



01/90

Ref. 2835 GB.

SRWM2835

MECHANICAL

I



**AUTOMOBILES
PEUGEOT**

direction des pièces et services

DESCRIPTION OF PAGE NUMBERING SYSTEM

Chapter

(Title)
(Unit)
(Operation)

ENGINE
CYLINDER HEAD
REMOVING - REFITTING

1

B4.007

Section number
1 - Engine

Component Unit Deal With

The letter identifies the unit dealt with :

A - Complete unit

B - Cylinder head

C - Cylinder block - Moving parts
Flywheel

D - Sump

E - Timing Gear

F - Fuel system (carburettor or
injection system)

G - Ignition system

H - Exhaust system

J - Cooling system

K - Lubrication system

Nature of Operation

The first figure identifies the nature of the operation :

1 - General - identification - Specifications

2 - Inspection - adjustment

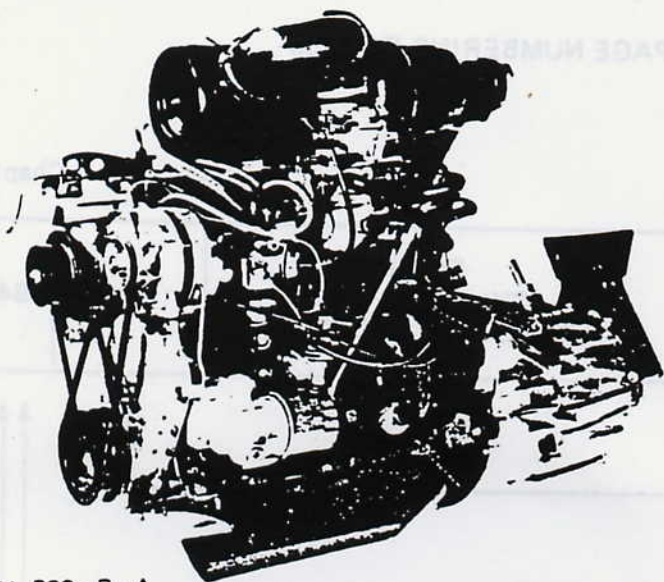
3 - Draining - filling - bleeding

4 - Removing - refitting

5 - Overhauling

The Page Number

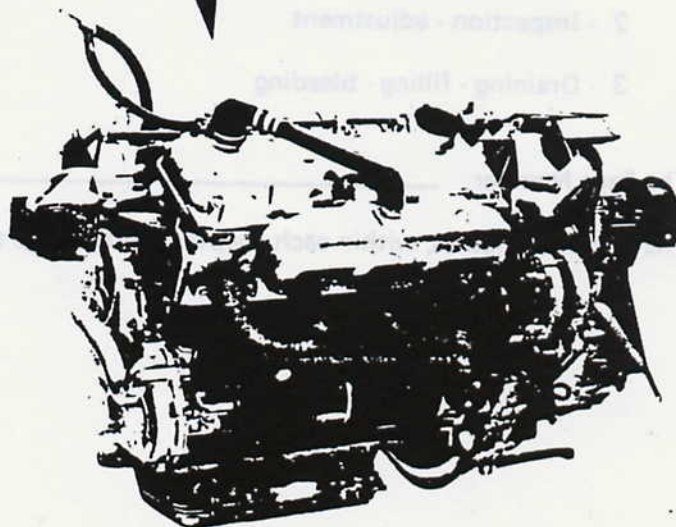
The last three figures, within each chapter, are the page sequence number.



7.5-81-P23-R-A

MOTEUR ESSENCE

XM7T-XN1T-XN1TA

U25-651 - U25-661 - U25-673
XUD9A

7.6-81-P12-R-A

	Pages
A - COMPLETE ENGINE	
Identificacion - data	
Tuning data, repair data , tightening torques	A1.001 to 011
Removing - refitting	
Removing - refitting the engine-gearbox assembly	A4.001 to 011
Overhauling	
Overhauling the engine	A5.001 to 041
B - CYLINDER HEAD	
Inspection - adjustments	
Retightening the cylinder head - adjusting the valve clearances	B2.001 to 005
Removing - refitting	
Removing - refitting the cylinder head in situ - Associated operations	B4.001 to 011
E - TMING GEAR	
Removing - refitting	
Removing - refitting the timing cover in situ	E4.001 to 007
F - FUEL SYSTEM	
Identification - data	
Carburettor, identification - data	F1.001 to 005
Checks - adjustments	
Checking - adjusting the carburettor	F2.001 to 007
Removing - refitting	
Removing - refitting the fuel tank - J5 4 x 4	F4.001 to 003
G - IGNITION SYSTEM	
Checks - adjustments	
Checking - adjusting the ignition system in situ*	G2.001 to 013
J - COOLING SYSTEM	
Identification - data	J1.001 to 003
K - LUBRICATION SYSTEM	
Checks - adjustments	
Checking the oil pressure	K2.001 to 003

*Refer to section 12 for checking-adjusting the ignition on a test bench.

Page

Identification - general specifications

Construction

A1.002 to 003

Tuning specifications

Ignition system - carburation

A1.004

Main tightening torques

A1.006

Original and repair specifications

A1.005 to 011

IDENTIFICATION

1 - Engine number : 1 figure + 3 letters followed by 5 figures
+ 6 figures (serial no.)

1 ABA → XM7T

1 ABT → XN1T

1 ACU → XN1TA

2 - Engine type : 169 (XM7T) 170A (XN1T) 170C (XN1TA)

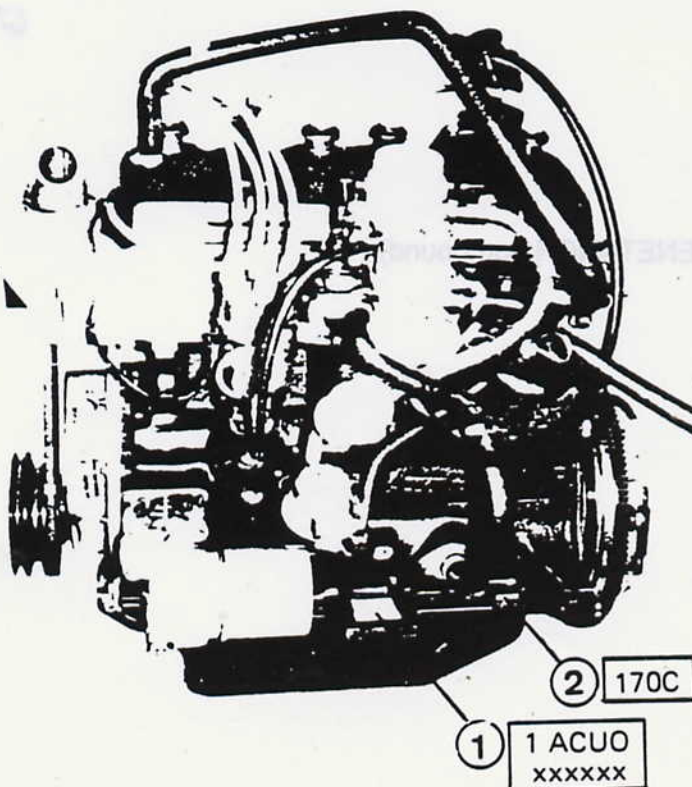
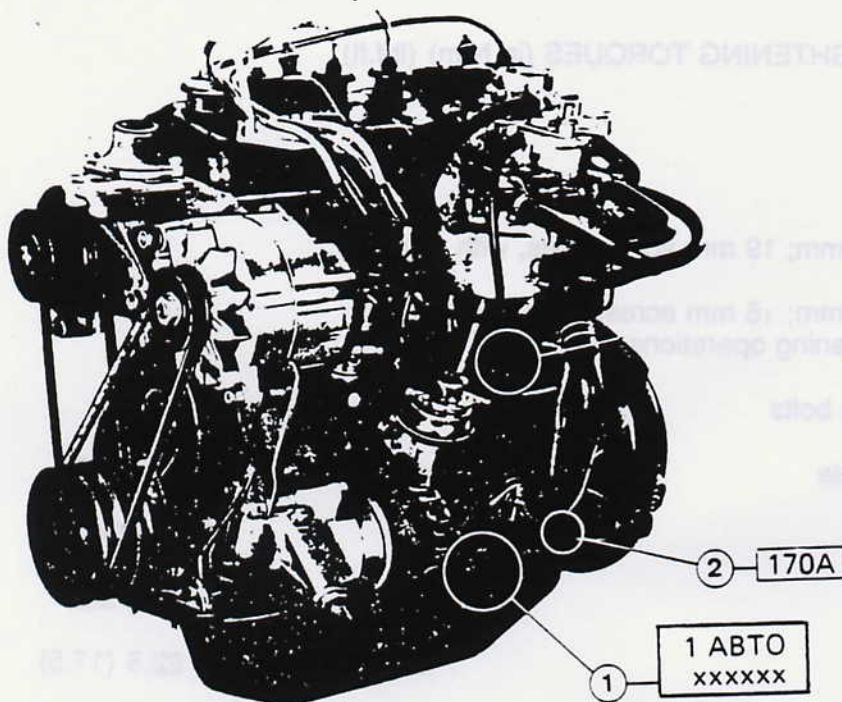
DATA

General data

Engine type	169 (XM7-T)	170A (XN1-T)	170C (XN1-TA)
Number of cylinders	4, in line		
Position, in the vehicle	at the front, transversely mounted, inclined, forwards, at 10°30'		
Capacity	1796 cm ³	1971 cm ³	1971 cm ³
Bore x stroke	84 x 81 mm	88 x 81 mm	88 x 81 mm
Compression ratio	7.5/1	8/1	8.8/1
FRENCH taxable horse power	10	11	
Max. power DIN - hp	69	78	85
ISO - kw	50	56.5	56.5
At a speed of	4800 rpm	5000 rpm	4750 rpm
Max. torque DIN - mKg	13.9	15.5	
ISO - m.daN	13.4	15	16
At a speed of	2300 rpm	2500 rpm	2500 rpm
Specific power DIN - hp/lit.	38.42	39.57	
ISO - Kw/lit.	27.83	28.66	

General structure

Cylinder block	cast iron
Liners	cast iron, of the wet, removable type
Pistons	light alloy with 3 piston rings
Connecting rods	forged steel
Crankshaft	forged steel, 5 bearing
Cylinder head	aluminium, with hemispherical combustion chambers
Cylinder head gasket	CURTY
Valves	8, overhead operated by rocker arms
Camshaft	side mounted
Timing gear drive	chain and sprocket



J5

ENGINE COMPLETE UNIT IDENTIFICATION - DATA

1

A1.005

REPAIR DATA

All dimensions are given in millimetres unless otherwise stated.

CYLINDER HEAD - Aluminium with hemispherical combustion chambers.

NOMINAL HEIGHT

92.5 ± 0.15 mm

Maximum permissible bow

0.10 mm

Min. height after refacing

92.10 mm

Repair : (following removal of the cylinder head or during engine overhaul).

the cylinder head is to be tightened with the ENGINE COLD
in the order shown here :



FRONT

Engine Type	Engine No.	INITIAL TIGHTENING	ENGINE WARM-UP	RETIGHTENING	At 1000/1200 mile MAINTENANCE (1500/2000 KM)
XM7-T	→ 012625	In the tightening order shown above - Pretighten to 50 N.m (37 lbf.ft) - Bolt by bolt, in the same order, tighten to 20 N.m (14.7 lbf.ft) then continue to tighten through an angle of 90° Adjust the valve clearances	Warm up the engine until the electric fan cuts in. Leave it to cool for a minimum of 6 hours.	Bolt by bolt, in the same order, with the engine cold - Loosen the bolt - Retighten to 20 N.m (14.7 lbf.ft) then continue to tighten through an angle of 90°. Adjust the valve clearances.	Bolt by bolt, in the same order, (with the engine cold) - Loosen the bolt - Retighten to 20 N.m (14.7 lbf.ft) then continue to tighten through an angle of 90°. Adjust the valve clearances.
XN1-T	→ 021874				
XN1-T	→ 021875 → 031998				
XM7-T	→ 012626	In the same order - Pretighten the bolts to 50 N.m (37 lbf.ft) - bolt by bolt, in the same order, loosen each bolt, retighten it to 20 N.m (14.7 lbf.ft) then continue to tighten through an angle of 180°. Adjust the valve clearances.	Warm up the engine until the electric fan cuts in.	Whatever the engine temperature, bolt by bolt, in the same order, tighten each bolt through an additional 35°. Adjust the valve clearances (with the engine cold).	No cylinder head retightening operation. Adjust the valve clearances (with the engine cold).
XN1-T	→ 031999				
XN1-TA					

CYLINDER HEAD GASKET

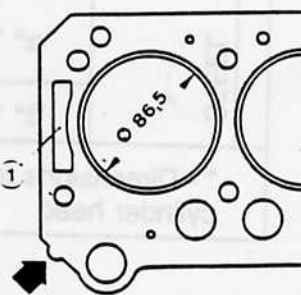
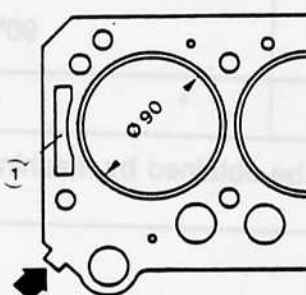
Make

CURTY

Identification

XN1-T
XN1-TA

XM7-T



Thickness

1.3 to 1.5 mm

Position

Inscription, on the upper surface, visible

With the rectangular cut-out (1) at the same end as the coolant pump

A1.006

1

ENGINE COMPLETE UNIT IDENTIFICATION - DATA

J5

VALVE SEATS

Nominal seat angle

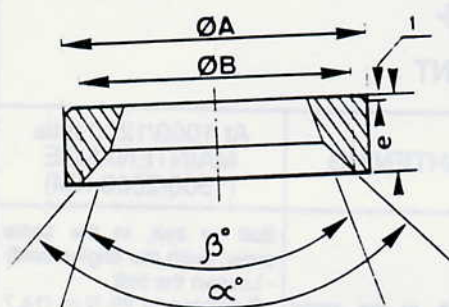
INLET

EXHAUST

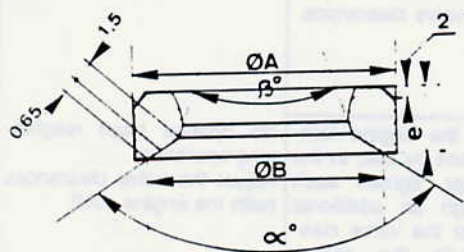
120°

90°

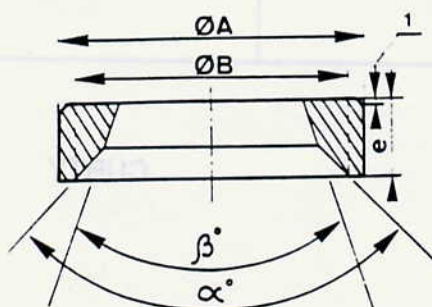
Inlet XM7-T




Inlet XN1-T (venturi seats)



Exhaust



			INITIAL SIZES		REPAIR SIZES		TOLERANCES FOR FITS	
			1	2	1	2		
INLET	CAST IRON	Ø A	43.51	43.71	43.85	44.01	+ 0.161 + 0.136	
		Ø in cyl. head	43.50	43.70	43.80	44	± 0.025	
			engine XM7-T			engine XN1-T XN1-TA		
		Ø B *	41			41		
		e *	7.33 + 0.1 0			10.257 ± 0.05		
		α° *	120° - 15' 0			120° - 15' 0		
		β° *	17°			70°		
EXHAUST	CAST IRON	XN1-T ↗ 11/83	Ø A	37.01	37.21	37.31	37.51	+ 0.137 + 0.112
		XM7-T ↗ 4/85	Ø in cyl. head	37	37.20	37.30	37.50	± 0.025
			Ø B *	35				
			e *	6.462 + 0.1 0				
			α° *	90° - 15' 0				
			β° *	15°				
	STEEL	XN1-T 7/83 ↗ 11/83	Ø A	38.01	38.21	38.31		+ 0.137 + 0.112
			Ø in cyl. head	38	38.20	38.30		± 0.025
		XM1-T ↗ 11/83 XM7-T ↗ 4/85 XN1-TA	Ø A	37.01	37.21	37.31	37.51	+ 0.137 + 0.112
			Ø in cyl. head	37	37.20	37.30	37.50	± 0.025
			Ø B *	35				
			e *	6.462 + 0.1 0				
			α° *	90° - 15' 0				
			β° *	15°				

* - Dimensions to be obtained by machining after fitting to the cylinder head

* - Dimensions to be obtained by machining after fitting to the cylinder head

VALVE GUIDES - Cast iron

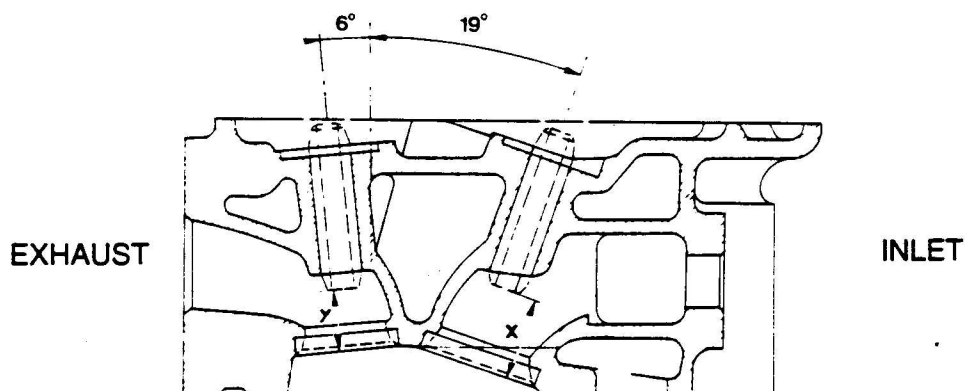
	INITIAL SIZES		REPAIR SIZES	
	1	2	1	2
Length	$58,4 \pm 0,3$		$55,4 \pm 0,3$	
Outside \varnothing guide	$14,02 \begin{smallmatrix} + 0,039 \\ + 0,029 \end{smallmatrix}$	$14,035 \begin{smallmatrix} + 0,039 \\ + 0,029 \end{smallmatrix}$	$14,29 \begin{smallmatrix} 0 \\ - 0,011 \end{smallmatrix}$	$14,59 \begin{smallmatrix} 0 \\ - 0,011 \end{smallmatrix}$
\varnothing location in cyl. head	$13,965 \begin{smallmatrix} + 0,032 \\ 0 \end{smallmatrix}$	$14,13 \begin{smallmatrix} + 0,032 \\ 0 \end{smallmatrix}$	$14,195 \begin{smallmatrix} + 0,032 \\ 0 \end{smallmatrix}$	$14,495 \begin{smallmatrix} + 0,032 \\ 0 \end{smallmatrix}$
Inside \varnothing guide	$8,02 \begin{smallmatrix} + 0,022 \\ 0 \end{smallmatrix}$		$8,02 \begin{smallmatrix} + 0,022^* \\ 0 \end{smallmatrix}$	

* supplied $\varnothing 7,4 \begin{smallmatrix} + 0,022 \\ 0 \end{smallmatrix}$ to be reamed-out after fitting to cylinder head

IMPORTANT - If one of the valve guides has to be replaced, one must replace all 8 guides and all 8 valves.

Distance from guide to seat

X : INLET	Y : EXHAUST
31.5	21.3



VALVES

Inclination

Stem \varnothing

Head \varnothing

Length

Seat angle

INLET	EXHAUST
$19^\circ \pm 5'$	$6^\circ \pm 5'$
$8,02 \begin{smallmatrix} - 0,025 \\ - 0,047 \end{smallmatrix}$	$8 \begin{smallmatrix} - 0,025 \\ - 0,040 \end{smallmatrix}$
$42,5 \pm 0,2$	$35,5 \pm 0,2$
118,25	112
$120^\circ \begin{smallmatrix} + 25' \\ 0 \end{smallmatrix}$	$90^\circ \begin{smallmatrix} + 25' \\ 0 \end{smallmatrix}$

VALVE SPRINGS

Number and position

Wire ø

Identification

Correct way round

Free height

Direction of winding

Checking height

- under a load of (Newtons)

8 inner

8 outer

3		4.3	
Painted white either			
39.6		44	
left hand		right hand	
35.9	26.8	39.8	30.7
8.8	30	17	59

CAMSHAFT

Number of bearings

End flat

Max. run-out

3, pressure lubricated

0.05 to 0.14

0.02

TIMING GEAR DRIVE

Double roller chain

Number of teeth on crankshaft sprocket

Number of teeth on camshaft sprocket

Hydraulic tensioner

Timing diagram (at a theoretical valve clearance of 0.7 mm)

58 links

19

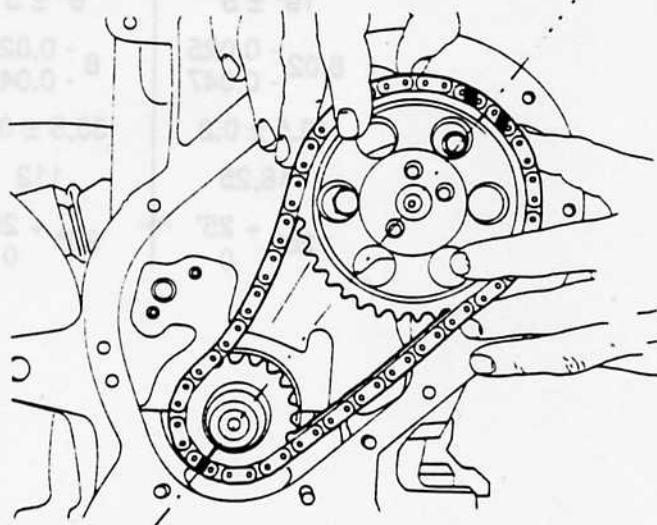
38

RENOLD or SEDIS

XM7-T/XN1-T	
Inlet opens ATDC	6°
Inlet closes ABDC	33°
Exhaust opens BBDC	21°
Exhaust closes ATDC	6°

XN1-TA	
Inlet opens BTDC	2°
Inlet closes ABDC	35°
Exhaust opens BBDC	34°
Exhaust closes ATDC	4°30'

Timing adjusted by timing marks on chain and sprockers.



Actual valve clearances on a cold engine	
inlet	exhaust
0.10 mm	0.25 mm

CYLINDER BLOCK - Cast iron

Height of block

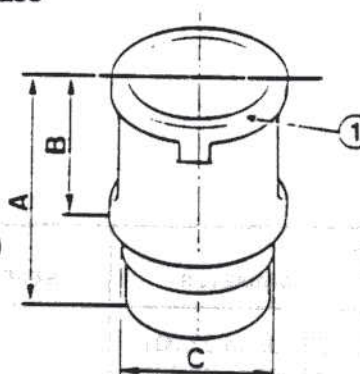
285,9 ± 0,15

Height between cylinder head gasket face
and liner locating flange90 + 0,045
- 0,015LINERS - Centrifugally cast iron
Type

Overall height (dimension A)

Height to locating flange (dimension E)






Lower locating ø (dimension C)

Liner protrusion (above cylinder
block)Difference between any 2 adjacent liners
Maximum ovality and taper

1 wet, removable, compressed

136,2⁰₋₁11/83 90.005
11/83 89.985 } ± 0,02593 - 9,02
- 0,08{ 0.07 to 0.14 as near as
possible to 0.140,04
0,03

Seals made from paper and white synthetic fibre → 07/85 ; Steel, plated with aluminium.

HIGHEST POINT ON LINER, WITHOUT SEAL	LINER SEAL TO BE FITTED			
	→ 07/85 : Paper	Thickness		→ 07/85 : Steel
+ 0,039 to + 0,045		0,07	0,10	
+ 0,014 to + 0,038		0,085		0,12
- 0,006 to + 0,018		0,105	0,15	
- 0,095 to - 0,007		0,130		

Liner/piston matching

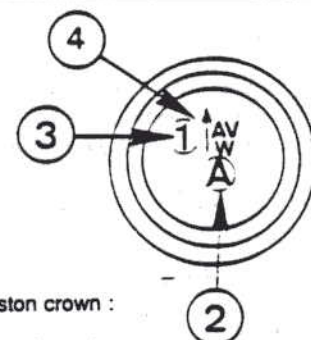
	PISTON ø	PISTON REFERENCE	LINER I.D.	LINER REFERENCE (1)	NOMINAL CLEARANCE
ENGINES XM7-T	83,930 to 83,941	A	84,000 to 84,011	1 line	0,06 to 0,08
	83,942 to 83,952	B	84,012 to 84,022	2 lines	
	83,953 to 83,963	C	84,023 to 84,033	3 lines	
	83,064 to 83,974	D	84,034 to 84,044	4 lines	
ENGINES XN1-T	87,925 to 87,936	A	88,000 to 88,011	1 line	0,06 to 0,08
	87,937 to 87,947	B	88,102 to 88,022	2 lines	
	87,948 to 87,958	C	88,023 to 88,033	3 lines	
	87,959 to 87,969	D	88,034 to 88,044	4 lines	

PISTONS - Light alloy. XM7-T XN1-T - XN1-TA

Nominal ø 84 88

XN1-T 0,51

XN1-TA 2,98

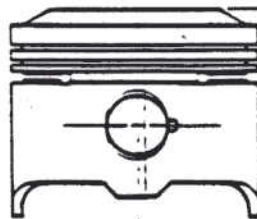
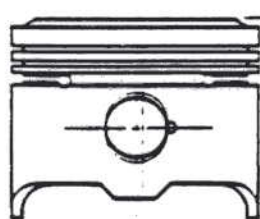


References on piston crown :

(2) liner/piston matching reference

(3) piston/gudgeon pin matching reference

(4) arrow to point towards timing gear



ENGINE COMPLETE UNIT IDENTIFICATION - SPECIFICATIONS

GUDGEON PINS - Case hardened, heat treated steel

Nominal diameter

23

Length

74

Fit

Free running in both piston and connecting rod
Retained in piston by 2 circlips

Piston and Gudgeon Pin Matching

PIN		PISTON	
REFERENCE	DIAMETER	REFERENCE (3)	DIAMETER
(Dab of paint)	blue	1	23.005 to 23.001
	white	2	23.001 to 22.996
	red	3	22.996 to 22.992

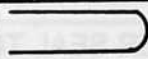

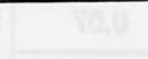
PISTON RINGS

Number : 3

1 "firing" ring

1 "compression" ring

1 "scraper" ring

	SPECIFICATIONS	THICKNESS	GAP
	barrel section	1.5 mm	0.20 to 0.50 mm
	taper*	2.0 mm	0.40 to 0.55 mm
	with expander	3.96 mm	0.25 to 0.40 mm

* Fitted with inscription upwards

CONNECTING RODS

Material

Forged steel

Between centres dimension

132 ± 0.07

Big-end diameter without shells

 $\varnothing 53.655^{+0.019}_0$

Direction of fitting connecting rod to piston



SMALL-END BUSH

Length

27

Outside Ø

- supplied under size
- to be reamed-out to provide a clearance of 0.04 to 0.08 when the gudgeon pin is fitted

Inside Ø

 $23.005^{+0.013}_0$

BIG-END SHELLS

Material

Steel plus antifriction metal facing

Width

 $23.40^{+0.05}_0$

Thickness

1.815 ± 0.003

For repair size shells (see section dealing with crankshaft).

J5	ENGINE COMPLETE UNIT IDENTIFICATION - DATA	1	A1.011
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CRANKSHAFT

Material

forged steel

Number of bearings

5

MAIN BEARING JOURNALS

		CLUTCH END I	LH INTER. II	CENTRE III	RH INTER. IV	TIMING GEAR END V
INITIAL SIZE	Ø	54,92 $\begin{smallmatrix} - 0 \\ - 0,015 \end{smallmatrix}$	56,165 $\begin{smallmatrix} - 0 \\ - 0,025 \end{smallmatrix}$	57,189 $\begin{smallmatrix} - 0 \\ - 0,015 \end{smallmatrix}$	58,573 $\begin{smallmatrix} - 0 \\ - 0,025 \end{smallmatrix}$	59,416 $\begin{smallmatrix} - 0 \\ - 0,015 \end{smallmatrix}$
	Width	37 + 0,07	30 $\begin{smallmatrix} + 0,3 \\ - 3 \end{smallmatrix}$	38 $\begin{smallmatrix} + 0,3 \\ - 0 \end{smallmatrix}$	30 $\begin{smallmatrix} + 0,3 \\ - 0 \end{smallmatrix}$	38 ± 0,35
REPAIR SIZE	Ø	54,62 $\begin{smallmatrix} - 0 \\ - 0,015 \end{smallmatrix}$	55,865 $\begin{smallmatrix} - 0 \\ - 0,025 \end{smallmatrix}$	56,889 $\begin{smallmatrix} - 0 \\ - 0,015 \end{smallmatrix}$	58,273 $\begin{smallmatrix} - 0 \\ - 0,025 \end{smallmatrix}$	59,116 $\begin{smallmatrix} - 0 \\ - 0,015 \end{smallmatrix}$

MAIN BEARING SHELLS

	Material	aluminium - tin				
	Width	29,35 $\begin{smallmatrix} - 0 \\ - 0,25 \end{smallmatrix}$	21,50 $\begin{smallmatrix} - 0 \\ - 0,25 \end{smallmatrix}$	29,5 $\begin{smallmatrix} - 0 \\ - 0,25 \end{smallmatrix}$	21,5 $\begin{smallmatrix} - 0 \\ - 0,25 \end{smallmatrix}$	29,5 $\begin{smallmatrix} - 0 \\ - 0,25 \end{smallmatrix}$
INIT. SIZE	Thickness	1,885 ± 0,003				
REP. SIZE		2,035 ± 0,003				

Arrangement

Earlier assembly (crankshaft with plugs)	Later assembly (crankshaft without plugs)
Grooved shells on bearings I, III, V Ungrooved shells on bearings II and IV	Grooved 1/2 shells on block side Ungrooved 1/2 shells on cap side

CRANK PINS

	INITIAL SIZE		REPAIR SIZE	
Width	Ø	Thickness of big-end shells	Ø	Thickness of big-end shells
30,05 $\begin{smallmatrix} + 0,2 \\ - 0 \end{smallmatrix}$	50 $\begin{smallmatrix} - 0 \\ - 0,016 \end{smallmatrix}$	1,815 ± 0,003	49,7 $\begin{smallmatrix} - 0 \\ - 0,016 \end{smallmatrix}$	1,965 - 0,003

Journal at clutch end

Width

INITIAL	REPAIR 1	REPAIR 2	REPAIR 3
37 + 0,07	37,10 $\begin{smallmatrix} + 0,007 \\ + 0,002 \end{smallmatrix}$	37,15 $\begin{smallmatrix} + 0,007 \\ + 0,002 \end{smallmatrix}$	37,20 $\begin{smallmatrix} + 0,007 \\ + 0,002 \end{smallmatrix}$

Crankshaft end float

The end float of 0.08 to 0.20 mm is obtained by varying the thickness of 4 half flanges fitted on either side of the bearing journal at the clutch end.

- on the inner side : 2 half flanges 2.30 mm thick.
- on the outer side : select 2 half flanges from amongst the following thicknesses : 2.30 - 2.35 - 2.40 - 2.45 - 2.50 mm.

When fitting, place the lubrication grooves against the crankshaft.

ENGINE COMPLETE UNIT REMOVING AND REFITTING THE POWER UNIT ASSEMBLY

SPECIAL TOOLS

SPECIAL TOOLS

Fig. A :

Engine lifting fixture 8.0102 Y comprising :

D - Sling bar

F - Long hook (clutch end)

G - Short hook (water pump end).

Fig. B :

From petrol engine tool kit 8.0110 :

T - Power unit assembly lifting lug, to be fitted at water pump end.

U - Lug to be fitted at clutch end.

Figs. C and D :

Power unit assembly support fixture 8.0151 comprising :

A - Diesel or petrol engine cradle.

B - Intermediate support for petrol engines.

TIGHTENING TORQUES

4 bolts securing left hand engine mounting bracket to intermediate
5 mdaN 50 Nm 37 lbf ft

1 nut securing right hand engine mounting bracket to rubber pad
5.5 mdaN 55 Nm 40 lbf ft

3 bolts securing right hand engine mounting bracket to water pump
5 mdaN 50 Nm 37 lbf ft

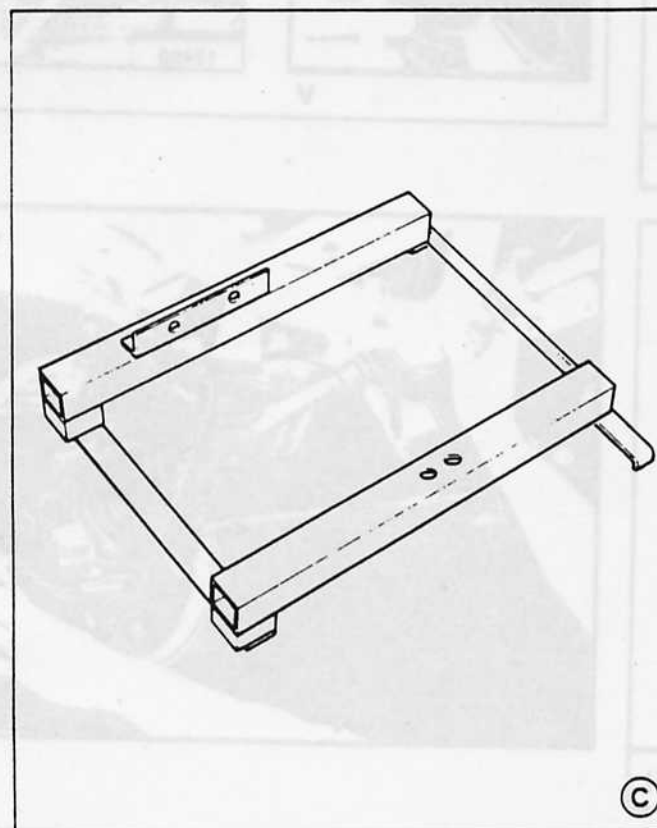
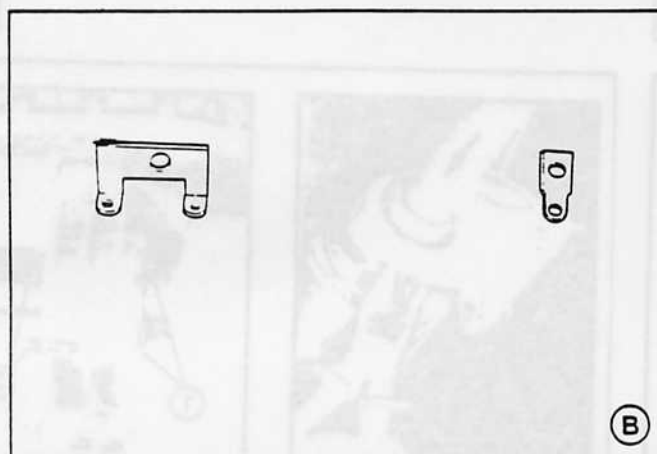
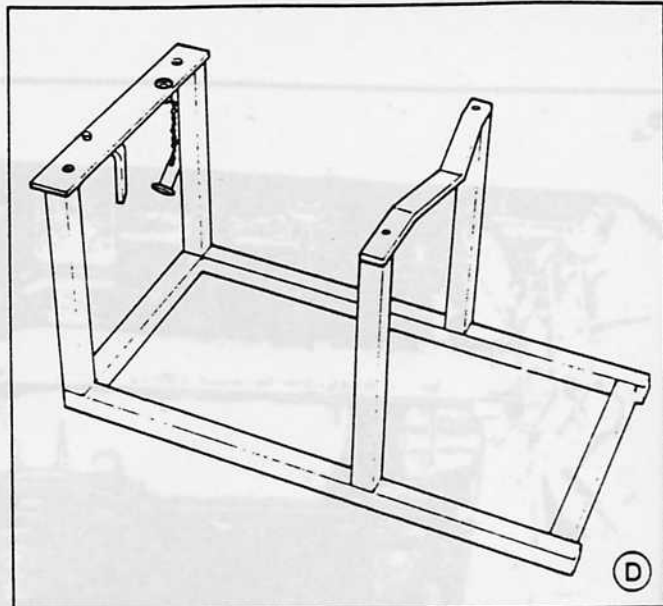
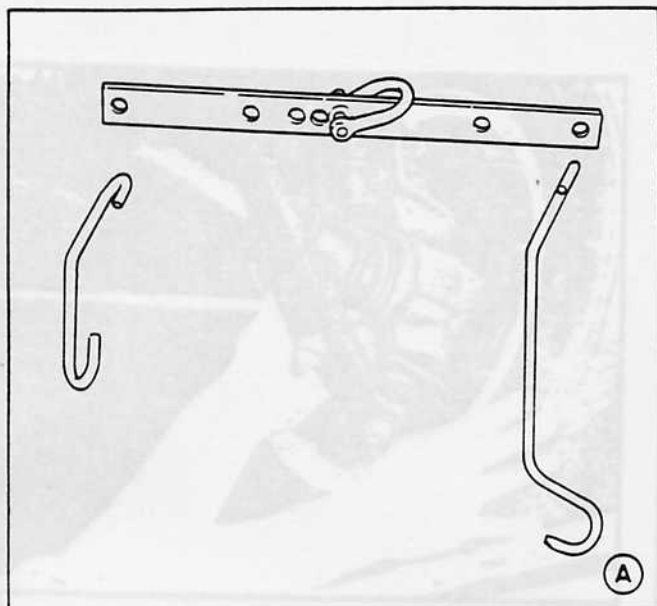
1 rear lower mounting pin
5.5 mdaN 55 Nm 40 lbf ft

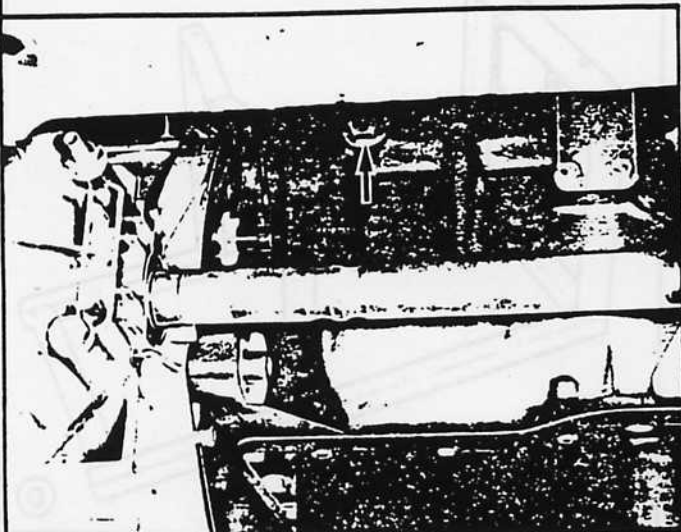
1 engine to gearbox securing bolt
9 mdaN 90 Nm 66 lbf ft

4 bolts securing the lower ball joint casing to the swivel
5 mdaN 50 Nm 37 lbf ft

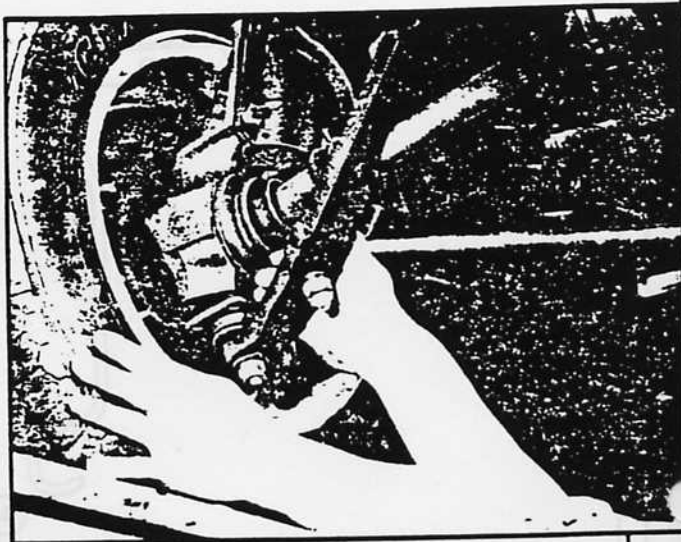
2 bolts securing the track rod arm to the swivel
12.5 mdaN 125 Nm 92 lbf ft

3 bolts securing the drive shaft bearing to the cylinder block
3 mdaN 3 Nm 22 lbf ft

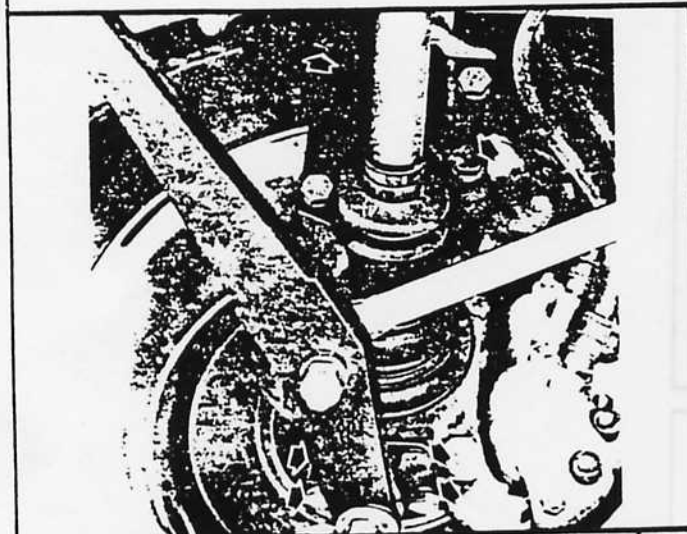




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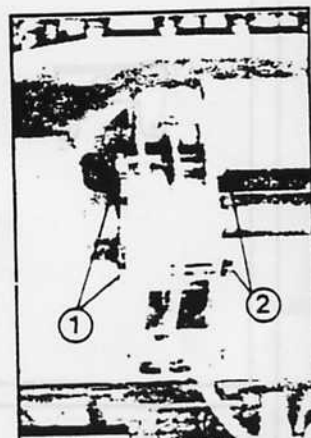
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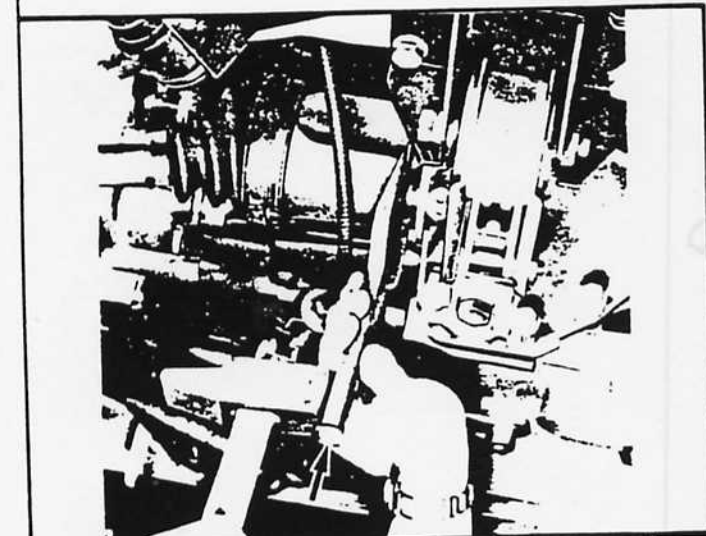
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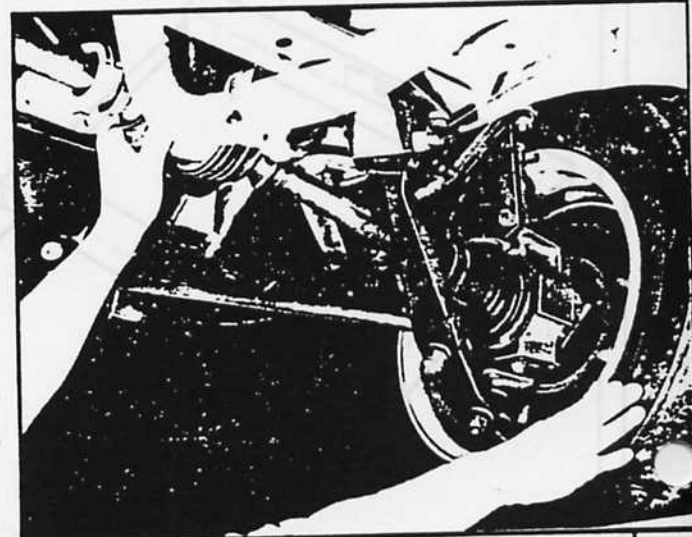
V



VI



III



VII

SPECIAL POINTS TO BE NOTED DURING REMOVAL

- The power unit assembly is to be removed with the wheels hanging free, preferably on a lift.
- It is not necessary to drain the unit (engine or gearbox) not affected by the repair operations.
- Do not disconnect either the track rod lever ball joint or the lower ball joint. It is preferable to remove the bolts that secure them to the stub axle carrier.
- To left hand drive shaft is retained in the sun wheel by a circlip (use a tapered tool such as panel beater's drift or a thick cold chisel).
- The right hand drive shaft is retained, transversely, by a bearing mounted on a support on the cylinder block and secured by a circlip (pinch the circlip together to remove the drive shaft then remove the bearing assembly).

