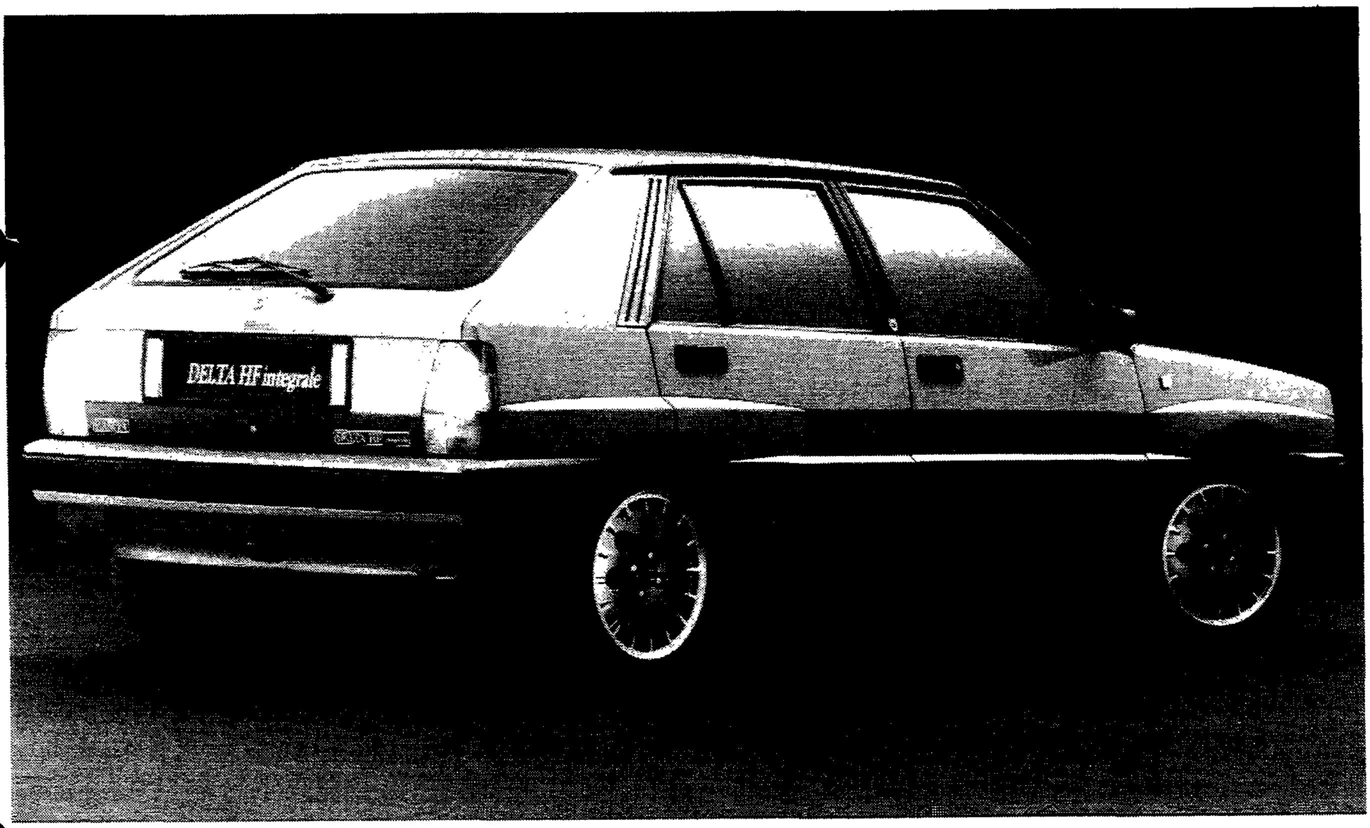
00.

page

3/4 front view

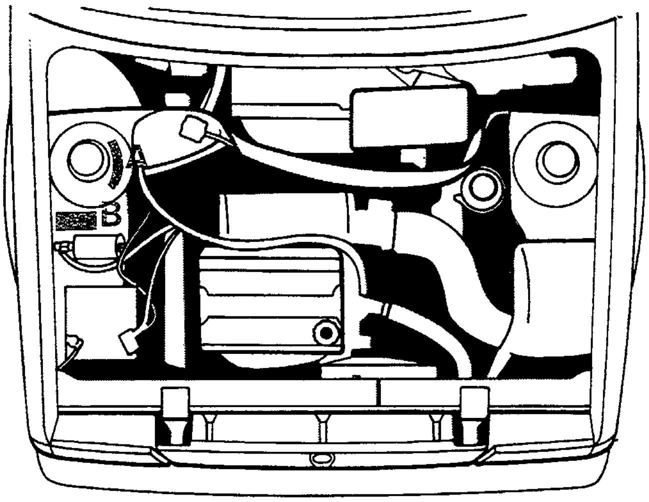


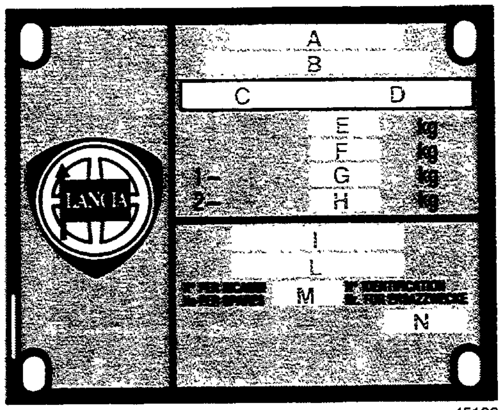
3/4 rear view

IDENTIFICATION DATA

	CHASSIS	ENGINE	VERSION	5 speed gearbox
2000 ie *turbo*	ZLA 831 ABO	831 C5.000	831 ABO 24	•

LOCATION OF IDENTIFICATION DATA ON VEHICLE





45198

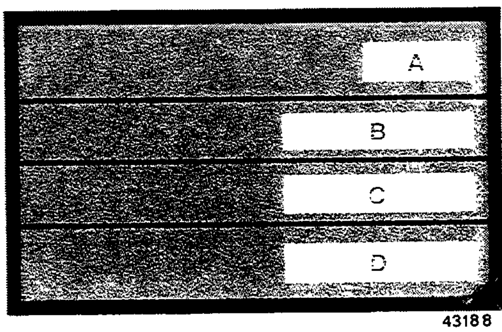
B V.I.N. Plate

A. Name of Manufacturer.
B. Type approval number.
C. Vehicle type identification code.
D. Chassis manufacture number.
E. Maximum authorized weight of vehicle fully laden.
F. Maximum authorized weight of vehicle fully laden plus tow.
G. Maximum authorized weight on first axle (front).
H. Maximum authorized weight on second axle (rear).
I. Bodywork version code.
L. Engine type.
M. Spares number.
N. Correct value of smoke absorption coefficient (for diesel engines).

A Chassis identification

– Vehicle type: (ZLA 831 ABO)
– chassis manufacture number.

NOTE *The engine type and number are stamped on the cylinder block/crankcase behind the engine oil cartridge filter.*



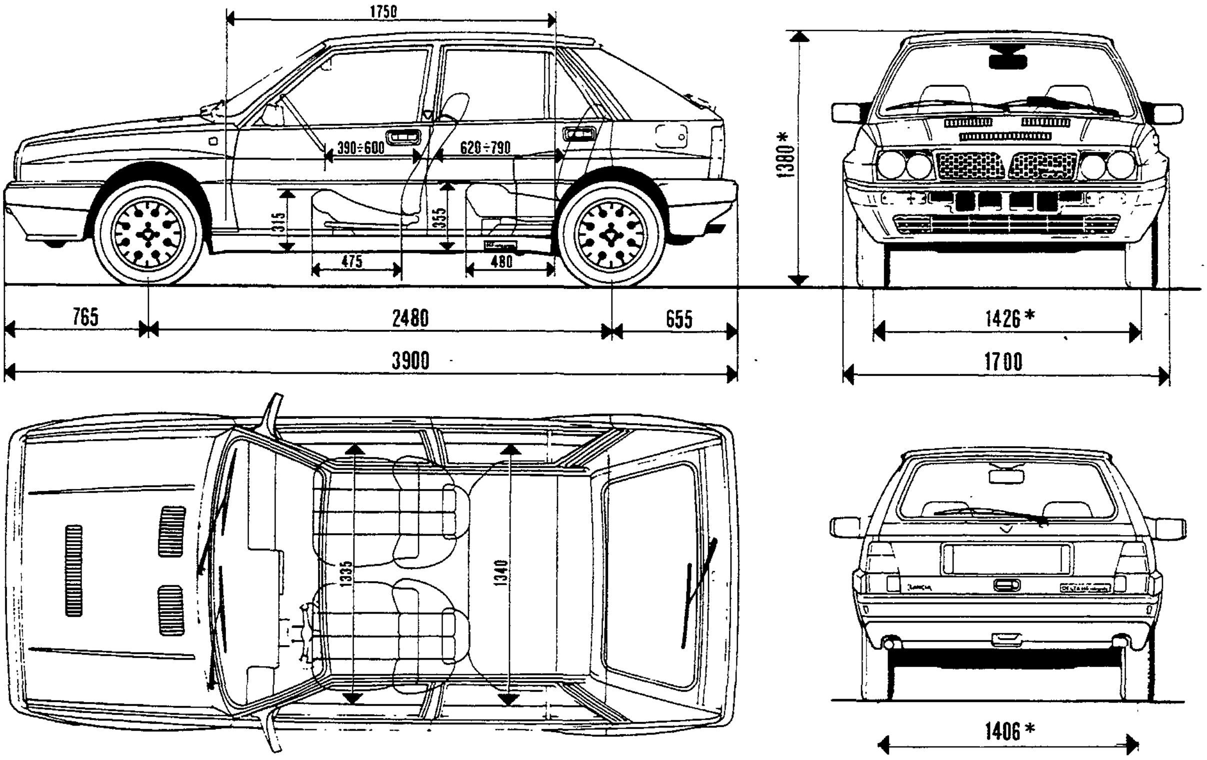
43188

Bodywork paint identification plate

Found inside the boot lid

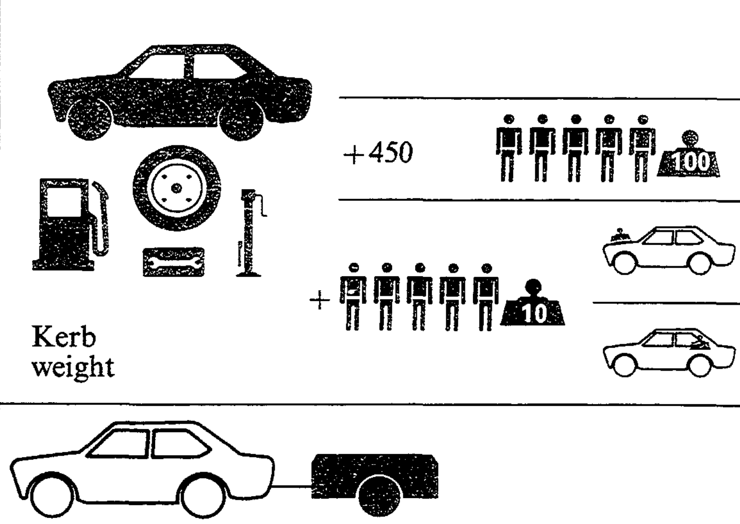
A. Paint manufacturer
B. Description of colour
C. Colour code
D. Colour code for touching up or respraying

