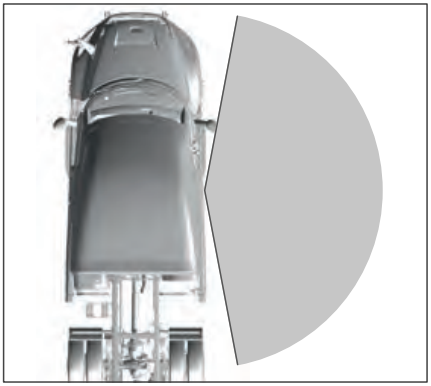
J460784

The Angle offset icon.

Lane Change Support (LCS)

Lane Change Support (LCS) is a driver support system that, in certain circumstances, alerts the driver to the vehicles that are traveling in the same direction as the truck on the passenger side (in the so-called blind spot).

The system minimizes the risk of accidents during lane changes.



J460833

LCS Sensor Coverage Area

⚠ WARNING

The system is a supplement to a safe driving style and the use of rear view mirrors. It cannot replace your awareness and responsibility. The responsibility for changing lanes in a safe manner always lies with you as the driver.

ⓘ NOTE

The system does not actuate the brakes, steering or other systems in the truck. It only sends out warning light and acoustic signals.

Engaging Lane Change Support

LCS activates automatically when the truck is started and the vehicle speed is more than 21 mph (34 km/h). The system cannot be turned Off. However, the audible alert can be turned On or Off via the secondary information display.

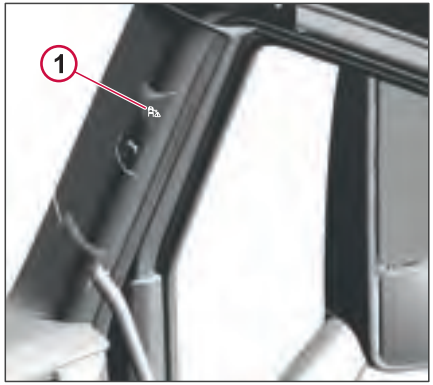
When does the system give a warning?

The system provides a warning when the following conditions are met:

- The truck has a speed more than 21 mph (34 km/h).
- The direction indicator on the passenger side flashes.
- Another vehicle is moving within the LCS sensor's coverage area.

The system alerts via a flashing light from the light-emitting diode (LED) in the door pillar on the passenger side of the vehicle. Also, an audible signal emits.

VADA (VOLVO ACTIVE DRIVER ASSIST)



J460939

1 Lane Change Support LED

The LCS LED will be positioned either on the right side or on both sides of the pillar, depending on the specific variant of the truck.

LCS (Lane Change System) Alert Sound

To change the LCS (Lane Change System) alert sound setting in the SID, complete the following:

1 Use the Toggle/Enter button to scroll to the LCS Alert Sound sub-menu.

2 Press Enter.

The LCS Alert Sound screen displays. The default mode is ON.

J460940

To deactivate LCS alert, toggle off. This will result in the LCS warning sounds to be turned Off until next key cycle.

There is also a switch on the dashboard that allows you to disable the LCS audible warnings. The visible alert on the passenger side pillar will still illuminate when the system detects a vehicle in the blind spot area.

J474418

> **NOTE**
>
> With Lane Change Support deactivation, the Lane Change Support function will remain Off until:
>
> - Driver activates Lane Change Support again by pressing the switch again.
> - Key cycle will activate Lane Change Support again after key cycle.

At low speed

If the LCS is On, it will be inactive at speeds less than 21 mph(34 km/h). When LCS is inactive due to low speed, a symbol is shown in the instrument display.

J460964

Icon for Inactive Lane Change Support at Low Speed.

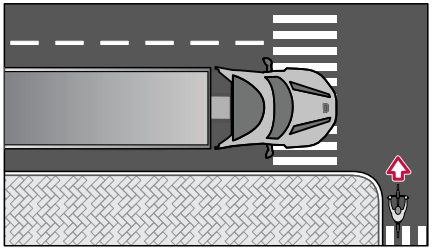
Typical situations

When assessing the truck's surroundings, the system considers the speed and the approach angle of other road users in relation to the speed and direction of your truck. In the following, you will find some examples of situations that normally will alert you about road users in the monitored area.

NOTE
In tunnels or close to guard rails, false alarms might occur.

Bicycle passing in front of truck

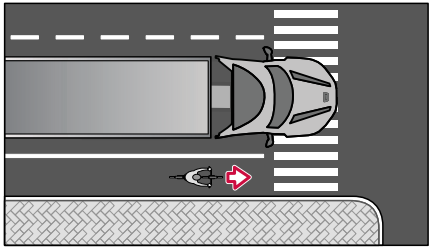
At a standstill, you are also informed if a bicycle is about to pass in front of the truck.



J484339

Bicycle parallel to the truck

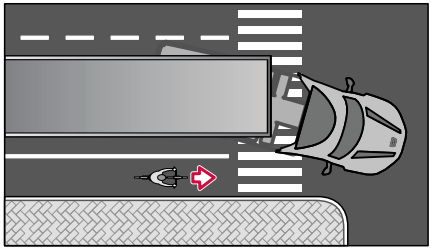
If you have a bicycle traveling in parallel with your truck on the passenger side, you will be informed.



J484341

Bicycle in blind spot

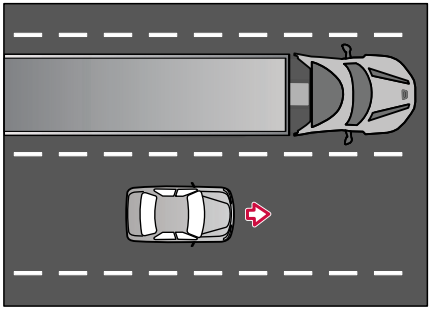
While driving, if you use the turn signal to turn to the passenger side and have a bicycle in the blind spot area beside the truck, the system warns you.



J484343

Vehicle parallel to the truck

When you have a vehicle in the adjacent line, the system will inform you and when using the turn signal warn you. The system is constantly evaluating your own speed and the adjacent vehicle's speed so the warning is done in the correct situation.



J484430

LCS Malfunction

Lane Change Support (LCS) functionality is limited if there is snow, ice or dirt blocking the sensor. Also, extreme weather conditions, such as snowfall or heavy rain can affect functionality. Keep the area in front of the sensor clean during vehicle operation.

The sensor's function may be impaired if the vehicle is carrying an extremely wide load or has bodywork or other fixed installations within the sensor's field of vision. If bodywork or other modifications are made in or adjacent to the sensor's

field of vision, the function of the LCS must be checked by certified technician.

The LCS does not warn of pedestrians, cyclists or fixed objects that are in the sensor's field of vision, and in certain situations may have difficulty in detecting motorcycles and mopeds.

If there is a system malfunction, the following tell-tale and Secondary Information Display (SID) screen display. If system issues occur, ensure that the LCS sensor is not hampered by any obstacles. If system issues persist, have the system serviced by a certified technician.

Forward Collision Warning

Forward Collision Warning with Automatic Emergency Braking

The purpose of FCW-AEB is to aid the driver in avoiding or reducing the severity of collisions in rear-end crash scenarios. The system detects motorized vehicles. It also detects vulnerable road users like pedestrians and bicyclists.

The system uses a combination of data from camera and radar sensors to detect and measure positions and dynamics of vehicles and vulnerable road users.

⚠ WARNING

FCW-AEB is a complementary tool and may not work in all driving situations. It is not a substitute for attentive driving. Always keep your eyes on the road and never rely solely on FCW-AEB to prevent collisions.

ⓘ NOTE

This system is triggered in dangerous situations. Do not try to test the system.

The system detects vulnerable road users and vehicles ahead and determines if they represent a hazardous condition and if the driver has an adequate opportunity to avoid the hazard. If there is only very limited time available for the driver to respond by braking or steering, the system first warns the driver. If the system assesses that a collision is still imminent, the system activates the vehicle brake. This to avoid a collision or to mitigate the severity of a collision.

The system is activated automatically when the truck is started (at key ON), and is available at speeds above 3 mph (5 kmph).

ⓘ NOTE

Several factors can reduce the performance of FCW-AEB causing unnecessary, invalid, inaccurate or missed warnings or braking.

Forward Collision Pre-Warning

The Pre-warning will be represented by a steady red light. There is a line of red LEDs on the dash that reflects on the inside of the windshield glass to alert the driver, called Heads-Up Warning. This is intended to get the driver's attention and alert them about potential hazardous situations.

The Heads-up Warning lamp will illuminate for the following situations:

Distance Warning

- The Distance Warning will only be active when the Adaptive Cruise Control is disengaged and for speeds more than 37 mph (60 km/h).
- Distance warning will be represented by a steady red light
- When Adaptive Cruise Control is enabled, the truck will control the following distance, no distance warning will be presented.
- If the Distance Warning is displayed, the brightness will be set by the ambient lighting.

- If the driver usually follows close to other vehicles, this lamp may illuminate often.
- The Distance Warning lamp can be temporarily disabled with the Forward Collision Alert Deactivation Switch.

J463062

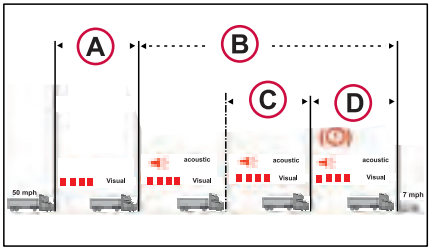
Forward Collision Warning

It consists of red light warning and audible warning to make the driver immediately steer or apply the brakes. There is no disable function for the Forward Collision Warning Alerts.

Automatic Emergency Braking

If the driver has not reacted to the Forward Collision Warnings, the truck will engage emergency braking automatically. This will happen quickly after the second alert and will progressively engage the brakes until the collision is mitigated or the truck is stopped. When emergency braking is active, the brake lamps on the tractor and trailer will flash.

The brakes remain active until the accelerator pedal is given full throttle or the driver takes sudden evasive action. The system itself releases the brakes when there is no longer any risk of collision and the display shows the message:
"Automatic Emergency Brake was activated"
If the vehicle comes to a complete standstill, the hazard warning lights are activated automatically. In this case, the system then releases the brakes when the driver either releases the brake pedal, depresses the accelerator pedal, engages reverse gear or the parking brake.
If the driver does not do anything, then the system activates the parking brake, if this action is possible. In certain situations, the system may skip steps of the process to respond to the criticality of the situation.



J484779

(A) pre warning, which can be switched off (B) warning and signal (C) pre braking (D) emergency braking.

NOTE

Depress the accelerator pedal fully to stop unwanted emergency braking.

CAUTION

Do not place paper or objects on the instrument panel that risk obscuring the LEDs that emit the light signal.

CAUTION

FCW-AEB may provide a warning or braking in situations where the likelihood of collision may not exist. Stay alert and always pay attention to the area in front of the vehicle so you can anticipate whether any action is required.

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WARNING

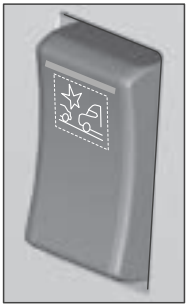
Warnings and pre-braking may be triggered frequently if driving aggressively.

WARNING

If there is snow, ice or dirt around the radar sensor or camera sensor the system may have limited functionality. Poor weather conditions with heavy rainfall, fog or strong oncoming light may also limit functionality, particularly for detecting stationary vehicles.

Switching off the system manually

There is a disable switch to disable the forward collision pre-warning. This only disables the pre-warning, this will not disable the second level of warnings or emergency braking functions.



J462643

There are two levels of collision warnings, and if the driver does not respond to these warnings, the system will automatically apply the emergency brake.

NOTE

If the system has been switched off manually, it is automatically reactivated when the truck is restarted.

It is recommended to switch off the system if there is following:

- Front-mounted accessories, for example, snow plough
- Damage to the front of the truck

NOTE

If special equipment is mounted in front of the radar and the truck is equipped with an auxiliary snow plough light, the system is disabled when the auxiliary light is enabled.

Situations that require special attention

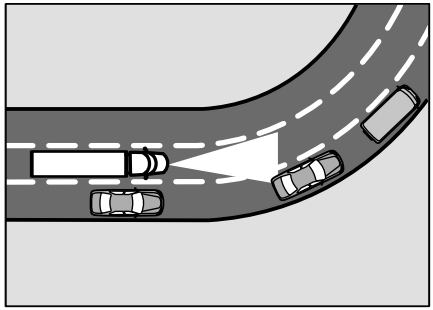
WARNING

The system can sometimes have difficulty identifying and dealing with certain situations in traffic. Always use appropriate caution when driving.

Situations

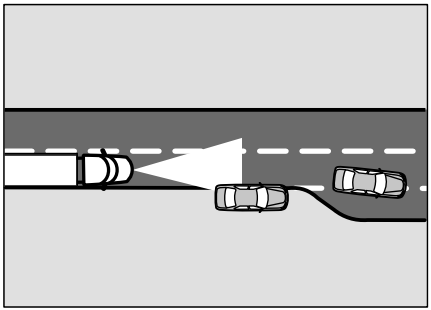
The system has limited ability to detect:

- Motorcycles and other smaller road users
- Vehicles of unusual shape, for example a boat trailer
- Vehicles in poor visibility conditions, for example, bad weather conditions, strong oncoming light, night condition, rain or snow smoke from another vehicle



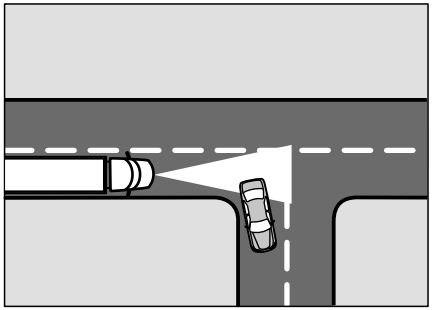
J484292

The system has limited ability to detect vehicles in a bend. This situation can result in the vehicle issuing a warning unnecessarily or braking unduly.



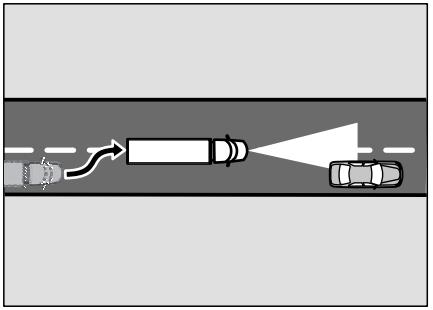
J484305

The system has limited ability to detect vehicles that are laterally offset. This situation can result in the vehicle issuing a warning unnecessarily or braking unduly, or not braking or warning.



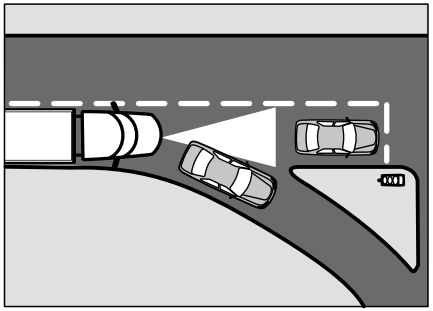
J484439

The system has limited ability to detect whether the vehicle in front is turning off. This situation can result in the vehicle issuing a warning unnecessarily or braking unduly.



J484452

When overtaking, the system may unexpectedly issue a warning or brake the truck if you drive too close to the vehicle you are overtaking and are in the same lane.



J484455

The system cannot detect an obstacle or a stationary vehicle in front of the vehicle being followed. This situation can result

VADA (VOLVO ACTIVE DRIVER ASSIST)

in the vehicle issuing a warning unnecessarily or braking unduly, or not braking or warning.

> **NOTE**
>
> The system considers vulnerable road users in front of the vehicle. The system also considers stationary vehicles and vehicles ahead that are driving in the same direction and in the same lane. It does not consider oncoming or crossing vehicles or animals.

> **WARNING**
>
> The described situations do not represent an exhaustive list of situations that may interfere with proper operation of Collision Warning with Emergency Brake. FCW-AEB may fail to provide warnings or braking for many other reasons. To avoid a collision, stay alert and always pay attention to the area in front of the vehicle. You can then anticipate the need to take corrective action as early as possible.

When coupling to a trailer

> **WARNING**
>
> It is important to check that your truck has detected the trailer. If a trailer is coupled without functioning ABS, the emergency braking functionality may be reduced.

Activate the direction indicator and check that the arrow and the rectangle in the instrument symbol flash after coupling a trailer.
Both symbols flash when the trailer has been coupled correctly.

> **NOTE**
>
> When connecting several trailers, it is important that all have a functioningsystem otherwise the emergency braking functionality may be reduced.

If FCW-AEB is deactivated due to a fault, the instrument symbol illuminates and the message "Contact workshop, Driver Support System not available" is shown in the instrument display. Contact an authorised Volvo workshop to rectify the fault.

> **WARNING**
>
> The emergency braking system will be automatically deactivated after three emergency brake interventions. The function can be reactivated at an authorized Volvo workshop.

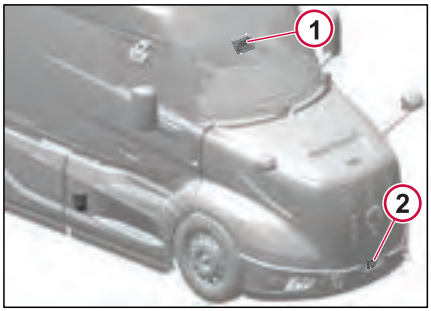
ABS or ESP system

FCW-AEB is deactivated if your truck'ssystem is not working properly.

If the ESP/ESC system on your truck is not working properly or if a connected trailer has a malfunctioning ABS or no ABS at all, the emergency braking functionality may be reduced.

If there is deactivation or reduction of brake performance due to a fault in the ABS or ESP/ESC system, the instrument symbol illuminates.

> **NOTE**
>
> When the ABS system is not working properly on your truck, the emergency braking functionality is turned off (the symbol illuminates in the cluster) but the warnings are still available.”



J484780

1 Forward Looking Camera (FLC)

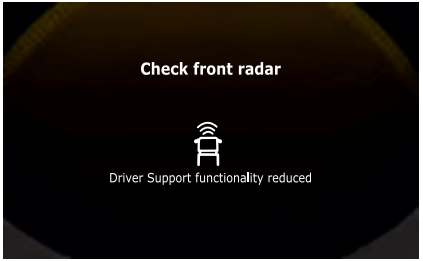
2 Forward Looking Radar (FLR)

> **WARNING**
>
> Do not use high-pressure washing to clean the radar sensor.

270346_1

Radar Sensor

Make sure that you keep the area in front of the radar sensor clean. If the radar sensor is dirty or blocked, a message is shown in the instrument display. Clean the radar sensor at the next stop.



J484291

WARNING

Do not paint, stripe or fit anything (such as auxiliary lamps, number plate or ADR panel holder) in front of the radar sensor. Any modifications to the radar sensor installation or to the area in front of the radar sensor may result in incorrect function of the system.

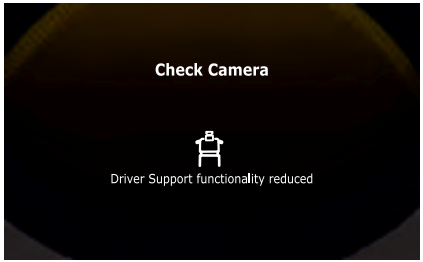
WARNING

After a collision or minor impact that affect the area around the radar sensor, visit an authorized Volvo workshop to ensure full function of the sensor.

When the sensor is cleaned, FCW returns to normal function after a few minutes of driving.

Camera Sensor

Make sure that you keep the area in front of the camera sensor clean. If the system detects that the camera is blocked, the message "Check camera Driver support functionality reduced" is shown in the instrument display.



J484284

WARNING

Any modifications to the camera installation or to the area in front of the camera sensor may result in the incorrect functioning of the system.

Distance Alert

Driver Alert helps you keep a safe time gap to the vehicle ahead of you.

WARNING

Distance Alert can never replace you as a driver! As a driver, you have the ultimate responsibility for maintaining a safe distance to any vehicle ahead of you.

How Distance Alert works

When the time gap to the vehicle ahead is too short, you are warned by a red light signal on the windscreen.

This function is active when you drive more than 37mph (60 km/h), without using the adaptive cruise control.

NOTE

Distance Alert is using the same red light as the collision warning.

VADA (VOLVO ACTIVE DRIVER ASSIST)

If you in some situations find the Distance Alert disturbing, you can switch off the function in the menu.

The function will remain switched off even after a restart of the truck.

How to find the Distance Alert setting

SETTINGS
↳ Vehicle Settings
↳ Distance Alert

ACC Traffic Stop and GO

This permits the use of Cruise Control in stop and go traffic situations. There are two versions, with ACC engaged, vehicle will come to a complete stop if traffic stops. When traffic starts moving, if less than two seconds from being stopped, the truck will automatically move forward without driver interaction (Auto Go). If traffic is stopped for more than 2 seconds, the truck will not start moving unless the driver initiates movement by pressing the Cruise Resume or by pressing the accelerator pedal to re-engage the ACC system.

With ACC set, the truck will follow in traffic just like at normal speeds but with a closer following distance. If the forward vehicle comes to a stop, the truck will also stop and hold the brakes. Once the lead vehicle starts moving again, the truck driver will need to press the accelerator to move the truck forward. This system will continue to operate until cancelled or until the traffic speeds up.

With the related variants, the following time gap distance settings are provided, defined in seconds from the vehicle in front of the truck:

Variant	Time GAP in seconds				
ACCTG_C1	3.5	3	2.5	2	1.5
ACCTG_C2	3.5	3.2	3	2.8	2.5
UACCTG	3.5				

Lane Support System And Active Lane Keeping

Lane Detection

When lanes are detected by the forward-looking camera the left and right lanes will be indicated in the instrument cluster. This safety system is active above 37 mph (60 km/h) and deactivates when speeds drop below 34 mph (55 km/h).

J463064

J463065

Lane Departure Warning

With a lane departure warning, there will be an amber lane indication in the instrument cluster with an audible warning sound to warn the driver to take action to keep the vehicle in the lane. Example: Right side lane departure warning:

270346_1

J463068

J463067

Active Lane Keeping

The Active Lane Keeping system requires Volvo Dynamic Steering to actively steer the truck inside the lane markings.

> **NOTE**
>
> There are two functions that can be activated by pressing the Cruise Control Button.

The Advanced Driver Assistance system must be enabled by the driver using the Cruise Control button on the steering wheel. The first press enables the Adaptive Cruise Control. The ACC can be activated/set at this point, but the Active Drive Assist is not engaged.

J463069

Pressing the Cruise Control button one more (or pressing the down button), will enable the Drive Assist Icon on the instrument cluster. To activate Drive Assist, press the SET button on the steering wheel. Notice that the Green Icon above changes to match the Drive Assist Icon, indicating that Drive Assist mode is activated.

J463071

This Active Lane Keeping System will steer the truck to the center of the lane of travel (Continuous Steering), while Drive Assist is activated. This system works to help the driver maintain the lane of travel in a more active manner but doesn't substitute the need for the driver to have hands on the steering wheel.

With Drive Assist engaged, and corrective steering is necessary for lane centering, there will be a green lane indication in the instrument cluster, see below. The driver will also feel the torque in the steering wheel, guiding the truck to the center of the lane. While the driver

VADA (VOLVO ACTIVE DRIVER ASSIST)

can feel action happening in the steering wheel, they are always in control and can override the steering torque applied by the system.

Example below: corrective steering right side

J463075

J463072

If Drive Assist is **not engaged,** lane keeping support will not actively keep the truck in the center of the lane. This system will alert the driver by using haptic feedback in the steering wheel and a gentle nudging of the wheel, helping the driver guide the truck back into the lane of travel.

Trucks equipped with Drive Assist will provide the driver with the option to change the alert preferences of this safety system.

- Steering vibration (Default setting)
- Audible sound
- Audible sound and vibration.

J463078

J463077

> **NOTE**
>
> The Active Lane Keeping system is a level of automation to help the driver keep their truck in the lane of travel. As with all driver assistance systems, this should never be considered a substitute for safe driving practices.

To encourage safe driving practices, the Drive Assist system will monitor the driver interface with the steering wheel. This system will send a warning to the driver if no steering input is detected after 15 seconds.

J463079

If no steering input is detected after 30 seconds, an audible warning will sound along with the visual warning.

Finally, if still no driver steering input is detected, this will be presented in the driver information screen along with the disabling of the Active Lane Keeping system until the next key ignition cycle.

J463080

Safe Stop In Lane

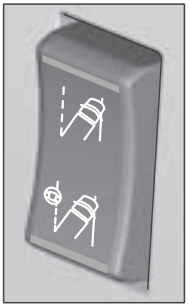
If the driver has not interacted with the warnings, the truck will start applying the brakes slowely to slow down until it comes to a complete stop in the same lane of travel.

As the brakes are applied, the hazard lights of the truck will be turned On.

Lane Support System Deactivation

All Lane Departure Warning systems have a temporary disable/deactivation switch.

When entering construction zones or in areas where lanes are not clearly marked, it could be necessary to disable Lane Departure Warning alerts or Lane Keeping Support temporarily. Pressing the deactivation switch will disable the lane assistance functions for 10 minutes.



J463083

Pressing the top of the switch will diable the lane assistance functions for 10 minutes. This will result in a 10-minute period of no audible/visual lane departure warnings.

When pressing the bottom of the switch, the Active Lane Keeping functions are disabled. There will be no haptic feedback or Active Lane Keeping until the switch is pressed downward again or the ignition switch is cycled Off/On

Road Sign Recognition System

Know Limitations

On minor roads, where map data is unavailable, the function utilizes the most recent known speed limit from the map data in scenarios such as turning onto a new road. The incorrect speed limit persists until a new speed limit sign is encountered.

Functionality

J484569

Appearance of the road signs as they are displayed for the driver in the upper area of the IC (Instrument Cluster).

Features

The following main features shall be provided by the function

Visual information:

·Speed limit information, both current speed limit and upcoming speed limit.

·Road restriction information, like overtaking restriction and size restrictions.

·Road warnings information, most relevant like road inclination, wind, curves.

Warning/Attention

VADA (VOLVO ACTIVE DRIVER ASSIST)

·Overspeed warning, both visual (blinking speed limit icon) and sound.

·Speed limit update, alert sound.

Road signs included to be displayed

Main sign type	Example of related road sign	Displayed as	Description
Speed information			The speed limit provided by the function is the limit that is valid for the vehicle combination driven, e.g. the speed limit for a truck with trailer.Speed signs with conditional signs attached will be displayed in addition to the main speed information and use one of the spots where other signs are displayed.
Upcoming speed information	Map data based		The upcoming speed limit will be displayed “beyond” the valid speed limit when the vehicle is closer than 500 m to a speed limit change. Option: Only shown if map data with speed information is available for the system.
No speed information is available			No speed information is available for the system.
Overtaking restriction			Will be displayed from passing sign until the end sign is passed or when turning in an intersection/roundabout or maximum 12 km.

VADA (VOLVO ACTIVE DRIVER ASSIST)

Main sign type	Example of related road sign	Displayed as	Description
Overtaking restriction for trucks	TRUCKS USE RIGHT LANE 	DO NOT PASS	Will be displayed from passing sign until the end sign or is passed or when turning in an intersection/roundabout or a maximum 12 km.
Warning Sharp curve right			Will be displayed for 300 m
Warning Sharp curve left			Will be displayed for 300 m
Warning Sharp curves first right			Will be displayed for 300 m

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Filter summery to long to be displayed.

Main sign type	Example of related road sign	Displayed as	Description
Warning Sharp curves first left			Will be displayed for 300 m
Warning wind from right			Will be displayed for 300 m
Warning wind from left			Will be displayed for 300 m
Warning slippery road			Will be displayed for 300 m
Warning Cattle			Will be displayed for 300 m
Warning wild animals			Will be displayed for 300 m

VADA (VOLVO ACTIVE DRIVER ASSIST)

Main sign type	Example of related road sign	Displayed as	Description
Railroad crossing			Will be displayed for 300 m
No Hazardous material			Will be displayed for 300 m

Filter summery to long to be displayed.

Driver Overspeed Warning

- The system will notify the driver for exceeding the speed limit for two different levels: First when exceeding the speed limit by more than 5 mph, and then an additional warning if the vehicle speed exceeds the speed limit by more than 10 mph above the speed limit. For the latter case the warning will go directly to visual and acoustic and skip the ‘only visual warning’ step.
- The warning will not be activated at truck speeds below 10 mph.
- The visual warning activates after 1.5 s, while the acoustic warning activates after between 3-6 s depending on relative overspeeding. The earlier for more overspeeding.
- The acoustic warning lasts for about 3 s.
- The visual warning will end 5 s after the acoustic warning has ended.
- The acoustic warning will be suppressed if.
  1. Speed goes below speed limit
  2. The accelerator pedal is released (and CC/ACC is not activated)
  3. Or by deactivation of CC/ACC
  4. Or if a brake system is activated
- The visual warning will be suppressed if
  1. time-out has passed
  2. Speed comes below speed limit
- Once the warning has been suppressed it will be reactivated if speed is above the speed limit when
  1. Accelerator pedal is pressed
  2. The CC/ACC is activated
  3. The speed has gone below the speed limit and then over it again
  4. The speed limit is lowered

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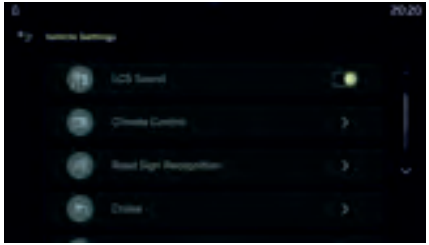
Driver Settings

In the menu for vehicle settings, the settings for Road Sign Recognition can be found



J484733

Four different settings can be made,

Speed Limit Signs – Turns on/off the speed limit information in the IC.

Speed Warnings – Turns on/off warnings when the speed limit is violated.

Speed Update Sound – Turns on/off the sound reminding about when a new speed limit is valid.

Other signs – Turns on/off the information about other types of road signs than speed limits.

The two first settings will normally be automatically reactivated after the vehicle has been turned off while the two last settings will be saved for the next start of the vehicle. (A parameter can be changed to enable all settings to be saved after the vehicle has been turned off.)

All four driver settings can be enabled/ disabled by parameters individually.

J463105

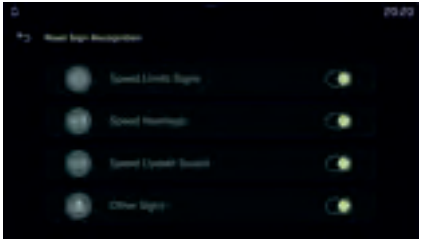
The highest priority of the signs will be speed limit signs. Once a speed limit sign is recognized, the driver may be presented with alerts if they are travelling over the limit.

VADA (VOLVO ACTIVE DRIVER ASSIST)

Alert Level 1: Warning sound when travelling at 5 mph over the speed limit.

Alert Level 2: Additional warning if travelling at 10 mph over the speed limit.

The driver will be able to turn Off the over speed warning alerts via the instrument cluster menu. When disabled, the feature will remain as set until the next key cycle.



J484734

If the setting Speed Limit Signs is turned off, the two other speed-related settings will also be turned off and grayed out in the menu and not possible to update.

When the setting Speed Limit Signs is turned on again the Speed Warnings and Speed update Sound will remain off and needs so be turned on again manually to be active.

System Failure

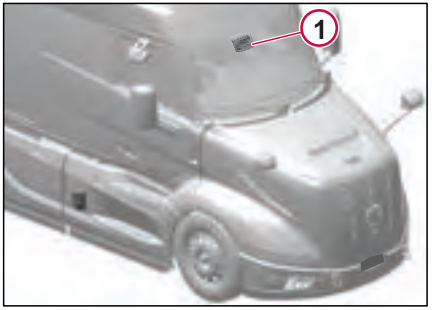
When there is a system failure the generic contact workshop for driver support functions will show together with a tell-tale

J481337

Road Sign Recognition

Forward Looking Camera

The camera sensor is used to identify the lane markings. If the system is not available or switches off unexpectedly, this may be due to dirt or mist blocking the camera sensor. Check that the area in front of the sensor is clean.



J484033

1. Forward Looking Camera (FLC)

Speed Warning System

If the Speed Warning System is selected, drivers will be able to set a warning if the truck reaches their chosen speed. This is completely driver selectable and not tied to the road sign recognition feature.

VADA Volume Control

With the Active Safety Volume Control enabled, the driver will have the ability to adjust the related audible warning sounds via the instrument cluster or Secondary Display if equipped with an infotainment system.

The Volume can be controlled by going into the System Volumes in the System Settings.

J474592

Electronically Controlled Suspension

The Electronic Controlled Suspension (ECS) system maintains constant vehicle chassis height to improve ride quality, reduce driveline vibration, and maintain tractor-trailer alignment for improved fuel economy. Unlike a standard air suspension, ECS allows for manual override to a higher or lower ride height. This option is useful for trailer coupling/ uncoupling or docking operations.

Operation

Driver Controls

The driver interacts with the ECS system through the three dashboard-mounted switches and the wired remote control (if equipped).

The three dashboard-mounted switches are:

1 Ride Height Recall Switch

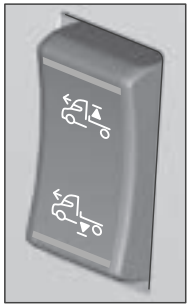
2 Loading Level Adjustment Switch

3 Traction Mode Switch

Ride Height Recall Switch (Three Positions)

The driver is allowed to store the user-defined (frequently used) ride heights in the upper and lower positions. Using the ride height recall switch, the driver can select a ride height that suits the current road conditions.

Press the switch to return the chassis height to the proper riding level. If ride height is not selected and the truck's speed exceeds 19 mph (30 km/h), a warning signal sounds while a message is shown in the instrument cluster.



J473595

The ride height recall switch has three positions. These positions can be configured according to user requirement.

- **Middle position** - when the switch is in the middle position, the ride height is at standard drive position. The middle position is the factory-set ride height.
- **Upper position** - when the switch is in the upper position, the ride height is at the high driving level.
- **Lower position** - when the switch is in the lower position, the ride height is at the low driving level.

> ⓘ NOTE
>
> Driver can reprogram the ride heights (within allowed range) using the remote control ECS.

ELECTRONICALLY CONTROLLED SUSPENSION

Ride Height Recall Switch (one Position)

J473602

The ride height recall switch on the dashboard adjusts the truck chassis to its factory-set ride height. Press the switch to return the chassis height to the proper riding level. If ride height is not selected and the truck's speed exceeds 18 mph (30 km/h), a warning signal sounds while a message is shown in the instrument cluster.

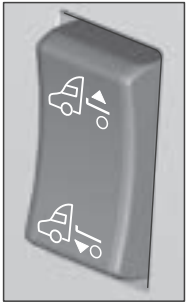
> **NOTE**
>
> The system will not mute the warning sound and instrument cluster notification until the driver selects the proper ride height using the dashboard switch.

> **NOTE**
>
> Driver can program the chassis height based on the requirements.

Loading Level Adjustment Switch

The loading level adjustment switch is intended to be used during loading and unloading situations. When the adjustment switch is used to raise/lower the chassis height, the system adjusts the suspension air spring pressure to compensate for the uneven distribution of the load.

This switch works only when the vehicle speed is below 18 mph (30 km/h).



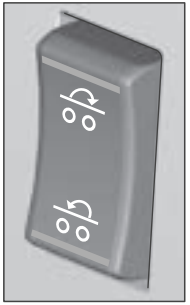
J474053

The loading level adjustment switch has two positions:

- **Upper position** - raises the chassis height.
- **Lower position** - lowers the chassis height.

ECS Traction Mode Switch (Load Distribution)

> **NOTE**
>
> The interaxle differential lock must be engaged to activate the Traction modes (Maximum Traction 1 or 2).



J474060

When the ECS system is in the drive mode, the traction modes are controlled using the traction mode switch.

The traction mode switch has the three positions:

- **Upper position** - Maximum Traction-2
- **Middle position** - Basic Traction (Normal Load Distribution)
- **Lower position** - Maximum Traction-1

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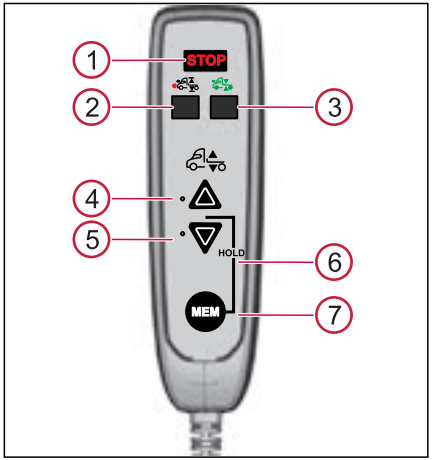
The traction mode helps to accelerate and prevent wheel slippage when driving on slippery surfaces. The traction control is most effective when accelerating from a stopped or slowed position or when trying to accelerate up a slippery hill.

Remote Control ECS



J474208

Control Buttons

1 **STOP** - At any point of time during level raising or lowering, the function can be brought to a halt using the STOP button.

2 **Change Ride Height** (lamp illuminates)

3 **Ride Height or Drive Level, for normal driving** - Press the button to restore the chassis height to the factory-set/user defined drive level both while driving and in a parked condition.

4 **Control Button Up** - Press and hold the button to raise the chassis height. When the button is released, the system stops raising the chassis height.

5 **Control Button Down** - Press and hold the button to lower the chassis. When the button is released, the system stops lowering the chassis height.

6 **Hold** - The hold function is used to avoid holding the Up or Down button continuously while changing the chassis height.
To raise the chassis height using the hold function, press and release the memory button and control button Up at the same time.
To lower the chassis height using the hold function, press and release the memory button and control button Down at the same time.

7 **Memory** - The memory button allows the operator to store a specific drive level and recall it whenever required.

An operator can store and recall up to three specific vehicle loading levels. Press the memory button to activate the memory function (short press to recall and long press to store the ride height).

Function Table

Function	Command
Manual height adjustment	Control button Up/Down
Up/Down	Control button Up + Memory button
	Control button Down + Memory button
Cancel lock	Stop/Control button Up or Down/Drive level
Adjust ride height	Change ride height + Control button Up or Down
Save ride height	Change ride height + Control button Up or Down + Memory button (5 sec)
Return to factory set ride height	Change ride height + Memory button (2 sec)

ELECTRONICALLY CONTROLLED SUSPENSION

Warnings

When the ECS is engaged to allow for manual ride height adjustment (such as loading or unloading a trailer), certain conditions activate the ECS warning system. For example, once the trailer is loaded, it is necessary to return the chassis to the any of predefined ride height level. If the system did not detect the predefine ride height and the vehicle is driven, and the vehicle reaches approximately 15 mph (24 km/h), an audible warning emits, and a pop-up message appears in the instrument cluster. These warnings continue until the ride height recall switch is pressed, or the vehicle's speed is reduced below the alarm threshold.

