

New Car Features 1981 USA and Canada

VOLVO

Contents

	<i>Item</i>	<i>Page</i>
Introduction		1
Section 0: General Specifications		
Dimensions and weights		4
Identification and designation plates and labels		6
- Routing of vacuum hoses		15
1981 Vehicle Specifications		18
- Diesel		31
Section 1: Maintenance		
New Maintenance Manuals		35
Important changes to Maintenance Manuals		35
Summary of 600-1, 200 and 7,500 mile maintenance inspections		37
- Miscellaneous maintenance		38
- Special for Canada		38
Section 2: Engine		
Summary of engines		39
Summary of engine new features		40
Camshafts, new valve clearances (B28F)	21A	40
Engine B23E (Canada only)	21B	41
Engine B21F-Turbo	21C	45
Engine B21F-MPG	21D	54
- Fault tracing electronic ignition system for B21F-MPG ...		58
PCV system		60
- B21A	22A	60
- B21F, B23E	22B	60
Fuel system		
- Increased capacity fuel filter	23A	61
- CO adjustment sealed	23B	61
- Electronic modules for Lambda-sond systems	23C	61
- Richer air /fuel mixture during acceleration	23D	62
- Enrichment at warm starts	23E	63
- New location for frequency valve	B23F	63
Constant idle speed system		64
Section 3: Electrical system and instruments		
Location of ignition coil, 4-cyl.	34A	68
Halogen lights	35A	68
Instrument light rheostat	35B	68
Tail lights, wagons	35C	68
Window wipers	36A	69
Tail gate window washer, wagon	36B	69
Heater blower	36C	69
El. operated trunk lid opener	36D	70
Circular pin connectors	37A	70
Instruments	38A	70
Additional instruments	38B	71

	<i>Item</i>	<i>Page</i>
Section 4: Power transmission		
Summary of transmissions		72
Clutch, B21F-Turbo	41A	72
Clutch, B28F	41B	72
Clutch control, B21F-Turbo	41C	72
Clutch control, B28F	41D	73
Manual transmission with needle bearings	43A	74
Gearshift knob	43B	74
Overdrive engagement	43C	74
Section 5: Brakes		
No new features for 1981.		
Section 6: Front end and steering		
One size of front wheel bearings	61A	75
Location of power steering fluid container, B28F	64A	75
Section 7: Suspension and wheels		
No new features for 1981.		
Section 8: Body		
Rear fenders, wagons	81A	76
Rear side window	84A	76
Lockable storage space	85A	77
Storage space for long cargo	85B	77
Dashboard	85C	77
Section 9: Accessories		
Information issued by Parts Division.		
Wiring diagrams and locators		78

Introduction

This manual contains information on various items introduced to 1981 model product line.

Information is presented in the same sequence as it would appear in the Binder System (Sections 0-8).

The specification section provides a complete listing of all pertinent data and appears also in complete form in the front sections of the following new manuals:

TP 30310 Pre-Delivery Service

TP 30311 600-1,200 mile (1,000-2,000 km) Maintenance Service

TP 30312 7,500 mile (12,500 km) Maintenance Service



DL USA

2, 4 or 5 doors (wagon). Equipped with B21F engine. 2-door models also come equipped with the new B21F-MPG engine (optional).

DL Canada

With 2, 4 or 5 doors (wagon). Equipped with B21A engine.

Emission systems:

- Pulsair in combination with 4-speed manual transmissions M45 and M46.
- EGR type "on/off" + Pulsair in combination with automatic transmission for 2- and 4-door models.
- EGR type "proportional" + Pulsair in combination with automatic transmission for wagons.

GL USA

2- and 4-door models with engine B21F. 4- and 5-door (wagon) models also with D24 diesel engine.

GL Canada

4- and 5-door (wagon) models equipped with B23E engine.

Emission systems:

- Pulsair used with 4-speed manual transmissions M45 and M46.
- EGR type "on/off" + Pulsair used with automatic transmission 2- and 4-door models.
- EGR type "proportional" + Pulsair used with automatic transmission wagons.

4- and 5-door models also equipped with D24 diesel engine.

GLT USA

2-door model equipped with B21F-Turbo engine.

GLT Canada

2-door model equipped with B23E engine.



GLE USA and Canada

4- and 5-door (wagon) models with B28F engine.

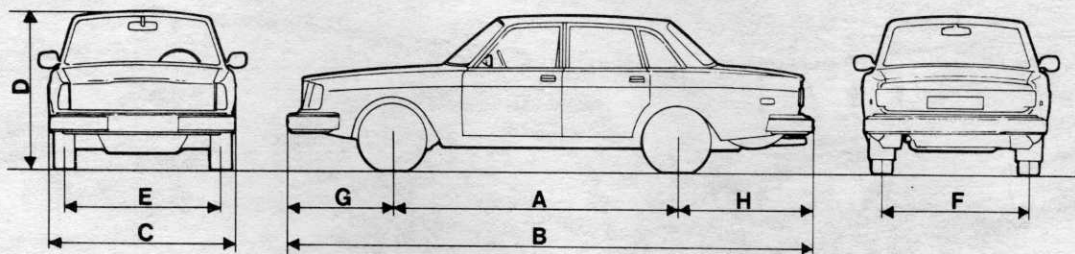


COUPE USA and Canada

2-door sports model with B28F engine .
Assembled by Bertone, Italy.

Section O: General Specifications

Dimensions and weights



A Wheel base

Manual steering 2640 mm
104.0"

Power steering 2650 mm
104.3"

B Length 4888 mm
192.4"

C Width 1707 mm
67.2"

D Height

GLT, GL, GLE: at curb weight 1427 mm
56.2"

at Gross Vehicle Weights (GVW) 1392 mm
54.8"

Wagons: at curb weight 1460 mm
57.5"

at Gross Vehicle Weight (GVW) 1430 mm
56.3"

Coupe: at curb weight 1368 mm
53.9"

E Track, front 1430 mm
56.3"

F Track, rear 1360 mm
53.5"

G Overhang, front

Manual steering 978 mm
38.5"

Power steering 968 mm
38.1"

H Overhang, rear 1270 mm
50"

Turning circle (between curbs) 9.8 m
32.6 feet

Curb weights (depending on model, for "California" versions generally add 3 kg = 7 lbs). AC = 28 kgs included.

GLT, DL	1312–1362 kg 2891–2999 lbs
GL	1332–1392 kg 2933–3065 lbs
GLE	1416–1430 kg 3120–3149 lbs
Wagon, 4-cyl.	1421–1436 kg 3129–3162 lbs
Wagon, 6-cyl.	1471–1485 kg 3241–3271 lbs
Coupe	1410–1415 kg 3105–3115 lbs

Gross Vehicle Weight Rating (GVWR)

GLT, GL, DL, Coupe	1830 kg 4030 lbs
GLE	1900 kg 4190 lbs
Wagons:	
– with gasoline engine (except GLT)	1950 kg 4300 lbs
GLT wagon	1900 kg 4190 lbs
– with diesel engine	2000 kg 4410 lbs

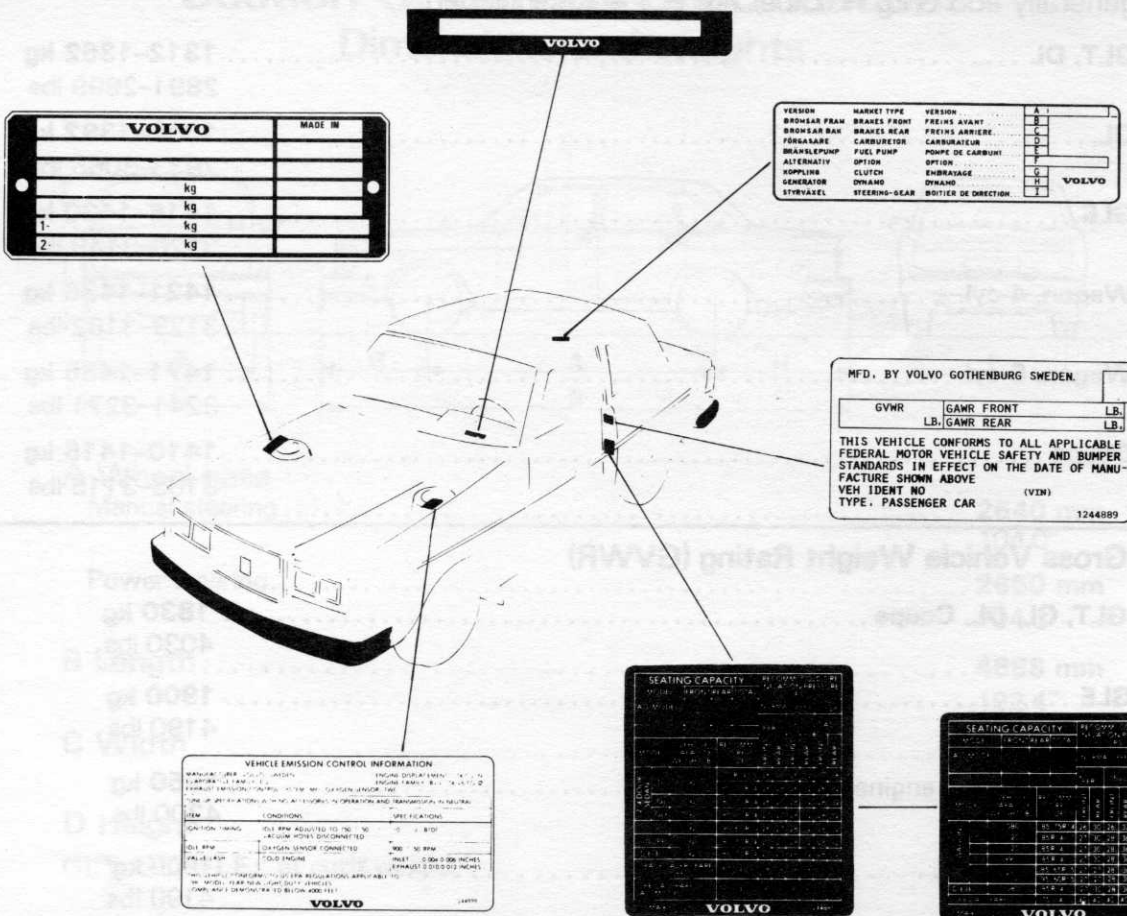
Gross Axle Weight Rating (GAWR), front

GLT, DL, GL, 4-cyl Wagon	855 kg 1885 lbs
GLE, 6-cyl Wagon, Coupe	930 kg 2050 lbs

Gross Axle Weight Rating (GAWR), rear

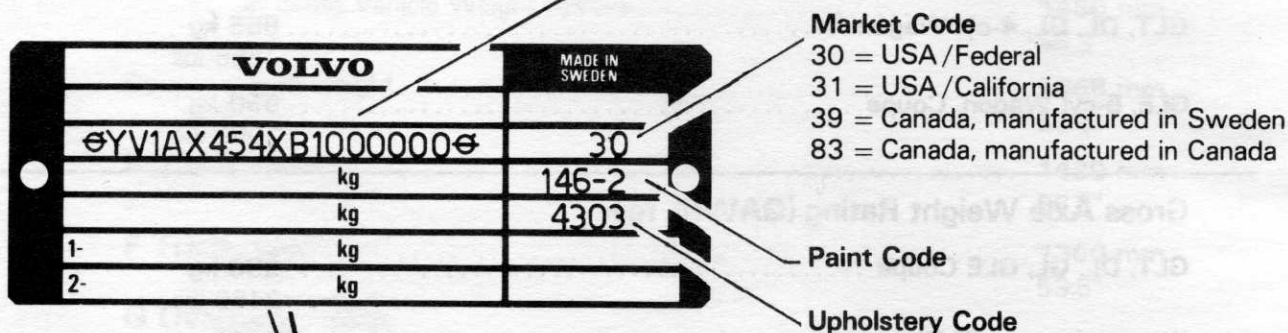
GLT, DL, GL, GLE Coupe	990 kg 2180 lbs
Wagons (except GLT)	1180 kg 2600 lbs
GLT Wagon	1060 kg 2340 lbs
Max. trailer weight	908 kg 2000 lbs
Max. hitch load	90 kg 200 lbs

Identification and designation plates and labels



130500

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



130501

Decoding of Vehicle Identification Number (VIN)

ØYV1AX454XB1000000Ø

Manufacturer code

Assigned by ISO

Series and safety system

A = 240 with 3-point safety belt

B = 260 with 3-point safety belt

Vacant

Engine

41 = B21A

45 = B21F 47 = B21F-Turbo 49 = B21F-MPG

69 = B28F

77 = D24 (diesel)

84 = B23E

Body

2 = 2-door, not Coupe, standard wheelbase

4 = 4-door, standard wheelbase

5 = 5-door (wagon), standard wheelbase

7 = 2-door, Coupe, standard wheelbase

Check figure

Calculated from other digits.

Year model code

Assigned by FMVSS

Manufacturing plant

0 = Kalmar /Sweden

1 = Torslanda /Sweden

2 = Volvo Europe

3 = Canada

D = Italy (assembled by Bertone)

Serial number ("chassis number")

For 1981 year models, the serial numbers start at:

189180 for 4-cylinder, 2-door

592110 for 4-cylinder, 4-door

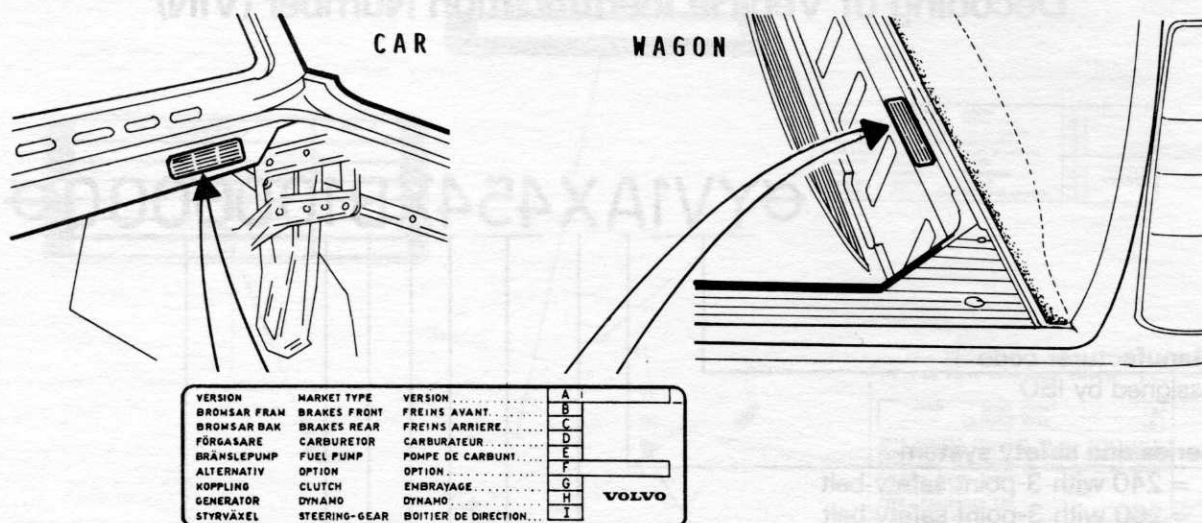
317940 for 4-cylinder, 5-door (wagon)

8375 for 6-cylinder, 2-door (Coupe)

107610 for 6-cylinder, 4-door

28320 for 6-cylinder, 5-door (wagon)

Service label



ill.
130498

A. Version.

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

B. Front brakes.

Code number 1 = Girling

C. Rear brakes.

Code number 1 = Girling
2 = ATE

D. Carburetor.

Code number 1 = Zenith-Stromberg
2 = SU

E. Fuel pump.

Code number 1 = SEV Marchal
2 = Pierburg
3 = Bosch
4 = AC-Delco

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 1 = Borg & Beck
2 = Fichtel & Sachs

H. Alternator.

Code number 1 = Bosch
2 = SEV Marchal

I. Steering gear.

Code number 1 = Cam Gear
2 = 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.

VERSION	MARKET TYPE	VERSION	
BROMSAR FRAM	BRAKES FRONT	FREINS AVANT	
BROMSAR BAK	BRAKES REAR	FREINS ARRIERE	
FÖRGASARE	CARBURETOR	CARBURATEUR	
BRÄNSLEPUMP	FUEL PUMP	POMPE DE CARBUNT	
ALTERNATIV	OPTION	OPTION	
KOPPLING	CLUTCH	ENBRAYAGE	
GENERATOR	DYNAMO	DYNAMO	
STYRVÅXEL	STEERING-GEAR	BOITIER DE DIRECTION	

III.
130499

Service label

VIC number breakdown

24 2 84 06 4 2 1

Vehicle model

24 = 240 Series

26 = 260 Series

Number of doors

2 = 2 doors, Coupe

4 = 4 doors

5 = 5 doors, wagon

Engine

41 = B21A

45 = B21F 47 = B21F-Turbo 49 = B21F-MPG

69 = B28F

77 = D24

84 = B23E

Sales model

02 = DL

03 = GL

06 = GLT

07 = Coupe

Body model

3 = Without sunroof USA/Canada

4 = With sunroof USA/Canada

Transmission

1 = M45

2 = M46

6 = AW55

8 = BW55

Steering wheel position

1 = Left hand drive

2 = Right hand drive

Version Identification Codes (VIC)

Gasoline engines

US "Federal" specifications Vehicles manufactured in Sweden

NA = Not Applicable

Model and doors	Version Identification Code (VIC)	Engine	Ignition System	Emission Control	Transmission	Rear axle ratio	Tires	Steering	Sun-roof
DL 2-d	242-4502-421	B21F	Bosch	Lambda+CAT	M46	3.73	175SR	Power	Yes
DL 2-d	242-4502-461	B21F	Bosch	Lambda+CAT	AW55	3.73	175SR	Power	Yes
GL 2-d	242-4503-421	B21F	Bosch	Lambda+CAT	M46	3.73	185/70SR	Power	Yes
GL 2-d	242-4503-461	B21F	Bosch	Lambda+CAT	AW55	3.73	185/70SR	Power	Yes
GLT 2-d	242-4706-421	B21F-Turbo	Bosch	Lambda+CAT	M46	3.73	195/60HR	Power	Yes
DL 2-d	242-4902-311	B21F-MPG	Volvo	Lambda+CAT	M45	3.54	175SR	Manual	No
DL 2-d	242-4902-321	B21F-MPG	Volvo	Lambda+CAT	M46	3.54	175SR	Manual	No
DL 2-d	242-4902-361	B21F-MPG	Volvo	Lambda+CAT	AW55	3.54	175SR	Power	No
DL 4-d	244-4502-311	B21F	Bosch	Lambda+CAT	M45	3.73	175SR	Manual	No
DL 4-d	244-4502-321	B21F	Bosch	Lambda+CAT	M46	3.73	175SR	Manual	No
DL 4-d	244-4502-361	B21F	Bosch	Lambda+CAT	AW55	3.73	175SR	Power	No
DL 4-d	244-4502-421	B21F	Bosch	Lambda+CAT	M46	3.73	175SR	Power	Yes
DL 4-d	244-4502-461	B21F	Bosch	Lambda+CAT	AW55	3.73	175SR	Power	Yes
DL 5-d	245-4502-311	B21F	Bosch	Lambda+CAT	M45	3.73	185SR	Power	NA
DL 5-d	245-4502-321	B21F	Bosch	Lambda+CAT	M46	3.73	185SR	Power	NA
DL 5-d	245-4502-361	B21F	Bosch	Lambda+CAT	BW55	3.73	185SR	Power	NA
Coupe 2-d	262-6907-321	B28F	Bosch	Lambda+CAT	M46	3.73	185/70SR	Power	No
Coupe 2-d	262-6907-381	B28F	Bosch	Lambda+CAT	BW55	3.54	185/70SR	Power	No
GL 4-d	264-4503-421	B21F	Bosch	Lambda+CAT	M46	3.73	185/70SR	Power	Yes
GL 4-d	264-4503-461	B21F	Bosch	Lambda+CAT	AW55	3.73	185/70SR	Power	Yes
GLE 4-d	264-6904-421	B28F	Bosch	Lambda+CAT	M46	3.73	185/70ST	Power	Yes
GLE 4-d	264-6904-481	B28F	Bosch	Lambda+CAT	BW55	3.54	185/70SR	Power	Yes
GLE 5-d	265-6904-321	B28F	Bosch	Lambda+CAT	M46	3.73	185/70SR	Power	NA
GLE 5-d	265-6904-381	B28F	Bosch	Lambda+CAT	BW55	3.54	185/70SR	Power	NA

Canada

Vehicles manufactured in Sweden

NA = Not Applicable

Model and doors	Version Identification Code (VIC)	Engine	Ignition System	Emission Control	Transmission	Rear axle ratio	Tires	Steering	Sun-roof
Coupe 2-d	262-6907-321	B28F	Bosch	Lambda+CAT	M46	3.73	185/70SR	Power	No
Coupe 2-d	262-6907-381	B28F	Bosch	Lambda+CAT	BW55	3.54	185/70SR	Power	No
GLE 4-d	264-6904-421	B28F	Bosch	Lambda+CAT	M46	3.73	185/70SR	Power	Yes
GLE 4-d	264-6904-481	B28F	Bosch	Lambda+CAT	BW55	3.54	185/70SR	Power	Yes
GLE 5-d	265-6904-321	B28F	Bosch	Lambda+CAT	M46	3.73	185SR	Power	NA
GLE 5-d	265-6904-381	B28F	Bosch	Lambda+CAT	BW55	3.54	185SR	Power	NA

US "California" specifications

Vehicles manufactured in Sweden

NA = Not Applicable

Model and doors	Version Identification Code (VIC)	Engine	Ignition System	Emission Control	Trans-mission	Rear Axle ratio	Tires	Steering	Sun-roof
DL 2-d	242-4502-421	B21F	Bosch	Lambda+CAT	M46	3.73	175SR	Power	Yes
DL 2-d	242-4502-461	B21F	Bosch	Lambda+CAT	AW55	3.73	175SR	Power	Yes
GL 2-d	242-4503-421	B21F	Bosch	Lambda+CAT	M46	3.73	185/70SR	*Power	Yes
GL 2-d	242-4503-461	B21F	Bosch	Lambda+CAT	AW55	3.73	185/70SR	Power	Yes
GLT 2-d	242-4706-421	B21F-Turbo	Bosch	Lambda+CAT	M46	3.73	195/60HR	Power	Yes
DL 2-d	242-4902-311	B21F-MPG	Volvo	Lambda+CAT	M45	3.54	175SR	Manual	No
DL 2-d	242-4902-321	B21F-MPG	Volvo	Lambda+CAT	M46	3.54	175SR	Manual	No
DL 2-d	242-4902-361	B21F-MPG	Volvo	Lambda+CAT	AW55	3.54	175SR	Power	No
DL 4-d	244-4502-311	B21F	Bosch	Lambda+CAT	M45	3.73	175SR	Manual	No
DL 4-d	244-4502-321	B21F	Bosch	Lambda+CAT	M46	3.73	175SR	Manual	No
DL 4-d	244-4502-361	B21F	Bosch	Lambda+CAT	AW55	3.73	175SR	Power	No
DL 4-d	244-4502-421	B21F	Bosch	Lambda+CAT	M46	3.73	175SR	Power	Yes
DL 4-d	244-4502-461	B21F	Bosch	Lambda+CAT	AW55	3.73	175SR	Power	Yes
DL 5-d	245-4502-311	B21F	Bosch	Lambda+CAT	M45	3.73	185SR	Power	NA
DL 5-d	245-4502-321	B21F	Bosch	Lambda+CAT	M46	3.73	185SR	Power	NA
DL 5-d	245-4502-361	B21F	Bosch	Lambda+CAT	BW55	3.73	185SR	Power	NA
Coupe 2-d	262-6907-321	B28F	Bosch	Lambda+CAT	M46	3.73	185/70SR	Power	No
Coupe 2-d	262-6907-381	B28F	Bosch	Lambda+CAT	BW55	3.54	185/70SR	Power	No
GL 4-d	264-4503-421	B21F	Bosch	Lambda+CAT	M46	3.73	185/70SR	Power	Yes
GL 4-d	264-4503-461	B21F	Bosch	Lambda+CAT	AW55	3.73	185/70SR	Power	Yes
GLE 4-d	264-6904-421	B28F	Bosch	Lambda+CAT	M46	3.73	185/70SR	Power	Yes
GLE 4-d	264-6904-481	B28F	Bosch	Lambda+CAT	BW55	3.54	185/70SR	Power	Yes
GLE 5-d	265-6904-321	B28F	Bosch	Lambda+CAT	M46	3.73	185SR	Power	NA
GLE 5-d	265-6904-381	B28F	Bosch	Lambda+CAT	BW55	3.54	185SR	Power	NA

Canada

Vehicles manufactured in Canada

NA = Not Applicable

Model and doors	Version Identification Code (VIC)	Engine	Ignition System	Emission Control	Trans-mission	Rear axle ratio	Tires	Steering	Sun-roof
DL 2-d	242-4102-311	B21A	Bosch	Pulsair	M45	3.91	DR78/185	Manual	No
DL 2-d	242-4102-381	B21A	Bosch	EGR on/off+Pulsair	BW55	3.73	DR78/185	Power	No
DL 2-d	242-4102-421	B21A	Bosch	Pulsair	M46	3.91	DR78/185	Power	Yes
GLT 2-d	242-8406-421	B23E	Bosch	EGR on/off+Pulsair	M46	3.73	195/60HR	Power	Yes
DL 4-d	242-4102-311	B21A	Bosch	Pulsair	M45	3.91	DR78/185	Manual	No
DL 4-d	244-4102-381	B21A	Bosch	EGR on/off+Pulsair	BW55	3.73	DR78/185	Power	No
DL 4-d	244-4102-421	B21A	Bosch	Pulsair	M46	3.91	DR78/185	Power	Yes
GL 4-d	244-8403-421	B23E	Bosch	EGR on/off+ Pulsair	M46	3.73	185/70SR	Power	Yes
GL 4-d	244-8403-481	B23E	Bosch	EGR prop.+Pulsair	BW55	3.54	185/70SR	Power	Yes
DL 5-d	245-4102-311	B21A	Bosch	Pulsair	M45	3.91	DR78/185	Power	NA
DL 5-d	245-4102-321	B21A	Bosch	Pulsair	M46	3.91	DR78/185	Power	NA
DL 5-d	245-4102-381	B21A	Bosch	EGR on/off+Pulsair	BW55	3.73	DR78/185	Power	NA
GL 5-d	245-8403-321	B23E	Bosch	EGR on/off+Pulsair	M46	3.73	185SR	Power	NA
GL 5-d	245-8403-381	B23E	Bosch	EGR prop.+Pulsair	BW55	3.54	185SR	Power	NA

Diesel engines

US "Federal" specifications Vehicles manufactured in Sweden

NA = Not Applicable

Model and doors	Version Identification Code (VIC)	Engine	Trans-mission	Rear axle ratio	Tires	Steering	Sun-roof
GL 4-d	264-7703-321	D24	M46	3.54	185/70SR	Power	No
GL 4-d	264-7703-381	D24	BW55	3.31	185/70SR	Power	No
GL 4-d	264-7703-421	D24	M46	3.54	185/70SR	Power	Yes
GL 4-d	264-7703-481	D24	BW55	3.31	185/70SR	Power	Yes
GL 5-d	265-7703-321	D24	M46	3.54	185SR	Power	NA
GL 5-d	265-7703-381	D24	BW55	3.31	185SR	Power	NA

Canada

Vehicles manufactured in Canada

Model and doors	Version Identification Code (VIC)	Engine	Trans-mission	Rear axle ratio	Tires	Steering	Sun-roof
GL 4-d	264-7703-321	D24	M46	3.73	185/70SR	Power	No
GL 4-d	264-7703-381	D24	BW55	3.54	185/70SR	Power	No
GL 4-d	264-7703-421	D24	M46	3.73	185/70SR	Power	No
GL 4-d	264-7703-481	D24	BW55	3.54	185/70SR	Power	Yes
GL 5-d	265-7703-321	D24	M46	3.73	185SR	Power	NA
GL 5-d	265-7703-381	D24	BW55	3.54	185SR	Power	NA

Anniversary wagon

Special GLT-model equipped with 15 in. aluminum wheels, ribbed plush upholstery etc.

US "Federal" Specifications

Model and doors	Version Identification Code (VIC)	Engine	Ignition System	Emission Control	Trans-mission	Rear axle ratio	Tires	Steering
GLT 5-d	245-4506-321	B21F	Bosch	Lambda+CAT	M46	3.73	185/65SR	Power
GLT 5-d	245-4506-381	B21F	Bosch	Lambda+CAT	BW55	3.73	185/65SR	Power

US California Specifications

Model and doors	Version Identification Code (VIC)	Engine	Ignition System	Emission Control	Trans-mission	Rear axle ratio	Tires	Steering
GLT 5-d	245-4506-321	B21F	Bosch	Lambda+CAT	M46	3.73	185/65SR	Power
GLT 5-d	245-4506-381	B21F	Bosch	Lambda+CAT	BW55	3.73	185/65SR	Power

Canada

Model and doors	Version Identification Code (VIC)	Engine	Ignition System	Emission Control	Trans-mission	Rear axle ratio	Tires	Steering
GLT 5-d	245-8406-321	B23 E	Bosch	EGR on/off+Pulsair	M46	3.73	195/60HR	Power
GLT 5-d	245-8406-381	B23 E	Bosch	EGR prop.+Pulsair	BW55	3.54	195/60HR	Power



VIN ("chassis number") plate.

Location:

On top of dashboard

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

129320

VEHICLE EMISSION CONTROL INFORMATION		
MANUFACTURER: VOLVO, SWEDEN		ENGINE DISPLACEMENT: 130 CU IN
EVAPORATIVE FAMILY: E 2		ENGINE FAMILY: BVV 13 Ø V6 FFX
EXHAUST EMISSION CONTROL SYSTEM: MFI, OXYGEN SENSOR, TWC		
TUNE-UP SPECIFICATIONS WITH NO ACCESSORIES IN OPERATION AND TRANSMISSION IN NEUTRAL		
ITEM	CONDITIONS	SPECIFICATIONS
IGNITION TIMING	IDLE RPM ADJUSTED TO 750 ± 50 VACUUM HOSES DISCONNECTED	8° ± 2° BTDC
IDLE RPM	OXYGEN SENSOR CONNECTED	900 ± 50 RPM
VALVE LASH	WARM ENGINE	0.016 - 0.018 INCHES
THIS VEHICLE CONFORMS TO US EPA REGULATIONS APPLICABLE TO 1981 MODEL YEAR NEW LIGHT DUTY VEHICLES. COMPLIANCE DEMONSTRATED BELOW 4000 FEET.		
VOLVO		1244856

Vehicle emission control information label.

Location:

On left front wheel housing.

Black text on white background.

The label to the left is typical for B21F.

130503

VEHICLE EMISSION CONTROL INFORMATION		
MANUFACTURER: VOLVO, SWEDEN		ENGINE DISPLACEMENT: 130 CU IN
EVAPORATIVE FAMILY: E 2		ENGINE FAMILY: BVV 13 Ø V6 FA 5
EXHAUST EMISSION CONTROL SYSTEM: MFI, OXYGEN SENSOR, TWC		
TUNE-UP SPECIFICATIONS WITH NO ACCESSORIES IN OPERATION AND TRANSMISSION IN NEUTRAL		
ITEM	CONDITIONS	SPECIFICATIONS
IGNITION TIMING	VACUUM HOSES DISCONNECTED	8° ± 2° BTDC
VALVE LASH	WARM ENGINE	0.016 - 0.018 INCHES
THIS VEHICLE CONFORMS TO US EPA AND CALIFORNIA REGULATIONS APPLICABLE TO 1981 MODEL YEAR NEW LIGHT DUTY VEHICLES. COMPLIANCE DEMONSTRATED BELOW 4000 FEET.		
VOLVO		1244968

The label to the left is typical for B21F-MPG.

Note that no idle rpm is specified (Constant Idle Speed System on B21F-MPG).

Ignition timing is set at normal idle speed.

130504

VOLVO 1981 MODELS		
APPLICABLE CALIFORNIA EXHAUST CONTROL STANDARDS		
HC - G/M	CO - G/M	NOX - G/M
0.41	7.0	0.7
HIGHEST VALUES FROM THE ENGINE FAMILY EMISSION DATA FLEET		
0.41	7.0	0.7
THIS VEHICLE HAS BEEN TESTED UNDER AND CONFORMS TO CALIFORNIA ASSEMBLY LINE TEST REQUIREMENTS		
VOLVO		1313291

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.)

130508

MFD. BY VOLVO GOTENBURG SWEDEN

GVWR	GAWR FRONT	LB.
	LB. GAWR REAR	LB.

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY AND BUMPER STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE

VEH IDENT NO. 4YV123454XB1000000#

TYPE PASSENGER CAR

VEHICLE EMISSION CONTROL INFORMATION

THIS VEHICLE CONFORMS TO U.S.E.P.A. REGULATIONS APPLICABLE TO 1981 MODEL YEAR NEW MOTOR VEHICLES

CATALYST

VOLVO

MANUFACTURED BY ABVOLVO

Gothenburg, Sweden

Assembled in Canada

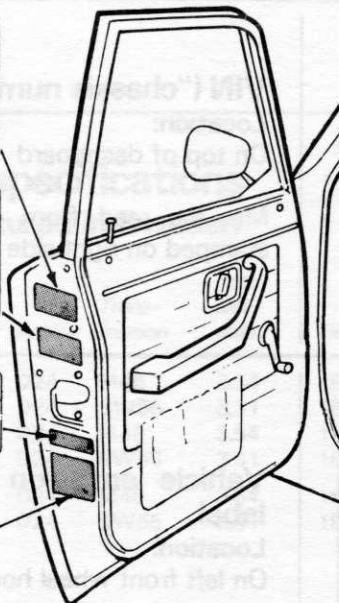
(CANADA ONLY)

SEATING CAPACITY				RECOMM. COLD TIRE INFLATION PRESSURE			
MODEL	FRONT	REAR	TOTAL	PSI	PSI	PSI	PSI
ALL MODELS	2	3	5	75	75	75	75
				1-3 FULL LOAD			
MODEL	VEHICLE WEIGHT	RECOMM. TIRE SIZE	FRONT	FRONT	REAR	REAR	REAR
DL	920	175 R14	26	27	26	32	33
DL	920	185/75R14	26	28	26	32	32
DL	920	185/70R14	26	27	28	32	32
GLE	920	185/70R14	27	27	28	32	32
GLT	920	185/60R15	26	27	28	32	32
COUPE	920	185/70R14	27	27	28	32	32
DIESEL	920	185/70R14	27	27	28	32	32
"SPACE SAVER SPARE"							
COUPE	185-14	35	36	36	36	36	36
"SPECIAL SPARE"							
ALL MODELS	185-14	36	36	36	36	36	36

* MAX 50 mph

VOLVO

130509



Left front door labels.

On the left front door are displayed several information labels for the driver's immediate attention.

Loads, catalytic converter warning, seating capacity and tire pressures 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.

