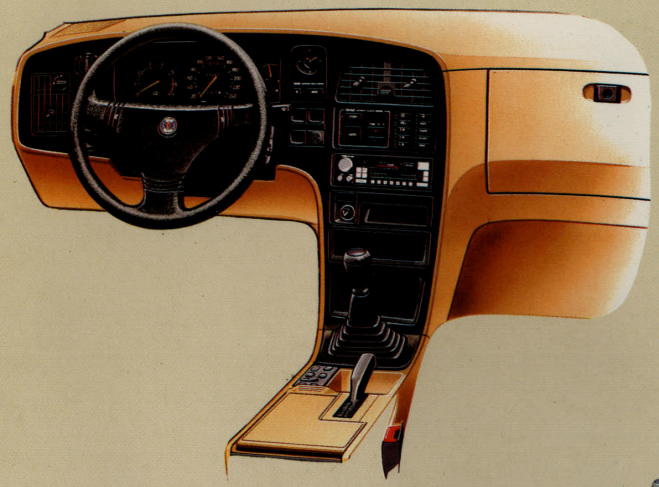
SAAB

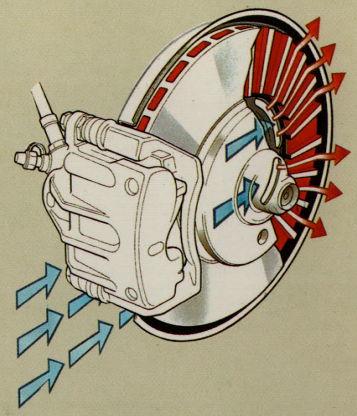
9000

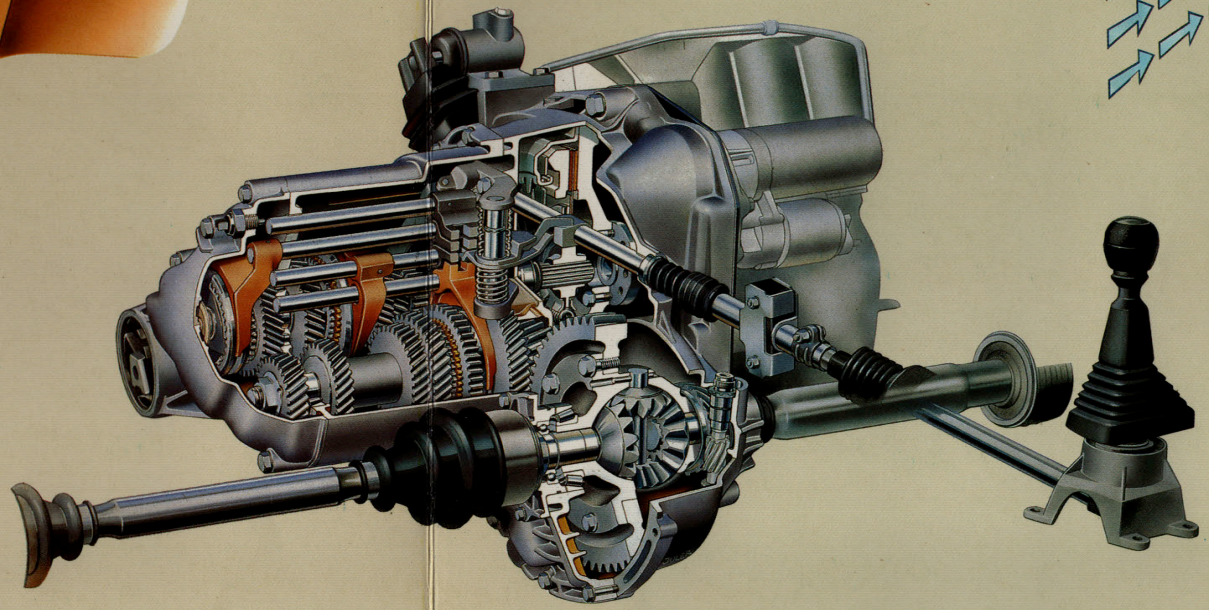
SERVICE MANUAL

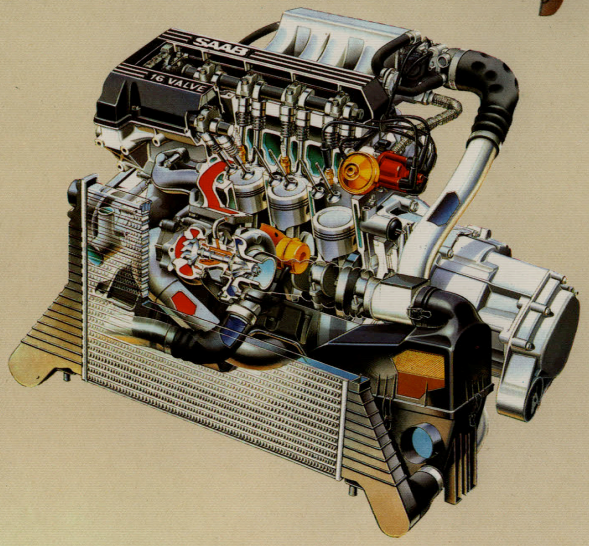
0 Technical data

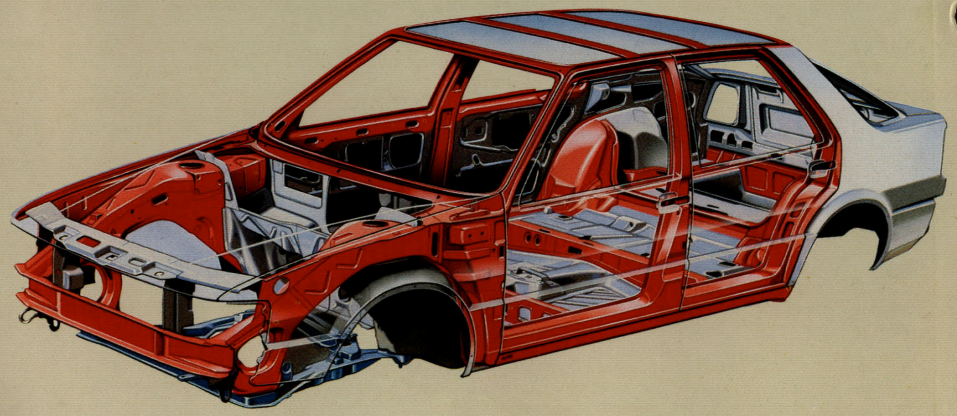
M 1986–








SAAB
16 VALVE



SERVICE MANUAL

0 Technical data

M 1986–

010 General

022 Engine

023 Electrical system

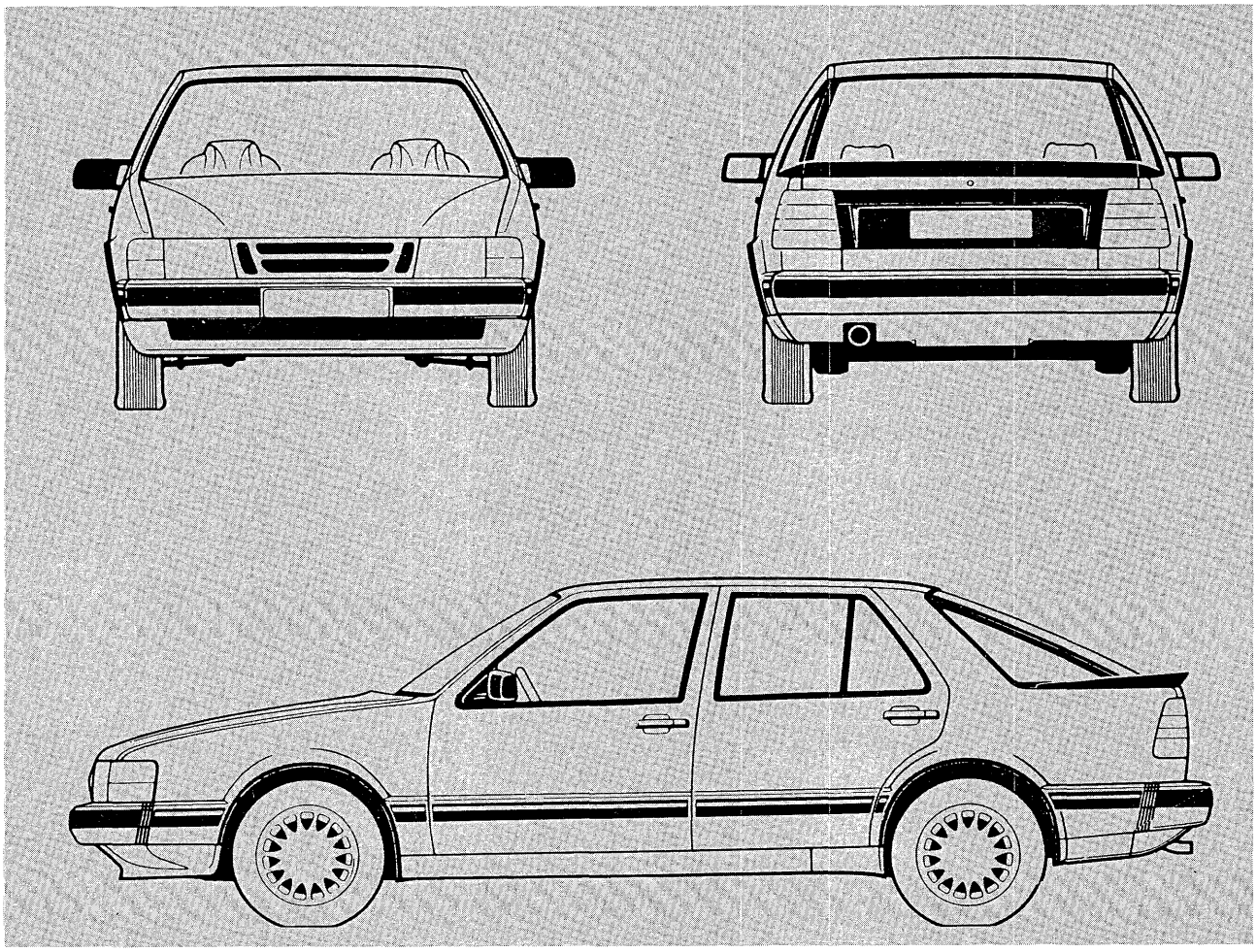
024 Transmission

025 Brakes

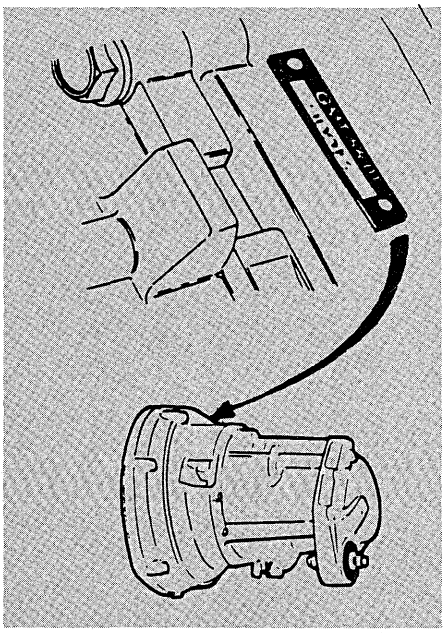
026 Front assembly, steering device

027 Suspension, wheels

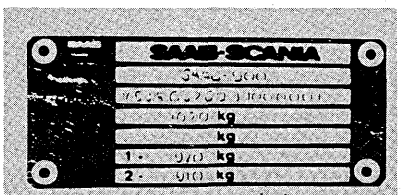
028 Body



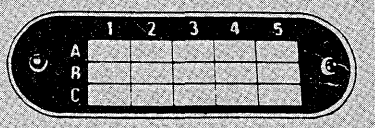
Saab 9000



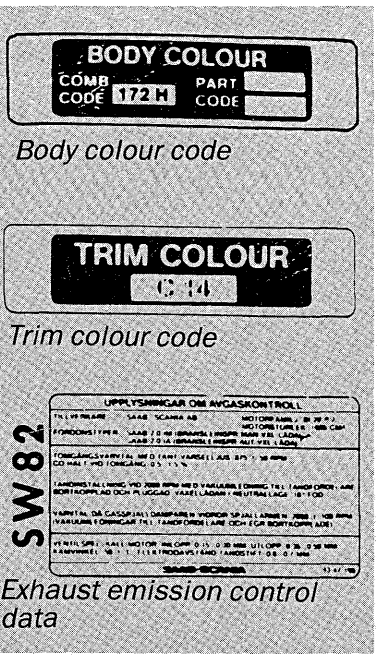
Transmission number, manual transmission



