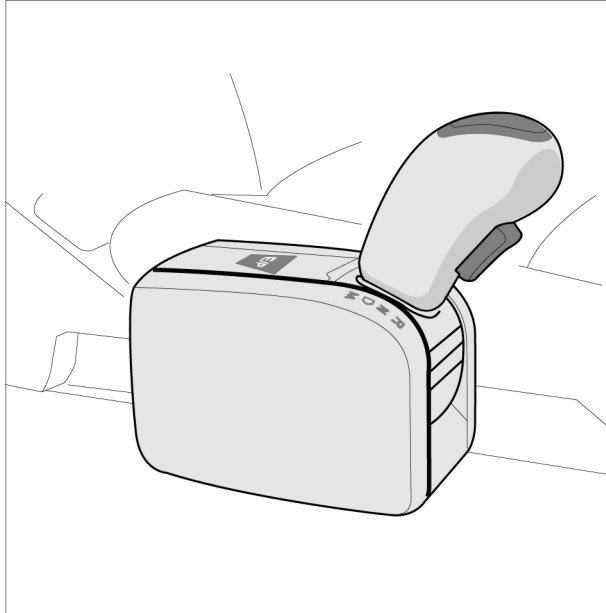


Operating Instructions

Operating Instructions I-shift



T4033051

VOLVO

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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.

Introduction

This booklet is intended to help the driver about how to operate properly and take care of the I-Shift transmission.

I-shift, general

I-shift is an automatic transmission with 12 forward gears and 4 reverse gears. The clutch and gear shifting are operated fully automatically so that the driver can concentrate on the traffic. The gear selector, located on the driver's seat, can be tilted horizontally to the seat cushion. Tilting the selector will make it easier for the driver to move around in the cab.

I-shift is delivered with two different software packages. As some functions are optional, not everything in this document is applicable to your transmission.

2 Instruments and controls

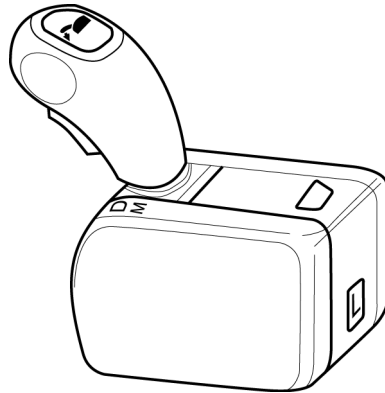
Gear selector

The gear selector permanently attached to the seat and the gear lever can be tilted to give the driver room to move with the lever out of the way.

There are two types of gear selector:

Standard

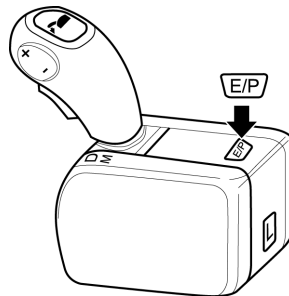
- 4 positions, R-N-D-M
- M= locks the current gear
- without +/- button
- without economy/performance button (E/P)



T4033019

Professional

- 4 positions R-N-D-M
- M= manual gear changing
- with +/- button
- with economy/performance button (E/P)



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Continued descriptions in this instruction are based on “Gear selector Professional”. All information is also relevant for “Gear selector Standard” except that describing +/- and E/P buttons.

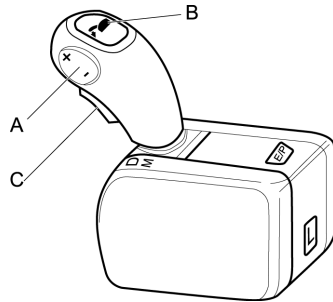
Gear selector

On the side of the gear lever facing the driver’s seat, there is a +/- button (A) with spring-loaded up and down positions and a neutral position in the middle. On the top is a button (B) that is used to tilt the gear selector to horizontal position. On the front, there is also a gear selector lock (C) to prevent inadvertent engagement of a gear. The lock must be pressed in for the following gear shifts:

- from N to R.
- from N to any one of the forward gears.

The lock does not need to be pressed when the gear selector is moved from D to M.

The gear selector can always be moved to N without having to press a button.



T4033021

4 Instruments and controls

Gear selector positions

The gear selector is used to choose between four different driving programs.

- R Reverse. The bus must be stationary when selecting R.
- N Neutral position. No gear engaged.
- D Automatic program. The gearbox itself selects the gear with respect to load, slope, speed and accelerator position.
- M Manual program. Changing up and down is done with the +/- button on the gear lever.
- F Tilted.

