

# J5

01/90

Ref. 2835 GB.

SRWM 2835

MECHANICAL



AUTOMOBILES  
**PEUGEOT**

direction des pièces et services

## DESCRIPTION OF PAGE NUMBERING SYSTEM

SOMMARIO

ATTINA - TINX - TMX

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

F - Fuel system (carburettor or  
injection system)

B - Cylinder head

G - Ignition system

C - Cylinder block - Moving parts  
Flywheel

H - Exhaust system

D - Sump

J - Cooling system

E - Timing Gear

K - Lubrication system

Nature of Operation \_\_\_\_\_

The first figure identifies the nature of the operation :

1 - General - identification - Specifications

4 - Removing - refitting

2 - Inspection - adjustment

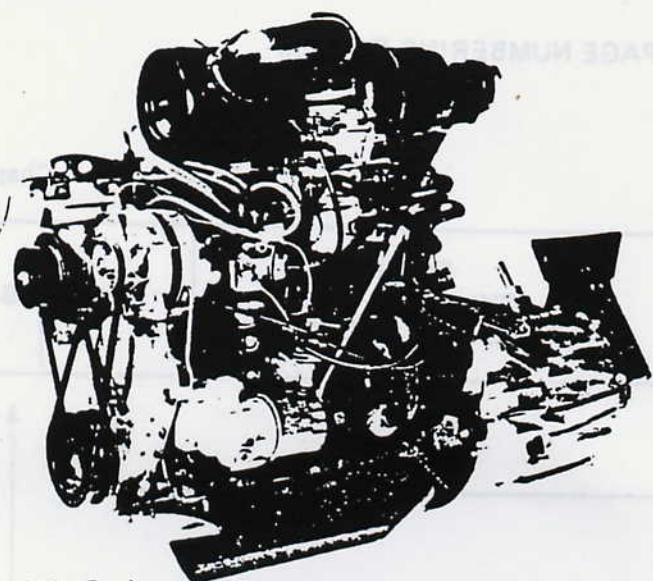
5 - Overhauling

3 - Draining - filling - bleeding

The Page Number \_\_\_\_\_

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

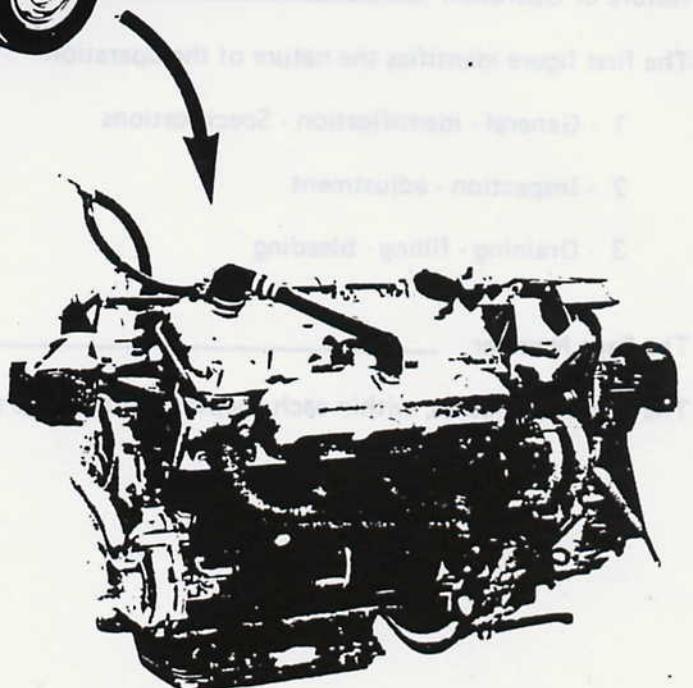
CTA-ESU - FAS-ESU - ICA-ESU  
AeroJX



MOTEUR ESSENCE

XM7T-XN1T-XN1TA

7-5-81-P23-R-A

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

7-6-81-P12-R-A

	Pages
<b>A - COMPLETE ENGINE</b>	
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>B - CYLINDER HEAD</b>	
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
 <b>E - TMING GEAR</b>	
Removing - refitting	
Removing - refitting the timing cover in situ	E4.001 to 007
 <b>F - FUEL SYSTEM</b>	
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
 <b>G - IGNITION SYSTEM</b>	
Checks - adjustments	
Checking - adjusting the ignition system in situ*	G2.001 to 013
 <b>J - COOLING SYSTEM</b>	
Identification - data	J1.001 to 003
 <b>K - LUBRICATION SYSTEM</b>	
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)

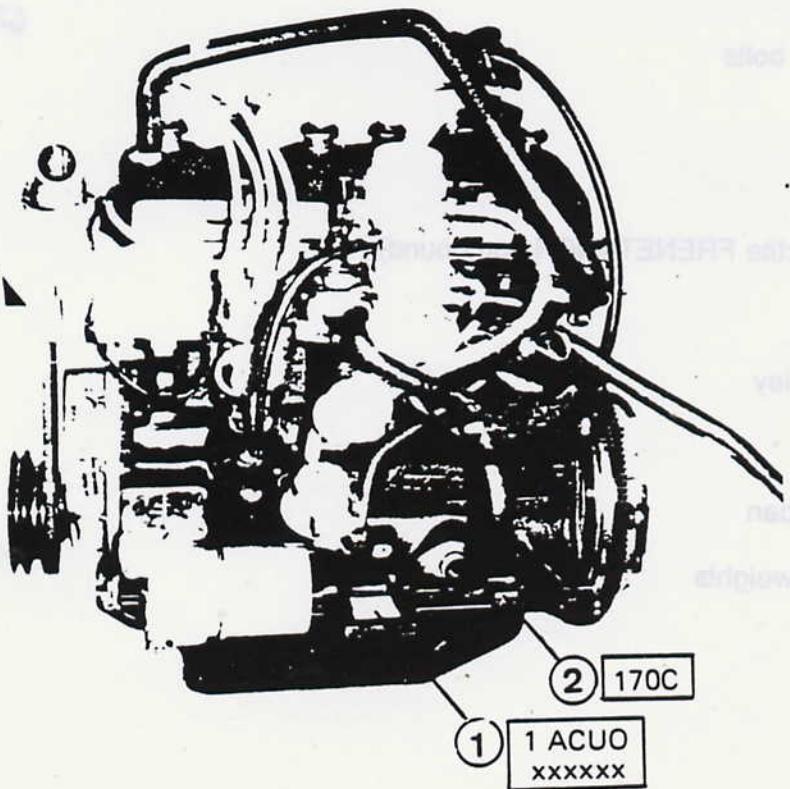
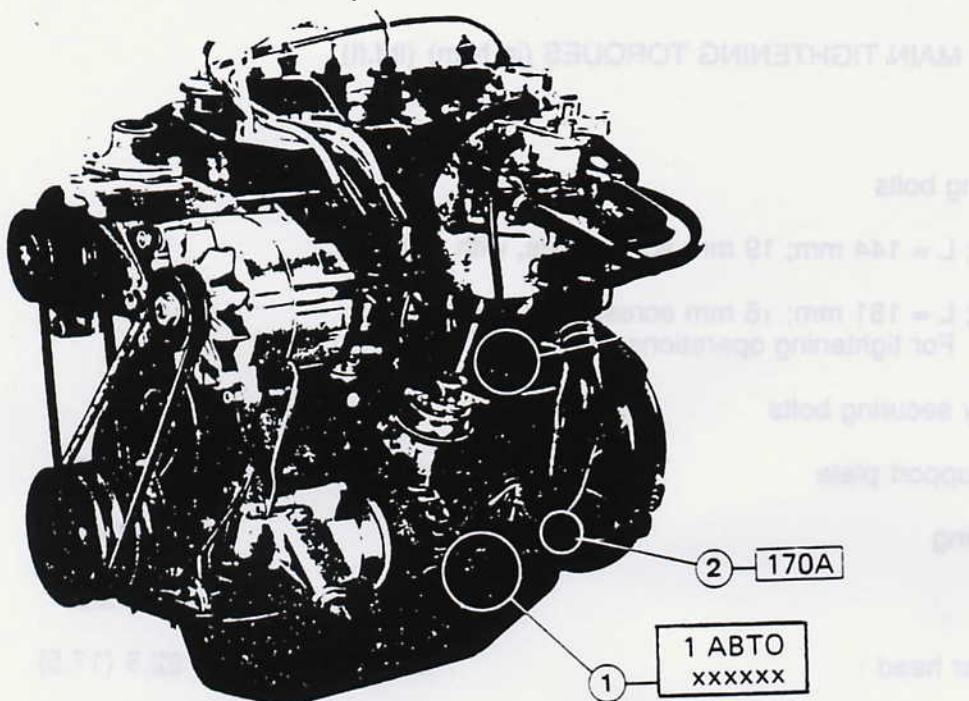
### DATA

#### 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 <sup>3</sup>	1971 cm <sup>3</sup>	1971 cm <sup>3</sup>
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



**REPAIR DATA**

All dimensions are given in millimetres unless otherwise stated.

**CYLINDER HEAD** - Aluminium with hemispherical combustion chambers.

**NOMINAL HEIGHT**

$92.5 \pm 0.15$  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)	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	- 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			
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°. Ajust the valve clearances.		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			Warm up the engine until the electric fan cuts in.		

**CYLINDER HEAD GASKET**

Make

CURTY

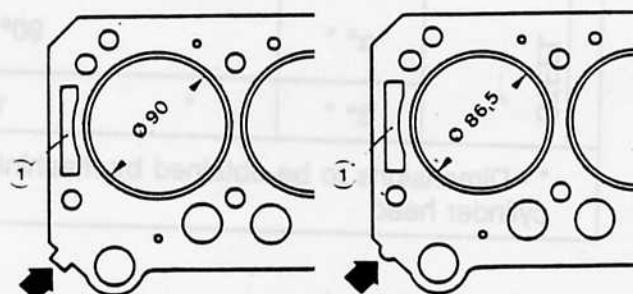
Identification

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

## VALVE SEATS

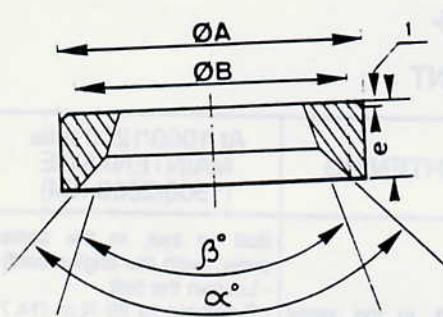
Nominal seat angle

INLET EXHAUST

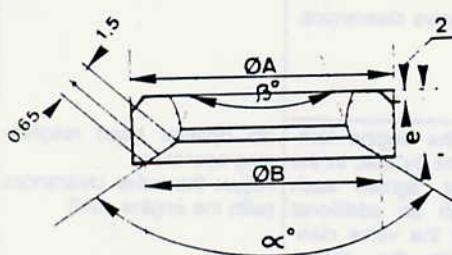
120° 90°

mm 0.158

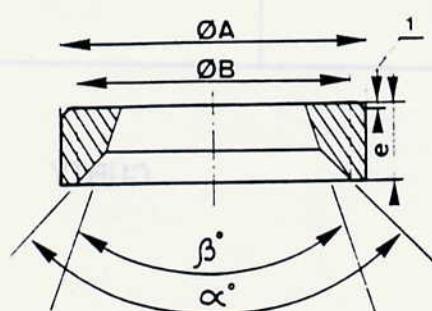
Inlet XM7-T



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	
		<del>engine XM7-T</del>				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°		
	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					
EXHAUST	CAST IRON	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
		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					
	STEEL	e *	6.462 + 0.1 0					
		α° *	90° - 15' 0					
		β° *	15°					

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

**VALVE GUIDES - Cast iron**

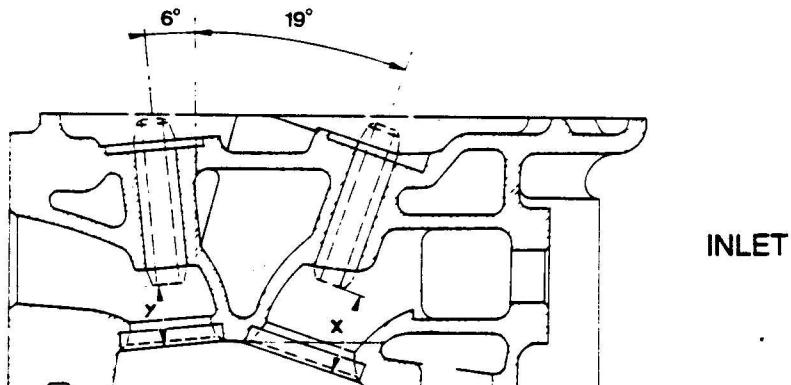
	INITIAL SIZES		REPAIR SIZES	
	1	2	1	2
Length		$58,4 \pm 0,3$		$55,4 \pm 0,3$
Outside ø guide	$14,02 + 0,039$ $+ 0,029$	$14,035 + 0,039$ $+ 0,029$	$14,29 0$ $- 0,011$	$14,59 0$ $- 0,011$
ø location in cyl. head	$13,965 + 0,032$ $0$	$14,13 + 0,032$ $0$	$14,195 + 0,032$ $0$	$14,495 + 0,032$ $0$
Inside ø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

\* supplied ø  $7,4 + 0,022$   
 $0$  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**

	INLET	EXHAUST
Inclination	$19^\circ \pm 5'$	$6^\circ \pm 5'$
Stem ø	$8,02 - 0,025$ $- 0,047$	$8 - 0,025$ $- 0,040$
Head ø	$42,5 \pm 0,2$	$35,5 \pm 0,2$
Length	118,25	112
Seat angle	$120^\circ + 25'$ $0$	$90^\circ + 25'$ $0$

**Stem ø**
**Head ø**
**Length**
**Seat angle**

**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	39.8
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

58 links

19

38

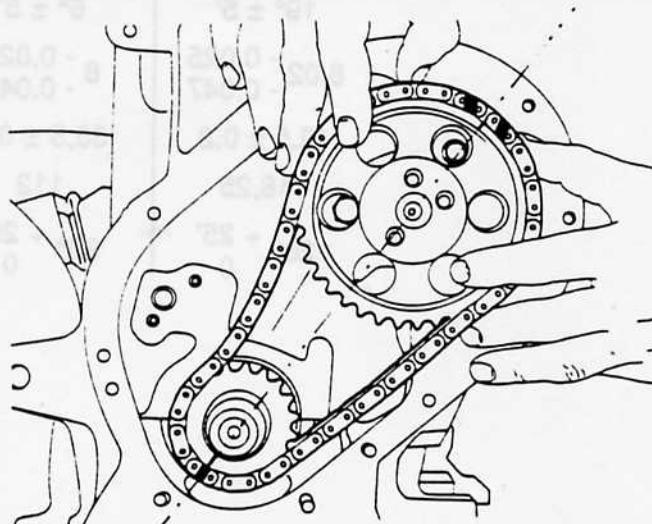
RENOLD or SEDIS

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

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 sprockets.

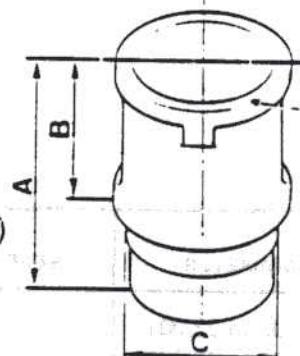


Actual valve  
clearances on a  
cold engine

inlet	exhaust
0.10 mm	0.25 mm

**CYLINDER BLOCK - Cast iron**

Height of block

 $285,9 \pm 0,15$ Height between cylinder head gasket face  
and liner locating flange $90 \pm 0,045$   
 $90 - 0,015$ **LINERS - Centrifugally cast iron**  
Type

Overall height (dimension A)

 $136,2^0_{-1}$ 

Height to locating flange (dimension E)

 $\rightarrow 11/83\ 90.005$   
 $\rightarrow 11/83\ 89.985 \} \pm 0,025$ 

Lower locating ø (dimension C)

 $93^0_{-9,02}$ Liner protrusion (above cylinder  
block) $93 - 0,08$   
{ 0,07 to 0,14 as near as  
possible to 0,14

Difference between any 2 adjacent liners

0,04

Maximum ovality and taper

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

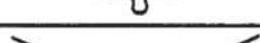


+ 0,014 to + 0,038



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

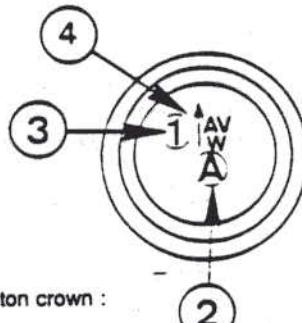
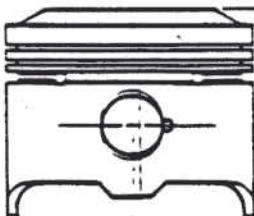
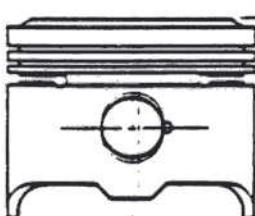
88

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

A 010

1

**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**

REFERENCE	PIN	DIAMETER	REFERENCE (3)	PISTON	DIAMETER
	(Dab of paint)	blue	1	23.009 to 23.005	
	white	23.001 to 22.996	2	23.005 to 23.000	
	red	22.996 to 22.992	3	23.000 to 22.995	

**PISTON RINGS**

Number : 3

	SPECIFICATIONS	THICKNESS	GAP
1 "firing" ring	barrel section	1.5 mm	0.20 to 0.50 mm
1 "compression" ring	taper*	2.0 mm	0.40 to 0.55 mm supplied to correct fit
1 "scraper" ring	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

Ø 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

INITIAL SIZE	REPAIR SIZE
24.408 +0.068 + 0.035	24.708 + 0.068 + 0.065

23.005 + 0.013  
0**BIG-END SHELLS**

Material

Steel plus antifriction metal facing

Width

0  
23.40 - 0.25

Thickness

1.815 ± 0.003

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

**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 - 0 - 0,015	56,165 - 0 - 0,025	57,189 - 0 - 0,015	58,573 - 0 - 0,025	59,416 - 0 - 0,015
	Width	37 + 0,07	30 + 0,3 - 3	38 + 0,3 - 0	30 + 0,3 - 0	38 ± 0,35
REPAIR SIZE	Ø	54,62 - 0 - 0,015	55,865 - 0 - 0,025	56,889 - 0 - 0,015	58,273 - 0 - 0,025	59,116 - 0 - 0,015

**MAIN BEARING SHELLS**

		aluminium - tin					
		Width	29,35 - 0 - 0,25	21,50 - 0 - 0,25	29,5 - 0 - 0,25	21,5 - 0 - 0,25	29,5 - 0 - 0,25
INIT. SIZE	Thickness						
REP. SIZE							

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**

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

Journal at clutch end

Width	INITIAL	REPAIR 1	REPAIR 2	REPAIR 3
	37 + 0,07	37,10 + 0,007 + 0,002	37,15 + 0,007 + 0,002	37,20 + 0,007 + 0,002

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

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

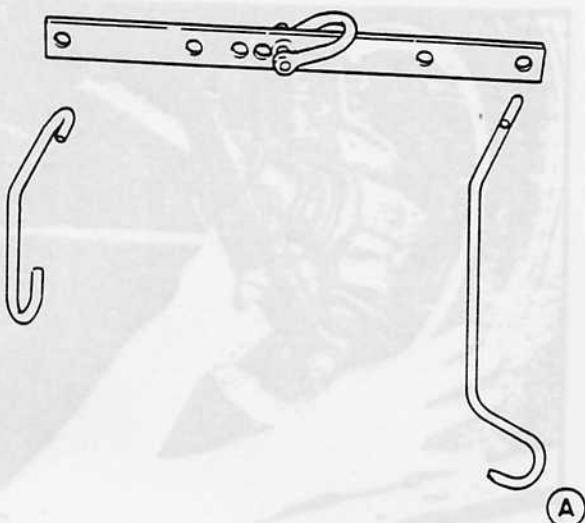
**4 bolts securing the lower ball joint casing to the swivel**  
**5 mdaN 50 Nm 37 lbf ft**

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

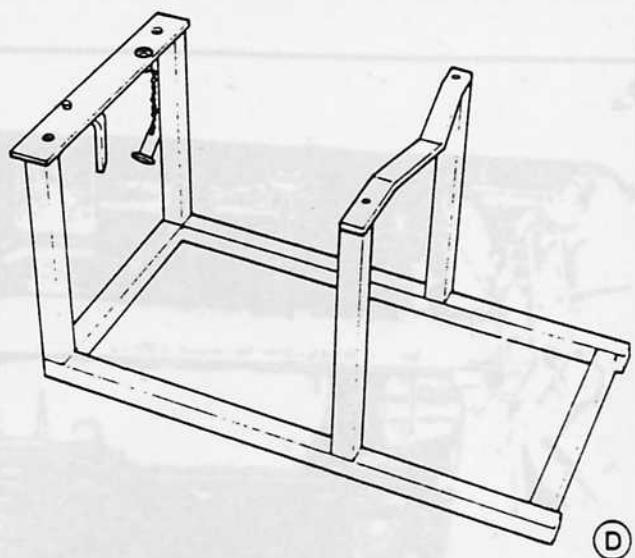
**2 bolts securing the track rod arm to the swivel**  
**12.5 mdaN 125 Nm 92 lbf ft**

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

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



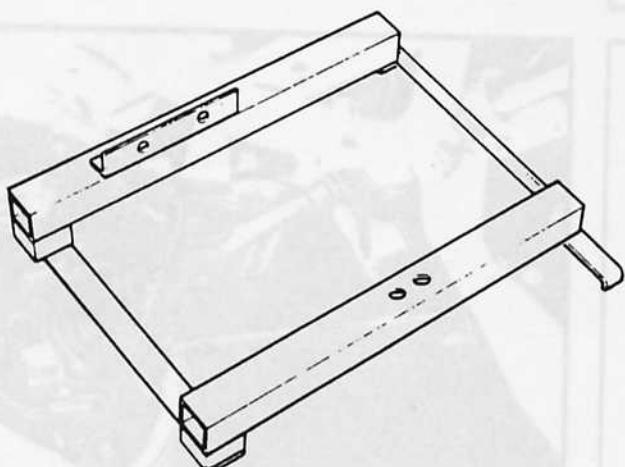
A



D



B

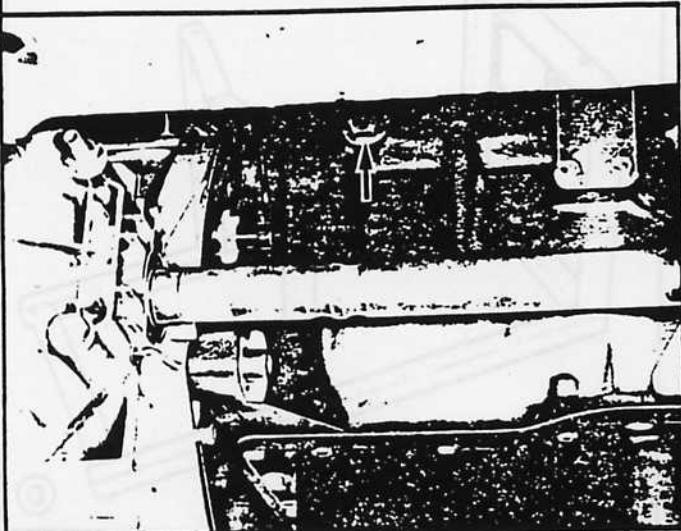


C

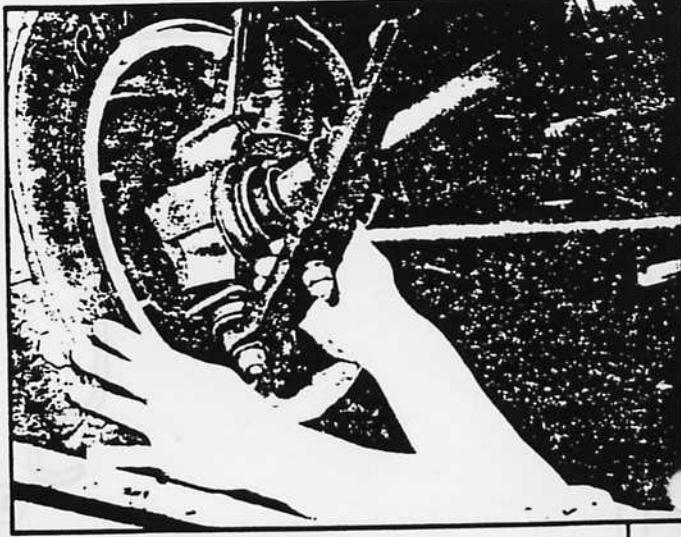
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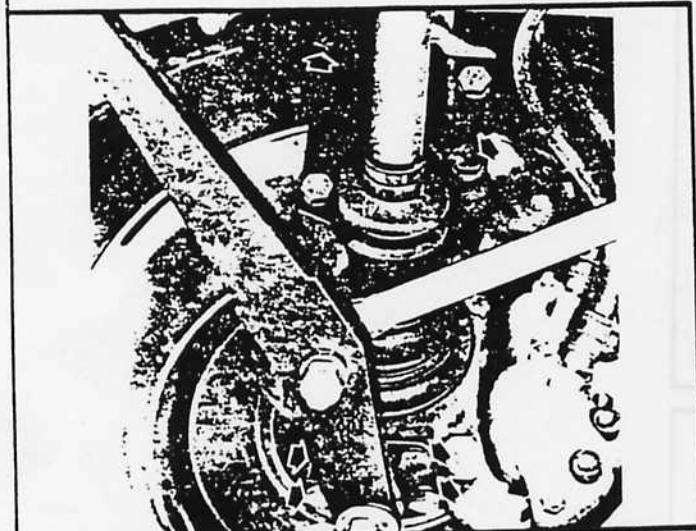
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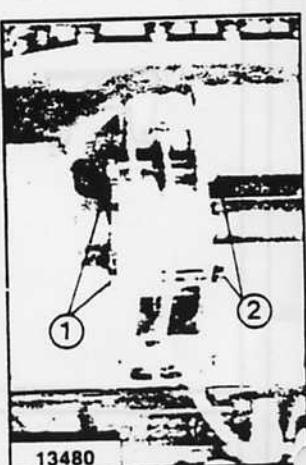
IV



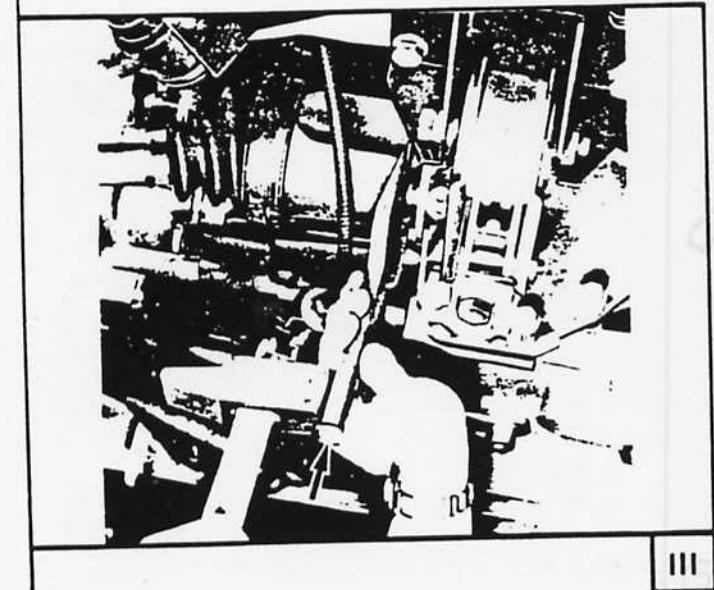
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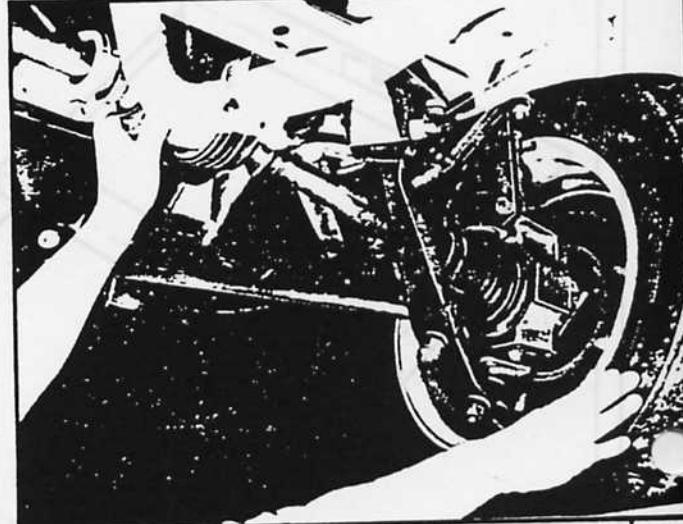
V



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.
- The 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. I.

#### 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.

**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.

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

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

- 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.