Chassis number plate



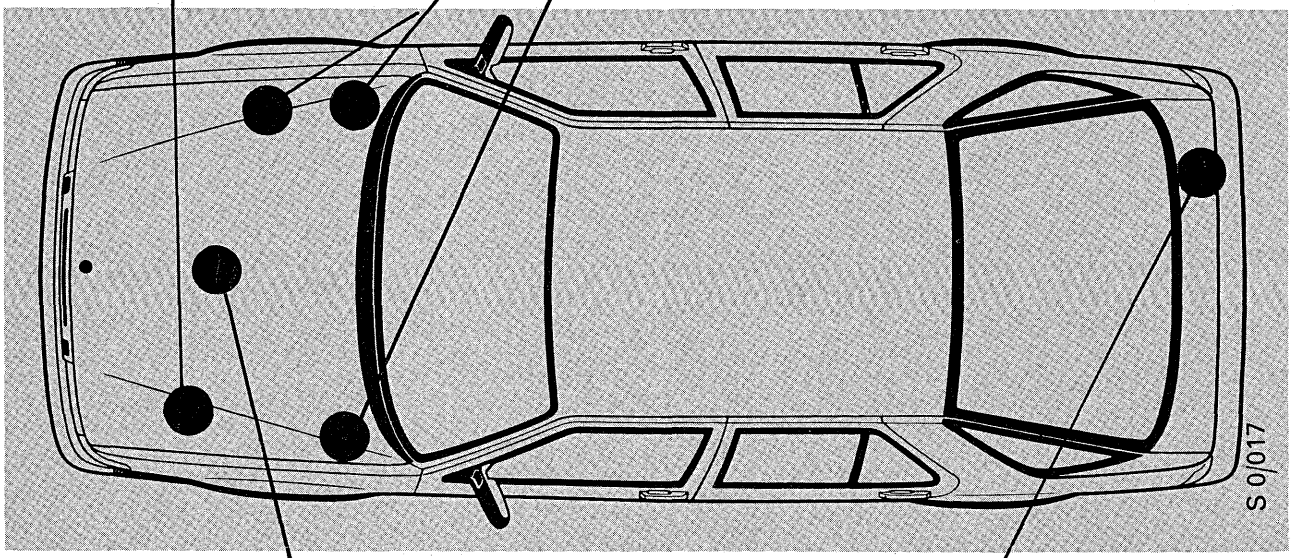
Modification code plate

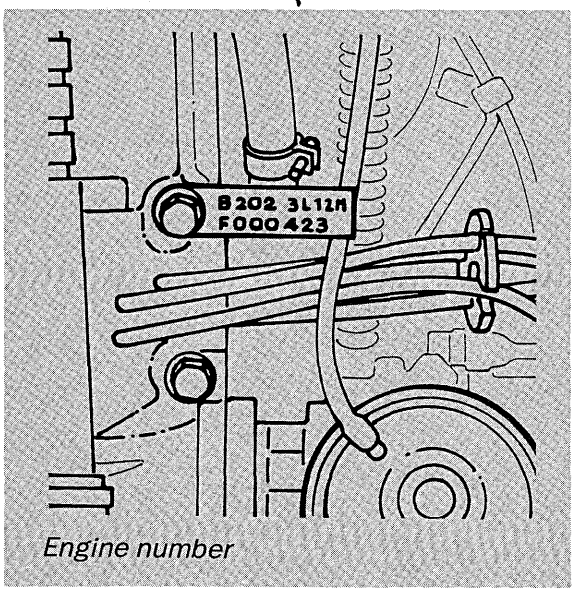


Body colour code

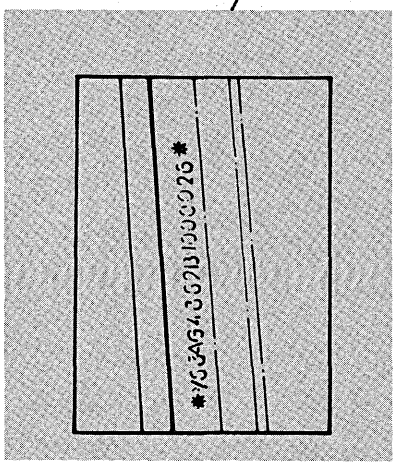
Trim colour code

Exhaust emission control data





Engine number



Chassis number (punched in car body left of right rear light behind panel in luggage compartment)

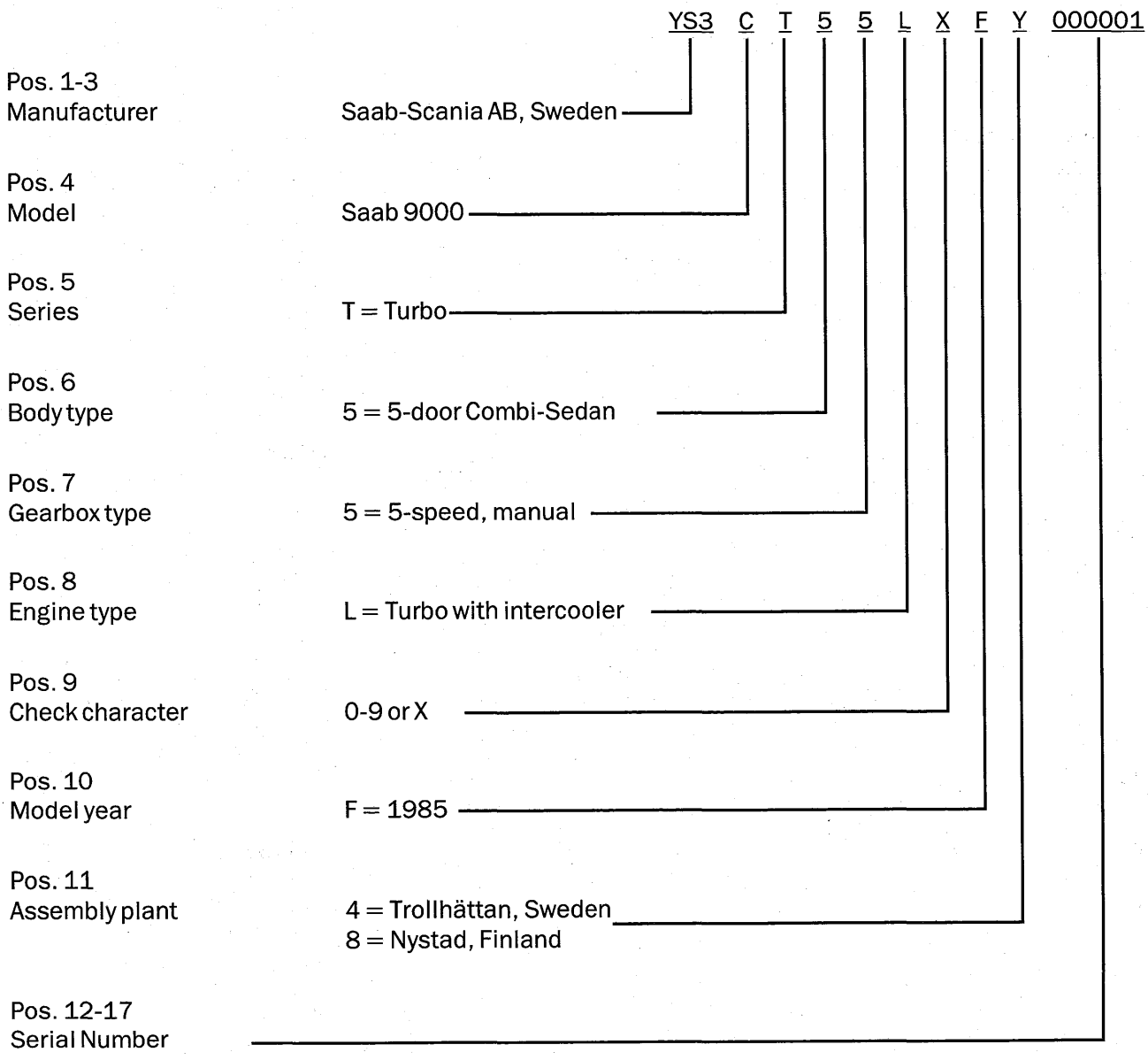
General

Chassis and engine numbers

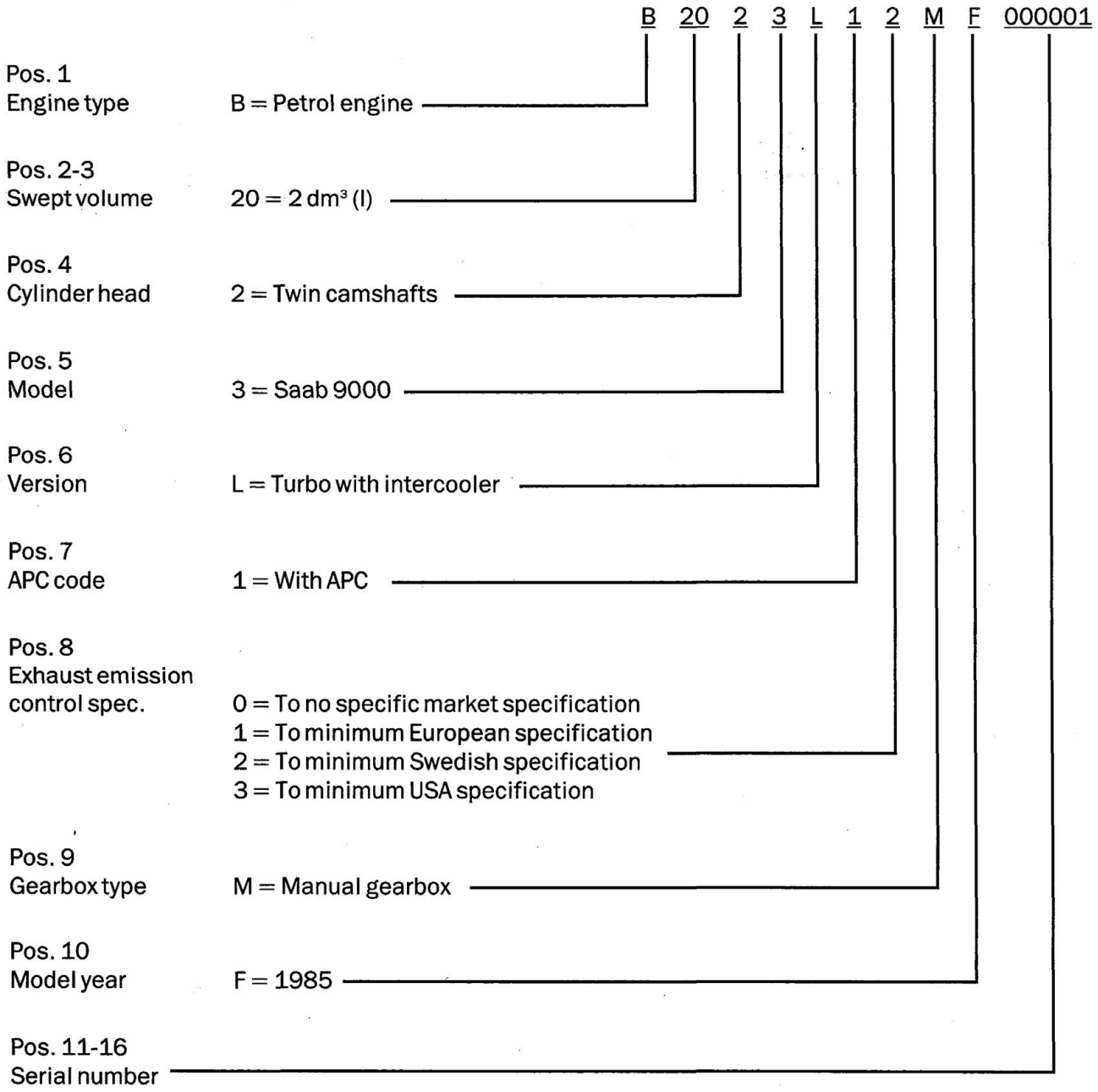
The location of the chassis and engine numbers are shown on the facing page. For positive identification of a car or engine, these numbers, together with the odometer reading, should be quoted in all correspondence, e.g. when claims are being submitted. When a replacement engine is fitted, the number of the old engine must always be stamped in the place provided for that purpose. This is essential to obviate subsequent problems should the car be taken out of the country.