MFD. BY VOLVO GOTENBURG SWEDEN.

GVWR	GAWR FRONT	LB.
	LB. GAWR REAR	LB.

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY AND BUMPER STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE

VEH IDENT NO. (VIN)

TYPE PASSENGER CAR

1244889

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

130505

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 red background.

In the upper right hand corner 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.

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

VEHICLE EMISSION CONTROL INFORMATION

THIS VEHICLE CONFORMS TO U.S.E.P.A. REGULATIONS APPLICABLE TO 1981 MODEL YEAR NEW MOTOR VEHICLES

CATALYST

VOLVO

1244891

130507

Catalytic converter label

Location:

Rear facing side of left front door.

Black text on red background.

SEATING CAPACITY				RECOMM COLD TIRE INFLATION PRESSURE PSI						
MODEL		FRONT	REAR	TOTAL	NORMAL SPEED		75 mph			
ALL MODELS		2	3	5						
					1 3 PERS		FULL LOAD			
MODEL		VEHICLE CAPACITY WEIGHT LBS		RECOMM TIRE SIZE	FRONT	REAR	FRONT	REAR		
2 4 DOOR SEDAN	DL	920		175 R14	26	27	26	32	30	36
				185 75 R14	26	28	26	32	26	32
	GL	920		185 70 R14	26	27	28	32	28	32
	GLE	920		185 70 R14	27	27	28	32	28	32
GLT		920		195 60 R15	26	27	28	32	28	32
COUPE		920		185/70 R14	27	27	28	32	28	32
DIESEL		920		185/70 R14	27	27	28	32	28	32
SPACE SAVER COUPE				165 14	36	36	36	36	**	**
SPECIAL SPARE ALL MODELS				165 14	36	36	36	36	**	**

* MAX 50 mph

VOLVO

1244885

VOLVO

1244885

Vehicle carrying capacity and tire information label

Location:

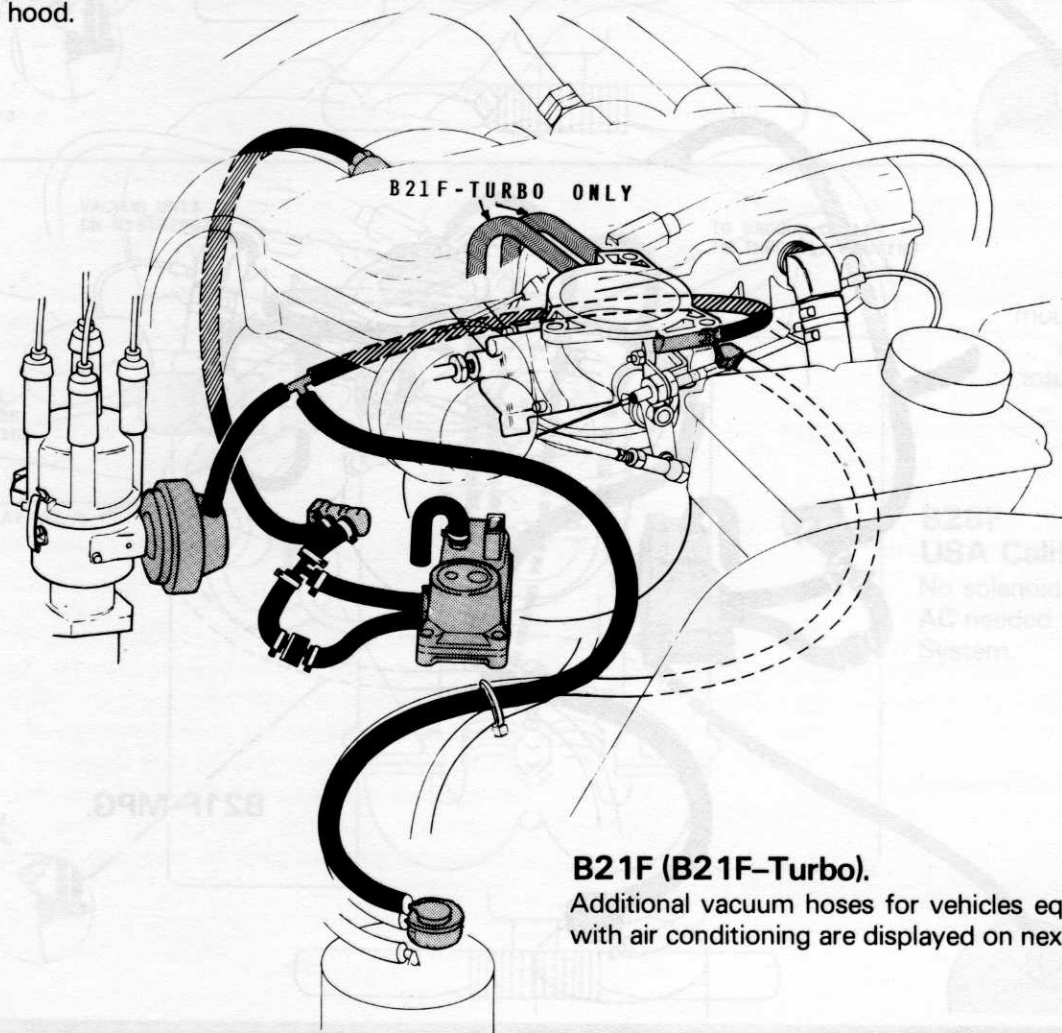
Rear facing end of left front door.

White text on red background.

130506

Routing of vacuum hoses

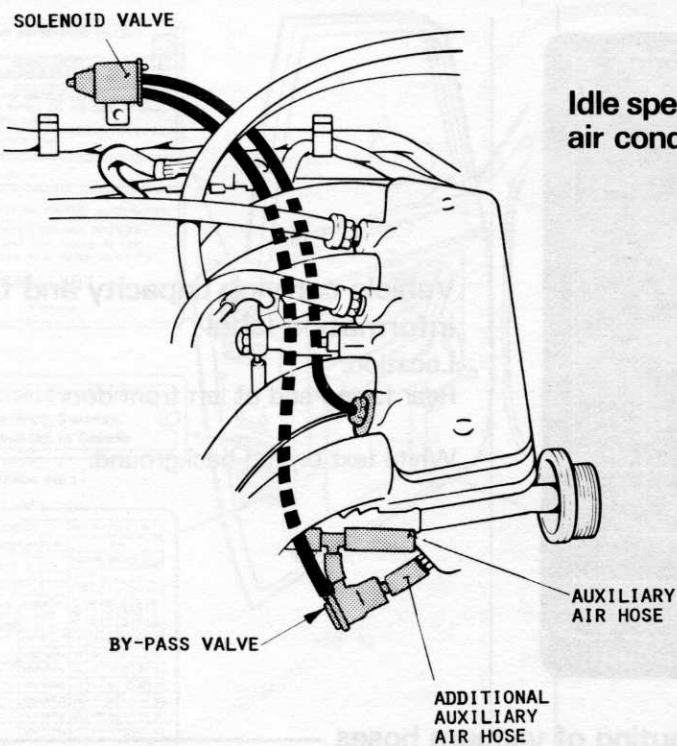
Corresponding information may be attached to the vehicle, in the form of labels attached to the underside of the hood.



B21F (B21F-Turbo).

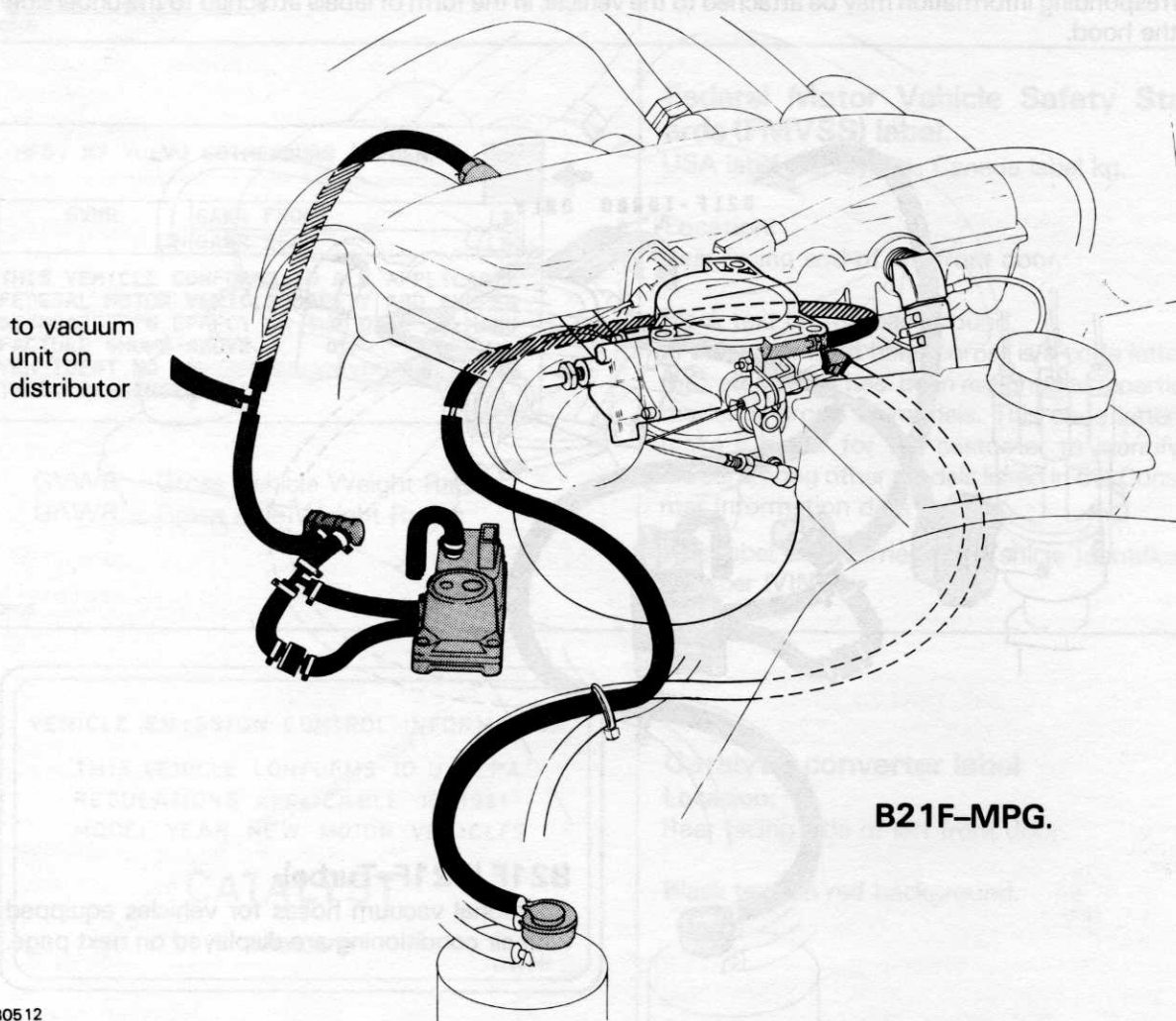
Additional vacuum hoses for vehicles equipped with air conditioning are displayed on next page.

130510

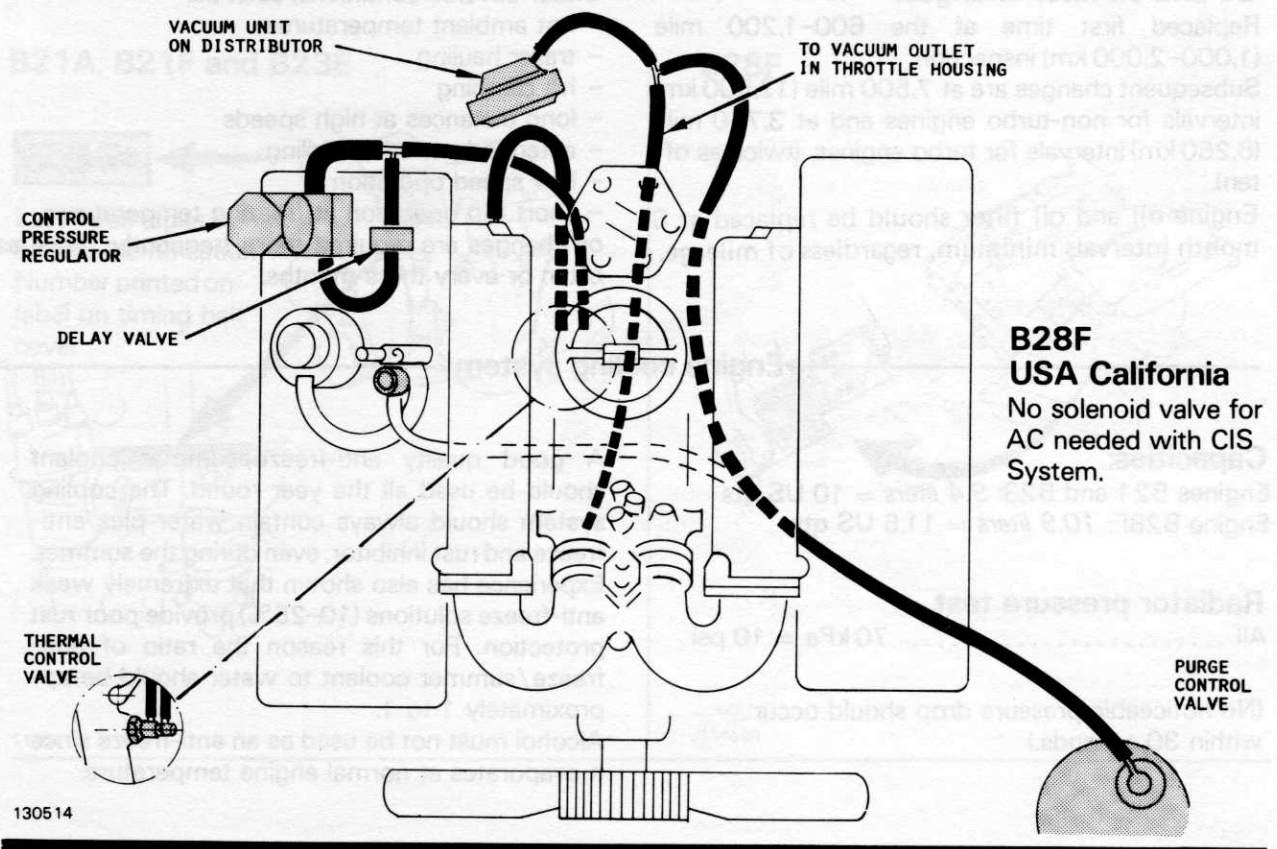
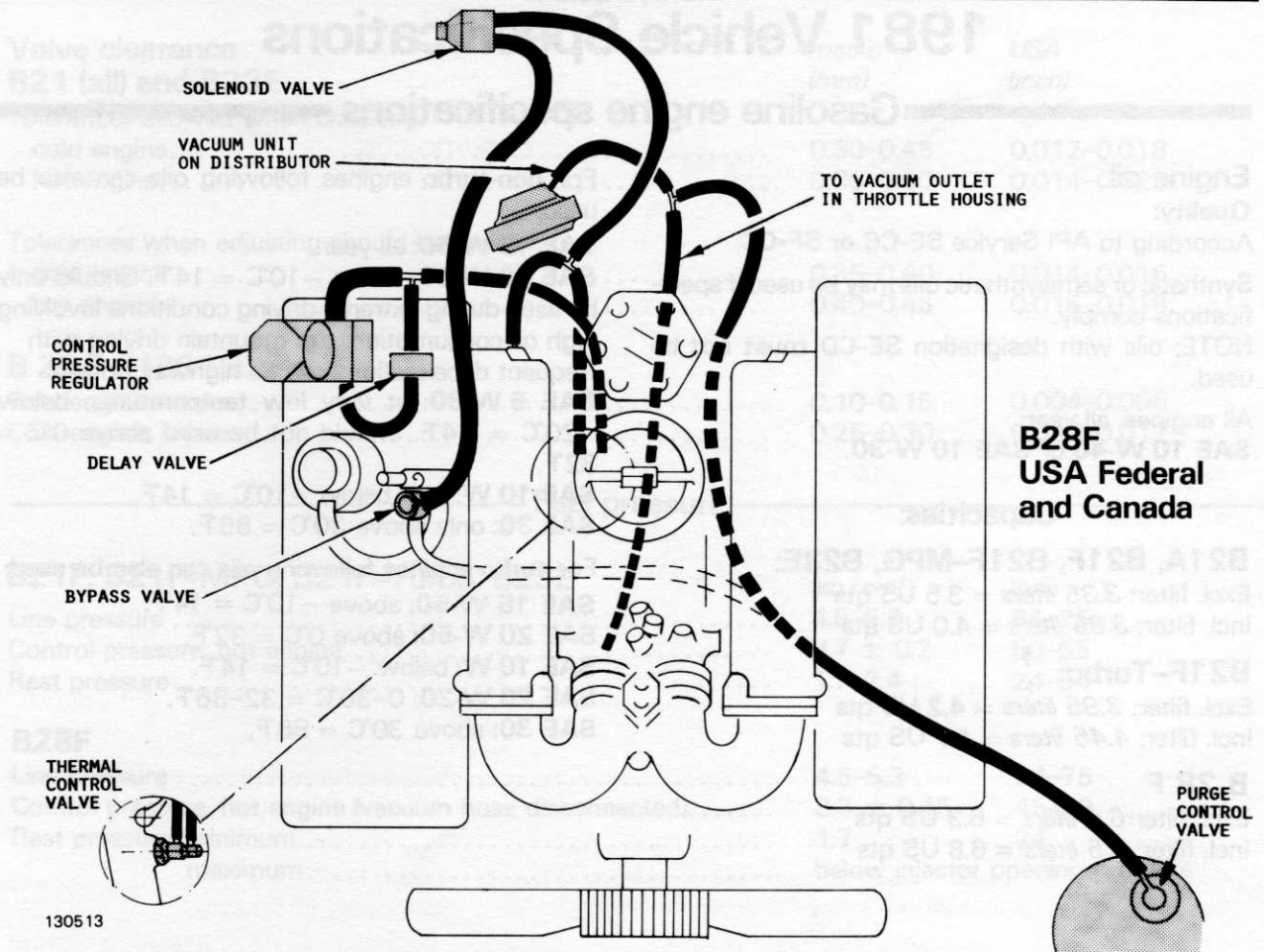


Idle speed compensation for B21F with air conditioning.

130511



130512



1981 Vehicle Specifications

Gasoline engine specifications

Engine oil

Quality:

According to API Service SE-CC or SF-CC.

Synthetic or semisynthetic oils may be used if specifications comply.

NOTE: oils with designation SE-CD **must not** be used.

All engines, all year:

SAE 10 W-40 or **SAE 10 W-30**.

Capacities:

B21A, B21F, B21F-MPG, B23E:

Excl. filter: *3.35 liters* = 3.5 US qts

Incl. filter: *3.85 liters* = 4.0 US qts

B21F-Turbo:

Excl. filter: *3.95 liters* = 4.2 US qts

Incl. filter: *4.45 liters* = 4.7 US qts

B 28 F

Excl. filter: *6.0 liters* = 6.3 US qts

Incl. filter: *6.5 liters* = 6.8 US qts

Oil and oil filter changes.

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

Subsequent changes are at 7,500 mile (12,500 km) intervals for non-turbo engines and at 3,750 mile (6,250 km) intervals for turbo engines (twice as often).

Engine oil and oil filter should be replaced at 6 month intervals minimum, regardless of mileage.

For **non-turbo** engines following oils can also be used:

SAE 15 W-50: all year.

SAE 20 W-50: above $-10^{\circ}\text{C} = 14^{\circ}\text{F}$. Should only be used during extreme driving conditions involving high oil consumption, e.g. mountain driving with frequent decelerations or fast highway driving.

SAE 5 W-30: at very low temperatures, below $-20^{\circ}\text{C} = -4^{\circ}\text{F}$. Should not be used above $0^{\circ}\text{C} = 32^{\circ}\text{F}$.

SAE 10 W: only below $-10^{\circ}\text{C} = 14^{\circ}\text{F}$.

SAE 30: only above $30^{\circ}\text{C} = 86^{\circ}\text{F}$.

For **turbo** engines following oils can also be used:

SAE 15 W-50: above $-10^{\circ}\text{C} = 14^{\circ}\text{F}$.

SAE 20 W-50: above $0^{\circ}\text{C} = 32^{\circ}\text{F}$.

SAE 10 W: below $-10^{\circ}\text{C} = 14^{\circ}\text{F}$.

SAE 20 W-20: $0-30^{\circ}\text{C} = 32-86^{\circ}\text{F}$.

SAE 30: above $30^{\circ}\text{C} = 86^{\circ}\text{F}$.

Under adverse conditions, such as:

- hot ambient temperatures
 - trailer hauling
 - hill climbing
 - long distances at high speeds
 - extended periods of idling
 - low speed operation
 - short trip operation at freezing temperatures
- oil changes are required more frequently; twice as often or every three months.

Engine cooling system

Capacities:

Engines B21 and B23: *9.4 liters* = 10 US qts

Engine B28F: *10.9 liters* = 11.5 US qts

Radiator pressure test

All 70 kPa = 10 psi

(No noticeable pressure drop should occur within 30 seconds.)

A good quality anti-freeze/summer coolant should be used all the year round. The cooling system should always contain water plus anti-freeze and rust inhibitor, even during the summer. Experience has also shown that extremely weak anti-freeze solutions (10-25%) provide poor rust protection. For this reason the ratio of anti-freeze/summer coolant to water should be approximately 1 to 1.

Alcohol must not be used as an anti-freeze since it evaporates at normal engine temperature.

Valve system

Valve clearance B21 (all) and B23E

Tolerances allowed when checking:

	metric (mm)	USA (inch)
cold engine.....	0.30-0.45	0.012-0.018
hot engine.....	0.35-0.50	0.014-0.020

Tolerances when adjusting should be kept within:

	metric (mm)	USA (inch)
cold engine.....	0.35-0.40	0.014-0.016
hot engine.....	0.40-0.45	0.016-0.018

B 28 F (1981 models)

Cold engine, intake	0.10-0.15	0.004-0.006
Cold engine, exhaust	0.25-0.30	0.010-0.012

Fuel pressure

B21F, B21F-MPG, B21F-Turbo, B23E

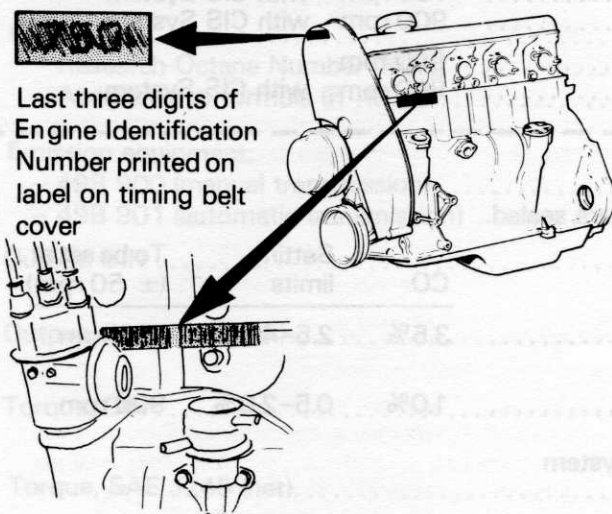
	(kp/cm ²)	(psi)
Line pressure	4.5-5.2	64-75
Control pressure, hot engine.....	3.7 ± 0.2	50-55
Rest pressure.....	1.7-2.4	24-34

B28F

Line pressure	4.5-5.3	64-75
Control pressure, hot engine (vacuum hose disconnected).....	3.3 ± 0.15	45-49
Rest pressure, minimum	1.7	24
maximum.....	below injector opening pressure	

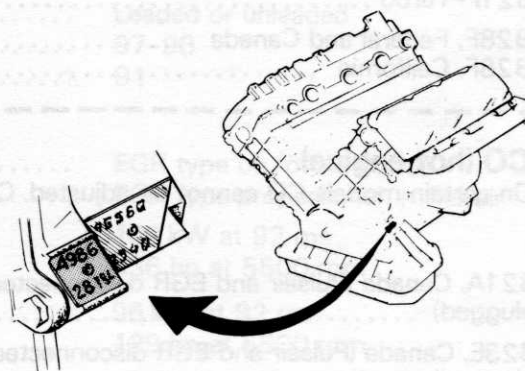
Engine Identification Number

B21A, B21F and B23E



114651

B28F



114690

Engine tuning specifications

Ignition timing

	Ignition timing (tolerance $\pm 2^\circ$)	To be set at speed (tolerance ± 50 rpm)
B21A, Canada	12°	750 rpm
B23E, Canada	5°	750 rpm
B21F, Federal	8°	750 rpm
B21F, California	8°	900 rpm
B21F-MPG	12°	750 rpm
B21F-Turbo	12°	900 rpm
B28F, Federal and Canada	10°	750 rpm
B28F, California	10°	900 rpm

Firing order:

B21 (all) and B23E:

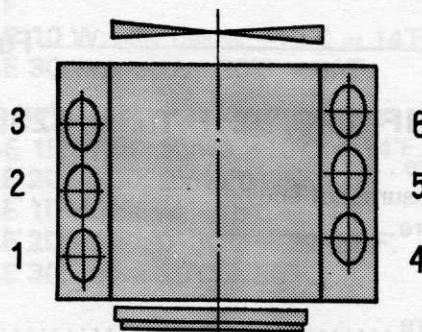
1-3-4-2

Cyl. 1 up front

B28F:

1-6-3-5-2-4

Cyl. numbering:



Engine idle speed

On certain models (with Constant Idle Speed System = CIS system) idle speed cannot be adjusted. Controls are sealed.

	Idle speed (tolerance ± 50 rpm)	
B21A, Canada	900 rpm	
B23E, Canada	900 rpm	
B21F, Federal	900 rpm	
B21F, California	900 rpm	with CIS System
B21F-MPG	750 rpm	with CIS System
B21F-Turbo	900 rpm	with CIS System
B28F, Federal and Canada	900 rpm	
B28F, California	900 rpm	with CIS System

CO (hot engine)

On certain models CO cannot be adjusted. Controls are sealed.

	CO	Setting limits	To be set at (± 50 rpm)
B21A, Canada (Pulsair and EGR disconnected and plugged)	3.5%	2.5-4.0%	900 rpm
B23E, Canada (Pulsair and EGR disconnected and plugged)	1.0%	0.5-2.0%	900 rpm

Following should be checked with Oxygen Sensor System (Lamba sond) disconnected. When the System is reconnected, CO should drop below 1.0%.

B21F, USA Federal/California	1.0%	0.7-1.3%	900 rpm
B21F-MPG	1.0%	0.7-1.3%	750 rpm
B21F-Turbo	1.0%	0.7-1.3%	900 rpm
B28F, Canada and USA Federal/California	1.0%	0.7-1.3%	900 rpm

Engines

B21A Canada

Engine Identification Number:

- B 21 A, manual transmission 498 914
- B 21 A, automatic transmission 498 915

Compression ratio 8.5:1

Gasoline Leaded or unleaded

- Research Octane Number (RON) 93
- According to formula $(R+M)/2$ 87

Emission equipment:

- 498 914 (manual transmission) EGR type on/off + Pulsair
- 498 915 (automatic transmission) EGR type proportional + Pulsair

Output, DIN 74 kW at 88 rps
100 hp at 5250 rpm

Output, SAE J245 (net) 72 kW at 88 rps
96 hp at 5250 rpm

Torque, DIN 169 Nm at 42 rps
17.2 kpm at 2500 rpm

Torque, SAE J245 (net) 163 Nm at 42 rps
121 ft. lbs. at 2500 rpm

Carburetor SU HIF 6

Ignition system w. breaker points

- Type Bosch SZ

B23E Canada

Engine Identification Number:

- B23E, manual transmission 498 900
- B23E, automatic transmission 498 901

Compression ratio 10:1

Gasoline Leaded or unleaded

- Research Octane Number (RON) 97-98
- According to formula $(R+M)/2$ 91

Emission equipment:

- 498 900 (manual transmission) EGR type on/off + Pulsair
- 498 901 (automatic transmission) EGR type proportional + Pulsair

Output, DIN 100 kW at 92 rps
136 hp at 5500 rpm

Output, SAE J245 (net) 96 kW at 92 rps
129 hp at 5500 rpm

Torque, DIN 190 Nm at 75 rps
19.4 kpm at 4500 rpm

Torque, SAE J245 (net) 183 Nm at 75 rps
135 ft. lbs. at 4500 rpm

Fuel injection system Bosch CI System

Ignition system w. breaker points

- Type Bosch TSZ-2

B21F USA Federal

Engine type	B21-5
- Camshaft type	B
- Camshaft, Volvo P/N	1219030
Engine Identification Number:	
- B21F, manual transmission	498 920
- B21F, automatic transmission	498 921
Compression ratio	9.3:1
Gasoline:	Unleaded
- Research Octane Number (= RON)	91
- Acc. to formula (R+M)/2	87
Emission equipment, all	Oxygen sensor system, catalytic converter
Output, DIN	83 kW at 92 rps 113 hp at 5500 rpm
Output, SAE J245 (net)	80 kW at 92 rps 107 hp at 5500 rpm
Torque, DIN	160 Nm at 42 rps 16.3 kpm at 2500 rpm
Torque, SAE J245 (net)	154 Nm at 42 rps 114 ft. lbs. at 2500 rpm
Fuel injection system	Bosch CI system
Ignition system	Breakerless
- Type	Bosch TSZ-2

B21F California

Engine type	B21-5
- Camshaft type	B
- Camshaft, Volvo P/N	1219030
Engine Identification Number:	
- B21F, manual transmission	498 892
- B21F, automatic transmission	498 893
Compression ratio	9.3:1
Gasoline	Unleaded
- Research Octane Number (= RON)	91
- Acc. to formula (R+M)/2	87
Emission equipment	Oxygen sensor system, catalytic converter, Constant Idle Speed System
Output, DIN	83 kW at 92 rps 113 hp at 5500 rpm
Output, SAE J245 (net)	80 kW at 92 rps 107 hp at 5500 rpm
Torque, DIN	160 Nm at 42 rps 16.3 kpm at 2500 rpm
Torque, SAE J245 (net)	154 Nm at 42 rps 114 ft. lbs. at 2500 rpm
Fuel injection system	Bosch CI System
Ignition system	Breakerless
- Type	Bosch TSZ-2

B21F-MPG

USA/Federal and California

Engine type	B21-9
- Camshaft type	A
- Camshaft, Volvo P/N	1306887
Engine Identification Number:	
- B21F, manual transmission	498 896
- B21F, automatic transmission	498 897
Compression ratio	9.3:1
Gasoline	Unleaded
- Research Octane Number (= RON)	91
- Acc. to formula (R+M)/2	87
Emission equipment	Oxygen sensor system, catalytic converter, Constant Idle Speed System
Output, DIN	77 kW at 83 rps 105 hp at 5000 rpm
Output, SAE J245 (net)	74 kW at 83 rps 99 hp at 5000 rpm
Torque, DIN	160 Nm at 50 rps 16.3 kpm at 3000 rpm
Torque, SAE J245 (net)	154 Nm at 50 rps 114 ft. lbs. at 3000 rpm
Fuel injection system	Bosch CI System
Ignition system	Breakerless electronic
- Type	Volvo

B21F-Turbo

USA/Federal and California

Engine Identification Number:	
B21F-Turbo, manual transmission	498 898
Compression ratio	7.5
Gasoline	Unleaded
- Research Octane Number (= RON)	91
- Acc. 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
Output, SAE J245 (net)	93 kW at 90 rps 126 hp at 5400 rpm
Torque, DIN	210 Nm at 63 rps 21.4 kpm at 3750 rpm
Torque, SAE J245 (net)	200 Nm at 63 rps 150 ft. lbs. at 3750 rpm
Fuel injection system	Bosch CI System
Ignition system	Breakerless
- Type	Bosch TSZ-2

B28F

USA/Federal and Canada

Engine Identification Number:

- Manual transmission	498 640
- Automatic transmission	498 641
Compression ratio	8.8:1
Gasoline	Unleaded
- Research Octane Number (= RON)	91
- Acc. to formula (R+M)/2	87
Emission equipment	Oxygen sensor system, catalytic converter
Output, DIN	100 kW at 92 rps 136 hp at 5500 rpm
Output, SAE J245 (net)	97 kW at 92 rps 130 hp at 5500 rpm
Torque, DIN	215 Nm at 46 rps 21.9 kpm at 2750 rpm
Torque, SAE J245 (net)	208 Nm at 46 rps 153 ft. lbs. at 2750 rpm
Fuel injection system	Bosch CI System
Ignition system	Breakerless
- Type	Bosch TSZ-4

B28F

California

Engine Identification Number:

- Manual transmission	498 638
- Automatic transmission	498 639
Compression ratio	8.8:1
Gasoline	Unleaded
- Research Octane Number (= RON)	91
- Acc. to formula (R+M)/2	87
Emission equipment	Oxygen sensor system, catalytic converter, Constant Idle Speed System
Output, DIN	100 kW at 92 rps 136 hp at 5500 rpm
Output, SAE J245 (net)	97 kW at 92 rps 130 hp at 5500 rpm
Torque, DIN	215 Nm at 46 rps 21.9 kpm at 2750 rpm
Torque, SAE J245 (net)	208 Nm at 46 rpm 153 ft. lbs. at 2750 rpm
Fuel injection system	Bosch CI System
Ignition system	Breakerless
- Type	Bosch TSZ-4

Electrical

Battery

Voltage	12.0 V
Starting voltage	9.5 V
Specific gravity of electrolyte:	
Fully charged	1.28
Recharge at	1.21

Distributor, B 21 A/Canada

Dwell angle	62° ± 3°
-------------------	----------

Spark plugs

NOTE:

Spark plugs must be tightened to specified torque for proper operation and to avoid damage to threads.

Spark plug removal and installation must be performed when engine is cold (low reading on temperature gauge).

B 21 A	Volvo P/N 273592-6 (set of four) or Bosch W7DC
Gap	0.7-0.8 mm = 0.028-0.032"
Torque (plug threads not oiled)	20-30 Nm = 15-18 ft. lbs.
B 23 E	Volvo P/N 273591-8 (set of four) or Bosch W6DC
Gap	0.7-0.8 mm = 0.028-0.032"
Torque (plug threads not oiled)	20-30 Nm = 15-18 ft. lbs.
B 21 F, B 21 F-MPG, B 21 F-Turbo	"Super" spark plug Volvo P/N 273594-2 (set of four) or Bosch WR7DS
Gap	0.7-0.8 mm = 0.028-0.032"
Torque (plug threads not oiled)	20-30 Nm = 15-22 ft. lbs.
B 28 F	"Super" spark plug Volvo P/N 273593-4 (set of six) or Bosch HR6DS
Gap	0.7-0.8 mm = 0.028-0.032"
Torque (plug threads not lubricated)	10-14 Nm = 7-10 ft. lbs.

Transmission, rear axle

Clutch

Clutch fork play

B21A, B21F and B23E	3-4 mm = 0.12-0.16"
B21F-Turbo	1-3 mm = 5/64" negative play
B28F	No play, no adjustment

Manual transmission

Manual 4-speed transmission, M45

Capacity: 0.75 liters = 0.8 US qt.

