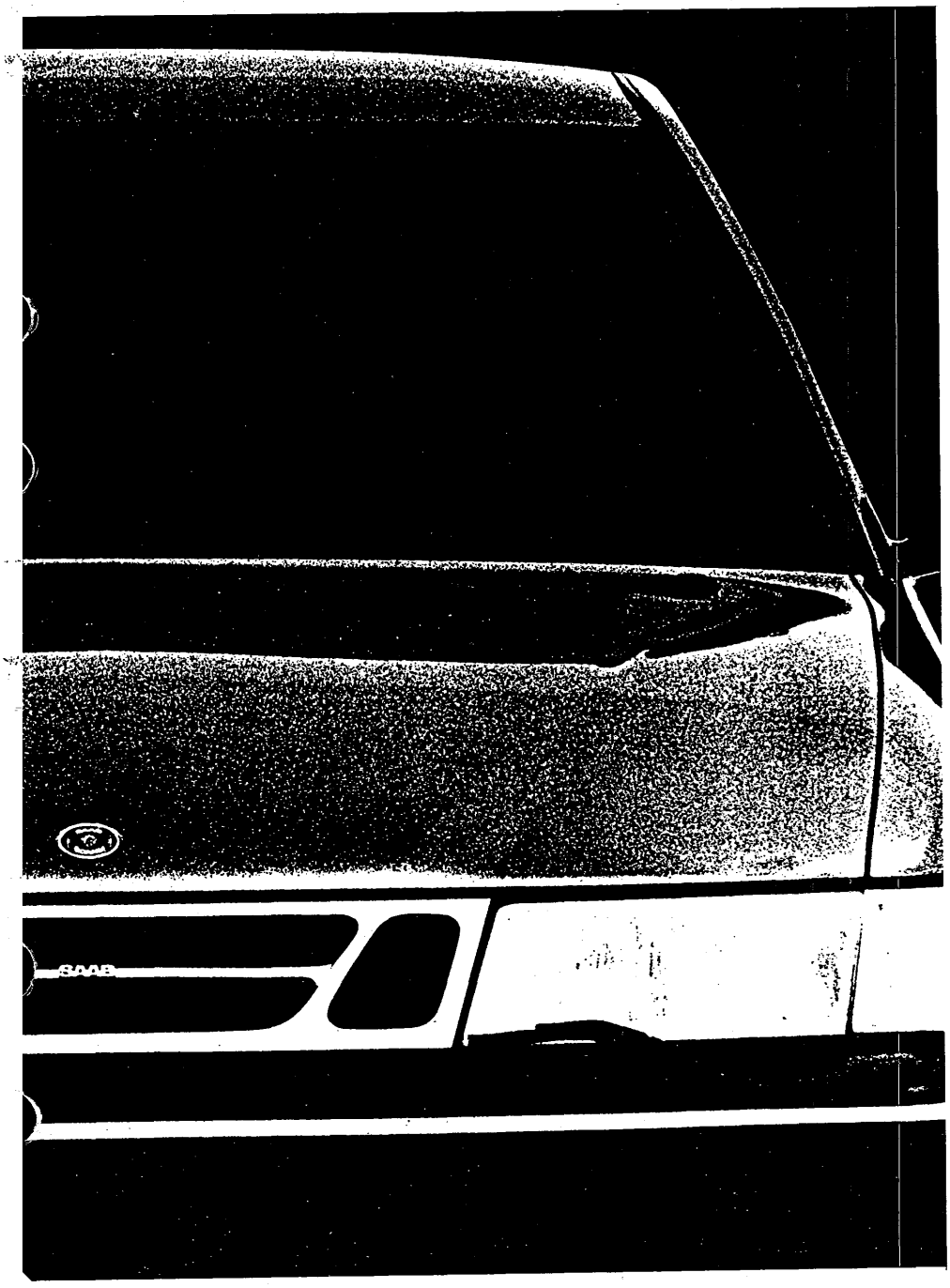
Saab 9000

Service Manual



M 1985-96

ENG

Saab 9000

SERVICE MANUAL

0:2 Technical data

M 1985–96

Foreword

All particulars and illustrations in this Service Manual are based on the version of the cars prevailing at the time of going to press. Model variants, technical data and equipment vary from market to market and may be subject to alteration without prior notice.

Saab Automobile AB

RECYCABLE PAPER

Warning, Important and Note

The headings "Warning", "Important" and "Note" occur from time to time in the Service Manual. They are used to draw the attention of the reader to information of special interest and seriousness. The importance of the information is indicated by the three different headings and the difference between them is explained below.

⚠ WARNING

Warns of the risk of material damage and grave injury to mechanics and the driver, as well as serious damage to the car.

Important

Points out the risk of minor damage to the car and also warns the mechanic of difficulties and time-wasting mistakes.

Note

Hints and tips on how the work can be done in a way that saves time and labour. This information is not supplied for reasons of safety.

Market codes

The codes refer to market specifications

AT	Austria
AU	Australia
BE	Belgium
CA	Canada
CH	Switzerland
DE	Germany
DK	Denmark
ES	Spain
EU	Europe
FE	Far East
FI	Finland
FR	France
GB	Great Britain
GR	Greece
IS	Iceland
IT	Italy
JP	Japan
ME	Middle East
NL	Netherlands
NO	Norway
SE	Sweden
US	USA
UC	US California

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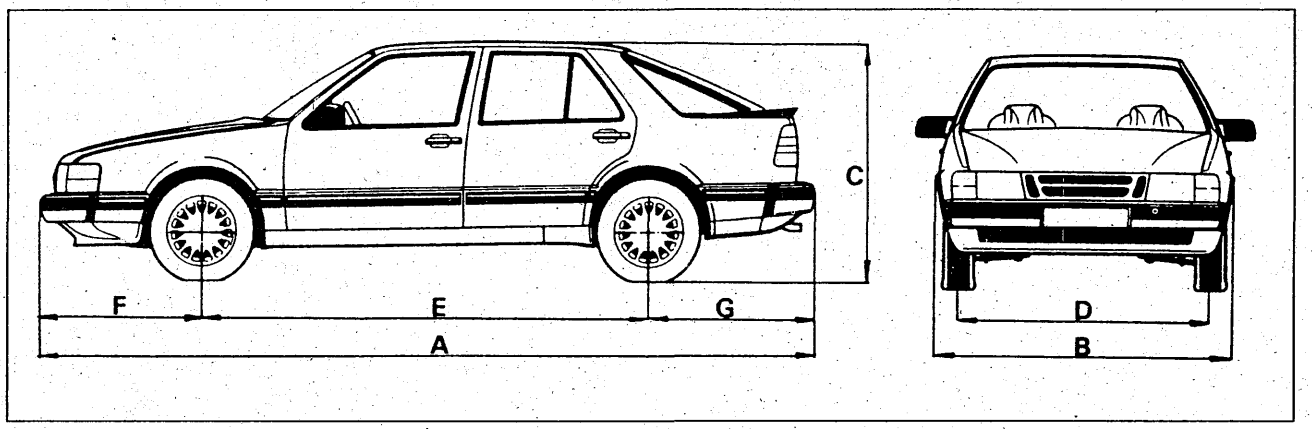
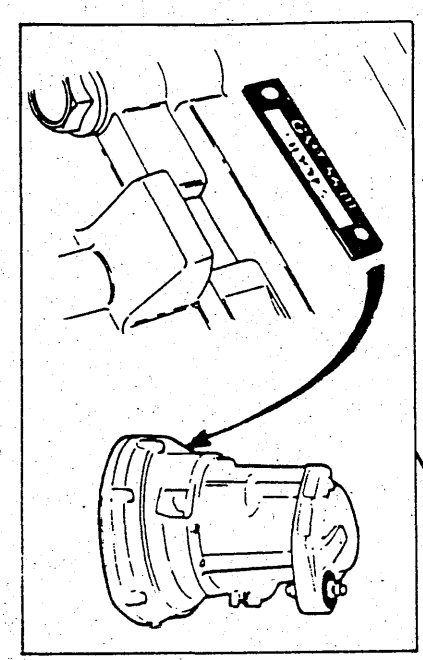
Production: Service Support, Saab Automobile AB, Trollhättan, Sweden

General

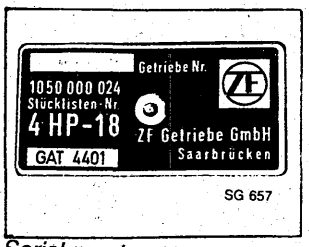


General information

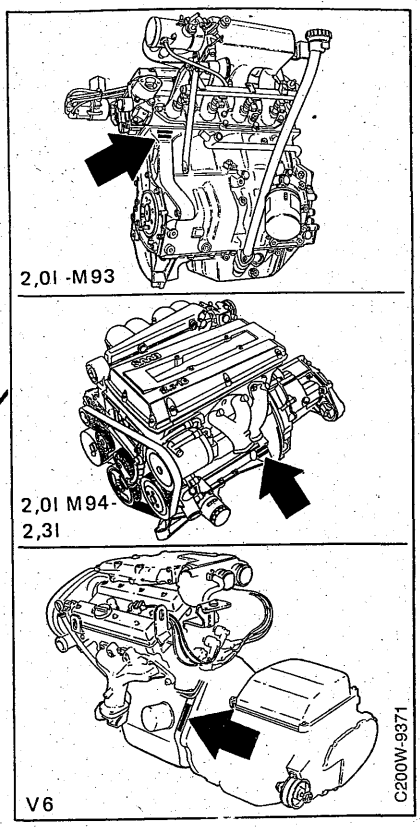
		9000 5-d	9000 CD	9000 CS
A Overall length	mm (in)	4620 (182)	-M94: 4780 (188) M95-: 4794 (189)	4761 (186)
B Overall width	mm (in)	1764-1806 (68.8-70.4)	1764-1808 (68.8-70.5)	1778-1818 (69.3-70.9)
C Maximum height	mm (in)	1430 (56) M86-: 1420 (55.9)	1420 (55.9)	1415-1420 (55.7-55.9)
Ground clearance	mm (in)	150 (5.9) M87-: 155 (6.1)	155 (6.1)	154-159 (6.1-6.3)
D Front track	mm (in)	5 1/2 in rim: 1510 (58.9)	5 1/2 in rim: 1510 (58.9)	5 1/2 in rim: 1510 (58.9)
	mm (in)	6 in rim: 1522 (59.4)	6 in rim: 1522 (59.4)	6 in rim: 1522 (59.4)
	mm (in)	6 1/2 in rim: 1534 (59.8)	6 1/2 in rim: 1534 (59.8)	6 1/2 in rim: 1534 (59.8)
	mm (in)	7 in rim: 1538 (60.0)	7 in rim: 1538 (60.0)	7 in rim: 1538 (60.0)
Rear track	mm (in)	5 1/2 in rim: 1480 (57.7)	5 1/2 in rim: 1480 (57.7)	5 1/2 in rim: 1480 (57.7)
	mm (in)	6 in rim: 1492 (58.5)	6 in rim: 1492 (58.5)	6 in rim: 1492 (58.5)
	mm (in)	6 1/2 in rim: 1504 (58.7)	6 1/2 in rim: 1504 (58.7)	6 1/2 in rim: 1504 (58.7)
	mm (in)	7 in rim: 1508 (58.8)	7 in rim: 1508 (58.8)	7 in rim: 1508 (58.8)
E Wheelbase	mm (in)	2672 (104)	2672 (104)	2672 (104)
F Front overhang	mm (in)	965 (37.6) M91-: 1012 (39.5)	-M94: 1012 (39.5) M95-: 1026 (40.0)	1026 (40.0)
G Rear overhang	mm (in)	983 (38.3)	1096 (42.7)	1063 (41.5)
Turning circle radius	m (in)	5.45 (215)	5.45 (215)	5.45 (215)
Kerb weight	kg (lb)	1390-1550 (3058-3410)	1395-1550 (3069-3410)	1410-1570 (3110-3454)
Gross weight	kg (lb)	1780-1960 (3920-4310)	1780-1960 (3920-4310)	1830-1960 (4030-4310)
Max. axle load. front	kg (lb)	1000-1060 (2200-2330)	1000-1060 (2200-2330)	1060 (2330)
Max. axle load, rear	kg (lb)	920-980 (2030-2160)	920-980 (2030-2160)	980 (2160)
Max. roof-rack load	kg (lb)	100 (220)	100 (220)	100 (220)
Max. trailer weight	kg (lb)	1600 (3500)	1600 (3500)	1800 (3970)



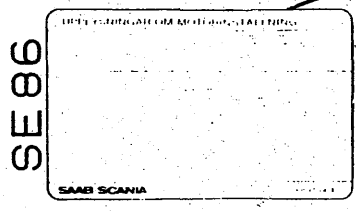
Serial number, manual gearbox



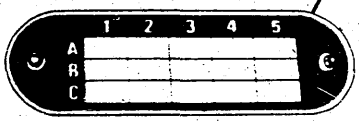
Serial number, automatic transmission



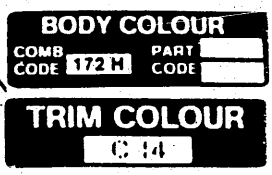
Engine number



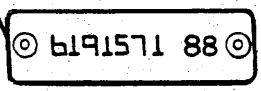
Engine setting data



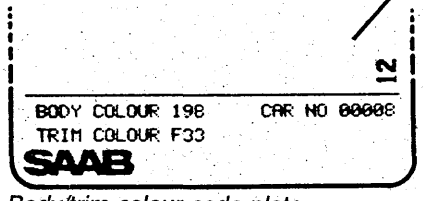
Modification identity plate



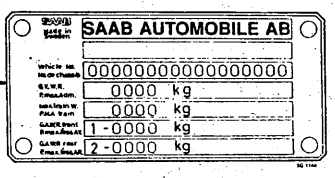
Body/trim colour code plate.
Model year 1985

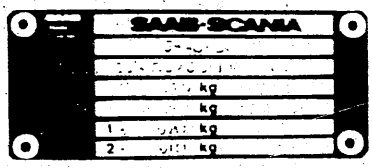


Body number



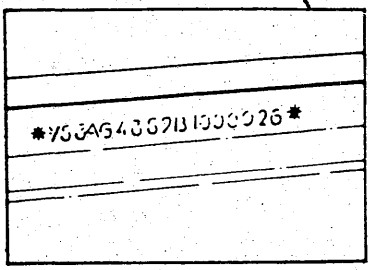
Body/trim colour code plate
Model year 1991 and later



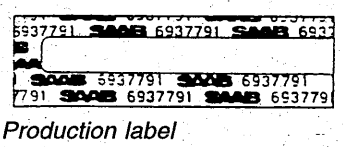


Chassis number plate

Body/trim colour code plate
Model year 1990 and earlier



Chassis number punched in car body to the left of right-hand rear light cluster behind the plastic cover in the luggage compartment, model year 1988 and earlier, or on member in the spare wheel well, model year 1989-.



Production label

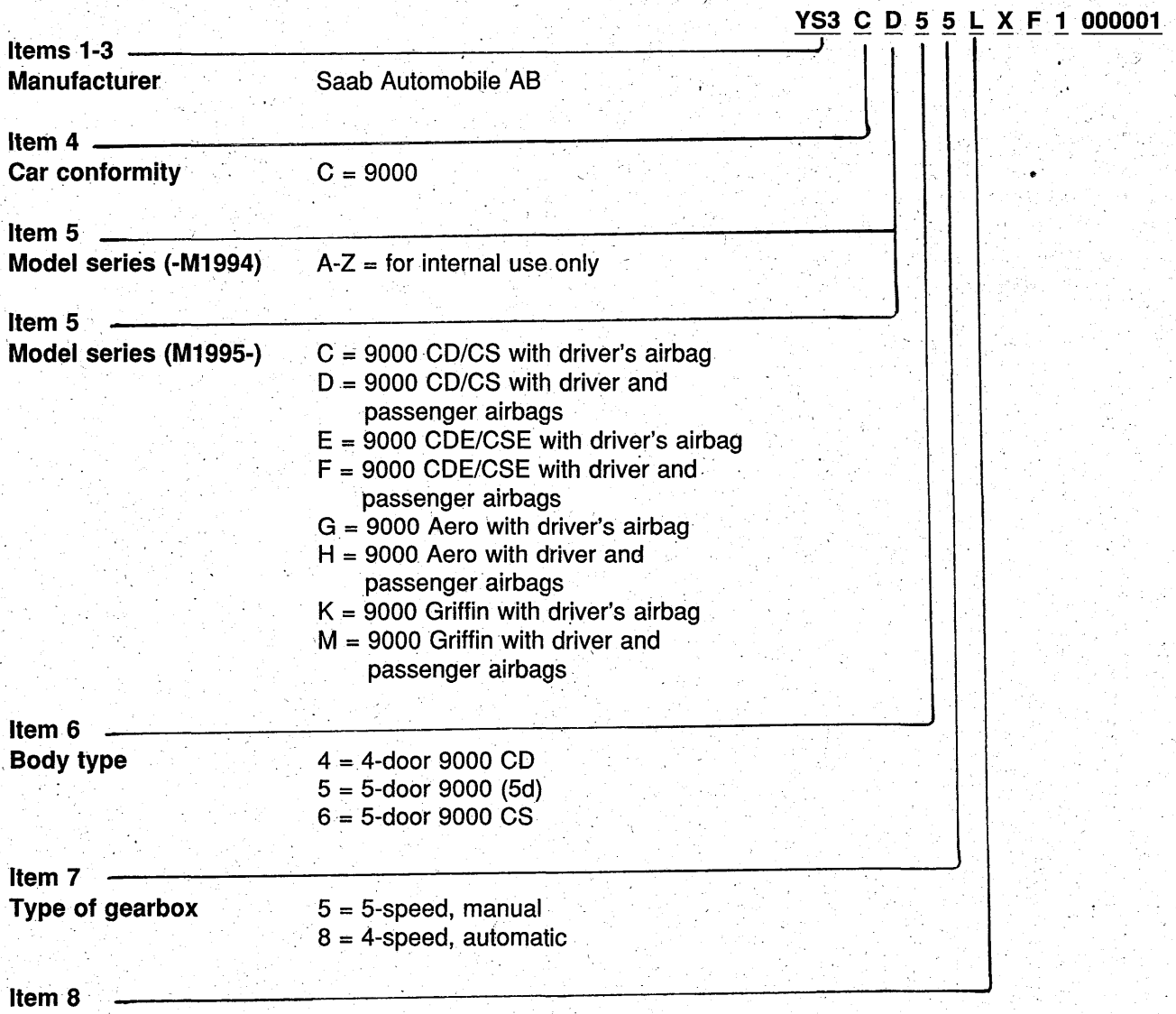
Spare part label

Chassis and engine numbers

The locations of the chassis and engine numbers, etc. are shown in the adjacent illustrations. For positive identification of a car or engine, these numbers and the odometer reading of the car should always be stated in connection with claims under warranty and the like.

When a car is fitted with a replacement engine, the number of the old engine must be punched in the place provided for this purpose. This is essential to ensure that no difficulties will arise if the car is used for travel abroad at a later date.

Chassis number (Vehicle Identification Number = VIN)



Chassis number (Vehicle Identification Number = VIN) (contd.)

YS3 C D 5 5 L X F 1 000001

Item 9
Check character 0-9 or X

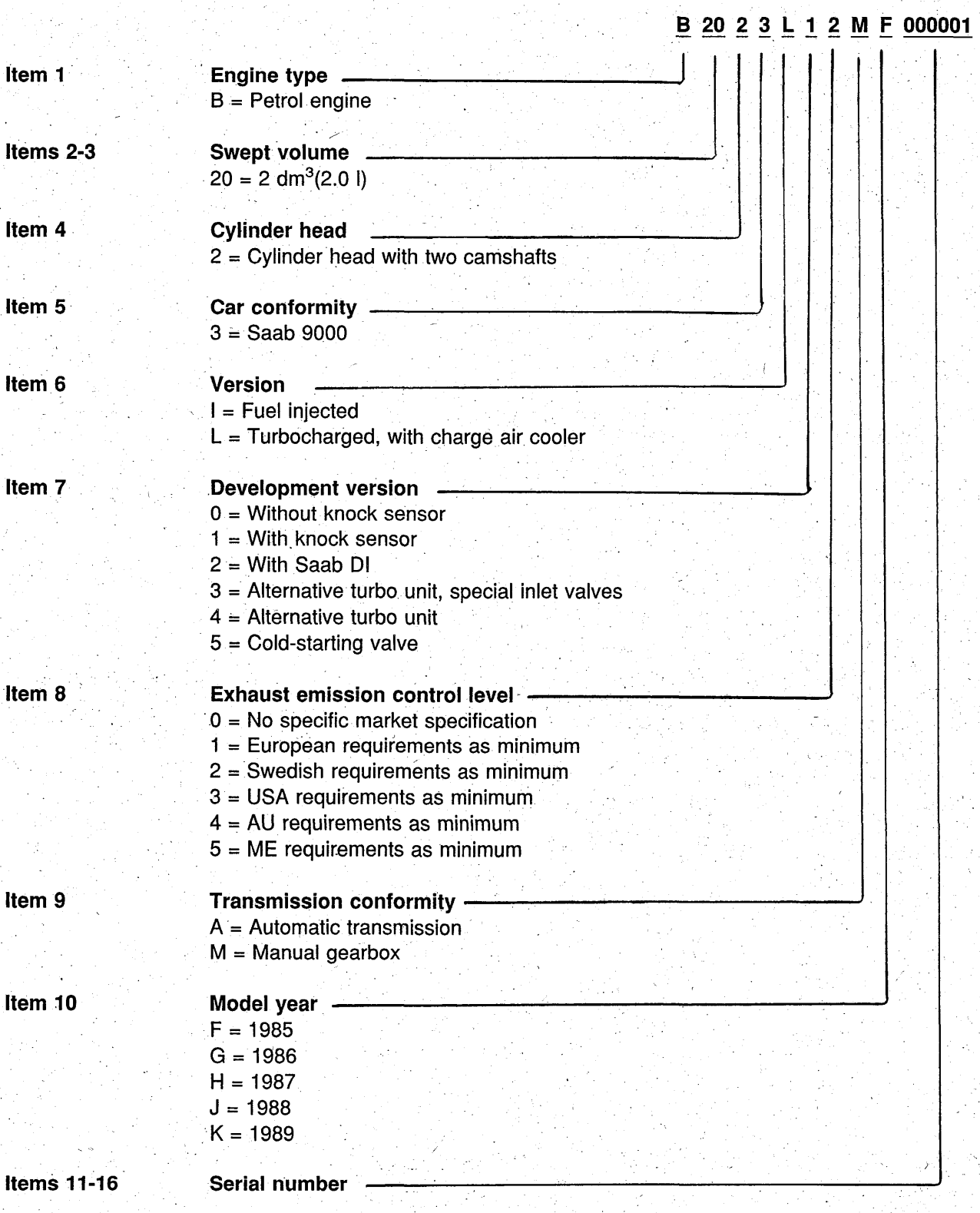
Item 10
Model year
[6] J = 1988
K = 1989
L = 1990
M = 1991
N = 1992
P = 1993
R = 1994
S = 1995
T = 1996

Item 11
Place of manufacture
[2]1 = Trollhättan, Sweden
[3]1, 2 = Trollhättan, Sweden
[1]4 = Trollhättan, Sweden
[4]4 = Malmö
[5] 8 = Uusikaupunki (Finland)

Items 12-17
Serial number Serial number in model year

[1]model years 1985-86
[2]model year 1986 and later
[3]model years 1988-1992
[4] model year 1989 and later
[5] model years 1985-90
[6] model year 1988B:
YS3CD45L8J1050001-YS3CD55L1J1050735
YS3CC58D8J2030001-YS3CC55DXJ2032417
YS3CD58L2J8005001-YS3CC55D2J8005449

Engine number, model year 1989 and earlier



Engine number, model years 1990-1993

B 23 4 I 2 M 00 L 000001

Item 1 **Engine type**
B = Petrol engine

Items 2-3 **Swept volume**
20 = 1.985 dm^3
23 = 2.290 dm^3

Item 4 **Cylinder head**
2 = Cylinder head with two camshafts
4 = Cylinder head with two camshafts and two balancer shafts

Item 5 **Engine version**
I = Fuel injected
S = Fuel injected, turbocharged
L = Fuel injected, turbocharged with charge air cooler

Item 6 **Car conformity**
2 = Saab 9000 with exhaust emission control to ECE-R15/04
4 = Saab 9000 with exhaust emission control complying with Swedish A12 (-1991) or A13 (1992-) requirements and US FTP-75 (-1991) or CRF 40/86 (1992-) Federal requirements
6 = Saab 9000 with exhaust emission control complying with State of California Administration Code Title 13, Swedish A13 requirements and US CRF 40/86 Federal requirements

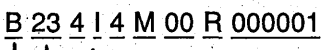
Item 7 **Transmission conformity**
A = Automatic transmission
M = Manual gearbox

Items 8-9 **Variant**
00 = Basic level (no variant)
01 = Engine modified to meet fuel evaporation system requirements
02 = With special equipment for improved cold starting
05 = Special inlet valves
06 = Special inlet valves and modified to meet fuel evaporation system requirements
07 = Engine with T25 Turbo
08 = Engine with ETS
09 = Engine with power optimization
10 = Engine with divided intake manifold
11 = Engine with divided intake manifold and ETS
12 = Engine modified for cold-climate markets
13 = Engine modified for cold-climate markets and equipped with ETS
14 = Engine with power optimization and ETS
15 = Engine with acid-resistant fuel system

Item 10 **Model year**
L = 1990
M = 1991
N = 1992
P = 1993

Items 11-16 **Serial number**

Engine number, model year 1994 and later



Item 1 **Engine type**
B = Petrol engine

Items 2-3 **Swept volume**
20 = 1.985 dm^3
23 = 2.290 dm^3
30 = 2.961 dm^3

Item 4 **Cylinder head**
4 = 4 cylinders, in-line cylinder block with 2 balancer shafts and cylinder head with 2 camshafts and 4 valves per cylinder
8 = 6 cylinders, V configuration, two cylinder heads with 2 camshafts per cylinder head and 4 valves per cylinder

Item 5 **Version**
I = Fuel injection engine
E = Turbocharged engine with charge air cooler and low boost pressure
S = Turbocharged engine
L = Turbocharged engine with charge air cooler, power 1
R = Turbocharged engine with charge air cooler, power 2

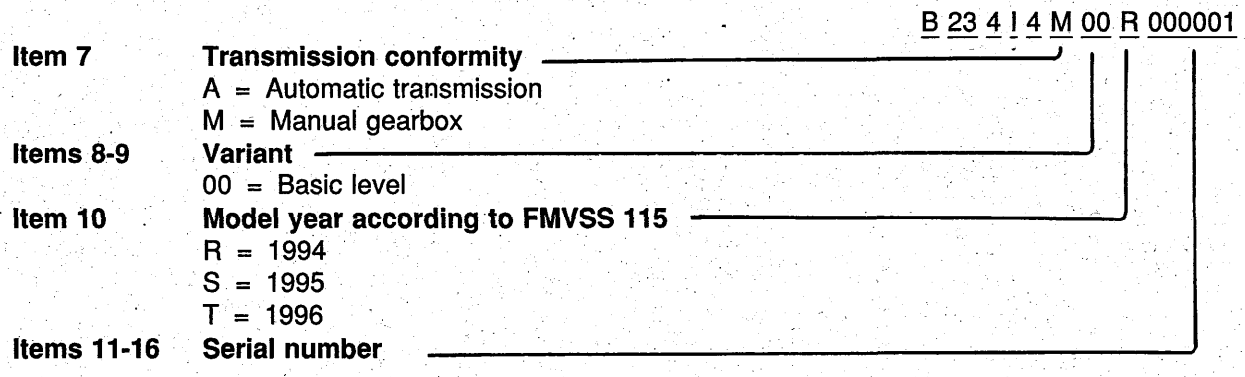
Item 6 **Car conformity (-M95)**
4 = Saab 9000 with exhaust emission control to European 91/441/EEC requirements, Swedish A13 environment class C3 requirements and US CFR 40 part 86 requirements
6 = Saab 9000 with exhaust emission control meeting the requirements of State of California Administration Code Title 13, Swedish A14 environment class C2, and US CFR 40 part 86
8 = Saab 9000 with exhaust emission control meeting the requirements of State of California Administration Code Title 13 and Swedish A14 environment class C1

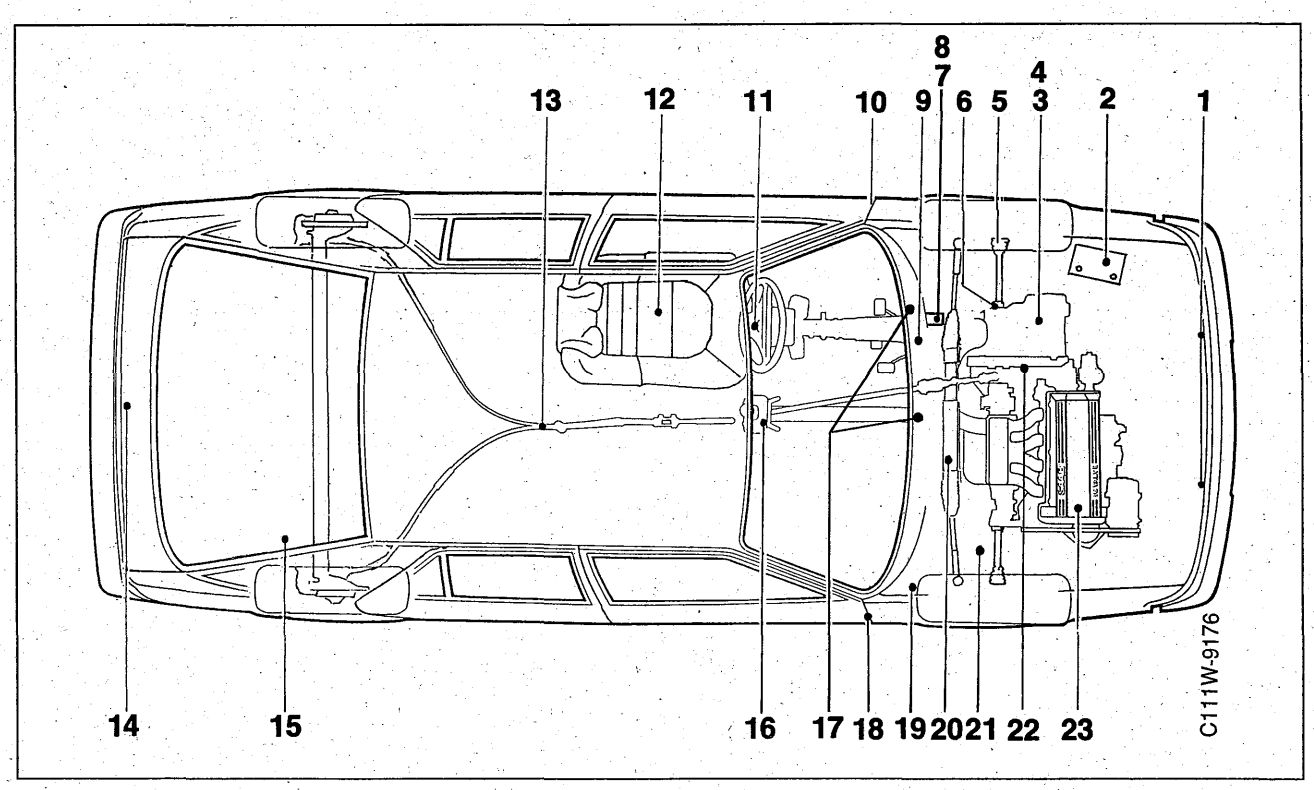
Item 6 **Car conformity (M96)**
4 = Saab 9000 meeting the exhaust emission requirements of:
- Europe: 70/220*93/59/EEC
- USA: US CFR 40 part 86, Tier 0
- Sweden: A13

6 = Saab 9000 meeting the exhaust emission control requirements of 4 and:
- Europe: 70/220*94/12/EEC
- USA: US CFR 40 part 86, Tier 1
- Sweden: A14 environment class C2
- California: State of California Administration Code Title 13

8 = Saab 9000 meeting the exhaust emission control requirements of 4, 6 and:
- California: State of California Administration Code Title 13, TLEV

Engine number, model year 1994 and later (contd.)





Lubrication, lubricants

Lubrication in conjunction with service work

Item	Lubrication point	Lubricant
1	Locking pins, safety latch and bonnet lock	Gleitmo 805 (45) 30 06 442
2	Battery	Petroleum jelly (Vaseline), part No. (45) 30 06 665
3	Manual gearbox	Not ME: Motor oil (mineral oil) to API service SF/CC, SF/CD Viscosity: 10W30 or 10W40 ME only: SHPD B.P. Vanellus F.E. Viscosity: 10W30 or 15W40 **Synthetic motor oil must not be used**
4	Automatic transmission	Not ME: ATF DEXRON II ME only: ATF DEXRON IIE
5	Outer drive-shaft universal joint	Molycote VN 2461C part No. (45) 87 81 676
6	Inner drive-shaft universal joint	Mobile Grease K 575GS
7	Brake system	Brake fluid grade to DOT 4 specification
8	Hydraulic clutch operation	Brake fluid grade to DOT 4 specification
9	Brake light switch	Petroleum jelly (Vaseline), part No. (45) 30 06 665
10	Door switch, interior lighting	Petroleum jelly (Vaseline), part No. (45) 30 06 665
11	Horn slip-ring and contacts	Gleitmo 165
12	Seat rails	Saab special chassis grease EP 2, part No. (45) 30 09 990 (sparingly)
13	Handbrake cables	Saab special chassis grease EP 2, part No. (45) 30 09 990

Item	Lubrication point	Lubricant
14	Tailgate lock mechanism	Thin penetrating oil
15	Rear anti-roll bar bushes	Molycote 33 medium, part No. (45) 30 20 476
16	Gear lever housing	Gleitmo 980 spray, part No. (45) 30 06 954, allow to dry for about 15 minutes Then smear with Gleitmo 750 grease, part No. (45) 30 07 309 paste.
17	Windscreen wiper arm	Gleitmo 582 (white grease) or Gleitmo 540
18	Door keeps	Gleitmo 880 (45) 30 06 582
19	Bonnet hinges	Vaseline, part No. (45) 30 06 665, or Gleitmo 805 (45) 30 06 442
20	Power steering	-M1994: Saab Power Steering Fluid 1890, part No. (45) 30 02 995, 0.75 litres, or Saab Power Steering Fluid 4634, part No. (45) 30 09 800, 0.75 litres M1995, 1996: Saab Power Steering Fluid 1890, part No. (45) 30 02 995, 0.75 litres
21	Front anti-roll bar bushes	Molycote 33 medium (45) 30 20 476
22	Input shaft splines	Molycote Rapid G, part No. (10) 87 81 684, or Molybdenum sulphide paste, Gleitmo (45) 30 06 632
23	Engine	Grade: Saab Turbo motor oil or motor oil to API SG and CCMC G4/G5. These oils contain suitable additives for the engine. We advise against the use of other additives. Viscosity: SAE 10W-30, 10W-40, 5W-30 or 5W-40. If these grades are unobtainable, 15W-40 oil may be used but not during the winter. If 5W oils are used, they must be of fully-synthetic or semi-synthetic type. In countries where the temperature never falls below +15-20°C, oil having a viscosity of 15W-50 or 20W-50 is recommended.

Lubrication to prevent seizing

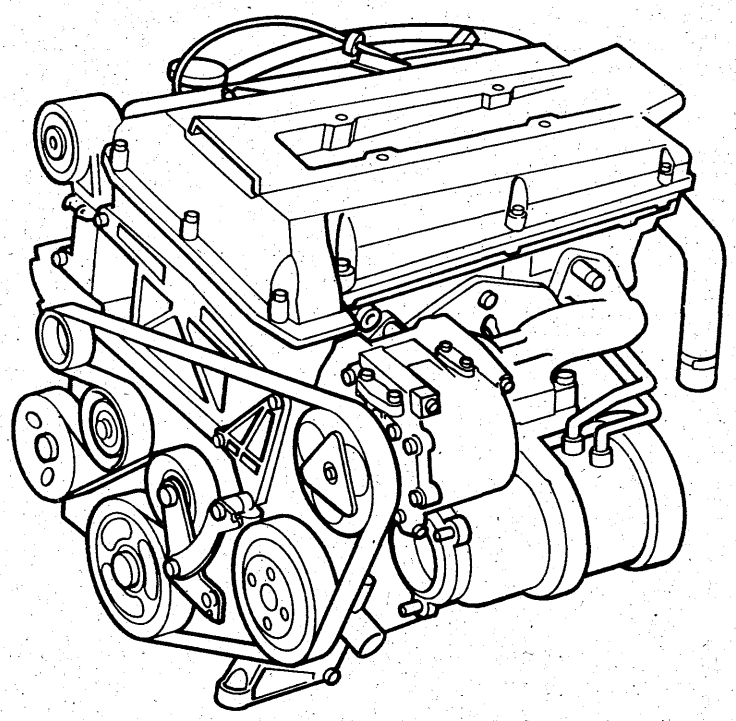
Threaded joints subjected to wide temperature fluctuations may tend to seize and will then be difficult to unscrew on the next service occasion.

Typical threaded joints of this type are:

- EGR valve connections
- Oxygen sensor
- Exhaust manifold and turbocharger retaining nuts

Recommended lubricants:
MOLYCOTE 1000 (45) 30 20 971 or
NEVER SEIZE.

Engine, 4-cylinder



C201W-2253

General data

Engine type		B202	B234	B204
		4-cylinder, 4-stroke, 16-valve engine with 2 overhead camshafts. Transversely mounted.	4-cylinder, 4-stroke, 16-valve engine with 2 overhead camshafts and 2 balancer shafts. Transversely mounted.	4-cylinder, 4-stroke, 16-valve engine with 2 overhead camshafts and 2 balancer shafts. Transversely mounted.
Cylinder bore	mm (in)	90 (3.546)	90 (3.546)	90 (3.546)
Stroke	mm (in)	78 (3.07)	90 (3.546)	78 (3.07)
Swept volume	$cm^3(in^3)$	1985 (121)	2290 (140)	1985 (121)
Firing order		1-3-4-2	1-3-4-2	1-3-4-2
Weight	kg (lb)	approx. 150 (330)	160 (350)	approx. 160 kg (350)

Performance, compression ratio, fuel octane number -M93

Engine version	Model year	RON octane rating (AKI)*)	Compression ratio	KW (bhp) DIN at rpm	Torque, Nm (lbf ft) at rpm
B202i	1986-88	Min. 91 Rec. 98	10.1	96 (130)/5500	173 (128)/3000
	1989-93			99 (135)/6000	173 (128)/3750
B202i (TWC)	1986-88	Min. 91 (87) Rec. 95 (91)	10.1	92 (125)/5500	170 (126)/3000
	1989-93			96 (130)/6000	173 (128)/3750
B202 Turbo	1985-93	Min. 91 Rec. 98	9.0	129 (175)/5300	270 (200)/3000
B202 Turbo (TWC)	1986-88	Min. 91 (87) Rec. 95 (91)	9.0	118 (160)/5500	255 (188)/3000
DI	1989-93			121 (165)/5500	265 (196)/3000
B234i	1990-93	Min. 91 (87) Rec. 95 (91)	10.1	110 (150)/5500	212 (157)/3800
B234L	1991-92	Min. 91 (87) Rec. 95 (91)	8.5	M:147 (200)/5000 A: 147 (200)/5000	330 (242)/2000 300 (221)/2000
B234L	1993	Min. 91 (87) Rec. 95 (91)	8.5	M: 147 (200)/5500 A: 147 (200)/5500	330 (242)/1900 300 (221)/1900
B234R	1993 1/2	Min. 91 (87) Rec. 95 (91)	8.5	M: 166 (225)/5500	350 (258)/1950
B202 S (Ecopower)	1992 1/2-93	Rec. 95 (91)	9.0	110 (150)/5500	215 (158)/3000

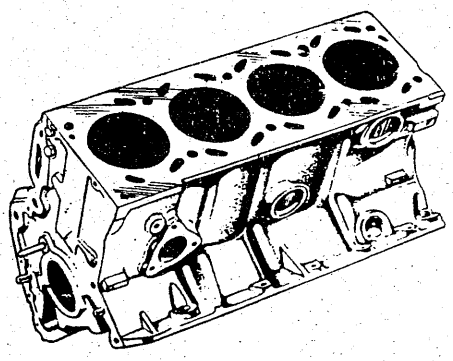
*) The specified octane ratings are minimum values. They may differ from the ratings given in the Owner's Manual, as the latter takes into account the fuel grades currently applicable.

Performance, compression ratio, fuel octane number M94-

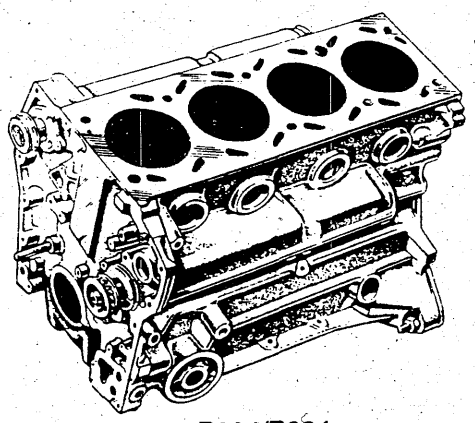
Engine version	Model year	RON octane rating (AKI)*)	Compression ratio	KW (bhp) EEC at rpm	Torque, EEC Nm (lbf ft) at rpm
B204i	1994-	Min. 91 (87) Rec. 95 (91)	10.1	96 (130)/5500	177 (130)/4300
B204S	1994-95	Min. 91 (87) Rec. 95 (91)	8.8	110 (150)/5500	210 (154)/2500
B204E	1996	Min. 91 (87) Rec. 95 (91)	9.2	110 (150)/5500	215 (158)/2500
B204L	1994-	Min. 91 (87) Rec. 95 (91)	9.2	136 (185)/5500	283 (210)/2100
B234i	1994-	Min. 91 (87) Rec. 95 (91)	10.5	108 (147)/5600	205 (151)/3800
B234E	1994-	Min. 91 (87) Rec. 95 (91)	9,25	125 (170)/5700	260 (192)/3200
B234LM	1994-	Min. 91 (87) Rec. 95 (91)	9,25	147 (200)/5500	323 (240)/1800
B234LA	1994-	Min. 91 (87) Rec. 95 (91)	9,25	147 (200)/5500	294 (218)/1800
B234R	1994-	Min. 91 (87) Rec. 95 (91)	9,25	165 (225)/5500	342 (253)/1800

*) The specified octane ratings are minimum values. They may differ from the ratings given in the Owner's Manual, as the latter takes into account the fuel grades currently applicable.

Engine block



B202



B204/B234

Cylinder block

Cylinder bore, B202

Standard (A)	mm (in)	90.000-90.010 (3.5460-3.5464)
Standard (B)	mm (in)	90.010-90.020 (3.5464-3.5468)
First oversize	mm (in)	90.500 (3.5657)
Second oversize	mm (in)	91.000 (3.5854)

Cylinder bore, B204/B234

Standard (A)	mm (in)	90.000-90.012 (3.5460-3.5465)
Standard (B)	mm (in)	90.003-90.020 (3.5461-3.5468)
Standard (B)	mm (in)	90.011-90.030 (3.5464-3.5472)
First oversize	mm (in)	90.500-90.512 (3.5657-3.5662)
Second oversize	mm (in)	91.000-91.012 (3.5854-3.5859)

Cylinder head -M93

Height, new cylinder head	mm (in)	140.5 ± 0.1 (5.536 ± 0.004)
Height, minimum after regrinding	mm (in)	140.1 (5.520)

Cylinder head M94-

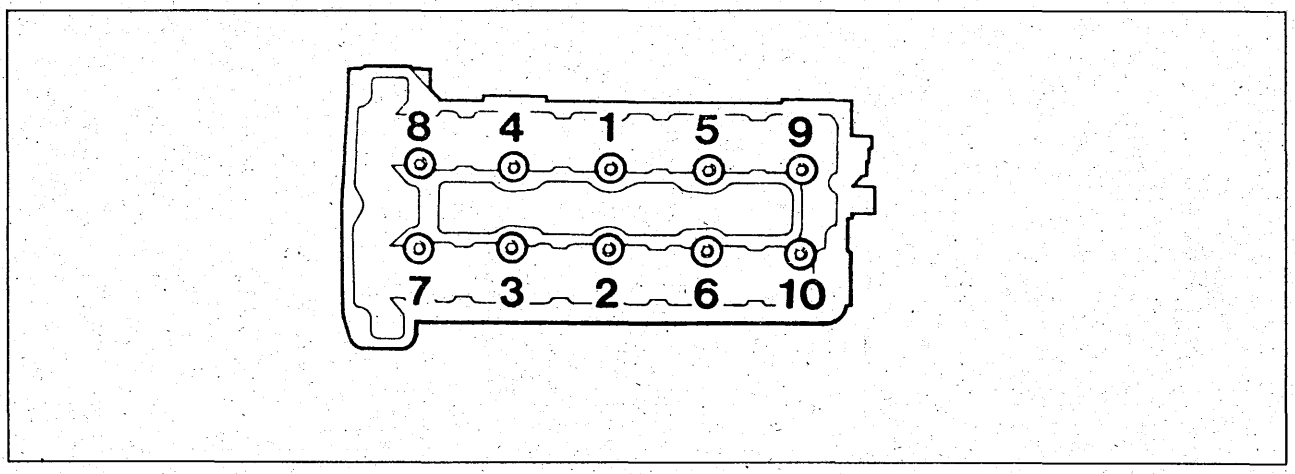
Height, new cylinder head	mm (in)	139.4 - 139.6 (5.492 - 5.500)
Height, minimum after regrinding	mm (in)	139.0 (5.477)

Tightening torques model year 1985 and later

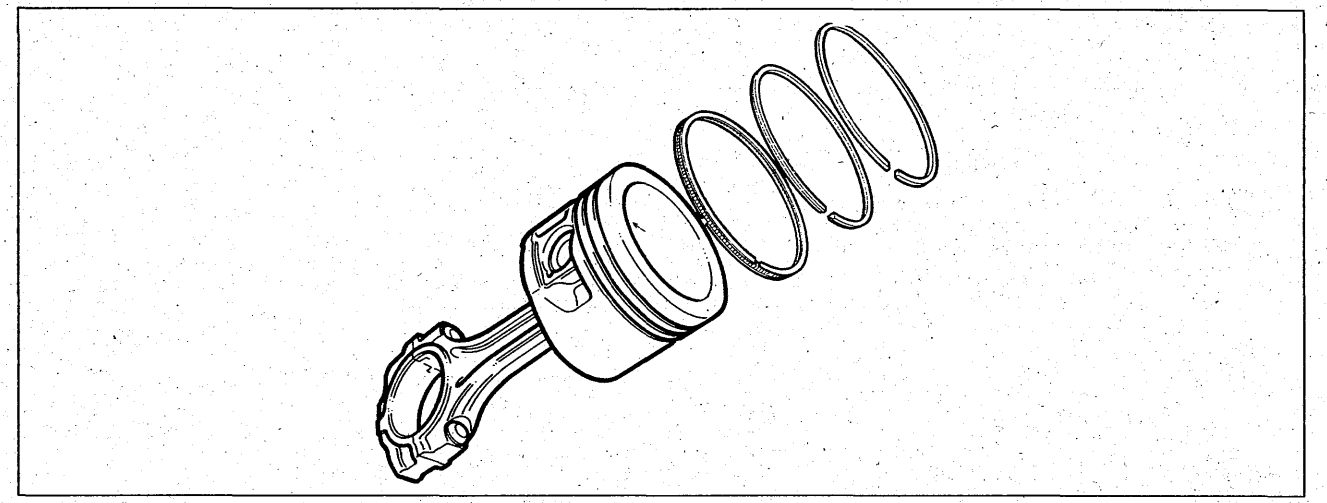
The specified torques apply to lubricated bolts and washers in connection with cylinder head gasket replacement (75 85 045)

Stage I	Nm (lbf ft)	60 (44)
Stage II	Nm (lbf ft)	80 (59)
Stage III		Tighten through a further 90° (1/4 turn)

Tightening sequence



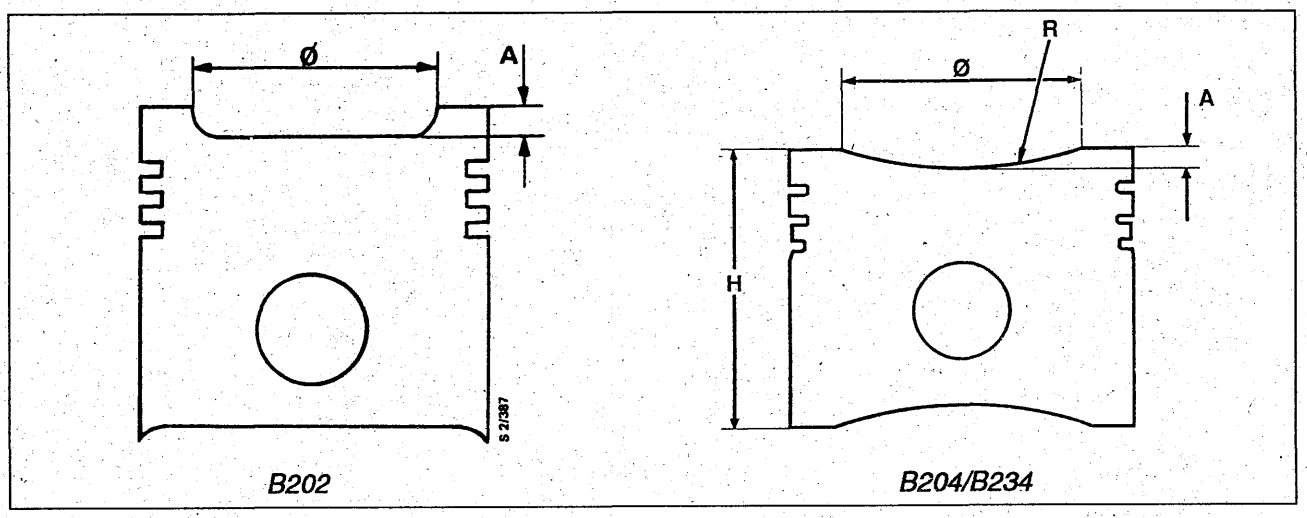
Pistons



		B202	B234	B204
Piston speed at 5000 rpm	m/sec	13	15	13

Piston types

The piston type fitted depends on the compression ratio of the engine.



Engine	Model year		R	Ø	A	H
B202 Turbo	1985	mm (in)		64 (2.52)	4.7 (0.185)	
B202 Turbo	1986-93	mm (in)		64 (2.52)	3.85 (0.152)	
B202S	1992-93	mm (in)		64 (2.52)	3.85 (0.152)	
B202i	1987-93	mm (in)		64 (2.52)	1.0 (0.040)	
B234i	1990-93	mm (in)	257 (10.1)	75 (2.95)	3.05 (0.120)	
B234 Turbo	1991-93	mm (in)	108 (4.25)	80 (3.15)	7.95 (0.313)	
B204i	1994-	mm (in)	55 (2.17)	42.3 (1.67)	4.4 (0.17)	68.3 (2.69)
B204L	1994-	mm (in)	150 (5.91)	70 (2.76)	4.4 (0.17)	68.3 (2.69)
B234i	1994-	mm (in)	149 (5.87)	70 (2.76)	4.4 (0.17)	58.3 (2.30)
B234L/R/E	1994-	mm (in)	145 (5.71)	83.6 (3.29)	6.4 (0.25)	68.3 (2.69)
B204S	1994-95	mm (in)	255 (10.05)	83.6 (3.29)	4.0 (0.16)	68.3 (2.69)
B204E	1996	mm (in)	150 (5.91)	70 (2.76)	4.4 (0.17)	68.3 (2.69)

Important

Different makes of piston must not be fitted in the same engine.

Piston diameter

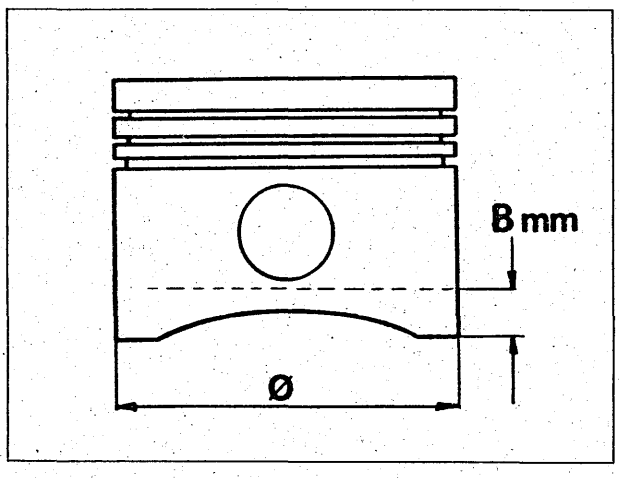
Piston diameter is measured at right angles to the gudgeon pin hole at a distance of B mm from the bottom of the piston skirt.

B202: B = 16 mm (0.630 in)

B234 (–M93): B = 9 mm (0.355 in)

B204L/S, B234 L/R/E M94–: B = 9.3 mm (0.366 in)

B204i, B234i M94–: B = 11 mm (0.433 in)



Classification of pistons and cylinder bores

The piston classification is stamped on the top of the piston crown. The piston service classes are:

AB

B

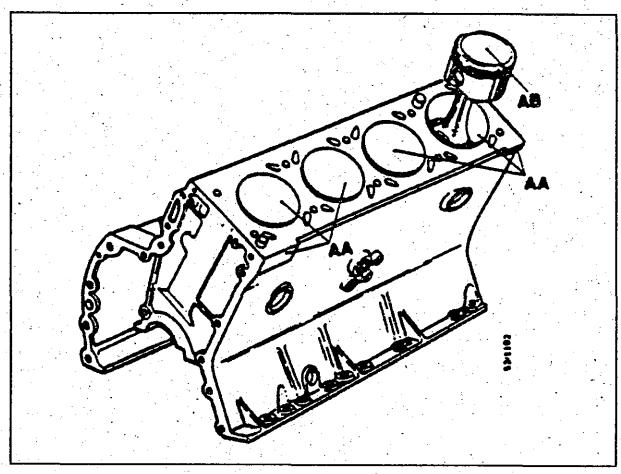
C

First oversize (0.5)

Second oversize (1.0)

The cylinder class is stamped on the cylinder head joint face and is specified for each cylinder.

The cylinder classes are designated A, B and B+. All classes may occur in the same cylinder block.



Piston classification

B202i

Standard A (not a spare part)	mm (in)	89.971-89.980 (3.5449-3.5452)
Standard AB	mm (in)	89.980-89.989 (3.5452-3.5456)
Standard B	mm (in)	89.989-90.000 (3.5456-3.5460)
Standard C	mm (in)	90.000-90.008 (3.5460-3.5463)
First oversize (0.5)	mm (in)	90.470-90.485 (3.5645-3.5651)
Second oversize (1.0)	mm (in)	90.970-90.985 (3.5842-3.5848)
Nominal clearance, piston - cylinder bore	mm (in)	0.010-0.039 (0.0004-0.0015)

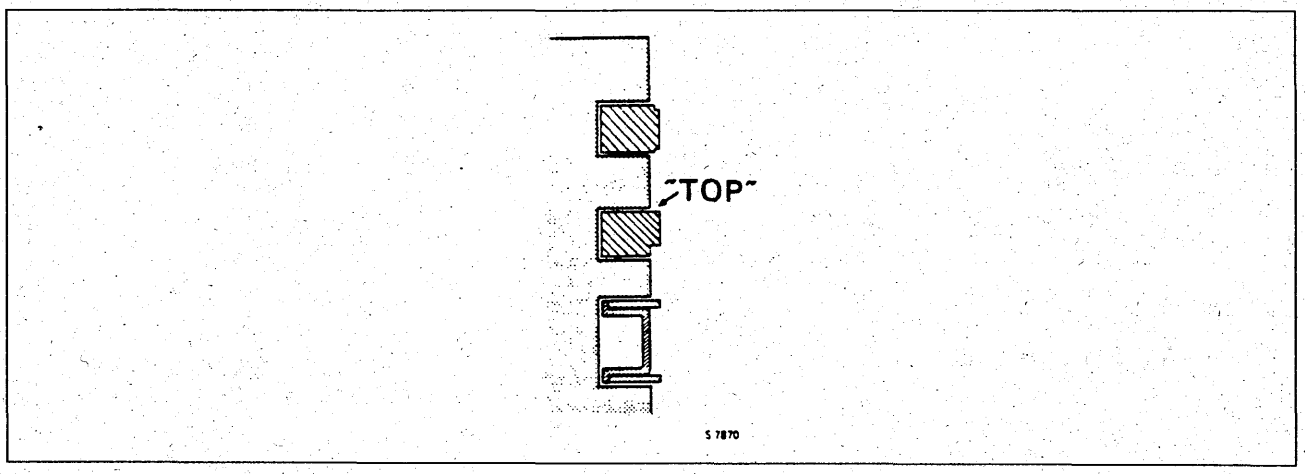
Standard A (not a spare part)	mm (in)	89.967-89.977 (3.5447-3.5451)
Standard AB	mm (in)	89.977-89.985 (3.5451-3.5454)
Standard B	mm (in)	89.985-89.993 (3.5454-3.5457)
Standard C	mm (in)	89.993-90.009 (3.5457-3.5464)
First oversize (0.5)	mm (in)	90.470-90.485 (3.5645-3.5651)
Second oversize (1.0)	mm (in)	90.970-90.985 (3.5842-3.5848)
Nominal clearance, piston - cylinder bore	mm (in)	0.015-0.043 (0.0006-0.0017)

B204/B234

Standard A (not a spare part)	mm (in)	89.971-89.980 (3.5449-3.5452)
Standard AB	mm (in)	89.980-89.989 (3.5452-3.5456)
Standard B (B234i) -M93, (B204/B234) M94-	mm (in)	89.989-90.000 (3.5456-3.5460)
Standard B (B234 Turbo) -M93	mm (in)	89.989-89.997 (3.5456-3.5459)
Standard C (B234i) -M93 (B204/B234) M94-	mm (in)	90.000-90.013 (3.5460-3.5465)
Standard C (B234 Turbo) -M93	mm (in)	89.997-90.013 (3.5456-3.5465)
First oversize (0.5)	mm (in)	90.472-90.488 (3.5646-3.5652)
Second oversize (1.0)	mm (in)	90.972-90.988 (3.5843-3.5849)
Nominal clearance, piston - cylinder bore -M93	mm (in)	0.006-0.041 (0.0002-0.0016)
Nominal piston clearance M94-	mm (in)	0.011-0.041 (0.0004-0.0016)

Classification piston/cylinder		**Clearance limits B202**	**B204, B234**
A/A	1/1000 mm	30-50	20-41
AB/A	1/1000 mm	22-40	11-32
AB/B	1/1000 mm	32-50	14-40
B/A	1/1000 mm	14-32	-
B/B	1/1000 mm	24-42	6-31 (–M93)
B/B+	1/1000 mm		11-41 (M94–)

Piston rings



B202		Top compression ring	Second compression ring	Scraper ring
Thickness	mm (in)	1.728-1.740 (0.0680-0.0686)	1.980-1.996 (0.0780-0.0786)	2.63-2.73* (0.1036-0.1076)
Side clearance in groove	mm (in)	0.050-0.082 (0.0020-0.0032)	0.034-0.070 (0.0013-0.0028)	
Working gap in new cylinder	mm (in)	0.35-0.48 (0.0138-0.0189)	0.25-0.38 (0.0099-0.0150)	0.38-1.40*** (0.0150-0.0552)

* Segment width (thickness) 0.58-0.64 mm (0.023-0.025 in)

*** Applies to segment

B234 – M93		Top compression ring	Second compression ring	Scraper ring
Thickness	mm (in)	1.728-1.740 (0.0680-0.0686)	1.980-1.996 (0.0780-0.0786)	2.934-3.052** (0.1156-0.1202)
Side clearance in groove	mm (in)	0.050-0.082 (0.0020-0.0032)	0.034-0.070 (0.0013-0.0028)	
Working gap in new cylinder	mm (in)	0.30-0.50 (0.012-0.020)	0.30-0.45 (0.012-0.018)	0.38-1.40*** (0.0150-0.0552)

** Segment width (thickness) 0.51 mm (0.020 in)

*** Applies to segment

B204/234 M94–		Top compression ring	Second compression ring	Scraper ring
Thickness	mm (in)	1.728-1.740 (0.680-0.686)	1.978-1.990 (0.0779-0.784)	2.976-3.052 (0.1173-0.1202)
Side clearance in groove	mm (in)	0.050-0.082 (0.0020-0.0032)	0.040-0.072 (0.0016-0.0028)	
Working gap in cylinder	mm (in)	0.30-0.50 (0.012-0.020)	0.15-0.65 (0.006-0.026)	0.38-1.40 (0.015-0.055)

Gudgeon pin

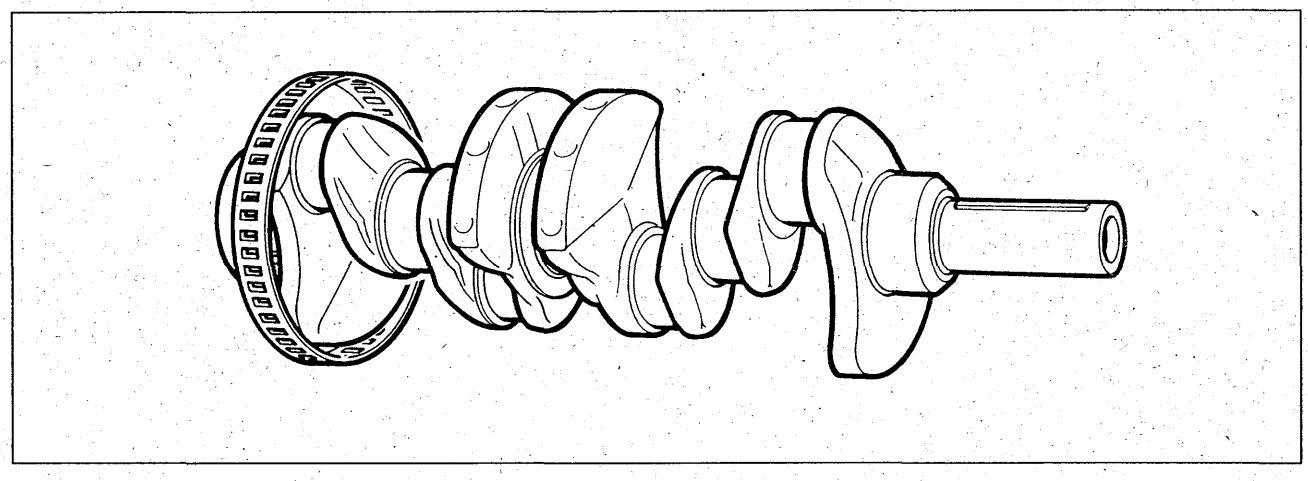
B202		
Diameter	mm (in)	23.996-24.000 (0.9447-0.9449)
Fit	mm (in)	-0.001- +0.008 (-0.00004- +0.00031)

B204/B234		
Diameter	mm (in)	23.996-24.000 (0.9454-0.9456)
Fit, normally aspirated engine	mm (in)	0.005-0.014 (0.0002-0.0006) (Sliding fit under gentle thumb pressure.)
Fit, turbocharged engine	mm (in)	0.002-0.011 (0.0001-0.0004) (Sliding fit under gentle thumb pressure.)