Vehicle Identification Number, VIN (chassis number)

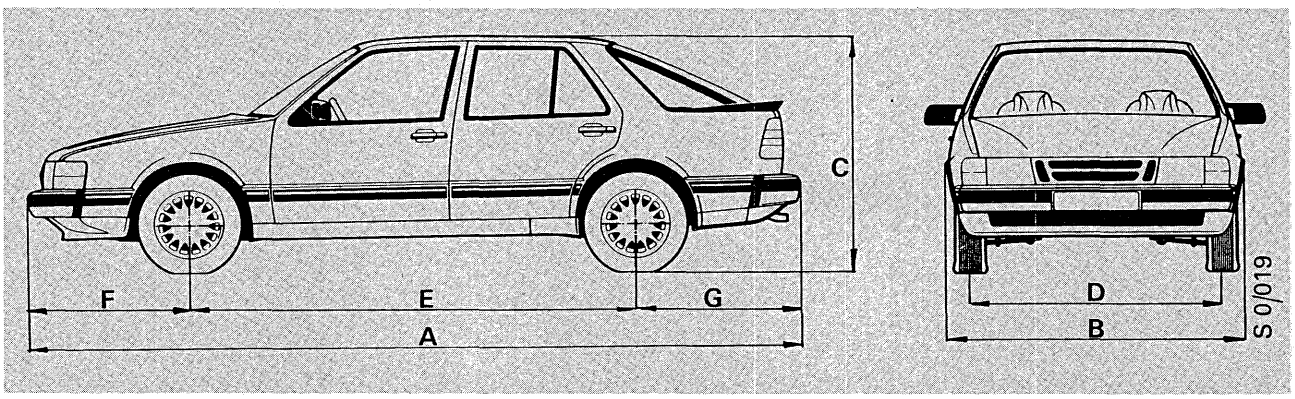
The vehicle identification number contains seventeen characters. The significance of the characters is as follows.



Engine Number

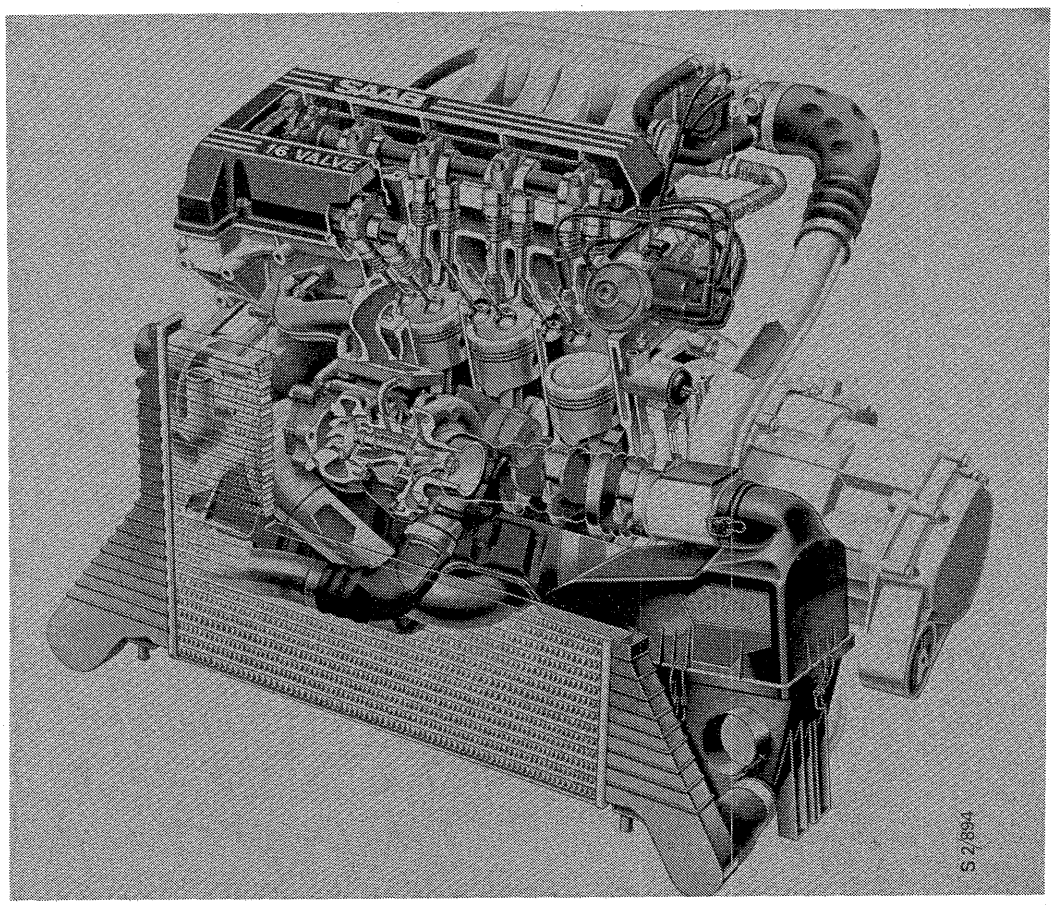


General data



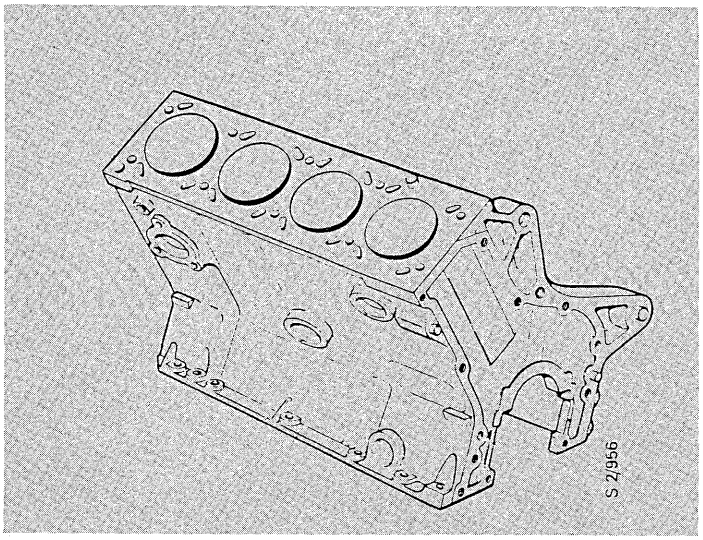
A	Overall length	mm	4620
B	Overall width	mm	1764
C	Maximum height	mm	1430
	Ground clearance	mm	150
D	Front track	mm	1522
	Rear track	mm	1492
E	Wheelbase	mm	2672
F	Front overhang	mm	965
G	Rear overhang	mm	983 mm
	Turning-circle radius	m	5.45
	Service weight	kg	1370 - 1410
	Gross weight	kg	1780 - 1810
	Max. axle load, front	kg	940
	Max. axle load, rear	kg	860
	Max. roof-rack load	kg	100
	Max. trailer weight	kg	1600

Engine



General

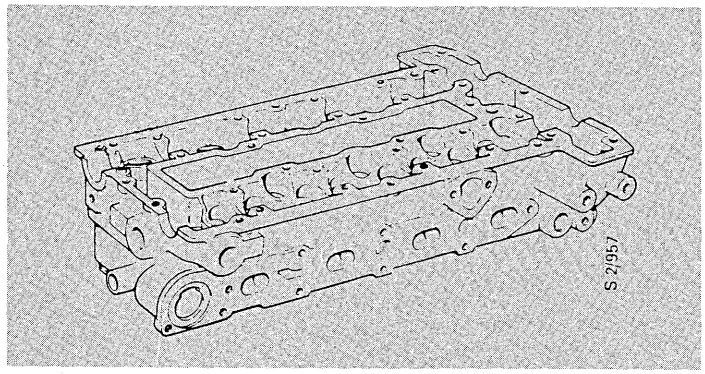
Type		4-cylinder, 16-valve, 4-stroke twin overhead camshaft engine with turbocharger, intercooler and APC. Transverse mounted.
Cylinder bore	mm	90
Stroke	mm	78
Swept volume	cm^3	1985
Compression ratio		9.0:1
Rating (DIN)	kW (hp)	129 (175) at 5300 r/min
Torque (DIN)	Nm (kgf m)	273 (27.8) at 3000 r/min
Fuel octane number	RON	92 - 98
Firing order		1-3-4-2
Weight	kg	approx. 150



Cylinder head

Cylinder bore:

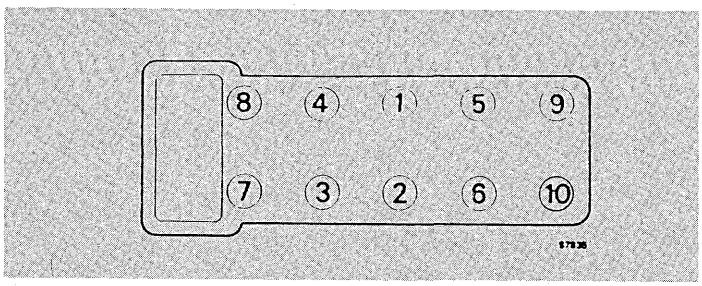
Standard (A)	in (mm)	3.5433-3.5437 (90.000-90.010)
Standard (B)	in (mm)	3.5437-3.5441 (90.010-90.020)
First oversize	in (mm)	3.5630 (90.500)
Second oversize	in (mm)	3.5827 (91.000)



Cylinder head

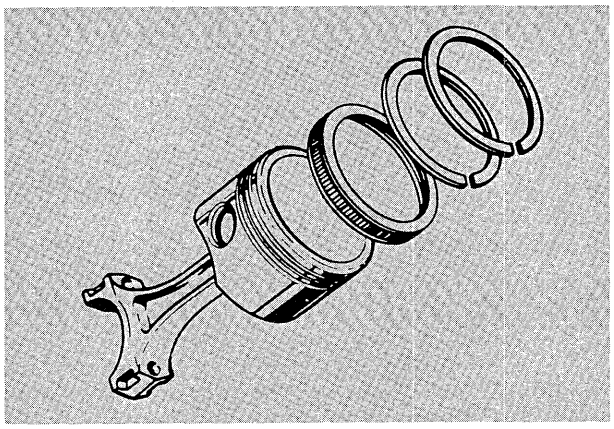
Height of new cylinder head	in (mm)	5.5315 ± 0.004 (140.5 ± 0.1)
Min. after regrinding	in (mm)	5.5157 ± 0.004 (140.1 ± 0.1)

