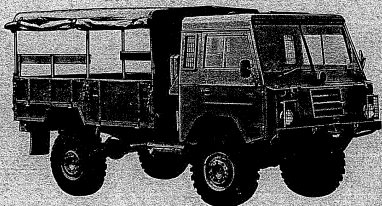


# **VOLVO LIGHT CROSS-COUNTRY TRUCK SERIES**

**OWNER'S MANUAL**



~~XXXXXXXXXXXXXXXXXXXX~~  
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# **VOLVO LIGHT CROSS-COUNTRY TRUCK SERIES**

## **OWNER'S MANUAL**

**C 303**

**G. S. CARGO**

**C 304**

**MORTAR CARRIER  
GUN TOWER  
AMBULANCE**

**C 306**

**6x6 G. S. CARGO**

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## **GENERAL**

This vehicle has three variants, two two-axle versions and one three-axle version. It is intended for driving on highways and for cross-country operation. The two-axle variants are known as the C 303 and C 304, and the three-axle variants as the C 306. They have a common designation, the C-series.

Generally the usual mode of operation is rear-wheel drive, but front-wheel drive can also be engaged when necessary.

The vehicle's cross-country traversability is increased due to the fact that the front and rear axles are provided with mechanical differential locks.

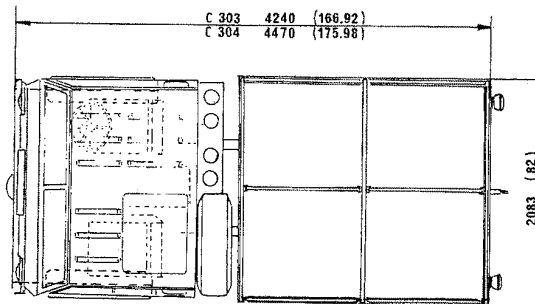
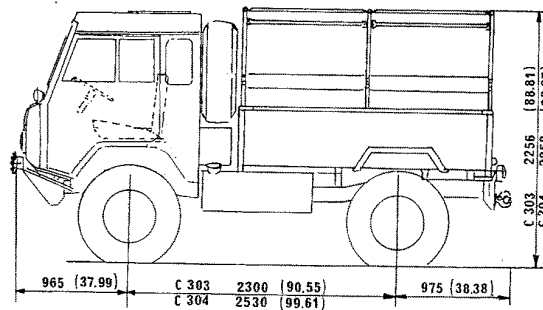
# DATA

## Vehicle

Make ..... Volvo  
 Type Designation ..... C-series

## Measurements

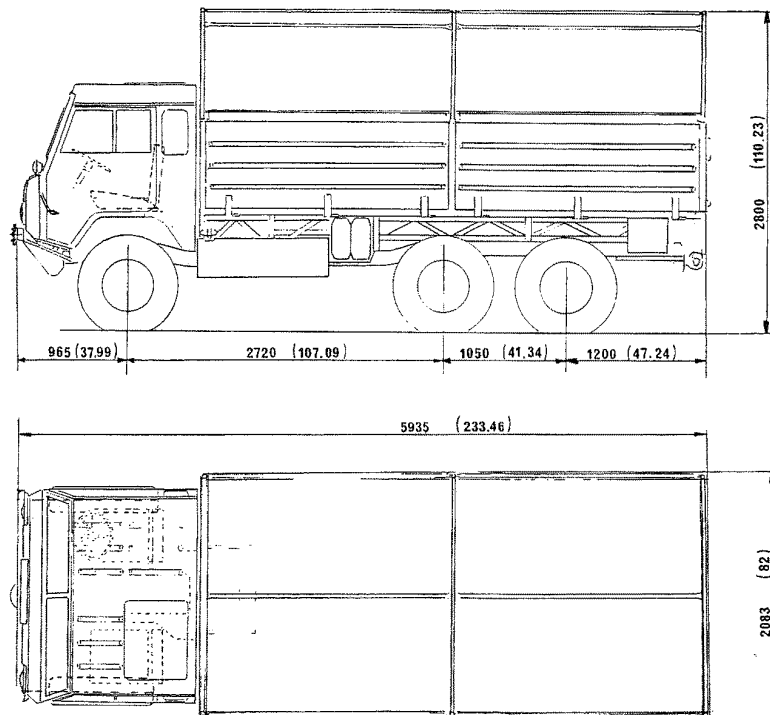
	C 303	C 304
Length .....	4240 mm (166.92 inch)	4470 mm (175.98 inch)
Width .....	1930 mm ( 76.0 inch)	1940 mm ( 76.4 inch)
Height (laden) .....	2256 mm ( 88.81 inch)	2260 mm ( 88.97 inch)
Wheelbase .....	2300 mm ( 90.55 inch)	2530 mm ( 99.61 inch)
Clearance height .....	380 mm ( 15 inch)	380 mm ( 15 inch)
Clearance angle, front .....	45°	45°
rear .....	45°	45°
Turning circle .....	11.5 m (37.72 ft)	11.70 m (38.38 ft)



C 303, C 304

### C 306

Length .....	5935 mm (233.46 inch)
Width .....	2082 mm ( 82 inch)
Height (laden) .....	2800 mm (110.23 inch)
Wheelbase .....	2720 + 1050 mm (107.09 + 41.34 inch)
Clearance height .....	380 mm ( 15 inch)
Clearance angle, front .....	45°
rear .....	40°
Turning circle .....	14.04 m (46 ft)



C 306

<b>Weights</b>	<b>C 303</b>	<b>C306</b>
Service weight .....	2163 kg (4759 lb)	3131 kg ( 6888 lb)
Total weight .....	3180 kg (6996 lb)	5881 kg (13938 lb)
Max. axle pressure, front .....	1537 kg (3381 lb)	1979 kg ( 4354 lb)
rear .....	1643 kg (3617 lb)	1951 + 1951 kg (4292 + 4292 lb)
Max. load .....	1017 kg (2237 lb)	2750 kg ( 6050 lb)

### **C 304**

	<b>Mortar Carrier</b>	<b>Gun Tower</b>	<b>Ambulance</b>
Service weight .....	2426 kg (5337 lb)	2406 kg (5293 lb)	2731 kg (6008 lb)
Total weight .....	3794 kg (8347 lb)	4198 kg (9235 lb)	3696 kg (8131 lb)
Max. axle pressure, front .....	1893 kg (4165 lb)	1950 kg (4290 lb)	1938 kg (4264 lb)
rear .....	1901 kg (4182 lb)	2248 kg (4946 lb)	1758 kg (3868 lb)
Max. load .....	1368 kg (3010 lb)	1792 kg (3942 lb)	965 kg (2123 lb)

### **Capacities**

Fuel tank, C 303 .....	125 litres	27.5 Imp. gals	33.0 US gals
C 304 and C 306 .....	150 litres	33.0 Imp. gals	40.0 US gals
Cooling system .....	12 litres	2.6 Imp. gals	3.2 US gals
Engine .....	5.2 litres	9.2 Imp. pints	11.0 US pints
Engine with oil filter .....	5.7 litres	10.0 Imp. pints	12.0 US pints
Gearbox .....	1.2 litres	2.1 Imp. pints	2.5 US pints
Auxiliary gearbox .....	1.3 litres	2.3 Imp. pints	2.7 US pints
Differential carriers .....	1.5 litres	2.6 Imp. pints	3.2 US pints
Front wheel carriers .....	0.3 litre	0.5 Imp. pint	0.6 US pint
Rear wheel carriers .....	0.4 litre	0.7 Imp. pint	0.8 US pint
Steering gear .....	0.5 litre	0.9 Imp. pint	1.0 US pint
Windscreen washer container .....	3 litres	5.3 Imp. pints	6.3 US pints

### **Performance, C 303**

	<b>High</b>	<b>Low</b>
Max. speed at 67 rev/sec (4000 rev/min), 1st gear .....	25 km/h (15 mile/h)	10 km/h ( 6 mile/h)
2nd gear .....	50 km/h (30 mile/h)	20 km/h (12 mile/h)
3rd gear .....	70 km/h (42 mile/h)	30 km/h (18 mile/h)
4th gear .....	100 km/h (62 mile/h)	40 km/h (24 mile/h)
Max. wading depth .....	700 mm (28 in.)	

### **Performance, C 304 and C 306**

	<b>High</b>	<b>Low</b>
(4000 rev/min), 1st gear .....	20 km/h (12 mile/h)	8 km/h ( 5 mile/h)
2nd gear .....	40 km/h (25 mile/h)	15 km/h (10 mile/h)
3rd gear .....	55 km/h (33 mile/h)	25 km/h (15 mile/h)
4th gear .....	80 km/h (48 mile/h)	32 km/h (20 mile/h)
Max. wading depth .....	700 mm (28 in.)	

## Engine

Make .....	VOLVO
Type designation .....	B 30 A
Output (DIN) .....	125 h.p. at 4250 rev/min
Max. torque (DIN) .....	22.4 kpm (162 lbfft) at 2800 rev/min
Number of cylinders .....	6
Bore .....	88.90 mm (3.4656 in.)
Stroke .....	80 mm (3.1496 in.)
Capacity .....	2.98 dm <sup>3</sup> (litres) /182 cu. in.)
Compression ratio .....	9.3:1
Idling speed .....	11.5-13.5 rev/sec (700-800 rev/min)
Valve system .....	overhead
Valve clearance, intake .....	0.40-0.45 mm (0.016-0.018")
exhaust .....	0.40-0.45 mm (0.016-0.018")
Carburetor, Number .....	2
Make .....	Zenith-Stromberg
Type designation .....	175 CD 2 SE
Petrol .....	97 octane
Cooling system .....	Sealed and with expansion tank

## Electrical system

Battery, number .....	1
voltage .....	12 V
capacity .....	57 Ah
earth pole .....	Negative
Alternator .....	SEV Marchal 28/35
Fuses .....	17-8A, 1-16A

## Bulbs:

	<b>Output</b>	<b>Socket</b>	<b>Number</b>
Headlights with insert .....	Sealed beam		2
Position lights .....	4 W	Ba 9 s	2
Stop lights .....	23 W	Ba 15 s	2
Direction indicators, front and rear .....	23 W	BA 15 s	4
Reversing lights .....	10 W	Ba 15 s	2
Blackout lights, front .....	15 W	S 8.5	2
reversing .....	3 W	SV 5.5	2
stop lights .....	3 W	SV 5.5	2
Interior lighting .....	10 W	S 8.5	1
Indicator/warning lights:			
full beams .....	2 W	Ba 9 s	1
direction .....	2 W	Ba 9 s	2
battery charging .....	2 W	Ba 9 s	1
oil pressure .....	2 W	Ba 9 s	1
brake system .....	2 W	Ba 9 s	1
differential locks .....	2 W	Ba 9 s	2
front wheel drive .....	2 W	Ba 9 s	1



Indicator lights in switches:			
full beams/dipped beams switch .....	2 W	Ba 7 s	1
windscreen wipers .....	2 W	Ba 7 s	2
windscreen washer .....	2 W	Ba 7 s	1
emergency warning lights .....	2 W	Ba 7 s	1

### Ignition system

Firing sequence .....	1-5-3-6-2-4
Spark plugs, type designation .....	Bosch W 200 T 35
electrode gap .....	0.7-0.8 mm (0.028-0.032 in.)
tightening torque .....	35-40 Nm (3.5-4.0 kpm = 25-29 lbftf)
firing setting .....	10° B.T.D.C. at 10-13 rev/sec (600-800 rev/min)
Distributor, direction of rotation .....	Anti-clockwise
breaker points gap .....	min. 0.25 mm (0.010")

### Power transmission system

Clutch lever clearance .....	4-5 mm (0.16-0.20 in.)
Gearbox, type designation .....	ZF S4-18
reduction 1st gear .....	3.85:1
2nd gear .....	2.08:1
3rd gear .....	1.39:1
4th gear .....	1:1
reverse .....	4.13:1
Auxiliary gearbox, type designation .....	VOLVO FD 51
reduction, high .....	1:1
low .....	2.39:1
Differential carriers, reduction, C 303 .....	2.91:1
C 304 and C 306 .....	3.44:1
Wheel carriers, reduction .....	2.06:1
Total axle reduction, C 303 .....	6.0:1
C 304 and C 306 .....	7.1:1

### Brake system

Service brakes, type .....	two-circuit, vacuum-hydraulic with drum brakes
brake pedal clearance .....	10 mm (0.4")
Parking brake, type .....	Mechanical prop. shaft brake
clearance .....	2-3 ratchet notches

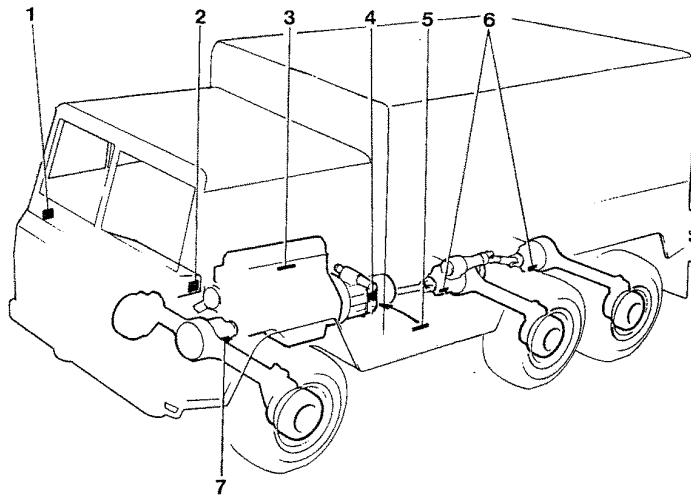
### Steering system

Steering gear, type .....	ZF, worm and roller
number of turns from stop to stop .....	5.1

## Wheels

Tyres C 303 .....	280/85x16 4-ply, special
C 304 and C 306 .....	280/85x16 6-ply, special
Disc wheels with rims, size .....	7.5 L-16

## Data Plates



Data plates

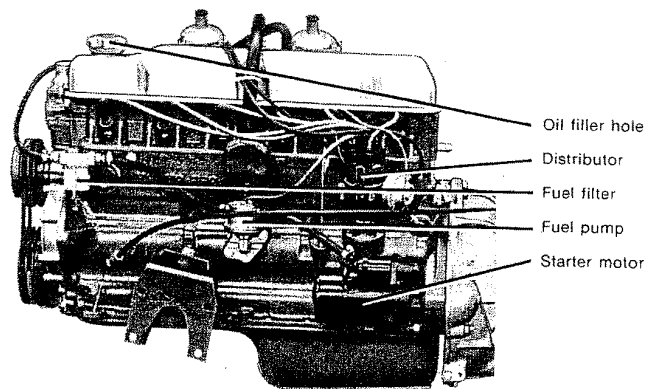
- 1 Volvo Data plate
- 2 Volvo Data plate
- 3 Engine part number and serial number
- 4 Gearbox type designation, part number and manufacturing number
- 5 Auxiliary gearbox type designation, part number and manufacturing number
- 6 Rear differential carrier component and manufacturing numbers
- 7 Front differential carrier component and manufacturing numbers

# CONSTRUCTION AND FUNCTION

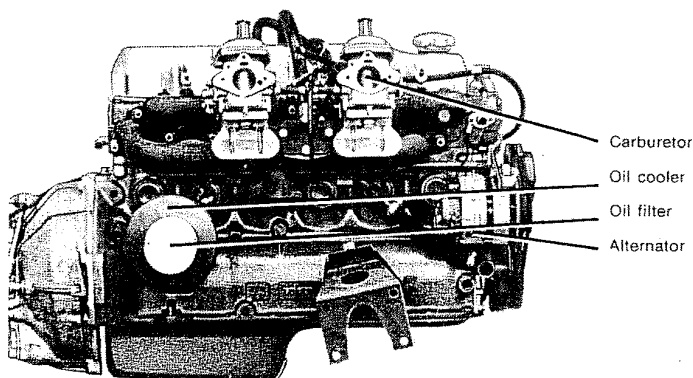
## Engine

### GENERAL

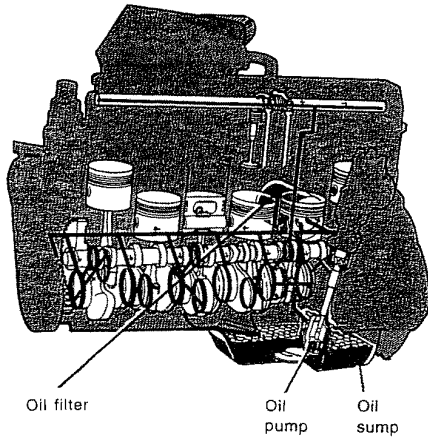
The engine is an in-line, six-cylinder, water-cooled, overhead valve unit with two horizontal carburetors. The engine block is made of special cast-iron and is cast in one piece. The cylinder liners are drilled directly in the block. The block has separate intake and exhaust channels, one for each valve.