DIMENSIONS



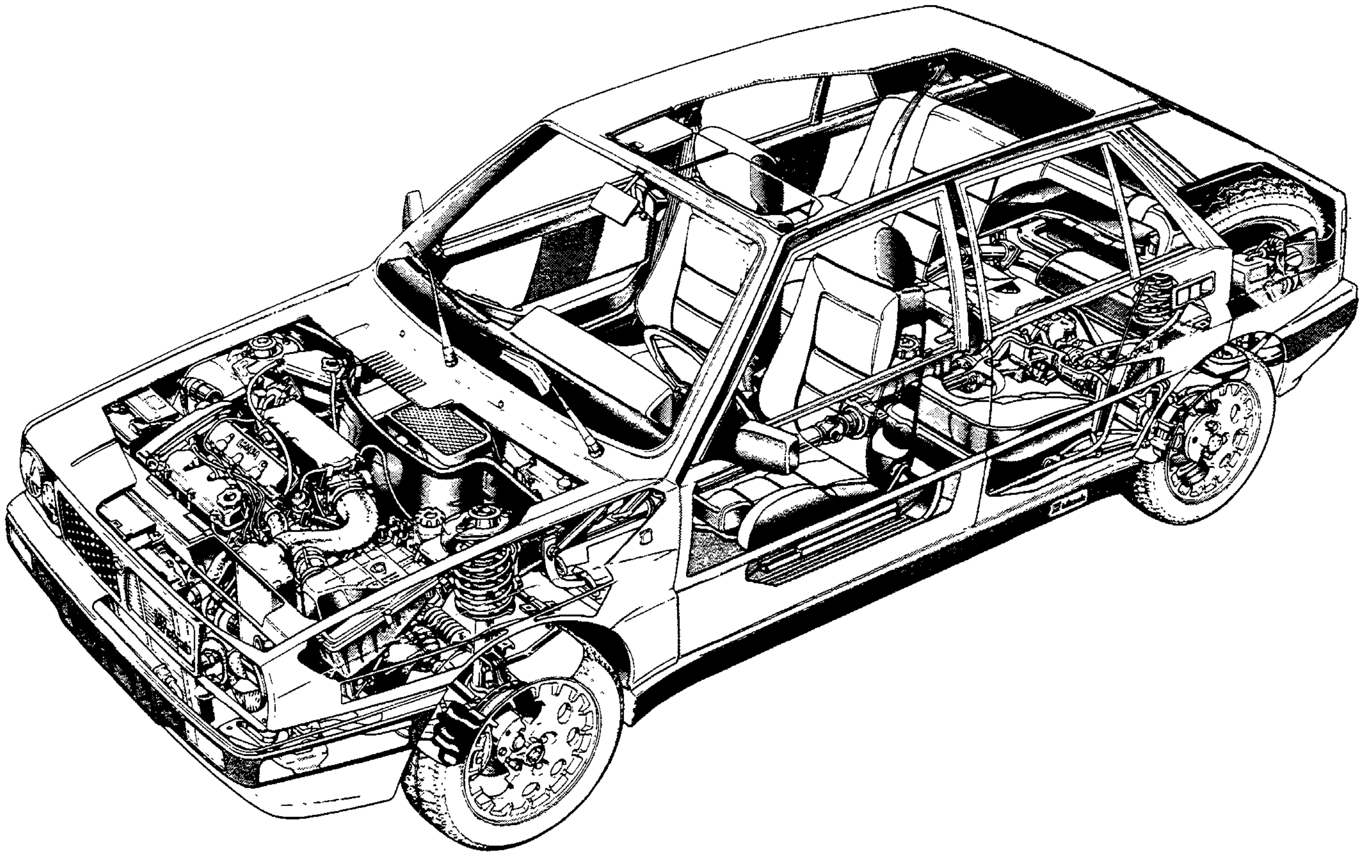
(*) Vehicle unladen
Luggage compartment capacity with rear seat backrest in normal position 200 dm (7.06 cu ft)³.
Luggage compartment capacity with rear seat folded down :940 dm (33.19 cu ft)³.

WEIGHTS (in kg)

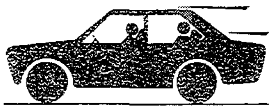
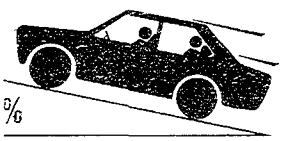
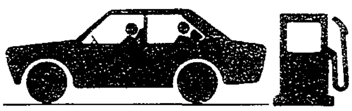


Kerb weight	1215
+450	1665
+ (front axle)	911
+ (rear axle)	754
Towing	1200

Layout of mechanical components



PERFORMANCE

Speed kph 	1	60
	2	95
	3	140
	4	185
	5	215
	R	60
Maximum climable gradient  %	1	58
	2	41
	3	25
	4	17
	5	12
	R	68
EEC fuel consumption figures (litres/100km) 	Urban cycle (A)	10,8
	Constant speed 90 kph (B)	7,7
	Constant speed 120 kph (C)	10,2
	Average consumption (CCMC proposal) $\frac{A+B+C}{3}$	9,6

Description	Unit		Quantity dm³	Quantity (kg)
Petrol O.R.(98–100)			57	–
50% + ▲	Total capacity of cooling system		6,2	–
VS⁺ Superstagionale (SAE 10 W) (SAE 20 W) (SAE 30) (SAE 40); VS⁺ Supermultigrado (SAE 15 W/40); VS⁺ Turbo Synthesis (SAE 15 W/40)	Total capacity		5,9	5,0
	Partial capacity (periodic replacement)		–	4,80
a = TUTELA ZC 80S		a	–	3,40
b = TUTELA GI/A		b	–	–
TUTELA W 90/M DA	a	a	–	–
	b Self-locking	b	–	1
a = TUTELA GI/A	a	a	–	061
b = K 854	b	b	–	–
c = TUTELA MRM2	c	c	–	–
TUTELA DOT 3	Total capacity		–	0,30
+ DP1	3%; ~–10 °C 50%; ~–20 °C 100%		2	–

▲ Distilled water

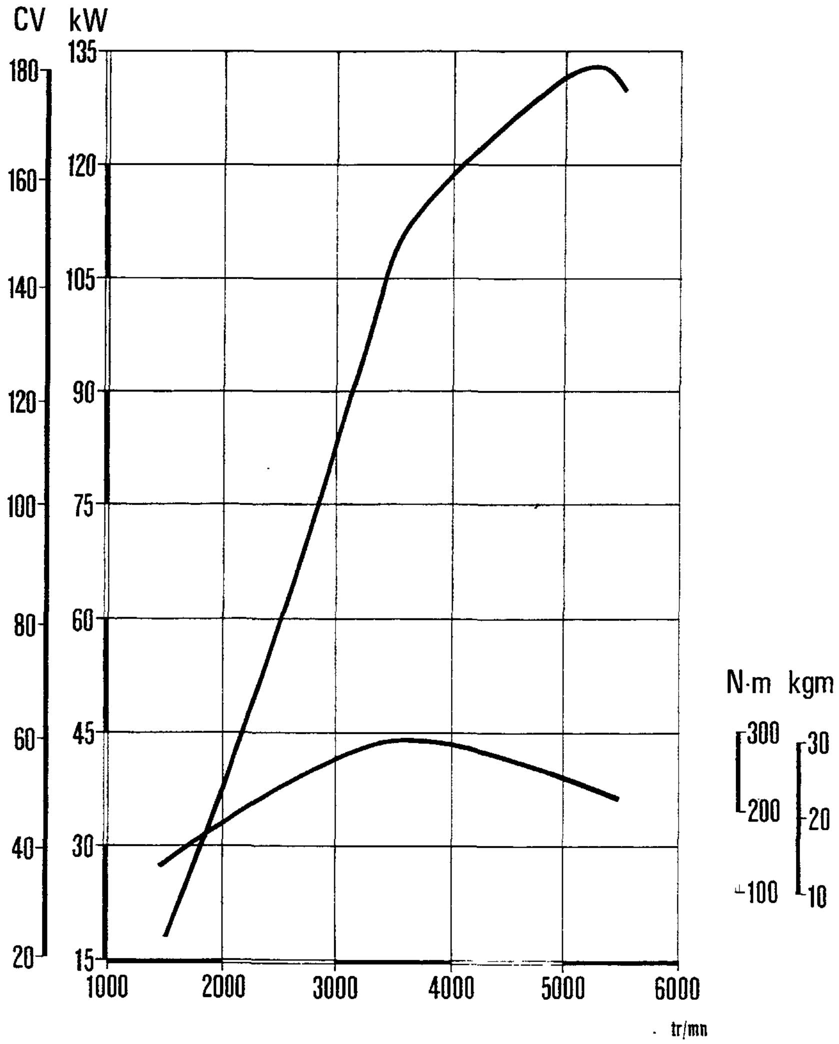
Characteristics of *Olio Fiat lubricants*

for cars and commercial vehicles

Name of product		Description International designation	Usage
VS Super stagionale	SAE 40	Low ash content detergent oil for petrol engines. Service API "SE". Exceeds European specification CCMC-G1	Temperature 0°C÷ >35°C
	SAE 30		Temperature 0°C÷ <35°C
	SAE 20 W		Minimum temperature −15°C÷ 0°C
VS Super multigrado	SAE 10 W/30	Low ash content detergent oil for petrol engines. Service API "SF". Exceeds European specification CCMC-G2	Temperature below −15°C÷30°C
	SAE 15 W/40		Temperature −15°C÷ >35°C
VS Turbo Syntesis SAE 15 W/40		Synthetic base detergent oil for petrol engines. Service API "SF". Exceeds European specification CCMC-G2	Temperature −15°C÷ >40°C
VS Diesel Supersta-gionale	SAE 40	Oil for Diesel engines. Service API "CD". Satisfies specifications MIL-L-2104 D and CCMC-D2	Temperature 0°C÷50°C
	SAE 30		Temperature −5°C÷30°C
	SAE 20 W		Temperature −15°C÷15°C
VS Diesel Supermul-tigrado	SAE 10 W/30	Oil for Diesel engines. Service API "CD". Satisfies standards MIL-L-2104 D and CCMC-PD1	Temperature below −15°C÷30°C
	SAE 15 W/40		Temperature −15°C÷ >40°C
VS Turbo D		Oil for Diesel engines. Service API "CD". Satisfies standards MIL-L-2104 D and CCMC-PD1	Temperature −15°C÷ >40°C
TUTELA ZC 80S		SAE 80/W oil. Satisfies standards MIL-L-2105 and API GL-4	Manual gearboxes and differentials
TUTELA ZC 90		SAE 80 W/90 non EP oil for manual gearboxes containing anti-wear additives	Non hypoid gearboxes and differential
TUTELA W 90/M DA		SAe 80 W/90 EP oil specially for normal and self-locking differentials. Satisfies standards MIL-L-2105 C and API GL5	Hypoid differentials Self-locking diffs. Steering boxes
TUTELA GI/A		"DEXRON II" type oil for automatic transmissions	Automatic gearboxes power assisted steering
TUTELA JOTA 1		Lithium soap based grease, consistency NLGI = 1	Greasing vehicle except for components particularly exposed to water requiring special greases
TUTELA MRM2		Lithium soap based water-repellant grease containing molybdenum disulphide, consistency NLGI = 2	Constant velocity joints
TUTELA MR3		Lithium soap based grease, consistency NLGI = 3	Wheel hub bearings, steering rods, various components
TUTELA DOT 3 TUTELA DOT 4		Fluid for hydraulic brakes, meeting standards USA FMVSS n. 116, SAE J 1703, ISO 4925. CUNA NC-956-01	Hydraulic brakes and hydraulically operated clutches
K 854		Lithium soap based grease, consistency NLGI = 000, containing molybdenum disulphide	Rack and pinion steering boxes
SP 349		Special castor oil and sodium soap based grease containint graphite and molybdenum disulphide, compatbile with brake fluid and brake circuit rubber seals	Load proportioning valve Load proportioning valve rod
Liquido Autofà DP1		Alcohol based detergent fluid	To be used undiluted or diluted for windscreen and headlamp washers
Liquido Paraflù[11] FIAT		Mono-ethylene glycol based anti-freeze for cooling system	Cooling circuits Percentage to be used 35% up to −25°C 50% up to −35°C
Diesel Mix		Additive with protective action for Diesel engines	To be mixed with diesel fuel (17 cc per 10 litres)

CHARACTERISTICS

		831 C5.000
Cycle		OTTO 4 stroke
Number of cylinders		4
Cylinder liner (bore)	mm	84
Stroke	mm	90
Capacity	cc	1995
Compression ratio		8 ± 0,1
Max power EEC	kW (CV)	133 (185)
	rpm	5300
Max torque EEC	daNm (kgm)	29,8 (31)
	rpm	3500



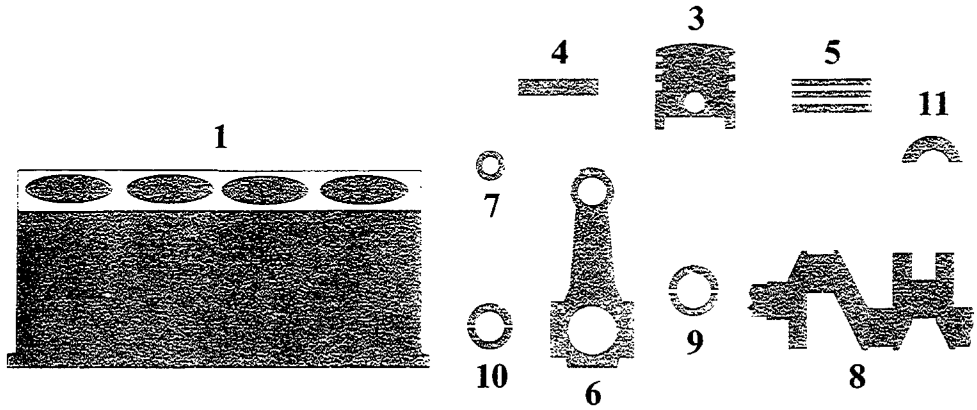
Engine power curves obtained by EEC method

The power curves illustrated can be obtained with the engine overhauled and run in, without a fan and with an exhaust silencer and air filter fitted at sea level.

