

Service manual

Repairs and Maintenance

TP 30425/4

Section 0(03)

Specifications

240 ALL

1983—1985

VOLVO

VOLVO CARS OF NORTH AMERICA

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A bar in the margin indicates changes in text
and/or specifications in this manual.

TP 30425/4

(Supersedes
30425/3)

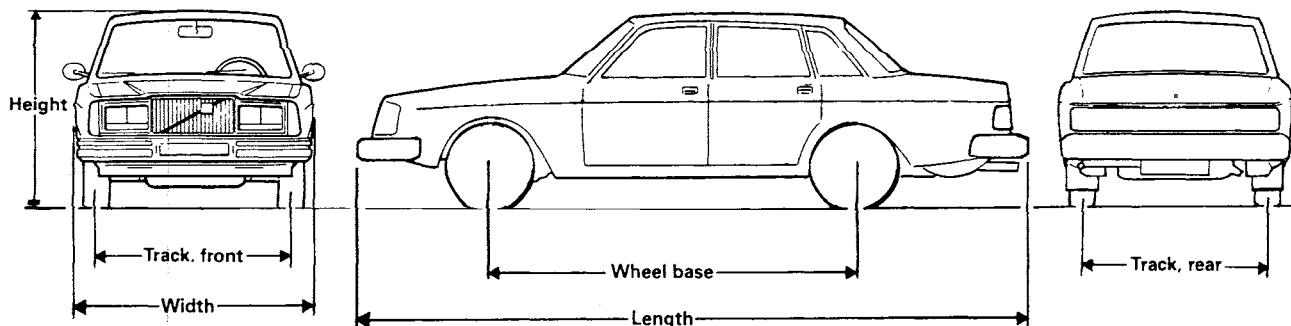
Reprint of 09.85 information with minor changes.

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Section O: General Specifications

Dimensions



1983–1984

	2-door	4-door	Wagon
Length, USA models	481 cm 189.4"	481 cm 189.4"	481 cm 189.4"
Length, Canada models	489 cm 192"	489 cm 192"	489 cm 192"
Width	171 cm 67.3"	171 cm 67.3"	171 cm 67.3"
Height, curb weight:			
– 2-door and 4-door models	143 cm 56.3"	143 cm 56.3"	143 cm 56.3"
– Wagons	146 cm 57.5"	146 cm 57.5"	146 cm 57.5"
Wheel base			
– Power steering	265 cm 104.3"	265 cm 104.3"	265 cm 104.3"
Ground clearance, full load	12 cm 4.7"	12 cm 4.7"	12 cm 4.7"
Track:			
– Front	143 cm 56.3"	143 cm 56.3"	143 cm 56.3"
– Rear	136 cm 53.5"	136 cm 53.5"	136 cm 53.5"
Turning circle, between curbs	9.8 m 32.2 ft	9.8 m 32.2 ft	9.8 m 32.2 ft

1985

Measurements are the same for US and Canada models, unless otherwise stated.

Length	
– USA models	189.4" 481 cm
– Canada models	489 cm
Width	
– All	67.3" 171 cm
Height, at curb weight	
– 4-door	56.3" 143 cm
– 5-door (wagon)	57.5" 146 cm

Wheel base	
– All	104.3" 265 cm
Ground clearance, full load	
– All	4.7" 12 cm
Track	
– Front	56.3" 143 cm
– Rear	53.5" 136 cm
Turning circle, between curbs	
– All	32.2 ft 9.8 m

Weights**USA 1983–1984**

	2-door	4-door	Wagon
Curb weight, depending on type:			
– Gasoline, except Turbo Wagon	1299–1327 kg 2860–2920 lbs	1298–1377 kg 2860–3035 lbs	1354–1390 kg 2980–3060 lbs
– Turbo Wagon	–	–	1426 kg 3140 lbs
– Diesel	–	1398–1410 kg 3080–3105 lbs	1439–1452 kg 3170–3200 lbs
Gross Vehicle Weight, GVW:			
– Gasoline, except Turbo Wagon	1830 kg 4030 lbs	1830 kg 4030 lbs	1950 kg 4300 lbs
– Turbo Wagon	–	–	1900 kg 4190 lbs
– Diesel	–	1900 kg 4190 lbs	2000 kg 4410 lbs
Capacity weight:			
– Gasoline, except Turbo Wagon	445 kg 980 lbs	435 kg 960 lbs	555 kg 1220 lbs
– Turbo Wagon	–	–	440 kg 970 lbs
– Diesel	–	440 kg 960 lbs	545 kg 1200 lbs
Permissible axle weight, front:			
– Gasoline models	855 kg 1885 lbs	855 kg 1885 lbs	855 kg 1885 lbs
– Diesel	–	930 kg 2050 lbs	930 kg 2050 lbs
Permissible axle weight, rear:			
– Gasoline, except Turbo Wagon	990 kg 2180 lbs	990 kg 2180 lbs	1180 kg 2600 lbs
– Turbo Wagon	–	–	1060 kg 2340 lbs
– Diesel	–	990 kg 2180 lbs	1180 kg 2600 lbs
Maximum trailer weight, trailer equipped with service brakes			
	1500 kg 3300 lbs	1500 kg 3300 lbs	1500 kg 3300 lbs
Maximum hitch load	90 kg 200 lbs	90 kg 200 lbs	90 kg 200 lbs
Maximum roof load (wagon, with roof rack)			100 kg 220 lbs

Weights, special for Canada models 1983–1984

	2-door	4-door	Wagon
Curb weight, depending on type:			
– Gasoline, except Turbo Wagon	1295–1379 kg 2850–3035 lbs	1315–1399 kg 2895–3080 lbs	1359–1376 kg 2990–3030 lbs
– Turbo Wagon	–	–	1448 kg 3190 lbs
– Diesel	–	1398–1410 kg 3080–3105 lbs	1439–1451 kg 3170–3195 lbs
Gross Vehicle Weight, GVW			
– Gasoline	1830 kg 4030 lbs	1830 kg 4030 lbs	1900 kg 4190 lbs
– Turbo Wagon	–	–	1900 kg 4190 lbs
– Diesel	–	1900 kg 4190 lbs	2000 kg 4410 lbs
Capacity weight:			
– Gasoline, except Turbo Wagon	960 lbs 435 kg	940 lbs 425 kg	1090 lbs 495 kg
– Turbo Wagon	–	–	950 lbs 430 kg
– Diesel	–	431 kg 950 lbs	540 kg 1190 lbs

Weights, USA and Canada 1985

Permissible axle weight, front USA and Canada

- Gasoline models	1885 lbs 855 kg
- Diesel models (late 1984)	2050 lbs 930 kg

Permissible axle weight, rear, USA

- Sedan (gasoline and Diesel)	2180 lbs 990 kg
- Wagon (except Turbo)	2600 lbs 1180 kg
- Turbo Wagon	2340 lbs 1060 kg

Canada

- Sedan (gasoline and Diesel)	990 kg
- Wagon (except Turbo)	1120 kg
- Turbo Wagon	1060 kg

Max trailer weight	3300 lbs 1500 kg
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Max. hitch load	200 lbs 90 kg
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Curb weight, USA models

- Sedan	2841–3040 lbs 1290–1380 kg
- Wagon	2963–2984 lbs 1345–1355 kg
- Turbo Wagon	3128 lbs 1420 kg
- Diesel Sedan (late 1984 models) ...	3006–3030 lbs 1365–1376 kg
- Diesel Wagon (late 1984 models) ...	3132–3154 lbs 1422–1432 kg

Curb weight, Canada models

- Sedan	1280–1350 kg
- Wagon	1340–1390 kg
- Turbo Wagon	1390 kg
- Diesel Sedan (late 1984 models) ...	1365–1376 kg
- Diesel Wagon (late 1984 models) ...	1439–1451 kg

031.002

Gross Vehicle Weight (GVW), USA models

- Sedan	4030 lbs 1830 kg
- Wagon	4300 lbs 1950 kg
- Turbo Wagon	4190 lbs 1900 kg
- Diesel Sedan (late 1984 models) ...	4190 lbs 1900 kg
- Diesel Wagon (late 1984 models) ...	4410 lbs 2000 kg

Gross Vehicle Weight (GVW), Canada models

- Sedan	1830 kg
- Wagon	1900 kg
- Turbo Wagon	1900 kg

Capacity weight, USA models

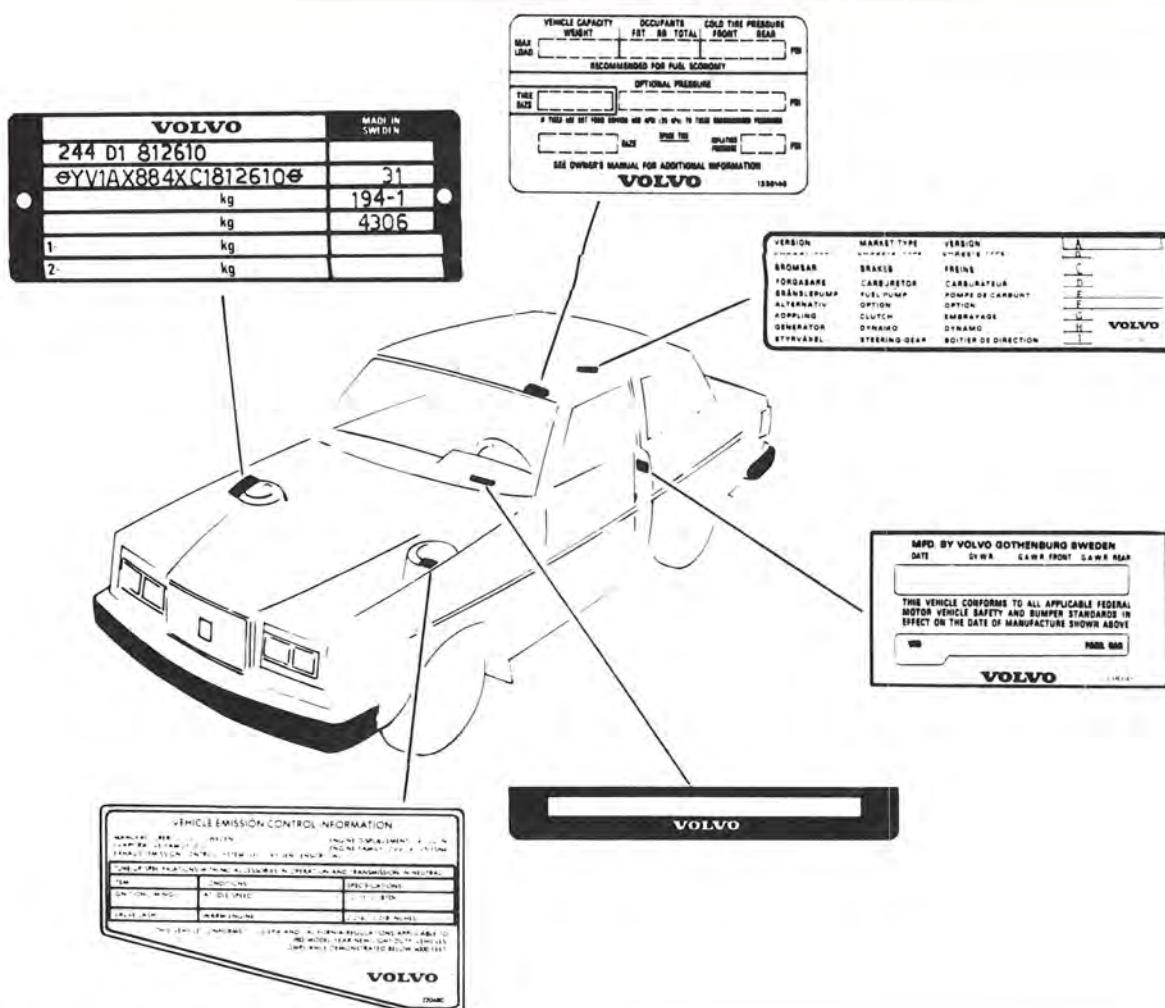
- Sedan	960 lbs 435 kg
- Wagon	1220 lbs 555 kg
- Turbo Wagon	970 lbs 440 kg
- Diesel Sedan (late 1984 models) ...	960 lbs 440 kg
- Diesel Wagon (late 1984 models) ...	1200 lbs 545 kg

Capacity weight, Canada models

- Sedan	425 kg
- Wagon	495 kg
- Turbo Wagon	430 kg
- Diesel Sedan (late 1984 models) ...	430 kg
- Diesel Wagon (late 1984 models) ...	540 kg

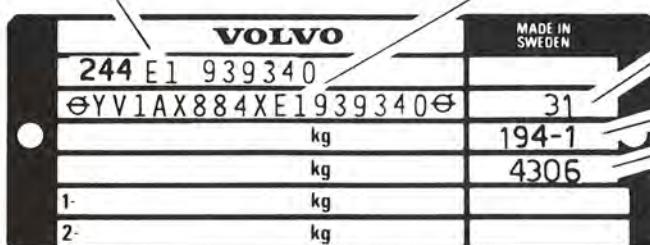
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Identification and designation plates and labels



Service Designation Number

Service Designation Number:
For all service transactions for which the dealer is seeking reimbursement.



Vehicle Identification Number (VIN)
For decoding, see next page.

Market Code

30 = USA/Federal ("49 states")

31 = USA/Fer

(“50 states”)

81 = USA, assembled in Canada

83 =



Decoding of Vehicle Identification Number (VIN)

SYV1AX884XE1939340S

Manufacturer code

Assigned by ISO

Series and safety system

A = 240 Series

Vacant

Engine

41 = B21A

47 = B21F-Turbo

77 = D24 (diesel)

84 = B23E

88 = B23F, B230F

Body

2 = 2-door, standard wheelbase

4 = 4-door, standard wheelbase

5 = 5-door (wagon), standard wheelbase

Check figure

Calculated from other digits.

Year model code, assigned by FMVSS

A = 1980 D = 1983

B = 1981 E = 1984

C = 1982 F = 1985

Manufacturing plant

0 = Kalmar/Sweden

1 = Torslanda/Sweden

2 = Volvo Europe

3 = Canada

Serial number ("chassis number")

The serial numbers start at:

For 1983 year models:

223940 for 4-cylinder 2-door

812610 for 4-cylinder 4-door

434460 for 4-cylinder 5-door (wagon)

For 1984 year models:

237370 for 4-cylinder 2-door

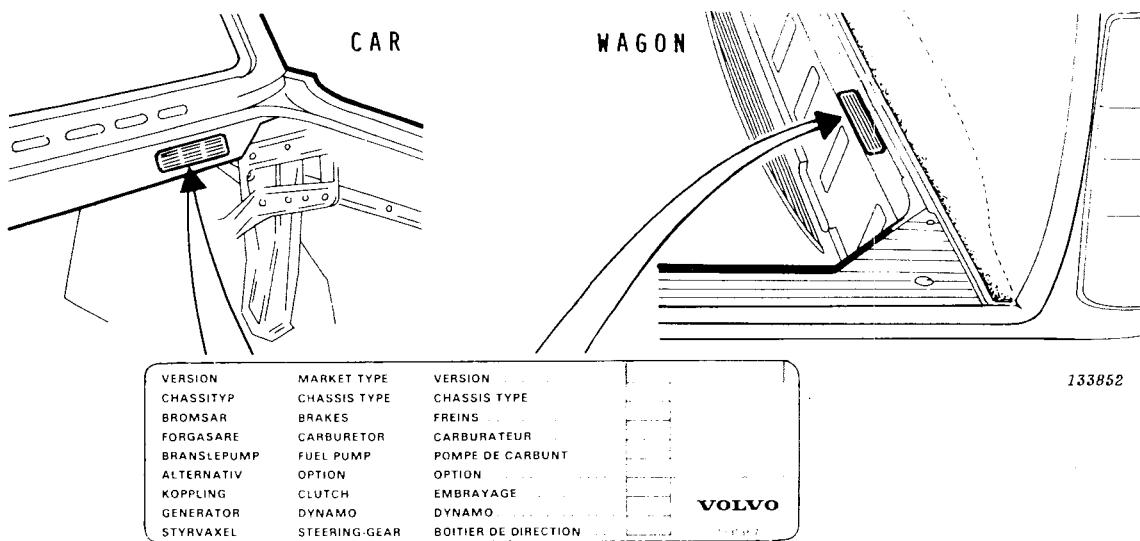
939340 for 4-cylinder 4-door

506270 for 4-cylinder 5-door (wagon)

For 1985 year models:

72450 for 4-cylinder 4-door

592006 for 4-cylinder 5-door (wagon)

Service label

133609

A. Version.

See "Decoding of Version Identification Code (VIC), next page.

C. Brakes.Code Number 1 = Girling front and rear
2 = Girling front, ATE rear**D. Carburetor.**Code number 1 = Zenith
3 = Pierburg
5 = Solex**E. Fuel Pump.**

Code number

2 = Pierburg
3 = Bosch
4 = AC-Delco
5 = Sofabex**F. Option.**

Special code number with several digits identifies special equipment, such as aluminum wheels, air conditioning, air dam, central lock etc.

G. Clutch.Code number 2 = Fichtel & Sachs
3 = Verto/Valeo**H. Alternator.**

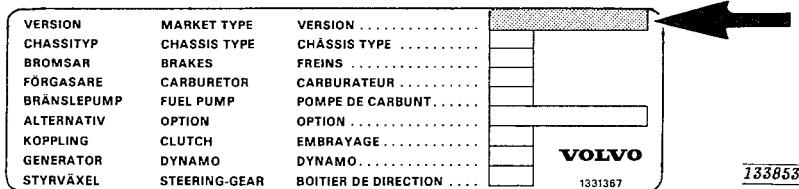
Code number 1 = Bosch

I. Steering gear.Code number 2 = Cam Gear
3 = ZF

Decoding of Version Identification Code (VIC)

These numbers identify the vehicle model, body type, engine type, fuel system, emission equipment and other market features.

Service label



VIC number breakdown

24 2 88 03 4 2 1

Vehicle model

24 = 240 Series

Number of doors

2 = 2 doors
4 = 4 doors
5 = 5 doors, wagon

Engine

41 = B21A
47 = B21F-Turbo
77 = D24
88 = B23F LH-Jetronic, 1983-1984
88 = B230F LH-Jetronic 2.2, 1985

Trim level

02 = DL
03 = GL
06 = GLT

Body model

3 = Without sunroof
4 = With sunroof

Transmission

2 = M46
7 = AW70/AW71
8 = BW55

Features

1 = Left hand drive
2 = Right hand drive
7 = Special

US specifications 1983

Federal and California

Vehicles manufactured in Sweden Market code 31.

Model and doors	Version Identification Code (VIC)	Engine	Fuel system	Trans-mission	Rear axle	Rear axle ratio	Prop. shaft	Tires	Sun-roof	Special version
DL 2-d	242-8802-321	B23F	LH-Jetronic	M46	1031	3.31	1310	175-SR	No	
DL 2-d	242-8802-371	B23F	LH-Jetronic	AW70	1030	3.73	1140	175-SR	No	
DL 4-d	244-8802-321	B23F	LH-Jetronic	M46	1031	3.31	1310	175-SR	No	
DL 4-d	244-8802-371	B23F	LH-Jetronic	AW70	1030	3.73	1140	175-SR	No	
DL 4-d	244-8802-323	B23F	LH-Jetronic	M46	1031	3.31	1310	175-SR	No	"Taxi"
DL 4-d	244-8802-373	B23F	LH-Jetronic	AW70	1030	3.73	1310	175-SR	No	"Taxi"
DL 4-d	244-8802-327	B23F	LH-Jetronic	M46	1031	3.31	1310	175-SR	No	"Police"
DL 4-d	244-8802-377	B23F	LH-Jetronic	AW70	1030	3.73	1310	175-SR	No	"Police"
DL 4-d	244-4702-327	B21F-Turbo	CI	M46	1031	3.73	1310	195/60HR	No	"Police"
DL 4-d	244-4702-377	B21F-Turbo	CI	AW71	1030	3.91	1310	195/60HR	No	"Police"
DL 4-d	244-7702-323	D24	-	M46	1030	3.54	1310	175-SR	No	"Taxi"
DL 4-d	244-7702-383	D24	-	BW55	1031	3.31	1310	175-SR	No	"Taxi"
DL 5-d	245-8802-321	B23F	LH-Jetronic	M46	1031	3.31	1310	185-SR	NA	
DL 5-d	245-8802-371	B23F	LH-Jetronic	AW70	1030	3.73	1140	185-SR	NA	
DL 5-d	245-8802-377	B23F	LH-Jetronic	AW70	1030	3.73	1310	185-SR	NA	"Police"
DL 5-d	245-8802-373	B23F	LH-Jetronic	AW70	1030	3.73	1310	185-SR	NA	"Taxi"
DL 5-d	245-4702-377	B21F-Turbo	CI	AW71	1030	3.91	1310	195/60HR	NA	"Police"
DL 5-d	245-7702-323	D24	-	M46	1030	3.54	1310	185-SR	NA	"Taxi"
DL 5-d	245-7702-383	D24	-	BW55	1031	3.31	1310	185-SR	NA	"Taxi"
GL 4-d	244-8803-421	B23F	LH-Jetronic	M46	1031	3.31	1310	185/70SR	Yes	
GL 4-d	244-8803-471	B23F	LH-Jetronic	AW70	1030	3.73	1140	185/70SR	Yes	
GL 4-d	244-7703-421	D24	-	M46	1030	3.54	1140	185/70SR	Yes	
GL 4-d	244-7703-481	D24	-	BW55	1031	3.31	1140	185/70SR	Yes	
GL 5-d	245-8803-321	B23F	LH-Jetronic	M46	1031	3.31	1310	185-SR	NA	
GL 5-d	245-8803-371	B23F	LH-Jetronic	AW70	1030	3.73	1140	185-SR	NA	
GL 5-d	245-7703-321	D24	-	M46	1030	3.54	1140	185-SR	NA	
GL 5-d	245-7703-381	D24	-	BW55	1031	3.31	1140	185-SR	NA	
GLT 2-d	242-4706-421	B21F-Turbo	CI	M46	1031	3.73	1310	195/60HR	Yes	
GLT 2-d	242-4706-471	B21F-Turbo	CI	AW71	1030	3.91	1310	195/60HR	Yes	
GLT 4-d	244-4706-421	B21F-Turbo	CI	M46	1031	3.73	1310	195/60HR	Yes	
GLT 4-d	244-4706-471	B21F-Turbo	CI	AW70	1030	3.91	1310	195/60HR	Yes	
GLT 5-d	245-4706-321	B21F-Turbo	CI	M46	1031	3.73	1310	195/60HR	NA	
GLT 5-d	245-4706-371	B21F-Turbo	CI	AW71	1030	3.91	1310	195/60HR	NA	

Vehicles assembled in Canada Market code 81.

Model and doors	Version Identification Code (VIC)	Engine	Fuel system	Trans-mission	Rear axle	Rear axle ratio	Prop. shaft	Tires	Sun-roof
DL 2-d	242-8802-321	B23F	LH-Jetronic	M46	1031	3.31	1310	175-SR	No
DL 2-d	242-8802-421	B23F	LH-Jetronic	M46	1031	3.31	1310	175-SR	Yes
DL 4-d	244-8802-321	B23F	LH-Jetronic	M46	1031	3.31	1310	175-SR	No
DL 4-d	244-8802-421	B23F	LH-Jetronic	M46	1031	3.31	1310	175-SR	Yes
DL 5-d	245-8802-321	B23F	LH-Jetronic	M46	1031	3.31	1310	185-SR	NA

Column "Sunroof": NA=not applicable.

**US "Federal" specifications
1983**

Model and doors	Version Identification Code (VIC)	Engine	Fuel System	Trans-mission	Rear axle	Rear axle ratio	Prop. shaft	Tires	Sun-roof
GL 4-d	244-7703-421	D24	-	M46	1030	3.54	1140	185/70SR	Yes
GL 4-d	244-7703-481	D24	-	BW55	1031	3.31	1140	185/70SR	Yes
GL 5-d	245-7703-321	D24	-	M46	1030	3.54	1140	185-SR	NA
GL 5-d	245-7703-321	D24	-	BW55	1031	3.31	1140	185-SR	NA

**Canada
1983**

Model and doors	Version Identification Code (VIC)	Engine	Fuel system	Trans-mission	Rear axle	Rear axle ratio	Prop. shaft	Tires	Sun-roof
GL 4-d	244-7703-421	D24	-	M46	1030	3.54	1140	185/70SR	Yes
GL 4-d	244-7703-481	D24	-	BW55	1031	3.31	1140	185/70SR	Yes
GL 5-d	245-7703-321	D24	-	M46	1030	3.54	1140	185-SR	NA
GL 5-d	245-7703-381	D24	-	BW55	1031	3.31	1140	185-SR	NA

**Canada
1983**

Model and doors	Version Identification Code (VIC)	Engine	Fuel system	Trans-mission	Rear axle	Rear axle ratio	Prop. shaft	Tires	Sun-roof
DL 2-d	242-4102-321	B21A	Carb.	M46	1030	3.54	1140	P185/75	No
DL 2-d	242-4102-421	B21A	Carb.	M46	1030	3.54	1140	P185/75	Yes
DL 4-d	244-4102-321	B21A	Carb.	M46	1030	3.54	1140	P185/75	No
DL 4-d	244-4102-381	B21A	Carb.	BW55	1030	3.54	1140	D185/75	No
DL 5-d	245-4102-321	B21A	Carb.	M46	1030	3.54	1140	D185/75	NA
DL 5-d	245-4102-381	B21A	Carb.	BW55	1030	3.54	1140	P185/75	NA
GL 4-d	244-8403-421	B23E	CI	M46	1031	3.73	1310	P185/75	Yes
GL 4-d	244-8403-481	B23E	CI	BW55	1031	3.54	1310	P185/75	Yes
GL 5-d	245-8403-321	B23E	CI	M46	1031	3.73	1310	P185/75	NA
GL 5-d	245-8403-381	B23E	CI	BW55	1031	3.54	1310	P185/75	NA
GLT 2-d	242-4706-421	B21F-turbo	CI	M46	1031	3.73	1310	175/60HR	Yes
GLT 2-d	242-8406-421	B23E	CI	M46	1031	3.73	1310	195/60HR	Yes
GLT 2-d	242-8406-481	B23E	CI	BW55	1031	3.54	1310	195/60HR	Yes
GLT 4-d	244-4706-421	B21F-Turbo	CI	M46	1031	3.73	1310	195/60HR	Yes
GLT 4-d	244-4706-471	B21F-Turbo	CI	AW71	1030	3.91	1310	195/60HR	Yes
GLT 5-d	245-4706-321	B21F-Turbo	CI	M46	1031	3.73	1310	195/60HR	NA
GLT 5-d	245-4706-371	B21F-Turbo	CI	AW71	1030	3.91	1310	195/60HR	NA

Column "Sunroof": NA=not applicable.

**US specifications
1984**

**Federal and
California**

**Vehicles manufactured in Sweden
Market code 31.**

<i>Model and doors</i>	<i>Version Identification Code (VIC)</i>	<i>Engine</i>	<i>Fuel system</i>	<i>Trans- mission</i>	<i>Rear axle</i>	<i>Rear axle ratio</i>	<i>Prop. shaft</i>	<i>Sun- roof</i>	<i>Special version</i>
DL 2-d	242-8802-321	B23F	LH-Jetronic	M46	1031	3.31	1310	No	
DL 2-d	242-8802-371	B23F	LH-Jetronic	AW70	1030	3.73	1140	No	
DL 4-d	244-8802-321	B23F	LH-Jetronic	M46	1031	3.31	1310	No	
DL 4-d	244-8802-371	B23F	LH-Jetronic	AW70	1030	3.73	1140	No	
DL 4-d	244-8802-373	B23F	LH-Jetronic	AW70	1030	3.73	1140	No	"Taxi"
DL 4-d	244-8802-377	B23F	LH-Jetronic	AW70	1030	3.73	1140	No	"Police"
DL 5-d	245-8802-321	B23F	LH-Jetronic	M46	1031	3.31	1310	NA	
DL 5-d	245-8802-371	B23F	LH-Jetronic	AW70	1030	3.73	1140	NA	
DL 5-d	245-8802-373	B23F	LH-Jetronic	AW70	1030	3.73	1140	NA	"Taxi"
DL 5-d	245-8802-371	B23F	LH-Jetronic	AW70	1030	3.73	1140	NA	"Police"
GL 4-d	244-8803-421	B23F	LH-Jetronic	M46	1031	3.31	1310	Yes	
GL 4-d	244-8803-471	B23F	LH-Jetronic	AW70	1030	3.73	1140	Yes	
GL 5-d	245-8803-321	B23F	LH-Jetronic	M46	1031	3.31	1310	NA	
GL 5-d	245-8803-371	B23F	LH-Jetronic	AW70	1030	3.73	1140	NA	

<i>Model and doors</i>	<i>Model designation</i>	<i>Version Identification Code (VIC)</i>	<i>Engine</i>	<i>Fuel system</i>	<i>Trans- mission</i>	<i>Rear axle</i>	<i>Rear axle ratio</i>	<i>Prop. shaft</i>	<i>Sun- roof</i>	<i>Special version</i>
Turbo 2-d	GLT	242-4706-421	B21F-Turbo	CI	M46	1031	3.73	1310	Yes	
Turbo 2-d	GLT	242-4706-471	B21F-Turbo	CI	AW71	1030	3.91	1310	Yes	
Turbo 4-d	DL	244-4702-377	B21F-Turbo	CI	AW71	1030	3.91	1310	No	"Police"
Turbo 4-d	GLT	244-4706-421	B21F-Turbo	CI	M46	1031	3.73	1310	Yes	
Turbo 4-d	GLT	244-4706-471	B21F-Turbo	CI	AW71	1030	3.91	1310	Yes	
Turbo 5-d	GLT	245-4706-321	B21F-Turbo	CI	M46	1031	3.73	1310	NA	
Turbo 5-d	GLT	245-4706-371	B21F-Turbo	CI	AW71	1030	3.91	1310	NA	

Not sold in California:

Diesel 4-d	DL	244-7702-383	D24	Diesel	BW55	1031	3.31	1310	No	"Taxi"
Diesel 4-d	GL	244-7703-421	D24	Diesel	M46	1030	3.54	1140	Yes	
Diesel 4-d	GL	244-7703-481	D24	Diesel	BW55	1031	3.31	1140	Yes	
Diesel 5-d	DL	245-7702-383	D24	Diesel	BW55	1031	3.31	1310	NA	"Taxi"
Diesel 5-d	GL	245-7703-321	D24	Diesel	M46	1030	3.54	1140	NA	
Diesel 5-d	GL	245-7703-381	D24	Diesel	BW55	1031	3.31	1140	NA	

**Vehicles assembled in Canada
Market code 81.**

<i>Model and doors</i>	<i>Version Identification Code (VIC)</i>	<i>Engine</i>	<i>Fuel system</i>	<i>Trans- mission</i>	<i>Rear axle</i>	<i>Rear axle ratio</i>	<i>Prop. shaft</i>	<i>Sun- roof</i>
DL 2-d	242-8802-321	B23F	LH-Jetronic	M46	1031	3.31	1310	No
DL 4-d	244-8802-321	B23F	LH-Jetronic	M46	1031	3.31	1310	No
DL 5-d	245-8802-321	B23F	LH-Jetronic	M46	1031	3.31	1310	NA

Column "Sunroof": NA=not applicable.

**US "Federal" specifications
1984**

**Vehicles manufactured in Sweden
Market code 30.**

<i>Model and doors</i>	<i>Model designation</i>	<i>Version Identification Code (VIC)</i>	<i>Engine</i>	<i>Fuel system</i>	<i>Trans-mission</i>	<i>Rear axle</i>	<i>Rear axle ratio</i>	<i>Prop. shaft</i>	<i>Sun-roof</i>	<i>Special version</i>
Diesel 4-d	GL	244-7703-421	D24	Diesel	M46	1030	3.54	1140	Yes	
Diesel 4-d	GL	244-7703-481	D24	Diesel	BW55	1031	3.31	1140	Yes	
Diesel 5-d	GL	245-7703-321	D24	Diesel	M46	1030	3.54	1140	NA	
Diesel 5-d	GL	245-7703-381	D24	Diesel	BW55	1031	3.31	1140	NA	

**Canada
1984**

**Vehicles assembled in Canada
Market code 83.**

<i>Model and doors</i>	<i>Version Identification Code (VIC)</i>	<i>Engine</i>	<i>Fuel system</i>	<i>Trans-mission</i>	<i>Rear axle</i>	<i>Rear axle ratio</i>	<i>Prop. shaft</i>	<i>Sun-roof</i>
DL 2-d	242-4102-321	B21A	Carb.	M46	1030	3.54	1140	No
DL 2-d	242-4102-421	B21A	Carb.	M46	1030	3.54	1140	Yes
DL 4-d	244-4102-321	B21A	Carb.	M46	1030	3.54	1140	No
DL 4-d	244-4102-381	B21A	Carb.	BW55	1030	3.54	1140	No
DL 5-d	245-4102-321	B21A	Carb.	M46	1030	3.54	1140	NA
DL 5-d	245-4102-381	B21A	Carb.	BW55	1030	3.54	1140	NA
GL 4-d	244-8803-421	B23F	LH-Jetronic	M46	1031	3.31	1310	Yes
GL 4-d	244-8803-471	B23F	LH-Jetronic	AW70	1030	3.73	1140	Yes
GL 5-d	245-8803-321	B23F	LH-Jetronic	M46	1031	3.31	1310	NA
GL 5-d	245-8803-371	B23F	LH-Jetronic	AW70	1030	3.73	1140	NA
GLE 4-d	244-8804-421	B23F	LH-Jetronic	M46	1031	3.31	1310	Yes
GLE 4-d	244-8804-471	B23F	LH-Jetronic	AW70	1030	3.73	1140	Yes

<i>Model and doors</i>	<i>Model designation</i>	<i>Version Identification Code (VIC)</i>	<i>Engine</i>	<i>Fuel system</i>	<i>Trans-mission</i>	<i>Rear axle</i>	<i>Rear axle ratio</i>	<i>Prop. shaft</i>	<i>Sun-roof</i>
Turbo 2-d	GLT	242-4706-421	B21F-Turbo	CI	M46	1031	3.73	1310	Yes
Turbo 4-d	GLT	244-4706-421	B21F-Turbo	CI	M46	1031	3.73	1310	Yes
Turbo 4-d	GLT	244-4706-471	B21F-Turbo	CI	AW71	1030	3.91	1310	Yes
Turbo 5-d	GLT	245-4706-321	B21F-Turbo	CI	M46	1031	3.73	1310	NA
Turbo 5-d	GLT	245-4706-371	B21F-Turbo	CI	AW71	1030	3.91	1310	NA
Diesel 4-d	GL	244-7703-421	D24	Diesel	M46	1030	3.54	1140	Yes
Diesel 4-d	GL	244-7703-481	D24	Diesel	BW55	1031	3.31	1140	Yes
Diesel 5-d	GL	245-7703-321	D24	Diesel	M46	1030	3.54	1140	NA
Diesel 5-d	GL	245-7703-381	D24	Diesel	BW55	1031	3.31	1140	NA

Column "Sunroof": NA=not applicable.

**US “Federal” specifications
1985**

Vehicles manufactured in Sweden
Market code 30.

Late-production 1984 Diesel models

Model and doors	Version Identification Code (VIC)	Engine	Fuel system	Trans-mission	Rear axle	Rear axle ratio	Steering gear	Interior light	Shift indicator	Heater AC	Sun-roof	Note
Diesel 4-d	244-7702-321	D24	Diesel	M46	1030	3.54	CamGear	Std	No	Heater	No	DL
Diesel 4-d	244-7702-381	D24	Diesel	BW55	1031	3.31	CamGear	Std	No	Heater	No	DL
Diesel 4-d	244-7702-383	D24	Diesel	BW55	1031	3.31	CamGear	Std	No	Heater	No	DL, Special
Diesel 5-d	245-7702-321	D24	Diesel	M46	1030	3.54	CamGear	Std	No	Heater	NA	DL
Diesel 5-d	245-7702-381	D24	Diesel	BW55	1031	3.31	CamGear	Std	No	Heater	NA	DL

031.006

**US “Federal” specifications
1985**

Vehicles assembled in Canada
Market code 81.

Model and doors	Version Identification Code (VIC)	Engine	Fuel system	Trans-mission	Rear axle	Rear axle ratio	Steering gear	Interior light	Shift indicator	Heater AC	Sun-roof
DL 4-d	244-8802-371	B230F	LH-Jetronic 2.2	AW70	1030	3.73	SZF	Std	–	Heater	No
DL 5-d	245-8802-371	B230F	LH-Jetronic 2.2	AW70	1030	3.73	SZF	Std	–	Heater	–

031.007

**US specifications
1985**

Federal and California

**Vehicles manufactured in Sweden
Market code 31.**

Model and doors	Version Identification Code (VIC)	Engine	Fuel system	Trans-mission	Rear axle	Rear axle ratio	Steering gear	Interior light	Shift indicator	Heater AC	Sun-roof	Note
DL 4-d	244-8802-321	B230F	LH-Jetronic 2.2	M46	1031	3.31	CamGear	Std	Yes	Heater	No	
DL 4-d	244-8802-371	B230F	LH-Jetronic 2.2	AW70	1030	3.73	CamGear	Std	–	Heater	No	
DL 4-d	244-8802-373	B230F	LH-Jetronic 2.2	AW70	1030	3.73	CamGear	Std	–	Heater	No	Special
DL 4-d	244-8802-377	B230F	LH-Jetronic 2.2	AW70	1031	3.73	CamGear	Std	–	Heater	No	Special
GL 4-d	244-8803-421	B230F	LH-Jetronic 2.2	M46	1031	3.31	CamGear	Delayed	Yes	AC	Yes	
GL 4-d	244-8803-471	B230F	LH-Jetronic 2.2	AW70	1030	3.73	CamGear	Delayed	–	AC	Yes	
DL 5-d	245-8802-321	B230F	LH-Jetronic 2.2	M46	1031	3.31	CamGear	Std	Yes	Heater	–	
DL 5-d	245-8802-371	B230F	LH-Jetronic 2.2	AW70	1030	3.73	CamGear	Std	–	Heater	–	
GL 5-d	245-8803-321	B230F	LH-Jetronic 2.2	M46	1031	3.31	CamGear	Delayed	Yes	AC	–	
GL 5-d	245-8803-371	B230F	LH-Jetronic 2.2	AW70	1030	3.73	CamGear	Delayed	–	AC	–	
Turbo 4-d	244-4702-377	B21F-Turbo	CI	AW71	1031	3.91	CamGear	Std	–	Heater	–	DL, Special
Turbo 4-d	244-4706-421	B21F-Turbo	CI	M46	1031	3.73	CamGear	Delayed	–	AC	Yes	GLT
Turbo 4-d	244-4706-471	B21F-Turbo	CI	AW71	1031	3.91	CamGear	Delayed	–	AC	Yes	GLT
Turbo 5-d	245-4706-321	B21F-Turbo	CI	M46	1031	3.73	CamGear	Delayed	–	AC	–	GLT
Turbo 5-d	245-4706-371	B21F-Turbo	CI	AW71	1031	3.91	CamGear	Delayed	–	AC	–	GLT

031.008

Column “Sunroof”: NA = not applicable

**Canada
1985**

**Vehicles assembled in Canada
Market code 83.**

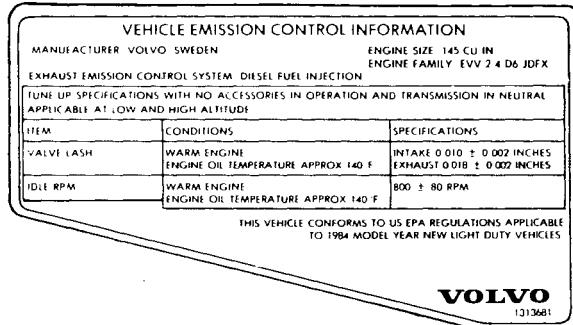
Model and doors	Version Identification Code (VIC)	Engine	Fuel system	Trans mission	Rear axle	Rear axle ratio	Steering gear	Interior light	Shift indicator	Heater AC	Sun- roof	Note
DL 4-d	244-8802-321	B230F	LH-Jetronic 2.2	M46	1031	3.31	CamGear	Std	Yes	Heater	No	
DL 4-d	244-8802-371	B230F	LH-Jetronic 2.2	AW70	1030	3.73	CamGear	Std	-	Heater	No	
DL 4-d	244-8802-373	B230F	LH-Jetronic 2.2	AW70	1030	3.73	CamGear	Std	-	Heater	No	Special
DL 4-d	244-8802-377	B230F	LH-Jetronic 2.2	AW70	1030	3.73	CamGear	Std	-	Heater	No	Special
GL 4-d	244-8803-421	B230F	LH-Jetronic 2.2	M46	1031	3.31	ZF	Delayed	Yes	Heater	Yes	
GL 4-d	244-8803-471	B230F	LH-Jetronic 2.2	AW70	1030	3.73	ZF	Delayed	-	Heater	Yes	
DL 5-d	245-8802-321	B230F	LH-Jetronic 2.2	M46	1031	3.31	CamGear	Std	Yes	Heater	-	
DL 5-d	245-8802-371	B230F	LH-Jetronic 2.2	AW70	1030	3.73	CamGear	Std	-	Heater	-	
GL 5-d	245-8803-321	B230F	LH-Jetronic 2.2	M46	1031	3.31	ZF	Delayed	Yes	Heater	-	
GL 5-d	245-8803-371	B230F	LH-Jetronic 2.2	AW70	1030	3.73	ZF	Delayed	-	Heater	-	
Turbo 4-d	244-4702-377	B21F-Turbo	CI	AW71	1031	3.91	CamGear	Std	-	Heater	No	DL, Special
Turbo 4-d	244-4706-421	B21F-Turbo	CI	M46	1031	3.73	CamGear	Delayed	-	Heater	Yes	GLT
Turbo 4-d	244-4706-471	B21F-Turbo	CI	AW71	1031	3.91	CamGear	Delayed	-	Heater	Yes	GLT
Turbo 5-d	245-4706-321	B21F-Turbo	CI	M46	1031	3.73	CamGear	Delayed	-	Heater	-	GLT
Turbo 5-d	245-4706-371	B21F-Turbo	CI	AW71	1031	3.91	CamGear	Delayed	-	Heater	-	GLT
Diesel 4-d*	244-7702-321	D24	Diesel	M46	1030	3.54	CamGear	Std	-	Heater	No	DL
Diesel 4-d*	244-7702-381	D24	Diesel	BW55	1031	3.31	CamGear	Std	-	Heater	No	DL
Diesel 4-d*	244-7702-383	D24	Diesel	BW55	1031	3.31	CamGear	Std	-	Heater	No	DL
Diesel 5-d*	245-7702-321	D24	Diesel	M46	1030	3.54	CamGear	Std	-	Heater	-	DL
Diesel 5-d*	245-7702-381	D24	Diesel	BW55	1031	3.31	CamGear	Std	-	Heater	-	DL

*1 Late-production 1984 models

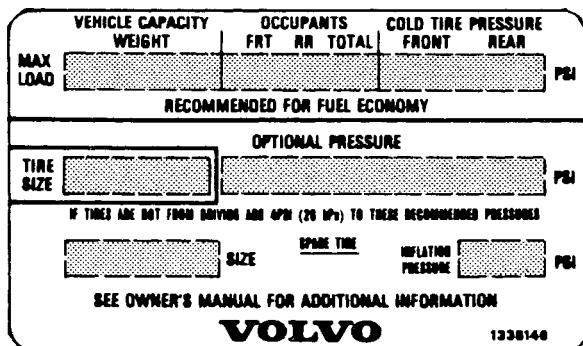
031.009



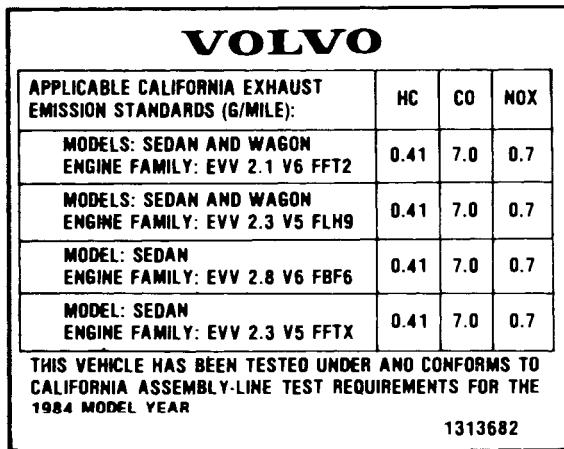
129320



133857



133606



133862

VIN ("chassis number) plate.

