GENERAL INFORMATION

Administration

FAULT-TRACING

CAMSHAFT DIAGNOSTICS (CVVT)

In addition to electrical checks of the camshaft reset valve, the engine control module (ECM) checks that the position of the camshaft is correct and that the control (deployment and return of the camshaft) is working satisfactorily. The control module uses the signals from the camshaft position sensor and engine speed (RPM) sensor (crankshaft position) for the diagnostics.

Checking the camshaft position

The control module checks that the 0 position of the camshaft (mechanical rest position) is correct. During certain driving conditions, camshaft control is not active. If this is the case, the control module checks the deviation between the camshaft position (angle position) and the crankshaft position (angle position).

The difference is stored in the engine control module (ECM) as an adaption value. A diagnostic trouble code (DTC) is stored in the engine control module (ECM) if the adaptation value becomes too high or low. The deviation of the camshafts from the reference position can be read off.

Checking the camshaft control

When camshaft control is active, the control module checks that the camshaft moves to the intended position. If the position is not reached, the time the system takes to deploy to the correct camshaft position (the transition time from the actual to the desired camshaft angle) is measured. A diagnostic trouble code (DTC) is stored in the engine control module (ECM) if the camshaft angle does not reach the desired value within a certain time frame.

CATALYTIC CONVERTER DIAGNOSTIC

- For 5 cylinder engines, see **CATALYTIC CONVERTER DIAGNOSTICS 5 CYLINDER**
- For 6 cylinder engines, see **CATALYTIC CONVERTER DIAGNOSTICS 6 CYLINDER**.

CATALYTIC CONVERTER DIAGNOSTICS 5 CYLINDER

- Measuring the voltage between #B12 (#26) and #B5 (#19) on control module connector B.
- Measuring battery voltage.

If the difference between the control module supply voltage and battery voltage is greater than 2 V, the fault is in the supply cable or is due to contact resistance.

Also check the fuse of the driver door/passenger door module (DDM/PDM). A half-blown fuse can cause intermittent faults.

If the difference is less than 2 V, there could be an internal fault in the door control module.

Remedy as necessary.

Other information:

- see **CONNECTING THE BREAKOUT BOX**
- see **SIGNAL SPECIFICATION**
- Replacing the driver's side door module. See **DRIVER DOOR MODULE (DDM), REPLACING**
- Replacing the passenger side door module. See **PASSENGER DOOR MODULE (PDM), REPLACING** .
- see **CHECKING WIRING AND TERMINALS**

- **Continue**

  see: **VERIFICATION MIXED**

VERIFICATION MIXED

VERIFICATION

HINT: After carrying out the repair, check that the fault has been remedied.

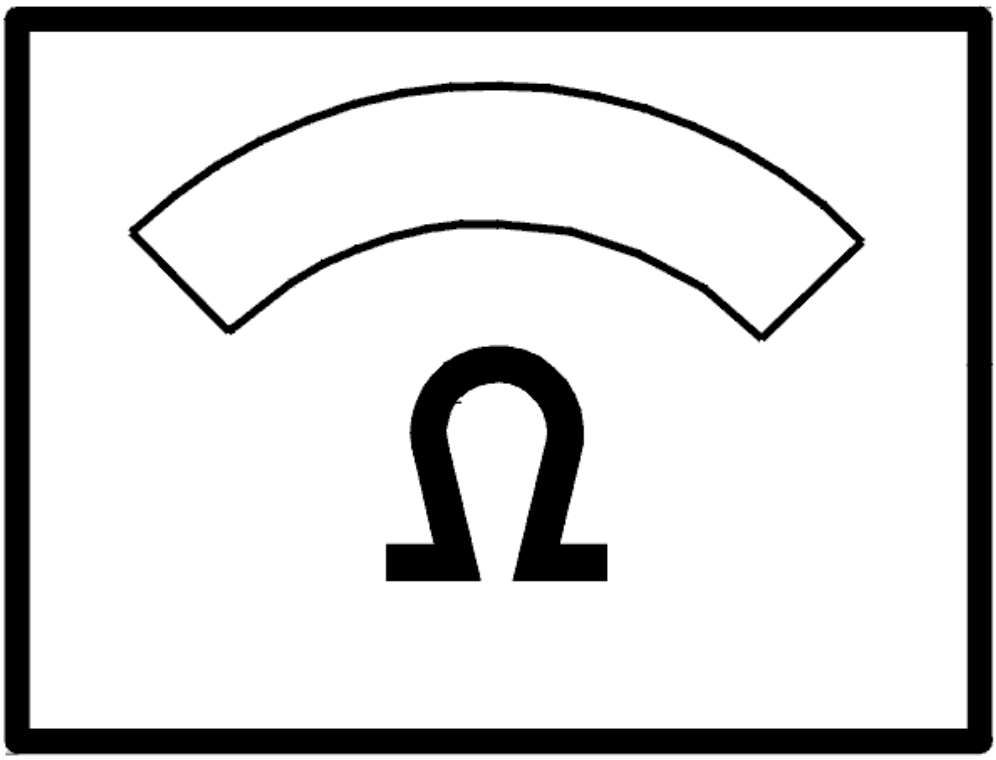


Fig. 119: Identifying Ohmmeter
Courtesy of VOLVO CARS CORPORATION

- **Continue**

  Refer to **INFORMATION**

VERIFICATION

HINT: After carrying out the repair, check that the fault has been remedied.

General Information

DTC Index

DRIVER DOOR MODULE (DDM) DTCS

DRIVER DOOR MODULE (DDM) - DTC INDEX

DTC	Description
DDM-0019	Lock, driver's door. Signal too low
DDM-001A	Driver's door lock. Signal too low
DDM-001D	Central locking button. Internal fault
DDM-0034	Control, driver's window. Faulty signal
DDM-0035	Control, passenger window. Faulty signal
DDM-0036	Control, left rear side window. Faulty signal
DDM-0037	Control, right rear side window. Faulty signal
DDM-0038	Control, door mirror. Faulty signal
DDM-0039	Child-proof lock. Stuck in the active position
DDM-003B	Control, driver's window. Faulty signal
DDM-003C	Control, passenger window. Faulty signal
DDM-003D	Control, left rear side window. Faulty signal
DDM-003E	Control, right rear side window. Faulty signal
DDM-003F	Control, door mirror. Signal too high
DDM-0040	Control, door mirror selector. Signal too high
DDM-0045	Door mirror lamp. Signal too low
DDM-0049	Control module. Internal fault
DDM-004A	Outside temperature sensor. Signal too high
DDM-004B	Outside temperature sensor. Signal missing
DDM-004C	Control module. Internal fault
DDM-004D	Control module. Internal fault
DDM-E001	Control module communication. Faulty communication
DDM-E003	Configuration fault. Faulty configuration
DDM-XXXX	Unknown diagnostic trouble code (DTC) for the current control module version

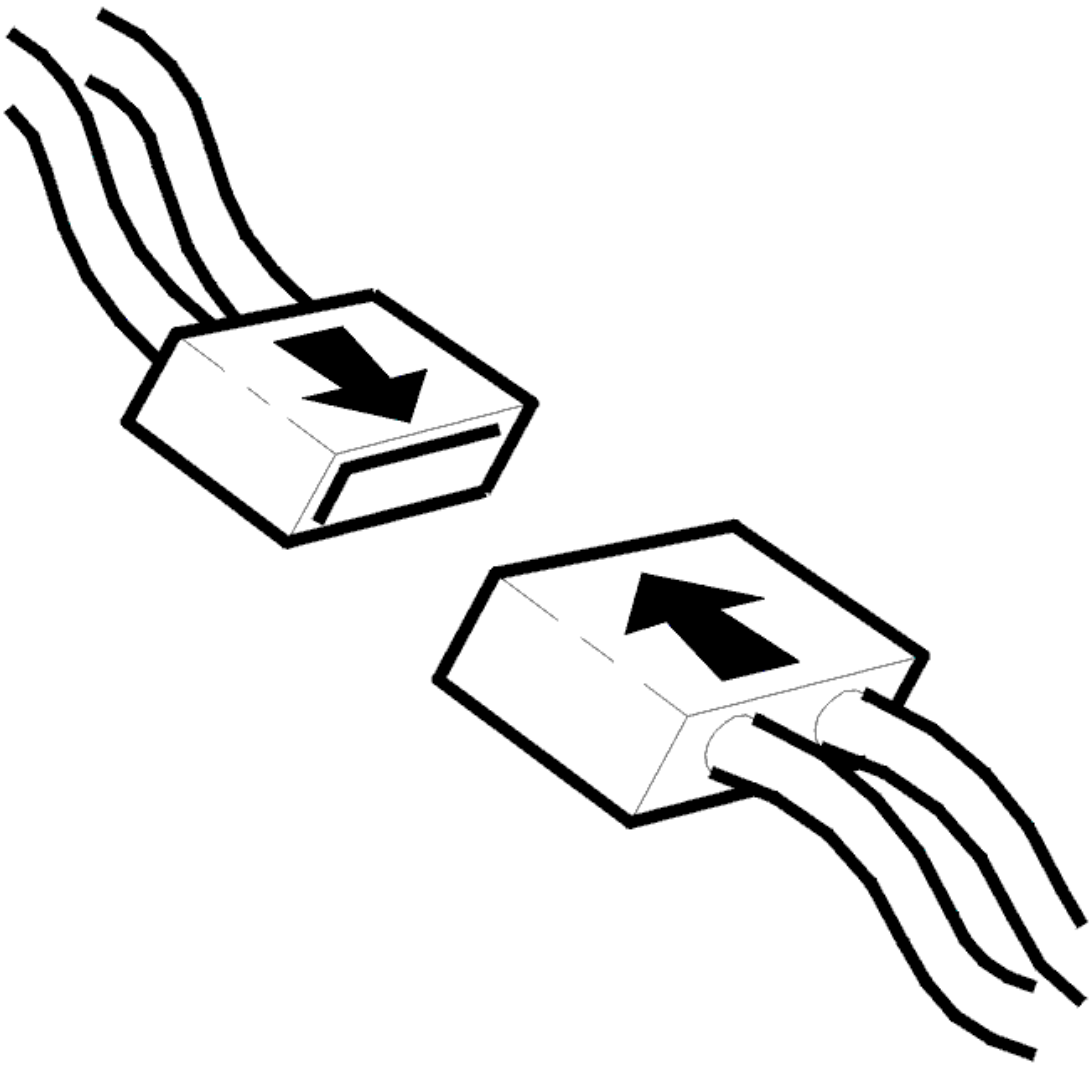


Fig. 43: Connecting Connector
Courtesy of VOLVO CARS CORPORATION

- Ignition off
- Reinstall the connectors, components etc.
- Ignition on
- Activate the carphone.

  Make a call so that both the handset and the hands-free system are used.

  - Ignition off.
  - Ignition on.
  - Read off the diagnostic trouble codes (DTCs).
  - Check that the relevant diagnostic trouble code (DTC) has switched status from permanent to

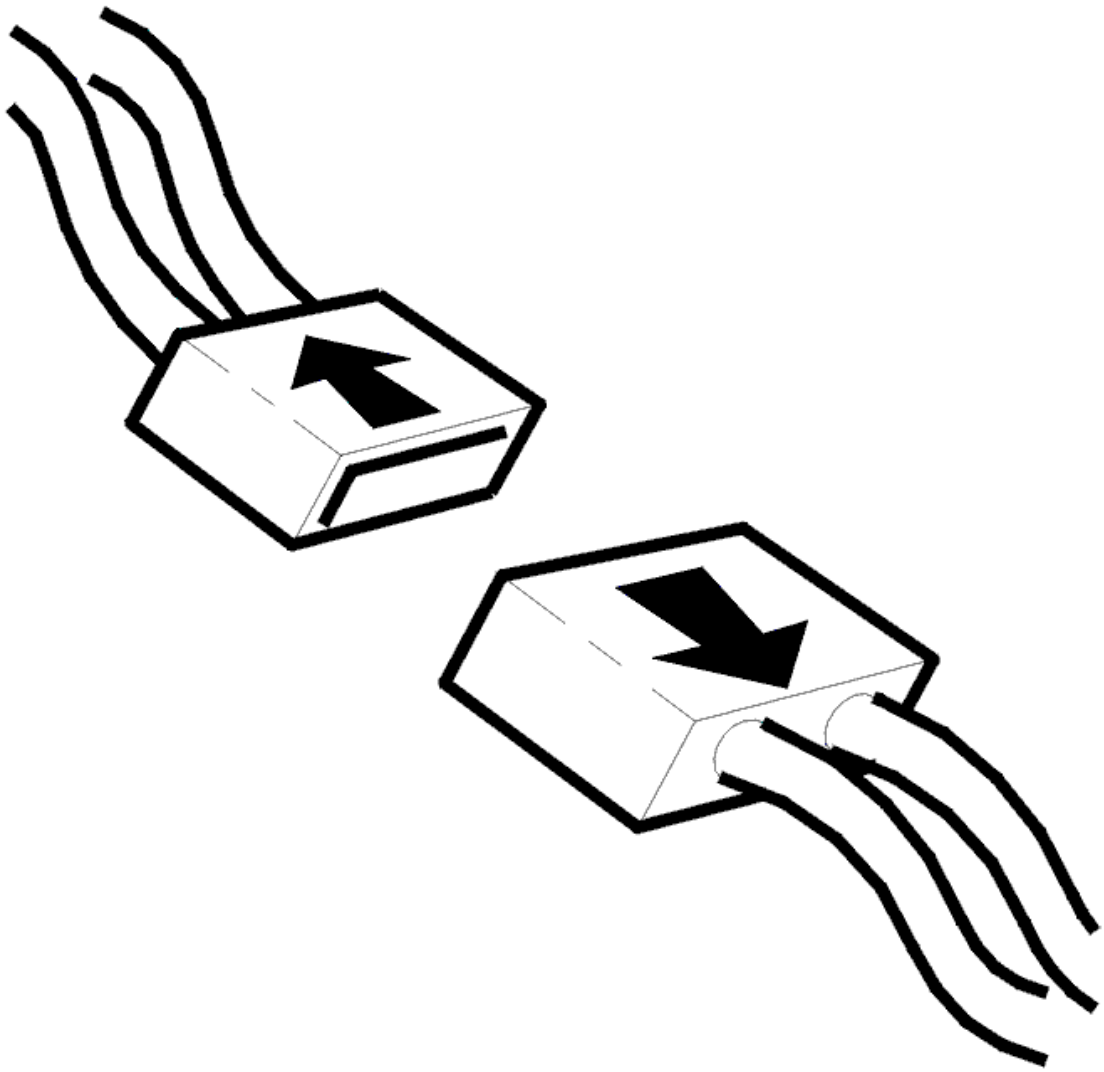


Fig. 68: Disconnecting Connector
Courtesy of VOLVO CARS CORPORATION

- Ignition off
- Disconnect the connector for the treble loudspeaker/upper loudspeaker in the left front door
- Disconnect the 16-pin connector for the audio module (AUD).

HINT: The front left treble loudspeaker/upper loudspeaker and the front left loudspeaker are connected to these signal cables.

Check the cable terminals in the female and male sections of the connector. The cable terminals must not be damaged or pressed back.

Check the signal cable between audio module (AUD) terminal #B1 and treble speaker/upper loudspeaker terminal #2 in the front left door. Check for a short-circuit to ground. Check for a short-circuit to supply

- **NO**

  Refer to **INFORMATION**

INFORMATION

FAULT-TRACING INFORMATION

The fault should have been detected and remedied. As this is not the case fault-tracing has failed.

Exit fault-tracing for this diagnostic trouble code (DTC) or make another attempt.

INFORMATION

FAULT-TRACING INFORMATION

In case of this defect, troubleshooting is not followed by verification.

The information can be displayed again or the fault-tracing for this fault can be interrupted.

MMM-2110: CONTROL MODULE. INTERNAL FAULT (2007-2011)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION MMM-2110

Condition

The multimedia module (MMM) checks internal control module components.

The diagnostic trouble code (DTC) is stored if the control module detects that:

- The DVD player cannot carry out the requested task.

The control module's test for the diagnostic trouble code (DTC) starts in the event of:

- Activating the DVD player.

NOTE: The control module can only detect the fault once the test has been started and the diagnostic trouble code (DTC) is stored when the conditions are met.

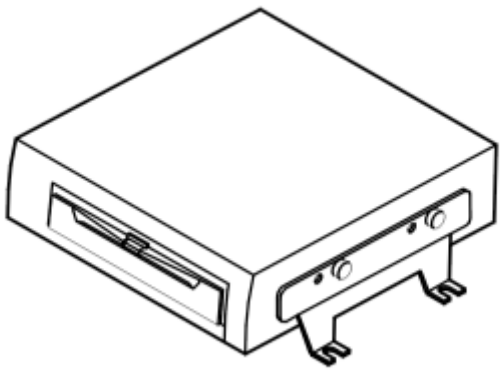


Fig. 24: Identifying Multimedia Module (MMM)
Courtesy of VOLVO CARS CORPORATION

Substitute Value

- None.

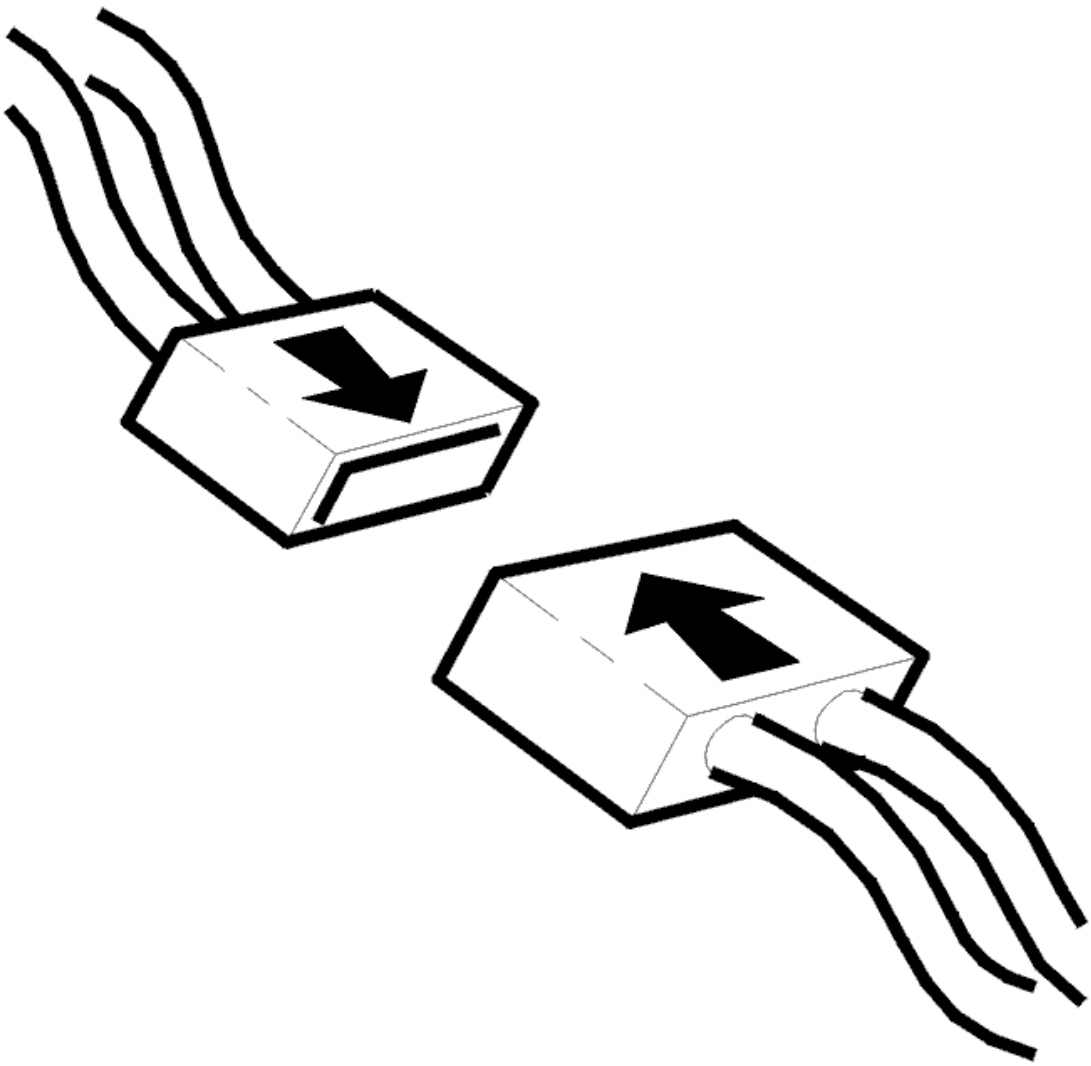


Fig. 58: Connecting Connector
Courtesy of VOLVO CARS CORPORATION

- Ignition off
- Reinstall the connectors, components etc.
- Ignition on

Check that the sound is heard from the speakers by testing the CD player.

Are the speakers working?

- **YES**

VERIFIED: Troubleshooting has been completed.

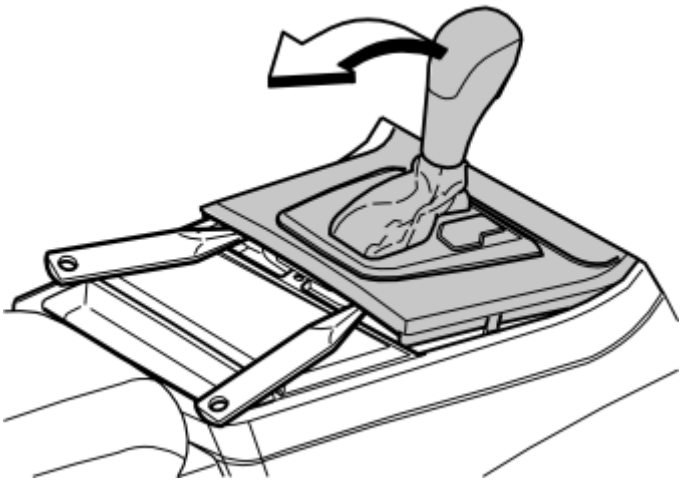


Fig. 6: Prying Off Gear Selector Panel At Rear Edge
Courtesy of VOLVO CARS CORPORATION

Applies to cars with automatic gearbox

- Turn the ignition key to position II.
- Move the gear selector lever to its rearmost position.
- Use a weatherstrip and pry off the gear selector panel at the rear edge.

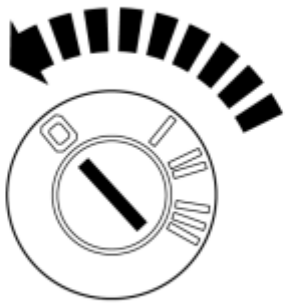


Fig. 7: Identifying Ignition Switch Turned To Position 0
Courtesy of VOLVO CARS CORPORATION

- Turn the ignition key to position 0.

NOTE: Wait at least three minutes before unplugging the connectors or removing other electrical equipment.

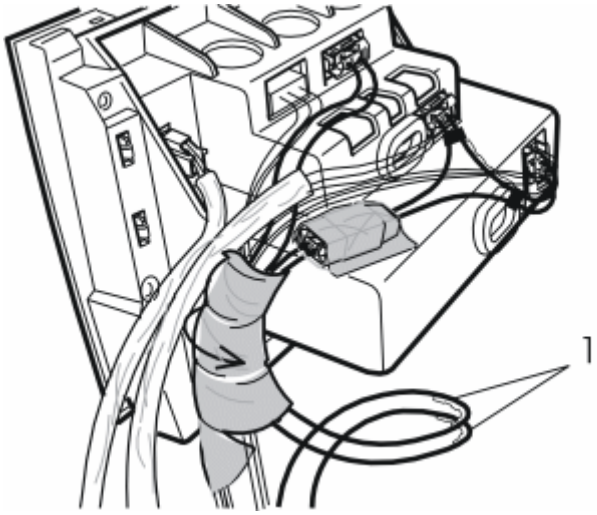


Fig. 50: View Of Load-Removing Grommets (1) Secured In The Fibre Optic Cable Loops
Courtesy of VOLVO CARS CORPORATION

HINT: work from the right-hand seat.

- Position the wiring so that it runs around the bracket as illustrated
- Take half of the remaining foam tape from the wiring kit and wrap it around the cables not already protected.

NOTE: There will be excess fibre optic wiring which should be placed in an loop as illustrated.

- Take the two load-removing grommets (1) from the wiring kit and secure it in the loops formed by the fibre optic cable as illustrated.

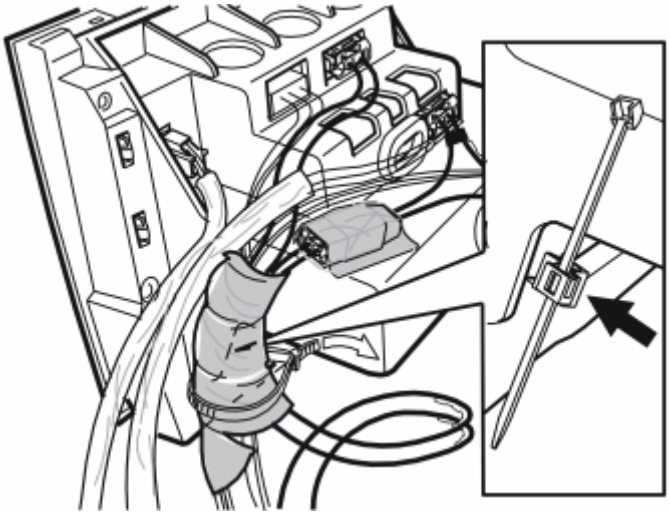


Fig. 51: Identifying Corner Clip And Tie Strap
Courtesy of VOLVO CARS CORPORATION

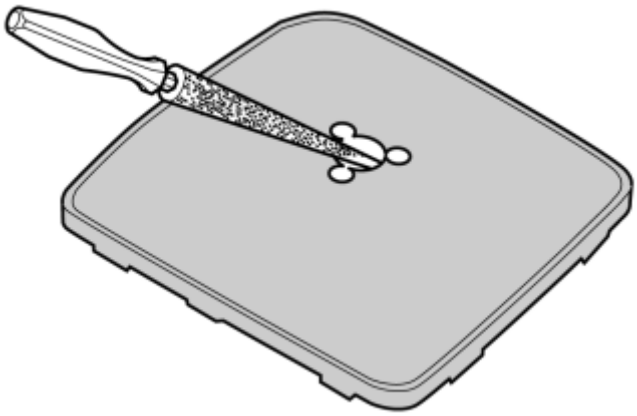


Fig. 694: Deburr And Bend In The Edges Using A Round File
Courtesy of VOLVO CARS CORPORATION

- Deburr and bend in the edges using a round file.

Illustration A

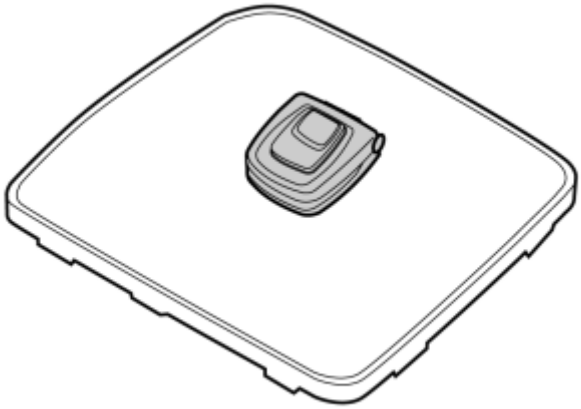


Fig. 695: Secure To The Loudspeaker Grille
Courtesy of VOLVO CARS CORPORATION

- Take three nuts, washer and the cradle out of the kit and secure to the loudspeaker grille.

Illustration B

The normal value at ignition and with the engine running should be approximately 12 V (battery voltage).

TEMPERATURE UNIT

The parameter indicates the internal temperature in the phone module (PHM).

Measurement range -127 - 127°C.

The normal temperature is approximately 70°C but may vary depending on whether the air conditioning (A/C) or heater is in use.

DESCRIPTION OF READING DETAILED DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION

SELECT DESCRIPTION

see **DESCRIPTION OF FROZEN VALUES**

see **STATUS IDENTIFIER, DESCRIPTION**

see **COUNTERS, DESCRIPTION**

DESCRIPTION OF FROZEN VALUES

EXPLANATION

Not all the parameters that are described need to be implemented in the control module. These varies from system to system.

The number of parameters can also vary between diagnostic trouble codes (DTCs).

Frozen values are parameter values that are stored when a diagnostic trouble code (DTC) is stored.

ENGINE RUNNING, STATUS

The status displays whether the engine was running when the diagnostic trouble code (DTC) was stored.

The phone module (PHM) obtains the value via the control area network (CAN).

No = the engine was not running

Yes = the engine was running

PASSENGER COMPARTMENT TEMPERATURE, VALUE

Measurement range -60 - 195°C.

The value indicates the passenger compartment temperature at the time the diagnostic trouble code (DTC) was stored.

Is the transportation protection disc in the DVD player?

- **YES**

  Refer to **CHECKING THE FUNCTION**

- **NO**

  Refer to **CHECKING THE INLET ON THE CONTROL MODULE**

CHECKING THE INLET ON THE CONTROL MODULE

Fig. 110: Identifying Ignition In Off Position
Courtesy of VOLVO CARS CORPORATION

- Ignition off.
- Move the connector for the dvd-player to the input for the tv-connection.
- Ignition on.

  Select the dvd-player as source for one of the screens and press on the remote control's PLAY button. Adjust the screen settings for the monitor where playing takes place, if needed.