Test bench cycles for overhauled engines

During the bench test for the overhauled engines it is not advisable to run the engines at maximum speed but to stick to the figures prescribed in the table; complete the running in of the actual engines in the vehicle.

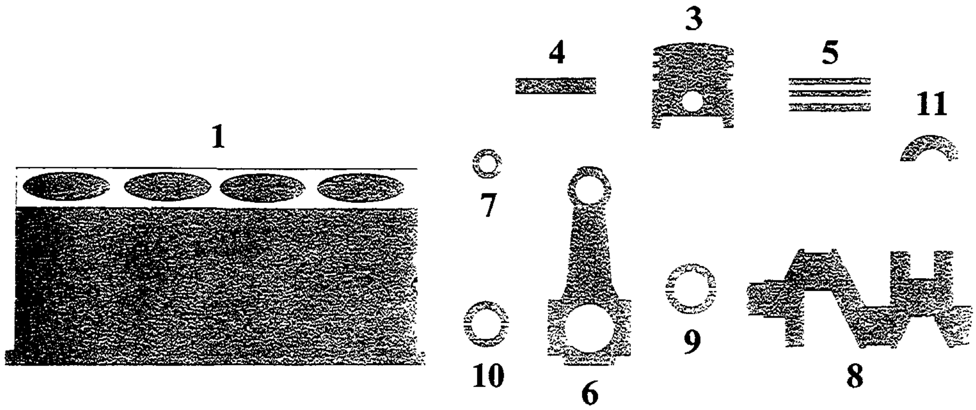
Test speed (rpm)	Time in minutes	Load on the brakes
800 ÷ 1000	10′	no load
1500	10′	no load
2000	10′	no load

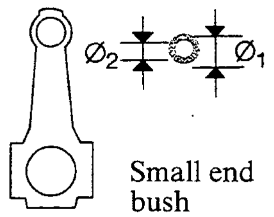
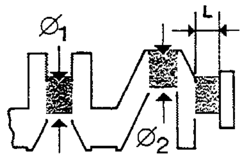
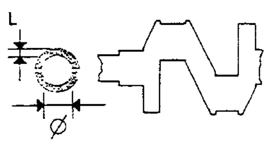


DESCRIPTION

			Values in mm
1	Main bearing supports	L	23,100 ÷ 23,200
		Ø A	56,717 ÷ 56,723
		Ø B	56,723 ÷ 56,729
		Ø C	56,729 ÷ 56,735
	Cylinder bore	Ø (0,010)	84,000 ÷ 84,050
3	Piston	Y	25
		Ø A	83,940 ÷ 83,950
		Ø C	83,960 ÷ 83,970
		Ø E	83,980 ÷ 83,990
		Ø LANCIA >	0,4
3	Difference in weight between pistons		±5 g
3-1	Piston-Cylinder bore		0,050 ÷ 0,070
3	Gudgeon pin housing	Ø 1	21,996 ÷ 21,999
		Ø 2	21,999 ÷ 22,002

DESCRIPTION			Values in mm
4	Gudgeon pin	Ø 1	21,991 ÷ 21,994
		Ø 2	21,994 ÷ 21,997
		Ø LANCIA>	0,2
4-3	Gudgeon pin - Housing		0,002 ÷ 0,008
3	Piston ring grooves	1	1,535 ÷ 1,555
		2	2,020 ÷ 2,040
		3	3,967 ÷ 3,987
5	Piston rings	L 1	1,478 ÷ 1,490
		L 2	1,987 ÷ 1,990
		L 3	3,925 ÷ 3,937
		Ø LANCIA>	0,4
5-3	Piston rings Piston ring grooves	1	0,045 ÷ 0,077
		2	0,030 ÷ 0,062
		3	0,030 ÷ 0,062
5-1	Opening at end of rings in cylinder bore	1	0,30 ÷ 0,50
		2	0,30 ÷ 0,50
		3	0,25 ÷ 0,40
6	Small end bush housing (Ø1) Big end bearing housing (Ø2)	Ø1	24,988 ÷ 25,021
		Ø2 1	53,904 ÷ 53,910
		Ø2 2	53,898 ÷ 53,904
		Ø2 3	53,892 ÷ 53,898



DESCRIPTION				Values in mm
7	 Small end bush	Ø1		25,065 ÷ 25,090
		Ø2	1	22,004 ÷ 22,007
			2	22,007 ÷ 22,010
4-7	Gudgeon pin / Small end bush			0,010 ÷ 0,016
7-6	Small end bush / Bush housing			0,044 ÷ 0,102
8	 Main journals	Ø1	A	52,998 ÷ 53,004
			B	52,992 ÷ 52,998
			C	52,986 ÷ 52,992
	Crank pins	Ø2	1	50,799 ÷ 50,805
			2	50,793 ÷ 50,799
			3	50,787 ÷ 50,793
			L	27,975 ÷ 28,025
9	 Crankshaft bearings	L	A	0,838 ÷ 1,844
			B	1,844 ÷ 1,850
			C	1,850 ÷ 1,856
		Ø LANCIA <		0,254 ÷ 0,508

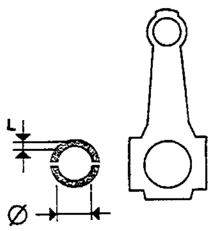
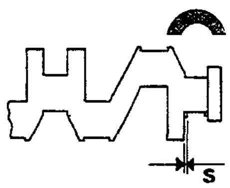
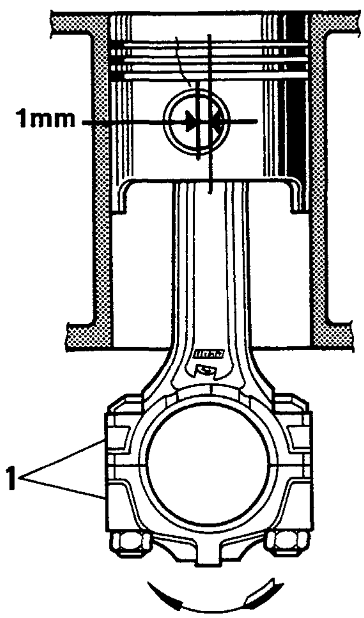
DESCRIPTION			Values in mm
9-8	Crankshaft bearings - Main journals		0,025÷0,049
10 	Big end bearings	L A	1,527÷1,533
		L B	1,533÷1,539
		L C	1,539÷1,545
		∅ LANCIA <	0,254÷0,508
10-8	Big end bearings - Main journals		0,033÷0,057
11 	Thrust washers	S	2,310÷2,360
		S LANCIA >	0,127
11-8	Crankshaft end float		0,055÷0,305

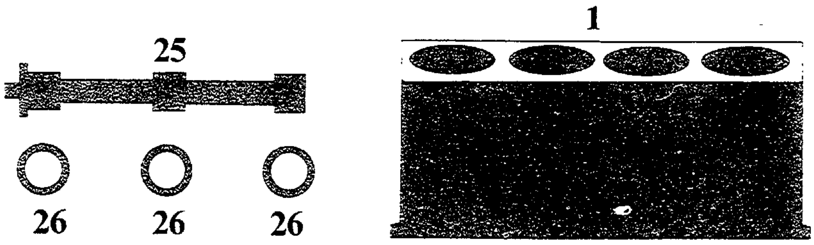
Diagram showing fitting of connecting rod-piston assembly and direction of rotation in engine

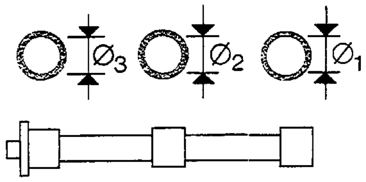
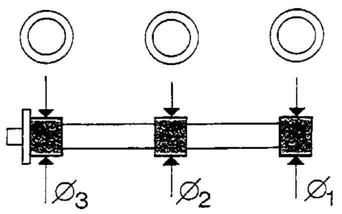


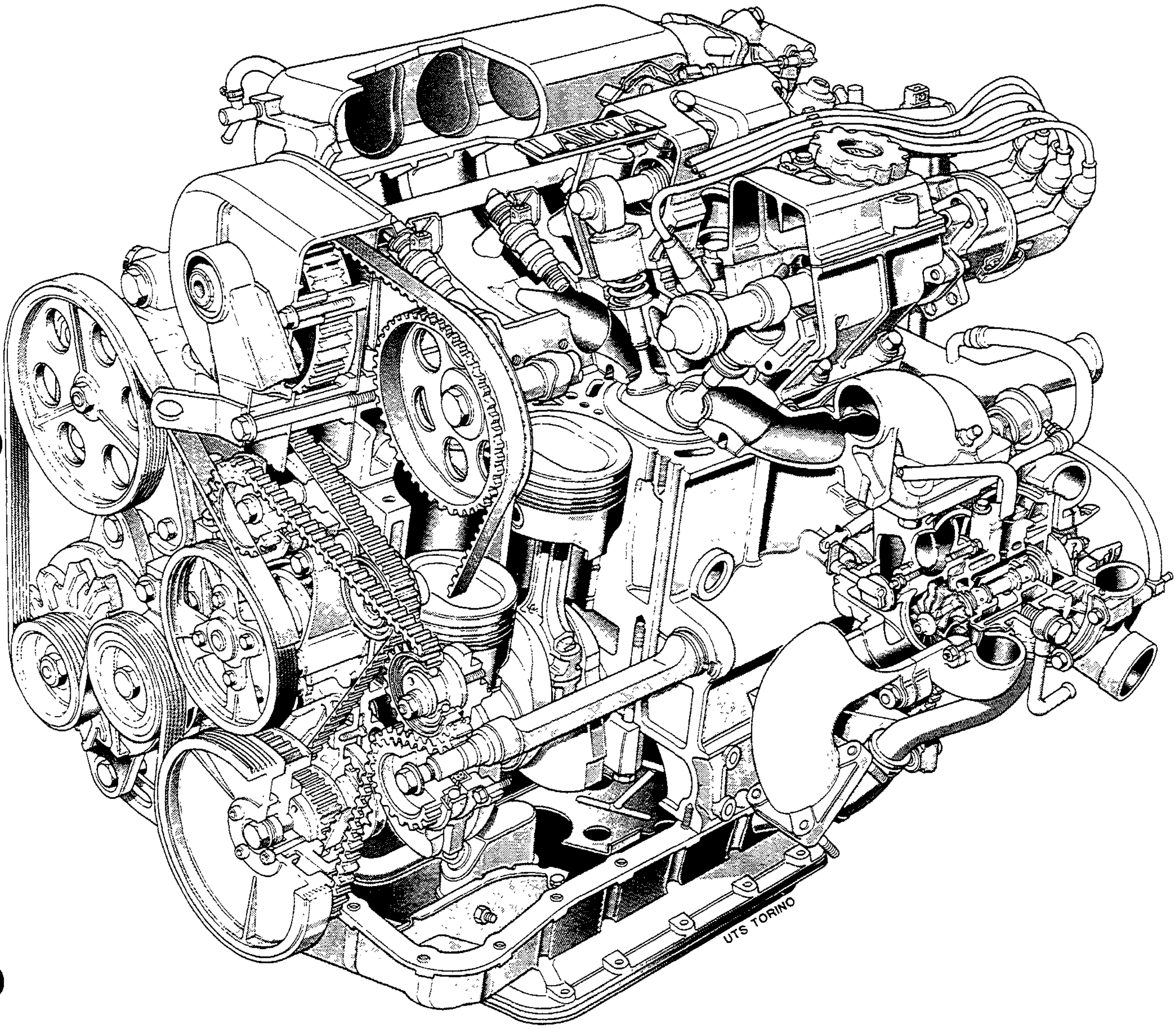
1 = Area where matching number of cylinder bore to which connecting rod belongs is stamped.

The arrow shows the direction of rotation of the engine as seen from the timing side.