Location:
On top of dashboard.

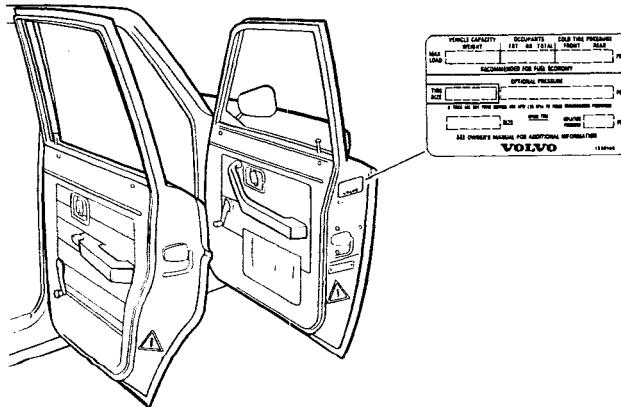
May be read from outside of vehicle. Also stamped on right side door pillar.

Vehicle emission control information label.

Location:
On left front wheel housing.
Black print on white background.

Vehicle capacity and tire pressure.

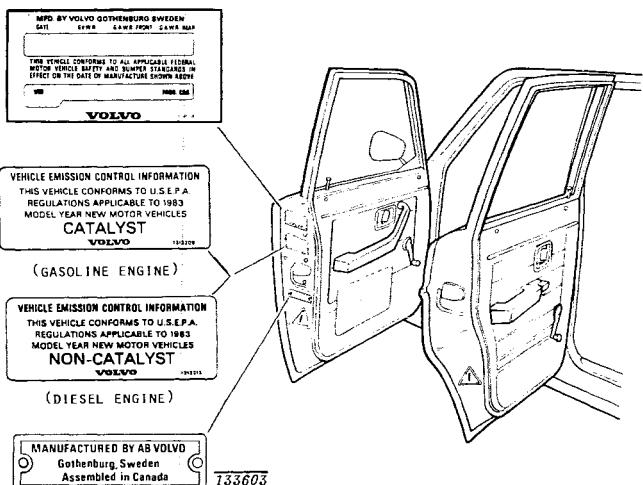
Location:
On right front door.
Black print on white background.



133567

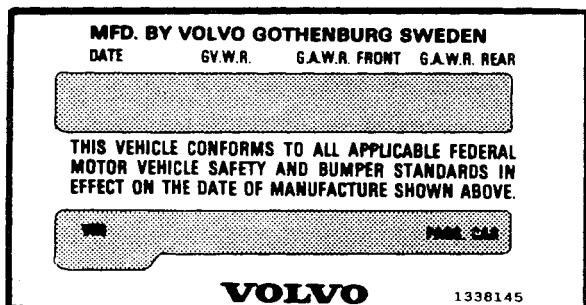
California, conformity label.

Location:
On left rear side window:
Black text on transparent background.
(The information on this label may change during the production run.)



Left front door labels.

On the left front door are displayed several information labels for the driver's attention. Loads and catalytic converter warnings are displayed. Also the Vehicle Identification Number (VIN) is stated. It can be found on the FMVSS label. Further explanations of the labels on the left front door appear below.



GVWR = Gross Vehicle Weight Rating
GAWR = Gross Axle Weight Rating

133604

Federal Motor Vehicle Safety Standards (FMVSS) label.

USA label displays lb., Canada label kg.

Location:

Rear facing end of left front door.

Black text on white background, gray fields.

This label also carries the Vehicle Identification Number (VIN).

Below the VIN number is a code letter (A, B, C, etc) which has been assigned to a particular model or group of models. This code letter will make it easier for the customer to identify his model among other models listed in the Consumer Information data booklet.



133863

Catalytic converter label

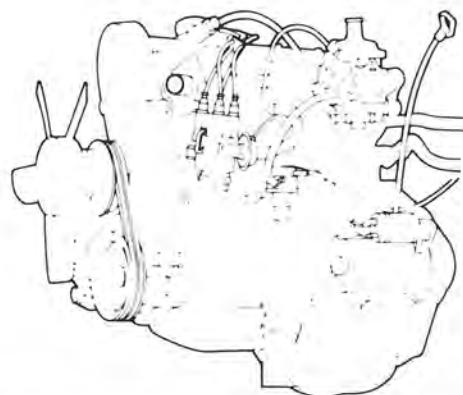
Location:

Rear facing side of left front door.

Text CATALYST for gasoline engines, NON-CATALYST for Diesel engines.

Black print on yellow background.

Engines

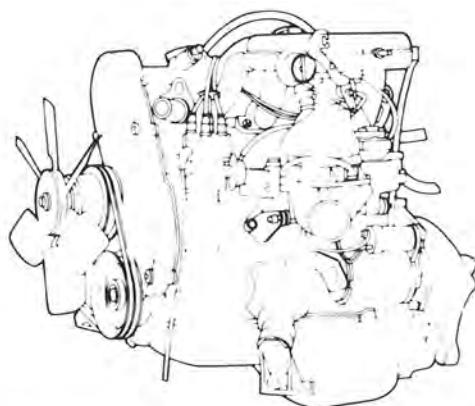


133734

B21A, Canada 1983

Features:

- Four-cylinder in-line gasoline engine with overhead camshaft.
- Carburetor.
- Emission control systems consisting of Puls-air in combination with EGR (Exhaust Gas Recirculation) type "on/off" (manual transmission) or "proportional" (automatic transmission).

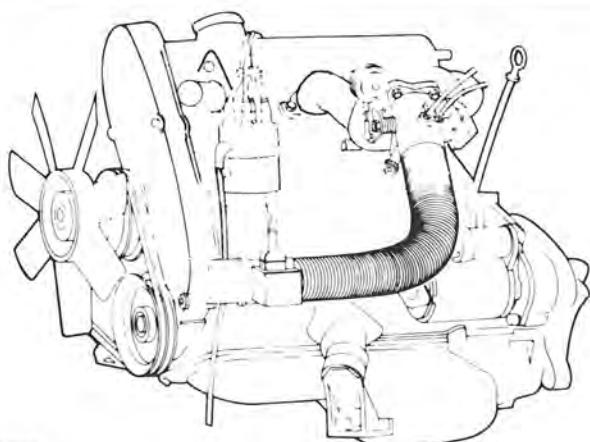


133760

B23E (Canada 1983)

Features:

- Four-cylinder in-line gasoline engine with overhead camshaft.
- CI fuel injection system.
- Breakerless electronic ignition system.
- Emission control systems consisting of Puls-air in combination with EGR (Exhaust Gas Recirculation) type "on/off" (manual transmission) or "proportional" (automatic transmission).



133733

B23F LH-Jetronic, 1983–1984

The B23F engine is used in combination with the LH-Jetronic II fuel system with knock sensor.

Features:

- Four-cylinder in-line gasoline engine with overhead camshaft.
- Computer controlled ignition system.
- LH-Jetronic II fuel system with integrated constant idle speed system.
- Lambda-sond system in combination with 3-way catalytic converter.

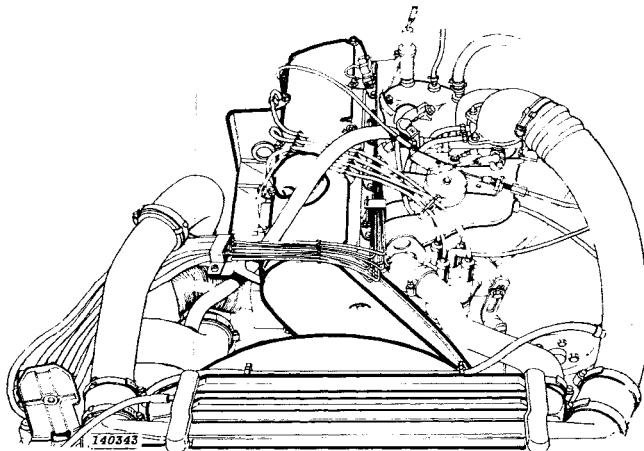


133248

B21F-Turbo, 1983–1984

Features:

- Four-cylinder in-line gasoline engine with overhead camshaft and exhaust-driven turbo-compressor.
- CI fuel injection system.
- Breakerless electronic ignition system.
- Lambda-sond system in combination with 3-way catalytic converter.
- Constant idle speed system.

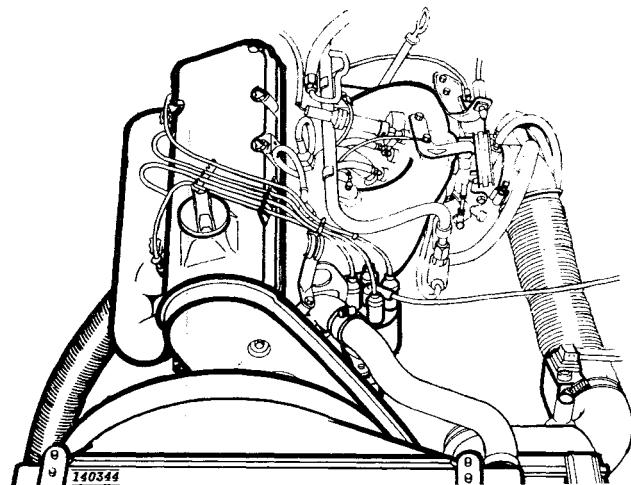


B21F-Turbo, with intercooler, 1985

Basically the same engine that was used on 1984 late models.

Features:

- Four-cylinder in-line gasoline engine with overhead camshaft, exhaust-driven turbo-compressor and intercooler.
- CI fuel injection system.
- Breakerless electronic ignition system.
- Lambda-sond system in combination with 3-way catalytic converter.
- Constant idle speed system.

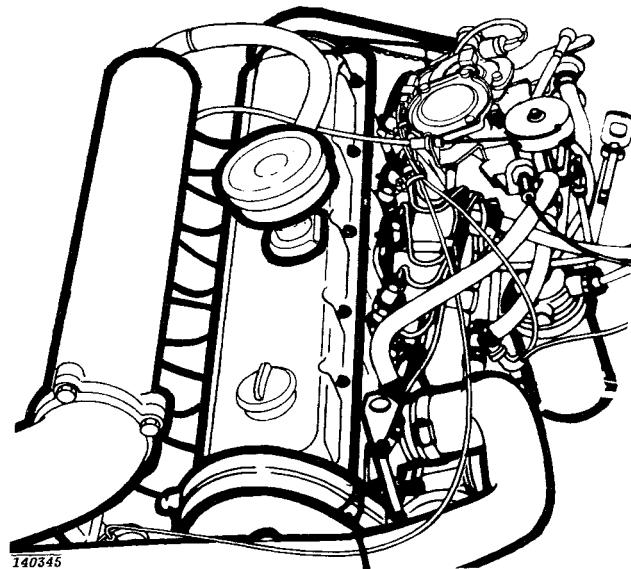


B230F 1985

A development of the B23F engine used on 1984 models. Reduced friction and vibrations, improved fuel economy and cold start ability.

Features:

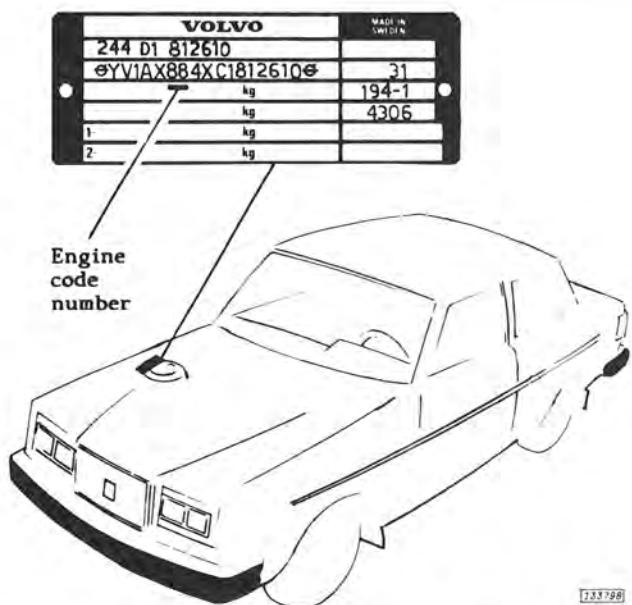
- Four-cylinder in-line gasoline engine with overhead camshaft.
- Computer controlled ignition system with knock sensor.
- LH-Jetronic 2.2 fuel system with integrated constant idle speed system.
- Lambda-sond system in combination with 3-way catalytic converter.



D24 (Diesel)

Features:

- Six-cylinder in-line diesel engine with fuel injection into swirl chambers.



**Engine code number
in
VIN (Vehicle Identification Number)**

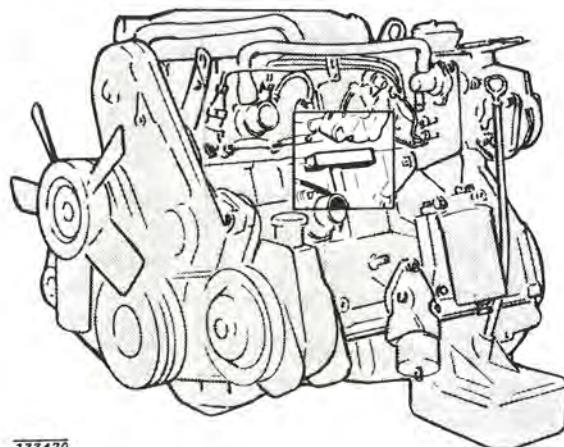
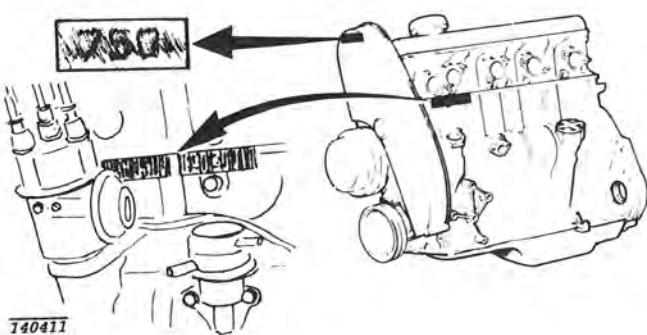
Engine

- 41 = B21A
- 47 = B21F-Turbo
- 77 = D24
- 84 = B23E (Canada 1983)
- 88 = B23F LH-Jetronic
- 88 = B230F LH-Jetronic 2.2, 1985

Engine Identification Number

B21 and B23

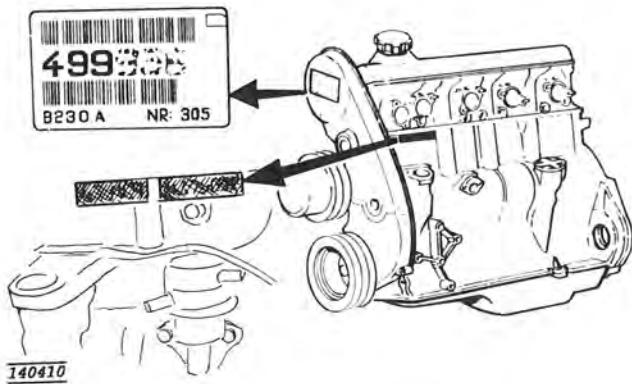
Last three digits of Engine Identification Number printed on label on timing belt cover.



D24 Diesel

**Engine Identification Number and
Engine Serial Number**

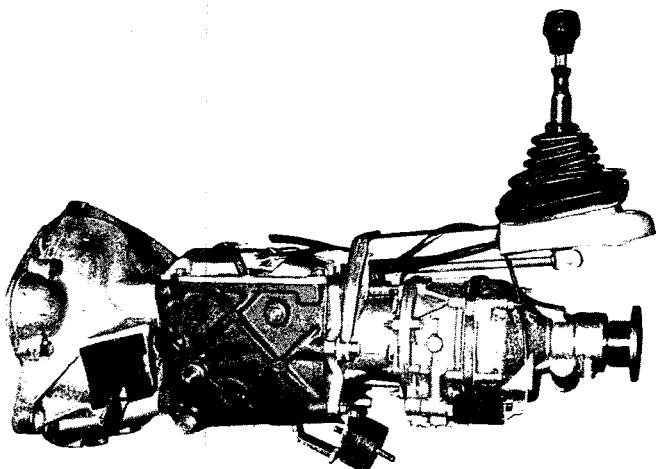
Stamped under the vacuum pump on engine left side.



B230

Six-digit number on decal on camshaft drive cover.
Also stamped in left side of cylinder block, behind distributor.

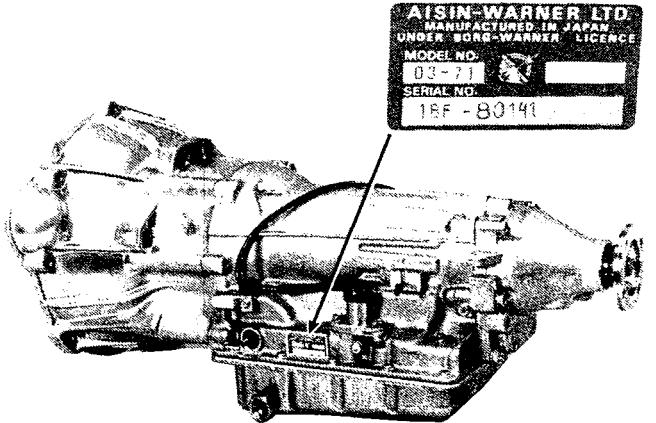
Transmissions



140256

M46

Manual 4-speed transmission plus overdrive.
With first gear ratio 4.03:1.



140340

BW55

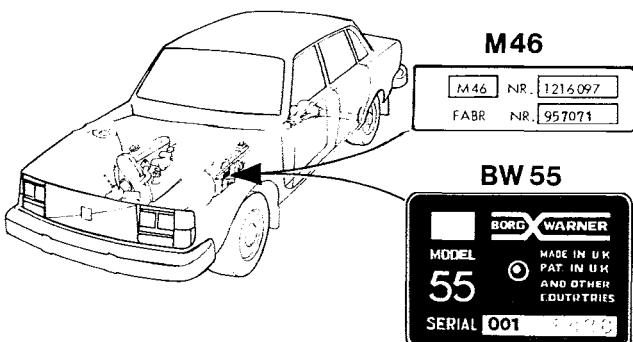
3-speed automatic transmission.

AW70

4-speed automatic transmission. (May be more technically correct to say "3-speed automatic transmission plus overdrive").

AW71

4-speed automatic transmission, for somewhat heavier duty applications than AW70 above.



M46

M46 NR. 1216097
FABR. NR. 957071

BW 55

BORG X WARNER
MODEL 55
MADE IN UK PAT IN UK AND OTHER COUNTRIES
SERIAL 001 1422

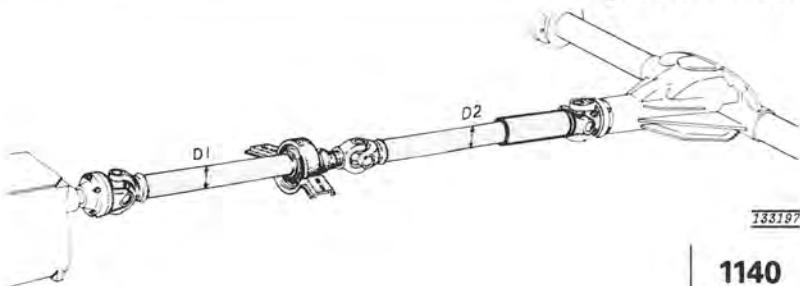
Type designation, part number and serial number

Manual transmission:
Plate on transmission underside.

Automatic transmission:
Plate on transmission left side.

133799

Propeller shafts



133197

1140

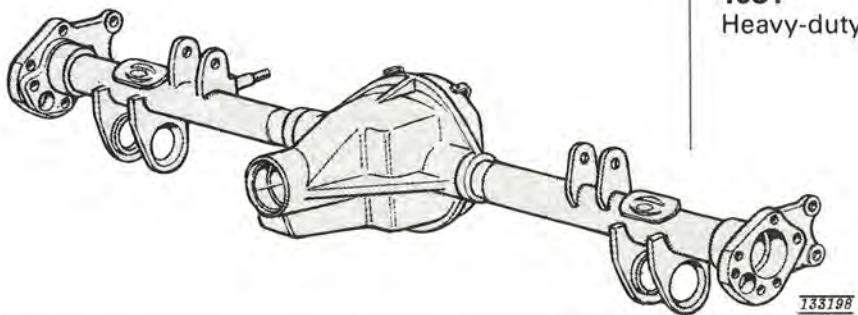
Standard propeller shaft, used on the majority of vehicles.

Diameters D1 and D2 are 44.5 mm = 1.752".

1310

Heavy-duty version of 1140 above. Diameters D1 and D2 are 50.8 mm = 2".

Rear axles



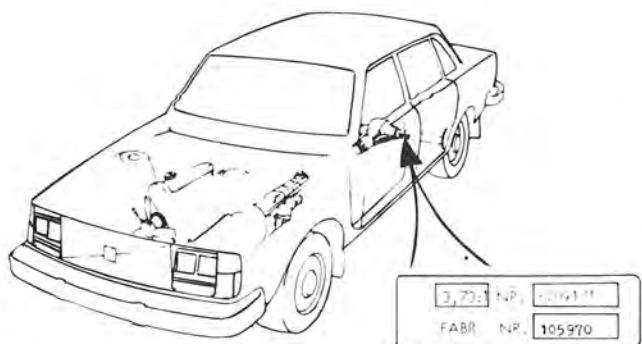
133198

1030

Standard rear axle, used on the majority of vehicles.

1031

Heavy-duty version of 1030 above.



133800

Final drive reduction ratio, part number and serial number

Plate on rear axle.

Section 1: Maintenance

Engine oil

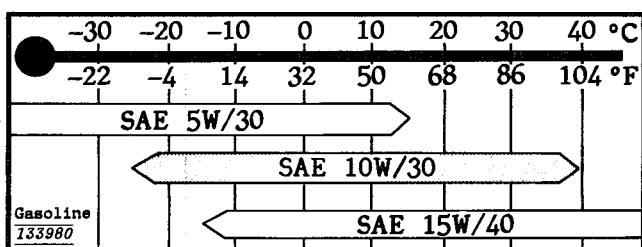
NOTE:

Volvo does not recommend oil additives, as they can adversely affect the engine.

Quality specifications.

Complete specifications for quality, viscosity and oil changes follow below.

Gasoline engines

Gasoline: SF**Viscosity:** (stable ambient temperatures)

SAE 15W/40 is recommended for use in extreme driving conditions that involve high oil temperature and consumption e.g. mountain driving with frequent decelerations or fast motorway driving.

Note however the higher temperature range.

Quality:

According to API Service SF. (Oils with specifications SF, SF/CC and SF/CD comply.)

Synthetic or semisynthetic oils may be used if specifications comply.

Fuel-saving oils are recommended. When using such oils, oil change intervals recommended by Volvo must be followed.

Oil and filter changes

Replaced first time at 600-1,200 mile(1,000-2,000 km) inspection.

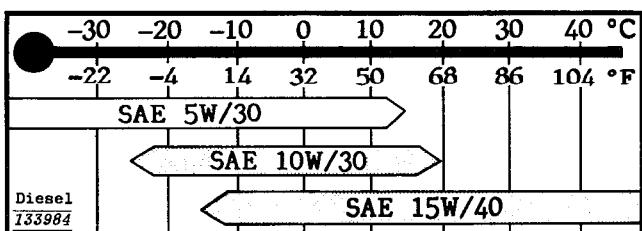
Subsequent changes: Mileage or time interval (whichever comes first). See chart below:

Driving conditions	Without Turbo	With Turbo
Driving under adverse conditions – see below	Each 7,500 miles (12,500 km) or every third month	Each 3,750 miles (6,250 km) or every third month
Normal driving conditions	Each 7,500 miles (12,500 km) or every sixth month	3,750 miles (6,250 km) or every sixth month

1700.192.M1

Diesel engine

1700.197. M1

Diesel: CD**Viscosity:** (stable ambient temperatures)

SAE 15W/40 is recommended for use in extreme driving conditions that involve high oil temperature and consumption e.g. mountain driving with frequent decelerations or fast motorway driving.

Note however the higher temperature range.

Quality:

According to API Service CD (minimum). Oils with specifications SE/CD and SF/CD comply.

Synthetic or semisynthetic oils may be used if specifications comply.

1700.193.M1

Oil and filter changes

Replaced first time at 600-1,200 mile (1,000-2,000 km) inspection.

Subsequent changes: Mileage or time interval (whichever comes first). See chart below:

Driving conditions	Oil change interval
Driving under adverse conditions – see below	Each 7,500 miles (12,500 km) or every third month with oil filter change every second oil change
Normal driving conditions	Each 7,500 miles (12,500 km) or every sixth month with oil filter change every second oil change

1700.194

Adverse driving conditions:

- sustained driving in dusty/sandy conditions
- sustained trailer hauling
- sustained hill climbing
- sustained high speed driving

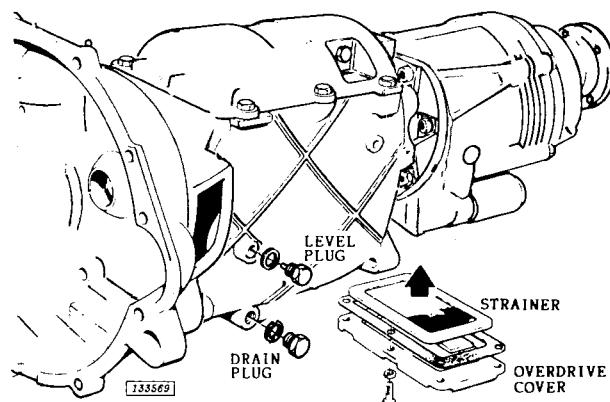
- sustained low speed driving or idling
- when driving short distances (7 miles = 10 km or less) at low temperatures (below 32°F = 0°C).

1700.198

Manual 4-speed transmission with overdrive, M46.

Capacity: 2.3 liters = 2.4 US qts

Fluid type: Automatic Transmission Fluid type G (or F).



031.402

Automatic transmission

BW55.

Capacity: 6.75 liters = 7.1 US qts.

Fluid type: Automatic Transmission Fluid type G (or F).

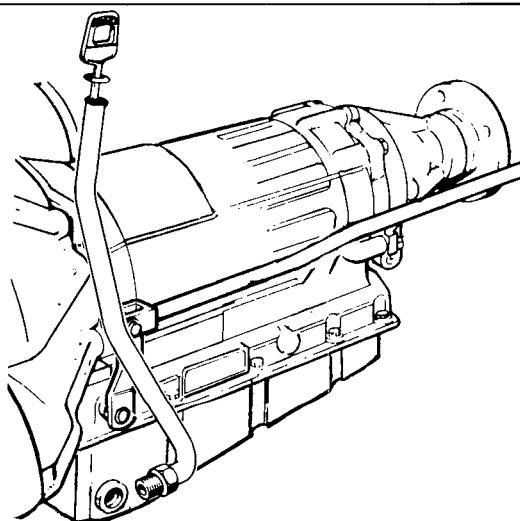
AW70/AW71.

Capacity: 7.4 liters = 7.8 US qts.

Fluid type: Automatic Transmission Fluid type Dexron II.

Replacing fluid.

Approx. 3.4 liters = 3.5 US qts can be drained.
The rest remains in torque converter and control systems.



1335692

Rear axle

Capacity:

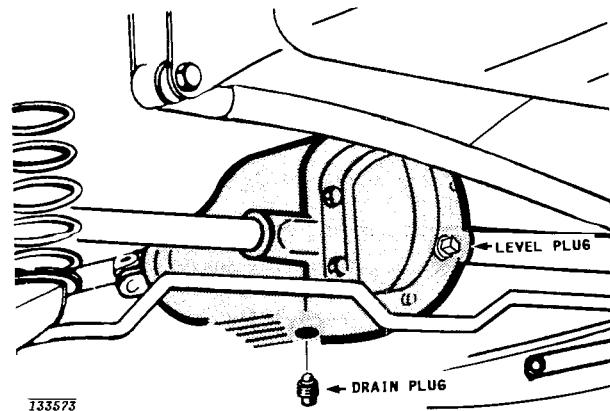
- Type 1030: 1.3 liters = 1.4 US qts.

- Type 1031: 1.6 liters = 1.7 US qts.

Fluid type: API GL-5 (MIL-L-2105 B or C)

Viscosity: SAE 90

When the temperature is steadily below 15°F = -10°C, use API GL-5 SAE 80 W oil. Use oils with proper additives for cars equipped with limited slip differential.



133573

031.405

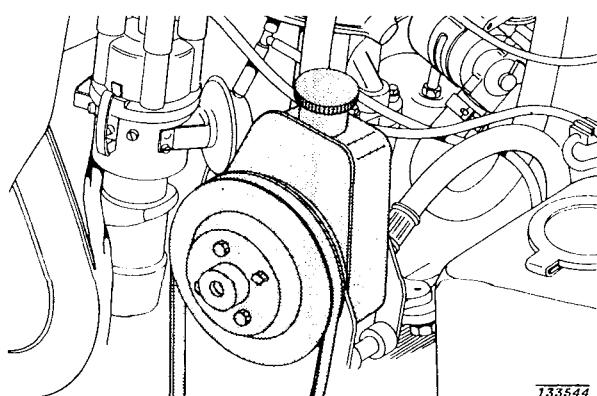
Power steering gear.

Steering gear lubricant

- type	grease
- capacity	100 grams 3.5 oz.

Hydraulic fluid

- pinion housing	ATF
- quality	A, F or G
- capacity	0.7 liters 0.75 US qt.



133544

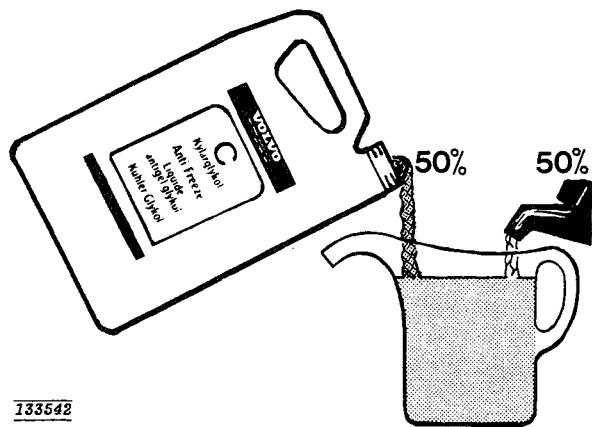
Coolant.

Use mixture consisting of 50 % water and 50 % Volvo Ant-Freeze Type C.

Volvo all weather Anti-Freeze Type C (blue-green) should be used all year round. Cooling system should always contain water plus anti-freeze, even during summer. Experience has also shown that extremely weak anti-freeze solutions (10-20 %) provide poor rust protection. For this reason ratio of anti-freeze/summer coolant to water should be 1 to 1.

Cooling system pressure check.

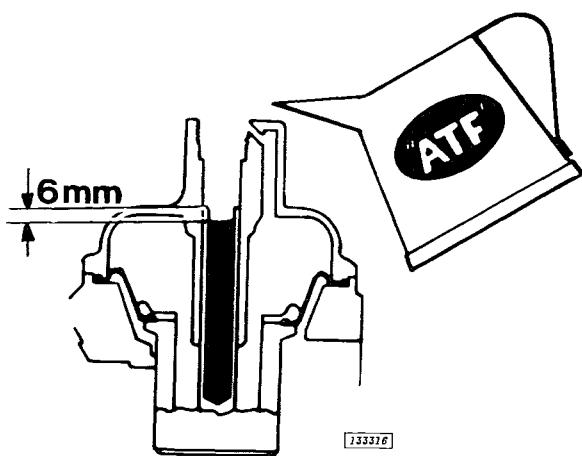
Cap relief pressure should be 65-85 kPa = 9-12 psi. When pumped, pressure should stand for minimum 30 seconds.



B21A, carburetor.

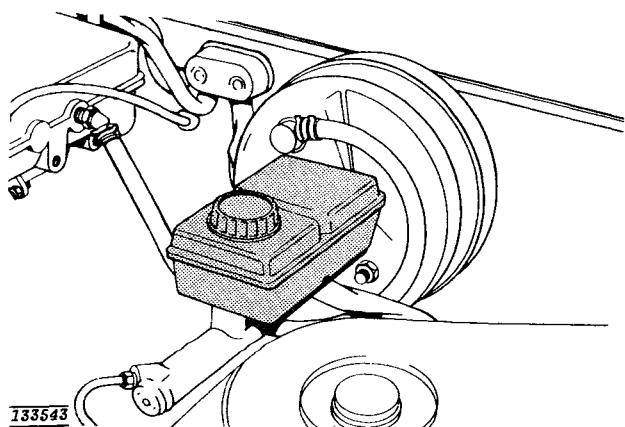
Damper oil level.

Automatic Transmission Fluid to $\frac{1}{4}$ " = 6 mm from top of cylinder.



Brake fluid.

Check brake fluid level without removing cap. If brake fluid has to be refilled, use brake fluid according to specification DOT 4.



