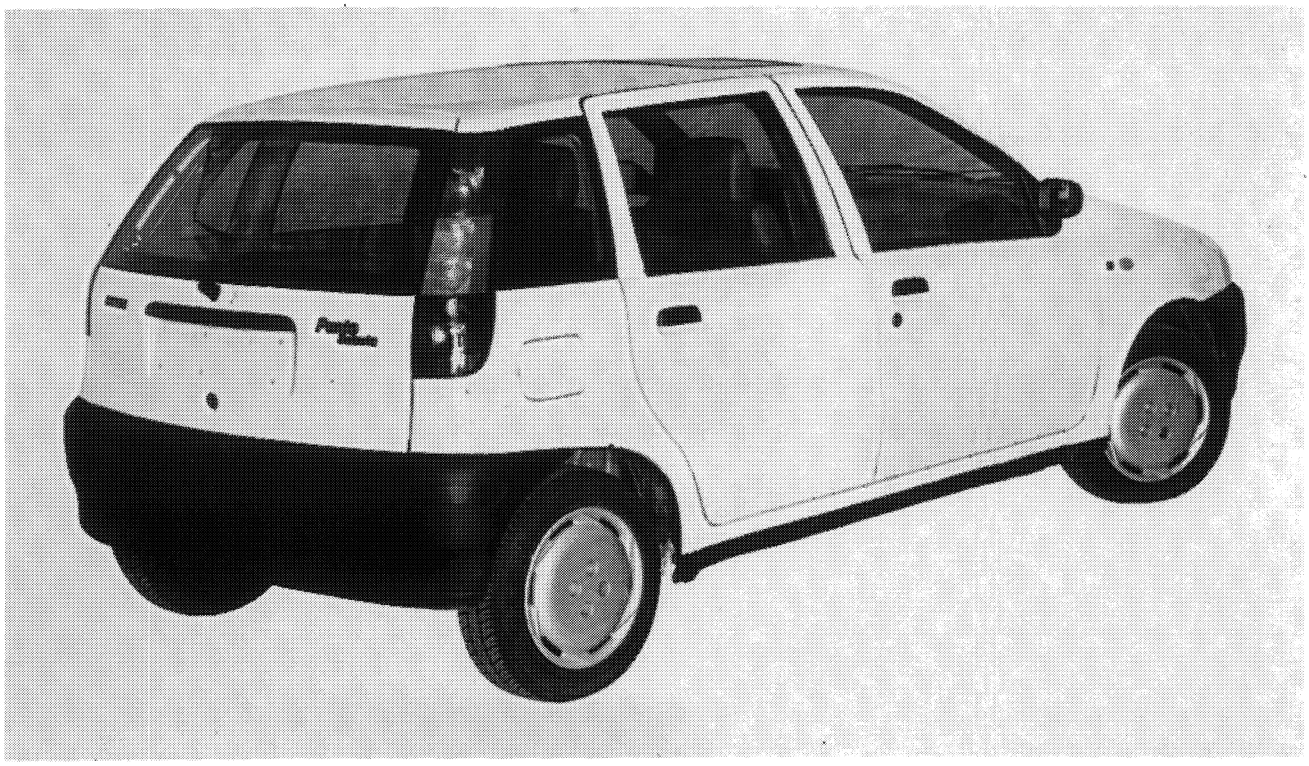
P3M01CA01

3/4 front view of vehicle



P3M001CA2

3/4 rear view of vehicle

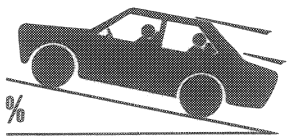
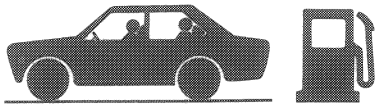
IDENTIFICATION DATA	CHASSIS	ENGINE	VERSION	N° doors	GEARBOX
1242 SPI	ZFA 176.000	176 B1.000	176 AP 13P	3	
			176 AP 15P	5	

ENGINE	1242 SPI
GEARBOX	

WEIGHTS (in kg)

