

# SERVICE MANUAL

CARS AND VANS

P 44403/4. (9)

Part 13

SPECIFICATIONS

*Export Service Department*

AKTIEBOLAGET

**VOLVO**

GÖTEBORG . SWEDEN

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## IMPORTANT

N.B. To avoid beforehand any possible confusion which may arise concerning the points and commas in the decimal figures in this book, we should like to point out that the CONTINENTAL system is used and not the English and American, i.e.

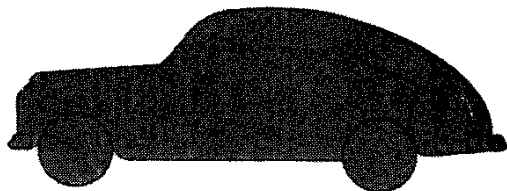
read	0,8 = 8/10	0,08 = 8/100
	1,000 = One	1.000 = One thousand

However, with typical English measurements such as inches, the ENGLISH system is used, i.e. .004" and not 0,004"

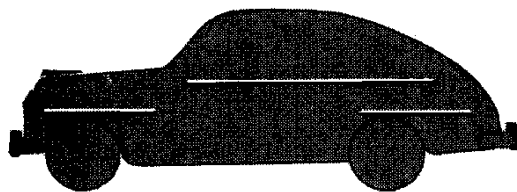
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## TYPE DESIGNATIONS

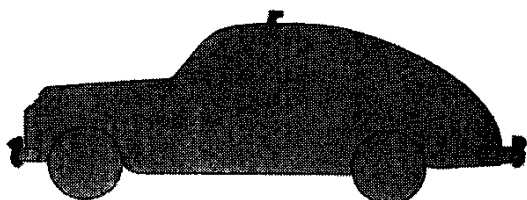
These specifications concern Volvo saloon car PV 444. Type designations, models and distinguishing marks are shown in the following silhouettes.



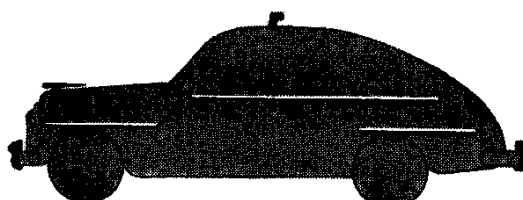
*Fig. 1.*  
P 44403, Chassis Nos. 1—12504



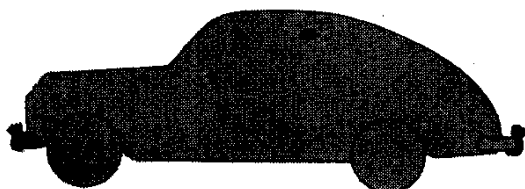
*Fig. 2.*  
P 44404, Chassis Nos. 1—12504  
(dove-grey enamel, bonnet emblem  
and chromed strips)



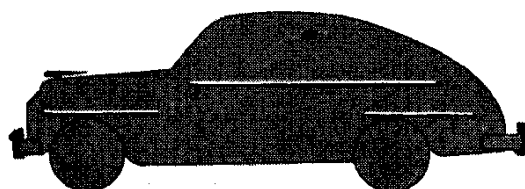
*Fig. 3.*  
P 44403, Chassis Nos. 12505—28004  
P 44403, Chassis Nos. 28005—37004  
(early prod.)



*Fig. 4.*  
P 44404, Chassis Nos. 12505—28004  
(dove-grey enamel, bonnet emblem  
and chromed strips),  
P 44404, Chassis Nos. 28005—37004  
(early prod.)  
(bonnet emblem and chromed strips)



*Fig. 5.*  
P 44403, Chassis Nos. 12505—28004  
with direction indicators fitted on sides  
P 44403, Chassis Nos. 28005—37004  
(late prod.)  
P 44403, Chassis Nos. 37005—68955



*Fig. 6.*  
P 44404, Chassis Nos. 12505—28004  
(dove-grey enamel, bonnet emblem  
and chromed strips),  
with direction indicators fitted on sides  
P 44404 Chassis Nos. 28005—37004  
(late prod.)  
(bonnet emblem and chromed strips)  
P 44404, Chassis Nos. 37005—68955  
(bonnet emblem and chromed strips)

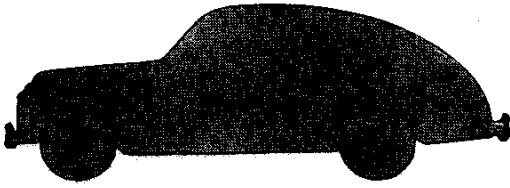


Fig. 7.

P 44403, Chassis Nos. 68956—131917

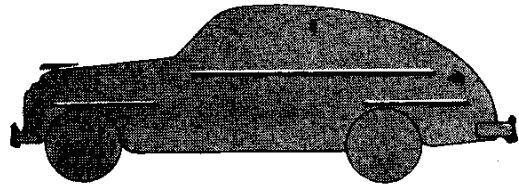


Fig. 8.

P 44404, Chassis Nos. 68956—about 98000  
(grey or red enamel, bonnet emblem and chromed strips)

P 44404, Chassis Nos. about 98000—131917  
(grey, midnight-blue, riviera-blue or red enamel, bonnet emblem and chromed strips)

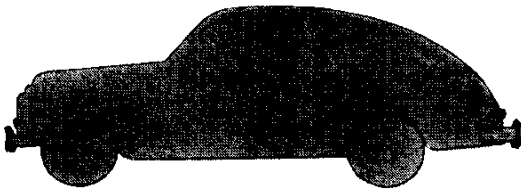


Fig. 9.

P 44403, Chassis Nos. 131918—onwards

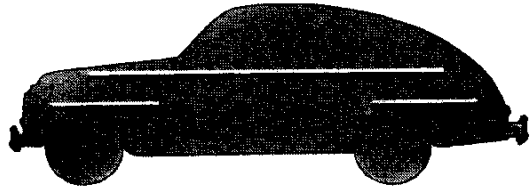


Fig. 10.

P 44404, Chassis Nos. 131918—onwards  
(California white, grey, midnight blue, Riviera blue or red enamel; chromed strips)

Chassis number location:

Body number location:

Engine number location:

Engine part number:

Gearbox number:

Rear axle number:

Rear axle ratios:

Plate under bonnet at right-hand side of engine (3).

Plate under bonnet at left-hand side of engine (5).

Plate on right-hand side of engine above starter motor (1).

On the same plate as the engine no. (1)

Stamped on plate attached to the left-hand side of the gearbox (2).

Stamped on plate attached to rear axle housing (4).

(Early production).

Stamped on the same plate as the rear axle no. (4)

(Early production).

