

Engine

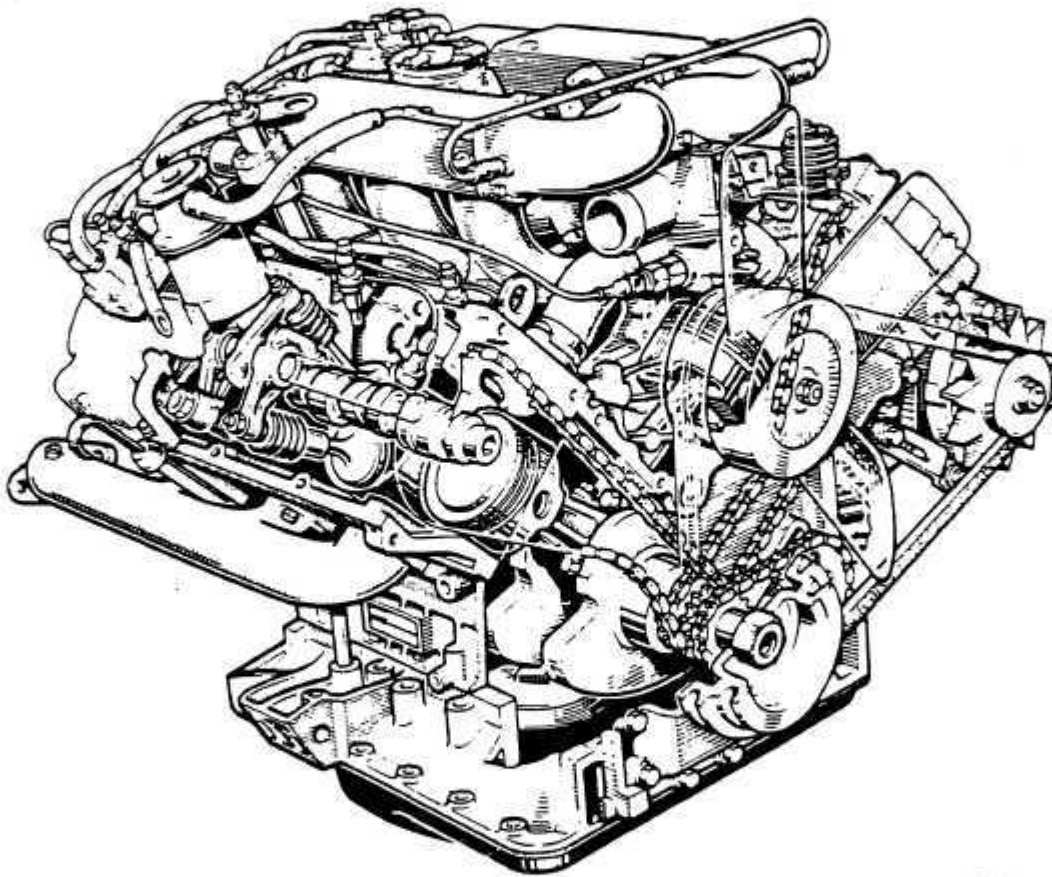
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Engine

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Specifications



Number of Cylinders
Bore
Stroke
Engine Capacity
Compression Ratio

V6
91 mm (3.58 in)
73 mm (2.87 in)
2849 cc (173.86 cu in)
8.8:1

Fig. 1

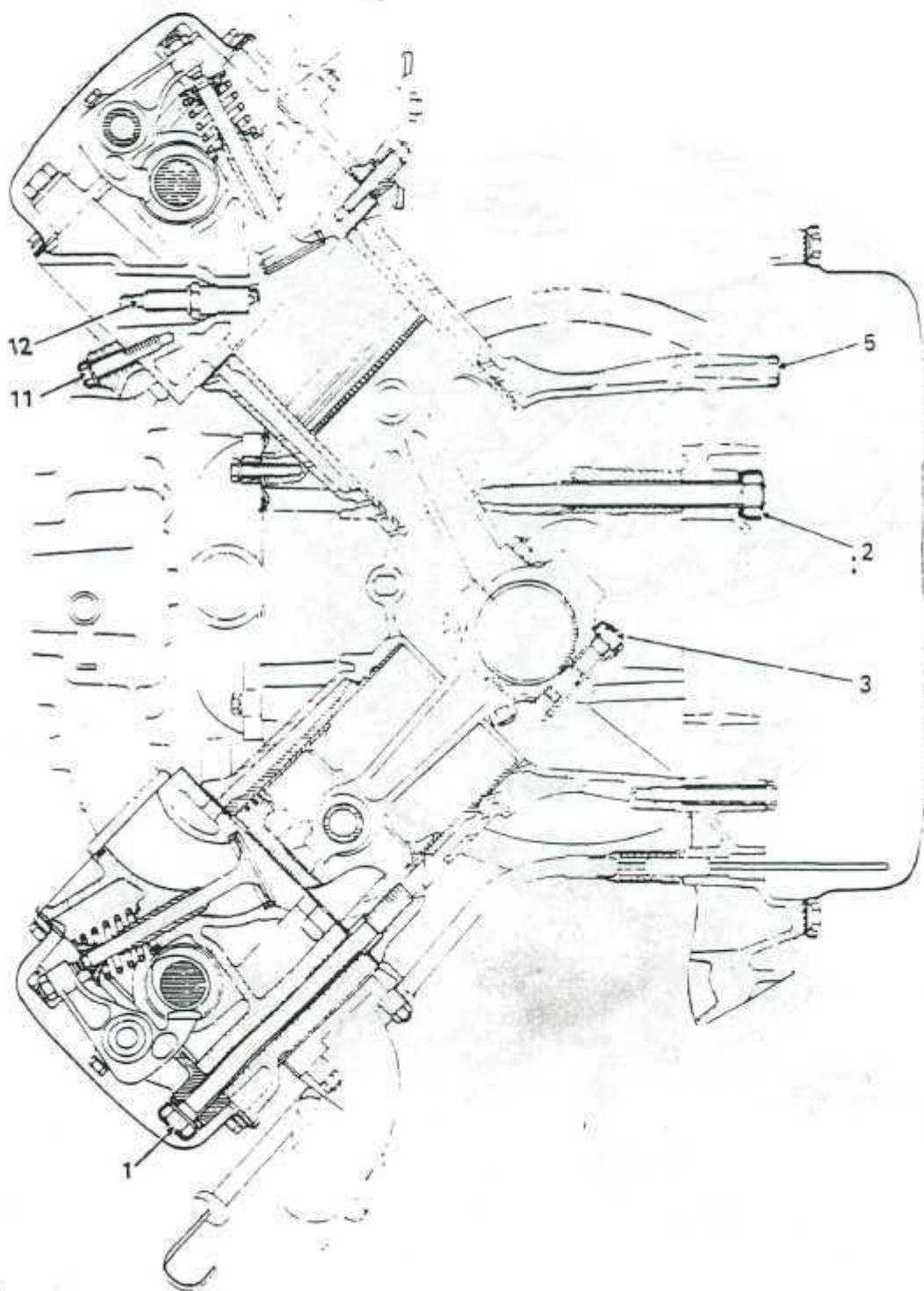


Fig. 2

TIGHTENING TORQUES—Figs. 3 and 4**NEW CYLINDER HEAD GASKET**

Torque tighten to 45 lb·ft (60 Nm) slacken off, pre-tighten to 15 lb·ft (20 Nm) and then angular tighten 115°—(No. 1).

RETIGHTENING CYLINDER HEAD

Slacken off, pre-tighten to 15 lb·ft (20 Nm) then angular tighten 115°—(No. 1).

TIGHTENING MAIN BEARING CAP NUTS

Pre-tighten to 20 lb·ft (28 Nm) then angular tighten 75°—(No. 2).

No. 3	Big End Cap Nuts	35 lb·ft (48 Nm)	
No. 4	Flywheel Fixing Bolts	45 lb·ft (60 Nm)	With Loctite
No. 4	Converter Driving Plate Fixing Bolts	50 lb·ft (68 Nm)	With Loctite
No. 5	Sump Fixing Bolts	11 lb·ft (16 Nm)	
No. 6	Crankshaft Pulley Fixing Nut	135 lb·ft (183 Nm)	With Loctite
	Oil Pump Sprocket Bolts	4 lb·ft (6 Nm)	
No. 7	Chain Tensioner Blade Bolts	11 lb·ft (15 Nm)	
No. 8	Timing Cover Fixing Bolts	11 lb·ft (15 Nm)	Bottom Bolts with Loctite
No. 9	Camshaft Sprocket Fixing Bolts	60 lb·ft (81 Nm)	
	Camshaft Stop Fixing Bolt	11 lb·ft (15 Nm)	
No. 10	Camshaft Sprocket Access Plug	22 lb·ft (30 Nm)	
No. 11	Inlet Manifold Fixing Bolts	11 lb·ft (15 Nm)	
No. 12	Spark Plug	15 lb·ft (20 Nm)	

CYLINDER HEADS

Rocker arm clearance adjustment

When cold (mm)

inlet 0.10 (.004")

exhaust 0.25 (.010")

Maximum bow of gasket face (mm) 0.05 (.002")

No resurfacing permitted.

Cylinder head height (mm)—

111.07 + 0.15 (4.373" + .006)

VALVE SEATS

Seat angle

inlet 30° + 0.25

exhaust 30° + 0.25

SEAT WIDTH (mm)

inlet 1.7—2.1 mm (0.067—0.0827 in)

exhaust 2.0—2.4 mm (0.0788—0.0945 in)

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Engine

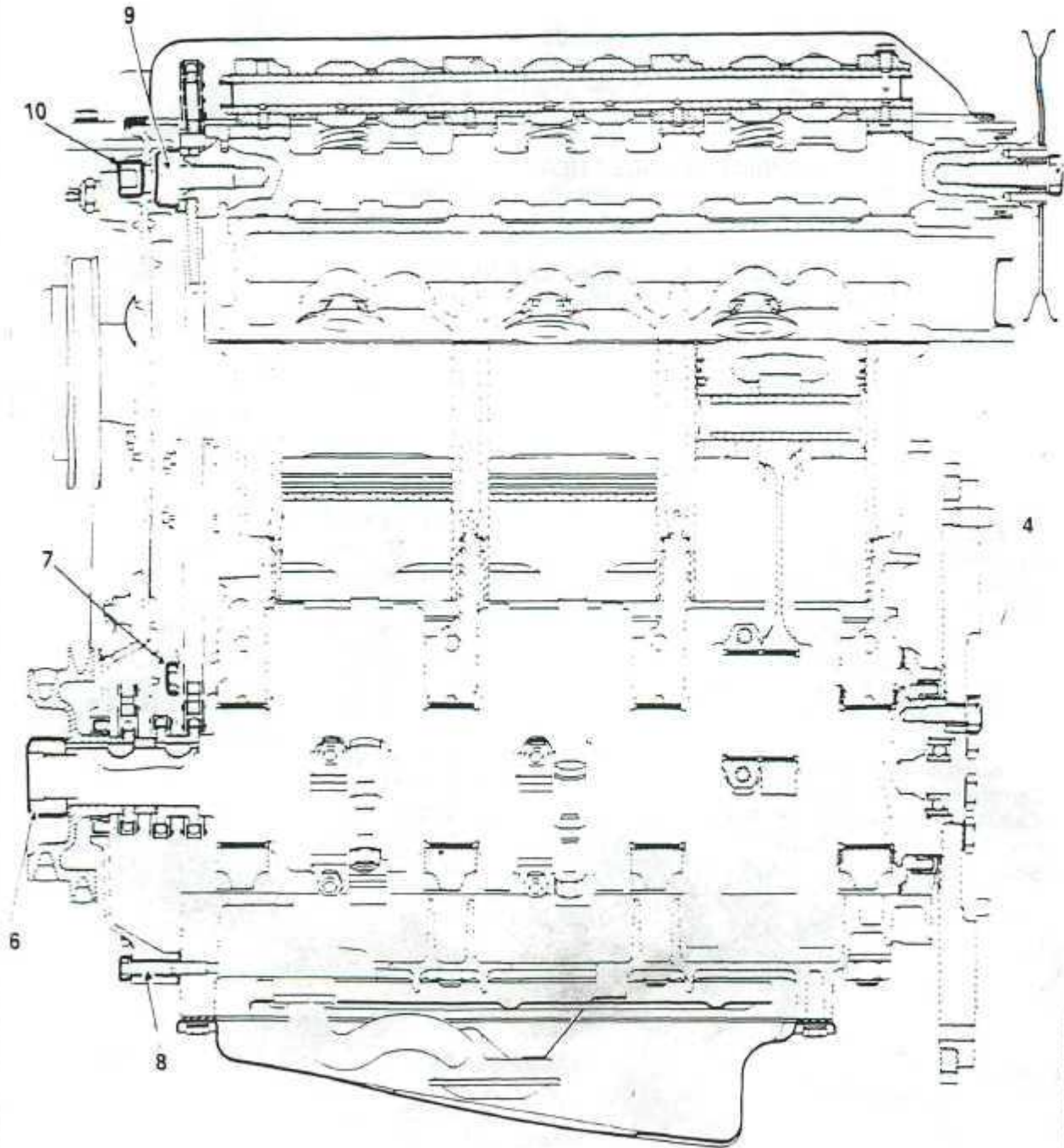


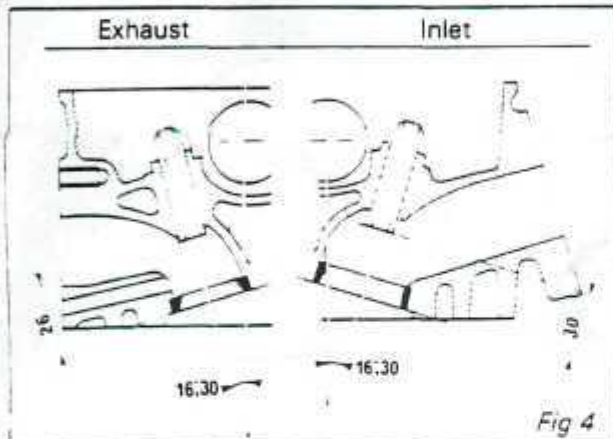
Fig. 3

DMC

VALVE GUIDES

Bore (mm) 8—8,022 (0.3150—0.3158 in)
 External dia (mm)
 nominal 13 mm (.512 in)
 repair size
 1st oversize 13.1 (.516 in)
 2nd oversize 13.25 (.522 in)

Valve guide positions



VALVES

Stem dia (mm)
 Angle (included)
 inlet 8 mm (0.315")
 exhaust 8 mm (0.315")

VALVE SPRINGS

Inlet and Exhaust Valve Springs are identical.
 Approx. free length (mm) 47.2 (1.858")
 Length (mm) under load of
 56.3 lbs 40 (1.268")
 124 lbs 32.2 (1.268")
 Length Coil Touching 30 (1.181")
 Coil (mm)
 Wire Diameter (mm) 4.2 (1.153")
 Coil Internal Dia (mm) 21.4 (.842")

CAMSHAFT

Number of Bearings 4
 End Play (mm) 0.07 to 0.14
 (.003" to .0055")

VALVE TIMING

With tappets adjusted to a clearance of 0.7 mm (.028")

		LH	RH
Inlet Valve Opens	BTDC	9°	7°
Inlet Valve Closes	ABDC	45°	43°
Exhaust Valve Opens	BBDC	45°	43°
Exhaust Valve Closes	ATDC	9°	7°

CONNECTING RODS

Bearing Shell Material: Aluminium-Tin
 Side Clearance (mm) 0.20 to 0.38
 (.008 to .015")

CRANKSHAFT

Number of Bearings 4
 Main Bearing Shell Material: Aluminium-Tin
 End Play (mm) 0.07 to 0.27
 (.003 to .010")
 Thrust Washer Thickness (mm)
 —2.30 —2.40 —2.45 —2.50
 (— .0905 — .0944 — .0964 — .0984")
 Roll-Hardened Main Bearing Journals:
 nominal diameter (mm) 70.062 (2.7583")
 regrind diameter (mm) 69.762 (2.7465")
 regrinding tolerance (mm) 0—0.019
 (— .0007")

LINERS

Bore (mm) 91 mm (3.58 in)
 Base Locating Diameter 93.48 (3.6803 in)
 Liner Protrusion (mm) 0.16 to 0.23
 (.006 to .009")
 Liner Base Seal Thickness (mm)
 Blue Tag 0.087
 White Tag 0.102
 Red Tag 0.122
 Yellow Tag 0.147

PISTONS

Gudgeon Pin Fitting: Press—fit in small end and free turning in piston.

FITTING DIRECTION:

Arrow Facing Timing Gear End.
 Gudgeon Pin Length (mm) 72 (2.8346")
 Gudgeon Pin Dia (mm)
 External 23.5 (.9252")
 Bore 15 (.5906")

3 Piston Rings, Thickness (mm)

1 Top Ring 1.5 (.059")
 1 Taper Compression Ring 2 (.079")
 1 Oil Scraper 4 (.158")
 Gap Measurement: Supplied
 Pre-adjusted.

C:02:06

Engine

After regrounding, the roll-hardened zone should remain intact over the 140° sector.

The zones concerned are those marked "A" and "B".

