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# CONTENTS

GENERAL VIEWS .....	1	SERVICE DATA AND SPECIFICATIONS .....	20
Dimensions .....	1	Technical data .....	20
Weights and loads .....	2	Fuel delivery and injection	
Wheels and tyres .....	3	system components .....	37
MODEL IDENTIFICATION .....	4	Carburettors .....	38
NEW IDENTIFICATION LABEL .....	8	ELECTRICAL SYSTEM .....	39
MAINTENANCE OF MECHANICAL		Component parts .....	39
AND BODYWORK COMPONENTS .....	9	STARTING .....	40
Technical data checks and		Technical data	
adjustments .....	9	and specifications .....	40
MOTRONIC 1.8		CHARGING .....	42
WIRING DIAGRAM .....	10	Technical data	
75 1.8 IE MODEL VIEW OF		and specifications .....	42
ENGINE COMPARTMENT .....	12	TRANSISTORISED	
75 1.8 IE MODEL VIEW		BREAKERLESS IGNITION .....	43
FROM BELOW .....	14	Technical data	
75 2.4 TD MODE VIEW		and specifications .....	43
FROM ENGINE COMPARTMENT .....	16	GEARBOX AND TRANSMISSION .....	47
75 2.4 TD MODEL VIEW		Technical data	
FROM BELOW .....	18	and specifications .....	47

# WORKSHOP MANUAL

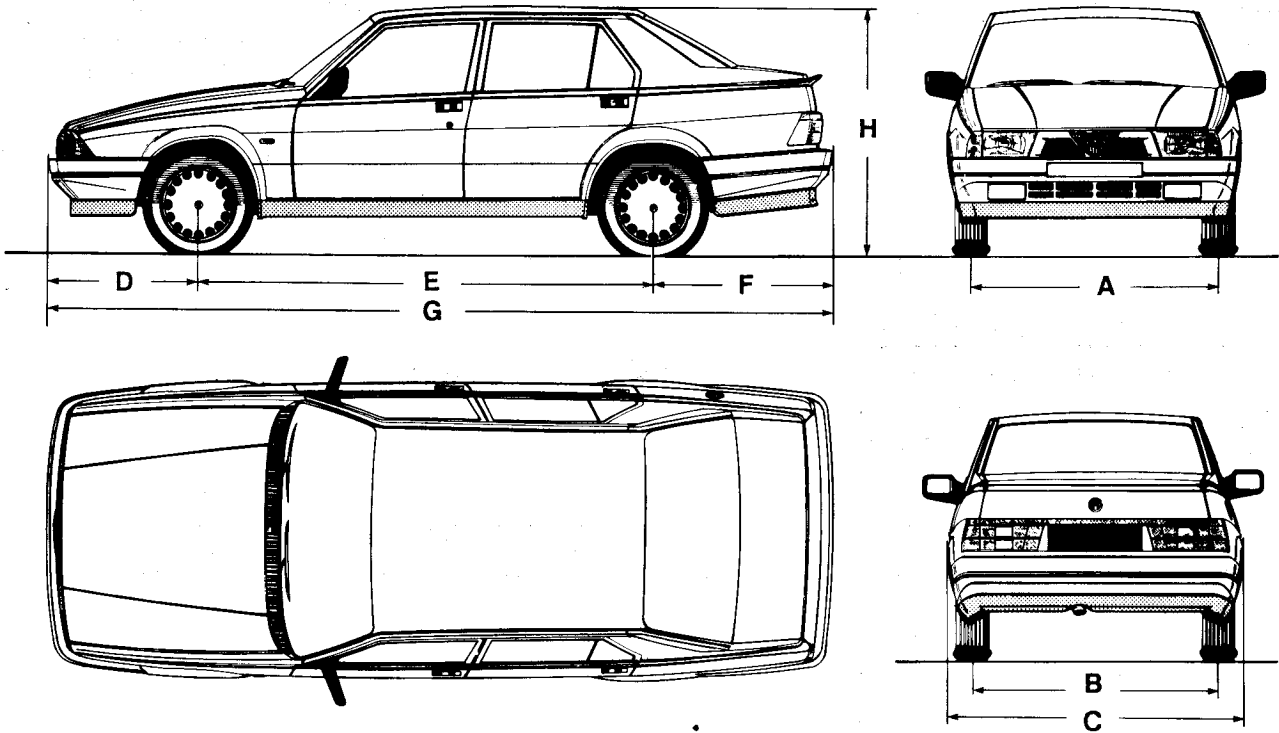
# 75

## TEMPORARY EDITION



DIREZIONE ASSISTENZA TECNICA *Alfa Romeo* 

# GENERAL VIEWS



## DIMENSIONS

Unit: mm

Versions	Dimensions Model	A	B	C	D	E	F	G	H max	R		
		75	1.6	1368(1) 1366(2)	1358(1)(2)	1630	825	2510	995	4330	1400	5050
1.8												
1.8 IE												
1.8 TB	1396(4)		1382(4)	1660	865	1045	4420					
2.0 TS					825	995	4330					
2.5 CA					865	1045	4420					
3.0 6V	1368(1) 1366(2)		1358(1)(2)	1630	825	2510	995	4430	1400	5050		
2.0 TD												
2.4 TD												

- (1) with 5 1/2" x 13" rims
- (2) with 5 1/2" x 14" rims
- (3) with 6j x 15" rims
- (4) with 6 1/2" x 14" rims

R = Radius of the circumference described in correspondence with the ground from the driving wheel outer edge with full steering lock on.

## WEIGHTS AND LOADS

Weights and loads		Model	<b>75</b>				
		Versions	<b>1.6</b>	<b>1.8</b>	<b>1.8 IE</b>	<b>1.8 TB</b>	<b>2.0 TS</b>
Max weight allowed	(Kg)		1515		1525	1665	1585
Kerb weight (vehicle in running condition)*	(Kg)		1090		1100	1240	1160
Useful load	(Kg)		425				
Max permissible gross weight per axle	Front		850				
	Rear		990		970	990	
Max. gross towing weight	(Kg)		1200		1300	1200	
Max. vertical load on towhook	(Kg)		60				
Seating capacity	Front		2				
	Rear		3				

(\*) Without driver

## WEIGHTS AND LOADS

Weights and loads		Model	<b>75</b>			
		Versions	<b>2.5 CA</b>	<b>3.0 6V</b>	<b>2.0 TD</b>	<b>2.4 TD</b>
Max weight allowed	(Kg)		1675	1725	1645	1685
Kerb weight (vehicle in running condition)*	(Kg)		1250	1300	1220	1260
Useful load	(Kg)		425			
Max permissible gross weight per axle	Front		850		940	
	Rear		990	970	990	
Max. gross towing weight	(Kg)		1300			
Max. vertical load on towhook	(Kg)		65	60	65	
Seating capacity	Front		2			
	Rear		3			

(\*) Without driver

## WHEELS AND TYRES

		Model		75			
		Version		1.6	1.8	1.8 TB	2.0 TS
Wheels and tyres					1.8 IE		
Rims				5 1/2Jx13" 5 1/2Jx14"	5 1/2x13" 5 1/2Jx14"	6 1/2Jx14" 6Jx15"	6 1/2Jx14"
Tubeless tyres				185/70R1384H 185/65R1486H (1)	185/70r1384H 185/65R1486H (1)	195/60VR14 195/55VR15	195/60VR14
Inflating pressures (Kg/cm) (2)		N	A	1.8		2.1	2.0
			P	2.0		2.1	2.0
		C	A	-		2.2	
			P	-		2.5	

## WHEELS AND TYRES

		Model		75			
		Version		2.5 CA	3.0 6V	2.0 TD	2.4 TD
Wheels and tyres							
Rims				6 1/2Jx14"	5 1/2Jx14" 6Jx15"	5 1/2Jx13" 5 1/2Jx14"	6 1/2x14"
Tubeless tyres				195/60VR14	195/60VR14 195/55VR15	185/70R1384T 185/65R1486H (1)	195/60VR14
Inflating pressures (Kg/cm) (2)		N	A	2.0		2.1	
			P	2.0		2.1	
		C	A	2.2		2.3	
			P	2.5		2.3	

(1) For versions with ABS

(2) Pressures measured with tyres cold

### WARNING:

The wheel nuts should be tightened to a torque of 98 Nm (10 kgm.)

A: front

P: rear

N: reduced load and normal speed

C: full load and high speed

T: up to 190 Km/h

H: up to 210 Km/h

# MODEL IDENTIFICATION

(FOLLOWING STANDARD CODE NUMBERING CRITERIA)

Identification		Model	75					
		Version	1.6		1.8		1.8 IE	
Body		4 door salon						
Drive		LH	RH	LH	RH	LH	RH	
Manufacturer's code number	on identification label	161.002	—	161.022	—	161.682	—	
Vehicle type	on identification label	162B2B		162B1B		162B1F		
approval number	on luggage compartment floor to right of spare wheel housing	162B20		162B10		162B10		
Chassis serial number	on luggage compartment floor to right of spare wheel housing	00.070.001 06.003.001 (1)	—	00.085.001 06.009.001 (1)	—	00.075.301 06.010.001 (1)	—	
Engine type and serial number	on rear left part of engine block	061.00 from 000001		062.02 from 000001		061.68 from 000001		

Identification		Model	75					
		Version	1.8 TB		2.0 TS		2.5 CA	
Body		4 door salon						
Drive		LH	RH	LH	RH	LH	RH	
Manufacturer's code number	on identification label	161.442	—	161.222	—	—	161.632	
Vehicle type	on identification label	162B1G		162B4A		162B3C		
approval number	on luggage compartment floor to right of spare wheel housing	162B10		162B40		162B30		
Chassis serial number	on luggage compartment floor to right of spare wheel housing	00.065.001 06.009.601 (1)	—	00.026.501 06.018.001 (1)	—	—	4.001.501 06.016.101 (1)	
Engine type and serial number	on rear left part of engine block	06134 from 000001		06224 from 000001		01646 from 000001		

(1) New numbering.

		Model		<b>75</b>					
		Version		<b>3.0 6V</b>		<b>2.0 TD</b>		<b>2.4 TD</b>	
Identification									
Body		4 door salon							
Drive		LH		RH		LH		RH	
Manufacturer's code number	on identification label	161.202		—		161.042		—	
Vehicle type	on identification label	162.B6A			162.BG			162.B5	
	approval number	162.B60			162.B00			162.B50	
Chassis serial number	on luggage compartment floor to right of spare wheel housing	00.004.001		—		00.040.001		—	
		06.023.201 (1)		—		06.014.501 (1)		—	
Engine type and serial number	on rear left part of engine block	061.20 from 000.001			VM.80A from 000.001			VM.81A from 000.001	

(1) New numbering.

# MODEL IDENTIFICATION

(FOLLOWING THE E.E.C. CODE NUMBERING ADOPTED WITH THE NEW IDENTIFICATION LABELS)

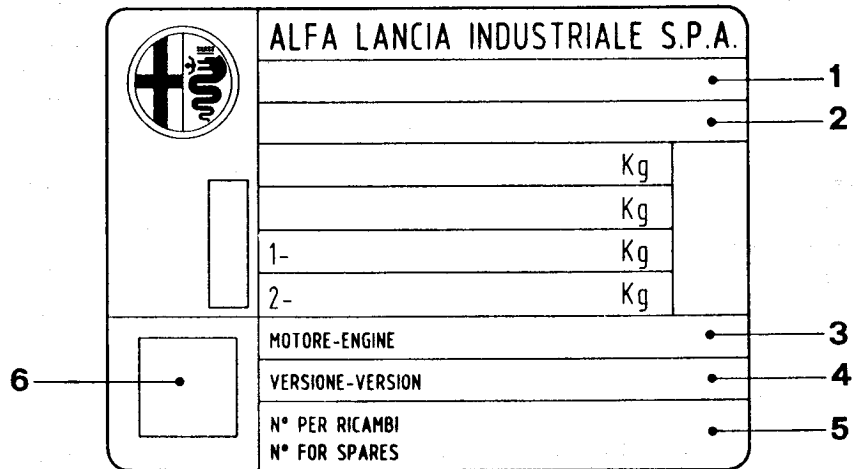
		Model	<b>75</b>					
		Version	<b>1.6</b>		<b>1.8</b>		<b>1.8 IE</b>	
Identification								
Body		4 door salon						
Drive		LH	RH	LH	RH	LH	RH	
Vehicle type	on identification label	162B2B		162B1B		162B1F		
approval number	on luggage compartment floor to right of spare wheel housing	162.000		162.000		162.000		
Chassis serial number	on luggage compartment floor to right of spare wheel housing	06100001	-	06100001	-	06100001	-	
Engine type and serial number	on rear left part of engine block	061.00 from 000001		062.02 from 000001		061.68 from 000001		

		Model	<b>75</b>					
		Version	<b>1.8 TB</b>		<b>2.0 TS</b>		<b>2.5 CA</b>	
Identification								
Body		4 door salon						
Drive		LH	RH	LH	RH	LH	RH	
Vehicle type	on identification label	162B1G		162B4A		162B3C		
approval number	on luggage compartment floor to right of spare wheel housing	162.000		162.000		162.000		
Chassis serial number	on luggage compartment floor to right of spare wheel housing	06100001	-	06100001	-	-	06100001	
Engine type and serial number	on rear left part of engine block	06134 from 000001		06224 from 000001		01646 from 000001		



Identification		Model	75					
		Version	3.0 6V		2.0 TD		2.4 TD	
Body		4 door salon						
Drive		LH	RH	LH	RH	LH	RH	
Vehicle type	on identification label	162.B6A		162.BG		162.B5		
approval number	on luggage compartment floor to right of spare wheel housing	162.000		162.000		162.000		
Chassis serial number	on luggage compartment floor to right of spare wheel housing	06.100.001	—	06.100.001	—	06.100.001	—	
Engine type and serial number	on rear left part of engine block	061.20 from 000.001		VM.80A from 000.001		VM.81A from 000.001		

# THE NEW IDENTIFICATION NUMBERING



1 - Type approval number

2 - Body code number

3 - Engine type number

4 - Basic type and version of the vehicle

5 - Serial number of number of units manufactured. To be used for ordering parts, for the identification of the plant of manufacture or assembly and as a reference for the introduction of modifications.

6 - Symbol indicating the correct fume absorption coefficient value (for diesel engines only).

## BODY CODE NUMBERING

ZAR 162.000 + 06.100.001  
 (1) (2) (3)

(1) Manufacturer's identification number

(2) Vehicle model

(3) Chassis serial number

## MAINTENANCE OF MECHANICAL AND BODYWORK COMPONENTS

### TECHNICAL DATA - CHECKS AND ADJUSTMENTS

#### Suspension and Axles

Specification		Model	75			
		Version	1.6	1.8	1.8 IE	1.8 TB
Static loading arrangement (1)		A + B = 490 + 245 = 735N (50 + 25 = 75Kg)				
Front height	mm	E = B - A = 44 ± 5				
Rear height	mm	C = 13 ± 5				
	mm	T = 83 ± 5				
Front toe-out (2)	mm	1 ± 1			-2 ± 1	
Front toe-out angle						
Diameter of wheel rim	mm	φ = 340	φ = 365 (3)	φ = 340 φ = 365 (3)	φ = 365	
Rear toe-out angle		α = 0° ± 10'				
Tie-rod length		G = H				
Front camber angle (2)		β = -30' ± 30'				
Rear camber angle (2)		β = 0° ± 30'				
Front caster angle (2)		γ = 3°30' ± 30'			γ = 4°30' ± 30'	γ = 4°30' ± 30'
Maximum steering angle (2)		δ = 30°				

#### Suspension and Axles

Specification		Model	75			
		Version	2.5 CA	3.0 6v	2.0 TD	2.4 TD
Static loading arrangement (1)		A + B = 490 + 245 = 735 N (50 + 25 = 75 Kg)				
Front height	mm	E = B - A = 44 ± 5				
Rear height	mm	C = 13 ± 5				
	mm	T = 83 ± 5				
Front toe-out (2)	mm	1 ± 1	-2 ± 1	1 ± 1	-2 ± 1	
Front toe-put angle						
Diameter of wheel rim	mm	φ = 365	φ = 365 φ = 390 (4)	φ = 340 φ = 365 (3)	φ = 365	
Rear toe-out angle		α = 0° ± 10'				
Tie-rod length		G = H				
Front camber angle (2)		β = -30' ± 30'				
Rear camber angle (2)		β = 0° ± 30'				
Front caster angle (2)		γ = 4°30' ± 30'		γ = 3°30' ± 30'	γ = 4°30' ± 30'	
Maximum steering angle (2)		δ = 30°				

(1) Load vehicle and rock backwards and forwards on the suspension a few times.