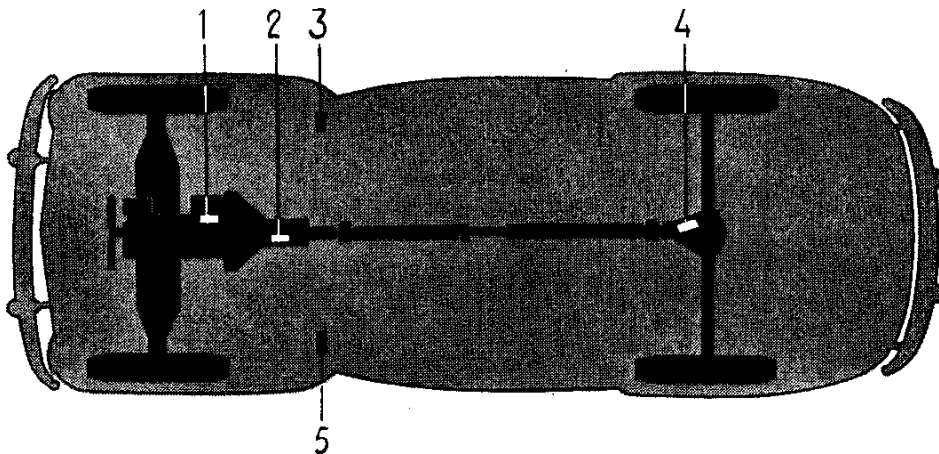


Fig. 11. Locations of type designation and part nos.

## GENERAL INFORMATION

Weights:	Curb weight (with driver)	Unladen weight	Max. wheel pressure
P 44403, Chassis Nos. 1—12504 .....	995 kg (2193 lb.)	880 kg (1940 lb.)	365 kg (804 lb.)
P 44404, Chassis Nos. 1—12504 .....	1040 kg (2292 lb.)	925 kg (2039 lb.)	380 kg (838 lb.)
P 44403, Chassis Nos. 12505—20004 .....	1040 kg (2292 lb.)	925 kg (2039 lb.)	380 kg (838 lb.)
P 44404, Chassis Nos. 12505—20004 .....	1040 kg (2292 lb.)	925 kg (2039 lb.)	380 kg (838 lb.)
P 44403, Chassis Nos. 20005—28004 .....	1020 kg (2248 lb.)	905 kg (1995 lb.)	375 kg (827 lb.)
P 44404, Chassis Nos. 20005—28004 .....	1030 kg (2270 lb.)	915 kg (2017 lb.)	380 kg (838 lb.)
P 44403, Chassis Nos. 28005—37004 .....	1040 kg (2292 lb.)	925 kg (2039 lb.)	375 kg (827 lb.)
P 44404, Chassis Nos. 28005—37004 .....	1050 kg (2314 lb.)	935 kg (2060 lb.)	375 kg (827 lb.)
P 44403, Chassis Nos. 37005—68955 .....	1025 kg (2259 lb.)	910 kg (2006 lb.)	375 kg (827 lb.)
P 44404, Chassis Nos. 37005—68955 .....	1035 kg (2281 lb.)	920 kg (2027 lb.)	375 kg (827 lb.)
P 44403, Chassis Nos. 68956—about 98000 .....	1050 kg (2314 lb.)	935 kg (2060 lb.)	375 kg (827 lb.)
P 44404, Chassis Nos. about 98000—131917 .....	1050 kg (2314 lb.)	935 kg (2060 lb.)	375 kg (827 lb.)
P 44403, Chassis Nos. 131918—onwards .....	1040 kg (2292 lb.)	925 kg (2039 lb.)	375 kg (827 lb.)
P 44404, Chassis Nos. 131918—onwards .....	1040 kg (2292 lb.)	925 kg (2039 lb.)	375 kg (827 lb.)
Wheelbase .....		2600 mm (102½")	

	Chassis Nos.				
	1— 12504	12505— 20004	20005— 37004	37005— 68955	68956— onwards
<b>Track:</b>					
Front .....	1280 mm (50½")	1280 mm (50½")	1295 mm (51")	1295 mm (51")	1295 mm (51")
Rear .....	1300 mm (51¼")	1300 mm (51¼")	1315 mm (51¾")	1315 mm (51¾")	1315 mm (51¾")
Overall length .....	4365 mm (172")	4450 mm (175")	4500 mm (177")	4500 mm (177")	4500 mm (177")
Overall width .....	1580 mm (62")	1580 mm (62")	1580 mm (62")	1580 mm (62")	1580 mm (62")
Overall height, unladen, with side-mounted direction indicators .....	1560 mm (61½")	1560 mm (61½")	1560 mm (61½")	1560 mm (61½")	1560 mm (61½")
Overall height, unladen, with roof-mounted direction indicators .....	—	1650 mm (65")	1650 mm (65")	—	—
Ground clearance, laden .....	220 mm (8½")	200 mm (8")	200 mm (8")	200 mm (8")	200 mm (8")
Turning circle diam. (measured on centre of tread) .....	10 m (394")	10 m (394")	10.2 m (401½")	10.2 m (401½")	10.8 m (425")

## ENGINE

### General

Type, up to chassis no. 131917 .....	B 4 B			
"  from chassis no. 131918 onwards .....	B 16 A			
Type designation .....	B 4 B	B 4 B	B 4 B	B 16 A
Engine part no. (various productions) .....	495300	495301	495302	495383
Output, b.h.p. at r.p.m. ....	40/3800	44/4000	51/4500	60/4500
Max. torque, kgm (lb.ft.) at r.p.m. ....	9.5 (69) /2200	9.5 (69) /2200	10.0 (72½) /2500	11.3 (81) /2500
Compression pressure (warm engine) when turning over with starter motor, 200 r.p.m. ....	8.1—8.4 kg/cm <sup>2</sup> p.s.i.	8.1—8.4 115—120	9.2—9.6 130—136	9.8—10. 139—14
Compression ratio .....	6.5: 1	6.5: 1	7.3: 1	7.4: 1
Common data:	B 4 B		B 16 A	
Number of cylinders .....	4		4	
Bore .....	75 mm (2.953")		79.37 mm (3.125")	
Stroke .....	80 mm (3.150")		80 mm (3.150")	
Displacement .....	1.4 litres		1.6 litres	
Weight .....	about 145 kg (319½ lb.)		about 150 kg (330 lb)	

### Cylinder block

Material .....	B 4 B	B 16 A
The cylinder bores are machined direct into the block		Special-alloy cast-iron
Bore, standard .....	75 mm (2.953")	79.37 mm (3.125")
"  .010" oversize .....	75.25 mm (2.963")	79.62 mm (3.134")
"  .020" oversize .....	75.51 mm (2.973")	79.88 mm (3.145")
"  .030" oversize .....	75.76 mm (2.983")	80.13 mm (3.155")
"  .040" oversize .....	76.02 mm (2.993")	80.39 mm (3.165")
"  .050" oversize .....	76.27 mm (3.003")	80.64 mm (3.175")

Concerning the letter stamped on the cylinder bore see Part 1, "Fitting of pistons".