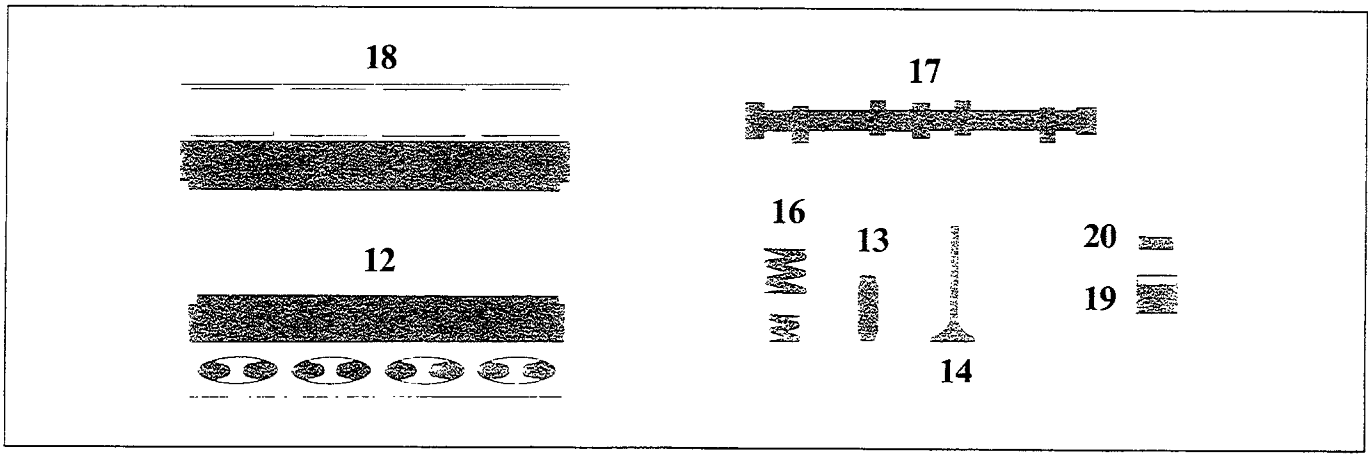
1mm = Gudgeon pin offset on the piston.

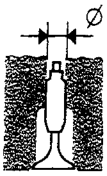
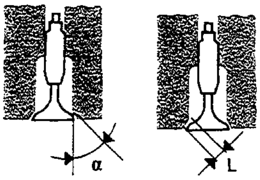
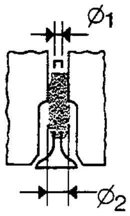
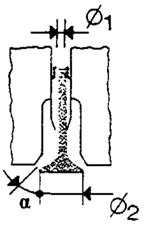


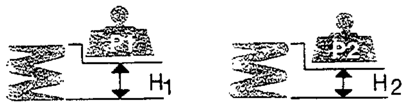
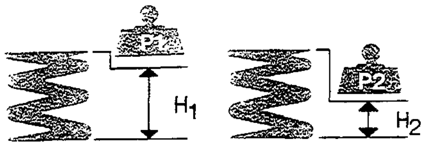
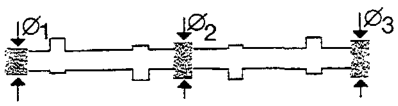
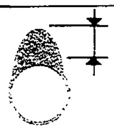
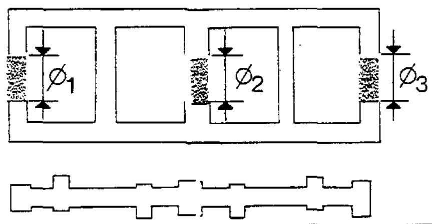
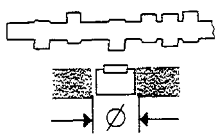
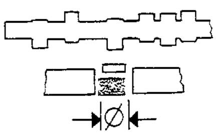
DESCRIPTION		Values in mm
25	Counter-balance shafts	n° 2
	Shafts driven	by toothed belt
26	 Ø1	36,920 ÷ 36,940
	Ø2	37,020 ÷ 37,040
	Bushes for counter-balance shafts in housing Ø3	38,020 ÷ 38,040
25	 Ø1	36,850 ÷ 36,870
	Ø2	36,950 ÷ 36,970
	Counter-balance shaft bearings Ø3	37,950 ÷ 37,970
26-1	Shaft bushes Cylinder block/crankcase seats	0,080 ÷ 0,140
25-26	Shaft bearings-Bushes	0.050 ÷ 0.090

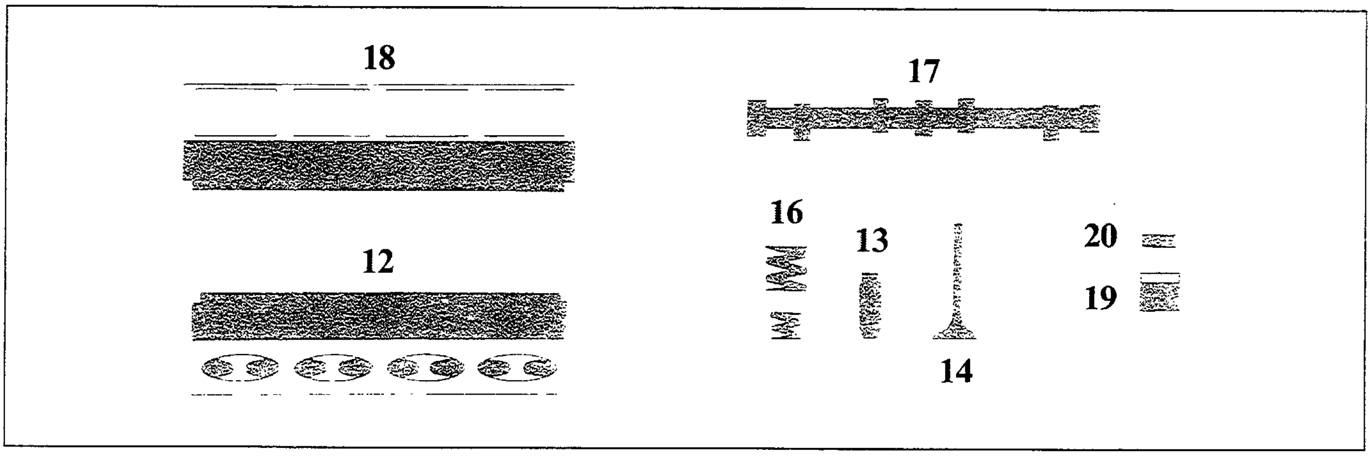


Partial cross section of engine



DESCRIPTION					Values in mm
12		Valve guide bore in cylinder head	Ø		13,950 ÷ 13,977
		Valve seats	α		45° ± 5′
					45° ± 5′
			L		~ 2
13		Valve guides	Ø1		8,022 ÷ 8,040
			Ø2		14,040 ÷ 14,058
					13,988 ÷ 14,016
			Ø2 LANCIA >		0,05-0,10-0,25
13-12	=–=	Valve guide Bore in cylinder head			0,063 ÷ 0,108
					0,021 ÷ 0,066
14		Valves		Ø1	7,974 ÷ 7,992
				Ø2	43,300 ÷ 43,700
				α	45° 30′ ± 5′
				Ø1	7,974 ÷ 7,992
				Ø2	35,850 ÷ 36,450
				α	45° 30′ ± 5′

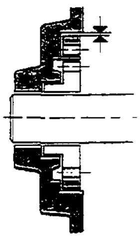
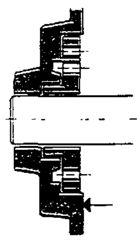
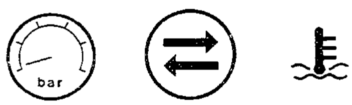
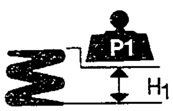
DESCRIPTION			Values in mm
14-13	Valves - Valve guides		0,030 ÷ 0,066
15	 Internal valve spring	P_1	14,13 ÷ 15,11 daN
		H_1	31
		P_2	26,39 ÷ 28,74 daN
		H_2	21,5
16	 External valve spring	P_1	36,68 ÷ 39,6 daN
		H_1	36
		P_2	55,91 ÷ 60,82 daN
		H_2	26,5
17	 Camshaft bearings	$Ø_1$	29,944 ÷ 29,960
		$Ø_2$	45,755 ÷ 45,771
		$Ø_3$	46,155 ÷ 46,171
	 Cam lift	(intake)	9,1
		(exhaust)	8,6
18	Camshaft bearings in camshaft housing 	$Ø_1$	30,009 ÷ 30,034
		$Ø_2$	45,800 ÷ 45,825
		$Ø_3$	46,200 ÷ 46,225
	 Tappet housings	Ø	37,000 ÷ 37,025
17-18	Camshaft bearings Camshaft housing supports	$Ø_1$	0,049 ÷ 0,090
		$Ø_2$-$Ø_3$	0,029 ÷ 0,070
19	 Tappet	Ø	36,975 ÷ 36,995



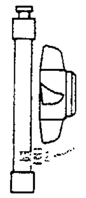
DESCRIPTION			Values in mm
19-18	Tappet Housing in cylinder head		0,005 ÷ 0,050
20	Shim	S (0,05)	3,25 ÷ 4,70
17-20	clearance for timing check		0,80
			0,80
	operational clearance		0,35 ÷ 0,04
			0,40 ÷ 0,04

TIMING ANGLES

inlet	opens BTDC	8°
	closes ABDC	42°
exhaust	opens BTDC	42°
	closes ABDC	1°

	Values in mm
Oil pump	lobe gears
Pump operated	through crankshaft
Oil pressure relief valve	incorporated in crankshaft front cover
 between pump casing and driven gear	$0{,}080 \div 0{,}186$
 between upper side of gears and pump cover	$0{,}025 \div 0{,}056$
Full flow filter	cartridge
Insufficient oil pressure sender unit	electrical
 Operating pressure at a temperature of 100 °C	$3{,}4 \div 4{,}9$ bar ($3{,}5 \div 5$ kg/cm^2)
 Oil pressure relief valve spring — P_1	$11{,}1 \div 12{,}1$ daN
H_1	35,3

COOLING SYSTEM

Cooling circuit		coolant circulation via centrifugal pump, radiator and electric fan operated by thermostatic switch
Water pump operated		through belt
 Thermal switch to engage fan	(engage)	86° ÷ 94°C
	stop	81° ÷ 89°C
Engine cooling water thermostat	opens	81° ÷ 85°C
	max opening	97°C
	valve travel	⩾7,5 mm
Fitting clearance between impeller blades and pump casing		0,6 ÷ 1 mm
Pressure for checking radiator water tightness		0,98 bar
Pressure for checking calibration of spring loaded overflow valve for expansion tank		0,98 bar

FUEL SYSTEM

Pump	electrical
Flow rate	~ 120 litres/h

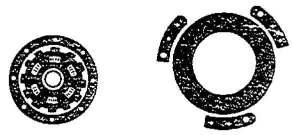
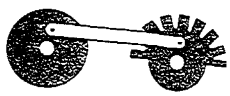
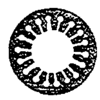
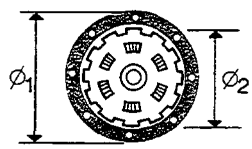
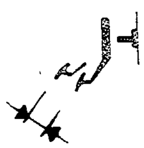
SUPERCHARGING (with turbo-charger activated by exhaust gases with waste-gate valve)

Turbo-charger type:	Garrett T3
Maximum supercharging pressure	1 bar

Checking engine idle speed and carbon monoxide emissions

Engine idle speed	rpm	800 ÷ 900	(750 ÷ 800) (*)
CO idle emissions	(%)	1,5 ± 0,5	

(*) With VAE valve disconnected

	Values in mm
Type	 dry, single plate
 Operating mechanism	 diaphragm spring
Spring loading	600 daN
 Lining ∅1	230
∅2	142
 Distance between pedal fully depressed and in rest position	155±5
Clutch release	mechanical

GEARBOX

Synchronizers	spring ring (Porsche type)	–
	baulk ring type	1 3 5 / 2 4
Gears	straight toothed	R
	helical toothed	1 3 5 / 2 4
Gear ratios	1	3,500
	2	2,235
	3	1,518
	4	1,132
	5	0,928
	R	3,583
Crown wheel and pinion reduction		56/18 (3,11)
Ratio at the wheels	1	10,888
	2	6,953
	3	4,722
	4	3,521
	5	2,887
	R	11,146

CENTRE DIFFERENTIAL

Differential internal casing bearing	conical roller bearing
Adjustment of bearing pre-loading	by shims
Thickness of shims LANCIA (0,05) mm	1,00 ÷ 1,60
Interference to obtain exact bearing pre-loading mm	bearings not pre-loaded = 0,12 bearings pre-loaded (350 daN) = 0,08