Tightening sequence



Tightening torques

The specified torques apply to lubricated bolts and washers and to cylinder heads fitted with a new gasket		
Stage I	ft.lbs (Nm)	44 (60)
Stage II	ft.lbs (Nm)	66 (90)
Stage III		Run the engine to normal temperature and then allow it to cool for 30 minutes
Stage IV	ft.lbs (Nm)	Slacken and then retighten each bolt to 66 (90)
Stage V		Tighten by turning through a further 90°



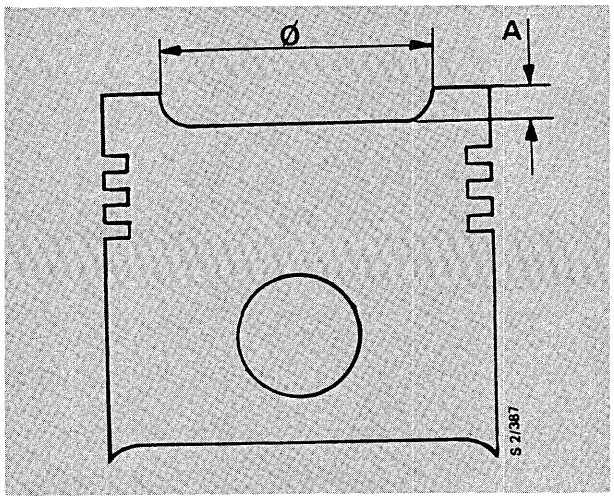
Pistons

Make		MAHLE
Piston speed at 5000 r/min	m/sek	13

Pistons of different makes must not be fitted in the same engine

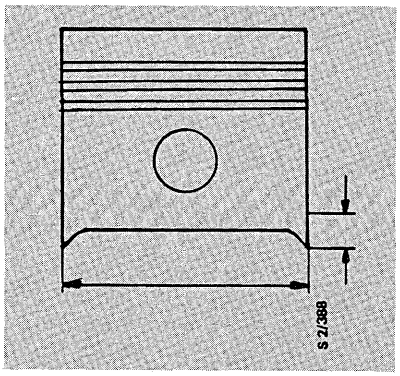
Piston type

Engine		Ø	A
Turbo 16, 1985	in (mm)	2.5197 (64)	0.1850 (4.7)

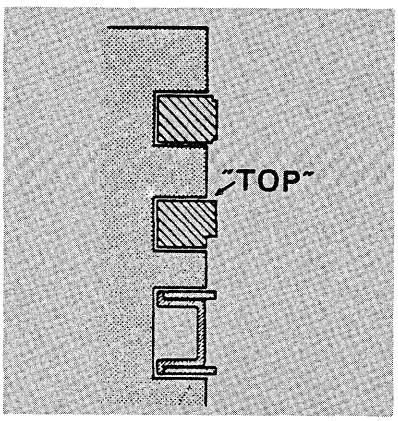


Piston diameter

Measured at right angles to the gudgeon pin hole and 0.63 in (16 mm) above the bottom edge of the skirt.	



		Turbo 16
Standard A (not carried as a spare part)	in (mm)	3.5417-3.5421 (89.960-89.970)
Standard AB	in (mm)	3.5421-3.5424 (89.970-89.978)
Standard B	in (mm)	3.5424-3.5427 (89.978-89.986)
Standard C	in (mm)	3.5427-3.5434 (89.986-90.002)
First oversize 0.02 (0.5)	in (mm)	3.5614-3.5620 (90.460-90.475)
Second oversize 0.04 (1.0)	in (mm)	3.5811-3.5817 (90.960-90.975)
Piston clearance	in (mm)	0.0008-0.0020 (0.02-0.05)



Piston rings

		Top compression ring	Second compression ring	Scraper ring
Width (thickness)	in (mm)	0.0681-0.0689 (1.73-1.75)	0.0779-0.0783 (1.98-1.99)	0.1035-0.1075 (2.63-2.73*)
Side clearance in groove	in (mm)	0.0019-0.0032 (0.050-0.082)	0.0016-0.0028 (0.040-0.072)	
Working gap in new cylinder	in (mm)	0.0138-0.0216 (0.35-0.55)	0.0118-0.0177 (0.30-0.45)	0.0149-0.0551 (0.38-1.40**)

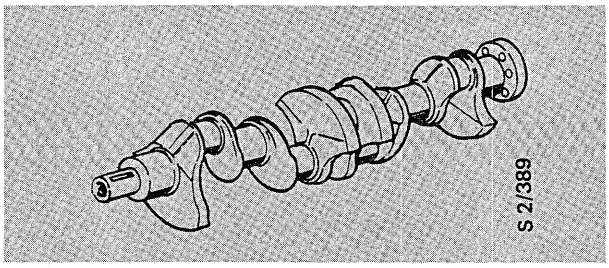
* Segment width (thickness): 0.0228-0.0252 in (0.58-0.64 mm)
** Applies to segment

Gudgeon pins

Diameter	in (mm)	0.9447-0.9449 (23.996-24.000)
Fit	in (mm)	0.0002-0.0006 (0.005-0.014) (sliding fit under gentle thumb pressure)

Connecting rods

Diameter of big-end	in (mm)	2.2047-2.2055 (56.000-56.019)
Diameter of small-end busch (fitted)	in (mm)	0.9451-0.9453 (24.005-24.010)
Maximum permissible weight variation per set	oz (g)	0.2 (6)



Crankshaft

Maximum variation in straightness	in (mm)	0.0039 (0.10)
End float	in (mm)	0.0031-0.0110 (0.08-0.28)
Max. ovality of journals	in (mm)	0.0019 (0.05)
Max. taper of journals	in (mm)	0.0019 (0.05)
Radius of main journal fillet	in (mm)	0.0866-0.0984 (2.2-2.5)
Max clearance of main journal fillet	in (mm)	0.0008-0.0024 (0.020-0.062)

Colour markings of main bearing and big-end bearing shells:	Thin	Thick
Standard	Red	Blue
First undersize	Yellow	Green
Second undersize	White	Brown

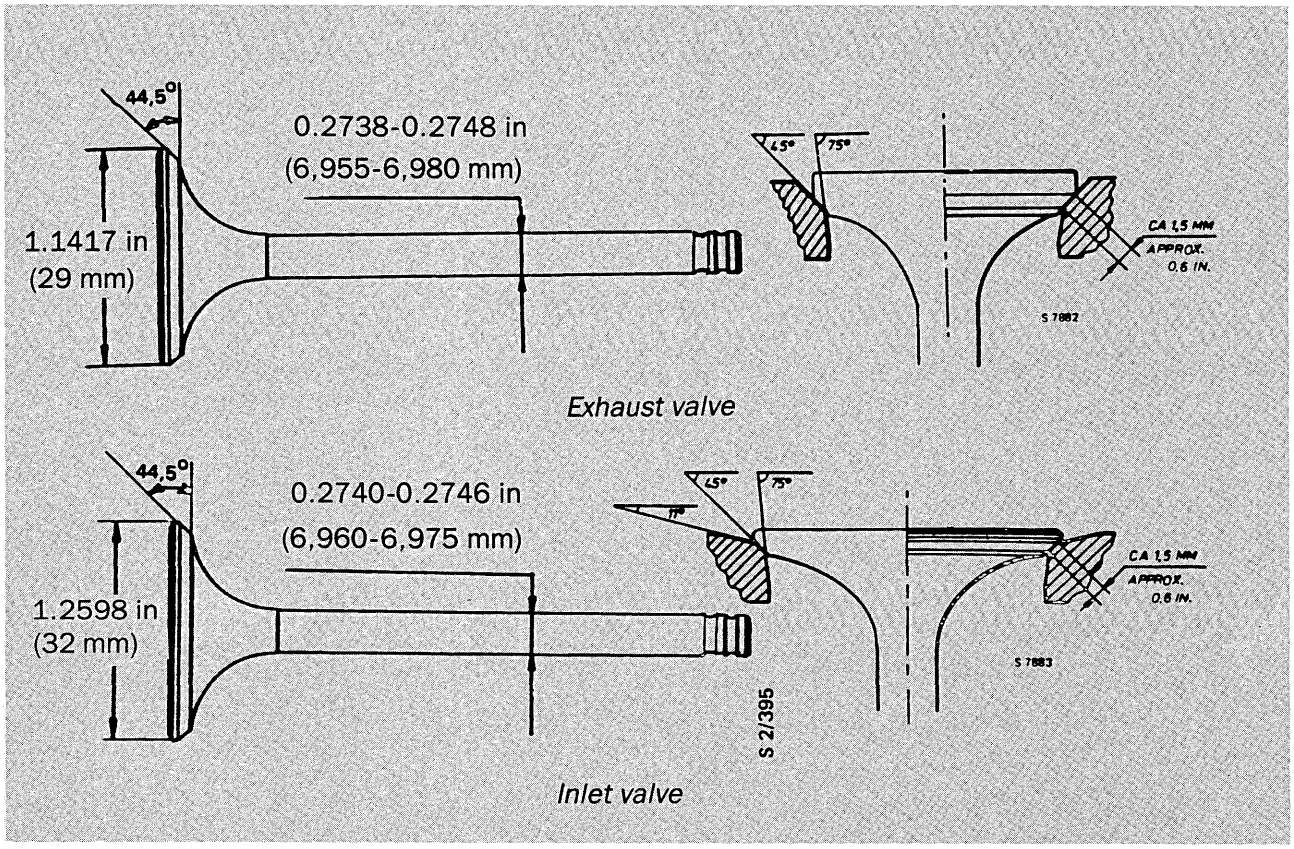
Crank pin diameter

Standard	in (mm)	2.0465-2.0472 (51.981-52.000)
First undersize	in (mm)	2.0366-2.0374 (51.731-51.750)
Second undersize	in (mm)	2.0268-2.0276 (51.481-51.500)
Third undersize	in (mm)	2.0172-2.0177 (51.237-51.250)
Fourth undersize	in (mm)	2.0074-2.0079 (50.987-51.000)
Bearing clearance	in (mm)	0.0010-0.0024 (0.026-0.062)

Main journal diameter

Standard	in (mm)	2.2827-2.2835 (57.981-58.000)
First undersize	in (mm)	2.2729-2.2736 (57.731-57.750)
Second undersize	in (mm)	2.2630-2.2638 (57.481-57.500)
Third undersize	in (mm)	2.2534-2.2539 (57.237-57.250)
Fourth undersize	in (mm)	2.2436-2.2441 (56.987-57.000)

Valve mechanism



Note
The exhaust valves are stellited and should therefore not be machined. The use of grinding paste is the only method of grinding recommended.

