

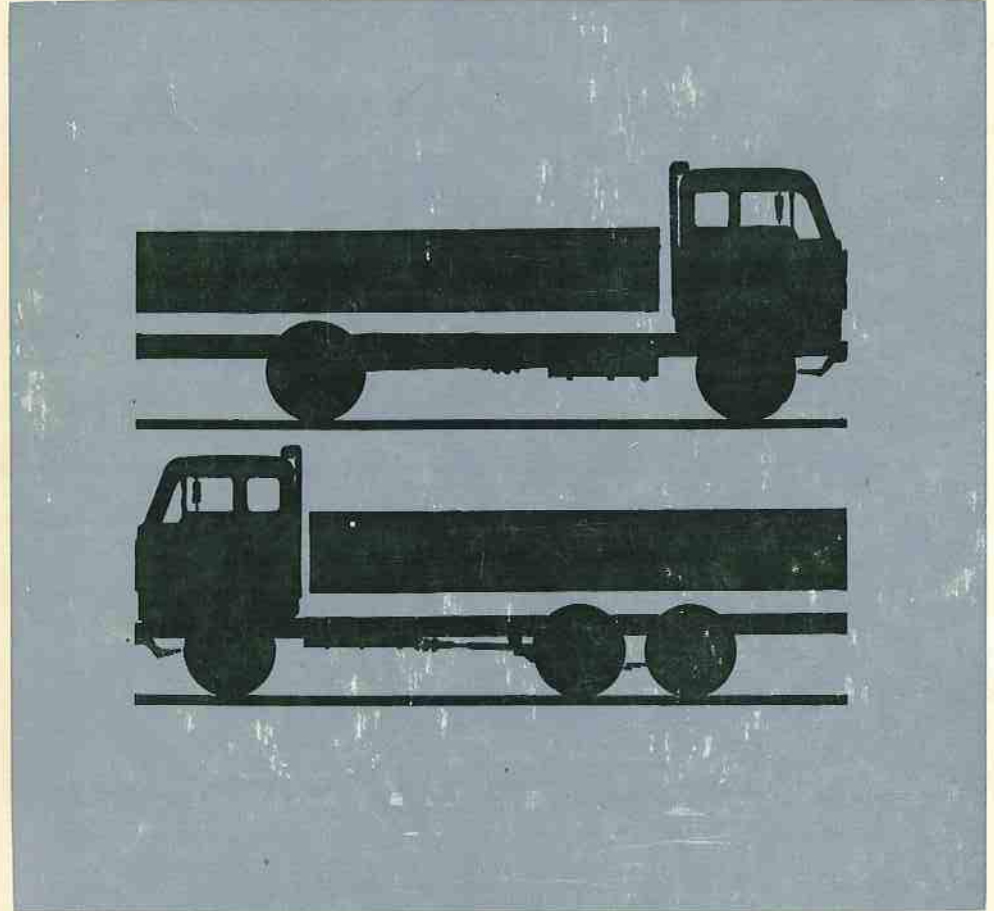
VOLVO

INSTRUCTION BOOK

F 88

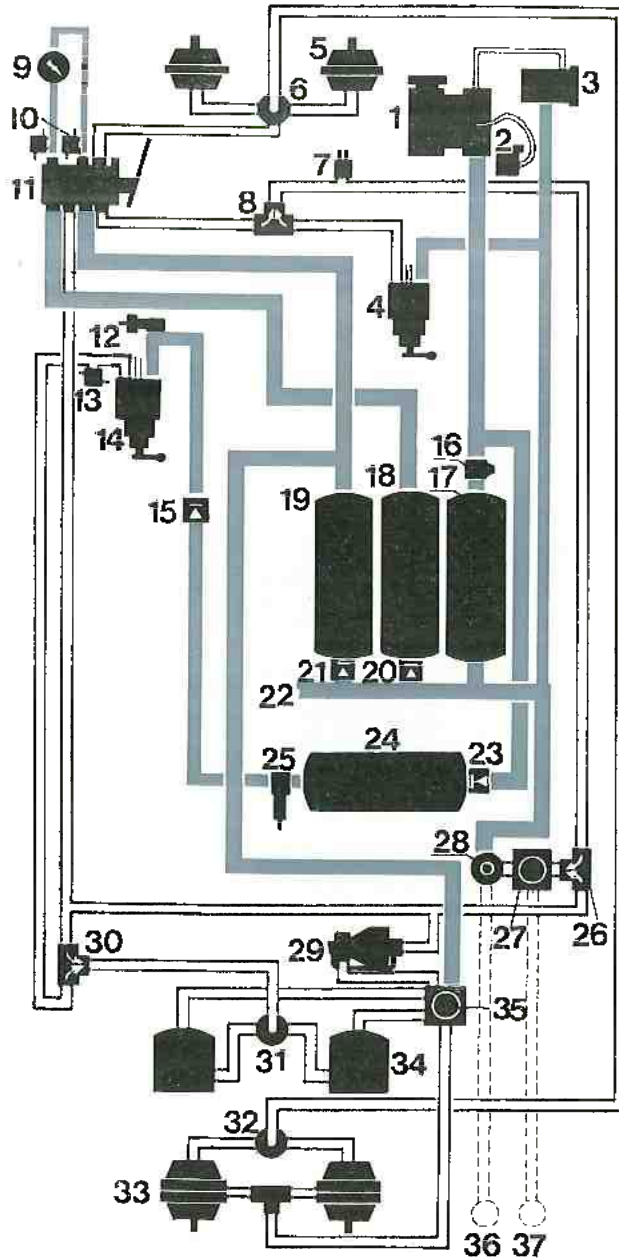
G 88

VOLVO F 88 G 88



BRAKE SYSTEM

General arrangement diagram of standard compressed air system FB 88 G 88 (6x2 version)



- 1 Compressor
- 2 Anti-freeze container
- 3 Pressure regulator
- 4 Hand control for trailer brakes
- 5 Brake cylinder, front wheel
- 6 Quick-release valve
- 7 Brake light contact
- 8 Two-way valve
- 9 Compressed air gauge
- 10 Low-pressure gauge (incl. in gauge 9)
- 11 Brake valve
- 12 Tank valve
- 13 Low-pressure indicator
- 14 Hand control for parking brakes
- 15 Non-return valve
- 16 Relief valve
- 17 "Wet" tank
- 18 Compressed air tank, front wheel circuit
- 19 Compressed air tank, driving wheel circuit
- 20 Non-return valve
- 21 Non-return valve
- 22 Connector for extra compressed air equipment
- 23 Non-return valve
- 24 Compressed air tank, parking brakes
- 25 Safety valve
- 26 Two-way valve
- 27 Relay valve
- 28 Pressure retaining valve
- 29 Brake regulator (load-sensing valve)
- 30 Two-way valve
- 31 Quick-release valve
- 32 Quick-release valve
- 33 Brake cylinder, trailing wheels (double diaphragm cylinder)
- 34 Spring brake cylinder
- 35 Relay valve
- 36 Air feed line for trailer brakes
- 37 Control line for trailer brakes

TECHNICAL DESCRIPTION

N.B. The description given below concerns the standard Volvo compressed air system. On certain markets the compressed system may include other components. The compressed air system is of the dual-circuit type, i.e. after the compressed air reservoirs the system is divided up into separate circuits for the drive wheels and front wheels respectively. This means that the vehicle can be braked even if a brake line should fail. The parking brake is also available for use in an emergency.

The compressed air is supplied by a twin-cylinder compressor which is gear-driven direct from the auxiliary drive gears of the engine. The compressor is lubricated from the force-feed lubrication system of the engine and is cooled through the engine cooling system.

Compressed air from the compressor first passes to the compressed air reservoir for the parking brake (24). When the pressure has risen to a certain value, the compressed air flows to the "wet" tank (17), where most of the condensation water is separated. From the "wet" tank the compressed air passes to the reservoir (19) for the drive wheel circuit and to the reservoir (18) for the front wheel circuit. Both these reservoirs are provided with non-return valves (20, 21) on the inlet side to prevent the compressed air from returning to the "wet" tank.

The trailing wheels on 6x2 trucks are fitted with double diaphragm cylinders which are connected to the front wheel circuit and through a relay valve also to the driving wheel circuit. This means that the trailing wheels are always braked by the circuit which has the highest pressure.

In the case of 6x4 trucks, the front wheel circuit only includes the front wheels. The driving wheel circuit consists of both the foremost and rearmost driving wheel axles. The rear circuit is fitted with a relay valve in order to decrease brake application time.

In order to prevent the pressure from reaching excessive values there is a pressure regulator (3) which controls the unloading mechanism of the compressor so that the pressure is maintained between 6.7-7.0 kp/cm² (95-100 lb/sq.in.) and 7.9-8.5 kp/cm² (112-121 lb/sq.in.).

In the event of a fault on the pressure regulator or unloading mechanism of the compressor, there is also a safety valve (25) which opens at a pressure of 9.2-9.9 kp/cm² (131-141 lb/sq.in.).

When the brake pedal is pressed down, the brake valve (11) allows compressed air to pass from the reservoirs (18, 19) to the brake cylinders of the wheels (5, 33, 34). From the brake cylinders the movement is transmitted to the brake shoes by mechanical means. When the brake pedal is released, the lines are opened to the outside air through quick-release valves (6, 31, 32) and the brake valve, so that the pressure in the lines between the brake valve and wheel cylinders falls to atmospheric pressure. The mechanical parts then return to the rest position and the brakes are released.

On the steering column is a hand control for the trailer brakes (4). By means of this the trailer brakes can be applied without affecting the brakes of the towing vehicle.

If a failure should occur in the pipe lines to the trailer, it is possible to close off this system with a pressure-retaining valve (28) which automatically cuts out the trailer system when the pressure in the feed line has fallen to 3.7–4.3 kp/cm² (56–61 lb/sq.in.).

The tank valve (12) can be used both for releasing the parking brake before towing, as well as to inflate the tyres.

Certain vehicles (tractor units) are fitted with a brake regulator (load-sensing valve) (29) as additional equipment. This valve is automatically affected by the amount of loading on the springs and adapts the braking force on the rear wheels to the actual load. When a trailer is connected, this must also have a brake regulator for avoiding "jack-knifing".

After a new vehicle has been in use for some time, the brake regulator setting should be checked because of spring leaf changes.