Fluid type: Automatic transmission Fluid type F or G (FLM).

Replace: at the 600-1200 mile
(1 000-2 000 km) service only.

The oil level should be up to the filler plug hole. Drain the oil while it is still hot from driving by removing the drain plug.

Manual 4-speed transmission with overdrive, M46

Capacity: 2.3 liters = 2.4 US qts.

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

Replace: at the 600- 1200 mile
(1 000-2 000 km) service only.

The oil level should be up to the filler plug hole. Transmission and overdrive are lubricated by the same oil. Therefore, when the oil is drained, remove cover on overdrive and clean strainer. Drain the oil while it is still hot from driving by removing the drain plug.

Automatic transmission

AW55/BW55

Capacity: 6.75 liters = 7.3 US qts.

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

Replace: no fluid changes necessary under normal driving conditions.

Driving under adverse conditions such as trailer hauling, driving long distances at high speeds etc. should have the oil changed every 30,000 miles (50,000 km). If an additional oil cooler has been installed this oil change is not necessary.

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.

Shift speeds, AW55/BW55 and engine B21 (all) and B23E

	km/h	mph
Kick-down upshift 1-2, 5200 engine rpm	55-70	35-44
Kick-down upshift 2-3, 5400 engine rpm	100-115	62-71
Kick-down downshift 3-2.	min. 90	min. 56
Kick-down downshift 3-1	35-55	22-35

Shift speeds, BW 55 and engine B 28 F

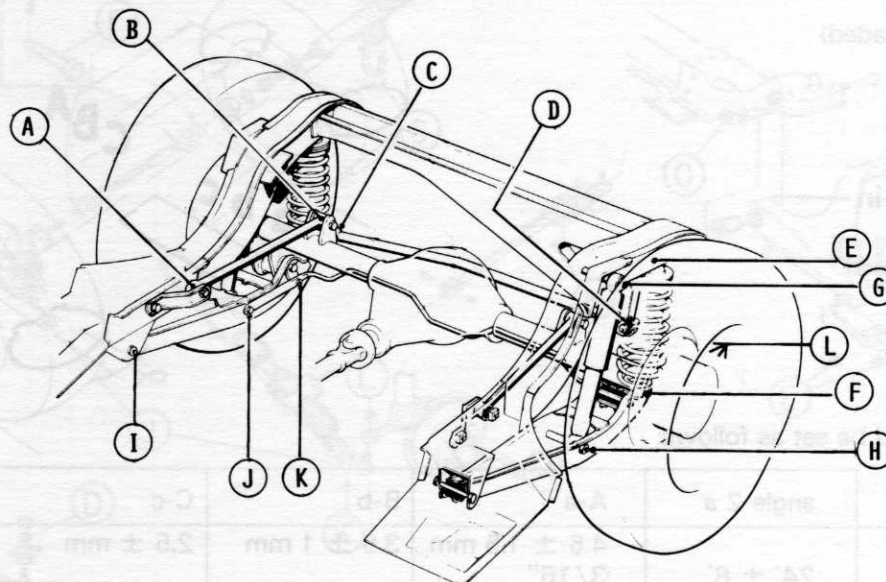
Kick-down upshift 1-2	65-80	39-48
Kick-down upshift 2-3	110-130	66-78
Kick-down downshift 3-1.	40-58	24-35
Kick-down downshift 3-2.	min. 105	min. 63
When manually shifting into first gear, 2-1 downshift is obtained at	40-58	24-35

Rear axle

Capacity: 1.6 liters = 1.7 US qts.
Fluid type: API GL-5 (MIL-L-2105 B or C).
Viscosity: SAE 90
Replace: between first 600-1200 miles only.

The oil level should be up to the filler plug hole. Drain rear axle oil by removing drain plug. 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.

Rear end torques



130515

	Nm	ft. lbs.
Reaction rod:		
A Body attachment	85	62
B Rear axle attachment	85	62
Track rod (Panhard rod):		
C Rear axle attachment	60	44
D Body attachment	85	62
Rear spring:		
E Upper attachment	45	32
F Lower attachment	19	14
Shock absorber:		
G Upper attachment	85	62
H Lower attachment	85	62
Trailing arm:		
I Body attachment	115	85
F Rear attachment (= spring lower attachment)	19	14
Stabilizer:		
J Front attachment (= shock absorber)	85	62
K Rear attachment	45	32
Wheels:		
L Nuts, tightened criss-cross	115	85

Brakes

Brake fluid

Fluid type: DOT 4

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

Check (without removing the cap) that the level is above the "MIN" mark of the fluid reservoir.

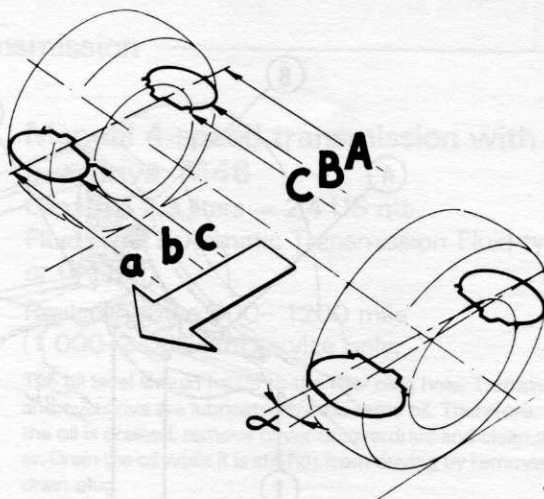
Change brake fluid every year when the car has been driven under extremely hard conditions: mountain driving etc., and if the vehicle is equipped with an air dam.

Front end

Alignment

(vehicles unloaded)

Toe-in



Toe-in should be set as follows:

VOLVO
112 486

	angle 2 a	A-a	B-b	C-c
Manual steering	24' ± 8'	4.5 ± 1.5 mm 3/16" (0.18 ± 0.06")	3.5 ± 1 mm (0.14 ± 0.04")	2.5 ± mm (0.10 ± 0.04")
Power steering	16' + 8'	3.0 ± 1.5 mm 1/8" (0.12 ± 0.06")	2.0 ± 1 mm (0.08 ± 0.04")	1.5 ± 1 mm (0.06 ± 0.04")

Vehicle should not be loaded. Measurements 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.

Camber, caster

Caster (not to exceed 1/2° difference between sides)

- manual steering + 2° to + 3°
- power steering + 3° to + 4°

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

- all, except GLT +1° to +1 1/2°
- GLT +1/4° to +3/4°

(Reduce camber if excessive wear on tire outer shoulder is observed)

Power steering

Fluid type: ATF

Replace: no fluid change required.

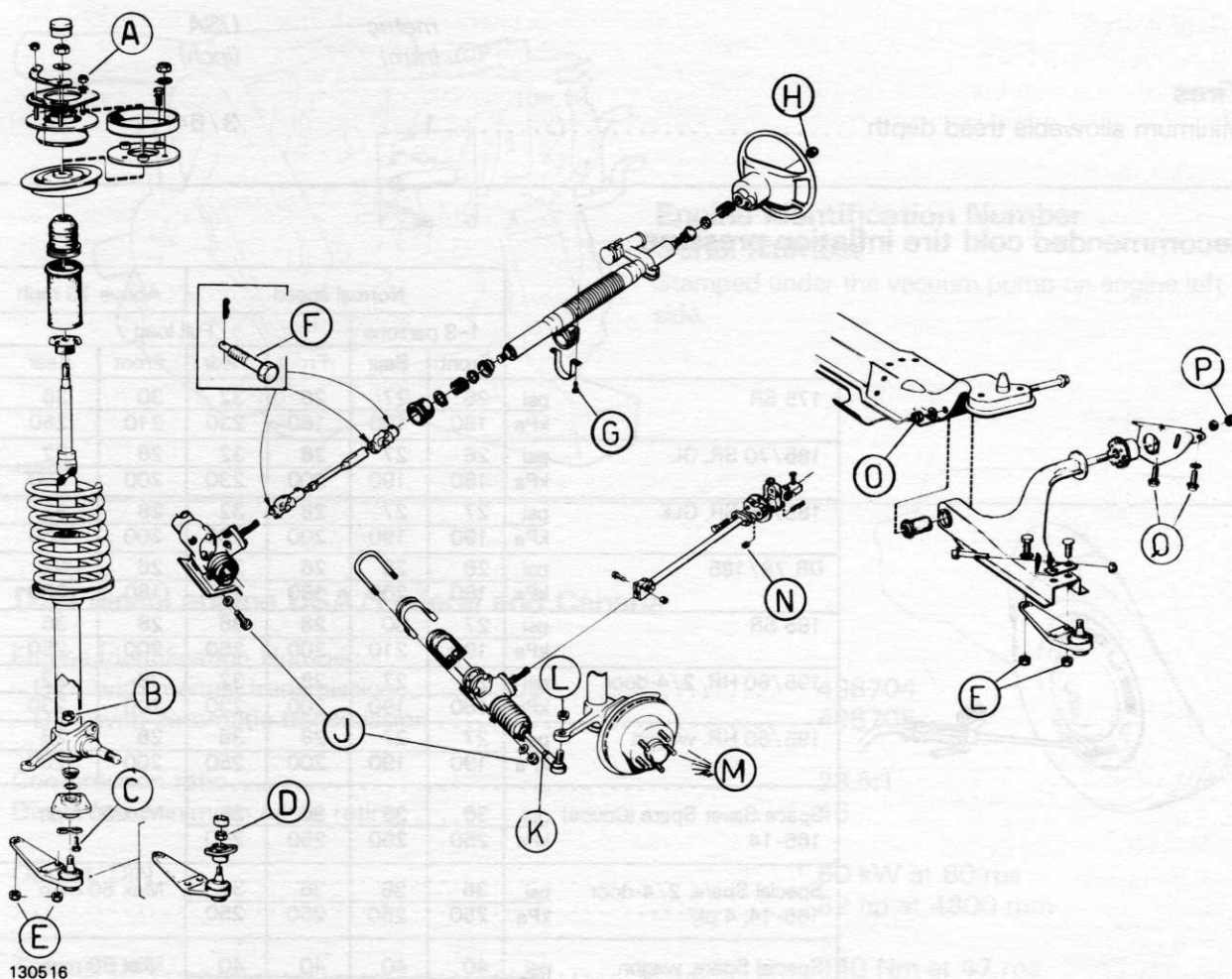
Capacities:

B21 (all) and B23E: 0.7 liters = 0.8 US qts.

B 28 F: 1.2 liters = 1.3 US qts

Check fluid level with engine idling while the fluid is still hot from driving. Wipe the reservoir clean. The fluid level should be within the markings on the dipstick which is attached to the cover.

FRONT END TORQUES



	Nm	Ft.lbs.
A Nuts for upper journaling	20	14
B Ball joint nut in strut (early prod.)	60	43
C Ball joint bolts	23	17
D Ball joint nut (late prod.)	60	43
E Nuts, ball joint to control arm	115	85
F Bolts for steering shaft joints	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

Wheels

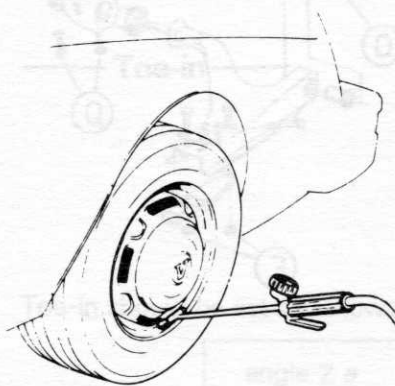
Tires

Minimum allowable tread depth 1 3/64

metric
(mm)

USA
(inch)

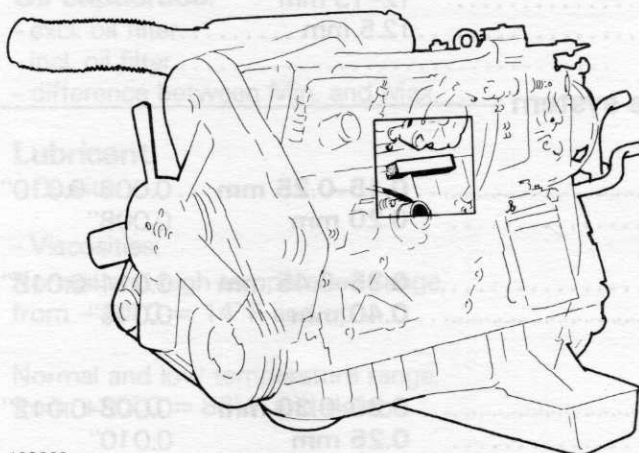
Recommended cold tire inflation pressure.



		Normal speed				Above 75 mph	
		1-3 persons		Full load			
		Front	Rear	Front	Rear	Front	Rear
175 SR	psi	26	27	26	32	30	36
	kPa	180	190	180	230	210	250
185/70 SR, GL	psi	26	27	28	32	28	32
	kPa	180	190	200	230	200	230
185/70 SR, GLE	psi	27	27	28	32	28	32
	kPa	190	190	200	230	200	230
DR 78/185	psi	26	28	26	32	26	32
	kPa	180	200	180	230	180	230
185 SR	psi	27	30	28	36	28	36
	kPa	190	210	200	250	200	250
195/60 HR, 2/4-door	psi	26	27	28	32	28	32
	kPa	180	190	200	230	200	230
195/60 HR, wagon	psi	27	27	28	36	28	36
	kPa	190	190	200	250	200	250
Space Saver Spare (Coupe) 165-14	psi	36	36	36	36	Max 50 mph	
	kPa	250	250	250	250		
Special Spare, 2/4-door 165-14, 4 ply	psi	36	36	36	36	Max 50 mph	
	kPa	250	250	250	250		
Special Spare, wagon 175-14, 8 ply	psi	40	40	40	40	Max 50 mph	
	kPa	280	280	280	280		

For driving with full load, speed must be limited to 75 mph = 120 km/h.
50 mph = 80 km/h is max speed for Space Saver Spare and Special Spare.

Diesel engine specifications



128669

Engine Identification Number Serial Number

Stamped under the vacuum pump on engine left side.

D24 diesel engine USA/Federal and Canada

Engine Identification Number:

- D24 with manual transmission	498704
- D24 with automatic transmission	498705

Compression ratio..... 23.5:1

Diesel fuel minimum cetan rating..... 45

Output, DIN 60 kW at 80 rps
82 hp at 4800 rpm

Torque, DIN 140 Nm at 47 rps
14.3 kpm at 2800 rpm

Cylinders..... 6
Firing order..... 1-5-3-6-2-4

Displacement 2.383 liters = 145 cu.in.

Cylinder bore 76.5 mm = 3.0118"

Stroke 86.4 mm = 3.4016"

Compression pressures:

- New engine	3.4 MPa = 485 psi
- Minimum	2.8 MPa = 400 psi
- Max difference between cylinders	0.5 MPa = 70 psi

Gear belts

Belt tension (check with tool 5197)

- | | |
|-----------------------------|----------|
| - Value when checking | 12-13 mm |
| - Value when setting | 12.5 mm |

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 | 0.010" |
| – Exhaust valve, checking | 0.40–0.50 mm | 0.016–0.020" |
| setting | 0.45 mm | 0.018" |

Adjusting disc thicknesses..... **3.30 to 4.25 mm in increments of 0.05 mm**
0.1299" to 0.1673" in increments of 0.0020"

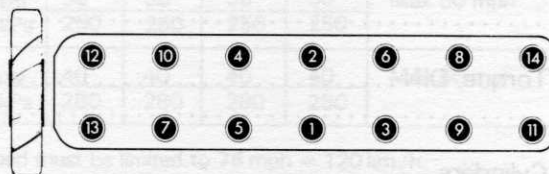
Tightening torques

Cylinder head bolts

After driving 1000–2000 km = 600–1,200 miles, bolt torque should be checked with warm engine. Apply torque wrench and torque to:
85 Nm = 62 ft.lbs.

Cylinder head bolts should NOT be loosened before re-torquing.

Tightening sequence for cylinder head bolts.



129149

	<i>Nm</i>	<i>ft.lbs.</i>
Crankshaft pulley (vibration damper):		
– Center bolt, with wrench 5188	350	255
– Center bolt, torque wrench	450	330
NOTE:		
<i>Sealing fluid, Volvo P/N 277961-9, should be applied to bolt threads and bolt head contact surface. Note difference in torque when using special tool 5188 and an ordinary torque wrench.</i>		
– Inhex screws	20	15
Flywheel bolts (use new bolts and sealing fluid, Volvo P/N 277961-9)	75	55
Camshaft gears:		
– front	45	33
– rear	100	73
Camshaft bearing cap nuts	20	15

Engine lubricating system

Oil capacities:

- excl. oil filter	6.2 liters	=6.6 US qts
- incl. oil filter	7.0 liters	=7.4 US qts
- difference between Min. and Max.	1.0 liters	=1 US qt

Lubricant:

- Quality	API Service SE/CC
-----------------	-------------------

- Viscosities:

Normal and high temperature range, from -10° C = 14° F and up	SAE 15W/50 or 20W/50
--	----------------------

Normal and low temperature range, from +30° C = 86° F and down	SAE 10W/40 or 10W/30
---	----------------------

Oil pressure at an oil temperature of +80° C = 175° F and 2000 rpm, minimum	200 kPa	28 psi
--	---------	--------

Oil pressure sender

Oil pressure warning light goes out at	15-45 kPa	2-6 psi
--	-----------	---------

Oil pump

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

Fuel system

General

Injection sequence.....	1-5-3-6-2-4	
Low idle	12.5 rps	= 750 rpm
High idle	87 rps	= 5200 rpm

Fuel

Standards	ASTM-D 975-No 2D DIN 51601 CEC-ERF-DI
-----------------	---

Cetan rating, minimum	45
Sulphur content, max. weight proportion	0.5 %

Injection pump

Injection timing (distributor plunger stroke at top dead center) - when checking	0.65-0.73 mm	0.0256-0.0287"
- when setting	0.70 mm	0.02"

Injectors

Injector opening pressure:		
- when checking	12-13 MPa	1700-1845 psi
- when setting	12.5-13.5 MPa	1775-1920 psi

Tightening torques

	Nm	ft.lbs.
Injector to cylinder head	70	50
Injector top to bottom	70	50
Gear on injection pump	45	33
Delivery pipes	25	18

Cooling system

General

Capacity:

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

Expansion tank

Pressure valve in cap opens at:

- overpressure **65-85 kPa** 9-12 psi
- vacuum **7 kPa** 1 psi

Thermostat

- Marking **87° C**
- Starts to open at **87° C** 186° F
- Fully open at **102° C** 236° F
- Slit opening **8 mm** 5/16"

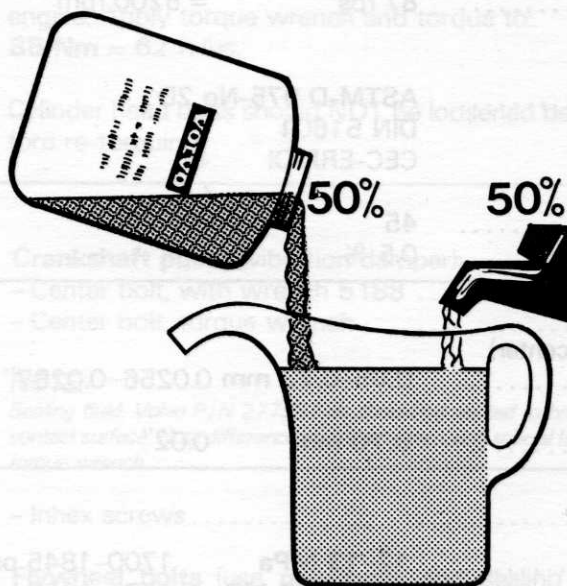
Fan belt

- Designation **HC 38x800**
- Volvo P/N (kit, containing two belts) **958347**

Tightening torques

- | | <i>Nm</i> | <i>ft. lbs.</i> |
|--|-----------|-----------------|
| Fan to hub | 9 Nm | 6.5 ft.lbs. |
| Cap nuts for oil pipes at oil cooler | 30 Nm | 22 ft.lbs. |
| Oil cooler connections | 6 Nm | 4.5 ft.lbs. |
- (Hold oil cooler connections when tightening oil pipe cap nuts)

Coolant



A new type coolant has been introduced for the Volvo diesel engines. It has a special chemical composition and is marked **BLUE**.

Only coolant supplied from Volvo under the following Part Numbers must be used:

- 1 kg can P/N 1188500-1
- 5 kg can P/N 1188501-9

Different types of coolant must not be mixed. The cooling system must be flushed when changing to the new coolant.

- DO NOT use water alone. Use Volvo coolant, mixed with equal amount of **clean** water.
- Replace coolant every third Fall or according to Maintenance Program. The coolant loses the protective properties after being used for a certain time.

Section 1: Maintenance

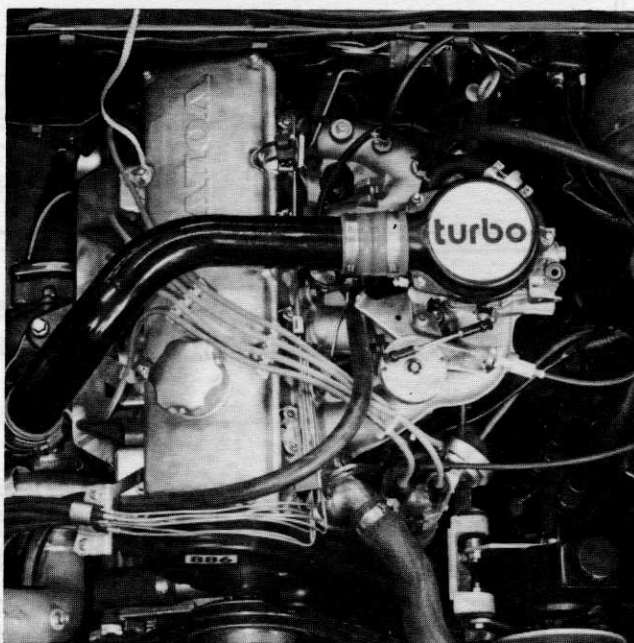
New Manuals:

Pre-Delivery Service, 1981 Models with gasoline engines.
TP 30310.

600-1,200 Mile Maintenance Service, 1981 models with gasoline engines.
TP 30311.

7,500 Mile Maintenance Service, 1981 models with gasoline engines.
TP 30312.

Important changes to Maintenance Manuals:

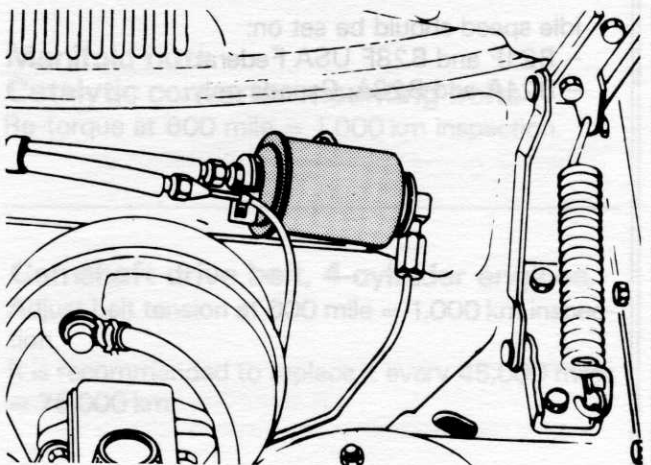


130662

Information changes because of new equipment:

New engines:

- B21F-Turbo
- B21F-MPG
- B23E (Canada)



130661

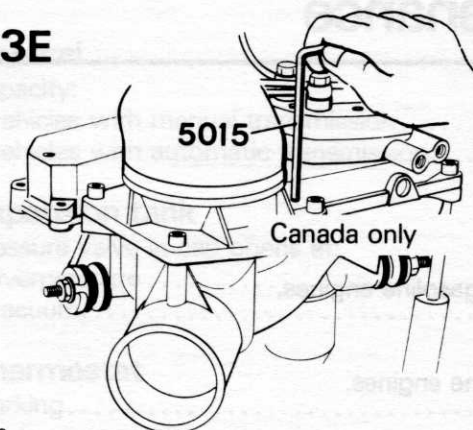
Information changes because of changes to service intervals:

Example:

- Fuel filter change at 45,000 miles = 75,000 km.

Previously 15,000 miles = 25,000 km.

B23E



130520

CO

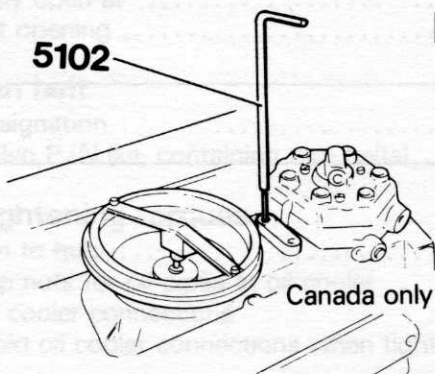
For USA vehicles (Federal and California), no CO setting should be made. CO adjustment points are plugged and CO can be adjusted only after removing plug.

Thus all procedures regarding check of CO, setting of CO and balance are eliminated.

For Canada, CO setting is performed as before.

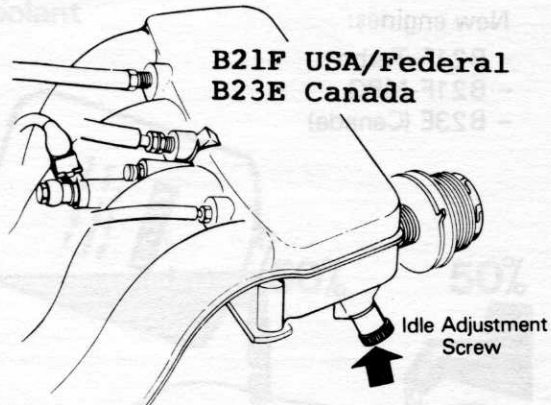
5102

B 28 F



130521

B21F USA/Federal
B23E Canada



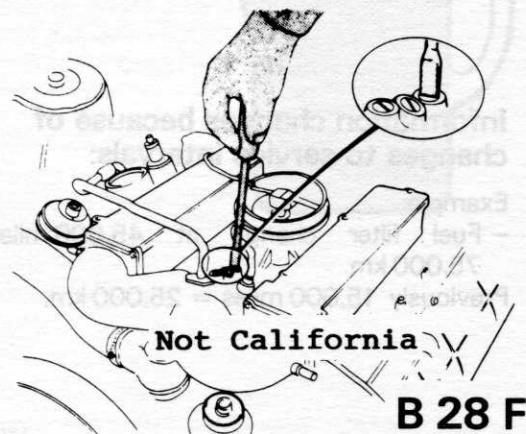
130522

Idle speed.

Idle speed setting is deleted on several engines. These are equipped with Constant Idle Speed (CIS) System.

Idle speed should be set on:

- B21F and B28F USA Federal.
- B21A and B23A, Canada only.



130523

Summary of 600-1,200 and 7,500 mile maintenance inspections

(Also see "Special for Canada")

Emission systems

Engine oil and filter.

Except Turbo:

Replace at 600 mile = 1,000 km inspection and every 7,500 miles = 12,500 km. Minimum every sixth month.

Turbo:

Replace at 600 mile = 1,000 km inspection and every 3,750 miles = 6,250 km. Minimum every sixth month.

Driving under adverse conditions may require oil and filter changes more frequently.

Cooling system hoses.

Engine drive belts.

Check at 600 mile = 1,000 km inspection and every 30,000 miles.

Air cleaner filter.

Replace every 30,000 miles = 50,000 km.

Vacuum hoses, fittings and connections. Fuel system cap, tank, lines and connections.

Check at 600 mile = 1,000 km inspection.

Manifold nuts.

Catalytic converter mounting bolts.

Re-torque at 600 mile = 1,000 km inspection.

Camshaft drive belt, 4-cylinder engines.

Adjust belt tension at 600 mile = 1,000 km inspection.

It is recommended to replace it every 45,000 miles = 75,000 km.

Valve clearance.

Adjust every 30,000 miles = 50,000 km.

Oxygen sensor (Lambda Sond).

Replace every 30,000 miles = 50,000 km. Reset service indication light on dashboard.

Manual transmission oil.

Rear axle oil.

Replace at 600 mile = 1,000 km inspection and check level and for leaks every 15,000 miles = 25,000 km.

Spark plugs.

Replace every 30,000 miles = 50,000 km.

Ignition timing.

Check at 600 mile = 1,000 km inspection.

Idle rpm.

Models with Constant Idle Speed System are sealed and cannot be adjusted.

Other models should have idle rpm checked at 600 mile = 1,000 km inspection and every 15,000 miles = 25,000 km.

Automatic transmission oil.

Inspect oil level at 600 mile = 1,000 mile inspection and every 15,000 miles = 25,000 km.

For cars used for hard driving or hilly terrain etc, change oil every 30,000 miles = 50,000 km. If the vehicle is equipped with extra oil cooler, this requirement can be deleted.

Miscellaneous maintenance

(Most items should be checked also at the 600-1,200 mile = 1,000-2,000 km "warranty inspection").

Fuel line filter.

Fulfills the 50,000 mile = 80,000 km replacement requirement. It is recommended to replace it at the major 45,000 mile = 75,000 km service interval. More frequently if fuel is dirty.

Fuel tank filter.

Replace every 60,000 miles = 100,00 km.

Engine coolant.

Every 30,000 miles = 50,000 km or every second year, the cooling system should be drained, flushed and refilled. 50/50 solution of water and good quality antifreeze/summer coolant should be used.

Crankcase ventilation.

Clean nipple (orifice) every 60,000 miles = 100,00 km.
Check rubber hoses for damage and deterioration.

Brakes.

Every 7,500 miles = 12,500 km:

- Check hoses, lines and parking brake.

Every 15,000 miles = 25,000 km:

- Check brake pad thickness.

Every 45,000 miles = 75,000 km:

- Replace brake fluid.

Vehicles equipped with air dam:

- Replace brake fluid every 15,000 miles = 25,000 km.

Steering and wheels.

Every 7,500 miles = 12,500 km:

- Check tire wear (align front end if necessary).
- Check wheel bearing play.
- Check front shock absorbers and springs.
- Check control arms, steering rods, ball joints, steering gear etc.
- Check power steering fluid.

Body.

Every 7,500 miles = 12,500 km:

- Lubricate hinges for hood, trunk lid, doors etc.

Special for Canada

CO

Check/adjust CO every 15,000 miles = 25,000 km.

Spark plugs.

Replace every 15,000 miles = 25,000 km.

Crankcase ventilation.

Check every 15,000 miles = 25,000 km.

Choke and fast idle (B21A).

Check every 7,500 miles 12,500 km.

Carburetor damper oil level (B21A).

Check/adjust oil level every 7,500 miles = 12,500 km.

Breaker points, dwell angle. (B21A).

Check/adjust every 7,500 miles = 12,500 km:

Fuel pump strainer.

Clean every 30,000 miles = 50,000 km. More often if fuel is dirty and/or contaminated with water.

Section 2: Engine

Engines

B21, general.

Gasoline in-line 4-cylinder engine with overhead valve arrangement.

Several versions have been derived from the basic B21, as noted below.

B21A.

For Canada only. With carburetor and leaded/unleaded fuel.

Emission systems: EGR type "on/off" or "proportional" in combination with Pulsair air injection system.

B21F, USA Federal and California.

With Continuous Injection fuel injection system (CI). Unleaded fuel is required because of emission system.

California models equipped with Constant Idle Speed (CIS) System.

Emission system: Lambda-sond (= oxygen sensor feedback system) in combination with 3-way catalytic converter.

Two additional versions of the B21F engine have been developed, which share many of the features of the original engine: B21F-MPG and B21F-Turbo, below.

B21F-MPG.

Equipped with an electronic spark control system. This engine is used in combination with a low rear axle ratio of 3.54 to provide improved gas mileage.

B21F-Turbo.

Equipped with an exhaust driven turbo-compressor to improve performance and fuel economy.

B23E, Canada only.

Essentially a B21 engine with increased displacement and compression. The same CI fuel injection system as for B21F is used. Many specifications are the same as for B21F.

Emission system: EGR type "on/off" or "proportional" in combination with Pulsair air injection system.

B28F, USA and Canada.

Gasoline, V-6 engine with overhead valve system. Equipped with Continuous Injection fuel injection system (CI). Unleaded fuel only.

The same specifications apply for USA/Federal, California and Canada with the exception that California vehicles are equipped with Constant Idle Speed (CIS) System.

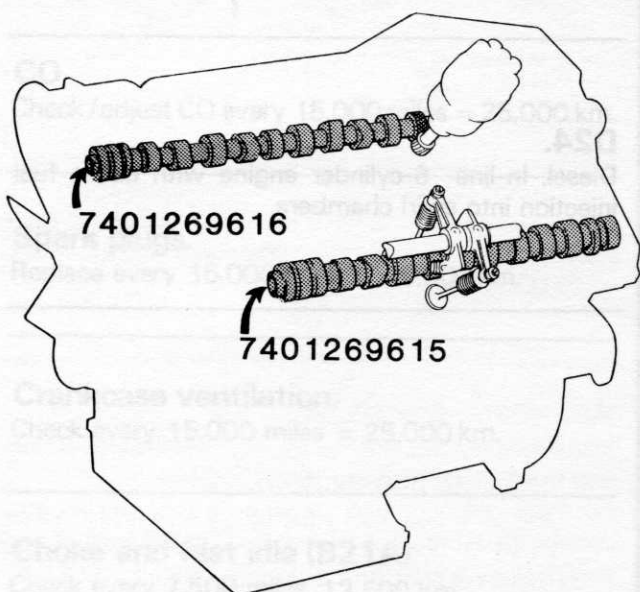
Emission system: Lambda-sond (oxygen sensor feedback system) in combination with 3-way catalytic converter.

D24.

Diesel. In-line- 6-cylinder engine with direct fuel injection into swirl chambers.

Summary of engine new features

B21A Canada B23E Canada B21F Federal B21F California B21F-Turbo B21F-MPG B28F Federal and Canada B28F California								
					Feature		Reference	
X			X		X	X	Camshafts New Engine B23E New Engine B21F-Turbo New engine B21F-MPG	21A 21B 21C 21D
X	X	X	X	X			Crankcase ventilation, 4-cyl. A-engine Crankcase ventilation, 4-cyl. E- and F-engines	22A 22B
	X	X	X	X	X	X	Increased capacity fuel filter CO-adjustment sealed Electronic module for Lambda-sond System	23A 23B 23C
	X	X		X			Acceleration enrichment Warm start enrichment Location of frequency valve	23D 23E 23F
		X	X	X		X	Constant Idle Speed (CIS) System	23G



B28F

21 A

Camshafts.

Part Number:

- Left side: 1269615-9
- Right side: 1269616-7

Also valve clearances have been changed.

Cold engine:

- Intake: **0.10-0.15 mm** = 0.004-0.006"
- Exhaust: **0.25-0.30 mm** = 0.010-0.012"

If a set of these camshafts is installed in a 1980 B28F engine, the new valve clearances must be used.

