

SERVICE INFORMATION

Volvo Truck Corporation



Product information on Volvo Trucks
for emergency services personnel

FM FH



Foreword

The descriptions and service procedures contained in this manual are based on designs and methods studies carried out up to December 2013.

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

The following levels of observations, cautions and warnings are used in this Service Documentation:

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

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

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

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

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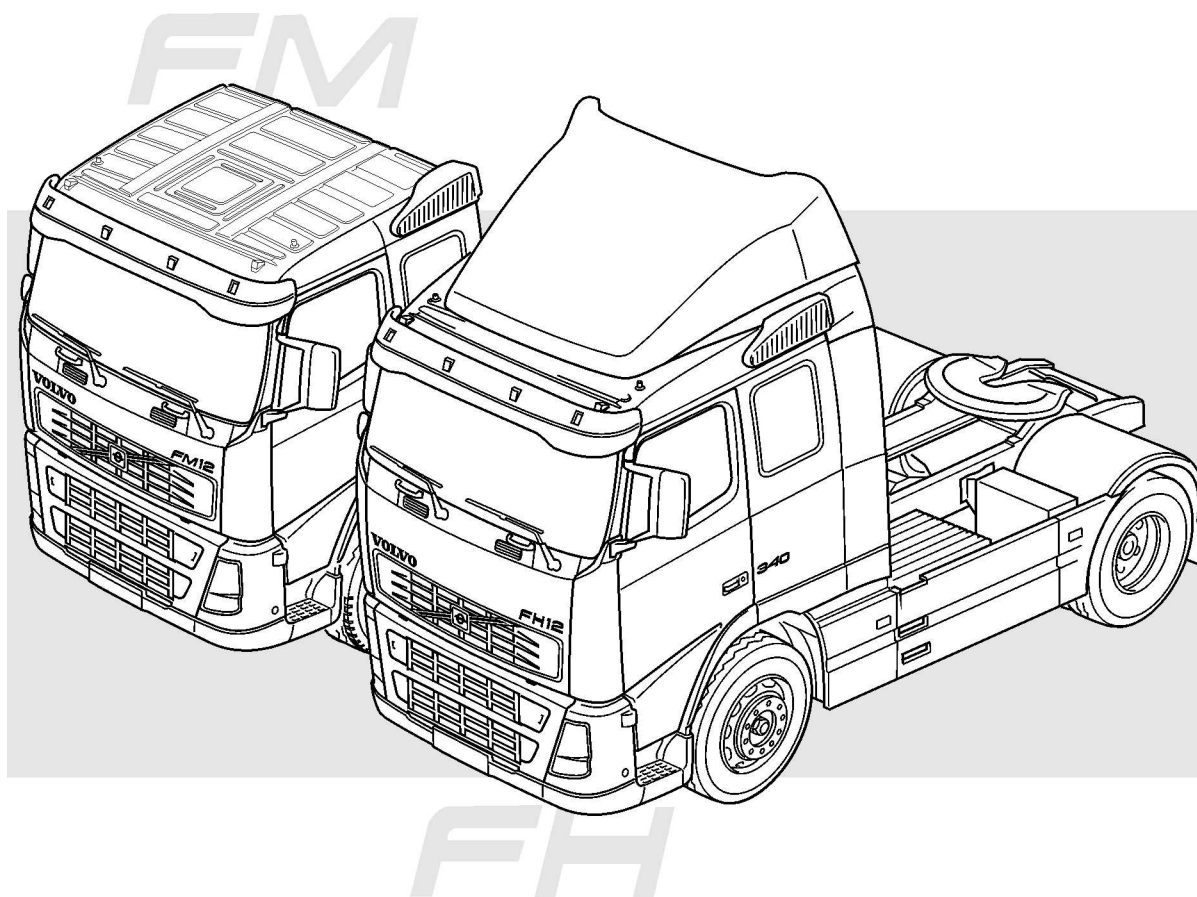
Product information - FM, FH

Product information on Volvo Trucks for emergency services personnel

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Introduction



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The purpose of this document is to give technical product information that can be used to develop routines and methods for rescue work in traffic accidents involving Volvo trucks.