B 30 A Engine from left



B 30 A Engine from right



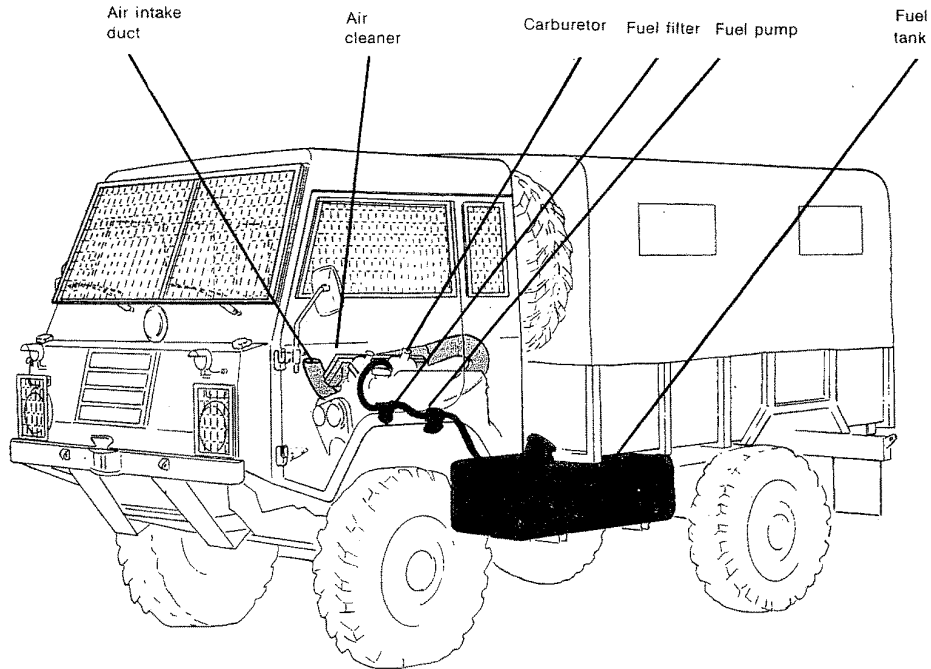
Lubricating system

## LUBRICATING SYSTEM

The driving force behind the engine lubricating system is the gear-driven pump. The pump is driven via the camshaft gear. Oil is pumped from the pump through the oil filter and channels to the various lubricating points. A relief valve built into the oil pump prevents the pressure from becoming excessive. The oil filter is of the full-flow type, i.e., all the oil passes through the filter before going out to the various lubricating points of the engine.

An oil cooler is fitted between the oil filter and cylinder block.

## FUEL SYSTEM



Fuel system

## Fuel pump

The fuel pump is of the diaphragm type and is driven by the camshaft. It sucks fuel from the fuel tank and pumps it through a fuel filter to the carburetors. The fuel filter is mounted on the left-hand side of the engine.

## Carburetors

The engine is provided with two horizontal carburetors of the Zenith-Stromberg type.

## INTAKE SYSTEM

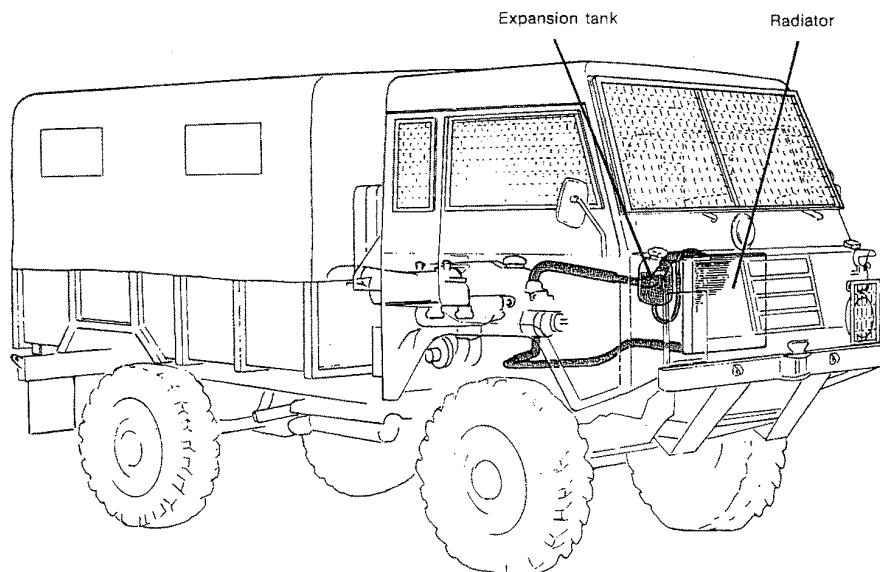
### Air cleaner

The air cleaner functions both as a cleaner for the incoming air and as an intake silencer. It is provided with a replaceable paper insert.

## COOLING SYSTEM

The engine has a sealed cooling system. The coolant is circulated round the system by means of a centrifugal pump. A double-operating thermostat ensures that the engine is heated up rapidly. It also ensures that the engine is maintained at a temperature most suitable to all operating conditions.

An expansion tank prevents air from circulating with the coolant, since this could cause corrosion in the cooling system.



Cooling system

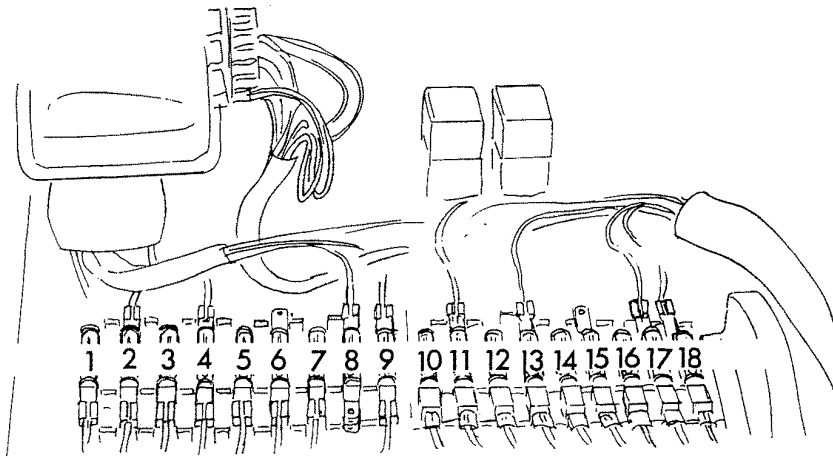
# Electrical system

## LIGHTING COMPONENTS

The vehicle's lighting at the front consists of two headlights with full beam and dipped-beam arrangement as well as two lights which are used as parking lights and direction indicators. Up front there are also two removable blackout lights. At the rear there are two lamp clusters containing the tail, directional indicator and brake lights as well as a blackout light and parking brake light.

## FUSES

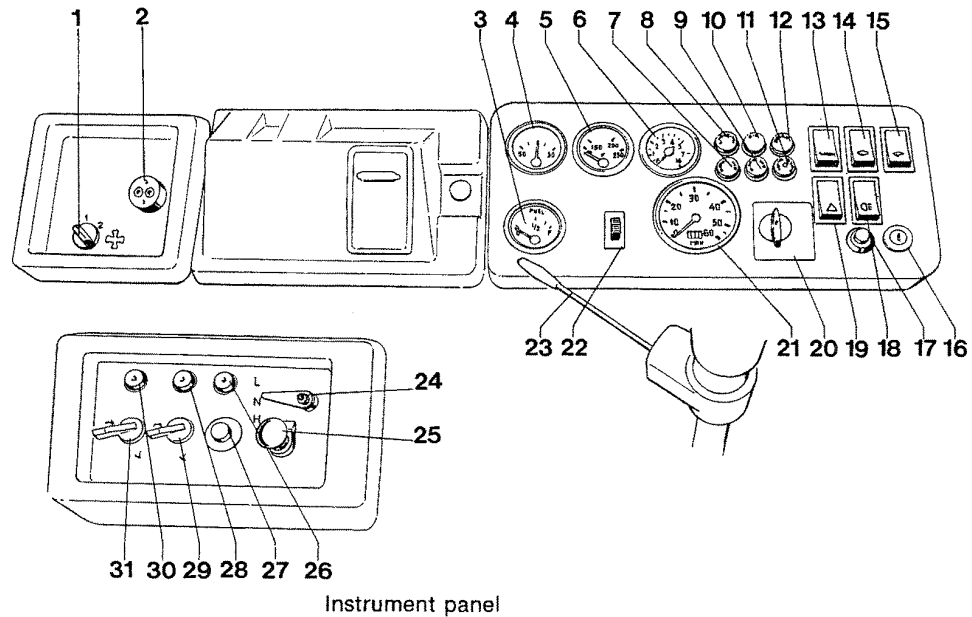
The electrical equipment is protected by fuses grouped behind the dashboard stowage locker. Always make sure you use the right type of fuse when replacing fuses. A plate located next to the fuseboard as well as the following list tell you which components are protected by the various fuses.



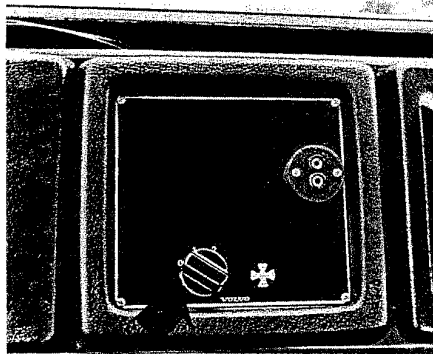
Fuses

- |  |   |
|--|---|
| 1 Full beam, left<br>Full beam control light | 13 Step relay   |
| 2 Full beam, right                           | 14 Wiper motor<br>Rheostat                                    |
| 3 Dipped beam, left                          | 15 Direction indicators<br>Light relay                        |
| 4 Dipped beam, right                         | Brake circuit warning light                                   |
| 5 Position light, front left                 | 16 Fuel and coolant temp gauges<br>Oil pressure warning light |
| 6 Position light, tail                       | Horn  |
| 7 Position light, front right                | Washers   |
| 8 —  | 17 Differential lock<br>Ace wheel drive                       |
| 9 Cab light                                  | Fan   |
| 10 Black-out light, front left and tail      | 18 Socket outlet  |
| 11 Black-out light, front right              |   |
| 12 Stop light                                |   |

## INSTRUMENTS, SWITCHES, INDICATOR/WARNING LIGHTS AND CONTROLS



- |                                      |  |
|--------------------------------------|--|
| 1 Fan switch                         | 19 Emergency warning flasher switch                    |
| 2 Inspection lamp socket             | 20 Blackout light switch                               |
| 3 Fuel gauge                         | 21 Speedometer   |
| 4 Ammeter                            | 22 Instrument panel light                              |
| 5 Temperature gauge                  | 23 Direction indicator lever                           |
| 6 Oil pressure gauge                 | 24 Indicator for High and Low gear range               |
| 7 Direction indicator light, vehicle | 25 Choke   |
| 8 Battery charging warning light     | 26 Indicator light for front wheel drive               |
| 9 Direction indicator light, trailer | 27 Push-push button for front wheel drive              |
| 10 Oil pressure warning light        | 28 Indicator light for front axle differential carrier |
| 11 Full beam indicator light         | 29 Control switch for front axle differential carrier  |
| 12 Warning light for parking brake   | 30 Indicator light for rear axle differential carrier  |
| 13 Windscreen washer switch          | 31 Control switch for rear axle differential carrier   |
| 14 Left windscreen wiper switch      |  |
| 15 Right windscreen wiper switch     |  |
| 16 Ignition                          |  |
| 17 Starter button                    |  |
| 18 Headlight switch                  |  |

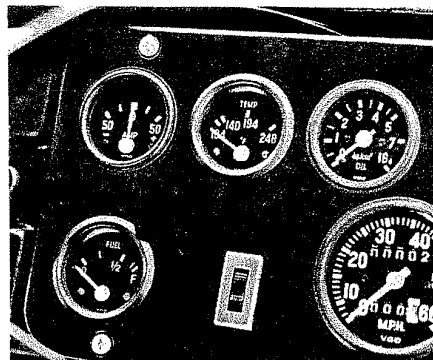


Fan switch

### Fan switch

The switch has three positions:

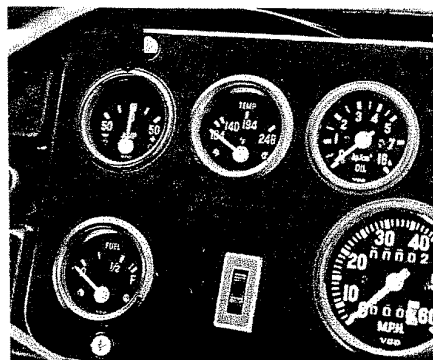
- 0 — OFF
- 1 — FULL OUTPUT
- 2 — HALF OUTPUT



Fuel gauge

### Fuel gauge

The fuel gauge indicates the approximate amount of fuel in the tank. It is marked "full", "half" and "empty". It starts functioning when the ignition is switched on.