IMPORTANT - The cooling system is to be filled, permanently, in all seasons with a **RECOMMENDED** type coolant. See maintenance literature.

- Disconnect the battery.
- Drain the cooling system :
 - at the tap on the radiator,
 - at the plug on the cylinder block, fig. 1.

OPERATIONS UNDER THE VEHICLE

RELEASING THE DRIVE SHAFTS

- Remove, from each side as shown in fig. II :
 - the 4 bolts that secure the ball joint housing to the swivel,
 - the 2 bolts that secure the track rod arm to the swivel.

Left hand side

- Insert a taper drift between the drive shaft yoke and one of the bolts on the final drive casing, fig. III.
- Drive the drift against the yoke by tapping lightly on its end (see arrow).
- Then release the drive shaft by tapping the side of the drift.

- Pull down the lower suspension arm, fig. IV, to release the ball joint housing whilst pushing the wheel upwards.
- Completely free the left hand drive shaft from the sun wheel and allow it to rest on the lower suspension arm.

On the right hand side

- Squeeze in the circlip, fig. V, and remove the drive shaft sideways.
- 3/83
- Loosen (Fig. VI) the nuts (2) on the drive shaft support bearing.
- Swing the tie rods (1) through half a turn to free the bearing outer track ring.
- Remove the 3 bolts that secure the bearing assembly to the cylinder block.
- Lower the lower suspension arm and free the ball joint casing.
- Pull the suspension leg fig. VII to one side accompanied by the inner spider joint bell casing.
- Retrieve the aluminium bearing.
- Rest the drive shaft on the lower suspension arm.

ENGINE
COMPLETE UNIT
REMOVING THE POWER UNIT ASSEMBLY

ON THE GEARBOX (Fig. I)

- Disconnect :
 - the clutch cable at the two clutch clearance adjusting nuts,
 - the speedometer drive at the worm wheel.
- Remove the power unit assembly rear mounting pin.

AT THE REAR OF THE CYLINDER BLOCK (Fig. II)

- Disconnect :
 - the exhaust clamp,
 - the hose from the rear water pipe.

OPERATIONS UNDER THE BONNET

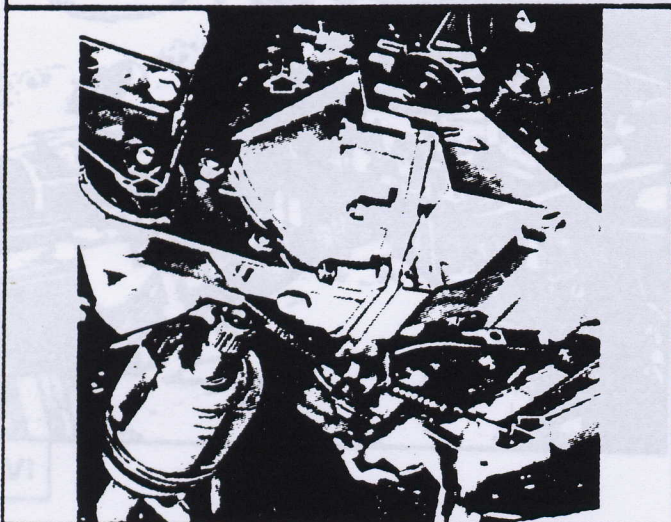
- Disconnect the prop from the right hand side of the bonnet and tie it the right hand rear view mirror, with a piece of string.
- Remove the various parts shown in Fig. III.

REMOVING THE FRONT PANEL

- Disconnect, fig. IV, the wires and plugs from :
 - the headlamps and direction indicators,
 - the electric cooling fan,
 - the temperature switch on the radiator,
 - the coil.
- Remove the 2 lower fastenings from the electric fan unit to free the wiring clips.

- Disconnect, fig. V :
 - the upper and lower radiator hoses, engine end,
 - the degassing hose, degassing tank end,
 - the bonnet latch : remove its 2 securing nuts.

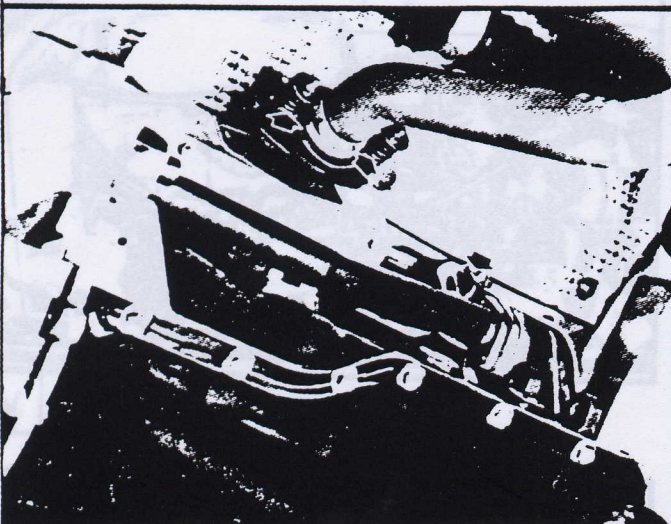
- Remove, fig. VI :
 - the upper bolts,
 - the 2 front panel lower securing nuts,
 - the front panel with the radiator and the electric fan.



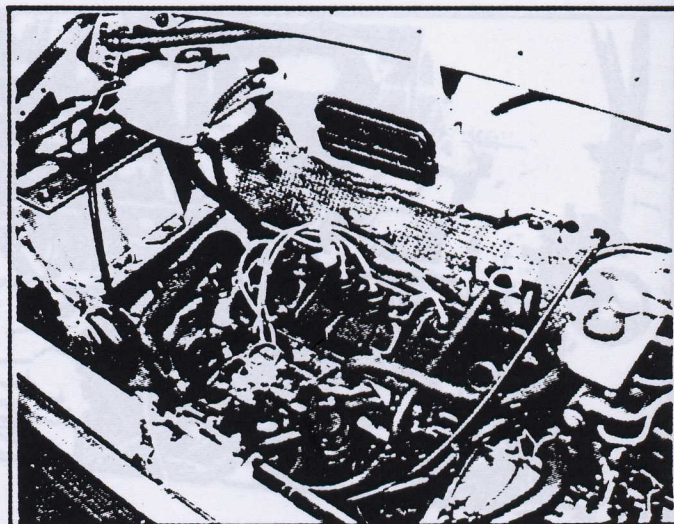
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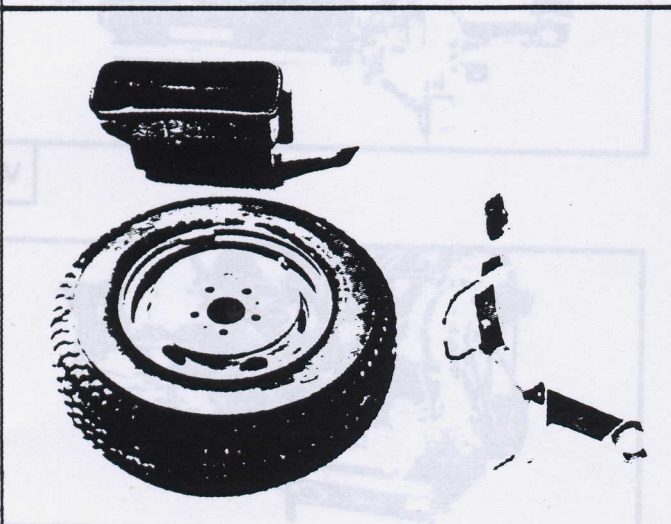
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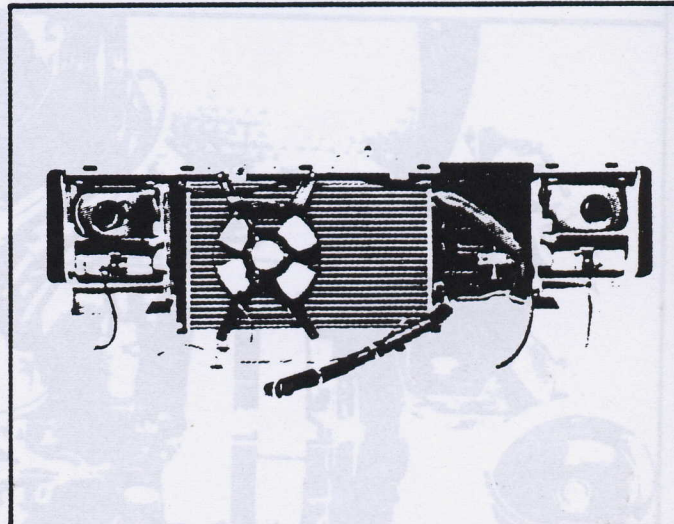
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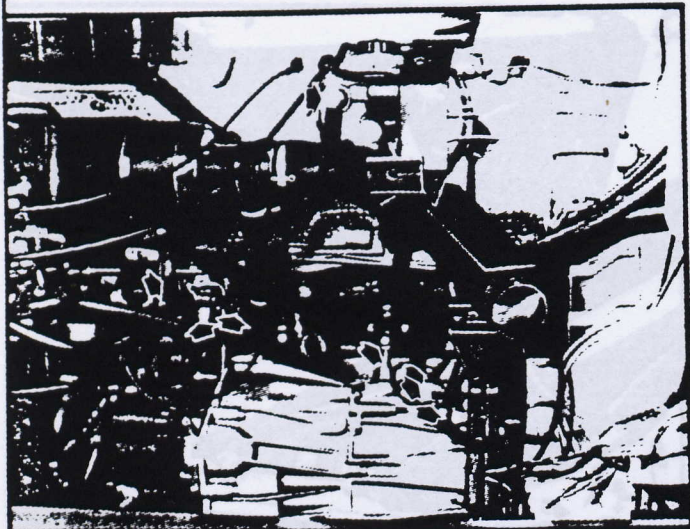
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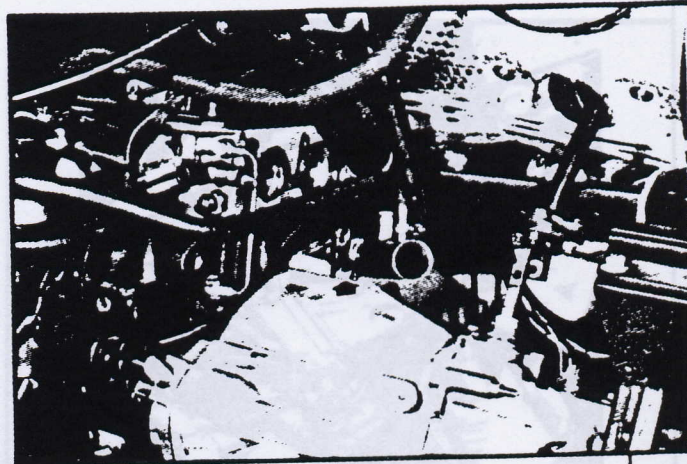
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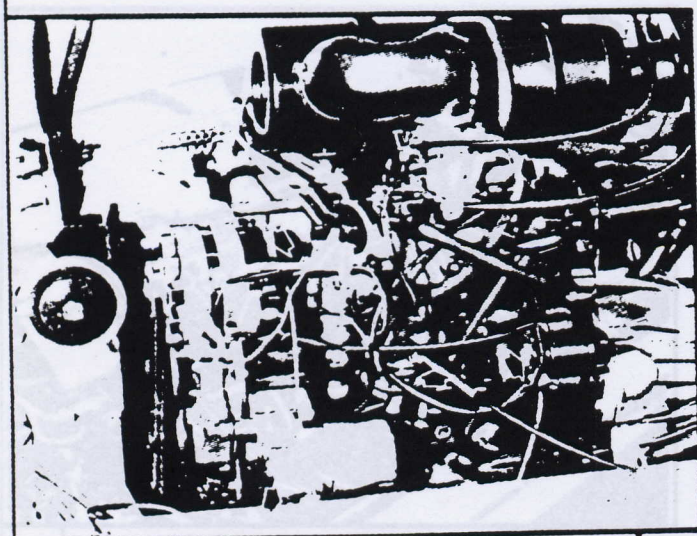
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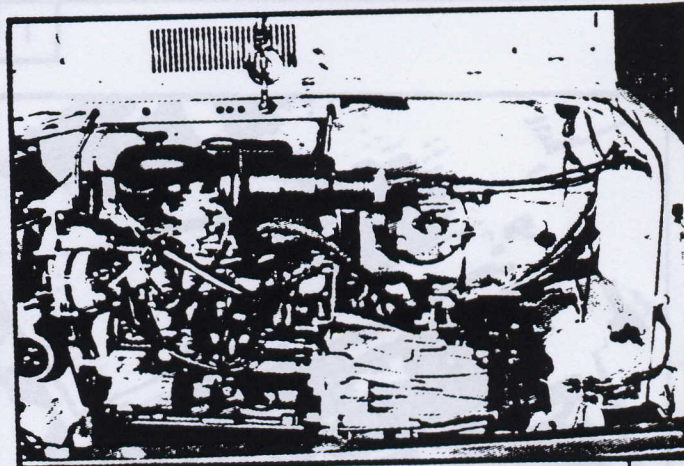
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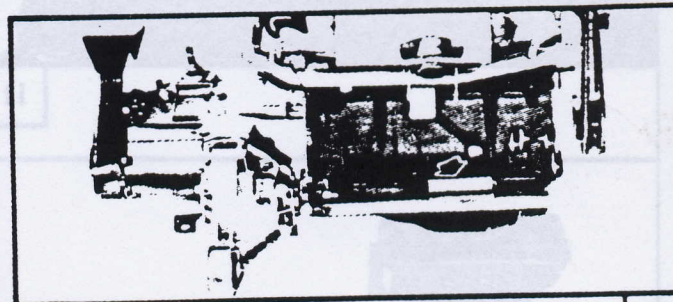
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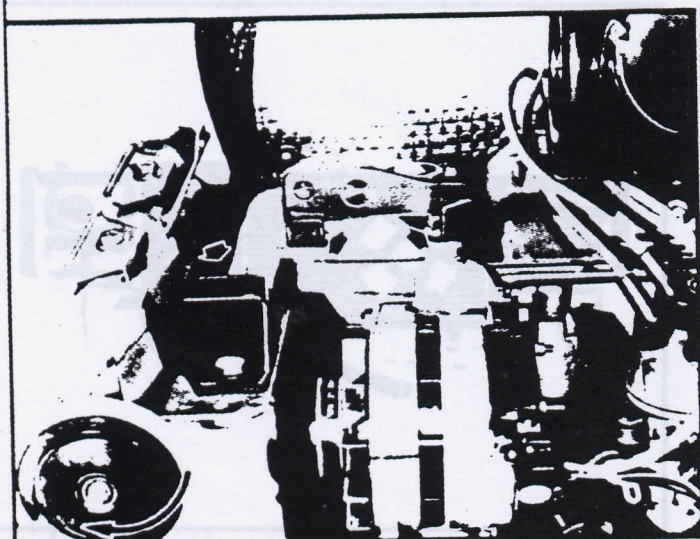
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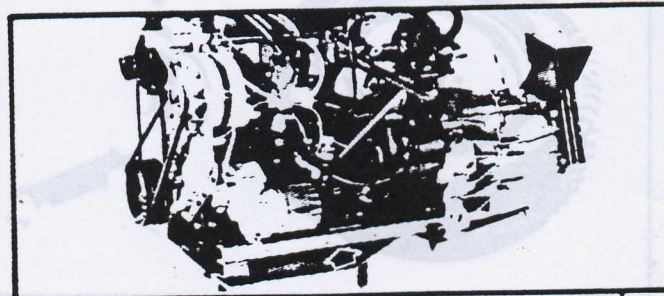
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VI



III



VII

- Disconnect, fig. I :
 - the gear shift control, (lower pin),
 - the following hoses :
 - heater input and output,
 - brake servo vacuum,
 - the following wires :
 - gearbox earth,
 - reversing light switch petrol,
 - temperature switch and thermistor on cylinder head.

Left hand side, fig. IV :

- Remove the clutch housing upper securing bolt.
- Insert lifting lug 8.0110 U.
- Remove the upper nut from the rubber pad.

- Disconnect, fig. II :
 - the fuel line from the fuel pump,
 - the wires from the following engine accessories :
 - starter motor,
 - alternator,
 - oil pressure switch,
 - idling jet solenoid.

- Fit, as shown in fig. V :
 - short hook 8.0102 G, at the water pump end,
 - long hook 8.0102 F, at the clutch end,
 - sling bar 8.0102 D.
- Take the weight on the hoist.
- Remove the 4 upper bolts from the intermediate mounting at the gearbox end.
- Release and lift out the power unit assembly.

LIFTING THE ENGINE

Right hand side, fig. III

NOTE - Work one bolt at a time.

- Remove the 2 front securing bolts from the engine mounting.
- Retighten these two bolts after fitting the lifting lug 8.0110 T.
- Swing the horn as far as it will go towards the outside of the vehicle.

LOWERING THE POWER UNIT ASSEMBLY ONTO ITS CRADLE.

- Secure the petrol intermediate support 8.0151 B under the cylinder block as shown in figs. VI and VII.
- Lower the assembly onto cradle 8.0151 A as shown in fig. VII.

REFITTING

Carry out the removing operations in reverse.

For the tightening torques see the « special tools » page.

SPECIAL POINTS

Left hand drive shaft :

- Check that the circlip that retains it, in the sun gear, is correctly engaged.

Exhaust pipe joint Fig. I :

- Lubricate the taper areas with MOLYKOM-BIN paste Part no. 9730.95 (100 g tube).
- Compress the springs to dimension :
x = 22 mm

Clutch free travel fig. II and III :

- Turn the nuts at the end of the clutch cable until the clutch pedal is level with the brake pedal.

Cooling system

- System capacity : 9 litres.
- Only coolant made up with permanent anti-freeze of an officially approved type (see the current literature) is to be used.
- If necessary see the section entitled : « Filling and bleeding the cooling system ».

Electrical connections

- Connect them by following Figs IV, V and VI.

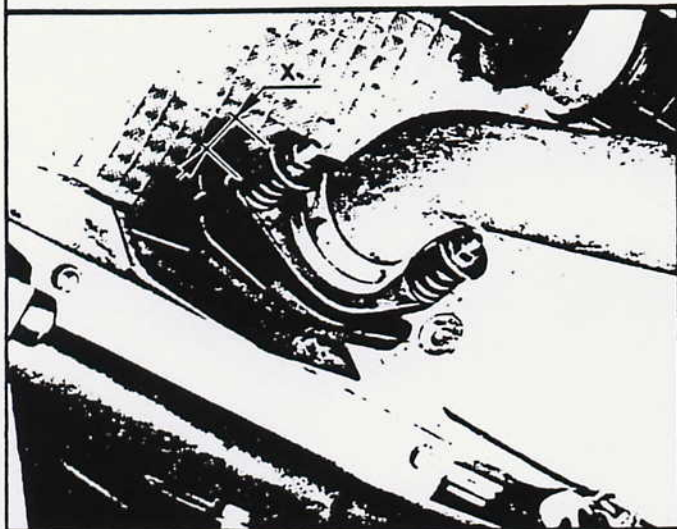
COLOUR CODES					
- White	Bc	- Red	R		
- Blue	Bl	- Brown	M		
- Light blue	B	- Green	V		
- Yellow	J	- Grey	G		
- Orange	O	- Black	N		
- Pink	Ro	- Violet	Vi		

	Non-electronic ignition		Electronic ignition		DESCRIPTION REFERENCE	
	Wire	Ter.end	Wire	Ter.end		
ENGINE (Fig. IV)	O		O		Strangler	1
	V-Bc		V-Bc		Temperature sensor	2
	O		O	Bc	Reversing light	3
	Bc		BC	BC	Reversing light	3
	Bl		Bl		Coolant temp. switch	4
	R	N	R	N	Starter field	5
	M		V		Alternator cable	6
	G		G	Bc	Oil pressure switch	7
	N-Vi				Alternator field	8
FAN (Fig. V)	N		N	N	Direction indicators	9
	N		N	Bc	Fan temperature	10
				N	Switch	10
					Electric fan	11
COIL (Fig. VI)	M		J	Bc	- Coil	12
	N				- Coil	12
	G		M-Bc		+ Coil	13
	M-Bc		M-Bc	Bl	+ Coil	13

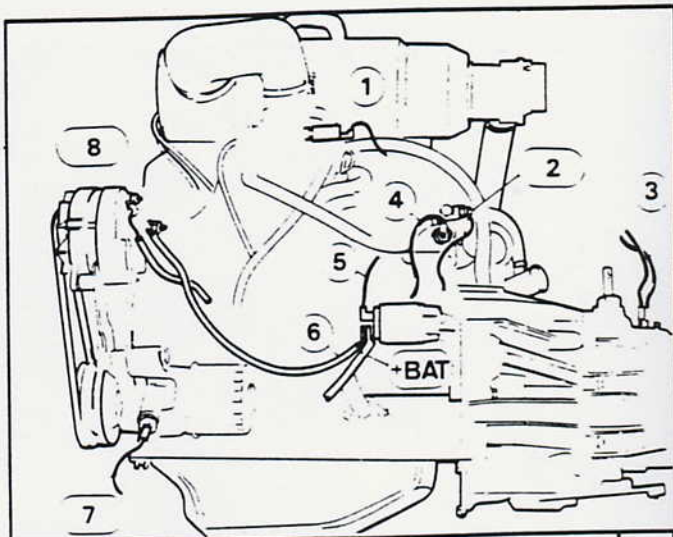
IMPORTANT. Carry out the additional essential operations :

OPERATION	OVERHAULED ENGINE
RETIGHTEN CYLINDER HEAD ADJUST VALVE CLEARANCES	1) Before returning to customer - After first warm-up 2) After 1000/1500 miles depending on engine No.
DRAIN ENGINE OIL REPLACE FILTER CARTRIDGE ADJUST VALVE CLEARANCES	NEW, OVERHAULED OR STANDARD EXCHANGE ENGINE
	After 1000 to 1500 miles

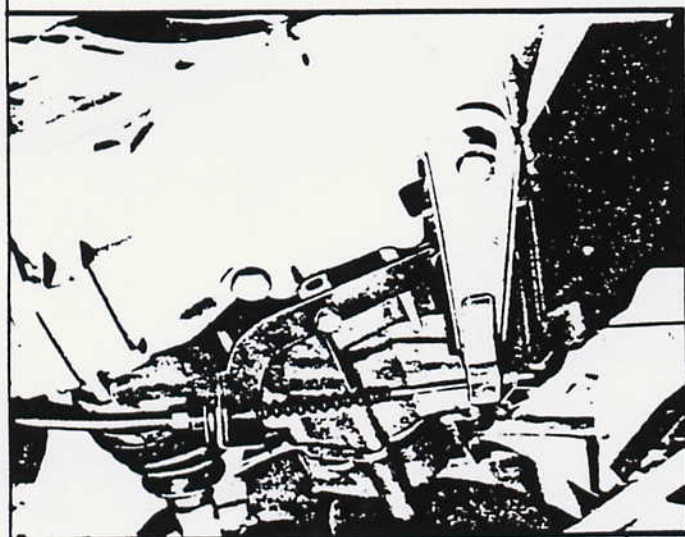
NOTE : See the section entitled « Retightening the cylinder head ».



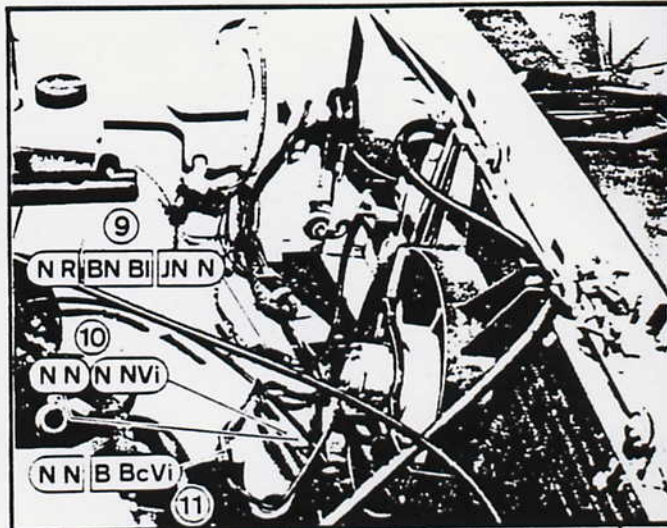
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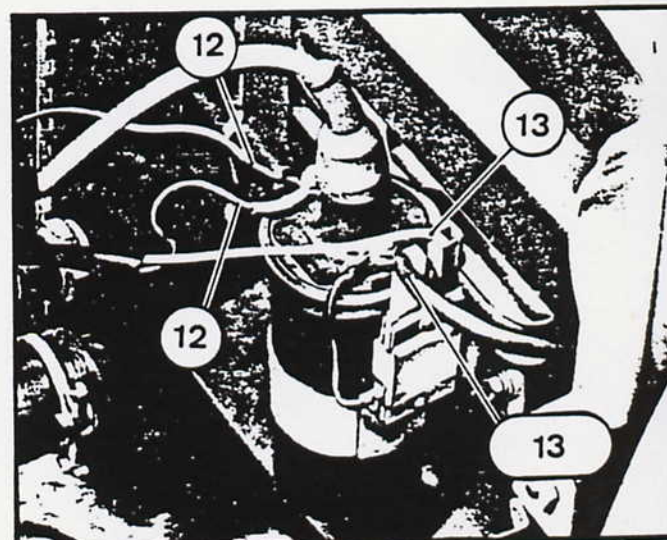
II



V



III



VI

ENGINE OVERHAUL

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A5.001

Page

Special tools

A5.002 and 003

Dismantling

A5.004 and 013

Requirements prior to dismantling

A5.014

Reassembling

A5.014 to 041

Comprising :

Checking the connecting rods

A5.014

Preparing the crankshaft

A5.014 to 018

Crankshaft end float

A5.018 and 019

Fitting the rear main bearing

A5.018 to 021

Flywheel and clutch

A5.021 and 022

Liner protrusion

A5.022 to 025

Assembling the pistons, piston rings and connecting rods

A5.026

Camshaft - timing gear

A5.028 to 033

Crankshaft pulley

A5.033

Adjusting the graduated timing plate

A5.033

Cylinder head - adjusting the valve clearances

A5.037 and 038

ENGINE OVERHAUL

SPECIAL TOOLS

From kit 8.0110 ZW :
(fig. A, B, C and D)

Fig. A :

BZ - Tool for fitting the rear main bearing side seals.

C1 - Set of 2 shims.

D2 - Spacer for cutting off the side seals.

Fig. B :

GY - Dial indicator fixture comprising :

G1 - support

G2 - end fitting

H - Dial indicator support

8.0118 FZ

— Adjustable dial indicator holder.

Fig. C :

8.0132 A1Z

— Set of 2 liner retaining clamps.

M - Set of 4 bolts M12 x 150 (yellow)

R - Plug for fitting the seal and centralising the timing cover.

8.0144 R

— Liner extractor plate.

Fig. D :

8.0132 K

— Crankshaft spigot bush extractor comprising

K1 - body

K4 - claws

K5 - long bolt

S - Drift for fitting the spigot bush.

Fig. E :

8.0115 Y

— Cylinder head guides.

8.0129 ZZ

— Tool for tightening cylinder head bolts by the angular method.

(-).0158

— Tool for tightening cylinder head bolts by the angular method.

Fig. F :

8.0128

— Liner compression tool.

8.0212

— Clutch plate centralising mandrel.

TOOLING TO BE MADE LOCALLY

Fig. G :

0.0149

— Set of 2 cylinder head releasing levers.
(material : 16 mm Ø drawn steel bar).

TIGHTENING TORQUES (Torque wrench)

Crankshaft plugs 5.5 mdaN (55 Nm, 40 lbf ft)

Crankshaft counterbalance weights

6.75 mdaN (67.5 Nm, 50 lbf ft)

Crankshaft main bearings

7.5 mdaN (75 Nm, 55 lbf ft)

Flywheel 6.75 mdaN (67.5 Nm, 50 lbf ft)

Big-end caps (4 mdaN (40 Nm, 30 lbf ft)

Crankshaft pulley 17 mdaN (17 Nm, 125 lbf ft)

Oil filter base (thread coated with Loctite)

1.3 mdaN (13 Nm, 10 lbf ft)

Cylinder head (angular tightening method)

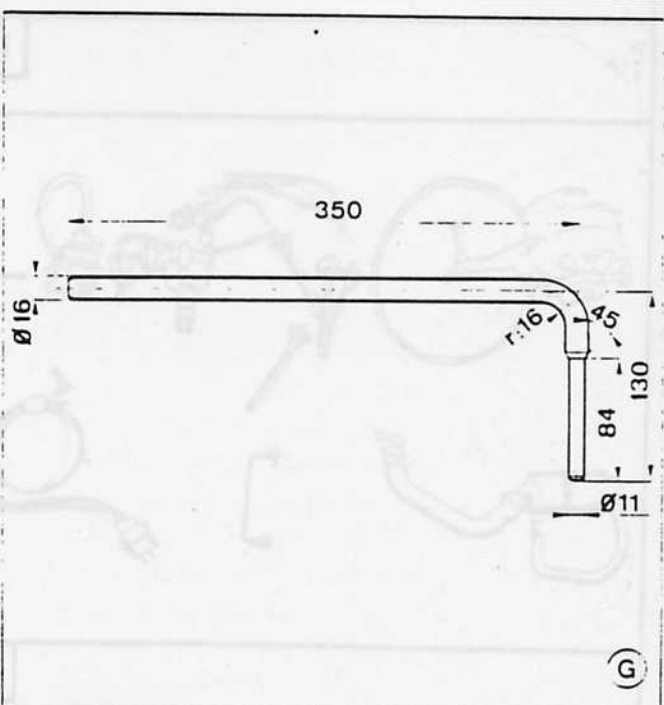
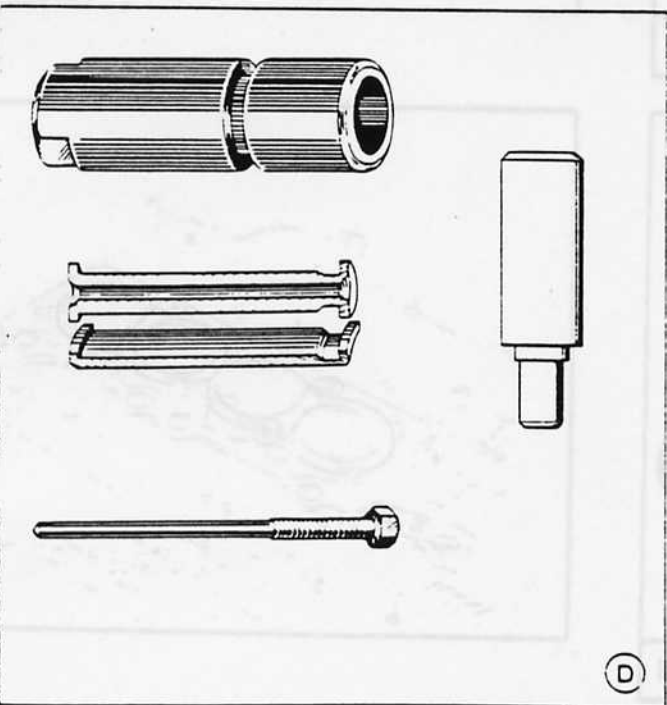
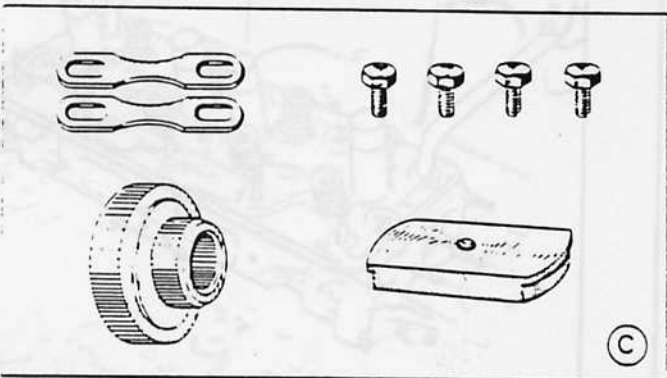
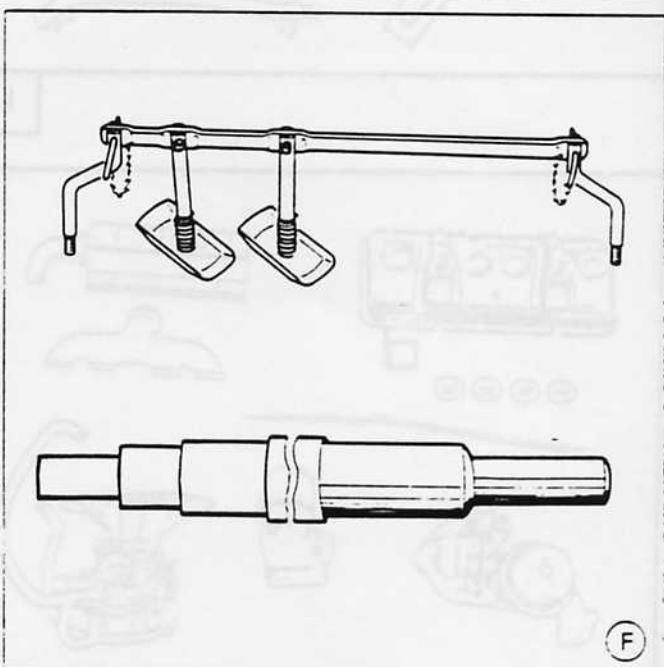
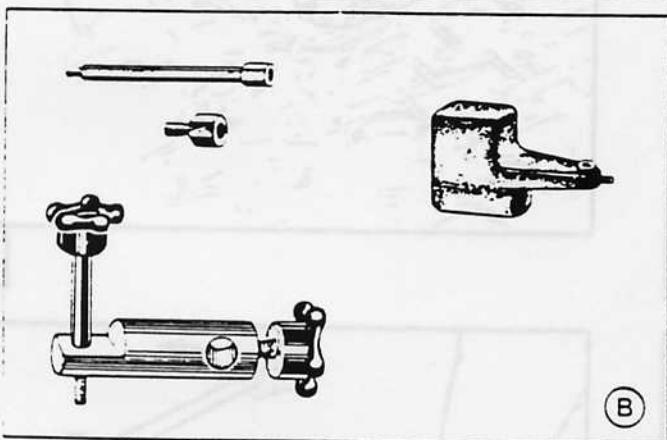
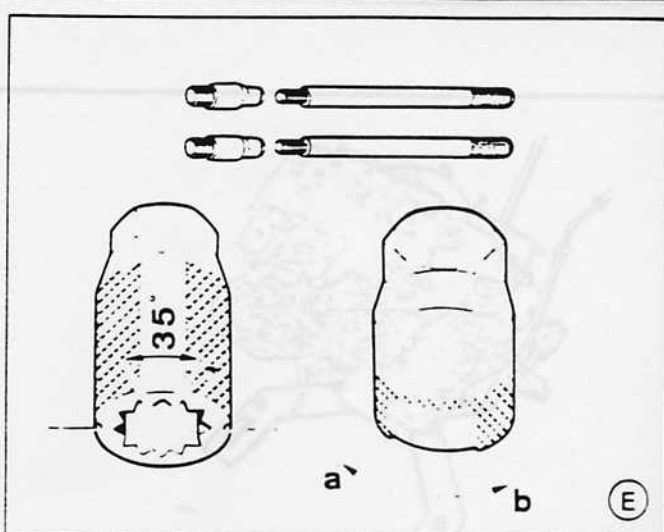
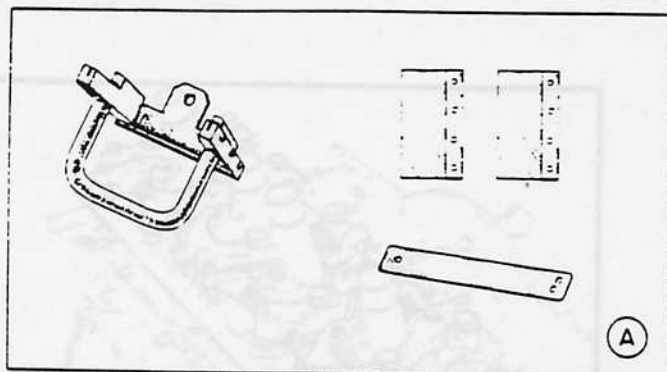
See method

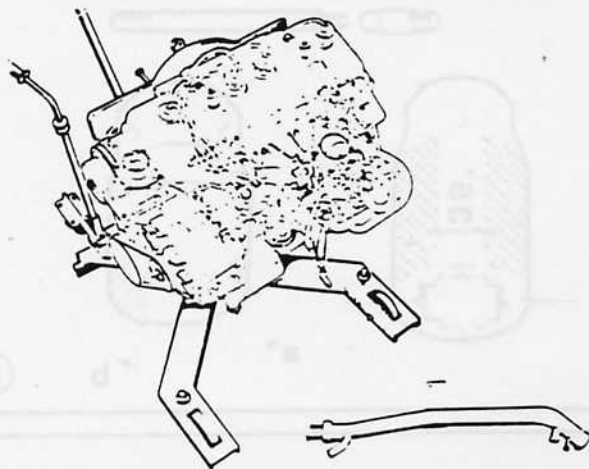
Water pump fastenings :

- 8 mm nuts 2.25 mdaN (22.5 Nm, 17 lbf ft)

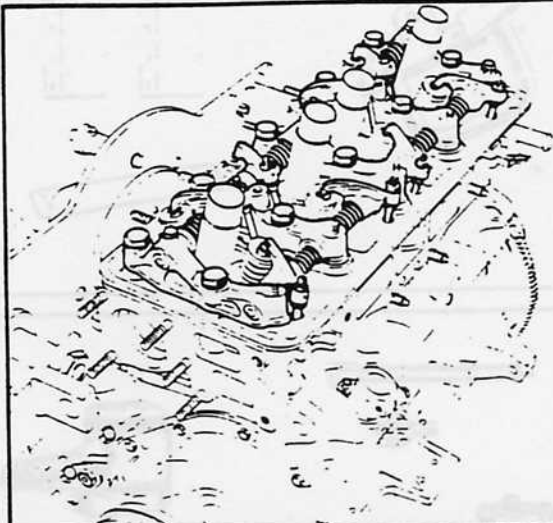
- 10 mm nuts 4,25 mdaN (42.5 Nm, 31 lbf ft)

- 10 mm bolts 2.75 mdaN (27.5 Nm, 20 blf ft)

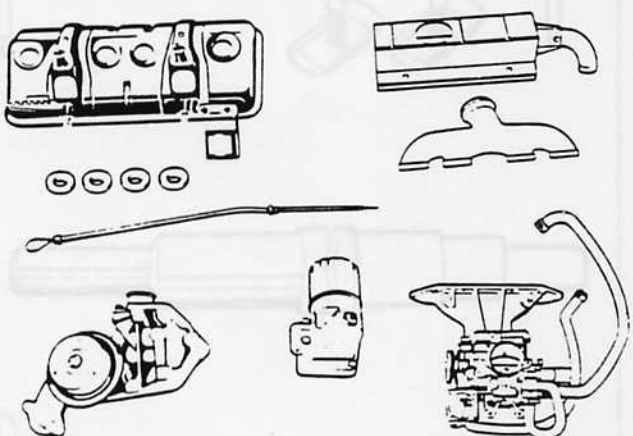




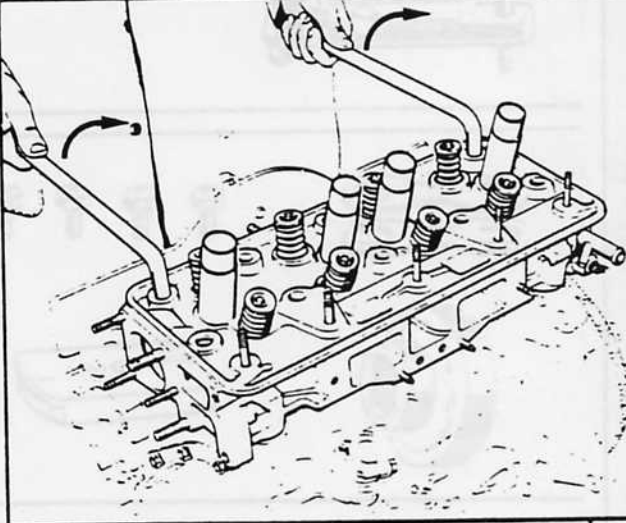
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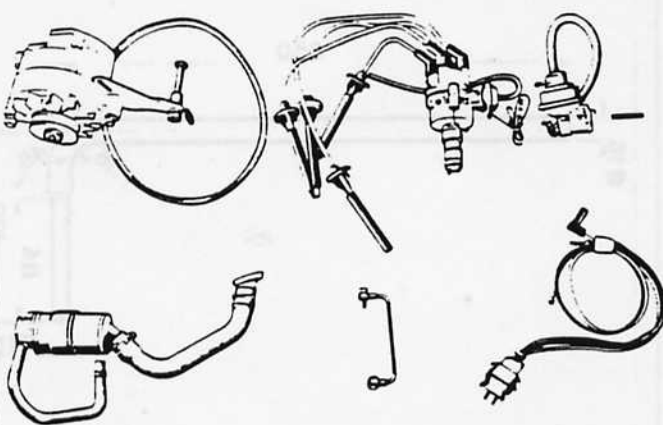
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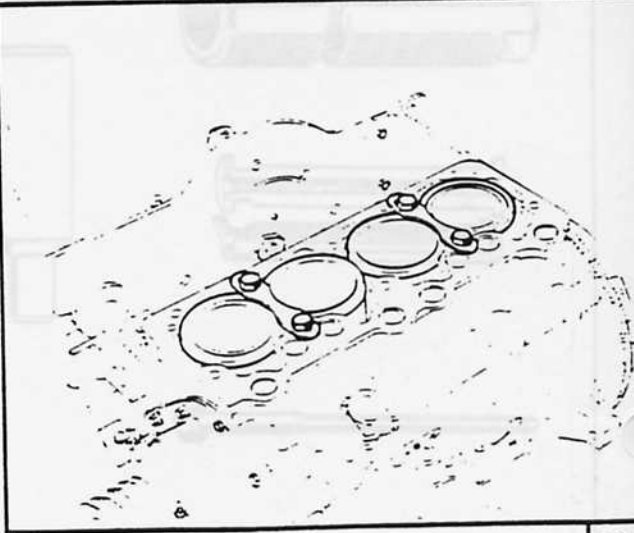
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V



III



VI

ENGINE
OVERHAUL

1

A5.005

Mount the engine on the DESVIL stand, fig. I, after having first removed the rear water hose.