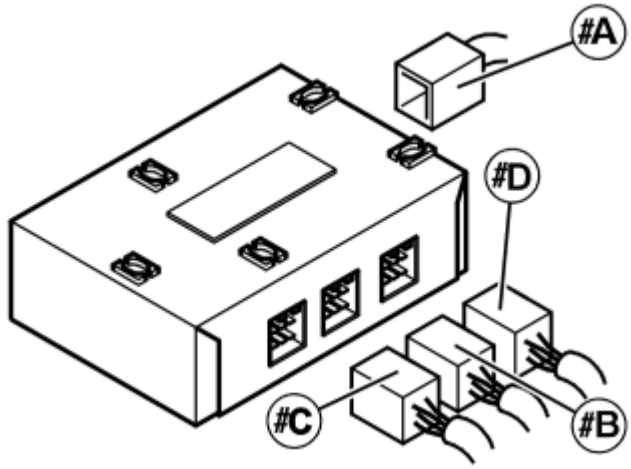


Fig. 111: Identifying Rear Seat Entertainment Module (RSE)
Courtesy of VOLVO CARS CORPORATION

Is playing OK?

Fig. 17: Identifying Measurement Dimensions
Courtesy of VOLVO CARS CORPORATION

The dimensions in the table are listed as follows:

Symbol number 1 means that the measurement is taken from the center.

Symbol number 2 means that the measurement is taken from one edge.

INSTALLING THE AUXILIARIES BELT

Fig. 372: Identifying Belt And Special Tool 999 7109
Courtesy of VOLVO CARS CORPORATION

CAUTION: Make sure that the belt is correctly seated in all the grooves on each pulley.

Turn the belt tensioner clockwise as much as possible.

see **9997109**

Fit the belt.

CHECKING WORK

Start the engine.

Check the rotation of the belt and the function of the belt tensioner.

CAMSHAFT SEAL/VARIABLE VALVE TIMING (VVT) UNIT, REPLACING

Special tools:

see **9995452**

see **9995651**

see **9995719**

see **9995718**

see **9995474**

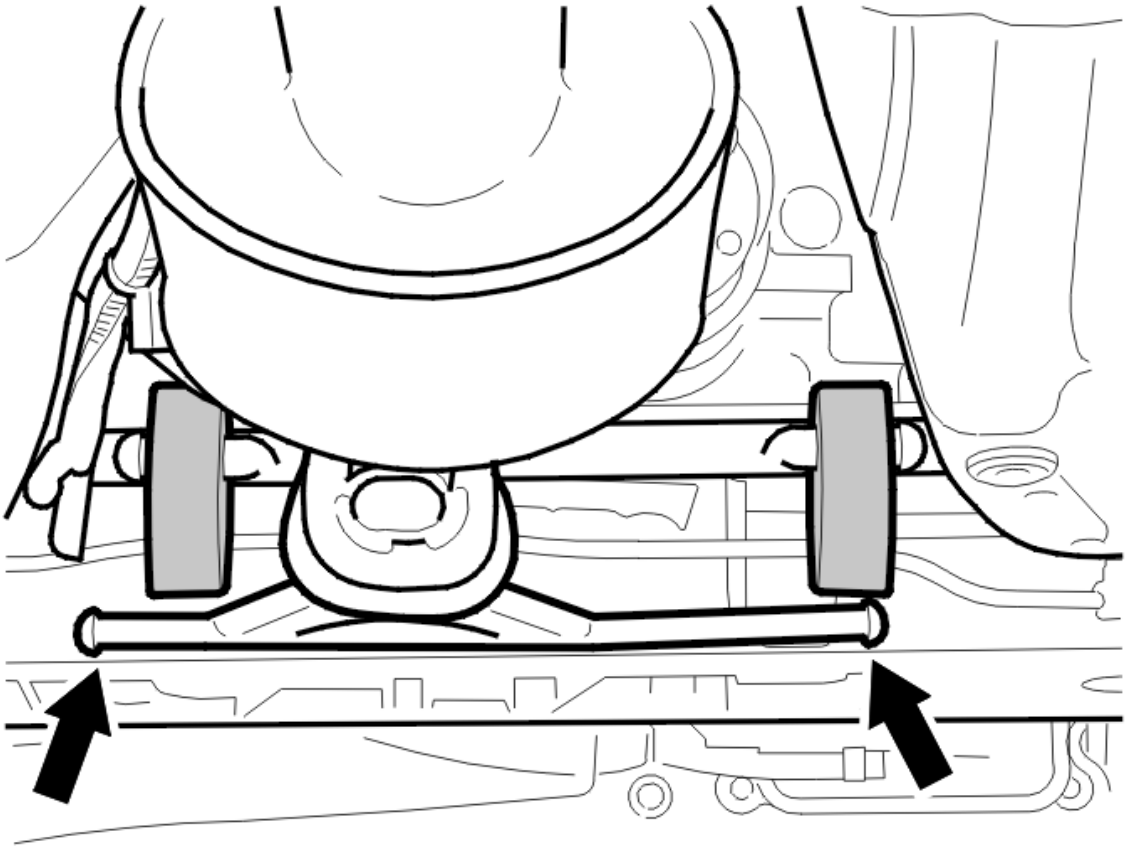


Fig. 287: Identifying Exhaust Pipe Rubber Mountings
Courtesy of VOLVO CARS CORPORATION

Remove the rubber mountings for the exhaust pipe.

REMOVING THE ENGINE PAD SCREW

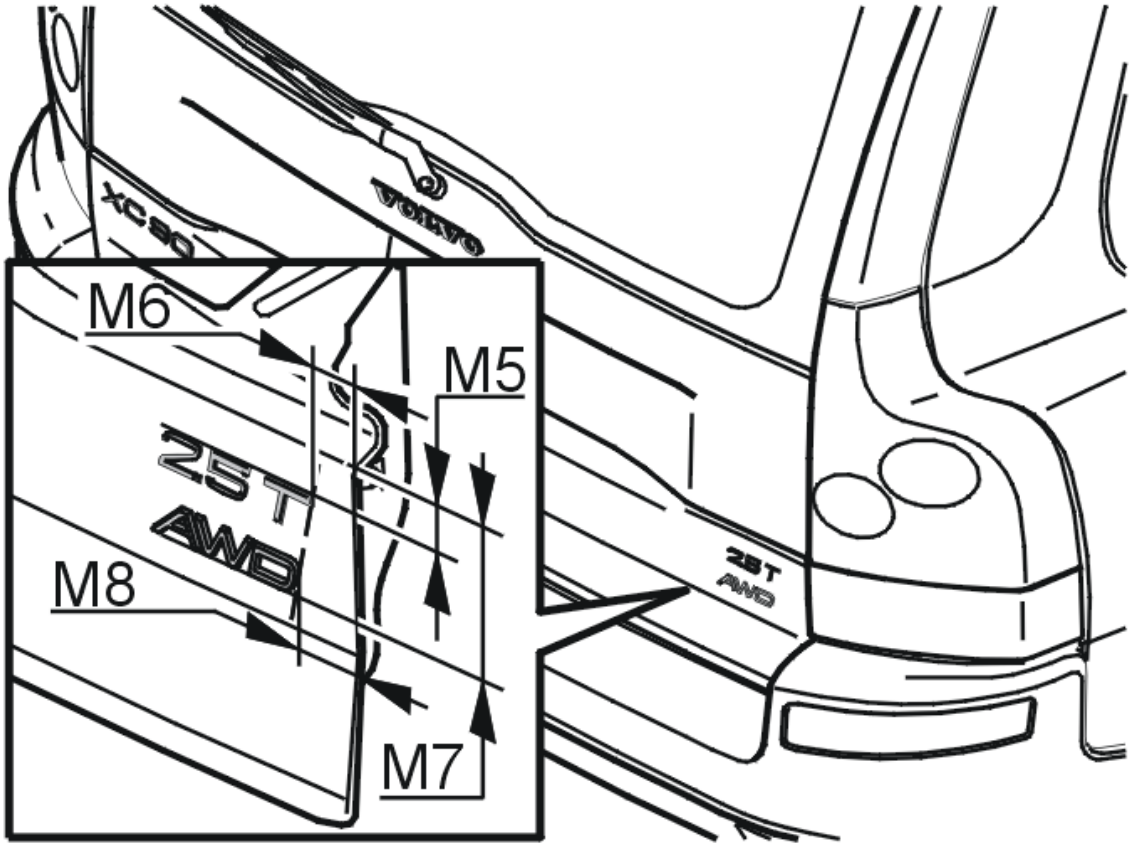


Fig. 149: Identifying Engine Designation Badge
Courtesy of VOLVO CARS CORPORATION

Engine designation

M5 = 27±1 mm

M6 = 33±2 mm

M7 = 78.5±1 mm

M8 = 41±2 mm

Check that the edges of the badge are against the base. There must be no gaps.

Remove the securing foil.

NOTE: To ensure optimal adhesion, do not wash the car for 72 hours. It gradually increases.

OUTER TRIM DETAILS, EMBLEMS, REFLECTIVE STRIPS (EXECUTIVE; 2008-2011)

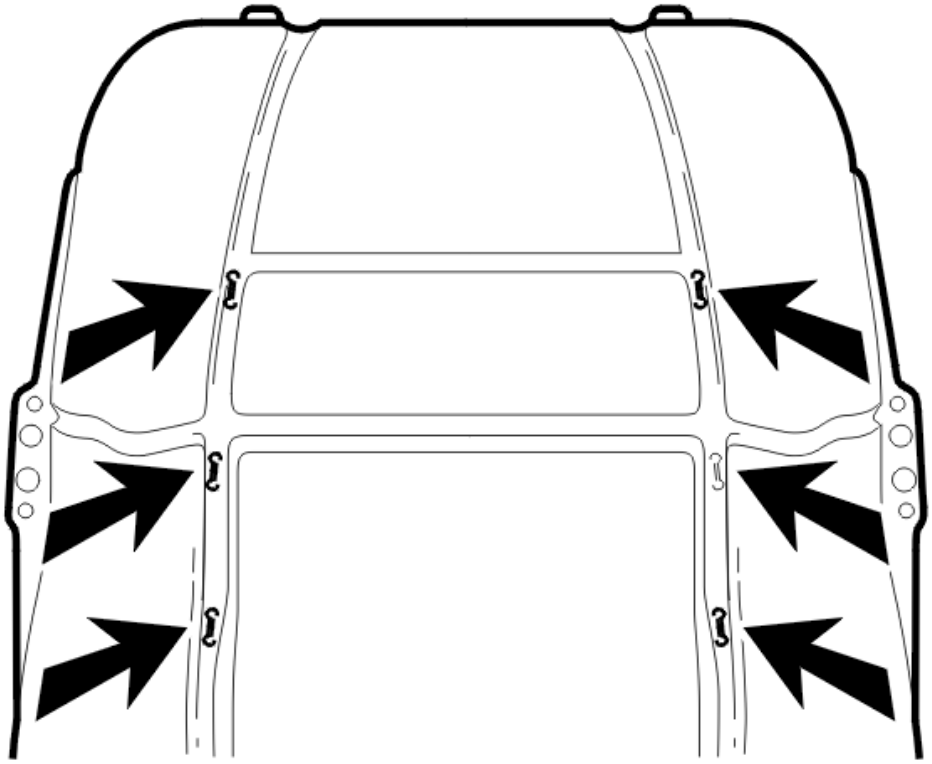


Fig. 97: Half Moon Clips On Each Front-Rear Channel
Courtesy of VOLVO CARS CORPORATION

- the half moon clips, 3 on each front-rear channel.

Pull the upholstery down.

Other information:

- To access or replace the front impact sensor, see **COLLISION SENSOR FRONT, REPLACING** .
- **Continue**

  See: **VERIFICATION**

INFORMATION

FAULT-TRACING INFORMATION

The fault should have been detected and remedied. As this is not the case fault-tracing has failed.

Exit fault-tracing for this diagnostic trouble code (DTC) or make another attempt.

VERIFICATION

VERIFICATION

HINT: After carrying out the repair, check that the fault has been remedied.

- 5 half moon clips in the underside of the backrest
- the backrest adjustment knob. This applies only to manual seats
- the side piece by pressing it straight in
- the lumbar support knob. See **LUMBAR SUPPORT BACKREST CUSHION, REPLACING** (-2004) or **LUMBAR SUPPORT BACKREST CUSHION, REPLACING** (2005-).

Reinstall the seat in the vehicle. See **INSTALLING THE FRONT SEAT** (-2004) or **FRONT SEAT, REPLACING** (2005-).

Re-tension the lumbar support.

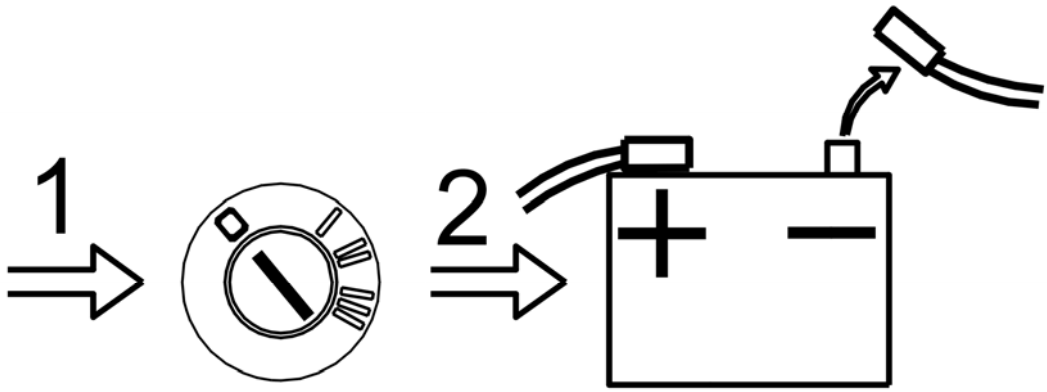
Carry out an inspection. See **SUPPLEMENTARY RESTRAINT SYSTEM (SRS), INSPECTION** .

AIRBAG PASSENGER (SRS), REPLACING

NOTE: The illustrations in this service information are used for different model years and/or models. Some variation may occur. However, the essential information in the illustrations is always correct.

PREPARATORY WORK

REMOVING THE BATTERY LEAD AND IMPORTANT INFORMATION



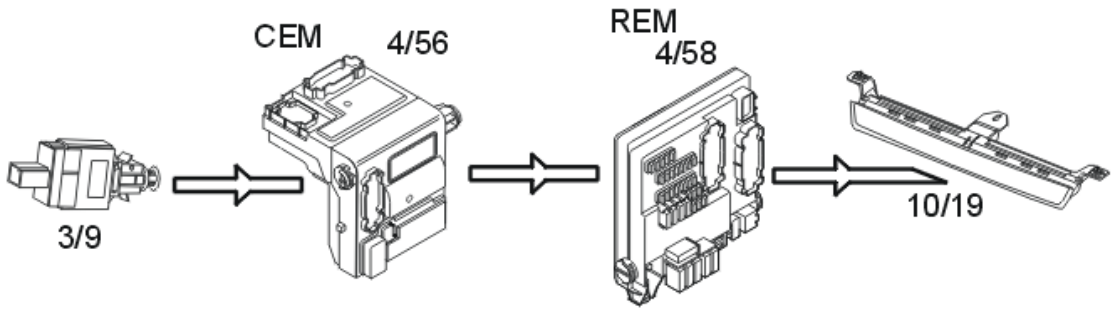


Fig. 203: Identifying High Level Stop Lamp Communication Links & Components
Courtesy of VOLVO CARS CORPORATION

When the stop lamp switch (3/9) is closed, a signal is transmitted to the central electronic module (CEM) (4/56). The signal is transmitted from the central electronic module (CEM) to the rear electronic module (REM) (4/58) via a directly connected cable. The high mounted stop lamp is supplied with power directly from the rear electronic module (REM). The stop lamp is supplied with power for as long as the stop lamp switch is closed.

REAR DEMIST

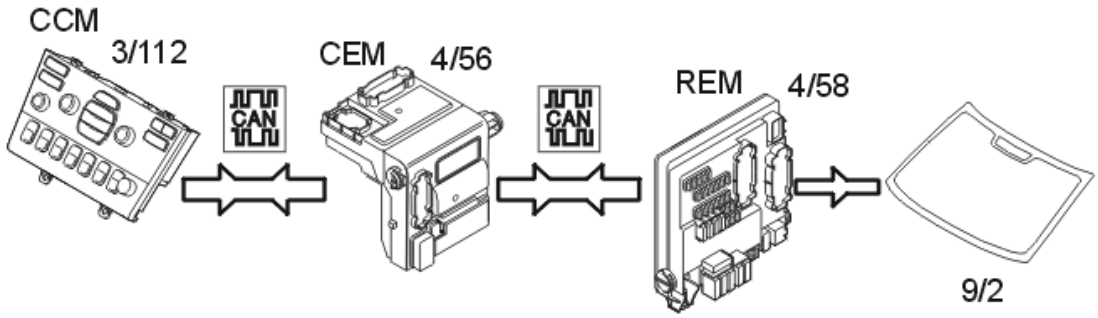


Fig. 204: Identifying Rear Demister Communication Links & Components
Courtesy of VOLVO CARS CORPORATION

Rear demist (9/2) is activated by pressing the switch on the climate control module (CCM) (3/112). The climate control module (CCM) transmits the data via the Control area network (CAN) to the central electronic module (CEM) (4/56). The central electronic module (CEM) checks that the conditions to start the demist have been met. If the conditions are met, a request is transmitted via the controller area network (CAN) to the rear electronic module (REM) (4/58) to activate the relay. The rear electronic module (REM) powers the relay and the demister is powered.

The central electronic module (CEM) also transmits a request via the Control area network (CAN) back to the climate control module (CCM) to light the LED in the switch.

CARGO COMPARTMENT LIGHTING)

new control module.

Customer parameters can be programmed for approach lights, seat heaters, post drying and daytime running lamps.

Seat heater: First read off the data that is programmed in the central electronic module (CEM). Answer, for example, 37C. Then enter the temperature desired by the customer, for example 41C. After programming, the new data must be saved in the control module memory. The following values can be programmed in: 0, 10C, 28C, 30C, 31C, 32C, 33C, 34C, 35C, 36C, 37C, 38C, 39C, 40C, 41C, 43C. The left and right-hand seats are programmed individually and there are two settings that can be selected by the customer, high or low.

Approach lights: First read off the data that is programmed in the central electronic module (CEM). Answer, for example, 30 seconds. Then enter the time desired by the customer, for example 90 seconds). After programming, the new data must be saved in the control module memory. The following values can be programmed in: 0, 30, 60 and 90 seconds.

Post drying: First read off the parameters programmed in the central electronic module (CEM). Reply for example the function is not set. Then enter if the customer wants post drying (the function is set). After programming, the new parameters must be saved to the control module memory. The following values can be entered: Off or on.

Daytime running lamps: First read off the data that is programmed in the central electronic module (CEM). For example, daytime running lamps off. Then enter if the vehicle is to have daytime running lamps (daytime running lamps on). After programming, the new data must be saved in the control module memory. The following values can be programmed in: Off or on. There are two versions of off. Dipped headlamps can be switched on in all light switch positions apart from the P position. The dipped headlamp beam can also be adjusted.

READING OFF THE CONTROL MODULE IDENTIFICATION

VIDA identifies control modules by reading off a number of codes from the control module memory.

The codes contain information about the control module:

- hardware P/N (control module without software)
- hardware serial number (control module without software)
- software P/N
- diagnostic software P/N.

DOWNLOADING SOFTWARE AND REPLACING THE CONTROL MODULE

New software can be downloaded into the central electronic module. When ordering software, the hardware and the software in the car is compared to the Volvo central database. If the comparison is OK the software is downloaded to the control module.

If the comparison between the car and Volvo central database is not OK, the database is updated with the car configuration. When this is complete the software is downloaded.

speed	Solenoid						Clutch			Brakes		Freewheel
	SLC1	SLC 2	SLC 3	SLB1	S1	S2	C1	C2	C3	B1	B2	F1
Max 7 km/h	X	X	X	-	X	-	-	-	X	-	X	-
Above 7 km/h	X	X	X	X	X	-	-	-	-	-	X	-

X = activated

- = not activated

Planetary train unit	Power in	Locked	Power out
Front	Ring gear	Sun gear	Planetary gear carrier
Rear	Large sun gear	Planetary gear carrier	Ring gear

The input shaft rotates clockwise, the same direction as the torque converter's turbine rotor.

The front planetary train's ring gear rotates clockwise.

The front planetary train's planetary gear rotates clockwise on its shafts. Because the front planetary train's sun gear is locked by the oil pump, the planetary train's planetary gear presses against the front planetary train's ring gear, and therefore rotates around the sun gear. Because the front planetary train's ring gear has inner teeth, the direction of rotation does not change.

The front planetary gear carrier rotates clockwise.

Clutch C3 rotates clockwise and connects the front planetary gear carrier with the rear planetary train's large sun gear.

The rear planetary train's large sun gear rotates clockwise.

Brake B2 locks the rear planetary gear carrier.

The rear planetary train's outer planetary gear rotates counter-clockwise.

The rear planetary train's ring gear rotates counter-clockwise using the rear planetary train's outer planetary gear. Because the rear planetary train's ring gear has inner teeth, the direction of rotation does not change.

The driven gear rotates counter-clockwise. Because the rear planetary train's ring gear is on the driven gear, the driven gear rotates in the same direction as the rear planetary train's ring gear.

The counter-rotating gear rotates clockwise.

The differential's ring gear rotates counter-clockwise.

Engine brake

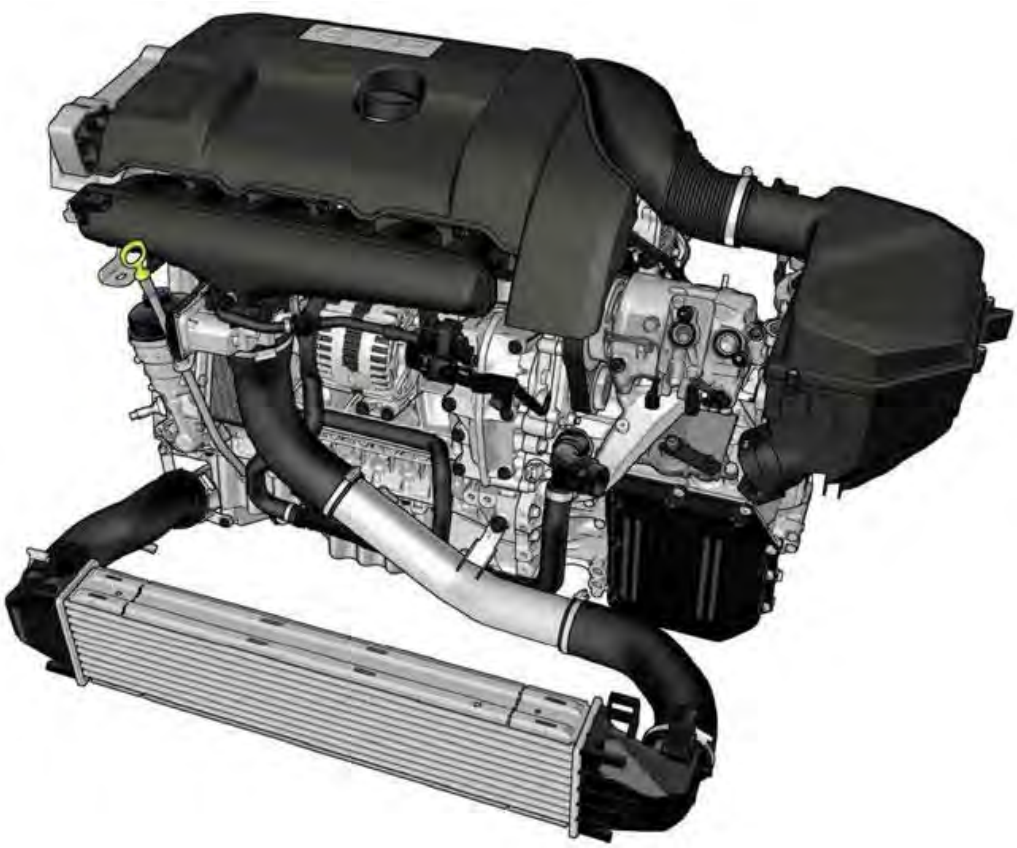


Fig. 150: ENGINE (B6324S5; 2011-2012)
Courtesy of VOLVO CARS CORPORATION

The engine has been developed by Volvo.

It is a 6 cylinder transverse in-line engine with a cylinder capacity of 3.2 L for naturally aspirated engines and 3.0 L for turbocharged engines.

After having been relatively unchanged since the introduction 0620, this engine family has been updated on several points. Most modifications have their basis in an effort to achieve lower fuel consumption and thus less environmental impact.

Engine power has increased, at the same time as fuel consumption has decreased.

- B6304T4: (ULEV2 Ultra Low Emission Vehicle): 300(US)/ 304 hp / 440 Nm
- B6324S4 (PZEV - Partial Zero Emission Vehicle): 230(US) 233 hp (torque unchanged 300 Nm)
- B6324S5 (ULEV - Ultra Low Emission Vehicle): 240(US) /243 hp (torque unchanged 320 Nm)

All of these engines meet the emission standards for Euro5.

The engines' idle speed 650 rpm.

The engine is extremely compact. When it was introduced it was the shortest 6-cylinder engine of 3.2 L on the

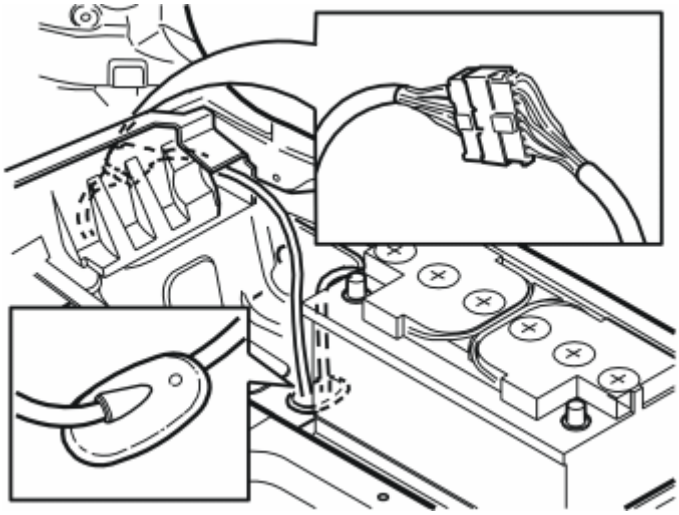


Fig. 300: Connecting The Routed Cable Harness
Courtesy of VOLVO CARS CORPORATION

- Connect the routed cable harness to the existing pre-routed cable harness in the space
- Route the excess cable into the small space and secure to the existing cable harness. Ensure that the connectors are secured so that they do not rattle
- Reinstall the drain hose for the battery
- If the fog tail lamp and/or positive power supply / charge function is being connected for the XC90, continue with point 21. Otherwise go directly to point 25.

CONNECTING THE FOG TAIL LAMP AND/OR POSITIVE POWER SUPPLY / CHARGE FUNCTION

NOTE: To connect the positive power supply / charge function for the XC90, remove the side panel on the left-hand side of the cargo compartment according to points 21-24.

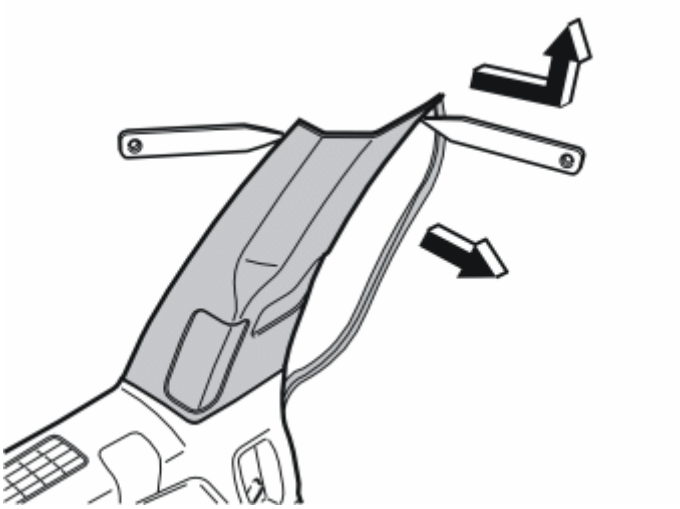


Fig. 301: Identifying Left-Hand C-Post Panel And Plastic Weatherstrip Tools
Courtesy of VOLVO CARS CORPORATION

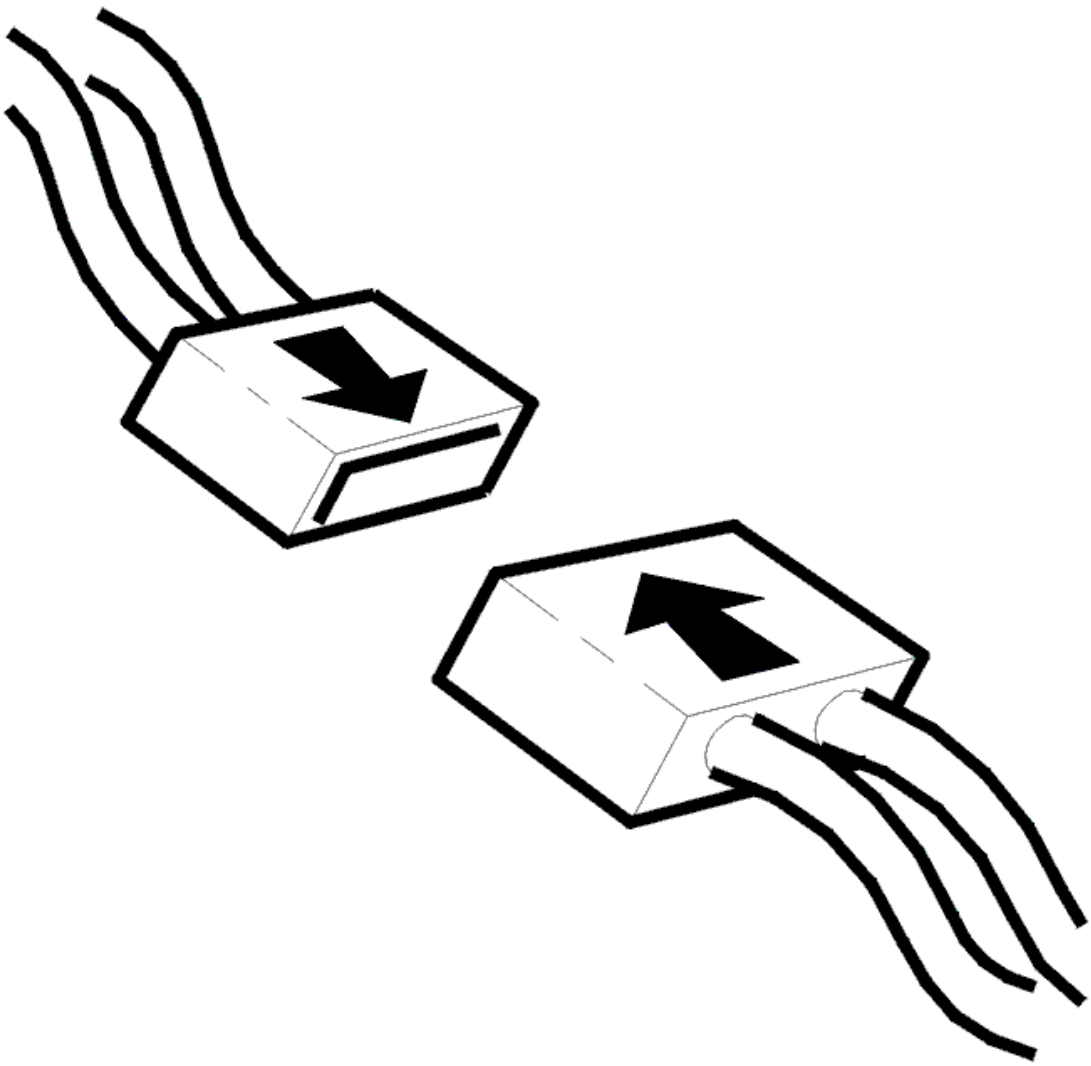


Fig. 44: Connecting Connector
Courtesy of VOLVO CARS CORPORATION

- Ignition off
- Reconnect the connectors, reinstall components etc.
- Test drive the car. See **TEST DRIVE FORM (DSTC (DYNAMIC STABILITY AND TRACTION CONTROL) /BRAKE CONTROL MODULE), DESCRIPTION**
- Ignition on.

