



SERVICE MANUAL

VOLVO 140 1974



FOREWORD

This Manual contains Service Procedures for the Volvo 140-series (142, 144, 145) 1974 models, from the following chassis Nos.,

142 Chassis No. 393950

144 Chassis No. 428000

145 Chassis No. 210050

The 1974 models have the designation "A".

The book is divided in 9 sections as indicated by the register opposite. The pages and figure illustrations in each section are numbered in such a way that the first figure shows the number of the section concerned while the second one shows the number of the page or figure illustration in that particular section, for example, under the heading "Electrical system"; 3—1, 3—2, etc. A convenient way of finding the particular section you are looking for is to bend the right side of the Manual back so that the arrows in the register point to the index marks on the first page of each section.

The various sections are divided as follows:

Tools

General Information

Service Procedures

The specifications can be found in Section 0, General. The instructions given in this book generally assume that special tools are used and are based on experience gained from method studies.

Similar results may be obtained with other working methods, but we are convinced that by following the instructions given in this Manual you will always achieve the best results in the shortest possible time.

AB VOLVO
Göteborg - Sweden

0 General

1 Servicing and maintenance

2 Engine

3 Electrical system and instruments

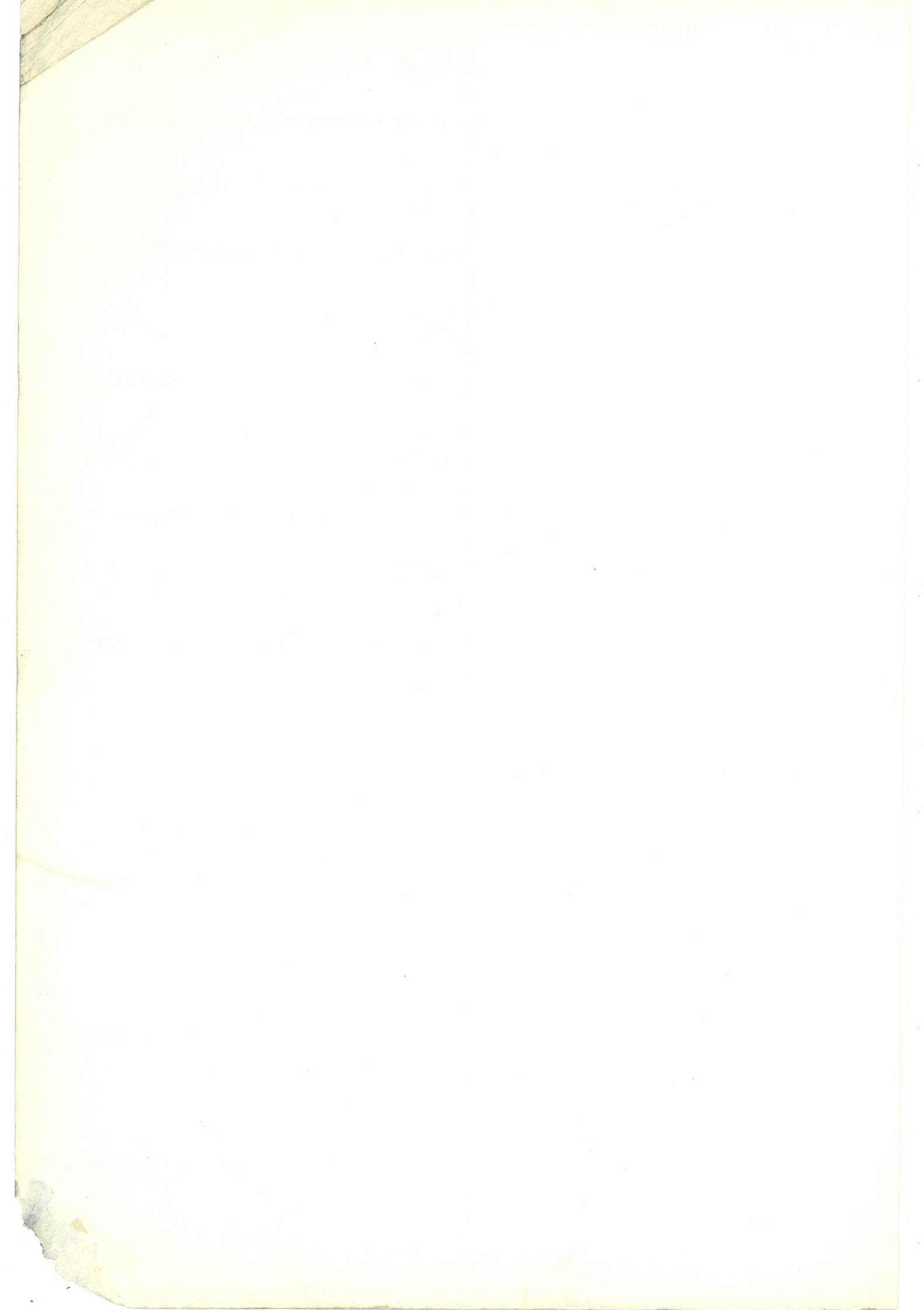
4 Power transmission, rear axle

5 Brakes

6 Front end and steering gear

7 Frame, suspension, wheels

8 Body



Section 0

GENERAL



GROUP 01

TYPE DESIGNATIONS

This manual deals with Volvo 140-series cars, 1974 models, of the following types:

Type	Type designation
Two-door	142
Four-door	144
Station Wagon	145

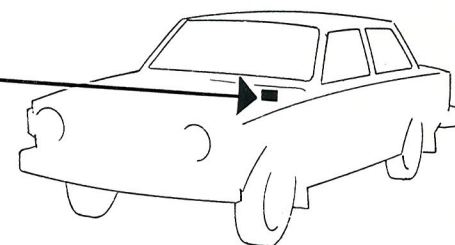
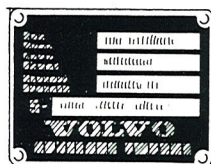
TYPE PLATES

MODEL PLATE

Earlier version

Vehicle: Type and Designation, Color Code
Upholstery Code

Location: Engine compartment, left side of the firewall

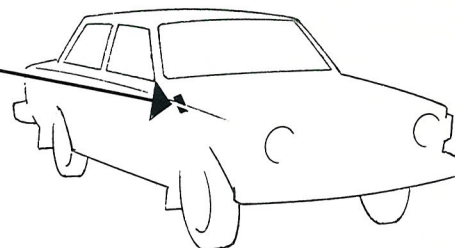
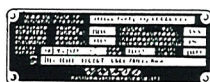


MODEL PLATE

Later version, introduced Nov. 1973

Vehicle: Type and Designation
Chassis No.
Weight Specifications
Color Code
Upholstery Code

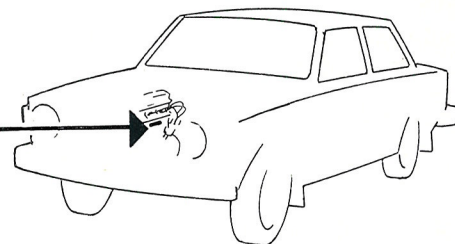
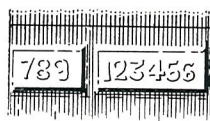
Location: Right side wheel housing



VOLVO
108 753

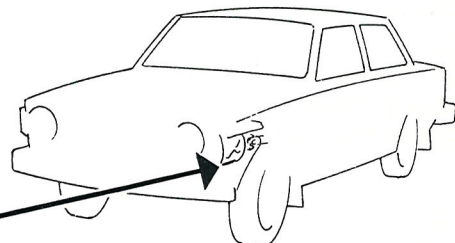
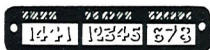
Engine: Type, P/N and Serial No.