### Pistons

Material .....	Light-alloy	Light-alloy
Weight .....	355±3 grammes (12.67±.107 oz.)	407±3 grammes (14.35±.107 oz.)
Permissible weight difference for pistons in the same engine .....	6 grammes (.214 oz.)	6 grammes (.214 oz.)
Total height .....	86 mm (3.386")	86 mm (3.386")
Height from gudgeon pin centre to piston top .....	46 mm (1.81")	46 mm (1.81")
Piston clearance .....	0.04—0.06 mm (.016"—.024")	0.03—0.05 mm (.012"—.02")
Diameter, standard, measured at right angles to gudgeon pin at bottom end of piston .....	74.95 mm (2.9508")	79.33 mm (3.123")
.010" oversize .....	75.20 mm (2.9606")	79.58 mm (3.133")
.020" oversize .....	75.46 mm (2.9709")	79.84 mm (3.144")
.030" oversize .....	75.71 mm (2.9807")	80.09 mm (3.153")
.040" oversize .....	75.97 mm (2.9909")	80.35 mm (3.164")
.050" oversize .....	76.22 mm (3.0008")	80.60 mm (3.173")

Concerning the letter stamped on the cylinder bore see Part 1, "Fitting of pistons".

## Piston rings

Piston ring gap measured at ring opening .....  
 Piston ring oversizes .....

**B 4 B**

**B 16 A**

0.25—0.50 mm  
 (.010"—.020")  
 .010"  
 .020"  
 .030"  
 .040"  
 .050"

## Compression rings

Chromed upper ring  
 Number of rings per piston .....  
 Height .....  
 Piston ring clearance in groove .....

**2**

**2**

2.5 mm (.098")  
 0.051—0.088 mm  
 (.0020—.0035")

1.97 mm (.078")  
 0.068—0.079 mm  
 (.0027—.0031")

**B 4 B** Ring No. 1 from piston top: chamfered inner edge,  
 turned up  
 Ring No. 2 from piston top: chamfered outer edge,  
 turned up  
**B 16 A** Both rings have chamfered inner edges. These are  
 turned upwards.

## Oil rings

Number on each piston .....  
 Height .....  
 Piston ring clearance in groove .....

**1**

**1**

4.5 mm (.177")  
 0.025—0.064 mm  
 (.0010—.0025")

4.73 mm (.186")  
 0.045—0.073  
 (.0018—.0029")

## Gudgeon pins

Fully-floating. Circlips at both ends in piston.  
 Fit:

In connecting rod .....  
 In piston .....  
 Diameter, standard .....  
     0.05 mm oversize .....  
     0.10 mm    " .....  
     0.20 mm    " .....

Close running fit  
 Slide fit  
 19 mm (.748")  
 19.05 mm (.750")  
 19.10 mm (.752")  
 19.20 mm (.756")

## Cylinder head

Height, measured from cylinder head contact surface to  
 cylinder head nut level .....

Part No. 495300: 100 mm (3.937")  
 Part No. 495301: 100 mm (3.937")  
 Part No. 495302: 98 mm (3.858")

**99 mm**  
**(3.898")**

## Crankshaft

(Replaceable bearing shells for main and big-end  
 bearings)

Crankshaft axial clearance .....  
 Main bearings, radial clearance .....

0.01—0.10 mm  
 (.0004—.004")  
 0.014—0.064 mm  
 (.0005—.0025")

## Main bearings

### Main bearing journals

Diameter, standard .....  
     undersize .010" .....

53.950—53.960 mm  
 (2.1240—2.1244")  
 53.696—53.706 mm  
 (2.1140—2.1144")

**B 4 B**

**B 16 A**

Diameter, undersize .020" .....	53.442—53.452 mm (2.1040—2.1044")
"    .030" .....	53.188—53.198 mm (2.0940—2.0944")
"    .040" .....	52.934—52.944 mm (2.0840—2.0844")
<b>Main bearing journal width (distance between webs):</b>	
Standard .....	38.935—38.975 mm (1.5329—1.5344")
Oversize 0.1 mm (undersize shell .010") .....	39.035—39.075 mm (1.5369—1.5384")
0.2 mm (    "    "    .020") .....	39.135—39.175 mm (1.5407—1.5423")
0.3 mm (    "    "    .030") .....	39.235—39.275 mm (1.5447—1.5463")
0.4 mm (    "    "    .040") .....	39.335—39.375 mm (1.5486—1.5502")

**Main bearing shells**

Thickness, standard .....	1.911—1.918 mm (.0752—0.0755")
undersize .010" .....	2.038—2.045 mm (.0802—0.0805")
"    .020" .....	2.165—2.172 mm (.0852—0.0855")
"    .030" .....	2.292—2.299 mm (.0902—0.0905")
"    .040" .....	2.419—2.426 mm (.0952—0.0955")

**Big-end bearings**

**Big-end bearing journals**

Big-end bearings, radial clearance .....	0.013—0.049 mm (.0005—0.0019")	0.051—0.091 mm (.0021—0.0036")
Bearing seat width .....	32.900—33.000 mm (1.2953—1.2992")	
Diameter, standard .....	47.589—47.600 mm (1.8736—1.8740")	
undersize .010" .....	47.335—47.347 mm (1.8636—1.8640")	
"    .020" .....	47.081—47.092 mm (1.8536—1.8540")	
"    .030" .....	46.827—46.838 mm (1.8436—1.8440")	
"    .040" .....	46.573—46.584 mm (1.8336—1.8340")	

**Big-end bearing shells**

Thickness, standard .....	1.581—1.587 mm (.0622—0.0625")	1.560—1.568 mm (.0611—0.0614")
undersize .010" .....	1.708—1.714 mm (.0672—0.0675")	1.687—1.695 mm (.0645—0.0657")
"    .020" .....	1.835—1.841 mm (.0722—0.0725")	1.814—1.822 mm (.0715—0.0719")
"    .030" .....	1.962—1.968 mm (.0772—0.0775")	1.941—1.949 mm (.0756—0.0759")
"    .040" .....	2.089—2.095 mm (.0822—0.0825")	2.068—2.076 mm (.0817—0.0820")

## Connecting rods

Marked 1—4 from the camshaft. Classified A—D to show the weight classification. Only connecting rods with the same weight classification may be fitted in any one engine.

