

Driver's Handbook

Electronic Brake System (EBS)
Multiplex electrical system Version 2

VOLVO

Foreword

This manual contains information concerning the operation and function of the Electronic Brake System (EBS). The information in this manual applies to vehicles built January 2009 and later. Please keep this manual in the vehicle at all times.

Note: Illustrations in this manual are used for reference only and may differ slightly from the actual vehicle. However, key components addressed in this document are represented as accurately as possible.

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Order number: PV776-20196363

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Safety Information

IMPORTANT: Before driving this vehicle, be certain that you have read and that you fully understand each and every step of the driving and handling information in this manual. Be certain that you fully understand and follow all safety warnings.

IT IS IMPORTANT THAT THE FOLLOWING INFORMATION BE READ, UNDERSTOOD AND ALWAYS FOLLOWED.

The following types of advisories are used throughout this manual:



DANGER

Danger indicates an unsafe practice that could result in serious personal injury or death. A danger advisory banner is in **white** type on a **black** background with a **black** border.



WARNING

Warning indicates an unsafe practice that could result in personal injury. A warning advisory banner is in **black** type on a **gray** background with a **black** border.



CAUTION

Caution indicates an unsafe practice that could result in damage to the product. A caution advisory is in **black** type on a **white** background with a **black** border.

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

General

EBS (for multiplex electrical system Version 2) does not work in the same way as previous braking systems. In previous braking systems a particular pressure to the pedal applied a particular pressure to the braking system. With EBS a particular pressure to the pedal now gives a particular reduction in speed, while the pressure applied to the brake cylinders on the axles varies depending on the load of the axles.

The initial braking after reloading can identify differences and allows the braking system has to adjust to the new axle loading.

2 Manually Engaged Functions

Antispin (Traction Control System, TCS)

The Traction Control System (TCS) automatically reduces engine torque in the event of wheel spin. At speeds below 40 km/h (25 mph), TCS also functions as an automatic differential brake and brakes the driving wheels on one side when required.

Off-road TCS

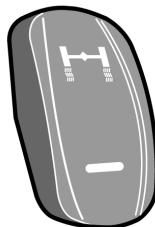
Engage the off-road TCS in difficult conditions, such as on sand, gravel or snow. TCS then allows the wheels to spin more. The function is activated by pressing the switch. Disengage the off-road TCS by pressing the switch again. When the off-road TCS is engaged an indicator on the switch lights up, at the same time as the level for engaging Electronic Stability Program (ESP) is raised slightly.

Note: Do not use the off-road TCS during normal driving.



T3014400

Display symbol when TCS is activated.

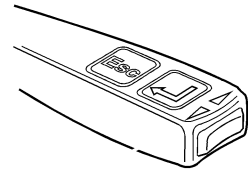


T0012059

Disengage TCS

Use the display control lever to disengage the TCS. The vehicle should be stationary. Please refer to the “Drivers Information Display (DID)” manual for more information about the display functions.

- 1 Scroll to the “Settings” menu (3 and 4)
- 2 Press “Select” (2)
- 3 Scroll to the “Traction control” menu (3 and 4)
- 4 Press “Select” (2)
- 5 Scroll to “Off” (3 and 4)
- 6 Press “Select” (2)



T3008810

The next time that the ignition key is turned to the drive position or the front axle rotates faster than 12 km/h (7 mph) the TCS will engage again.

Note: Switch off TCS before towing with a raised axle!

Note: Disengage the TCS during rolling brake tests!

If TCS is Activated After Changing a Wheel

If a smaller wheel is installed on the drive axle TCS may be activate.

Drive faster than 25 km/h (16 mph). The EBS system learns the difference in size between the wheels. How long for depends on how great the difference in size between the wheels is.

It may be difficult to drive because the TCS is limiting the engine torque. In this case engage terrain TCS (“Off-road TCS” page 2). Terrain TCS permits greater differences in wheel speed between the front axle and the driven axle. When Terrain TCS is engaged, it will take longer for the EBS system to learn the difference of the new wheel size.