It is intended for the local rescue services that carry out work at the site of an accident and includes the following information:

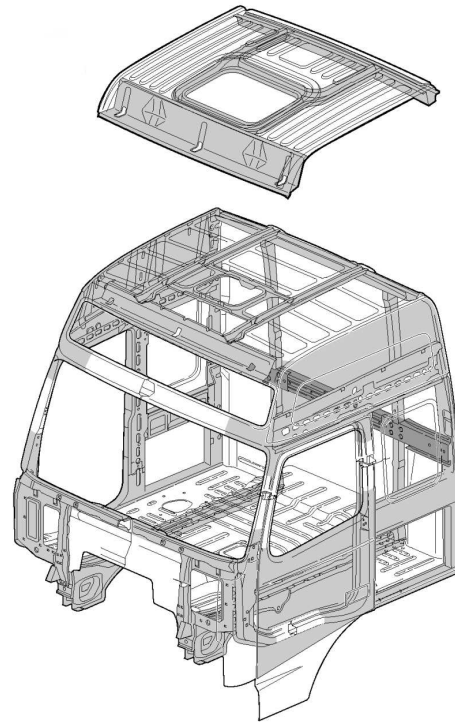
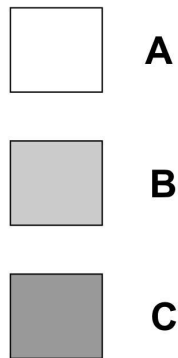
- Driver's cab
- Electrical system
- Driver's position and steering wheel adjustments
- SRS/ Airbag system
- SCR System

Cab

Older cabs are made of softer sheet steel that is welded together, while newer cabs are fabricated in high-strength steel.

Below is a diagram showing the areas in the cab where high-strength steel is used, indicated by the darker grey colour.

Cab reinforcement



- A Lower strength areas
- B Reinforced areas
- C High-strength steel

Electrical system

General recommendations:

There are two types of switches to break the electric power on the vehicle. These are the **main switch** and the **ADR circuit breaker switch**.

The main switch

- The main supply switch only functions when the engine is switched off. The power supply to the tachograph, central locking system, alarm and parking heater is NOT cut off.



CAUTION

Wait 2 minutes after the engine has shut down before using the main switch to ensure that the system is completely drained of urea solution.

The ADR circuit breaker switch

- There must always be an ADR circuit breaker switch on vehicles carrying dangerous goods.

When this switch is used, all electrical supply is cut whether the engine is running or not.



CAUTION

Note! If the ADR main switch is used to disconnect power and the ignition is still on, the SCR system will still be pressurised and will not have been drained of urea solution!

Note: Only disconnection from the battery or the ADR circuit breaker switch cuts ALL electrical supply.

- Subsequent to cutting the battery supply, energy is stored in the SRS control unit for some seconds, which is sufficient to activate the airbag or safety belt tensioner. To be sure that the system is dead, wait for approx. 3 seconds after cutting the supply from the battery.
- **Before disconnecting power: Consider any need to open doors or move the driver seat!** (See: "Driver's position", page 7)

If the driver seat is electrically adjustable, it will not be possible to adjust it once the power is removed, since the seat has no mechanical controls.

- The appearance and operation of the main switches varies; some vehicle models have no main switch.

How is the electrical supply cut off?

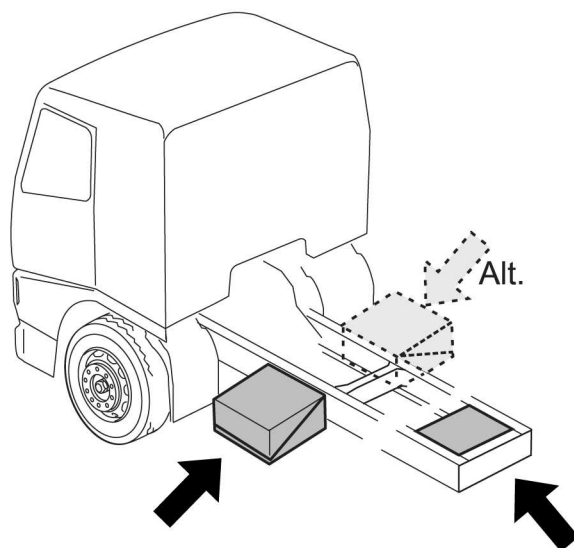
- **Switch off the main switch.** Not all of the truck's circuits are cut off; specific parts of the vehicle are still powered. Not all cabs have a main switch.
- **Disconnect battery circuit by removing/cutting cables from battery terminals.** This is the safest way of disconnecting power. All power is disconnected, even to the tachograph.

Note that specific parts of the vehicle are still powered if only the ignition key is removed.

With regard to SRS, energy remains stored in the SRS control unit for some seconds after the supply has been cut. This is enough to activate the airbag and seat belt tensioner for up to three seconds after the supply has been cut off.