Pop-Up Scenario	Pop-up message
When the driver has chosen to go to ”drive level/ride height”, and the truck has not yet had time to adjust itself before the driver starts to drive.	
When the driver has not chosen to go to ”drive level/ride height” and is driving in a speed above 30 km/h.	

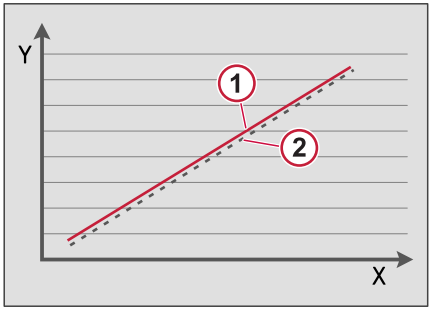
Traction Modes

> **NOTE**
>
> To activate Maximum Traction-1 or 2, the inter-axle differential lock must be engaged.

To obtain optimum traction, the air suspension system can redistribute the load between the driving axles. How much extra load put on to axle is governed mainly by the position of the traction mode switch and sometimes the speed.

Normal Load Distribution

In Normal Load Distribution, the load is distributed proportionally between the axles. Some deviation occurs around maximum load so as not to exceed the technical and legal maximum loads on each respective axle. See the diagram, the actual load values depend on the truck's specification.



J481526

X-axis: Bogie Load
Y-axis: Axle Load
1: First-Rear Driving Axle
2: Second-Rear Driving Axle

Maximum Traction-1

Some driving conditions require extra traction. This function redistributes the load on the axles in order to obtain increased traction, but without exceeding legal axle loads.

Press the lower portion of the ECS traction mode switch to activate the maximum traction-1. In the maximum traction-1, the system prioritizes or starts loading the first-rear driving axle and then to the second-rear driving axle.

The maximum traction-1 has two modes:

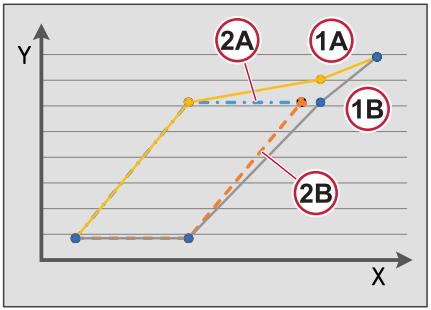
- Starting Help-1
- Traction Help-1

When the speed is below 18 mph (30 km/h), the load is increased by a further 30% (i.e 130%) on the first-rear driving axle in order to produce good traction when starting. This function is called as Starting Help-1. The Starting Help-1 mode is only activated if the switch is pressed in when the speed is below 18 mph (30 km/h). The LED indicator in the switch flashes in the event of Starting Help.

When the speed is above 18 mph (30 km/h), the system automatically moves from the Starting Help-1 to Traction Help-1 mode. When the Traction Help-1 mode is activated, the LED indicator in the switch stays On.

In the Traction Help-1 mode, the system redistributes load only to the 100% of the axle capacity. In this mode, the system starts loading the first-rear driving axle first and then to the second-rear driving axle. In the final, the load on both the rear driving axles is redistributed proportionally/evenly.

ELECTRONICALLY CONTROLLED SUSPENSION



J481560

X-axis: Bogie Load
Y-axis: Axle Load
1A: Load on First-Rear Driving Axle (Starting Help)
1B: Load on Second-Rear Driving Axle (Starting Help)
2A: Load on First-Rear Driving Axle (Traction Help)
2B: Load on Second-Rear Driving Axle (Traction Help)

Maximum Traction-2

Some driving conditions require extra traction. This function redistributes the load on the axles in order to obtain increased traction, but without exceeding legal axle loads.

Press the upper portion of the ECS traction mode switch to activate the maximum traction-2. In the maximum traction-2, the system prioritizes or starts loading the second-rear driving axle and then to the first-rear driving axle.

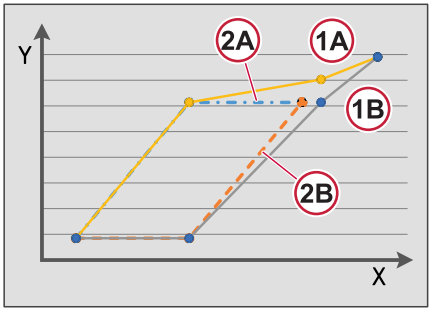
The maximum traction-2 has two modes:

- Starting Help-2
- Traction Help-2

When the speed is below 18 mph (30 km/h), the load is increased by a further 30% (i.e 130%) on the second-rear driving axle in order to produce good traction when starting. This function is called as Starting Help-2. The Starting Help-2 mode is only activated if the switch is pressed in when the speed is below 18 mph (30 km/h). The LED indicator in the switch flashes in the event of Starting Help.

When the speed is above 18 mph (30 km/h), the system automatically moves from the Starting Help-2 to Traction Help-2 mode. When the Traction Help-2 mode is activated, the LED indicator in the switch stays On.

In the Traction Help-2 mode, the system redistributes load only to the 100% of the axle capacity. In this mode, the system starts loading the second-rear driving axle first and then to the first-rear driving axle. In the final, the load on both the rear driving axles is redistributed propotionally/evenly.



J481560

X-axis: Bogie Load
Y-axis: Axle Load
1A: Load on Second-Rear Driving Axle (Starting Help)
1B: Load on Second-Rear Driving Axle (Starting Help)
2A: Load on Rear-Rear Driving Axle (Traction Help)
2B: Load on First-Rear Driving Axle (Traction Help)

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ECS Modes

Auto Standby Mode (if equipped)

Auto standby mode allows the driver to use the air stored in the tanks for ECS functionality, even when the engine is turned Off. This ensures that ECS can maintain its level during loading/ unloading, even with the engine turned off, as long as there is sufficient air in the air tanks.

The auto-standby mode will be activated automatically in the Vehicle Mode Living (when the engine is turned Off and the key is not removed from the key switch). The auto standby will be active for a pre-defined time with a default value of 30 minutes and maximum value of 4 hours.

When auto standby mode is not in use for more than 30 minutes, the system will move out of auto-standby mode. The system will prohibit any ECS activity on the vehicle with the key off. The driver must turn On or start the engine to enable the ECS functions.

Prohibit Mode

The prohibit mode is automatically activated when the ignition is turned On. When the driver starts the vehicle, the automatic adjustments of the air suspension will be prohibited until requested by the driver or the parking brake is released to prevent the unintended movement. The prohibit mode is deactivated when the system air pressure reaches to a predefined value.

Downgraded Mode

If there is a fault in the ECS system, the ECS system may go into the downgraded mode and prevents the automatic adjustment of ride height.

ELECTRONICALLY CONTROLLED SUSPENSION

Load Indicator

⚠ CAUTION

DO NOT rely on gauges or the instrument display or infotainment display to determine axle pressure. Weight must be verified on scales, and adjust pressure in the air springs accordingly.

To avoid overload and improper distribution of load between the vehicle axles, the driver can read out the load distribution on the air-suspended axles. The load on each axle, cargo weight and total weight is then presented in the instrument cluster or infotainment display.

The load indicator function also allows the driver to:

- Reset cargo load
- Calibrate the indicator
- See when the last calibration was performed.

The load indicator menu on the instrument cluster or infotainment display enables the driver to calibrate the axle load based on the measured value from the weighing scale.

How to Find the Load Indicator Menu

Infotainment display

All Apps
↳ Load Indicator
↳ Calibration
Calibration Data

Main View Axle Load Indicator

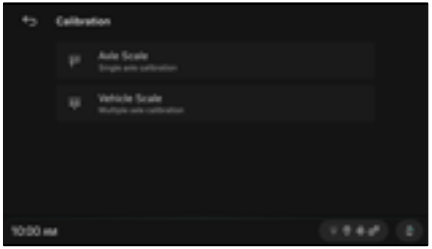
J481639

Calibration

The axle load can be calibrated through the infotainment display. The infotainment display offers the option to calibrate loads for both single and multiple axles.

To calibrate the load on an axle or multiple axles:

- Drive an axle onto the weighing scale.
- Measure and note the axle load value from the weighing scale.
- Navigate the calibration menu through the infotainment display.



J481689

Choose the Axle Scale option to calibrate a single axle and select the Vehicle Scale option to calibrate multiple axles.

Once the option is selected, the system checks for Preconditions. Ensure that all the preconditions shown in the display are met.

J481675

Select the axle resting on the weighing scale and select the "Calibrate" button to adjust the axle load value. Update the axle load value measured on the weighing scale.

J481843

Update the axle load value measured on the weighing scale in the display. Tap the Save button on the display to calibrate.

J481844

Once the calibration is completed, a calibration successful message appears in the display.

J481846

When the multiple axle calibration is choosen

After calibrating the first axle, drive the next axle onto the weighing scale and select the second axle. Follow the above steps to calibrate the new axle.

Tire Pressure Monitoring System

Overview

TPMS is a system that monitors air pressure and temperature of each tire fitted to a vehicle. If a fault is detected, the system shows a message in the instrument cluster.

With correct tire pressure, both fuel consumption and tire wear are reduced.

Each tire that is monitored by the system has a sensor. The sensor sends information about the tire pressure and temperature to the system. After the truck is started, it takes about 30 seconds before the tire pressure and temperature can be seen in the instrument cluster. The trailer tire pressure and temperature may take longer to show depending on the manufacturer. Refer to the user manual for your trailer.

J465255

Example of the tire pressure display in the Infotainment Display.

1 Reference pressure for the tires on this axle

2 Actual pressure in the tire

System Warnings

The TPMS gives a warning when any of the following conditions are detected:

- Slow or fast air leakage.
- Too high or too low pressure compared to a reference pressure.
- The battery in the TPMS sensor is discharged and the sensor must be replaced.

The reference pressures and warning levels can be adjusted.

J465260

Warning indication

1 Battery level in sensor low

2 Battery level in sensor very low

3 tire with a warning, for example, pressure too low

Warning Symbols

Warning symbols related to the tires are shown in the pop-up messages in the instrument display.

All messages related to the TPMS have the following symbol in them.

J465274

> **NOTE**
>
> If the symbol flashes when the truck is started, it means that there is both malfunction in the tyre pressure monitoring system, and an incorrect tire pressure in one or more tires. Contact Volvo workshop.

Messages in the instrument display

Message	What to do
Fast LEAK	Stop the truck. Check the menu to see which tire that is concerned and rectify the fault immediately.
Slow LEAK	Check the TPMS menu to see which tire that is concerned and rectify the fault.
Very low pressure	Stop the truck. Check the menu to see which tire that is concerned and rectify the fault immediately.
Low pressure	Check the TPMS menu to see which tire that is concerned and rectify the fault.
High pressure	Check the menu to see which tire that is concerned and rectify the fault.
Replace sensor, Tire pressure sensor malfunction	Contact Volvo workshop.

270346_1

Settings

How to find tire pressure monitoring settings

Infotainment Display

All Apps

Tire Status Monitor

Settings ->Manage Tires

- Set Truck Reference Pressure
- Set Truck Pressure Warning Levels
- Truck Sensor Position

Reference Pressure

The reference pressure is shown in the centre of each axle. The reference value can be adjusted to match your specific tyres and driving conditions.

J465296

1 Reference pressure

2 Settings

J465421

For setting the pressure, press the sub setting icon and select "Set Truck Reference Pressure". Select the axle you want to adjust, set the desired axle pressure.

TIRE PRESSURE MONITORING SYSTEM

J465441

After setting the desired axle pressure, Press save.

Warning Levels

Pressure warnings can be triggered by three different levels.

- High-pressure
- Low-pressure
- Extreme low pressure

The values for the warning levels are given as a percent of the reference pressure. They can be adjusted individually for each axle.

J465442

1 Limit value for High pressure

2 Limit value for Low pressure

3 Limit value for Extreme low pressure

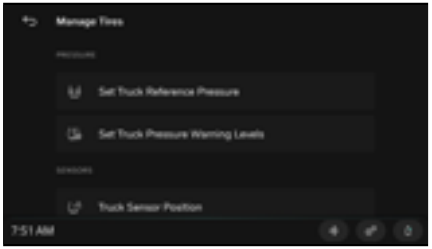
Select the axle you want to adjust.

TPMS Sensor Position Pairing

During the tire swapping or when replacing the TPMS sensors, the position of the sensors must be paired.

To pair the sensors:

1. Open "Truck Sensor Position" from the Tire Status Monitor App -> Settings-> Manage Tires.



J483690

2. Select the tire position from the display before replacing the sensor or swapping the tire

J483694

3. Exit the cab, install the sensor or swap the tire and then inflate or deflate the selected tire.

J483711

4. Check for sensor pairing progression timer (top right corner) in the display.

5. Once the sensor is paired, "Sensor Registerd" message is dispalyed in the display.

J483714

BACKUP MONITORING SYSTEM

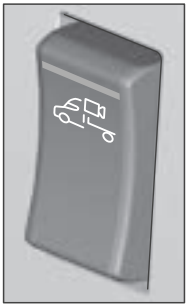
Backup Monitoring

The Backup Monitoring system is designed to give the driver a better view of the area on the sides and the rear by using the cameras.

When the cameras are active, the driver interface shows the video. This enables the driver to detect obstacles, people or other road users while operating the vehicle (for example, when reversing, parking, loading, using built-on equipment or connecting a trailer).

The Backup Monitoring system consists of a rear-mounted backup camera, wiring, and a dashboard switch to activate the camera. The camera image will be shown in the instrument cluster as the primary location unless the truck is equipped with an infotainment display.

The camera view can be activated automatically when the truck is shifted into reverse or if the driver uses the dash-mounted camera switch.



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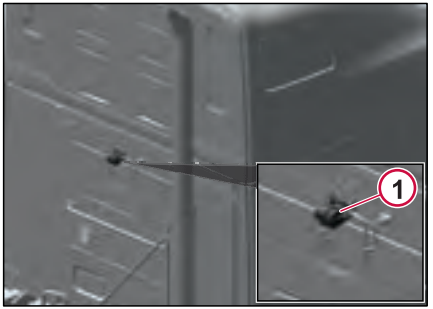
Camera Activation Switch

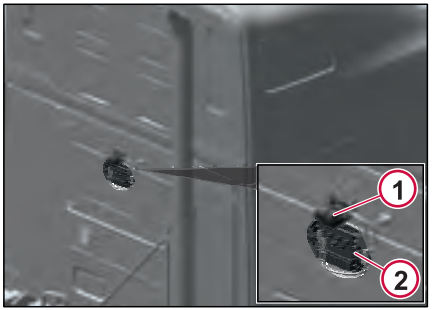
Vehicle with Camera Only



J481495

1 Back-up Camera

Vehicle with Camera and Ethernet Switch



J481502

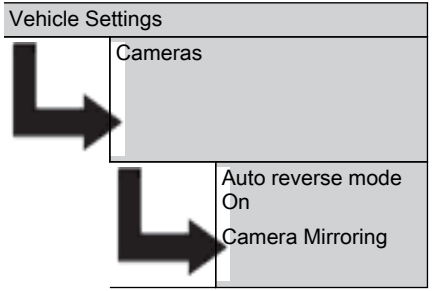
1 Backup Camera

2 Ethernet Switch

The Ethernet switch is located on the rear wall of the cab. The Ethernet switch allows us to connect multiple digital cameras, up to six.

Customers have choices when it comes to adding cameras to their trucks through the aftermarket. Depending on the configuration, the vehicle may already have the monitoring preparation kit connections. To install additional cameras or to learn more about the preparation kit, contact authorized Volvo dealers.

Manage cameras



The camera can be mirrored horizontally and vertically. The camera can also be renamed to better reflect the use of camera, for example, a fifth wheel camera.

J465491

Camera View Mirroring

Auto Reverse Mode

Here you can enable or disable the auto back-up camera. If the auto reverse mode is On, when the driver engages the reverse gear, the instrument cluster shows the back-up camera view automatically.

Views

View sets

You can have up to four view sets.

Standard view has one camera and you can select which camera to view.

You can add additional three view sets with two, three or four cameras. For each view set you can set a name, select and arrange the cameras to be used.

Using cameras

You can use any camera view when needed.

Activate camera view in the infotainment display or use the backup camera switch. If you have two or more camera view sets, press again to toggle between them or use the swipe function in the infotainment display.

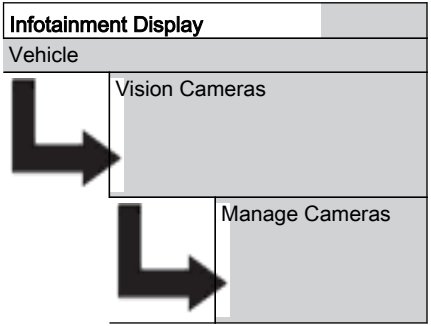
You can have one or two cameras active while driving.

Activate standard or double camera view in the infotainment display or use the backup camera switch. Press again to toggle between camera displays if available.

Views with three or more cameras are blocked when the speed exceeds 18.6 mph.

Auto Modes

The reversing camera view is always activated automatically when you select Reverse drive. Which cameras that should be activated is set in the manager cameras menu.



How the automatic camera view works

When an automatic camera mode is enabled the camera view is opened automatically, for example, when you activate the direction indicator.

Auto bodywork mode

The bodywork camera view is activated automatically when you activate the bodywork. The cameras that should be activated are set in the "Manage Cameras" menu.

BACKUP MONITORING SYSTEM

Trailer camera

A trailer with an analogue camera can be connected to the vision camera system. You have to enable the trailer camera to include the trailer in the camera views.

⚠ DANGER

Always have all fifth wheel maintenance and repairs done by a qualified technician. An incorrect repair can cause the trailer to separate from the tractor causing an accident with serious personal injury or death.

Fifth Wheel General Information

Things to think about with trailer hook-up:

- Always chock the trailer wheels.
- Grease the plate unless it is a low lube or no lube top plate.
- Verify visually that plungers are locked on slider.
- Verify 5th wheel is in unlatched position before coupling to trailer.
- Verify visually that coupling has occurred.
- Check for slack between the fifth wheel and the trailer kingpin.
- Check the load distribution between axles.

Follow the instructions on the advisory labels attached to the various manufacturers' fifth wheels.

Please refer to manufacture's website for additional information.

⚠ DANGER

Always keep the fifth wheel plate well lubricated to prevent binding between the tractor and trailer. A binding fifth wheel could cause erratic steering and loss of vehicle control that may result in serious personal injury or death.

⚠ DANGER

To ensure a positive hook-up or coupling, these procedures should be followed in every case. A trailer that is not connected correctly may disconnect from the tractor while in motion, resulting in an accident, personal injury or death.

⚠ CAUTION

Attempting to couple with the trailer at an improper height could result in a false or improper couple and cause damage to the tractor, fifth wheel and trailer.

⚠ DANGER

It is important that the operating procedures contained in this manual are fully understood and closely followed. Failure to properly couple the tractor and trailer can result in their separation, causing death and property damage. Proper pick-up and coupling to a trailer is a serious matter. A trailer that becomes disconnected while in motion is extremely dangerous to other traffic and may result in death or severe personal injury. To ensure a positive hook-up or coupling, the procedures should be followed in every case.

Chock the trailer wheels. Use two chocks (both on the front and rear of the wheel) on both sides of the trailer.

Back up close to the trailer, centering the kingpin on the throat of the fifth wheel, and STOP.

Fifth Wheel Trailer Height

Check to see that the trailer is at the proper height for coupling. The leading edge of the trailer plate should initially contact the fifth wheel top plate surface about 200 mm (8 in.) behind the pivot point as the tractor backs under the trailer. Raise or lower the trailer landing gear as required to obtain this position.

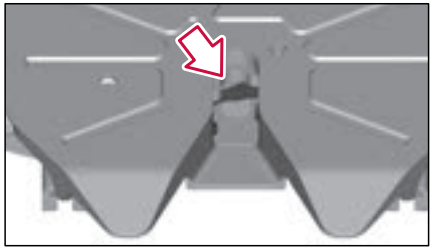
Back under the trailer; keep the trailer kingpin centered in the throat of the fifth wheel.

FIFTH WHEEL

Fifth Wheel Visual Check

As an initial check, pull forward slightly to test the completeness of the coupling with trailer brakes applied.

A direct visual check is required to ensure proper coupling. Several types of improper couplings will pass the initial pull test. Sound is not reliable. Do not take for granted that you are properly coupled. Get out of the cab and look.



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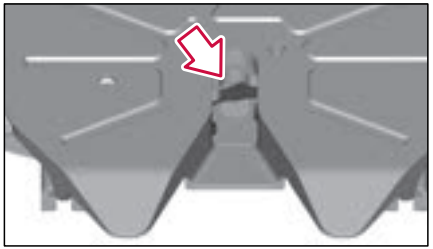
Visual Check

Trailer Kingpin

Make sure the trailer kingpin is in the jaw slot and that the jaw is closed behind the pin. The kingpin should not overhang the fifth wheel or be caught in the grease groove. To verify that the kingpin is actually in the fifth wheel slot and the jaw is closed, the pin must be visually inspected from the rear. Use a flashlight if necessary.



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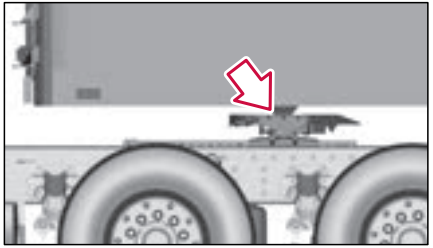
Make sure the trailer bed is resting on the top surface of the fifth wheel plate and that there is no visible gap between the fifth wheel and the trailer bed plate.



J304143

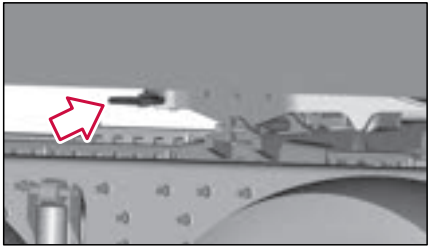
Rest on Trailer Plate

Make sure the operating rod is fully engaged, and is equipped with safety latch. Be sure it is in locked position.

If the fifth wheel is equipped with a manual secondary lock, check to see that it is properly engaged.

NOTE

If you cannot get a proper coupling, repeat this procedure. **DO NOT** use any fifth wheel which fails to operate properly.



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Fifth Wheel Handle

Fifth Wheel switch

J464678

Fifth Wheel Slide Switch

Fifth Wheel Air Slide Operation

The slider moves the fifth wheel horizontally to adjust its position. The fifth wheel is adjusted to support for different weight distribution on the semi-trailer and to change the turning radius when maneuverability is restricted.

Always slide the fifth wheel with semi-trailer coupled. To slide the fifth wheel, follow the procedure:

1. Apply the trailer brakes by pulling out the trailer air supply knob.

2. Press the fifth wheel slide switch on the dashboard to unlock the fifth wheel from the sliding rail.

3. Move the truck forward and reverse to adjust to the desired fifth wheel position. A pop-up message is displayed in the instrument cluster when the adjustment is in progress.

J474990

4. Press the fifth wheel slide switch on the dashboard to lock the fifth wheel with a sliding rail.

If the truck is driven when the fifth wheel is coupled improperly, a pop-up message is displayed in the instrument cluster.

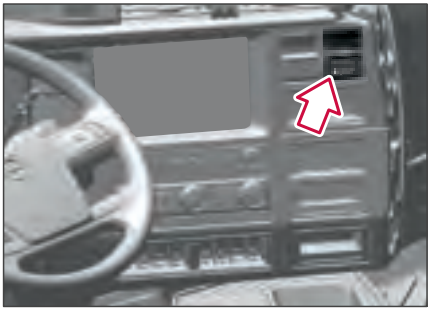
J475045

FIFTH WHEEL

Trailer Uncoupling

1. Apply the parking brake on the tractor.

2. Apply the trailer brakes by pulling out the trailer brake hand lever.



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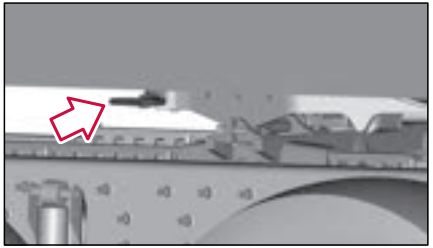
3. Place the gear selector in N (Neutral) position.

4. Chock the trailer wheels. Use two chocks (one on the front and one on the rear of the wheel) on both sides of the trailer.

5. Wind down the landing gear until it touches the ground and then give it a few extra turns in low gear. Do not raise the trailer off of the fifth wheel. Fold down or remove the crank handle and place it in the crank handle holder.

6. Disconnect the air/electric lines from the trailer and store them appropriately.

7. To release the fifth wheel kingpin lock, pull the fifth wheel handle. This will release the locking mechanism.

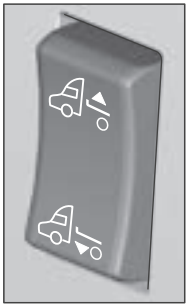


J304142

Fifth Wheel Handle

8. Release the tractor parking brake and drive the vehicle 12″ (305 mm) away from the king pin.

9. Deflate the air suspension by pressing the lower part of the loading level adjustment switch. After suspension lowers, pull clear of the trailer and reinflate the suspension by pressing the upper portion of the ride height switch (Applicable only for vehicle with air suspension).



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NOTE

The fifth wheel king pin lock will only relock if you follow the complete coupling procedures.

NOTE

In poor ground conditions, it may be necessary to provide a stable base for the landing gear.

NOTE

If the operating rod is too difficult to pull, back the tractor up slightly to relieve any kingpin load against the fifth wheel jaw.

07

INFOTAINMENT

Overview of the Infotainment System

The infotainment system of the truck is the system that provides Information and Entertainment features to the Driver. This includes the truck's audio system, USB ports, and Bluetooth connectivity module.

The core of the infotainment system is the infotainment display. This is where the driver can access the available apps and functions of the infotainment system. Additionally, some basic infotainment information is shown in the instrument cluster.

The USB ports mounted in the instrument panel allow you to connect and charge your devices.

J476758

1 Instrument Display
2 Steering Wheel Switches
3 USB Ports
4 DECM (Driver Environment Control Module)
5 Infotainment Display
6 Bluetooth Microphone

Controlling the Infotainment System

You can use the following to control the infotainment system:

- Touchscreen Infotainment Display
- Steering Wheel Switches
- DECM (Driver Environment Control Module)
- LECM (Living Environment Control Module)

The infotainment system is primarily controlled using the touchscreen on the infotainment display. Some basic actions, such as launching the FM app or changing the radio station, can be done using the control panel or the steering wheel switches. Some functions can also be controlled using voice control through the voice assistant in your connected device (works only with approved mobile device projection).

⚠ WARNING

Do not use the infotainment system in such a way that it interferes with safe and attentive operation of the truck. When driving, keep your attention to the road. Infotainment tasks that require your attention should be done when the truck is stationary. Examples of such tasks are managing connected devices or adjusting the audio settings.

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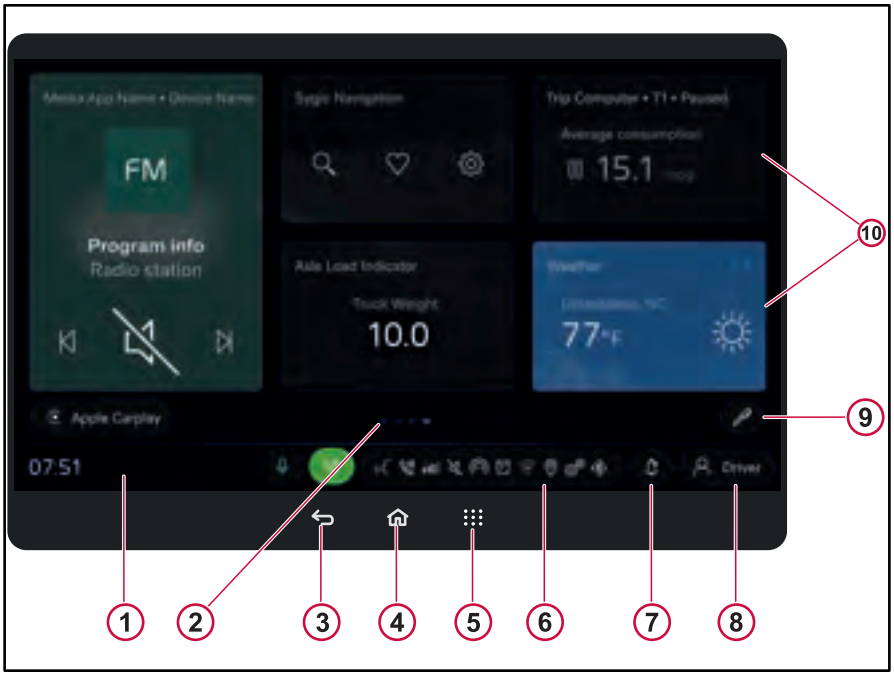
Infotainment Display

At start-up, a home page with widgets is shown in the infotainment display. You can always return to this view by tapping the Home icon at the bottom of the infotainment display.

In addition to the home page, you can have up to three more pages, each containing up to five widgets. To access the additional pages, swipe left on the infotainment display. A calm view, containing only an analog clock, is available if you swipe right. The layout and content of the home page and any additional pages can be customized and saved to your profile.

1 Infotainment Display (Touchscreen)
2 Page indicator
3 Back
4 Return to Home Page
5 Open the App Drawer
6 Personalize (not visible during driving)
7 Status bar and Settings
8 Notifications
9 Profile Setting
10 Widgets



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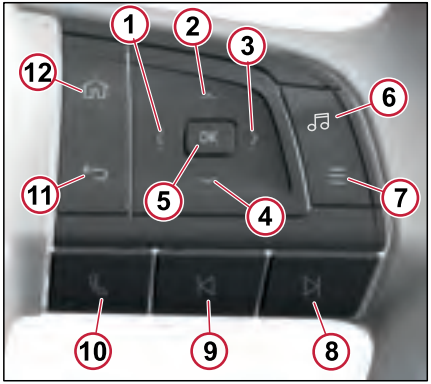
Steering Wheel Switches

Left Steering Wheel Switch

J476753

1 Reduce Volume.
2 Increase Volume.
3 Push to Talk/ Voice Call

Right Steering Wheel Switch



J476743

1 Navigate Left
2 Navigate Up
3 Navigate Right
4 Navigate Down
5 Select
6 Media Source Button
7 Open a Menu
8 Previous Selection Button
9 Next Selection Button
10 Accept/Reject Call
11 Back
12 Home

The buttons 10 and 11 are used for phone calls. The others are used for navigating in the instrument display and controlling the infotainment system.

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DECM (Driver Environment Control Module)

The information provided is general features found for the operation of the Radio.

J466495

1 Volume Knob
2 Power/Mute
3 Preset 1
4 Preset 2
5 Preset 3
6 Preset 4
7 Preset 5
8 Manual Tune
9 Media Source
10 PREV (Previous/Reverse)
11 Next (Next/Forward)
12 Media Settings
13 Display On/Off

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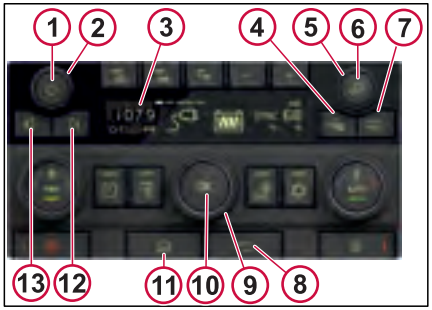
- **Power/Mute** Press to switch to FM -> AM -> SXM-> WX -> USB-> BT (Bluetooth Audio (if equipped)) and to turn Radio ON. Press and hold to turn radio OFF.
- **Ignition Off/Accessory:** With the ignition off, pressing the SRC/PWR button will turn on the receiver and activate the receiver's one-hour timer.
- **VOLUME KNOB/OK:** Rotate to Increase/decrease Volume or during a Menu for Navigation.
- **PREV (Previous/Reverse):** Press to select the previous track or station. Press and hold for FR or Tune Down.
- **NEXT (Next/Forward):** Press to select the next track or station. Press and hold for FF or Tune Up.
- **Manual Tune:** Rotate the knob on the control panel to manually select and fine-tune the desired radio frequency.
- **Media Source:** Press to choose different audio inputs such as FM -> AM -> SXM-> WX -> USB-> BT (Bluetooth Audio (if equipped)).
- **Media Settings**: Press to adjust audio preferences such as equalizer settings, bass, treble and balance for optimal sound quality.
- **Display On/Off**: Press to toggle the visibility of the screen or display, either turning it on to view information or turning it off to conserve power or minimize distractions.

OVERVIEW

LECM



J477563

1 Power/Mute Button
2 Volume Control (Rotary Knob)
3 Display
4 Media Setting Button
5 Radio Manual Tuning (Rotary knob)
6 Media Source Button
7 Display On/Off Button
8 Menu Back Button
9 Menu Navigation (Rotary Knob)
10 Menu Selection Button
11 Menu Home Button
12 Next (Next/Forward)
13 PREV (Previous/Reverse)

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A brief introduction to Phone

Opening Phone

To open the PHONE app, press the Phone Icon on the Infotainment display or Phone button in the steering wheel switch (right-hand side).

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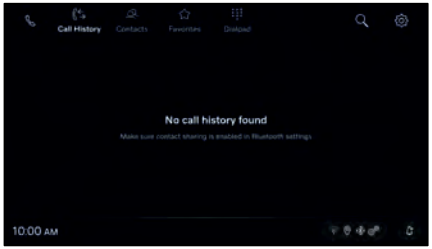
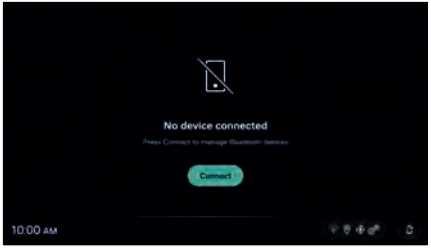


J476867

Connecting Your Mobile Phone

PHONE app works only when at least one device with a SIM card is connected to the truck by Bluetooth®. If you open PHONE app with no device connected, you will be asked to connect a device. You can add a device from the PHONE App.

To add/pair a new device, press the Phone Icon on the infotainment display, then press the Connect button on the display. A Bluetooth page appear and asks to pair a new device. Press to Pair New device to scan or search for your device. Select your phone and make sure that the pairing code shown on the infotainment display matches the code shown in your phone.
Contacts sync should be accepted on the phone that is being connected.



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Making a Phone Call

A phone call can be made in different ways:

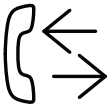
- Call a number or contact that is in your call history.
- Call someone that is stored as a contact.
- Call a number or contact that is in your Favorites.
- Manually enter a phone number.

> **NOTE**
>
> If you have two mobile phones connected to the truck, you are prompted to select which mobile phone to use each time you make a phone call.

Making a call from History

To make a call from History, do as follows:

When in the PHONE app, tap your finger on the Call History icon and select the recent contact that you want to dial in.



J367642

The History icon.

> **NOTE**
>
> You can also make a call from your call history in the instrument display. When focus is shifted to the instrument display, press the phone button in the right steering wheel switch. In the list, select the contact or number that you want to call.

> **NOTE**
>
> If two mobile phones are connected, their call histories are merged into a single list.

Making a call from Contacts

To make a call from Contacts, when in the PHONE app, tap your finger on the Contacts icon (PHONE App).

J367643

The Contacts icon.

Finding a contact

You can search for a contact, either by free-text search or by quickly jumping to a certain alphabetic letter.

To do a free-text search, select the Filter field and start typing. The list of contacts is updated as you type.

To jump to a certain alphabetic letter, select it from the letter field above the contact list.

To scroll the contact list, use the arrows or the slider to the right of the list.

The contacts can be sorted either by first name or by last name. If you want to change the sorting, tap Sorting, using the touchscreen.

J367645

The Sorting icon.

Make a contact Favorite

To add a contact in the Favorites, from your contact list:

- Tap your finger on the contact that needs to be in the favorite list
- The details of the contact are shown in the display.
- Tap the favorite icon shown in the right side of the contact.

Calling a contact

If a contact has only one phone number stored, a phone call is made directly when you select the contact.

An arrow on a contacts row shows that the contact has more than one phone number stored. When you select the contact, a list with all stored information for that contact is shown. To make a phone call, select the phone number that you want to use.

Making a call from Favorites

To make a call from Favorites, when in the PHONE app, tap your finger on the Favorites icon (PHONE App) and select the contact that you want to dial in.

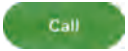
J367489

The Favorites icon.

Manually entering a phone number

Start typing the number, using the keypad on the side display. A list of suggestions from your contacts are shown, and is updated as you type.

To make the phone call, either select one of the suggested contacts or select Call when you have finished typing the phone number.



J476869

The Call icon.

During a phone call

During a phone call you can use the keypad for dual-tone multifrequency signaling. Select Keypad to show or hide the keypad.

J367663

The Keypad icon.

Select Mute Microphone to mute the microphone in the truck.

J367644

The Mute Microphone icon.

When you mute the microphone, the appearance of the icon changes. Select the icon again to unmute the microphone.

Select the pause icon to hold the ongoing call. Select the icon again to resume the call.

J481019

The Hold icon.

Ending a phone call

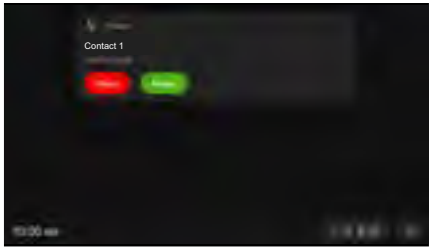
When you press the phone button on the right steering wheel, the active call will be highlighted on the Information Display, and you can end the call by using the digital button on the Information Display or by pressing the OK button on the steering wheel switch.

J481034

Incoming Phone Call

When you receive a phone call, an incoming call notification will be displayed in the Secondary Information Display.

- Select the Accept icon from the display to accept the call.
- Select the Reject icon to disconnect the call.



J481020

A Brief Introduction to MEDIA

In MEDIA, for example, you can listen to radio or listen to music from a connected device. Devices can be connected to the infotainment system through Bluetooth® or USB.

Selecting MEDIA Source

To open MEDIA, press the Media button in the steering wheel switch or in the DECM.