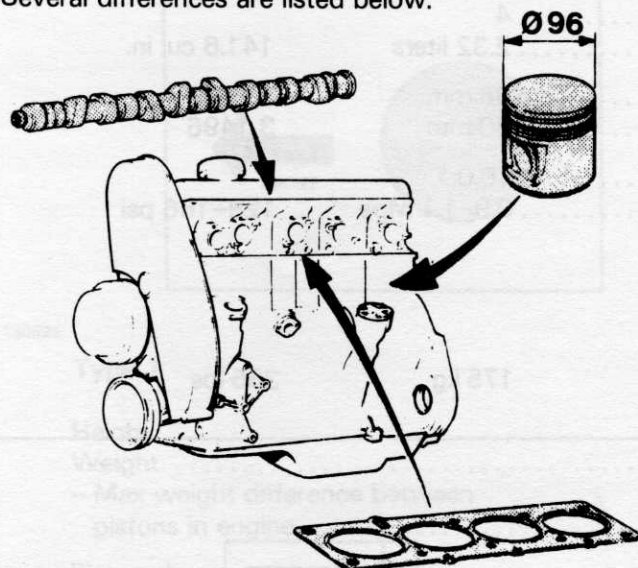
Camshafts identified by numbers stamped on front end. Numbers are 740 followed by Part Number.

Engine B23E

(Canada only)

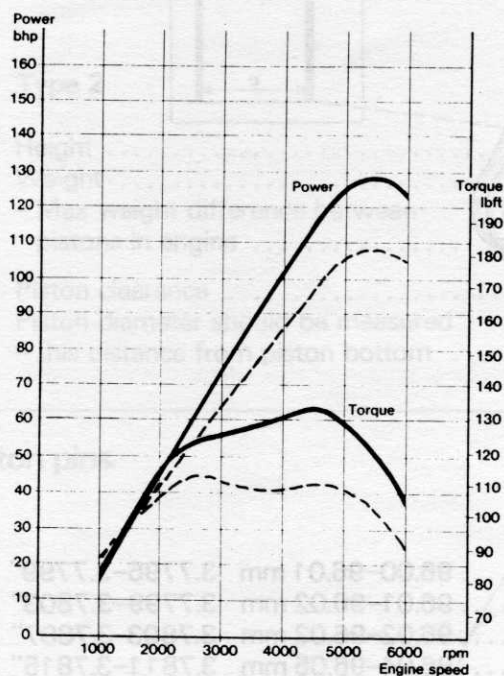
21B

Basically, the B23E engine is a B21 engine with increased displacement and compression. Several differences are listed below:



- The cylinder block is a new casting, NOT a bored B21 block.
- The cylinder head has sand core casted intake valve channels. Provide improved gas flow.
- Forged light alloy pistons. Two types are used, see Specifications.
- Camshaft with 11.95 mm lifting heights. Marked K.
- Cylinder head gasket of new design. Same thickness as for B21.
- Air passage in air/fuel control unit has new design.

130528



Output curve, B23E, SAE J 245 Net.

The B21F output curve is shown in dotted lines for comparison.

130517

Fuel injection system.

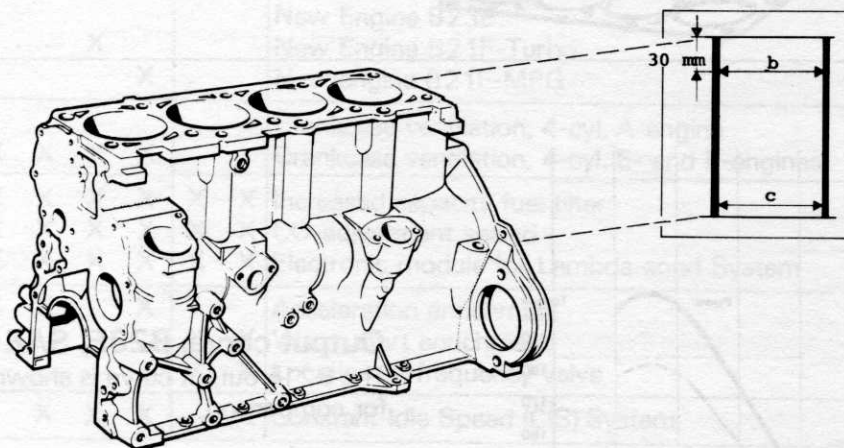
The B23E engine is equipped with a fuel injection system of the same type as for B21F (CI System). The same specifications apply.

Specifications for engine B23E

General

No. of cylinders	4	
Displacement	2.32 liters	141.6 cu. in.
Bore	96 mm	3.7795"
Stroke (same as B21)	80 mm	3.1496"
Compression ratio	10.0:1	
Compression pressure	0.9-1.1 Mpa	128-156 psi
(measured with engine at operating temperature, throttle wide open and cranking starter motor 250-300 rpm)		
Engine weight, incl. engine electrical and injection equipment	175 kg	385 lbs

Cylinder block



130524

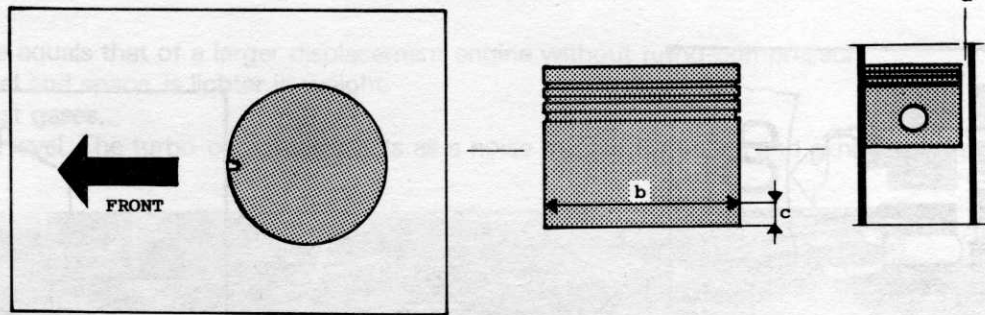
Cylinder diameter (measured at points b and c):

Standard (marked C)	96.00-96.01 mm	3.7795-3.7799"
marked D	96.01-96.02 mm	3.7799-3.7803"
marked E	96.02-96.03 mm	3.7803-3.7807"
marked G	96.04-96.05 mm	3.7811-3.7815"
Oversize 1	96.3 mm	3.7913"
Oversize 2	96.6 mm	3.8032"

Bore cylinders if oil consumption is excessive and wear, measured on cylinder bores, exceeds

0.1 mm 0.004"

Pistons



130525

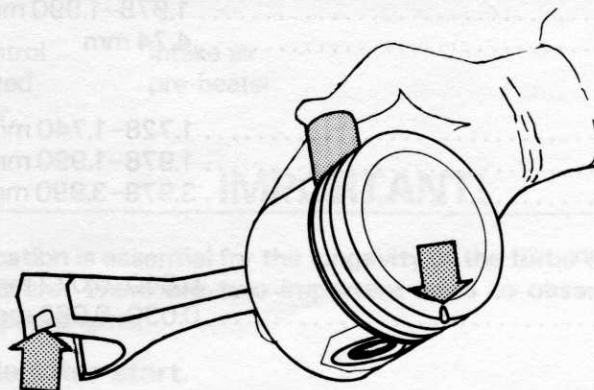
Type 1

Height	80.4 mm	3.1654"
Weight	555 ± 6 grams	
- Max weight difference between pistons in engine	12 grams	
a Piston clearance	0.05-0.07 mm	0.0020-0.0028"
b Piston diameter should be measured		
c - this distance from piston bottom	15 mm	0.6"

Type 2

Height	76.4 mm	3.0079"
Weight	565 ± 6 grams	
- Max weight difference between pistons in engine	12 grams	
a Piston clearance	0.01-0.03 mm	0.0004-0.0012"
b Piston diameter should be measured		
c - this distance from piston bottom	8 mm	0.32"

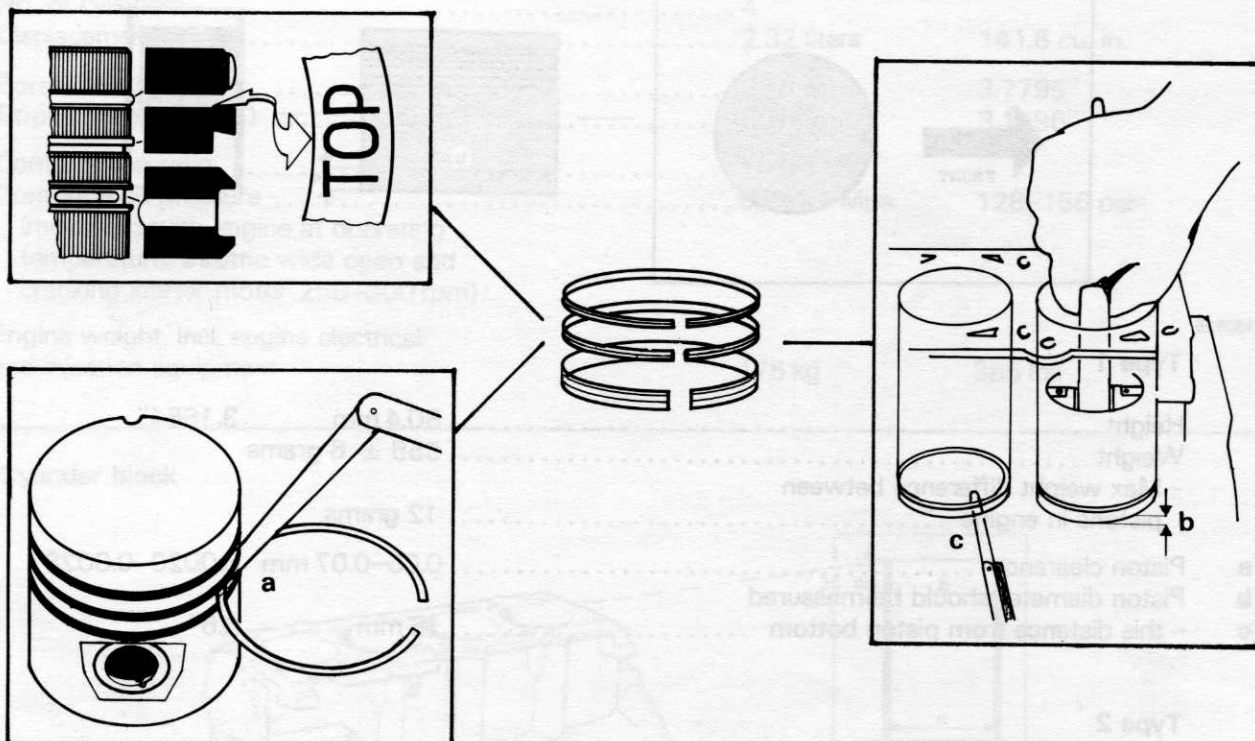
Piston pins



130526

Fit, in connecting rod	close running fit	
in piston	sliding fit	
Diameter, standard	24.00 mm	0.9449"
oversize	24.05 mm	0.9468"

Piston rings



130527

Ring thickness, Type 1:

- Two compression rings	1.978-1.990 mm	0.0779-0.0783"
- Oil scraper ring	4.74 mm	0.1866"

Ring thickness, Type 2:

- 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"

a Side clearance, ring on piston:

- Compression rings	0.040-0.072 mm	0.0016-0.0028"
- Oil scraper ring	0.030-0.062 mm	0.0012-0.0024"

Ring gap:

b - Distance measured from cylinder lower edge	15 mm	0.6"
c - Ring gap, upper compression ring	0.35-0.65 mm	0.014-0.026"
c - Ring gap, lower compression ring	0.35-0.55 mm	0.014-0.022"
c - Ring gap, oil scraper ring	0.25-0.60 mm	0.010-0.024"

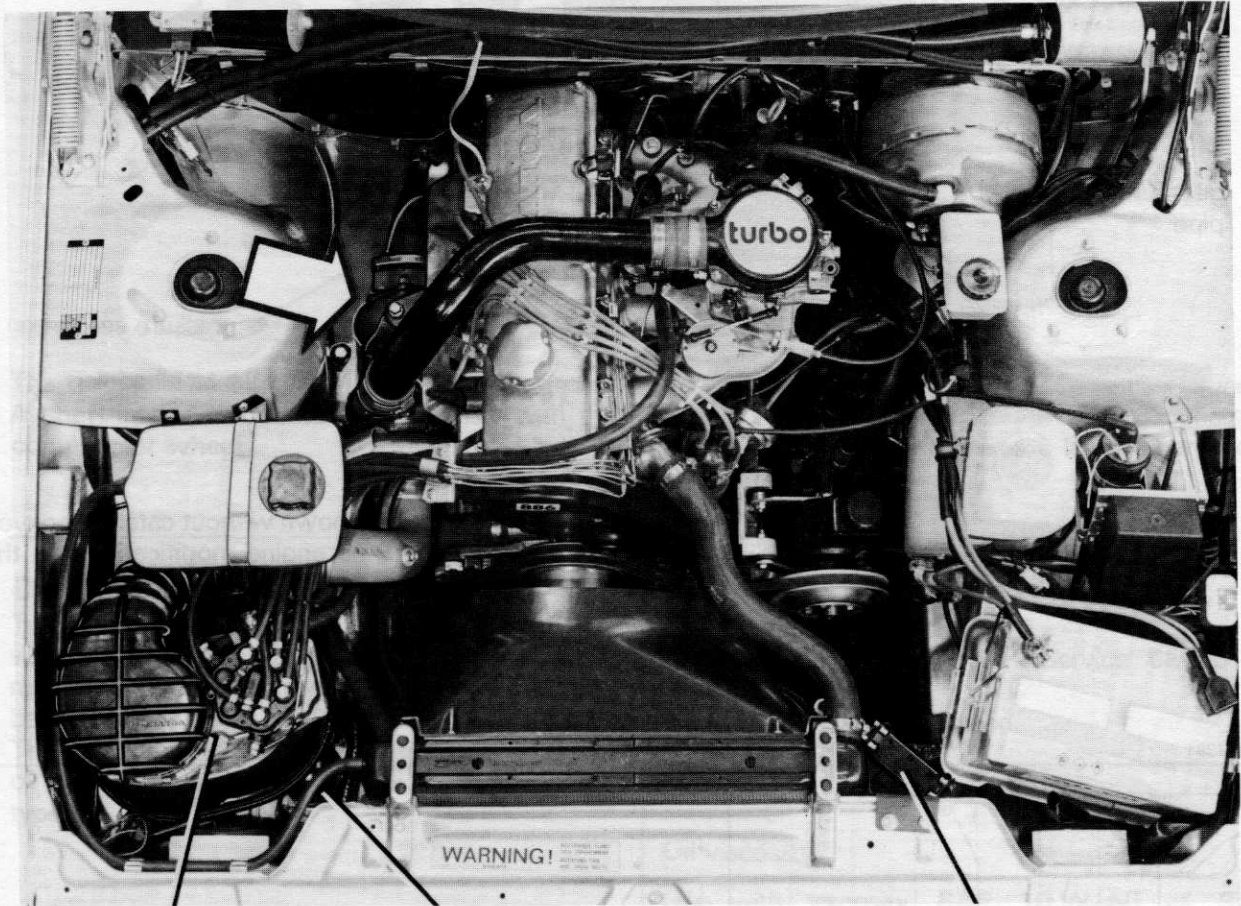
Engine B21F-Turbo

21C

Basically a B21 engine, equipped with an exhaust driven turbo-compressor.

Benefits:

- Performance equals that of a larger displacement engine without turbo-compressor.
- Uses less fuel and space, is lighter in weight.
- Clean exhaust gases.
- Lower noise level. The turbo-compressor acts as a noise muffler for intake and exhaust systems.



131380

Air /fuel control
unit integrated
in air cleaner.

Intake air
pre-heater.

Engine oil cooler.

IMPORTANT!

Satisfactory lubrication is essential for the longevity of the turbo-compressor. It is lubricated by engine oil pressure. There are two important rules to observe when driving a turbo-compressor equipped engine:

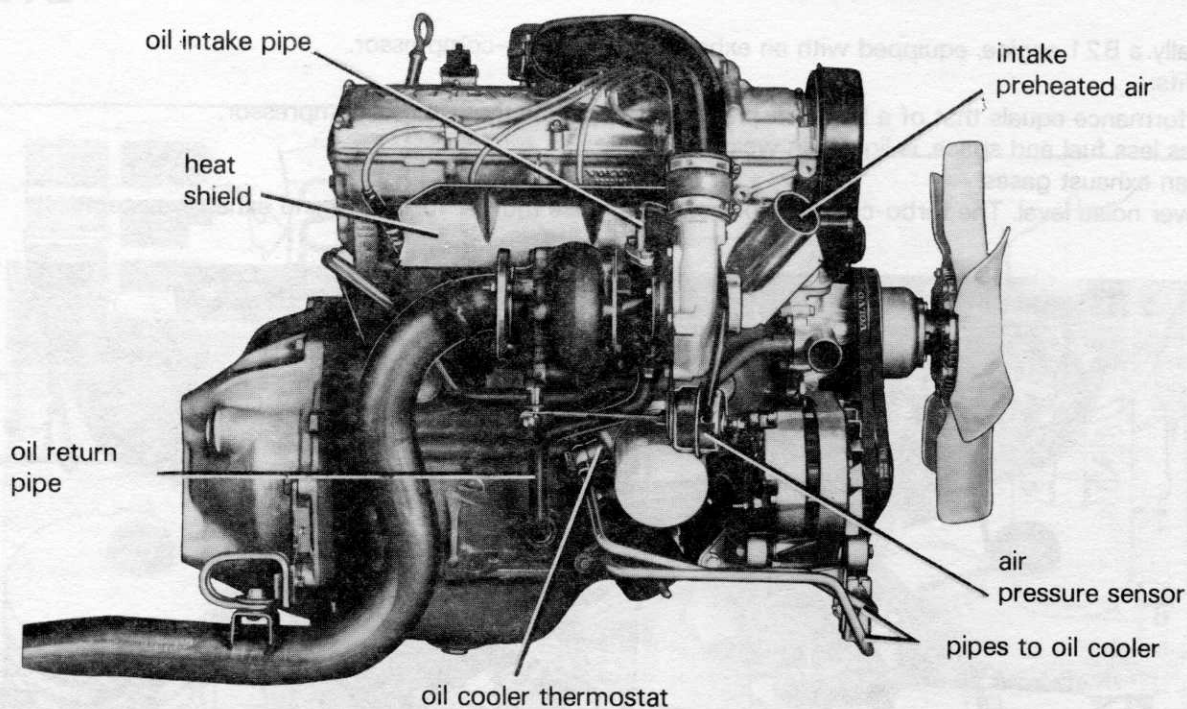
- **Let engine idle after start.**

This will provide initial lubrication. Never start with high rpm.

- **Let engine idle before shut-off.**

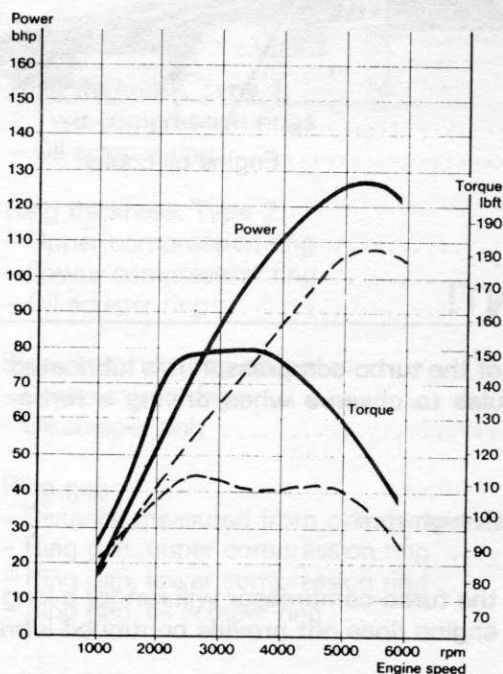
If the engine is shut off while running at high rpm, the turbo-compressor will run for a long time. This will harm the turbo-compressor as the engine does not provide continued lubrication after stopping.

Idling before shut-off will also reduce turbine temperatures.



- This engine is shown without catalytic converter. See "Turbo engine modifications" in this manual.

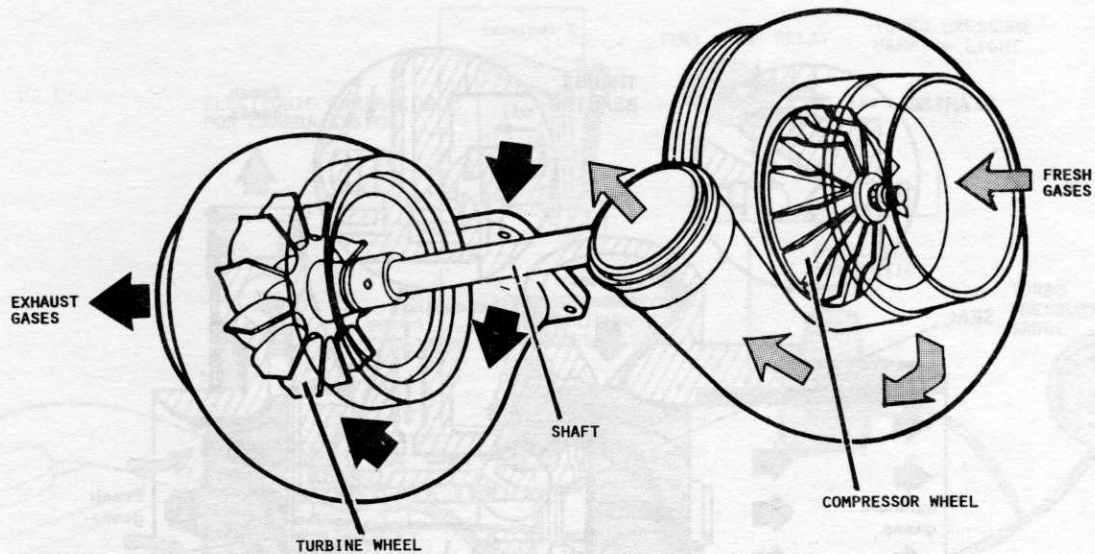
131381



Output curve, B21F-Turbo, SAE J 245 Net.

B21F output curve shown in dotted lines for comparison.

130518



130663

The **turbine wheel** is driven by the exhaust gases. A **shaft** interconnects the turbine wheel with the **compressor wheel**.

Increased exhaust gas flow increases turbine speed and consequently the compressor discharge increases. The engine receives a larger charge of air/fuel mixture.

Design.

Turbo-compressor wheels rotate at a very high speed. Max speed is approx. 120 000 rpm which means that the assembly must be very carefully balanced.

The shaft is supported by bearings using pressurized oil for lubrication. The shaft seals are of piston ring type.

Oil quality.

Oil quality according to API Service **SE-CC** or **SF-CC**.

SE-CD oils must not be used.

Oil viscosity.

Oils with viscosity **SAE 10 W-40** or **SAE 10 W-30** can be used all year.

Following oils can be used with limitations:

SAE 10 W: only below $-10^{\circ}\text{C} = 14^{\circ}\text{F}$.

SAE 15 W-50: only above $-10^{\circ}\text{C} = 14^{\circ}\text{F}$.

SAE 20 W-50: only above $0^{\circ}\text{C} = 32^{\circ}\text{F}$.

SAE 20 W-20: only $0-30^{\circ}\text{C} = 32-86^{\circ}\text{F}$.

SAE 30: only above $30^{\circ}\text{C} = 86^{\circ}\text{F}$.

Lubrication.

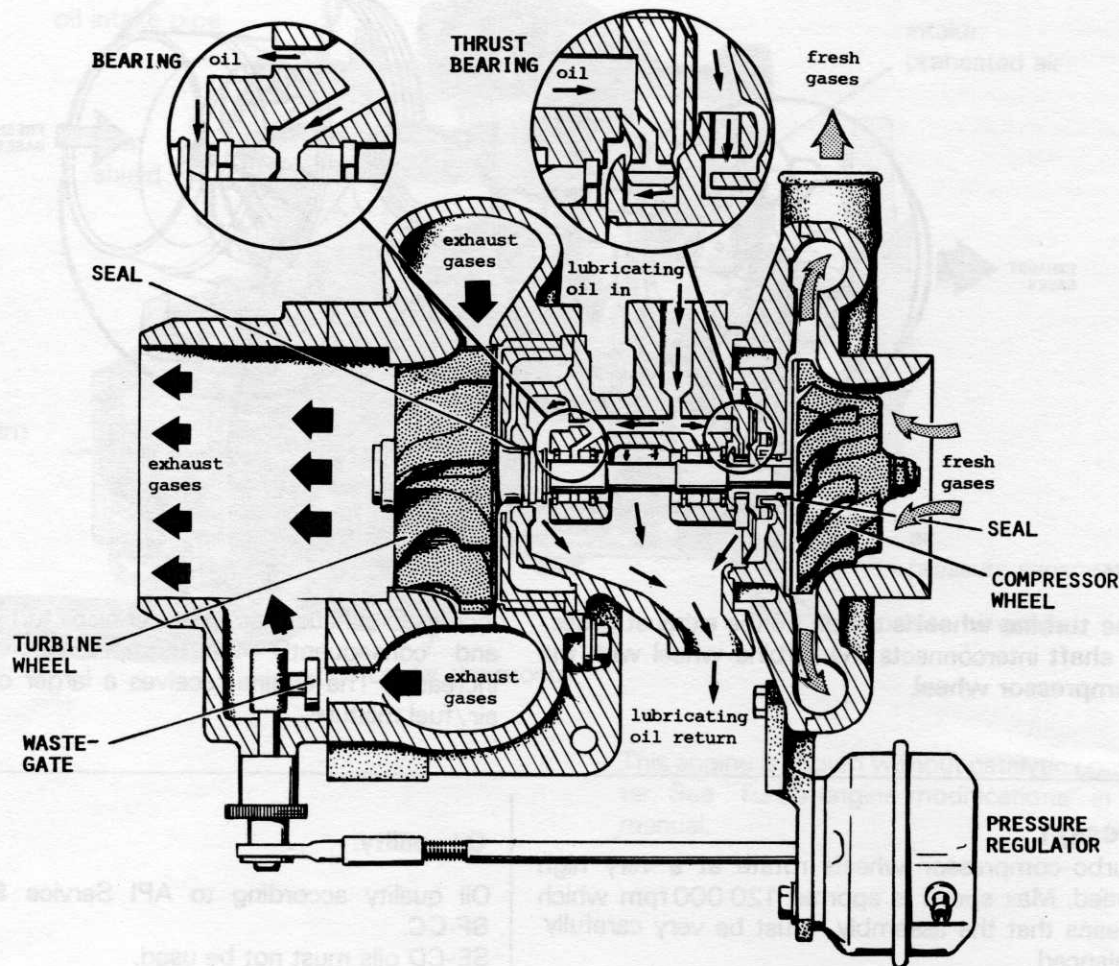
Proper lubrication is of vital importance. The turbo-compressor is connected to the standard engine lubricating oil system. Oil supply and pressure must be adequate, therefore the requirement not to run the turbo-compressor at high speeds at start and stop should be observed.

Lubricating oil must be clean. It is important to replace oil and oil filter at regular intervals.

Engine lubricating oil correct **quality** and **viscosity** must be used.

Oil changes.

Engine oil should be replaced every 3,750 miles = 6,250 km or at least every 6 months. This is twice as often as for other gasoline engines.



130529

Turbo controls

Control equipment.

The turbo-compressor is designed to provide a relatively high discharge pressure at middle range rpms.

Therefore several controlling and regulating functions are necessary to avoid excessive pressures at high speeds.

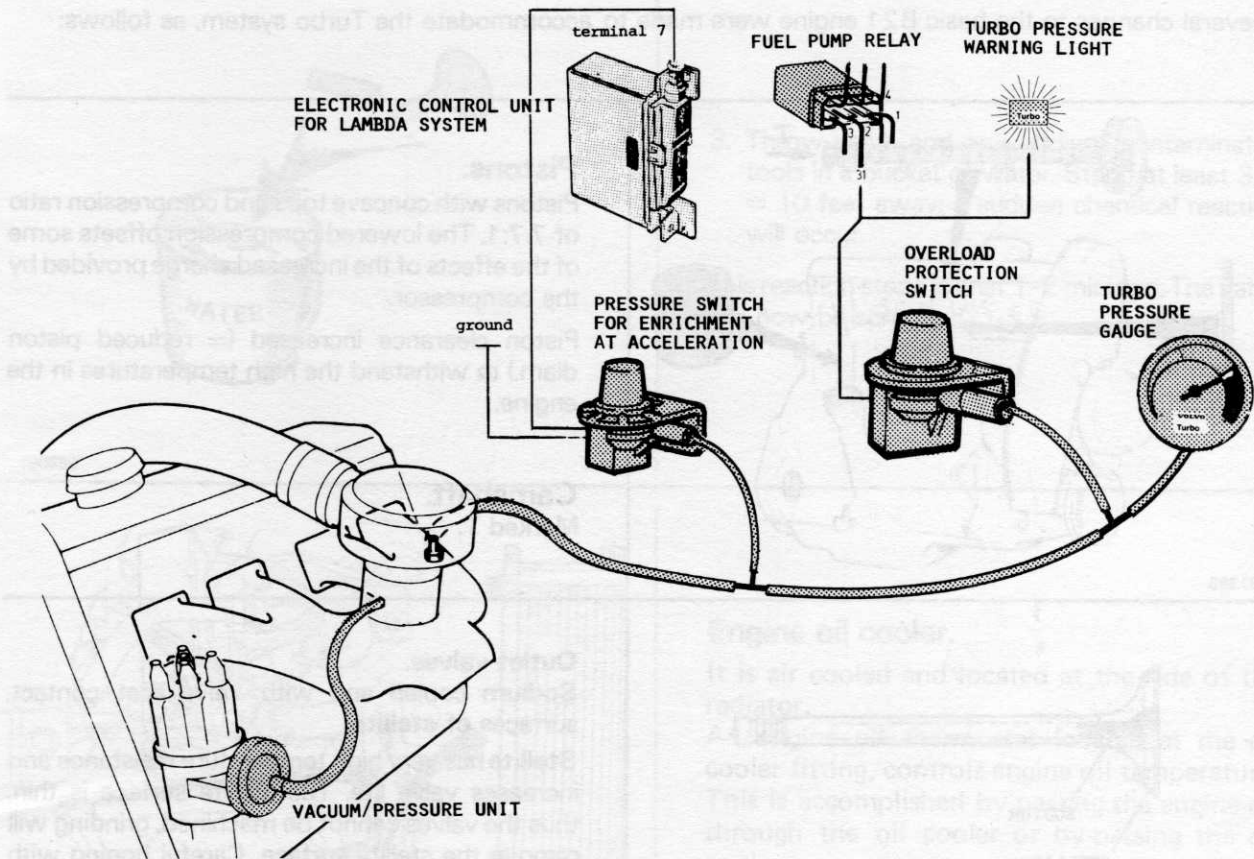
Pressure sensor (regulator) and wastegate actuator.

Monitors the discharge pressure from the compressor. Starts to open the **wastegate** at a compressor pressure of 41 kPa = 6 psi.

Gradually increases wastegate opening with increasing compressor pressure. A control rod stroke of approx. 10 mm = 3/8" is achieved just before the maximum pressure switch cuts out the fuel pump relay.

Wastegate.

Will let part of the exhaust gases bypass the turbine wheel.



130530

Pressure switch for enrichment at acceleration.

A pressure switch on the firewall receives compressor pressure from a fitting on the intake manifold. It closes when compressor pressure reaches 20.3 kPa = 2.9 psi. When closing it grounds terminal 7 of the Lambda sond electronic module. This will cause the Lambda system to operate on a special fixed cycle of 58.5°, measured with a dwell meter of good quality.

Overload protection switch.

Excessive compressor pressures may damage the engine by inducing overload. Excessive pressures are normally prevented by the pressure sensor and wastegate actuator. In case of failures of that system, there is a second overload protection feature.

(Overload protection switch, continued)

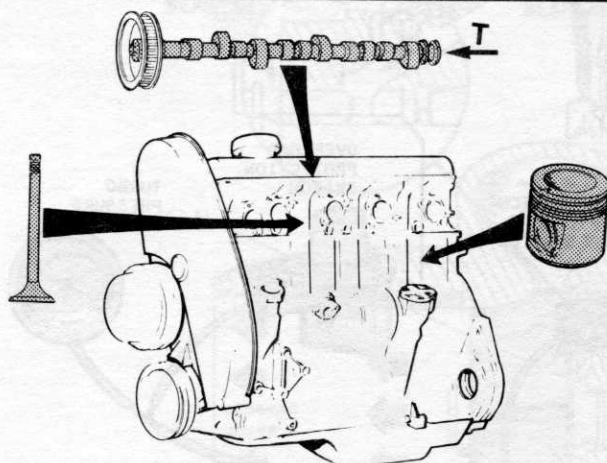
It is a pressure switch, also receiving pressure input from the intake manifold which opens the ground circuit for the fuel pump relay at a pressure of 70 kPa 10 psi. This will momentarily stop fuel pump and engine and reduce compressor pressure.

Pressure control of spark timing.

The distributor centrifugal advance mechanism provides a spark timing which is too advanced when the turbo engine operates at high load. To counteract this, the pressure control unit at the distributor has a double function. Under normal operating conditions, it can advance the spark by max. 15°. At high pressures it **retards** the spark timing: maximum 8° at a compressor pressure of 36 kPa = 5 psi.

Turbo engine modifications

Several changes to the basic B21 engine were made to accommodate the Turbo system, as follows:



131393

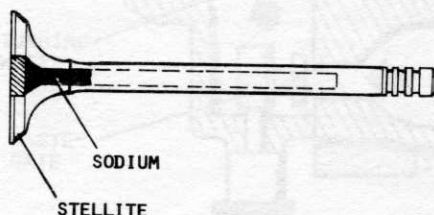
Pistons.

Pistons with concave tops and compression ratio of 7.7:1. The lowered compression offsets some of the effects of the increased charge provided by the compressor.

Piston clearance increased (= reduced piston diam.) to withstand the high temperatures in the engine.

Camshaft.

Marked T.



130656

Outlet valves.

Sodium cooled and with valve seat contact surfaces of **stellite**.

Stellite has very high temperature resistance and increases valve life. The stellite surface is thin, thus the valves cannot be machined, grinding will remove the stellite surface. Careful honing with grinding paste against the head surface is permitted.

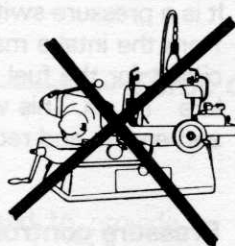
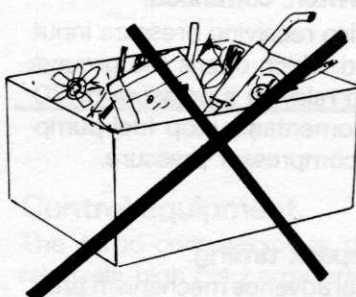
Sodium becomes fluid when heated and splashes back and forth in the valve cavity. This provides conduction of excess heat from the valve head to the cooler valve stem.

WARNING!