The figure indicates the usual position of the battery.

- Side mounted battery box. Can be mounted on either left or right side.
- Back mounted battery box.



Different ways of cutting off the electrical supply:



D. Remote controlled mains switch.

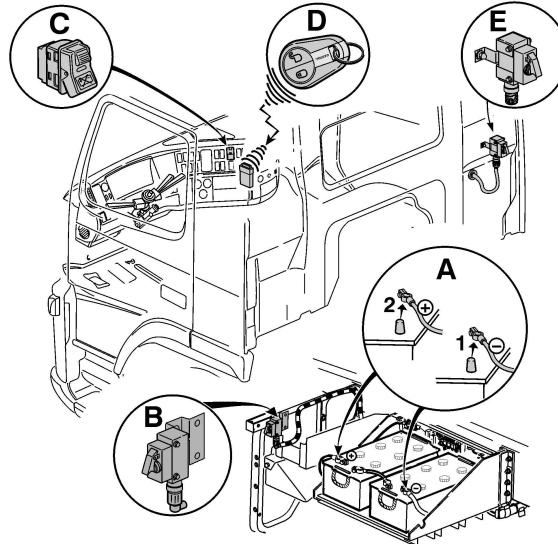
Not on all vehicles. Pressing the left button twice within five seconds switches off the main switch. Specific parts of the vehicle are still powered.

C. ADR circuit breaker.

Only provided on vehicles transporting dangerous goods. Disconnects ALL power.

B. Main switch/ battery switch.

Not on all vehicles. Certain circuits still provided with power.



E. External switch, ADR option.

This main switch is an option on vehicles transporting dangerous goods. Disconnects ALL power.

A. Battery.

When disconnecting the battery, start with the negative terminal. If you need to cut the cable, cut as close to the terminal as possible to include any secondary connections beside the main connection.

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Note: Note that not all of the components in the figure above are found on every vehicles!

Central locking

Some newer models equipped with an airbag, the doors are unlocked in a collision that activates the SRS system. A single control unit activates the airbag, belt tensioner and central locking system. The central locking system does not function for two minutes after being activated in this way.

For other models the central locking system is immobilised by breaking the battery circuit; in vehicles for the transport of dangerous goods central locking is also immobilised from the main supply switch.

Locked doors can be opened from inside using the opening handle.

Driver's position

Seat design

There are several seat models for each type of truck.

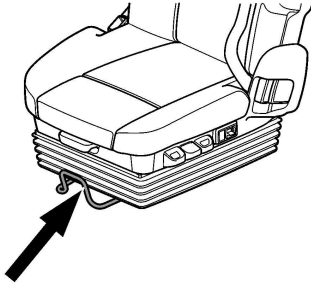
Back-and-forth seat position adjustment is in some cases mechanical, but the most advanced models have electrical adjustment.

Those with mechanical adjustment are adjusted via a handle under the front section of the seat cushion, and those with electrical adjustment via a button on the left side of the seat.

Note that seats with electrical adjustment have no mechanical adjustment system.

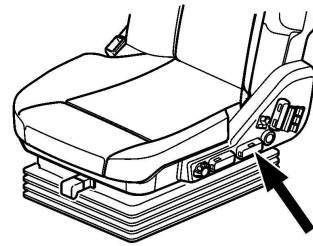
For more information see: "Electrical system", page 4

Back-and-forth seat adjustment



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Adjustment via the handle.



T8010449

Electrical adjustment.

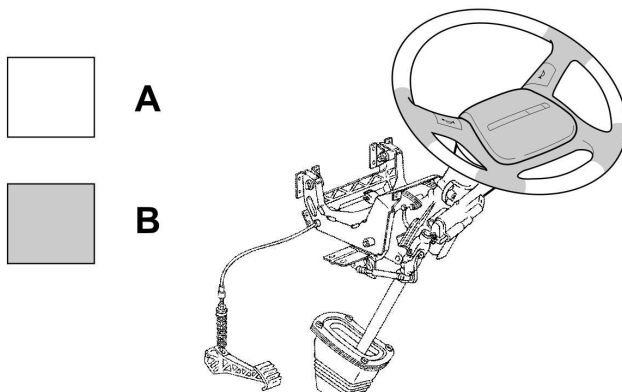
Steering wheel adjustment

The steering wheel position is adjusted via a foot pedal. The steering wheel can be adjusted for height, back-and-forth position and angle to the driver.