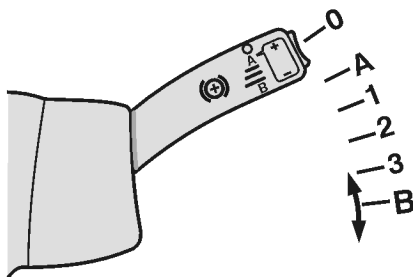
4 Manually Engaged Functions

Brake Blending

When the retarder lever is in the “A” position, the supplementary brakes are applied together with the normal brakes when the brake pedal is pressed.

The EBS ensures that the different brakes are used in the most effective way. The supplementary brakes are used as much as possible and the normal brakes are applied as required.

Note: The “B” position for the lever is only available on vehicles built with the I-Shift transmission. This position activates a braking program that allows a higher engine speed when engine braking is applied.



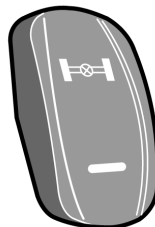
T0010263

Put the lever in position “A”

Engage Differential Lock

(This function is an option.)

On vehicles equipped with a differential lock, the differential lock can be coupled without pressing down the coupling. When the switch is pressed at speeds (below 40 km/h (25 mph)), the EBS system will slow the wheels so that they are all rotating at the same speed when the differential lock is engaged. At speeds above 40 km/h (25 mph) the EBS system waits (it does not brake the wheels) until the wheels are rotating at the same speed before engaging the differential lock.



T0012041

Differential lock engaged. The light on the instrument panel flashes.

For automatic engagement of the differential lock see “Automatic Engagement of Differential Lock (DLC — Differential Lock Control)” page 6 .

- 1 Set the switch to the lower position
- 2 Wait until the indicator light on the instrument panel flashes
- 3 Accelerate **carefully** so not to damage the drive axle and gear
- 4 Drive away from the slippery area
- 5 Release the accelerator
- 6 Disengage the differential lock

Note: The differential lock is not engaged until the warning lamp on the instrument panel flashes. **And remains engaged as long as the warning lamp is flashing, even if the switch is turned off.**

6 Manually Engaged Functions

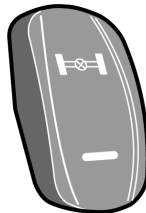
Automatic Engagement of Differential Lock (DLC — Differential Lock Control)

(This function is an option.)

Put the differential lock switch in the center position. The DLC is then activated.

The differential lock engages automatically when the drive wheels turn at different speeds and vehicle speed is below 15 km/h (9 mph).

The differential lock disengages if the vehicle speed exceeds 15 km/h (9 mph) or at the next gear shift.



T0012041

Overview of the Switch Functions

Switch position	Function
0 (upper position)	No differential lock engaged.
1 (center position)	DLC engaged.
2 (lower position)	Differential lock manually engaged.

Manual Engagement of the Differential Lock

See “Engage Differential Lock” page 4 .

Hill Start Assistance

(This function is an option.)

The function is activated by pressing the switch. The lamp on the switch, then lights up to indicated the activation.

Note: The function works differently depending on whether the vehicle is equipped with a manual or automatic transmission.



T0012045

Switch for hill start help.

- 1 Keep the bus still with the brake pedal
- 2 Release the foot brake.
The brake pressure is automatically retained for a few moments.
The symbol in the display is shown as long as the brakes are applied.
- 3 Start accelerating.

The brakes are automatically released two seconds after the brake pedal is released, or when the engine torque is sufficient.

Deactivate the function by pressing the switch again. The function is always disengaged when the engine is started.

8 Automatic Functions

ABS

ABS is part of EBS and is fully automatic.

Electronic Stability Program (ESP)

(This function is an option.)

ESP is a stabilizing system that reduces the risk of overturning and skidding.

If the system senses that the bus is going to tip over. It first cuts back the engine. If this is not sufficient, it then applies the wheel brakes to reduce the speed of the vehicle.