**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.

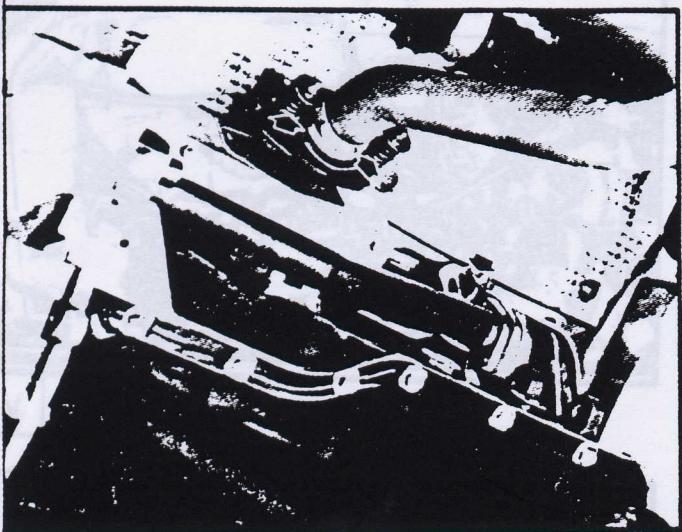
**— Remove, fig. VI :**

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

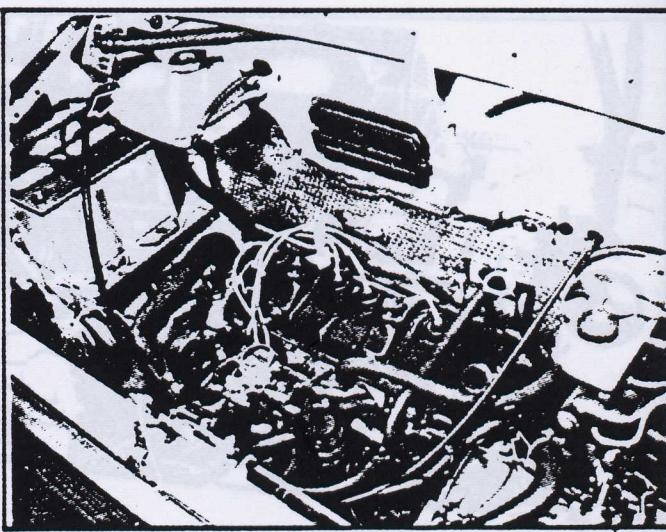


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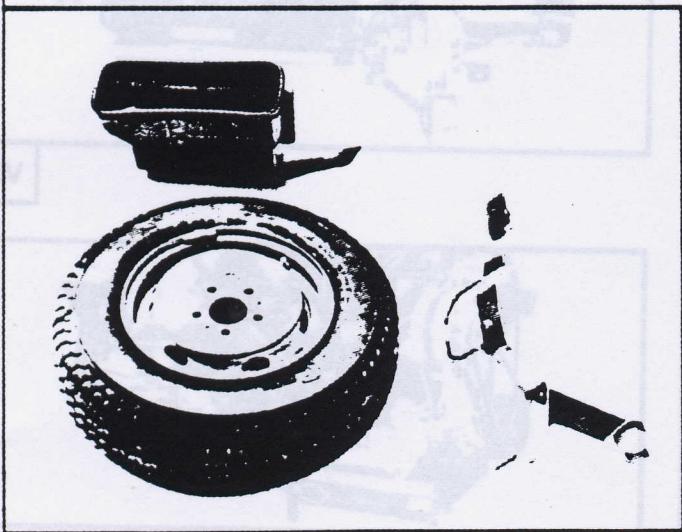
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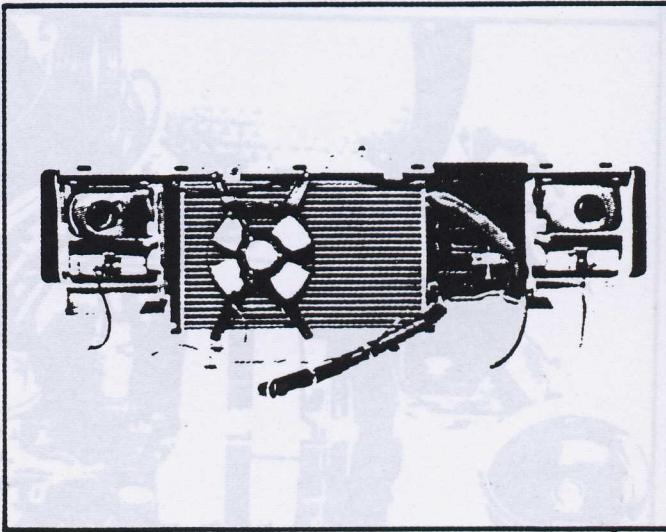
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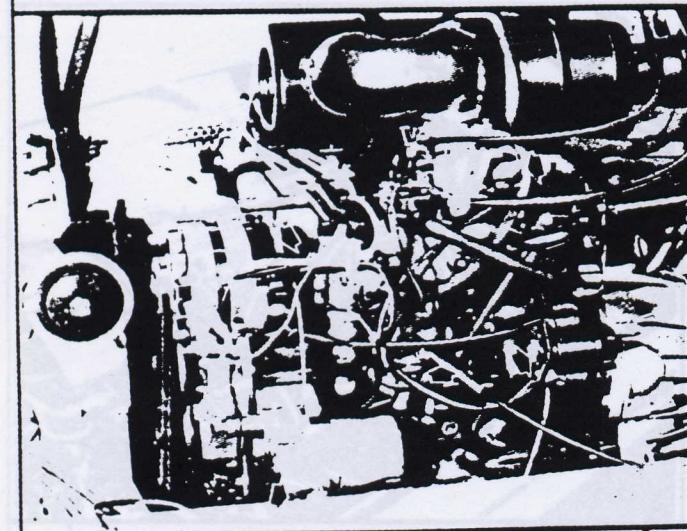
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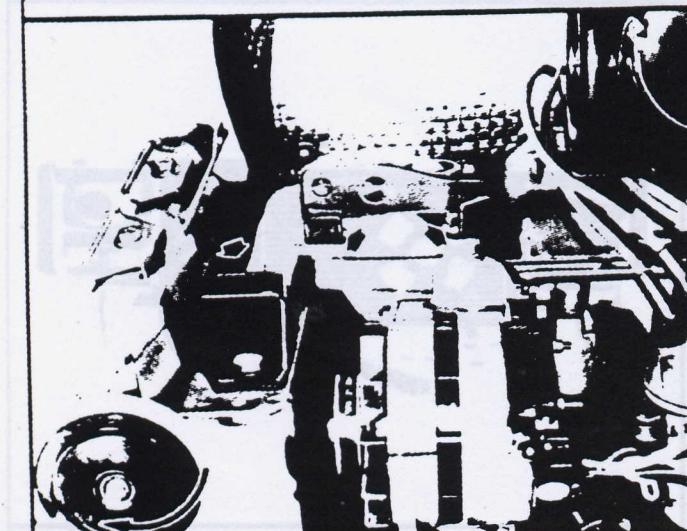
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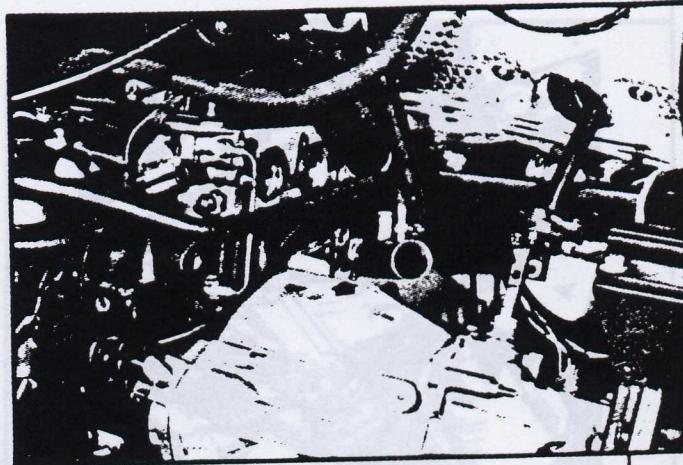
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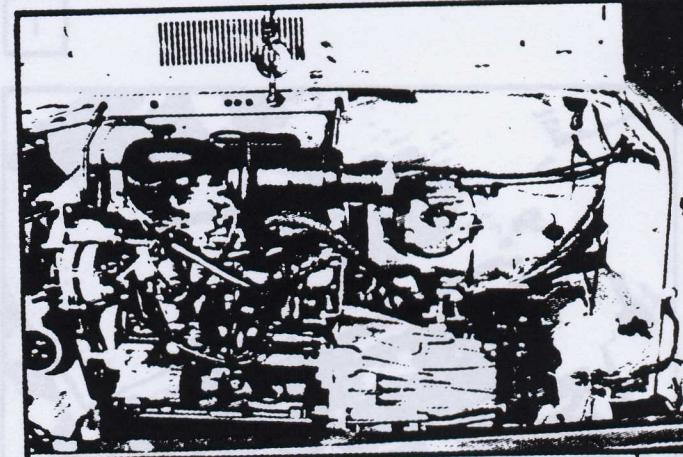
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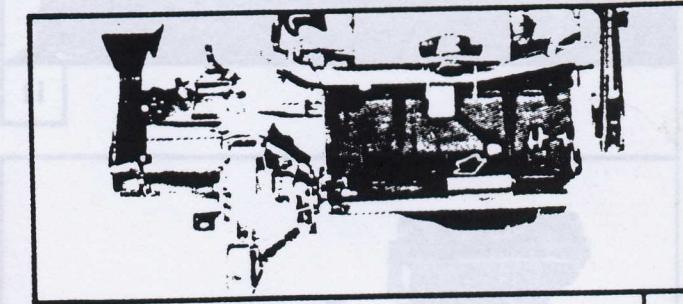
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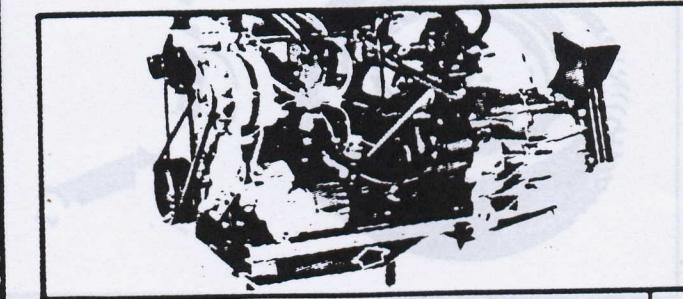
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VI



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.

— 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.

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.

— 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.

## LOWER 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 :

$$x = 22 \text{ mm}$$

**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.

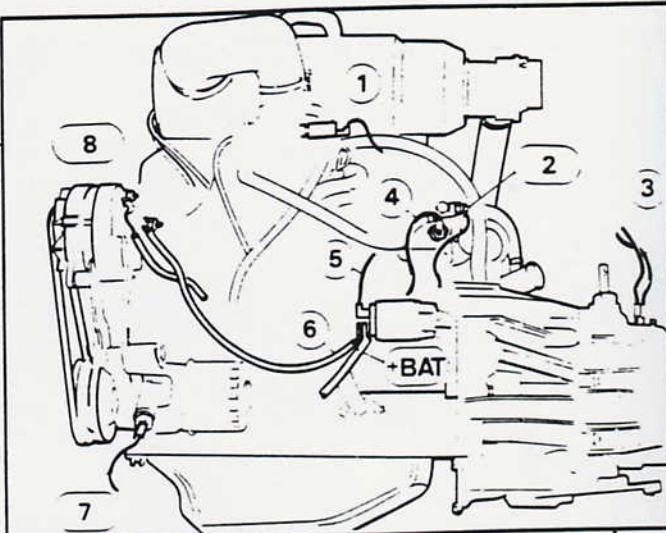
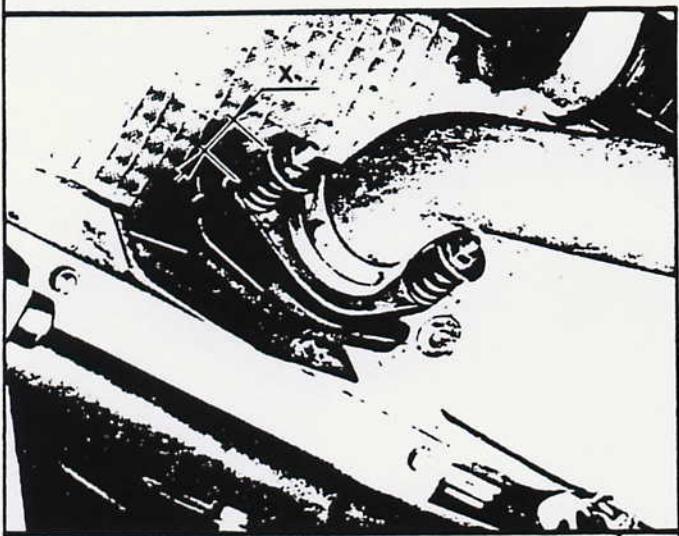
COLOUR CODES			
- White	Bc	- Red	R
- Blue	Bl	- Brown	M
- Light blue	B	- Green	V
- Yellow	J	- Grey	G
- Orange	O	- Black	N
- Pink	Ro	- Violet	Vi

	Non-electronic ignition		Electronic ignition		DESCRIPTION REFERENCE
	Wire	Ter.end	Wire	Ter.end	
ENGINE (Fig. IV)	0		G		Strangler
	V-Bc		V-Bc		Temperature sensor
	0		0	Bc	Reversing light
	Bc		BC	BC	Reversing light
	Bl		Bl		Coolant temp. switch
	R	N	R	N	Starter field
	M		V		Alternator cable
	G		G	Bc	Oil pressure switch
FAN (Fig. V)	N-Vi				Alternator field
			N		Direction indicators
	N		N	Bc	Fan temperature
	N		N	N	Switch
COIL (Fig. VI)	M		J	Bc	Electric fan
	N				- Coil
	G		M-Bc		- Coil
	M-Bc		M-Bc	Bl	+ Coil
					+ Coil

**IMPORTANT.** Carry out the additional essential operations :

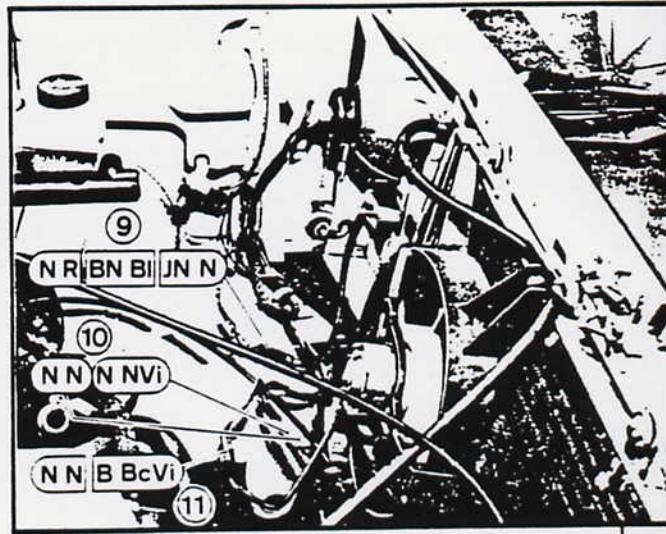
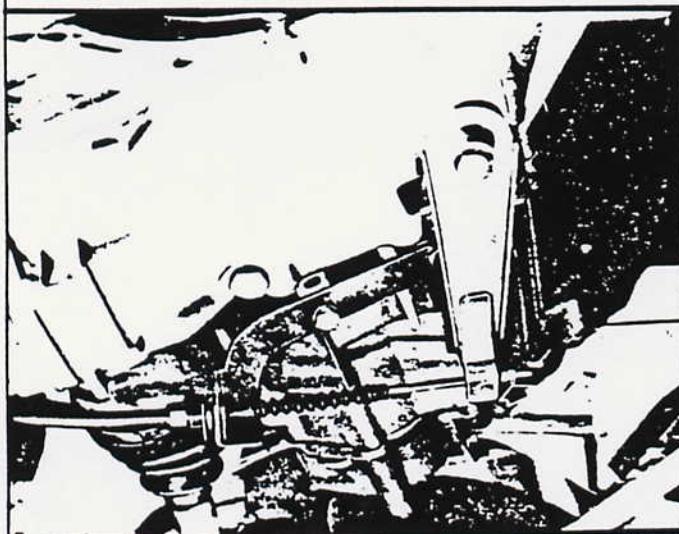
OPERATION	OVERHAULED ENGINE
RETIGHTEN CYLINDER HEAD ADJUST VALVE CLEARANCES	1) Before returning to customer - After first warm-up 2) After 1000/1500 miles depending on engine No.
DRAIN ENGINE OIL REPLACE FILTER CARTRIDGE ADJUST VALVE CLEARANCES	NEW, OVERHAULED OR STANDARD EXCHANGE ENGINE
	After 1000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

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



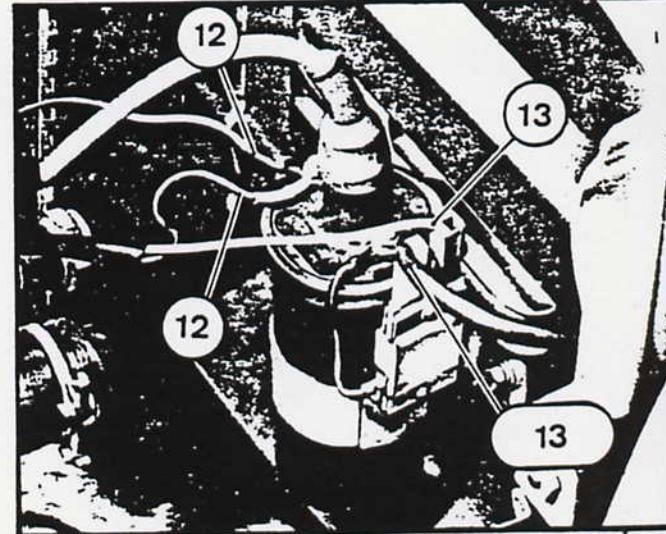
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IV



II

V



III

VI

	Page
<b>Special tools</b>	<b>A5.002 and 003</b>
<b>Dismantling</b>	<b>A5.004 and 013</b>
Requirements prior to dismantling	A5.014
<b>Reassembling</b>	<b>A5.014 to 041</b>
<b>Comprising :</b>	
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)

Oil filter base (thread coated with Loctite)

1.3 mdaN (13 Nm, 10 lbf ft)

Crankshaft counterbalance weights

6.75 mdaN (67.5 Nm, 50 lbf ft)

Cylinder head (angular tightening method)

See method

Crankshaft main bearings

7.5 mdaN (75 Nm, 55 lbf ft)

Water pump fastenings :

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

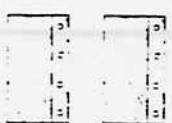
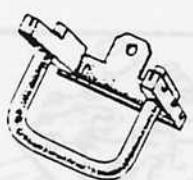
Flywheel 6.75 mdaN (67.5 Nm, 50 lbf ft)

- 10 mm nuts 4.25 mdaN (42.5 Nm, 31 lbf ft)

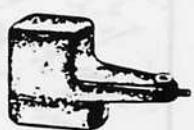
Big-end caps (4 mdaN (40 Nm, 30 lbf ft)

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

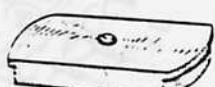
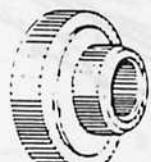
Crankshaft pulley 17 mdaN (17 Nm, 125 lbf ft)



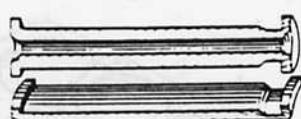
(A)



(B)



(C)



(D)

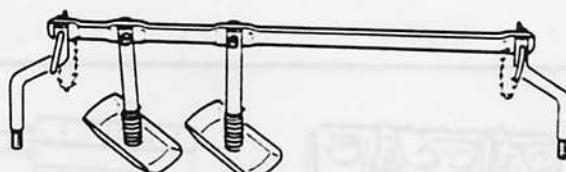


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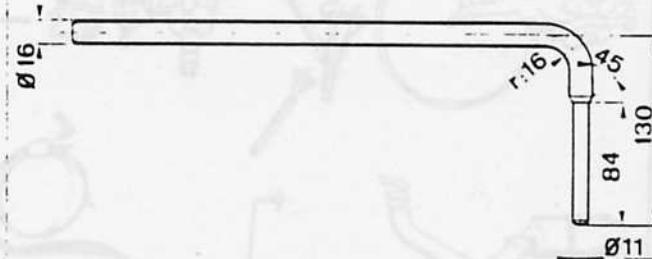
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(E)



(F)

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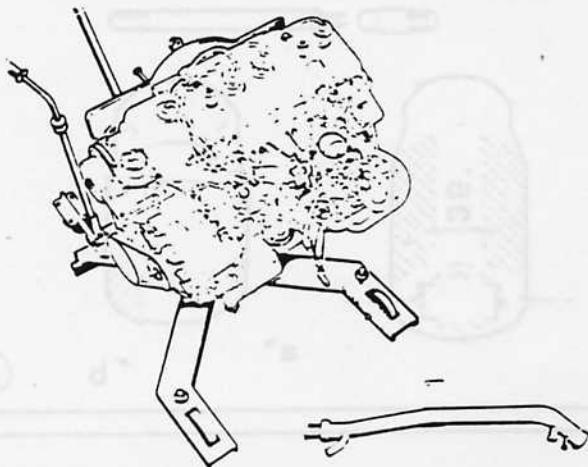


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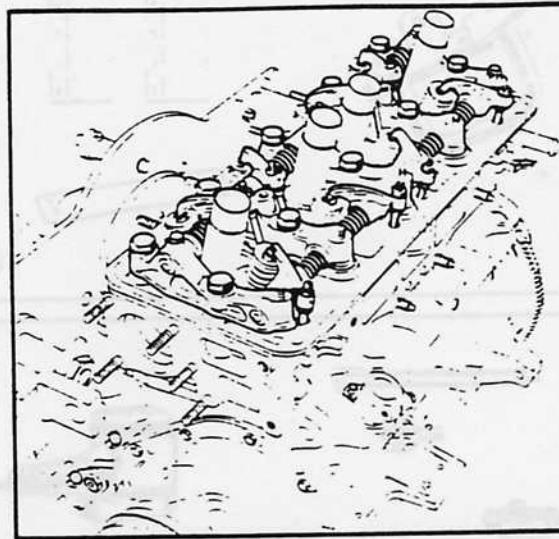
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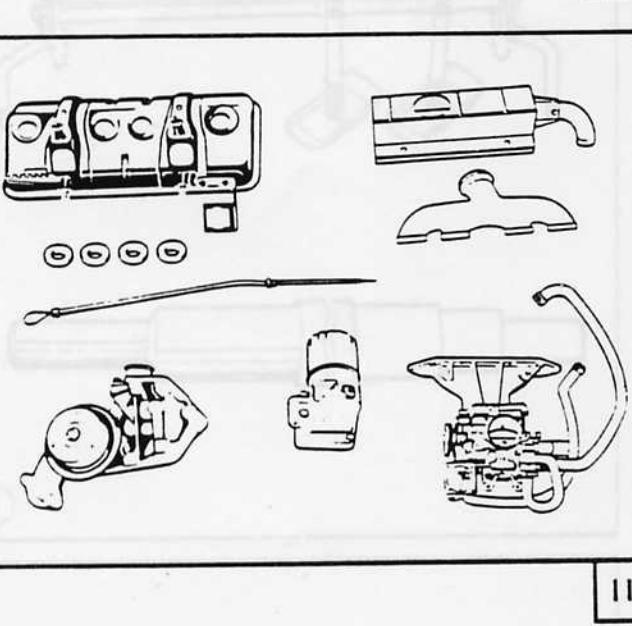
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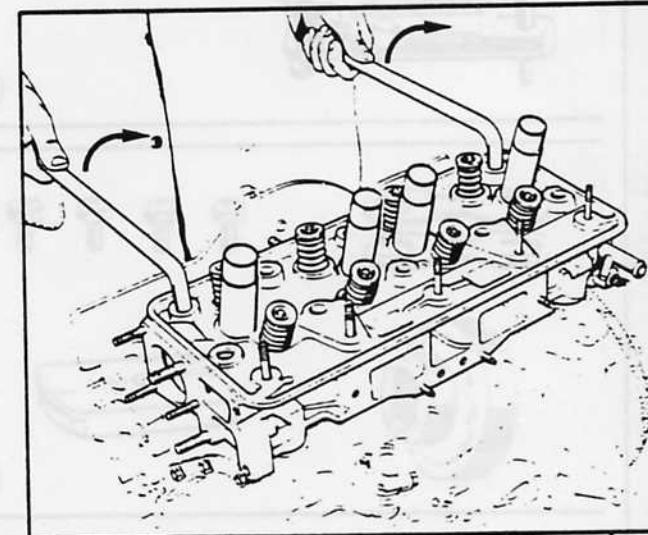
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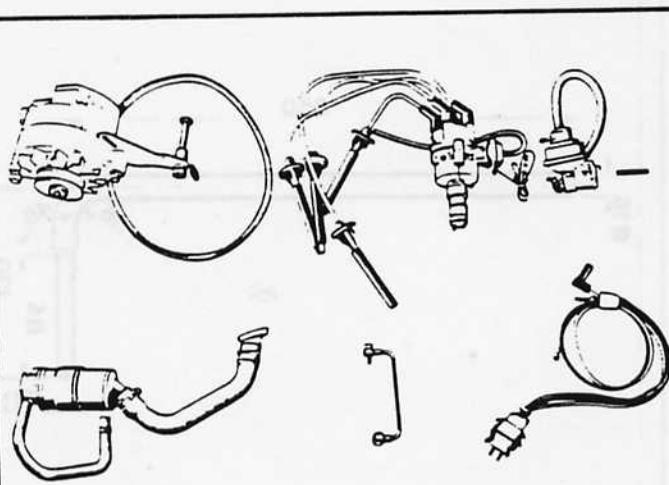
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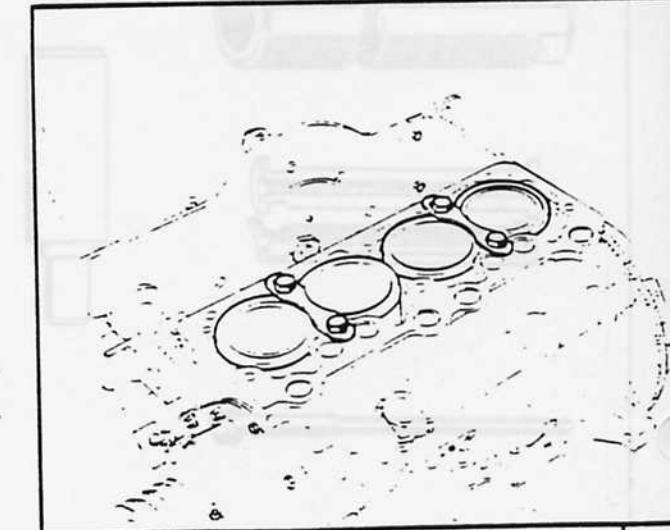
II



V



III



VI

ENGINE  
OVERHAUL

1

A5.005

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

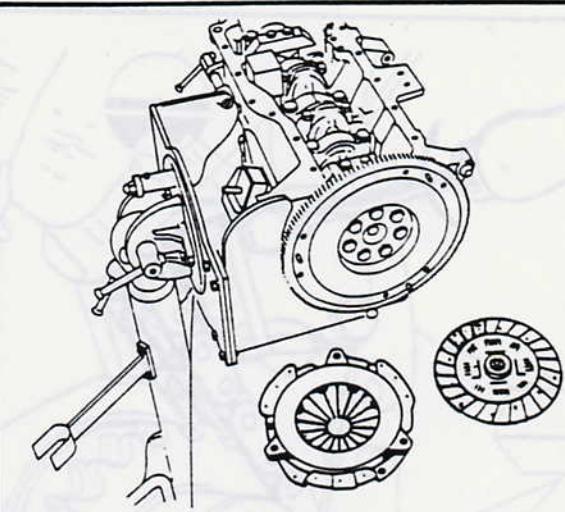
- the crankshaft pulley.

Remove the oil pump, fig. III.

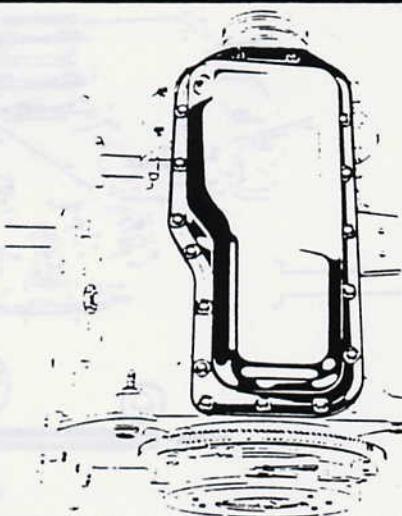
– the timing cover.