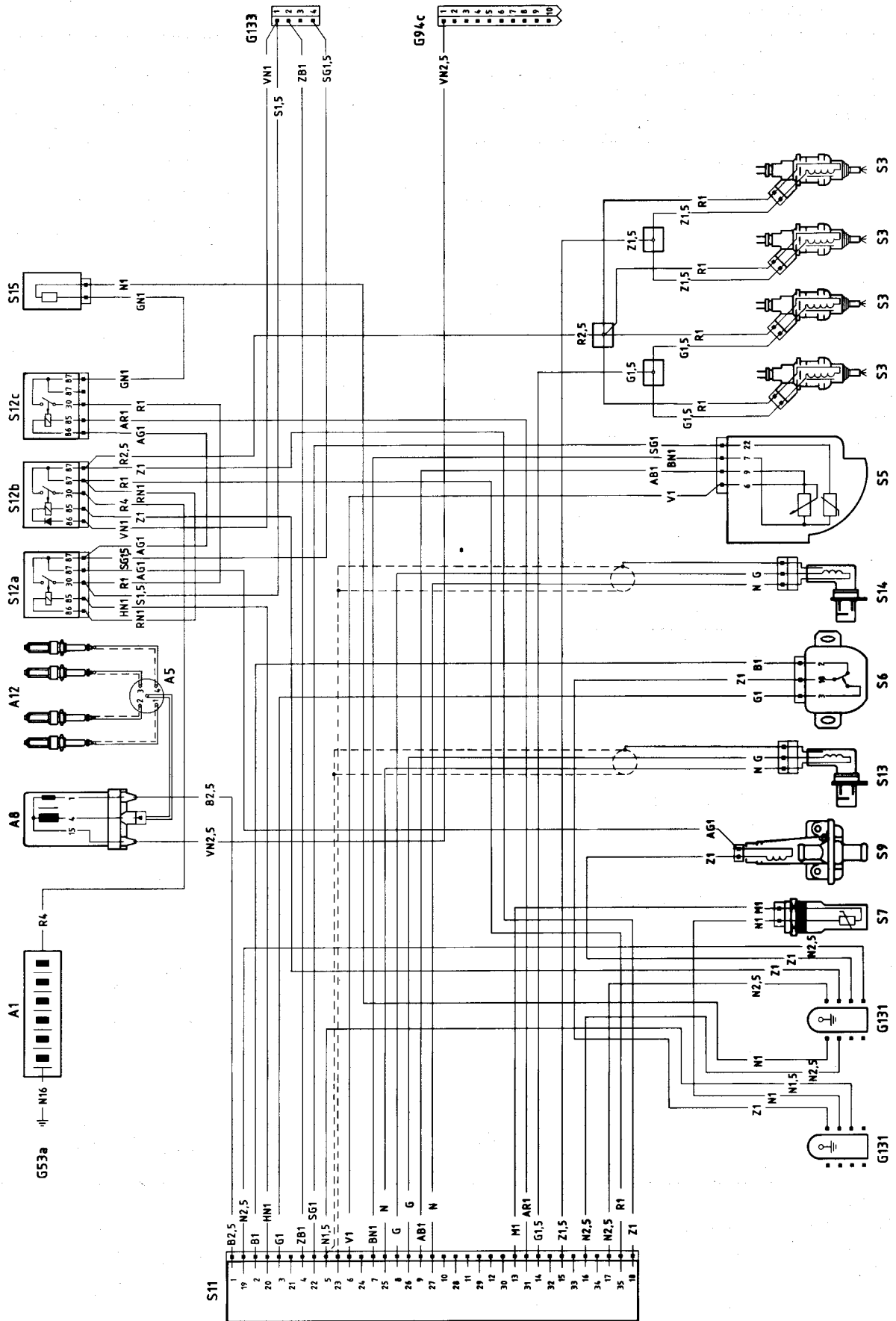
(2) Values are for vehicle at nominal height, corresponding to static loading.

(3) With 5 1/2J x 14".

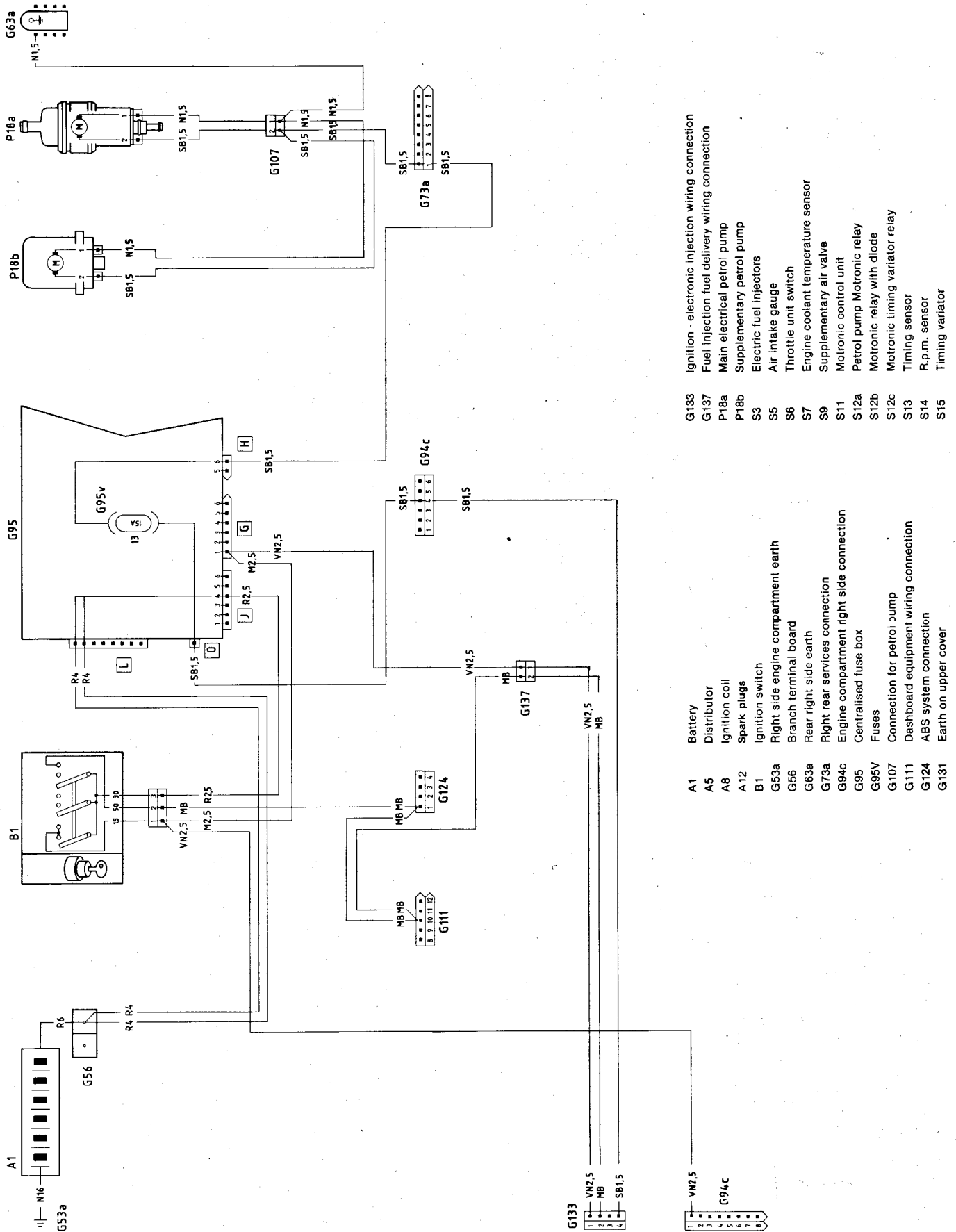
(4) With 6J x 15".

# 1.8 MOTRONIC wiring diagram

(diagram A)



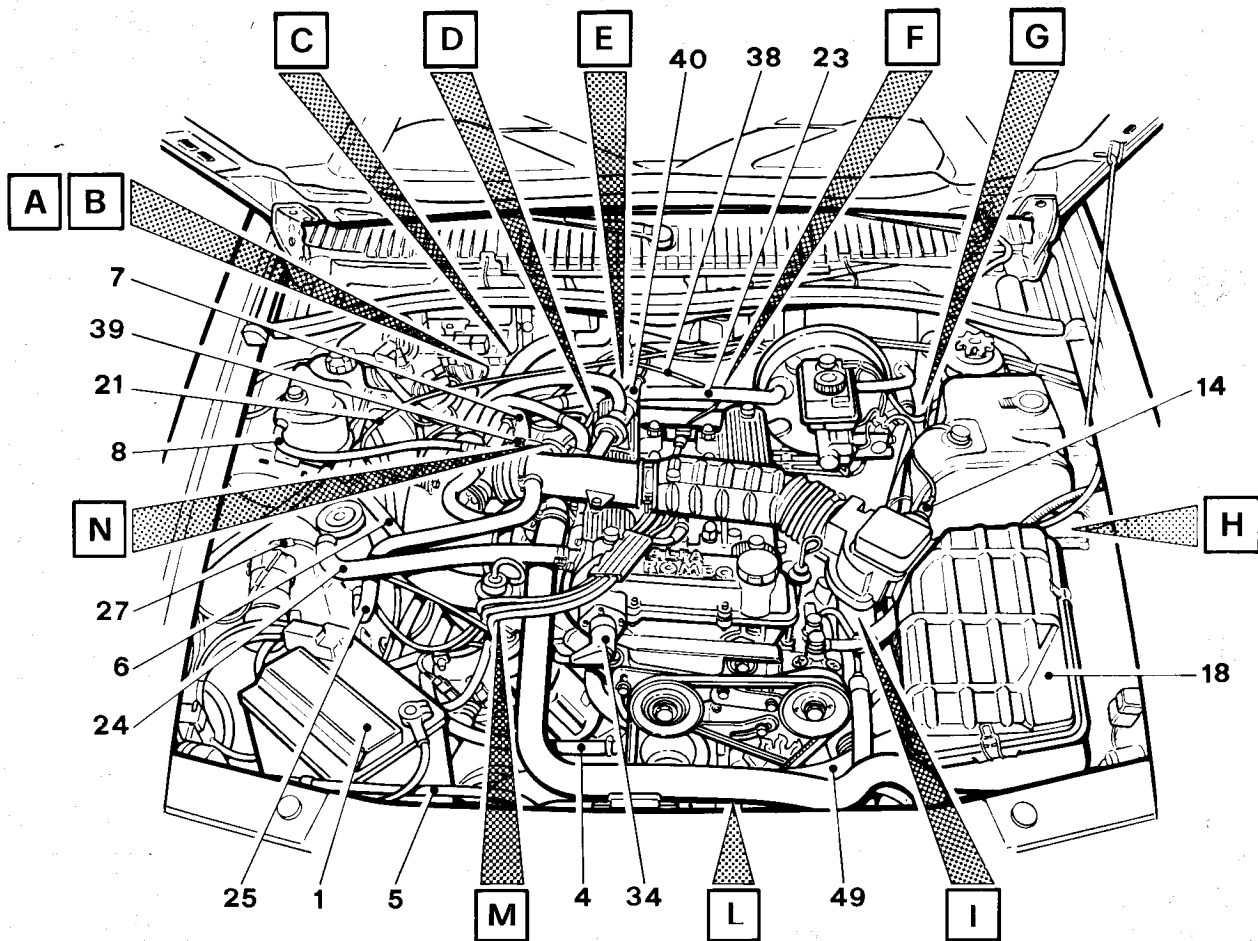
# 1.8 MOTRONIC wiring diagram (diagram B)



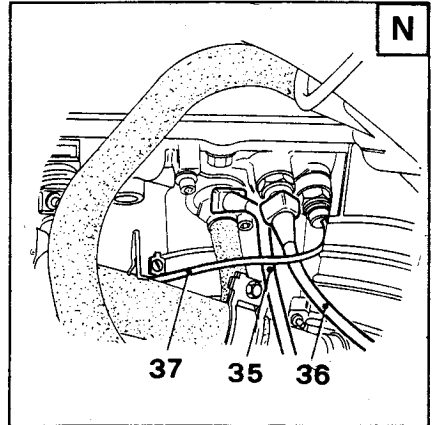
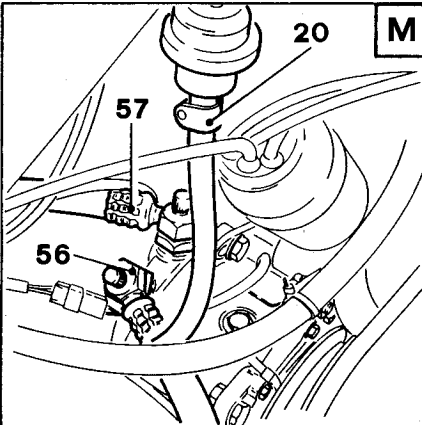
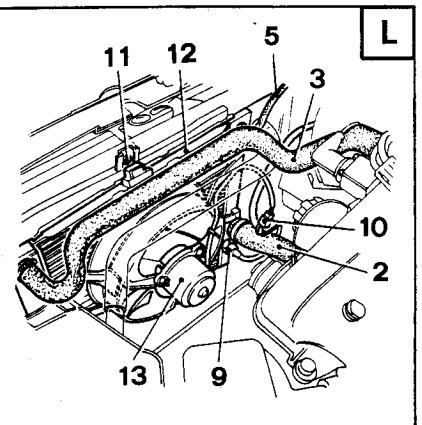
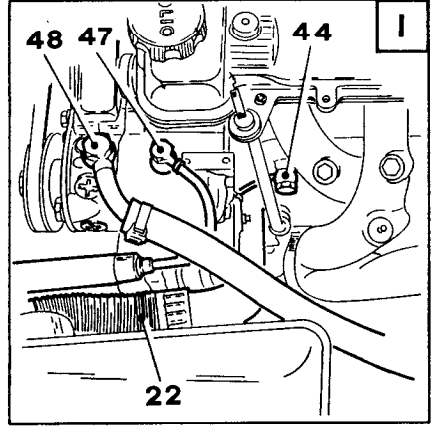
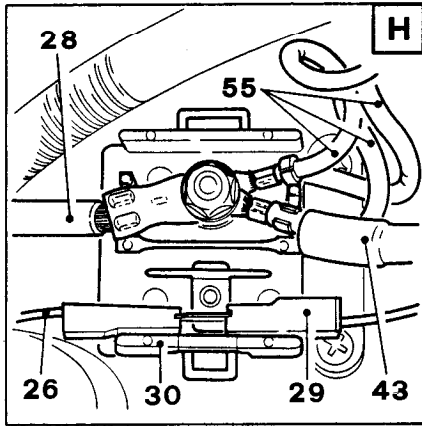
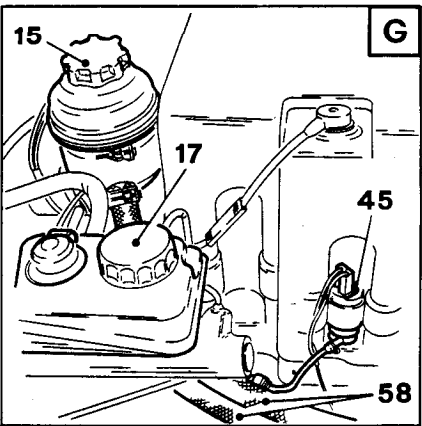
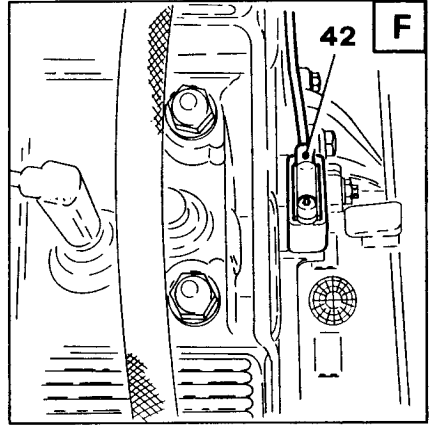
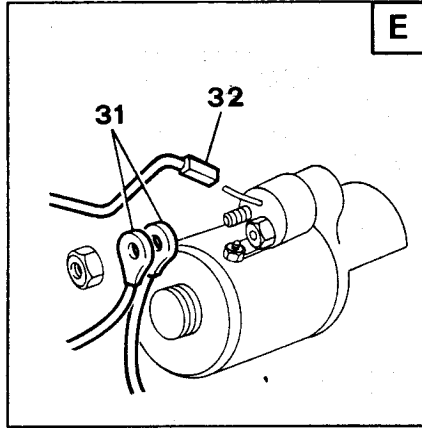
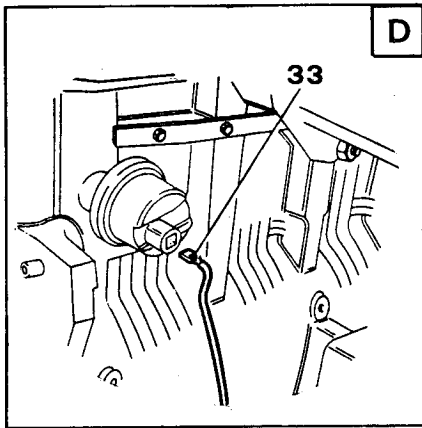
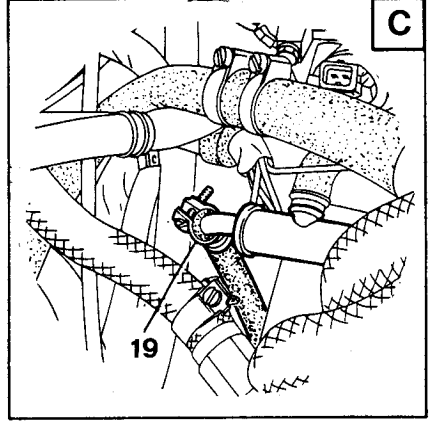
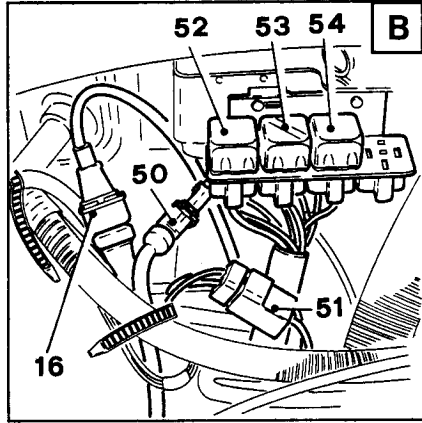
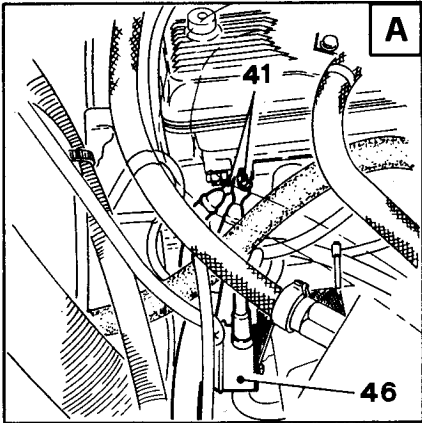
- G133 Ignition - electronic injection wiring connection
- G137 Fuel injection fuel delivery wiring connection
- P18a Main electrical petrol pump
- P18b Supplementary petrol pump
- S3 Electric fuel injectors
- S5 Air intake gauge
- S6 Throttle unit switch
- S7 Engine coolant temperature sensor
- S9 Supplementary air valve
- S11 Motronic control unit
- S12a Petrol pump Motronic relay
- S12b Motronic relay with diode
- S12c Motronic timing variator relay
- S13 Timing sensor
- S14 R.p.m. sensor
- S15 Timing variator