Remove, as shown in fig. IV

- the 5 nuts that secure the rocker shaft,
- the 10 cylinder head bolts,
- the rocker shaft assembly,
- the push rods (mark their respective positions as they are removed).

Remove the components parts as shown in fig. II and III.

Free the cylinder head, fit V, using levers 0.0149 to tilt it.

Retain the liners fig. VI, using clamps 8.0132 A1Z.

ENGINE
OVERHAUL

Remove, fig. I :

- the tappets (marking their respective positions),
- the distributor support,
- the distributor drive shaft.

Remove, fig. IV :

- the clutch mechanism, retrieving the friction disc,
 - the flywheel,
- (lock the crankshaft with a wood block).

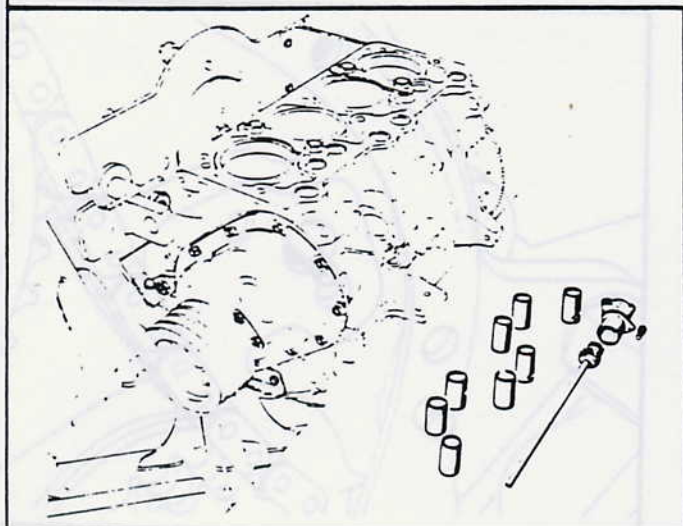
Remove the sump, fig. II.

Remove, figs. V and VI

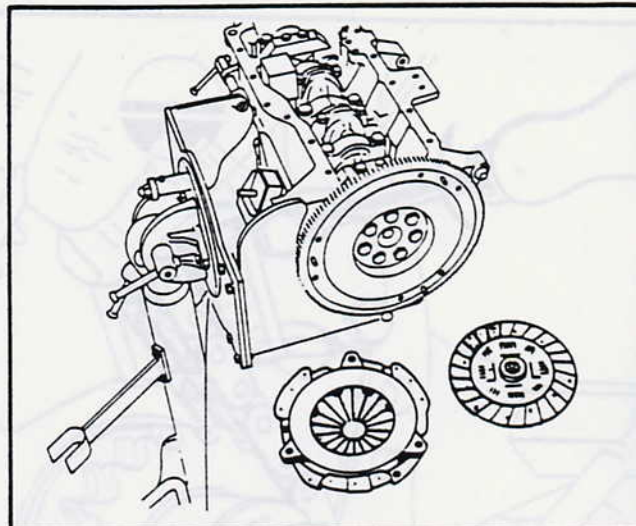
- the crankshaft pulley.

Remove the oil pump, fig. III.

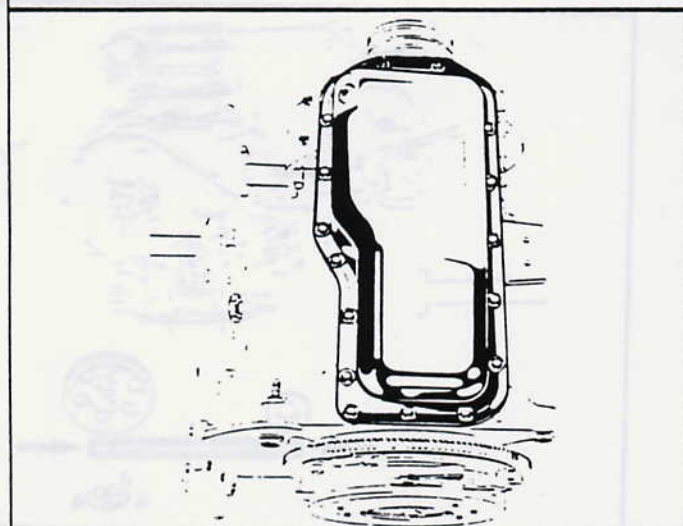
- the timing cover.



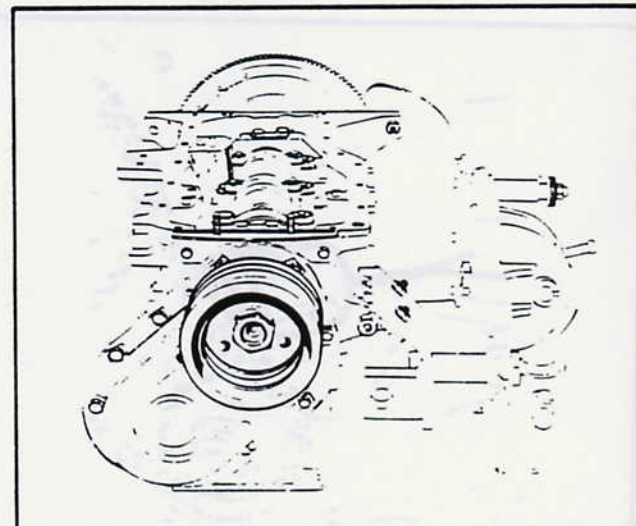
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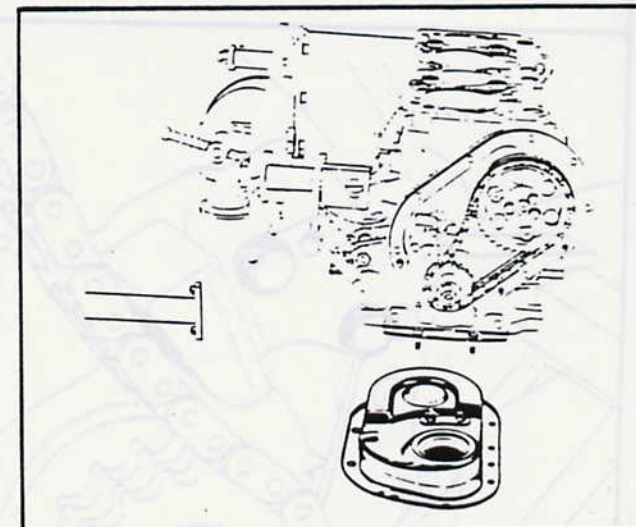
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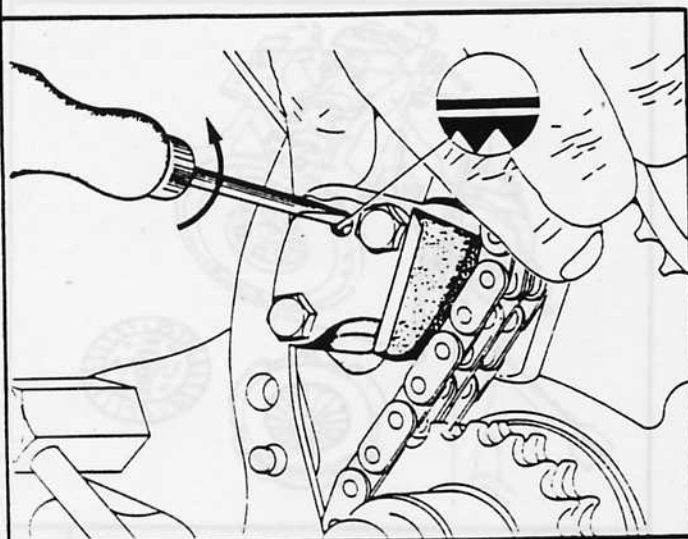
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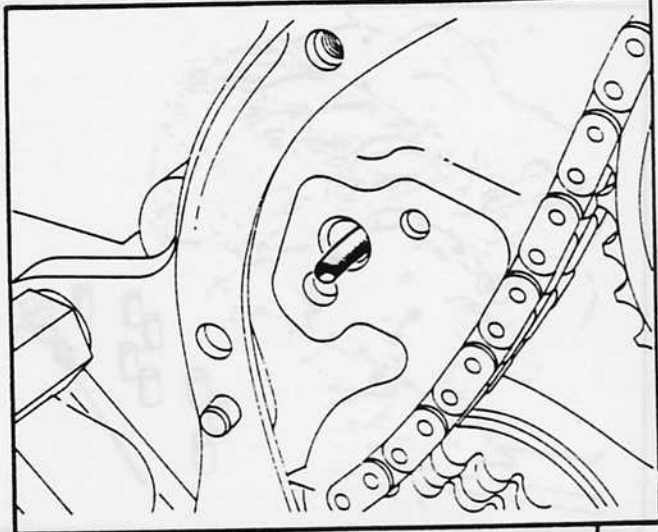
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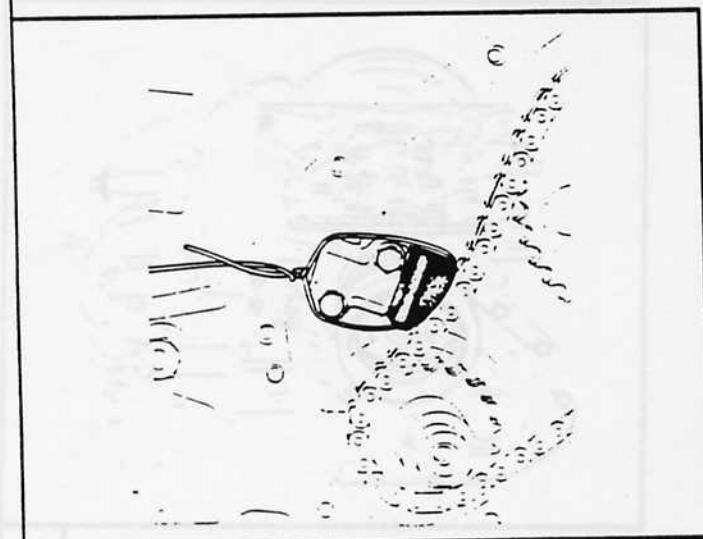
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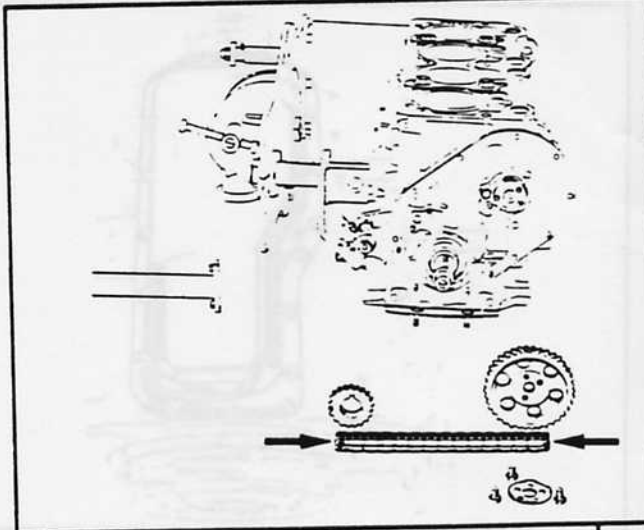
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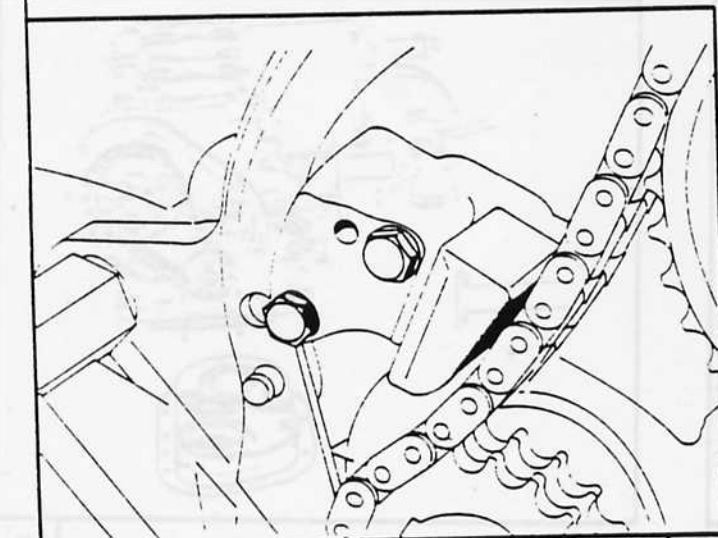
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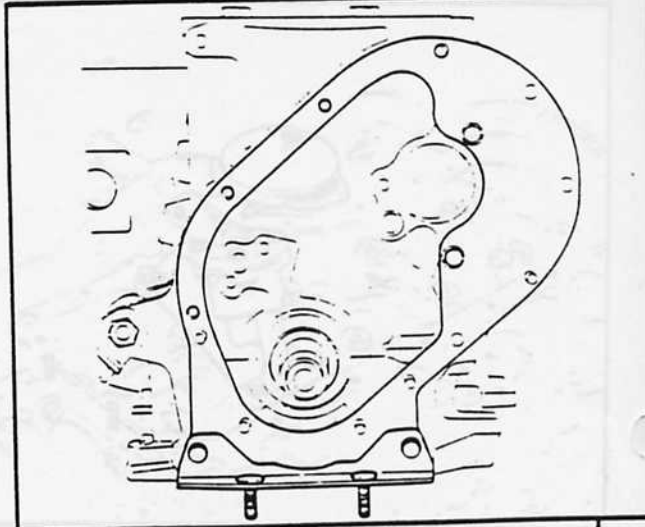
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V



III



VI

Locking the chain tensioner

Put aside the filter, fig. IV :

SEDIS type tensioner, fig. I

- release the rack by positioning the ratchet as shown in the illustration,
- press the pad,
- lock the rack by turning the ratchet to the left.

RENOLD type tensioner, fig. II :

- secure the pad with a length of wire.

Remove, figs. V and VI

- the camshaft chain wheel,
- the chain,
- the crankshaft chain wheel,
- the camshaft.

(If there are no timing marks on the chain, mark the links as shown in fig. V).

Fig. III — remove the 2 tensioner securing bolts and remove the tensioner.

- the timing cover back plate.

The big-end c-ps, fig. I :

— the bearing half-shells.

Ensure that the big-end caps are marked with identification marks.

IF THEY ARE NOT, mark them.

The main bearing caps, fig. II :

Check that the caps have been marked with identification marks as follows :

a) Dabs of paint :

BEARING	No.	COLOUR
REAR	1	NONE
INTER. REAR	2	RED
CENTRE	3	GREEN
INTER. FRONT	4	WHITE
FRONT	5	BLUE

b) Cast-in reference marks
(on the flywheel end).

1 reference mark on caps 4 and 5,
2 reference mark on caps 2 and 3

IF THERE ARE NO REFERENCE MARKS,
apply them.

Remove, figs. III and IV :

- the crankshaft,
- The crankshaft end float thrust washers.

Extract the piston and connecting rod assembly, fig. V :

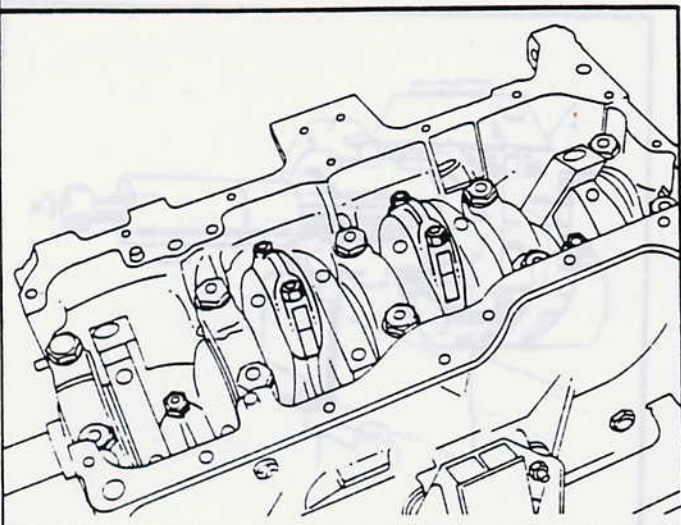
Refit the big-end caps to their respective connecting rods.

Number the connecting rods 1 to 4.

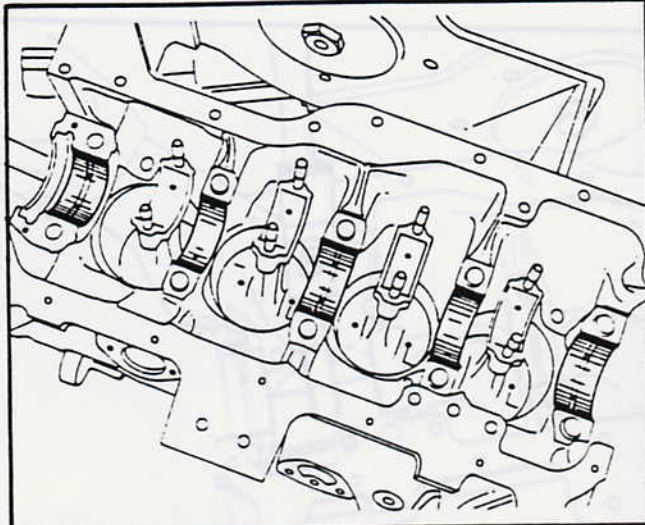
Disconnect, the connecting rods from the pistons, fig. VI.

Remove the gudgeon pin retaining circlips with the end of a scriber.

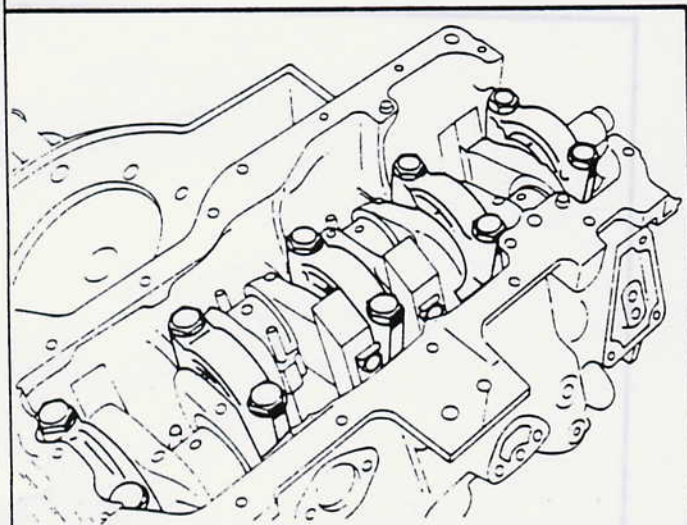
Push out the gudgeon pins by and.



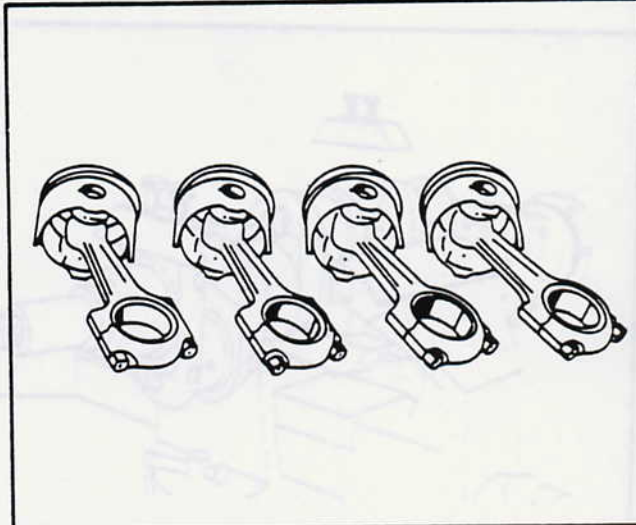
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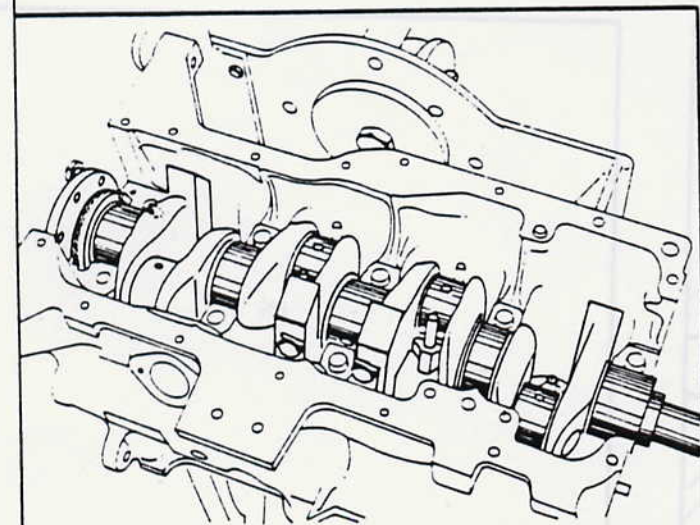
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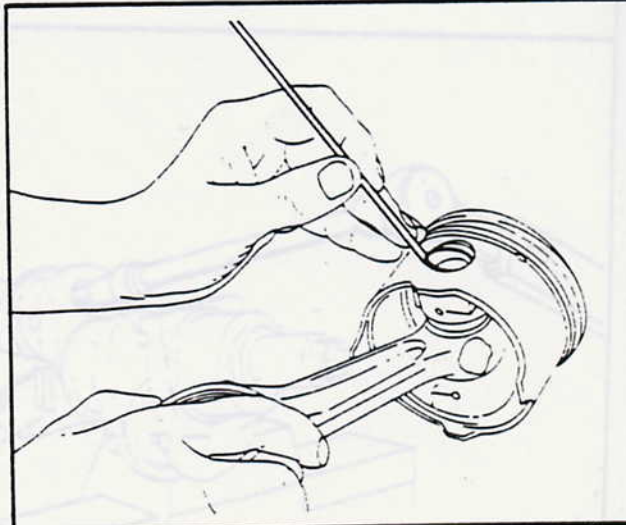
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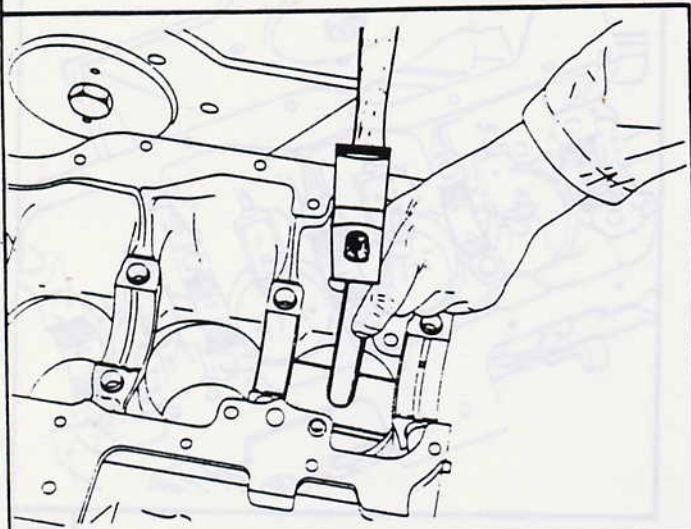
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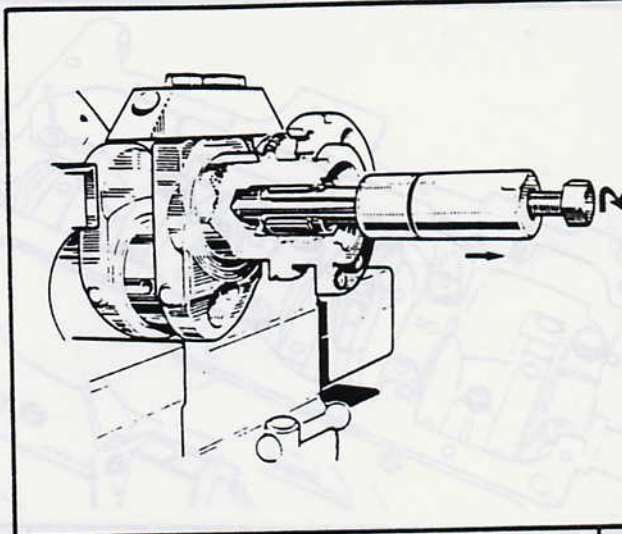
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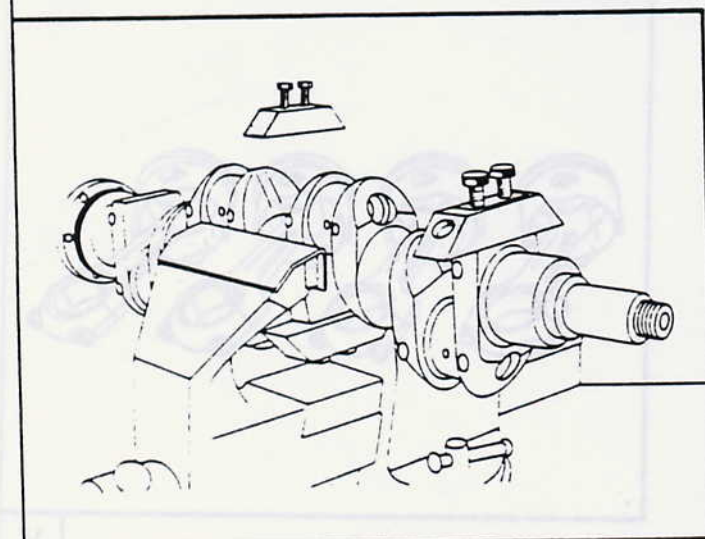
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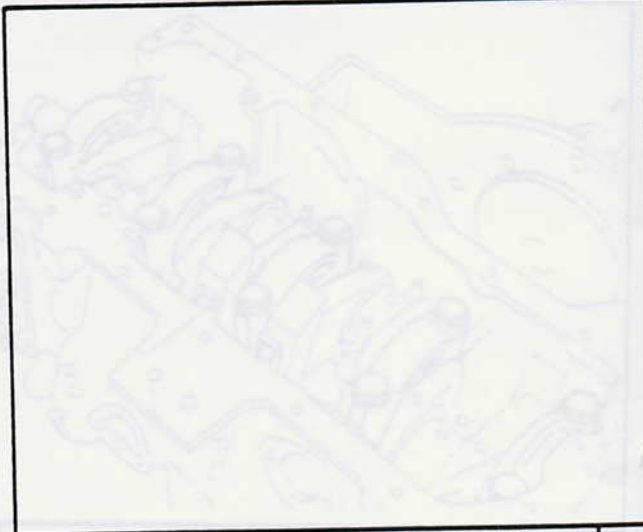
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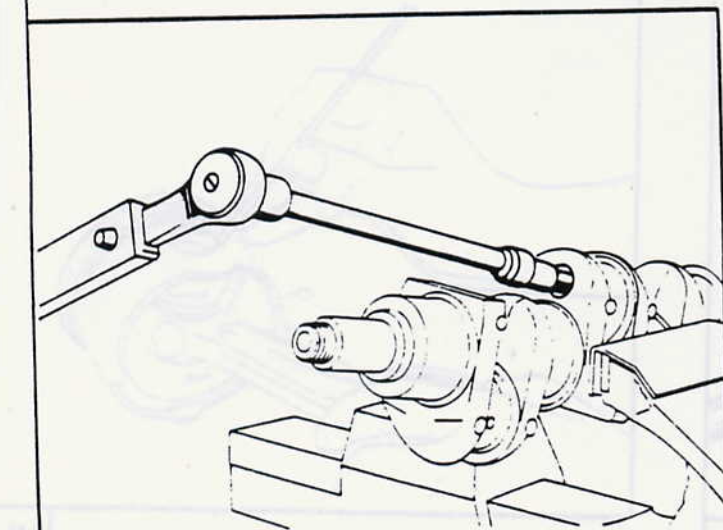
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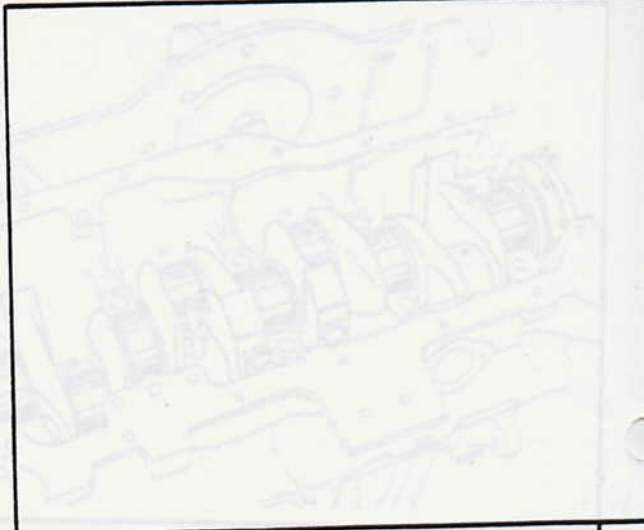
II



V



III



VI

**ENGINE
OVERHAUL**

1

A5.013

Remove the liners, by hand or by using plate 8.0144 R, fig. I.

Remove the drive gear locating bush, fig. IV.

Use special tool assembly 8.0132 K which consists of parts K1, K4 and K5.

Mark and remove the counterbalance weights, fig. II.

Remove the sludge trap plugs, fig. III.

Clean out the sludge traps and the oil galleries

ENGINE OVERHAUL

REFITTING

PRIOR REQUIREMENTS

Cleaning the gasket and joint faces

- Never clean these faces with an abrasive or a sharp edged tool. There should be no impact marks, scores or burrs on the gasket and joint faces.
- Use the special stripper (pt. no. 9731.25), scrupulously observing the instructions for use.

Lubricate the various engine components with engine oil as they are fitted.

Consult the relevant sections for information on refacing the cylinder head, recutting the valve seats, regrinding the crankshaft, etc.

Preparation :

- Use only parts that are clean and free from defect.
- When refitting original components, retain the same matched assemblies and follow the position and direction marks made during dismantling.
- Retain new components in their correct matched assemblies.
- Automatically replace all seals and locking washers.

Checking the connecting rods, figs. I and II :

- Check the condition of the big-end bolts.
- There should be no signs of overheating.
- There should be no signs of picking-up in the small end and big-end bores.

NOTE - The big-end bolts should not be replaced.

They can, however, be replaced individually if the threads is damaged.

- Ensure that the oil jet is not blocked.

Preparing the crankshaft

Sludge trap plugs

- Clean the thread, fig. III, by screwing and M24 x 1,50 plug tap down the thread (depth 10 mm).

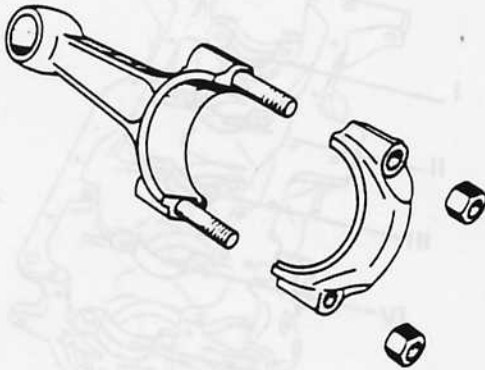
- Screw-in a new plug as shown in fig. IV and tighten it to a torque of 5.5 m.daN (55 Nm, 40 lbf ft).

- Lock it fig. V by marking a punch mark half on the plug and half.

Counterbalance weights

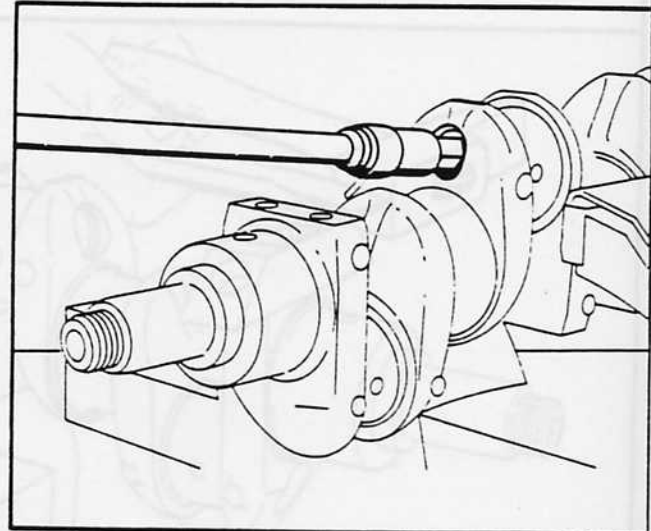
- Fit the counterbalance weights, fig. VI, following the marks made during dismantling.

- Tighten the bolts to a torque of 6.75 m.daN. (67.5 Nm, 50 lbf ft).