  Read off the status of the diagnostic trouble code (DTC).

(B6324S5; 2011-2012)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION

see **DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION**

TROUBLESHOOTING

see **TROUBLESHOOTING**

BCM-C006128: ACCELERATION SENSOR LATERAL. GENERAL SIGNAL ERROR. SIGNAL DISPLACEMENT ERROR/ZERO ADJUSTMENT ERROR (B8444S; 2005-2011)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION

see **DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION**

TROUBLESHOOTING

see **TROUBLESHOOTING**

BCM-C006164: ACCELERATION SENSOR LATERAL. ALGORITHM ERROR. SIGNAL OUTSIDE PERMITTED RANGE (B6324S; 2007-2010)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION

Condition

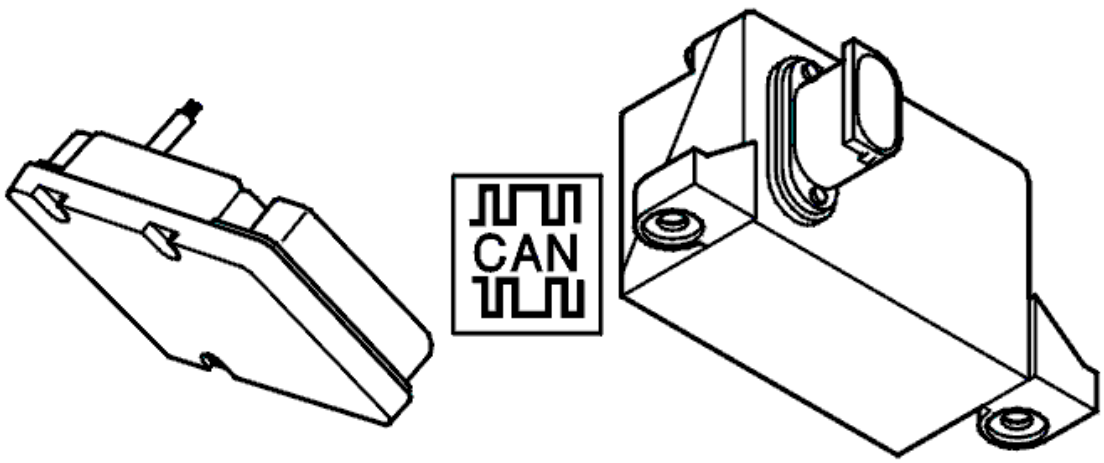


Fig. 14: Identifying Brake Control Module & Active Yaw Control Sensor

FAULT-TRACING INFORMATION

Condition

- No diagnostic trouble codes (DTCs) stored.
- The fault is permanent.

Possible Source

- Vibrations from brake pedal (caused by variations in brake disc thickness).

CHECKING BRAKE FAILURE WARNING LAMP

CHECKING BRAKE FAILURE WARNING LAMP

CHECKING BRAKE FLUID LEVEL

Check brake fluid level is not too low. Brake fluid reservoir should be full.

If the brake fluid level is low, check that there are no brake fluid leaks in the hydraulic brake system.

Remedy as necessary.

- Top up brake fluid.
- Start engine and check that the brake failure warning lamp goes out.

Courtesy of VOLVO CARS CORPORATION

CAUTION: Make sure that the mating faces are clean and free of foreign material.

Use: Silicone grease, 1161688

Fig. 20: Identifying Contact Points
Courtesy of VOLVO CARS CORPORATION

CAUTION: Make sure that the mating faces are clean and free of foreign material.

To install, reverse the removal procedure.

REAR WHEEL BRAKE

BRAKE DISC REAR, CALIBRATING

Special tools:

see **9995418**

see **9995419**

see **9995507**

PREPARATORY WORK

DRIVELINE/AXLES

Rear Axle, Drive Shafts - Diagnostic Trouble Codes And Associated Procedures

DEM-P066615: PCM / ECM / TCM INTERNAL TEMPERATURE SENSOR CIRCUIT. GENERAL ELECTRICAL FAILURES. CIRCUIT SHORT TO BATTERY OR OPEN (B8444S, TF-80SC AWD; 2009-2011)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION DEM-P066615

see **DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION DEM-P066615**

FAULT-TRACING

see **FAULT-TRACING**

DEM-P066727: PCM / ECM / TCM INTERNAL TEMPERATURE SENSOR RANGE/PERFORMANCE. GENERAL SIGNAL FAILURES. SIGNAL RATE OF CHANGE ABOVE THRESHOLD (B6324S, TF-80SC AWD; 2009-2010)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION DEM-P066727

Condition

The Differential Electronic Module (DEM) has a temperature sensor fitted on the control module's circuit board. If the temperature rises too quickly, four-wheel drive disengages. This is to protect the control module.

The diagnostic trouble code (DTC) is stored if the control module detects that:

- The temperature increases at a speed greater than 10 °C/s.
- Incorrect value lasts longer than 50 ms.

The control module's test for the diagnostic trouble code (DTC) starts in the event of:

- Engine running.

NOTE: The control module can only detect the fault once the test has been started and the diagnostic trouble code (DTC) is stored when the conditions are met.

INSTALLING DRIVE SHAFTS

Install the drive shafts on both sides according to: **DRIVE SHAFT REAR, REPLACING**.

INSTALLING THE SPARE WHEEL AND REAR SECTION OF THE EXHAUST SYSTEM

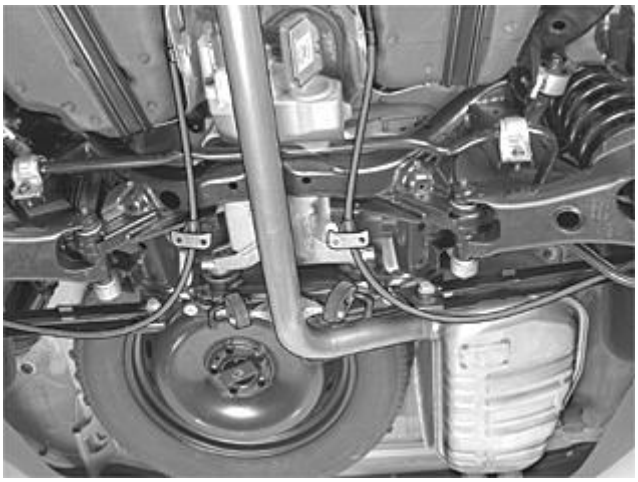


Fig. 62: Identifying Rear Section Of Exhaust System & Spare Wheel
Courtesy of VOLVO CARS CORPORATION

Check that the gasket for the flanged joint between the front and rear exhaust pipe is not damaged. Replace if necessary.

Install the rear cross member. Use 2 x M8 screws. Tighten.

FILLING AND CHECKING THE OIL LEVEL

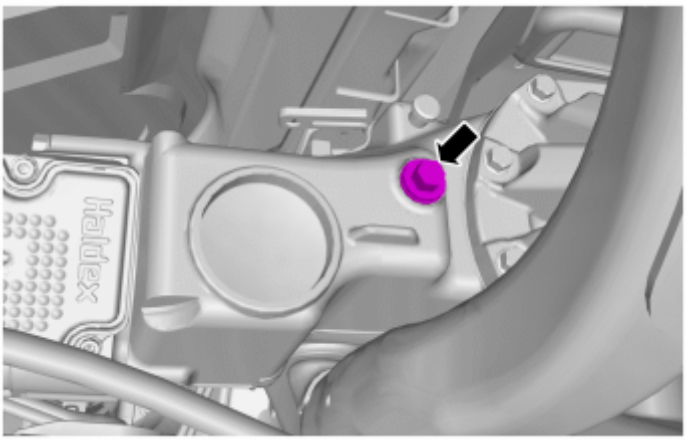


Fig. 63: Filling And Checking The Oil Level
Courtesy of VOLVO CARS CORPORATION

Top up and check the oil level in the active on demand coupling (AOC).

- Tighten the 3 screws for the generator (GEN). M8.

FINISHING WORK

Install:

- the front panel
- the bumper cover
- the right-hand headlamp. See **HEADLIGHT/BULB, REPLACING**
- the turbocharger hose
- the power steering pump. See **POWER STEERING PUMP, REPLACING**
- the auxiliaries belt. See **REPLACING THE ACCESSORY DRIVE BELT/BELT TENSIONER**
- the engine coolant hose. Top up the coolant.
- the battery negative lead. See **BATTERY, DISCONNECTING**

Test the function.

PULLEY, REPLACING

See **PULLEY, REPLACING**

GENERATOR (B5254T2; 2007)

GENERATOR (GEN), REPLACING

NOTE: The graphics in this service information are used for different model years and/or models. Some variation may occur. However, the essential information in the graphics is always correct.

PREPARATORY WORK

IGNITION OFF

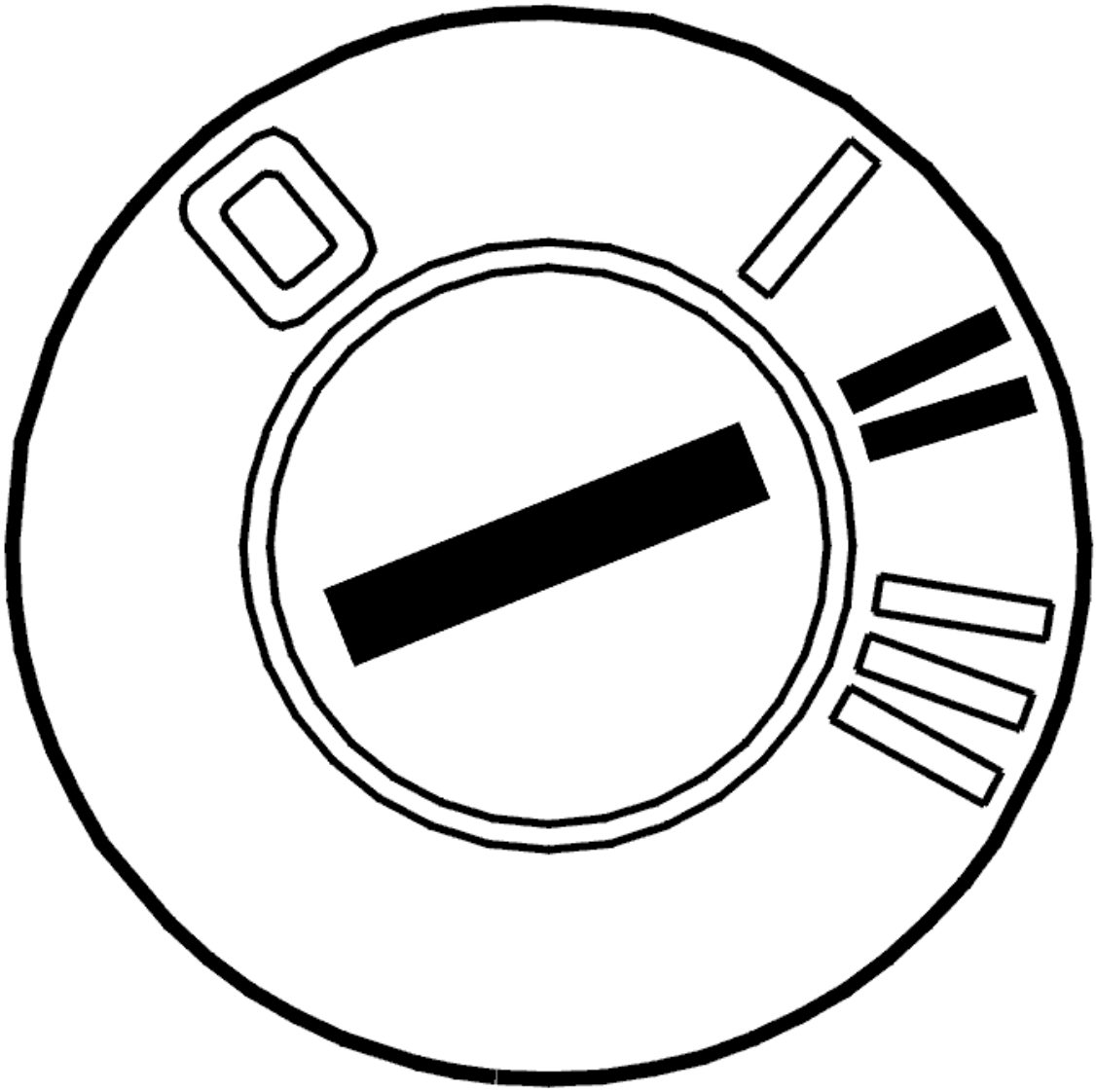


Fig. 219: Identifying Ignition ON
Courtesy of VOLVO CARS CORPORATION

- Reinstall the connectors, components etc.
- Ignition on.
- Erase diagnostic trouble codes using the VCT2000 (or appropriate scan tool).
- Start the car. Allow the vehicle to run for 10 minutes.
- Read off diagnostic trouble codes (DTCs).

Faults in the CAN network may be due to a control module sending faulty messages that disrupt normal communication. When messages are sent incorrectly, this results in a considerable increase in the amount of traffic on the CAN network. The load can be checked by reading the average value of the voltage on the CAN cables in relation to ground.

The following applies for model year -2004:

Connect a voltmeter between CAN-L and ground. The voltage shall be approx. 2.3 V.

Then connect a voltmeter between CAN-H and ground. The voltage shall be approx. 2.8 V.

The following applies for model year 2004-:

Connect a voltmeter between CAN-L and ground. The voltage should be approx: V

Connect a voltmeter between CAN-H and ground. The voltage should be approx: V

NOTE: For vehicles of later model years, normal voltage values lie within a specific interval due to increased traffic between the control modules on the CAN network upon update of the electrical system.

HINT: If possible, measure from the rear of the affected connectors so that they are not damaged.

Other information

- see **BATTERY, DISCONNECTING**

Is the value OK?

- **YES**

  Refer to **INFORMATION**

- **NO**

  Refer to **IDENTIFYING A CONTROL MODULE IN THE CAN NETWORK**

IDENTIFYING FAULT CAUSES IN THE CAN NETWORK

- Disconnect a control module that disconnects the CAN network (a control module that has four terminals to the CAN network).

  HINT: For the low speed network, suitable places for disconnecting the network are at the steering wheel module (SWM), the driver information module (DIM) or the climate control module (CCM).

  In the event of an short-circuit between on of the CAN cables and voltage or ground, the fault can be localized disconnecting a control module that splits the CAN network. Readings can then be taken to

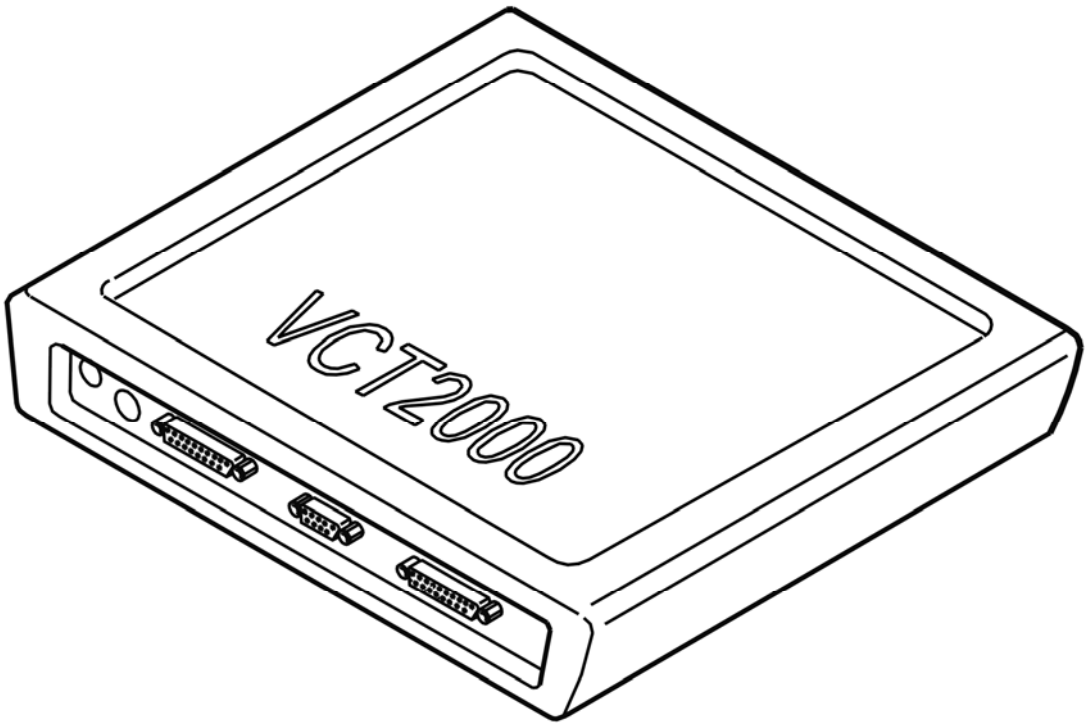


Fig. 116: Identifying VCT2000 Diagnostic Tool Symbol In VIDA
Courtesy of VOLVO CARS CORPORATION

Is the function OK?

- **YES**

  VERIFIED: Troubleshooting has been completed.

- **NO**

  Refer to **INFORMATION**

INFORMATION

FAULT-TRACING INFORMATION

The fault should have been detected and remedied. As this is not the case fault-tracing has failed.

Exit fault-tracing for this diagnostic trouble code (DTC) or make another attempt.

CEM-2F06: SEAT POSITION SENSOR, PASSENGER. FAULTY SIGNAL (2005-2012)

The diagnostic trouble code (DTC) is stored if the central electronic module (CEM) registers that the power supply to the combustion preheater module (CPM) exceeds 16 V.

The diagnostic trouble code (DTC) can be diagnosed when the heater is activated.

Substitute Value

- None.

Possible Source

- A battery charger or starter unit with incorrect charge voltage is connected
- Damaged generator (GEN).

Fault symptom[s]

- Poor heating in the passenger compartment.
- Starting/Engine does not start/Unsure when/at all times
- Warning lights and chimes/Generator warning indication/no indication
- Alternator and charge regulator/Power supply problems

SIGNAL TOO HIGH

CHECKING CHARGE VOLTAGE

HINT: It is important that the correct voltage is set when the battery charger or start unit is connected to the battery.

HINT: Charging with too high a voltage can cause a diagnostic trouble code (DTC) to be stored.

The ohmmeter should display 0 ohm.

If the resistance deviates, replace the rear electronic module (REM).

Additional information

- To access/replace the rear electronic module (REM):
  - For -2004, see: **RELAY/FUSE BOX CARGO COMPARTMENT/REAR ELECTRONIC MODULE (REM), REPLACING**
  - For 2005-, see: **REAR ELECTRONIC MODULE (REM), REPLACING** .

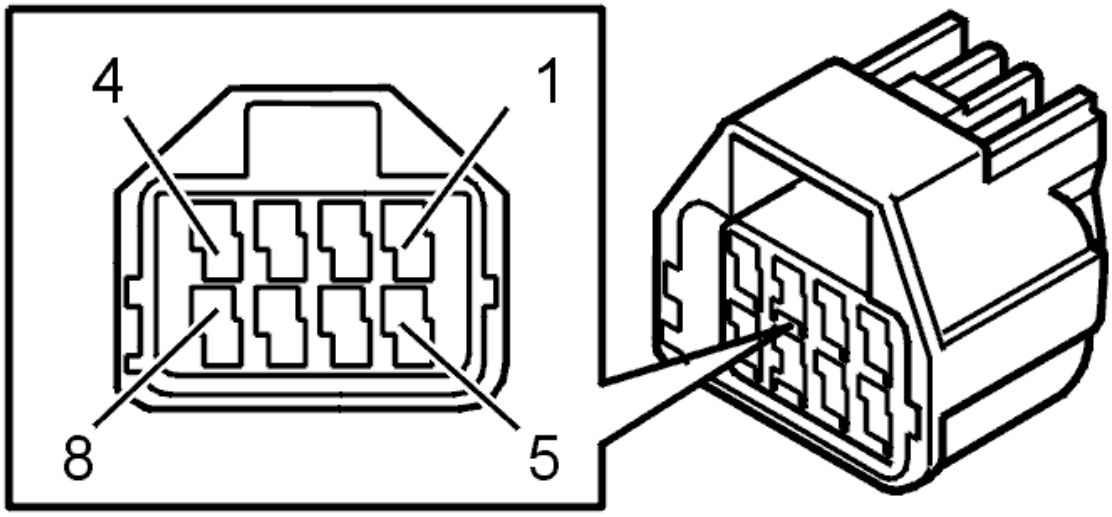


Fig. 331: Identifying Connector Terminals
Courtesy of VOLVO CARS CORPORATION

Other information:

- For -2004, see: **CENTRAL ELECTRONIC MODULE (CEM), REPLACING**
- For 2005-, see: **CENTRAL ELECTRONIC MODULE (CEM), REPLACING** .
- see **CHECKING WIRING AND TERMINALS**

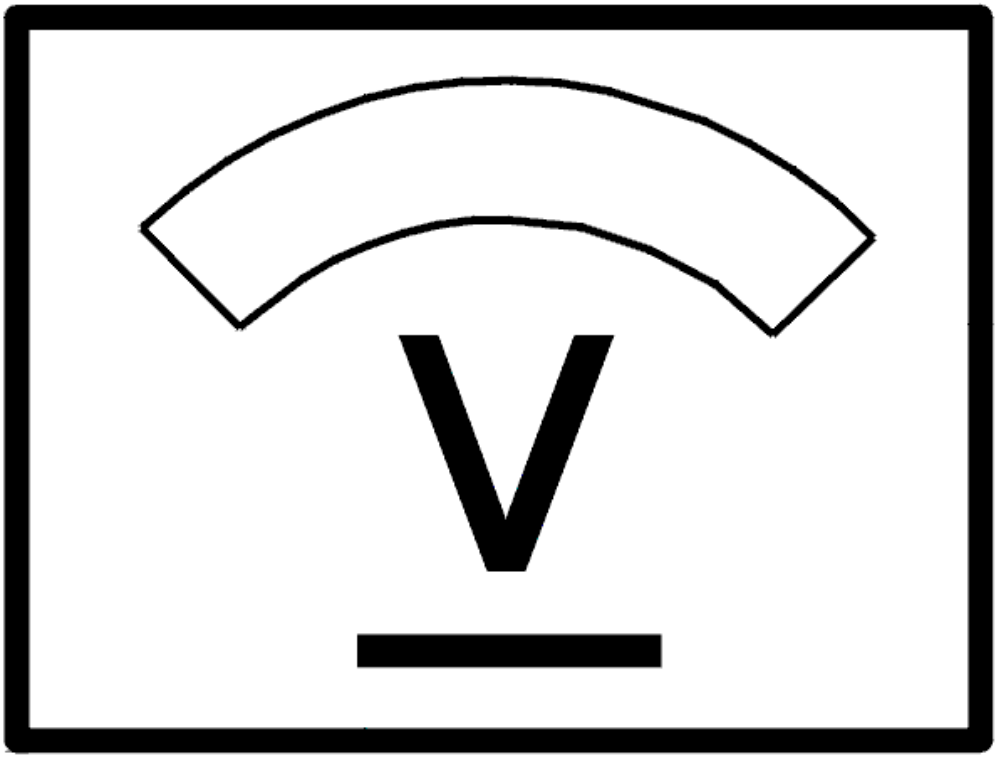


Fig. 130: Identifying Voltage Display
Courtesy of VOLVO CARS CORPORATION

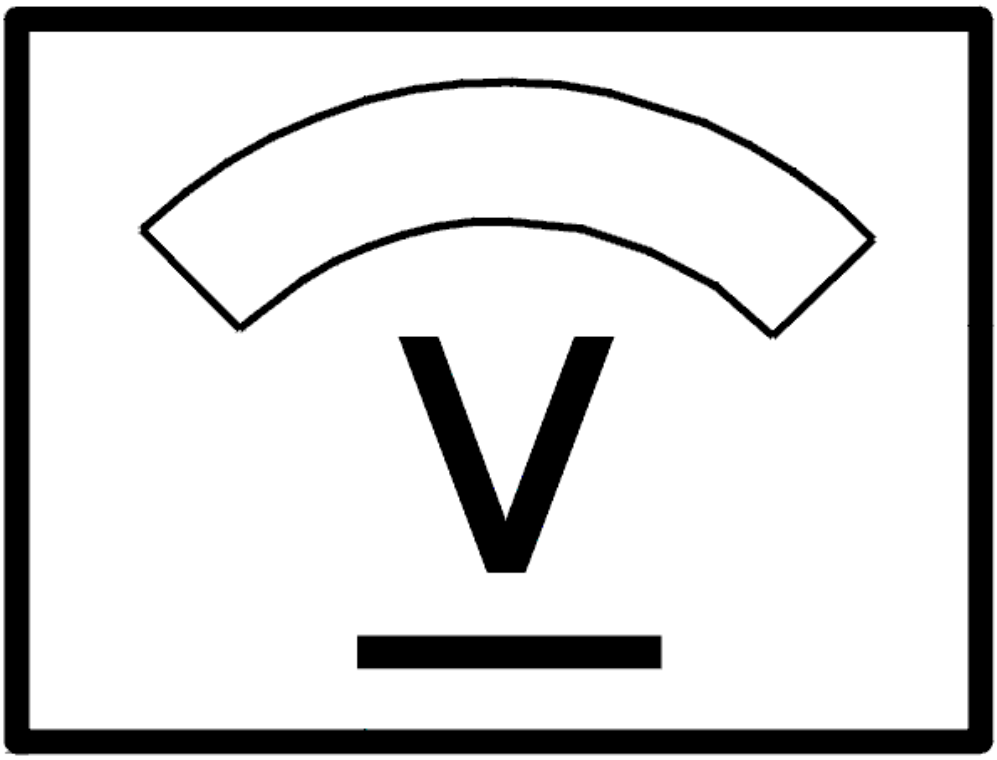


Fig. 90: Identifying Voltage Display
Courtesy of VOLVO CARS CORPORATION

Does the voltmeter show the battery voltage?