Ammeter

### Ammeter

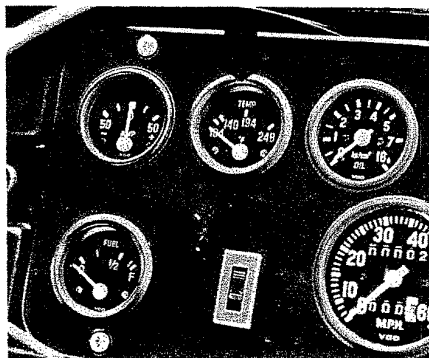
The ammeter indicates the current in the system and also battery discharge. At low engine speed it is quite normal for the ammeter pointer to swing to negative (-). The ammeter needle should swing to positive (+) when engine speed is increased, unless there are a great many power consumers switched on at the same time.

However, if the ammeter pointer points to a low value, this indicates low charging probably due to poorly tensioned drive belts which are slipping on the pulleys.



### Temperature gauge

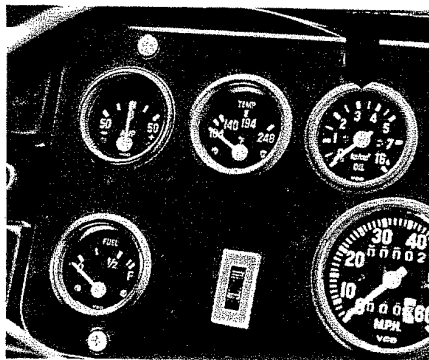
The temperature gauge indicates the temperature of the coolant in the engine and thereby the engine operating temperature. Normally the temperature should not exceed 194° F. Should the gauge pointer repeatedly go above 194° F, check the coolant level and the tension on the drive belts, see page 44.



Temperature gauge

### Oil pressure gauge

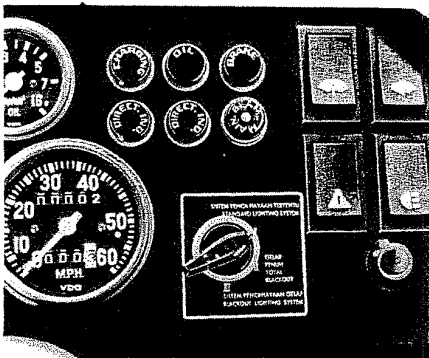
The oil pressure gauge indicates the pressure of the oil in the engine lubricating system. The pressure is dependent on engine speed and temperature. Normally the pressure should be 3 kp/cm<sup>2</sup> (43 lbf/in<sup>2</sup>) when the engine is warm. Should pressure drop near to zero while the engine is running, stop the engine immediately and find out the reason for this.



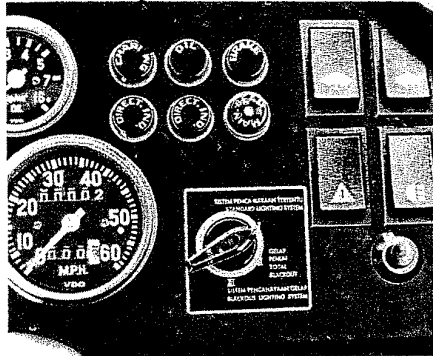
Oil pressure gauge

### Battery charging warning light

This light goes on red when the alternator is not charging or is charging excessively. It also lights when the ignition is switched on but goes out again when the engine starts. Should it go on during driving, this indicates either a fault in the electrical system or also the drive belts are poorly tensioned and are slipping on the alternator pulley.



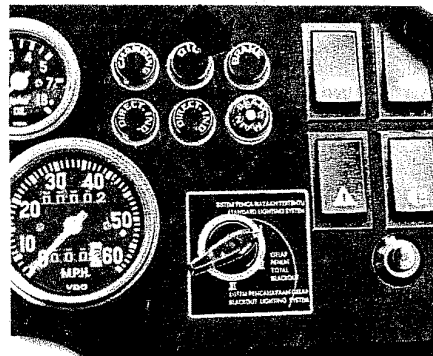
Battery charging warning light



Oil pressure warning light

### Oil pressure warning light

This light goes on red when the engine oil pressure is too low. It goes on when the ignition is switched on but goes out again when the engine has started. Never start driving until the light goes out.

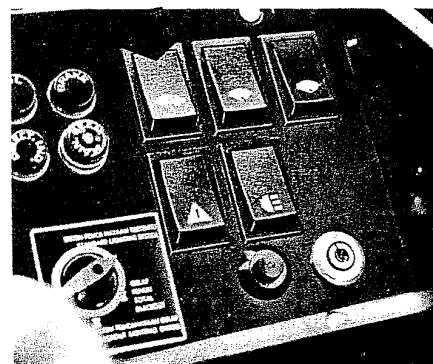


Warning light for parking brake

### Warning light for parking brake

This goes on red when the ignition is switched on and if:

- the parking brake is applied
- the brake pedal has to be depressed further than normal because the brakes are worn.



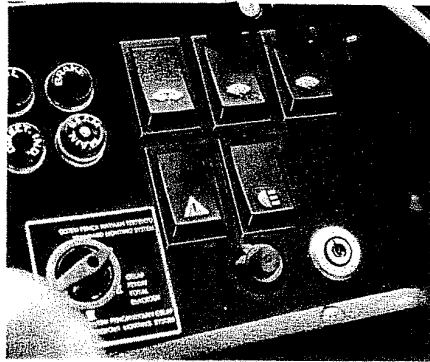
Windscreen washer switch

### Windscreen washer switch

To engage the windscreen washer, push in this switch. The washer can also be used when the windscreen wipers are disengaged. The fluid container is on the left under the dashboard and is filled through the opening at the front of the vehicle, left-hand side.

**Left windscreen wiper switch  
Right windscreen wiper switch**

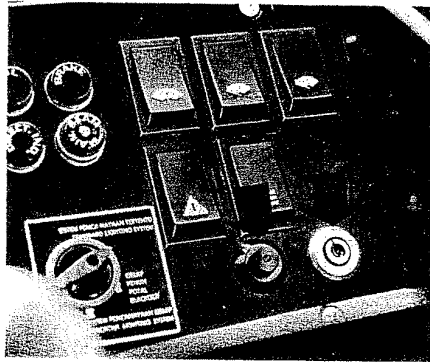
The windscreen wipers can be switched to two speeds:  
half speed = switch pushed in one notch  
full speed = switch pushed in fully.



Windscreen wiper switch

**Ignition  
Starter button**

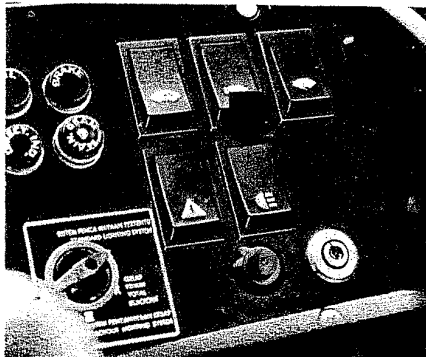
The ignition is engaged by turning the ignition key clockwise. To start the engine first switch on and then push in the starter button.



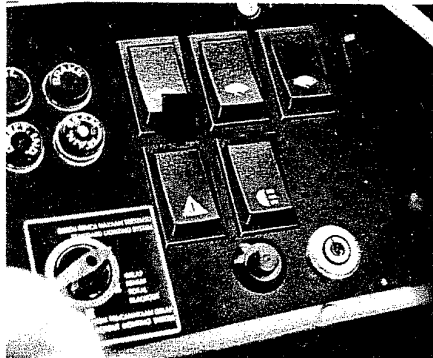
Ignition and starter button

**Direction indicator lever  
Indicator light for fullbeams**

Pushing the switch into the first notch switches on the vehicle's parking light. Pushing the switch in fully switches on the fullbeams or dipped headlights. To switch between fullbeams and dipped headlights, use the direction indicator lever (23), which is pulled towards the steering wheel. The blue indicator light (11) goes on when fullbeams are switched on.



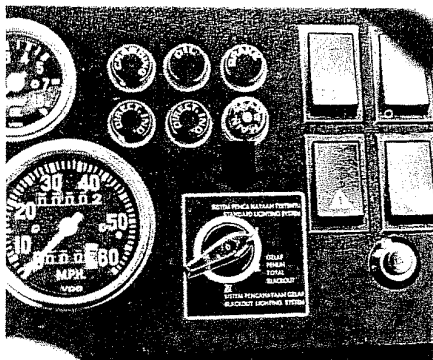
Direction indicator lever



Switch for emergency warning flashers

### Switch for emergency warning flashers

Pushing in this switch turns on all the vehicle's direction indicators. A red warning light in the switch blinks in unison with them. These emergency warning lights can be switched on irrespective of whether the ignition is turned on or not.



Black-out light switch

### Black-out light switch

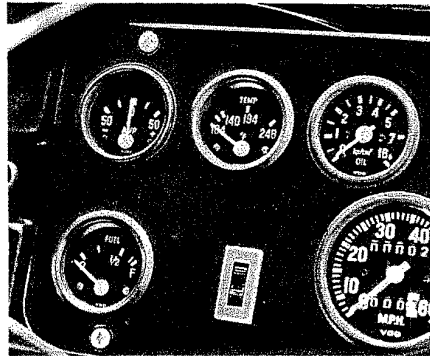
The following happens when the headlights are switched off:

- I with the switch in this position, the black-out light is switched off, but the stop light functions.
- II with the switch in this position the black-out light is switched off as well as the stop light.
- III with the switch in this position the black-out light is switched on and the stop light contact connected to the stop light for black-out operation.

With the switch in positions II and III, the vehicle headlights, direction indicators and other lighting are switched off. But the instrument lighting and the warning lights for oil pressure, choke, battery charging, differential carriers and front wheel drive function.

### Speedometer

The speedometer indicates the speed at which the car is being driven. It houses a tripmeter which runs up to a maximum 999 miles and is zero-set with a small knob under the dashboard.



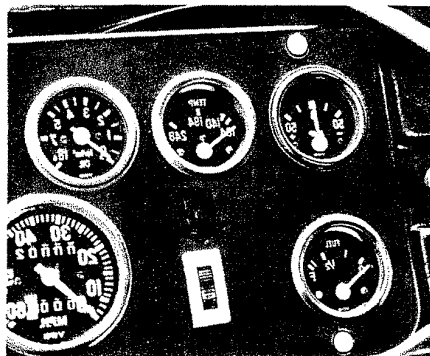
Speedometer



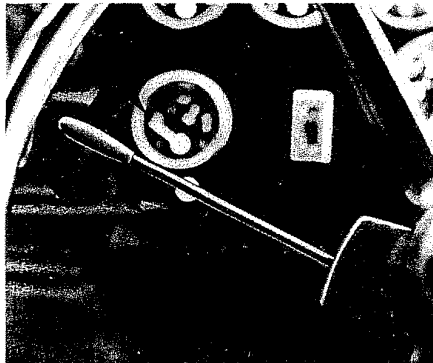
Knob for zero-setting the tripmeter

### Instrument panel light switch

Turning this switch either dims or strengthens the instrument panel light. Moving the knob from the bottom position upwards gradually increases the lighting, which is fully on when the knob is in the upper position. The instrument panel light functions irrespective of whether the headlights are switched on or not.



Instrument panel light switch



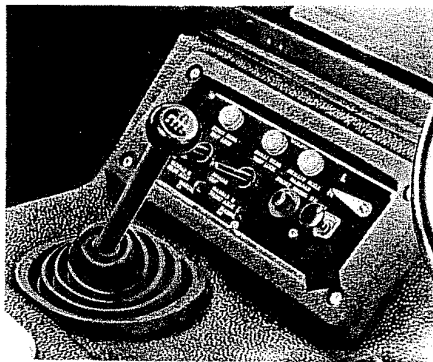
Direction indicator lever and indicator lights

**Direction indicator lever and indicator lights also lighting switch and fullbeam flasher.**

The direction indicators are operated by means of the lever attached to the steering column under the steering wheel. The panel indicator lights for these direction indicators, for both vehicle and trailer, flash a green light in unison with the direction indicators. When the direction indicators are used when driving without a trailer, both the indicator lights switch on during the first flashing of the direction indicators.

To switch from fullbeams to dipped beams and vice-versa, move the lever on the steering column towards the steering wheel and then release it. The headlight switch (18) should then be pushed in fully. In other words the headlights should be switched on.

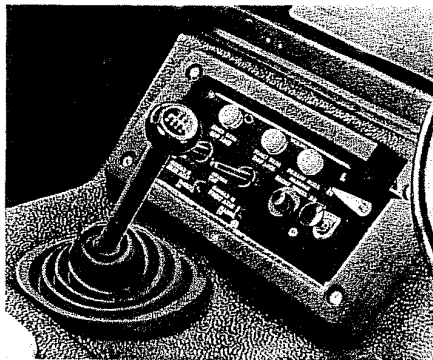
But this lever can also be used for flashing with the headlights even when the headlights are not switched on. All you have to do is move the lever towards the steering wheel. The headlights remain on as long as the lever is pulled towards the steering wheel. Once you release it, the headlights go out.



Choke

**Choke**

Use the choke to assist starting the engine when it is cold.



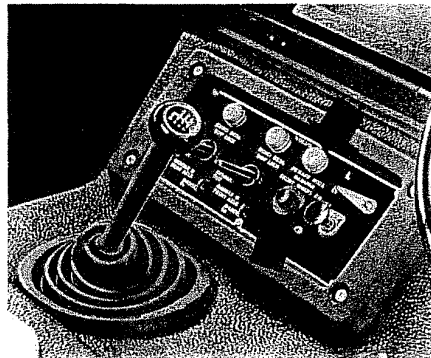
High-gear and low-gear range indicator

**High-gear and low-gear range indicator**

Low-gear range is engaged when the indicator points to L and the high-gear range is engaged when it is at H. No gear is engaged when the indicator is at N (neutral).

**Front-wheel drive push button  
Front-wheel drive indicator light**

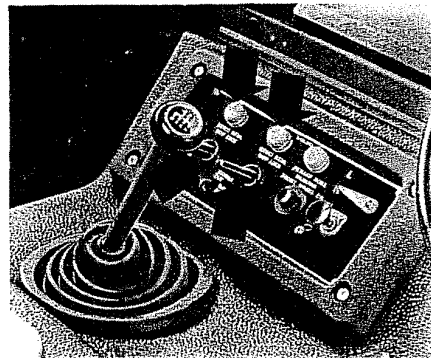
To engage the front-wheel drive when operating in the high-gear range, push in the button. This lights the indicator light (amber). Front-wheel drive is engaged automatically when operating in the low-gear range. Front-wheel drive is used in combination with the high-gear range when driving on ground that is not firm or is slippery.