Connecting rods

Diameter of big end	mm (in)	56.000-56.019 (2.2091-2.2091)
Diameter of small-end bush (fitted)	mm (in)	24.005-24.010 (0.9458-0.9460)
Maximum permissible weight variation per set	g (oz)	B202: 9 (0.32) B204/B234: 6 (0.22)
Length, B202	mm (in)	134 (5.2796)
B234 -M93	mm (in)	147 (5.7918)
B204, B234I M94-	mm (in)	147 (5.7918)
B234E/L/R	mm (in)	153 (6.0282)

Crankshaft



B202

Maximum variation in straightness	mm (in)	0.10 (0.004)
End float	mm (in)	0.06-0.31 (0.002-0.012)
Maximum ovality of journals	mm (in)	0.005 (0.0002)
Maximum taper of journals	mm (in)	0.005 (0.0002)
Radius of main journal fillet	mm (in)	1.65-1.85 (0.065-0.073)
Main bearing clearance	mm (in)	0.020-0.062 (0.0008-0.0024)

B204/B234

Maximum variation in straightness	mm (in)	0.10 (0.004)
End float	mm (in)	0.06-0.31 (0.002-0.012)
Maximum ovality of journals	mm (in)	0.005 (0.0002)
Maximum taper of journals	mm (in)	0.005 (0.0002)
Radius of main journal fillet	mm (in)	1.65-1.85 (0.065-0.073)
Main bearing clearance (-M93)	mm (in)	0.020-0.062 (0.0008-0.0024)
Main bearing clearance (M94-)	mm (in)	0.014-0.062 (0.0006-0.0024)
Length (-M93)	mm (in)	543 (21.39)
Length (M94-)	mm (in)	539.2 (21.24)

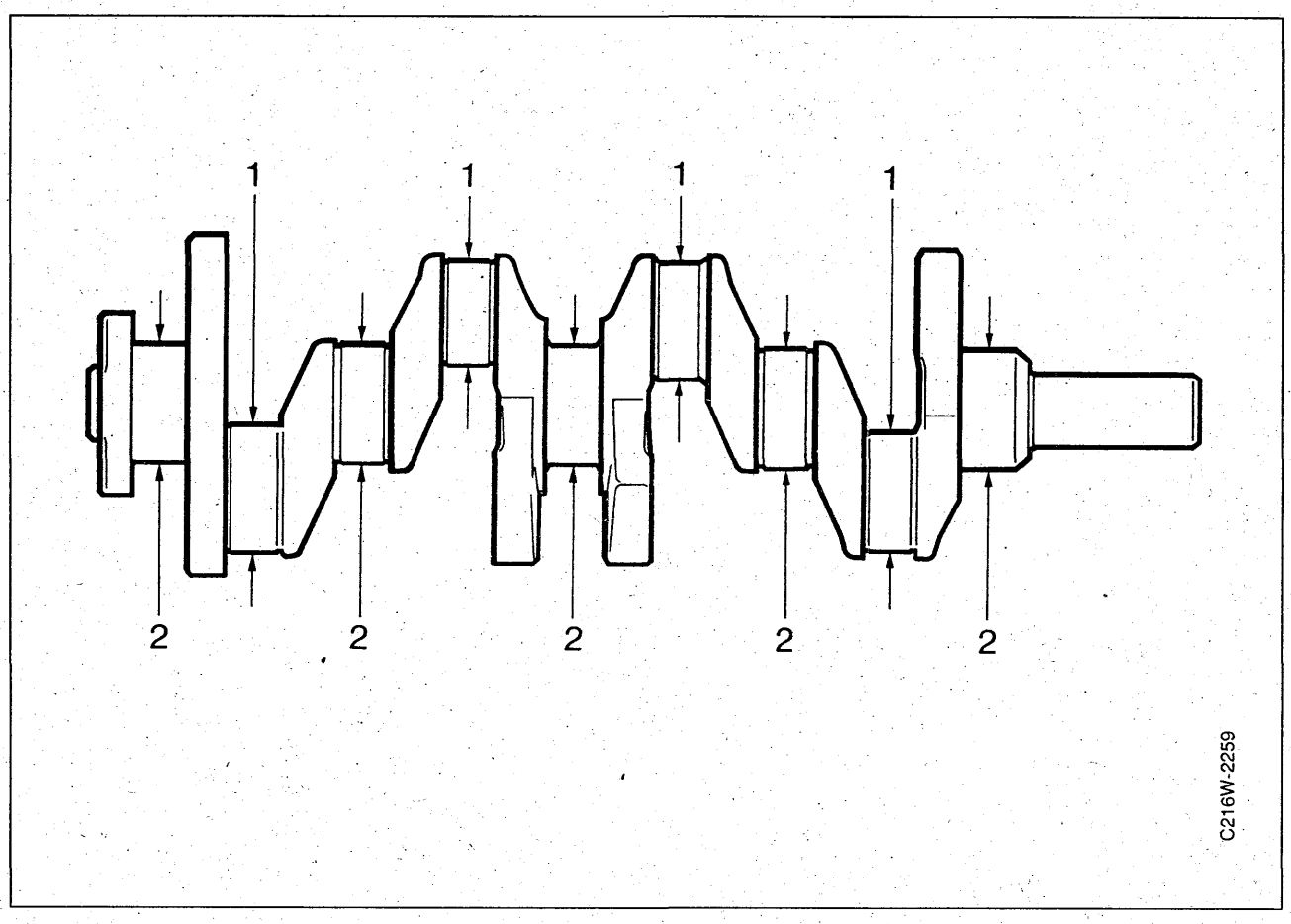
Colour coding of main bearing and big-end bearing shells

B202/B234 (–M93)	**thin**	**thick**
Standard	red	blue
First undersize	yellow	green
Second undersize	white	brown

B204/B234 (M94–)

Standard bearing shells are **Yellow — Yellow** or **Red — Blue** .

Red shells are thinnest, yellow are 0.005 mm (0.0002 in) thicker than red, and blue shells are 0.005 mm (0.0002 in) thicker than yellow ones. Only yellow bearing shells are available as a spare part.



Crankpin diameter (1)

Standard	mm (in)	51.981-52.000 (2.0481-2.0488)
First undersize	mm (in)	51.731-51.750 (2.0382-2.0390)
Second undersize	mm (in)	51.481-51.500 (2.0284-2.0291)
Third undersize	mm (in)	51.237-51.250 (2.0187-2.0192)
Fourth undersize	mm (in)	50.987-51.000 (2.0089-2.0094)
Big-end bearing clearance (-93)	mm (in)	0.026-0.062 (0.0010-0.0024)
Big-end bearing clearance (M94-)	mm (in)	0.020-0.068 (0.0008-0.0027)

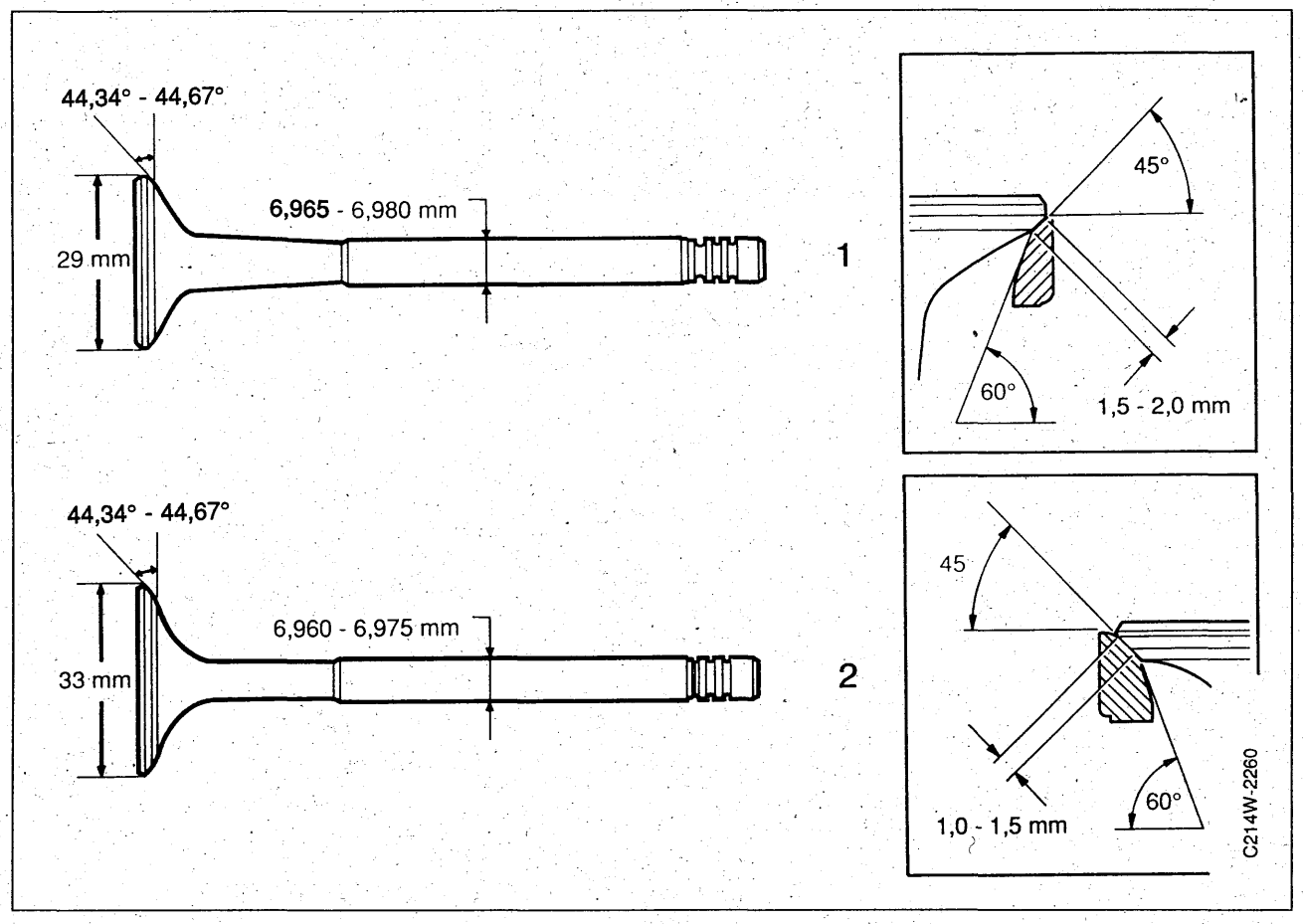
Main journal diameter (2)

Standard	mm (in)	57.981-58.000 (2.2845-2.2852)
First undersize	mm (in)	57.731-57.750 (2.2746-2.2754)
Second undersize	mm (in)	57.481-57.500 (2.2648-2.2655)
Third undersize	mm (in)	57.237-57.250 (2.2551-2.2556)
Fourth undersize	mm (in)	56.987-57.000 (2.2453-2.2458)

Valve gear

Important

The exhaust valves are stellited and should therefore not be machined. Grinding with valve-grinding (lapping) paste is the only advisable method.



1 Exhaust valve
2 Inlet valve

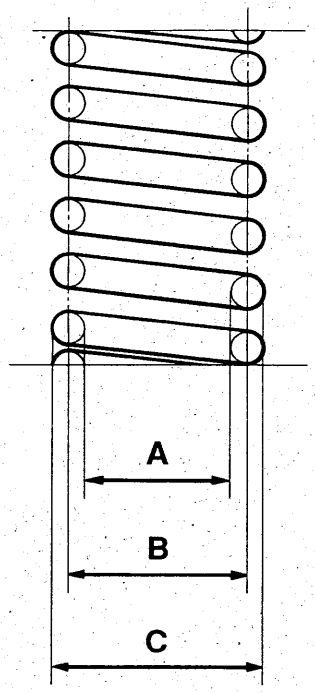
Valve guides

–M93

Length, B202	mm (in)	49.0 (1.930)
Length, B234	mm (in)	45.0 (1.773)
Outside diameter	mm (in)	12.039-12.050 (0.4743-0.4748)
Bore for valve guides in cylinder head	mm (in)	12.000-12.018 (0.4728-0.4735)
Maximum clearance between valve guide and valve stem	mm (in)	0.5 (0.02) Measured on the valve head raised 3 mm (0.12 in) above seat.

M94–

Length	mm (in)	42.5 (1.675)
Outside diameter	mm (in)	12.039-12.050 (0.4743-0.4748)
Bore for valve guides	mm (in)	12.000-12.018 (0.4728-0.4735)
Maximum clearance between valve stem and valve guide	mm (in)	0.50 (0.02) Measured on the valve head raised 3 mm (0.12 in) above seat.



A min 19,6 mm

B 24 mm

C max 28,4 mm

C214W-2261

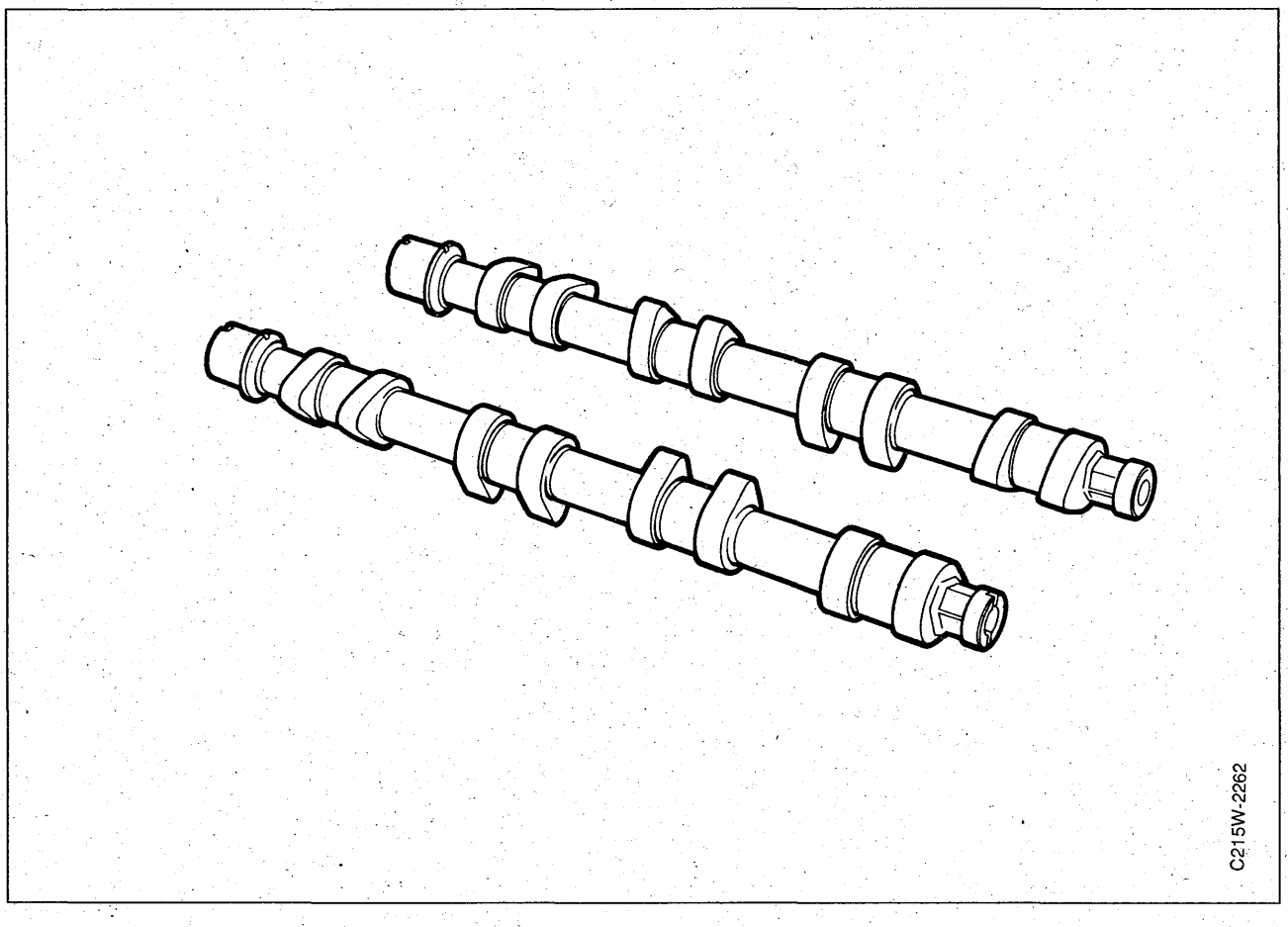
Valve springs

Length, when fitted	mm (in)	37.0 (1.46)
Length, free	mm (in)	45.5 ± 1.5 (1.793 ± 0.059)
Length under compressive force of 595-645 N (131-141 lbf) B234 Turbo: 620-645 N (138-141 lbf) B204/B234 M94–: 620-670 N (138-150 lbf)	mm (in)	28.4 (1.12)

Cam followers (tappets)

Diameter	mm (in)	32.959-32.975 (1.2986-1.2992)
Height	mm (in)	26.0 (1.024)
Bore for cam followers (tappets) in cylinder head (camshaft bearing assembly)	mm (in)	33.000-33.016 (1.3002-1.3008)

Camshafts



Number of bearings		5
Bearing diameter	mm (in)	28.922-28.935 (1.1395-1.1400)
End float (-M93)	mm (in)	0.14-0.35 (0.0055-0.0138)
End float (M94-)	mm (in)	0.08-0.35 (0.0032-0.0138)

Lift at 0 valve clearance

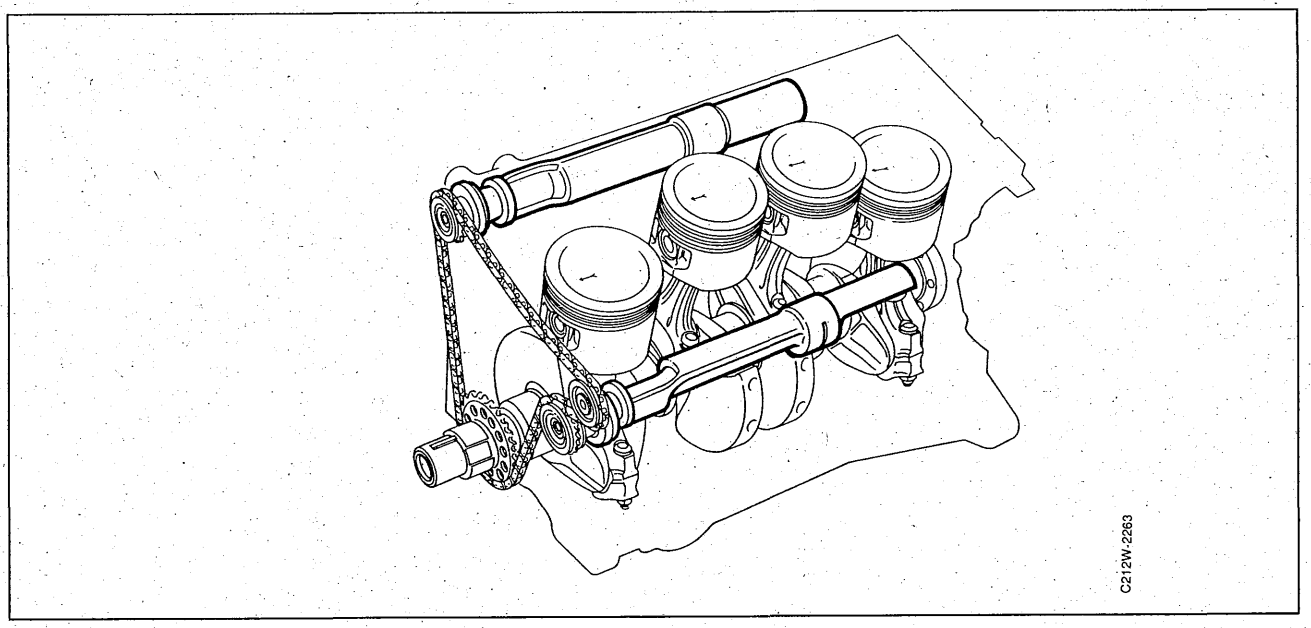
Version	Model year		Inlet	Exhaust
B202 Turbo	1985	mm (in)	8.65/6.65	8.65 (0.3408)
B202 Turbo (TWC)	-1986	mm (in)	(0.3408/0.2618)	8.65 (0.3408)
B202 Turbo, B202i	1986-93	mm (in)	8.65 (0.3408)	8.65 (0.3408)
B202 Turbo (TWC)	1987-93	mm (in)	8.65 (0.3408)	8.65 (0.3408)
B202S	1992-93	mm (in)	8.65 (0.3408)	8.65 (0.3408)
B234i	1990-93	mm (in)	8.65 (0.3408)	8.65 (0.3408)
B234 Turbo	1991-93	mm (in)	8.65 (0.3408)	8.65 (0.3408)
B204/B234	1994-	mm (in)	8.65 (0.3408)	8.65 (0.3408)

Valve timing

(At design clearance of 0.05 mm (0.0002 in) for inlet valves and 0.15 mm (0.006 in) for exhaust valves.)

Crankshaft angle, valve opening		Inlet		Exhaust	
		Open	Close	Open	Close
B202 Turbo 1985	degrees (°)	16 BTDC	56 ABDC	56 BBDC	10 ATDC
B202 Turbo 1986-93, B202S	degrees (°)	16 BTDC	56 ABDC	61 BBDC	13 ATDC
B202i 1986-93	degrees (°)	16 BTDC	44 ABDC	61 BBDC	13 ATDC
B234i 1990-93	degrees (°)	13 BTDC	53 ABDC	50 BBDC	16 ATDC
B234 Turbo 1991-93	degrees (°)	13 BTDC	53 ABDC	50 BBDC	16 ATDC
B204i/S/E/L, B234E/L/R 1994–	degrees (°)	14 BTDC	46 ABDC	44 BBDC	16 ATDC
B234i 1994–	degrees (°)	13 BTDC	53 ABDC	48 BBDC	18 ATDC

Balancer shafts



Diameter of balancer shaft journal (larger - inner)	mm (in)	39.900 ± 0.008 (1.5721 ± 0.0003)
Diameter of balancer shaft bearing (larger - inner)	mm (in)	39.988-40.043 (1.5755-1.5777)
Bearing clearance, larger (inner) journal	mm (in)	0.080-0.151 (0.0032-0.0060)
Maximum permissible bearing clearance after a period of running	mm (in)	0.18 (0.0071)
Diameter of balancer shaft journal (smaller - outer)	mm (in)	19.947-19.960 (0.7859-0.7864)
Diameter of balancer shaft bearing (smaller - outer)	mm (in)	20.000-20.021 (0.7880-0.7888)
Bearing clearance, smaller journal	mm (in)	0.040-0.074 (0.0016-0.0029)
End float	mm (in)	0.050-0.450 (0.0020-0.0177)

Tightening torques

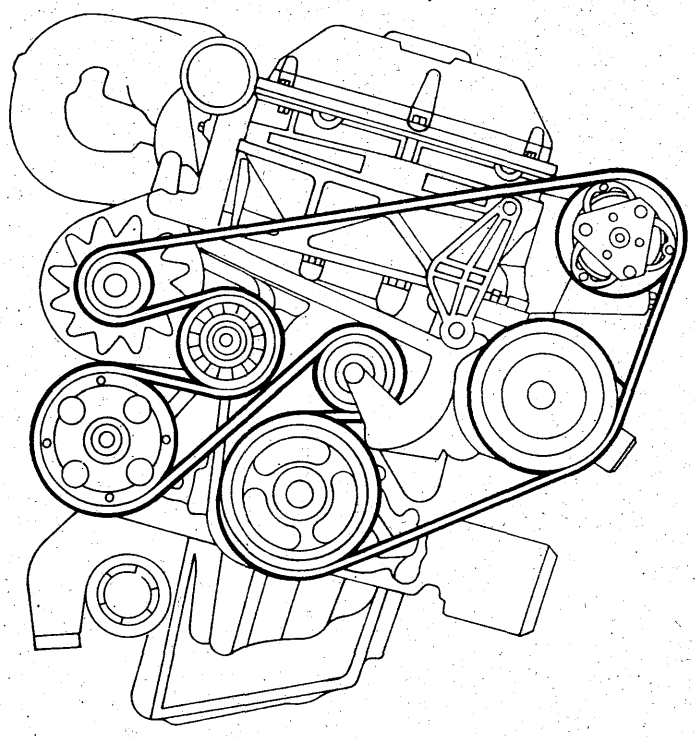
B202	1985-	1985-			Bolt size
	Nm	lbf ft	Nm	lbf ft	
Exhaust manifold	25	19	25[1]/18[2]	19[1]/13[2]	M8
Drain plug, engine oil	25	19			M14x1.5
Intake manifold	18	13.5	22 (M89-)	16 (M89-)	M8
Camshaft bearing caps	15	11			M8
Camshaft sprockets	63	47			M10
Chain tensioner	63	47			M22x1.5
Knock sensor	20±5	15±3.7			
Knock sensor (DI)	13±2	9.6			
Knock sensor, engine No. G122318 and previous	14±2	10.4			
Oil filter	10	7.4			
Oil pump	8	5.9			M6
Main bearing	110	81			M12
Throttle body	18	13.5	22 (M89-)	16 (M89-)	M8
Flywheel (17 mm bolt head)	60	44			M10
Flywheel (19 mm bolt head)	85	63			M10
Thermostat housing	18	13.5	22 (M89-)	16 (M89-)	M8
Timing gear cover	20	15	25 (M89-)	18 (M89-)	M8
Distributor	18	13			M8
Camshaft cover	15	11			M8
Crankshaft pulley	190	140			M16
Crankshaft pulley			175 (M91-)	129 (M91-)	M16x1.5
Big-end bearings	55	41			M10x1

[1)]B202 Turbo

[2)]B202i

B234	Torque, Nm	Torque, lbf ft	Bolt size
Exhaust manifold	25	18,5	M8
Drain plug, engine oil	25	18,5	M14x1.5
Idler sprocket, balancer-shaft chain	25	18,5	M8
Cylinder head, stage I stage II stage III	60 80 Tighten a further 90°	44 59 Tighten a further 90°	
Intake manifold	22	16	M8
Camshaft bearing caps	15	11	M8
Balancer shaft sprockets	42	31	M10
Camshaft sprockets	63	47	M10
Timing chain tensioner	63	47	M22x1.5
Knock sensor, DI/APC blue locking screw other	13 14 20	9.6 10.5 15	
Piston cooling nozzle/plug for piston cooling nozzle -M93	23	17	M10x1
Piston cooling nozzle/plug for piston cooling nozzle M94-	18	13,3	M10x1
Drive plate M94-	95	70.3	M10x1.25
Oil filter	10	7.4	
Oil pump -M93	8	5.9	M6
Oil hoses for oil cooler	18	13,3	
Oil sump	22	16	M8
Plug for timing chain tensioner	22	16	
Plug for oil pressure reducing valve	30	22	
Plug for oil cooler thermostat	60	44	
Main bearing	110	81,4	M12
Throttle body	22	16	M8
Flywheel, drive plate -M90 (17 mm bolt head)	60	44	M10
Flywheel, drive plate M91-93 (19 mm bolt head)	85	63	M10
Flywheel M94-	80	59,2	M10x1.25
Thermostat housing	22	16	M8
Timing gear cover	22	16	M8
Turbocharger	25	18.5	M8
Ignition discharge module	11	8	M6
Spark plugs	28	20.7	
Camshaft cover	15	11	M8
Crankshaft pulley	175	129,5	M16x1.5
Big-end bearings	48	35,5	M9x1
Other bolts, M5 M6 M8 M10	5 10 20 40	3.7 7.4 15 30	

Drive-belt tension



Drive belt B204/B234

Tension when checking	N (lbf)	170 (38)

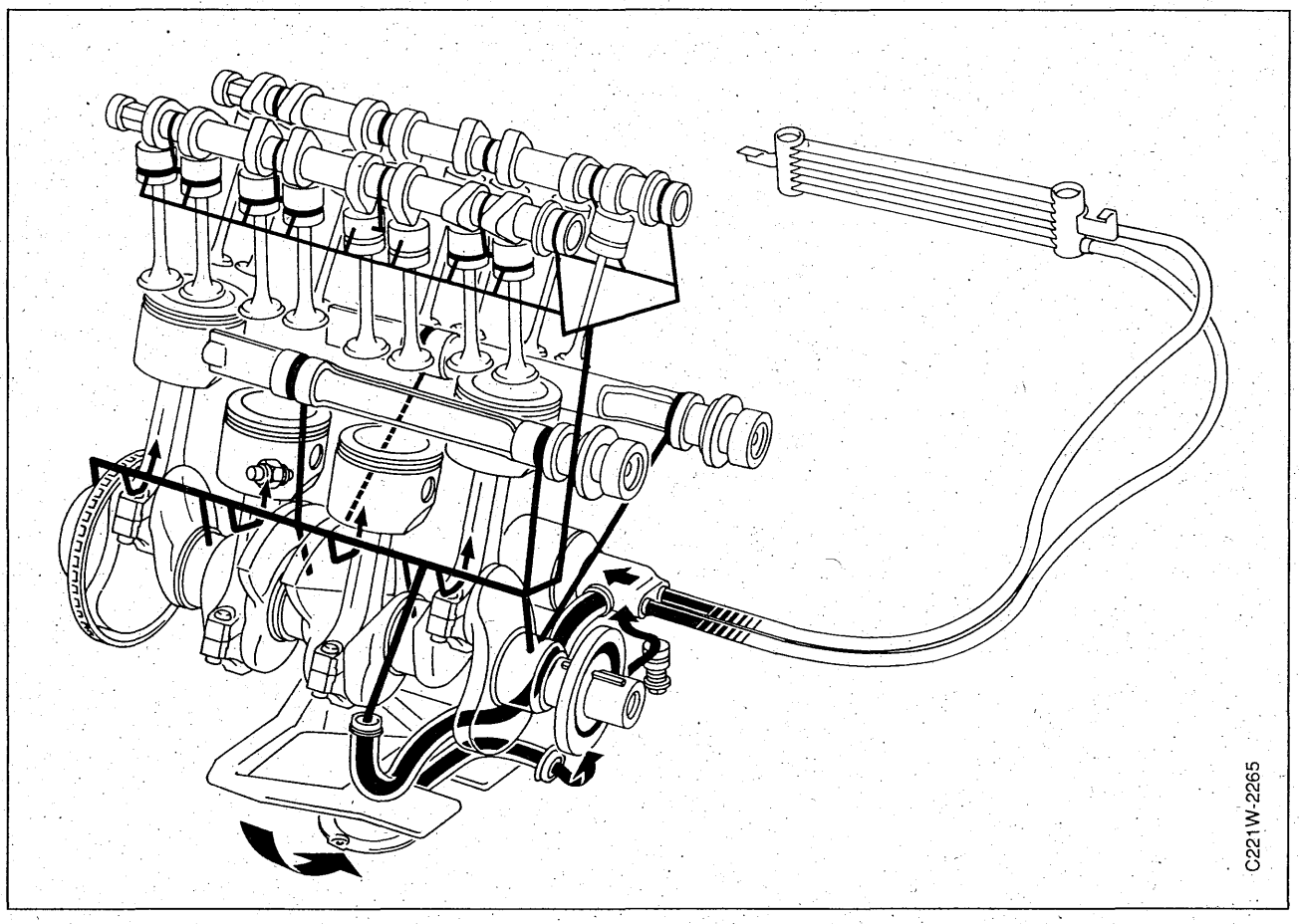
Drive belt, generator-power steering servo pump (B202)

Minimum tension	N (lbf)	355 (80)
Tension to	N (lbf)	535 ± 45 (120 ± 10)
New belt	N (lbf)	800 ± 45 (180 ± 10)

Drive belt, A/C compressor (B202)

Minimum tension	N (lbf)	265 (60)
Tension to	N (lbf)	355 ± 20 (80 ± 5)
New belt	N (lbf)	535 ± 45 (120 ± 10)

Lubricating system

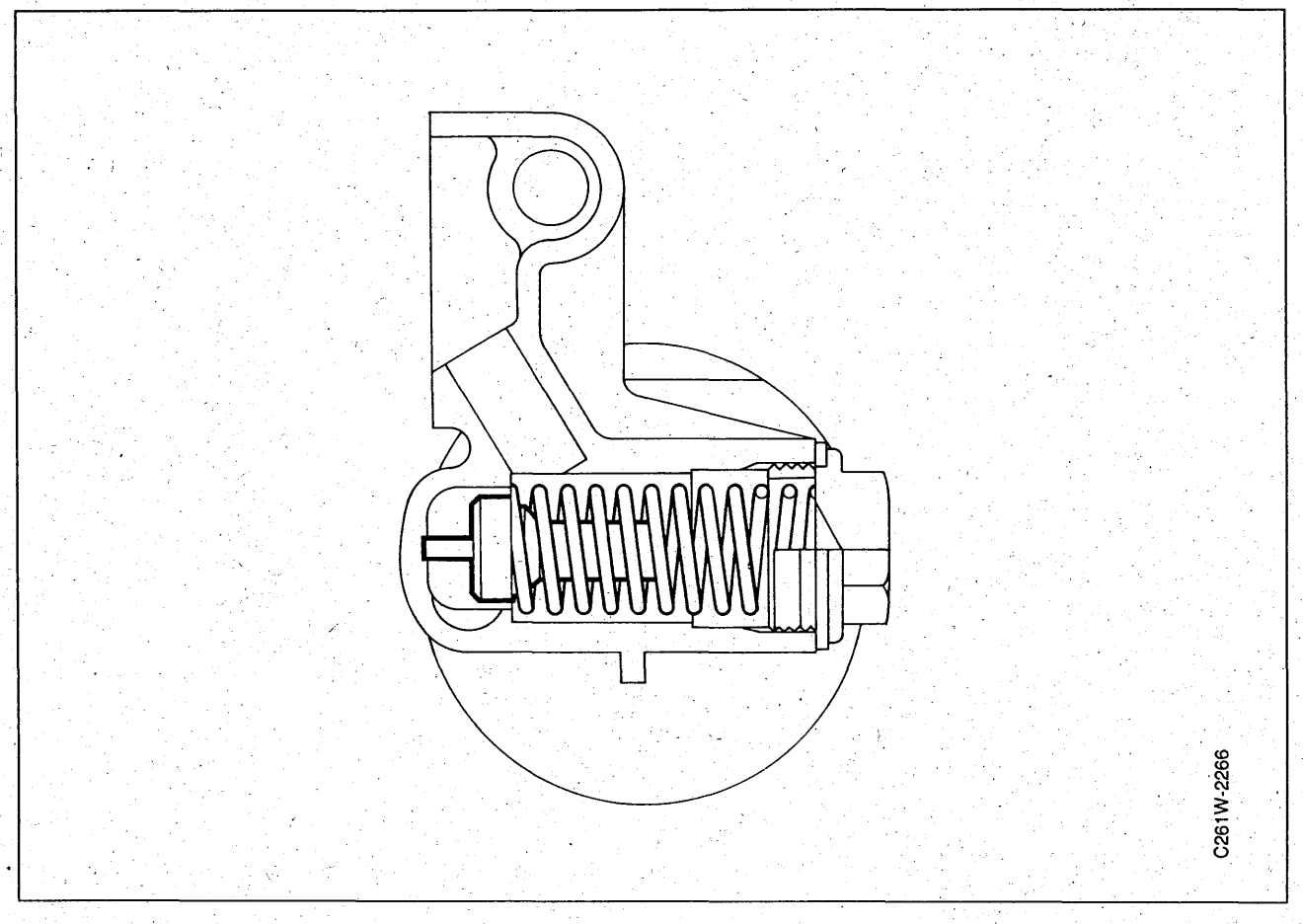


		B202	B234 -M93	B204/234 M94–
Oil capacity (dry engine), including oil filter	litres (qts)	4.2 (4.5)	4.3 (4.6)	5.5 (5.8)
Difference in volume, max-min	litres (qts)	1.0 (1.05)	1.0 (1.05)	1.0 (1.05)
Grade of oil		Saab Turbo motor oil or motor oil to API SG and CCMC G4/G5 specifications.		
Viscosity		SAE 10 W 30 or 10 W 40. In markets where these viscosities are unobtainable, 15 W 40 may be used instead. Use 5 W 30 or 5W40 in climates with temperatures consistently below -20°C (-4°F). These oils should be of all-synthetic or semi-synthetic type. At constant temperatures of +15°C (+59°F) or above, use 15W50 or 20W50.		

Important

If the engine is fitted with an oil cooler, its oil capacity will be an additional 0.4 litres.

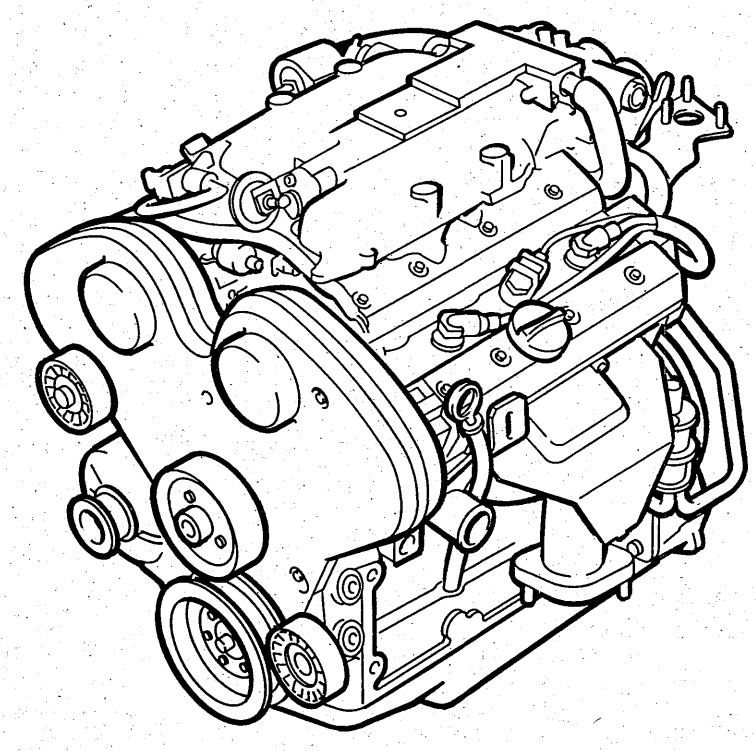
The grades of oil recommended above contain all necessary additives. The use of further additives should therefore be avoided.



Oil pressure

		B202	B234 -M93	B204/B234 M94–
Oil pump pressure-reducing valve opens at	bar (psi)	3.6-5.2 (52.2-75.4)	3.5 (50.8)	3.0 (43.5)
Warning lamp comes on at	bar (psi)	0.3-0.5 (4.4-7.2)	0.3-0.55 (4.4-8.0)	0.3-0.5 (4.4-7.2)
Oil pressure at 2000 rpm, engine temperature 80°C (176°F), 10 W 30 oil.	bar (psi)	minimum 2.7 (38.9)	minimum 2.7 (38.9)	min 2.7 (13.9)
End float between oil pump rotor and housing	mm (in)	0.03-0.08 (0.0012-0.0031)	0.03-0.08 (0.0012-0.0031)	0.03-0.08 (0.0012-0.0031)
Oil cooler thermostat, opening temperature	°C (°F)	90 (194)	75 ± 2 (167 ± 4)	107 (225)

Engine, V6



General data

Engine type		6-cylinder, 4-stroke engine with four valves per cylinder and 2 overhead camshafts per cylinder head. The V-angle between the cylinder banks is 54°.
Cylinder bore	mm	86
Stroke	mm	85
Swept volume	cm^3	2961
Compression		The difference in compression between the cylinders must not be more than 100 kPa (1 bar).
Firing order		1-2-3-4-5-6
Weight	kg	199 (automatic transmission) 218 (manual gearbox)

Performance, compression ratio, fuel octane number M95-

Engine version	Model year	RON octane rating (AKI)*)	Compression ratio	KW (bhp) DIN at rpm	Torque, Nm (lbf ft) at rpm
B308i	1995-	Min. 91 (87) Rec. 95 (91)	10.8	155 (210)/6200	270 (199)/3300

Cylinder bore

Classification codes

8	mm	85.975-85.985
99	mm	85.985-85.995
00	mm	85.995-86.005
01	mm	86.005-86.015
02	mm	86.015-86.025

Cylinder head

Total height	mm	134,0
Maximum permissible distortion	mm	0.05/100 mm length

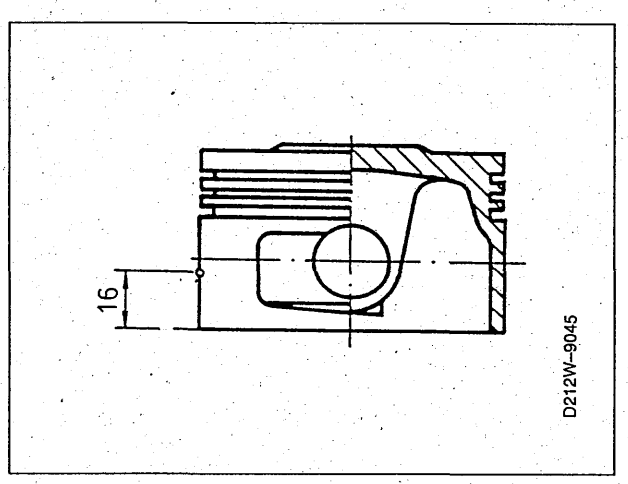
Pistons

Piston diameter

Piston diameter is measured at right angles to the gudgeon pin hole, 16 mm from the bottom of the piston skirt.

Important

New pistons are graphite coated, but the coating is not included in the measurements below.



Classification codes

8	mm	85.940-85.950
99	mm	85.950-85.960
00	mm	85.960-85.970
01	mm	85.970-85.980
02	mm	85.980-85.990
Piston clearance, nominal	mm	0.025-0.045

Oversizes

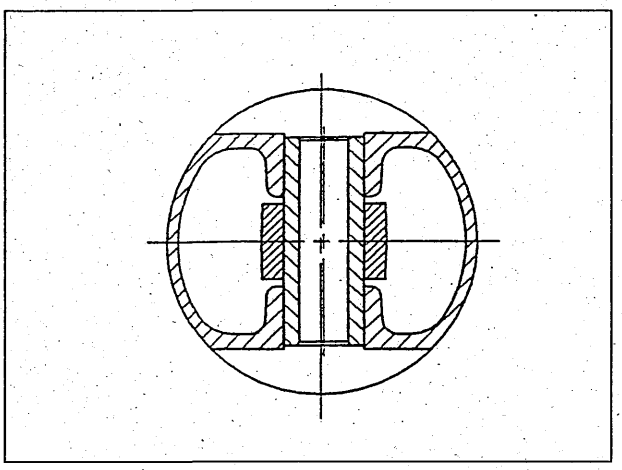
7 + 0.5	mm	86.430-86.440
8 + 0.5	mm	86.440-86.450
9 + 0.5	mm	86.450-86.460
0 + 0.5	mm	86.460-86.470

Pistons (contd.)

Piston rings

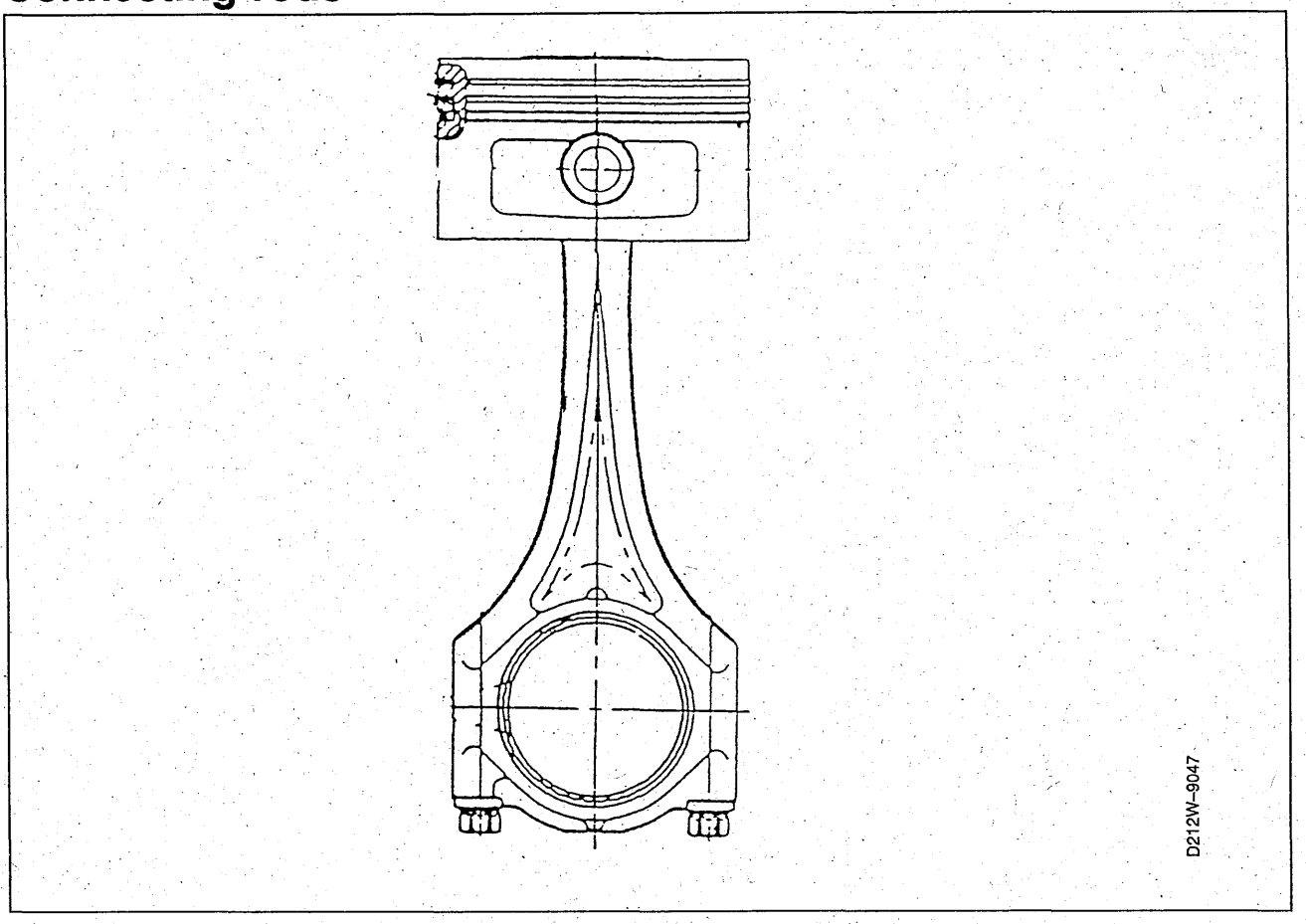
		Top compression ring	Second compression ring	Scraper ring
Thickness	mm	1.478-1.490	1.478-1.490	3.0
Working gap in cylinder	mm	0.30-0.50	0.30-0.50	0.40-1.40

Gudgeon pin



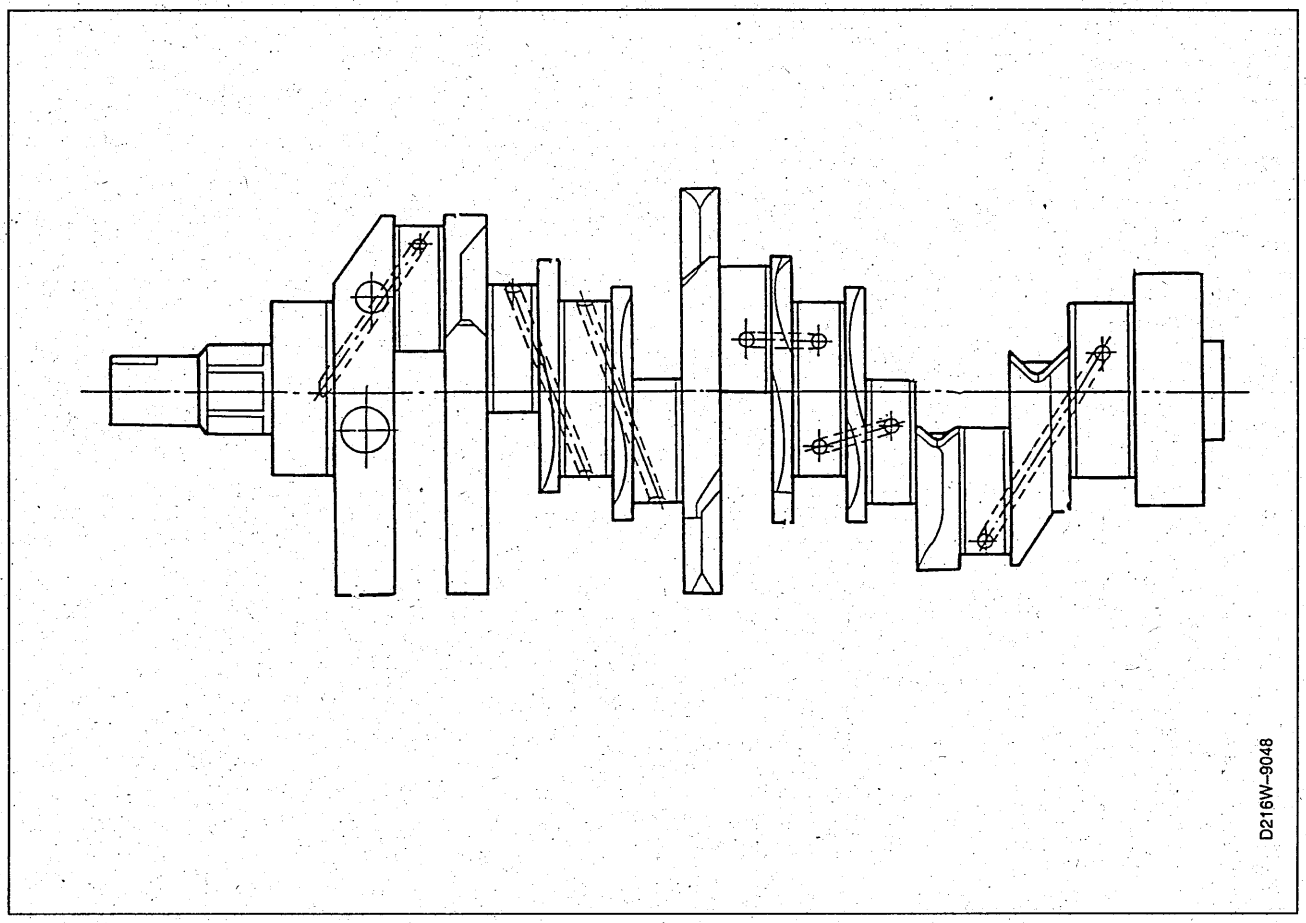
Diameter	mm	20.990-21.000
Gudgeon pin in relation to connecting rod	mm	Floating bearing

Connecting rods



Diameter of big end	mm	52.000-52.012
Length	mm	148
Maximum permissible weight variation per set	g	8

Crankshaft



General data

End float	mm	0.1-0.76
Maximum journal out-of-round	mm	0.003
Maximum permissible rotational variation	mm	0.05

Crankpin diameter

Standard	mm	48.971-48.987
First undersize (0.25)	mm	48.721-48.737
Second undersize (0.5)	mm	48.471-48.487
Big-end bearing clearance	mm	0.013-0.061

Main journal diameter

Standard	mm	67.980-67.996
First undersize	mm	67.730-67.746
Second undersize	mm	67.480-67.496
Main bearing clearance	mm	0.014-0.043

Crankshaft (contd.)

Main bearing

	Standard size				Undersize -0.25				Undersize -0.50			
Marking cyl. block	0		1		0		1		0		1	
Size main bearing seat	72.0000-72.0065		72.0065-72.0130		72.0000-72.0065		72.0065-72.0130		72.0000-72.0065		72.0065-72.0130	
Marking crankshaft	Green	Brown	Green	Brown	-	-	-	-	-	-	-	-
Size main journals	67.980-67.988	67.988-67.996	67.980-67.988	67.988-67.996	67.730-67.738	67.738-67.746	67.730-67.738	67.738-67.746	67.480-67.488	67.488-67.496	67.480-67.488	67.488-67.496
Bearing shell in cylinder block	Brown	Brown	Green	Green	Brown/blue	Brown/blue	Green/blue	Green/blue	Brown/white	Brown/white	Green/white	Green/white
Bearing shell in bearing cap	Green	Brown	Green	Brown	Green/blue	Brown/blue	Green/blue	Brown/blue	Green/white	Brown/white	Green/white	Brown/white
Resultant bearing clearance (mm)	0.0160-0.0425	0.0140-0.0405	0.0165-0.0430	0.0145-0.0410	0.0160-0.0425	0.0140-0.0405	0.0165-0.0430	0.0145-0.0410	0.0160-0.0425	0.0140-0.0405	0.0165-0.0430	0.0145-0.0410

Permissible resultant bearing clearance	mm	0.0140-0.0430

	Brown	Green	Brown/blue	Green/blue	Brown/white	Green/white
Bearing thickness (mm)	1.989-1.995	1.995-2.001	2.114-2.120	2.120-2.126	2.239-2.245	2.245-2.251

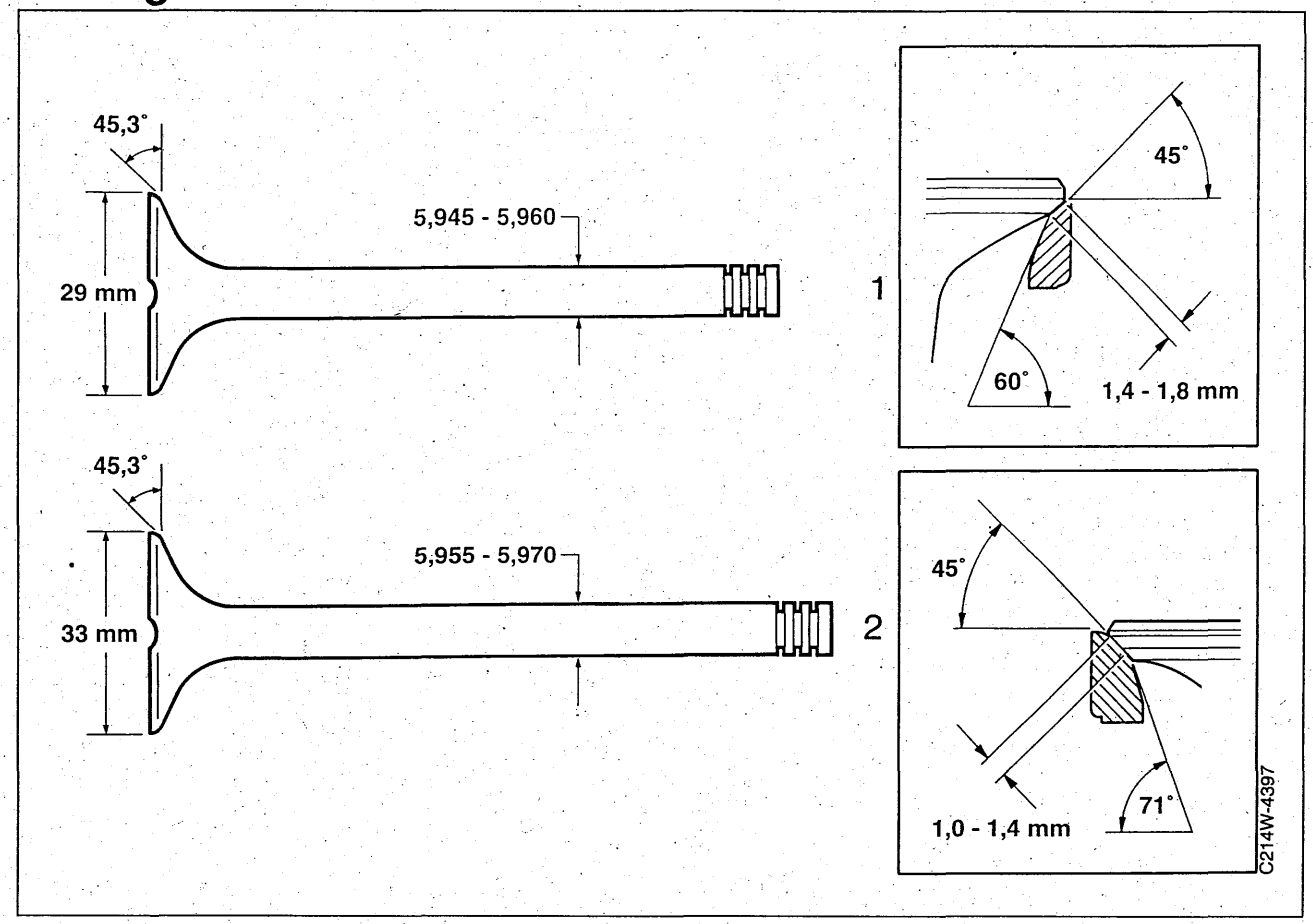
⚠ WARNING

Always measure the bearing clearance before assembling the engine.