	B 4 B	B 16 A
Axial play at crankshaft . . . . .	0.15—0.35 mm (.0059—.0138")	
Length, centre-centre . . . . .	150±0,1 mm (5.905±.0039")	
Weight, classification A . . . . .	528—558 grammes (18.62—19.6802 oz.)	578—608 grammes (20.35—21.48 oz.)
"    B . . . . .	558—588 grammes (19.68—20.7402 oz.)	608—638 grammes (21.48—22.54 oz.)
"    C . . . . .	588—618 grammes (20.74—21.8002 oz.)	638—668 grammes (22.54—23.60 oz.)
"    D . . . . .	618—648 grammes (21.80—22.8502 oz.)	668—698 grammes (23.60—24.65 oz.)

## Flywheel

Permissible axial throw . . . . .	0.20 mm (.79")
Ring gear (chamfer facing front) . . . . .	116 teeth

## Flywheel housing

Permissible axial throw, max. . . . .	0.08 mm (.0031")
radial throw, max. . . . .	0.15 mm (.0059")

## Camshaft

Drive . . . . .	Gear, fibre gear on camshaft	
Number of bearings . . . . .	3	
Front bearing journal, diameter . . . . .	46.975—47.000 mm (1.8494—1.8504")	
Centre bearing journal, diameter . . . . .	42.975—43.000 mm (1.6919—1.6929")	
Rear bearing journal, diameter . . . . .	36.975—37.000 mm (1.4557—1.4567")	
Radial clearance . . . . .	0.025—0.075 mm (.0010—.0030")	
Clearance for camshaft setting examination (cold engine):		
engine part No. 495300 . . . . .	0.31 mm (.0122")	1.1 mm (.0429")
495301 . . . . .	0.60 mm (.0236")	
495302 . . . . .	1.1 mm (.0433")	
Inlet valve should open at engine part No. 495300 . . . . .	5° B.T.D.C.	10° A.T.D.C.
495301 . . . . .	5° B.T.D.C.	
495302 . . . . .	10° A.T.D.C.	

## Camshaft bearings

Front bearing, diameter . . . . .	47.025—47.050 mm (1.8514—1.8524")
Centre bearing, diameter . . . . .	43.025—43.050 mm (1.6939—1.6949")
Rear bearing, diameter . . . . .	37.025—37.050 mm (1.4577—1.4587")



Engine with part No. 495302:	<b>B 4 B</b>	<b>B 16 A</b>
Spring coloured blue. Lower spring seat washer not used.		
Length, unloaded . . . . .	45 mm (1.772")	
with 25.5 ± 2 kg (56 ± 4½ lb.) loading . . . . .	39 mm (1.535")	
with 66 ± 3.5 kg (145½ ± 7¾ lb.) loading . . . . .	30.5 mm (1.201")	
Length, unloaded . . . . .		45 mm (1.772")
with 25.5 ± 2 kg (56 ± 4½ lb.) loading . . . . .		39 mm (1.535")
with 66 ± 3.5 kg (145½ ± 7¾ lb.) loading . . . . .		30.5 mm (1.201")

### Lubricating system

Oil capacity in crankcase . . . . .	3.25 litre (6 Imp. pints)	2.75 litre (4¾ Imp. pints)
Oil capacity incl. oil filter . . . . .	3.75 litre (6½ Imp. pints)	3.5 litre (6¼ Imp. pints)
Oil pressure, hot engine, 2000 rpm (about 50 kph (30 mph) in 3rd gear) . . . . .	1.5—2.5 kg/cm <sup>2</sup> (21½—35½ p.s.i.)	2.5—3.5 kg/cm <sup>2</sup> (35.6—49.8 p.s.i.)
Lubricant, type . . . . .	Engine oil	
quality . . . . .	Service MM, MS	
viscosity, summer . . . . .	SAE 20	
winter . . . . .	SAE 10 W	
Lubricating oil pump, type . . . . .	Gear	
number of teeth . . . . .	10	
axial clearance . . . . .	0.02—0.10 mm (.0008—.004")	
radial clearance . . . . .	0.00—0.10 mm (0—.004")	
tooth flank clearance . . . . .	0.15—0.35 mm (.0059—.0138")	
Relief valve spring:		
Length, unloaded . . . . .	36 ± 0.5 mm (1.417 ± .0197")	40 ± 0.5 mm (1.575 ± .0197")
loaded with kg/lb . . . . .	32 mm/2 ± 0.2 kg (1.26"/4½ ± .44 lb.)	34 mm/2.5—0.2 kg (1.34"/5.51 ± .44 lb.)

### Fuel system

Fuel pump, type . . . . .	AC diaphragm pump
Fuel pressure . . . . .	Min. 0.14 kg/cm <sup>2</sup> (2 p.s.i.) Max. 0.25 kg/cm <sup>2</sup> (3.5 p.s.i.)
Pumping capacity when idling (min. 300 r.p.m.) . . . . .	0.5 litre/min. (⅞ Imp. pint/min.)
Fuel tank, capacity . . . . .	35 litres (7¾ Imp. galls.)
Fuel gauge, type . . . . .	Electric

### Carburettor, B4B Engine

#### Carter

Model designation, early production . . . . .	W-O 618 S	
late production . . . . .	W-O 618 SA	
	Designation	Data
Venturi, diameter . . . . .		23 mm (.91")
Metering rod jet . . . . .	120—151 S	dim. 0.070"
Needle, fuel . . . . .	75—590	dim. 0.0590"—0.0532" (two-stage)
Needle for light Bentlyl . . . . .	75—697	
Needle for lean mixture . . . . .	75—676	
Main jet, WO 618 S . . . . .	12—255	dim. 0.096"
WO 618 SA . . . . .	12—323	dim. 0.096"
Acceleration jet . . . . .	48—141	dim. 0.024"

	Designation	Data
Idling jet .....	11—186 S	dim. 0.029"
Needle valve .....	25—93 S	
Setting tool for fuel needle .....	T 109—26	length 2.718"
Wire gauge (for richer fuel mixture) .....	T 109—44	diam. 0.015"
Float level (measurement between cover and upper side of float. Turn the cover upside down with the gasket removed) .....		9.5 mm (.474")
Acceleration pump stroke .....		9/64" (3.5 mm)
Idling speed (warm engine) .....		400—600 r.p.m.

