TRIM ETC : MR. STAN GREY.

MARCOS 1800

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Temporary servicing and data sheet - November, 1964.

RUNNING-IN.

During the first 500 miles (800 km) keep the revolutions below 3500 r.p.m. For the next 1,000 miles (1,600 km) gradually make more and more use of the performance until at the end of the period the car may be fully extended. Do not race the engine or let it idle for long periods; avoid full-throttle acceleration and over-revving. Never overload the engine and change down to a lower gear in good time when necessary.

GENERAL DATA.

Engine:

Type	Volvo B 18 B
Cubic capacity	108.6 cu. in. (1780 c.c.)
Bore	3.313 in. (84.14 m.m.)
Stroke	3.15 (80 m.m.)
Compression ratio	10.0 : 1
Valve clearances (hot or cold)	Inlet and exhaust .020 in - .022in. (.50 mm - .55 mm)
Firing order	1, 3, 4, 2.
Lubricant	
below 0°C	SAE 10W or SAE 10W - 30 multigrade
between 0°C and 30°C	SAE 20 or SAE 10W - 30 multigrade
above 30°C	SAE 30 or SAE 10W - 30 multigrade
Sump capacity	6½ Imp. pints including filter (8U.S. pints, 3.75 litres) 5¼ Imp. pints excluding filter (7 U.S. pints, 3.25 litres)
Oil pressure at 2000 r.p.m. (with warm engine and new oil filter)	50 - 85 lb/in^2 (3.5 - 6.0 kg/cm^2)
Carburettors	Two horiz. Stromberg 175 CD
Oil for carburettor dampers	SAE 20 (not multigrade)
Carburettor needle	3 A
Tightening torques:	
Cylinder head	70-75 lb.ft. (9.8 - 10.5 kgm)
Main bearings	87-94 lb.ft. (12 - 13 kgm)
Connecting rod bearings	38-42 lb.ft. (5.2 - 5.8 kgm)

Electrical:

Voltage	12 V
Battery capacity	38 ampere hr.
Ignition timing setting with stroboscope at 1500 r.p.m.	17° - 19° before T.D.C.
Sparking plugs	Bosch W225T1 (or equivalent)
Sparking plug gap	.028"-.032" (0.7 - 0.8 mm.)
Distributor	Bosch VJU 4 BL 33

Contact breaker gap..... .016"-.018" (0.4-0.5 mm.)

Fuel System: Capacity..... 12 Imp. galls (14.4 U.S. galls, 54 litres).

Fuel..... 97 octane (research method)

Pump ..... AC diaphragm type UG

Cooling: Capacity with heater ..... 14 Imp. pints (16.8 U.S. pints, 8 litres)

without heater..... 12 Imp. pints (14.4 U.S. pints, 6.8 litres)

Fan belt .....HC 38 x 35" (Ferodo 950807)

Gearbox and Overdrive:

Gearbox type ..... Volvo (M41) four forward speed all synchromesh with remote control extension.

Overdrive type.....Laycock (not as fitted to Volvo) No.61734

Ratios:

First	3.13	: 1
Second	1.99	: 1
Third	1.36	: 1
Fourth	1.00	: 1
Overdrive	0.802	: 1
Reverse	3.25	: 1

Lubricant..... SAE 30

Capacity including overdrive. $3\frac{1}{8}$ Imp. pints ($3\frac{3}{4}$ U.S. pints, 1.8 litres).

N.B.
The overdrive is fed from the gearbox and does not have a separate filler.

Differential:

Type ..... B.M.C. 'B' series mounted in Marcos aluminium alloy housing

Lubricant ..... SAE 90 EP

Capacity..... $1\frac{3}{4}$ Imp. pints (2 U.S. pints, 1 litre)

Brakes: Type ..... Hydraulic

Front..... Girling 9" discs

Rear..... Girling 8" x $1\frac{1}{4}$" drums

Hydraulic lubricant ..... Castrol Girling crimson fluid (SAE 70, R3)

* Front Suspension:

Castor..... $7\frac{1}{2}^{o}$ (fixed)

Camber ..... Nil (fixed)

Toe in..... $\frac{1}{8}$" (3mm)

*Rear Suspension

Camber..... Nil (fixed)

Toe out..... $\frac{1}{8}$" (3 mm)(fixed)

*N.B.
These figures at 7" (18 cm) to undertray (not seat well)

Dimensions:

Overall length	159"	(404 cm)
With bumpers.....	161"	(409 cm)
Overall height	41$\frac{1}{2}$"	(105 cm)
Overall width	62$\frac{1}{2}$"	(158 cm)
Wheel base	89"	(225 cm)
Front track	49"	(124 cm)
Rear track.....	49$\frac{1}{2}$"	(126 cm)
Ground clearance.....	5"	(13 cm)

Jacking points:

There is a socket on the undertray halfway along the car at each side. This accepts the jack provided with the car.

