VOLVO
for life

Course Code: 0819

2004 Model Year Product, Featuring the R-Range

TECHNICAL UPDATE 1

Name:_____ S.S.N./S.I.N.:_____ Retailer/Code:_____ Date:_____

IMPORTANT SAFETY NOTICE

WARNING: Before performing service, diagnosis or troubleshooting procedures on a vehicle equipped with safety devices containing pyro-technical igniters, i.e., airbags, seatbelt tensioners, side impact curtains, etc., **you must be aware of certain precautions, and follow special procedures to help ensure your safety**. Refer to applicable SAFETY SYSTEM service information for these procedures and precautions.

NOTE: The information contained in this manual is intended for technical training purposes **ONLY**. Always refer to appropriate Volvo service information & wiring diagram manuals when performing fault tracing or service procedures.

Following proper service and repair procedures is essential for the safe, reliable operation of motor vehicles, as well as for the personal safety of the individual doing the work. This manual provides general directions for accomplishing service and repair work with tested, effective techniques.

Numerous variations in procedures, techniques, tools and parts for servicing vehicles, as well as the skill of individual doing the work cannot possibly be anticipated or provided for. Accordingly, anyone who departs from instructions provided in this manual must first establish that they compromise neither their own personal safety nor the vehicle integrity by their choice of methods, tools or parts.

As you read through the procedures, you will come across NOTES, CAUTIONS, and WARNINGS. Each one is there for a specific purpose. NOTES give you added information that can help you to complete a particular procedure. CAUTIONS are given to help prevent you from making an error that could damage the vehicle. WARNINGS remind you to be especially careful in areas where carelessness can cause personal injury. The following list contains some general WARNINGS that you should follow whenever you work on a vehicle.

- Always wear safety glasses for eye protection.
- Use safety stands whenever a procedure requires you to be under the vehicle.
- Turn the ignition switch OFF unless otherwise required by the procedure.
- Set the parking brake when working on the vehicle. If you have an automatic transmission, set it in PARK unless instructed otherwise for a specific service operation. If you have a manual transmission it should be in NEUTRAL unless instructed otherwise for a specific service operation.
- Operate the engine only in a well-ventilated area to avoid the danger from carbon monoxide.
- Keep yourself and your clothing away from moving parts when the engine is running, especially the cooling fan and belts.
- To prevent serious burns, avoid contact with hot metal parts such as the radiator, exhaust manifold, tail pipe, catalytic converter and muffler.
- Do not smoke while working on the vehicle.
- To avoid injury, always remove rings, watches, loose hanging jewelry, and loose clothing before beginning to work on a vehicle. Tie long hair securely behind your head.
- Keep hands and other objects clear of the radiator fan blades. Electric cooling fans can start to operate at any time even with the ignition turned OFF.

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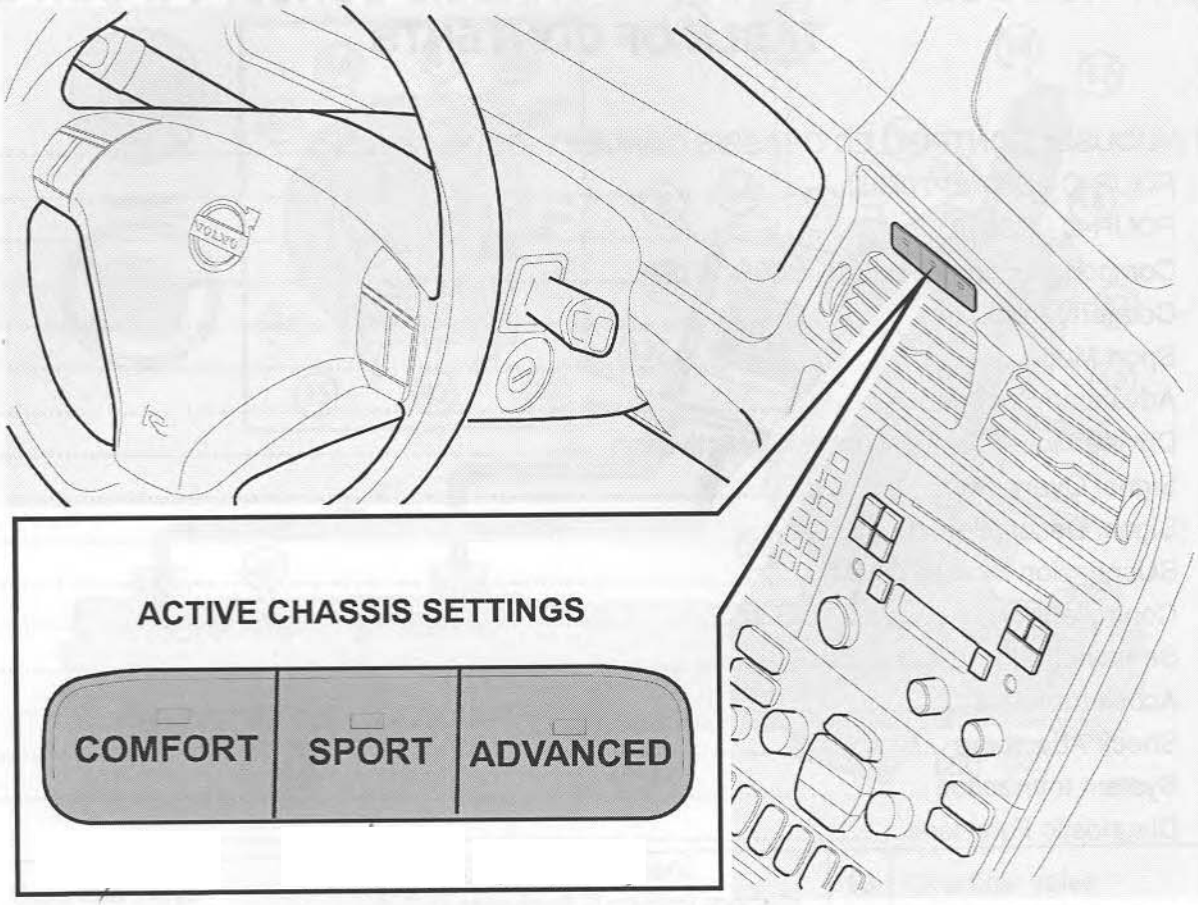


CONTINUOUSLY CONTROLLED CHASSIS CONCEPT (FOUR-C)

FOUR-C – S60R/V70R

ACTIVELY CONTROLLED CHASSIS

The S60R and V70R have an advanced chassis system that is controlled electronically. The system is based on a technology known as FOUR-C (Continuously Controlled Chassis Concept).

The driver determines the handling characteristics of the car. The driver varies the chassis setting and degree of stability control – while driving. The system is activated automatically when the speed of the car exceeds 1 km/h (0.6 mph).

Three Positions

Three different positions – Comfort, Sport and Advanced Sport – can be selected using the ASC switch on the instrument panel.

The FOUR-C System

The FOUR-C system consists of two control sub-systems.

Body	Chassis
DCC (Dynamic Cornering Control)	BGC (Brake Grip Control)
DLC (Dive and Lift Control)	BRC (Bump and Rebound Control)
DBC (Dynamic Body Control)	WHC (Wheel Hop Control)
	ASC (Advanced Sport Control)

ACS Switch

The ACS switch is connected to the SUM (SUspension Module) control module.
The selected driving program is confirmed by an illuminated LED on the active button.

Reversing

FOUR-C is not activated in reverse.

Automatic Gearbox

If the driver selects Advanced Sport in cars with an automatic gearbox, the TCM selects Sport shift control.

Choice of Chassis Properties

The driver can reset the chassis properties while driving – when the nature of the road changes or to change driving style. The change takes place in a few milliseconds.

Other Cars with Active Chassis Control

- Chevrolet Corvette (Delphi system)
- BMW 7 series (Sachs – CDC + ARC + Level control)
- Lancia Thesis (Sachs)
- Ferrari Modena 360 (Sachs)

Lowered Chassis

The R models have a lowered chassis compared with other AWD models. This lowers the roll center and ensures a low center of gravity. The aerodynamics and driving stability are improved at high speeds.

The roll center denotes the point in the chassis geometry around which the car rolls when cornering.

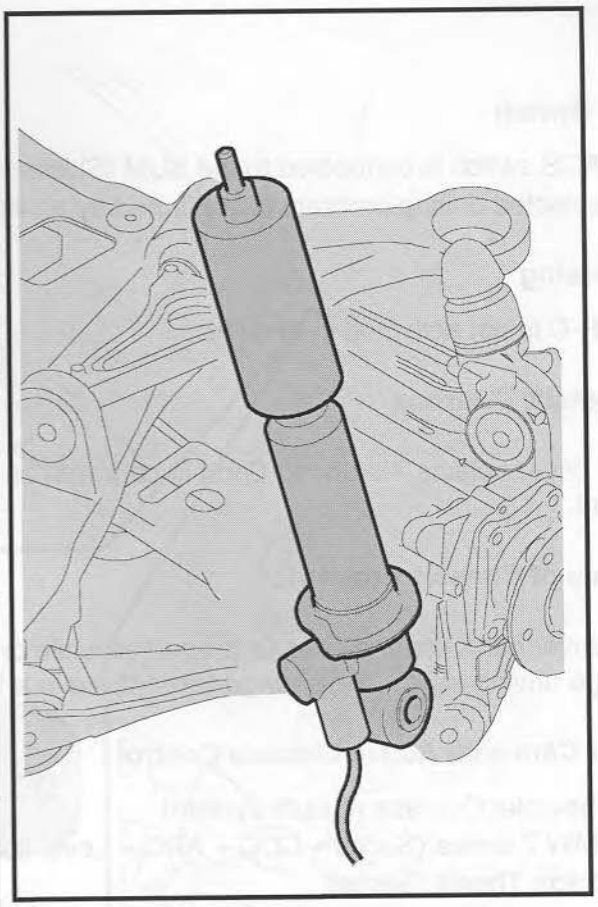
Ground Clearance, V70R (front/rear):

Compared with V70 AWD: -20mm/-28mm
Compared with V70 FWD: -10mm/-4mm

Ground Clearance, S60R (front/rear):

Compared with S60 AWD: -16mm/-23mm
Compared with S60 FWD: -6mm/+7mm

The Continuously Controlled Chassis Concept cannot be combined with Nivomat shock absorbers.