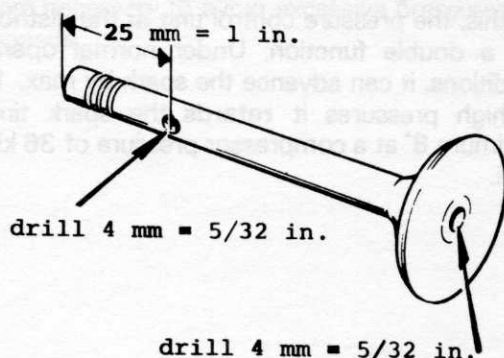
Sodium-filled valves **MUST NOT** be mixed with ordinary scrap iron. The sodium must first be removed when being discarded otherwise explosions might occur when the scrap is melted.

DO NOT
SCRAP

DO NOT
GRIND



130657

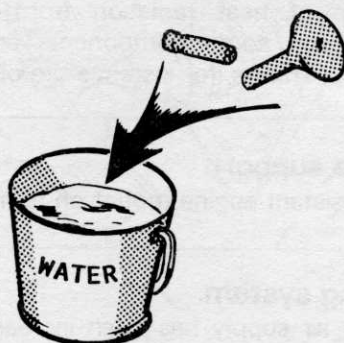


130658

How to remove the sodium content.

Warning! Sodium is extremely explosive in presence of water.

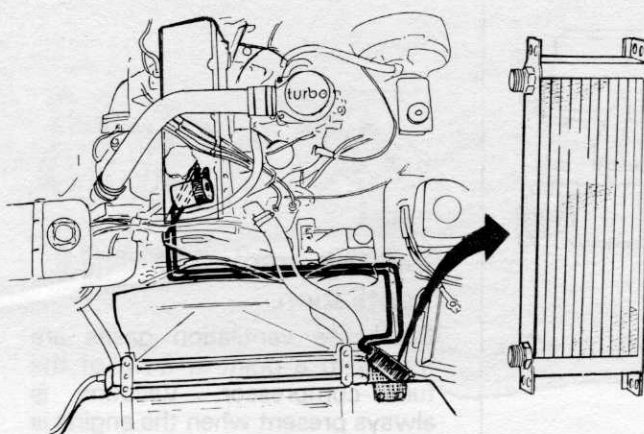
1. Drill a 4 mm = 5/32" hole in the valve center, down to the sodium filled cavity.
2. Drill a 4 mm = 5/32" hole through the valve stem, approx 25 mm = 1" from the end. Alternate: cut the stem approx 25 mm from the end.



130659

3. Throw valve and any sodium contaminated tools in a bucket of water. Stand at least 3 m = 10 feet away: a sudden chemical reaction will occur.

This reaction stops within 1-2 minutes. The valve can now be scrapped.

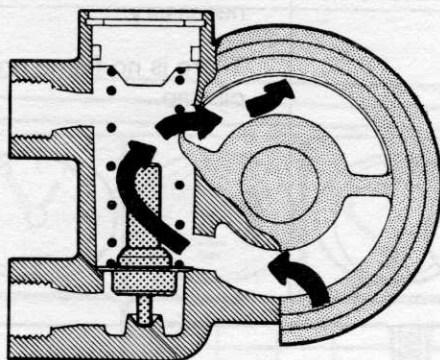


131399

Engine oil cooler.

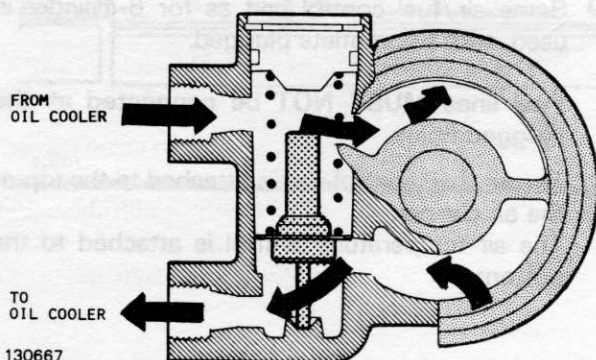
It is air cooled and located at the side of the radiator.

An engine oil thermostat located at the oil cooler fitting, controls engine oil temperature. This is accomplished by passing the engine oil through the oil cooler or by-passing the oil cooler.



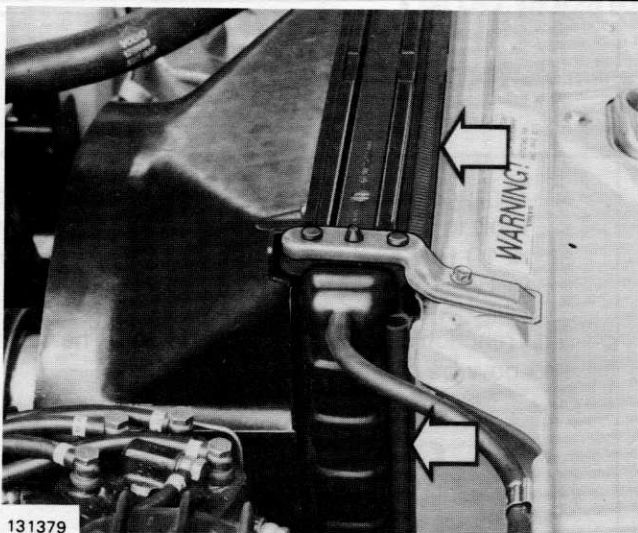
The oil cooler thermostat starts to open at approx. $75^{\circ}\text{C} = 165^{\circ}\text{F}$ and is fully open at approx. $90^{\circ}\text{C} = 195^{\circ}\text{F}$.

- Oil cooler thermostat closed.



130667

- Oil cooler thermostat open.



131379

Heat shield.

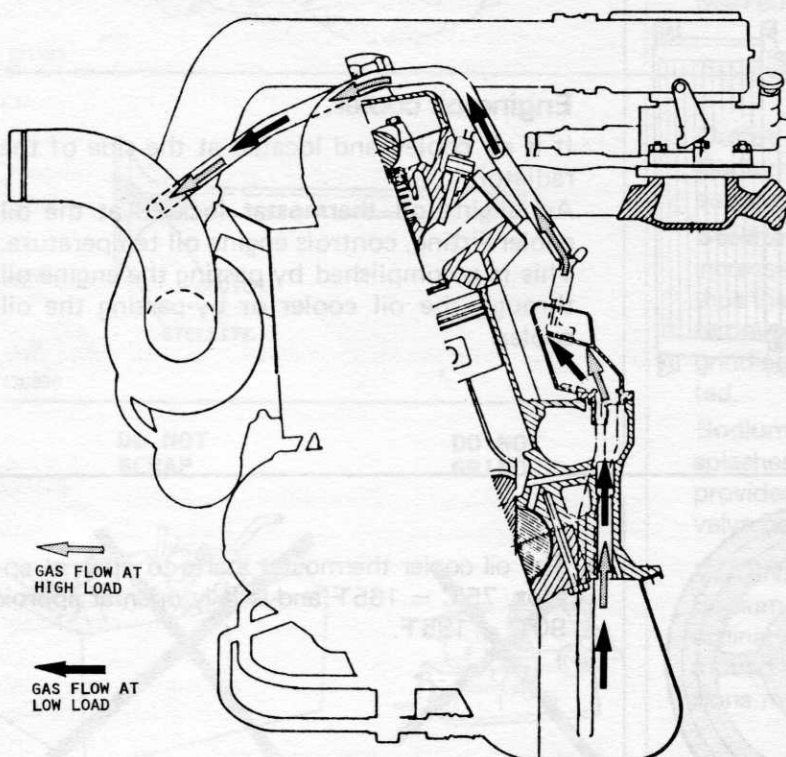
Because of heat radiation from the turbo-compressor, some components are provided with heat shields, for instance the oil filter.

Engine support.

Heat-resistant engine mount on right side.

Cooling system.

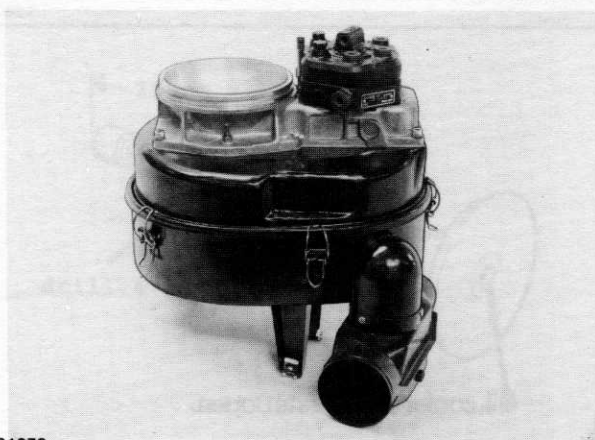
Cooling air supply has been increased approx. 15% by sealing openings between radiator and vehicle front.



Positive crankcase ventilation.

Crankcase ventilation gases are routed to a point in front of the turbo-compressor. Vacuum is always present when the engine is running and no additional connection with the intake manifold is necessary.

There is no flame protector at the oil trap.



131378

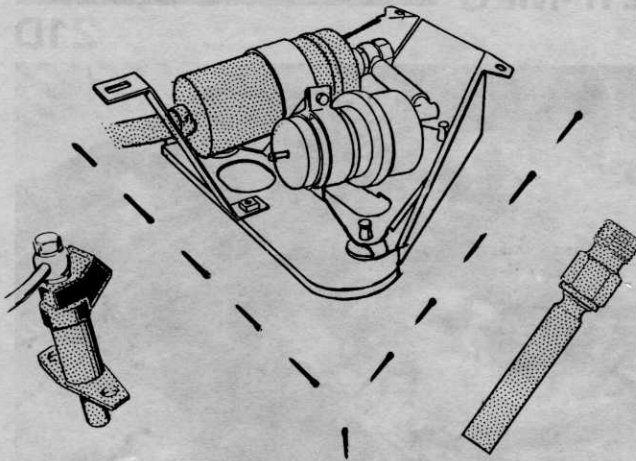
CI System - air/fuel control unit.

Same air/fuel control unit as for 6-cylinder is used, with two outlets plugged.

Fuel lines MUST NOT be connected at the plugged holes.

The air/fuel control unit is attached to the top of the air cleaner.

The air temperature control is attached to the bottom.



130532

CI System – fuel pump.

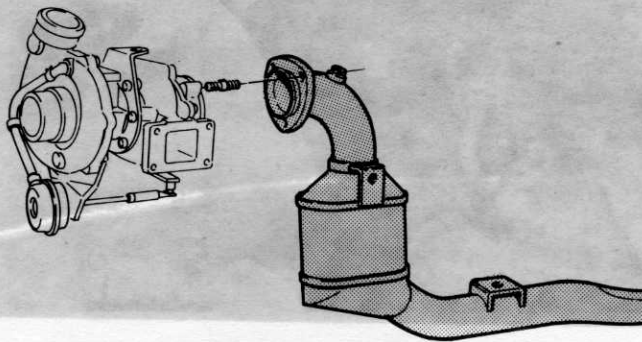
Has increased capacity, 130 liters per hour = 33 gallons per hour.

CI System – injectors.

Modified connection of fuel pipes and larger openings (larger quantity of fuel injected as necessary).

CI System – cold start injector.

Increased capacity.



130560

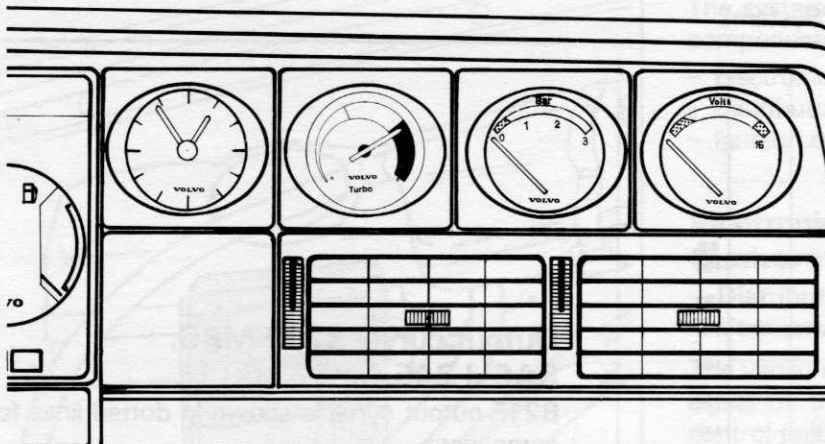
Catalytic converter.

The catalytic converter is moved up close to the turbine. It is only 105 mm downstream from the turbine outlet.

A lot of heat is generated in the engine compartment and several heat shields protect equipment from excess heat.

The voltage regulator is moved to the inner wheel housing in front of the spring tower.

Motor mount cushions are made of extra heat resistant material.



130561

Instruments.

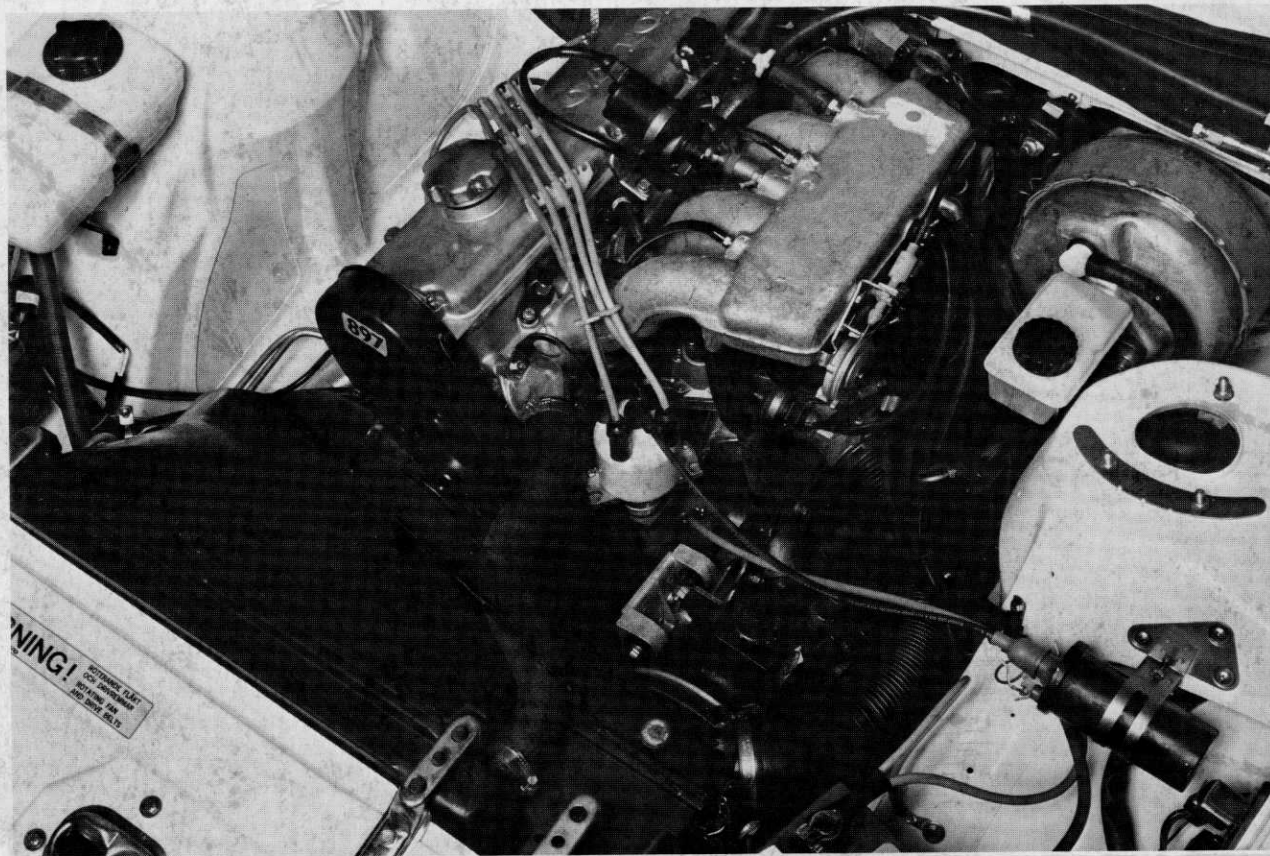
Vehicles with turbo engines are equipped with oil pressure gauge. This underlines the importance of proper oil pressure and turbo-compressor lubrication at all times.

There is also a turbo pressure gauge. It helps the driver to monitor turbo conditions.

The instrument cluster is provided with a warning light which illuminates in case overpressure occurs. The overpressure switch will illuminate this light at the same time it shuts off the fuel pump to stop the engine and relieve overpressure.

Engine B21F-MPG

21D

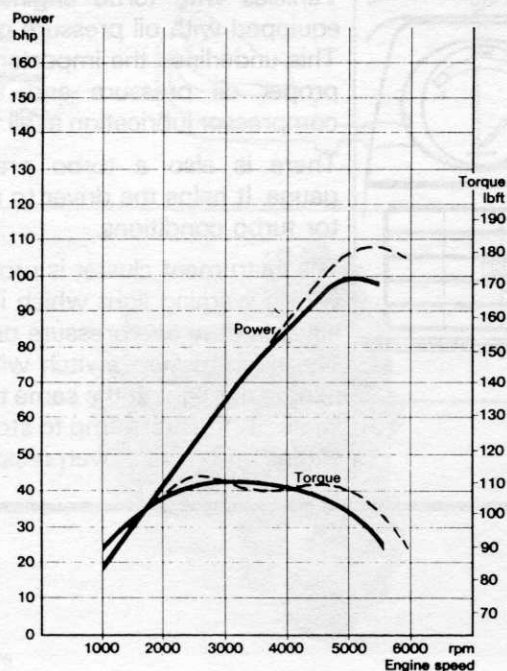


Engine B21F-"MPG" is basically a B21F engine, equipped with:

- Camshaft with A-profile.
- Computer controlled ignition system, assembled by Volvo.
- Constant Idle Speed System (CIS System).

The engine is used in combination with:

- A low first gear ratio of 4.03:1 (same as for Diesel).
- Rear axle 1030 with a low ratio of 3.54:1.
- 70 amp. alternator.



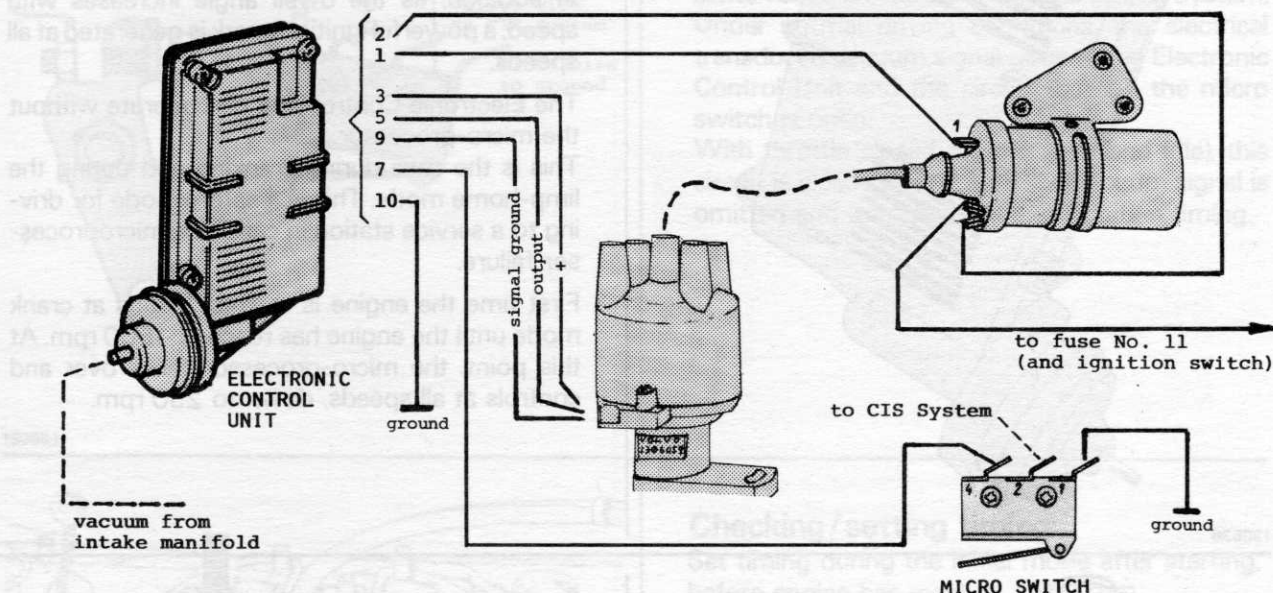
Output curve, B21F-MPG, SAE J 245 Net.

B21F output curve is shown in dotted lines for comparison.

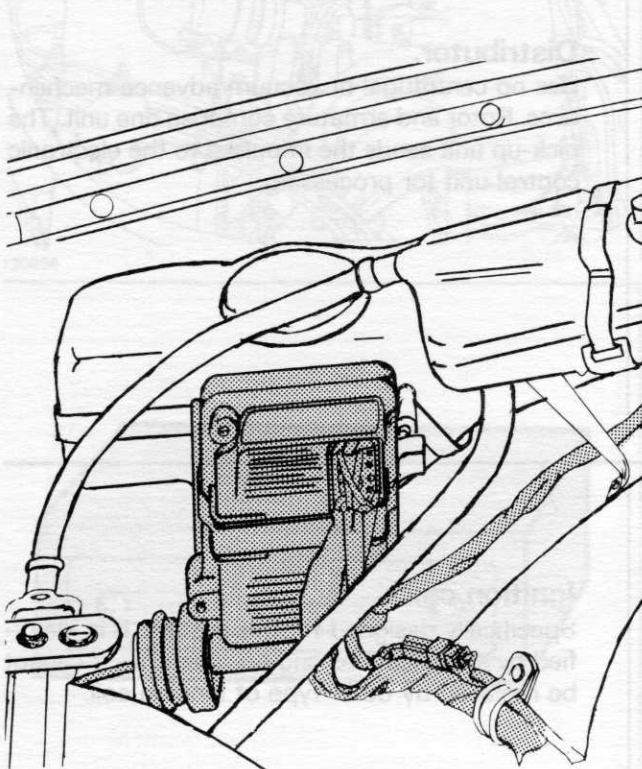
130519

Computer Controlled Ignition System.

A new type ignition system is introduced for the B21F-MPG. It is a breakerless electronic ignition system with computer controlled spark advance. The electronic control unit also controls the power flow through the ignition coil and sets the dwell angle.



130534



130535

Components.

The system is comprised of the following main components:

- Electronic control unit.
- Distributor.
- Ignition coil.

Electronic Control Unit.

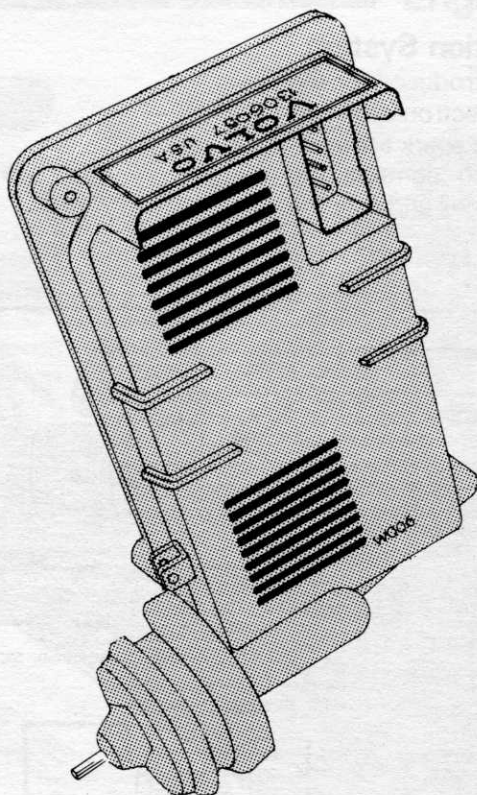
Receives information from two sources:

- **Distributor**, on engine speed.
- **Vacuum**, from intake manifold, on engine load.

The vacuum signal is transduced to an electrical signal by the micro-processor in the electronic control unit.

Speed and vacuum signals are then processed in the micro-computer. The resulting information is used to control the spark advance.

Speed advance is 0° at 1000 rpm and reaches a peak of 24° at 5000 rpm. Vacuum (load) advance is 0° at 0 vacuum and reaches a peak of 22° at a vacuum of 400 mm Hg = 16" Hg.



130536

Electronic control unit (cont.)

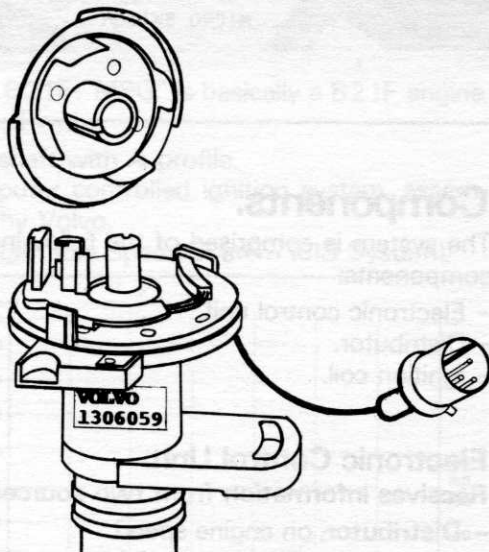
The electronic control unit also controls the dwell. It is 25° at 1000 rpm and 70° at 5000 rpm. Thus there is no excessive current flow through the ignition coil at cranking and low speeds and no ballast resistor is required.

In addition, as the dwell angle increases with speed, a powerful ignition spark is generated at all speeds.

The Electronic Control Unit can operate without the micro-processor.

This is the case during cranking and during the limp-home mode. This is a safety mode for driving to a service station in case of a microprocessor failure.

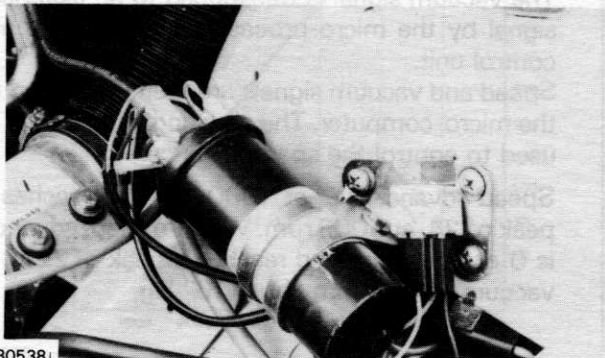
First time the engine is started, it runs at crank mode until the engine has reached 1500 rpm. At this point, the micro-processor takes over and controls at all speeds, down to 250 rpm.



130537

Distributor.

Has no centrifugal or vacuum advance mechanisms. Rotor and armature comprise one unit. The pick-up unit sends the impulses to the electronic control unit for processing.

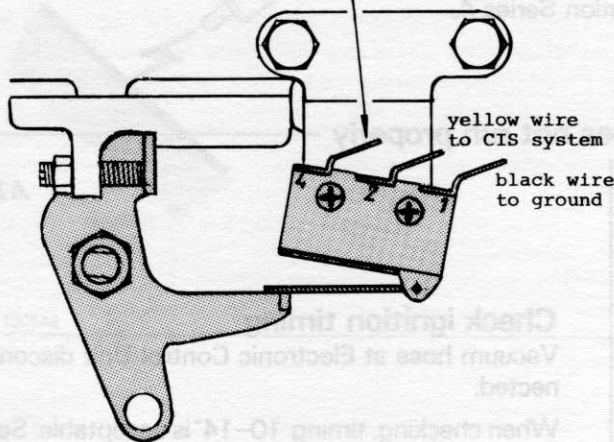


130538

Ignition coil.

Specifically designed for this system. It is identified by specifications and number only. It cannot be replaced by other type of ignition coil.

orange wire to terminal 7
on Electronic Control Unit
for Computer Controlled
Ignition System

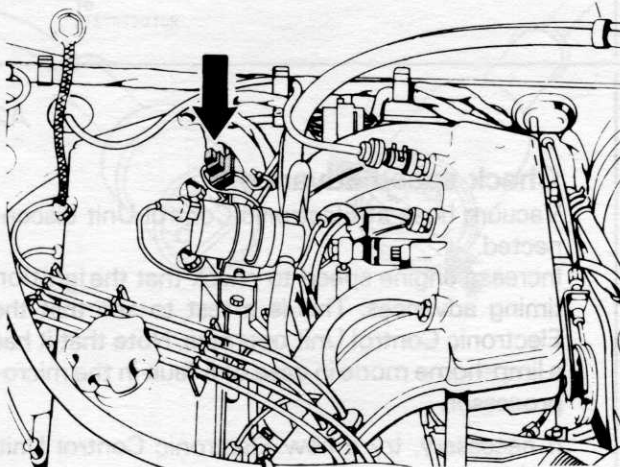


130681

Micro switch.

It is located at the throttle and is the same micro switch used for the Constant Idle Speed System. Under normal driving conditions, the electrical transduced vacuum signal goes to the Electronic Control Unit and the circuit through the micro switch is open.

With throttle closed (deceleration and idle), this circuit is closed (grounded). The vacuum signal is omitted and does not influence ignition timing.

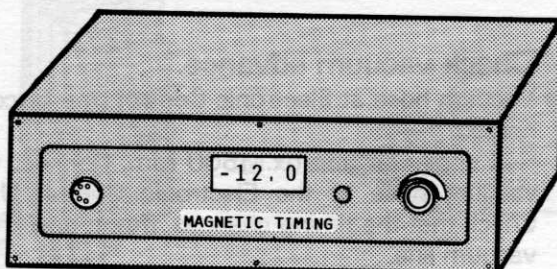


130688

Checking/setting timing.

Set timing during the initial mode after starting, before engine has reached 1500 rpm.

Thus there is no influence from timing advance. It is preferred to use instruments connected to the engine's magnetic timing sensor.



130683

Instruments used are "Magnetic Timing" Units, equipped with proper adapter.

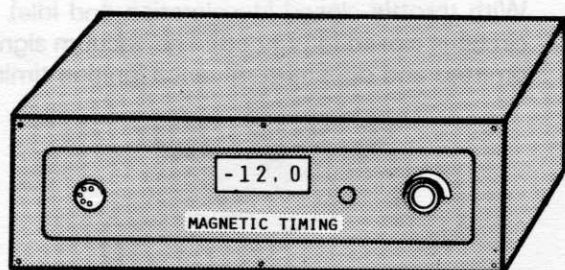
Fault tracing electronic ignition system for B21F-MPG

If other fault sources have been eliminated, and it is evident that the fault may lie in the electronic ignition system, following fault tracing procedures can be used to locate the fault. It is divided in two fault categories:

- Engine starts but does not run properly. See Operation Series A.
- Engine does not start. See Operation Series B.

Engine starts but does not run properly

A1

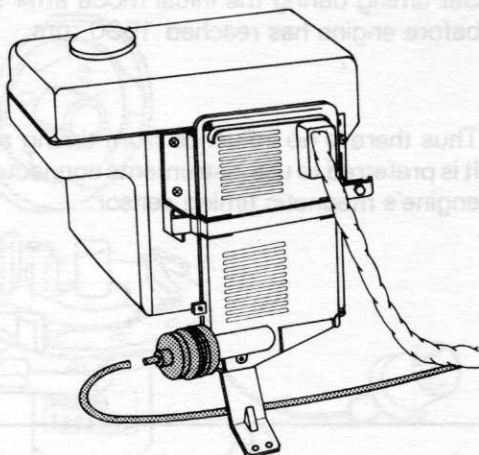


Check ignition timing.

Vacuum hose at Electronic Control Unit disconnected.

When checking, timing 10–14° is acceptable. Set at 12° BTDC, after start before engine first time has reached 1500 rpm.

130683



A2

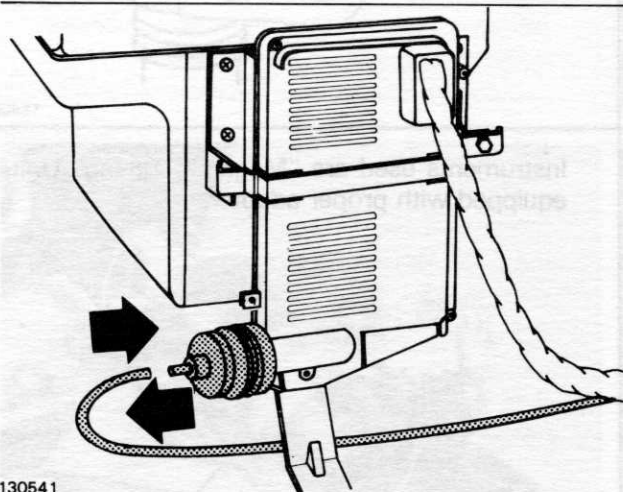
Check speed advance.

Vacuum hose at Electronic Control Unit disconnected.

Increase engine speed to check that the ignition timing advances. This is a test to see that the Electronic Control Unit operates. Note that it has a limp-home mode in case of a fault in the micro-processor.

If necessary, try a new Electronic Control Unit, and re-test.

130540



A3

Check vacuum advance.

Vacuum hose at Electronic Control Unit disconnected.

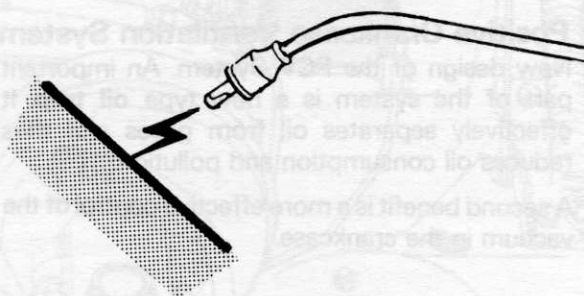
Run engine at approx. 1500 rpm. Connect the vacuum hose at the Electronic Control Unit. Check that the timing changes. If not: check the vacuum line.

If the vacuum line is open, try a new Electronic Control Unit.

130541

Engine does NOT start

B1



130542

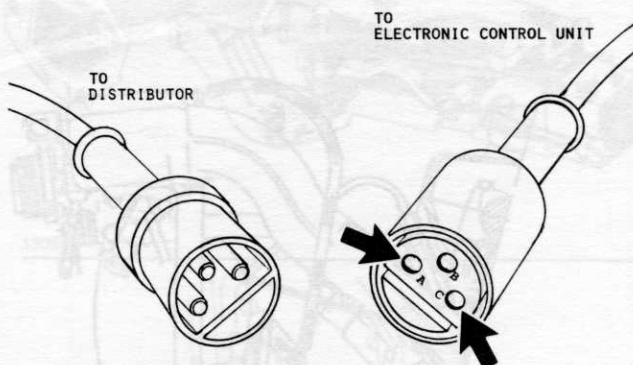
Check spark.

Disconnect high tension wire at distributor cap. Hold it approx. 12 mm = 1/2" from engine block. Crank engine.

Spark: check that it reaches spark plugs. If necessary, check distributor rotor and cap.

No spark: proceed to B2.

B2



130543

Eliminate distributor.

Disconnect connector at distributor.

Connect a **jumper** wire to pin A in connector going to Electronic Control Unit. With ignition ON, touch pin C repeatedly.