Important

The main bearing shells in bearing caps 2 and 3 have no oilway.

Valve gear



Exhaust valves (1) are available in two oversizes:

+0.075	diameter 6.020-6.035 mm
+0.150	diameter 6.095-6.110 mm

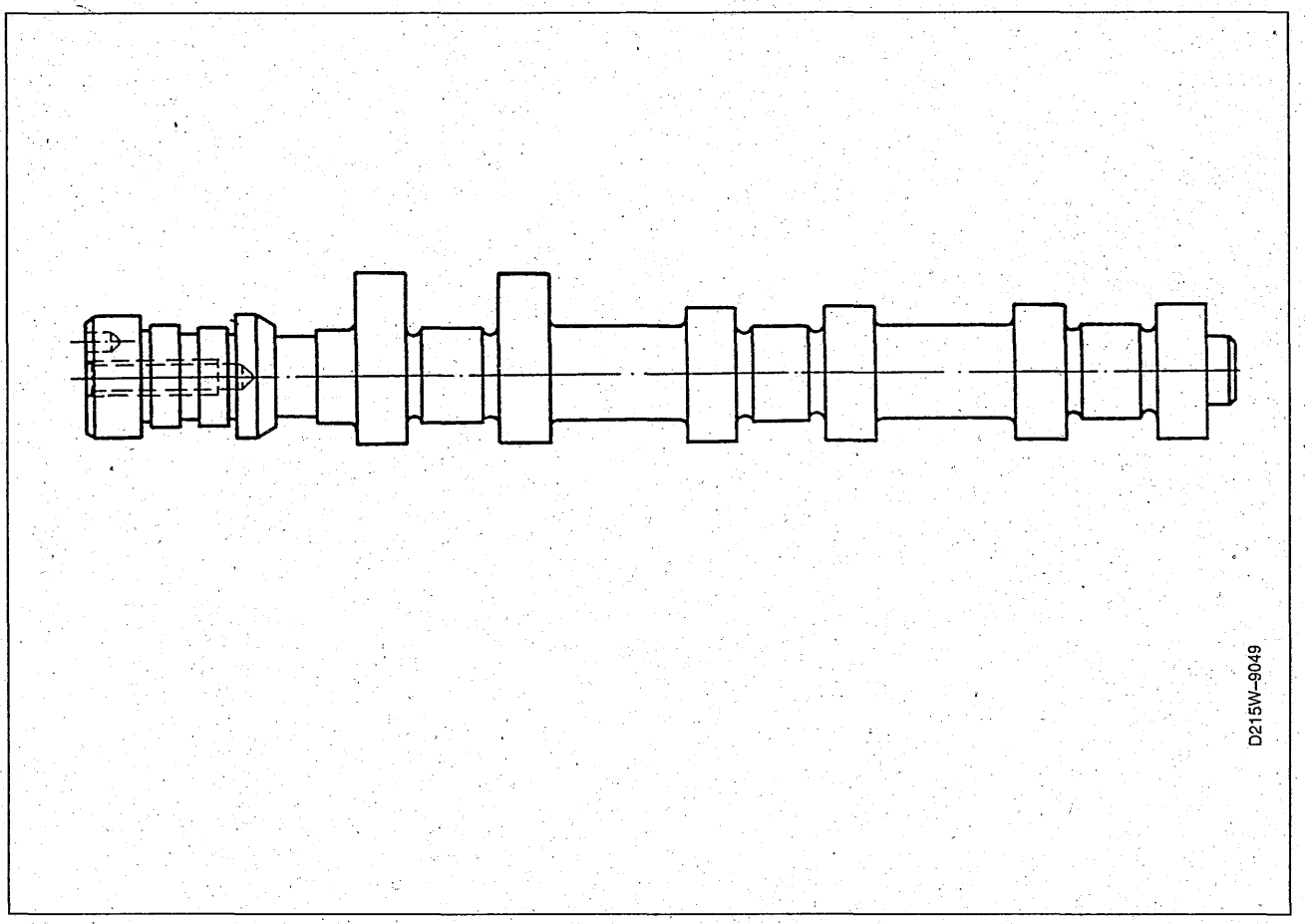
Inlet valves (2) are available in two oversizes:

+0.075	diameter 6.030-6.045 mm
+0.150	diameter 6.105-6.120 mm

Valve springs

Length, free	mm	approx. 41.8
Length under compressive force of 252-288 N	mm	34
Length under compressive force of 630-680 N	mm	24

Camshafts



General data

The camshafts on the exhaust side are marked in **Green** and with the letter "A" on the turned surface behind the front journal.
The camshafts on the inlet side are marked in **Blue** or **Orange** and with the letter "G" on the turned surface behind the front journal.

Journals	mm	27.960-27.939
End float	mm	0.040-0.144
Lift	mm	10

	Inlet valves		**Exhaust valves**	
	Open	Close	Open	Close
Crankshaft angle, valve opening	7.5° BTDC	79.5° ABDC	56.5° BBDC	30.5° ATDC
Fully open valve	119° ATDC		109.5° BTDC	

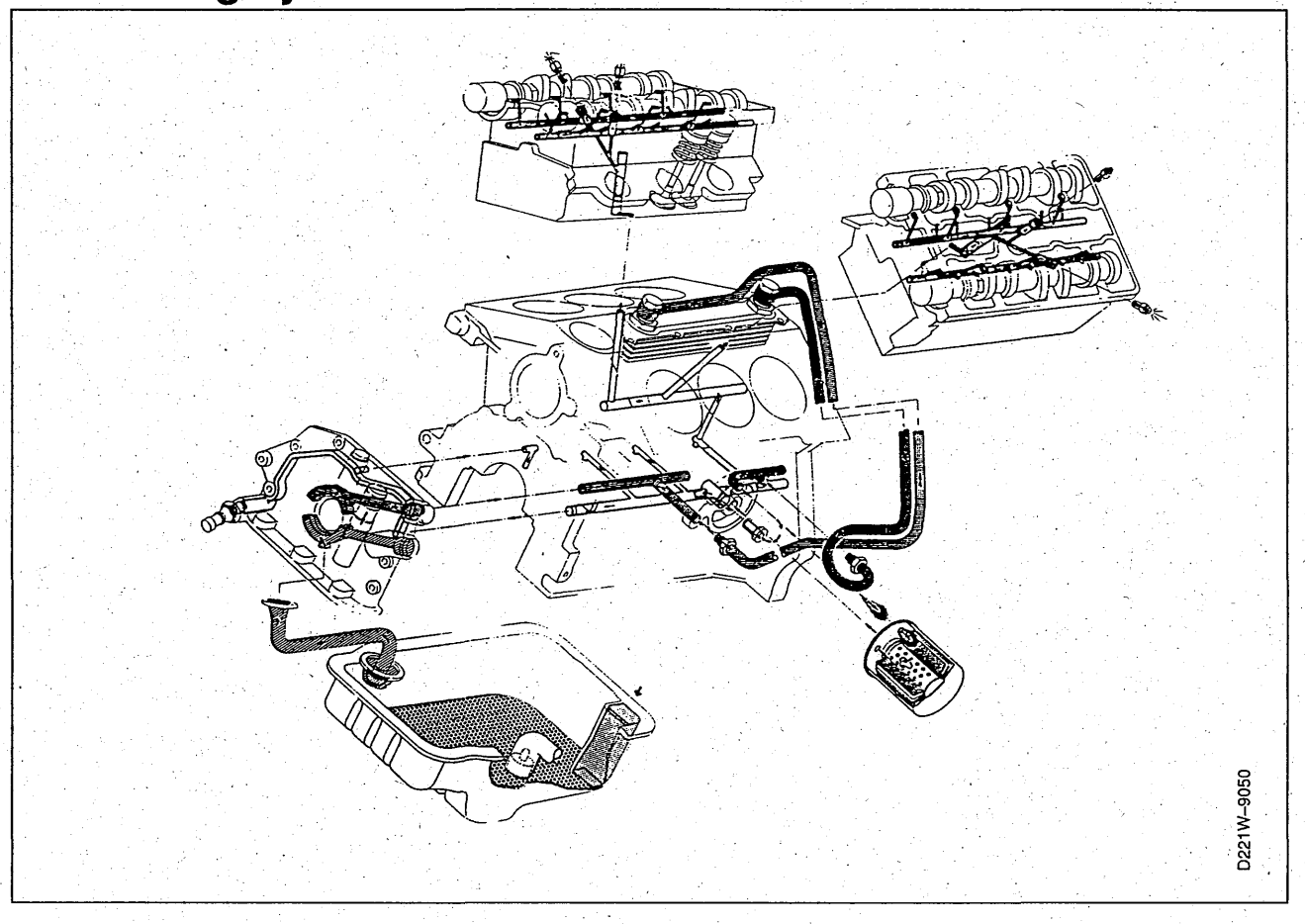
Tightening torques

	Torque (Nm)	Torque (lbf ft)
Drain plug, engine oil	55	41
Cylinder head, stage I	25	18.5
stage II	Tighten a further 90°	Tighten a further 90°
stage III	Tighten a further 90°	Tighten a further 90°
stage IV	Tighten a further 90°	Tighten a further 90°
Timing roller, camshaft drive	40	30
Camshaft sprockets	50+60°	37+60°
Camshaft bearing caps	8	6
Toothed belt sprocket, crankshaft	250+45°	184.5+45°
Knock sensor	22	16
Coolant bridge	30	22
Water pump	25	18.5
Crankshaft position sensor	8	6
Oil filter	10	7.4
Oil pump	6	4.5
Oil line to heat exchanger/cylinder block	30	22
Antislosh baffles	8	6
Oil suction pipe	8	6
Oil sump	15	11
Main bearing caps	50+60°+15°	37+60°+15°
Tensioning roller	20	15
Flywheel or drive plate	65+30°	48+30°
Spark plugs	25	18.5
Camshaft cover	8	6
Big-end bearing caps	35+45°+15°	26+45°+15°
Heat exchanger	30	22
Heat exchanger cover	20	15
Other bolts M5	5	3.7
M6	10	7.4
M8	20	15
M10	40	30

Sealing compounds/Thread locking fluids

Applications	Part number
Sealing rear main bearing caps	(10) 81 52 381
Sealing joints in the cylinder block sealing surface against the oil sump	(10) 81 52 381
Locking the main bearing member adjusting sleeves	(10) 74 96 268
Locking bolts for oil sump, antislosh baffles and oil suction pipe	(10) 74 96 268
Strengthening the oil pump gasket	(10) 93 21 795
Locking bolts for oil pump drive cover	(10) 74 96 268
Sealing coolant bridge connections	(10) 74 96 284
Sealing coolant bridge bolts to the cylinder heads	(10) 74 96 284
Sealing front camshaft bearing caps	(10) 74 96 268
Sealing the heat exchanger cover	(10) 81 52 381
Strengthening valve cover gaskets on camshaft bearing caps	(10) 81 52 381
Locking bolts on intake manifolds	(10) 74 96 268
Locking bolts on flywheel/drive plate	(10) 74 96 292

Lubricating system



General data

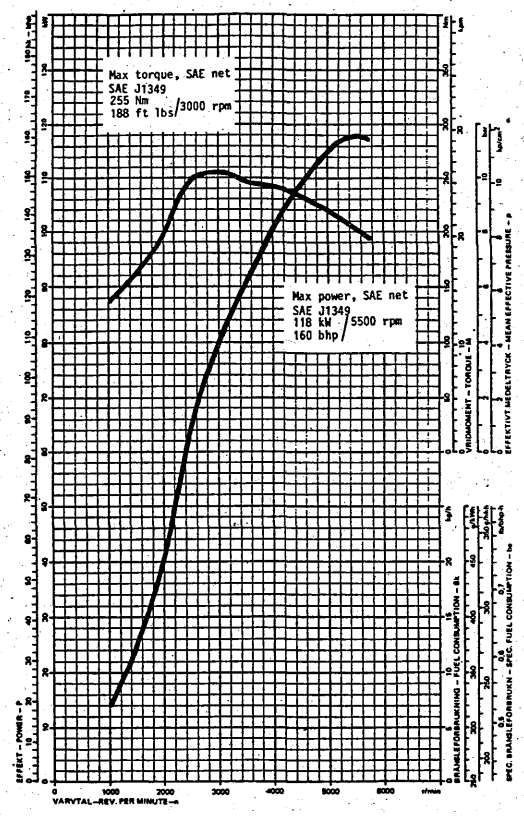
Oil capacity (dry engine), including oil filter	litres	5.0
Oil capacity when changing oil	litres	4.5
Difference in volume, max-min	litres	1.0
Oil pump pressure-reducing valve opens at	bar	4.5 ± 1
Grade of oil		Saab Turbo motor oil or motor oil to API SG and CCMC G4/G5specifications.
Viscosity		SAE 10W-30 or 10W-40. SAE 15W-40 oil may be used in markets where these grades are unobtainable, but not during the winter. In climates with temperatures regularly below -20°C (-4°F), use 5W-30 or 5W-40 oil of all synthetic or partially synthetic type. In climates with a constant temperature of +15°C (+59°F) or above, use 15W-50 or 20W-50.

Important

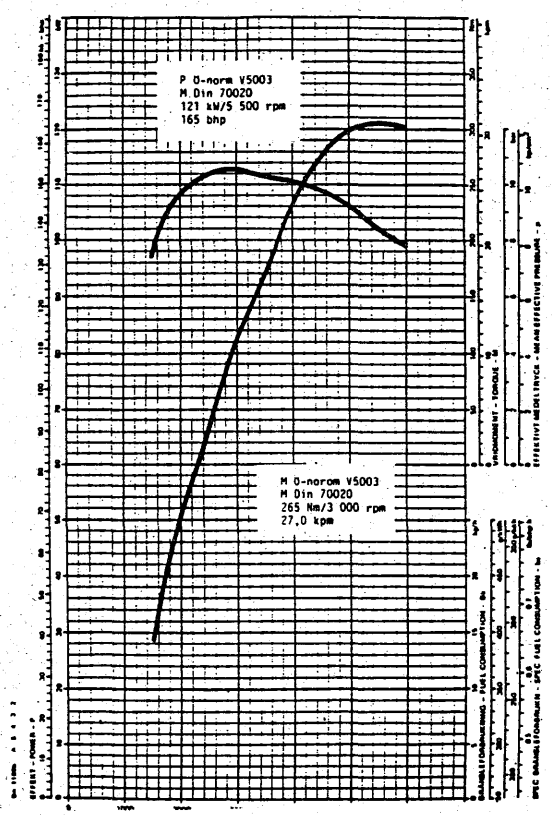
The recommended grades of oil contain all necessary additives and the use of additional additives should therefore be avoided.

Engine performance graphs

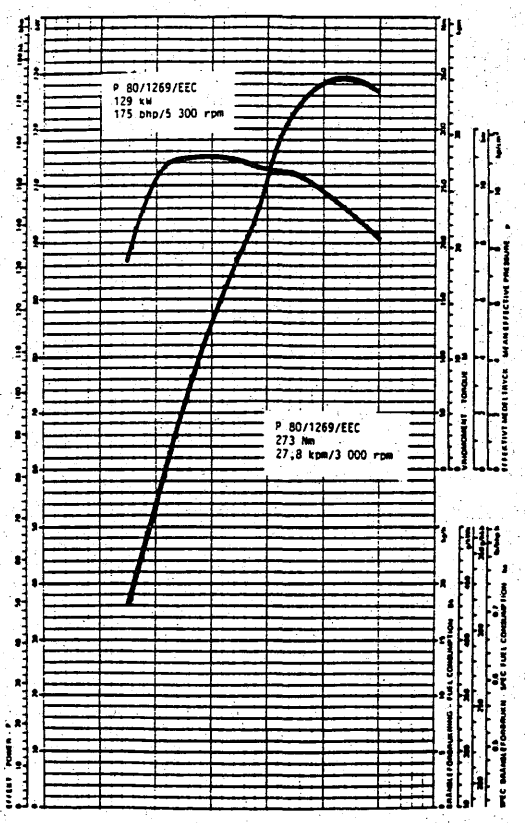
9000 Turbo (TWC) –M1988



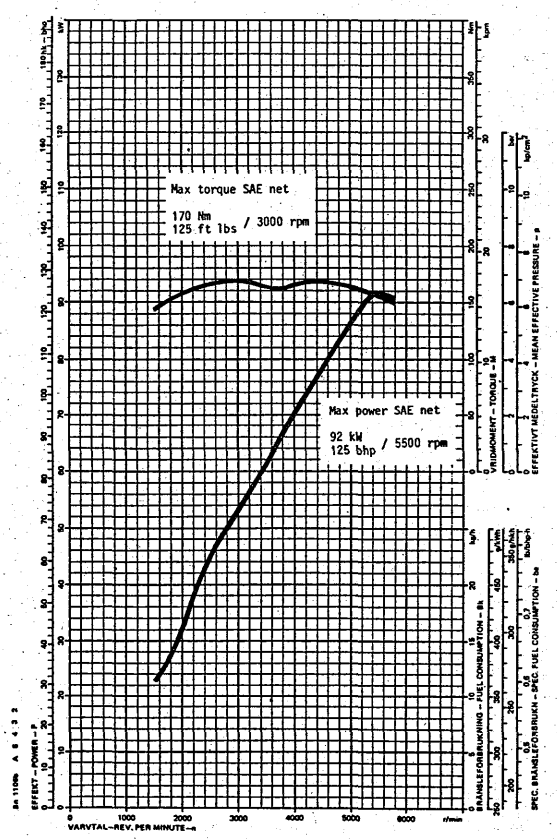
9000 Turbo (TWC) M1989–



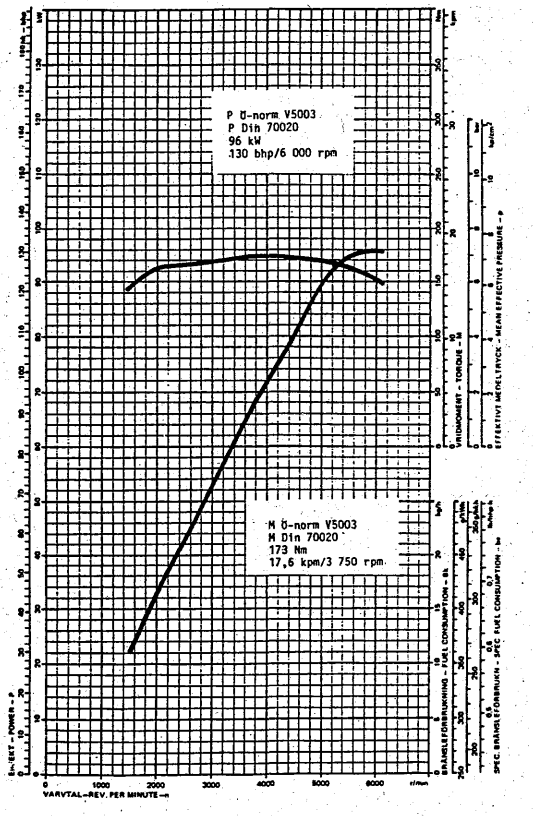
9000 Turbo



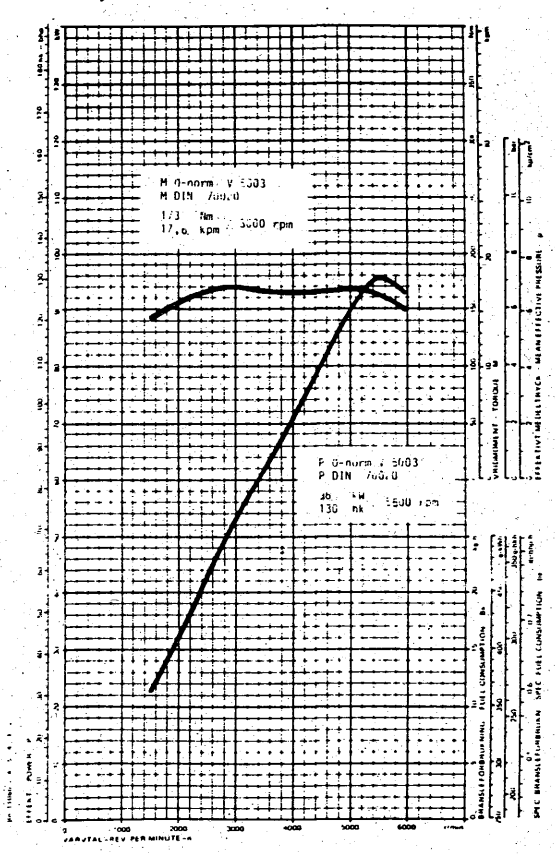
9000i (TWC) –M1988



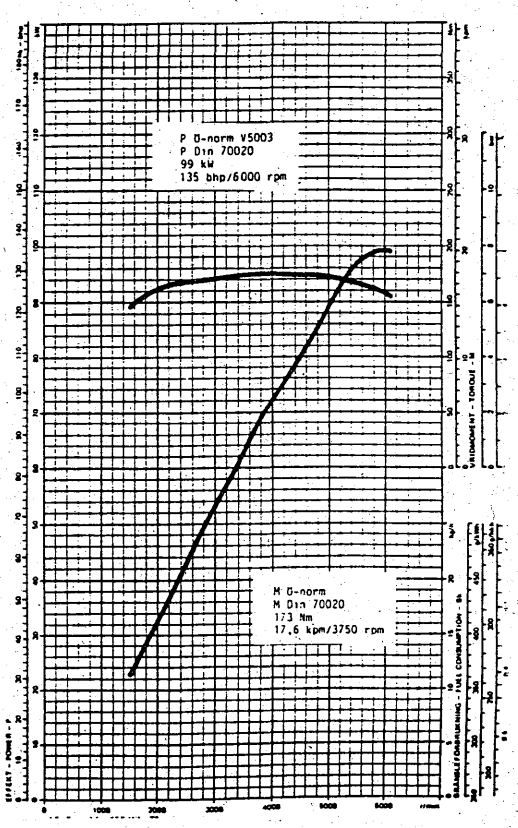
9000i (TWC) M1989-93



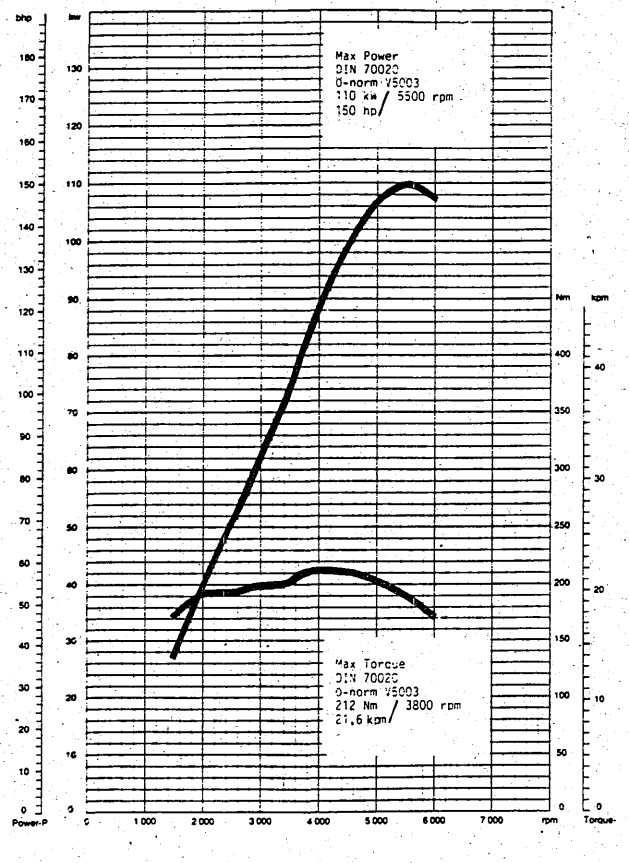
9000i, -M1988



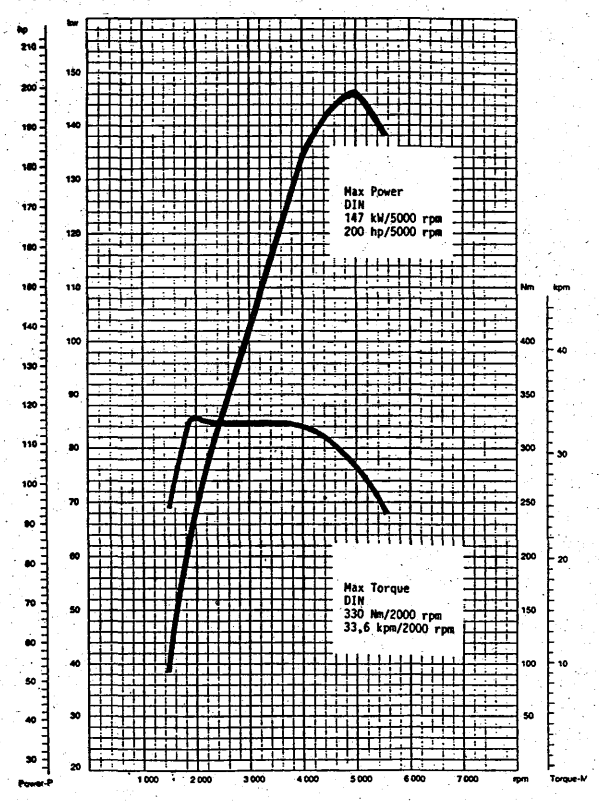
9000i M1989-93



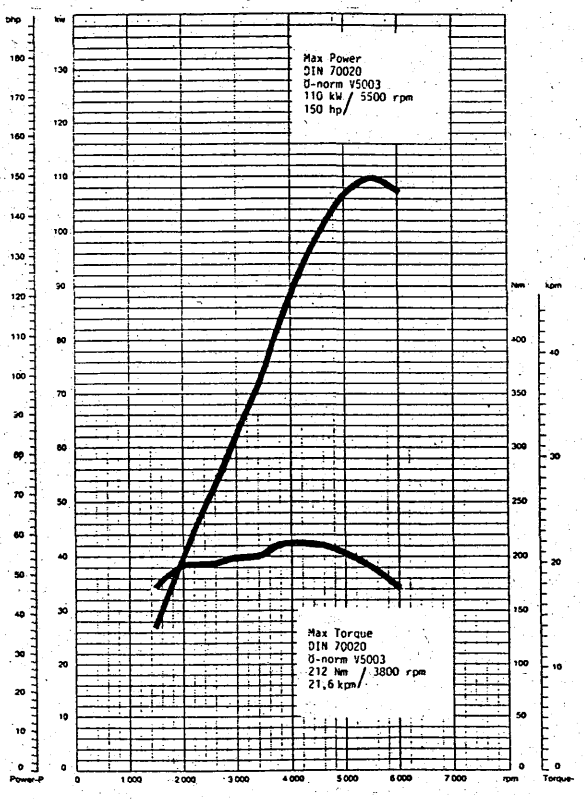
9000i, 2.3 (TWC) -M93



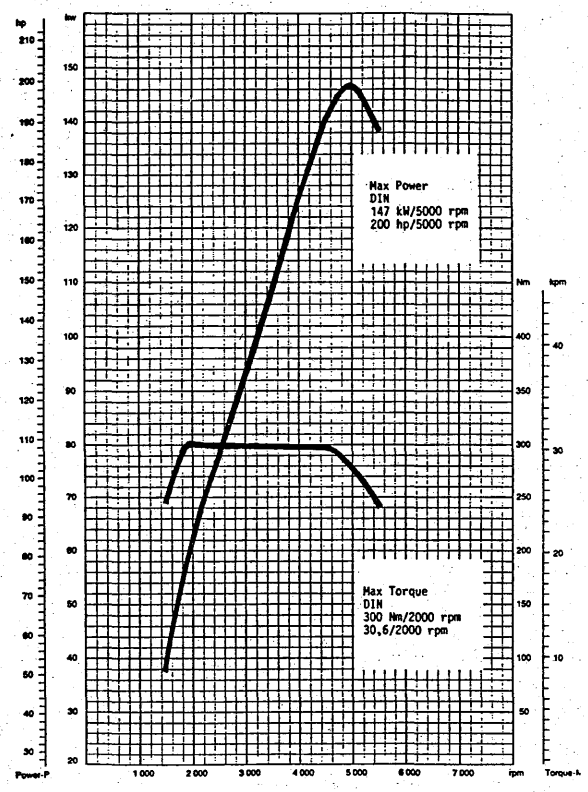
9000 Turbo B234 man - M93



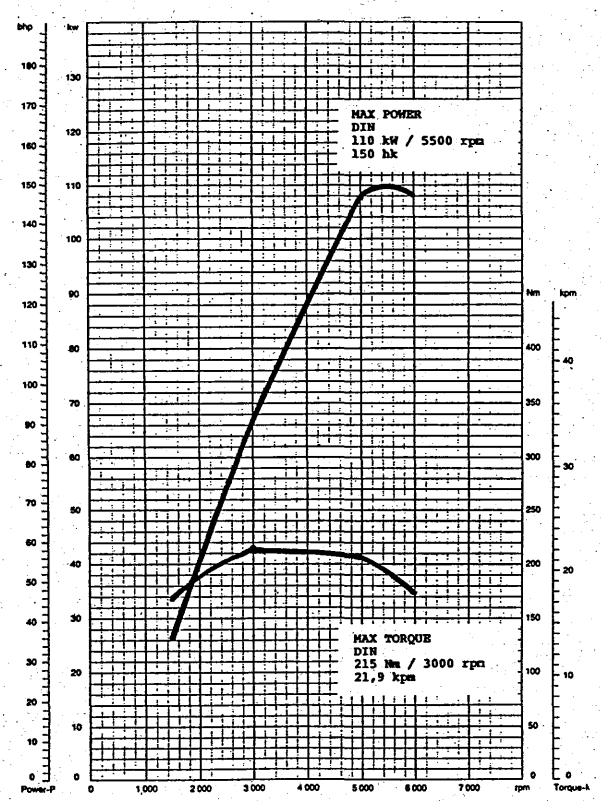
9000i, 2.3 (no TWC) -M93



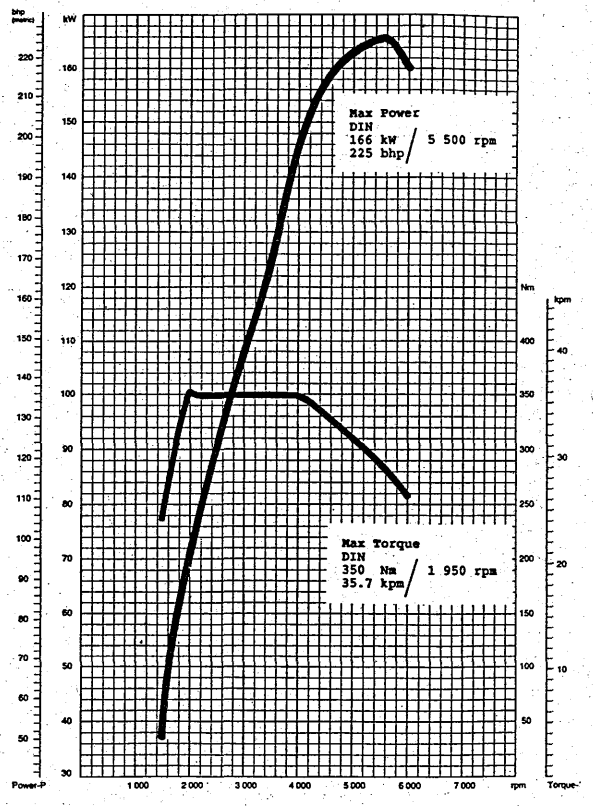
9000 Turbo B234 aut -M93



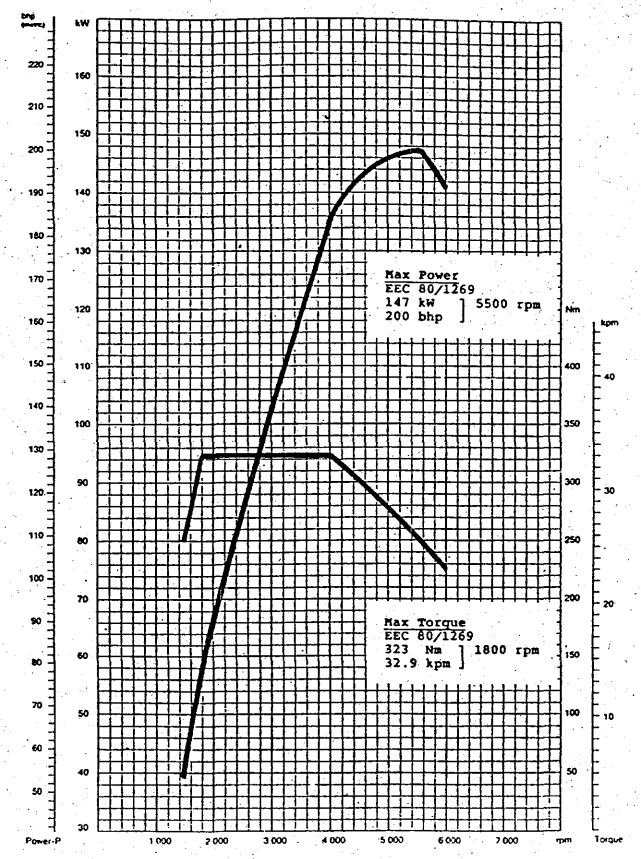
9000S B202S (Ecopower) -M93



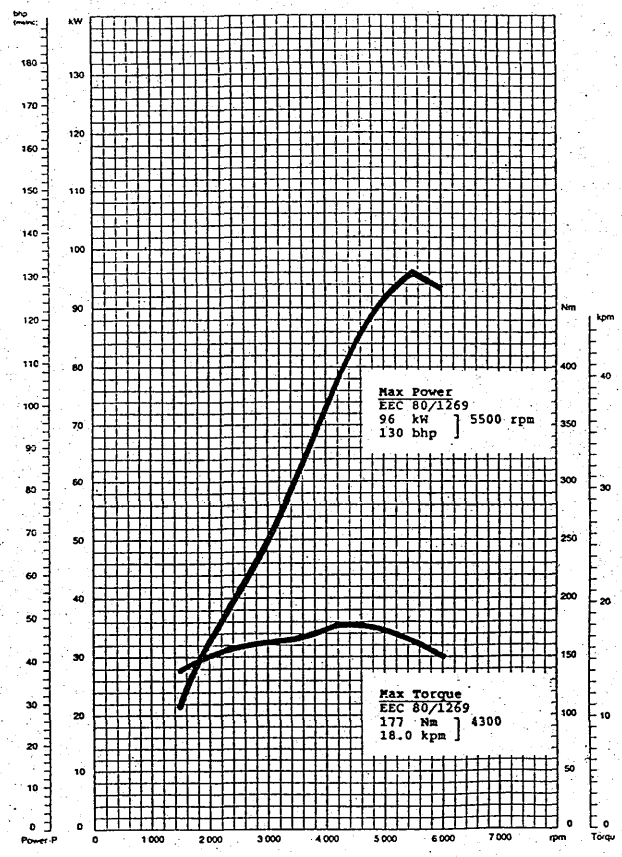
9000 Turbo B234R (Aero) M93



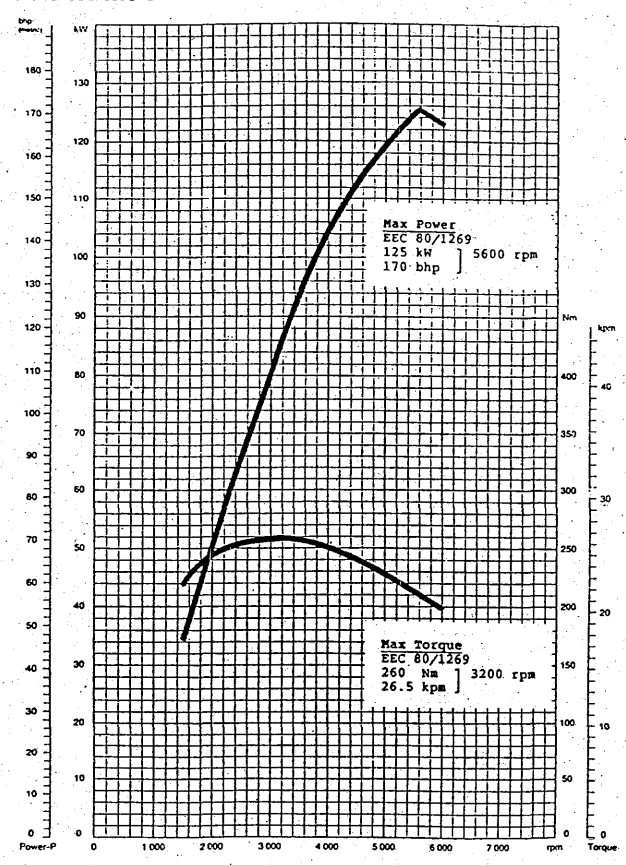
B234L (manual gearbox) M94-



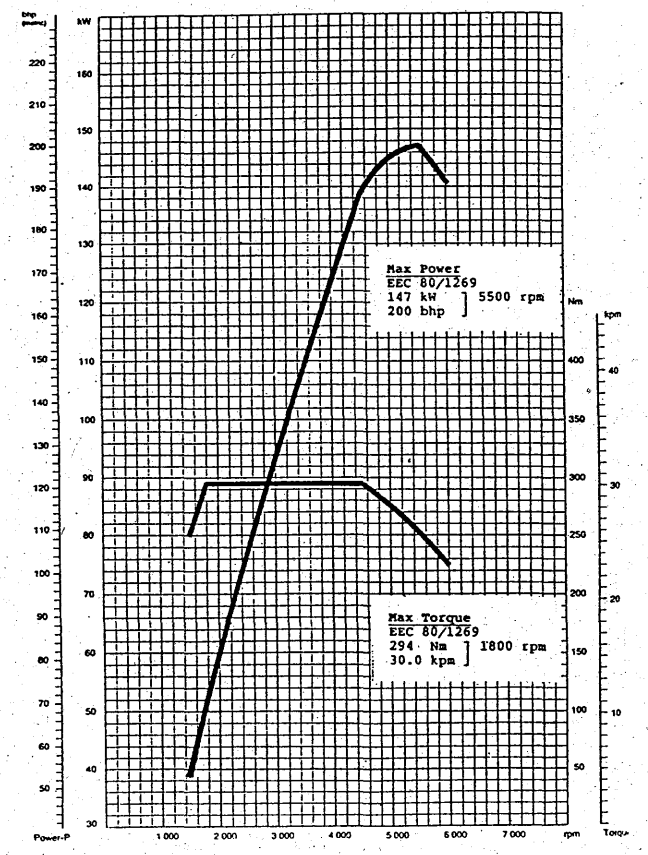
B204i M94-



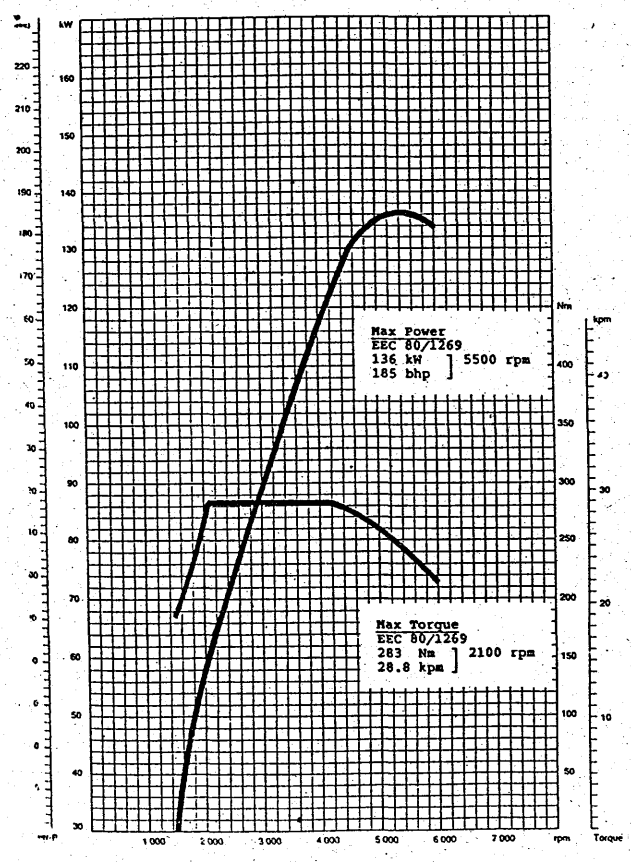
B234E M94-



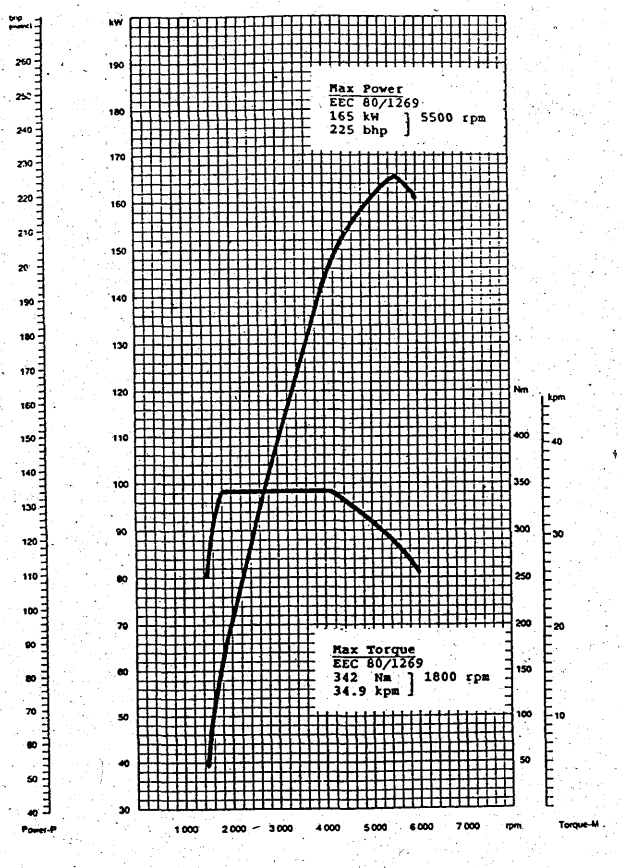
B234L (automatic transmission) M94-



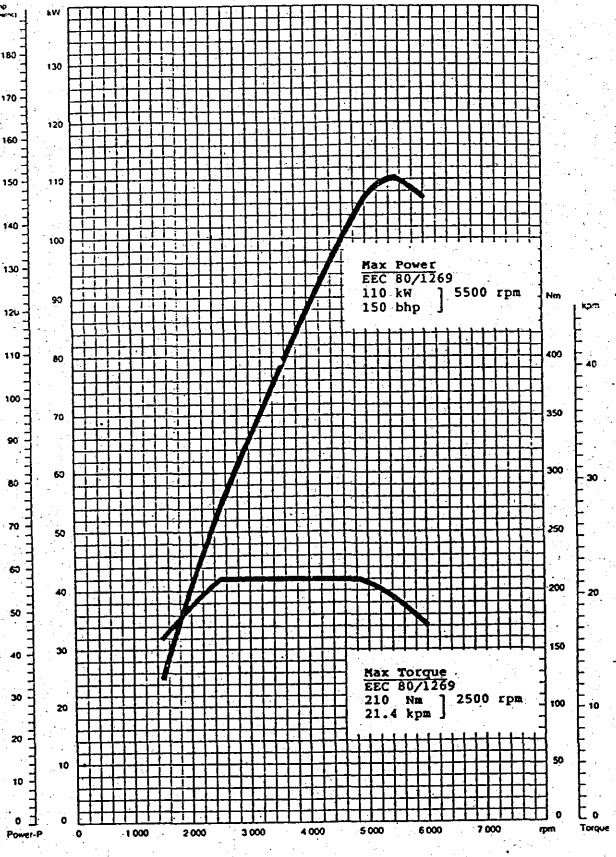
B204L M94–



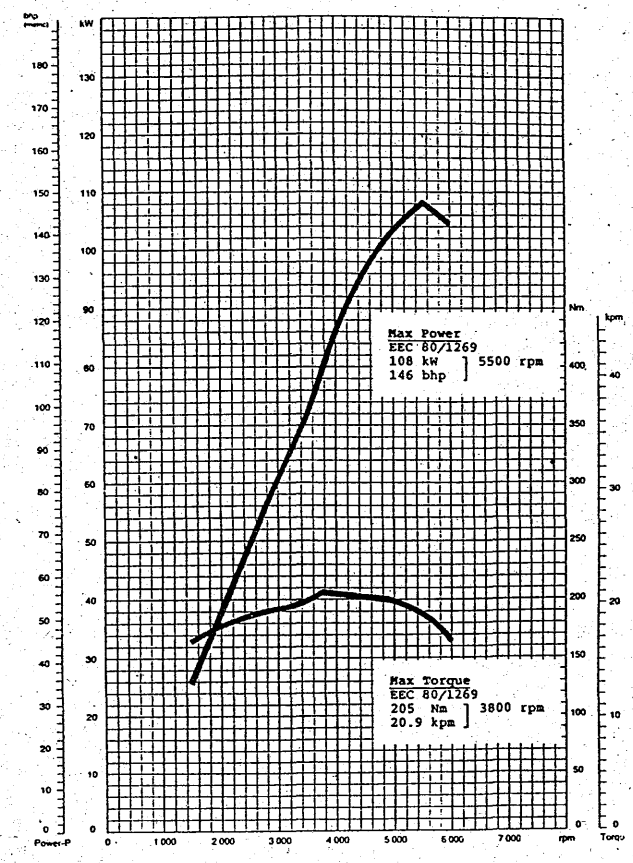
B234R M94–



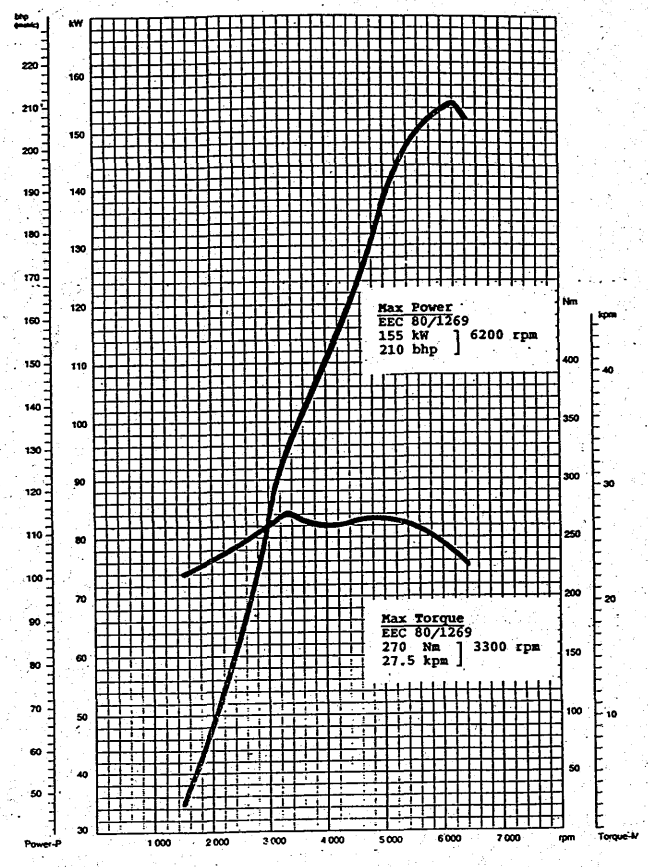
B204S M94–95



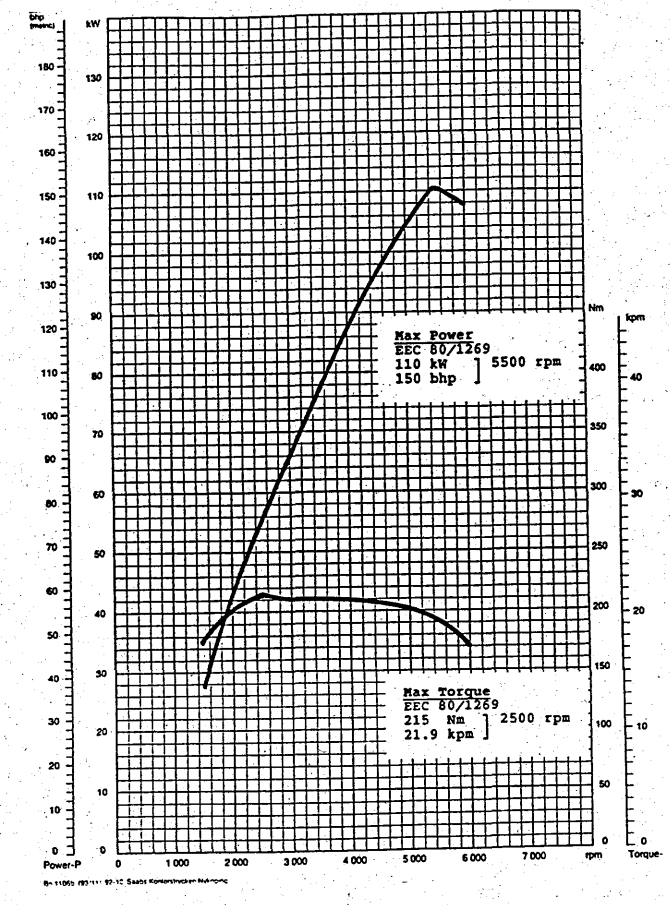
B234i M94–



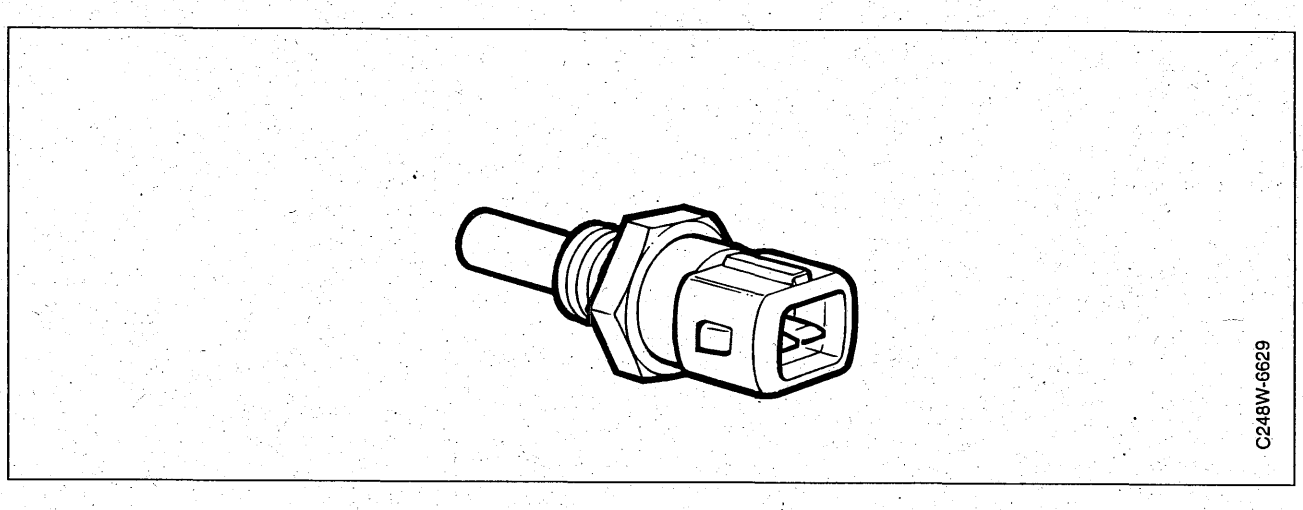
B308i M95–



B204E M96-



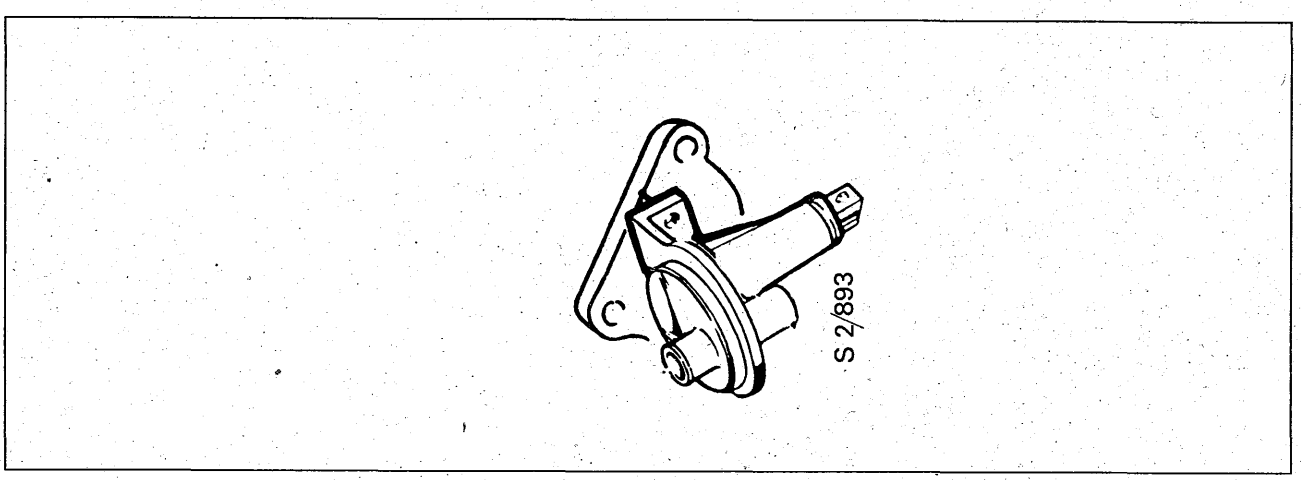
LH fuel injection system



Engine coolant temperature sensor

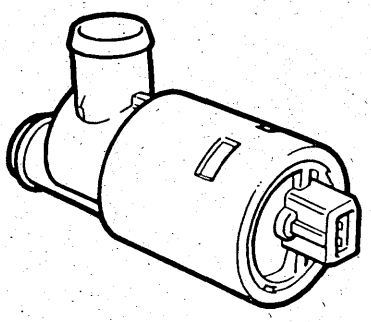
Designation		9357021 (Bosch 0280130026) or 8788200 (Bosch 0280130032) (TCS cars)
Resistance at 0°C (32°F)	Ohms	5800 ± 10%
20°C (68°F)	Ohms	2600 ± 7%
80°C (176°F)	Ohms	320 ± 5%

Note: Temperature sensor 87 88 200 incorporates two parallel circuits. The above values apply to each circuit.



Auxiliary air valve, 1985

Resistance at 20°C (68°F)	Ohms	40-60



Idle air control valve (IAC), 1986-

Resistance at 20°C (68°F),	LH2.2	Ohms	20 ± 5 (connections 2-1 and 2-3)
	LH2.4, LH2.4.1	Ohms	7 ± 5 (connections 1-2)
	LH2.4.2		12 ± 3 (connections 2-1 and 2-3)

Full-load enrichment

Throttle position switch LH 2.2, 2.4, 2.4.1 (throttle opening when switch is closed)	degrees (°)	approx. 72
CO value under simulated full-load enrichment conditions (no TWC)	%	4-6 (increases 2-4%)
Throttle position sensor LH 2.4.2.	V	0.25 (idle position)
Ignition on, current between pins 2 and 3	V	4.0 (wide open throttle position)

Fuel pump

Capacity	cm^3/30 s cm^3/30 s	minimum 900 (Bosch) minimum 700 (Walbro)
Resistance, fuel level sensor, B234, tank full	Ohms	350
Resistance, fuel level sensor, B234, tank empty	Ohms	35

Fuel tank

Total capacity, model years 1985-1989	litres (qts)	68 (71)
model years 1990, 1992–	litres (qts)	66 (69)
model year 1991	litres (qts)	62 (65)
Amount in tank when fuel low warning lamp lights up	litres (qts)	approx. 7 (7.4)

CO content at 850 rpm idling speed (no TWC)

Engine	Model year	CO %
B202 Turbo	1985-	1.3 ± 0.3
B202i	1986-	1.0 ± 0.5
B234i	1991-	1.0 ± 0.5

Pulse ratio, closed loop LH 2.2

Idling speed 850 ± 50 rpm

Engine	Model year	Pulse ratio	Remarks
B202	1985-1988	50/50	Measured with ISAT scan tool and cables or pulse ratio meter 83 93 597

Mass air flow sensor

The voltage is proportional to the engine load - the voltage increases with increasing engine load. Depending on the system, the operating temperature is 100-155°C (212-311°F), higher than the temperature of the intake air. Burn-off temperature is about 1000°C (1830°F).

Important

A mass air flow sensor of plastic must never be replaced by a mass air flow sensor of aluminium, or vice versa.

Oxygen sensor

Signal voltage 0-1 V when system operative. Preheating resistance 4 ± 2 ohms (at 20°C).

Injectors

Flow capacity

Fuel pressure regulator, opening pressure (bar)	minimum (ml/30 s)
2.5 (turbo 1985-86)	104
2.8 (Turbo 1987-)	110
3.0 (B202i)	90
3.0 (B234i)	125
3.0 Turbo (B234)	145

Check that the flow capacity of the individual injectors is the same.

The values are for room temperature (20 ± 1°C).

The opening duration of the injectors is proportional to engine load - higher engine load = longer opening duration.

Summary of LH components

To facilitate the handling of LH control modules, we have compiled a general survey of all the LH components in use.

The survey consists of two tables. Table A covers cars **with** a catalytic converter and table B covers car **without** a catalytic converter.