Section 2 Engine

Gasoline engines B21/B23

B21A, Canada 1983

Engine Identification Number (EIN):

– manual trans 498980

– auto trans 498981

Compression ratio 9.3:1

Gasoline:

– leaded 97 RON, 91 (R+M)/2

– unleaded 96 RON, 91 (R+M)/2

Emission equipment:

– EIN 498980 EGR "on/off" + Pulsair

– EIN 498981 EGR "prop" + Pulsair

Output:

– DIN 78 kW at 88 rps

106 hp at 5250 rpm

– SAE J245 (net) 75 kW at 88 rps

100 hp at 5250 rpm

Torque:

– DIN 172 Nm at 42 rps

17.5 kpm at 2500 rpm

– SAE J245 (net) 166 Nm at 42 rps

122 ft. lbs. at 2500 rpm

Carburetor Zenith 175 CD2 SE

Ignition system w. breaker points

– type Bosch SZ

B21F-Turbo, USA and Canada 1983

Engine Identification Number (EIN):

– manual trans 499800

– auto trans 499801

Compression ratio 7.5:1

Gasoline, unleaded:

– RON 91

– (R+M)/2 87

Emission equipment:

– Oxygen sensor system,
Catalytic converter,
Constant Idle Speed system

Output:

– DIN 98 kW at 90 rps

133 hp at 5400 rpm

– SAE J245 (net) 95 kW at 90 rps

127 hp at 5400 rpm

Torque:

– DIN 210 Nm at 63 rps

21.4 kpm at 3750 rpm

– SAE J245 (net) 204 Nm at 63 rps

150 ft. lbs. at 3750 rpm

Fuel injection system Bosch CI

Ignition system Breakerless

– type Bosch TSZ-2

B21A, Canada 1984

Engine Identification Number (EIN):

– manual trans 499882

– auto trans 499883

Compression ratio 9.3:1

Gasoline:

– leaded 97 RON; 91 (R+M)/2

– unleaded 96 RON; (R+M)/2

Emission equipment:

– EIN 499882 EGR "on/off" + Pulsair

– EIN 499883 EGR "prop" + Pulsair

Output:

– DIN 78 kW at 88 rps

106 hp at 5250 rpm

– SAE J245 (net) 75 kW at 88 rps

100 hp at 5250 rpm

Torque:

– DIN 172 Nm at 43 rps

17.5 kpm at 2600 rpm

– SAE J245 (net) 166 Nm at 43 rps

122 ft. lbs. at 2600 rpm

Carburetor Zenith 175 CD2 SE

Ignition system w. breaker points

– type Bosch SZ

B21F-Turbo, USA and Canada 1984

Engine Identification Number (EIN):

– manual trans 499868

– auto trans 499869

Compression ratio 7.5:1

Gasoline, unleaded:

– Research Octane Number
(RON) 91

– According to formula
(R+M)/2 87

Emission equipment:

– Oxygen sensor system,
catalytic converter,
Constant Idle Speed System

Output:

– DIN 98 kW at 90 rps

133 hp at 5400 rpm

– SAE J1349 131 hp at 5400 rpm

Torque:

– DIN 210 Nm at 63 rps

21.4 kpm at 3750 rpm

– SAE J1349 155 ft. lbs. at 3750 rpm

Fuel injection system Bosch CI System

Ignition system Breakerless

– type Bosch TSZ-2

B23E, Canada 1983

Engine Identification Number (EIN):	
– manual trans	499812
– auto trans	499813
Camshaft, A-profile	P/N 1219706
Compression ratio	10.3:1
Gasoline:	
– leaded	97 RON, 91 (R+M)/2
– unleaded	96 RON, 91 (R+M)/2
Emission equipment:	
– EIN 499812	EGR "on/off" + Pulsair
– EIN 499813	EGR "prop" + Pulsair
Output:	
– DIN	91 kW at 85 rps 124 hp at 5100 rpm
– SAE J245 (net)	86 kW at 85 rps 115 hp at 5100 rpm
Torque:	
– DIN	170 Nm at 50 rps 19.4 kpm at 3000 rpm
– SAE J245 (net)	181 Nm at 50 rps 133 ft. lbs. at 3000 rpm
Fuel injection system	Bosch CI
Ignition system	Breakerless
– type	Bosch TSZ-2

B23F USA 1983

Engine Identification Number (EIN):	
– manual trans	499802
– auto trans	499803
Compression ratio	10.3:1
Gasoline, unleaded:	
– Research Octane Number	91
– Formula (R+M)/2	87
Emission equipment:	
– Oxygen sensor system, Catalytic converter, Constant Idle Speed system	
Output:	
– DIN	85 kW at 90 rps 116 hp at 5400 rpm
– SAE J245 (net)	80 kW at 90 rps 107 hp at 5400 rpm
Torque:	
– DIN	180 Nm at 58 rps 18.3 kpm at 3500 rpm
– SAE J245 (net)	172 Nm at 58 rps 127 ft. lbs. at 3500 rpm
Fuel injection system	Bosch LH-Jetronic II
Ignition system	Computer controlled
– type	Volvo

B23F, USA 1984

Engine Identification Number (EIN):	
– manual trans	499846
– auto trans	499847
Compression ratio:	
– EIN 499846	9.5
– EIN 499847	10.3
Gasoline, unleaded:	
– Research Octane Number (RON)	91
– According to formula (R+M)/2	87
Emission equipment:	
– Oxygen sensor system,– catalytic converter, – Constant Idle Speed System.	
Engine B23F, with EIN 499846, compression 9.5 and used in combination with manual transmissions:	
Output, DIN	83 kW at 90 rps 113 hp at 5400 rpm
Output, SAE J1349	111 hp at 5400 rpm
Torque, DIN	184 Nm at 46 rps 18.8 kpm at 2750 rpm
Torque, SAE J1349	136 ft.lbs. at 2750 rpm
Engine B23F, with EIN 499847, compression 10.3 and used in combination with automatic transmissions:	
Output, DIN	85 kW at 90 rps 116 hp at 5400 rpm
Output, SAE J1349	114 hp at 5400 rpm
Torque, DIN	180 Nm at 58 rps 18.3 kpm at 3500 rpm
Torque, SAE J1349	133 ft. lbs. at 3500 rpm
Fuel injection system	Bosch LH-Jetronic II
Ignition system	Computer controlled
– type	Volvo

Cylinder block

Material Special alloy
cast iron

Bore, B21

Standard, marked C	92.00–92.01 mm 3.6220–3.6224"
Standard, marked D	92.01–92.02 mm 3.6224–3.6228"
Standard, marked E	92.02–92.03 mm 3.6228–3.6232"
Standard, marked G	92.03–92.04 mm 3.6232–3.6236"
Oversize 1	92.5 mm 3.6417"
Oversize 2	93.0 mm 3.6614"

Bore, B23

Standard, marked C	96.00–96.01 mm 3.7795–3.7799"
Standard, marked D	96.01–96.02 mm 3.7799–3.7803"
Standard, marked E	96.02–96.03 mm 3.7803–3.7807"
Standard, marked G	96.04–96.05 mm 3.7811–3.7815"
Oversize 1	96.3 mm 3.7913"
Oversize 2	96.6 mm 3.8031"

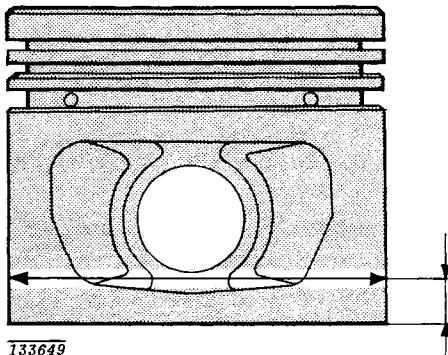
Machine cylinders when worn 0.1 mm = 0.004" if
engine oil consumption is abnormal.

Piston height

B21A	71.0 mm 2.7953"
B21F–Turbo	71.5 mm 2.8150"
B23, version 1	80.4 mm 3.1654"
B23, version 2	76.4 mm 3.0079"

**Distance from piston pin center
to piston top**

B21A	46.0 mm 1.8110"
B21F–Turbo	46.5 mm 1.8307"
B23, version 1	46.4 mm 1.9270"
B23, version 2	46.4 mm 1.8870"

**Pistons****Piston clearance**

B21A	0.01–0.04 mm 0.0004–0.0016"
B21F–Turbo	0.02–0.04 mm 0.0008–0.0016"
B23E, version 1	0.005–0.007 mm 0.0020"–0.0028"
B23E, version 2, piston height 76.4 mm	0.001–0.004 mm 0.0004–0.0016"

Piston diameter is measured at right angles to piston
pin hole and at following distances from lower edge of
piston

B21A	6 mm 0.24"
B21F–Turbo	7 mm 0.28"
B23	8 mm 0.31"

Piston weight

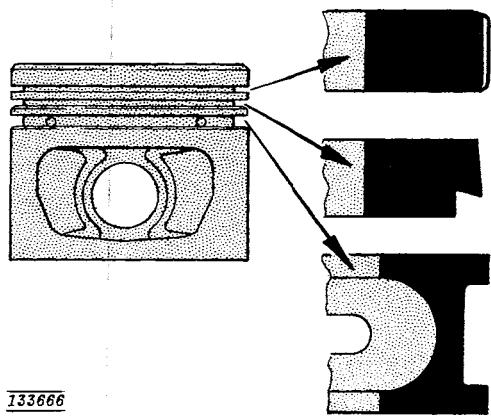
B21A	555 ± 6 grams
B21F–Turbo	535 ± 6 grams
B23, version 1	555 ± 6 grams
B23, version 2	570 ± 7 grams

Maximum difference in weight
between pistons in engine 12 grams

Piston rings

Width

— upper compression ring	.....	1.728–1.740 mm 0.0680–0.0685"
— lower compression ring	.....	1.978–1.990 mm 0.0779–0.0783"
— oil scraper ring	.....	3.978–3.990 mm 0.1566–0.1571"

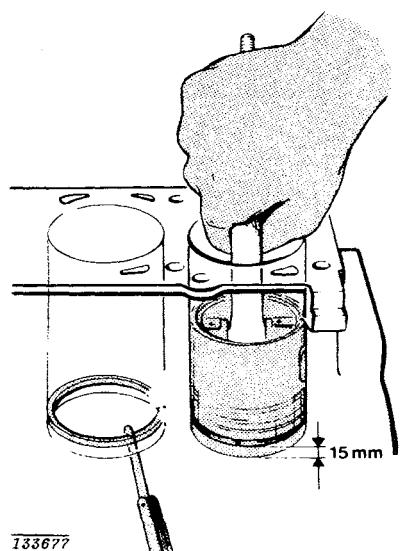


Side clearance, ring on piston

— compression rings	.....	0.040–0.072 mm 0.0015–0.0028"
— oil scraper ring	.....	0.030–0.062 mm 0.0012–0.0024"

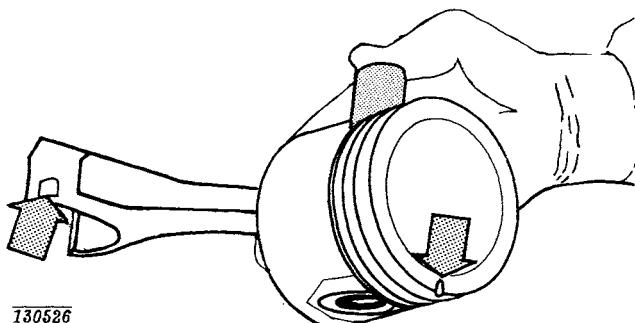
Ring gap, measured in cylinder

— upper compression ring	.....	0.35–0.65 mm 0.014–0.026"
— lower compression ring	.....	0.35–0.55 mm 0.014–0.022"
— oil scraper ring	.....	0.25–0.60 mm 0.010–0.024"



Piston pins

Floating fit, circlips at both ends in piston.



Fit:

- In connecting rod: light thumb pressure (close running fit)
- In piston: thumb pressure (push fit)

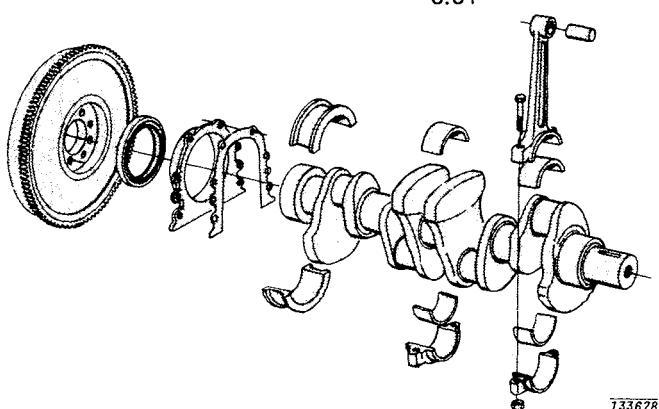
Diameter

— standard	.....	24.00 mm 0.945"
— oversize	.....	24.05 mm 0.947"

Crankshaft assembly

Crankshaft

Max. out-of true	.....	0.05 mm 0.0020"
Max. end float	.....	0.25 mm 0.01"



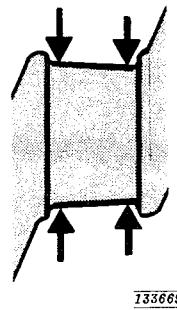
Main bearings,
clearance to crankshaft 0.028–0.083 mm
0.0011–0.0033"

Big-end bearings,
— clearance to crankshaft 0.024–0.070 mm
0.0009–0.0028"
— side clearance 0.15–0.35 mm
0.006–0.014"

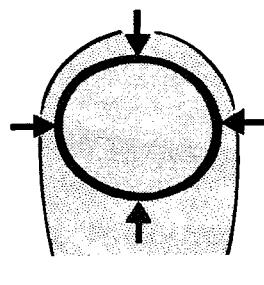
Main bearing journals

Out-of-round limit	.....	0.07 mm 0.0028"
Taper limit	.....	0.05 mm 0.002"

Diameter	
– standard	63.451–63.464 mm 2.4981–2.4986"
– undersize 1	63.197–63.210 mm 2.4881–2.4886"
– undersize 2	62.943–62.956 mm 2.4781–2.4786"
Width on crankshaft for bearing	
– standard	38.960–39.000 mm 1.5338–1.5354"
– oversize 1	39.061–39.101 mm 1.5378–1.5394"
– oversize 2	39.163–39.203 mm 1.5419–1.5434"



Taper



Out-of-round

Big-end bearing journals

Out-of-round limit	.....	0.05 mm 0.0020"
Taper limit	.....	0.05 mm 0.0020"
Diameter		
– standard	.....	53.987–54.000 mm 2.1255–2.1260"
– undersize 1	.....	53.733–53.746 mm 2.1155–2.1160"
– undersize 2	.....	53.479–53.492 mm 2.1055–2.1060"
Bearing seat width	.....	29.95–30.05 mm 1.1790–1.1830"

Connecting rods

End float on crankshaft	.....	0.15–0.35 mm 0.006–0.014"
Length, center to center	.....	145 ± 1 mm 5.71 ± 0.004"
Max weight deviation between connecting rods in engine	.....	10 grams 0.35 oz

Flywheel

Axial throw		
– maximum	0.05 mm 0.002"
– measured at diameter	150 mm 6"

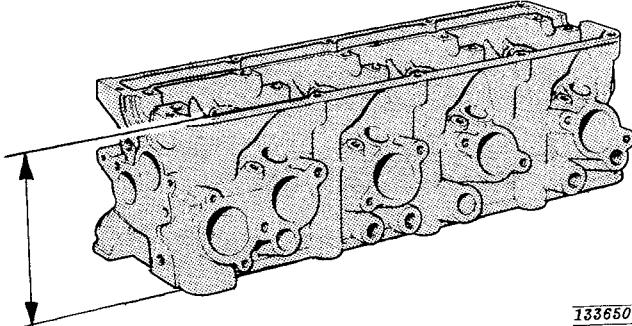
Cylinder head

Height

– new	146.1 mm 5.7520"
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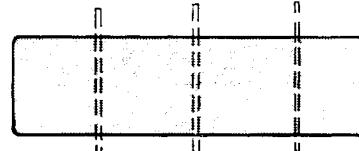
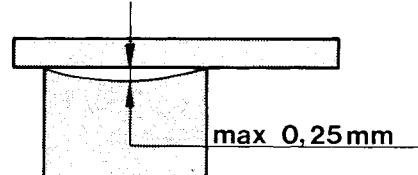
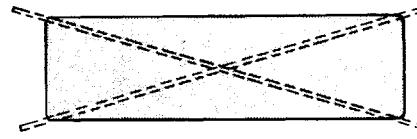
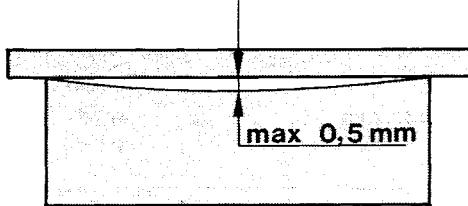
Thickness of cylinder head gasket

– not compressed	1.2 mm 0.047"
– compressed	1.0 mm 0.039"



Max. warp

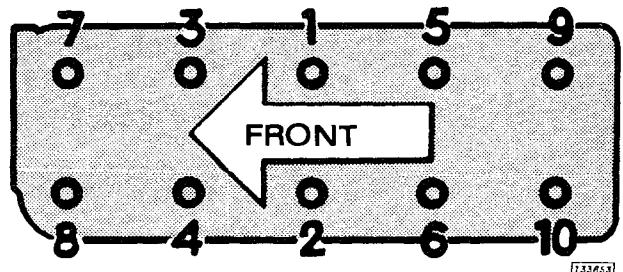
Replace cylinder head if warp is more than 1.0 mm = 0.04" lengthwise or 0.5 mm = 0.02" crosswise.



Torques, cylinder head bolts

Tightening torques apply to oiled screws, bolts and nuts.
Degreased (washed) parts must be oiled.

1. Torque to 20 Nm
15 ft. lbs.
2. Torque to 60 Nm
44 ft. lbs.
3. Angle-tighten 90°



Tightening sequence for cylinder head bolts. 133653

Valve clearances

Intake and exhaust valves

Tolerances allowed when checking

– cold engine	0.30–0.40 mm 0.012–0.016"
– hot engine	0.35–0.45 mm 0.014–0.018"

Tolerances allowed when adjusting
should be kept within

– cold engine	0.35–0.40 mm 0.014–0.016"
– hot engine	0.40–0.45 mm 0.016–0.018"
Adjusting disc thickness	3.3–4.5 mm 0.13–0.18"
– in increments of	0.05 mm 0.002"

Valves

Intake valve

Disc diameter (A)	44 mm 1.73"
Angle (B)	44.5
Stem diameter (C)	
– new	7.955–7.970 mm 0.3132–0.3138"
– minimum	7.935 mm 0.3124"

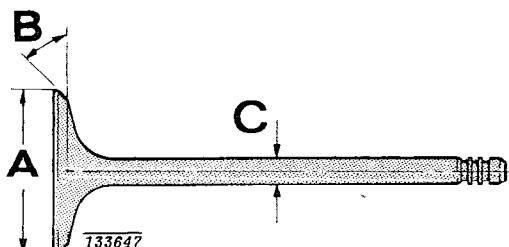
Exhaust valve

Disc diameter (A)	35 mm 1.38"
Angle (B)	44.5
Stem diameter (C)	
– new, measured 32 mm = 1.25" from valve face	7.945–7.960 mm 0.3128–0.3134"
– minimum, measured	7.925 mm 0.3120"

NOTE:

Exhaust valves for turbo engines have the same measurements. However, new stem diameter is measured 32 mm = 1.25" from valve face and min. stem diameter 16 mm = 0.64" from stem end.

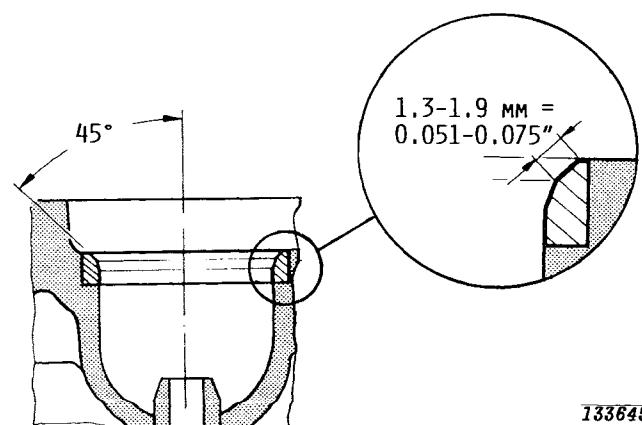
Exhaust valves for turbo engines are stellite coated and must not be machined. They may be ground against valve seat.



Valve seats

Intake valve seat diameter

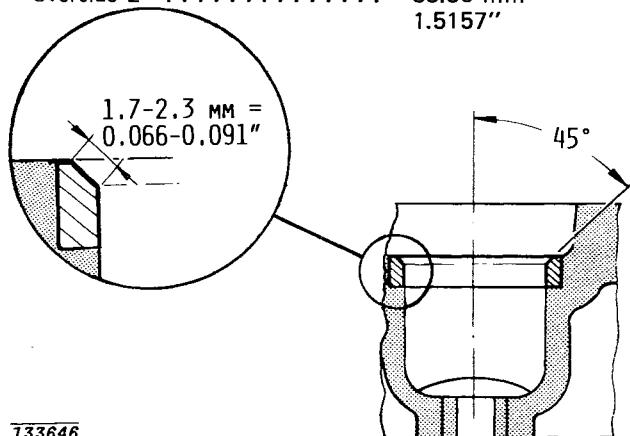
– standard	46.00 mm 1.8110"
– oversize 1	46.25 mm 1.8208"
– oversize 3	46.50 mm 1.8307"



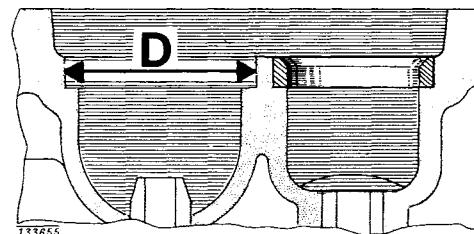
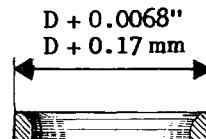
Valve seats

Exhaust valve seat diameter

– standard	.....	38.00 mm 1.4960"
– oversize 1	.....	38.25 mm 1.5157"
– oversize 2	.....	38.50 mm 1.5157"



133646



NOTE:

When replacing valve seats, there should be a negative clearance (grip) of 0.17 mm = 0.0068" between valve seat and cylinder head recess. This means valve seat diameter must be 0.17 mm = 0.068" larger than recess diameter.

Valve guides

Length, intake valve	.....	52 mm 2.047"
Length, exhaust valve	.....	52 mm 2.047"
Inner diameter	.....	8.000–8.022 mm 0.3150–0.3159"

Height above upper face of cylinder head

– intake	.....	15.4–15.6 mm 0.606–0.614"
– exhaust	.....	17.9–18.1 mm 0.705–0.713"

Clearance, valve stem to valve guide

– intake valve	.....	0.030–0.060 mm 0.0012–0.0024"
– exhaust valve	.....	0.060–0.090 mm 0.0024–0.0035"
– maximum	.....	0.15 mm 0.006"

Valve depressors

Diameter	.....	36.975–36.995 mm 1.4557–1.4565"
Height	.....	30–31 mm 1.18–1.22"

Clearance

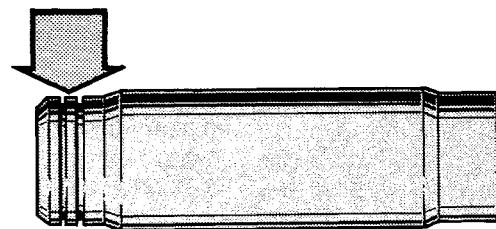
– adjusting disc to depressor	...	0.009–0.064 mm 0.0004–0.0025"
– depressor to cylinder head	...	0.030–0.075 mm 0.0012–0.0030"

Adjusting disc (for valve clearance)

Thickness	.....	3.3–4.5 mm 0.13–0.18"
In increments of	.....	0.05 mm 0.002"
Diameter	.....	32.980–33.000 mm 1.2984–1.2992"

Valve guides are available in three oversizes and are marked with grooves.

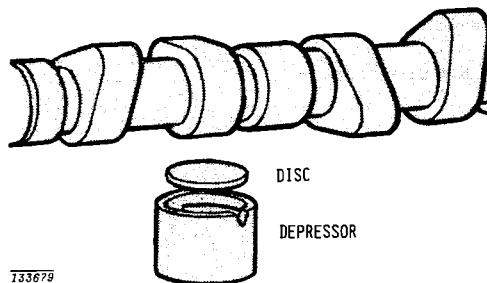
	Marking	Reamer for seat
Standard	No groove	–
Oversize 1	1 –"–	5161
	2 –"–	5162
	3 –"–	5163



133654

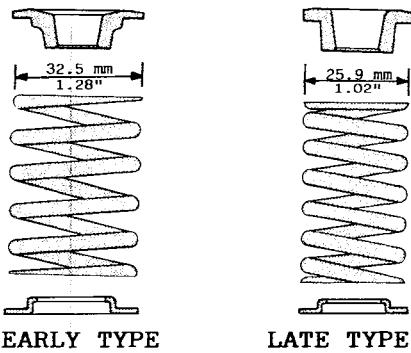
NOTE:

Force used when pressing in valve guides must exceed 9000 N = 1980 lbs. If pressing force is lower, recess for guide must be reamed to nearest oversize and a guide of corresponding size pressed in.



133679

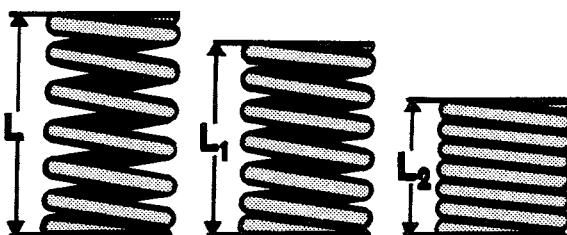
During 1983, a late type valve springs and spring seats were introduced on B21F-Turbo and B23F.



133830

Valve springs (dimensions in mm)

Length with different loadings



133765

Early type, diameter 1.28":

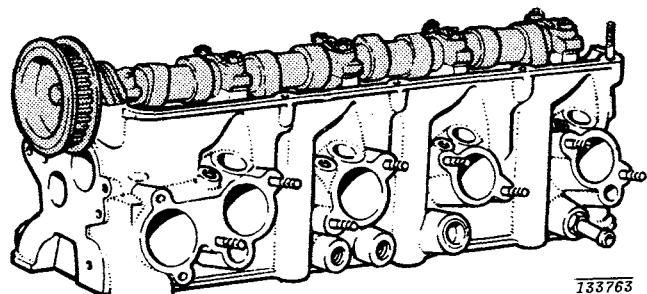
Length		Loading	
mm	inch	N	lbs
L	45	1.77	0
L ₁	38	1.50	280–320
L ₂	27	1.06	710–790

Late type, diameter 1.02":

Length		Loading	
mm	inch	N	lbs
L	45.5	1.77	0
L ₁	38	1.50	280–320
L ₂	27.5	1.06	702–782

Camshaft

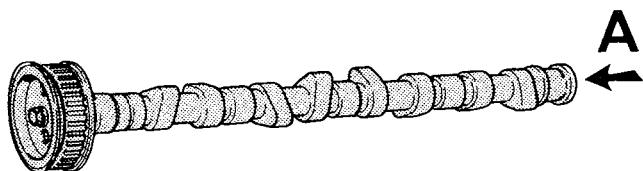
Number of bearings	5
Bearing journal diameter	29.050–29.070 mm 1.1437–1.1445"
Clearance, journal to bearing	
– new	0.030–0.071 mm 0.0012–0.0028"
– maximum	0.15 mm 0.006"
End play	0.1–0.4 mm 0.004–0.016"



engine	I.D. LTR	Camshaft lift		Volvo P/N
		mm	inch	
B21A	A	10.5	0.4134	1219706-7
B21F-Turbo	T	9.9	0.3898	1276688-7
B23E	A	10.5	0.4134	1219706-7
B23F	M			1317745-6

Camshaft bearings

Inside diameter	30.000–30.021 mm 1.1811–1.1823"
-----------------------	------------------------------------



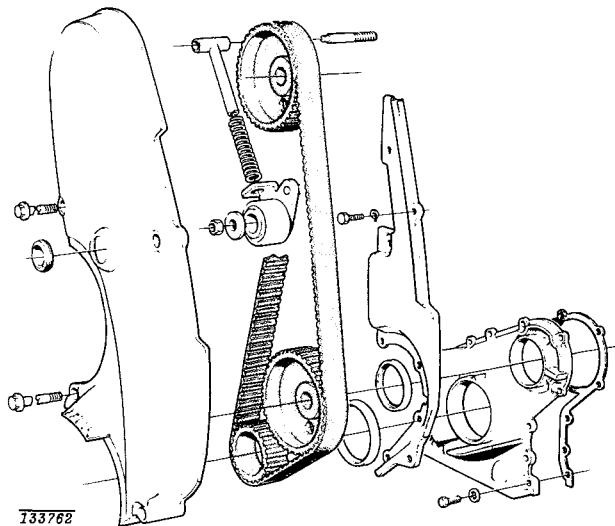
Camshaft setting

engine	I.D. LTR	Adjust clearance for cyl 1 intake valve to:		Intake valve should then open at:
		mm	inch	
B21A	A	0.7	0.0276	13° BTDC
B21F-Turbo	T	0.5	0.0197	11° BTDC
B23E	A	0.7	0.0276	13° BTDC
B23F	M			

Timing gears

Number of teeth

– crankshaft gear	19
– intermediate gear	38
– camshaft gear	38
– camshaft drive belt	123



Intermediate shaft

Diameter, front bearing

– journal	46.975–47.000 mm 1.8494–1.8504"
– bearing inside	47.020–47.050 mm 1.8512–1.8524"

Diameter, middle bearing

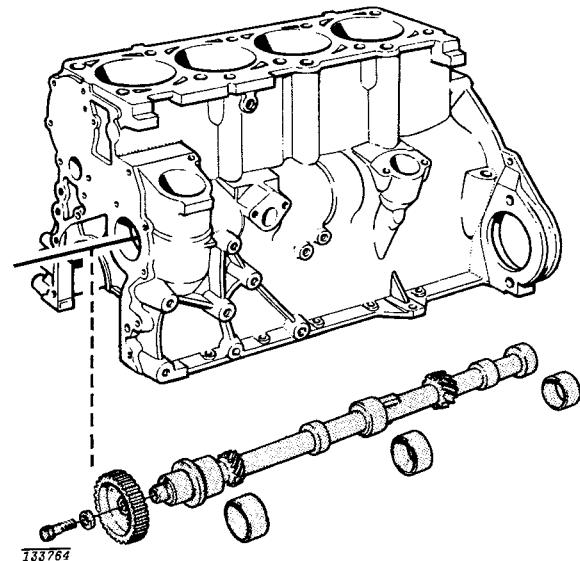
– journal	43.025–43.050 mm 1.6939–1.6949"
– bearing inside	43.070–43.100 mm 1.6957–1.6968"

Diameter, rear bearing

– journal	42.925–42.950 mm 1.6900–1.6909"
– bearing inside	42.970–43.000 mm 1.6917–1.6929"

Clearance, journal to bearing . . . 0.020–0.075 mm
0.0008–0.0030"

End play 0.20–0.46 mm
0.0080–0.0181"



Group 22 Lubricating system

Engine oil.

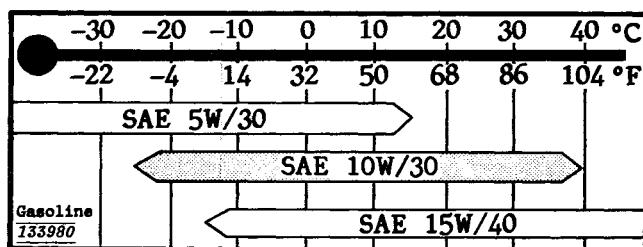
Quality:

According to API Service SF. Oils with specifications SF/CC and SF/CD comply.

Synthetic or semisynthetic oils may be used if specifications comply.

Fuel-saving oils are recommended. When using such oils, oil change intervals recommended by Volvo **must** be followed.

Viscosity: (stable ambient temperatures)



SAE 15W/40 is recommended for use in extreme driving conditions that involve high oil temperature and consumption e.g. mountain driving with frequent decelerations or fast motorway driving.

Note however the higher temperature range.

1700.192.M1

Capacities:

B21 and B23 (all):

Excl. filter: 3.35 liters = 3.5 US qts

Incl. filter: 3.85 liters = 4.0 US qts

B21F-Turbo:

Add 0.6 liters = 0.7 US qt when draining or replacing engine oil cooler.

031.201

Oil and filter changes

Replaced first time at 600-1,200 mile(1,000-2,000 km) inspection.

Subsequent changes: Mileage or time interval (whichever comes first). See chart below:

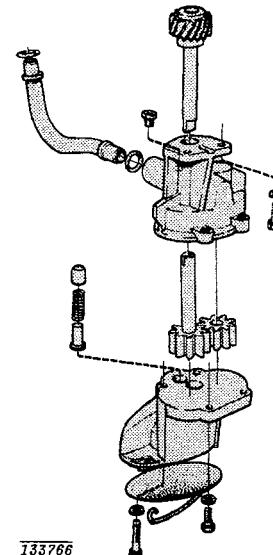
Driving conditions	Without Turbo	With Turbo
Driving under adverse conditions – see below	Each 7,500 miles (12,500 km) or every third month	Each 3,750 miles (6,250 km) or every third month
Normal driving conditions	Each 7,500 miles (12,500 km) or every sixth month	3,750 miles (6,250 km) or every sixth month.

Severe driving conditions

- sustained low-speed driving or idling
- when driving short distances (7 miles = 10 km or less) at low temperatures (below 32°F = 0°C).
- sustained driving in dusty/sandy conditions
- sustained trailer hauling
- sustained hill climbing
- sustained high-speed driving

Oil pump

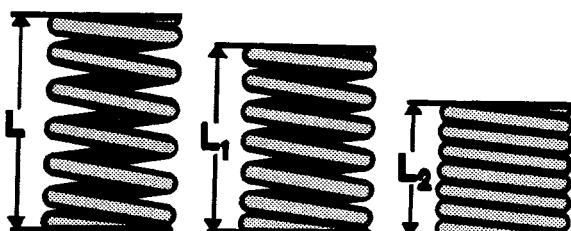
End play	0.02–0.12 mm 0.0008–0.0047"
Side clearance, excl. bearing clearance	0.02–0.09 mm 0.0008–0.0035"
Backlash, excl. bearing clearance	0.15–0.35 mm 0.0059–0.0138"
Bearing clearance	
– drive shaft	0.032–0.070 mm 0.0013–0.0028"
– idling shaft	0.014–0.043 mm 0.0006–0.0016"



133766

Relief spring length at various loadings.

Length	Loading			
	mm	inch	N	lbs
L	39.2	1.543	0	0
L ₁	26.25	1.033	46–54	10.1–11.9
L ₂	21.0	0.827	62–78	13.6–17.2



133765

Group 23 Fuel system**CO**

Idle speed and engine at operating temperature. CO should be set within three minutes after thermostat opens.

On USA models, CO cannot be adjusted. Controls are sealed.

B21A, Canada

Pulsair disconnected and plugged. Prior to readings increase engine speed momentarily to allow cold fuel to enter carburetor.

Set to	3.0 % CO
Permitted when checking	2.5-4.0 % CO
Idle speed	900 rpm
Tolerance	+/- 50 rpm

B23E, Canada

Pulsair disconnected and plugged.

Setting	1.0 % CO
Permitted when checking	0.5-2.0 % CO
Idle speed	900 rpm
Tolerance	+/- 50 rpm

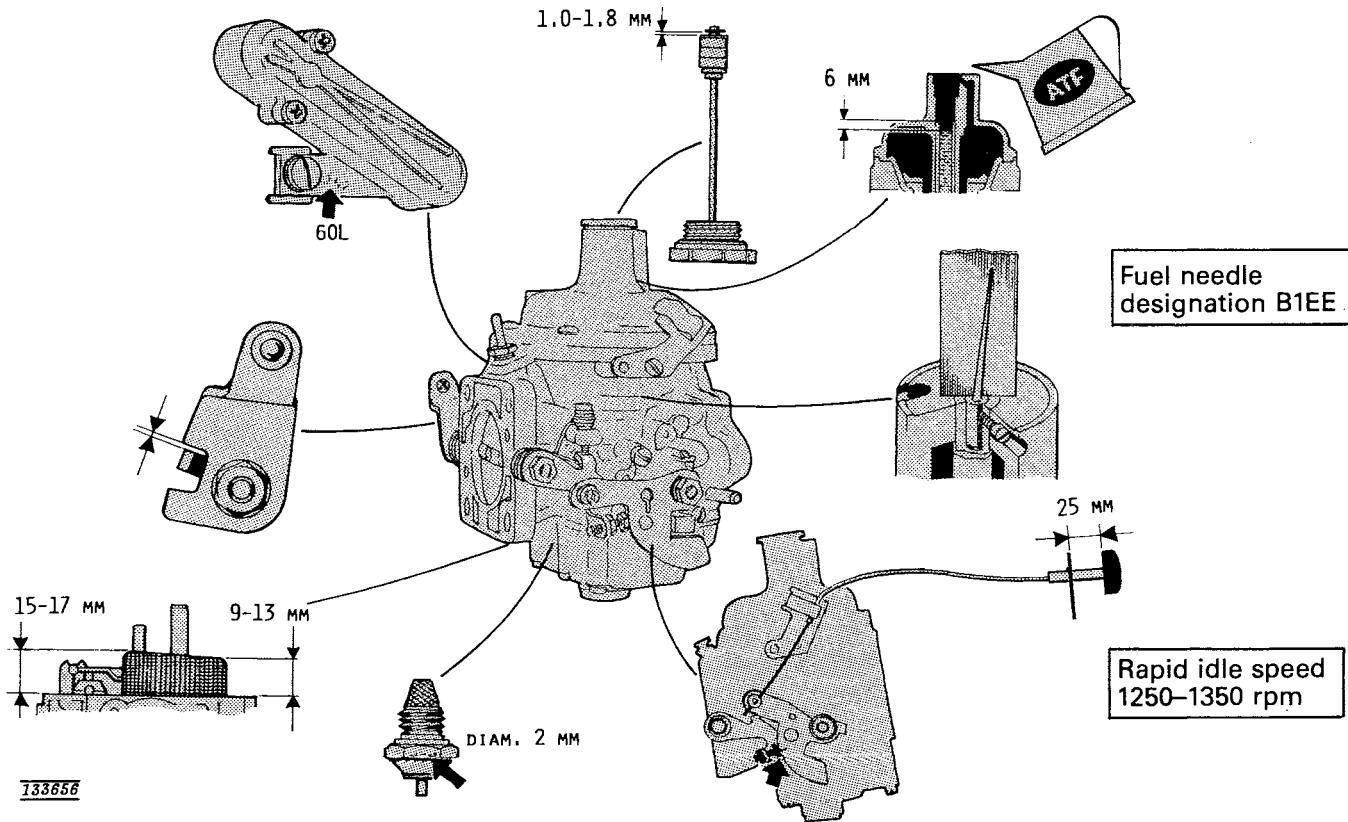
Following should be checked with oxygen sensor disconnected. When system is reconnected, CO should drop below 1 %.

B21F-Turbo, USA and Canada

Setting	1.0 % CO
Permitted when checking	0.7-1.3 % CO
Idle speed	900 rpm
Tolerance	+/- 20 rpm

B23F, USA

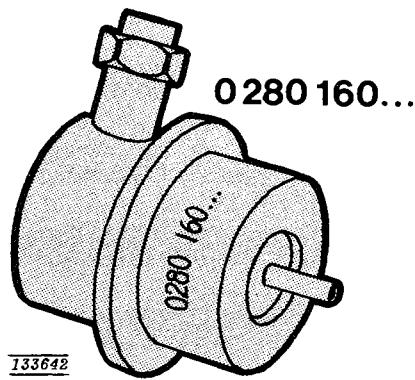
Setting	0.6 % CO
Permitted when checking	0.4-0.8 % CO
Idle speed	750 rpm
Tolerance	+/- 20 rpm

B21A, Canada**Zenith 175 CD-2SE carburetor**

Fuel pressure

Line pressure

– B21F-Turbo	520–580 kPa 75–83 psi
– B23E	450–530 kPa 64–76 psi
B23F:	
– Line pressure above intake manifold pressure	250 kPa 35.5 psi
Line pressure regulator:	
– Bosch No	0 280 160 214
– Volvo P/N	1306935–6



133642

B23F: line pressure regulator

Identified by stamped number (last three digits).

Control pressure

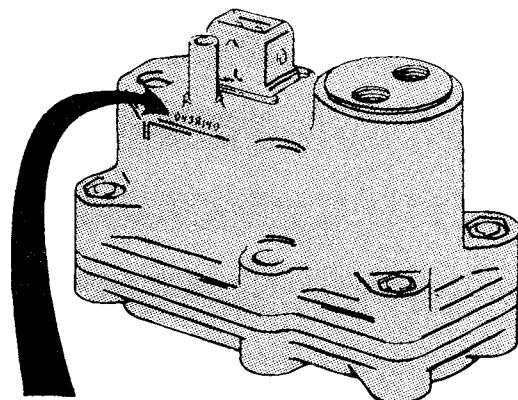
B21F-Turbo 1983: Control pressure regulator

Provides richer air/fuel mixture during acceleration with a cold engine. System is switched off by thermostat valve when engine reaches approx. 53°C = 125°F.

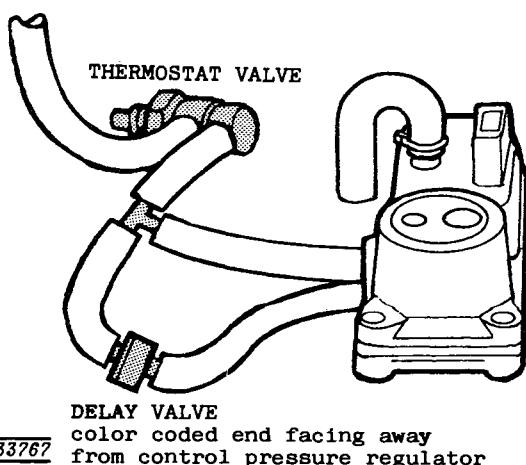
Bosch No	0 438 140 079
Volvo P/N	1276878–4
Resistance	10–20 ohm

Delay valve, in line to thermostat valve:

- delay time, approx. 1 second
- color marking gray



133660



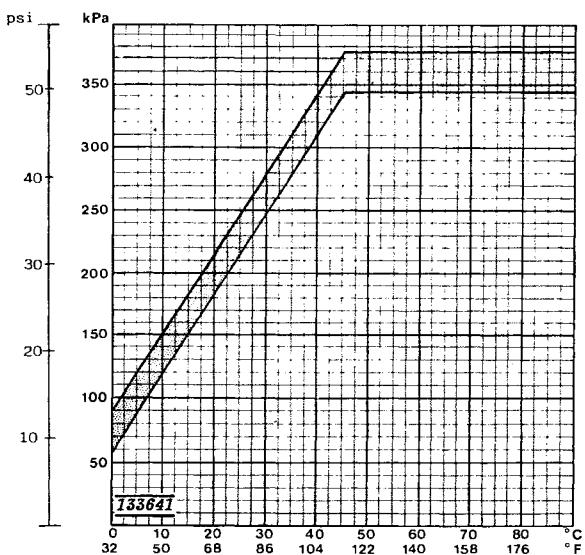
133767

Control pressure:

– cold engine, see diagram	345–375 kPa 49–53 psi
– hot engine	
– at acceleration with cold engine but control pressure regulator at normal operating temperature	145–175 kPa 20–25 psi 265–295 kPa 38–42 psi
– at 45 psi charge	

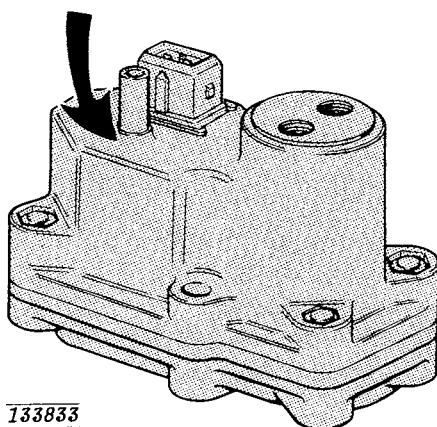
Control pressure regulator

Identified by stamped number (last three digits).