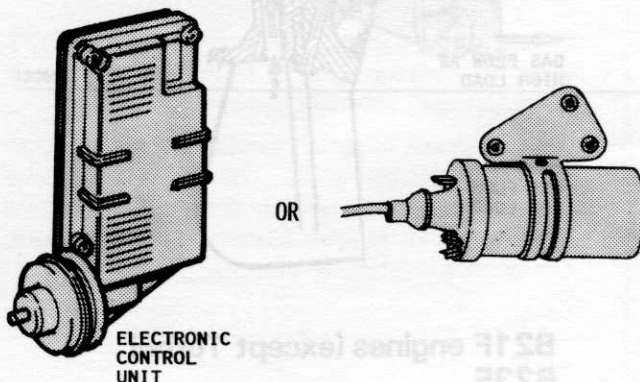
Spark: check that pin B is live.

- **Live:** try a new pick-up plate in distributor.

- **Not live:** first check wiring harness, then try a new Electronic Control Unit.

No spark: proceed to B3.

B3



130544

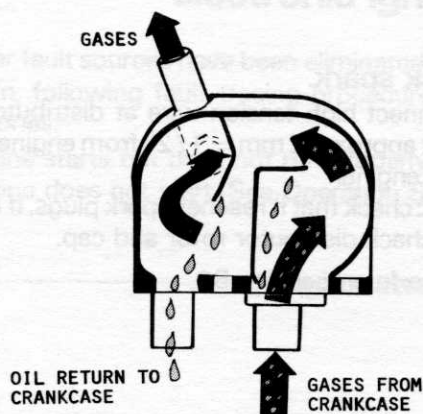
Eliminate wires.

Check wires and connectors carefully.

If no fault is found: try a new Electronic Control Unit.

Still no spark: try a new ignition coil.

PCV System



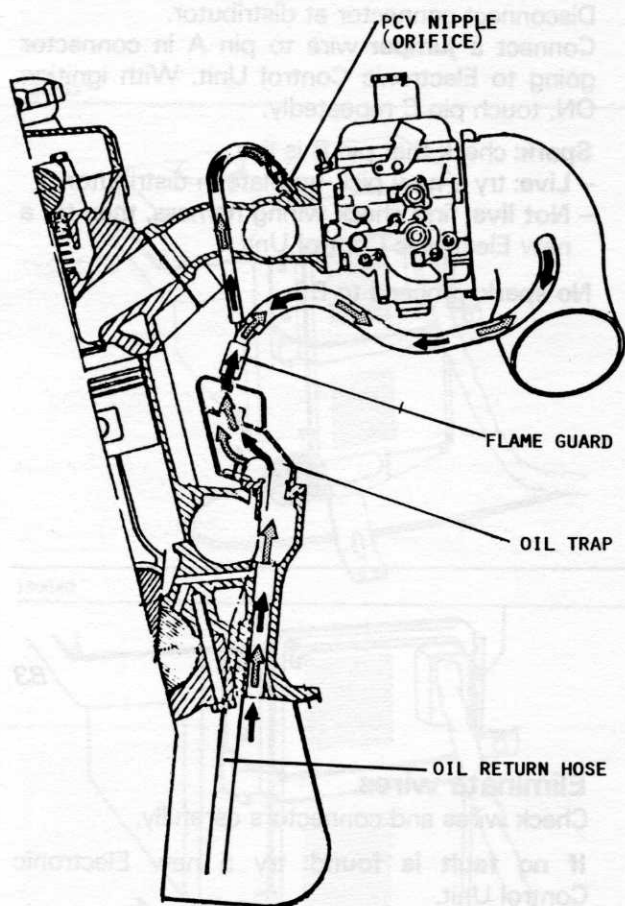
Positive Crankcase Ventilation System

New design of the PCV System. An important part of the system is a new type oil trap. It effectively separates oil from gases and thus reduces oil consumption and pollution.

A second benefit is a more effective control of the vacuum in the crankcase.

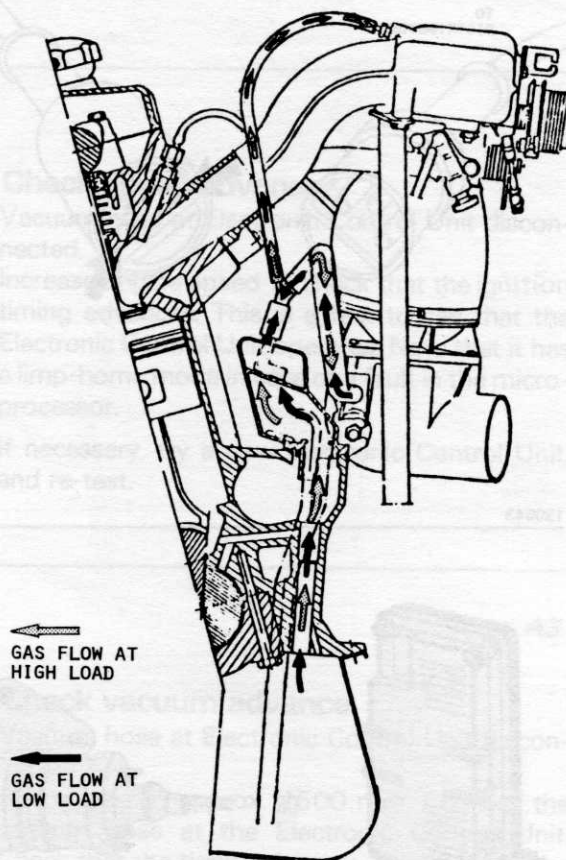
130668

22A



Engine B21A

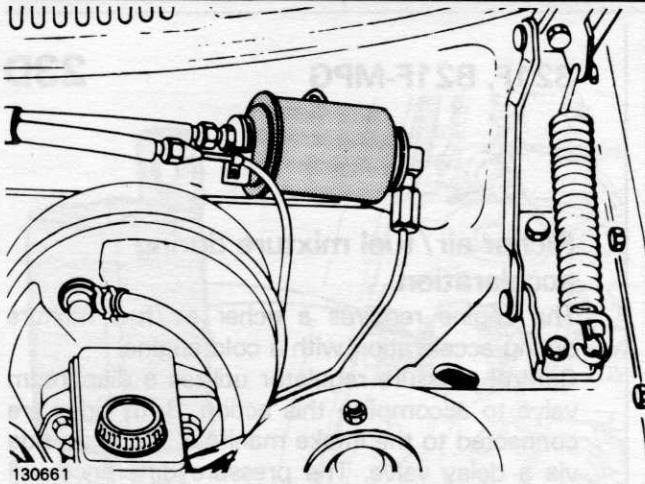
22B



B21F engines (except Turbo)
B23E

130664

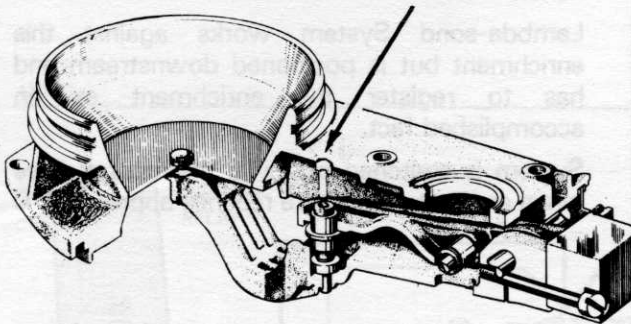
1306651



B21F
B28F

23 A

Increased capacity fuel filter.



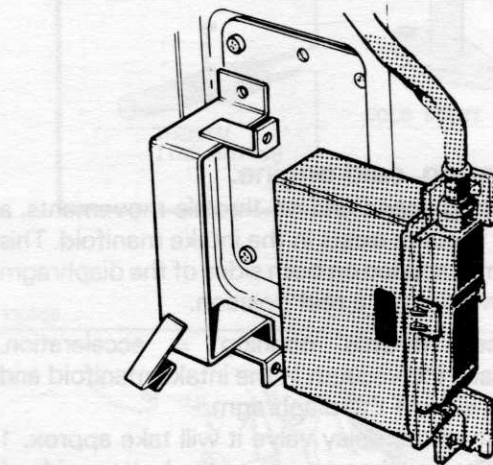
B21F
B28F (except Canada)

23B

CO adjustment sealed.

Initial CO setting is made at the factory and should then not be changed. The access hole for CO adjustment is sealed with a steel plug.

For Canada, where CO adjustment is permitted, there will be a rubber plug or other removable item.



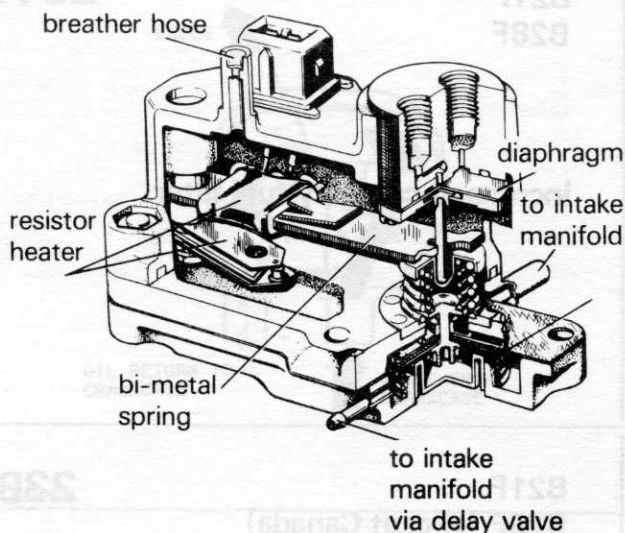
B21F
B28F

23C

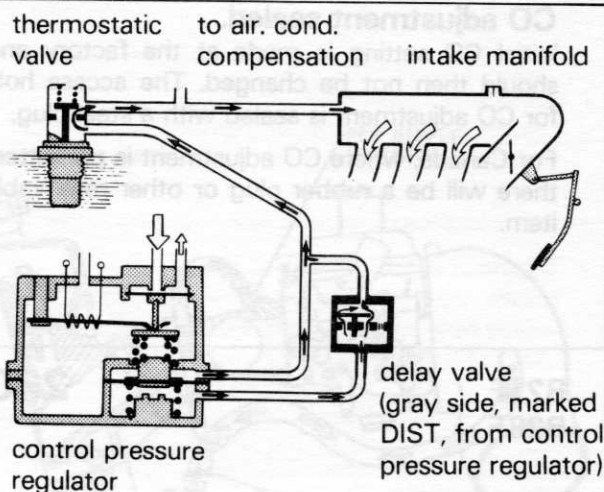
Electronic modules for Lambda-sond systems.

New modules introduced to accomodate various changes to the fuel systems.

New label markings and identification numbers.

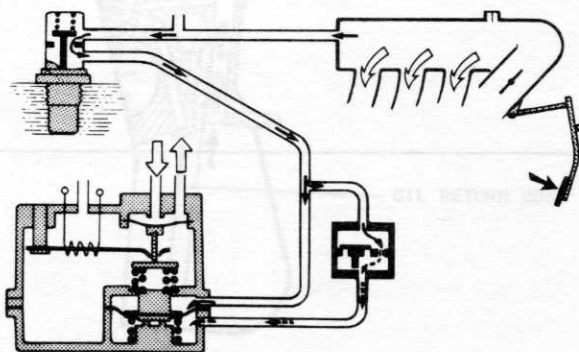


129075



**Operation,
cruising at steady speed**

129073



**Operation,
acceleration**

129074

B21F, B21F-MPG

23D

Richer air/fuel mixture during acceleration.

The engine requires a richer air/fuel mixture during acceleration with a cold engine.

Control pressure regulator utilizes a diaphragm valve to accomplish this action. Both sides are connected to the intake manifold, the underside via a delay valve. The pressure difference will cause the valve to momentarily reduce the control pressure and make the air/fuel mixture richer.

Lambda-sond System works against this enrichment but is positioned downstream and has to register the enrichment as an accomplished fact.

System is switched off by a thermostat valve when engine temperature reaches approx. 53°C = 12°F .

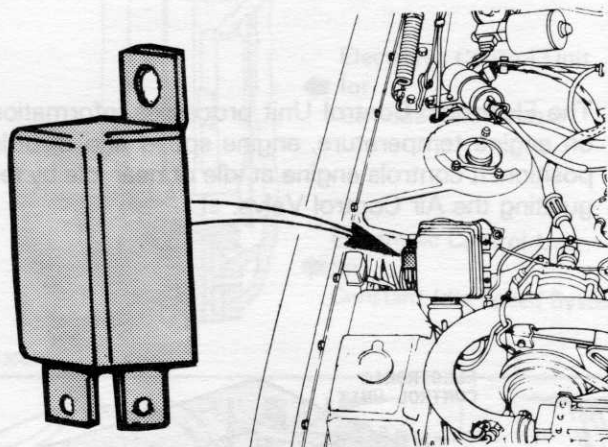
Operation, cold engine.

At cruising speed and no throttle movements, a steady vacuum exists in the intake manifold. This vacuum is applied on both sides of the diaphragm valve which is in a rest position.

Increased throttle opening = acceleration, decreases the vacuum in the intake manifold and the top side of the diaphragm.

Because of the delay valve it will take approx. 1 second before the vacuum on the bottom side of the diaphragm valve has equalized.

This will create a higher pressure on the top side of the diaphragm valve. The diaphragm valve moves downward, causing the control pressure regulator to open, lowering the control pressure. The air-fuel mixture is thus made richer.



130557

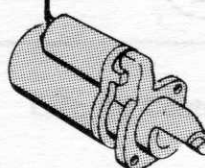
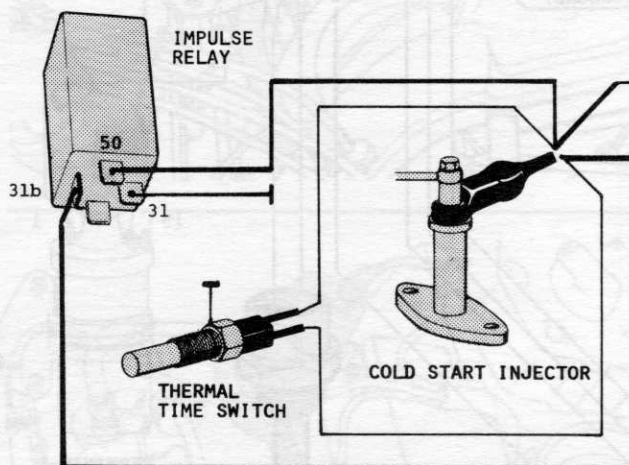
B28F

23E

Enrichment at warm starts.

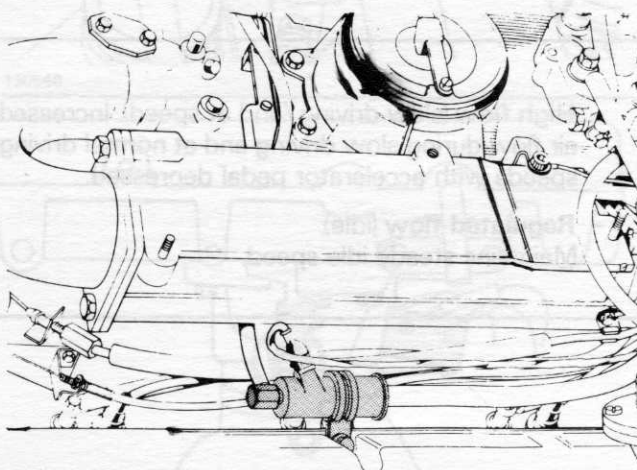
This system utilizes an impulse relay and the cold start injector to provide enrichment when starting an engine after it has been shut down for a while. This is especially effective after the vehicle has been parked for a couple of hours.

At warm starts, the impulse relay is engaged after approx. 1.5 seconds. It then starts to give 0.1 second of injection with 0.3 second interval.



The impulse relay is wired in parallel to the thermal time switch, which provides enrichment at cold starts.

130558



130689

B28F

23F

New location for frequency valve.

On engine left bank. This location provides protection and easy access for listening. It is stated in the Lambda-sond Fault Tracing Manual that "if the frequency valve buzzes, something other than this system is most likely at fault".

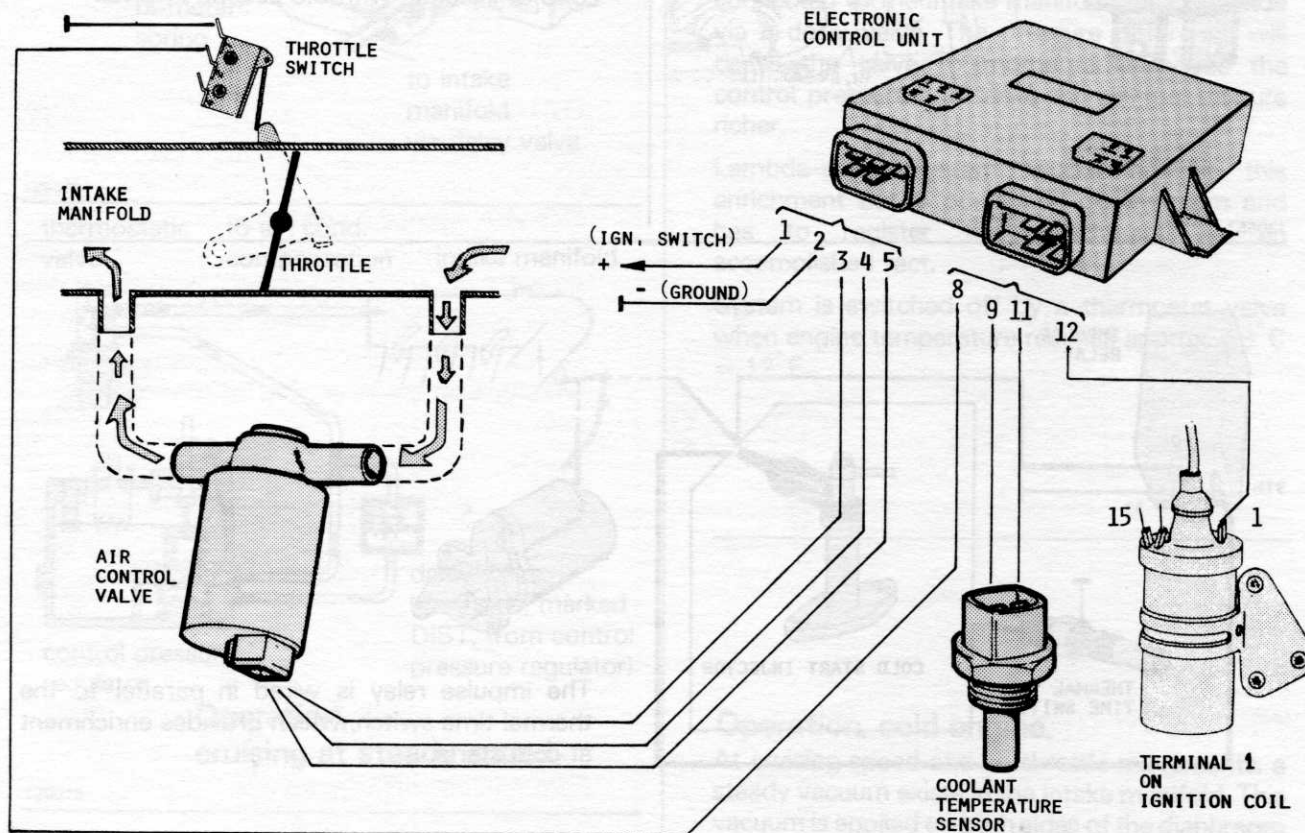
This location change was introduced as a running change during the 1980 model year and is from 1981 models on all B28F.

Constant Idle Speed System (CIS System)

The system is comprised of the following main components:

- Electronic Control Unit.
- Air Control Valve.
- Throttle switch.
- Coolant temperature sensor.
- Distributor.

The Electronic Control Unit processes information on engine temperature, engine speed and throttle position. It controls engine at idle or near idle by regulating the Air Control Valve.



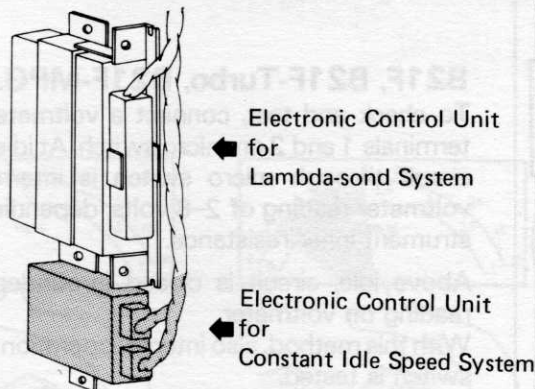
130545

Air flow modes.

The system has three basic air flow modes:

- **Low flow** (deceleration /idle).
Reduced air flow occurs when the throttle switch circuit is closed, i.e. during deceleration and idle.

- **High flow** (slow driving /and at speed). Increased air flow during slow driving and at normal driving speeds with accelerator pedal depressed.
- **Regulated flow** (idle).
Maintains steady idle speed.



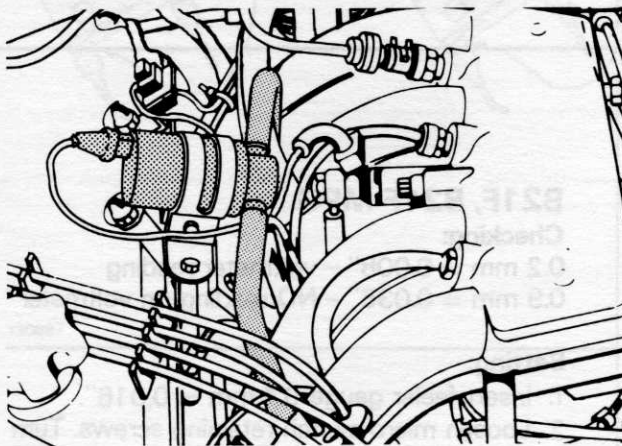
130669

Electronic Control Unit.

Receives information from three sources:

- Coolant temperature sensor gives input to provide higher idle rpm at low temperatures.
- Terminal 1 on ignition coil provides information on engine speed.
- A micro switch at the throttle provides input when the throttle control is at idle position.

The Electronic Control Unit is located below the Control Unit for the Lambda-sond system, in front of right front door.



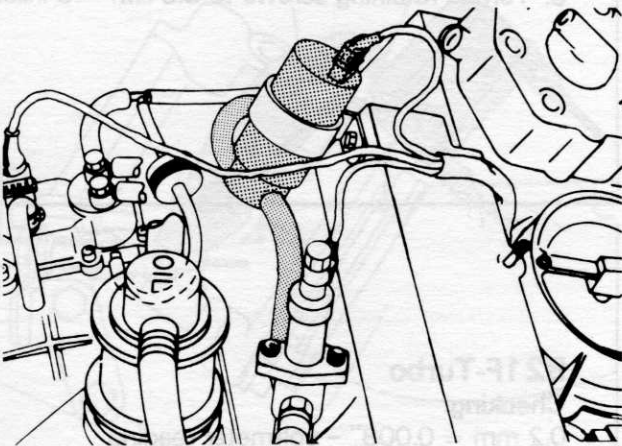
130547

Air Control Valve.

Bypasses air around the throttle valve. A small electric motor rotates clockwise or counter-clockwise, depending on signal from the Electronic Control Unit.

The valve responds very quickly to obtain a precise air flow.

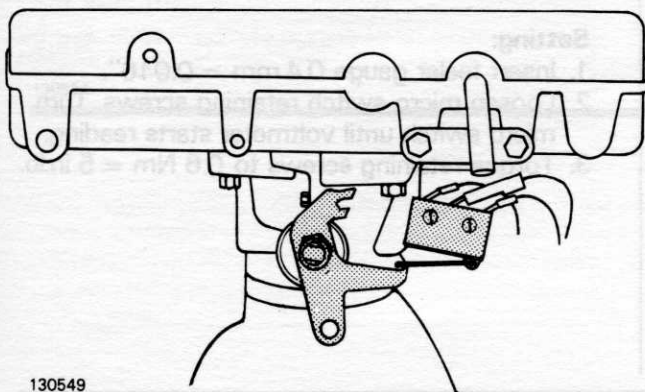
Left: Air Control Valve for B21F.



130548

Left: Air Control Valve for B28F.

- Air Control Unit for B21F-Turbo is located in front under intake manifold.



130549

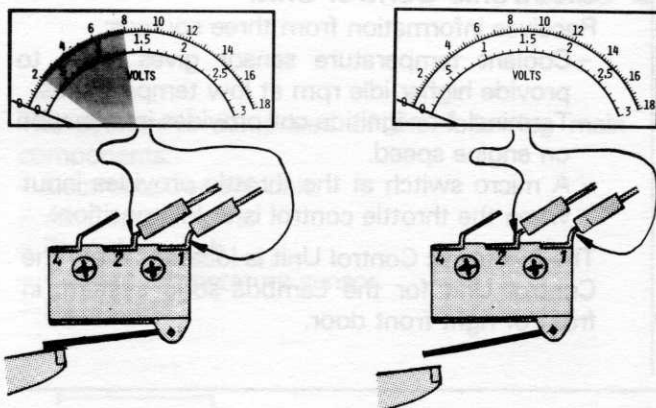
Throttle Switch.

The throttle actuates a micro switch which controls a circuit in the Electronic Control Unit when the throttle goes to idle position. This occurs during idle and deceleration.

For B21F, B21F-Turbo and B21F-MPG the ground circuit is interrupted at idle. For B28F it is closed at idle.

For throttle switch checking and setting, see next page.

Throttle switch checking and setting



130550

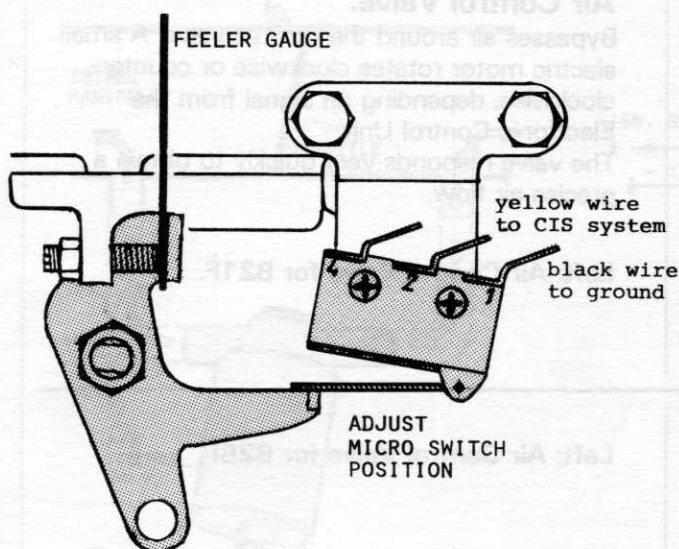
B21F, B21F-Turbo, B21F-MPG.

To check and test, connect a voltmeter across terminals 1 and 2 on micro switch. At idle, electric circuit through micro switch is interrupted = voltmeter reading of 2-8 volts, depending on instrument inner resistance.

Above idle, circuit is closed (grounded) = NO reading on voltmeter.

With this method, also internal operation of micro switch is tested.

All tests with ignition ON, using feeler gauge.



130551

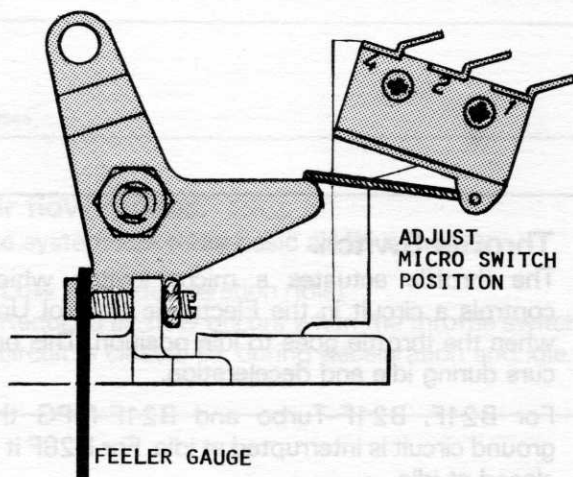
B21F, B21F-MPG.

Checking:

- 0.2 mm = 0.008" - voltmeter reading
- 0.9 mm = 0.036" - NO reading on voltmeter

Setting:

1. Insert feeler gauge 0.4 mm = 0.016".
2. Loosen micro switch retaining screws. Turn micro switch until voltmeter starts reading.
3. Torque retaining screws to 0.6 Nm = 5 in.lbs.



130552

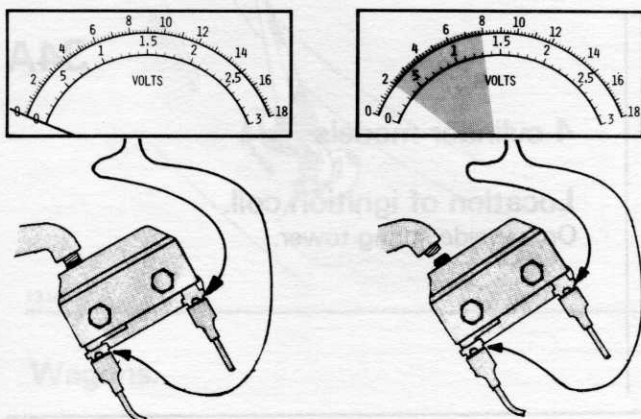
B21F-Turbo

Checking:

- 0.2 mm = 0.008" - voltmeter reading
- 1.1 mm = 0.045" - NO reading on voltmeter

Setting:

1. Insert feeler gauge 0.4 mm = 0.016".
2. Loosen micro switch retaining screws. Turn micro switch until voltmeter starts reading.
3. Torque retaining screws to 0.6 Nm = 5 in.lb.



B28F.

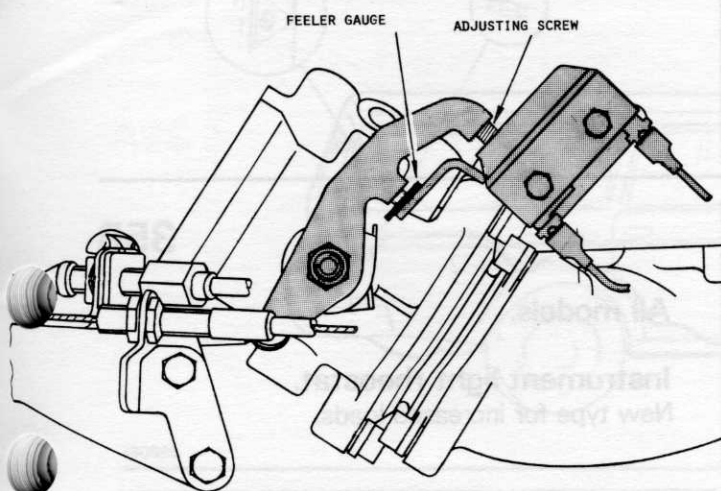
To check and test, connect a voltmeter across terminals on micro switch. At idle, electric circuit through micro switch is closed (grounded) = NO reading on voltmeter.

Above idle, circuit is interrupted = voltmeter readings of 2-8 volts, depending on instrument inner resistance.

With this method, also internal operation of micro switch is tested.

All tests with ignition ON, using feeler gauge.

130687



B28F

Checking:

0.2 mm = 0.008" - NO reading on voltmeter.
0.6 mm = 0.024" - voltmeter reading.

Setting:

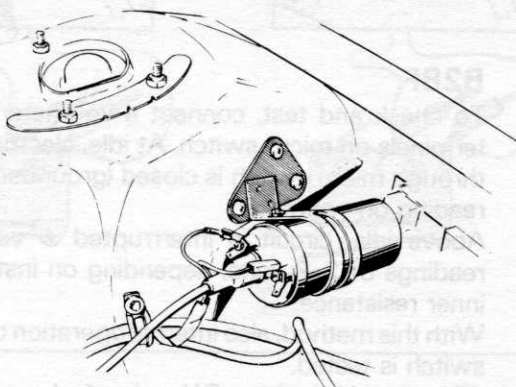
1. Insert feeler gauge 0.3 mm = 0.012".
2. Turn adjusting screw until voltmeter drops to 0.
3. Torque lock nut to 3 Nm = 2 ft.lbs.

Note:

B28F is equipped with **two** micro switches actuated by the throttle control. The other micro switch closes a Lambda-sond circuit at full throttle to provide a richer air/fuel mixture at maximum acceleration.

130554

Section 3: Electrical system and instruments



131418

34A

4-cylinder models

Location of ignition coil.
On left side spring tower.

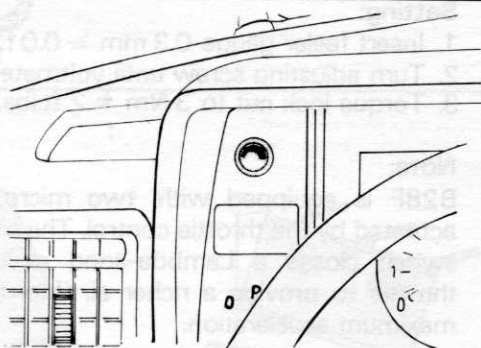


130562

35A

All models.

Halogen lights.
For upper beams, inner bulbs only.

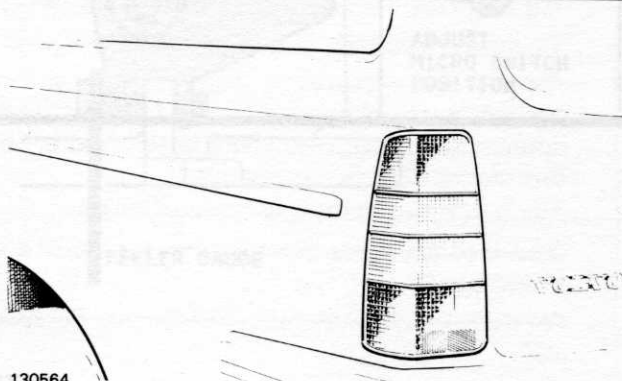


130563

35B

All models.

Instrument light rheostat.
New type for increased loads.

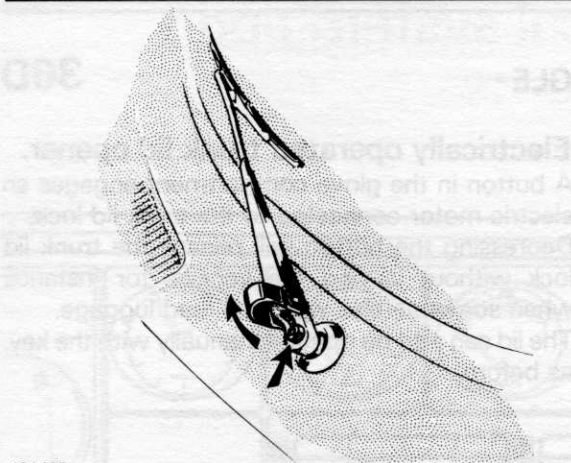


130564

35C

Wagons.

Tail lights.
Larger, "wrap-around"-type. Side marker lights no longer necessary, therefore deleted.
Bulbs replaced from inside.



131425

36A

Window wipers.

Improved wiper power transmission system with larger diameter wiper shaft. Wiper arms retained on shaft by nuts, torque 20 Nm = 15 ft.lbs.