If the system senses a risk of skidding, it cuts back the engine and applies the wheel brakes as necessary to hold the vehicle on its course. If necessary, the supplementary brakes are also disengaged.



T0012128

The displays shows the symbol for ESP engaged because of the risk of tipping.



T3014400

Display symbol when the ESP is activated because of the risk of skidding.



WARNING

Drive the vehicle in the same way as vehicles without an ESP. ESP reduces the risk of tipping and skidding, but a bus can still tip over if the center of gravity is very high and the wheels hit a curb at high speed, or by careless driving. A bus can skid on slippery surfaces even if it is equipped with ESP.

Do not drive buses equipped with ESP through steeply banked curves (for example on a test track). Driving through steeply banked curves can cause the ESP to be engaged unnecessarily, which could be dangerous.

Engine Torque Control

(This function is an option.)

When the accelerator is released on a slippery road, the supplementary brake or the engine brake can lock the driving wheels. When this happens the supplementary brake is disengaged and the engine drives the driving wheels until they rotate at the same speed as the front wheels. This does not happen if the transmission is in neutral, the ABS is activated or the vehicle speed is less than 10 km/h (6 mph).



T3014400

Display symbol for regulation of engine torque.

Emergency Braking Assistance

(This function is an option.)

When the brake pedal is pressed quickly and forcefully the braking pressure is higher and the braking effect stronger. This function is there to enable rapid application of full braking force in emergency situations.

Equalizing Brake Pad Wear

Note: Does not apply to low entry buses.

If the brake pads wear more on one axle than another, greater braking force is distributed to the other wheels to even out the wear.

Note: This function works during gentle braking. During harder braking the braking force is divided so that braking occurs as effectively as possible.

A warning symbol is shown on the display panel when a brake shoe becomes more than 80% worn.



T5013668

Display symbol when a brake shoe is more than 80% worn.

Low Entry Buses

Buses with low entry have a wear warning, but do not perform the brake shoe wear evening function. The wear warning only applies to the drive and running axle, when the front axle has no wear sensor.

Predicted Brake Pad Wear

Note: Does not apply to low entry buses.

(This function is an option.)

The “Vehicle Data” menu displays information about when the brake linings must be replaced. This information can also be read off by a Volvo service shop.

Warning of High Brake Temperature

If the brakes become too hot the “CHECK” lamp illuminates and a symbol is shown on the display.

Note: If the temperature is allowed to rise even further, the feeling of the brakes changes so that the pedal has to be pressed harder to obtain the same braking effect as before.



T5013670

Warning symbol for high brake temperature.

Wheel Brake Monitoring

(This function is an option.)

If the braking effect on a wheel is weaker than on the other wheels, the “CHECK” lamp illuminates and a symbol is shown on the display. This does not necessarily mean that braking feels different as the other wheels brake harder. However a fault code is stored in the system and a Volvo service shop should examine the braking system.



T3014494

Warning symbol for poor braking effect.

Resetting Fault Codes

If the brake pedal is pressed when the pressure in the braking system is too low, several fault codes can be set. These codes can be removed in the following way:

- 1 Ensure that the vehicle is stationary.
- 2 Check the display to see that the air pressure is at least 9 bar (130 psi). If it is not, start the engine to allow the pneumatic system to pressurize.
- 3 Switch off the ignition so that the control unit is reset.
- 4 Start the engine without touching the foot brake.
- 5 Wait at least five seconds.
- 6 Slowly depress the foot brake until it is fully depressed (it should take at least one second to be fully applied from when it is released).
- 7 Hold the foot brake fully depressed for at least seven seconds.
- 8 Release the foot brake slowly (it should take at least one second from fully applied to when it is released).
- 9 Switch off the ignition.
- 10 Wait at least five seconds.
- 11 Switch the ignition on.
- 12 Check the fault codes.

After resetting, the fault codes should be inactive. Otherwise the fault remains.

If it takes longer than 25 seconds to carry out steps 10, 11 and 12 or the fault codes will not be deactivated.

Note: If the above procedure does not help, contact a Volvo service shop for further examination of the system.

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