Parking brake

The parking brake operates directly on the drive wheel brakes and consists of a spring-loaded braking device with compressed air release which is built into the rear wheel brake cylinders.

When the hand control for the parking brake is pulled back, the compressed air which keeps the brake released is evacuated, when the spring in the brake cylinder pushes the piston rod outwards, thereby applying the brake.

35 CHECKING WARNING LAMP

(service brakes)

The warning lamp and pressure regulator should be checked every day when starting the engine.

When the key is turned the warning lamp should light and should then go out again after the engine has started and the pressure has built up to 3.9–4.5 kp/cm² (55–64 lb/sq.in.).

CHECKING PRESSURE REGULATOR

- 1 With the engine running, check on the compressed air gauge that the pressure regulator cuts out when the pressure has risen to 7.9–8.5 kp/cm² (112–121 lb/sq.in.).
- 2 Press down and release the brake pedal and check that the compressor cuts in again when the pressure has fallen to 6.7–7.0 kp/cm² (95–100 lb/sq.in.).

36 CHECKING FOR LEAKAGE

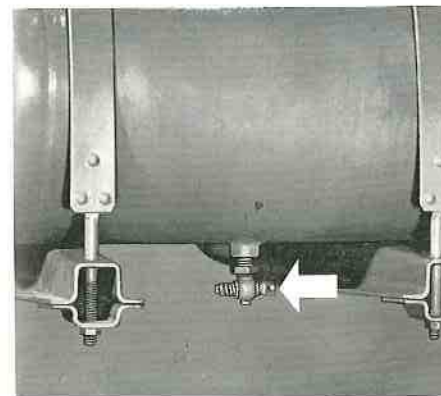
- 1 Start and run the engine until the pressure gauge shows a pressure of 7 kp/cm² (100 lb/sq.in.). Stop the engine and watch the gauge for 4 minutes. The pressure must not fall more than 0.5 kp/cm² (lb/sq.in.).
- 2 Run the engine again until the pressure is 7 kp/cm² (100 lb/sq.in.). Press down the brake pedal as far as it will go and stop the engine. Keep the pedal pressed down for 2 minutes and watch the gauge. The pressure must not drop more than 0.4 kp/cm² (5.7 lb/sq.in.).

If the pressure drop exceeds these values, this means that there is excessive leakage, which must be attended to as soon as possible at a Volvo workshop.

37 DRAINING CONDENSATION WATER IN COMPRESSED AIR RESERVOIRS

The condensation water which collects in the compressed air reservoirs should be drained once a week, and in very damp weather every day.

Draining is done through the drain cocks on the reservoirs after finishing driving for the day.



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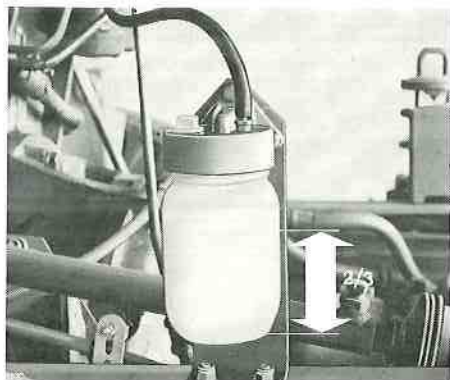
38 CHECKING FLUID LEVEL IN ANTI-FREEZE CONTAINER

During the cold season, the container should be 2/3 full of methylated spirits in order to prevent ice formation in the compressed air system.

In exceptionally low temperatures methanol should be used instead, since this has a lower evaporation temperature.

N.B. Methanol is poisonous.

Check the level once a week, daily in the case of very low air temperatures.



39 CLEANING ANTI-FREEZE DEVICE STRAINER

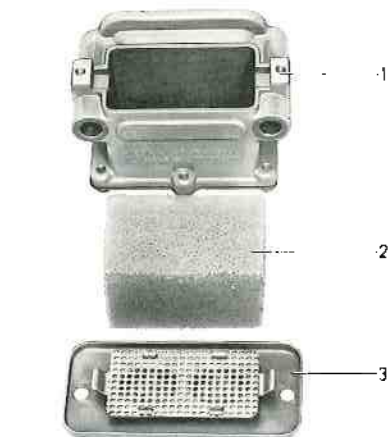
It is advisable to remove the whole anti-freeze device for cleaning.

The anti-freeze device is provided with a metal strainer. If a compressed air supply is available, disconnect the air pipe and blow the strainer clean from the back. If no compressed air supply is available, remove the locking washer and strainer and then wash the strainer in white spirit.

40 CLEANING COMPRESSOR FILTER

The compressor is fitted with a foam plastic filter. When cleaning, remove the entire filter from the compressor. Then remove the cover and separate the filter from the filter housing. Clean the cover and housing thoroughly. Fit a new foam plastic insert.

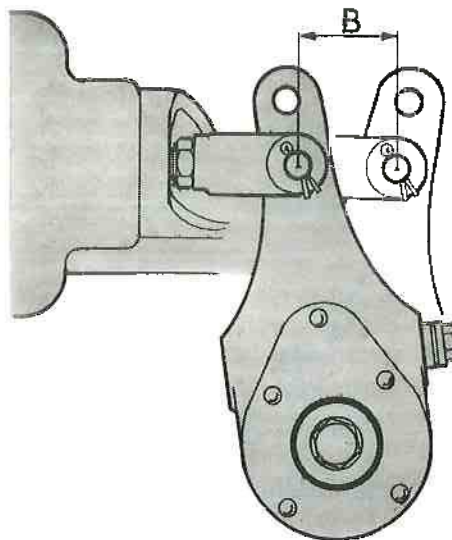
NOTE. The filter element must not be dipped in oil.



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Compressor filter
1 Filter body
2 Filter
3 Cover

43 CHECKING BRAKE CYLINDER TRAVEL ADJUSTING THE BRAKE

As the brake linings become worn, so the travel of the brake cylinder push rods increases. In order to ensure proper braking effect, the travel must not exceed certain pre-determined values.



The travel is measured by noting the amount of movement of the push rods when the brakes are applied at an air pressure of about 7 kp/cm² (100 lb/sq.in.).

The distance B must not exceed:

44 mm (1.73") for the drive wheel brake cylinders
51 mm (2.00") for the drive wheel brake cylinders, (44 mm = 1.73" on 6x4 trucks).

44 mm (1.73") for the trailing wheel brake cylinders. If larger values than these are obtained, the brakes must be adjusted, which is done as follows:

- 1 Jack up the vehicle so that the wheels are free to rotate.
- 2 Spin the wheel round. Push in the locking sleeve of the adjusting screw as far as it will go and turn the adjusting screw (see figure opposite) clockwise until the wheel moves stiffly.
- 3 Then back off the adjusting screw until the wheel rotates freely, usually about 1/3 of a turn. Make sure that the locking sleeve locks the adjusting screw.

42 CHECKING BRAKE LININGS, BRAKE DRUMS AND BRAKE CAMS

The brake linings, brake drums and brake cams should be checked for wear at the intervals shown in the maintenance schedule.

43 FUNCTION CHECK OF BRAKE SYSTEM

The function of the vehicle brake system should be checked as described in the Service Manual once a year.

44 OVERHAULING THE COMPRESSOR

Once every other year the vehicle should be taken to the workshop for overhaul of the compressor.

FRONT END AND STEERING GEAR

Front axle

TECHNICAL DESCRIPTION

Both the F 88 and G 88 have a rigid front axle, i.e. the front axle is made in one piece. The front axle member consists of drop-forged, high-alloy steel. It is attached to the front springs by means of four shackles.

45 CHECKING FRONT WHEEL ALIGNMENT

For proper function of the vehicle steering, it is essential that the front wheel alignment is correct. Faulty front wheel alignment can also cause rapid wear of the front tyres.

If you suspect that the alignment of the front wheel is not correct, have this checked at once.

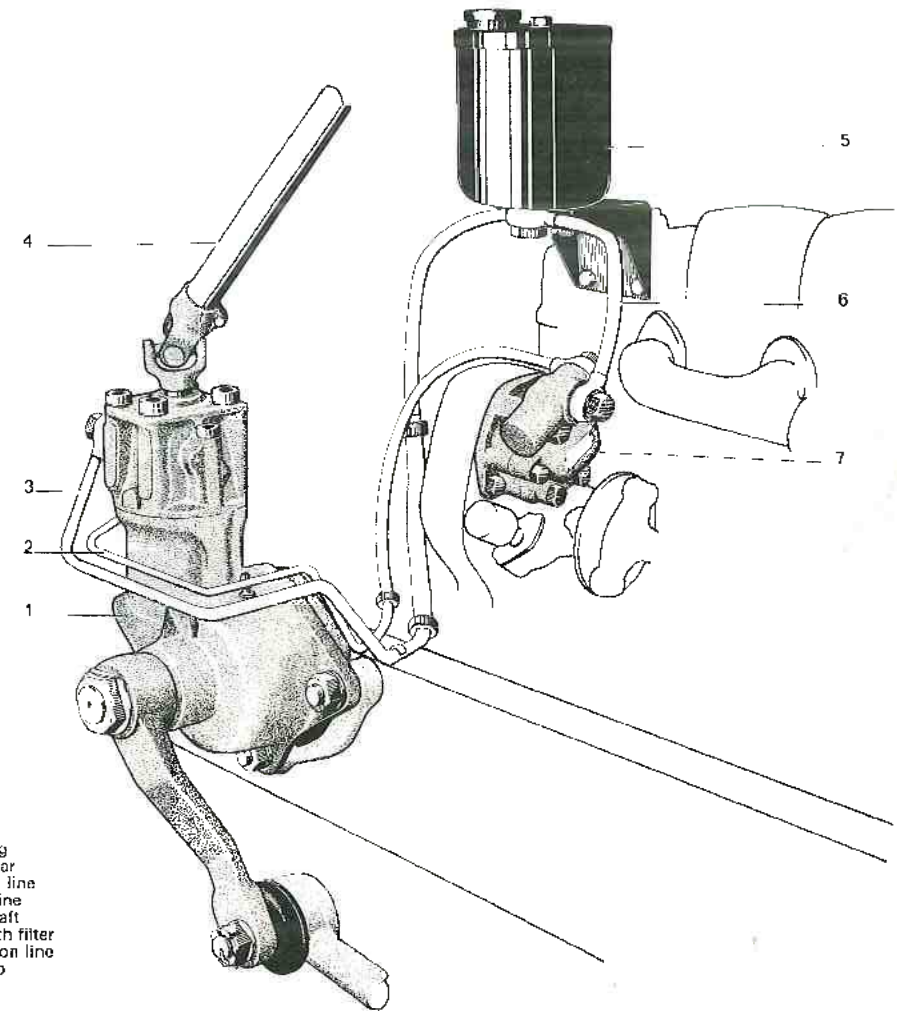
46 CHECKING FRONT END FOR PLAY

This check should be carried out with the front end jacked up. Check all the parts of the front end for play.