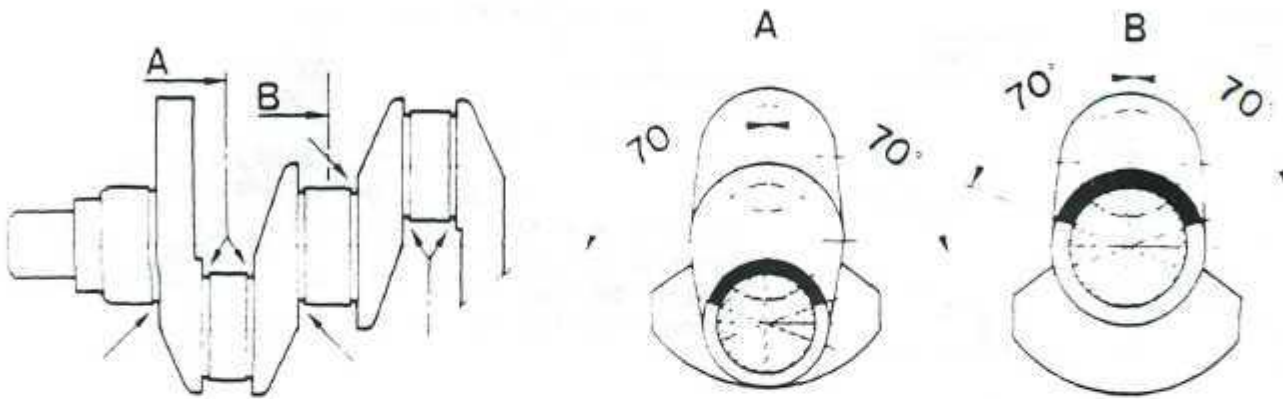


Fig. 5

OIL PUMP

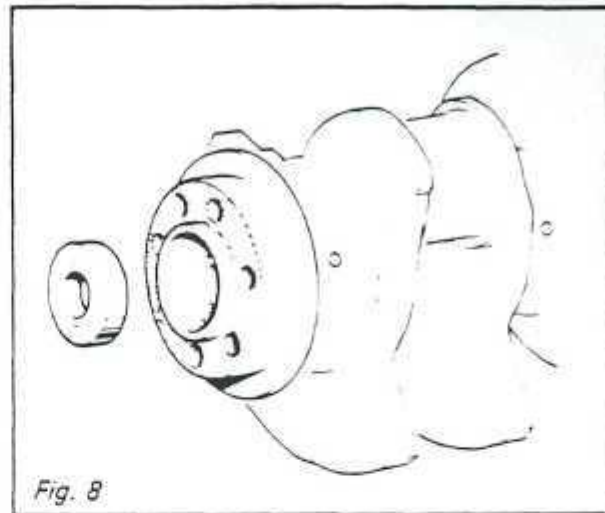
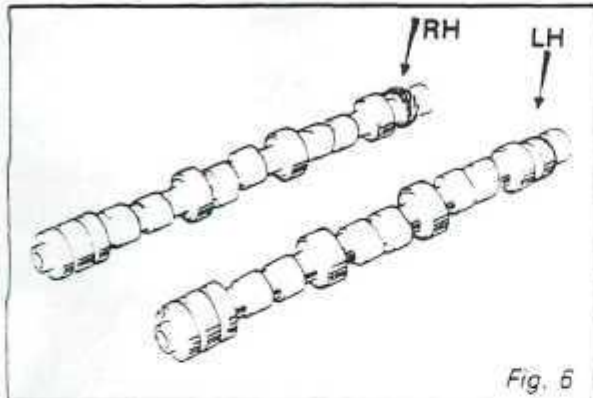
Minimum oil pressure at 80°C

at 900 rpm (bar) 2,2 (32 psi)

at 4000 rpm (bar) 4,4 (64 psi)

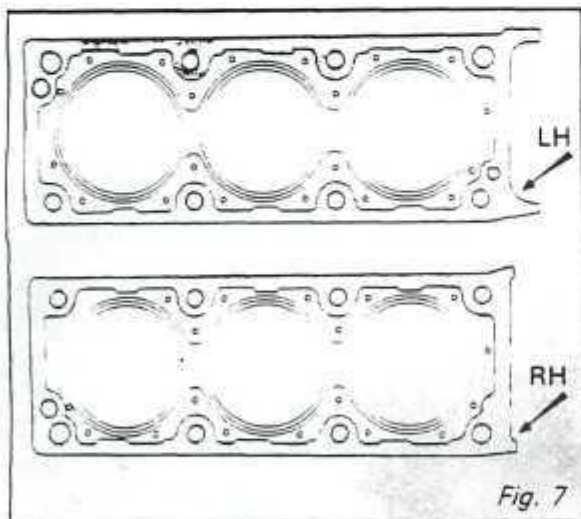
CAMSHAFT

The camshafts differ: The R.H. camshaft has the distributor drive. (Fig. 6)



CYLINDER HEAD GASKETS

The cylinder head gaskets differ: the L.H. head gasket has a large cut-out at one end. (Fig. 7)



Components which must be changed at each dismantling.

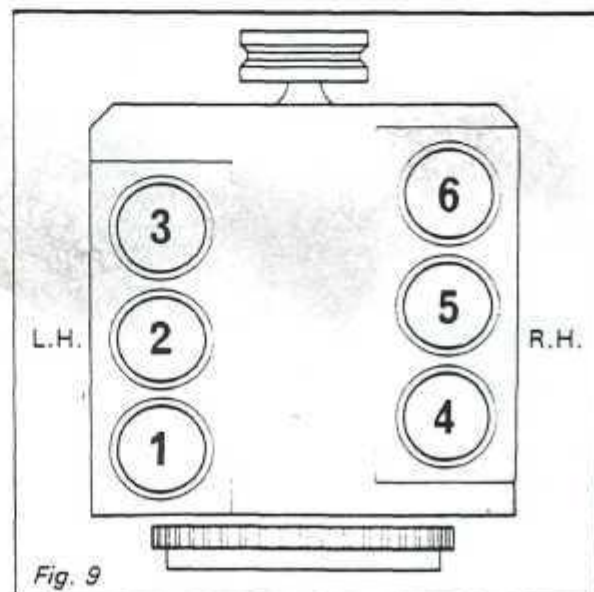
Flywheel fixing bolts.

Converter driving plate fixing bolts.

Big-end cap nuts.

CYLINDER NUMBERING IN EACH BANK

The bank comprising cylinders 1, 2, and 3 is designated the L.H. bank or group and that for cylinders 4, 5, and 6 the R.H. bank or group. (Fig. 9)



CRANKSHAFT

The service crankshaft is not fitted with the clutch shaft spigot bearing. The spigot bearing must be inserted if the engine is mated to a manual gearbox. It is bonded in; smear the outside of the bearing with loctite. (Fig. 8)

Engine

C:03:01

Special Tools

Part No.	Description	Fig. No.
J.23907	PILOT BEARING PULLER	Not Illustrated
J.28847	DRAIN PLUG WRENCH	Not Illustrated
J.28851	ENGINE SUPPORT	Not Illustrated
J.28852	CYLINDER LINER CLAMPS (4)	Fig. 88
J.28853	MAIN BEARING RETAINING BLOCKS	Fig. 91
J.28854	PISTON PIN SERVICE SET	Fig. 71
J.28855	CYLINDER LEAD BREAKER BAR	Fig. 40
J.28856	CYLINDER LINER DEPTH GAUGE	Fig. 66
J.28857	ANGULAR TORQUE GAUGE	Fig. 38
J.28858	TIMING SPROCKET SUPPORT TOOL	Fig. 45
J.28859	FLYWHEEL LOCK	Not Illustrated
J.28860	REAR CRANKSHAFT PULLEY SEAL INSTALLER	Fig. 115
J.28861	FRONT CRANKSHAFT SEAL INSTALLER	Fig. 120
J.28872	OIL GAUGE	Fig. 129
J.28873	PIPE AND ADAPTOR FOR OIL GAUGE	Fig. 128

Engine/Gearbox

REMOVING

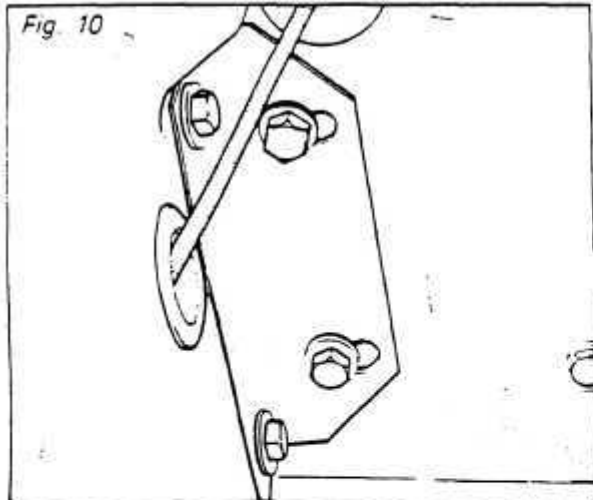
Disconnect battery.

Remove
rear louvre
engine compartment cover
air conditioning compressor drive belt
air conditioning compressor and set aside
air filter
ignition coil cover

Disconnect
rear light harness
coil lead
engine harnesses from their multi sockets

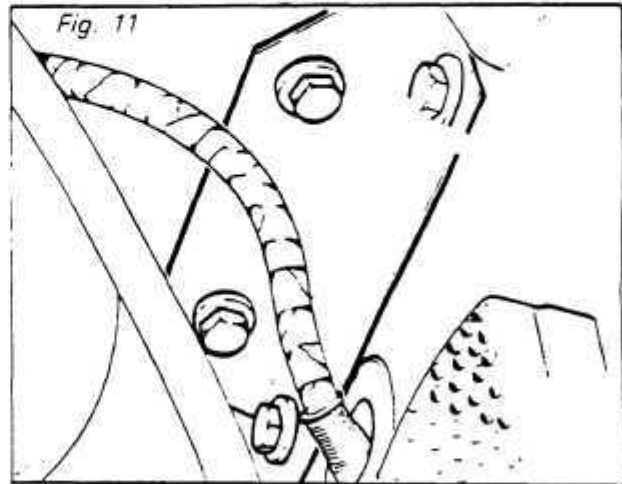
Remove
rear side markers and disconnect wiring harnesses

Remove
engine compartment lock and disconnect release
cable

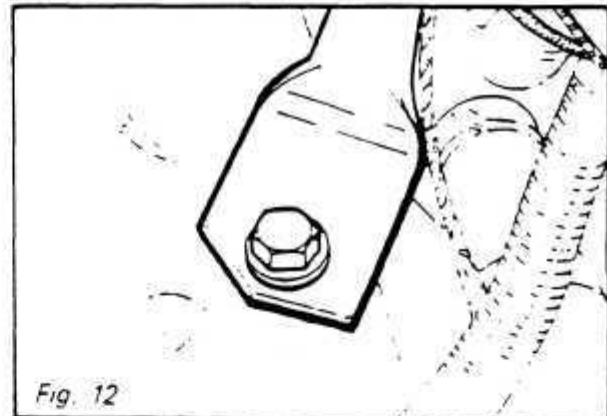


Remove
rear fascia attachment bolts and remove fascia
(Figs. 10/11)

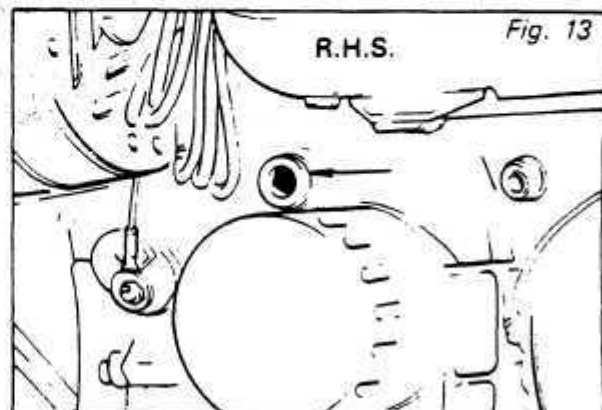
Remove
exhaust muffler and heat shields
(See Section "D")



Remove
chassis cross brace (Fig. 12)



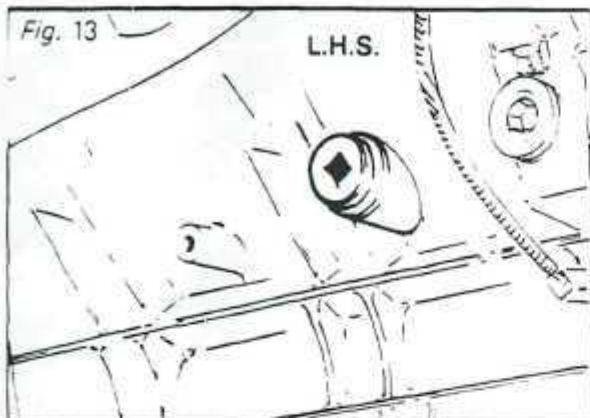
Drain
coolant from cylinder block (Fig 13)
engine oil and transmission oil, fluid if applicable



C:04:02

Engine

Fig. 13



Disconnect
heater hoses from control valve and cylinder head
heater bleed pipe from header tank
brake servo vacuum pipe
fuel feed to metering head

fuel return at bundy metal pipe connection
accelerator cable
starter positive cables (Fig. 14)
wiring harness at bulkhead (auto transmission only)

Fig. 14

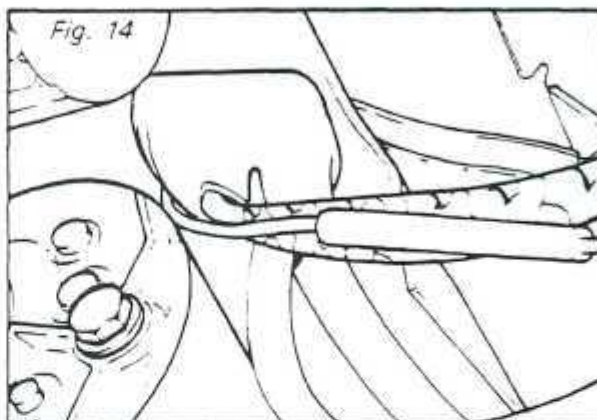
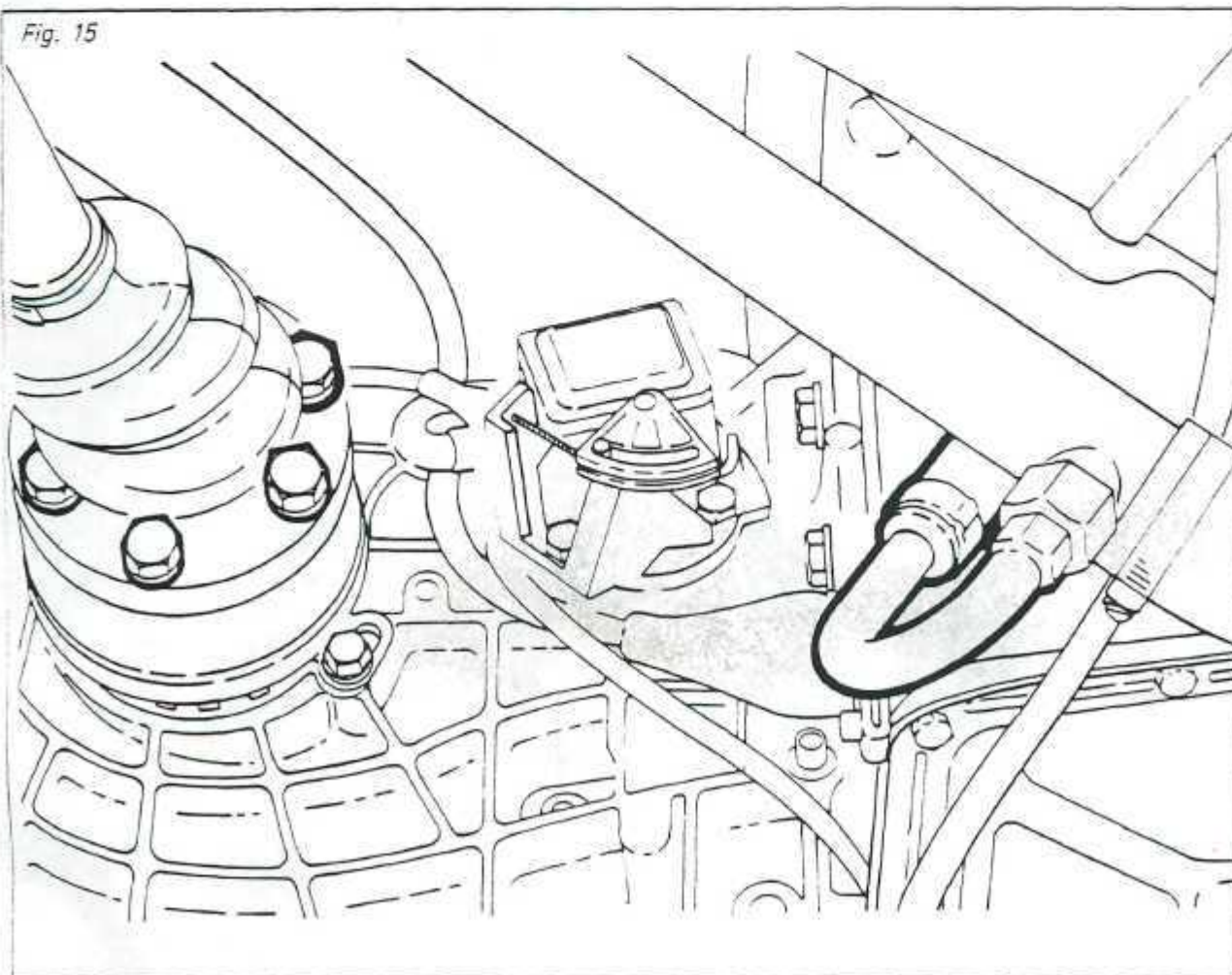


Fig. 15



Remove
coolant hoses at engine

Remove
driveshaft retaining bolts
exhaust cross-over pipe (Fig. 15)

For automatic transmission disconnect oil cooler
hoses at cooler end.

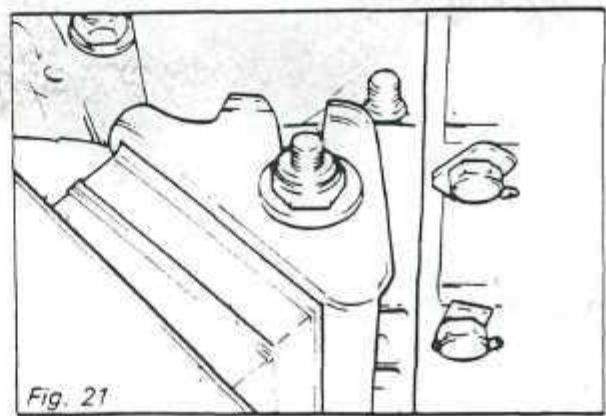
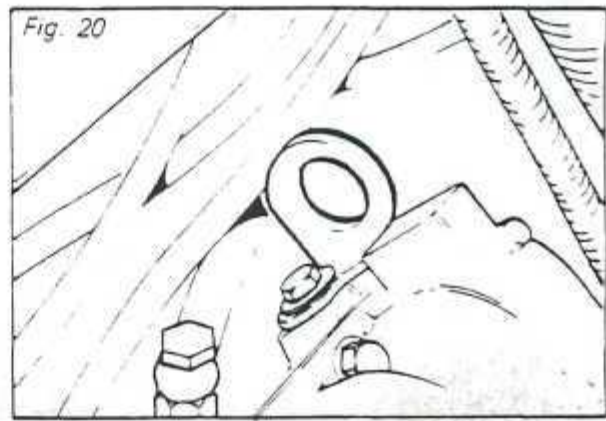
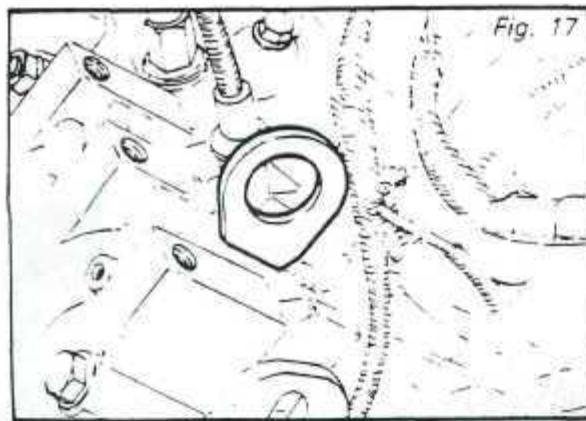
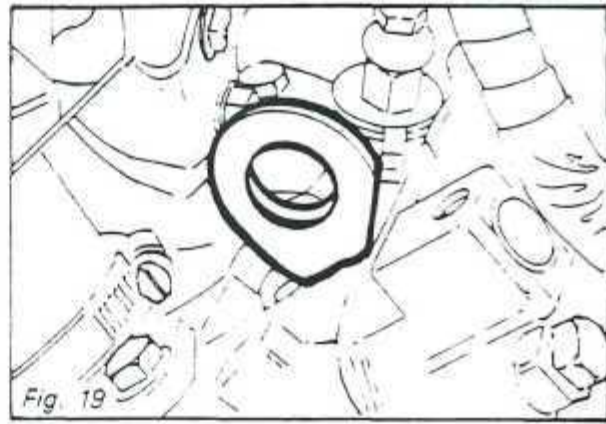
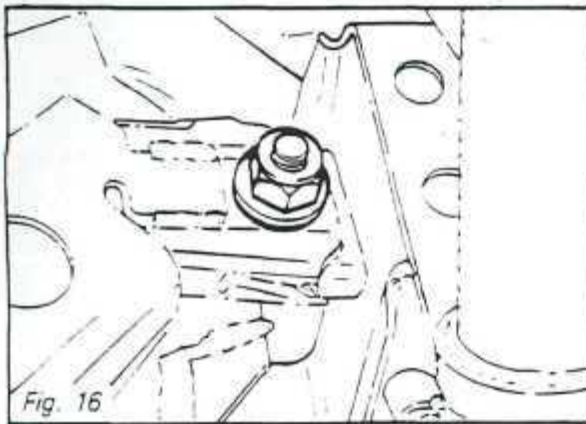
Disconnect gear change control (manual
transmission).