Location: Stamped on the engine left side



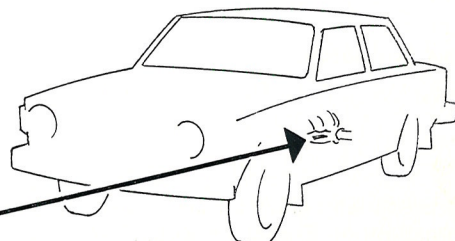
Transmission: Type and Designation
P/N and Serial No.

Location: On the transmission underside



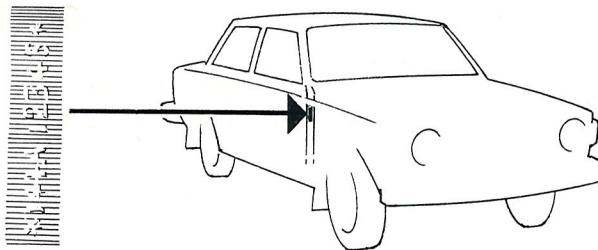
Final gear: Ratio, P/N and Serial No.

Location: On the left side of the final gear housing



**Type, Model Year Designation,
Chassis No.**

Location: Stamped on the right front door post. Vehicles intended for USA are provided with a Chassis No. Plate also on the left windshield pillar.

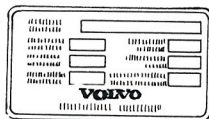


Service Plate

Introduced Nov. 1973.

Chassis No, Codes for brakes, clutch etc

Location: The pillar behind right front door.



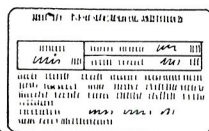
Body No.

Location: On the left side of the firewall in the engine compartment.



USA: Chassis No. and Weight Specifications

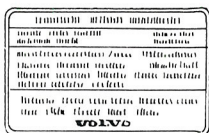
Location: The pillar behind left front door.



USA: *) Vehicle Emission Control Information

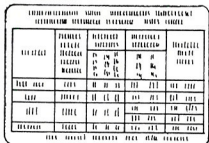
Location: On the left side of the firewall in the engine compartment.

For California there is also a label with Emission Control Information on the left Quarter Window.



Tire pressures.

Location: Rear front door jam.



*) European vehicles have a plate with information on European regulations.

GROUP 03

SPECIFICATIONS

DIMENSIONS AND WEIGHTS

	142	144	145
Length	4780 mm (182.2")	4780 mm (182.2")	4780 mm (182.2")
Width	1705 mm (67")	1705 mm (67")	1705 mm (67")
Height	1440 mm (56.8")	1440 mm (56.8")	1450 mm (57.3")
Wheelbase	2620 mm (103.3")	2620 mm (103.3")	2620 mm (103.3")
Ground clearance, full load	125 mm (8.3")	125 mm (8.3")	125 mm (8.3")
Track, front	1350 mm (53.6")	1350 mm (53.6")	1350 mm (53.6")
rear	1350 mm (53.6")	1350 mm (53.6")	1350 mm (53.6")
Turning circle	9.6 m (31 ft. 6 in.)	9.6 m (31 ft. 6 in.)	9.6 m (31 ft. 6 in.)
Curb weight	1185 kp (2620 lb)	1210 kp (2665 lb)	1270 kp (2805 lb)
Depending on model	1260 kp	1285 kp	1305 kp

LUBRICATION

ENGINE

Lubricant	Engine oil for Service SD, SE and CC (MS)
viscosity, summer (above $-12^{\circ}\text{C} = +10^{\circ}\text{F}$)	Multigrade Oil SAE 20 W—40 or 20 W—50
winter (below $-12^{\circ}\text{C} = +10^{\circ}\text{F}$)	Multigrade Oil SAE 10 W—30
continuous temp. below $-18^{\circ}\text{C} = 0^{\circ}\text{F}$	Multigrade Oil SAE 5 W—20
Oil capacity, including oil filter	3.75 dm ³ = 3.3 Imp. Qts = 4.0 US Qts
excluding oil filter	3.25 dm ³ = 2.9 Imp. Qts = 3.4 US Qts

TRANSMISSION (WITHOUT OVERDRIVE)

Lubricant, type	Gear oil
viscosity	SAE 80
Alternative lubricant, type	Engine oil
viscosity, all year round	SAE 30
Oil capacity	.75 dm ³ = .7 Imp. Qts = .8 US Qts

TRANSMISSION WITH OVERDRIVE

Lubricant, type	Engine oil
viscosity, all year round	SAE 30
alternative	Multigrade oil SAE 20 W—40
Oil capacity	1.6 dm ³ = 1.4 Imp. Qts = 1.7 US Qts

AUTOMATIC TRANSMISSION

Lubricant	Automatic Transmission Fluid, Type F
Oil capacity	6.4 dm ³ = 5.6 Imp. Qts = 6.8 US Qts

FINAL DRIVE

Lubricant, type, without limited slip	Oil acc. to MIL-L-2105 B
with limited slip	Oil acc. to MIL-L-2105 B provided with additive for limited slip
viscosity	SAE 90
Oil capacity	1.3 dm ³ = 1.1 Imp. Qts = 1.4 US Qts

MECHANICAL STEERING GEAR

Lubricant, type	Hypoid oil
viscosity	SAE 80
Oil capacity	.25 dm ³ = .2 Imp. Qts = .25 US Qts

POWER STEERING

Lubricant, type	Automatic Transmission Fluid, Type A or Dexron
Oil capacity	1.2 dm ³ = 1.1 Imp. Qts = 1.3 US Qts

ENGINE

GENERAL

Type, designation		B 20 A	B 20 B	B 20 E	B 20 F
Output hp at rpm	SAE	90/4800	118/5800	135/6000	
	DIN	82/4700	100/5500	124/6000	
	SAE J 245				109/6000
Output kW at r/s	SAE	66/80	87/97	99/100	
	DIN	60/78	74/92	91/100	
	SAE J 245				80/100
Max torque $\frac{\text{kpm}}{\text{lb ft}}$ at rpm	SAE	$\frac{16.5}{119}/3000$	$\frac{17.0}{124}/3500$	$\frac{18.0}{130}/3500$	
	DIN	$\frac{16.0}{116}/2300$	$\frac{15.5}{113}/3500$	$\frac{17.0}{123}/3500$	
	SAE J 245				$\frac{16.0}{115}/3500$
Max. torque Nm at r/s	SAE	162/50	167/58	177/58	
	DIN	157/38	152/58	167/58	
	SAE J 245				156/58
Compression pressure (warm engine when turned over with starter motor) 4.2—5.0 r/s (250—300 rpm). kp/cm ²		B 20 A	B 20 B	B 20 E	B 20 F
		10—12	11—13	12—14	9—11
psi		142—170	156—185	170—200	128—156
Compression ratio		8.7:1	9.3:1	10.2:1	8.7:1
Number of cylinders		4	4	4	4
Bore			88.9 mm=3.500"		
Stroke			80 mm=3.150"		
Displacement			1.99 dm ³ =1.99 liters		
Weight, including electrical equipment and carburetor, approx.			155 kg=341 lbs		