Front-wheel drive push button

**Control switch for rear axle differential carrier  
Indicator light for rear axle differential carrier  
Control switch for front axle differential carrier  
Indicator light for front axle differential carrier**

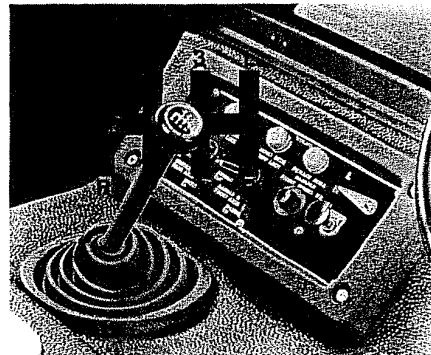
Use the respective switches to engage or disengage the differential carrier on the front or rear axle. The indicator light for the differential carrier in question goes on when the carrier is engaged.



Control switch for differential carrier

**Gear lever**

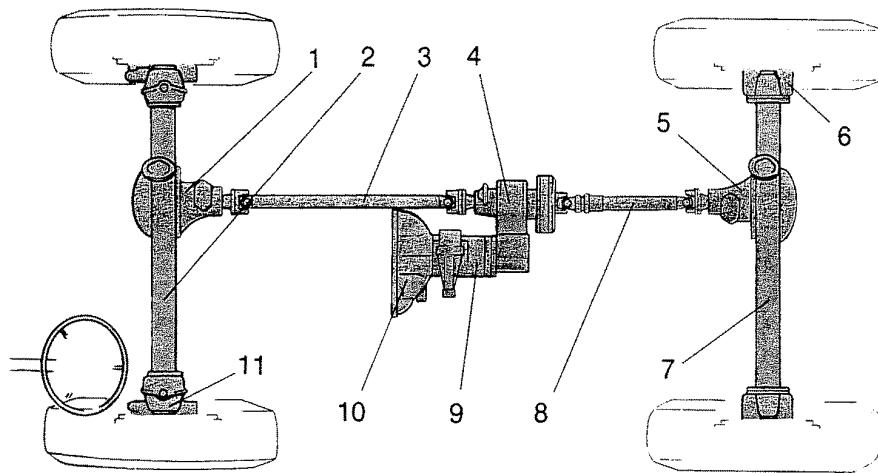
The gear lever operates both the main gearbox and the auxiliary gearbox. The adjacent picture shows the various gear positions for the lever.



Gear lever

# Power transmission

## GENERAL



Power transmission, C 303 and C 304

- |  |                      |   |
|--|----------------------|---|
| 1 Front axle carrier                     | 4 Auxiliary gearbox  | 8 Propeller shaft for rear axle carrier |
| 2 Front axle                             | 5 Rear axle carrier  | 9 Clutch                                |
| 3 Propeller shaft for front axle carrier | 6 Rear wheel carrier | 10 Front wheel carrier                  |
|  | 7 Rear axle          |   |

## CLUTCH

The clutch, which transfers power from the engine to the gearbox, is of the single, dry-plate type. Pressure on the clutch pedal is transmitted to the engaging fork via a wire.

## GEARBOX

Note that the gear lever operates both the gearbox and the auxiliary gearbox. The gearbox is four-speed and fully synchronized. All gears except reverse are in constant mesh with each other. Engaging a gear causes the corresponding gear wheel to mesh with the mainshaft by an engaging sleeve.

## AUXILIARY GEARBOX

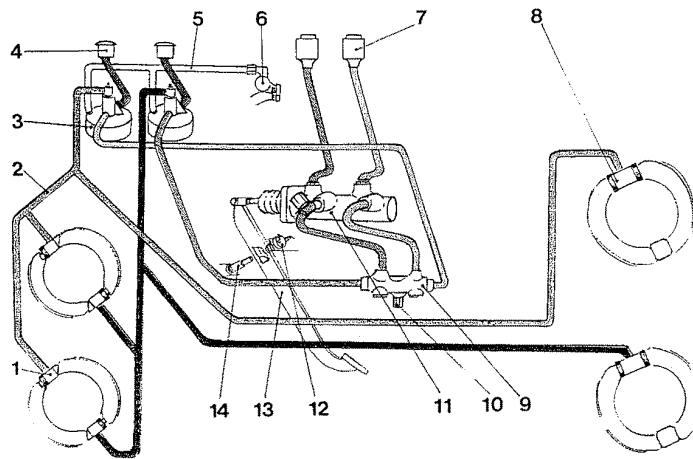
The auxiliary gearbox is synchronized and has two speeds, high and low as well as neutral. It is operated by the gear lever, which also operates the ordinary gearbox.



# Brake system

## GENERAL

The vehicle is fitted with two brake systems, one for the service brake and the other for the parking brake. These systems are independent of each other.



Brake system

- |                                |                                |
|--------------------------------|--------------------------------|
| 1 Wheel cylinder, front wheels | 8 Wheel cylinder, rear wheels  |
| 2 Brake line                   | 9 Warning valve                |
| 3 Servo unit                   | 10 Contact, press. diff.       |
| 4 Air cleaner                  | 11 Master cylinder             |
| 5 Vacuum line                  | 12 Contact for stop lights     |
| 6 Suction pipe                 | 13 Brake pedal                 |
| 7 Brake fluid reservoir        | 14 Contact, brake pedal travel |

## SERVICE BRAKES

The brake system here is of the two-circuit type with drum brakes.

One circuit operates on the front wheels and the right rear wheel. The other operates on the front wheels and the left rear wheel.

Each circuit has a vacuum power unit and a brake fluid container.

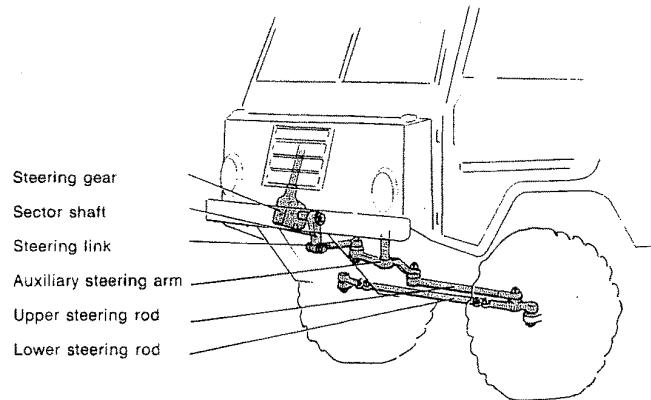
If the brake pedal has to be depressed too far due to the brakes being worn, then a warning light goes on.

## PARKING BRAKE

The parking brake is a mechanical brake operating on the propeller shaft with internal shoes which are fixed to the rear end of the auxiliary gearbox. A warning light goes on when the parking brake is applied.

## Steering system

The steering gear is of the rack and pinion type. The steering system includes two steering rods, an upper and a lower, as well as a steering link.



Steering system

## Frame, suspension and wheels

### FRAME

The frame is comprised of two, box-profile side members which are linked to four crossmembers. The front and rear crossmembers are of the box type while the two intermediate are gas-tight tubular beams which function as vacuum tanks.

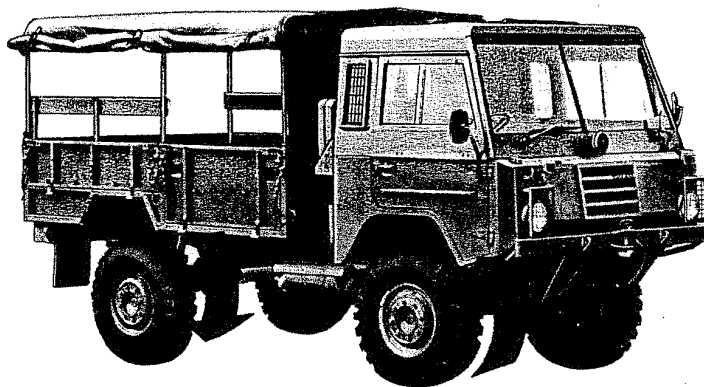
### SUSPENSION

Both rear and front suspensions are of the spring leaf type. The leading end of the springs is suspended by means of spring shackles. The vehicle is provided with hollow rubber springs both front and rear.

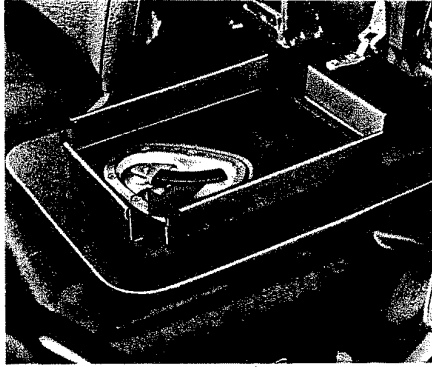
The shock absorbers are of the hydraulic, double operating, telescopic type.

### WHEELS

The wheels are of the disc type. The tyres may either be of the tubeless type or contain tubes. The tyres have an arrowed pattern. They should be fitted so that this pattern on the rear tyres points straight forward in the same direction as travel and in the opposite direction on the front tyres.



Tyre pattern must face in direction shown by arrows



Inspection cover

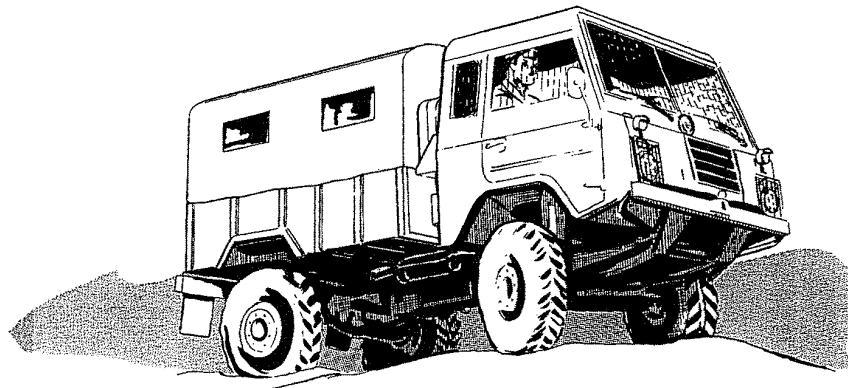
## Body

### INSPECTION COVER

Under the stowage locker between the front seats there is an inspection cover. Remove this cover when you want to get at the following components:

- Oil dipstick
- Oil filler cap
- Drive belts
- Carburettors

# OPERATING INSTRUCTIONS



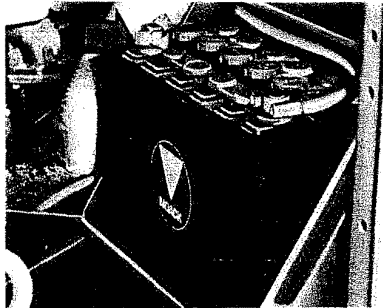
## Starting the engine

- 1 Make sure that the parking brake is on and that the gear lever is in neutral.
- 2 If the engine is cold, pull out the choke fully. Do not touch the accelerator pedal. If the engine is warm, depress the accelerator pedal about half way.
- 3 Depress the clutch pedal fully.
- 4 Switch on the ignition by turning the key.
- 5 Push in the starter button. Release the button as soon as the engine has started. If the engine is warm and does not start immediately, depress the accelerator pedal to the floor and keep it there until the engine starts.
- 6 If the choke has been used, push it in gradually to get the best idling. And as the engine becomes warmer, push it in more and more. The choke should be pushed in fully when the engine is completely warm.
- 7 Check that the oil pressure warning light is out. Do not race the engine. Never load the engine until it is warm. During the cold part of the year, treat the engine and gearbox with the greatest care, particularly when starting.

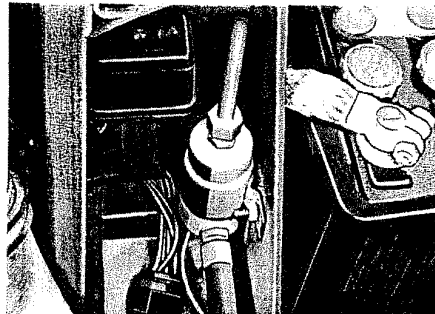
## Changing the battery

When changing the battery or when doing any other work with the electrical system, the following must be observed:

- **Make sure that the battery is connected with the correct polarity.**  
If the battery is incorrectly wired, this will ruin the alternator safety diode when the current is switched on.
- **The charging circuit must not be broken while the engine is running.**  
The charging circuit goes from B+ on the alternator to the battery and from the other pole on the battery via one or two chassis connections to the engine. If this circuit is broken at any point while the alternator is charging, this will damage the alternator rectifier.
- **Rapid charging and starting aid.**  
Always remember the polarity.  
For rapid charging, you must disconnect one of the battery cable terminals. The vehicle's battery **must be** connected up when using another battery as an aid in starting.
- **For reasons of safety, the following must be observed when doing any electrical welding work on the vehicle:**  
First disconnect the battery negative cable.  
Separate the connection adapter on the charging regulator.



Battery negative cable



Connection adapter on the charging regulator

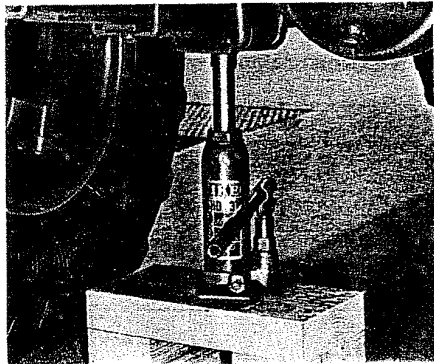
## Changing a wheel

When about to change a front wheel, place the jack and wooden trestle under the spring assembly next to the wheel that is to be changed.

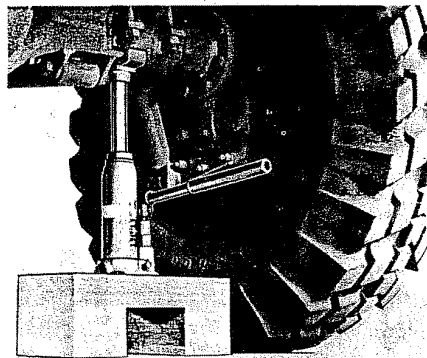
When about to change a rear wheel, place the jack and wooden trestle under the rear axle and as near as possible to the wheel that is being changed.