**Zenith**

Model designation, early production .....	Zenith 30 VIG-9/C 1412	
late production .....	Zenith 30 VIG-9/C 1412 B	
	Designation	Data
Venturi .....	25	
Main jet, standard, early production .....	102	1.02 mm (.040")
late production .....	107	1.07 mm (.042")
lean mixture, early production .....	95	0.95 mm (.037")
late production .....	100	1.00 mm (.030")
Compensating jet, standard .....	70	0.70 mm (.028")
rich mixture (Bentyl) .....	75	0.75 mm (.030")
Idling jet .....	50	0.50 mm (.020")
Acceleration jet .....	50	0.50 mm (.020")
Air jet for partial acceleration, early production .....	2.0	
late production .....	2.8	
Bentyl .....	2.4	
Air jet for full acceleration .....	1.8	
Float valve .....	1.5	
Float valve gasket, thickness .....		2 mm (.075")
Idling speed .....		400—600 r.p.m.

**Carburetter, B16A Engine**

Model designation .....	Zenith 34 VN	
	Designation	Data
Venturi .....	27	
Main jet, standard .....	97	0.97 mm (.0382")
Bentyl .....	102	1.02 mm (.0469")
Compensating jet .....	97	0.97 mm (.0382")
Idling jet .....	50	0.50 mm (.0197")
Air jet for idling .....	50	0.50 mm (.0197")
Acceleration jet .....	40	0.40 mm (.0157")
Float valve .....	1.75	
Float valve gasket, thickness .....		1.0 mm (.039")
Fuel level, when running .....		18 mm (.709") below top of float chamber
Idling speed .....		400—600 r.p.m.

**Cooling system**

Type .....	Pressure
Capacity .....	about 8 litres (1 <sup>3</sup> / <sub>4</sub> Imp. galls.)
Radiator cap valve opens at .....	0.23—0.30 kg/cm <sup>2</sup> pressure (3 <sup>1</sup> / <sub>4</sub> —4 <sup>1</sup> / <sub>4</sub> p.s.i.)
Thermostat:	
Rated .....	165
Type .....	Balanced = is not influenced by water pump pressure



Clutch springs, length:	
B4B, Unloaded .....	58 mm (2.28")
Loaded with $77 \pm 2.5$ kg ( $170 \pm 5\frac{1}{2}$ lb.) .....	38 mm (1.5")
B16 A, Unloaded .....	55 mm (2.165")
Loaded with $88 \pm 2.5$ kg ( $194 \pm 5\frac{1}{2}$ lb.) .....	38 mm (1.496")
Clutch springs, number .....	6
Clutch levers, adjust to:	
7.5 mm (.3") lower than the adjuster jig (SVO 2065)	
hub within $\pm 1.5$ mm (.06") and within 0.25 mm (.010") of each other.	
Clutch pedal free play, Chassis Nos. 1—131917 .....	20—25 mm (.8—1.0")
Chassis Nos. 131918 onwards ...	10—15 mm (.4—.6")

## G E A R B O X

The type and number are stamped on a plate attached to the left-hand side of the gearbox.

Type designations

H1 .....	All gears are helical except for first speed and reverse. Lock ring for roller bearings at rear end of drive pinion shaft.
H3 .....	All gears are helical. Lock ring for roller bearings at rear end of drive pinion shaft.
H4, H5 and H6 .....	All gears are helical. No lock ring for roller bearings at rear end of drive pinion shaft.

Second and third speed gear are synchronized

Ratios:

1st speed .....	H1—H5	H6
2nd speed .....	3.23: 1	3.13: 1
3rd speed .....	1.62: 1	1.62: 1
Reverse .....	1: 1	1: 1
	2.92: 1	2.66: 1

Number of teeth on the different gears:

Main drive pinion .....	17	17
Countershaft, drive gear .....	24	24
1st speed gear .....	14	14
2nd speed gear .....	20	20
Main shaft, 1st speed gear .....	32	31
2nd speed gear .....	23	23
Reverse .....	18 and 20	17 and 20
Lubricant .....	Gearbox oil	Gearbox oil
viscosity .....	SAE 80	SAE 80
Oil capacity .....	0.5 litres	0.5 litres
	(1 Imp. pint)	(1 Imp. pint)

Speedometer gears

Rear axle gear ratios	Tyre size	Speedometer gears			Speedometer theoretical inaccuracy %
		Number of teeth		Ratio	
		Drive gear	Driven gear		
4.56: 1 (9: 41) and 4.57: 1 (7: 32)	5.00"—16"	4	14	3.5	+5.5
4.63: 1 (8: 37)	5.00"—16"	4	15	3.75	$\pm 0.0$
4.56: 1 (9: 41)	5.00"—16"	5	18	3.6	+2.5
	5.90"—15"	5	18	3.6	AC-speedometer +3.7 VDO-speedometer +1.5

Speedometer cable revolutions per kilometer (mile):	
AC-speedometer .....	616 (990)
VDO-speedometer .....	630 (1135)

## PROPELLER SHAFT

Propeller shaft, up to chassis number 2505 .....	Tubular, one-piece, two universal joints
from chassis number 2506 onwards ...	Tubular, two-piece, three universal joints, support bearing
Manufacture and type .....	Hardy-Spicer with needle bearings
Number of rollers in each bearing .....	22
Lubricant, universal joints .....	Special chassis lubricant

## REAR AXLE

Manufacturing number and gear ratios are stamped on a plate attached to the rear axle housing.

Rear axle, type .....	Semi-floating
Track, Chassis Nos. 1—20004 .....	1300 mm (51")
Chassis Nos. 20005 onwards .....	1315 mm (51 <sup>3</sup> / <sub>4</sub> ")
Axial clearance for drive shafts, ENV .....	0.02—0.12 mm
	(.0008"—.0047")
Spicer .....	0.07—0.20 mm
	(.0028—.0079")

### Rear axle gear

#### Chassis Nos. 1—12504, early production

Type .....	Crown wheel and pinion
Gear ratio, alternative .....	4.57: 1 (7: 32)
	4.63: 1 (8: 37)
Tooth flank clearance (pinion—crown wheel) .....	0.10—0.20 mm (.004"—.008")
Axial throw, crown wheel .....	max. 0.08 mm (.0032")
Tension, pinion bearing .....	2—4 kgcm (1.74—3.48 lb. in)
Lubricant .....	Hypoid oil
viscosity .....	SAE 80
Oil capacity .....	1.3 litres (2 <sup>1</sup> / <sub>4</sub> Imp. pints)