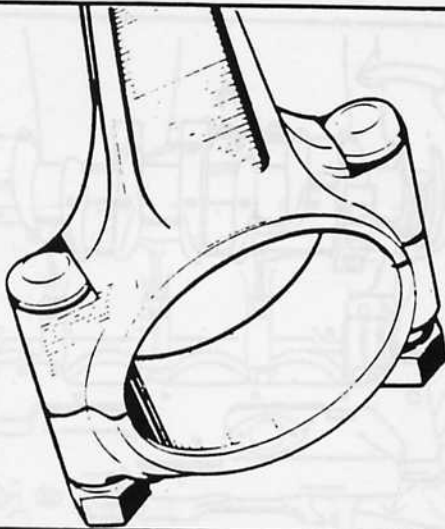
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I



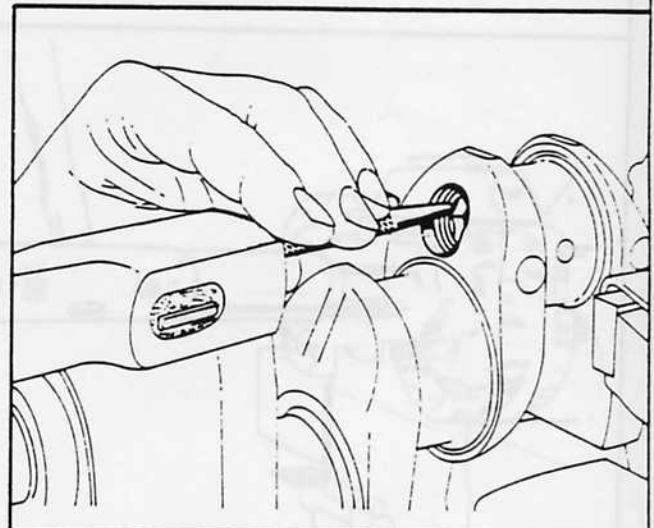
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IV



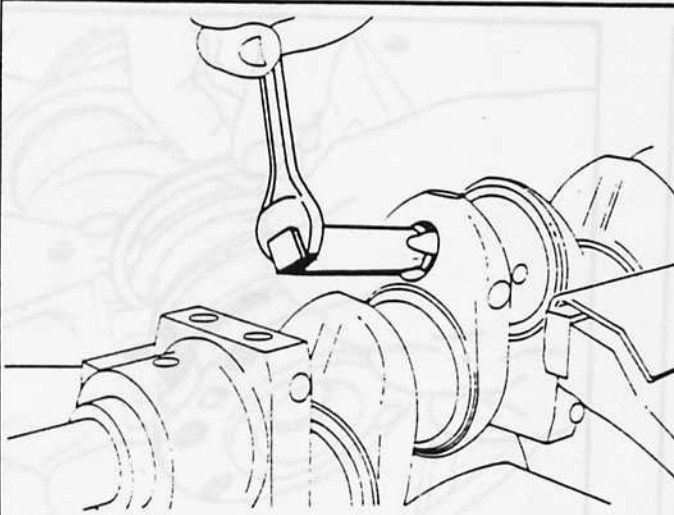
11 - 05 - 81 - 3 - A

II



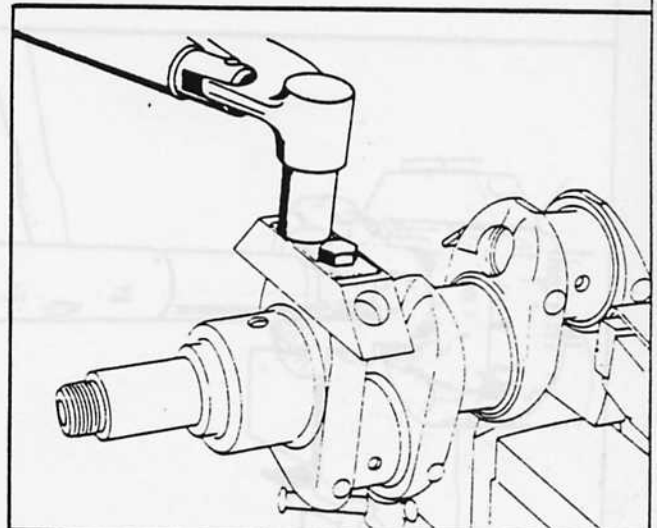
26 - 06 - 76 - C70 - L - A

V



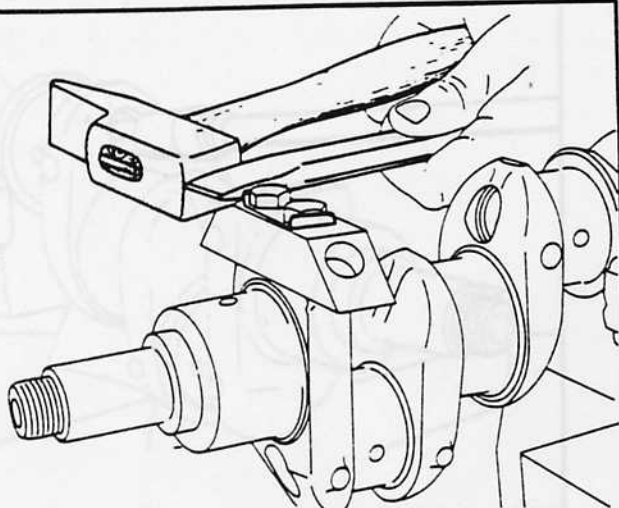
26 - 06 - 76 - C60 - L - A

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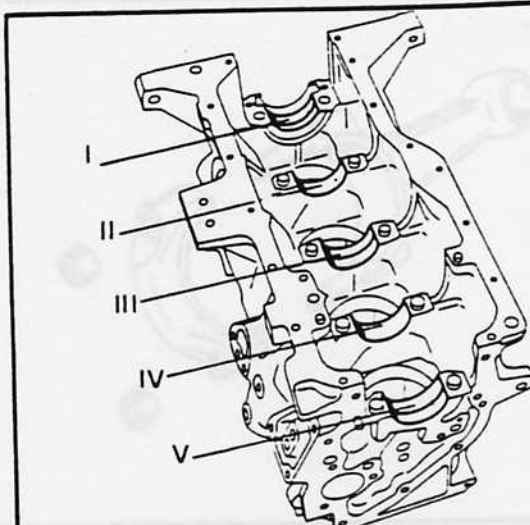
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VI



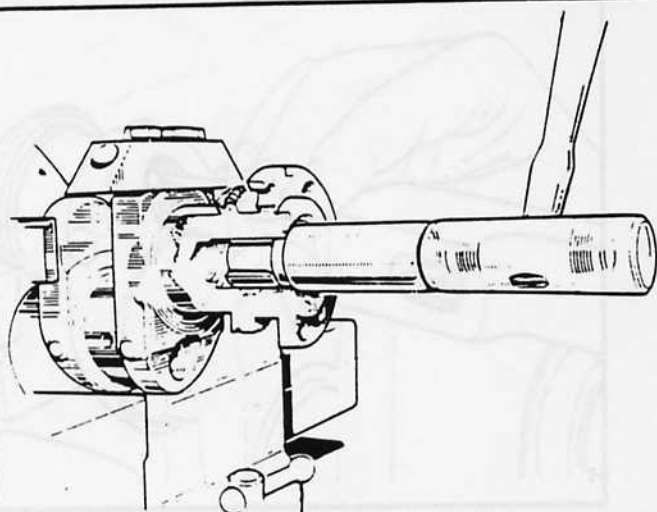
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I



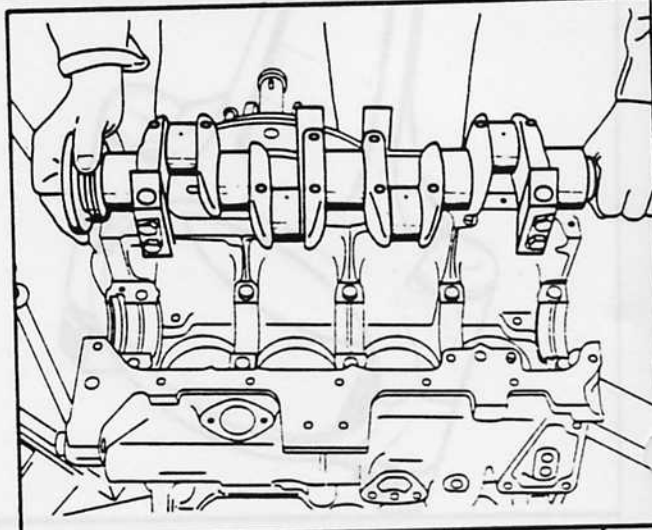
21 - 05 - 80 - C97 - L - A

IV



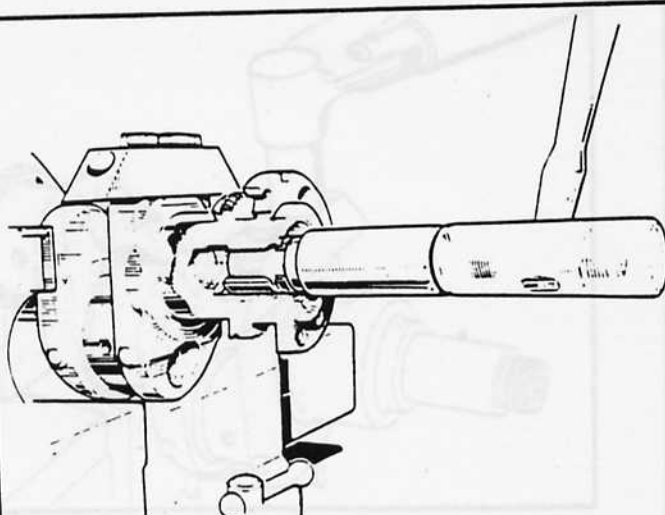
11 - 05 - 81 - 4 - A

II



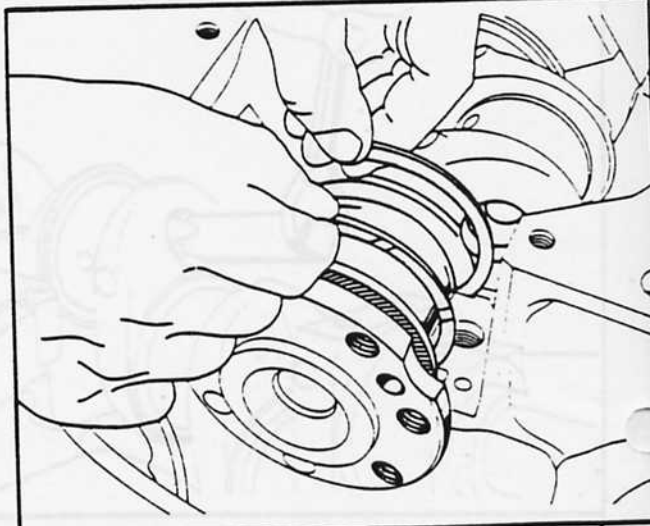
21 - 05 - 80 - C99 - L - A

V



11 - 05 - 81 - 5 - A

III



21 - 05 - 80 - C83 - L - A

VI

Preparing the crankshaft (continued)

Fit :

Fold up the locking plate fig. I.

- Fig. IV the main bearing half-shells.
- 1st type crankshafts WITH sludge plugs :
 - 2 GROOVED shells to bearings (I), (III) and (V)
 - 2 PLAIN shells to bearings (III) and (IV).
- 2nd type crankshafts WITHOUT sludge plugs :
 - 5 GROOVED shells in the cylinder block,
 - 5 PLAIN shells in the bearing caps.

Refit, using tool 8.0110.S.

- Fig. V the crankshaft, taking great care when lowering it into place.

- The clutch spigot bush, fig. II, with its chamfer towards the outside.

- the lip seal, fig. III as illustrated.

- Fig. VI crankshaft end float thrust washers, initial thickness of 2,30 mm.

- Moderately oil the bush and seal.

The LUBRICATION GROOVES must be towards the crankshaft.

ENGINE
OVERHAUL

Fit the main bearing caps and their half-shells, fig. I.

Follow the identification and marks made during dismantling.

Refit the rear main bearing cap fig. II, without its side seals but end float thrust washers, initial thickness of 2.30 mm.

THE LUBRICATION GROOVES must be against the crankshaft.

Tighten the bearing caps to torque of 7.5 m.daN (55 lbf ft), fig. III.

Crankshaft end float

– Fit the dial indicator supports 8.0100 GY and 8.0118 FZ, fig. IV, then fit dial indicator 8.1504.

– Measure the crankshaft end float it should be between 0.08 mm and 0.20 mm.

Thrust washers of the following thicknesses are available : 2,30, 2,35, 2,40, 2,45 and 2.50 mm.

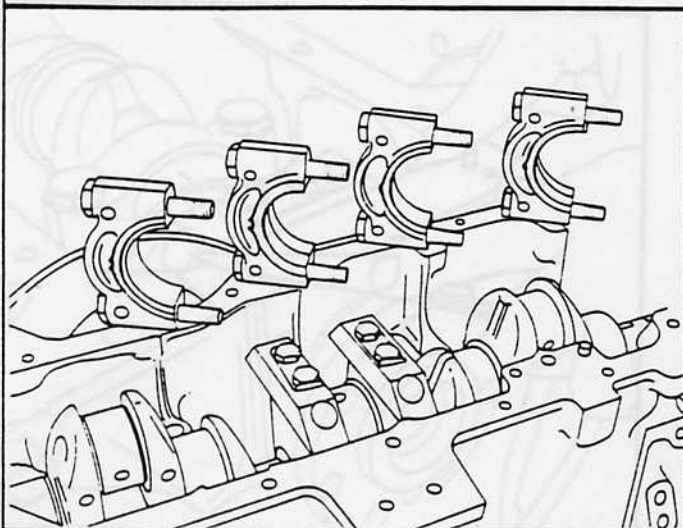
IMPORTANT - If the end float is greater than 0.20 mm **REPLACE THE THRUST WASHERS** which are behind the bearing, as shown in fig. V.

If the end float is less than 0.08 mm, **LOOK FOR THE CAUSE**. There could be a foreign body between a bearing cap and the cylinder block, a burr or an impact mark or a distorted end float thrust washer.

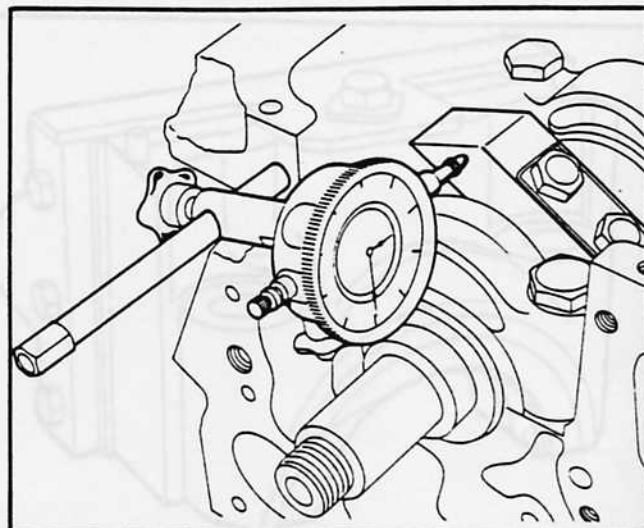
Fitting the rear main bearing and side seals.

– Remove the rear main bearing cap.

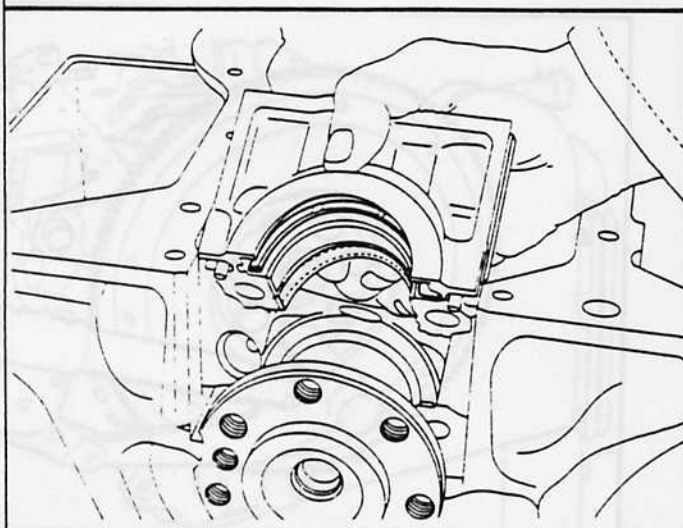
Fit shims 8.0110 C1 as shown in fig. VI to tool BZ, to obtain the minimum spacing.



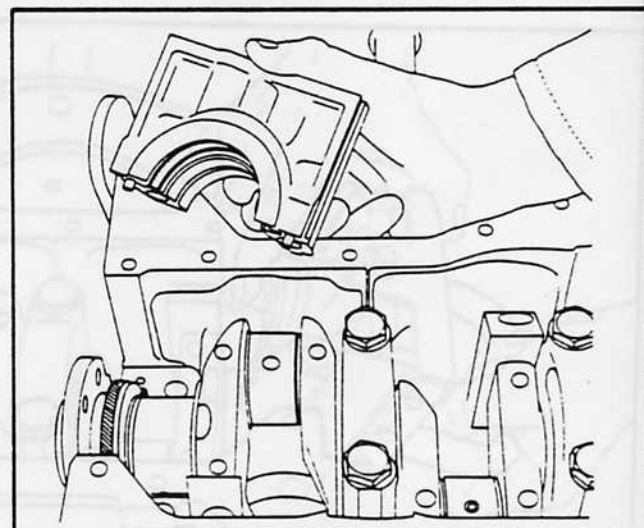
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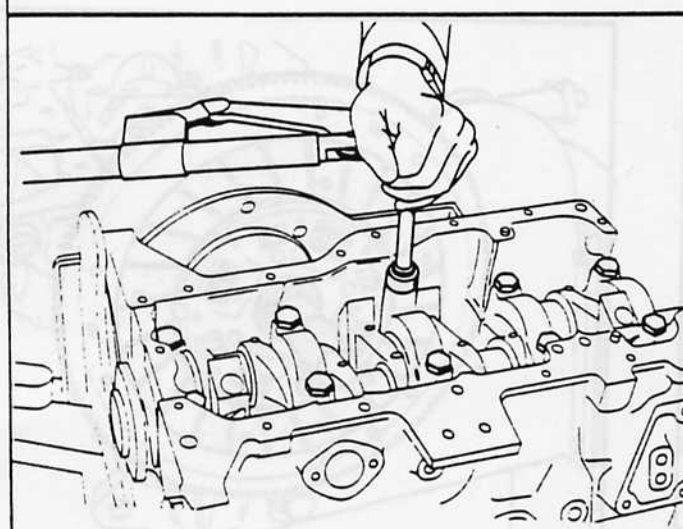
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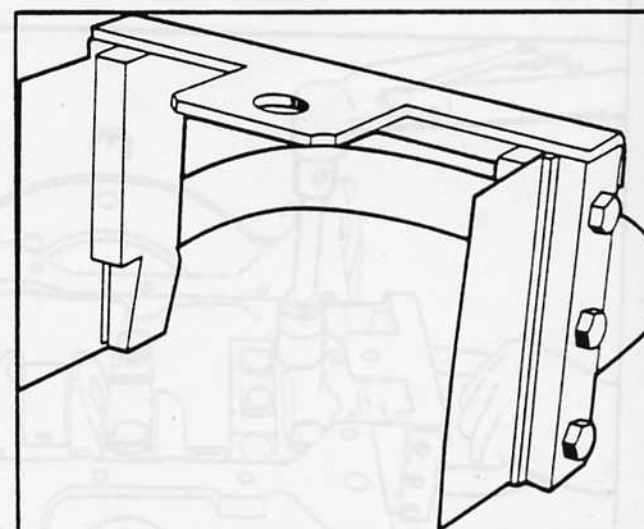
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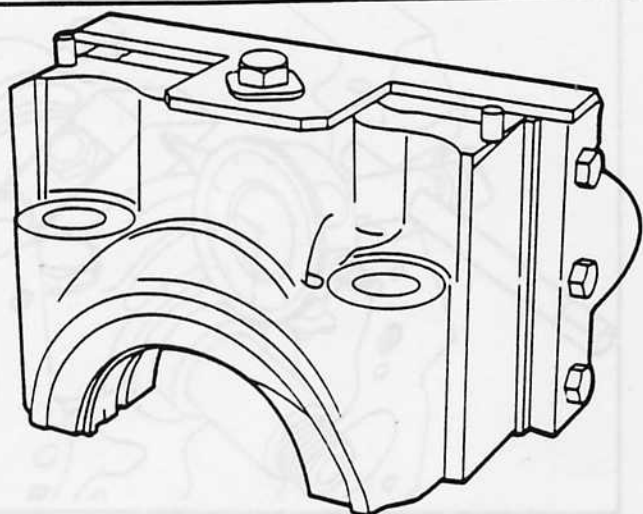
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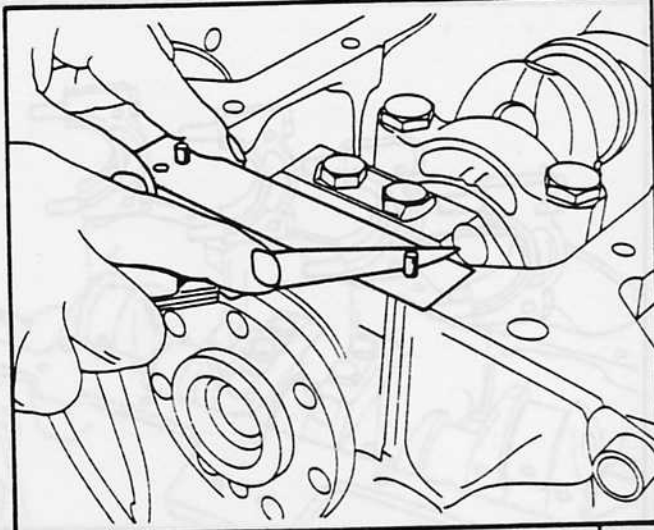
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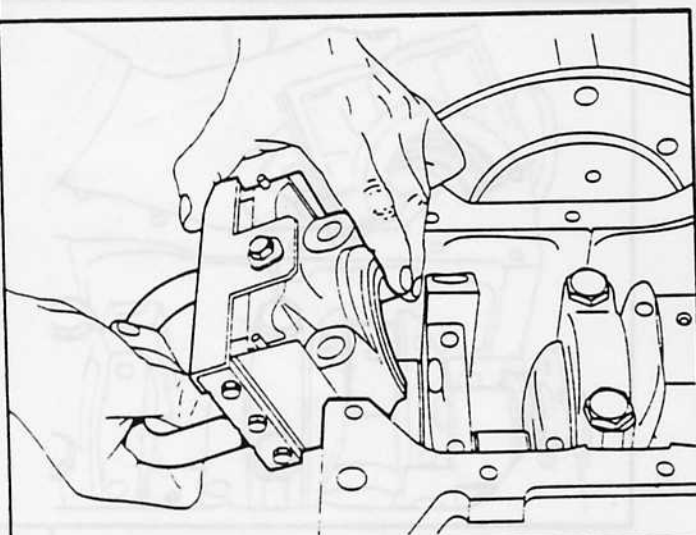
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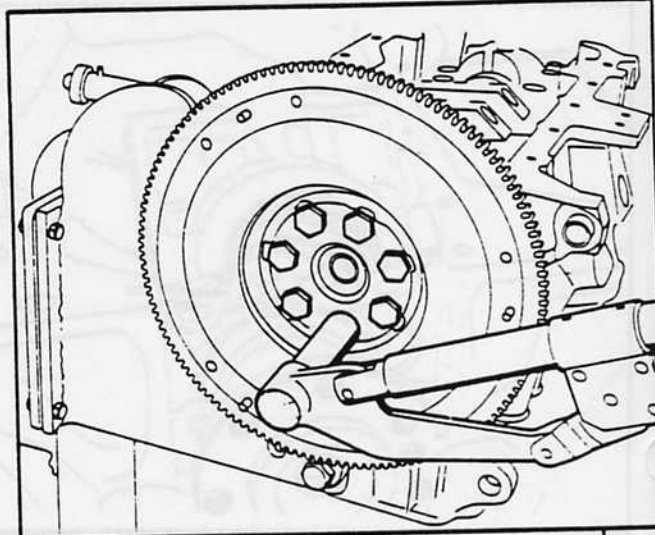
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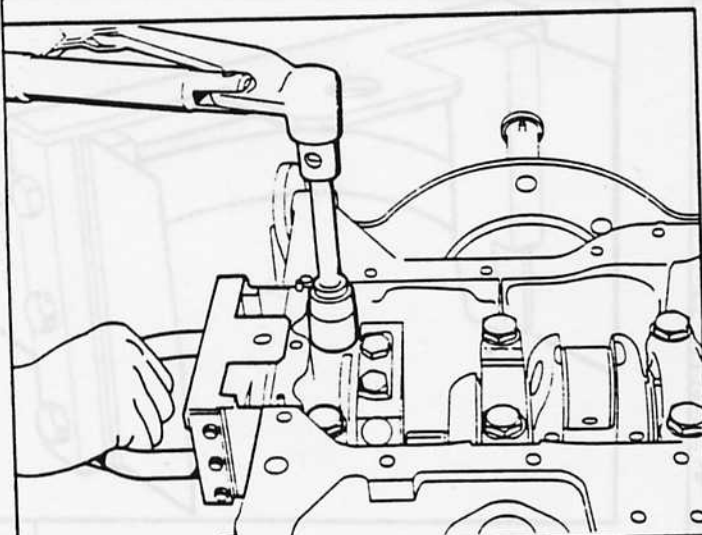
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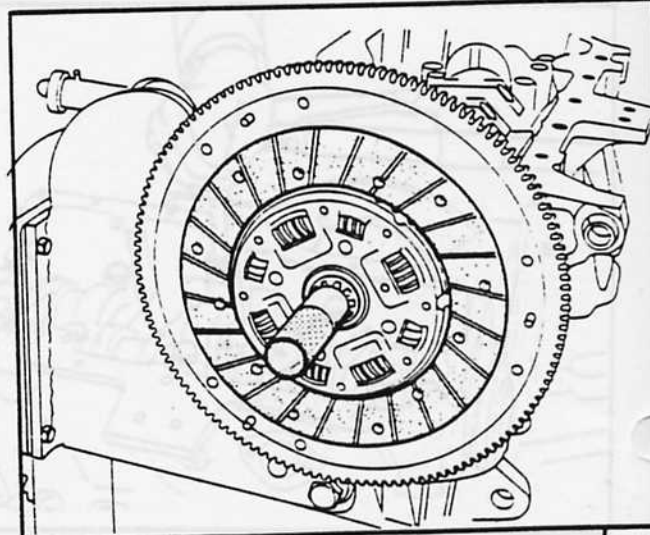
II



V



III



VI

ENGINE
OVERHAUL

1

A5.021

Fitting the rear main bearing and side seals
(contd.).

Cut off the side seals, fig. IV, using the 2 mm
spacer, Pt. No. 8.0110 D2

Hold new rubber seals against the bearing cap,
fig. I.

Lubricate the shims, retighten the shims, tilt
the assembly, fig. II and insert it into the
cylinder block.

Fit the flywheel, fig. V.

Fit a new locking plate.

Coat the bolts with Loctite ordinary thread
locking compound.

Tighten the bolts to a torque of 6.75 m.daN
(67,5 Nm, 50 lbf ft).

Fit the bolts, fig. III.

Centralise the clutch friction disc using
mandrel 8.0207 fig. VI.

Remove tool 8.0110 BZ.

Tighten the bolts to a torque of 7.5 m.daN
(75 Nm, 55 lbf ft).

ENGINE OVERHAUL

Fit the clutch mechanism, fig. I.

Tighten the bolts (fitted with new locking washers) to a torque of 1.5 m.daN (15 Nm, 11 lbf ft).

The maximum difference between (A), (B), (C) and (D) should be less than 0.07 mm.

If the difference is greater than 0.07 mm.

Look for the cause and if necessary change the position occupied by the liner.

Fit the liners, fig. II, without their seals, positioning the flats as shown in the illustration.

Mark the liners 1 to 4, fig. V.

IMPORTANT - Ensure that the pistons and liners are retained in their original matched assemblies.

Liner protrusion


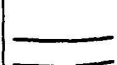
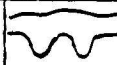

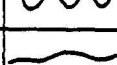
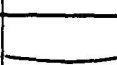
Select a seal so that the liner protrusion, at the highest point, is between 0.07 and 0.14 mm, as near 0.14 mm as possible :

Liner seals

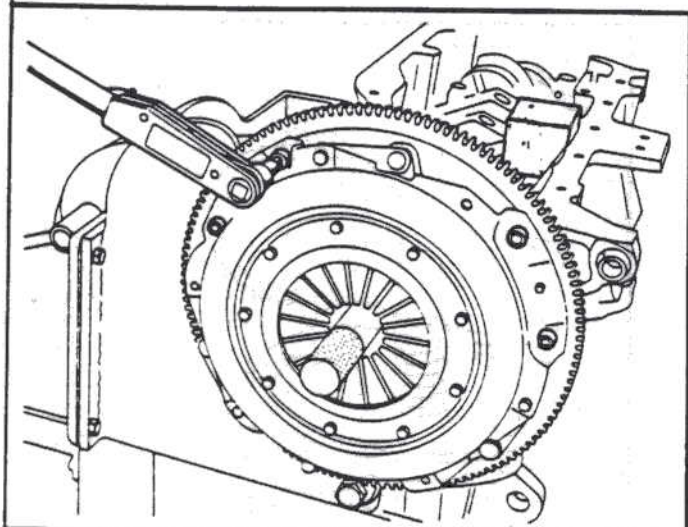
paper and white synthetic fibre → 07/85, steel plated with aluminium.

Zero the dial indicator on the cylinder block, fig. III and measure the height of each of the liners at points (A), (B), (C) and (D) as shown in fig. IV.

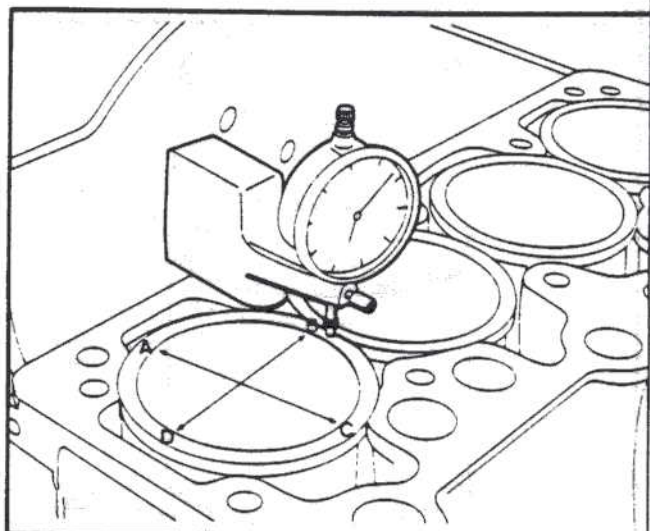
NOTE the highest liner protrusion.

The highest point on the liner, without the seal (mm)	LINER SEAL TO BE FITTED			
	→ 07/85 paper	Thick- ness		→ 07/85 steel
from + 0.039 to + 0.045		0.07	0.10	
from + 0.019 to + 0.038		0.085		0.12
from - 0.006 to + 0.018		0.105	0.15	
from - 0.095 to - 0.007		0.130		

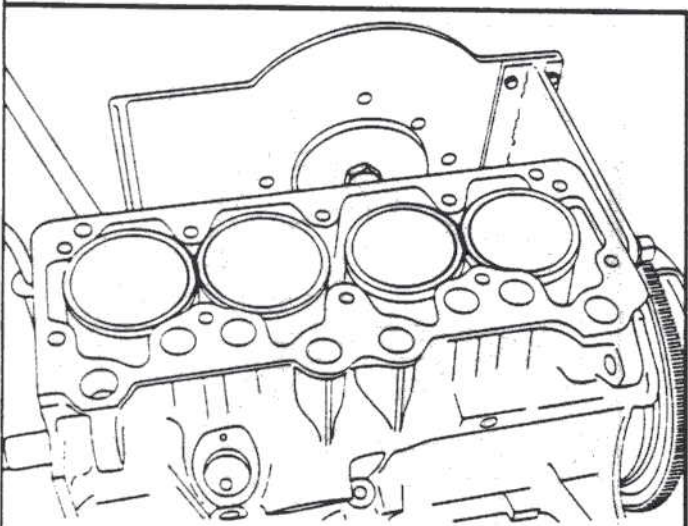
IMPORTANT - Use only one seal per liner.



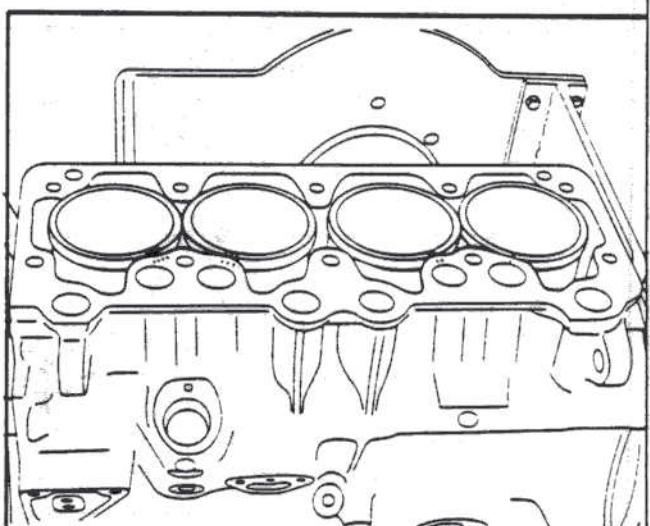
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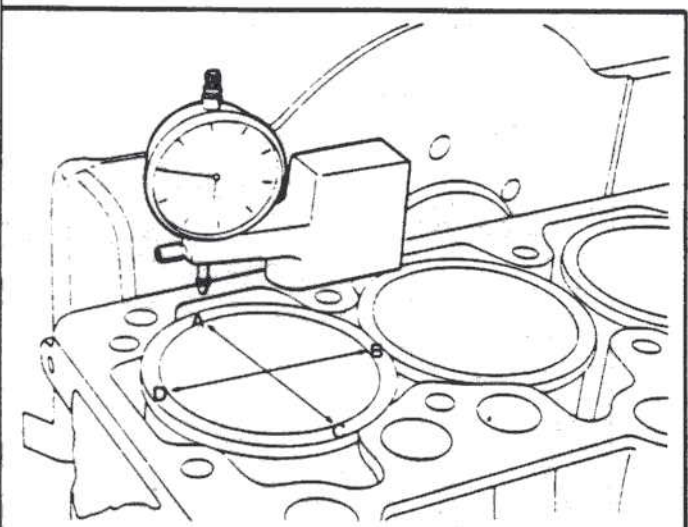
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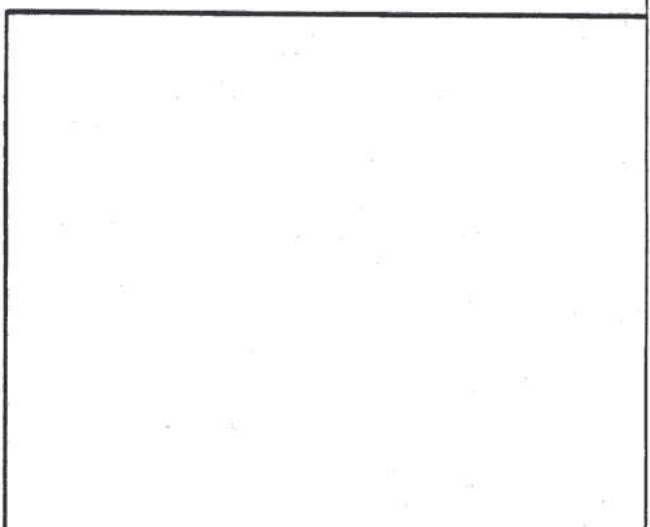
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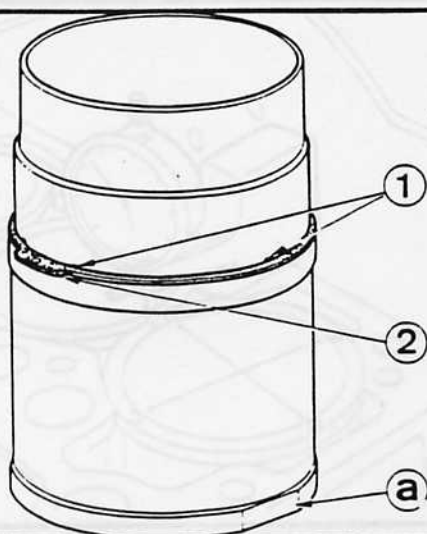
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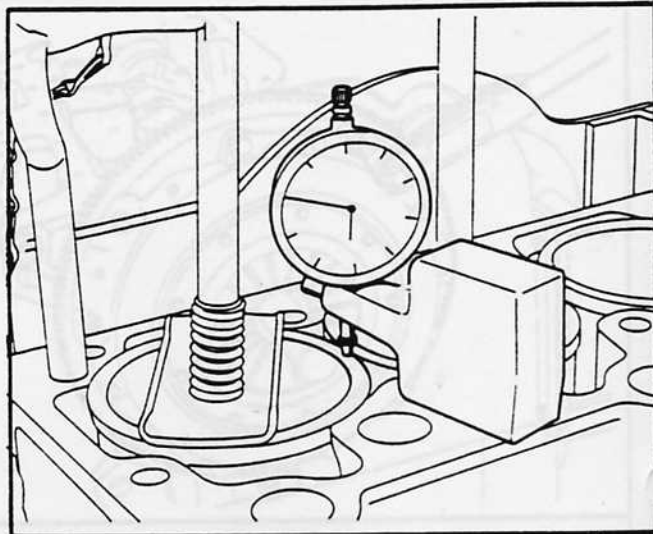
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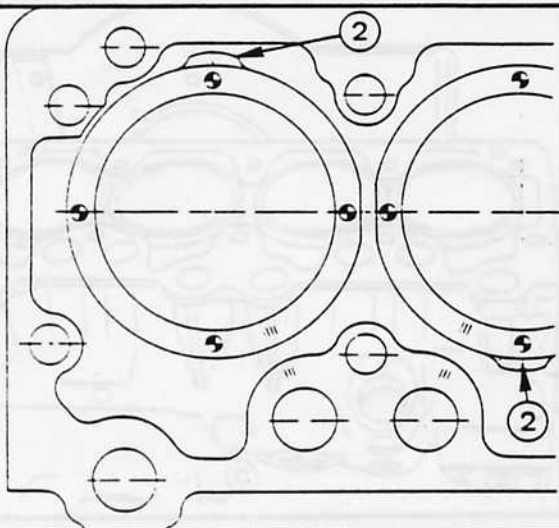
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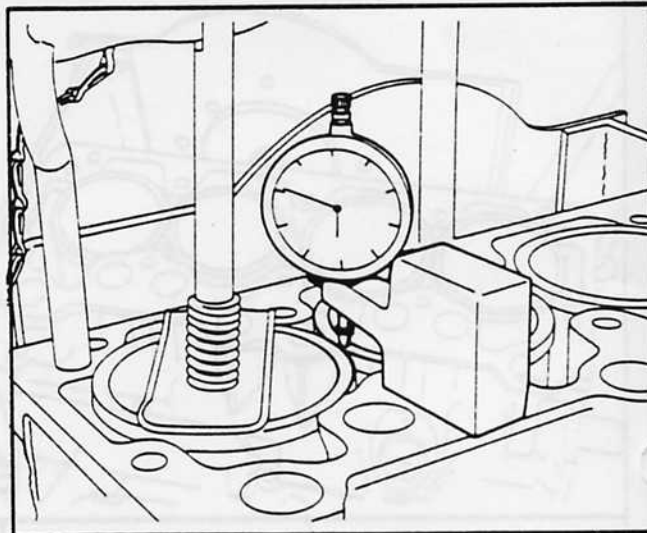
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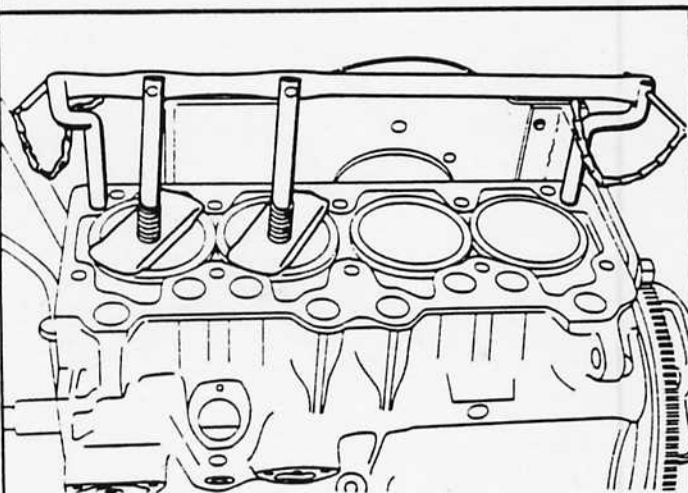
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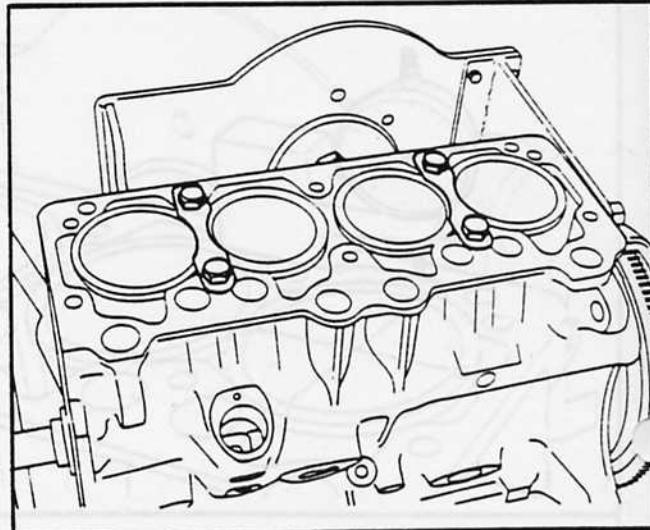
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III



VI

ENGINE
OVERHAUL

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Fit the liner seals, the thickness of which have just been determined, fig. I.

Measure the liner protrusion, above the cylinder block, at four points, fig. IV.

Carefully fold the tags (1) on the seal into the locating remove.

The highest point should be in the region of 0.14 mm.

Position the identification tabs (2) so that they are perpendicular to flat (a).

Place the liners in their respective locations as shown in fig. II, positioning the identification tabs (2) as shown in the illustration.

Measure the maximum height difference between any two adjacent liners, fig. V.

— the height difference should not exceed 0.04 mm.

If the difference is greater than 0.04 mm.

— Replace the liner seal on the highest of the liners.

Reverse the position of toll 8.0128.

Repeat these reading on liners 1 and 2.

Compress liners 3 and 4, fig. III, using tool 8.0128.

Lock the liners, in fig. VI using clamps 8.0132 A1Z.

ENGINE
OVERHAUL

Place the connecting rods and pistons in position, ensuring that :

- the piston and liner matching is maintained,
- that the connecting rod sequence 1, 2, 3, and 4, as identified during removal, is correct.

Fit the piston with the arrow marked "AV" (front) and the oil jet in the connecting rods positioned as shown in the illustration.

Fit the gudgeon pin, by hand, to secure the connecting rod to the piston, fig. II.

NOTE - Depending on the fit, it may be necessary to warm up the piston, before fitting the pin, by immersing it for a few minutes in boiling water.

Carefully fit the circlips to their grooves, fig. III.

Position the oil control ring gap as shown in fig. IV.

Stagger the gaps in the compression rings with reference to gap (a) on the oil control ring.

The mark engraved on the piston rings must face towards the piston crown.

Tighten a piston ring sleeve round the rings, fig. V.