For automatic transmission disconnect cable at
relay lever.

Remove
gear box side mounting bolts (Fig. 16)
(R.H. illustrated)

Fit lifting sling to rings provided
(Figs. 17 & 18) (L.H.S.) (Figs. 19 & 20) (R.H.S.)

Take weight off engine and remove both
mounting bolts. Pull engine forward and lift out.
(Fig. 21) (L.H.S. illustrated)



C:04:04

Engine

Refitting is reverse of removal operation

SPECIAL POINTS CONCERNING REFITTING

Adjust the travel of the accelerator cable and gear change linkages.

For automatic transmission: adjust the governor cable travel and the selector cable travel.

CHECK:

Engine, gearbox or automatic oils and fill as necessary.

Fill and bleed cooling system.

Adjust all controls.

Cylinder Heads

RETIGHTENING—TIGHTENING

Before commencing the above operation, loosen the inlet manifold fixing bolts. Also the bolts securing the timing cover to the cylinder heads.

RETIGHTENING CYLINDER HEAD

This operation is to be carried out when the engine is cold (at least 2 hours after engine has stopped).

Cylinder heads should be retightened:

1. After a cylinder head has been replaced. Run engine until engine reaches normal operating temperature, i.e. when cooling fans have switched themselves on. After two hours, when engine is cold, repeat tightening procedure.
2. After a service exchange engine has been fitted. While engine is in its transit cradle (and easily accessible).

The vehicle need not return to workshop for cylinder head retightening when the above procedure is observed.

PRETIGHTENING—Fig. 22

Loosen bolt No. 1 and retorque tighten to 15 lb ft (20 Nm). Repeat the above on each bolt in the tightening sequence shown.

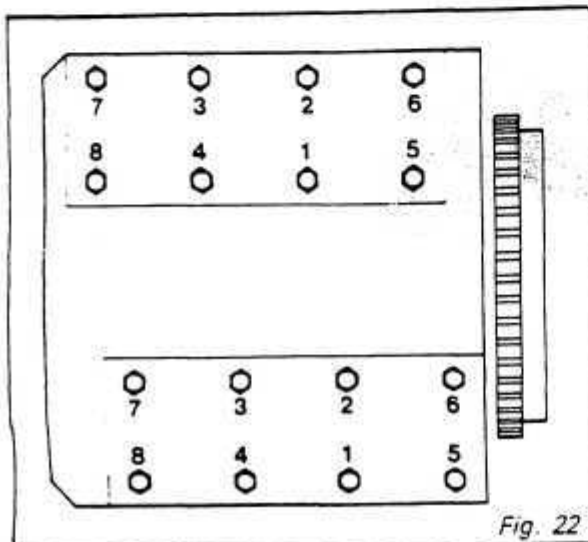
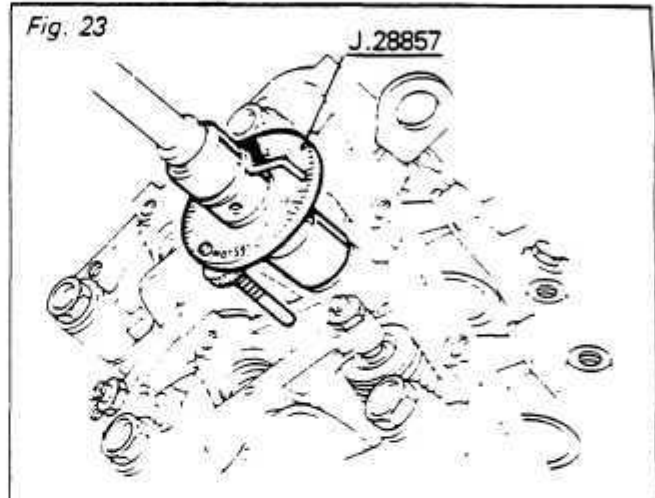


Fig. 22

ANGULAR TIGHTENING—Fig. 23

Slip graduated disc J.28857 over the socket before fitting the torque wrench J.28855. Turn the graduated disc clockwise until the locking stem rests against a solid object which will prevent the disc from turning.



Adjust the moving pointer to angular tightening value 115°. Tighten bolt No. 1 until the moving pointer reaches "O". Repeat the above operation on each bolt in sequence shown. (Fig 24)

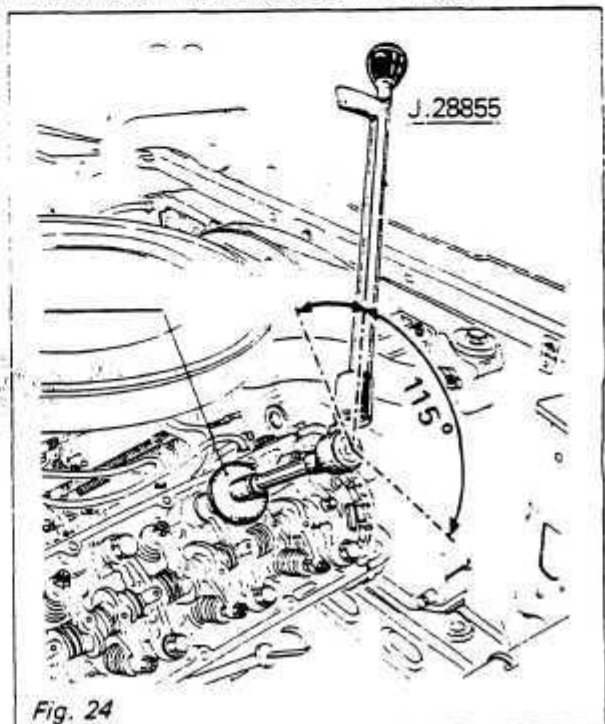


Fig. 24

TIGHTENING

This operation is carried out when the cylinder heads are fitted with new gaskets.

Pre-torque tighten all bolts to 15 lb/ft (20 Nm) then to 45 lb/ft (60 Nm) in the correct sequence to compress the head gaskets.

Loosen bolt No. 1 and retorque. Tighten it to 15 lb/ft (20 Nm).

Repeat the above on each bolt in the tightening sequence shown opposite.

Slip the graduated disc over the socket before fitting the torque wrench and lock it as previously.

Adjust the mobile pointer to angular tightening value 115°.

Tighten bolt No. 1 until the moving pointer reaches "O".

Repeat the above operation on each bolt in the sequence shown.

Then commence "retightening" operations after running the engine.

ADJUSTING ROCKER ARM CLEARANCES

Clearances with engine cold.

inlet: 0.10 (.004")

exhaust: 0.25 (.010")

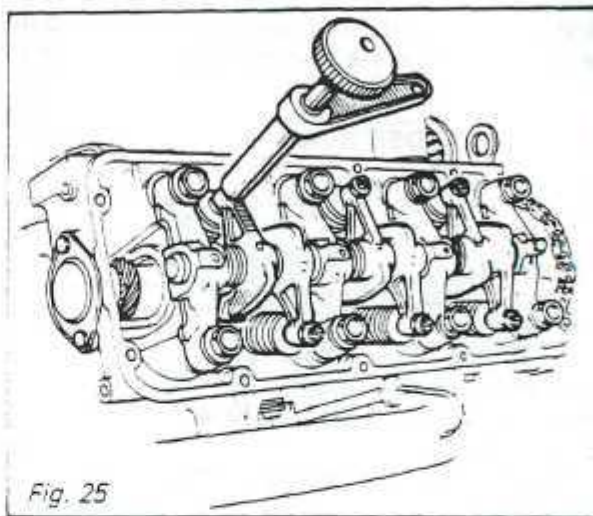
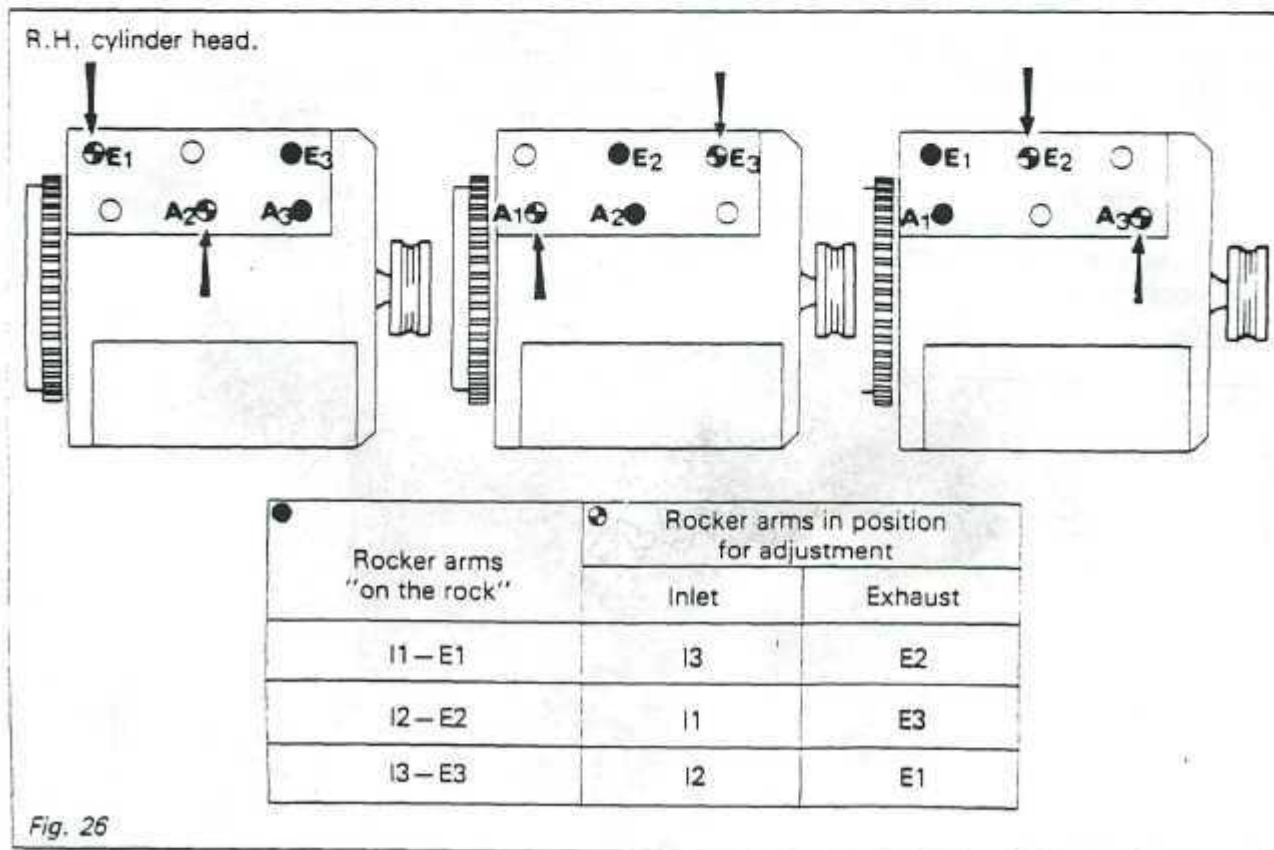


Fig. 25

FIRST METHOD

Adjust the rocker arms on each cylinder head in turn.



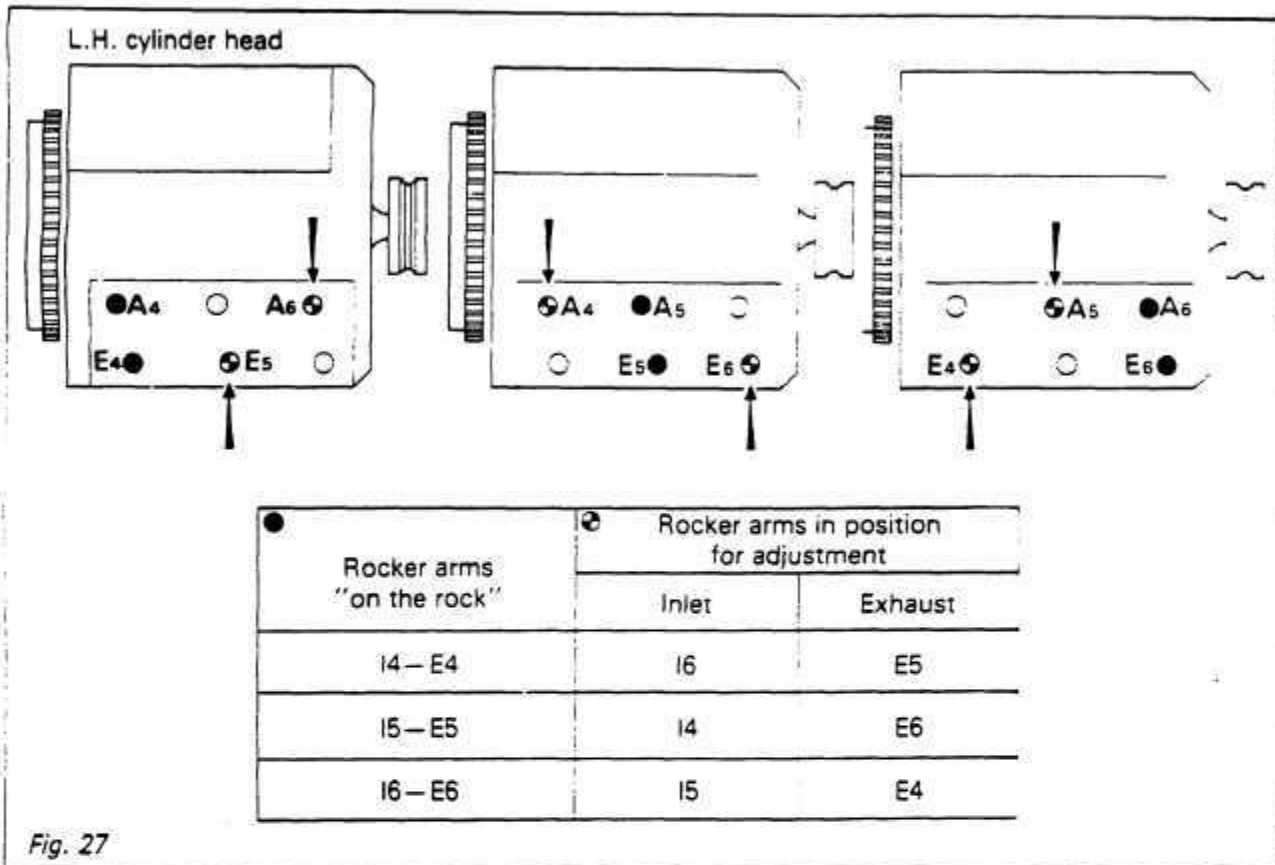


Fig. 27

SECOND METHOD

- Set the piston in No. 1 cylinder to T.D.C. firing stroke, which corresponds to No. 5 cylinder rocker arms "on the rock"

Timing mark on crankshaft pulley opposite pointer (O) on timing cover. (Fig. 28)

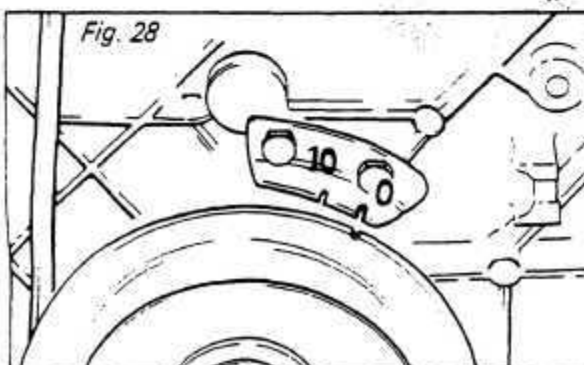


Fig. 28

Cylinder No. 1 on T.D.C. Firing Stroke	Adjust	
	Inlet	Exhaust
	I1	E1
	I2	E3
	I4	E6

- Starting from pos. 1 turn the crankshaft one complete turn (360°) which corresponds to T.D.C. "End of Exhaust—commencement of inlet on cylinder No. 1".
Cylinder No. 1 rocker arms "on the rock".
Timing mark (O) on the crankshaft pulley opposite pointer (A) on timing cover.

Cylinder No. 1 on T.D.C. "End of Exhaust— commencement of inlet"	Adjust	
	Inlet	Exhaust
	I3	E2
	I5	E4
	I6	E5

CHANGING CYLINDER HEAD GASKETS

NOTE:

If only one cylinder head is to be removed, the operation may be performed without removing the timing cover using camshaft sprocket support tool (B) No. J.28858 to support the timing sprocket and maintain tension on timing chain. (Fig. 29)

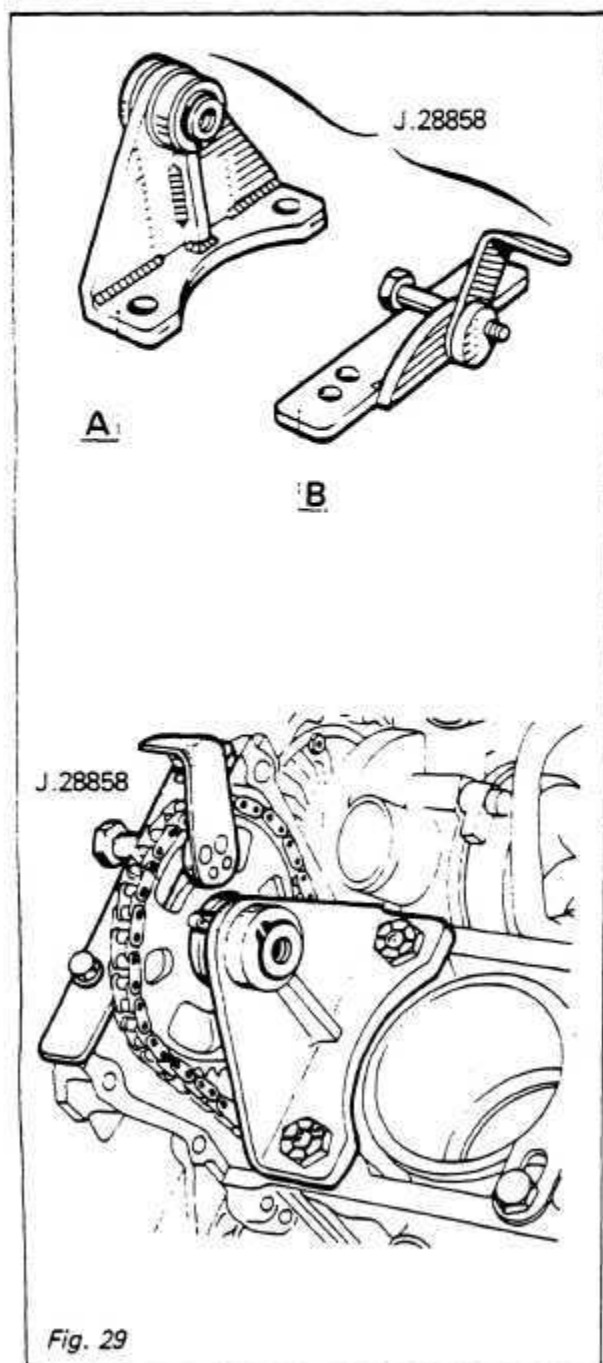


Fig. 29

The timing chain must not be allowed to become slack during this operation. The timing cover will have to be removed to release the tensioner if the chain is slackened accidentally.