Valve guides

Length	in (mm)	1.93 in (49.0)
Outside diameter	in (mm)	0.4740-0.4744 (12.039-12.050)
Bore for valve guides in cylinder head	in (mm)	0.4724-0.4731 (12.000-12.018)
Max. clearance between valve stem and valve guide	in (mm)	0.02 (0.5) measured on valve head raised 0.12 in (3 mm) above seat

Valve springs

Length when fitted	in (mm)	1.457 (37.0)
Free length	in (mm)	1.772 (45.0)
Length when under load of 133.9-145.1 lbs (595-645 N)	in (mm)	1.118 (28.4)

Cam followers

Diameter	in (mm)	1.2976-1.2982 (32.959-32.975)
Height	in (mm)	1.0236 (26.0)
Bore for cam followers in cylinder head (camshaft bearing assembly)	in (mm)	1.2992-1.2998 (33.000-33.016)

Camshafts

Number of bearings		5
Bearing diameter	in (mm)	1.1387-1.1392 (28.922-28.935)
End float	in (mm)	0.0031-0.0138 (0.08-0.35)

Cam lift at 0

		Inlet valves	Exhaust valves
Turbo 16	in (mm)	0.3406/0.2618 (8.65/6.65)	0.3406 (8.65)

Valve timing

(at design clearance of 0.0138 in (0.35 mm) for inlet valves and 0.0217 in (0.55 mm) for exhaust valves)

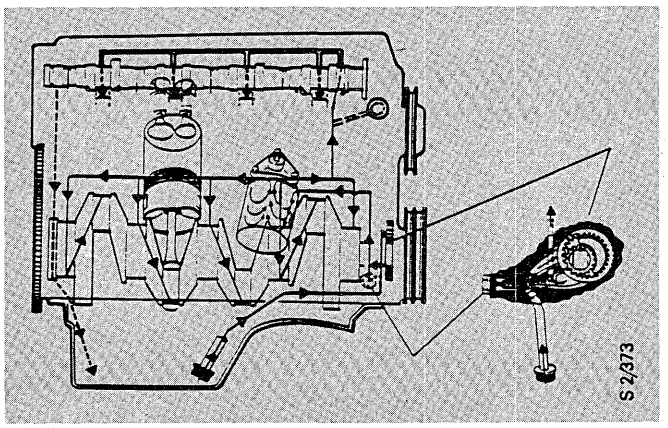
	Inlet valves		Exhaust	
valves	Open	Close	Open	Close
Turbo 16, 1985 degrees (°)	10 BTDC	56 ABDC	56 BBDC	16 ATDC
Turbo 16, 1986 degrees (°)	16 BTDC	56 ABDC	61 BBDC	13 ATDC

Tightening torques

	Torque (ft.lbs)	Torque (Nm)	Dimension
Main bearings	81	110	M12
Big-end bearings	41	55	M10
Camshaft bearing caps	11	15	M8
Camshaft cover	11	15	M8
Crankshaft pulley	140	190	M16
Flywheel	44	60	M10
Oil pump	5.9	8	M6
Chain tensioner	48	65	M22
Camshaft sprocket	48	65	M10
Inlet manifold	13.5	18	M8
Thermostat housing	13.5	18	M8
Throttle housing	13.5	18	M8
Exhaust manifold	19	25	M8
Timing cover	15	20	M8
Distributor	15	20	M8
Knock detector	15 ± 3.7	20 ± 5	

All other bolts should be tightened as follows:

Dimension	Tightening torque	
	ft.lbs	Nm
M5	3.7	5
M6	7.4	10
M8	15	20
M10	30	40

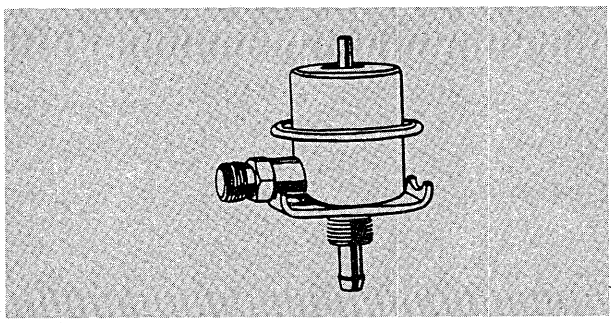


Lubricating system

Oil capacity including oil filter	liter	4.3 Oil capacity of empty oil cooler 0.1 liter
Volume of oil required to raise oil level from MIN mark on dipstick to MAX mark	liter	1.0
Grade of oil, Turbo		Saab Turbo engine oil or oil to API Service SF/CD or SF/CC
Viscosity		10W30 or 10W40. If these viscosities are unobtainable, 15W40 or 15W50 oil may be used.

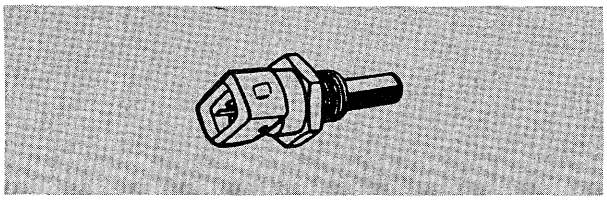
Oil pressure

Oil pump pressure-reducing valve opens at:	PSI (bar)	52-75 (3.6-5.2)
Oil warning light comes on when pressure falls to:	PSI (bar)	4.35-6.60 (0.3-0.5)
Pressure at 2000 r/min and engine temperature of 168°F (80°C) and 10W40 oil in use	PSI (bar)	minimum 43 (3.0)
Axial clearance between rotor and casing	in (mm)	0.0012-0.0031 (0.03-0.08)
Thermostat oil cooler, opening temperature	°	90



Fuel system

System pressure	PSI (bar)	36 (2.5) above pressure in inlet manifold
Residual pressure (engine switched off)	PSI (bar)	Approx. 33 (2.3)



Temperature transducer

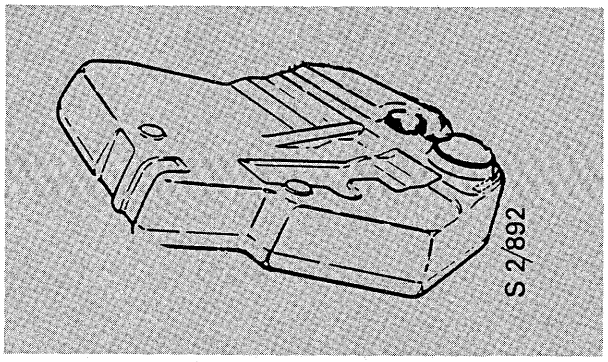
Resistance at 26°F (0°C)	Ohm	5 800
64°F (20°C)	Ohm	2 600
168°F (80°C)	Ohm	320

Full-load enrichment system

Throttle switch (butterfly angle when switch closes)	degrees (°)	Approx. 72
CO value at simulated full-load conditions	%	4-6

Fuel pump

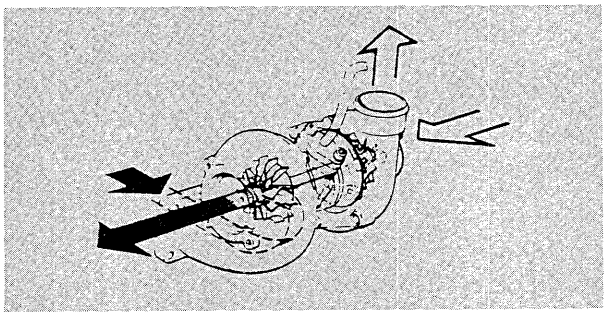
Capacity at back pressure of 36 PSI (2.5 bar)	At least 900 cm^3/30 s



Fuel tank

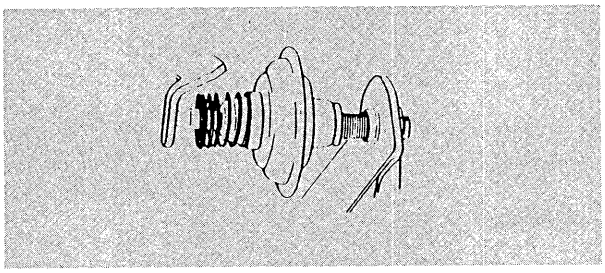
Capacity	liter	Approx. 68
Amount left in tank when fuel warning light comes on	liter	Approx. 7

Induction and exhaust systems



Turbo compressor

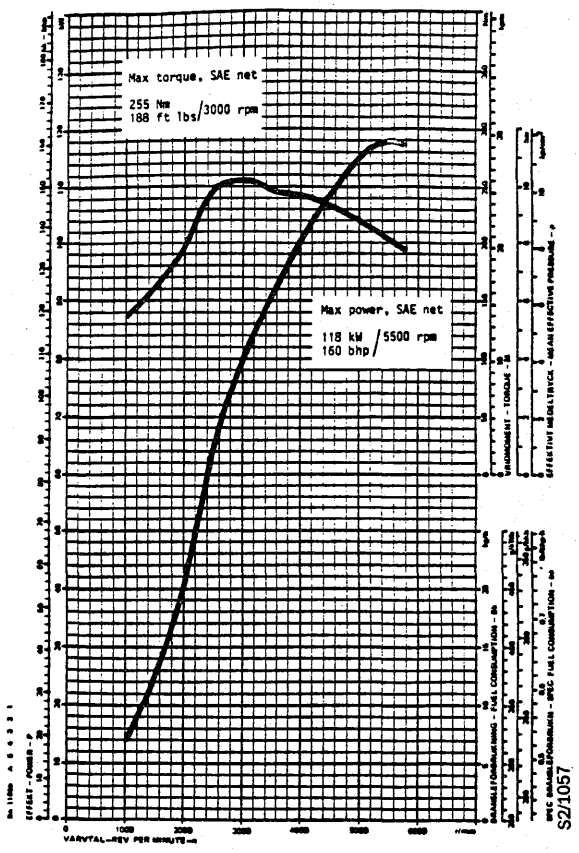
Maximum charging pressure	PSI (bar)	13.8 ± 0.7 (0.95 ± 0.05)
Basic charging pressure	PSI (bar)	5.8 ± 0.4 (0.40 ± 0.03)
Tripping pressure for pressure switch	PSI (bar)	16 ± 0.7 (1.10 ± 0.05)
Turbo shaft bearings:		
End float	in (mm)	0.0010-0.0039 (0.025-0.10)
Radial clearance	in (mm)	0.0030-0.0071 (0.075-0.18)



Mechanical throttle damper (dashpot)

Time taken for engine to slow from 3000 r/min to idling speed	s	3-6
Setting speed	r/min	2600 ± 100

Engine performance graph



Cooling system

Coolant

Type		Saab Original Coolant
Capacity	liter	10

Thermostat

Opening temperature	degrees F	192 ± 4 (alternative market specifications: 179 ± 4

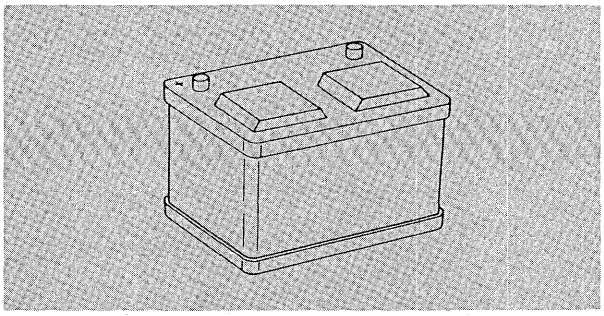
Expansion tank

Pressure valve opens at	PSI (bar)	13-17 (0.9-1.2)

Thermostatic switch

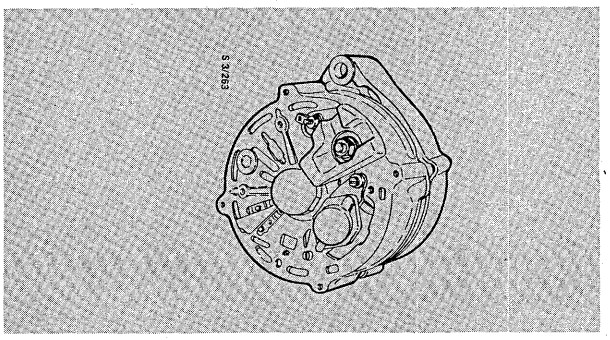
Makes circuit	degrees F	194-203
Breaks circuit at	degrees F	185-194

Electrical system



Battery

Voltage	V	12
Capacity	Ah	62
Polarity		Negative (-) earth
Specific gravity of electrolyte:		
Recharging required		1.21
Battery fully charged		1.28



Alternator

Bosch K1-14V 70A 20

Rated voltage	V	14
Rated speed	r/min	2 000
Stator connection		Delta connection △
Slip ring diameter, new	mm	27.8
minimum	mm	26.8
Maximum permissible slipring runout	mm	0.03
Maximum permissible rotor runout	mm	0.05
Minimum brush length	mm	5 (protruding from brush holder)
Gear ratio between crankshaft pulley and alternator		1:2.4