133641

O 438 140 . . .



B21F-Turbo 1984:

Control pressure regulator with improved cold start compensation and high altitude compensation.

Bosch No 0 438 140 128
Volvo P/N 1336678-6

Cold start compensation.

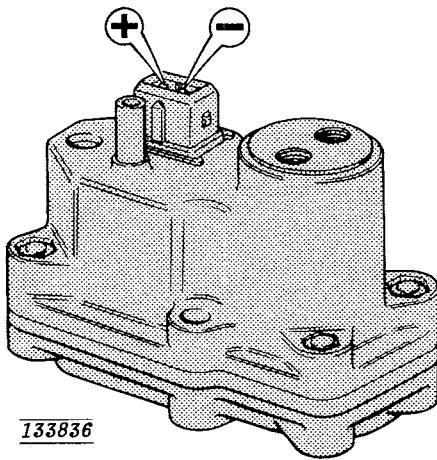
The bi-metal arm has two heater elements wrapped around it. Below +15°C=60°F, the thermal switch is open and only one heater element therefore connected.

At +15°C=60°F, the second heater element is switched in by the thermal switch.

If the engine is started at temperatures above +15°C=60°F, both heating elements are energized and the control pressure increases quickly.

NOTE:

The switched heating element is grounded in the control pressure regulator housing. This means that the polarity of the plug connector **must** be maintained correctly.



High altitude compensation.

Normally, the control pressure is regulated by a diaphragm and a spring. To achieve altitude compensation, another diaphragm with a spring and a chamber have been added.

The chamber maintains a constant (low altitude) pressure while the pressure outside it varies according to altitude. The pressure difference causes the diaphragm to exert more or less pressure on the inner spring.

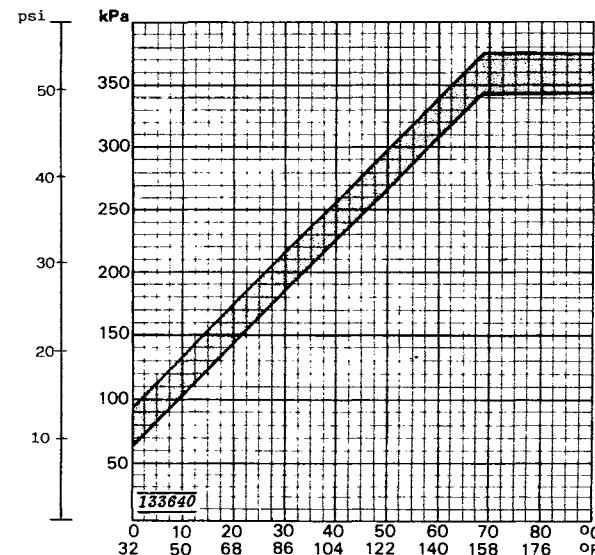
B23E: control pressure regulator:

Bosch No 0 438 140 004
Volvo P/N 463971-2

Resistance 20–30 ohm

Control pressure:

- cold engine see diagram
- hot engine 345–375 kPa
49–53 psi



133640

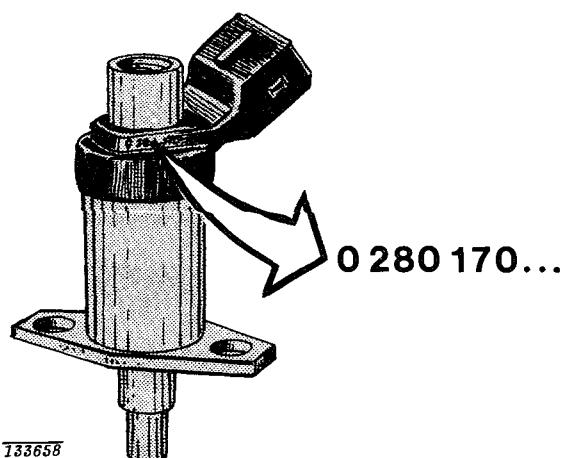
Cold start injector

B21F-Turbo: cold start injector

Bosch No 0 280 170 413
Volvo P/N 1269585-4
Injection quantity 135 cm³/minute

B23E: cold start injector

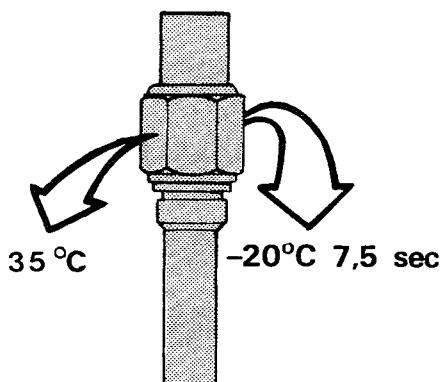
Bosch No 0 280 170 413
Volvo P/N 1276498-1
Injection quantity 85 cm³/minute



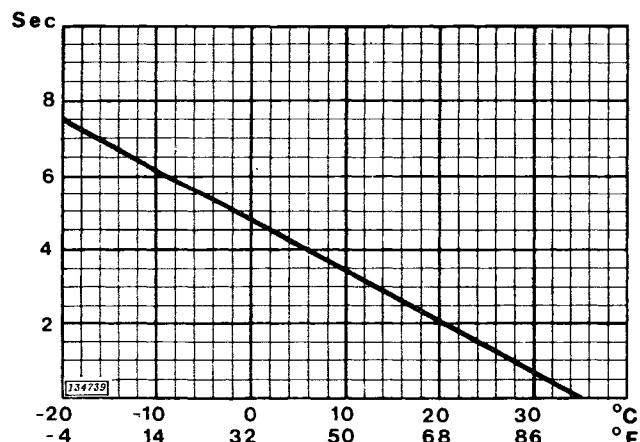
Cold start injector

Identified by stamped number
(last three digits).

Thermal time switch



Switch-off temperature and operating time at -20°C
are stamped on hex flat.

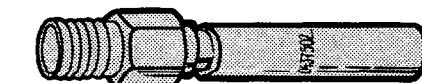


Operating times at various temperatures.

Injectors

B21F-Turbo and B23E

Bosch No	0 437 502 015
Volvo P/N	1276037-7
Injector opening pressure	350–410 kPa 50–58 psi
No leakage permitted below ...	290 kPa 41 psi

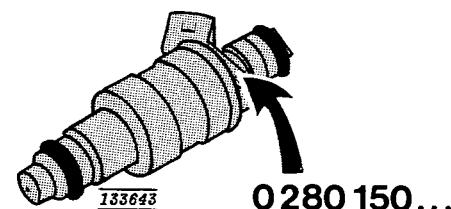


100044 0 437 502...

Identified by stamped number
(last three digits).

B23F

Bosch No	0 280 160 209
Volvo P/N	1326427-9
At fuel pressure	250 kPa 35.5 psi
– injected fuel quantity is	167 cm ³ /minute



133643 0 280 150...

Identified by stamped number
(last three digits).

Auxiliary air valve

B23E only.

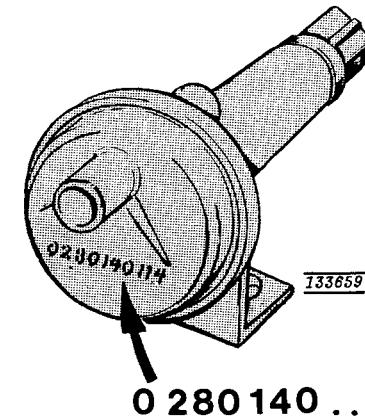
Not on vehicles equipped with Constant Idle Speed (CIS) system.

Resistance	40–60 ohms
Completely open at	-30°C = -22°F
Completely closed at	+70°C = 158°F

The valve is electrically controlled. It should be completely closed after being switched on for five minutes at an ambient temperature of +20°C = 68°F.

B23E, manual transmission:

Bosch No	0 280 140 106
Volvo P/N	1219160-7



0 280 140 ...

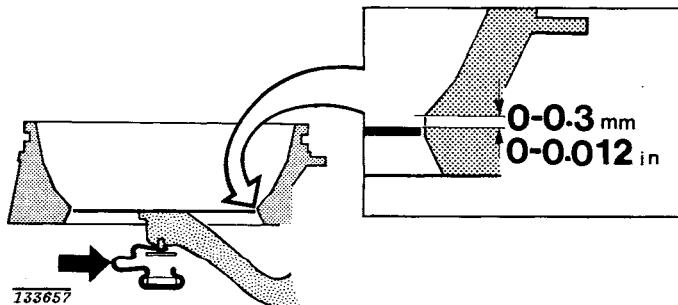
Identified by stamped number
(last three digits).

Air flow sensor

Sensor plate position

Check at maximum control pressure = engine hot and fuel pump operating.

Top side of air flow sensor plate flush with, or no more than 0.3 mm = 0.0012" below edge of cone.



Fuel pump

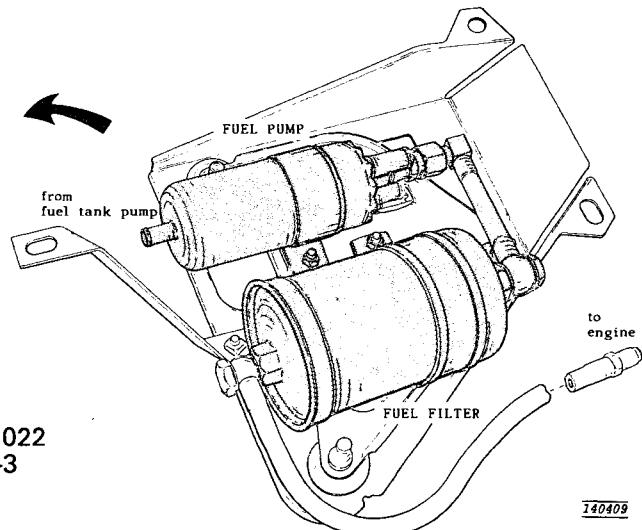
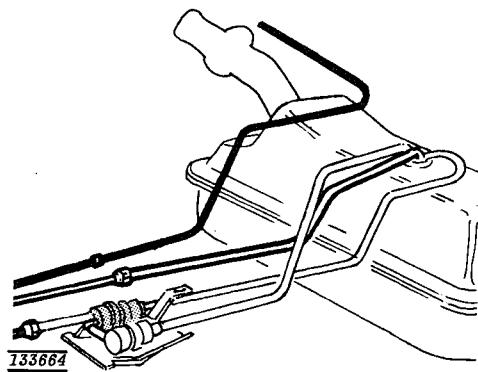
Capacity, at measuring conditions:
12 V, +20°C = 68°F, pressure 500 kPa = 71 psi.

B23E

Capacity 120 liter/hour
32 US gal/hour
Current consumption max. 9.5 amp

B21F-Turbo

Capacity 150 liter/hour
40 US gal/hour
Current consumption max. 9.5 amp



B23F LH-Jetronic

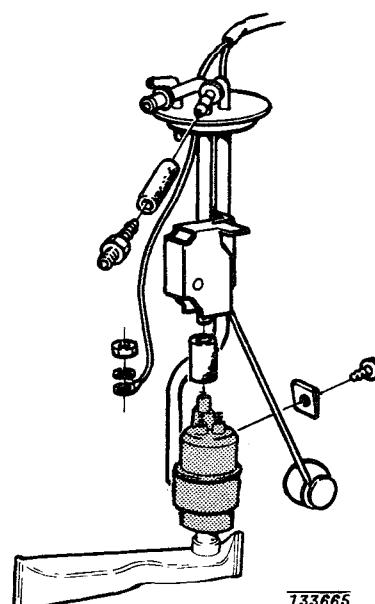
Fuel pump, Bosch P/N 0 580 464 022
Volvo P/N 1 306 932-3

Pump capacity at 300 kPa (42.6 psi), + 20°C
and 12 V 130 liters/hour (1.08 liters/30 sec
= 1.13 qt/30 sec)

11 V 110 liters/hour (0.9 liter/30 sec
= 0.94 qt/30 sec)

10V 85 liters/hour (0.7 liter/30 sec
= 0.73 qt/30 sec)

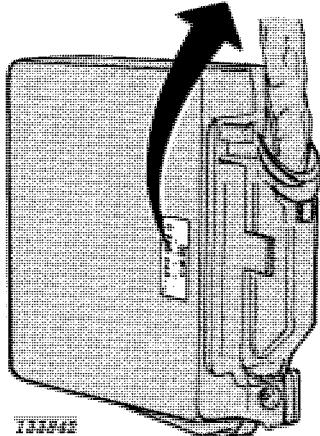
Current consumption, max 6.5 A



Fuel feed pump (tank pump)

Current consumption 1-2 amp

0 280 000...



**Electronic Control Unit
fuel injection system**

B21F-Turbo 1983:

Bosch No 0 280 800 052
Volvo P/N 1306412-6

B21F-Turbo 1984:

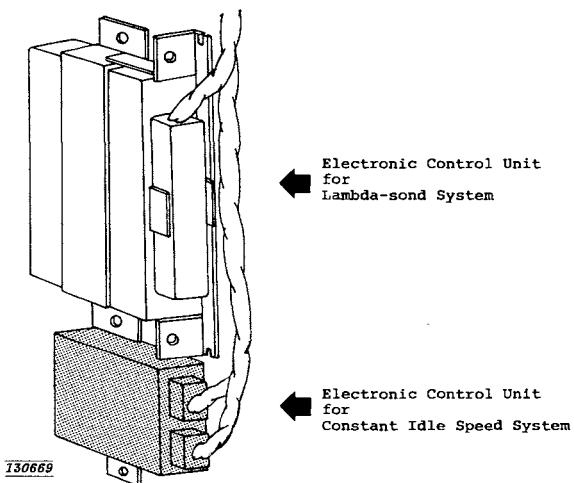
Bosch No 0 280 800 052
Volvo P/N 1306412-6

B23F 1983:

Bosch No 0 280 000 503
Volvo P/N 1317029-5

B23F 1984:

Bosch No 0 280 000 510
Volvo P/N 1346563



**Electronic Control Unit
Constant Idle Speed (CIS) system**

B21F-Turbo 1983:

Bosch No 0 280 220 005
Volvo P/N 1317499

B21F-Turbo 1984:

Bosch No 0 280 220 005
Volvo P/N 1317499

Group 25 Intake and exhaust systems

B21F-Turbo

Maximum discharge pressure 42–48 kPa
6–6.8 psi

Measured while driving, throttle pedal fully depressed and brake pedal depressed to achieve engine speed 4000 rpm.

Pressure regulator

Starts to open wastegate at compressor pressure 41 kPa
6 psi

Wastegate actuator

Control rod stroke of 10 mm
3/8"

. . . achieved just before overload protection switch cuts out fuel pump relay.

Pressure switch for enrichment at acceleration

Closes, and grounds terminal 7 of Lambda sond Electronic Control Unit, when compressor pressure reaches 20.3 kPa
2.9 psi

Overload protection switch

Opens ground circuit for fuel pump relay at pressure 70 kPa
10 psi

Spark timing

Max. advance 15°
Max. retard 8°
— at compressor pressure 36 kPa
5.1 psi

Tightening torques

Use lock fluid, Volvo P/N 1161035–9
on following bolt connections:

Nuts, retaining front exhaust pipe to turbo 25 Nm
18 ft. lbs.

Bolts, retaining turbine housing 20 Nm
15 ft. lbs.

Bolts, retaining compressor housing 18 Nm
13 ft. lbs.

Bolts, retaining rear housing with wastegate, to turbine housing 20 Nm
15 ft. lbs.

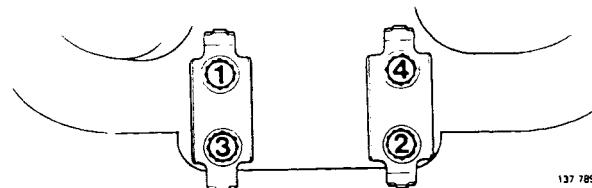
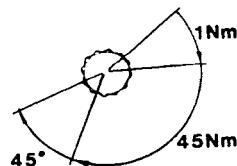
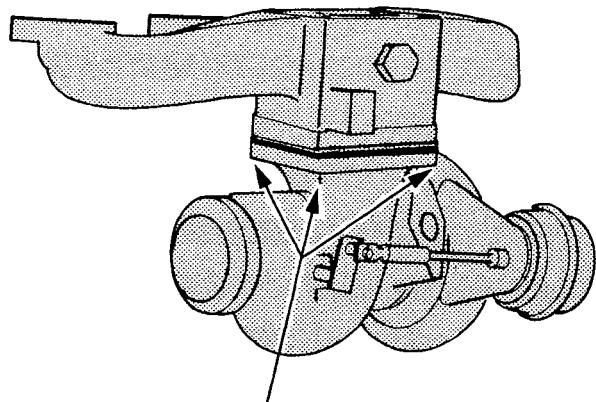
Bolts, retaining turbocompressor to manifold
— lubricate bolt threads and contact surfaces with rustproofing agent, P/N 282036–3

— tighten bolts in three stages and in sequence shown

Stage 1 1 Nm
0.7 ft. lbs.

Stage 2 45 Nm
33 ft. lbs.

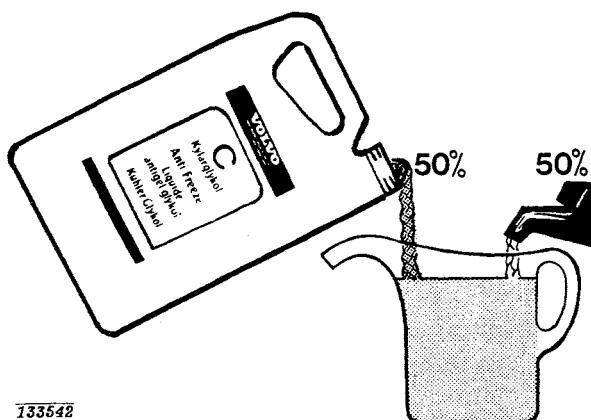
Stage 3 — torque additional 45°



137 789

Group 26 Cooling system

Volvo all weather Anti-Freeze Type C (blue-green) should be used all year round. Cooling system should always contain water plus anti-freeze, even during summer. Experience has also shown that extremely weak anti-freeze solutions (10-20 %) provide poor rust protection. For this reason ratio of anti-freeze/summer coolant to water should be 1 to 1.



133542

1700.169

Expansion tank

Pressure valve in filler cap opens at

— overpressure	65–85 kPa 9–12 psi
— vacuum	7 kPa 1 psi

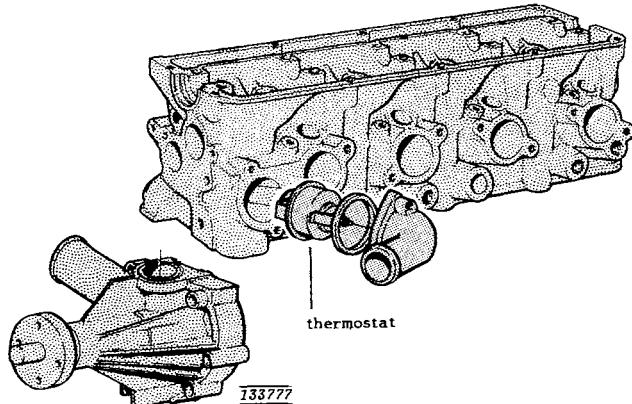
Thermostat

Alt. 1

— marking	87°
— starts to open at	86–88°C 187–190°F
— fully open at	97°C 207°F

Alt. 2

— marking	92°
— starts to open at	91–93°C 196–199°F
— fully open at	102°C 216°F



133777

Gasoline engine B230

B230F

Engine Identification number (EIN):

- manual transmission 499 858
- automatic transmission 499 859

Cylinders

4

Bore

3.78"

96 mm

Stroke

3.15"

80 mm

Displacement

141 cu.in.

2.32 liters

Compression ratio:

9.8

Gasoline

Unleaded

Research Octane Number (RON)

91

- According to formula (R+M)/2

87

Emission equipment

Oxygen sensor system,

catalytic converter.

Constant Idel Speed System

Fuel injection system

Bosch LH-Jetronic

Ignition system

Computer controlled, knock sensor

- Type

Volvo (Chrysler)

Output, DIN

85 kW at 90 rps

Output, SAE J1349

114 hp at 5400 rpm

Torque, DIN

185 Nm at 46 rps

Torque, SAE J1349

136 ft.lbs. at 2750 rpm

Cylinder block

Material Special alloy cast iron

Bore, B230

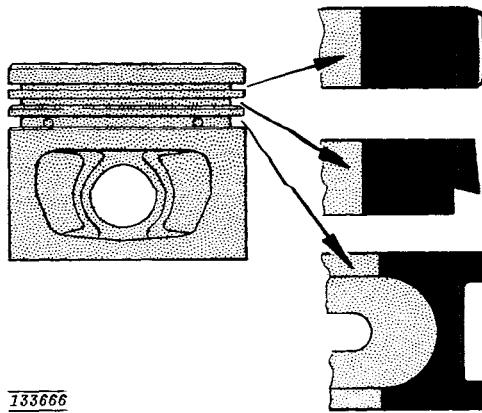
Standard, marked C	96.00–96.01 mm 3.7795–3.7799"
Standard, marked D	96.01–96.02 mm 3.7799–3.7803"
Standard, marked E	96.02–96.03 mm 3.7803–3.7807
Standard, marked G	96.04–96.05 mm 3.7811–3.7815"
Oversize 1	96.3 mm 3.7913"
Oversize 2	96.6 mm 3.8031"

Machine cylinders when worn 0.1 mm – 0.004" if engine oil consumption is abnormal.

Piston rings

Width

– upper compression ring	1.728–1.740 mm 0.0680–0.0685"
– lower compression ring	1.728–1.740 mm 0.0680–0.0685"
– oil scraper ring	3.475–3.490 mm 0.1368–0.1374"

133666**Pistons**

Piston clearance

B230	0.01–0.03 mm 0.0004–0.0012"
------------	--------------------------------

Piston weight

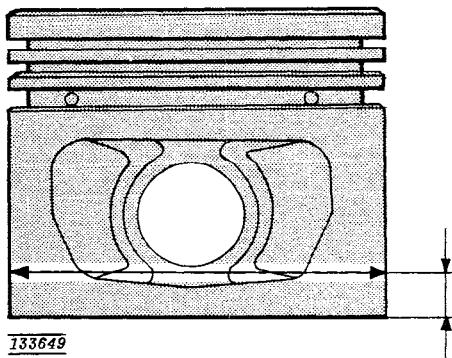
B230	535 ± 8 grams
Maximum difference in weight beween pistons in engine	16 grams

Piston height

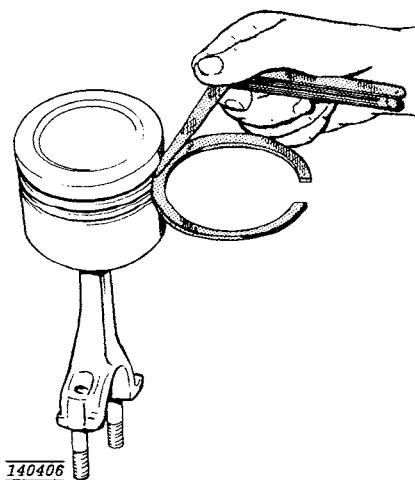
B230	64.7 mm 2.5412"
------------	--------------------

Distance from piston pin center to piston top

B230	39.7 mm 1.5630"
------------	--------------------

133649**Side clearance, ring on piston**

– upper compression ring	0.060–0.092 mm 0.0240–0.0362"
– lower compression ring	0.040–0.072 mm 0.0610–0.0283"
– oil scraper ring	0.030–0.065 mm 0.0120–0.06256"

140406

Piston diameter is measured at right angles to piston pin hole and at following distances from lower edge of piston

B230	7 mm 0,28"
------------	---------------

Ring gap, measured in cylinder

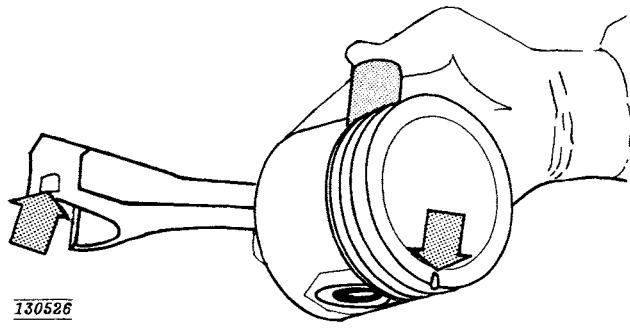
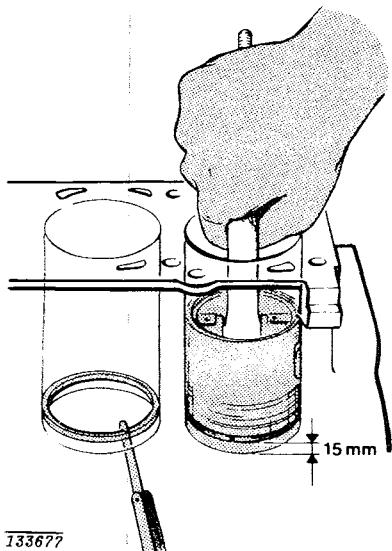
– upper compression ring	0.30–0.55 mm 0.012–0.022"
– lower compression ring	0.30–0.55 mm 0.012–0.022"
– oil scraper ring	0.30–0.60 mm 0.012–0.24"

Piston pin

Floating fit, circlips at both ends in piston.

Fit:

- In connecting rod: light thumb pressure (close running fit)
- In piston: thumb pressure (push fit)



Diameter

– standard	23.00 mm 0.906"
– oversize	23.05 mm 0.907"

Crankshaft assembly

Crankshaft

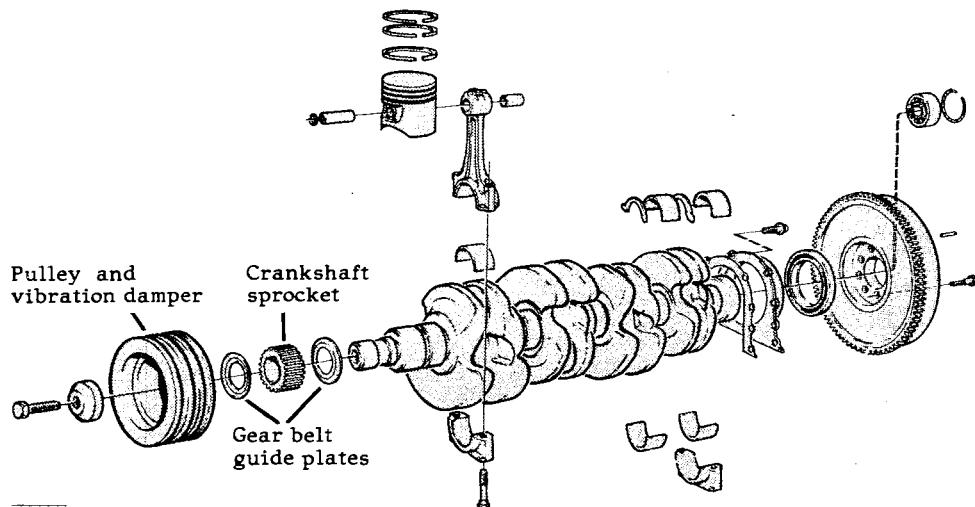
Max. out-of true	0.025 mm 0.010"
Max. end float	0.080–0.0270 mm 0.031–0.0106"

Main bearings,
clearance to crankshaft

0.024–0.072 mm
0.00095–0.0283"

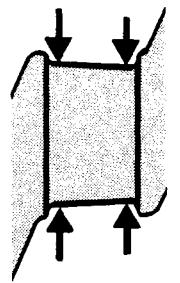
Big-end bearings,
– clearance to crankshaft

0.023–0.067 mm
0.0009–0.002

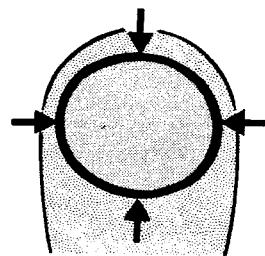


Main bearing journals

Out-of-round limit	0.004 mm 0.00016
Taper limit	0.004 mm 0.00016"
Diameter	
– standard	55 mm 2.16535"
limits	54.987–55.000 mm 2.16484–2.16535"
– undersize 1	54.75 mm 2.15551"
limits	54.737–54.750 mm 2.15500–2.15551"
– undersize 2	54.50 mm 2.14567"
limits	54.487–54.500 mm 2.14515–2.14567"
Bearing seat width	22.9–25.1 mm 0.902–0.988"
Width on crankshaft for thrust bearing	
– standard	31.96–32.00 mm 1.2578–1.2598"
– oversize 1	32.21–32.25 mm 1.2681–1.2697"
– oversize 2	32.46–32.50 mm 1.2779–1.2795"



133669



133670

Big-end bearing journals

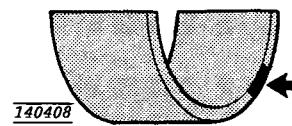
Out-of-round limit	0.004 mm 0.00016"
Taper limit	0.004 mm 0.00016"
Diameter	
– standard	49.00 mm 1.92913"
limits	48.984–49.005 mm 1.92850–1.92933"
– undersize 1	48.75 mm 1.91929"
limits	48.734–48.755 mm 1.91866–1.91949"
– undersize 2	48.50 mm 1.90845"
limits	48.484–48.505 mm 1.90882–1.90965"
Width on crankshaft for bearing	23.9–26.1 mm 0.941–1.028"

Connecting rod bearings

At manufacture, two carefully sized and marked bearing halves are used as follows:

- Alt. 1: Both bearing halves marked yellow.
Alt. 2: One marked blue, one marked red.

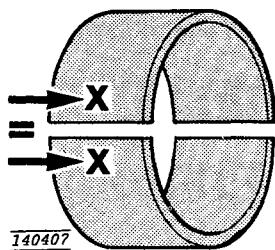
The bearing half marked blue is located in the connecting rod, the red one in the cap.
For Spare Parts, only yellow marked bearings are used.



140408

Main bearings

Two Manufacturers are used. Both bearing halves in a bearing should be from the same manufacturer.



140407

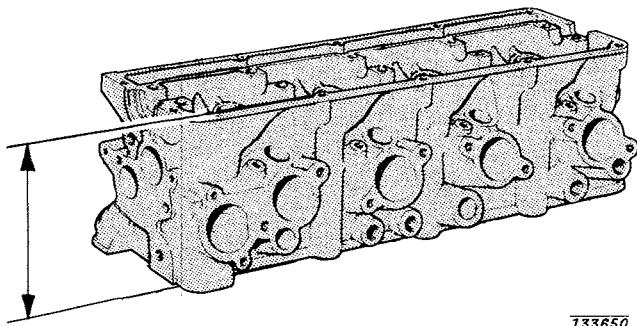
Cylinder head

Height

- new	146.1 mm 5.7520"
- minimum	145.6 mm 5.7323"

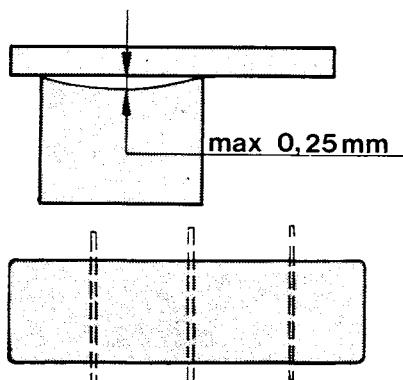
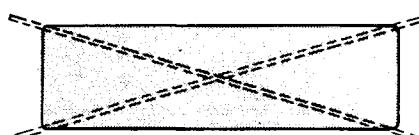
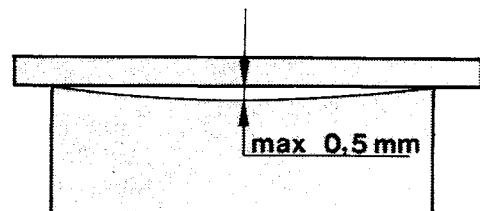
Thickness of cylinder head gasket

- not compressed	1.3 mm 0.051"
- compressed	1.2 mm 0.047"



Max. Warp

Replace cylinder head if warp is more than 1.0 mm = 0.04" lengthwise or 0.5 mm = 0.02" crosswise.

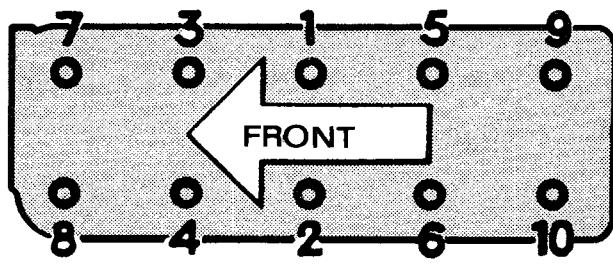


133651

Torques, cylinder head bolts

Tightening torques apply to oiled screws, bolts and nuts.
Degreased (washed) parts must be oiled.

1. Torque to 20 Nm
15 ft. lbs.
2. Torque to 60 Nm
44 ft. lbs.
3. Angle-tighten 90°



133653
Tightening sequence for cylinder head bolts.

Replace bolts if center section shows signs of extension.

Do not re-use bolts more than 5 times.

If there are any doubts about bolts, install new ones.

Valve clearances

Intake and exhaust valves

Tolerances allowed when checking

- cold engine	0.30–0.40 mm 0.012–0.016"
- hot engine	0.35–0.45 mm 0.014–0.018"

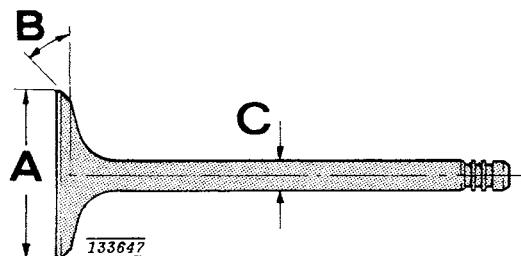
Tolerances allowed when adjusting
should be kept within

- cold engine	0.35–0.40 mm 0.014–0.016"
- hot engine	0.40–0.45 mm 0.016–0.018"
Adjusting disc thickness	3.3–4.5 mm 0.13–0.18"
- in increments of	0.05 mm 0.002"

Valves

Intake valve

Disc diameter (A)	44 mm 1.73"
Angle (B)	44.5
Stem diameter (C)	
- new	7.955–7.970 mm 0.3132–0.3138"
- minimum	7.935 mm 0.3124"



Exhaust valve

Disc diameter (A)	35 mm 1.38"
Angle (B)	44.5
Stem diameter (C)	
- new	7.945–7.960 mm 0.3128–0.3134"
- minimum	7.925 mm 0.3120"

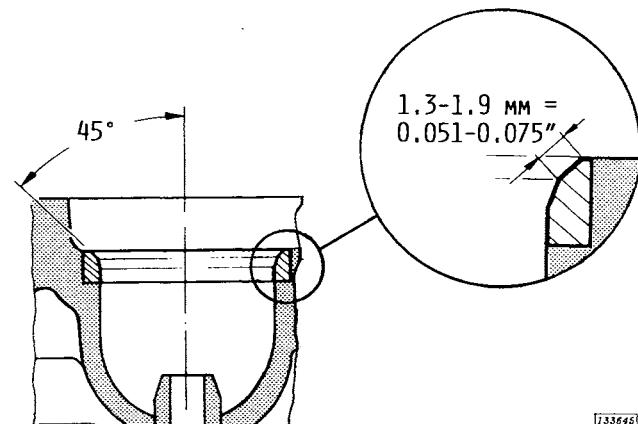
NOTE:

Exhaust valves are stellite coated and must not be machined. They may be ground against valve seat.

Valve seats

Intake valve seat diameter

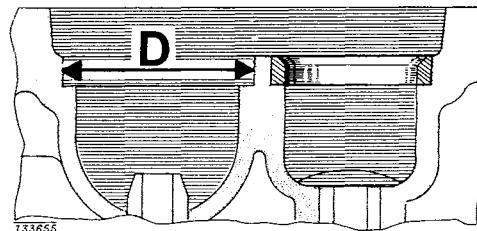
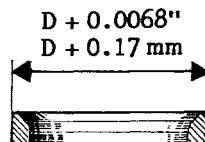
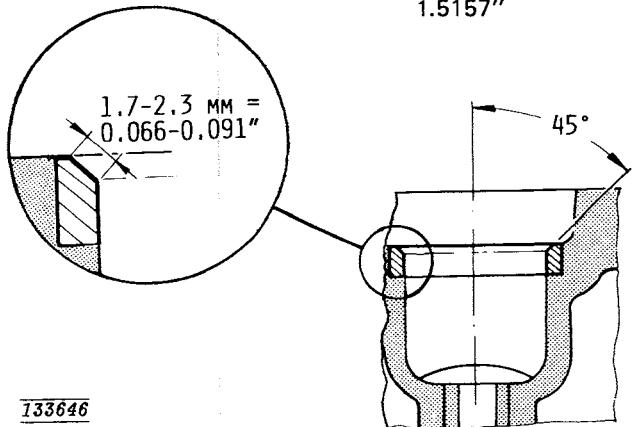
- standard	46.00 mm 1.8110"
- oversize 1	46.25 mm 1.8208"
- oversize 3	46.50 mm 1.8307"



Valve seats

Exhaust valve seat diameter

– standard	.....	38.00 mm 1.4960"
– oversize 1	.....	38.25 mm 1.5157"
– oversize 2	.....	38.50 mm 1.5157"



NOTE:

When replacing valve seats, there should be a negative clearance (grip) of 0.17 mm = 0.0068" between valve seat and cylinder head recess. This means valve seat diameter must be 0.17 mm = 0.068" larger than recess diameter.

Valve guides

Length, intake valve	.....	52 mm 2.047"
Length, exhaust valve	.....	52 mm 2.047"
Inner diameter	.....	8.000–8.022 mm 0.3150–0.3159"

Height above upper face of cylinder head

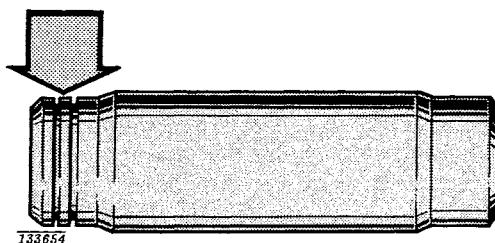
– intake	.....	15.4–15.6 mm 0.606–0.614"
– exhaust	.....	17.9–18.1 mm 0.705–0.713"

Clearance, valve stem to valve guide

– intake valve	.....	0.030–0.060 mm 0.0012–0.0024"
– exhaust valve	.....	0.060–0.090 mm 0.0024–0.0035"
– maximum	.....	0.15 mm 0.006"

Valve guides are available in three oversizes and are marked with grooves.

	Marking	Reamer for seat
Standard	No groove	–
Oversize 1	1 –“–	5161
2	2 –“–	5162
3	3 –“–	5163



NOTE:

Force used when pressing in valve guides must exceed 9000 N = 1980 lbs. If pressing force is lower, recess for guide must be reamed to nearest oversize and a guide of corresponding size pressed in.

