VOLVO

260 GLE

EXHAUST EMISSIONS CONTROL BOOKLET 1985

TP 2582/1

VEHICLE EMISSION CONTROL INFORMATION

MANUFACTURER: VOLVO, SWEDEN

ENGINE SIZE: 2849 ml
ENGINE FAMILY: B 28 E (265)

TUNE-UP SPECIFICATIONS WITH NO ACCESSORIES IN OPERATION AND TRANSMISSION IN NEUTRAL		
ITEM	CONDITIONS	SPECIFICATIONS
IGNITION TIMING	IDLE RPM ADJUSTED TO 750 ± 50 VACUUM HOSES DISCONNECTED	10° ± 2° BTDC
IDLE AIR-FUEL MIXTURE	INSERT PROBE MIN 450 mm INTO EXHAUST PIPE. FOR FURTHER DETAILS SEE EXHAUST EMISSIONS CONTROL BOOKLET TP 2582 VACUUM HOSES CONNECTED. REMOVE PULSAIR HOSE FROM AIR FILTER AND PLUG THE HOSE.	IDLE CO: 2.0% ± 1%
IDLE RPM		1000 ± 50 RPM
VALVE CLEARANCE	HOT ENGINE	INLET 0.15 - 0.20 mm EXHAUST 0.30 - 0.35 mm

THIS VEHICLE CONFORMS TO AUSTRALIAN REGULATIONS APPLICABLE TO 1985 MODEL YEAR NEW MOTOR VEHICLES.

VOLVO

1367284

EXHAUST GAS EMISSIONS

Special exhaust gas emission regulations for new vehicles came into force in Australia in 1976. The regulations were introduced to curb the emission of pollutants into the atmosphere.
Car owners should therefore be aware of the components in the engine that can either directly or indirectly affect exhaust gas emissions.
This publication explains the emission control system incorporated in your vehicle and details the service measures which must be carried out to conform to local legislation.

Warranty service & 1,000 km (600 mile) service

When your car has been driven 1,000 km (600 miles) you should return it to your dealer for a Warranty service.
After this service we recommend that you follow our service programme which is designed to maintain your car in a roadworthy and reliable condition between services.
The Warranty and 10,000 km (6,000 mile) services involve servicing of components which are essential to keep exhaust gas emissions within legal limits. Also included are many other items over and above these, items such as oil changes, fluid checks, suspension and steering checks etc. All these items are described in this booklet in accordance with Australian legislation.
The complete Service Programme is shown in tabular form on pages 2, 3, 4 and 5, items referring to exhaust gas emissions are printed on pages 4 and 5.
Items marked with an asterisk (*) are also included in the Warranty service.

VOLVO SERVICE PROGRAMME

The simplest way to maintain your vehicle is to let a Volvo workshop carry out all the service work. Listed below are the operations that are included in the service programme.

Volvos service programme consist of a maintenance service every 10,000 km and more extensive service every 20,000 km. Additional operations are also included in the 40,000 km service.

Every 10,000 km (6,000 mls) or at least every six months

Gearbox oil leakage/level*	— check
Final drive oil leakage/level*	— check
Steering gear fluid leakage/level*	— check
Brake/clutch fluid reservoir	— check level, also for leakage
Battery	— check mounting, electroyte level
Tyre wear	— check
Kick down wire	— check/adjust
Servo brakes	— check

Every 20,000 km (12,000 mls) or at least once a year

Battery	— check voltage
Clutch	— check/adjust play
Propeller shaft, centre bearing, joints	— check
Brake lines	— check
Brake fluid	— check (customer request)
Rustproofing & paintwork	— check
Engine controls	— check, lubricate
Parking brake*	— adjust
Rubber gaiters	— check
Shock absorbers	— check
Paintwork and underbody	— check
Wheel bearings	— check
Ball joints	— check
Steering gear	— check
Control arms, bushings	— check
Rear end	— check
Door stops, hinges, locks	— adjust
Bonnet, hinges, locks	— check, lubricate
Engine (leakage)*	— check
Brake pads	— check wear
Windschreen wash/wipe	— check
Headlamp wash/wipe	— check

Additional operations every 40,000 km (24,000 mls)

Automatic transmission	— change oil

*Also included in the Warranty service

Customer checks

The items listed below should also be checked periodically. If your do not wish to do so yourself your dealer will be pleased to help, preferably when the car is in for its next service.
Have a look at the Owner's Manual if you are not sure of the function of some of the items.