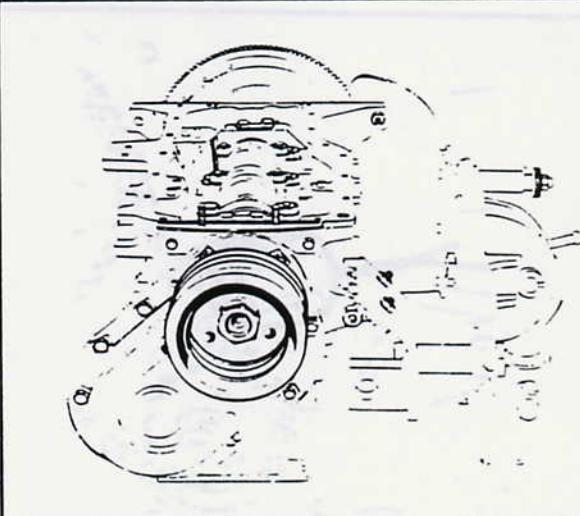
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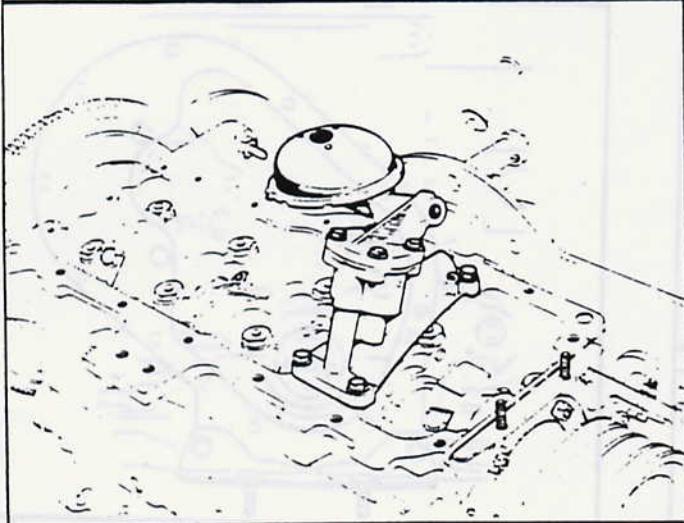
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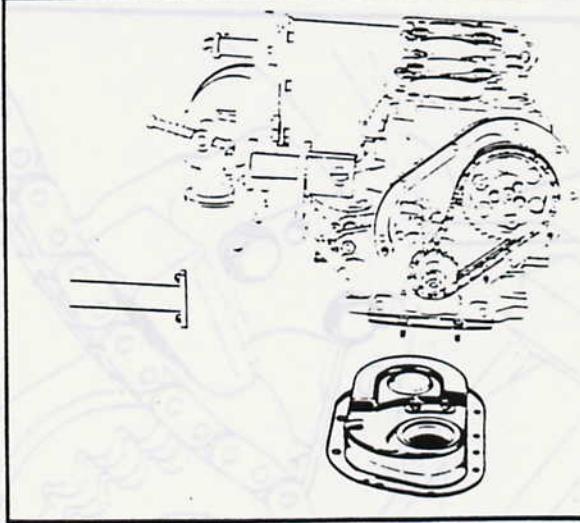
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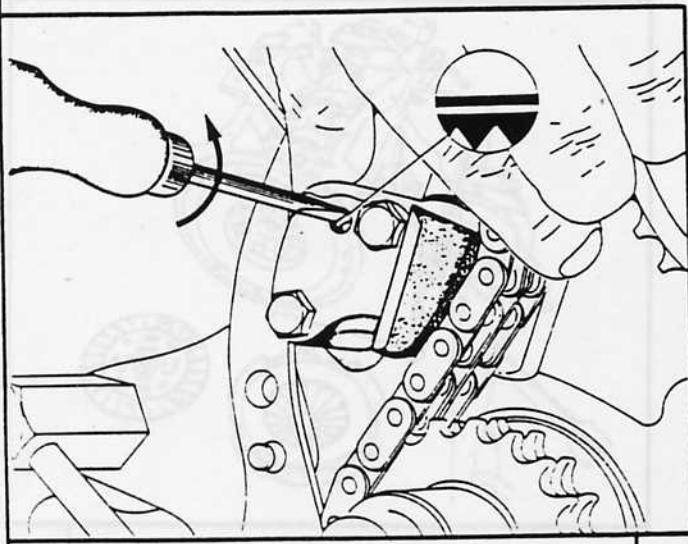
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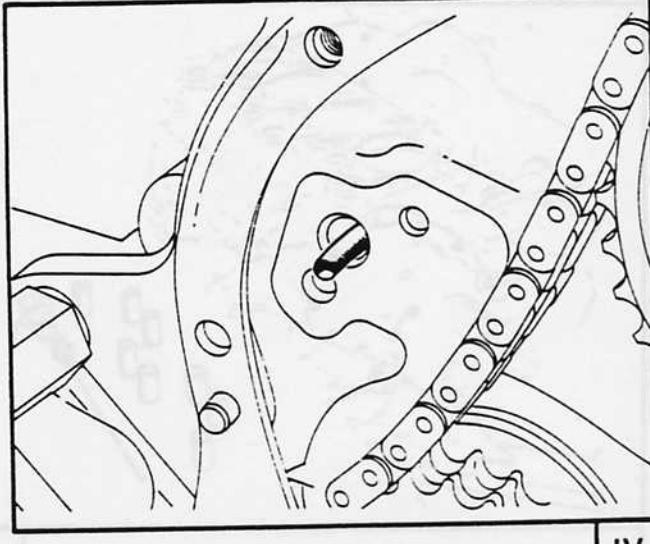
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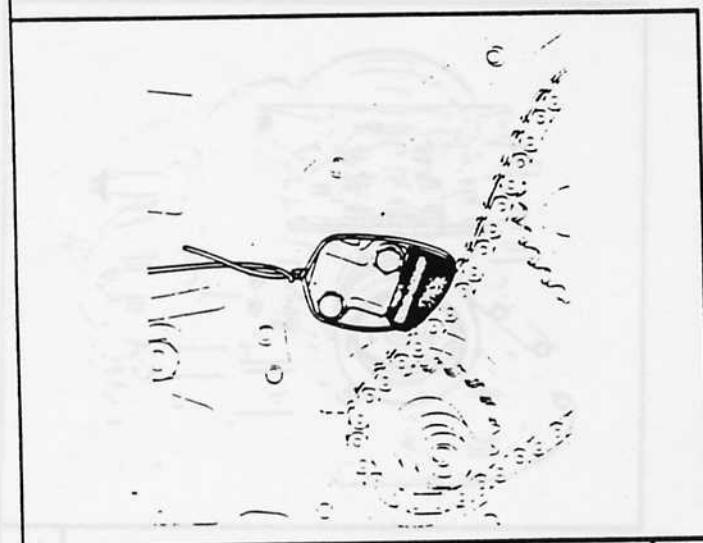
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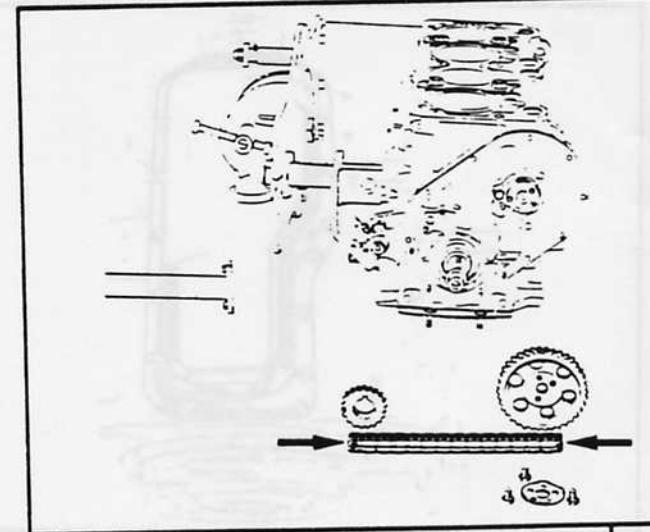
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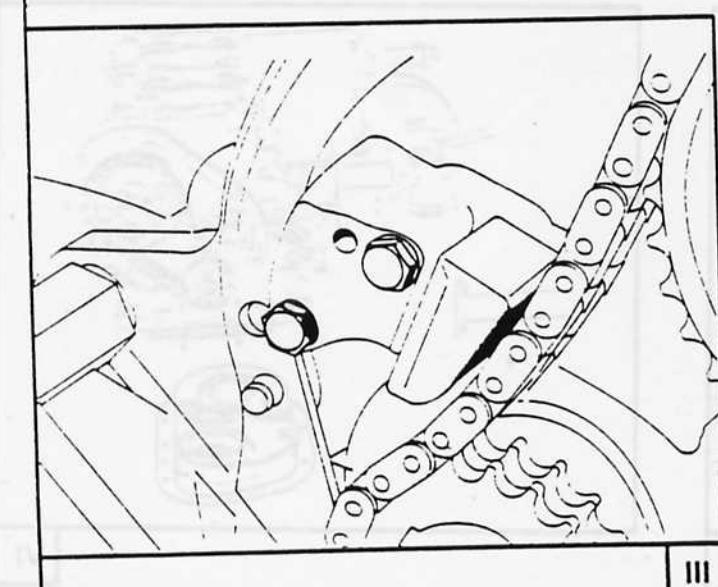
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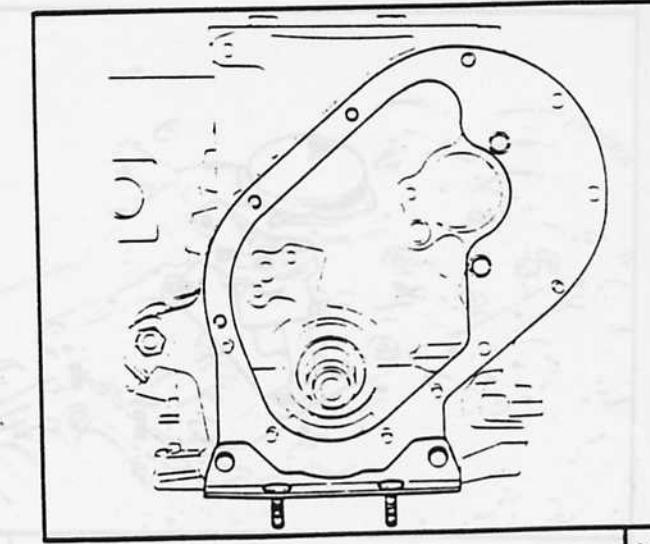
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III



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 :

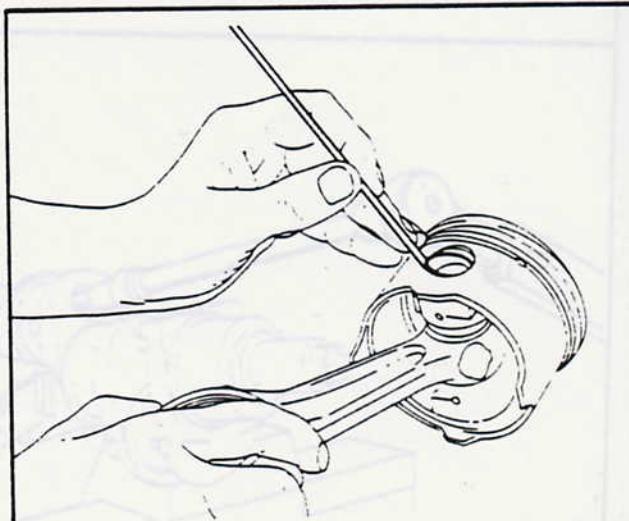
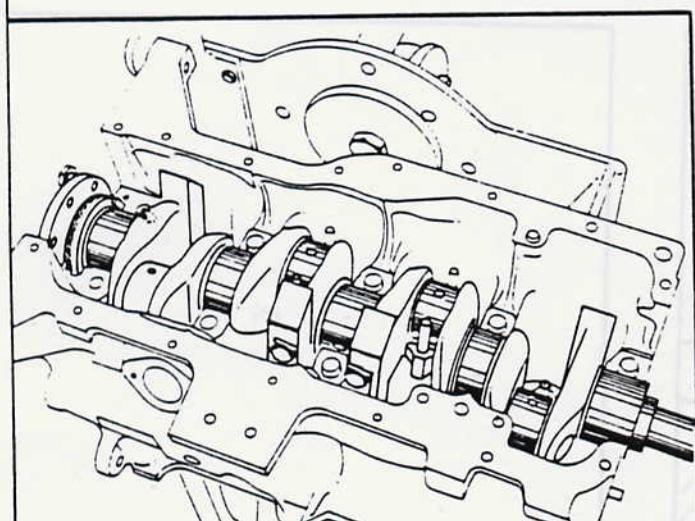
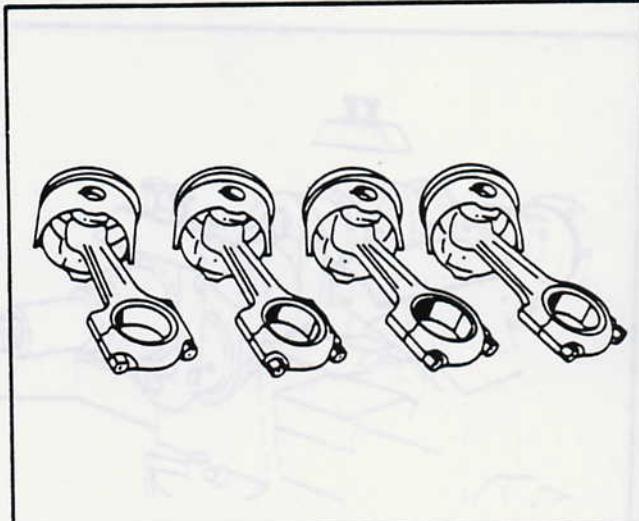
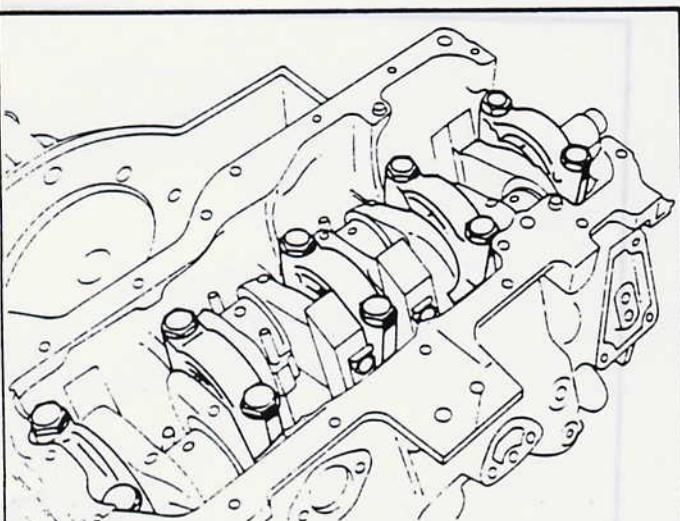
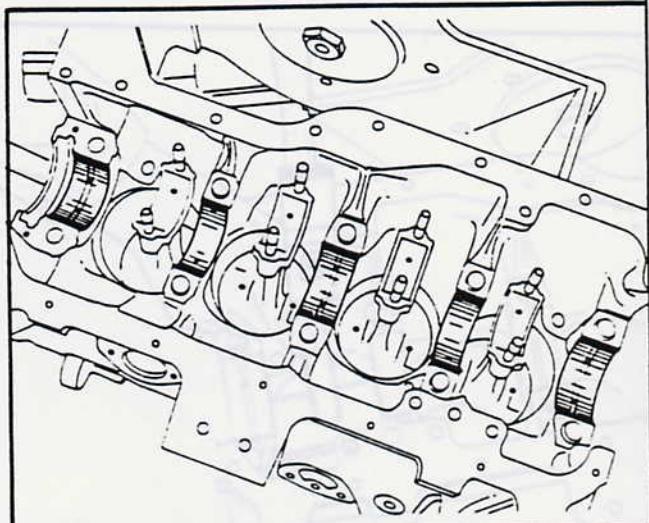
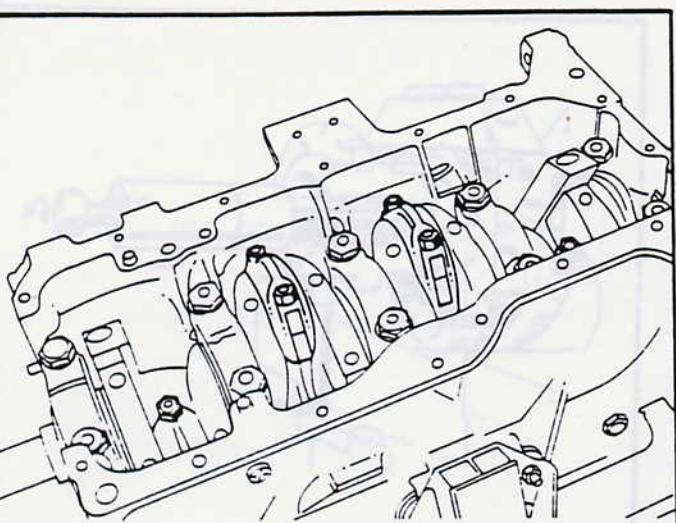
Refit the big-end caps to their respective connecting rods.

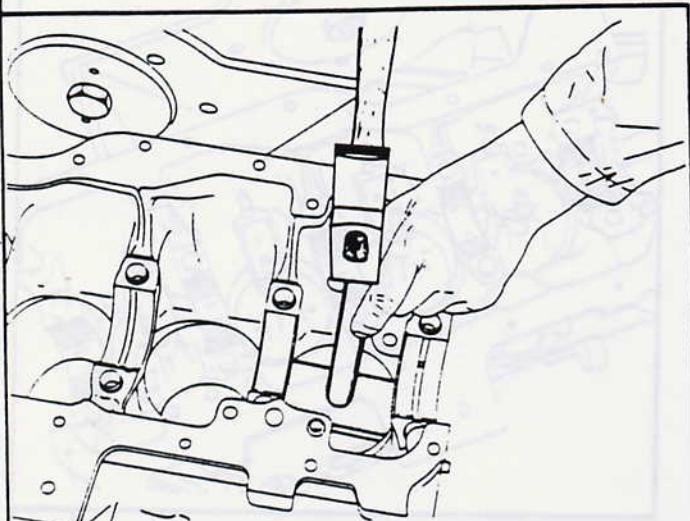
Number the connecting rods 1 to 4.

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

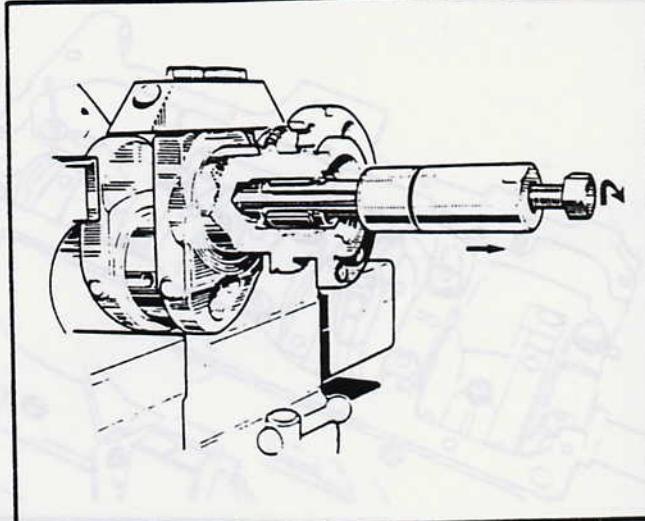
Remove the gudgeon pin retaining circlips with the end of a scriber.

Push out the gudgeon pins by hand.

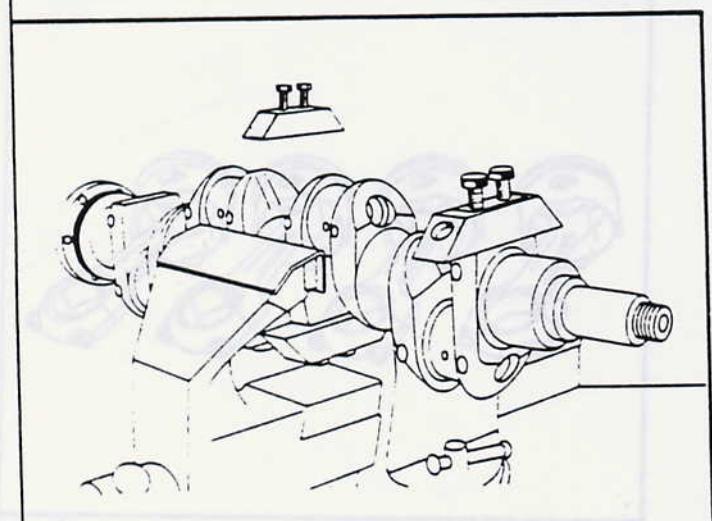




I



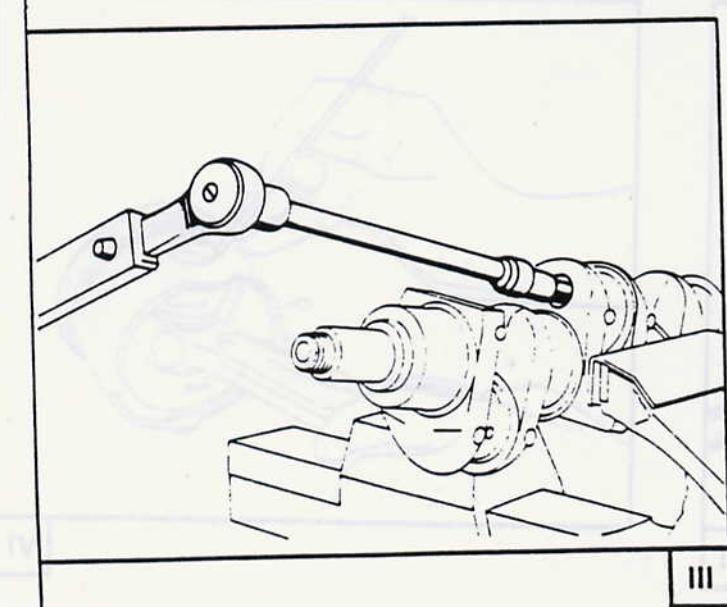
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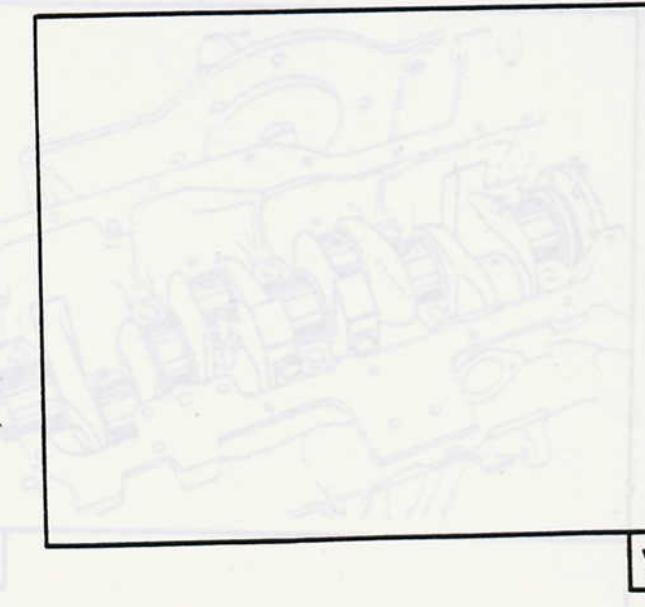
II



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**

## 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.

— 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.

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

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

## Counterbalance weights

- Ensure that the oil jet is not blocked.

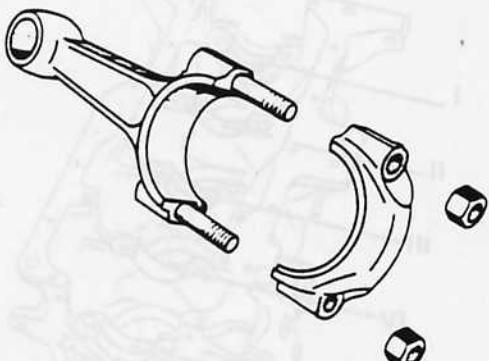
— Fit the counterbalance weights, fig. VI, following the marks made during dismantling.

## Preparing the crankshaft

## Sludge trap plugs

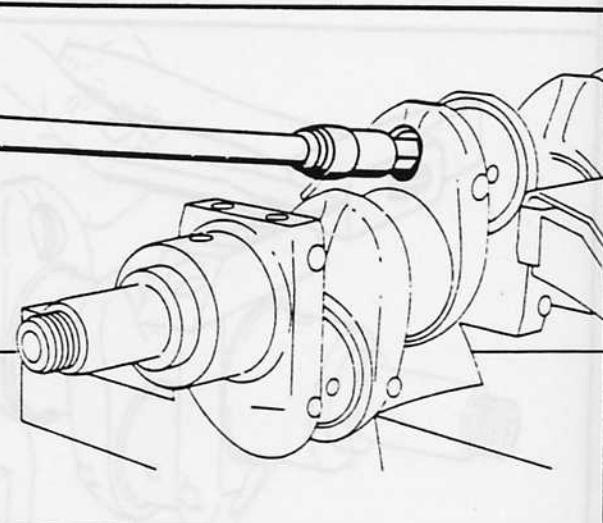
- Clean the thread, fig. III, by screwing and M24 x 1,50 plug tap down the thread (depth 10 mm).

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



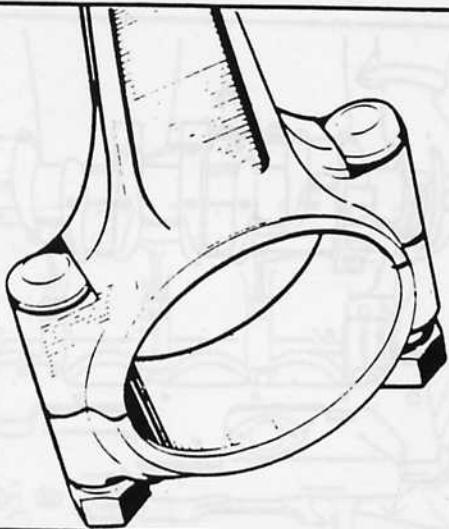
26 - 06 - 76 - C84 - L - A

I



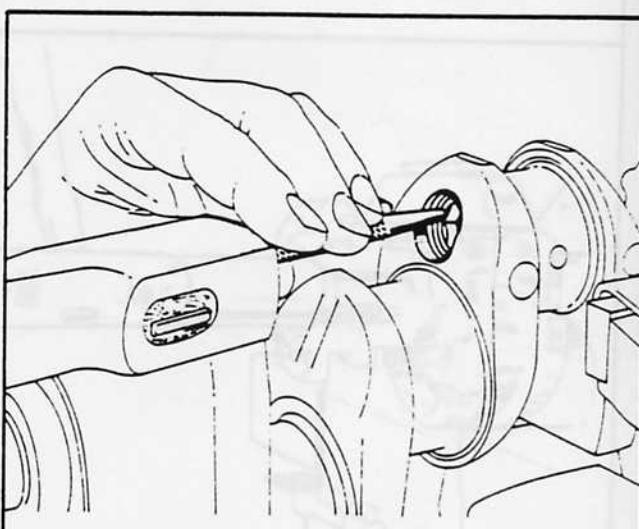
26 - 06 - 76 - C43 - L - A

IV



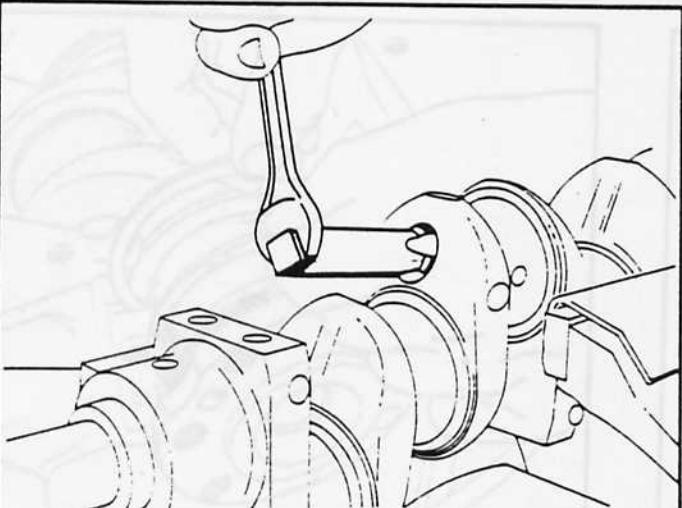
11 - 05 - 81 - 3 - A

II



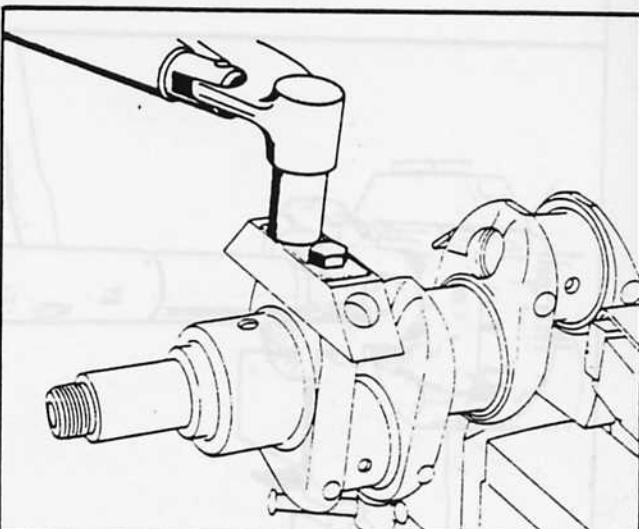
26 - 06 - 76 - C70 - L - A

V



26 - 06 - 76 - C60 - L - A

III



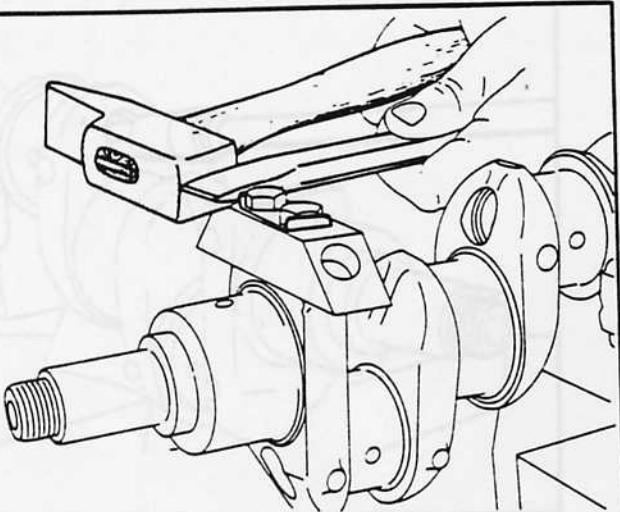
26 - 06 - 76 - C75 - L - A

VI

A5.016<sup>(1)</sup>

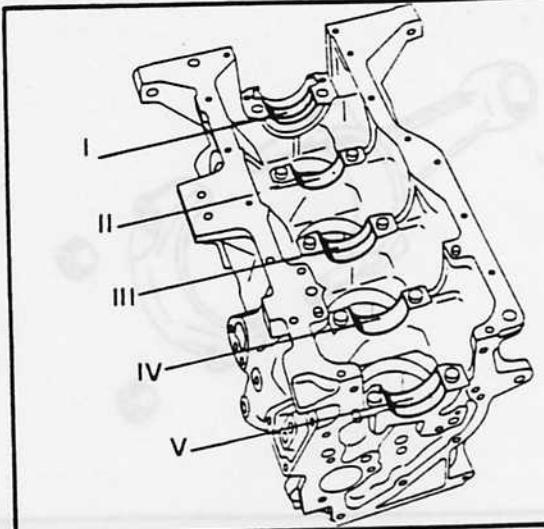
1

J5



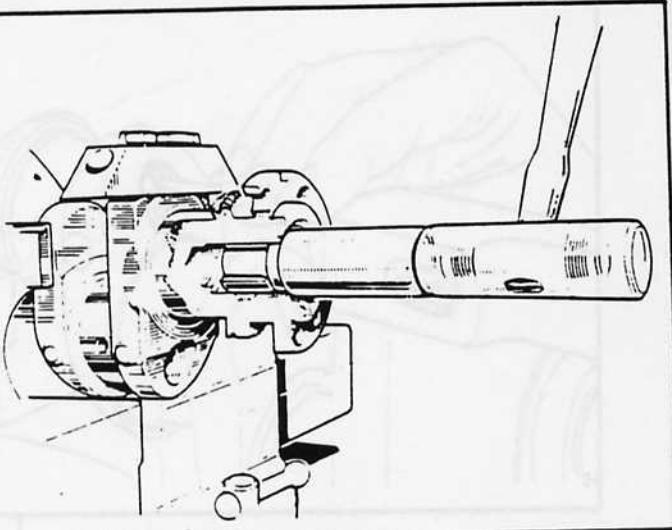
26 - 06 - 75 - C72 - L - A

I



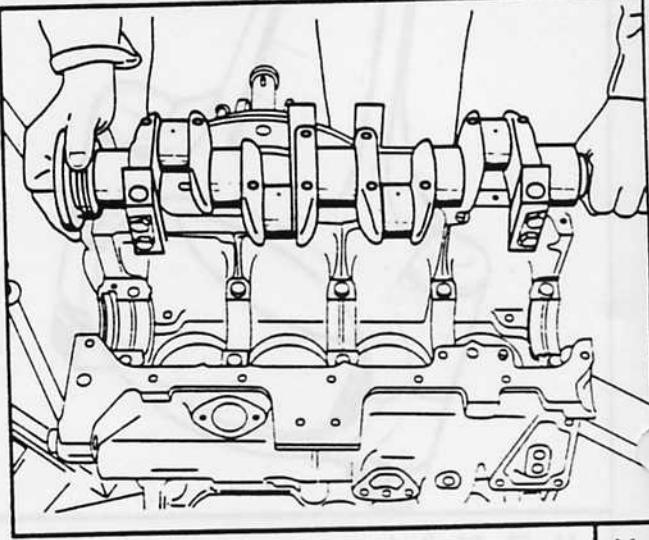
21 - 05 - 80 - C97 - L - A

IV



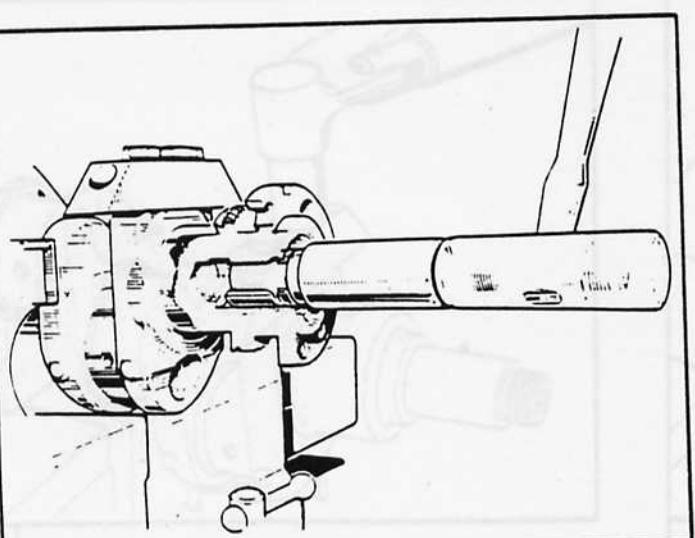
11 - 05 - 81 - 4 - A

II



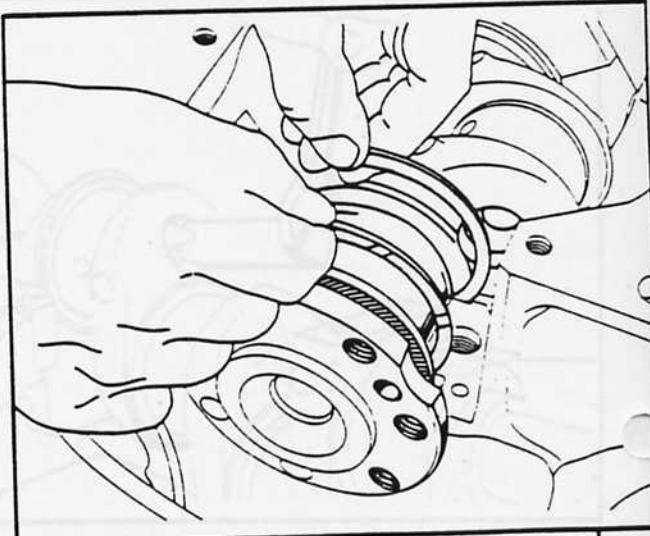
21 - 05 - 80 - C99 - L - A

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.