To lift the front of the car a jack may be placed at the central point of the tubular space frame (level with the front of the engine).

To lift the rear of the car the jack should be positioned beneath the centre cross-piece of the H-frame beneath the differential. These are the only points recommended.

S E R V I C I N G

(The number in brackets refers to the paragraph under which the operation is described).

Daily or Weekly:

Check sump, hydraulic fluid, radiator and battery levels.

First 500 mile service (800 km.)

Change engine oil	(1)
Change gearbox oil	(2)
Change differential oil	(3)
Change engine oil filter	(1)
Clean overdrive filter	(2)
Grease nipple on propeller shaft sliding joint behind overdrive.	(5)

Lubricate steering lower swivels (9)

Lubricate pedal carriage sliding tubes (7)

Lubricate throttle linkage (7)

Lubricate body hinges, locks, catches, etc. (7)

Lubricate distributor (7)

Top up battery, radiator, windshield washer, clutch and brake fluid reservoirs, carburettor dashpots (where necessary) (1)

Adjustments

Tighten cylinder head and manifold nuts, tighten sump bolts. Check and adjust valve clearances. Adjust fan belt.

Examine and adjust distributor points and sparking plugs.

Clean sediment from fuel filter.

Adjust brakes where necessary) (4)

Adjust clutch (where necessary) (13)

Check rear wheel bearing adjustment (14)

Check wheel nuts. Correct tyre pressures

Check front wheel toe-in. Check door operation and adjust striker plates (where necessary)

Inspection:

Check operation of all controls, instruments, lights, horns, windshield washers and wipers and all other accessories. Check and grease battery connections. Check for water and oil leaks.

Test:

Road or roller test and adjust carburettors and ignition if required.

Every 3,000 miles (5,000 km).

Change engine oil (1)

Check gearbox oil level (2)

(Change gearbox and overdrive oil after first 3,000 miles only) (2)

Check differential oil level (3)

Check carburettor dashpots (1)

Adjust footbrake and handbrake if necessary (4)

Adjust clutch if necessary (13)

Lubricate lightly throttle linkage, pedal carriage, sliding tubes and pedal shafts.

Grease rear hubs and propeller shaft sliding joint (5)

Change round wheels

Check and grease battery connections

Every 6,000 miles (10,000 km.)

As 3,000 plus:

Change engine lubricating oil filter (1)

Clean engine filler cap and carburettor air cleaners (6)

Clean out fuel filter (if necessary)

Oil steering lower swivels (9)

Inspect front brake discs and rear brake shoes (4)

Oil distributor (7)

Oil hinges, locks, etc. on body work (8)

Every 12,000 miles (20,000 km.)

As 6,000 plus:

Change gearbox and overdrive oil (2)

Clean overdrive oil strainer (2)

Change differential oil (3)

Lubricate speedometer cable (10)

Dismantle fron and rear hubs and repack

Check front wheel alignment

Grease steering box (11)

Lubricate throttle cable, grease prop shaft universal joints (12)

Twice yearly.

Lubricate handbrake cables and linkages inside tunnel. (4)

Yearly

Remove door trim and lubricate door lock mechanism.

Lubricate wiper motor and drive.

(1) Engine.

The oil should be drained immediately after driving, whilst the engine is still warm. There is a plug for draining the oil in the sump. After all the oil has run out, check the washer and screw in and tighten the plug. Oil is filled in through the rocker box filler. When changing the filter an extra quantity of oil is required. (See "General Data").

Each time the car is serviced, the oil level in the carburettor damping cylinders must be checked. This is done by removing the top nut and damping plunger. There should be sufficient oil there so that the centre spindle but not the part above it is full when the plunger is fitted. If required, top up with SAE 20 engine oil (not multigrade).

(2) Gearbox and Overdrive.