Power steering

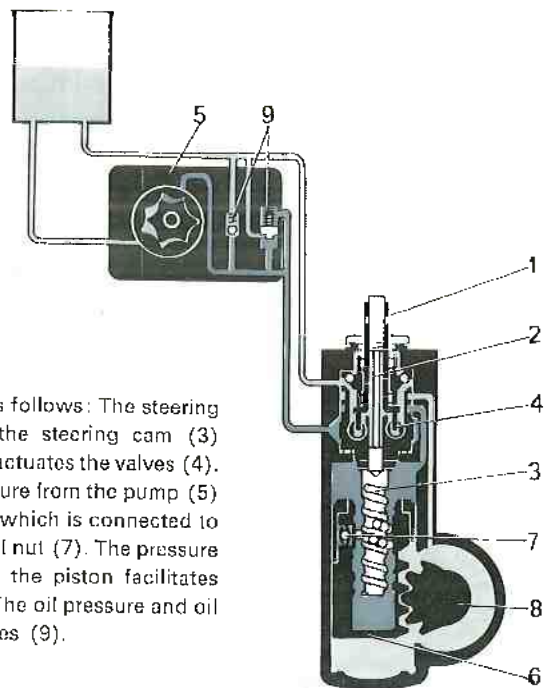
TECHNICAL DESCRIPTION

The F 88 and G 88 are equipped with power steering. The steering box is of the cam and ball nut type. The oil pump, which is fitted on the left-hand side of the engine, is of the rotor type and is gear driven. The pump serves as the source of power and supplies the necessary pressure to the servo cylinder. The oil container is placed above the pump.



Power steering
 1 Steering gear
 2 Pressure oil line
 3 Return oil line
 4 Steering shaft
 5 Oil tank with filter
 6 Pump suction line
 7 Servo pump

If the hydraulic system should fail, the power steering functions as an ordinary mechanical steering gear. However, it is not then possible to make rapid movements of the steering wheel, so that care must be observed.



The power steering functions as follows: The steering column (1) is connected to the steering cam (3) through the torsion rod (2) and actuates the valves (4). The valves direct oil under pressure from the pump (5) to either side of the piston (6), which is connected to the steering cam through the ball nut (7). The pressure thereby caused on the side of the piston facilitates turning of the sector shaft (8). The oil pressure and oil quantity are limited by the valves (9).

LUBRICANT

The oil in the power steering system fulfils two purposes, acting both as a pressure medium and lubricant for the moving parts of the system.

The oil used in the power steering system should conform with the specifications. "Automatic Transmission Oil, Type A" or DEXRON should be used.



47 CHECKING OIL LEVEL

The oil level is checked with the dipstick in the oil container. This check should be done with the engine stationary. The oil level should then reach up to about 1-2 cm ($\frac{3}{8}$ - $\frac{3}{4}$ ") above the maximum mark. If the level is lower than this, top up with oil with the engine stationary, which prevents the possibility of air being sucked in.

Start the engine and let it idle for a short time. Stop the engine and check the level again, which should be about 1-2 cm ($\frac{3}{8}$ - $\frac{3}{4}$ ") above the maximum mark.

48 CHANGING OIL AND FILTER ELEMENT

Oil and filter changes	Local traffic	Short-distance traffic	Long-distance traffic
1st time mileage	10 000 km (6000 miles)		
2nd time mileage	40 000 km (25 000 miles)		80 000 km (50 000 miles)
Then at intervals of	40 000 km (25 000 miles)		80 000 (50 000 miles)

Oil and filter element change is carried out as follows:

- 1 Jack up the vehicle under the front axle. Remove the pitman arm.
- 2 Remove the drain plug. Turn the steering wheel to the left lock position. Start the engine and let it run for a maximum of 10 seconds until the oil has been emptied from the container and pump. Stop the engine and turn the steering wheel from lock to lock until all the oil has run out. Tighten up the drain plug again.
- 3 Wash the outside of the container. Loosen the screw on top of the oil container and remove the old filter element from the container. Place a finger under the centre so that impurities from the inside of the filter cannot come into the container. Oil the filter container and sealing ring and fit a new filter.
- 4 Fill up with oil to edge of the container. Turn the engine round with the starter motor (stop knob pulled out) and top up with additional oil as the level falls to prevent air from being sucked in.



When the oil level reaches the upper mark on the dipstick, start the engine and let it idle, and turn the steering wheel with a slow, even movement repeatedly in both directions until the oil in the container is free from air bubbles. Top up with more oil if necessary. Turn the steering wheel slowly without forcing it to the full-lock position.

N.B. Let the engine run at idling speed the whole time, otherwise there is a risk that the pump will suck in air, resulting in damage to the pump.

5 The lower part of the cylinder is vented through the venting nipple. Remove the protecting plug from the venting nipple and connect a hose, the other end of which should be placed in a transparent vessel filled with oil.

6 Turn the steering wheel so that the piston comes at the upper extreme position i.e. to the left (on left-hand drive vehicles). Open the venting screw $1/2 - 1$ turn. Turn the steering wheel to the other lock position with the engine running. Close the venting screws. Turn back the steering wheel to the upper extreme position of the piston. Repeat the venting procedure 3-5 times. Make sure all the time that the oil level is correct. Because of the position of the container, the level should be checked when the engine is stationary. The level should then reach to about 1-2 cm ($3/8 - 3/4$ "") above the maximum mark when the system is free from air.

Oil capacity: approx. 4.3 litres

(3.8 Imp. quarts - 4.5 US quarts)

7 Fit the pitman arm.

49 OVERHAULING POWER STEERING SYSTEM

The vehicle should be taken to the workshop for a complete overhaul of the power steering system in accordance with the Service Manual.

50 RECONDITIONING POWER STEERING SYSTEM AND EXCHANGING STEERING BOX

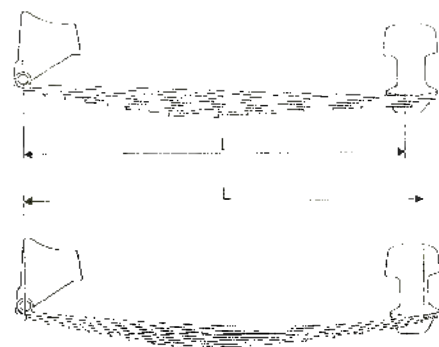
After every 240 000 km (150 000 miles) we recommend that the steering box is replaced by an exchange unit.

FRAME

TECHNICAL DESCRIPTION

Depending on wheelbase, the frame has a constant web height or a raised part with a larger height in the middle of the side members. The side and cross-members are made of pressed, U-section steel. The cross-members are attached to the web of the frame members, which means that the flanges are not drilled and are therefore stronger.

On bogie vehicles the frame over the bogie unit is reinforced with an extra frame member.



L - effective length, unloaded spring
l - effective length, loaded spring

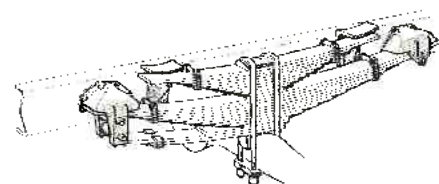
SUSPENSION SYSTEM

The front suspension on the F 88 and G 88 consists of progressively-acting, semi-elliptical leaf springs with double-acting, hydraulic, telescopic shock absorbers.

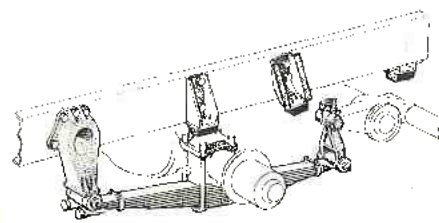
The springs are attached at the front with threaded shackle pins and have a movable contact point at the rear. This means that the stiffness of the springs increases with increased loading since the effective length of the spring becomes less as the rear contact point is moved.

The rear suspension on the 4x2 vehicles consists of progressively-acting, semi-elliptical leaf springs and helper springs with movable contact points at both front and rear. The stiffness of the springs thus increases with increased loading in the same way as with the front springs. The rear axle is located by means of reaction rods which are attached to the front anchorages of the rear springs. The rear suspension can either be provided with double hollow rubber springs or as alternative equipment on certain wheelbases, with main springs only in combination with double hollow rubber springs.

On the 6x2 vehicles the rear suspension consists of semi-elliptical leaf springs mounted in threaded shackle pins at both front and rear.



Rear suspension, F 88/G 88 4x2



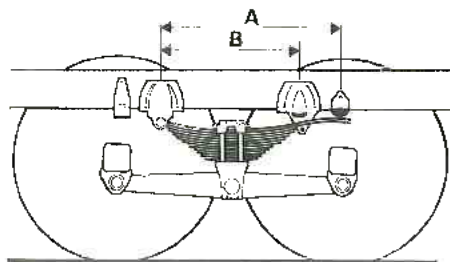
Rear suspension, F 88/G 88 6x2

Rear suspension 6x4

The rear axles are attached to two balance arms, one on each side. The balance arms on each side are attached to the frame through the medium of leaf springs. The springs are attached to the frame at the front end and each has two variable slipper type contact points at the rear to provide progressive springing.

In the case of low loading, the spring supports against the contact point at the extreme rear. At full load, the spring supports against the foremost of the rear contact points whereby the effective spring length becomes shorter and the spring becomes thereby more rigid.

Both the rear axles are fitted with a torque rod which absorbs braking and acceleration forces.



A = active length, unladen spring
B = active length, loaded spring

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WHEELS

51 CHECKING TYRE PRESSURE

The most important and simplest measure for ensuring maximum tyre life is to maintain the correct tyre pressure. Make a habit of checking the pressure in the tyres regularly, for example, once a week.