Tilting the gear selector

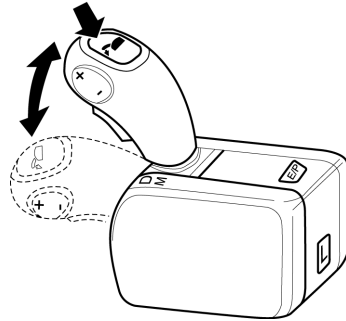
The gear lever is tiltable to horizontal position so that it is out of the way and allows the driver to move around in the driver area.

To tilt the selector:

- Make sure the selector is in neutral position N.
- Press in the button on top of the gear selector and tilt the selector forwards, past the reverse position R, to horizontal position.

To raise the selector for driving:

- Move the selector up, past the reverse position R, until it locks in neutral N.



T4033022

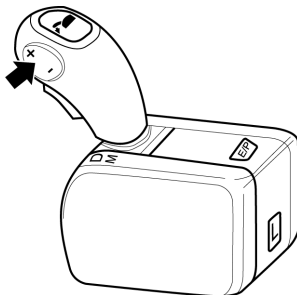
6 Instruments and controls

Buttons

Changing up/down

The +/- button is used to:

- change up or down one step at a time when in manual mode
- adjustment of gears in automatic mode
- to select reverse, see “Reverse gears” page 21
- choice of start gear in automatic mode

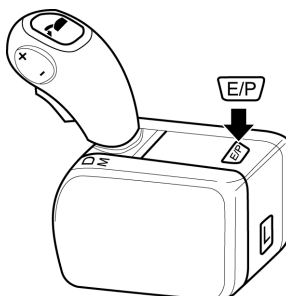


T4033023

Economy/Power (E/P)

There is an economy/power button (E/P) on top of the gear selector. This is used to:

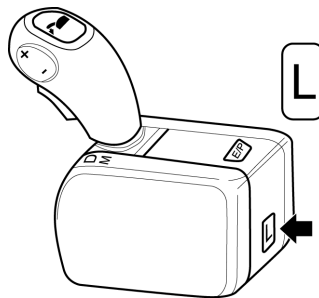
- switch between the economy program and the power program



T4033024

Limp-Home (L)

L is used to activate the limp-home mode, see “In case of gearbox malfunction” page 22.



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8 Instruments and controls

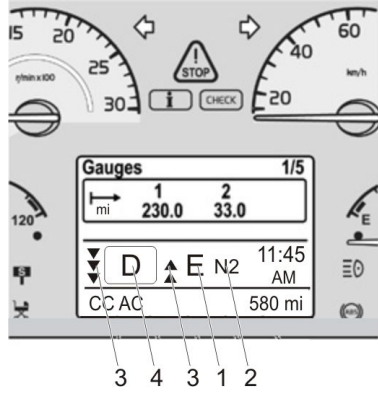
Display

Select the GAUGES menu in the display to view information on I-shift. Information on the gearbox is shown on the driver display.

Please refer to “Driver Instruction Display” for information on how you set the information on the gearbox as the default display.

The gearbox section is divided into smaller sections showing:

- 1 Driving program
- 2 Selected gear
- 3 Available gears (down/up)
- 4 Lever position



T8055856

1. Driving program

The section to the left of the gearbox section shows the driving program. The following driving programs are available:

E = economy

P = power

B = braking¹

L = Limp-Home function



T8055857

When the selector is tilted (see “Tilting the gear selector” page 5) the programme package the gearbox is equipped with is shown:

B = Basic

CO = Commuter traffic

LH = Line Haul traffic

TC = Tourist & Charter traffic

¹ The brake program is included in some program packages as an option.

2. Selected gear

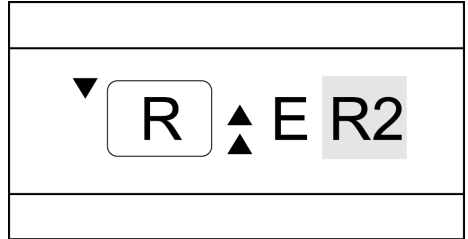
The section to the right of the gearbox field shows the selected gear.