- A1 Battery
- A5 Distributor
- A8 Ignition coil
- A12 Spark plugs
- B1 Ignition switch
- G53a Right side engine compartment earth
- G63a Branch terminal board
- G73a Rear right side earth
- G94c Right rear services connection
- G95 Engine compartment right side connection
- G95V Centralised fuse box
- Fuses
- G107 Connection for petrol pump
- G111 Dashboard equipment wiring connection
- G124 ABS system connection
- G131 Earth on upper cover

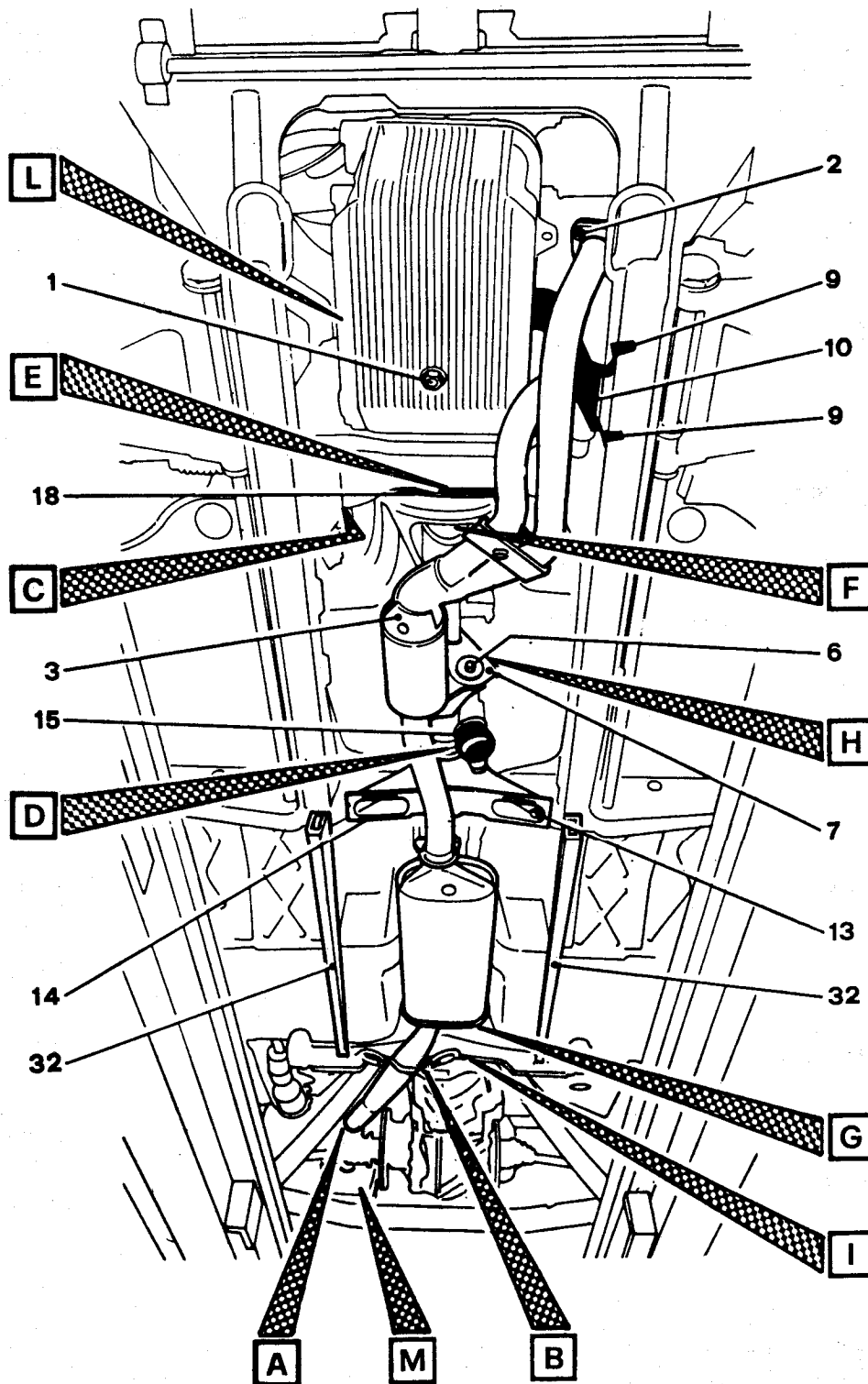
# 75 1.8 IE MODEL VIEW OF ENGINE COMPARTMENT



- |   |   |
|---|---|
| 1. Battery  | 29. Alternator warning lamp lead                      |
| 2. Coolant intake hose (radiator-pump)                      | 30. Terminal board                                    |
| 3. Coolant delivery hose (engine - heater)                  | 31. Starter motor power supply lead                   |
| 4. Hose for return of coolant from heater                   | 32. Starter motor exciter lead                        |
| 5. Coolant delivery hose (expansion tank - radiator)        | 33. Indicator lead                                    |
| 6. Coolant delivery hose (expansion tank-cooling circuit)   | 34. Timing variator device lead                       |
| 7. Coolant delivery hose to heater                          | 35. Fuel injector operating leads                     |
| 8. Cooling circuit breather hose                            | 36. Coolant temperature sender lead                   |
| 9. Electric fan activation lead                             | 37. Coolant temperature indicator lead                |
| 10. Electric fan power lead                                 | 38. Coolant temperature warning lamp lead             |
| 11. Radiator securing screws                                | 39. Throttle opening sender lead                      |
| 12. Radiator  | 40. Supplementary air actuation lead                  |
| 13. Electric fan  | 41. Injection wiring engine earth                     |
| 14. Air flow sender lead                                    | 42. R.p.m. sensor                                     |
| 15. Hydraulic steering fluid reservoir                      | 43. Battery lead                                      |
| 16. Reference sensor  | 44. Minimum engine oil pressure warning lamp          |
| 17. Brake fluid reservoir                                   | 45. Windscreen washer liquid pump                     |
| 18. Cover with air flow gauge                               | 46. Petrol feed pressure damper                       |
| 19. Fuel delivery tube                                      | 47. Hydraulic steering fluid delivery tube            |
| 20. Fuel return tube  | 48. Hydraulic steering fluid discharge tube           |
| 21. Accelerator operating cable                             | 49. Air intake extension                              |
| 22. Corrugated sleeve for alternator cooling                | 50. Rev sensor  |
| 23. Servo braking vacuum hose                               | 51. Engine compartment - fusebox wiring connection    |
| 24. Hose for the delivery of oil vapours to the air cleaner | 52. Fuel pump relay                                   |
| 25. Oil vapour recycling tube                               | 53. Main relay  |
| 26. Lead from alternator                                    | 54. Timing variator relay                             |
| 27. High tension lead                                       | 55. Fuse box service leads                            |
| 28. Power lead to alternator                                | 56. Feed tube to condensing radiator                  |
|   | 57. Return tube from evaporator                       |
|   | 58. Hydraulic steering system feed and delivery tubes |

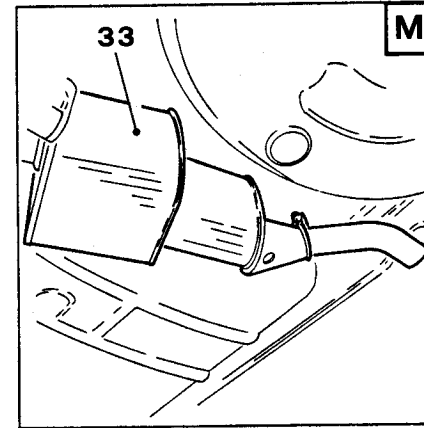
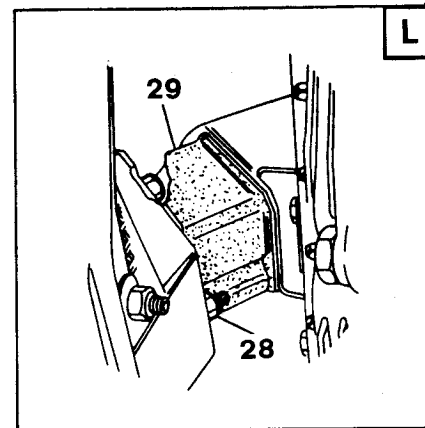
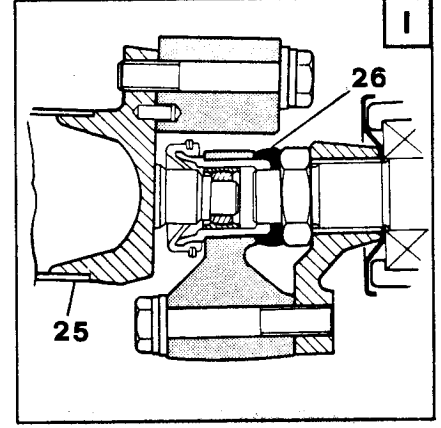
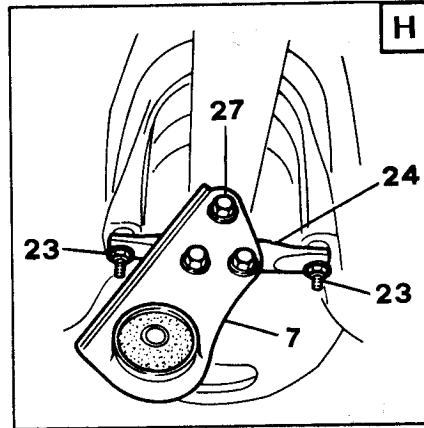
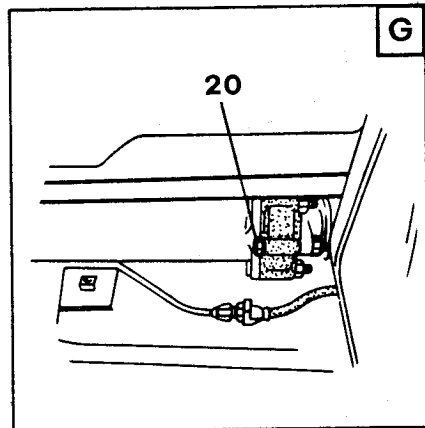
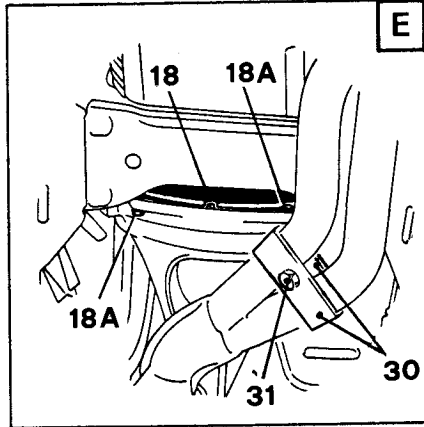
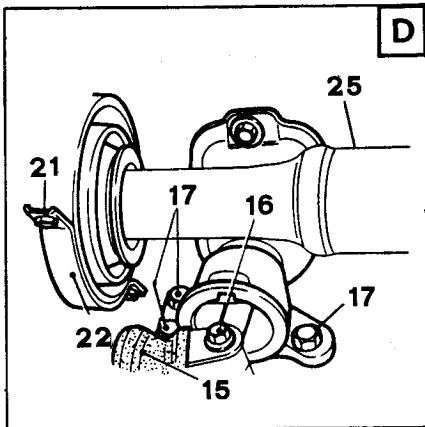
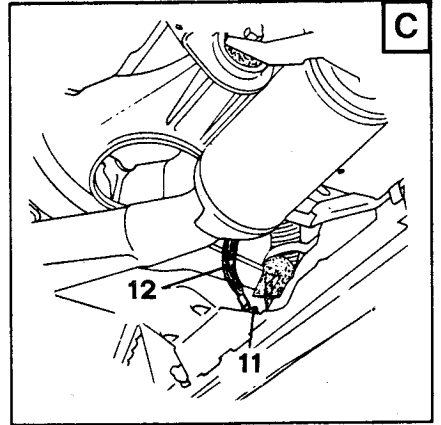
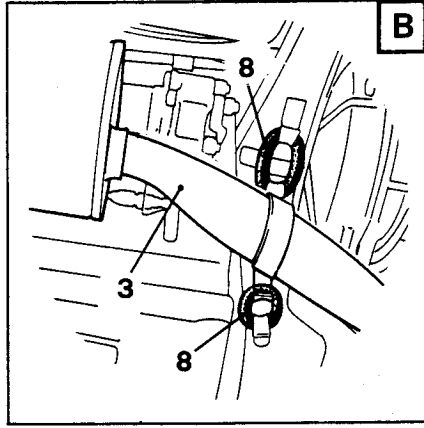
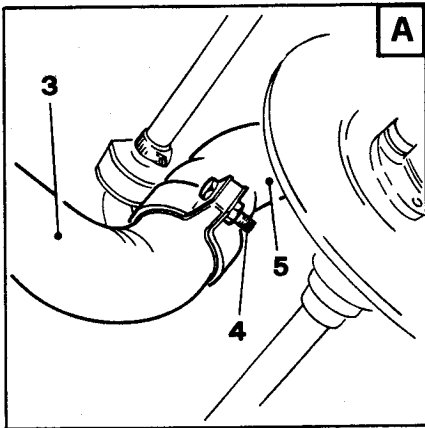