Table A. Specification, LH fuel injection system Cars with catalytic converter

Variant	Model year	Engine	LH	Fuel pressure regulator			Mass air flow sensor		Injector		Control module	
				Bar	Bosch	SAAB	Bosch	SAAB	Bosch	SAAB	Bosch	SAAB
9000iM, iA	86-87	B202	2.2	3.0	-258	7580160	1)-009	9390428	-711	7560162	-532	9389768
-"-	88	-"-	2.4	-"-	-256	7564123	2)-011	7538663	-"-	-"-	-552	7538671
-"-	89	-"-	-"-	-"-	-706	7486921	-"-	-"-	-"-	-"-	-565	7487143
-"-	90	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-584	9119470
-"-C)	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-581	9119496
-"-	-"-	B234	2.4.1	-"-	-"-	-"-	3)-019	9113838	-002	9113721	-579	9113804
-"-	91	-"-	2.4.2	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-905	7872237
-"-C)	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-905	7872237
-"-	-"-	B202	2.4	-"-	-"-	-"-	2)-011	7538663	-711	7560162	-584	9119470
9000 LMA)	86	B202	2.2	2.5	-257	7580152	1)-005	9375643	-712	7560170	-531	9389750
-"-A)	87	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-
9000 LAB)	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-539	9391178
9000 LMB),LA	88	-"-	-"-	-"-	-255	7564131	-"-	-"-	-"-	-"-	-"-	-"-
-"-	89	-"-	2.4	-"-	-704	7486905	2)-013	7538655	-"-	-"-	-566	8978355
-"-	90	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-586	9119488
-"-C)	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-583	8787079
9000 LM, LA	91	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-940	9126194
-"-	-"-	B234	2.4.2	3.0	-524	9131061	8)-012	9113846	-009	8857153	-908	8857187
9000 LM13)	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-910	7872260
-"-13)	-"-	B202	2.4	2.5	-704	7486905	-013	7538655	-712	7560170	-941	9126202
9000iM, iA	92	B202	2.4	3.0	-706	7486921	-011	7538663	-711	7560162	-584	9119470
-"-	-"-	B234	2.4.2	-"-	-"-	-"-	-019	9113838	-002	9113721	-905	7872237
9000 LM, LA	-"-	B202	2.4	2.5	-704	7486905	-013	7538655	-712	7560170	-940	9126194
9000 LM13)	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-941	9126202
9000 LM, LA	-"-	B234	2.4.2	3.0	-524	9131061	-012	9113846	-009	8857153	-908	8857187
-"-13) man+aut TCS	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-910	7872260
9000iM, iA	93	B202	2.4	-"-	-706	7486921	-011	7538663	-711	7560162	-584	9119470
9000iM, iA	93	B234	2.4.2	-"-	-706	7486921	-019	9113838	-002	9113721	-905	7872237
9000iM, iA	93	-"- *)	-"-	-"-	-706	7486921	-019	9113838	-002	9113721	-960	4300224
9000L (IT 137kW)	90-93	B202	2.4	-"-	-706	7486921	-013	7538655	-712	7560170	-940	9126194
9000L	93	B202	-"-	2.5	-704	7486905	-013	7538655	-712	7560170	-940	9126194
9000L13)	93	B202	-"-	-"-	-704	7486905	-013	7538655	-712	7560170	-941	9126202

**) Catalytic converter repositioned forwards, US, SE*

1)HLM 1, alum. 100°

2)HLM 2/4.7, plastic, 120°

3)HLM 2/4.7, plastic, 155°

8)HLM 2/6.4, plastic, 155°

13)Traction Control

14)Traction Control

A)Air filter in engine bay

B)Air filter in wheel housing

C)EGR (US/Cal)

D)Traction Control

L = turbo engine

I = fuel injection engine

M = manual gearbox

A = automatic transmission

Table B. Specification, LH fuel injection system
Cars without catalytic converter

Variant	Model year	Engine	LH	Fuel pressure regulator			Mass air flow sensor		Injector		Control module	
				Bar	Bosch	SAAB	Bosch	SAAB	Bosch	SAAB	Bosch	SAAB
9000iM, iA	86	B202	2.2	3.0	-258	7580160	[1]-009	9390428	-711	7560162	-530	9388513
-"-	87	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-
-"-	88	-"-	-"-	-"-	-"-	-"-	[2]	7591183	-"-	-"-	-553	7591498
9000 iM	89-90	-"-	-"-	-"-	-706	7486921	-"-	-"-	-"-	-"-	-574	9114711
9000 iA	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-567	7487127
9000 iM, iA	91	-"-	2.4.2	-"-	-"-	-"-	[3]-022	7872385	-"-	-"-	-903	7872203
9000 iA	-"-	B234	-"-	-"-	-"-	-"-	-"-	-"-	-002	9113721	-907	7872229
9000iM, iA	92	B202	2.4.2	3.0	-706	7486921	-022	7872385	-711	7560162	-903	7872203
9000iA, iM	-"-	B234	-"-	-"-	-"-	-"-	-"-	-"-	-002	9113721	-907	7872229
9000 LM	85	B202	2.2	2.5	-225	7518681	[1]-005	9375643	-712	7560170	-519	9388471
-"-	86	-"-	-"-	-"-	-257	7580152	-"-	-"-	-"-	-"-	-534	9389545
-"-	87	-"-	-"-	2.8	-265	7568058	-"-	-"-	-"-	-"-	-548	9393463
9000 LA	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-540	9391186
9000 LM, LA	88	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-
9000 LM	89	-"-	-"-	-"-	-705	7486913	[2]-017	8978280	-"-	-"-	-575	9114729
9000 LA	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-555	8975294
9000 LM	90	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-587	9119520
9000 LA	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-"-	-588	9119538
9000 LM, LA	91	-"-	2.4.2	-"-	-"-	-"-	[3]-018	7872393	-"-	-"-	-904	7872211
9000 LM, LA	92	B202	-"-	2.8	-705	7486913	-018	7872393	-712	7560170	-904	7872211
9000 LM, LA	93	B202	-"-	2.8	-705	7486913	-018	7872393	-712	7560170	-904	7872211
9000iA, iM	93	B202	-"-	3.0	-706	7486921	-022	7872385	-711	7560162	-903	7872203
9000iA, iM	93	B234	-"-	3.0	-706	7486921	-022	7872385	-002	9113721	-907	7872229

[1]HLM 1, alum. 100°

[2]HLM 2/4.7, plastic, 120°

[3]HLM 2/4.7, plastic, 155°

[D]Traction Control

L = turbo engine

I = fuel injection engine

M = Manual gearbox

A = Automatic transmission

Table C. Specification, LH components

Component	LH system				Car variants	Bosch	SAAB
	2.2	2.4	2.4.1	2.4.2			
Temp. sensor	X				9000 Turbo (TEC) aut M87-88	-055	7563562
Temp. sensor		X			TCS	-032	8788200
Temp. sensor	X	X	X	X	Others	-026	9357021
Oxygen sensor	X	X			9000i M87-M89	-009	7525603
Oxygen sensor		X	X	X	9000i M90-M91, 9000i M86, 9000 Turbo M85-M91	-028	9392762
Oxygen sensor	X		X		M92–	-245	9132564
Oxygen sensor	X	X	X	X	9000 Turbo, Brazil –M91	-095	9129743
Oxygen sensor	X	X	X	X	9000 Turbo, Brazil and ME M92	-258	4164323
Knock sensor	X				All	-001	9358037
Knock sensor[1)]	X	X	X	X	All	-006	7568801
Knock sensor	X	X	X	X	Saab DI	-	7585755
Throttle position switch	X	X	X		All except 2.4.2	-300	7501612
Throttle position sensor				X	2.4.2 M91-	-001	8857195
Idle air control valve	X				M86–	-502	7516792
Idle air control valve		X	X		2.4 M88-, 2.4.1 M90	-516	7586019
Idle air control valve				X	B234 Turbo M91-	-526	8787996
Idle air control valve				X	Other 2.4.2 M91-	-505	8857179
Auxiliary air valve	X				M85	-107	8357832
Cold-starting valve		X			9000i (TWC)	-432	7486129
Evaporative emission canister	X				Cars with TWC. ME market	-	7532054
Evaporative emission canister excl. purge valve		X	X	X	All	-	7539216
EVAP canister purge valve		X	X	X	All	-157	7539257
Bypass valve	X	X	X	X	All turbo cars	-103	9390022

[1)]Engine No. G122319 onwards

Fuel pressure regulator, test readings

	Turbo 1986	- Turbo 1987-	B202i 1986- B234 1990-
System pressure bar (psi)	2.5 (36)	2.8 (40)	3.0 (43)

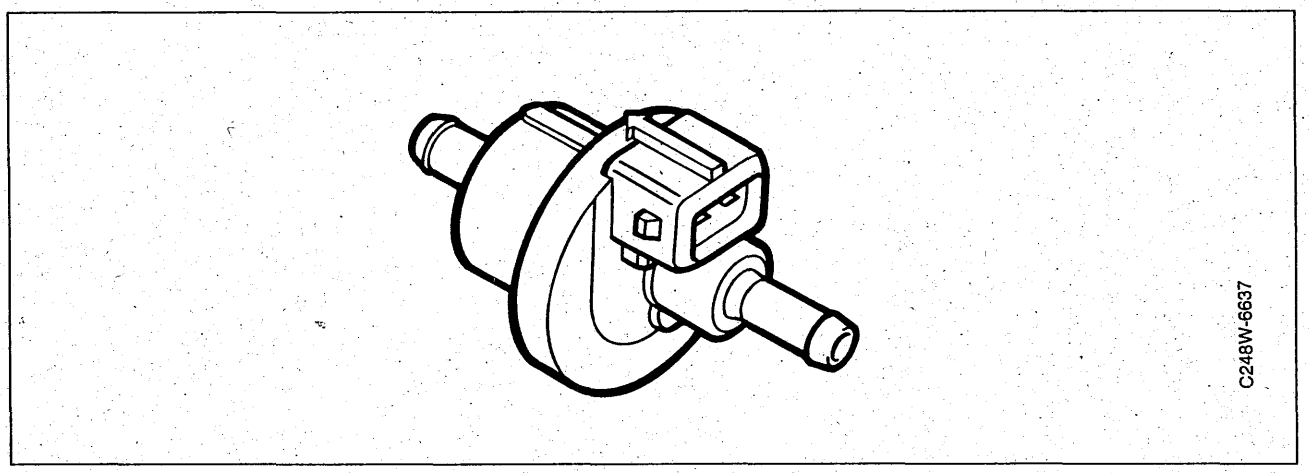
Tolerance range:

2.5 + 0.25/-0.15 bar (36 + 3.6/-2.3 psi)

2.8 + 0.25/-0.15 bar (40 + 3.6/-2.3 psi)

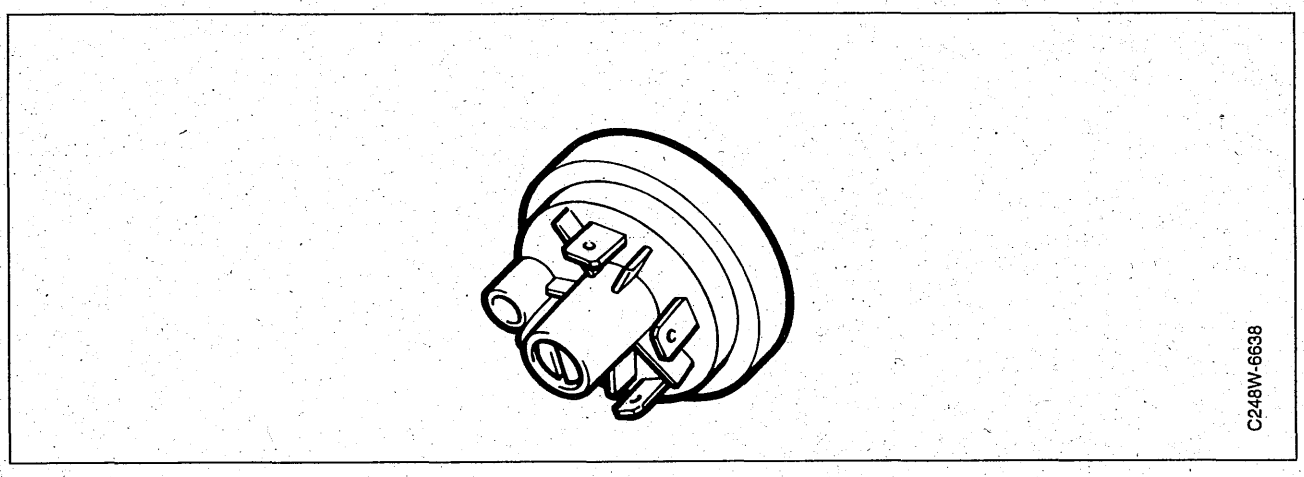
3.0 + 0.25/-0.15 bar (43 + 3.6/-2.3 psi)

Permissible tolerances when checking with workshop equipment and taking into account the temperature, grade of fuel and instrument tolerance and calibration: +5%.



EVAP canister purge valve

Designation		Bosch TEV 1
Type		Open at zero current
Resistance at 20°C (68°F)	ohms	45 ± 5 %
Control voltage	V	13



Pressure switch

Switch-off pressure	bar (psi)	1.10 ± 0.05 (without TWC) (-M1990) 0.95 ± 0.03 (TWC) (-M1990)

DI system

Ignition voltage	V	40 000
Ionization voltage	V	80
Capacitor voltage	V	400

APC system

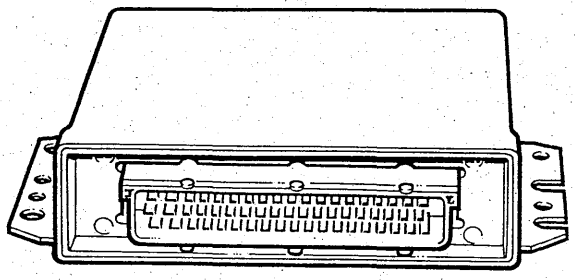
Boost pressure control valve

Frequency	Hz	90
Coil resistance	ohms	3

Knock sensor

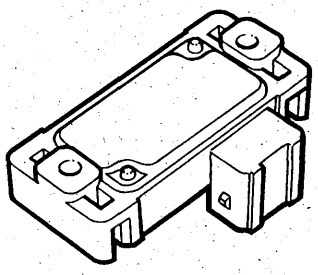
Signal voltage	V	0.1 - 0.7 (approx.)
Tightening torque	Nm (lbf ft)	13 ± 2 (9.6 ± 1.5)

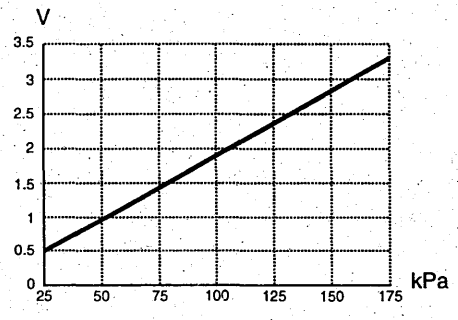
Saab Trionic engine management system, M1993-



Trionic control module

Number of connector pins	qty	70
Power supply (+30 circuit)	pins	1 and 48
Main ground	pins	24 and 25
Signal ground	pins	66 and 67
Reference ground	pins	47 and 66 (66 TCS cars only)



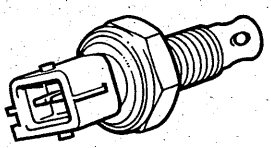


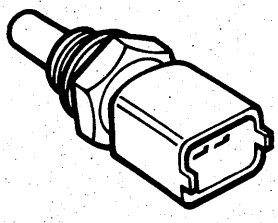
Manifold absolute pressure sensor

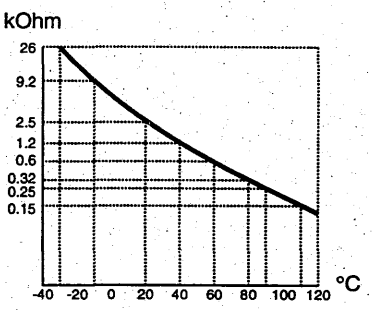
Voltage at -0.75 bar (25 kPa*))	V	approx. 0.48
-0.50 bar (50 kPa*))	V	approx. 0.95
0 bar (100 kPa*))	V	approx. 1.9
0.25 bar (125 kPa*))	V	approx. 2.4
0.50 bar (150 kPa*))	V	approx. 2.8
0.75 bar (175 kPa*))	V	approx. 3.3

**) Absolute pressure, i.e. 100 kPa corresponds to barometric pressure.*
When checking the pressure sensor using a pressure/vacuum pump, somewhat lower voltage readings may be obtained at high altitudes. Power supply 5 V

Intake air temperature sensor and engine coolant temperature sensor

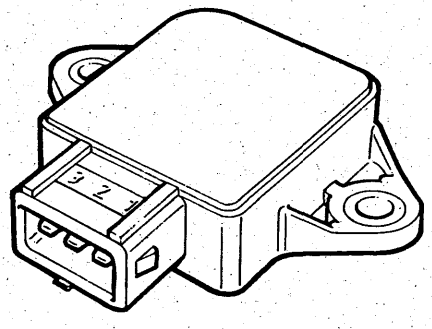


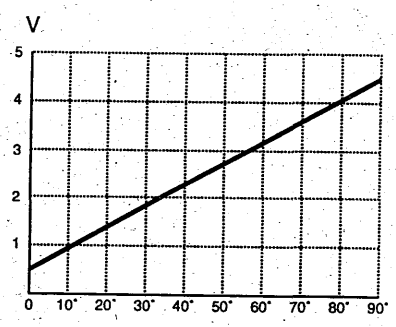




Resistance at -30°C	kohms	20-30 (approx. 4.5 V)
-10°C	kohms	7.0-11.4 (approx. 3.9 V)
20°C	kohms	2.1-2.9 (approx. 2.4 V)
40°C	kohms	1.0-1.3 (approx. 1.5 V)
60°C	Ohms	565-670 (approx. 0.9 V)
80°C	Ohms	295-365 (approx. 0.54 V)
90°C	Ohms	240-260 (approx. 0.41 V)

Throttle position sensor (not TCS)





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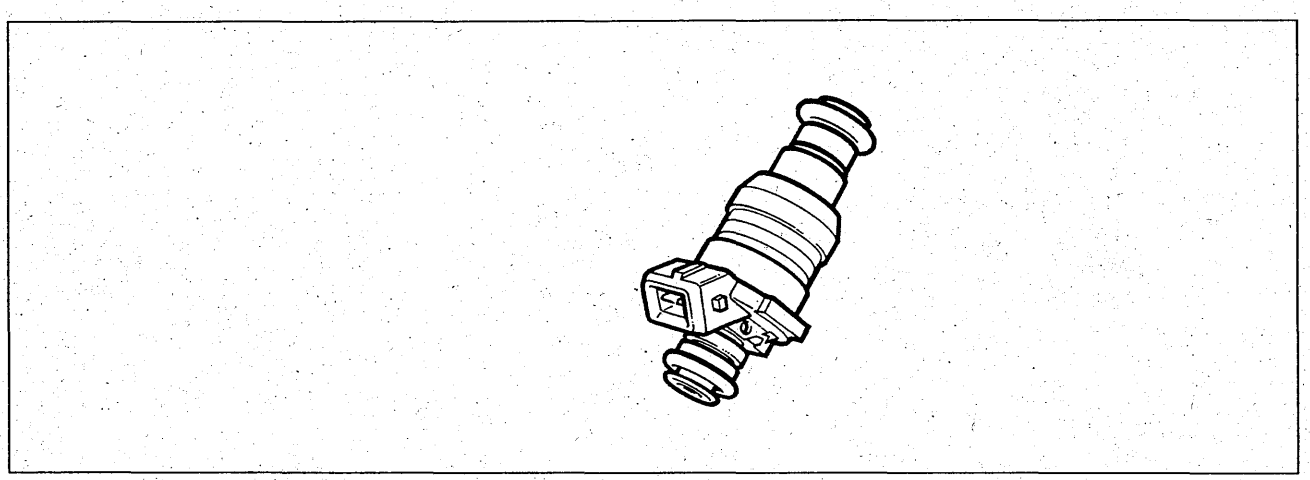
Resistance (pins 1 - 2)	kohms	1.6-2.4 (5±0.1 V)
Resistance at idling speed (pins 2 - 3)	kohms	0.8-1.2 (0.5±0.4 V)
Resistance at wide open throttle (pins 2 - 3)	kohms	2.0-3.0 (4.5±0.4 V)

Injectors -M93

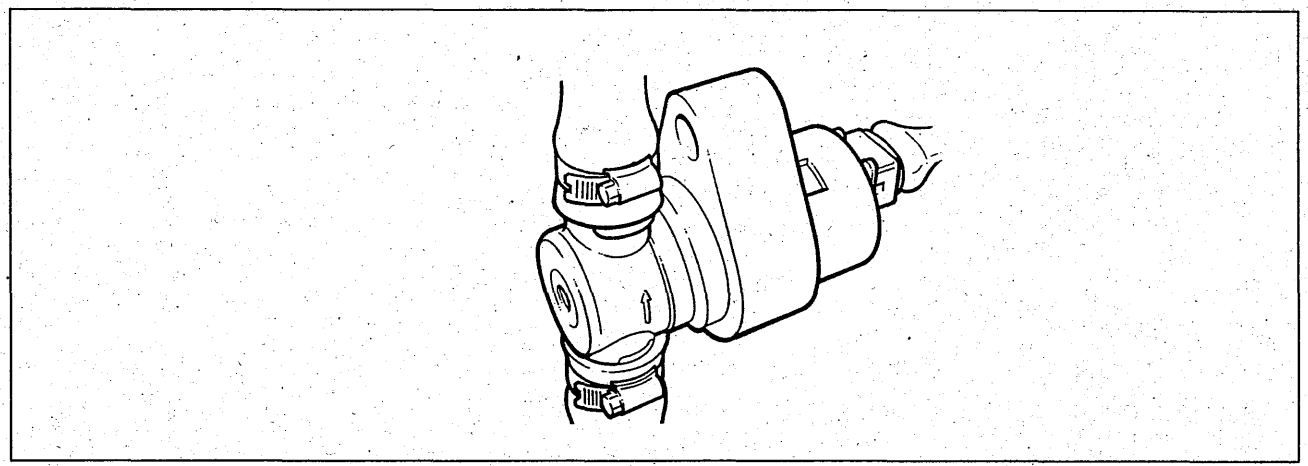


Resistance	Ohms	15.5-16.3 (→20 ± 5° C)

Injectors M94-

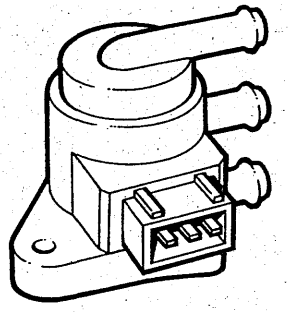
		Turbo	Fuel injection engine
Manufacturer		Bosch EV1-3E, red	Bosch EV1-3E, black or blue
Bosch No.		0 280 150 431	0 280 150 432
Version		4-hole	4-hole
Resistance at 20°C (68°F)	Ohms	12.0 ± 0.35	14.5 ± 0.35
Flow capacity	ml/30 s	176 ± 14	127 ± 10
Maximum permissible difference between injectors	ml	18	13

Idle air control valve (IAC)



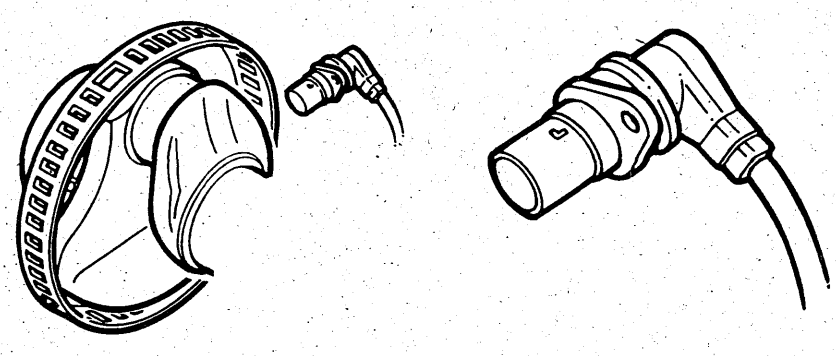
Number of windings		1
Winding resistance at 20°C (68°F)	Ohms	7.7 ± 1
Control voltage	PWM 12 V	500 Hz
Idling speed, warmed-up engine	rpm	850 ± 50

Boost pressure control valve



Number of windings		2
Resistance per winding at 20°C (68°F)	Ohms	31
Control voltage, <2500 rpm	PWM 12 V	90 Hz
Control voltage, >2500 rpm	PWM 12 V	70 Hz

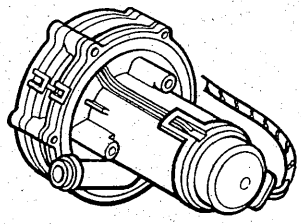
Crankshaft position sensor



C248W-7177

Location		Mounted in crankcase wall
Type		Inductive sensor
Resistance, pin 1 — 2 at 20°C (68°F)	Ohms	540±55
Slotted ring, number of ribs	qty	58 (60-2)
Distance between sensor and ring	mm	0.4-1.3

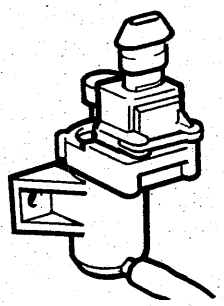
Secondary air injection pump



C430W-2442

Manufacturer		Pierburg
Pump capacity at 13 volts	kg/h	25-30
Rating	Watt	325

Secondary air injection control valve



C430W-2445

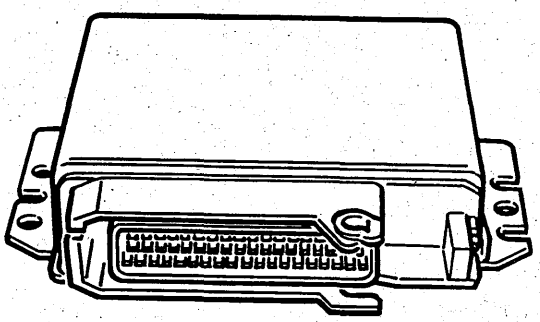
Manufacturer		Eaton
Type		Closed at zero current
Resistance	Ohms	40

Table D. Specification, TRIONIC

Variant	Model year	Engine	Pressure regulator			Injector		Control module
			Bar	Bosch	SAAB	Bosch	SAAB	
9000 Turbo	93	B234L	3.0	-524	9131061	-	9135120	9136474
9000 Turbo, TCS/ASR		B234L	-"-	-"-	-"-	-	-"-	9136490
9000S		B234R	-"-	-"-	-"-	-	-"-	4300810
9000S, TCS		B234R	-"-	-"-	-"-	-	-"-	9136516
9000i	94	B204I	-"-	-706	7486921	-432	9142423	4300349
9000	-"-	B204S	-"-	-524	9131061	-431	9142449	4300331
9000 Turbo	-"-	B204L	-"-	-"-	-"-	-		4300844
9000i	-"-	B234I	-"-	-706	7486921	-432	9142423	4300356
9000i, SAI	-"-	B234I	-"-	-"-	-"-	-	-"-	4301313
9000E	-"-	B234E	-"-	-524	9131061	-431	9142449	4300877
9000 Turbo	-"-	B234L	-"-	-"-	-"-	-	-"-	4300828
9000 Aero	-"-	B234R	-"-	-"-	-"-	-	-"-	4300851
9000 Aero, TCS	-"-	B234R	-"-	-"-	-"-	-	-"-	4300414
9000i	95	B204I	-"-	-706	7486921	-432	9142423	4301925
9000i	-"-	B204I*	-"-	-"-	-"-	-"-	-"-	4302642
9000	-"-	B204S	-"-	-524	9131061	-431	9142449	4301933
9000 Turbo	-"-	B204L	-"-	-"-	-"-	-	-"-	4301941
9000i	-"-	B234I	-"-	-706	7486921	-432	9142423	4301891
9000i	-"-	B234I*	-"-	-"-	-"-	-"-	-"-	4302659
9000i, SAI	-"-	B234I	-"-	-"-	-"-	-	-"-	4301966
9000E	-"-	B234E	-"-	-524	9131061	-431	9142449	4301909
9000E	-"-	B234E*	-"-	-"-	-"-	-"-	-"-	4302667
9000 Turbo	-"-	B234L	-"-	-"-	-"-	-	-"-	4301917
9000 Aero	-"-	B234R	-"-	-"-	-"-	-	-"-	4301974
9000 Aero		B234R	-"-	-"-	-"-	-	-"-	4302683
9000i	96	B204I	-"-	-706	7486921	-432	9142423	4301925
9000i	-"-	B204I**	-"-	-"-	-"-	-"-	-"-	4302642
9000	-"-	B204E	-"-	-524	9131061	-431	9142449	4660833
9000	-"-	B204E**	-"-	-"-	-"-	-"-	-"-	4660841
9000 Turbo	-"-	B204L	-"-	-"-	-"-	-	-"-	4301941
9000 Turbo	-"-	B204L**	-"-	-"-	-"-	-"-	-"-	4661260
9000E	-"-	B234E	-"-	-524	9131061	-431	9142449	4302303
9000E	-"-	B234E**	-"-	-"-	-"-	-"-	-"-	4302972
9000 Turbo	-"-	B234L	-"-	-"-	-"-	-	-"-	4302329
9000 Turbo	-"-	B234L**	-"-	-"-	-"-	-	-"-	4302980
9000 Aero	-"-	B234R	-"-	-"-	-"-	-	-"-	4301206
9000 Aero	-"-	B234R**	-"-	-"-	-"-	-	-"-	4302998
9000E (US)	-"-	B234E	-"-	-"-	-"-	-"-	-"-	4300364
9000 Turbo (US)	-"-	B234L	-"-	-"-	-"-	-	-"-	4300836
9000 Aero (US)	-"-	B234R	-"-	-"-	-"-	-	-"-	4300422

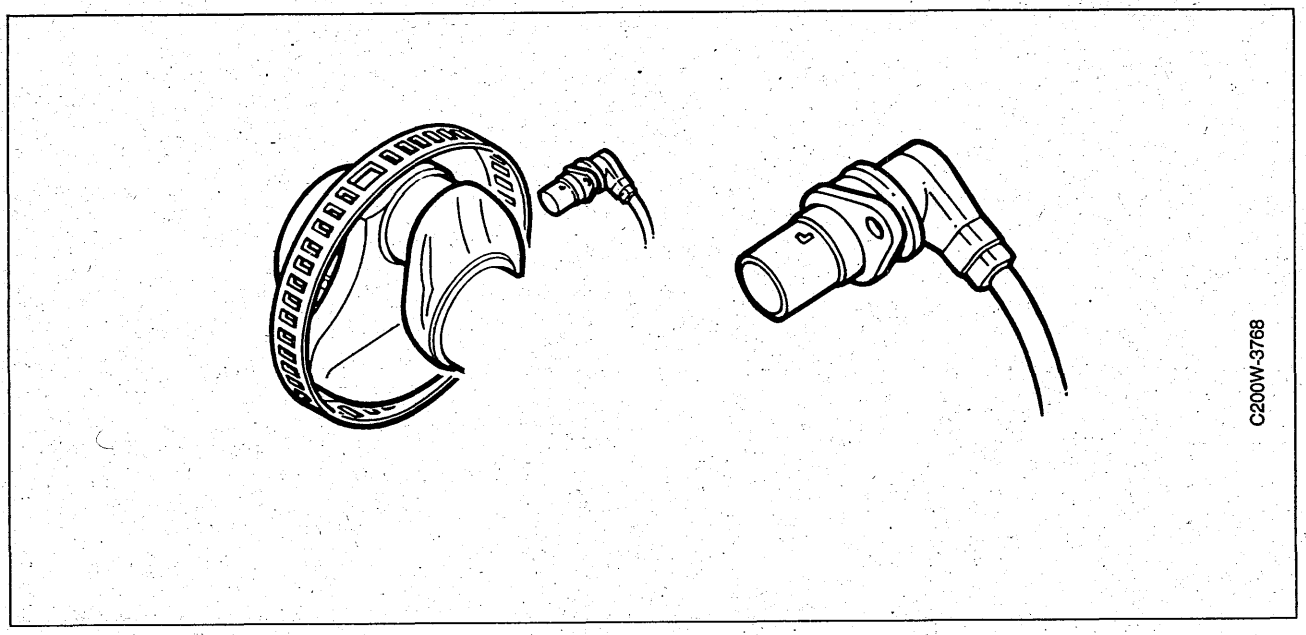
*) with anti-theft alarm (DE market)
**) anti-theft alarm with VSS

Motronic 2.8.1



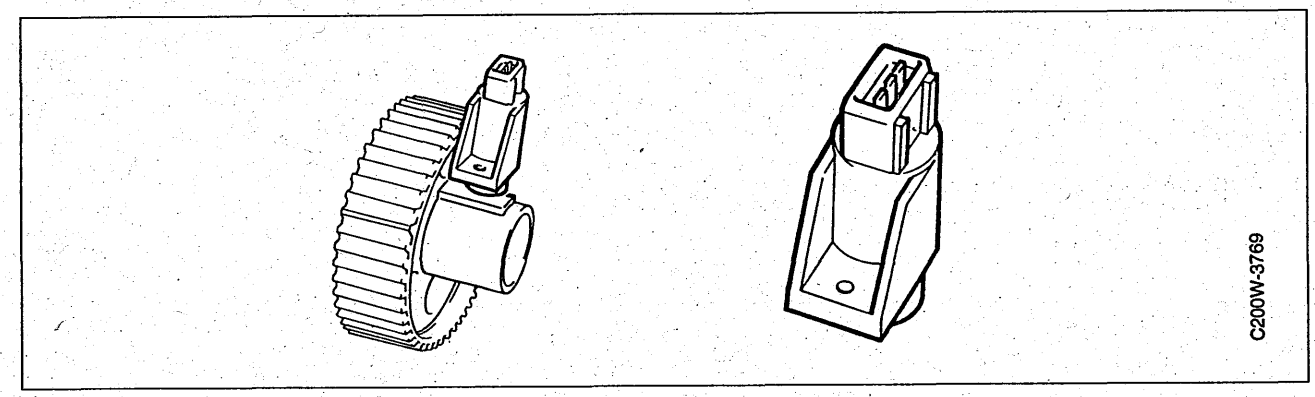
Control module

Number of pins		55
Power supply (+30 circuit)	pin	18
Power supply (+15 circuit)	pin	27
Power supply from main relay	pin	37
Power ground, ignition	pin	2
Power ground, injectors	pin	14
Power ground, other output stages	pin	24
Ground, control module circuitry	pin	19
Sensor ground (output)	pin	30
Reference ground, oxygen sensor	pin	10



Crankshaft position sensor

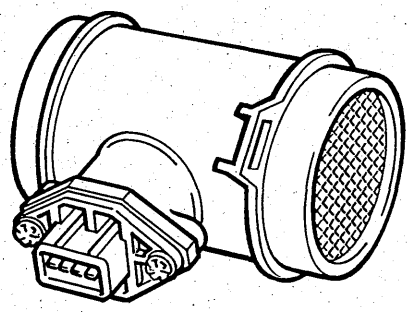
Location		Mounted in crankcase wall
Type		Inductive sensor
Resistance at 20°C (68°F), pins 1-2	Ω	540±55
Slotted ring	number of ribs	58 (60-2)
Distance between sensor and ring	mm	1.0±0.7

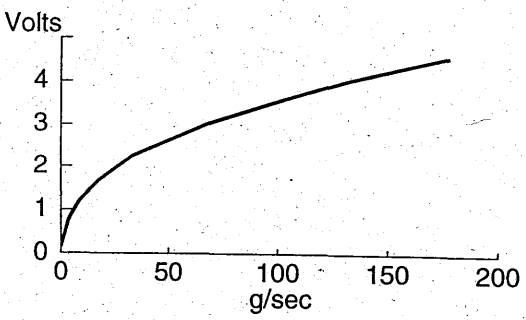


Camshaft position sensor

Location		At front exhaust camshaft sprocket
Power supply	V	12
Air gap, sensor — sprocket hub ridge	mm	max. 1.5
Sensor output	V	0 or 5

The sensor does not generate a signal but grounds the control module input when the ridge passes it.



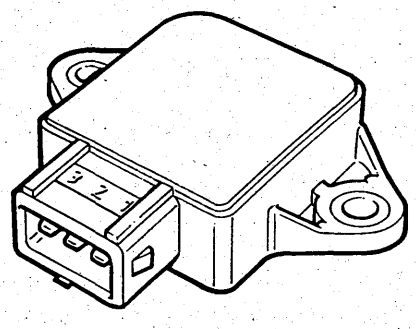


C200W-3762

Mass air flow sensor

Temperature, hot film	°C (°F)	180 (356)
Number of pins		4
Power supply	V	12
Voltage at air flow of: 0 g/s	V	0,15
3.3 g/s	V	0,75
4.2 g/s	V	0,85
8.3 g/s	V	1,20
17 g/s	V	1,65
33 g/s	V	2,25
69 g/s	V	3.05
103 g/s	V	3,60
133 g/s	V	4.05
178 grammes per second	V	4,60

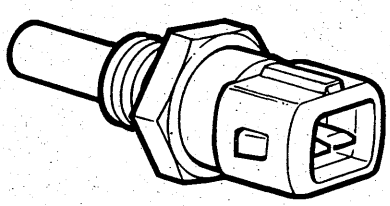
At a given air flow the voltage tolerance is ±5 %.

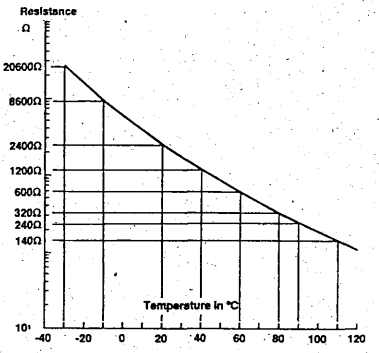


C200W-3763

Throttle position sensor

	kΩ	V
Pins 2-1	1.6-2.4	5±0.1
Resistance at idling speed (pins 3-1)	0.8-1.2	0.5±0.4
Resistance at wide open throttle (pins 3-1)	2.0-3.0	4.5-±0.4

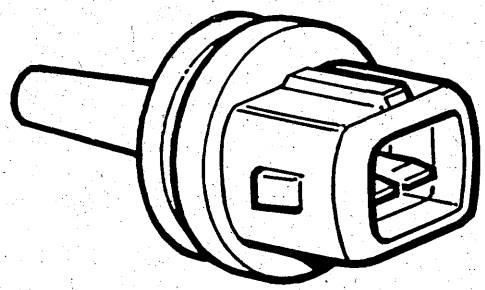


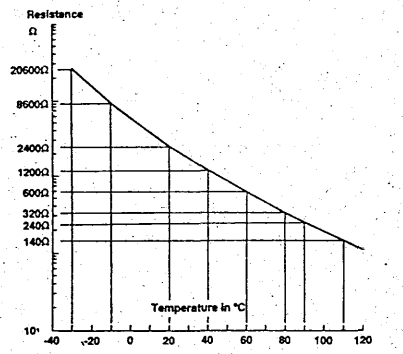


Engine coolant temperature sensor

°C (°F)	kΩ	V
-30 (-22)	20-30	4.8
-10 (14)	8.3-10.6	4.5
20 (68)	2.3-2.7	3.6
40 (104)	1.0-1.3	2.7
60 (140)	0.565-0.670	1.9
80 (176)	0.295-0.365	1.2
90 (194)	0.24-0.26	1.0
110 (230)	0.14-0.16	0,65

5 V power supply through 1 kΩ resistor in the control module

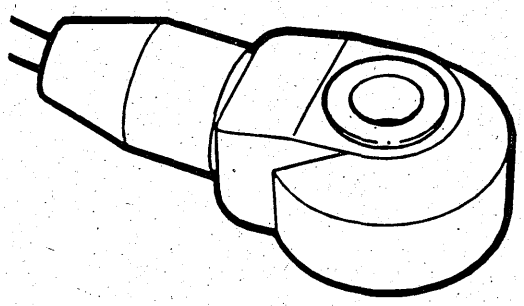




Intake air temperature sensor

°C (°F)	kΩ	V
-30 (-22)	20-30	4.8
-10 (14)	8.3-10.6	4.5
20 (68)	2.3-2.7	3.6
40 (104)	1.0-1.3	2.7
60 (140)	0.565-0.670	1.9
80 (176)	0.295-0.365	1.2
90 (194)	0.24-0.26	1.0

5 V power supply through 1 kΩ resistor in the control module

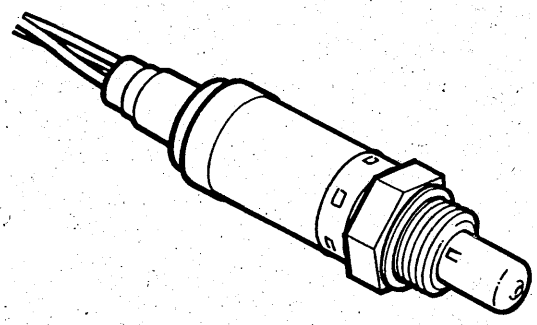


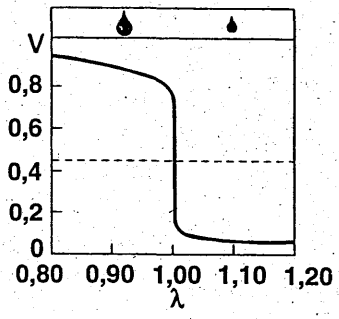
C200W-3770

Knock sensors

Voltage at idling speed	mV AC	≈ 5
Voltage when tapping on the retaining bolt with a hammer	mV AC	≈ 100
Tightening torque	Nm (lbf ft)	22 (16)

The voltages are measured directly on the sensor's connections.



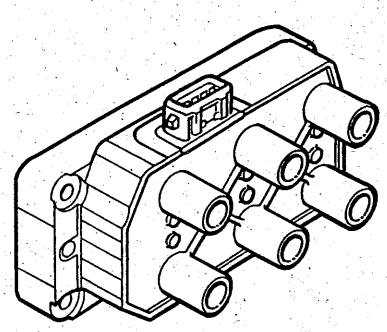


C200W-3771

Oxygen sensors

Designation		Bosch LSH 24 with electric preheating
Rating, heating element	W	12
Control range	V	0.1 – 0.9
Resistance at 20°C (68°F), pins 1-2	Ω	3.5±0.4 (PTC)

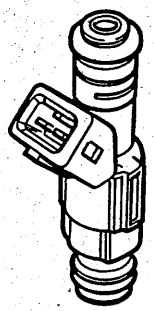
For markets with leaded petrol: LSH23 (18 W/2.0Ω)



C200W-3766

Ignition coil module

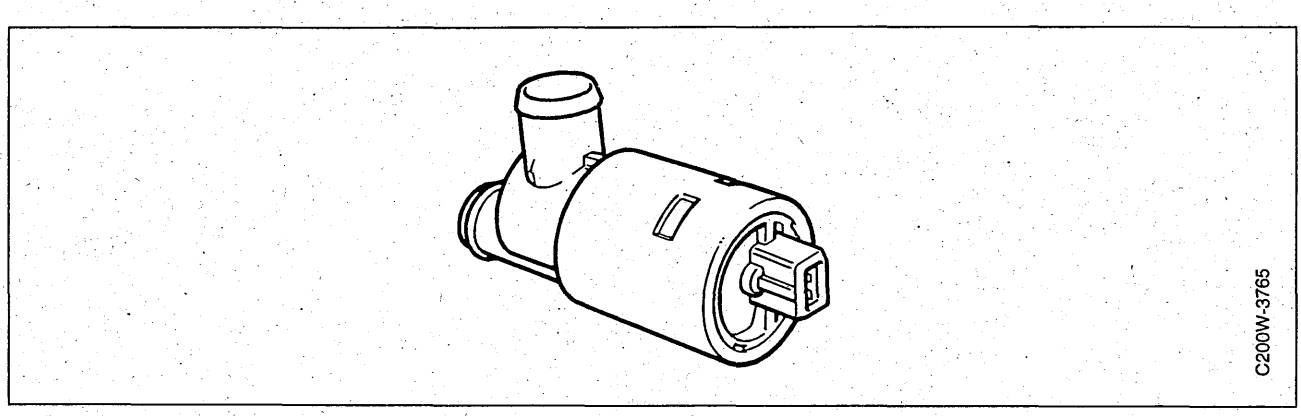
Resistance at 20°C (68°F), primary winding	Ω	0.5±0.1
Resistance at 20°C (68°F) secondary winding	kΩ	12±2



C200W-3772

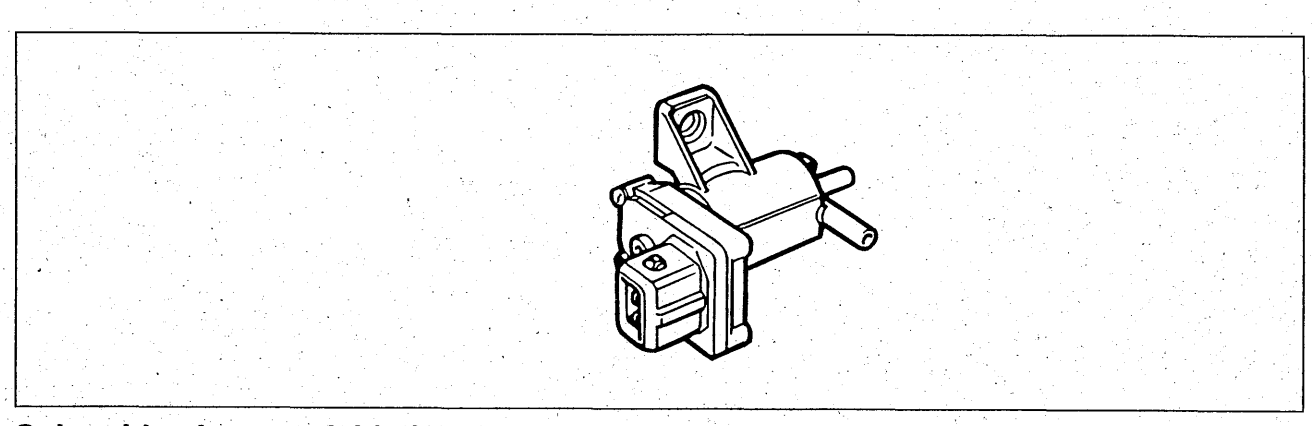
Injectors

Designation		Bosch EV6E
Version		4-hole
Resistance at 20°C (68°F)	Ω	15.9±0.5
Flow capacity	ml/30s	109±9
Maximum permissible difference between injectors	ml	11



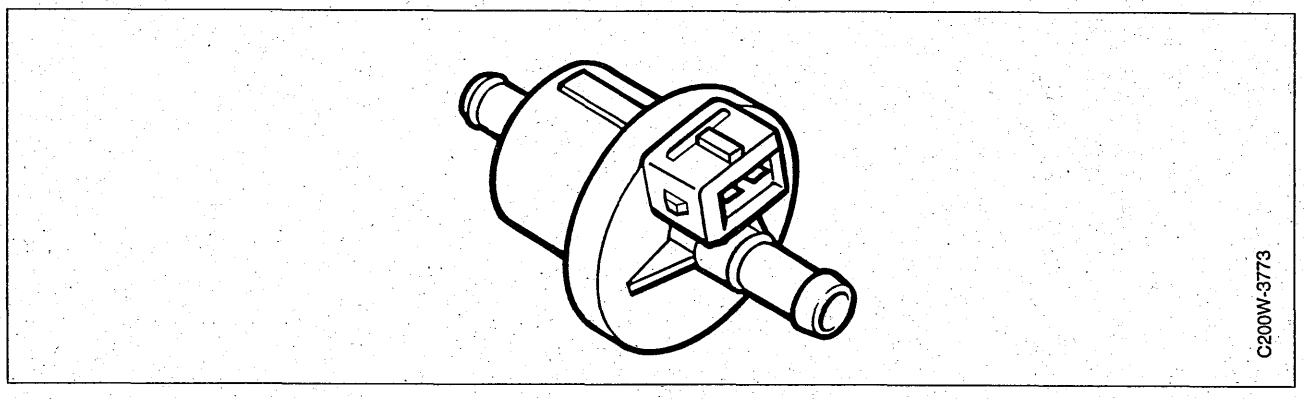
Idle air control valve

Number of windings		1
Resistance at 20°C (68°F)	Ω	7.7±1
Control voltage	PWM 12 V	100 Hz



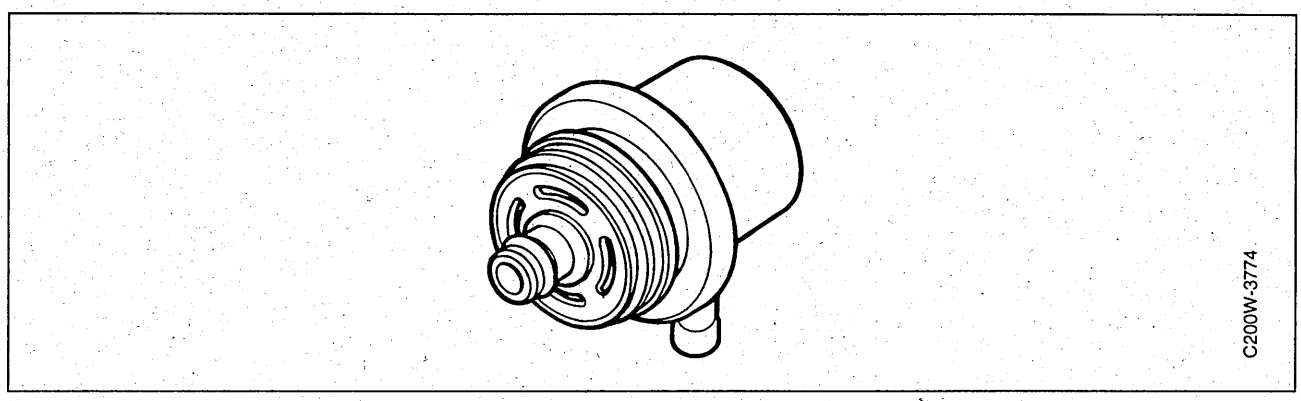
Solenoid valves, variable intake manifold

Type		Closed at zero current
Resistance at 20°C (68°F)	Ω	40±5



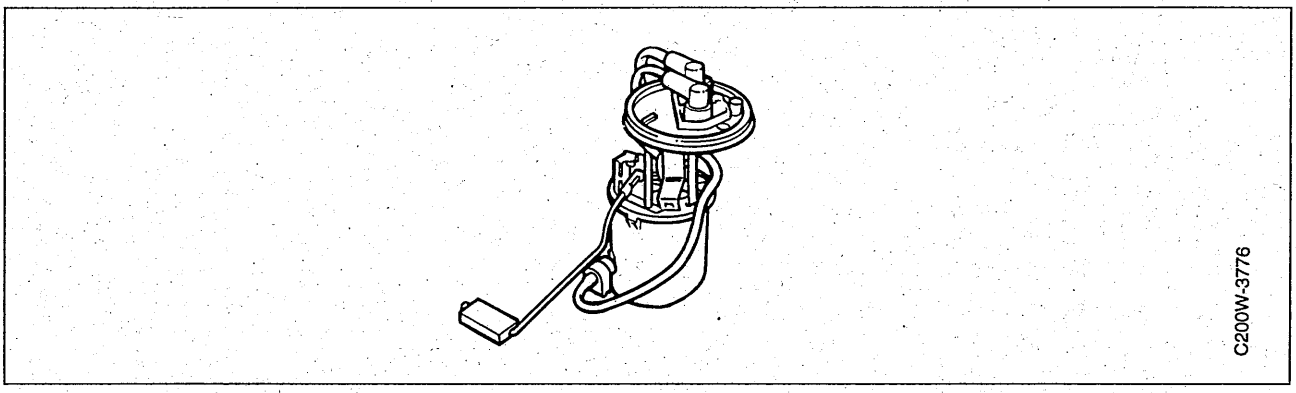
EVAP canister purge valve

Designation		Bosch TEV2
Type		Closed at zero current
Resistance at 20°C (68°F)	Ω	26±3



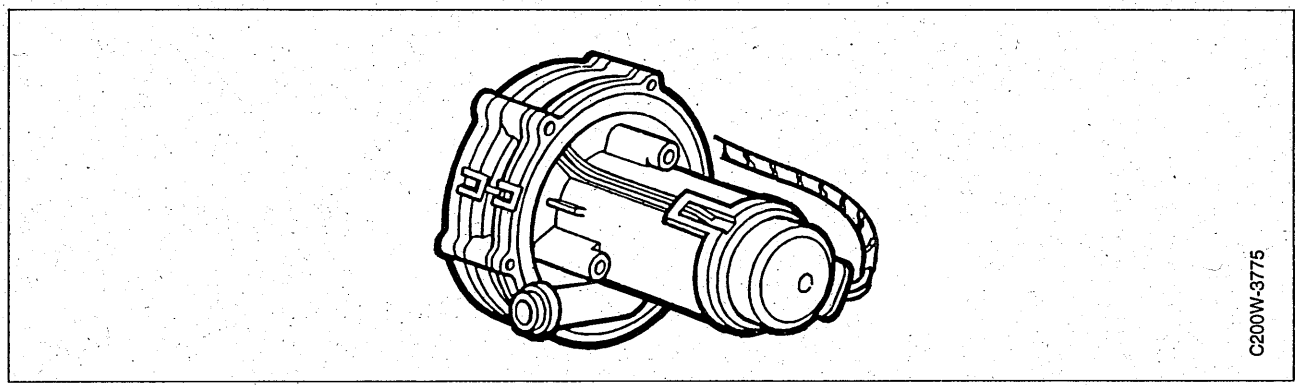
Fuel pressure regulator

Fuel pressure	bar	3.0±0.1
Pressure, air side		connected before throttle body (barometric pressure)



Fuel pump

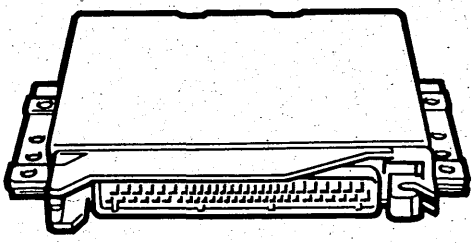
Capacity at 3.0 bar backpressure	ml/30s	min. 700
Resistance, level sensor	Ω	25-370
Tightening torque, screw top	Nm (lb ft)	75 (55)



Secondary air injection pump

Manufacturer		Pierburg
Pump capacity at 13 V	kg/h	25-30
Rating	W	325
Resistance, control valve at 20°C (68°F)	Ω	40±5

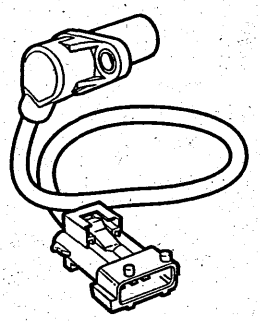
Motronic 5.2



C248W-8984

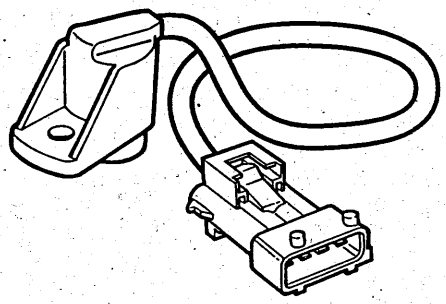
Control module

Number of pins		88
Power supply (+30 circuit)	pin	26
Power supply (+15 circuit)	pin	56
Power supply from main relay	pin	54
Power ground, ignition	pin	55
Power ground, injectors	pin	6
Power ground, other output stages	pin	34
Ground, control module circuitry	pin	28
Sensor ground (output)	pin	71
Reference ground, oxygen sensors	pin	46



Crankshaft position sensor

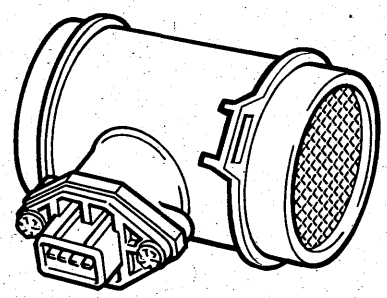
Location		Mounted in crankcase wall
Type		Inductive sensor
Resistance at 20°C (68°F), pins 1-2	Ohms	860±90
Slotted ring	number of ribs	58 (60-2)
Distance between sensor and ring	mm	1.0±0.7

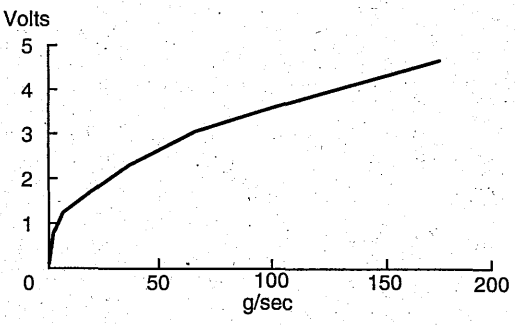


Camshaft position sensor

Location		At front exhaust camshaft sprocket
Power supply	V	12
Air gap, sensor — sprocket hub ridge	mm	max. 1.5
Sensor output	V	0 or 12

The sensor does not generate a signal but grounds the control module input when the ridge passes it.



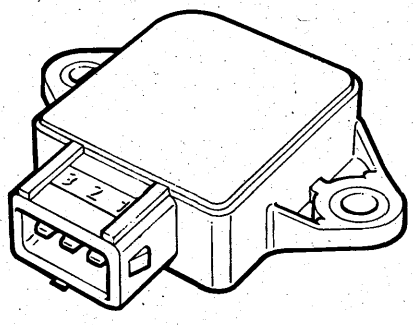


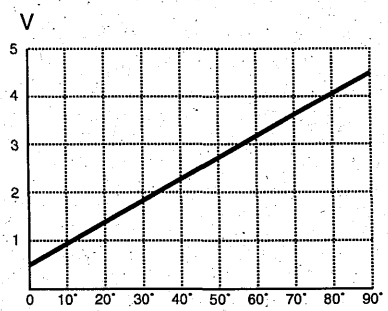
C248W-8987

Mass air flow sensor

Temperature, hot film	°C (°F)	180 (356)
Number of pins		4
Power supply	V	12
Voltage at air flow of: 0 g/s	V	0,15
3.3 g/s	V	0,75
4.2 g/s	V	0,85
8.3 g/s	V	1,20
17 g/s	V	1,65
33 g/s	V	2,25
69 g/s	V	3.05
103 g/s	V	3,60
133 g/s	V	4.05
178 grammes per second	V	4,60

At a given mass air flow the voltage tolerance is ±5%. The mass air flow sensor's 4 pins are gold-plated.



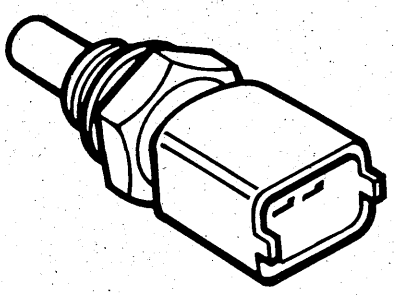


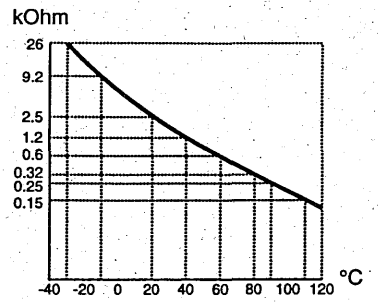
C248W-8988

Throttle position sensor

	kohms	V
Pins 2-1	1.6-2.4	5±0.1
Resistance at idling speed (pins 3-1)	0.8-1.2	0.5±0.4
Resistance at wide open throttle (pins 3-1)	2.0-3.0	4.5-±0.4

The throttle position sensor's pins are gold-plated.



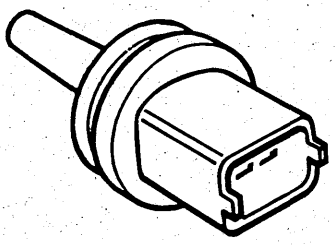


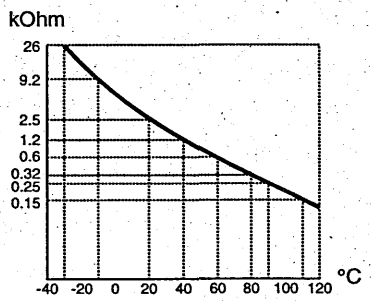
C248W-8989

Engine coolant temperature sensor

°C (°F)	kohms	V
-30 (-22)	20-30	4.8
-10 (14)	8.3-10.6	4.5
20 (68)	2.3-2.7	3.6
40 (104)	1.0-1.3	2.7
60 (140)	0.565-0.670	1.9
80 (176)	0.295-0.365	1.2
90 (194)	0.24-0.26	1.0
110 (230)	0.14-0.16	0,65

Power supply 5 V through a 1 kohm resistor in the control module.



