

## SUPPLEMENT TO INSTRUCTION BOOK VOLVO 120



AB VOLVO GÖTEBORG SWEDEN



To a great extent the instruction book for the Volvo 120 (P) applies also to the Volvo 120 (S). This supplement deals only with the important differences between the Volvo 120 (S) and 120 (P) models.

Type designation	Engine	Gearbox
13 - 134 S	B 20 A	M 40
13 - 334 S	B 20 B	M 40
and on certain markets		
13 - 335 S	B 20 B	M 41

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## DESCRIPTION

### Engine

The Volvo 120 (S) is fitted with a new 2-litre, 4-cylinder engine with type designation B 20. The engine is available in two variations: B 20 A with single carburettor and B 20 B with twin carburettors. Both variations have a higher torque and larger output than previously.

On certain markets, the B 20 B engine is fitted with a fan with slip coupling.

### Exhaust emission control

The Volvo 120 (S) is now fitted with exhaust emission control, that is, a system which as a result of better mixing and distributing of fuel and air provides a more complete combustion and thereby cleaner exhaust gases.

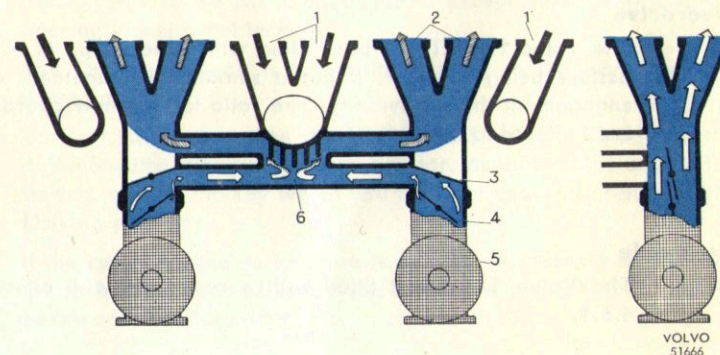
On the B 20 A engine, the exhaust emission control is obtained through the carburettor type Zenith-Stromberg 175 CD 2 SE which is specially designed for this purpose.

On the B 20 B engine the exhaust emission control is provided partly through carburettors specially designed for this purpose and partly by the engine having a special induction manifold with throttles and preheating chamber, see Fig. below.

When driving at low speeds the throttles are closed so that the fuel-air mixture is forced to pass the preheating chamber.

When higher output is required, the throttles open so that the fuel-air mixture flows directly to the cylinders.

- |                     |                             |                       |
|---------------------|-----------------------------|-----------------------|
| 1. Exhaust manifold | 3. Intake manifold throttle | 5. Carburettor        |
| 2. Intake manifold  | 4. Carburettor throttles    | 6. Preheating chamber |

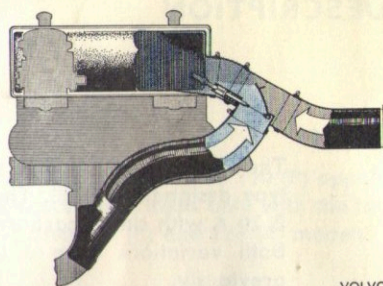




### Air preheating

Certain variations of the 120 (S) model are provided with thermostatically controlled air preheating.

With this arrangement the induced air is maintained at a constant, favourable temperature. Air preheating counteracts ice formation in the carburettor and also contributes to a shorter warming up period after starting.



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### Electrical system

The electrical components are catered for by a 12 Volt system which includes an alternator. Caution should be observed when changing the battery or when carrying out any other work with the electrical system, see instruction book page 39.

### Power transmission

#### Clutch

The Volvo 120 (S) has a mechanical clutch provided with a cable control. The part of the text in the instruction book which covers the clutch hydraulic system does not apply.

#### Overdrive

The Volvo 123 GT has been fitted with a new type of overdrive. Besides being stronger, it has a smoother engagement and disengagement than previously. The ratio for the new overdrive has been altered to 0.797:1.

#### Rear axle

The Volvo 123 GT is fitted with a rear axle with altered ratio 4.3:1.

### Brakes

The brake system is a dual-circuit system with disc brakes on the front wheels and drum brakes on the rear wheels. The system is provided with a tandem master cylinder and a direct operating servo cylinder.

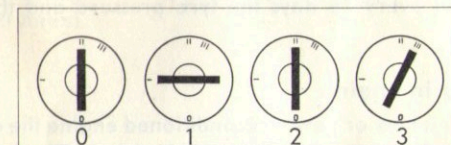
The principle for the dual-circuit system is that both front wheels are connected to a rear wheel, that is, should one of the systems cease to function, there is always brake power for both front wheels and a rear wheel.

The delivery lines to the rear wheels are fitted with relief valves which prevent involuntary locking of the rear wheels.