Insert the piston/connecting rod assemblies into their liners, without turning them :

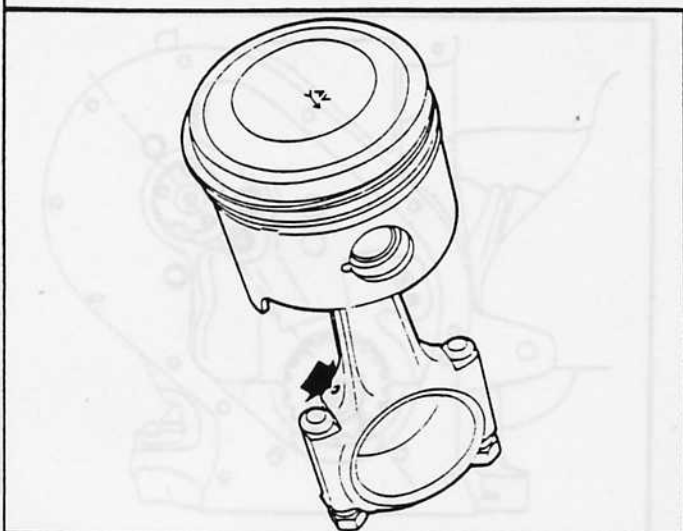
- with the arrows marked "AV" (front) on the piston crowns pointing towards the timing gear end,
- ensuring that the pistons and liners are in their correct matched assemblies.

Check that the sequence 1, 2, 3, 4 is correct.

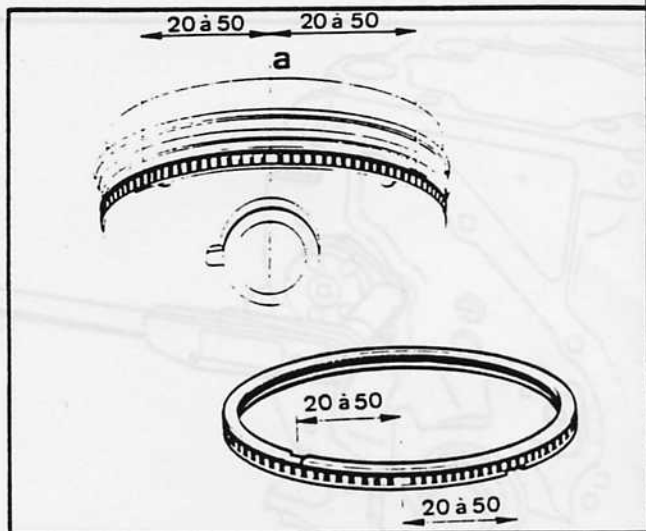
Guide each connecting rod big-end on to its crank pin, fig. VI.

Fit the big-end caps to the correct respective connecting rods.

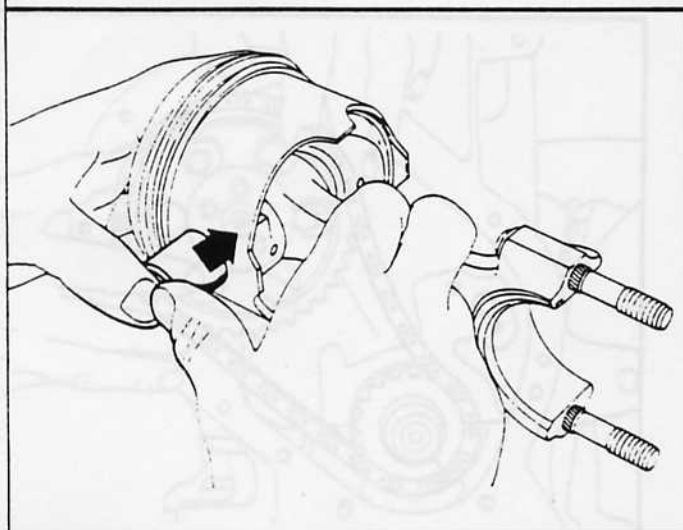
Tightening torque : 4 m.daN (40 Nm, 30 lbf ft).



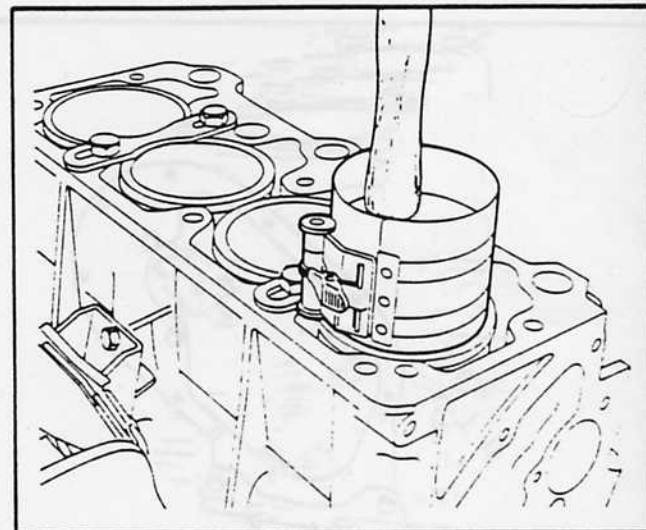
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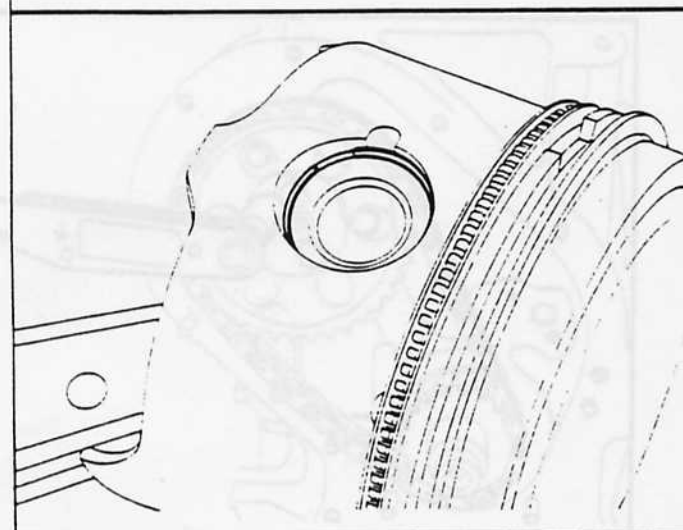
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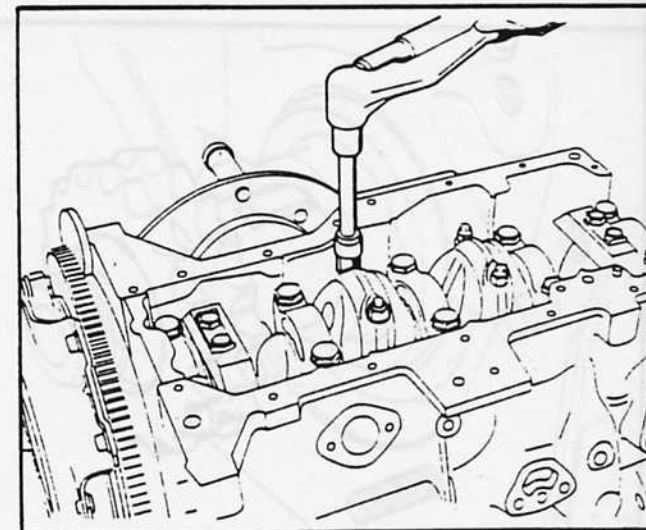
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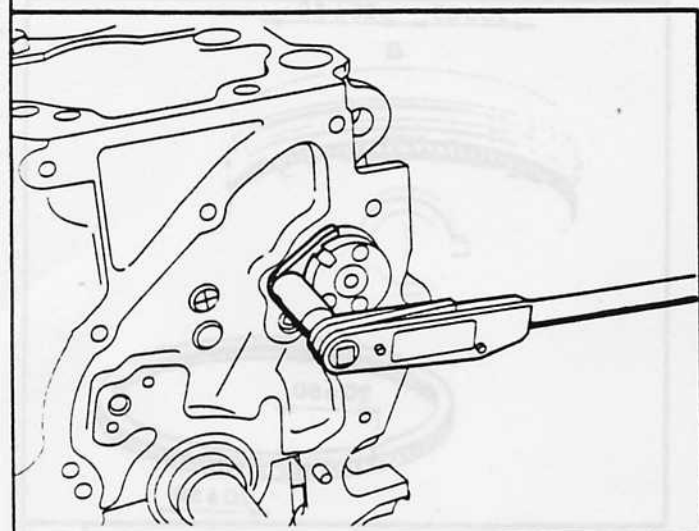
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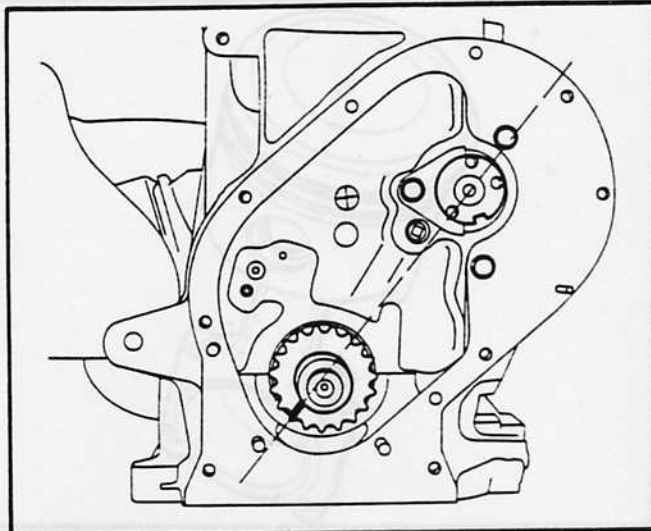
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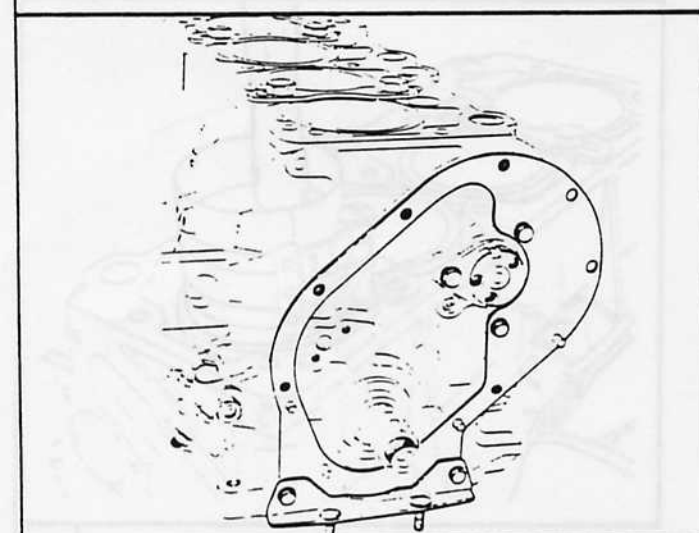
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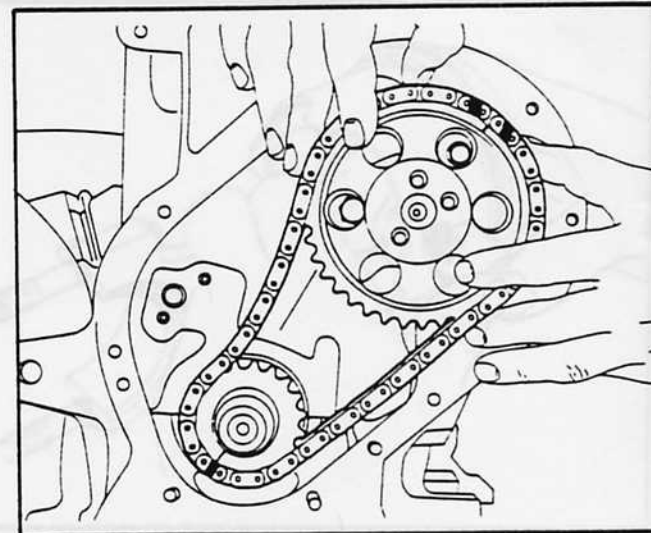
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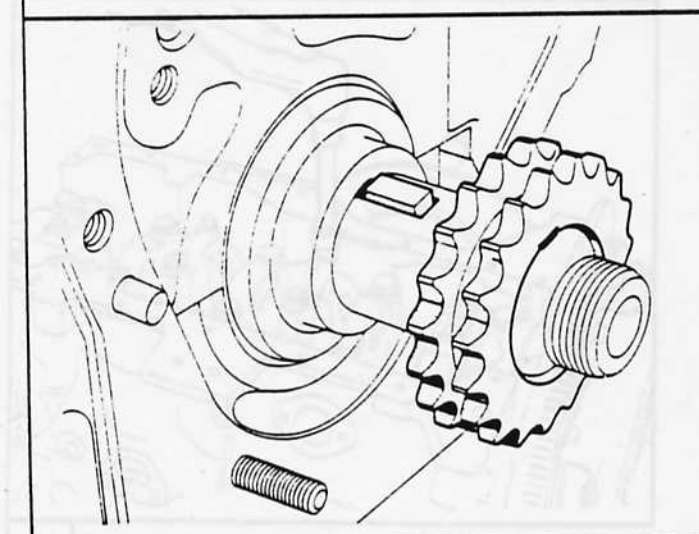
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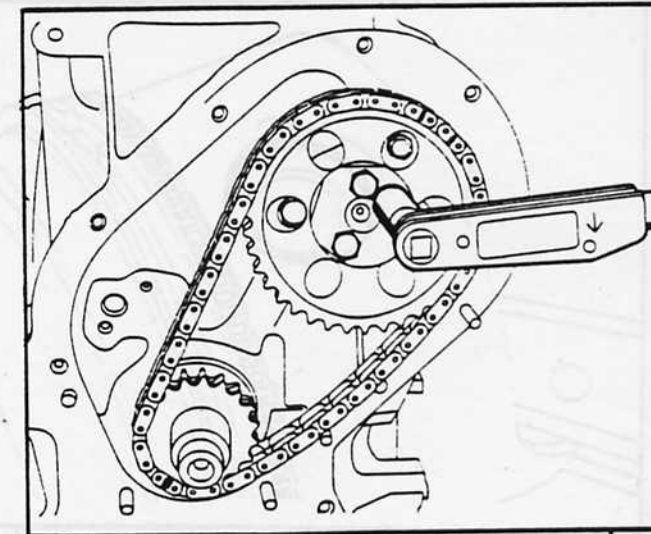
II



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III



VI

ENGINE
OVERHAUL

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A5.029

Fit, fig. I :

- the camshaft,
- its thrust washer.

Tightening torque : 1.7 m.daN
(17 Nm, 12 lbf ft).

Position the camshaft and the crankshaft,
shown in fig. IV.

Fit, fig. II :

- a new paper gasket,
- the timing cover backplate.

Tighten the bolts to 1 m.daN (10 Nm, 7 lbf ft).

Fit the timing chain, fig. V with the timing
marks :

- on either side of the timing mark on the
camshaft wheel,
- in line with the timing mark on the crank-
shaft wheel.

If there are no timing marks on the chain,
carry out the operation described in the
dismantling section.

Fit to the crankshaft, fig. III :

- the key,
- the chain wheel, with its timing mark out-
wards.

Fit a new locking plate to the camshaft wheel,
fig. VI.

Tighten the bolts to a torque of 2.25 m.daN
(22,5 Nm, 17 lbf ft).

FOLD UP the locking plate.

Dismantling and Reassembling the chain tensioner.

Place the GAUZE FILTER in position, fig. IV.

IMPORTANT - Ensure, when reassembling the various component parts :

- that they slide freely in their locations,
- that the oil holes are all clean.

SEDIS type tensioner, fig. I :

- Set the ratchet as shown in detail (1) and take out the pad, the rack and the spring, in one movement.

Warning : do not remove the ratchet (a) from its location (its return system would prevent it being refitted).

- Reassemble by carrying out the removing operations in reverse.
- Lock the tensioner by moving the ratchet as shown in detail (2).

Fit the tensioner.

Tighten the bolts, fig. V to a torque of 0.6 m.daN (6 Nm, 4,5 lbf ft).

Setting the tensioner.

SEDIS type tensioner, fig. V.

Set the tensioner by turning the ratchet to the right.

RENOLD type tensioner, fig. II :

- Lock the tensioner using a 3 mm Allen key.
- Fit the pad to the tensioner body.

RENOLD type tensioner, fig. VI :

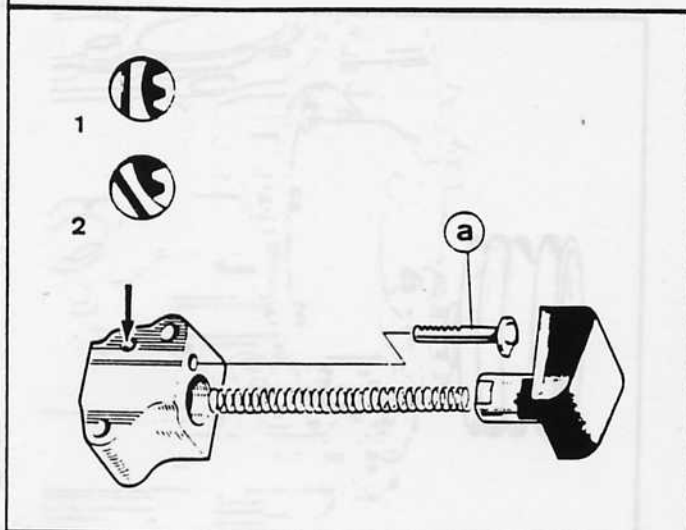
- Place, fig. III, a length of steel wire 2 mm in diameter, between the tensioner body and the pad to prevent it being reset by accident.

- Remove the length of wire or the plastic tab (new tensioner) and push in the pad until it makes contact with the bottom of the bore in the tensioner body.

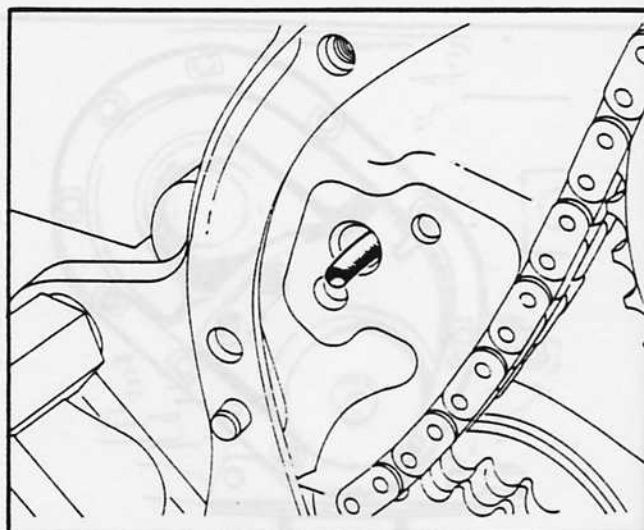
- Release the pad.

New tensioners are supplied fitted with a plastic tab for this purpose.

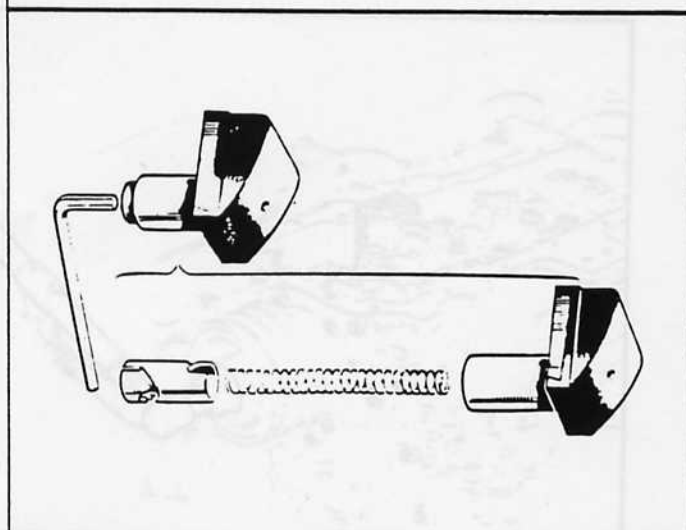
IMPORTANT - On neither of these types of tensioner should the movement of the pad be assisted.



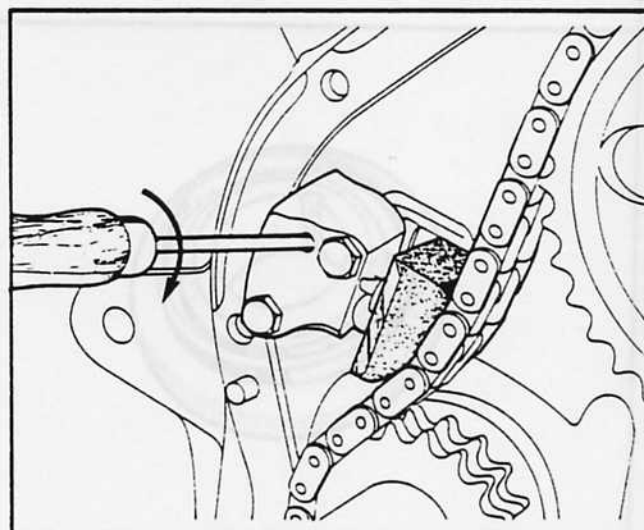
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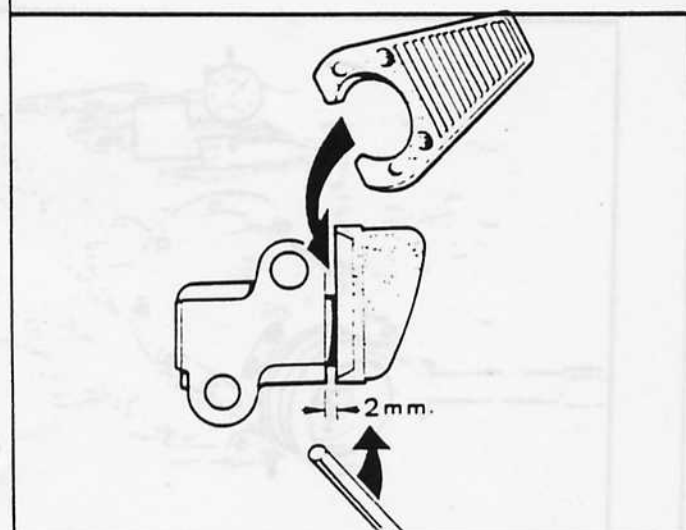
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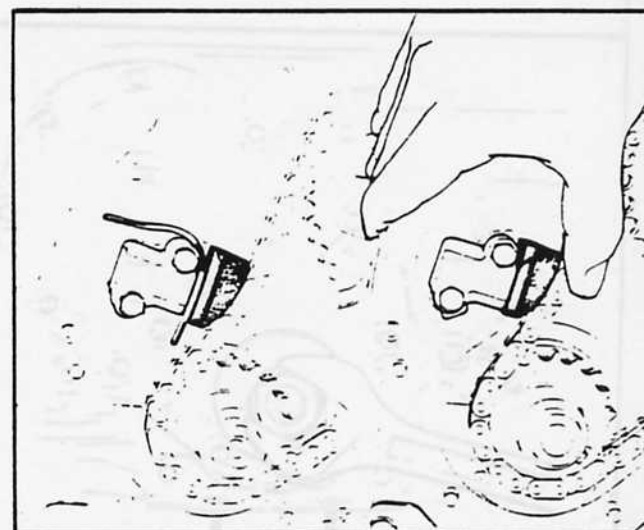
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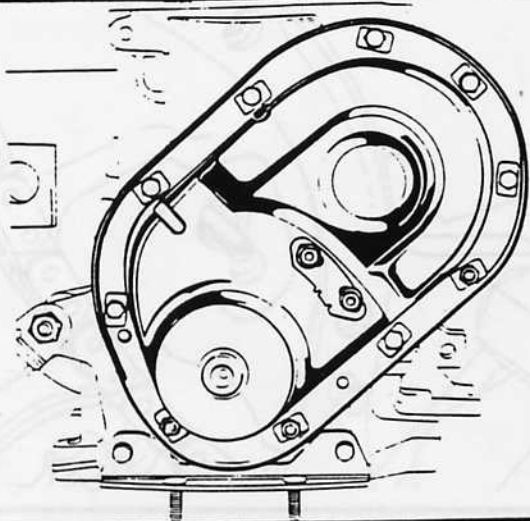
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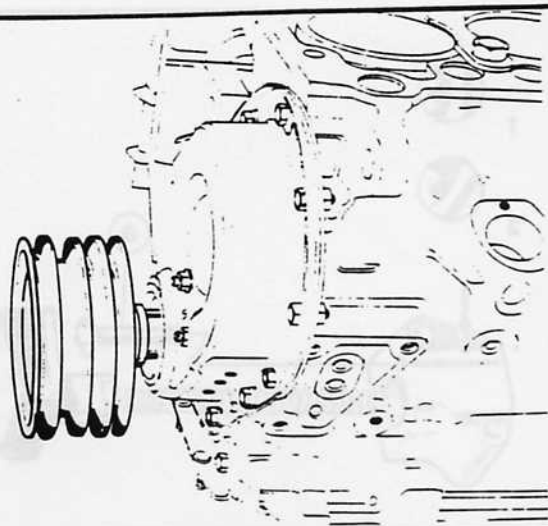
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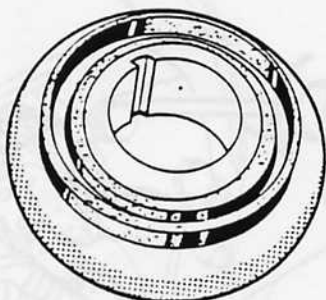
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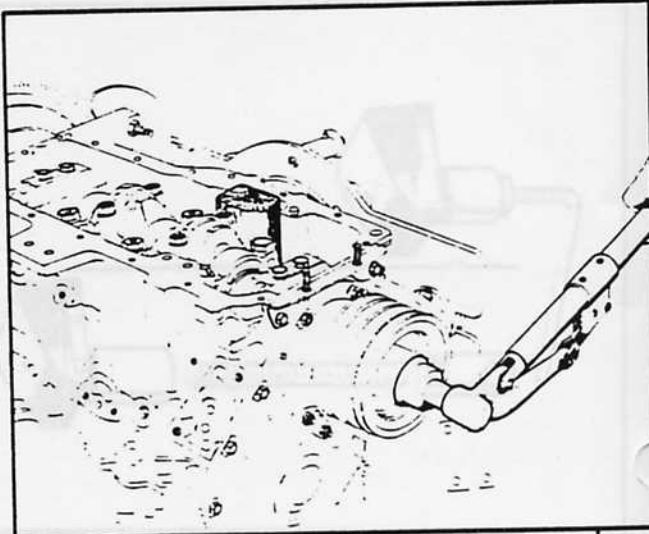
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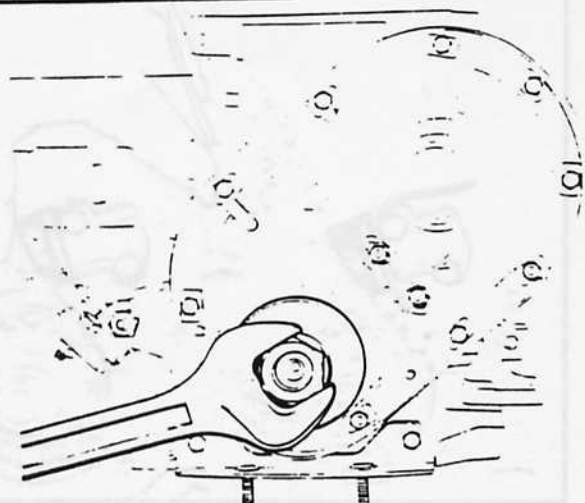
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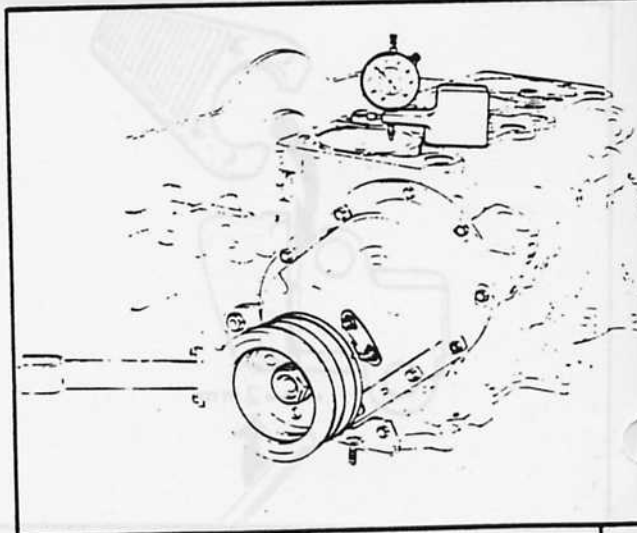
II



V



III



VI

Refit the timing cover, fig. I, using a new gasket.

Centralise the timing cover using adaptor 8.0110 R.

Tighten the bolts to a torque of 1.25 m.daN (12,5 Nm, 9 lbf ft).

Fit the seal, to adaptor 8.0110 R, fig. II.

Fit the seal, fig. III by screwing on the crankshaft nut as far as it will go without forcing it.

Refit, fig. IV :

- the key,
- the crankshaft pulley.

Tighten the nut to a torque of 17 m.daN (170 Nm, 125 lbf ft).

(Lock the crankshaft with a wood block as shown in the illustration).

Adjusting the timing plate, fig. VI.

Bring pistons No. 1 and No. 4 to top dead centre (TDC), with the cams on No. 4 cylinder "rocking".

The zero on the timing plate should be in line with the timing mark on the pulley.

Adjust it if necessary.

Apply a dab of paint to one of the nuts.

ENGINE
OVERHAUL

Distributor and Oil Pump Drive Shaft.

(With the piston of No. 1 cylinder at TDC on the firing stroke).

Place the drive shaft in position, fig. I :

- With its slot parallel with the engine centre line,
- with the smallest side of the offset towards the cylinder block.

When the shaft is fully engaged, the slot should be in the position shown in fig. II.

Refit the distributor support, fig. III.

Oil pump, fig. IV.

Ensure that the locating dowel is in position on the cylinder block.

Fit a new "O" ring.

Fit the oil pump, moving the drive shaft to the correct position to do so.

Tighten the bolts to a torque of 1 m.daN (10 Nm, 7 lbf ft).

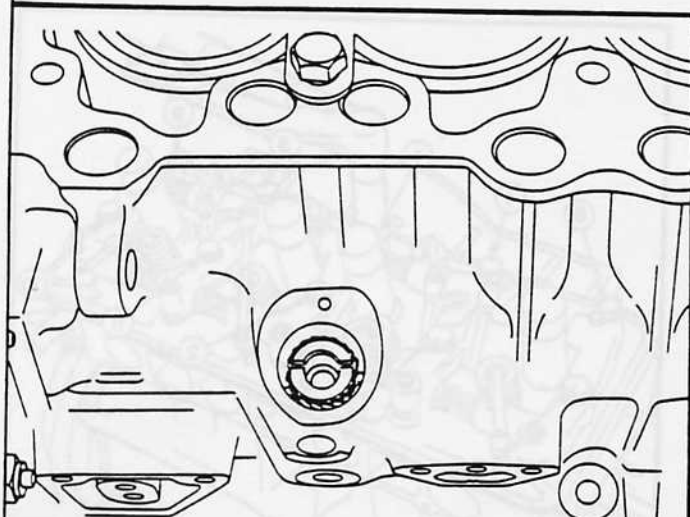
Refit the sump, fig. V, using a new gasket.

Tighten the bolts to 1 m.daN (10 Nm, 7 lbf ft).

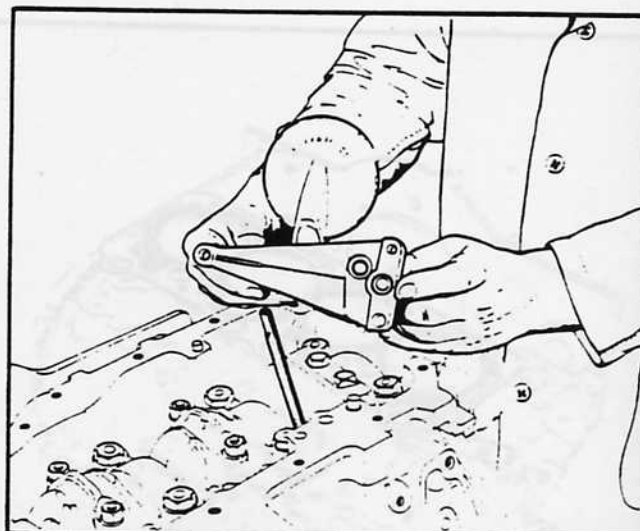
Insert the tappets in their respective locations, fig. VI.

Remove the liner retaining clamps 8.0132 A1Z.

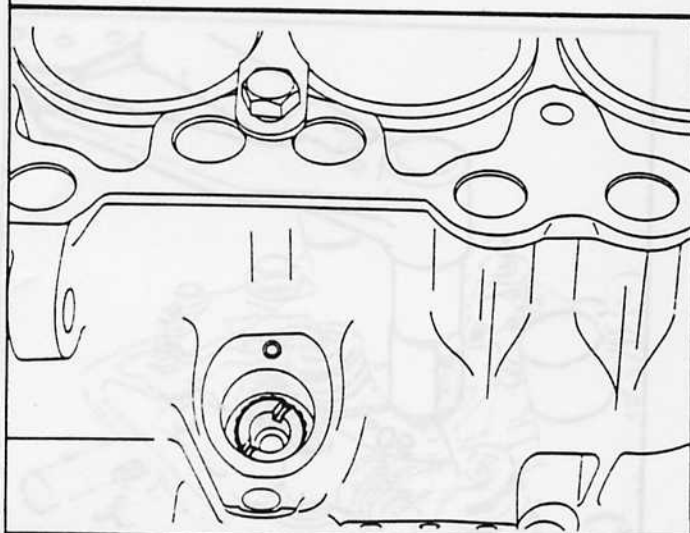
Ensure that the flats on the end flanges of liners 1 and 2 and 3 and 4 are parallel.



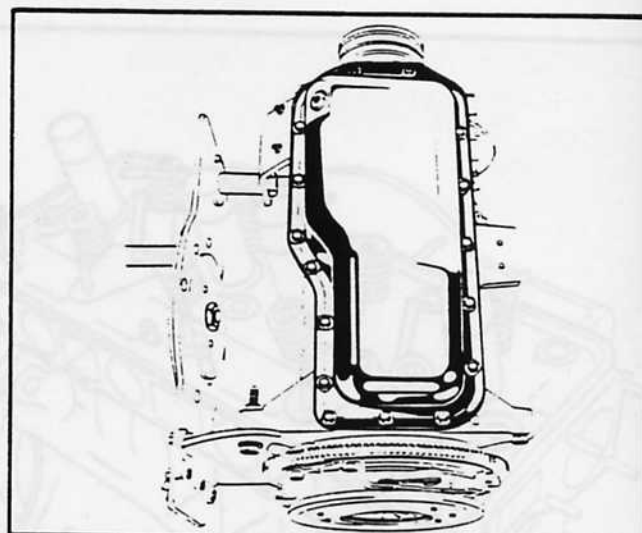
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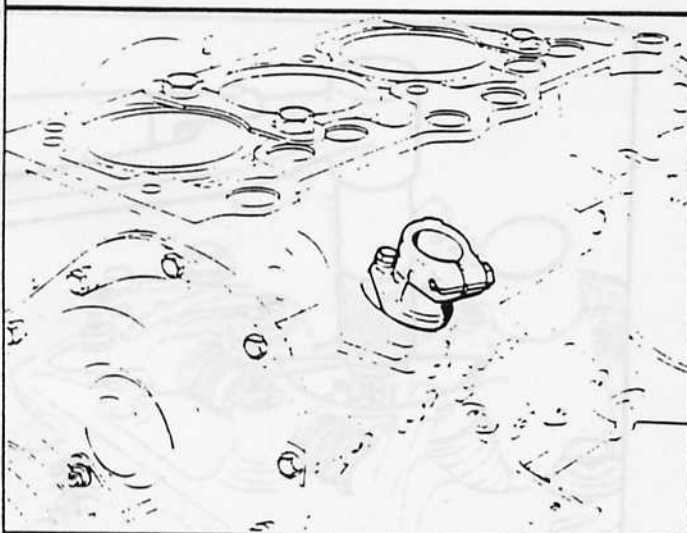
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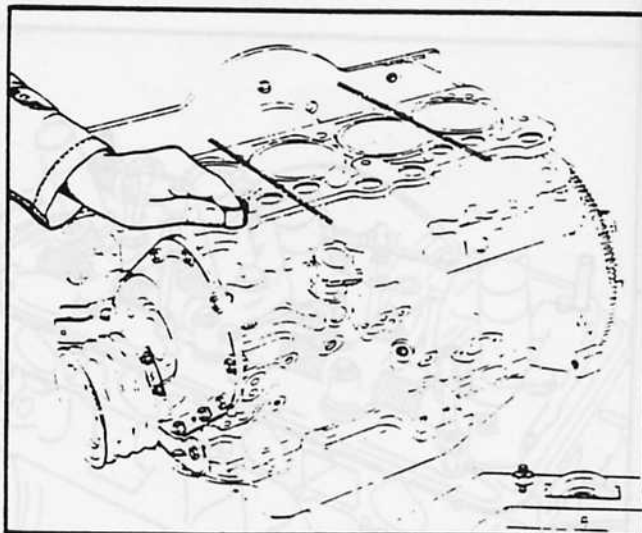
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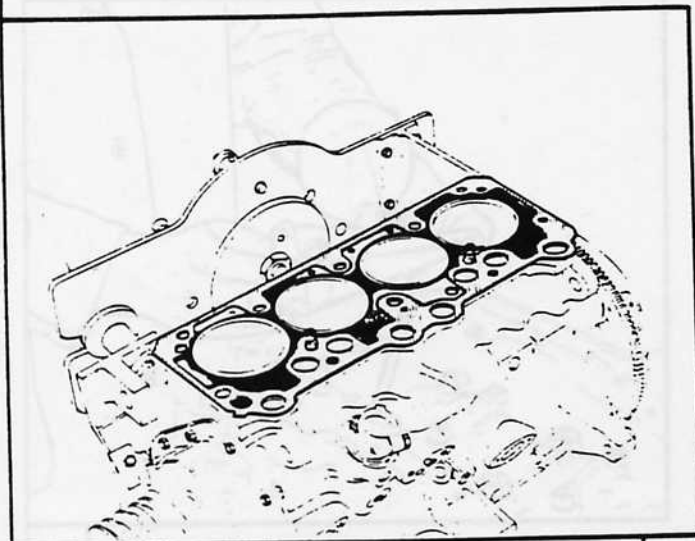
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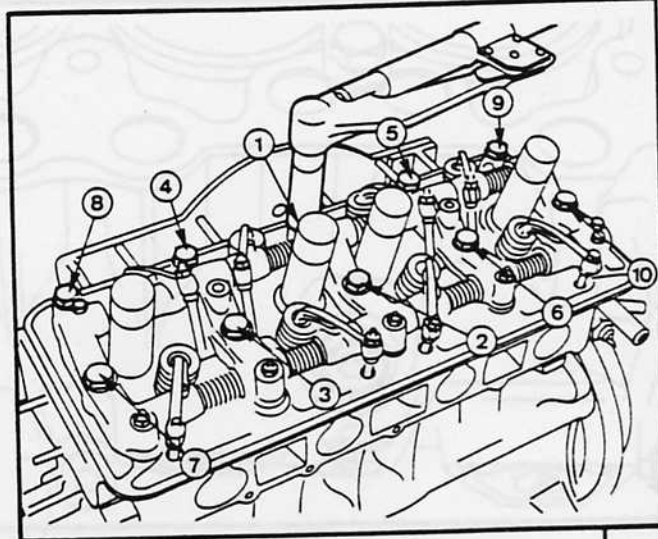
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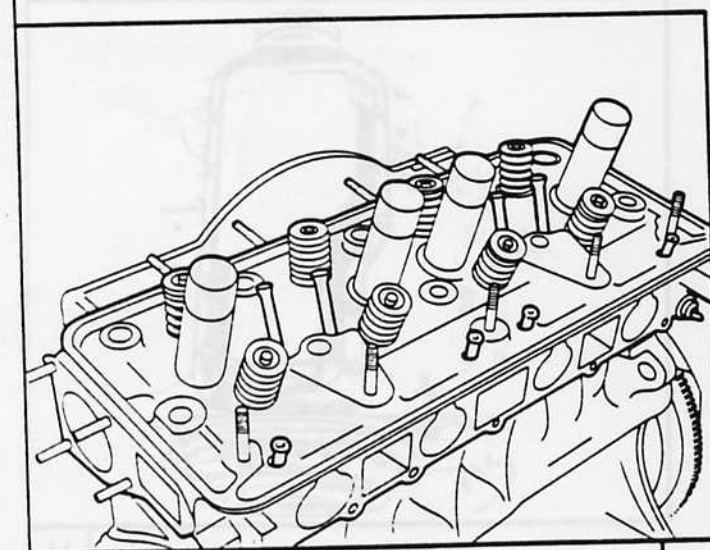
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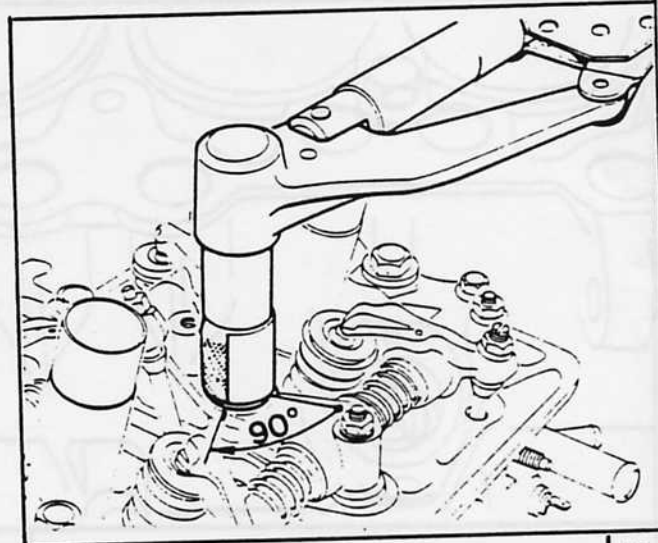
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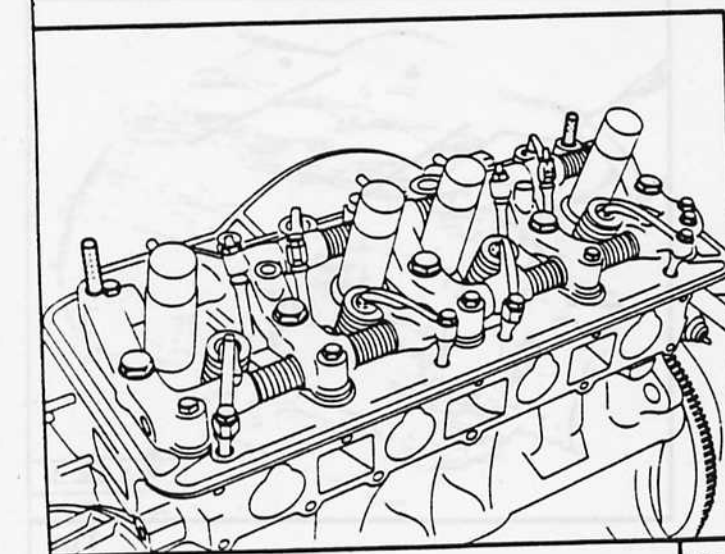
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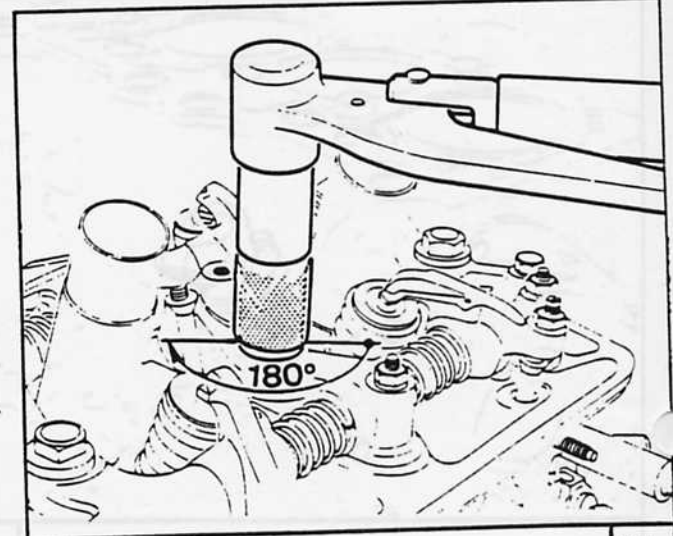
II



V



III



VI

Refitting the cylinder head.