The dummy bearing (A) will only be used if the crankshaft has to be turned, for example, when "piston and liner" assemblies are changed to prevent any alteration in the valve timing.

LH Cylinder

Disconnect battery

Drain cooling system

Remove intake manifold

Remove water pump hose leading to head

Disconnect any heater hoses leading to cylinder heads

Remove rocker cover and access plug for the camshaft sprocket bolt.

Turn the camshaft sprocket so that the drive pin (1) is at the top.

Unlock the camshaft sprocket fixing bolt (10 mm male hexagon key) (Fig. 30)

Fit the camshaft sprocket support on the timing cover.

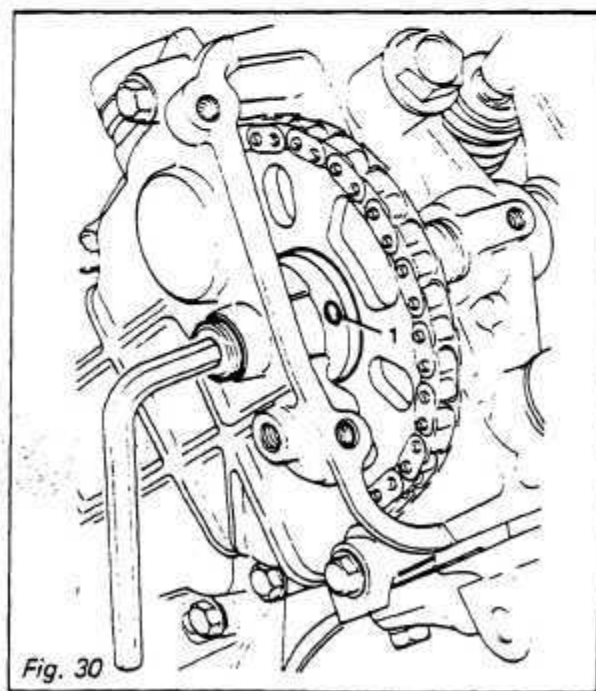
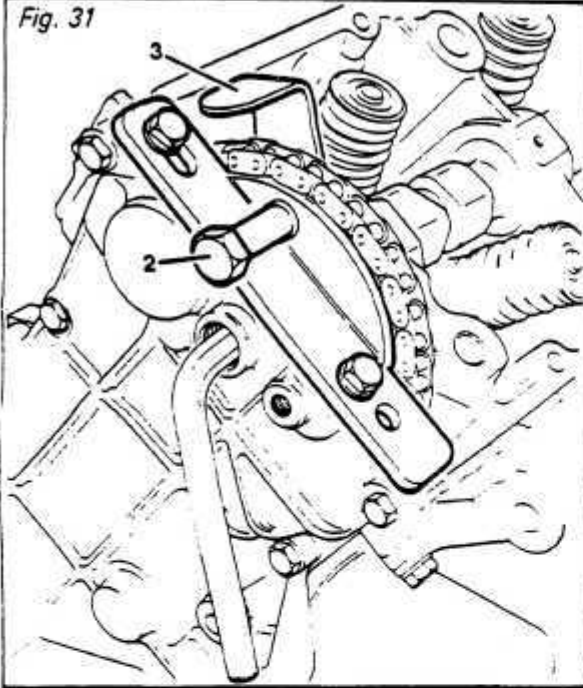


Fig. 30

Moderately tighten both bolts. Attach the camshaft sprocket to it with bolt (2) and nut (3), using a hole in the sprocket. (Fig. 31)

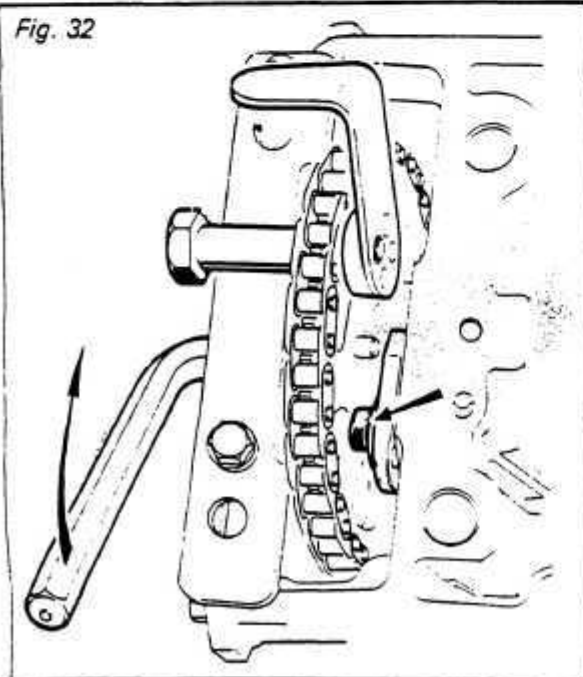
Fig. 31



Remove the cylinder head fixing bolts and rocker assembly.

Unscrew the camshaft flange and free the flange from its recess, unscrew the camshaft sprocket bolt carefully until the camshaft disengages the sprocket. (Fig. 32)

Fig. 32



Press the locating roll pins down at (A) and (B) using an old pushrod. (Fig. 33)

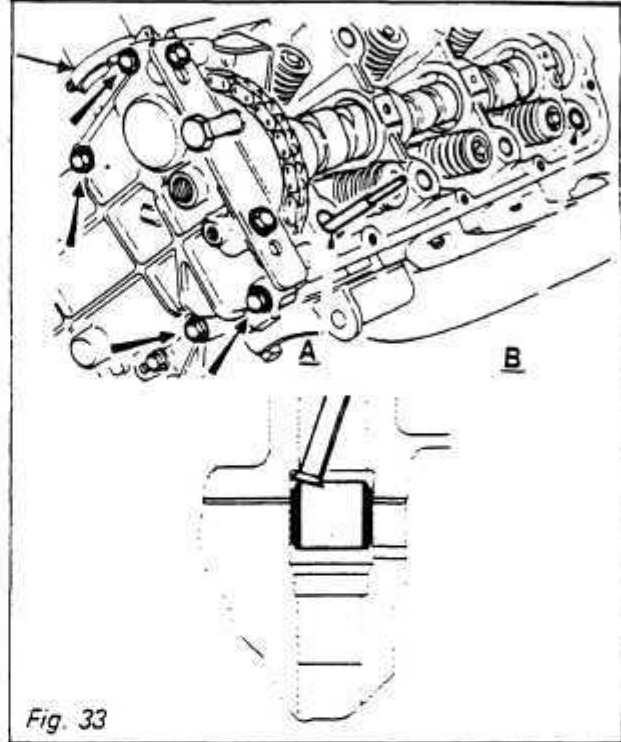


Fig. 33

Remove the 4 bolts securing the cylinder head to the timing cover.

Remove cylinder head bolts and remove rocker arm assembly.

Unstick the cylinder head gasket and remove the cylinder head, taking care not to unseat the liners. Remove the cylinder head gasket.

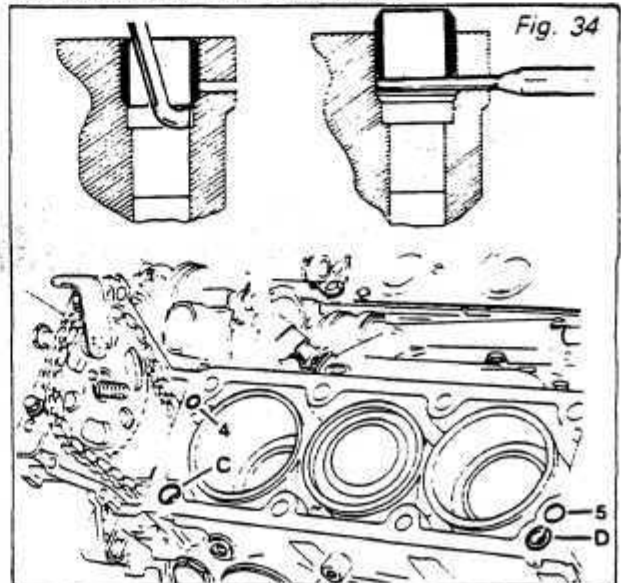


Fig. 34

Remove the cylinder head locating sleeves (C) and (D).

Use paint stripper to clean the gasket faces on the cylinder block and head.

Take care not to introduce any foreign matter into the oilways (4) and (5) which might block the rocker arm oil jet holes and lead to excessive wear of cam lobes and rocker fingers.

REFITTING

Check that the camshaft sprocket driving pin is uppermost. (Fig. 35)

Avoid any slackening of the timing chain. If it becomes slack accidentally then it is imperative that the timing cover be removed in order to release the tensioner.

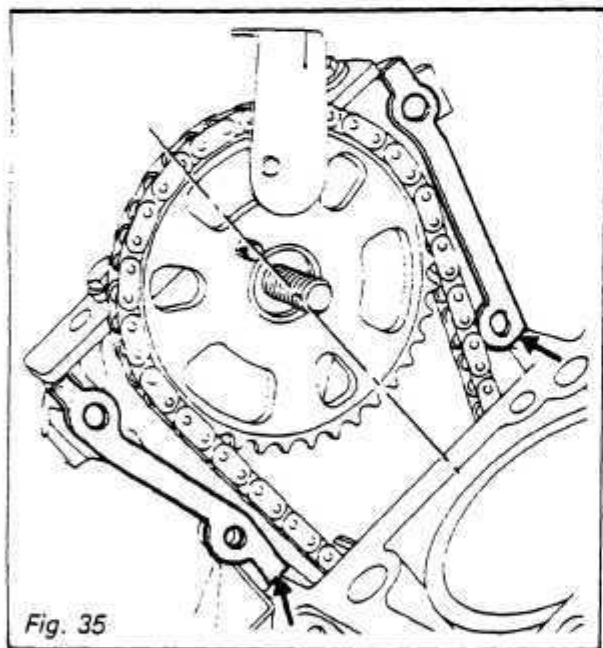


Fig. 35

In this case, use the dummy bearing to prevent the valve timing becoming out of phase. Oil tightness between cylinder head and timing cover.

Cut the timing cover gasket off level with the cylinder head gasket face.

Cut sections from new gaskets to replace the above.

Use gasket cement to hold new gaskets in place and seal joint at cut area.

Insert a 3 mm (1/8") dia. pin punch into each locating roll pin hole and press the dowels against them. (Fig. 36)

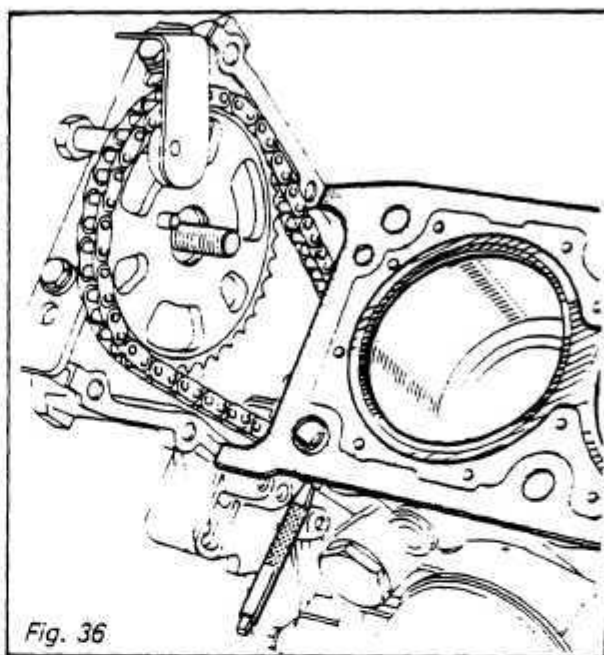


Fig. 36

Fit a new cylinder head gasket dry. Fit the cylinder head, taking care not to move the timing cover gaskets. Insert the timing cover fixing bolts and hand tighten them.

Line up the driving peg and hole and enter the camshaft into the sprocket carefully. Make sure

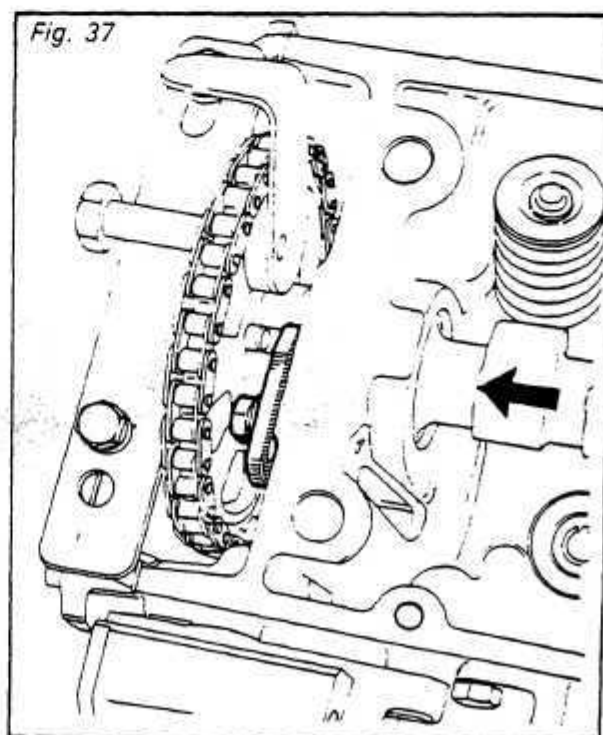


Fig. 37

that the camshaft top is fully withdrawn to allow the camshaft flange to pass through. Partially tighten the sprocket fixing bolt. (Fig. 37)

Remove sprocket support.

Push the camshaft stop fully home in its groove and torque. Tighten the bolt. Remove both pin punches.

Fit the rocker arm assembly and the cylinder head bolts.

Carry out the angular tightening operation.

Pre-tighten the bolts in the order shown to 15 lb/ft (20 mm) then tighten them to 45 lb/ft (60 mm) to compress gasket. Loosen bolt No. 1. Retighten it to 15 lb/ft (20 mm) then angular tighten it to 115°. Repeat for all the remaining bolts in the order shown.

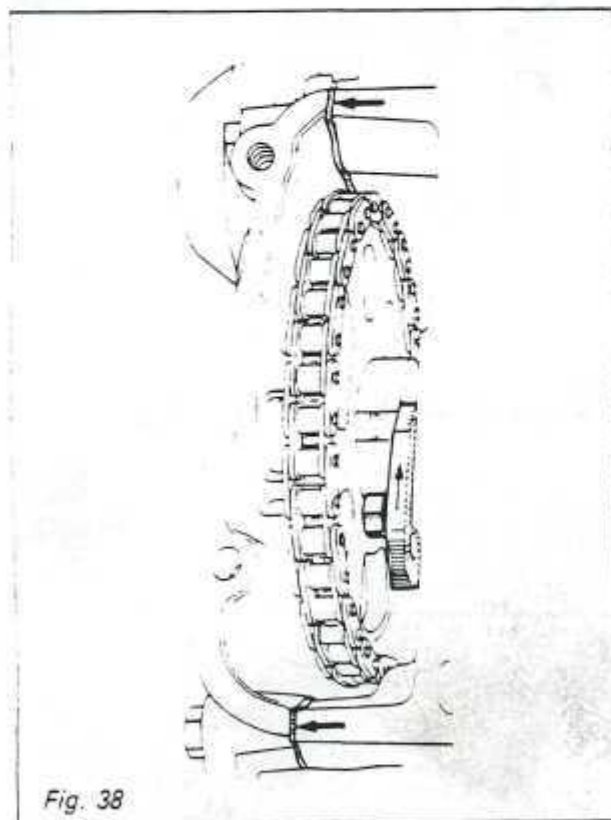


Fig. 38

Torque tighten the timing cover bolts and cut the gaskets off flush. (Fig. 38)
the timing sprocket fixing bolt.
the access plug for the timing sprocket fixing bolt.
Fit the manifold using new gaskets.

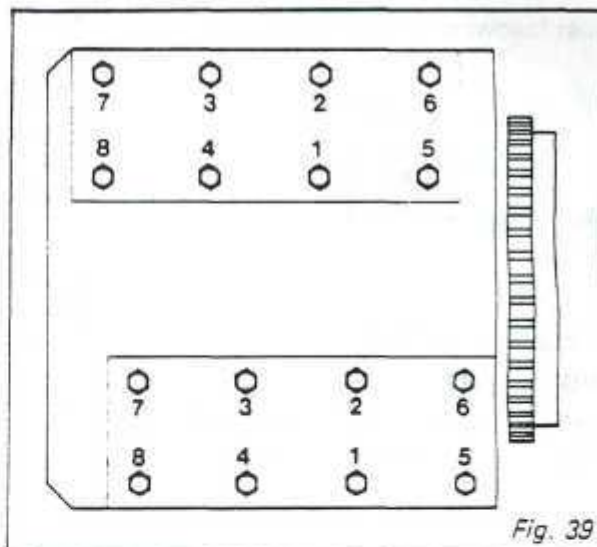


Fig. 39

Refit hoses and pipes.
Refit exhaust clamp.
Adjust the rocker arm clearances.
Fit the rocker cover.
Fill and bleed cooling system.
Run engine for 30 minutes.
Let the engine cool down for at least 2 hours then retighten the cylinder head. (Fig. 39)

RH CYLINDER HEAD

The removing and refitting operations for the RH cylinder head are identical to those of LH cylinder head with the exception of the dipstick tube clip diagnostic socket and bracket and distributor

ADJUSTING VALVES—Fig. 22

Set the piston in No. 1 cylinder to TDC firing stroke, which corresponds to No. 5 cylinder rocker arms "on the rock"
TDC mark on pulley is aligned with "O" mark on timing plate.