CYLINDER BLOCK

	mm	inch
Material		Special alloy cast iron
Bore, standard (D-marked)	88.91—88.92	3.5004—3.5008
oversize .015"	89.295	3.5155
.030"	89.675	3.5305

PISTONS

Material		Light alloy
Weight, standard		507±5 grammes= 17.90±.18 oz.
Permissible weight deviation between pistons in same engine		10 grammes= .35 oz.
Height, total	71	2.79
Height from piston pin center piston crown	46	1.81
Piston clearance	.01—.03	.0004—.0012

PISTON RINGS

Piston ring gap, measured in ring opening	.40—.55	.016—.022
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COMPRESSION RINGS

Upper ring chromed		
Number on each piston	2	
Height	1.98	.078
Compression ring clearance in groove	.040—.072	.0016—.0028

OIL SCRAPER RINGS

Number on each piston	1	
Height	4.74 mm	.186"
Scraper ring clearance in groove	.040—.072 mm	.0016—.0028"

PISTON PINS

Floating fit. Circlips at both ends in piston.

Fit:

In connecting rod		Close running fit
In piston		Push fit
Diameter, standard	24.00 mm	.945"
oversize	24.05 mm	.947"

CYLINDER HEAD

	B 20 A	B 20 B	B 20 E	B 20 F
Height, measured from cylinder contact face to face for bolt heads	87.0 mm (3.42")	86.2 mm (3.39")	84.9 mm (3.34")	87.0 mm (3.42")
Cylinder head gasket, thickness, standard, unloaded	1.2 mm (.047")	.8 mm (.031")	1.2 mm (.047")	1.2 mm (.047")
loaded	1.0 mm (.039")	.7 mm (.028")	1.0 mm (.039")	1.0 mm (.039")
Distance from top side of head to overflow pipe upper end (pipe placed under thermostat)	35			1.38

CRANKSHAFT

	mm	inch
Crankshaft, end float	.047—.137	.0018—.0054
Main bearings, radial clearance	.028—.083	.0011—.0033
Big-end bearings, radial clearance	.029—.071	.0012—.0028

MAIN BEARINGS

MAIN BEARING JOURNALS

Diameter, standard	63.451—63.464	2.4981—2.4986
Undersize .010"	63.197—63.210	2.4881—2.4886
.020"	62.943—62.956	2.4781—2.4786
Width on crankshaft for pilot bearing shell		
Standard	38.960—39.000	1.5338—1.5351
Oversize 1 (undersize bearing shell .010")	39.061—39.101	1.5438—1.5451
2 (undersize bearing shell .020")	39.163—39.203	1.5538—1.5551

BIG-END BEARINGS

BIG-END BEARING JOURNALS

Width of bearing recess	29.95—30.05	1.179 —1.183
Diameter, standard	53.987—54.000	2.1255—2.1260
Undersize .010"	53.733—53.746	2.1155—2.1160
.020"	53.479—53.492	2.1055—2.1060

CONNECTING RODS

End float on crankshaft	.15—.35 mm	.006—.014"
Max. permissible weight deviation between connecting rods in same engine		10 grammes = .35 oz

FLYWHEEL

Permissible axial throw, max.	.05 mm = .002" at a diameter of 150 mm = 5.9"
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FLYWHEEL HOUSING

Max. axial throw for rear face	.05 mm = .002" at a diameter of 100 mm = 3.9"
Max. radial throw for rear guide	.15 mm .006"

CAMSHAFT

	mm	inch
Marking/max. lift height B 20 A	A/6.0	.24
B 20 B	C/6.7	.26
B 20 E and B 20 F	K/7.2	.28
B 20 F, left hand steering and AT ..	D/7.2	.28
Number of bearings	3	
Radial clearance	.020—.075	.0008—.0030
End float	.020—.060	.0008—.0024
Valve clearance for control of camshaft setting (cold engine), B 20 A	1.10	.043
B 20 B	1.45	.057
B 20 E and B 20 F	1.00	.039
B 20 F w. D-marked camshaft	1.40	.055
Inlet valve should then open at,		
B 20 A	10° ATDC	
B 20 B	0° TDC	
B 20 E and B 20 F	3.5 BTDC	
B 20 F w. D-marked cam- shaft	5.5 BTDC	

TIMING GEARS

Backlash	.04—.08	.0016—.0032
End float, camshaft	.02—.06	.0008—.0024

VALVE SYSTEM

VALVES

Inlet

Disc diameter	44	1.732
Stem diameter	7.955—7.970	.3132—.3138
Valve seat angle	44.5° 45°	
Seat angle in cylinder head		
Seat width in cylinder head	2	.08
Clearance, both hot and cold engine, B 20 A, B 20 E and B 20 F	.40—.45	.016—.018
B 20 B	.50—.55	.020—.022

Exhaust

Disc diameter	35	.378
Stem diameter	7.925—7.940	3.3120—.3126
Valve seat angle	44.5° 45°	
Seat angle in cylinder head		
Seat width in cylinder head	2	.080
Clearance, both hot and cold engine, B 20 A, B 20 E and B 20 F	.40—.45	.016—.018
B 20 B	.50—.55	.020—.022

VALVE GUIDES

Length, inlet valve	52	2.047
exhaust valve	59	2.323
Inner diameter	8.000—8.022	.320—.321
Height above upper face of cylinder head, B 20 A and B 20 B B 20 E and B 20 F	17.5 17.9	.689 .705
Clearance, valve stem-valve guide, inlet valve	.030—.068	.0012—.0026
exhaust valve	.060—.097	.0024—.0038

VALVE SPRINGS

Length unloaded, approx	46	1.81
with a loading of 295±23 N=65±5 lbs	40	1.57
with a loading of 825±43 N=181 5±9.5 lbs	30	1.18

LUBRICATING SYSTEM

Oil capacity, including oil filter	3.75 dm ³ =3 3 Imp. Qts=3 9 US Qts
excluding oil filter	3.25 dm ³ =2 8 Imp. Qts=3 4 US Qts
Oil pressure at 33 3 r/s 2000 rpm (with hot engine and new oil filter)	2 5—6.0 kp/cm ² =36—85 psi

OIL PUMP

OIL PUMP		mm	inch
Oil pump, type		Gear	
number of teeth on each gear wheel		9	
end float	.20—10		.0080—.0040
radial clearance	.08—.14		.0032—.0055
backlash	.15—.35		.0060—.0140

RELIEF VALVE SPRING (IN OIL PUMP)