J367295

Adjusting the Volume

You can control the volume in two ways:

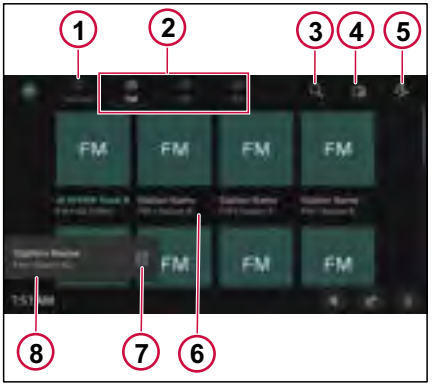
- Turn the knob on the DECM clockwise or counterclockwise.
- Press the volume control button in the steering wheel switch.

If you want to mute the speakers, press the Mute/Power button on the Control Panel (Instead of the Steering Wheel Switches).

Listening to Radio

When you select radio as the source, the last selected radio station will start playing.

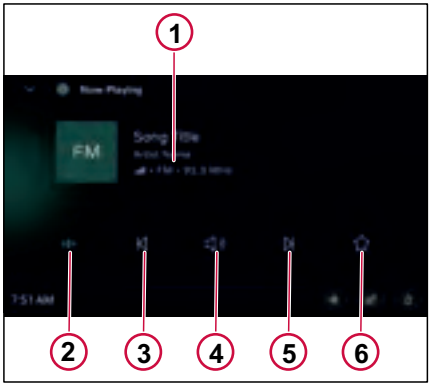
Overview of the Radio Player



J476935

1 Favorites
2 Radio Options (FM/AM/WX)
3 Search
4 Radio Settings
5 Media Source Icon (To Go back to Media Source Page)
6 FM Stations Grid View (List view Optional)
7 Pause/Play
8 Station name (if available) and/or frequency

Tap the station name on the bottom bar to the touchscreen for open the Now Playing screen.



J476936

1 Station name (if available) and/or frequency
2 Manual Tuning
3 Previous station
4 Mute/Play
5 Next station
6 Favorites

270346_1

Filter summery to long to be displayed.

Changing Station

To skip to the next or previous radio station:

- Tap the Next or Previous button on the infotainment display.

Manual Tuning

If you want to manually search for a radio station, tap Manual Tuning, using the touchscreen.

The arrows on each side of the frequency band adjust the frequency. If you tap and hold an arrow, the frequency changes until you release the arrow.

You can also tap the frequency band and drag it.

J476937

If you want to save the found radio station as a favorite, tap Favorite. The icon changes to filled.

J367489

The Favorite icon.

To exit the manual tuning, tap exit button.

Mute/Play

Select Mute/Play to mute the radio. Select Play or raise the volume to unmute.

Favorites

To save the current radio station as a favorites, tap Favorites, using the touchscreen. The icon changes to filled and the radio station is saved in Favorites.

To remove the current radio station from the favorites, tap Favorite again.

J367489

The Favourite icon.

Adding a Preset Radio Station

You can have up to five preset radio stations.

To save the current radio station as a preset station, press and hold any of the Preset keys (1 to 5) on the DECM. A message appears in the infotainment display when the radio station is saved and you can release the key.

Any station that is already saved to the Preset key that you press, will be overwritten.

NOTE

Preset function is different than favorites. Preset radio stations are added through DECM whereas Favorites are added through Infotainment display.

Browse Radio

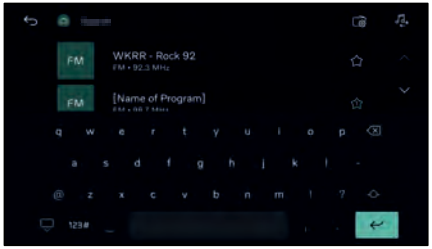
When in the radio app, you can also do the following:

- Manage your Favorites.
- Search for radio stations (FM or AM or WX).
- Adjust the Radio Settings.

Favorites

You can reorder or delete favorites.

To delete, you must press the star to the right, and "De-select it" to delete it.



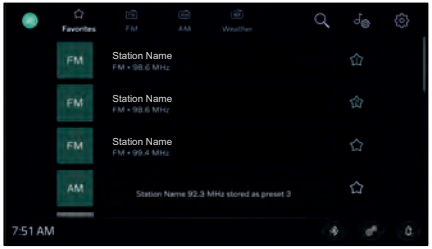
J477189

Search Radio Stations

When in radio station (FM or AM or WX), you can see, and search among, all available radio stations. Tap the search icon (top-left corner) on the radio player to search for radio stations.

When in Search screen, start typing the station name, the list of radio stations is updated as you type.

The radio station that is playing is marked with the Now Playing icon. A radio station that is saved as a preset station is marked with a number, showing which Preset key it is saved to.

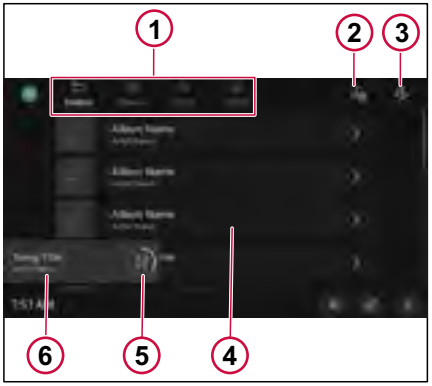


J477192

Listening from a USB Device

When you select USB as the source, you can listen to media files that are stored on the selected device.

Overview of the Local Media/USB Player



J477197

1 Playlist Category
2 Audio Settings
3 Change Source Icon (To display available media Source)
4 Playlist
5 Play or Pause

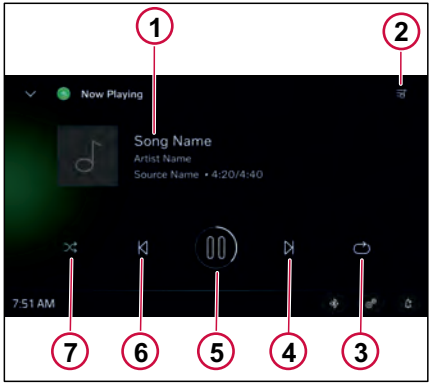
270346_1

Filter summery to long to be displayed.

6 Now Playing

Tap (6) on the touchscreen for open the Now playing screen.

> ⓘ NOTE
>
> USB has FAT32 system disk format and it support specific file formats.



J477198

1 Now Playing details
2 Playlist
3 Repeat
4 Next
5 Play or Pause
6 Previous
7 Shuffle

270346_1

Play/Pause

Tap on the Play or Pause button in the touchscreen display to start playing. Tap the button again to stop.

Skip or Fast Forward/Rewind

To skip to the next or previous media file, tap the Next or Previous button in the touchscreen display.

You can also use the Next or Previous button on the control panel or steering wheel switches to skip to the next or previous media file.

Shuffle

To play the media files in random order, tap Shuffle, using the touchscreen. The Shuffle icon is black when shuffle is on, and gray when it is off.

Repeat

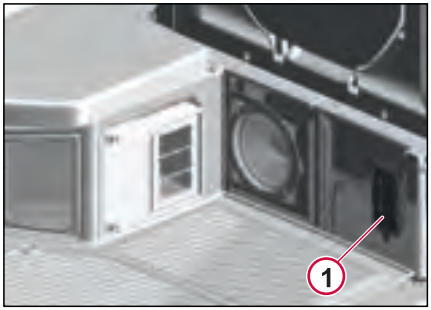
The repeat function can be toggled between the following modes:

- Repeat off (the icon is gray and striked out)
- Repeat all (the icon is black)
- Repeat current (the digit 1 appears on the black icon)

To switch between the modes, tap Repeat, using the touchscreen.

Amplifier (If Equipped)

Volvo's multichannel amplifier is an eight-channel high power amplifier, which is located inside the bunk storage compartment. The amplifier has automatic settings that provide a natural and well-balanced sound reproduction.



J476768

1 Amplifier

Audio Settings

In Audio Settings, you can change the settings for audio.

How to Find the Audio Settings Menu

Infotainment display

SETTINGS
↳ System Settings
↳ Audio

J477200

1 Settings

2 System Settings

3 Audio Settings

When in the media player, open the Media menu and select Audio Settings.

Audio Settings

Volume Control

With the Volume Control setting, you can adjust the strength of the sound for the following functions:

1 Media

2 Radio Announcements

3 In-Call

4 Ringtones

5 Navigation

Equalizer

With the Equalizer, you can adjust the strength of the sound for the following:

- Bass - you can adjust the strength of the low frequency components
- Mid - you can adjust the strength of the middle frequency components
- Treble - you can adjust the strength of the high frequency components

Balance/Fader

With the Balance/Fader setting, you can balance the sound of the speaker system in the cab.

Example: Balance or adjust the strength of sound coming from the front speakers to rear speakers or rear speakers to front speakers.

ⓘ NOTE
Day cabs do not have fader feature.

Sound stage

The Sound Stage setting allows you to adjust the strength of sound for the left, center, and right speaker systems in the cab.

Speed Dependent Volume Control

The speed dependent volume control adjusts the strength of the audio systems sound based on vehicle current speed. It allows you to hear the audio clearly irrespective of vehicle speed. It can be selected from the settings.

With the Speed Dependent setting, you can turn off or set the strength of the sound to either Low or medium or High.

Bluetooth® Settings

In the Bluetooth® settings, you can turn Bluetooth® on or off and manage your Bluetooth® settings and devices.

How to Find the Bluetooth® Settings Menu

Infotainment display

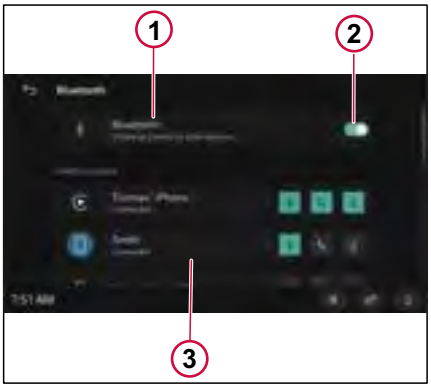
SETTINGS
↳ System Settings
↳ Bluetooth

J477254

1 Settings
2 System Settings
3 Bluetooth Settings

Turning Bluetooth® On or Off

To turn Bluetooth® on or off, use the toggle switch in the upper, right corner. When Bluetooth® is on, you can see any paired or available devices.



J481047

1 Your Bluetooth Device
2 Toggle switch (On/Off)
3 Paired/Available devices

Paired Devices

One device can be connected, but you can have more devices paired. To see all paired devices, open the Bluetooth menu on the "Paired devices" row.

Next to the name of each device (right side), it is shown if the device is connected or not. To connect or disconnect the device, select the device row.

> **NOTE**
>
> During the connection process, the Bluetooth® contact list will synchronize with the infotainment system. This synchronization, which takes a short while, prohibits the establishment of any other pairings or connections.

To edit the settings for a Bluetooth® device, tap the device name that is listed in the display.

In the view that opens, you can edit the name of the device and what it is used for.

A Bluetooth® device can be used for the following functions in the truck:

- Phone calls
- Media audio

- Contacts sharing

Select the "Return" icon in the top-left corner to leave the menu and save your settings.

Unpair Devices

To unpair, select and open the device from the list. A new page appears in the display, select the Forget icon to unpair the device.

Available Devices

To see all available devices, click pair a new device.

Devices that are already paired with the truck are not shown here, but can be found in the Bluetooth menu.

To pair with a device, select the device you wish to pair with.

- A code will now be shown in the respective display. Check that the codes agrees. Verify by pressing OK on both devices.
- If you do not use Secure Simple Pairing (SSP) or if the Bluetooth® device does not support it, you will be prompted to enter a numeric code into the device. Enter the same code.

Dual Device Connection

Two Bluetooth® devices can be connected simultaneously to the infotainment system.

Connecting Automatically

At start-up, the system will search for devices in the list of paired devices. Devices that are available will then be connected automatically.

Frequency Bands and Output Power

Application	Frequency
AM	153–279 kHz, 522–1611 kHz
FM	87.5–108 MHz
Bluetooth	2402–2480 MHz

FCC (Federal Communication Commission)

FCC ID: LTQVTREMNAR

FCC § 15.19 Labeling requirements

This device complies with part 15 of the FCC Rules and Industry Canada license exempt RSS standard(s). Operation is subject to the following two conditions:

1 This device may not cause harmful interference, and

2 This device must accept any interference received, including interference that may cause undesired operation.

FCC § 15.21 Information to users

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF exposure requirements

To comply with FCC RF exposure compliance requirements, the device must be installed to provide a separation distance of at least 20 cm from all persons.

NAVIGATION

As you deliver goods and services to your customers, every minute on the road counts. Preparing your route as efficiently as possible is therefore crucial for greater safety, energy consumption, vehicle wear and tear and time.

That's why we've selected a solution developed for your business. Sygic Professional Navigation will assist you with smart features, such as advanced routing options based on vehicle parameters, emission zones, traffic, and more. Added safety and assistance features like lane guidance, preferred right or left turn, and reaching the destination in the driving direction, can help to prevent dangerous situations.

Furthermore, the app can be used fully offline or in a hybrid mode with added online features.

App checks and start-up

App controls

The app is controlled by touching the multifunction screen.

- Pinch to zoom out
- Spread your fingers or press twice to zoom in
- Slide with one finger to explore

Launching the app

On start-up, the screen displays a map. A purple arrow (1) represents your position. While driving, the street name or road number appears below the position indicator.

If the GPS signal is interrupted, your position will not be determined. In this case, the icon will be greyed out and placed in the last location known to the system.

J483469

On the right of the multifunction screen, a button (2) allows you to switch from 2D to 3D mode. You can also use this button to zoom in and out.

Swipe the map to access a **browse mode** to explore the map freely. Compass and recenter buttons appear in the upper right and lower left corners. A tap on the compass icon automatically rotates the map to face north. The recenter button returns the map view to the default (locked on your current position).

Access Main Menu

To access the main menu, press the "≡" icon at the top left of the screen (3). To close this menu, press the "X" symbol in the upper left corner.

J483492

The menu is separated into 4 categories:

- Vehicle (4),
- Map (5),
- Favourites (6),
- Settings (7).

J483530

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Filter summery to long to be displayed.

Vehicle

You can set up to 7 vehicle configurations, allowing to easily change in between different truck combinations and different loads. The route choice and restriction options are adjusted to match your Vehicle settings.

Add a vehicle using the "+" icon at the top right of the screen.

Use the arrows to view the available vehicle profiles and choose yours by typing its name.

To edit or delete a profile, go to the "vehicle details" menu using the pencil icon next to the profile you wish to delete. Select "delete vehicle profile" at the bottom of the menu.

You need to define at least one vehicle profile to use the app.

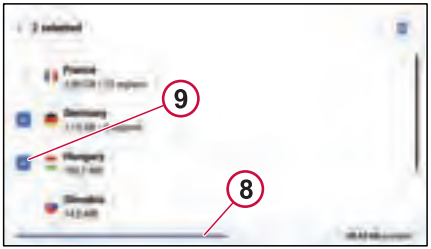
Map

Maps are divided into regions. Your navigation system is delivered with already installed maps.

Maps can be downloaded from the "Map" menu (5).

Select the region in which the vehicle will be travelling. The available storage space is displayed at the bottom of the screen (8). Press the arrow on the right to display the list of maps for a given region.

To download a map, press the download icon next to the country thumbnail (9). You can stop the download by pressing the stop icon that will replace the download icon. A pop-up window will offer two options: either stop the download or continue.



J483569

To manage your downloaded maps, return to My Maps (one step back from the map download window) or, if you are on the default screen, go to Main Menu - Maps. Press the three-dot button in the top right-hand corner. Select the maps you wish to delete and choose "delete" in the bottom right-hand corner.

The "delete all" button will be displayed if no maps are selected. Press "Done" in the top right-hand corner to go back to the previous screen.

Favourites

There are two ways of accessing Favourites from the default screen. Tap the search bar, then tap the heart-shaped icon on the right or go to the main menu and choose "Favourites".

"Favourites" displays the locations, points of interest or routes you have saved for quick access whenever you need them. The list of favourites is sorted chronologically, with the most recently added favourites listed first. You can rename the favourite when you save it, or at a later date using the three-dot button next to it. You can also delete favourites using the same method.

Add Favorite Place

To add a place to your favourites, press the "+" button and search for the point of interest, address or GPS coordinates. You can also add a Favourite directly from a location on the map by pressing "Add to Favourites" (10) after it has been selected.

J483571

Tap on the added favourite to see it on the map with the following information:

1 Aerial distance from current location
2 Deleting favourites
3 Add as POI
4 GPS coordinates
5 Get directions

Add Favorite Route

Create a route to add it to your favourites. You can change it by adding waypoints and adjusting the route options. Once the route has been created, expand the route planner at the bottom by dragging it upwards and choose the "Add to favourites" option at the bottom.

J483580

Once saved, you can simply tap on the route in Favourites at any time and it will be displayed on the map, ready to set off.

Settings

Various options can be adjusted to suit your needs and preferences. They are divided into the following categories:

J483581

Various options can be adjusted to suit your needs and preferences. They are divided into the following categories:

Route and Navigation

Adjust the settings for the route and navigation options.

Route planning

Choose the type of route calculation that you prefer:

- Fastest - gets you to your destination as quickly as possible.
- Shortest - gets you to your destination using the shortest distance.
- Economical - gets you to reach your destination with optimum fuel consumption.

Route options

You can choose to avoid one or more of the following road categories:

- Motorways
- Toll Roads
- Congestion Charging Zones
- Ferries
- Unpaved Roads

Navigation

The app operates in several driving modes:

- 2D: Vertical view of the map
- 2D with north pointing up: Vertical view of the map always pointing

north so that the map does not rotate.

- 3D: Tilted view from behind your position so you can see the road ahead better.

Compass appearance
The appearance of the compass icon can be either a classic needle (world style) or an abbreviation of the main directions (American style).

You can press on the compass when navigating the map using the world compass in order to rotate the map northwards.

Language and voice

App language
Select the language to be used in the app.

Sound
Choose the option you prefer:

- Full voice instructions
- Alerts only
- Mute all sounds

J483590

Voice instructions
Choose between a human voice (standard) and a computer voice (TTS):

- Human voice has preset navigation instructions and sounds more natural.
- TTS voice uses a text-to-speech algorithm that also reads street names, house numbers, personalised warnings and notifications.

Notifications
Notifications are customizable, allowing you to choose which categories you want to be notified about and specify whether they should be audible only or also displayed on the map.

Map views and units

Map view
Type of buildings: enable or disable 3D buildings on the map (generally available in large urban areas).

Point Of Interest (POI, for short) on the map: select the categories of points of interest to display on the map.

Units
The time format and GPS coordinates can be set in this section.

Information

About
Detailed information about your app version and your device.

Licence agreement
The EULA document for using Sygic.

Reset
Resets all the app settings to their default values as they were when the app was first installed.

The application can be used in 4 different modes:

- Default
- Free Drive
- Explore

- Navigation

Default

Default mode is selected when the app is launched. The map is displayed with your GPS position locked and facing north. A search bar is located in the top left-hand corner, with vehicle details displayed below. A zoom/2D/3D toggle is located in the centre right of the screen.

Free Drive

This mode is activated when no route has been defined, but you are travelling above a certain speed. The map is displayed with the GPS position locked in the middle.

Browse

Allows you to explore the map. Swipe to move, rotate, zoom or select points on the map, regardless of your current position. The browse mode can be activated whenever the view is unlocked by swiping the map, even during navigation or when not using a set route. The map view will lock on your current position if you do not touch the screen for several seconds. Otherwise, you can return to the default screen by pressing "recenter".

Navigation

Corresponds to the app status when a selected route has been calculated and the app is guiding you. The GPS position is locked to your location. A road sign indicates bends and warnings, a widget displays points of interest along the route for easy access and lane guidance at major junctions.

J483591

You will see the name of the street you have crossed, the nearest town or the road number displayed below your current position indicator. The information bar at the bottom provides more information about the selected route, such as estimated arrival time, remaining time and distance, as well as a progress bar.

The app can be used in two different connection modes: hybrid or offline. Hybrid mode combines offline services (maps, search and routing) with online functions (traffic, weather, fuel prices and W3W search). Online services only work with an active Internet connection.

Traffic

This feature requires a licence and an appropriate Internet connection.

It shows you the traffic situation in real time. In the event of heavy traffic, the app will highlight the roads concerned in orange or red, depending on the density of traffic. The highlighted arrows on the road indicate the direction of traffic.

J483593

In addition to the coloured highlight, each traffic event also has an icon with a symbol representing the type of event. For example, two vehicles in a row for traffic jams or a human figure with a mound of earth for roadworks.

Reporting speed cameras

When driving with the app running, you can receive notifications of upcoming static speed cameras. The list is updated daily. There are six types of speed camera:

- Fixed camera
- Cameras at traffic lights
- Speed cameras at traffic lights
- Average speed zones
- Restricted area cameras
- Hazardous areas (France)

⚠ CAUTION

Under no circumstances should the information received lead you to drive faster or less carefully. Statistics show that areas that regularly have speed cameras in them have fewer accidents and, above all, far fewer serious accidents.
Always obey the highway code and drive carefully.

Weather information

Weather forecasts are an online feature and require a licence. This service provides weather forecasts along the route and any warnings that may be necessary. This function is available during route planning and is displayed for all proposed routes.

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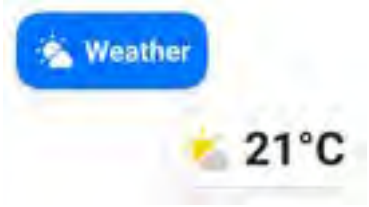
Forecasts can be activated or deactivated by pressing the "Weather" button in the top right-hand corner.



J467470

W3W search

What3words is a location reference system that has divided the world into 3 metre by 3 metre squares, each with a unique address made up of three keywords. This service is licence-based and requires an Internet connection to operate. Enter an address W3Wfor example, the address of the entrance to the Renault Trucks technical training centre in Lyon is: tenir.portant.informons, the result will be displayed below the search bar (you may have to scroll down or hide the keyboard to see it) or press the search button to display the result.

J466492

Fuel prices

The fuel price function helps you find the cheapest fuel along your route, so you can plan efficiently where to fill up. Service availability depends on crowdsourcing data and other suppliers.

Address Search

To search for an address or location, simply tap on the search bar and it will immediately list your latest destinations. As you type, results from your list of favourites, recent search history and nearby results are displayed first if they match part of the expression you are searching for.

J483594

You are free to type any text into the search bar, such as an address, the name of a point of interest, GPS coordinates or a W3W address.

Category Search

Press the heart-shaped icon next to the search bar to access your saved favorites or select one of the POI categories on the right.

Explore more categories of points of interest using the three dots icon in the top right-hand corner. After selecting a category, the application shows you a screen with a list of points of interest on the left, sorted by aerial distance from your current position. The closest results are displayed first. The map on the right-hand side of this screen shows the locations of the points of interest displayed in the list. As you scroll down the list on the left, the map view expands to include additional items on the list.

Results

Suggested results matching your search terms are displayed in the area below the search bar. While typing in the search bar, you can press the search or enter button on your on-screen keyboard to display suggested search results on the left-hand side and their locations on the map on the right.

Recently searched

Every time you choose a destination and a route is calculated in the planner (even if navigation has not yet started), the app saves it and so you can quickly select that destination again in the future. This recent history is displayed on the search screen in the area below the search bar when the search bar is empty or when a recent location is among the first results of a search.

Points of Interest

Once you have selected a point of interest, it will be displayed on the map with the following details:

1 Address
2 Distance in a straight line from your current position
3 Contact information
4 Fuel prices (in the case of service stations and if data is available)
5 Connectors, energy performance, etc. (related to electric vehicles)
6 Add to favourites
7 Explore nearby places (points of interest categories)
8 Add as a POI (Point of Interest)
9 GPS coordinates
10 Get directions

Pin on map

You can place a pin by pressing anywhere on the map in navigation mode (enter it by swiping the map). If you choose a location that is not a point of interest, the pin will be grey, as opposed to the coloured point-of-interest pins. You can create your own point of interest from such a location. Simply choose the option to add it to favourites in the location details. When a location is selected from the suggested search results, it is automatically pinned to the corresponding location on the map.

Get directions

To confirm a selected location as your navigation destination, press the "Get directions" button (11). This action starts the route planning process and allows

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you to further customization the route where possible.

J483597

Once a destination has been selected, press the "Obtain routes" button.

The route planner panels appear on the left-hand side of the screen. They display information about the starting point, the destination, the number of waypoints (if any) and an option to change the route.

J483640

The lower route planner provides information on the time and distance to the destination, the estimated time of arrival (ETA), expected delays due to traffic, the gradient and any warnings that may be necessary. The arrow icon launches navigation.

You can swipe this panel to view details of warnings, the option to add the route to favourites and to preview the route.

Edit route

The edit option on the top panel lets you view the ETA, duration, distance to destination and traffic delays.

Adding waypoints

You can add stops (called waypoints) and change the order of the start point, destination and waypoints. Simply drag and drop the "=" symbol next to the point you want to reorganise.

J483641

Route options

You can choose another vehicle profile or define additional route options. The following types of itinerary can be avoided for each country crossed by the route:

1 Highways
2 Toll Roads
3 Congestion Charging Zones
4 Ferries
5 Unpaved Roads

You can avoid an entire country if it is possible to go through another country instead.

Alternative routes displayed on the map

Once the app has calculated the way to a destination, it will present up to three suggested routes.

Depending on the point of departure and destination, it may offer fewer options if the alternatives are considerably longer. A suggested route is highlighted in blue, while alternative routes are shown in light purple.

Calculation alerts

If it is not possible to reach a destination without involving one or more of the aspects you have set to avoid (such as an unpaved road), the route planning screen will alert you to this and display a warning below the route details.

J483642

Route demonstration

The app can show you the planned route. Once the route has been configured, swipe up the bottom information bar and scroll to the "Demonstrate route" option and select it. You can use the arrows to speed up, slow down or pause the preview.

The navigation screen is activated once navigation has started. It ends when you reach your destination or if you cancel the route.

Signpost Instruction Panel

The same information as road signs in the real world is displayed on the left of the screen, including road numbers, boroughs and street names.

The icons, mainly in the form of directional arrows or roundabout exits, represent the next instructions along your route. Your next instruction is displayed as a large icon on the left side, while the smaller directional arrow shows your succeeding instructions.

J483687

Warning centre

If there are any warnings on your route, they will appear on the upper part of the navigation.

Up to three warnings can appear at the same time. You can receive different types of warnings, for example of traffic delays or level crossings. An indication of the distance to the event is given below so that you can prepare for it.

Warning zone

If you enter a warning zone, it will remain highlighted until you leave.

For traffic jams, the warning displays the estimated time remaining in the traffic jam.

Audio guidance

Before you reach a place where action is required, the main instruction is announced out loud to help you be ready for it. It will be repeated when action needs to be taken.

Lane indication

Lane guidance is available at major junctions and provides a visual representation of the lanes for easier navigation.

This feature can also be deactivated. You can choose from two variants:

- Single lane assistant: Simple arrows represent the lanes of the upcoming junction, and appear below a representation of the signposts. The lanes you need to follow are highlighted,

- Dynamic lane assistant: A more complex widget in the top right-hand corner. The lanes you need to follow are highlighted.

J483680

Points of interest on the road

A widget below the panel will suggest the four nearest points of interest in one of the following categories: petrol stations car parks and rest areas.

You can change the POI categories you wish to see. Go to Main Menu - Settings - Notifications - Places on Route. Use the toggle to activate the categories you want to see in the widget. Deactivate the categories you don't need. However, you can access all the POI categories by simply pressing the "≡" icon on the left. The arrow on the right minimizes the widget.

Name of current position

The name of the current street, nearest town or road number is displayed below your current position indicator. This can be deactivated in the Main menu - Settings - Route and navigation.

Information bar

The information bar at the bottom left of the screen provides more information about the selected route:

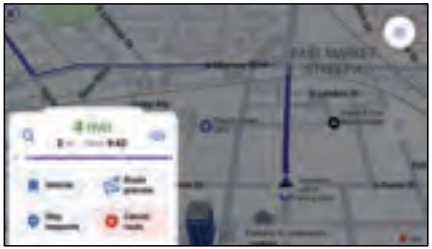
- time remaining (displayed in green, orange or red depending on traffic if the traffic function is available. Otherwise, it is white or black, depending on the app's colour scheme),
- remaining distance,
- ETA (estimated time of arrival),
- search,
- sound options (choose sound on, sound off or alerts only),
- progress bar. Press the information bar to scroll through the quick menu. The +- icon lets you zoom in and out and switch between 2D/3D map modes. The option disappears automatically after five seconds.

You can access navigation mode by swiping across the map to explore the both the map itself and any points of interest. The compass icon in the top right-hand corner reorients the map to face north. To return to navigation, press the "Reposition" button in the bottom left-hand corner or wait for the app return to the navigation window after a short period of inactivity.

Quick menu

Press or swipe up on the information panel to display the quick menu, which provides access to these elements:

- vehicle: used to modify or create a vehicle profile,
- route options: displays an overview of the entire route. The most recent option returns to the default view and the options button opens the detailed route planner with editing options,
- ignore waypoint,
- cancel route.



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The "≡" icon is always available in the top right-hand corner of the screen. Tap this icon to access the main menu.

Progress bar

A progress bar is shown underneath the information bar (12). It represents the previously calculated route.

The arrow indicates your current position, moving from left to right to show how far you have travelled during the journey. The dots indicate the waypoints on the route (where applicable). Sections highlighted in red or orange represent traffic problems along the route.

J483684

Faster route found

An audible alert and an on-screen message inform you each time a new route is found, if it saves at least 10 minutes. You can preview this route and either accept, refuse or cancel it.

The new route alert will be rejected automatically if you take no action.

Last Mile

If a destination is in a area with restricted access, the application will alert you with a TTS voice instruction and display a warning. However, it will still guide you to your destination. Any part of the route with restricted access will be highlighted in a magenta color.

Destination reached

The audio instruction "You have reached your destination" is played when you arrive at your destination.

Regional

Distances can be shown in either metric or imperial units. The units option can be changed in the main menu.

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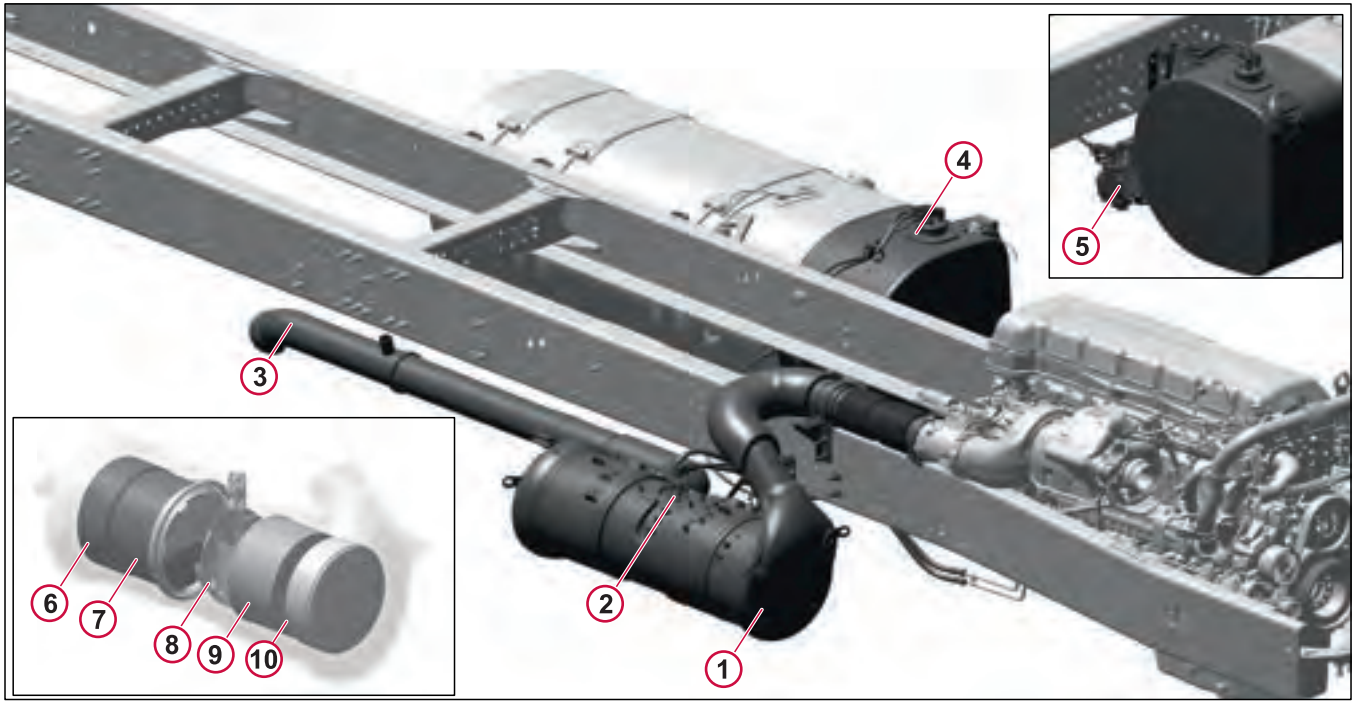
08

EMISSION SOLUTION AND CONTROL

EXHAUST AFTERTREATMENT SYSTEM (EATS)



J470514

1 Linear EATS
2 Aftertreatment DEF Dosing Unit
3 Exhaust Tailpipe
4 Aftertreatment DEF Tank
5 Aftertreatment DEF pump
6 ASC (Ammonia Slip Catalyst)
7 SCR (Selective Catalytic Reduction)
8 Diesel Exhaust Fluid mixing chamber
9 DPF (Diesel Particulate Filter)
10 DOC (Diesel Oxidation Catalyst)

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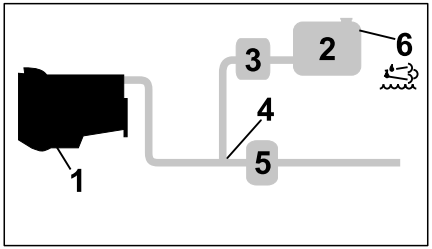
EATS is an emissions-reduction technology that achieves near-zero nitrogen oxides (NOx) emissions. It has proven performance in real-world trucks globally and long-term U.S. field tests. EATS reduces NOx emissions while maintaining fuel efficiency and reliability. It works by injecting Diesel Exhaust Fluid (DEF), a solution of ultra-pure water and urea, into the exhaust, converting NOx into harmless components. This results in cleaner air and a reliable emissions control system for modern diesel engines.

NOTE

The Linear Exhaust Aftertreatment System contains the DOC, DPF, SCR and ASC in one unit. They operate the same as the individual units.



J352366

1 Diesel Engine

2 Aftertreatment DEF Tank

3 Aftertreatment DEF Pump

4 Aftertreatment DEF Dosing Unit

5 Linear EATS

6 Aftertreatment DEF Tank Gauge

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CAUTION

Do not put diesel fuel in the aftertreatment DEF tank. Diesel fuel, if sprayed into the hot exhaust along with the DEF, could ignite explosively causing a fire resulting in personal injury or damage to the exhaust system.

CAUTION

When handling the blankets and or straps, gloves should be worn to protect from cuts and abrasions.

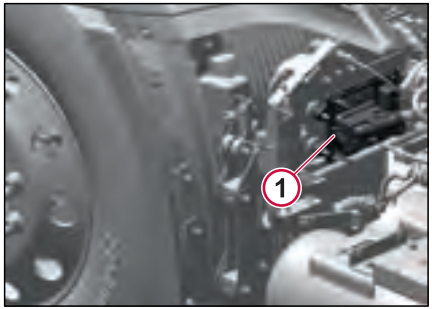
The advantage of using DEF is that it enables the engine to use less Exhaust Gas Recirculation, which results in more efficient combustion. Using DEF also meets the EPA near-zero NOx emissions requirement of 0.2 g/hp-hr NOx. By using DEF, we avoid the disadvantages of increasing EGR to massive levels. This benefit results in better fuel economy from your engine.

Aftertreatment Control Module (ACM)

The ACM is located on the left-hand side of the truck near to the battery.

The ACM controls the following components in the exhaust aftertreatment system:

- Aftertreatment DEF Dosing Unit
- Aftertreatment DEF Tank Heater Valve
- Aftertreatment DEF Line Heaters
- Aftertreatment DEF Pump
- Aftertreatment DEF Return Valve
- Aftertreatment DEF Quality Sensor
- Aftertreatment Particulate Matter (PM) Sensor



J473188

1 Aftertreatment Control Module

EXHAUST AFTERTREATMENT SYSTEM (EATS)

Aftertreatment Diesel Particulate Filter (DPF)

Aftertreatment system reduces exhaust smoke. White vapor during cold start is normal. Black exhaust smoke signals a problem. Visit authorized Volvo Trucks dealer promptly.

Vehicles with newer emission engines have an aftertreatment system: DOC, DPF, SCR and ASC. These components replace the muffler, reducing particulate emissions. Soot is collected in DPF, then oxidized through regeneration.

⚠ WARNING

For chassis equipped with a heated dump body, be aware that temperature around the area where the exhaust enters the body, as well as the product contained in the body, may be elevated, particularly during DPF regeneration.

⚠ CAUTION

When active regeneration occurs (with either system), the temperature of the exhaust will be elevated. DO NOT park the vehicle with the exhaust outlet under low hanging overhead flammable objects such as trees, awnings, etc., that could be damaged by elevated exhaust temperatures. DO NOT remove the diffuser.

⚠ CAUTION

If the vehicle is in a location that may be hazardous when an active regeneration begins (i.e., in close proximity to flammable materials or gases), the regeneration should be stopped by selecting "Stop Regeneration" in the DID menu. If an active regeneration is stopped by the vehicle operator, it should be initiated at a later time when the vehicle is in a safe location. However, if an active regeneration is stopped repeatedly, the vehicle may need to be taken to a Volvo service facility.The service facility will use a service tool to manually initiate the regeneration.

⚠ CAUTION

Use of diesel fuel other than ULSD and engine oils other than VDS-5, will adversely affect performance, efficiency and durability of the DPF system and the engine, to the point where the engine may not run at all. Manufacturer's warranties will also be rendered void due to usage of improper fuel. Unapproved fuel additives (including engine oil) are NOT permitted.

The DPF is used to meet EPA requirements to help reduce soot and particulate emissions into the atmosphere. The particulates are removed by collecting in the DPF unit, where they are eventually oxidized with passive regeneration or active regeneration of the filter. The engine control unit (ECU) and exhaust aftertreatment system of the vehicle will determine when regeneration is required.