The oil should be changed every 12,000 miles (20,000 km). In the case of a new or reconditioned transmission the oil should be changed after the first 3,000 miles (5,000 km.). The old oil should be drained out immediately after driving whilst it is still warm. Open the filler plug and drain plug in the gearbox housing and also the drain plug in the overdrive unit. After the oil has drained off remove the cover plate on the side of the overdrive next to the drain plug and take out the oil strainer. Clean the strainer in petroleum or white spirit and dry. Check that the strainer gasket is in good condition and place it in position. Fit the oil strainer, a new cover joint and the cover. Fill up with new oil after having screwed in and tightened the drain plugs on overdrive and gearbox. Oil for the overdrive is fed from the gearbox and filling is completed when the oil becomes level with the filler hole. Screw in and tighten filling plug. ($3\frac{1}{4}$ Imp. pints, $3\frac{7}{8}$ U.S. pints, 1.8 litres).

N.B. Time must be allowed for the new oil to run through into the overdrive unit.

(3) Differential.

To check the differential oil level lift the car on a hoist and unscrew the filler plug from the rear of the alloy housing whilst the oil is still warm. Insert small quantities of oil until it starts to run back out again. Wait until this flow has completely stopped before refitting plug. For draining the oil remove the drain plug at the bottom of the differential housing and the filler plug. Ensure that all the old oil has run out before replacing the drain plug and refilling ($1\frac{3}{4}$ Imp. pints, 2 U.S. pints, 1 litre).

N.B. If the car is jacked up for this operation ensure the differential is level when checking the capacity. Under no circumstances should the differential be overfilled as excess oil will force out the seals and onto the rear brake shoes. See (4) brake shoe contamination.

(4) The Disc Brakes fitted to the front.

The disc brakes fitted to the front of the car are self-adjusting. Replacement shoe pads should be fitted when the linings are reduced to approximately $\frac{1}{8}$" thickness. Under no circumstances allow the pads to wear below 1/16" thickness.

Pad renewal may be effected without having to bleed the brake system.

1. Jack up the front of the car and remove the road wheels.
2. Withdraw the retaining pin clips and remove the pad retainers.
3. Remove the pads from the calipers.
4. Push the pistons to the bottom of their cylinders and fit new pads but take care that when pushing the pistons down the fluid displaced is not ejected from the master cylinder onto the paintwork.

5. Refit the retainers and retaining pin clips.
6. Before driving pump the foot pedal until solid resistance is felt.

Excessive foot and handbrake travel indicates the need for rear brake adjustment. Chock the front wheels, remove the back wheels and release the handbrake fully. Each rear brake is provided with an adjuster at the top on the rear of the back plate. To adjust the shoes turn the adjuster clockwise until the shoes are hard against the drum; then slacken the adjuster by one notch increments until the drum is free to rotate.

N.B. There is a constant drag on the rear wheels caused by the action of the differential and the axle oil. Do not confuse this with brake drag.

Brake shoes, contaminated with oil or grease are detrimental to brake efficiency. Should a brake be so affected, the drum and backing plate must be thoroughly cleaned with petrol, and the brake shoes renewed. When renewing or replacing shoes, the pull-off springs behind the shoes must hook through the correct holes, therefore it is advisable to mark the holes before removing.

Adjustment of the rear brake shoes re-adjusts the handbrake mechanism. If cable slackness remains it is necessary to tighten the handbrake cable. Remove the seat cushions and seat shells, place the trim panel containing the interior lamp to one side exposing a hole in the centre tunnel and thus giving access to the handbrake fulcrum arm. Remove the split pin and clevis pin which attaches the cable to the top of the arm, ensuring that the arm is returned fully to the rear. At the differential slacken the lock nut on the yoke of the handbrake inner cable, remove the split pin and clevis pin and allow the brake levers to return to the relaxed position. Screw up the yoke until the clevis pin can be slipped in again. Fit a new split pin and tighten the locknut. Return to the fulcrum arm in the propeller shaft tunnel and adjust the outer cable which runs forward until the inner cable clevis pin may be slipped into place. Fit a new split pin and tighten the outer cable locknut.