- **YES**

  Refer to **CHECKING THE LOCKING MOTOR WIRES**

- **NO**

  Refer to **CHECKING FOR AN OPEN CIRCUIT**

CHECKING FOR AN OPEN CIRCUIT

Check door control unit connector B12 for contact resistance and oxidation as described in, see **CONTACT**

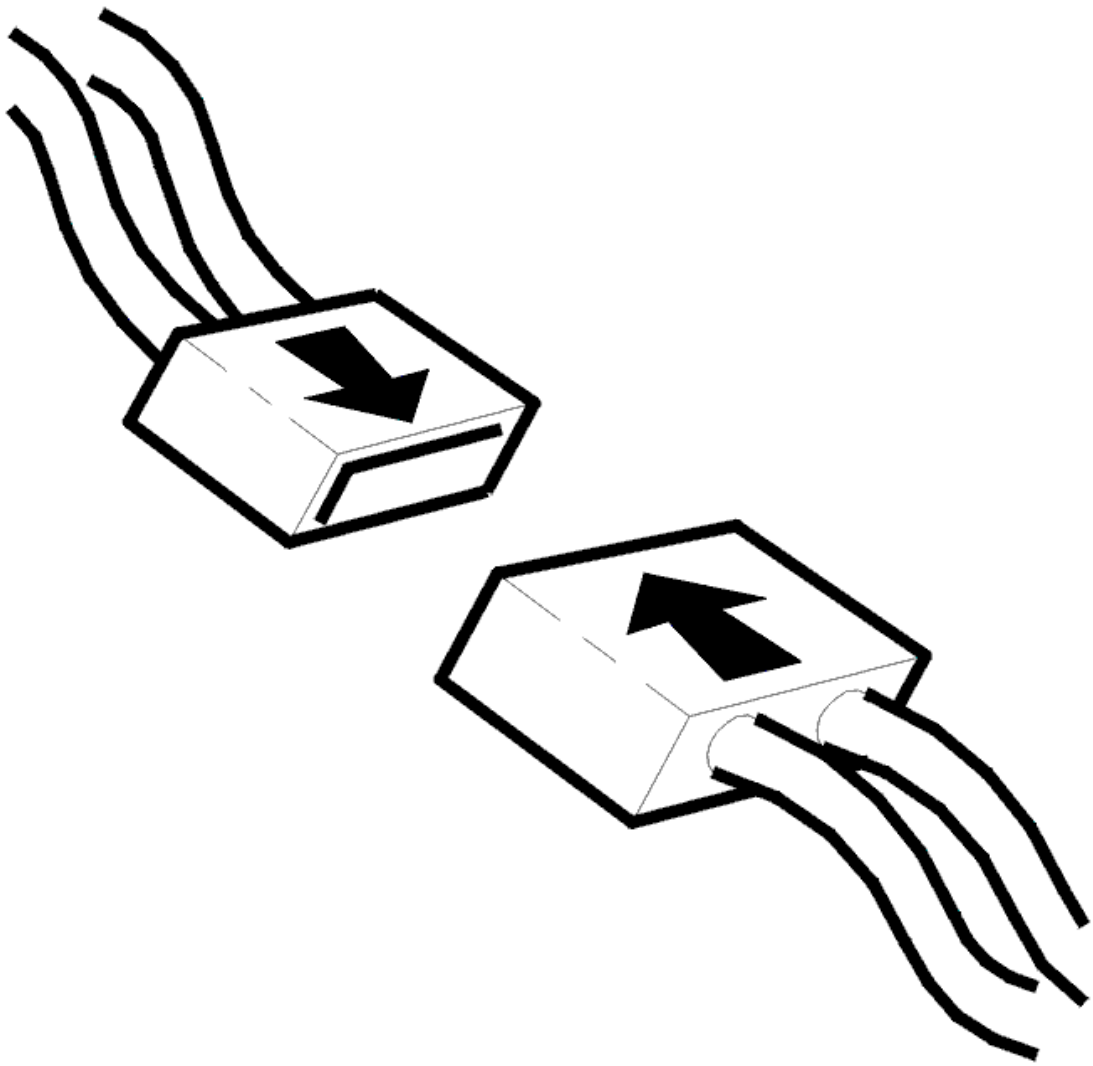


Fig. 384: Connecting Connector
Courtesy of VOLVO CARS CORPORATION

- Ignition off
- Reinstall the connectors, components etc.
- Ignition on.

Check that the function for the relevant button or switch is OK.

Is the function OK?

- **YES**

VERIFIED: Troubleshooting has been completed.

If the fault is intermittent, do not verify fault-tracing if the fault does not recur.

It is possible to view the information again, or leave fault-tracing for this diagnostic trouble code (DTC).

CEM-5F3F: FUEL PUMP (FP). SIGNAL TOO HIGH (2005-2012)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION CEM-5F3F

Condition

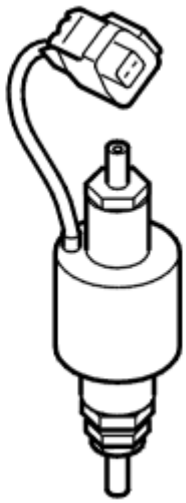


Fig. 309: Identifying Fuel Pump
Courtesy of VOLVO CARS CORPORATION

The central electronic module (CEM) checks the communication with the combustion preheater module (CPM).

The diagnostic trouble code (DTC) is stored if the central electronic module (CEM) registers that the signal in the circuit for the fuel pump (FP) is too high.

The diagnostic trouble code (DTC) can be diagnosed when the heater is activated.

Substitute Value

- None.

Possible Source

- Short-circuit to supply voltage in the signal cable
- Damaged fuel pump.

Fault symptom[s]

- Poor heating in the passenger compartment.

- Tail light/Brake lights constantly lit

FAULT-TRACING

CHECKING STOP LAMP SWITCH STATUS

NOTE: The following troubleshooting shall not be performed if no symptom (according to trouble code information) is noticed on the vehicle. Then the diagnostic trouble code shall be erased instead.

This diagnostic trouble code indicates that there is a defect in the brake light switch or the leads to the same.

Brake light switch is a switch that controls when the brake lights shall be activated/not activated.

Troubleshoot according to:

1. Check the brake light switch connector for contact resistance and oxidation.

2. Check that the brake light switch is supplied with voltage.

3. Check leads between Central electronic module (CEM) and brake light switch.

If no defect is detected, replace brake light switch.

Remedy as necessary.

Other information

- see **SIGNAL SPECIFICATION**
- see **CHECKING WIRING AND TERMINALS**
- **Continue**

  Refer to **INFORMATION**

INFORMATION

FAULT-TRACING INFORMATION

In case of this defect, troubleshooting is not followed by verification.

The information can be displayed again or the fault-tracing for this fault can be interrupted.

CEM-8D04: INTERNAL FAULT IN CONTROL MODULE (2005-2012)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION CEM-8D04

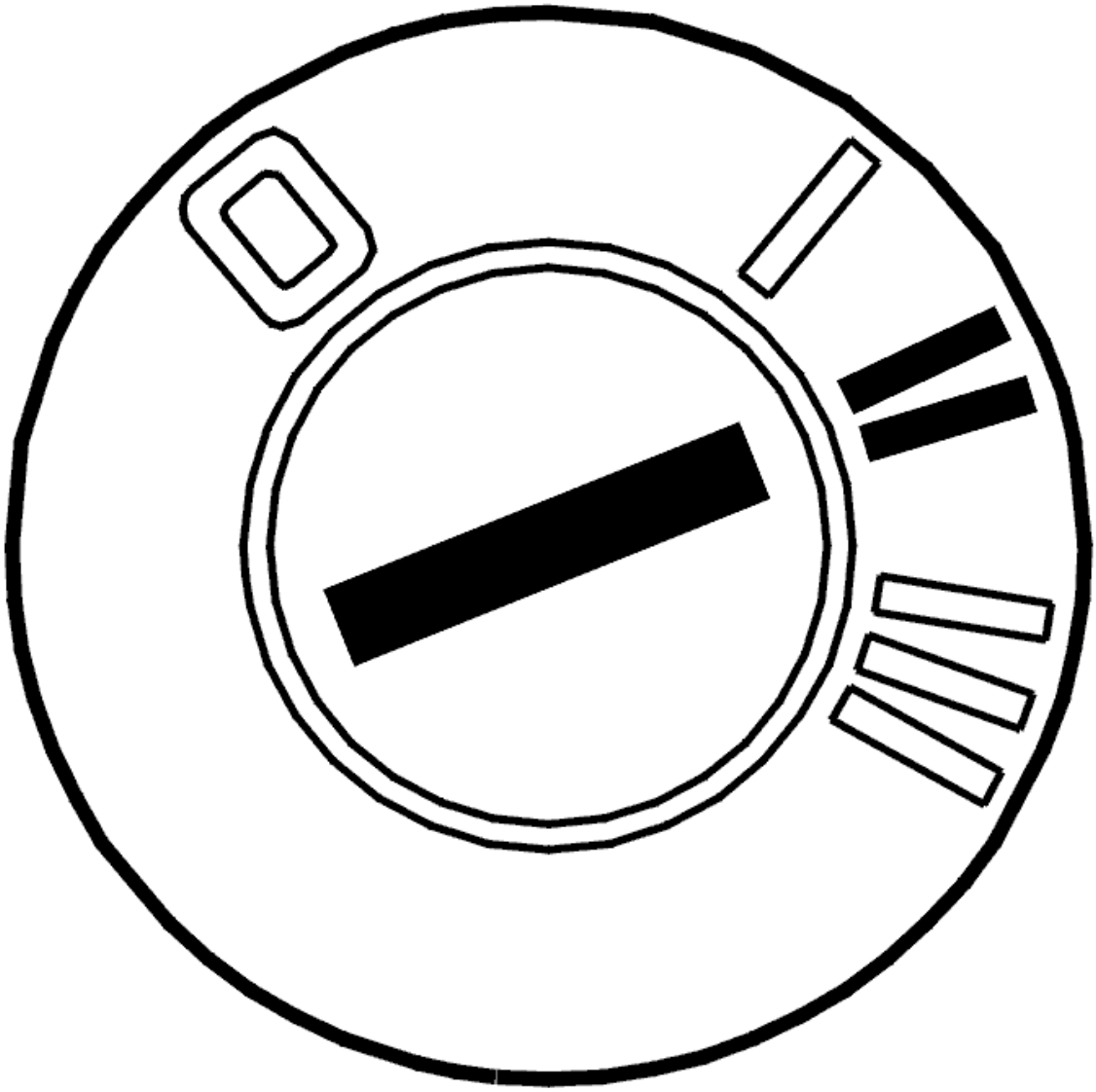


Fig. 59: Identifying Ignition ON
Courtesy of VOLVO CARS CORPORATION

To connect the test box to the CCM control unit, see **CONNECTING THE BREAKOUT BOX**

To connect the test box to the SWM control unit, see **CONNECTING THE BREAKOUT BOX**

- steering wheel module (SWM) 20 and supplemental restraint system (SRS) 25B.

  To connect the test box to the SWM control unit, see **CONNECTING THE BREAKOUT BOX**

  To connect the test box to the SRS control unit, see **CONNECTING THE BREAKOUT BOX**

- supplemental restraint system (SRS) 26B, upper electronic module (UEM) 5 and intermediate connector 54/13.

  To connect the test box to the SRS control unit, see **CONNECTING THE BREAKOUT BOX**

  To connect the test box to the UEM control unit, see **CONNECTING THE BREAKOUT BOX**

- driver door module (DDM) 3A, upper electronic module (UEM) 5 and intermediate connector 54/10.

  To connect the test box to the DDM/PDM control units, see **CONNECTING THE BREAKOUT BOX**

  To connect the test box to the UEM control unit, see **CONNECTING THE BREAKOUT BOX**

Additional information:

- The voltage should be between approximately 1.5 V and 2.5 V.
- To disconnect the battery, see **BATTERY, DISCONNECTING**

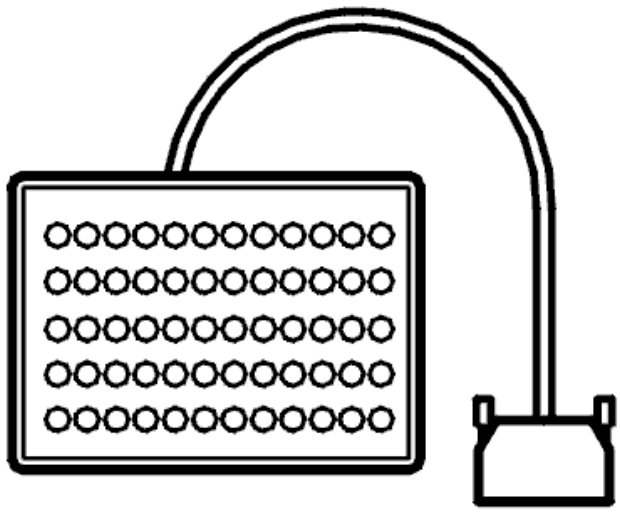


Fig. 10: Identifying Breakout Box
Courtesy of VOLVO CARS CORPORATION

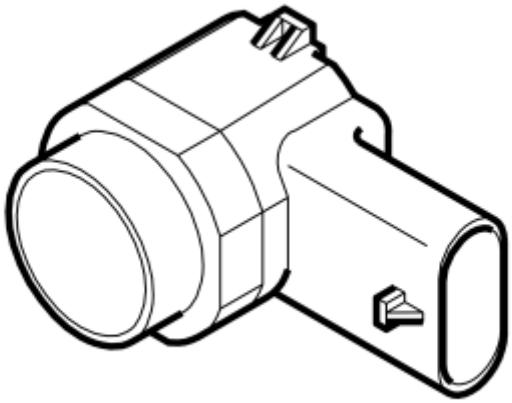


Fig. 295: Identifying Parking Sensor
Courtesy of VOLVO CARS CORPORATION

The rear electronic module (REM) communicates with the parking assistance module (PAM) which checks the signal from parking sensor 7.

The diagnostic trouble code (DTC) is stored if the parking assistance module (PAM) registers a faulty signal from the parking sensor (7).

The diagnostic trouble code (DTC) can be diagnosed at key position II.

Substitute Value

- None.

Possible Source

- Short-circuit to ground or supply voltage in the signal cable between the parking assistance module (PAM) and parking sensor 7
- Short-circuit to ground in the power supply cable between the parking assistance module (PAM) and parking sensor 7
- Short-circuit to supply voltage in the ground lead between the parking assistance module (PAM) and parking sensor 7.

Fault symptom[s]

- The parking assistance system does not operate
- Message in the display.

FAULTY SIGNAL (2007-2012)

CHECKING COMPONENTS AND WIRING

- The lamp goes off.

Possible Source

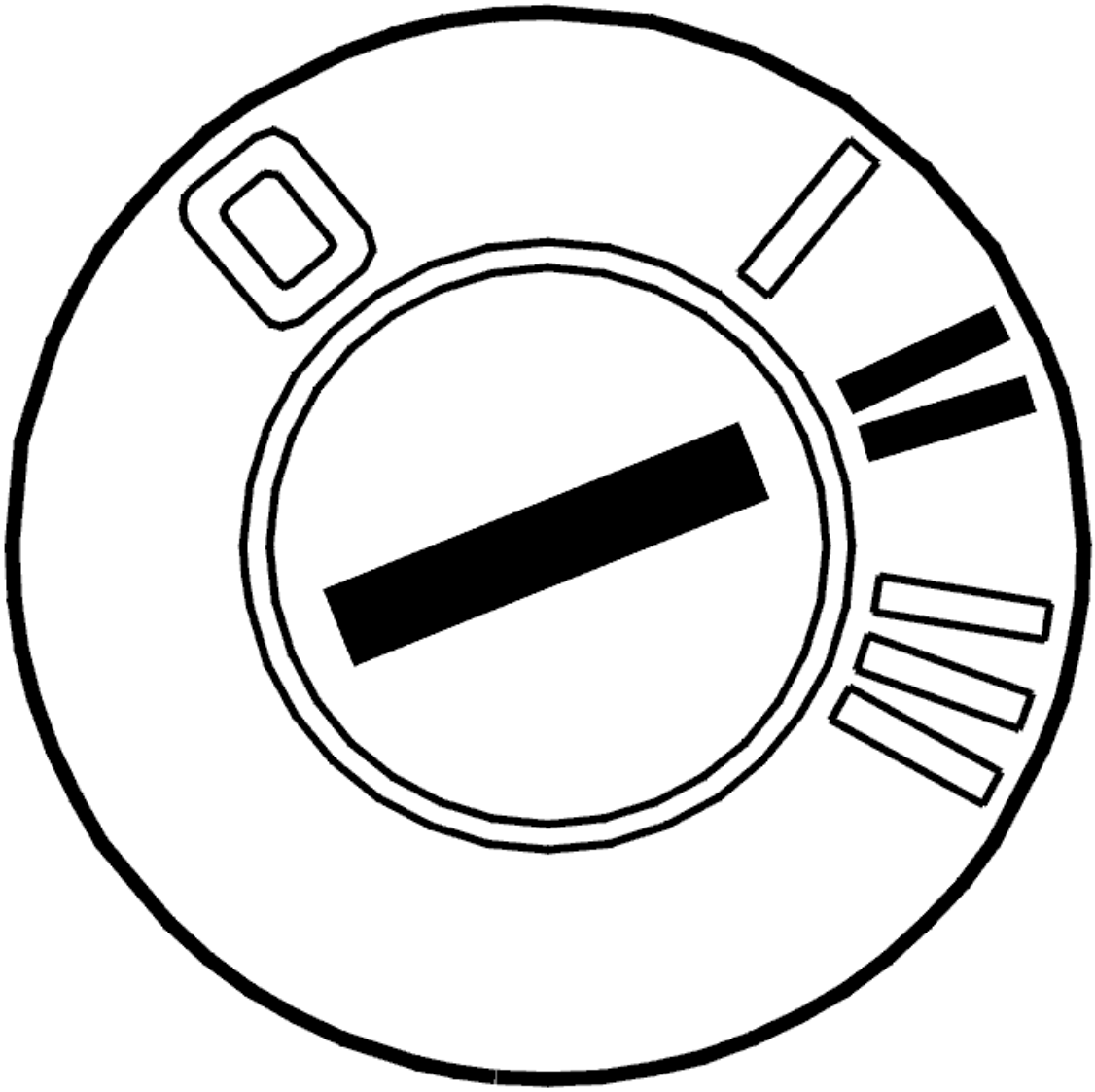
- Open circuit in signal wire for the general courtesy lighting.
- Short circuit to voltage supply on signal wire for general lighting.

Fault symptom[s]

- Passenger compartment lighting/Does not work

SIGNAL MISSING

CHECKING THE CABLE AND COMPONENT



Check the driver circuit for the relay coil for an open-circuit as follows: activate the relay driver. Measure the voltage between terminals #1 and #2 on the relay base.

HINT: The voltage between terminals #1 and #2 should be battery voltage.

HINT: If the value deviates excessively, check the voltage between terminal #2 and the battery voltage and between terminal #1 and ground. Both should equal battery voltage.

HINT: Check for an open-circuit.

HINT: Do not forget to check that the power supply to the control module is OK.

Other information:

- For -2004, see: **RELAY/FUSE BOX CARGO COMPARTMENT/REAR ELECTRONIC MODULE (REM), REPLACING**
- For 2005-, see: **REAR ELECTRONIC MODULE (REM), REPLACING** .
- see **CHECKING WIRING AND TERMINALS** .

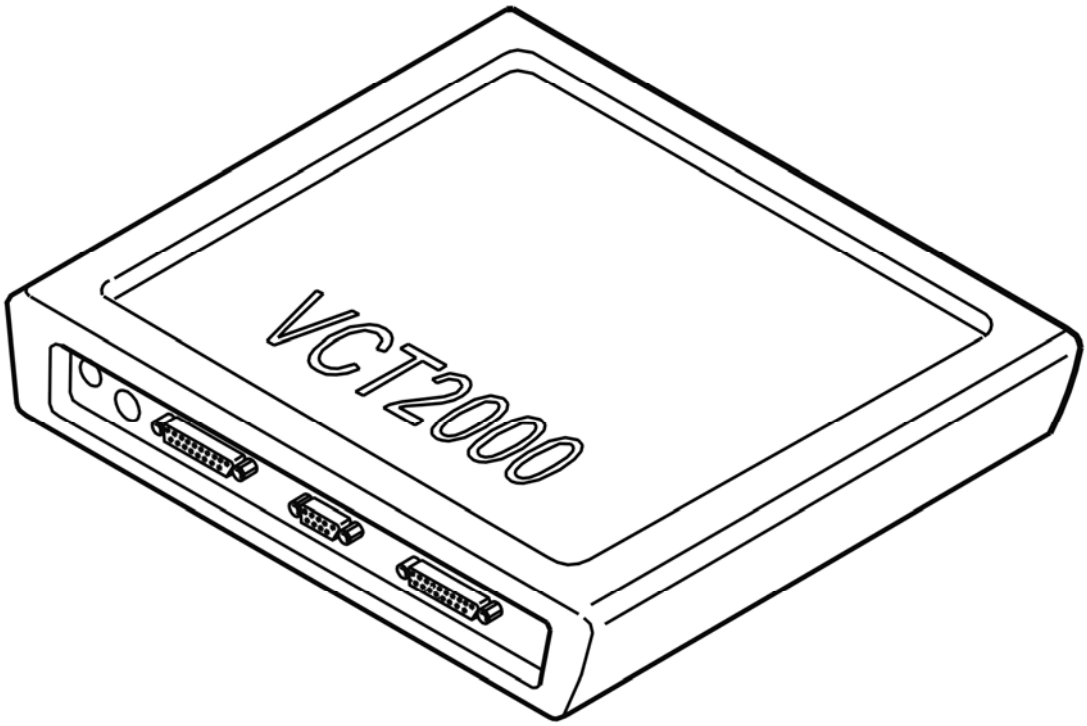


Fig. 175: Identifying VCT2000 Diagnostic Tool Symbol In VIDA
Courtesy of VOLVO CARS CORPORATION

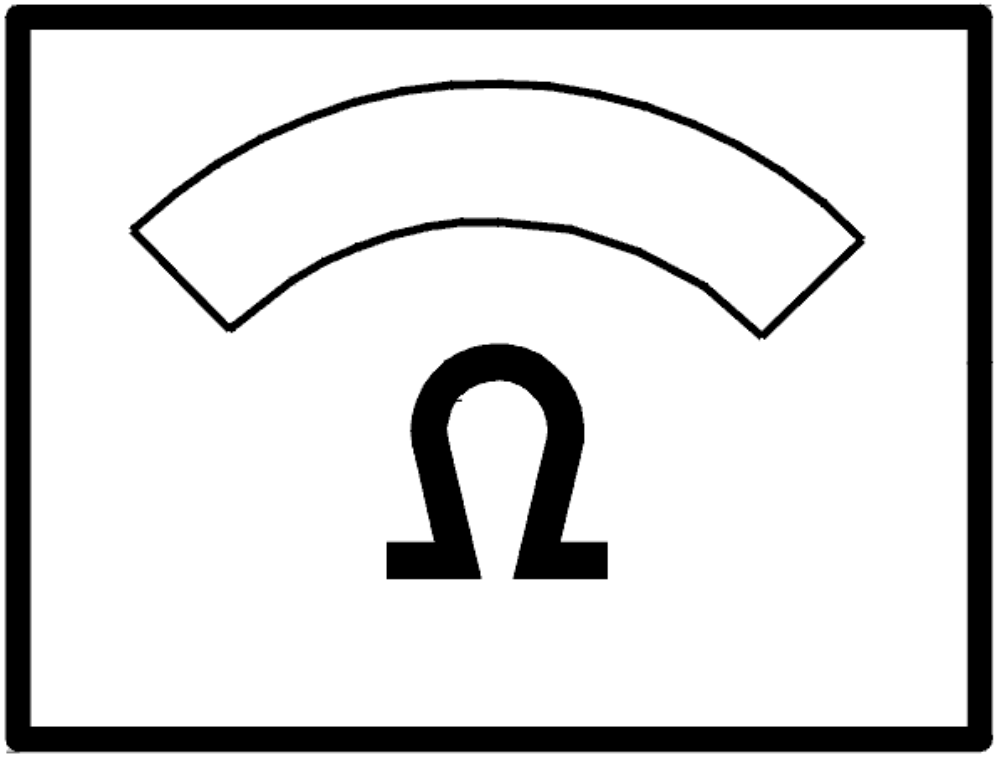


Fig. 13: Identifying Ohmmeter
Courtesy of VOLVO CARS CORPORATION

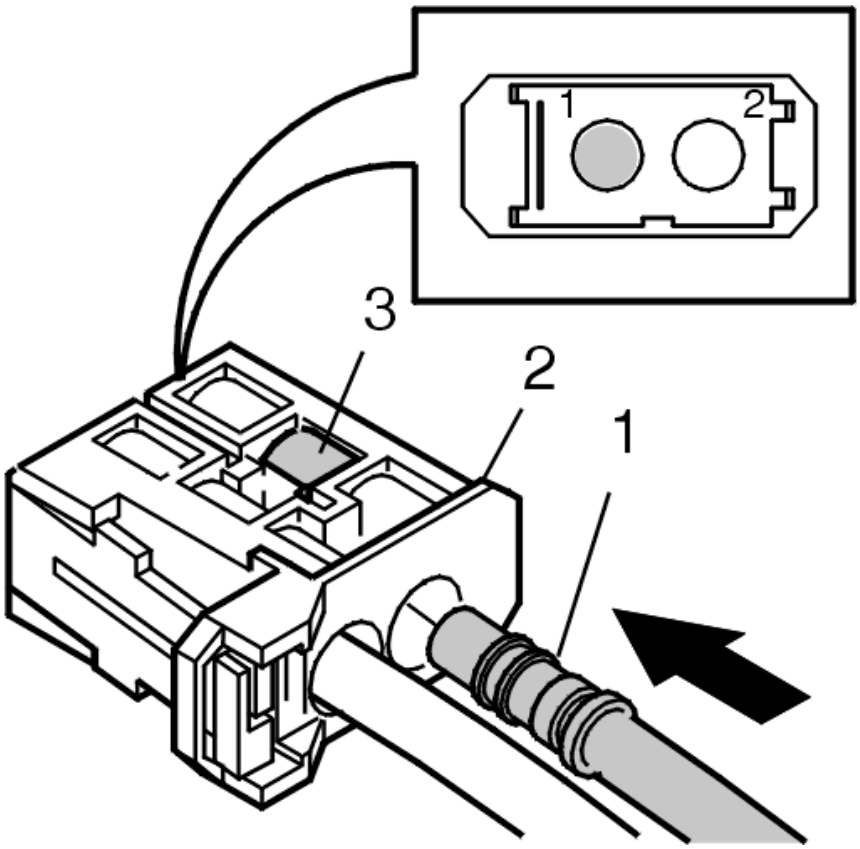


Fig. 128: Identifying Ferrule Pressed Into Place In Connector
Courtesy of VOLVO CARS CORPORATION

NOTE: There is one fiber for the input and one for the output signal. If they are mixed up the system will not work.

Press the ferrule (1) into place in the connector (2).

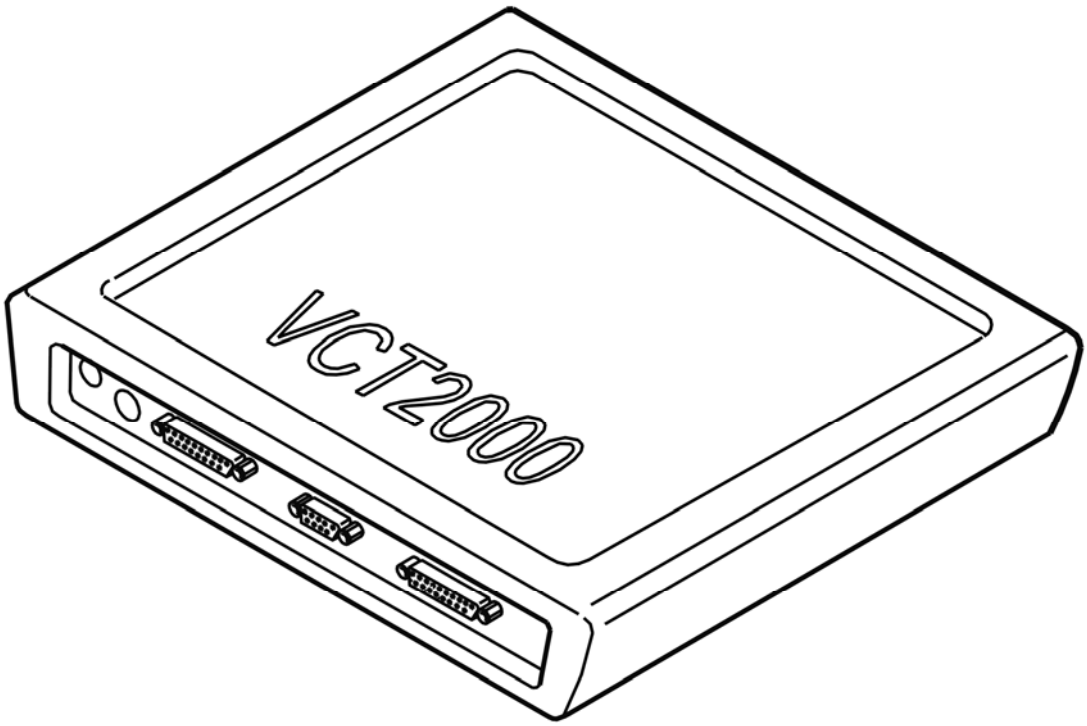


Fig. 72: Identifying VCT2000 Diagnostic Tool Symbol In VIDA
Courtesy of VOLVO CARS CORPORATION

WINDSHIELD WIPER AND WASHER SWITCH

- Install the rubber boot.

NOTE: The pins on the switch are fragile.

- Insert the switch straight in from the side in the correct position. Carefully press the switch into the micro-switch. Ensure that the pins are in the correct positions in the micro-switch
- Install the screws for the switch
- Install the upper and lower steering column covers. See **REPLACING THE STEERING COLUMN COVERS** .

WINDSHIELD WASHER FLUID RESERVOIR, REPLACING

NOTE: The illustrations in this service information are used for different model years and/or models. Some variation may occur. However, the essential information in the illustrations is always correct.

PREPARATORY WORK

REMOVING THE RIGHT-HAND BUMPER COVER

Detach the right side of the bumper cover. See: **CASING BUMPER FRONT, REPLACING** .

LOCATION OF COMPONENTS

Press in the pump over the sliding sleeve.

Install the screws as a guide.

Carefully tap in the oil pump with a rubber mallet.

Tighten the oil pump crosswise. See **SUMMARY OF SPECIFIC COMPONENTS AND TIGHTENING TORQUES** .

Remove the sliding sleeve see **9995747** .

INSTALLING FRONT CRANKSHAFT SEAL

See **OIL PUMP / CRANKSHAFT SEAL, FRONT, REPLACING** .