	3 P	950
	5 P	965
+ 450 = 100	**3 P**	1400
Kerb weight	**3 P**	1415
		1000

ENGINE	1242 SPI
GEARBOX	

Speed kph (average load)  Top speed permissible fully laden after running in		150
Max climable grad. fully laden  Maximum climable gradient		35
ECE average fuel consumption figures (litres/100 km) 	Urban cycle (A)	7,5
	Constant speed 90 kph (B)	5,5
	Constant speed 120 kph (C)	7,4
	Av. consump. (CCMC proposal) $\frac{A + B + C}{3}$	6,8

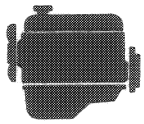
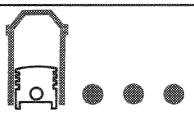
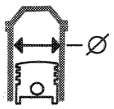
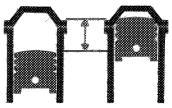
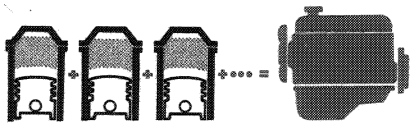
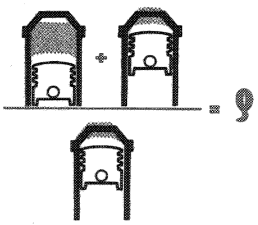
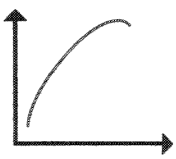
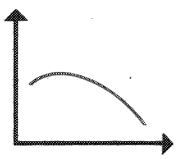
Capacities

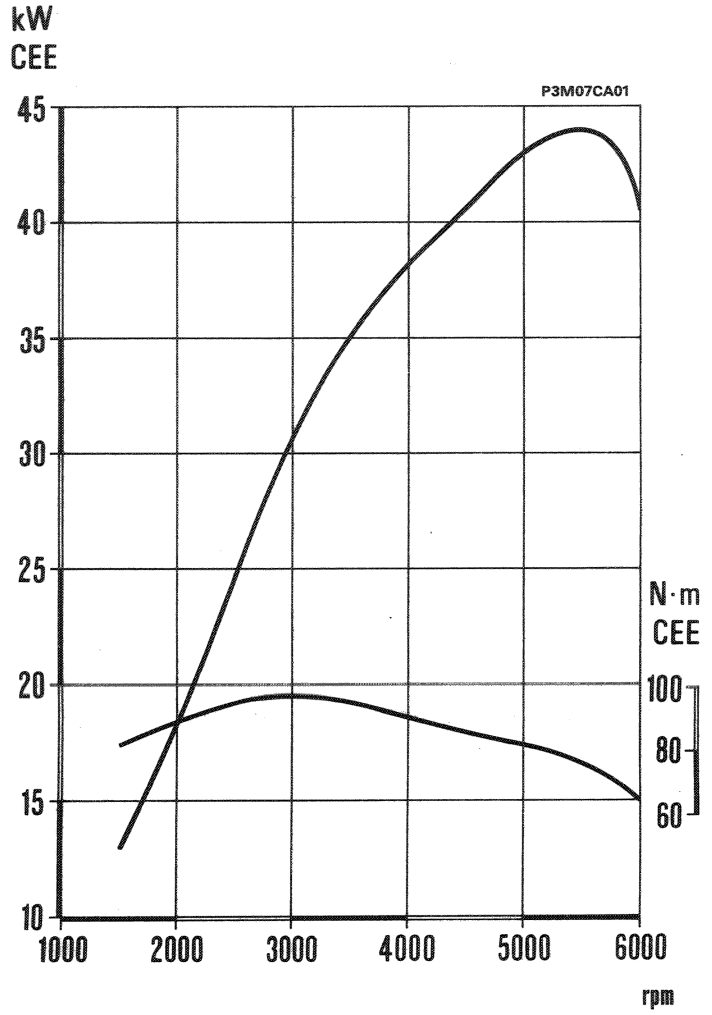
00.0

Capacities	Unit	Quantity dm³(l)	Quantity (kg)
Petrol ⩾ O.R. 95 (●)		47	–
50% + (▲)	Total capacity of cooling system	4,6	–
Petrol engines: SELENIA (SAE 15 W/40)	Total capacity	3,85	3,5
Diesel engines SELENIA Turbo Diesel (SAE 15 W/40)	Partial capacity (periodic replacement)	3,74 3,3*	3,4 3*
a = TUTELA ZC 80S	a	–	-
b = TUTELA CVT	b	2,8 1,9■	–
a = TUTELA GI/A	a	–	0,65
b = K 854	b	–	0,126
c = TUTELA MRM2	c	–	0,080
TUTELA TOP 4 (270°C)	Total capacity	0,4	–
+ AREXONS	☼ 3% ❄ ~ - 10°C 50% ❄ ~ - 20°C 100%	2,5 (7 wh/ Impwshr)	–