FOUR-C – S80

DIFFERENCES COMPARED with S60R/V70R

System

There is only one button, which is located on the ACS switch on the CCM.

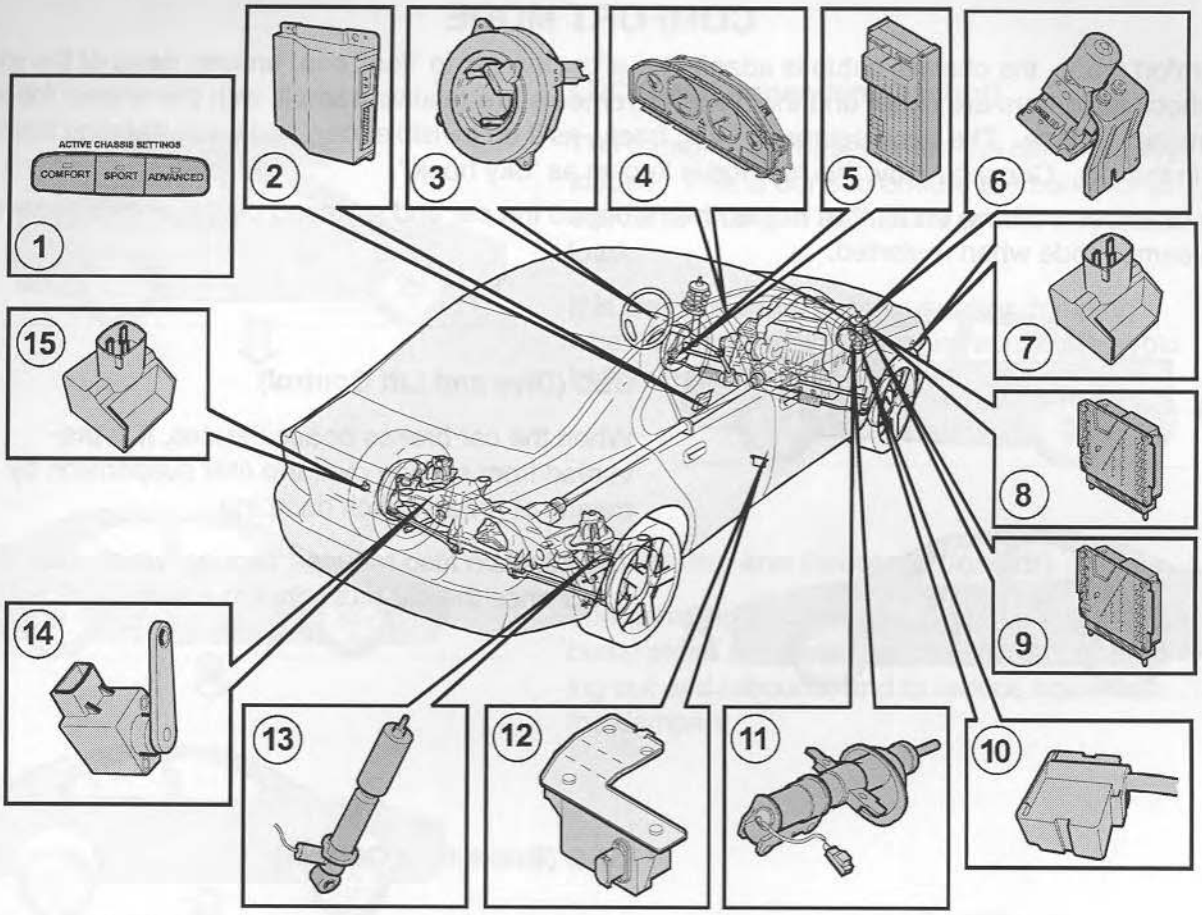
Two settings – Comfort and Sport. Confirmed by an illuminated LED on the button.

The normal position is Comfort. Sport is selected only when the button is pressed.

When the ignition is switched off, the system returns to Comfort mode.

Shock Absorbers

The rear shock absorbers are different in the S60R/V70R and S80, due to differences in the design of the rear suspension.



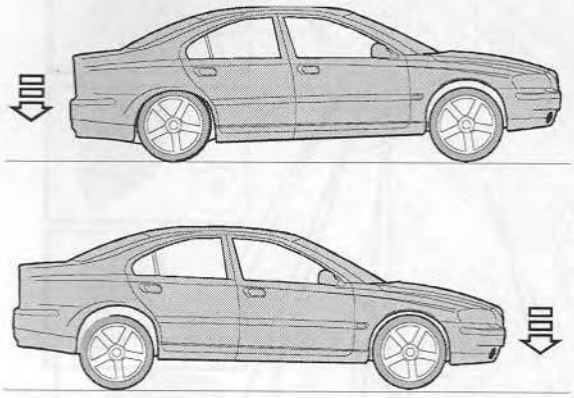
COMPONENTS and LOCATION – S60R/V70R

1	ACS switch	9	TCM (Transmission Control Module)
2	SUM (SUspension Module)	10	Accelerometer, shock absorber
3	SAS (Steering Angle Sensor)	11	Shock absorber, front
4	DIM (Driver Information Module)	12	DSTC sensor module
5	CEM (Central Electronic Module)	13	Shock absorber, rear
6	BCM (Brake Control Module) RHD location shown	14	Level control sensor
7	Accelerometer, front	15	Accelerometer, rear
8	ECM (Engine Control Module)		

COMFORT MODE

In Comfort mode, the chassis setup is adapted to allow the car to 'float' over uneven parts of the road. The shock absorbers are softer and the body movements are relatively small, with the wheels following the uneven surface. The body seems to hang freely, as if on invisible, damped wires hanging from a hook in the sky. Consequently, this method is known as 'Sky hook.'

If you have been driving in Comfort mode, then stopped the car and switched off the engine, it remains in the same mode when restarted.

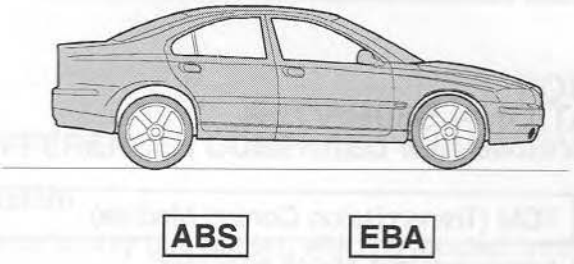


DLC (Dive and Lift Control)

When the car brakes or accelerates, it is prevented from settling over the rear suspension by means of greater pitch damping.

This function also reduces 'rocking' which may occur once the car has come to a stop.

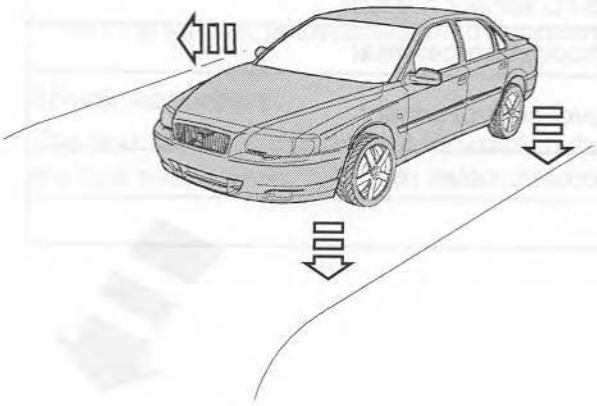
BGC (Brake Grip Control)



When the driver wants maximum braking, the damping is controlled to reduce the braking distance.

The system starts this function if the EBA (Electronic Braking Assistance) function is already active, if the ABS is activated, or braking has exceeded a specific limit value.

DBC (Dynamic Body Control)

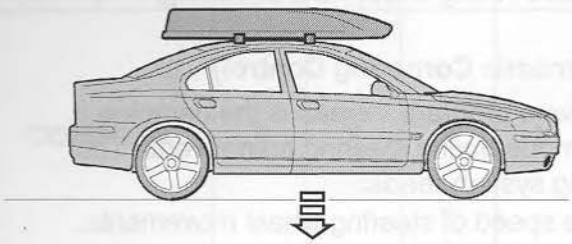


The damping effect can be changed very quickly. This rapid control is used to:

- restrict rolling when cornering.
- limit front end dive under braking.
- limit rear end squat during acceleration.

The degree of damping is controlled when cornering to distribute the dynamic loads over the wheels so the car reacts quickly to steering inputs.

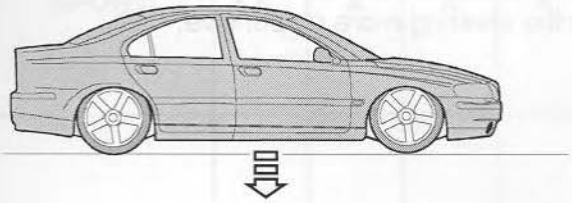
The damping increases as the car speed increases to achieve optimum control. At high speeds, the damping is also increased when the lateral acceleration is high to provide stability.



LDC (Load Dependent Control)

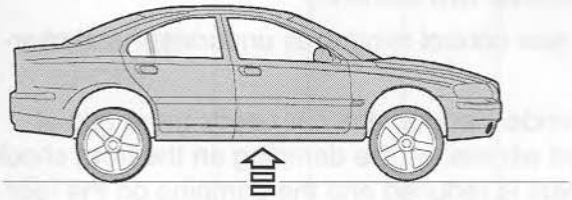
The damping increases when the car is heavily loaded. This is done to ensure the behavior of the car is changed as little as possible by the load.