#### Chassis Nos. 1—12504, late production and

#### Chassis Nos. 12505 onwards

Type .....	Crown wheel and pinion (hypoid)
Gear ratio .....	4.56: 1 (9: 41)
Tooth flank clearance (pinion—crown wheel) .....	0.10—0.20 mm (.004"—.008")
Axial throw, crown wheel .....	max. 0.08 mm (.0032")
Tension, pinion bearing, ENV .....	2—4 kgcm (1.74—3.48 lb.in)
Spicer .....	9—14 kgcm (7.82—12.2 lb.in)
Lubricant .....	Hypoid oil
viscosity .....	SAE 80
Oil capacity, ENV, Chassis Nos. 1—131917 .....	0.9 litre (1 <sup>1</sup> / <sub>2</sub> Imp. pints)
Chassis Nos. 131918 onwards .....	1.3 litre (2 <sup>1</sup> / <sub>4</sub> Imp. pints)
Spicer .....	1.3 litre (2 <sup>1</sup> / <sub>4</sub> Imp. pints)

## Tightening torques

	Kgm	Lb-ft
Companion flange (18×1.5 mm thread) . . . . .	max. 20	max. 150
(3/4"-16 thread) . . . . .	28-30	200-220
Cap (11×1.5 mm thread) . . . . .	5.5-6	40-45
(1/2"-13 thread) . . . . .	8.5-10	60-70
Crown wheel (10×1 mm thread) . . . . .	5.5-6	40-45
(10×1.25 mm thread) . . . . .	5.0-5.5	36-40
(3/8"-24 thread) . . . . .	5.5-7	40-50
(7/16"-20 thread) . . . . .	7-8.5	50-60

## FRONT AXLE AND STEERING GEAR

## Steering gear

Steering wheel diameter, Chassis Nos. 1-12504 . . . . .	417 mm (16 1/2")
Chassis Nos. 12505 onwards . . . . .	425 mm (16 3/4")
Steering wheel turns, lock to lock . . . . .	3 1/4
Steering gear, early production . . . . .	Ross, cam and lever
late production . . . . .	Gemmer, cam and roller
Gear ratio, centre position, early production . . . . .	12:1
late production . . . . .	13.9:1
outer positions, early production . . . . .	14:1
late production . . . . .	13.9:1
Oil capacity, early production . . . . .	3.0 dl (1/2 Imp. pints)
late production . . . . .	1.3 dl (1/4 Imp. pints)
Lubricant . . . . .	Caltex Special Oil 250, Castrol SB Special Gear oil, Esso Gear Oil 250 Special, Kendall No. 400, Vacuum Mobilube Special Steering Gear Oil or Nynäs Steering Gear Oil 250

## Wheel alignment (unladen)

Caster . . . . .	-3/4° to +1/4°
Camber . . . . .	-1/4° to +1/2°
Toe-in . . . . .	0-3 mm (0"-.118")
Toe-out:	
When the outer wheel is turned 20°, the inner wheel should be turned . . . . .	22°±1°
King pin inclination inwards . . . . .	5° (at 0° camber)
length, Chassis Nos. 1-20004 . . . . .	124.5 mm (4.9")
length, Chassis Nos. 20005 onwards . . . . .	133.5 mm (5.25")
diameter . . . . .	19.0 mm (.75")

## BRAKES

Brake drum, diameter, front . . . . .	228.6 mm (9.0")
rear . . . . .	228.6 mm (9.0")
radial throw, max. . . . .	0.15 mm (.006")
Effective brake lining area, early prod. (rivetted linings)	850 cm <sup>2</sup> (132 sq. in.)
late prod. (bonded linings)	930 cm <sup>2</sup> (144 sq. in.)

<b>Brake linings:</b>	
Type .....	Pressed
Size, front shoes .....	2"× <sup>3</sup> / <sub>16</sub> "×258 mm (10.15")
rear shoes .....	2"× <sup>3</sup> / <sub>16</sub> "×198 mm (7.8")
<b>Brake lining rivets:</b>	
Size .....	<sup>9</sup> / <sub>64</sub> "× <sup>5</sup> / <sub>16</sub> " (3.5×8 mm)
Number of rivets on front brake shoes .....	10
Number of rivets on rear brake shoes .....	8
Clearance between shoes and drums .....	0.10 mm (.004")
Pedal free-play .....	7—12 mm (.28"—.47")

## Hydraulic system

Type .....	Lockheed
Master cylinder, diameter .....	1"
Wheel unit cylinders, diameter, front .....	1"
rear .....	<sup>7</sup> / <sub>8</sub> "
Clearance between plunger and cylinder, min. ....	0.03 mm (.0012")
max. ....	0.15 mm (.006")

## WHEELS AND TYRES

### Wheels

Type .....	Disc
Size, Chassis Nos. 1—20004 .....	3.50"D—16"
Chassis Nos. 20005 onwards .....	4.00"J—15"
Out-of-roundness, max. ....	2.5 mm (.09")
Warping, max. ....	2.5 mm (.09")
Wheel, r.p.km. (mile): 5.00"—16" .....	about 500 (800)
5.90"—15" .....	about 505 (808)
Torque required for tightening wheel nuts .....	10—14 kgm (70—100 lb. ft.)

### Tyres

Type:	<b>Chassis Nos. 1 - 20004</b>	<b>Chassis Nos. 20005 onw</b>
Standard model, to chassis No. 101041 .....	Tyres with tubes	Tyres with tubes
from chassis No. 101042 onwards ..	—	Tubeless tyres
Special model, to chassis No. 87492 .....	Tyres with tubes	Tyres with tubes
from chassis No. 87493 onwards ..	—	Tubeless tyres
Size .....	5.00"—16"	5.90"—15"
Ply .....	4	4
Rolling radius .....	319 mm (12.56")	315 mm (12.40")
Tube .....	5.00"—16"	5.90"—15"
Tyre pressure (cold tyres):		
Two persons, front tyres .....	1.5 kg/cm <sup>2</sup> (21.3 p.s.i.)	1.3 kg/cm <sup>2</sup> (18.5 p.s.i.)
rear tyres .....	1.6 kg/cm <sup>2</sup> (22.8 p.s.i.)	1.5 kg/cm <sup>2</sup> (21.3 p.s.i.)
Full load, front tyres .....	1.7 kg/cm <sup>2</sup> (24.2 p.s.i.)	1.5 kg/cm <sup>2</sup> (21.3 p.s.i.)
rear tyres .....	2.0 kg/cm <sup>2</sup> (28.4 p.s.i.)	1.7 kg/cm <sup>2</sup> (24.2 p.s.i.)