• Windscreen	Condition
• Interior rear view mirror	Condition & mounting
• Hazard warning lights	Function
• Glove box	Function
• Courtesy lighting	Function
• Indicator lamps	Function
• Heater fan	Function
• Heater	Function
• Heated rear window	Function
• Wipers	Function
• Washers	Function, spray
• Wiper blades	Condition
• Horn	Function
• Turn signals	Function
• Headlamp flash	Function
• Panel lighting	Function
• Headlamps	Function
• Parking lights	Condition & function
• Numberplate	Condition
• Tail lights	Function
• Reversing lights	Function
• Brake lights	Condition & function
• Numberplate lights	Condition & function
• Reflectors	Condition
• Seat belts	Condition & mounting
• Door stops	Condition
• Latches	Condition
• Door mirrors	Condition & function
• Tyres	Inflation pressure
• Cooling system	Top-up
• Battery	Top-up

10,000 km (6,000 mile) Service (Exhaust Emissions Control Service)

The items listed below comprise the Exhaust gas emission service, and are part of the Maintenance Service.

I = Inspect (Correct or replace if necessary)
A = Adjust
R = Replace

Maintenance Operation	Kilometres (miles)		Additional items every		Description on page
	1000 (600) (Warranty service)	every 10,000 (6,000)	20,000 (12,000)	40,000 (24,000)	
Engine Mechanical Components					
Valve Clearance				A	6
Engine Drive Belts	I		I		7
Compression				I	7
Engine Oil	R	R			8
Engine Oil Filter	R	R			8
Cooling System Hoses and Connections	I				9
Vacuum Fittings, Hoses and Connections	I		I		9
Exhaust Manifold Bolts	I		I		7
Coolant, glycol content			I		9
Coolant, level	I	I			9
Coolant, change**					9

* Replace every 60,000 km (36,000 miles)

** Customer request. Not part of service.

10,000 km (6,000 mile) Service (Exhaust Emissions Control Service)

I = Inspect (Correct or replace if necessary)
A = Adjust
R = Replace

Maintenance Operation	Kilometres (miles)		Additional items every		Description on page
	1000 (600) (Warranty service)	every 10,000 (6,000)	20,000 (12,000)	40,000 (24,000)	
Engine Fuel System					
Air Cleaner Filter				R	10
Fuel (Line) Filter				R	10
Fuel System Lines	I				10
Idle CO Level	I	I			11
Engine Ignition Components					
Spark Plugs		R			12
Distributor			Lubricate		12
Ignition timing	I				12
Engine Crankcase Ventilation System					
Ventilation Hoses and filter				I	13
PCV Nipples — Clean				I	13
External Exhaust Emission Systems					
Exhaust System			I		9
Exhaust Gas Recirculation System			I	Clean	16

Valve clearance

Check and if necessary adjust valve clearances every 40,000 km (24,000 miles). Incorrect clearance can cause burnt valves, poor performance etc. Moreover the level of exhaust gas pollutants emitted may contravene local legislation.

Inlet valves
cold engine 0.10—0.15 mm (0.004—0.006in)
warm engine 0.15—0.20 mm (0.006—0.008in)

Exhaust valves
cold engine 0.25—0.30 mm (0.010—0.012in)
warm engine 0.30—0.35 mm (0.012—0.014in)

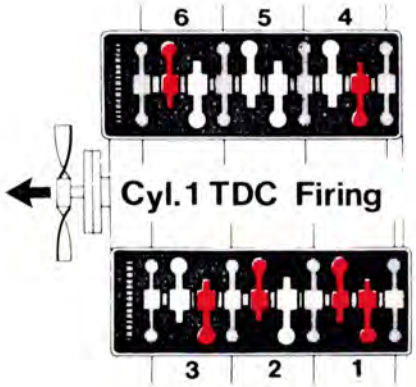
To adjust:
Remove both valve covers.
(1) Turn crankshaft until No.1 cylinder is at TDC, firing. Check/adjust the following valves:

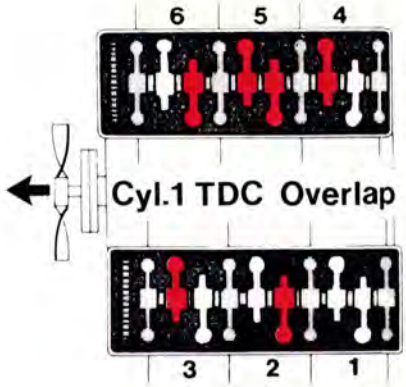
Inlet	No. 1 cyl
Exhaust	No. 1 cyl
Inlet	No. 2 cyl
Exhaust	No. 3 cyl
Exhaust	No. 6 cyl
Inlet	No. 4 cyl

(2) Turn the crankshaft one complete turn so that No. 1 cylinder is at TDC overlap. Check/adjust the remaining valves shown below, as follows:

Inlet	No. 5 cyl
Exhaust	No. 5 cyl
Inlet	No. 3 cyl
Exhaust	No. 2 cyl
Inlet	No. 6 cyl
Exhaust	No. 4 cyl

Refit the valve covers.





Drive belts

Belt tension should be checked every 20,000 km (12,000 miles). Also check that the belts are in good condition and are clean.
Worn, slack or dirty belts can cause poor cooling and alternator output as well as impair the operation of the power-assisted steering and the air conditioning unit.

From rear to the front of the engine, the various belts have the following function:

Belt 1 } fan, power-assisted steering and
Belt 2 } water pump
Belt 3 alternator
Belt 4 air conditioning

Belt adjustment and replacement

Since the belts are difficult to reach it is advisable to let your Volvo workshop adjust the tension of the belts, or replace them if necessary.

Checking the belt tension

It should be possible to depress the belts by 5—10 mm — air conditioning compressor belt 1—2 mm — in the centre of one of the runs. If the belts have just recently been renewed, the tension should be checked after 1000 — 2000 km (600 — 1200 miles).

Manifold bolts

The manifold bolts should be torqued at the warranty service (1000 km = 600 miles) and every 20,000 km (12,000 miles) thereafter. A loose manifold could alter air/fuel ratio and cause an increase in emissions and/or poor driveability.
Tightening torque: 10—15 Nm (1.0—1.5 kpm = 7—11 ft. lbs)

Compression

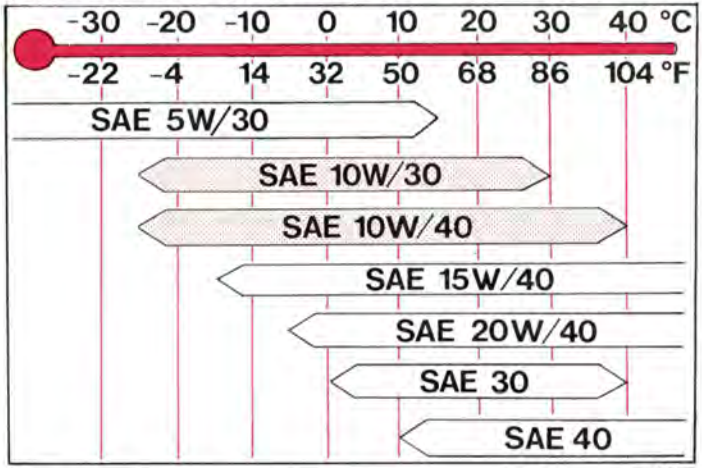
Check compression every 40,000 km (24,000 miles).
Compression: 0.8—1.1 MPa (8—11kp/cm²)
Applies to hot engine, fully open throttle and Starter motor turning speed 4.2—5.0 r/s (250—300 rpm).

Mechanical engine components

Oil quality:

According to API: not less than SF* (CCMC Class G2)
* Oils with designation SF/CC and SF/CD meet this requirement.
Synthetic or semisynthetic oils may be used if their specifications comply with the above.
Volvo do not recommend the use of supplementary additives because of potential damage to engine.

Viscosity: Temperature range (stable ambient temperatures)



SAE 15 W/40 or SAE 20 W/40 oils are recommended for use in extreme driving conditions that involve excessive oil consumption and high oil temperatures e.g. mountain driving with frequent decelerations or fast motorway driving. (Note however the lower temperature limits.)

Capacity: 6.5 litres.
Oil-level check: When refuelling

Oil and filter change

The oil and filter are changed for the first time at the Warranty service after 1000-2000 km (600-1200 miles), and thereafter according to the table below.