It is also important to have greater damping when the suspension travel is reduced to avoid bottoming out.

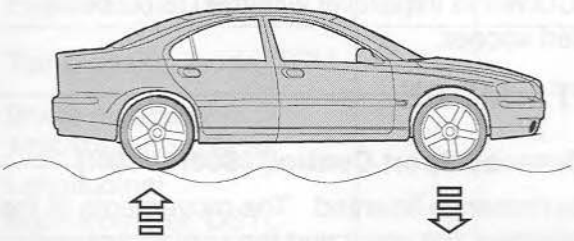


BRC (Bump and Rebound Control)

The damping is increased when the suspension bump stops are closed to prevent hard bottoming out and rebound, and to reduce noise from the dampers.



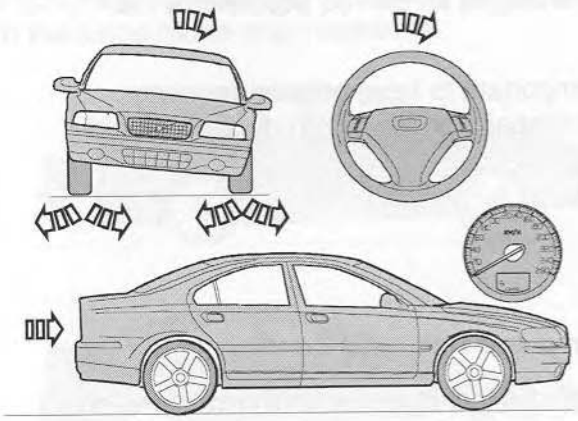
WHC (Wheel Hop Control)



The damping is modulated to dampen the self-oscillation of the wheels when driving on uneven surfaces. The amplitude and frequency of wheel movement are analyzed in order to know when the wheels are self-oscillating.

SPORT MODE

Sport mode is the default setting. What is known as the 'Sky hook' principle is applied in Sport mode, too. But the shock absorbers stiffen in order to reduce rolling under hard cornering.



DCC (Dynamic Cornering Control)

A software program increases the damping in roll mode during steering maneuvers. The steering system reads:

- the speed of steering wheel movements,
- the speed of the car,
- the roll speed of the car,

in order to calculate optimal damping. This function makes the car less likely to roll and makes the steering more responsive.

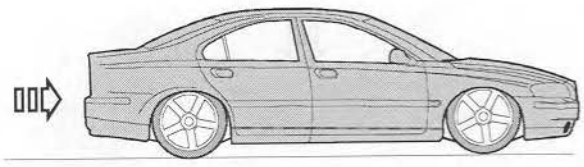
AYC (Active Yaw Control)

Active yaw control minimizes understeer and oversteer.

When understeering, the car needs more grip at the front wheels, so the damping on the front shock absorbers is reduced and the damping on the rear shock absorbers is increased. The opposite occurs when the car is oversteering.
When the car is cornering and roll angle has decreased, the shock absorbers provide control by varying the overall damping and varying bump and rebound damping.

The DCC works in parallel with the DSTC but is activated sooner.

ADVANCED SPORT – MODE



ASC (Advanced Sport Control) (S60R/V70R)

This is performance oriented. The movements of the shock absorbers are small and the contact between the tires and the road surface is at its peak. ASC works best when used on even, flat roads.

The car performs well with excellent road holding and maximum grip.
The response to acceleration is more direct with this chassis setting.

If the engine is turned off while this setting is enabled, Sport mode is automatically selected when the engine is restarted.

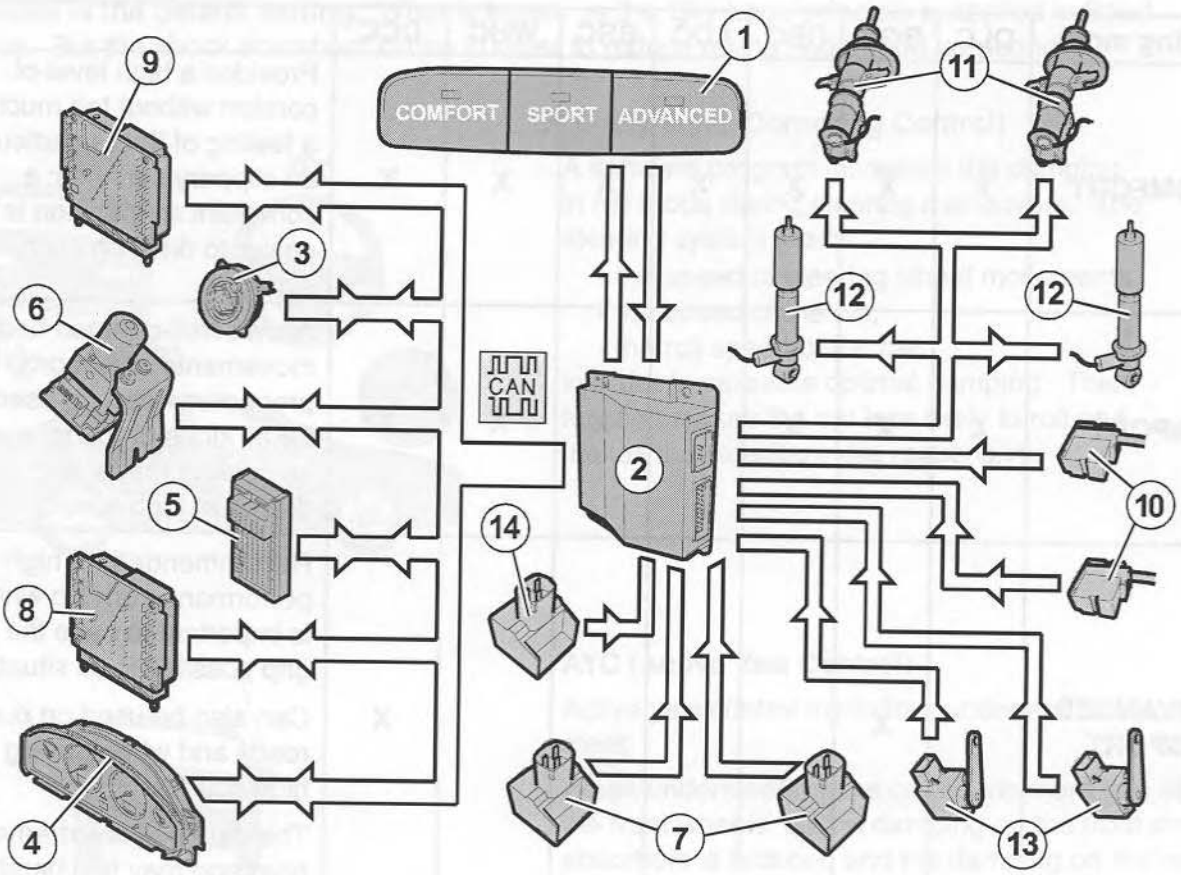
DRIVING MODE/CONTROL SUBSYSTEM ACTIVATION

Driving mode	DLC	BGC	DBC	LDC	BRC	WHC	DCC	
COMFORT	X	X	X	X	X	X	X	Provides a high level of comfort without too much of a feeling of float - particularly on slippery surfaces; a compliant suspension is easier to drive on such surfaces.
SPORT	X	X	X	X	X	X	X	Allows well-damped body movements and sporty properties. Can be used for all kinds of roads, such as curving roads, and when driving at high speeds.
ADVANCED SPORT		X					X	Recommended for high performance driving where it is important to have the best grip possible in all situations. Can also be used on curving roads and when driving at high speeds. The damping is extremely hard and may feel harsh.

Parameters Included

	DLC	BGC	DBC	LDC	BRC	WHC	DCC	ASC
Engine torque, ECM	X	X					X	
Transmission mode, TCM	X						X	
Brake pressure/ ABS/BA mode, BCM	X	X					X	
Longitudinal accelerometer, DSTC	X						X	
Accelerometer, front shock absorbers	X	X	X	X	X	X	X	X
Rear level sensors	X	X	X	X	X	X	X	X
Front accelerometers (2)		X	X				X	
Rear accelerometer (1)		X	X				X	
Wheel sensor		X		X			X	
SAS, steering wheel position and speed							X	