## 75 1.8 IE MODEL VIEW FROM BELOW

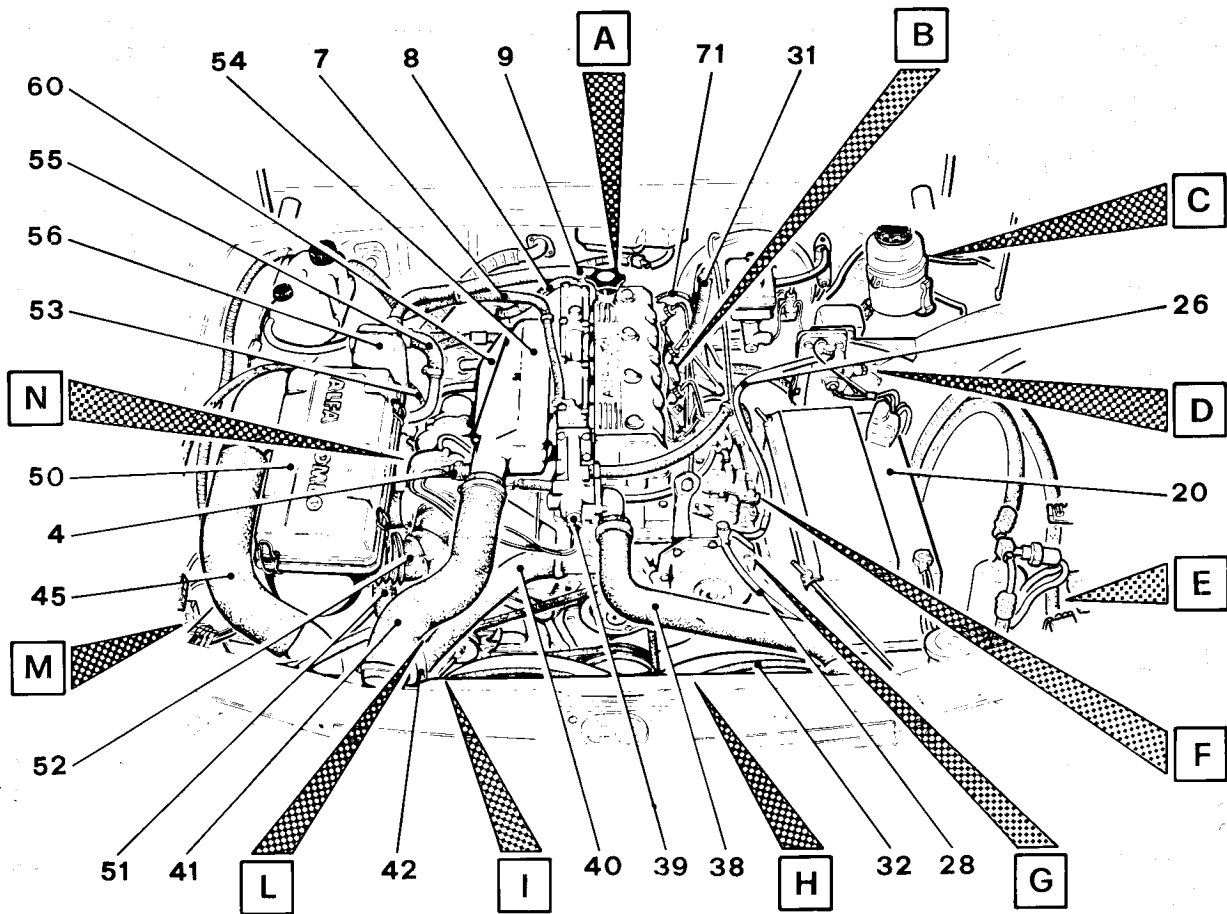


- |   |   |  |
|---|---|--|
| 1. Engine oil drain plug                | 13. Central cross member securing screws                    | 23. Nuts securing rear engine mounting               |
| 2. Nuts and washers                     | 14. Central cross member                                    | 24. Rear engine mounting                             |
| 3. Front section of exhaust pipe        | 15. Protective boot   | 25. Propeller shaft                                  |
| 4. Pipe clip securing bolt              | 16. Gear lever - rod connecting bolt                        | 26. Rubber oil seal                                  |
| 5. Rear section of exhaust pipe         | 17. Gear lever support securing screws                      | 27. Central exhaust mounting bracket securing screws |
| 6. Bolt                                 | 18. Protective panel for flywheel                           | 28. Engine mounting securing nuts                    |
| 7. Exhaust pipe central support bracket | 18A. Flywheel protective panel securing screws              | 29. Rubber engine mounting                           |
| 8. Rear rubber rings                    | 19. Propeller shaft - flywheel rubber joint securing nuts   | 30. Brackets   |
| 9. Heat shield lower securing screws    | 20. Bolts securing rubber transmission joint to clutch fork | 31. Bracket tightening screws                        |
| 10. Heat shield                         | 21. Central mounting securing nuts                          | 32. Longitudinal reinforcement members               |
| 11. Engine earth plait securing screws  | 22. Central mounting  | 33. Silencer - rear element                          |
| 12. Earth plait                         |   |  |

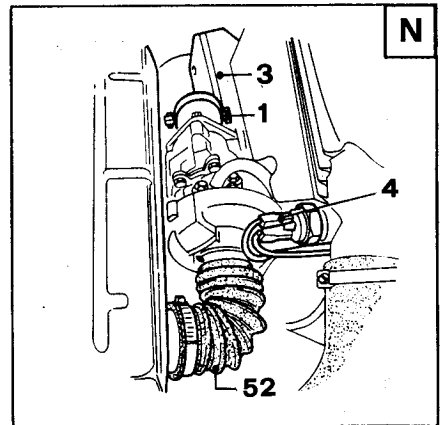
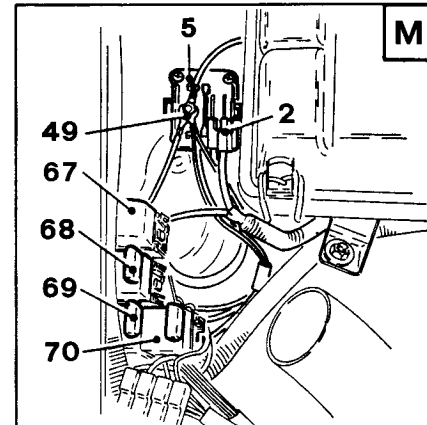
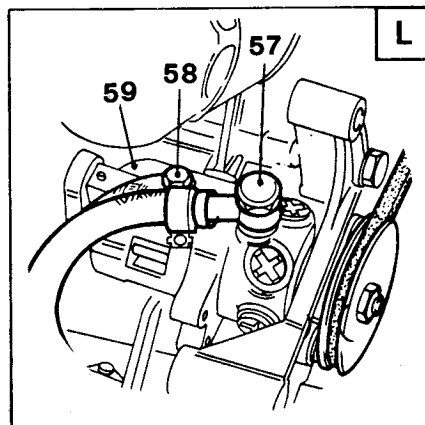
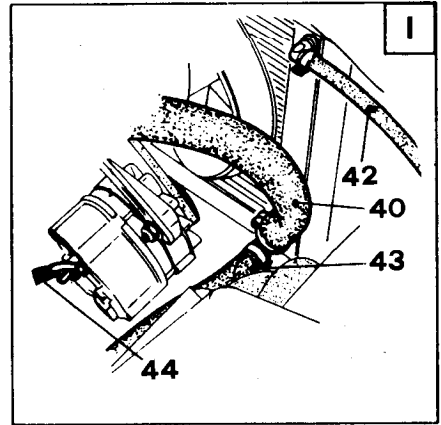
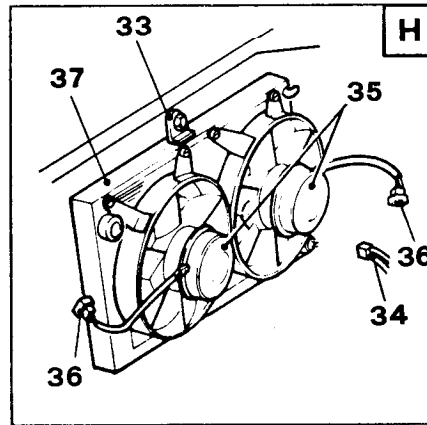
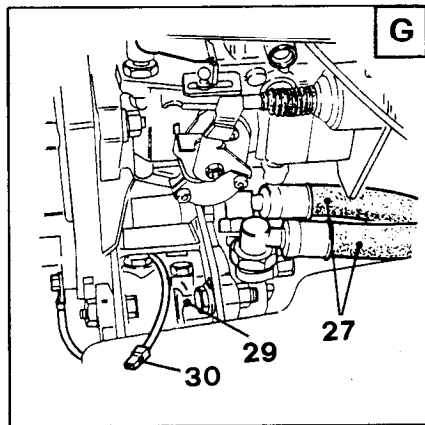
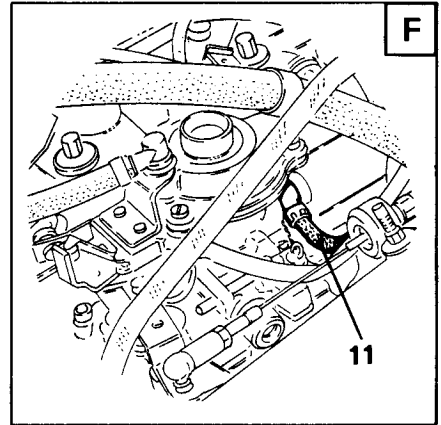
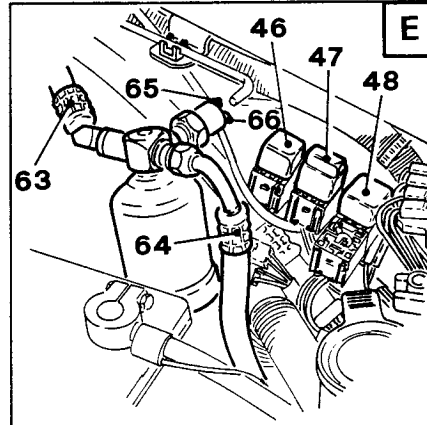
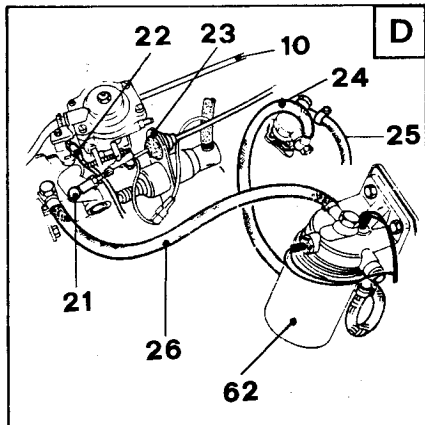
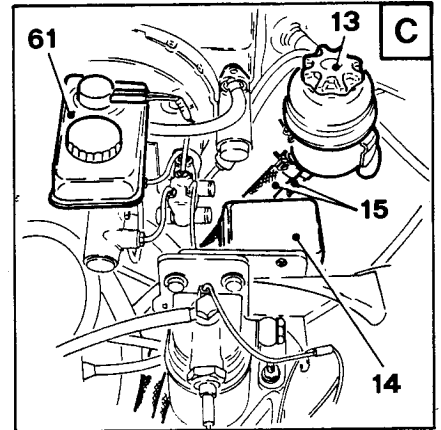
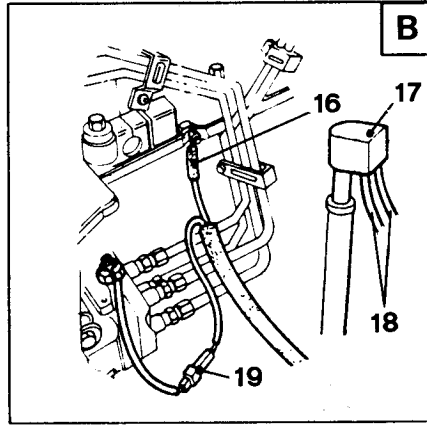
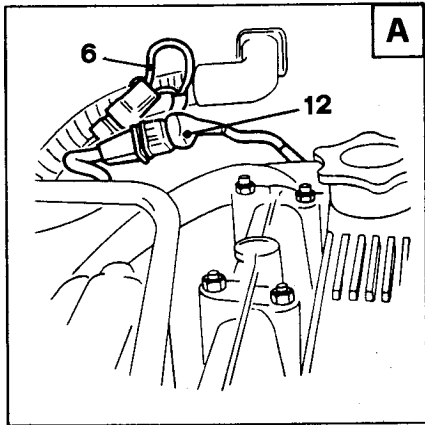




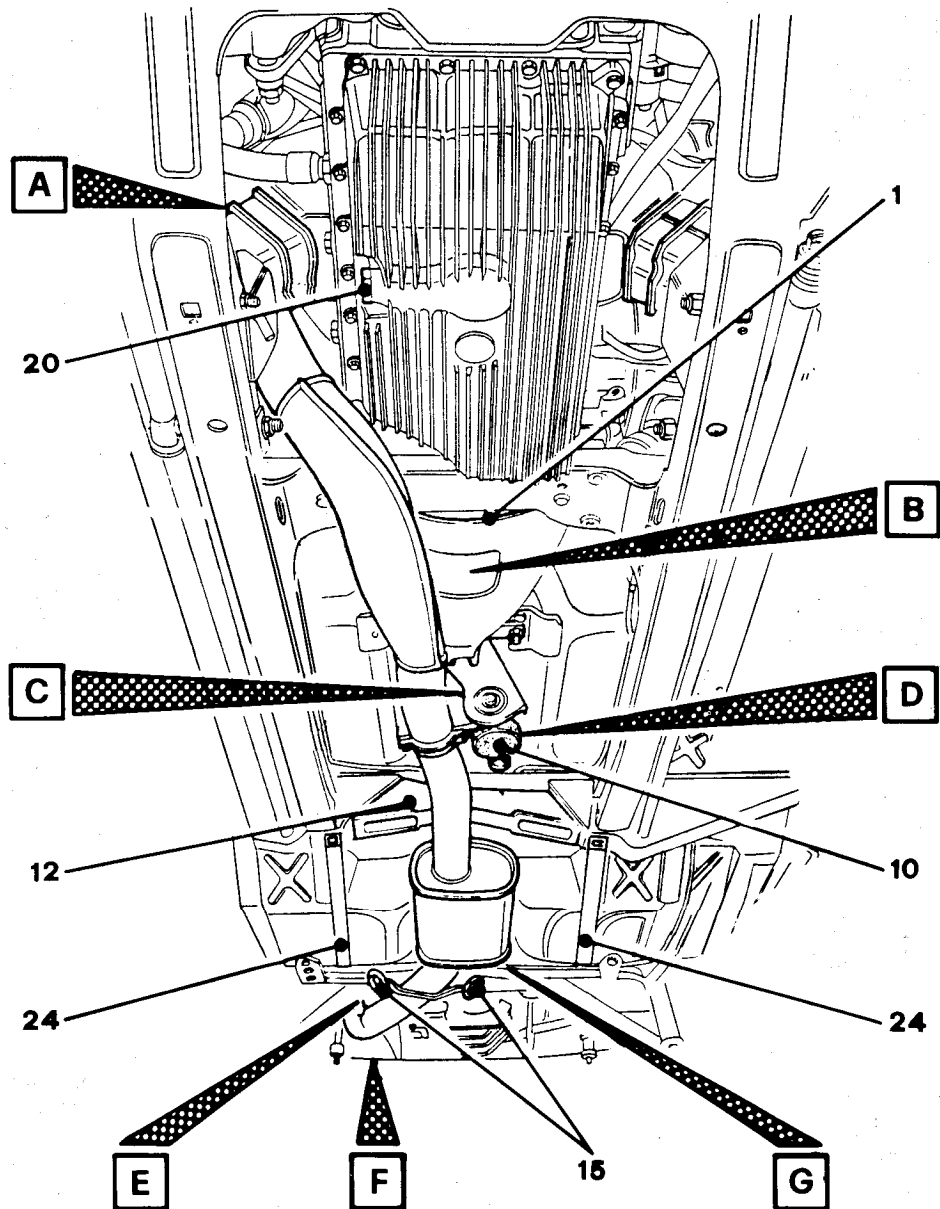
# 75 2.4 TD MODEL VIEW FROM ENGINE COMPARTMENT



- |  |   |
|--|---|
| 1. Exhaust downpipe securing collar                  | 37. Radiator  |
| 2. Starter solenoid                                  | 38. Coolant to radiator delivery hose                                       |
| 3. Starter motor protective panel                    | 39. Coolant temperature indicator and maximum temperature warning lamp lead |
| 4. Supercharging pressure indicator lead             | 40. Coolant return hose from radiator                                       |
| 5. Relay power supply connector block                | 41. Air intake duct to air intake manifold                                  |
| 6. Engine compartment connector lead                 | 42. Radiator breather tube  |
| 7. Cylinder head breather tube                       | 43. Return hose from radiator   |
| 8. Coolant delivery tube to heater                   | 44. Alternator power and warning lamp lead                                  |
| 9. Oil vapour breather tube                          | 45. Air intake duct   |
| 10. Injector drain tube                              | 46. Brake fluid level and pad wear relay                                    |
| 11. Injection pump drain tube                        | 47. Diesel preheating relay   |
| 12. Electronic rev counter impulse sender            | 48. Orns relay  |
| 13. Hydraulic steering fluid reservoir               | 49. Battery power feed lead   |
| 14. Glow plug preheating control unit                | 50. Air filter cover  |
| 15. Hydraulic steering fluid feed and return tubes   | 51. Intercooler air feed duct   |
| 16. Preheating glow plugs power lead                 | 52. Turbo compressor air intake duct  |
| 17. Engine oil dipstick                              | 53. Oil recycling tube  |
| 18. Oil level sensor lead for ALFA ROMEO CONTROL     | 54. Air intake manifold   |
| 19. Engine cut-out electromagnet actuating lead      | 55. Oil vapour recycling tube   |
| 20. Battery  | 56. Oil vapour cleaner  |
| 21. Accelerator ball joint                           | 57. Hydraulic steering pump inlet fitting                                   |
| 22. Charging switch lead                             | 58. Hydraulic steering pump outlet fitting                                  |
| 23. Accelerator cable sheathing retaining bracket    | 59. Hydraulic steering pump   |
| 24. Fuel delivery tube to filter                     | 60. Heat shield   |
| 25. Fuel suction tube from tank                      | 61. Brake fluid reservoir   |
| 26. Fuel delivery tube to injection pump             | 62. Diesel filter   |
| 27. Freon inlet and outlet tubes on compressor       | 63. Drying filter outlet (air conditioning system)                          |
| 28. Earth lead                                       | 64. Drying filter inlet (air conditioning system)                           |
| 29. Air conditioning system compressor               | 65. Freon high temperature actuating lead                                   |
| 30. Power lead to compressor electromagnet           | 66. Freon high temperature actuating lead                                   |
| 31. Servo braking vacuum tube                        | 67. Starter motor relay   |
| 32. Loom   | 68. Left hand electric fan relay (30 A)                                     |
| 33. Radiator to body securing screws                 | 69. Right hand electric fan relay (30 A)                                    |
| 34. Electric fans operating leads                    | 70. Compressor relay  |
| 35. Electric fans                                    | 71. Fuel recovery tube from injectors                                       |
| 36. Flying connections for electric fans power leads |   |