Test values

Resistance, rotor winding	Ohm	2.8 ± 10 %
between phases on stator	Ohm	0.09 ± 10 %
Output:		
At 1 500 r/min	A	27
At 2 000 r/min	A	46
At 6 000 r/min	A	70

Bosch N1-14V 80 A 19

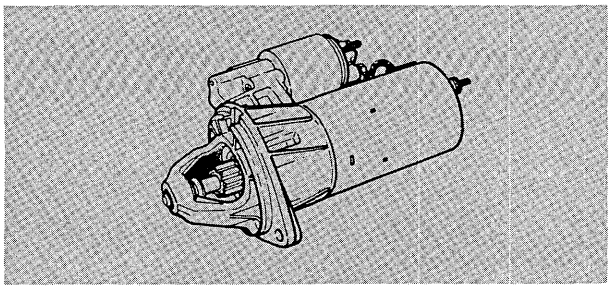
Rated voltage	V	14
Rated speed	r/min	1900
Stator connection		Star connection
Slip ring diameter, new	mm	27.8
minimum	mm	26.8
Maximum permissible slipring runout	mm	0.03
Maximum permissible rotor runout	mm	0.05
Minimum brush length	mm	5 (protruding from brush holder)
Gear ratio between crankshaft pulley and alternator		1:2.4

Test values

Resistance, rotor winding	Ohm	2.8 ± 10 %
between phases on stator	Ohm	0.10 ± 10 %
Output:		
At 1 500 r/min	A	36
At 2 000 r/min	A	54
At 6 000 r/min	A	80

Belt tension

New belt	N	800 ± 45
Minimum	N	265
After adjusting	N	535 ± 45



Starter motor

Type		Bosch DW 12V 0 001 108 012
No. of teeth on pinion		9
No. of teeth on ring gear		142
Gear ratio		15.8:1
Output	kW (hp)	1.4 (1.9)

Test values, mechanical

Backlash	mm	0.35 - 0.60
Clearance between pinion and ring gear	mm	2.5 - 3.0
Rotor end float	mm	0.05 - 0.40
Torque of freely rotating pinion	Nm (kgf cm)	0.12 - 0.18 (1.2 - 1.8)

Test values, electrical

Idling, 12 V and 70 A	r/min	3 000
Under load, 9 V and 315 A	r/min	1 700
Starter motor locked, 4 V and 650 - 750 A	r/min	0
Minimum voltage for solenoid engagement	V	7

Tightening torques

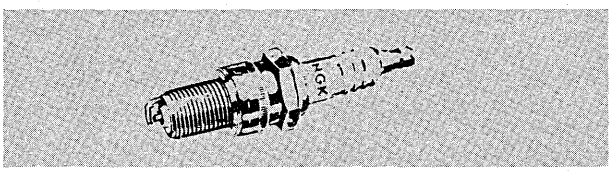
Solenoid securing bolts	Nm (kpm)	4.5 - 5.5 (0.45 - 0.55)
Commutator end bracket securing bolts (throughbolts)	Nm (kpm)	2.7 - 3.5 (0.27 - 0.35)

Ignition system

Type	Breakerless incorporating a Hall transducer
Firing order	1-3-4-2

Ignition setting with vacuum control unit disconnected

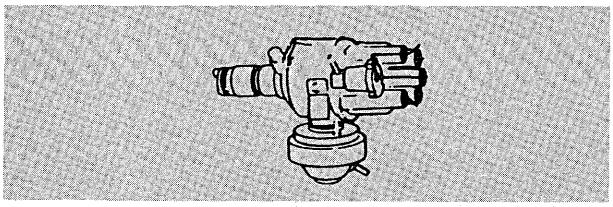
Engine	Timing at r/min	Remarks
Turbo 16	16° BTDC/850	Model year 1985



Spark plugs

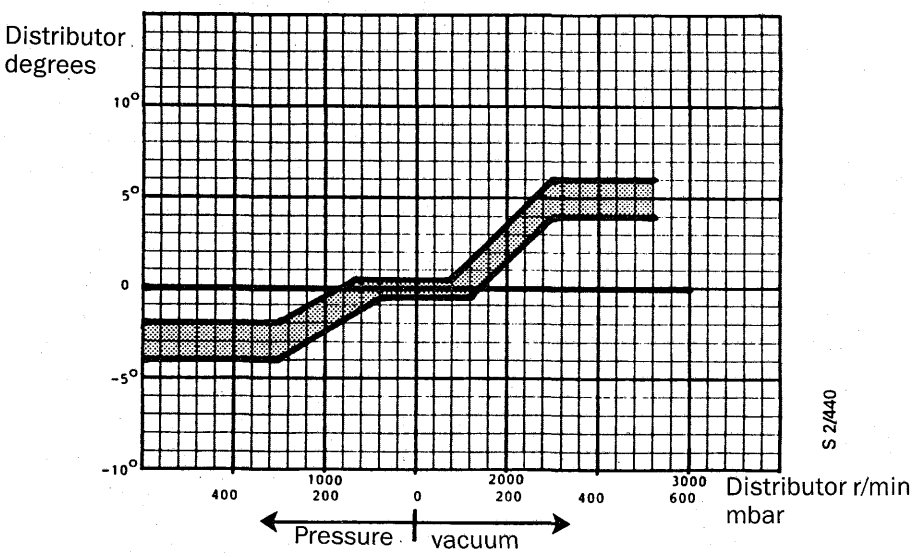
Engine	Type	Remarks
Turbo 16	Bosch F7DC	
	Champion C7GY	extremely hard driving
	Champion C9GY	
	Champion C9YC	
	NGK BCP 6ES	
	NGK BCP 6EV	
	NGK BCP 7EV	extremely hard driving

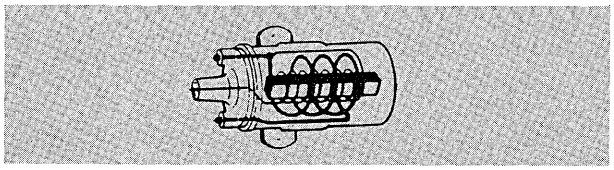
Electrode gap	mm	0.6
Tightening torque (non-lubricated plug)	Nm (kpm)	25 - 29 (2.5 - 2.9)



Distributor

Type		Bosch 0 237 507 007
Direction of rotation		Anticlockwise
Rotor arm resistance	kOhm	1



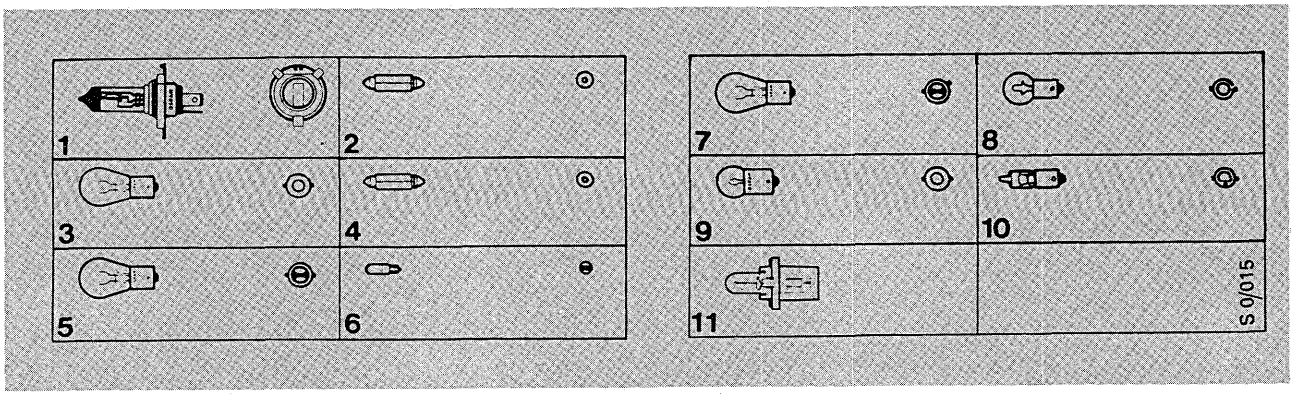


Ignition coil

Resistance of primary winding measured between terminals 1 and 15	Ohm	0.52 - 0.76
Resistance in secondary winding measured between terminal 1 and the HT output terminal	kOhm	2.4 - 3.5

HT leads

Resistance of lead (including connectors) between coil and distributor	kOhm	0.5 - 1.5
Resistance of lead (including connectors) between distributor and plug	kOhm	2 - 4



Light bulb table

			Socket	Pos
Headlamp (USA only)	W	75/50	Sylvania 9004 DOT	8
Headlamp	W	60/55	H4 holder P43 t-38	1
Rear direction indicators, stop lights, reversing lights	W	21	BA 15s	3
Front direction indicators, daylight driving lights/parking lights	W	21/5	BAY 15d	5
Fog lights/tail lights	W	21/4	BAZ 15d	7
Tail lights	W	5	BA 15s	9
Number plate illumination, door-mirror-switch illumination, glove compartment light, radio console light and door lights, seat-belt warning light	W	5	SV 8.5-8	2
Dome light and luggage compartment light	W	10	SV 8.5-8	4
Illumination for light switch and front ashtray	W	1.2	W2x4.6d	6
Warning/indicator lights for oil pressure, brakes, direction indicators (repeater), choke, rear-window heating main beam, hand brake, fuel level and pictogram, shift up	W	1.12	bulb with bulb holder	–
Fuel warning light	W	1.2	bulb with bulb holder	11
Charging warning light	W	2.0	bulb with bulb holder	11
Illumination for heating and ventilation controls and cigar lighter	W	2	W2 x 4.6d	6
Instrument illumination	W	3	bulb with bulb holder	–
Spotlight, front roof panel	W	5	halogen	10
Spotlight, rear seat	W	5	halogen	10
Side indicator repeater lights	W	5	W2.1 x 9.5 d	12
Rear-window stop lights	W	21	BA 15s	3

Other electrical equipment

Windscreen wiper motor

Speed (double sweeps per minute) and power consumption:			
Wet glass, 13.5 V, half-speed	r/min	44 ± 4	≤3 A
Wet glass, 13.5 V, full speed	r/min	64 ± 6	≤4 A
Motor locked (e.g. wiper blades frozen to glass)	A	approx.20	

Fuses

Red	A	10
Blue	A	15
Yellow	A	20
Colourless	A	25
Green	A	30

Headlamp wiper motor

Type		Bosch AHO 12V
Operating speed at output shaft when unladen, double sweeps/min		50 - 60
Power demand	A	0.75 - 1.5
Power demand when motor locked (e.g. wiper blades frozen to screen)	A	4.0 - 5.5

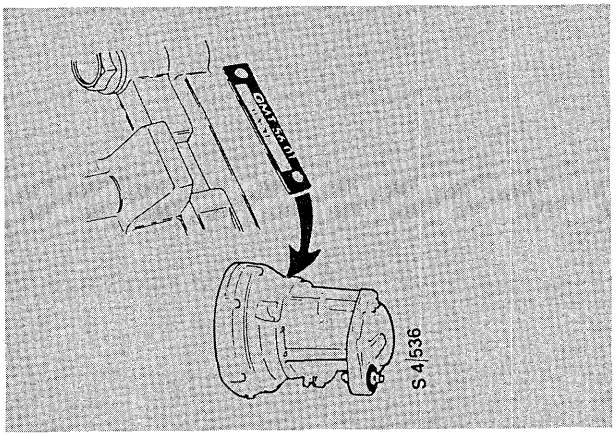
Heated front seats

Cut-in temperature of thermostat	°C (°F)	+12 (54) ± 2.8 (37)
Cut-out temperature of thermostat	°C (°F)	+28 (83) ± 2.8 (37)
Output of heating elements	W	approx. 86

Heated rear window

Output at 13 V	W	300 ± 30

Transmission



Gearbox number

Type numbers

The type number is located next to the transmission serial number and signifies the following:

GM T 5 6 01

- Manual gearbox
- Gearbox for transversely mounted unit
- Number of forward gears
- Fifth-speed gear ratio
- Variant (stage of development)

Serial No.: 300 000 series

Type numbers

Gearbox	Type number
For turbo engines	GMT 5301
For injection engines	GMT 5101

Oil level, as from 1986 models

Remove the oil pipe filler cap and insert the engine-oil dipstick until the cap rests on the top of the oil pipe. Thereafter, check the oil in the same way as for 1985 models.