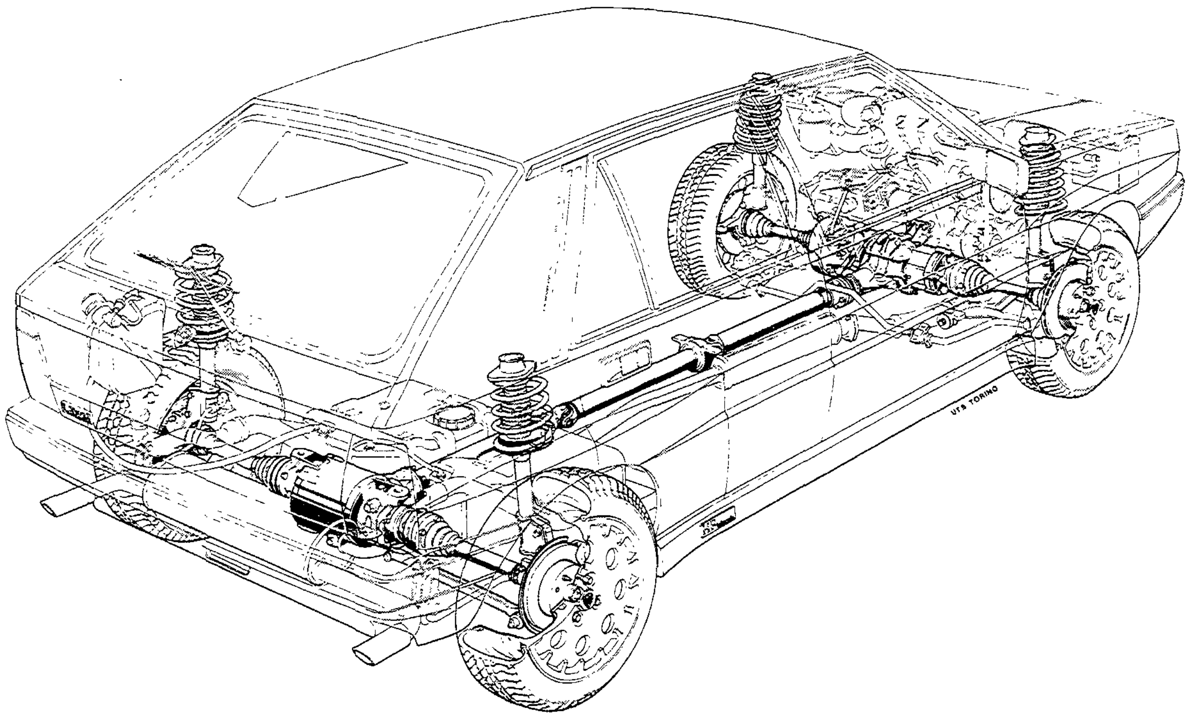
FRONT DIFFERENTIAL

Clearance between satellite and planet gears mm	≤0,10
Adjustment of clearance between planet and satellite gears	cannot be adjusted

IDLER GEAR

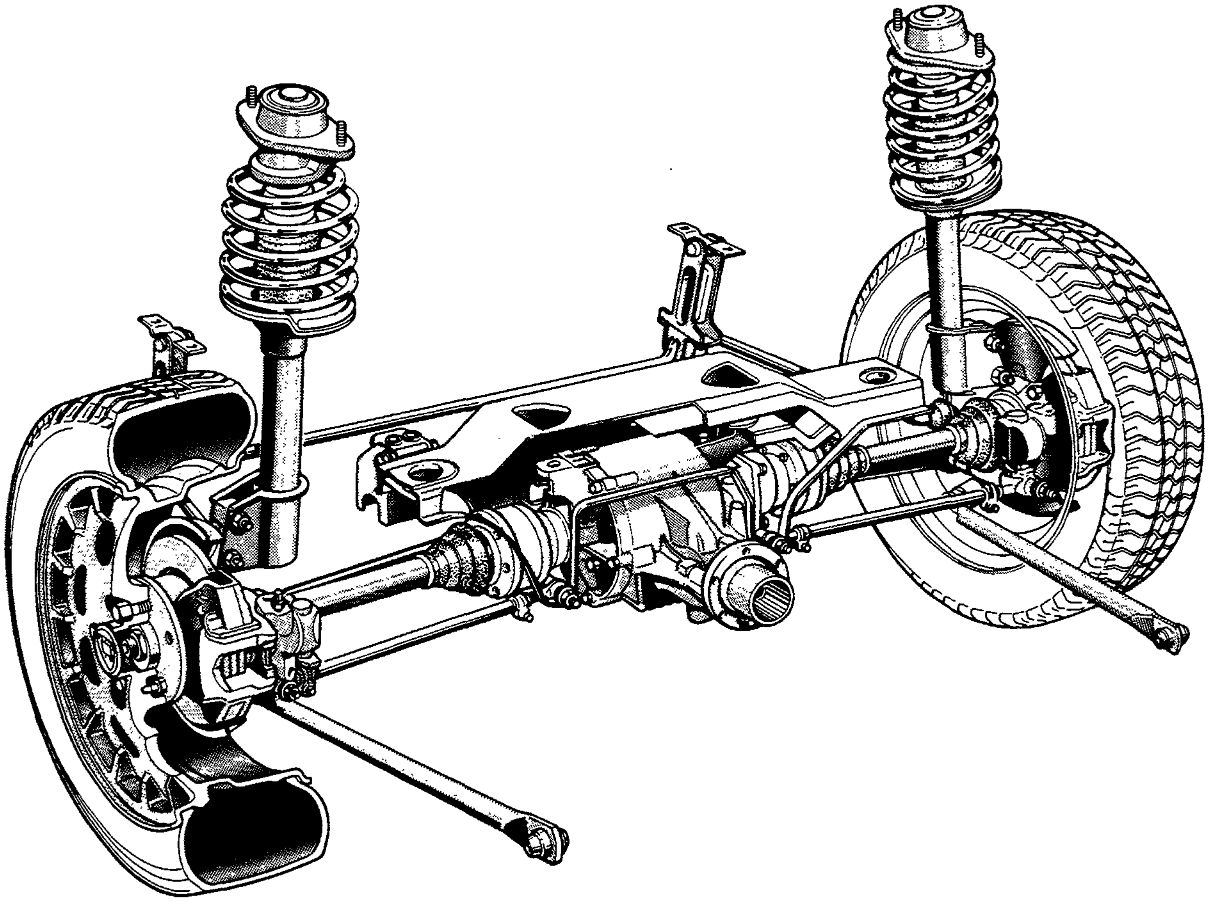
Idler gear ratio	43/19 (2,263)
Crown wheel bearing rolling torque daNm	0,18 ÷ 0,20
Adjustment of crown wheel bearings	by shims
Thickness of shims LANCIA (0,025) mm	1,475 ÷ 2,90
Adjustment of pinion position	by shims
Thickness of shims LANCIA (0,02) mm	2,55 ÷ 3,35
Pinion bearing rolling torque daNm	0,08 ÷ 0,12
Clearance between crown wheel and pinion mm	0,08 ÷ 0,15
Adjustment of clearance between crown wheel and pinion	by shims
Thickness of shims LANCIA (0,025) mm	1,475 ÷ 2,90

Type		in three sections
Supports		2 { 1 on the centre section with a ball bearing on the support 1 on the rear section with a ball bearing inside the dust cover for the support
Sliding constant velocity joints		1, on the front section
Universal joints		2, on the centre section
Splined joint		1, on the rear section
Spider radial clearance	mm	0,01 ÷ 0,04
Thickness of shims for adjusting spider radial clearance	mm	1,50-1,53-1,56-1,59-1,62
Spline backlash	mm	0,175 ÷ 0,350

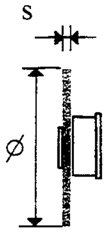
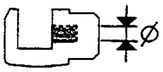
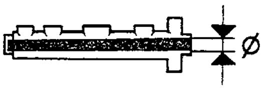
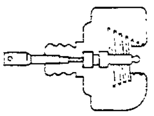
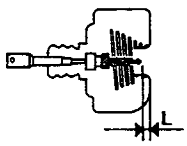


Crown wheel and pinion reduction	19/43 (2,263)
Ratio at the wheels	10,304
	6,580
	4,468
	3,332
	2,732
	10,548
Bevel pinion bearings rolling torque daNm	0,08 ÷ 0,12
Adjustment of bevel pinion position	by shims
Thickness of shims LANCIA (mm 0,05)	2,55 ÷ 3,35
Differential internal casing bearing	conical roller bearing
Crown wheel bearings rolling torque daNm	0,18 ÷ 0,20
Clearance between crown wheel and pinion mm	0,08 ÷ 0,15

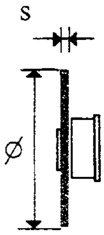
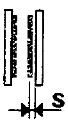
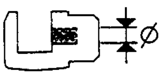
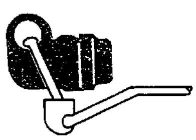
Adjustment of clearance between crown wheel and pinion	by shims
Adjustment of bearing pre-loading	by shims
LANCIA (0,05) mm Thickness of differential internal casing bearing pre-loading adjustment shims	0,18 ÷ 0,20



FRONT BRAKES

			Values in mm
	Disc	Ø	284
		s	21,90÷22,10
		s (machining)	20,9
		s < allowed	20,2
	Brake pads	s < allowed	1,5
	Caliper	Ø	54
	Master cylinder (pump)	Ø	22,225 (7/8″)
	Servo brake		ISOVAC 7″
	Distance of hydraulic piston push rod from master cylinder support plate	L	0÷0,3

REAR BRAKES

	Disc	Ø	227
		s	10,70÷10,90
		s (machining)	9,70
		s < allowed	9
	Brake pads	s < allowed	1,5
	Caliper	Ø	34
	Load proportioning valve		acting on the rear wheels
	Ratio (reduction)		0,36

——— Hydraulic circuit for left front and right rear brakes
- - - - Hydraulic circuit for right front and left rear brakes

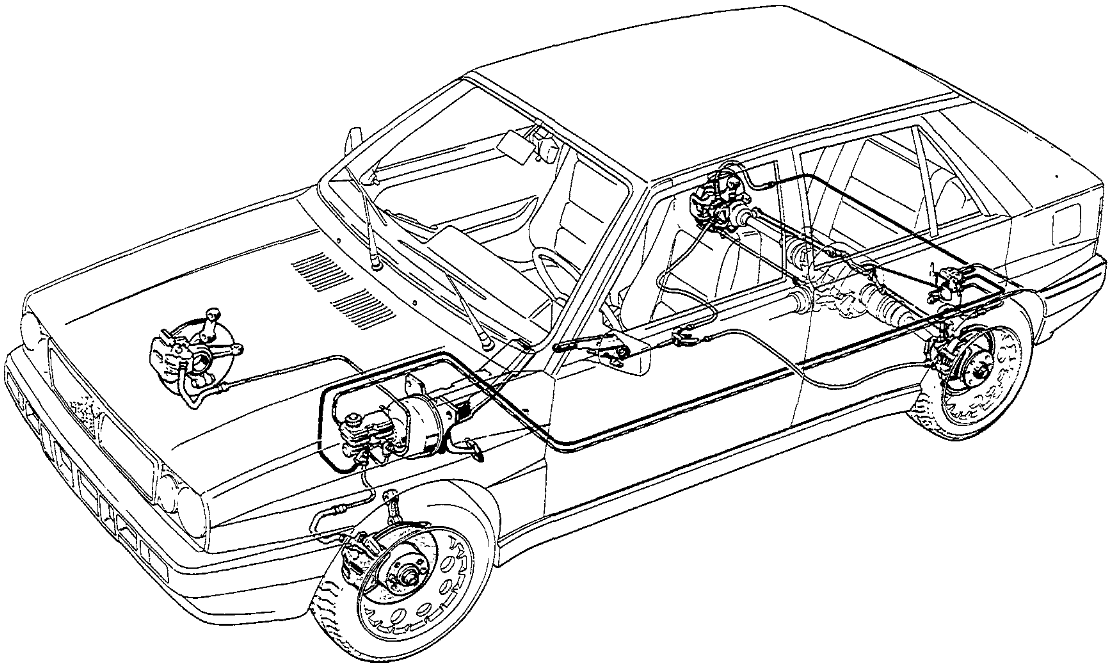
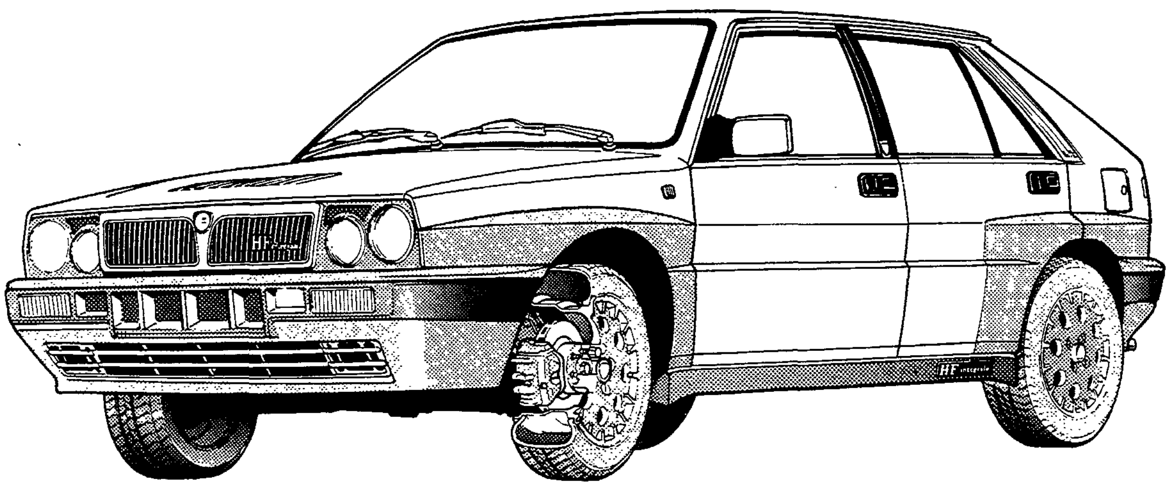
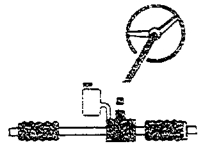
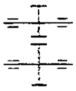
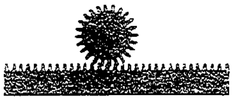
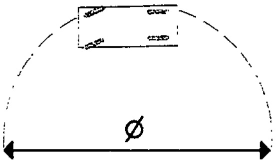
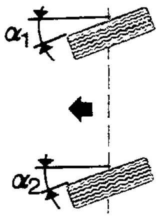
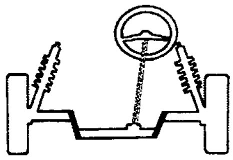
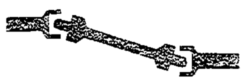