Check and adjust the following rocker arms in this position.

INLET

Cyl No. 1
Cyl No. 2
Cyl No. 4

EXHAUST

Cyl No. 1
Cyl No. 3
Cyl No. 6

Turn the crankshaft clockwise one complete turn and align TDC mark on pulley with "O" mark on timing plate.

Check and adjust following rocker arms in this position.

INLET

Cyl No. 3
Cyl No. 5
Cyl No. 6

EXHAUST

Cyl No. 2
Cyl No. 4
Cyl No. 5

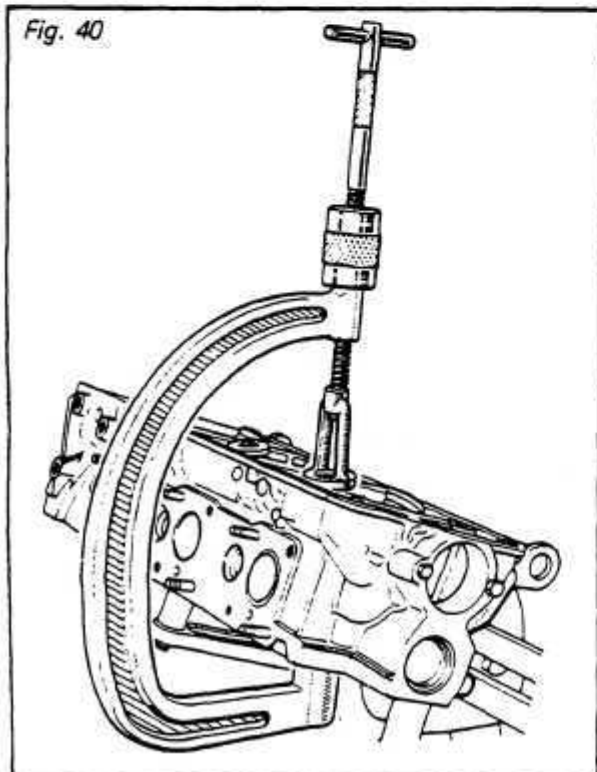
CHANGING CYLINDER HEADS**DISMANTLING**

Once a cylinder head has been removed lift out the camshaft and remove the spark plugs.

Remove
camshaft stop
exhaust manifold
coolant outlet pipe
engine lifting rings and diagnostic socket bracket
(RH cylinder head)

Compress the valve springs using a valve spring compressor.

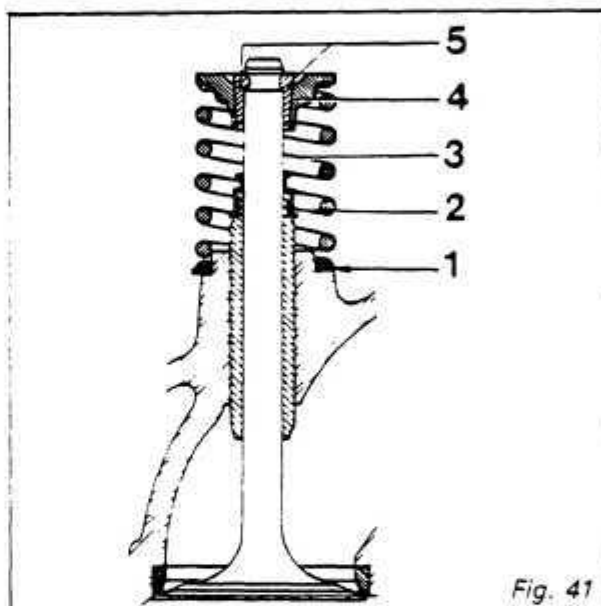
Remove the split cotters, topcups, springs and thrust washers; lay them out in their correct order. (Fig. 40)

**RE-ASSEMBLING**

Grind in the valves and check them for gas tightness

Clean the cylinder head carefully. Re-assemble the valves, fitting components in the following order: —

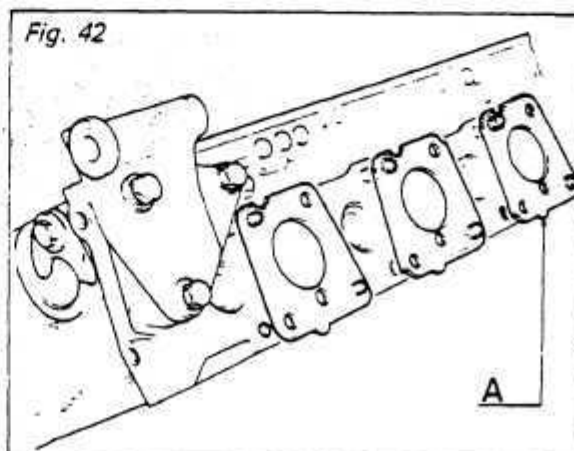
- 1 Thrust washer
- 2 Oil seal
- 3 Valve spring (closest coil facing cylinder head)
- 4 Cup washer
- 5 Split cotters (Fig. 41)



Re-attach the components to the cylinder head.

Position of exhaust manifold gaskets:

Pip (A) on each gasket to face downwards.
(Fig. 42)



ROCKER SHAFTS**DISMANTLING**

The oilway plugs on the ends of the rocker shafts are press-fitted and cannot be removed.

Remove the set bolt, withdraw the parts and lay them out in order.

RE-ASSEMBLING

The RH and LH side rocker shaft assemblies are identical. They match their respective cylinder heads by turning the complete assembly round. The position of the rocker shaft must not be reversed because the oil feed holes (A) will be blocked; the rocker shafts must be fitted with their oil holes facing downwards. (Fig. 43)

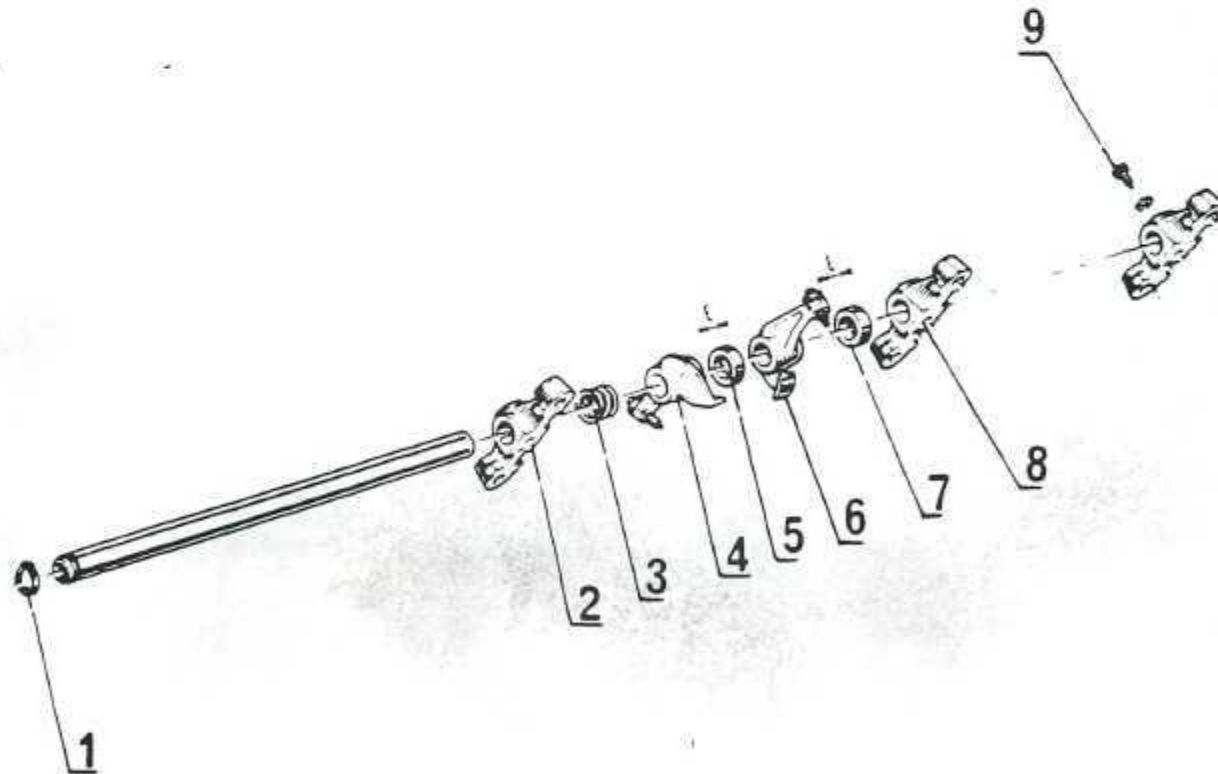
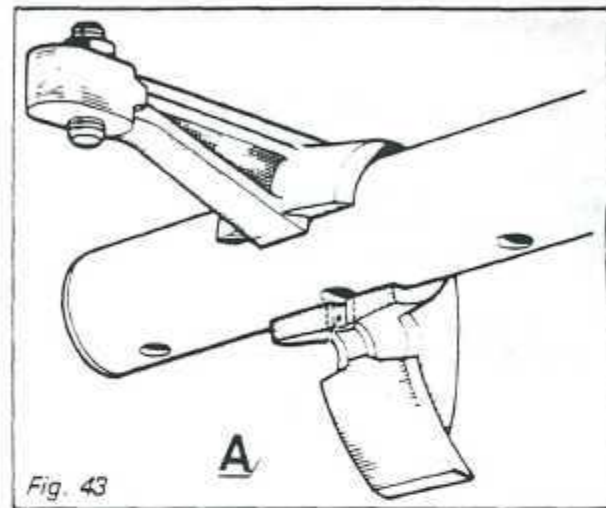


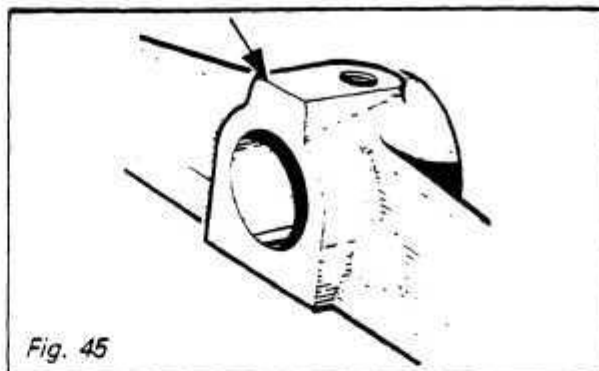
Fig. 44

C:05:10

Engine

Assemble in the following order (*Fig. 44*)

- 1 Snap ring
- 2 Bearing with flat on boss facing snap ring
(*Fig. 45*)
- 3 Spacer spring
- 4 Rocker arm with tappet adjusting screw on left
- 5 Spacer "E" equals 5,35 mm thick
- 6 Rocker arm with tappet adjusting screw on right
- 7 Spacer "E" equals 8,2 mm thick
- 8 Bearing with flat on boss facing snap ring



Liners—Pistons

CHANGING

The engine need not be removed for this operation, furthermore, it is possible to change one individual "liner-piston" assembly.

It is not necessary to remove the timing cover and timing gear when one or more "liner" and "piston" assemblies belonging to one bank of cylinders (LH or RH) have to be changed.

Use the J28858 Tool, (Fig. 46)

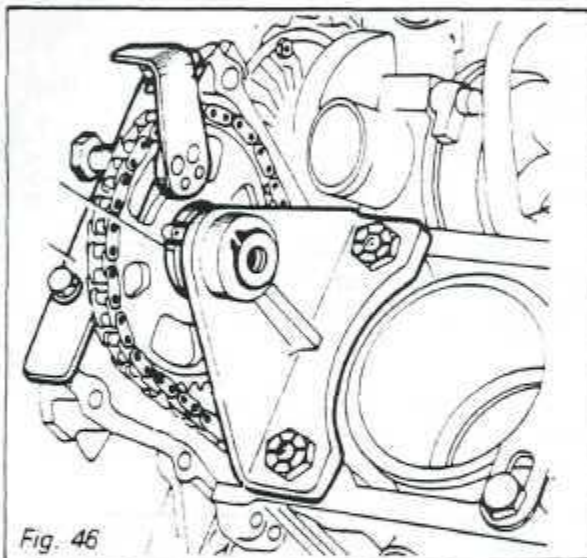


Fig. 46

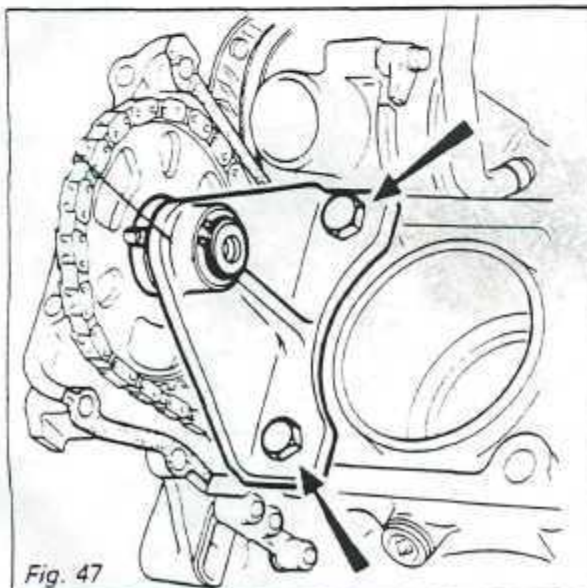


Fig. 47

Support (S) will be used as outlined in the chapter "Cylinder Heads—Changing the Gaskets".

Dummy bearing (F) will be fitted and this will allow the crankshaft to be turned in order to reach each big-end cap in turn without upsetting the timing phase.

FITTING THE DUMMY BEARING—Fig. 47

With support (S) already in position, fit dummy bearing (F) and tighten the camshaft sprocket fixing bolt moderately.

If a clearance exists between the underside of the dummy bearing bottom flange and the gasket face on the cylinder head, pack up with shims to prevent any slackening of the timing chain which may jam the tensioner in the forward position. Moderately tighten both bolts. Remove support (S).

Removal of all six assemblies is dealt with in this chapter. As both cylinder heads have to be removed it is more practical to remove the timing gear.

Disconnect battery.

Drain the cooling system and sump (oil pan)

Remove

the air filter

inlet manifold

exhaust

timing cover (to loosen pulley nut, lock the flywheel)

oil pump driving sprocket and its chain

camshaft sprockets and their chains

oil pan (sump)

the suction pipe and gauge

anti-emulsion plate

and cylinder heads.

Refer to chapters "Cylinder Block" and "Cylinder Heads" for peculiar points dealing with the various dismantling operations.

Fit liner clamps J28852.

Mark the connecting rods, starting with No. 1 at the flywheel end, so that they match the cylinder numbers.

The nuts holding the six big-end caps cannot be unscrewed with the crankshaft in one position only. Work round in order of accessibility and withdraw the "liner-piston" assemblies one by one.

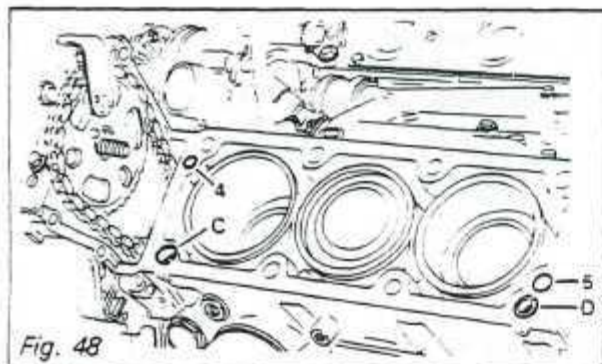
OVERHAULING—Fig. 38

Clean gasket faces on cylinder heads and cylinder block using paint stripper (protect oil holes) 4 and 5.

Take care not to let any foreign matter enter the oilways which could block the rocker arm jet holes and lead to excessive wear of cam lobes and rocker arm fingers.

Clean inside the cylinder block, particularly the locating flanges for the liner base seals and crankshaft.

Extract the cylinder head locating roll pins (C) and (D).



Check condition of:

oil pump

and cylinder heads; check their gasket faces for truth (resurfacing not permitted)

Grind in the valves and re-cut the valve seats.

Change the "liner-piston" assemblies. (Fig. 49)

**LINER PROTRUSION**

Excelnyl liner base seals are used in the engine.

They are available in the following thicknesses:

blue tag 0,087 mm (.0034")

white tag 0,102 mm (.004")

red tag 0,122 mm (.0048")

yellow tag 0,147 mm (.0058")

With liner base seals in position, the amount of liner protrusion above the cylinder block face should be

between 0,16 and 0,23 mm (.0063 to .0091")

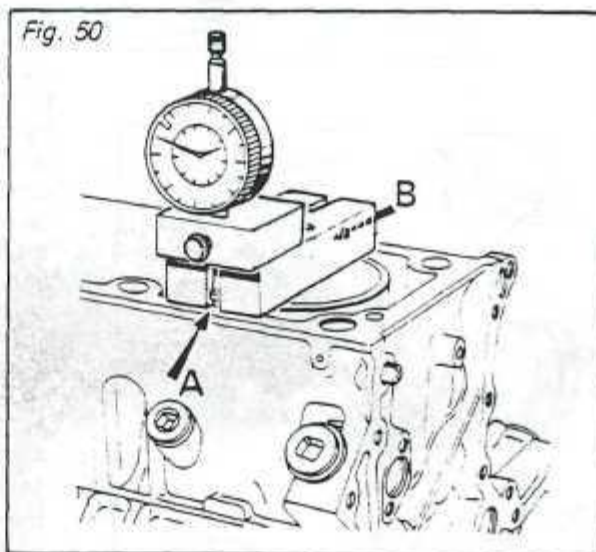
work as close to 0,23 mm as possible.

The new liners need not be inserted with an angular reference.

Difference in level liner to liner may be made by selective insertion.

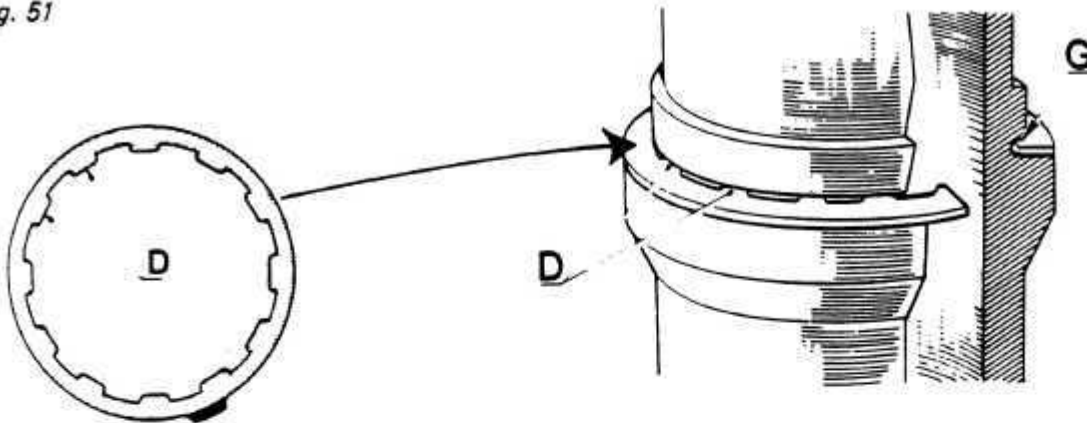
To select the correct liner base seals, the amount of protrusion of each "liner-piston-connecting rod" assembly, without its seal, must be determined for each block of cylinders.