Diesel Exhaust Fluid (DEF)

⚠ CAUTION

To avoid tank damage do not attempt to top-off Diesel Exhaust Fluid (DEF). Diesel Exhaust Fluid (DEF) expands when frozen and air volume space at the top of the tank is needed.

DEF (Diesel Exhaust Fluid) is essential for SCR. It's a non-toxic, ultra-pure urea-water solution. Urea turns to ammonia when heated. The fluid is non-flammable and safe if handled properly. Be cautious as it's highly corrosive to certain metals, like copper and brass. Refer to the DEF handling section for more details.

Use only DEF labeled meeting ISO-22241 and American Petroleum Institute certified. Avoid agricultural or industrial urea. Using uncertified fluids affects system performance, emissions, and your product warranties. DEF quality sensor detects diluted DEF, triggering system inducement. Never dilute DEF with water or other fluids.

It is recommended that DEF is not stored in extreme hot or cold conditions, or for prolonged periods. Follow the

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instructions for proper storage and handling as indicated on the container or provided with the purchase.

> **NOTE**
>
> Diluted Urea will negatively effect engine performance.

> **NOTE**
>
> Agriculture mixtures are not pure enough for use in the EATS system and impurities in the solution will compromise the EATS system.

Diesel Exhaust Fluid (DEF) Handling

Avoid DEF contact with electrical parts due to oxidation risk. Use of water or air won't help, as DEF rapidly oxidizes metals. If connector contacts DEF, replace it promptly to prevent copper wiring damage.

> **CAUTION**
>
> When detaching hoses and components, do not spill DEF on disconnected or unsealed connectors. If DEF is spilled on a disconnected or unsealed connector, the connector must be replaced immediately

Things to know about spilled Diesel Exhaust Fluid (DEF)

1. Spilled DEF on skin: Rinse with water, remove contaminated clothing.
2. Spilled DEF in eyes: Rinse for minutes, seek medical help if needed.
3. Inhaling DEF: Breathe fresh air, seek medical help if necessary.
4. Avoid contact of DEF with other chemicals.
5. DEF solution is not flammable. if exposed to high temperature, it breaks down into ammonia and carbon dioxide.
6. The DEF solution is highly corrosive to certain metals, including copper and brass.
7. Spilled DEF can form white crystals on vehicle, rinse off with water.

> **NOTE**
>
> Do not flush DEF spillage into the normal drain system.

Diesel Exhaust Fluid(DEF) Consumption

> **CAUTION**
>
> To avoid tank damage do not attempt to top-off Diesel Exhaust Fluid (DEF). Diesel Exhaust Fluid (DEF) expands when frozen and air volume space at the top of the tank is needed.

DEF consumption tied to fuel consumption. Highway truck: 362-482 Km (225–300 miles) per gallon of DEF.

Gauge shows DEF level. DEF low warning will activate when DEF is low. Empty DEF tank reduces engine power. Refill restores normal power.

> **NOTE**
>
> DEF tanks are sized for a two to one fuel to DEF ratio in order to meet US 2010 and later requirements.

Diesel Exhaust Fluid (DEF) Availability

DEF is available in 2.5-gallon containers, 55-gallon drums, 275 gallon IBC and in bulk storage for fleet locations, truck stops and dealerships. All major truck stops, dealers and distributors carry DEF.

DEF freezes at –11 ° C (12 ° F). Protect DEF from extended periods of severe cold. For more information on DEF and availability please visit the website www.volvotrucks.us or call 1–800–52 Volvo.

EXHAUST AFTERTREATMENT SYSTEM (EATS)

Misfilling Diesel or Aftertreatment DEF Tanks

⚠ CAUTION

The missfilling of either Diesel Exhaust Fluid (DEF) or diesel fuel can cause vehicle diagnostic trouble codes, improper component operation or damage. If missfilling occurs do not start the vehicle. Also, tow the vehicle immediately to a certified technician for service.

Although diesel fuel and aftertreatment DEF caps are clearly labeled and filler necks and nozzles are different accidents can happen.

Contamination of fluids by- misfilling of diesel or DEF in the wrong tank can result in vehicle malfunction.

Results of misfilling DEF in Diesel Tank

- Engine can run poorly or not at all
- Injectors can be damaged
- Exhaust system corrosion can occur between turbocharger and aftertreatment DPF
- On Board Diagnostic (OBD) Diagnostic Trouble Codes (DTC)
- Costly repairs

Results of misfilling diesel in Aftertreatment DEF Tank

- Diesel can damage the aftertreatment SCR system
- Diesel can damage the SCR Catalyst (chemical damage)
- Emissions can be non-compliant
- On Board Diagnostic (OBD) Diagnostic Trouble Codes (DTC)
- Costly repairs

Extended Idling and Aftertreatment System

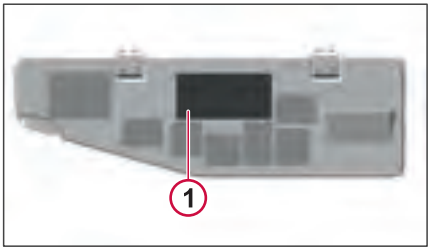
Extended idling with an exhaust aftertreatment system should be done at low engine idle speed with the parking brake set. Raised engine idle speed has no benefit for extended idling, except for active Power Take-Off (PTO). Engine speed above 1300 rpm is recommended for extended idling with active PTO.

During extended idling, engine speed increases to about 1050–1400 rpm for non-PTO to complete exhaust aftertreatment conditioning. Temperatures rise slightly but are lower than during regeneration.

A driver display message "EATS Conditioning in Progress, No Action Required" appears . If no driver display is available, there will be no indication of Aftertreatment system conditioning, event except engine speed automatically increases

Warning and Inducement

Refer to the Exhaust Aftertreatment System Information sun visor label for additional warning information.



J470524

1 DEF/DPF INFORMATION DECAL

Instrument Cluster Icons

Aftertreatment icons are displayed on the instrument cluster. There are three aftertreatment icons:

- Parked Aftertreatment DPF Regeneration Required
- High Exhaust System Temperature (HEST)
- Aftertreatment DEF Tank Low Level Indicator

The Aftertreatment DPF Regeneration Required icon flashes when the Diesel Particulate Filter is full or overfull and regeneration is needed.

J342601

The High Exhaust System Temperature icon illuminates during parked or passive regenerations, indicating high exhaust system temperature. Avoid parking or operating the vehicle near people, flammable materials, vapors, or structures when the HEST icon is illuminated.

J342600

The Aftertreatment DEF Tank Low Level Indicator icon illuminates when the fluid level is low. It also Flashes when the level becomes critically low.

J342711

EXHAUST AFTERTREATMENT SYSTEM (EATS)

Malfunction Indicator Lamp

If the MIL lamp comes On means fault in emission control system. Driveabiltiy may be affected. Get checked by authorized Volvo dealer.

- MIL indicates government Regulated On Board Diagnostics (OBD) faults
- MIL indicates OBD faults only, stays lit if issue persists.
- **Call the dealership when the MIL is illuminated to schedule time to repair the vehicle. Lamp can remain active after repair until system confirms repair.**

J342598

DEF Tank Level

Aftertreatment DEF tanks are sized to have no less than two times the diesel fuel tank mileage or hour range.

The vehicle instrument cluster has an aftertreatment DEF tank level gauge.

NOTE
Repeated acts of tampering will result in more severe Inducement.

None	**Display Screen:** None
	Trigger: 100% to 12 % Aftertreatment DEF Tank Level Gauge
	Display Screen: **DEF LEVEL LOW** **Refill fluid soon to** **prevent engine derate**
	Trigger: <=12 % Aftertreatment DEF Tank Level Gauge
	Display Screen: **ENGINE IN DERATE** **Refill DEF tank** **to avoid 5 MPH limit**
	Trigger: 0% Aftertreatment DEF Tank Level Gauge (~1% DEF Remaining)

EXHAUST AFTERTREATMENT SYSTEM (EATS)

	Display Screen: **ENGINE IN DERATE** **Refill DEF tank** **to avoid 5 MPH limit**
	Trigger: DEF tank empty and refueling event with parking brake applied
	Display Screen: **DEF TANK EMPTY** **Vehicle speed** **limited to 5 MPH** **Refill DEF fluid.**
	Trigger: Vehicle Stationary for 1 Hour or Engine re-start (Key OFF, Key ON)

DEF Quality

The vehicle instrument cluster has an aftertreatment DEF quality indicator.

Triggers	Aftertreatment DEFQuality Indicator	Driver InformationDisplay Screen
Good DEF Quality	None	None
Poor DEF Quality DTCInitial Detected		**POOR DEF QUALITY** **Engine will derate in approx. ___ mins**
Poor DEF Quality DTCInitial Detected + 1 hours		**ENGINE IN DERATE** **Poor DEF quality.** **5 MPH in approx. ___ mins** Note: : Once this DEF Quality fault occurs the DID timer displays. The timer displays the minutes available before the 5 mph derate occurs. The timer can be cleared using the Escape (ESC) button on the stalk switch control lever. When the vehicle is restarted after shutdown the remaining minutes before derate occurs will reappear.
Poor DEF Quality DTCInitial Detected + 4 hours		**ENGINE IN DERATE** **Service DEF.** **5 MPH limit after next vehicle stop.**

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EXHAUST AFTERTREATMENT SYSTEM (EATS)

Triggers	Aftertreatment DEFQuality Indicator	Driver InformationDisplay Screen
Refueling Event with ParkingBrake ON		POOR DEF QUALITY Service DEF Vehicle speed limited to 5 MPH.
Vehicle Stationary for 1 Hour or Engine re-start(Key OFF, Key ON)		POOR DEF QUALITY Service DEF. Vehicle speed limited to 5 MPH.
Ignition Key Cycle		POOR DEF QUALITY Service DEF. Vehicle speed limited to 5 MPH.

Exit conditions for DEF Quality "8 Km/h (5 mph) road speed limit" Inducement:

Next 1 Engine Starts: Return to 25% torque reduction until there is a proper DEF quality evaluation. If poor DEF quality is detected during the next monitoring cycle then 8 Km/h (5 mph) is resumed after the vehicle is stationary for 1 Hour. After one engine start has been exhausted then a Tech Tool is required to exit the 8 Km/h (5 mph) road speed limit.

Aftertreatment Tampering

When the SCR tampering fault is active for one or more hours a new Driver Information Display (DID) screen appears. The text changes for the Driver Information Display (DID) screen associated with this fault are listed in the table below.

Triggers	AftertreatmentTampering Indicator	Driver InformationDisplay Screen
No Fault	None	None
Tampering Fault Detected **Note:** For examples of the various SCR sensor tampering types refer to the “SCR Sensor Disconnected Tampering Type” table below.		**SCR System Fault** **Engine will Derate in approx.___ mins**
Driving with Active Fault for+ 1 hrs		**SCR system fault.** **Engine in derate** **5 MPH limit in approx. <___mins** **Note:** Once this SCR tampering fault occurs the DID timer displays. The timer displays the minutes available before the 5 mph derate occurs. The timer can be cleared using the Escape (ESC) button on the stalk switch control lever. When the vehicle is restarted after shutdown the remaining minutes before derate occurs will reappear.

EXHAUST AFTERTREATMENT SYSTEM (EATS)

Triggers	AftertreatmentTampering Indicator	Driver InformationDisplay Screen
Driving with Active Fault for+ 4 hrs		SCR system fault. Repair needed. 5 MPH limit after next vehicle stop.
1 Refueling Event (> 15 % fuel level increase) with stationary brake 2 Vehicle stationary for 1 Hour (vehicle speed < 1.6 Km/h (1 mph) 3 Ignition Key Cycle		SCR system fault. Veh speed limited to 5 MPH

EATS Sensor Disconnected Tampering Type
Exhaust Temperature Sensors Disconnected
Aftertreatment Control Module (ACM) Disconnected
Aftertreatment NOx Sensor 1 Disconnected
Aftertreatment NOx Sensor 2 Disconnected
DEF Pump Disconnected
DEF Dosing Valve Disconnected
DEF Tank Level Sensor Disconnected
DEF Supply Line to DEF Pump Disconnected
DEF Return Line Blocked or Plugged

Active Regeneration

When Regen is required, a message will appear in the instrument cluster. Active regeneration can only be initiated through the instrument cluster menu. Follow these steps to access regeneration.

1 Go to Maintenance in the menu.

The application menu screen displays.

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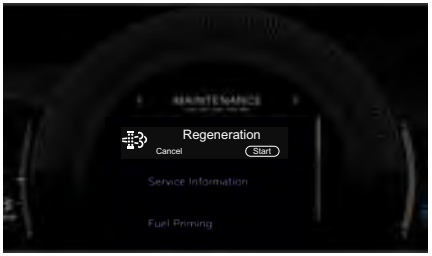
If the Regeneration is not needed, The screen displays Regeneration not needed.

2 If the Regeneration is needed click on 'Regeneration', It will show the display asking to start or cancel.



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After you press on start. If the conditions are not met, The display shows 'Regeneration not possible'.

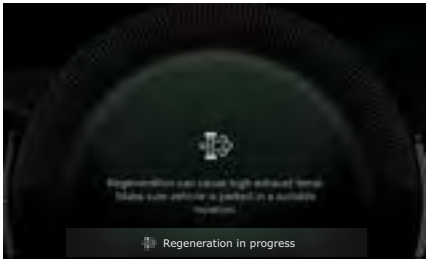
J473250

Conditions to start Regeneration

Display will show 'Regeneration not possible' notification if any of the below conditions are not fulfilled.

- Disable PTO
- Release Accelerator
- Move Gear Selector(Stalk Switch) to N
- Park Vehicle
- Apply Parking Brake
- Release Clutch
- Engine Warmup Required
- Raise Truck Height

If the conditions are fulfilled. Regeneration starts.



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The display shows the 'Regeneration Completed' status after it is completed.

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EXHAUST AFTERTREATMENT SYSTEM (EATS)

Active Regeneration DID Notifications

When Regeneration is Needed

When the regeneration is needed the display shows 'Regeneration needed'.

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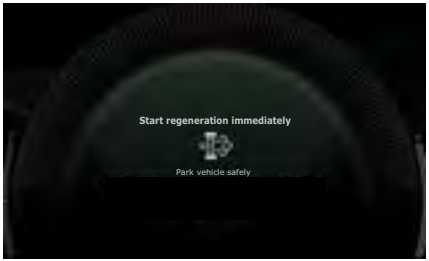
When regeneration needed immediately.

When the regeneration is needed immediately, the system asks to park vehicle and start regeneration immediately.



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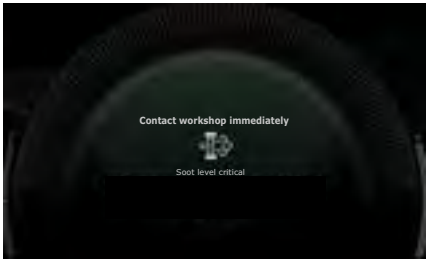
When Soot Level is critical

If the Soot level is critical, the display asks to contact the workshop



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> **NOTE**
>
> If there is a malfunction in Regeneration system, the display shows to 'Contact workshop'.

Regeneration not possible due to certain criteria

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09

MAINTENANCE, LUBRICATION AND SERVICE

PRE-TRIP INSPECTION AND DAILY MAINTENANCE

⚠ DANGER

Before working on or inspecting a vehicle, set the parking brakes, place the transmission in neutral and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

(!) NOTE

Make sure that all fluid levels are at their proper levels. If the fluids are not at their proper levels, add as necessary.

(!) NOTE

While Checking the fluid levels, visually inspect hoses, pipes and their connections for signs of leakage. Inspect the ground under the engine, transmission and rear axle(s) for signs of leakage.

(!) NOTE

Failure to address leaks in a timely manner, may lead to preventable failure and void warranty on that component.

Safety is the most important and obvious reason for doing a pre-trip inspection. Federal and state laws require inspection performed by the driver. Federal and state inspectors also inspect commercial vehicles. An unsafe vehicle can be placed "out of service" until the driver or owner corrects the deficiency. Owners and operators should familiarize themselves with sections 49 CFR 396.11 and 396.13 concerning Federal requirements for vehicle inspection. Certain other laws may also apply.

Section 49 CFR 396.13 states that all motor carrier drivers must complete a written report at the end of each work day for each vehicle operated, covering most of what is covered in the pre-trip list. The report should list all defects or deficiencies discovered by the driver. A pre-trip inspection prepares for the end-of-work report.

In this section are the suggested guidelines to be used in performing truck, tractor and trailer pre-trip inspections. Depending on the application of the vehicle being used, these guidelines should be modified to include other necessary inspection points. For example, steps and grab handles should be checked daily on refuse trucks because the operator is getting in and out of the cab more frequently.

If any component or system does not pass this inspection, it must be corrected before operating the vehicle. Whenever equipment requires adjustment, replacement, repair or lubrication, refer to the Service Manuals or contact an authorized dealer for the correct procedures, specifications and intervals.

Take your time going through the pre-trip inspection. Remember that a careful pre-trip inspection saves time by eliminating unscheduled stops for correcting a faulty item. The following information has been provided by the American Trucking Association as developed by the D.O.T. Office of Motor Carriers (BMCS).

Pre-Trip Assistant

The Pre-Trip Assistant option is a tool to assist the driver in completing the pre-trip inspection of the vehicle. This option is not a substitute for a complete pre-trip inspection. If any system of the vehicle does not pass inspection, the error must be corrected before operating the vehicle.

The following tests are available:

- Adblue Level: Allows the driver to check the Adblue level.
- Battery Level: Provides information about the level of the vehicle battery charge
- Light Inspection: Allows the driver to perform a test of the vehicle lighting systems
- Battery Capacity: Indicates the charge level of the vehicle battery.
- Coolant Level:Allows the driver to check the coolant level in the vehicle engine cooling system.
- Fifth Wheel Status: Provides information about the status of the fifth wheel.
- Fuel Level: Allows the driver to check the level of fuel in the fuel tank.
- Parking Heater Status: Provides information about the status of the parking heater.
- Washer Fluid Level: Allows the driver to check the level of washer fluid in the vehicle.
- Brake Pad Wears: Provides information about the wear status of the brake pads.

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After the pre-check inspection the status is displayed in the instrument cluster.

J481340

If the status is green, vehicle has no issue found and the vehicle is ok.

J481341

If the status is orange, the vehicle has an issue with a warning condition and action message.

J481342

If the status is red, the vehicle has issue with a critical warning and action message. The truck should be stopped and need to contact the nearby Volvo authorized dealer.

> **NOTE**
>
> The Hazard and High/Low beam switches are momentary switches and return to the OFF position when released during testing.

The Light Inspection check repeatedly turns all exterior lights on/off for the vehicle. This check allows the operator to start the test, exit the vehicle and do a visual check and determine that all exterior lighting is functioning properly.

PRE-TRIP INSPECTION AND DAILY MAINTENANCE

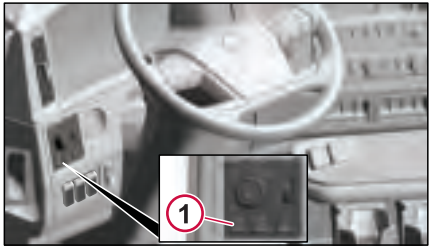
The following exterior lights are cycled through the check:

- Parking
- Hazard
- Turn signals (left and right)
- High/Low beam headlights
- Brake
- Fog/Driving (Optional)

Light Inspection check/test can be activated either by using the button on the ELCP or from the Pre-Trip Assistant main menu.

Light Inspection Switch

- Switch On the Light Inspection Switch.



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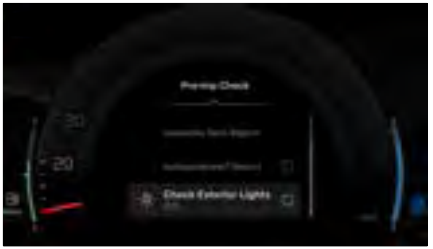
1. Pre-Trip Inspection Light Button (ELCP)

Pre-Trip Assistant main menu

- From the Pre-Trip Assistant main screen, select Check Exterior Lights. Press OK button on the right steering wheel switch.



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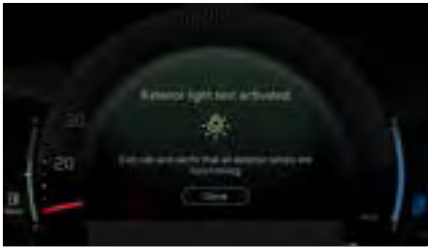
Once the test is started, all exterior lights flash on and off so that you can perform a visual check. The test continues to run until the Applications button, on the steering wheel controls, is pressed. Also, the test turns off if the vehicle is moving faster than 3 mph (5 km/h).



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Pre-Trip Inspection Quick List

1 Pre-trip Approach Vehicle

Inspect the vehicle in a circular manner.

Approaching the Vehicle

- Check under the vehicle for oil, fuel, coolant leaks or other signs of damage.
- Check body surfaces for signs of breaks or damage.

Preparation

- Open the drain cocks on the air tanks to let the tanks drain.
- Chock the wheels on the vehicle and trailer (if hooked up).
- Close the drain cocks of the air tank.
- Start the engine and let the air pressure build up to normal. Stop the engine and check for air leaks.
- Switch on parking lights and hazard lights.
- Apply the parking brake. Listen for air leaks.
- Raise the hood so belts can be checked.

2 Left Side of the Cab

Left Front Wheel

- Check condition of wheel rim. Especially look for cracks, missing lockrings, bent or broken studs, missing clamps or lug nuts.
- Check condition of tire: properly inflated, no serious cuts, bulges, tread wear or any signs of misalignment; valve stem not touching wheel, rim or brake drum; valve cap in place.
- Check wheel bearing and hub: no obvious leaking on outside or inside wheel. Verify correct oil level in hub.

Left Front Suspension

- Check condition of spring, spring hangers, shackles, u-bolts: no cracks, breaks or shifting.
- Check shock absorber condition.

Left Front Brake

- Condition of brake drum. With brakes released, look for a noticeable gap between lining and drum. This check cannot be made if dust covers are in place.
- Condition of brake air hose.
- Check brake chamber mounting bolts and bracket.
- Check slack adjuster and chamber pushrod travel for proper brake adjustment.

Left Front Axle and Steering System

- No loose, worn, bent, damaged or missing parts.

Engine Compartment, Left Side

- Check coolant hose condition.
- Check condition of fan drive belts.
- Check engine and surrounding areas for coolant, oil and fuel leaks.
- Check wiring harnesses for signs of damage.

3 Front of Cab Area

Condition of Windshield

- Check for damage. Clean if it is dirty.
- Check the windshield wiper arms for proper spring tension.
- Check the wiper blades for any damage, "dead" rubber and attachment to arm.

Lights and Reflectors

PRE-TRIP INSPECTION QUICK LIST

- Lower the cab and inspect the parking clearance, and identification lights on the cab. They should be clean, operating and of the proper color.
- Check that the reflectors are clean and of the proper color.
- Turn on the headlights. Check that the high and low beams are operational and the lenses are clean. If equipped, check the daytime running lights.
- Check that the left and right front turn signal lights are clean, operating and of the proper color.

Grille

- Check that the charge air cooler, radiator and bugscreens are clean and undamaged.

4 Right Side of Cab Area

Right Front Wheel

- Check condition of wheel rim. Especially look for cracks, missing lockrings, bent or broken studs, missing clamps or lug nuts.
- Check condition of tire: properly inflated, no serious cuts, bulges, tread wear or any signs of misalignment; valve stem not touching wheel, rim or brake drum; valve cap in place.
- Check wheel bearing and hub: no obvious leaking on outside or inside wheel. Verify correct oil level in hub.

Right Front Suspension

- Check condition of spring, spring hangers, shackles, U-bolts: no cracks, breaks or shifting.
- Shock absorber condition.

Right Front Brake

- Condition of brake drum. With brakes released, look for a noticeable gap between lining and drum. This check cannot be made if dust covers are in place.
- Condition of brake air hose: check for any chafing.
- Check slack adjuster and chamber pushrod travel. With brakes applied or released, look for conspicuously different positions of the slack adjusters for proper brake adjustment.
- Check brake chamber mounting bolts and bracket.

Condition of Front Axle and Steering System, Right Side

- No loose, worn, bent, damaged or missing parts.

Engine Compartmenr, Right Side

- Check condition coolant and heater hoses.
- Check condition of fan drive belts.
- Check engine and surrounding areas for coolant, oil and fuel leaks.
- Check fuel seperator sight glass and drain if necessary. Check for leaks.
- Check wiring harness for sign of damage.
- Check air filter with brackets and hoses for loose connections or damage. Check filter guage, if mounted on the filter.

5 Right Saddle Tank Area

Right Fuel Tank(s)

- Securely mounted Diesel and Diesel Exhaust Fluid are not damaged or leaking.
- Fuel lines secure and not leaking. Check that shut-off valves are open.
- Tank(s) full of fuel. Cap on and secure.

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Condition of Visible Components

- Rear of engine: not leaking.
- Transmission: not leaking. If equipped with oil cooler, check cooler, hoses and fittings for leaks.
- Check drive shaft.
- Exhaust system: secure, not leaking, not touching wires, fuel or air tubing.
- Frame and cross members: no bends, cracks or breaks. DPF/SCR check hoses and fittings for leaks.
- Air tubing and electrical wiring: secured against snagging and chafing.

6 Right Rear Vehicle Area

Dual Wheels, One or Two Axles

- Check condition of wheels and rims. Especially look for cracks, missing lockrings, bent or broken spacers, studs, missing clamps or lug nuts.
- Check condition of tires: properly inflated, no serious cuts, bulges, tread wear or any signs of misalignment; valve stems not touching wheels, rims or brake drums; valve caps in place and no objects stuck between the wheels.
- Check that both tires are of same type, for example, not mixed radial and bias type and that their circumferences are matched.
- Check wheel bearing and hub: no obvious leaking on outside or inside wheel.

Suspension

- Check condition of springs (leaf), spring hangers, shackles and U-bolts.
- Axle alignment.

Brakes

- Condition of brake drums. With brakes released, look for a noticeable gap between lining and drum. This check cannot be made if dust covers are in place.
- Condition of brake hoses: check for any chafing.
- Check brake chamber mounting bolts and brackets.
- Check slack adjusters and chamber push rod travel. With brakes applied or released, look for conspicuously different positions of the slack adjusters for proper adjustment.
- Check spring brakes.

7 Rear of Vehicle Area

- Frame or cross members not bent, cracked or otherwise damaged or missing.
- Check that air tubing and electrical lines are properly secured to the frame with no damage or chafing.

Lights and Reflectors

- Tail lights, brake lights and turn signal lights: operating, clean and proper color.

8 Coupling System Area

Fifth Wheel

- Securely mounted to the frame.
- No missing or damaged parts.
- Check that trunnion and plate are properly lubricated.

Sliding Fifth Wheel

- Mechanism not worn, bent, damaged or parts missing.
- Properly lubricated.
- All locking pins present and locked in place.
- If air operated: no air leaks.

PRE-TRIP INSPECTION QUICK LIST

Air Tubing and Electric Lines Visible From This Point

- Should be secure from dangling.
- Both air lines and electric line should be free from damage, oil and grease.

9 Left Saddle Tank and Left Rear Vehicle Wheels Area

Dual Wheels, One or Two Axles

- Check condition of wheels and rims. Especially look for cracks, missing lockrings, bent or broken spacers, studs, missing clamps or lug nuts.
- Check condition of tires: properly inflated, no serious cuts, bulges, tread wear or any signs of misalignment; valve stems not touching wheels, rims or brake drums; valve caps in place and no objects stuck between the wheels.
- Check that both tires are of same type, for example, not mixed radial and bias type and that their circumferences are matched.
- Check wheel bearing and hub: no obvious leaking on outside or inside wheel.

Suspension

- Check condition of springs (leaf or air), spring hangers, shackles and u-bolts, no cracks, breaks or shifting.

Brakes

- Condition of brake drums. With brakes released, look for a noticeable gap between lining and drum. This check cannot be made if dust covers are in place.
- Condition of brake hoses: check for any chafing.
- Check brake chamber mounting bolts and brackets.
- Check slack adjusters and chamber push rod travel. With brakes applied or released, look for conspicuously different positions of the slack adjusters for proper brake adjustment.
- Check spring brakes.

Condition of Visible Components

- Transmission: not leaking.
- Driveshaft: looks OK.
- Exhaust system: secure, not leaking, not touching wires, fuel or air tubing.
- Frame and cross members: no bends, cracks or breaks.
- Air tubing and electrical wiring: secured against snagging and chafing.

Left Fuel Tank(s)

- Securely mounted and not damaged or leaking.
- Fuel lines secure and not leaking. Check that shut-off valves are open.
- Tank(s) full of fuel. Cap on and secure.

Battery Area

- Open the battery box. Battery box securely mounted to vehicle.
- Batteries secured against movement.
- Battery cases not broken or leaking. Battery cables free from damage.
- Tops of batteries and terminals clean and free from foreign material.
- If equipped, replace battery lid and make sure it is securely fastened.

In the Cab

Check steps and grab handles for looseness or breakage. Also, clean them if there is any substance that

makes them slippery, which makes cab entry/exit hazardous.

- Start the engine. If equipped, check that exhaust rain cap opens when accelerating engine.
- Check gauges and tell-tale light function. See the Instruments and Controls section.
- Check function of Brake Air pressure warning.
- Check clutch function. If equipped, check for clutch brake function.
- Check windshield wipers and washers and horns, including back-up alarm, if equipped.
- Clean inside windshield, door windows and instruments. Clean mirrors.
- Check temperature control and defroster. If equipped, check mirror heater.
- Check condition of warning triangles, fire extinguisher and flares.
- Adjust the seat. Check mirror adjustment.
- Check safety belts for function and damage.
- Apply service brakes. After initial drop, pressure should hold steady, or increase slightly, with engine at idle.
- Check steering wheel for excessive free play.
- Check for loose items in the cab. Secure them if necessary.

Hooking Up To Trailer

Hook-Up Preparation

- Check kingpin and mounting plate on trailer, free from wear, bends or damage.
- Chock trailer wheels.

Fifth Wheel or Trailer Hitch

- No visible space between fifth wheel and trailer.
- Locking jaws around the shank and not the head of kingpin.
- Release lever properly seated and safety latch/lock engaged.
- Check all connections to dolly or trailer hitch and safety chains are secured.
- Check function of trailer air supply valve and trailer brakes.

Sliding Fifth Wheel

- Check that fifth wheel is not so far forward that the tractor frame will strike the landing gear during turns.

10 Trailer Front Area

Air and Electrical Connections

- Glad hands properly mounted, free from damage and not leaking.
- Trailer cord receptacle properly mounted, free of damage; plug properly seated and safety catch engaged to prevent accidental disconnect.
- Air and electrical lines properly secured against tangling, snagging and chafing with sufficient slack for turns.

> ⓘ NOTE
>
> Refer to the trailer manufacturer's manual for specific information on the trailer checks.

11 Right Side of Trailer Area

Landing Gear or Dolly Area

- Fully raised; no missing or damaged parts.
- Crank handle present and secured.
- If power operated, no air/ hydraulic leaks.

Spare Wheel(s)

PRE-TRIP INSPECTION QUICK LIST

- Carrier or rack not damaged.
- Spare wheel securely mounted in rack.
- Tire and wheel condition adequate for a spare: proper size, properly inflated.

Lights and Reflectors

- Trailer side clearance lights: clean, operating and proper color.
- Reflectors clean and proper color.

Frame and Body

- Frame and crossmembers not bent, cracked, damaged or missing.
- Proper placarding.
- Body parts not damaged or missing.

12 Right Rear Trailer Wheel

Dual Wheels, One or Two Axles

Check condition of wheels and rims. Especially look for cracks, missing lockrings, bent or broken spacers, studs, missing clamps or lug nuts.

Check condition of tires: properly inflated, no serious cuts, bulges, tread wear or any signs of misalignment; valve stems not touching wheels, rims or brake drums; valve caps in place and no objects stuck between the wheels.

Check that both tires are of same type, for example, not mixed radial and bias type and that their circumferences are matched.

Check wheel bearing and hub: no obvious leaking on outside or inside wheel.

Suspension

- Condition of springs (leaf or air), spring hangers, shackles and U-bolts.
- Axle alignment.
- Condition of torque rod arms.
- If equipped with sliding axles, check position and alignment. Look for damaged, worn or missing parts, all locks present, fully in place and locked.
- Flexible air tubing not cracked, cut, crimped or otherwise damaged. Secured against tangling, dragging and chafing.

Brakes

- Condition of brake drums. With brakes released, look for a noticeable gap between lining and drum. This check cannot be made if dust covers are in place.
- Condition of brake hoses: check for any chafing.
- Check brake chamber mounting bolts and brackets.
- Check slack adjusters and chamber push rod travel. With brakes applied or released, look for conspicuously different positions of the slack adjusters for proper brake adjustment.
- Check spring brakes.

13 Rear of Trailer Area

Lights and Reflectors

- Rear clearance, identification and tail lights clean, operating and proper color.
- Reflectors clean and proper color.

Cargo Securement

- Cargo properly blocked, braced, tied, chained, etc.
- Tailboard up and properly secured. End gates free from damage, properly secured in stake pockets.
- Canvas or tarp (if required) properly latched down to prevent water damage, tearing, billowing or blockage of either mirrors or tail lights.

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- Rear doors securely closed, latched or locked; required security seals in place.
- Underside guard in place: not cracked, bent or broken.

14 Left Rear Trailer Wheels Area

Dual Wheels, One or Two Axles

- Check condition of wheels and rims. Especially look for cracks, lockrings missing, bent or broken spacers, studs, missing clamps or lug nuts.
- Check condition of tires: properly inflated, no serious cuts, bulges, tread wear or any signs of misalignment; valve stems not touching wheels, rims or brake drums; valve caps in place and no objects stuck between the wheels.
- Check that both tires are of same type, for example, not mixed radial and bias type and that their circumferences are matched.
- Check wheel bearing and hub: no obvious leaking on outside or inside wheel.

Suspension

- Condition of springs (leaf or air), spring hangers, shackles and U-bolts.
- Axle alignment.
- Condition of torque rod arms.
- If equipped with sliding axles, check position and alignment. Look for damaged, worn or missing parts, all locks present, fully in place and locked.
- Flexible air tubing not cracked, cut, crimped or otherwise damaged. It should be secured against tangling, dragging and chafing.

Brakes

- Condition of brake drums. With brakes released, look for a noticeable gap between lining and drum. This check can not be made if dust covers are in place.
- Condition of brake hoses: check for any chafing.
- Check brake chamber mounting bolts and brackets.
- Check slack adjusters and chamber push rod travel. With brakes applied or released, look for conspicuously different positions of the slack adjusters.
- Check spring brakes.

15 Left Side of Trailer Area

Landing Gear or Dolly Area

- Fully raised; no missing or damaged parts.
- Crank handle present and secured.
- If power operated, no air/ hydraulic leaks.

Spare Wheel(s)

- Spare wheel securely mounted in rack with no damage to rack.
- Tire and wheel condition adequate for a spare: proper size, properly inflated.

Lights and Reflectors

- Trailer side clearance lights: clean, operating and proper color.
- Reflectors clean and proper color.

Frame and Body

- Frame and crossmembers not bent, cracked, damaged or missing.
- Proper placarding.
- Body parts not damaged or missing.

Before Leaving the Parking Area

- Remove chocks from the wheels.
- Test trailer hook-up by slowly pulling while applying the trailer

PRE-TRIP INSPECTION QUICK LIST

brakes with the trailer brake hand control valve.

- Test the service brakes before leaving the parking area.
- Test parking brakes by stopping on a 20% grade and applying the parking brakes. The parking brakes shall hold the combined vehicle and trailer without moving.

Service Charts

The vehicle had a pre-delivery inspection before being delivered to you, the customer. Regular maintenance inspections should be continued. The maintenance program and lubrication intervals that are listed in this manual may not suit your operation. Contact your nearest authorized dealer, who can help with designing a maintenance program that works in your application.

• For regular service or maintenance, call the dealer in advance and arrange for a service appointment. This gives the dealer time to schedule the correct equipment and provide a trained technician to service the vehicle.
• Setting an appointment can decrease vehicle downtime.
• When in for service at an authorized dealer, ask for outstanding safety related recalls that relate to the vehicle. This service is available only at an authorized dealership.

NOTE

It is strongly recommended that you do not attempt to service, repair or maintain the vehicle yourself unless you are fully trained and have the proper tools, equipment and parts. Some procedures are better performed by an authorized dealer who has the proper equipment and trained technicians.

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SERVICE CHARTS

Scheduled Service Date

Scheduled Service Data			
Scheduled Service Date	Preventive Maintenance	Work Completed	
		Date	Mileage

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Noise Control Log

Noise Control Log			
Noise Control System Maintenance Log			
Date	Mileage	Maintenance Performed	Maintenance Facility

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SERVICE CHARTS

Repair Record

Repair Record				
Repair Record				
Date	Mileage	Work Order or Invoice No.	Dealer	Notes

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Tire Record

Tire Record			
Date	Type Front	Type Rear	Notes (Tire Pressure, Tread Depth)

SERVICE CHARTS

Fuel and Oil Record

Fuel and Oil Record					
Date	Accumulated		Oil Qty	SAE No.	Notes
	Mileage	Fuel Qty (Gallon)			

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Engine Data

Engine Data
Vehicle Identification Number (VIN)
Engine Model
Engine Serial Number
Primary Fuel Filter Part Number
Secondary Fuel Filter Part Number
Oil Filter Part Number, Full Flow
Oil Filter Part Number, By-pass
Air Cleaner Element Part Number
Coolant Filter Part Number
Fan Drive Belt Part Number
Accessory Drive Belt Part Number
Diesel Particulater Filter Part Number (If Equipped)
Diesel Oxication Catalyst Part Number (If Equipped)

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ENGINE

Precautions and Warnings

⚠ WARNING

Misuse or modification of a turbocharger can result in serious injury and property damage. In addition, extreme care must be taken to avoid foreign material induction, excessive exhaust temperatures and lack of lubrication.

⚠ CAUTION

The maximum allowable engine speed is listed on the warning label on the sun visor. DO NOT exceed 2,300 rpm.

⚠ CAUTION

If a winterfront is needed, use only a winterfront that was designed for this specific chassis. Winterfronts are not recommended, but can be used during cold weather with sustained temperatures below -25°C (-13°F).