Valve depressors

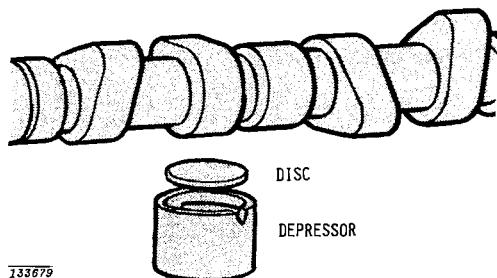
Diameter	.....	36.975–36.995 mm 1.4557–1.4565"
Height	.....	30–31 mm 1.18–1.22"

Clearance

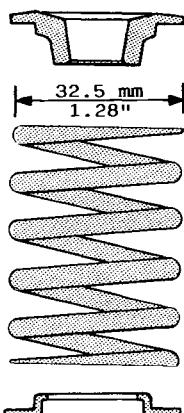
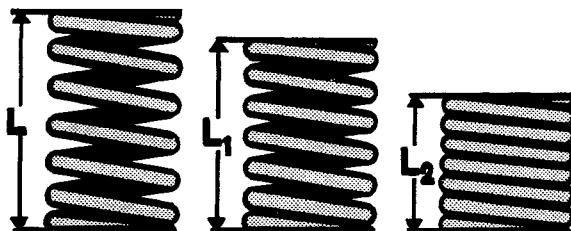
– adjusting disc to depressor	...	0.009–0.064 mm 0.0004–0.0025"
– depressor to cylinder head	...	0.030–0.075 mm 0.0012–0.0030"

Adjusting disc (for valve clearance)

Thickness	.....	3.3–4.5 mm 0.13–0.18"
In increments of	.....	0.05 mm 0.002"
Diameter	.....	32.980–33.000 mm 1.2984–1.2992"



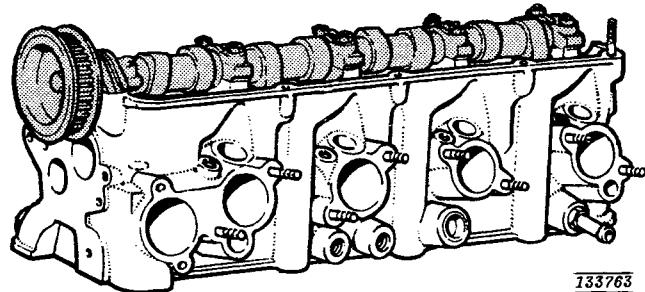
133679

**EARLY TYPE**140462
Valve springs (dimensions in mm)
 Length with different loadings
133765**Length**

	mm	inch	N	lbs
L	45	1.77	0	0
L ₁	38	1.50	280–320	62–70
L ₂	27	1.06	710–790	156–174

Camshaft

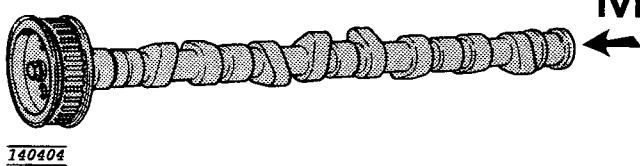
Number of bearings	5
Bearing journal diameter	29.050–29.070 mm 1.1437–1.1445"
Clearance, journal to bearing	
– new	0.030–0.071 mm 0.012–0.0028"
– maximum	0.15 mm 0.006"
End play	0.2–0.5 mm 0.008–0.020"

133763

engine	I.D. LTR	Camshaft lift		Volvo P/N
		mm	inch	
B230F	M	9.5	0.3740	1336779–2
– intake		10.5	0.4134	
– outlet				

Camshaft bearings

Inside diameter	30.000–30.021 mm 1.1811–1.1823"
-----------------------	------------------------------------

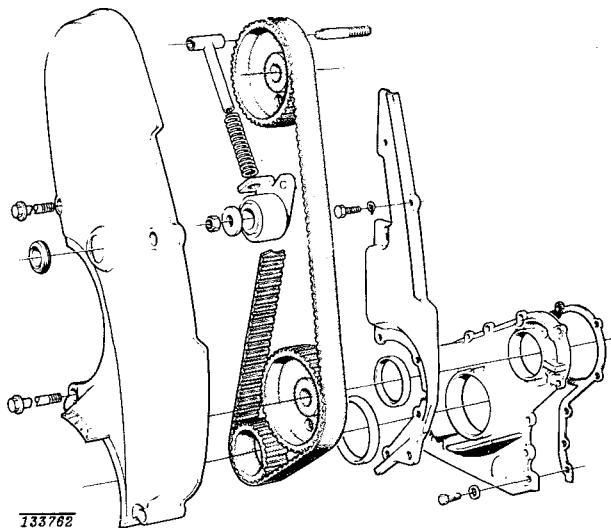
140404**Camshaft setting**

engine	I.D. LTR	Adjust clearance for cyl 1 intake valve to:		Intake valve should then open at:
		mm	inch	
B230F	M	0.7	0.0276	3° ATDC
– intake		0.7	0.0276	48° BTDC
– outlet				

Timing gears

Number of teeth

- crankshaft gear	19
- intermediate gear	38
- camshaft gear	38
- camshaft drive belt	123



Intermediate shaft

Diameter, front bearing

- journal	46.975–47.000 mm 1.8494–1.8504"
- bearing inside	47.020–47.050 mm 1.8512–1.8524"

Diameter, middle bearing

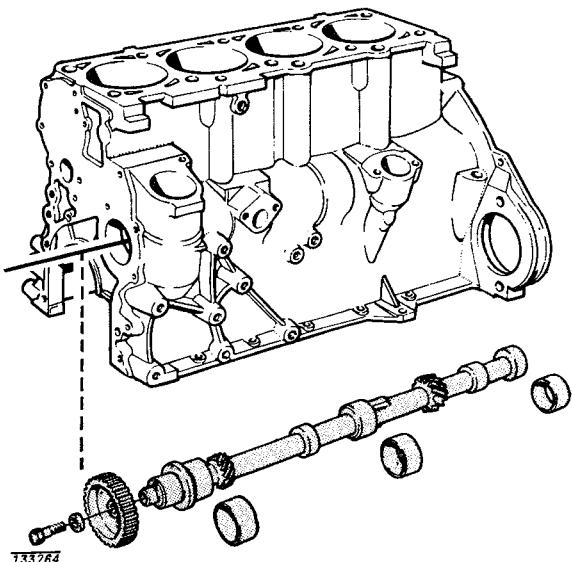
- journal	43.025–43.050 mm 1.6939–1.6949"
- bearing inside	43.070–43.100 mm 1.6957–1.6968"

Diameter, rear bearing

- journal	42.925–42.950 mm 1.6900–1.6909"
- bearing inside	42.970–43.000 mm 1.6917–1.6929"

Clearance, journal to bearing 0.020–0.075 mm
0.0008–0.0030"

End play 0.20–0.46 mm
0.0080–0.0181"



Group 22 Lubricating system

Engine oil.

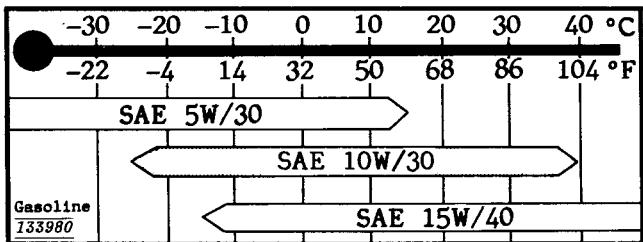
Quality:

According to API Service SF. Oils with specifications SF/CC and SF/CD comply.

Synthetic or semisynthetic oils may be used if specifications comply.

Fuel-saving oils are recommended. When using such oils, oil change intervals recommended by Volvo **must** be followed.

Viscosity: (stable ambient temperatures)



SAE 15W/40 is recommended for use in extreme driving conditions that involve high oil temperature and consumption e.g. mountain driving with frequent decelerations or fast motorway driving.

Note however the higher temperature range.

Capacities:

Excl. filter: 3.35 liters = 3.5 US qts

Incl. filter: 3.85 liters = 4.0 US qts

Oil and filter changes

Replaced first time at 600–1.200 mile (1.000–2.000 km) inspection.

Subsequent changes: Mileage or time interval (whichever comes first). See chart below:

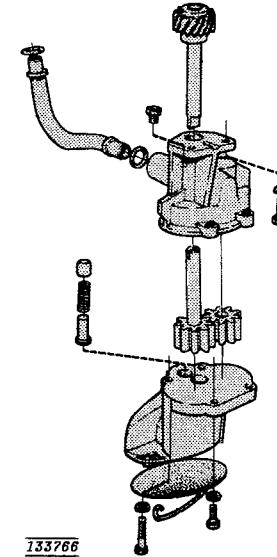
Driving conditions	
Driving under severe conditions – see below	Each 7.500 miles (12.500 km) or every third month
Normal driving conditions	Each 7.500 miles (12.500 km) or every sixth month

Severe driving conditions

- sustained driving in dusty/sandy conditions
- sustained trailer hauling
- sustained hill climbing
- sustained high-speed driving
- sustained driving short distances (7 miles = 10 km or less) at low temperatures (at or below 32°F = 0°C).

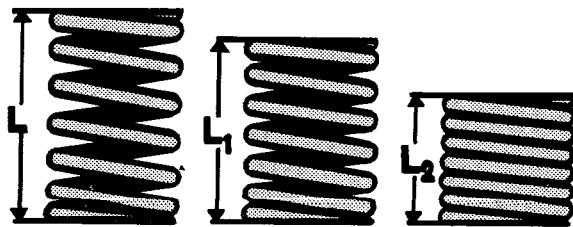
Oil pump

End play	0.02–0.12 mm 0.0008–0.0047"
Side clearance, excl. bearing clearance	0.02–0.09 mm 0.0008–0.0035"
Backlash, excl. bearing clearance	0.15–0.35 mm 0.0059–0.0138"
Bearing clearance	
– drive shaft	0.032–0.070 mm 0.0013–0.0028"
– idling shaft	0.014–0.043 mm 0.0006–0.0016"



Relief spring length at various loadings.

Length	Loading
mm inch	N lbs
L 39.2 1.543	0 0
L ₁ 26.25 1.033	46–54 10.1–11.9
L ₂ 21.0 0.827	62–78 13.6–17.2



Group 23 Fuel system

CO

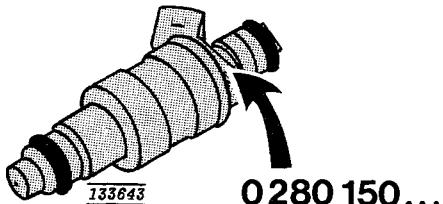
Idle speed and engine at operating temperature.
CO should be set within three minutes after
thermostat opens.

CO cannot be adjusted. Controls are sealed.

Setting	0.6% CO
Permitted when checking ...	0.4–0.8% CO
Idle speed	750 rpm
Tolerance	+/- 20 rpm
Mono-Tester reading	20–70°

Injectors

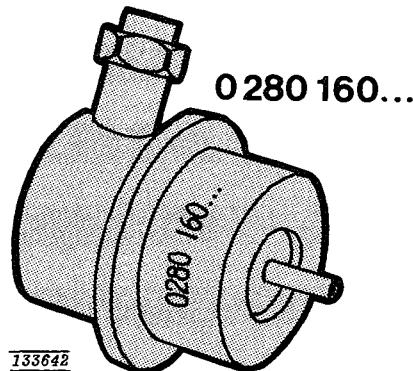
Bosch No	0 280 150 209
Volvo P/N	1326427–9
At fuel pressure	250 kPa 35.5 psi
– injected fuel quantity is ...	167 cm ³ /minute



Identified by stamped number
(last three digits).

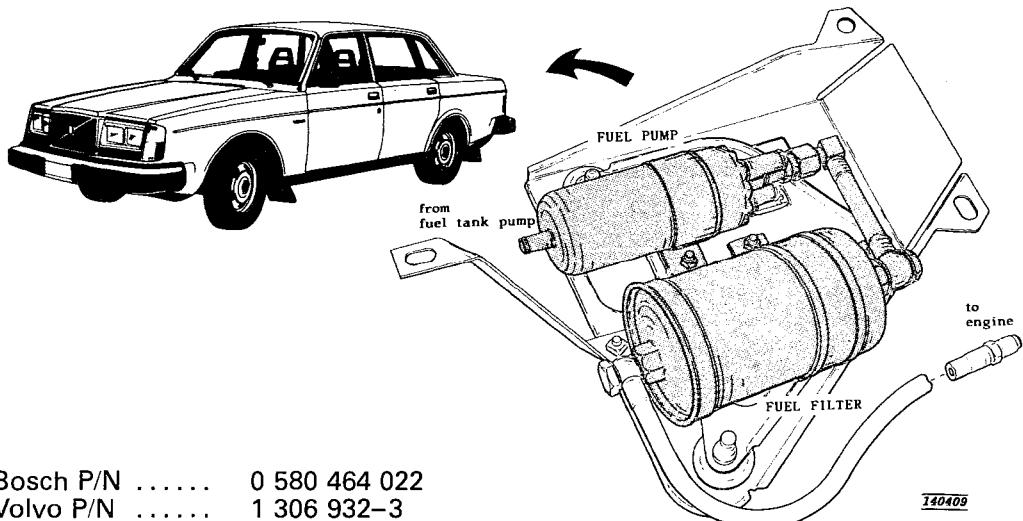
Line pressure

– Line pressure above intake manifold pressure	250 kPa 35.5 psi
Line pressure regulator:	
– Bosch No	0 280 160 214
– Volvo P/N	1306935–6



Line pressure regulator

Identified by stamped number (last three digits).



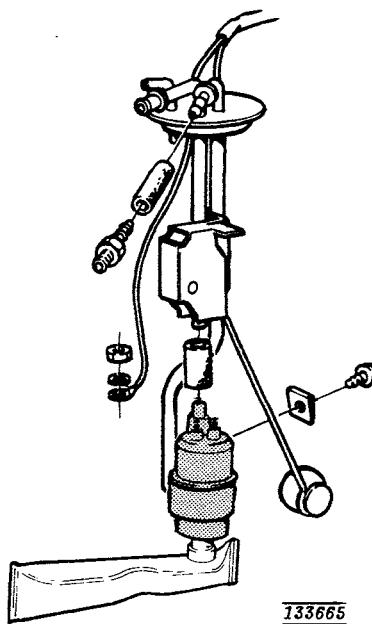
Fuel pump

Fuel pump, Bosch P/N	0 580 464 022
Volvo P/N	1 306 932–3

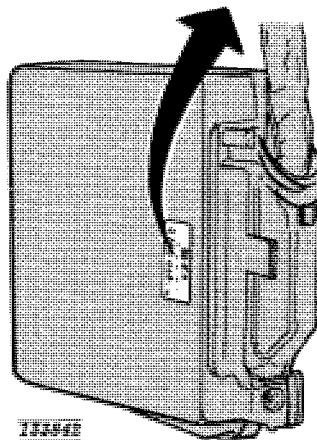
Pump capacity at 300 kPa (42.6 psi), + 20°C and 12 V ...	130 litres/hour (1.08 liters/30 sec = 1.13 qt/30 sec)
11 V	110 liters/hour (0.9 liter/30 sec = 0.94 qt/30 sec)
10V	85 liters/hour (0.7 liter/30 sec = 0.73 qt/30 sec)
Current consumption, max ...	6.5 A

Fuel feed pump (tank pump)

Current consumption 1–2 amp



0 280 000...



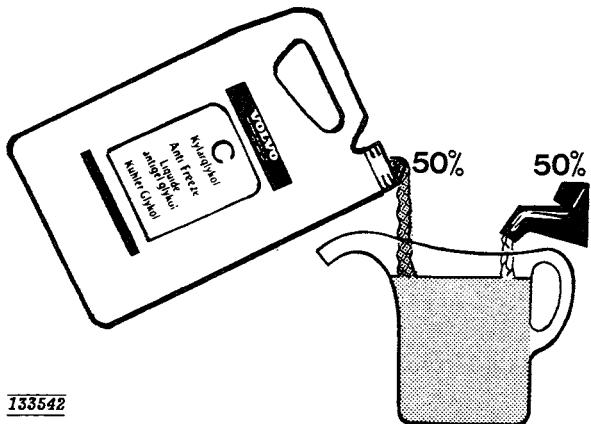
Electronic Control Unit fuel injection system

Bosch No 0 280 000 511

Volvo P/N 1 336 801-4

Group 26 Cooling system

Volvo all weather Anti-Freeze Type C (blue-green) should be used all year round. Cooling system should always contain water plus anti-freeze, even during summer. Experience has also shown that extremely weak anti-freeze solutions (10-20 %) provide poor rust protection. For this reason ratio of anti-freeze/summer coolant to water should be 1 to 1.



1700.169

Expansion tank

Pressure valve in filler cap opens at

- | | |
|----------------------|-----------------------|
| — overpressure | 65–85 kPa
9–12 psi |
| — vacuum | 7 kPa
1 psi |

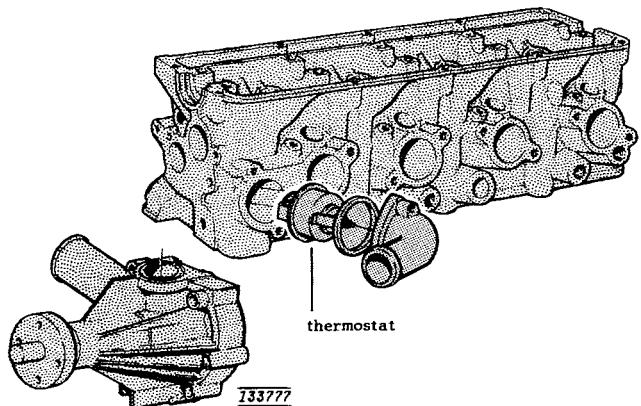
Thermostat

Alt. 1

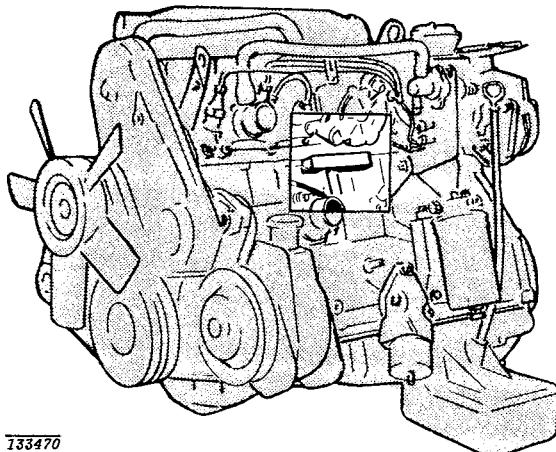
- | | |
|---------------------------|----------------------|
| — marking | 87° |
| — starts to open at | 86–88°C
187–190°F |
| — fully open at | 97°C
207°F |

Alt. 2

- | | |
|---------------------------|----------------------|
| — marking | 92° |
| — starts to open at | 91–93°C
196–199°F |
| — fully open at | 102°C
216°F |



Diesel engine D24



D24 Diesel

Engine Identification Number and Engine Serial Number

Stamped under the vacuum pump on engine left side.

Engine Identification Number (EIN)	
– manual transmission	498704
– automatic transmission	498705
Compression ratio	
	23.0:1
Compression pressures	
– maximum	3.2 MPa 455 psi
– minimum	2.4 MPa 340 psi
– max difference between cylinders	0.8 MPa 115 psi
Cylinders	6
Injection sequence	1–5–3–6–2–4
Displacement	2.383 liters 145 cu. in.

Weight, including engine mounts, starter motor and alternator . . .	198 kg 436 lbs
Cylinder bore	76.5 mm 3.0118"
Stroke	86.4 mm 3.4016"
Output	
– DIN	60 kW at 80 rps 82 hp at 4800 rpm
– SAE J270	57 kW at 80 rps 76 hp at 4800 rpm
Torque	
– DIN	140 Nm at 47 rps 14.3 kpm at 2800 rpm
– SAE J270	133 Nm at 47 rps 89 ft. lbs. at 2800 rpm

Fuel (diesel oil)

Standard	DIN 51 601, CEC-ERF-DI or ASTM-D 975-No 1-D, 2-D
-----------------------	---

Diesel engine specifications

Cylinder block

Cylinder bore

Standard

– honing group 651	.....	76.51 mm 3.0122"
– honing group 652	.....	76.52 mm 3.0126"
– honing group 653	.....	76.53 mm 3.0130"

Oversize 1 = 0.25 mm

– honing group 676	.....	76.76 mm 3.0220"
– honing group 677	.....	76.77 mm 3.0224"
– honing group 678	.....	76.78 mm 3.0228"

Oversize 2 = 0.50 mm

– honing group 701	.....	77.01 mm 3.0319"
– honing group 702	.....	77.02 mm 3.0323"
– honing group 703	.....	77.03 mm 3.0327"

Oversize 3 = 1.00 mm

– honing group 751	.....	77.51 mm 3.0516"
– honing group 752	.....	77.52 mm 3.0520"
– honing group 753	.....	77.53 mm 3.0524"

Max wear	0.04 mm 0.0016"
-----------------	-------	--------------------

Piston diameter

Standard

– honing group 651	.....	76.48 mm 3.0110"
– honing group 652	.....	76.49 mm 3.0114"
– honing group 653	.....	76.50 mm 3.0118"

Oversize 1 = 0.25 mm

– honing group 676	.....	76.73 mm 3.0209"
– honing group 677	.....	76.74 mm 3.0213"
– honing group 678	.....	76.75 mm 3.0216"

Oversize 2 = 0.50 mm

– honing group 701	.....	76.98 mm 3.0307"
– honing group 702	.....	76.99 mm 3.0311"
– honing group 703	.....	77.00 mm 3.0315"

Oversize 3 = 1.00 mm

– honing group 751	.....	77.48 mm 3.0504"
– honing group 752	.....	77.49 mm 3.0508"
– honing group 753	.....	77.50 mm 3.0512"

Max wear	0.04 mm 0.0016"
-----------------	-------	--------------------

Piston

Weight, including pin 455–465 gram

Max weight deviation between

pistons in engine 12 gram

Overall height 71.7 mm

2.8228"

Height from piston pin center to
piston top 41.7 mm

1.6417"

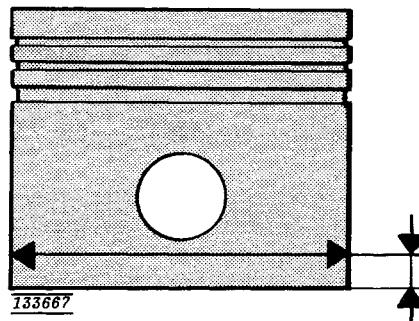
Piston clearance

– new 0.03–0.05 mm
0.0012–0.0020"

– max 0.13 mm
0.00512"

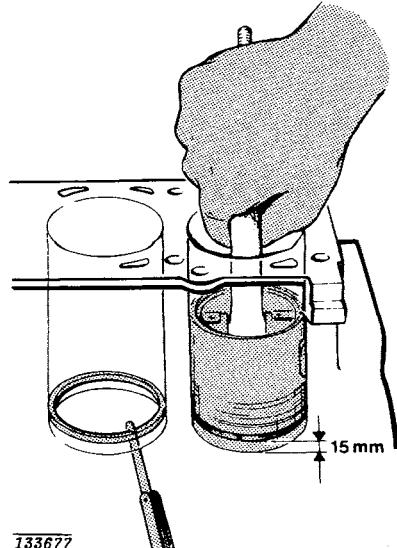
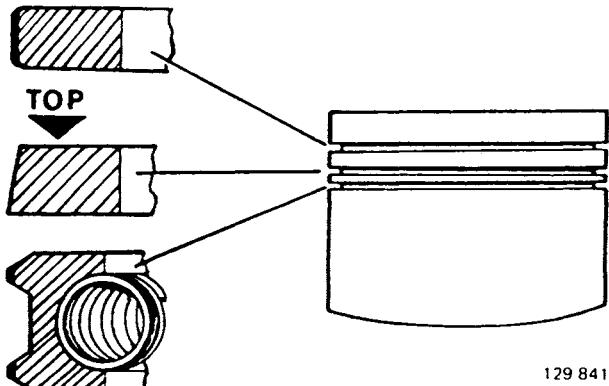
Max wear, compared with normal
diameter 0.04 mm

0.0016"



Measure piston diameter at right angles to piston pin
hole and 15 mm = 0.16" from piston lower edge.

Piston rings



133677

Width

— upper compression ring	1.730–1.740 mm 0.0681–0.0685"
— lower compression ring	1.980–1.990 mm 0.0780–0.0789"
— oil scraper ring	2.975–2.990 mm 0.1171–0.1177"

Measure piston ring gap 15 mm = 0.16" from cylinder lower edge.

Use piston to press piston ring into measuring position.

Side clearance, ring on piston

Upper compression ring

— new	0.06–0.09 mm 0.0024–0.0035"
— max	0.2 mm 0.0079"

Lower compression ring

— new	0.05–0.08 mm 0.0020–0.0032"
— max	0.2 mm 0.0079"

Oil scraper ring

— new	0.03–0.06 mm 0.0012–0.0024"
— max	0.15 mm 0.0059"

Ring gap, measured in cylinder

Upper compression ring

— new	0.3–0.5 mm 0.012–0.020"
— max	1.0 mm 0.04"

Lower compression ring

— new	0.3–0.5 mm 0.012–0.020"
— max	1.0 mm 0.04"

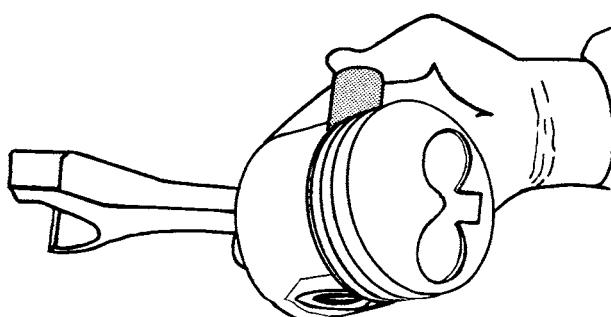
Oil scraper ring

— new	0.25–0.40 mm 0.010–0.016"
— max	1.0 mm 0.04"

Piston pins

Fit in connecting rod Light thumb pressure
(close running fit)

Fit in piston Thumb pressure
(push fit)



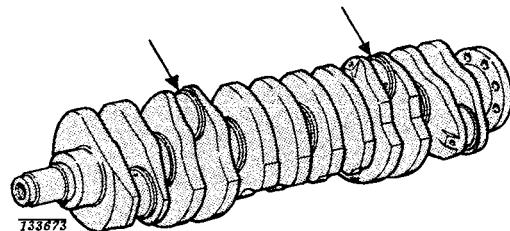
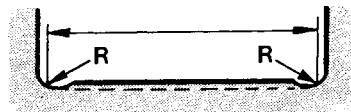
133810

Crankshaft assembly**Crankshaft**

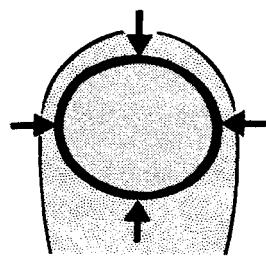
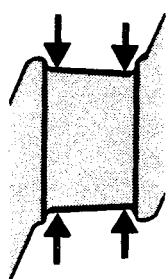
Max out-of true, two center bearings (measured with two outer main bearings placed in V-block)	0.06 mm 0.0024"
— remaining bearings	0.04 mm 0.0016"
Crankshaft end float	
— new	0.07–0.18 mm 0.0028–0.0071"
— max	0.25 mm 0.010"
Clearance, main bearings to journal	
— new	0.016–0.075 mm 0.0006–0.0030"
— max	0.16 mm 0.0063"
Connecting rod big-end bearings	
— side clearance, max	0.4 mm 0.016"
Clearance bearing to journal	
— max	0.12 mm 0.0047"
— new	0.015–0.062 mm 0.0006–0.0024"

Bearing recess width

Flange bearing	
— minimum	22.5 mm 0.8858"
— maximum	23.0 mm 0.9055"
Other main bearings	
— minimum	21.5 mm 0.8465"
— maximum	22.0 mm 0.8661"
Big-end bearings	
— minimum	24.6 mm 0.9685"
— maximum	25.0 mm 0.9842"

**Main bearing journals**

Out-of-round, max	0.003 mm 0.0001"
Taper, max	0.005 mm 0.0002"
Diameter	
— standard 58 mm	57.995–57.975 mm 2.2833–2.2825"
— undersize 1, 57.75 mm	57.705–57.725 mm 2.2718–2.2726"
— undersize 2, 57.50 mm	57.445–57.475 mm 2.2620–2.2628"
— undersize 3, 57.25 mm	57.205–57.225 mm 2.2522–2.2530"



Taper

Out-of-round

133669

133670

Radius

Flange bearing	
— minimum	1.0 mm 0.0394"
— maximum	1.5 mm 0.0591"
Other main bearings	
— minimum	1.0 mm 0.0394"
— maximum	1.5 mm 0.0591"
Big-end bearings	
— minimum	2.0 mm 0.0787"
— maximum	2.5 mm 0.0984"

Big-end bearing journals

Out-of-round, max	0.03 mm 0.001"
Taper, max	0.05 mm 0.002"
Diameter	
— standard, 47.80 mm	47.758–47.778 mm 1.8802–1.8810"
— undersize 1, 47.55 mm	47.508–47.528 mm 1.8704–1.8712"
— undersize 2, 47.30 mm	47.258–47.278 mm 1.8606–1.8613"

Connecting rods

Replace in sets only.

Side clearance on crankshaft

– max 0.4 mm
0.0158"

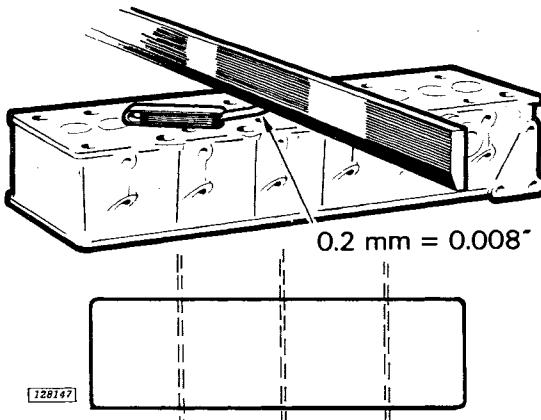
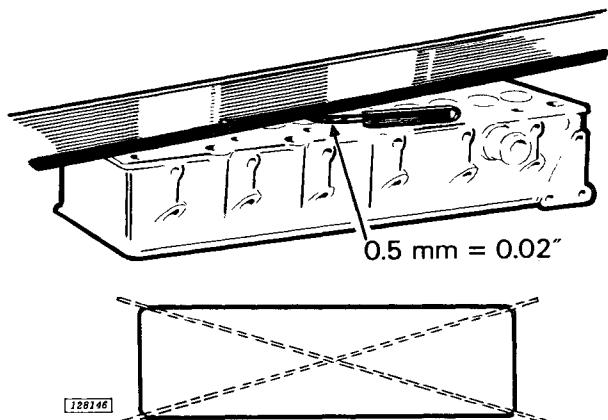
Length center to center 136 mm
5.3543"

Flywheel

Warp, max at 150 mm =
5.905" diameter 0.05 mm
0.002"

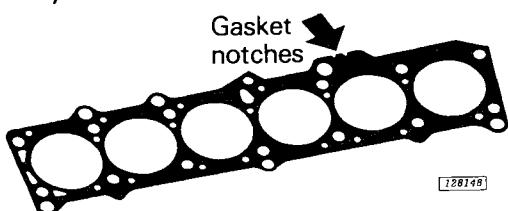
Cylinder head

Replace cylinder head in case of excessive warp. DO NOT resurface or machine.



Cylinder head gasket

Three cylinder head gaskets are available. Selecting the proper gasket depends on piston projection above cylinder block face.



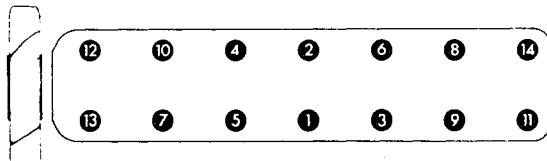
Piston projection	Gasket notches	Gasket thickness
0.67–0.80 mm 0.026–0.031"	1	1.4 mm 0.055"
0.81–0.90 mm 0.032–0.035"	2	1.5 mm 0.059"
0.91–1.02 mm 0.036–0.040"	3	1.6 mm 0.063"

Cylinder head bolts

From late 1980 new type cylinder head bolts are used. They are longer and 12 mm diameter (previously 11 mm). Use following procedures for torquing cylinder head bolts after the cylinder head has been removed.

- Install **new bolts**. The washers can be re-used.
 - Use tightening sequence shown in illustration and following six steps:
1. Torque to **40 Nm** = 30 ft. lbs.
 2. Torque to **60 Nm** = 44 ft. lbs.
 3. Torque to **75 Nm** = 55 ft. lbs.
 4. Tighten **180°**, in one movement, without stopping.
 5. Run engine until oil temperature is minimum **50°C** = **120°F**.
 6. Tighten **90°**, in one movement, without stopping.

Tightening sequence for cylinder head bolts.



When removing cylinder head, loosen bolts in reverse order.

After driving, 1,000–2,000 km = 600–1,200 miles, cylinder head bolts must be retorqued.

- Use tightening sequence shown in illustration.
- Engine **cold** or nearly cold.
- **DO NOT** slacken bolt first.
- Tighten **90°**, in one movement, without stopping.

Valve system

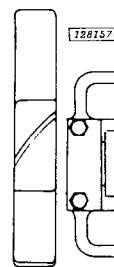
Valve clearances, cold engine

Intake valve

— checking	0.15–0.25 mm 0.006–0.010"
— setting	0.20 mm 0.008"

Exhaust valve

— checking	0.35–0.45 mm 0.014–0.018"
— setting	0.40 mm 0.016"



Valve clearances, warm engine

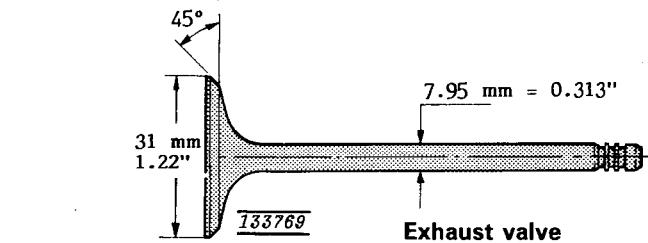
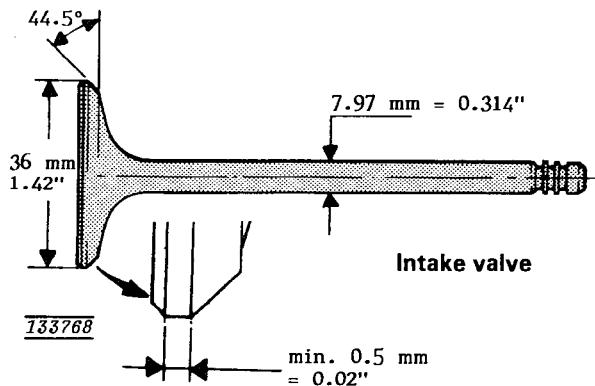
Intake valve	— checking	0.20–0.30 mm 0.008–0.012"
	— setting	0.25 mm 0.01"
Exhaust valve	— checking	0.40–0.50 mm 0.016–0.020"
	— setting	0.45 mm 0.018"
Adjusting disc thickness	— in increments of	3.00–4.25 mm 0.1181–0.1673" 0.05 mm 0.002"

I = intake valve
A = exhaust valve

Checking/adjusting sequence
1-5-3-6-2-4

128157

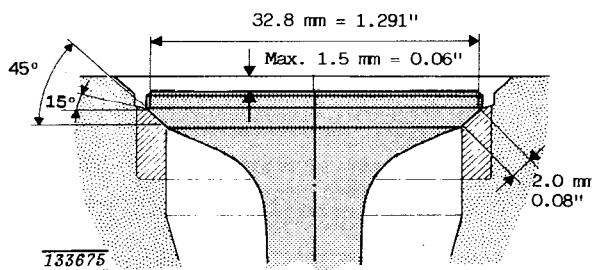
Valves



Note. The exhaust valves are stellite-flashed and must not be machined. They may only be ground in against the seat.

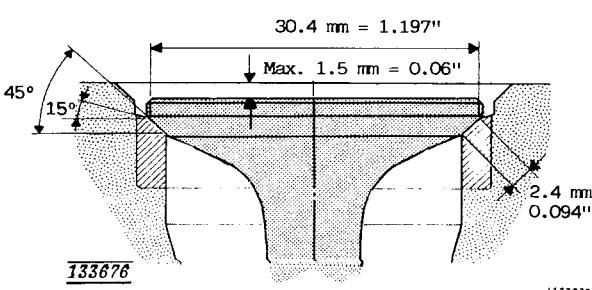
Intake valve seat diameter

— standard	37.090–37.105 mm 1.4602–1.4608"
— oversize 1	37.290–37.305 mm 1.4681–1.4687"



Intake valve seat diameter in cylinder head

— standard	37.000–37.016 mm 1.4681–1.4687"
— oversize 1	37.200–37.216 mm 1.4645–1.4552"

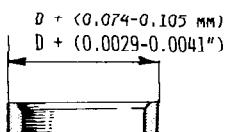


Exhaust valve seat diameter

— standard	33.090–33.105 mm 1.3027–1.3033"
— oversize 1	33.290–33.305 mm 1.3106–1.3112"

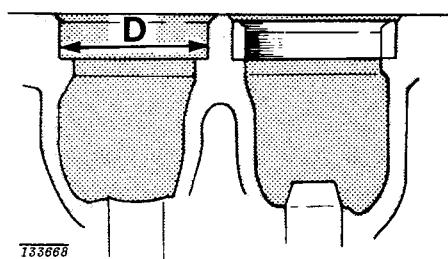
Exhaust valve seat diameter in cylinder head

— standard	33.000–33.016 mm 1.2992–1.2998"
— oversize 1	33.200–33.216 mm 1.3070–1.3077"



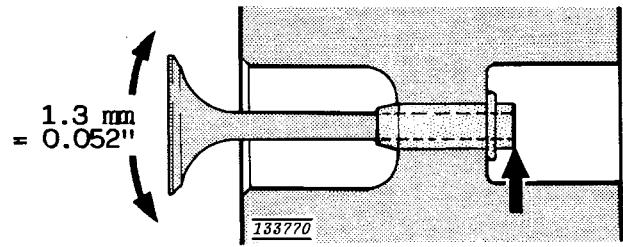
NOTE:

When replacing valve seats there should be a negative clearance (grip) of 0.074–0.105 mm = 0.0029–0.0041" between valve seat and cylinder head recess. This means that valve seat diameter should be 0.074–0.105 mm = 0.0029–0.0041" larger than recess diameter.



Valve guides

Length	36.50–36.75 mm 1.437–1.447"
Inner diameter	8.000–8.015 mm 0.3150–0.3151"
Height above cylinder head lower surface	40.1–40.5 mm 1.57–1.59"
Clearance valve stem to guide (see illustration)	
— new	0.3 mm 0.012"
— max	1.3 mm 0.051"

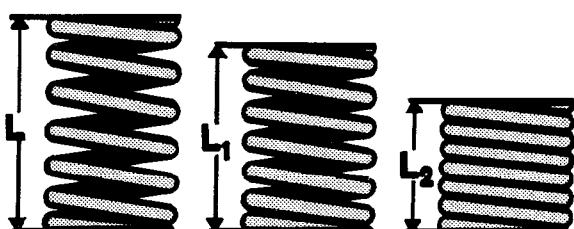


Clearance measured with new valve guide and with valve stem edge to edge with valve guide.

Valve springs

Inner valve springs

Length		Loading	
mm	inch	N	lbs
L	33.9	1.335	0
L ₁	28.6	1.126	67–77
L ₂	18.3	0.720	209–231
			46.0–51.0



133765

Outer valve springs

Length		Loading	
mm	inch	N	lbs
L	40.2	1.583	0
L ₁	32.6	1.283	167–185
L ₂	22.3	0.878	433–479
			95.4–105.5

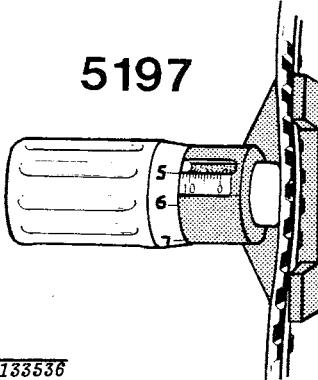
Valve depressors

Diameter	34.950–34.975 mm 1.3760–1.3770"
Height	28.0–28.8 mm 1.10–1.13"
Clearance	
— disc to depressor	0.016–0.046 mm 0.0006–0.0018"
— depressor to cylinder head ..	0.025–0.075 mm 0.0010–0.0030"

Disc (to adjust valve clearance)

Thickness	3.00–4.25 mm 0.118–0.167"
— in increments of	0.05 mm 0.002"
Diameter	30.950–30.975 mm 1.2185–1.2195"

5197



133536

Timing belts

Belt tension, measured with tool 5197

- when checking 12–13
- when setting 12.5

Camshaft

Max lift height

- intake 8.5 mm
0.3347"
- exhaust 9.0 mm
0.3543"

Bearing journal diameter

- front 31.925–31.950 mm
1.2569–1.2579"
- others 29.939–29.960 mm
1.1787–1.1795"

Clearance, bearing to camshaft

- new 0.05–0.10 mm
0.002–0.004"

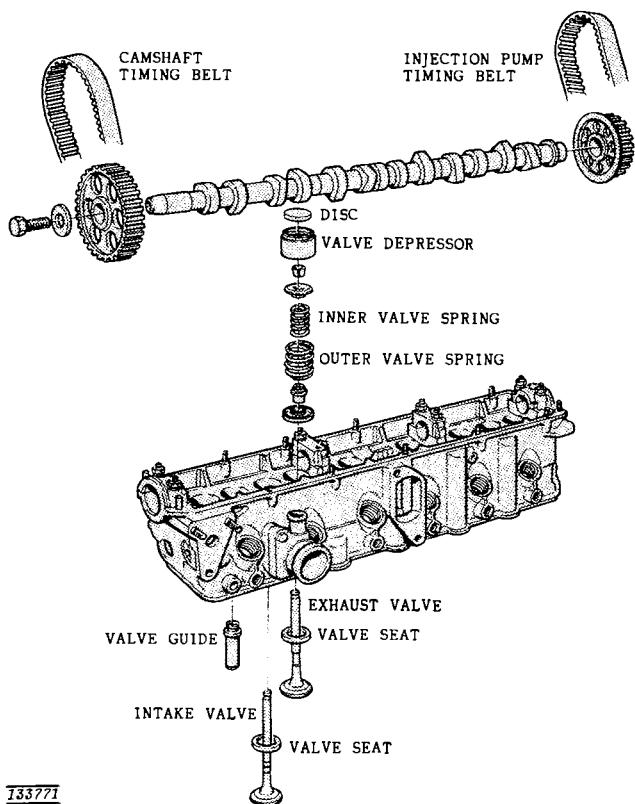
- End play; new 0.15 mm
0.006"

Use gauge 5190 to check camshaft setting.