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

Crankshaft end float

Follow the identification and marks made during dismantling.

- 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.

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

THE LUBRICATION GROOVES must be against the crankshaft.

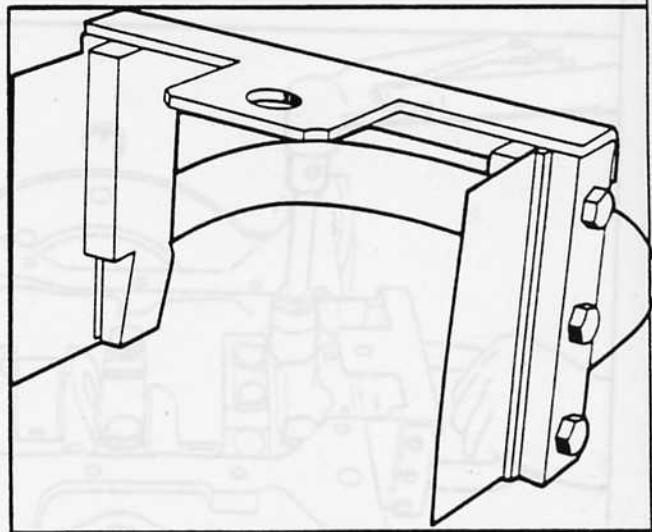
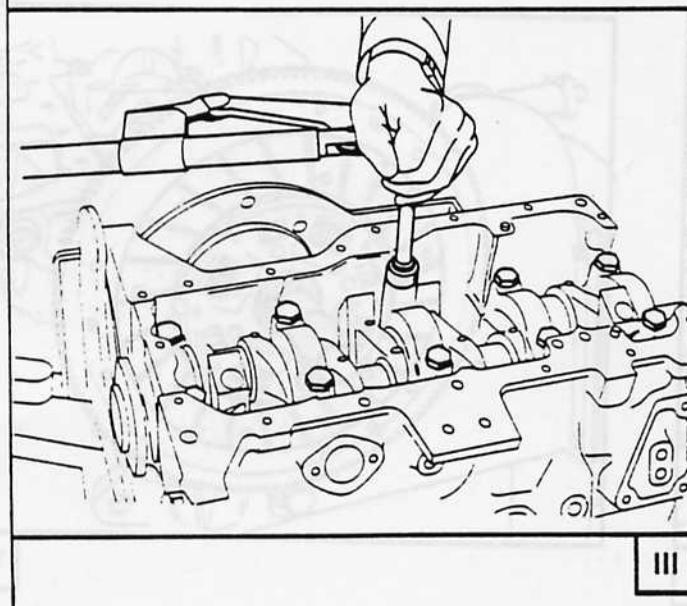
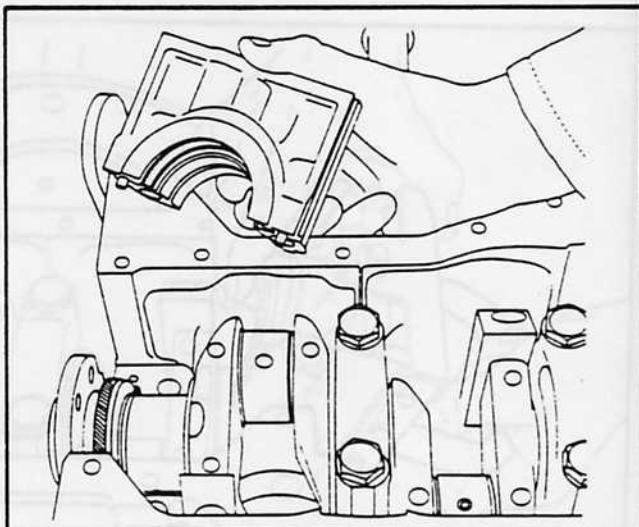
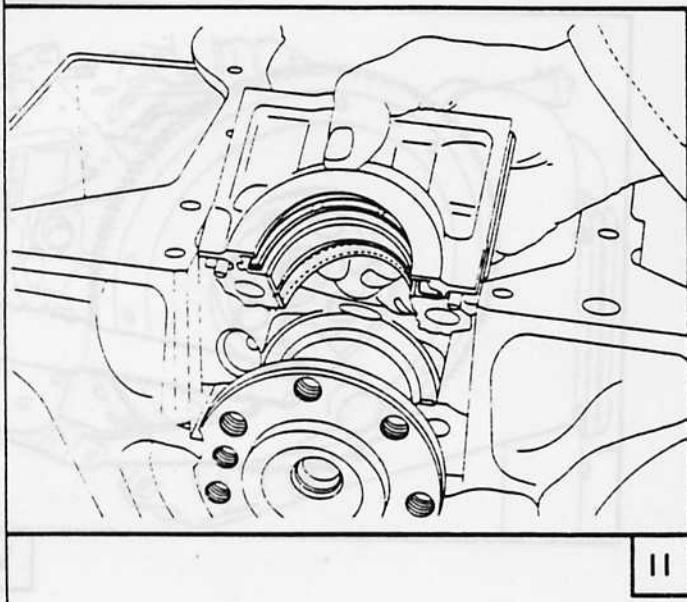
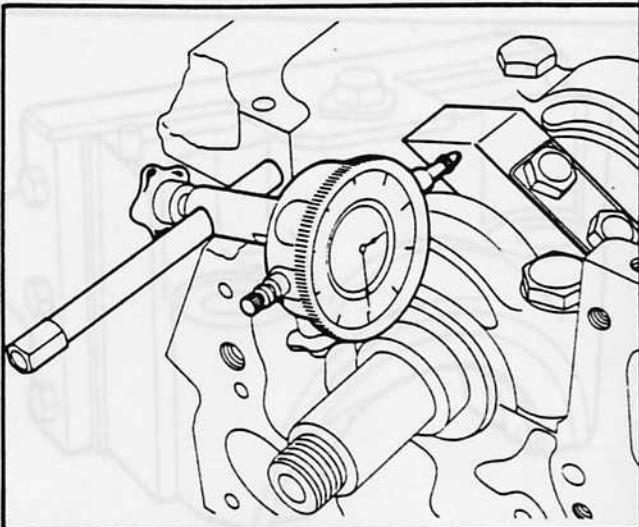
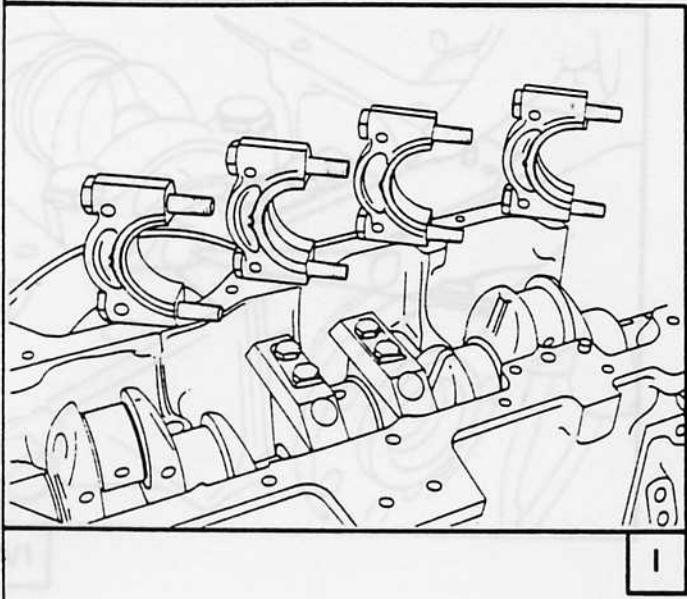
If the end float is less than 0.08 mm, LOOK FOR THE CAUSE. There could be a foreign body between a bearing cap and the cylinder block, a burr or an impact mark or a distorted end float thrust washer.

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

Fitting the rear main bearing and side seals.

- Remove the rear main bearing cap.

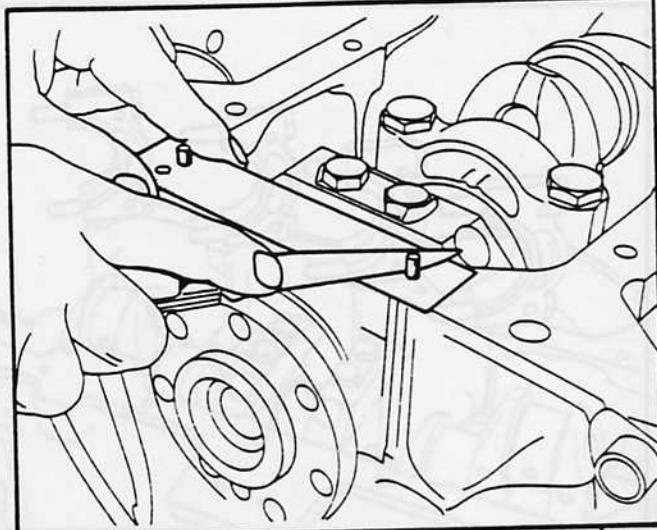
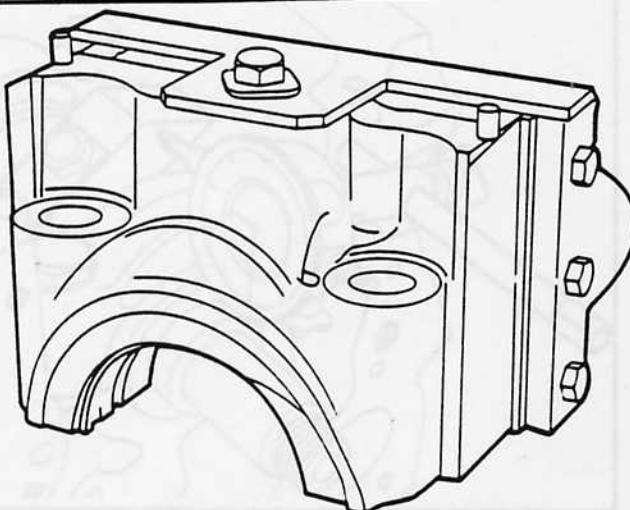
Fit shims 8.0110 C1 as shown in fig. VI to tool BZ, to obtain the minimum spacing.



A5.020

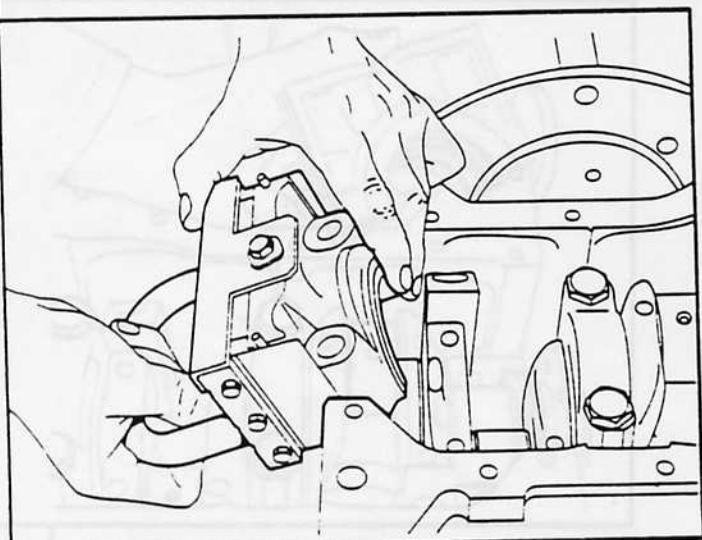
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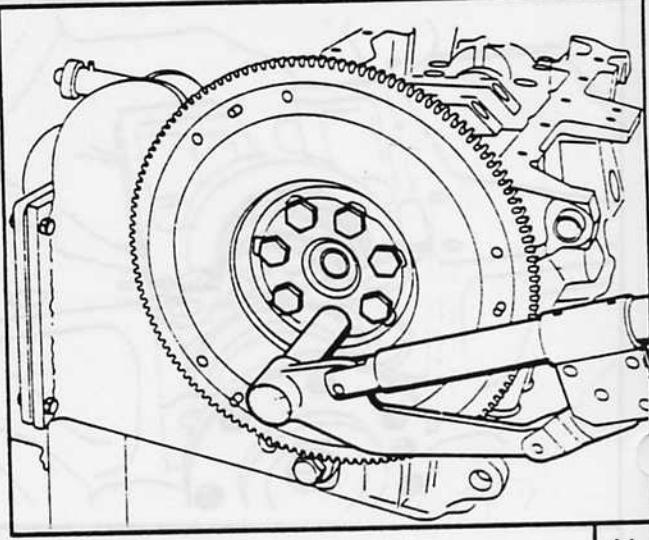


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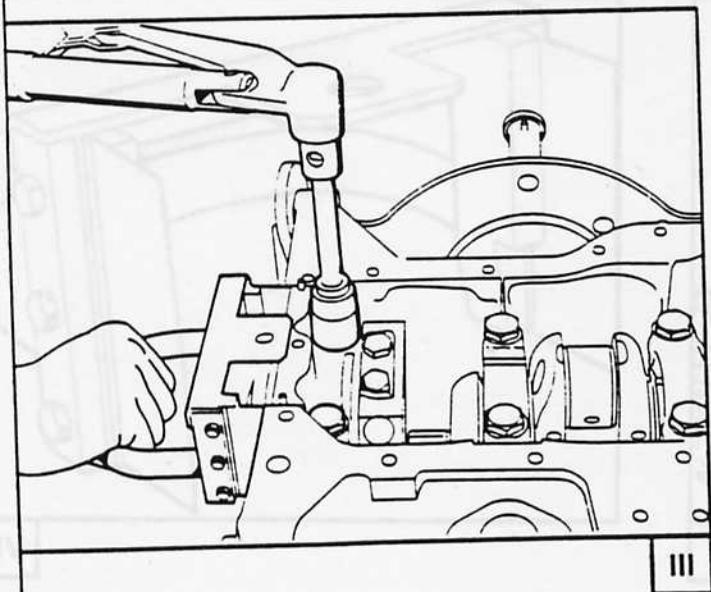
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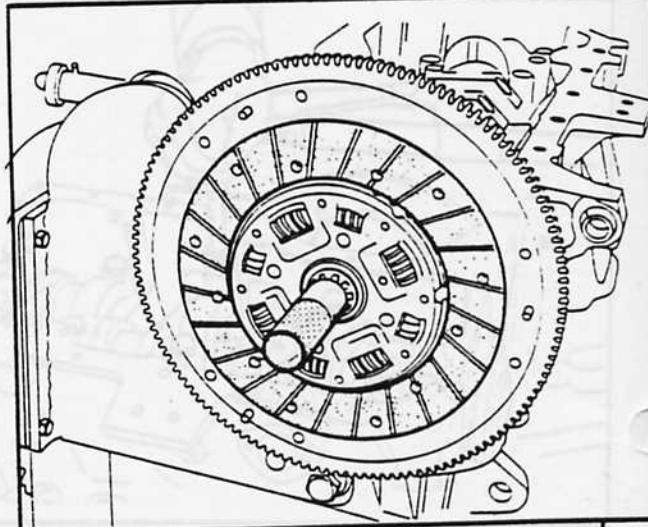
II



V



III



VI

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

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

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

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).

**Fit the clutch mechanism, fig. I.**

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

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

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

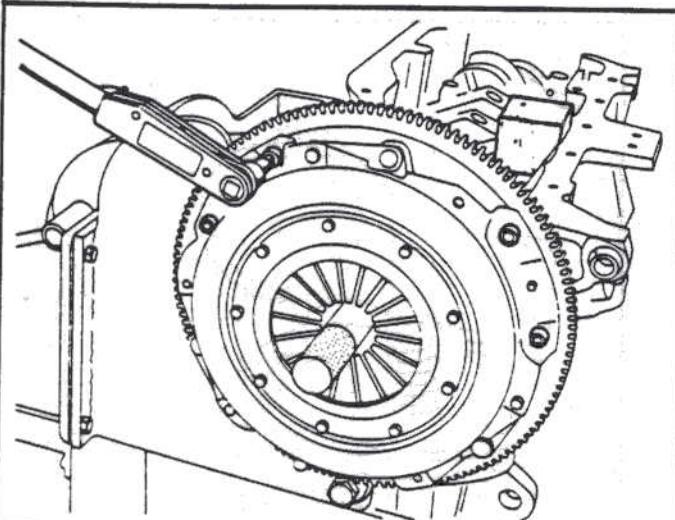
paper and white synthetic fibre → 07/85,  
steel plated with aluminium.

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.

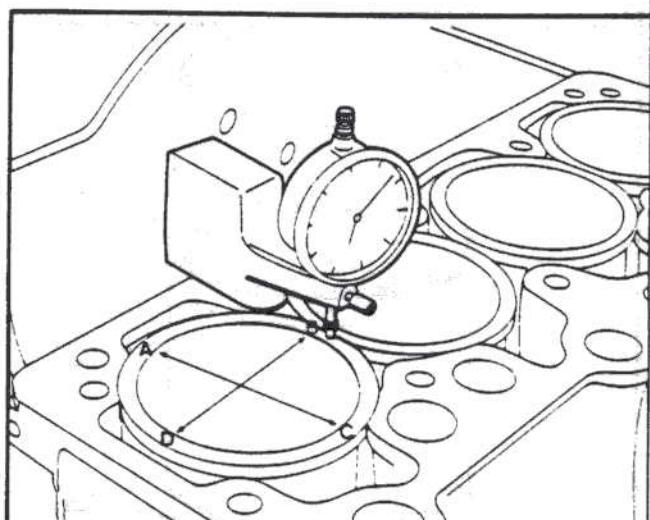
**NOTE the highest liner protrusion.**

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	
from - 0.095 to - 0.007		0.130	

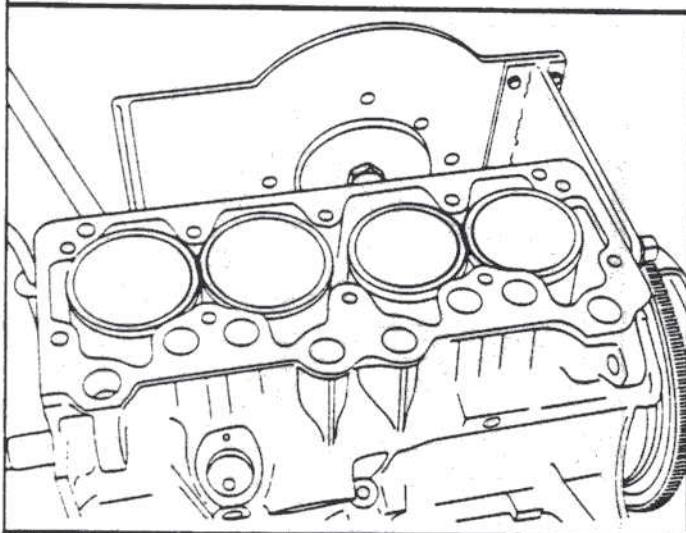
**IMPORTANT - Use only one seal per liner.**



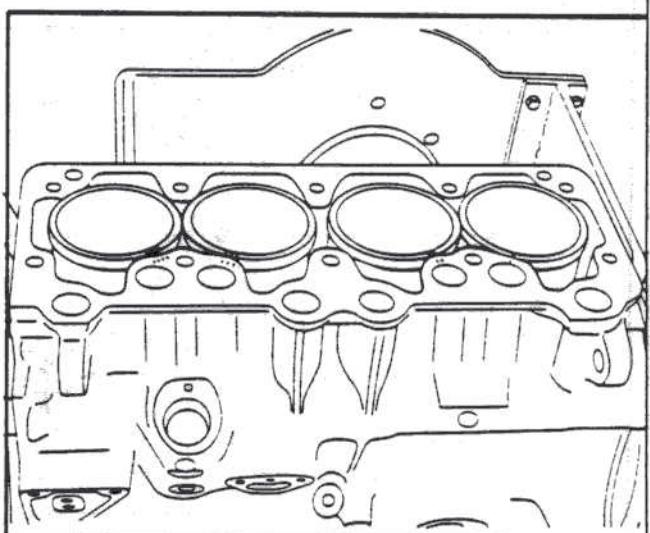
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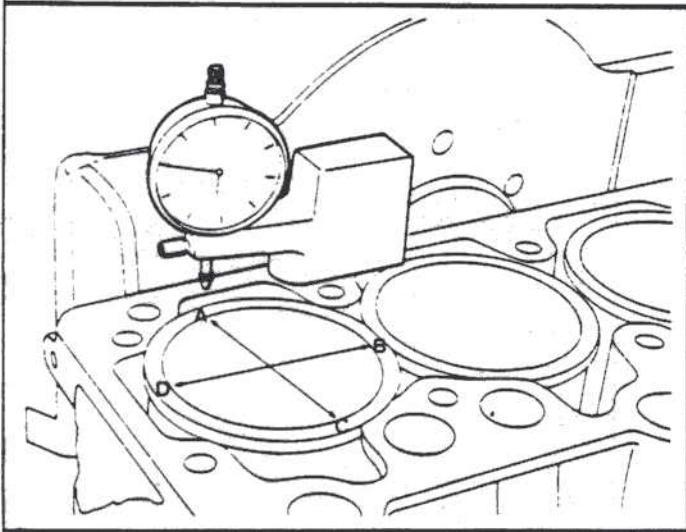
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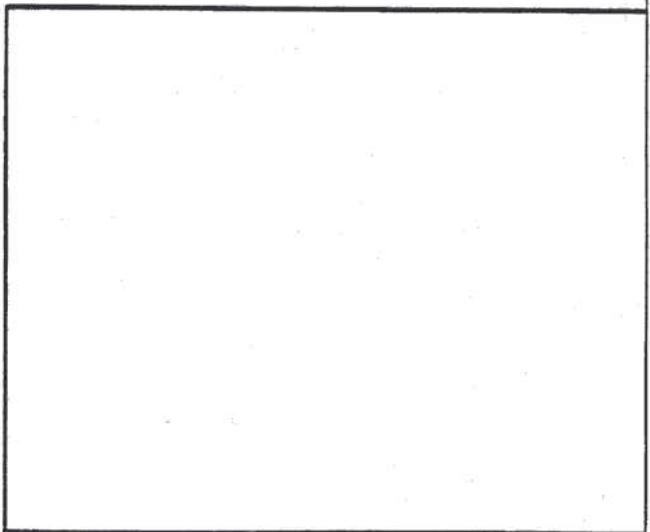
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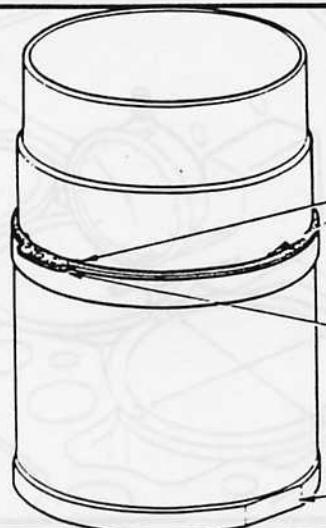
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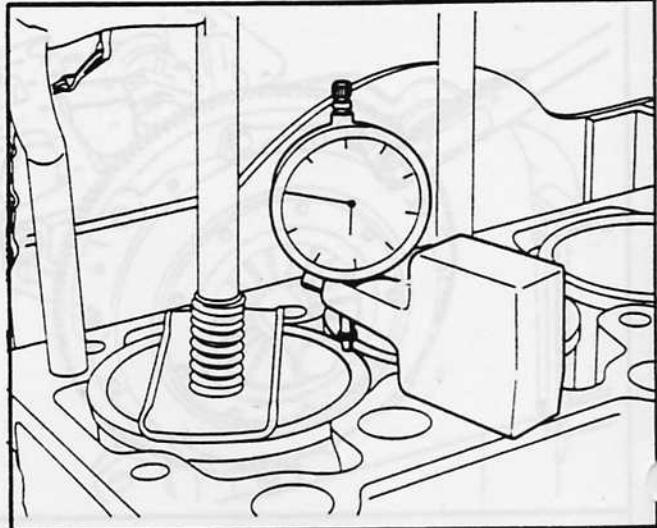
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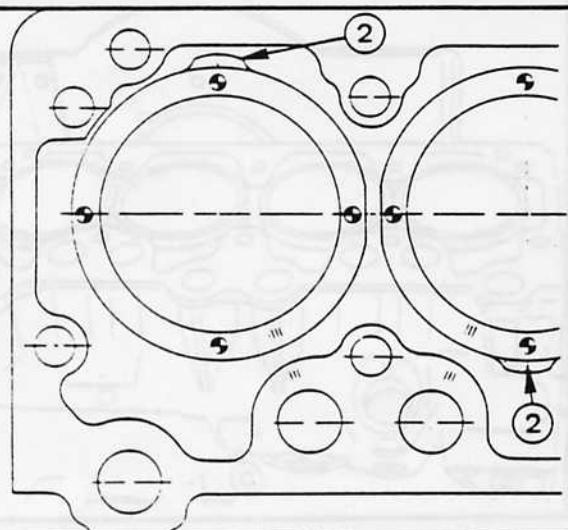
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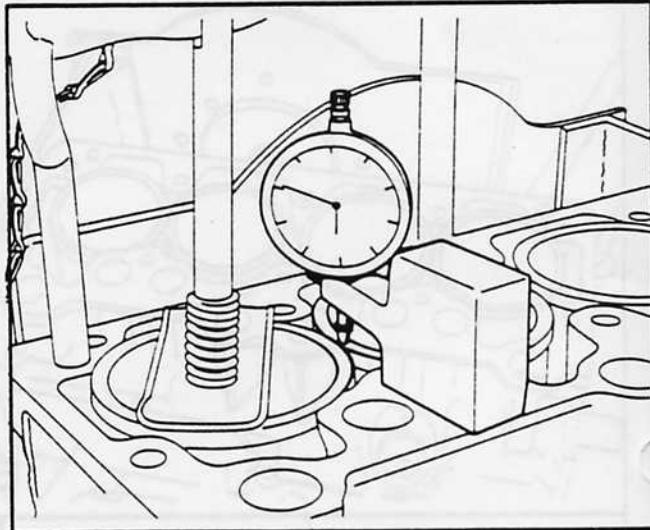
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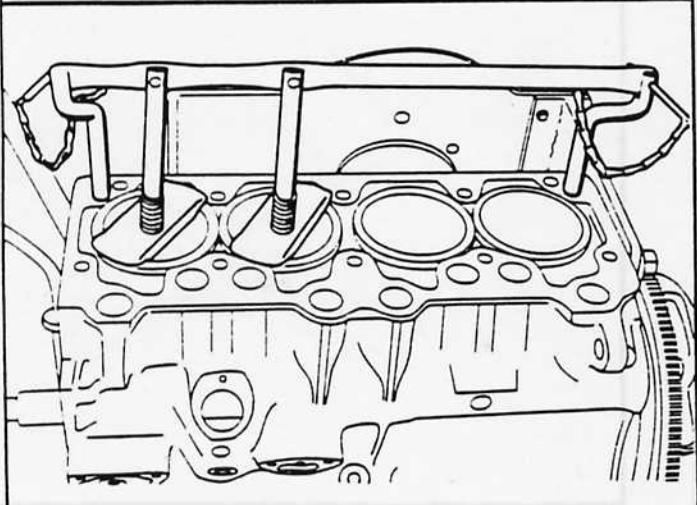
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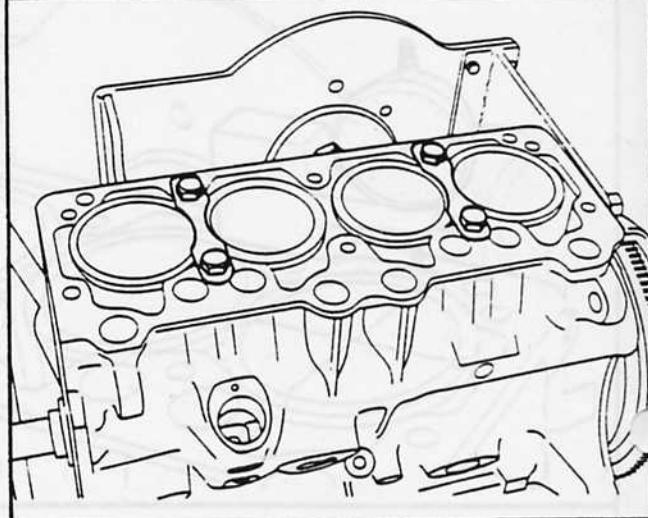
II



V



III



VI

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.

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.

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.

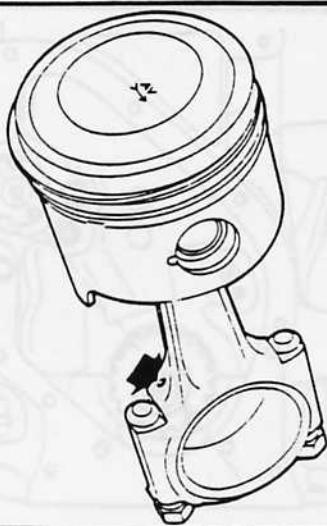
Check that the sequence 1, 2, 3, 4 is correct.

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

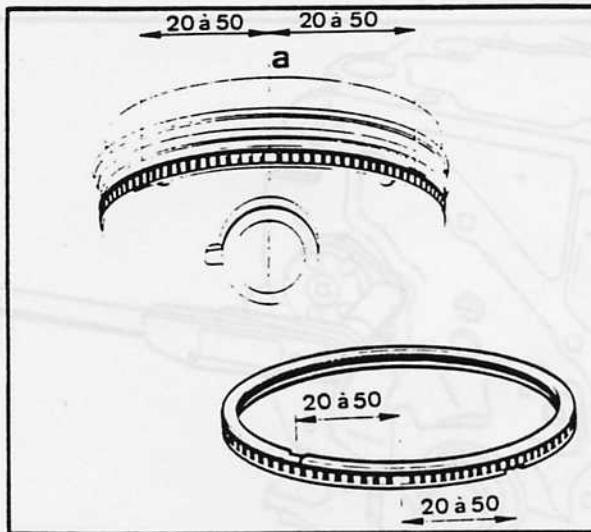
Guide each connecting rod big-end on to its crank pin, fig. VI.