Change a wheel as follows:

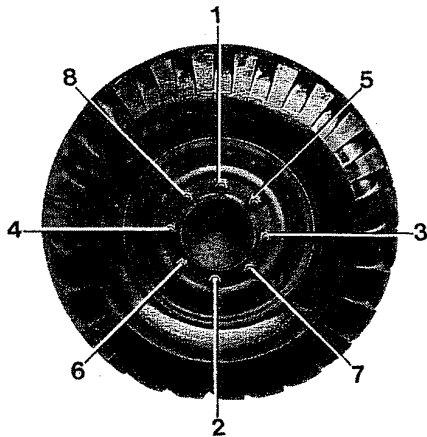
First slacken the wheel nuts, then jack up the vehicle so that the wheel is off the ground. Remove the wheel nuts and lift off the wheel. Clean thoroughly the contact surfaces on the new wheel and wheel nuts.



Changing a front wheel



Changing a rear wheel



Tightening sequence for wheel nuts

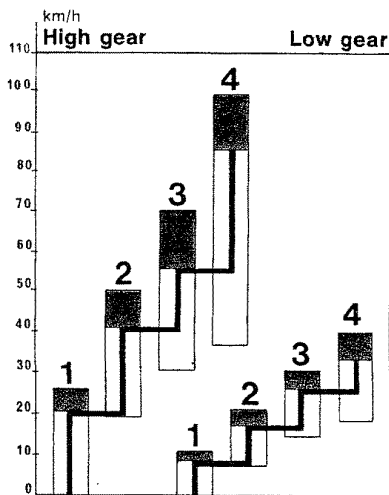
Lift on the new wheel. Screw on the wheel nuts. Lower the vehicle and tighten the wheel nuts diametrically to a torque of 21 Nm. (2.1 kpm = 15 lbfft).

# Driving

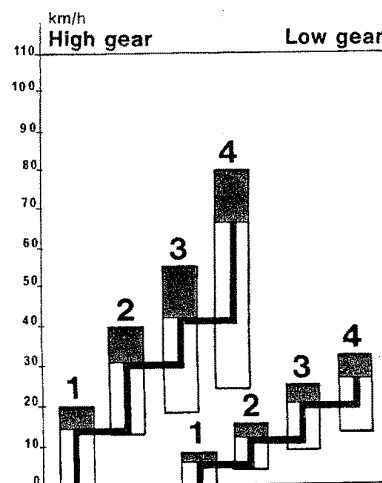
## GEAR-CHANGING

Under normal conditions, the vehicle should be driven in the high-gear range and only with rear-wheel drive. Four-wheel drive, i.e. drive is on both rearwheels, is to be utilized only when driving on the rear wheels is inadequate to cope with a particular situation. The low-gear range is used for driving under severe conditions, e.g., cross-country driving. Four-wheel drive engages automatically when the low-gear range is engaged.

To get the best possible performance out of the engine, it is important to remember that the gear-changing should be adapted to enable the engine speed to be kept within certain limits. In other words, the engine speed should be neither too high nor too low when changing a gear. The gear-changing diagram indicates the speeds permitted for the various gears.



Gear-changing diagram, C 303



Gear-changing diagram, C 304 and C 306

**The gearbox** is four-speed and fully synchronized.

The low and the high gear ranges are engaged in the **auxiliary gearbox**. But the gear lever operates both gearbox and auxiliary gearbox. Gear-changing between the high and low gear range should be done at a very low speed or even with the vehicle standing still. Gear-changing is carried out in the usual way by depressing the clutch pedal and releasing the accelerator pedal. The gear lever is first moved to position L and then either to 1, 2, 3 or 4, depending on which is most suitable for the speed of the vehicle at that particular time.

Changing from the low-gear to the high-gear range is in reverse order, i.e., the gear lever is first moved from the gear it is in to position H and then to the gear which suits the speed of the vehicle at that particular time.

The auxiliary gearbox is synchronized. So the best way to change from the high-gear to the low-gear range and vice-versa is to quietly force the gear lever in the desired direction until the desired gear is engaged. Gear-changing to the low-gear range must not take place at speeds higher than 40 km/h (25 mile/h).



## **BRAKING**

### **Service brakes**

It can happen in damp weather that the brake bands become moist and cause the brakes to grab when applied. This can be eliminated if you lightly depress the brake pedal now and again in order to heat the brake bands and dry them out. After driving the vehicle in water or after washing it, test the brakes as mentioned in the previous paragraph in order to make sure that they are functioning properly.

If one of the brake circuits should fail, you must use twice the normal foot pressure on the brake pedal in order to get about 80% of the normal braking effect you get from both circuits. About 50% is achieved with normal foot pressure on the brake pedal.

When the vehicle's brake power-assistance is not functioning, e.g., when the vehicle is rolling or being towed with the engine switched off, or if one of the servo units should stop functioning, about 4 times more pedal force is required in order to get the same braking effect you get with brake power-assistance.

Concerning the warning light for the parking brake, see page 17.

## **ENGAGING FRONT-WHEEL DRIVE WHEN DRIVING IN HIGH-GEAR RANGE**

To engage the front-wheel drive, push in the button marked "front-wheel drive". An indicator light goes on.

**NOTE!** Drive so that the front and rear wheels do not rotate at different speeds at the moment you engage the front-wheel drive.

## **ENGAGING AND DISENGAGING THE DIFFERENTIAL CARRIERS**

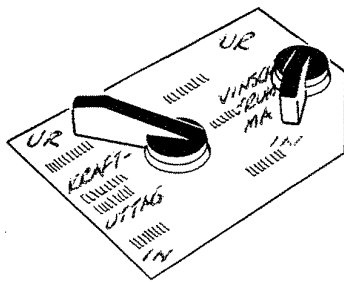
The differential carriers may only be used when driving on a slippery surface. They are engaged when the vehicle is running.

**NOTE!** The differential carriers must not be engaged when any of the drive wheels is spinning.

## **TOWING**

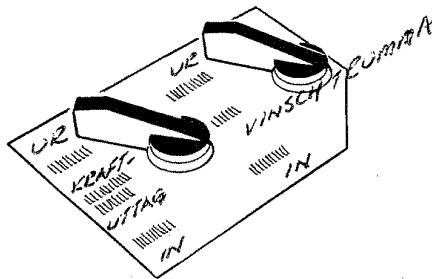
For towing use the towing line or towing bar which is connected to the vehicle towing hitch at the front or hook at the rear.

## ENGAGING AND DISENGAGING THE WINCH AND POWER TAKE-OFF



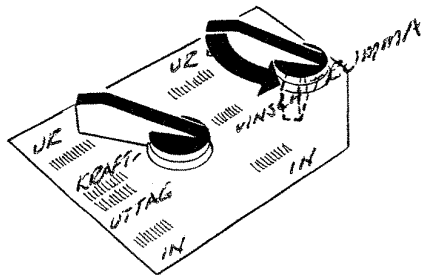
Make sure that the power take-off is always disengaged when not using the winch.

Control for operating winch and power take-off



- 1 To operate the winch, first disengage the winch drum. A sufficient length of the winch cable should then be pulled out by hand. If the winch is to be used for pulling a heavy load, it is worthwhile remembering that it has its greatest pulling power when only 3–4 cable turns are left on the drum.  
**NOTE!** When the beginning of the red mark on the cable is seen from the driver's seat (approx. 2–3 metres in front of the bumper), the cable must not be pulled out further.

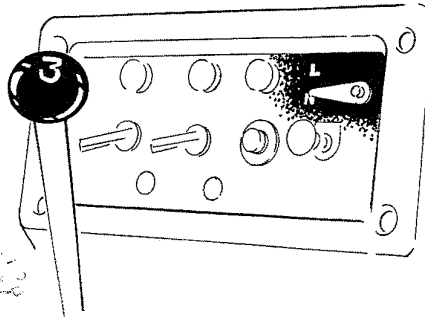
Disengaging the winch drum



Engaging the winch drum

- 2 Start the engine and engage the winch drum.

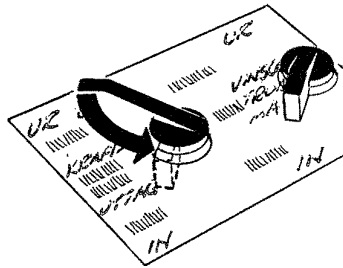
- 3 Move the gear lever so that the auxiliary gearbox is in neutral and then engage a suitable gear with the lever.  
For normal cable operation, 2nd or 3rd gear is to be recommended, otherwise the speed should be varied according to the winch operation involved.



*... Revvill an det  
bäst att börja vincha,  
för man eller 3:an de  
man står fast i ny  
eller i en vänt backe  
det är bättre än hast,  
är för ...*

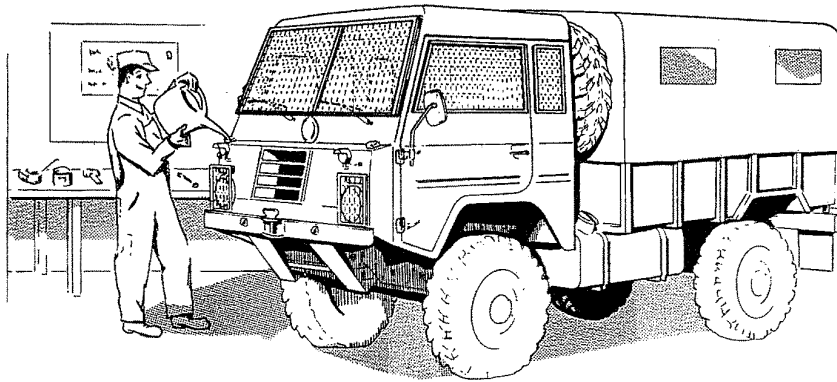
Auxiliary gearbox in neutral

- 4 Depress the clutch pedal and engage the power take-off.
- 5 Rev up the engine and carefully release the clutch pedal.  
When maximum pulling power has been obtained, the slip coupling releases and the cable stops. Winch operation should immediately be discontinued (declutch).  
After winch operation has been completed, the cable should be wound in on the drum under a light load. This load must be applied otherwise the cable will wind poorly on the drum — but the cable must not be excessively loaded otherwise it could be damaged.



Engaging the power take-off

# MAINTENANCE



The following chapter deals with the maintenance of the vehicle. It is divided into Daily Maintenance, Monthly Maintenance and Lubrication. The lubricating intervals are mileage-tied. The various lubricating points are also given in a lubricating chart at the end of this manual.

Avoid dirt, etc., when checking oil levels, filling with oils, and when lubricating.

# Daily Maintenance

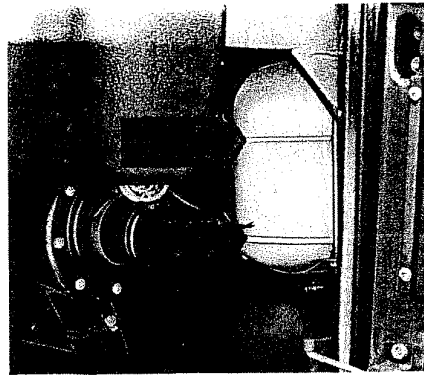
## BEFORE DRIVING

### 1 Coolant

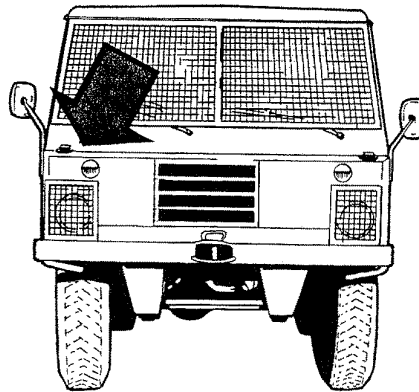
Check the coolant level in the expansion tank. It should be between the Max and Min marks.

Coolant must be added when the level has dropped to the Min mark. It is added through the filler hole at the front of the vehicle. Always use a mixture of water and rustproofing.

Top up with coolant when necessary — to Max when the engine is warm, to Min when it is cold.



Expansion tank

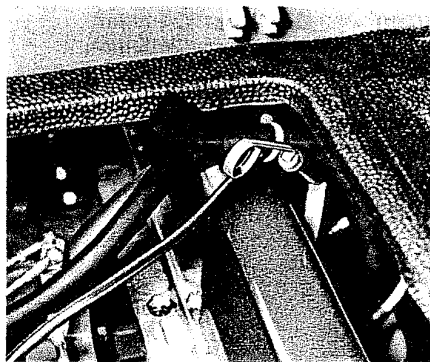


Filler hole

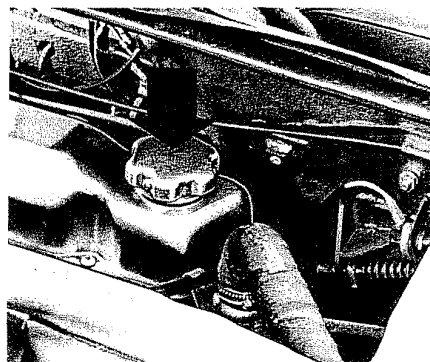
## 2 Oil

Check the oil level in the engine with the dipstick. Wipe the dipstick before checking with, e.g., a piece of paper or a clean cloth. The oil level should be between the Max and Min marks on the dipstick. When the level approaches the Min mark, top up with oil through the filler hole in the rocker arm cover. The distance between the Max and Min marks corresponds to about 2 litres (4 pints).

Concerning type of oil and viscosity, see lubricating chart.

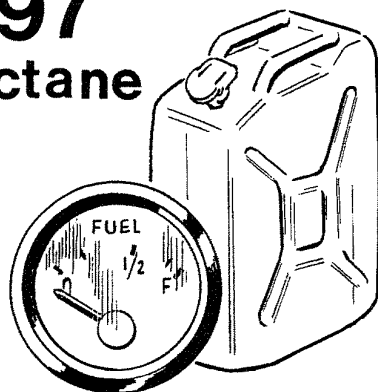


Oil dipstick



Oil filler hole

**97**  
octane



Check petrol in the tank

## 3 Petrol

Check that there is sufficient petrol in the tank and that the spare petrol can is filled. Stop the engine before refuelling. Have a look at the strainer in the fuel tank filler pipe. If it is blocked, clean it before refuelling. Check that the spare petrol can contains **CORRECT FUEL**.

#### 4 Wheels (also spare)

Check the tyre pressure according to table below. If it is low, check to make sure that the tyre valves are tight and do not leak. All the valves should have valve caps. Check the tyres for wear or damage. Remove any stones that may have fastened in the tyres. Check that the wheel rims are not damaged and that the wheel nuts are properly tightened.