## SPRINGS AND SHOCK ABSORBERS

### Springs

Front .....	Coil springs
Length loaded with 435±12 kg (959±26 <sup>1</sup> / <sub>2</sub> lb.) ....	177 mm (6.96")
Material thickness .....	13.6±0.1 mm (.54"±.004")

## PV 444

Rear .....	Coil springs
Chassis Nos. 1—onwards	
Length loaded with 215±8 kg (474±17½ lb.) . . . .	242 mm (9.5")
Material thickness .....	11.8±0.1 mm (.46"±.004")
PV 444 TL	
Length loaded with 300±10 kg (661±22 lb.) . . . . .	255 mm (10")
Material thickness .....	13±0.1 mm (.5"±.004")

## Shock absorbers

Manufacture and type .....	Delco telescopic
Can be dismantled up to chassis no. 10000, all-welded design on late production	

# ELECTRICAL SYSTEM

## Battery

Type .....	Boliden 3F06, NOACK 312, SAAJ GH 13—6, Tudor 3 Df6 or similar
Earthed .....	Negative
Voltage .....	6 volts
Battery capacity, standard .....	85 amp.h.
Electrolyte specific weight, fully charged battery .....	1.275—1.285
Electrolyte specific weight, when charging is necessary	1.230

## Ignition system

Firing order .....	1—3—4—2
Ignition setting, B 4 B, basic setting, engine part Nos. 495300, 495301 .....	5° B.T.D.C.
engine part No. 495302, 83 oct. ROT ..	5° A.T.D.C.
93 oct. ROT .....	2° B.T.D.C.
B 16 A, basic setting, 83 oct. ROT .....	2° A.T.D.C.
93 oct. ROT .....	4° B.T.D.C.
B 16 A, stroboscope setting (1500 r.p.m., vacuum control disconnected), 83 oct. ROT .....	15° B.T.D.C.
93 oct. ROT .....	21° B.T.D.C.
Ignition coil, production I .....	Auto-Lite IG-4090
II .....	Auto-Lite CR-6001
III .....	Bosch ZS/KZ 1/6
Sparking plugs, early production .....	10 mm thread Bosch U 175 T 3 AC 104 Auto-Lite P-6 Champion Y 6 or similar
Sparking plugs, late production .....	14 mm thread Bosch W175T4 AC 44 Com Auto-Lite A7 Champion J7 or similar
Sparking plug gap .....	0.7—0.8 mm (.028—.032")

## Distributor

Type, B 4 B production	I	Auto-Lite IGS-4210
	II	Auto-Lite IAT-4006
	III	Bosch VJU 4BR9
B 16 A		Bosch VJU 4BR20

### Test values for Auto-Lite distributor:

Direction of rotation:	Clockwise				
Centrifugal governor					
Distributor, degrees	0	4	7.5	13	17.5
Distributor speed, r.p.m.	250	355	450	1160	1750
Vacuum governor:					
Distributor, degrees	0	1	3	6	7.5
Vacuum cm Hg	10	14	22	35	40
Breaker points, gap	0.45—0.55 mm (.018"—.022")				
contact pressure	0.48—0.57 kg (1—1.25 lb)				
closing angle	47°				
Condenser, capacity	0.20—0.25 $\mu$ F (microfarad)				

### Test values for Bosch distributor VJU4 BR9:

Direction of rotation:	Clockwise				
Ignition setting:					
Centrifugal governor					
Distributor degrees	0	5	10	15	17.5
Distributor speed, r.p.m.	140—300	280—450	560—920	1180—1580	1500—1900
Vacuum governor:					
Distributor degrees	0	7.5 $\pm$ 1			
Vacuum cm Hg	9—14	44			
Breaker points, gap	0.4—0.5 mm (.016"—.020")				
contact pressure	0.4—0.5 kg (1—1.25 lb)				
closing angle	54 $\pm$ 2°				

### Test values for Bosch distributor VJU4 BR20:

Direction of rotation	Clockwise				
Ignition setting:					
Centrifugal governor					
Distributor degrees	0	5	10	14 $\pm$ 1	
Distributor speed, r.p.m.	210—380	370—500	825—1200	1575—1925	
Vacuum governor					
Distributor degrees	0	8 $\pm$ 1			
Vacuum cm Hg	7—14	50			
Breaker points, gap	0.4—0.5 mm (.0157"—0.197")				
contact pressure	0.4—0.5 kg (.88—1.1 lb)				
closing angle	50 $\pm$ 3°				

## Dynamo

Type, B 4 B engine up to engine No. 12096	Auto-Lite GDZ-4821 A
engine Nos. 12097—43099 and	
engine Nos. 74630—75219	Auto-Lite GDZ-6001 C
engine Nos. 43100—73048	Bosch LJ/GJM160/6 1500R10
engine Nos. 73049—74629 and	
engine Nos. 75220—131917	Bosch LJ/GJM160/6 1800R10
B 16 A engine	Bosch LJ/GG200/6 2300R6..7

Auto-Lite GDZ-4821 A

Auto-Lite GDZ-6001 C

Voltage	6 volts
Earthed	Negative



Charging, cold dynamo:		
6.4 volts 0 amps	.....	1850—1900 r.p.m.
8 volts 40 amps	.....	2575—2675 r.p.m.
Charging, warm dynamo:		
6.4 volts 0 amps	.....	1875—1950 r.p.m.
8 volts 40 amps	.....	2750—2850 r.p.m.

### Charging control:

Type, B 4 B engine, up to engine No. 12096	.....	Auto-Lite VRP-4007 C2
engine Nos. 12097—43099 and		
engine Nos. 74630—75219	.....	Auto-Lite VRP-6003A
engine Nos. 43100—73048	.....	Bosch RS/UA 160/6/30
engine Nos. 73049—74629 and		
engine Nos. 75220—131917	.....	Bosch RS/UA 160/6/16
B 16 A engine	.....	Bosch RS/UA 200/6/23

### Auto-Lite VRP-4007 C2

### Auto-Lite VRP-6003A

Series resistance (2)	.....	7 and 38 ohms.
-----------------------	-------	----------------

### Test values

Reverse current relay:		
Adjusted for cutting-in at	.....	6.5 volts
Adjusted for cutting-out at	.....	4.1—4.8 volts (open circuit)
		4—6 amps. (closed circuit)
Voltage control:		
Control voltage adjusted to	.....	7.35 volts
Current control:		
Control current adjusted to	.....	35 amps.
Test values are rated at an air temperature of	.....	$20 \pm 1^{\circ} \text{C}$ ( $68 \pm 2^{\circ} \text{F}$ )

### Bosch RS/UA 160/6/30

### Bosch RS/UA 160/6/16

Equalizing resistance AR	.....	5.5—6.0 ohms
Control resistance W1	.....	4.0—5.0 ohms