⚠ CAUTION

Be sure to avoid high intake/exhaust temperatures when using winterfronts under normal operating conditions (above freezing). The restriction of airflow can cause higher exhaust temperatures, power loss, excessive fan usage and reduced fuel economy.

⚠ CAUTION

Do not permit a heavy load to drive the engine above the governed speed.

⚠ CAUTION

Operate in a gear low enough to allow the engine to accelerate to (or maintain) governed speed when applying the throttle.

Engine Maintenance

⚠ DANGER

Before working on or inspecting a vehicle, set the parking brakes, place the transmission in neutral and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

⚠ DANGER

DO NOT attempt to repair or service this vehicle without having sufficient training, correct service literature and the proper tools. Failure to follow this could lead to personal injury or death, or making your vehicle unsafe.

(!) NOTE

Read all safety information before working on the vehicle.

Service Planning and Schedules

Preventive maintenance is vital to the life of your new vehicle. This section of the Operator Handbook covers items of importance concerning the proper care of your vehicle. A well-run maintenance and lubrication program is the best way to ensure a long life of productive operation.

By performing daily checks and observing the equipment while in operation, minor defects can be corrected before putting the equipment into operation.

If you have any questions concerning the proper care, maintenance and lubrication of your vehicle, contact your local dealer.

Engine Service, Volvo

Component	Operation	Km (Miles) / Maximum Months/Hours
Fuel Filter	Change	Each oil change*
Water Separator (Engine Mount)	Filter Change	Each oil change*
Fuel / Water Separator (Chassis Mount)	Change	Each oil change*
Fuel Tank Ventilation Filter	Change	Every 12 Months
Fuel Tank Ventilation Filter (Stanchion Mount)	Change	Every 12 Months
Air Filter (Engine)	Change	At maximum restrictions as indicated on gauge, or 12 months
Coolant (Normal or Heavy Duty)	Change	500 000 km (300,000 mi) or 24 months whichever comes first
Coolant (Severe Duty)	Change	240 000 km (150,000 mi) or 12 months whichever comes first
Coolant, Extended Life (ELC)	Change	1 609 344 km (1,000,000 mi) or 96 months, whichever comes first
Coolant Filter	Change	At every engine oil change.
Coolant Filter Extended Life (ELC)	Change	240 000 km (150,000 mi) or 12 months, whichever comes first
Coolant Conditioner	Change	Traditional coolants requiring Supplemental Coolant Additive (SCA) 80 000 km (50,000 mi) or 6 months
Valves/Injectors ***	Initial Adjust	240 000 km (150,000 mi) or 12 months, whichever comes first
Valves/Injectors ***	Adjust	500 000 km (300,000 mi) or 24 months, whichever comes first
Drive Belts (Normal or Heavy Duty)	Change	500 000 km (300,000 mi) or 36 months, whichever comes first
Drive Belts (Severe Duty)	Change	240 000 km (150,000 mi) or 12 months, whichever comes first
Accessory Drive Belt (Normal or Heavy Duty)	Change	500 000 km (300,000 mi) or 36 months, whichever comes first

ENGINE

Component	Operation	Km (Miles) / Maximum Months/Hours
Accessory Drive Belt (Severe Duty)	Change	240 000 km (150,000 mi) or 12 months, whichever comes first
Drive Belt Tensioner (Fan)	Change	500 000 km (300,000 mi) or 36 months, whichever comes first
Accessory Drive Belt Tensioner (Alternator)	Change	500 000 km (300,000 mi) or 36 months, whichever comes first
Aftertreatment Diesel Exhaust Fluid (DEF) Tank Flushing and Filler Neck Filter	Clean	240 000 km (150,000 mi) or 4,500 hours, whichever comes first
Aftertreatment Diesel Exhaust Fluid (DEF) Pump Filter**	Change	240 000 km (150,000 mi) or 4,500 hours, whichever comes first
Aftertreatment Diesel Particulate Filter (DPF) (Normal or Heavy Duty)	Clean	650 000 km (400,000 mi) or 10,000 hours, whichever comes first
Aftertreatment Diesel Particulate Filter (DPF) (Severe Duty)	Clean	400 000 km (250,000 mi) or 4,500 hours, whichever comes first
Aftertreatment Hydrocarbon Doser (If equipped)	Clean	240 000 km (150,000 mi) or 4,500 hours, whichever comes first
*Under certain conditions (for example, irregular fuel quality), the fuel/water separator filters may require more frequent replacement.		
**Under certain conditions (for example, dirt and dust) filters may require more frequent replacement.		
***Valves must be adjusted whenever the rocker shaft has been removed and reinstalled for any reason.		

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Engine Service, Volvo

Component	Operation		Economy Duty Greater than 7.5 mpg (miles per gallon)	Normal Duty Greater than 6 mpg (miles per gallon)	Heavy Duty Greater than 5 mpg (miles per gallon)	Severe Duty
+ Requires Connected Vehicle Maintenance and/or a Volvo Service Contract						
Volvo PREMIUM ENGINE OIL, OIL FILTERS, FUEL FILTERS (*Volvo premium oil VDS-5 / ** other approved VDS-5 oil) **Note:** Volvo cannot be responsible for problems caused by non-genuine filters that do not meet Volvo performance or durability requirements.						
D11 / D13 with 42L/44qt Oil Pan : Volvo VDS-5*, Oil Filters and Fuel Filters If idle time is greater than 30%, use the next lower drain interval. **Note:** Actual fuel filter service intervals may vary based on fuel quality and vehicle application.	Change	Miles	75,000*/55,000**	60,000* / 55,000**	45,000* / 40,000**	35,000* / 30,000**
		km	120,000*/90,000**	95,000* / 90,000**	70,000* / 65,000**	55,000* / 50,000**
		Hours	2,000*/1,600**	1,700* / 1,600**	1,400* / 1,300**	825* / 750**
MISCELLANEOUS						
Valve / Injector Adjustment	Adjust	Miles	Initial adjustment 150,000 / then every 300,000			
		km	Initial adjustment 240,000 / then every 500,000			
		Time	Initial adjustment 12 months / then every 24 months			

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ENGINE

Component	Operation		Economy Duty Greater than 7.5 mpg (miles per gallon)	Normal Duty Greater than 6 mpg (miles per gallon)	Heavy Duty Greater than 5 mpg (miles per gallon)	Severe Duty
Fan and Accessory Drive Belt and tensioners	Change	Miles	4,50,000	3,60,000	3,15,000	2,10,000
		km	7,24,000	5,79,000	5,06,000	3,37,000
		Time	36 months			12 months
Volvo Premium Air Filter and Fuel Tank Ventilation Filter	Change	Time	Inspect at each oil drain. At maximum restrictions as indicated on gauge, or 24 months			Inspect at each oil drain. At maximum restrictions as indicated on gauge, or 12 months
EXHAUST AFTERTREATMENT SYSTEM			Economy duty	Normal Duty	Heavy Duty	Severe Duty
DEF, Pump and Tank Filler Neck Filter Drain DEF tank, replace DEF pump main filter++, clean DEF tank neck filter	Clean	Miles	3,00,000	2,40,000	1,80,000	1,75,000
		km	4,82,000	3,86,000	2,89,000	2,80,000
		Hours	9,000	7,000	5,500	5,200
Diesel Particle Filter (DPF)	Clean	Miles	6,00,000	4,80,000	4,05,000	2,80,000
		km	9,65,000	7,72,000	6,50,000	4,50,000
		Hours	15,000	12,000	10,000	5,000
Under certain conditions (for example, dirt and dust) filters may require more frequent replacement.						
Valves must be adjusted whenever the rocker shaft has been removed and reinstalled for any reason.						

Filter summery to long to be displayed.

Engine Service, Volvo

Component	Operation	Km (Miles) / Maximum Months/Hours
Fuel Filter	Change	Each oil change*
Oil Filter	Change	Each oil change
Water Separator (Engine Mount)	Filter Change	Each oil change*
Fuel / Water Separator (Chassis Mount)	Change	Each oil change*
Fuel Tank Ventilation Filter	Change	At each primary air filter change**
Air Filter (Engine), Primary	Change	Low, Medium, Heavy, Severe duty POC; Every 24 months or when indicator lamp illuminates. Very Severe or Very Severe Plus POC; Every 12 months/4000 km (2485 miles) or when lamp indicator illuminates.
Air Filter (Engine), Secondary	Change	At every 3rd primary filter change or 36 months.
Coolant	Change	500 000 km (300,000 mi) or 48 months whichever comes first
Coolant Filter	Change	At every engine oil change.
Valves/Injectors ***	Initial Adjust	200 000 km (125,000 mi) or 24 months, whichever comes first
Valves/Injectors ***	Adjust	Heavy or Severe duty POC; 400 000 km (250,000 mi) or 24 months, whichever comes first. Very Severe or Very Severe Plus POC; 200 000 km (125,000 mi) or 12 months/4000 km (2485 miles), whichever comes first.
All multi-ribbed belts, tensionersand idler (fan), (Normal or Heavy Duty)	Change	300 000 km (187,000 mi) or 36 months, whichever comes first.
All multi-ribbed belts, tensionersand idler (fan), (Severe Duty and Very Severe Duty)	Change	300 000 km (187,000 mi) or 36 months/5000 km (3100 miles), whichever comes first.
All multi-ribbed belts, tensionersand idler (fan), (Very Severe Duty Plus)	Change	200 000 km (125,000 mi) or 36 months/3500 km (2200 miles), whichever comes first.
EGR Pipe (if applicable)	Clean	200 000 km (125,000 mi) or 24 months, whichever comes first.
Aftertreatment Diesel Exhaust Fluid (DEF) Tank Flushing and Filler Neck Filter	Clean	240 000 km (150,000 mi) or 4,500 hours, whichever comes first

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Filter summery to long to be displayed.

ENGINE

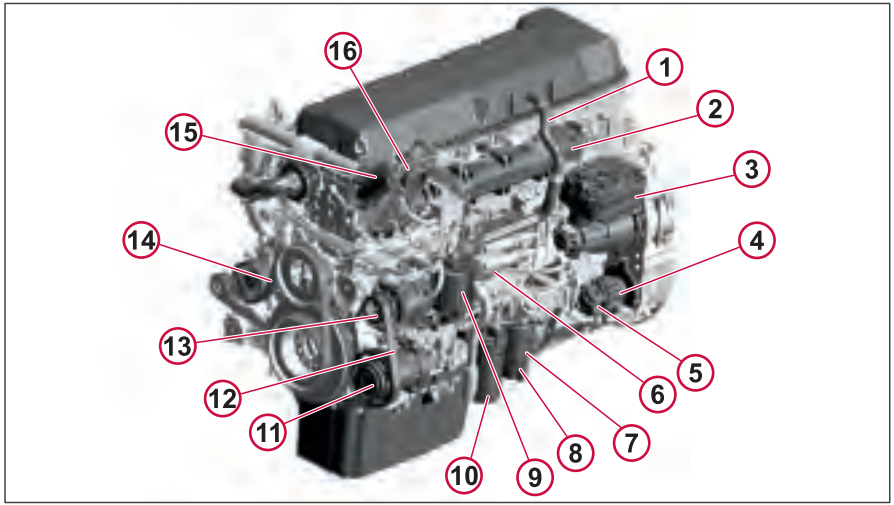
Component	Operation	Km (Miles) / Maximum Months/Hours
Aftertreatment Diesel Exhaust Fluid (DEF) Pump Filter**	Change	240 000 km (150,000 mi) or 4,500 hours, whichever comes first
Aftertreatment Hydrocarbon Doser (If equipped)	Clean	240 000 km (150,000 mi) or 4,500 hours, whichever comes first
*Under certain conditions (for example, irregular fuel quality), the filters may require more frequent replacement.		
**Under certain conditions (for example, dirt and dust) filters may require more frequent replacement.		
***Valves must be adjusted whenever the rocker shaft has been removed and reinstalled for any reason.		

NOTE

Do NOT use extended-life coolant in engines equipped with a coolant conditioner filter. A coolant filter that contains no supplemental coolant additives (SCA) is available for use when extended-life coolant is used.

Filter summery to long to be displayed.

Engine Overview, VE13 Left Side View

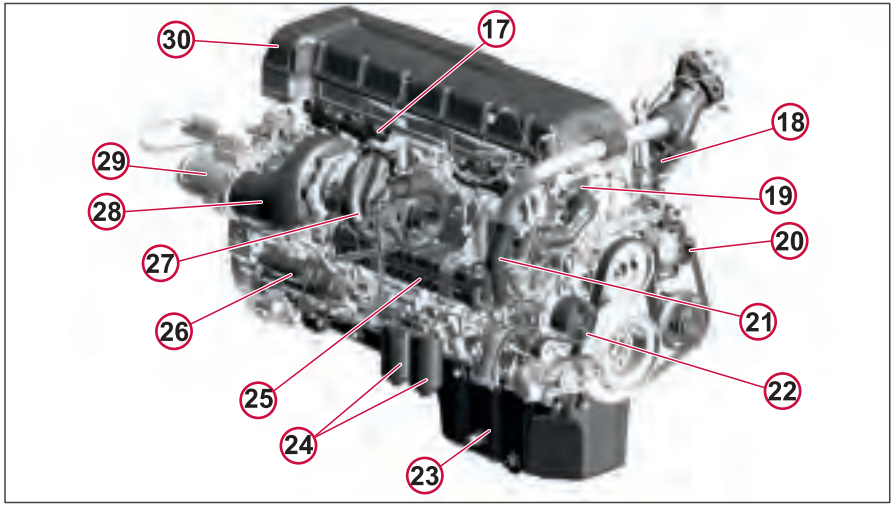


J481038

1 Breather Tube
2 Intake Manifold
3 Air Compressor
4 Power Steering Pump
5 Fuel Pump
6 Engine Control Module (ECM)
7 Fuel Filter
8 Fuel/Water Separator
9 Crankcase Ventilator
10 Fuel Filter
11 AC Compressor
12 Alternator/AC Compressor Belt
13 Alternator
14 Fan/Coolant Pump Belt
15 EGR Mixing Chamber
16 Inlet Throttle Valve

270346_1

Engine Overview, VE13 Right Side View



J481040

17 Exhaust Manifold
18 Intake Air Heater (IAH) optional
19 Thermostat
20 Belt Tensioner
21 Venturi Pipe
22 Coolant Pump
23 Oil Pan
24 Oil Filters
25 EGR Cooler
26 Starter Motor
27 Turbocharger
28 Turbo Compound
29 Closed Loop Butterfly
30 Valve Cover

270346_1

General
Keep the engine oil at the proper level and change it at the recommended intervals. Always replace the oil filters at the same time as when the oil is changed.

Oil Quality
Volvo recognizes engine oils that meet or exceed the standards given by the American Petroleum Institute (API) for the oil classifications listed in this manual. Only oils licensed to carry the API symbol should be used. Lubricants meeting API standards have provided maximum engine life when used together with the recommended oil and oil filter change intervals.

⚠ CAUTION

DO NOT add extra oil additives. Additives such as break-in oils, top oils, graphitizers and friction-reducing liquids are not necessary and can harm the engine.

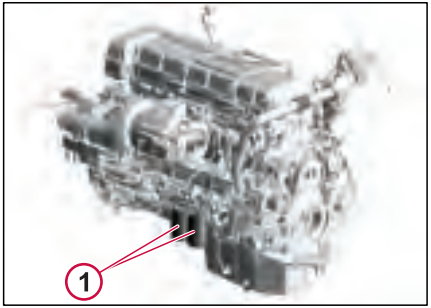
Oil Change Intervals
The length of time an engine can operate before an oil change depends on the quality of oil used, the type of fuel used, fuel consumption, engine oil consumption, vehicle application, level of dust in the air and fuel consumption. The change intervals given in this manual are maximum intervals. If the vehicle is operating in heavy-duty, dusty or off-road conditions more frequent oil changes should be scheduled.

For additional information about oil change intervals and approved oils, see a certified dealer.

Oil Filters
There are two full-flow filters on the engine. The filters should be changed at the same time.

⚠ CAUTION

Volvo branded oil filters are designed to provide the proper level of filtration and protection for Volvo engines. Filters that do not meet the same stringent requirements may void engine warranty.



J467714

1 Spin-Off Oil Filters

ⓘ NOTE

Oil filters should always be changed when changing oil.

Synthetic Lubrication
Synthetic oils are offered by some oil suppliers as an alternative to the traditional, petroleum-based oils for engines. These oils may be used in Volvo engines.

The use of synthetic oils does not permit the extension of the recommended oil change intervals. It is the contamination rate, i.e., soot, and the depletion of additives, rather than base oil quality that determines the useful engine oil life and therefore the oil change intervals.

Oil Additives

⚠ CAUTION

Extra oil additives must never be added to any engine oil used. Additives such as break-in oils, top oils, graphitizers, and friction reducing liquids are not necessary and may even harm the engine.

Using oils to the quality standards recommended in this manual makes the use of extra oil additives unnecessary, as these oils already contain a balanced treatment of additives.

ENGINE OIL

Oil Consumption

Once the engine is stopped, check the oil level daily. If the engine has just been stopped and it is warm, wait approximately five minutes to allow the oil to drain back to the oil pan before checking. Add oil as necessary.

> **NOTE**
>
> DO NOT overfill engine with oil.

All diesel engines are designed to consume some oil, so it is normal to add oil periodically. An engine used in heavy-duty operation will consume more oil than one in normal operation.

Oil Change

> **WARNING**
>
> A hot engine or engine oil can be dangerous. Serious burns can result from contact with a hot engine or oil. Take precautions when draining the oil. Wear gloves or let the engine cool down before draining.

> **WARNING**
>
> When draining the oil, use the proper tools and keep away as far as possible. Raise the elbow so the forearm is parallel to the ground to prevent oil running down the arm, causing burns.

> **CAUTION**
>
> Always dispose of all lubricants (motor oil, coolant, gear box oils, etc.) and filters according to Federal and local regulations. Used oil disposed of in nature or waterways contaminates our drinking water and kills wildlife.

> **CAUTION**
>
> Prolonged contact with used engine oil may be harmful. Use rubber gloves when handling used oil. Wash skin thoroughly if it comes in contact with used oil.

It is important to drain as much oil as possible. Try to change oil immediately after driving, when the oil is warm. Always replace the oil filters when changing oil.

Oil Filters Change

> **WARNING**
>
> Hot oil can cause severe burns. DO NOT allow hot oil to contact the skin. When changing oil, wear protective gloves.

> **CAUTION**
>
> Oil filters are designed to provide the proper level of filtration and protection for engines. Filters that do not meet the same stringent requirements may cause unsatisfactory results.

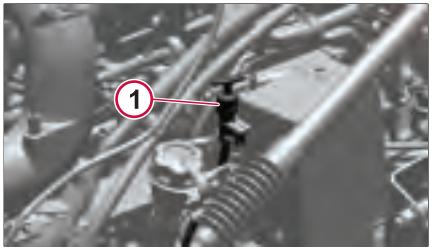
1. Coat the filter gasket with oil.
2. Install the filter and turn it by hand until the gasket makes contact with the sealing surface.
3. Manually turn the filter an additional 3/4 to one full turn.

Checking Oil Level

NOTE

DO NOT let the oil level fall below the marking on the dipstick. DO NOT overfill so the level is above the upper marking on the dipstick. This could lead to excessive oil temperature and/or poor crankcase breather performance.

Ensure that the vehicle is parked on level ground before checking the oil level. Wait five minutes after shutting off the engine, then proceed with checking oil.



J481016

1 Oil Dipstick

Notifications

If the engine oil level drops below the standard level, the "Attention: Engine Oil Level Low" warning will appear on the DID displays. Perform an oil level check at the next stop. Add oil as necessary.

J481018

If the engine oil pressure drops below the standard level, the "Check engine oil: Engine oil pressure low" warning will appear on the DID displays. Perform an engine oil check at the next stop.

J481039

If the critically low oil level and pressure are appears in the DID screen displays. Along with that, the Stop tell-tale displays in the instrument cluster. Stop the vehicle immediately. Service by a certified technician is required before the vehicle can return to service.

J481075

J481076

ENGINE OIL AND FILTER INTERVALS

Powertrain Operating Conditions (POC)

Transport cycle	Long distance driving							Distribution				Construction sites			
								Regional		City					
CMT	≤ 44		45 - 70		71-80		> 80	≤ 32	33–44	45–70	≤ 32	≤ 32	33–44	45–80	>80
Topography	PF	H	PF	H	PF	H	PF/H					H	H	H	VH
POC	L	M	H	S	S	VS	VS	M	H	S	S	H	S	VS	VS+

POC	L	M	H	S	VS	VS+
l/100 km (quarts/miles)	≤ 33 (35)	≤ 39 (41)	≤ 50 (53)	≤ 64 (68)	> 64 (68)	-
km/liters (miles/quarts)	≥ 3.0 (1.8)	≥ 2.5 (1.5)	≥ 2.0 (1.2)	≥ 1.5 (0.9)	≥ 0.8 (0.5)	-

[1] Typical vehicle configurations normally involved in Construction applications are sugar cane, tipper, dumper, swap carrier, concrete mixer or refuse bodies.
[2] If vehicle speed frequently exceeds 90 km/h (56 mph), move to the next higher POC classification.
[3] If the combined PTO (at zero vehicle speed) and idle time exceeds 25% of total operating time, move to the next higher POC classification.

Filter summery to long to be displayed.

D13 Engines with Volvo VDS 4.5 Premium Oil

Engine Operating Condition	Severe Duty	Heavy Duty	Normal Duty
Total Fuel Consumption (L/100 km)	>50	<50	<39
Total Fuel Consumption (mpg)	<5.0	>5.0	>6.0
Engine Oil and Filter Change Interval - 42 L (44 quarts) oil capacity	55 000 km (35,000 mi) 825 hours	70 000 km (45,000 mi) 1,300 hours	95 000 km (60,000 mi) 1,700 hours

D13 Engines with Volvo VDS 4.5 Approved Oil

Engine Operating Condition	Severe Duty	Heavy Duty	Normal Duty
Total Fuel Consumption (L/100 km)	>50	<50	<39
Total Fuel Consumption (mpg)	<5.0	>5.0	>6.0
Engine Oil and Filter Change Interval - 42 L (44 quarts) oil capacity	50 000 km (30,000 mi) 750 hours	65 000 km (40,000 mi) 1,200 hours	90 000 km (55,000 mi) 1,600 hours

NOTE

Using oils that meet API CJ-4, VDS-4 and EO-O Premium Plus quality standards is strongly recommended at all times.

NOTE

If idle time is greater than 30%, use the next lower change interval.

Filter summery to long to be displayed.

OIL CAPACITY AND VISCOSITY

NOTE

Use the information in the table below to determine the operating condition and usage applicable to your vehicle.

	Filter Volume	Pan Volume	Oil Change Fill
	Two Full Flow Oil Filter	Two Full Flow Oil Filter	Two Full Flow Oil Filter
13 L Plastic Oil Pan	31 liters (33 quarts)	37 liters (39 quarts)	35 liters (37 quarts)
13 L Steel Oil Pan (Corrosion Resistant)	31 liters (33 quarts)	33 liters (35 quarts)	35 liters (37 quarts)

NOTE

Check the dipstick and top-off as needed.

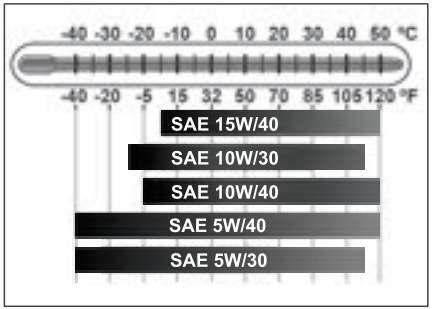
Filter summery to long to be displayed.

Oil Viscosity

The viscosity grade defines the thickness of the oil. The oil must be thin enough at low temperatures for easy cold starts and thick enough to protect at high temperatures. An oil is not fully defined until both the oil quality and the viscosity grade are specified.

Choose the viscosity grade for the typical ambient temperature for the application.Multigrade oils have a broad range that suit operation in changing temperature. The recommended engine oil weight for VDS 5 is 5W/30 and for VDS 4.5 is 10W/30.

The engine viscosities shown in the viscosity/temperature table is recommended.



J395351

ENGINE STORAGE

If the vehicle must be parked for a period (more than 30 days), protect it as follows:

1. Drain the engine oil.
2. Fill up to the proper level with oil of the recommended quality and viscosity.
3. Fill up the fuel tanks with the recommended grade of fuel.
4. Run the engine for two minutes around 1000 rpm. Shut the engine down. DO NOT drain the oil after this run.
5. Check the coolant for proper levels of antifreeze and inhibitor (SCA) protection. Service as necessary.
6. Seal all engine openings using protective covers.

To return to service an engine preserved in this manner, remove previously installed protective covers. Check all fluid levels and if necessary replace engine oil contaminated by condensation.

> **NOTE**
>
> For recomended intervals, refer to Engine Maintence Tables in the Engine section of this manual.

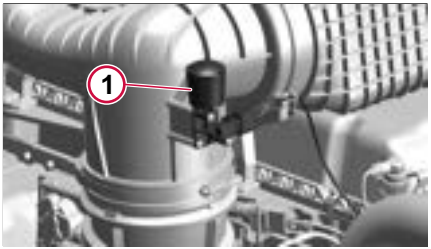
The air cleaner prevents dust, dirt and other harmful contaminants from entering the engine through the air intake system. Maximum engine protection can only be achieved through regularly scheduled maintenance practices that include periodic air intake system inspections and air filter element changes.

The most efficient method of determining air filter element change intervals is by regularly checking the air filter restriction gauge, which may either be mounted directly to the air cleaner canister, on the air cleaner outlet tube or inside the cab. The restriction gauge measures the amount of restriction in the air filter element. Some chassis may have a dash-mounted dial-type restriction gauge, which measures filter restriction in mm/inches of water. Also, change the air filter if the Air Filter Restricted Driver Information Display (DID) screen displays.

Change the air filter element in accordance with the procedures as outlined below.

Mounted Gauge Inlet Restriction Indication

Engine	Millimeters (Inches) Water/KPa
D13	510 mm (20)/5 kPa



J480966

1 Air Filter Restriction Gauge

J480876

Damage to the air filter element, such as holes in the filter media, will give an inaccurate restriction reading. Therefore, even if a maximum restriction is not indicated, the air filter element should be changed yearly or at recomended intervals, as described in this manual.

When replacing the air filter element, or whenever the air inlet system has been disassembled, inspect the inlet air ducts between the air cleaner canister outlet and the turbocharger inlet as follows:

- Inspect the rubber elbows for cracks, splitting and/or holes. Rubber components must be flexible so that they conform to the plastic ducts and ensure a tight seal.
- Inspect plastic ducts for cracks and/or holes.
- Ensure that all hose clamps are properly installed and tightened to specifications.
- Make sure the plastic ducts do not rub against any components such as air conditioning hoses, wire harnesses, etc.

Filter summery to long to be displayed.

ENGINE AIR FILTER

Filter Element Installation

1 Wipe the air cleaner housing clean.

2 Remove the filter element(s).

3 Inspect sealing areas for dirt tracks which would indicate that dust has leaked past the seal. If dirt tracks are found, the cause must be determined and corrected.

4 Thoroughly clean the inside of the air cleaner canister with a damp cloth or vacuum cleaner.

5 Inspect the sealing areas of the housing for damage. Repair or replace as necessary.

6 If equipped with a metal canister, inspect inside the canister for rust. If rust is present:

   1 Remove the air cleaner canister from the chassis.

   2 Remove all loose rust with a wire brush or a coarse Scotch Brite pad.

   3 Sand with 180/240 grit wet or dry sand paper.

   4 Thoroughly wash the area with PPG DX-440, DX-436, DX-437 wax and grease remover or equivalent, and wipe dry.

   5 Prime immediately with PPG DEP-351 epoxy primer.

   6 Reinstall the air cleaner canister.

7 Use Volvo-approved replacement elements and gaskets. Make sure that the new elements and gaskets are not damaged. Be sure to use new gaskets each time the element is changed. Install the cover and, depending upon cover configuration, tighten as follows:
• Air cleaner with large wing nut in center of cover; hand-tighten wing nut.
• Air cleaner with three thumb screws around outer edge of cover; hand-tighten thumb screws.
• Air cleaner with retaining nuts around outer edge of cover; tighten retaining nuts Max. 2.5 Nm (Max. 1.8 ft-lb).

NOTE

DO NOT attempt to clean the air filter element with compressed air, as this could damage the filter media and possibly result in severe engine damage.

⚠ DANGER

If oil leaks internally from the turbocharger to the engine intake, the oil acts as a fuel. Watch for excessive exhaust smoke. DO NOT operate engine until problem is corrected. There is no way to regulate the engine speed if it runs on oil and it may over speed. Loss of control of vehicle may lead to an accident causing severe personal injury or death.

⚠ WARNING

DO NOT remove, attach, or tighten turbocharger air intake ducting while the engine is operating, or operate the engine while the ducting is removed. Working around the turbocharger with the ducting removed may cause severe personal injury.

Visually inspect turbo mountings, intake and exhaust ducting and connections for leaks on a daily basis. Check oil inlet and outlet for leaks or signs of restrictions to oil flow. Check for unusual noise or vibration. If any faults are detected, do not operate the engine until the cause is determined and repaired.

Charge Air Cooler and Radiator Package Cleaning

⚠ WARNING

Always wear eye protection when cleaning radiator, charge-air cooler and condenser. Failure to follow this recommendation may result in eye injury.

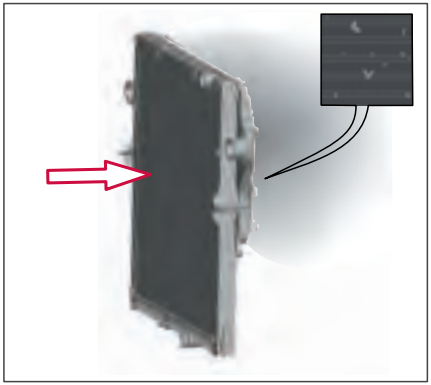
⚠ CAUTION

When using a pressure washer to clean the vehicle, do not direct the spray at electrical components in the engine compartment such as the alternator, starter and compressors. Water spray from pressure washers can damage electrical components.

Periodically inspect the front of the radiator/charge-air-cooler package. Over time, there may be a build-up of dirt, mud, insects, etc., between the radiator and charge air cooler.

Over time the reduced air flow reduces the heat transfer from the components to the air. This increases the load on the fan and air conditioning compressor and can result in engine overheating and other performance related problems, such as high fuel consumption. Inspect for build-up and contact your authorized Volvo Trucks dealer, if necessary.

The simplest method to clean the package is to use air pressure or a water stream. This should be done from the back of the core. Air pressure should not exceed 30 psi (200 kPa) for radiator and charge air cooler cores. The use of a fin comb is also a good tool to loosen bugs and dirt from the fins. If dirt cannot be cleaned off with this procedure, consult your Volvo Trucks dealer.



J481752

Inspect the charge air cooler for cracks at every inspection. DO NOT operate the vehicle with a damaged or broken charge air cooler. To do so would void the warranty and the engine will not meet emission regulation requirements.

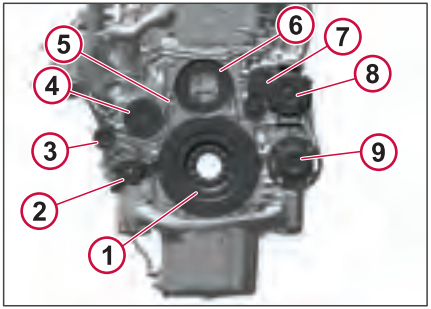
DRIVE BELT ROUTING

Drive Belt Installation

To install a poly V-belt, swing the automatic tensioner to the full sprung position (fully toward the install stop), then place the belt over the pulleys. Slowly return the automatic tensioner back to its original position. Do not allow the tensioner to snap against the stops. Before installing the new belt, ensure that the pulley grooves are clean and free of debris.

Accessory Drive Belt Routing

Accessory drive belt and main belt routing with and without air conditioning. This diagram is located in a clear area on the outside of the left frame between the radiator and center line of the front axle.



J468147

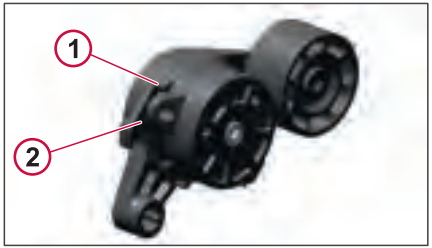
1 *Crankshaft Pulley*
2 *Belt Tensioner*
3 *Idler Pulley*
4 *Coolant Pump*
5 *Main Drive Belt*
6 *Fan Drive*
7 *Automatic Tensioner*
8 *Alternator*
9 *Air Conditioner Compressor*

Automatic Belt Tensioner

The automatic belt tensioner is designed to maintain proper belt tension throughout the life of the tensioner. The belt tensioner cannot be adjusted or repaired. When inspecting:

• With the belt on the drive, check the following:

Check to see if the tensioner is resting against the install stop or the free-arm stop. If the tensioner is resting against either stop, the tensioner must be replaced.

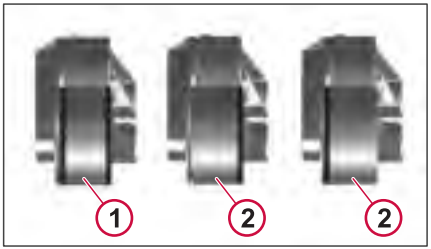


J468175

1 Install Stop

2 Free Arm Stop

On main drive belt tensioners, check belt tracking. If the belt is tracking all the way to one side of the tensioner pulley (either the front- or back-side), replace the tensioner. Belt tracking can be determined by looking at the witness mark (the shiny area on the pulley where the belt rides). The witness mark should be approximately the same width of the belt.



J303625

1 Acceptable (Witness Mark Approximately Same Width as Belt)

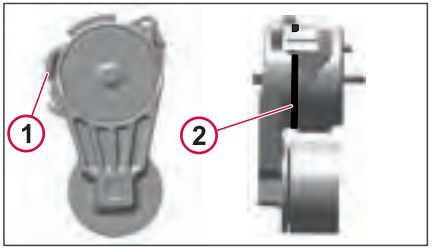
2 Not Acceptable (Witness Mark Tracking Off Edge of Pulley)

Remove the belt by using a 1/2 inch breaker bar to pull the tensioner back to the install stop. Slowly return the tensioner to the free-arm stop.

With the belt removed, use the breaker bar to slowly pull the tensioner from the free-arm stop to the install stop and then slowly releasing it back to the free-arm stop. Any excessive roughness or hesitancy noticed while performing this check indicates that the tensioner must be replaced.

Check for metal-to-metal contact as follows:

Check for contact between the arm and the spring case. Replace if metal-to-metal contact is seen.

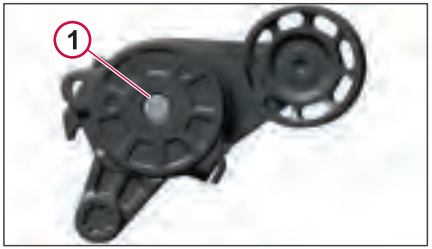


J468186

1 Free-Arm Stop Position

2 Contact between Arm and Spring Case Check.

Check for metal-to-metal contact between the arm and the end cap. Replace if contact is seen.



J468187

1 Contact between Arm and End Cap Check

DRIVE BELT REPLACEMENT INTERVALS

Check pulleys for debris, clean as needed.

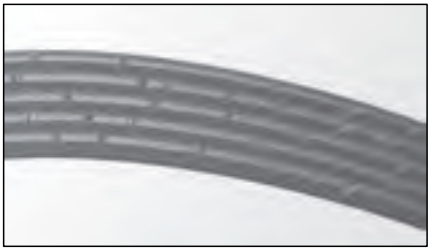
Rib Cracking

An in-service poly V-belt will go through several phases of cracking during its life. After an extended time in service, minor rib cracks may appear, usually one or two cracks per inch. This cracking is normal.

J304012

Belt With Minor Cracking

Belts should not be replaced unless the ribs exhibit severe multiple cracking as shown below. Multiple cracking will lead to rib chunking.



J304013

Belt With Multiple Cracking

J304014

Belt With Severe Cracking

Rib Sidewall Glazing

When the belt ribs appear to have a shiny surface that is hard and brittle, it is usually an indication of belt slippage. This is attributed to inadequate tension and/or extreme temperature. Both these conditions will lead to severe cracking and belt failure, often with little advance warning. If this occurs, locate the cause and correct before installing a new belt.

Belt Wear

Accelerated wear on any part of the belt (fabric backing, tensile cord or rib rubber) is a concern and should be investigated for cause, and corrected before installing a new belt.

Possible Causes of Accelerated Belt Wear

- Drive belt performance will be adversely affected when misalignment exceeds 1/16 inch for every 12 inches of belt span.
- Belt length must be correct.
- Environmental conditions, temperature, exposure to engine fluids, etc.
- Abrasive materials, small stones, metal shavings, etc.

Foreign Objects

Any object protruding in the path of the belt drive and contacting the belt will cause damage and eventual failure. Locate the object before installing a new belt.

Noise, Vibration and Harshness (NVH)

Poly V-belt drive systems were designed to prevent Noise, Vibration and Harshness (NVH) problems. Field problems, however, which may be related to NVH causes occasionally occur.

Possible Causes of (NVH)

Insufficient belt tension may create a high-pitched howl (squeal) or rasping sound during engine acceleration or deceleration.

Misalignment may cause a chirping noise, especially at, or near, idle speed. Rigid bracketing of accessories is a must for reasonably vibration-free belt spans. Some span vibration is to be expected during the range of engine speed and accessory loading.

⚠ WARNING

Failure to follow recommended application information and recommended procedures for installation, care maintenance and storage of belts may result in failure to perform properly and may result in damage to property and serious bodily injury. Make sure the belt selected for any application is recommended for that service

TRANSMISSION

⚠ DANGER

Before working on or inspecting a vehicle, set the parking brakes, place the transmission in neutral and chock the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

⚠ DANGER

Do not attempt to repair or service this vehicle without having sufficient training, the correct service literature and the proper tools. Failure to follow this could make your vehicle unsafe and lead to serious personal injury or death.

Transmission Oil

⚠ CAUTION

Never reuse drained I-Shift oil. The oil must be replaced along with the oil filter. Reusing drained oil can result in damage to transmission components.