Vehicle	Front	Rear
C 303 G. S. Cargo	1.7 kp/cm <sup>2</sup> (24 lbf/in <sup>2</sup> )	1.7 kp/cm <sup>2</sup> (24 lbf/in <sup>2</sup> )
C 304 Mortar	1.9 kp/cm <sup>2</sup> (27 lbf/in <sup>2</sup> )	1.9 kp/cm <sup>2</sup> (27 lbf/in <sup>2</sup> )
Gun Tower	1.9 kp/cm <sup>2</sup> (27 lbf/in <sup>2</sup> )	2.4 kp/cm <sup>2</sup> (34 lbf/in <sup>2</sup> )
Ambulance	1.9 kp/cm <sup>2</sup> (27 lbf/in <sup>2</sup> )	1.7 kp/cm <sup>2</sup> (24 lbf/in <sup>2</sup> )
C 306 6x6 G. S. Cargo	1.9 kp/cm <sup>2</sup> (27 lbf/in <sup>2</sup> )	1.9 kp/cm <sup>2</sup> (27 lbf/in <sup>2</sup> )

#### 5 Windows, mirrors and mudflaps

Check that:

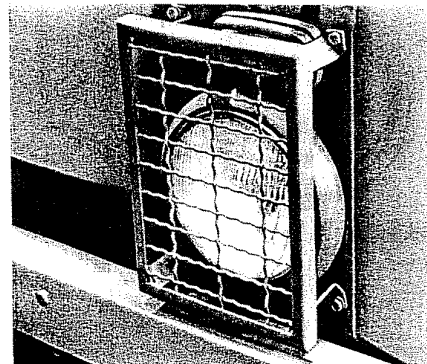
- all the windows are in good condition and are clean
- the rearview mirrors are properly adjusted
- the mudflaps are in good condition.

#### Lighting

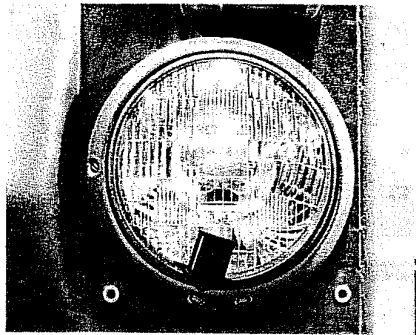
- Check that the headlight lens is clean and that the lighting is functioning properly.
- Check that the tail, stop and blackout light lens is clean and the various lights are functioning properly.

#### Changing bulbs

- 1 Unscrew the grille in front of the headlight.

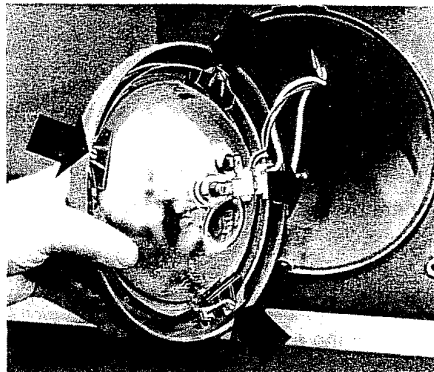


Headlight grille



Headlight rim

2 Remove the screw from the headlight rim.



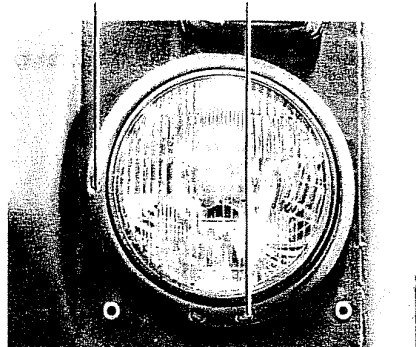
Connector and screws

3 Unscrew the three screws and lift out the lamp.

4 Disconnect the connector and change the bulb.

Change the bulbs in combined tail lights as follows: Remove the grille and screw off the lens.

Lateral adjustment screw    Vertical adjustment screw



Adjuster screws

### Adjusting headlights

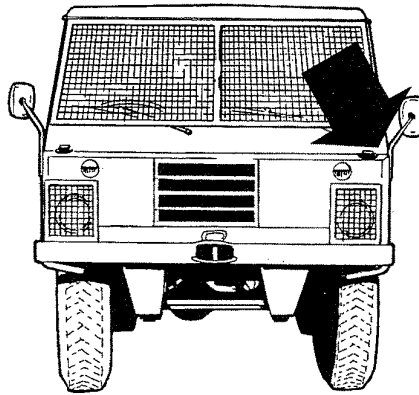
The headlights are adjusted by means of the adjuster screws. Beams are adjusted with a beam adjusting apparatus and must be done by a mechanic.



## 6 Direction indicators, horn, wipers, washers

Check that:

- the direction indicators are functioning properly and are in good condition and clean.
- the horn gives an even, subdued tone.
- the windscreen wipers function and that the wiper blades are in good condition and lie well against the windscreen throughout their full sweep.
- the windscreen washers are functioning properly and that the washer container is well-filled.



Filler hole for washer container

## 7 Towing hitch

Check that the towing hitch is in good condition.

If a trailer is used, check that:

- it is properly hitched to the vehicle.
- the electric cables between the vehicle and trailer are properly connected to the vehicle.

## 8 Instrument panel, indicator/warning lights, operating switches

Check that the oil pressure warning light goes out when the engine has started.

Check the function of the alternator charging warning light. It should go out when the alternator is charging, but during driving it may give a weak light or blink. It should go out when the engine speed is increased.

## 9 Brakes

Check the function of the parking brake. Drive the car and test the footbrake. The brakes should brake the wheels evenly.

## **DURING STOPPAGES AND WHEN DRIVING**

### **10 Instruments, etc.**

Check now and again when driving that:

- the engine temperature is normal, that is between 176–194° F
- the oil pressure warning light is out
- the alternator charging warning light is out

**Note!** Do not exceed the recommended speeds, see gear-changing chart on page 31.

## **AFTER DRIVING**

### **11 Necessary measures — cleaning, lubricating, care**

After driving, carry out necessary measures such as cleaning the vehicle, also used tools and accessories.

After the vehicle underbody has been thoroughly sprayed with water, lubricate the steering rods, auxiliary steering arm and propeller shafts.

### **12 Cross-country or on water**

After the vehicle has been used for cross-country driving or operating on water, check vital parts of the underbody, such as the front shaft, steering rods, steering link and brake lines. Test the brakes.

**Note!** Remember that a faulty steering or brake system could be a traffic safety risk.

### **13 Faults and damage**

Discovered faults should be remedied immediately if possible. Replace burnt fuses, defective bulbs, etc.

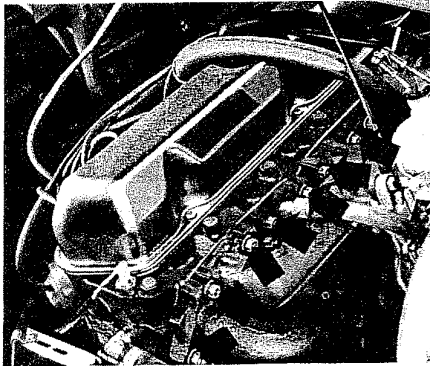
# Monthly Maintenance

## ENGINE

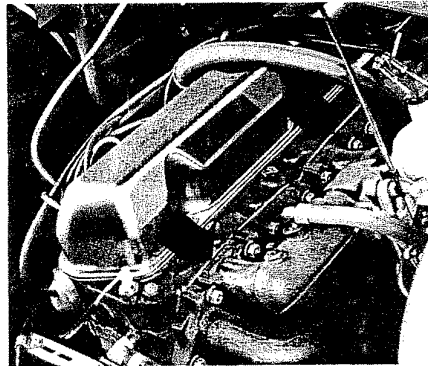
### 1 Intake manifold, exhaust manifold, exhaust pipe, silencer and tail pipe

Run the engine at approx. 3000 rev/min and check that:

- the retaining nuts on the intake and exhaust manifolds are secure and that the manifolds are in good condition
- the exhaust pipe, silencer and tail pipe are mounted securely
- there is no leakage at gaskets, joints and connections.



Retaining nuts



Gasket

### Engine (run warm)

Listen to the engine at different speeds and also when it is idling. Noises such as valve knocking, etc., must not occur.

Any adjustment work here should be done by a mechanic.

**Important! Leaking exhaust gases are dangerous.**

## 2 Radiator, cap, hoses, pipes

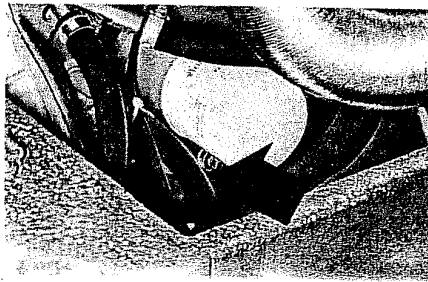
Check that:

- the radiator does not leak
- the cooling system hoses, pipes, connections and unions are not leaking
- the cooling system hoses are not cracked, scuffed or damaged by heating or oil.

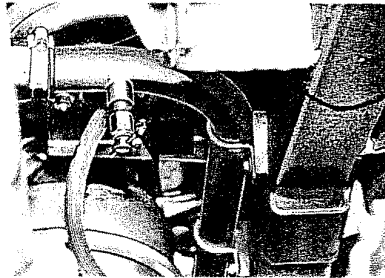
### Changing the coolant

Normally the coolant retains its properties for about two years. After that time it should be changed, preferably in the autumn. Clean the cooling system in connection with the change. Empty the cooling system as follows:

- 1 Remove the drain plug on the oil cooler
- 2 Open the drain cock on the lower radiator pipe.



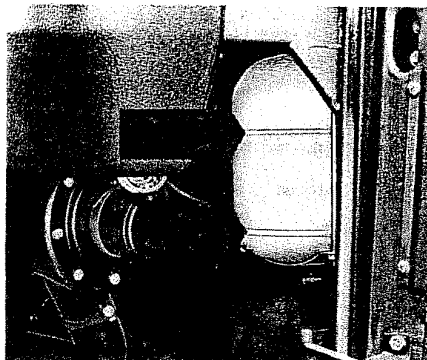
Drain plug on oil cooler



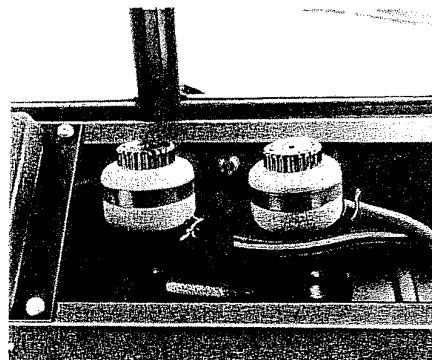
Drain cock on radiator pipe

Flush the system throughout with clean water before filling it with coolant. Fill with coolant as follows:

- 1 Fill the radiator with coolant and fit the radiator cap. Use a mixture of water and rustproofing throughout the year.
- 2 Fill the expansion tank to the Max level.
- 3 Run the engine warm and check the level in the expansion tank. Top up if necessary.



Expansion tank



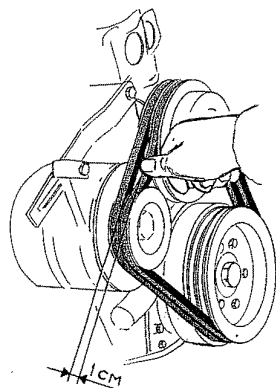
Radiator cap

### 3 Drive belts

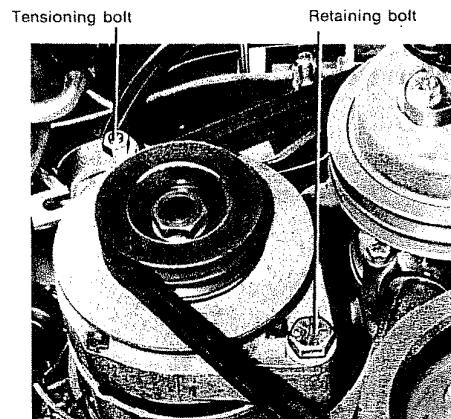
Check to make sure the drive belts are properly tensioned. They are properly tensioned when they can be depressed approx. 1 cm (3/8") under normal thumb pressure midway between the alternator and fan belt pulleys.

If necessary, tension the belts as follows:

- 1 Slacken the alternator retaining bolt.
- 2 Slacken the alternator tensioning bolt and move the alternator sufficiently to obtain proper tension on the belt.



Drive belts

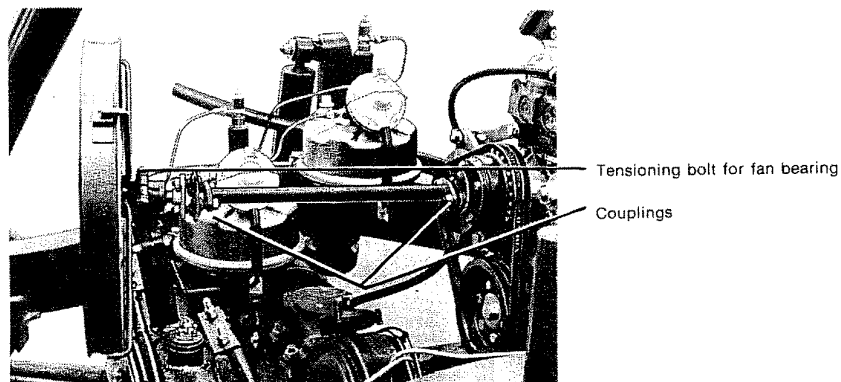


Alternator bolts

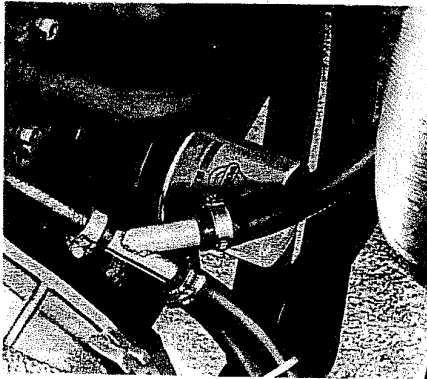
Changing belts:

- 1 Slacken the alternator tensioning bolt, and move the alternator in order to slacken the tension on the belt.
- 2 Screw apart the two couplings on the shaft between pulley and fan.
- 3 Slacken the tensioning bolt for the fan bearing and push the bearing forward so that the fan shaft and drive belts can be removed.

**Important! Always change both belts at the same time.**



Fan shaft

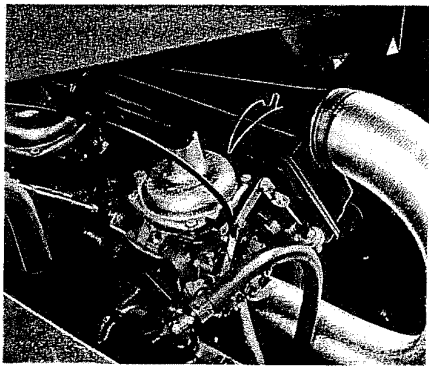


Oil filter

#### 4 Oil filter, cooler, sump, covers, lines

Check for leakage. If necessary, first clean the part in question and adjacent areas and check for leakage with the engine running.

**NOTE!** Pay particular attention the gaskets on the oil filter, oil cooler and oil sump.



Air cleaner

#### 5 Air cleaner

Make sure that the air cleaner is properly secured.