Camshaft bearings

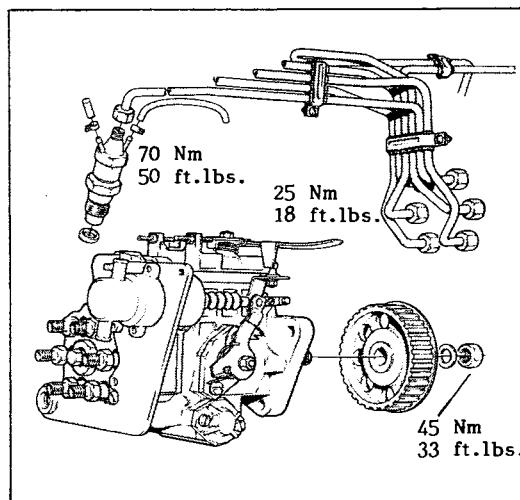
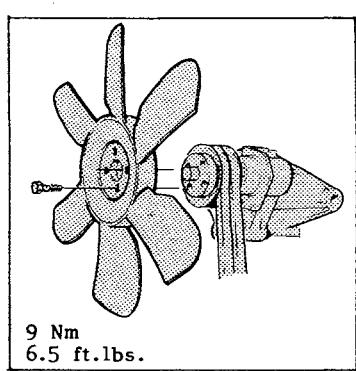
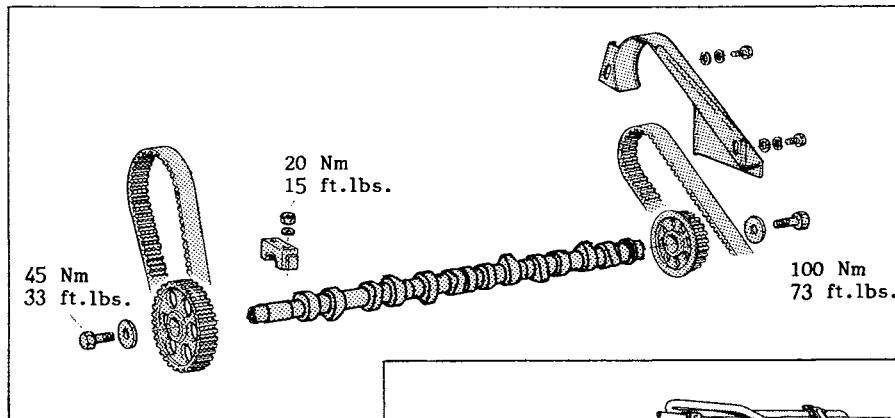
Bearing diameter

- front 32.000–32.025 mm
1.2598–1.2608"
- remaining three 30.000–30.021 mm
1.1811–1.1819"



133771

Tightening torques



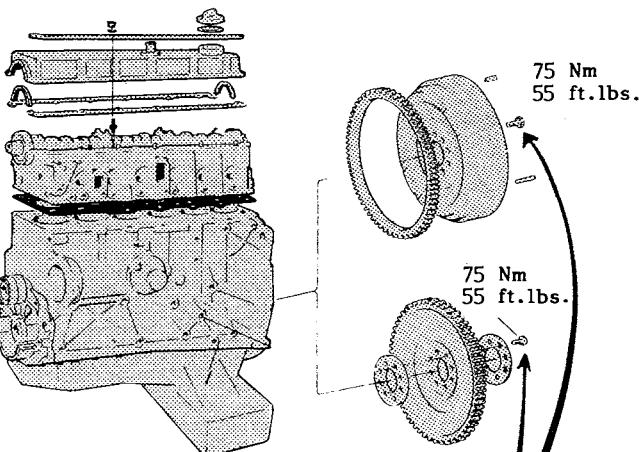
Sealing agent
P/N 277961-9 on
threads and
contact surfaces

Wrench 5188:
- 350 Nm
- 255 ft.lbs.

Std torque wrench:
- 450 Nm
- 330 ft.lbs.

20 Nm
15 ft.lbs.

133775



Group 22 Lubricating system

Quality:

According to API Service CD. Oils with specifications SE/CD and SF/CD comply.
Synthetic or semisynthetic oils may be used if specifications comply.

1700.193.M1

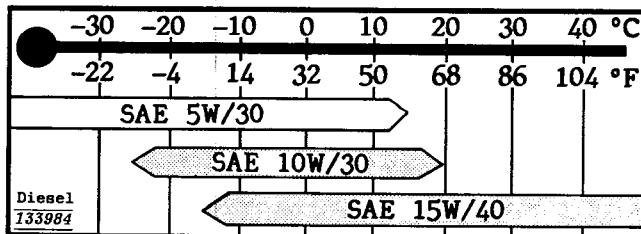
Oil and filter changes.

Replaced first time at 600-1,200 mile (1,000-2,000 km) inspection.

Subsequent changes: Mileage or time interval (whichever comes first). See chart below:

Driving conditions	Oil change interval
Driving under adverse conditions – see below	Each 7,500 miles (12,500 km) or every third month with oil filter change every second oil change.
Normal driving conditions	Each 7,500 miles (12,500 km) or every sixth month with oil filter change every second oil change.

1700.194

Viscosity: (stable ambient temperatures)

SAE 15W/40 is recommended for use in extreme driving conditions that involve high oil temperature and consumption e.g. mountain driving with frequent decelerations or fast motorway driving.

Note however the higher temperature range.

1700.192.M1

031.202

Adverse driving conditions:

- sustained driving in dusty/sandy conditions
- sustained trailer hauling
- sustained hill climbing
- sustained high-speed driving
- sustained low-speed driving or idling
- when driving short distances (7 miles = 10 km) at low temperatures (below 32°F = 0°C).

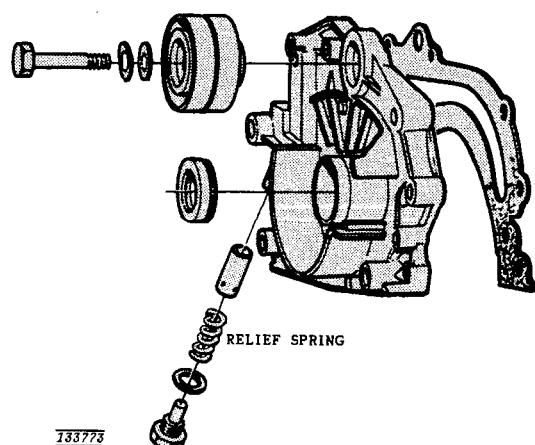
1700.198

Capacities:**D24:**

Excl. oil filter: **5.0 liters** = 5.3 US qts

Incl. oil filter: **6.0** = 6.3 US qts

Difference between Min. and Max: **1.0 liters** = 1 US qt.

**Oil pressure sensor**

Oil pressure indicator light goes out at 15–45 kPa
2.1–6.4 psi

Oil pump

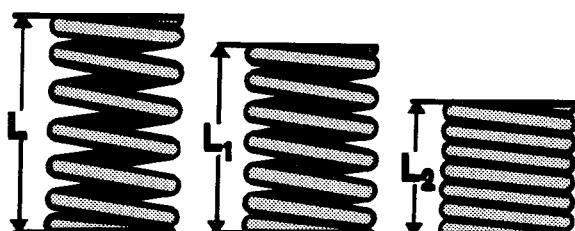
Relief valve opens at 600–700 kPa
85–100 psi

Relief valve spring

Length at various loadings.

Length		Loading	
mm	inch	N	lbs
L	49	1.93	0
L ₁	22	0.87	175–195
L ₂	19.8	0.78	200
			38–43
			44

Length L₂ is completely compressed.
Loading is approximate.



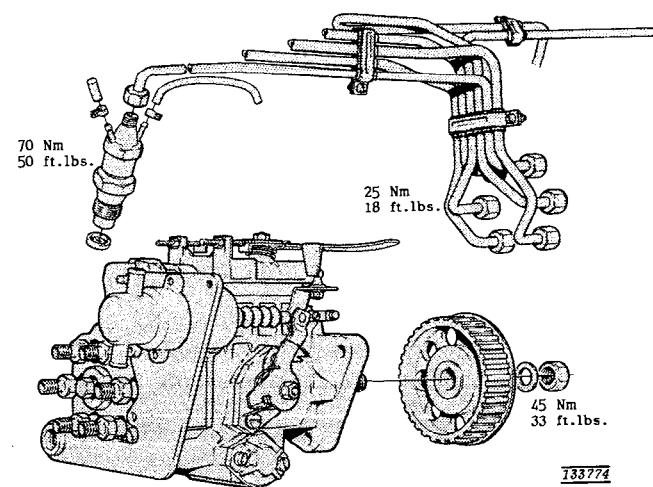
133765

Group 23 Fuel system**General**

Injection sequence	1-5-3-6-2-4
Low idle	750 rpm
- tolerance	+/- 50 rpm
High idle	5200 rpm
- tolerance	+/- 100 rpm

Fuel

Standard	DIN 51601 CEC-ERF-D1 ASTM-F975 No 1-D or 2-D
----------------	---

**Tightening torques****Injection pump**

Distributor type pump.

Designation, Bosch

- w. manual transmission ...	VE6/10 F2400 L32
- w. auto. trans.	VE6/10 F2400 L32-1

Injection timing, distributor plunger stroke at top dead center:

- permitted when checking	0.82-0.90 mm 0.032-0.035"
- set to	0.85 mm 0.033"

Injectors

Injector assembly:

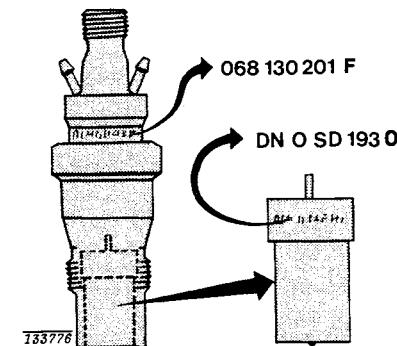
- Bosch No	068 130 201 F, alt J
- Volvo P/N	1328073-0

Nozzle:

- Bosch No	DN O SD 193 0
- Volvo P/N	1328096-1

Injector opening pressure:

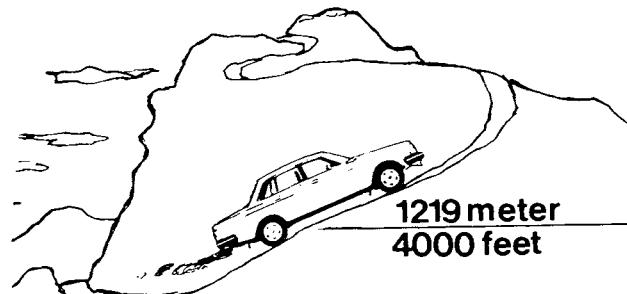
- permitted when checking ..	12-13 MPa 1700-1845 psi
- set to	12.5-13.5 MPa 1775-1920 psi

**1983 models:****High altitude modifications**

Altitudes above 4000 feet (1,219 m).

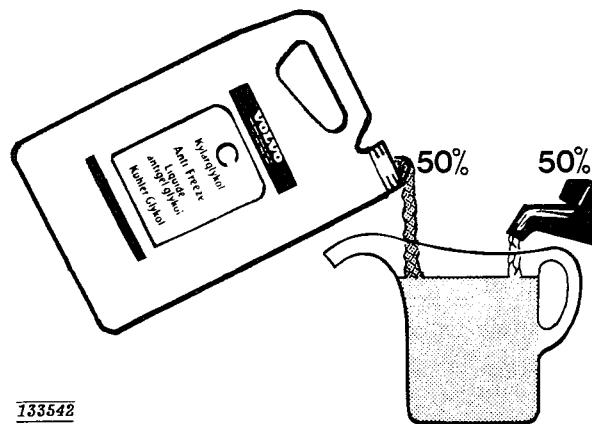
Injection timing.

Increase by 0.0028" = 0.07 mm for each 3,300 feet (1,000 m) increase in altitude.

Injected fuel amount:Reduce by 2.3 mm³/stroke for each 3,300 feet (1,000 m) increase in altitude. This corresponds to counter-clockwise turning of the adjustment screw by 35°.**1984 models:**Equipped with high altitude compensation system.
No modification required.

Group 26 Cooling system

Volvo all weather Anti-Freeze Type C (blue-green) should be used all year round. Cooling system should always contain water plus anti-freeze, even during summer. Experience has also shown that extremely weak anti-freeze solutions (10-20 %) provide poor rust protection. For this reason ratio of anti-freeze/summer coolant to water should be 1 to 1.



1700.169

133542

Capacity:

- with manual transmission . 9.4 liters
10 US qts
- automatic transmission ... 9.2 liters
9.8 US qts

Thermostat

Marking	87°C
Starts to open at	87°C
.....	189°F
Fully open at	102°C
.....	216°F
Opening, minimum	8 mm 0.31"

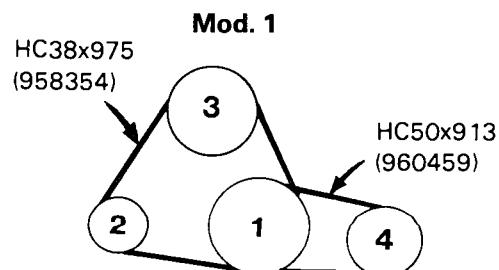
Expansion tank

Pressure valve in cap opens at:

- overpressure 100 kPa
14 psi
- vacuum 7 kPa
1 psi

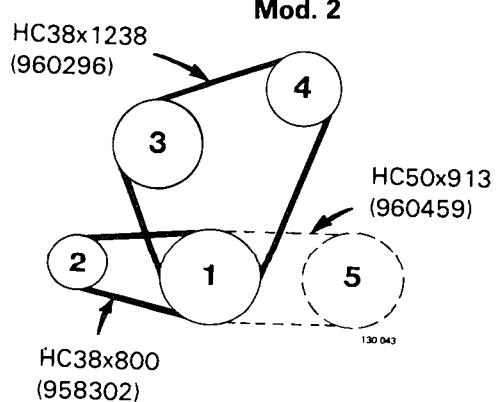
Drive belts

Designation (Volvo part no.)



Mod. 1

- 1 Crankshaft pulley
- 2 Alternator
- 3 Fan
- 4 Servo pump
- 5 Air conditioning compressor



Mod. 2

Section 3 Electrical system

Group 31 Battery

System voltage	12 V
Ground connection	Negative terminal
Battery capacity, standard	
- gasoline engines	60 Ah
- diesel	88 Ah
Electrolyte specific gravity	
- battery fully charged	1.28
- recharging necessary	1.21
Recommended charging current	
- 60 Ah battery	5.5 amps
- 88 Ah battery	7.5 amps

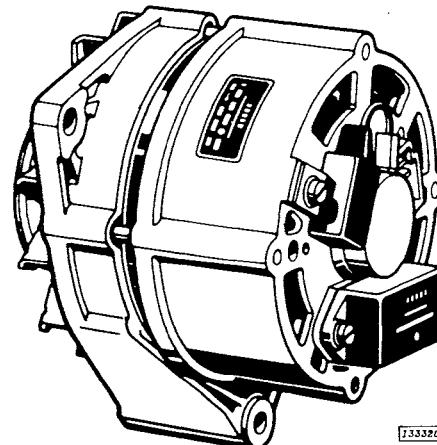


133780

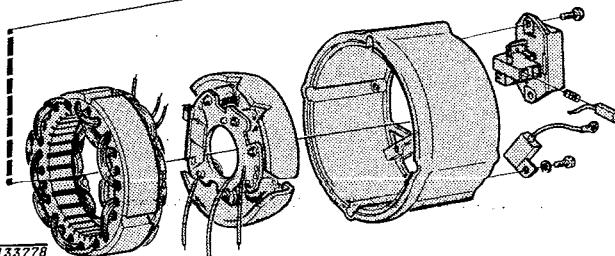
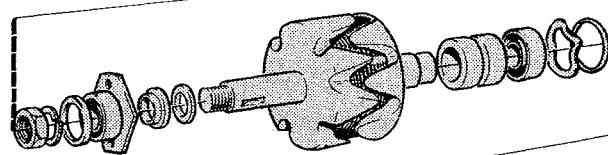
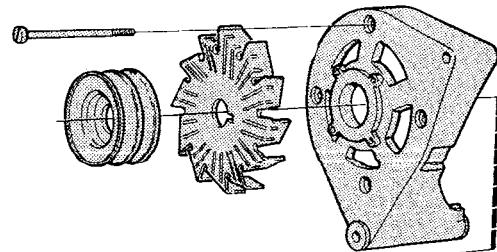
Group 32 Alternator

Bosch K1 14 V 55A 20

Bosch designation	
- B21A	0 120 489 066
- D24	0 120 489 070
Max. current rating	55 amps
Max. output	770 W
Max. speed	15.000 rpm
Direction of rotation	Clockwise
Min. diameter, slip rings	
- with separate regulator	31.5 mm 1.240"
- with built-in regulator	26.8 mm 1.055"
Max. permitted radial throw	
- slip rings	0.03 mm 0.0012"
- rotor frame	0.05 mm 0.0020"
Brushes	
- spring force	3–4 N 0.6–0.9 lbs
- min. length	5 mm 0.2"
Torque	
- attaching bolts	4 Nm 3 ft. lbs.
- pulley nut	40 Nm 30 ft. lbs.
Test values	
Resistances	
- separate regulator	4–4.4 ohms
- built-in regulator	3.4–3.75 ohms
- stator coil, per phase	0.14–0.15 ohms
Current rating at 14 V	
- at 2000 rpm	36 amps
- at 3000 rpm	47 amps
- at 4000 rpm	52 amps



133320



133778

Bosch N1 14 V 70 A 20**Bosch designation**

- B21F-Turbo, B23E, B23F, B230F . . . 0 120 469 568

Max. current rating 70 amps

Max. output 980 W

Max. speed 13,500 rpm

Direction of rotation Clockwise

Min. diameter of slip rings

- separate regulator 31.5 mm
1.240"

- built-in regulator 26.8 mm
1.055"

Max. permitted radial throw

- slip rings 0.03 mm
0.0012"

- rotor frame 0.05 mm
0.0020"

Brushes

- spring force 3-4 N
0.6-0.9 lbs

- min. length 5 mm
0.2"

Torque

- attaching bolts 4 Nm
3 ft. lbs.

- pulley nut 40 Nm
30 ft. lbs.

Test values**Resistance**

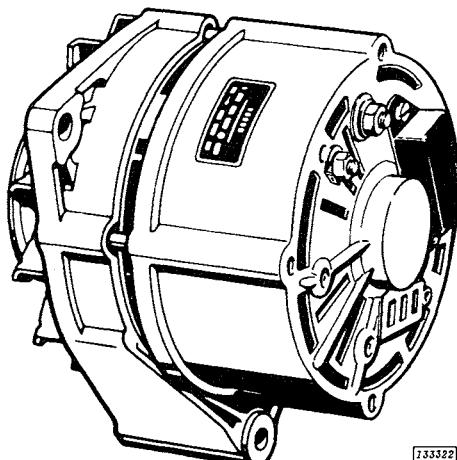
- rotor coil (sep. regulator) 4-4.4 ohms
- rotor coil (built-in regulator) 3.4-3.75 ohms
- stator coil, per phase approx. 0.1 ohms

Current rating at 14 V

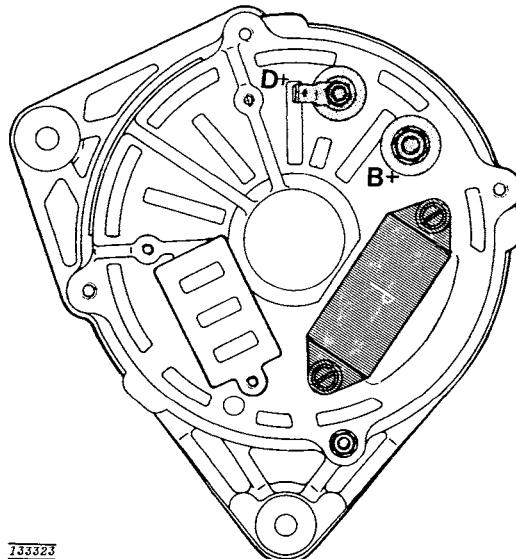
- at 2000 rpm 46 amps

- at 3000 rpm 58 amps

- at 4000 rpm 64 amps



133322



133323

Built-in voltage regulator

Bosch designation 0 197 311 008

Test conditions

- battery fully charged

- regulator temperature 25°C

77°F

- alternator speed 6000 rpm

- alternator load 5-10 amps

Test values

Control voltage measured across B +
and D- on alternator

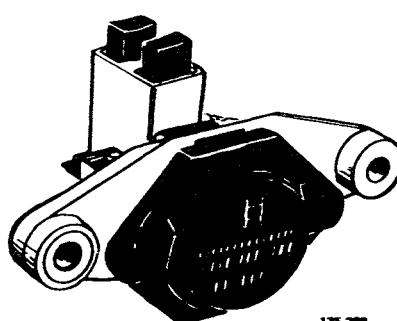
- cold regulator (reading taken
within one minute) 14.1-14.8 V

- warm regulator (operated for
15 minutes) 13.8-14.3 V

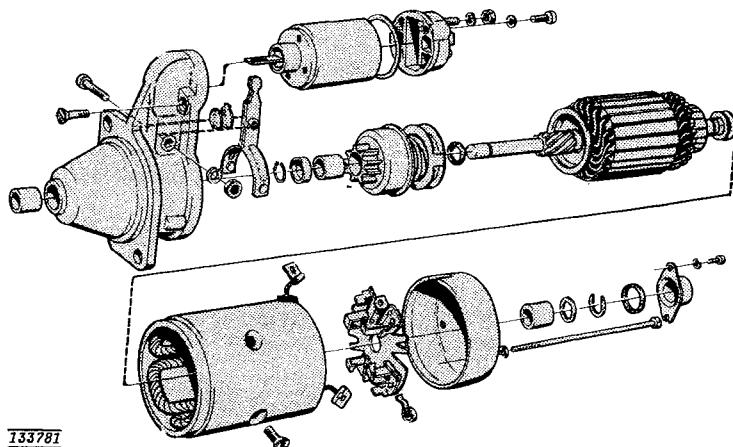
Control tolerance may drop max.
0.3 V compared with previous
reading, when loaded to: (85% of
rating)

- for 55 A alternator 47 amps

- for 70 A alternator 60 amps



135 288

Group 33 Starter motor**BOSCH GF 12V 1.1 kW**

Bosch designation	0 001 311 103
Volvo P/N	463856
Voltage	12 V
Grounded terminal	Negative
Output	1.1 kW 1.5 hp
Direction of rotation, viewed toward pinion	Clockwise
Specifications, mechanical	
Armature	
– clearance to stator	0.1–0.30 mm 0.004–0.012"
– brake friction torque	30–35 Ncm 2.2–3.5 in. lbs.
– min. commutator diam.	33.5 mm 1.32"
Brushes	
– spring tension	18–21 N 4–4.6 lbs.
– min. length	13 mm 0.51"
Pinion	
– distance from ring gear	2–3 mm 0.79–1.18"
– idling torque	0.14–0.22 Nm 1.2–1.9 in. lbs.
– gear clearance	0.3–0.6 mm 0.012–0.024
– modulus	2.12
Test specifications	
Starter motor unloaded	
– input	11.5 V, 30–50 A
– speed at this input	5800–7800 rpm
Starter motor loaded	
– input	9.0 V, 185–220 A
– speed at this input	1050–1350 rpm
Starter motor locked (0 rpm)	
– current at 7 V	480–560 A
– current at 6 V	330–420 A
Control solenoid	
Min. cut-in voltage	7.5 V

BOSCH JF 12 V 2 kW

Application	D24
Bosch designation	0 001 362 069
Volvo P/N	1257325
Voltage	12 V
Grounded terminal	Negative
Output	2 kW 2.7 hp

Direction of rotation, viewed toward pinion

Clockwise

Specifications, mechanical

Armature	
– clearance to stator	0.1–0.3 mm 0.004–0.012"
– brake friction torque	0.44–0.74 Nm 3.9–6.5 in. lbs.
– min. commutator diam.	42.5 mm 1.67"
Brushes	
– spring tension	23–25 N 5.1–5.5 lbs
– min. length	8.5 mm 0.355"

Pinion

– distance from ring gear	2.5–4.0 mm 0.010–0.016"
– idling torque	0.27–0.39 Nm 2.4–3.5 in. lbs.
– gear clearance	0.35–0.60 mm 0.014–0.024"
– modulus	2.12

Test specifications

Starter motor unloaded	
– input	11.5 V, 65–95 A
– speed at this input	6500–8500 rpm
Starter motor locked (0 rpm)	
– current at 4.5 V	700–880 A

Control solenoid

Min. cut-in voltage

7.5 V

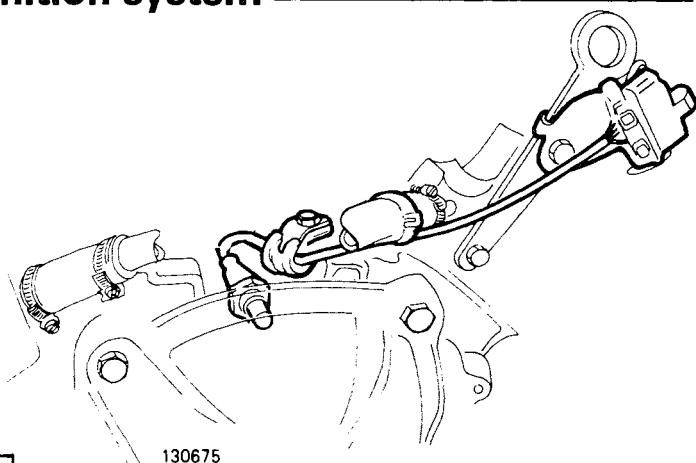
Group 34 Ignition system**Ignition timing**

Vacuum units disconnected, air conditioning OFF.

B21A	7° at 750 rpm
B21F-Turbo	12° at 900 rpm
B23E	10° at 750 rpm
B23F	12° at 750 rpm

Start engine and do not run it over 1500 rpm (to avoid influence from Spark Control Unit).

B230 F (cannot be adjusted) (12° at 750 rpm)

**Spark plugs****B21A**

- Volvo P/N, set of four	273592-6
- Bosch No	W7DC
- gap	0.7–0.8 mm 0.028–0.032"
- torque, threads not oiled	20–30 Nm 15–18 ft. lbs.
- normal replacement interval	25,000 km 15,000 miles

B21F-Turbo

- Volvo P/N, set of four	273594-2
- Bosch No	WR7DS
- gap	0.7–0.8 mm 0.028–0.032"
- torque, threads not oiled	20–30 Nm 15–18 ft. lbs.
- normal replacement interval	50,000 km 30,000 miles

B23E

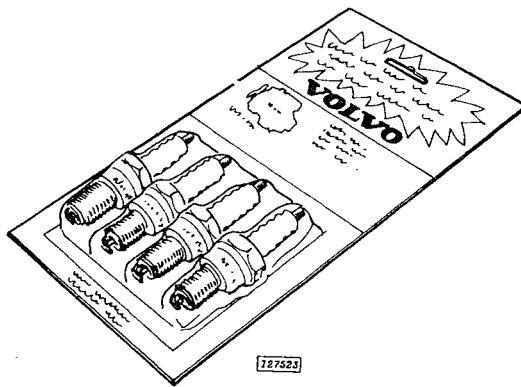
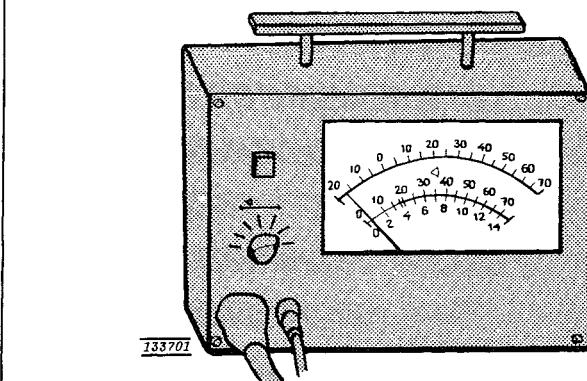
- Volvo P/N, set of four	273591-8
- Bosch No	W6DC
- gap	0.7–0.8 mm 0.028–0.032"
- torque, threads not oiled	20–30 Nm 15–18 ft. lbs.
- normal replacement interval	25,000 km 15,000 miles

B23F, B230 F

- Volvo P/N, set of four	273594-2
- Bosch No	WR7DS
- gap	0.7–0.8 mm 0.028–0.032"
- torque, threads not oiled	20–30 Nm 15–22 ft. lbs.
- normal replacement interval	50,000 km 30,000 miles

It is preferred to use instruments connected to engine's timing sensor. Provides increased accuracy and safety.

Instruments used are Volvo Mono-Tester or "Magnetic Timing Units" equipped with proper adapter.



Distributor specifications**B21A/Canada**

Bosch No	0 231 170 284
Volvo P/N	1306792-1
Breaker gap	0.40 mm 0.016"
Dwell angle	62°
— tolerance	± 3°
— setting speed (=starter speed)	500 rpm
Contact pressure	6.5–8.0 N 2.3–2.8 oz

Speed control (centrifugal governor)**Total advance**

— distributor degrees	12.5 ± 1°
— crankshaft degrees	25 ± 2°

Advance begins at

— distributor speed	460–575 rpm
— engine speed	920–1050 rpm

Speed advance**Distributor**

— 5° at	780–990 rpm
— 10° at	1160–1370 rpm
— 12.5° (= max.) at	1500 rpm

Crankshaft

— 10° at	1560–1980 rpm
— 20° at	2320–2740 rpm
— 25° (= max.) at	3000 rpm

Vacuum control

Direction	advance
-----------------	---------

Total (= max.) control

— distributor degrees	7.5 ± 1°
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— crankshaft degrees	15 ± 2°
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Vacuum control starts at	110–150 mm Hg 4.4–6.0 in Hg
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Vacuum advance

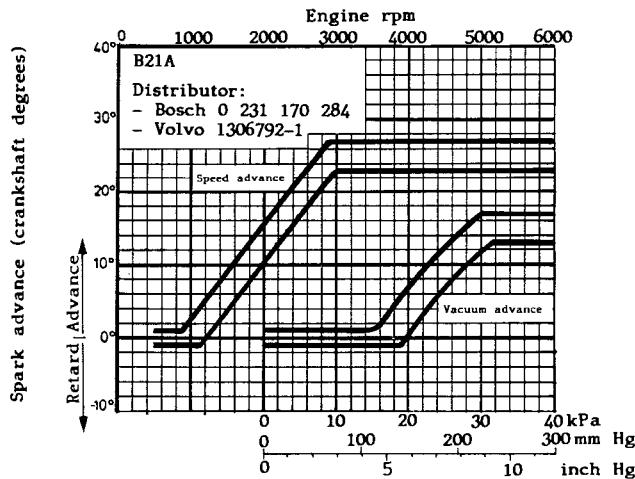
2° (distributor)	130–180 mm Hg 5.2–7.2 in Hg
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5° (distributor)	165–220 mm Hg 6.6–8.8 in Hg
------------------------	--------------------------------

Max.

7.5° (distributor)	240 mm Hg 9.6 in Hg
--------------------------	------------------------

15° (crankshaft)	240 mm Hg 9.6 in Hg
------------------------	------------------------



133801

B21F-Turbo

Bosch No 0 237 003 024
 Volvo P/N 1276703-4
 Impulse sender resistance 0.95–1.25 kohm

Speed control (centrifugal governor)

Total advance
 – distributor degrees $12 \pm 1^\circ$
 – crankshaft degrees $24 \pm 2^\circ$
 Advance begins at
 – distributor speed 500 rpm
 – engine speed 1000 rpm

Speed advance

Distributor
 – 5° at 800–1050 rpm
 – 10° at 1500–2100 rpm
 – 12° (= max.) at 2200–2600 rpm
 Crankshaft
 – 10° at 1600–2100 rpm
 – 20° at 3000–4200 rpm
 – 24° (= max.) at 4400–5200 rpm

Vacuum control

Direction advance
 Total (= max.) control
 – distributor degrees $6.5\text{--}8.5^\circ$
 – crankshaft degrees $13\text{--}17^\circ$
 Vacuum control starts at 100–140 mm Hg
 4.0–5.8 in Hg

Vacuum advance

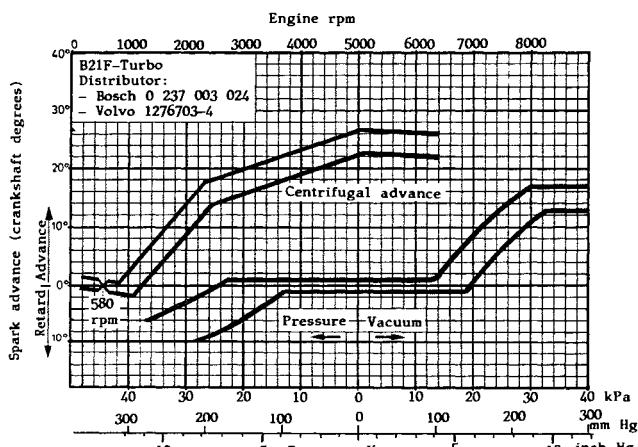
2° (distributor) at 125–185 mm Hg
 4° (crankshaft) 5.0–7.4 in Hg
 5° (distributor) at 175–235 mm Hg
 10° (crankshaft) 7.0–9.4 in Hg
 Max.
 7.5° (distributor) at 250 mm Hg
 15° (crankshaft) 10 in Hg

Pressure control

Direction retard
 Total (= max.) control
 – distributor degrees $4 \pm 1^\circ$
 – crankshaft degrees $8 \pm 2^\circ$
 Pressure control starts at 100–170 mm Hg
 4.0–6.8 in Hg

Pressure advance

2° (distributor) at 130–230 mm Hg
 4° (crankshaft) 5.2–9.2 in Hg
 Max.
 4° (distributor) at 170–270 mm Hg
 8° (crankshaft) 6.8–10.8 in Hg



133802

B23E/Canada

Bosch No 0 237 002 039
 Volvo P/N 1276403-1
 Impulse sender resistance 0.95–1.25 kohm

Speed control (centrifugal governor)

Total advance
 — distributor degrees $12.5 \pm 1^\circ$
 — crankshaft degrees $25 \pm 2^\circ$
 Advance begins at
 — distributor speed 450–550 rpm
 — engine speed 900–1100 rpm

Speed advance

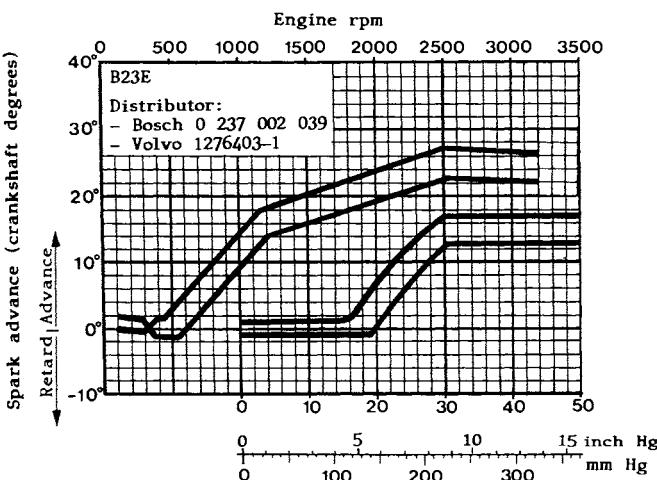
Distributor
 — 5° at 820–1050 rpm
 — 10° at 1500–2150 rpm
 — 12.5° (= max.) at 2500 rpm
 Crankshaft
 — 10° at 1640–2100 rpm
 — 20° at 3000–4300 rpm
 — 25° (= max.) at 5000 rpm

Vacuum control

Direction advance
 Total (= max.) control
 — distributor degrees $7.5 \pm 1^\circ$
 — crankshaft degrees $15 \pm 2^\circ$
 Vacuum control starts at 110–140 mm Hg
 4.4–5.6 in Hg

Vacuum advance

2° (distributor) at	.....	130–170 mm Hg
4° (crankshaft)	.....	5.2–6.8 in Hg
5° (distributor) at	.....	170–210 mm Hg
10° (crankshaft)	.....	6.8–8.4 in Hg
Max.	.....
7.5° (distributor) at	.....	220–230 mm Hg
15° (crankshaft)	.....	8.8–9.2 in Hg



133803

B23F LH-Jetronic**USA 1983****Ignition Electronic Control Unit**

P/N 1317295

Distributor

— Volvo P/N 1332684-8

Electronic Control Unit

— Volvo P/N 1317295-2

Speed control (electronic)**Total (= max.) advance**

— distributor degrees $12 \pm 1^\circ$
 — crankshaft degrees $24 \pm 2^\circ$

Advance begins at

— distributor speed 850 rpm
 — engine speed 1700 rpm

Speed advance

Distributor —
 — 5° at 1020–1200 rpm
 — 10° at 1800–2100 rpm
 — 12° (=max.) at 2250 rpm

Crankshaft —
 — 10° at 2040–2400 rpm
 — 20° at 3600–4200 rpm
 — 24° (= max.) at 4500 rpm

Vacuum control**Direction**

— advance above 195 mm Hg
 (retard below) 7.8 in Hg

Total (= max.) control

— distributor degrees $12 \pm 1^\circ$
 — crankshaft degrees $24 \pm 2^\circ$

Vacuum advance

5° (distributor) at 240–285 mm Hg
 10° (crankshaft) 9.6–11.4 in Hg

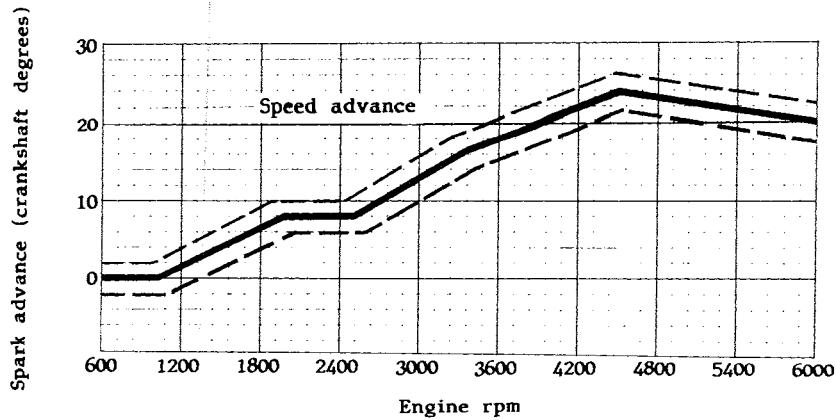
10° (distributor) at 360–480 mm Hg
 20° (crankshaft) 14.4–19.2 in Hg

Max.