### Test values

Reverse current relay:		
Adjusted for cutting-in at	.....	5.8—6.3 volts
Adjusted for cutting-out at	.....	4—9 amps. (closed circuit)
Voltage control:		
Control voltage adjusted to	.....	7.1—7.4 volts
Current control:		
Control current adjusted to	.....	$40 \pm 1$ amp.
Test values are rated at an air temperature of about	.....	$20^{\circ} \text{C}$ ( $68^{\circ} \text{F}$ )

### Bosch RS/UA 2000/6/23

Equalizing resistance AR	.....	5.5—6.0 ohms
Control resistance W1	.....	4.0—5.0 ohms
W2	.....	6.0—7.0 ohms

### Test values

Reverse current relay:		
Cut-in voltage	.....	5.8—6.3 volts
Reverse current	.....	4—9 amps
Voltage control:		
Control voltage, unloaded dynamo, first control stage	.....	7.0—7.5 volts



Electrical:

Unloaded starter motor:	
Test period . . . . .	max. 15 secs.
5.5 volts and 65—75 amps. . . . .	3500—4500 r.p.m.
Loaded starter motor:	
4.5 volts and 260—280 amps. . . . .	750—850 r.p.m.
Locked starter motor:	
3.5 volts and 450—480 amps . . . . .	min. 1.33 kgm (9.4 lb.ft) (r.p.m.=0)
Solenoid:	
Cut-in voltage . . . . .	2.5—3.3 volts
Cut-out voltage . . . . .	0.8—1.6 volts
Measurement "a" (see fig. 13) . . . . .	32.2+0.1 mm (1.27+.004")

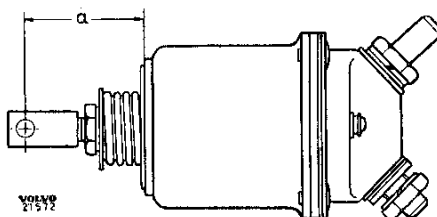


Fig. 13. Control solenoid setting.  
(iron core withdrawn).

## Bulbs

Figures in the columns indicate:  
number  
output  
socket

	Chassis Nos. 1—12504	Chassis Nos. 12505—20004	Chassis Nos. 20005—28004	Chassis Nos. 28005—37004	Chassis Nos. 37005—68955	Chassis Nos. 68956—about 98000	Chassis Nos. about 98000—131917	Chassis Nos. 131918—onwards
Headlights	2 45/40 W BA 20 d							
Parking lights	2 2.4 W BA 9 s						2 1.5 W BA 9 s	2+ 20/5 W BA 15 d spec.
Long time parking lights							2 1.5 W BA 9 s	
Number plate lighting	1 5 W BA 15 s							
Stop and tail lights	2 20/3 W BA 15 d						2 20/5 W BA 15 d spec.	2+ 20/5 W BA 15 d spec.
Instrument lamps	3 1.5 W BA 9 s	2 2.4 W BA 9 s						
Direction indicator lamps	2 3 W S 5	3 15 W BA 15 s	2 15 W BA 15 s	2 15 W BA 15 s	2 15 W S 8	++		
Control lamps for direction indicators	1 2.4 W BA 9 s						2 2.4 W BA 9 s	
Control lamp for headlights	1 2.4 W BA 9 s	1 1.5 W BA 9 s						
Interior lighting	1 15 W BA 15 s	1 1.5 W BA 9 s	1 15 W BA 15 s			1 10 W S 8		

+ Also direction indicator lamps.  
++ See parking lights and stop and tail lights respectively.

## Fuses

Fusebox under the bonnet on the left-hand side of the cowl.

	Number	Amps.
Chassis Nos. 1—20004 (P 44403) .....	3	8
	1	25
Chassis Nos. 12505—20004 (P 44404) .....	2	8
	2	25
Chassis Nos. 20005—28004 (P 44403) .....	5	8
	1	25
Chassis Nos. 28005—68955 (P 44403) .....	4	8
	2	25
Chassis Nos. 68956 onwards (P 44403) .....	4	8
	2	25
Chassis Nos. 68956 onwards (P 44404) .....	3	8
	3	25

## Headlight setting

Adjust at a distance of 16 ft 5" (5 m) from wall.

Vertical setting (Dimension "C" in Service Manual Part 10 Fig. 68) .....

3" (7.5 cm) below the headlight horizontal centre line.

Horizontal setting (Dimension "B" in Service Manual Part 10 Fig. 68) .....

3" (7.5 cm) out from the headlight vertical centre line.

# LUBRICATION

## Engine

	<b>B 4 B</b>	<b>B 16 A</b>
Lubricating oil, type .....	Engine oil	Engine oil
grade .....	Service MM, MS	Service MM, MS
viscosity, summer .....	SAE 20	SAE 20
winter .....	SAE 10 W	SAE 10 W
Oil capacity without oil filter .....	3.25 litres	2.75 litres
	(5 <sup>3</sup> / <sub>4</sub> Imp. pints)	(4 <sup>7</sup> / <sub>8</sub> Imp. pints)
Oil capacity with oil filter .....	3.75 litres	3.5 litres
	(6 <sup>1</sup> / <sub>2</sub> Imp. pints)	(6 <sup>1</sup> / <sub>8</sub> Imp. pints)

## Gearbox

Lubricating oil, type .....	Gearbox oil
viscosity .....	SAE 80
capacity .....	0.5 litres (1 Imp. pint)

## Rear axle gear

Lubricating oil, type .....	Hypoid oil
viscosity .....	SAE 80
Oil capacity, chassis Nos. 1—12504 (early production) ..	1.3 litres (2 <sup>3</sup> / <sub>8</sub> Imp. pints)
Oil capacity, chassis Nos. 1—12504 (late prod.) and Nos	
12505—131917, ENV .....	0.9 litres (1 <sup>5</sup> / <sub>8</sub> Imp. pints)
Spicer .....	1.3 litres (2 <sup>3</sup> / <sub>8</sub> Imp. pints)
chassis Nos. 131918—onwards .....	1.3 litres (2 <sup>3</sup> / <sub>8</sub> Imp. pints)

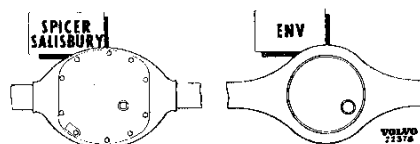


Fig. 14. Identification of rear axle.

## Steering gear

Lubricating oil, type .....	Caltex Special Oil 250 Castrol SB Special Gear Oil Esso Gear Oil 250 Special Kendall 400 Mobilube Special Steering Gear Oil or Nynäs Steering Gear Oil 250
Oil capacity, early prod. (Ross) .....	0.3 litres (1/2 Imp. pints)
late prod. (Gemmer) .....	0.13 litres (1/4 Imp. pints)