VOLVO ENGINE MODIFICATION

140 Series (4 Cyl. Engines)
B20B (1968-73)
B20F (1972-73)
164 Series (6 Cyl. Engines)
B30A (1969-73)
B30E & F (1972-73)

NOTE – Since 1972 only fuel injected models are imported into USA. Carbureted models, with fuel injection as an option, are imported into Canada.

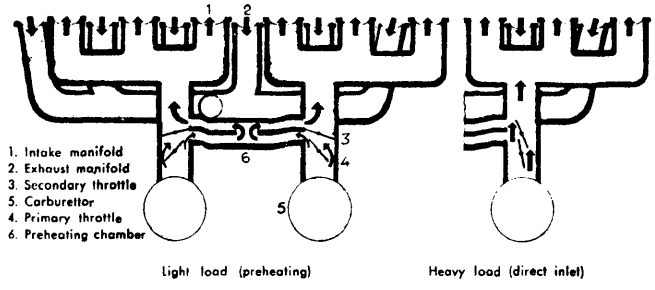
DESCRIPTION & OPERATION

Volvo engines are equipped with exhaust emission systems which reduce amount of CO and NOx. This is achieved through engine modifications, specially calibrated emission carburetors or fuel injection, a special distributor and a modified induction system.

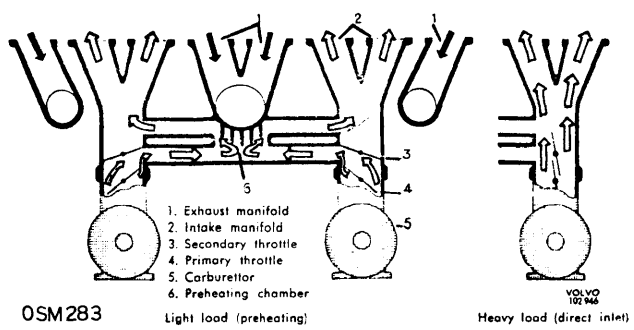
Carburetors – All B20B and B30A engines use two carburetors. B20B engines use either two Zenith-Stromberg 175 CD-2 SE or two SU-HIF 6 carburetors. B30A engines use two Zenith-Stromberg 175 CD-2 SE carburetors. *See appropriate article in CARBURETOR Section.*

Fuel Injection – All B20F, B30E and B30F engines use a Bosch electronically controlled fuel injection system. *See Bosch Electronic Fuel Injection in CARBURETOR Section.*

Intake Manifold (Carbureted Engines) – Intake manifold has a preheat chamber and secondary throttle plates for each carburetor. When engine is idling and during normal driving, secondary throttle plates are closed. This forces air/fuel mixture through a central preheating chamber, which completely vaporizes air/fuel mixture. During high speed or heavy load conditions (wide open throttle), secondary throttle plates open to allow air/fuel mixture to enter directly into cylinders without going through preheat chamber.



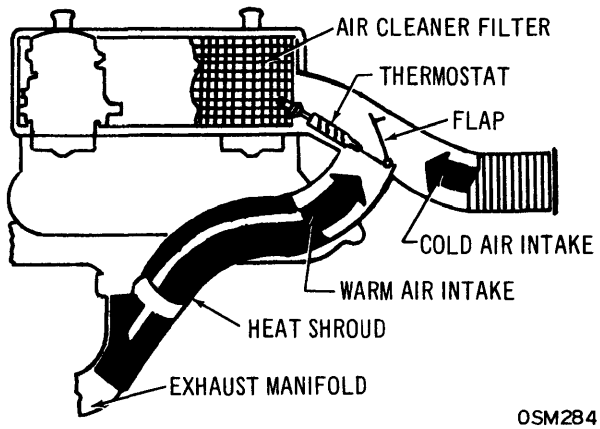
164 SERIES



1968-71 140 SERIES

VOLVO DUAL MANIFOLD

Constant Temperature Air Cleaner – Constant temperature air cleaner consists of a housing with a preset thermostat and a regulator flap. Thermostat is connected to regulator flap which controls air intake from both hot and cold intake tubes. Air supplied to carburetors is maintained at a constant temperature of approximately 90°F (140 series) or 87±9°F (164 series).



CONSTANT TEMPERATURE AIR CLEANER

Distributor – B30A engines are equipped with a Bosch JFUR 6 (JFURG in 1969) distributor. These distributors have a dual diaphragm unit, however the advance side of unit is disconnected and plugged. 1972 B30E & B30F engines are equipped with a Bosch JFURX6 distributor. 1973 engines have a Bosch PFURX6 distributor. All B20B engines use Bosch JFUR 4 distributors while B20F engines use a Bosch JFUX 4 distributor. Some early B20B engines were equipped with a plastic bottle in hose between carburetor and distributor, function of this bottle is to delay retard unit for about six seconds.

Exhaust Gas Recirculation Valve – All fuel injection engines have an E.G.R. valve which provides cleaner exhaust during part throttle operation. System operates between idle and full throttle. System allows a small amount of exhaust gas into intake manifold during part throttle operation.

MAINTENANCE

Ignition Timing – Set timing at 10° BTDC at 600-800 RPM with distributor vacuum unit disconnected and plugged on both 140 and 164 series engines.