INSTALLING THE CRANKSHAFT TIMING GEAR PULLEY

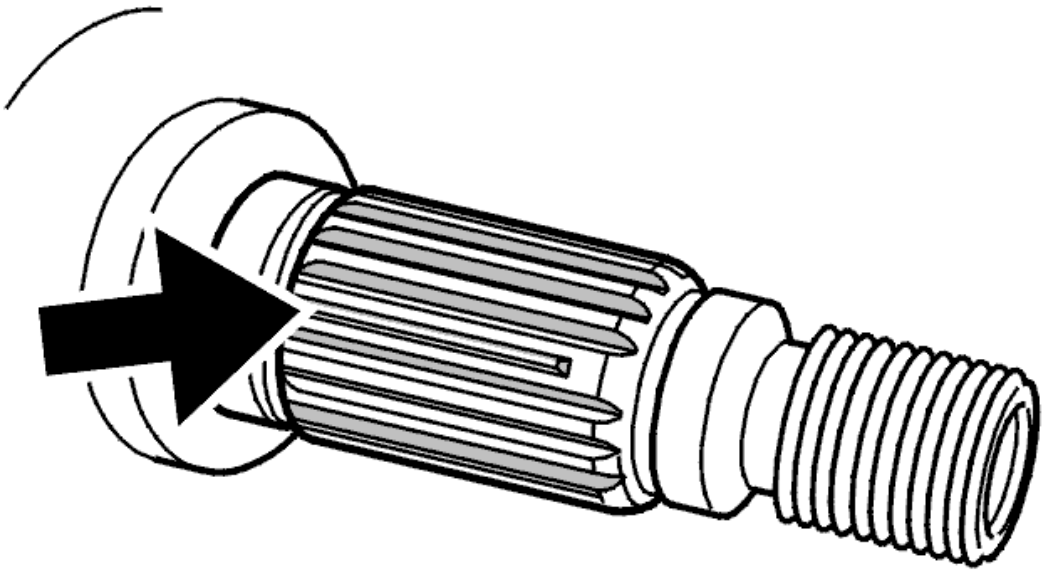


Fig. 24: Crankshaft Timing Gear Pulley
Courtesy of VOLVO CARS CORPORATION

NOTE: The timing gear pulley can only be installed in one position on the crankshaft journal splines (see the illustration).

Carefully tap in the timing gear pulley with a rubber mallet.

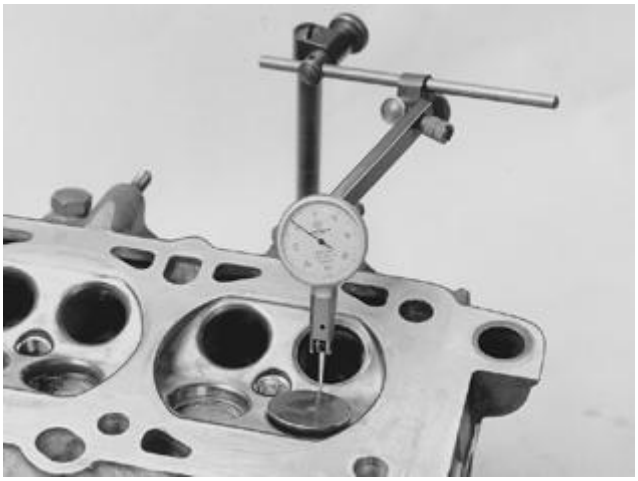


Fig. 12: Identifying Measurement Of Wear In Valve Guides Using A Dial Indicator And Magnetic Holder
Courtesy of VOLVO CARS CORPORATION

CLEARANCE BETWEEN NEW COMPONENTS:

Inlet/Exhaust.....0.03-0.06 mm

MAXIMUM PLAY FOR USED COMPONENTS:

Inlet/Exhaust.....0.15 mm

CAMSHAFTS

Inlet camshaft	Part number	Maximum lift height (mm)	Exhaust camshaft	Part number	Maximum lift height (mm)
B5204Tx excluding T4	9207943	8.40	**B5204Tx**	9207944	9.05
B5204T4	9207941	8.15			
B5234Tx	9207943	8.40	**B5234Tx**	9207944	9.05
B5244Tx excluding T2, T3	9207942	8.40	**B5244Tx** excluding T3	9207944	9.05
B5244T2	9497231	8.40	**B5244T3**	9497822	9.05
B5244T3	9497823	8.45	**B5254Tx**	9207944	9.05
B5254Tx	9207942	8.40			

CYLINDER HEAD

system.

APPLIES TO CARS WITH 8-CYLINDER AND 6-CYLINDER ENGINES

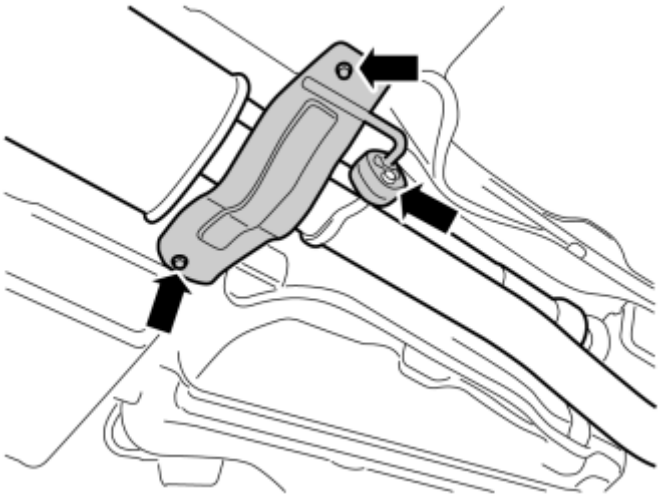


Fig. 31: Removing The Bracket With Rubber Mountings
Courtesy of VOLVO CARS CORPORATION

- Remove the screws in the bracket under the exhaust pipe.
- Remove the bracket with rubber mountings from the exhaust pipe. Use low temperature grease to get the rubber mountings to slide off the mounting hook more easily.

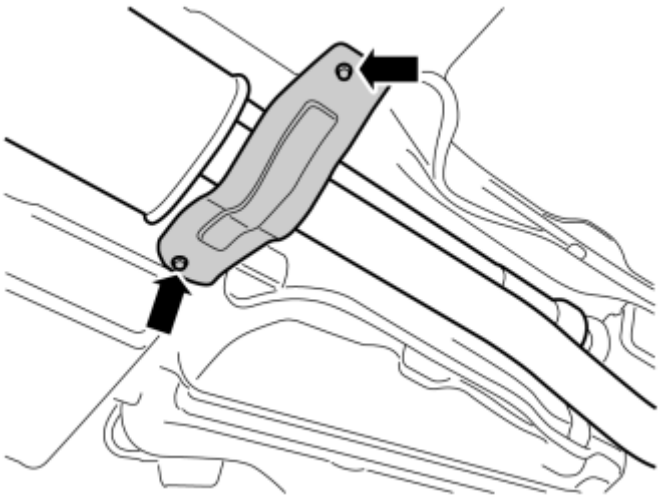


Fig. 32: Removing The Bracket
Courtesy of VOLVO CARS CORPORATION

- Remove the bolts in the bracket underneath the exhaust pipe and remove it.

APPLIES TO ALL MODELS

INJECTOR/PULSE DAMPER, REPLACEMENT

PREPARATION

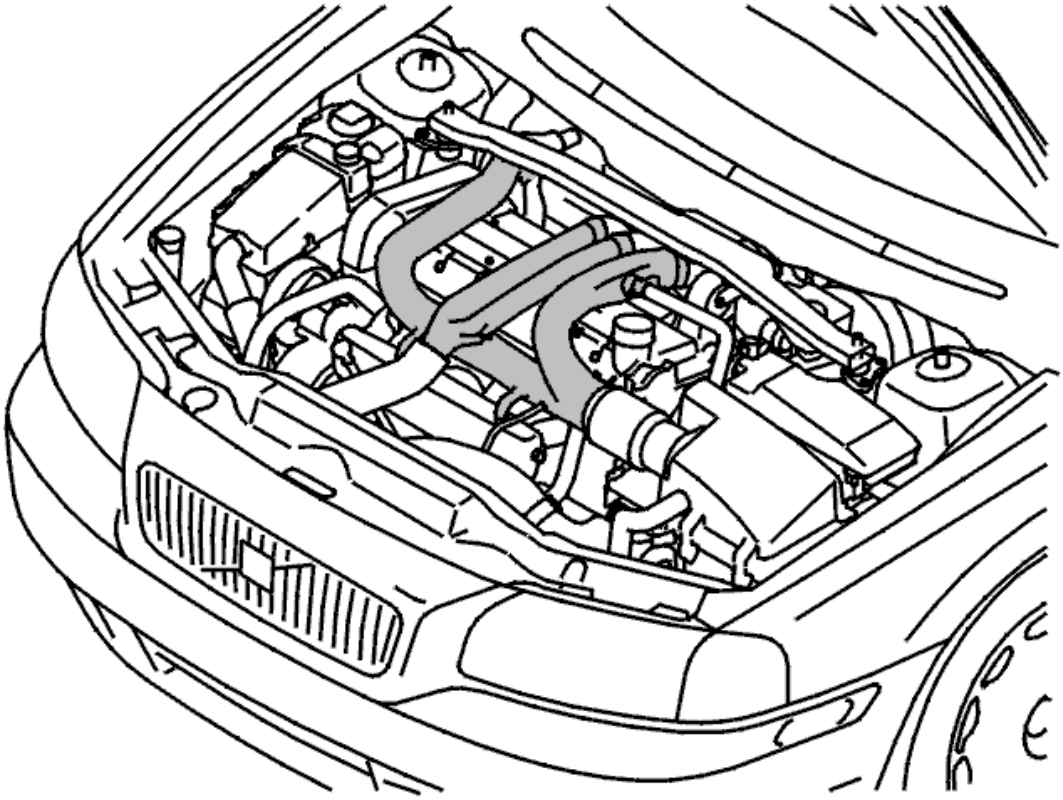


Fig. 7: Identifying Plastic Hoses Between Turbocharger, Charge Air Cooler And Air Cleaner/Turbocharger
Courtesy of VOLVO CARS CORPORATION

Drain the fuel injection system. See **FUEL SYSTEM PRESSURE RELEASE**.

Remove the plastic hoses between the turbocharger (TC) / charge air cooler (CAC) and the air cleaner (ACL) / turbocharger (TC). Place them to one side and seal the openings. **Applies only to B6xx4T** .

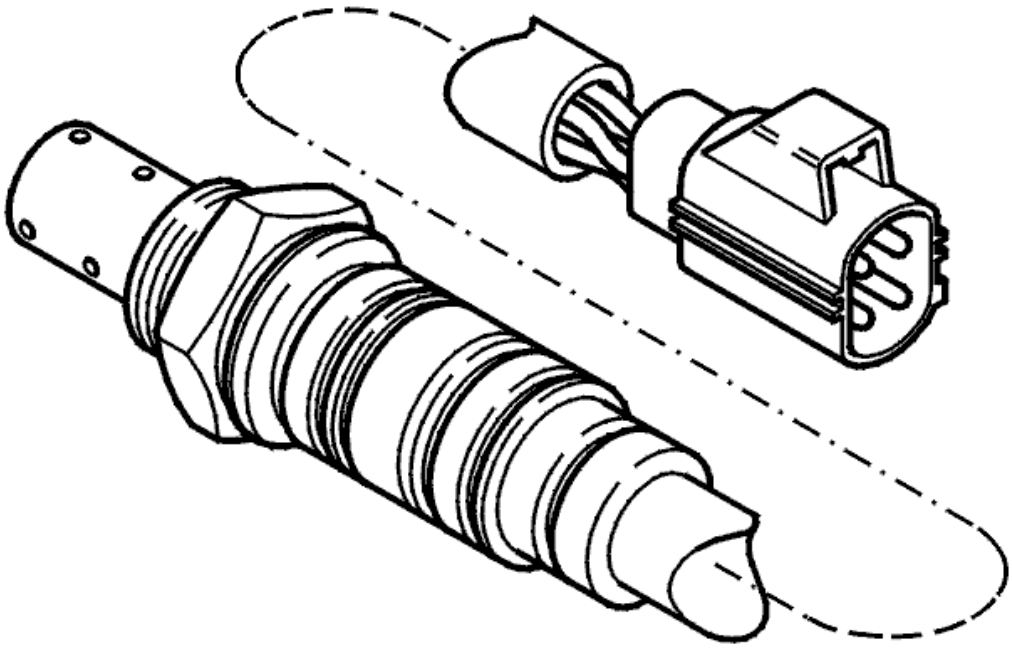


Fig. 303: Identifying Thermostat Housing & Cable Duct
Courtesy of VOLVO CARS CORPORATION

- the thermostat housing cover
- the thermostat.

INSTALLING THE THERMOSTAT

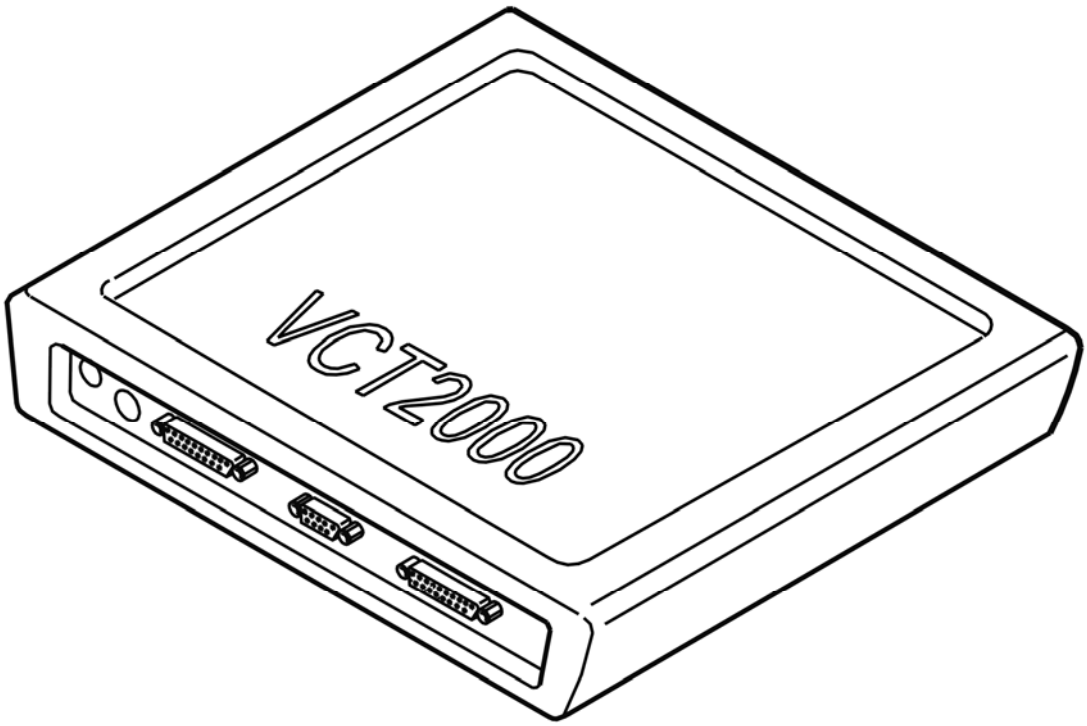


Fig. 209: Identifying VCT2000 Diagnostic Tool Symbol In VIDA
Courtesy of VOLVO CARS CORPORATION

Does the status of the input signal change?

- **YES**

  VERIFIED: Troubleshooting has been completed.

- **NO**

  Refer to **INFORMATION**

INFORMATION

FAULT-TRACING INFORMATION

The fault should have been detected and remedied. As this is not the case fault-tracing has failed.

Exit fault-tracing for this diagnostic trouble code (DTC) or make another attempt.

ECM-240B: FRONT HEATED OXYGEN SENSOR (HO2S), BANK 1, HEATING. SIGNAL MISSING (B5254T2; 2005-2007)

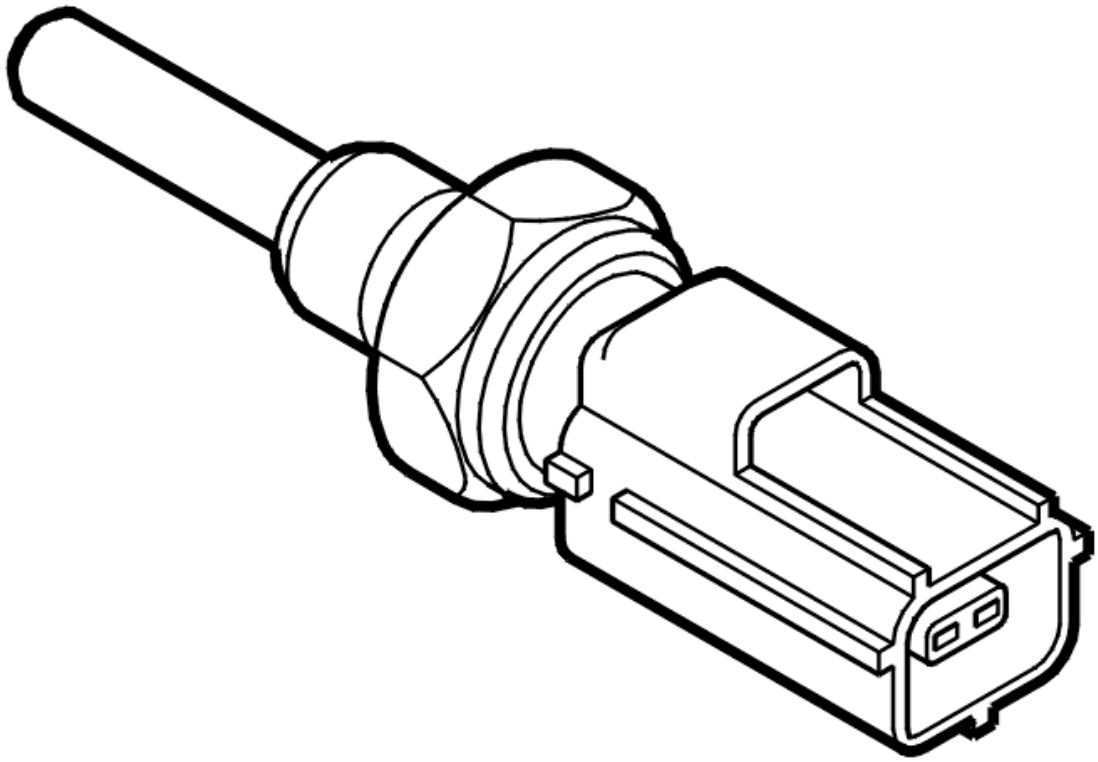


Fig. 66: Identifying 2-Bit Connector Side View
Courtesy of VOLVO CARS CORPORATION

- **Continue**

  Refer to **VERIFICATION**

VERIFICATION

VERIFICATION

HINT: After carrying out the repair, check that the fault has been remedied.

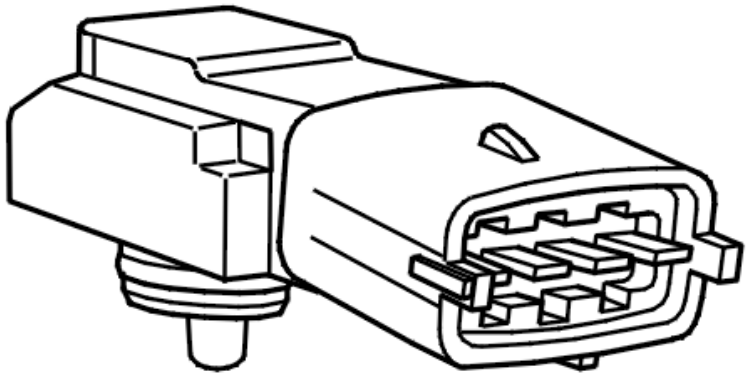


Fig. 2: Identifying Fuel Pressure Sensor
Courtesy of VOLVO CARS CORPORATION

Is the fuel pressure sensor correct?

- **YES**

  Refer to **CHECKING REGULATION OF THE FUEL PRESSURE**

- **NO**

  Refer to **CHECKING COMPONENTS AND WIRING**

CHECKING REGULATION OF THE FUEL PRESSURE

WARNING: In this test, the pressure in the fuel injection system will reach approximately 650 kPa. Disconnect the pressure gauge, as it is not intended to be used at such high pressures.

HINT: The method described below is used to check the control of the pressure in the fuel injection system by activating the quick test for the fuel pump (FP). If the pressure gauge for pressures up to 650 kPa is connected, the fuel pressure sensor can also be checked during this test.

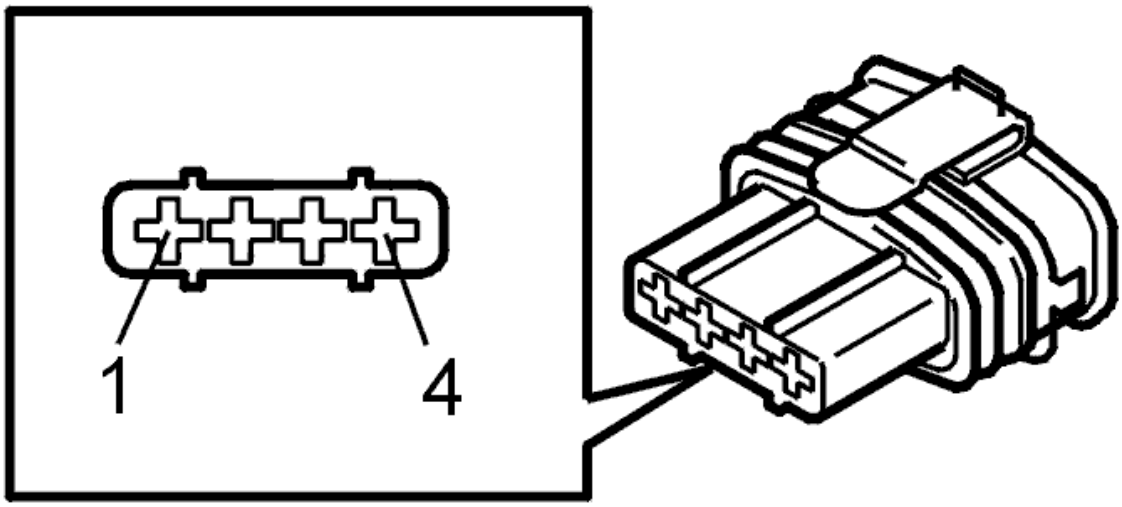


Fig. 332: Identifying Connector Terminals
Courtesy of VOLVO CARS CORPORATION

NOTE: The tank system's status is unknown since the test was interrupted.

- **Continue**

  Refer to **PERFORM QUICK-TEST TANK SYSTEM**

TANK SYSTEM, TEST RESULT = "NO LEAKAGE FOUND"

Diagnostic trouble code limit (minor leakage):Estimated leakage = 0.40 mm

No problem has been detected on leakage diagnostics unit and fuel tank system is OK. The vehicle is ready to be delivered back to customer.

NOTE: The parameter estimated leakage does not necessarily have to show 0 mm for a sealed system.

TANK SYSTEM, TEST RESULT = "MAJOR LEAKAGE FOUND" OR "MINOR LEAKAGE FOUND"

If a leakage is detected during this test, it indicates that the problem with the leakage diagnostics unit (DMTL) is solved. Now the Engine control module (ECM) has the possibility to check the fuel tank system. A leakage has been found.

- Cancel troubleshooting for this problem.
- Read off diagnostic trouble codes again and start troubleshooting for the new diagnostic trouble code.

DMTL, TEST RESULT AND TANK SYSTEM, TEST RESULT = "UNKNOWN"

Engine control module (ECM) cannot perform check of tank system. This may be due to the conditions for start of the quick-test not being fulfilled, that they have changed during the course of the test, or that a problem has occurred during troubleshooting.

- Check that all conditions for start of the quick-test are fulfilled.
- Visually check hoses and connections on leakage diagnostics unit, canister, EVAP-valve, and filler pipe. Check for damage or incorrect/loose installation.
- Remedy as necessary.
- Restart the test.

- **Continue**

  Refer to **PERFORM QUICK-TEST TANK SYSTEM**

ECM-431D: LEAK DIAGNOSTIC UNIT. FAULTY SIGNAL (B6294T; 2003-2004)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION

see **DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION**

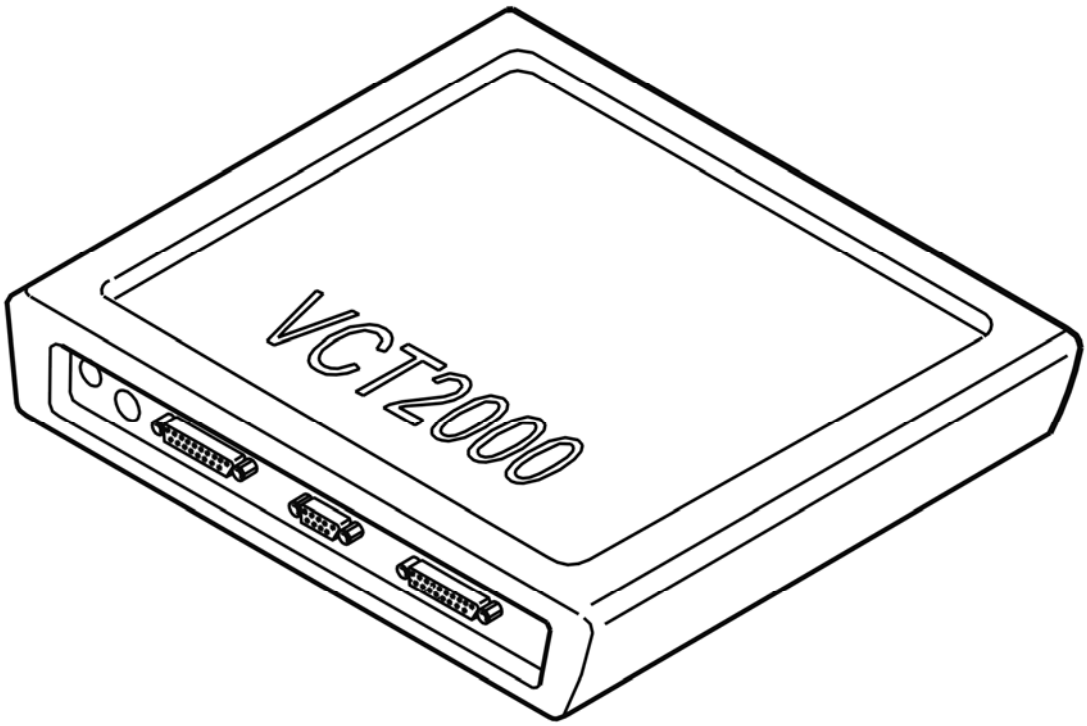


Fig. 128: Identifying VCT2000 Diagnostic Tool Symbol In VIDA
Courtesy of VOLVO CARS CORPORATION

Is the engine cooling fan (FC) working?

- **YES**

  VERIFIED: Troubleshooting has been completed.

- **NO**

  Refer to **INFORMATION**

INFORMATION

FAULT-TRACING INFORMATION

The fault should have been detected and remedied. As this is not the case fault-tracing has failed.

Exit fault-tracing for this diagnostic trouble code (DTC) or make another attempt.

ECM-6110: ENGINE COOLING FAN (FC) RELAY. SIGNAL TOO HIGH (B5254T2; B6294T; 2003-2004)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION ECM-820C

see **DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION ECM-820C**

SIGNAL TOO HIGH

see **SIGNAL TOO HIGH**

ECM-820D: BATTERY VOLTAGE. SIGNAL TOO LOW (B5254T2; 2005-2007)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION ECM-820D

Condition

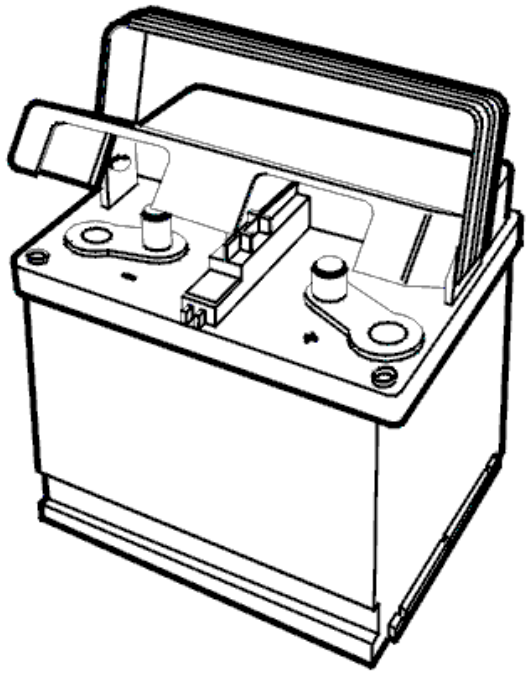


Fig. 46: Identifying Battery
Courtesy of VOLVO CARS CORPORATION

The engine control module (ECM) checks the power supply from the system relay.

The diagnostic trouble code (DTC) is stored if the engine control module (ECM) detects that the voltage from the system relay is lower than a certain value.

The diagnostic trouble code (DTC) can be diagnosed at ignition on or when the engine is running.

Substitute Value

- None.