(▲) Distilled water
(●) Unleaded petrol only must be used
* Engine sump only
■ Periodic replacement

Name of product	Description International designation	Usage
SELENIA SAE 15 W/40	Semi-synthetic multigrade engine oil. Exceeds specifications API SG, CCMC-G4 and UNI 20153	Temperature - 15°C ÷ 40°C
VS MAX SAE 15 W/40	Mineral based multigrade engine oil. Exceeds specifications API SG, CCMC-G4 and UNI 20153	Temperature - 15°C ÷ 40°C
SELENIA Turbo Diesel SAE 15 W/40	Semisynthetic, multigrade engine oil. Exceeds standards API CD, CCMC-PD2, UNI 20153	Temperature - 15°C ÷ 40°C
VS MAX Diesel SAE 15 W/40	Multigrade mineral based engine oil. Exceeds standards API CD, CCMC and UNI 20153	Temperature - 15°C ÷ 40°C
TUTELA ZC 80S	SAE 80W EP oil. Satisfies standards MIL-L-2105 and API GL4	Manual gearboxes and differentials
TUTELA ZC 90	Non EP SAE 80 W/90 oil, for manual gearboxes, containing anti-wear additives.	Gearboxes and non hypoid differentials
TUTELA W 90/M DA	Special SAE 80 W/90 ep oil for normal and self-locking differentials. Satisfies standards MIL–L–2105 D and API GL5	Hypoid differentials Self-locking differentials. Steering boxes
TUTELA GI/A	"DEXRON II" type oil for automatic transmissions	Automatic gearboxes. Power assisted steering
TUTELA CVT Universal	Oil for continuous variation automatic transmissions.	Continuous variation automatic transmissions
TUTELA JOTA 1	Lithium soap based grease, consistency NLGI = 1	Greasing the vehicle except for components particularly exposed to water requiring special greases
TUTELA MRM2	Water-repellant, lithium soap based grease containing molybdenum disulphide, consistency NLGI = 2	Constant velocity joints
TUTELA MR3	Lithium soap based grease, consistency NLGI= 3	Wheel hub bearings, s/rod, various comps
TUTELA PLUS 3 (240 °C)	Synthetic fluid, F.M.V.S.S. n° 116 DOT 3 ISO 4925, CUNA NC 956-01	Hyd. brakes & hyd. op. clutches
TUTELA TOP 4 (270 °C)	Synthetic fluid, F.M.V.S.S. n° 116 DOT 4 ISO 4925, CUNA NC 956-01	Hyd. brakes & hyd. op. clutches
K 854	Lithium soap based grease, consistency NLGI = 000, containing molybdenum disulphide	Rack and pinion steering boxes
SP 349	Special grease compatible with brake fluid	Load proportioning valve Load proportioning valve rod bush
Arexons DP1	Mix. of alcohol, H2O & surf. act. agents CUNA NC 956-11	To be used neat or diluted in windscreen washer systems
Paraflu[11]	Mono-ethylene glycol based anti-freeze for cooling system, CUNA NC 596 - 16	Cooling circuits. Percentage to be used 50% up to - 35°C
Diesel Mix Arexons	Additive for diesel fuel with protective action for diesel engines	To be mixed with diesel fuel (25 cc per 10 litres)