Adapt the pressure in the tyres to suit the body of the vehicle and the load carried.

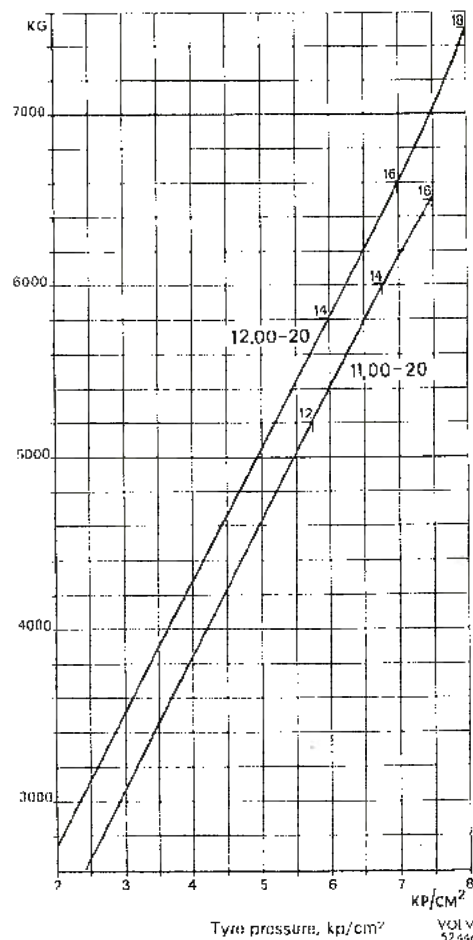
N.B. The pressure shown in the graphs applies to cold tyres.

After driving for a few miles the temperature in the tyres rises which means that the pressure also increases to a value about 0.8-1 kp/cm² (11-14 lb/sq.in.) higher than with cold tyres.

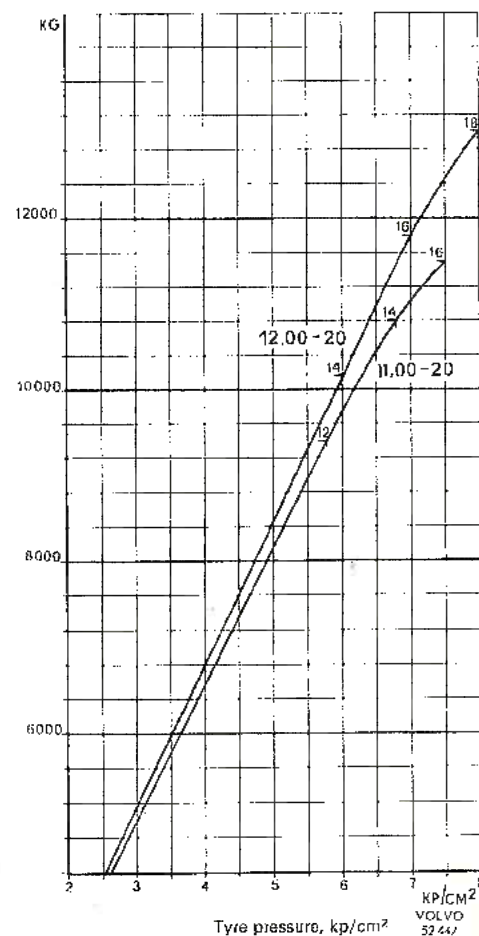
With warm tyres the pressure should only be altered when the tyre needs inflating.

The graphs apply for 20" diagonal ply tyres. For radial tyres the values obtained from the graphs should be increased by about 0.25-0.5 kp/cm² (4-8 lb/sq.in.).
14 - PR (Ply class). This symbol in the graphs indicates the maximum tyre pressure and axle pressure for the ply class concerned.

Single fitting



Twin fitting



HINTS FOR AVOIDING UNNECESSARY TYRE WEAR

Maintain the correct tyre pressure.
Remember that tyre wear increases with speed. Do not overload the tyres, for example, by lop-sided loading.
Have the front wheel alignment checked regularly. Do not run with unbalanced wheels.
Do not change the tyres round needlessly.

TWIN WHEELS

With twin wheel fitting, only tyres of the same type and with a difference in diameter of not more than 6 mm (1/4") should be fitted together. If two tyres with different diameters are fitted together, they should be placed so that the largest one comes innermost.

CHANGING THE WHEELS

When changing a wheel, first slacken the wheel nuts a few turns and then jack up the vehicle so that the wheel is clear of the ground. Then remove the wheel nuts completely and lift off the wheel.

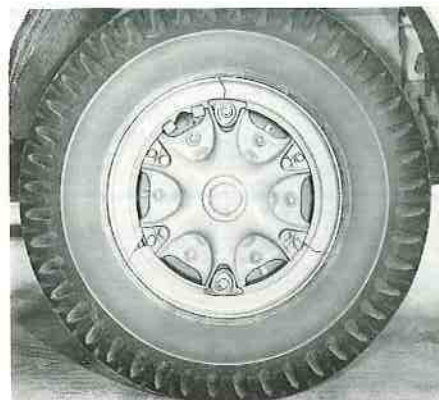
Fitting disc wheels

Before fitting, clean and lubricate the threads of the wheel studs. Also clean the contact surfaces on the wheel and brake drum. When fitting the wheel, tighten the wheel nuts diametrically (as shown in the figure) a little at a time until all are well tightened. (Tightening torque: 36-44 kpm = 260-318 lb.ft.). Check the wheel nuts for tightness again after driving for a short distance.

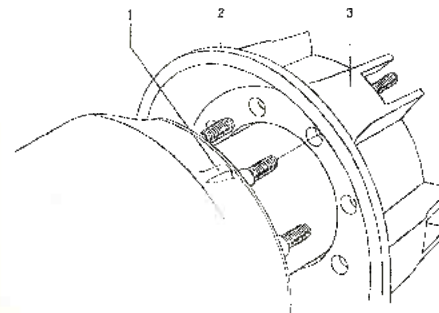


Tightening sequence, disc wheels

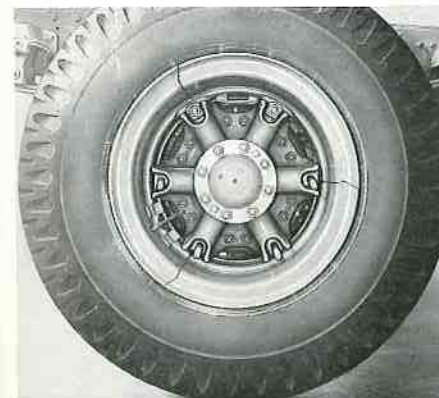
VOLVO
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Single wheel



1 Locating lug
2 Spoke ring
3 Spokes



Twin wheels

Fitting spoke wheels

Single wheels

- 1 Clean spoke ends, clamps and bolts.
 - 2 Fit wheel over ends of spokes so that the valve and stop on the rim are located between two spokes.
 - 3 First fit the upper and lower clamp as shown in the illustration and tighten the nuts to centre the wheel.
 - 4 Fit the remaining clamps and nuts.
- Tighten the nuts in order** (do not take diametrically opposed nuts at the same time) to a torque of 30-34 kpm (217-246 lb.ft.). This is done two or three times.
- 5 Re-tighten the nuts after the truck has run a short distance.

Twin wheels

- 1 After cleaning all parts, fit the inner tyre so that the valve and stop on the rim are between two spokes. If the spoke wheel ring has been removed from a vehicle fitted with hub reduction, then this ring must be guided so that the holes opposite a spoke fit a wheel bolt located opposite a locating lug on the brake drum.
 - 2 Fit the intermediate ring so that it fits closely to the inner rim. The stop on the intermediate ring is to be located between two spokes. Make sure that the stop does not cover the valve on the inner tyre.
 - 3 Fit the outer wheel tightly against the intermediate ring making sure that the stop and valve are located between two spokes and diagonally against the valve on the inner wheel.
 - 4 Attach both the upper clamps and tighten the nuts sufficiently to centre the wheel. Fit the remaining clamps and nuts and then tighten the nuts in order (do not take diametrically opposed nuts at the same time). Repeat this two or three times. Centring is facilitated if the wheel is turned.
- Tightening torque: 30-34 kpm (217-246 lb. ft.).

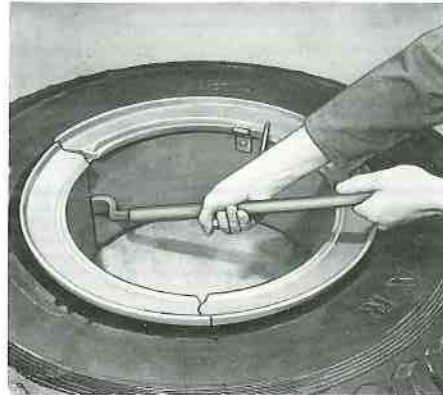
Fitting and removing tyre rims (spoke wheels)

NOTE. The special tool included in the truck tool kit is to be used for all assembly and disassembly work. It is absolutely forbidden to knock on the rims using a hammer or other tool.

Removing the rim

Clean the rim. Unscrew the valve and let out the air before disassembling the rim. Check that the rim is free from damage.

- 1 Press down the tyre from the rim.
- 2 Place the lever in the slot and lever upwards.

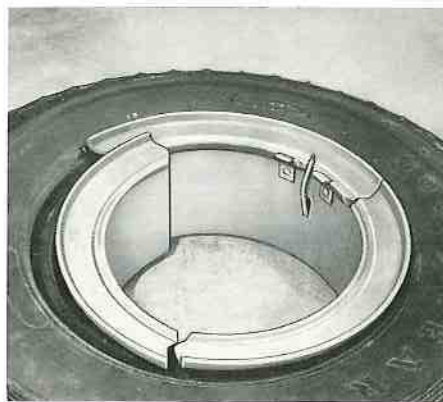


Removing

Fitting

Before fitting make sure that all the air has been let out, the valve unscrewed and the rim band has been properly laid in. The tyre edges should be dusted with talc or similar material.

- 1 Place the segment with the valve hole in the tyre. Fit so that the valve points upwards.
- 2 Place the second segment on the first.
- 3 Place the third segment beside the first. Both segments must be close to the rim bed. Make sure that the valve is located properly.
- 4 When fitting, locate the lever in the slot in the valve segment. Locking is obtained by pulling the lever firmly.