⚠ CAUTION

Only use Volvo approved synthetic SAE 75W/90 gearbox oil (specification 97319) in the I-Shift transmission. Using non-approved oil can result in damage to transmission components.

⚠ CAUTION

Only use Volvo approved synthetic gearbox oil in the I-Shift transmission. Using non-approved oil can result in damage to transmission components.

Viscosity Grade

Viscosity is selected in accordance with the diagram below.

Temperature values refer to constant air temperatures.

For the transmissions fitted with transmission mounted oil cooler, high viscosity oils which comply with the grade requirements for transmission oil 97319 must be used.

Transmission Oil Type and Change Intervals

Transmission Oil Change Interval

Component	Operation		Economy Duty Greater than 7.5 mpg (miles per gallon)	Normal Duty Greater than 6 mpg (miles per gallon)	Heavy Duty Greater than 5 mpg (miles per gallon)	Severe Duty
+ Requires Connected Vehicle Maintenance and/or a Volvo Service Contract						
Volvo I-Shift, Volvo I-Shift Severe Duty*, and Volvo I-Shift with Crawler Gears*						
Transmission oil and filter (Replace) Oil quality: Volvo Transmission Oil 97319	Change	Miles	525,000	500,000	500,000	250,000*
		km	844,000	800,000	800,000	400,000*
		Time	60 months			2500 hours

NOTE

All oil types used for oil changes must meet Volvo approved specifications. To confirm these specifications contact a Volvo certified dealer.

NOTE

Transmission oil change intervals may be reduced if the vehicle operates with high Gross Combination Weights (GCWs).

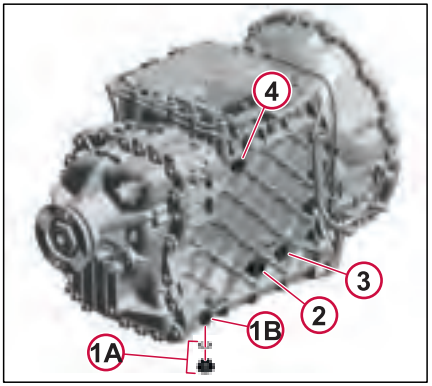
TRANSMISSION

Check Oil Level

NOTE

For transmissions with dipsticks, the proper level is between the cold ADD mark and the cold FULL mark.

Check the transmission oil level at each service interval. Park the vehicle on a level surface. Check the oil level through the sight glass on the side of the transmission. Add oil as necessary. Always use the correct Volvo approved synthetic oil.



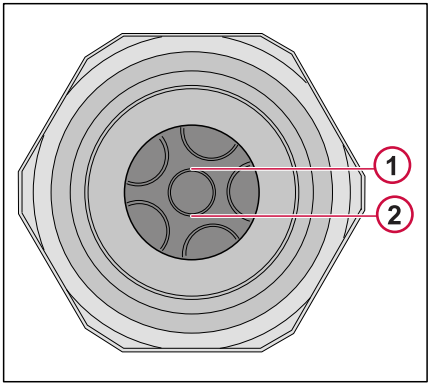
J481751

1 *Drain Plug (A and B)*

2 *Oil Level Inspection Glass*

3 *Oil Level Plug*

4 *Oil Filling Plug*



J414728

1 *Maximum Oil Level*

2 *Minimum Oil Level*

Oil Change

NOTE

Hot oil can cause burns. DO NOT allow hot oil to contact the skin. When changing oil, wear protective gloves.

CAUTION

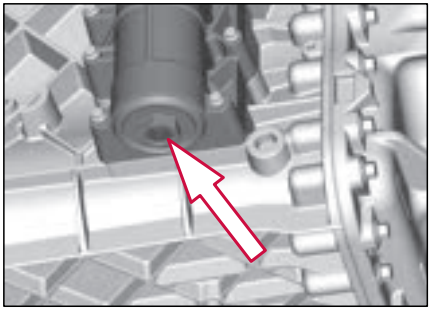
Always dispose of all lubricants (engine oil, coolant, transmission oil, etc.) and filters according to Federal or local regulations. Used oil disposed of in nature or waterways contaminates our drinking water and kills wildlife.

Change the seal (oil drain/fill plug) at every oil change. Tighten nut to 35 ± 5 Nm (25 ± 4 ft-lbs).

Change the oil filter at every oil change. Drain the oil filter housing before you remove the filter.

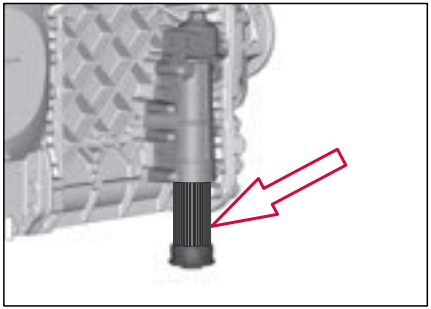
After replacing oil filter, install a new seal and lubricate seal at bottom of housing before installing. Tighten nut to 50 ± 5 Nm (37 ± 4 ft-lbs).

Two types of oil plugs exist; silver and brass. The type of plug indicates which oil type to use. A transmission with a silver plug requires 97315 or SAE 50 high viscosity oil. A transmission with a brass plug requires 97318 low viscosity oil.



J303599

Oil Filter Nut



J303600

Oil Filter Replacement

Batteries

⚠ WARNING

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

⚠ WARNING

Always wear eye protection when working around batteries to prevent the risk of injury due to contact with sulfuric acid or an explosion.

⚠ CAUTION

When using a pressure washer to clean the vehicle, do not direct the spray at electrical components in the engine compartment such as the alternator, starter and compressors. Water spray from pressure washers can damage electrical components.

The vehicle has either a flooded battery or an AGM (Absorbent Glass Mat) battery.

The flooded battery, also known as a wet cell battery, contains a liquid electrolyte solution of sulfuric acid and water, and the electrolyte freely moves within the cell. It requires periodic maintenance, including the addition of distilled water to compensate for water loss through electrolysis.

The AGM (Absorbent Glass Mat) has a fiberglass mat separator to absorb and hold the electrolyte close to the lead plates. It eliminates the need for a free electrolyte, making the battery maintenance-free, spill-proof and resistant to vibration. The battery has a maintenance-free battery does not require the addition of water for its normal expected life.

J303189

Battery Rating

Ensure the battery used meets the specified Cold Cranking Amperes (CCAs) for reliable cold weather starts. Even well-maintained batteries at -18°C (0 °F) may only provide 40% of their capacity at 27 °C (80 °F). Keep terminals clean to prevent corrosion.

In winter, fully charge the battery to avoid electrolyte freezing. A fully discharged battery can freeze at -5°C (23 °F) and sustain permanent damage. Prioritize monitoring the battery's condition and inspecting the charging and starting systems before cold weather.

Battery Condition

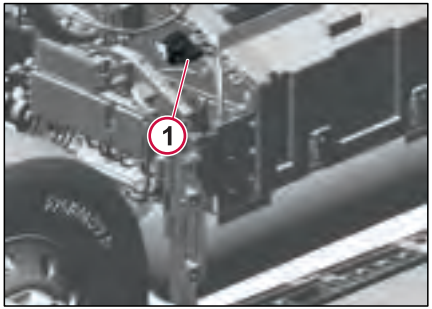
The first procedure when testing a battery is to check for external damage such as a cracked case, loose or corroded terminals, or signs of excessive gassing or overcharging.

A battery must be fully charged before a load test is performed. Test the flooded battery with a hydrometer to the level of charge.

Battery Saver Switch

The battery saver switch is located under the cab, above the top step, and behind the battery cover on the driver's side.

- Turn the battery saver switch to the Off position to prevent battery rundown when the truck is parked for an extended time. The battery saver switch can be locked in the Off position to prevent tampering.
- Turn battery saver switch to On position to operate the vehicle.



J467803

1 Battery Saver Switch

Electric and Electronic Systems

⚠ WARNING

Always wear eye protection when working around batteries to prevent the risk of injury due to contact with sulfuric acid or an explosion.

Check regularly around the engine and engine compartment for loose or frayed wires. Have all loose or frayed electrical wires and cables repaired before operating the vehicle.

Grounding Practices

Proper grounding is vital for vehicle and engine electrical systems. Improper grounding leads to unreliable performance, potential damage to engine components, and electrical noise affecting vehicle and radio performance. Ensure the engine-to-frame ground strap is installed tightly and free of corrosion to prevent damage.

⚠ DANGER

The engine uses high voltage to the electronic unit injectors. DO NOT come in contact with the unit injector terminals while the engine is running. An electric shock can cause an involuntary muscle spasm and cause loss of balance and falls leading to severe personal injury or death.

Electronic Engine Control System

Tampering with the electronic system installation can be dangerous and could result in personal injury or death and/or engine damage. It is very important to take the proper precautions with the electrical and electronic system when charging the batteries, jump-starting or performing electric welding on the vehicle.

This vehicle is equipped with monitoring features that may cause reduced power or shutdown under certain conditions. Monitoring and idling features can only be programmed and/or changed with electronic service tools and passwords.

Certain features, such as low oil pressure, high coolant temperature or low coolant level could cause the engine power and/or vehicle speed to be limited and the engine may also shut down.

ELECTRICAL SYSTEM

⚠ DANGER

Failure to take necessary action when the STOP tell-tale is on can ultimately result in automatic engine shutdown and loss of power steering assist. Vehicle crash can occur, resulting in personal injury or death.

Wiring Harness / Cable and Connector Protection

If corrosion is seen at any external ring-type terminal connections, such as those used at the starter, alternator, chassis and/or engine grounds, etc. Corrosion protectant must be applied to the connection after disconnecting, cleaning and reconnecting the ring terminal. Additionally, corrosion protectant should be applied to any ring-type terminal connector following any type of service procedure which involved disconnecting/ reconnecting the ring terminals (such as component replacement, troubleshooting, service and repair, etc.).

To help protect your vehicle's external high amperage electrical cables and connections from corrosion due to the effects of newer salts (calcium chloride and magnesium chloride) on the roadways, use an approved corrosion inhibitor.

Coat all high amperage (positive and ground) exposed electrical connections at a minimum of every 6 months or, whenever the connector has been disassembled. The following list contains the recommended connections that should be liberally coated with the corrosion inhibitor;

- Battery connections
- Battery main shut off switch connections
- Maxi and/or Mega fuse connections
- All ground stud connections
- Electrical pass-thru connections
- All alternator connections
- All starter connections
- Intake preheater and preheater relay connections
- Electrical power inverter connections

All connections should be cleaned and free of previously applied inhibitors, oil, dirt, dust or other contaminants prior to application. Allow time for the product to dry before use (drying time may vary depending temperature, humidity, etc.)

Charging

Charging should be conducted carefully under controlled conditions. Never charge a frozen battery. If a frozen battery is suspected, thaw it in a warm area for several hours before charging.

The following chart shows the normal charging times necessary to reach a full charge at 26 °C (80 °F). In colder temperatures, the necessary charging time may increase.

Battery Charging

Open Circuit Voltage	Battery Specific Gravity*	State of Charge	Charging Time to Full Charge at 80°F**					
			at 60 amps	at 50 amps	at 40 amps	at 30 amps	at 20 amps	at 10 amps
12.6	1.265	100%	Full Charge					
12.4	1.225	75%	15 min	20 min	27 min	35 min	48 min	90 min
12.2	1.190	50%	35 min	45 min	55 min	75 min	95 min	180 min
12.0	1.155	25%	50 min	65 min	85 min	115 min	145 min	280 min
11.8	1.120	0%	65 min	85 min	110 min	150 min	195 min	370 min
*Correct for temperature								
**If colder, it will take longer								

ELECTRICAL SYSTEM

Completely Discharged Batteries

When a battery is completely discharged or exposed to extremely cold temperatures, it may not initially show a charge due to the electrolyte being nearly pure water, which is a poor conductor. To charge a completely discharged battery, follow these steps:

1. Measure the voltage at the battery terminals. If it is below 10 volts, current will be very low and may not show up on many battery charger ammeters.
2. Set the charger on the high setting.
3. Some chargers have a polarity protection feature which prevents accidental reversal of the charger leads. A completely discharged battery will not have enough voltage to override this feature, making it appear that the battery will not accept a charge. Check the charger manufacturer's instructions on how to bypass this feature.
4. Once the battery starts to accept a charge, the charging rate will rise very rapidly. Carefully monitor the ammeter to prevent too-high a charging rate.
5. Proceed to charge battery at one-tenth of its rated capacity for one-half hour. Example: For battery rated at 64 (amps-hour), charge at 6.4 amp setting.

> **NOTE**
>
> Batteries with very low voltage (below 11.6 volts) or those that do not initially accept a charge are not necessarily defective. Batteries that have been discharged for long periods of time may be heavily sulfated or hydrated (containing lead shorts that cause the battery to self-discharge). To accept a charge, batteries with either of these conditions may require a longer charging time or a very high initial charge.

Use the following chart to determine the time required for the battery to begin accepting a measurable charge. (If the battery has not started to accept a charge after the specified time, it should be replaced.)

Charger Voltage	Hours
16.0 or more	Up to 4
14.0 to 15.9	Up to 8
13.9 or less	Up to 16

Load Test

A battery must be fully charged before performing a load test. To load-test a battery follow the manufacturer's written instructions.

Lighting

> **WARNING**
>
> Using incorrect bulbs or lamps may result in failures that could lead to a fire or a vehicle accident caused by improper lighting.

Check all lights on the vehicle daily for proper function. Replace burned out inserts and bulbs. Replace any broken or cracked side or rear reflectors.
Headlights should be checked for aim at least once per year.

Precautions When Installing Electrical Equipment

Connecting electrically powered or electrically controlled equipment to a vehicle may cause interference with other vehicle electrical or electronic equipment (such as ABS systems, Electronic Stability Program, etc.). The amount of interference depends upon the operating frequency of any new signals and the degree to which transient

signals are coupled to the vehicle system.

> **NOTE**
>
> Whenever new electrical equipment is installed, it is the obligation of the installer to ensure that the new equipment does not interfere with the proper operation of all other electrical systems on the vehicle.

If new electrical equipment is installed, a vehicle checkout procedure should be performed.

1. Perform the checkout procedure under the following conditions:
   - Engine running
   - Brake system air pressure in operating range
   - Vehicle stationary
   - Brake pedal fully depressed
2. Operate the new equipment under all starting, running and shutdown conditions.
3. Listen for signs of air exhausting from the ABS modulator valves (which is an indication of an interference condition).
4. Correct all interference conditions before operating the vehicle.

> **NOTE**
>
> The center pin of the standard seven-pin trailer electrical connector has been standardized as the dedicated connection for uninterrupted power for trailer ABS. This pin is always powered when the tractor ignition is turned on.

> **DANGER**
>
> Some trailers manufactured prior to the trailer ABS regulations may use the center pin to power certain trailer auxiliary equipment. The possibility exists that this auxiliary equipment may be unexpectedly activated by the truck or tractor electrical system, resulting in personal injury or damage to equipment. Caution must be used when connecting the trailer electrical connector to ensure that power to the center pin will not unintentionally activate any trailer auxiliary equipment.

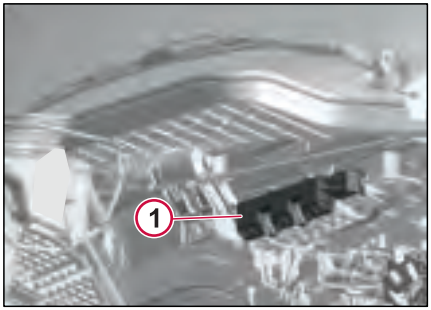
Fuses and Relays

The truck's fuses are designed to protect the electrical system's circuits from overload and are usually only tripped as a result of a short circuit. For this reason, if a fuse has blown you should always have an authorised Volvo workshop determine the cause.

> **WARNING**
>
> Always use fuses with the correct rating when changing. Never overfuse.
> Never install a fuse higher than the instructed rating.

External Fuse and Relay Center (EFRC)

This fuse panel (EFRC) is located under the hood toward the driver's side of the truck. The fuse and relay locations are etched into the inside cover.
Normally the fuses and relays last for the truck's entire service life without blowing. If a fuse does blow then the truck should be taken to an authorized Volvo workshop for inspection of the electrical system.



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1 External Fuse and Relay Center (EFRC)

ELECTRICAL SYSTEM

Fuses

No.	Rated current	Function
FE01	30 A	CCIOM
FE02	30 A	FCIOM
FE03	30 A	CCIOM
FE04	30 A	RCIOM
FE05	20 A	ACM (After Treatment System)
FE06	20 A	Extra Axle Steering
FE07	50 A	Integrated Parking Cooler
FE08	30 A	Body Builder Module
FE09	60 A	Spare
FE10	20 A	TRAILER ABS/EBS
FE11	40 A	Spare
FE12	15 A	EMS (Engine Management system)
FE13	10 A	EMS
FE14	20 A	Volvo Transmission ECU
FE15	30 A	Volvo ECM (Engine Control Module)
FE16	40 A	SPARE
FE17	10 A	EMS
FE18	15 A	EMS
FE19	15 A	Fuel Filter Heater Load
FE20	20 A	EATS (After Treatment System)
FE21	15 A	VEND Transmission ECU
FE22	40 A	SPARE
FE23	60 A	SPARE
FE24	20 A	SPARE

No.	Rated current	Function
FE25	20 A	SPARE
FE26	20 A	SPARE
FE28	30 A	SPARE
FE29	20 A	SPARE
FE30	10 A	SPARE FLOATING
FE31	20 A	SPARE FLOATING
FE32	SERVICE	
FE33	SERVICE	
FE34	SERVICE	
FE35	SERVICE	
FE36	SERVICE	
FE37	SERVICE	

Relays

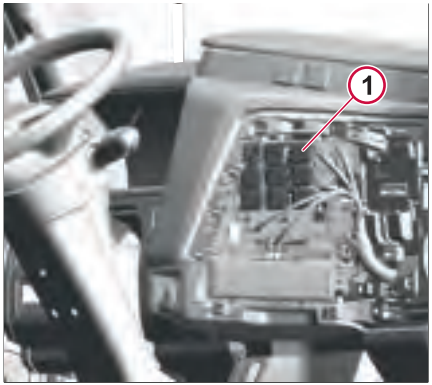
No.	Function
K40	ENGINE MANAGEMENT SYSTEM
K41	SPARE

Filter summery to long to be displayed.

ELECTRICAL SYSTEM

BBEC (Body Builder Electrical Centre)

To open the fuse and relay center access panel, which opens from the passenger side under the cover in the center of the instrument panel.



J481794

Fuses

No.	Rated current	Function
FBB01	15 A	Aux 1 PDC
FBB02	15 A	Aux 2 Bat
FBB03	5 A	Aux 3 bat
FBB04	5 A	Aux 4 (PDC:Ign)

Relays

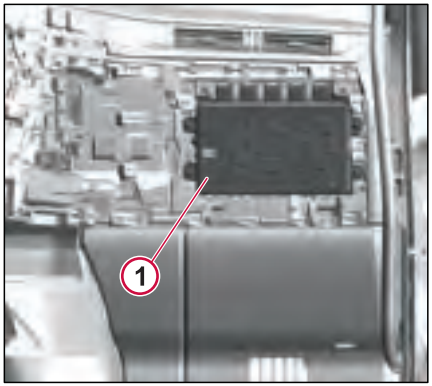
No.	Rated current	Function
KB06	15 A	Aux 4 (PDC:Ign)
KB07	15 A	Aux 5 (PDC:Ign)
KB08	5 A	Aux 6 switch up relay
KB09	5 A	Aux 6 switch down relay
KB10	40 A	Neutral relay
KB11	20 A	Park relay
KB12	20 A	Reverse ignition relay
KB13	20 A	RP170 8-pin cavity 5 relay 1
KB14	40 A	RP170 8-pin cavity 5 relay 2
KB15	20 A	24V ignition controlled through reverse circuit to pin 5 of RP170 power connector
KB16	10 A	24V ignition to reverse signal relay that provides reverse signal to pin 2 of RP170 function connector
KB17	20 A	Low beam lights
KB18	20 A	High beam lights
KB19	20 A	Low beam lights
KB20	20 A	High beam lights
KB22	20 A	Aux 5 (PDC:Ign)
KB23	20 A	Aux 6 switch up relay
KB24	20 A	Aux 6 switch down relay
KB05B	20 A	Aux 1 (PDC:Main)
KB11A	10 A	Neutral indicator
KB11B	10 A	Park lights
KBB15	10 A	RP170 31-pin cavity 25
KBB16	10 A	RP170 31-pin cavity 13
K90	20 A	Plough lamp relay 1
K91	20 A	Plough lamp relay 2
K92	20 A	Plough lamp relay 3

Fuses and Relays Center Instrument Panel

The truck's fuses and relays are located under the cover in the center of the instrument panel.

There are decals under the cover which show the location of fuses and relays and what they are used for.

The vehicle's normal exterior lighting is controlled by control units. These include control functions for each respective lighting circuit. Should a circuit be broken, due to overload or short circuit for example, then you will be notified with a message on the instrument cluster. The function is reset when the fault has been corrected.



J467890

1 Fuse and Relay Center

⚠ WARNING

Always use fuses with the correct rating when changing. Never overfuse.
Never install a fuse higher than the instructed rating.

ⓘ NOTE

Set the electrical component in the "OFF" position if possible, before changing the fuse. The fuse holder can be burned, if the voltage remains switched on.

ELECTRICAL SYSTEM

Fuses

No.	Rated current	Function
F01	30 A	BB Electrical Center Ignition Supply 1
F2	5 A	SPARE
F3	10 A	SPARE
F04	10 A	VEND Transmission PTO
F05	10 A	SPARE
F06	3 A	TASK LIGHT
F07	15 A	SEATS HTR
F08	20 A	WIPER
F09	30 A	Body Builder Module
F10	20 A	VMCU INTERNAL Connection - 1
F11	10 A	VMCU INTERNAL Connection - 2
F12	15 A	VMCU INTERNAL Connection - 3
F13	10 A	SPARE
F14	15 A	CAB PARKING HEATER
F15	20 A	BB Electrical Center Ignition Supply 2
F16	20 A	Body Builder Electrical Centre
F17	10 A	Body Builder Module
F17	30 A	AUX SWITCH 3 & 4
F18	20 A	SPARE
F19	5 A	TRANS Ignition
F20	5 A	Supplementary Restraint System
F21	30 A	SPARE
F22	15 A	SPARE
F23	20 A	AMPLIFIER

No.	Rated current	Function
F24	10 A	Security & Cab Interface Module
F25	20 A	HVAC BNK
F26	15 A	MIRROR HEATER Supply - 1
F27	15 A	MIRROR HEATER Supply - 2
F28	5 A	SPARE
F29	3 A	Tachograph
F30	15 A	Integrated Parking Cooler
F31	10 A	SPARE
F32	20 A	SPARE
F33	20 A	Passenger Door Module
F34	20 A	Driver Door Module
F35	20 A	EL3
F36	5 A	BEACON WRN
F37	10 A	SPARE
F38	30 A	SPARE
F39	30 A	ENG-RUN SPARE
F40	30 A	COFFEE MAKER
F41	10 A	SPARE
F42	10 A	Camera Monitor System
F43	5 A	Driver Assistance Control Unit
F44	3 A	Secondary Information Display
F45	5 A	SPARE
F46	3 A	SPARE
F47	5 A	SPARE
F48	3 A	SPARE

ELECTRICAL SYSTEM

No.	Rated current	Function
F49	5 A	INSTRUMENT CLUSTER
F50	3 A	Tachograph
F51	3 A	Driver-Environment Control Module
F52	3 A	Telematics Extended Service Platform
F53	5 A	SPARE
F54	15 A	SPARE - SEAT-MTR
F55	40 A	SPARE
F56	10 A	SPARE
F57	15 A	SPARE
F58	5 A	VISION CAMERA
F59	10 A	SPARE
F60	15 A	Cigarette Lighter
F61	15 A	SPARE
F62	20 A	SPARE
F63	5 A	SPARE
F64	20 A	SPARE
F65	3 A	SPARE
F66	10 A	REFG
F67	20 A	SPARE
F68	5 A	FAN
F69	5 A	USB PLUG
F70	5 A	VEND Engine
F71	10 A	SPARE
F72	5 A	Venerable Reducer Unit
F73	10 A	SPARE

No.	Rated current	Function
F74	15 A	REVRSE SIDE
F75	15 A	SPARE
F76	15 A	SPARE
F77	15 A	SPARE
F78	20 A	SPARE
F79	10 A	WND SCRN HEATER
F80	20 A	Climate Control Module
F81	15 A	Body Builder Module
F82	15 A	SPARE
F83	5 A	Living Environment Control Module
F84	40 A	Body Builder Electrical Centre

Relays

No.	Rated Current	Function
K01	40 A	Cab/body working lamp EL3 relay
K02	10 A	Refrigerator relay
K05	20 A	Front wiper On/Off relay
K06	20 A	Front wiper Low/High relay
K07	40 A	Power supply 2 relay
K08	40 A	Accessories relay
K09	40 A	Engine running relay
K10	10 A	Vision camera relay
K11	40 A	Power supply 4 relay
K12	10 A	SPARE
K13	40 A	Side reverse working lamp EL2 relay
K14	40 A	SPARE

ELECTRICAL SYSTEM

No.	Rated Current	Function
K16	20 A	Mirror heating relay
K17	20 A	Windscreen heater relay
K20	40 A	BB ignition relay
K21	10 A	Seat movement spare relay
K22	40 A	Ignition relay
K23	40 A	SPARE
K27	40 A	Beacon warning lamps relay
K101	10 A	SPARE
K102	10 A	SPARE
K103	10 A	SPARE

External Relays

No.	Function
ER1	OPEN
ER2	OPEN
ER3	OPEN
ER4	OPEN
ER5	OPEN
ER6	OPEN
ER7	OPEN
ER8	OPEN
ER9	OPEN

No.	Function
F87	BAT1
F32	CUSTOMER IGN1
F63	CUSTOMER IGN2
F23	CUSTOMER IGN3

Expansion

No.	Function
F28	CUSTOMER LVD1
F10	CUSTOMER LVD2

⚠ DANGER

Coolant is toxic; risk of poisoning. DO NOT drink coolant. Use proper hand protection when handling. Keep coolant out of reach of children and animals. Failure to follow these precautions can cause serious illness or death.

⚠ WARNING

DO NOT raise the engine hood if you see or hear steam or coolant escaping from the engine compartment. Wait until steam or coolant cannot be seen or heard before raising the hood.
DO NOT remove the coolant fill cap if the coolant in the surge tank is boiling. Also, DO NOT remove the cap while the engine and radiator are still hot. Scalding fluid and steam may be blown out under pressure if the cap is taken off too soon and can cause personal injury.

⚠ WARNING

Coolant may be combustible. Coolant leaked or spilled onto hot surfaces or electrical components can cause a fire. Clean up coolant spills immediately.

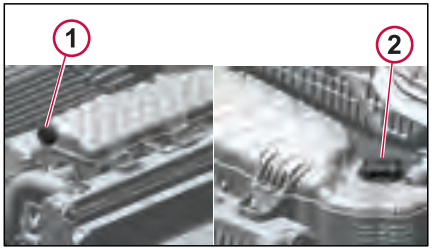
⚠ CAUTION

Using plain water in the cooling system is not recommended by Volvo. Water alone is corrosive, lacks sufficient boiling protection, and can lead to corrosion, cavitation, and reduced boiling point in the engine and radiator. Failure to follow Volvo's cooling system care/maintenance recommendations can void the warranty.

The cooling system maintains optimal engine temperature for efficient combustion and prevents overheating. Regular maintenance and monitoring prevent engine damage. Follow specified intervals for best performance.

Surge Tank Cap

The surge tank cap on your vehicle is mounted on top of the radiator. The surge tank has a fill cap located on the top right-hand side of the tank, and a pressure cap rated at 16 lb. which incorporates an overflow tube located on the left-hand side of the tank. Check the coolant level regularly, making sure the coolant level is between the COLD MIN and COLD MAX lines on the back of the tank. Inspect the rubber gaskets on each of the caps. Replace the cap(s) if the gaskets show evidence of damage which could affect sealing.



J468324

1 Pressure Cap

2 Fill Cap

Coolant Level

J483872

1 Cold Minimum Line

2 Cold Maximum Line

COOLING SYSTEM

⚠ WARNING

DO NOT remove the fill cap while the cooling system is hot. Allow the system to cool sufficiently before removing. Turn the fill cap slowly counterclockwise and wait for the pressure in the system to dissipate. After the pressure has dissipated, completely remove the cap.

The Coolant main purpose is to prevent pitting, cavitation, erosion damage, Scale, sludge, clogging and damage to engine parts, while being compatible with cooling system materials and maintain effectiveness in cold climates.

(!) NOTE

Always dispose of coolant according to Federal and local regulations. Take all used coolant to a recycling or waste collection center.

Coolant mixture consisting of an antifreeze solution in water should be used year-round to provide freeze and boil-over protection.

(!) NOTE

DO NOT use antifreeze formulated for automobile gasoline engines. These have a very high silicate content that will clog the radiator and leave unwanted deposits in the engine.

Coolant System Capacities

⚠ CAUTION

Capacities may vary due to hoses and size of radiator, as well as accessory cooling equipment. After running the engine until normal operating temperature is reached, check the coolant level and add coolant as needed.

Use the chart shown in conjunction with the Ethylene-Glycol and Propylene-Glycol Protection Charts in this section to determine the amount of antifreeze needed to protect your vehicle.

Coolant Capacity

Chassis Model	Engine Model	Coolant Capacity in Liters (Quarts)
VN	D13*	54 (57)
*Coolant capacities listed are for chassis equipped with manual transmissions. For automatic transmissions, add 9.5 liters (10 qts.)		

Use the following antifreeze protection charts to determine the percentage of antifreeze needed to achieve specific protection levels for various coolant systems.

Ethylene-Glycol Protection Chart

Ethylene Glycol	Ambient Air Temperature
40%	-24ºC (-12ºF)
50%	-37ºC (-34ºF)
60%	-52ºC (-62ºF)

Propylene-Glycol Protection Chart

Propylene-Glycol	Ambient Air Temperature
40%	-21ºC (-6ºF)
50%	-33°C (-27°F)
60%	-49°C (-56°F)

A well-functioning and maintained cooling system is as important to the engine as performing regular oil changes or using good fuel. To get the best result

use quality products and service the system at the correct intervals. Please read this section carefully.

Keep the radiator (including charge air cooler) and the frontal area free from bugs, dirt, leaves, etc.

Check the coolant level in the tank regularly. Fill the tank as necessary with the correct coolant.

Inspection of the whole cooling system is important. Check for swollen or deteriorated heater and radiator hoses, loose hose clamps and connections, and coolant leaks.

⚠ DANGER

DO NOT work near the fan with the engine running. The engine fan can engage at any time without warning. Anyone near the fan when it turns on could be seriously injured. Before turning on the ignition, be sure that no one is near the fan.

⚠ CAUTION

Never add coolant to a hot or overheated engine. Engine damage can result. Allow the engine to cool first.

Additives

Additives prevent rust, scale, deposits, corrosion, cavitation, and foaming. Replenish them as needed for non-extended life coolant with SCA, and halfway through coolant lifetime for extended life coolant with extender package.

Regular Coolant Change Interval

Coolant SCA level must be tested at least twice per year or whenever coolant loss occurs. For maximum coolant system efficiency, test the system at every engine oil change interval, every 1,000 hours or every 6 months (whichever comes first).

COOLING SYSTEM

Regular Coolant Change Interval

Component	Operation		Economy Duty Greater than 7.5 mpg (miles per gallon)	Normal Duty Greater than 6 mpg (miles per gallon)	Heavy Duty Greater than 5 mpg (miles per gallon)	Severe Duty Less than 5 mpg (miles per gallon)
+ Requires Connected Vehicle Maintenance and/or a Volvo Service Contract						
VOLVO PREMIUM EXTENDED-LIFE COOLANT						
Volvo Premium Extended-Life Coolant (Replace)	Change	Miles	750,000			
		km	1200,000			
		Time	96 months			
Volvo Premium Extended-Life Coolant Filter (Replace)	Change	Miles	150,000			
		km	240,000			
		Time	12 months			

⚠ WARNING

Hot engine. Keep clear of all hot engine parts and fluids. A hot engine and fluids can cause serious burns.

Regular Coolant Filter Change Intervals

The charged coolant filter contains 8 units of SCA that are released slowly over time to maintain the recommended level during operation. Consult engine service manual for proper SCA level and change intervals.

⚠ CAUTION

Extended life coolant will test as out of additives (SCA), but SCA should not be added. Shortened engine life may be the result of adding SCA.

ⓘ NOTE

DO NOT add supplement coolant additives (SCA) to extended life coolant.

Should the extended life coolant system become contaminated with regular coolant exceeding 10% of the systems total capacity or if SCA is added to extended life coolant, drain the system and refill with new extended life coolant or regular coolant.

⚠ CAUTION

DO NOT use a filter that contains SCA. Damage to components can result.

FUEL SYSTEM

⚠ DANGER

A diesel engine will operate on any fuel, which enters the cylinder, whether it is from the injectors or from the air intake system. Therefore, if any solvent is used to clean out the air cleaner element, the engine may over speed during start-up. Engine damage, severe personal injury or death from burns or explosion may occur.

⚠ DANGER

DO NOT mix gasoline or alcohol with diesel oil fuel. This mixture can cause an explosion and result in severe personal injury or death.

⚠ DANGER

DO NOT remove the fuel tank cap near an open flame. Diesel fumes are combustible and can cause an explosion or fire resulting in severe personal injury or death.

⚠ WARNING

If a fuel leak is detected, stop the engine immediately. The vapors from hot fuel are highly flammable which may result in a fire.

⚠ WARNING

DO NOT store fuel containers in the vehicle. They may leak, explode and cause or feed a fire. Empty or full, they present a hazard that may lead to burns in the event of a fire.

Diesel Fuel Specification

⚠ CAUTION

Diesel engines designed for 2007 and later model year vehicles should only be operated with Ultra Low Sulfur Diesel (ULSD) fuel. The use of fuel other than ULSD can reduce engine efficiency and durability, damage emission control systems, reduce fuel economy, and may void warranties.

Quality

The proper selection of fuel is essential for good economy, performance and engine life. No. 2D ULSD should be used when climatic conditions permit. No. 1D ULSD can be used during cold weather conditions. Blends of No. 1D and No. 2D ULSD fuels can be used to suit various climatic conditions.

ⓘ NOTE

The use of lighter fuels (grade No. 1-D) can reduce fuel economy

Fuel Sulfur Content

Fuel sold for use in diesel-powered engines may only contain a maximum sulfur content of 0.0015% by weight. This was done to reduce particle emissions in the exhaust

ⓘ NOTE

The use of ultra-low sulfur diesel fuel does not permit extension of engine oil change intervals or oil filter changes.

Cetane Number

Direct injected diesel engines require a minimum cetane number of 43 under normal starting conditions. Fuel with a higher cetane value may be required for high-altitude or cold-weather operation.

Filtration

Fuel should be clean and free of contamination. Clean fuels should have no more than 0.05% of sediment and water.

Fuel Additives

Fuel additives are generally not recommended or needed for fuels listed earlier. Cetane improvers can be used as necessary. Biocides may be needed to eliminate microorganism growth in storage tanks. In cold conditions,

treatment for water in the vehicle tanks may also be necessary.

Consult your fuel supplier about the use of additives to prevent incompatibility among additives already in the fuel and the additives to be used.

Supplemental Fuel Enhancers

There are many aftermarket products available today which are intended to be added by the customer. They generally increase operating cost without providing benefits. Included are a variety of independently marketed products which claim to be:

- Cetane improvers
- Emission control additives
- Detergents
- Combustion improvers
- Smoke suppressants
- Cold weather flow improvers

⚠ CAUTION

Supplemental additives are not recommended because of a high risk of injection system problems or engine damage.

(!) NOTE

Repair expenses resulting from malfunctions in the fuel system or with engine components when fuel enhancers have been used are not covered under warranty.

Some fuel additives may be used temporarily, but they do not replace good fuel handling practices. These products can be used:

- Isopropyl Alcohol Use 1/2 liter per 450 liters (1 pint per 125 gallons) of fuel for winter freeze-up protection.
- Biocide For treatment of microbe growth or black slime. Follow manufacturers instruction for treatment.

Prohibited Additives

Do not mix gasoline or used lubricating oil with diesel fuel as it can reduce performance, increase combustion temperature, and cause corrosion in the injection system.

Alternative Fuels

Do not use alternative fuels unless authorized by Volvo, as they may cause emissions issues and make the vehicle illegal for road use.

Fuel Storage

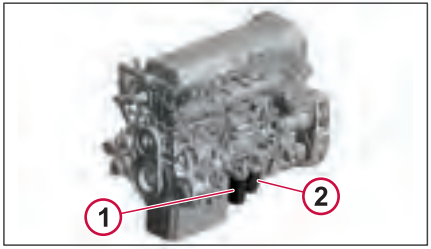
For on-site fuel storage, ensure that the tank is covered, avoid galvanized metal tanks or piping, prevent fuel oxidation, keep the cap area clean, and prioritize fuel quality and cleanliness to prevent contamination issues.

Fuel Filters

A primary fuel filter can be located on the engine or remote mounted on the frame rail. This filter consists of a filter cartridge, a water separation bowl and may have a fuel heater built in.

The secondary fuel filter is located on the cold side of the engine, below the engine electronic control unit (EECU). The filter is a spin-on filter.

Volvo engines utilize a spin-on primary and secondary fuel filter. Both filters are located on the cold side of the engine



J482020

1 Secondary Fuel Filter

2 Primary Fuel Filter

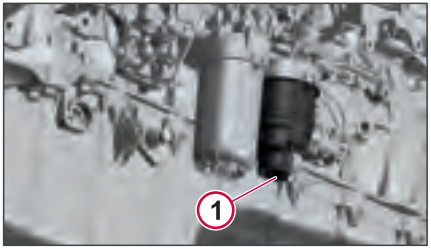
The primary fuel filter on Volvo engines incorporates a plastic water separator

bowl. Additionally, the plastic bowl includes a water-in-fuel sensor. A warning lamp on the instrument panel illuminates when water is detected in the fuel.

> **NOTE**
>
> There are optional fuel filter systems (such as Davco, Conmet, etc.) available for Volvo engines. These fuel filter systems use a single remote-mounted filter, eliminating the spin-on primary and secondary filters. For service information concerning these filters, refer to the specific fuel filter manufacturers service literature.