Check liner protrusions at (A) and (B) using thrust plate, bracket fitted with a clock gauge. J 28856 (Fig. 50)



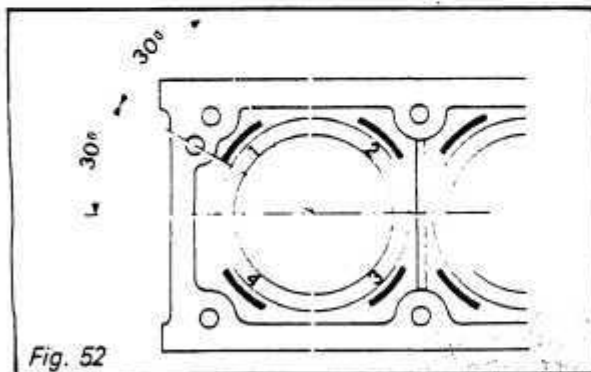
Subtract the larger measurement from 0,23 mm to determine the thickness of the seal required. Select a seal whose thickness is equal to, or just less than, the thickness calculated.

Fig. 51

**EXAMPLE—Fig. 51**

First measurement at A: 0,10 mm (.004")
 Second measurement at B: 0,08 mm (.003")
 Subtract 0,10 mm from 0,23 mm which leaves
 0,13 mm (.005"). Select a seal with red tag, 0,122
 mm (.0048") thick (average value)
 Fit one seal of the same thickness to each liner
 and bend castellation (D) into recess (G).

Insert the liners so that the base seal colour tags
 are visible (spaced as shown in the sketch). (Fig.
 52)



Positions 1, 2, 3, or 4.

Check the protrusion of each liner in relation to
 the cylinder block.

If necessary, change the thickness of the seals in
 order to position the liners so that:

- the difference in protrusion between any two
 adjacent liners do not exceed 0,04 mm (.0016")
 within the permitted tolerance. (Fig. 53)
- and any differences are stepped from cylinder
 No. 1 to No. 3 (or 4 to 6) and vice versa.

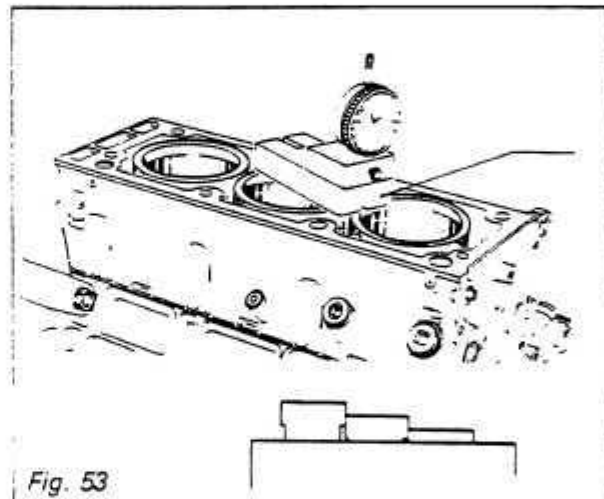


Fig. 53

Once the correct protrusions have been obtained,
 refit assemblies A, B, C, D, E, and F together,
 then number the liners, pistons and gudgeon pins
 1 to 6 (No. 1 at flywheel end) so that they match
 the corresponding connecting rods. (Fig. 54)

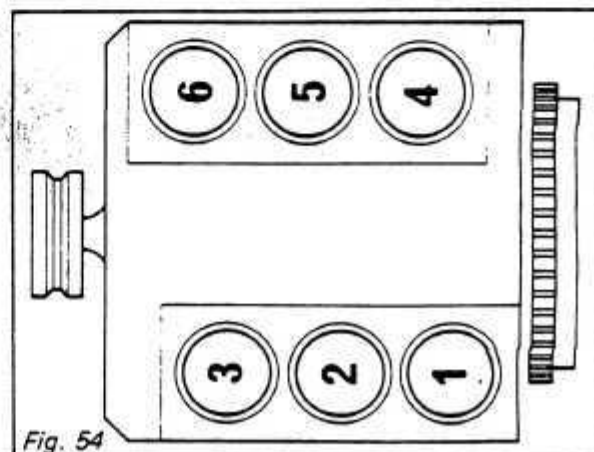


Fig. 54

GUDGEON PINS—TOOLING

The gudgeon pins are a press fit in the small ends and free turning in the pistons.

Use tooling J 28854 which is supplied in a box containing

piston supporting block

an extraction mandrel

piston thrust collar

inserting mandrels and guides.

We approved the use of an electric hot plate to make gudgeon pin insertion easy. The required temperature of 250°C is restricted to small end zone only. (Fig. 55)

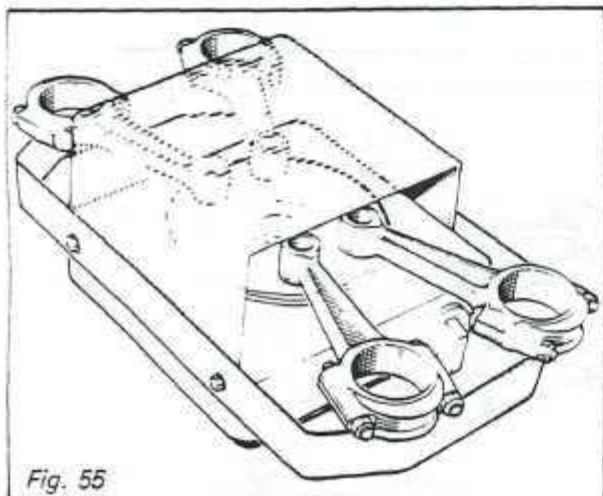


Fig. 55

EXTRACTING GUDGEON PINS

Rest the piston in the vee on the support base, with the gudgeon pin over the extraction hole. Press out the piston with the extracting mandrel (B). (Fig. 56)

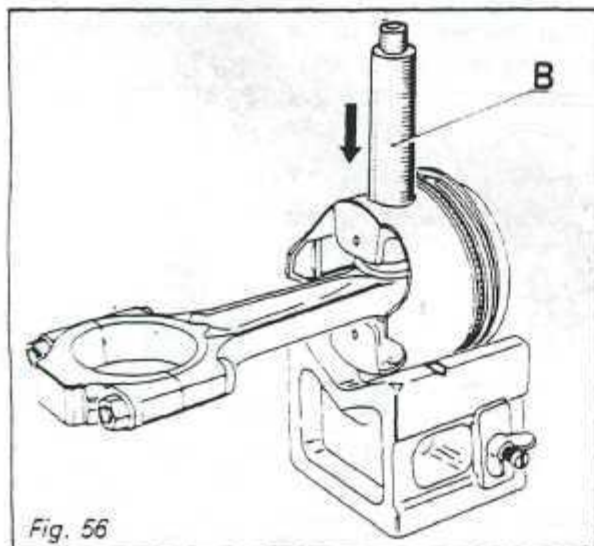


Fig. 56

INSERTING GUDGEON PINS

Preparing the connecting rods. Check the rods for truth (twist—out of square).

Selecting the bottom end components by cylinder bank.

The connecting rod big-ends are offset and have an extended flange (E) on one side (counter balanced side) in order that a pair of connecting rods can share a common crank pin. (Fig. 57)

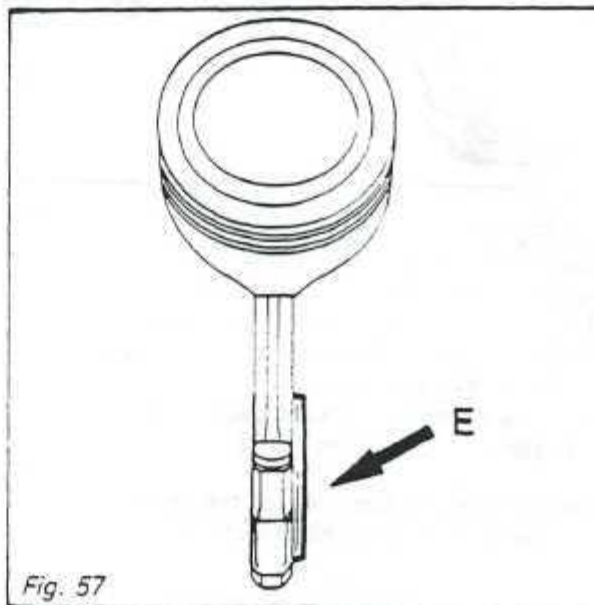


Fig. 57

ALIGNING THE PISTONS

All six pistons will be laid in turn on support base (A) with the arrow pointing upwards and with spot facing on the piston resting on thrust pad (C). Connecting rod—piston assemblies LH cylinder bank.

Spread the small ends on connecting rods 1-2-3 evenly round the hot plate, with extended flange (E) face downwards.

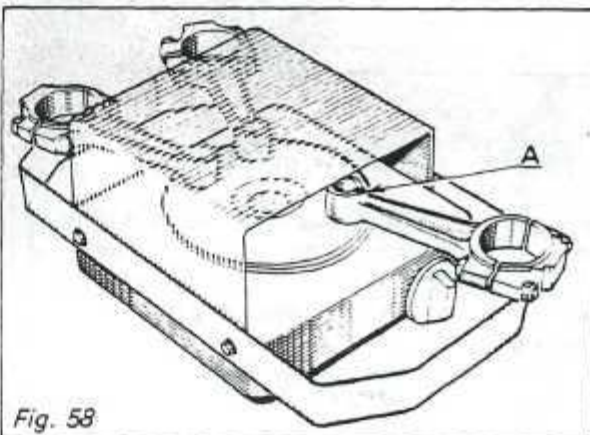
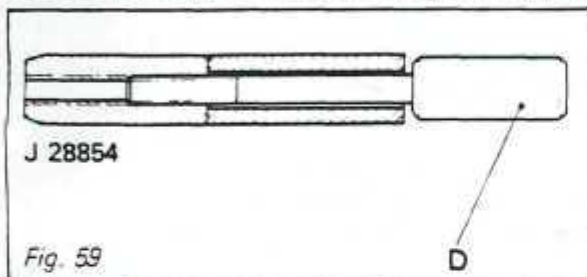


Fig. 58

Check that each small end is lying square on the hot plate. As the temperature guide, place a small piece of cored tinmans, solder with a melting pointing of about 250°C on each small end (A). Let them heat up until the solder melts. (Fig. 58)

PREPARING GUDGEON PINS

Check that each gudgeon pin rotates freely in its piston. Fit the gudgeon pins in turn to assembly mandrel (D). (Do not tighten; the gudgeon pin must be free to float between mandrel and guide.) (Fig. 59)



Fit a thrust pad (C) (Fig. 60) which corresponds to the gudgeon pin on the support base (A) and clamp the piston to the support base with the clip; the spotfacing on the piston must rest on the thrust pad.

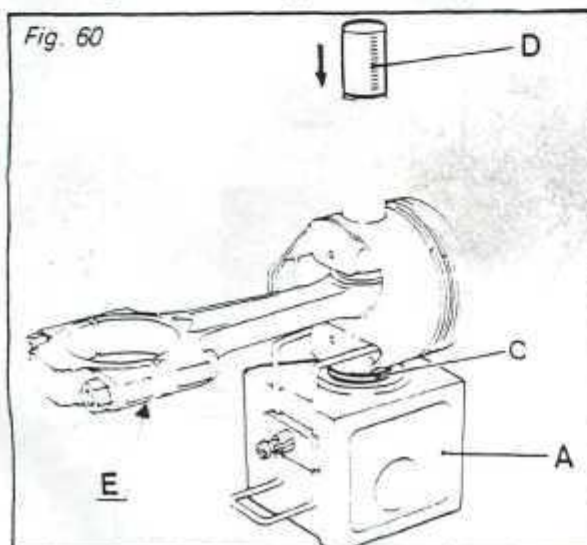
The following operations must be carried out rapidly so that heat loss is reduced to a minimum. As soon as the piece of solder melts:

Wipe off the solder droplet

Insert locating guide (D) in the piston

Fit the connecting rod to the piston with one hand (extended flange (E) facing downwards)

Press in the piston pin quickly with other hand until the guide bottoms against the support base.



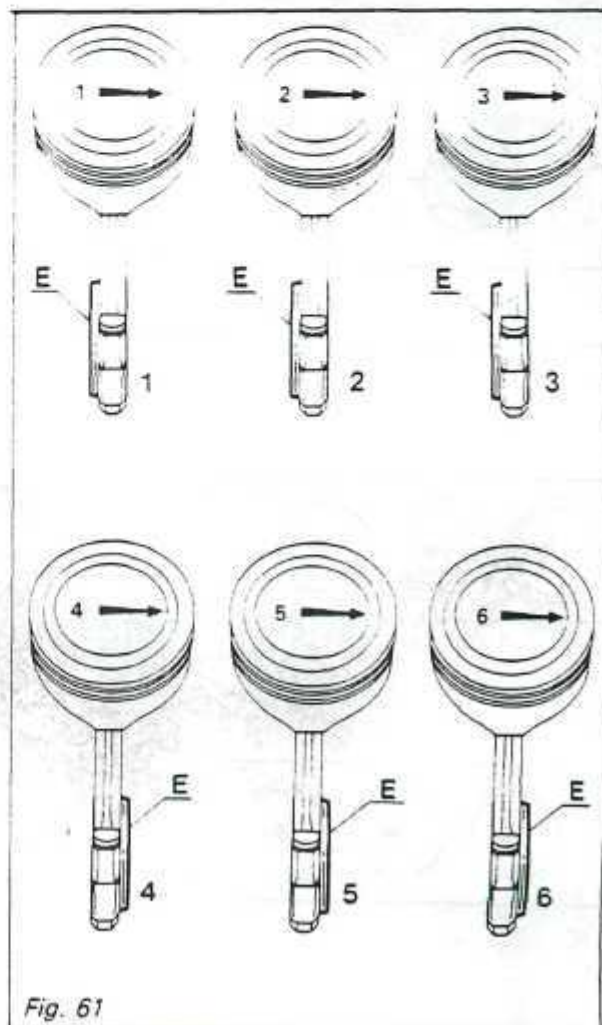
After a few seconds, remove the connecting rod-piston assembly from the support base; unscrew the guide and remove the mandrel assembly. Assemble the other two connecting rods in the same way.

Mark the three assemblies made up in this way so that they are immediately identifiable with the LH bank of cylinders. (Fig. 61)

Connecting rod-piston assemblies: RH cylinder bank.

Spread the small ends on connecting rods 4-5-6 evenly round the hot plate, with extended flange face downwards. Then carry out the assembly operations as indicated earlier, taking care to insert the gudgeons pins with extended flange (E) facing upwards.

Mark the three assemblies made up in this way so that they are immediately identifiable with RH bank cylinders. (Fig. 61)



ASSEMBLING THE PISTONS AND LINERS

Fitting piston rings. (Fig. 62)

The piston rings, which have their gaps pre-set, should be free in their grooves.

Faces with markings must face upwards towards the combustion chamber.

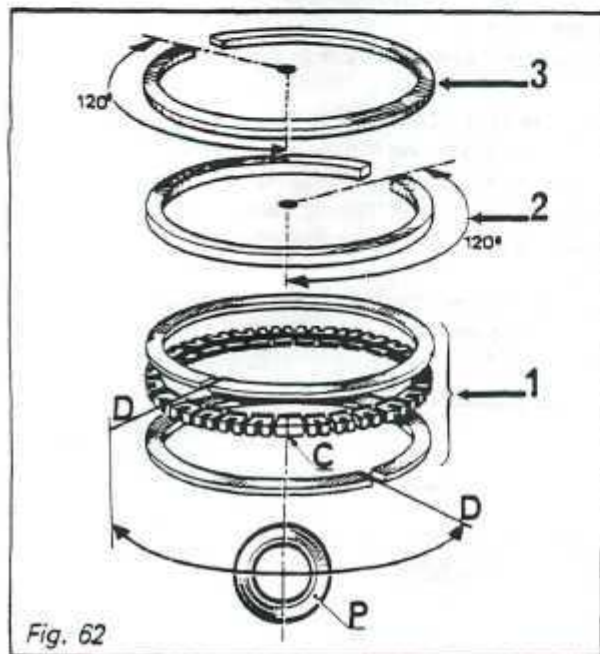


Fig. 62

1 Scraper Ring

Gap (C) in the expander in line with centre of gudgeon pin (P).

Gaps (D) on the rings offset about 20 to 50 mm (3/4" to 1").

2 Taper Compression Ring

Spaced evenly at 120° from the expander gap.

3 Top Ring

Lubricate the pistons.

Fit the connecting "rod-piston" assemblies into their respective liners using a piston ring clamp.

Fit the shell bearings to the big-ends. Insert No. 1 assembly in the cylinder block (arrow on the piston crown facing towards the timing gear end). (Fig. 63)

Fit No.1 big-end cap together with its shell bearing. Make sure that the assembly marks on the cap and rod match. (Fig. 64)

Screw up the cap nuts by hand. Clamp No. 1 liner with a liner clamp.