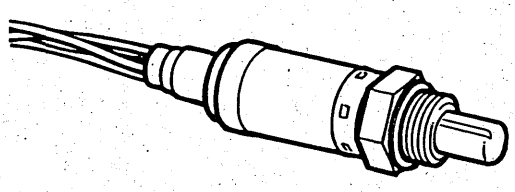


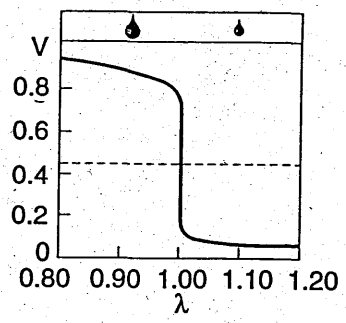
C248W-8990

Intake air temperature sensor

°C (°F)	kohms	V
-30 (-22)	20-30	4.8
-10 (14)	8.3-10.6	4.5
20 (68)	2.3-2.7	3.6
40 (104)	1.0-1.3	2.7
60 (140)	0.565-0.670	1.9
80 (176)	0.295-0.365	1.2
90 (194)	0.24-0.26	1.0

Power supply 5 V through a 1 kohm resistor in the control module.



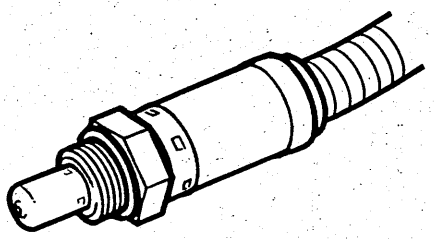


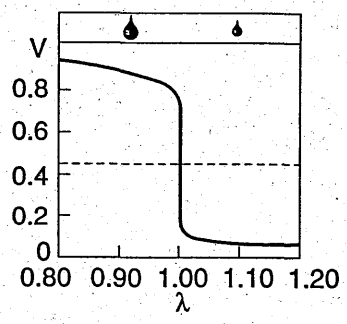
C248W-8991

Oxygen sensors before three way catalytic converters

Designation		Bosch LSH25P with electric preheating
Rating, heating element	W	18
Control range	V	0 – 1
Resistance at 20°C (68°F), pins 1-2	Ohms	2.0 +0.5/-0.2 (PTC)

Pins 3 and 4 are gold-plated.



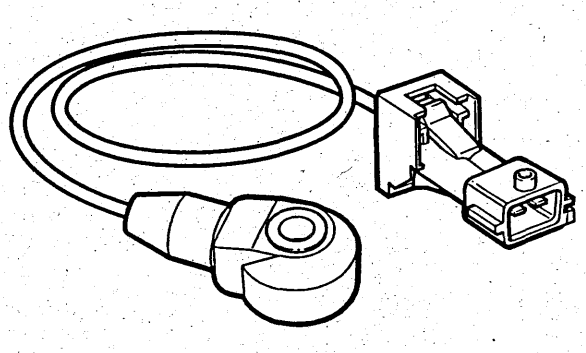


C248W-8992

Oxygen sensors after three way catalytic converters

Designation		Bosch LSH25PL with electric preheating
Rating, heating element	W	18
Control range	V	0 – 1
Resistance at 20°C (68°F), pins 1-2	Ohms	2.0 +0.5/-0.2 (PTC)

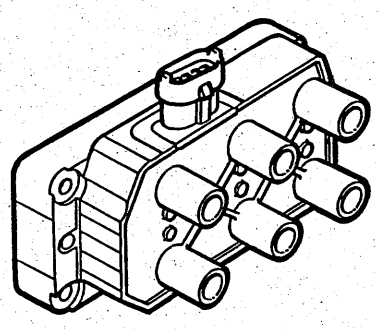
Pins 3 and 4 are gold-plated.



Knock sensors

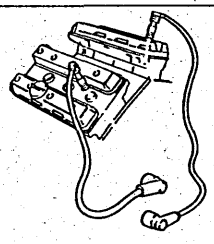
Voltage at idling speed	mV AC	≈ 5
Voltage when tapping on the retaining bolt with a hammer	mV AC	≈ 100
Tightening torque	Nm (lbf ft)	22 (16)

The voltages are measured directly on the sensor connections. The knock sensor pins are gold-plated.



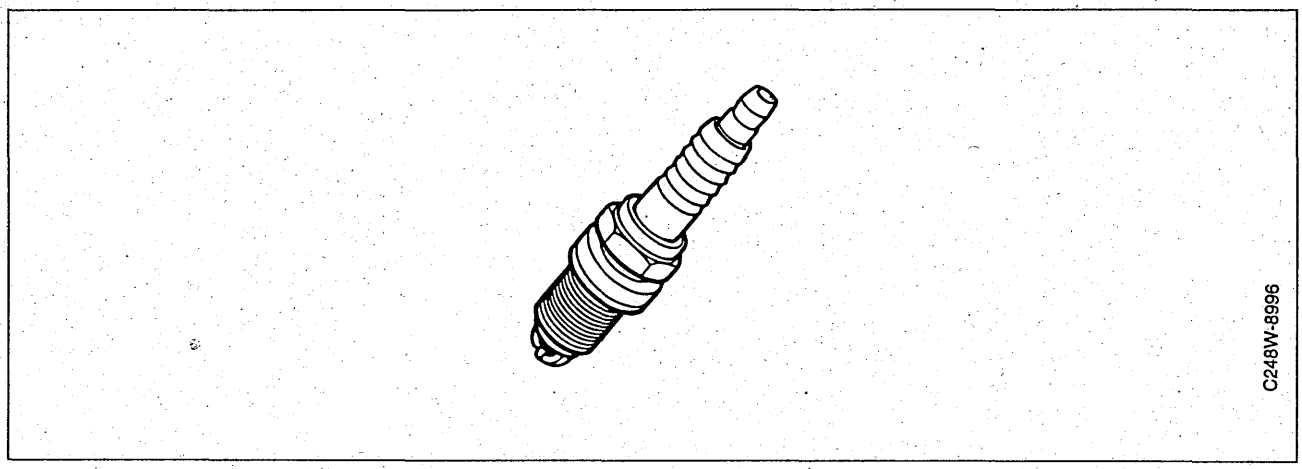
Ignition coil module

Resistance at 20°C (68°F), primary winding	Ohms	0.5±0.1
Resistance at 20°C (68°F) secondary winding	kohms	12±2



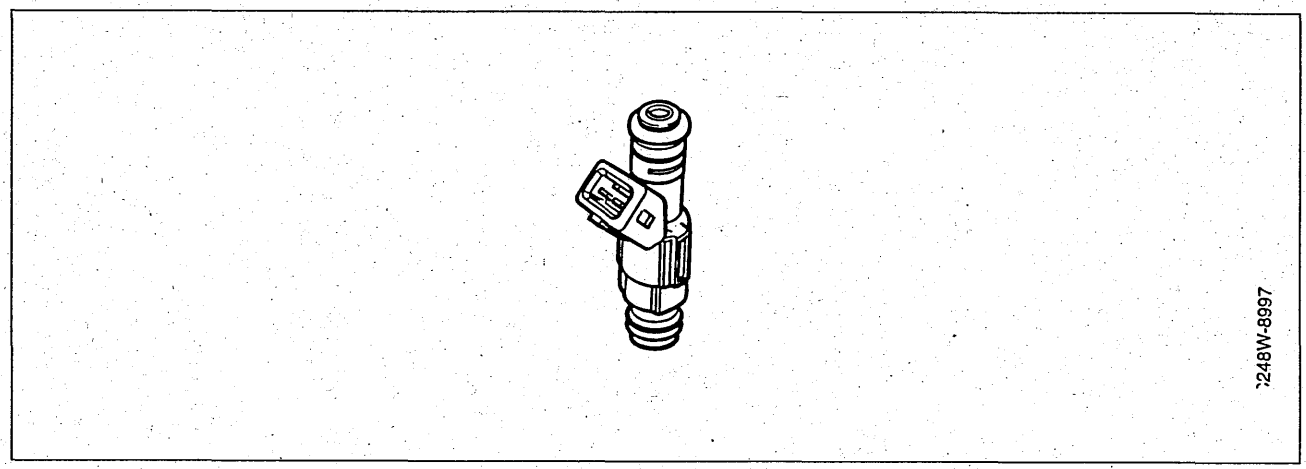
HT cables

Resistance of HT cables 1-3-5	kohms	7-9
Resistance of HT cables 2-4-6	kohms	2-6



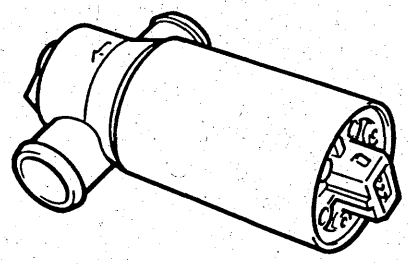
Spark plugs

Manufacturer		Bosch
Designation		FR8LDC, double side electrodes
Electrode gap	mm	0.8 (not to be adjusted)



Injectors

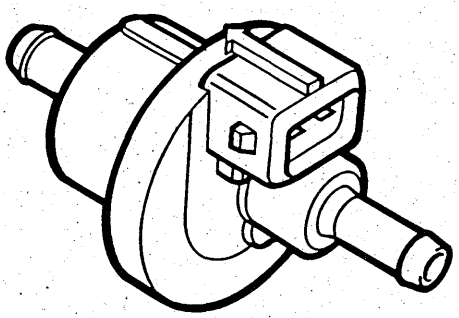
Designation		Bosch EV6E
Type		4-hole
Resistance at 20°C (68°F)	Ohms	15.9±0.5
Flow capacity	ml/30s	109±9
Maximum permissible difference between injectors	ml	11



C248W-8998

Idle air control valve

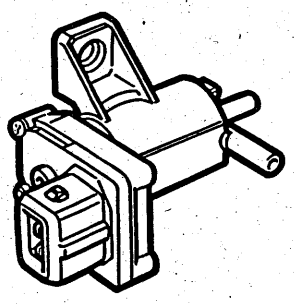
Number of windings		2
Resistance at 20°C (68°F), pins 1-2	OhmΩ	12±3
Resistance at 20°C (68°F), pins 2-3	OhmΩ	12±3
Control voltage	PWM 12 V	100 Hz



C248W-8999

EVAP canister purge valve

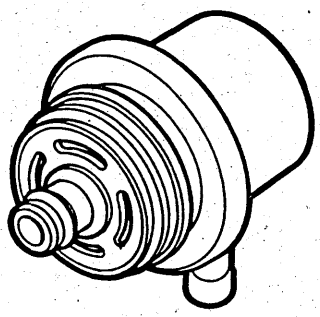
Designation		Bosch TEV2
Type		Closed at zero current
Resistance at 20°C (68°F)	Ohms	26±3
Control voltage	PWM 12 V	7.5 Hz/15 Hz/39 Hz



C248W-9501

Solenoid valves, variable intake manifold

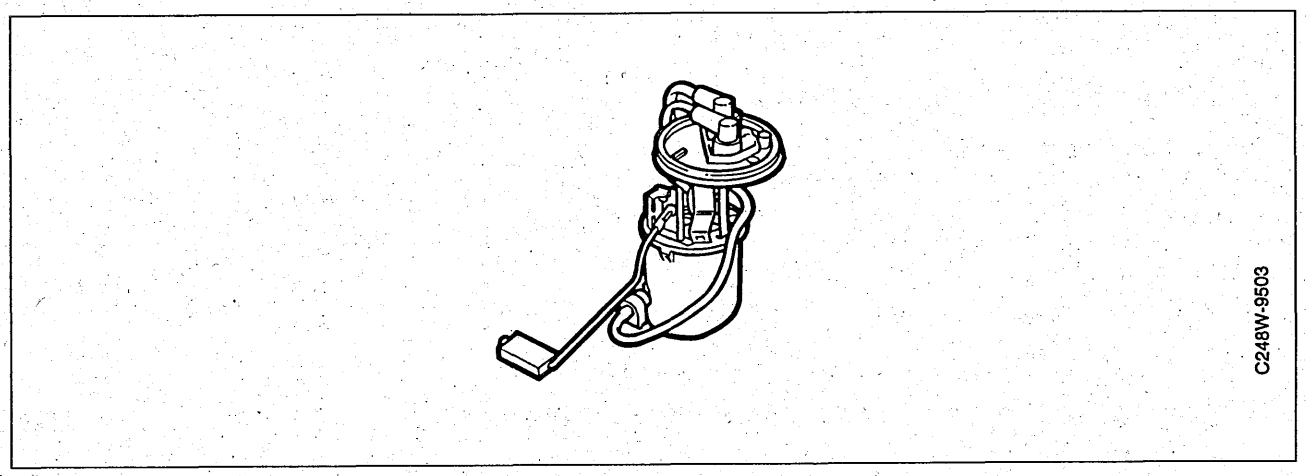
Type		Closed at zero current
Resistance at 20°C (68°F)	Ohms	40±5



C248W-9502

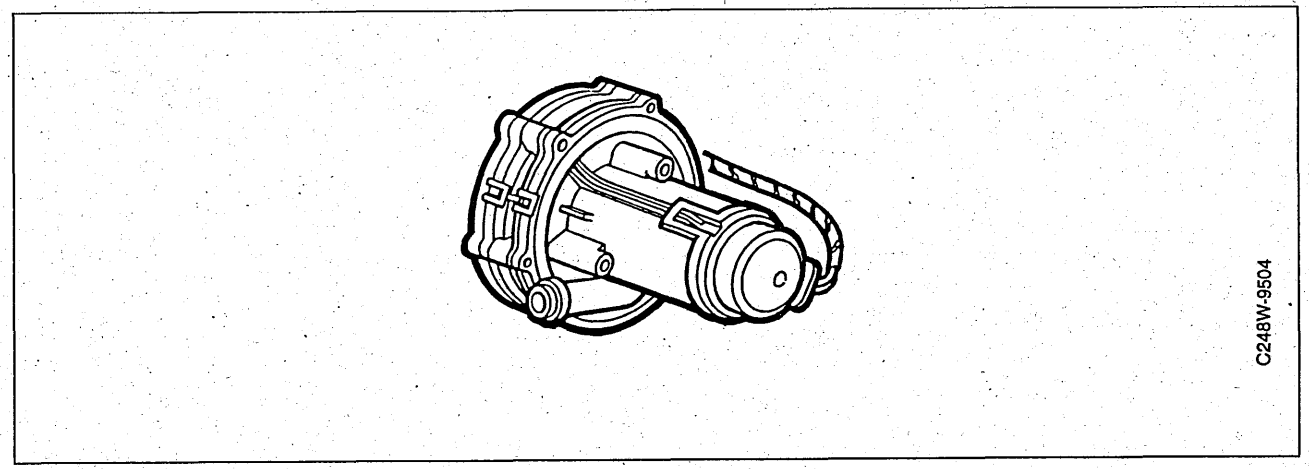
Fuel pressure regulator

Fuel pressure	bar	3.0±0.1
Pressure, air side		connected before throttle body (barometric pressure)



Fuel pump

Capacity at 3.0 bar backpressure	ml/30s	min. 700
Resistance, level sensor	Ohms	25-370
Tightening torque, screw top	Nm (lb ft)	75 (55)



Secondary air injection pump

Manufacturer		Pierburg
Pump capacity at 13 V	kg/h	25-30
Rating	W	325
Resistance, control valve at 20°C (68°F)	Ohms	40±5

Exhaust emission control system

Mechanical throttle damper (dashpot)

Time taken for engine to slow from 3000 rpm to idling speed	seconds	3-5
Setting speed	rpm	2500-2700

EGR system (without three-way catalytic converter)

			Turbo	Without turbo
EGR valve	type		Proportional	
	maximum flow	kg/h (lb/h)	20 (44)	10 (22)
	colour coding		Blue	Black
	constriction, M85	mm	4.3	6.0
	constriction, M86-	mm	4.7	
Thermostatic valve	opening temperature	°C (°F)	30 (86)	
	closing temperature	°C (°F)	20 (68)	

Cooling system

			4-cyl.	6-cyl.
Coolant	type		Saab Original Coolant (50% water)	
	quantity	litres	9.0	8.5
Thermostat, opening temperature		°C (°F)	89 ± 2 (192 ± 4) *)	92 + 1/- 2 (198 + 1/- 4)
System boiling point		°C (°F)	124 (255)	
The temperature gauge enters the red zone at		°C (°F)	121 (250) (M85-94) 121.5 (251) (M95)	118.5 (245)
Expansion tank pressure valve, opening pressure		bar	0.9-1.2	
Radiator fan (engine coolant temperature)	on, speed I	°C (°F)	92 (198) (M85-88) 90 (194) (M89-94) 100 (212) (M95)	97 (207)
	speed II		110 (230) (M89-91) 106 (223) (M92-94) 111 (232) (M95)	108 (226)
	off, speed I	°C (°F)	88 (190) (M85-88) 86 (187) (M89-94) 96 (205) (M95)	93 (199)
	speed II		106 (223) (M85-88) 102 (216) (M89-94) 107 (225) (M95)	104 (219)
A/C switch-off		°C (°F)	115 (239) (M85-94) 119 (246) (M95)	116 (241)
A/C switch-on		°C (°F)	111 (232) (M85-94) 118 (244) (M95)	115 (239)
Tightening torques, hose clips	10 - 16 mm	Nm (lbf ft)	3 (2.2)	
	17 - 35 mm	Nm (lbf ft)	4 (3.0)	
	36 mm -	Nm (lbf ft)	4.5 (3.3)	

*) 82 ± 2 (180 ± 4) in certain markets.

The difference in the temperature of the cooling system between the 4-cylinder and 6-cylinder engines is due to the difference in the location of the engine coolant temperature sensor. This is compensated for by the EDU in such a way that the temperature of the coolant at radiator fan switch-on, for instance, is the same for both types of engine.

Electric water pump (6-cyl.)

Current consumption	A	Max. 1.2
Pump capacity (at 10 kPa backpressure)	litres/min	14

Turbo system

Basic boost pressure

B202L (without TWC)	bar	0.40 ± 0.03
B202L (TWC)	bar	0.35 ± 0.03
B202R	bar	0.40 ± 0.03
B202S	bar	0.40 ± 0.03
B204L	bar	0.40 ± 0.03
B204S	bar	0.40 ± 0.03
B204E	bar	0.40 ± 0.03
B234E	bar	0.40 ± 0.03
B234L	bar	0.40 ± 0.03
B234R	bar	0.45 ± 0.03

Maximum boost pressure

B202L (without TWC)			bar	0.85 ± 0.05
B202L (TWC)			bar	0.75 ± 0.05
B202R			bar	0.85 ± 0.05 (M1993)
B202S			bar	0.55 ± 0.05
B204L			bar	1.05 ± 0.03
B204S			bar	0.59 ± 0.03
B204E			bar	0.40 ± 0.03
B234E			bar	0.40 ± 0.03
B234L	LH	manual gearbox	bar	1.00 ± 0.03 (M1991-1993)
		automatic transmission	bar	0.77 ± 0.03 (M1993)
	Trionic without heat plates	manual gearbox	bar	0.94 ± 0.03 (M1993) 1.00 ± 0.03 (M1994-1995) 0.90 (M1996)*)
		automatic transmission	bar	0.78 ± 0.03 (M1993) 0.81 ± 0.03 (M1994-1995) 0.70 (M1996)*)
	Trionic with heat plates	manual gearbox	bar	0.90 (M1996)*)
		automatic transmission	bar	0.68 (M1996)*)
B234R	without heat plates		bar	1.02 ± 0.03 (M1993) 1.08 ± 0.03 (M1994-1995) 0.91 (M1996)*)
B234R	with heat plates		bar	0.92 (M1996)*)

*) The above values refer to an engine speed of 3500 rpm (manual gearbox) or 4000 rpm (automatic transmission) and an ambient temperature of 20°C. That is to say, not the maximum boost pressure that can arise for brief periods when the car is being driven. These values are not to be compared with the values for earlier model year cars.

Pressure switch tripping pressure		bar	1.10 ± 0.05 (without TWC) (-M1990) 0.95 ± 0.03 (TWC) (-M1990)
Play in turbo shaft	axial	mm	0.025-0.084 (T25) 0.013-0.081 (T3) 0.057-0.103 (TE05/TD04)
	radial	mm	0.056-0.127 (T25) 0.076-0.145 (T3) 0.400-0.620 (TE05) 0.340-0.550 (TD04)

Tightening torques

	Torque (Nm)	Torque (lbf ft)
Exhaust pipe joints	40	30
Exhaust manifold, 4-cyl.	25	18.5
Exhaust manifold, 6-cyl.	20	15
Non-return valve, secondary air	25	18.5
Front exhaust pipe to exhaust manifold (not turbo)	40	30
Front exhaust pipe to turbocharger	25	18.5
Secondary air injection pipe, 4-cyl., cap nuts	30	22
Secondary air injection pipe, 4-cyl., retaining nuts	25	18.5
Secondary air injection pipe, 6-cyl.	20	15
Knock sensor, blue locking bolt	14	10.5
Knock sensor, DI/APC	13	9.6
Knock sensor, other	20	15
Coolant pipe, turbocharger	30 (turbo) 25 (engine/pump)	22 (turbo) 18.5 (engine/pump)
Water pump 4-cyl.	22	16
Water pump 6-cyl.	25	18.5
Water pump belt pulley	8	6
Charge air cooler to the condenser	8	6
Oil hoses, engine to oil cooler	18	13
Oil hoses, gearbox	25	18.5
Oil pipes, turbocharger	30 (engine) 20 (turbo -M1993) 25 (turbo M1994-)	22 (engine) 15 (turbo -M1993) 18.5 (turbo M1994-)
Belt tensioner, automatic, 4-cyl.	24	17.8
Belt tensioner, 6-cyl.	40	30
Oxygen sensor	55	41
Thermostat housing	20	15
Turbocharger T3/TE05	40	30
Turbocharger T25/TD04	22	16
Other bolts M5	5	3.7
M6	10	7.4
M8	20	15
M10	40	30

Traction Control System, 4-cyl

TC/ABS-system

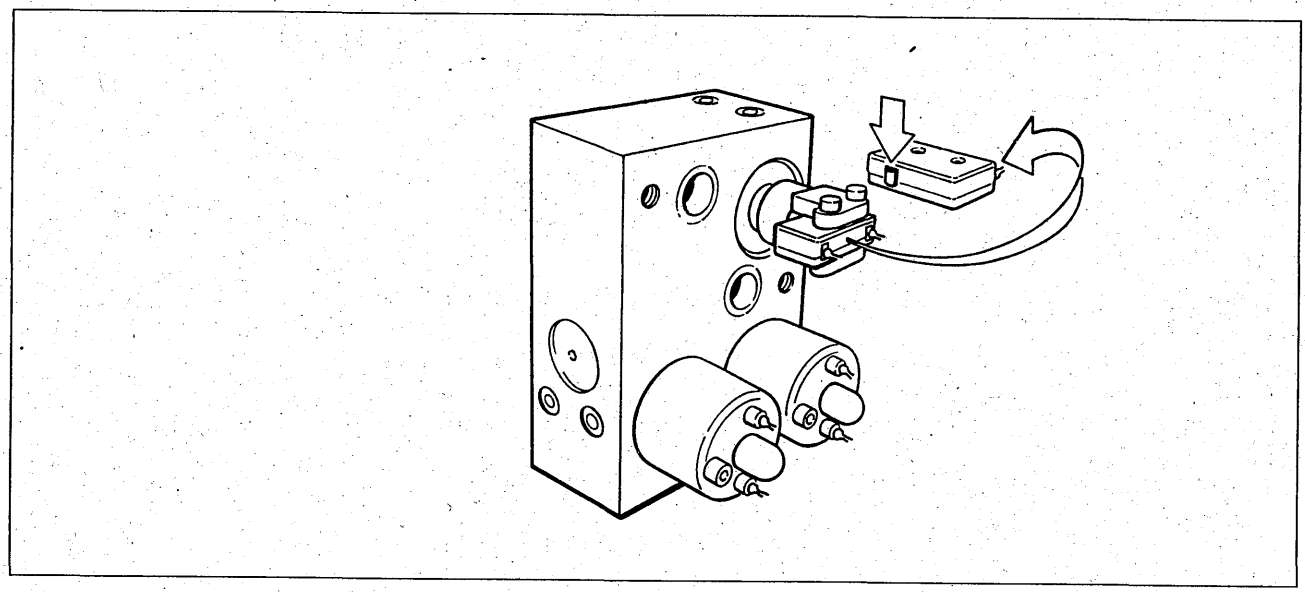
Hydraulic system, pressure

Pressure, brake circuits	bar	0 - 180
Accumulator pressure, nominal	bar	140 - 180
minimum	bar	105

Brake fluid: DOT 4 (FMVSS 116)

Electrical data

Operating voltage	V	10 - 14
Current consumption at 13 V:		
Pump motor	A	<20
Main valve	A	<3.3
NO valve	A	<2.0
NC valve	A	<2.0

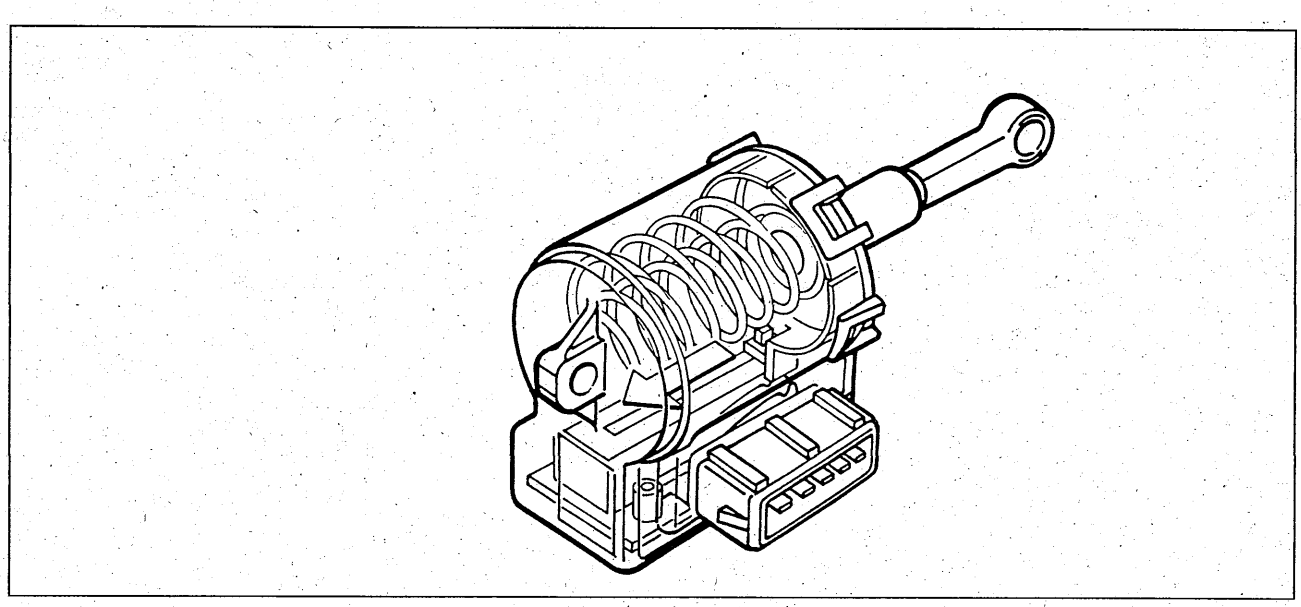


Pressure-limiting valve, TC block

Pressure reduction to	bar	70 ± 10

Pressure switch, TC block

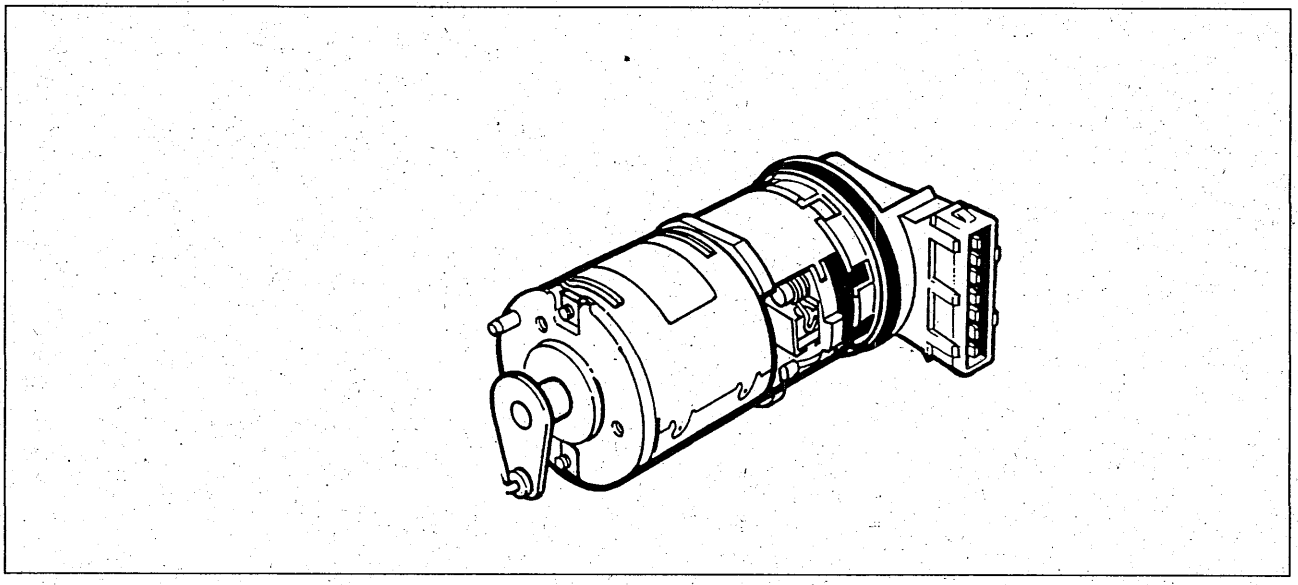
Activated at	bar	6



ETS system

Pedal potentiometer

Resistance, idling speed	Ohms	5 - 50
Resistance, wide open throttle	Ohms	900 - 1200



Throttle potentiometer

Resistance, idling speed	Ohms	5 - 50
Resistance, wide open throttle	Ohms	800 - 1200

Throttle motor

Resistance, motor winding	Ohms	max. 2

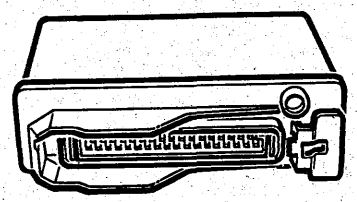
Safety valve

Resistance	Ohms	30

Charge air bypass control valve

Resistance	Ohms	30

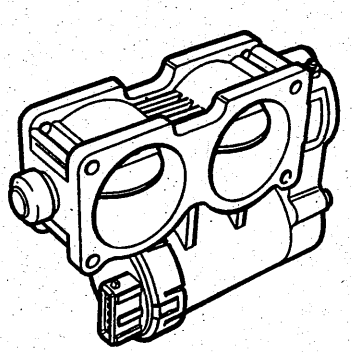
Traction Control System, V6



C271W-3724

TCS control module

Number of connector pins	qty	35
Power supply (+30 circuit)	pin	32
Power supply (+15 circuit)	pin	28
Main ground	pins	13 and 30



C271W-3725

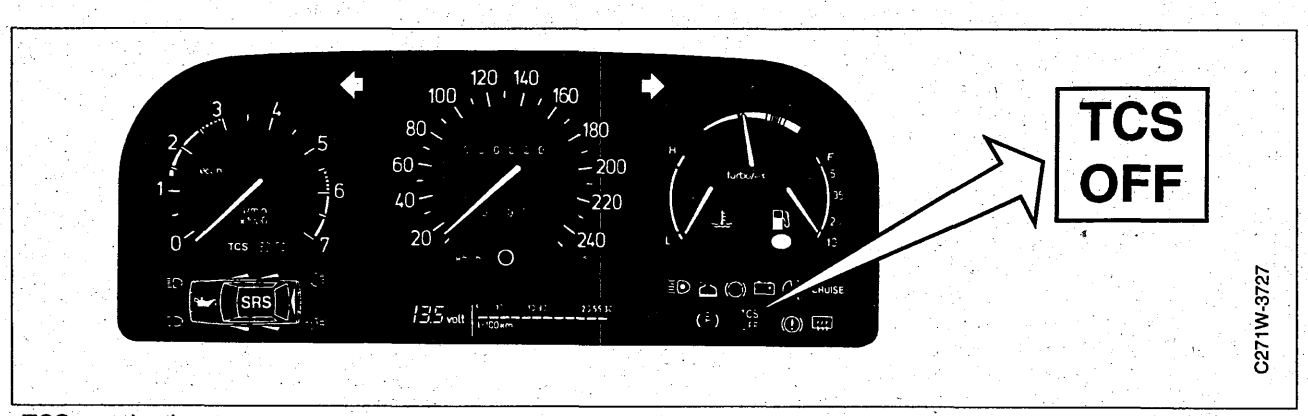
Throttle body, TCS

Motor

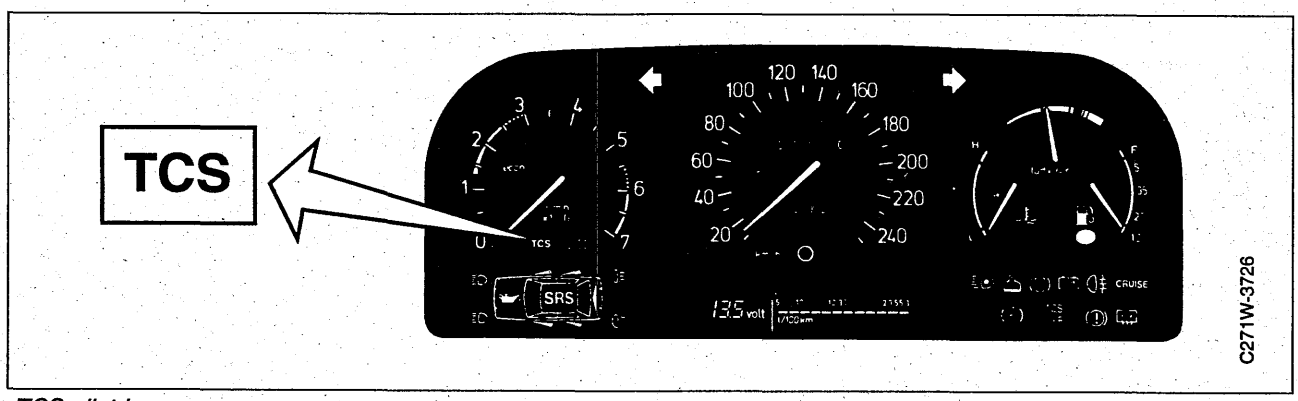
Motor, supply (PWM)	Hz	500 (0-100%)
Motor, resistance, pins 1-5	Ohms	1.2

Position sensor

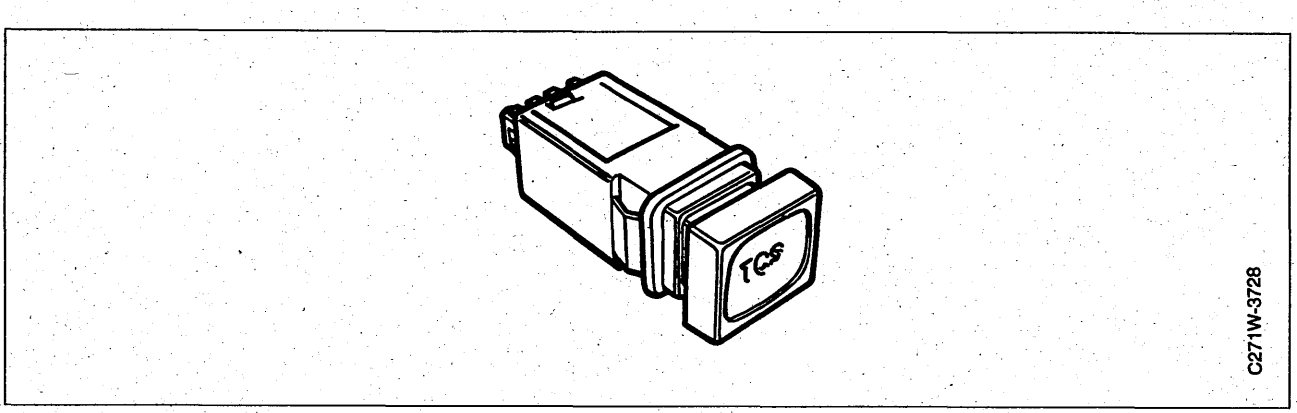
Position sensor, resistance, pins 2-4	Ohms	1100 ±100



TCS warning lamp

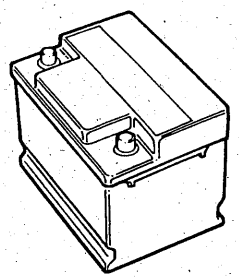


TCS pilot lamp



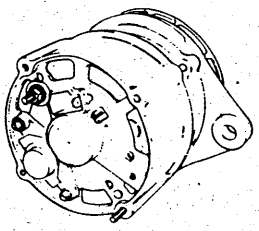
TCS ON/OFF switch

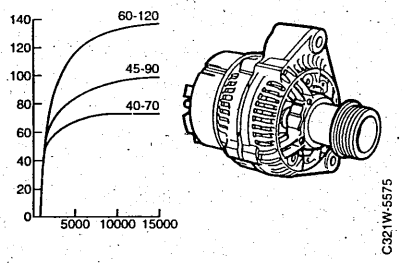
Electrical system



Battery

Voltage	V	12
Capacity	Ah	60 (70 M95-)
Grounding		Negative(-)
Specific gravity of electrolyte:		
when recharging advisable		1,21
when battery fully charged		1,28





Generator

Bosch K1-14V 70A 20

Rated voltage	V	14
Rated speed	rpm	2000
Stator connection		Delta connection
Slip-ring diameter, new	mm (in)	27.8 (1.09)
min	mm (in)	26.8 (1.06)
Max. permissible slip-ring runout	mm (in)	0.03 (0.001)
rotor	mm (in)	0.05 (0.002)
Min. brush length	mm (in)	5 (0.2) (protruding from brush holder)
Ratio between crankshaft and generator belt pulleys		1:2.4

Test values

Resistance, armature winding	Ohms	2.8 ± 10%
between stator phases	Ohms	0.09 ± 10%
Current output at:		
1500 rpm	A	27
2000 rpm	A	46
6000 rpm	A	70

Bosch N1-14V 80A 19, Bosch N1-14V 36/80A

Rated voltage	V	14
Rated speed	rpm	1900
Stator connection		Star connection
Slip-ring diameter, new	mm (in)	27.8 (1.09)
min	mm (in)	26.8 (1.06)
Max. permissible slip-ring runout	mm (in)	0.03 (0.001)
rotor	mm (in)	0.05 (0.002)
Min. brush length	mm (in)	5 (0.2) (protruding from brush holder)
Ratio between crankshaft and generator belt pulleys		1:2.4

Test values

Resistance, armature winding	Ohms	2.8 ± 10%
between stator phases	Ohms	0.10 ± 10%
Current output at:		
1500 rpm	A	36
1900 rpm	A	54
6000 rpm	A	80

Bosch N1-14V 40/115A

Rated voltage	V	14
Rated speed	rpm	1900
Stator connection		Star connection
Slip-ring diameter, new	mm (in)	27.7 (1.09)
min	mm (in)	27.2 (1.07)
Max. permissible slip-ring runout	mm (in)	0.02 (0.0008)
rotor	mm (in)	0+0/-0.087 (0+0/-0.0035)
Min. brush length	mm (in)	5 (0.2) (protruding from brush holder)
Ratio between crankshaft and generator belt pulleys		1:2.4

Test values

Resistance, armature winding	Ohms	2.6 ± 0.15
between stator phases	Ohms	0.05+0.01/-0
Current output at:		
1500 rpm	A	40
1900 rpm	A	62
6000 rpm	A	115

Bosch KC 14V 45-90A

Rated voltage	V	14
Stator connection		Star connection
Slip-ring diameter, new	mm (in)	15.8 (0.622)
min	mm (in)	14.8 (0.583)
Max. permissible belt-pulley runout	mm (in)	0.2 (0.008)
Min. brush length	mm (in)	7.5 (0.295) (protruding from brush holder)
Ratio between crankshaft and generator belt pulleys		1:2.8

Test values

Resistance, armature winding	Ohms	2.6
between stator phases	Ohms	0,027
Current output at:		
1800 rpm	A	45
6000 rpm	A	90

Bosch KC 14V 60-110A

Rated voltage	V	14
Stator connection		Star connection
Slip-ring diameter, new	mm (in)	15.8 (0.622)
min	mm (in)	14.8 (0.583)
Max. permissible belt-pulley runout	mm (in)	0.2 (0.008)
Min. brush length	mm (in)	7.5 (0.295) (protruding from brush holder)
Ratio between crankshaft and generator belt pulleys		1:2.8

Test values

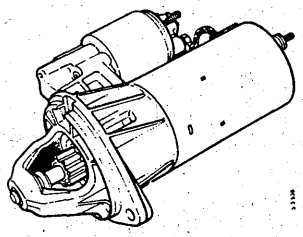
Resistance, armature winding	Ohms	2.6
between stator phases	Ohms	0,015
Current output at:		
1500 rpm	A	60
6000 rpm	A	120

Bosch NC 14V 60-120A

Rated voltage	V	14
Stator connection		Star connection
Slip-ring diameter, new	mm (in)	15.8 (0.622)
min	mm (in)	14.8 (0.583)
Max. permissible slip-ring runout	mm (in)	0.02 (0.008)
Max. permissible rotor runout	mm (in)	0 +0/-0.087
Min. brush length	mm (in)	7.5 (0.295) (protruding from brush holder)
Ratio between crankshaft and generator belt pulleys		1:2.6

Test values

Resistance, armature winding	Ohms	2.6
between stator phases	Ohms	0,015
Current output at:		
1500 rpm	A	60
6000 rpm	A	120



Starter motor (4-cyl. engine)

Type designation		Bosch DW 12V 0 001 108 012 -M86 Bosch DW 12V 0 001 108 038 M87-
Rating	kW (hp)	1.4 (1.9)
Number of teeth on pinion		9
Number of teeth on ring gear		142
Ratio between engine and starter motor		1:15.8

Test values, mechanical

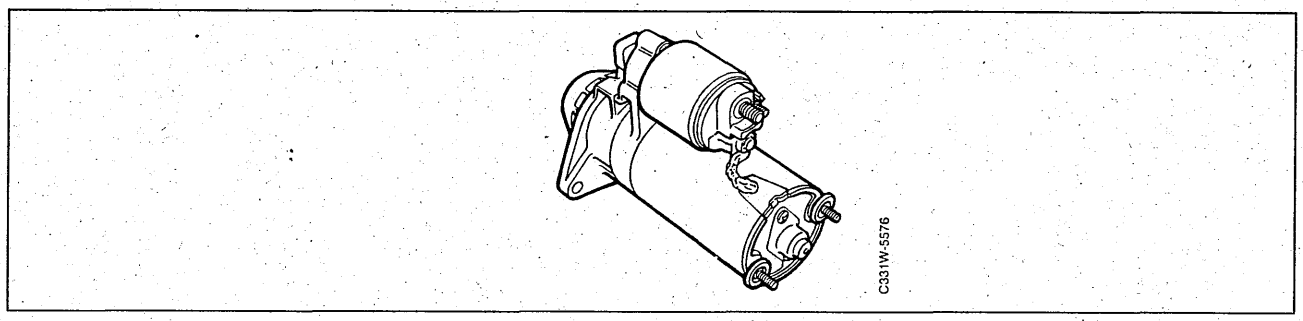
Backlash in gear train	mm (in)	0.35-0.60 (0.014-0.024)
Clearance between pinion and ring gear	mm (in)	2.5-3.0 (0.1-0.12)
Rotor end float	mm (in)	0.05-0.40 (0.002-0.016)
Pinion free-running torque	Nm (lbf ft)	0.12-0.18 (0.09-0.13)

Test values, electrical

Idling, 12 V and 70 A	rpm	3000
Under load, 9 V and 315 A	rpm	1700
Starter motor locked, 4 V and 650-750 A	rpm	0
Minimum voltage for energizing solenoid	V	7

Tightening torques

Solenoid retaining bolts	Nm (lbf ft)	4.5-5.5 (3.3-4.1)
Commutator end bracket retaining bolts (long)	Nm (lbf ft)	2.7-3.5 (2.0-2.6)



Starter motor (V6 engine)

Type designation		Bosch DW 12V 0 001 108 080
Rating	kW	1.4
Number of teeth on pinion		9
Number of teeth on ring gear		135
Ratio between engine and starter motor		1:15

Test values, electrical

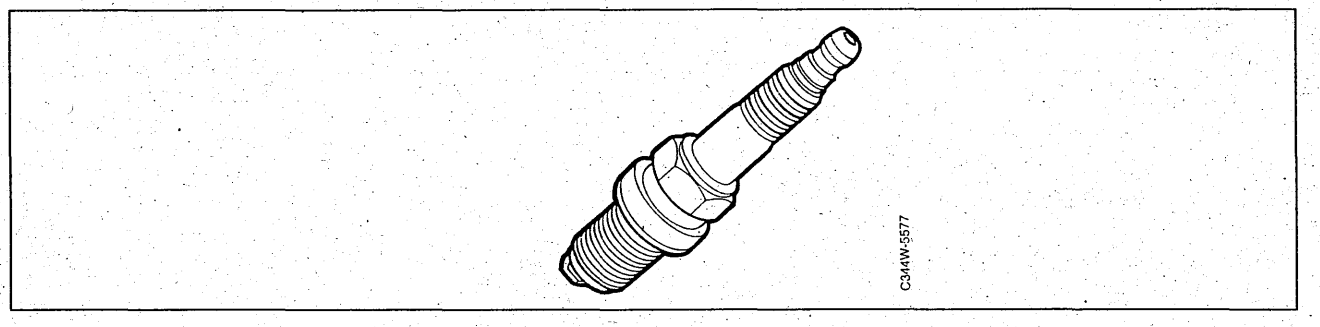
Idling, 12 V and 80 A	rpm	3300
Under load, 9 V and 295 A	rpm	1650
Under load, 7.5 V and 510 A	rpm	910
Minimum voltage for energizing solenoid	V	7

Tightening torques

Solenoid retaining bolts	Nm	5
Commutator end bracket retaining bolts (long)	Nm	3

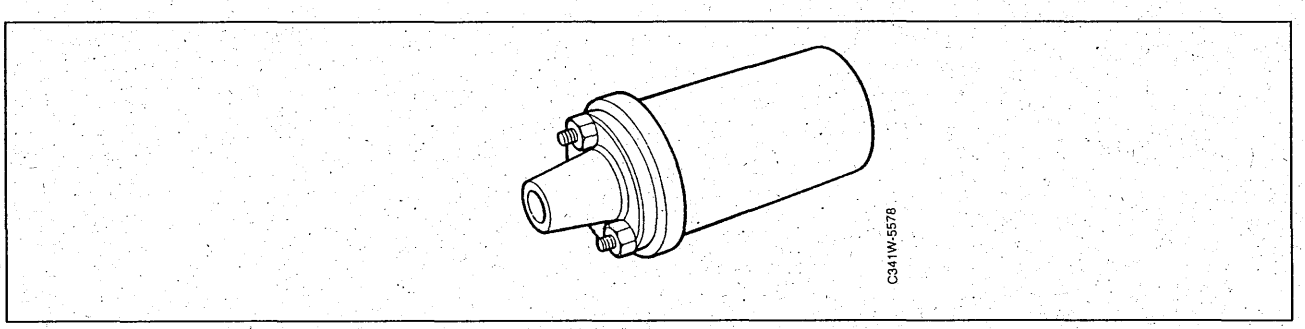
Ignition system (Cars without Saab DI -M93)

Type	Breakerless with Hall sensor
Firing order	1-3-4-2



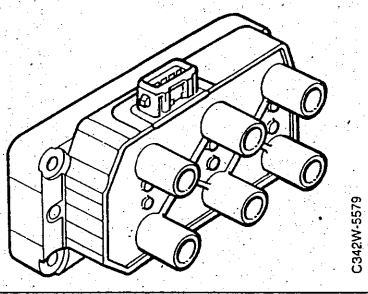
Spark plugs

Engine	Designation	Remarks
B202i	NGK BCP 5 ES (-1991) NGK BCP 5 EV (1992-) Champion RC12YC Bosch FR8DCX	
B202 Turbo	NGK BCP 7 EV Champion C7GY	Precious metal Precious metal
Replacement interval		See applicable service programme
Electrode gap mm (in)	0.6-0.7 (0.02-0.03)	
Tightening torque, non-lubricated plug Nm (lbf ft)	25-29 (18.5-21.5)	



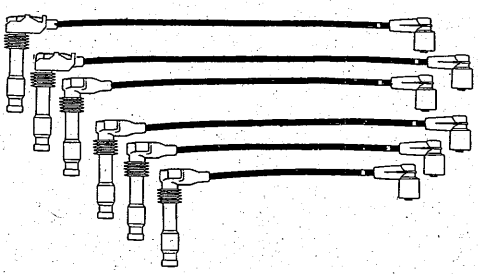
Ignition coil, 4-cyl. engine

Resistance of primary winding across terminals 1 and 15	Ohms	0.52-0.76
Resistance of secondary winding across terminal 1 and the HT output terminal	kohms	7.2-8.2



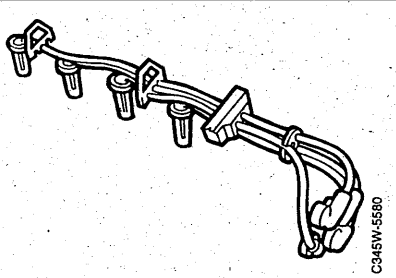
Ignition coil, V6

Resistance of primary winding across terminals 1 and 15	Ohms	0.42-0.58
Resistance of secondary winding across terminals 1 and the HT output terminal	kohms	10.2-13.8



HT cables, V6

Resistance of cables, including connections, between distributor and spark plugs	kohms	7-9 (rear cylinder bank (1, 3, 5)) 2-6 (front cylinder bank (2, 4, 6))

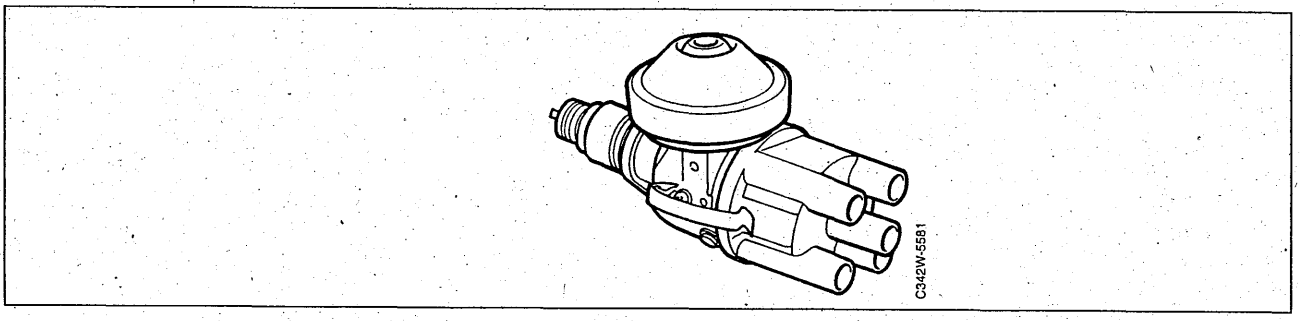


HT cables, 4-cyl. engine

Resistance of cables, including connections, between ignition coil and distributor	kohms	0.5-1.5
Resistance of cables (including connections) between distributor and spark plugs	kohms	2-4

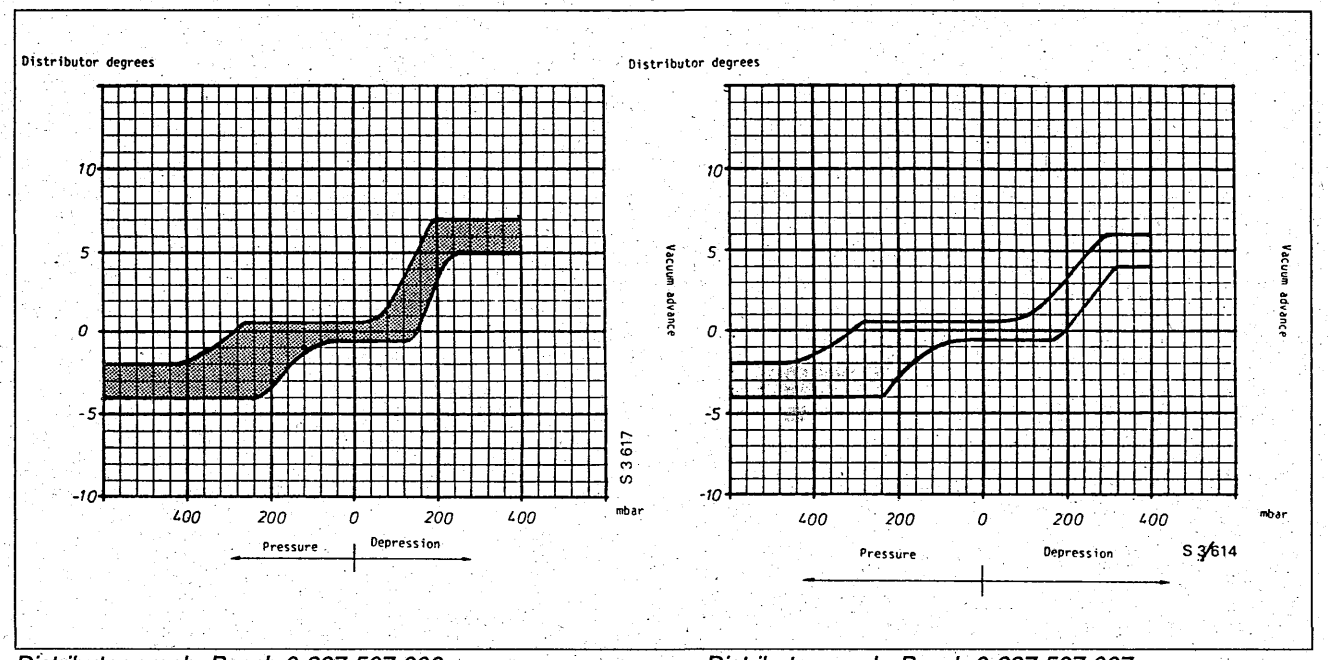
Ignition advance with vacuum control unit disconnected.

Engine	Timing (degrees BTDC)/rpm	Remarks
Turbo 16	16°/ 850	
Fuel injection engine	14°/ 850	



Distributor

Type designation Fuel injection engine		Bosch 0 237 506 009 M86-M88 Bosch 0 237 506 013 M88 or Bosch 0 237 501 010 M89-
Turbo		Bosch 0 237 507 001 M85 Bosch 0 237 507 006 M86 (not US) Bosch 0 237 507 007 M86 (US), M87-M88 Bosch 0 237 507 008 M88 or M89 (US)
Direction of rotation		Anticlockwise
Rotor arm resistance	kohms	1



Distributor graph, Bosch 0 237 507 006

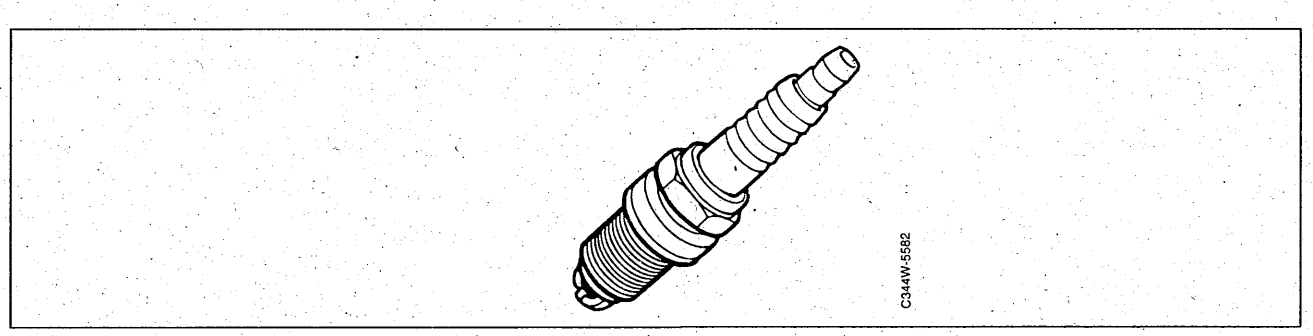
Distributor graph, Bosch 0 237 507 007

Ignition power module

Type designation Turbo	Bosch 0 227 100 139
Fuel injection engine	Bosch 0 227 100 124

Ignition system (Cars with Saab DI, all Saab 9000 M94-)

Designation	Saab DI
Firing order	1-3-4-2



Spark plugs

Engine	Designation	Remarks
B202 Turbo, B202S, B204E	NGK BCPR 7 ES	
204i	NGK BCPR 6ES	
B204 Turbo	NGK BCPR 7ES	
B234i	NGK BCPR 6ES	
B234 Turbo	NGK BCPR 7ES	
B308i	Bosch FR 8 LDC Bosch FR 7 LDC	Normal driving Hard driving
Replacement interval		See applicable service programme

Spark plugs (contd.)

Electrode gap, B202 and B204	mm (in)	1.0 + 0.1/-0.2 (0.04 + 0.004/-0.008)
Electrode gap, B308i	mm (in)	0.7-0.9 (0.027-0.035)
Tightening torque, non-lubricated plug	Nm (lbf ft)	25-29 (18.5-21.5)

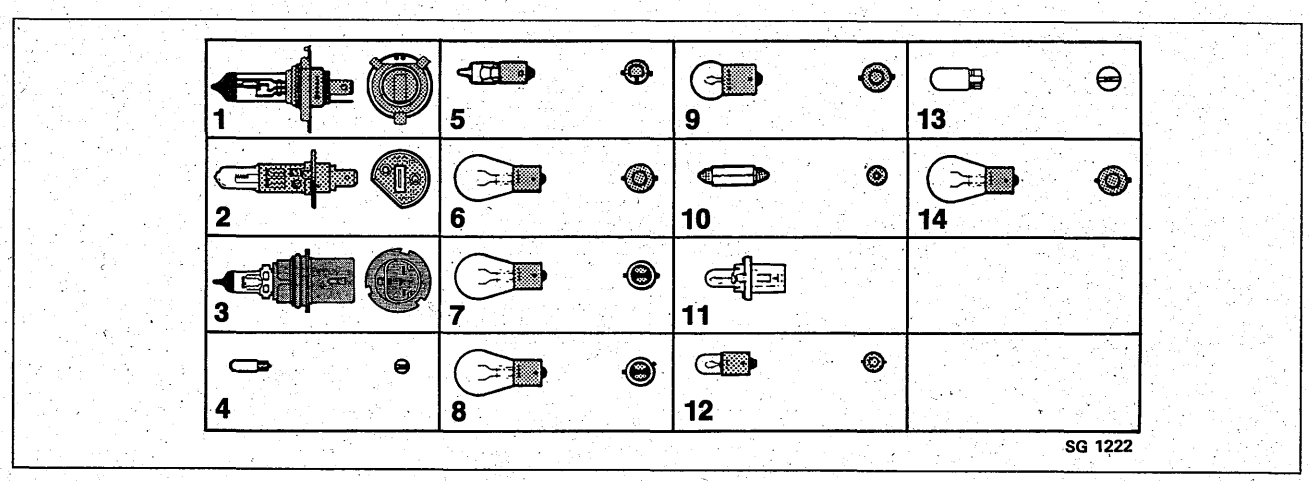
Ignition discharge module

Tightening torque	Nm (lbf ft)	12 (8.9)

Ignition advance

Programmed. No adjustment possible.