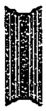
Diagram showing hydraulic braking system and mechanically operated handbrake



3/4 front view with cross section of left front wheel

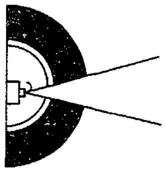
Type		 rack and pinion power assisted
 Ratio	 no. of turns lock to lock	2,835
	 rack travel	134 mm
	Minimum turning circle	10,4 m
 Steering angle	outer wheel α_1	30° 46′
	inner wheel α_2	35° 4′
	Steering column	 with 2 universal joints

WHEELS

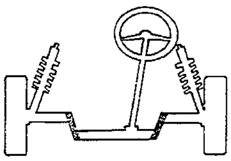
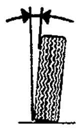
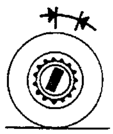
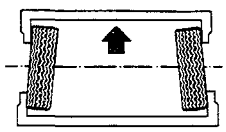
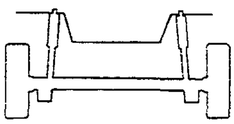
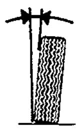
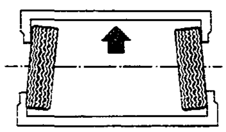
  Tyre		type	195/55 - VR - 15″
	front	average load	2 bar
	front	full load	2,2 bar
	rear	average load	2 bar
	rear	full load	2,2 bar
 Rim		type	in light alloy 6 J x 15″

NOTE Spare wheel with 4Jx15 rim″AH2-40 and tyre 115/70 R 15″ XTL
Speed limit: 80 kph (50 mph). Inflation pressure: 4,2 bar

WHEEL GEOMETRY



unladen vehicle (*)

 Front suspension	camber (**)		−40′ ± 30′
	caster (**)		3° 10′ ± 30′
	toe in		−2 ÷ 1,5 mm (•)
 Rear suspension	camber		−55′ ± 30′
	toe in		3 ÷ 5 mm (•)

(*) With tyres inflated to correct pressure and vehicle in running order.
(**) Angles cannot be adjusted (•) Measured on the 360 mm diameter

Front suspension independent, Mac Pherson type with lower track control arm and damper comprising double acting, gas, telescopic, hydraulic shock absorber and offset coil spring.
Stabilizer bar

Coil spring

Diameter of wire mm	13,1 ± 0,05
Number of turns	6,39
Direction of coil	clockwise
Height of spring released mm	442,3
Height of spring under a load of 412,8 daN mm	198
The springs are subdivided into two categories, identifiable by a mark: yellow (1) for those under a load of: 412,8 daN	> 198
green (1) for those under a load of: 412,8 daN	≤ 198

(1) Springs of the same category must be fitted.

Shock absorbers

Type: telescopic, hydraulic, double acting	Way-Assauto
Travel mm	158
Maximum extension mm	521,5

Rear suspension independent, Mac Pherson type with lower longitudinal arm and damper comprising double acting hydraulic telescopic shock absorber and offset coil spring.
Stabilizer bar

Coil spring

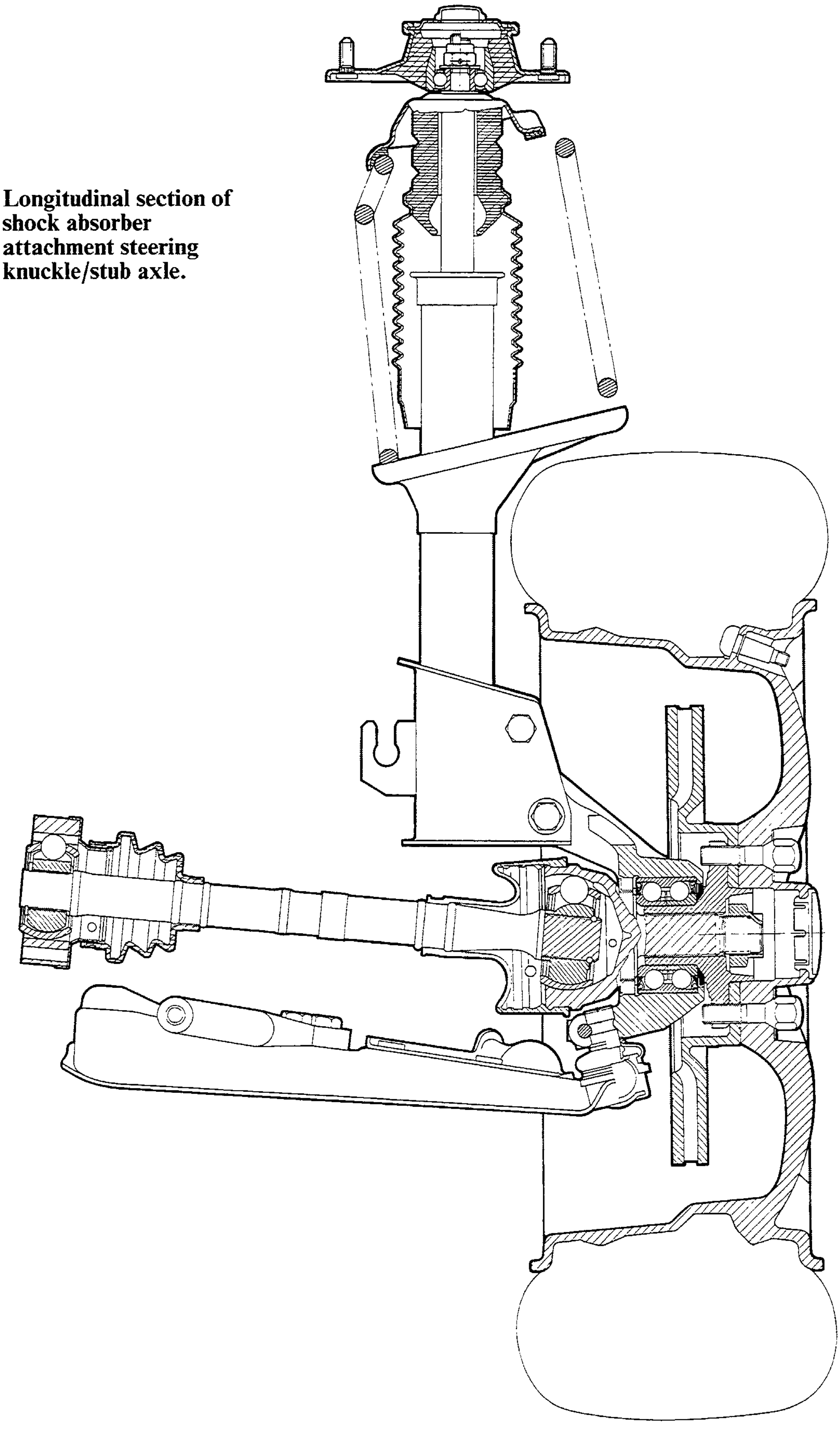
Diameter of wire		mm	11,9 ± 0,05
Number of turns			3,86
Direction of coil			clockwise
Height of spring released		mm	316
Height of spring under a load of 412,8 daN		mm	173
The springs are subdivided into two categories identifiable by a mark:			
yellow (1) for those under a load of: 268 daN	having a height of mm		> 173
green (1) for those under a load of: 268 daN	having a height of mm		⩽ 173

(1) Springs of the same category must be fitted.

Shock absorbers

Type: telescopic, hydraulic, double acting		Way-Assauto
Travel	mm	190
Maximum extension	mm	590

Longitudinal section of shock absorber attachment steering knuckle/stub axle.



SUMMARY

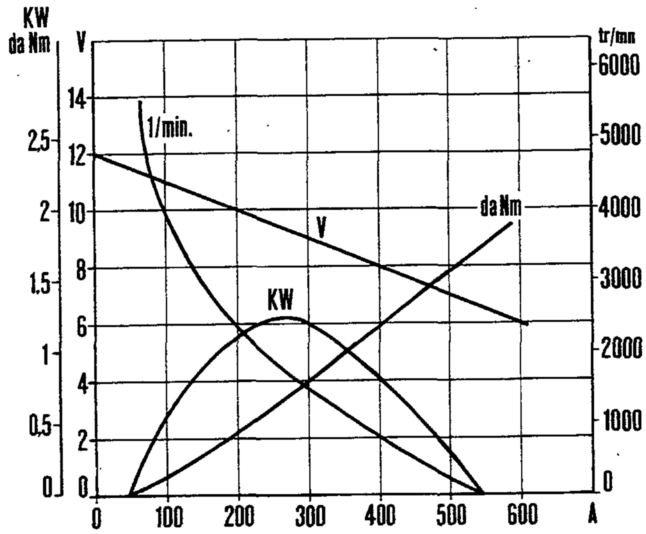
STARTER MOTOR	M. Marelli E95 - 1,1 kW - 12 V
ALTERNATOR	M. Marelli AA125R - 14 V - 65 A
VOLTAGE REGULATOR	M. Marelli RTT 119 AC
BATTERY	12 V - 45 Ah - 225 A
IGNITION SYSTEM	Weber electronic injection/ignition
DISTRIBUTOR	DT 543 AX
IGNITION COIL	M. Marelli BAE 504 CK
IGNITION COIL WITH CONTROL UNIT	M. Marelli AEI 600 A
SPARK PLUGS	Fiat V45 LSR M. MARELLI F8 LCR Bosch WR6 DC Champion RN7 YC

Motor: type				M. Marelli E 95 - 1,1 kW - 12 V
Voltage			V	12
Nominal power			kW	1,1
Rotation, pinion side				clockwise
No. of poles				4
Field coil				in series-parallel
Engagement				free wheel
Operation				soleonid
End float of armature shaft			mm	0,15÷0,45
Data for bench test	Operating test (*):			
		current	A	270
		speed	rpm	1750
		voltage	V	9,2
		torque developed	daNm	0,65
	Engagement test (*):			
		current	A	530÷570
		voltage	V	6,6
		torque developed	daNm	≥1,6
	Free running test (*):			
		current	A	35÷45
		voltage	V	11,6÷11,7
		speed	rpm	8500÷9500
Relay	Winding resistance (*)	pull in	Ω	0,33÷0,37
		hold in	Ω	1,13÷1,27
Lubrication	Internal splines and shaft bushes			VS+ SAE 10 W
	Sleeve and intermediate disc			TUTELA MR3

(*) Data obtained at an ambient temperture of 20 °C.