Driving conditions	Change interval oil + filter
Unfavourable	Every 5000 km (3000 miles), or 3 months, whichever occurs first
Average	Every 10 000 km (6000 miles) or 6 months, whichever occurs first

Unfavourable conditions such as

- long distance driving in dusty/sandy areas
- long distance towing
- long distance driving in hilly terrain
- stop-start driving
- low temperatures, (below -10 °C), driving short distances (less than 10 km = 7 miles)
- sustained high speed driving

If oil and oil filter are not changed at specified intervals, excessive wear and damage may result.
Also, sludge could form in the oil pan and cause a blockage in the crankcase ventilation system.

Exhaust system

Check the exhaust system every 20,000 km (12,000 miles) for leakage. If gases leak from the exhaust system they could be drawn into the passenger compartment and cause drowsiness. Exhaust emission may also contravene local legislation.

Also check the mounting of the exhaust system.

Coolant

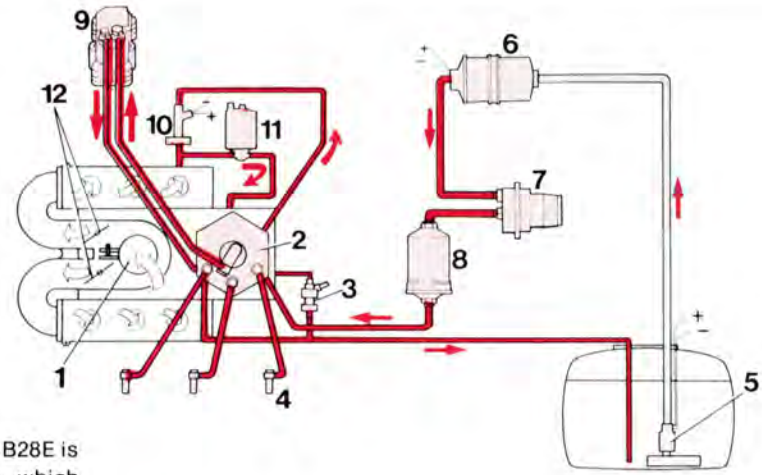
The level should be between the MAX and MIN marks on the expansion tank. If necessary, top up with a mixture of 50 % Volvo anti-freeze type C (bluegreen) and 50 % water.

Check the **anti-freeze capacity** of the coolant. Normally, with approx. 50 % glycol in the system, the coolant should provide protection against freezing down to approx. —35 °C (—31 °F). A lower glycol content has a negative effect on the corrosion resistance. This results in corrosion forming in the engine cooling channels. Eventually this would impair the cooling.

Change the coolant every second autumn.

Fuel system

1 *Air-fuel control unit*
2 *Fuel distributor*
3 *Frequency valve (USA only)*
4 *Injector*
5 *Tank pump*
6 *Fuel pump*
7 *Pressure accumulator*
8 *Fuel filter*
9 *Control pressure regulator*
10 *Start injector*
11 *Air control valve (constant idle speed system)*
12 *Throttle valves*



CI-System

The fuel injection system fitted to the B28E is of the continuous injection (CI) type, which means that the injectors continuously spray fuel i.e are open all the time the engine is running.

The system has few moving parts, is reliable and combusts fuel efficiently, ensuring that emission regulations are not contravened. Basically it operates as follows: the amount of air entering the inlet side of the engine is measured continuously by an air flow sensor which is attached by a lever to a fuel distributor. Variations in air flow are consequently sensed by the fuel distributor which can then adjust the fuel flow to the injectors. The air flow is adjusted by the throttle valves shown above.

Fuel

1985 models equipped with B28E engines require 98 (RON) octane fuel.
RON = Research Octane Number.

Fuel filter

Replace the fuel filter every 40 000 km (24 000 miles).
A clogged filter may affect the air/fuel mixture, causing erratic engine running.

Air cleaner

Replace the air cleaner cartridge every 40,000 km (24,000 miles).
If however the vehicle has been run on dusty roads or in industrial areas the filter should be replaced more often.
Never clean and refit an old filter.
Remember that a dirty filter may affect the air/fuel mixture, causing a reduction in engine performance, and in addition adversely affect exhaust emissions.