Gear 1 - 12

N = neutral

(N1 = low split, N2 = high split)

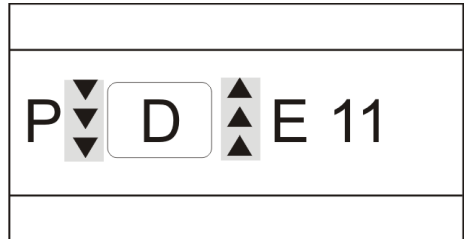
R = reverse



T4033036

3. Available gears

The field second from the left in the gearbox field shows, with arrows, the number of lower gears that are available (maximum 3 arrows). The field second from the right in the gearbox field shows how many higher gears are available (maximum 3 arrows).



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4. Lever position

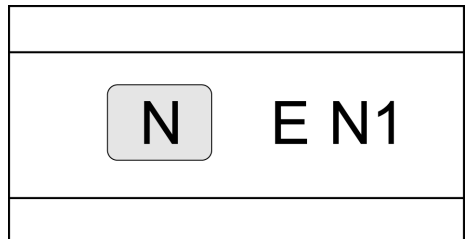
The section in the middle of the display shows the gear selector position.

R = reverse

N = neutral

D = drive

M = manual/locks current gear



T4033037

10 Starting and stopping

Starting instructions

Put the gear selector in the neutral or tilted position or the engine will not start.

When the air pressure to the gearbox is too low, a warning will be displayed automatically. An icon will appear on the display at the same time as the information lamp comes on. Wait until the lamp has gone out before driving off.



T3014366

Information lamp



T3008849

Icon for low air pressure to gearbox

Stopping the bus

When the vehicle is stationary:

- Apply the parking brake.
- Move the gear selector to N, neutral.
- Switch off the engine.



DANGER

Always apply the parking and put the gear selector in N when the vehicle is parked or whenever the driver leaves the driver position. Failure to apply the parking brake may result in unexpected bus movement resulting in possible personal injury or death.

Program package

Gearboxes have different characteristics and functions depending on the program package that is installed. The following program packages are available:

- **Basic** is the standard gearbox program
- **Commuter** is suited to the requirements of commuter traffic and includes functions that provide improved fuel economy and also make the bus more easily maneuverable.
- **Line Haul** is suited to the requirements of commuter traffic and includes functions that make the bus more easily maneuverable.
- **Tourist & Charter** are suited to the requirements of tourist traffic. The program also includes functions that provide improved fuel economy and make the bus more easily maneuverable.

12 Driving

Basic is the standard program and the other two programs include extra equipment. The table below shows the functions that are included in the different program options.

Function	Ba- sic	Commuter	Line Haul	Tourist & Charter
Gear selector				
Gear selector, standard	x	x		
Gear selector, Professional			x	x
Functions				
Launch control		x	x	x
Enhanced Shift Strategy		x	x	x
Kick-down			x	x
Eco Roll incl Smart cruise control				x
Gear selection Adjustment In Auto				x
Possible optional functions	Ba- sic	Commuter	Line Haul	Tourist & Charter
Eco Roll incl Smart cruise control		o	o	

Function description

Standard characteristics

- **Performance Shift**
The function selects the best way of performing a gear shift. This gives faster and more comfortable gear changing.
- **Basic Shift Strategy**
Drive choice of pulling away gear See page 15.
- **Basic Gear Shift Adjustment**
Enables adjustment of automatically selected gear during engine braking.
- **Gearbox Oil Temperature Monitor**
A warning system informs the driver if the oil temperature becomes too high.

14 Driving

Optional characteristics

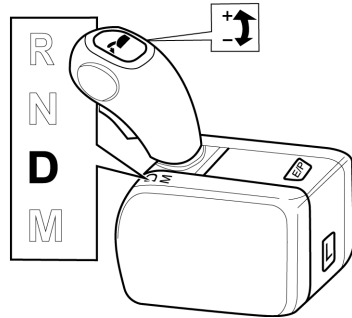
- **Eco Roll (VEB or retarder required)**
Automatic in and out engagement of the freewheel function, with the aim of reducing fuel consumption. When the accelerator pedal is released, the drive line is disconnected so that the vehicle can roll freely, and the engine is brought down to idling speed. See page 16.
- **Smart Cruise Control**
Only active when cruise control is activated. Saves fuel by deactivating the auxiliary brakes in certain conditions. This function improves cruise control by disengaging the auxiliary brakes during uphill driving.
- **Launch Control**
Permits clutch control at low speeds by using the brake pedal. Permits the engine to idle without the clutch slipping. Regulates the engine torque when pulling away to optimise gear changing and avoid high RPM.
- **Enhanced Shift Strategy**
Works together with EBS as compensation for lack of engine braking during gear changing. The function enhances comfort.
- **Gear Selection Adjustments in Auto**
Enables selection of gears in automatic mode even when the accelerator pedal is depressed.
- **Kickdown**
the Kick Down function provides maximum acceleration.