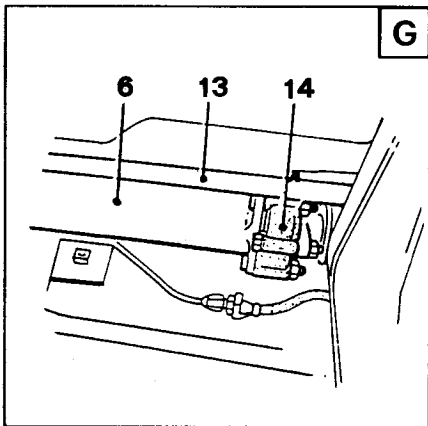
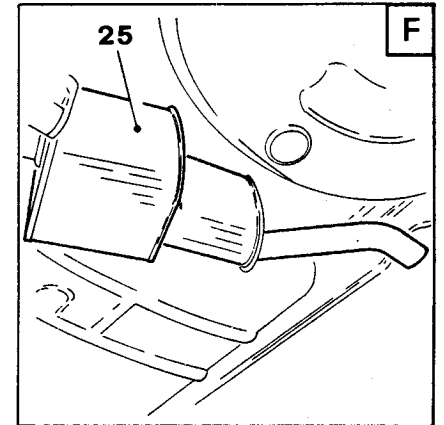
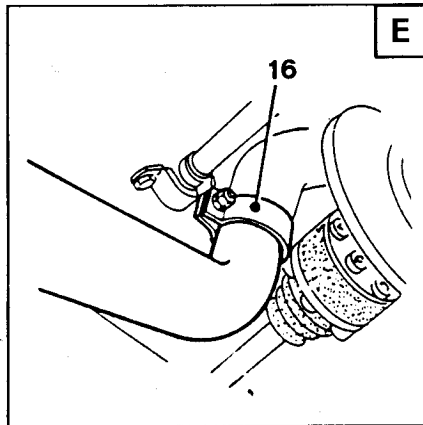
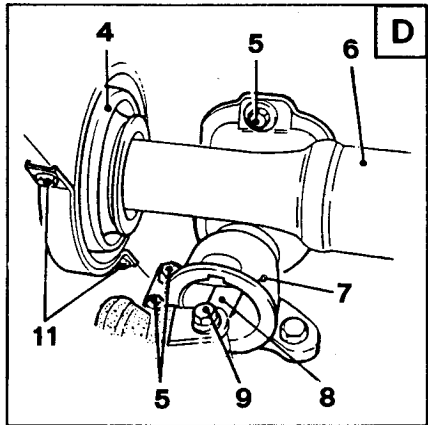
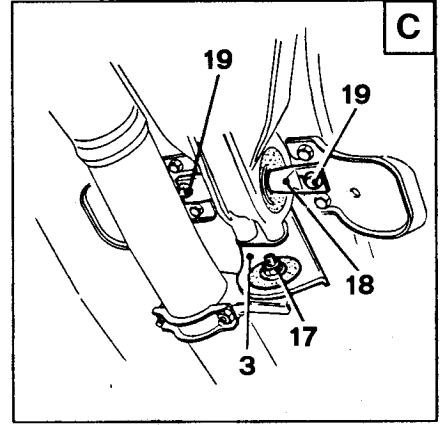
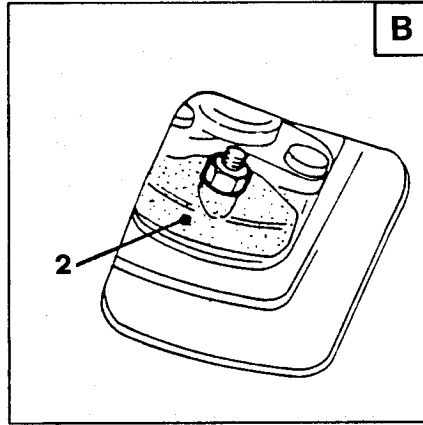
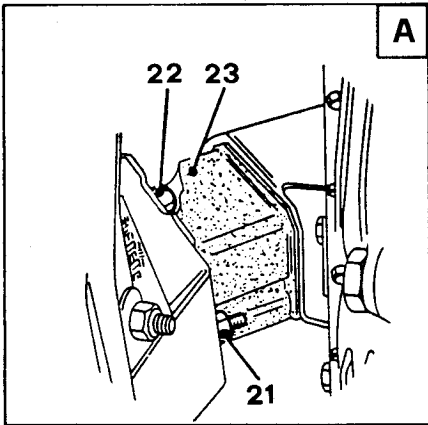


## 75 2.4 TD MODEL VIEW FROM BELOW



1. Flywheel protective panel
2. Front joint
3. Mounting
4. Propeller shaft central mounting
5. Gear lever mounting securing screws
6. Propeller shaft
7. Gear lever mounting
8. Gear lever
9. Gear lever-rod connecting bolt
10. Protective boot
11. Propeller shaft central mounting securing screws
12. Central cross member
13. Gear selector rod

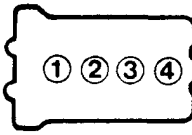
14. Rear joint
15. Exhaust pipe rubber mounting rings
16. Pipe clip
17. Bolt securing exhaust pipe to mounting bracket
18. Rear engine mounting stud
19. Rear engine mounting to body securing screws
20. Engine oil drain plug
21. Side engine mounting lower securing nut
22. Side engine mounting upper securing screw
23. Side engine mounting
24. Longitudinal reinforcement cross member
25. Silencer - rear element



# TECHNICAL DATA AND SPECIFICATIONS

## TECHNICAL DATA

### ENGINE

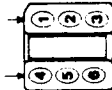

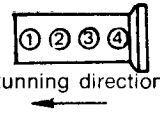
Features	Engines					
	1600	1800	1800	1800	2000	
	(061.00)	(062.02)	(061.68)	(061.34)	(062.24)	
Cycle	Otto 4 stroke					
Number of cylinders and arrangement	4 in line					
Cylinders numbering						
Bore - stroke	mm	78 x 82	80 x 88,5	80 x 88,5	80 x 88,5	84 x 88,5
Cubic capacity	cc	1570	1779	1779	1779	1962
Combustion chamber volume	cc	51	52	52	68,4	54,5
Compression ratio		9	9,5	9,5	7,5	10
DIN power output Maximum r.p.m.	kw (HP)	81 (110) at 5800 r.p.m.	88 (120) at 5300 r.p.m.	88 (122) at 5500 r.p.m.	114 (155) at 5800 r.p.m.	107 (148) at 5800 r.p.m.
DIN torque	Nm (kgm)	146 (14,9) at 4000 r.p.m.	168,8 (17) at 4000 r.p.m.	157 (16,3) at 4000 r.p.m.	226 (23) at 2600 r.p.m.	157 (16) at 2000 r.p.m.
						176 (18) at 3000 r.p.m.
						186 (19) at 4000 r.p.m.
Average effective piston velocity (1)	m/sec	15,3	15,6	—	15,34	17,7
Octane requirement		$\geq 98$ $\geq 95$ (3)			$\geq 98$	$\geq 98$ $\geq 95$ (3)
Oil pressure (2) at 800-900 r.p.m. at 5500 r.p.m.	kPa (bar; kg/sq cm)	49,03 : 98,06 (0,49 : 0,98; 0,5 : 1) 343,21 : 490,3 (3,43 : 4,90; 3,5 : 5)				

(1) With maximum power output

(2) Values measured with engine at normal running temperature

(3) For unleaded petrol

## ENGINE

Features	Engines				
	2500	3000	2000	2400	
	(016.46)	(061.20)	VM80A	VM81A	
Cycle	Otto 4 stroke		Diesel 4 stroke		
Number of cylinders and arrangement	V6 60°		4 in line		
Cylinders numbering	Right head  Left head 		 Running direction		
Bore-stroke	mm	88 x 68,3	93 x 72,6	88 x 82	92 x 90
Cubic capacity	cc	2492	2959	1995	2393
Combustion chamber volume	cc	52	58	23,2 + 24,3	28,16 + 29,66
Compression ratio		9	9,5	22	22
DIN power output		115 (157)	136 (188)	70 (95)	81 (112)
Maximum	kw (HP)	46 (62,6)		36,25 (49,25)	33,83 (46)
r.p.m.		at 5600 r.p.m.	at 5800 r.p.m.	at 4300 r.p.m.	at 4200 r.p.m.
DIN torque	Nm (kgm)	210 (21,4)	216 (22)	192 (19,6)	236 (24)
		at 4000 r.p.m.	at 1000 r.p.m.	at 2300 r.p.m.	at 2400 r.p.m.
			235 (24) at 2000 r.p.m.		
			245 (25) at 3000 r.p.m.		
			245 (25) at 4000 r.p.m.		
Average effective piston velocity (1) - m/se		12,7		11,75	12,6
Octane requirement		$\geq 98$ $\geq 95$ (3)			
Cylinder compression				2156 (21,56;22)	
Specified value	kPa (bar ; Kg/sq cm)			98 (0,98;1)	
Maximum pressure difference between cylinders					
Oil pressure (2)				min. 49,03 (0,49;0,5)	
at 800-900 r.p.m.	kPa (bar ; kg/sq cm)	49,3 + 147,1 (0,49 + 1,47; 0,5 + 1,5)		343,21 + 588,4 (3,43 + 5,88; 3,5 + 6)	
at 5500 r.p.m.		392,24 + 588,36 (3,92 + 5,88; 4 + 6)			

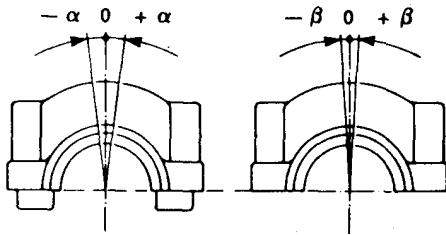
(1) With maximum power output

(2) Values measured with engine at normal running temperature

(3) For unleaded petrol

## TIMING DATA (1)

### REFERENCE ON FRONT BEARING CAP (viewed from flywheel side)



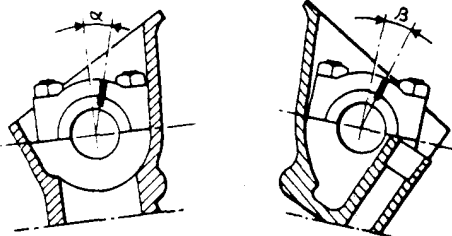
Unit: mm

		Engines				
		1600 (061.00)	1800 (062.02)	1800 (061.68)	1800 (061.34)	2000 (062.24)
Cam shaft	Intake	116.55.03.200.08		116.85.03.200.01	116.99.03.200.00	195.36.03.200.01
	Exhaust	105.20.03.200.00		105.20.03.200.00	105.20.03.200.00	195.36.03.201.05
Operating play between minimum radius of cam and top of valve cup	Intake	0,400 ÷ 0,450		0,400 ÷ 0,450	0,400 ÷ 0,450	0,400 ÷ 0,450
	Exhaust	0,450 ÷ 0,500		0,450 ÷ 0,500	0,550 ÷ 0,600	0,450 ÷ 0,500
Value of timing reference angle of cam shaft bearings	Intake ( )	- 2°4'		+ 12°45'	- 1°20'30"	+ 2°40'
	Exhaust ( )	- 1°6'		- 1°	- 7°	- 13°15'
Nominal lift	Intake	11		11	8	11
	Exhaust	9		9	9	9,5

(1) All measurements are with engine cold

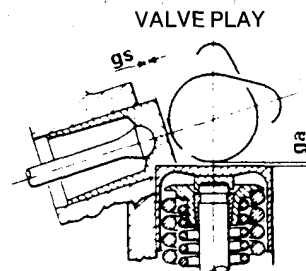
## TIMING DATA (1)

### REFERENCE ON CAM SHAFT BEARING CAP (viewed from front side)



Left head

Right head



Unit: mm

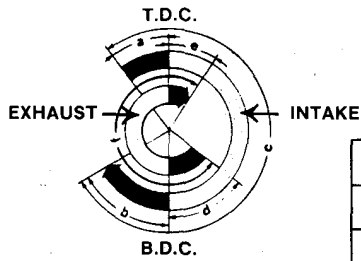
		Engines	
		2500 (016.46)	3000 (061.20)
Cam shaft	Right head	119.00.03.200.25	195.32.03.200.10
	Left head	119.00.03.201.25	195.32.03.201.10
Nominal lift	Intake cam	9	9,1
	Exhaust cam	6,4	
Value of timing reference angle on cam shaft bearings	Right head (α)	15°	
	Left head (β)	15°	
Operating play between minimum radius of cam and top of valve cup	Intake ga	0,475 ÷ 0,500	
	Exhaust gs	0,225 ÷ 0,250	

(1) All measurements are with engine cold.



## TIMING DATA (1)

ANGLE VALUES OF THE ACTUAL TIMING DIAGRAM  
(Clockwise rotation of crankshaft)  
(viewed from front side)



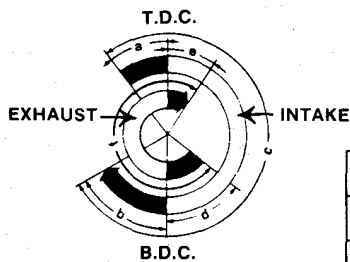
			Engines				
			1600	1800	1800	1800	2000
			(061.00)	(062.02)	(061.68)	(061.34)	(062.24)
Intake	Opening (before T.D.C.) (a)		53°44'	28°44' + 21°44'	60°44' + 53°44'	40°36'	24°44' + 17°44'
		(2)		90°28' + 97°28'	58°28' + 65°28'	54°36'	56°44' + 49°44'
		(2)					62°28' + 69°28'
	Closing (after B.D.C.) (b)		65°28'				94°28' + 101°28'
		(2)					62°28' + 69°28'
	Intake valve angle (c)			299°12'		275°12'	299°12'
Exhaust	Opening (before T.D.C.) (e)		58°12'			60°	67°50'
	Closing (after T.D.C.) (e)		33°48'			12°	34°
	Exhaust valve angle (f)			272°		252°	281°50'

(1) All measurements are with engine cold

(2) The values refer to the variation in the timing angle

## TIMING DATA (1)

ANGLE VALUES OF THE ACTUAL TIMING DIAGRAM  
(Clockwise rotation of crankshaft)  
(viewed from front side)

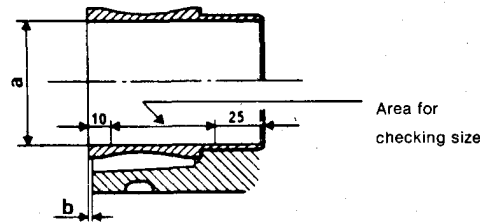


			Engines	
			2500	3000
			(016.46)	(061.20)
Intake	Opening (before T.D.C.) (a)		36°50'	32°30'
	Closing (after B.D.C.) (b)		60°50'	67°30'
	Intake valve angle (c)		277°40'	280°
Exhaust	Opening (before B.D.C.) (d)		59°55'	
	Closing (after T.D.C.) (e)		23°55'	
	Exhaust valve angle (f)		263°50'	

(1) All measurements are with engine cold

# CYLINDER LINERS, PISTON RINGS, PISTON RINGS AND GUDGEONS

## Liners

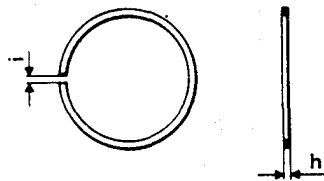


Unit: mm

Measurements		Engines				
		1600	1800	2000	2500	3000
		(061.00)	(062.02 - 061.68) (061.34)	(062.24)	(016.46)	(061.20)
Cylinder liner diameter (a)	Class A (Blue)	77,985 ± 77,994	79,985 ± 79,994	83,985 ± 83,994	87,985 ± 87,994	92,985 ± 92,994
	Class B (Pink)	77,995 ± 78,004	79,995 ± 80,004	83,995 ± 84,004	87,995 ± 88,004	92,995 ± 93,004
	Class C (Green)	78,005 ± 78,014	80,005 ± 80,014	84,005 ± 84,014	88,005 ± 88,014	93,005 ± 93,014
Protrusion of liner from block (1) (b)		0,00 ± 0,06	0,01 ± 0,06	0,01 ± 0,06	0,01 ± 0,06	0,01 ± 0,06
Maximum cylindricity and roundness of liner			0,01		-	0,01
Maximum ovality and taper of liner			0,01		0,01	-