Fitting



Fitting

NOTE. Do not pull upwards.

- 5 Fit the valve assembly and inflate the tyre.

52 CHECK-TIGHTENING OF WHEEL STUDS

The wheel nuts should be checked-tightened regardless of whether the wheels have been removed. This check is particularly important when wheels or brake drums have just been painted since the paint can gradually wear off, the studs slipping and the wheel loosening.

BODY

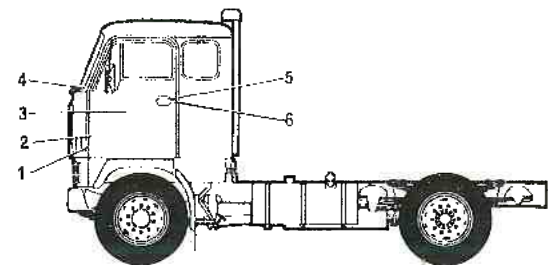
TECHNICAL DESCRIPTION

The cab is made of pressed sheet steel. The various sheet metal parts are either welded or bolted together. The radiator is attached to the front section.

53 BODY LUBRICATION

In order to avoid squeaks and unnecessary wear, the body should be lubricated at the intervals shown opposite.

The figure below shows the most important lubricating points:



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No.	Lubricating point	Lubricant
1	Door stop	Grease
2	Door hinge	Grease
3	Window lift	Oil and grease
4	Windscreen wiper bearings	Oil
5	Lock button Keyhole	Paraffin wax Lock oil
6	Latches Striker plates	Paraffin wax Paraffin wax

The window lifts should be lubricated about once a year.

PRECAUTIONS TO BE TAKEN DURING COLD WEATHER

In order to forestall difficulties which might otherwise arise during the winter, it is advisable to check over your vehicle in good time.

CHANGING OIL

For winter use when the temperature approaches -10°C (14°F), or when cold-starting difficulties can be expected, the engine oil should be changed to SAE 10 W or SAE 10 W-20. These oils are sufficiently thin to reach all the engine lubricating points. (See also page 45.) If the temperature remains continuously below -10°C (14°F), the rear axle oil should be changed to SAE 80. See page 75 for gearbox.

Do not forget to change the oil in good time, particularly if the vehicle is mainly used for short-distance work.

Engine cooling system

As soon as there is a risk of frost, change the coolant to a mixture consisting of water and at least 40% anti-freeze fluid.

Electrical system

During winter the batteries are subjected to considerably greater loading than during the summer, since the lighting and other current-consuming units are used to a greater extent. The battery capacity also decreases as the temperature falls.

Check the batteries regularly — the electrolyte freezes more quickly in a discharged or poorly charged battery.

Compressed air system

In order to prevent ice formation in the brake system, the anti-freeze container should be 2/3 full of methylated spirits. At extremely low temperatures methanol should be used instead, as this has a lower evaporation point. N.B. Methanol is poisonous.

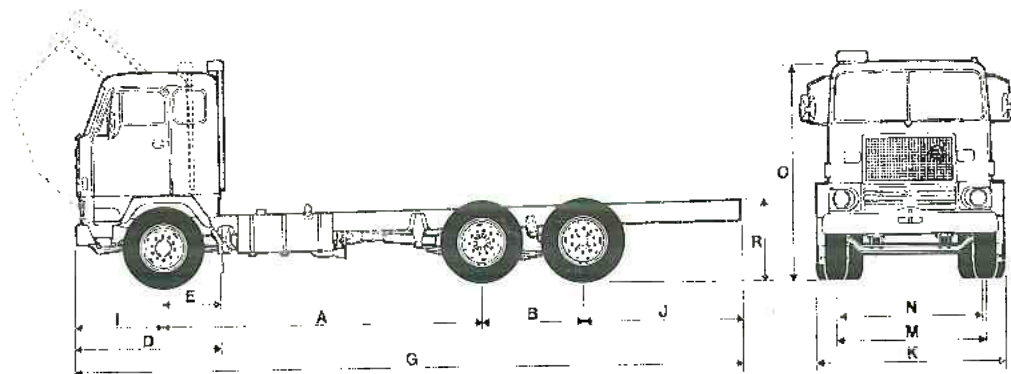
Fuel system

Use one of the special winter fuels supplied by the well-known oil companies.

Try to keep the fuel tank as full as possible in order to avoid the formation of condensation water. Fill up the tank immediately after finishing driving.

Windscreen washer

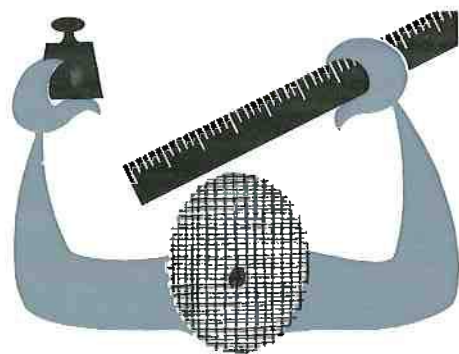
In order to prevent freezing during winter, the windscreen washer container should be filled with frost-resistant fluid. This is important since winter driving often involves dirt and water splashes on the windscreen, which means that the windscreen washer and wipers have to be used frequently.



General data

Length measurements		F 88-32	F 88-38	F 88-49	F 88-53	F 88-56	FB 88-32	FB 88-42	FB 88-46
A	Wheelbase	mm 3200	3800	4900	5300	5600	3200	4200	4600
		in. 126"	150"	193"	209"	220"	126"	165"	181"
B	Bogie wheelbase	mm -	-	-	-	-	1320	1320	1320
		in. -	-	-	-	-	52"	52"	52"
D	Front bumper - rear edge of cab, rest cab	mm 1915	1915	1915	1915	1915	1915	1915	1915
		in. 75"	75"	75"	75"	75"	75"	75"	75"
	short cab	mm 1515	1515	1515	1515	1515	1515	1515	1515
		in. 59.7"	59.7"	59.7"	59.7"	59.7"	60"	60"	60"
F	Centre of front axle - rear edge of cab, rest cab	mm 760	760	760	760	760	760	760	760
		in. 30"	30"	30"	30"	30"	30"	30"	30"
	short cab	mm 360	360	360	360	360	360	360	360
		in. 14"	14"	14"	14"	14"	14"	14"	14"
G	Overall chassis length, rest cab	mm 6457	6757	8520	9257	9740	7027	8677	9357
		in. 215"	266"	335"	365"	384"	276"	342"	368"
	short cab	mm 6157	6957	9057	9467	9740	7327	8977	9677
		in. 243"	274"	357"	373"	384"	289"	354"	380"
I	Front overhang	mm 1155	1155	1155	1155	1155	1155	1155	1155
		in. 45"	45"	45"	45"	45"	45"	45"	45"
J	Rear overhang, rest cab	mm 1102	1802	2465	2802	2985	1352	2002	2282
		in. 43.5"	71"	97"	110"	117.5"	53"	79"	90"
	short cab	mm 1802	2002	3002	3002	2985	1652	2302	2602
		in. 71"	79"	118"	118"	117.5"	65"	91"	103"
	Turning circle diameter	mm 12,000	14,000	17,400	18,000	19,800	14,000	17,200	18,400
		ft. 39 ft.	46 ft.	57 ft.	62 ft.	65 ft.	46 ft.	56 ft.	60 ft.

SPECIFICATIONS



Length measurements		G 89-35 4 x 2	G 88-56 4 x 2	G 88-35 6 x 2	G 89-45 6 x 2	G 89-49 6 x 2
A	Wheelbase	mm 3500	5600	3500	4500	4900
		in. 138"	221"	138"	177"	193"
B	Bogie wheelbase	mm -	-	1320	1320	1320
		in. -	-	52"	52"	52"
D	Front bumper - rear edge of cab, rest cab	mm 1915	1915	1915	1915	1915
		in. 75"	75"	75"	75"	75"
	short cab	mm 1515	1515	1515	1515	1515
		in. 59.6"	59.6"	60"	60"	60"

SPECIFICATIONS

Length measurements		G 89-35 4x2	G 89-57 4x2	G 89-35 6x2	G 89-45 6x2	G 89-49 6x2
E Centre of front axle — rear edge of cab, rest cab	mm	1060	1060	1060	1060	1060
	in.	41.5"	41.5"	41.5"	41.5"	41.5"
short cab	mm	660	660	660	660	660
	in.	26"	26"	26"	26"	26"
G Overall chassis length, rest cab	mm	6457	9257	7027	8377	9077
	in.	215"	365"	277"	330"	358"
short cab	mm	6157	9257	7027	8677	9357
	in.	243"	364"	277"	342"	369"
I Front overhang	mm	855	855	855	855	855
	in.	33.5"	33.5"	33.5"	33.5"	33.5"
J Rear overhang, rest cab	mm	1102	2802	1352	1702	2002
	in.	43.5"	110"	53.5"	67"	79"
short cab	mm	1802	2802	1352	2002	2282
	in.	71"	110.5"	53.5"	79"	90"
Turning circle diameter	mm	13,600	20,600	15,600	19,000	20,400
	in.	44.5 ft.	67.5 ft.	51 ft.	62 ft.	67 ft.

Length measurements		FB 88-32 6x4	FB 88-42 6x4	FB 88-46 6x4	G 88-35 6x4	G 88-45 6x4	G 88-49 6x4
A Wheelbase	mm	3200	4200	4800	3500	4500	4900
	in.	126"	165"	181"	138"	177"	193"
B Bogie Wheelbase	mm	1370	1370	1370	1370	1370	1370
	in.	54"	54"	54"	54"	54"	54"
D Front bumper — rear edge of cab, rest cab	mm	1915	1915	1915	1915	1915	1915
	in.	75"	75"	75"	75"	75"	75"
short cab	mm	1515	1515	1515	1515	1515	1515
	in.	60"	60"	60"	59.5"	59.5"	58.5"
E Centre of front axle — rear edge of cab, rest cab	mm	760	760	760	1060	1060	1060
	in.	30"	30"	30"	41.5"	41.5"	41.5"
short cab	mm	360	360	360	660	660	660
	in.	14"	14"	14"	26"	26"	26"
G Overall chassis length, rest cab	mm	7100	8920	9600	7100	8920	9600
	in.	280"	350"	378"	280"	350"	378"
short cab	mm	7327	9250	9900	7327	9250	9900
	in.	288"	365"	390"	288"	364"	390"
I Front overhang	mm	1155	1155	1155	855	855	855
	in.	45"	45"	45"	33.5"	33.5"	33.5"
J Rear overhang, rest cab	mm	1375	2195	2475	1375	2195	2475
	in.	54"	86.5"	97.5"	54"	86.5"	97.5"
short cab	mm	1602	2525	2775	1602	2525	2775
	in.	63"	99"	109"	63"	99"	109"
Turning circle diameter	mm	14,200	17,400	18,800	16,800	19,200	20,600
	in.	46.6 ft.	57 ft.	61.5 ft.	52 ft.	63 ft.	67.5 ft.