Fit guides 8.0115 BZ, fig. 1.

Fit the correct type of cylinder head gasket for the engine in question so that :

- the inscription "DESSUS" (top) is visible,
- the rectangular water aperture is at the water pump end.

Fit, figs. II and III :

- the cylinder head,
- the push rods.

- the rocker shaft assembly,
- the cylinder head bolts, fitted with flat washers, after lubricating the bolts,
- the rocker shaft securing nuts.

RETRIEVE the 2 guides 8.0115 BZ using their extensions 8.0115 A.

Tighten the cylinder head.

a) In the order shown in fig. IV.

Tighten :

- the cylinder head bolts to a torque of 5 m.daN (50 Nm, 37 lbf ft),
- the rocker shaft securing nuts to a torque of 1.5 m.daN (15 Nm, 11 lbf ft).

1°) → 1986 MY

Method Fig. V

In the correct tightening order, bolt by bolt.

- 1 Loosen and retighten to 20 N.m (14.7 lbf.ft.).
- 2 Tighten through a further 90° using socket (-).0129 ZZ.

2°) → 1986 MY

Method Fig. VI

In the correct tightening order, bolt by bolt.

- 1 Loosen and retighten to 20 N.m (14.7 lbf.ft.).
- 2 Tighten through a further 180° using socket (-).0158.

NOTE - If there is any doubt on the tightness of one of the bolts, recommence the operation from the very beginning.

IMPORTANT - The cylinder head is to be retightened after a first warm-up of the engine carried out as follows :

- 1) Run the engine at 2000 rpm until the electric fan cuts in.
- 2) Retighten the cylinder head.

Adjusting the valve clearances fig. I.

Valve clearances

Inlet ● : 0.10 mm

Exhaust ⊗ : 0.25 mm

Fully open exhaust valve Exhaust	Adjust valves	
	Inlet	Exhaust
⊗ 1	● 3	⊗ 4
⊗ 3	● 4	⊗ 2
⊗ 4	● 2	⊗ 1
⊗ 2	● 1	⊗ 3

Refit the oil filter support fig. IV.

Coat the 3 bolts with Loctite Thread Locking Compound and tighten them to 13 N.m (9.6 lbf.ft.).

Refit the rocker arm cover fig. II :

- Place the cups and new rubber seals on the spark plug tubes.
- Bond the new rubber gasket to the rocker arm cover.
- Secure the rocker arm cover in place with 2 bolts, not forgetting to fit new rubber tubes.

Refit the filter cartridge fig. V :

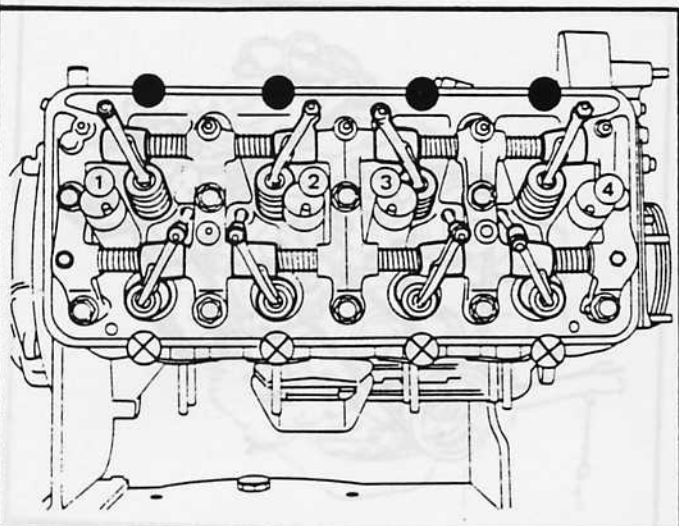
- Oil between the seal and the cartridge.
- Degrease the upper face of the seal and its locating area on the support.
- Screw in the cartridge until the joint makes contact with its face.
- Tighten the cartridge by a further 3/4 turn.

Refit the rocker arm assembly lubrication pipe fig. III.

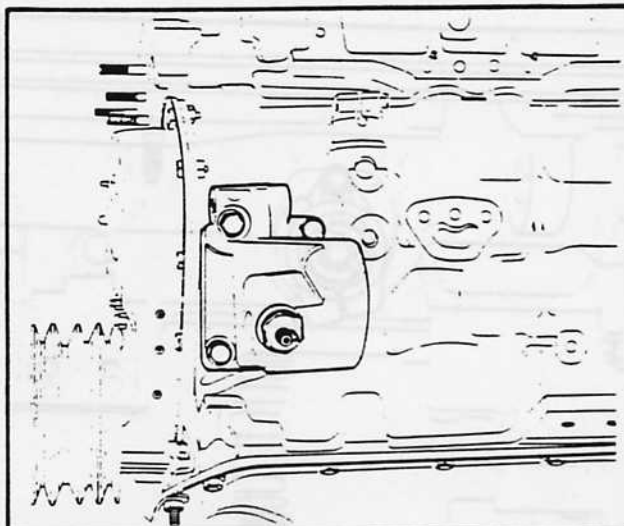
Fit the unions with new seals.

Preset the distributor timing.

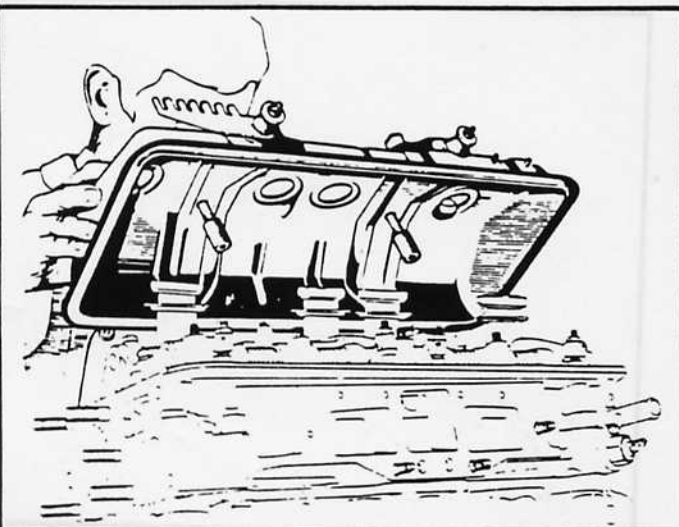
Bring the slot in the pulley in line with the mark on the timing plate fig. VI.



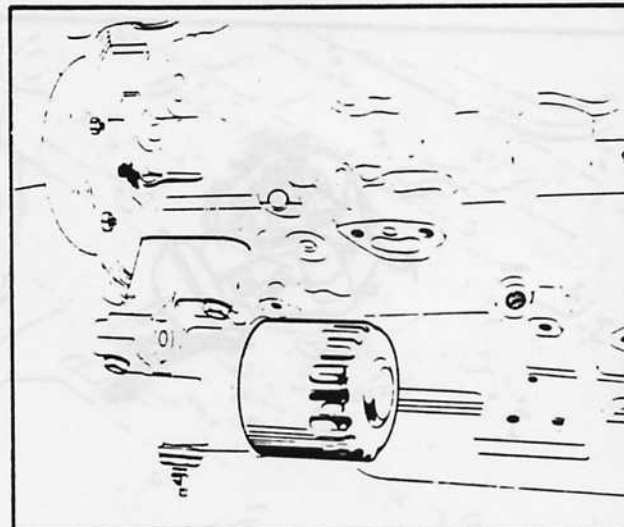
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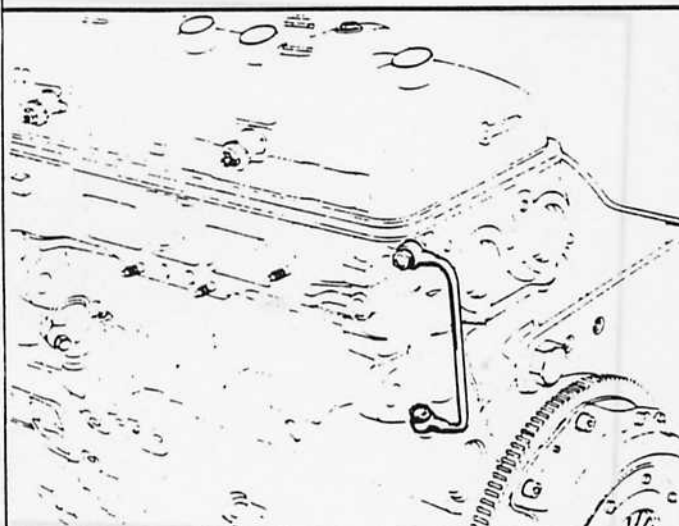
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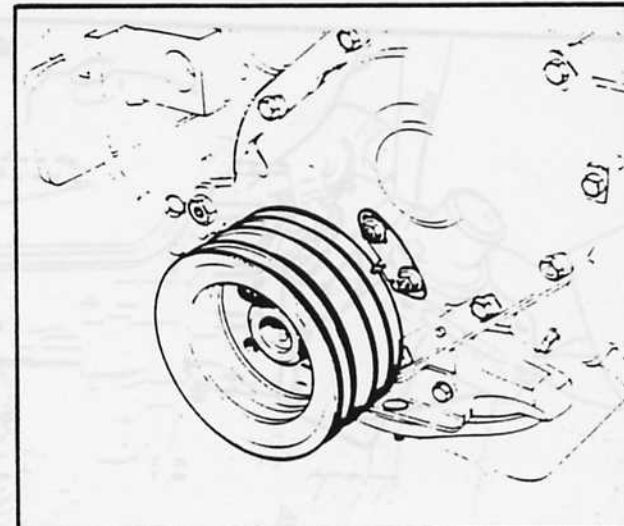
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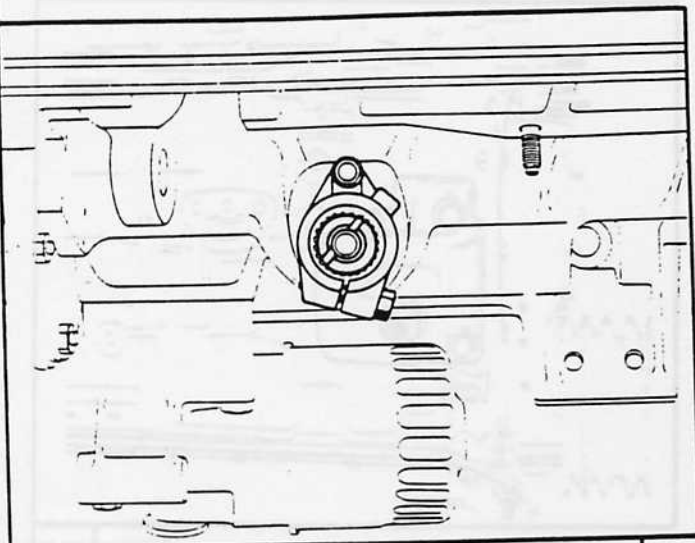
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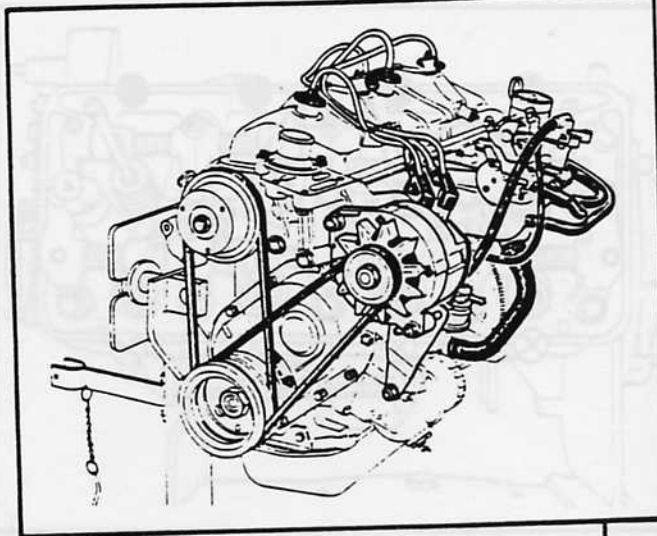
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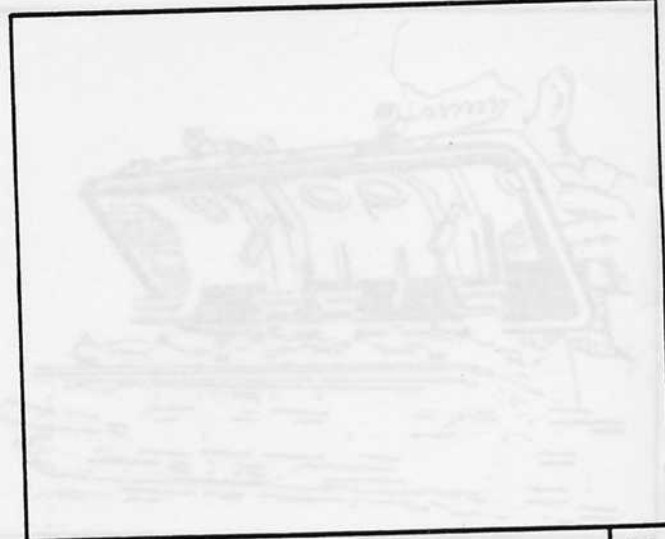
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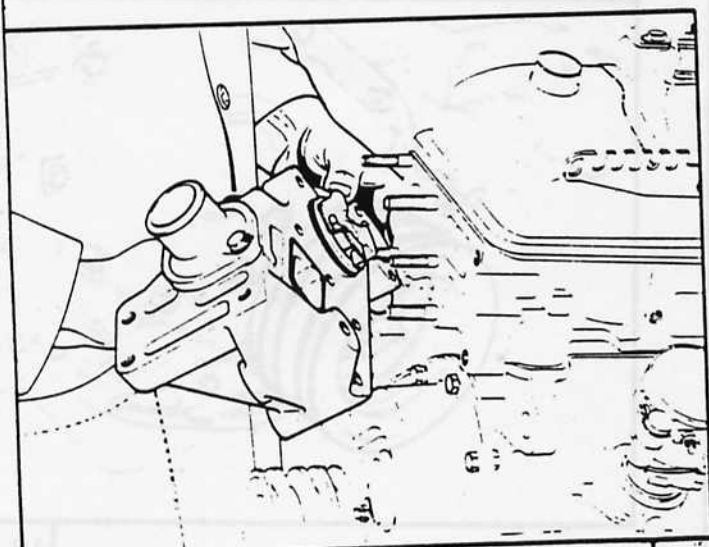
IV



II



V



III



VI

- The largest offset on the drive dog, fig. I, should then be towards the rear of the engine and No. 1 cylinder should be at its firing point.

Refit the various engine accessories as shown in fig. IV.

If not, turn the crankshaft through a complete turn and re-align the notch in the pulley with the index on the timing plate.

- Push the distributor fully in, fig. II.
- Find the point at which the contact breaker points open.
- Lock the distributor in this position.

Refit the water pump, fig. III

Fit new rubber seals.

Tightening torques :

- 8 mm nuts : 2.25 m.daN (22.5 Nm, 17 lbf ft).
- 10 mm nuts : 4.25 m.daN (42,5 Nm, 31 lbf ft).
- 10 mm bolts : 2.75 m.daN (27,5 Nm, 20 lbf ft).

Page

Special tools

B2.002 and 003

Retightening the cylinder head-Adjusting the valve clearances

B2.004 and 005

RETIGHTENING THE CYLINDER HEAD
ADJUSTING THE VALVE CLEARANCES

B2.002

1

ENGINE
CYLINDER HEAD
RETIGHTENING

J5

TOOLS REQUIRED

Fig. A

- 8.0129 ZZ - Socket for angular tightening operations (90°)

Fig. B

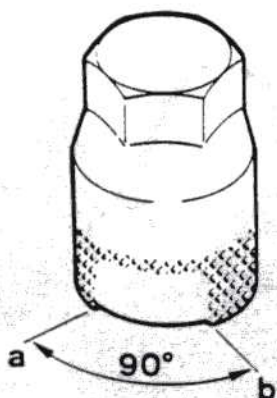
- ().0158 Socket for angular tightening operations (180° and 35°)

Fig. C

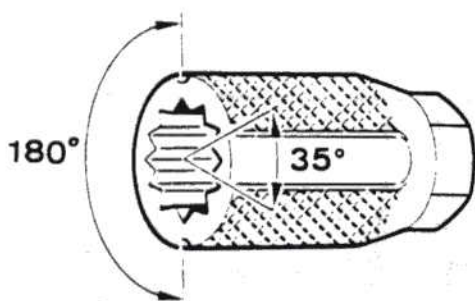
- 8.0118 P1 - Socket for crankshaft pulley nut

APPROVED TOOLS

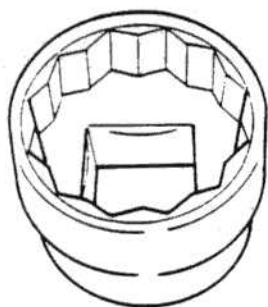
- Torque wrench.
- FACOM reducer S 232.
- FACOM ratchet spanner S 151.



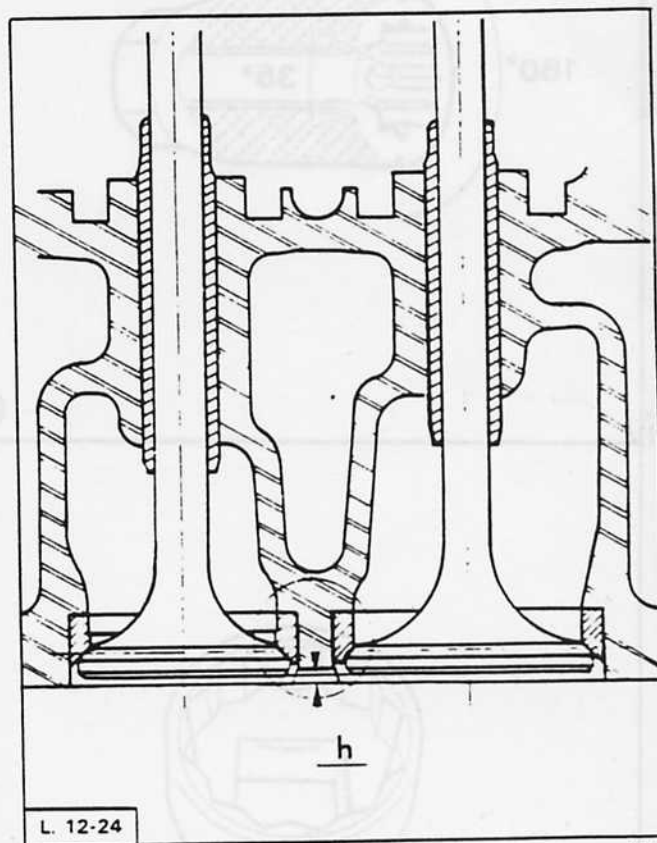
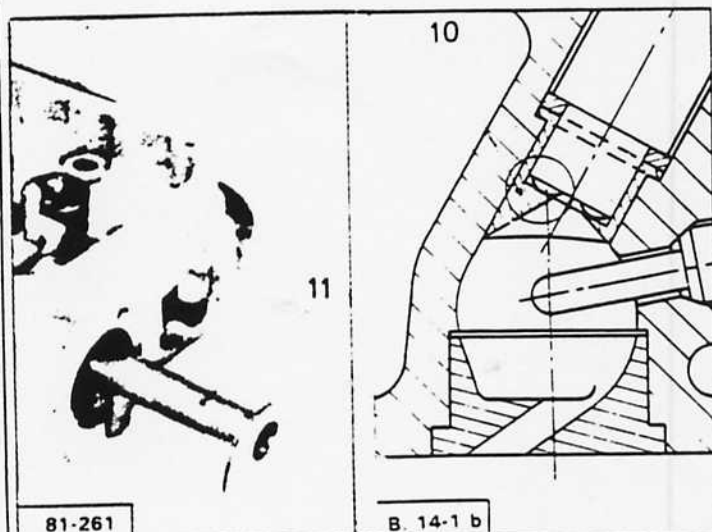
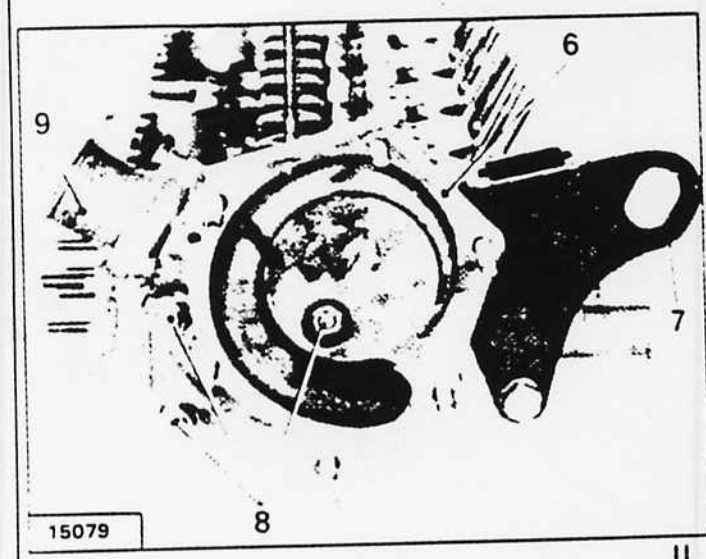
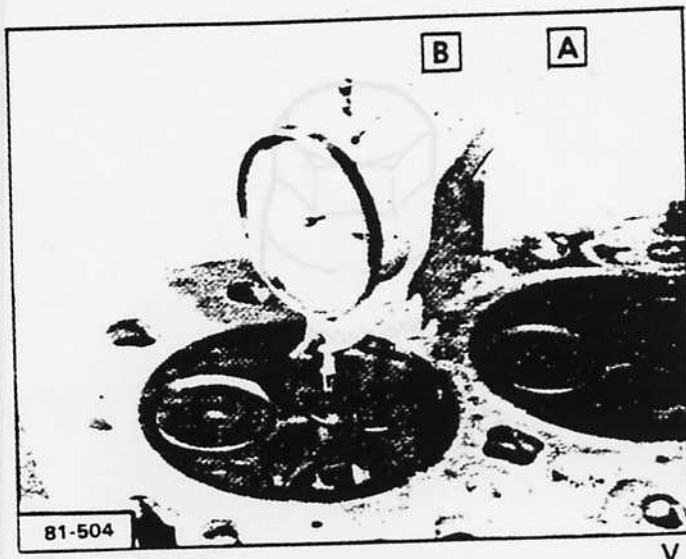
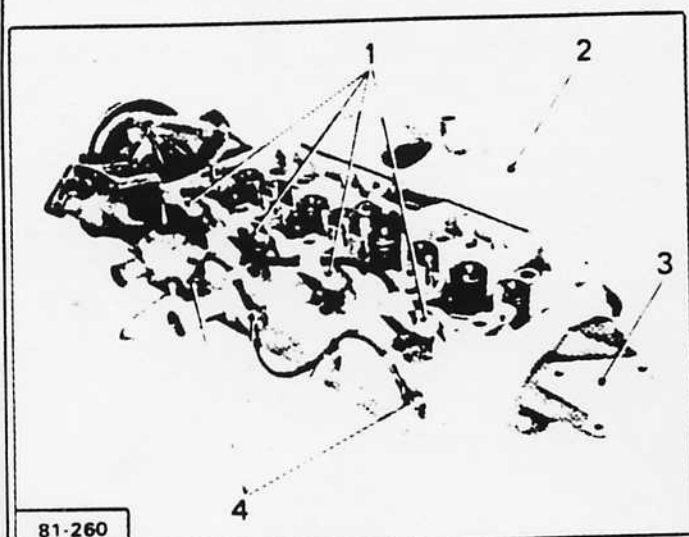
(A)



(B)



(C)



J5		ENGINE CYLINDER HEAD RETIGHTENING			1	B2.005
Engine Type	Engine No.	INITIAL TIGHTENING	ENGINE WARM-UP	RETIGHTENING	At 1000/1200 mile MAINTENANCE (1500/2000 KM)	
XM7-T	→1012625	In the tightening order shown above - Pretighten to 50 N.m (37 lbf.ft) - Bolt by bolt, in the same order, tighten to 20 N.m (14.7 lbf.ft) then continue to tighten through an angle of 90° Adjust the valve clearances	Warm up the engine until the electric fan cuts in. Leave it to cool for a minimum of 6 hours.	Bolt by bolt, in the same order, - Loosen the bolt - Retighten to 20 N.m (14.7 lbf.ft) then continue to tighten through an angle of 90°. Adjust the valve clearances.	Bolt by bolt, in the same order, (with the engine cold) - Loosen the bolt - Retighten to 20 N.m (14.7 lbf.ft) then continue to tighten through an angle of 90°. Adjust the valve clearances.	
XN1-T	→1021874					
XN1-T	→ 021875 →1031998					
XM7-T	→ 012626	In the same order - Pretighten the bolts to 50 N.m (37 lbf.ft) - bolt by bolt, in the same order, loosen each bolt, retighten it to 20 N.m (14.7 lbf.ft) then continue to tighten through an angle of 180°.	Warm up the engine until the electric fan cuts in.	Whatever the engine temperature, bolt by bolt, in the same order, tighten each bolt through an additional 35°. Adjust the valve clearances (with the engine cold).	No cylinder head retightening operation. Adjust the valve clearances (with the engine cold).	
XN1-T	→ 031999					
XN1-TA						

This operation, followed by adjusting the valves, is to be carried out, on a cold engine, that is to say after it has cooled down for 6 hours.

- Remove the components shown in fig. I.

RETIGHTENING THE CYLINDER HEAD

1 - Tighten bolt no. 1 fig. II :

- Fully loosen bolt no. 1, then retighten it to 20 N.m (14.7 lbf.ft.).
(The illustration actually shows bolt no. 2).

2 - Tighten bolt no. 1 through the specified angle fig. III :

- Place socket 8.0129 ZZ or (-).0158 on bolt no. 1 to mark a line on the rocker arm support in line with position mark (a).
- Tighten the socket until position mark (b) comes opposite this line (a rotation of 90° or 180°).
- Mark the bolt that has just been tightened in this way.

3 - REPEAT operations 1 and 2 BOLT BY BOLT on all 10 bolts in the order shown in fig. IV.

IMPORTANT - If there is any doubt on the tightening of one of the bolts, repeat operations 1 and 2 on the said bolts.

ADJUSTING THE VALVE CLEARANCES fig. V :

- Clearances, on a cold engine
 Inlet ● : 0.10 mm
 Exhaust ⊗ : 0.25 mm
- Turn the crankshaft to FULLY OPEN the following exhaust valves :

Exhaust		Inlet	Exhaust
⊗ 1	To adjust	● 3	⊗ 4
⊗ 3		● 4	⊗ 2
⊗ 4		● 2	⊗ 1
⊗ 2		● 1	⊗ 3

- Refit all the components removed.
- Check the condition of the belts and their tensions.
- Test the operation of the cooling system.

ENGINE CYLINDER HEAD REMOVING - REFITTING

SPECIAL TOOLS

From petrol engine tool kit 8.0110 :

TOOLING TO BE MADE LOCALLY

Fig. A :

0.0149

H - Dial indicator holder.

– Cylinder head releasing levers (material :
16 mm Ø drawn steel bar).

M - Set of four M12 x 150 bolts (yellow).

8.0132 A1Z

– Liner retaining clamps.

Fig. B :

RECOMMENDED TOOLING

8.0115 Y

– Cylinder head locating guides.

– KRIKIT tension meter for checking the
alternator drive belt tension.

8.0118 P1

– Crankshaft pulley nut socket.

– FACOM adaptor S 232.

8.0129 ZZ

– Socket for tightening the cylinder head
bolts by the angular method.

– FACOM ratchet spanner S 151.

- (-).0158 Socket for angular
tightening operations on the cylinder head
(180° and 35°)

8.0150

– Engine support equipment comprising :

Fig. C :

A - Cross piece

B - Thrust Rod.

TIGHTENING TORQUES

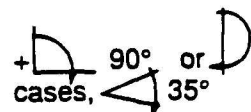
– Nut on left hand engine mounting rubber
pad 5.5 m.daN (55 Nm, 40 lbf ft)

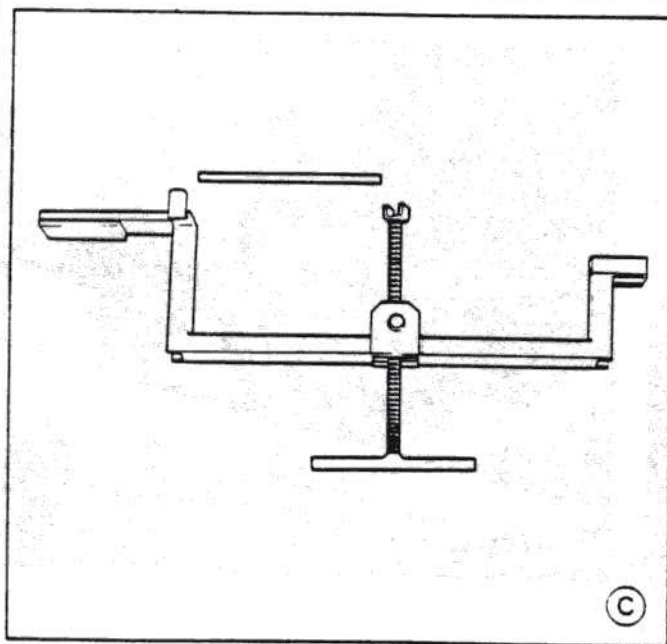
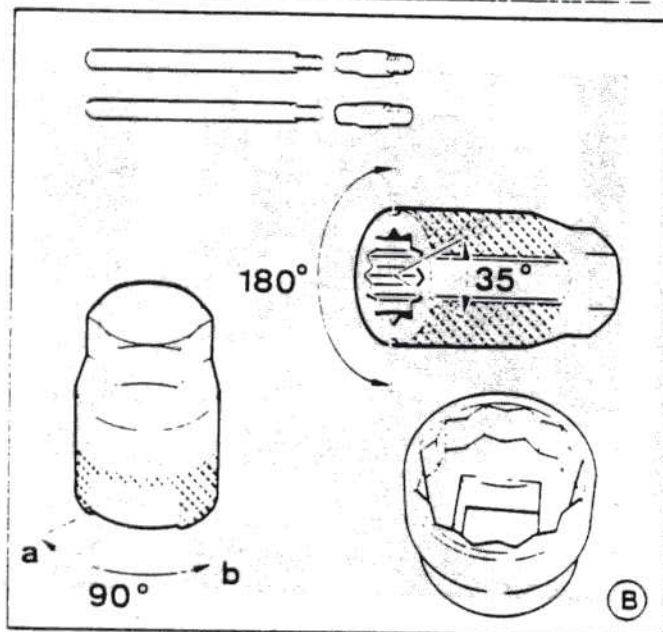
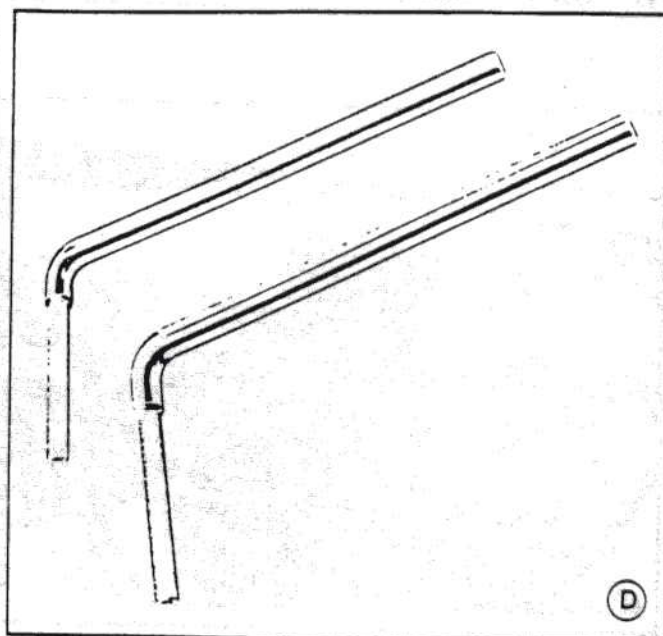
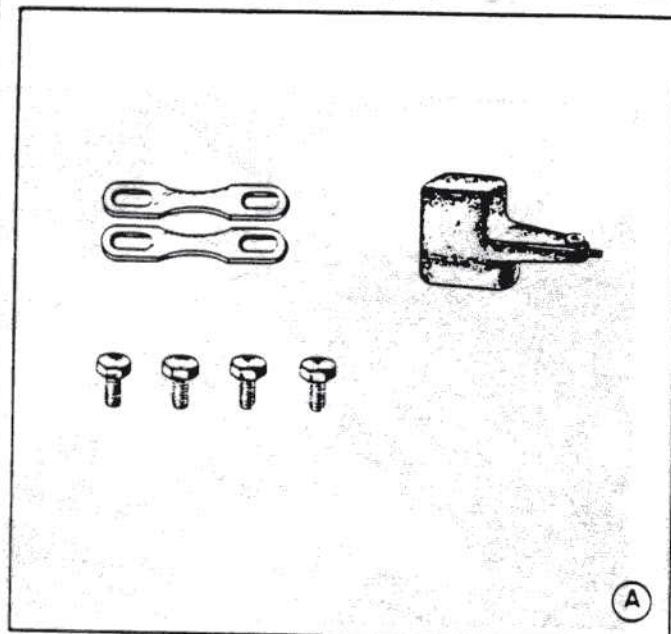
– Cylinder head tightening sequence :

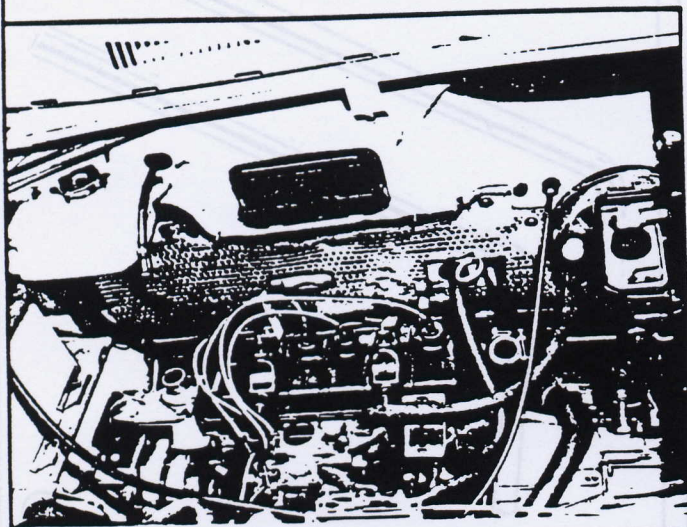
- initial tightening to
5 m.daN (50 Nm, 37 lbf ft)

– Bolt securing engine mounting bracket to
water pump 5 m.daN (50 Nm, 37 lbf ft)

- tightening by the angular method :
up to 2 m.daN (20 Nm, 15 lbf ft)

 90° or 180° and, in certain
cases, 35°

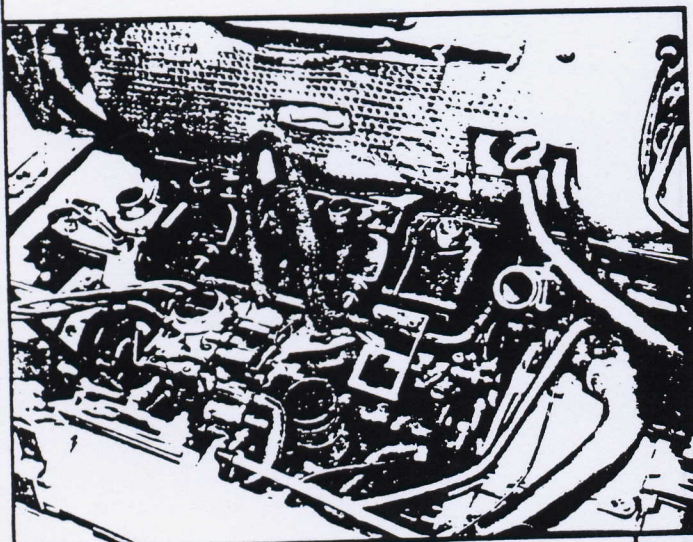




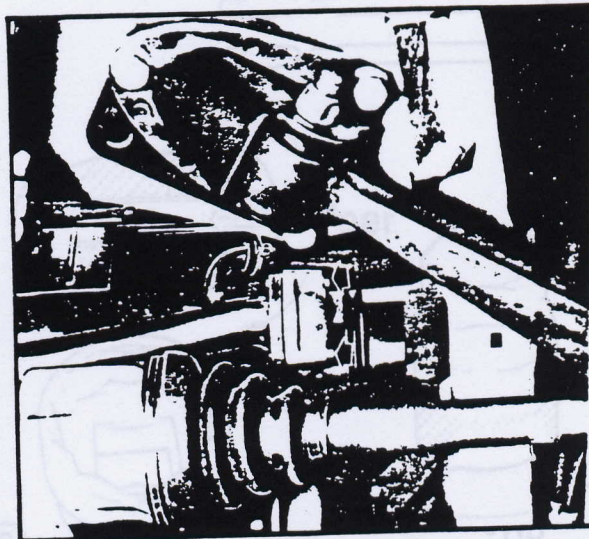
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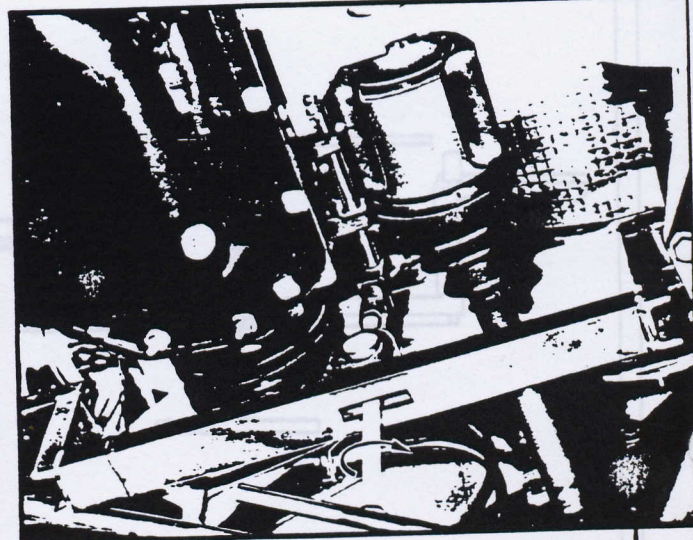
II



V



III



VI

This operation is carried out with the engine in the vehicle and supported by equipment 8.0150.