SIGNAL OVERVIEW

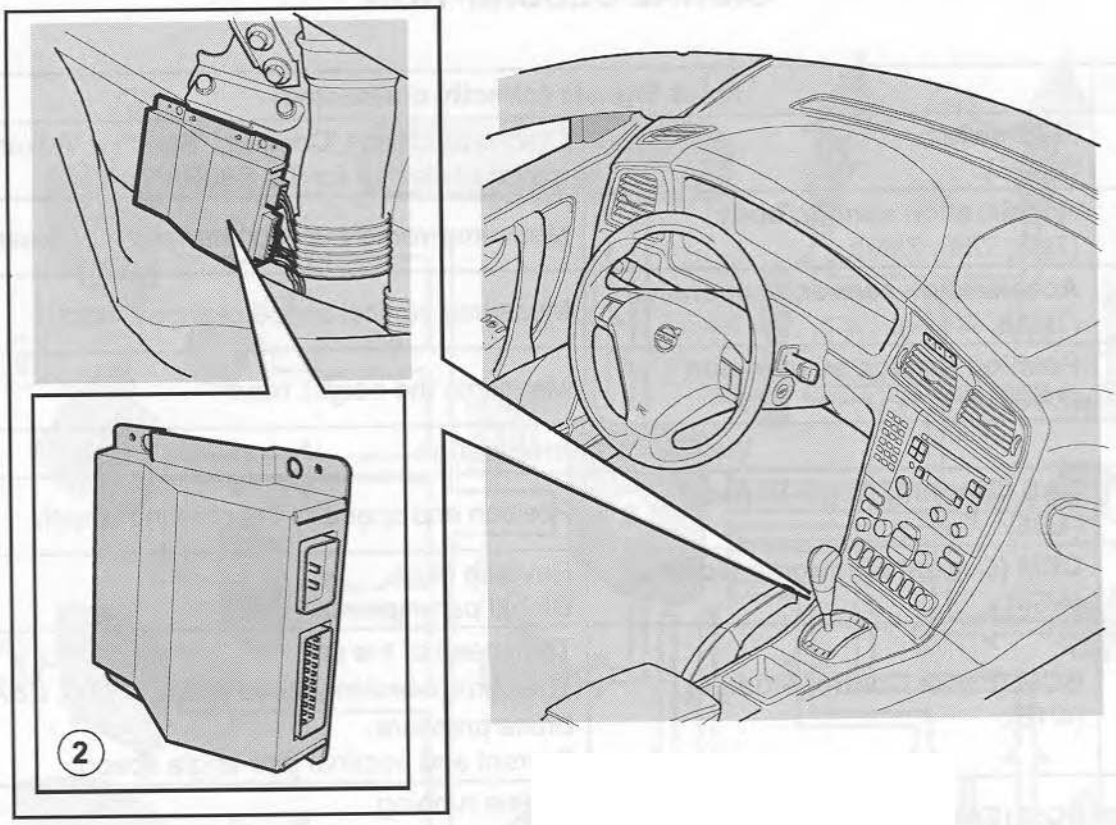


Pos.		Input signal	Pos.		Output signal
1	3/225	ACS switch	1	3/225	ACS switch
2		SUM (Suspension Module)	4	5/1	DIM (Driver Information Module)
3	4/68	SAS (Steering Angle Sensor)	8	4/28	ECM (Engine Control Module)
5	4/56	CEM (Central Electronic Module)	9	4/46	TCM (Transmission Control Module)
6	4/16	BCM (Brake Control Module)	11	8/23	Shock absorber, front
7	7/87	Accelerometer, front	12	8/20	Shock absorber, rear
9	4/46	TCM (Transmission Control Module)			
10	7/118, 7/119	Accelerometer, front shock absorber			
13	7/120, 7/121	Position sensor, rear			
14	7/89	Accelerometer, rear			

SIGNAL DESCRIPTION

Pos. no.	Input Signals (directly connected)	
1	**ACS switch** (3/225):	Driving programs 'Comfort,' 'Sport' or 'Advanced' may be selected for the S60R/V70R.
7 – 14	**Acceleration sensor, body** (7/87, 7/88, 7/89):	Measures vertical speed changes, front/rear.
10	**Acceleration sensor, suspension** (7/118, 7/119):	Measures vertical speed changes, front.
13	**Position sensor, suspension** (7/120, 7/121):	Measures the height, rear.
	Via CAN communication	
3	**SAS (Steering Angle Sensor)** (4/68):	Position and speed of the steering wheel.
5	**CEM (Central Electronic Module)** (4/56):	Reverse gear. Global parameters.
6	**BCM (Brake Control Module)** (4/16):	The speed of the car. The current braking mode (ABS, DSTC, EBA). Brake pressure. Current and nominal yaw angle speed.
8	**ECM (Engine Control Module)** (4/46):	Engine running. Engine torque required. Actual engine torque.
	CCM (Climate Control Module) (3/112):	The intensity of the illumination of the key pad via the dusk sensor.
	LSM (Light Switch Module) (3/111):	The intensity of the illumination of the key pad via a rheostat.

	Output Signals (directly connected)	
1	**Valve guide, shock absorbers** (8/20, 8/21, 8/22, 8/23):	Driving programs 'Comfort,' 'Sport' or 'Advanced' may be selected for the R models.
11 – 12	**ACS switch** (3/225):	Power feed to solenoids.
	Via CAN communication	
4	**DIM (Driver Information Module)** (5/1):	Text message indicating that the FOUR-C (Continuously Controlled Chassis Concept) is non-operational.
8	**ECM (Engine Control Module)** (4/46):	• Driving program selected.
9	**TCM (Transmission Control Module)** (4/28):	• Driving program selected.



SUSPENSION MODULE (SUM)

The SUM has been developed by Volvo.

- Control of the shock absorber valve is calculated 500 times a second.
- Body movement and adaptations are calculated 100 times a second.

It is possible to download new software for the SUM.

- Control module is located on the left side of the transmission tunnel next to the gearshift.
- SUM reads input signals to calculate the car's current and upcoming movements and to control the damping force to make the ride as comfortable as possible.
- SUM monitors and controls directly connected components, and communicates with other control modules and components via the CAN.
- SUM monitors activations, as well as input and output signals via built-in diagnostics. When the control module detects a fault, a diagnostic trouble code is set, while at the same time the control module places the system in a fail-safe mode and the shock absorbers function as ordinary passive shock absorbers.
- In the event of a fault, an error message is sent to the combined instrument (DIM).

CONTROLLABILITY

The controllability options depend on the resolution and accuracy (and on the number of incoming signals), as well as the overall response time and working range of the damping.

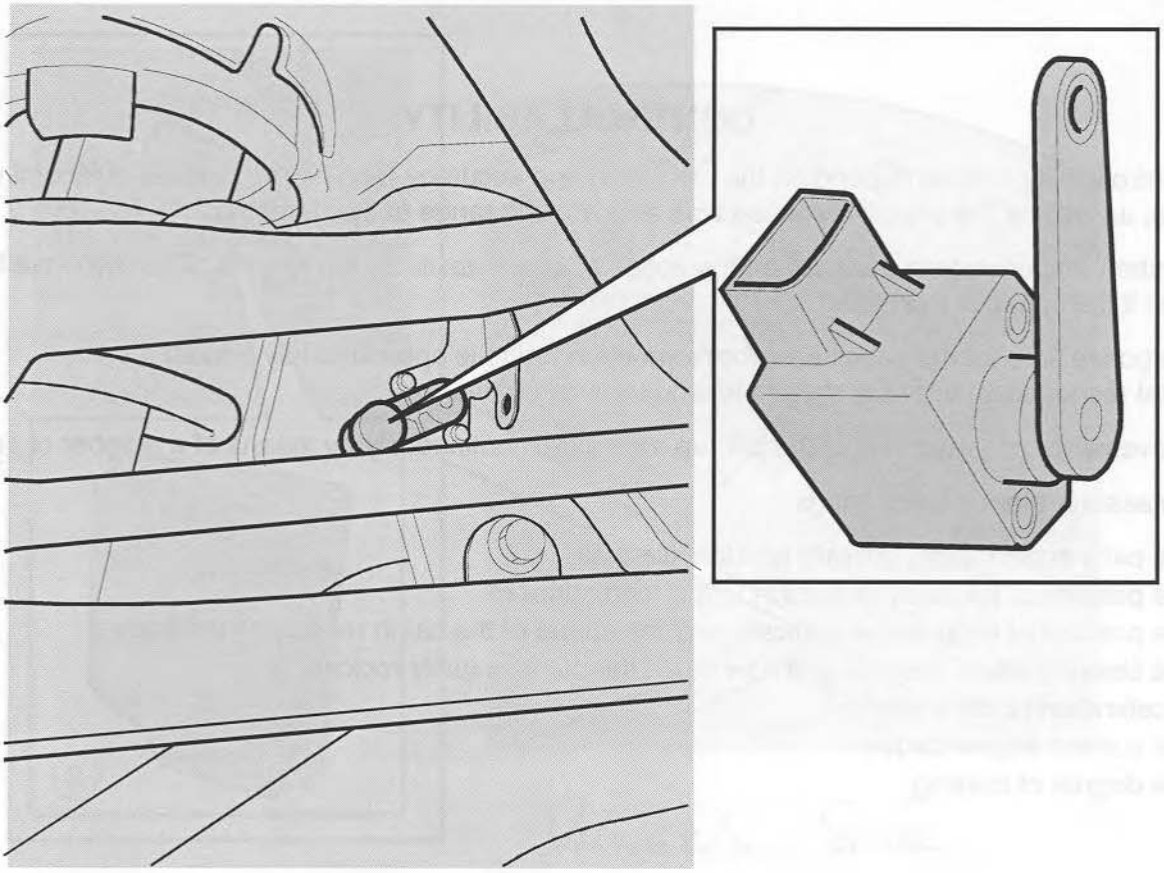
The system response time depends on the speed of shock absorber movement. The response time is reduced if the speed is increased.

The response time for the shock absorber's variation range is approximately 5 to 20 ms.
The total response time for the system is around 10 to 30 ms.

The movements and reactions of the car are monitored continuously by means of a number of sensors.

They measure, among other things:

- The car's acceleration, laterally and longitudinally
- The position of the body in relation to the road surface
- The position of each wheel vertically and the speed of the car in relation to the body
- The steering wheel position and how much the car is actually rocking
- Acceleration (throttle angle)
- The current engine torque
- The degree of braking.