Wiper blades and arms are also modified type.

Wagons.

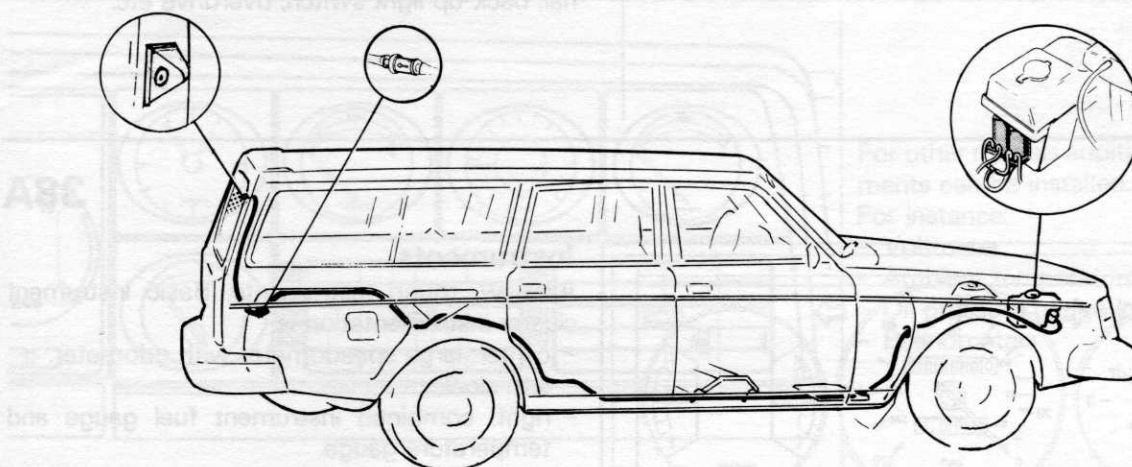
36B

Tail gate window washer.

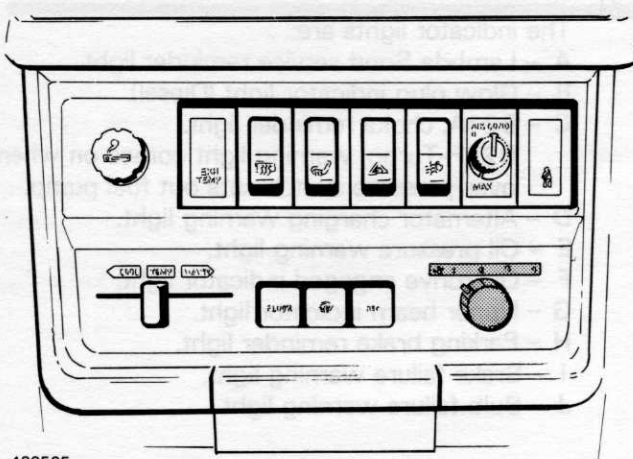
Fluid container common for windshield washer and tail gate window washer.

The pump for the tail gate window washer is separate and marked with a blue dot. The pump for the windshield washer has increased power, 40 W.

Both pumps are located on the side of the fluid container.



130666



130565

36C

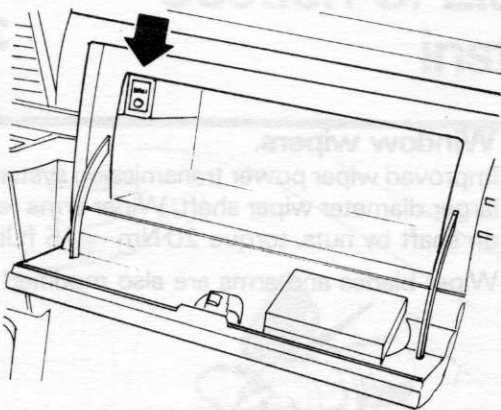
All models.

Heater blower.

More powerful blower motor. Air flow increased approx. 20% at max. speed compared to previous model.

The motor has permanent magnet fields.

Also the switch has been changed to stand the increased load. It has four positions, no OFF position. Blower motor is always on when ignition is ON.



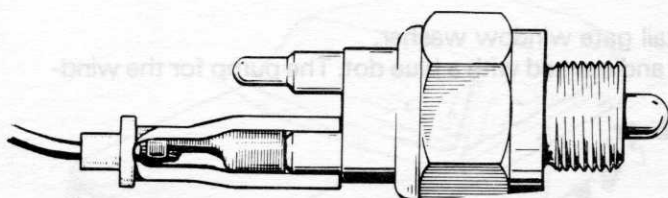
130628

GLE

36D

Electrically operated trunk lid opener.

A button in the glove compartment engages an electric motor connected to the trunk lid lock. Depressing the button will release the trunk lid lock without leaving the vehicle, for instance when someone else wants to load luggage. The lid can also be opened manually with the key, as before.



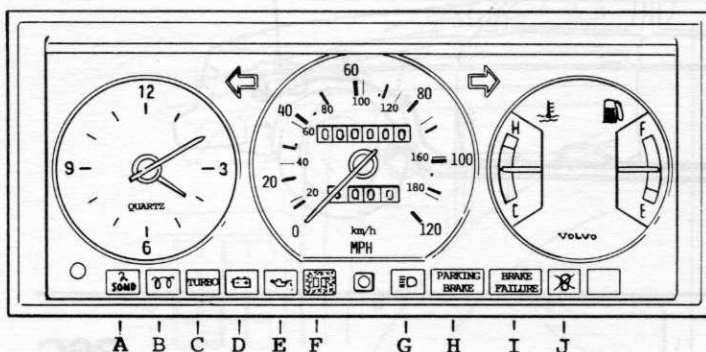
131422

37A

Circular pin connectors.

Circular pin terminals in combination with tight fitting seals provide reliable contacts and improved resistance against moisture and corroding gases.

These connectors are used for several items, such as: washer pump, front parking light and turn signal, back-up light switch, overdrive etc.



NOTE:

Several instrumentation versions exist. On versions with tachometer, it is located to the left and a smaller clock is located to the right of the instrument cluster. There are also digital clocks.

38A

Instruments.

All new, round instruments. Basic instrument cluster instrumentation is:

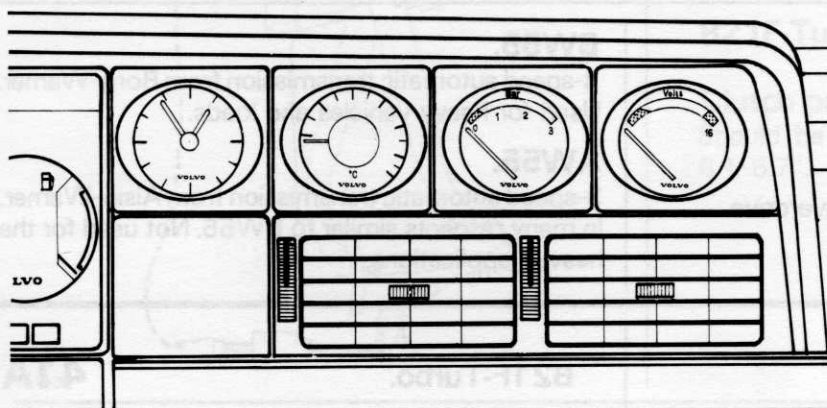
- center: large speedometer with odometer.
- left: clock.
- right: combined instrument fuel gauge and temperature gauge.

The indicator lights are:

- A – Lambda Sond service reminder light.
- B – Glow plug indicator light (Diesel).
- C – B21A: choke reminder light.
B21F-Turbo: warning light comes on when over-pressure switch cuts out fuel pump.
- D – Alternator charging warning light.
- E – Oil pressure warning light.
- F – Overdrive engaged indicator light.
- G – Upper beam indicator light.
- H – Parking brake reminder light.
- I – Brake failure warning light.
- J – Bulb failure warning light.

130567

38B



Additional instruments.

Some models utilize the space to the right of the instrument cluster for additional instrumentation.

Example:

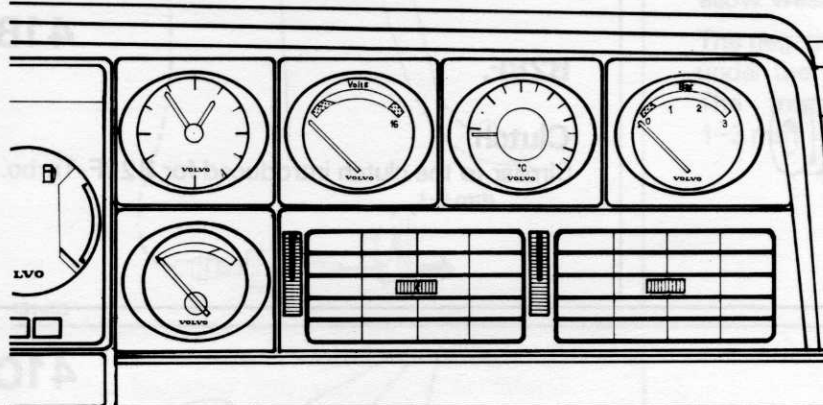
Model GLT, USA
(engine B21F-Turbo):

- Turbo pressure gauge.
- Oil pressure gauge.
- Voltmeter.

Model GLT, Canada (engine B23E):

- Ambient temperature gauge.
- Oil pressure gauge.
- Voltmeter.

130568



For other models additional instruments can be installed.

For instance:

- Voltmeter.
- Ambient temperature gauge.
- Oil pressure gauge (not B28F).
- Econometer.

130680

Section 4: Power transmission

Transmissions

M45.

Manual 4-speed transmission.

M46.

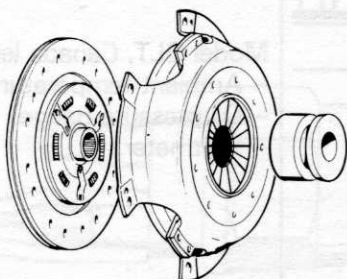
Manual 4-speed transmission with overdrive.
Essentially a M45 with overdrive.

BW55.

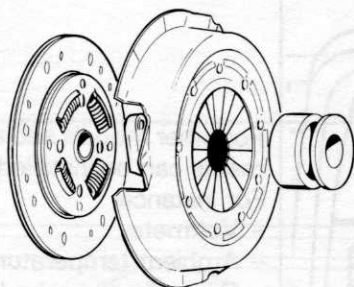
3-speed automatic transmission from Borg-Warner.
Used for heavy vehicles and loads.

AW55.

3-speed automatic transmission from Aisin-Warner.
In many respects similar to BW55. Not used for the heavier applications.



130569



B21F-Turbo.

41A

Clutch.

A new clutch of heavy-duty type introduced to stand the increased torque developed with the Turbo engine.

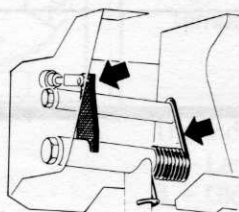
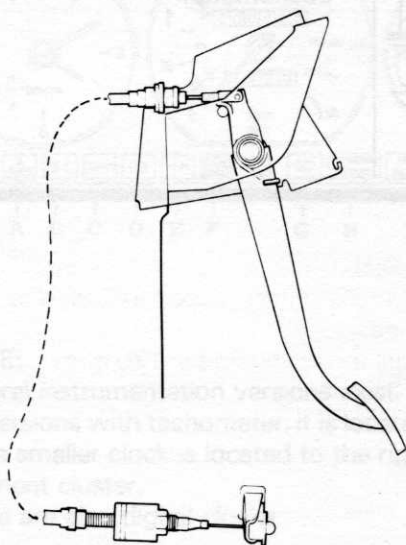
Clamping force is increased approx. 45%.

B28F.

41B

Clutch.

Similar to the clutch introduced for B21F-Turbo.



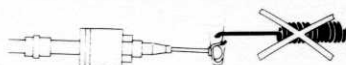
41C

B21F-Turbo

Clutch control.

The clutch is cable actuated and has been modified to fit the new clutch. The clutch pedal travel is longer to reduce pedal power.

The throw-out bearing has no play and operates with a small pre-load, which is applied by a spring located at the top of the pedal bracket, see illustration.



no return spring

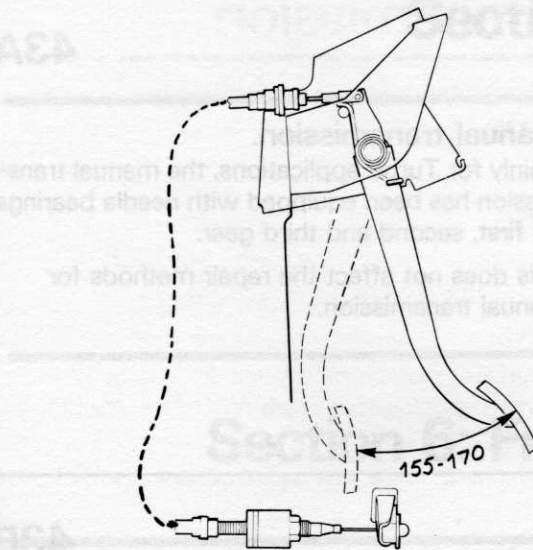
130570

41C (cont.)

B21F-Turbo

Clutch pedal travel.

Should be unobstructed and 155-170 mm = 6.1-6.7".



131430

41C (cont.)

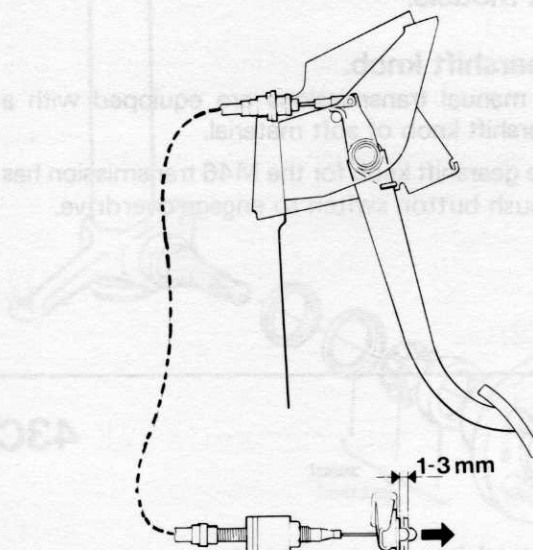
B21F-Turbo

Clutch negative play.

The new clutch must have a negative play to allow wear.

The negative play is measured at the clutch fork, under the vehicle.

The free movement **rearward** should be 1-3 mm = approx. 5/64".



131433

41D

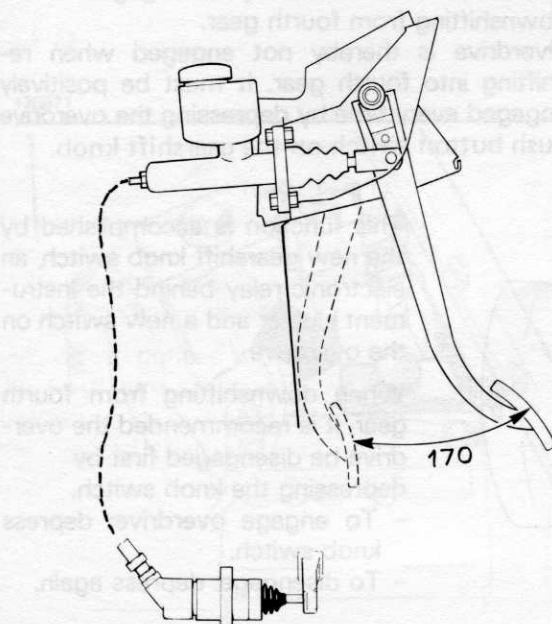
B28F

Clutch control.

A similar clutch control is used for vehicles with B28F engines.

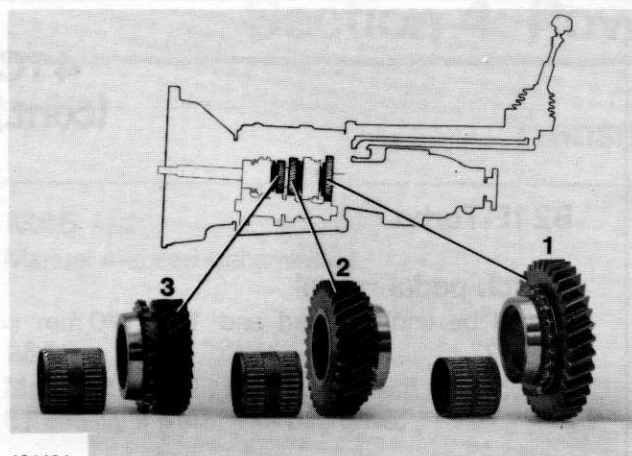
Clutch pedal travel should be 170 mm = 6.7".

Because of the hydraulic power transfer there is no play to adjust.



131431

43A



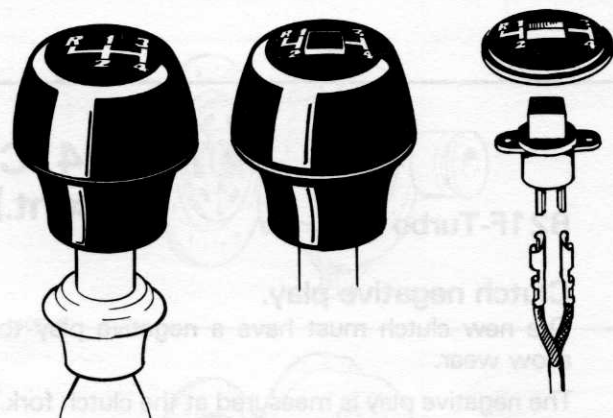
131434

Manual transmission.

Mainly for Turbo applications, the manual transmission has been equipped with needle bearings for first, second and third gear.

This does not affect the repair methods for manual transmission.

43B



131435

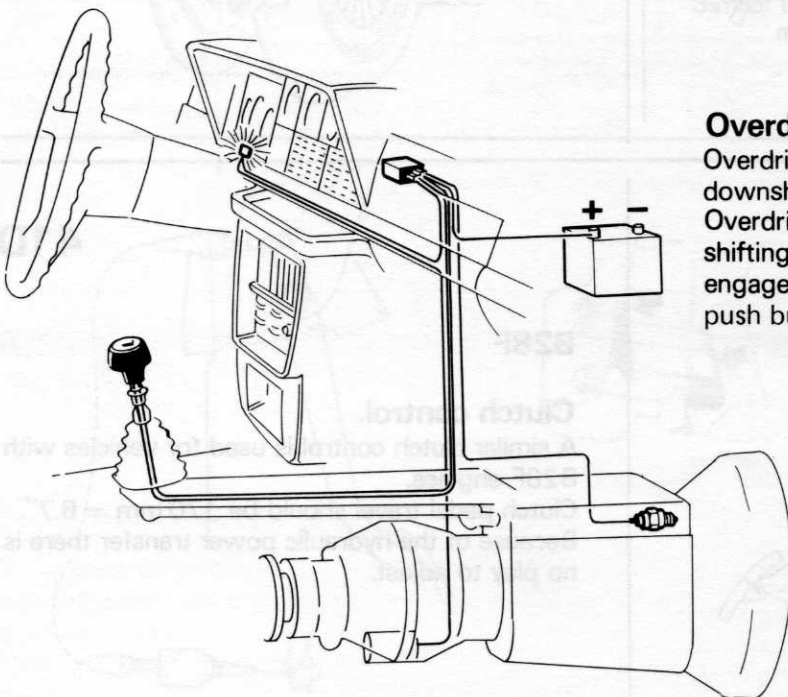
All models.

Gearshift knob.

All manual transmissions are equipped with a gearshift knob of soft material.

The gearshift knob for the M46 transmission has a push button switch to engage overdrive.

43C



Overdrive engagement.

Overdrive is automatically disengaged when downshifting from fourth gear.

Overdrive is thereby not engaged when re-shifting into fourth gear. It must be positively engaged every time by depressing the overdrive push button switch on the gearshift knob.

This function is accomplished by the new gearshift knob switch, an electronic relay behind the instrument cluster and a new switch on the overdrive.

When downshifting from fourth gear, it is recommended the overdrive be disengaged first by depressing the knob switch.

- To engage overdrive: depress knob switch.
- To disengage: depress again.

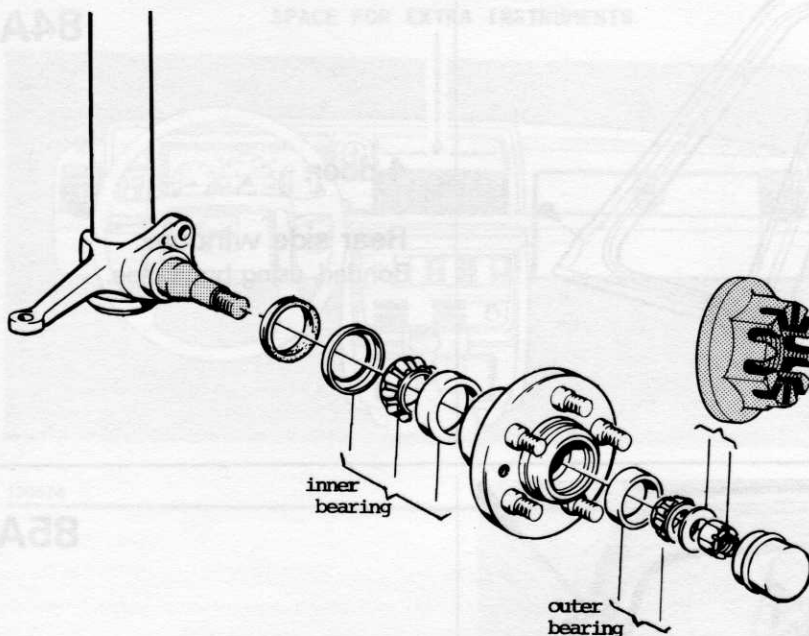
131419

Section 5: Brakes

No new features for 1981

Section 6: Front end and steering

61A



All.

Front wheel bearings.

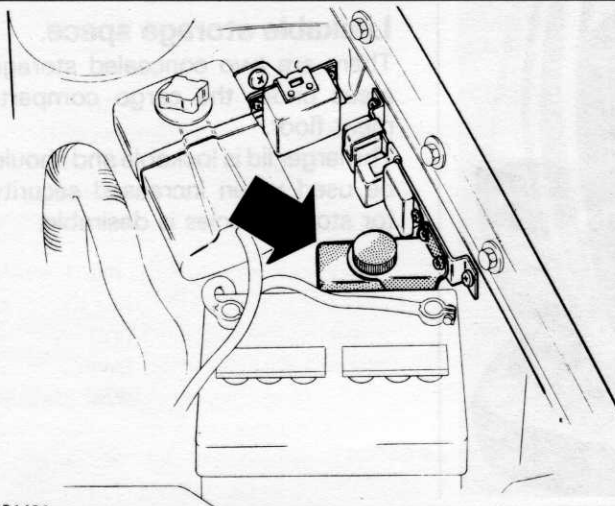
Previously there existed two different axle shafts and bearings for the front axle. One for standard and one for special applications.

Now there is one size bearing. There are still two axle shafts, but the difference is in material, not size.

A new nut, with flat washer, is introduced. It provides added adjustment possibilities.

130571

64A



B28F

Location of power steering fluid container.

New location on a bracket behind the battery.

131436

Section 8: Body

81A

Wagons

Rear fenders.

Modified to fit the new wrap-around rear lights.

130564

84A

4-door.

Rear side window.

Bonded, using butyl tape.

131364

85A

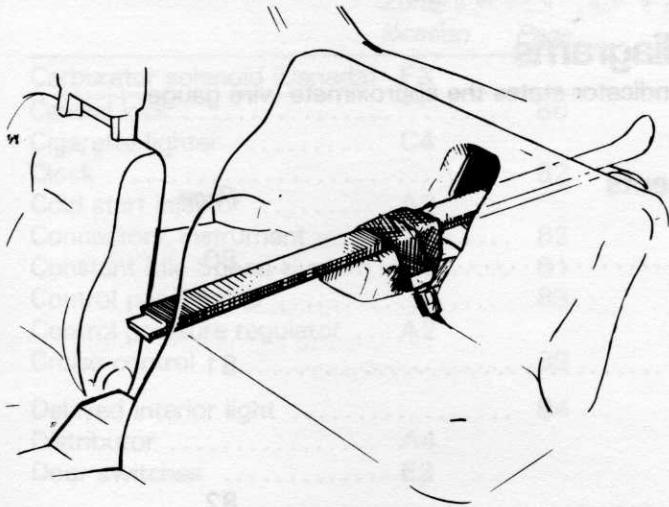
Wagon.

Lockable storage space.

There are two concealed storage areas under the cargo compartment floor.

The larger lid is lockable and should be used when increased security for stored articles is desirable.

130573



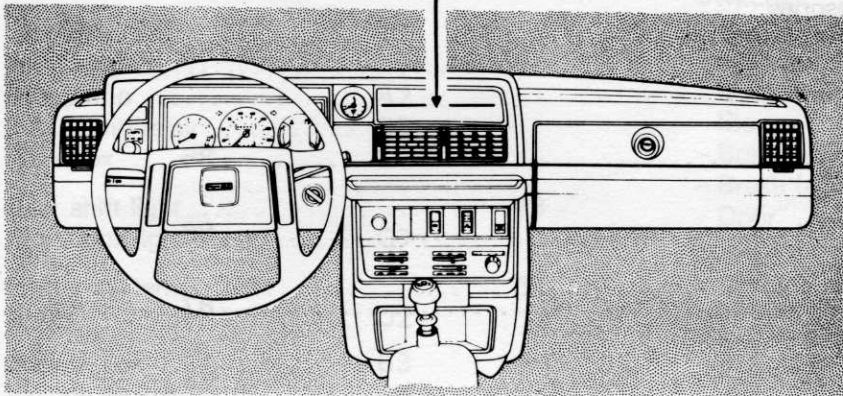
85B

2-door/4-door models.

Storage space for long cargo.

A flap in the rear seat can be opened to provide storage space for long cargo, like skis.

SPACE FOR EXTRA INSTRUMENTS



ALL

85C

Dashboard.

Redesigned:

- New instruments.
- New glove box.
- Additional storage spaces.
- New type switches.
- Space for extra instruments.
- Modified air louvers.

130574

Wiring diagrams

In the wiring diagrams, the number after the color indicator states the approximate wire gauge.

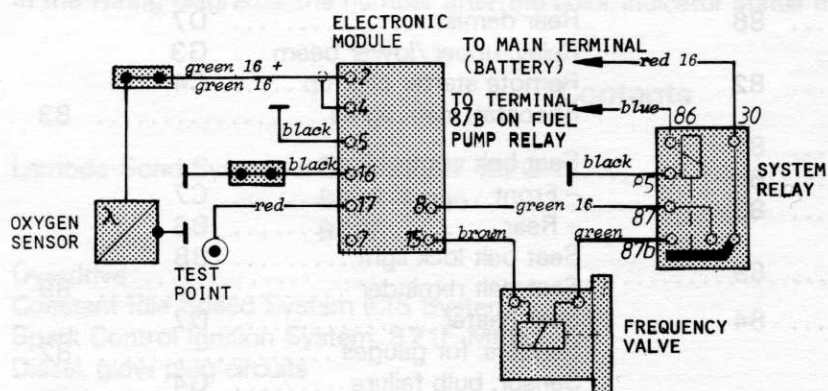
Contents	Page
Lambda-Sond System: - B21F, B21F-MPG B21F-Turbo B28F	80
Overdrive	81
Constant Idle Speed System (CIS System) Spark Control Ignition System, B21F-MPG Diesel, glow plug circuits	
Instrument cluster	82
Instrument connector	
Additional instruments, B21F-Turbo	83
Additional instruments, B23E Control panel lights, lights on accessories	
Interior light	84
Rear interior light, wagon Delayed interior light	
Window lifts: - 2-door - 4-door	85
Central lock: - 2-door - 4-door	86
Tail gate window wiper, wagon	87
Back-up light, automatic transmission	
Heater blower	88
Air conditioning Electric cooling fan	
Cruise control	89
Seat belt reminder system Passenger seat heater, rear cigarette lighter	
Radio/antenna	90
Electric trunk lid opener Electrically operated side mirrors	
Master wiring diagram	Fold-out sheet.

Alphabetical index

Zone locations refer to grid system on fold-out sheet.

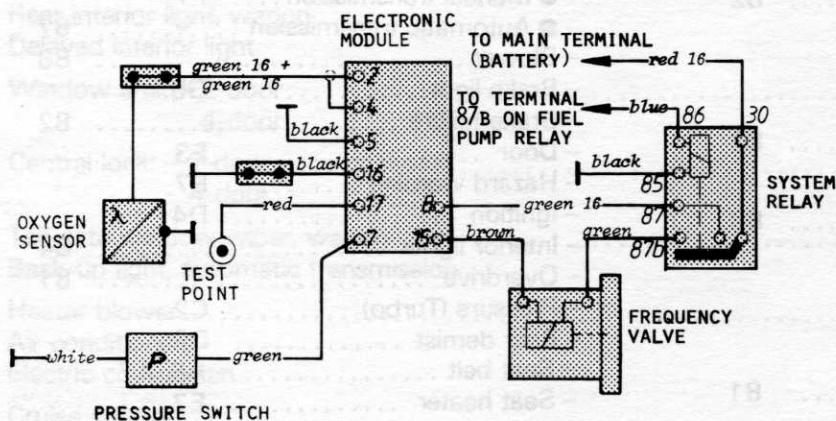
Name	Zone location	Page	Name	Zone location	Page
AC system		88	Ballast resistor	B3	
Alternator	B1		Battery	B1	
Ash tray light		83	Blower		88
Automatic transmission		87	Brake failure switch		82
Auxiliary air valve	A3		Brake lights	C9, G9	
Back-up lights	C9, G9		Brake light switch	G5	
- Wagon	D10, G10		Bulb failure sensor	G4	
			Buzzer		89

	Zone location	Page	Name	Zone location	Page
Carburetor solenoid (Canada)	F3		Radio		90
Central lock		86	Rear demist	D7	
Cigarette lighter	C4		Relay, upper /lower beam	G3	
Clock		82	Remote starter pick-up	C4	
Cold start injector	A2		Rheostat, instr, lights		83
Connectors, instrument		82	Seat belt control light:		
Constant Idle Speed System		81	- Front	C7	
Control panel lights		83	- Rear	B6	
Control pressure regulator	A2		Seat belt lock light	B8	
Cruise control		89	Seat belt reminder		89
Delayed interior light		84	Seat heater	D7	
Distributor	A4		Senders, for gauges		82
Door switches	E3		Sensor, bulb failure	G4	
Electrical cooling fan		88	Side mirrors		90
El. heated rear window	D7		Solenoid (carburetor, diesel)	F3	
El. operated door mirrors		90	Spark plugs	A4	
Engine compartment light		83	Starter motor	A1	
Flasher unit	E7		Switches:		
Fuel gauge		82	- Back-up light:		
Fuel pump	A2		● Manual transmission	F7	
Fuel pump relay	B2		● Automatic transmission		87
Fuse box	E4		- Blower		88
Gear shift light		83	- Brake light	G5	
Glove box light	G7		- Brake failure		82
Heater system		88	- Door	E3	
Horns	D2		- Hazard warning	E7	
Ignition coil	B3		- Ignition	D4	
Ignition switch	D4		- Interior lights		84
Ignition electronic module	B4		- Overdrive		81
Ignition system, B21F-MPG		81	- Pressure (Turbo)	C2	
Impulse relay	A1		- Rear demist	D8	
Instruments:			- Seat belt	A6, A7	
- B21F-Turbo		83	- Seat heater	E7	
- B23E		83	- Tail gate wiper /washer		87
Indicator lights		82	- Trunk lid opener		90
Instrument connectors		82	- Turn signal	F7	
Instrument lights		82	- Windshield wiper /washer	B8	
Interior light		84	Tachometer		82
Interval relay, wiper	B7		Tail lights	C9, G9	
- Tail gate window wiper		87	- Wagon	D10, G10	
Lambda system		80	Thermal time switch	A2	
License plate light	E9		Trunk lid opener		90
- Wagon	E10		Trunk light	E8	
Light switch	F2		Turn signal, front	D1, G1	
Mirrors		90	- Rear	C9, G9	
Overdrive solenoid, switch		81	- Rear, wagon	D10, G10	
Oxygen sensor system		80	Voltage regulator	B1	
Parking lights, front	D1, G1		Voltage stabilizer		82
			Washer, tail gate window		87
			- Windshield	B9	
			- Window lifts		85
			Wiper motor:		
			- Tail gate window		87
			- Windshield	B9	



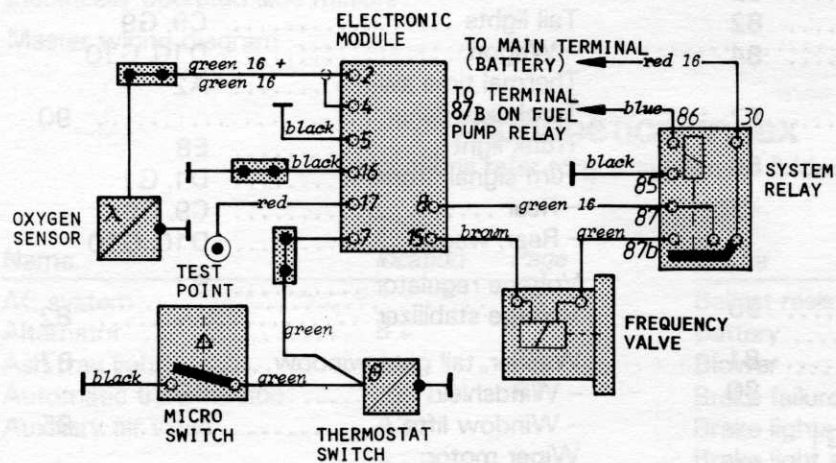
**Lambda-sond System
B21F-MPG**

130576



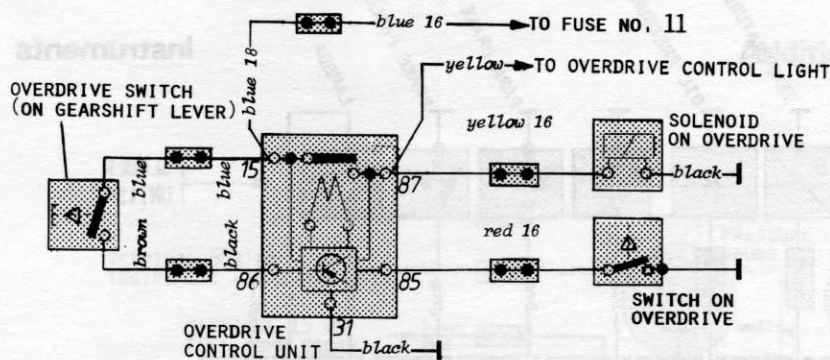
**Lambda-sond System
B21F-Turbo**

130577



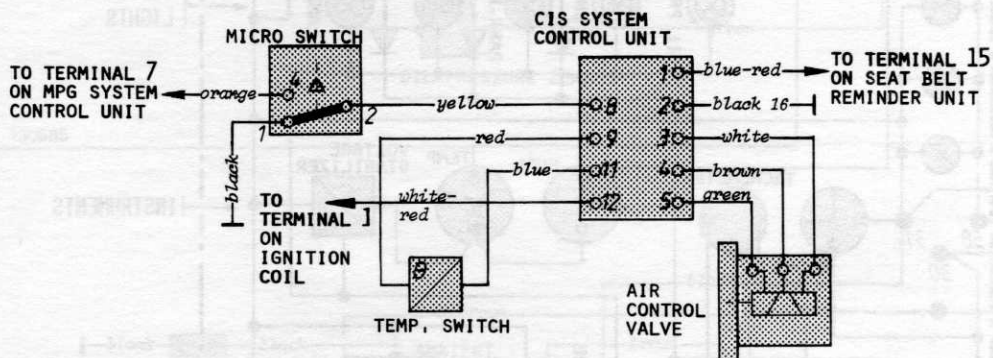
**Lambda-sond System
B21F
B28F**

130578



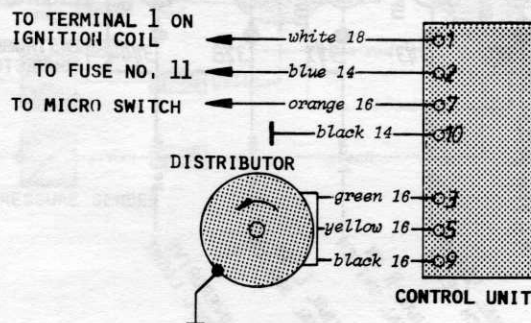
Overdrive

130579



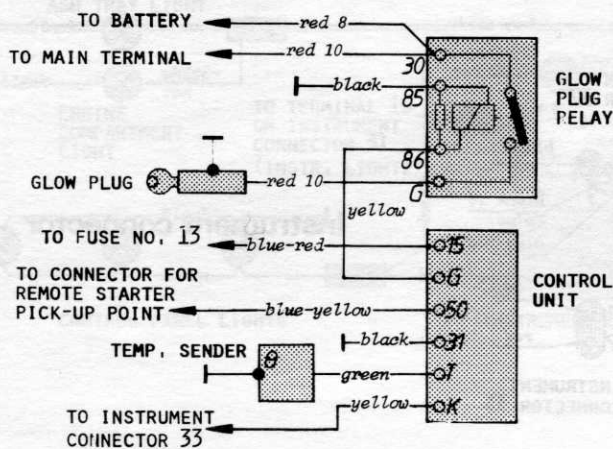
**Constant Idle
Speed System
(CIS System)**