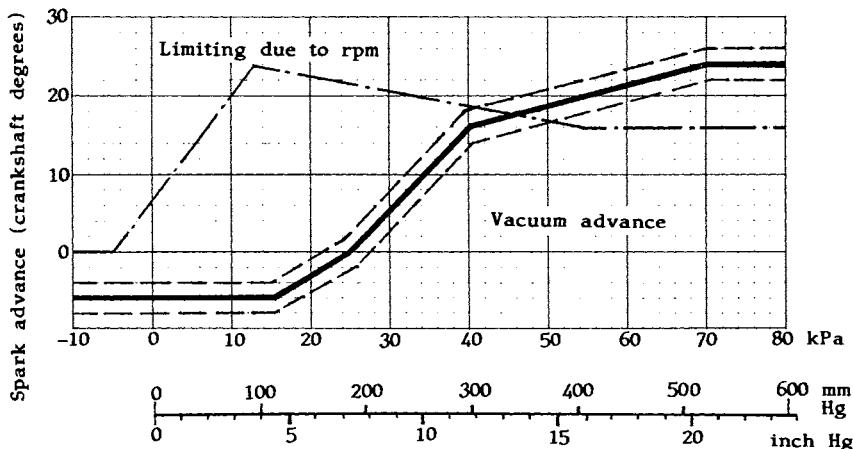
12° (distributor) at 540 mm Hg
 24° (crankshaft) 21.6 in Hg

Vacuum retard

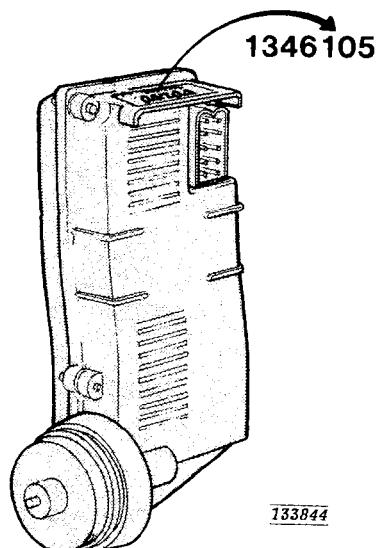
3° (distributor) below 100 mm Hg
 6° (crankshaft) 4.0 in Hg



133804



133805



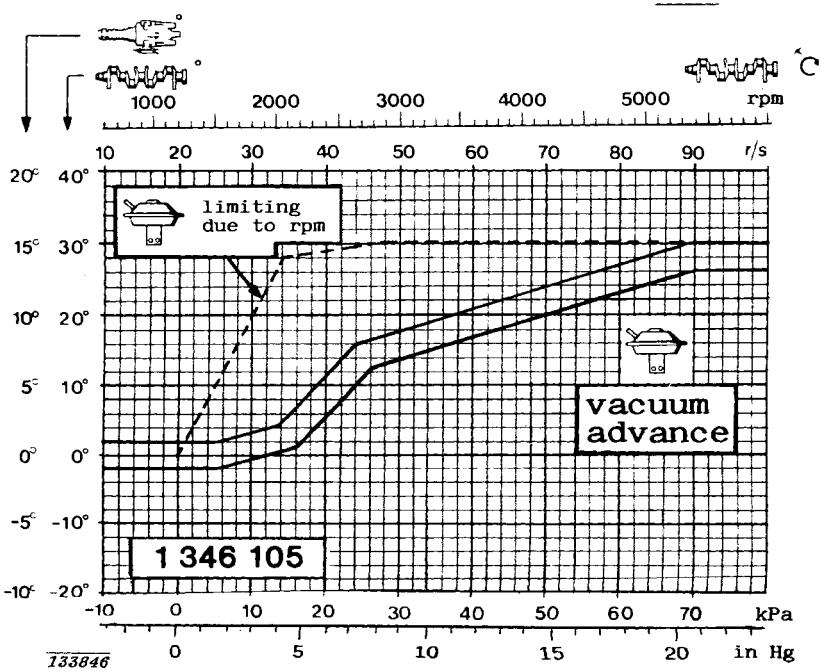
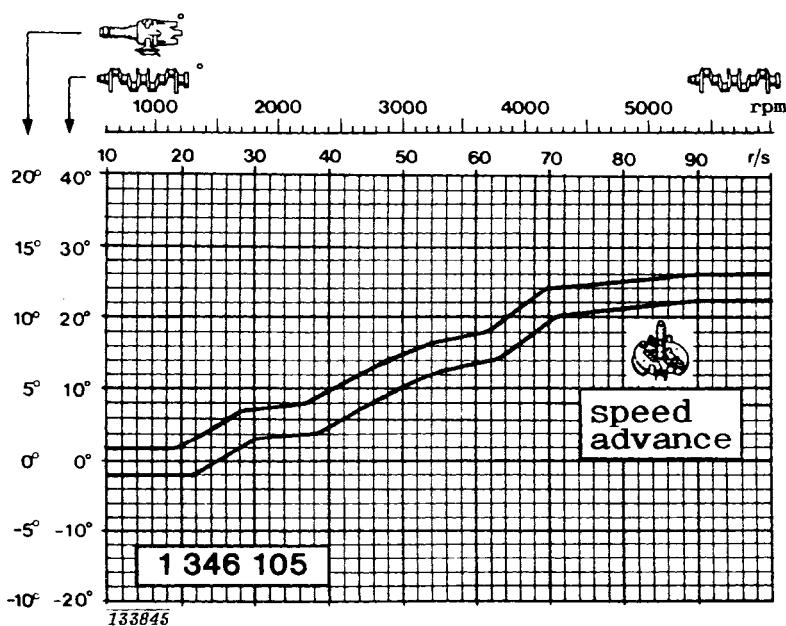
B23F 1984:

Ignition Electronic Control Unit.

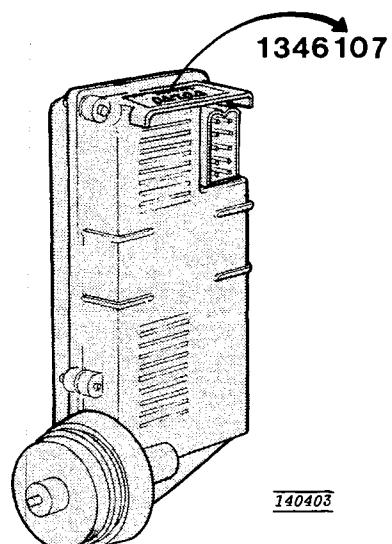
In connection with lowered compression a new ignition Electronic Control Unit was introduced for the B23F with manual transmission. Volvo P/N is 1346105-8, blue color mark.

B23F with automatic transmission retains ignition Electronic Control Unit, Volvo P/N 1317295.

Ignition control points:
12° BTDC at 700–800 rpm
18–22° BTDC at 2500 rpm

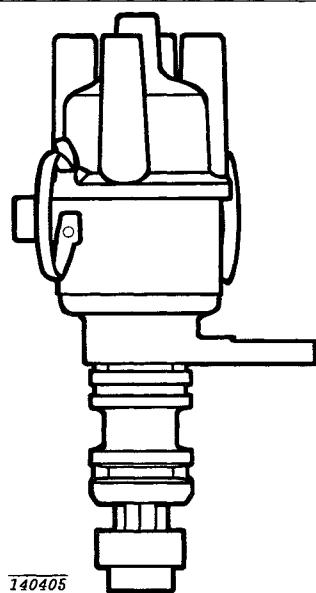


= max. vacuum advance at various speeds:
For example: at 1800 rpm, vacuum advance cannot exceed 20°, even if vacuum warrants higher advance.



B230F 1985:

Ignition Electronic Control Unit.
P/N 1346107-4

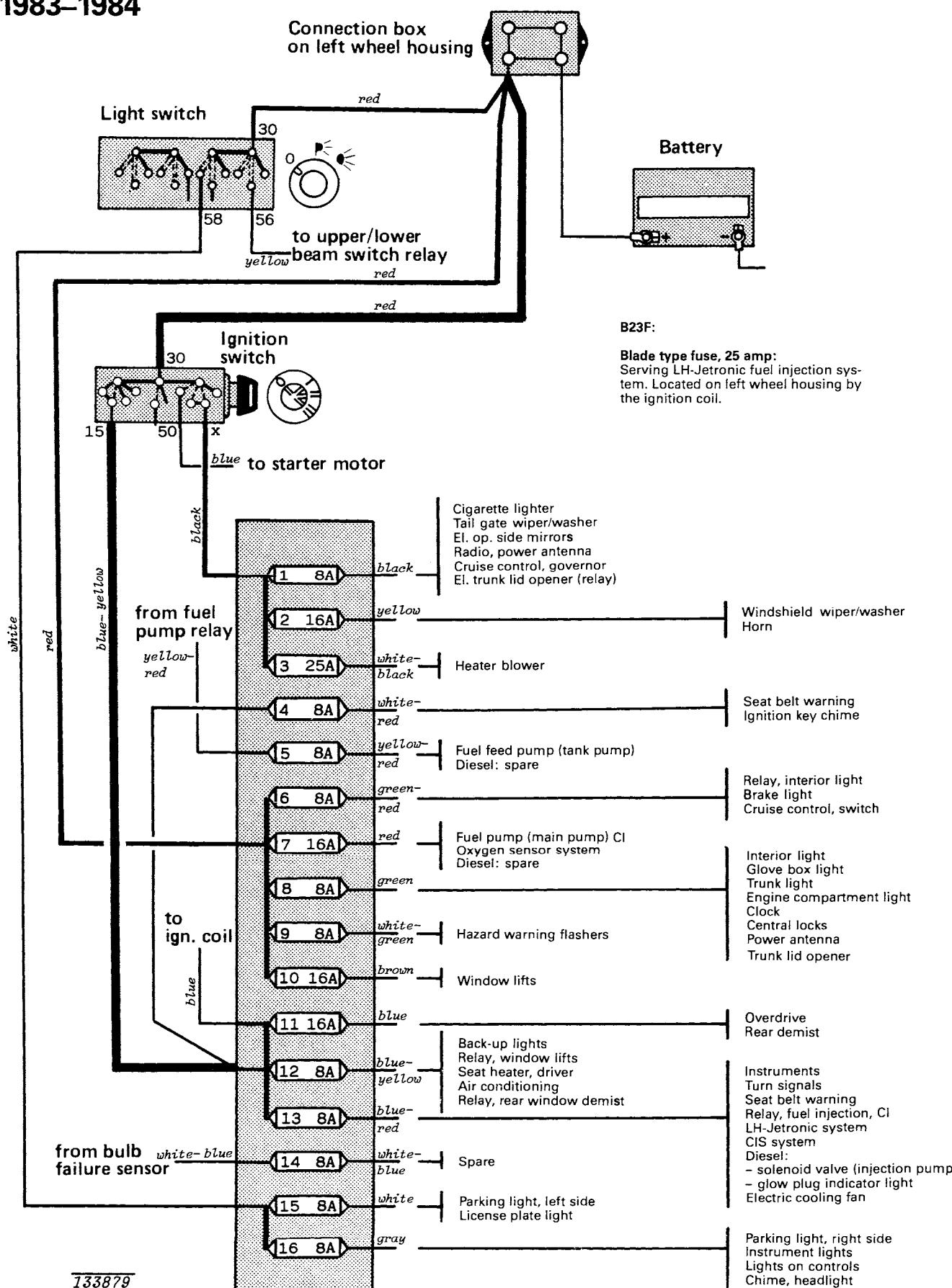


Distributor

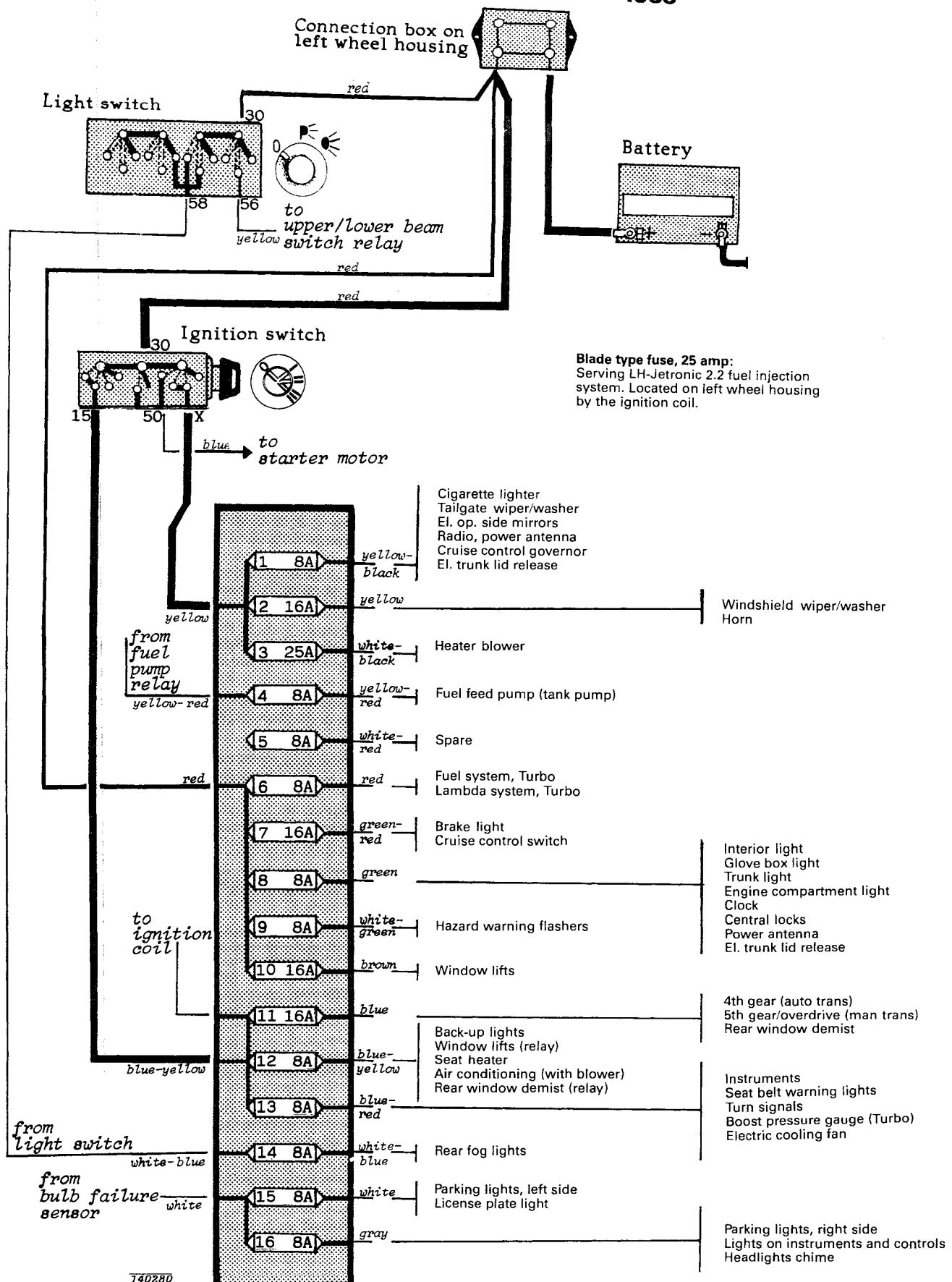
Volvo P/N 1332587-2
Bosch No 0 237 506 001

Fuses and related circuits

1983–1984



Fuses and related circuits 1985



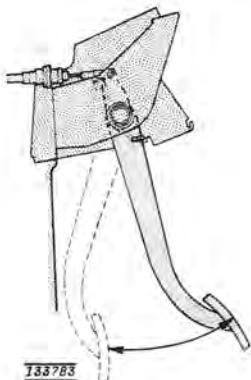
Group 03 Specifications

- Clutch, manual transmission -

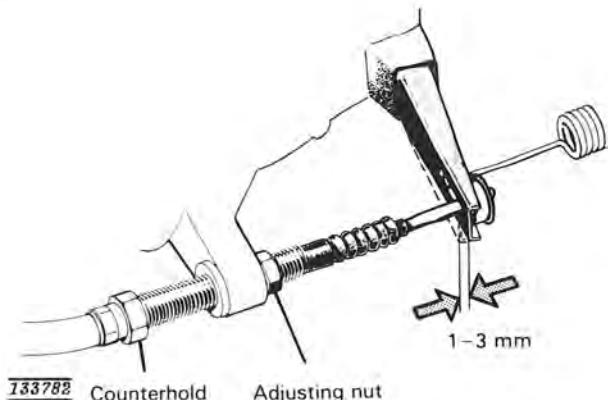
Section 4 Power transmission

Group 41 Clutch

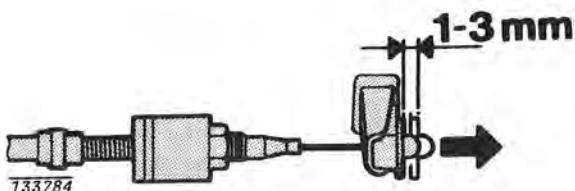
Type	Single dry plate
Size	215.9 mm 8.5"
Total friction area	440 cm ² 68.2 sq. in.



Clutch pedal travel	
- B21A, B23E	150 mm 5.9"
- D24	165 mm 6.5"
- B21F-Turbo, B23E	155–170 mm 6.1–6.8"



Clutch fork free travel 1-3 mm
0.04–0.12"



Clutch fork negative play,
B21-Turbo, B23F, B230F 1-3 mm
0.04–0.12"

Group 43 Transmission

M46: manual transmission + overdrive

Gear ratios

- first	4.03:1
- second	2.16:1
- third	1.37:1
- fourth	1.1
- fourth + overdrive	0.797:1
- reverse	3.68:1

Lubricant

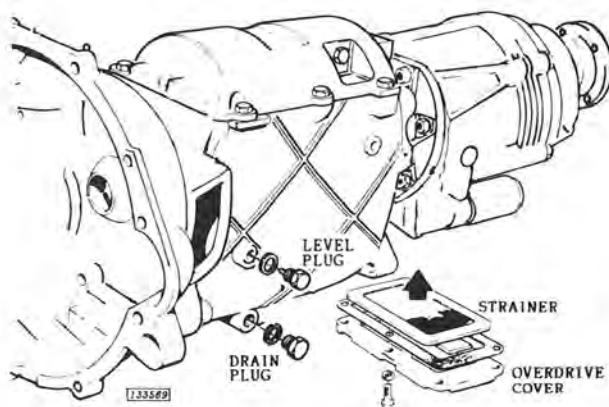
Automatic Transmission Fluid (ATF).	F or G
Capacity	2.3 liters 2.4 US qts

Clearances

Between reverse gear and shift fork ..	0.1–1.0 mm 0.004–0.04"
--	---------------------------

Axial clearance

- input shaft	0.01–0.20 mm 0.0004–0.0080"
- intermediate shaft	0.025–0.10 mm 0.001–0.004"
- main shaft	0.01–0.20 mm 0.0004–0.0080"



Aluminum transmission housing

Pre-tension intermediate shaft to ...	0.03–0.08 mm 0.0012–0.0032"
---------------------------------------	--------------------------------

Torques

Bell housing bolts	35–50 Nm 25–35 ft. lbs.
Output shaft flange nut	90–110 Nm 65–80 ft. lbs.
Rear cover (gearshift assy)	35–50 Nm 25–35 ft. lbs.

Overdrive

Reduction ratio	0.797:1
Lubricant	
– Automatic Transmission	
Fluid (ATF)	F or G
– capacity (inc.l trans.)	2.3 liters 2.4 US qts

Transmission and overdrive are lubricated by the same oil.
Oil level should be up to filler plug hole. When draining transmission oil, also remove cover on overdrive and clean strainer.

Oil pressures

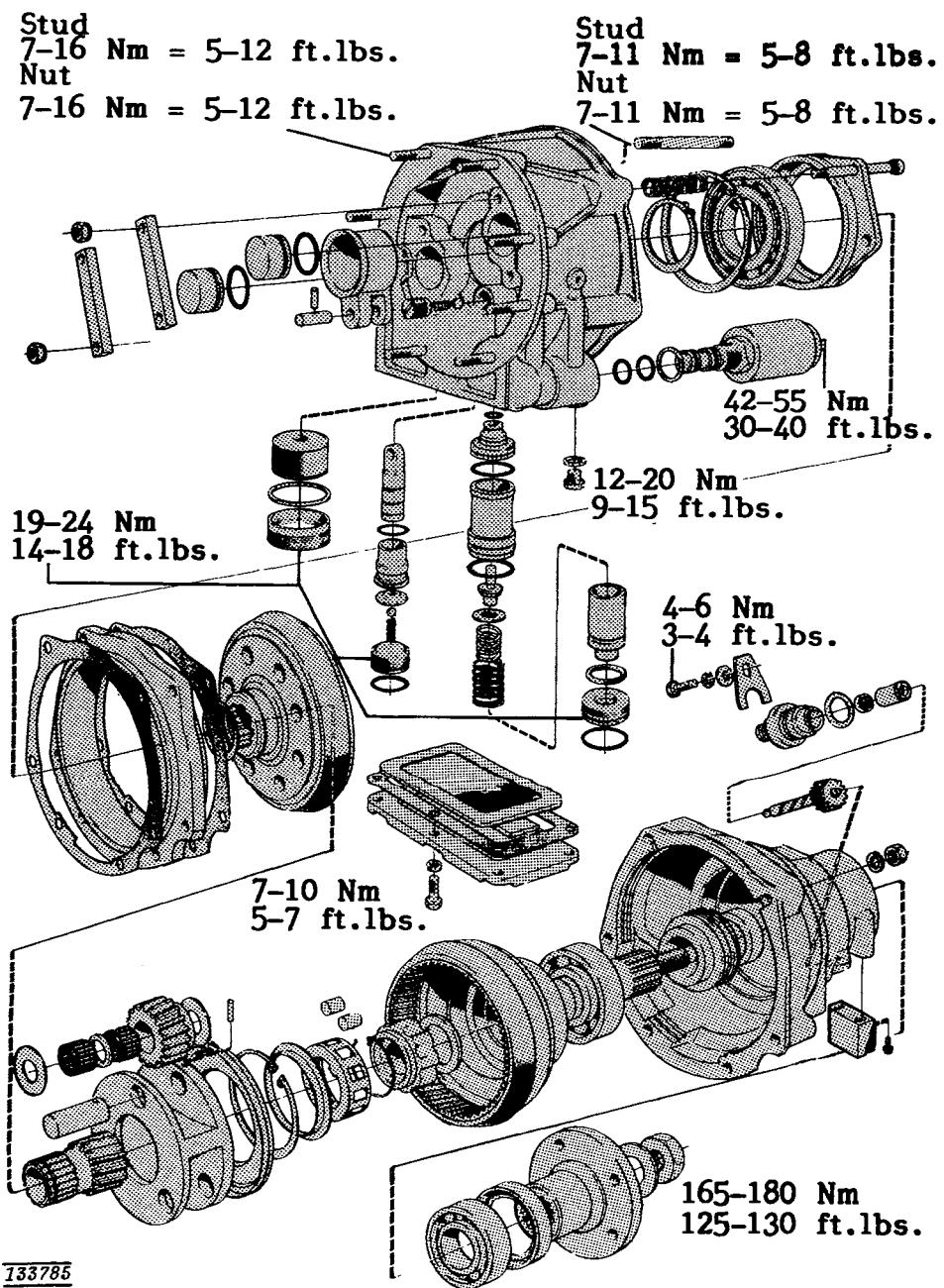
Test condition

Driving in fourth gear, speed 45 mph = 70 km/h

– overdrive not engaged	0.15 MPa 21 psi
– overdrive engaged	2.7–3.1 MPa 380–440 psi

Solenoid

Current draw, approx. 2 A at 12 V



Automatic transmission**BW55.**

Capacity: 6.75 liters = 7.1 US qts.

Fluid type: Automatic Transmission Fluid, type G
(or F).

Replace: every 22,500 miles = 37,500 km.

Converter ratio 1:2.1

Converter size 9.5"

When checking fluid level, the car should be on level ground in PARK position with the engine idling. If topping up is necessary, fill through the dipstick tube.

NOTE: the dipstick has graduations for hot and cold transmission fluid. When checking the fluid level use a clean rag that will not leave lint.

Reduction ratios

First speed 2.452:1

Second speed 1.452:1

Third speed 1:1

Reverse 2.212:1

BW55, application B21A

Designation 0455..14

Type plate color Middle buff

Volvo P/N 1208165-9

Normal stall speed 2200 rpm

Kickdown speeds

— 1-2 67 km/h = 41 mph

— 2-3 118 km/h = 72 mph

— 3-2 109 km/h = 67 mph

— 3-1, approx. 50 km/h = 30 mph

Line pressure, idle— position D 0.525–0.630 MPa
75–90 psi— position R 0.735–0.910 MPa
105–130 psi**Stall speed pressure**— position D 1.12–1.37 MPa
160–195 psi— position R 1.54–1.96 MPa
220–280 psi**Governor pressure**at 30 km/h 0.10–0.13 MPa
14–18 psiat 60 km/h 0.15–0.19 MPa
21–27 psiat 110 km/h 0.36–0.46 MPa
37–65 psi**BW55, application B23E (Canada 1983)**

Designation 045..30

Type plate color Smoke gray

Volvo P/N 1208207-9

Normal stall speed 2400 rpm

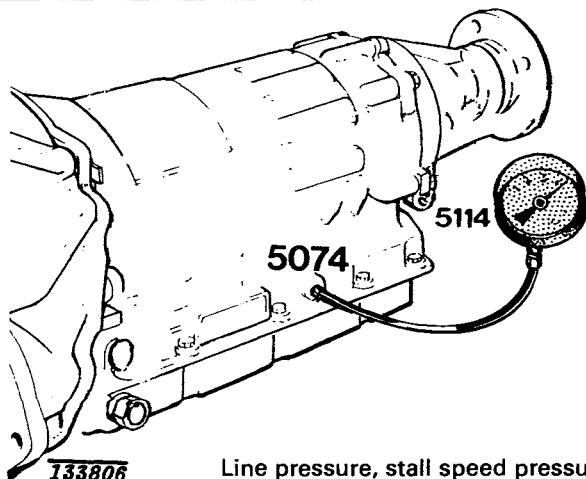
Kickdown speeds

— 1-2 69 km/h

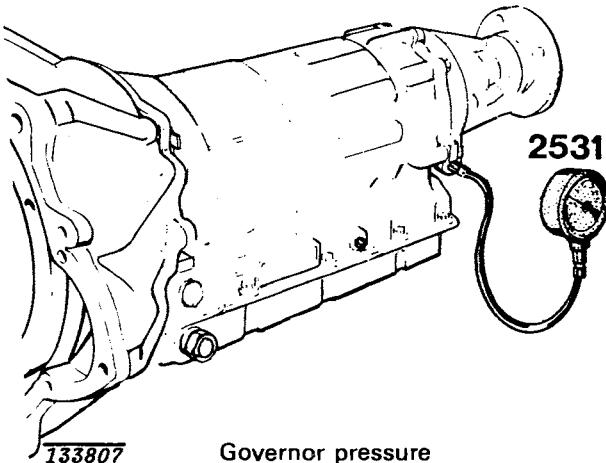
— 2-3 123 km/h

— 3-2 114 km/h

— 3-1, approx. 50 km/h

Line pressure, idle— position D 0.525–0.630 MPa
75–90 psi— position R 0.735–0.910 MPa
105–130 psi**Stall speed pressure**— position D 1.12–1.37 MPa
160–195 psi— position R 1.54–1.96 MPa
220–280 psi**Governor pressure**at 30 km/h 0.10–0.13 MPa
14–18 psiat 60 km/h 0.15–0.19 MPa
21–27 psiat 110 km/h 0.36–0.46 MPa
37–65 psi

Line pressure, stall speed pressure



Governor pressure

BW55, application D24

Designation	0455..20
Type plate color	Smokey grey
Volvo P/N	1208173-3
Normal stall speed	2200 rpm

Kickdown speeds

- 1-2	58 km/h 36 mph
- 2-3	106 km/h 66 mph
- 3-2	98 km/h 61 mph
- 3-1, approx.	50 km/h 31 mph

Line pressure, idle

- position D	0.525–0.630 MPa 75–90 psi
- position R	0.735–0.910 MPa 105–130 psi

Stall speed pressure

- position D	1.12–1.37 MPa 160–195 psi
- position R	1.54–1.96 MPa 220–280 psi

Governor pressure

at 30 km/h = 20 mph	0.11–0.14 MPa 16–20 psi
at 60 km/h = 40 mph	0.18–0.22 MPa 26–31 psi
at 110 km/h = 70 mph	0.38–0.43 MPa 53–61 psi

BW55, application D24 "Taxi"

Designation	045..26
Type plate color	Light blue
Volvo P/N	1208173-3
Normal stall speed	2200 rpm

Kickdown speeds

- 1-2	58 km/h 36 mph
- 2-3	106 km/h 66 mph
- 3-2	98 km/h 61 mph
- 3-1, approx.	50 km/h 31 mph

Line pressure, idle

- position D	0.525–0.630 MPa 75–90 psi
- position R	0.735–0.910 MPa 105–130 psi

Stall speed pressure

- position D	1.12–1.37 MPa 160–195 psi
- position R	1.54–1.96 MPa 220–280 psi

Governor pressure

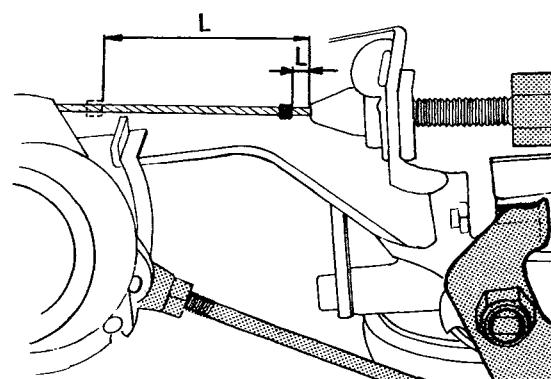
at 30 km/h = 20 mph	0.11–0.14 MPa 16–20 psi
at 60 km/h = 40 mph	0.18–0.22 MPa 26–31 psi
at 110 km/h = 70 mph	0.38–0.43 MPa 53–61 psi

BW55: kickdown cable adjustment

Check cable length at closed and open throttle.
Open throttle measurement should be checked
with throttle pedal in car depressed, NOT by
actuating linkage by hand.

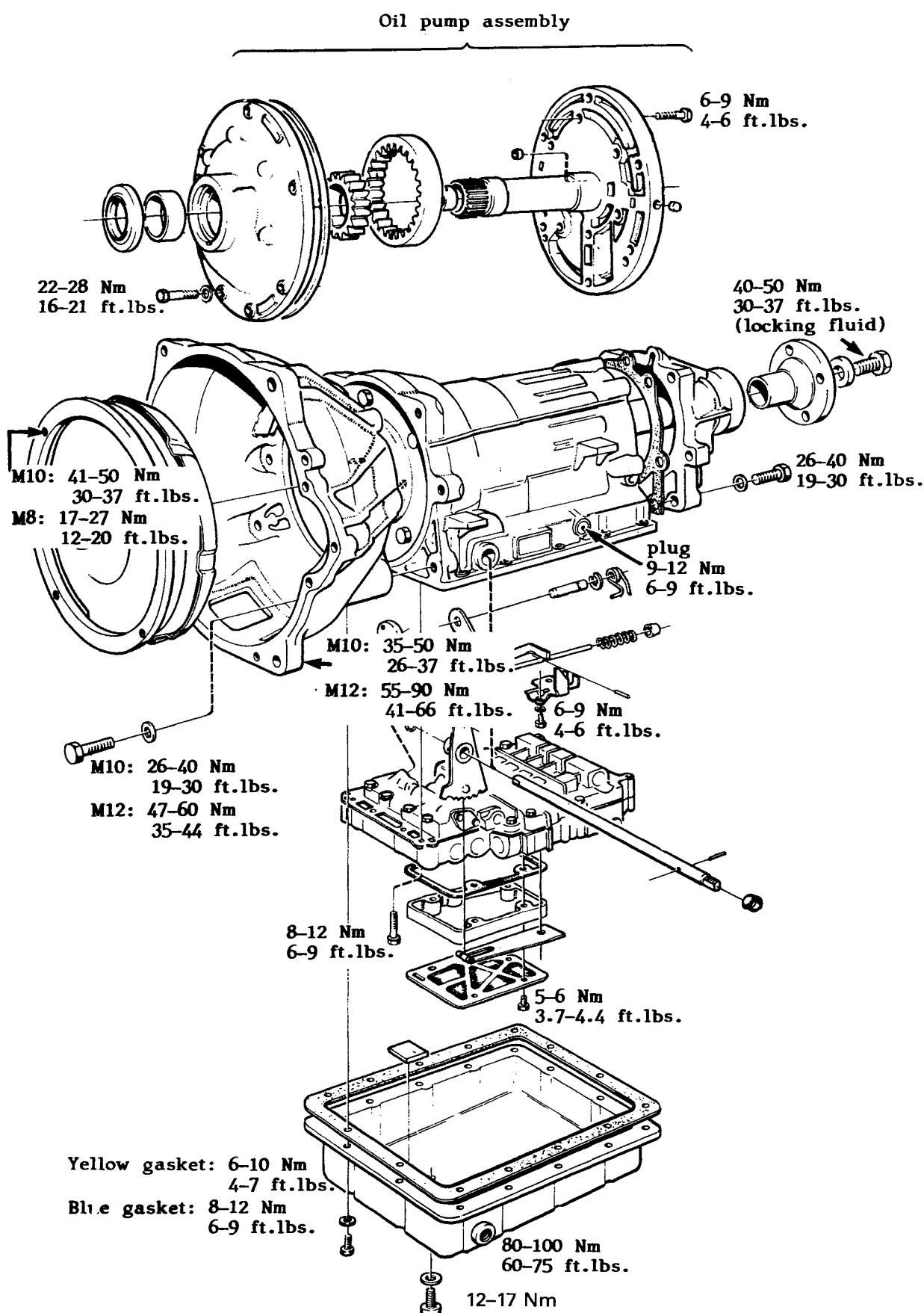
Closed throttle, L = 0.25–1.0 mm
0.01–0.04"

Open throttle, L = 50.4–52.6 mm
1.98–2.07"



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Torques, BW55

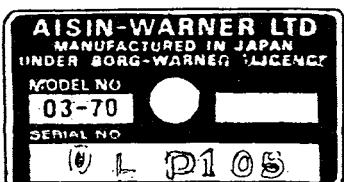


Automatic transmission**(continued)****AW70.**

Capacity: 7.4 litres = 7.8 US qts.

Fluid type: Automatic Transmission Fluid, type Dexron II.

Replace: every 22,500 miles = 37,500 km.



132 431

AW70, application B23F, B230F

Designation 03 70 000 055
 Type plate color Purple
 Volvo P/N 1208320-0

Reduction ratios

First speed	2.45:1
Second speed	1.45:1
Third speed	1:1
Fourth speed (overdrive)	0.69:1
Reverse	2.21:1

Torque converter

- type	190 k
- ratio	1-1.8:1
- size	248 mm

Stall speedReduce by 120 rpm for every 1000 m =
3200 feet above sea level.

- at sea level	2250 rpm
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When checking fluid level, the car should be on level ground in PARK position with the engine idling. If topping up is necessary, fill through the dipstick tube.

NOTE: the dipstick has graduations for hot and cold transmission fluid. When checking the fluid level use a clean rag that will not leave lint.

Line pressure, at idle

- position D	0.35-0.44 MPa 50-62 psi
- position R	0.50-0.64 MPa 71-91 psi

Line pressure, at stall speed

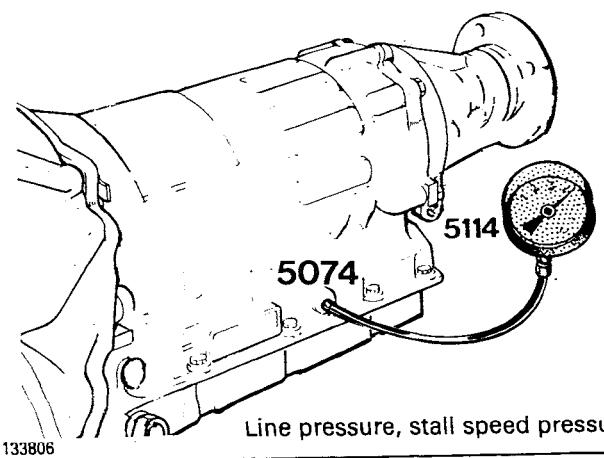
- position D	0.96-1.1 MPa 136-156 psi
- position R	1.37-1.7 MPa 195-242 psi

Governor pressure

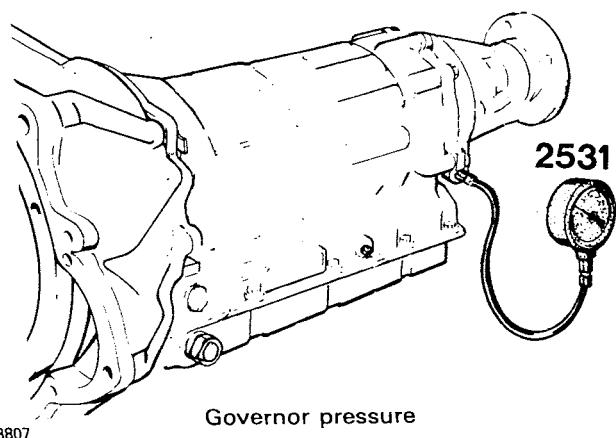
at 30 km/h = 20 mph	0.09-0.15 MPa 13-21 psi
at 55 km/h = 33 mph	0.16-0.22 MPa 23-31 psi
at 110 km/h = 70 mph	0.41-0.53 MPa 59-75 psi

Shift speeds

1-2 (kickdown)	65 km/h 40 mph 5200 rpm
2-3 (kickdown)	108 km/h 67 mph 5400 rpm
3-4 (75 % throttle)	114 km/h 70 mph
4-3 (throttle at idle)	40 km/h 25 mph
3-2 (kickdown)	102 km/h 64 mph
2-1 (kickdown)	51 km/h 32 mph



Line pressure, stall speed pressure



Governor pressure

Automatic transmission**(continued)****AW71.**

Capacity: 7.4 litres = 7.8 US qts.

Fluid type: Automatic Transmission Fluid, type Dexron II.

Replace: every 22,500 miles = 37,500 km.

When checking fluid level, the car should be on level ground in PARK position with the engine idling. If topping up is necessary, fill through the dipstick tube.

NOTE: the dipstick has graduations for hot and cold transmission fluid. When checking the fluid level use a clean rag that will not leave lint.

AW71, application B21F-Turbo

Designation	03 71 000 075
Type plate color	Dark brown
Volvo P/N	1208319-2

Governor pressure

at 30 km/h = 20 mph	0.09–0.15 MPa 13–21 psi
at 50 km/h = 30 mph	0.16–0.22 MPa 23–31 psi
at 100 km/h = 62 mph	0.41–0.53 MPa 59–75 psi

Reduction ratios

First speed	2.45:1
Second speed	1.45:1
Third speed	1:1
Fourth speed (overdrive)	0.69:1
Reverse	2.21:1
Torque converter	
– type	217 k
– ratio	1–2:1
– size	248 mm

Stall speed

Reduce by 120 rpm for every 1000 m = 3200 feet above sea level.

– at sea level

(2050)–2500 rpm

Line pressure, at idle

– position D	0.46–0.54 MPa 65–77 psi
– position R	0.70–0.82 MPa 100–116 psi

Line pressure, at stall speed

– position D	1.00–1.20 MPa 140–170 psi
– position R	1.50–1.90 MPa 213–270 psi

Shift speeds

1–2 (kickdown)	60 km/h 37 mph 5400 rpm
2–3 (kickdown)	100 km/h 62 mph 5600 rpm
3–4 (75 % throttle)	105 km/h 65 mph
4–3 (throttle at idle)	37 km/h 23 mph
3–2 (kickdown)	94 km/h 58 mph
2–1 (kickdown)	48 km/h 30 mph

AW70/AW71: kickdown cable adjustment

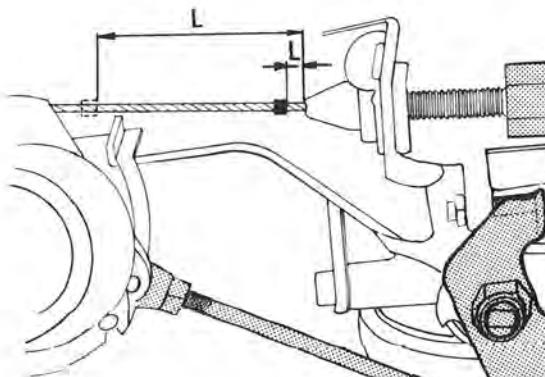
Check cable length at closed and open throttle. Open throttle measurement should be checked with throttle pedal in car depressed, NOT by actuating linkage by hand.