- On lefthand drive vehicles, the foot pedal is located above and to the left of the steering column.

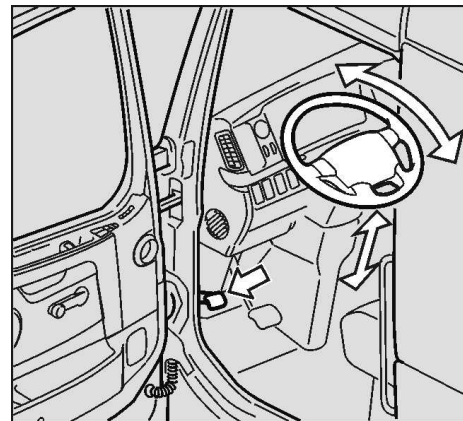
- On righthand drive vehicles, the foot pedal is located above and to the right of the steering column.

If it is necessary to cut the steering wheel, this is easiest in the areas marked in white, in the figure below. The remaining parts are reinforced.



Reinforcement profile, steering wheel

- A Lower strength areas
- B Reinforced areas



T0010228

Steering wheel adjustment

Supplemental restraint system (SRS)

General recommendations:

- Make sure that the battery is disconnected!
- The airbag module must never be disassembled.
- Use no current carrying instruments on the airbag or seat belt tensioner.

DANGER

Some parts of the SRS contain explosive material. Explosives can cause personal injury or death if handled incorrectly.

DANGER

Open fire can cause an airbag or seat belt tensioner to activate.

The SRS system

SRS/airbag is not standard; it is only in some models.

SRS is a complementary collision protection system to the seat belts and consists of an airbag and belt tensioner.

In more recent models, if a collision occurs, the SRS system sends a signal to the central locking unit, which unlocks the doors and activates the warning blinkers.

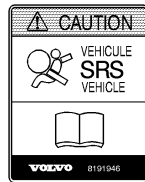
There are labels in the cabs of vehicles with SRS airbag informing of this:

On the windscreen



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On the steering column cover, top and bottom

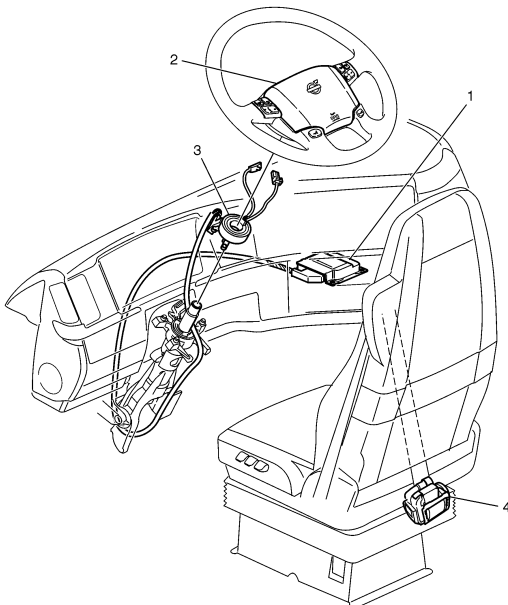


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On the driver's side B-upright below the lock lug



Overview of the SRS system and its components:



T8008552

1. Control unit.

In a collision the control unit sends an impulse which simultaneously activates the seatbelt tensioner and the airbag.

2. Airbag module.

If there is an airbag in the vehicle, the airbag module is located in the centre of the steering wheel. The airbag module is comprised of an electrical primer, a gas generator and an inflatable cushion.

3. Friction roller.

4. Seat belt tensioner.

A seat belt tensioner is optional equipment and is only found in some vehicles with airbag and seat belt.

Consists of an electrical primer and a powder charge which is activated.

The seat belt tensioner is activated at the same time as the airbag.

**The SRS airbag is designed to be activated in a frontal collision at high speed.
The SRS airbag has not been designed to activate with:**

- A collision against the side of the vehicle.
 - A collision against the back of the vehicle.
 - Tipping or rolling of the vehicle.
 - Frontal collision at “lower” speed or against soft objects, e.g. bushes or snow drifts.
-

Control unit

In order for the control unit to activate the airbag and tensioner, a high and continuous retardation must occur. In practice, such a high retardation can only be provided by a serious frontal collision.

Both a large G-force and lasting deceleration (braking) are required for the control unit to activate the system. Consequently, it would not be activated in the event of, e.g. a hammer blow, which would cause high G force but for a short duration.