130580



**Spark Control Ignition System
B21F-MPG**

130581

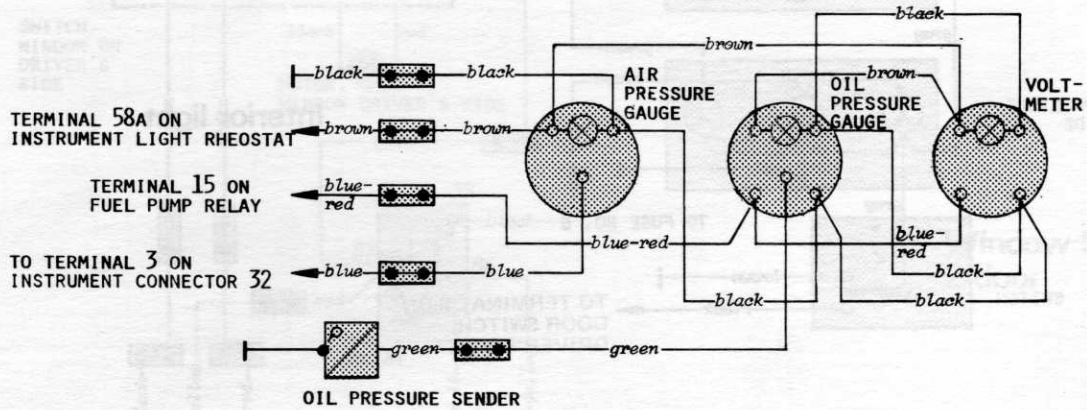


**Diesel,
glow plug circuits**

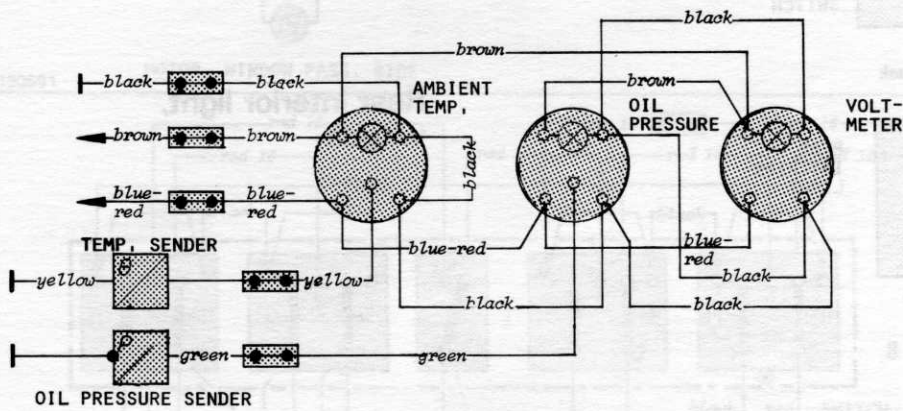
130582



Additional instruments, B21F-Turbo

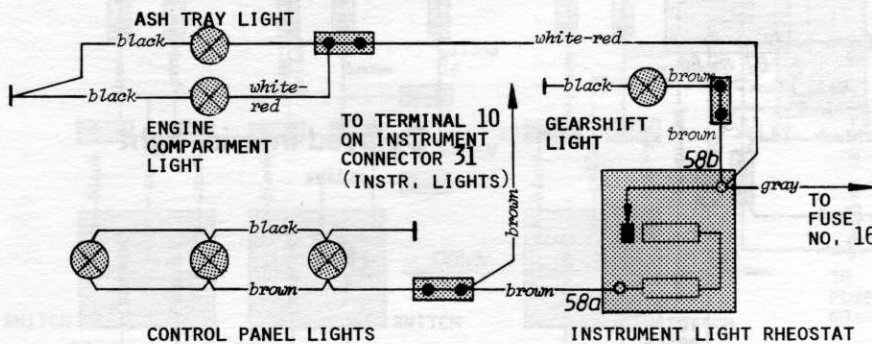


130585



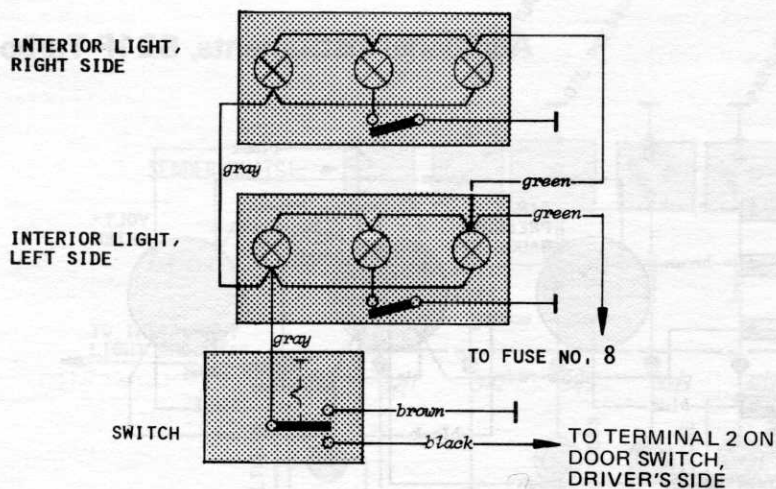
Additional instruments, B23E

130586



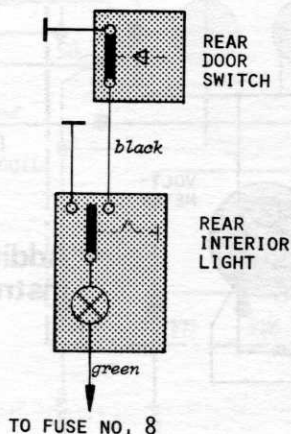
Control panel lights, lights on accessories

130587



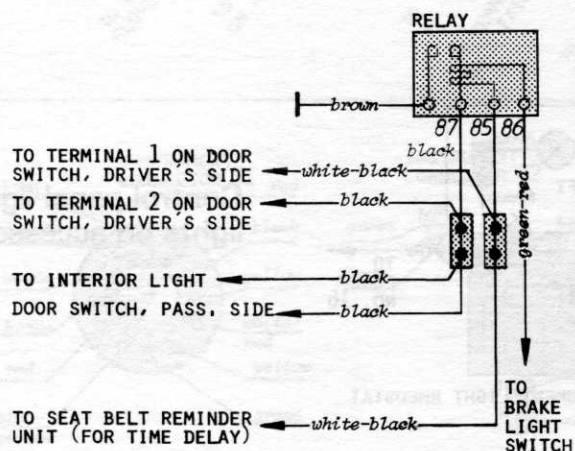
Interior light

130588



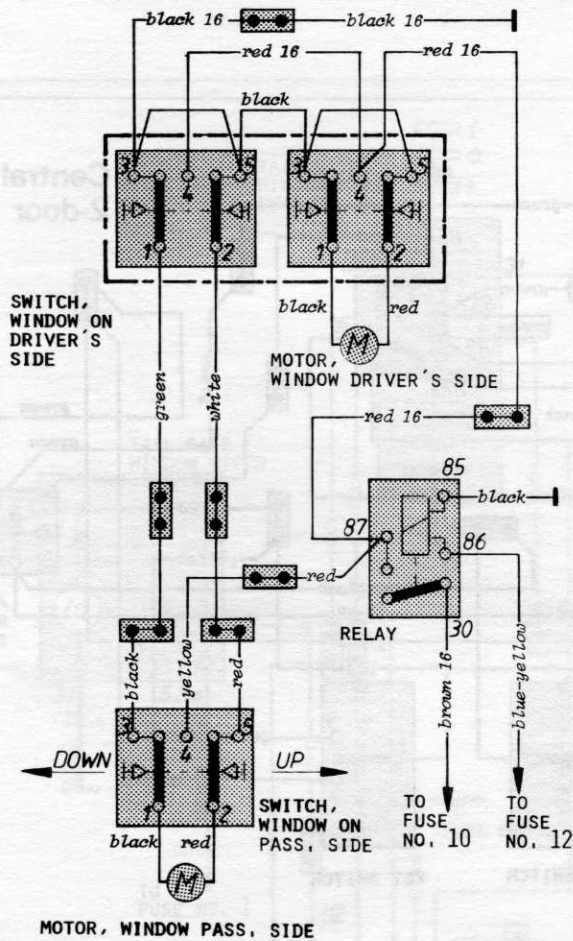
Rear interior light, wagon

130589



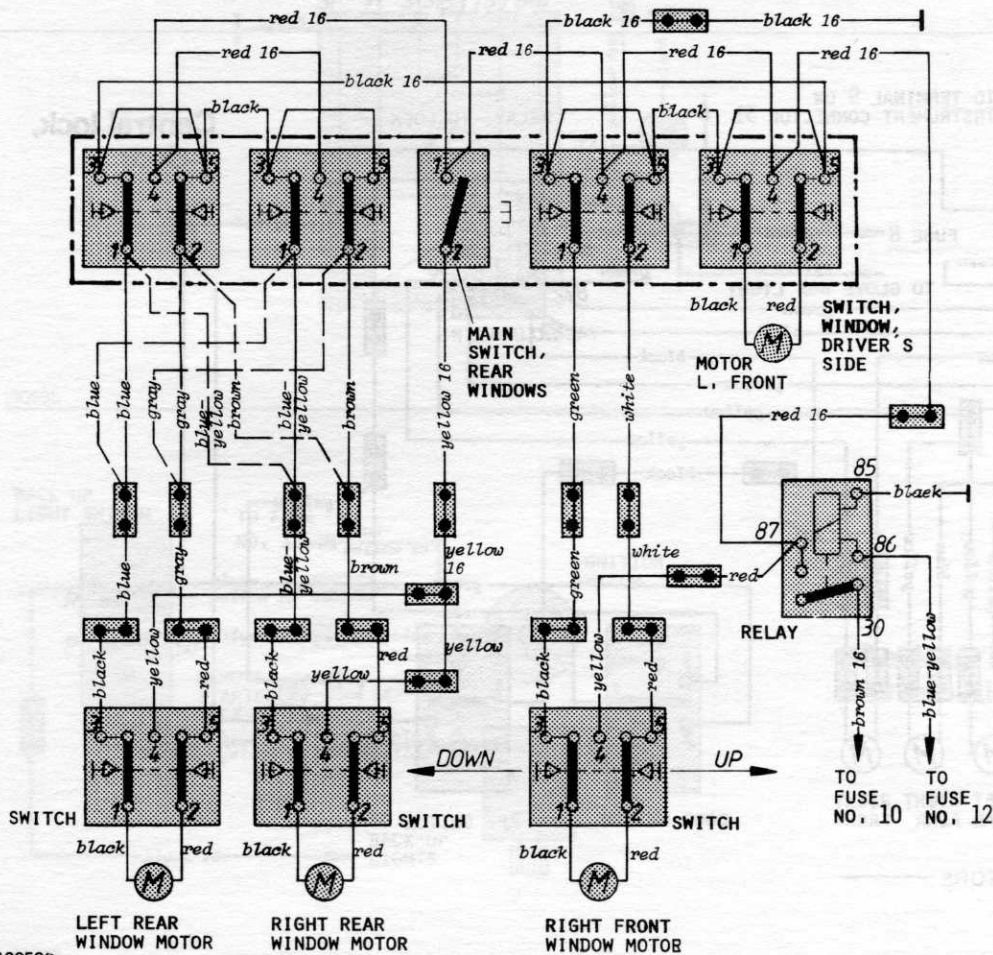
Delayed interior light

130590



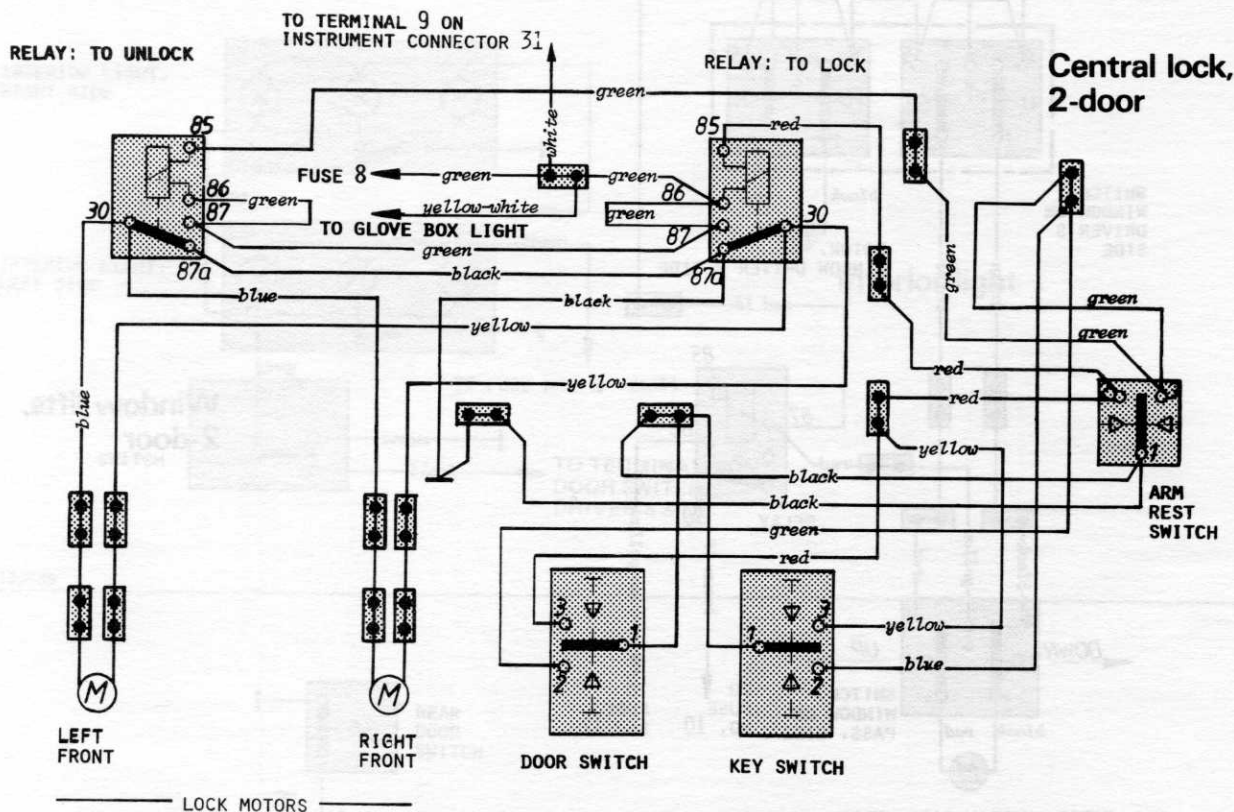
Window lifts,
2-door

130591

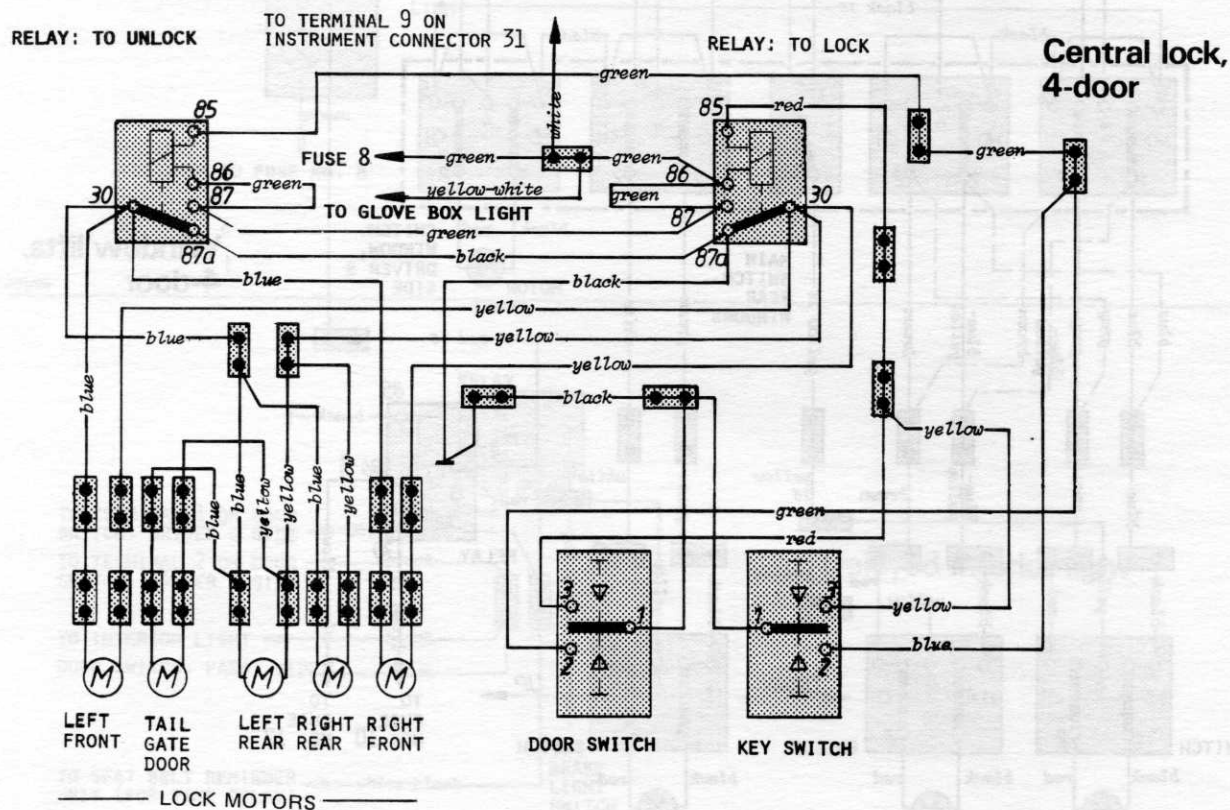


Window lifts,
4-door

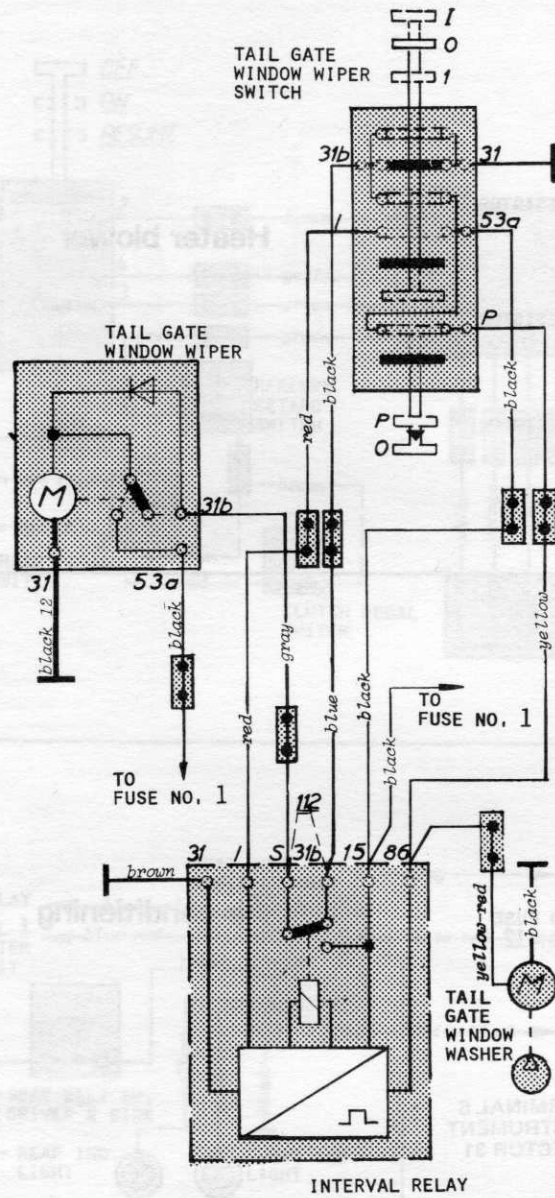
130592



130593

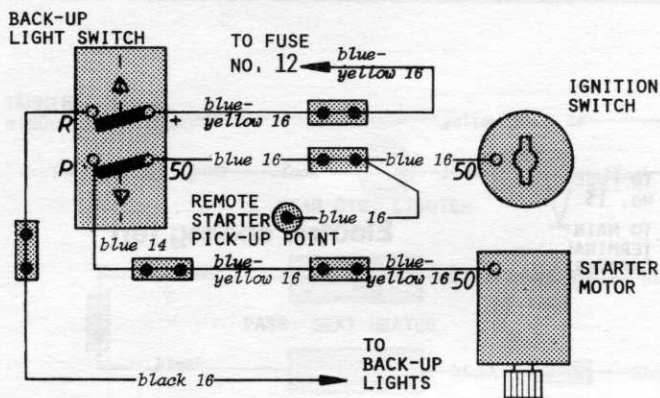


130594



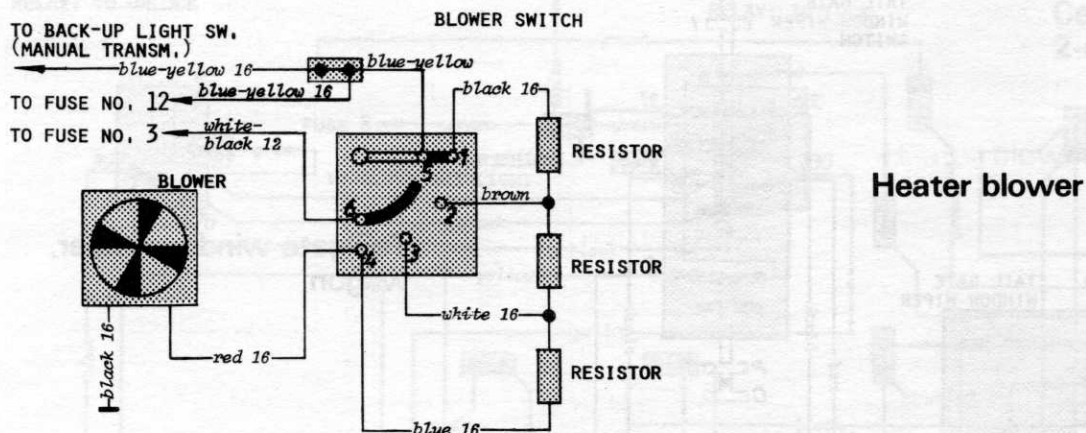
**Tail gate window wiper,
wagon**

130595

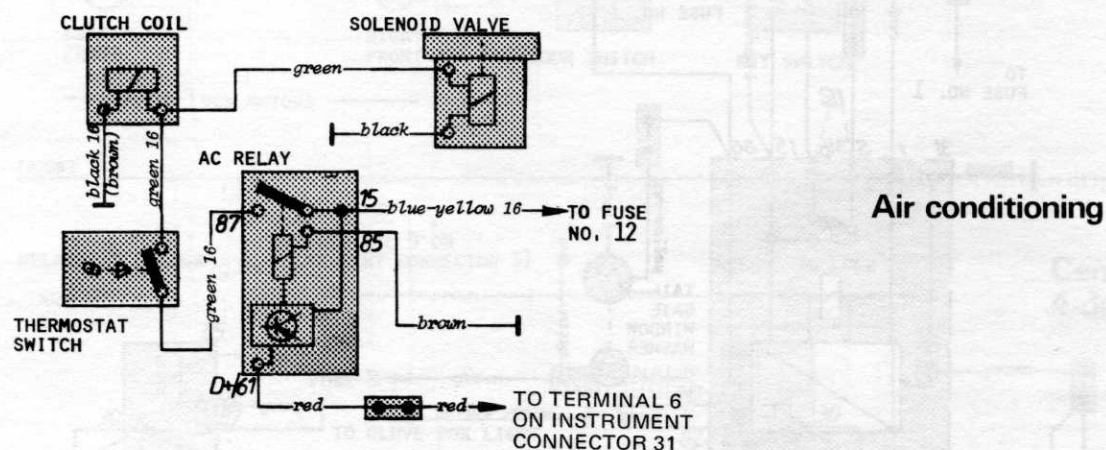


**Back-up light,
automatic transmission**

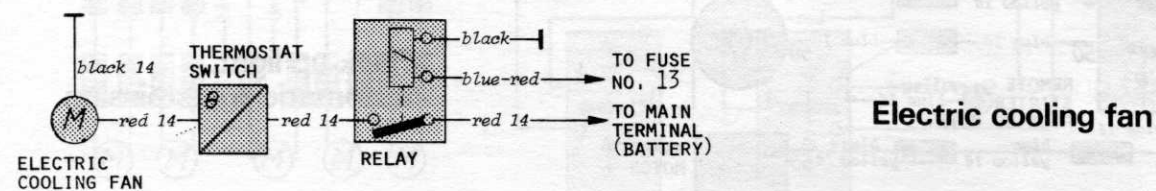
130596



130597

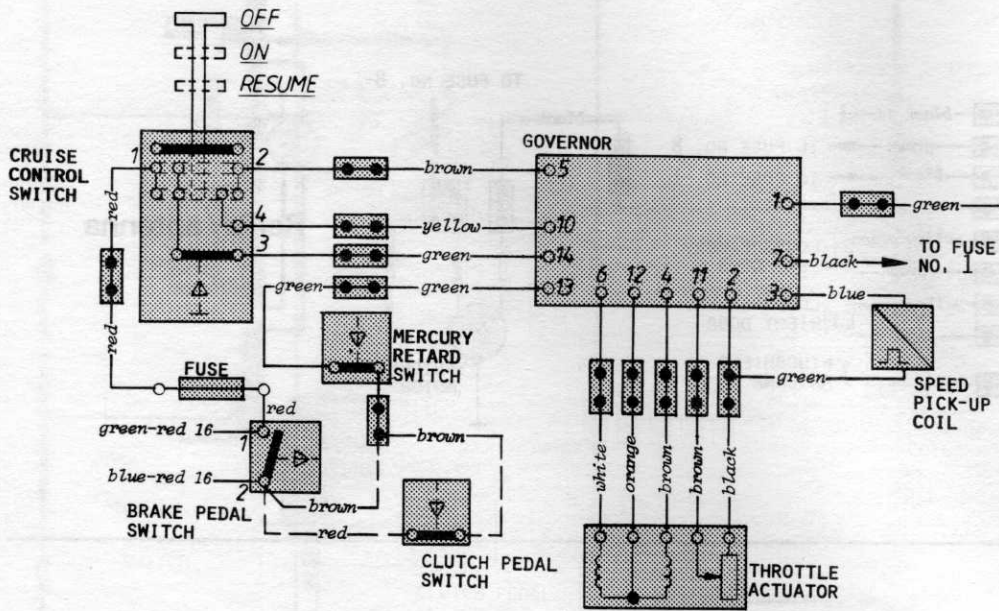


130598

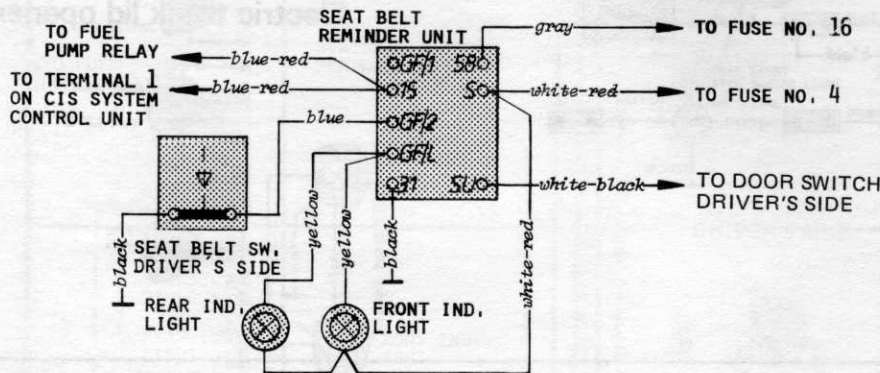


130599

Cruise control

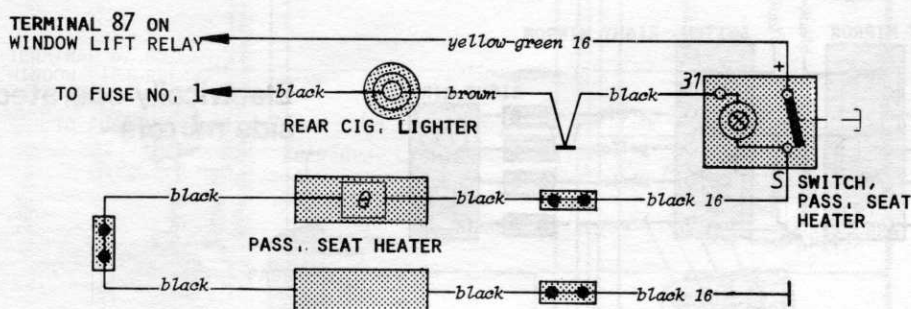


130600



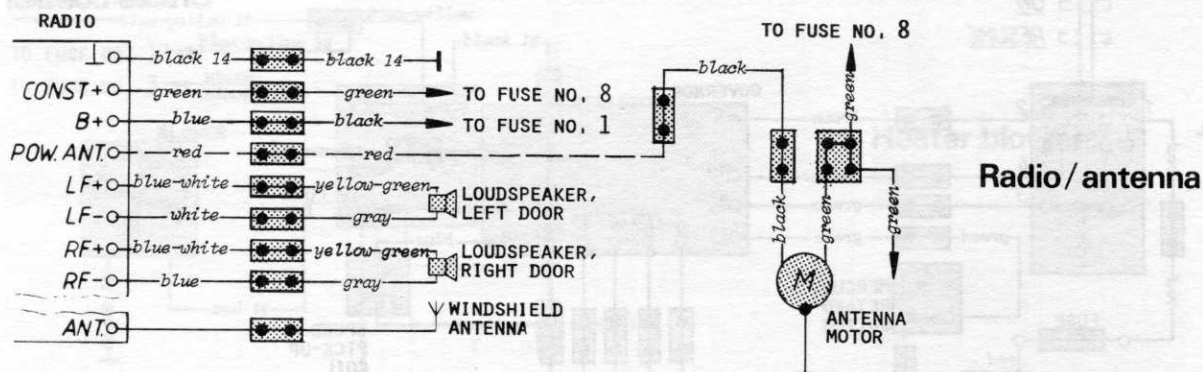
Seat belt reminder system

130601

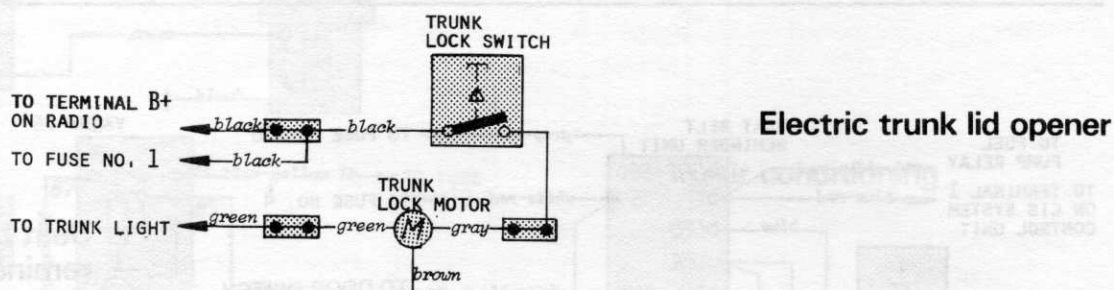


Pass. seat heater, rear cigarette lighter

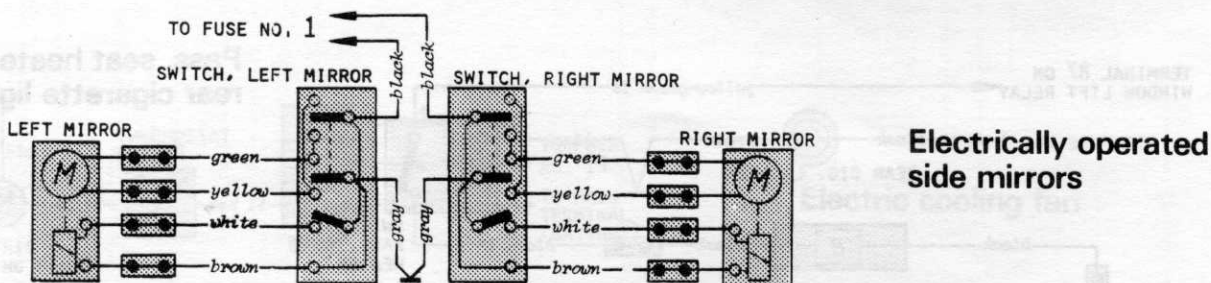
130602



130603



130604



130605



**VOLVO SUPPORTS VOLUNTARY
MECHANIC CERTIFICATION
BY THE N.I.A.S.E.**

(U.S.A. Only)

VOLVO