Length, unloaded	approx.	39.0	1.54
loaded with 50±4 N=11	0± 88 lbs	26.25	1.03
70±8 N=15.4±1.7	lbs	21 0	.83

FUEL SYSTEM B 20 A, B 20 B

FUEL PUMP

Diaphragm type pump. Alt. 1 make	Pierburg (PE 15695)
Alt. 2 make	S.E.V. (20005012)
Fuel pressure, measured at same level as pump, 17—	min. .15 kp/cm ² =2.1 psi
1000 r/s=1000—6000 rpm	max. .28 kp/cm ² =4.0 psi

CARBURETORS

Stromberg, B 20 A

Type		Horizontal carburetor	
Make and designation		Zenith-Stromberg	
		175 CD-2 SE	
Number		1	
Air intake diameter	41.3		1.63
Fuel needle, designation		B 1 CC	
Idling speed		11.7 r/s=700 rpm	
Oil for damping cylinders		"Automatic Transmission Fluid, Type A"	

Stromberg, B 20 B

(Engine in car with right-hand drive)

Type		Horizontal carburetor	
Make and designation		Zenith-Stromberg	
		175 CD-2 SE	
Number		2	
Air intake diameter	41.3		1.63
Fuel needle, designation		B 1 DA	
Idling speed		13.4 r/s 800 rpm	
For cars with automatic transmission		11.7 r/s 700 rpm	
Oil for damping cylinders		"Automatic Transmission Fluid, Type A"	

SU, B 20 B

Type		Horizontal carburetor	
Make and designation		SU-HIF 6	
Number		2	
Air intake diameter	41.3		1.63
Fuel needle, designation		BBZ	
cars for Canadian market, designation		BBB	
Idling speed		13.4 r/s=800 rpm	
For cars with automatic transmission		11.7 r/s=700 rpm	
Oil for damping cylinders		"Automatic Transmission Fluid, Type A"	

CO-test

Hot engine, idling speed	2.5 %
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FUEL INJECTION SYSTEM

Fuel filter

Type Paper
Change interval 80 000 km = 50 000 miles

Fuel pump

Type Electric, roller type
Capacity 100 dm³/h at 5 kp/cm²
(26.5 gals/hour at 71 psi)
Current draw Max. 8.5 Amps

Auxiliary air valve

Completely open at -30°C (-22°F)
Completely closed at +70°C (+158°F)
(or after 5 min. driving with an
ambient temperature of +20°C =
68°F)
Line pressure 4.5—5.2 kp/cm² = 64—74 psi
Rest pressure 1.7—2.4 kp/cm² = 24—34 psi
Control pressure 3.7 ± .2 warm engine = 50—55 psi

Air filter

Type Paper
Change interval 40 000 km = 25 000 miles

CO

Warm engine and idle5—3.5 %
USA 1.5 %

COOLING SYSTEM

Type Sealed system
Radiator cap valve opens at7 kp/cm² = 10.0 psi
Capacity Approx. 9.4 dm³ = 9 Imp. Qts = 10 US Qts
Fan belt, designation HC - 38 × 888
car with right-hand drive HC - 38 × 988

Fan belt tensioning:

	with 2906			F N (lbs)
	A	B	C	
Vehicle with l-h drive	9.0—10.0	7.5—8.0	11.0	70—100 (15.5—22)
Vehicle with r-h drive	7.2— 8.3	6.5—7.1	9.5	55— 70 (12 —15.5)
Vehicle with r-h drive and air conditioning	9.0—10.0	8.8—9.3	11.0	85—100 (19 —22)

A = Check value with belt tensioner gauge, 2906, new belt

B = With belt in outer position (stretched belt)

C = Value when installing new belt

F = Depression force in N (lbs) when depressing 10 mm (3/8") midway between pulleys.
(The lower value with belt in outer position, stretched.)

Thermostat	Type 1	Type 2
Type	Wax	Wax
Marking	170	82°
Begins opening at	75—78°C	81—83°C
	(168—172°F)	(177—181°F)
Fully open at	89°C (192°F)	90°C (195°F)

WEAR TOLERANCES

CYLINDERS:

To be rebored when wear amounts to (if engine has abnormal oil consumption) 25 mm = .010"

CRANKSHAFT

Permissible out-round on main bearing journals, max.	.05 mm=.0020"
Permissible out-of-round on big-end journals, max.	.07 mm=.0028"
Crankshaft end float, max.	.15 mm=.0060"

VALVES

Permissible clearance between valve stems and valve guides, max.	.15 mm=.0060"
Valve stems, permissible wear, max.	.02 mm=.0008"

CAMSHAFT

Permissible out-of-round (with new bearings) max.	.07 mm = .0028"
Bearings, permissible wear, max.	.02 mm = .0008"

TIMING GEARS

Permissible backlash, max.12 mm = .0048"

TIGHTENING TORQUES

TIGHTENING TORQUES		Nm	Lb. ft.
Cylinder head (oiled screws)		90	65
Main bearings		120—130	87—94
Big-end bearings		70—78	51—57
Flywheel		65—70	47—51
Spark plugs		35—40	25—29
Camshaft nut		130—150	94—108
Bolt for crankshaft pulley, single pulley		95—105	69—76
double pulley		110—140	80—101
Alternator bolt (1/2")		70—85	50—60
Nipple for oil filter		45—55	32—40
Sump bolts		8—11	6—8

ELECTRICAL SYSTEM

BATTERY

Type	Tudor 6 EX 3 op or equivalent
Grounded	Negative terminal
System voltage	12 V
Battery, capacity, standard	60 Ah
Specific gravity of electrolyte:	
Fully charged battery	1.28
When recharging is necessary	1.21
Recommended charging current	5.5 A

ALTERNATOR

B 20 A, l-h steering	Bosch 14 V 35 A
B 20 A, r-h steering	Marshall 14 V 35 A
B 20 B and D, l-h and r-h steering	Marshall 14 V 35 A
B 20 E and F	Marshall 14 V 55 A

S. E. V. MARSHALL A - 14/30

Output	490 W
Max. amperage	35 A
Max. speed	250 r/s=15 000 rpm
Direction of rotation	Optional
Ratio: engine — alternator	1,2
Min. length, brushes	5 mm=.2"
Tightening torque: Attaching screws	28—30 Nm=2.0—2.2 lb ft
Nut for pulley	40 Nm=29 lb ft

Test values

Field winding resistance	5.2± 2 ohm
Voltage drop across insulating diode	.8—.9 V
Output test	30 A (min. at 50 r/s=3000 rpm and approx. 13 V)

S. E. V. MARSHALL 14 V - 34833 (14 V 55 A)

Output	770 W	
Max. amp	55 A	
Max. speed	250 r/s	15000 rpm
Direction of rotation	Optional	
Min. length, brushes	5 mm=.2"	2"
Tightening torque:		
Attaching screws	2.8—3.0 Nm	2.0—2.2 lb. ft.
Nut for pulley	40 Nm	29 lb. ft.