Should the brakes become "spongy", or a pipe joint be uncoupled the hydraulic system will require bleeding. Bleed the brake nearest to the master cylinder first and the others in sequence, finishing with the brake furthest away. With the aid of a second operator proceed as follows:-

1. Ensure that the reservoir is topped up to $\frac{1}{2}$" from the top.
2. Wipe clean the bleed nipple and attach to it a short length of small bore tubing. Allow the tube to hang in a clean container partially filled with hydraulic fluid, so that its end is below the level of the fluid.
3. Unscrew the bleed nipple one complete turn.

   N.B. During bleeding the reservoir fluid level falls rapidly. Should the reservoir empty, air will be drawn into the system and necessitate repeating the bleeding procedure. Ensure that the level does not fall below half full, by constantly replenishing with NEW fluid.

4. Depress fully the brake pedal and let it return without assistance. Repeat this operation with a slight pause between each depression of the pedal. Observe the fluid being discharged into the glass container and when all bubbles have ceased to appear, hold the brake pedal down on the following down stroke. Whilst the pedal is thus held, securely tighten the bleed screw and remove the tubing from the nipple.

5. Top up the master cylinder with hydraulic fluid and road test the vehicle.

   IMPORTANT. For bleeding or replenishment of the system use only fluid that has been stored in a container sealed from atmosphere. Immediately bleeding is completed, re-seal residual fluid in the container, before it is again stored, as exposure to atmosphere lowers the fluid boiling point. Be very careful to avoid any drips when filling as the fluid attacks the vehicle paintwork.

(5) Rear Hub.

Each rear hub has a grease nipple over it. Give three strokes only of the grease gun to each nipple. Excessive grease will only damage the oil seals. Immediately behind the overdrive unit is located the propeller shaft sliding joint. Once again apply a few strokes of the grease gun.

(6) Cleaning the filling cap.

In order for crankcase ventilation to be satisfactory, the filter in the oil filling cap should be removed and cleaned every 6,000 miles (10,000 km.). Remove the cap, unscrew the three screws and lift off the head. Clean the filter in gasoline, let it dry and moisten it with thin oil.

Similarly take the air cleaners apart and repeat the process.

(7) Distributor.

Lubricate the felt wick under the rotor arm of the distributor with a few drops of light engine oil. Fill the lubricating cup with light engine oil. In addition, lubricate the contact surface of the cam with a smear of petroleum jelly.

(8) Body.

Lightly oil the various body hinges and fastenings; bonnet (hood) hinges and locks, door hinges and locks, boot (trunk) hinges, stay and lock. The boot hinges are accessible from inside the boot and can be reached by painting with a small brush.

(9) Steering lower swivels.

To lubricate the steering lower swivels remove the hexagon headed plug on the inside near the base of the kingpost. Fit a screwed nipple and apply a grease gun filled with HYPOID OIL. Pump the gun until oil exudes from the swivel. Remove screwed nipple and refit plug

N.B. The road wheels must be jacked clear of the ground for this operation.

(10) Speedometer cable.

The speedometer cable can be reached by lifting away the top dashboard panel. The rear of the speedometer is now exposed and the outer cable can be disconnected. Withdraw the inner cable for approximately 15 ins. (40 cms.) and smear lightly with grease. Replace ensuring that the cable has engaged at the gearbox end.

(11) Steering box.

For the steering box remove the filler plug, fit a grease nipple and apply the grease gun, giving five strokes only. Remove nipple and refit plug.

(12) Propeller shaft universal joints.

The propeller shaft universal joints have a plug in the central spider. This should be removed and replaced by a grease nipple. Apply the grease gun until all the old grease has been expelled. Remove nipple and refit plug.

Similarly there is a universal joint at the inner and outer end of each rear drive shaft. These should be greased as above.

(13) Clutch.

The clutch fork should be adjusted away from the slave hydraulic cylinder so that there is a 3/8"-3/16" free movement of the fork beyond the locknuts on the slave arm when the system is in the free position.

(14) Rear Wheel Bearing.

To check the rear wheel bearing adjustment the car should be jacked up. The wheel may then be grasped at the top and bottom and rocked in and out. If any play is present then the taper bearings need adjusting. (The pin connecting the cross brace to the leading

arm may also have worn - do not confuse any movement here with that in the bearings). Remove road wheel, hub nut and hub. Tighten the adjuster for the taper bearings as necessary and then back off again for half the width of the machined slot. Refit hub and tighten nut, at the same time ensuring that the shaft does not turn. This will then hold the adjusting nut in the correct position whilst tightening. Recheck.