Fuel / Water Separator (Engine Mounted)

A warning lamp on the instrument panel illuminates when water is detected in the fuel. When the lamp illuminates, drain the water from the separator by opening the drain valve and allowing the water to drain from the bowl into a suitable container. When fuel begins to drain, close the valve and tighten to 0.655 Nm (5 in-lb). Dispose of the drained water/ fuel in an environmentally safe manner.



J482024

1 Water Separator Drain Valve

> **NOTE**
>
> DO NOT drain the water separator bowl while the engine is running.

> **NOTE**
>
> Drain the filter water trap daily. Change the fuel filters at every oil change.

> **NOTE**
>
> DO NOT drain the water separator bowl while the engine is running.

> **NOTE**
>
> Drain the filter water trap daily. Change the fuel / water separator filter at every oil change or when the fuel reaches the top of the filter.

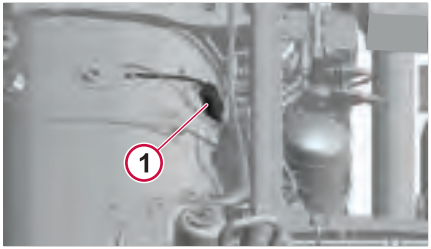
Fuel Tank Ventilation Filter

Some vehicles are equipped with a fuel tank ventilation filter. The purpose of this component is to filter out contaminants that can enter the fuel tank from the vent lines.

This filter should be replaced in conjunction with the vehicle air filter, when indicated by the air restriction gauge or the air filter restrictor indicator light in the instrument cluster.

The maximum time allowed before replacement is 24 months.

For non-severe environments a vehicle will have a frame-rail mounted filter.



J482025

1 Frame Rail Mounted Filter

For extremely dusty applications the fuel tank ventilation filter is added to the fuel tank vent pipes and mounted on the stanchion exhaust bracket at the right side of the truck. For both single or dual-

Filter summery to long to be displayed.

tank applications, the vent pipes will run from the tank vent fittings to the fuel tank ventilation filter.

AIR TANKS

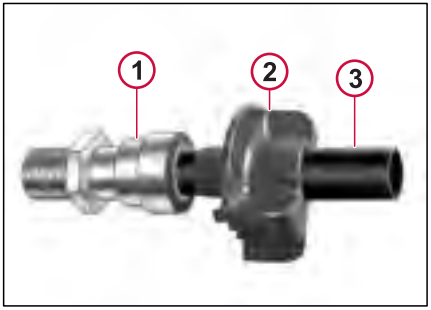
Air Line Release Tools

The Air Line release tools, used to remove the air lines from the push-in coupling, are located in the cab of the vehicle.

The following sizes are included in the kit:

- 1/4"
- 3/8"
- 1/2"
- 5/8"
- 3/4"

J357406



J357410

1 Push-In Coupling

2 Air Line Release Tool

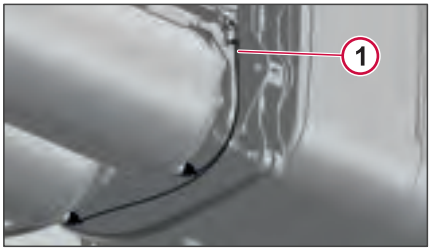
3 Air Line

Air Tanks

All air tanks on the vehicle should be drained daily. Empty any moisture from the air tanks by pulling the drain valve wire or by opening the drain cocks and allowing the air pressure to drain completely. Make sure the drain cocks close properly after draining. During draining the tanks should be checked for condensation fluid even if an automatic drain valve is installed.

⚠ WARNING

When draining the air tanks, do not look into the area of the draining air. Dirt or sludge particles may be in the air stream and could cause eye injury.



J482026

1 Air Tank Drain Valve Wire

Charging Air to Another Vehicle

There are many methods used to charge the air system of another vehicle. Vehicles equipped with the standard two-valve system (trailer supply and parking brake) must use the following procedure when using the emergency trailer air line as an auxiliary air source, other than to charge the trailer air reservoirs.

1. Connect the emergency trailer air line to the auxiliary source.
2. Start the engine to build air pressure.
3. Connect the two vehicles trailer supply air lines together.
4. With assistance, release the trailer park brake valves on each vehicle. (The valve may need to be held in manually).
5. Charge the air system.

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Tires

⚠ DANGER

DO NOT attempt to repair wheels or tires unless you are trained and equipped to do so. Wheel and tire assemblies cannot be worked on without proper tools and equipment. Failure to follow this may lead to serious personal injury or death.

⚠ DANGER

DO NOT install regrooved, retreaded or repaired tires on the steering axle(s). They could fail unexpectedly and cause the loss of vehicle control, leading to serious personal injury or death.

⚠ DANGER

DO NOT use mismatched tires on the same axle. Always use the same type (radial or bias ply) or size. Mixing tires on the same axle will affect the roadholding and can lead to an accident, and serious personal injury or death.

⚠ DANGER

Tires used on multipiece rims must be assembled and inflated only by experienced, qualified personnel. Tires must be inflated in a safety cage whenever possible. If, however, a safety cage is not available, use a portable lock-ring guard. The tire must be deflated prior to removal of the tire-and-rim assembly from the vehicle. Remove the valve core to ensure complete deflation.

⚠ DANGER

NEVER position your body in front of the rim during inflation.

⚠ DANGER

DO NOT install tires with a load rating that is less than stated on the Certification Label in the door frame. The tire could be unintentionally overloaded, leading to an accident, causing serious personal injury or death.

⚠ WARNING

UNDER NO CIRCUMSTANCES should you drive on underinflated or overloaded tires. A tire in this condition builds up excessive heat which can result in sudden tire destruction, property damage and personal injury.

⚠ CAUTION

NEVER use water-based sealants, puncture proofing, or liquid balance materials containing water in All-Steel Radial Ply truck tires.

⚠ CAUTION

Never bleed air from your tires in an attempt to gain traction for a vehicle stuck in snow, ice or mud. This practice provides no additional traction and typically results in under inflated tires. Never bleed air from a hot tire since that tire will then be under inflated.

Inflation Pressure

Ensure correct tire inflation pressure for optimal mileage and performance. Check tire pressure daily while tires are cold using an accurate gauge. Refer to tire manufacturer's information or vehicle certification label for recommended inflation pressures.

Adjust tire pressure for temperature fluctuations in winter weather by checking daily when tires are cold.

Inspection

Check tires daily for bulges, cracks, cuts, penetrations, oil contamination, and uneven wear. Have a qualified mechanic inspect and replace any damaged tires or components.

TIRES, WHEELS AND HUB

Tire Manufacturer Information

Obtain detailed information from each tire manufacturer's documentation regarding high speed and low speed ratings, repair, retreading, regrooving, use of tire chains, and tire mounting/ dismounting.

Oil Contamination of Tires

Prevent tire damage from oil contamination by regularly inspecting axle end seals, engine seals, transmission seals, drive axle seals, oil filters, and oil/hydraulic lines. Ensure preventive maintenance to prevent oil leakage. Refer to tire manufacturer's books or vehicle certification label for more tire care information.

Wheels

⚠ DANGER

DO NOT use oil or grease on studs or nuts. The tightening torque is affected and can lead to incorrect clamping loads between the rim and hub. This could lead to a loss of the wheel. Loss of vehicle control and serious personal injury or death can occur.

⚠ DANGER

Before checking the wheels, set the parking brakes, place the transmission in neutral and chock the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

⚠ DANGER

DO NOT use mismatched wheel components. If they do not exactly match the original design specifications, they may cause failure or separation leading to blowout and an accident and personal injury or death.

⚠ DANGER

Wheels must be serviced only by a qualified technician. DO NOT do this work yourself. Inflated tires on wheels contain compressed air and if suddenly released, do so with an explosive force, resulting in serious personal injury or death.

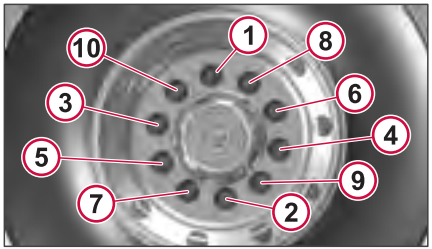
Check wheels for signs of rust streaks around the wheel nuts. This indicates looseness (steel rims). Inspect all types of rims for cracks. Cracks can appear in many places but typically radiate out from where a load is applied. Inspect closely around wheelnuts, handholes and inside circumference.

Wheel Nut Tightening

After the initial tightening, retightening must be made within the first 800 Km (500 miles). After the first retightening, only normal inspection of nut tightness is needed. Check front and rear wheel nut tightness with a torque wrench. All disc wheels for Volvo vehicles have a tightening torque of 610 Nm (450 lb-ft). Tighten the nuts in the correct sequence. Inspect bolts and nuts for signs of wear or cracks. Make sure that the bolts are not bent. This tightening check is particularly important when rims or brake drums are newly painted. Paint can flake off from these surfaces, causing the nuts to lose their grip and the wheel to loosen.

⚠ DANGER

Failure to properly torque-tighten the wheel nuts can result in the breakage of wheel studs and the subsequent loss of wheels. Loss of vehicle control and serious personal injury or death can occur.



J304269

1 1-10 -Stud Wheel Nut Tightening Sequence

Tire Wear

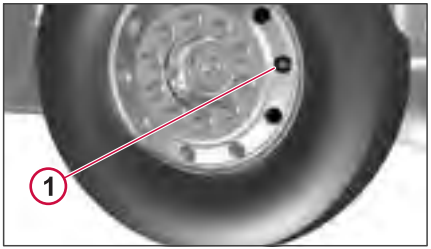
⚠ WARNING

DO NOT operate the vehicle with under-inflated tires. Always keep your tires inflated to the manufacturers recommendation. Increased flexing in the tire sidewall produces heat. The heat can build to the point of blowing the tire out causing an accident.

⚠ WARNING

Check tire pressure when the tire is cold. Never bleed the air from hot tires. Increased tire pressure measured in a hot tire is normal. Low pressures may cause side wall flexing, resulting in increased heat, leading to tire failure and vehicle accident.

Remove stones lodged in ribs or in between double-mounted wheels. Check the tire pressure and leak-test the valve stems.



J304270

1 Valve Stem

Measure the tread depth. The depth should not be less than 3.2 mm (4/32-in) on front tires and not less than 1.6 mm (2/32-in) on drive tires.

Most premium steer tires start with 14.2 mm (18/32-in) tread depth when new. Usually remove steer tires at 3.2 mm (4/32-in). Drive tires should be removed at not less than 1.6 mm (2/32-in).

It is important to have the wheels correctly aligned. Check for uneven tire wear frequently. Uneven tire wear is a sign of wheels out of alignment.

Tire Hints

Hints on How to Avoid Unnecessary Tire Wear

- Maintain correct tire pressure
- Check the tire pressure when the tires are cold
- Check that valve caps are not missing
- Keep the wheels balanced
- Tire wear increases with speed
- Overloading not only decreases tire life but also creates a hazard
- Incorrect front end alignment causes increased wear

Dual mounted wheels should always be of the same type and diameter (maximum diameter difference allowed is 6 mm (1/4 in)

TIRES, WHEELS AND HUB

Hubs

NOTE

Hub maintenance should be performed by a certified technician.

Front Wheel Hubs

DANGER

Failure to keep wheel bearings properly adjusted and lubricated may result in accelerated tire wear, poor handling and, in extreme cases, wheel separation from the hub or from the spindle resulting in loss of vehicle control and serious personal injury or death.

Conmet Preset-Plus Hub

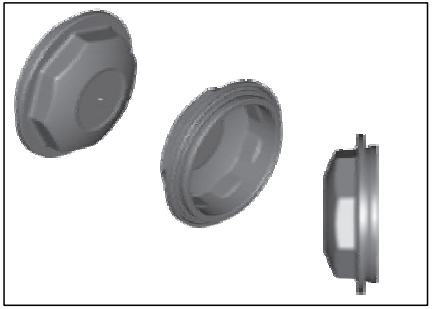
The front wheel hubs can be filled with one of several types of oil. Motor oil should be SAE 30 or 15W40. The oil can be either petroleum based or synthetic. Axle oil, API GL-5, SAE 75W-90, can also be used. There are no set change intervals for hub lubrication. The only requirement is that if the hub is opened, the lubricant must be changed.

J482037

1 Hub Oil Filling Plug

Unitized Front Hubs

The non-tapered axle hubs are sealed with lubricant inside the hub.



J304291

Rear Wheel Hubs

The rear wheel hubs can be filled with one of several types of oil. The oil can be either petroleum-based or synthetic. Axle oil, API GL-5, SAE 75 W-90, can be used. There are no set change intervals for hub lubrication. The rear wheels may have either Conmet Preset or Preset+ hubs.

The rear wheels hubs are oil lubricated. The hub has the drain/fill plug but recommended filling oil through differential fill plug.

TIRES, WHEELS AND HUB

Hub oil/grease, Grade, Quantity

Front Hub

Front hub	Oil grade	Quantity per hub
FHUM-IR: Iron preset hub, without or without integrated spindle nut, front axle	75W-90	946.5 ml
FHUM-AL: Aluminum preset hub, without or without integrated spindle nut, front axle	75W-90	946.5 ml

Front hub	Grease grade
FHUM-IR: Basic unitized hub (iron), front axle	97715
FHUM-AL: Basic unitized hub (aluminum), front axle	97715

Rear Hub

Rear hub (Drum brakes)		Oil grade	Quantity per hub
Axle	Hub		
1st driven	DHUM-AL: Aluminum preset hub, with integrated spindle nut, drive axle	75W-90	946.5 ml
	DHUM-IR: Iron preset hub, with integrated spindle nut, drive axle	75W-90	946.5 ml
2nd driven	DHUM-AL: Aluminum preset hub, with integrated spindle nut, drive axle	75W-90	946.5 ml
	DHUM-IR: Iron preset hub, with spindle nut, drive axle	75W-90	946.5 ml

Rear hub (Disc brakes)		Oil grade	Quantity per hub
Axle	Hub		
1st driven	DHUM-AL: Aluminum preset hub, with or without integrated spindle nut, drive axle	75W-90	946.5 ml
	DHUM-IR: Iron preset hub, Conmet, with generic bearing and seal, drive axle	75W-90	946.5 ml
2nd driven	DHUM-AL: Aluminum preset hub, with or without integrated spindle nut, drive axle	75W-90	946.5 ml
	DHUM-IR: Iron preset hub, Conmet, with generic bearing & seal, drive axle	75W-90	946.5 ml

The following maintenance items should be performed on all air suspensions:

Preventive Maintenance

• **Visual Inspection**: Inspect all suspension components, checking for signs of wear, damage or unwanted movement. Look for bent or cracked parts. Replace all worn or damaged components as required.
• **Air Spring**: Inspect for chafing or any signs of spring or component damage. Ensure that the upper bead plate is tight against the underside of the frame. Check for lateral slippage at the lower air spring bracket.
• **Support Beam Assembly**: Inspect the overall condition of the support beam for dents, dings or other damage. On Hendrickson PRIMAAX suspensions, check the D-pin bushings for tearing or extreme bulging. Check for metal-to-metal contact in the bushed joints. Replace worn or damaged components as required.
• **Frame Hanger Bracket**: Inspect for any signs of loosening or damage. On Hendrickson PRIMAAX suspension, check for loosening or damage at the QUIK-ALIGN connections or longitudinal torque rod connections. Replace worn or damaged components as required.
• **Cross Beam**: Inspect for cracks, damage, metal shavings or looseness at the beam connections. Replace worn or damaged components as required.
• **Transverse Torque Rods**: Inspect for signs of looseness at the transverse torque rod connections. Check bushings for tearing or excessive bulging. Check the transverse torque rod for dents or bending. Replace worn or damaged components as required.
• **Shock Absorbers**: Inspect for signs of dents or leaking (oil misting is not considered leakage). Replace worn or damaged shocks as required.
• **Tire Wear**: Inspect tires for wear patterns that might indicate suspension damage or misalignment. Replace worn or damaged components as required.
• **Height Control Valve and Air Lines**: Check for loose, bent or damaged parts. Check air lines for chafing or leaking. Check height control valve and air lines for leakage. Replace worn or damaged components as required.

STEERING AND BRAKES MAINTENANCE

Steering System

Check for excessive play in the steering system by turning the steering wheel while the engine is off. Front wheels should move with minimal play, not exceeding 25 mm (1 in) at the rim of the steering wheel. If play is excessive, inspect and repair the steering linkage for looseness or wear before driving the vehicle.

Power Steering Fluid

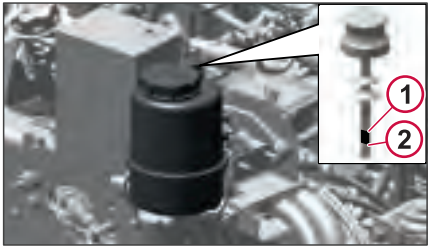
Use ATF Dexron III to fill the power steering fluid reservoir to maintain the system's health. If the fluid becomes dark, it indicates overheating, requiring a visit to a dealer for troubleshooting and fluid replacement.

Checking Power Steering Fluid

Proper fluid level should be between the lines on the dipstick.

NOTE

CHECK COLD



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1 Maximum Level

2 Minimum Level

Brake System

DANGER

DO NOT use replacement parts anywhere in the brake system unless it conforms exactly to original specifications. A nonconforming part in your vehicles brake system could cause a malfunction, leading to loss of control of the vehicle resulting in severe personal injury or death.

DANGER

DO NOT release the parking brake or attempt to move the vehicle until brake air pressure in both circuits is at least 100 psi (690 kPa). Failure to follow this procedure may lead to uncontrolled vehicle movement and cause severe personal injury or death.

Air Brake System

Chassis has a dual braking system with separate air circuits: primary for rear brakes, secondary for front brakes. Each circuit has separate reservoirs but operates as one system through dual-circuit treadle valve, offering easy control when applying and releasing brakes.

Air pressure in both circuits monitored by gauges on the instrument panel. If pressure drops below specified levels (517 ± 34 kPa or 75 ± 5 psi) in either system at any time other than startup, pull to the side of the road to check the

problem. If pressure drops below 55 ± 5 psi in BOTH systems, Brake Air pressure warning indicator and buzzer activate.

In tractor applications, the Trailer Supply Valve (red octagonal knob) pops out if there is a trailer breakaway or sudden air line failure, applying the trailer spring brakes. If there is a slow leak in the trailer air system, the valve pops out at 70 psi to protect the tractor air system from further pressure loss.

If the Trailer Supply Valve is held in to override trailer spring brakes, parking brake Valve (yellow diamond knob) pops out at 20-45 psi, applying parking brakes. Trailer pops first, then the tractor.

The air brake system consists of three main elements:

- The compressor, governor and reservoirs supply and store the air pressure.
- The brake application valve controls the brake application pressures.
- The brake chambers control the brake mechanism.

Air Brake Operation

⚠ CAUTION

Avoid sudden stops. Constant, sudden stops may negatively affect the performance of braking and driving parts.

When slowing for a stop, leave the clutch engaged for as long as possible to use the braking effect of the engine. When forward speed has dropped to a little above idling speed, push clutch pedal in and brake to a complete stop.

Automatic Slack Adjuster

⚠ DANGER

DO NOT manually adjust automatic slack adjusters in an effort to correct excessive push rod stroke. Excessive push rod stroke indicates a problem that won't be resolved by manual adjustment. It is dangerous and gives a false sense of security about the effectiveness of the brakes. Take the vehicle to a repair facility for proper investigation and correction.

Automatic slack adjusters maintain brake chamber push rod travel and compensate for lining wear. Manual adjustment should only be done during brake or wheel service. Excessive push rod travel indicates a problem with the slack adjuster or brake components. Take the vehicle to a repair facility for investigation and correction if brakes are out of adjustment.

ⓘ NOTE

The brake system is a critical vehicle safety system. For your safety and for those around you, follow the recommended preventive maintenance checks. If any problems occur, have them investigated immediately by an authorized service facility

STEERING AND BRAKES MAINTENANCE

Brake System Maintenance

1 Block the wheels to prevent the vehicle from moving.

2 Start the engine and build air system pressure to governor cutout.

3 Stop the engine.

4 Release the parking brakes.

5 Apply and hold the Service Brake.

6 Have an assistant check for proper results by observing the movement of the slack adjusters as indicated below:

- The brakes on both the steering axle or the rear drive axle(s) should always apply as indicated by movement of the slack adjuster.
- Check for air leakage.

7 Set park brake when done.

Air Tanks

⚠ DANGER

Drain the air system tanks at the recommended intervals. If condensation accumulates, moisture can enter the brake system air valves, causing corrosion or clogging. The safety of the brake system could be compromised, leading to an accident causing severe personal injury or death.

⚠ WARNING

When draining the air tanks, DO NOT look into the area of the draining air. Dirt or sludge particles may be in the air stream that could cause eye injury.

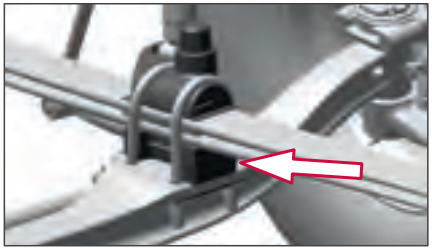
Drain air tanks daily to remove moisture. Ensure drain cocks close properly. Check for condensation and keep the air system clean. Contact your authorized Volvo dealer if sludge or excessive fluid is present.

Air Dryers

Air dryers use an oil coalescing desiccant cartridge to remove oil and particles from the air system. Change the cartridge annually.

Springs

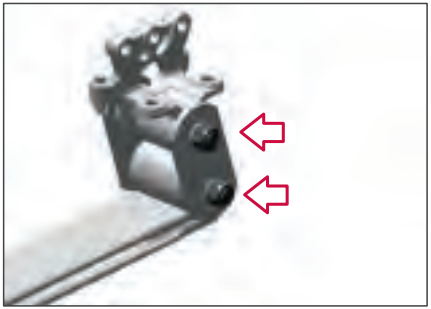
Properly tighten U-bolt nuts to prevent issues like broken springs, axle misalignment, and abnormal tire wear. Inspect the chassis for broken springs, shocks, and loose or broken U-bolts. Contact your Volvo dealer if any issues are found.



J469818

Spring Bushings

When lubricating the springs, lift the axle off of the floor, suspend the frame with axle stands and lower the axle. The spring bushings are now in the position where grease can be added to the contact surfaces. If the spring bushings are greased without taking the load off, high wear and lower lifetime will occur because grease is not able to reach the contact surfaces. If the vehicle is for severe service applications, increase the frequency of spring bushing lubrication.



J469817

Rubber Bushings

Rubber bushings are used for extended service life. If your vehicle is equipped with rubber bushings DO NOT lubricate them. Replace the leaf spring if it is damaged or has premature or excessive wear.

CHASSIS MAINTENANCE

Axle and Chassis Components Maintenance Interval

Component	Operation		Economy Duty	Normal Duty	Heavy Duty Greater than 5 mpg (miles per gallon)	Severe Duty Less than 5 mpg (miles per gallon) Greater than 50L/ 100km
+ Requires Connected Vehicle Maintenance and/or a Volvo Service Contract						
Axles						
3 Axle Alignment	Alignment	Time	12 months (minimum)			
Vendor Rear Axle Oil (Replace)	Change		See axle manufacturer guidelines			
CHASSIS						
Volvo Premium Chassis Lubrication		Miles	15,000			10,000
		Km	24,000			16,000
Electrical System Connectors	Check	Time	Every 6 months			
Power Steering Fluid and Filter	Replace	Miles	150,000			
		Km	240,000			
		Time	12 months			
Air Dryer Coalescing Cartridge	Replace	Miles	150,000			
		Km	240,000			
		Time	12 months			

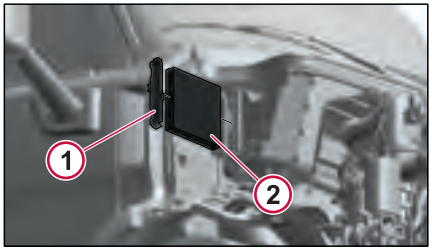
Cab Air Filter

To provide comfortable and clean fresh air in the cab, the heating and air conditioning system is designed with a replaceable filter.

Under normal operating conditions the filter should be replaced every 6 months to ensure the efficiency of the heating and air conditioning system. Failure to replace the filter may cause damage to heater/AC components.

Dusty conditions may require more frequent replacement.
The vehicle has two cab air filters. One is from under the hood and another one is inside the cab.

Under The Hood

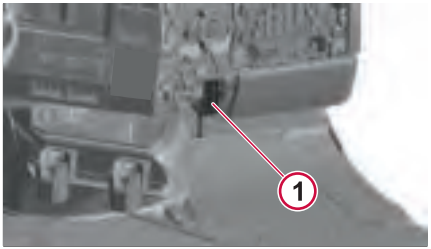


J482035

1 Cab Air Filter Cap

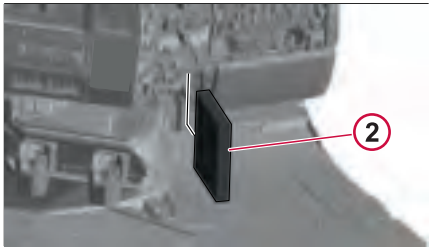
2 Cab Air Filter

Inside the Cab



J482019

1. Cab Air Filter Cap

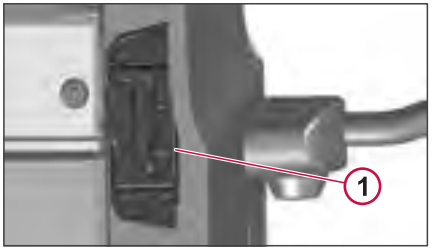


J481991

2. Cab Air Filter

Doors

The door lock mechanism should be greased annually using white grease. Lubricate the door lock cylinder with liquid graphite annually, or more often in climates with a lot of snow and salt on the roads. Coat the door stop arm with white grease annually. On wet and salted roads, road spray can enter the door lock key cylinder. Lubricate the cylinder with liquid graphite annually or more often if necessary. The door hinge pins are treated at manufacturing and then sealed. No lubrication is necessary. To keep the door rubber moldings and seals around the windows in good working order and to prevent them from freezing shut during the cold season, occasionally spray on a silicone compound.



J304298

1 Door Lock Mechanism

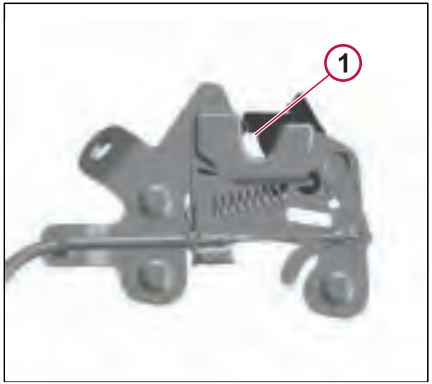
Rust Protection

The rust protection applied when the cab was produced is adequate for normal use and service. If an extension of the cab rust protection is desired or if the vehicle is used in a severe application, it is recommended that cavity wax is re-applied every 3rd year.

CAB MAINTENANCE

Hood Locks

The hood locks mechanism should be greased with lithium NLGL2 every 160934 Km (100,000 mi). If the mechanism is hard to work or binds, the latch should be cleaned before greasing.



J481982

1 Apply Grease

Chassis Lubrication

General lubrication includes lubricating all the grease fittings in the drivetrain, front and rear suspensions, power steering, and front axle, using a grease gun.

Grease the chassis every 15,000 mi (24,000 km). However, the lubrication intervals should be every 10,000 mi (16,000 km) or less to reflect heavy-duty use if the vehicle is in a demanding environment or running in a dirty or corrosive atmosphere.

Lubricating Grease

Use grease with a lithium base with EP additives and a consistency of NLGI No. 2. Care should be taken not to use any grease other than one with EP additives for the driveshaft. DO NOT use any solid lubricants, such as graphite, copper or molybdenum disulfide.

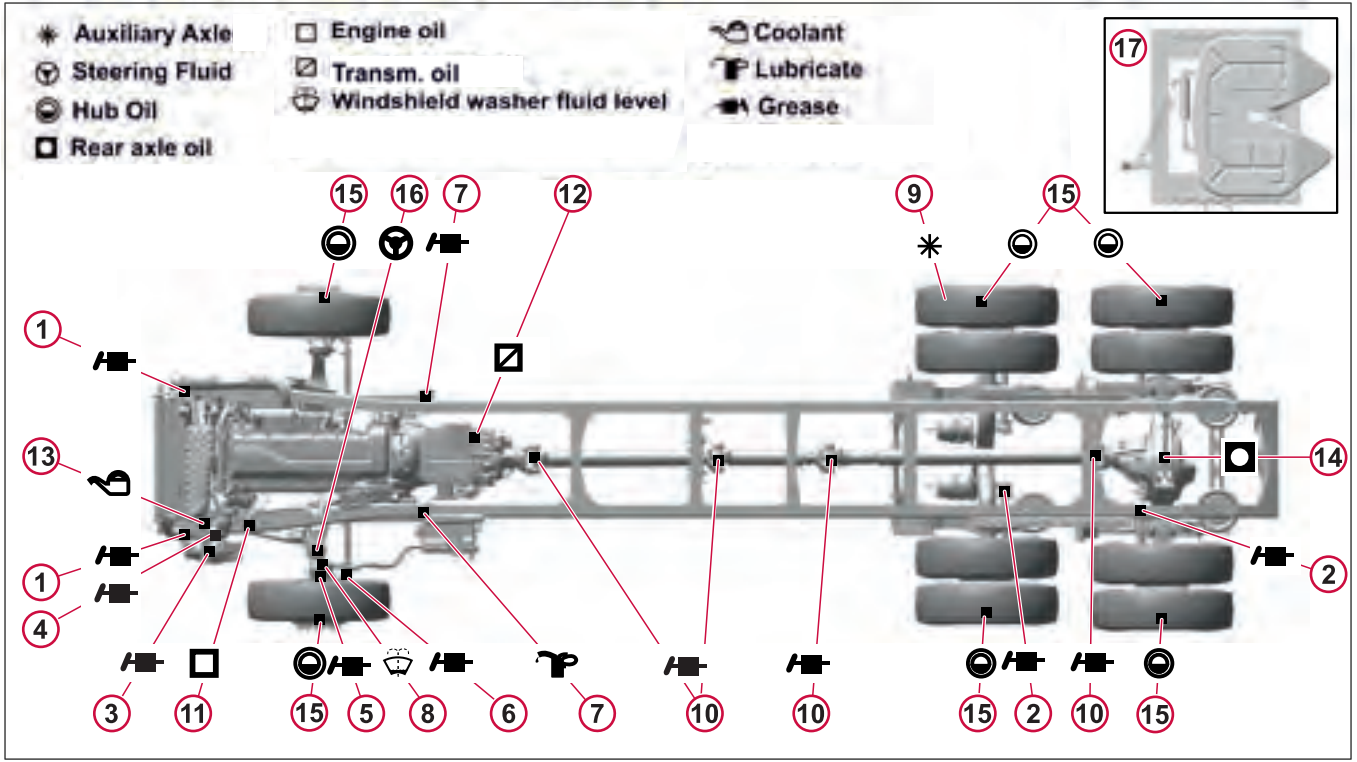
Lubrication Procedure

Make sure the grease fittings are cleaned off before greasing fill grease to the point where old grease and contaminants are forced out from the part and only new grease comes out. If new grease cannot be filled so old grease is flushed out, the part needs to be checked for problems. If a fitting does not accept lubrication due to damage or internal stoppage, replace it.

NOTE

Think of greasing the same way as an oil change. All old grease should come out and be replaced with new grease. Remove excess grease from fittings, shackles and other surfaces.

LUBRICATION



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Filter summery to long to be displayed.

Lubrication Notes

1 Spring Hanger

Use a lithium based grease with specification API NLGI No. 2. When lubricating the left and right sides of the front springs, lift the axle off of the floor, suspend the frame with axle stands and lower the axle. The spring bushings are now in the position where grease can be added to the contact surfaces.

> **NOTE**
>
> The rock guard will have to be removed (if equipped).

> **NOTE**
>
> Always grease a Volvo front axle with the wheels on the ground.

> **NOTE**
>
> To grease non-Volvo axles, they are typically greased with the wheels on the ground. Consult with the axle manufacturer for the latest recommendation.

2 Slack Adjuster

Do not grease untill the 1st scheduled maintenance interval.

> **NOTE**
>
> See manufacturer's specifications for specific grease. Adjust according to the specific slack adjuster manufacturing specifications.

> **NOTE**
>
> If the brake cam seal does not purge, make sure the inner seal does not purge into the brake drum and onto the brake linings.

3 Steering Gear

Use a lithium based grease with specification API NLGI No. 2. Only use a hand operated grease gun. The high pressure from an air operated grease gun will damage the seal.

4 Draglink and Steering Shaft

Use a lithium based grease with specification API NLGI No. 2.

5 Kingpin, Upper and Lower

Use a lithium based grease with specification API NLGI No. 2.

> **NOTE**
>
> Always grease a Volvo front axle with the wheels on the ground.

> **NOTE**
>
> To grease non-Volvo axles, they are typically greased with the wheels on the ground. Consult with the axle manufacturer for the latest recommendation.

6 Tie-Rod

Use a lithium based grease with specification API NLGI No. 2.

> **NOTE**
>
> Axles may use a greased-for-life tie-rod. No provisions for adding grease are available.

7 Leaf Springs

Front leaf spring eye pins, should be pressure lubricated with chassis grease. Vehicles equipped with multi leaf springs should also have the leaves lubricated with a spray gun or brush using a rust inhibiting oil.

> **CAUTION**
>
> Keep grease and oil off of rubber bushings. Failure to do so will result in component damage.

LUBRICATION

> **NOTE**
>
> If the vehicle is operated in sandy or dusty environments, the spring ends should be left dry. Dirt and grease can mix, resulting in a "sandpaper" action that may cause pre-mature wear to the spring ends.

8 Windshield Washer Fluid Level

Regularly check and maintain the windshield washer fluid l, see page 432evel.

9 Auxiliary Axle

If equipped with auxiliary steer, lift or steerable lift axles use a lithium based grease with specification API NLGI No. 2.

Also, lubricate the Brake, Cams, Slack adjuster and Tie-rod ends.

10 U-Joints

Use a lithium based grease with EP additives to specification API NLGI No. 2.

> **NOTE**
>
> Ensure that grease purges out of all four seals of the U-joints.

11 Engine Oil and Filter

For oil change schedule see Service Information in Group 175-60.

12 I-Shift Transmission

With the vehicle level, the oil should be between the maximum and minimum levels on the sight glass. Only use Volvo approved oils.

13 Coolant Level

Add coolant if necessary. Only use pre-mixed clean water and antifreeze in a 50/50 mix.

Add only the same type antifreeze, that is: extended life or standard.

14 Rear Axle

Check the oil level in the differential by removing the fill/level plug in the housing. The oil should be level with the bottom of the fill/level plug hole. Add oil if necessary. The check should be performed parked on a flat level surface.

> **CAUTION**
>
> Most rear differentials have a large screw and nut protruding from the housing. The screw and nut hold the thrust plate shoe against the ring gear and are not to be confused with the fill/level plug.

> **NOTE**
>
> Refer to Service information for Oil Types and for Approved/Correct Oils.

15 Oil Lubricated Wheel Bearings (if applicable)

There is no set change interval. Change the oil (or grease) only in connection with work on the hub or if dirt is found in the lubrication. Use motor oil SAE 30. Lubricate both the right and the left wheel bearings.

16 Power Steering Fluid

Check the fluid in the reservoir with the dipstick. Add oil if necessary. Use ATF Dexron® III or better. Change fluid every 240,000 km (150,000 mi). Change filter every year.

17 Fifth Wheel

The fifth wheel and slider assemblies should always be re-lubricated after steam cleaning or at least every oil change.

Due to different manufactures of 5th wheels and models, some 5th wheels may not have grease fittings.

Use a lithium based grease with specification API NLGI No. 2 on tracks and moving components.

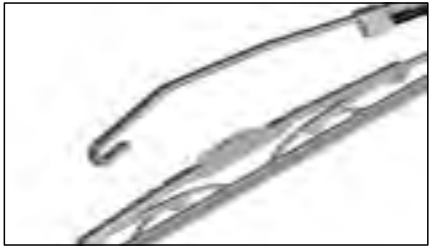
> **NOTE**
>
> A heavy coating of grease is recommended on the fifth wheel plate by using the grease gun or a putty knife by direct application to the top of the plate.

Vehicle Wiper Blades

Check wiper blades for any damage, "dead" rubber and attachment to arm.

Hook-Slot Connector

Your vehicle is equipped with a hook-slot type connector attachment where the arm and blade meet. To remove the wiper blade, push the locking tab on the blade. Then using moderate pressure, push the blade toward the base of the wiper arm. Replace with a new unit.



J307495

Paint and Brightwork Care

Cab

> ⚠ CAUTION
>
> When using a pressure washer to clean the vehicle, do not direct the spray at electrical components in the engine compartment such as the alternator, starter and compressors. Water spray from pressure washers can damage electrical components.

Wash all exterior painted surfaces frequently to remove dirt. It is especially important to wash off salt-laden snow and ice during the cold season. A mild detergent approved for automotive cleaning can be used but avoid strong detergents.

> ⓘ NOTE
>
> DO NOT aim the water jet directly at door and window seals or door locks.If locks are filled with water, use compressed air to clean the water out and then apply liquid graphite. Be especially careful of leaving water in locks or around seals during freezing weather.

Apply a coat of wax regularly. This will help the paint and other surfaces keep their luster. If the surface gets dull, use a restoring cleaner specially designed for this. Clean off all tar spots and tree sap before waxing.

Chassis

Keep the chassis free from buildup of dirt. Make sure the chassis is cleaned before the maintenance inspections to help spotting leaks, etc. As salt can be part of the road sludge during the cold season, remove buildup of snow and ice so it does not promote corrosion. At the end of the cold season, thoroughly flush away all collected dirt from the chassis

If signs of delamination of the frame rail are apparent, complete the following steps:

1. Clean chassis with high pressure water spray. Use mild detergent if available; remove loose dirt and grease.
2. Continue high pressure wash to affected delamination areas of paint from the frame rails. Apply high pressure spray until paint holds on frame substrates.

> ⓘ NOTE
>
> After completing these steps, to avoid further delamination, have the framerail serviced as soon as possible.

Stainless Steel

Stainless steel will rust if exposed to salt for too long. Wash frequently, especially during the cold season, to remove salt-laden snow and ice. If rust appears, wash the surface and use a rubbing compound to remove the rust. Apply a coat of wax as a finish (do not wax parts that get hot, such as exhaust pipes, etc.).