REMOVING

- Drain the cooling system (there are drain points on the radiator and on the cylinder block).

Operations under the bonnet

- Remove, fig. I :
 - the spare wheel,
 - the air intake,
 - the air filter.
- Disconnect the upper hose from the water pump.

- Disconnect, fig. II :
 - the following hoses :
 - heater input,
 - manifold heating at the cylinder head outlet pipe,
 - manifold heating outlet at the manifold end,
 - vacuum, at the brake servo unit,
 - the wires :
 - from the thermistor and warning light temperature switch,
 - from the idling solenoid valve,
 - the accelerator and choke cables,
 - the rocker shaft oil pipe.

- Unhook the diagnostic socket and move it away from its support.

- Remove, fig. III :
 - the rocker cover,
 - the seals and pins from the spark plug tubes,
 - the alternator and its drive belt.

Operations under the vehicle.

- Remove the water pump drive belt, fig. IV, by levering it off the pulley.

Turn the engine crankshaft using :

- socket 8.0118 P1,
- FACOM adaptor S 232,
- FACOM ratchet spanner S 151.

- Remove the two bolts that secure the rear pipe assembly to the water pump, fig. V.
- Remove the nuts from the exhaust pipe clamp.

Fitting engine support equipment 8.0150, fig. VI.

- Place the thrust rod (B) in the "lugs" on the cylinder block.
- Place the cross piece (A) in position :
 - at the front on the front suspension arm support,
 - at the rear over the welded nut.
- Turn the screw until the fixture is under tension.

ENGINE CYLINDER HEAD REMOVING - REFITTING

REMOVING (contd.)

Operations under the bonnet :

- Remove, fig. I :
 - the three engine mounting bolts on the water pump,
 - the nut from the rubber mounting pad,
 - the aluminium support bracket.

- Remove, fig. II :
 - the ten cylinder head securing bolts,
 - the five rocker shaft securing nuts,
 - the rocker shaft,
 - the push rods.

- Fit the cylinder head releasing levers 0.0149 as shown in fig. III.

Lever the cylinder head free.

- Remove the cylinder head.
- Fit liner retaining clamps 8.0132 A1Z and bolts 8.0110 M.

CLEANING

- Clean the cylinder head and cylinder block gasket faces with DECAP-LOC 88 stripping compound.

Plug the tappet locations, fig. IV with screwed up balls of paper.

- Clean and bush the cylinder head bolts and blow out the tappings in the block.
- Never decarbonise the piston crowns or tops of the cylinders.

INSPECTION

Check the cylinder head for bow, fig. V.

MAXIMUM permissible bow $c = 0.10 \text{ mm}$

Refacing (fig. V)

Nominal height : $92.5 \text{ mm} \pm 0.15$

Minimum height after refacing : 91.85 mm

Liner protrusion, fig. VI

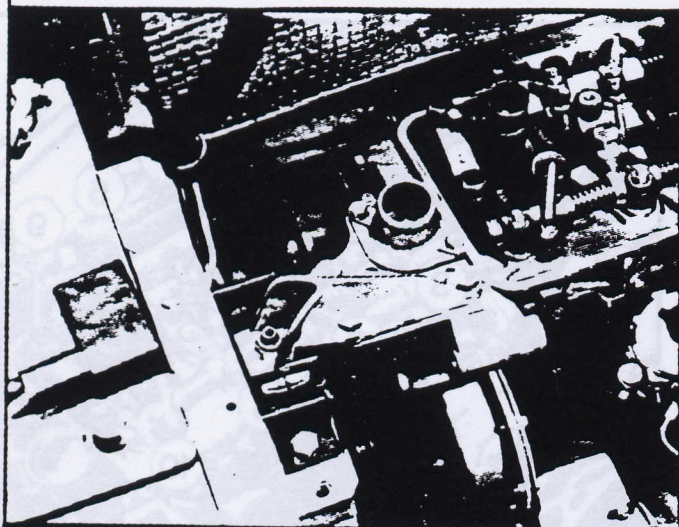
- Measure the protrusion, on the cylinder centre line, using support 8.0110 H and dial indicator 8.1505.

a) measure the height above the cylinder block :

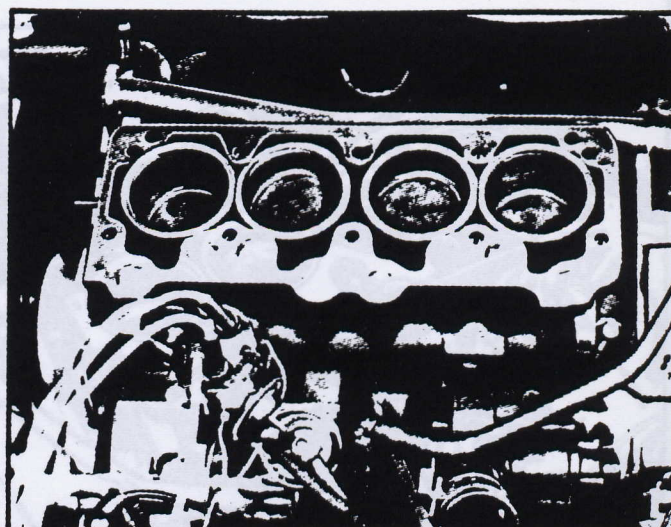
- Max. : 0.14 mm
- Min. : 0.07 mm

b) between any two adjacent liners :
- maximum difference : 0.04 mm .

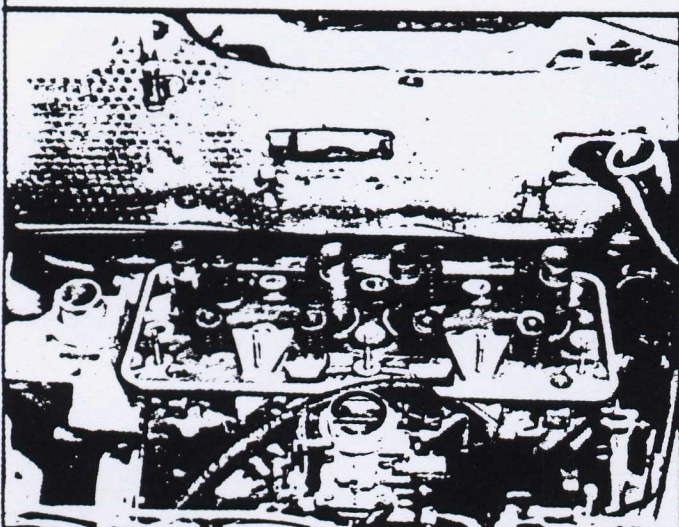
IMPORTANT - If the dimensions are outside these tolerances, remove the engine from the vehicle so that the liner seals can be replaced.



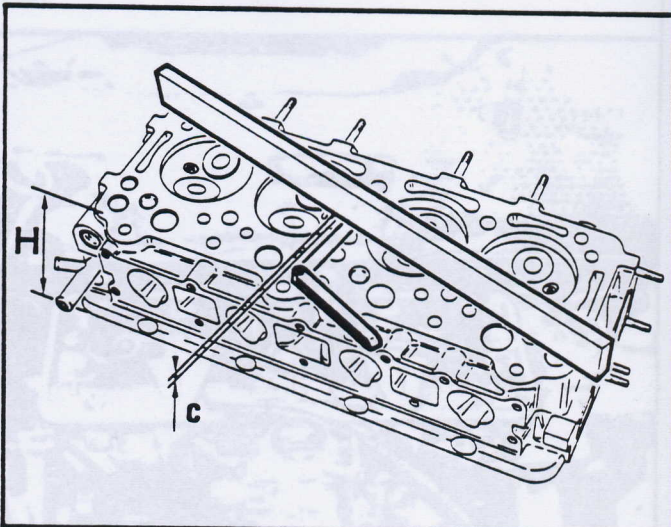
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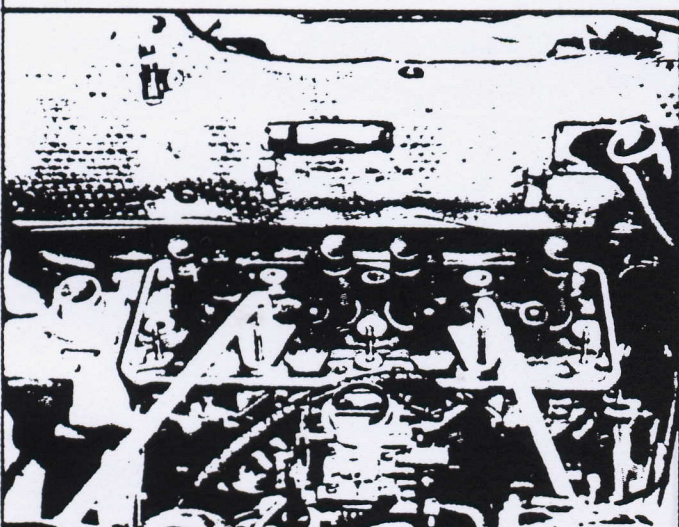
IV



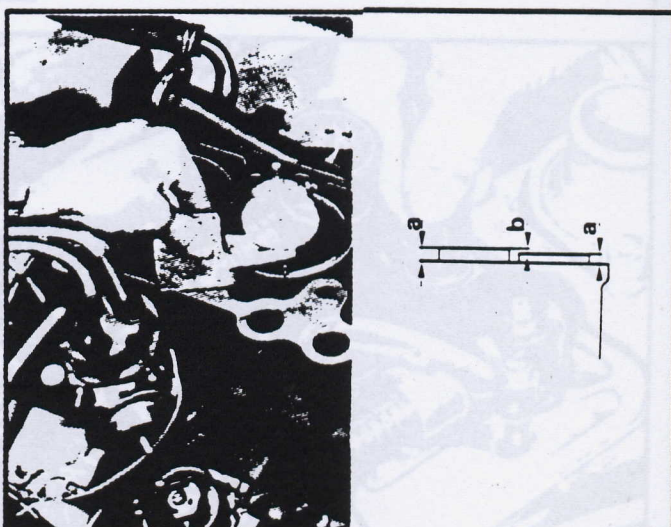
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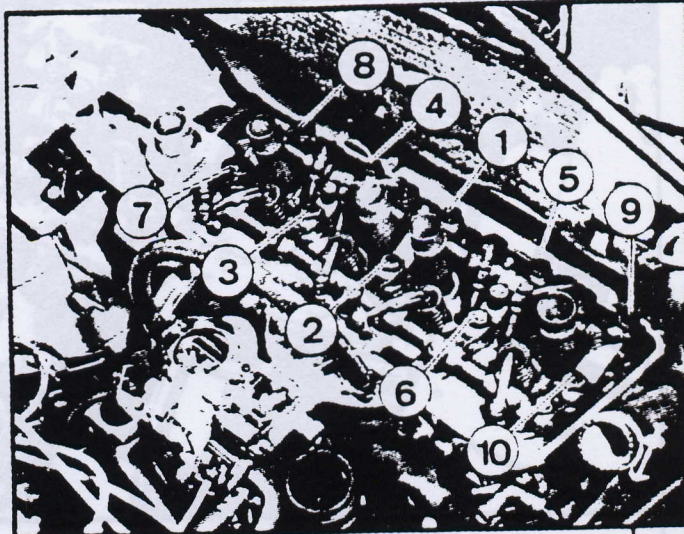
VI

B-008

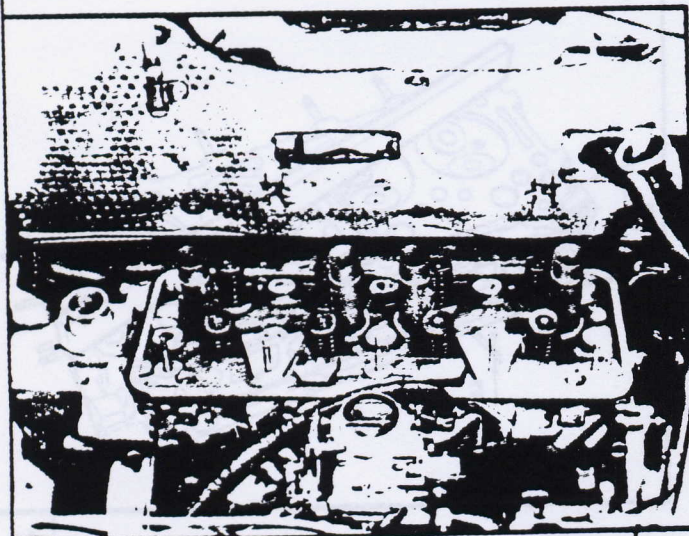
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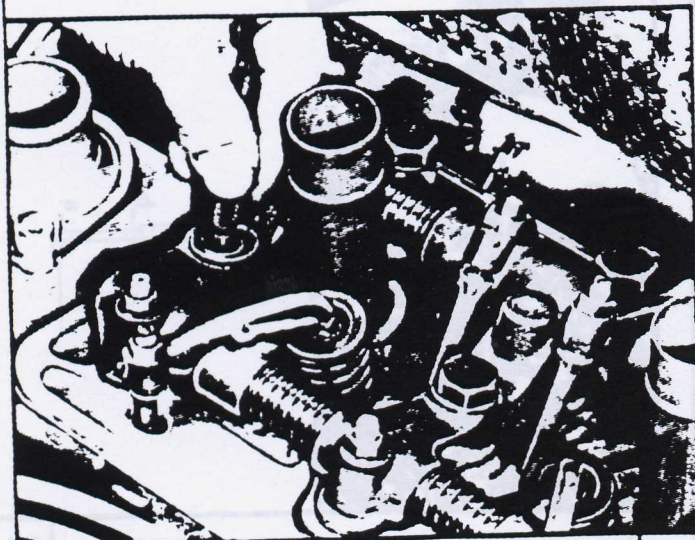
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IV



II



III

REFITTING

— Fit fig. I :

- the cylinder head locating guides 8.0115 BZ,
- a new cylinder head gasket.

- the rectangular aperture is to be towards the front,
- and the inscription "DESSUS" (top) should be visible.

— Tighten in the order shown in fig. IV :

- the ten cylinder head bolts to a torque of 5 m.daN, 50 Nm, 37 lbf ft),
- the rocker arm assembly nut to a torque of 1.5 m.daN (15 Nm, 11 lbf ft).

— Fit, fig. II :

- the cylinder head,
- the push rods.

- the four short rods are the inlet push rods,
- the four long rods are the exhaust push rods.

TIGHTENING THE CYLINDER HEAD

See section B2.001 to 005

— Place the rocker shaft assembly in position.

— Lightly tighten :

- the cylinder head bolts after first greasing them and placing flat washers on them,
- the rocker shaft nuts.

— Take out the two locating guides 8.0115 BZ, using extensions 8.0115 A.

— Fit the two bolts to the tappings from which the guides have been removed.

ENGINE CYLINDER HEAD REMOVING - REFITTING

REFITTING (contd.)

ADJUSTING THE VALVE CLEARANCES, FIG. I.

- Valve clearance, on a cold engine :

Inlet : 0.10 mm

Exhaust : 0.25 mm

- Turn the crankshaft to FULLY OPEN the exhaust valves, in the order shown below :

Exhaust		Exhaust	Inlet
⊗ 1 →	To adjust	● 3	⊗ 4
⊗ 3 →		● 4	⊗ 2
⊗ 4 →		● 2	⊗ 1
⊗ 2 →		● 1	⊗ 3

- Refit the drive belts (see Removing).

- Tension the alternator drive belt, fig. IV, using the KRIKIT tension meter :

- New belt : 30/40 kg/span. (66/88 lb)

- Used belt : 25/30 kg/span. (55/66 lb).

- Cooling system :

- Cooling system capacity : 9 liters.

- only a Peugeot recommended antifreeze is to be used in the system (see current maintenance literature),

- if necessary, consult the section entitled "Filling the Cooling System".

SPECIAL POINTS TO BE NOTED DURING REFITTING

- Engine mounting tightening torques, fig. II
 - Nut on rubber pad :
5.5 m.daN (55 Nm, 40 lbf ft)
 - 3 bolts on water pump :
5 m.daN (50 Nm, 37 lbf ft)

- Support cross piece 8.0150 A,

- Thrust rod 8.0150 B.

ASSOCIATED OPERATIONS

- 1 - Before handing the vehicle back to the customer :

- Warm up the engine :
 - by running it at 2 000 rpm until the electric fan cuts-in,
 - and then continuing to run it for a further five minutes at 1 200 rpm.

- Adjust the carburation.

- Allow the engine to cool down for a period 6 hours.

- Retighten the cylinder head, bolt by bolt.

- Adjust the valve clearances.

- 2 - After 1 000 to 1 500 miles
(1 500 to 2 500 km)

- Allow the engine to cool down for 6 hours.

- Retighten the cylinder head.

- Adjust the valve clearances.

- Adjust the carburation if necessary.

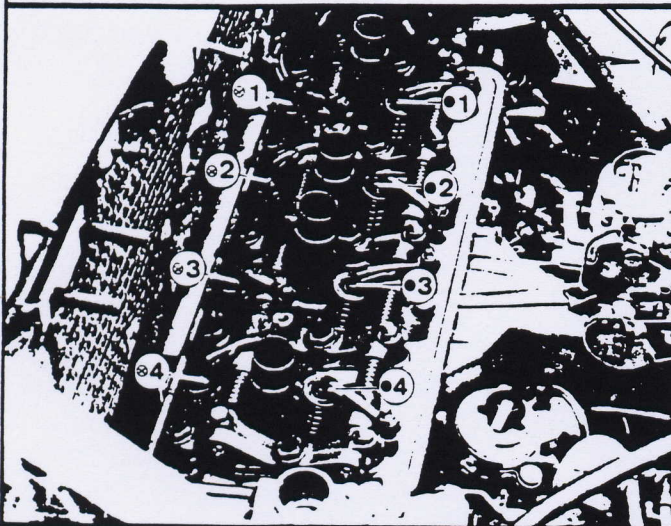
- Change the engine oil.

- Change the oil filter cartridge.

- Reconnect the exhaust downpipe clamp, fig. III.

- Lubricate the cones with MOKYKOMBIN paste, Pt. No. 9730.95 (100 g tube).

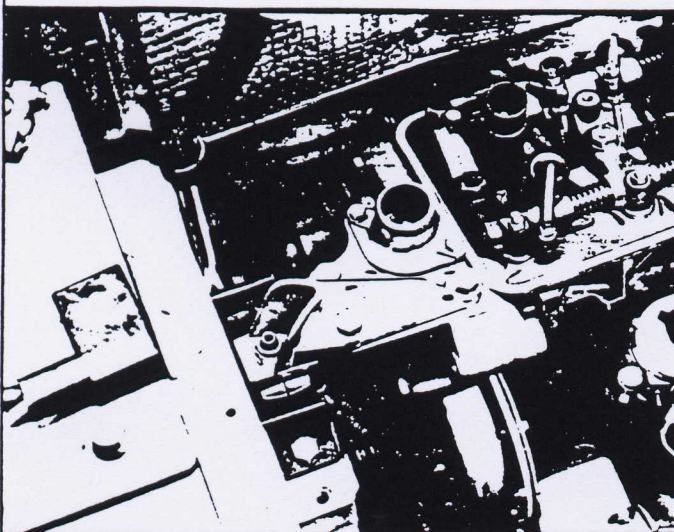
- Compress the springs to a length :
x = 22 mm



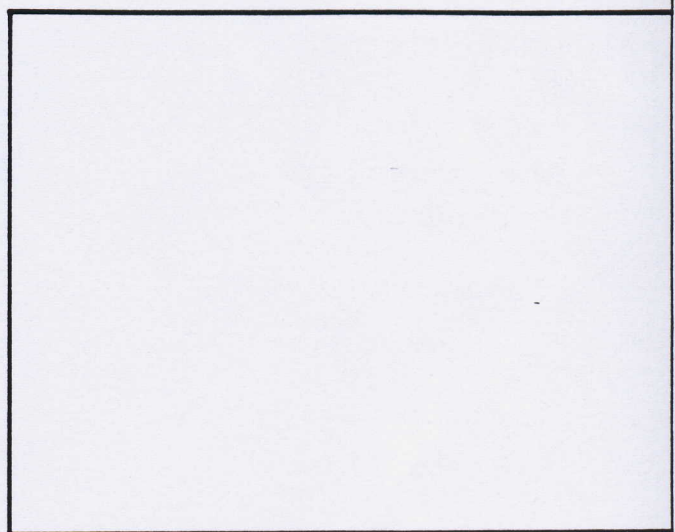
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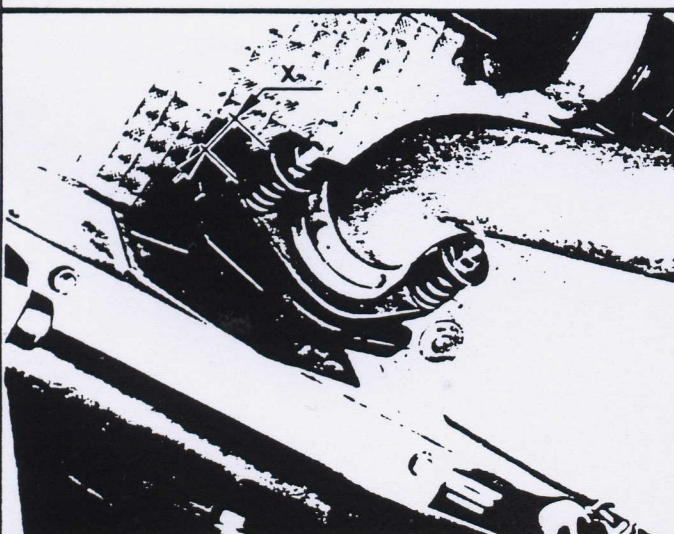
IV



II



V



III



VI

E4.002

1

U 25/661/673 ENGINE
(Timing gear drive by toothed belt)
REPLACING LIP SEALS

J5
DIESEL

This operation requires the removal of the engine (see this section) and the removal of the timing gear drive belts (see engine overhaul).

REMOVAL

Pierce two diametrically opposite holes with a punch or similar tool. Fig. I.

Position the seal so as to centralise the oil reserve groove in relation to the studs of the damper. Fig. IV.

Position tool F from kit (-).0157, screw the two drive screws into the body of the seal and extract the seal by turning the centre bolt. Fig. II.

Fit the seal. Fig. V.

FITTING

Clean the seal housing and the bearing surface on the crankcase.

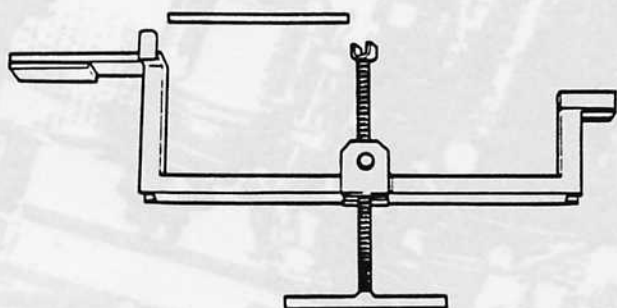
Lubricate the housing and the seal lips to assist fitting.

Mount the seal on tool (-).0157 B. Fig. III.

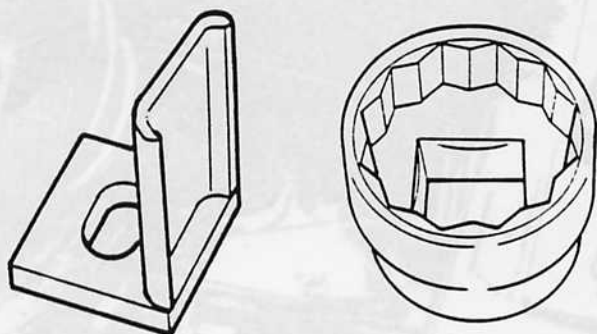
Withdraw the tool and check that the outer dust excluding lip is correctly positioned. If necessary, pull it out with a paper clip. Fig. VI.

Note - Take same precautions when changing oil pump and camshaft seals, but these do not need to be positioned in the same way.

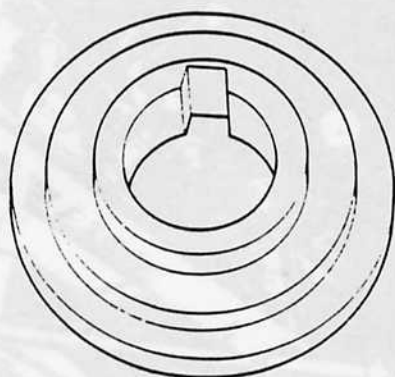
Refit the drive belts and the timing covers (see engine overhaul).



(A)



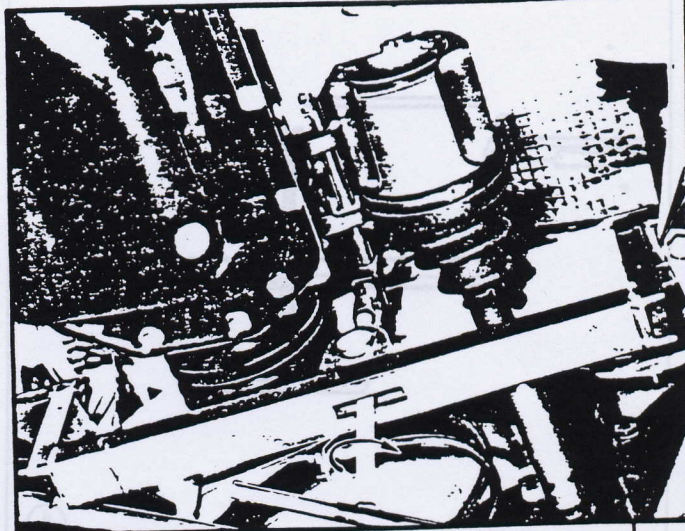
(B)



(C)



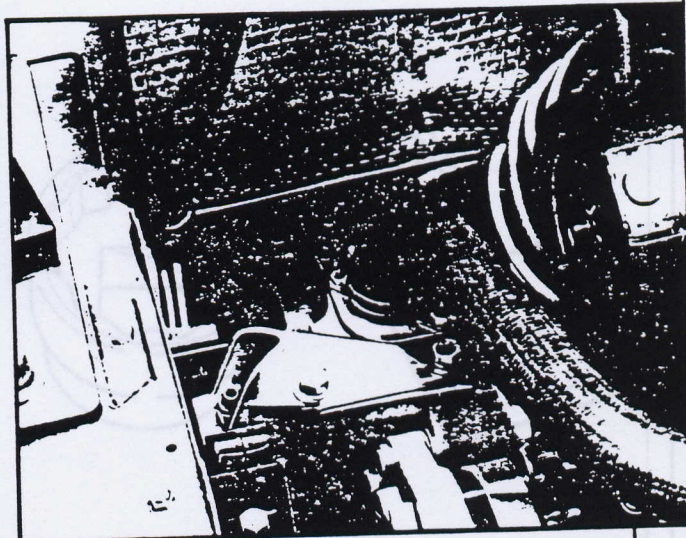
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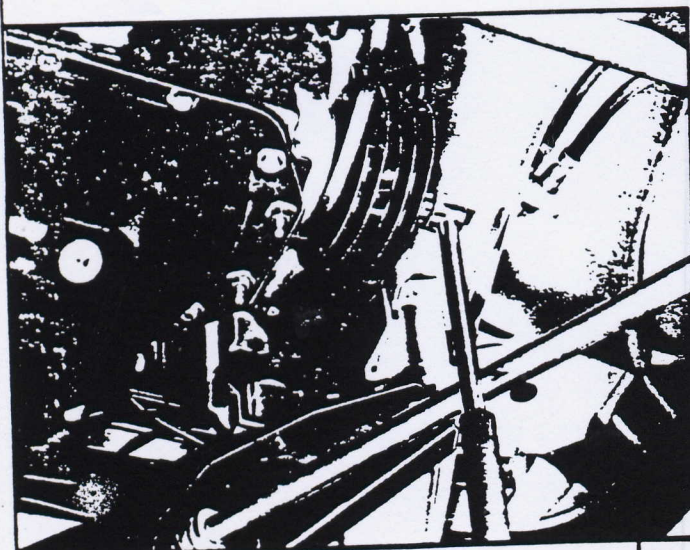
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III



VI

This operation is carried out with the engine in the vehicle, preferably on a lift.

NOTE - 1 - For the operations involved in overhauling the timing gear, see the section entitled "Engine Overhauling".

2 - Replacing the pulley seal does not involve removing the timing cover. Simply remove the pulley by the method described below.

REMOVING

- Disconnect the battery.
- Remove the alternator drive belt.

OPERATIONS UNDER THE VEHICLE

- Remove the water pump drive belt, fig. I, by levering it out of its pulley groove.

- To do so, turn the crankshaft with :
 - spanner 8.0118 P1,
 - FACOM adaptor S 232.
 - FACOM spanner S 151.

- Remove the clutch housing lower cover plate.

- Fit the retainer into the flywheel ring gear, fig. II.

- Tighten the original securing bolt.

- Loosen the pulley nut, fig. III, using spanner 8.0118 P1.

- Support the engine, fig. IV by fitting support equipment 8.0150 :

A - cross piece.

B - thrust rod which has already been passed through the lugs on the cylinder block.

- Tighten the screw to place the equipment under tension.

Operations under the bonnet :

- Remove the aluminium engine mounting bracket from the water pump, fig. V.

- Loosen the lifting equipment screw, fig. VI, so as to be able to remove the pulley.

- Remove the pulley.

ENGINE
TIMING GEAR
REMOVING AND REFITTING THE TIMING COVER

- Remove, fig. I :
 - the bolts from the cover,
 - the timing cover.

NOTE - To overhaul the timing gear :

- Remove the sump.
- Remove flywheel retainer 8.0110 J.
- Consult the section entitled "Engine Overhaul".

- Tighten the screw on the fixture so that the aluminium engine mounting bracket can be fitted.

Tightening torques, fig. IV :

- 3 bolts on water pump : 5 m.daN (50 Nm, 37 lbf ft).
- 1 nut on rubber mounting pad : 5,5 m.daN (55 Nm, 40 lbf ft).

REFITTING

- Refit the timing cover, using a new gasket.
- Centralise the cover, fig. II using adaptor 8.0110 R.
- Fit the bolts and tighten them to 1.25 m.daN (12.5 Nm, 9 lbf ft).

- Refit the flywheel retainer 8.0110 J.

- Tighten the nut on the pulley fig. V, to a torque of 17 m.daN (170 Nm, 125 lbf ft).

- Remove the flywheel retainer 8.0110 J.

- Refit the clutch housing cover plate.

- Fit the seal to adaptor 8.0110 R.
- Fit the seal, fig. III by screwing on the crankshaft nut as far as it will go without forcing it.

- Refit the belts (see the section on removing them).

- Refit :
 - the key,
 - the crankshaft pulley, passing the bolt behind it.

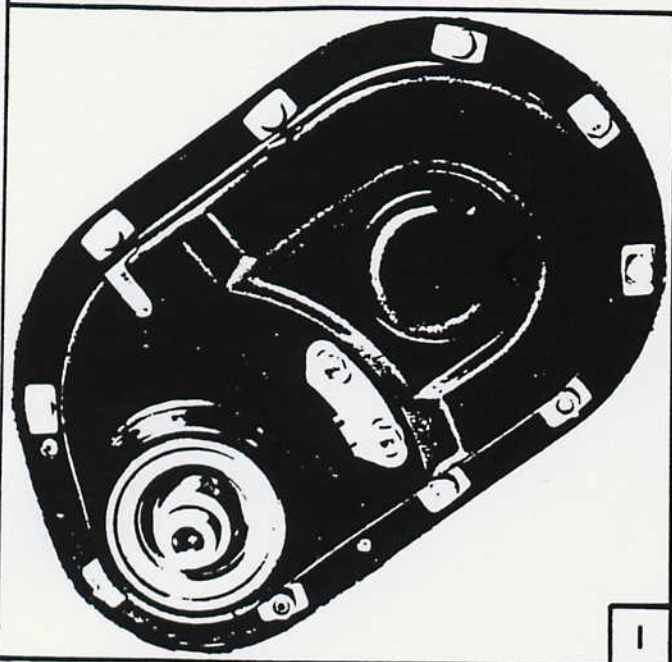
- Tension the alternator drive belt, fig. VI, using the KRIKIT tension meter.

Tension on a new belt :

30/40 kg/span (66/88 lb)

Tension on a used belt :

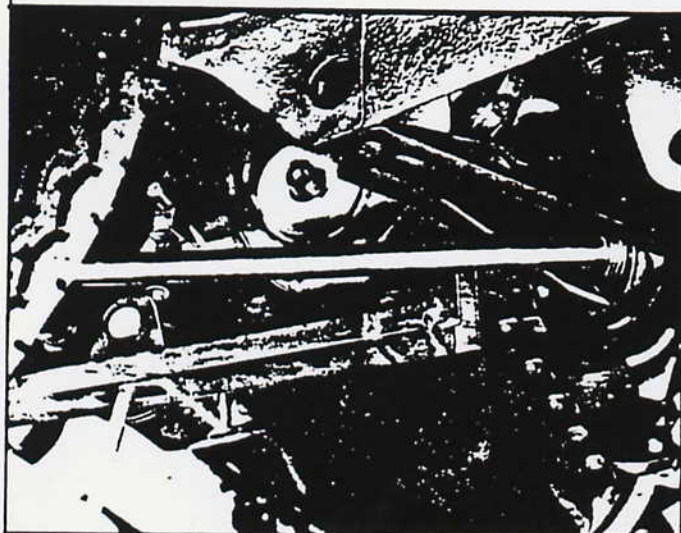
25/30 kg/span (55/66 lb)



I



IV



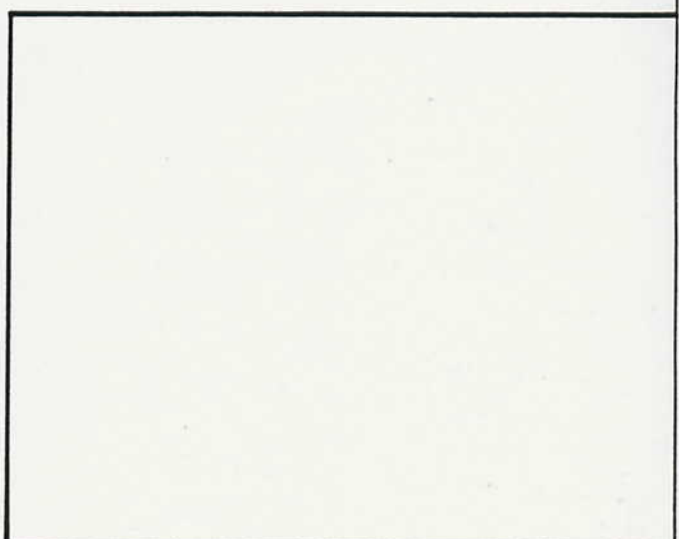
II



V



III



VI

Pages

Identification

F1.002

Data :

- Specifications
- Adjustments with the carburettor removed
- Idling - mixture adjustments on the vehicle
- Carburettor assembly specifications

F1.005

CARBURETTOR IDENTIFICATION
AND DATA

SOLEX CARBURETTOR 34 PBISA 16

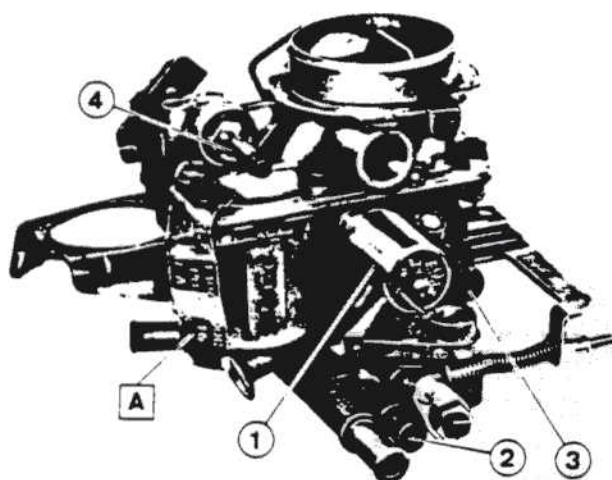
Single barrel downdraught carburettor with :

- manual cold start control, strangler flap type,
- carburettor base heated by coolant circulation,
- constant CO idling device.

IDENTIFICATION Fig. I, II and III.