Test values

Field winding resistance	3.7 ohms
Voltage drop across insulating diode	.8—9 V
Output test	48 A (min. at 50 r/s=3000 rpm and approx 14 V)

BOSCH K 1 - 14 V 35 A 20

Output	490 W	
Max. amp	35 A	
Max. speed	200 r/s	12 000 rpm
Direction of rotation	Clockwise	
Ratio, engine — alternator	1:2	
Min. diameter of slip rings	31.5 mm	1.24"
Max. permissible radial throw on, slip rings	.03 mm	.0012"
rotor body	.05 mm	.0020"
Min. length of brushes	8 mm	.31"
Brush pressure	3—4 N	5.6—8.8 lbs
Tightening torque for pulley	35—40 Nm	25—29 lb. ft.

Test values

Resistance in, stator	.26 (max. .29 ohm)
rotor	4.0 (max. 4.4 ohm)
Output test	35 A (min. at 100 r/s=6000 rpm and 14 V)

VOLTAGE REGULATOR

S. E. V. MOTOROLA 14 V - 33525

Control voltage, cold regulator	13.1—14.4 V
after driving 45 minutes	13.85—14.25 V

Š. E. V. MOTOROLA 14 V - 33544

Control voltage, cold regulator
after driving 45 minutes

13.1—14.4 V
13.85—14.25 V

BOSCH AD - 14 V

Control voltage at 67 alternator r/s, (4000 rpm) cold regulator, read off within 30 seconds (lower two contacts)
Load current, lower two contacts
Control range (between two upper and lower contacts)
Load current, upper two contacts

14.0—15.0 V
28—30 A
0—0.3 V
3—8 A

STARTER MOTOR

Type
Voltage
Grounded
Direction of rotation
Output
Brushes, number

Bosch GF 12 V 1 PS
12 V
Negative terminal
Clockwise
Approx. 736 W (1 h p)
4

TESE VALUES

Mechanical

Armature end float	.05—.30 mm	.002—.12"
Brush spring tension	11.5—13 N	2.53— 86 lbs
Distance from pinion to ring gear	1.2—4.4 mm	.047—.173"
Frictional torque of rotor brake	.25—.40 Nm	2.17—3.81 lb. in.
Pinion idling torque	.13—.18 Nm	1.13—1.56 lb. in.
Backlash	.35— 60 mm	.014—.024"
Min. diameter of commutator	33 mm	1.29"
Min length of brushes	14 mm	.55"

Electrical

Unloaded starter motor:		
12.0 volts and 40—50 amp.	115—135 r/s	6900—8100 rpm
Loaded starter motor:		
9 volts and 185—220 amp.	17.5—22.5 r/s	1050—1350 rpm
Locked starter motor:		
6 volts and 300—350 amp.	0 r/s	

CONTROL SOLENOID

Cut-in voltage Min. 8 V

IGNITION SYSTEM

Firing order 1-3-4-2

B 20 A:

Ignition timing, 97 octane (RON) at 10—13 engine r/s = 600—800 rpm	
(vacuum unit disconnected)	14° B T D C
Spark plugs	Bosch W 175 T 35 or corresponding
Tightening torque	35—40 Nm 25—29 lb. ft.

B 20 B:

Ignition timing, 100 octane (RON) at 10—13 engine r/s = 600—800 rpm	
(vacuum unit disconnected)	10° B T D C
Spark plugs	Bosch W 200 T 35 or corresponding
Tightening torque	35—40 Nm 25—29 lb. ft.

B 20 E:

Ignition timing, 97 octane (RON) at 10—
13 engine r/s=600—800 rpm
Spark plugs
Tightening torque

10° B T D C

Bosch W 225 T 35 or corresponding

35—40 Nm

25—29 lb. ft.

B 20 F:

Ignition timing, 94 octane (RON) at 10—
13 engine r/s=600—800 rpm
(vacuum unit disconnected)
Spark plugs
Tightening torque

10° B T D C

Bosch W 200 T 35 or corresponding

35—40 Nm

25—29 lb. ft.

DISTRIBUTOR**B 20 A:**

Type
Direction of rotation
Breaker point, gap
 dwell angle
 contact force

Bosch JFUR 4

Counter-clockwise

Min. .35 mm=.014"

59—65°

5.0—6.3 N=1.10—1.40 lbs

Centrifugal governor:

Advance, total

13±1 degrees (distributor)

Advance begins at

5—8.3 r/s

300—500 distr. rpm

Values 5°

12.5—15.7 r/s

750—940 distr. rpm

10°

20.2—29.2 r/s

1250—1750 distr. rpm

Advance finishes at

40 r/s

2400 distr. rpm

Vacuum unit:

Advance total

5±1 degrees
(distributor)

Advance begins at

60—100 mm

2.36—3.96" Hg

Values 3°

105—145 mm

4.13—5.71" Hg

Advance finishes at

105—160 mm

5.91—6.30" Hg

B 20 B:

Type
Direction of rotation

Bosch JFUR 4

Counter-
clockwise

Breaker point, gap

.35 mm

.014"

dwell angle (8.3 r/s=500 rpm)

59—65°

contact force

5.0—6.3 N

1.10—1.40 lbs

Centrifugal governor:

Advance, total

10.0±1.0 degrees
(distributor)

Advance begins at

8.3—10.0 r/s

500—600 distr. rpm

Values 5°

11.2—12.7 r/s

675—760 distr. rpm

10°

18.8—29.1 r/s

1130—1750 distr. rpm

Advance finishes at

30.0 r/s

1800 distr. rpm

Vacuum governor:

Retard, total

3±0.5 degrees
(distributor)

Retard, begins at

160—240 mm

5.91—9.45" Hg

Values 2°

230—305 mm

9.06—12.0" Hg

Retard finishes at

280—320 mm

11.0—12.6" Hg

B 20 E

Type
Direction of rotation

Bosch JFUF

Counter-
clockwise

Breaker point, gap

.35 mm

.014"

dwell angle (8.3 r/s=500 rpm)

59—65°

contact force

5.0—6.3 N

1.10—1.40 lbs

Centrifugal unit:

Advance, total

11.0±1 degrees
(distributor)

Advance begins at	6.3—9.2 r/s	375—550 distr. rpm
Values 3°	10.4—13.2 r/s	625—790 distr. rpm
7°	16.0—18.8 r/s	960—1125 distr. rpm
Advance finishes at	22.9 r/s	1375 distr. rpm
Vacuum unit: (negative control)		
Retard, total		±1 degree (distributor)
Retard, begins at	60—100 mm	2.36—3.96" Hg
Values 3°	90—127 mm	3.56—5.03" Hg
Retard finishes at	130—140 mm	5.15—5.54" Hg

B 20 F

Type		Bosch JF
Direction of rotation		Counter- clockwise
Breaker point, gap	.35 mm	.14"
dwell angle (8.3 r/s=500 rpm)		59—65°
contact force	5.0—6.3 N	1.10—1.40 lb
Centrifugal governor:		
Advance, total		12±1 degrees (distributor)
Advance begins at	6.0—8.8 distr. r/s	400—525 distr. rpm
Values 3°	10.2—13.0 distr. r/s	610—780 distr. rpm
7°	15.8—18.8 distr. r/s	950—1125 distr. rpm
10°	23.3—32.8 distr. r/s	1400—1970 distr. rpm
Advance finishes at	37.5 distr. r/s	2250 distr. rpm