Lighting



	Rating (W)	Base	Item
Headlamps (5-d, CD -M94)	60/55	H4 base P43t-38	1
Headlamps (CS, CD M95-)	55	H1 base	2
Headlamps US, JP (-M92)	70/50	Sylvania 9004 DOT 12 V	3
Headlamps US (M93-)	70/60	Sylvania 9005/9006 DOT 12 V	3
Rear direction indicators (CD -M94), brake lights (CD -M94), reversing lights, high-level brake light* (CD), side reversing lights*	21	BA 15s	6
Front direction indicators/side marker lights* (-M94), corner lights*-daylight running lights model year 1986 and earlier/parking lights (CD -M94), brake lights/rear lights CD (M95-)	21/5	BAY 15d	7
Parking lights (CS, CD M95-)	4	Ba 9s	12
Rear fog lights*/rear lights	21/4	BAZ 15d	8
Rear lights	5	BA 15s	9

*) certain markets/models only

	Rating (W)	Base	Item
Front and rear direction indicators (CD), front direction indicators (CS)	21 (yellow)	BAU 15s	14
Number plate lighting, interior lighting rearview mirror, glove box, centre console lighting, courtesy lighting, seat-belt warning lamp	5	SV 8.5-8	10
Roof lamp, luggage compartment lighting	10	SV 8.5-8	10
Lighting for switches, front ashtray	1.2	W2x4.6d	4
Warning/indicator lamps: oil pressure, brakes, direction indicators, electrically heated rear window, main beam, handbrake, washer fluid level, pictogram, shift indication*, rear fog lights*, ABS brakes*, CHECK ENGINE (MIL)*, Airbag SRS*, Traction Control System TCS*	1,12	Lamp with bulb holder	11
Fuel level warning lamp	1.2	Lamp with bulb holder	11
Charging warning lamp	2.0	Lamp with bulb holder	11
Lighting for heating and ventilation controls, cigarette lighter	2	W2x4.6d	4
Instrument lighting	3	Lamp with bulb holder	11
Spotlight in roof console, reading lamp C pillar (halogen)	5	-	5
Side direction indicators, high-level brake light (CD)**	5	W2.1x9.5d	13
Engine bay lighting, model year 1987 and later	15	SW8.5	10

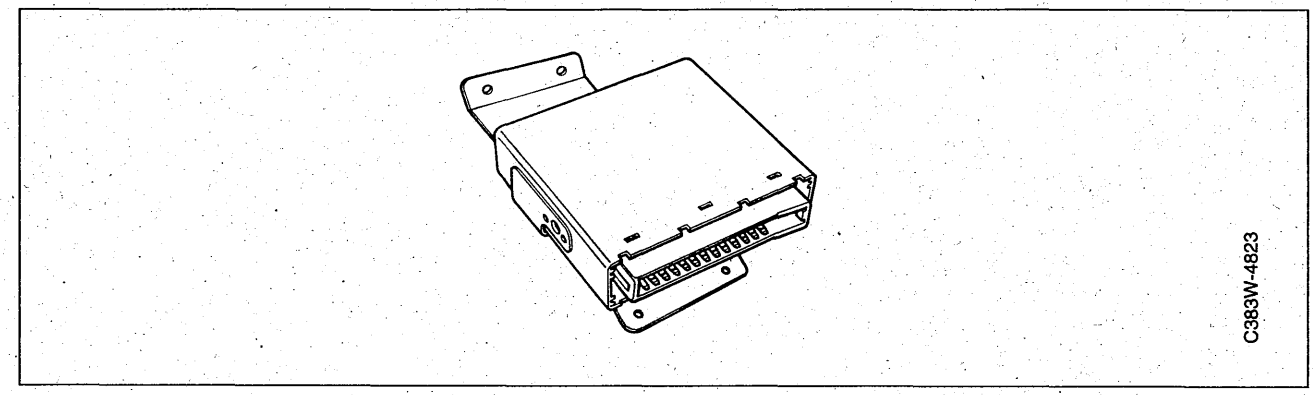
*) certain markets/models only

**) To meet legal requirements in England, two of the bulbs must be rated at 3 W.

Fuses

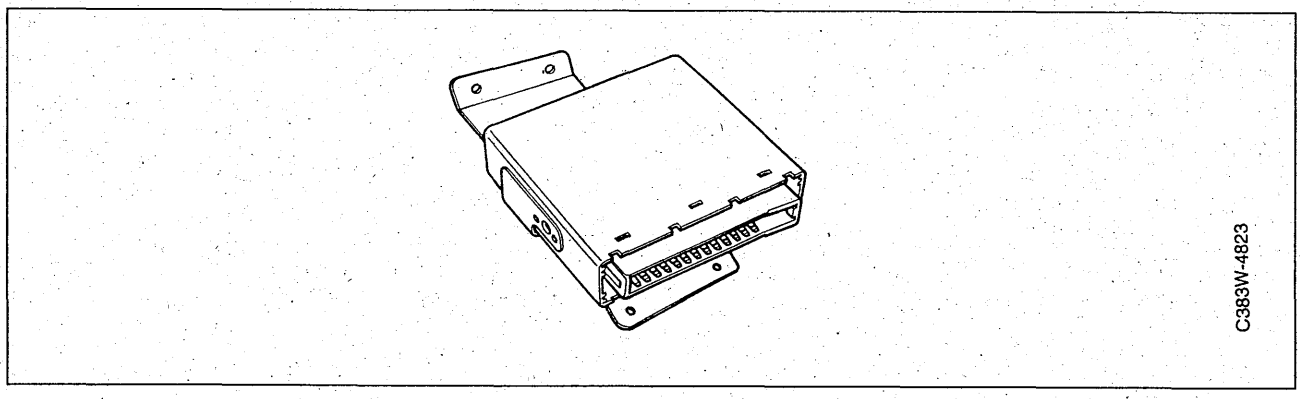
Light brown	5 A
Dark brown	7.5 A
Red	10 A
Blue	15 A
Yellow	20 A
Colourless	25 A
Green	30 A
Orange	40 A

Electrical system, anti-theft alarm



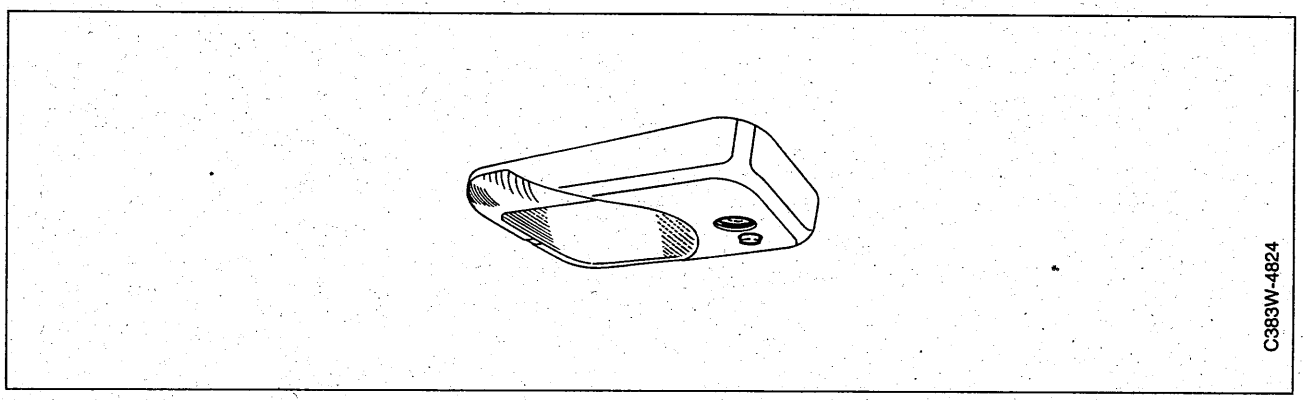
Control module

Number of pins		25
Power supply (+15 circuit)	pin	10
Power supply (+30 circuit)	pin	25
Ground	pin	13
Closed-circuit current consumption		
alarm not armed	mA	<4
alarm armed	mA	<7



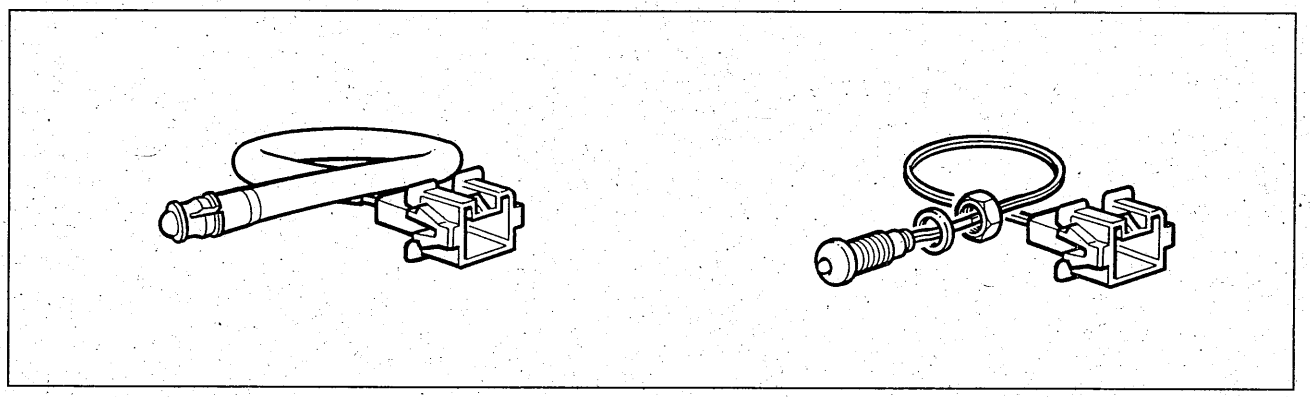
Control module, anti-theft alarm with VSS

Number of pins		25
Power supply (+15 circuit)	pin	10
Power supply (+30 circuit)	pin	25
Power supply (+30 circuit), direction indicators	pin	22
Power supply (+B circuit)	pin	9
Ground	pin	13
Closed-circuit current consumption		
alarm not armed	mA	<4
alarm armed	mA	<7



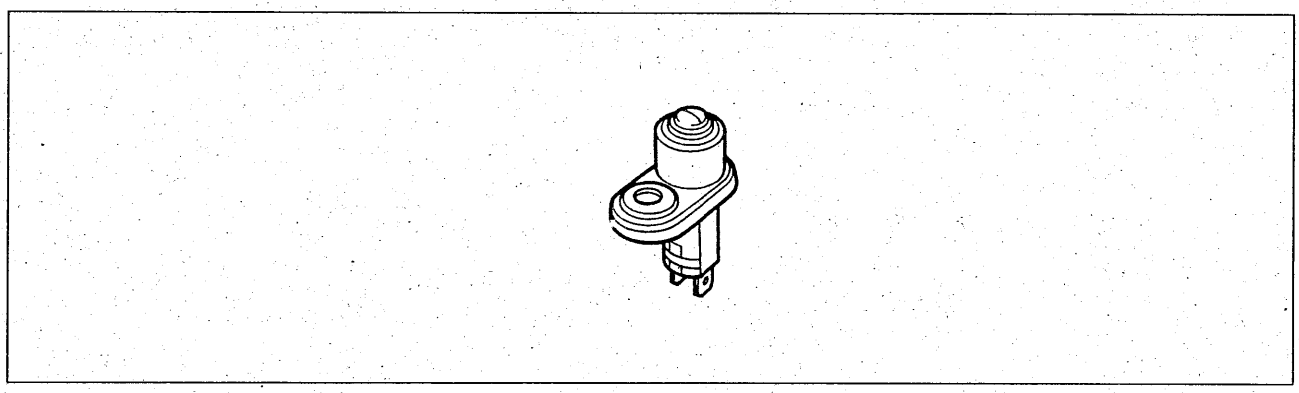
Glass breakage sensor

Location		In the interior lighting lamp
Type		Ultrasound (microphone)
Sensor voltage	pin	2
Ground	pin	4
Frequency range		40 kHz band



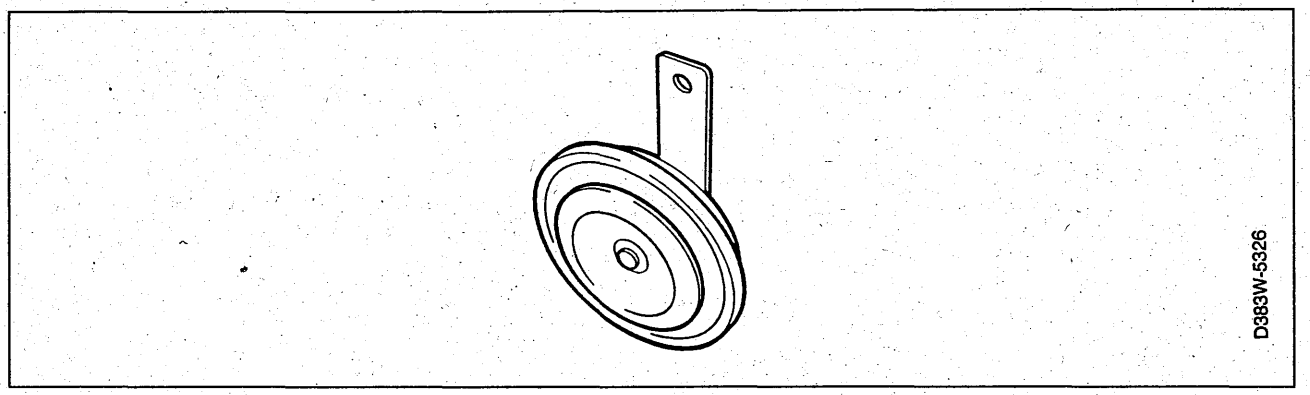
LED

Location		Loudspeaker grille on driver's side
Current limiting from electronic control module	mA	20
Power supply	pin	2
Ground	pin	1



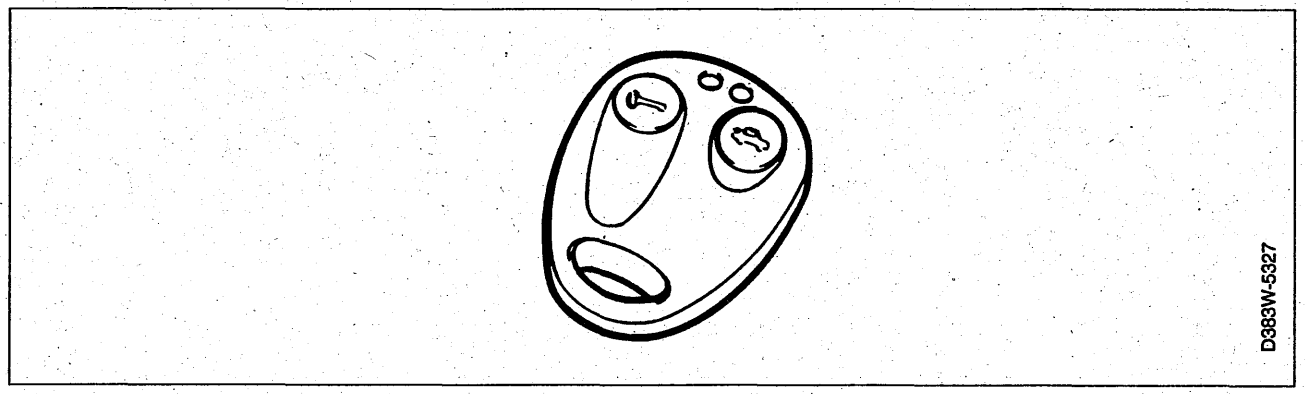
Bonnet switch

Location		Front member
Type		Normally closed
Power supply	pin	1
Ground	pin	2



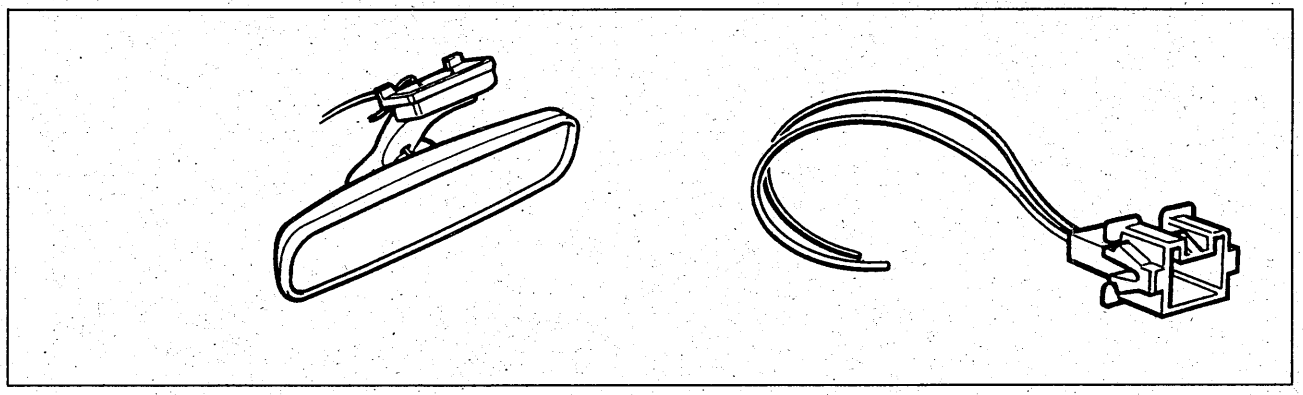
Horn

Location		Left-hand front wheel housing
Type		Diaphragm horn
Operating voltage	V	9 - 12
Power supply	pin	1
Ground	pin	2 (via control module, pin 11)



Remote control

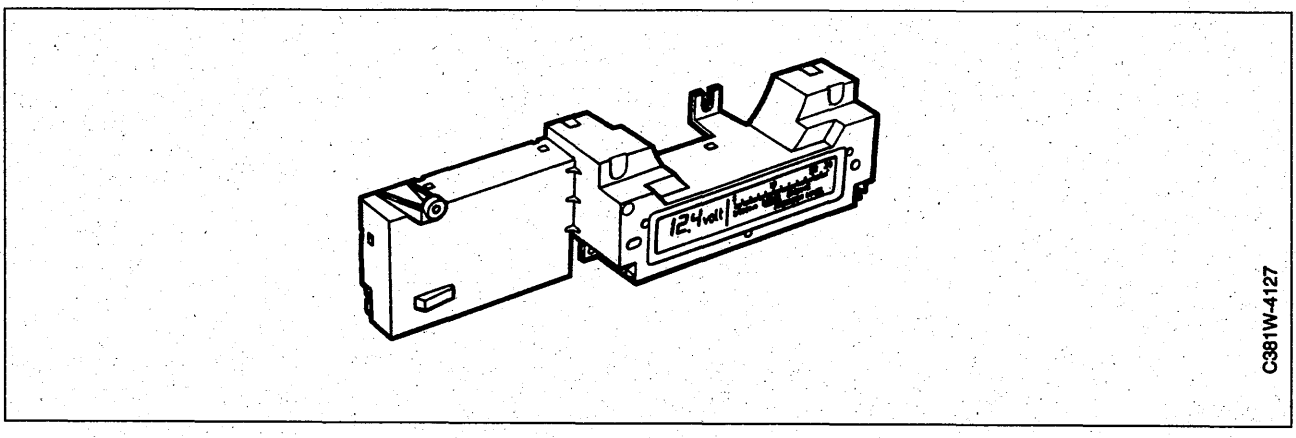
Type			Frequency modulated RF (Radio Frequency) signal
Frequency (carrier wave),	EU	MHz	433.92
	US/CA	MHz	315
	JA	MHz	315 (short range)
Operating voltage		batteries	2 Lithium/CR2016 (3 V)



Aerial

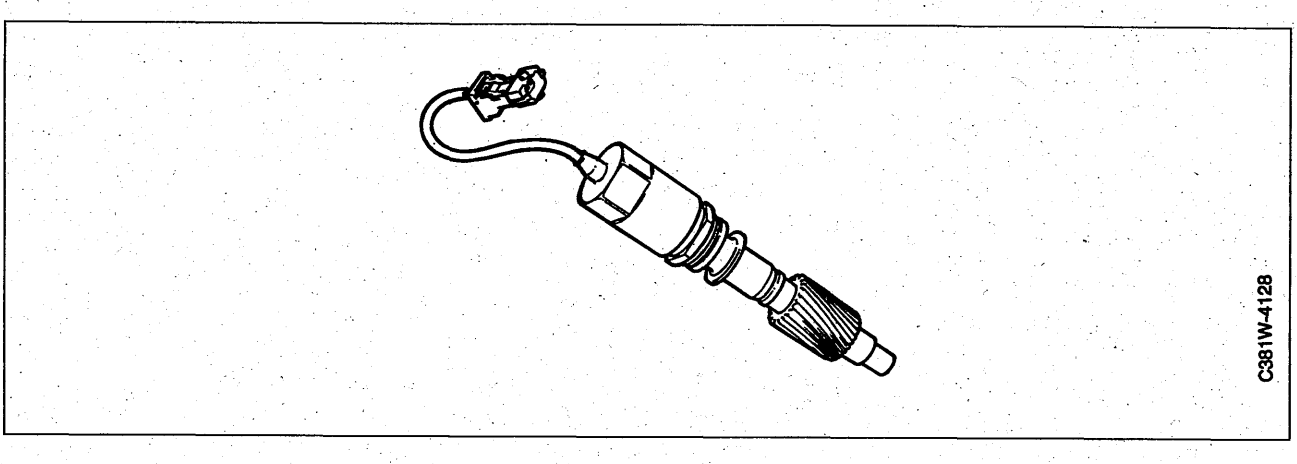
Location	JA Others	Interior rearview mirror Under roof console
Type	JA Others	Conductive Dipole (17 cm)
Signal connection	pin	1
Ground	pin	2

Electrical system, EDU



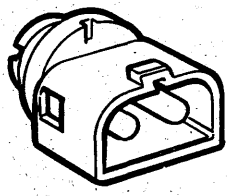
EDU control module

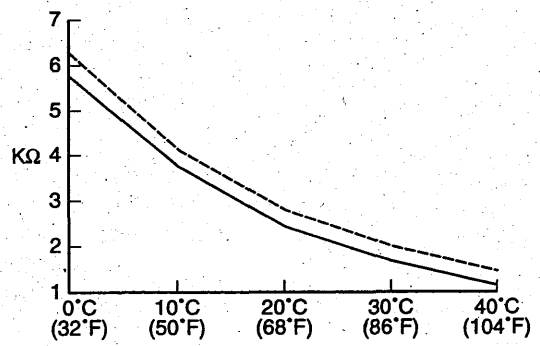
Number of pins		39
Power supply (+30 circuit)	pin	1
Power supply (+15 circuit)	pin	37
Power ground	pin	21



Speed sensor, gearbox

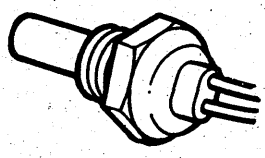
Coil resistance	Ohms	380 ± 20%

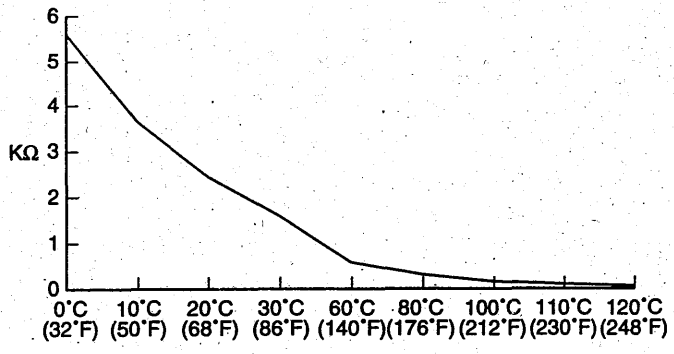




Outside temperature sensor

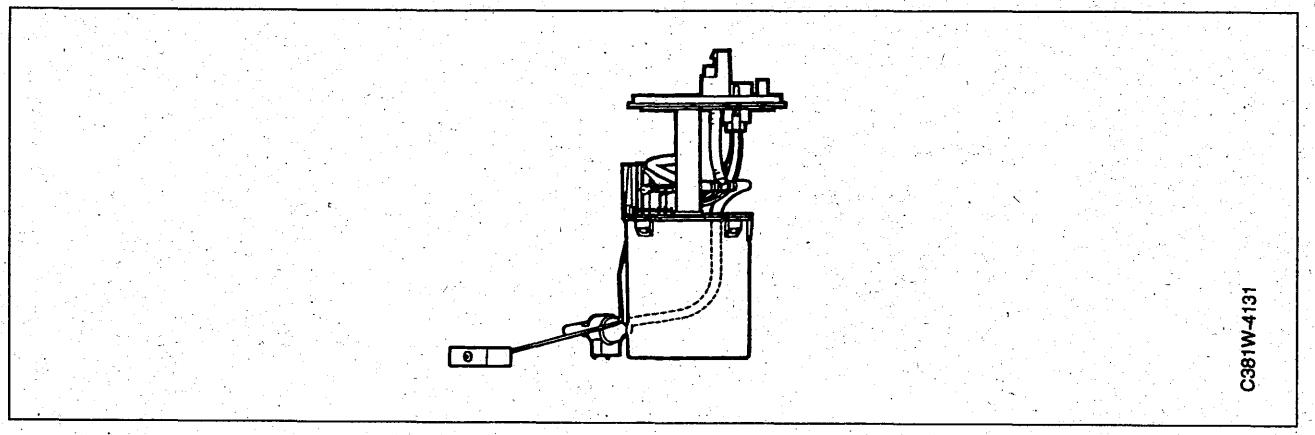
Resistance at 0°C(32°F)	kohms	5.8 - 6.2
10°C (50°F)	kohms	3.8 - 4.1
20°C (68°F)	kohms	2.5 - 2.8
30°C (86°F)	kohms	1.7 - 1.9
40°C (104°F)	kohms	1.2 - 1.4





Engine coolant temperature sensor

Resistance at 0°C (32°F)	kohms	5.7
10°C (50°F)	kohms	3.7
20°C (68°F)	kohms	2.4
30°C (86°F)	kohms	1.6
60°C (140°F)	Ohms	570
80°C (176°F)	Ohms	300
100°C (212°F)	Ohms	180
110°C (230°F)	Ohms	140
120°C (248°F)	Ohms	110



Fuel level sensor

Resistance	Ohms	25 - 370

Radiator fan

Stage 1

		4-cyl.	6-cyl.
Ignition on, fan starts at	°C (°F)	100 (212)	97 (207)
stops at	°C (°F)	96 (205)	93 (199)

After-running

Ignition on, fan starts at	°C (°F)	103(217) for both 4-cyl. and 6-cyl.
stops at	°C (°F)	<107(225) after 0.5 min. after-running >107(225) after 0.5 min. causes fan to run for a further 3 minutes

Stage 2

		4-cyl.	6-cyl.
Fan starts at	°C (°F)	111 (232)	108 (226)
Fan stops at	°C (°F)	107 (225)	104 (219)

A/C, switching on and off

		4-cyl.	6-cyl.
A/C switched off at	°C (°F)	119 (246)	116 (241)
on at	°C (°F)	118 (244)	115 (239)

Temperature display

		4-cyl.	6-cyl.
Horizontal position at	°C (°F)	80 (176)	77 (171)
Leaves horizontal position at	°C (°F)	113 (235)	110 (230)
Enters red zone at	°C (°F)	121.5 (250.7)	118.5 (245)

Other electrical equipment

Windscreen wiper motor

		-1989	1990-
Speed (double strokes per minute) and current consumption at 13.5 V			
Wet windscreen, half speed	rpm (A)	44 ± 4 (≤3)	44 +3/-4 (≤4.5)
Wet windscreen, full speed	rpm (A)	64 ± 6 (≤4)	64.5 ± 4.5 (≤7)
Current consumption, motor stalled (because wiper blades are frozen to windscreen, or for some other reason)	A	about 20	≤40

Headlamp wiper motor

Speed (double strokes/minute)	rpm	50-66
Current consumption	A	0.5-1.0
Current consumption, motor stalled (because wiper blades are frozen to windscreen, or for some other reason)	A	max. 6.5

(An integral PTC resistor connected in series protects the motor from damage when stalled.)

Rear window wiper motor

Speed, wet window (double strokes/minute)	rpm	38 ± 5
Current consumption, wet window	A	max. 4.5
Current consumption, no load	A	2.0
Current consumption, motor stalled (because wiper blades are frozen to windscreen, or for some other reason)	A	max. 14.0

(An integral PTC resistor connected in series protects the motor from damage when stalled.)

Electrically heated front seats

Rating at 12.5 V and trim	Contur W	80 ± 5
	Horisont W	90 ± 5

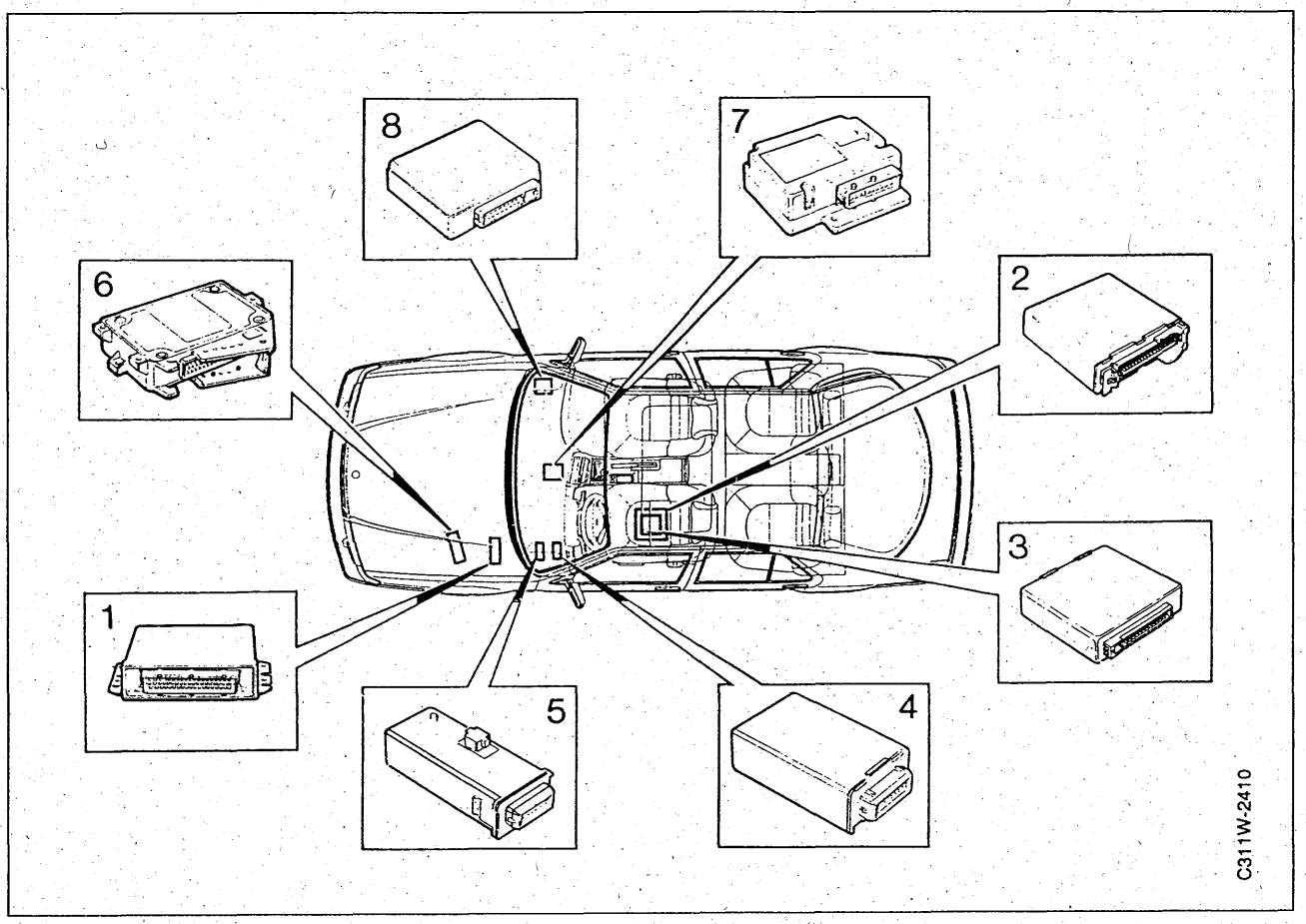
Electrically heated rear window

Rating at 12.5 V: 9000 CC (5-d)	W	235 ± 25
9000 CD (4-d)	W	190 ± 20
9000 CS (5-d)	W	250 ± 20

Control module, Cruise Control system (M1995-)

Number of pins	qty	10
Power supply (+54 circuit)	pin	F (6)
Power ground	pin	E (5)

Control module location M94



Since all Saab 9000 M1994 cars have the TRIONIC engine management system, the control modules for LH and DI/APC (EZK) are no longer fitted. The control module for the seat-belt tensioners is no longer fitted because all cars now have an airbag (or two) and the seat-belt tensioners are controlled from the airbag control module.

Engine systems

1 TRIONIC

The TRIONIC control module is located on a bracket in the bulkhead partition space. The bracket is mounted on the front bulkhead partition at the top on the left-hand side.

2 ETS

3 ASR

The ETS control module is mounted on a bracket under the left-hand front seat. On automatic transmission cars with an anti-spin system, an ASR control module is mounted in addition on top of the ETS control module.

Comfort systems

4 Cruise Control system

5 Central locking system

The control modules for the Cruise Control and central locking systems are mounted on a bracket at far left under the dashboard.

Safety systems

6 ABS or TC-ABS

The ABS or TC-ABS control module is mounted on the battery tray.

7 Airbag

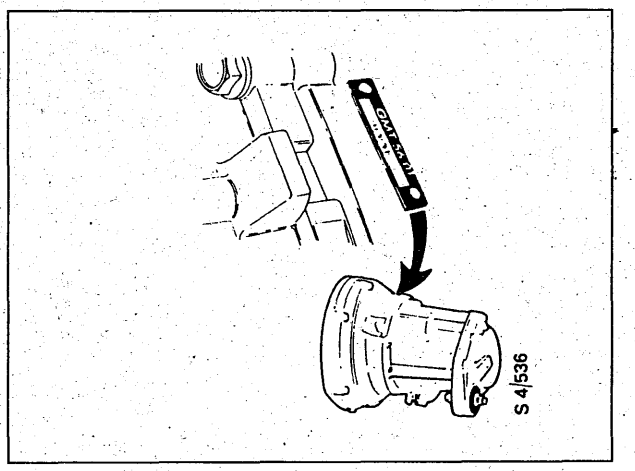
The airbag control module is mounted inside the cabin on a bracket in the front part of the centre console under the dashboard.

8 Anti-theft alarm

The anti-theft alarm control module is located inside the cabin behind the glove box and knee shield in the dashboard, on the right-hand side.

For more information on the electrical wiring diagrams, see Service Manual 3:2 "Electrical system, supplement". For descriptions of operation and fault diagnosis, see Service Manual 3:2 "Electrical system, wiring diagrams, operation and fault-tracing M1993" under the description of operation for the relevant system.

Transmission



Gearbox number

Type designation, model year 1987 and earlier

The type designation is punched on a plate affixed next to the gearbox serial number and signifies the following:

GM T 5 3 01

Type
GM = manual gearbox
GA = automatic transmission

Transversely mounted

Number of forward gears

Total ratio 5th gear

Variant, development stage

Serial number: 300,000 series

Type designation, model years 1988-1993

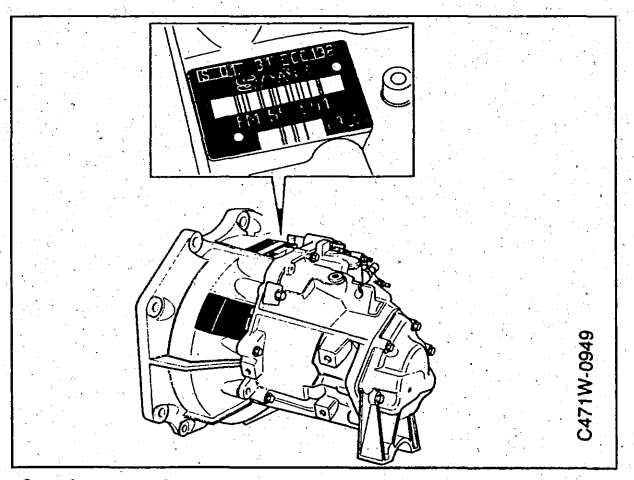
GM 6 5 1 01 12345

Version
GM = manual gearbox
GA = Automatic transmission
Adaptation
6 = adapted for i/S engines
7 = adapted for turbocharged engines
Number of forward gears
Gear ratio
Total ratio highest gear
See table below
Development version
Serial number

Type designation, model year 1994 and later

The type designation for a manual gearbox is divided into three groups of characters as in the following example:
FM55 001 A12345.

The three groups of characters are separated by spaces and contain different information about the gearbox as specified below.



Gearbox number

F M 5 5 0 01 A12345

First group:

Type of drive
- F = Front wheel drive

Type of gearbox
- A = Automatic transmission
- M = Manual gearbox

Number of forward gears

Total gear ratio, top gear (code)

Code	0	1	2	3	4	5	6	7	8	9
Gear ratio	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3

Second group:

Engine/Car adaptation
- 0 = Manual gearbox and automatic transmission adapted to B204I, B204E, B234I and B204S engines and manual gearbox adapted to B234E and B204L engines.
- 1 = Manual gearbox adapted to B204L and B234R engines.
- 2 = Automatic transmission adapted to B234E, B204L and B234L engines.
- 3 = Automatic transmission adapted to B308 engine.

Development variant

Third group:

Serial number

Manual gearboxes have a six character designation which starts with a letter showing the line on which the gearbox was fitted. Each number series consists of a five digit number.

Type designations

Manual gearbox		Type designation	Automatic transmission		Type designation
B202 turbo engine	1985	GMT 5301	B202 turbo engine	1987	GAT 4301
	1986	GMT 5301		1988	GA 74301
	1987	GMT 5401		1989	GA 74302
	1988	GM 75401		1990	GA 74303
	1989	GM 75301		1991	GA 74303
	1990	GM 75402		1992	GA 74307
	1991	GM 75402		1992 (with ASR)	GA 74308
	1992	GM 75402		1993	GA 74307
	1993	GM 75402		1993 (with ASR)	GA 74308
B204 turbo engine	1994-	FM 54001 or 54002	B204 turbo engine	1994-	FA 43001
B202S light pressure turbo	1993	GM 65103	B202S light pressure turbo	1993	GA 74307
B204S light pressure turbo	1994-	FM 51001	B204S light pressure turbo	1994-	FA 43001
B204E light pressure turbo	1996	FM 54003	B204E light pressure turbo	1996	FA 43005
B202 fuel injection engine	1986	GMT 5101	B202 fuel injection engine	1987	GAT 4102
	1987	GMT 5202		1988	GA 64101
	1987	GMT 5203		1989	GA 64102
	1988	GM 65101		1990	GA 64103
	1989	GM 65102		1991	GA 64103
	1990	GM 65102 or 65103		1992	GA 64107
				1993	GA 64107
	1991	GM 65103	B204 fuel injection engine	1994	FA 41001
	1992	GM 65103			
	1993	GM 65103			
B204 fuel injection engine	1994-	FM 51001			
B234 turbo engine	1991	GM 75403	B234 turbo engine	1991	GA 74304
	1992	GM 75404		1992	GA 74306
	1993	GM 75701		1992 (with ASR)	GA 74308
	1994-	FM 57001 or 57101		1993	GA 74309
				1993 (with ASR)	GA 74310
				1994-	FA 43201
				1996	FA 43205
B234 fuel injection engine	1990	GM 65103	B234 fuel injection engine	1990	GA 64104
	1991	GM 65103		1991 not US	GA 64104
	1992	GM 65103		1991 US	GA 64301
	1993	GM 65103		1992 not US	GA 64106
	1994-	FM 51001		1992 US	GA 64302
B234E light pressure turbo	1994-	FM 54001		1993 not US	GA 64106
	1995-	FM 57001 or 57101		1993 US	GA 64302
				1994- US	FA 43003
				1994- not US	FA 41003
			B234E light pressure turbo	1995	FA 43201
				1996	FA 43205
B308 fuel injection engine	1995-	FM 54001 or 54002	B308 fuel injection engine	1995-	FA 46302

Manual gearbox

Lubricants

Gearbox			Not ME: Motor oil (mineral oil) to API, SF/CC, SF/CD Viscosity: 10W30 or 10W40 **Synthetic motor oil must not be used** ME only: SHPD BP Vanellus FE Viscosity 10W30 or 15W40
Oil volume	–M1993 M1994–	l (qts) l (qts)	2.5 (2.65) 1.8 (1.91)
Weight, including oil		kg (lb)	47 (104)
Clutch release bearing			Permanently lubricated at the factory. Do not wash
Clutch shaft splines			Molycote Rapid G or Gleitmo molybdenum sulphide paste
Gear lever housing			Spray with Gleitmo 980 and allow to dry for about 15 minutes. Then apply Gleitmo 750.
Master cylinder plunger and seals			Gleitmo 750
Slave cylinder plunger and seals			Gleitmo 750
Inboard drive-shaft universal joint (tripod), incl. rubber gaiter		g	175 Mobil grease GS 57C **Important.** Observe cleanliness when carrying out work on the drive-shaft universal joints. Even the smallest amount of sand or other dirt will shorten the useful life of the universal joints.
Universal joint driver, intermediate shaft, right-hand side			MOLYCOTE Rapid G
Outboard drive-shaft universal joint		g	80 MOLYCOTE VN 2461C
Clutch pedal bearing			Gleitmo 750
Sealing compound between gearcase and clutch housing			LOCTITE 518
Seals			Shell Grease 1344 LIEP II
Seal, support sleeve			Shell Grease 1344 LIEP II

Clutch

Manufacturer		Fichtel/Sachs or AP (Borg/Beck)
Type		Single dry-plate clutch with diaphragm spring
Operation		Hydraulic
Diameter	mm (in)	228 (9), 215 (8 1/2), 216 (8 1/2), 240 (9 1/2) (Turbo M94–)

Tightening torques, model year 1993 and earlier

Output shaft bearing support	Nm (lbf ft)	26 ± 2 (19.2 ± 1.5)
Inner gear mechanism bolts	Nm (lbf ft)	22 ± 2 (16.3 ± 1.5)
Reverse gear selector	Nm (lbf ft)	22 ± 2 (16.3 ± 1.5)
Gear selector rod's gear-changing actuator	Nm (lbf ft)	22 ± 2 (16.3 ± 1.5)
Selector rod-selector rod universal joint	Nm (lbf ft)	30 $^{+3}/_{0}$(22.2$^{+2.2}/_{-0}$)
Parting surface, gear case/clutch housing	Nm (lbf ft)	22 ± 2 (16.3 ± 1.5)
Input shaft bearing support	Nm (lbf ft)	26 ± 2 (19.2 ± 1.5)
Slave cylinder	Nm (lbf ft)	9 ± 1 (6.7 ± 0.7)
Crown wheel bolts	Nm (lbf ft)	90 ± 10 (66.6 ± 7.4)
Bearing seat, left-hand driver	Nm (lbf ft)	22 ± 2 (16.3 ± 1.5)
Oil filler plug	Nm (lbf ft)	50 ± 10 (37.0 ± 7.4)
End cover retaining bolts	Nm (lbf ft)	22 ± 2 (16.3 ± 1.5)
Reversing-light switch	Nm (lbf ft)	22 ± 2 (16.3 ± 1.5)
Pressure plate	Nm (lbf ft)	20 ± 6 (14.8 ± 4.4)

Tightening torques, model year 1994 and later (F-35)

Output shaft bearing support	Nm (lbf ft)	38 ± 5 (28 ± 3.7) (countersunk head)
	Nm (lbf ft)	24 ± 4 (18 ± 3) (cylindrical head)
Inner gear mechanism bolts	Nm (lbf ft)	24 ± 4 (18 ± 3)
Reverse gear selector	Nm (lbf ft)	28 ± 2 (20.7 ± 1.5)
Gear selector rod's gear-changing actuator	Nm (lbf ft)	24 ± 4 (18 ± 3)
Selector rod-selector rod universal joint	Nm (lbf ft)	30 +5/-0 (22 +3.7/-0)
Parting surface of gear case/clutch housing	Nm (lbf ft)	24 ± 4 (18 ± 3)
Final gear wheel	Nm (lbf ft)	72 ± 3 (53 ± 2.2)
Bearing seat, driver	Nm (lbf ft)	24 ± 4 (17.7 ± 3)
Oil filler plug	Nm (lbf ft)	50 ± 10 (37 ± 7.4) (8 mm socket cap)
Oil drain plug	Nm (lbf ft)	50 ± 10 (37 ± 7.4)
Level plug	Nm (lbf ft)	50 ± 10 (37 ± 7.4)
End cover retaining bolts	Nm (lbf ft)	24 ± 4 (18 ± 3)
Reversing light switch	Nm (lbf ft)	24 ± 4 (18 ± 3)
Slave cylinder	Nm (lbf ft)	10 ± 2 (7.4 ± 1.5)
Differential bearing race, seal holder	Nm (lbf ft)	24 ± 4 (18 ± 3)
Clutch, flywheel	Nm (lbf ft)	22 ± 2 (16 ± 1.5)
Input shaft bearing support	Nm (lbf ft)	38 ± 5 (28 ± 3.7)
Reverse gear selector	Nm (lbf ft)	28 ± 2 (20.7 ± 1.5)
Bearing seat, driver	Nm (lbf ft)	24 ± 4 (17.7 ± 3)

Ratios (contd.)

Gear ratios

Year	Model	Gearbox number	Final-drive ratio	Overall ratio					
				1	2	3	4	5	Reverse
1985	9000T	GMT 5301	19:80 4.21	13.93	7.42	4.91	3.61	2.88	13.53
1986	9000T	GMT 5301	20:77 3.85	13.93	7.42	4.41	3.61	2.88	13.53
1986	9000i	GMT 5101	19:80 4.21	13.93	7.42	4.91	3.83	3.07	13.53
1987	9000i	GMT 5202	20:89 4.45	14.72	7.84	5.25	3.80	3.04	14.30
1987	9000i	GMT 5203	20:89 4.45	14.72	7.84	5.25	3.80	2.99	14.30
1987	9000T	GMT 5401	19:80 4.21	13.93	7.42	4.97	3.60	2.83	13.53
1988	9000i	GM 65101	20:89 4.45	14.72	7.84	5.25	3.98	3.13	14.30
1988	9000T	GM 75401	19:80 4.21	13.93	7.42	4.97	3.60	2.83	13.53
1989	9000i	GM 65102	20:89 4.45	15.06	7.84	5.25	3.98	3.13	14.30
1989	9000T	GM 75301	19:77 4.05	13.72	7.13	4.78	3.62	2.85	13.03
1990	9000T	GM 75402	21:85 4.05	13.70	7.12	4.77	3.62	2.85	13.01
1990	9000i	GM 65102 or GM 65103	20:89 4.45	15.06	7.84	5.25	3.98	3.13	14.30
1991	9000T (B202)	GM 75402	21:85 4.05	13.70	7.12	4.77	3.61	2.85	13.01
1991	9000T (B234)	GM 75403	21:85 4.05	13.70	7.12	4.77	3.61	2.85	13.01
1991	9000i	GM 65103	20:89 4.45	15.06	7.83	5.25	3.98	3.13	14.30
1992	9000T (B202)	GM 75402	21:85 4.05	13.70	7.12	4.77	3.61	2.85	13.01
1992	9000T (B234)	GM 75404	21:85 4.05	13.70	7.12	4.77	3.61	2.85	13.01
1992	9000i	GM 65103	20:89 4.45	15.06	7.83	5.25	3.98	3.13	14.30
1993	9000T (B202)	GM 75402	21:85 4.05	13.70	7.12	4.77	3.61	2.85	13.01
1993	9000T (B234)	GM 75701	23:83 3.61	12.21	6.35	4.26	3.22	2.54	11.60
1993	9000S (B202S)	GM 65103	20:89 4.45	15.06	7.83	5.25	3.98	3.13	14.30
1993	9000i	GM 65103	20:89 4.45	15.06	7.83	5.25	3.98	3.13	14.30

Year	Model	Gearbox number	Final-drive ratio	Overall ratio					
				1	2	3	4	5	Reverse
1994-	9000S (B204) 9000i (B204) 9000i (B234)	FM 51001	89:20 4.450	15.06	7.83	4.97	3.98	3.13	14.09
1994-	9000T (B204)	FM 54001 or 54002	85:21 4.048	13.70	7.12	4.52	3.62	2.85	12.82
1994-	9000T (B234)	FM 57001 or 57101	83:23 3.609	12.21	6.35	4.03	3.22	2.54	11.43
1995-	9000S (B234E)	FM 57001 or 57101	83:23 3.609	12.21	6.35	4.03	3.22	2.54	11.43
1995-	9000 V6 (B308)	FM 54001 or 54002	85:21 4.048	13.70	7.12	4.52	3.62	2.85	12.82
1996	9000S (B204E)	FM 54003	85:21 4.048	13.70	7.12	4.52	3.62	2.85	12.82

Speed

Year	Model	Gearbox number	Tyres	Road speed, km/h (mph) at 1000 rpm					
				1	2	3	4	5	Reverse
1985	9000T	GMT 5301	2)	8.1 (5.0)	15,1 (9.4)	22,9 (14.2)	31,2 (19.4)	39,2 (24.4)	8.4 (5.2)
1986	9000T	GMT 5301	4)	8.0 (5.0)	15,0 (9.3)	22,7 (14.1)	30.8 (19.1)	38,6 (24.0)	8.3 (5.2)
1986	9000i	GMT 5101	2)	8.0 (5.0)	15,1 (9.4)	22,7 (14.2)	29,4 (18.3)	36,9 (22.9)	8.4 (5.2)
1987	9000i	GMT 5202	1)	7.7 (4.8)	14,5 (9.0)	21,6 (13.4)	29,9 (18.6)	37,3 (23.2)	7.9 (4.9)
			2)	7.7 (4.8)	14,4 (8.9)	21,5 (13.4)	29,7 (18.4)	37,1 (23.0)	7.9 (4.9)
1987	9000i	GMT 5203	1)	7.7 (4.8)	14,5 (9.0)	21,6 (13.4)	29,9 (18.6)	38,0 (23.6)	7.9 (4.9)
			2)	7.7 (4.8)	14,4 (8.9)	21,5 (13.4)	29,7 (18.4)	37,7 (23.4)	7.9 (4.9)
1987	9000T	GMT 5401	1)	8.1 (5.0)	15,2 (9.4)	22,7 (14.1)	31,3 (19.4)	39,8 (24.7)	8.3 (5.2)
			2)	8.0 (5.0)	15,0 (9.3)	22,4 (13.9)	30.9 (19.2)	39,3 (24.4)	8.2 (5.1)
1988	9000i	GM 65101	1)	7.7 (4.8)	14,5 (9.0)	21,6 (13.4)	28,5 (17.7)	36,2 (22.5)	7.9 (4.9)
			2)	7.7 (4.8)	14,4 (8.9)	21,5 (13.4)	28,3 (17.6)	35,9 (22.3)	7.9 (4.9)
1988	9000T	GM 75401	3)	8.1 (5.0)	15,2 (9.4)	22,7 (14.1)	31,3 (19.4)	39,3 (24.7)	8.3 (5.2)
			4)	8.0 (5.0)	15,0 (9.3)	22,4 (13.9)	30.9 (19.2)	39,3 (24.4)	8.2 (5.1)
1989	9000i	GM 65102	1)	7.5 (4.7)	14,5 (9.0)	21,6 (13.4)	28,5 (17.7)	36,2 (22.5)	7.9 (4.9)
			5)/6)	7.7 (4.8)	14,7 (9.1)	22,0 (13.7)	29,0 (18.0)	36,8 (22.9)	8.1 (5.0)
			4)	7.4 (4.6)	14,2 (8.8)	21,2 (13.2)	28,0 (17.4)	35,5 (22.1)	7.8 (4.8)
1989	9000T	GM 75301	3)	8.2 (5.1)	15,8 (9.8)	23,6 (14.7)	31,1 (19.3)	39,6 (24.6)	8.7 (5.4)
			6)	8.4 (5.2)	16,2 (10.1)	24,1 (15.0)	31,9 (19.8)	40.5 (25.2)	8.9 (5.5)
			4)	8.1 (5.0)	15,6 (9.7)	22,3 (14.5)	30.7 (19.1)	39,0 (24.2)	8.5 (5.3)
			7)	8.2 (5.1)	15,7 (9.8)	23,4 (14.5)	30.9 (19.2)	39,3 (24.4)	8.5 (5.3)

1) 185/65 R15H: Dynamic rolling radius 301 mm
2) 195/60 R15H: Dynamic rolling radius 299 mm
3) 195/60 VR15: Dynamic rolling radius 299 mm
4) 205/55 VR15: Dynamic rolling radius 295 mm
5) 195/65 R15H: Dynamic rolling radius 306 mm
6) 195/65 VR15: Dynamic rolling radius 307 mm
7) 205/50 VR16: Dynamic rolling radius 297 mm
8) 205/50 ZR16: Dynamic rolling radius 297 mm
9) 205/60 ZR15: Dynamic rolling radius 306 mm
10) 195/65 TR15: Dynamic rolling radius 306 mm

Year	Model	Gearbox number	Tyres	Road speed, km/h (mph) at 1000 rpm					
				1	2	3	4	5	Reverse
1990	9000i	GM 65102 or 65103	1)	7.5 (4.7)	14,5 (9.0)	21,6 (13.4)	28,5 (17.7)	36,2 (22.5)	7.9 (4.9)
			5)/6)	7.7 (4.8)	14,7 (9.1)	22,0 (13.7)	29,0 (18.0)	36,8 (22.9)	8.1 (5.0)
			4)	7.4 (4.6)	14,2 (8.8)	21,2 (13.2)	28,0 (17.4)	35,5 (22.1)	7.8 (4.8)
1990	9000T	GM 75402	3)	8.2 (5.1)	15,8 (9.8)	23,6 (14.7)	31,2 (19.4)	39,6 (24.6)	8.7 (5.4)
			6)	8.4 (5.2)	16,2 (10.1)	24,2 (15.0)	31,9 (19.8)	40.5 (25.2)	8.9 (5.5)
			4)	8.1 (5.0)	15,6 (9.7)	23,3 (14.5)	30.7 (19.1)	39,0 (24.2)	8.5 (5.3)
			8)	8.2 (5.1)	15,7 (9.8)	23,4 (14.5)	31.0 (19.3)	39,3 (24.4)	8.6 (5.3)
1991	9000T (B202)	GM 75402	3)	8.2 (5.1)	15,8 (9.8)	23,6 (14.7)	31,2 (19.4)	39,6 (24.6)	8.7 (5.4)
			6)	8.4 (5.2)	16,2 (10.1)	24,2 (15.0)	31,9 19.8)	40.5 (25.2)	8.9 (5.5)
			4)	8.1 (5.0)	15,6 (9.7)	23,3 (14.5)	30.7 (19.1)	39,0 (24.2)	8.5 (5.3)
			7)	8.2 (5.1)	15,7 (9.8)	23,4 (14.5)	31,0 (19.3)	39,3 (24.4)	8.6 (5.3)
1991	9000T (B234)	GM 75403	3)	8.2 (5.1)	15,8 (9.8)	23,6 (14.7)	31,2 (19.4)	39,6 (24.6)	8.7 (5.4)
			6)	8.4 (5.2)	16,2 (10.1)	24,2 (15.0)	31,9 19.8)	40.5 (25.2)	8.9 (5,5)
			4)	8.1 (5.0)	15,6 (9.7)	23,3 (14.5)	30.7 (19.1)	39,0 (24.2)	8.5 (5.3)
			7)	8.2 (5.1)	15,7 (9.8)	23,4 (14.5)	31,0 (19.3)	39,3 (24.4)	8.6 (5.3)
1991	9000i	GM 65103	1)	7.5 (4.7)	14,5 (9.0)	21,6 (13.4)	28,5 (17.7)	36,2 (22.5)	7.9 (4.9)
			5)	7.7 (4.8)	14,7 (9.1)	22,0 (13.7)	29,0 (18.0)	36,8 (22.9)	8.1 (5.0)
			4)	7.4 (4.6)	14,2 (8.8)	21,2 (13.2)	28,0 (17.4)	35,5 (22.1)	7.8 (4.8)
			2)/3)	7.5 (4.7)	14,4 (8.9)	21,5 (13.4)	28,3 (17.6)	36,0 (22.4)	7.9 (4.9)
			7)	7.5 (4.7)	14,3 (8.9)	21,3 (13.2)	28,1 (17.5)	35,7 (22.2)	7.9 (4.9)

1) 185/65 R15H: Dynamic rolling radius 301 mm
2) 195/60 R15H: Dynamic rolling radius 299 mm
3) 195/60 VR15: Dynamic rolling radius 299 mm
4) 205/55 VR15: Dynamic rolling radius 295 mm
5) 195/65 R15H: Dynamic rolling radius 306 mm
6) 195/65 VR15: Dynamic rolling radius 307 mm
7) 205/50 VR16: Dynamic rolling radius 297 mm
8) 205/50 ZR16: Dynamic rolling radius 297 mm
9) 205/60 ZR15: Dynamic rolling radius 306 mm
10) 195/65 TR15: Dynamic rolling radius 306 mm

Year	Model	Gearbox number	Tyres	Road speed, km/h (mph) at 1000 rpm					
				1	2	3	4	5	Reverse
1992	9000T (B202)	GM 75402	6)	8.4 (5.2)	16,2 (10.1)	24,2 (15.0)	31,9 19.8)	40.5 (25.2)	8.9 (5.5)
			9)	8.4 (5.2)	16,2 (10.1)	24,2 (15.0)	31,9 (19.8)	40.5 (25.2)	8.9 (5.5)
			7)	8.2 (5.1)	15,7 (9.8)	23,5 (14.5)	31,0 (19.3)	39,3 (24.4)	8.6 (5.3)
1992	9000T (B234)	GM 75404	6)	8.4 (5.2)	16,2 (10.1)	24,2 (15.0)	31,9 (19.8)	40.5 (25.2)	8.9 (5.5)
			9)	8.4 (5.2)	16,2 (10.1)	24,2 (15.0)	31,9 (19.8)	40.5 (25.2)	8.9 (5.5)
			7)	8.2 (5.1)	15,7 (9.8)	23,5 (14.5)	31,0 (19.3)	39,3 (24.4)	8.6 (5.3)
1992	9000i	GM 65103	10)	7.7 (4.8)	14,7 (9.1)	22,0 (13.7)	29,0 (18.0)	36,8 (22.9)	8.1 (5.0)
			6)	7.7 (4.8)	14,7 (9.1)	22,0 (13.7)	29,0 (18.0)	36,8 (22.9)	8.1 (5.0)
			9)	7.7 (4.6)	14,7 (8.8)	22,0 (13.2)	29,0 (17.4)	36,8 (22.1)	8.1 (4.8)
			8)	7.4 (4.6)	14,3 (9.1)	21,3 (13.2)	28,2 (17.5)	35,8 (22.2)	7.8 (4.8)
1993	9000T (B202)	GM 75402	6)	8.4 (5.2)	16,2 (10.1)	24,2 (15.0)	31,9 19.8)	40.5 (25.2)	8.9 (5.5)
			9)/11)	8.4 (5.2)	16,2 (10.1)	24,2 (15.0)	31,9 (19.8)	40.5 (25.2)	8.9 (5.5)
			7)	8.2 (5.1)	15,7 (9.8)	23,5 (14.5)	31,0 (19.3)	39,3 (24.4)	8.6 (5.3)
1993	9000T (B234)	GM 75701	6)/9)/11)	9.4 (5.8)	18,2 (11.3)	27,1 (16.8)	35,8 (22.2)	45,4 (28.2)	9.9 (6.1)
			8)	9.2 (5.7)	17,6 (10.9)	26,3 (16.3)	34,7 (21.5)	44,1 (27.4)	9.7 (6.0)
1993	9000S (B202S) 9000i	GM 65103	5)/6)/9)/11)	7.7 (4.8)	14,7 (9.1)	22,0 (13.7)	29,0 (18.0)	36,8 (22.9)	8.1 (5.0)
			8)	7.4 (4.6)	14,3 (9.1)	21,3 (13.2)	28,2 (17.5)	35,8 (22.2)	7.8 (4.8)