SENSORS

POSITION – REAR

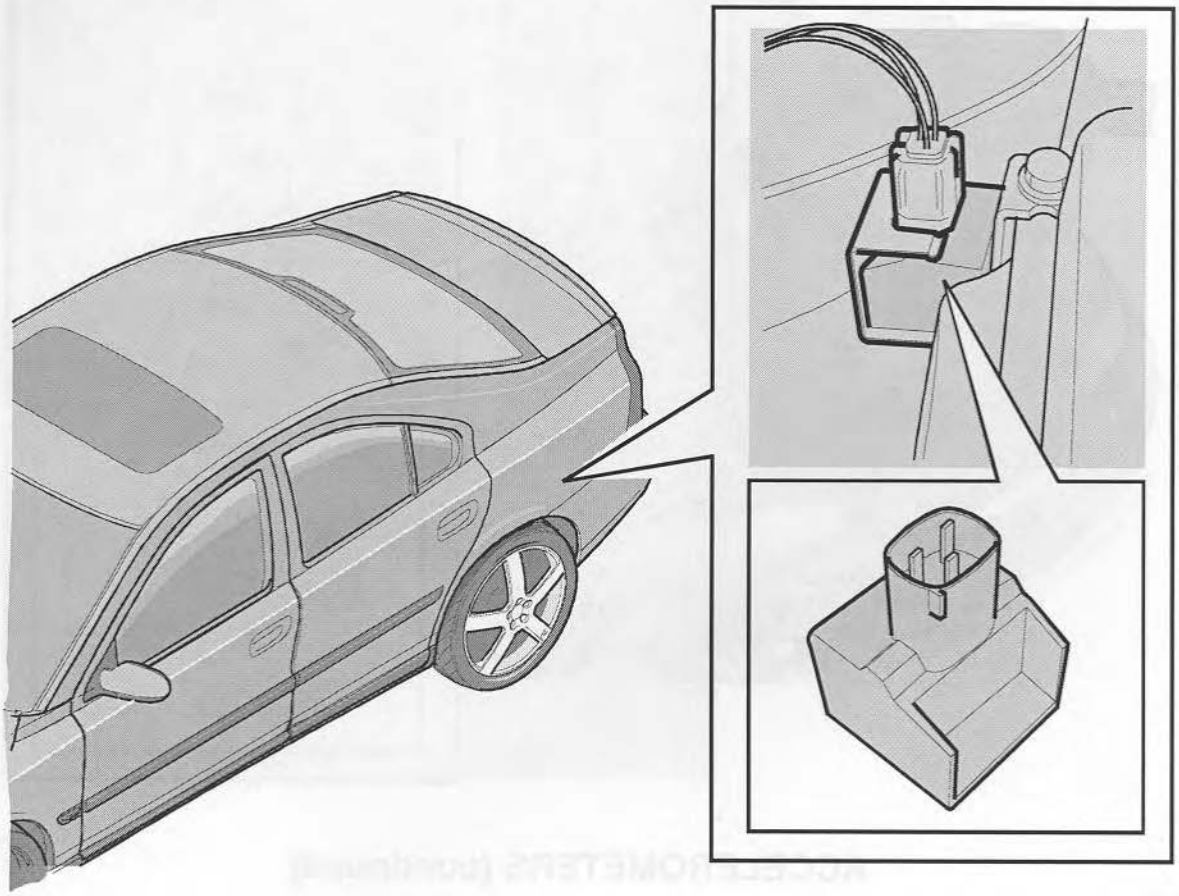
Two position sensors are fitted in the body, rear, on the underside of the floor, on both right and left sides.

The position sensors measure the angle of the suspension in relation to the body and link arm. This information is used to calculate the vertical position of the shock absorber and chassis.

- The sensors are fed with 5V from the SUM. The output signal from the sensors is approximately 2.5V when the car is stationary.
- When vertical movements are detected, the signal will fluctuate around these values. The greater the movement, the greater the deviations.
- The SUM software contains diagnostic software for the position sensors.

Calibration

When a suspension module, shock absorber, or position sensor (rear) is replaced, adaptive data in the SUM has to be calibrated using VADIS.



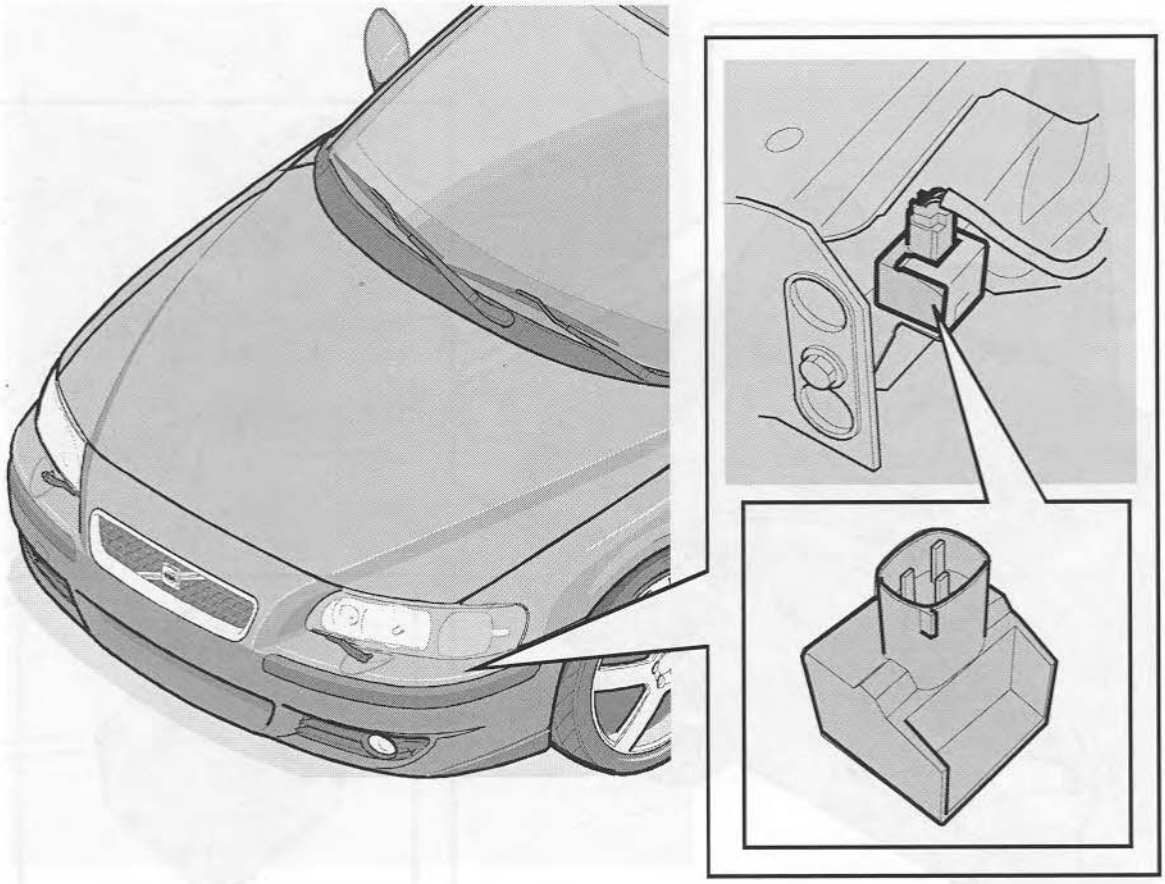
ACCELEROMETERS

REAR

An accelerometer which measures the speed of vertical body movement is fitted on the body behind the left wheel housing in the luggage compartment.

- The acceleration sensor is fed with 5V from the SUM.
- The output signal from the sensor is approximately 2V when the car is stationary.
  - When vertical body movements are detected, the signal will fluctuate around 2V (measurement range 0-5V).
- The SUM calculates the information from the acceleration sensor and then controls the damping forces on the basis of the driving program selected.
- The SUM contains diagnostic software for the rear accelerometer.

NOTE: It is very important the acceleration sensors are mounted with the connector facing upward and mounted firmly in the car. Otherwise movement may generate incorrect values, which may impair the system's properties when cornering.

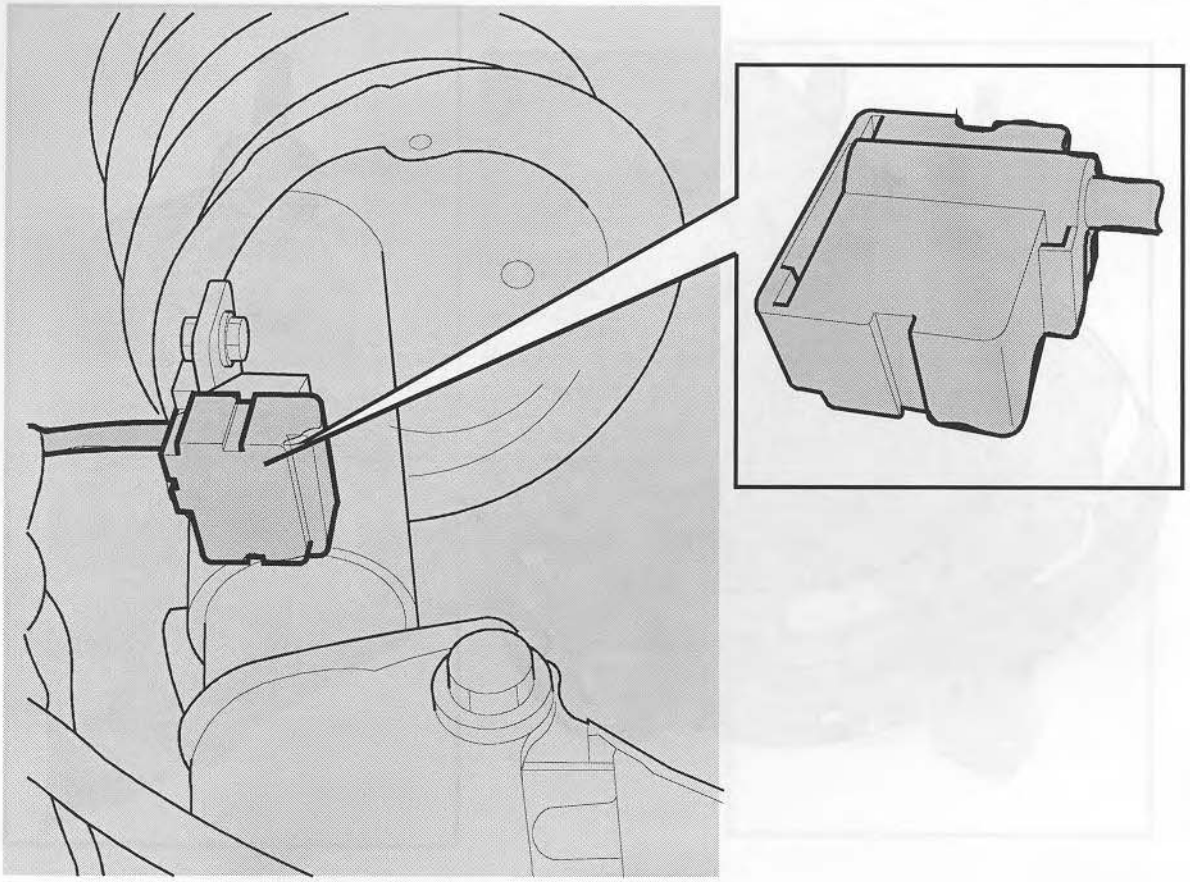


ACCELEROMETERS (continued)

FRONT

Two acceleration sensors that measure the speed of vertical body movement are fitted beneath the headlights.