NOTE *When overhauling it is not necessary to undercut the insulator between the commutator bars.*

STARTER MOTOR - TYPICAL CURVES



M. Marelli E 95 - 1,1 kW - 12 V

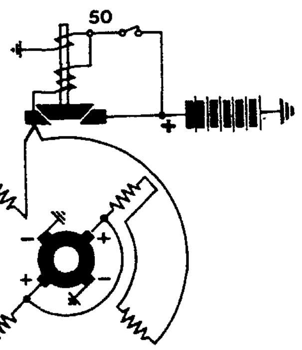


Diagram showing starter motor
M. Marelli E 95 - 1,1 kW - 12 V

ALTERNATOR

Make and type		M. Marelli AA 125R - 14 V - 65 A
Nominal voltage	V	12
Maximum current	A	65
Cut in speed when warm	rpm	1050 ÷ 1150
Current delivery on battery at 7000 rpm at operating temperature	A	⩾63
Field winding resistance between the slip rings (*)	Ω	2,6 ÷ 2,8
Direction of rotation (seen from control side)		clockwise
Engine/alternator ratio		1 : 2
Diode rectifiers		bridge

(*) Data obtained at an ambient temperature of 25 °C.

VOLTAGE REGULATOR

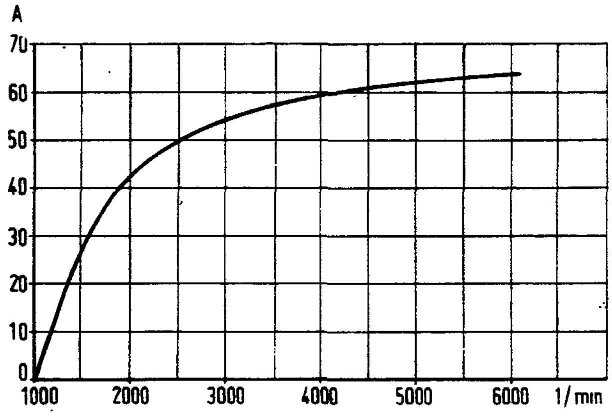
Type		Built in electronic RTT 119 AC
Alternator test speed	rpm	7000
Thermal stabilization current	A	30 ÷ 35
Test current	A	32 ÷ 33
Regulation voltage (*)	V	14 ÷ 14,3

(*) Data obtained at an ambient temperature of 20 °C.

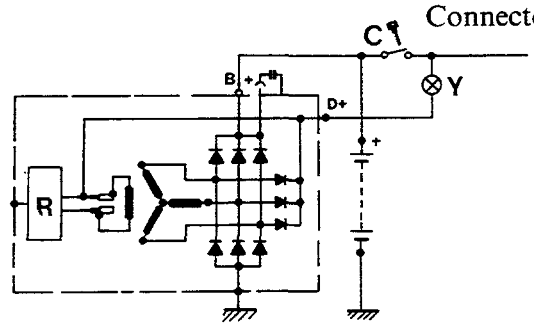
BATTERY

Nominal voltage	V	12
Capacity (20 hour discharge)	Ah	45

ALTERNATOR – TYPICAL OUTPUT CURVES
(obtained at operating temperature at a constant voltage of 13.5 V with bedded in brushes)

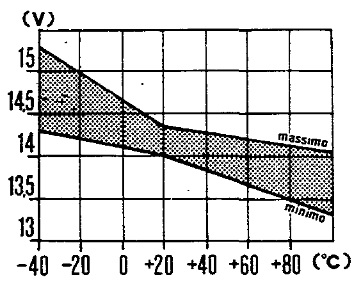


M. Marelli AA 125 R - 14 V - 65 A



Wiring diagram for Marelli alternator

C = Ignition switch with key
Y = Battery recharging warning light (12V - 3/5W)
R = Electronic voltage regulator



Typical voltage regulator curve
FIMM RTT 119 AC

ELECTRONIC IGNITION POWER MODULE

Make and type		M. Marelli AEI 600A
Firing order		1 - 3 - 4 - 2

DISTRIBUTOR

Make		M. Marelli
Type		DT 453 AX
Built in rotor arm resistance	Ω	1000
Electro-magnetic impulse generator coil winding resistance at 20 °C	Ω	758 ÷ 872

COIL

Make		M. Marelli
Type		BAE 504 CK
Ohmic resistance of primary winding at 20 °C	Ω	0,415 ÷ 0,495
Ohmic resistance of secondary winding at 20 °C	Ω	4320 ÷ 5280

TOP DEAD CENTRE AND RPM SENSOR

Make and type		M. Marelli SEN 8 D
Sensor winding resistance	Ω	612 ÷ 748
Distance (gap) between sensor and crankshaft pulley	mm	0,4 ÷ 1

ENGINE ADVANCE

Minimum from 800 to 850 rpm at 0.43 bar (0.60 bar)*	15° ± 2°
Maximum at 4000 rpm at 0.43 bar (0.299 bar)*	40° ± 2°

SPARK PLUGS

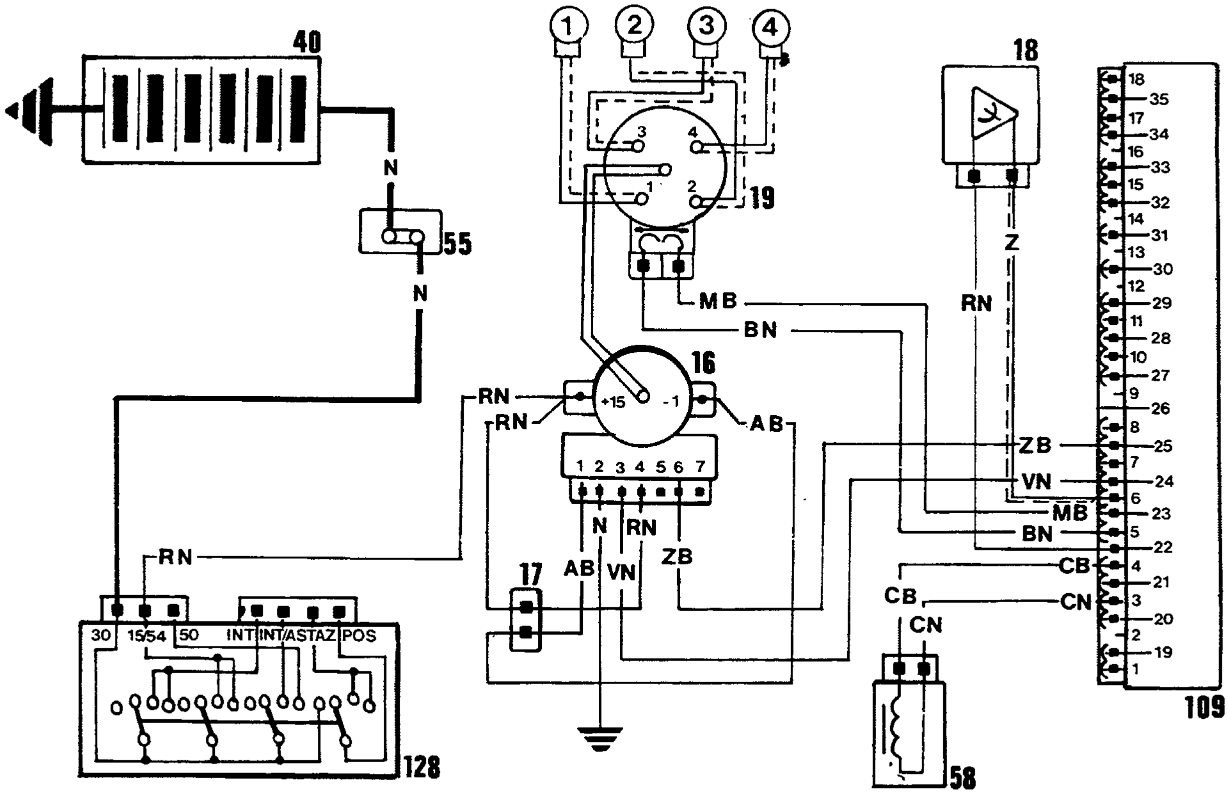
Make and type	Fiat V 45 LSR	Bosch WR 6 DC	Champion RN7YC	M. Marelli F8LCR
Thread	M 14 × 1,25			
Electrode gap	0,6 ÷ 0,7 mm			

I.A.W. ELECTRONIC INJECTION SYSTEM COMPONENTS

DESCRIPTION	QUANTITY	TYPE
ELECTRONIC CONTROL UNIT	1	WH4E.03/OAO-F6
BUTTERFLY CASING	1	52 CFL 15
INJECTOR	4	IW 025/01
ENGINE IDLE AUTOMATIC ADJUSTMENT SOLENOID VALVE	1	VAE 02
PRESSURE REGULATOR	1	RP1/3 bar
AIR TEMPERATURE SENSOR	1	ATS 04
WATER TEMPERATURE SENSOR	1	WTS 05
ABSOLUTE PRESSURE SENSOR	1	APS 02/01
BUTTERFLY VALVE POSITION SENSOR	1	PF 09/01
FUEL FILTER	1	FI 02/01
ELECTRIC FUEL PUMP	1	PI 022/2

DIAGRAM SHOWING INJECTION/IGNITION CONTROL UNIT CONNECTIONS (APPLICABLE TO ELECTRONIC IGNITION ONLY)

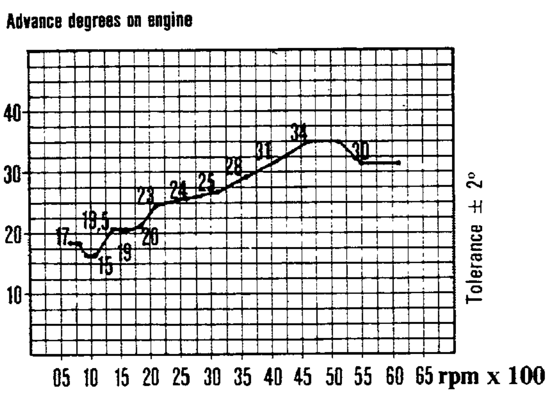
The identification numbers for the components are the same as those in the wiring diagrams



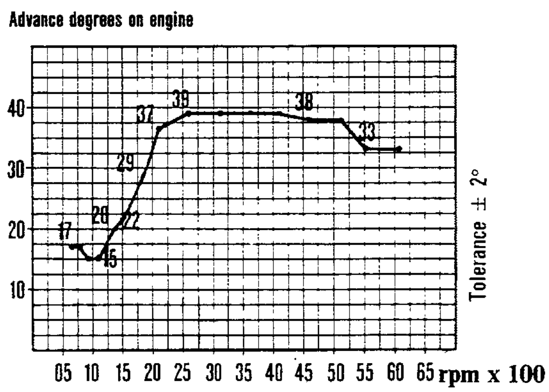
16. Ignition coil with power module
17. Connection
18. Anti-detonation sensor
19. H.T. distributor with built in timing sensor
40. Battery
55. Connector
58. Rpm and TDC sensor
109. Injection/ignition electronic control unit
128. Ignition switch

DIAGRAMS SHOWING IGNITION ADVANCE FOR EIGHT DIFFERENT VACUUM VALUES IN THE INLET MANIFOLD

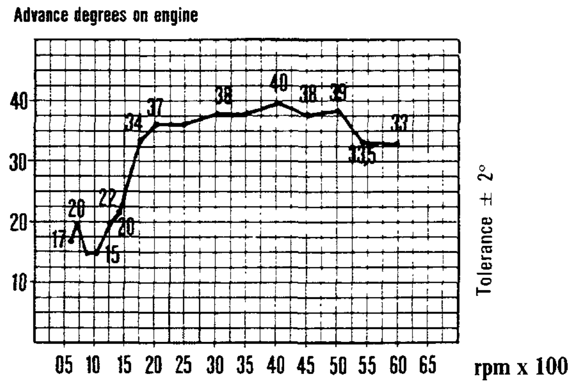
at an absolute pressure of 0.18 bar (135 mmHg)



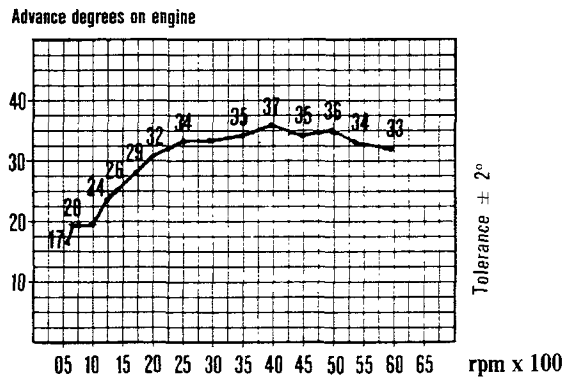
at an absolute pressure of 0.299 bar (225 mmHg)