Closed throttle, L =

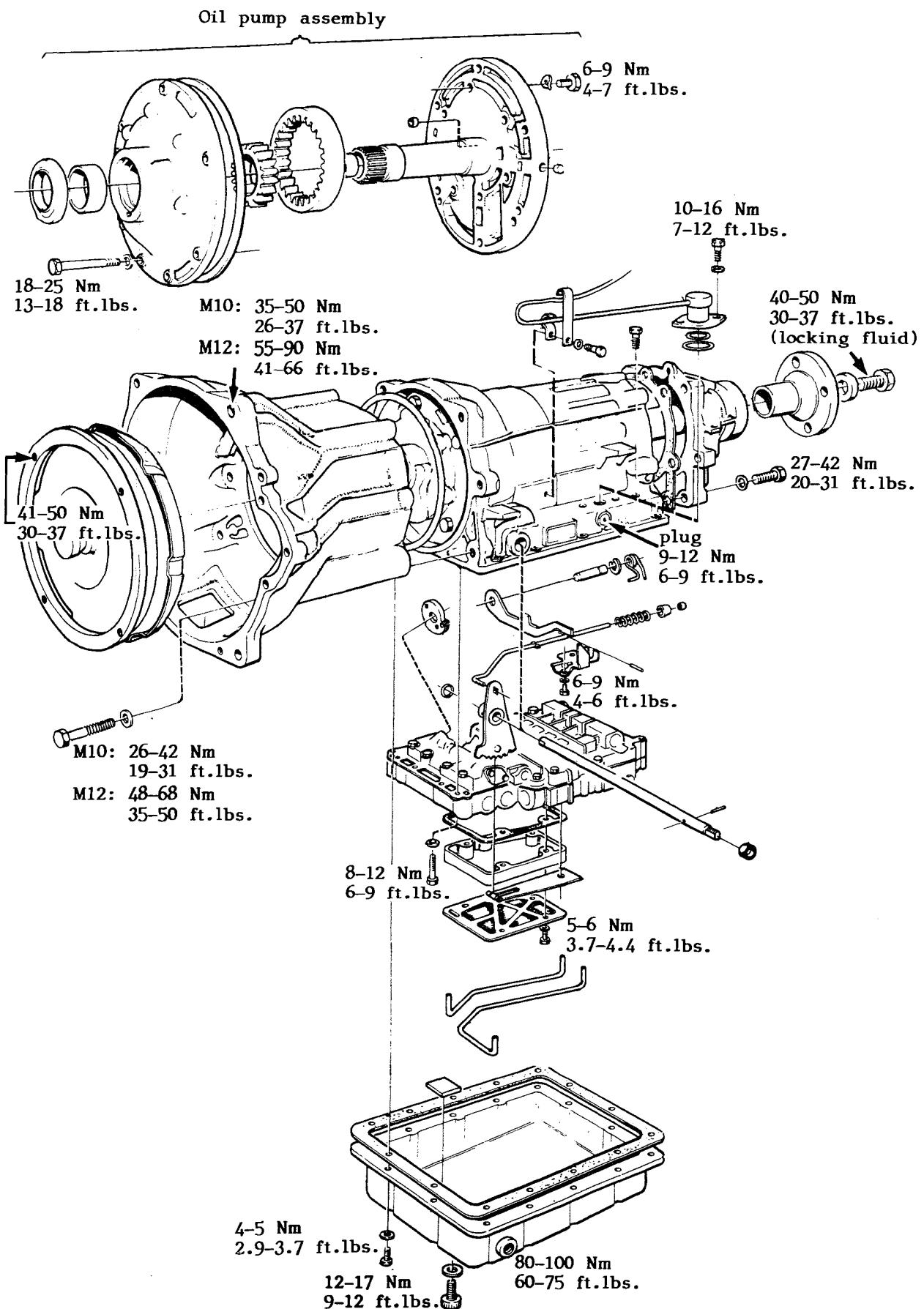
0.25–1.0 mm
0.01–0.04"

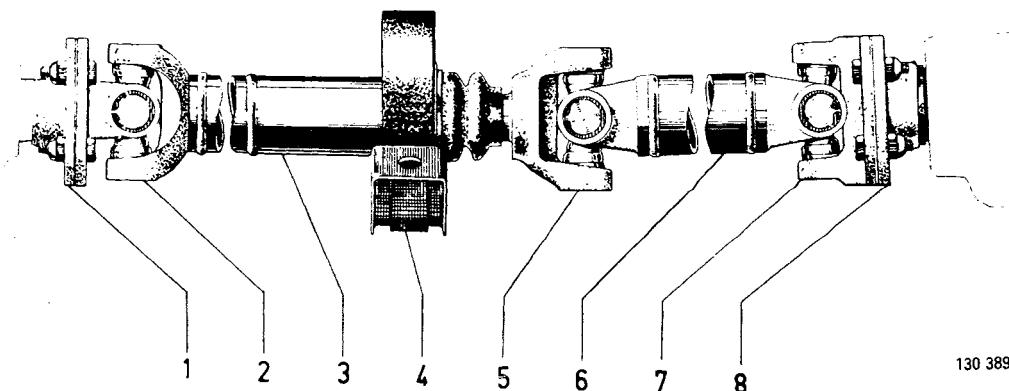
Open throttle, L =

50.4–52.6 mm
1.98–2.07"



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Torques, AW70/AW71

Group 45 Propeller shaft

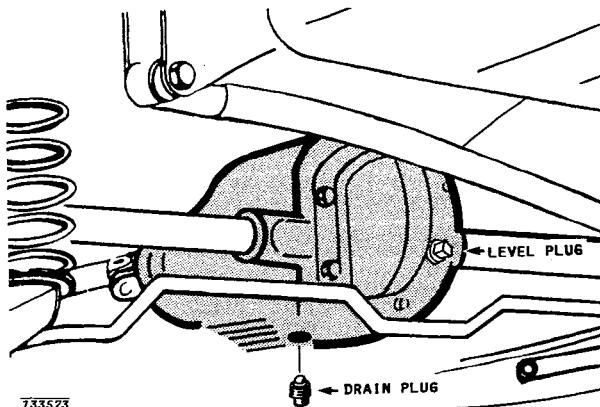
Type: tubular 2-piece propeller shaft
with 3 universal joints and support
bearing.

Lubricants used on assembly
(relube not necessary)

— splined shaft	Grease
— P/N	1161033-4
— U-Joints	Chassis grease

1. Transmission flange
2. Front U-joint
3. Front propeller shaft
4. Support bearing
5. Center U-joint
6. Rear propeller shaft
7. Rear U-joint
8. Differential flange

130 389

Group 46 Rear axle

Capacity

— type 1030	1.3 liters 1.4 US qts
— type 1031	1.6 liters 1.7 US qts

(Oil level should be up to filler plug
hole)

Fluid type

API GL-5
MIL-L-2105 B or C

Viscosity

SAE 90

Use API GL-5 SAE 80 W when temperature is steadily
below -10°C = 15°F .

Use oils with proper additives for cars equipped with
limited slip differential.

Final drive, differential

Type	Bevel gear (hypoid)
Reduction ratios	3.31
	3.54
	3.73
	3.91

Ring gear

— max. axial throw	0.08 mm 0.0032"
— backlash	0.13–0.18 mm 0.005–0.007"

Pinion bearings

— preload on new bearings	250–450 Ncm 2.2–4.0 in. lbs.
— preload on used bearings	60–110 Ncm 0.5–1.0 in. lbs.

Differential bearings

— preload	0.13–0.20 mm 0.0052–0.0080"
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Torques

— caps	50–70 Nm 35–50 ft. lbs.
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Ring gear

— standard bolt heads	70–80 Nm 50–58 ft. lbs.
— flanged bolt heads	90–110 Nm 65–80 ft. lbs.
— flange nut	200–250 Nm 145–180 ft. lbs.
— wheel nuts	100–140 Nm 70–100 ft. lbs.

Rear suspension**Torques****Reaction rod**

A – body attachment	85 Nm
B – rear axle attachment	85 Nm 62 ft. lbs.

Track rod (Panhard rod)

C – rear axle attachment	60 Nm 44 ft. lbs.
D – body attachment	85 Nm 62 ft. lbs.

Rear spring

E – upper attachment	45 Nm 32 ft. lbs.
F – lower attachment	19 Nm 14 ft. lbs.

Shock absorber

G – upper attachment	85 Nm 62 ft. lbs.
H – lower attachment	85 Nm 62 ft. lbs.

Trailing arm

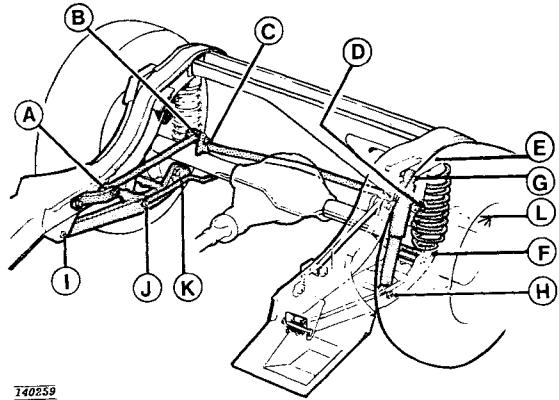
I – body attachment	110 Nm 80 ft. lbs.
F – attachment at rear axle	125 Nm 90 ft. lbs.

Stabilizer

J – front attachment (shock absorber) ...	85 Nm 62 ft. lbs.
K – rear attachment	45 Nm 32 ft. lbs.

Wheels

L – nuts, tightened criss-cross	115 Nm 85 ft. lbs.
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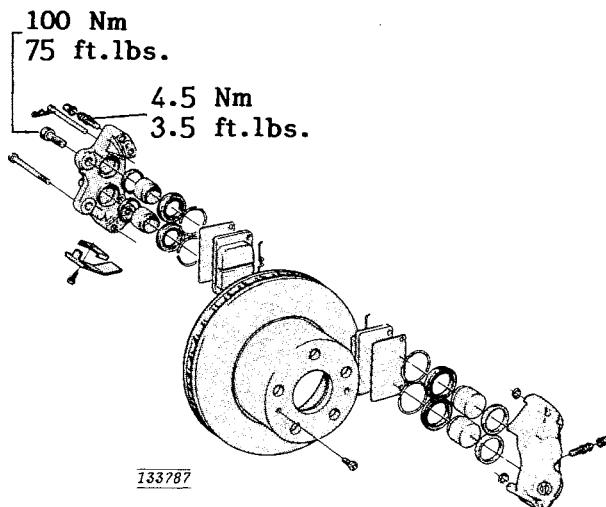
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Section 5 Brakes

Group 51 Wheel brakes

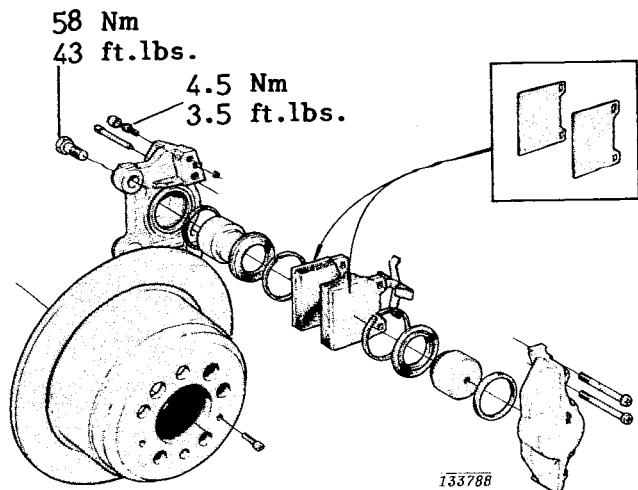
Front wheel brakes (ventilated & non-ventilated)

Type	Disc brakes
Brake disc	
- outer diameter (both)	263 mm 10.33"
- thickness, new (ventilated)	24 mm 0.945"
- thickness, new (non-ventilated)	14.3 mm 0.563"
- reconditioned, min. (ventilated)	20.8 mm 0.82"
- reconditioned, min. (non-ventilated) ..	13.14 mm 0.536"
- lateral throw, max. (both)	0.10 mm 0.004"
Brake pad lining	
- thickness, new (both)	10 mm 0.394"
- effective friction area (both)	166 cm ² 26 sq. in.
Wheel cylinders	
- cross section area (both)	11.34 cm ² 1.76 sq. in.



Rear wheel brakes

Type	Disc brakes
Brake disc	
- outer diameter	281 mm 11.06"
- Thickness, new	9.6 mm 0.378"
- reconditioned, min.	8.4 mm 0.33"
- lateral throw, max.	0.10 mm 0.394"
Brake pad lining thickness	
- thickness, new	10 mm 0.394
- effective friction area	145 cm ² 22.4 sq. in.
Wheel cylinders	
- cross section area	11.33 cm ² 1.76 sq. in.



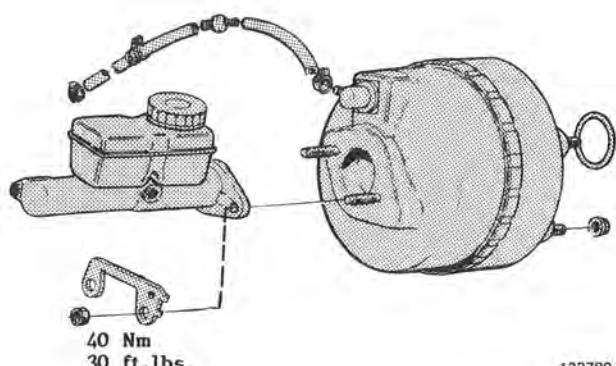
Group 52 Hydraulic brake system

Brake fluid

Fluid type DOT 4

Replace every third year or 45,000 miles
= 75,000 km.

Replace brake fluid every year when
driving under extremely hard conditions
and if equipped with air dam.



Master cylinder

Type: tandem with stepped bore.

Secondary cylinder

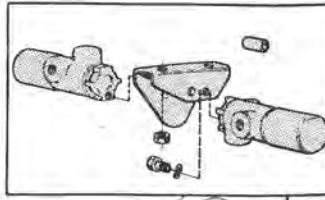
— nominal diameter 15.75 mm
0.62"

Primary cylinder

— nominal diameter 22.3 mm
0.88"

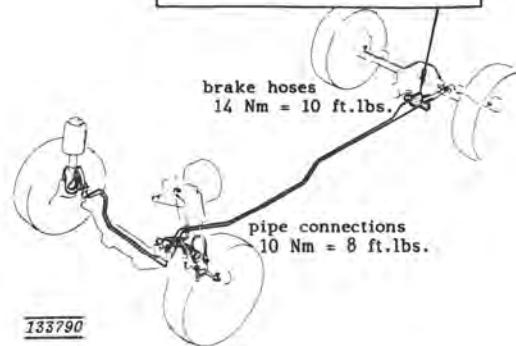
Power cylinder

Make DBA
Type Tandem 8"
Ratio 1:4



Brake (reducer) valves

Make ATE
Designation BRM 18
Cut-out point
— standard, except below 3.4 MPa
483 psi
— cars with diesel engine 2.5 MPa
355 psi
— wagons 5.0 MPa
710 psi



Group 55 Parking brake

Brake drum

— diameter, max. 160.45 mm
6.317"
— radial throw, max. 0.15 mm
0.006"
— out-of-round, max. 0.2 mm
0.008"

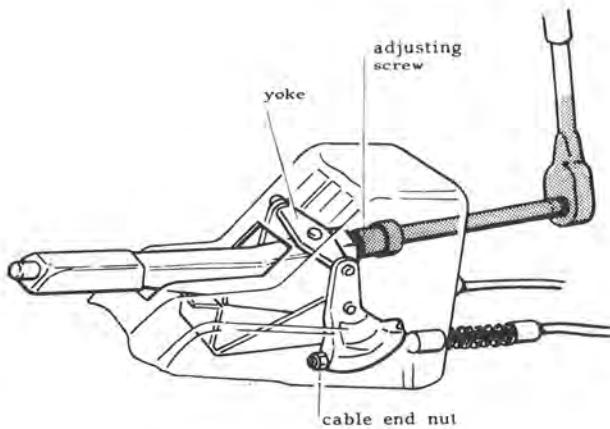
Brake linings

— effective friction area 176 cm²
27.3 sq. in.

Adequate braking power should be obtained after pulling 2-8 notches, pulling force approx. 65 lbs.

Yoke should be at right angles to parking brake lever.

If yoke is askew, use nuts at cable ends to adjust. At least $\frac{1}{16}$ " = 2 mm thread should protrude.



Section 6 Suspension and steering

Group 60 Wheel alignment

Caster:

Power steering: +3 to +4°.

(not to exceed 1/2° difference between sides).
Caster cannot be adjusted.

Camber (not to exceed 1/2° between sides):

1983-1984

DL, GL	+1° to 1.5°
GLT, GLE (Canada):	+1/4° to 3/4°
1985, all:	+1/4° to 3/4°

King pin inclination 12°

Turning angles

At turning outer wheel 20°,
inner wheel should turn 20.8°

Toe-in:

Vehicle should not be loaded. Measurement must
be made at center (hub) height.

"a" is an angle, read on certain instruments.

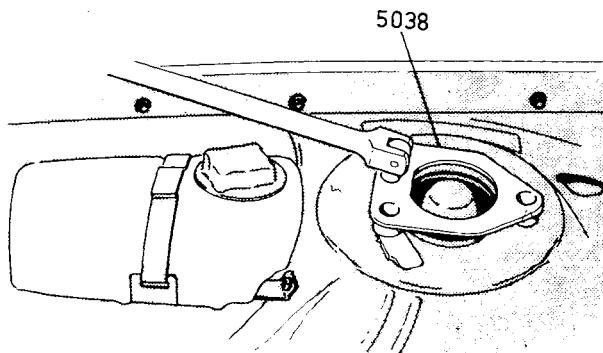
A, B and C refer to tire outer diameter, tire inner
shoulder and rim, respectively.

Angle 2 α 16'
- tolerance (+/-) 8'

A-a 3.0 mm
0.12" = 1/8"
- tolerance (+/-) 1.5 mm
0.06"

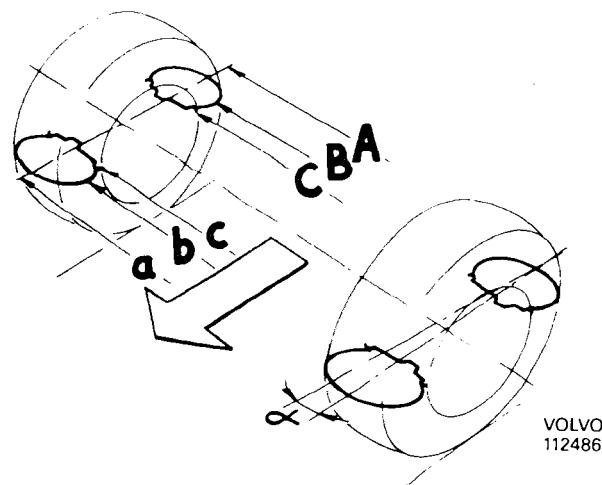
B-b 2.0 mm
0.08"
- tolerance (+/-) 1 mm
0.04"

C-c 1.5 mm
0.06"
- tolerance (+/-) 1 mm
0.04"



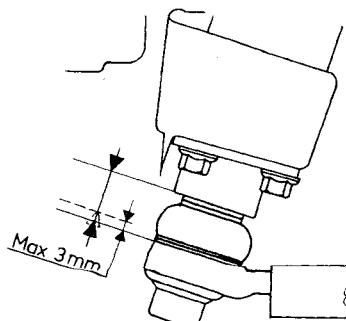
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Use tool 5038 to adjust camber.


Ball joints

Max. axial play with normally
loaded front end 3 mm
1/8"

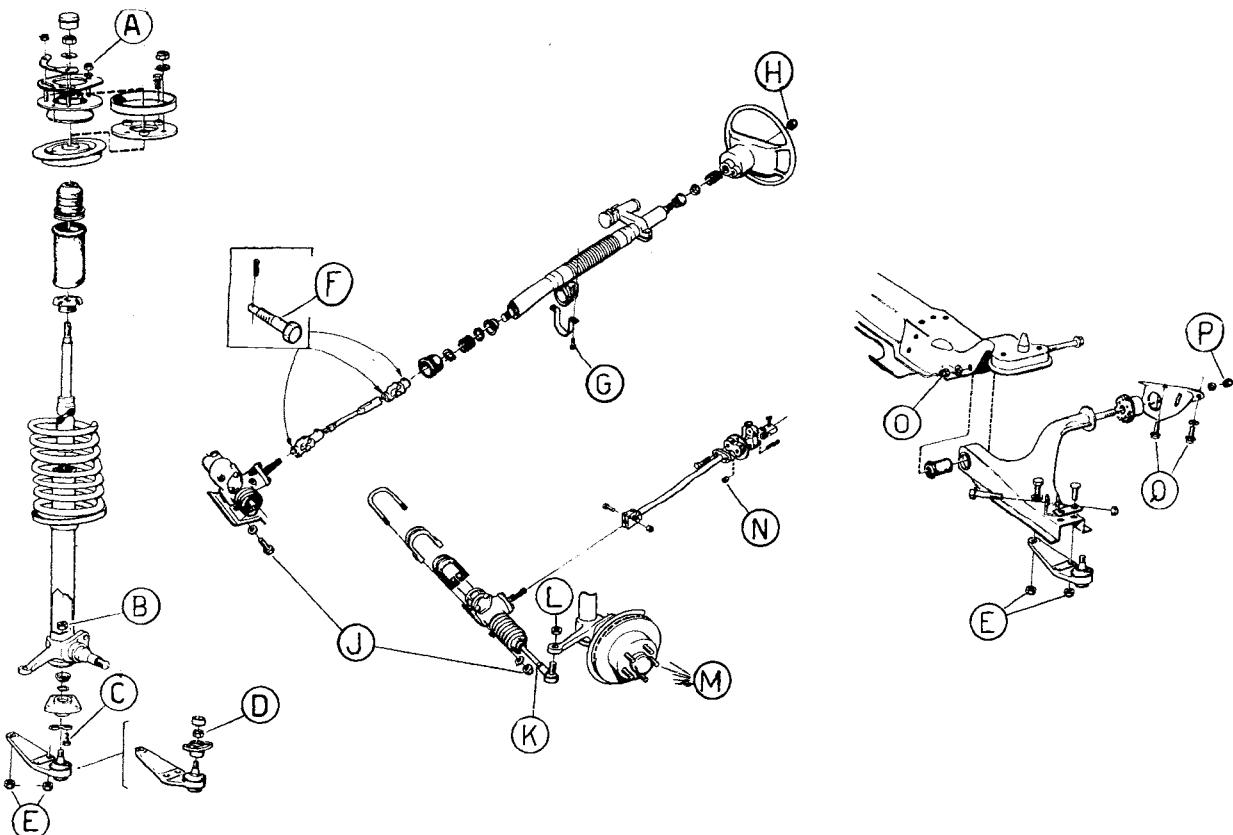
Max. radial play 0.5 mm
1/64"



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Group 61 Front suspension

Front end torques



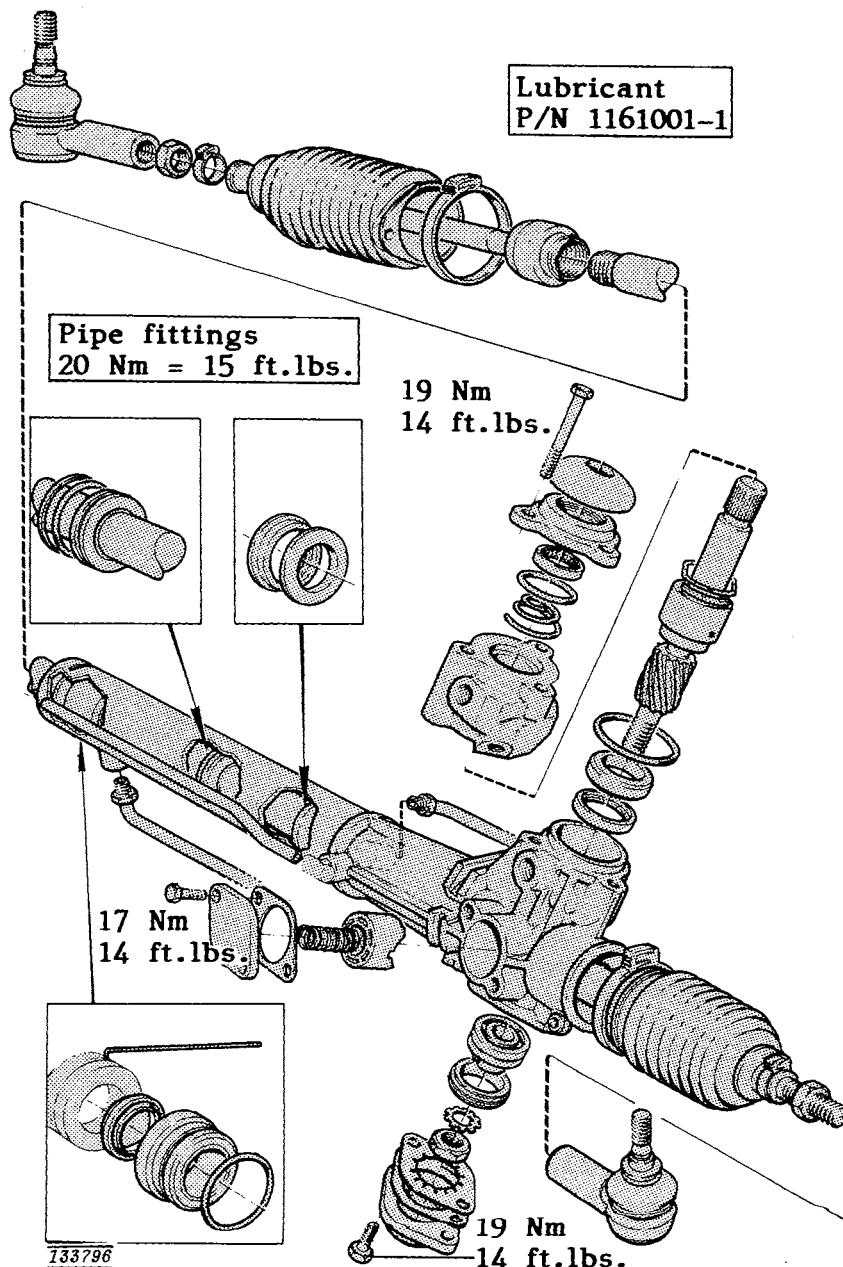
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	Nm	Ft.lbs.
A Nuts for upper journalling	20	14
C Ball joint bolts	23	17
D Ball joint nut	60	43
E Nuts, ball joint to control arm	115	85
F Bolts for steering shaft units	23	17
G Bolts for steering column attachment	20	14
H Steering wheel center nut	60	44
J Bolts/nuts retaining steering gear	20	14
K Lock nut on steering rod	70	50
L Nut, tie rod to steering arm	60	44
M Wheel nuts	120	90
N Bolts for steering shaft rubber coupling	20	14
O Front bolt for control arm bushing	75	54
P Nut for control arm rear bushing	55	40
Q Bolts for control arm rear bushing bracket	40	29

Group 64 Steering**Cam Gear power steering gear**

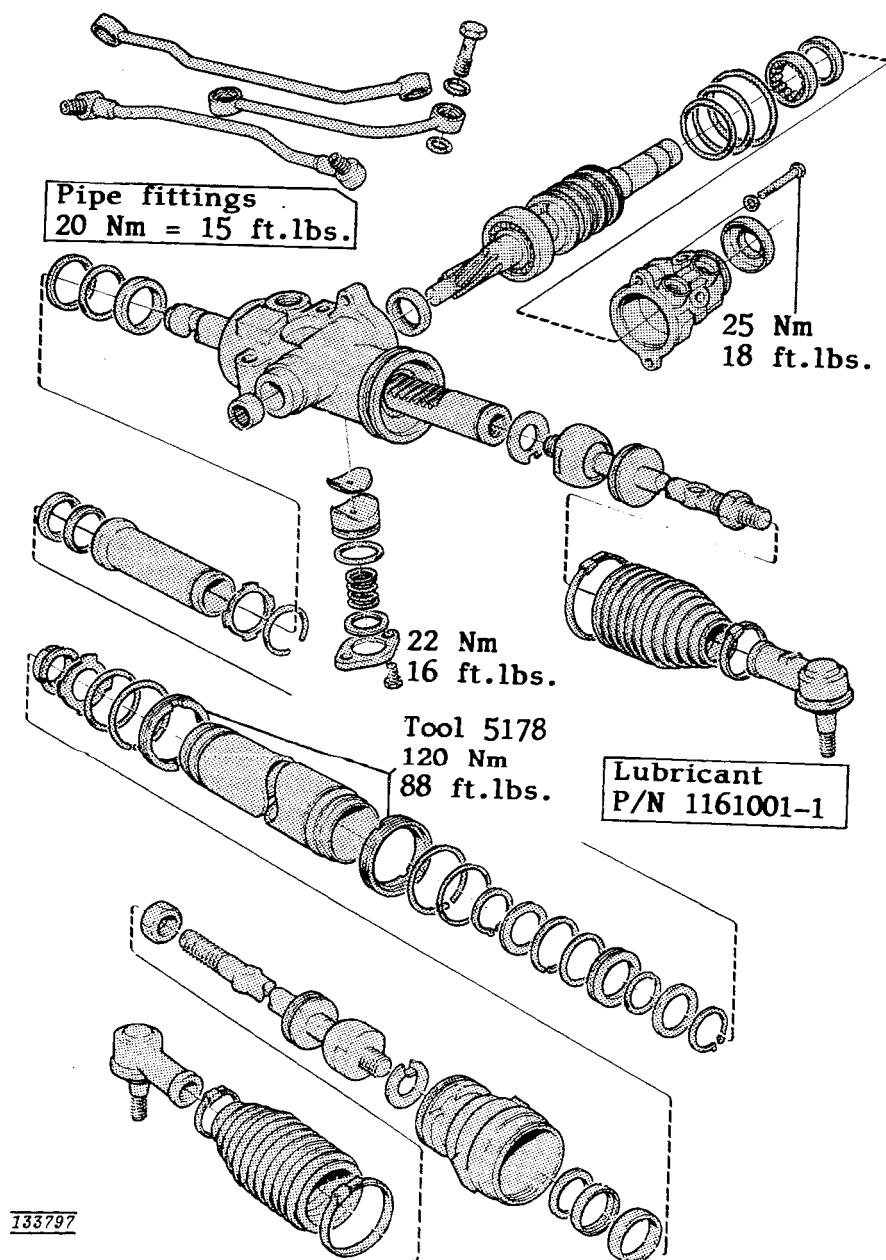
Volvo P/N	1272460
Turns from lock to lock	3.5
Ratio	17.2:1
Clearance between pre-tensioning piston and cover	0.05–0.15 mm 0.002–0.006"
Spacers available	0.05–0.127– 0.254 mm 0.002–0.005– 0.01"
Pre-tension, pinion to rack	0.9–1.7 Nm 0.66–1.25 ft. lbs.

Lubricant	
– P/N	1161001-1
– quantity	100 grams 3.5 oz.
Hydraulic system	
– fluid	ATF
– quantity	0.7 liters 0.75 US qts.
Balance check	
Pump pressure	1.2 MPa 170 psi
– at torque reading	3.5–5.0 Nm 2.5–3.7 ft. lbs.
Difference between sides must not exceed	1 Nm 0.8 ft. lbs.



ZF power steering gear

Volvo P/N	1329694-2	Hydraulic system	
Turns from lock to lock	3.5	- fluid	ATF
Ratio	17.2:1	- quantity	0.7 liters 0.75 US qts.
Clearance between pre-tensioning piston and cover	0.1-0.15 mm 0.002-0.006"	Sealant	P/N 281145-3
Spacer thickness	2.10-2.90 mm 0.083-0.114"		
- in increments of	0.05 mm 0.002"	Balance check	
Lubricant		Pump pressure	2.0 MPa 285 psi
- for rack and pinion	P/N 1161001-1 100 grams 3.5 oz.	- at torque reading	4-5.5 Nm 3-4 ft. lbs.
- quantity	P/N 1161006-0	Difference between sides must not exceed	0.5 Nm 0.37 ft. lbs.
- lubricant for tube nuts			



Section 7 Springs, shock absorbers, wheels

Group 77 Wheels, tires, hubs

Wheel rims

Type	Disc wheels
Number of wheel nuts	5
Tolerances	
- radial throw, max.	1.0 mm 0.04"
- warp, max	0.8 mm 0.032"
- out-of-balance, max	0.039 Nm 0.035 in. lbs.

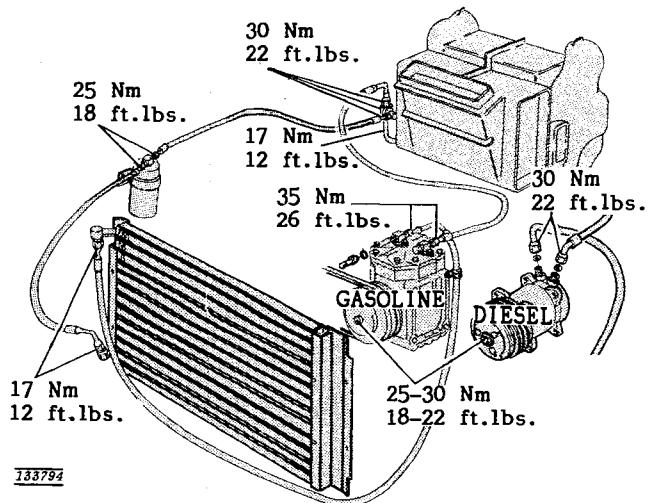
Air pressure, cold tires

		Economy		Comfort	
		Front	Rear	Front	Rear
175R14	psi	36	36	26	27
	kPa	250	250	180	190
185/70R14	psi	36	36	26	27
185/70T14	kPa	250	250	180	190
195/60R15	psi	36	36	26	27
195/60HR15	Sedan	kPa	250	250	190
	Wagon	psi	36	36	27
		kPa	250	250	190
185R14	Wagon	psi	36	36	27
185SR14		kPa	250	250	190
P185/75R14 (Canada)		psi	35	35	26
	Sedan	kPa	243	243	180
	Wagon	psi	35	35	26
		kPa	245	245	180
Special Spare, 165-14	Sedan	psi	36	36	
		kPa	250	250	
Special Spare; 175-14	Wagon	psi	40	40	
		kPa	280	280	

50 mph = 80 km/h is max speed for Space Saver Spare and Special Spare.

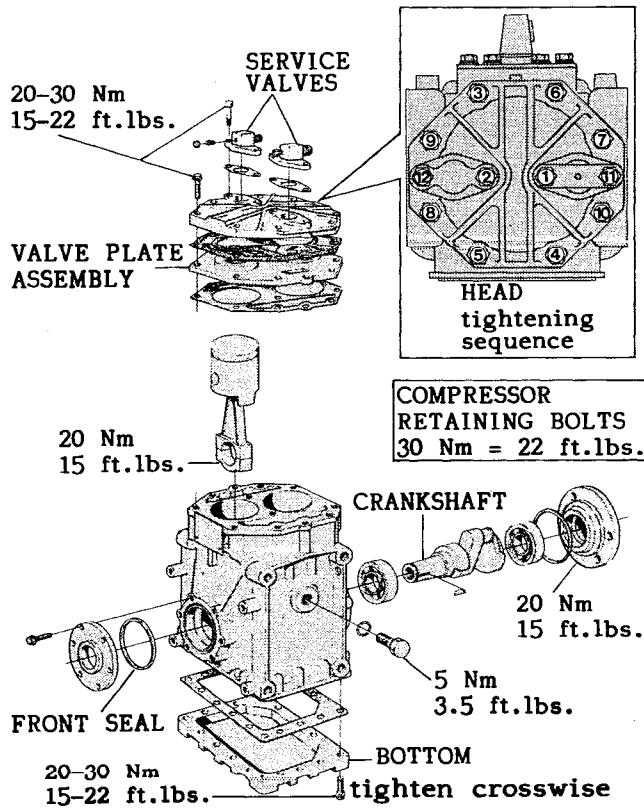
Section 8 Body and interior

Group 87, Climatic control installation



Compressor York A210

Number of cylinders	2
Displacement	164 cm ³ 10 cu. in.
Max. speed	6000 rpm
Lubricant	
- quantity	300 cm ³ 10.2 fl. oz.
- P/N	1160048-3
Suniso 5	
BP Energol LPT 100	
Shell Clavus 33	
Capella E 500	

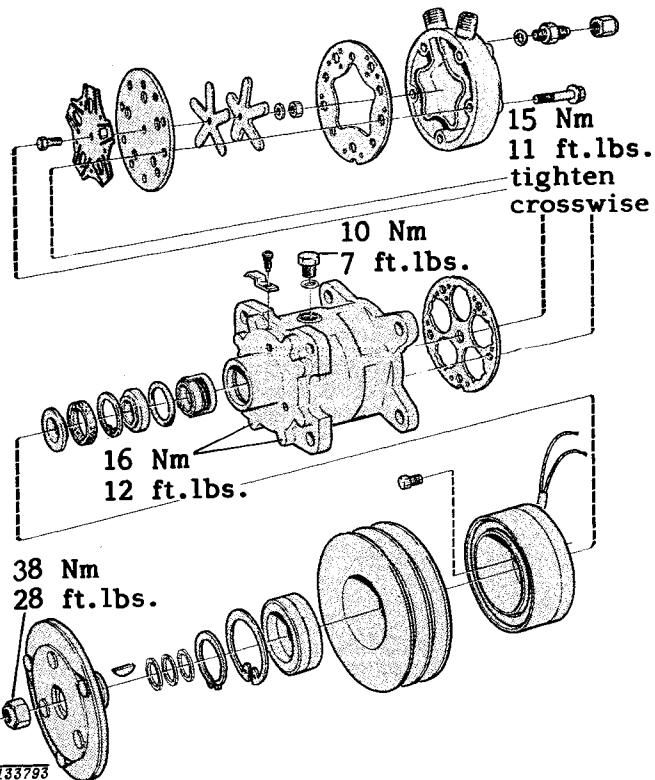


Refrigerant

Refrigerant	R12
(freon)	
Quantity	1300 grams 45.8 oz.

Compressor Sankyo SD-510

Application	D24 diesel
Number of cylinders	5
Displacement	164 cm ³ 10 cu. in.
Max. speed	6000 rpm
Lubricant	
- quantity	135 cm ³ 4.6 fl. oz.
- P/N	1160048-3
Suniso 5	
BP Energol LPT 100	
Shell Clavus 33	
Capella E 500	



Performance test**Conditions**

Hood	closed
Front doors	closed
Engine speed	2000 rpm

Controls

– Fan speed	3 (max)
– Temperature	Cool
– FLOOR control	closed (button out)
– DEF control	closed (button out)
– REC control	Recirculation (button in)
– panel vents	open
– AC switch	ON

Readings, gasoline engines

Ambient air temperature, in front of vehicle	20°C 68°F
Compressor pressure	
– suction side (heavy gage connection)	0.12–0.26 MPa 17–37 psi
– discharge side (light gage connection)	0.65–0.90 MPa 92–128 psi
Output air temperature, measured in center vents	9–12°C 48–54°F

Ambient air temperature, in front of vehicle	30°C 86°F
Compressor pressure	
– suction side (heavy gage connection)	0.14–0.26 MPa 20–37 psi
– discharge side (light gage connection)	0.80–1.20 MPa 114–170 psi
Output air temperature, measured in center vents	9–12°C 48–54°F

Ambient air temperature, in front of vehicle	40°C 104°F
Compressor pressure	
– suction side (heavy gage connection)	0.13 MPa 18 psi
– discharge side (light gage connection)	1.48 MPa 210 psi
Output air temperature, measured in center vents	9–12°C 48–54°F

Readings, D24 diesel

Ambient air temperature, in front of vehicle	20°C 68°F
Compressor pressure	
– suction side (heavy gage connection)	0.1–0.27 MPa 14–38 psi
– discharge side (light gage connection)	0.67–1.09 MPa 95–155 psi
Output air temperature, measured in center vents	8–12°C 46–54°F

Ambient air temperature, in front of vehicle	30°C 86°F
Compressor pressure	
– suction side (heavy gage connection)	0.10–0.27 MPa 14–38 psi
– discharge side (light gage connection)	0.94–1.41 MPa 133–200 psi
Output air temperature, measured in center vents	8–12°C 46–54°F

Ambient air temperature, in front of vehicle	40°C 104°F
Compressor pressure	
– suction side (heavy gage connection)	0.14 MPa 20 psi
– discharge side (light gage connection)	1.8 MPa 256 psi
Output air temperature, measured in center vents	8–12°C 46–54°F

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Service Literature

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