BULBS

	Power	Socket	Number
Headlights	60/55 W	P 43 t—38	2
Parking lights, front	5 W	S 8.5	2
rear	5 W (4 cp)	Ba 15 s	2
front and rear	32 cp	Ba 15 s	4
Stop lights	21 W (32 cp)	Ba 15 s	2
Back-up light	15 W (32 cp)	Ba 15 d	2
Side marker lights	5 W	Ba 15 s	4
License plate light	5 W	S 8.5	2
Interior light	10 W	S 8	1 (145.2)
Glove compartment light	2 W	Ba 9 s	1
Instrument light, combined instrument	2 W	W 2.2 d	3
clock	2 W	Ba 7 s	1
Light, heater controls	1.2 W	W 1.8 d	3
Control panel light	1.2 W	W 1.8 d	3
Gear selector light	1.2 W	W 1.8 d	1
Warning light, charging	1.2 W	W 1.8 d	1
oil pressure	1.2 W	W 1.6 d	1
Bulb Integrity	1.2 W	W 1.8 d	1
Control light, headlights	1.2 W	W 1.8 d	1
turn signal	1.2 W	W 1.8 d	1
electrically heated rear window			
142, 144	1.2 W	W 1.8 d	1
145	2 W	Ba 7 s	1
hazard warning signal flasher ..	1.2 W	W 1.8 d	1
overdrive	1.2 W	W 1.8 d	1
choke	1.2 W	W 1.8 d	1
parking brake	1.2 W	W 1.8 d	1
safety belt	1.2 W	W 1.8 d	1

FUSES

	Qty
Retard current 8 A	3
5 A	7
16 A	2

ELECTRICALLY HEATED REAR WINDOW

142, 144, 145

Output 150 W

INSTRUMENTS

SPEEDOMETER GEARS

Tyre 165 S 15 and 165 S R 15

Vehicle	Gearbox	Final drive red. ratio	Small S-gear		Large S-gear		Ratio	Error %
			Part No.	Teeth	Part No.	Teeth		
142, 144	M 40	4.10:1	380164	16	380449	5	3.2	+3.44
142, 144, 145	M 40	4.30:1	380166	17	380449	5	3.4	+2.15
142, 144, 145	M 41	4.30:1	380753	20	380682	6	3.33	+4.20
142, 144, 145	BW 35	4.10:1	380164	16	381106	5	3.2	+3.44

The percentage error in the above table is calculated for a rolling radius of 308 mm (12.1"), which is the value of the figure established by AB Volvo for tires at a vehicle speed of approx. 80 km/h (50 mph).
Number of speedometer cable revolutions per km (mile) registered: 640 (1030).

Vehicle	Gearbox	Final drive red. ratio	Small S-gear		Large S-gear		Ratio	Error %
			Part No.	Teeth	Part No.	Teeth		
142, 144	M 40	4.10:1	380164	16	380449	5	3.2	+2.19
142, 144, 145	M 40	4.30:1	380166	17	380449	5	3.4	+0.86
142, 144, 145	M 41	4.30:1	380753	20	380682	6	3.33	+2.88
142, 144, 145	BW 35	4.10:1	380164	16	381106	5	3.2	+2.19

The percentage error in the above table is calculated for a rolling radius of 312 mm (12.3"), which is the value of the figure established by AB Volvo for tires at a vehicle speed of approx. 80 km/h (50 mph).
Number of speedometer cable revolutions per km (mile) registered: 640 (1030).

POWER TRANSMISSION, REAR AXLE

CLUTCH

Clutch, type	Single dry plate, diaphragm spring	
Size	8½"	
Clutch friction area, total	440 cm ²	68.2 sq in
Clutch pedal travel LHD	150 mm	6.0"
RHD	160 mm	6.4"
Throw-out yoke travel	3 mm	.12"

TRANSMISSION

M 40

Type designation	M 40
Reduction ratios:	
1st speed	3.41:1
2nd speed	1.99:1
3rd speed	1.36:1
4th speed	1:1
Reverse	3.25:1
Lubricant, see under "Lubrication"	
Oil capacity	.75 cm ³ = 7 Imp. Qts = .8 US Qts

Tightening torque	Nm	Lb. ft.
Nut for driving flange	95—105	65—75

M 41 (TRANSMISSION M 40 WITH OVERDRIVE)

Reduction ratio, overdrive	.797:1	
Clearance, piston-cylinder in oil pump	.005—.040 mm	.0002—.0016"
Oil pressure, direct drive	approx. 1.5 kp/cm ²	21 psi
overdrive	27—30 kp/cm ²	385—425
Lubricant, see under "Lubrication"		
Oil capacity, gearbox and overdrive	1.6 dm ³ = 1.4 Imp. Qts = 1.7 US Qts	

TIGHTENING TORQUE

Nut for driving flange 110—140 Nm

AUTOMATIC TRANSMISSION

Make and type	Borg-Warner, type 35
Type designation, B 20 A engine	327
B 20 B engine	325
B 20 E engine	321
B 20 F engine	351 H
Color of type plate, B 20 A engine	Yellow
B 20 B engine	Ligth green
B 20 E engine	Grey
B 20 F engine	Light orange
Reduction ratios:	
1st gear	2.31:1
2nd gear	1.45:1
3rd gear	1:1
Reverse	2.09:1
Number of teeth, front sun gear	32
rear sun gear	28
planet gear, short	16
planet gear, long	17
ring gear	67
Size of converter	24 cm
Torque ratio in converter	2:1—1:1
Normal stall speed, B 20 A engine	36.7 r/s
B 20 B engine	35.0 r/s
B 20 E engine	42.5 r/s
B 20 F engine	40.8 r/s
Weights total, with fluid	53.1 kg
	9 1/2"
	2200 rpm
	2100 rpm
	2550 rpm
	2450 rpm
	117 lbs
Fluid, type	Automatic Transmission Fluid, Type F (FLM)
Fluid capacity	6.4 dm ³ =5.6 Imp. Qts=6.8 US Qts
Normal operating temperature of fluid, approx.	110—115°C
	212—240°F

APPROXIMATE SHIFT SPEEDS AT KICK-DOWN

Car	Engine	Rear axle ratio	1—2 shift		2—3 shift		3—2 shift		3—1 shift	
			km p h	m p h	km p h	m p h	km p h	m p h	km p h	m p h
142, 144	B 20 A	4.10:1	60	37	95	59	86	53	max 49	30
	B 20 B	4.10:1	63	39	105	65	94	58	max 49	30
	B 20 E, F	4.10:1	60	37	108	67	98	—	max 49	30
	B 20 E, F	3.91:1	63	39	112	70	102	63	max 49	30