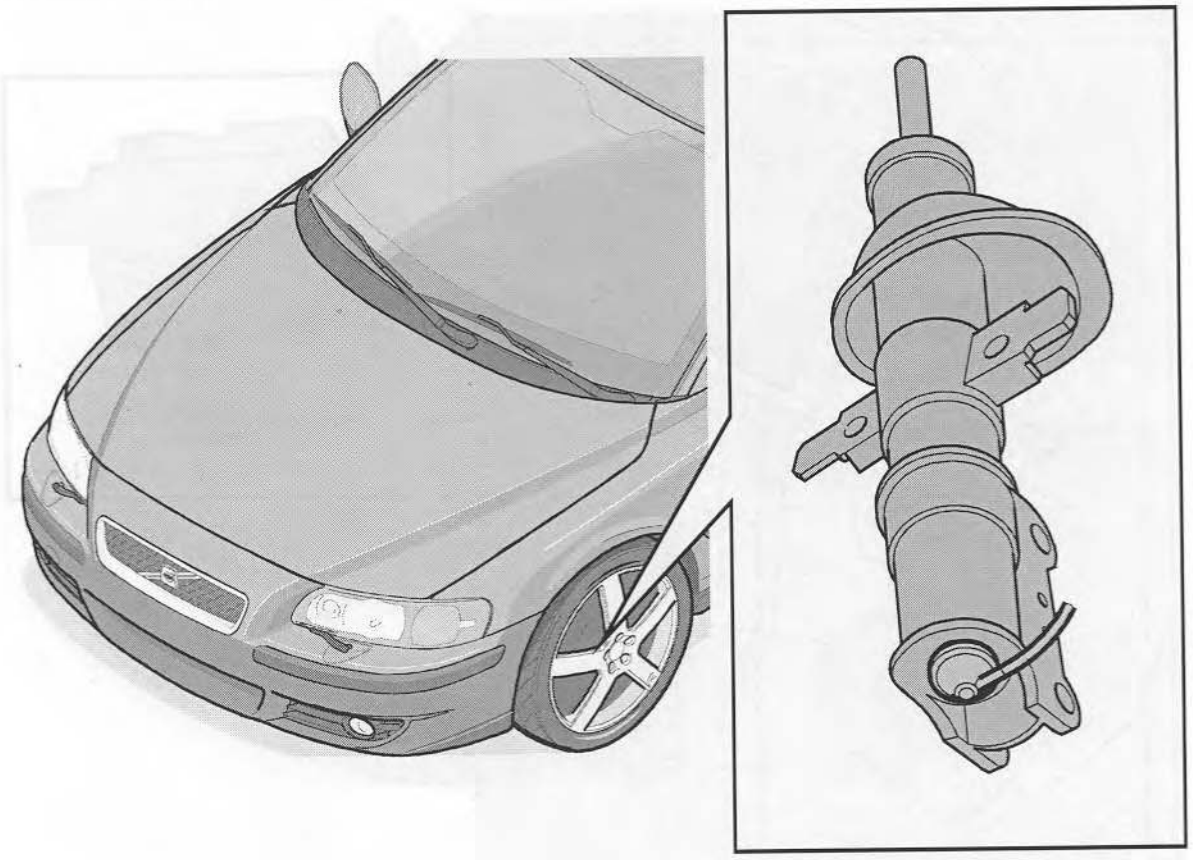
- The acceleration sensor is fed with 5V from the SUM.
- The output signal from the sensor is approximately 2V when the car is stationary.
  - When vertical body movements are detected, the signal will fluctuate around 2V (measurement range 0-5V).
- The SUM calculates the information from the acceleration sensor and then controls the damping forces on the basis of the driving program selected.
- The SUM contains diagnostic software for the front accelerometers.



HEIGHT

The two acceleration sensors are located on the front suspension, one on each spring strut.
They measure vertical speed changes of the suspension system.

- The sensors are fed with 5V from the SUM.
- The output signal from the sensors is approximately 2.5V when the car is stationary.
  - When vertical movements are detected, the signal will fluctuate around 2.5V (measurement range 0-5V).
- The position and speed are used by the SUM to evaluate the damping force required.
- The SUM contains diagnostic software for the suspension accelerometers.



SHOCK ABSORBERS

FRONT

Both front and rear shock absorbers were developed by TA/Monroe. The damping force of the shock absorber is changed by means of an adjustable valve in the shock absorber that is activated by the current in the surrounding solenoid.

The control valve in the shock absorber is constantly monitored by the SUM. The control is variable.

- The valve contains a mechanical safety device that controls the shock absorber in a manner similar to conventional, passive shock absorbers when there is zero current flow.

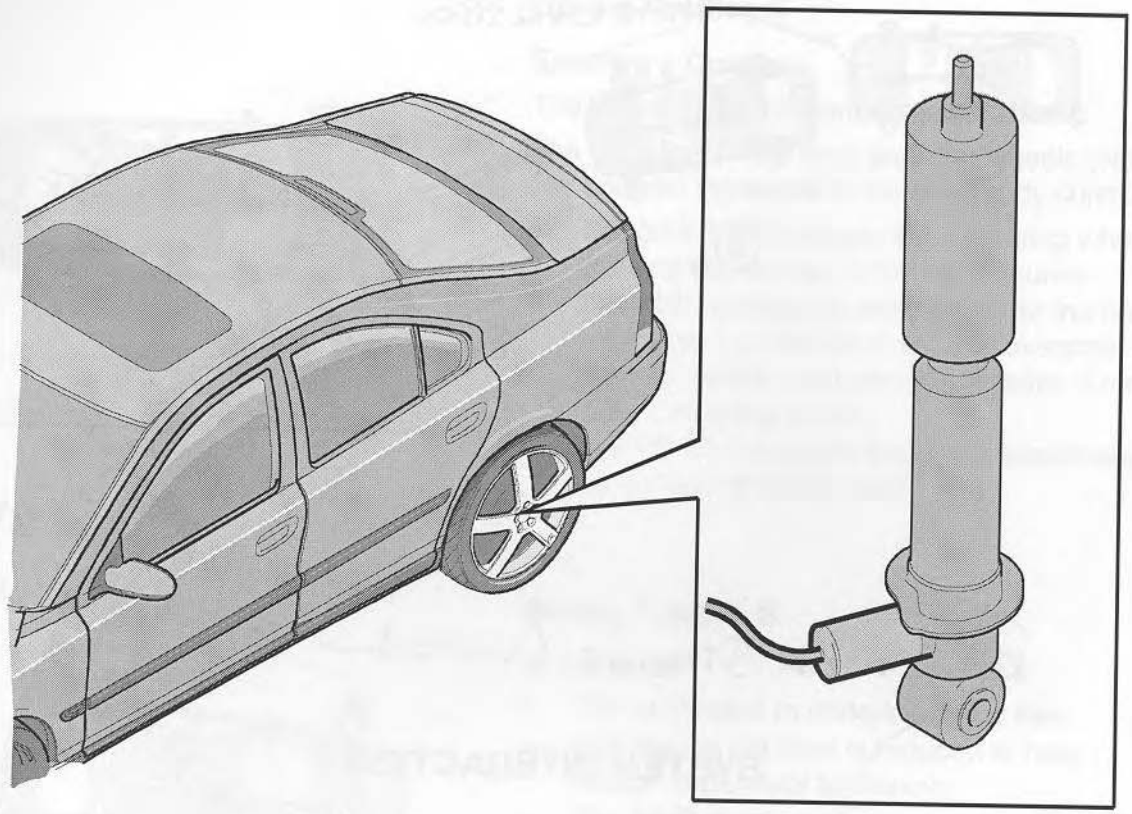
Signal Control

The SUM controls the valve with a PWM (Pulse Width Modulated) signal.

- The SUM controls the current to the solenoid.
  - low currents give low damping forces.
  - high currents give high damping forces.
- The SUM contains diagnostic software for the solenoids.
- The shock absorber settings can be regulated approximately 500 times a second.

Calibration

When a suspension module, shock absorber, or position sensor (rear) is replaced, adaptive data in the SUM has to be calibrated using VADIS.



REAR

The damping force of the shock absorber is changed when an adjustable valve in the shock absorber is actuated by the current in the surrounding solenoid.