Normally the air cleaner paper insert should be changed according to the interval given in the lubricating chart.

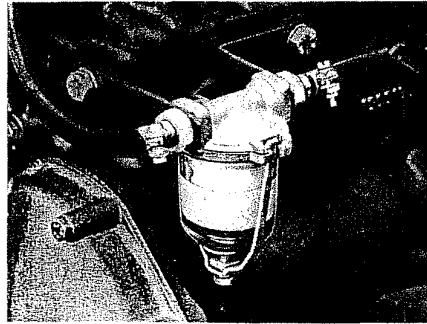
#### 6 Fuel system

Check that:

- there is no leakage at the carburettor and pipe connections
- the nuts on the carburettor are properly tightened
- the carburettor control and control links move freely, are in good condition and are lubricated.

### Fuel pump and fuel filter

Check that the fuel pump is properly mounted and that the connections are tight. Check that the fuel filter is not blocked. Clean the filter if the glass is filled with water or impurities. Do not remove the glass unless a new packing is available.



Fuel filter

### Fuel tank, cap and lines

Check that the fuel tank and lines are secured properly and are tight. Leakages will cause moist spots or drops.

## ELECTRICAL SYSTEM

### 7 Battery, cables, starter motor

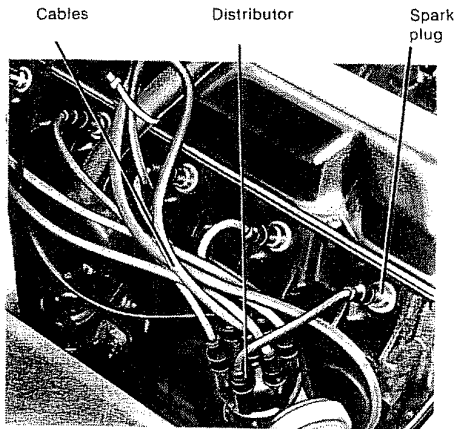
**Important! First disconnect the earth cable to avoid possible short-circuiting.**

- Clean the pole terminals and battery holder.
- Clean the battery with warm water and a brush (not a steel brush).
- Make sure that the cell covers are in good condition and that the breather holes are not blocked.
- Grease the pole terminals and the battery holder and make sure that the battery and the terminals are securely fitted.
- Check the electrolyte level which should be 5–10 mm (3/16–3/8") above the cell plates — top up with distilled water when necessary.
- Make sure that the starter motor is well-secured and that the starter-motor cables are tightened up and free from dirt, etc.

### Visible cables

Make sure that all visible cables are tightened up, that their insulation is not damaged and that the cables themselves have not been scuffed against any sharp edge. Check particularly where the cables go through holes in the body.

For other work on the electrical system, see under the section "Changing the battery" on page 29.



Ignition coil and cables

## 8 Ignition coil, distributor, cables, spark plugs

- Clean spark plugs, ignition coil, distributor and cables.
- Make sure that the ignition coil is properly fitted.
- Make sure that the cables are properly connected up and that their insulation is in good condition.

## POWER TRANSMISSION SYSTEM

### 9 Clutch with linkage system and gearboxes

Check to make sure that gears engage without grating. Check when starting off that the clutch does not grab. Check during driving to make sure that the clutch is not slipping under heavy loading.

If a noise is heard when depressing the clutch pedal, this indicates wear or damaged throw-out bearing.

If a noise is heard when the clutch pedal is released, this indicates a fault in the gearbox.

#### Gearboxes

Check the function of the gear lever by moving it to the various gear positions. It should be possible to engage here without difficulty and without any unusual noise.

### 10 Propeller shafts, universal joints, front and rear axles

- Make sure that the bolts on the flanges are securely tightened.
- Check for looseness on the universal joints and slip joints. Check this by rotating the propeller shaft in its operational direction of rotation and by jerking it up and down.
- Check that the propeller shafts are not damaged.
- Make sure that the bolting on the front and rear axles is tight.
- Check that the axles do not leak oil. With leakage, check the oil level and the plugs.
- Make sure that the retaining bolts at the wheel hub are tight.



## **BRAKE SYSTEM**

### **11 Brakes**

#### **Service brakes**

- Check and if necessary top up with brake fluid, see the section under "Lubrication", point 2.
- Check that brake lines and cylinders are not leaking.
- Check that the brake shoes do not slip on the brake drums when the brake pedal is released. (Check with a raised wheel or feel if any of the brake drums has become worn during driving.)

#### **Parking brake**

Check that the parking brake is functioning properly. It should not be necessary to apply the brake lever more than six notches. The parking brake should function satisfactorily at the 3rd-4th notch.

## **STEERING SYSTEM**

### **12 Steering gear**

- Check that the steering gear is properly secured.
- Check with the wheels pointing straight forward that there is no abnormal looseness in the steering wheel.
- Check the steering system for looseness.
- Make sure that the steering rods are not bent or deformed in any other way.

## **FRAME AND SPRINGS**

### **13 Frame, springs and shock absorbers**

*Frame.* Make sure that the frame is not cracked. Note particularly the bolting for the cross-members, the spring attachments and the towing member.

*Spring leaves, spring anchorages.* Check the anchorage of the springs. Make sure that none of the spring leaves is broken.

*Shock absorbers.* Make sure that the shock absorbers are properly tightened and do not leak oil.

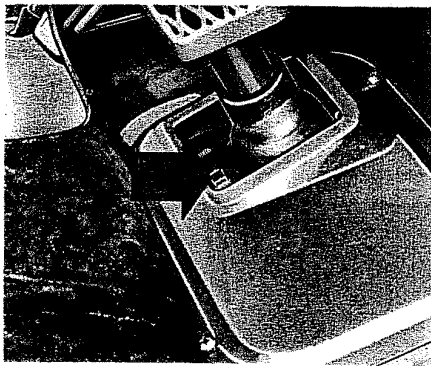
## **BODY**

### **14 Personell and cargo space, floor plates, bumpers, bonnet**

- Make sure that the inspection cover and roof cover are properly locked.
- Make sure that doors, locks, door stops, hinges and sealing strips are in good condition and are functioning properly.
- Make sure that the bumpers and mudflaps are fitted securely and are not damaged.
- Clean the vehicle and make sure that the driver's seat can be adjusted to all the positions and that it locks properly.
- Clean the instrument panel.

# Lubrication

Lubrication is important for the maintenance of your vehicle. It should never be neglected. Before greasing and oiling the various components, make sure the lubricating nipples and filler holes are clean in order to prevent dirt, etc., accompanying the lubricant. Replace faulty nipples and plugs. Make sure you use the right lubricant for a particular lubricating point and at the interval given in the lubricating chart, see page 58.

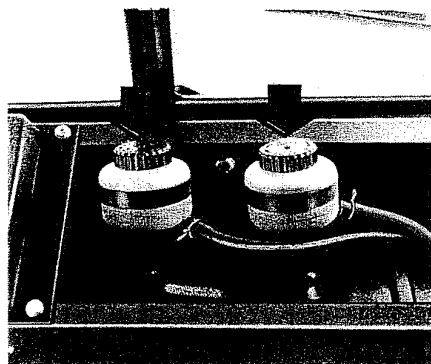


Steering gear

## 1 Steering gear

Check the oil level. It should be up to the filler plug. Top up if necessary. It is not necessary to change the oil other than after the steering gear has been overhauled.

Oil capacity: 0.6 litre (1 Imp. pint = 1.3 US pints).



Brake fluid reservoirs

## 2 Brake fluid reservoirs

Check to make sure that the brake fluid reservoirs are filled with brake fluid up to about 15–20 mm (5/8") below the cap. For topping-up use the brake fluid recommended in the lubricating chart.

### 3 Front axle carrier

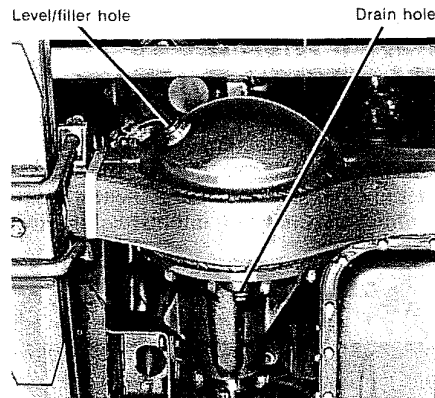
The oil should be up to the level and filler hole.

If the oil is to be changed, this should be done immediately after driving when it is still warm and viscous. Drain the old oil through the drain hole. Fill with the oil recommended in the lubricating chart.

Oil capacity: 1.50 litres (2.6 Imp. pints = 3.2 US pints).

The carrier oil-change instructions for the running-in period are to be found on page 57.

- 1 Level and filler hole
- 2 Drain hole



Front axle carrier

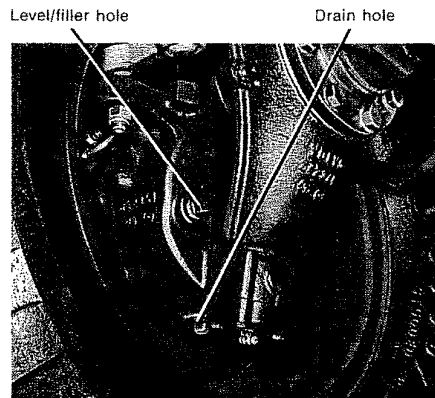
### 4 Front wheel carrier

Check to make sure that the oil is up to the level and filler hole.

If the oil is to be changed, this should be done immediately after driving, when it is still warm and viscous. Drain the old oil by removing the drain plug. Fill with the oil recommended in the lubricating chart.

Oil capacity: 0.30 litre (0.5 pint). The carrier oil-change instructions for the running-in period are to be found on page 57.

- 1 Level and filler hole
- 2 Drain hole



Front wheel carrier

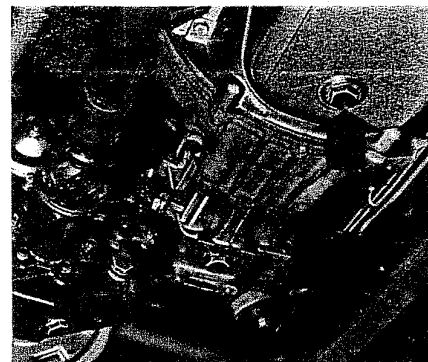
### 5 Engine

If the engine oil is to be changed, the oil should be drained immediately after driving when it is still warm and viscous. Drain the oil by removing the plug in the bottom of the engine oil sump. Fill with oil through the filler hole on the rocker arm casing.

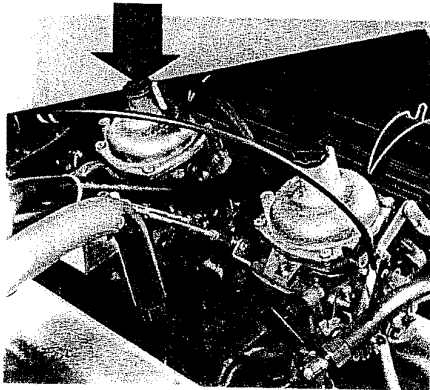
Oil capacities: 5.2 litres (9 Imp. pints = 11 US pints) without oil filter.

5.7 litres (10 Imp. pints = 12 US pints) with oil filter

The engine oil-change instructions for the running-in period are to be found on page 57.



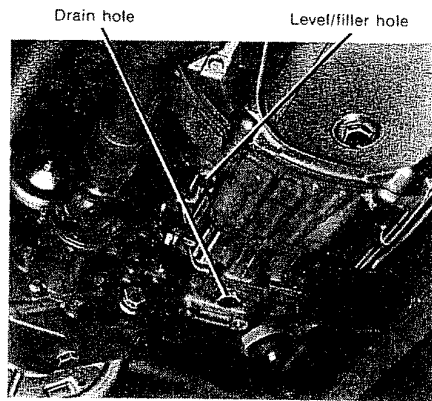
Engine drain hole



Carburetors

## 6 Carburetors

Check the oil level in the centre spindles of the carburetors. The level should reach up to about 6 mm (1/4") from the edge of the spindle. Fill with oil when necessary and according to the lubricating chart.



Gearbox

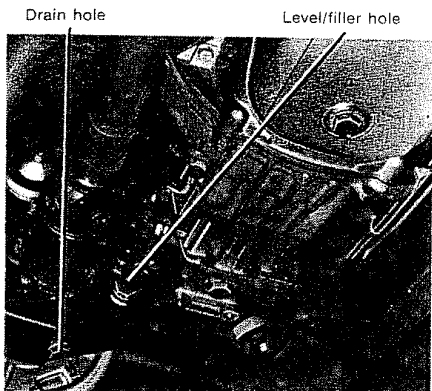
## 7 Gearbox

The oil should be up to the level and filler hole.

If the oil is to be changed, it should be done immediately after driving when it is still warm and viscous. Drain the oil by removing the plug. Fill with the oil recommended in the lubricating chart.

Oil capacity: 1.2 litres (2 Imp. pints = 2.5 US pints):

The gearbox oil-change instructions for the running-in period are to be found on page 57.



Auxiliary gearbox

## 8 Auxiliary gearbox

The oil level should be up to the level and filler hole.

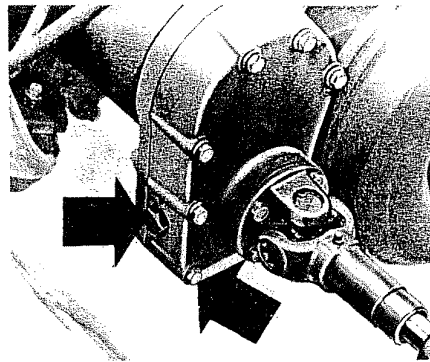
If the oil is to be changed, it should be done immediately after driving when it is still warm and viscous. Drain the oil by removing the drain plug. Fill with the oil recommended in the lubricating chart.

Oil capacity: 1.30 litres (2.3 Imp. pints = 2.7 US pints).

The auxiliary gearbox oil-change instructions for the running-in period are to be found on page 57.

### 9 Power take-off

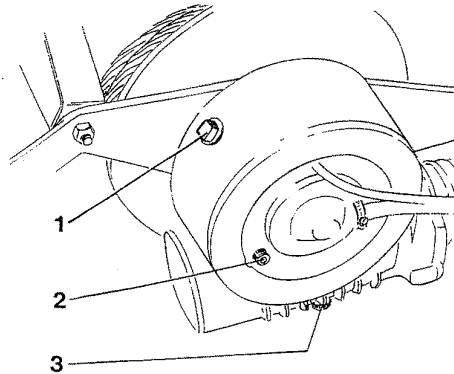
The oil should be level with the filler hole (1).  
The oil is changed by removing the plug from the drain hole (2).