> ⓘ NOTE
>
> Never use steel wool to clean stainless steel. Pieces of the steel wool break off and can create rust stains on the surface.

Chrome

Chrome surfaces will rust if they are not cleaned and protected. This is especially important during the cold season when roads are salted or in coastal areas where the salt level in the air is high. Clean chrome surfaces with clean water. If the surface has heavy dirt or tar spots, use a tar remover. To remove rust spots, use a non-abrasive chrome cleaner and apply a coat of wax as a finish (do not wax parts that get hot, such as exhaust pipes, etc.).

> ⓘ NOTE
>
> Never use steel wool to clean chrome. Pieces of the steel wool break off and can create rust stains on the surface.

Aluminum
Unprotected aluminum surfaces will form an oxide layer if not maintained. This is especially important during the cold season when roads are salted or in coastal areas where the salt level in the air is high. Clean with steam or high pressure water. Use a mild detergent if the dirt is heavy. Rinse well. Clean aluminum surfaces with warm water. If the surface has heavy dirt or tar spots, use a tar remover. To prevent spotting, wipe aluminum surfaces dry after washing.

Upholstery
Clean vinyl and cloth upholstery with light brushing or vacuuming. If heavily soiled use a fabric stain remover.

Plastic
The plastic in the upholstery can be cleaned with a soft cloth and mild soap solution.

Alcantara Suede-Like Material
Suede-like upholstery can be cleaned with a soft cloth and mild soap solution.

Leather Care
Leather upholstery is manufactured with a protectant to repel soiling. Over time, sunlight, grease and dirt can break down the protection. Staining, cracking, scuffing, and fading can result.

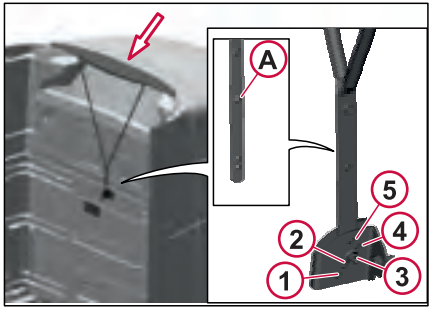
⚠ CAUTION

DO NOT use gasoline, naphtha or similar cleaning agents on the plastic or leather since these can cause damage. Take extra care when removing stains such as ink or lipstick since the coloring can spread. Use solvents sparingly. Too much solvent can damage the seat padding. Start from the outside of the stain and work toward the center. Sharp objects (e.g. pencils or pens in a pocket) or Velcro fasteners on clothing may damage the upholstery.

ROOF EXTENDER (IF EQUIPPED)

Vehicle Roof Extender

The roof extender increases fuel economy. The extender is adjustable to five positions which are shown in the illustration and in the graphs. The vehicle is delivered with the extender or deflector lowered or down, which is the transport position, see A in illustration.



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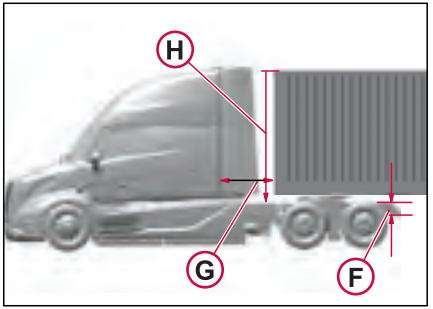
To set the extender to normal riding position, measure points H and G, then select positions 1 through 5 in the rod as determined by the adjustment chart.

- H = Height from the top of the trailer to the top of the frame rail.
- G = Gap or distance from the back of the cab to the trailer.
- F = Frame rail height.

> **NOTE**
>
> For 440 and 300 vehicle models, the frame height must be measured. See F in illustration. If F measures 266 mm (10-1/2 inches), subtract 17 mm (5/8-inch) from the value determined for H.



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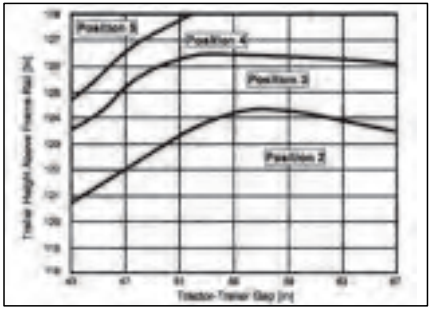
> **NOTE**
>
> Refer to the label located on the back of the cab for roof extender adjustment chart.

VNL 440/ VNL 640/ VNL 840 Roof Extender Adjustment Chart



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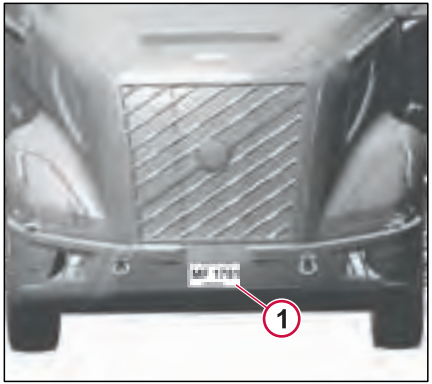
Front Bumper / License Plate

⚠ CAUTION

DO NOT cover the opening in the front bumper with a license plate. Covering this hole will restrict airflow to the lower portion of the radiator. This can cause the engine to overheat, which can damage the engine.



J469859

1 - Plate Mounting

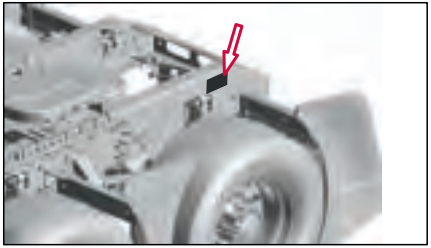
MODIFICATIONS TO VEHICLE

Chassis Frame

⚠ WARNING

DO NOT weld on any part of the frame or drill holes in the top or bottom flanges. Serious structural damage could occur.

Frame side rails are heat treated. No welding is permitted because this can result in structural failure. DO NOT drill through either top or bottom flanges. A warning label is also attached to the frame for information.



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Drilling is permitted in the frame web in accordance with a specified hole spacing pattern. Consult an authorized Volvo Trucks dealer to obtain approved hole spacing dimensions.

Frame rail and cross member nuts and bolts should be checked periodically and tightened to the specified torque if necessary.

Frame Alterations

Under no circumstances can the frame be cut and an extension piece added to increase the wheelbase. The only alteration allowed is wheel base shortening, where the only change in the frame rail is a new hole pattern drilled for the new location of the rear suspension

Welding in Vehicle

⚠ CAUTION

Use only electric welders due to the coating on material used to build cabs. Oxygen and Acetylene welding will not bond properly due to coating.

Do not weld anywhere in or on the vehicle before disconnecting batteries, all electronic control units (ECUs) and instrument cluster. DO NOT use oxy/acetylene welding to repair cab panels.

NOTE

Use all tools on the fasteners they were made to be used on. Use metric tools on SI metric units only. Never try to use metric tools on U.S. standard fasteners or U.S. standard tools on SI metric units.

CAUTION

Potential external/internal thread mismatch condition(s) may occur with certain metric thread-inch thread fastener combinations, and with fastener combinations involving incompatible metric fastener systems. A given thread mismatch condition can result in thread stripping and/or assembly weakness leading to potential service failure, thereby rendering a vehicle non-operational and/or unsafe for operation.

METRIC CONVERSIONS

Conversion Chart		
SI to U.S. Conversions		
25.4 millimeters	=	1 inch
1.61 kilometers	=	1 mile
.473 liter	=	1 pint (U.S. liquid)
.946 liter	=	1 quart (U.S. liquid)
.01639 liter	=	1 cubic inch
1.3558 Newton meters	=	1 pound-foot
.746 kilowatt	=	1 horsepower
6.895 kilopascals	=	1 pound/square inch
(1.8 x degrees Celsius) + 32	=	degrees Fahrenheit
.83267 Imperial gallon	=	1 gallon (U.S. liquid)
U.S. to SI Conversions		
0.03937 inch	=	1 millimeter
.6214 mile	=	1 kilometer
2.1134 pints (U.S. liquid)	=	1 liter
1.0567 quarts (U.S. liquid)	=	1 liter
61.024 cubic inches	=	1 liter
.7376 pound-foot	=	1 Newton meter
1.34 horsepower	=	1 kilowatt
.145 pound/square inch	=	1 kilopascal
.556 x (degrees Fahrenheit -32)	=	degrees Celsius
1.2009 gallons (U.S. liquid)	=	1 Imperial gallon

EMERGENCY ACTION

TOWING

General Information

- Use only the designated lifting points to lift the vehicle.
- Always use suitable lifting devices, such as clevises and chassis guards, to avoid damaging the vehicle.
- Switch on the hazard lamps and parking lamps if the electrical system is functioning.

> ⓘ NOTE
>
> During towing, the functional main switch (under driver side of the cab) should be in ON position and the hazard lamps should flash.

Towing Instructions

It is important to consider the truck weight, position and condition of the truck before towing. This helps to know the type of tow truck and the equipment required for towing.

Procedure Before Towing

- Ensure that the parking brake is applied.
- Switch on the hazard lamps, if the electrical system is functioning.
- Switch off the TCS (Traction Control System).
- Turn off the key and remove it from the starter switch.
- Lock the cab.
- Release the parking brake. If the parking brake needs to be released mechanically, chock the wheels first and release it.

Auto Parking Brake

Your vehicle is equipped with EPB (Electronic Parking Brake), and it has the auto parking brake feature. The parking brake is applied automatically when the key is turned to the off position.

Before towing a vehicle, it is important to release the parking brake manually. For some reason, if the parking brake cannot be released manually, use the service mode to inhibit the auto parking brake feature. The service mode should only be used in an emergency-type scenario. Example: If a truck broke down in the middle of the road or highway, use the service mode to get the truck out of the way and off to the side.

> ⚠ CAUTION
>
> Never tow the truck in active service mode

Service Mode

In service mode, the automatic application of the parking brake is inhibited.

To enter service mode, when the engine is running, press and hold the EPB (Electronic Parking Brake) lever while turning the ignition key or ignition button (START/STOP button) to the Off position. A message in the instrument display shows that the service mode is active.

When the EPB lever is pulled or the vehicle speed exceeds 18 mph (30 km/h), service mode exits automatically.

> ⚠ CAUTION
>
> The parking brake warning sound will not be active in the service mode.

Towing Configurations

⚠ WARNING

The steering does not have any servo effect if the engine is not running.
The vehicle will not have air brakes when not powered up.

⚠ WARNING

The vehicle's towing hook(s) must only be used for towing. Incorrect use can lead to personal injury if the towing hook is loaded with a greater weight than it is designed for.

Use the towing hook for towing a vehicle. The towing hooks are designed to push in and lock with a ¼ rotation into the socket behind a cover on the left and right hand sides of the bumper.

1. Remove the cover.

J473248

2. Push in and lock the towing hook with a ¼ rotation into the socket

J473110

The parking brake must be released during towing.

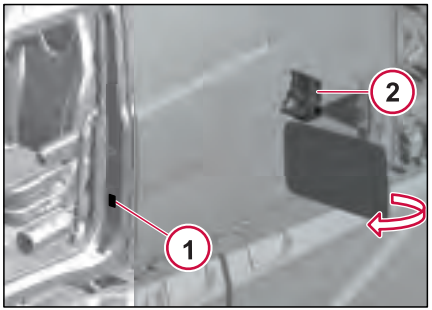
Use the vehicle's towing hook(s) for towing. The truck is equipped with **two** towing hooks, each one of them may have half the gross weight of the truck applied from straight in front.

Refer to Maximum Loading During Lifting and Towing for additional weight configuration's.

Tow Hooks (Sleeper Cab)

The tow hooks are stored in the storage compartment (left-hand side).

Press the switch (1) on the B-pillar to open the storage compartment. The storage compartments provide easy access to the dedicated tow hook (2) storage.



J473111

Maximum Loading During Lifting and Towing

This information specifies the loading that can be applied when using a towing hook, towing hitch cross-member, axles, and/or torque stay anchorages.

Single Towing Hook: The hook must not be loaded more than the vehicle's gross weight.

Double Towing Hooks: Each hook must not be loaded more than half the vehicle's gross weight.

Towing Hitch, Towing Hitch Cross-Member: maximum 200 mm (7.8 inches) from center of member web.

Maximum load on towing cross member are:

- Lengthways: 20 tons
- Vertically (lift): 7 tons
- Sideways: 17 tons

Axles, Front and Rear:

- Static loading, lengthways and vertically: two times axle loading
- Dynamic, e.g. during towing: one time axle loading

Air Suspension Vehicles, Front Torque Stays:

- Per side: max 5 tons
- Gross: max 9.5 tons

⚠ DANGER

Do not use the tow eyes to raise the front of the vehicle; the tow eyes can break. Do not crawl under a vehicle suspended by tow eyes. Failure to follow these instructions may cause serious personal injury or death.

ⓘ NOTE

The towing hooks on the vehicle must only be used for towing.

Unloading

If circumstances allow, unload the vehicle before lifting the rear suspension.

The vehicle is unloaded to reduce the axle loading on the towing vehicle, limit the loading on the vehicle's lifting points to minimize the risk of damage to the towing vehicle.

If it is not possible to unload the vehicle where it is, it can be towed a short distance to a suitable place where unloading can take place.

Parking Brake Mechanical Release

⚠ WARNING

Always install the wheel chocks, so that the vehicle cannot roll away. This is important, while working underneath the vehicle. Failure to install wheel chocks, may cause personal injury or death.

There are three ways to release the parking brake in an emergency:

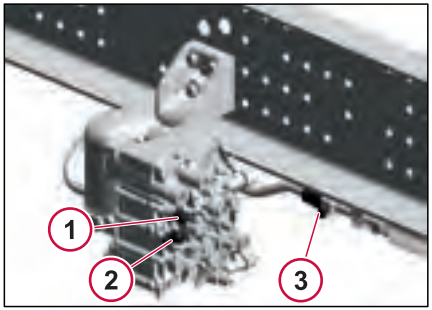
- If there is no air in the brake system, use the Schrader valve located under the hood or the Schrader valve located on the APM (Air Production Modulator) discharge line to fill the reservoirs. Release the parking brake by using the EPB (Electronic Parking Brake) lever in the dashboard.
- If an electrical fault occurs and the air reservoirs have compressed air, manually release the parking brake by supplying compressed air into the Schrader Valves (Port 4.3 & 4.4) on the APM control block to release the parking brake.
- Mechanical release of the parking brake on all spring brake chambers. See procedures under Brake Chambers heading.

> **NOTE**
>
> The air pressure in the reservoirs must be a minimum of 100 psi (7 bar).The parking brakes apply automatically when the air pressure lowers to 32 psi (2.2 bar) for tractor and 41 psi (2.8 bar) for trailer.

> **NOTE**
>
> The Schrader valves (Port 4.3 and 4.4) must be supplied with a minimum of 60 psi (4 bar) air pressure from the external source to release the parking brakes.

Schrader Valve

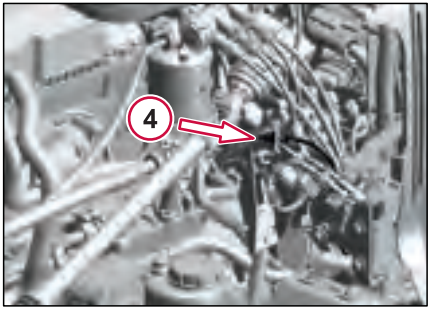
APM (Air Production Modulator)



J476220

1 *Schrader Valve (Port 4.4) - External Air Fill (Trailer Air Supply)*
2 *Schrader Valve (Port 4.3) - External Air Fill (Tractor Parking Brake)*
3 *Schrader Valve, APM Discharge Line*

Under the Hood



J477329

4 *Schrader Valve, Under the Hood*

Brake Chambers (Drum Brakes)

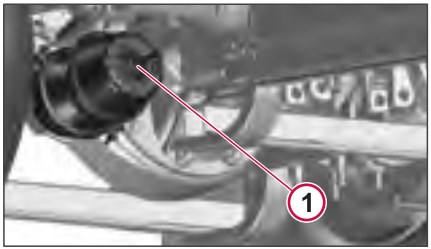
The parking brake can be released mechanically if compressed air is not available.

- Remove the cap on the end of the parking brake cylinder.
- Loosen the nut and remove the release screw from the parking brake cylinder.
- Secure the release screw in the slot provided.
- 1/4 turn the release screw and then securely tighten the nut.

When towing is completed,

- Remember to remove the release screw and nut from the slot and install it in the parking brake.
- Install the protective cap on the parking brake cylinder.

> **NOTE**
>
> Do not remove the split pins from designs, which have a split pin. Instead unscrew the screw and nut together.



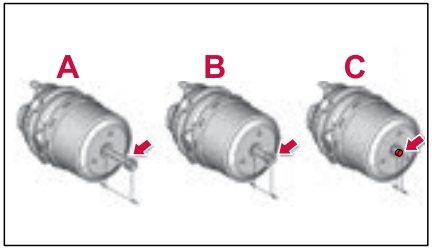
J302330

1 *Parking Brake Release Screw*

Brake Chambers (Disc Brakes)

The brake cylinders have a release mechanism for the parking brake spring, which means that the release bolt does not come out of the brake cylinder.

When you start to release the parking brake manually, a red plastic plug comes out of the center of the nut. It is entirely out after three turns. A total of about 45 turns are needed to fully compress the parking brake spring. When the parking brake is fully reinstated, (spring released), the red plastic plug will return into the center of the nut.



J474364

Release Screw	Description
A Standard release	The bolt head protrudes 80 mm from the surface of the brake cylinder.
B Half release	The bolt head protrudes 40 mm from the surface of the brake cylinder.
C Parking brake release	It takes 45 turns to fully release the parking brake. A red plastic plug comes out of the center of the nut.

NOTE

Always fill the parking brake tank with air when available, and release the parking brake, to reduce the amount of turning needed on the release mechanism nut. The nut should only be released in exceptional cases, with no air in the parking brake section.

CAUTION

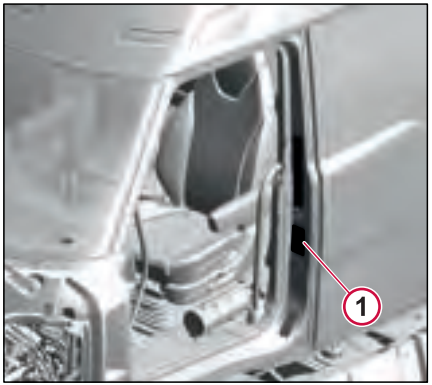
The maximum torque for the release mechanism nut is 47 Nm (34.67 ft-lbs).

Towing A vehicle Equipped With I-Shift Transmission

Without Towing Alternative Procedure

NOTE

Refer to label on the driver door to check if vehicle is equipped with towing alternative procedure. Also, some vehicles have had the transmission control module (TCM) software updated to add the towing alternative procedure.



J472517

1 I-Shift Towing Label

If the vehicle is not equipped with the Towing Alternative Procedure, the driveshaft must be disconnected to tow the vehicle.

> ⚠ CAUTION
>
> Failure to disconnect the drive axle shaft(s) or lift the drive wheels off the ground before towing or pushing the vehicle, can cause serious transmission damage.

> ⚠ DANGER
>
> If the drive shaft has been removed for towing, DO NOT reuse bearing retainer bolts or stamped strap bolts, or stamped straps. Reuse of bearing retainer bolts or stamped strap bolts, or stamped straps can cause driveline failure, which can result in separation of the driveline from the vehicle. A separated driveline can result in property damage, serious personal injury or death.

With Towing Alternative Procedure

> ⓘ NOTE
>
> This procedure is not intended to replace the standard towing procedures and must only be used when it is not possible to follow the standard procedures.

If the vehicle cannot have the driveshaft removed and is equipped with Towing Alternative Procedure, the vehicle can be towed without the removal of the driveshaft. This procedure allows the vehicle to be removed from toll-ways, bridges, and tunnels without disconnecting the driveshaft.

> ⚠ CAUTION
>
> At the earliest possible time, the vehicle should be configured for standard towing by disconnecting the axle shaft. Failure to disconnect the drive axle shaft(s) or lift the drive wheels off the ground before towing or pushing the vehicle can cause serious transmission damage.

When the Towing Alternative Procedure is used, 3rd gear and High Range is engaged which enables the oil pump to rotate during towing. Towing gear 3 HR will be engaged if the following conditions are met:

- Transmission in neutral position
- Vehicle moves forward faster than a set limit for a number of seconds
- Engine is not running
- Air pressure to the transmission must be greater than 700 kPa (100 psi). Air should be supplied continuously from the towing vehicle.
- Ignition ON and power provided to the TCM
- Battery voltage must be 12 volts or higher for proper TCM function
- No transmission air pressure diagnostic trouble codes (DTC)

> ⚠ CAUTION
>
> Reverse towing is not allowed when Towing Alternative Procedure is used. Reverse towing can damage the transmission.

> ⚠ CAUTION
>
> Do not use the Towing Alternative Procedure if the vehicle has been in an accident that has compromised the oil cooling lines or cooler or if the vehicle is being towed for transmission failure. Using this procedure may result in further damage to the equipment.

This procedure should NOT be used in the following situations.

- Vehicle power and or air supply cannot be verified to the transmission or cannot be consistently supplied from the towing vehicle if moving longer distances.
- Heavy frontal damage to the radiator assembly on vehicles that have the transmission oil cooler in the bottom tank of the radiator, and the cooler lines are compromised. Towing with broken lines will pump all the oil out of the transmission and further damage the equipment.
- Complaints involving transmission failure that requires towing.
- Active air pressure DTC in the Instrument Cluster for the transmission.

Towing the Vehicle From the Front

NOTE

During recovery, **Do Not** pull from front axle. Pulling the front axle may cause damages to U-bolts clamp group.

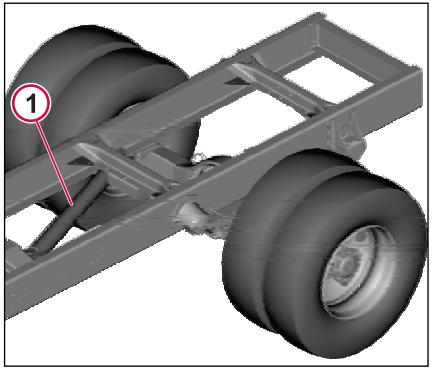
When the vehicle is towed with the front suspension lifted, the steering lock must be released.

CAUTION

During towing, when the driving wheels are in contact with the ground, the axle shafts or propeller shaft must always be removed in order not to damage the electric motor.

If the axle shafts have to be removed, the hubs must have tight fitting covers installed. Sand and dirt could otherwise find their way in and cause considerable damage.

Disconnect the propeller shaft from the rear axle and fix it securely to the chassis, or remove the entire propeller shaft.



J387385

1 Propeller Shaft

NOTE

When the vehicle is towed with the front suspension lifted, a fault code for "abnormal sensor signal front" is set in the ABS system. This should be considered during the next service, when the ABS fault codes are checked.

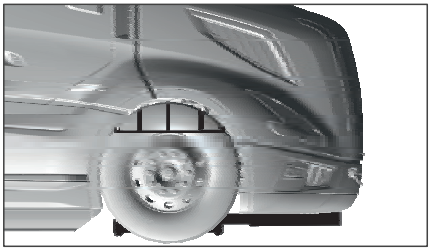
The ABS fault code can be deleted with the service tool; refer to the service information for the ABS system.

Lifting A Vehicle With Leaf Springs

Method 1: Wheel Lift

This is the easiest method to tow the vehicle. Lifting at the wheels help reduce the risk of possible damage to the axle,

and suspension components during towing operations.

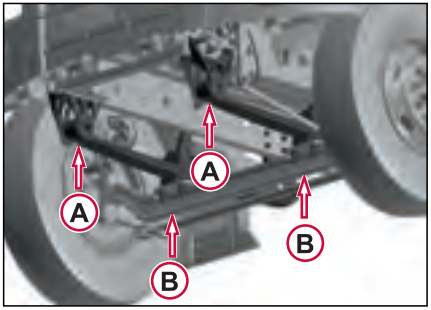


J481850

Method 2: Spring Eye And Hanger Lift Method

Lift behind the front spring anchorage to tow the vehicle.

If for any reason, you cannot lift the vehicle from the front using the front spring anchorage, use the front axle member to lift.



J461277

A. Lifting Point, Front Spring Anchorage
B. Lifting Point, Front Axle Member

Method 3: Axle Fork Lift

This is an alternative procedure to tow the vehicle. It requires standard tow forks and designated lift points depending on which axle is equipped on the vehicle.

1 Install the fork in the boom properly.

2 Position the proper tow forks directly under the axle, inside the axle clamp groups.

3 Prior to lifting the vehicle, ensure that the bottom axle plate is flat in the tow fork to minimize any gap between the bottom axle plate and the tow fork.

J302289

Lifting A Vehicle With Front Air Suspension

If possible, "Automatic Ride Height" should be activated during towing. The ignition lock should then be in position I or II.

If "Manual Ride Height" is activated, set the height to the same drive height as for Automatic Ride Height.

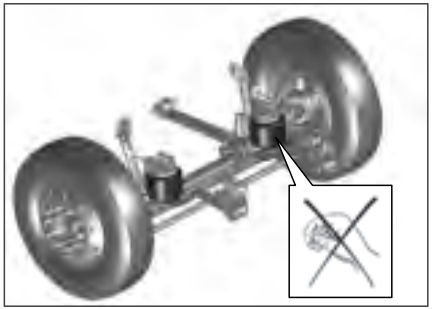
The vehicle must not be driven faster than 10 km/h (6.2 mph) if the air suspension is not activated.

⚠ WARNING

When you lift a vehicle with air suspension, there is a risk that the air bellows could slide apart. When you lower the vehicle again when you have finished towing, **do not use** your hands **under any circumstances** to guide the air bellows into place again. You risk pinching your hands, which would cause serious injury.

TOWING

> **NOTE**
>
> When you lower the vehicle to drive height again, make sure that the bellows are filled with air. When Automatic Ride Height" is activated, lower the vehicle carefully to ensure that there is enough time for the bellows to fill with air.

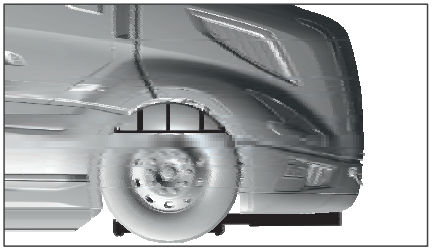


J302287

Do not use *your hands to guide air bellows back into place if they have slid apart.*

Method 1: Wheel Lift

This is the easiest method to tow the vehicle. Lifting at the wheels help reduce the risk of possible damage to the axle, and suspension components during towing operations.



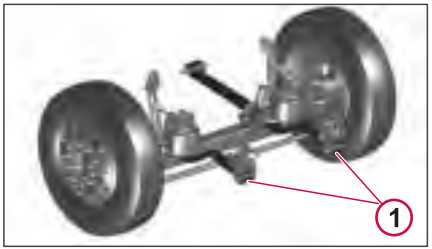
J481850

Method 2: Spring Eye And Hanger Lift Method

This method is permitted for under lift equipped units, but caution must be taken to avoid damaging the leaf spring.

> **NOTE**
>
> When lifting a vehicle with the under lift boom, care must be taken to avoid damaging the engine oil pan.

> **NOTE**
>
> It may be necessary to remove the front fairing. If necessary, place a block of wood between the top of the bottom and the bottom of the axle.



J302290

1 Lift Point

Method 3: Axle Fork Lift

This is an alternative procedure to tow the vehicle. It requires standard tow forks and designated lift points depending on which axle is equipped on the vehicle.

1. Install the fork in the boom properly.
2. Position the proper tow forks directly under the axle, inside the axle clamp groups.
3. Prior to lifting the vehicle, ensure that the bottom axle plate is flat in the tow fork to minimize any gap between the bottom axle plate and the tow fork.

J302289

Towing With The Rear Suspension Lifted

> **NOTE**
>
> When the vehicle is towed with the rear suspension lifted, the steering wheel must be locked with the steering locked.

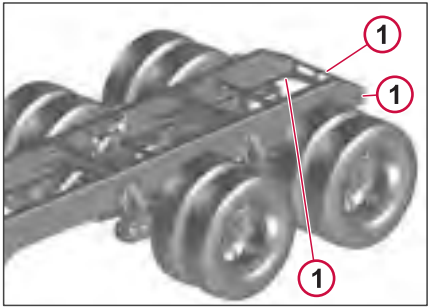
This method is preferred when the proper equipment is not available to perform the wheel lift method and is necessary for wreckers not equipped with an under axle lift system.

Lift underneath the towing hitch cross member. If the vehicle does not have a towing hitch cross member, use the chassis ends for lifting.

Lifting A Vehcile with Leaf Spring

Lift underneath the towing hitch cross member in the first instance. If the vehicle does not have a towing hitch cross member, use the chassis ends for lifting.

> **CAUTION**
>
> Remember to always use a chassis guard when using a cross member for lifting.



J302284

1 Cross Member Lifting Locations

Lifting a Vehicle Rear Air Suspension

If possible, avoid lifting the rear of a truck with air springs. The consequence could be that the air bellows slide apart, unless you first secure the rear axle to the chassis. It then takes a lot of time to line up the air bellows again.

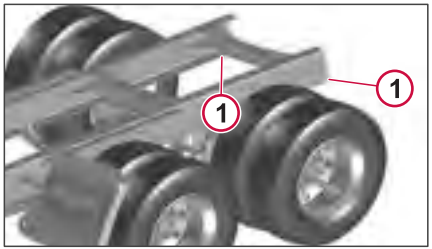
> **NOTE**
>
> If the rear axle is fixed to the chassis with straps etc. when the vehicle is lowered, the straps will burst when Automatic Ride Height control is activated later on.

If you have to lift the rear of the vehicle anyway, lift the towing hitch support cross member in the first instance. If the vehicle does not have a towing hitch support cross member, lift the chassis ends.

If you lift the vehicle by the chassis, the following applies:

1. The ignition lock must be in position I or II and the air suspension in "Automatic Ride Height" mode.
2. Lift the chassis until the wheels almost leave the ground. Take a rest until the air has drained out of the air bellows.
3. If possible, fix the rear axle to the chassis so that the air bellows can not slide apart.
4. Lift to the desired height.

TOWING

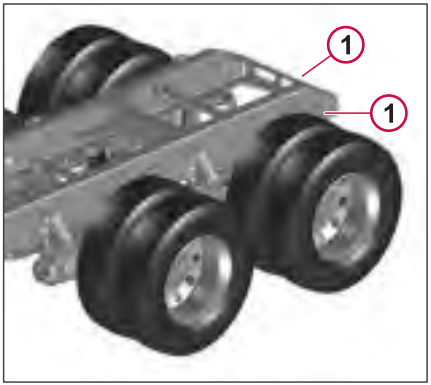


J302321

1 Lifting points on rear suspension, with air springs

Towing Backwards

- Use the towing hitch or the towing hitch cross member to lift the vehicle.
- If the vehicle does not have a towing hitch cross member, use the chassis end cross members for lifting.



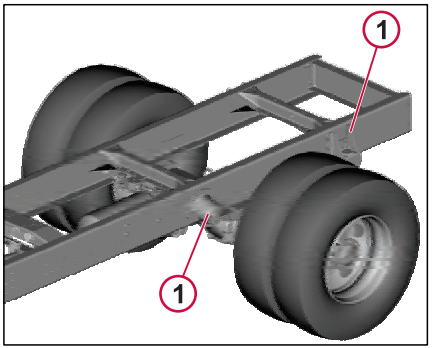
J302328

1 Tow from rear spring anchorage or trailer hitch hook

Towing Sideways

! NOTE
Use these methods for vehicle recovery only.

When towing sideways, select an attachment point close to the axle anchorage, such as a spring or torque stay anchorage. In other cases, the chassis could be subjected to such heavy loading that it could be bent.



J387430

1 Use a spring or torque stay anchorage

⚠ CAUTION

Attempting to start the vehicle using methods other than the ones described in this section of the manual may cause electrical damage to the vehicle.

In case of unexpected battery drain due to long parking or low usage of the vehicle, connecting an energy source to the Jump Charging Interface is the recommended method for charging the vehicle batteries and ultracapacitor (if equipped) using 12V battery chargers or another vehicle.

ⓘ NOTE

Your vehicle is equipped with a jump-charging interface, which is located on the left side of the cab.

ⓘ NOTE

Jump charging shall be performed only using the dedicated Jump Charging Interface. Do not attempt to connect the charger or external power source directly to the batteries and ultracapcitor (if equipped).

⚠ CAUTION

Ensure there are no loose connections between battery charger (or other vehicle) and Jump Charging Interface.

⚠ CAUTION

Do not connect the helper truck's negative cable to the dead truck's frame rail or other grounded metal.

ⓘ NOTE

DO NOT use battery chargers with high "boosting" capability. These produce a high voltage that could cause damage to the vehicle electrical and electronic components.

⚠ WARNING

Remember that batteries contain a hydrogen and oxygen mixture, which is highly explosive. A spark which could occur when you apply the jumper cables incorrectly could be enough to cause the battery to explode and injure you and damage the truck. The battery contains sulfuric acid, which can cause serious chemical burns. If you get any acid in your eyes, skin or clothes - rinse with large quantities of water. If you get any splashes in your eyes, contact a doctor at once.

⚠ CAUTION

The battery contains acid which is corrosive and poisonous. It is thus important that the battery is handled in an environmentally compatible manner.

⚠ WARNING

Always wear eye protection when working around batteries to prevent the risk of injury due to contact with sulfuric acid or an explosion.

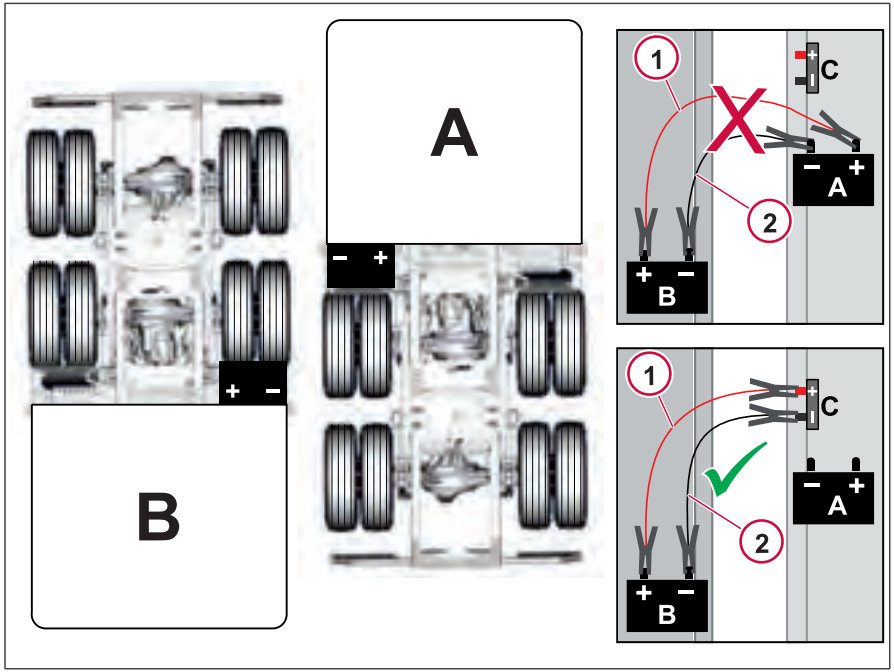
⚠ WARNING

Battery posts, terminals and related accessories contain lead compounds, chemicals known to the state of California to cause cancer and reproductive harm. Wash hands after handling.

Charging Specifications

- Vehicle accepts only 12 V input from the external source.
- Charging source must supply >10 A.

JUMP CHARGING



J473846

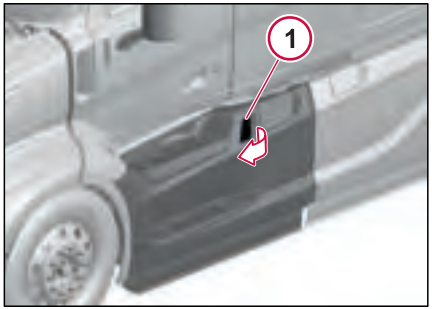
1 *Positive Cable (Red)*

2 *Negative Cable (Black)*

A. Truck with Dead Battery
B. Truck which charges the Truck A batteries.
C. Jump Charging Interface

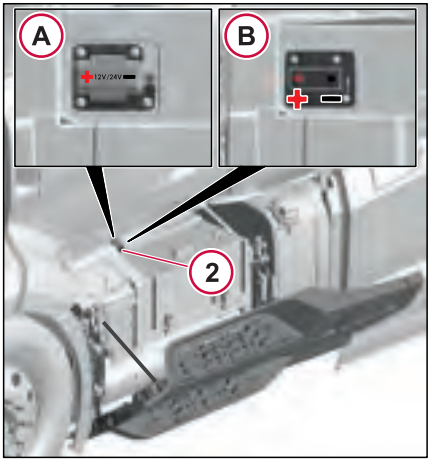
270346_1

Procedure for Charging (Using external 12V source)



J474496

1. Pull the lever **(1)** to open the chassis fairing (left-hand side).



J474497

2. Locate the Jump Charging Interface **(2)** and remove the top cover **(A)**

3. Connect the external power source to positive **(+)** and negative **(-)** studs of the Jump Charging Interface **(B)**. Refer to markup on the top cover

- Battery Management System will detect the connected voltage and begin charging the batteries (and ultracapacitor, if the vehicle is equipped) accordingly.
- Charging times will vary depending on initial battery voltage and charging input current.

Check Battery Voltage Status

Once the external source is connected for charging the batteries, wait until the batteries are sufficiently charged to crank the engine.

To check the battery voltage status:

- Turn the key to the On position.
- For a vehicle without ultracapcitor, check for the Battery gauge in the instrument cluster. If the battery gauge shows that the batteries are charged sufficiently, the vehicle is ready to be cranked.
- For vehicle with ultracapcitor, check for ultracapacitor charging pop-up in the instrument cluster. If there is no pop-up message, the vehicle is ready to be cranked. If yes, allow the ultracapcitor to be charged until the pop-up is no longer visible.
- Once the batteries are sufficiently charged, crank the engine.
- Disconnect the external charging source.
- Always close Jump Charging Interface with its top cover once the charging source has been removed. This protects the studs from dust and water splash.

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