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

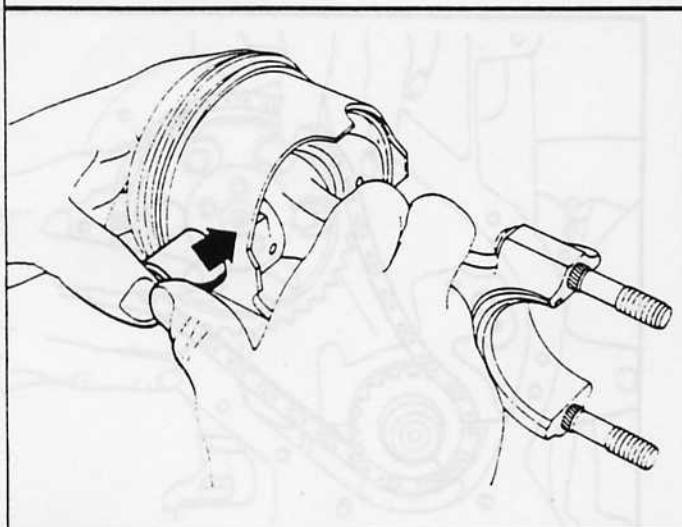
Tightening torque : 4 m.daN (40 Nm, 30 lbf ft).



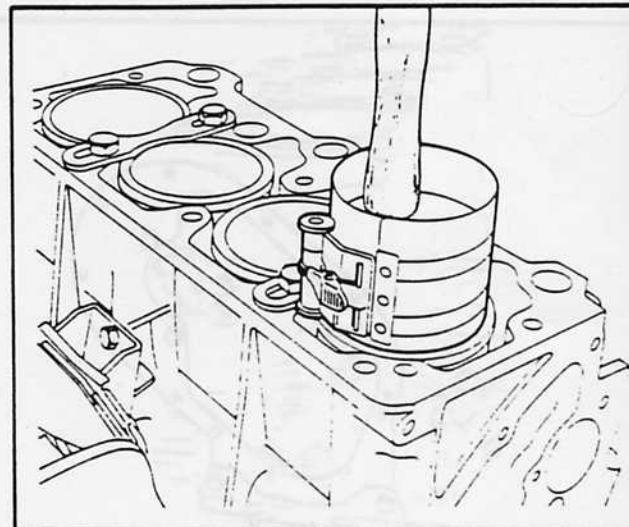
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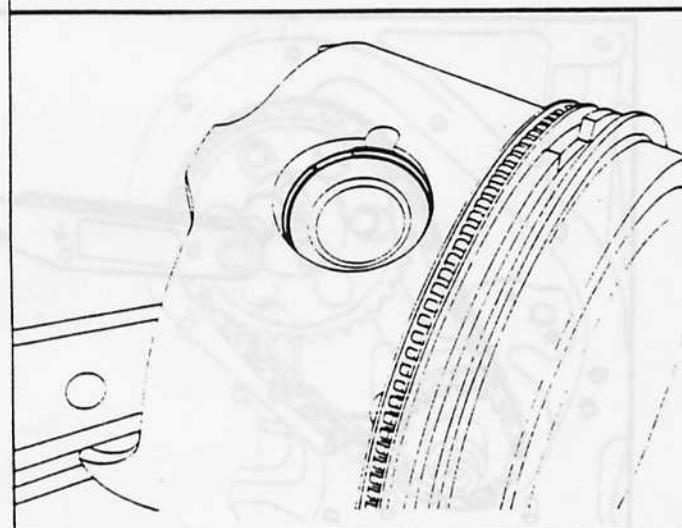
IV



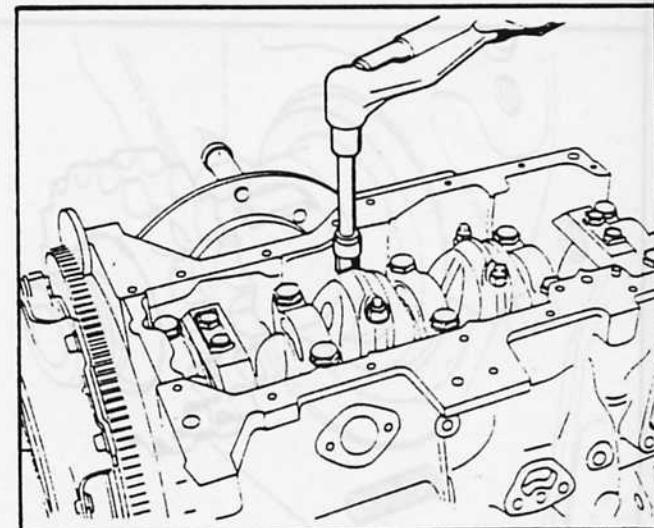
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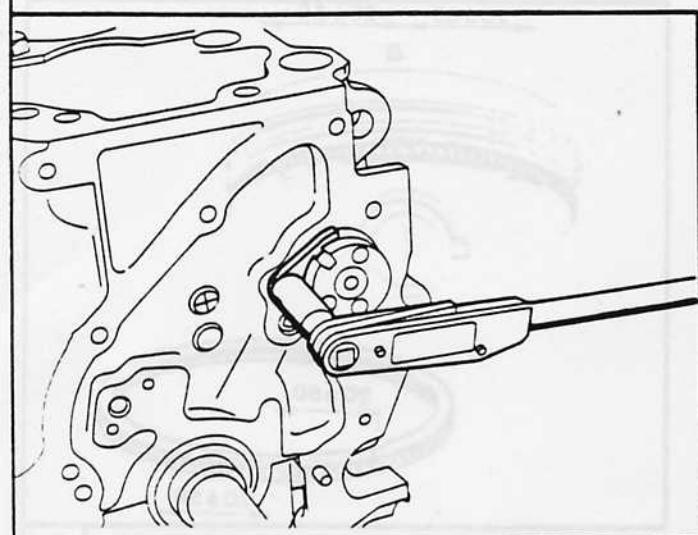
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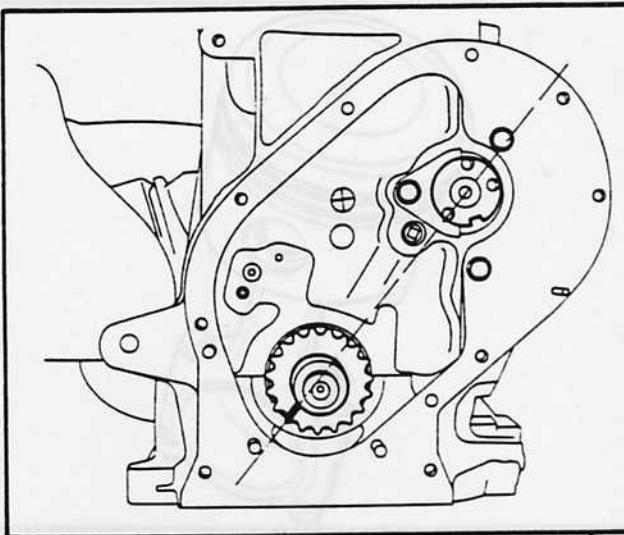
III



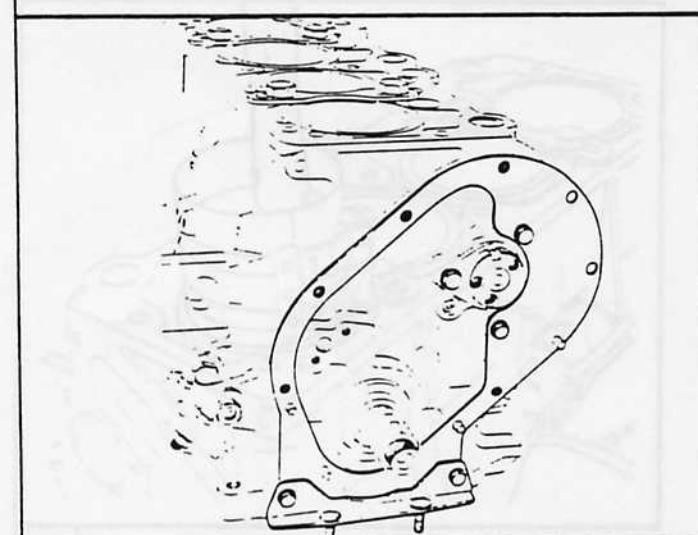
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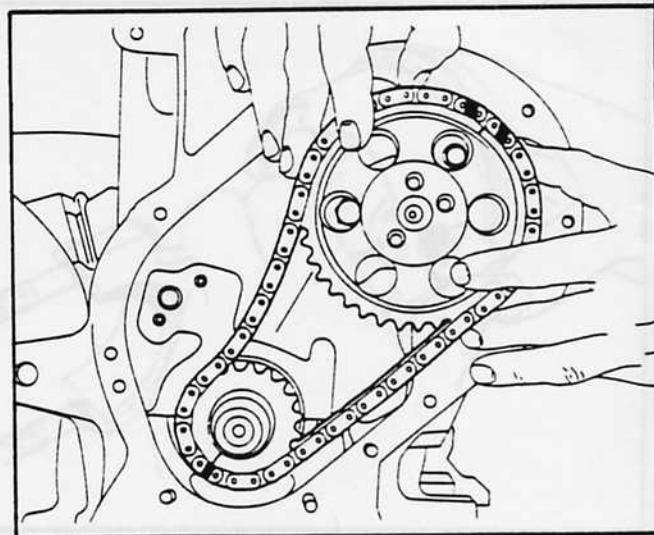
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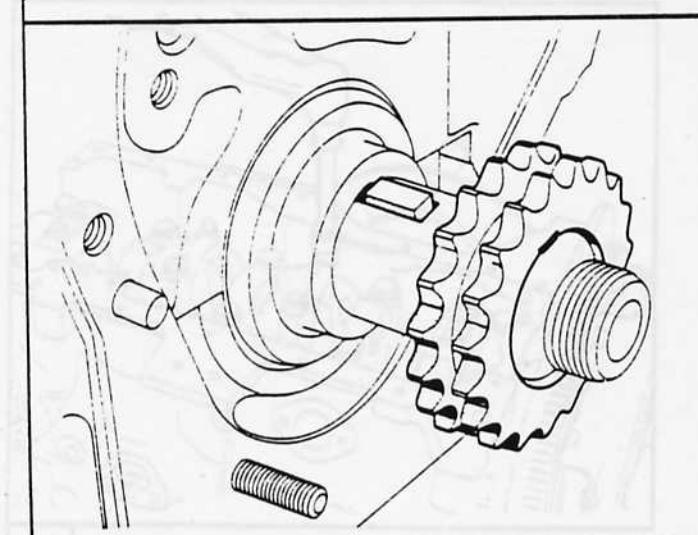
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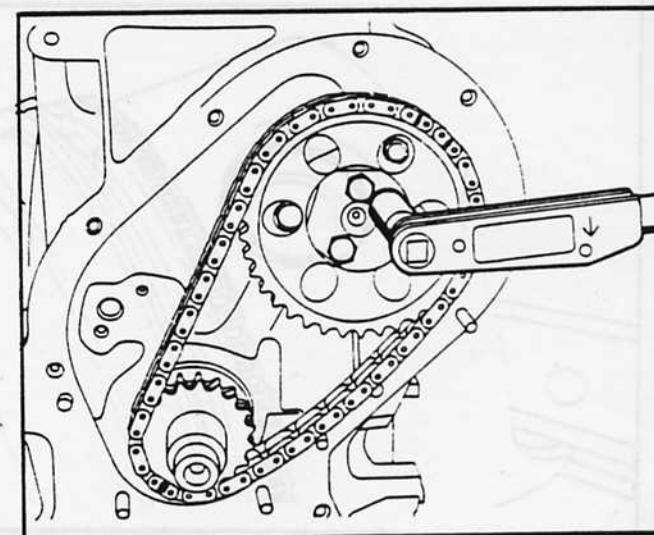
II



V



III



VI

## 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).

RENOULD type tensioner, fig. II :

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

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.

- 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.

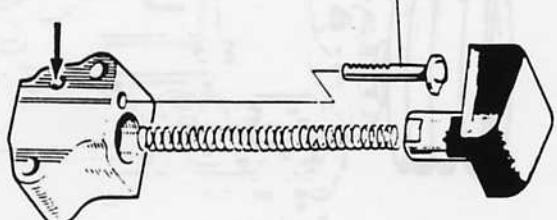
New tensioners are supplied fitted with a plastic tab for this purpose.

RENOULD type tensioner, fig. VI :

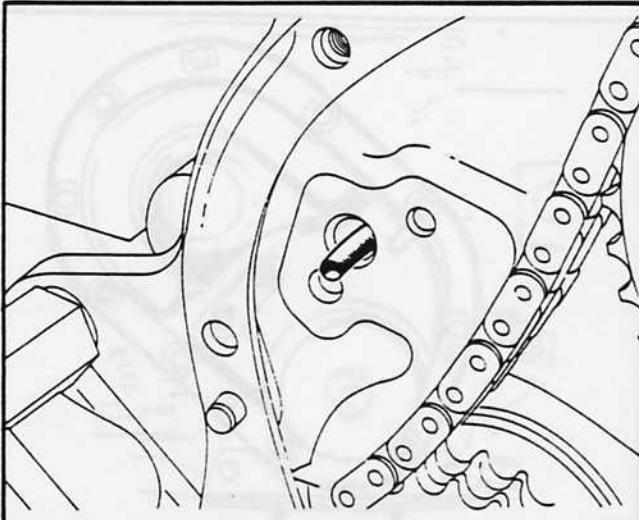
- Remove the length of wire or the plastic tab (new tensioner) and push in the pad until it makes contact with the bottom of the bore in the tensioner body.
- Release the pad.

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

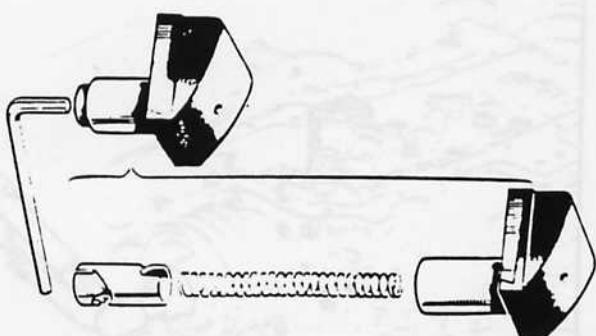
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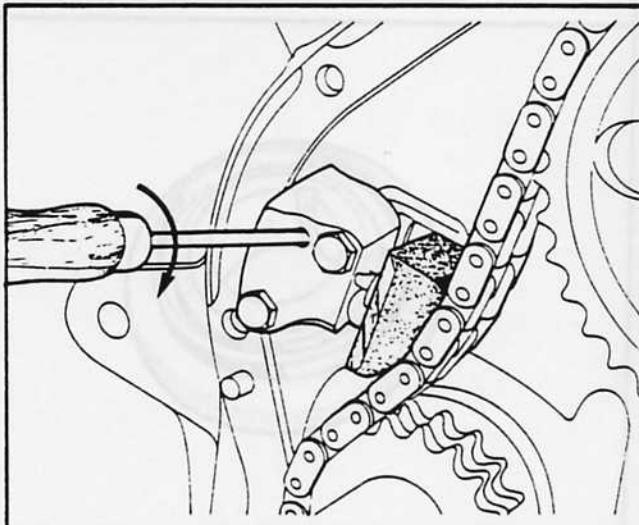
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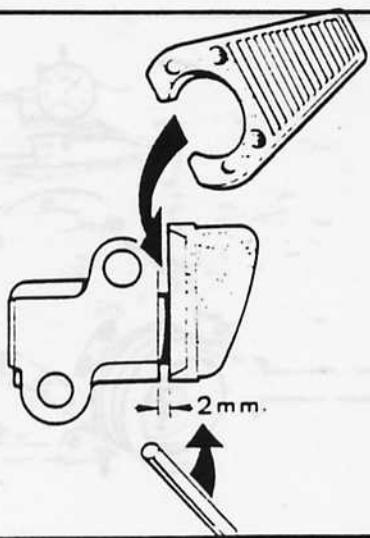
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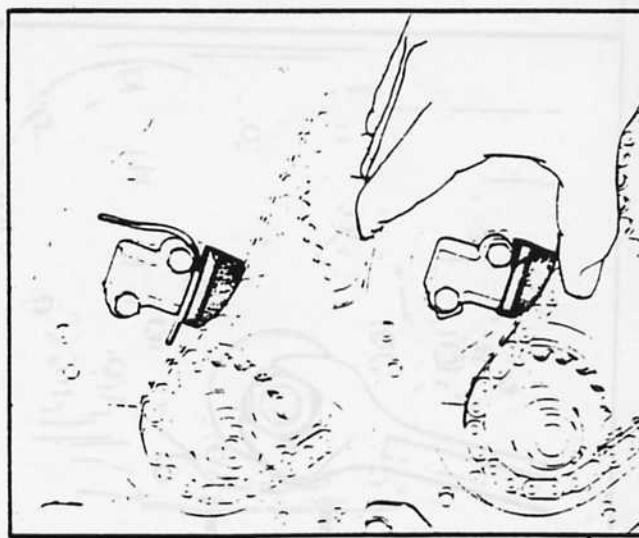
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V



III

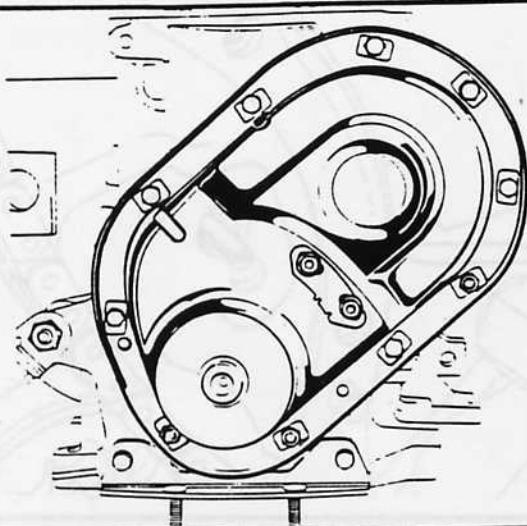


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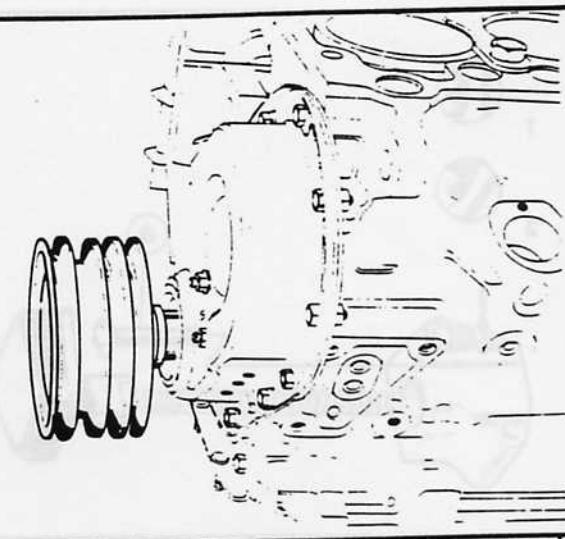
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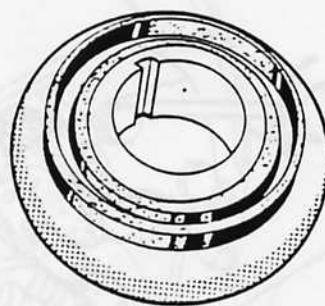
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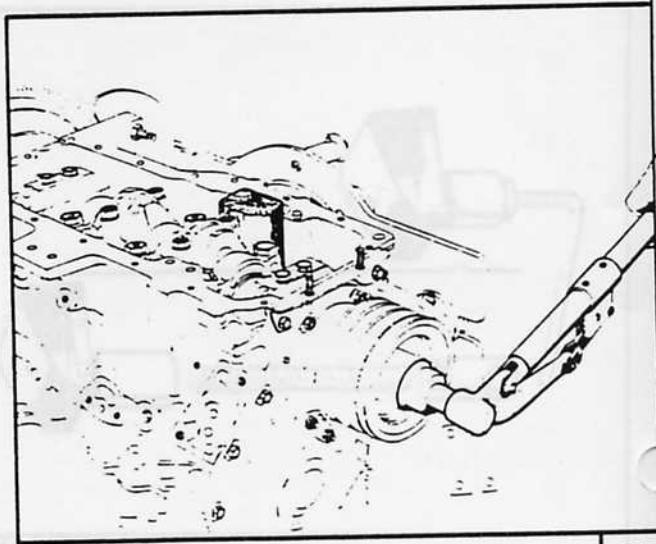
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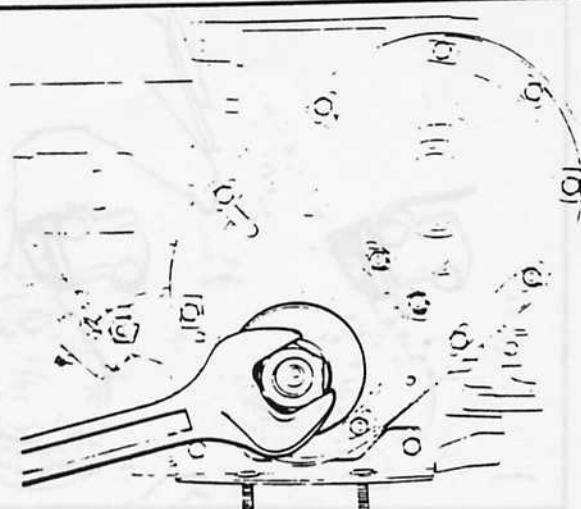
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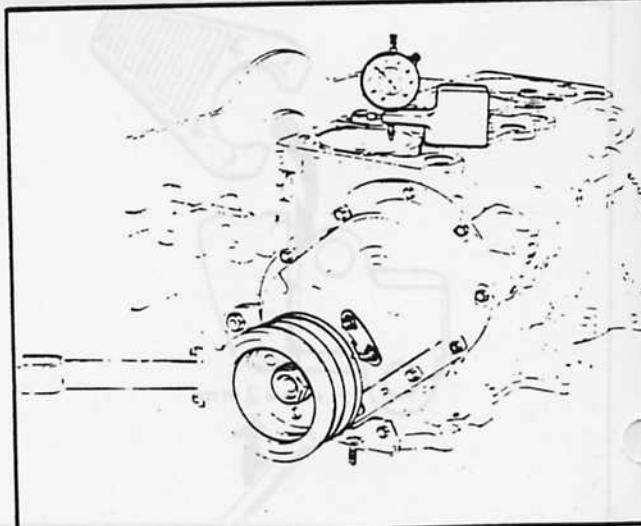
II



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 crank-shaft 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.

**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.

**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.

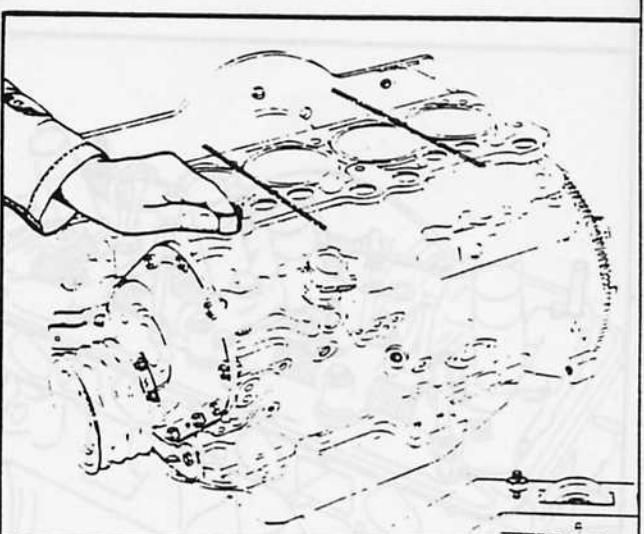
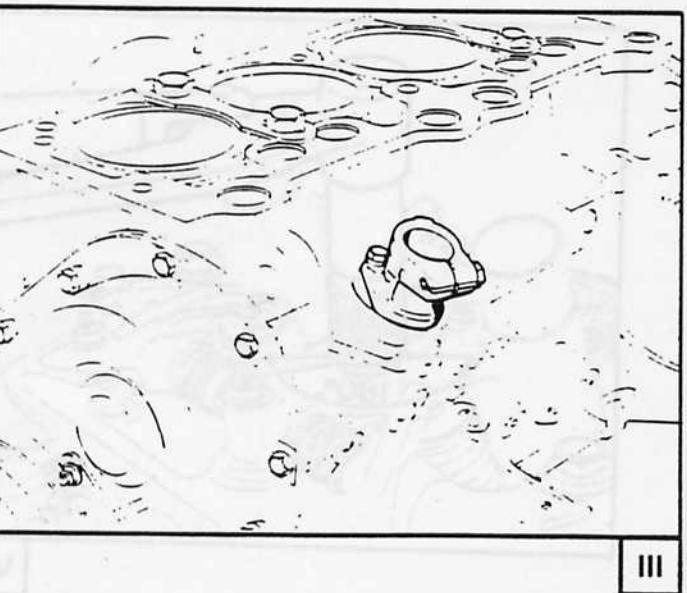
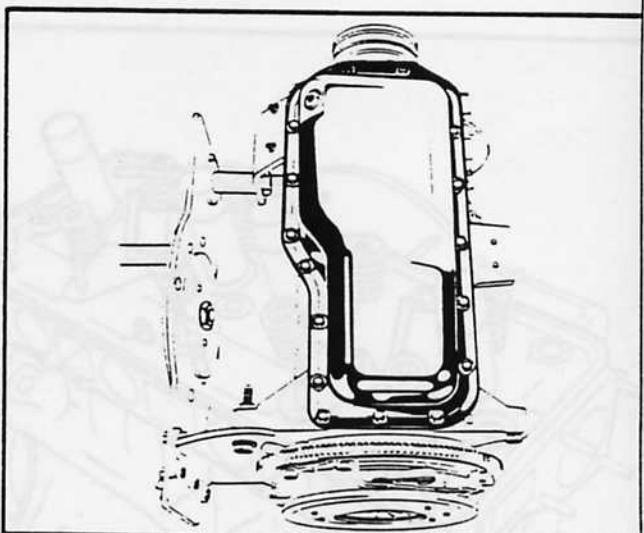
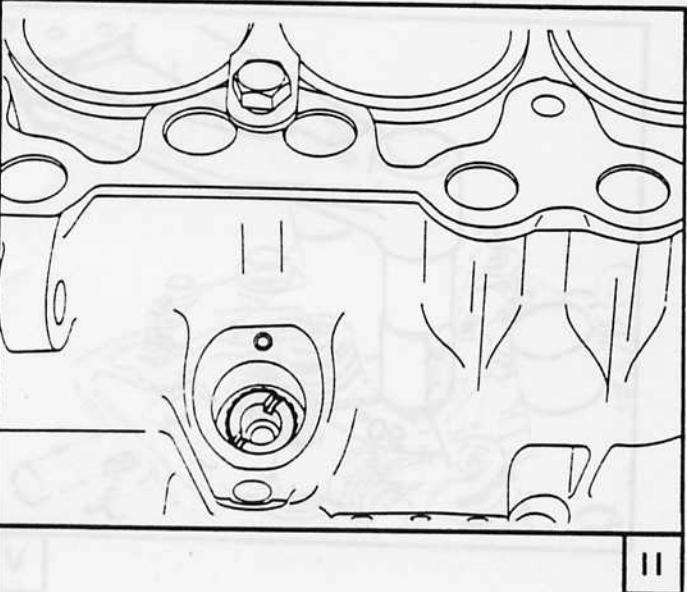
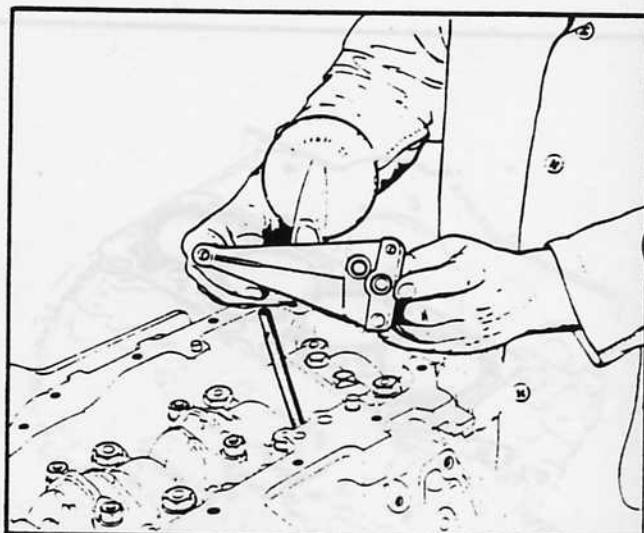
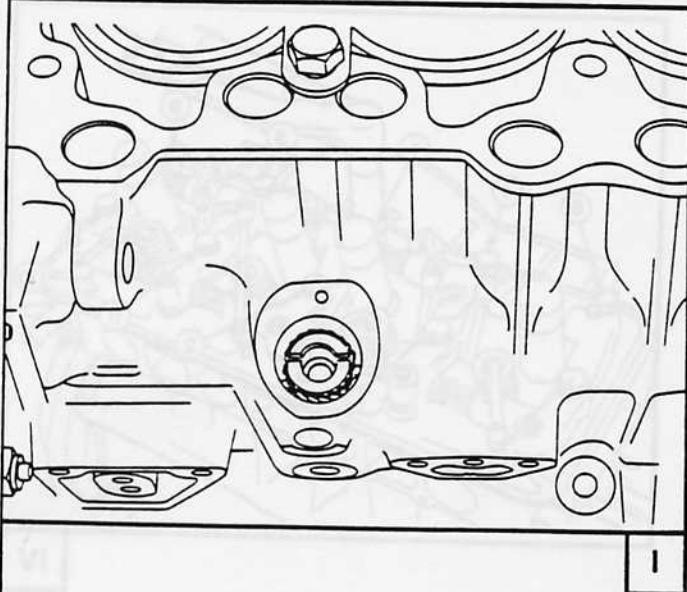
Tighten the bolts to 1 m.daN (10 Nm, 7 lbf ft).

**Refit the distributor support, fig. III.**

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

Remove the liner retaining clamps 8.0132 A1Z.

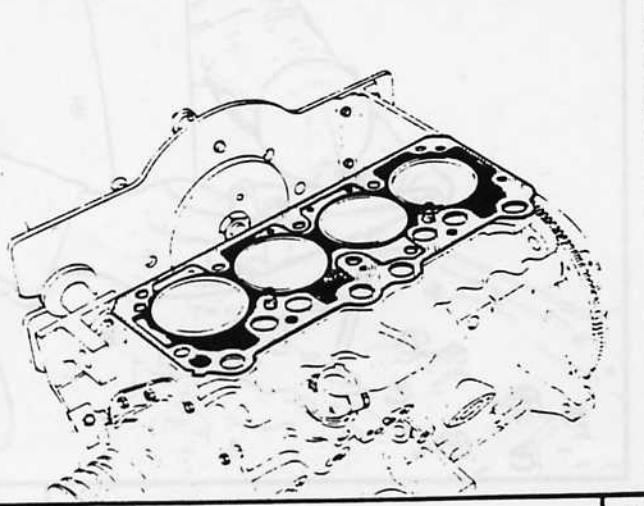
Ensure that the flats on the end flanges of liners 1 and 2 and 3 and 4 are parallel.