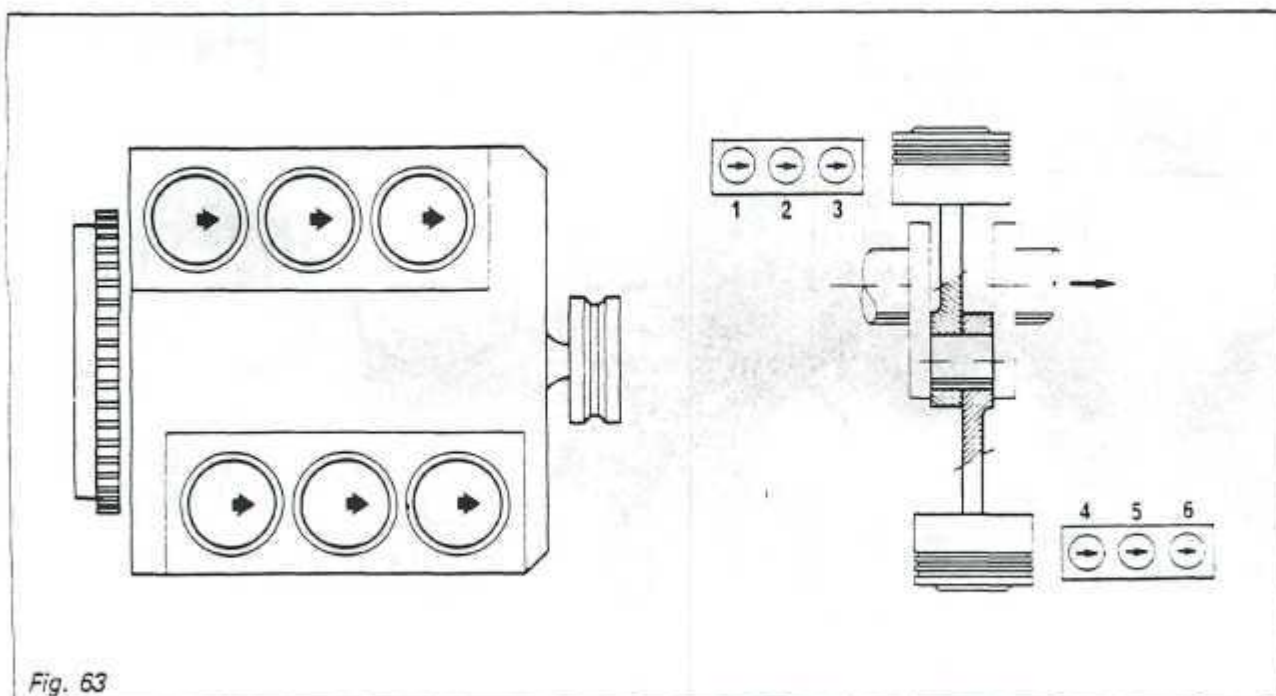
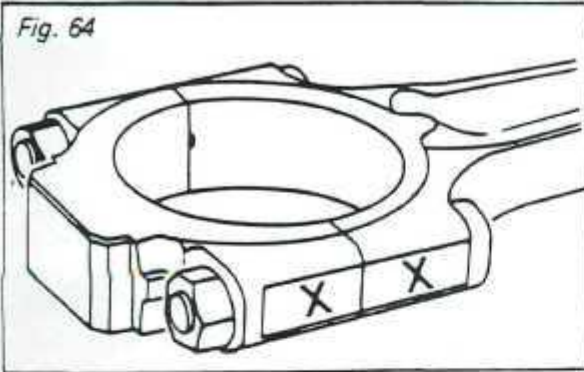


Fig. 63

Fig. 64



Proceed in the same way for assemblies No. 2-3-4-5- and 6 clamping the liners as assembly proceeds.

The cylinder heads,
Timing chains,
Timing cover,
Anti-emulsion plate, suction pipe and sump.

Refer to chapters "Cylinder Block-Changing" and "Cylinder Heads Changing".

Cylinder Block—Changing

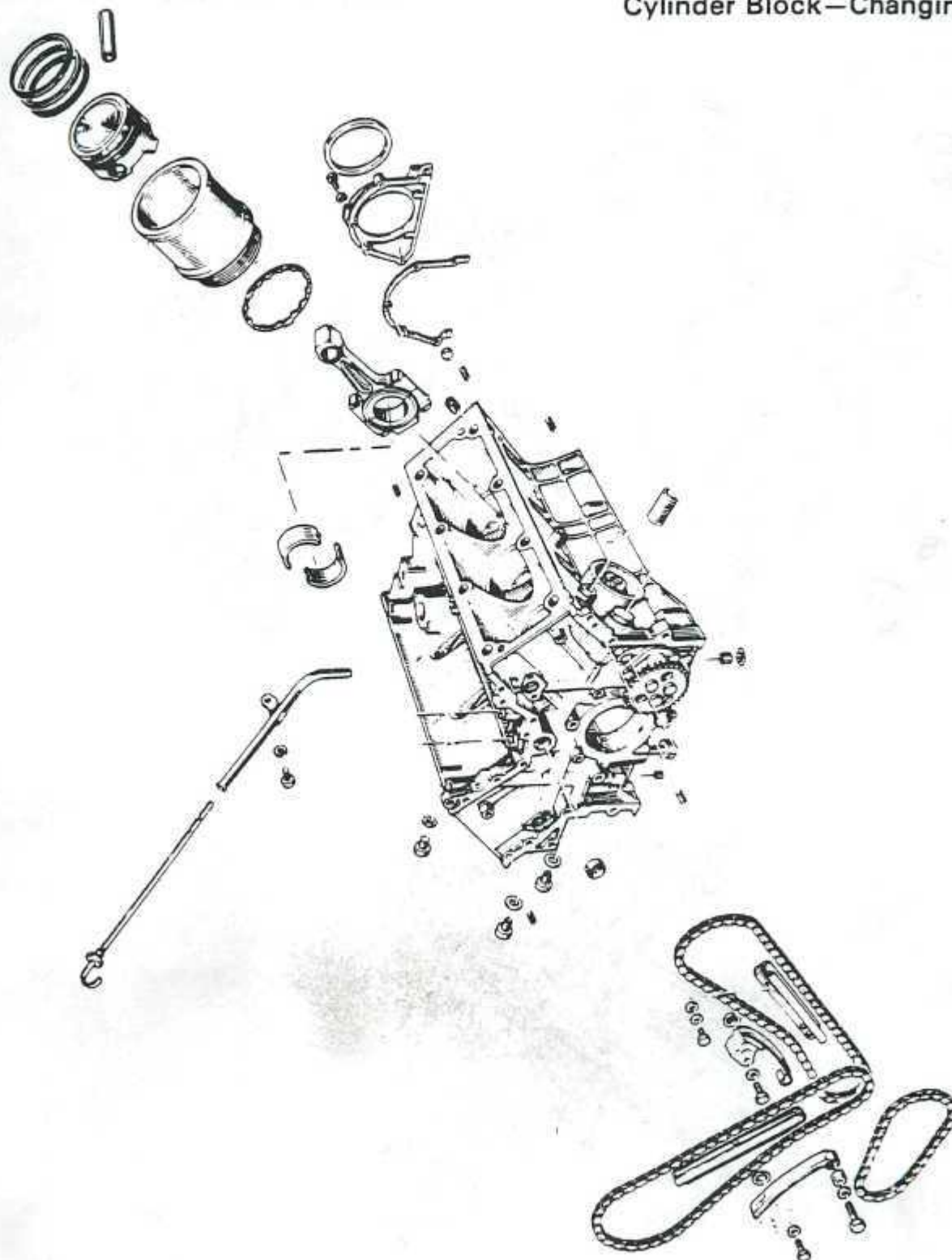


Fig. 65

Cylinder Block—Changing

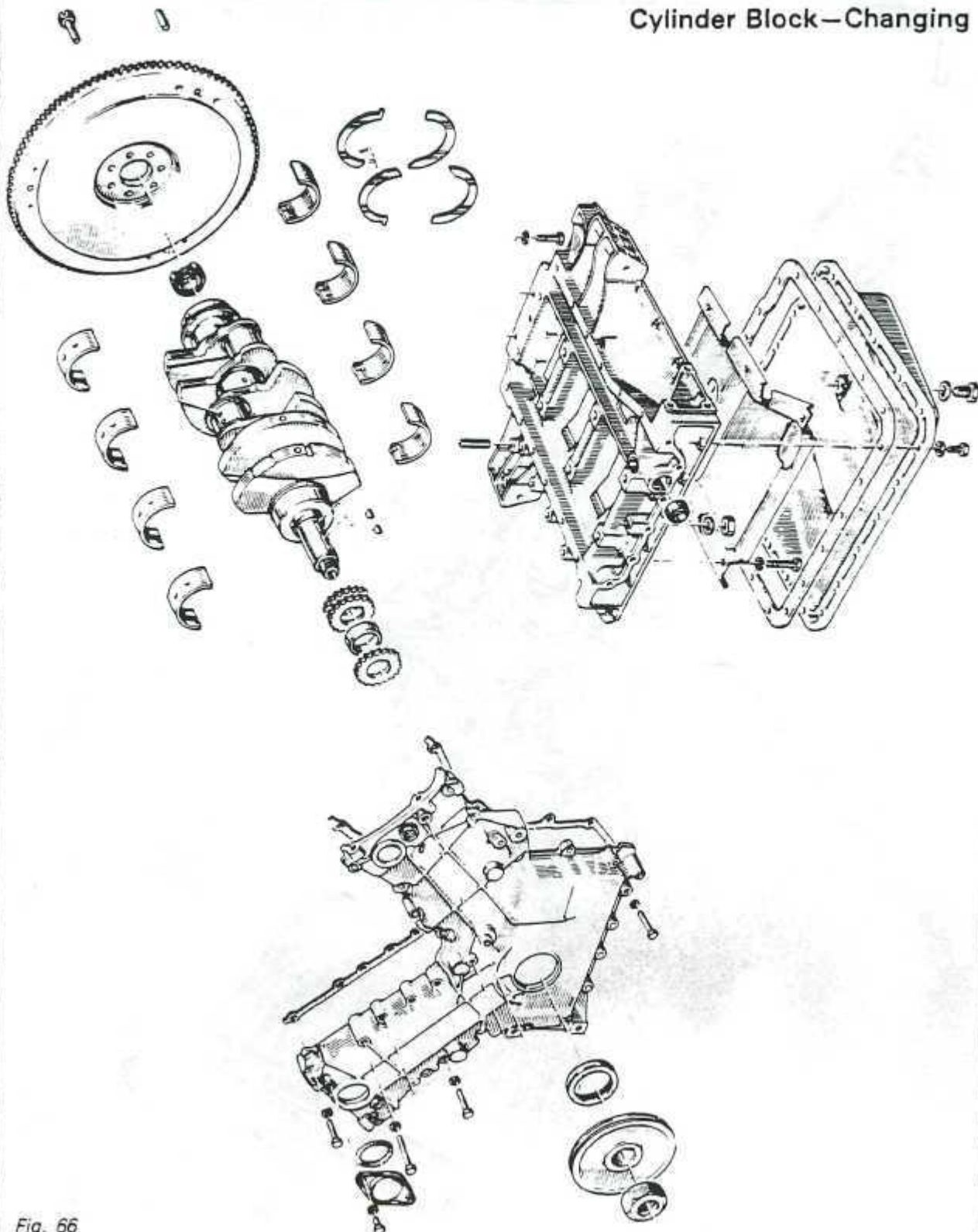


Fig. 66

Cylinder Block

CHANGING

Remove the engine.
Dismantling
Remove
clutch mechanism
flywheel or convertor driving plate
rear cover plate
oil filter
dipstick and tube
alternator and drive belt
distributor and leads
inlet manifold
the six rubber seal
and insulating blocks
water pump and hoses (Fig. 67)
fuel injection equipment
and crankshaft pulley fixing nut

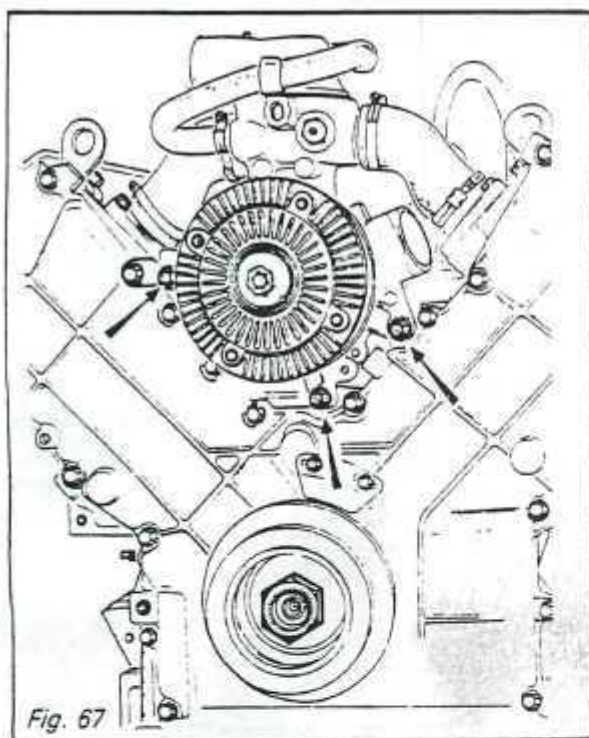


Fig. 67

Turn the crankshaft so that the keyway is vertical.
(Fig. 68)

Remove the
pulley
the rocker covers
timing cover
and sprockets with oil pump driving chain (retain
the key and spacer).

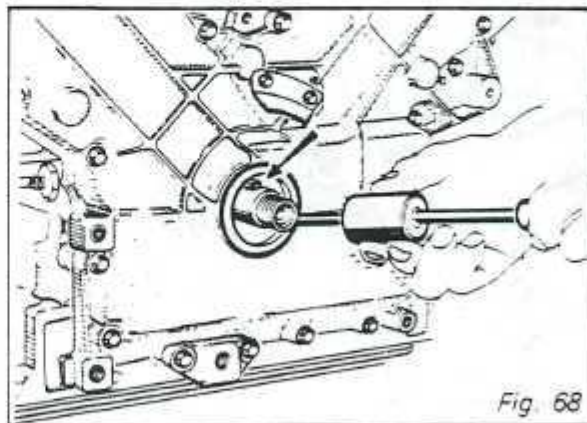


Fig. 68

Loosen the two camshaft fixing bolts.

Mark all the timing gear components according to
side if they are to be re-used. (Fig. 69)

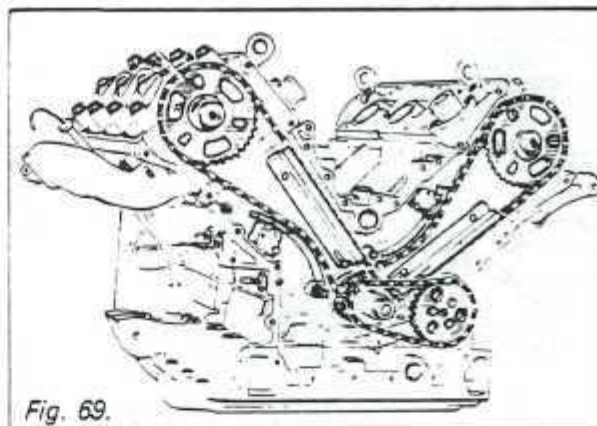


Fig. 69.

Release both chain tensioners by turning the
ratchet mechanism anti-clockwise with a screw-
driver. (Fig. 70)

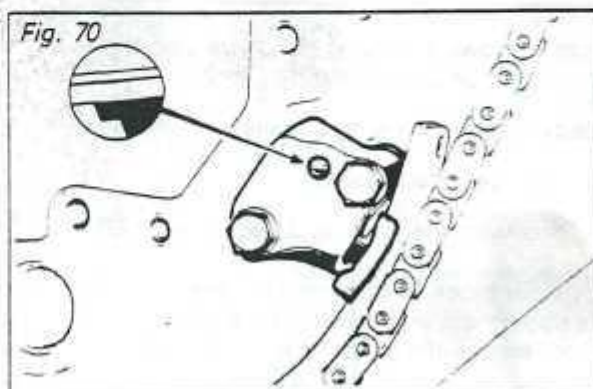
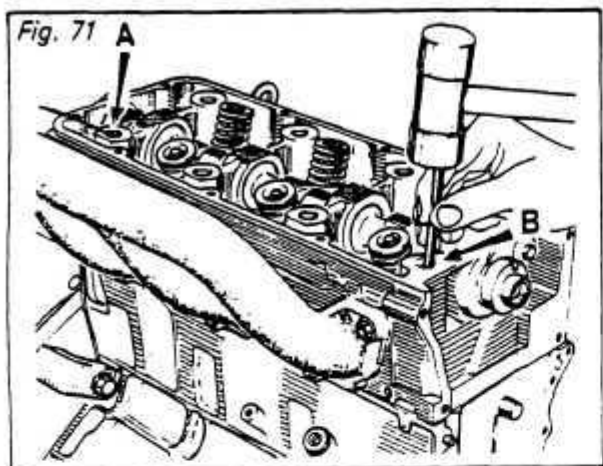


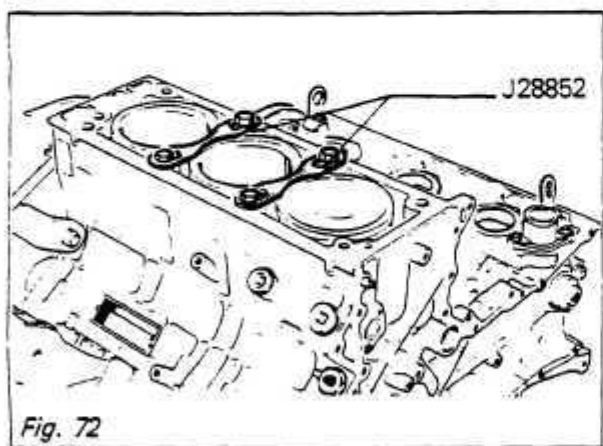
Fig. 70



Remove the timing chains RH first the tensioners and their shoes (retain the filters) and oil pressure switch

Turn the cylinder block so that the RH bank of cylinders is uppermost.

Remove the rocker assembly. (Fig. 71)



Tap the locating dowels (A) and (B) down into the cylinder block with an old push rod.

Unstick the cylinder head using a mallet.

Remove the cylinder head gasket.

Clamp the liners with the clamps. J 28852 (Fig. 72)

Turn the cylinder block so that the LH bank of cylinders is uppermost and carry out the same operations to remove the LH cylinder head. (Fig. 73)

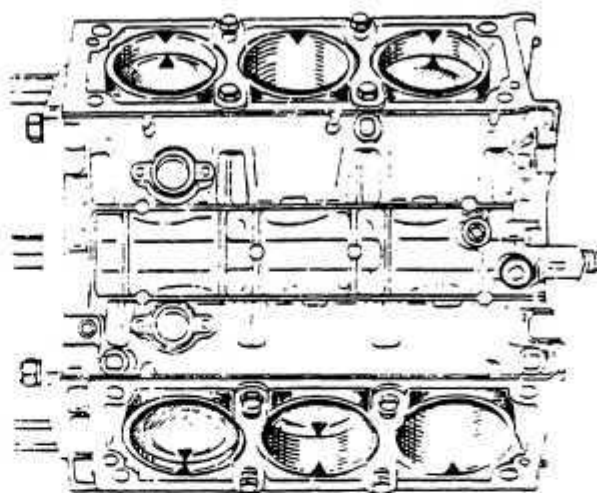


Fig. 73

Turn the engine over. (Fig. 74)

Remove the sump suction pipe and gauge anti-emulsion plate bottom casing and intermediate main bearing caps after marking their positions.