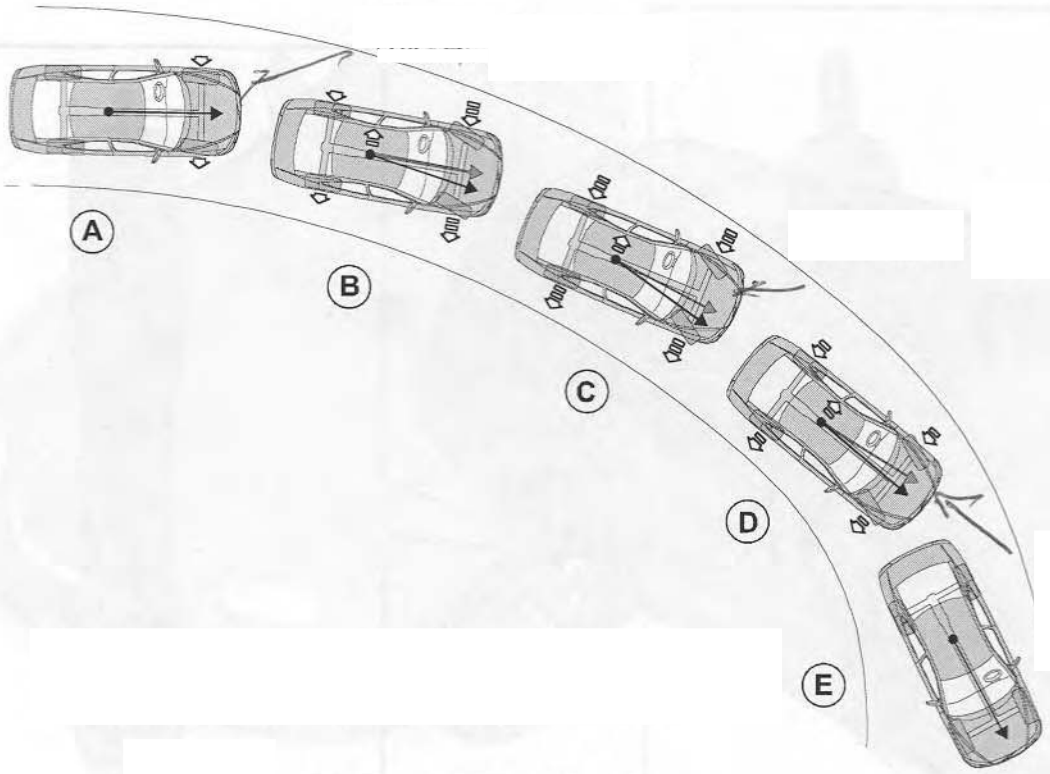
Signal control

The SUM controls the valve with a PWM (Pulse Width Modulated) signal.

- The SUM controls the current to the solenoid.
  - low currents give low damping forces.
  - high currents give high damping forces.
- The SUM contains diagnostic software for the solenoids.
- The damping is adapted automatically to the road surface by the SUM, resulting in consistent behavior in all situations.
- The shock absorber settings can be regulated approximately 500 times/second.

Calibration

When a suspension module, shock absorber, or position sensor (rear) is replaced, adaptive data in the SUM has to be calibrated using VADIS.



SYSTEM INTERACTION

The three systems - AWD, FOUR-C and DSTC - work together in different ways depending on the situation.

Acceleration	AWD provides the rear wheels with extra power to give maximum grip. FOUR-C controls the rear shock absorbers to ensure a stiffer setup so the rear suspension does not squat.
Driving in a straight line - constant speed	AWD system distributes most of the power to the front wheels to give the best possible directional stability. FOUR-C controls the shock absorbers for directional stability.
Cornering Entering the corner	DSTC measures the steering wheel position and changes in the car's direction. AWD distributes more power to the rear wheels so the car oversteers slightly. FOUR-C controls the shock absorbers for slight oversteer.
In the corner	AWD distributes the power equally between the front and rear wheels to ensure neutral steering. FOUR-C controls the shock absorbers to ensure minimal body roll.
Leaving the corner	AWD distributes the power between the front and rear wheels to permit maximum acceleration and stability. FOUR-C controls the shock absorbers for slight understeer.
Braking Light braking	FOUR-C controls the front shock absorbers, making them stiffer to ensure the front end does not dive. AWD deactivates rear wheel drive to ensure maximum directional stability.
Extreme braking	FOUR-C controls the shock absorbers to optimize grip to ensure the shortest possible braking distance. AWD deactivates rear wheel drive to ensure maximum directional stability. FOUR-C controls the shock absorbers when the car comes to a stop to prevent body 'rock.'

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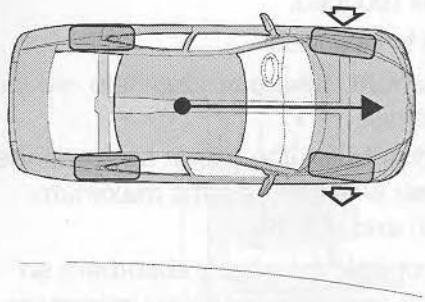

Driving Position A

Entering a Corner

The pressure on the front wheels builds up.

The damping on the front and rear wheels (equal at low speeds) increases to increase body control.

- The SAS/DSTC measure the steering wheel position and the change in the car's course.
- The AWD distributes more power to the rear wheels so that the car is easy to oversteer in order to permit rapid steering reaction during the initial cornering phase.
- The FOUR-C controls the shock absorbers to consolidate the oversteer.

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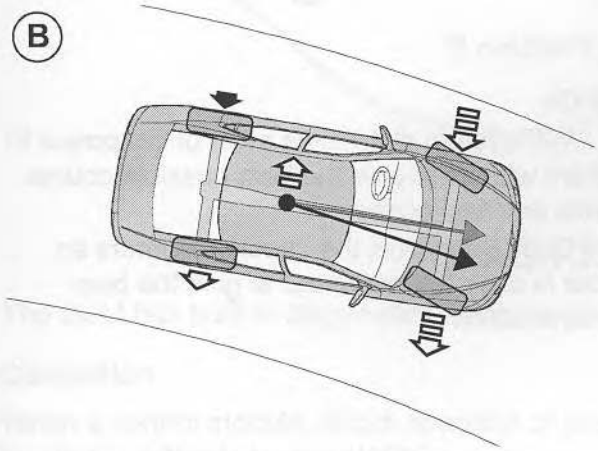

Driving Position B

In a Corner

- The car begins to understeer and lean.
- Damping at the front is reduced to help reduce understeer tendency.
- The AWD distributes the power equally between the front and rear wheels to ensure neither oversteer nor understeer.
- FOUR-C controls the shock absorbers individually to ensure minimal body roll, making the car easier to control through the corner.

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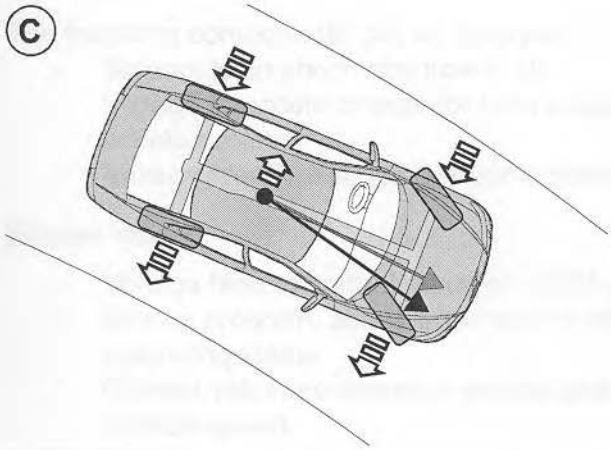
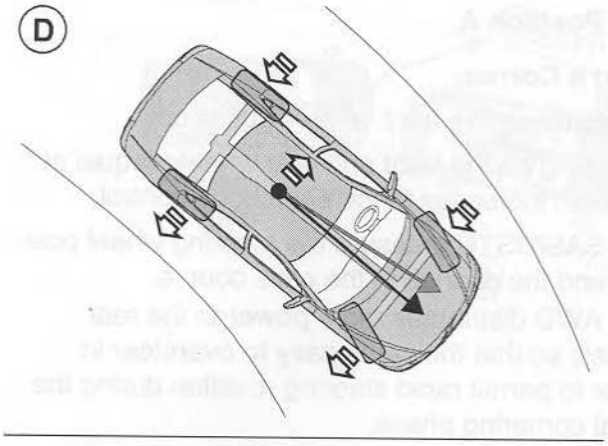


Driving Position C

Halfway Round a Corner

- Low damping control due to static properties (the roll speed is low in this situation).
- The AWD distributes the power more equally between the front and rear wheels to help ensure neither oversteer nor understeer and to make the car stable.
- The FOUR-C controls the shock absorbers to ensure minimal body roll, making the car easier to control through the corner.



Driving Position D

Leaving a Corner

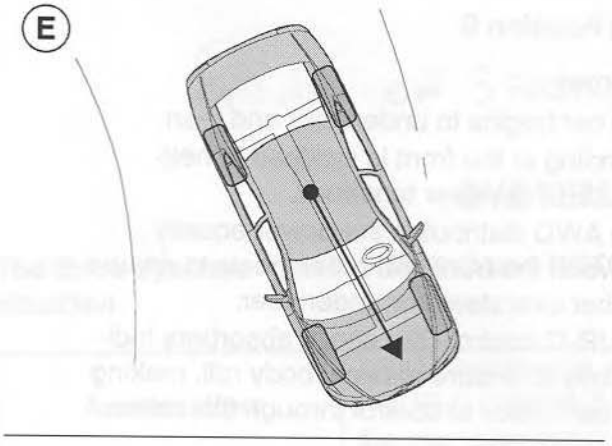
The roll angle is reduced.

The car begins to oversteer.

Damping at the front is increased to help reduce oversteer tendency.

- The AWD distributes the power between the front and rear wheels to permit maximum acceleration and stability.