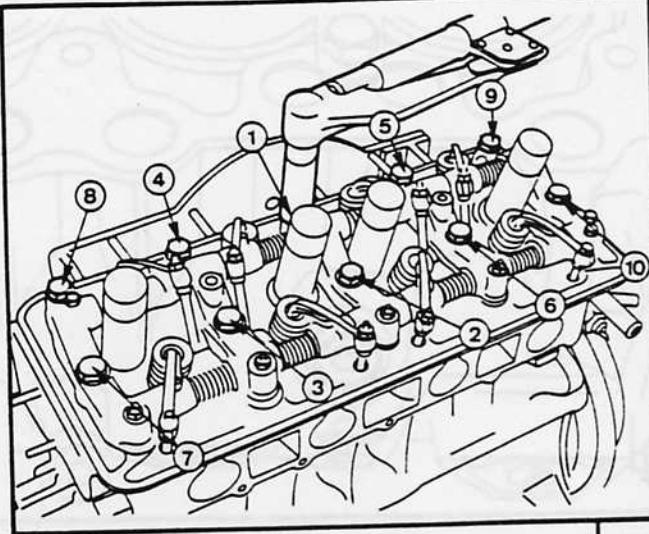
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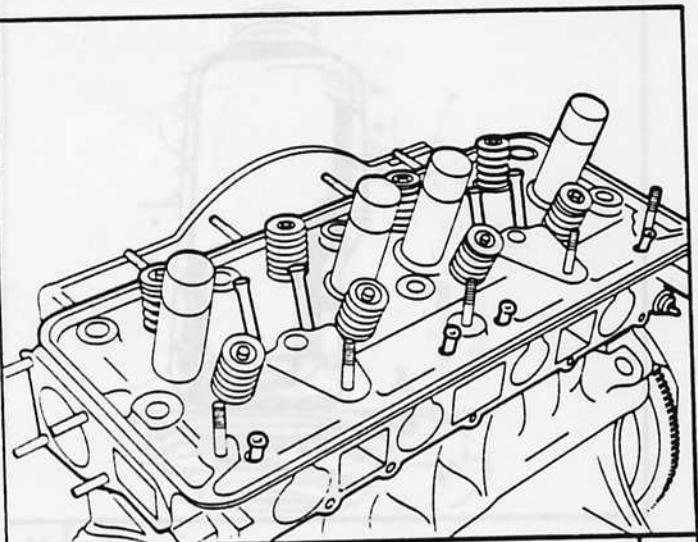
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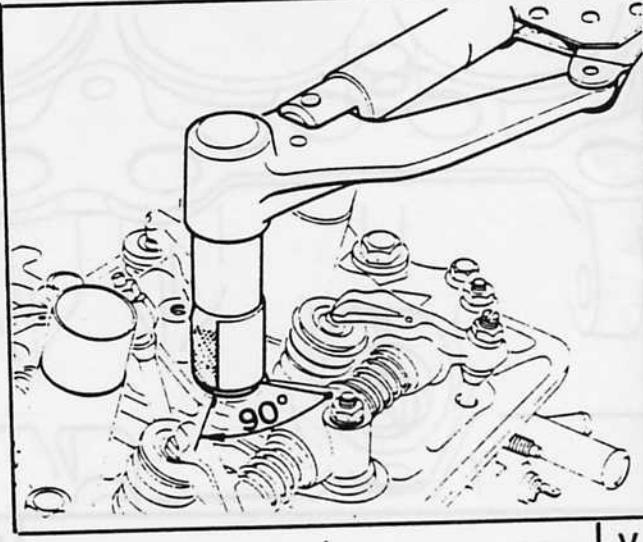
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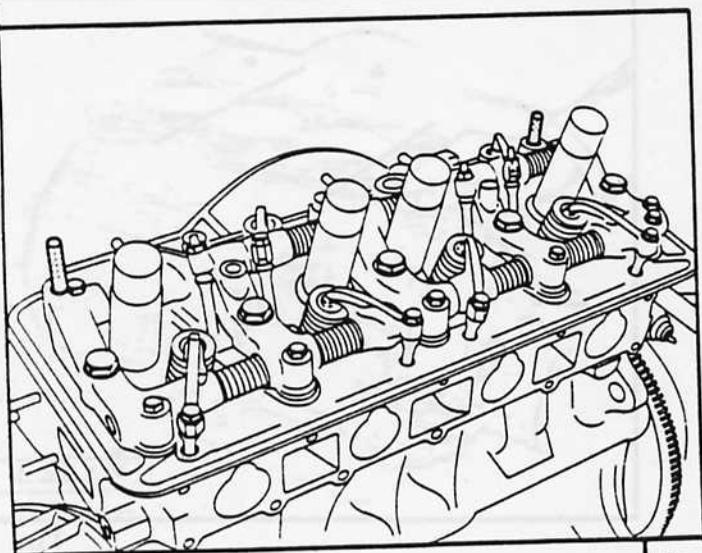
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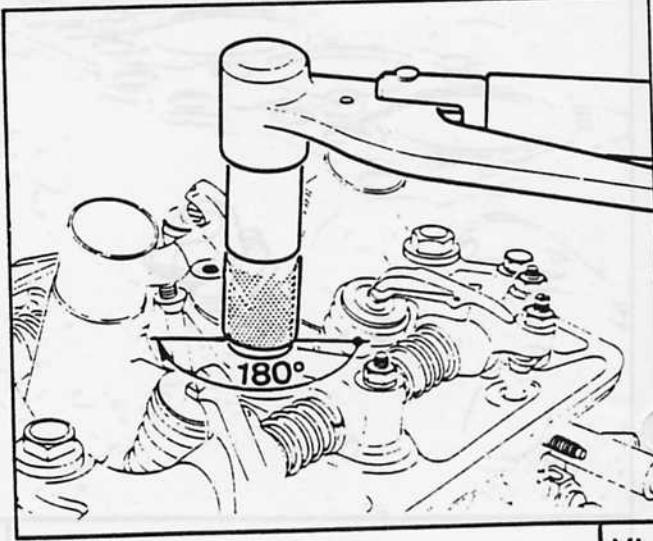
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V



III



VI

**Refitting the cylinder head.****Tighten the cylinder head.****Fit guides 8.0115 BZ, fig. 1.****a) In the order shown in fig. IV.****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.

**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.

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

**NOTE - If there is any doubt on the tightness of one of the bolts, recommence the operation from the very beginning.****RETRIEVE the 2 guides 8.0115 BZ using their extensions 8.0115 A.****IMPORTANT - The cylinder head is to be re-tightened 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	Adjust valves	
Exhaust	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 :

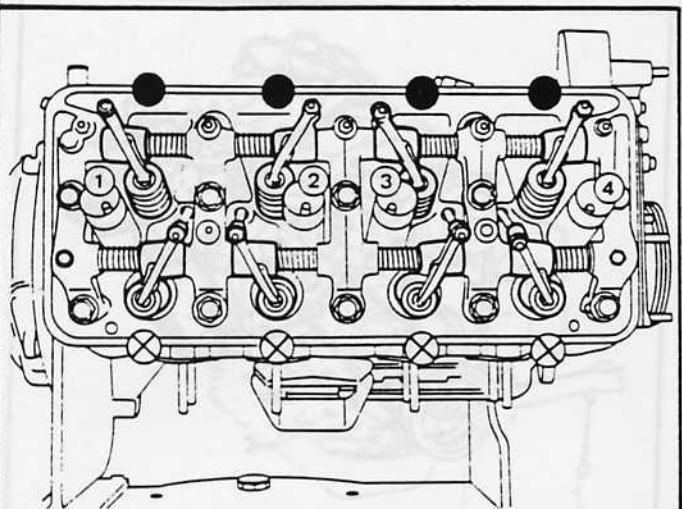
- Oil between the seal and the cartridge.
- Degrease the upper face of the seal and its locating area on the support.
- Screw in the cartridge until the joint makes contact with its face.
- Tighten the cartridge by a further 3/4 turn.

## Refit the rocker arm assembly lubrication pipe fig. III.

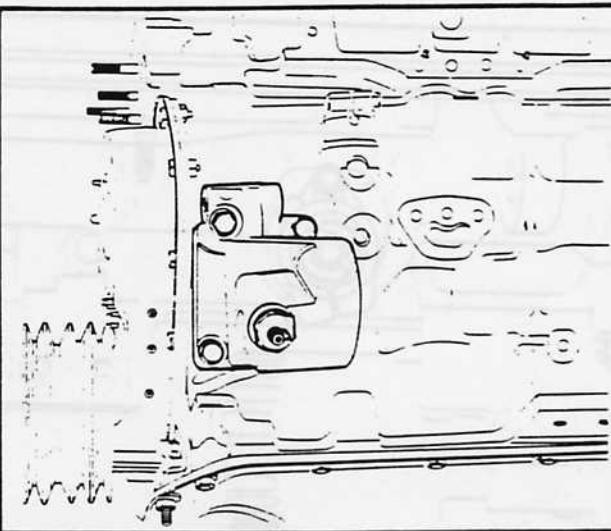
Fit the unions with new seals.

## Preset the distributor timing.

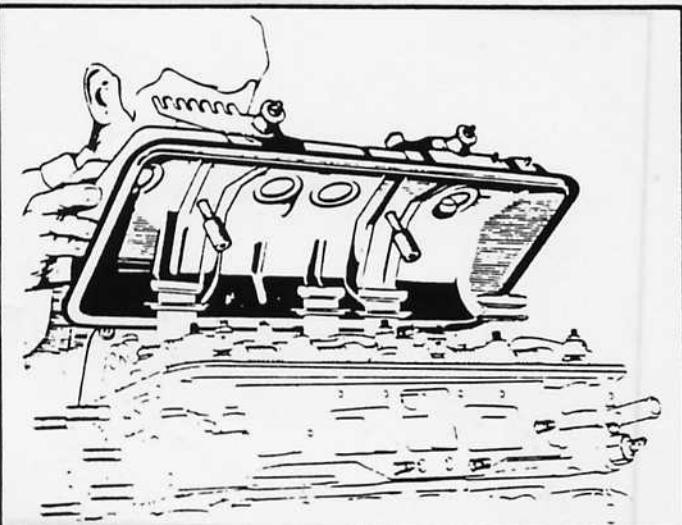
Bring the slot in the pulley in line with the mark on the timing plate fig. VI.



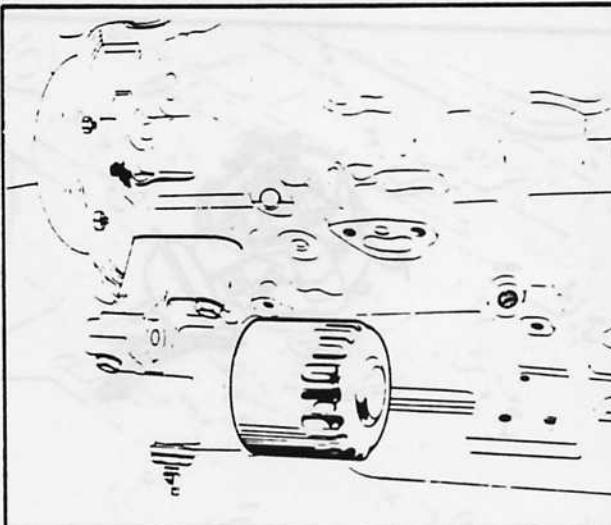
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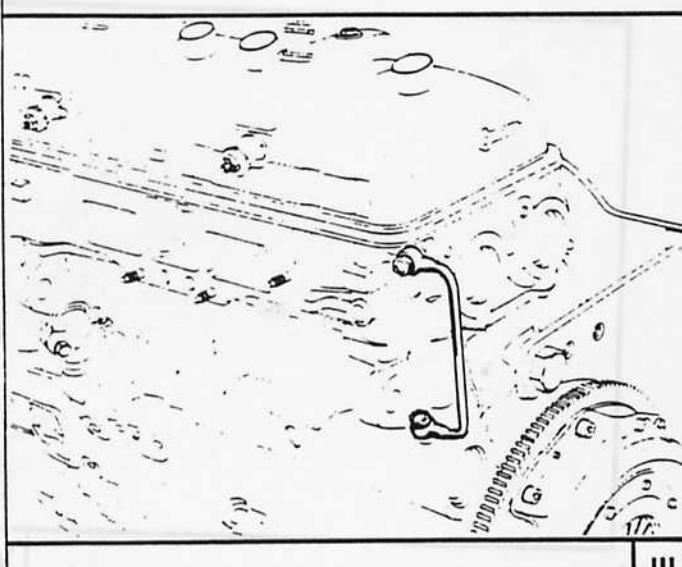
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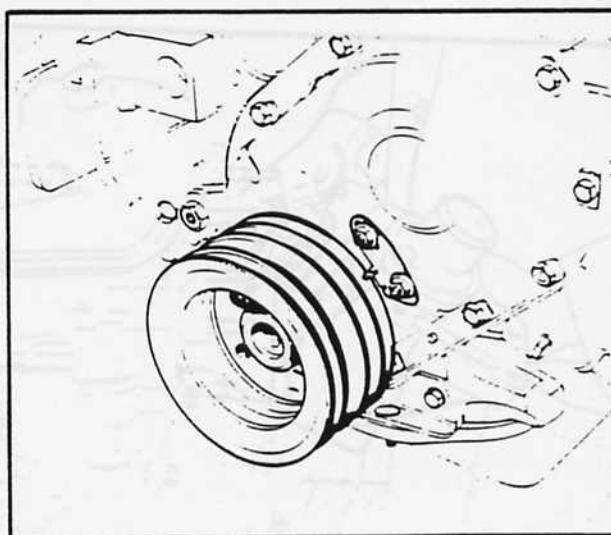
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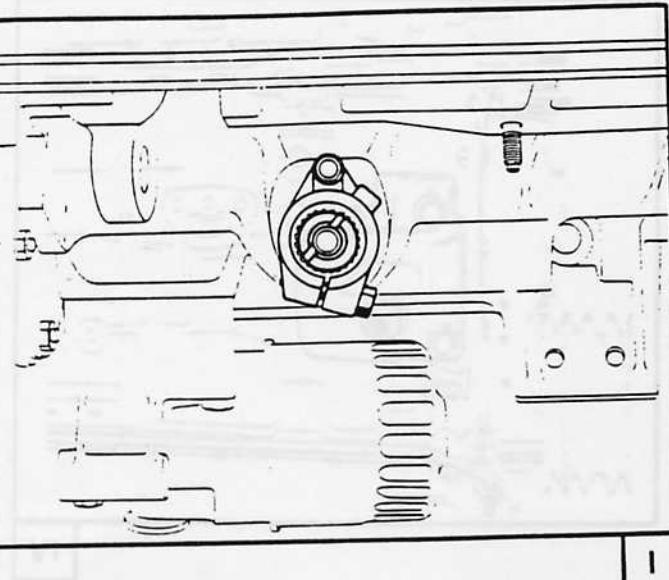


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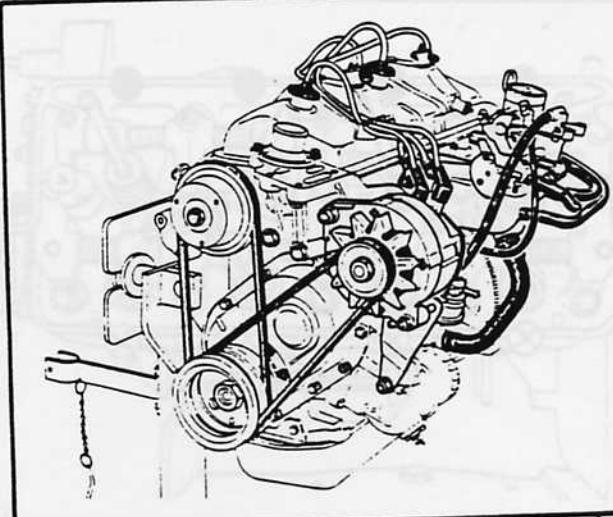
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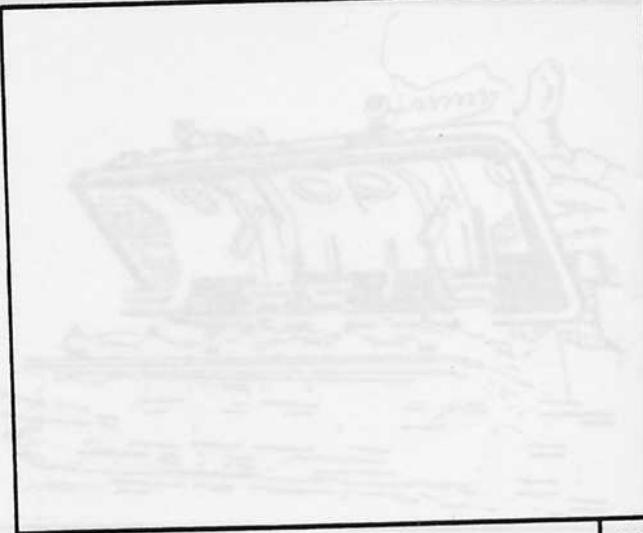
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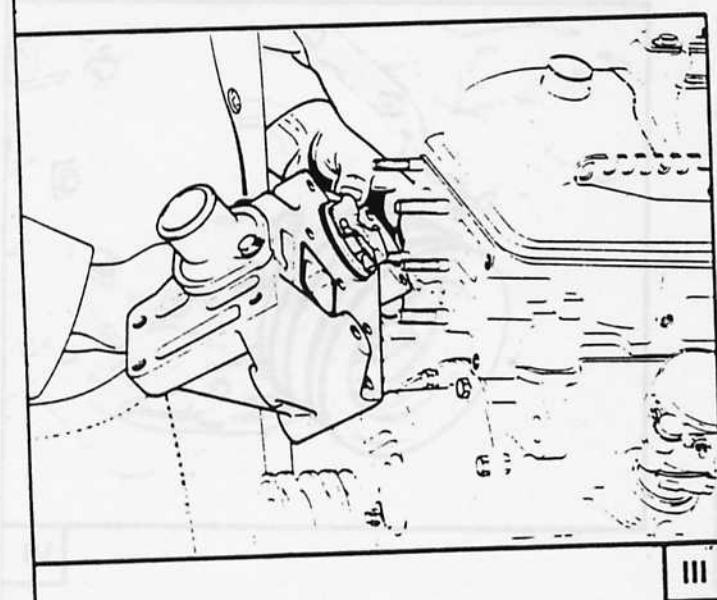
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III



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).

TOOLS REQUIRED

Page

Special tools ("09) enolmoco gnihetrigi valgus tel' zolos 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

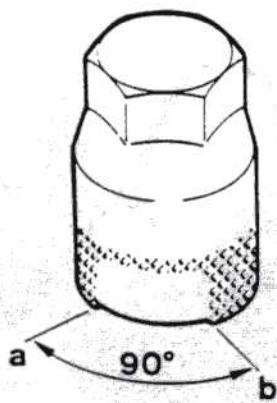
- ( ).0158      Socket for angular tightening operations (180° and 35°)

Fig. C

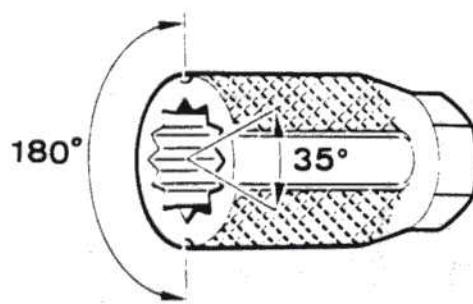
- 8.0118 P1 -      Socket for crankshaft pulley nut

APPROVED TOOLS

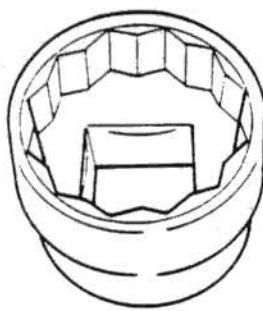
- Torque wrench.
- FACOM reducer S 232.
- FACOM ratchet spanner S 151.



(A)



(B)

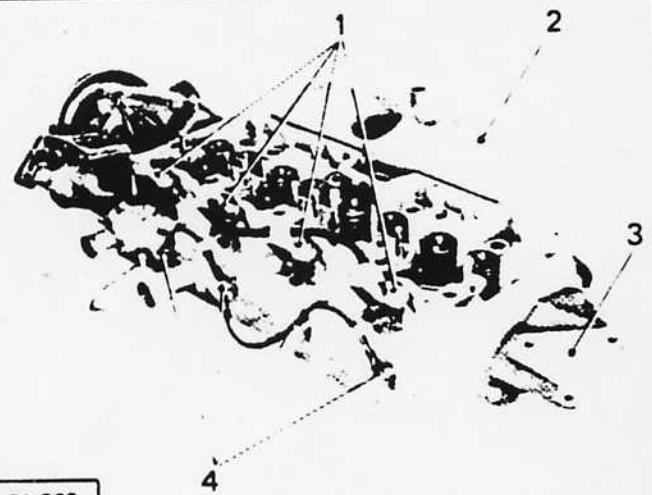


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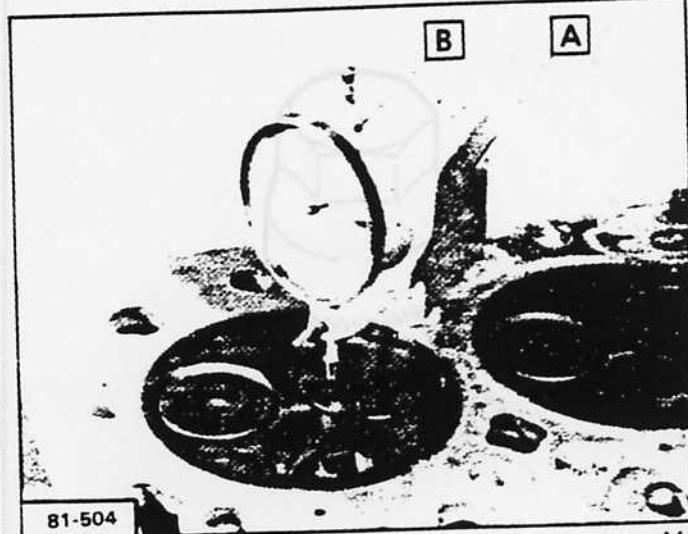
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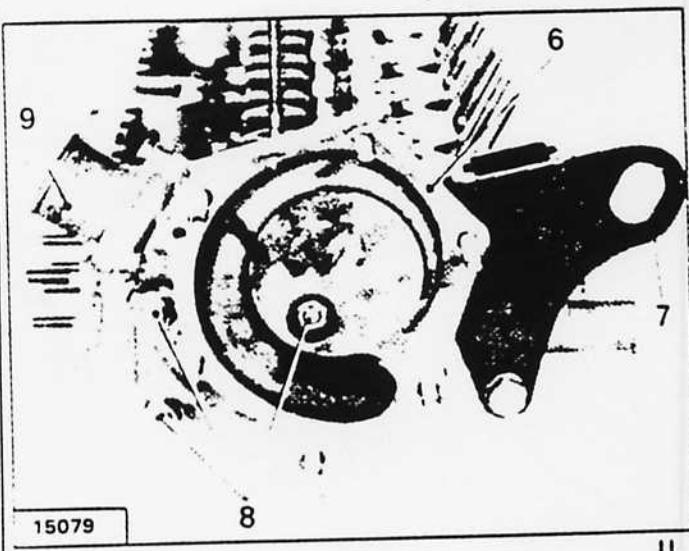


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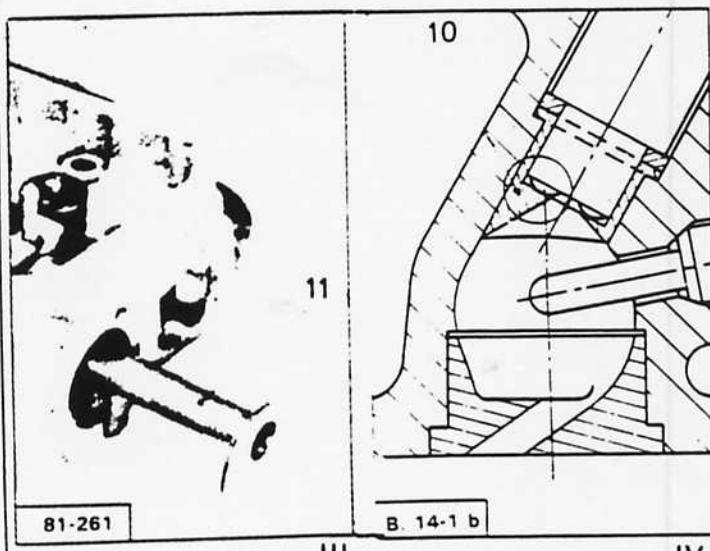


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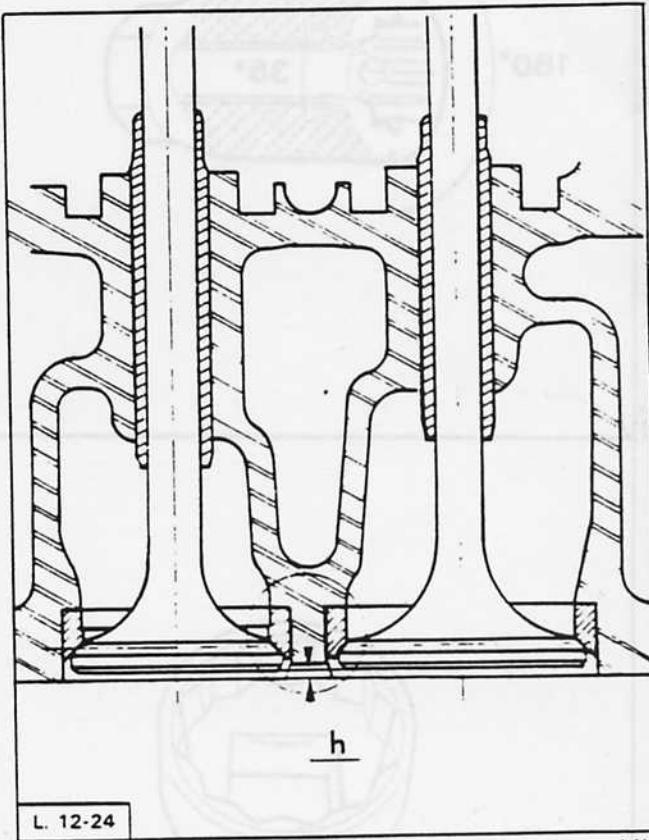


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B. 14-1 b

III

IV



L. 12-24

VI

J5	ENGINE CYLINDER HEAD RETIGHTENING	1	B2.005
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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)	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	- 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			
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°.		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			Warm up the engine until the electric fan cuts in.		

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.

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.

#### 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.

#### 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.

B4.002      1

**ENGINE  
CYLINDER HEAD  
REMOVING - REFITTING**

**SPECIAL TOOLS**

From petrol engine tool kit 8.0110 :

**TOOLING TO BE MADE LOCALLY**

Fig. A :

0.0149

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

H - Dial indicator holder.

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**

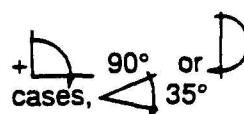
— Nut on left hand engine mounting rubber  
pad                    5.5 m.daN (55 Nm, 40 lbf ft)

— Cylinder head tightening sequence :

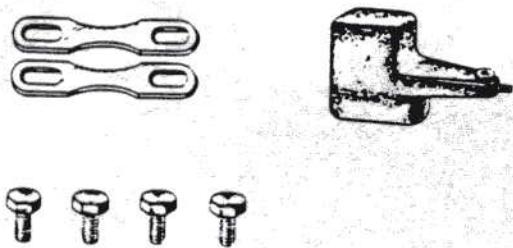
- initial tightening to  
5 m.daN (50 Nm, 37 lbf ft)

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

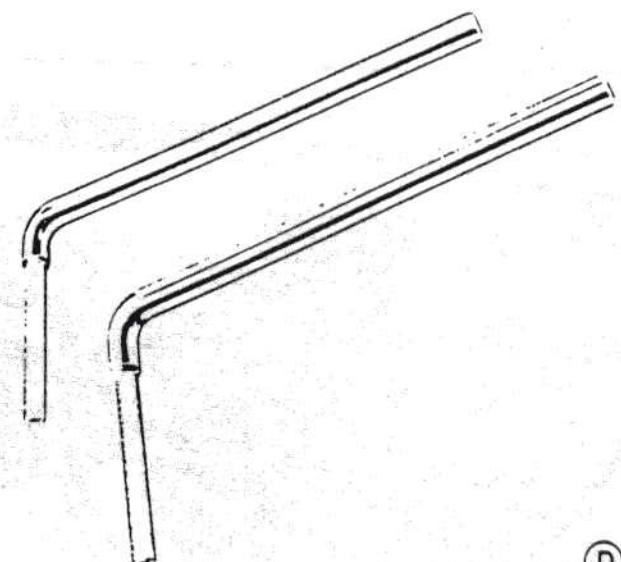
- tightening by the angular method :  
up to 2 m.daN (20 Nm, 15 lbf ft)



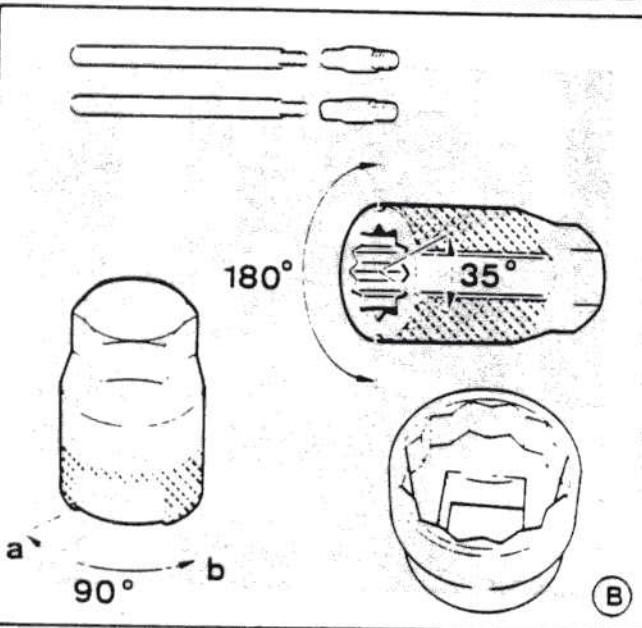
180° and, in certain  
cases,



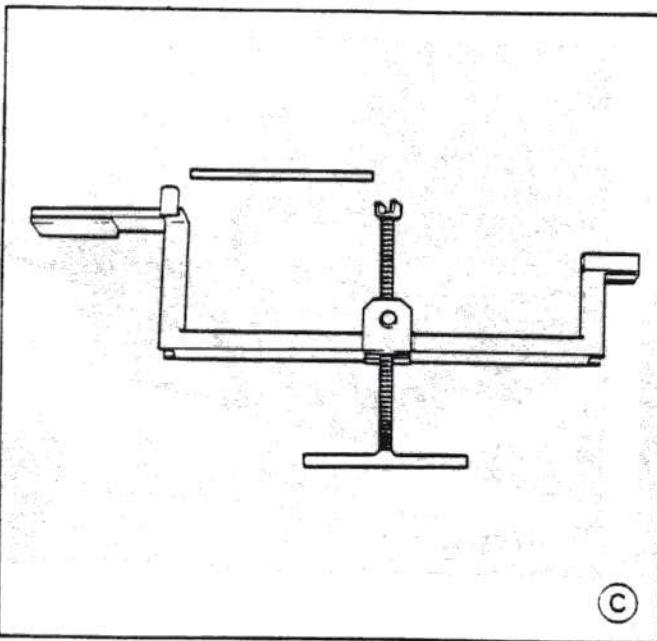
(A)



(D)



(B)

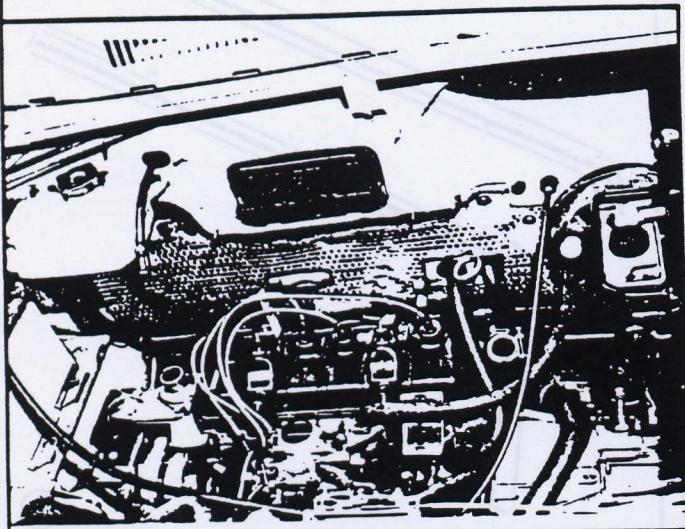


(C)

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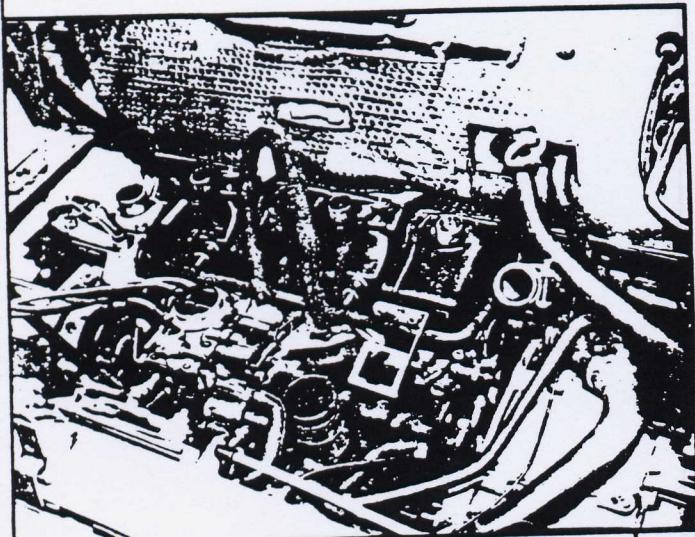
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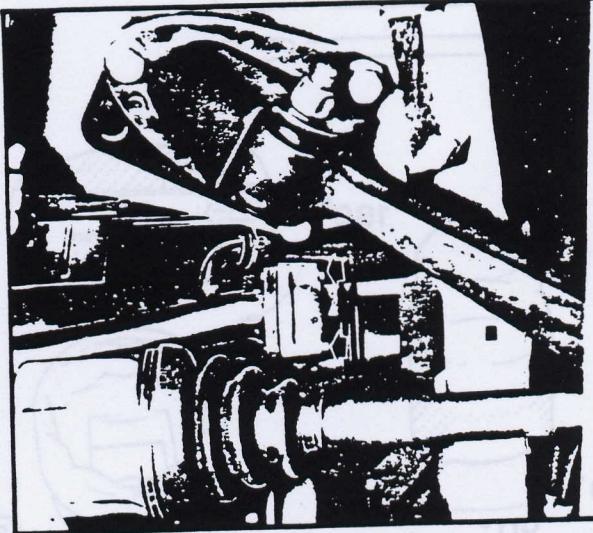
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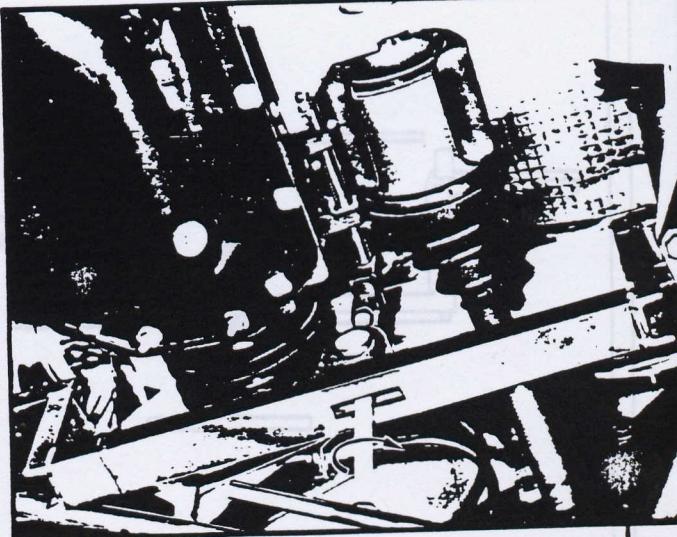
II



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.