Power take-off

### 10 Winch housing

The oil should be level with the level hole (2).  
The oil is changed by removing the plug from the drain hole (3). Top up by filling through the filler hole (1).

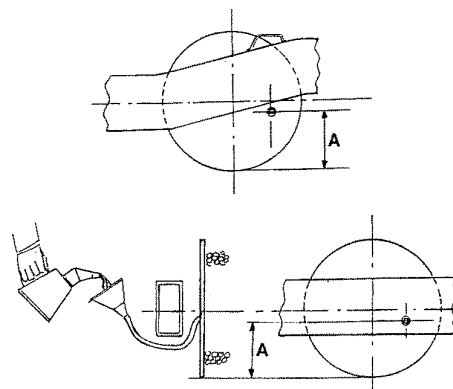


Winch housing

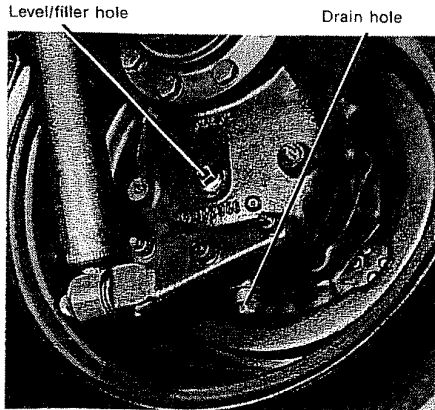
### 11 Planetary gear (in winding drum)

The oil should be level with the filler hole when it is turned to 122 mm (5") above the drum flange diameter, see picture. Since filling is difficult on a 3-axle vehicle due to the frame, a hose should be used, see picture. Oil is drained by turning the winding drum so that the plug is at the bottom.

A=122 mm (5")



Planetary gear



Rear wheel carrier

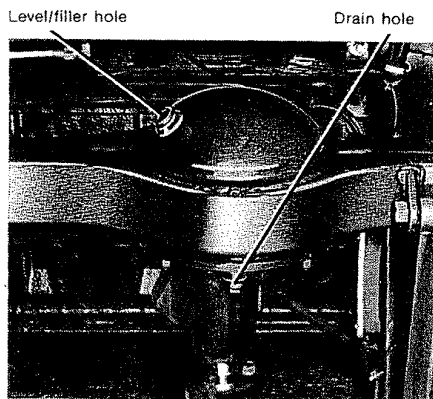
## 12 Rear wheel carrier

The oil level should be up to the level and filler hole.

If the oil is to be changed, it should be done immediately after driving when it is still warm and viscous. Drain the oil by removing the drain plug. Fill with the oil recommended in the lubricating chart.

Oil capacity: 0.4 litre (0.5 pint).

The carrier oil-change instructions for the running-in period are to be found on page 57.



Rear axle carrier

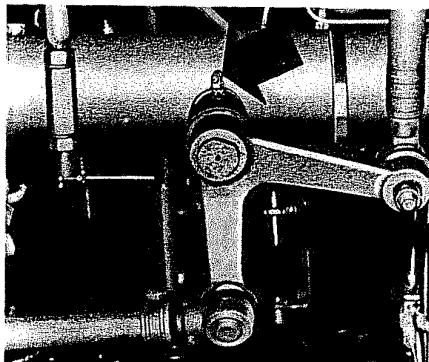
## 13 Rear axle carrier

The oil level should be up to the level and filler hole.

If the oil is to be changed, it should be done immediately after driving when it is still warm and viscous. Drain the oil by removing the drain plug. Fill with the oil recommended in the lubricating chart.

Oil capacity: 1.5 litre (2.6 Imp. pints = 3.2 US pints).

The carrier oil-change instructions for the running-in period are to be found on page 57.



Pivot arm

## 14 Pivot arm

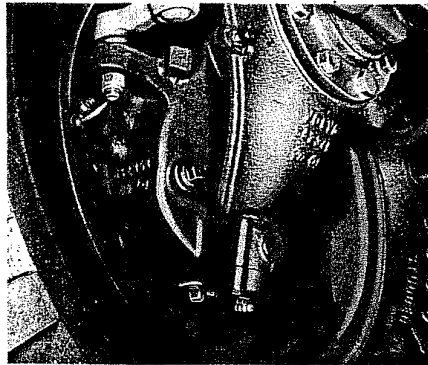
The pivot arm has a lubricating nipple.

Lubricate this nipple until grease squeezes out at the lower shaft end.

Greasing is made easier by turning the steering wheel at the same time.

### 15 Lower king pin joint

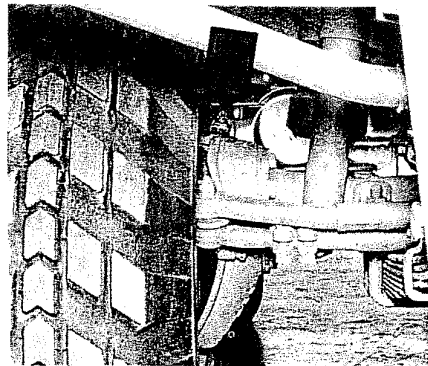
The lower king pin joint has a lubricating nipple. Lubricate this nipple until grease squeezes out.



Lower king pin joint

### 16 Upper king pin joint

The upper king pin joint has a lubricating nipple. Lubricate this nipple until grease squeezes out.

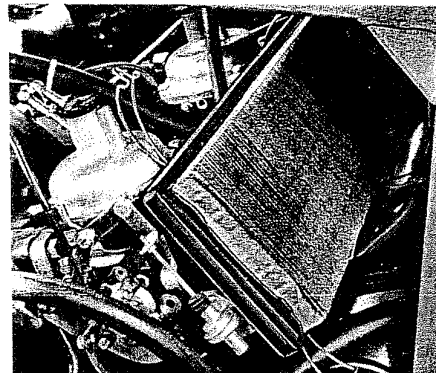


Upper king pin joint

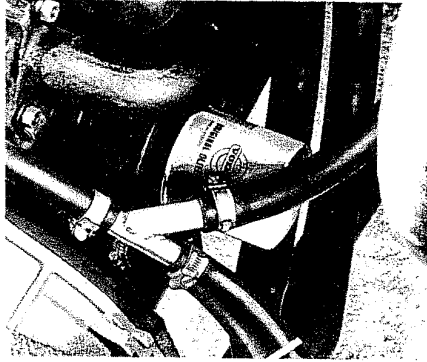
### 17 Air cleaner

To replace the cleaner insert undo the four clamps securing the air cleaner cover. Remove the cover and change the paper insert.

Make sure that the cover is properly secured after this operation.



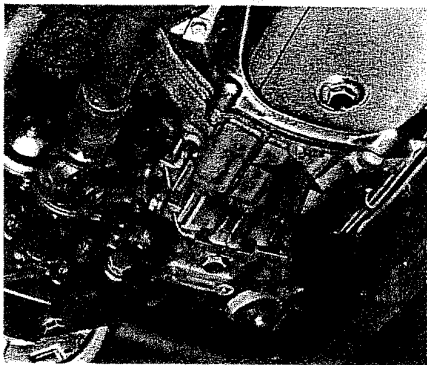
Air cleaner



Oil filter

### 18 Oil filter

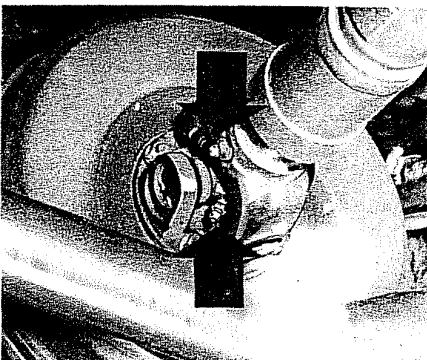
Before replacing the oil filter, clean round it to remove any dirt which could get into the lubricating system when the filter is removed. Use the special tool intended for removing the filter. Place a vessel underneath to collect the oil which runs out. Moisten the gasket on the new filter with oil. Screw on the filter tight by hand until it seals against the block. When the engine has been on for about 5 mins., check the filter for leakage.



Clutch casing

### 19 Clutch casing

Drain the oil in the clutch casing each time the engine oil is changed.



Propeller shaft spline joints and universal joints

### 20 Propeller shaft spline joints

These joints have two lubricating nipples, one on each propeller shaft.

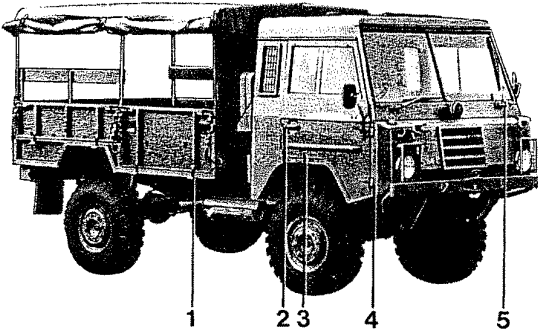
### 21 Universal joints

Each universal joint has four lubricating nipples. Lubricate these nipples until grease squeezes out at all the four bearing shells. If grease does not squeeze out, rotate the propeller shaft.



**22 Joints, links, hinges, locks**

<b>Lubricating points</b>	<b>Number</b>
1 Hinges	
2 Striker plates	2
3 Seat rails	4
4 Door hinges	4
5 Windscreen wipers, shafts	2



Joints, links, hinges, locks

## **RUNNING-IN INSTRUCTIONS**

When the vehicle is new, it should be treated with particular care. For it is during this first period, what we call the "running-in period", that all the vital parts of the vehicle such as the engine, gearboxes, front and rear axle carriers, wheels, etc., are run-in.

The following table indicates the maximum permitted speeds for the different gears during running-in:

<b>C 303</b>	<b>Low-speed range</b>	<b>High-speed range</b>
1st gear	10 km/h ( 6 mile/h)	24 km/h (15 mile/h)
2nd gear	16 km/h (10 mile/h)	40 km/h (25 mile/h)
3rd gear	25 km/h (16 mile/h)	60 km/h (38 mile/h)
4th gear	36 km/h (22 mile/h)	85 km/h (53 mile/h)

<b>C 304 and C 306</b>		
1 st gear	8 km/h ( 5 mile/h)	20 km/h (12 mile/h)
2nd gear	12 km/h ( 8 mile/h)	32 km/h (20 mile/h)
3rd gear	20 km/h (12 mile/h)	58 km/h (34 mile/h)
4th gear	28 km/h (18 mile/h)	68 km/h (40 mile/h)

### **CHANGING THE ENGINE OIL**

The oil in a new or recently overhauled engine should be changed for the first time after 2500 km (1500 miles), and the second time after 5000 km (3000 miles), and thereafter according to the intervals given in the lubricating chart.

### **CHANGING THE GEARBOX OIL**

Change the oil in a new or recently overhauled gearbox for the first time after 2500 km (1500 miles). Thereafter change the oil according to the intervals given in the lubricating chart.

### **CHANGING THE AUXILIARY GEARBOX OIL**

Change the oil in a new or recently overhauled auxiliary gearbox for the first time after 2500 km (1500 miles). Thereafter change the oil according to the intervals given in the lubricating chart.

### **CHANGING THE REAR AND FRONT AXLE CARRIER OIL**

Change the oil in a new or recently conditioned front or rear axle carrier for the first time after 2500 km (1500 miles). Thereafter change the oil according to the intervals given in the lubricating chart.

### **CHANGING THE REAR AND FRONT WHEEL CARRIER OIL**

Change the oil in a new or recently overhauled wheel carrier for the first time after 2500 km (1500 miles). Thereafter change the oil according to the intervals given in the lubricating chart.

### LUBRICATING CHART C 3-SERIES









Nr.	Lubricating point	Num-ber	Interval		Interval	Interval		Num-ber	Lubricating point	Nr.
			Every 5 000 km*	Every 30 000 km**		Every 30 000 km**	Every 5 000 km*			
					*) 3 000 miles or at least every 6 months **) 18 000 miles or at least once a year					
1	Steering gear	1					1	Intermediate lever	14	
2	Brake fluid container	2					2	Lower steering knuckle joint	15	
3	Front differential carrier	1					2	Upper steering knuckle joint	16	
4	Front wheel carrier	2					1	Air cleaner. Note 3	17	
5	Engine. Note 1	1					1	Oil filter. Note 4	18	
6	Carburetors. Note 2	2					1	Clutch casing. Note 5	19	
7	Gearbox	1					3	Slip joint	20	
8	Auxiliary gearbox	1					6	Universal joint	21	
9	Power take-off	1								
10	Winsch housing	1								
11	Planetary gear (in winding drum)	1								
12	Rear wheel carrier	2								
13	Rear differential carrier	1						Joints, links, hinges, locks	22	

#### Additional for the 3-axle vehicle

13	Rear differential carrier	2					2	Slip joint	21
12	Rear wheel carrier	1					1	Universal joint	20

# INSTRUCTIONS FOR LUBRICATING CHART

## SYMBOLS

-  **ENGINE OIL**  
 Quality: API Service SE  
 Viscosity: SAE 20 W/40 or SAE 30
-  **GEARBOX OIL**  
 Quality: API-GL-1  
 Viscosity: SAE 85 W/90 or SAE 80/90  
 or Engine oil SAE 40
-  **FINAL DRIVE OIL**  
 Quality: API-GL-5 or MIL-L-2105 B  
 Viscosity: SAE 90 or SAE 80/90
-  **AUTOMATIC TRANSMISSION FLUID**
-  **ENGINE OIL, Oil can**
-  **BRAKE FLUID**  
 Grade: SAE J 1703 or DOT 3
-  **GREASE ON LITHIUM BASE** with  
 EP-additive and consistency NLG 1  
 No. 2
- K CHECK**
- B REPLACE**
-  **SPECIALLY ACTION**

## OIL CAPACITIES

Engine, incl. oil filter	5.7 litres (10 pints)
excl. oil filter	5.2 litres (9 pints)
Gearbox	1.2 litres (2 pints)
Auxiliary gearbox	1.3 litres (2.3 pints)
Front differential carrier	1.5 litres (2.6 pints)
Rear differential carrier	1.5 litres (2.6 pints)
Front wheel carrier	0.3 litre (0.5 pints)
Rear wheel carrier	0.4 litre (0.7 pint)
Steering gear	0.5 litre (1 pint)
Power take-off	0.2 litre (0.4 pint)
Winch housing	1.2 litres (2 pints)
Planetary gear	0.6 litre (1 pint)

## NOTES

- Note 1 Check the oil level daily before starting.  
 Note 2 Check the oil level in the centre spindles.  
 Note 3 Change the paper insert.  
 Note 4 Replace the cleaner at every other oil change.  
 Note 5 Drain the clutch casing at every other oil change.

**LUBRICATING CHART C 3-SERIES**







**AB VOLVO • GÖTEBORG, SWEDEN**

TP 1218/1.3.000.6.75 (ENGELSKA)