Drive shifting

The easiest way to drive the bus is use position D. Gear changing is performed automatically and the driver can concentrate on driving the bus.

When changing gear, the system will govern the clutch, gearbox and throttle. The system selects the gear and the point in time for gear changing for optimum driving performance based on accelerator pedal position, vehicle weight, road inclination, vehicle acceleration, etc.

In automatic mode it is also possible to adjust the gears up or down. The arrows in the display show how many steps it is possible to change up or down.



T4033026

Automatic choice of starting gear

The gearbox can also select a suitable pulling away gear based on vehicle weight and road inclination.

Adjustment of pulling away gear

You can select a pulling away gear by using the + and - buttons.

16 Driving

Freewheel (Eco-Roll)

The freewheel can be activated if the lever for the auxiliary brake is in position D and if E+ is shown in the display. When the freewheel is activated, the split gear is set to N, neutral. The freewheel is activated differently depending on whether the cruise control is activate or not.

- 1 If the cruise control is active:
 - Free wheel is engaged in downwards slopes when the speeds exceed the selected driving speed (for example 50 mph). The selected permitted excess speed must be 4 mph or more.
 - The free wheel is disengaged when the speed exceeds the set excess speed or below the set driving speed (for example 50 mph).
- 2 If the cruise control is not active:
 - The free wheel is engaged when the accelerator is released and the road is flat or has a small slope upwards or downwards
 - The free wheel is disengaged when the brake pedal is depressed, the accelerator is depressed, the lever for the auxiliary brake is set in position 0, 1, 2, 3 or B or if the gear selector is set in position M.

When the free wheel is activated, N is shown as the gear in the info display and the engine idles.

Locking gear

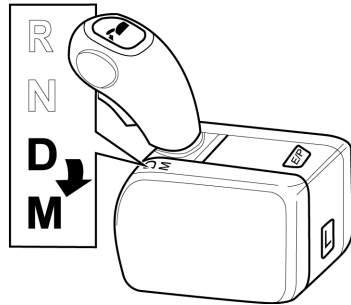
This function is used only when driving with the automatic program D

The function can be used in all forward gears (1 to 12).

Whenever gear changing is not desired, (e.g. driving up a hill), move the selector from D to M. No further gear changes will be carried out and the current gear will remain engaged. The display shows an M.

To return to the automatic program, move the selector back to D again.

Note: There is risk of over revving when the gear is locked.



T4035027



CAUTION

Pulling away in too high a gear causes excessive wear to the clutch and can increase the risk for breakdown in the clutch.

18 Driving

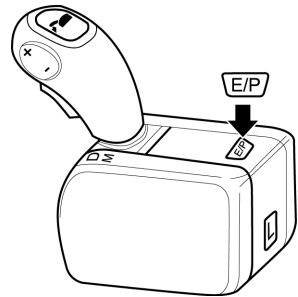
Driving program

There are three different driving programs:

- economy
- power
- braking

Economy

When the engine is started the economy program is always selected (shown as an E on the info display). The economy program gives priority to economical driving with low fuel consumption and is primarily used when driving under normal conditions.



T4033024

Power

The power program is engaged/disengaged using the E/P button (see illustration). The Power program gives driveability the highest priority.

To save fuel, the performance program is disengaged automatically after 30 seconds unless the accelerator is fully depressed and high gear is selected.

Brakes

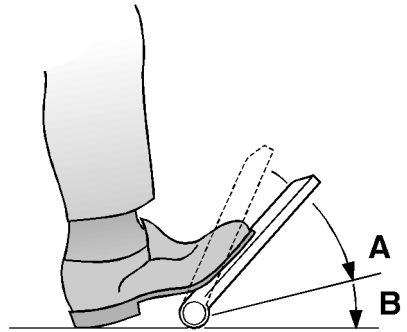
A special braking program can be engaged using the auxiliary brake lever. See“ Driver’s Manual”, section on auxiliary brake.

Kick-down

Kick-down is activated by pressing the accelerator pedal all the way down to the floor (position B). The kick-down program optimises gear selection/throttle for maximum acceleration. This is possible in both economy and power programs but not in manual position M. (Kick-down is an option.)