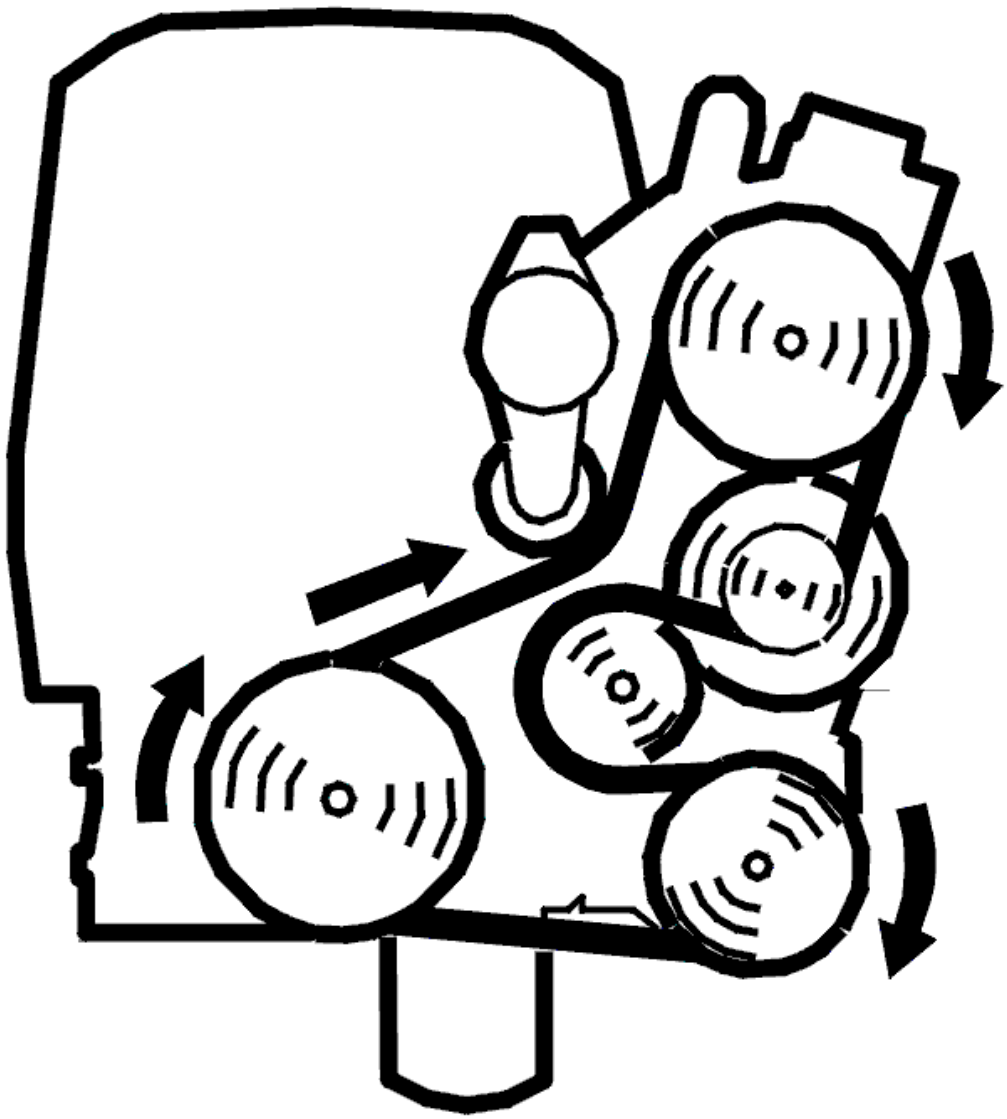


Fig. 366: Belt Routing / Engine Idling - Volvo
Courtesy of VOLVO CARS CORPORATION

- Poor engine oil quality
- Incorrectly adjusted camshafts
- Damaged camshaft reset valve
- Damaged variable valve timing (VVT) unit.
- Damaged (worn) timing chain.

Fault symptom[s]

- Uneven idle.
- High emissions
- The engines cuts out whilst driving.

FAULT-TRACING

CHECKING THE STATUS

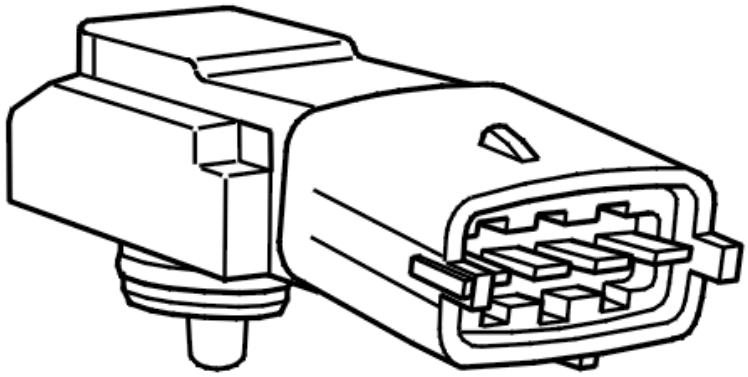


Fig. 144: Identifying Fuel Pressure Sensor
Courtesy of VOLVO CARS CORPORATION

Is the function OK?

- **YES**

  VERIFIED: Troubleshooting has been completed.

- **NO**

  Refer to **INFORMATION**

ECM-P008700: FUEL RAIL/SYSTEM PRESSURE - TOO LOW. GENERAL FAILURE INFORMATION. NO SUB TYPE INFORMATION (B6324S5; 2011-2012)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION ECM-P008700

see **DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION ECM-P008700**

FAULT-TRACING

see **FAULT-TRACING**

ECM-P015200: O2 CIRCUIT HIGH VOLTAGE (BANK 2, SENSOR 1). GENERAL FAILURE INFORMATION. NO SUB TYPE INFORMATION (B8444S; 2005-2011)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION ECM-P015200

Condition

The Engine control module (ECM) measures the volume of oxygen in the exhaust gases before the three-way catalytic converter (TWC) using a front heated oxygen sensor (HO2S) (bank 2). The control module checks the direct voltage from the sensor.

NOTE: **Engine cylinders are counted starting from the right side of the vehicle, that is, the cylinder farthest from the engine's flywheel. Bank 1 (cylinder row nearest the front): cylinders 1, 3, 5 and 7. Bank 2 (cylinder row furthest to the rear, nearest the passenger compartment): cylinders 2, 4, 6, and 8.**

The diagnostic trouble code (DTC) is stored if the control module detects that:

- The direct voltage is higher than 3.8 V.
- Incorrect value lasts longer than 5 seconds.
- Incorrect value lasts for 2 or more subsequent driving cycles.

The control module's test for the diagnostic trouble code (DTC) starts in the event of:

- Engine running for at least 2 minutes.

NOTE: **The control module can only detect the fault once the test has been started and the diagnostic trouble code (DTC) is stored when the conditions are met.**

for the engine speed sensor.

Remedy as necessary.

Other information

- see **CRANKSHAFT POSITION SENSOR (CKP)**
- see **CHECKING WIRING AND TERMINALS**

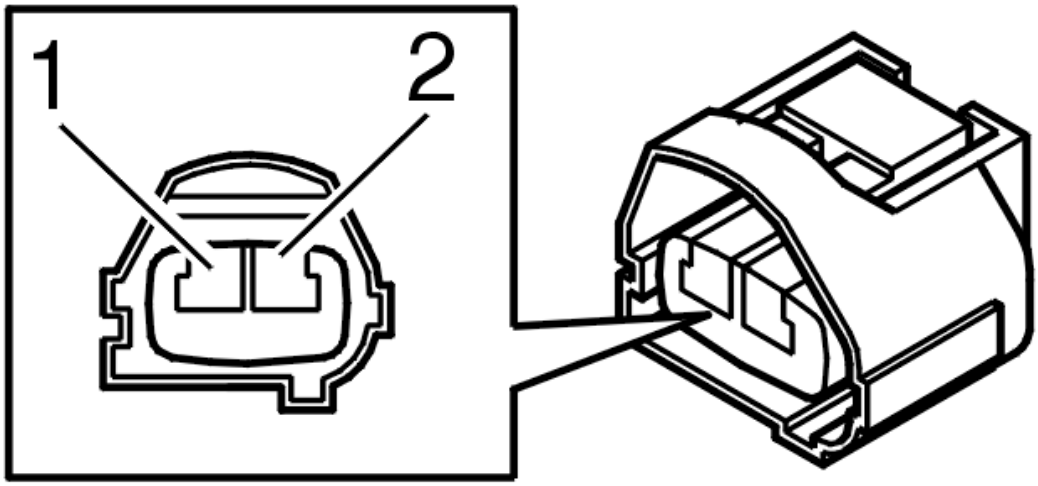


Fig. 375: Identifying 2-Bit Connector
Courtesy of VOLVO CARS CORPORATION

seconds.

The control module's test for the diagnostic trouble code (DTC) starts in the event of:

- Engine running.

NOTE: The control module can only detect the fault once the test has been started and the diagnostic trouble code (DTC) is stored when the conditions are met.

Substitute Value

- Cruise control is disengaged when the fault is active.

Possible Source

- Steering wheel button stuck in depressed position.
- Damaged steering wheel keypad.

Fault symptom[s]

- Cruise control does not operate

FAULT-TRACING

see **FAULT-TRACING**

ECM-P057500: CRUISE CONTROL INPUT CIRCUIT. GENERAL FAILURE INFORMATION. NO SUB TYPE INFORMATION (B6324S5; 2011-2012)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION ECM-P057500

see **DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION ECM-P057500**

FAULT-TRACING

see **FAULT-TRACING**

ECM-P060300: INTERNAL CONTROL MODULE KEEP ALIVE MEMORY (KAM) ERROR. GENERAL FAILURE INFORMATION. NO SUB TYPE INFORMATION (B6324S; 2007-2010)

DIAGNOSTIC TROUBLE CODE (DTC) INFORMATION ECM-P060300

Condition

- Uneven idle.

FAULT-TRACING

CHECKING COMPONENTS AND CONNECTIONS

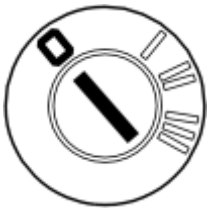


Fig. 251: Identifying Ignition In Off Position
Courtesy of VOLVO CARS CORPORATION

- Engine idling
- Activate read-out of the throttle damper's current position and the throttle damper's reference value.
- Check that both signals follow each other at different RPM and movements of the throttle disc.
- Ignition off.

Check if the throttle unit is blocked. Press the throttle disc to check for jamming.

Clean the throttle unit if necessary.

Other information

- see **THROTTLE BODY**

Fig. 252: Identifying VCT2000 Diagnostic Tool Symbol In VIDA
Courtesy of VOLVO CARS CORPORATION

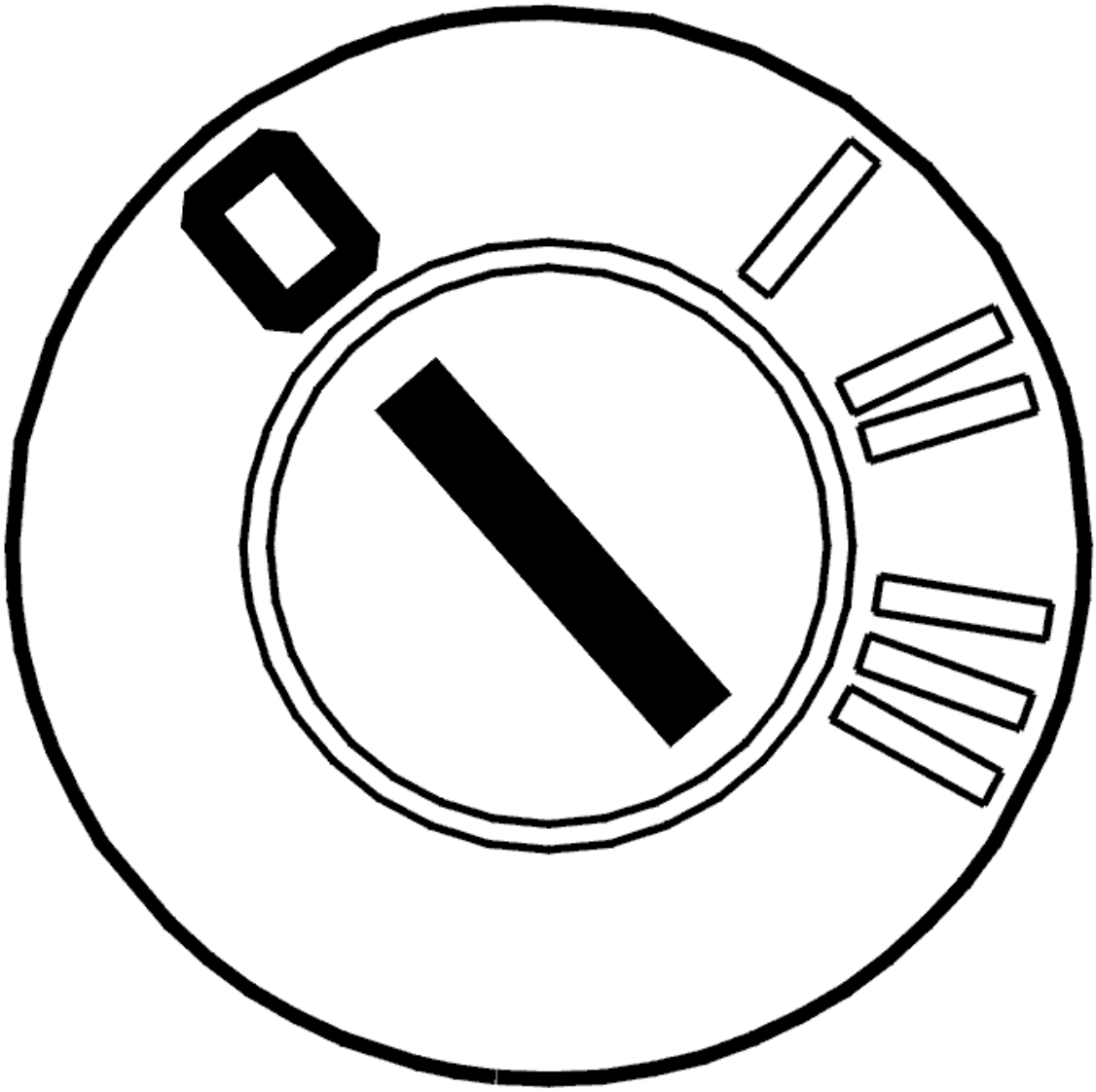


Fig. 136: Identifying Ignition OFF
Courtesy of VOLVO CARS CORPORATION

First screw in the part of the tool intended for the exhaust camshaft.

INSTALL THE ADJUSTMENT TOOLS

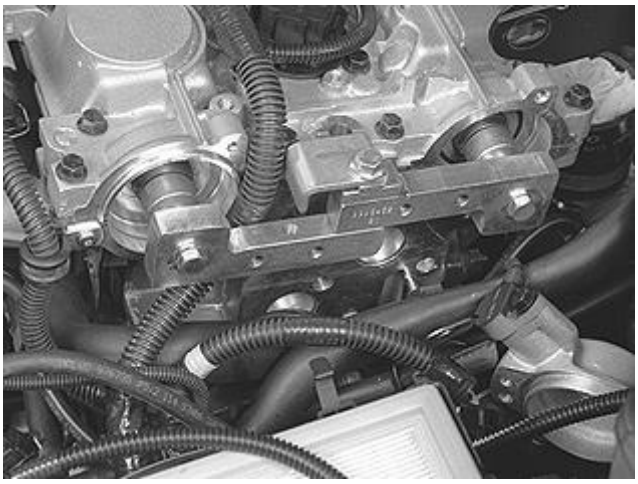


Fig. 12: Identifying Camshaft Adjustment Tool 9995452 Installed
Courtesy of VOLVO CARS CORPORATION

Screw the camshaft adjustment tools together

- Carefully turn the exhaust camshaft clockwise with the camshaft adjustment tool until the intake camshaft tool can be applied.
- Screw the camshaft adjustment tools together as shown in the illustration.

REMOVE THE TIMING GEAR PULLEY

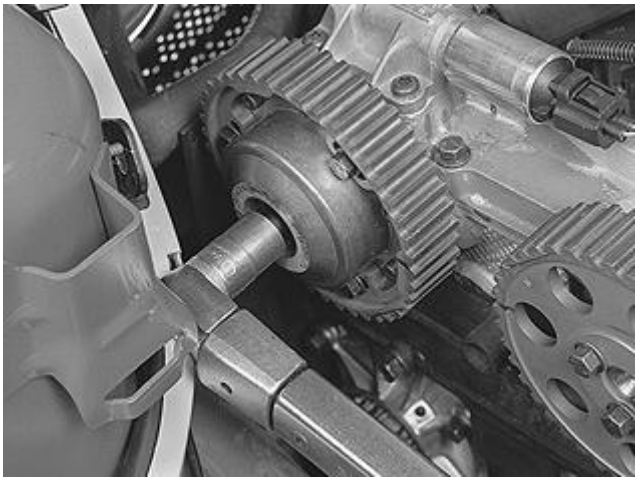


Fig. 13: Identifying Timing Gear Pulley, Center Screw And Plug
Courtesy of VOLVO CARS CORPORATION

Remove

- **Exhaust camshaft pulley:**

- Short-circuit to ground in the signal cable between the control module and the sun sensor.

Fault symptom[s]

- The passenger compartment temperature does not drop when the sun intensity is high.

SIGNAL TOO LOW

CHECKING COMPONENTS AND WIRING

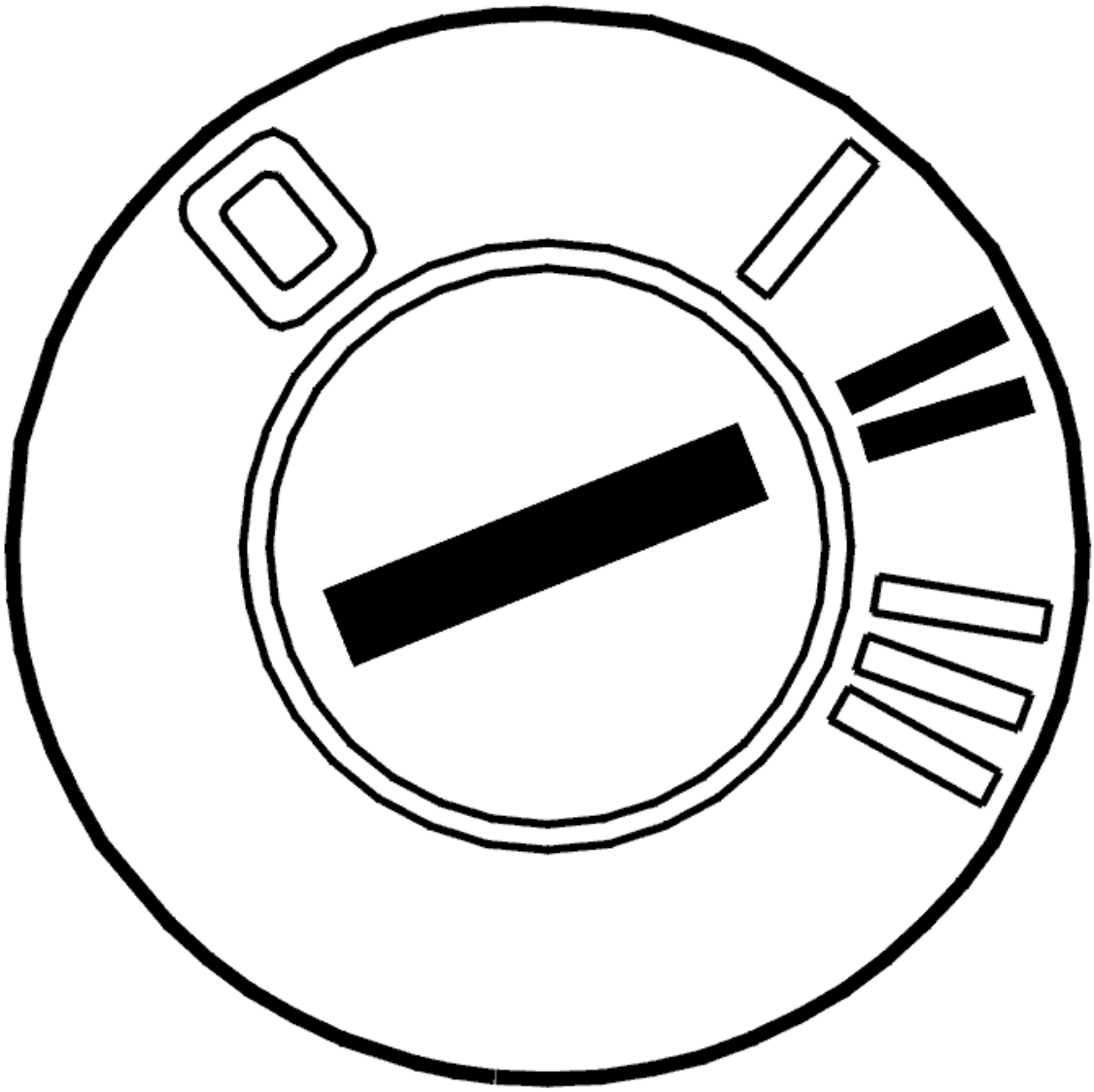


Fig. 147: Identifying Ignition ON
Courtesy of VOLVO CARS CORPORATION

- Ignition on.

  Check the sun sensor by varying the light intensity. Cover the sun sensor with your hand for example to

Possible Source

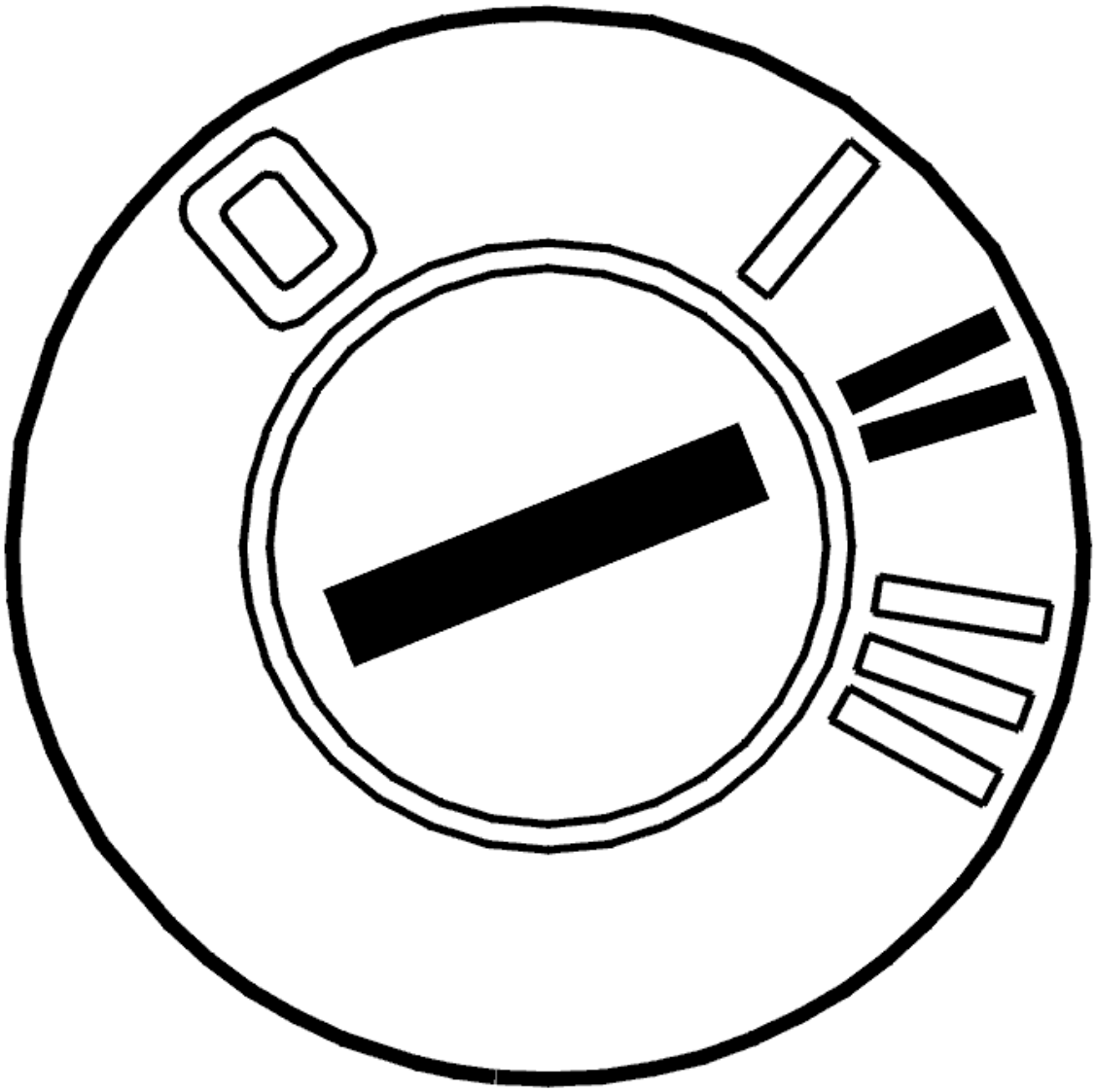
- Open-circuit in the cable between the seat heating module (SHM) and the temperature sensor
- There is a short-circuit to supply voltage in the cable between the seat heating module (SHM) and the temperature sensor
- There is a short-circuit to ground in the cable between the seat heating module (SHM) and the temperature sensor.

Fault symptom[s]

- The front seat heating does not function.

FAULTY SIGNAL

CHECKING THE SENSOR



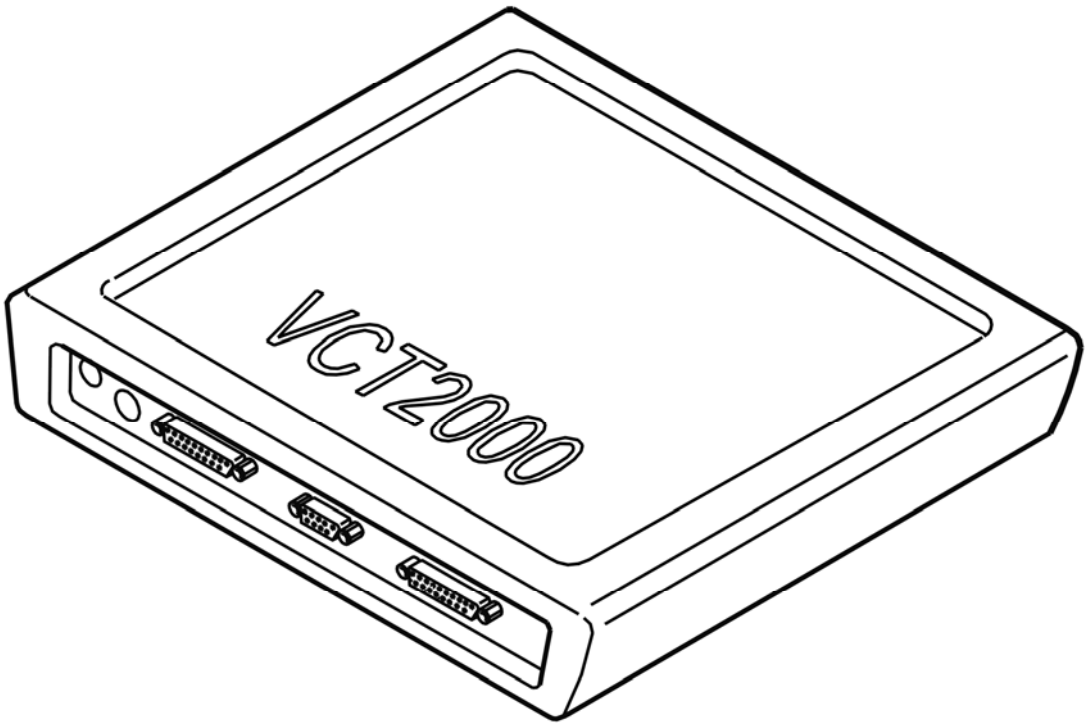


Fig. 166: Identifying VCT2000 Diagnostic Tool Symbol In VIDA
Courtesy of VOLVO CARS CORPORATION

- **Continue**

Refer to **CALIBRATING THE CLIMATE CONTROL MODULE (CCM)**

CALIBRATING THE CLIMATE CONTROL MODULE (CCM)

CAUTION: When activating this function, calibration of the Climate Control Module (CCM) starts. After carrying out calibration read off of the diagnostic trouble codes (DTCs) starts. To ensure that diagnostics for the Climate Control Module (CCM) have been carried out, delay for 30 seconds before reading out diagnostic trouble codes (DTCs) after calibration.

NOTE: Climate Control Module (CCM) and damper motors can be affected by the temperature. The vehicle should have normal room temperature when performing this service.

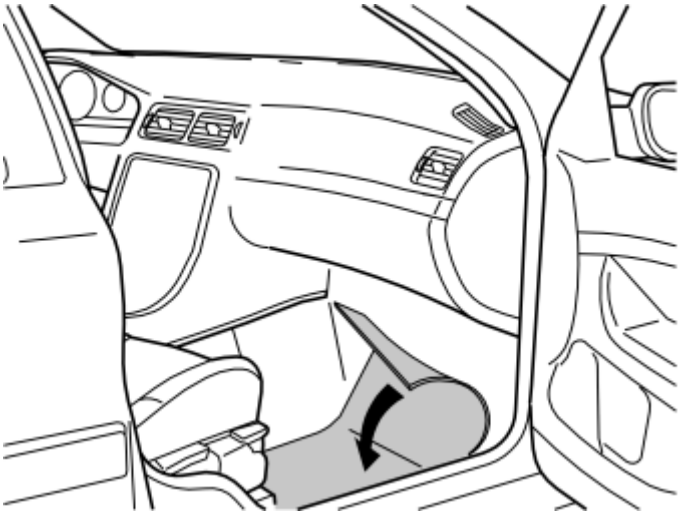


Fig. 476: Folding Carpet Aside
Courtesy of VOLVO CARS CORPORATION

- Fold the carpet to one side by the right-hand front seat.