(1) To take measurements, apply liner retaining equipment and tighten to a torque of 10 -15 Nm (1 - 1,5 kgm)

## Piston rings



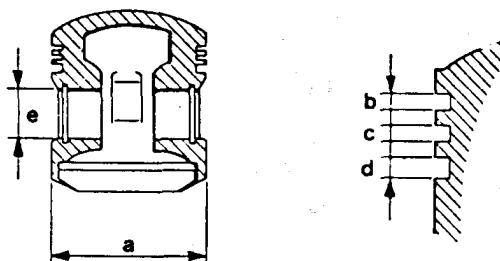
Unit: mm

Measurements		Engines				
		1600	1800	2000	2500	3000
		(061.00)	(062.02-061.68) (061.34)	(062.24)	(016.46)	(061.20)
Thickness of rings (h)	First piston ring	1,478 ± 1,490		1,475 ± 1,490 (1) 1,478 ± 1,490 (1)	1,478 ± 1,490	1,478 ± 1,490
	Second piston ring	1,728 ± 1,740		1,478 ± 1,490	1,728 ± 1,740	1,478 ± 1,490
	Oil scraper ring	3,478 ± 3,490		2,975 ± 2,990 (1) 3,478 ± 3,490 (2)	3,978 ± 3,990	3,478 ± 3,490
Ring end gap (i) (To be measured in checking ring or in the cylinder liner)	First piston ring	0,30 ± 0,45		0,30 ± 0,50	0,30 ± 0,45	0,40 ± 0,65
	Second piston ring	0,30 ± 0,45		0,30 ± 0,50	0,30 ± 0,45	0,40 ± 0,65
	Oil scraper ring	0,25 ± 0,50		0,25 ± 0,50	0,25 ± 0,40	0,30 ± 0,60

(1) GOETZE ring for Mondial pistons

(2) BORGIO ring for Borgo pistons

## Pistons



Unit: mm

Measurements		Engines		
		1600	1800	2000
		(061.00)	(062.02 - 061.68) (061.34)	(062.24)
Piston diameter (1)	(a) Class A (Blue)	77,945 ± 77,955	79,945 ± 79,955	83,935 ± 83,945
	Class B (Pink)	77,955 ± 77,965	79,955 ± 79,965	83,945 ± 83,955
	Class C (Green)	77,965 ± 77,975	79,965 ± 79,975	83,955 ± 83,965
Thickness of seating of first ring (b)		1,535 ± 1,555 (2) 1,525 ± 1,545 (3)	1,525 ± 1,545	1,525 ± 1,545
Thickness of seating of second ring (c)		1,775 ± 1,795		1,525 ± 1,545
Thickness of seating of oil scraper ring (d)		3,515 ± 3,535		3,515 ± 3,535
Diameter of piston gudgeon hole	(e) Black	22,000 ± 22,0025 (2)	22,000 ± 22,002 (3)	22,000 ± 22,0025
	White	22,005 ± 22,0025 (2)	22,003 ± 22,005 (3)	22,0025 ± 22,005

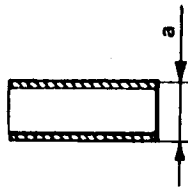
Measurements		Engines		
		2500	3000	
		(016.46 - 019.11)	(061.20)	
Piston diameter (1)	(a) Class A (Blue)	87,935 ± 87,945	92,935 ± 92,945	
	Class B (Pink)	87,945 ± 87,955	92,945 ± 92,955	
	Class C (Green)	87,955 ± 87,965	92,955 ± 92,965	
Thickness of seating of first ring (b)		1,525 ± 1,545	1,525 ± 1,545	
Thickness of seating of second ring (c)		1,775 ± 1,795	1,525 ± 1,545	
Thickness of seating of oil scraper ring (d)		4,015 ± 4,035	3,515 ± 3,535	
Diameter of piston gudgeon hole	(e) Black	22,003 ± 22,006	22,003 ± 22,006	
	White	22,006 ± 22,009	22,006 ± 22,009	

(1) To be measured perpendicularly to the gudgeon pin hole, at the following distance from the lower edge of the skirt:  
 1600 engine (Borgo piston, 17 mm - Mondial piston, 20 mm) - 1800 engine (15 mm) - 2000 engine (Borgo piston, 17 mm -  
 Mondial piston, 19 mm) - 2500 engine (12 mm) - 3000 engine (14 mm)

(2) Borgo piston

(3) Mondial piston

## Gudgeon pins



Unit: mm

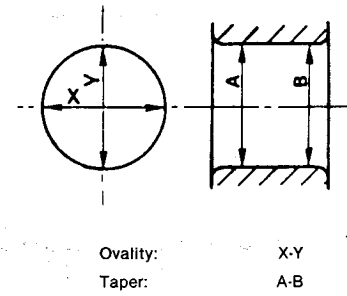
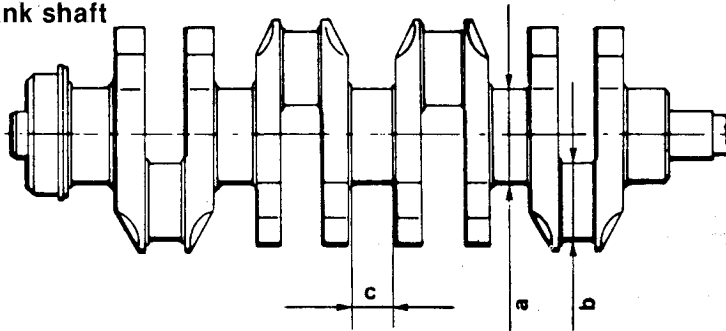
Measurements		Engines				
		1600	1800	2000	2500	3000
		(061.00)	(062.02 - 061.68) (061.34)	(062.24)	(061.46)	(061.20)
External diameter of gudgeon pin (a)	Black	21,994 + 21,997				
	White	21,998 + 22,000 (1) 21,997 + 22,000 (2)	21,997 + 22,000			

(1) BORGIO piston

(2) MONDIAL piston

# CRANK SHAFT, ENGINE BLOCK, CONNECTING RODS, BEARINGS AND FLYWHEEL

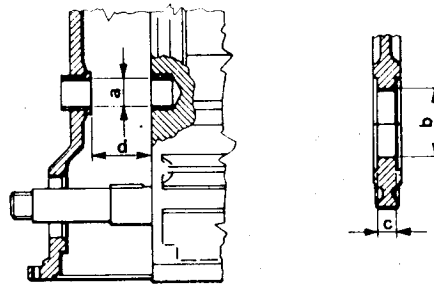
## Crank shaft



Unit: mm\*

Measurements		Engines		
		1600	1800	2000
		(016.00)	(062.02 - 061.68) (061.34)	(062.24)
Diameter of main journal (a)	Normal Blue	59,956 ± 59,966		
	Normal Red	59,966 ± 59,976		
Diameter of crankpin (b)	Normal Blue	49,978 ± 49,988		
	Normal Red	49,988 ± 49,998		
Length of centre main journal (c)	Normal	30,000 ± 30,035		
Maximum ovality of main journal and crankpin		0,007		
Maximum taper of main journal and crankpin		0,01		
Maximum out-of-parallel between main journals and crankpins		0,015		
Maximum eccentricity between main journals		0,04		
Maximum deviation between the centre lines of the two pairs of crankpins and the centre line of the main journals		0,3		

## Engine-block



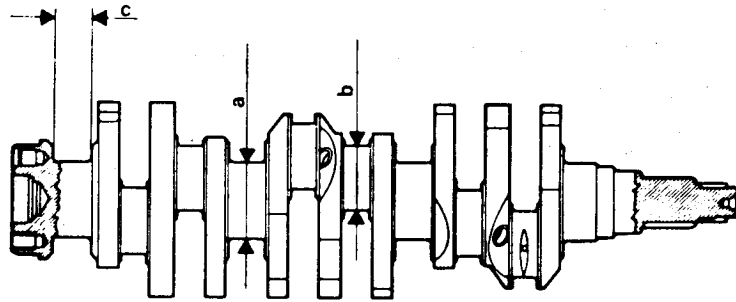
Unit: mm

Measurements		Engines		
		1600	1800	2000
		(061.00)	(062.02) (061.68) (061.34)	(062.24)
Internal diameter of bush housing for cam shaft drive spindle (bore) (1)	(a)	20,677 ± 20,698		
Diameter of main bearings	(b)	63,652 ± 63,664		
Width of centre main bearing shoulder	(c)	25,15 ± 25,20		
Width of shoulder between the two bush housings for cam shaft drive spindle (2)	(d)	47,720 ± 47,820	44,320 ± 44,420	

(1) The replacement of both bushes is recommended when carrying out repairs.

(2) The measurement must be made with the cover locked and the relative gasket fitted; the resultant play should be between 0,1 and 0,32

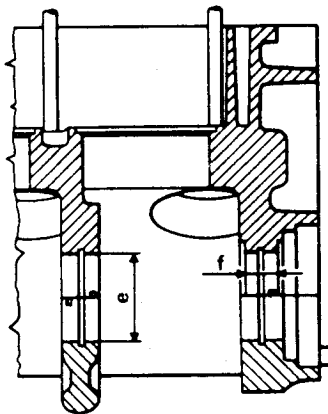
## Crank shaft



Unit: mm

Measurements		Engines	
		2500	3000
		(016.46)	(061.20)
Diameter of main journal (a)	Red	59,973 + 59,979	
	Blue	59,967 + 59,973	
	Green	59,961 + 59,967	
Diameter of crankpin (b)	Red	51,990 + 52,000	
	Blue	51,980 + 51,990	
Length of rear main journal (c)		31,300 + 31,335	
Maximum ovality of main journal and crankpin		0,004	
Maximum taper of main journal and crankpin		0,010	
Maximum out-of-parallel between main journals and crankpins		0,015	
Maximum eccentricity between main journals		0,040	
Maximum deviation between the centre lines of the two pairs of crankpins and the centre line of the main journals		0,3	

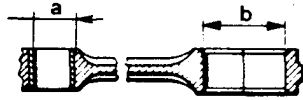
## Engine block



Unit: mm

Measurements		Engines	
		2500	3000
		(016.46)	(061.20)
Diameter of main bearings	(e)	63,657 + 63,676	
Length of shoulder of rear main bearing	(f)	26,450 + 26,500	

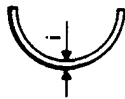
## Connecting rod



Unit: mm

Measurements	Engines				
	1600	1800	2000	2500	3000
	(061.00)	(062.02) (061.68) (061.34)	(062.24)	(016.46)	(061.20)
Diameter of small end bushing hole (a)	22,005 : 22,015				
Internal diameter of big end of connecting rod (b)	53,695 : 53,708			55,511 : 55,524	

## Main bearings



Unit: mm

Measurements		Engines				
		1600	1800	2000	2500	3000
		(061.00)	(061.02 - 061.68) (061.34)	(062.24)	(016.46)	(061.20)
Thickness of big end bushing (1)	Red	1,8365 : 1,841			1,833 : 1,8375	
	Blue	1,832 : 1,8365			1,8375 : 1,8420	
	Green	-			1,8420 : 1,8465	

(1) To be used on non oversize crankshafts only if the radial coupling play between the pin and the half bearing is greater than 0,050 mm after checking the dimension of each individual bearing.

## Connecting rod bearings



Unit: mm

Measurements		Engines				
		1600	1800	2000	2500	3000
		(061.00)	(062.02 - 061.68) (061.34)	(062.24)	(016.46)	(061.20)
Thickness of small end bushing (l)	Red	1,835 : 1,841			1,737 : 1,745	
	Blue	1,829 : 1,835			1,741 : 1,749	

## Thrust rings

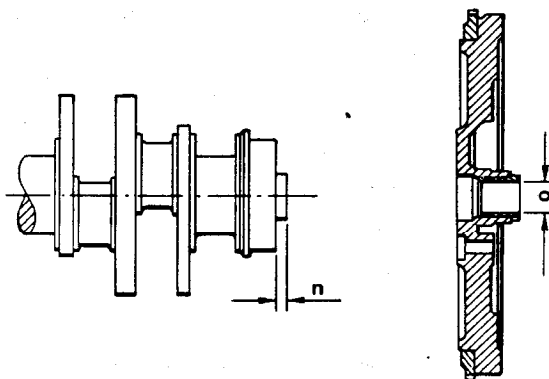
Unit:



mm

Measurements	Engines				
	1600	1800	2000	2500	3000
	(061.00)	(062.02) (061.68) (061.34)	(062.24)	(016.24)	(061.20)
Thickness of thrust ring (m)	2,311 ÷ 2,362			2,310 ÷ 2,360	

## Flywheel



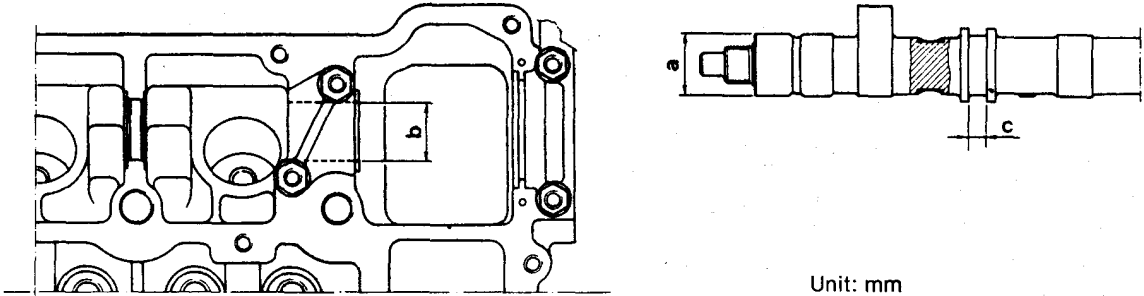
Unit: mm

Measurements	Engines				
	1600	1800	2000	2500	3000
	(061.00)	(062.02) (061.68) (061.34)	(062.24)	(016.24)	(061.20)
Protrusion of flywheel centring bushing from the rear end of crankshaft (n)	11			8	
Internal diameter of centre flywheel bushing (bore) (o)	26,010 ÷ 26,023				



# CAM SHAFT, CUP, SPRINGS, CYLINDER HEAD AND VALVES

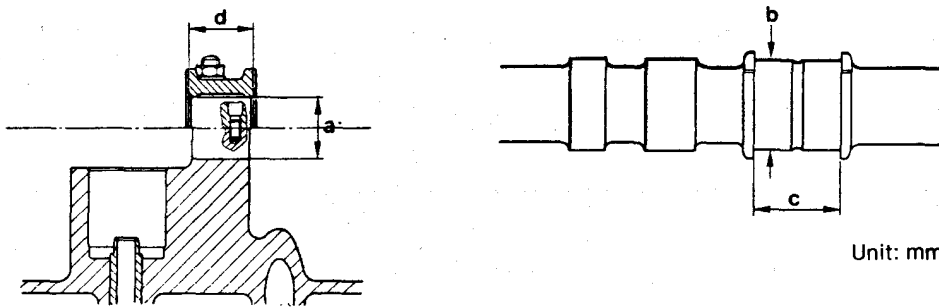
## Cam shaft



Unit: mm

Measurements		Engines		
		1600	1800	2000
		(016.46)	(062.02) (061.68) (061.34)	(062.24)
Diameter of cam shaft journal	(a)	26,959 : 26,980		
Diameter of seating of cam shaft journal	(b)	27,000 : 27,033		
Maximum eccentricity between cam shaft journals		-	0,03	
Width of shoulder	(c)	-	8,000 : 8,022	

## Cam shaft



Unit: mm

Measurements		Engines	
		2500	3000
		(016.46)	(061.20)
Diameter of seating of cam shaft journal	(a)	27,000 : 27,033	
Diameter of cam shaft journal	(b)	26,949 : 26,970	
Length of shoulder	(c)	-	27,000 : 27,052
Maximum eccentricity between cam shaft journals		-	0,03
Maximum width of shoulder	(d)	-	26,851 : 26,940