1) 185/65 R15H: Dynamic rolling radius 301 mm
2) 195/60 R15H: Dynamic rolling radius 299 mm
3) 195/60 VR15: Dynamic rolling radius 299 mm
4) 205/55 VR15: Dynamic rolling radius 295 mm
5) 195/65 R15H: Dynamic rolling radius 306 mm
6) 195/65 VR15: Dynamic rolling radius 307 mm
7) 205/50 VR16: Dynamic rolling radius 297 mm
8) 205/50 ZR16: Dynamic rolling radius 297 mm
9) 205/60 ZR15: Dynamic rolling radius 306 mm
10) 195/65 TR15: Dynamic rolling radius 306 mm
11) 205/55 ZR16: Dynamic rolling radius 306 mm

Year	Model	Gearbox number	Tyres	Road speed, km/h (mph) at 1000 rpm					
				1	2	3	4	5	Reverse
1994-	9000S (B204S) 9000i (B204, B234)	FM 51001	12)	7.7 (4.8)	14,8 (9.2)	23,2 (14.4)	29,1 (18.0)	37,0 (22.9)	8.2 (5.0)
			9)	7.7 (4.8)	14,7 (9.1)	23,2 (14.3)	29,0 (18.0)	36,8 (22.8)	8.2 (5.0)
1994-	9000T (B204)	FM 54001 or 54002	12)	8.4 (5.2)	16,2 (10.1)	25,6 (15.9)	32,0 (19.8)	40.5 (25.2)	9.0 (5.1)
			9)	8.4 (5.2)	16,2 (10.1)	25,5 (15.8)	31,9 (19.8)	40.5 (25.2)	9.0 (5.6)
1994-	9000T (B234)	FM 57001 or 57101	12)	9.5 (5.9)	18,2 (11.3)	28,7 (17.8)	35,9 (22.3)	45,6 (28.3)	10.1 (6.2)
			9)	9.4 (5.8)	18,2 (11.3)	28,6 (17.8)	35,8 (22.2)	45,4 (28.1)	10.1 (6.3)
			11)	9.4 (5.8)	18,2 (11.3)	28,6 (17.8)	35,8 (22.2)	45,4 (28.1)	10.1 (6.3)
1995-	9000S (B234E)	FM 57001 or 57101	6)	9.5 (5.9)	18,2 (11.3)	28,7 (17.8)	35,9 (22.3)	45,6 (28.3)	10.1 (6.2)
			13), 14)	9.4 (5.8)	18,2 (11.3)	28,6 (17.8)	35,8 (22.2)	45,4 (28.1)	10.1 (6.3)
1995-	9000 V6 (B308)	FM 54001 or 54002	12)	8.4 (5.2)	16,2 (10.1)	25,6 (15.9)	32,0 (19.8)	40.5 (25.2)	9.0 (5.1)
			9)	8.4 (5.2)	16,2 (10.1)	25,5 (15.8)	31,9 (19.8)	40.5 (25.2)	9.0 (5.6)
1996	9000S (B203E)	FM 54003	6)	8.4 (5.2)	16,2 (10.1)	25,6 (15.9)	32,0 (19.8)	40.5 (25.2)	9.0 (5.1)
			13), 14)	8.4 (5.2)	16,2 (10.1)	25,5 (15.8)	31,9 (19.8)	40.5 (25.2)	9.0 (5.6)

1) 185/65 R15H: Dynamic rolling radius 301 mm
2) 195/60 R15H: Dynamic rolling radius 299 mm
3) 195/60 VR15: Dynamic rolling radius 299 mm
4) 205/55 VR15: Dynamic rolling radius 295 mm
5) 195/65 R15H: Dynamic rolling radius 306 mm
6) 195/65 VR15: Dynamic rolling radius 307 mm
7) 205/50 VR16: Dynamic rolling radius 297 mm
8) 205/50 ZR16: Dynamic rolling radius 297 mm
9) 205/60 ZR15: Dynamic rolling radius 306 mm
10) 195/65 TR15: Dynamic rolling radius 306 mm
11) 205/55 ZR16: Dynamic rolling radius 306 mm
12) 195/65 R15 T/V: Dynamic rolling radius 307 mm
13) 205/60 VR15: Dynamic rolling radius 306 mm
14) 205/55 WR16: Dynamic rolling radius 306 mm

Automatic transmission

Capacity

		2-stage governor Turbo	3-stage governor Turbo	2-stage governor 9000i/S	3-stage governor 9000i/S	3-stage governor 9000i 2.3	3-stage governor Turbo 2.3
Input torque	Nm	max. 270	max. 270	max. 170	max. 170	max. 210	max. 300
Maximum torque ratio in the torque converter		1:1-1:2.5	1:1-1.2.5	1:1-1:2.67	1:1-1:2.67	1:1-1:2.67	1:1-1:2.67
Torque converter diameter	mm	260	260	260	260	260	260
Ratio:							
1st gear		2.58	2.58	2.58	2.58	2.58	2.58
2nd gear		1.41	1.41	1.41	1.41	1.41	1.41
3rd gear		1.0	1.0	1.0	1.0	1.0	1.0
4th gear		0.74	0.74	0.74	0.74	0.74	0.78
Reverse gear		2.88	2.88	2.88	2.88	2.88	2.88

Weight, fluid capacity and fluid grade

		2-stage governor Turbo	3-stage governor Turbo	2-stage governor 9000i/S	3-stage governor 9000i/S	3-stage governor 9000i 2.3	3-stage governor Turbo 2.3
Transmission (without torque converter, without fluid)	kg	approx. 55.0	approx. 55.0	approx. 55.0	approx. 55.0	approx. 55.0	approx. 55.0
Torque converter	kg	approx. 10.5	approx. 10.5	approx. 10.5	approx. 10.5	approx. 10.5	approx. 10.5
Volume of fluid (incl. torque converter and fluid cooler)	l	approx. 8.2	approx. 8.2	approx. 8.2	approx. 8.2	approx. 8.7	approx. 8.7
Fluid quantity when changing fluid	l	3.0 - 3.5	3.0 - 3.5	3.0 - 3.5	3.0 - 3.5	3.0 - 3.5	3.0 - 3.5
Grade of fluid		Not ME: DEXRON II automatic transmission fluid ME only: ATF DEXRON IIE automatic transmission fluid					
Grease, inboard universal joint driver	80g	Alternative 1. Mobile grease K575GS Alternative 2. Mobile grease GS57C Alternative 3. Quaker State multipurpose lubricant 50221					

Shifting points

Minimum throttle and accelerator steady

		2-stage governor Turbo	3-stage governor Turbo, 9000E	2-stage governor 9000i/S	3-stage governor 9000i/S	3-stage governor 9000i 2.3	3-stage governor 9000S, 2.3 US/CA
Upshifting to 2nd gear at	km/h (mph)	26-38 (16-24)	19-25 (12-15)	18-28 (11-17)	18-24 (11-15)	18-24 (12-15)	19-25 (12-15)
Upshifting to 3rd gear at	km/h (mph)	44-56 (27-34)	40-50 (25-31)	38-48 (24-30)	37-47 (23-29)	37-47 23-29)	40-50 (25-31)
Upshifting to 4th gear at	km/h (mph)	65-77 (40-48)	56-73 (34-45)	58-70 (36-44)	53-68 (33-42)	53-68 (33-42)	58-75 (36-46)

		3-stage governor B308					
Upshifting to 2nd gear at	km/h (mph)	22-28 (13-17)					
Upshifting to 3rd gear at	km/h (mph)	43-53 (26-32)					
Upshifting to 4th gear at	km/h (mph)	72-83 (44-51)					

Accelerator depressed to kickdown position and held there

		2-stage governor Turbo	3-stage governor Turbo	2-stage governor 9000i/S	3-stage governor 9000i/S	3-stage governor B308	
Upshifting to 2nd gear at 5400 ± 300 rpm	km/h (mph)	57-67 (35-42)	56-66 (34-41)	52-62 (32-38)	52-62 (32-38)	63-73 (39-45)	
Upshifting to 3rd gear at 5400 ± 300 rpm	km/h (mph)	109-121 (68-75)	108-120 (67-74)	102-112 (63-70)	100-111 (62-69)	122-136 (75-83)	
Upshifting to 4th gear at 5400 ± 300 rpm Upshifting to 4th gear at 5100 ± 300 rpm (3-stage governor) (model years 1988- 1990)	km/h (mph)	157-169 (98-105)	140-157 (87-97)	139-149 (86-93)	131-147 (81-91)	165-191 (101-117)	

		3-stage governor 9000i 2.3	3-stage governor 9000S, 2.3 US/CA	3-stage governor Turbo 2.3			
Upshifting to 2nd gear at 5400 ± 300 rpm	km/h (mph)	52-62 (32-38)	56-66 (34-41)	58-68 (36-42)			
Upshifting to 3rd gear at 5400 ± 300 rpm	km/h (mph)	100-111 (62-69)	108-120 (67-74)	111-125 (69-78)			
Upshifting to 4th gear at 5400 ± 300 rpm Upshifting to 4th gear at 5100 ± 300 rpm (3-stage governor) (model years 1988- 1990)	km/h (mph)	141-159 (87-98)	161-173 (100-107)	160-175 (99-109)			

Accelerator depressed to kickdown position at various speeds

		2-stage governor Turbo	3-stage governor Turbo	2-stage governor 9000i/S	3-stage governor 9000i/S	3-stage governor 9000i 2.3	3-stage governor 9000S US/CA, Turbo 2.3, 9000E
Maximum downshifting speed, 4th - 3rd	km/h (mph)	139-151 (86-94)	139-151 (86-94)	125-135 (78-84)	125-135 (78-84)	125-135 (78-84)	142-154 (88-96)
Maximum downshifting speed, 3rd - 2nd	km/h (mph)	90-102 (56-63)	90-100 (56-62)	82-92 (51-57)	82-92 (51-57)	82-92 (51-57)	92-102 (57-63)
Maximum downshifting speed, 2nd - 1st	km/h (mph)	55-65 (34-40)	45-55 (28-34)	45-55 (28-34)	40-50 (25-31)	40-50 (25-31)	45-55 (28-34)

Ratios

Year	Model	Gearbox number	Primary drive (Intermediate drive)	Final drive ratio	Overall ratio				
					1	2	3	4	Reverse
1987	9000i	GAT 4102	0.98	4.28	10.64	5.91	4.20	3.12	12.10
	9000T	GAT 4301	0.90	4.28	9.91	5.41	3.84	2.85	11.07
1988	9000i	GA 64101	0.98	4.28	10.64	5.91	4.20	3.12	12.10
	9000T	GA 74301	0.90	4.28	9.91	5.41	3.84	2.85	11.07
1989	9000i	GA 64102	0.98	4.28	10.84	5.91	4.20	3.12	12.10
	9000T	GA 74302	0.90	4.28	9.91	5.41	3.84	2.85	11.07
1990	9000i	GA 64103	0.98	4.28	10.84	5.91	4.20	3.12	12.10
	9000i, 2.3 l	GA 64104	0.98	4.28	10.84	5.91	4.20	3.12	12.10
	9000T	GA 74303	0.90	4.28	9.91	5.41	3.84	2.85	11.07
1991	9000i	GA 64103	0.98	4.28	10.84	5.91	4.20	3.12	12.10
	9000i, 2.3 l not US	GA 64104	0.98	4.28	10.84	5.91	4.20	3.12	12.10
	9000i, 2.3 l US	GA 64301	0.98	4.28	10.84	5.91	4.20	3.12	12.10
	9000T	GA 74303	0.90	4.28	9.91	5.41	3.84	2.85	11.07
1992	9000i	GA 64107	0.98	4.28	10.84	5.91	4.20	3.12	12.10
	9000i, 2.3 l not US	GA 64106	0.98	4.28	10.84	5.91	4.20	3.12	12.10
	9000i, 2.3 l US	GA 64302	0.98	4.28	10.84	5.91	4.20	3.12	12.10
	9000T	GA 74307/GA 74308	0.90	4.28	9.91	5.41	3.84	2.85	11.07
	9000T, 2.3 l	GA 74306/GA 74308	0.90	4.28	9.91	5.41	3.84	2.85	11.07
1993	9000i	GA 64107	0.98	4.28	10.84	5.91	4.20	3.12	12.10
	9000i, 2.3 l not US	GA 64106	0.98	4.28	10.84	5.91	4.20	3.12	12.10
	9000i, 2.3 l US	GA 64302	0.98	4.28	10.84	5.91	4.20	3.12	12.10
	9000S	GA 74307	0.90	4.28	9.91	5.41	3.84	2.85	11.07
	9000T	GA 74307/GA 74308	0.90	4.28	9.91	5.41	3.84	2.85	11.07
	9000T, 2.3 l	GA 74309/GA 74310	0.90	4.28	9.91	5.41	3.84	2.85	11.07
1994-	9000 2.0i	FA 41001	0.98	4.28	10.84	5.91	4.20	3.2	12.11
	9000 2.3i	FA 41003	0.98	4.28	10.84	5.91	4.20	3.2	12.11
	9000 2.3i US, CA	FA 43003	0.90	4.28	9.91	5.41	3.84	2.85	11.08
	9000S, 2.0T	FA 43001	0.90	4.28	9.91	5.41	3.84	2.85	11.08
	9000E, 2.3T	FA 43201	0.90	4.28	9.91	5.41	3.84	2.85	11.08
1995-	9000 V6	FA 46302	0.98	3.57	9.05	4.93	3.51	2.60	10.11
1996	9000S (2.0) 9000E (2.3)	FA 43005	0.90	4,28	9.91	5,41	3.84	2.85	11,08

Speed

Year	Model	Gearbox number	Tyres	Speed, km/h per 1000 rpm				
				1	2	3	4	Re-verse
1987	9000i	GAT 4102	1)	10.7	19,2	27,0	36,4	9.4
			2)	10.6	19,1	26,8	36,1	9.3
	9000T	GAT 4301	3)	11,4	20.8	29,4	39,6	10.2
			4)	11,2	20.6	29,0	39,0	10.0
1988	9000i	GA 64101	1)	10.7	19,2	27,0	36,4	9.4
			4)	10.5	18,8	26,5	35,6	9.2
	9000T	GA 74301	3)	11,4	20.8	29,4	39,6	10.2
			6)	11,7	21,4	31,1	40.6	10.5
			4)	11,2	20.6	29,0	39,0	10.0
1989	9000i	GA 64102	1)	10.5	19,2	27,0	36,4	9.4
			5)/6)	10.7	19,5	27,5	37,0	9.5
			4)	10.3	18,8	26,4	35,7	9.2
	9000T	GA 74302	3)	11,4	20.8	29,4	39,6	10.2
			6)	11,6	21,3	30.0	40.5	10.4
			4)	11,2	20.6	29,0	39,0	10.0
1990	9000i	GA 64103	1)	10.5	19,2	27,0	36,4	9.4
			5)/6)	10.7	19,5	27,5	37,0	9.5
			2)/3)	10.4	19,1	26,9	36,2	9.3
			4)	10.3	18,8	26,4	35,7	9.5
			7)/8)	10.4	18,9	26,7	35,9	9.2
	9000i, 2.3 l	GA 64104	1)	10.5	19,2	27,0	36,4	9.4
			5)/6)	10.7	19,5	27,5	37,0	9.5
			2)/3)	10.4	19,1	26,9	36,2	9.3
			4)	10.3	18,8	26,4	35,7	9.5
			7)/8)	10.4	18,9	26,7	35,9	9.2
	9000T	GA 74303	2)/3)	11,4	20.8	29,4	39,6	10.2
			5)/6)	11,6	21,3	30.0	40.5	10.4
			4)	11,2	20.6	29,0	39,0	10.0
			7)/8)	11,3	20.7	29,1	39,3	10.1

1) 185/65 R15H: Dynamic rolling radius 301 mm
2) 195/60 R15H: Dynamic rolling radius 299 mm
3) 195/60 VR15: Dynamic rolling radius 299 mm
4) 205/55 VR15: Dynamic rolling radius 295 mm
5) 195/65 R15H: Dynamic rolling radius 306 mm
6) 195/65 VR15: Dynamic rolling radius 307 mm
7) 205/50 VR16: Dynamic rolling radius 297 mm
8) 205/50 ZR16: Dynamic rolling radius 297 mm
9) 205/60 ZR15: Dynamic rolling radius 306 mm
10) 195/65 TR15: Dynamic rolling radius 306 mm

Year	Model	Gearbox number	Tyres	Speed, km/h per 1000 rpm				
				1	2	3	4	Re-verse
1991	9000i	GA 64103	1)	10.5	19,2	27,0	36,4	9.4
			5)/6)	10.7	19,5	27,5	37,0	9.5
			3)	10.4	19,1	26,9	36,2	9.3
			4)	10.3	18,8	26,4	35,7	9.5
			7)/8)	10.4	18,9	26,7	35,9	9.2
	9000i, 2.3 I not US	GA 64104	1)	10.5	19,2	27,0	36,4	9.4
			5)/6)	10.7	19,5	27,5	37,0	9.5
			3)	10.4	19,1	26,9	36,2	9.3
			4)	10.3	18,8	26,4	35,7	9.5
			7)/8)	10.4	18,9	26,7	35,9	9.2
	9000i, 2.3 I US	GA 64301	1)	10.5	19,2	27,0	36,4	9.4
			5)/6)	10.7	19,5	27,5	37,0	9.5
			3)	10.4	19,1	26,9	36,2	9.3
			4)	10.3	18,8	26,4	35,7	9.5
			7)/8)	10.4	18,9	26,7	35,9	9.2
	9000T	GA 74303	3)	11,4	20.8	29,4	39,6	10.2
			5)/6)	11,6	21,3	30.0	40.5	10.4
			4)	11,2	20.6	29,0	39,0	10.0
			7)/8)	11,3	20.7	29,1	39,3	10.1
1992	9000i	GA 64107	6)/10)	10.6	19,5	27,5	37,0	9.5
			9)	10.6	19,5	27,5	37,0	9.5
			8)	10.3	18,9	26,7	35,9	9.3
	9000i, 2.3 I not US	GA 64106	6)/10)	10.6	19,5	27,5	37,0	9.5
			9)	10.6	19,5	27,5	37,0	9.5
			8)	10.3	18,9	26,7	35,9	9.3
	9000i, 2.3 I US	GA 64302	6)/10)	10.6	19,5	27,5	37,0	9.5
			9)	10.6	19,5	27,5	37,0	9.5
			8)	10.3	18,9	26,7	35,9	9.3
	9000T	GA 74307/ GA 74308	6)/10)	11,6	21,3	30.0	40.5	10.4
			9)	11,6	21,3	30.0	40.5	10.4
			8)	11,3	20.7	29,2	39,3	10.1
	9000T, 2.3 I	GA 74306/ GA 74308	6)/10)	11,6	21,3	30.0	40.5	10.4
			9)	11,6	21,3	30.0	40.5	10.4
			8)	11,3	20.7	29,2	39,3	10.1

1) 185/65 R15H: Dynamic rolling radius 301 mm
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4) 205/55 VR15: Dynamic rolling radius 295 mm
5) 195/65 R15H: Dynamic rolling radius 306 mm
6) 195/65 VR15: Dynamic rolling radius 307 mm
7) 205/50 VR16: Dynamic rolling radius 297 mm
8) 205/50 ZR16: Dynamic rolling radius 297 mm
9) 205/60 ZR15: Dynamic rolling radius 306 mm
10) 195/65 TR15: Dynamic rolling radius 306 mm

Year	Model	Gearbox number	Tyres	Speed, km/h per 1000 rpm				
				1	2	3	4	Re-verse
1993	9000i	GA 64107	6)/9)/10)/11)	10.6	19,5	27,5	37,0	9.5
			8)	10.3	18,9	26,7	35,9	9.3
	9000i, 2.3 I not US	GA 64106	6)/9)/10)/11)	10.6	19,5	27,5	37,0	9.5
			8)	10.3	18,9	26,7	35,9	9.3
	9000i, 2.3 I US	GA 64302	6)/9)/10)/11)	10.6	19,5	27,5	37,0	9.5
			8)	10.3	18,9	26,7	35,9	9.3
	9000S	GA 74307/ GA 74308	6)/9)/10)/11)	11,6	21,3	30.0	40.5	10.4
	9000T	GA 74307/	6)/9)/10)/11	11,6	21,3	30.0	40.5	10.4
		GA 74308	8)	11,3	20.7	29,2	39,3	10.1
	9000T, 2.3 I	GA 74309/	6)/9)/10)/11)	11,6	21,3	30.0	40.5	10.4
		GA 74310	8)	11,3	20.7	29,2	39,3	10.1
1994-	9000i 2.0	FA 41001	12)	10.7	19,6	27,5	37,1	9.6
	9000i 2.3	FA 41003	12)	10.7	19,6	27,5	37,1	9.6
	9000i 2.3 US, CA	FA 43003	9)/11)	11,6	21,3	30.0	40.4	10.4
			12)	11,7	21,4	30.1	40.6	10.4
	9000S, 2.0T	FA 43001	9)/11)	11,6	21,3	30.0	40.4	10.4
			12)	11,7	21,4	30.1	40.6	10.4
	9000T, 2.0, 9000E	FA 43201	9)/11)	11,6	21,3	30.0	40.4	10.4
			12)	11,7	21,4	30.1	40.6	10.4
1995-	9000 V6	FA 46302	6)	12,5	22,9	32,2	43,4	11,2
			9)/11)	12,8	23,4	32,9	44,3	11,4
1996	9000S (2.0)	FA 43005	6)	11,7	21,4	30.1	40.6	10.4
	9000E (2.3)		13)/14)	11,6	21,3	30.0	40.4	10.4

1) 185/65 R15H: Dynamic rolling radius 301 mm
2) 195/60 R15H: Dynamic rolling radius 299 mm
3) 195/60 VR15: Dynamic rolling radius 299 mm
4) 205/55 VR15: Dynamic rolling radius 295 mm
5) 195/65 R15H: Dynamic rolling radius 306 mm
6) 195/65 VR15: Dynamic rolling radius 307 mm
7) 205/50 VR16: Dynamic rolling radius 297 mm
8) 205/50 ZR16: Dynamic rolling radius 297 mm
9) 205/60 ZR15: Dynamic rolling radius 306 mm
10) 195/65 TR15: Dynamic rolling radius 306 mm
11) 205/55 ZR16: Dynamic rolling radius 306 mm
12) 195/65 R15 T/V: Dynamic rolling radius 307 mm
13) 205/60 VR15: Dynamic rolling radius 306 mm
14) 205/55 WR16: Dynamic rolling radius 306 mm

Setting values, 9000E/Turbo

Speeds and pressures, warm transmission		Position R	Position N	Position D	Position 1
Idling	rpm	900	875	900	900
System pressure at idling speed	bar	11.3 ± 1.0	7.5 ± 0.4	7.5 ± 0.4	7.5 ± 0.4
System pressure at idling speed with kickdown cable fully withdrawn	bar	18.0 +3.0/-0	13.0 ± 0.7	13.0 ± 0.7	13.0 ± 0.7

Important

Stall tests must not be performed on turbo cars.

Setting values, 9000i/S

Speeds and pressures, warm transmission		Position R	Position N	Position D	Position 1
Idling	rpm	950	875	950	950
System pressure at idling speed	bar	11.3 ± 1.0	7.5 ± 0.4	7.5 ± 0.4	7.5 ± 0.4
System pressure at idling speed with kickdown cable fully withdrawn	bar	17.0 +2.0/-1.0	12.3 ± 0.7	12.3 ± 0.7	12.3 ± 0.7
Stalling speed in positions D and 1, max. 5 seconds	rpm			2300-2700	2300-2700
Stalling speed in positions D and 1, max. 5 seconds (9000i 2.3)	rpm			2600-3000	2600-3000

Setting values, 9000 V6

Speeds and pressures, warm transmission		Position R	Position N	Position D	Position 1
Idling	rpm	950	875	950	950
System pressure at idling speed	bar	11.3 ± 1.0	7.5 ± 0.4	7.5 ± 0.4	7.5 ± 0.4
System pressure at idling speed with kickdown cable fully withdrawn	bar	17.0 +2.0/-1.0	12.3 ± 0.7	12.3 ± 0.7	12.3 ± 0.7
Stalling speed in positions D and 1, max. 5 seconds	rpm			1900-2400	1900-2400

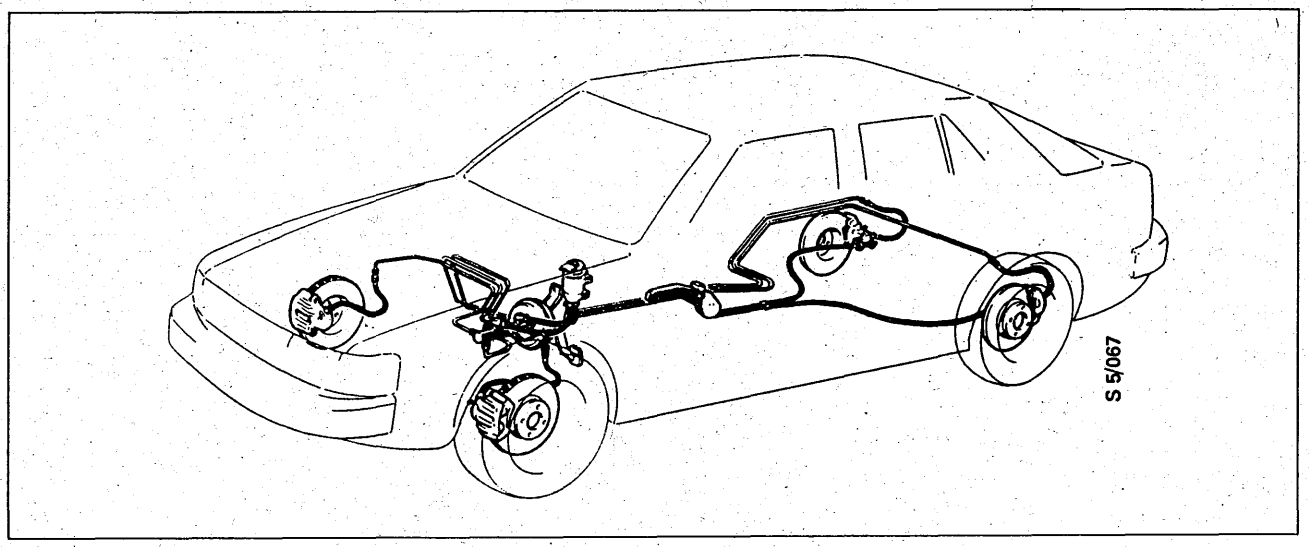
Important

The system pressures specified above presuppose a fluid temperature of +40 - 50°C (+105 - 120°F).

Tightening torques

Inboard universal joint driver bearing support	Nm (lbf ft)	22 ± 3 (17 ± 2.2)	
Parting surface of gear case/torque converter housing	Nm (lbf ft)	23 ± 3 (17 ± 2.2)	
Parting surface, torque converter/ engine	Nm (lbf ft)	70 ± 20 (50 ± 15)	
Valve body cover retaining bolts	Nm (lbf ft)	6 ± 1 (4 ± 0.7)	
Parting surface, gear case/valve body	Nm (lbf ft)	10 ± 1 (7 ± 0.7)	
Filter cover, gear case	Nm (lbf ft)	8 ± 1 (6 ± 0.7)	
Intermediate gear cover, gear case	Nm (lbf ft)	10 ± 1 (7 ± 0.7)	
Brake band, adjusting screw	Nm (lbf ft)	10 ± 0 (7 ± 0)	Back off two turns
Brake band, locknut	Nm (lbf ft)	50 ± 10 (37 ± 7.4)	
Crown wheel	Nm (lbf ft)	77 ± 11 (57 ± 8.1)	
Intermediate plate, gear case	Nm (lbf ft)	10 ± 1 (7 ± 0.7)	
Parting surface, pump/intermediate plate	Nm (lbf ft)	10 ± 1 (7 ± 0.7)	
Pinion, output shaft	Nm (lbf ft)	150 ± 22 (111 ± 16.2)	
Pinion, pinion shaft, 24 mm long bolt	Nm (lbf ft)	150 ± 22 (111 ± 16.2)	
Pinion, pinion shaft, 70 mm long bolt	Nm (lbf ft)	170 ± 25 (125 ± 18.4)	
Pinion, output shaft, 2.3T	Nm (lbf ft)	170 ± 25 (125 ± 18.4)	(M91 and later½)
Pinion, pinion shaft, 2.3T	Nm (lbf ft)	170 ± 25 (125 ± 18.4)	(M91 and later½)
Nut, 1st gear freewheel	Nm (lbf ft)	50 ± 7 (37 ± 5.1)	
Governor, retaining bolts	Nm (lbf ft)	10 ± 1 (7 ± 0.7)	
Shaft plug, parking detent	Nm (lbf ft)	32 ± 5 (24 ± 3.7)	
Plug, pressure take-off, governor	Nm (lbf ft)	15 ± 2 (11 ± 1.5)	
Plug, pressure take-off, system pressure	Nm (lbf ft)	15 ± 2 (11 ± 1.5)	
Drain plug, ATF fluid	Nm (lbf ft)	45 ± 7 (33 ± 5.1)	
Torque converter, 19 mm bolt head	Nm (lbf ft)	58 ± 9 (42.5 ± 7)	
Torque converter, 17 mm bolt head	Nm (lbf ft)	38 ± 5 (28 ± 3.7)	
Gear selector lever	Nm (lbf ft)	18 ± 3 (13 ± 2.2)	
Gear cable, rubber grommet	Nm (lbf ft)	8 ± 1 (6 ± 0.7)	
Banjo bolt, fluid hose	Nm (lbf ft)	20 ± 5 (15 ± 3.7)	
Kickdown cable adjustment, locknut	Nm (lbf ft)	6 ± 1 (4 ± 0.7)	

Brakes



Brake system

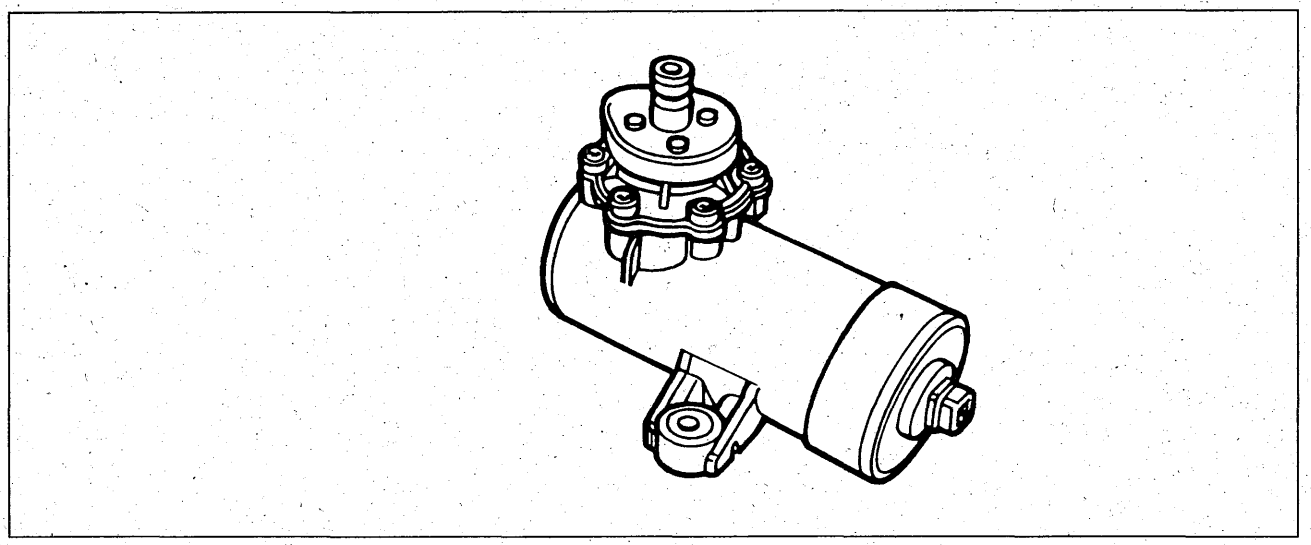
Type	Two separate diagonal brake circuits
Footbrake system	Acts hydraulically on all wheels
Handbrake system	Acts mechanically on rear wheels

Brake fluid reservoir

Capacity	litres	0,24
Total brake system capacity	litres	0.5
Brake fluid, type		DOT 4
Number of chambers		3
chamber 1		to primary circuit
chamber 2		to secondary circuit
chamber 3		to clutch cylinder

Brake servo unit

Manufacturer		Girling
Type		Vacuum assisted
Diameter	mm (in)	203 (8)
Power amplification		4:1 (at 300 N (66 lbf) pedal pressure)



Vacuum pump (M1996)

Engagement at	bar	0,35
Disengagement at	bar	0,40

Master cylinder

Manufacturer		Girling
Type		Tandem cylinder
Diameter	mm (in)	22.2 (0.87)

M1985-1987: 9000 Turbo

M1985-1989: 9000i

Front wheel brakes

Manufacturer		Girling
Type designation		Colette 54
Type		Disc brake with sliding caliper
Piston diameter	mm (in)	54 (2.13)

Brake disc, front wheel

(9000 Turbo M85-M86)

Type		Ventilated
Outside diameter	mm (in)	280 (11.03)
Thickness (new)	mm (in)	22.5 +0/-0.2 (0.89 +0/-0.01)
Thickness, minimum	mm (in)	20.5 (0.81)
Minimum thickness after grinding	mm (in)	21.0 (0.83)
Grinding depth per side	mm (in)	1.0 (0.04)
Max. runout (fitted)	mm (in)	0.08 (0.003)
Max. variation in thickness	mm (in)	0.015 (0.0006)

Brake discs should be machined by an equal amount on both sides when turned or ground.

Brake disc, front wheel

(9000 Turbo M87, 9000i M85-M89)

Type		Ventilated
Outside diameter	mm (in)	278 (10.95)
Thickness (new)	mm (in)	23.5 ± 0.2 (0.87 ± 0.01)
Thickness, minimum	mm (in)	21.5 (0.79)
Minimum thickness after grinding	mm (in)	22.0 (0.86)
Grinding depth per side	mm (in)	1.0 (0.04)
Max. runout (fitted)	mm (in)	0.08 (0.003)
Max. variation in thickness	mm (in)	0.015 (0.0006)

Brake discs should be machined by an equal amount on both sides when turned or ground.

Brake pads, front wheels

Thickness of friction material (new)	mm (in)	11 (0.43)
Minimum thickness of friction material	mm (in)	4.0 (0.16)
Area of friction material	$cm^2(in^2)$	35 (5.4)

M1988-: 9000 Turbo

M1992-: 9000S

M1990-: 9000i

M1995-: 9000 V6

Front wheel brakes

Manufacturer		ATE
Type designation		FN 57
Type		Disc brake with sliding caliper
Piston diameter	mm (in)	57 (2.44)

Brake disc, front wheel

Type		Ventilated
Outside diameter	mm (in)	278 (10.95)
Thickness (new)	mm (in)	25.0 ± 0.2 (0.98 ± 0.01)
Thickness, minimum	mm (in)	23.0 (0.90)
Minimum thickness after grinding	mm (in)	23.5 (0.91)
Grinding depth per side	mm (in)	1.0 (0.04)
Max. runout (fitted)	mm (in)	0.08 (0.003)
Max. variation in thickness	mm (in)	0.015 (0.0006)

Brake discs should be machined by an equal amount on both sides when turned or ground.

Brake pads, front wheels

Thickness of friction material (new)	mm (in)	13 (0.51)
Minimum thickness of friction material	mm (in)	4.0 (0.16)
Area of friction material	$cm^2(in^2)$	48 (7.4)

Rear wheel brakes

Manufacturer		Até
Type		Disc brake with sliding caliper
Piston diameter	mm (in)	33 (1.26)

Brake disc, rear wheels

Type		Solid (not ventilated)
Outside diameter	mm (in)	258 (10.16)
Thickness (new)	mm (in)	9.0 ± 0.1 (0.35 ± 0.004)
Thickness, minimum	mm (in)	7.5 (0.29)
Minimum thickness after grinding	mm (in)	8.0 (0.31)
Grinding depth per side	mm (in)	0.7 (0.03)
Max. runout (fitted)	mm (in)	0.08 (0.003)
Max. variation in thickness	mm (in)	0.015 (0.0006)

Brake discs should be machined by an equal amount on both sides when turned or ground.

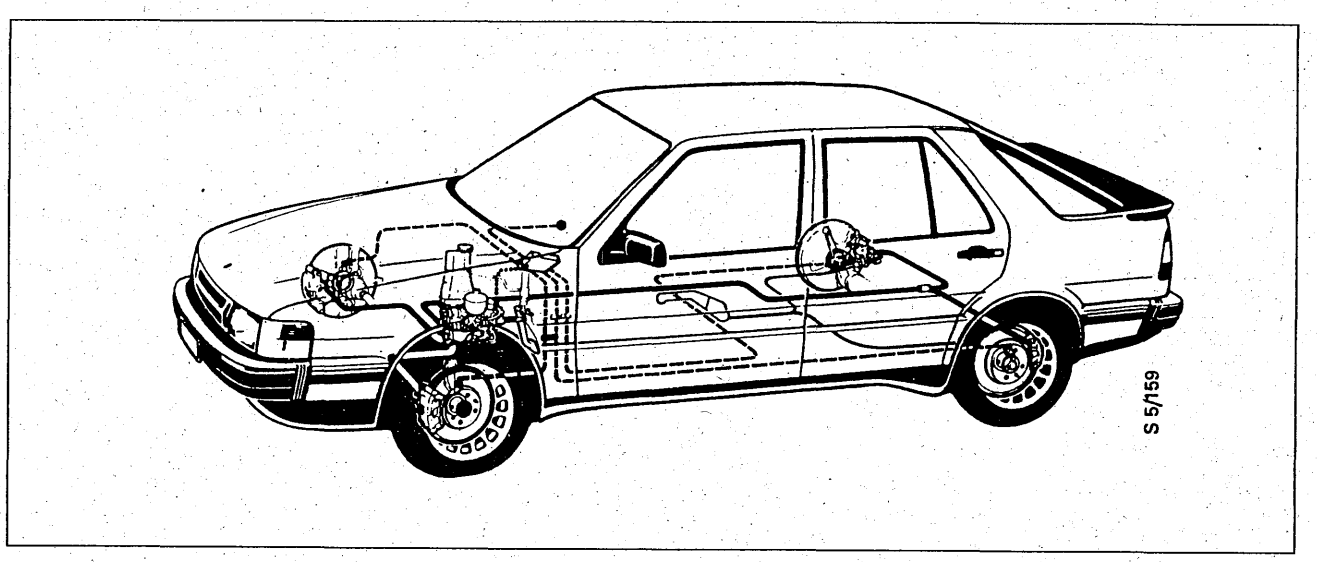
Brake pads, rear wheels

Thickness of friction material (new)	mm (in)	9 (0.35)
Minimum thickness of friction material	mm (in)	4.0 (0.16)
Area of friction material	$cm^2(in^2)$	18.4 (2.8)

Tightening torques

Holder-steering swivel member	Nm (lbf ft)	90 ± 20 (66.5 ± 14.5)
Holder-rear-wheel hub	Nm (lbf ft)	80 ± 10 (59.5 ± 7.5)

Anti-lock brake system, ABS



Brake system

Type	Three separate brake circuits
Footbrake system	Acts hydraulically on all wheels
Handbrake system	Acts mechanically on rear wheels

Brake fluid reservoir

Capacity	litres	0.8
Total brake system capacity	litres	1.2
Brake fluid, type		DOT 4
Number of chambers		3
chamber 1		static circuit
chamber 2		dynamic circuit (to high-pressure pump)
chamber 3		dynamic circuit (from servo cylinder)
Flow capacity, filter	l/min	0.5
Resistance, level warning switch	Ohms	10 (float at bottom)
Resistance, ABS warning switch	Ohms	1 (float at top)

Hydraulic unit

Manufacturer		Até
Operating voltage	V	10-14
Operating temperature	°C (°F)	-30 to +80 (-21 to +176)
Pressure, brake circuit	bar (psi)	0-180 (0-2610)
Pressure, accumulator	bar (psi)	140-180 (2030-2610)

High-pressure pump

Type		Ball-valve pump
Pressure, suction side	bar (psi)	0.1-1.0 (1.45-14.5)
Pressure, delivery side	bar (psi)	140-180 (2030-2610)
Opening pressure, relief valve	bar (psi)	210 (3045)
Rating	W	180 (at 160 bar)
Maximum operating time	minutes	2 per occasion, followed by 10-minute break (the pump must not be run dry)

Pressure accumulator

Gas		Nitrogen
Gas pressure	bar (psi)	80 (1160) (at 20 °C)
Minimum gas pressure	bar (psi)	40 (580)
Volume	litres	0,25
Operating pressure range	bar (psi)	135-190 (1958-2755)
Maximum pressure loss	bar (psi)/ 10 min	10 (145)

Pressure switch

Upper opening point, pressure switch	bar (psi)	180 ± 4 (2610 ± 58)
Lower opening point, pressure switch	bar (psi)	140 ± 4 (2030 ± 58)
Upper opening point, warning switch	bar (psi)	134 ± 2 (1943 ± 29)
Lower opening point, warning switch	bar (psi)	105 ± 2 (1523 ± 29)

Main valve

Maximum operating pressure	bar (psi)	180 (2610)
Rating	W	35 (at 12 V)
Resistance	Ohms	4-5 (pins 1-2)

Inlet / outlet valves

Maximum operating pressure	bar (psi)	180 ± 40 (2610 ± 580)
Rating	W	25 (at 12 V)
Resistance, inlet valve outlet valve	Ohms Ohms	6-7 (pins 7-1, 7-3, 7-6) 3-4 (pins 7-2, 7-4, 7-5
Flow capacity	cm^3/s	36 (at 20 °C and 100 bar)

Control module

Operating voltage	V	7-18
Rating	W	40
Operating temperature	°C (°F)	-40 to +80 (-40 to +176)

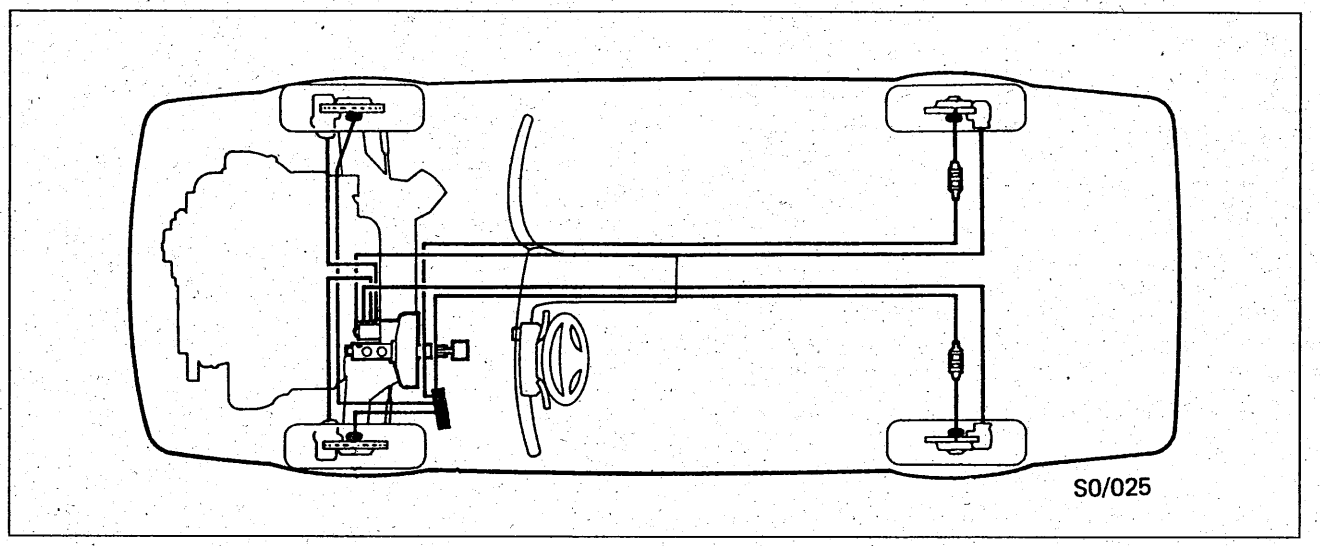
Wheel sensor

Operating voltage	V AC	0.15-0.70
Resistance	Ohms	800-1400
Number of teeth		94 (model year 1989 and earlier) 46 (model year 1990 and later)
Distance between wheel sensor and toothed wheel	mm (in)	0.65 (0.026)

Tightening torques

Hydraulic unit	Nm (lbf ft)	26 ± 4 (19 ± 3)
Pressure accumulator	Nm (lbf ft)	40 ± 6 (29.5 ± 4.5)
Pressure switch	Nm (lbf ft)	23 ± 3 (17 ± 2)

ABS anti-lock brakes (Mark IV)



Hydraulic unit

Manufacturer		ATE
Operating voltage	V	10-14
Operating temperature	°C	-30 to +80
Pressure, brake circuit	bar	100...300 (depending on pedal force)

Brake fluid reservoir

Capacity	litres	0,36
Brake fluid, type		DOT 4
Number of chambers		5
Chambers 1 and 2		Primary circuit
Chambers 3 and 4		Secondary circuit
Chamber 5		Hydraulic clutch
Flow capacity, filter	litres/min	0.5 for both brake circuits

Motor-Pump unit

Type		Eccentric piston pump
Pressure, suction side	bar	0.1-1.0
delivery side	bar	up to 300
Rating	W	180 at 160 bar
Maximum operating time		2 per occasion, followed by 10-minute break (the pump must not be run dry)

Solenoid valves

Maximum operating pressure	bar	180 ± 40
Rating	W	25 at 12 volts
Resistance		
Inlet valve	Ohms	7 ± 10%
Outlet valve	Ohms	3.7 ± 10%

Control module

Operating voltage	V	7-18
Rating	W	40
Operating temperature	°C	-40 to +80

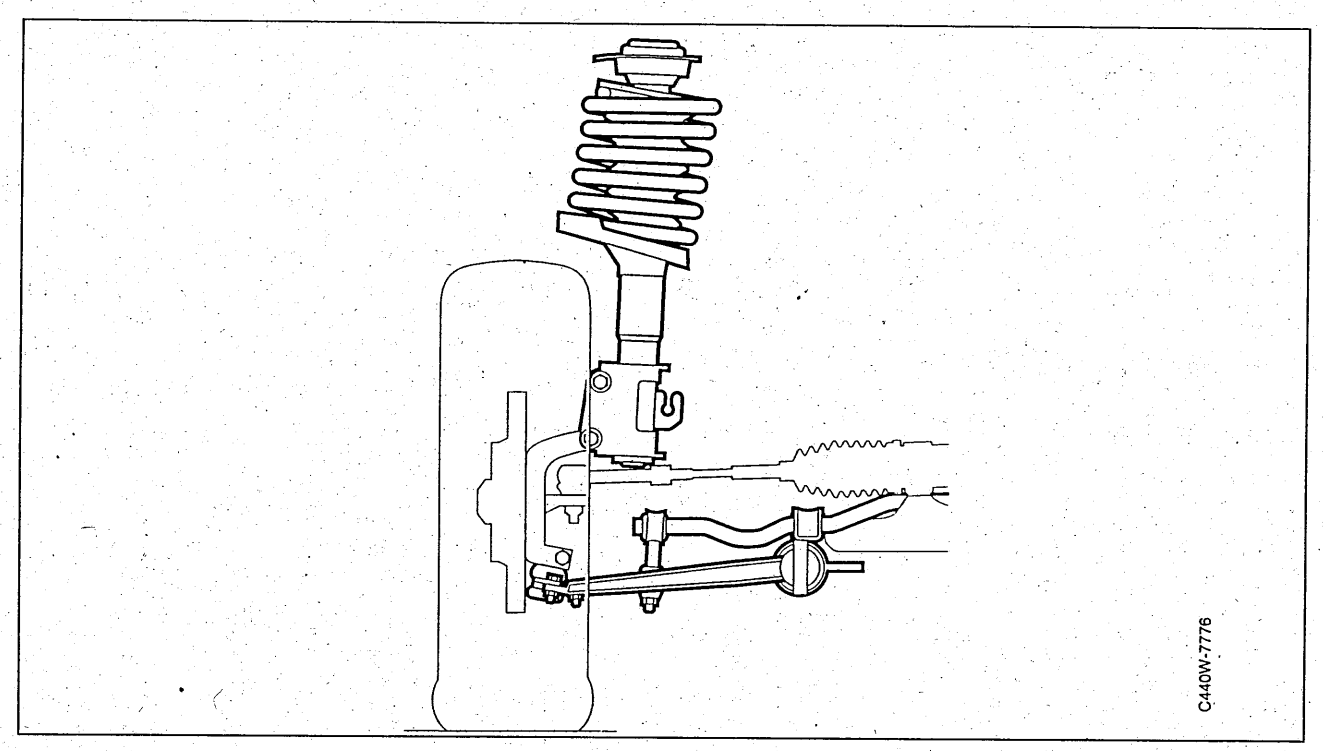
Wheel sensor

Operating voltage	V AC	0.15-0.70
Resistance	Ohms	800-1400
Number of teeth		46
Distance between wheel sensor and toothed wheel	mm	0,65

Tightening torque

Hydraulic unit	Nm (lbf ft)	25 ± 4 (18 ± 3)

Front assembly, steering



Front wheel alignment (unladen car)

Toe-in, measured on wheel rim	mm (in)	1.5 ± 0.5 (0.06 ± 0.02)
Camber	degrees (°)	-0.65 ± 0.5
Caster	degrees (°)	+1.65 ± 0.5
Swivel pin (king-pin) inclination	degrees (°)	11.3 ± 0.5
Steering angle, outer wheel	degrees (°)	20
Steering angle, inner wheel	degrees (°)	21 ± 0.5

Rear wheel alignment

Toe-in	mm	2.5 ± 1.5
Camber	degrees (°)	-0.25 ± 0.25

Steering gear

Steering wheel turns, lock to lock	turns	3.2
Plunger, adjustment		Screw the plunger fully home and then back off through 70-90°. Make sure that the rack does not bind at any point.
Ball joints (track rod ends)		Not adjustable. Replace when play arises.

Track-rod ends

Maximum distance between groove in track-rod and locknut	mm (in)	140 (5.51)
Max. permissible difference between the dimensions on each side of the car	mm (in)	2 (0.08)

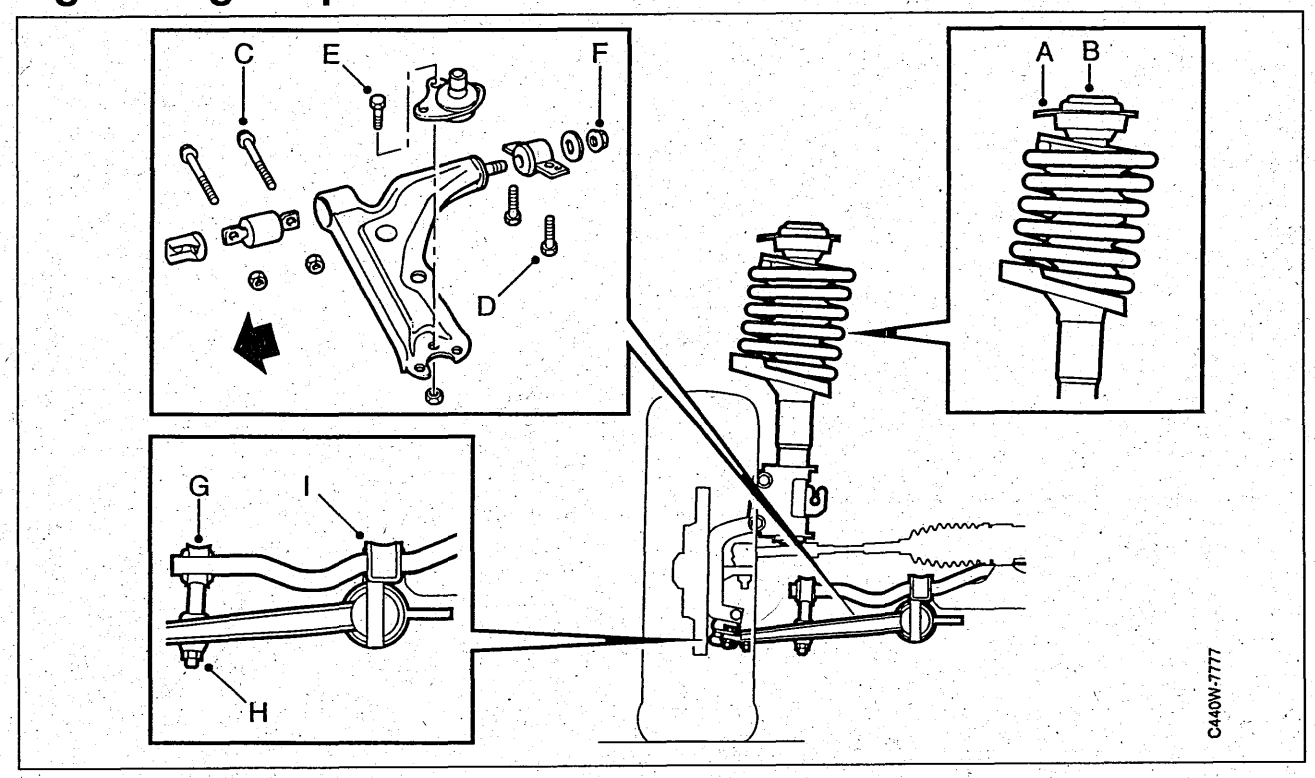
Wear limits

Track-rod ends, axial play	mm (in)	2 (0.08)
radial play	mm (in)	1 (0.04)
Ball joint (steering gear) axial play	mm (in)	1 (0.04)
Spindle guides, axial play	mm (in)	2 (0.08)
Spindle guides, radial play	mm (in)	1 (0.04)

Lubricant

Lubricant, type		Lithium grease such as Shell EP B2 Code 71303, Shell Retinax A and the like.
Lubricant, quantity	g (oz)	60 (2.1) (approx. 7 cl)
Power steering fluid, type		Saab Power Steering Fluid 4634, part No. (45) 30 09 800, GM Power Steering fluid part No. 105 0017 - 1 litre, 105 2884 - 0.5 litre or Saab Power Steering fluid 1890, part No. (45) 30 02 995 - 0.75 litres
Power steering fluid, quantity	cl (qts)	75 (0.78)

Tightening torques



MacPherson strut

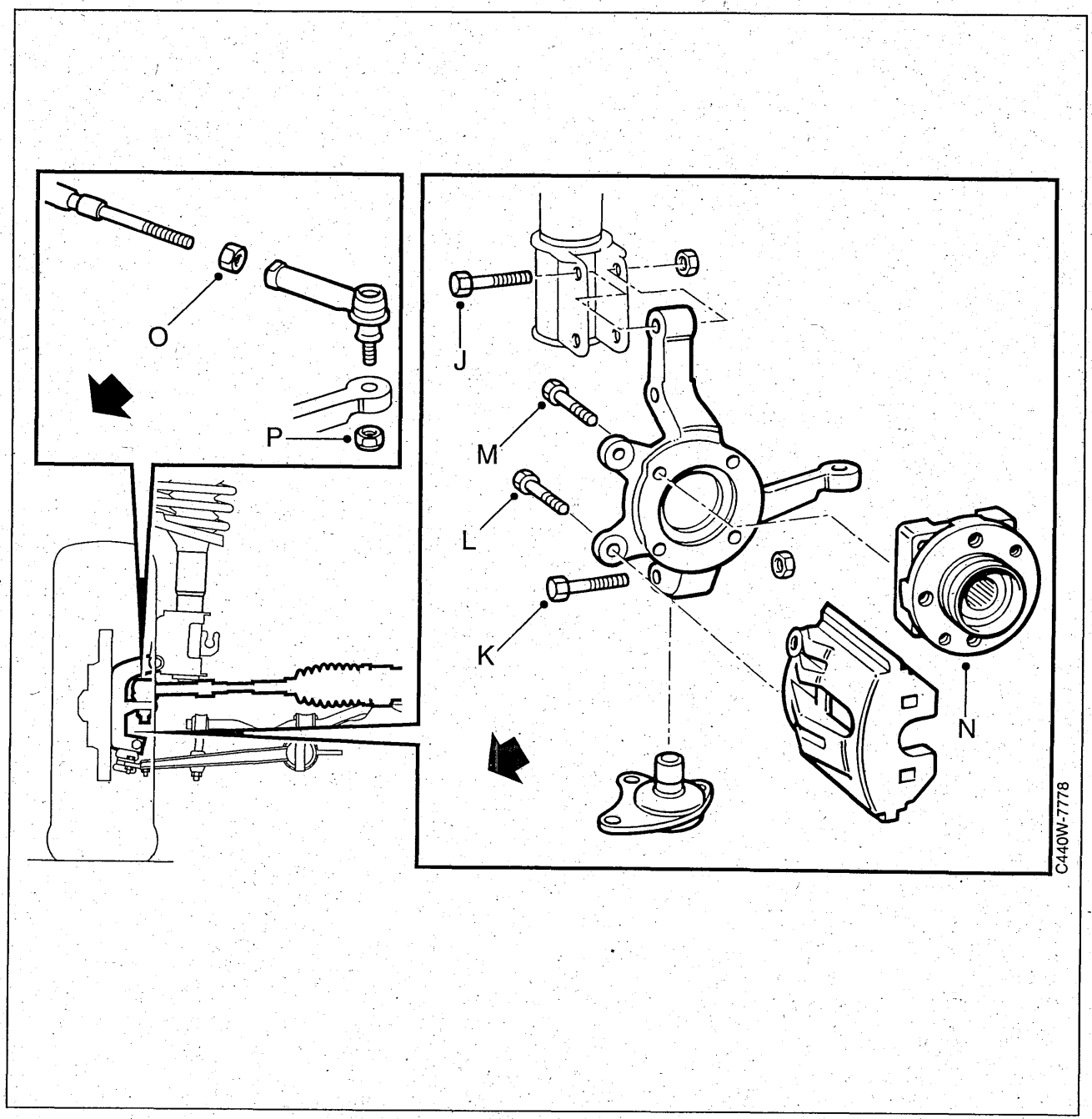
A Strut mounting - body	Nm (lbf ft)	47 (35)
B Strut mounting - damper	Nm (lbf ft)	75 (55)

Suspension arm

C Front suspension arm bearing, suspension arm to subframe	Nm (lbf ft)	50 (36)
D Rear suspension arm bearing, suspension arm to subframe	Nm (lbf ft)	50 (36)
E Suspension arm ball joint, suspension arm	Nm (lbf ft)	30 (22)
F Rear bearing, suspension arm	Nm (lbf ft)	65 (48) (car in driving position)

Anti-roll bar

G Anti-roll bar link to anti-roll bar	Nm (lbf ft)	30 (22)
H Anti-roll bar link to suspension arm	Nm (lbf ft)	24 (18)
I Anti-roll bar cup	Nm (lbf ft)	24 (18)



Steering swivel member

J Steering swivel member to MacPherson strut		
dry joint	Nm (lbf ft)	92 (68)
lubricated joint (waxed nut)	Nm (lbf ft)	65 (48)
K Suspension arm ball joint, steering swivel member to suspension arm	Nm (lbf ft)	59 (44)
L Steering swivel member to brake caliper	Nm (lbf ft)	80 (59)
M Steering swivel member to hub	Nm (lbf ft)	55 (41)
N Hub centre nut	Nm (lbf ft)	290 (215)
O Locknut, track-rod end	Nm (lbf ft)	70 (52)
P Ball joint, steering swivel member to track-rod end	Nm (lbf ft)	55 (42)

Suspension, wheels

Suspension

The spring should be marked on its two middle coils. The marking consists of five coloured zones. To ensure that the car is the same height on both sides, the springs on the left and right sides of the same axle should be of the same class (same colour coding). The class is indicated by the colour of the middle zone in the combination of colours on the spring. Zone 1 is the same as zone 5, zone 2 is the same as zone 4.