SPRINGS FOR CONTROL SYSTEM

SPRING

	Approximate length		Effective Number of turns	Wire diameter
1—2 shift valve	27.8 mm	1.094"	13 1/2	6.61 mm
Primary regulator valve, B 20 A	72.4 mm	2.850"	14 1/4	1.37 mm
B 20 B, E, F	74.7 mm	2.940"	14	1.42 mm
*) Primary regulator valve, B 20 A	72.4 mm	2.850"	15	1.42 mm
Servo orifice control valve	27.6 mm	1.086"	24	.64 mm
*) Servo orifice control valve	30.8 mm	1.213"	25	.61 mm
Modulator valve	27.2 mm	1.069"	19	.71 mm
*) Modulator valve	27.2 mm	1.069"	19	.71 mm
Secondary regulator valve	65.9 mm	2.593"	18	1.42 mm
2—3 shift valve (inner spring)	40.4 mm	1.59"	22 1/2	.91 mm
Throttle valve (inner spring)	20.5 mm	.907"	28	.46 mm
*) Throttle valve (inner spring)	20.5 mm	.907"	25	.46 mm
Throttle valve (outer spring)	29.8 —	1.107—	19 1/2	.81 mm
*) Throttle valve (outer spring)	30.1 mm	1.185"		
Governor valve	29.8 —	1.107—	18	.81 mm
*) Alternative springs	30.1 mm	1.185"		

TIGHTENING TORQUES

APPLICATION

	Nm	Lb. ft.
Torque converter — drive plate	35—41	25—30
Transmission case — converter housing	11—18	8—13
Extension housing — transmission case	41—76	30—55
Oil pan — transmission case	11—18	8—13
	11—18	8—13
Rear servo — transmission case	18—37	13—27
Pump adaptor — front pump body	24—30	17—22
Slotted screws	3—4	2—3
Pump adaptor — transmission case	11—26	8—18.5
Oil deflector flange — transmission case	6—10	4—7
Center support — transmission case	14—25	10—18
Outer lever — manual valve shaft	10—12	7—9
Pressure point	6—7	4—5
Oil pan drain plug	12—17	9—12
Oil tube collector — lower body	2.5—3.5	1.7—2.5
Governor line plate — lower body	2.5—3.5	1.7—2.5
Lower body end plate — lower body	2.5—3.5	1.7—2.5
Upper body end plate front or rear — upper body	2.5—3.5	1.7—2.5
Upper body — lower body	2.5—3.5	1.7—2.5
Valve bodies assembly — transmission case	6—12	4.5—9
Front pump strainer — lower body	2.5—3.5	1.7—2.5
Downshift valve cam bracket — valve body	2.5—5.0	1.7—3.5

Governor

Governor body — counterweight	6—7	4—5
Cover plate — governor body	2.5—5.5	1.7—4.0

Brake band adjustment

Adjusting screw locking nut, rear servo — case	41—55	30—40
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Special threaded parts

Starter inhibitor	8—12	6—8
Downshift valve cable adaptor — transmission case	11—12	8—9
Coupling flange — driven shaft	48—69	35—50
Nipple for oil cooler connection	7—10	5—7
Nut for nipple	14—17	10—12

REAR AXLE

Rear axle, type	Semi-floating	
Track	1350 mm	53.15"

FINAL DRIVE

Type	Hypoid	
Reduction ratio	3.91:1, 4.10:1 or 4.30:1	
Warp, crown wheel	max. .08 mm	.0032"
Backlash	.15—.20 mm	.003—.008"
Pre-loading on pinion bearings, new bearings	1.1—2.3 Nm	9.55—20 lb. in.
run-in bearings	.6—1.1 Nm	5.21—9.55 lb. in.
Pre-loading on differential bearings	.13—.20 mm	.005—.008"
Lubricant, see under "Lubrication"		
Oil capacity	1.3 dm ³ = 1.2 Imp. Qts = 1.4 US Qts	

TIGHTENING TORQUES

	Nm	Lb. ft.
Flange	280—300	200—220
Caps	50—70	35—50
Crown wheel	65—90	45—65
Wheel nuts	100—140	70—100

BRAKES

FRONT WHEEL BRAKES

Type		Disc brakes
Brake discs:		
Outside diameter	272.2 mm	10.7"
Thickness new, B 20 E	14.28—14.4 mm	.562—.567"
other engines	12.7—12.8 mm	.500—.504"
reconditioned, B 20 E	min. 13.14 mm	.557"
other engines	min. 11.6 mm	.457"
Warp	max. .10 mm	.004"
Brake linings:		
Thickness, new	10 mm (.394")	.394"
Effective area, Girling	166 cm ²	25.7 sq. in.
ATE	145 cm ²	22.5 sq. in.
Wheel unit cylinders:		
Area, Girling	10.25 cm ²	1.6 sq. in.
ATE	10.17 cm ²	1.5 sq. in.

REAR WHEEL BRAKES

Type		Disc brakes
Brake discs:		
Outside diameter	295.5 mm	11.63"
Thickness, new	9.6 mm	.378"
reconditioned	min. 8.4 mm	.331"
Warp	max. .15 mm	.006"
Brake linings:		
Thickness, new	10 mm	.394"
Effective area, Girling	100 cm ²	15.5 sq. in.
ATE	105 cm ²	16.3 sq. in.
Wheel unit cylinders:		
Area, Girling	11.43 cm ²	1.8 sq. in.
ATE	11.33 cm ²	1.7 sq. in.

MASTER CYLINDER

Nominal diameter		$\frac{7}{8}$ "
Bore	max. 22.40 mm	.882"
Piston diameter	min. 22.05 mm	.868"

BRAKE VALVE

Operating pressure, 142 and 144	34±2 kp/cm ²	484±28 psi
Operating pressure, 145	50±2 kp/cm ²	711±28 psi

POWER CYLINDER

Type 1

Type	8" Tandem
Make	ATE
Designation	Bremsgerät T51
Ratio	1:4

Type 2

Type	9" Single
Make	DBA
Designation	225
Ratio	1:2.8

PARKING BRAKE

Brake drum:

Diameter	Max. 178.33 mm	7.0"
Radial throw	Max. .15 mm	.006"
Out-of-round	Max. .2 mm	.008"
Brake linings, effective area	175 cm ²	27 sq. in.

TIGHTENING TORQUES

	Nm	Lb. ft.
Attaching bolts, front brake caliper	90—100	65—70
Attaching bolts, rear brake caliper	60—70	45—50
Wheel nuts	100—140	70—100
Stop screw, master cylinder	10—12	7—9
Attaching nuts, master cylinder	12—15	9—11
Bleeder nipples	2—3.5	1.2—2.5
Brake hose, front brake caliper	16—20	12—15
Warning valve, switch	14—20	10—15
Brake pipes	11—15	8—11

FRONT END AND STEERING GEAR

WHEEL ALIGNMENT (UNLOADED VEHICLE)

Caster, without power steering	+1.5° to +2.5°
Camber, power steering	+2° to +3°
King pin inclination at a camber of 0°	7.5°
Toe-in	2 to 5 mm
Turning angles:	
At a 20° turn of the outer wheel the inner wheel should be turned 21.5° to 23.5°.	
Shims, thickness	.15 mm .006"
	.50 mm .020"
	1.0 mm .039"
	3.0 mm .118"
	6.0 mm .236"