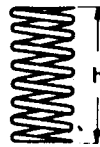
## Valve cup



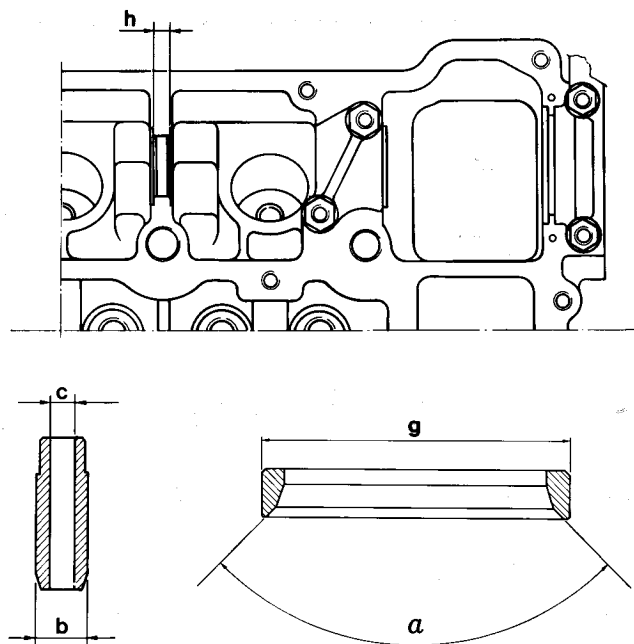
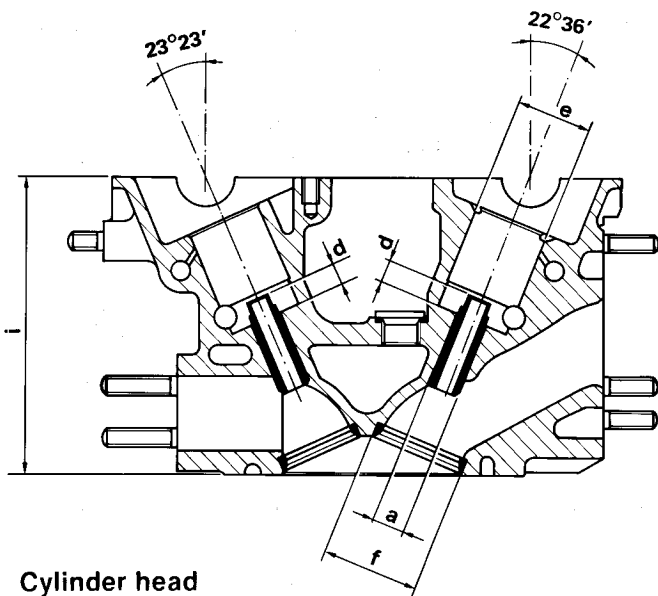
Unit: mm

Measurements	Engines				
	1600	1800	2000	2500	3000
	(061.00)	(062.02) (061.68) (061.34)	(062.24)	(016.46)	(061.20)
Diameter of valve cup (a)	34,973 : 34,989				

## Springs



Measurements		Engines				
		1600	1800	2000	2500	3000
		(061.00)	(062.02) (061.68) (061.34)	(062.24)	(016.46)	(061.20)
Length of springs with valve open	(h) External spring mm	25,5			23,5	
	(h) Internal spring mm	23,5			21,5	
Spring load at length	(h) External spring N (Kg)	452,175 : 469,825 (46,10 : 47,90)			470,2 : 487,8 (47,95 : 49,75)	
	(h) Internal spring N (Kg)	243,884 : 252,316 (24,87 : 25,73)			222,3 : 230,7 (22,67 : 23,53)	



### Cylinder head

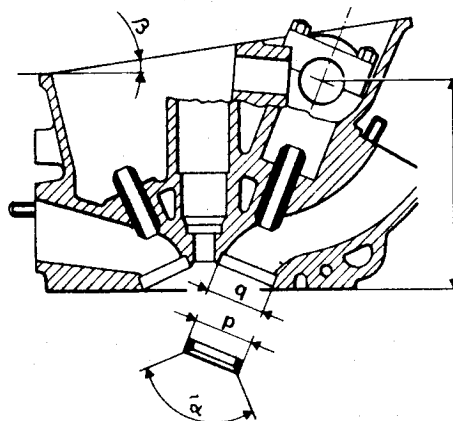
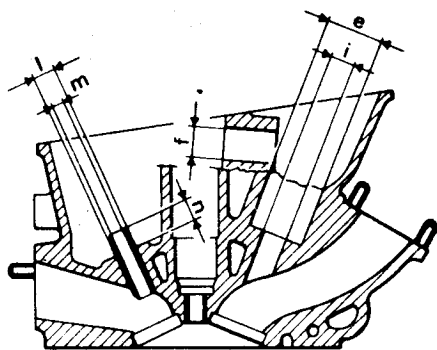
Unit: mm

Measurements		Engines		
		1600 (061.00)	1800 (062.02 - 061.68) (061.34)	2000 (062.24)
Diameter of valve guide seatings (a)		13,990 : 14,018		15,000 : 15,018
External valve guide diameter (b)	Intake	14,033 : 14,044		15,047 : 15,058
	Exhaust	14,033 : 14,044 (14,048 : 14,059) (1)		15,064 : 15,082
Internal valve guide diameter (bore) (c)	Intake	9,000 : 9,015		8,000 : 8,025
	Exhaust			7,800 : 7,900
Valve guide protrusion (d)	Intake	13,300 : 13,500 (11,800 : 12,000) (2)		9,850 : 10,150
	Exhaust	16,300 : 16,500 (11,800 : 12,000) (2)		
Diameter of valve cup seating (e)		35,000 : 35,025		
Diameter of valve seating housing (f)	Intake	42,532 : 42,557		45,000 : 45,025
	Exhaust	38,532 : 38,557		39,000 : 39,025
External diameter of valve seating (g)	Intake	42,597 : 42,632 (42,616 : 42,632) (3)		45,100 : 45,116
	Exhaust	38,616 : 38,632 (38,642 : 38,658) (1)		39,100 : 39,116
Taper of valve seating (α)		120°		89°40' : 90°20'
Minimum admissible height of cylinder head after skimming (i)		111,91	111,50	134,5
Maximum out-of-parallel between head surfaces		0,087		
Maximum out-of-faltness for lower head surface		0,05		

(1) Values for 1800 engine (061.34)

(2) Values for 1600 and 1800 engine (062.02)

(3) Values for 1800 engine (062.02)



### Cylinder head

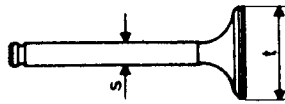
Unit: mm

Measurements			Engines	
			2500 (016.46)	3000 (061.20)
Diameter of intake valve cup seating (e)			35,000 : 35,025	
Diameter of exhaust valve cup seating (f)			22,000 : 22,021	
Diameter of valve guide seating (i)			13,990 : 14,018	
External diameter of valve guide (2) (l)			14,033 : 14,044	
External diameter of exhaust valve guide (l)			-- : 14,048 : 14,059	
Internal diameter of valve guide (bore) (m)			9,000 : 9,015	
Valve guide protrusion (n)			10,2 : 10,6	
External diameter of valve seating (p)	Normal	Intake	42,065 : 42,100	45,065 : 45,100
		Exhaust	37,065 : 37,100	39,065 : 39,100
	Oversize	Intake	42,365 : 42,400	45,365 : 45,400
		Exhaust	37,365 : 37,400	39,365 : 39,400
Diameter of valve seating housing (q)	Normal	Intake	42,000 : 42,025	45,000 : 45,025
		Exhaust	37,000 : 37,025	39,000 : 39,025
	Oversize	Intake	42,300 : 42,325	45,300 : 45,325
		Exhaust	37,300 : 37,325	39,300 : 39,325
Valve seating taper (α)			90°	89°40' : 90°20'
Minimum admissible height of cylinder head after skimming (length between axis of cam shaft and lower surface) (1) (r)			124,5	124,85 : 125,15
Maximum out-of-flatness for lower head surface			0,05	
Inclination of upper head surface (β)			8°	7°55' - 8°5'

(1) Skimming must be carried out on both heads of the same engine

(2) For the 3000 engine the value is for the exhaust valve

## Valves



Unit: mm

Measurements		Engines				
		1600	1800	2000	2500	3000
		(061.00)	(062.20) (061.68) (061.34)	(062.24)	(016.46)	(061.20)
Valve stem diameter	(s) Intake	8,972 : 8,987		7,970 : 7,985	8,972 : 8,987	8,972 : 8,987
	Exhaust	8,935 : 8,960 (8,940 : 8,960) (1)		7,945 : 7,960	8,935 : 8,960	8,940 : 8,995
Valve head diameter	(t) Intake	-		-	40,85 : 41,00	43,850 : 44,000
	Exhaust	-		-	36,40 : 36,60	38,500 : 38,700
Diameter of LIVIA type valve stem	(s) Intake	-		-	-	8,972 : 8,987
	Exhaust	-		-	-	8,940 : 8,955
Diameter of LIVIA type valve head	(t) Intake	41,850 : 42,000 (41,800 : 42,000) (1)		43,850 : 44,000	-	43,850 : 44,000
	Exhaust	37,000 : 37,150		37,850 : 38,000	-	38,450 : 38,600
Diameter of ATE type valve head	(t) Intake	41,000 : 41,200		-	-	-
	Exhaust	37,000 : 37,200		-	-	-

(1) Values for 1800 engine (061.34)

## CLEARANCES AND INTERFERENCES

Measurements		Engines				
		1600	1800	2000	2500	3000
		(061.00)	(062.02) (061.68) (061.34)	(062.24)	(016.46)	(061.20)
Clearance between liner and piston		0,030 ÷ 0,049		0,040 ÷ 0,059		
End play between piston rings and seating	First ring	0,045 ÷ 0,077 (1) 0,035 ÷ 0,067 (2)	0,035 ÷ 0,067 (0,035 ÷ 0,070) (3)			
	Second ring	0,035 ÷ 0,067				
	Oil scraper ring	0,025 ÷ 0,057				
Clearance between piston hole and gudgeon pin	Black	0,003 ÷ 0,008		0,003 ÷ 0,0085	0,006 ÷ 0,012	
	White			0,0025 ÷ 0,008		
Clearance between small end bushing and gudgeon pin	Black	0,008 ÷ 0,021				
	White	0,005 ÷ 0,018				
Radial clearance between crankpin and bearing	Blue	0,004 ÷ 0,045	0,004 ÷ 0,035	0,016 ÷ 0,057		
	Red	0,006 ÷ 0,047	0,003 ÷ 0,034	0,014 ÷ 0,055		
Radial clearance between gudgeon pin and connecting rod bearing	Blue	0,025 ÷ 0,060			0,021 ÷ 0,060	
	Red	0,027 ÷ 0,062			0,023 ÷ 0,062	
Crankshaft end play		0,080 ÷ 0,265				
Big end end play		0,2 ÷ 0,3				
Radial play between cam shaft journal and seating		0,020 ÷ 0,074			0,030 ÷ 0,084	
Cam Shaft end play		0,065 ÷ 0,182	0,080 ÷ 0,124	0,065 ÷ 0,200	0,060 ÷ 0,201	
Radial play between valve cup and seating		0,011 ÷ 0,052				
Radial play between valve stem and guide	Intake	0,013 ÷ 0,043	0,015 ÷ 0,045	0,013 ÷ 0,043		
	Exhaust	0,040 ÷ 0,080	0,040 ÷ 0,070	0,040 ÷ 0,080	0,045 ÷ 0,075	
Interference between valve guide and guide seating	Intake	0,015 ÷ 0,054		0,029 ÷ 0,058	0,015 ÷ 0,054	
	Exhaust			0,046 ÷ 0,082		
Interference between valve seating and housing	Intake	0,040 ÷ 0,0100		0,075 ÷ 0,016	0,040 ÷ 0,100	
	Exhaust					

(1) Borgo Piston

(2) Mondial Piston

(3) Values for 2000 engines with Mondial pistons only

## FUEL DELIVERY AND INJECTION SYSTEM

Component \ Models	1.8 IE	1.8 TB	2.0 TS	2.5 V6	3.0 V6
Fuel pressure regulator		195.00.32.045.00 BOSCH 0.280.160.214	195.36.11.034.00 BOSCH 0.280.160.235	119.11.32.045.00 BOSCH 0.280.160.210	
Hammering damper		195.05.04.550.00 BOSCH 0.280.161.029	161.10.04.550.00 BOSCH 0.280.161.030	-	161.10.04.550.00 BOSCH 0.280.161.030
Fuel injector	195.26.11.300.01 BOSCH 0.280.150.707	195.05.011.300.01 BOSCH 0.280.150.152	195.36.030.00 BOSCH 0.280.150.702	119.11.11.300.00 BOSCH 0.280.150.105	
Supplementary air valve	195.00.11.017.00 BOSCH 0.280.140.166			-	116.46.11.017.00 BOSCH 0.280.140.124
Injection control unit		195.05.11.042.00 BOSCH 0.280.000.320	162.24.11.042.00 (MOTRONIC)	116.46.11.042.00 BOSCH 0.280.001.117	195.46.11.042.00
Ignition control unit		195.05.05.012.01 BOSCH 0.277.400.024		-	
Coolant temperature sensor	-	195.05.11.010.00 BOSCH 0.280.130.032	195.32.11.010.00 BOSCH 0.280.130.026	-	-
Air flow gauge	195.26.11.013.00 BOSCH 0.280.202.078	195.05.11.013.02 BOSCH 0.280.202.058	195.36.11.013.02 BOSCH 0.280.152.039	116.46.11.013.00 BOSCH 0.280.202.013	195.46.11.013.00
Throttle unit	SOLEX 195.00.04.062.01 DELLORTO 195.00.04.062.00				
Impulse generator	115.44.05.013.00 BOSCH 0.261.210.002		195.32.11.019.00 BOSCH		
Temperature sensor	119.11.11.010.00 BOSCH 0.280.130.023			-	119.11.11.010.00 BOSCH 0.280.130.023
Turbo compressor	-	195.49.08.090.00 GARRET TB0353	-	-	-

## CARBURETTORS

Engine (1)	Cubic Capacity	1600				1800			
	Type	061.00				062.02			
CARBURETOR	Alfa Romeo part number	195.22.04.010.02 195.22.04.011.02		195.24.04.010.00 195.24.04.011.00		195.24.04.010.01 195.24.04.011.01		195.24.04.010.00 195.24.04.011.00	
	Model	WEBER 40DC0M4   40DC0M5		DELLORTO DHLA40N R5372   R5371		WEBER 40DC0M2   40DC0M3		DELLORTO DHLA40N R5377   R5376	
	Position	FRONT	REAR	FRONT	REAR	FRONT	REAR	FRONT	REAR
Choke	$\phi^*$	30		30		32		32	
Main jet	$\phi^*$	1,20		1,30		1,38		1,48	
Main air correction jet	$\phi^*$	1,50		1,80		1,60		2,10	
Main diffuser (initial)		F47		7772.10		F64		7772.11	
Idle jet	$\phi^*$	0,59		0,57		0,59		0,57	
Air correction idle jet	$\phi^*$	—		2,2		—		2,2	
Progression holes	$\phi^*$	4 No. HOLES 1.1		—		4 No. HOLES 1.1		—	
Acceleration pump jet	$\phi^*$	0,35		0,38		0,35		0,40	
Needle plug	$\phi^*$	1,50		1,50		1,50		1,50	
Float weight	$\phi^*$	26		8,50		26		8,50	
Starter jet	g	0,85		0,80		0,85		0,80	
Air correction starter jet	$\phi^*$	3 No. HOLES 2.5		2 No. HOLES 3.5		3 No. HOLES 2.5		2 No. HOLES 3.5	
Starter diffuser (initial)	$\phi^*$	F9		7482.3				7482.3	
Acceleration pump capacity per 20 pumps per duct	cm	10 + 1,5		6,5 ÷ 9,5		10 + 1,5		6,5 ÷ 9,5	
Check of operation of acceleration pump Clearance between lever and cap with throttle closed	mm	0,5		—		0,5		—	
Float chamber level: height "A" between cover with gasket and float	mm	7 + 0,5		14,5 ÷ 15,0		7 + 0,5		14,5 ÷ 15,0	

\* Dimension in mm

(1) The different types of engines can be distinguished by the differing serial numbering (letters and numbers). See Group 00



# ELECTRICAL SYSTEM

## Component units

Engine	Starter motor	Alternator (1)	Distributor	Coil with electronic module	Spark plugs
1600 (061.00)	116.00.05.030.09 PARIS-RHONE D8E 145	116.10.05.060.12 PARIS-RHONE A13R192	116.97.05.011.01 M. MARELLI SM802BX 195.22.05.011.00 BOSCH 0.237.002.133 195.22.05.011.01 M. MARELLI SM802BX	116.55.65.079.02 M. MARELLI AEI200B	
1800 (062.02)	116.00.05.030.10 MAGNETI MARELLI E95-0,9/12	116.10.05.060.08 BOSCH K1 14V55A20	116.97.05.011.01 M. MARELLI SM802BX 19517.05.011.01 M. MARELLI SM802BX 116.97.05.011.00 BOSCH 0.237.002.018	116.97.65.079.00 BOSCH 0221.600.002	195.17.05.106.00 GOLDEN LODGE 2 H L
1800 (061.68)	116.08.05.030.00 BOSCH 0.001.211.014 EF 12V - 0,8kW	119.13.05.060.00 BOSCH 0.120.489.905.906 K1 14V65A21	115.44.05.011.00 BOSCH 0.237.051.002	195.32.05.079.00 BOSCH 0221.122.344	
1800 (061.34)	116.08.05.030.03 DUCELLIER DmE124P1	116.10.05.060.12 PARIS-RHONE A13R192	195.05.05.011.02 BOSCH 0.237.520.001	116.97.65.079.00 BOSCH 0221.600.002	580.020 LODGE 25HL
2000 (062.24)	116.55.05.030.03 BOSCH 0.001.108.011 12V - 1,4kW	116.10.05.060.08 BOSCH 0.120.489.549 K1 14V55A20	195.36.05.011.00 (1) BOSCH 0.237.501.005 195.36.05.011.01 (2) BOSCH 0.237.501.006	195.36.05.079.02 BOSCH 0.221.600.054	195.10.05.106.00 LODGE 25HLD
2500 (016.46)	116.46.05.030.00 BOSCH 0.001.311.139 GF 12V - 1,5CV	119.13.05.060.00 BOSCH 0.120.489.905.906 K1 14V65A21	116.46.05.011.00 BOSCH 0.237.301.008	116.97.65.079.00 BOSCH 0.221.600.002	195.17.05.106.00 GOLDEN LODGE 2 H L
3000 (061.20)		195.46.05.060.00 BOSCH 0.120.488.103	116.69.05.011.00 BOSCH 0.237.322.001		