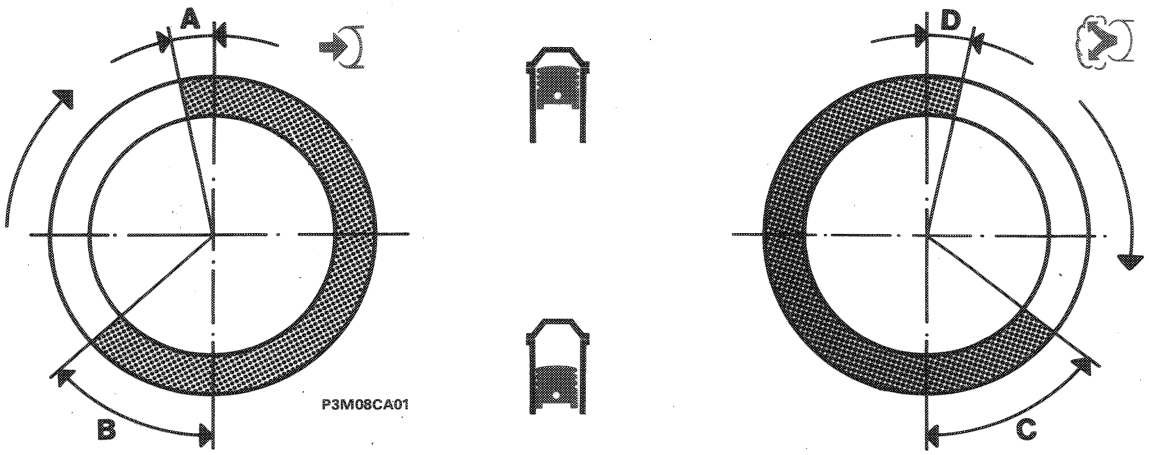
CHARACTERISTICS			1242 SPI
	Cycle		OTTO 4 stroke
	Timing		single overhead cam
	Type		Weber-Marelli I.A.W. integrated electronic injection/ignition
	Number of cylinders		4 in line
	Cylinder liner (bore)	mm	70,8
	Stroke	mm	78,9
	Capacity	cc	1242
	Compression ratio		9,6
	Max power	kW (CEE) (CV)(CEE)	44 (60)
		rpm	5500
	Max torque	daNm (CEE) (kgm)(CEE)	9,8 (10)
		rpm	3000



Typical power curves obtained by EEC method

The power and torque curves illustrated can be obtained with the engine overhauled and run in (50 hours of operation) without a fan, with a silencer and air filter fitted at sea level.

TIMING DIAGRAMS



1242 SPI

Timing angles

A	Inlet	opens before TDC	7°
B		closes after BDC	37°
C	Exhaust	opens before BDC	37°
D		closes after TDC	7°

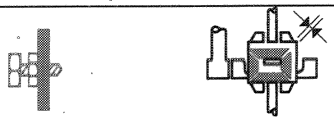
ELECTRONIC INJECTION/IGNITION SYSTEM COMPONENTS

Electronic control unit	I.A.W. 6F.SN
Butterfly casing (with fuel pressure regulator incorporated)	32 MM 17
Absolute pressure sensor	PRT 03/02
Butterfly valve position sensor	Bosch 0.280.122.005
Air temperature sensor	ATS 05
Injector	IWM 523
Coolant temperature sensor	WTS 05
Twin relay supplying electric pump and injection/ignition control unit	DRS 240 103/00
Electric fuel pump	MSS 070/01
Lambda sensor	B.258.562.081
Fuel filter	FI-03

		1242 SPI
Gears		P R N D L
Ratios at the gearbox	SHORT (LOW)	2,503
	LONG (HIGH)	0,497
OPENING	Ratio between the value of the short gear and the long gear	5,036

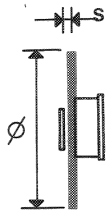
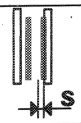
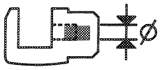
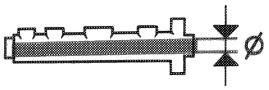
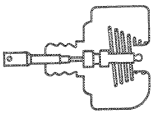
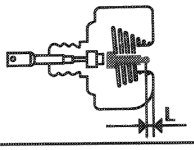
DIFFERENTIAL - REDUCTION GEARS UNIT

Ratio crown wheel and pinion reduction		4,647
Reduction gears unit ratio	Forward speeds	1,276
	Reverse	1,262
Ratio at the wheels	SHORT (LOW)	14,840 (Forward speeds) 14,674 (Reverse)
	LONG (HIGH)	2,945