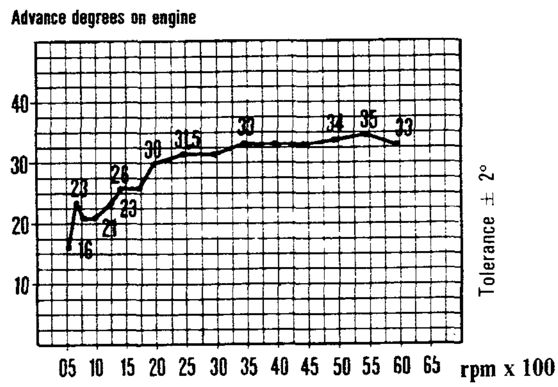
at an absolute pressure of 0.43 bar (321 mmHg)



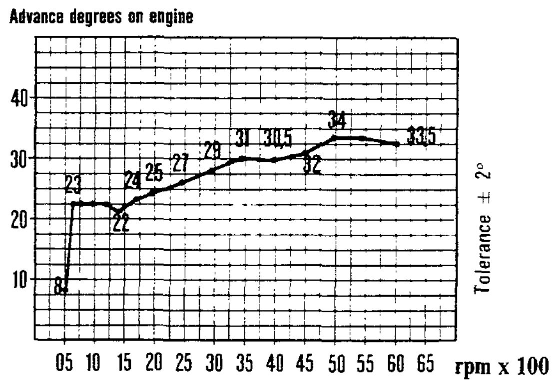
at an absolute pressure of 0.54 bar (405 mmHg)



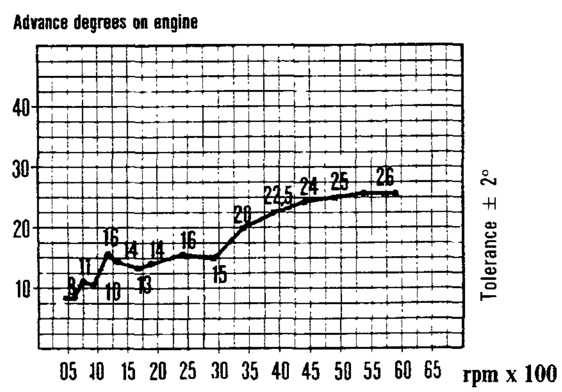
at an absolute pressure of 0.70 bar (525 mmHg)



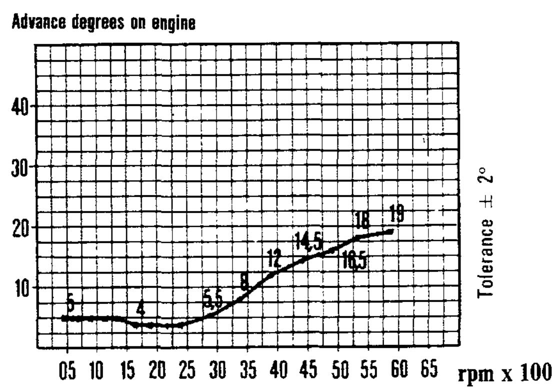
at an absolute pressure of 0.92 bar (690 mmHg)



at an absolute pressure of 1,38 bar (1035 mmHg)



at an absolute pressure of 1,80 bar (1350 mmHg)



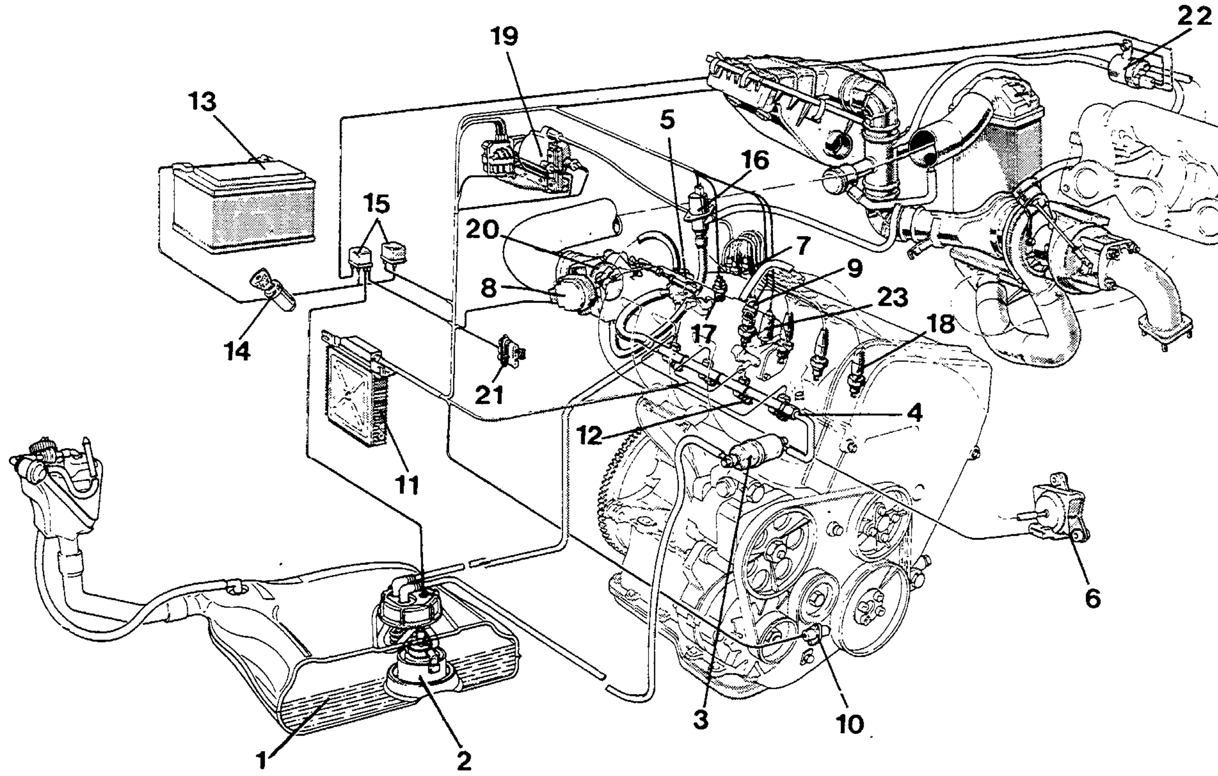


Diagram showing I.A.W. injection/ignition system

1. Fuel tank
2. Electric fuel pump
3. Fuel filter
4. Fuel manifold
5. Fuel pressure regulator
6. Intake air absolute pressure sensor
7. HT distributor with injection timing sensor
8. Butterfly valve position sensor
9. Intake air temperature sensor
10. TDC and rpm sensor
11. Electronic control unit
12. Injector
13. Battery
14. Ignition switch
15. Injection/ignition control relays
16. Additional air solenoid valve for engine idle automatic adjustment
17. Coolant temperature sensor
18. Spark plugs
19. Ignition unit
20. Butterfly valve
21. Diagnostic socket
22. Over-boost solenoid valve
23. Detonation sensor

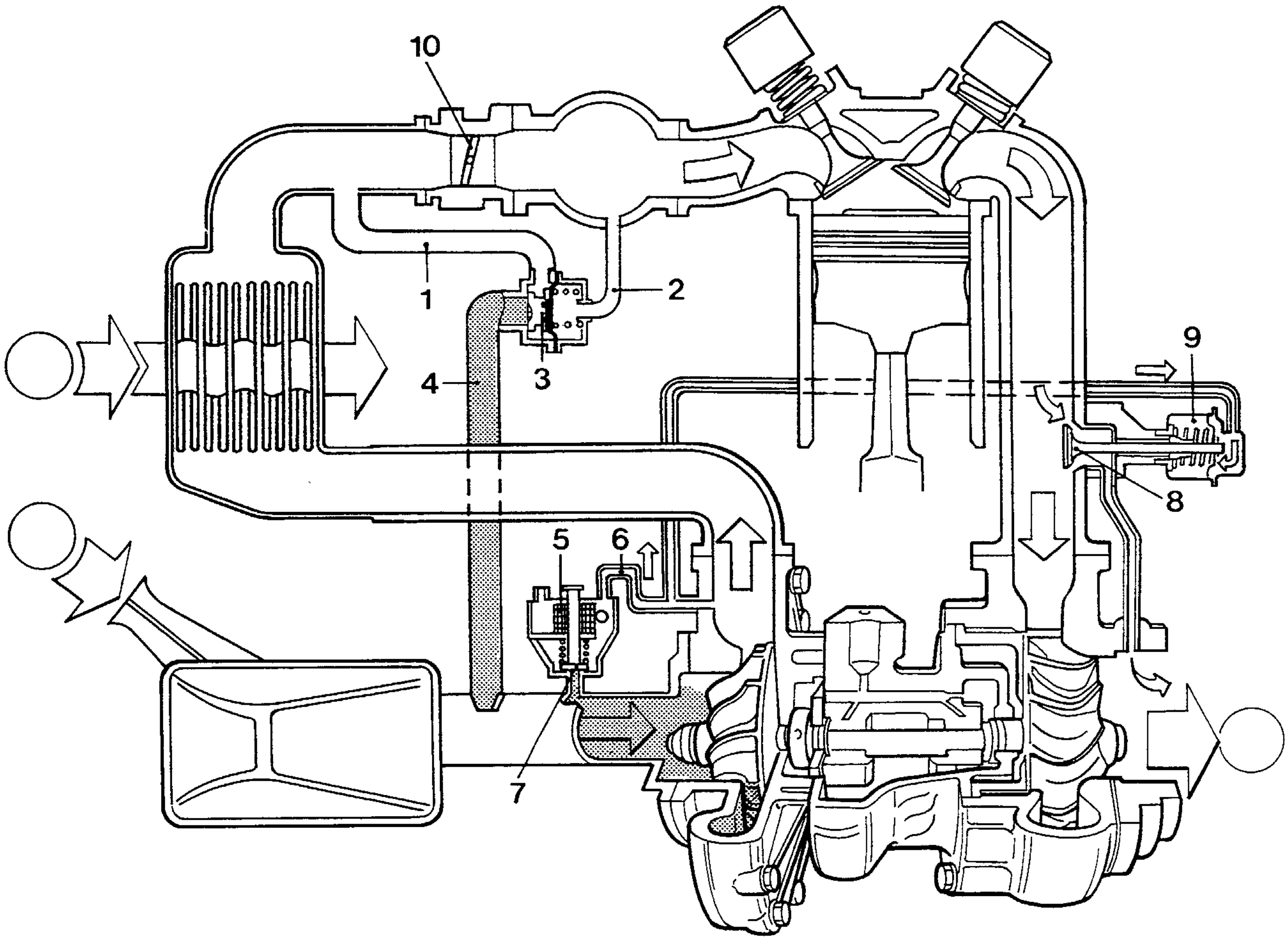


Diagram showing over-boost device

1. Duct connecting by-pass valve and duct downstream of butterfly
2. Duct connecting by-pass valve and duct upstream of butterfly
3. By-pass valve
4. Duct connecting by-pass valve and duct downstream of compressor
5. Winding for over-boost control valve
6. Duct connecting over-boost valve and inlet duct downstream of compressor
7. Over-boost control valve
8. Waste-gate valve
9. Actuator
10. Butterfly valve

Operation

The over-boost device allows the turbocharger to operate at a higher supercharging pressure than normal. The following two conditions must be realized to obtain over-boost pressure:

1) fully depress the accelerator pedal;
2) the engine must be operating at a speed between 2400 and maximum revs

When the turbocharger is working normally the adjustment of the maximum supply pressure takes place by means of the opening of the waste-gate valve (8). In actual fact the pressure on the actuator (9) diaphragm is the supercharging pressure i.e. the pressure upstream of the compressor. This pressure exerts a force on the actuator diaphragm; when this pressure overcomes the opposing force of the spring the waste-gate valve (8) opens

And part of the exhaust gases are diverted from the turbine, depriving it of some power.
When the winding (5) is magnetized by the injection/ignition control unit, the valve (7) places the supercharging pressure for the duct (6) in contact with the inlet duct downstream of the compressor discharging the pressure at the actuator (9) diaphragm: this reduction in force at the actuator diaphragm causes the waste-gate valve (8) to partly close as a result of which a greater amount of gases supply the turbine increasing its speed and consequently that of the compressor thereby also increasing the supercharging pressure.

Mechanical by-pass valve

The aim of this valve is to reduce and cancel the "gust of air" each time the accelerator pedal is released hurriedly when the engine is being supercharged.
When the butterfly valve (10) closes, the vacuum from the duct (2) connected to the inlet manifold opens the valve (3); this opening allows the pressure downstream of the butterfly (closed) to be discharged downstream of the compressor and cancel the pressure waves which cause noisy operation (gusts of air).