Width measurement	Wheels Tyres	Disc wheels			Spoke wheels		
		8.0x20" 11.00-20"	8.0x20" 12.00-20"	8.5x20" 12.00-20"	8.0x20" 11.00-20"	8.0x20" 12.00-20"	8.5x20" 12.00-20"
Overall width front	mm	2483	2483	2483	2417	2417	2417
	in.	97.7"	97.7"	95"	95"	95"	95"
K Overall width rear	mm	2476	2491	2496	2464	2480	2498
	in.	97.5"	98.2"	98.2"	98.2"	97.7"	98.5"
M Track front	mm	2022	2021	2021	2032	2031	2022
	in.	79.6"	79.6"	79.7"	80"	80"	79.6"
N Track rear	mm	1840	1840	1840	1839	1848	1840
	in.	72.4"	72.5"	72.5"	72.3"	72.8"	72.3"
O Cab roof — ground (unladen)	mm	2915	2930	2930	2915	2930	2930
	in.	115"	115.3"	115.3"	115"	115.3"	115.3"
Frame — ground (loaded)	mm	930	945	945	930	945	945
	in.	36.6"	37.2"	37.2"	36.6"	37.2"	37.2"
FB 88, 6x2	mm	950	955	955	950	955	955
	in.	39.4"	37.5"	37.5"	39.4"	37.5"	37.5"
FB 88, G 88 6x2	mm	965	995	995	965	995	995
	in.	38.0"	39.2"	39.2"	38.0"	39.2"	39.2"

SPECIFICATIONS

Weights		F 88-32	F 88-38	F 88-49	F 88-53	F 88-56	G 88-35 4x2	G 88-56 4x2
Chassis weight, front axle	kg	4,060	4,085	4,046	4,100	4,150	3,870	3,910
	lb.	8,950	9,000	8,900	9,030	9,130	8,530	8,620
Chassis weight, rear axle	kg	2,000	2,085	2,215	2,250	2,275	2,190	2,445
	lb.	4,400	4,600	5,000	4,950	5,130	4,830	5,380
Chassis weight, total	kg	6,060	6,170	6,260	6,350	6,425	6,060	6,350
	lb.	13,350	13,600	13,900	14,000	14,260	13,360	14,000
Max. front axle pressure	kg	6,500	6,500	6,500	6,500	6,500	6,500	6,500
	lb.	14,350	14,850	14,350	14,350	14,350	14,350	14,350
Max. rear axle pressure	kg	13,000	13,000	13,000	13,000	13,000	13,000	13,000
	lb.	28,700	28,700	28,700	28,700	28,700	28,700	28,700
GVW	kg	19,500	19,500	19,500	19,500	19,500	19,500	19,500
	lb.	43,000	43,000	43,000	43,000	43,000	43,000	43,000
Payload including superstructure approx.	kg	13,400	13,300	13,200	13,100	13,000	13,400	13,200
	lb.	29,700	29,700	29,100	29,000	28,700	29,600	29,000

Weights		G 88-35 6x2	G 88-45 6x2	G 88-49 6x2	G 88-35 6x4	G 88-45 6x4	G 88-49 6x4
Chassis weight, front axle	kg	3,730	3,850	3,870	3,765	3,885	3,910
	lb.	8,220	8,480	8,530	8,300	8,570	8,620
Chassis weight, bogie	kg	3,485	3,555	3,565	4,115	4,215	4,230
	lb.	7,670	7,830	7,880	9,060	9,270	9,330
Chassis weight, total	kg	7,215	7,405	7,435	7,880	8,100	8,140
	lb.	15,890	16,310	16,390	17,360	17,840	17,950
Max. front axle pressure	kg	6,500	6,500	6,500	6,500	6,500	6,500
	lb.	14,350	15,350	14,350	14,350	14,350	14,350
Max. bogie pressure	kg	16,500	16,500	16,500	20,000	20,000	20,000
	lb.	36,400	36,400	36,400	44,100	44,100	44,100
GVW	kg	22,700	22,700	22,700	26,000	26,000	26,000
	lb.	50,600	50,600	50,600	57,300	57,300	57,300
Payload incl. superstructure approx.	kg	15,500	16,300	16,300	18,100	17,900	17,900
	lb.	34,700	34,300	34,200	39,900	39,500	39,500

Weights		FB 88-32	FB 88-42	FB 88-46	FB 88-32 6x4	FB 88-42 6x4	FB 88-46 6x4
Chassis weight, front axle	kg	4,030	4,050	4,075	4,065	4,085	4,110
	lb.	8,890	8,930	8,980	8,960	9,000	9,050
Chassis weight, bogie	kg	3,185	3,355	3,360	3,815	4,015	4,030
	lb.	7,020	7,480	7,500	8,410	9,060	8,890
Chassis weight, total	kg	7,215	7,405	7,435	7,880	8,100	8,140
	lb.	15,910	16,410	16,480	17,360	17,840	17,950
Max. front axle pressure	kg	6,500	6,500	6,500	6,500	6,500	6,500
	lb.	14,350	14,350	14,350	14,350	14,350	14,350
Max. bogie pressure	kg	16,500	16,500	16,500	20,000	20,000	20,000
	lb.	36,400	36,400	36,400	44,100	44,100	44,100
GVW	kg	22,700	22,700	22,700	26,000	26,000	26,000
	lb.	50,600	50,600	50,600	57,300	57,300	57,300
Payload, incl. superstructure approx.	kg	15,500	15,300	15,300	18,100	17,900	17,800
	lb.	34,700	34,200	33,900	39,900	39,500	39,500

Max. axle pressure and GVW apply on condition that they are approved by the transport authorities concerned. Chassis weights include: TD 100 A engine, six steel disc wheels 8.0x20" with 11.00-20" tyres, double reduction (or hub reduction), 300 litre fuel tank 66 imp.galls. = 79 US galls. as well as water, oil, fuel, and tools but not spare wheel and spare wheel holder.

Weight modifications, kg	Front	Rear	Total
D 100 B engine	-35 (80)	-	- 35 (80)
Spare wheel holder	-	-	+ 15 (35)
Spare wheel with tyre 11.00-20"	-	-	+120 (265)
Driver	+70 (155)	-	+ 70 (155)
Rear pto.	+10 (25)	-	+ 10 (25)
Side pto.	+10 (25)	-	+ 15 (35)
Hollow rubber springs (DMG)	-	+ 5 (10)	+ 30 (70)
Rear springs (EMG)	-	+100 (220)	+ 70 (155)
Short cab, F 88, FB 88, G 88 4x2	-70 (155)	-	- 70 (155)
Short cab G 88 6x2, G 88 6x4	- 60 (132)	-	- 70 (155)
SR 61	+45 (99)	+ 15 (33)	+ 60 (132)

ENGINE

General data

	D 100 B	TD 100 A
Type designation	D 100 B	TD 100 A
Output (SMMT)	195 h.p. at 2200 r.p.m.	250 h.p. at 2200 r.p.m.
(SAE)	208 h.p. at 2200 r.p.m.	270 h.p. at 2200 r.p.m.
(DIN)	200 h.p. at 2200 r.p.m.	260 h.p. at 2200 r.p.m.
Max. torque (SMMT)	70 kpm (505 lb.ft.) at 1100 r.p.m.	92 kpm (665.5 lb.ft.) at 1400 r.p.m.
(SAE)	73 kpm (512 lb.ft.) at 1100 r.p.m.	100 kpm (722 lb.ft.) at 1400 r.p.m.
(DIN)	71 kpm (527 lb.ft.) at 1100 r.p.m.	96 kpm (694 lb.ft.) at 1400 r.p.m.
Number of cylinders	6	6
Bore	120.65 mm (4.750")	120.65 mm (4.750")
Stroke	140 mm (5.512")	140 mm (5.512")
Displacement	9.6 litres	9.6 litres
Compression ratio	17:1	15:1
Compression pressure	26 kp/cm ² (370 lb/sq.in.) at 220 r.p.m.	26 kp/cm ² (370 lb/sq.in.) at 230 r.p.m.
Max. unloaded speed	2500+50 r.p.m.	2450±50 r.p.m.
Idling speed	450±25 r.p.m.	450±25 r.p.m.
Weight with flywheel, flywheel housing and starter motor	892 kg (1966 lb.)	919 kg (2026 lb.)
Valve clearance, cold engine:	Overhead	
inlet	0.40 mm (0.016")	
exhaust	0.70 mm (0.028")	

Lubricating system

	D 100 B	TD 100 A
Oil filter	Disposable paper filter	Disposable paper filter
Oil pressure, operating speed	3-5 kp/cm ² (43-71 lb/sq.in.)	3-5 kp/cm ² (43-71 lb/sq.in.)
idling speed	0.5 kp/cm ² (7 lb/sq.in.)	0.5 kp/cm ² (7 lb/sq.in.)
Lubricant, type	For Service DM or DS	For Service DS
Viscosity, below -10°C (14°F) or when cold-starting difficulties can be expected between -10 and 20°C (14 and 70°F)	SAE 10 W or SAE 10 W-20	SAE 20/20 W or SAE 20 W-30
above 20°C (20°F)	SAE 20/20 W or SAE 20 W-30	SAE 30 or SAE 20 W-30
Oil capacity, excluding oil filter	approx. 18 litres (4.0 Imp.galls. = 4.8 US galls.)	approx. 18 litres (4.0 Imp.galls. = 4.8 US galls.)
including oil filter	approx. 20 litres (4.5 Imp.galls. = 5.4 US galls.)	approx. 20 litres (4.5 Imp.galls. = 5.4 US galls.)