If the collision is hard enough, the control unit activates the gas generator, inflating the airbag and activating the seat belt tensioner.

Note that the control unit contains a reserve energy function, which can activate the function even if the battery power is removed.

The airbag can still be activated up to 3 seconds after the battery voltage is removed, i.e. if one needs to be sure that the system is deactivated, wait 3 seconds.

SCR System

General recommendations:

- When the engine is shut down, the urea solution is pumped back to the urea tank, and the SCR-system is drained of urea solution. This process takes approximately two minutes. If the ADR main switch is used to disconnect power before the process is completed, the system may still be pressurised and contain urea solution!



CAUTION

If the ADR main switch is used to disconnect power and the ignition is still on, the SCR system will still be pressurised and will not have been drained of urea solution! Wait 2 minutes after the engine has shut down before using the main switch to ensure that the system is completely drained of urea solution.

- Urea is very corrosive and can damage electrical connectors. If urea solution comes into contact with unplugged electrical connectors, they must be replaced immediately. Cleaning does not help, since the urea solution quickly penetrates the cables and attacks the metal conductors.



CAUTION

Urea spilled on hot components can instantly become volatile. Turn your face away!



CAUTION

Note that the area around the silencer and exhaust pipe of a vehicle equipped with an SCR-system retains a high temperature considerably longer than a conventional vehicle.

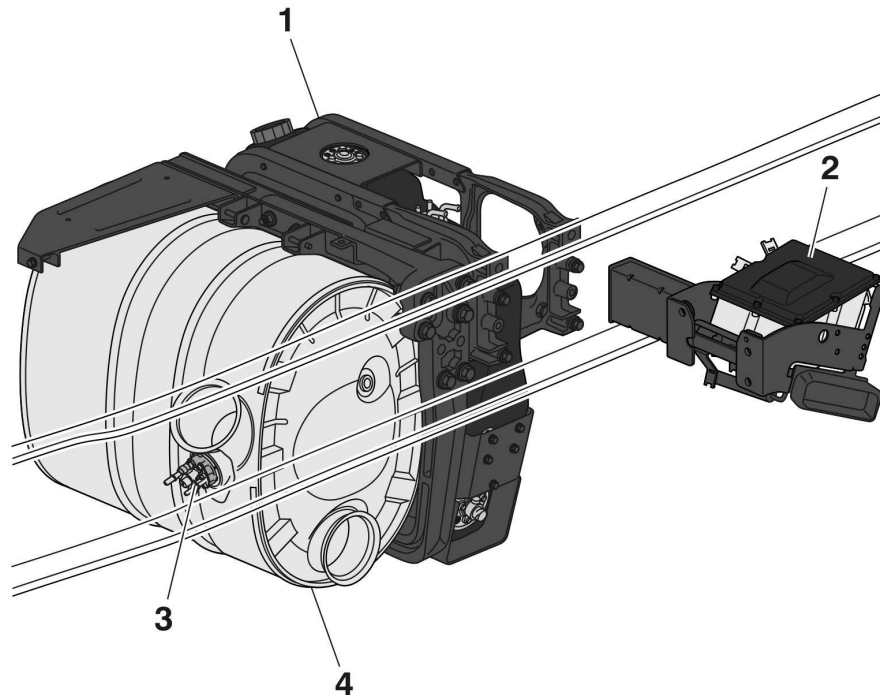
SCR system

The urea system is part of the exhaust treatment system that is installed on certain new engines in order to fulfil emission demand Euro 4.

A urea solution is injected into the exhaust before it passes through the catalytic converter and the oxides of nitrogen in the exhaust are reduced.

The main components of the SCR-system are the urea tank, pump unit, dosing unit and a silencer with built in SCR catalytic converter.

Overview of the SCR-system and main components:



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1. Urea tank
2. Pump unit
3. Dosing unit
4. Silencer

Urea solution

Urea solution comprises distilled water and 32.5% urea. It is a colourless liquid with a slight smell of ammonia.

Urea solution can be aggressive to certain materials, and should be handled with care.

The solution is not flammable.

At high temperatures, urea decomposes into ammonia and carbon dioxide and at temperatures below -11°C it can freeze.

Urea solution behaves very aggressive on metals, especially copper and aluminium.

Handling urea solution:

Skin contact:

Rinse thoroughly with luke-warm water and remove contaminated clothing

Eye contact:

Rinse thoroughly with water for several minutes and contact a doctor as required

With inhalation:

Breathe in fresh air and contact a doctor as required

With ingestion:

Drink water

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