Table of lubricants

Gearbox		Engine oil SAE 10 W-30, SF/CC
Clutch release bearing		Factory-sealed for life. Not to be washed.
Input shaft splines		On fitting, molybdenum paste or Esso Nebula EP2 (Saab Special Chassis grease)
Gear-lever housing		Esso Nebula EP2 (Saab Special Chassis grease)
Master cylinder plungers and seals		Wakefield Girling No. 3 Rubber Grease
Slave cylinder plunger and seals		Castrol UBCF 11
Universal joint	g	80 Esso Beacon EP2 Mobil 525/Mobil EXF 57C
Driver cup including rubber-bonded joint	g	60 Esso Beacon EP2 Mobil 525/Mobil EXF 57C
Intermediate drive shaft	g	100 Esso Beacon EP2 Mobil 525/Mobil EXF 57C
		Caution Take care to keep the grease off all painted surfaces as the grease is liable to discolour the paint.
Outboard drive shafts	g	80 Esso Nebula EP2 (Saab Special Chassis grease)
Clutch pedal pivot		Esso Nebula EP2 (Saab Special Chassis grease)
Sealant between gearbox and clutch housing		Loctite 510 (45) 30 20 468

Clutch

Make		Fichtel & Sachs
Type		Single dry-plate clutch of diaphragm-spring type
Operation		Hydraulic
Diameter	in (mm)	9 (228)

Manual gearbox

Oil capacity	l	2.5
Grade of oil		Engine oil SAE 10W30 or 10W40 SF/CC
Weight including oil	kg	47

Tightening torques

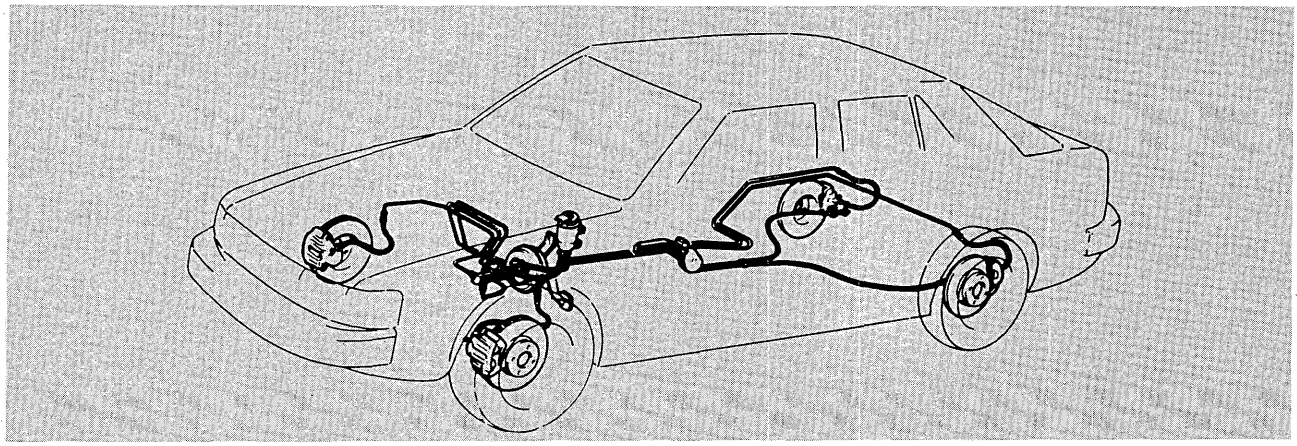
Output shaft bearing bracket	Nm (ft.lbs)	26± 2 (19.4 ± 1.5)
Internal gear selector mechanism	Nm (ft.lbs)	22 ± 2 (16.4 ± 1.5)
Selector for reverse gear	Nm (ft.lbs)	22 ± 5 (16.4 ± 1.5)
Selector shaft actuator	Nm (ft.lbs)	22 ± 2 (16.4 ± 1.5)
Securing bolts in joint between gear-box and clutch housing	Nm (ft.lbs)	22 ± 2 (16.4 ± 1.5)
Input shaft bearing bracket	Nm (ft.lbs)	26 ± 2 (19.4 ± 1.5)
Slave cylinder securing bolts	Nm (ft.lbs)	9 ± 1 (6.7 ± 0.7)
Crown wheel bolts	Nm (ft.lbs)	90 ± 10 (67.0 ± 7.0)
Bearing retainer, left-hand driver	Nm (ft.lbs)	22 ± 2 (16.4 ± 1.5)
Oil filler plug	Nm (ft.lbs)	50 ± 10 (37.2 ± 7.0)
End cover securing bolts	Nm (ft.lbs)	22 ± 2 (16.4 ± 1.5)
Reversing-light switch	Nm (ft.lbs)	22 ± 2 (16.4 ± 1.5)
Pressure plate	Nm (ft.lbs)	20 ± 6 (15.0 ±4.5

Gear ratio

Year	Model	Gearbox No.	Tyres	Dynamic rolling radius	Final dr. ratio	Gear ratios 1	2	3	4	5	Reverse
1985	9000	GMT 5301	195/60 HR15	299	19:80 4.21	13.93	7.42	4.91	3.61	2.88	13.53
1986	9000	GMT 5301	205/55 VR15	295	20:77 3.85	13.93	7.42	4.41	3.61	2.88	13.53
1986	9000	GMT 5101	195/60 HR15	299	19:80 4.21	13.93	7.42	4.91	3.83	3.07	13.53

Year	Model	Gearbox No.	Tyres	Road speed, mph (km/h) at 1 000 r/min 1	2	3	4	5	Reverse
1985	9000	GMT 5301	195/60 HR15	5.0 (8.1)	9.4 (15.1)	14.2 (22.9)	19.4 (31.2)	24.4 (39.2)	5.2 (8.4)
1986	9000	GMT 5301	205/55 VR15	5.0 (8.0)	9.3 (15.0)	14.1 (22.7)	19.1 (30.8)	24.0 (38.6)	5.2 (8.3)
1986	9000	GMT 5101	195/60 HR15	5.0 (8.0)	9.4 (15.1)	14.2 (22.7)	18.3 (29.4)	22.9 (36.9)	5.2 (8.4)

Brakes



Front brakes

Make			Girling
Type			Sliding caliper and ventilated discs
Brake disc:	Outside diameter	mm (in)	280 (11.024)
	Thickness, new disc	mm (in)	22 +0/-0,2 (0.866 +0/-0.008)
	Minimum thickness after grinding	mm (in)	20 (0.787)
	Maximum grinding depth each side	mm (in)	1 (0.039)
	Maximum runout, disc fitted	mm (in)	0.08 (0.0031)
	Maximum variation in disc thickness	mm (in)	0.015 (0.0006)
Brake pads:	Thickness of new lining	mm (in)	11 (0.433)
	Minimum thickness	mm (in)	1 (0.039)
	Area of friction material, each pad	cm^2 (in^2)	35 (5.42)

Rear brakes

Make			ATE
Type			Sliding caliper
Brake disc,	Outside diameter	mm (in)	258 (10.157)
	Thickness, new disc	mm (in)	9.0 ± 0.1 (0.354 ± 0.004)
	Minimum thickness after grinding	mm (in)	7.5 (0.295)
	Maximum grinding depth each side	mm (in)	0.75 (0.029)
	Maximum runout, disc fitted	mm (in)	0.08 (0.0031)
	Maximum variation in disc thickness	mm (in)	0.015 (0.0006)
Brake pads,	Thickness of new lining	mm (in)	11 (0.433)
	Minimum thickness	mm (in)	1 (0.039)
	Area of friction material, each pad	cm^2 (in^2)	18.4 (2.85)
Total area of friction material, front and rear brakes		cm^2 (in^2)	212 (32.86)

Brake fluid

Grade		DOT 4
Fluid capacity	l	Approx 0.50

Master cylinder

Type		Tandem cylinder
Make		Girling
Diameter	mm (in)	22.2 (0.874)

Servo unit

Make		Girling
Diameter	in	8
Power assistance		4.0:1 at a pedal effort of 55 lbs

Tightening torques:

Caliper assembly securing bolts,	Front	Nm (ft.lbs)	70-110 (52-82)
	Rear	Nm (ft.lbs)	70-90 (52-67)

Front assembly, steering device

Front wheel alignment (unladen car)

Swivel pin (king pin) inclination	degrees	11,3 ± 0,5
Castor	degrees	1,65 ± 0,50
Camber	degrees	-0,65 ± 0,50
Toe-in, measured at rim (410 mm or 16.1 in)	mm (in)	1.5 ± 1 (0.059 ± 0.040)
Toe-in, measured at a universal 28.64 in circle	mm (in)	2.6 ± 1,7 (0.102 ±0.067)
Steering angle, outer wheel	degrees	20
Steering angle, inner wheel	degrees	21 ± 0,5
Slip radius 195/60 HR 15/5 6 in	mm (in)	3 (0.118)

Rear wheel alignment

Toe-in, measured at rim (410 mm or 16.1 in)	mm (in)	2,5 ± 1,5 (0.098 ± 0.059) 1-3 (0.04 - 0.12)/side
Toe-in measured at a universal 28.64 in circle	mm (in)	4,4 ± 2,6 (0,173 ± 0,102)
Camber	degrees	- 0,25 ± 0,25

Wheelbase	mm (in)	2672 (105.197)

Steering

Number of steering wheel turns, lock-to-lock	3.21
Adjustment of plunger	Screw the plunger fully home and then back off through 40° - 60°. Check that the rack does not bind in any position.

Permissible wear limits

Track-rod end,	Axial play	mm (in)	2 (0.08)
	Radial play	mm (in)	1 (0.04)
Inner ball joint, rack-and-pinion gear,	Axial play	mm (in)	1 (0.04)
Ball joints (track-rod ends)			Non-adjustable. If excessive play is present, the ball joint must be replaced complete.