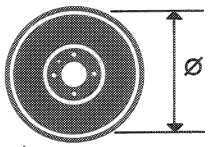
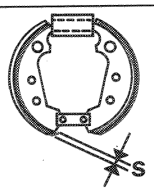
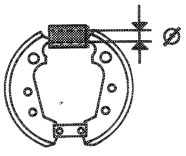
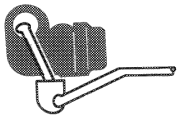
Differential internal casing bearings	roller bearings
 Adjusting differential unit fitting clearance	 by shims
 mm Thickness of shims	0,2
Differential unit fitting clearance mm	⩽0,2
 Adjusting clearance btwn planet & sat. gears	 by shims
 mm Thickness of shims	1,00 - 1,05 - 1,10
Adjusting pulley alignment	 by shims
 mm Thickness of shims	0,1 - 0,2 - 0,3 - 0,4 - 0,5 - 0,6
Main pulley shaft end float adjustment	 by shims
 mm Thickness of shims	1,35 - 1,43 - 1,51 - 1,59 - 1,67 - 1,75 - 1,83

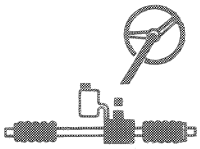
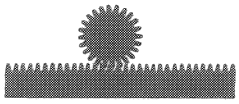
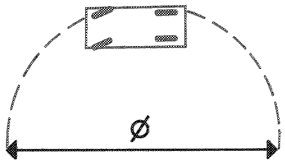
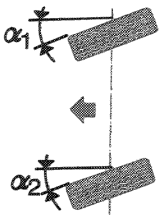
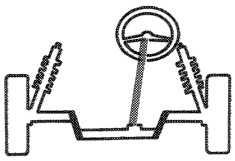
AUTOMATIC GEARBOX-DIFFERENTIAL

Gearbox	continuous variation with metal belt and electro-magnetic clutch
Selector lever positions: **P** = Park **R** = Reverse **N** = Neutral **D** = Drive **L** = Low	 The vehicle is mechanically locked bu the engine can be started up Reversing lights on. It can even be selected with the vehicle moving forwards without any risk because the engagement is inhibited; the engine cannot be started up The engine can be started up The vehicle is moving forwards with automatic operation between the short ratio (low) and long ratio (high); the engine cannot be started up The vehicle is always moving forwards with automatic operation mainly in short ratios, with optimum engine braking efficiency and the possibility of sporty driving uphill and downhill; the engine cannot be started up
Variation of ratios at the gearbox	Automatic, ensured by the hydraulic unit (depending on the positio of the selector lever, the position of the accelerator pedal, the engine rotation speed and the transmission ratio)
Operation of cam inside gearbox (Kick-down)	Mechanical, through cable
Gearbox/differential oil type: Quantity of oil: - first filling - periodic replacement	TUTELA CVT UNIVERSAL 2,8 litres 1,9 litres
Towing the vehicle The vehicle can be towed with the gear lever in "N" for a distance of up to	 25 km
Maximum permissible towing speed	Less than 30 kph
For distances of more than 25 km, speeds above 30 kph or when the gearbox is faulty	The vehicle must be towed with the front wheels raised off the ground, because with the engine switched off the rotating parts of the gearbox are not lubricated
Push starting the vehicle or with trailer	This is not possible because the pressure of the oil required to engage the servo mechanisms is produced by the oil pump housed inside the gearbox and caused to rotate by the actual engine
Correct position of the selector lever, with the ignition switched off	"P" (park). With the selector lever in "D"- "L"-"R"-"N", an electrical alarm system (timed buzzer) warns the driver of the incorrect position of the lever

	1242 SPI
FRONT BRAKES	Values in mm
 Disc — Ø	240
Disc — s	11,80 ÷ 12,10
Disc — s (worn)	10,55
Disc — s allowed	10,20
 Brake pads — s allowed	1,5
 Caliper — Ø	48
 Master cylinder (pump) — Ø	20,65 (13/16")
 Servo brake	Isovac 8" vacuum servo acting on all four wheels
 Distance of hydraulic piston push rod from master cylinder support plate — L	–