Front coil springs

Total number of coils		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Number of active coils		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Wire diameter	Ø mm	12,86	12,97	13,09	12,80	13,20	13,30	14,26	12,75
Free length	mm	455	455	455	455	455	455	369	455
Colour coding	zones 1 and 5	Red	Red	Red	Light blue	Red	Red	Yellow	Red
Colour coding	zones 2 and 4	Yellow	Blue	White	Beige	Green	Grey	Yellow	Red

Total number of coils		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Number of active coils		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Wire diameter	Ø mm	13,62	12,96	13,13	13,27	13,35	13,53	13,67	13,81
Free length	mm	416	444	440	438	437	436	434	431
Colour coding	zones 1 and 5	Yellow	Yellow	Yellow	Yellow	Blue	Blue	Blue	Blue
Colour coding	zones 2 and 4	Blue	White	Green	Grey	Blue	White	Green	Grey

Total number of coils		6.5	6.5	6.5	6.5
Number of active coils		5.5	5.5	5.5	5.5
Wire diameter	Ø mm	13,69	13,85	13,69	13,85
Free length	mm	402	413	392	405
Colour coding	zones 1 and 5	White	White	White	Green
Colour coding	zones 2 and 4	White	Green	Grey	Green

Coil spring, rear

Total number of coils		9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Number of active coils		8	8	8	8	8	8	8	8
Wire diameter	Ø mm	13,4	13,6	13,8	14,0	12,3	13,3	13,5	13,7
Free length	mm	321	321	322	317	333	325	325	326
Colour coding	zones 1 and 5	Red	Red	Red	Red	Red	Red	Yellow	Yellow
Colour coding	zones 2 and 4	Red	Yellow	Blue	White	Green	Grey	Yellow	Blue

Total number of coils		9.5	9.5	9.5	9.5
Number of active coils		8	8	8	8
Wire diameter	Ø mm	13,5	13,7	12,2	12,7
Free length	mm	320	321	337	320
Colour coding	zones 1 and 5	Yellow	Yellow	Yellow	Yellow
Colour coding	zones 2 and 4	White	Green	Grey	Blue

Choice of front coil spring (spare part), depending on options and power train (M1995)

The following table shows the type of spring that corresponds to the car's engine and standard of equipment. The colours indicated in the table refer to zones 1 and 2 and zones 5 and 4 of the spring's colour coding. In connection with changing the spring, the new spring must be of the same class (zone 3 should have the same colour).

Spring 1 (Green/Grey)	3800 N	810-842 kg
Spring 2 (Grey/Grey)	3970 N	843-874 kg
Spring 3 (Green/Green)	4163 N	875-906 kg
Spring 4 (Orange/Blue)	4315 N	907-938 kg

Key to abbreviations in the tables:

M5	=	Five-speed manual gearbox.
A4	=	Four-speed automatic transmission
ABAG2	=	Passenger air bag
AC	=	Air conditioning
ACC	=	Automatic climate control
AS	=	Audio system
EAS1	=	Electrically adjustable driver's seat
EAS2	=	Electrically adjustable front seats
SR3	=	Electrically operated glass sunroof

2.0i and 2.3i engines (2.3i not SE/US/CA)

	ABAG2	AC/ACC	AS	EAS1	EAS2	SR3	Spring 1	Spring 2	Spring 3	Spring 4
M5							X			
M5	X		X		X	X	X			
M5		X						X		
M5	X	X	X		X	X		X		
A4								X		
A4	X		X		X	X		X		
A4		X						X		
A4	X	X	X		X	X			X	

2.0 LTT and 2.3i engines SE/US/CA

	ABAG2	AC/ACC	AS	EAS1	EAS2	SR3	Spring 1	Spring 2	Spring 3	Spring 4
M5							X			
M5	X		X	X		X	X			
M5	X		X		X	X		X		
M5		X						X		
M5	X	X	X		X	X		X		
A4								X		
A4	X		X		X	X		X		
A4		X							X	
A4	X	X	X		X	X			X	

2.0T, 2.3LTT and 2.3T engines

	ABAG2	AC/ACC	AS	EAS1	EAS2	SR3	Spring 1	Spring 2	Spring 3	Spring 4
M5							X			
M5	X		X			X	X			
M5	X			X		X	X			
M5	X		X		X	X		X		
M5		X						X		
M5	X	X	X		X			X		
M5		X	X		X	X		X		
M5	X	X	X		X	X			X	
A4								X		
A4	X		X	X		X		X		
A4	X	X	X			X			X	
A4	X	X		X		X			X	
A4	X	X	X		X	X				X

V6 engine (not SE/US/CA)

	ABAG2	AC/ACC	AS	EAS1	EAS2	SR3	Spring 1	Spring 2	Spring 3	Spring 4
M5								X		
M5	X		X		X	X		X		
M5		X							X	
M5	X	X	X		X	X			X	
A4								X		
A4	X							X		
A4			X					X		
A4				X				X		
A4						X		X		
A4	X		X		X	X			X	
A4		X							X	
A4	X	X							X	
A4		X				X			X	
A4		X	X	X					X	
A4	X	X	X		X	X				X

V6 engine SE/US/CA

	ABAG2	AC/ACC	AS	EAS1	EAS2	SR3	**Spring 1**	**Spring 2**	**Spring 3**	**Spring 4**
M5								**X**		
M5	X		X		X	X		**X**		
M5		X							**X**	
M5	X	X	X		X	X			**X**	
A4								**X**		
A4	X		X		X	X			**X**	
A4		X							**X**	
A4	X	X							**X**	
A4		X	X						**X**	
A4		X		X					**X**	
A4		X				X			**X**	
A4	X	X	X		X	X				**X**

Wheels

Rim runout

Pressed steel wheels	Radial	mm (in)	1.0 (0.04)
Pressed steel wheels	Axial	mm (in)	1.0 (0.04)
Aluminium wheels	Radial	mm (in)	0.5 (0.02)
Aluminium wheels	Axial	mm (in)	0.5 (0.02)

Rear wheel geometry (unladen car)

Toe-in	mm (in)	2.5 ± 1.5 (0.1 ± 0.06)
Camber	degrees (°)	-0.25 ± 0.25

Recommended tyre pressures, cold tyres

SE, FI and EU, model years 1985-1989
AU, ME and FE, model years 1985-1990

Tyre size	Number of occupants	Speed	Front		Rear	
		km/h	bar	(psi)	bar	(psi)
185/65 R15 87T	1-3	0-190	2.2	(32)	2.2	(32)
	4-5		2.6	(38)	2.6	(38)
185/65 R15 87H	1-3	0-210	2.1	(30)	2.1	(30)
	4-5		2.4	(35)	2.4	(35)
195/60 R15 86H	1-3	0-210	2.2	(32)	2.2	(32)
	4-5		2.6	(38)	2.6	(38)
195/60 VR15	1-3	0-210	2.2	(32)	2.2	(32)
(Not DE)	1-3	>210	2.6	(38)	2.6	(38)
	4-5		2.6	(38)	2.6	(38)
195/65 R15 91H/V	1-3	0-210	1.9	(28)	1.9	(28)
	1-3	>210	2.2	(32)	2.2	(32)
	4-5		2.2	(32)	2.2	(32)
205/55 VR15	1-3	0-210	2.1	(30)	2.1	(30)
(Not DE)	1-3	>210	2.5	(36)	2.5	(36)
	4-5		2.5	(36)	2.5	(36)
Winter tyres						
175/70 R15	1-3		2.3	(33)	2.3	(33)
	4-5		2.4	(35)	2.4	(35)
185/65 R15	1-3		2.2	(32)	2.2	(32)
	4-5		2.3	(33)	2.3	(33)
Spare wheel						
T105/80R16 T115/70 R15/D15			4.2	(60)	4.2	(60)
175/70 R15 86T			2.6	(38)	2.6	(38)
Accessory tyre						
205/50 VR16	1-3	0-210	2.1	(30)	2.1	(30)
(Not DE)	1-3	>210	2.5	(36)	2.5	(36)
	4-5		2.5	(36)	2.5	(36)

DE, model years 1985-1989

Tyre size	Load conditions	Front		Rear	
		bar	(psi)	bar	(psi)
195/60 VR15	L1	2.2	(32)	2.2	(32)
	L2	2.4	(35)	2.4	(35)
	L3	2.8	(41)	2.8	(41)
205/55 VR15	L1	2.2	(32)	2.2	(32)
	L2	2.5	(36)	2.5	(36)
	L3	2.9	(42)	2.9	(42)
205/50 VR16	L1	2.3	(33)	2.3	(33)
	L2	2.6	(38)	2.6	(38)
	L3	3.0	(43)	3.0	(43)

SE, FI, EU and GB, model year 1990

Tyre size	Load conditions	Front		Rear	
		bar	(psi)	bar	(psi)
185/65 R15 87H	L1	2.1	(30)	2.1	(30)
	L2	2.4	(35)	2.4	(35)
	L4	2.6	(38)	2.6	(38)
195/60 VR15	L1	2.3	(33)	2.3	(33)
195/60 R15 87V	L2	2.5	(36)	2.5	(36)
195/60 R15 88V	L3	2.9	(42)	2.9	(42)
195/65 R15 91V	L1	1.9	(28)	1.9	(28)
	L2	2.2	(32)	2.2	(32)
	L3	2.6	(38)	2.6	(38)
195/65 R15 91H	L1	1.9	(28)	1.9	(28)
	L2	2.2	(32)	2.2	(32)
	L4	2.3	(33)	2.3	(33)
205/55 VR15	L1	2.3	(33)	2.3	(33)
205/55 R15 87V	L2	2.6	(38)	2.6	(38)
205/55 R15 88V	L3	3.0	(43)	3.0	(43)
205/50 ZR16	L1	2.4	(35)	2.4	(35)
	L2	2.5	(36)	2.5	(36)
	L3	2.9	(42)	2.9	(42)
Winter tyres					
185/65 R15 87T M+S	L1	2.3	(33)	2.3	(33)
	L2	2.4	(35)	2.4	(35)
	L5	2.6	(38)	2.6	(38)
195/65 R15 91T M+S	L1	2.1	(30)	2.1	(30)
	L2	2.3	(33)	2.3	(33)
	L5	2.3	(33)	2.3	(33)
205/50 R16 86H M+S	L1	2.3	(33)	2.3	(33)
	L2	2.4	(35)	2.4	(35)
	L4	2.9	(42)	2.9	(42)
Spare wheel					
T115/70 R16		4.2	(60)	4.2	(60)

L1	Max. 3 occupants	0-160 km/h	All tyres
L2	Max. load	0-160 km/h	All tyres
L3	Max. load	160 km/h to max. speed	V, Z tyres
L4	Max. load	160-210 km/h	H tyres
L5	Max. load	160-190 km/h	T tyres

Load conditions 3-5 apply to countries where there are no speed limits on some roads and when the car is driven for extended periods at maximum speed with a maximum load. For each occupant less, tyre pressures may be reduced by 0.1 bars.

Maximum load = 5 occupants and their luggage.

M1986-M1990 (US, CA, AU, ME, FE, JP)

Tyre size	Number of occupants	Speed	Front	Rear
		km/h	bar	bar
185/65 R15 87T	1-3	0-190	2.2	2.2
	4-5		2.6	2.6
195/65 R15 91T	1-3	0-190	1.9	1.9
	4-5		2.2	2.2
185/65 R15 87H	1-3	0-210	2.1	2.1
	4-5		2.4	2.4
195/65 R15 91H	1-3	0-210	1.9	1.9
	4-5		2.2	2.2
195/65 VR15, R15 91V	1-3	0-210	1.9	1.9
	1-3	>210	2.2	2.2
	4-5		2.2	2.2
195/60 R15 86/87H	1-3	0-210	2.2	2.2
	4-5		2.6	2.6
195/60 VR15, R15 87/88V	1-3	0-210	2.2	2.2
	1-3	>210	2.6	2.6
	4-5		2.6	2.6
205/55 VR15, R15 87/88V	1-3	0-210	2.1	2.1
	1-3	>210	2.5	2.5
	1-3		2.5	2.5
205/50 VR16, ZR16	1-3	0-210	2.1	2.1
	1-3	>210	2.5	2.5
	4-5		2.5	2.5
175/70 R15 (winter tyre)	1-3		2.3	2.3
	4-5		2.4	2.4
185/65 R15 (winter tyre)	1-3		2.2	2.2
	4-5		2.4	2.4
Other tyre sizes				
205/60 R15 90V	1-3	0-210	2.0	2.0
	1-3	>210	2.4	2.4
	4-5		2.4	2.4
205/55 R16 89V	1-3	0-210	2.0	2.0
	1-3	>210	2.4	2.4
	4-5		2.4	2.4

All markets, model year 1991

Tyre size	Load conditions	Front		Rear	
		bar	(psi)	bar	(psi)
185/65 R15 87H	L1	2.1	(30)	2.1	(30)
	L2	2.4	(35)	2.4	(35)
	L4	2.6	(38)	2.6	(38)
195/60 VR15	L1	2.3	(33)	2.3	(33)
195/60 R15 87V	L2	2.5	(36)	2.5	(36)
195/60 R15 88V	L3	2.9	(42)	2.9	(42)
195/65 R15 91V	L1	1.9	(28)	1.9	(28)
	L2	2.2	(32)	2.2	(32)
	L3	2.7	(39)	2.7	(39)
195/65 R15 91H	L1	1.9	(28)	1.9	(28)
	L2	2.2	(32)	2.2	(32)
	L4	2.3	(33)	2.3	(33)
205/55 VR15	L1	2.3	(33)	2.3	(33)
(not applicable T-16, EU)	L2	2.6	(38)	2.6	(38)
205/55 R15 87V	L3	3.0	(43)	3.0	(43)
(not applicable T-16, EU)					
205/55 R15 88V					
(not applicable T-16, EU)					
205/50 ZR16	L1	2.4	(35)	2.4	(35)
	L2	2.5	(36)	2.5	(36)
	L3	2.9	(42)	2.9	(42)
Winter tyres					
185/65 R15 87T M+S	L1	2.3	(33)	2.3	(33)
	L2	2.4	(35)	2.4	(35)
	L5	2.6	(38)	2.6	(38)
195/65 R15 91T M+S	L1	2.1	(30)	2.1	(30)
	L2	2.3	(33)	2.3	(33)
	L5	2.3	(33)	2.3	(33)
205/50 R16 86H M+S	L1	2.3	(33)	2.3	(33)
	L2	2.4	(35)	2.4	(35)
	L4	2.9	(42)	2.9	(42)
Spare wheel tyres					
T115/70 R16		4.2	(60)	4.2	(60)
175/70 R15 86T		2.6	(38)	2.6	(38)

L1	Max. 3 occupants	0-160 km/h	All tyres
L2	Max. load	0-160 km/h	All tyres
L3	Max. load	160 km/h to max. speed	V, Z tyres
L4	Max. load	160-210 km/h	H tyres
L5	Max. load	160-190 km/h	T tyres

Load conditions 3-5 apply to countries where there are no speed limits on some roads and when the car is driven for extended periods at maximum speed with a maximum load. For each occupant less, tyre pressures may be reduced by 0.1 bars.

Maximum load = 5 occupants and their luggage.

SE, EU, GB, ME, PA, LA M1992-

Tyre size	Load conditions	Front		Rear	
		bar	(psi)	bar	(psi)
195/65 TR15	L1	2.1	(30)	2.1	(33)
	L2	2.1	(30)	2.1	(30)
	L5	2.3	(33)	2.3	(33)
195/65 HR15	L1	2.1	(30)	2.1	(30)
	L2	2.1	(30)	2.1	(30)
	L4	2.4	(35)	2.4	(35)
195/65 VR15 205/60 VR15	L1	2.1	(30)	2.1	(30)
	L2	2.1	(30)	2.1	(30)
	L3	2.6	(38)	2.6	(38)
205/60 ZR15	L1	2.2	(32)	2.2	(32)
	L2	2.2	(32)	2.2	(32)
	L3	2.7	(39)	2.7	(39)
205/50 ZR16	L1	2.4	(35)	2.4	(35)
	L2	2.6	(38)	2.6	(38)
	L3	3.0	(43)	3.0	(43)
205/55 ZR16 205/55 WR16	L1	2.4	(35)	2.4	(35)
	L2	2.4	(35)	2.4	(36)
	L3	2.8	(41)	2.8	(41)
Winter tyres					
185/65 R15 87T M+S	L1	2.3	(33)	2.3	(33)
	L2	2.4	(35)	2.4	(35)
	L5	2.6	(38)	2.6	(38)
185/65 R15 91T M+S	L1	2.1	(30)	2.1	(30)
	L2	2.3	(33)	2.3	(33)
	L5	2.3	(33)	2.3	(33)
205/50 R16 86H M+S	L1	2.3	(33)	2.3	(33)
	L2	2.4	(35)	2.4	(35)
	L4	2.9	(42)	2.9	(42)
Spare wheel tyres					
T115/70 R16		4.2	(60)	4.2	(60)
175/70 R15 86T (cars with Traction Control System)		2.6	(38)	2.6	(38)

L1	Max. 3 occupants	0-160 km/h	All tyres
L2	Max. load	0-160 km/h	All tyres
L3	Max. load	160 km/h to max. speed	V, Z tyres
L4	Max. load	160-210 km/h	H tyres
L5	Max. load	160-190 km/h	T tyres

Load conditions 3-5 apply to countries where there are no speed limits on some roads and when the car is driven for extended periods at maximum speed with a maximum load. For each occupant less, tyre pressures may be reduced by 0.1 bars.

Maximum load = 5 occupants and their luggage.

AU M1992-

Tyre size	Load conditions	Front		Rear	
		bar	(psi)	bar	(psi)
195/65 R15 91T	L1	2.1	(30)	2.1	(33)
	L2	2.1	(30)	2.1	(30)
	L5	2.3	(33)	2.3	(33)
195/65 R15 91H	L1	2.1	(30)	2.1	(30)
	L2	2.1	(30)	2.1	(30)
	L4	2.4	(35)	2.4	(35)
195/65 R15 91V 205/60 R15 91V	L1	2.1	(30)	2.1	(30)
	L2	2.1	(30)	2.1	(30)
	L3	2.6	(38)	2.6	(38)
205/60 R15 90Z	L1	2.2	(32)	2.2	(32)
	L2	2.2	(32)	2.2	(32)
	L3	2.7	(39)	2.7	(39)
205/50 R15 86Z	L1	2.4	(35)	2.4	(35)
	L2	2.6	(38)	2.6	(38)
	L3	3.0	(43)	3.0	(43)
205/55 R16 88Z 205/55 R16 89W	L1	2.4	(35)	2.4	(35)
	L2	2.4	(35)	2.4	(36)
	L3	2.8	(41)	2.8	(41)
Winter tyres					
185/65 R15 87T M+S	L1	2.3	(33)	2.3	(33)
	L2	2.4	(35)	2.4	(35)
	L5	2.6	(38)	2.6	(38)
185/65 R15 91T M+S	L1	2.1	(30)	2.1	(30)
	L2	2.3	(33)	2.3	(33)
	L5	2.3	(33)	2.3	(33)
205/50 R16 86H M+S	L1	2.3	(33)	2.3	(33)
	L2	2.4	(35)	2.4	(35)
	L4	2.9	(42)	2.9	(42)
Spare wheel tyres					
T115/70 R16		4.2	(60)	4.2	(60)
175/70 R15 86T (cars with Traction Control System)		2.6	(38)	2.6	(38)

L1	Max. 3 occupants	0-160 km/h	All tyres
L2	Max. load	0-160 km/h	All tyres
L3	Max. load	160 km/h to max. speed	V, Z tyres
L4	Max. load	160-210 km/h	H tyres
L5	Max. load	160-190 km/h	T tyres

Load conditions 3-5 apply to countries where there are no speed limits on some roads and when the car is driven for extended periods at maximum speed with a maximum load. For each occupant less, tyre pressures may be reduced by 0.1 bars.

Maximum load = 5 occupants and their luggage.

US, CA M1992-

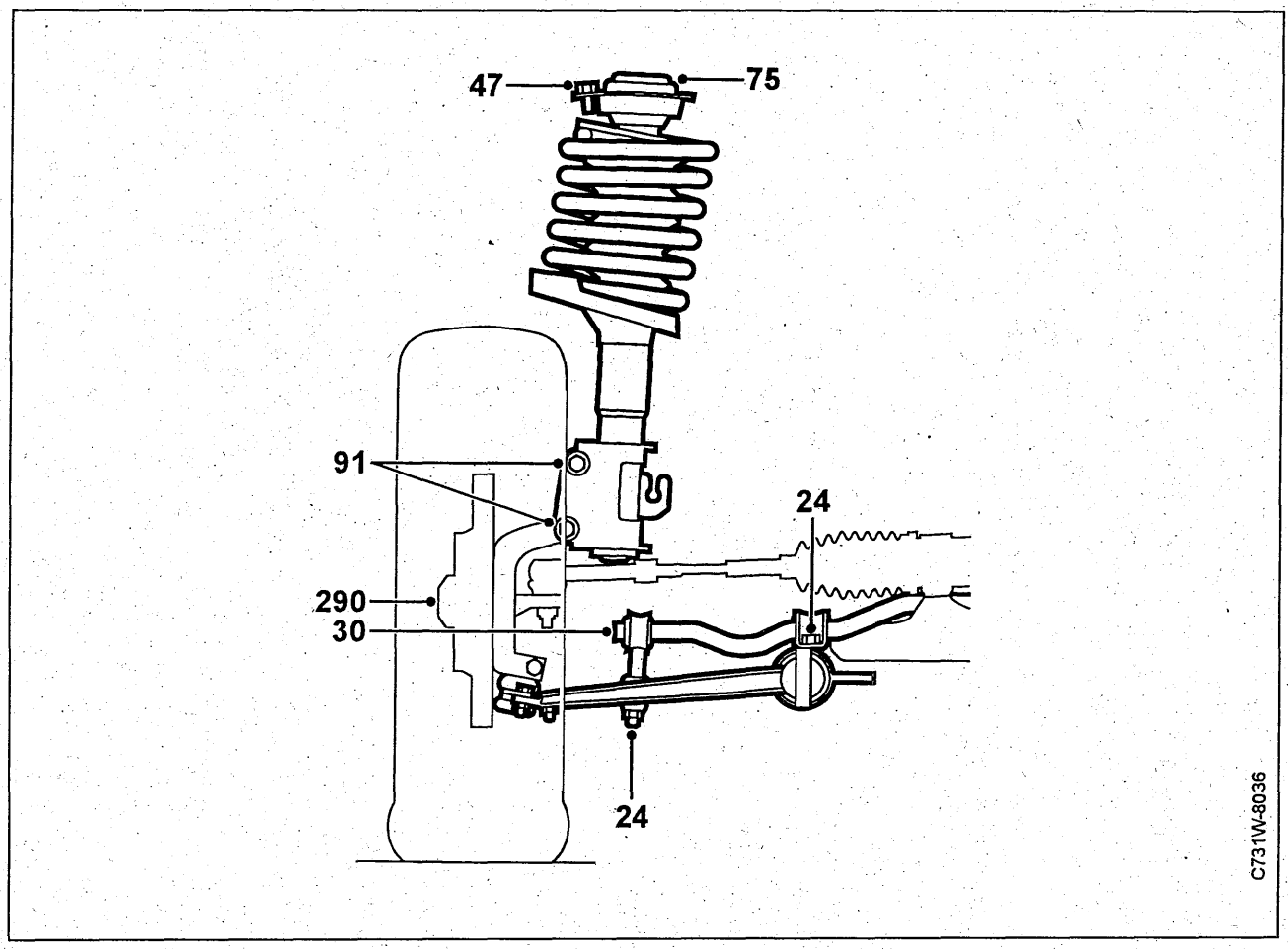
Tyre size	Load conditions	Front		Rear	
		bar	(psi)	bar	(psi)
195/65 TR15	L1	2.1	(30)	2.1	(33)
	L2	2.1	(30)	2.1	(30)
	L5	2.3	(33)	2.3	(33)
195/65 HR15	L1	2.1	(30)	2.1	(30)
	L2	2.1	(30)	2.1	(30)
	L4	2.4	(35)	2.4	(35)
195/65 VR15 205/60 VR15	L1	2.1	(30)	2.1	(30)
	L2	2.1	(30)	2.1	(30)
	L3	2.6	(38)	2.6	(38)
205/60 ZR15	L1	2.2	(32)	2.2	(32)
	L2	2.2	(32)	2.2	(32)
	L3	2.7	(39)	2.7	(39)
205/50 ZR15	L1	2.4	(35)	2.4	(35)
	L2	2.6	(38)	2.6	(38)
	L3	3.0	(43)	3.0	(43)
205/55 ZR16 205/55 WR16	L1	2.4	(35)	2.4	(35)
	L2	2.4	(35)	2.4	(36)
	L3	2.8	(41)	2.8	(41)
Winter tyres					
185/65 R15 87T M+S	L1	2.3	(33)	2.3	(33)
	L2	2.4	(35)	2.4	(35)
	L5	2.6	(38)	2.6	(38)
185/65 R15 91T M+S	L1	2.1	(30)	2.1	(30)
	L2	2.3	(33)	2.3	(33)
	L5	2.3	(33)	2.3	(33)
205/50 R16 86H M+S	L1	2.3	(33)	2.3	(33)
	L2	2.4	(35)	2.4	(35)
	L4	2.9	(42)	2.9	(42)
Spare wheel tyres					
T115/70 R16		4.2	(60)	4.2	(60)
175/70 R15 86T (cars with Traction Control System)		2.6	(38)	2.6	(38)

L1	Max. 3 occupants	0-160 km/h	All tyres
L2	Max. load	0-160 km/h	All tyres
L3	Max. load	160 km/h to max. speed	V, Z tyres
L4	Max. load	160-210 km/h	H tyres
L5	Max. load	160-190 km/h	T tyres

Load conditions 3-5 apply to countries where there are no speed limits on some roads and when the car is driven for extended periods at maximum speed with a maximum load. For each occupant less, tyre pressures may be reduced by 0.1 bars.

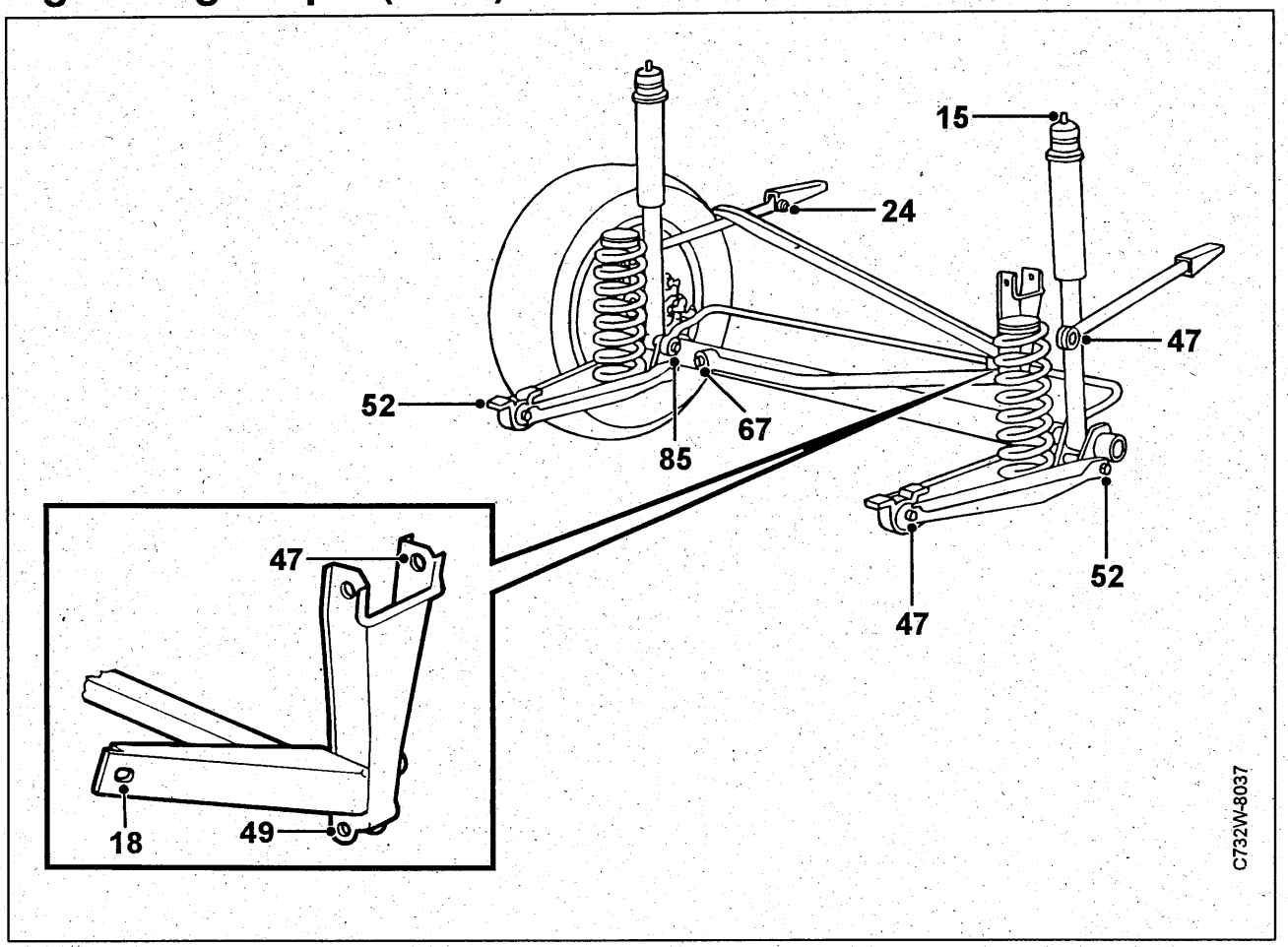
Maximum load = 5 occupants and their luggage.

Tightening torques



Wheel bolts	Nm (lbf ft)	120 (89)
Hub centre-nuts, front and rear	Nm (lbf ft)	290 (214)
Front hub retaining nut	Nm (lbf ft)	57 (42)
MacPherson strut top mounting bolts	Nm (lbf ft)	47 (35)
MacPherson strut bottom mounting bolts	Nm (lbf ft)	91 (67)
MacPherson strut top mounting nut	Nm (lbf ft)	75 (55)
Front anti-roll bar, top nut for link arm	Nm (lbf ft)	30 (22)
Front anti-roll bar, U-clamp bolts	Nm (lbf ft)	24 (18)
Front anti-roll bar, bottom nut for link arm	Nm (lbf ft)	24 (18)
Steering gear retaining bolts	Nm (lbf ft)	70 (52)

Tightening torque (cont.)



Rear link arm, rear mounting	Nm (lbf ft)	52 (38)
Rear link arm, mounting to body	Nm (lbf ft)	52 (38)
Rear link arm, front bush	Nm (lbf ft)	47 (35)
Torque arm, front mounting	Nm (lbf ft)	47 (35)
Torque arm, rear mounting	Nm (lbf ft)	24 (18)
Retaining bolt, rear damper and anti-roll bar	Nm (lbf ft)	85 (63)
Panhard rod mounting to rear axle	Nm (lbf ft)	67 (50)
Retaining bolt, Panhard rod to mounting bracket	Nm (lbf ft)	49 (36)
Mounting bracket, Panhard rod to body	Nm (lbf ft)	47 (35)
Support for Panhard rod mounting bracket	Nm (lbf ft)	18 (13)
Brake unit retaining bolts	Nm (lbf ft)	90 (66)
Rear damper, top mounting	Nm (lbf ft)	15 (11)

Body

Important

Chemical products like paint, adhesive, primer and the like should be stored and used in accordance with the laws and regulations of your country. Always read the warning labels and directions for use on the product packaging before commencing work.

Corrosion protection products

Primer	Standox 1K Füllprimer
Welding primer	Teroson Zinkspray, (45) 30 15 906
Sealant	Terostat 1K-PUR T 226, (45) 30 07 085
Stone damage protection	Terotex Super 3000 T 126 (black) — (45) 30 15 252 T 127 (light) — (45) 30 15 476
Underseal	Terotex 2000 T 122 (black) — (45) 30 15 237 T 123 (light) — (45) 30 15 245
Sprayable joint sealant/underseal	Terostat 9320 T 293, (45) 30 17 787
Cavity sealant	Mercasol 1, (45) 30 20 203
	Terotex HV 400 T 129, (45) 30 15 930
Body adhesive, door panel folds	Teromix 6700 T305
Cleaning agents	Cleaning agent FL T875, (45) 30 15 815
Filler for zinc sheet	Top filler (10) 82 85 488, hardener (10) 82 85 496

Sound absorbing panels

Doors and side panels	Terodem SP 100 Alu T401, (45) 30 15 799
Bottom panel, applied with hot-air gun	Terodem SP 300 T411, (45) 30 15 211

Adhesive and primer used when changing window glass

Adhesive kit, window glass	Betamate E 2400, (45) 30 05 600
Adhesive kit, embedded window glass	Betamate E 2400, (45) 30 05 618
Paint primer	Betaprime, (45) 30 18 702

Repairs to plastic components, 3M

Cleaning agents	3M 8984
Adhesion promoter	3M 5907 P.A.P.
Plastic filler	3M 5900
Primer	3M 5905 or 5906
Masking tape	3M 6945

Paintwork repairs, Standox

Cleaning agent	Silicon Entferner
Primer Acid primer Plastic primer filler	 1K Füllprimer Reaktiv Haftprimer 2K-Plastic-Grundierfüller
Extender 2K PUR extender	2K 4:1 Top Füller 2K H-S Füller
2K Paint	2K Standocryl Basislack 2K Standocryl Klarlack Standocryl Klarlack 20-60
Rubbing	Abrasive paper P120-P500 3M Scotch Brite

Finish paints

Colour code	Colour	Paint type	Remarks
117	Platinum blue	Base paint	M 1986 and earlier
120	Cochineal red	Base paint	M 1986 and earlier
127	Cherry red	Solid	M 1987 and earlier
129	Rose quartz	Base paint	M 1986 and earlier
131	Admiral blue	Solid	
153	Cirrus white	Solid	
156	Mother of pearl	Base paint	Texture primer + texture finish paint
158	Odoardo grey	Base paint	M 1986 and earlier
159	Malachite green	Base paint	M 1986 and earlier
170	Black	Solid	
172	Silver	Base paint	M 1986 and earlier
198	Embassy blue	Solid	
199*	Test colour	Solid or base paint	
200	Silver	Base paint	M 1987 and later
201	Bronze	Base paint	
202	Rose quartz	Base paint	M 1987 and later
203	Platinum blue	Base paint	M 1987 and later
204	Odoardo grey	Base paint	M 1987-1990
205	Malachite green	Base paint	M 1987 and later
206	Cochineal red	Base paint	M 1987 and later
212	Magenta	Base paint	
213	Rhodonite	Solid	
214	Cherry red	Solid	M 1988 and later
215	Ultramarine	Solid	
216	Beryl green	Base paint	M 1990 and earlier
217	Ascot grey	Solid	
219	Talladega red	Solid	
220	Iridium blue	Base paint	
223	Odoardo grey	Base paint	M1991 to M1993, inclusive
226	Beryl green	Base paint	M 1991
227	Citrine beige	Base paint	
228	Platana grey	Base paint	
229	Le Mans blue	Base paint	
230	Scarab green	Base paint	
232	Derby grey	Solid	M 1992 and later
233	Carrara white	Solid	M1992 and M1993
234	Nocturne blue	Base paint	M1992 and M1993
235	Eucalyptus green	Base paint	M 1992 and later
240	Imola red	Solid	M 1993 and later
241	Aubergine	Mica metallic**	M 1994 and later
242	Ruby red	Base paint	M 1993 and later
247	Silver	Base paint	M 1995 and later
248	Nova black	Base paint	M 1995 and later
252	Sky blue	Base paint	M 1996 and later
253	Java black	Base paint	M 1996 and later

*) Indicates that this paint is not a stock item. It is available to special order only.

**) A special type of metallic paint that refracts reflected light. This gives it a deeper lustre while at the same time a shimmering iridescent effect is obtained.

Important

Always quote the car's colour code when ordering paint.

Air conditioning, A/C

Compressor

Type designation		Sanden SD 510	Sanden SD 709	Seiko Seiki SS121 DN1
Number of cylinders		5	7	-
Swept volume	$cm^3(in^3)$	161 (9.8)	154.9 (9.45)	121 (7.38
Oil capacity, new compressor	dl	1,35	1,35	2.0
Clutch		Electromagnetic	Electromagnetic	Electromagnetic
Speed range	rpm	500-6000	500-6000	500-6000
Weight with clutch	kg (lb)	7.7 (16.8)	6.95 (15.2)	6.6 (14.8)

Expansion valve

Model year		**M1985-1991**	**M1992-**
Type		Thermic expansion valve with external pressure equalization	Thermic expansion valve with internal pressure equalization
Capacity	ton	2	1.7
Static overheating	°C (°F)	4.4 ± 0.8 (40 ± 2)	4.4 ± 0.8 (40 ± 2)

Antifrost thermostat

Model year		**M1985-1991**	M1992-
Manufacturer		Ranco	Ranco or General El.
Switch-off temperature	°C (°F)	+1.5 ± 1.1 (34.5 ± 1.1)	+2.0 ± 1.1 (35.6 ± 2)
Switch-on temperature	°C (°F)	5.0 (41.0) (Switch-off temp + maximum difference = 3.6)	2 + 3.0 ± 1.1 (35.6 + 3.6 ± 2)

Pressure switch

M1985		**First stage**	**Second stage**	**Third stage**
Switch-off pressure	bar (psi)	2.7 (39.5)		
Switch-on pressure	bar (psi)	3.1 (45)		
M1986-1991				
Switch-off pressure	bar (psi)	1.95 ± 0.24 (28 ± 3.5)	10.7 ± 0.97 (155 ± 14)	26.5 ± 1.95 (380 ± 28)
Switch-on pressure	bar (psi)	2.1 ± 0.34 (30.5 ± 4.95)	14.5 ± 0.97 (210 ± 14)	20.3 ± 1.95 (295 ± 28)
M1992-				
Switch-off pressure	bar (psi)	2.0 ± 0.25 (29 ± 3.6)	11.5 ± 1.5 (181 ± 22)	30 ± 2.0 (435 ± 29)
Switch-on pressure	bar (psi)	2.15 ± 0.35 (31 ± 5.1)	16.5 ± 1.2 (239 ± 17)	24.0 ± 2.0 (348 ± 29)

Safety valve

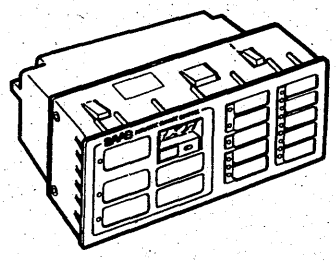
Refrigerant		**R12**	**R134a**
Type		Mechanical	Mechanical
Opening pressure	bar (psi)	31 ± 2 (445 ± 29)	37.0 ± 3.7 (537 ± 54)
Closing pressure	bar (psi)	28 (405)	30 (435)

Refrigerant

Model year		**M1985-1992**	**M1992-**
Designation		R12	R134a
Quantity	kg (lb)	1.1 (2.43)	0.95 (2.1)
Quantity for system with rear A/C	kg (lb)	1.35 (2.98)	

Lubricant

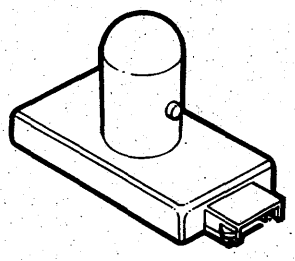
Refrigerant	**R12**	R134a
Type	Mineral oil 520 SUS 38 °C (100 °F)	P.A.G. oil (Poly Alkylene Glycol)
Part number		40 74 787



C870W-4308

ACC control module

Model year		M1985-1989	1990-1994	M1995-
Number of connector pins	qty	25	39+12	39
Power supply (+30 circuit)	pin No. pin No.	1	32 (in 39-pin connector) 1 (in 12-pin connector)	22
Power supply (+54 circuit)	pin No.	14	2 (in 12-pin connector)	7
Ground	pin No.	13	12 (in 12-pin connector)	1

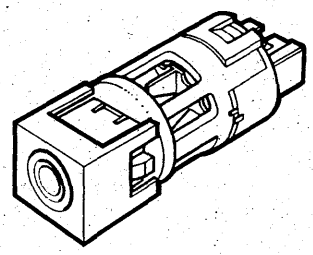


C870W-4309

Solar sensor

Model year		1990-94*	1995-
Dark	W/m^2	0**	0**
Light from incandescent lamp (60W)	W/m^2	600-1200*	600-1200*
Power supply approx. 10 V	pin No.	1 (+54)	1 (from ACC control module)
Ground	pin No.	4	4 (from ACC control module)
Sensor signal	pin No.	2	2 (to ACC control module)

** Earlier model year cars have no facilities for communication with the ISAT scan tool.*
***) Readings of the W/m^2 values can be obtained with the ISAT scan tool.*



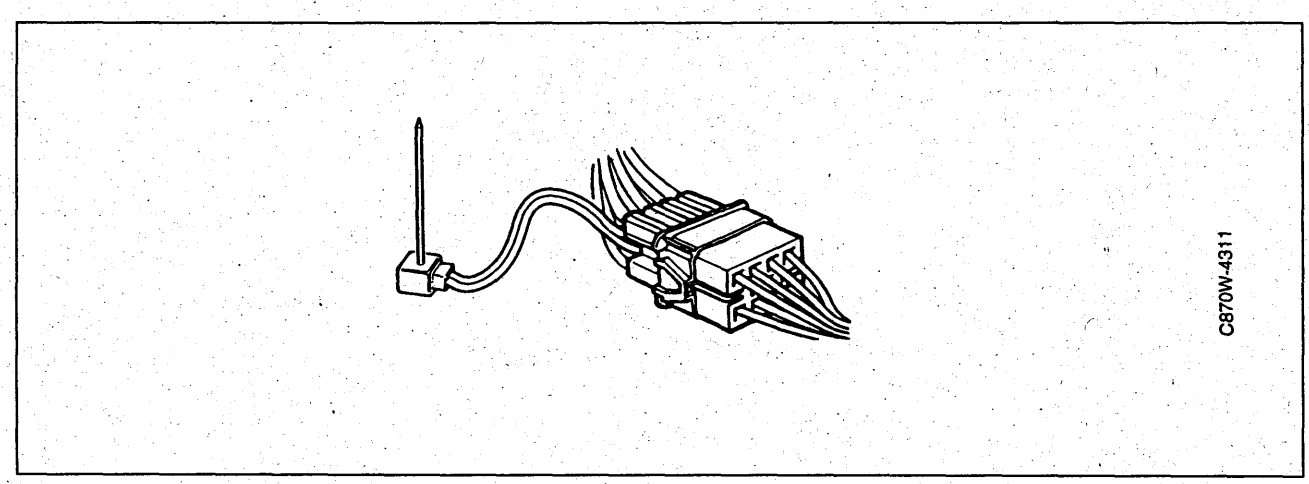
C870W-4310

Cabin temperature sensor

Pin numbers apply to M95-

Normally aspirated engine	V mA	12 approx. 50
Power supply, normally aspirated engine	pin No.	4 (from ACC control module)
Ground, normally aspirated engine		grounding point G8
Signal voltage, temperature sensor (NTC)	pin No.	3 (from ACC control module)
Ground, temperature sensor (NTC)	pin No.	2 (from ACC control module)

°C	°F	kohms
0	32	30.0 - 34.9
10	50	18.5 - 21.1
20	68	11.8 - 13.2
25	77	9.5 - 10.5
30	86	7.6 - 8.5
40	104	5.0 - 5.7



Blended air temperature sensor

		M1990-1994	M1995-
°C	°F	kohms	kohms
0	32	25.5-30.5	25.5 - 30.5
10	50	16.6-19.6	16.8 - 19.7
20	68	11.2-13.0	11.3 - 13.0
30	86	7.7-8.8	7.8 - 8.8
40	104	5.4-6.1	5.4 - 6.1
50	122		3.9 - 4.3
60	140		2.8 - 3.2
70	158		2.1 - 2.3
80	176		1.5 - 1.7
90	194		1.1 - 1.3

Tightening torques

Compressor

		Sanden
Centre nut, clutch	Nm (lbf ft)	38 ± 4 (28 ± 3)
Cylinder block bolts	Nm (lbf ft)	32 ± 2 (23.5 ± 1.5)
Oil filler plug	Nm (lbf ft)	10 ± 2 (7.4 ± 1.4)
Service valves	Nm (lbf ft)	14.5 ± 2.5 (10.6 ± 1.8)

Diverse

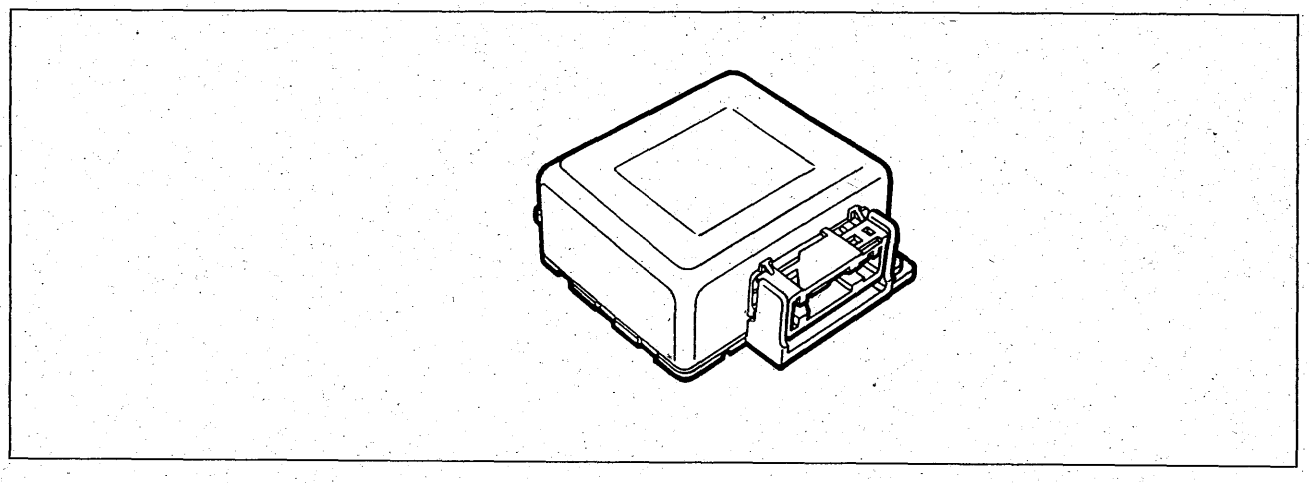
		Sanden	Seiko Seiki
Compressor, pressure	Nm (lbf ft)	32.5 ± 2.5 (24 ± 2)	10 ± 2 (7.4 ± 1.4)
suction	Nm (lbf ft)	37.5 ± 2.5 (28 ± 2)	10 ± 2 (7.4 ± 1.4)
Condenser, inlet	Nm (lbf ft)	24.5 ± 3.5 (18 ± 2.5)	24.5 ± 3.5 (18 ± 2.5)
outlet	Nm (lbf ft)	17 ± 3 (12.6 ± 2.2)	17 ± 3 (12.6 ± 2.2)
Receiver, inlet	Nm (lbf ft)	17 ± 3 (12.6 ± 2.2)	17 ± 3 (12.6 ± 2.2)
outlet	Nm (lbf ft)		18-25 (13.3-18.5)
expansion valve	Nm (lbf ft)	17 ± 3 (12.6 ± 2.2)	
Pressure switch	Nm (lbf ft)	17 ± 3 (12.6 ± 2.2)	17 ± 3 (12.6 ± 2.2)
Expansion valve	Nm (lbf ft)	23.5 ±3.5 (17.3 ±2.6)	
PAD connection	Nm (lbf ft)		17.5 ± 2.5 (12.8 ± 1.8)
Evaporator valve	Nm (lbf ft)		6 ± 2 (4.5 ± 1.5)
Equalization pipe connection on suction pipe	Nm (lbf ft)	8.5 ± 1.5 (6.2 ± 1)	
Evaporator outlet	Nm (lbf ft)	33.5 ±4.5 (24.5 ±3.5)	
Safety valve	Nm (lbf ft)	17 ± 3 (12.6 ± 2.2)	12 ± 1 (8.8 ± 0.8)

Drive-belt tension

		Sanden*	Seiko Seiki	for V6 engine
New, unused belt	N (lbf)	535 ± 45	Automatic	Automatic
Belt tension check	N (lbf)	355 ± 22	Automatic	Automatic
Refitting a used belt	N (lbf)	355 ± 22	Automatic	Automatic

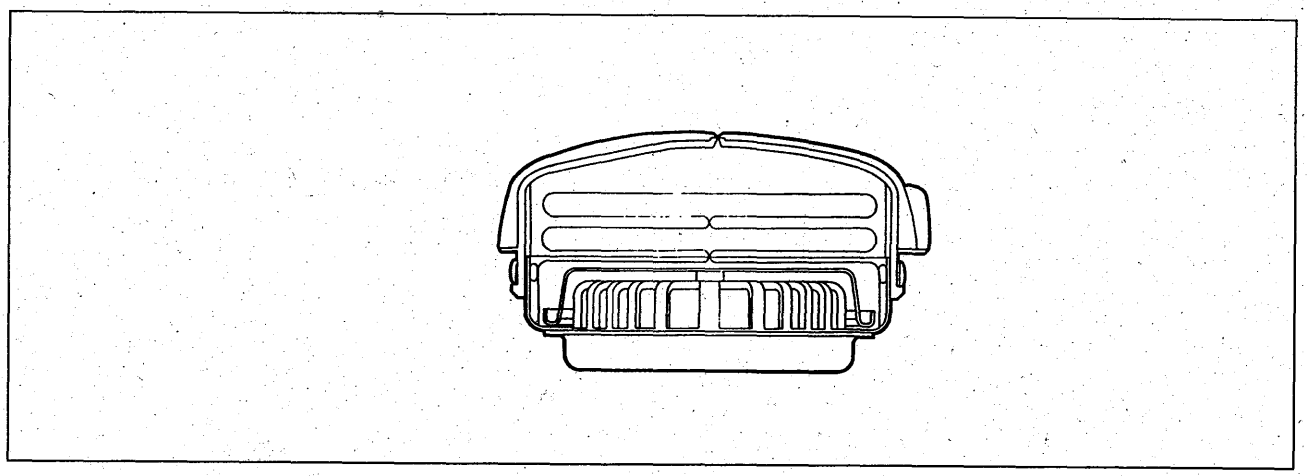
**With V-belt, otherwise automatic.*

Airbag SRS



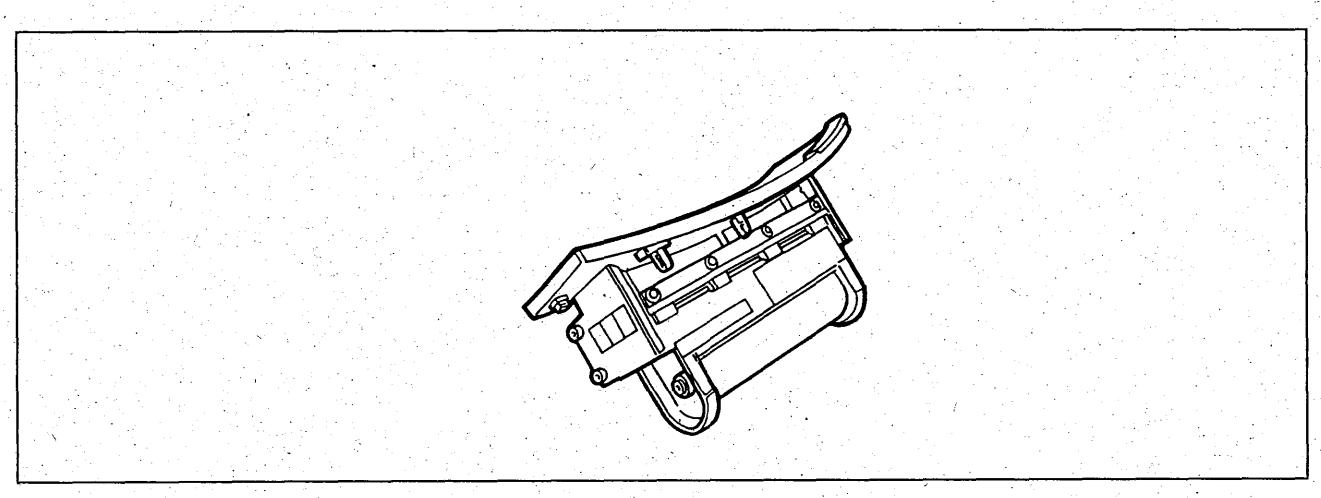
SRS control module (M1995-)

Power supply (+15 circuit)	pin	5
Ground	pin	6
Diagnosis	pin	9
Airbag, driver	pins	10-11
Airbag, passenger	pins	13-14
Seat-belt tensioner, driver	pins	1-2
Seat-belt tensioner, passenger	pins	3-4
Operating range	V	7-16
Time for self-test	s	6
Time for disconnection of energy reserve	s	max. 5
Number of diagnostic trouble codes stored	qty	5 + 1 for collision



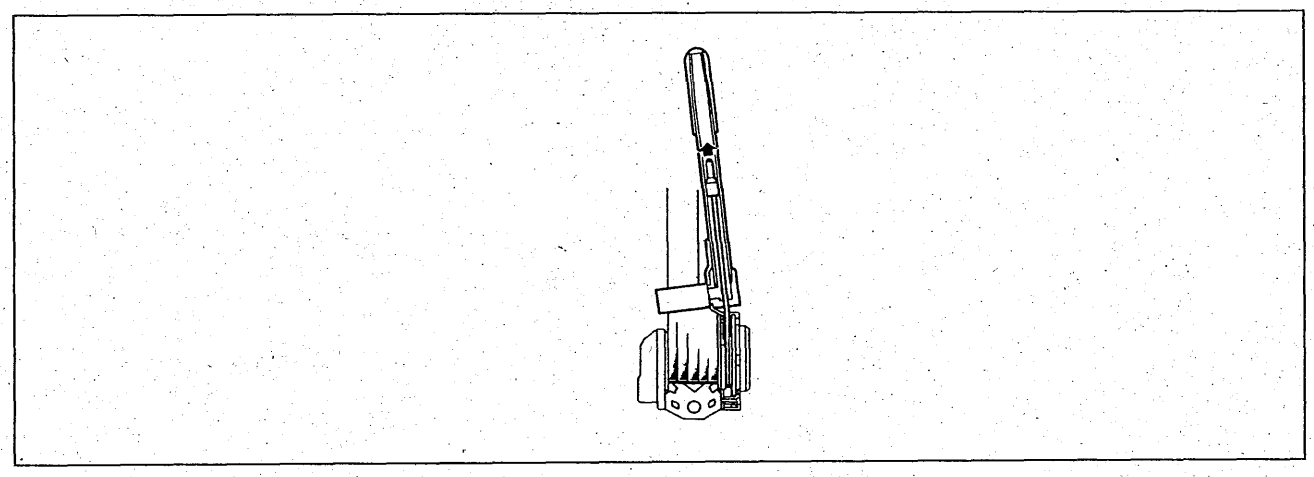
Airbag, driver

Volume	litres	approx. 70



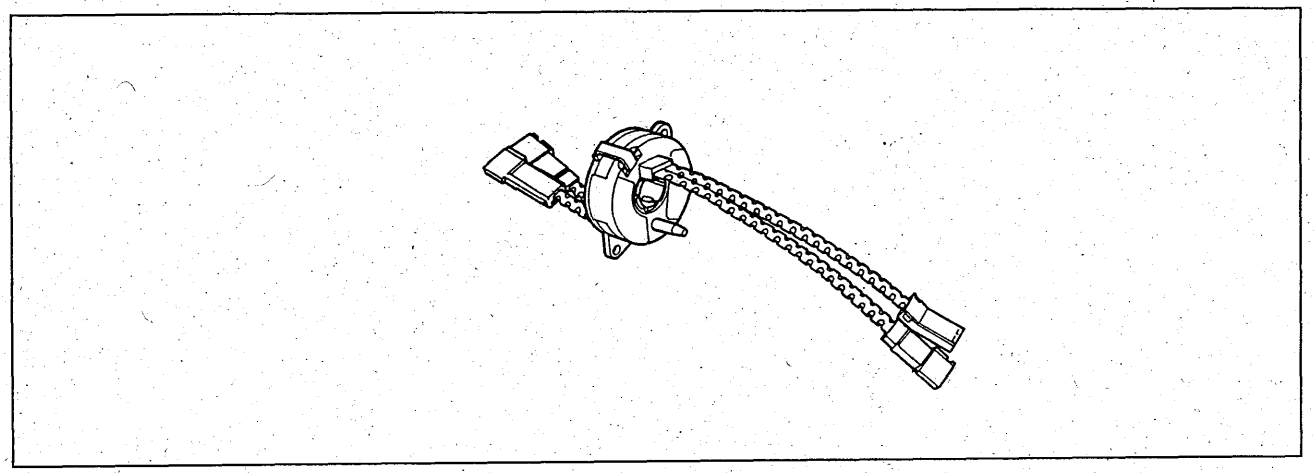
Airbag, passenger

Volume	litres	approx. 150



Belt tensioner

Stroke	mm	180



Contact roller (coil spring)

Permissible rotation of moving part	maximum 2.5 turns either way from the centre position

Workshop Information

User feedback

To

Saab Automobile AB
Workshop Information, MLVI
S-461 80 TROLLHÄTTAN
SWEDEN

Telefax phone no.: +46 520 84370

From

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Comments/suggestions

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Manual concerned: .....

It is important that Saab technicians in the field regard the Workshop Service Manual as their bible, and we therefore strive to make the manual easy to use and to provide accurate information.

By letting us have your views on this manual you will be helping us to maintain a high standard in our literature.

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