Track-rod ends

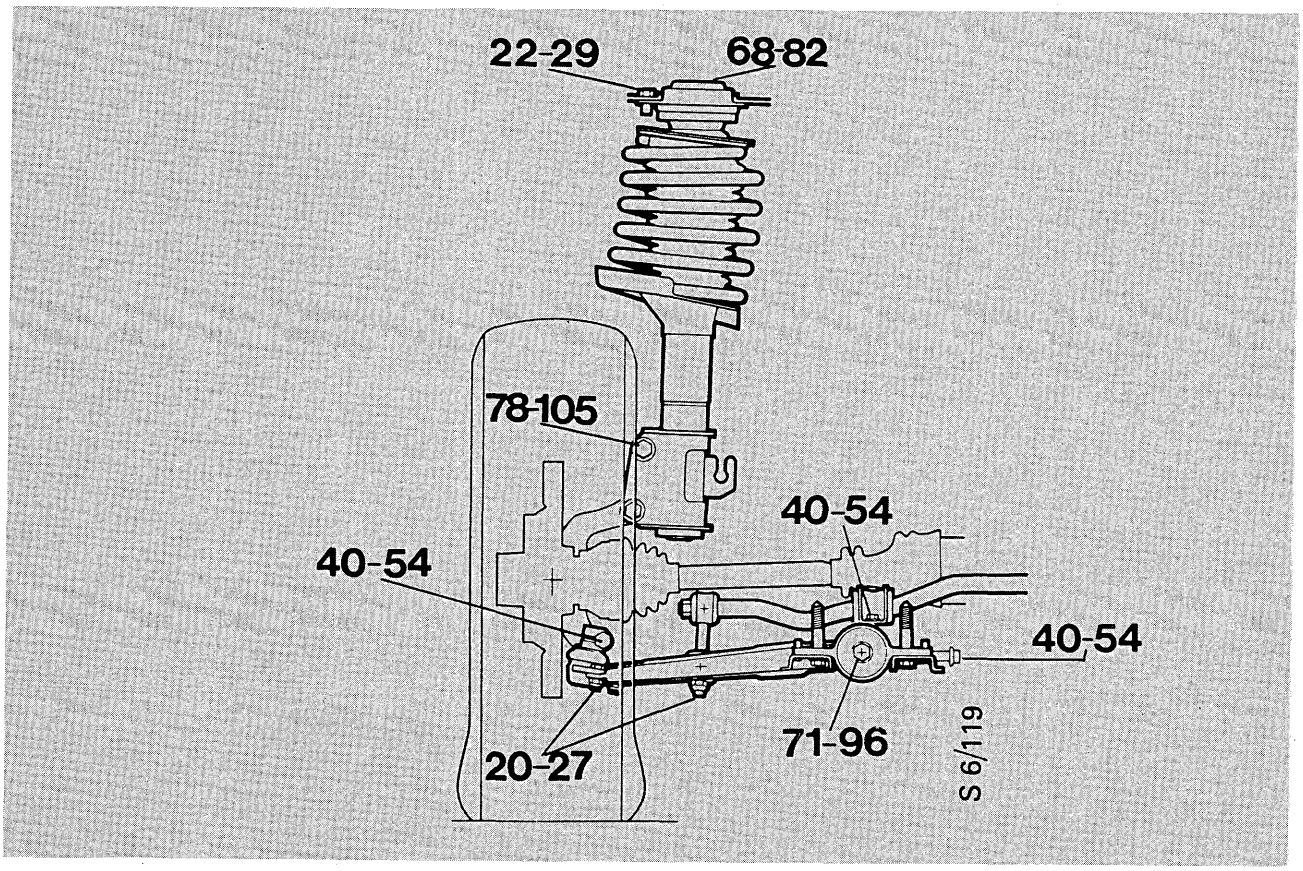
Maximum distance between end of thread and locknut	mm (in)	25 (0.98) max.
Maximum difference in above dimensions between left and right track rods	mm (in)	2 (0.08)

Lubricant

Lubricant type		Lithium grease - Shell EP B2, Code 71303, Shell Retinax A, or the equivalent.
Lubricant quantity	g (oz)	60 (2.1) (approx. 7 cl)
Servo fluid		Texaco 4634 power steering fluid
Servo fluid quantity	(dm^3 (qts)	0.75 (0.78)

Tightening torques

Locknut on track-rod end	Nm (ft.lbs)	60 - 80 (46 - 56)
Track-arm bolt, track-rod-end	Nm (ft.lbs)	50 - 60 (36 - 46)
Rack-and-pinion gear securing bolts	Nm (ft.lbs)	60 - 80 (46 - 56)
Pinch bolt, steering column universal joint	Nm (ft.lbs)	35 - 42 (26.5 - 32)
Steering wheel nut	Nm (ft.lbs)	27 (21)
Connectors, hydraulic lines	Nm (ft.lbs)	20 - 34 (14 - 26)
Inner ball joint	Nm (ft.lbs)	80 - 100 (56 - 72)



Tightening torques in Nm (10 Nm = 7.2 ft.lbs)
** Strength grade*

Suspension, wheels

Front coil springs

Total number of coils		6 1/2	6 1/2	6 1/2
Number of active coils		5 1/2	5 1/2	5 1/2
Rod diameter	mm (in)	12.86 (0.506)	12.97 (0.510)	13.09 ((0.515)
Free length	mm (in)	455 (17.913)	455 (17.913)	455 (17.913)
Colour coding, No. 1		Brown	Orange	Black
Colour coding, No. 2		Violet	Pink	White

Rear coil springs

Total number of coils		9 1/2	9 1/2
Number of active coils		8	8
Rod diameter	mm (in)	13.4 (0.528)	13.6 (0.535)
Free length	mm (in)	321 (12.638)	321 (12.638)
Colour coding, No.1		Brown	Black
Colour coding, No. 2		Blue	White

Wheels

Maximum radial runout	mm (in)	0,5 (0.02)
Maximum lateral runout	mm (in)	0,5 (0.02)

Rear-wheel alignment

Toe-in	mm	2,5 ± 1,5
Camber	°	−1/4 ± 1/4

Wheels

Spare wheel

Rims

Spare wheel

Type		Aluminum	Steel
Dimension		6 J x 15 H2	4 J x 15H2
Offset	mm (in)	33 (1.3)	50 (2.0)

Tyres

Spare wheel

Markets				GB	Others
Type			Radial (steel braced)	Radial	Cross-ply
Size		205/55 VR15	195/60 VR 15	T115/70R15	T115/70 D15
Rolling radius	mm (in)	295 (11.614)	299 (11.772)	–	–
Speed rating	km/h (mph)	>210(>130)	>210(>130)	80 (50)	80 (50)

Recommended tyre pressures for cold tyres

(The pressures are given in bar (PSI)
"Occup" = occupants)

Size		1-3 occup; max. cruising speed 130 mph (210 km/h)		1-3 occup; cruising speed above 130 mph (210 km/h)		4 or more occup;	
		Front	Rear	Front	Rear	Front	Rear
195/60 VR 15	bar (PSI)	2.2 (32)	2.2 (32)	2.5 (36)	2.5 (36)	2.5 (36)	2.5 (36)
205/55 VR15	bar (PSI)	2.1 (30)	2.1 (30)	2.5 (36)	2.5 (36)	2.5 (36)	2.5 (36)
Spare wheel							
T 115/70 R 15	bar (PSI)	4.2 (61)					
T 115/70 D 15	bar (PSI)	4.2 (61)					

Tightening torques in Nm (10 Nm = 7.2 ft.lbs

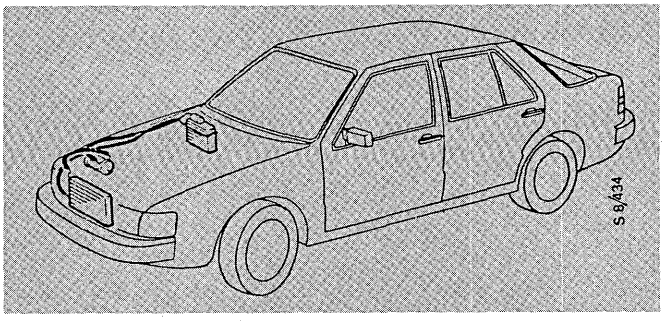
Wheel bolts	Nm (ft.lbs)	105–125 (76–90)
Hubs, front wheels	Nm (ft.lbs)	270–290 (194–208)
rear wheels	Nm (ft.lbs)	270–290 (194–208)

Body

Finishing coats

Colour code	Colour	Enamel type	Remarks
117	Platinum blue	Base	
119	Charcoal grey	Solid	Sill colour
120	Cockenville Red	Base	
127	Cherry Red	Solid	
129	Rose Quartz	Base	
156	Mother of pearl	Base	Effect primer + Pearl metallic
158	Odoardo grey	Base	
159	Malachite green	Base	
170	Black	Solid	
172	Silver	Base	

Air conditioning (AC)



Compressor

Model		Sanden SD 510
No. of cylinders		5
Swept volume	cm^3	161
Refrigerant		R 12
Oil capacity	dl	1.35 (new compressor)
Clutch		Electromagnetic
Speed range	r/min	500 - 6000
Weight including clutch	kg	7.7

Expansion valve

Type		Externally equalized thermal expansion valve
Capacity	tonnes	2 (24000 BTU/h)
Superheating	°C (°F)	44 ± 0.8 (111.2 ± 33.4)

Three-stage pressure switch

		First stage: Allows compressor to run	Second stage: Switches in electric radiator fan	Third stage: Safety function. Switches off compressor
Opening presure, kgf	m/cm^2	approx. 2	10–12	24–29
Operating pressure, kgf	m/cm^2	approx. 2.15	14–16	19–23

Anti-frost thermostat

Make		Ranco
Breaks circuit at	°C	+1.5 ± 1.1
Makes circuit at	°C	5.0 (breaking temperature +maximum difference = 3.6)

Pressure switch (fitted to receiver)

Breaks circuit at	kgf/cm^2	2.8
Makes the circuit at	kgf/cm^3	3.2

Safety valve (fitted on condenser tail pipe)

Type		Mechanical
Opens at	bar	31 ± 2
Closes at	bar	28

Refrigerant

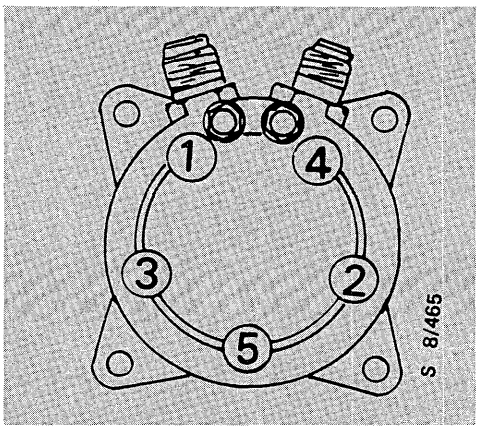
Type		R12
Refrigerant capacity in system	gram	1 100

Compressor oil

Type	Refrigeration oil
Viscosity	520 SUS, 38°C (100°F)
Alternative makes	Suniso 5GS Texaco Capella E (WF 100) BP Energol LPT 100

Tightening torques for connections

Compressor pressure side	Nm (kgf m)	30 - 35 (3.0 - 3.5)
suction side	Nm (kgf m)	35 - 40 (3.5 - 4.0)
Condenser inlet	Nm (kgf m)	21 - 28 (2.1 - 2.8)
outlet	Nm (kgf m)	14 - 20 (1.4 - 2.0)
Receiver inlet	Nm (kgf m)	14 - 20 (1.4 - 2.0)
-expansion valve	Nm (kgf m)	14 - 20 (1.4 - 2.0)
Pressure switch on receiver	Nm (kgf m)	14 - 20 (1.4 - 2.0)
Expansion valve - evaporator	Nm (kgf m)	14 - 20 (1.4 - 2.0)
Capillary tube connection to suction line	Nm (kgf m)	7 - 10 (0.7 - 1.0)
Evaporator outlet	Nm (kgf m)	29 - 38 (2.9 - 3.8)
Safety valve on condenser outlet	Nm (kgf m)	14 - 20 (1.4 - 2.0)



Cylinder head tightening sequence
30 - 34 Nm (3.0 - 3.4 kgf m)

Compressor tightening torques

Clutch centre-nut	Nm (kgf m)	34 - 42 (3.4 - 4.2)
Cylinder head screws	Nm (kgf m)	30 - 34 (3.0 - 3.4)
Oil filler plug	Nm (kgf m)	8 - 12 (0.8 - 1.2)
Service valves	Nm (kgf m)	12 - 17 (1.2 - 1.7)

Test conditions

Bonnet	Closed
Front doors	Closed
Engine speed	33 r/s (2000 r/min)

Belt tension, AC-compressor

Reading from IPU belt-tension meter:

New belt: 120 ± 10 lb (535 ± 45 N).

Belt tension control: If the belt tension is below 60 lb (265 N) we recommend a belt tension of 80 ± 5 lb (355 ± 22 N).

Refitting a used belt: Tension the belt to 80 ± 5 lb (355 ± 22 N).

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