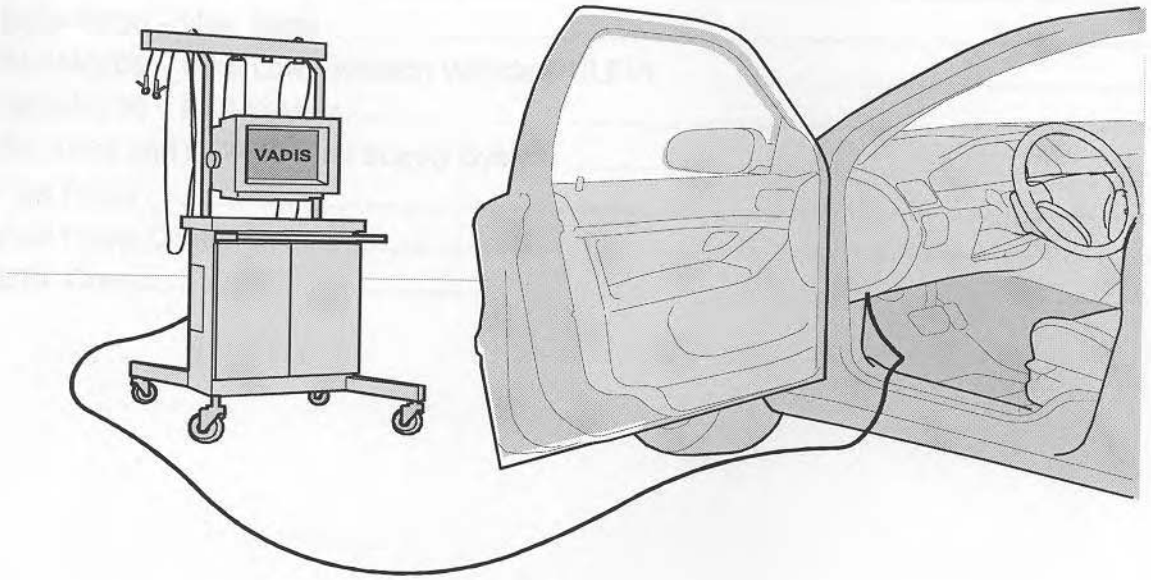
The FOUR-C controls the shock absorbers so there is a certain desired amount of understeer and the best possible course stability.



Driving Position E

Straight On

- The AWD system distributes most of the power to the front wheels to give the best possible course stability and fuel economy.
- The FOUR-C controls the shock absorbers so the car is easy to understeer to give the best course stability.



DIAGNOSTIC FUNCTIONS

The SUM has built-in diagnostics which monitor its own system along with the input and output signals.

Calibration

When a control module, shock absorber or position sensor (rear) is replaced, adaptive data in the SUM has to be calibrated using VADIS.

Activation of Components

The following components can be activated:

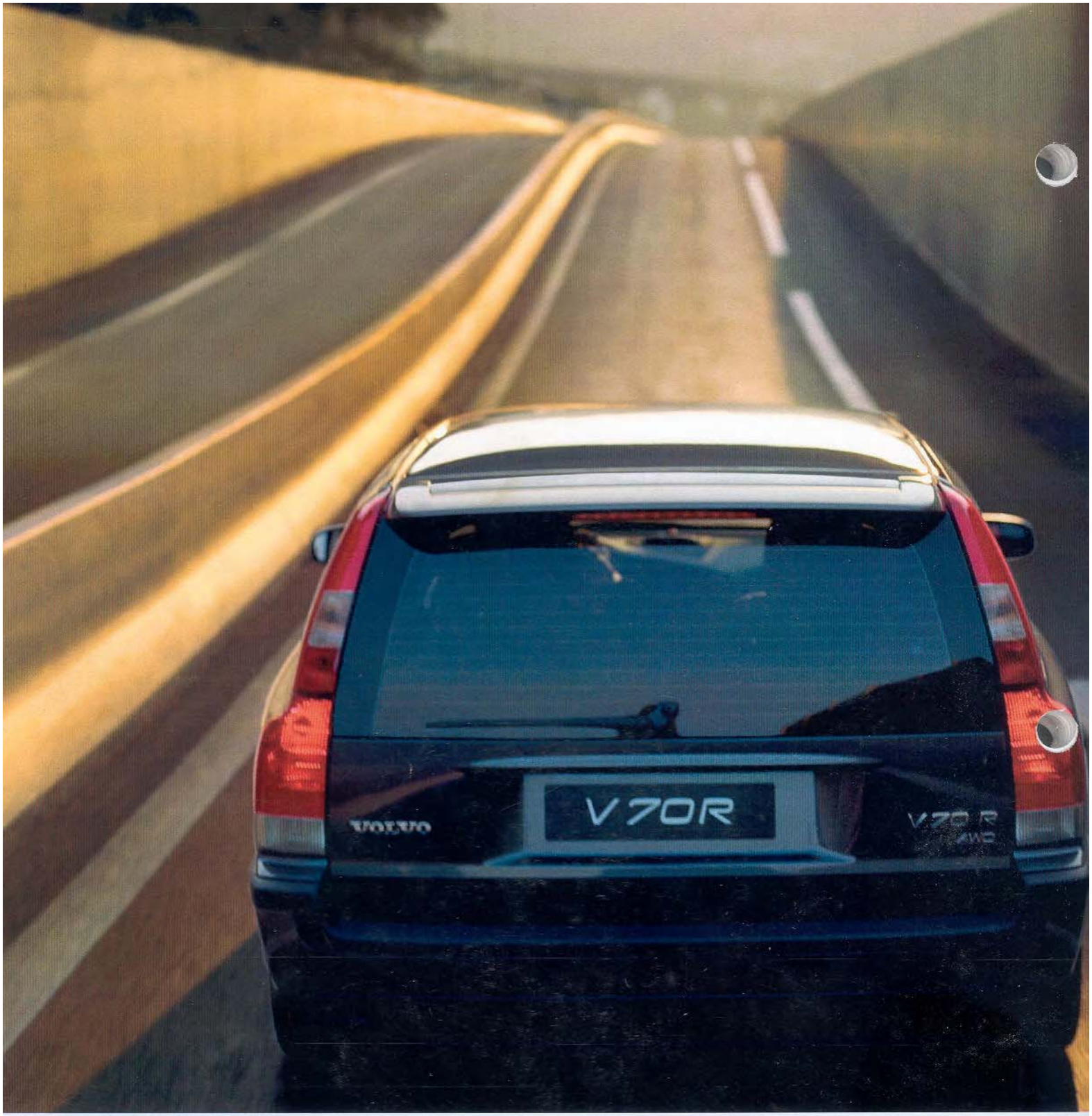
- Solenoids on shock absorbers, all.
- Voltage to accelerometer for front suspension, rear right position sensor and body front/rear left accelerometer.
- Voltage feed to rear left position sensor.

Frozen Values

- Voltage feed to control modules (CEM and SUM) and sensors
- Driving program, active when saving diagnostic trouble codes
- Operating status
- Current value, acceleration sensor and position sensor
- Vehicle speed
- Vehicle acceleration
- Engine status, running/not running
- Atmospheric temperature
- Time from the setting of diagnostic trouble codes
- Total distance, km (miles)

GLOSSARY

ABS	**A**nti-lock **B**raking **S**ystem
A/C	**A**ir **C**onditioning
ACS	**A**ctive **C**hassis **S**etting
AUX	**AUX**iliary
AWD	**A**ll **W**heel **D**rive
AYC	**A**ctive **Y**aw **C**ontrol
BCM	**B**rake **C**ontrol **M**odule
BGC	**B**rake **G**rip **C**ontrol
BRC	**B**ump and **R**ebound **C**ontrol
CAN	**C**ontroller **A**rea **N**etwork
CCC	**C**lose **C**oupled **C**atalyst
CCM	**C**limate **C**ontrol **M**odule
CEM	**C**entral **E**lectronic **M**odule
CM	**C**ontrol **M**odule
CVVT	**C**ontinuously **V**ariable **V**alve **T**iming
DBC	**D**ynamic **B**ody **C**ontrol
DCC	**D**ynamic **C**ornering **C**ontrol
DDM	**D**river **D**oor **M**odule
DEM	**D**ifferential **E**lectronic **M**odule
DIM	**D**river **I**nformation **M**odule
DLC	**D**ive and **L**ift **C**ontrol
DSTC	**D**ynamic **S**tability and **T**raction **C**ontrol
DTC	**D**iagnostic **T**rouble **C**ode
DVD	**D**igital **V**ersatile/**V**ideo **D**isc
EBA	**E**mergency **B**rake **A**ssistance
ECM	**E**ngine **C**ontrol **M**odule
FOUR-C	**C**ontinuously **C**ontrolled **C**hassis **C**oncept
FWD	Front Wheel Drive
GDL	**G**as **D**ischarge **L**ightning
IR	**I**nfra **R**ed
ISM	**I**nclination **S**ensor **M**odule
KIR	**K**ey **I**ntegrated **R**emote
LDC	**L**oad **D**ependable **C**ontrol
LED	**L**ight **E**mitting **D**iode
LEV	**L**ow **E**mission **V**ehicle
LSM	**L**ight **S**witch **M**odule
MHz	**M**ega**H**ertz
MLS	**M**ulti **L**ayer **S**ealing
MMS	**M**ass **M**ovement **S**ensor
MOST	**M**edia **O**riented **S**ystems **T**ransport
PDM	**P**assenger **D**oor **M**odule
PEM	**P**ump **E**lectronic **M**odule
Prog-mode	Programming mode
PRV	**P**ressure **R**egulation **V**alve
PVV	**P**ressure **V**entilation **V**alve
PWM	**P**ulse **W**idth **M**odulated
RSC	**R**oll **S**tability **C**ontrol
REM	**R**ear **E**lectronic **M**odule
SAS	**S**teering **A**ngle **S**ensor
SBL	**S**econdary **B**oot**L**oader
SC	**S**tability **C**ontrol
SCM	**S**iren **C**ontrol **M**odule
SRS	**S**upplementary **R**estraint **S**ystem
SULEV	**S**uper **U**ltra **L**ow **E**mission **V**ehicle
SUM	**SU**spension **M**odule
TCM	**T**ransmission **C**ontrol **M**odule
TCV	**T**urbo **C**ontrol **V**alve
TRACS	**TRAC**tion Control **S**ystem
UEM	**U**pper **E**lectronic **M**odule
VADIS	**V**olvo **A**ftersales **D**iagnostics & **I**nformation **S**ystem
WHC	**W**heel **H**op **C**ontrol



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