The system also includes a warning lamp mounted on the dashboard. This warning lamp lights if one of the circuits does not function during braking. The lamp also indicates when the handbrake is applied.

### Ignition key and steering wheel lock

The ignition key has four positions: (0) Locking position; (1) Garage position; (2) Driving position; (3) Starting position.



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The key can only be removed from the lock either in the Locking position or Garage position. When the key is removed from the Locking position the steering wheel is locked automatically.

If the key is taken from the lock in the Garage position, the electrical system of the car is disconnected except from the radio. The steering wheel is not locked.

The Driving position is the position in which the key should be during driving.

To start the engine, turn the key to the Starting position and this automatically engages the starter motor. As soon as the engine has started, release the key which will then automatically return to the Driving position.

If the car is parked as to cause tension in the steering mechanism, the lock is easier to release if the steering wheel is rotated slightly backwards and forwards.



## SERVICING

### Maintenance system

With effect from the 1969 models, the maintenance system has been modified. Servicing procedure carried out at 5000 km (3000 miles) intervals are omitted. Oil changing for the engine as well as oil level checking for the gearbox, final drive, steering gear and carburettor(s) should take place after every 10000 km (6000 miles), suitably in connection with the 10000 km (6000 miles) inspection. However, as previously, during the running-in period the engine oil should be changed after the first 2500 km (1500 miles) and the oil in the gearbox and final drive replaced after the first 5000 km (3000 miles).

In addition to the above, the following should be checked when filling with fuel:

- the oil level in the engine
- the coolant level
- the brake fluid level

that the container for the windscreen washer fluid is full  
about every 14 days the tyre pressure and the battery acid level.

### Oil changing in engine

With a new or newly reconditioned engine the oil should be changed after the first 2500 km (1500 miles). Thereafter oil changing is according to the intervals below.

The intervals for changing will depend to a great extent on the type of oil used. For engine lubrication "For Service MS" should be used. As far as viscosity is concerned a **multigrade oil** should primarily be used. These oils are better suited for demanding operating conditions, for instance, continuous driving in city traffic with incessant stopping and starting and long periods idling.

**For engine oil with viscosity SAE 10 W — 30 (multigrade), 10 W — 40 or 20 W — 50 the oil should be changed every 10000 km (6000 miles).**

**If an engine oil with viscosity SAE 10 W (singlegrade), 20/20 W or 30 is used, the oil should be changed every 5000 km (3000 miles), or at least twice a year.**

At very low temperatures ( $-20^{\circ}\text{C} = 4^{\circ}\text{F}$ ) multigrade oil SAE 5 W — 20 is recommended. However, this oil should not be used when the temperature constantly exceeds  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ).

Viscosity Oil quality	Temperature range	Oil changing intervals*)	Oil capacity
SAE 10 W — 30 10 W — 40 20 W — 50 "For Service MS"	all the year round	10000 km (6000 miles)	Excl. oil filter 3.25 litres (5.72 Imp. pints = 6.86 US pints)
SAE 10 W 20/20 W 30 "For Service MS"	below $-10^{\circ}\text{C}$ ( $14^{\circ}\text{F}$ ) between $-10^{\circ}\text{C}$ and $+30^{\circ}\text{C}$ ( $14^{\circ}\text{F}$ and $87^{\circ}\text{F}$ ) above $+30^{\circ}\text{C}$ ( $87^{\circ}\text{F}$ )	5000 km (3000 miles) (at least twice a year)	Incl. oil filter 3.75 litres (6.60 Imp. pints = 7.91 US pints)

\*) During running-in the oil should be changed after the first 2500 km (1500 miles).

### Gearbox without overdrive M 40

For the M 40 gearbox engine oil SAE 30 or SAE 20 W — 40 can also be used as an alternative to gear oil.

### Positive crankcase ventilation

All variants are provided with positive crankcase ventilation which has been given a different design in relation to previous models.

The positive crankcase ventilation prevents crankcase gases from being released into the atmosphere. Instead they are sucked into the engine through the intake manifold and participate in the combustion after which they are blown out through the exhaust pipe together with the other combustion gases.



Every 40000 km (25000 miles) the components for the positive crankcase ventilation should be cleaned and this operation ought to be done in a Volvo workshop.

### Air cleaner

The B 20 B has a new type of air cleaner, a so called rod-type cleaner which is the same for both the carburettors.

The air cleaner consists of a plastic casing with replaceable paper cleaner insert.

The insert should be replaced after every 40000 km (25000 miles). If the car is run mainly on roads which are very dusty, the cleaner, however, should be replaced more often.

To change the cleaner, slacken the hose clamp for the air preheating as well as the clamps retaining the upper part of the air cleaner so that the upper part can be taken off. The insert is now available for replacement.