Turbo-compressor

	D 100 B	TD 100 A
Make	-	Schwitzer-Holset
Max. speed	-	70 000 r.p.m.
Boost pressure at an engine speed of 2000 r.p.m.	-	0.7-0.8 kp/cm ² (10.0-11.4 lb/sq.in.)
Lubrication	-	Force-feed lubrication from engine

Fuel system

	D 100 B	TD 100 A
Injection pump	Bosch PE6P 110/320 RS 138	Bosch PE6P 100/320 RS 100
Injection pump direction of rotation viewed from coupling side	Clockwise	
Order of injection	1-5-3-6-2-4	
Injection advance	24° before T.D.C.	
Feed pressure	0.6-1.0 kp/cm ² (8.5-14.2 lb/sq.in.)	

Governor

	D 100 B	TD 100 A
Governor	Bosch ROV 200-1100 PA 99/2R	Bosch ROV 200-1100 PA 60/2 R
Fine filters	Bosch FJ/DB 1 W 6x2/102	Bosch KBL 112 S 21/13
Injectors, holder nozzle opening pressure	Bosch DLLA 150 S 178 200 kp/cm ² (2850 lb/sq.in.)	Bosch DLLA 150 S 178 175 kp/cm ² (2489 lb/sq.in.)
	210 kp/cm ² (2990 lb/sq.in.)	183 kp/cm ² (2587 lb/sq.in.)

Fuel tank capacity

	300 litres (66 Imp. galls. = 79 US galls.)
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Cooling system

	D 100 B	TD 100 A
Type	Pressurized, enclosed	Pressurized, enclosed
Pressure valve opens at	0.44-0.54 kp/cm ² (6.2-7.7 lb/sq.in.)	0.44-0.54 kp/cm ² (6.2-7.7 lb/sq.in.)
Thermostats, type	Wax	Wax
marked	76 and 81 respectively	76 and 81 respectively
begin to open at	73-76° C (163-168° F)	78-81° C (170-178° F)
fully open	84-88° C (183-191° F)	89-93° C (192-200° F)
Number	Three	Three
Cooling system capacity	approx. 47 litres (10.3 Imp. galls. = 12.4 US galls.)	approx. 47 litres (10.3 Imp. galls. = 12.4 US galls.)
Fan belts	HC 50x1225 and HC 50x1175	HC 50x1225 and HC 50x1175

Mixture table glycol/water

Capacity of cooling system	Necessary amount of glycol in litres (Imp. galls./US galls.) for frost protection down to:			
	-25° C (-13° F)	-30° C (-22° F)	-40° C (-40° F)	-59° C (-69° F)
47 litres (10.3 Imp.galls. = 12.4 US galls.)	19 (4.3/5)	21 (4.8/5.5)	25 (5.5/6.6)	28 (6.1/7.4)

* - 56° C (69° F) is the maximum amount of frost protection which can be provided. To increase the glycol content above this only impairs the frost protection.

Mixture for anti-rust additive/water

One 113-gramme (4-oz.) bag is mixed with 8-10 litres (about 2 Imp. galls. = 2.4 US galls.) of water.

Electrical system

Bulbs	Number	Effect (Watts)	Fitting	
Headlights	2	55/50	P 45 t	
Parking lights	2	5	Ba 9 s	
Rear lights and number plate lighting	2	5	Ba 15 s	
Brake lights	2	20	Ba 15 s	
Direction indicators	4	20	Ba 15 s	
Combination instrument, lighting	2	2	Ba 9 s	
	speedometer	1	2	Ba 9 s
	tachograph	3	2	Ba 9 s
tachometer	1	2	Ba 9 s	
Position lights	2	5	Ba 15 s	
Roof light	2	10	Sv 8.5	
Control lamps, full-beam headlights	1	3	Ba 9 s	
air pressure	2	3	Ba 9 s	
oil pressure	1	3	Ba 9 s	
water temperature	1	3	Ba 9 s	
direction indicators	2	3	Ba 9 s	
power take-off	2	3	Ba 7 s	
differential lock	2	1	Glass socket	
warning lamp	1	3	Ba 7 s	
foglight, spotlight	2	3	Ba 7 s	
charging	1	3	Ba 9 s	
System voltage	24 V			
Batteries, type	Tudor 6 E 7 HC or corresponding			
number	Two			
voltage	12 V			
capacity	133 Ah			
electrolyte specific gravity to be recharged at a specific gravity of	1.28			
Alternator, type	Bosch KI 28 V 35A 24			
raking	980 W			
max. current	35 A			
drive belt	HC 38 x 1175			
Starter motor, type	Bosch KB (R) 24 V 6.5 PS			
output	6.0 h.p.			
Fuses	8 amp. - 11			
	25 amp. - 1			

POWER TRANSMISSION

Clutch

Type	Single dry plate	Double dry plate
Size	16 1/2"	14"
Clutch lever free play	5-7 mm (0.20"-0.28")	5-7 mm (0.20"-0.28")
Distance, throw-out bearing - retainer hub		15 mm (0.59)

Gearbox

Type	R-60	SR-61
Reduction ratios:		
1st speed	10.60:1	11.22/9.46:1
2nd speed	7.40:1	7.84/6.61:1
3rd speed	5.20:1	5.50/4.64:1
4th speed	3.93:1	3.93/3.31:1
5th speed	2.70:1	2.86/2.41:1
6th speed	1.89:1	2.00/1.68:1
7th speed	1.32:1	1.40/1.18:1
8th speed	1.00:1	1.00/0.84:1
Reverse	8.80:1	10.29/8.67:1
Oil capacity	9.5 litres (2.1 Imp. galls. = 2.5 US galls.)	11.5 litres (2.5 Imp. galls. = 3.0 US galls.)
Lubricant	Gear oil (N.B. Not hypoid oil or multi-purpose oil)	
Viscosity, below -10° C (14° F)	SAE 80	
-10 to 30° C (14 to 86° F)	SAE 90*	
above 30° C (86° F)	SAE 140	
	or SAE 40 engine oil (all year round) at all temperatures below +30° C (86° F)	

* SAE 140 recommended for long driving periods at altitudes above 2000 m (6500 ft.)

Power take-offs

Location on gearbox	Direction of rotation compared with engine	Speed of output shaft	Approximate values for permissible loading in kpm (lb.ft.)	
			Short operating periods (max. 15 min.)	Long operating periods (more than 15 min.)
Side R 60	Same	0.77 x engine speed	35	35
Rear R 60	Opposed	0.61 "	100	60
Rear R 60	Same	0.96 x "	35	25
Side SR 61	Same	0.73/0.87 x engine speed	35	35
Rear SR 61	Opposed	0.56/0.66 x engine speed	100	60
Rear SR 61	Same	0.88/1.05 x engine speed	35	25

Final drives

Vehicle type	4x2 or 6x2		Tandem drive bogie 6x4	
	Double reduction	Single reduction with hub reduction	Single reduction	Single reduction with hub reduction
Designation	181	1841 NR 2	1840 EV	1841 NR 2
Reduction ratio in hub		2:1	--	2:1
total	4.92:1	4.88:1	4.87:1	6.14
alt. total	5.43:1	5.58:1	5.43:1	
alt. total		6.14:1	6.14:1	
Oil capacity	13 litres (2.9 Imp. galls. = 3.4 US galls.)	28 litres (6.4 Imp. galls. = 7.7 US galls.)	20 litres (4.4 Imp. galls. = 5.3 US galls.) in foremost, 9.5 litres (2.0 Imp. galls. = 2.5 US galls.) in rearmost	29 litres (6.6 Imp. galls. = 7.9 US galls.) in foremost, 28 litres (6.4 Imp. galls. = 7.7 US galls.) in rearmost
Lubricant	MIL-L-2105 B final drive oil SAE 80			
Viscosity below -10° C (14° F)	SAE 90*			
between -10° C (14° F) and +30° C (86° F)	SAE 140			
above 30° C (86° F)				

* When driving for long periods at altitudes of more than 2000 m (6500 ft.), SAE 140 is recommended.

Brakes

Brake drum diameter, front wheels, trailing wheels, rear wheels	16 ¹ / ₄ " 15 ¹ / ₂ "
Compressor, make designation	Westinghouse TU-FLO 500
Safety valve opening pressure, early production	9.2- 9.9 kp/cm ² (131-143 lb/sq.in.)
Brake cylinders, max. permissible travel	
front wheels	44 mm (1.73")
trailing wheels	44 mm (1.73")
drive wheels	51 mm (2.01") (44 mm = 1.73" on 6x4)
Pressure regulator, cut-out pressure	7.9- 8.5 kp/cm ² (112-121 lb/sq.in.)
cut-in pressure	6.7-7.0 kp/cm ² (96-100 lb/sq.in.)
Pressure retaining valve (safety valve for tractor unit)	
opening pressure	4.3-4.7 kp/cm ² (61-67 lb/sq.in.)
closing pressure	3.7-4.3 kp/cm ² (56-61 lb/sq.in.)
Low-pressure indicator, parking brake	5.8-6.6 kp/cm ² (82-94 lb/sq.in.)
footbrake circuit	3.9-4.5 kp/cm ² (55-64 lb/sq.in.)