Position A = full throttle

Position B = kick down



20 Driving

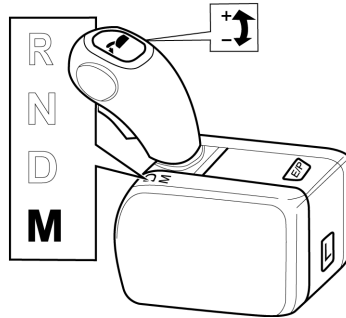
Manual shifting

It is possible to drive the bus with full manual gear changing or take over from the automatic gear changing system whenever required. Gear changing is done by first pulling the lever to the manual position M. The +/- button on the side of the lever is then used to select the gear.

To press the +/- button once for each gear change up or down respectively, to the required gear.

Press the +/- button several times to shift several gears at once.

Note: When changing a gear, the accelerator pedal should **not** be released.



T4033028



CAUTION

Starting in a too high gear exposes the clutch to high levels of wear.

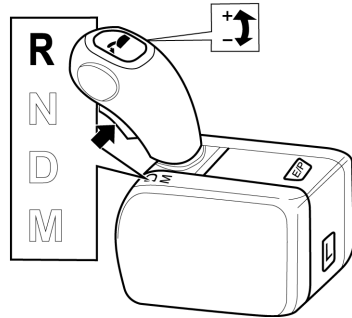
Reverse gears

The gearbox has four reverse gears (R1 to R4). The bus must be stationary before reverse gear can be engaged. The system will select R1 automatically when the gear lever is moved to R.

When driving, it is possible to shift between gears R1 and R2 and between R3 and R4. To shift gear between R2 and R3 the bus must be stationary.

Note: The gear selector lock must be pressed in before the gear selector can be moved from N to R.

Use the +/- button on the gear lever to change gear manually.



T4033029



CAUTION

Starting in a too high gear exposes the clutch to high levels of wear.

22 Driving

In case of gearbox malfunction

When a fault occurs on the gearbox which means that the vehicle cannot be driven, activate Limp home-function and drive on.

Note: The Limp-Home function should only be used for short distances.

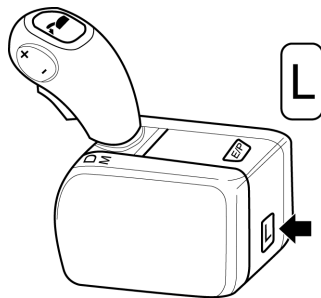
Activate Limp-Home as follows:

- 1 Hold in L on the gear selector cover
- 2 Move the gear selector to D
Limp-Home is activated
- 3 Move the gear selector to M
- 4 Professional: Select a gear using the +/- button on the gear lever.
Standard: Only 1st gear in Limp Home.

When Limp-Home is selected, it is not possible to drive if the selector is in position D. Only gears 1, 3 and 5 forwards and 1 reverse can be used. Gear shifting is only possible when the bus is stationary.

To select reverse, move the selector to R. Move the selector back to M to drive forwards again. It is not necessary to press the L button again.

The Limp-Home function will be disengaged when the ignition is turned off.

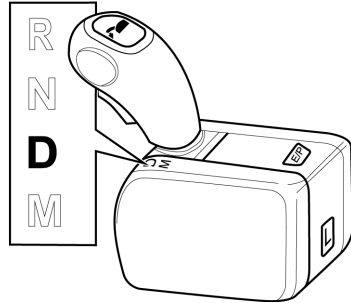


T4033025

Starting uphill/downhill

If the bus is equipped with “Hill Start Aid” it should be used.

- Keep the bus stationary using the parking brake.
- Put the gear selector in D.
- Press the brake pedal.
- Release the brake once the clutch starts to pull.



T4033038



CAUTION

Never hold the vehicle stationary on an upward slope using the accelerator pedal. The clutch could overheat, which could cause it to fail.

24 Driving tips

Clutch

The clutch is a dry disc type, i.e. has no torque converter. Therefore, never allow the clutch to slip in too high a gear when pulling away. The information lamp will come on and a symbol will appear on the display if the clutch overheats.

If the lamp lights up when the vehicle is started and the truck is already moving, continue driving.

If the lamp lights up when the vehicle is started and the truck is not moving, set the gear to position A or position R and let the motor idle until the light goes out.

When starting in manual position, choose 1st gear to avoid straining the clutch.



CAUTION

Never hold the vehicle stationary on an upward slope using the accelerator pedal. The clutch could overheat, which could cause it to fail.

Declutching

If rapid declutching is required, e.g. in slippery conditions, move the gear selector to N, neutral.

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VOLVO

Volvo Bus Corporation

Göteborg, Sweden