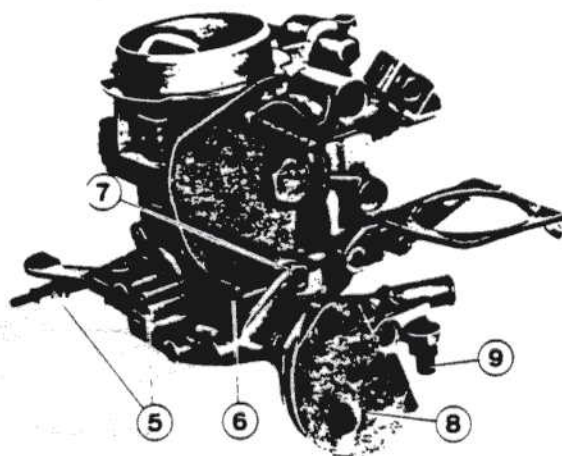
A - Carburettor reference number (identification and modifications page F1.005)

- | | |
|--|-----|
| 1 - Solenoid - idling fuel jet | g |
| 2 - Mixture screw (W) with tamper-proof cap | W' |
| 3 - Constant CO screw (Va) | Va |
| 4 - Fuel inlet (with filter screen) | |
| 5 - Pump stroke adjustment | |
| 6 - Adjusting screw, Positive Throttle Opening | |
| 7 - Choke flap control | |
| 8 - Throttle control | |
| 9 - Throttle stop screw (for adjusting the Normal idling Position) | |
| 10 - Pump injector (with discharge valve) | i |
| 11 - Constant CO fuel jet | gCo |
| 12 - Air calibration, constant CO circuit | |
| 13 - Main jet | Gg |
| 14 - Non-return valve, acceleration pump | |
| 15 - Econostat calibration | Ce |
| 16 - Air correction jet with emulsion tube | a |
| 17 - Choke tube (venturi) | K |



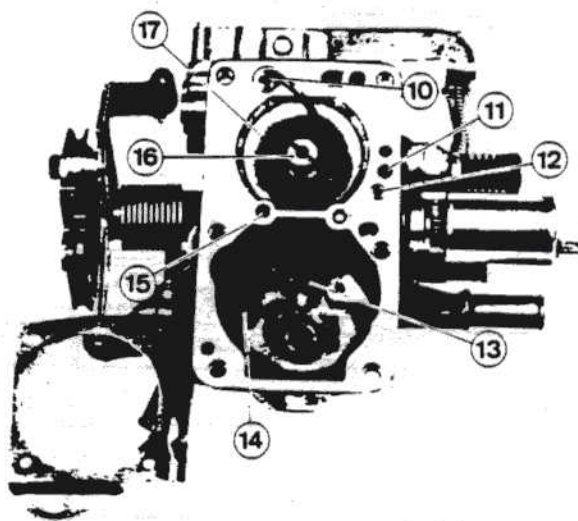
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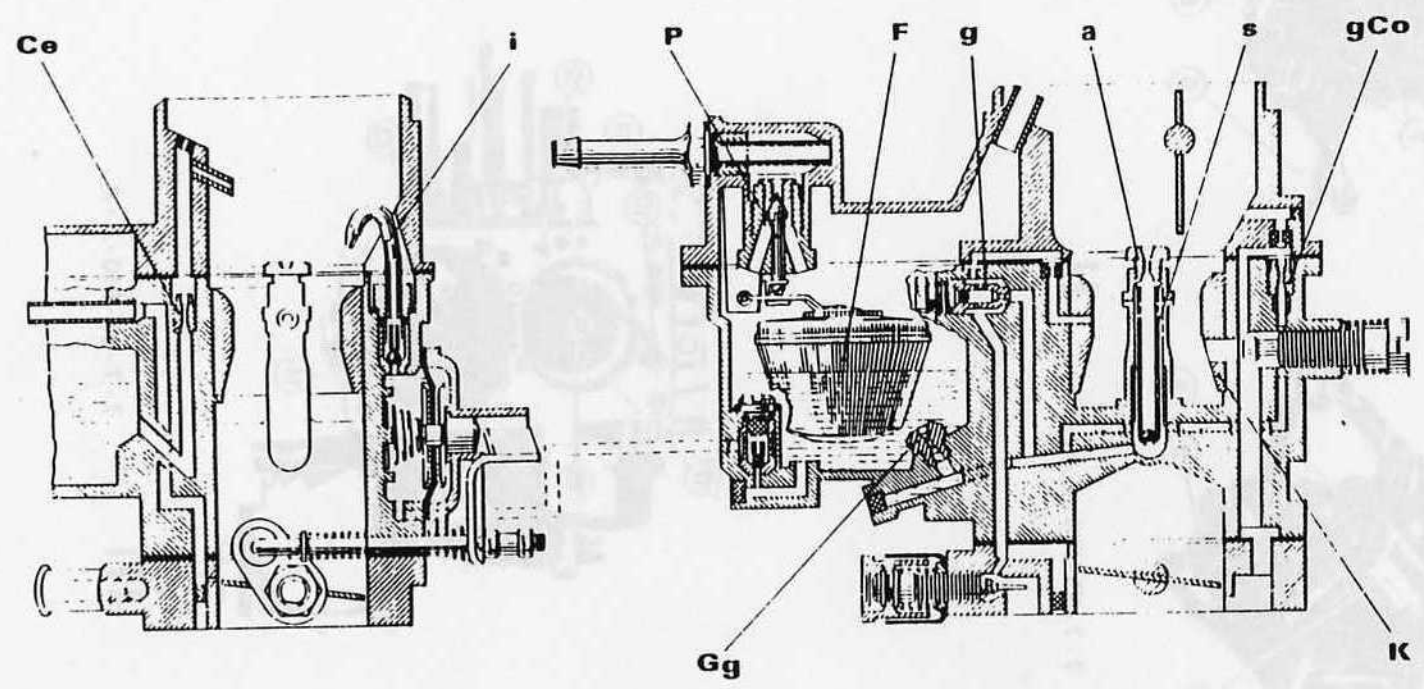
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III

7-7-81-P10-R-A



J5	ENGINE CARBURETTOR IDENTIFICATION - DATA	1	F1.005
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DATA

Settings

		PEU A 315	PSA 425
CARBURETTOR REFERENCE		XM7-T and XN1-T	XN1-TA
Choke tube	K	25	25
Main jet	Gg	130	127,5
Air correction jet	a	170	155
Idling jet	g	46 (strangler)	45 (strangler)
Constant CO jet	gCO	35	35
Econostat jet	Ce	70	50
Accelerator pump injector	i	50	50
Needle valve	P	ø 1,6mm (ball type)	1,6mm (ball type)
Float	F	5,7 g	5,7 g

Adjustments to be carried out after removal of the carburettor

		PEU A 315	PSA 425
CARBURETTOR REFERENCE		XM7-T and XN1-T	XN1-TA
Positive throttle opening	OP	0,9 mm	1 mm
Pump travel ends at a throttle opening of		4 mm	4 mm

Idling speed adjustment to be carried out on the vehicle

		PEU A 315	PSA 425
CARBURETTOR REFERENCE		XM7-T and XN1-T	XN1-TA
Idling speed - screw	Va	$800 + \begin{smallmatrix} 50 \\ 0 \end{smallmatrix}$ rpm	$900 + \begin{smallmatrix} 50 \\ 0 \end{smallmatrix}$ rpm
CO% - screw	W	1 to 2 %	1.5 to 2 %
CO ₂ %		10 % mini	10 % mini

Carburettor applications

REF	ENGINE	VEHICLE		SPECIAL FEATURES
		TYPE	FITTED	
PEU A 315	169 (XM7-T) and 170 (XN1-T)	All types	→ introduction	Solenoid valve on idling jet
PSA 425	170 C (XN1-TA)	All types	→ introduction	Solenoid valve on idling jet

TOOLS REQUIRED

RECOMMENDED TOOLS

- Fig. A : SOLEX angle measuring gauge

: Tachometer
- Fig. B : SOLEX tool kit, tamperproof caps

: Exhaust gas analyser

OPERATIONS TO BE CARRIED OUT

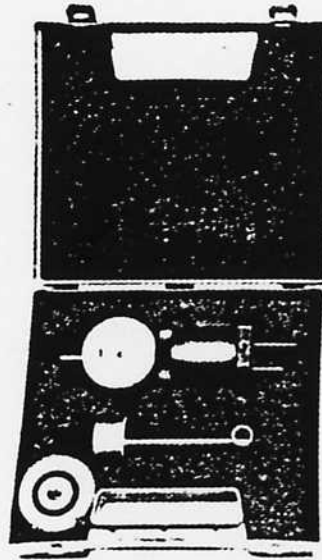
SYMPTOM	OPERATIONS				
	OVERHAUL CLEANING *	NORMAL IDLING POSITION (NIP)	POSITIVE THROTTLE OPENING (PTO)	ACCELE- RATOR PUMP STROKE	IDLING SPEED, MIXTURE (1)
Faulty carburation	X	X	X	X	X
Replacement carburettor			X		X
Faulty starting from cold; speed too high or too low			X		X (2)
Incorrect hot idling speed		X	X		X

Prior requirements

- (1) - Ignition in good condition and correctly adjusted.
- Engine warm, after electric fan has cut in.
 - Choke control correctly adjusted and fully pushed in.
 - Air filter in place and in good condition.
 - Accelerator control system correctly adjusted.

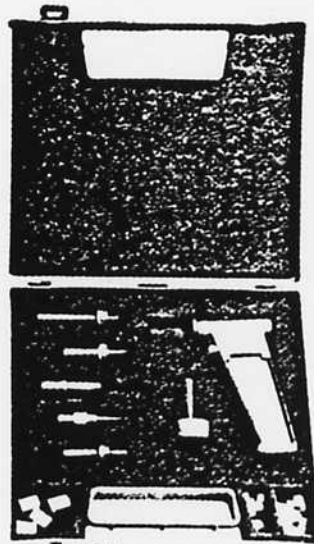
- (2) - Idling speed adjusted, when the engine is warm to

XM7-T - XN1-T	XN1-T
800 ⁵⁰ / ₀ rpm	900 ⁵⁰ / ₀ rpm



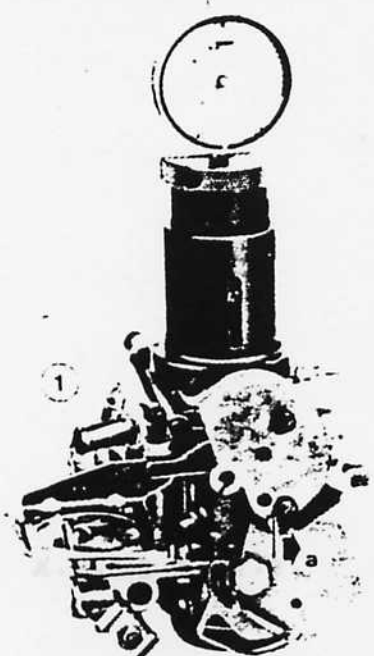
A

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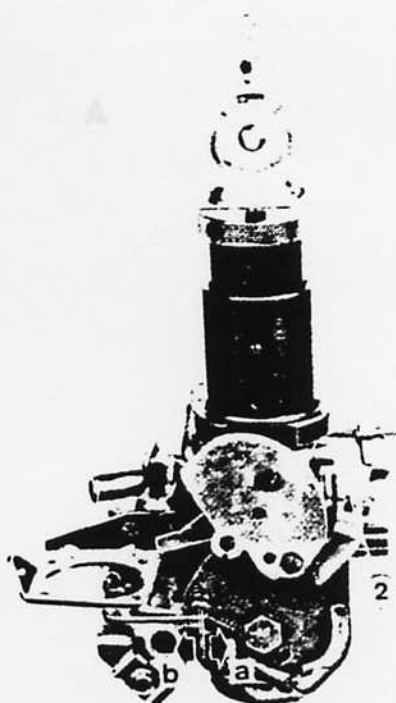
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6383 R - A



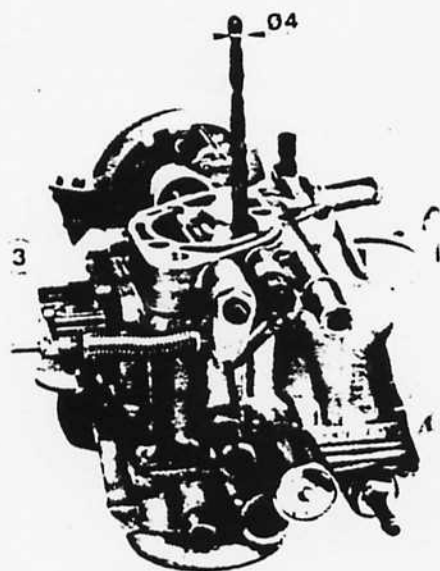
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II




7-7-81-P16-R-A

III



ADJUSTMENTS WITH THE CARBURETTOR REMOVED

NORMAL IDLING POSITION (NIP) Fig. I

- Remove the tamperproof cap from screw (1).
- Place the choke flap control at 0, with the choke flap open  (a)
- Place the SOLEX gauge on the butterfly and centralise it, without the removable dial.
- Move the screw (1) so as to read the NIP on the gauge :
- carburettor reference PEU A315 : 9° .

ADJUSTING THE POSITIVE THROTTLE OPENING (PTO) Fig. II

Requirement - NIP correctly adjusted

- place the choke flap control at 0, with the choke flap open  (a)
- Place the removable dial on the SOLEX gauge and adjust it to 0 (the minute scale, then the degree scale).
- Close the choke flap smoothly  (b)
- The dial gauge needles must indicate : carb. ref. PEU A315 : $16^{\circ} 15' \pm 1^{\circ}$.
- Adjust if necessary by means of the screw (2)

To check : Open, then close the choke flap. The gauge needle readings must be within the tolerance given above.

ACCELERATOR PUMP STROKE Fig. III

- Fit a gauge rod : carb. ref. PEU A315 : 4 mm diameter
- Loosen the locknut, unscrew the nut (3) a few turns
- Turn the nut (3) inward until it just touches the pump operation lever.
- Retighten the locknut.

ADJUSTING THE CARBURETTOR ON THE VEHICLE

REMINDER : Prior requirements : The ignition must be in good condition and correctly adjusted. The engine must be warm. The choke must be correctly adjusted and pushed fully in. The air filter must be in position and the accelerator control correctly adjusted.

ADJUSTING THE IDLING SPEED

1

Adjust the idling speed, by turning the idling screw Va to :	
PEU A 315	PSA 425
$800 + \frac{50}{0} \text{ rpm}$	$900 + \frac{50}{0} \text{ rpm}$

2

The CO% must be :	
PEU A 315	PSA 425
1 to 2 %	1,5 to 2 %

ADJUSTING THE MIXTURE WITHOUT AN EXHAUST GAS ANALYSER

1

Turn screw Va to obtain a speed of :	
PEU A 315	PSA 425
$850 + \frac{50}{0} \text{ rpm}$	$950 + \frac{50}{0} \text{ rpm}$

2

Find the maximum speed obtainable by turning the mixture screw W.

3

Recommence operations 1 and 2 until the maximum speed obtained by turning screw W is :	
PEU A 315	PSA 425
800 rpm	950 rpm

4

Screw in screw W to obtain a speed of :	
PEU A 315	PSA 425
800 rpm	900 rpm

Fit the tamperproof cap.

ADJUSTING THE MIXTURE USING AN EXHAUST GAS ANALYSER

1

Adjust the idling speed, at screw Va, to :	
PEU A 315	PSA 425
$800 + \frac{50}{0} \text{ rpm}$	$900 + \frac{50}{0} \text{ rpm}$

2

Adjust the CO% by turning screw W to :	
PEU A 315	PSA 425
1 to 2 %	1,5 to 2 %

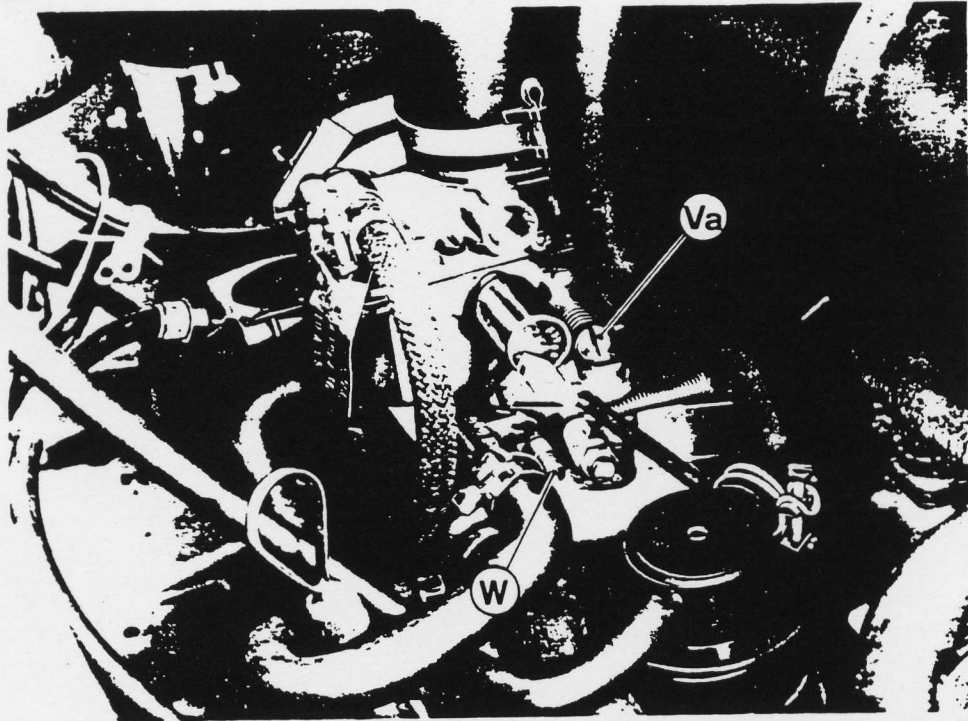
3

Turn screw Va to bring the speed to :	
PEU A 315	PSA 425
$800 + \frac{50}{0} \text{ rpm}$	$900 + \frac{50}{0} \text{ rpm}$

4

Check the CO% and, if necessary, repeat operations 2 and 3.

IMPORTANT : The CO% must not be less than 10%. If it is, check the exhaust system for leaks or check the operating condition of the engine.



I

24-6-81-P14-R-A

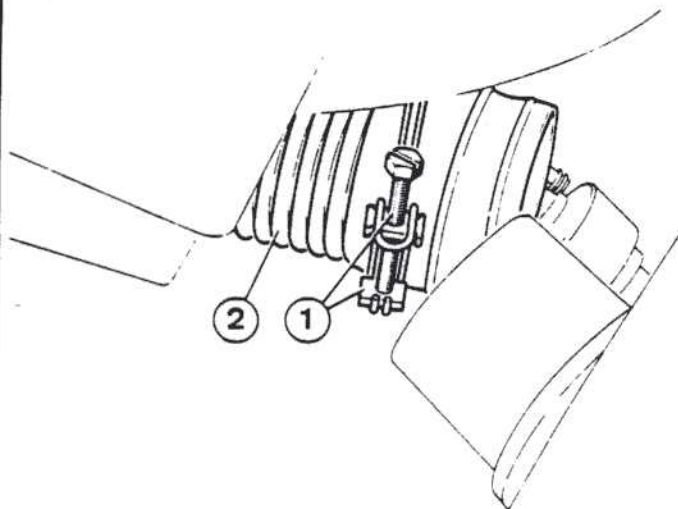
F4.002	1	4 x 4	FUEL SYSTEM FUEL TANK REMOVING - REFITTING	J5
I Raise the vehicle on a lift Empty the tank with a pump through the filler neck Loosen the clip (1) Free the hose (2) from the tank			IV To refit the tank, carry out the removing operations in reverse.	
II Loosen the 2 bolts, at the rear, that secure the viscous coupling support frame, without removing them Remove the 2 bolts (3) Lower the assembly formed by the viscous coupling and the propellor shafts Remove the screws (4) that secure the tank in place.				
III Tilt the tank assembly → towards the left of the vehicle taking care to disconnect the fuel gauge wires and the fuel input and output pipes →				

J5

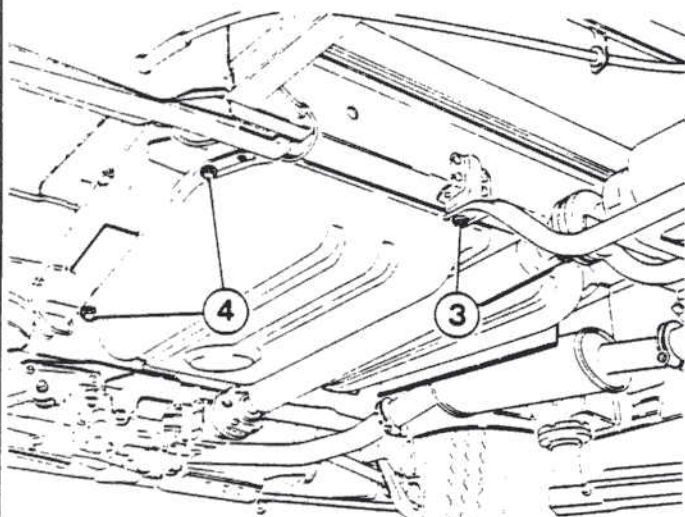
4 x 4

1

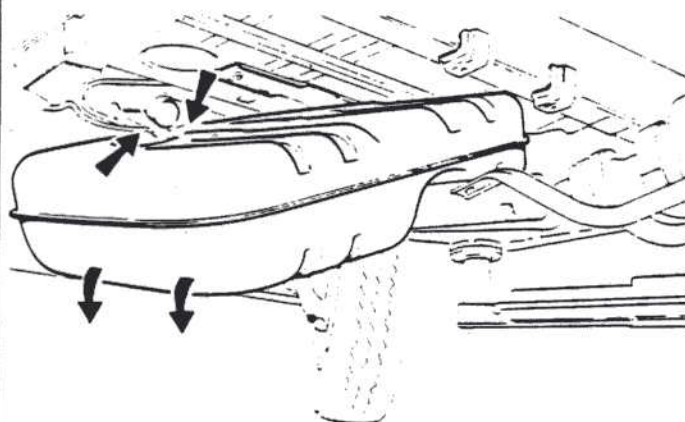
F4.003



09-11-88 CAR 5



09-11-88 CAR 7



09-11-88 CAR 6

TOOLS REQUIRED

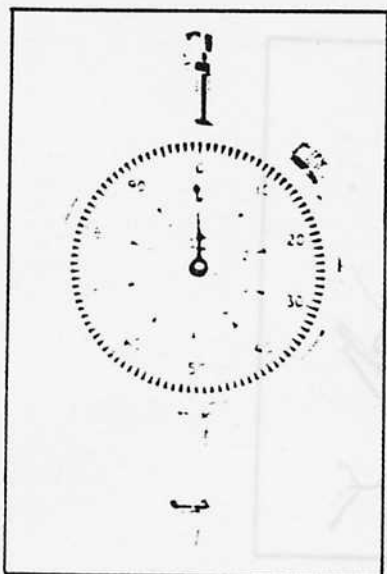
SPECIAL TOOLS

- Dial gauge Fig. A reference 8.1504.
- Throttle control tool Fig. C reference 8.0148.
- T.D.C. gauge Fig. B reference 8.0126.
- Socket for crankshaft pulley bolt Fig. D reference 8.0118 P1.

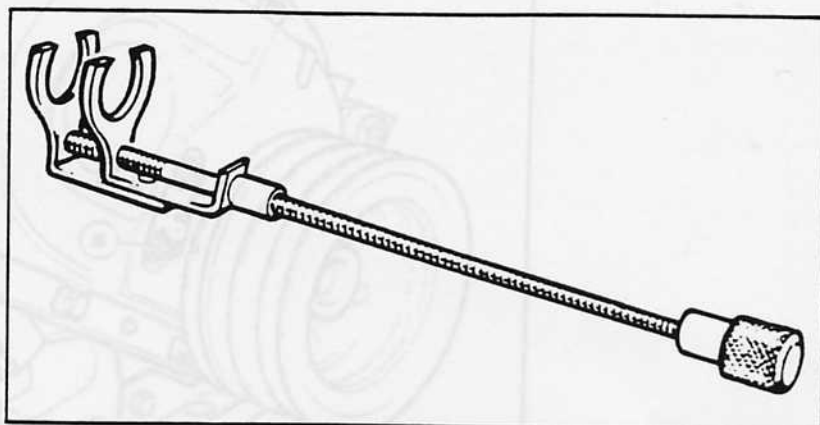
Used with (recommended tools)
- adaptor FACOM S232
- ratchet FACOM S151
for turning the crankshaft

RECOMMENDED TOOLS

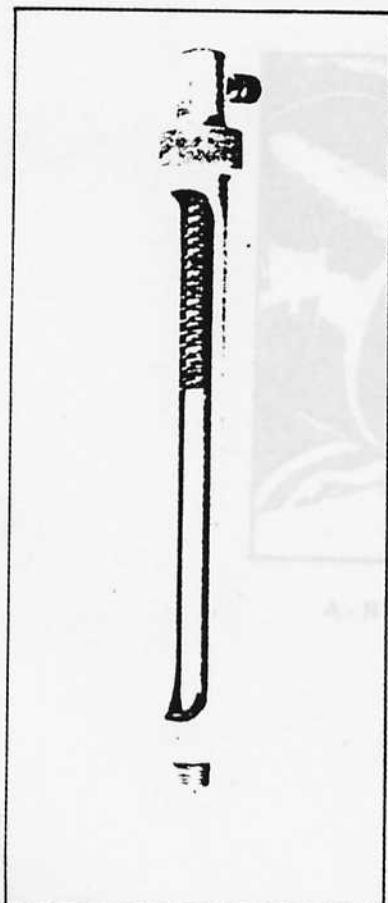
- Tachometer
- Dwell meter
- Stroboscopic timing lamp with advance control.
- Engine tester (for use with the diagnostic socket).
- Manual vacuum pump.



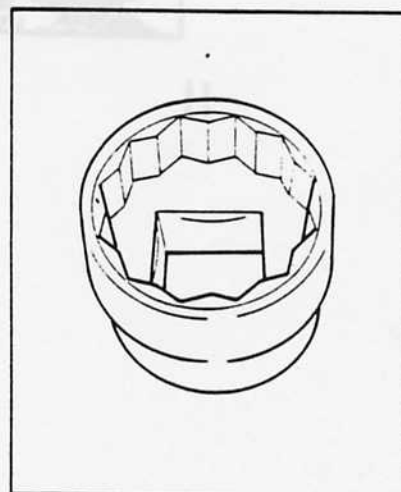
A



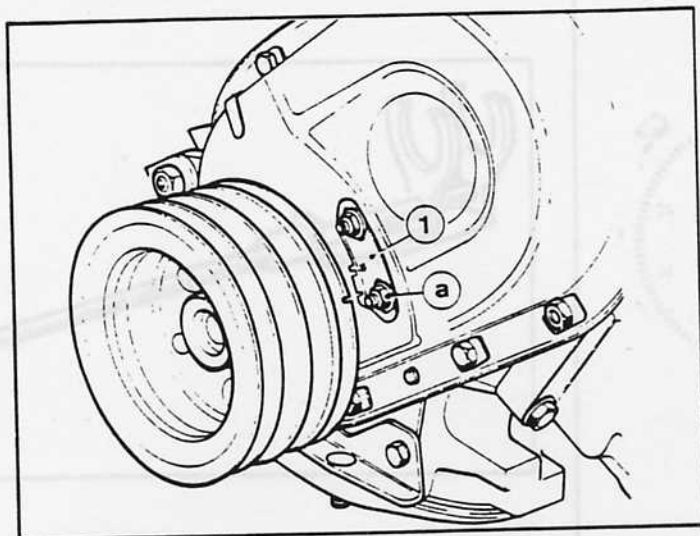
C



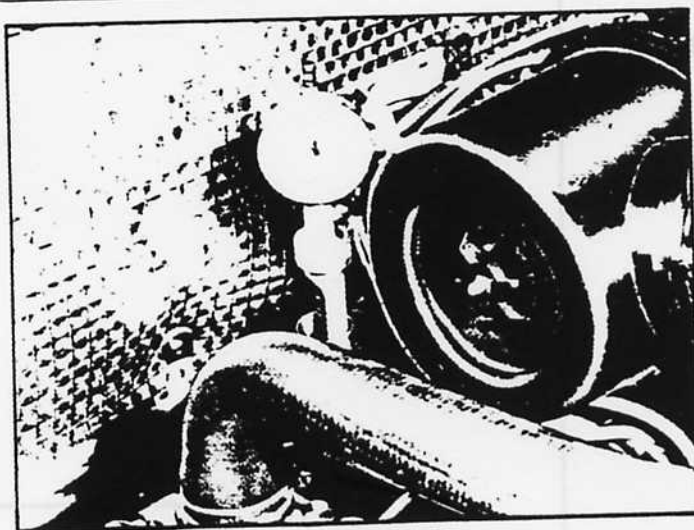
B



D



7-7-81-P9-L-A



24-6-81-P10-R-A

CHECKING THE POSITION OF THE TIMING PLATE

The adjustment of the ignition timing (initial setting) requires an exact setting of the timing plate (1) Fig. I on the timing cover.

When in doubt - flaking of the paint seal (a) - or after work involving the timing, it is essential to check the position of the timing plate.

- Remove the spark plug from No. 1 or No. 4 cylinder and fit Fig. II.
 - T.D.C. gauge 8.0126,
 - the dial gauge 8.1504.
- Turn the crankshaft slowly clockwise and note the point of the maximum reading on the dial gauge.

Turn the crankshaft using tools :

- socket 8.0118 P1
- adaptor FACOM S232
- ratchet FACOM S151

- Set the dial gauge the zero (millimetres and hundredths).

The mark on the pulley must be opposite the 0 on the timing plate

- If it is not, move the timing plate so that the 0 mark is opposite the mark on the pulley.
- Remove all traces of the original paint and put a new paint mark (a) on one of the nuts.
- Refit and tighten the spark plug to 2,5 m.daN (18 lbf ft).

ADJUSTING THE AIR GAP, T.D.C. SENSOR Fig. I and II

The setting of the T.D.C. sensor must be checked when replacing the flywheel or the steel closing plate on which the sensor is mounted, or if faulty readings of the initial ignition timing are found when using the diagnostic socket.

New T.D.C. sensor

- Plastic mounting (1) in place.
- Insert the sensor until the pins (2) fig. II just touch the flywheel face, without using force.
- Tighten the bolt (3) to retain the sensor.

Used sensor

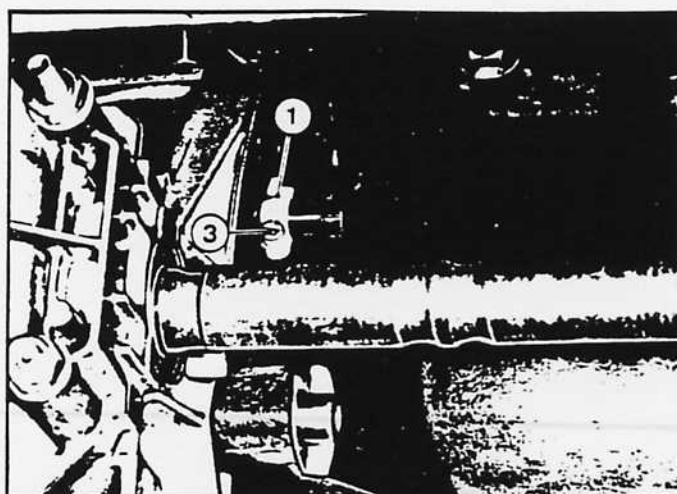
- Plastic mounting (1) in place.
- File or cut off the pins (2) Fig. II.
- Insert the sensor until it just touches the flywheel face, without using force.
- Tighten the bolt (3) to retain the sensor.

- Measure the distance X
- Loosen the bolt (3) and withdraw the sensor so that :
X – 1,7 mm.

- Retighten the bolt (3).

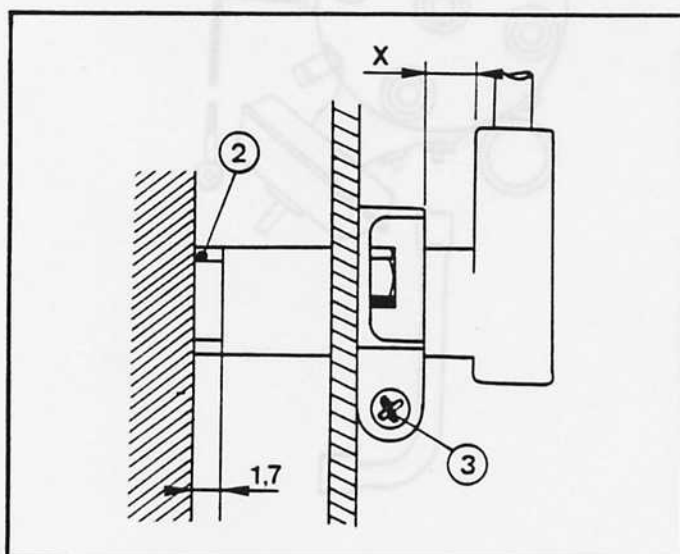
NOTE - The diagnostic socket enables the following checks to be made in situ (using the appropriate equipment - see Workshop Materials and Equipment Brochure ref. 2396) :

- the ignition primary circuit
 - the condition of the contact breaker
 - the contact breaker gap
 - the initial ignition timing
 - the centrifugal and vacuum advance curves
 - the engine rpm.
- } contact breaker ignition



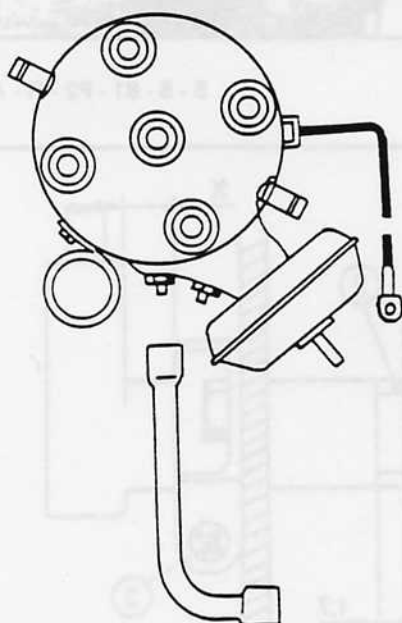
I

5 - 5 - 81 - P2 - R - A



45 - 13 - 2 - 22

26 - 5 - 82 - 1A



DUCELLIER

I

AI-01-2-25

26-5-82-2A

ADJUSTING THE DWELL ANGLE IN SITU (contact breaker ignition).

- Engine at idling speed (800 rpm).
- Adjust the dwell angle to :

$- 57^{\circ} \pm 2^{\circ}$
 $- 63\% \pm 3^{\circ}$ Dwells } according to the equipment being used

This adjustment is carried out externally on the distributor using :
Fig. 1 Ducellier distributor : box wrench 7 mm.

To check

- Raise the engine speed to 3 000 rpm.
- The dwell angle must be within the tolerance given above.
- If not, remove the distributor and check it on a distributor test bench (see section 12).

IMPORTANT : Check the initial timing.

NOTE : With the appropriate equipment, the dwell angle can be checked by using the diagnostic socket.

INITIAL IGNITION TIMING

Requirements

- Dwell angle adjusted.
- Timing plate correctly positioned (paint seal (a) Fig. II not flaked or chipped).
- Disconnect and plug the vacuum advance union at the carburettor end.

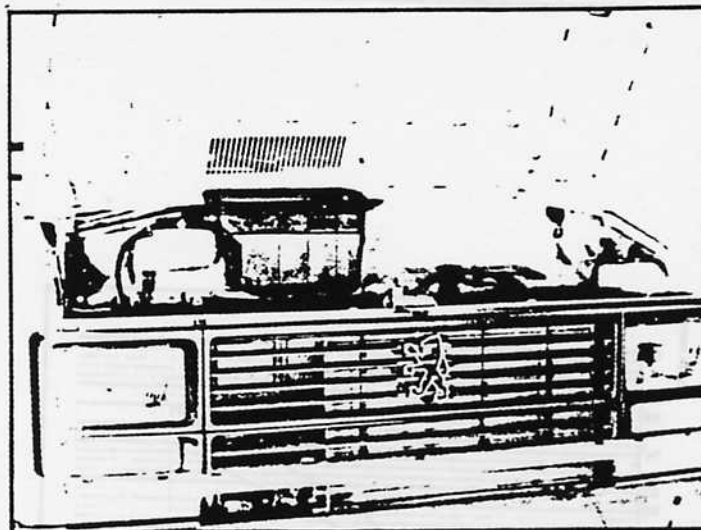
The crankshaft pulley has 2 grooves diametrically opposite, corresponding to the cylinders 1-4 and 2-3, so that the initial timing can be done on the four cylinders.

Proceed as follows :

- Connect the stroboscopic timing lamp to the H.T. cable on the ignition coil.
- Set the advance control on the timing lamp to 0.
- Run the engine at a speed not exceeding 800 rpm.
- Illuminate the crankshaft pulley by aiming the lamp through the opening above the front bumper Fig. I.
- 2 situations can arise :
 - Fig. II - the two grooves in the pulley merge into one (distributor is in good mechanical order) :
→ adjust the groove in the pulley with the 10° mark on the timing plate.
 - Fig. III - the 2 pulley grooves are separated by a certain distance (α°) (the cam profiles are not in good condition)
→ adjust the mean centre of this ignition "zone" (α') with the 10° mark on the timing plate.
- Reconnect the vacuum unit at the carburettor.
- Adjust the idling speed.

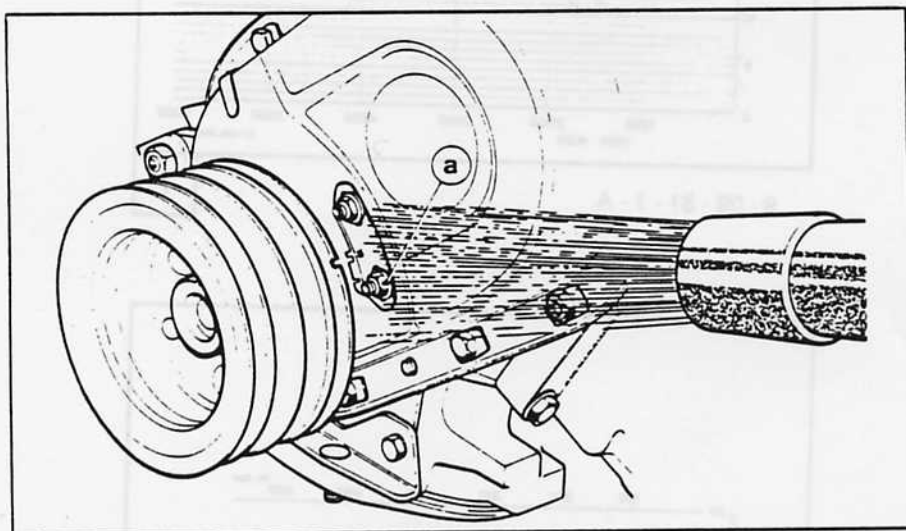
IMPORTANT - The ignition zone (α°) must not exceed $4^{\circ}30'$. If it does, replace the distributor.

NOTE - With the appropriate equipment the ignition timing can be checked by using the diagnostic socket.



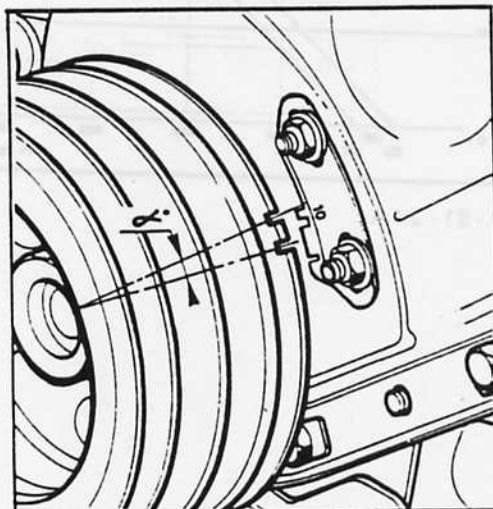
14-4-81-P27-R-A

I



7-7-81-P9-L-B

II



7-7-81-P9-L-C

III

CHECKING THE ADVANCE CURVES IN SITU

Use the throttle control tool 8.0148 to hold the engine rpm steady at the required speeds (see special tools page).

CENTRIFUGAL ADVANCE

- Initial timing set.
- Disconnect the vacuum advance pipe on the distributor.
- Connect the timing lamp to cylinder No. 1 (clutch end)
- Use the "0" on the timing plate as a reference.
- Check according to following table :

Engine rpm	1 500	2 200	3 000	4 000	5 000
Centrifugal advance (engine degrees)	10 - 11°30'	16° - 19°15'	24°30' - 28°	29°15' - 33°	34 - 38°

- If the readings are outside these tolerances it is advisable to remove the distributor and adjust it on a test bench.

VACUUM ADVANCE

- Centrifugal advance checked and within the tolerances.
- Connect a vacuum pump to the distributor advance capsule.
- Use the "0" on the timing plate as a reference.
- Raise the engine speed to 2 500 rpm and note the centrifugal advance reading.
- Apply the vacuum given in the table.
- Reset the engine speed to 2 500 rpm.
- Read the total advance (centrifugal + vacuum) and note it.

→ Total advance - centrifugal advance = VACUUM ADVANCE

Vacuum mm Hg	100	200	300 et +
Degrees of vacuum advance (engine degrees)	0 - 2°	8 - 12°	19 - 22°

- If the readings are outside these tolerances, it is advisable to remove the distributor and adjust it on test bench.

NOTE - With the appropriate equipment, these checks can be done with the diagnostic connector.

Cooling system

Coolant circuit :

Of the « auto-degaz » type with an expansion bottle.

- Filling through expansion bottle cap
- Level ... (cold engine with circuit fully bled) ... up to the position mark in the expansion bottle
- Coolant (water + anti-freeze) 9 litres
- Circuit frost protection (as stated on the label) - 30°C - 50% anti-freeze solution

Aluminium radiator made by

XM7-T - XN1-T

XN1-TA

VALEO

IPRA

- Pitch of radiator fins

1.15 mm

1.7 mm

- Dimensions of radiator

414 x 663 mm

- Radiator surface area

27.5 dm²

Type

Horizontal, with input and output on
the same side - PO (heavy duty)

- Filler cap pressure setting 0.9 bar

Thermostat

- Make

VERNET

DAUPHINOISE

- Reference or colour code

V28 Ref. V6697

THOMSON

Tawny beige

- Starts to open at

- Fully open at

95°C

- Lift

7.5 mm min.

Coolant temperature switch (on cylinder head) :

- The warning light (on the instrument panel) switches on at a temp. of 105° ± 3°C
- Tightening torque (ø 18 x 150) 28 N.m (20.6 lbf.ft)

Temperature sensor on cylinder head coolant output pipe TORRIX (red code)

Multi-stage temperature switch on radiator :

1 electric fan

Electric fan cuts in : temperature increasing

92° ± 2°C

Electric fan cuts out : temperature falling

87° ± 2°C

Multi-stage temperature switch tightening torque (coated with LOCTITE

FRENETANCH 19 N.m (14 lbf.ft)

Cooling fan :

- 1 electric fan unit - 4 bladed (operated by a multi-stage temperature switch) :
- Power of electric fan unit 80 W
- Speed 2300 rpm
- Diameter across blades 280 mm
- Direction of rotation (seen from electric motor end) C.W. (clockwise)

WARNING : Aluminium radiator

- The circuit must be kept permanently filled with an officially approved coolant solution (see current literature).
- It is to be renewed every 2 years.
- If the radiator is to be stored for more than 48 hours, flush it with clean water and blow it out with compressed air.

SPECIAL TOOLS

Fig. A : 8.1503

Pressure and vacuum checking kit comprising :

- A - Pressure gauge.
- B - Hose
- C - Union
- 1 - Retaining clip.

RECOMMENDED TOOLS

- Tachometer.

CHECKING THE OIL PRESSURE

- Remove the oil pressure switch from the oil filter base.
- Screw union 8.1503 C in its place.
- Fit hose 8.1503 B, fig. 1, together with its retaining clip (1).

IMPORTANT — The temperature of the oil in the sump is to be 90°C during the test.

- To obtain this temperature from cold (ambient temperature of 20°C), run the engine at 3 500 rpm and measure the pressure five minutes after the electric fan first cuts in.

Oil pressures at approximately 90°C :

- at 850 rpm : 2.7 ± 0.8 bars
- at 2 000 rpm : 3.3 ± 0.7 bars
- at 4 000 rpm : 3.8 ± 0.7 bars.

NOTE - On high mileage vehicles these figures may be lower by between 0.2 and 0.4 bars.