B4.006	1	ENGINE CYLINDER HEAD REMOVING - REFITTING
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## 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.

## 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.

— Remove, fig. II :

- the ten cylinder head securing bolts,
- the five rocker shaft securing nuts,
- the rocker shaft,
- the push rods.

## INSPECTION

Check the cylinder head for bow, fig. V.

MAXIMUM permissible bow c = 0.10 mm

## Refacing (fig. V)

Nominal height : 92.5 mm ± 0.15

Minimum height after refacing : 91.85 mm

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

## 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 :

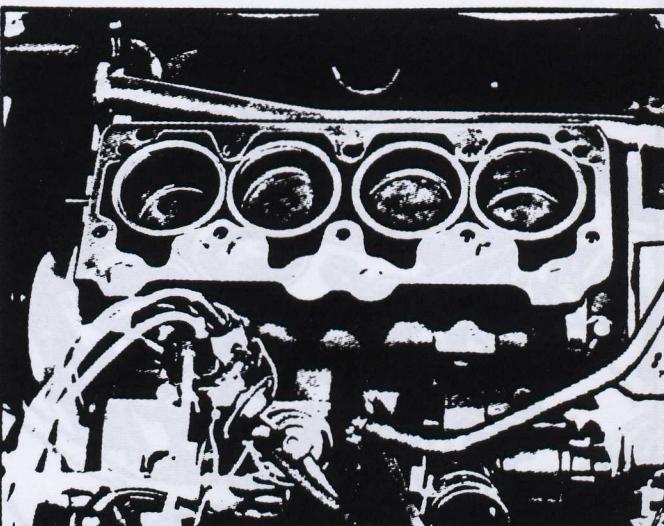
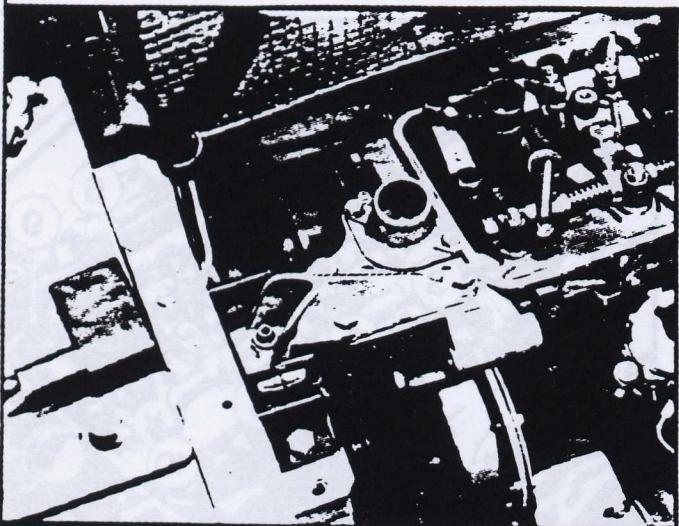
- maximum difference : 0.04 mm.

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

Lever the cylinder head free.

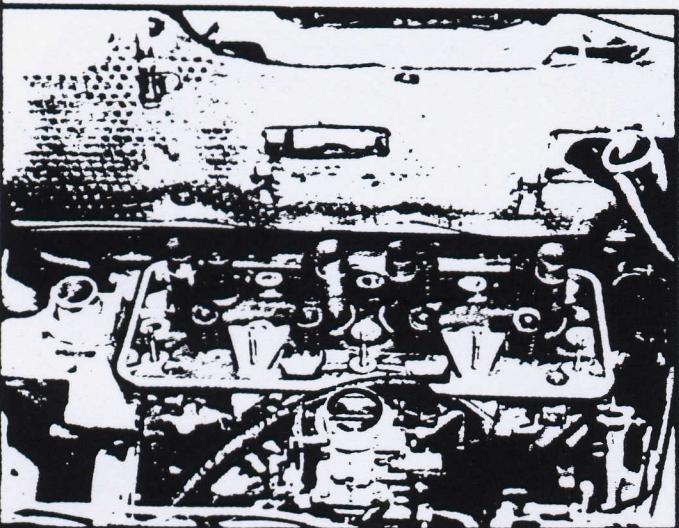
— Remove the cylinder head.

— Fit liner retaining clamps 8.0132 A1Z and bolts 8.0110 M.



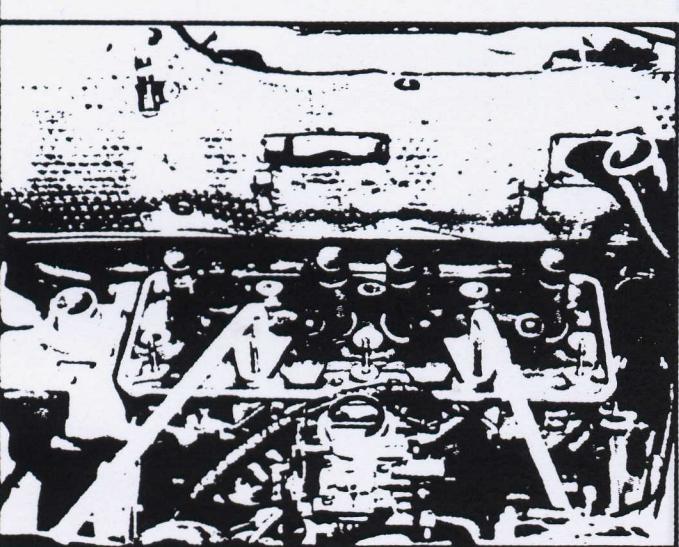
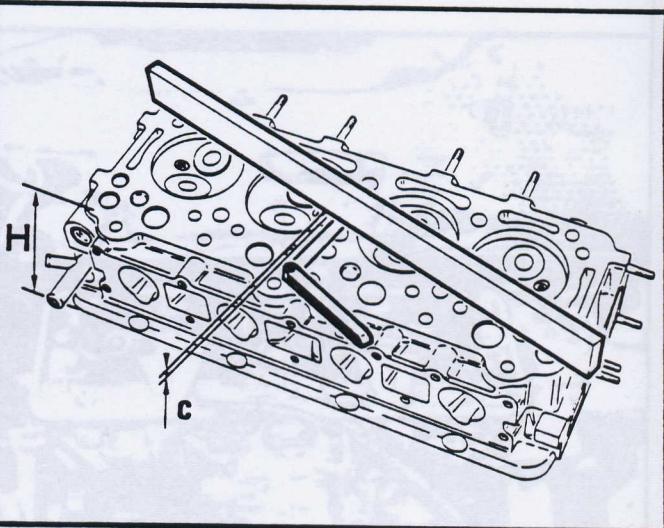
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IV



II

V



III

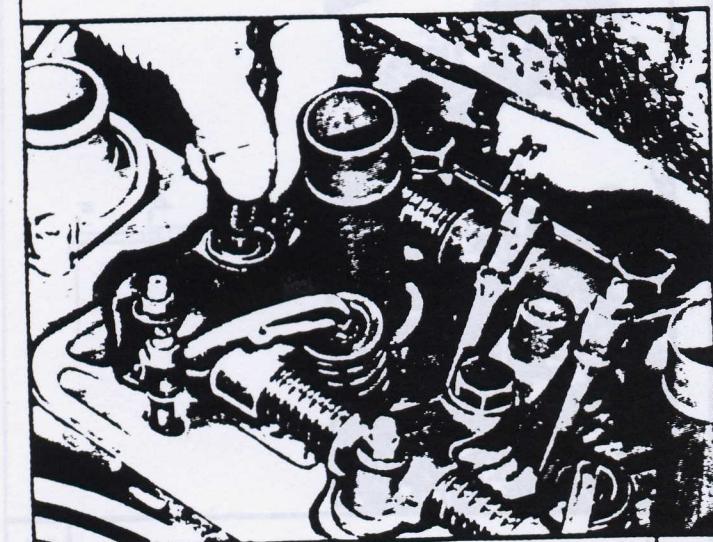
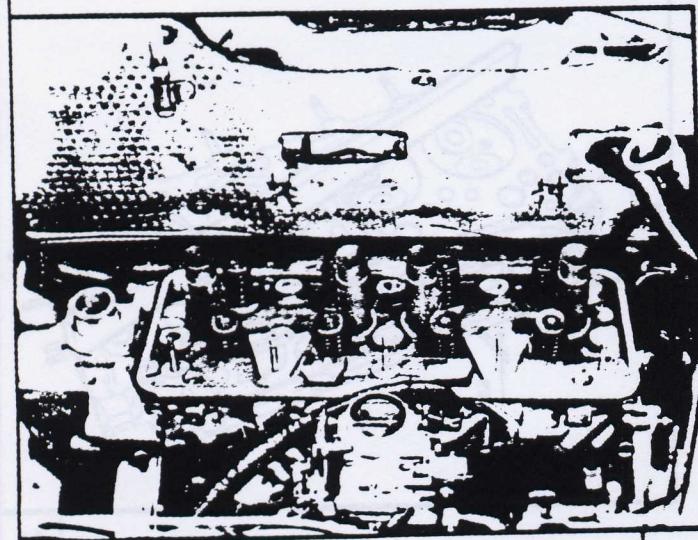
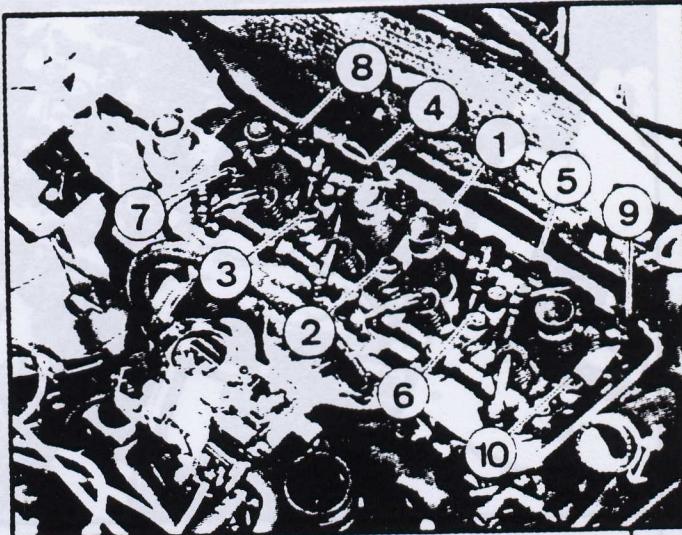


VI

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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.

### – 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.

### – 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).

## 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.
- 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 :  
 $x = 22 \text{ mm}$

**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.

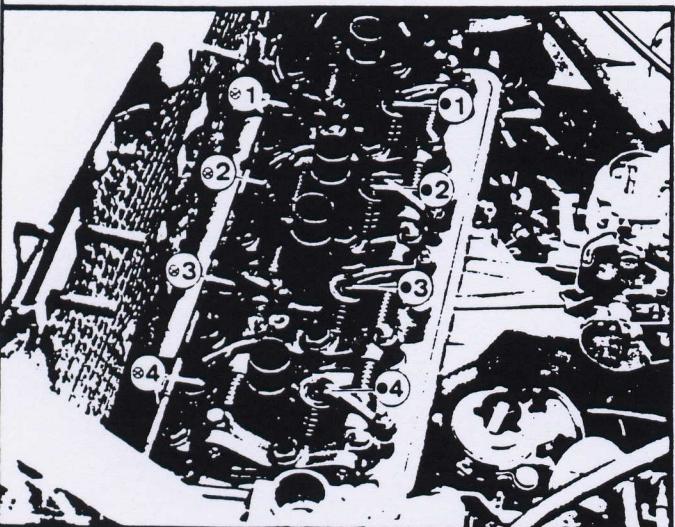
- Retighten the cylinder head.

- Adjust the valve clearances.

- Adjust the carburation if necessary.

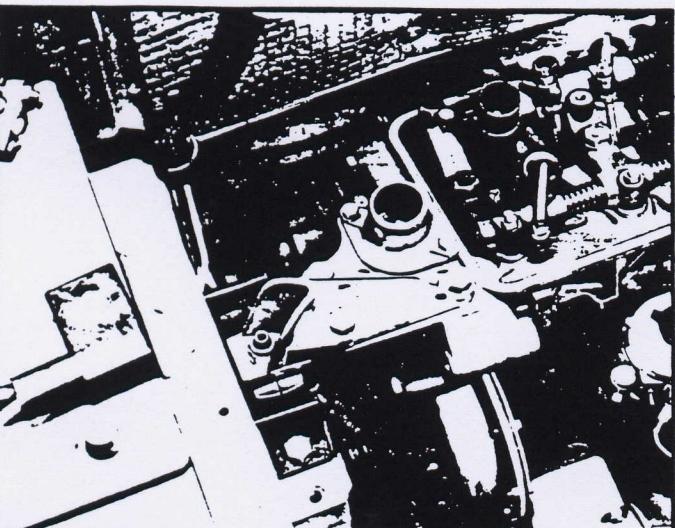
- Change the engine oil.

- Change the oil filter cartridge.



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VI

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.

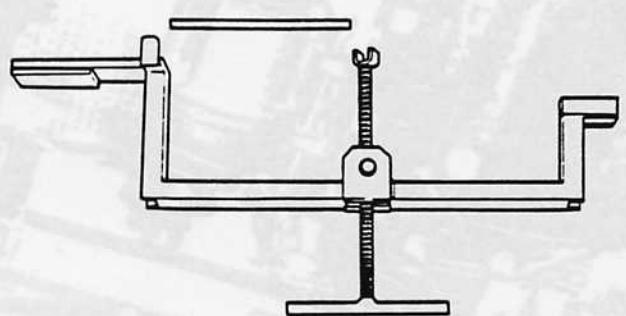
Lubricate the housing and the seal lips to assist fitting.

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

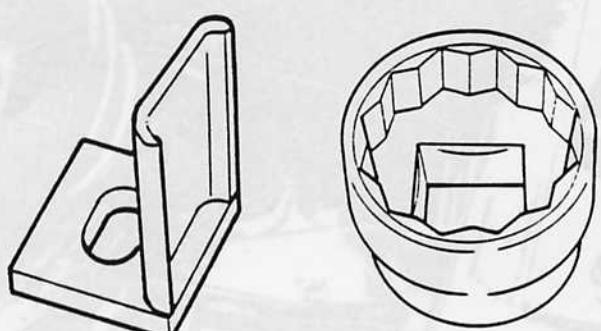
Withdraw the tool and check that the outer dust excluding lip is correctly positioned. If necessary, pull it out with a paper clip. Fig. VI.

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

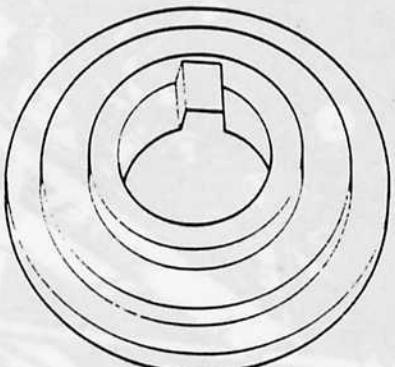
Refit the drive belts and the timing covers (see engine overhaul).



(A)



(B)



(C)

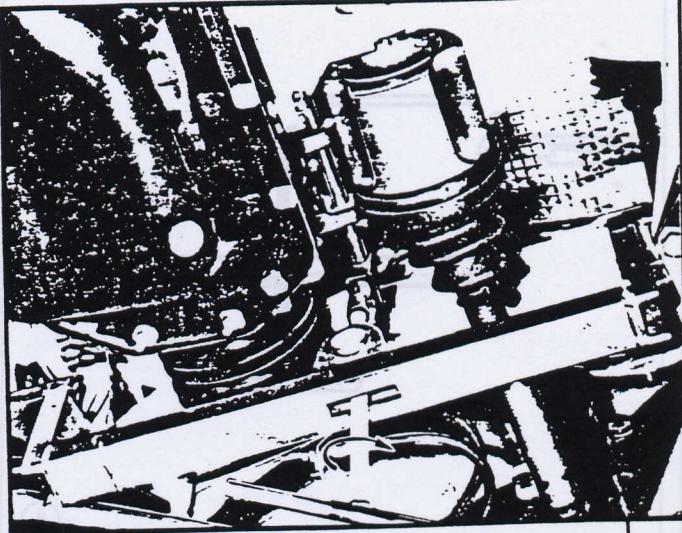
E4 004

1

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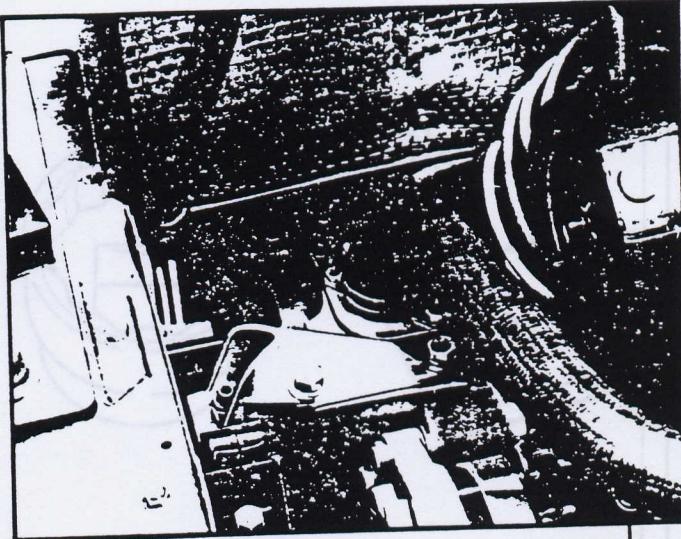
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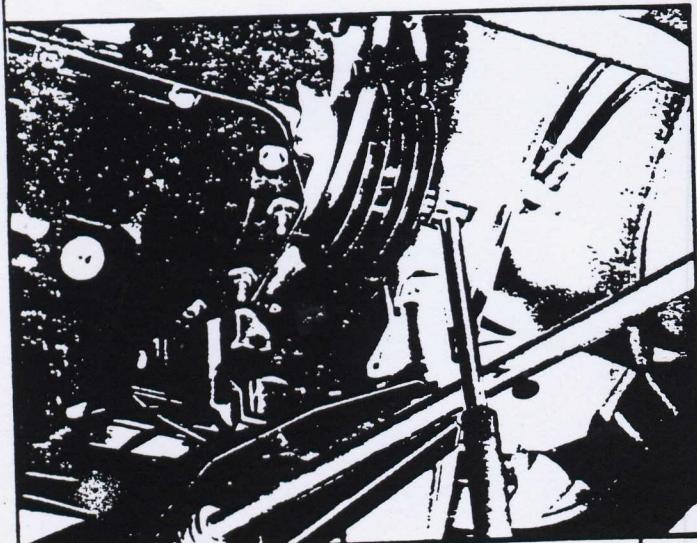
IV



II



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

**NOTE - To overhaul the timing gear :**

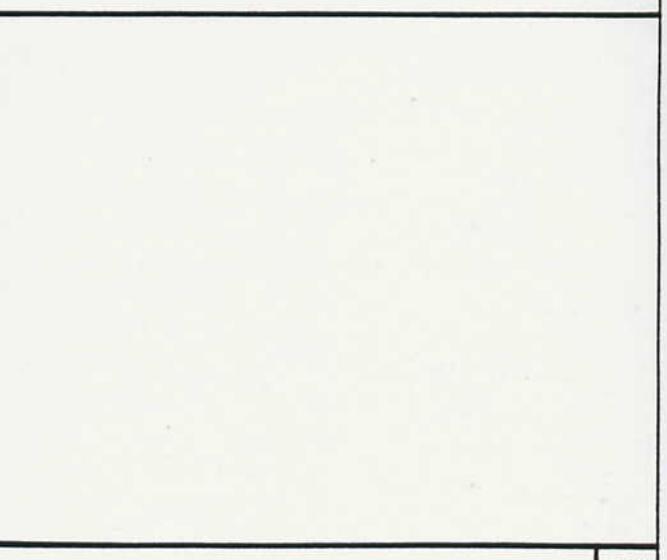
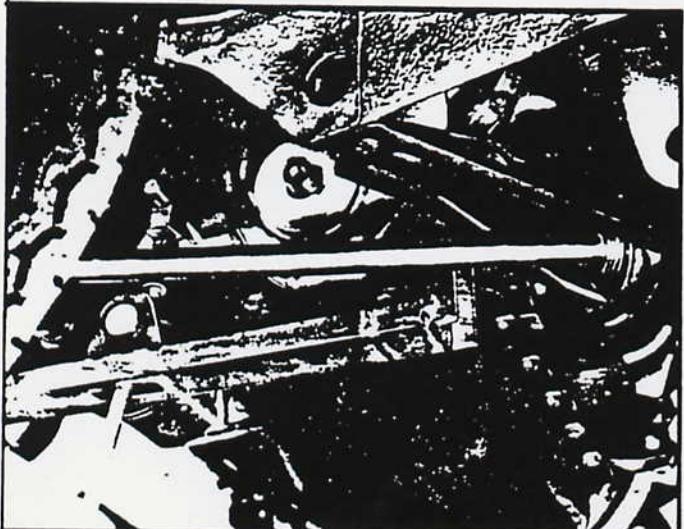
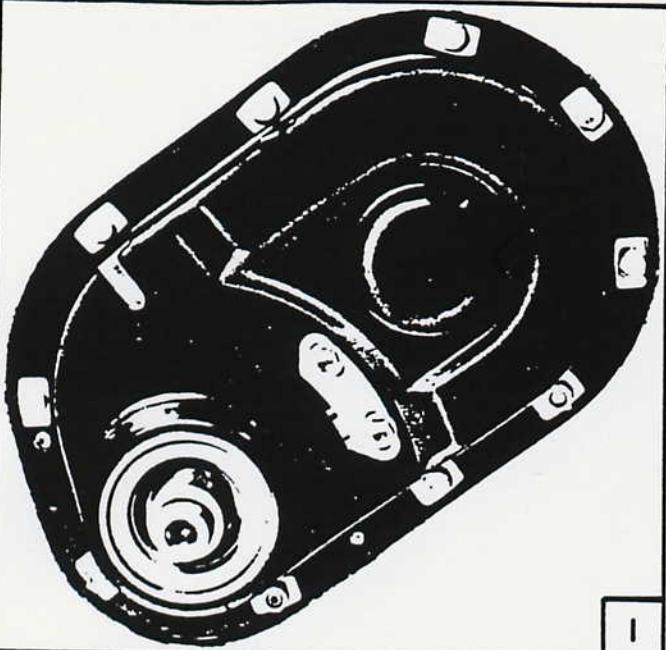
- Remove the sump.
- Remove flywheel retainer 8.0110 J.
- Consult the section entitled "Engine Overhaul".

**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.
- Refit the belts (see the section on removing them).
- Fit the seal, fig. III by screwing on the crankshaft nut as far as it will go without forcing 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)
- Refit :
  - the key,
  - the crankshaft pulley, passing the bolt behind it.