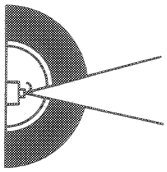
REAR BRAKES

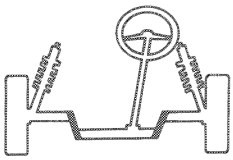
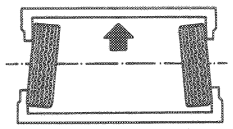
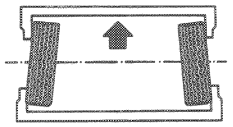
 Drum — Ø	180,00 ÷ 180,25
Drum — Ø (worn)	180,85
Drum — Ø allowed	181,35
 Shoes — s allowed	1,5
 Wheel cylinders — Ø	20,65 (13/16")
 Pressure regulators	Acting on the rear wheels
Reduction ratio	0,25

ENGINE	
Type	 rack and pinion power assisted
Ratio —  no. of turns lock to lock	about 4,25
 rack travel	137 mm
 Minimum turning circle	9,7 m
 Steering angle — outer wheel α_1	33°14′
inner wheel α_2	39°24′
 Steering column	 with 2 universal joints

	1242 SPI
	unladen car (*)

WHEEL GEOMETRY



 Front suspension	camber (**) 	-0°25′ ± 30′
	caster (**) 	1°20′± 30′
	toe in 	-1 ÷ 1 mm
 Rear suspension	camber (**) 	-0°25′ ± 30′
	toe in (**) 	-1 ÷ 3 mm

(*) With tyres inflated to the correct pressure and vehicle in running order
(**) Angles cannot be adjusted

	1242 SPI
STARTER MOTOR	M. Marelli E80E - 12V - 0,8kW
ALTERNATOR	M. Marelli A 115I - 14V - 38/65 A
VOLTAGE REGULATOR	Built in electronic
IGNITION SYSTEM	Electronic integrated with the injection
IGNITION COIL	M.Marelli BAE 800AK
SPARK PLUGS	Fiat/Lancia 9GYSSR Champion RC9YCC M. Marelli L7LCR
BATTERY	12V - 40Ah - 200A

STARTER MOTOR

Type		M. Marelli E80E - 12V - 0,8kW
Voltage	V	12
Nominal power	kW	0,8
Rotation, pinion side		clockwise
No. of poles		4
Field coil		series
Engagement		free wheel
Operation		solenoid
End float of armature shaft	mm	0,1 ÷ 0,5
Data for bench test		
Operating test (*):		
current	A	180
speed	rpm	1720
voltage	V	9,5
torque developed	daNm	0,37
Engagement test (*):		
current	A	324
voltage	V	7,1
torque developed	daNm	0,97
Free running test (*):		
current	A	40
voltage	V	11,4
speed	rpm	8500 ÷ 9000
Relay Winding resistance (*)	pull in Ω	0,30 ÷ 0,32
	hold in Ω	1,2 ÷ 1,3
Lubrication Internal splines and shaft bushes		VS+ SAE 10 W
Engagement sleeve and intermediate disc		TUTELA MR3

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

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

STATIC ADVANCE ELECTRONIC INJECTION/IGNITION

Type	Static advance electronic ignition integrated with Weber - Marelli injection system
Type	IAW 6F. SN
Firing order	1 – 3 – 4 – 2

IGNITION COIL WITH 2 HIGH TENSION PICK UPS

Make		M. Marelli
Type		BAE 800 AK
Ohmic resistance of primary winding at 20°C	Ω	0,495 ÷ 0,605
Ohmic resistance of secondary winding at 20°C	Ω	6660 ÷ 8140

RPM AND TOP DEAD CENTRE SENSOR

Make and type		M. Marelli /Jaeger CVM
Sensor winding resistance	Ω	575 ÷ 750
Distance (gap) between sensor and crankshaft pulley tooth	mm	0,5 ÷ 1,5

ADVANCE ON ENGINE

With engine idling	8° ± 3°

SPARK PLUGS

Make and type	Champion	RC9YCC
	Fiat/ Lancia	9GYSSR
	M. Marelli	L7LCR
Thread		M 14×1,25
Electrode gap	mm	0,85 ÷ 0,95