### Draining the coolant

The coolant should be changed every other year. To drain the coolant, open a cock on the right-hand side of the engine and release the hose connected to the lower part of the radiator. There is no drain plug on the radiator.

### Carburettors

The carburettors on the Volvo 120 (S) models are set and tested with a CO-gauge at the factory. Any subsequent checking or adjustment of the carburettor's setting need not be done other than when carrying out repairs to or replacement of the carburettors.

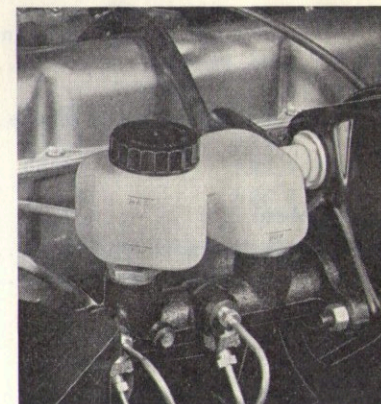
The only measure required to be carried out at regular intervals is a check on the oil level in the damping cylinders, this being carried out every 10000 km (6000 miles).

### Replacing the servo cylinder air cleaner

Normally, the servo cylinder air cleaner should be replaced every 40000 km (25000 miles). When driving mainly on dusty roads replacement should take place more often. The servo cylinder air cleaner should be replaced at a Volvo workshop having the proper equipment for this purpose.

### Brake fluid

The brake system is fitted with twin brake fluid containers, one for each circuit. The brake fluid level can suitably be checked when filling fuel in connection with the oil level check for the engine. The fluid should be between the Max. and Min. marks.



As far as the hydraulic brake system is concerned, only brake fluids meeting the requirements according to SAE 70 R 3 may be used. N. B. Do not use brake fluids with designation SAE 70 R 1, HD or similar. From a traffic safety point of view, it is very important that brake fluid of inferior value is not used. A first-class brake fluid must, namely, fulfil the heavy demands made by temperature variations and in addition must not have a damaging effect on the rubber components in the brake system.



## SPECIFICATIONS

### Engine

Type designation .....	Volvo B 20 A	Volvo B 20 B
Output (DIN) at r.p.m. ....	82 h.p./4700	100 h.p./5500
Output (SAE) at r.p.m. ....	90 h.p./4800	118 h.p./5800
Max. torque (DIN) at r.p.m. .	16 kpm/2300 (116 lb.ft.)	16.5 kpm/3500 (112 lb.ft.)
Max. torque (SAE) at r.p.m. .	16.5 kpm/3000 (119 lb.ft.)	17 kpm/3500 (123 lb.ft.)
Bore .....	88.9 mm (3.5")	
Stroke .....	80 mm (3.15")	
Displacement .....	1.99 litres	
Compression ratio .....	8.7:1	9.5:1
Valve clearances, warm and cold, inlet .....	.40—.45 mm (.016—.018")	.50—.55 mm (.020—.022")
Valve clearances, warm and cold, exhaust .....	.40—.45 mm (.016—.018")	.50—.55 mm (.020—.022")
Idling speed, warm engine ...	700 r.p.m.	800 r.p.m.

### Fuel system

Carburettors, type .....	Horizontal	Horizontal
designation ....	Zenith-Stromberg 175 CD 2 SE	SU HS 6*)
Fuel, octane rating, min. ....	97	100

### Cooling system

Thermostat begins opening at	approx. 82° C (179° F)
fully open at ....	approx. 95° C (204° F)

### Ignition system

Ignition setting, stroboscope setting (vacuum governor disconnected) .....	22—24° B.T.D.C. at 1500 r.p.m.	10° B.T.D.C. at 600—800 r.p.m.
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\*) On certain markets Zenith-Stromberg 175 CD 2 SE

Spark plug, normal driving ..	Bosch W 175 T 35*)	Bosch W 200 T 35*)
hard driving ....		Bosch W 225 T 35*)
electrode gap ...	.7—.8 mm (.028—.032")	
tightening torque	3.5—4.0 kgm (25—29 lb.ft.)	

\*) Or corresponding

### Electrical system

Battery, electrolyte specific gravity .....	1.28
recharged at .....	1.21
Alternator, current rating max. ....	35 A
output max. ....	450 W

### Gearbox

Type designation .....	M 40	M 41
Ratio, 1st speed .....	3.13:1	3.13:1
2nd speed .....	1.99:1	1.99:1
3rd speed .....	1.36:1	1.36:1
4th speed .....	1:1	1:1
4th speed with overdrive ....	—	0.797:1
reverse .....	3.25:1	3.25:1

### Final drive

Ratio:	
with gearbox M 40 .....	4.1:1
with gearbox M 41 .....	4.3:1