Front wheel alignment

Nominal values at service weight and with normal body	
Toe-in (measured on tyre treads)	0-3 mm (0-0.12")
Camber	1 ¹ / ₂ "
King pin inclination	5°
Caster (in relation to floor surface)	2 ¹ / ₂ ° + 1 ¹ / ₂ ° for F 88, G 88 4x2 2 ³ / ₄ ° + 1 ¹ / ₂ ° for FB 88, G 88 6x2 FB 88 6x4, G 88 6x4

Power steering

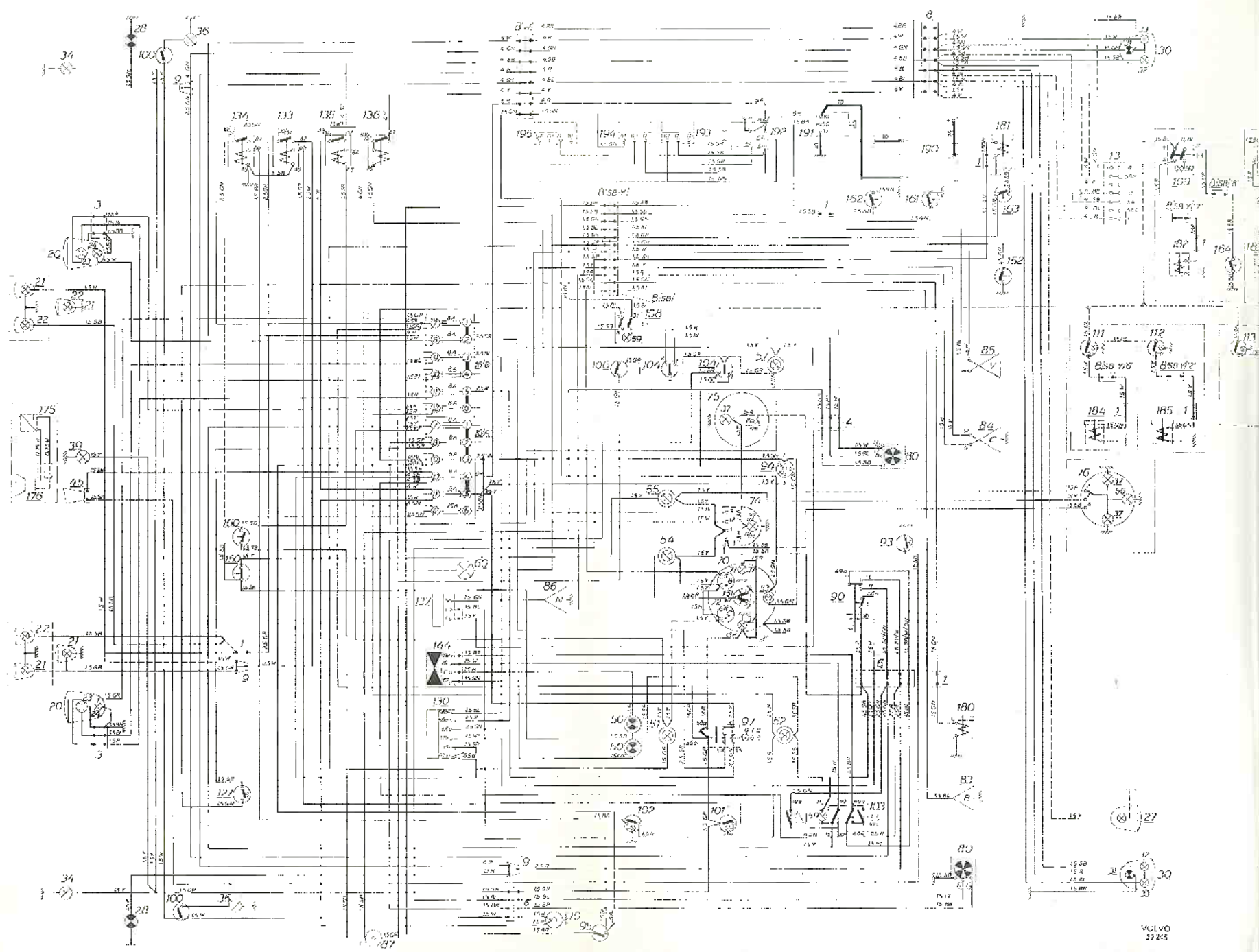
Make and type	ZF recirculating ball power steering
Number of steering wheel turns from lock to lock	3.7
Lubricant	"Oil for Automatic Transmissions, Type A" or DEXRON
Oil capacity	approx. 4.3 litres (3 Imp. quarts. = 4.3 US quarts.)

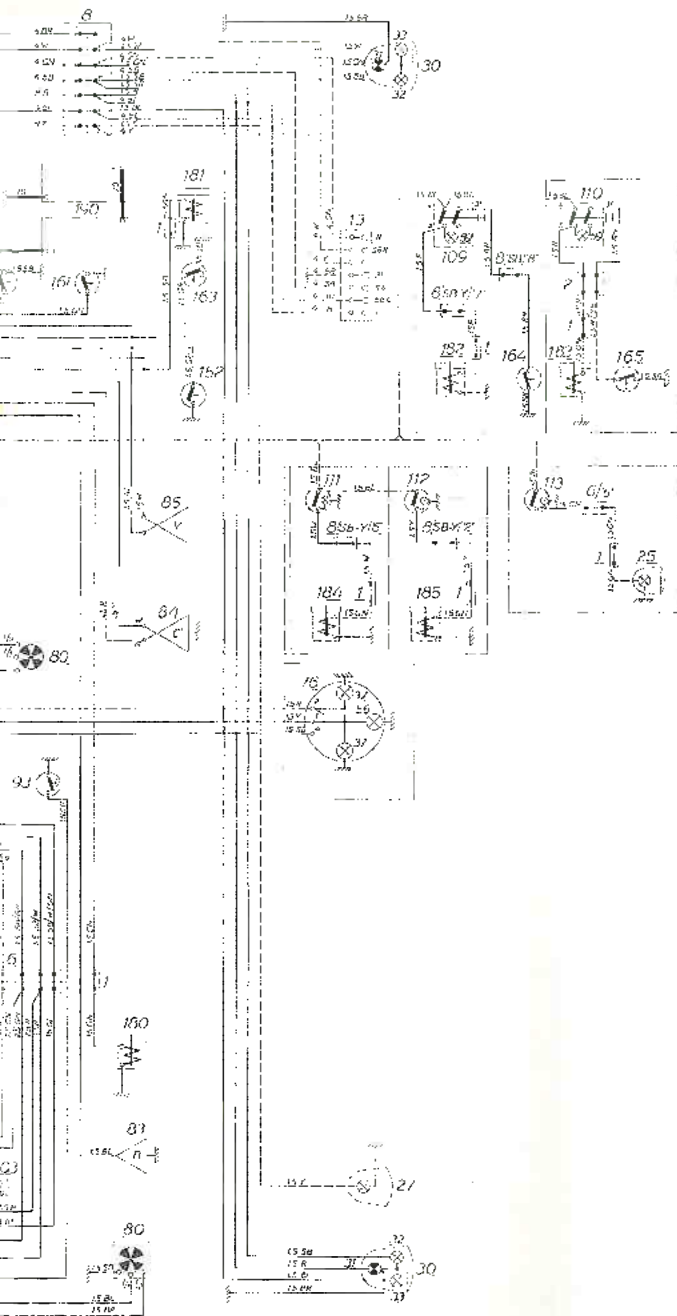
WHEELS

Disc wheels, rim	8.0" or 8.5"
Tyres	11.00-20" or 12.00-20"

TIGHTENING TORQUES

	kpm	lb.ft.
Engine, rocker arm casing	1	7.2
injector retaining nuts	2	14.5
plug for sump	8	58
Wheel nuts, disc wheels	36-44	260-318
spoke wheels	30-34	217-246





WIRING DIAGRAM

- | | |
|--|--|
| 1 Connector | 90 Direction indicator switch with anti-dazzle contact |
| 2 Connector | 93 Horn button |
| 3 Connector | 94 Main switch |
| 4 Connector | 95 Starting switch |
| 6 Connector | 97 Lighting switch |
| 8 Connector | 100 Switch, cab lighting |
| 9 Connector | 101 Switch, foglight |
| 13 Outlet, 7 pole | 102 Switch, spotlight |
| 16 Fuseboard | 103 Switch, all-round flasher |
| 20 Headlights, full and dipped | 104 Switch, heater |
| 21 Foglights | 106 Switch, windscreen washer |
| 22 Spotlights | 108 Switch, differential lock, wheels |
| 23 Warning lamp for full/dipped headlights | 109 Switch, differential lock, axles |
| 24 Lamp for parking lights | 110 Switch, weight distributor |
| 25 Loading floodlight | 111 Switch, power take-off I |
| 27 Reversing light | 112 Switch, power take-off II |
| 28 Direction indicator flasher, front | 113 Switch, loading floodlight |
| 30 Tail-light | 127 Foot switch, exhaust brake |
| 31 Direction indicator flasher, rear | 130 Relay, full and dipped headlights |
| 32 Brake stoplight | 133 Relay, foglight |
| 33 Tail-light, parking light, number-plate lighting | 134 Relay, spotlight |
| 34 Marking light, upper on cab | 135 Relay, brake stoplights |
| 36 Cab lighting | 136 Relay, reversing light |
| 37 Lamp for instrument lighting | 137 Relay, cooling water level sensor |
| 39 Illuminated sign | 144 Flasher, direction indicators |
| 45 Horn | 150 Contact breaker, warning lamp, parking brake after valve |
| 50 Warning lamp, direction indicators | 151 Contact breaker, warning lamp, running brakes |
| 51 Warning lamp, oil pressure | 152 Contact breaker, warning lamp, oil pressure |
| 52 Warning lamp, full headlights | 160 Breaker points, brake stoplights |
| 53 Warning lamp, charging | 161 Breaker points, reversing lights |
| 54 Warning lamp, running brakes | 162 Breaker points, warning lamp, supplementary gearbox |
| 55 Warning lamp, parking brakes after valve | 163 Breaker points, warning lamp, differential lock, wheels |
| 56 Warning lamp, tachograph | 164 Breaker points, warning lamp, differential lock, axles |
| 57 Warning lamp, water temp./level | 165 Breaker points, warning lamp, weight distributor |
| 59 Warning lamp, differential lock, weight distributor, all-round flashers | 175 Radio |
| 60 Warning lamp, supplementary gearbox | 176 Loudspeaker |
| 70 Combined instrument | 180 Solenoid, exhaust brake |
| 71 Fuel gauge | 181 Solenoid, differential lock, wheels |
| 72 Temperature gauge | 182 Solenoid, differential lock, axles |
| 74 Tachometer | 183 Solenoid, weight distributor |
| 75 Speedometer | 184 Solenoid, power take-off I |
| 76 Tachograph | 185 Solenoid, power take-off II |
| 80 Heater | 130 Battery |
| 83 Fuel level sensor | 91 Starter motor |
| 84 Temperature sensor | 92 Alternator |
| 85 Engine speed sensor | 93 Charging regulator |
| 86 Level sensor, water | 94 Over-voltage protector |
| 87 Windscreen washer | 95 Charging regulator, over-voltage protector |