(1) Distributor mounted on cylinder head

(2) Distributor mounted on front engine cover

# STARTING

## TECHNICAL DATA AND SPECIFICATIONS

### Technical data and checks

Starter motor	Alfa Romeo Part Number	116.08.05.030.00	113.48.05.030.00	116.46.05.030.00	116.55.05.030.00
	Type	BOSCH EF 12 V 0,8 kw 0,001.211.014	BOSCH 12 V 0,8 kw 0,001.109.012	BOSCH GF 12 V 1,4 kw 0,001.311.139	BOSCH 12 V 1,4 kw 0,001.108.011
Circuit tension	V	12	12	12	12
Rated power	KW (h.p.)	0,8 (1,1)	0,8 (1,1)	1,1 (1,5)	1,4 (1,9)
Maximum length of brushes	mm	11	11	-	-
Maximum commutator eccentricity	mm	0,06	0,06	-	-
Radial play: shaft-bushes	mm	0,02 : 0,05			
Test under load (with pinion engaged with the crown wheel with torque dynamometer)					
- Tension	V	9	9,3	9	9
- Current absorbed	A	≤ 250	≤ 250	290 max	≤ 315
- Velocity	r.p.m.	≥ 1050	≥ 1300	1200 min	≥ 1700
- Torque	Nm (kgm)	5,5 (0,5)	6 (0,60)	8 (0,8)	7,5 (0,75)
Test lock torque test (pinion meshing with locked ring gear)					
- Tension	V	5	7,1	6	4
- Current absorbed	A	≤ 290	≤ 480	500 max	≤ 750
- Torque	Nm (kgm)	≥ 5,5 (≥0,5)	≥ 9,5 (≥0,95)	13 (1,3)	≥ 1,6 (≥0,16)
Free wheel torque	Ncm (kgm)	13 : 22 (1,3 : 2,2)	12 : 18 (1,2 : 1,8)	14 : 20 (1,4 : 2,0)	12 : 18 (1,2 : 1,8)
Test with solenoid switch mounted on starter motor					
- Maximum absorption at rated tension	A	≤ 40		38	≤ 40
- Minimum engagement tension	V	a 20°C ≤ 7,8 a 100°C ≤ 10,3	a 20 : 25°C ≤ 7,8	7,5 (a - 20°C) 9,5 (a + 80°C)	≤ 7,8 (a 20°: 25°C)
Pinion teeth module		2,11	2,1167	2,1167	2,1167

## TECHNICAL DATA AND CHECKS

	Alfa Romeo Part Number	116.00.05.030.09	116.08.05.030.03	116.00.05.030.10
Starter motor	Type	PARIS - RHONE D8E 145 12 V 0,92 kw	DUCELLIER DmE 124P1 12 V 0,88 kw	MARELLI E95 0,9/12
Circuit tension	V	12	12	12
Rated power	KW (h.p.)	0,92 (1,25)	0,88 (1,2)	0,9 (1,22)
Maximum length of brushes	mm	9	9	9
Maximum commutator eccentricity	mm	0,05	0,05	0,06
Radial play: shaft-bushes	mm			
Test under load (with pinion engaged with the crown wheel with torque dynamometer)				
- Tension	V	9,3	-	9,8
- Current absorbed	A	≤ 230	-	≤ 220
- Velocity	r.p.m.	1600 - 1700	-	≥ 1800
- Torque	Nm (kgm)	5 (0,5)	-	5 (0,5)
Test lock torque test (pinion meshing with locked ring gear)				
- Tension	V	7,2	-	7,4
- Current absorbed	A	≤ 410	-	≤ 460
- Torque	Nm (kgm)	11,8 (1,2)	-	≥ 12 (≥ 1,2)
Free wheel torque	Ncm (kgcm)	12 - 19 (1,2 - 1,9)	-	13,3 (1,3)
Test with solenoid switch mounted on starter motor				
- Maximum absorption at rated tension	A		-	≤ 55
- Minimum engagement tension	V	≤ 5,5	-	a - 20°C ≤ 6,5 a + 80°C ≤ 9
Pinion teeth module		2,116	2,116	2,116

## CHARGING

### Technical data and checks

Alternator (1)		Alfa Romeo Part Number	116.10.05.060.08	116.55.05.060.00	116.10.05.060.12
		Type	BOSCH K1 - 14V55A20 0.120.489.549	MAGNETI MARELLI	PARIS - RHONE A13R192
Rated tension		V	14	14	14
Range of tension variation		V	-	-	-
Current output	Max output current	A	55	~60	50
	Start of output	r.p.m.	1000	1100	1000
	2/3 of maximum output	r.p.m.	2000	2100	2000
	Maximum output	r.p.m.	6000	7000	8000
Limit of brush wear		mm	5	7	6
Inductor winding resistance		Ω	4 ± 0,1	-	3,1±0,1
Tension regulator resistance		Ω	60 ÷ 64	-	-
Diodes resistance		Ω	0 ÷ 10	0 ÷ 10	0 ÷ 10

(1) With electronic tension regulator incorporated

Alternator (1)		119.13.05.060.00	195.46.05.060.00
		BOSCH K1 - 14V65A21 0.120.489.905.906	BOSCH 0.120.488.103
Rated tension		14	
Range of tension variation		-	
Current output	Max output current	65	
	Start of output	r.p.m.	1060
	2/3 of maximum output	2100	
	Maximum output	15000	
Limit of brush wear		-	
Inductor winding resistance		-	
Tension regulator resistance		-	
Diodes resistance		-	

(1) With electronic tension regulator incorporated

Battery		Vehicles				
		1.6 1.8	1.8 IE	1.8 TB	2.0 TS	2.5 6V 3.0 6V
Capacity	Ah	50	55		60	70
Tension	V	12				
Discharge current	A	240	255	225	290	380

# TRANSISTORISED BREAKERLESS IGNITION

## TECHNICAL DATA AND SPECIFICATIONS

### DISTRIBUTOR

Distributor	Alfa Romeo Part Number	116.97.05.011.01	195.22.05.011.00	195.22.05.011.01	195.17.05.011.01
	Type	MARELLI SM802BX*	BOSCH 0.237.002.133	MARELLI SM802BX	MARELLI SM802BX
Firing order		1 - 3 - 4 - 2			
Booster coil resistance	$\Omega$	730 $\pm$ 5%	1000 $\pm$ 5%	730 $\pm$ 5%	730 $\pm$ 5%
Internal distributor brush resistance	$\Omega$	5000 $\pm$ 1	1000 $\pm$ 0,2	5000 $\pm$ 1	5000 $\pm$ 1
Air gap	mm	0,5 $\div$ 0,6	0,5 $\div$ 0,6	0,5 $\div$ 0,6	0,5 $\div$ 0,6

### DISTRIBUTOR

Distributor	Alfa Romeo Part Number	116.97.05.011.00	195.05.05.011.02	195.36.05.011.00	195.36.05.011.01
	Type	BOSCH 0.237.002.018	BOSCH 0.237.520.001	BOSCH 0.237.501.005	BOSCH 0.237.501.006
Firing order					
Booster coil resistance	$\Omega$	1000 $\pm$ 5%	-	-	-
Internal distributor brush resistance	$\Omega$	1000 $\pm$ 0,2	-	-	-
Air gap	mm	-	-	-	-

### DISTRIBUTOR

Distributor	Alfa Romeo Part Number	116.46.05.011.00	116.69.05.011.00	
	Type	BOSCH 0.237.301.008	BOSCH 0.237.322.001	
Firing order		1 - 4 - 2 - 5 - 3 - 6		
Booster coil resistance	$\Omega$	-	-	
Internal distributor brush resistance	$\Omega$	-	-	
Air gap	mm	-	-	

## AUTOMATIC AND PNEUMATIC IGNITION ADVANCE CURVES

### BOSCH 0.237.002.018

Engine r.p.m.	Automatic advance curve		Depression mmHg	Automatic advance curve	
	Upper	Lower		Upper	Lower
100	15'	1°30'	0	30'	- 30'
230	- 30'	45'	60	30'	- 30'
280	0°	0°	90	45'	- 30'
330	15'	- 45'	101	1°15'	- 30'
380	0°	- 1°	150	3°30'	30'
470	1°	- 1°15'	195	5°45'	2°45'
900	6°	3°30'	210	6°30'	3°30'
1900	11°15'	9°	225	7°	4°
2500	15°15'	12°45'	300	8°45'	6°45'
2700	15°30'	13°30'			
3000	15°	13°			

### BOSCH 0.237.30.1008

Engine r.p.m.	Automatic advance curve		Depression mmHg	Pneumatic advance curve	
	Upper	Lower		Upper	Lower
100	- 15'	45'	0	30'	- 30'
300	- 30'	30'	90	30'	- 30'
350	- 15'	- 15'	105	1°	- 30'
400	15'	- 45'	128	2°30'	- 30'
450	15'	- 45'	165	5°	2°15'
600	2°15'	- 10'	180	5°45'	3°15'
1300	10°45'	8°	196	6°	4°
1500	12°	9°45'	300	6°	4°
1900	13°30'	11°30'			
2100	14°	12°			
2400	13°45'	11°45'			
3000	13°	11°			

### MARELLI SM802BX

Engine r.p.m.	Automatic advance curve		Depression mmHg	Pneumatic advance curve	
	Upper	Lower		Upper	Lower
100	0°	0°	0	30'	- 30'
300	12'	- 18'	40	30'	- 30'
350	18'	- 30'	100	2°30'	- 30'
550	1°	- 30'	212	9°45'	6°45'
800	4°24'	2°	300	9°45'	6°45'
1000	6°24'	4°24'			
1900	11°24'	9°			
2550	15°30'	13°30'			
3000	15°12'	13°12'			

## AUTOMATIC AND PNEUMATIC IGNITION ADVANCE CURVES

BOSCH 0.237.002.133

Engine r.p.m.	Automatic advance curve		Depression mmHg	Pneumatic advance curve	
	Upper	Lower		Upper	Lower
275	0°	0°	0	30'	- 30'
500	1°15'	- 1°	60	45'	- 30'
620	2°15'	18'	90	2°	- 30'
1000	6°24'	4°30'	101	2°45'	- 30'
1500	8°24'	6°30'	150	6°	3°
2000	10°30'	8°30'	195	8°30'	5°45'
2750	13°30'	11°24'	210	8°45'	6°30'
3000	13°30'	10°	225	8°45'	6°45'
			300	8°45'	6°45'

MARELLI SM802BX

Engine r.p.m.	Automatic advance curve		Depression mmHg	Automatic advance curve	
	Upper	Lower		Upper	Lower
275	0°	0°	0	30'	- 30'
500	1°15'	- 1°	40	30'	- 30'
620	2°45'	18'	100	2°30'	- 30'
1000	6°24'	4°30'	212	9°45'	6°45'
1500	8°24'	6°30'	300	9°45'	6°45'
2000	10°30'	8°30'			
2750	13°30'	11°24'			
3000	13°30'	10°			

## IGNITION ADVANCES

Advances (1)	Engines			
	061.00	062.02	061.68	061.34
Fixed (2)	7° ± 1° before T.D.C. at 900 $\begin{smallmatrix} +100 \\ -50 \end{smallmatrix}$ r.p.m.	7° ± 1° before T.D.C. at 900 $\begin{smallmatrix} +100 \\ -50 \end{smallmatrix}$ r.p.m.	10° ± 1° before T.D.C. à 900 ± 50 r.p.m.	9° before T.D.C. on idle
Maximum (3)	34° $\begin{smallmatrix} +0° \\ -3° \end{smallmatrix}$ before T.D.C. at 5400 r.p.m.	38° $\begin{smallmatrix} +0° \\ -3° \end{smallmatrix}$ before T.D.C. at 5100 r.p.m.	-	-

Advances (1)	Engines			
	062.24	016.46	061.20	
Fixed (2)	10° ± 1° before T.D.C. on idle	7° ± 1° before T.D.C. on idle	7° ± 1° before T.D.C. on idle	
Maximum (3)	-	31° $\begin{smallmatrix} +0° \\ -3° \end{smallmatrix}$ before T.D.C. at 5100 r.p.m.	32° ± 1° before T.D.C. at 5000 r.p.m.	

(1) Checking of the fixed and maximum advance should be carried out with the distributor vacuum hose disconnected (except for engines 062.24 and 061.34)

(2) Fixed value: correspondence of reference mark and notch "F" on engine pulley

(3) Maximum value: correspondence of reference mark and notch "M"

## IGNITION COIL

Ignition coil	Alfa Romeo Part Number	116.55.65.079.02	116.97.65.079.02	195.32.05.079.00	195.36.05.079.02
	Type	MAGNETI MARELLI AEI200B	BOSCH 0.221.600.002	BOSCH 0.221.122.344	BOSCH 0.221.600.054
Primary winding resistance (20 °C)	Ω	0,72 ± 10%	0,7 : 1	0,5 ± 10%	-
Secondary winding resistance (20 °C)	Ω	7900 ± 10%	6700 : 9600	6 ± 10%	-



# GEARBOX AND TRANSMISSION

## TECHNICAL DATA AND SPECIFICATIONS

### TECHNICAL DATA

75		1.6		1.8		1.8 IE		1.8 TB		2.0 T.S.	
		LHD 061.00	RHD -	LHD 062.02	RHD -	LHD 061.68	RHD -	LHD 061.34	RHD -	LHD 062.24	RHD -
Transmission ratios											
Gear ratios	I	1:2,875									
	II	1:1,720									
	III	1:1,226									
	IV	1:0,946									
	V	1:0,780									
	R.G.	1:3,000									
Differential ratio		9/41		10/43		11/43		10/41			
Overall gearbox differential ratio	I	1:13,096		1:12,362		1:11,238		1:11,787			
	km/h	8,315		8,809		9,690		9,239			
Nominal speed at 1000 r.p.m.	II	1:7,835		1:7,396		1:6,723		1:7,052			
	km/h	13,899		14,724		16,198		15,442			
	III	1:5,584		1:5,272		1:4,792		1:5,027			
	km/h	19,502		20,656		22,725		21,663			
	IV	1:4,309		1:4,068		1:3,698		1:3,879			
	km/h	25,273		26,770		29,448		28,074			
	V	1:3,553		1:3,354		1:3,049		1:3,198			
	km/h	30,650		32,469		35,717		34,052			
	R G	1:13,665		1:12,900		1:11,727		1:12,300			
	km/h	7,969		8,442		9,286		8,854			

75		2.5 CA		3.0 6V		2.0 TD		2.4 TD	
		LHD	RHD	LHD	RHD	LHD	RHD	LHD	RHD
Transmission ratios		-	016.46	061.20	-	161.04	-	161.70	-
Gear ratios	I	1:2,48		1:2,875		1:3,500			
	II	1:1,48		1:1,720		1:1,956			
	III	1:1,00 (*)		1:1,226		1:1,258			
	IV	-		1:0,946		1:0,946			
	V	-		1:0,780		1:0,780			
	R.G.	1:2,09		1:3,000		1:3,000			
Differential ratio		13/41		11/39		11/39		13/40	
Overall gearbox differential ratio	I	1:7,822		1:10,192		1:12,407		1:10,770	
	km/h	13,992		10,685		8,777		10,111	
	II	1:4,668		1:6,097		1:6,934		1:6,018	
	km/h	23,329		17,861		15,705		18,093	
Nominal speed at 1000 r.p.m.	III	-		1:4,346		1:4,460		1:3,870	
	km/h	-		25,057		24,417		28,139	
	IV	-		1:3,353		1:3,353		1:2,911	
	km/h	-		32,478		32,478		37,410	
	V	-		1:2,765		1:2,765		1:2,400	
	km/h	-		39,385		39,385		45,375	
	RG	1:6,592		1:10,635		1:10,635		1:9,231	
	km/h	16,520		10,240		10,240		11,797	

\*) Automatic transmission gear selection "D"