Tool number	DESCRIPTION OF TOOL

GEARBOX - DIFFERENTIAL

1840005002	Bridge for extraction
1840005003	Three arm bridge (complete with brackets)
1840005009	Bridge for extraction
1840005303	Brackets for extraction
1840005400	Clamp
1840206000	Percussion extractor
1870007000	Grip for drifts
1870100002	Drift for fitting ball bearings in gearbox casing to engine support
1870225002	Drift for fitting ball bearings in centre gearbox casing
1870426000	Drift for fitting seals on differential output shafts and seal on centre gearbox casing
1870473000	Drift for removing toothed sector retaining pin from gear selector control shaft
1870476000	Drift for fitting oil seal for speedometer/milometer
1870477000	Pliers for removing/refitting engine brake control cam circlips and drive gear for speedometer/milometer
1870478000	Drift for fitting ball bearings on differential casing
1870479000	Depth gauge for adjusting alignment between main pulley clearance and differential unit clearance
1870480000	Drift for fitting differential seal and main shaft on bell housing
1870481000	Drift for fitting seal inside main shaft, removing reduction gear and lay pulley roller bearing inner race
1870482000	Pressure gauge for measuring pressure

Tool number	DESCRIPTION OF TOOL
1870483000	Union for measuring pressure (to be used with pressure gauge 1870482000)
1870484000	Support for retaining lay pulley whilst adjusting retaining nut
1870485000	Tool for stretching lay pulley whilst removing and refitting drive belt
1870486000	Drift for fitting seal on oil pump control shaft
1870487000	Drift for fitting seal on lay pulley guide on side casing
1870488000	Gauge for checking alignment between pullies and main pulley clearance
1870489000	Extractor for removing oil pump
1870490000	Tool for removing roller bearing inner race and reduction gear from lay pulley (to be used with 1870481000)
1870491000	Gauge for checking differential unit fitting clearance (to be used with 1870479000)
1870492000	Caliper for removing and refitting sliding sleeve hub circlip
1870493000	Drift for removing cylindrical pin retaining secondary valve operating device
1870494000	Drift for extracting cylindrical pin retaining engine braking valve
1870495000	Support for gearbox whilst overhauling
1870496000	Tool for retaining secondary valve whilst removing and refitting hydraulic control unit
1870497000	Pliers for removing and refitting speedometer gear circlip
1895684000	Dial gauge with magnetic base

DESCRIPTION	Thread size	Tightening torques daNm
EXTERNAL GEARBOX CONTROLS		
Automatic gearbox grip fixing, bolt	M5	0,35
AUTOMATIC GEARBOX AND DIFFERENTIAL		
Electro-magnetic clutch to engine flywheel fixing, bolt	-	3,4
Centre casing to side gearbox casing fixing, bolt	-	2,45
Roller bearing inner race to reduction gear on lay pulley fixing, nut	-	12,7
Ball bearing on main pulley fixing, nut	-	17,2
Crown wheel to differential casing fixing, bolt	-	6,2
Oil pump to gearbox side casing fixing, bolt	-	0,98
Hydraulic control unit to gearbox side casing fixing, bolt	-	0,88
Oil filter to hydraulic control unit fixing, bolt	-	0,88
Oil sump fixing, bolt	-	0,38
Threaded oil drain plug	-	2,45
Gearbox casing to centre gearbox casing fixing, bolt	-	2,45
Blade carrier to bell housing fixing, bolt	-	0,49
Speedometer cover to bell housing fixing, bolt	-	0,65
Lay pulley to gearbox side casing fixing, bolt	-	1,57
Ball bearing to lay pulley fixing, bolt	-	6,4
Engine brake casing to gearbox centre casing fixing, bolt	-	0,34

DESCRIPTION	Thread size	Tightening torques daNm
Earth cable to gearbox fixing, bolt	M8	1,4

PEDALS

Brake and clutch pedals fixing, nut	M8	2,5
Accelerator pedal support fixing, nut with collar	M6	0,5
Bracket fixing, nut	M6	0,5
Flexible mounting fixing, nut	M10x0,75	2
Flexible mounting fixing, threaded spacer	M10x0,75	1,5
Bracket fixing, bolt	M6	0,35
Pipe fixing, nut with collar	M4	0,13

ELECTRICAL EQUIPMENT

Automatic gearbox control unit to bracket fixing, nut	M6	0,5
Automatic gearbox control unit to bodyshell fixing, nut	M6	0,5