MECHANICAL STEERING GEAR

Number of turns from lock to lock	4.15	4.15
Steering gear reduction ratio	17.5:1	17.5:1
Lubricant, see under "Lubrication"		
Oil capacity	approx. .25 dm ³ = .2 Imp Qt = .25 US Qt	

POWER STEERING

Steering wheel diameter	404 mm	15.9"
No. of steering wheel turns, lock to lock	3.7	
Steering gear:		
Make and type	ZF, ball-nut type	
Reduction ratio	15.7:1	
Bearing for steering spindle:		
Needle diameter, part Nos: 681348	1.992—1.994 mm	.0784—.0785"
681357	1.994—1.996 mm	.0785—.0786"
681356	1.996—1.998 mm	.0786—.0787"
681355	1.998—2.000 mm	.0787—.0790"
Bearing sleeve, ext. diameter, alt.	28.0 and 28.15 mm	1.10 and 1.11"
Washer for axial bearing, alt.	1.9—2.4 mm (th.diff. .1 mm = .039"	
	/.075—.095"	

Packing at worm, thickness, alt.	1.7 and 1.8 mm	.067 and .075"
Balls, piston — worm, No.	23	
diameter, alt.	6.989 mm	.2752"
	6.996 mm	.2754"
	7.000 mm	.2756"
	7.008 mm	.2760"
	7.012 mm	.2761"
Washer for adjuster screw, thickness, alt. .	2.15—2.45 mm	.085—.096"
th.diff. .05 mm		
Power pump:		
Make and type	ZF, vane type	
Max. pressure	75±5 kp/cm ²	
Theoretical capacity at 83 r/s (500 rpm) ...	6.65 dm ³ /min.	
Regulated capacity	5—8 dm ³ /min.	
Drive	Belt-driven	
Ratio, engine — pump	1:1	
Type of oil	Automatic Transmission	
	Fluid, Type A or Dexron	
Oil capacity	approx. 1.2 liters (1.1 imp. Qts =	
	1.3 US Qts)	

TIGHTENING TORQUES

	Nm	Lb. ft.
Nut, engine mounting	21—25	15—18
Nut, steering knuckle	70	50
Nut, upper control arm shaft	55—62	40—45
Nut, lower control arm shaft	140—180	100—130
Bolt for upper control arm shaft	55—70	40—50
Nut, upper ball point	85—100	60—70
Nut, lower ball joint	100—120	75—90
Steering wheel nut	28—40	20—30
Mechanical steering:		
Worm, upper cover	17—21	13—15
Power steering:		
Worm, valve housing	34	25
Worm, upper cover	31	22
Nut, adjuster screw	25	18
Nut for pitman arm	170—200	125—145
Attaching nut, steering box and idler arm shaft	35—40	25—30
Lock nut for tie rod	75—90	55—65
Nut for steering rod and tie rod M 10	32—37	23—27
3/8—24 UNF	32—37	23—27
7/16—20 UNF	48—62	35—45
Wheel nut	100—140	70—100

SUSPENSION, WHEELS

SPRINGS

FRONT SPRINGS

Type	Helical spring	
Wire thickness	15.0 mm	.059"
Outer diameter	126.0 mm	4.96"
Total number of turns	8.7	
Test values:		
Loading for a compression of 1 cm (25/64") (measured within a spring length of 185.5—205.5 mm=7.3—8.1") ..	527—567 N	115—125 lbs
Length, fully compressed	max. 125 mm	4.9"
Length when loaded with 5400—5700 N (1188—1254 lbs)	195.5 mm	7.7"

REAR SPRINGS, 142, 144

Type	Coil springs	
Wire diameter	12 mm	.472"
Outer diameter	128 mm	.504"
Springing coils	8	
Test datas:		
Loading for a compression of 10 mm (25/64")	164 N	37 lbs
Length, fully compressed	112 mm	4.41"
Load	2070—2207 N	464—495 lbs
at spring length	287 mm	11.3"

REAR SPRINGS, 145

Type	Standard	Delivery version
Wire diameter	Coil springs	
Outer diameter	12.7 mm = .50"	13.8 mm = .543"
Springing coils	129.4 mm = 5.09"	131.6 mm = 5.18"
Test datas:	8	8.3
Loading for a compression of 10 mm (25/64")	203 N = 45.5 lbs	257 N = 57.6 lbs
Length, fully compressed	120 mm = 4.72"	134 mm = 52.7"
Load	2384—2521 N	2345—2482 N
	= 535—565 lbs	= 525—556 lbs
at spring length	285 mm = 11.2"	322 mm = 12.67"

SHOCK ABSORBERS

SHOCK ABSORBERS

Type	Double-acting, hydraulic, telescopic	
Total length:		
front shock absorbers, compressed	approx. 223 mm	8.78"
unloaded	approx. 340 mm	13.39"
front shock absorbers, compressed	approx. 279 mm	10.98"
unloaded	approx. 443 mm	17.44"

WHEELS

WHEEL RIMS

Type	Disc	
Designation: 142, 144 de Luxe and Grand Luxe	5 J×15 L	
145 de Luxe	5 J×15 H	
142, 144	4.5 J×15 L	
145 and 145 Express	4.5 J×15 H	
Radial throw	max. 1.6 mm	.063"
Warp	max. 1.6 mm	.063"
Imbalance, complete wheel	.09 Nm	7.8 lb. in.
Tightening torque for wheel nuts	100—140 Nm	77—101 lb. ft.

TIRES

Type	Tubeless
Size, 142, 144	165 SR 15-4-PR
145	165 S 15-8-PR, 165 SR 15-4-PR
USA	6.85 S 15.8-PR

BODY

AIR CONDITIONING SYSTEM

Refrigerant, type	Freon 12 (dichlorodifluoromethane)
Compressor, type	York A 209
number of cylinders	2
max. speed	100 r/s (6000 rpm)
lubricating oil capacity	.3 dm ³ (.6 pint)
lubricating oil, type	Refrigerant compressor oil e.g.: SUNISO 5, BP ENERGOL LPT 100, SHELL CLAVUS 33, TEXACO CAPPELLA E 500
Compressor clutch, type	Electro-magnetic

COMPRESSOR DRIVE BELT

140 w/o power steering	HC 50×1350
140 w. power steering	HC×1500

PRESSURES AT 30°C=85°F*)

low side	1—3 kp/cm ²	14—40 psi
high side	10—15 kp/cm ²	140—220 psi

TIGHTENING TORQUES

	Nm	kgm	lb. ft.
Engine crankshaft pulley	120—140	12—14	87—100
Unions:			
Exp. valve pressure equalizing pipe	20	2	15
Expansion valve	50	5	35
Expansion valve hose	42	4.2	30
Evaporator hose	42	4.2	30
Condenser	42	4.2	30
Compressor	42	4.2	30
Receiver-drier	30	3	22
Compressor:			
Head	20—30	2—3	15—20
Bottom cover	20—30	2—3	15—20
Rear bearing housing	20	2	15
Conn. rod bolts	20	2	15
Oil plug	5	.5	4
Clutch center bolts	25—30	2.5—3	18—22

*) These figures are valid only if the vehicle is driven, or if a suitable fan is used to force cooling air through the condenser and the radiator (equal to driving conditions).