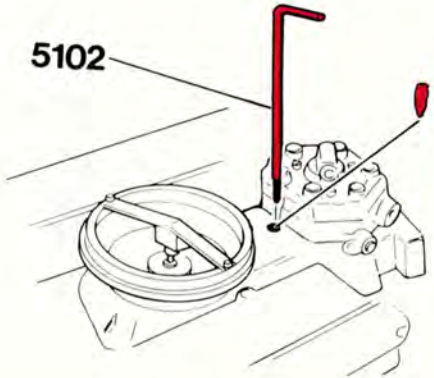
Carbon monoxide in exhaust gases

Every 10,000 km (6,000 miles) check the CO-content of the exhaust gases with a special CO-meter.
To check and adjust the idle CO value proceed as follows:

1 Calibrate CO-meter according to the manufacturer's instructions.
2 Connect exhaust sample probe to the vehicle tail pipe. Ensure that the probe extends a minimum of 450 mm (18 in) into the exhaust pipe otherwise readings will be incorrect.
3 Connect a tachometer.
4 Start engine and run to operating temperature.
5 Check, and if necessary, adjust the idle speed to the specified value.
6 Disconnect the Pulsair hose from the air cleaner and plug the end of the hose.
7 Check, and if necessary, adjust the idle CO using special tool 5102 (see picture below).
8 The value should be 2.0 ±1%
9 Recheck both idle speed and idle CO.
10 Reconnect the Pulsair system.

Note! The CO adjustment screw is sealed with a plug. This plug must be removed before adjusting CO.

After each adjustment, remove key 5102, refit the plug and rev-up the engine briefly. Failure to do so will invalidate results.



Throttle wire

The clearance of the throttle wire on cars with automatic transmissions must be checked and if necessary adjusted every 10,000 km (6,000 miles).

Ignition system

Spark plugs

Remove and check the spark plugs every 10,000 km (6,000 miles). If the electrodes are badly burnt, change the plugs. Otherwise the electrode gap should be adjusted to 0.6—0.7 mm (0.024—0.028in). Also check the spark plugs for cracked insulators etc.

Driving with poor spark plugs would not only have a negative effect on the exhaust emissions, the engine would run badly and be difficult to start.

Ignition timing

If the ignition setting is not according to specification adjust to the correct value.

To set:

1 Disconnect and plug the vacuum hose at the distributor.
2 Use air adjusting screw to set idle speed to 750±50 rpm.
3 Set the ignition timing to 10°±2° BTDC by rotating the distributor (clamp slackened).
4 Connect vacuum hose.
5 Adjust idle speed to 900±50 rpm (manual gearbox), 1000±50 rpm (for cars with automatic transmission).

An incorrect basic setting can have an adverse effect on the running of the engine and also the exhaust emission.

Distributor

Lubricate the distributor every 20,000 km (12,000 miles).

Add 1—2 drops of oil to the felt.

134 149

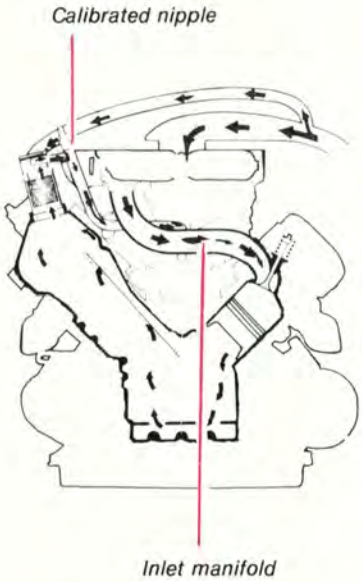
CAUTION

Danger High Voltages

The ignition system operates at very high voltages. Special safety precautions must be followed when:

— Connection engine test and diagnostic equipment to the vehicle (timing light tach-dwell tester, ignition oscilloscope etc).

— replacing ignition components e.g. plugs, coil, distributor, HT leads etc.



Positive Crankcase Ventilation,

The function of the crankcase ventilation system is to prevent crankcase gases from being released directly into the atmosphere. To aid pollutant control the gases are readmitted to the engine via the inlet manifold where they are mixed with fresh air from the air cleaner before being recombusted.