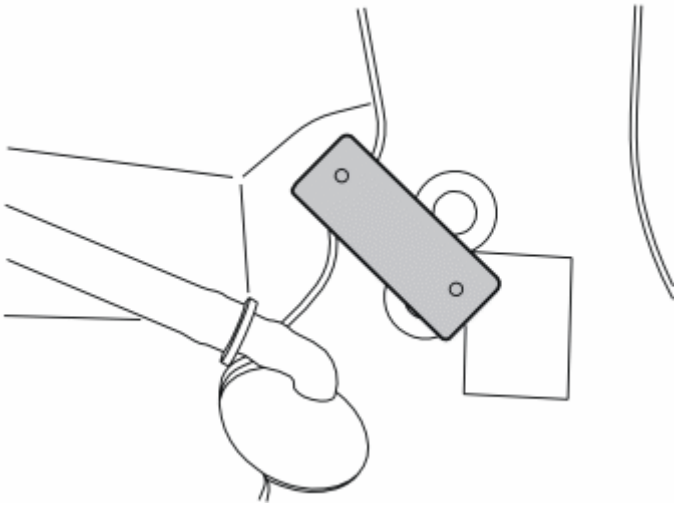


Fig. 477: Installing Bracket
Courtesy of VOLVO CARS CORPORATION

- Remove the lower piece of tape. The tape is situated where the bracket is to be screwed into place
- Take the bracket and screw from the kit. Install the bracket in the existing weld nut under the recently removed piece of tape
- Turn the bracket so that it is positioned as illustrated
- Loosely install the connector. Check that the connector is straight, with the power connector at the front
- Tighten the bracket. Tighten to **10 Nm (7 lbf. ft.)**
- If the car has a child seat mounting bracket, the passenger compartment socket bracket must be positioned above this. Secure using the M6 screw. Tighten to **10 Nm (7 lbf. ft.)** .

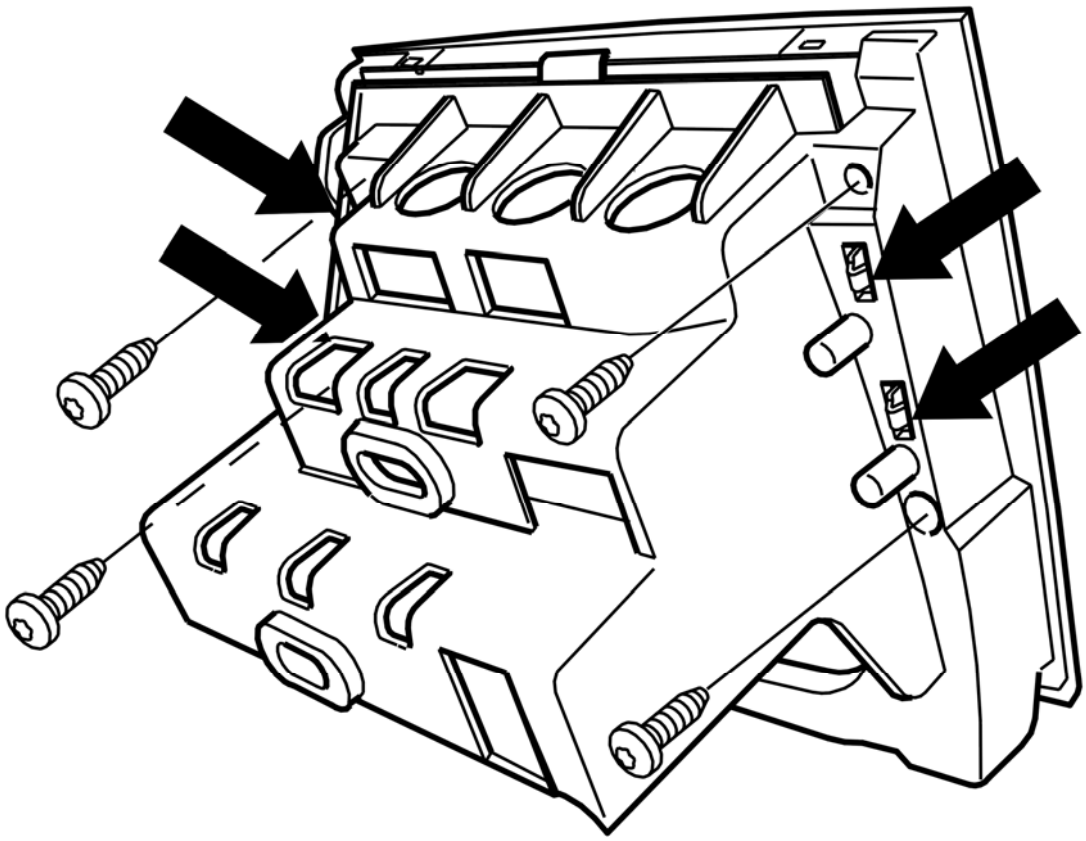


Fig. 155: Identifying Infotainment Module Connectors And Screws
Courtesy of VOLVO CARS CORPORATION

Disconnect the connectors.

Turn the infotainment module with the dashboard environment panel.

Remove the four screws as shown in the illustration.

SIGNAL VOLTAGE, SIGNAL A

The value indicates the signal voltage for signal A.

Measurement range: 0 to 16 V

SIGNAL VOLTAGE, SIGNAL B

The value indicates the signal voltage for signal B.

Measurement range: 0 to 16 V

LED CIRCUIT 1 CURRENT

The value displays the current through LED circuit 1.

Measurement range: 0 to 50 mA

LED CIRCUIT 2 CURRENT

The value displays the current through LED circuit 2.

Measurement range: 0 to 50 mA

SOFTWARE DOWNLOADING

New software can be downloaded into the control module for the Steering wheel angle sensor. When ordering software, the hardware and the software in the car is compared to the Volvo central database. If the comparison is OK the software is downloaded to the control module. If the comparison between the car and Volvo central database is not OK, the database is updated with the car configuration. When this is complete the software is downloaded.

SYSTEM OVERVIEW

CONTROL MODULE

This relay is only found on vehicles of model year -2004.

- For communication problems with control units on **the high-speed network** , check communication cables between diagnostic outlet #6/ #14 and central electronic module (CEM) #B7/#B8 for open circuit, short-circuit to ground and short-circuit to voltage according to references above.
- For communication problems with control units on **the low-speed network** , check communication cables between diagnostic outlet #3/#11 and central electronic module (CEM) #B19/#B20 for open circuit, short-circuit to ground and short-circuit to voltage according to references above.
- Also check the communication cables for the low and high-speed net between the central electronic module (CEM) and the other connected control modules according to troubleshooting above.

Control modules

- Check that the control module's voltage feed and ground connection are trouble-free.

CAUTION: If none of the above checks help, try reading out diagnostic trouble codes in the central electronic module (CEM). Done via VIDA vehicle communication. A prerequisite for being able to communicate with the control modules in the car is that the central electronic module (CEM) is active and can be communicated with. If communication is not possible with the central electronic module (CEM), check the voltage feed and ground for the central electronic module (CEM).

VCT2000 and cable harness

- Connect VCT2000 to the vehicle so that it is supplied with voltage. Test VCT2000 by selecting the system's self-test and VCT Test in the VIDA main menu. If any malfunction is found according to the test, first replace the cable harness then the VCT2000, if the test still indicates a malfunction.
- If no malfunctions were found after troubleshooting according to above, try with a new cable harness and/or new VCT2000.

VIDA

- If no malfunctions were found after troubleshooting according to above, try performing a complete system reset of VIDA (Volvo scan tool).

Other information

- see **CONTENTS**

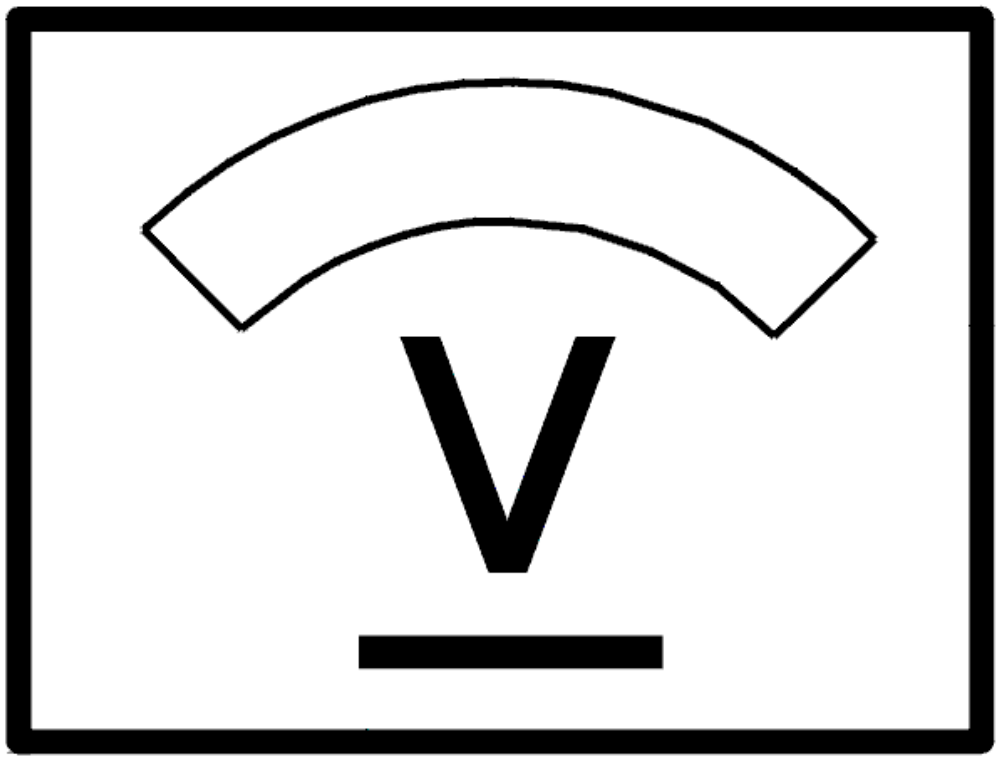


Fig. 116: Identifying Voltage Display
Courtesy of VOLVO CARS CORPORATION

- Insert the two cable ends (1) in the three tie straps (2). Route the wiring as shown.
- Adjust the cable lengths for the lamps. Press any excess cable outside the grille back into the grille
- Tighten the tie straps
- Tighten the two screws for the auxiliary lamp bracket
- Install a spacer washer (3) between the auxiliary lamp bracket (4) and the expander nut (5) on both sides
- Install the number plate. Tighten the number plate with the two screws.

INSTALLING THE AUXILIARY LAMPS

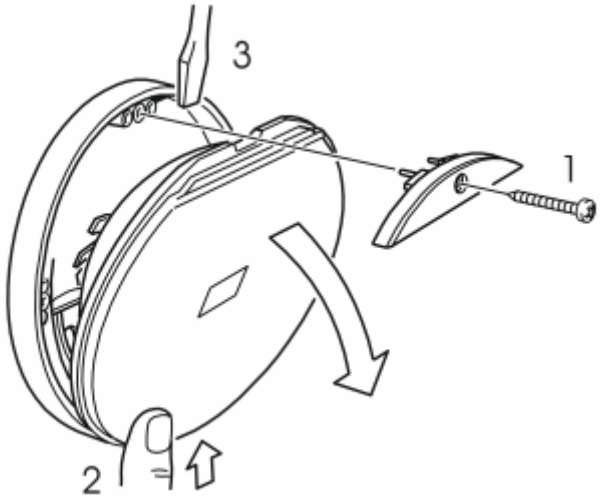


Fig. 53: Identifying Prying Lamp Housing
Courtesy of VOLVO CARS CORPORATION

Use auxiliary lamps recommended by your Volvo dealer.

- Remove the screw (1) and cover
- Press lightly on the lens (2)
- Position a screwdriver (3) between the insert and lamp housing and pry gently.

- Read off the current.

  Turn the steering wheel to the limit position in both directions. The current should be between 11 and 30 mA.

  If the current is OK, the cause of the fault was contact resistance or oxidation in the connectors for the control module for the steering wheel angle sensor or in the steering wheel module (SWM).

  Other information:

  - To access the connector for the control module for the steering wheel angle sensor, see **STEERING WHEEL MODULE (SWM), REPLACING**
  - To access the connector for the steering wheel module (SWM), see **STEERING WHEEL MODULE (SWM), REPLACING**
  - To connect the breakout box, see **CONNECTING THE BREAKOUT BOX**
  - To disconnect the steering wheel angle sensor, see **CONTACT REEL, REPLACEMENT**
  - For information about signals, see **SIGNAL DESCRIPTION, CONTROL UNIT FOR THE STEERING WHEEL ANGLE SENSOR (SAS)**.

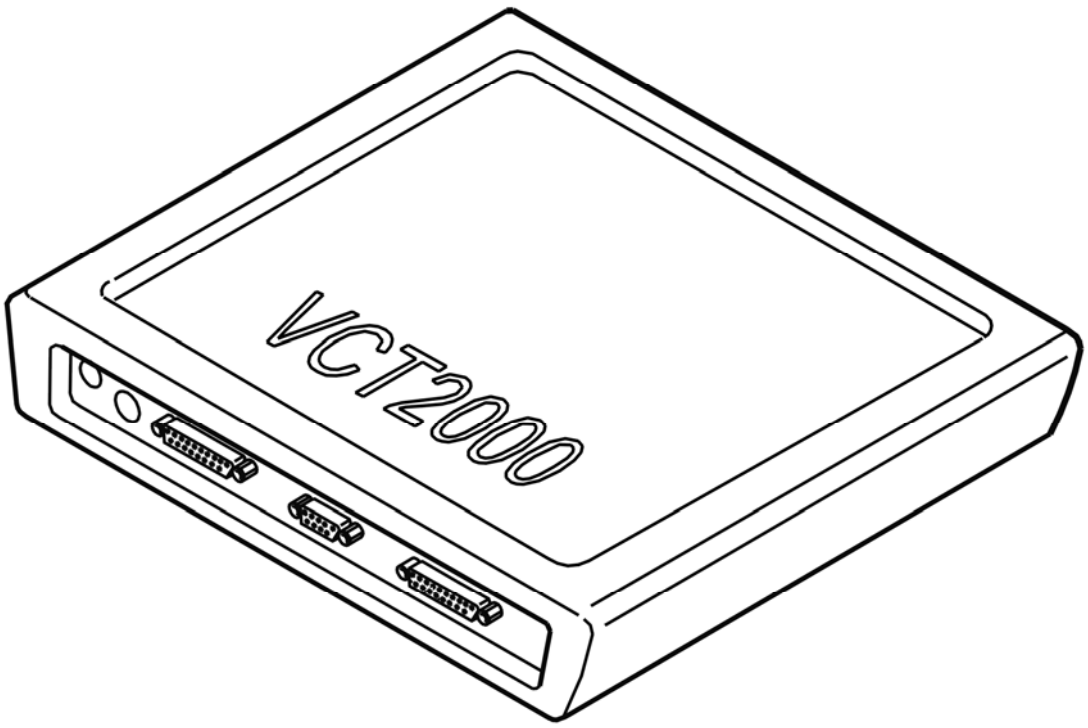


Fig. 98: Identifying VCT2000 Diagnostic Tool Symbol In VIDA
Courtesy of VOLVO CARS CORPORATION

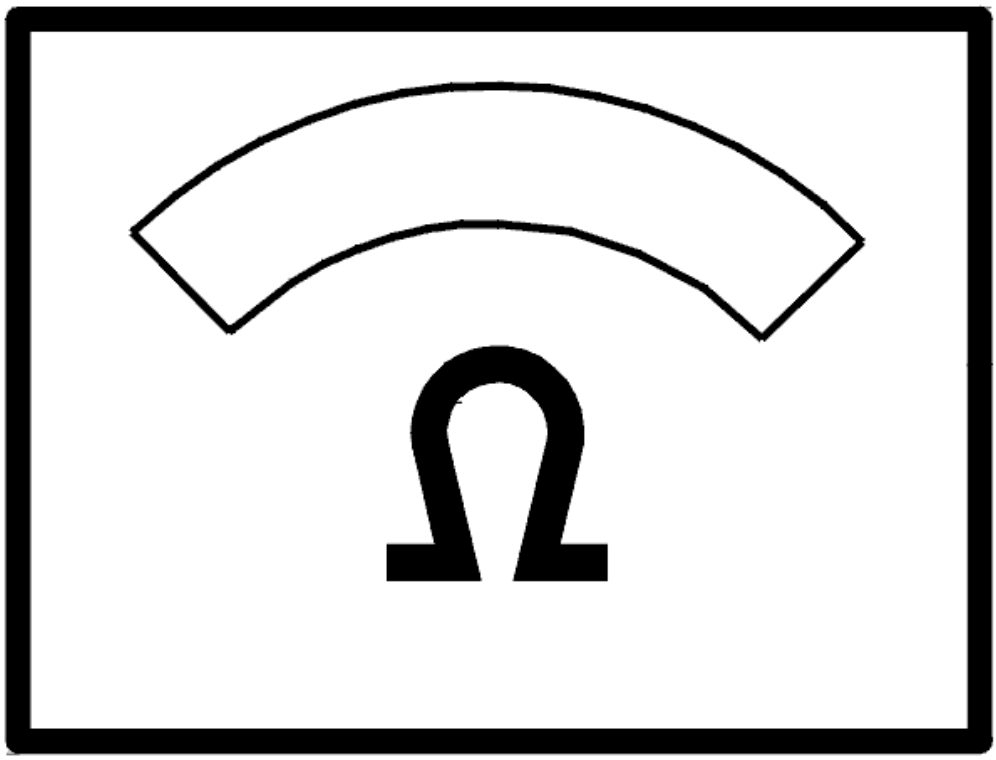


Fig. 123: Identifying Ohm Meter
Courtesy of VOLVO CARS CORPORATION

- **Continue**

  Refer to **VERIFICATION**

VERIFICATION

HINT: After the repair it is necessary to check that the fault has been rectified.

and/or models. Some variation may occur. However, the essential information in the illustrations is always correct.

REMOVAL

WARNING: Used fluid is considerably more dangerous than new fluid. Avoid skin contact with the oil.

REMOVING DRIVE BELT

Remove the drive belt. See: **AUXILIARIES BELT / BELT TENSIONER, REPLACING** .

DRAINING OIL

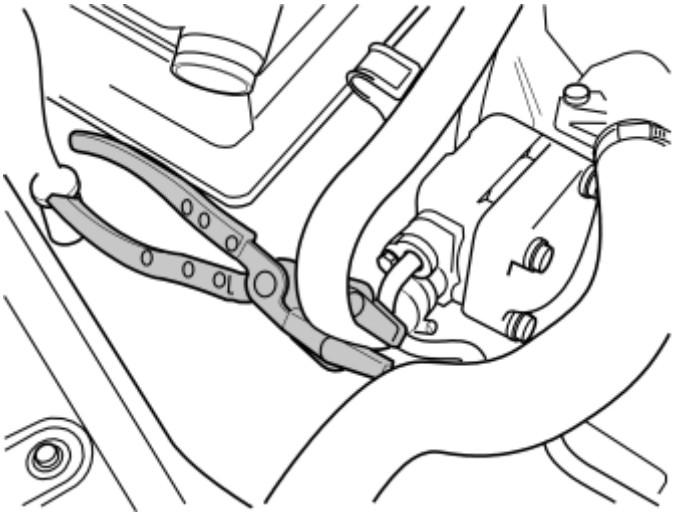


Fig. 146: Identifying Lock Grip / Hose Pliers On Power Steering Pump Feeder Hose
Courtesy of VOLVO CARS CORPORATION

WARNING: Avoid skin contact with the oil.

NOTE: Place paper over the generator (GEN) as protection against oil.

Install lock grip pliers on the hose from the fluid reservoir as close to the power steering pump as possible.

Extract the oil.

REMOVING THE PRESSURE HOSE

INSTALLING THE SUB-FRAME

Install:

- the anti-roll bar
- the 4 M10 screws for the anti-roll bar in the sub-frame.

INSTALLING THE SHOCK ABSORBER

Raise the new shock absorber to the upper mounting.

Install the new nut. Tighten. See **TIGHTENING TORQUE** .

NOTE: Ensure that the bushing seats correctly in the opening in the rear suspension.

Install:

- the sub-frame
- the M12 screws for the sub-frame cover
- the carbon filter container
- the M6 screws for the carbon filter container.

INSTALLING THE UPPER CONTROL ARM

Install:

- the screws for the rear control arm mounting. Only tighten a few turns
- the front upper control arm mounting using an M12 screw.

INSTALLING THE WHEEL SPINDLE

Install the screw on the outer control arm mounting in the wheel spindle. Only tighten a few turns.

LIFTING THE SUB-FRAME

Lift up the sub-frame approximately 100 mm from the upper position.

Install:

- the clamp for the pressure pump hose
- the pressure pump on the bracket
- the plastic clips.

Raise the sub-frame to the upper position.

Install:

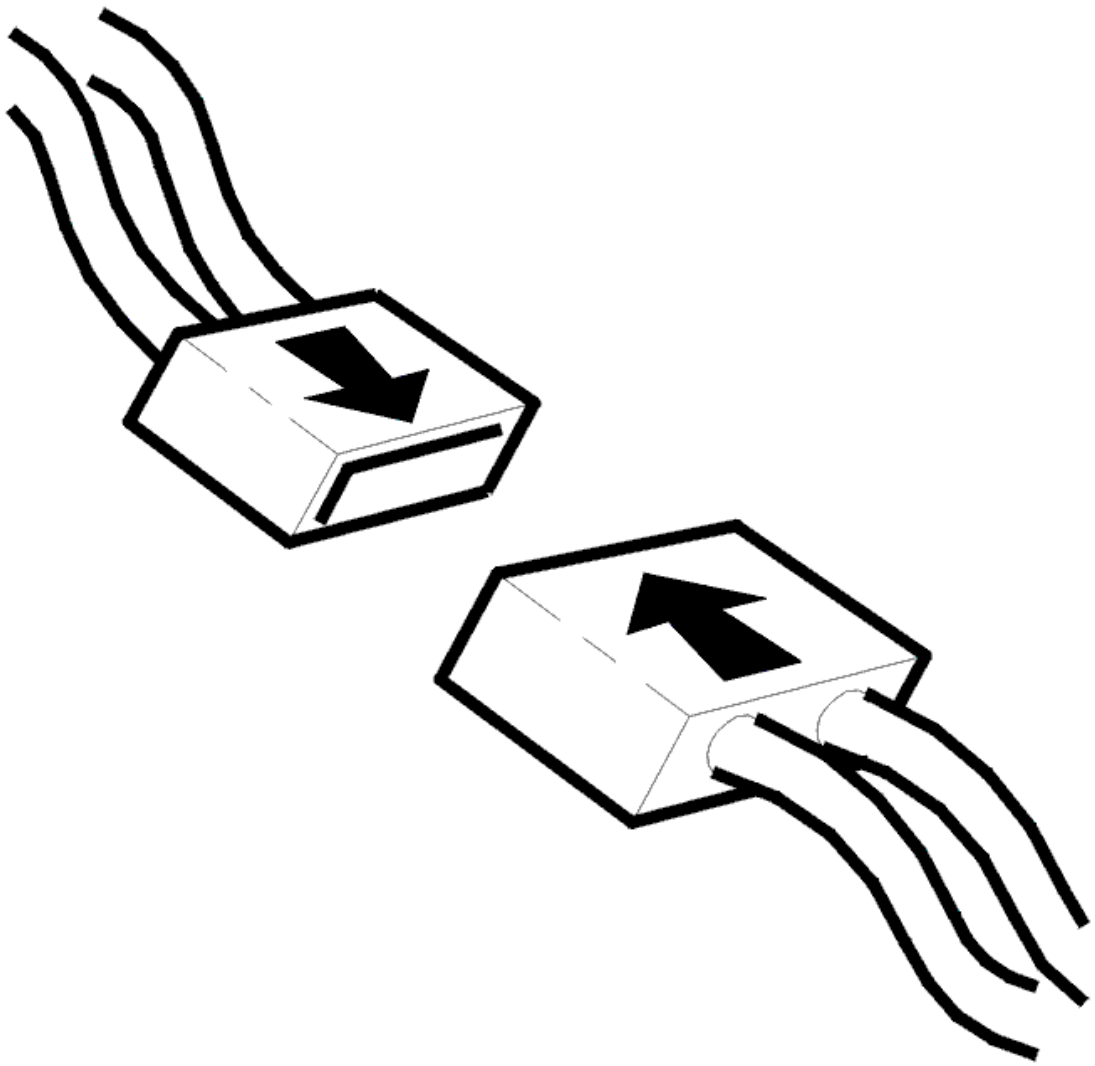


Fig. 25: Identifying Connector(s) Reinstallation
Courtesy of VOLVO CARS CORPORATION

- Ignition off.
- Wait at least 90 seconds.
- Reconnect the connectors, reinstall components etc.
- Ignition on.
- Gear selector in position P.
- Activate solenoid S1.

The value should change between OFF and ON.

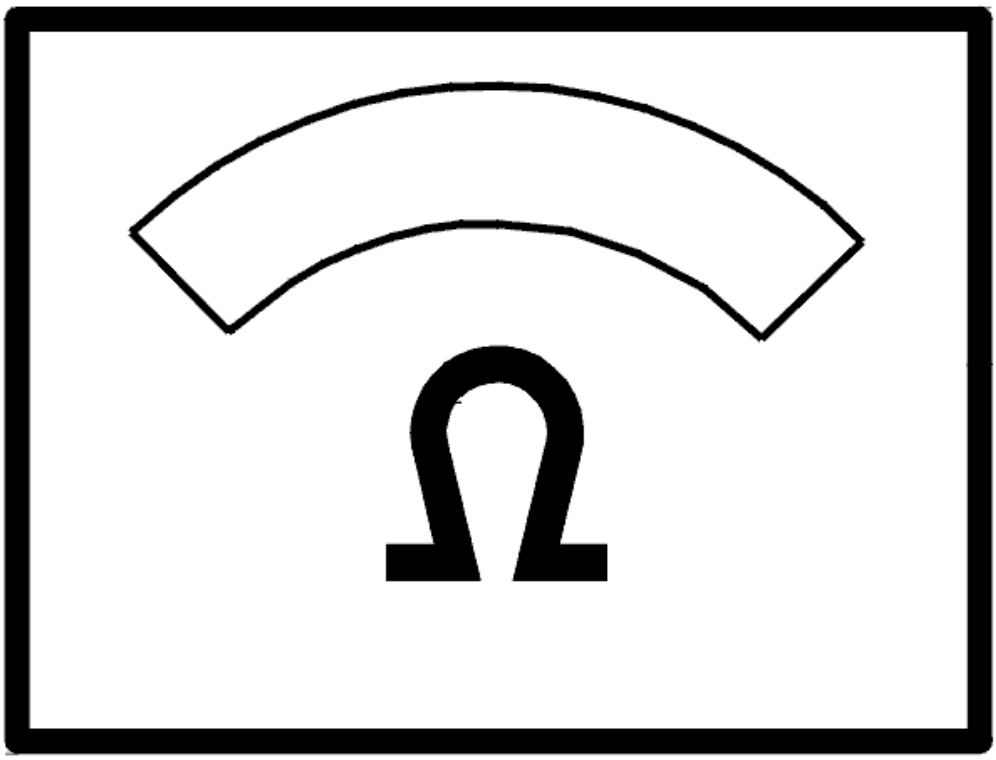


Fig. 367: Identifying Ohms Display
Courtesy of VOLVO CARS CORPORATION

- **Continue**

  Refer to **INFORMATION**

RESETTING THE ADAPTATION

RESETTING ADAPTATION AND THE COUNTER FOR "TRANSMISSION OIL CHANGE"

HINT: The transmission has torque controlled adaptive pressure control. Pressure control means that the transmission regulates the pressure itself during each gear shift. This avoids harsh gear shifting. Each gear shift is evaluated by the control module and stored in the memory. This allows for compensation for wear and tear in the transmission and clutch. It is important that the adaptation in the memory is reset after the transmission has been repaired. This is to ensure normal operation. The oil is replaced during

- **Continue**

  Refer to **TEST DRIVING**

REPLACING THE TRANSMISSION

Fault-tracing indicates a mechanical fault in the transmission. Replace the transmission. See **TRANSMISSION, REMOVING** and **TRANSMISSION, INSTALLING (2003, 2004)** or **TRANSMISSION, INSTALLING (2005, 2006)** .