ENGINE  
CARBURETTOR  
IDENTIFICATION - DATA

1

F1.001

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**

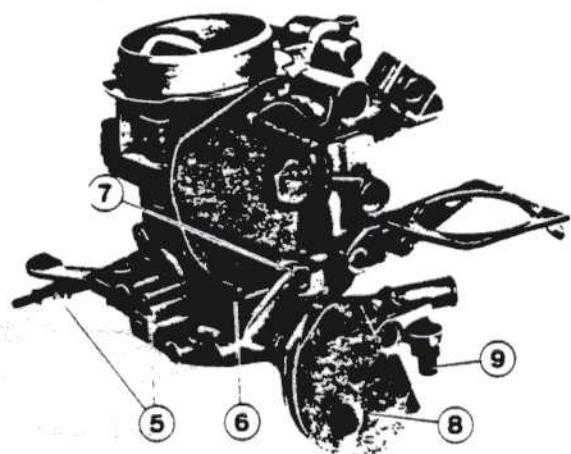
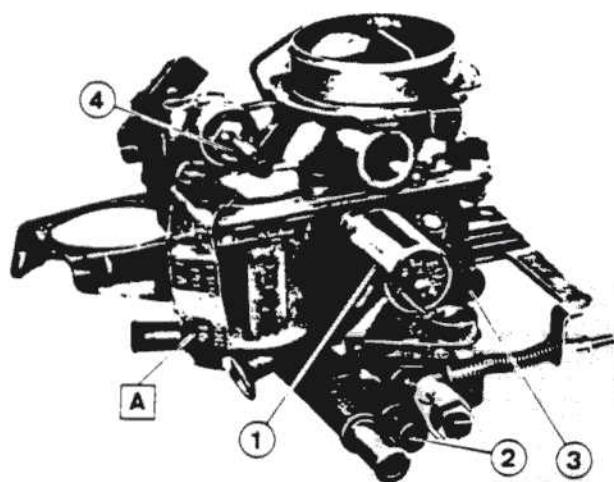
Single barrel downdraught carburettor with :

- 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)**

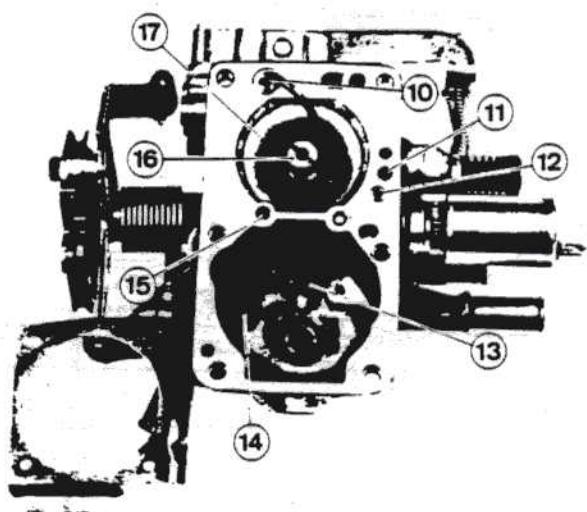
1 - Solenoid - idling fuel jet	g
2 - Mixture screw (W) with tamper-proof cap	W
3 - Constant CO screw (Va)	Va
4 - Fuel inlet (with filter screen)	
5 - Pump stroke adjustment	
6 - Adjusting screw, Positive Throttle Opening	
7 - Choke flap control	
8 - Throttle control	
9 - Throttle stop screw (for adjusting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



7-7-81-P14-R-A

II

7-7-81-P7-R-A



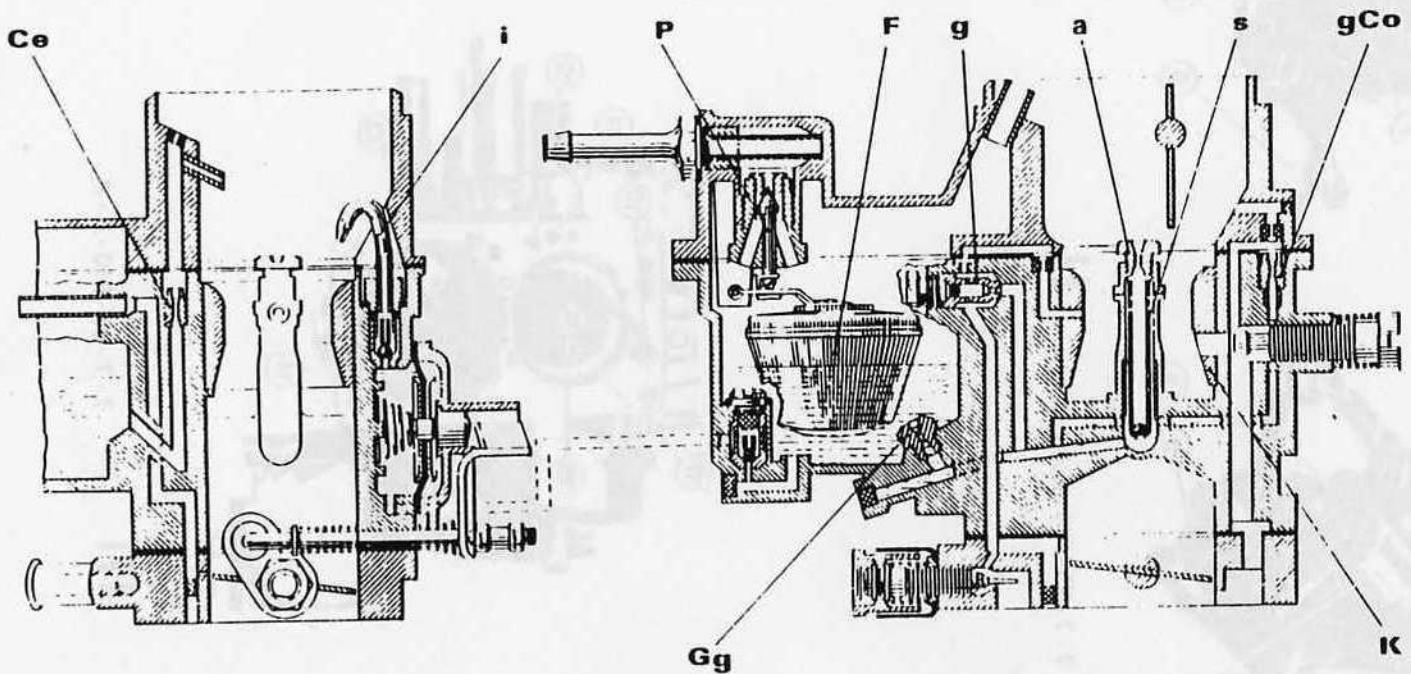
III

7-7-81-P10-R-A

5



F  
100



**DATA****Settings**

CARBURETTOR REFERENCE			PEU A 315	PSA 425
			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

CARBURETTOR REFERENCE			PEU A 315	PSA 425
			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

CARBURETTOR REFERENCE			PEU A 315	PSA 425
			XM7-T and XN1-T	XN1-TA
Idling speed - screw .....	Va	800 + 50 rpm	900 + 50 rpm	
CO% - screw .....	W	1 to 2 %	1.5 to 2 %	
CO <sub>2</sub> % .....		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

**ENGINE  
CARBURETTOR  
CHECKS - ADJUSTMENTS**

**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**

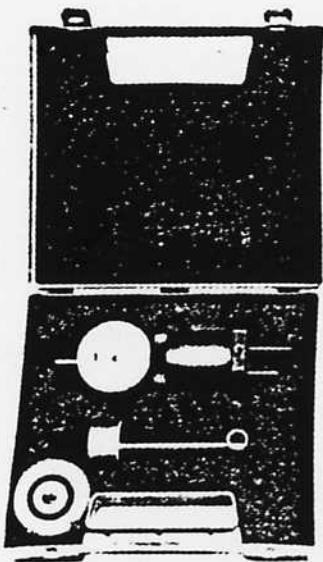
SYMPTOM	OPERATIONS				
	OVERHAUL CLEANING *	NORMAL IDLING POSITION (NIP)	POSITIVE THROTTLE OPENING (PTO)	ACCELE- RATOR PUMP STROKE	IDLING SPEED, MIXTURE (1)
Faulty carburation	X	X	X	X	X
Replacement carburettor			X		X
Faulty starting from cold; speed too high or too low			X		X (2)
Incorrect hot idling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

**Prior requirements**

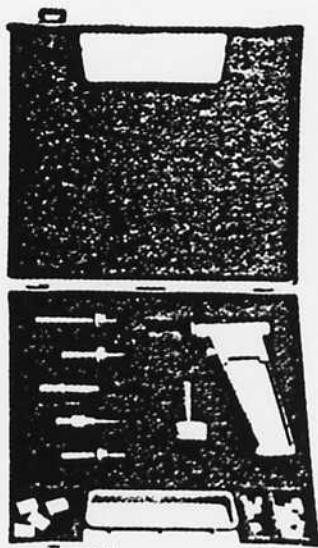
- (1) - Ignition in good condition and correctly adjusted.
- Engine warm, after electric fan has cut in.
- Choke control correctly adjusted and fully pushed in.
- Air filter in place and in good condition.
- Accelerator control system correctly adjusted.

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

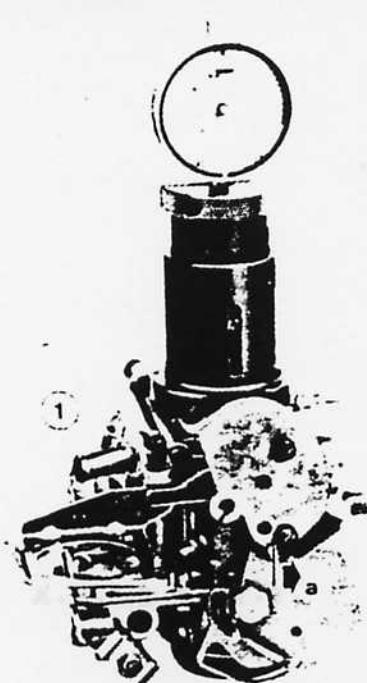
XM7-T - XN1-T	XN1-T
800 50 0 rpm	900 50 0 rpm

**A**

5 - 11 - 76 - C50 - R - A

**B**

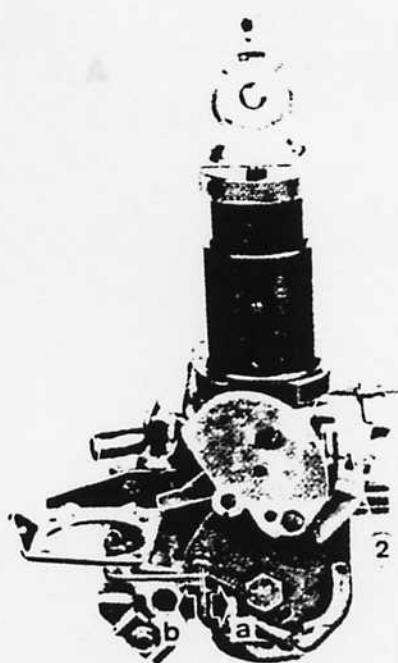
6383 R - A



7.7.81-P12-R-A

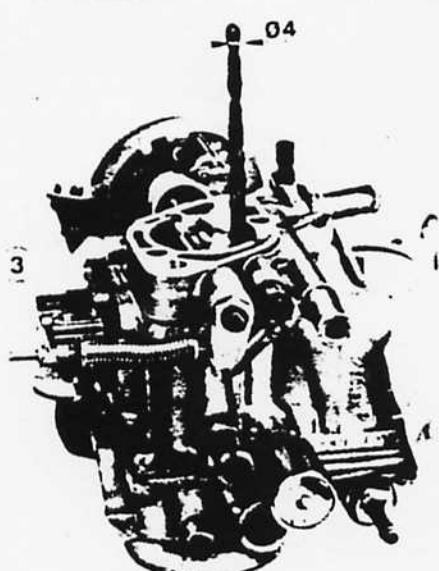


I



7.7.81-P11-R-A

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 
- 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 
- 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 
- The dial gauge needles must indicate : carb. ref. PEU A315 : 16° 15' ± 1°.
- 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
$800 + \frac{50}{0}$ rpm	$900 + \frac{50}{0}$ rpm

#### ADJUSTING THE MIXTURE USING AN EXHAUST GAS ANALYSER

1

Adjust the idling speed, at screw Va, to :

PEU A 315	PSA 425
$800 + \frac{50}{0}$ rpm	$900 + \frac{50}{0}$ rpm

2

The CO% must be :

PEU A 315	PSA 425
1 to 2 %	1,5 to 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
$800 + \frac{50}{0}$ rpm	$900 + \frac{50}{0}$ 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.

#### ADJUSTING THE MIXTURE WITHOUT AN EXHAUST GAS ANALYSER

1

Turn screw Va to obtain a speed of :

PEU A 315	PSA 425
$850 + \frac{50}{0}$ rpm	$950 + \frac{50}{0}$ 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 :

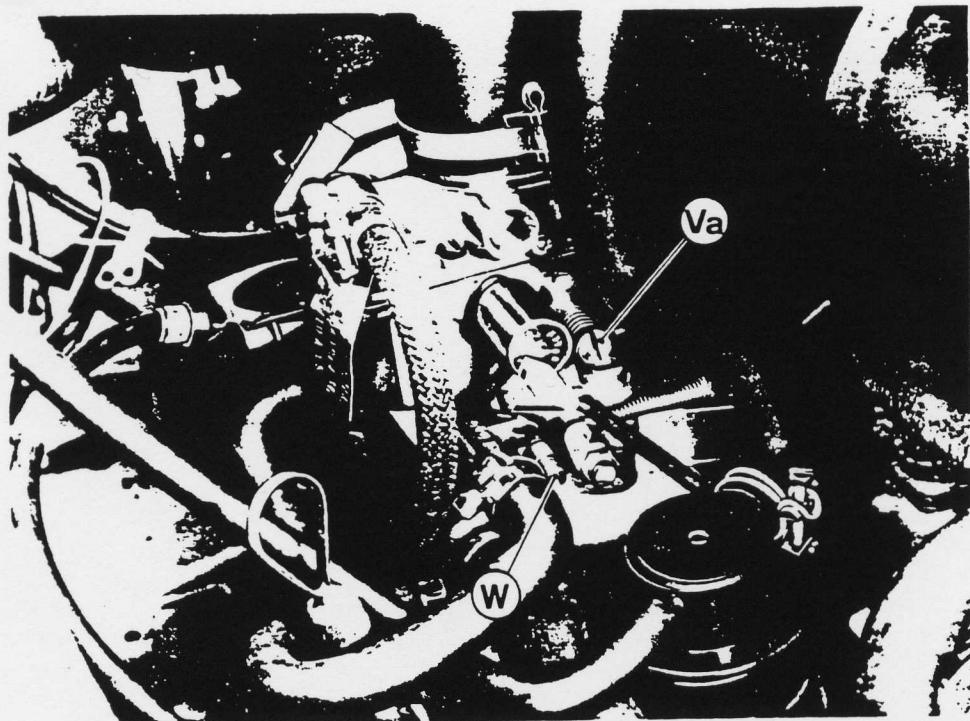
PEU A 315	PSA 425
800 rpm	950 rpm

4

Screw in screw W to obtain a speed of :

PEU A 315	PSA 425
800 rpm	900 rpm

Fit the tamperproof cap.



24 - 6 - 81 - P14 - R - A

F4.002

1

4 x 4

FUEL SYSTEM  
FUEL TANK  
REMOVING - REFITTING

J5

**IV**

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

**II**

Loosen the 2 bolts, at the rear, that secure the viscous coupling support frame, without removing them

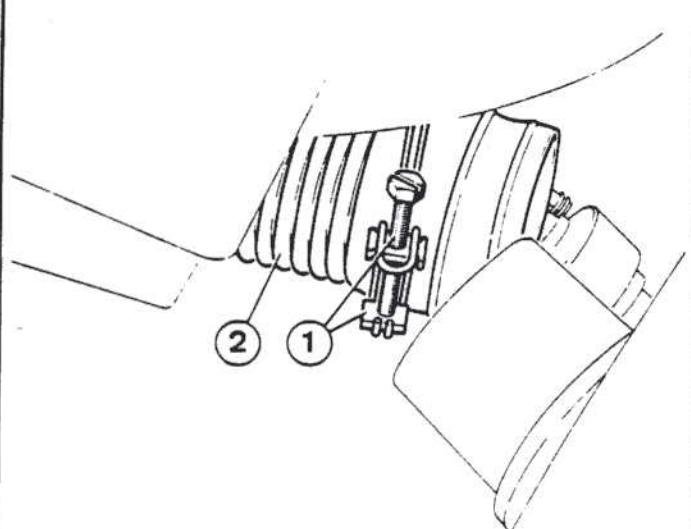
Remove the 2 bolts (3)

Lower the assembly formed by the viscous coupling and the propellor shafts

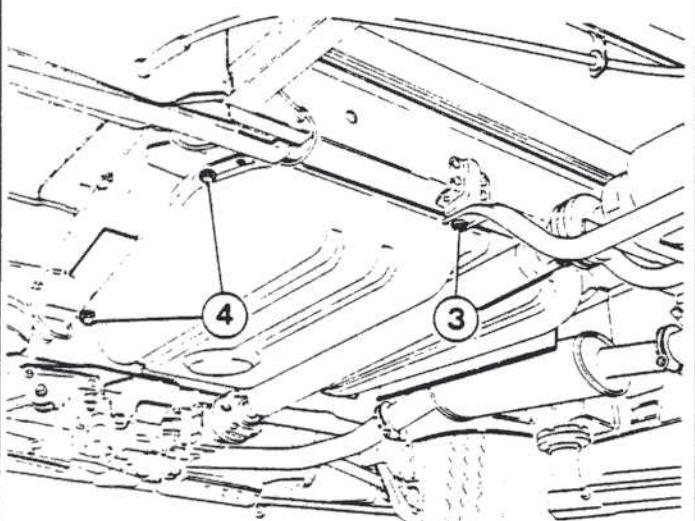
Remove the screws (4) that secure the tank in place.

**III**

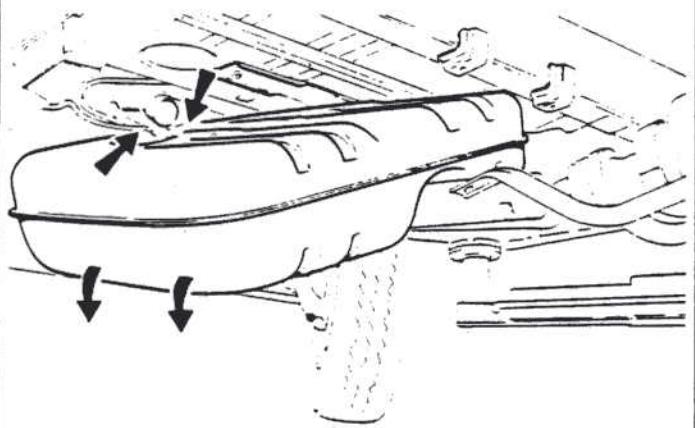
Tilt the tank assembly → towards the left of the vehicle taking care to disconnect the fuel gauge wires and the fuel input and output pipes →



09-11-88 CAR 5



09-11-88 CAR 7



09-11-88 CAR 6

## TOOLS REQUIRED

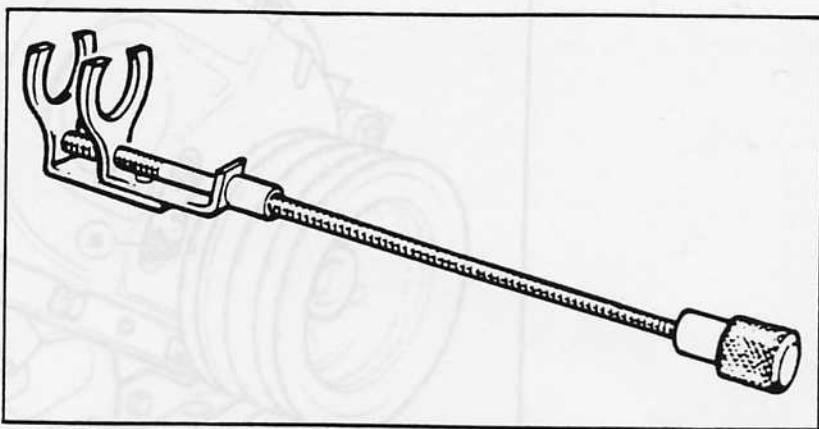
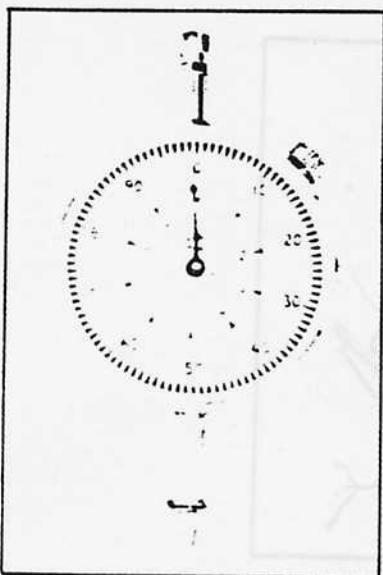
## SPECIAL TOOLS

- 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

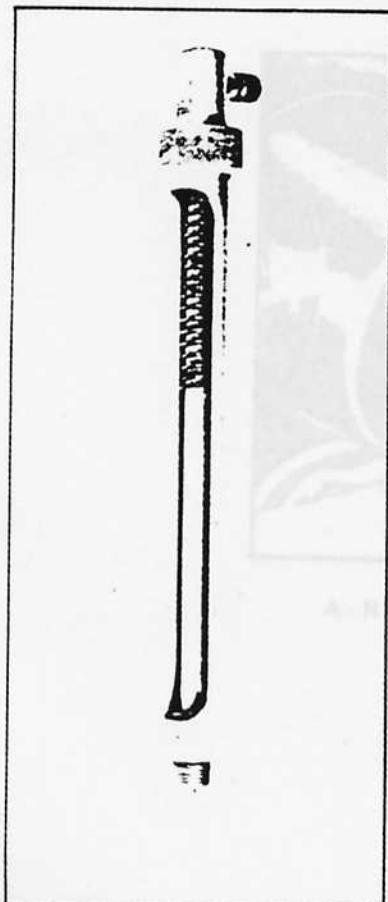
## RECOMMENDED TOOLS

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

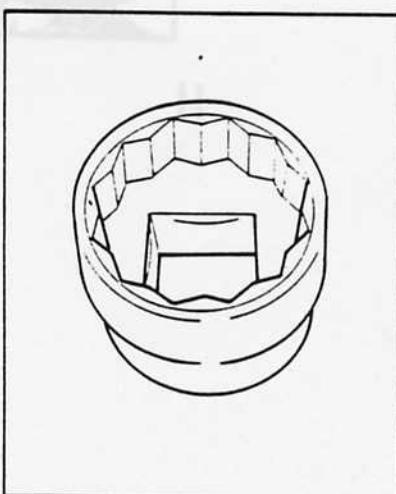


C

A



B

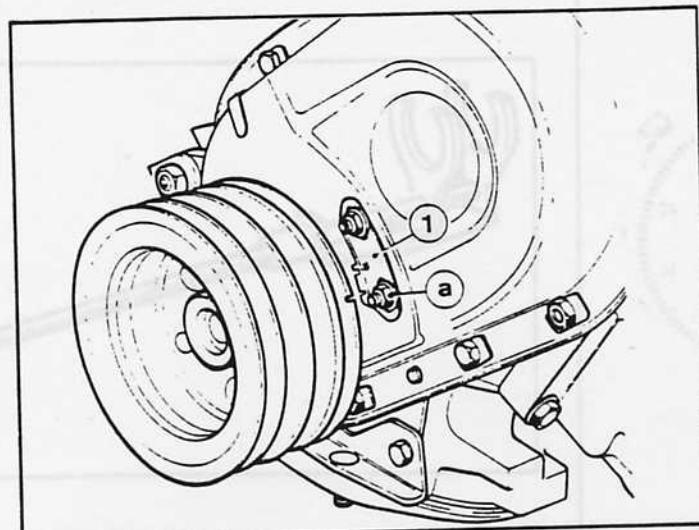


D

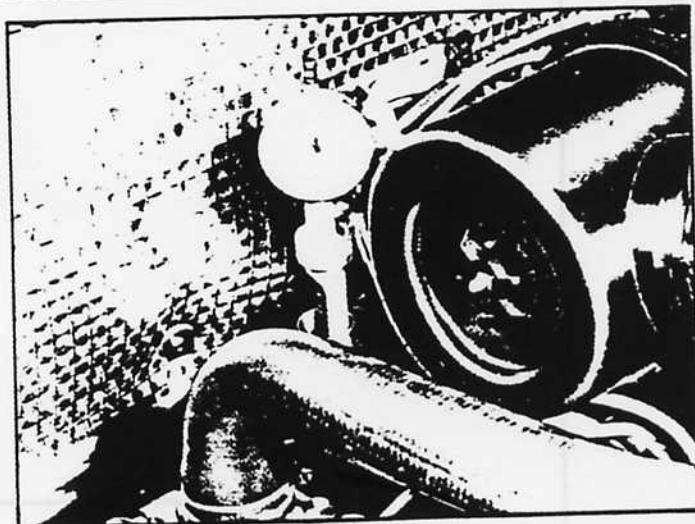
G 2004

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J5



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

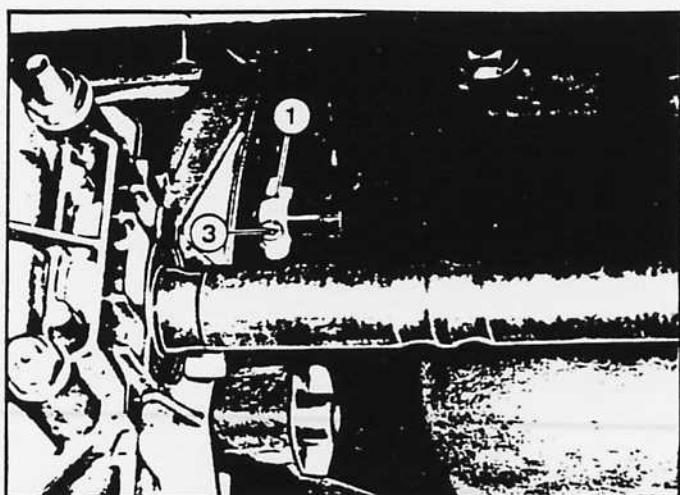
- Plastic mounting (1) in place.
- File or cut off the pins (2) Fig. II.
- Insert the sensor until it just touches the flywheel face, without using force.
- Tighten the bolt (3) to retain the sensor.

- Measure the distance X  
- Loosen the bolt (3) and withdraw the sensor so that :  
 $X - 1,7 \text{ mm.}$

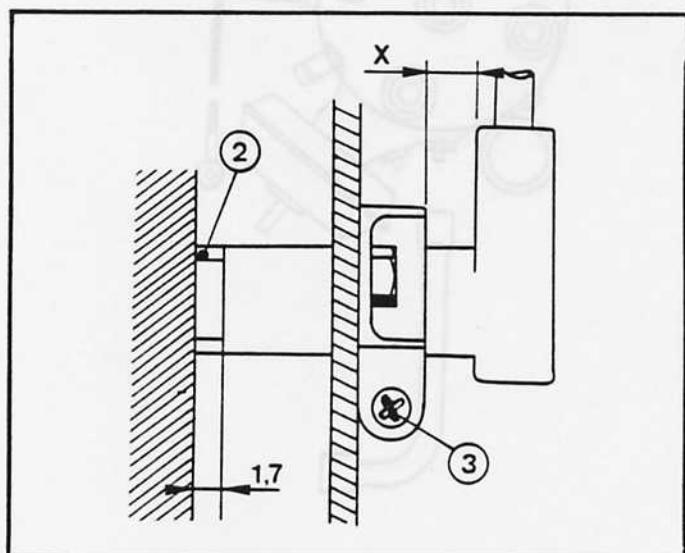
- Retighten the bolt (3).

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 tinitial ignition timing
  - the centrifugal and vacuum advance curves
  - the engine rpm.
- } contact breaker ignition



5 - 5 - 81 - P2 - R - A

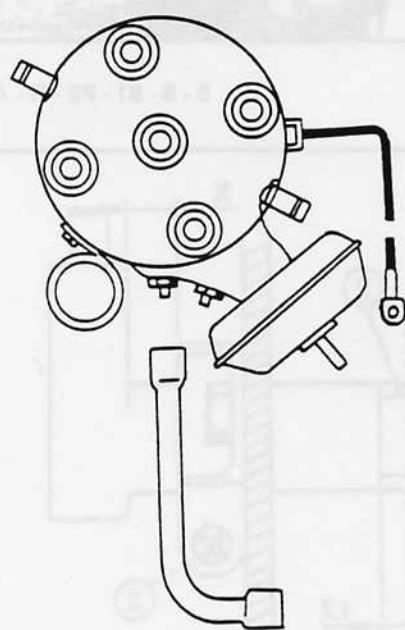


26 - 5 - 82 - 1A

G 2008

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A1 - 08 - 8 - 82

26 - 5 - 82 - 2A

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

— Engine at idling speed (800 rpm).

— Adjust the dwell angle to :

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

This adjustment is carried out externally on the distributor using :

Fig. I 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.

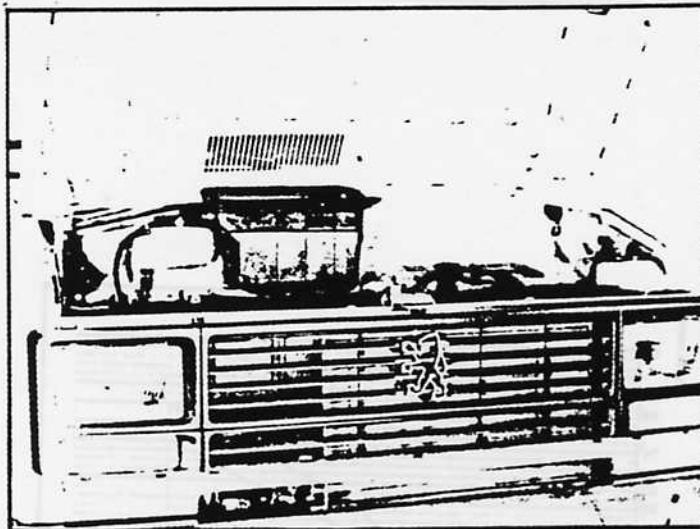
The crankshaft pulley has 2 grooves diametrically opposite, corresponding to the cylinders 1-4 and 2-3, so that the initial timing can be done on the four cylinders.

## Proceed as follows :

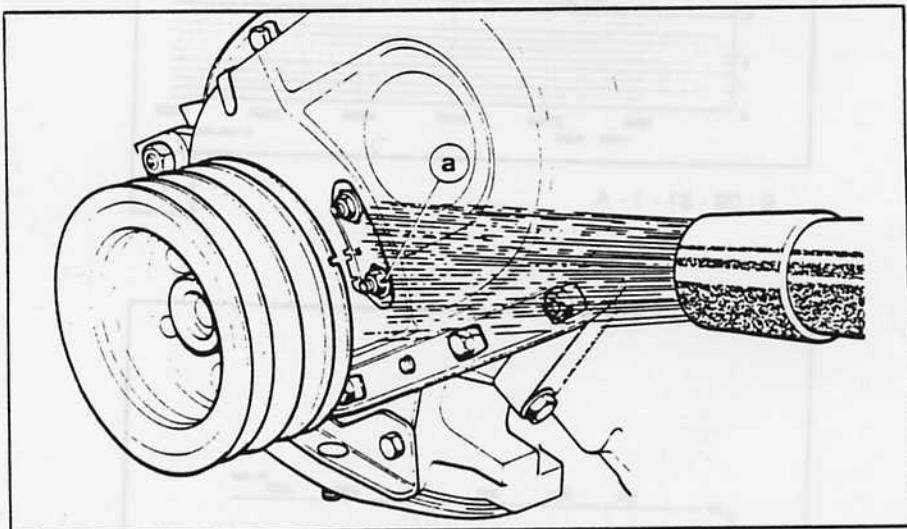
- Connect the stroboscopic timing lamp to the H.T. cable on the ignition coil.
- Set the advance control on the timing lamp to 0.
- Run the engine at a speed not exceeding 800 rpm.
- Illuminate the crankshaft pulley by aiming the lamp through the opening above the front bumper Fig. I.
- 2 situations 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  $10^\circ$  mark on the timing plate.
  - Fig. III - the 2 pulley grooves are separated by a certain distance ( $\alpha^0$ ) (the cam profiles are not in good condition)  
→ adjust the mean centre of this ignition "zone" ( $\alpha'$ ) with the  $10^\circ$  mark on the timing plate.
- Reconnect the vacuum unit at the carburettor.
- Adjust the idling speed.

IMPORTANT - The ignition zone ( $\alpha^0$ ) must not exceed  $4^030'$ . If it does, replace the distributor.

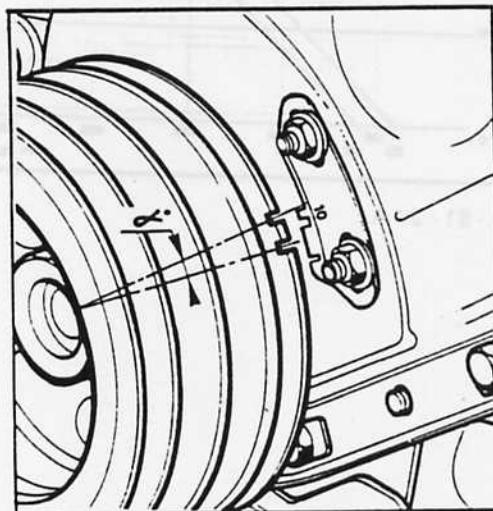
NOTE - With the appropriate equipment the ignition timing can be checked by using the diagnostic socket.



14 - 4 - 81 - P27 - R - A



7 - 7 - 81 - P9 - L - B



7 - 7 - 81 - P9 - L - C

### 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 a 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**

- Pitch of radiator fins .....
- Dimensions of radiator .....
- Radiator surface area .....

**Type** .....

XM7-T - XN1-T	XN1-TA
VALEO	IPRA
1.15 mm	1.7 mm
414 x 663 mm	
27.5 dm <sup>2</sup>	
Horizontal, with input and output on the same side - PO (heavy duty)	

- Filler cap pressure setting ..... 0.9 bar

**Thermostat**

- Make .....
- Reference or colour code .....
- Starts to open at .....
- Fully open at .....
- Lift .....

VERNET	DAUPHINOISE
V28 Ref. V6697	THOMSON
Tawny beige	
95°C	
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 ( $\varnothing$  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 :**

- Electric fan cuts in : temperature increasing  
 Electric fan cuts out : temperature falling

1 electric fan  
 92° ± 2°C  
 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

## RECOMMENDED TOOLS

- Tachometer.

Fig. A : 8.1503

Pressure and vacuum checking kit comprising :

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

## 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. I, 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 :  $2.7 \pm 0.8$  bars
- at 2 000 rpm :  $3.3 \pm 0.7$  bars
- at 4 000 rpm :  $3.8 \pm 0.7$  bars.

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