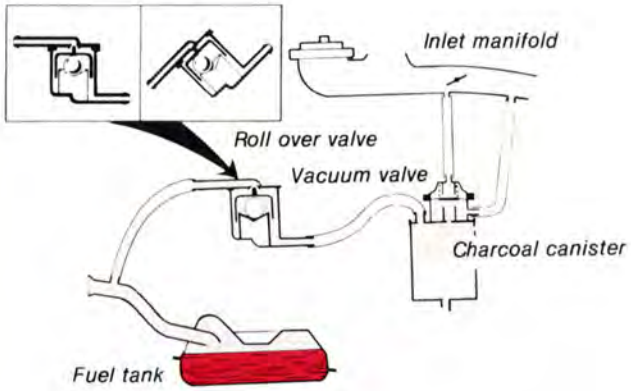
When the engine is idling or operating under low load the crankcase gases flow along the hose from the air cleaner to the valve cover, down through the hose between the flame trap and control valve (a calibrated nipple on the inlet manifold). The flow of gases through the valve is restricted so that a slight depression in the crankcase is maintained.

At full load and/or large gas flow the depression in the inlet manifold decreases and the gas flow in the hose between the flame trap and valve, reverses. The gases then flow in two different directions, partly through the calibrated nipple and party through the air cleaner into the engine again.

Service

Check the crankcase ventilation hoses every 40,000 km (24,000 miles). Make sure that the hoses are in good condition and are not clogged or restricted in any way. Defective hoses must be replaced. The calibrated nipple in the inlet manifold should also be removed and cleaned as well as the flame trap in the oil filler cap. Replace parts if and as necessary.

Evaporative Control System



Evaporative Control system

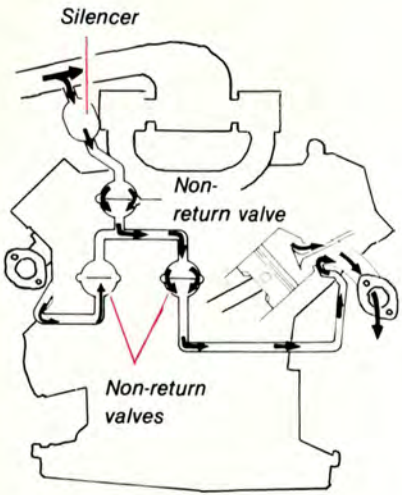
Vehicles intended for the Australian market are equipped with a fuel evaporative control system, which prevents fuel vapours from being released directly into the atmosphere.

The system comprises an expansion chamber in the fuel tank, a roll-over valve and a charcoal canister with a built-in vacuum valve.

The components are interconnected by hoses which convey fuel vapours from the tank to the charcoal canister where they are stored until the engine is started and then drawn into the engine.

Service

Normally this system does not require any maintenance.



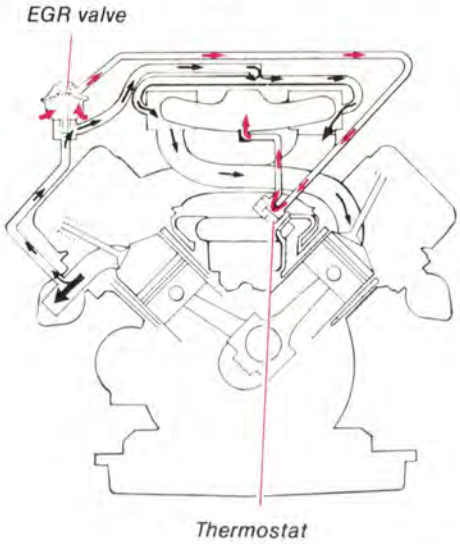
Pulsair system

This system is designed to burn off surplus toxic components from the exhaust by supplying air (oxygen) to the hot exhaust gases.
It is connected to the exhaust ports, directly after the exhaust valves and to the air cleaner. Three non return valves are incorporated in the system to prevent exhaust gases from being released into the atmosphere through the air cleaner.
A silencer (expansion chamber) is fitted to reduce pressure variations and noise.

Service

Normally not necessary.
Refer to Service manual if more information is required.

Exhaust Gas Recirculation System



Exhaust Gas Recirculation System (EGR-System)

In order to conform to exhaust emission legislation the B28E is equipped with an exhaust gas recirculation (EGR) system

The system operates by returning some of the exhaust gases to the engine to be recombusted: since this lowers the combustion temperature the amount of oxides of nitrogen released into the atmosphere is reduced.

Service

Check the function of the EGR system every 20,000 km (12,000 miles).

Clean the EGR system every 40,000 km (24,000 miles) according to Service manual.

VOLVO

VOLVO CAR CORPORATION
GÖTEBORG, SWEDEN

TP 2582/1 (English Austr.) 1000.9.84.