Idle & Mixture Adjustments (B20B Engine) – Remove air cleaner and check that oil in damper chambers is within ¼" of the upper edge. If necessary, fill with Automatic Transmission Fluid, Type "A".

1) Carry out basic setting of fuel jets. Lift air valve and screw in adjusting screw so that upper edge of fuel jet comes level with bridge. Then lower jet by turning adjusting screw 2½ turns clockwise, if temperature is 68°F. If temperature is higher or lower than 68°F, turn screw less than 2½ or more than 2½ turns.

2) Connect tachometer and CO meter, run engine at 1500 RPM until thermostat opens. Adjust engine speed to 800 RPM, 700 RPM if equipped with automatic transmission. *NOTE – Use a suitable carburetor synchronizer and balance air intake of each carburetor.*

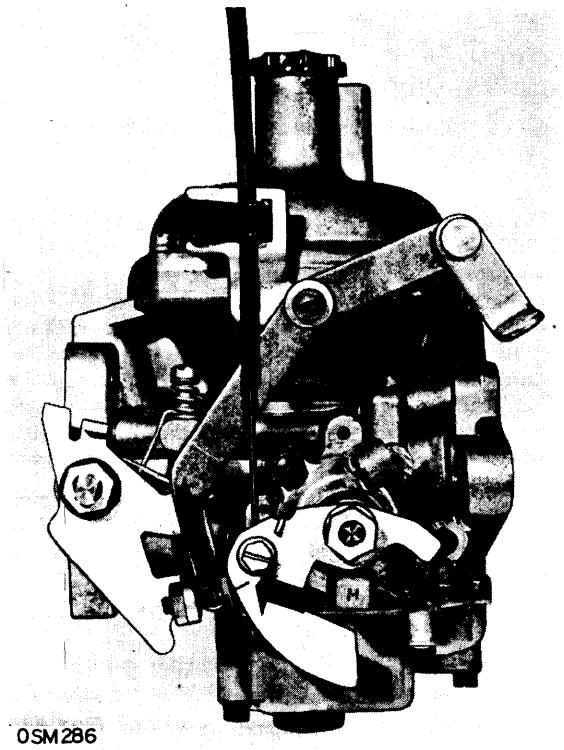
VOLVO ENGINE MODIFICATION (Cont.)

3) Screw in adjusting screws until CO reading is 2.5%. Adjust equally for both carburetors. Adjust link rods. With control against its stop on manifold bracket, link rods should be adjusted until there is a clearance of about 004" between lever and flange of primary throttle spindle.

4) Adjust hot start valve so that with control rods pressed down to bottom position, clearance between rod and adjusting screw should be a maximum of .04".

Idle & Mixture Adjustments (B30A Engine) – Adjustments should be made when air temperature is 60-80°F and must be made within eight minutes after cooling thermostat has opened. Check that oil in damper chambers is within ¼" of the upper edge. If necessary, fill with Automatic Transmission Fluid, Type "A".

1) Connect tachometer and CO meter, run engine at 1500 RPM until thermostat opens. Adjust engine speed to 800 RPM, 700 RPM if equipped with automatic transmission. *NOTE – Use a suitable carburetor synchronizer and balance air intake of each carburetor.*



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STROMBERG CARBURETOR FAST IDLE ADJUSTMENT

2) Adjust idle trimming screws to obtain a CO reading of 2.5%. Adjust link rods. With control against its stop on manifold bracket, link rods should be adjusted until there is a clearance of about .004" between lever and flange of primary throttle spindle.

3) Adjust hot start valve so that valve control is against the carburetor lever with valve piston in upper position and throttle control at idle.

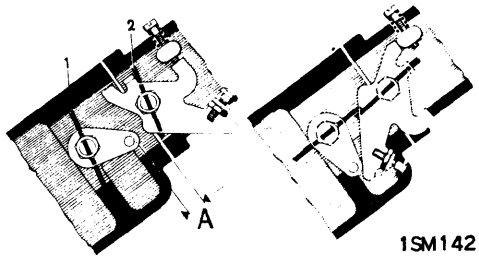
Fast Idle Setting – Pull out choke control on dash .8". Adjust fast idle screw to obtain a speed of 1400-1500 RPM.

E.G.R. Valve – Clean all hoses and pipes in the system every 12,000 miles. Replace E.G.R. valve every 25,000 miles.

TESTING

Constant Temperature Air Cleaner – Test thermostat in lukewarm water. Flap should be closed for cold air at a temperature of 70-77°F and closed for warm air at 95-105°F. If correct function is not obtained, replace complete housing with thermostat.

Secondary Throttles – When secondary throttle is closed, distance between lever pin and intake manifold flange should be .11-.17".



Throttle position at low output — Fully open throttle

1. Secondary throttle 2. Primary throttle
"A"=2.7—4.3 mm (0.11—0.17")

THROTTLE POSITION

E.G.R. Valve – With engine at idle, connect distributor vacuum line to vacuum connection of E.G.R. valve. Engine should now stop or begin to run rough. If this does not occur, check all hoses and pipes for clogging. If no clogging is found, replace E.G.R. valve and retest.