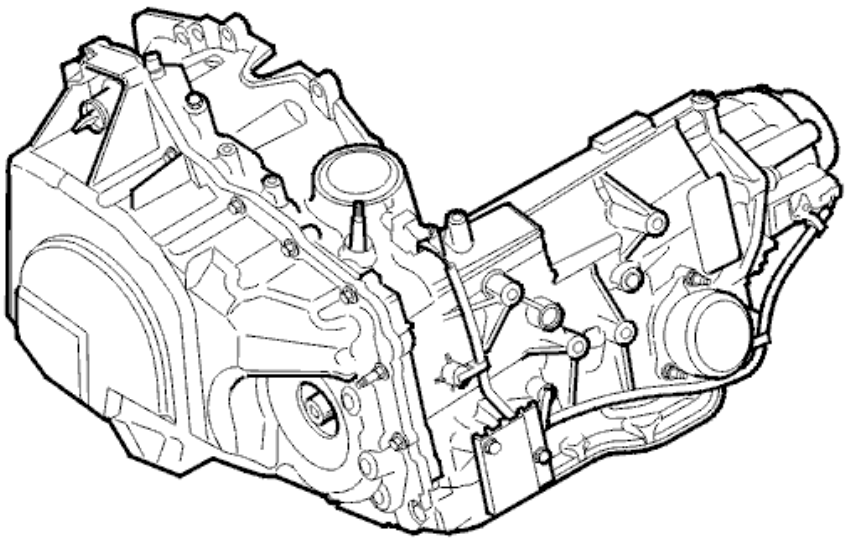


Fig. 155: Identifying Transmission
Courtesy of VOLVO CARS CORPORATION

- **Continue**

  Refer to **RESETTING THE ADAPTATION**

RESETTING THE ADAPTATION

RESETTING ADAPTATION AND THE COUNTER FOR "TRANSMISSION OIL CHANGE"

HINT: The transmission has torque controlled adaptive pressure control. Pressure control means that the transmission regulates the pressure itself during each gear shift. This avoids harsh gear shifting. Each

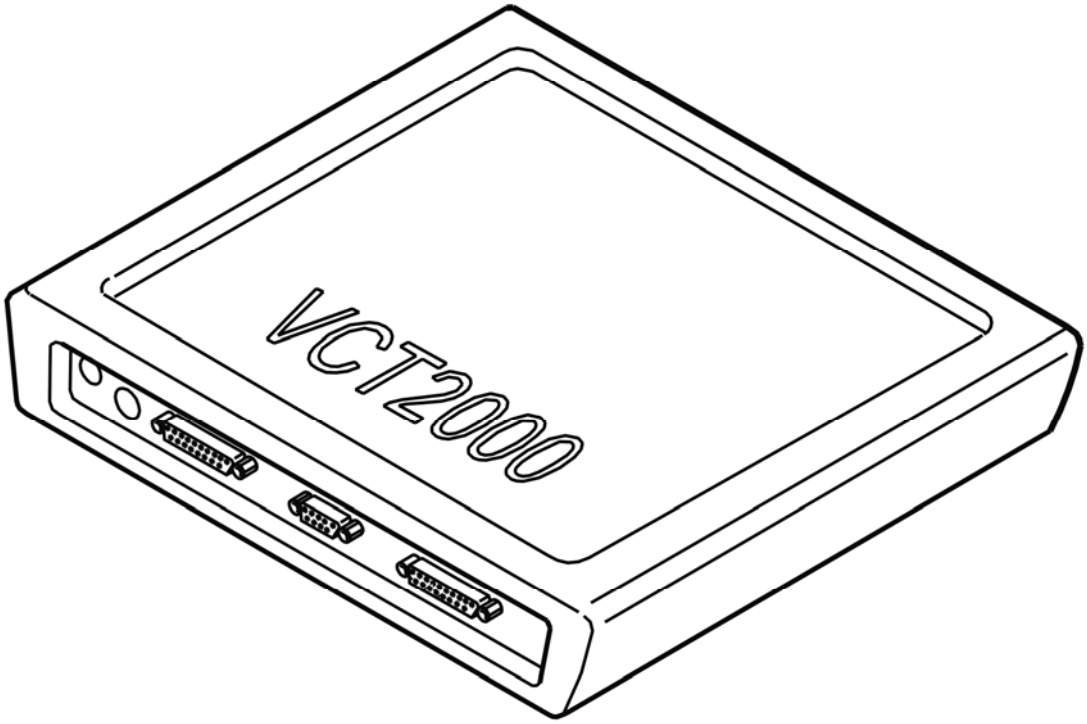


Fig. 13: Identifying VCT2000 Diagnostic Tool Symbol In VIDA
Courtesy of VOLVO CARS CORPORATION

- **Continue**

  Refer to **VERIFICATION**

RESETTING THE ADAPTATION

RESETTING ADAPTATION AND THE COUNTER FOR "TRANSMISSION OIL CHANGE"

HINT: The transmission has torque controlled adaptive pressure control. Pressure control means that the transmission regulates the pressure itself during each gear shift. This avoids harsh gear shifting. Each gear shift is evaluated by the control module and stored in the memory. This allows for compensation for wear and tear in the transmission and clutch. It is important that the adaptation in the memory is reset after the transmission has been repaired. This is to ensure normal operation. The oil is replaced during repair; the "Transmission oil change" counter must be reset. If the counter is not reset when the fluid is drained and replaced, there is a risk that a diagnostic trouble code (DTC) will be stored in incorrect circumstances.

NOTE: This applies only if the transmission or one of the components in the transmission have been replaced.

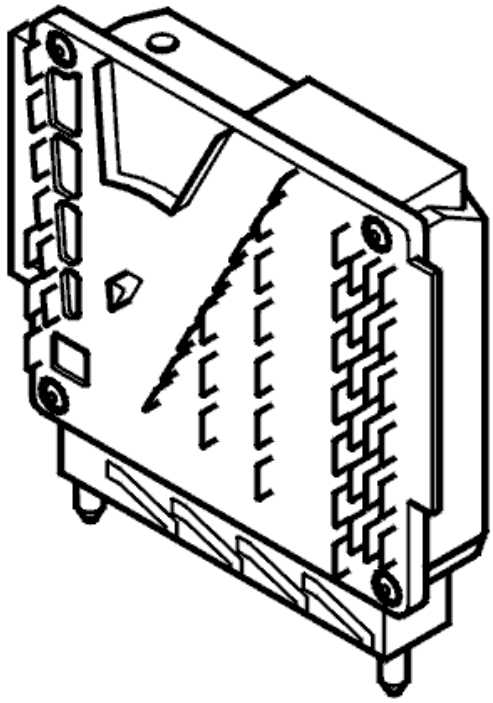


Fig. 343: Identifying Transmission Control Module (TCM)
Courtesy of VOLVO CARS CORPORATION

- **Continue**

  Refer to **TEST DRIVING**

CHECKING DIAGNOSTIC TROUBLE CODES (DTCS)

CHECKING DIAGNOSTIC TROUBLE CODES (DTCS)

transmission control module (TCM) terminal #B31 (#B21). Check for an intermittent open-circuit. See OPEN-CIRCUIT, INTERMITTENT FAULTS . Check for contact resistance and oxidation. See CONTACT RESISTANCE AND OXIDATION .

Remedy as necessary.

Other information:

- To connect the breakout box, see **CONNECTING THE BREAKOUT BOX**
- For information about signals, see **SIGNAL DESCRIPTION. TRANSMISSION CONTROL MODULE (TCM)** .

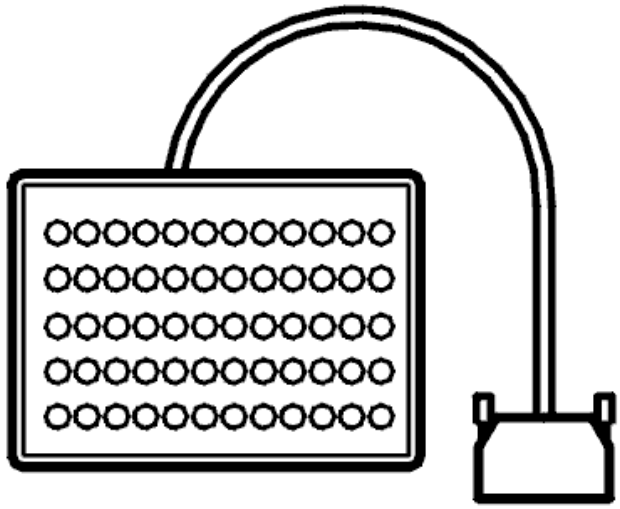


Fig. 170: Identifying Breakout Box
Courtesy of VOLVO CARS CORPORATION

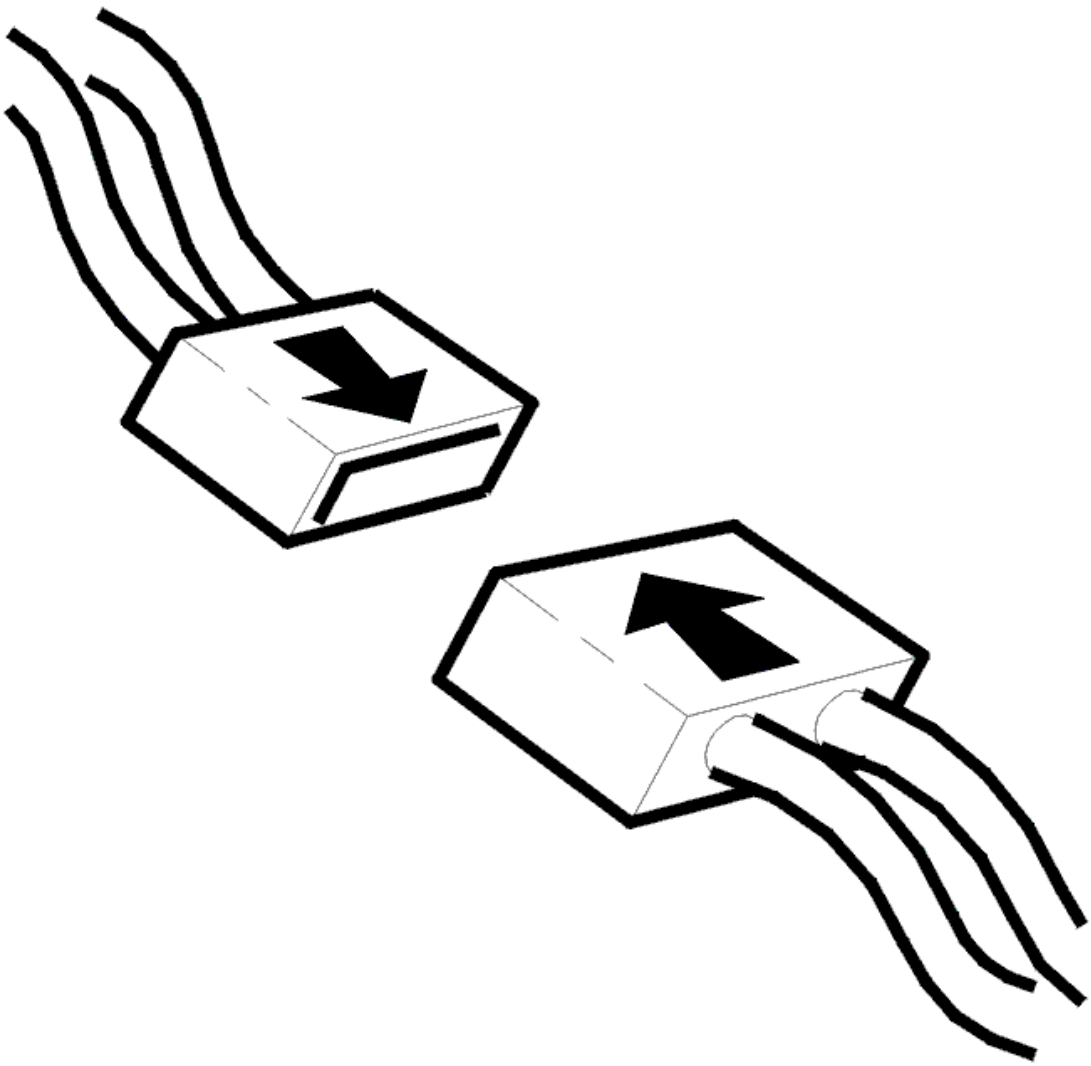


Fig. 23: Identifying Connector(s) Reinstallation
Courtesy of VOLVO CARS CORPORATION

- Ignition off
- Transmission connector D disconnected.

Check the temperature sensor. Measure the resistance between transmission connector D terminals #D7 and #D8.

The resistance must be 4.5-6 kohms at 20°C.

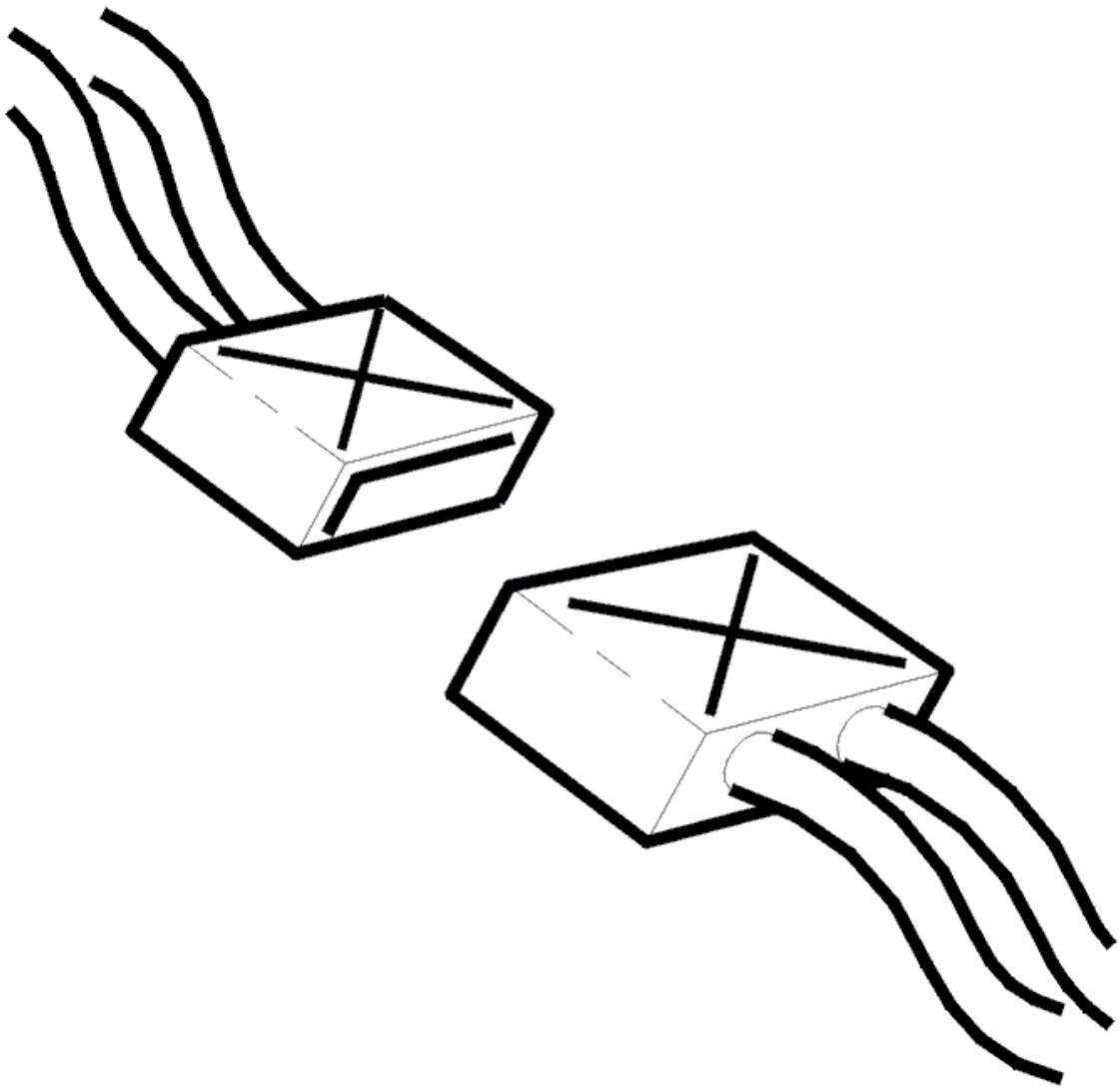


Fig. 366: Identifying Connectors
Courtesy of VOLVO CARS CORPORATION

If the transmission input speed does not update correctly it means that the fault is permanent.

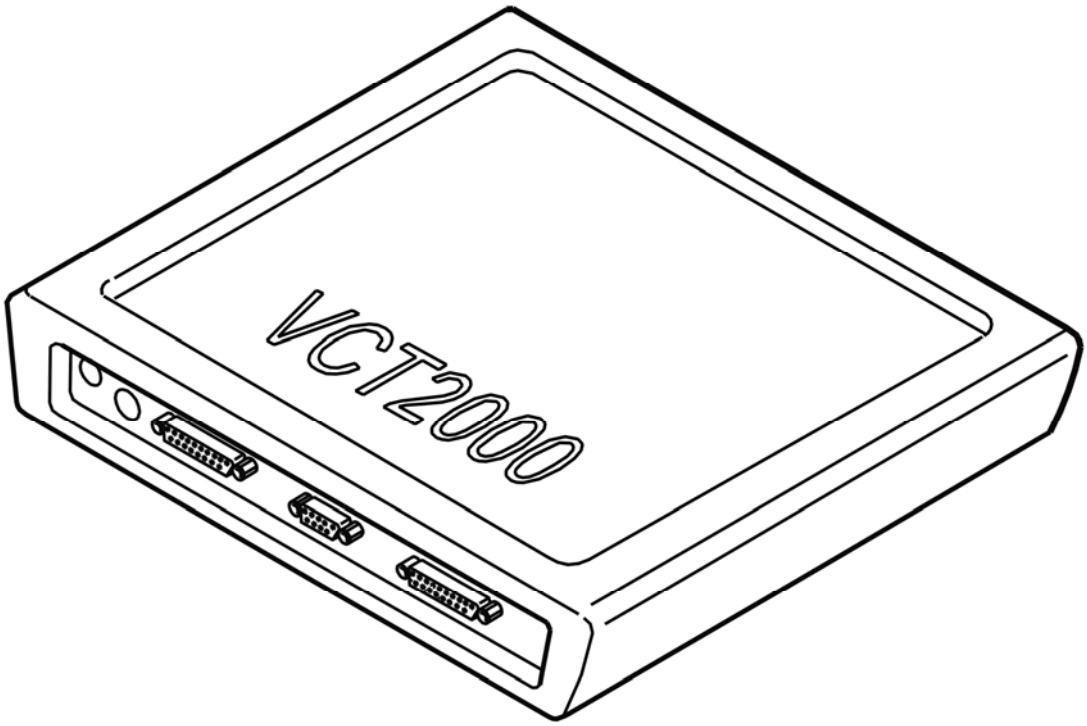


Fig. 241: Identifying VCT2000 Diagnostic Tool Symbol In VIDA
Courtesy of VOLVO CARS CORPORATION

- **Continue**

Refer to **CHECKING WIRING AND SENSORS**

CHECKING WIRING AND SENSORS

- Read off the position of the gear selector.
- Depress the brake pedal. Move the gear selector to the position for manual shifting and check that the status changes.
- Then move the gearshift selector toward both + and -, and check that the value has been updated in the driver information module's display window.

  If the value is updated in the driver information module display, the fault is intermittent. That is to say, it occurred earlier but is not active right now.

Fig. 315: Identifying VCT2000 Diagnostic Tool Symbol In VIDA
Courtesy of VOLVO CARS CORPORATION

Fig. 316: Identifying Automatic Transmission Gear Shifter With Manual Gear Changer
Courtesy of VOLVO CARS CORPORATION

- **Continue**

  Refer to **CHECKING THE COMPONENTS AND WIRING**

CHECKING THE COMPONENTS AND WIRING

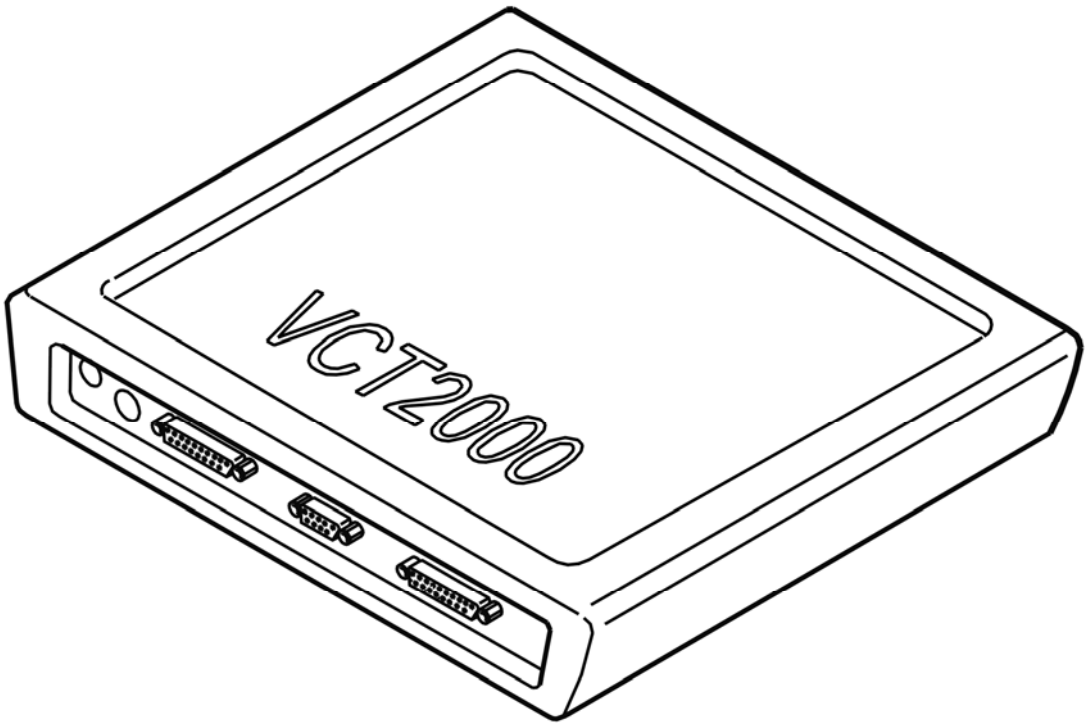


Fig. 372: Identifying VCT2000 Diagnostic Tool Symbol In VIDA
Courtesy of VOLVO CARS CORPORATION

Is the function OK?

- **YES**

  VERIFIED: Troubleshooting has been completed.

- **NO**

  Refer to **INFORMATION**

INFORMATION

FAULT-TRACING INFORMATION

The fault should have been detected and remedied. As this is not the case fault-tracing has failed.

Exit fault-tracing for this diagnostic trouble code (DTC) or make another attempt.

TCM-P097400: SHIFT SOLENOID A CONTROL CIRCUIT HIGH. GENERAL FAULT INFORMATION. NO INFORMATION ON FAULT TYPE (TF-80SC AWD;

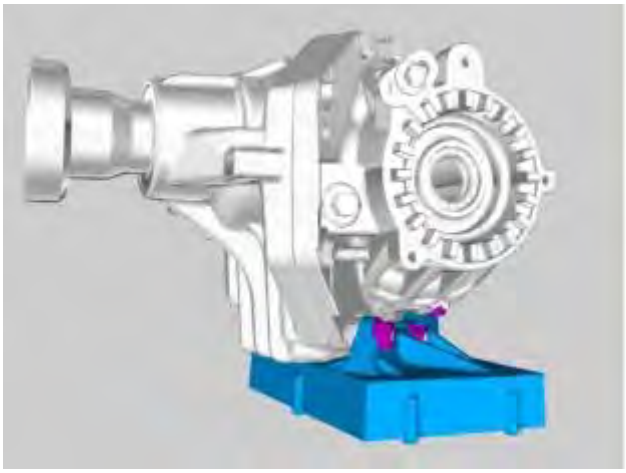


Fig. 6: Identifying Vibration Damper (1 Of 2)
Courtesy of VOLVO CARS CORPORATION

There are two different types of vibration damper (see this and the next step).

When replacing the bevel gear, transfer the vibration damper to the new bevel gear.

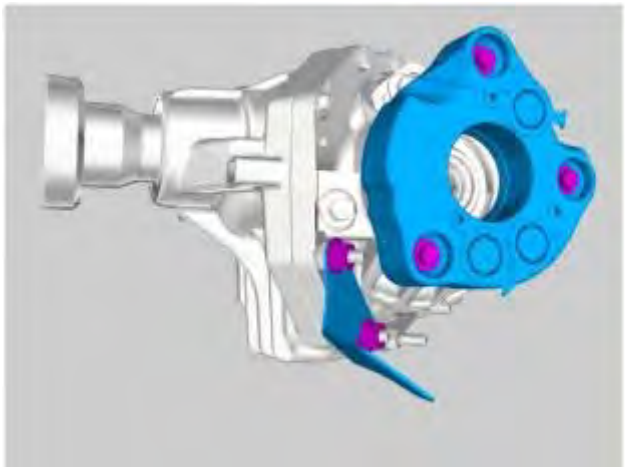


Fig. 7: Identifying Vibration Damper (2 Of 2)
Courtesy of VOLVO CARS CORPORATION

When replacing the bevel gear, transfer the vibration damper to the new bevel gear. In certain markets there is a bracket for an engine block heater. This bracket must also be transferred.

Install two washers between the bevel gear and bracket on the lower stud (see spare parts catalogue).

INSTALLATION

NOTE: For tightening torques, see: TIGHTENING TORQUE .

NOTE: Before installing the bevel gear, lubricate the spline joint between the transmission and the bevel gear using grease. See: SPLINES GREASING .

PREPARATIONS

Fig. 467: Identifying Oil Pan
Courtesy of VOLVO CARS CORPORATION

Suck up the oil from the transmission using an oil suction device.

Take out a container for the oil.

Raise the car.

Remove:

- the splash guard under the engine. Blow and wipe clean around the transmission oil trough
- the transmission oil trough. See **REMOVE THE OIL PAN AND THE SEAL**.

REMOVING THE ACCUMULATOR HOUSING FROM THE TRANSMISSION

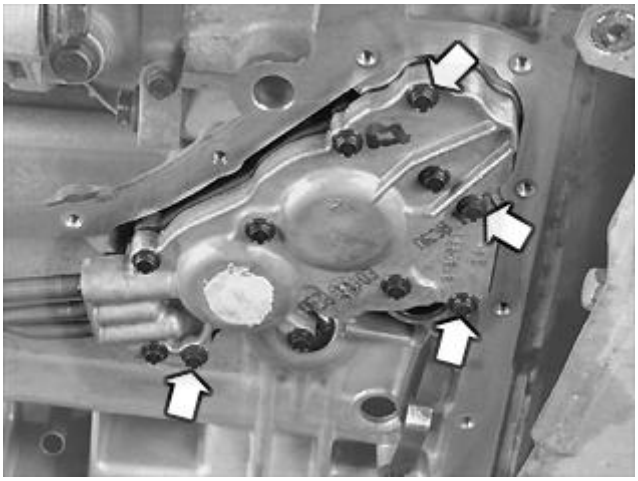


Fig. 468: Identifying Accumulator Housing
Courtesy of VOLVO CARS CORPORATION

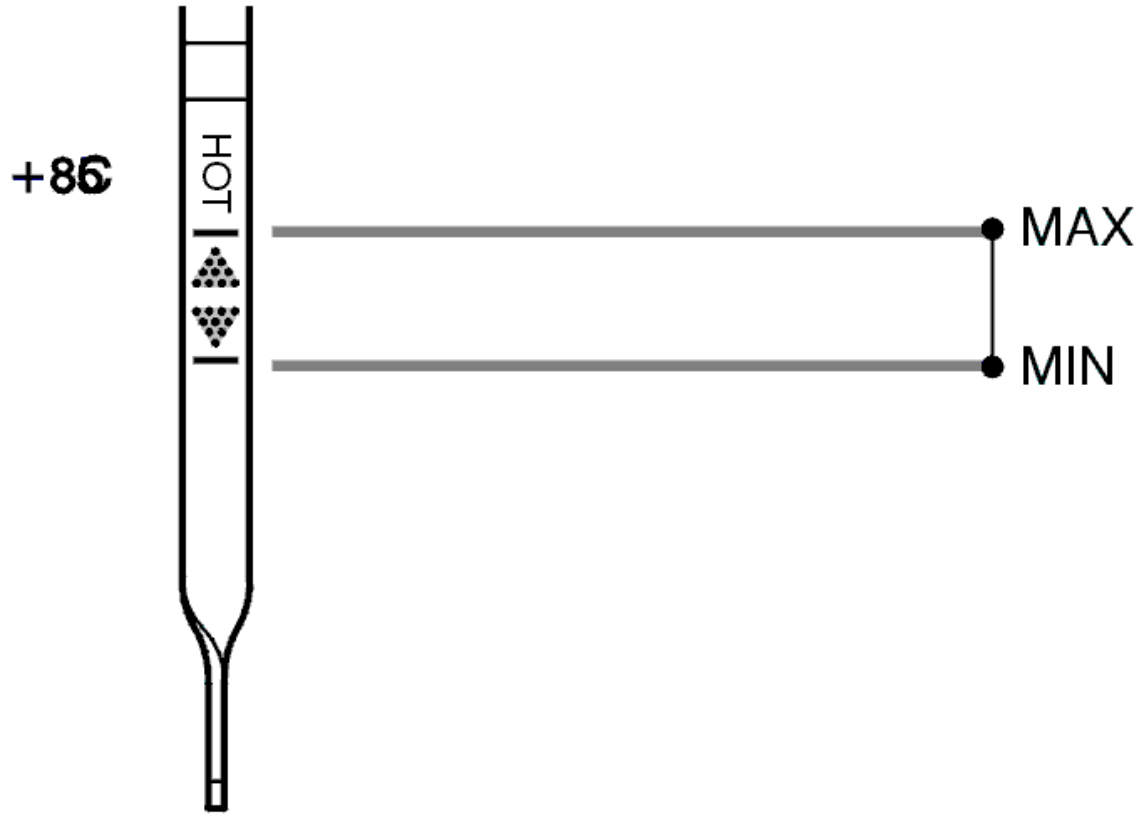


Fig. 7: Identifying Oil Level / Temperature
Courtesy of VOLVO CARS CORPORATION

Was the transmission fluid level correct?

- **YES**

  Refer to **TEST DRIVING**

- **NO**

  Refer to **RESETTING TRANSMISSION FLUID CHANGE COUNTER**

RESETTING THE ADAPTATION

RESETTING ADAPTATION AND THE COUNTER FOR "TRANSMISSION OIL CHANGE"

HINT: The transmission has torque controlled adaptive pressure control. Pressure control means that the transmission regulates the pressure itself during each gear shift. This avoids harsh gear shifting. Each gear shift is evaluated by the control module and stored in the memory. This allows for compensation for wear and tear in the transmission and clutch. It is important that the adaptation in the memory is reset after the transmission has been repaired. This is to ensure normal operation. The oil is replaced during repair; the "Transmission oil change" counter must be reset. If the counter is not reset when the fluid is drained and replaced, there is a risk that a diagnostic trouble code (DTC) will be stored in incorrect