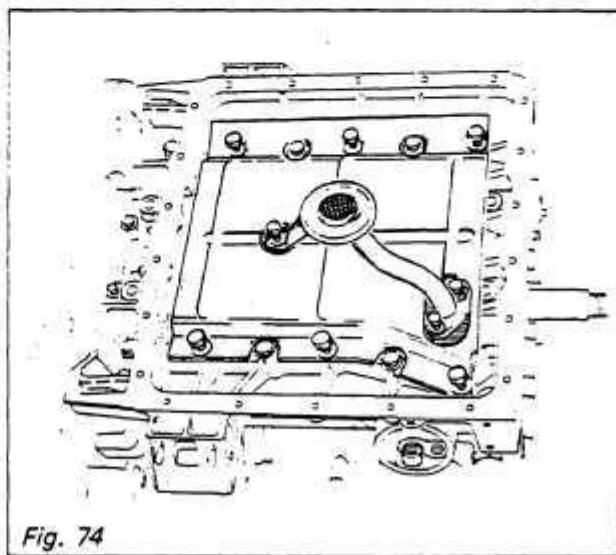


Fig. 74

Hold the front and rear main bearing caps with the two retaining blocks J 28853 which will keep the crankshaft in position. (Fig. 75)

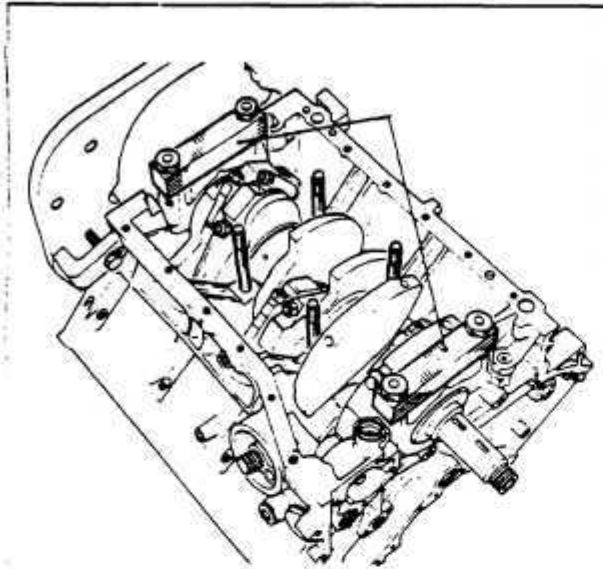


Fig. 75

Mark the connecting rods to match the cylinder numbering, starting at the flywheel end. (Fig. 76)

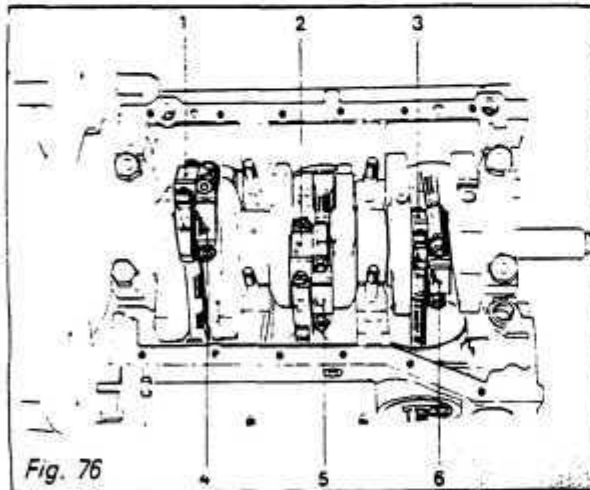


Fig. 76

Remove
the connecting rod big-end caps
liner retaining clamps
marked "liner-piston-connecting rod" assemblies
front and rear main bearing retaining caps and
caps themselves
thrust half-washers
and crankshaft

Clean all parts and inspect them for condition.

Use extractor to remove the clutch shaft spigot bearing. (Fig. 77)

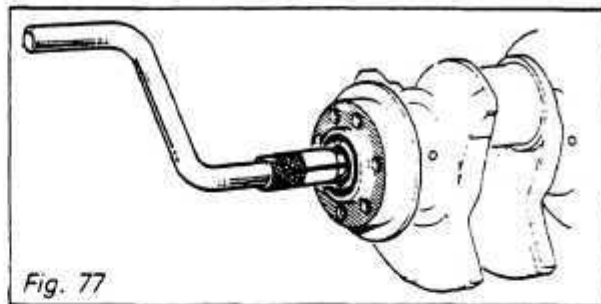


Fig. 77

RE-ASSEMBLING

Lubricate the parts as they are being assembled.
Always change gaskets, oil seals and lockwashers.

Make sure that the oilways are clean and that the oilway plugs are tight.

Check that the cylinder head fixing bolts run down the thread easily.

The new cylinder block is supplied with the oil pump already assembled.

Refit "liner-piston-conrod" assembly.

Refer to chapter changing pistons and liner replacement. (Fig. 78)

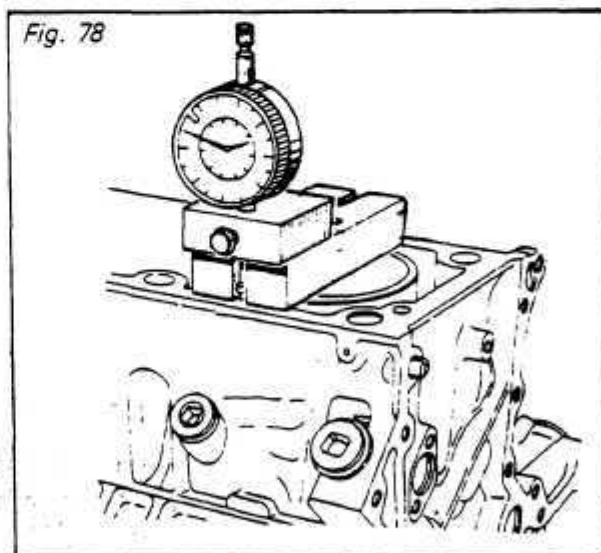


Fig. 78

Remove the assemblies. Turn the engine over. (Fig. 79)

Fit the upper halves of the main bearings (locating tags fully home)

Shells fitted with oil grooves are fitted to the block.

Shells without oil grooves are fitted to the main bearing caps.

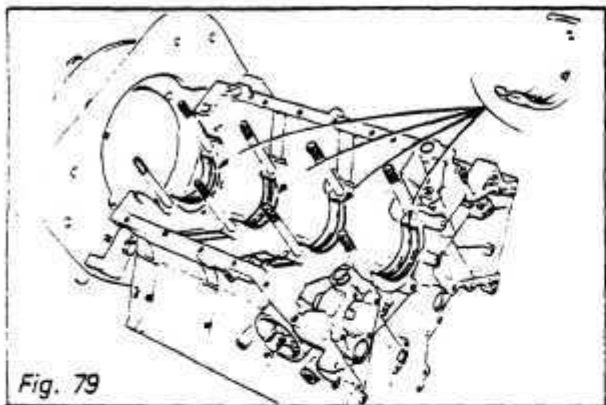


Fig. 79

Refit the crankshaft. (Fig. 80)

The nominal size top thrust half washers 2,30 mm (.0805") with the oil grooves facing the crankshaft flange.

The front and rear main bearing caps boss (A) facing the timing gear end.

Fit retaining block J 28853 astride the main bearing caps. Torque tighten the nuts to 20lb/ft.

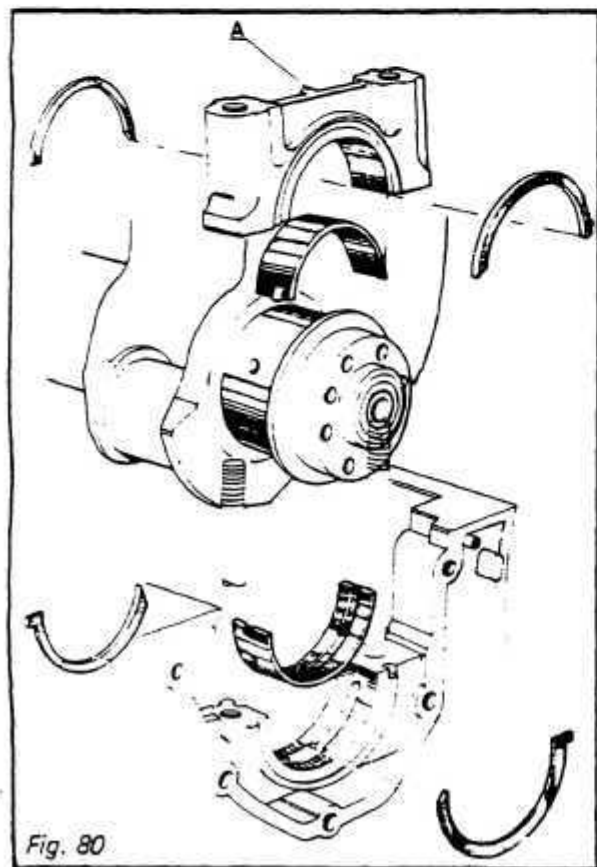


Fig. 80

Place a clock gauge on the end of the crankshaft and set it to zero. (Fig. 97)

Push the crankshaft towards the timing gear end. Read off the value of the end play. It should lie between 0,07 and 0,027 mm (.003 to .010"). If it is incorrect, change the thrust washers. Fit the half shells to the connecting rods. (Fig. 81)

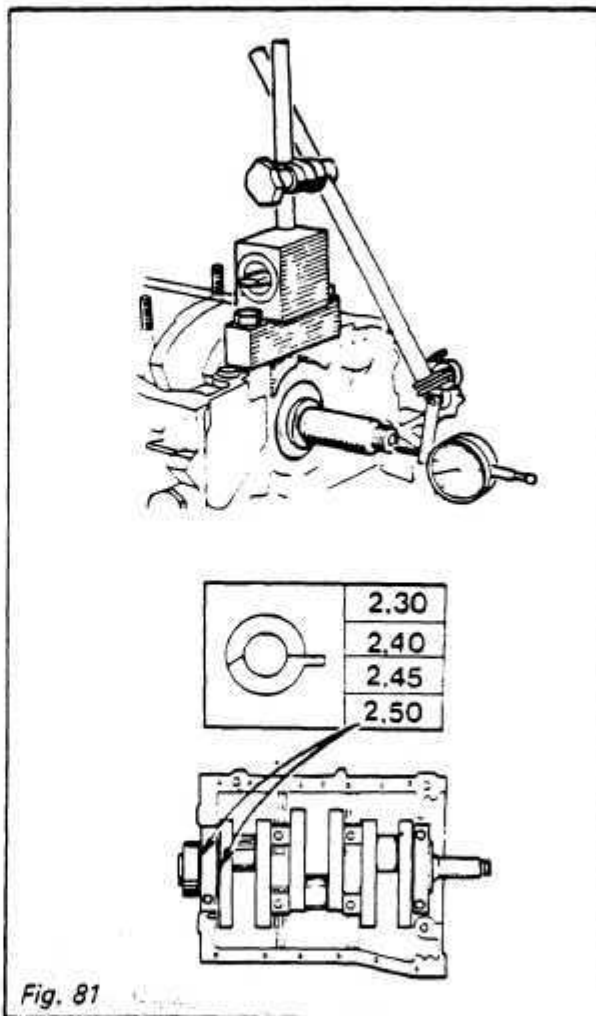


Fig. 81

ASSEMBLING THE "LINER-PISTON-CONNECTING ROD" ASSEMBLIES

Keep strictly to the markings made on dismantling to denote the correct way round and position of the various components.

Insert the assemblies in the order that they were marked during the liner protrusion check (numbered 1 to 6). (Fig. 82)

Clamp the first liner with a clamp.

Proceed in the same way for the other assemblies clamping the liners as assembly proceeds.

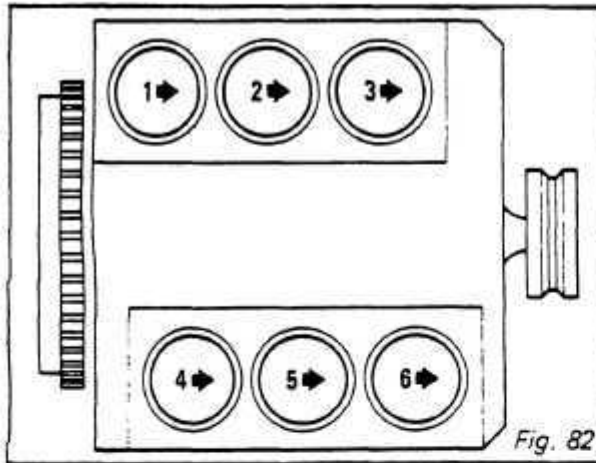


Fig. 82

Check that all the arrows on the piston crowns point towards the timing gear end.

Fit the big-end caps and torque tighten the new nuts.

Remove the main bearing retaining blocks.

Refit:

The intermediate main bearing caps bosses (A) facing towards the timing cover. (Fig. 83)

The rear plate fitted with its oil seal and if necessary, make the joint between plate and cylinder block flush. (Hand tighten the bolts).

Fit a new "O" ring seal on the oil entry pipe and smear the assembly face with sealing compound.

FITTING THE BOTTOM CASING

It is essential that the bottom casing and cylinder block are **absolutely flush** at the clutch end in order to avoid distortion of the clutch housing when the gear box is fitted.

Refit

The bottom casing

The flat washers (boss under nut) and main bearing cap nuts without tightening.

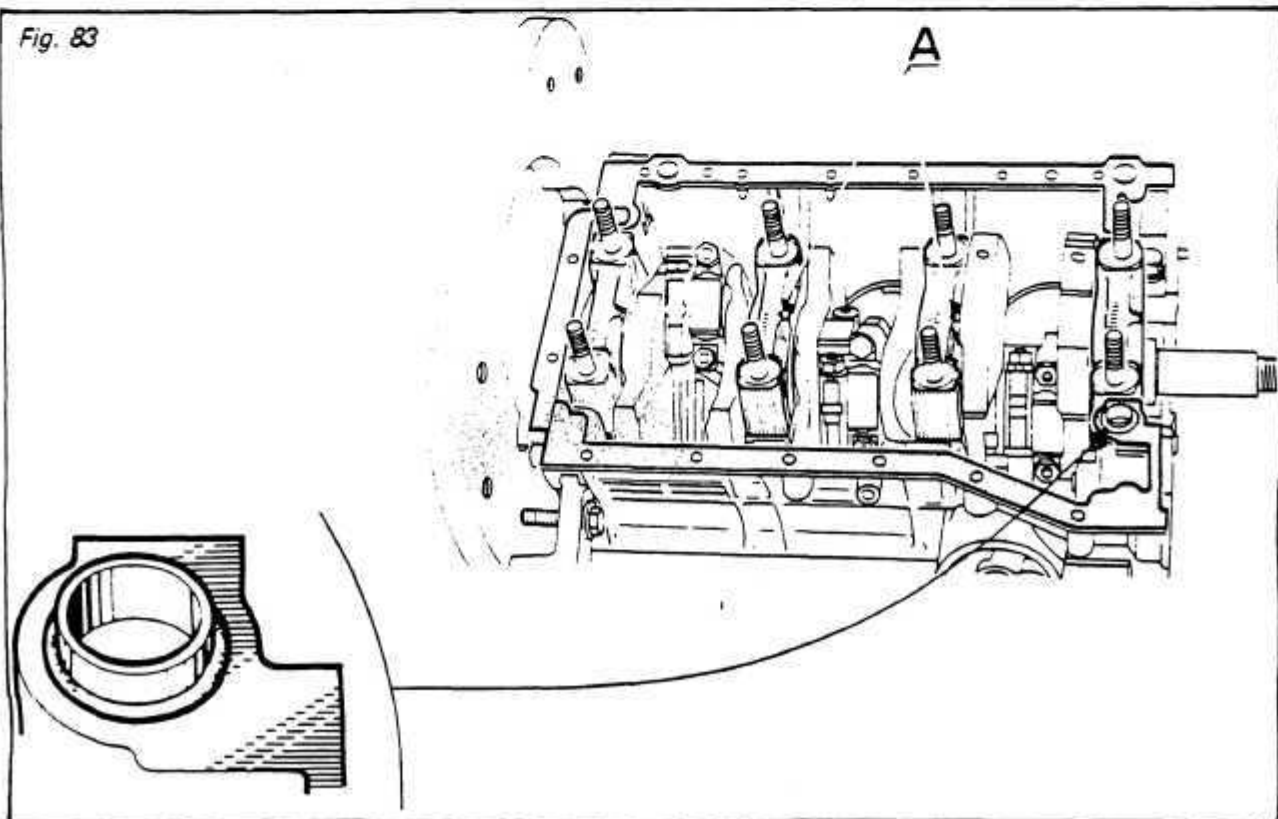
Another peripheral bolts also without tightening.

Align the bottom casing flush with the cylinder block using either

A clutch housing, tightening the four fixing bolts moderately (Fig. 84)

Or using two straight edges laid on the cylinder block in the latter case, check the alignment after tightening the fixing bolts.

Fig. 83



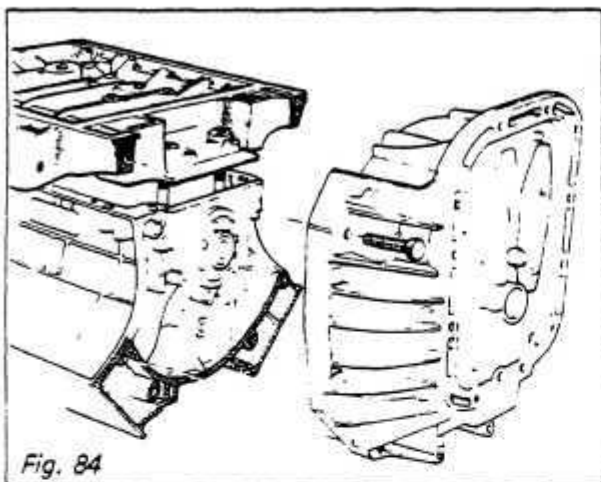


Fig. 84

ANGULAR TIGHTENING OF MAIN BEARING CAPS

Torque tighten the 8 nuts in sequence starting from centre main bearing cap and working outwards. (Fig. 85)

Slip the graduated disc over the socket before fitting the torque wrench.

Turn the graduated disc clockwise until the locking stem rests against a solid object which will prevent the disc from turning.

Adjust the moving pointer to the angular tightening value 75° for main bearing cap nuts.

Tighten the nuts until the moving pointer reaches "0".

Repeat the above operation on each nut.

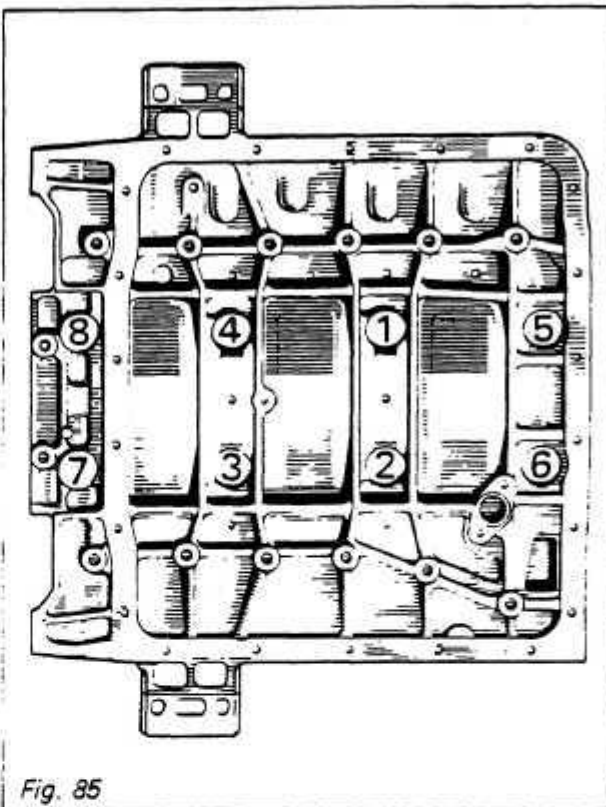
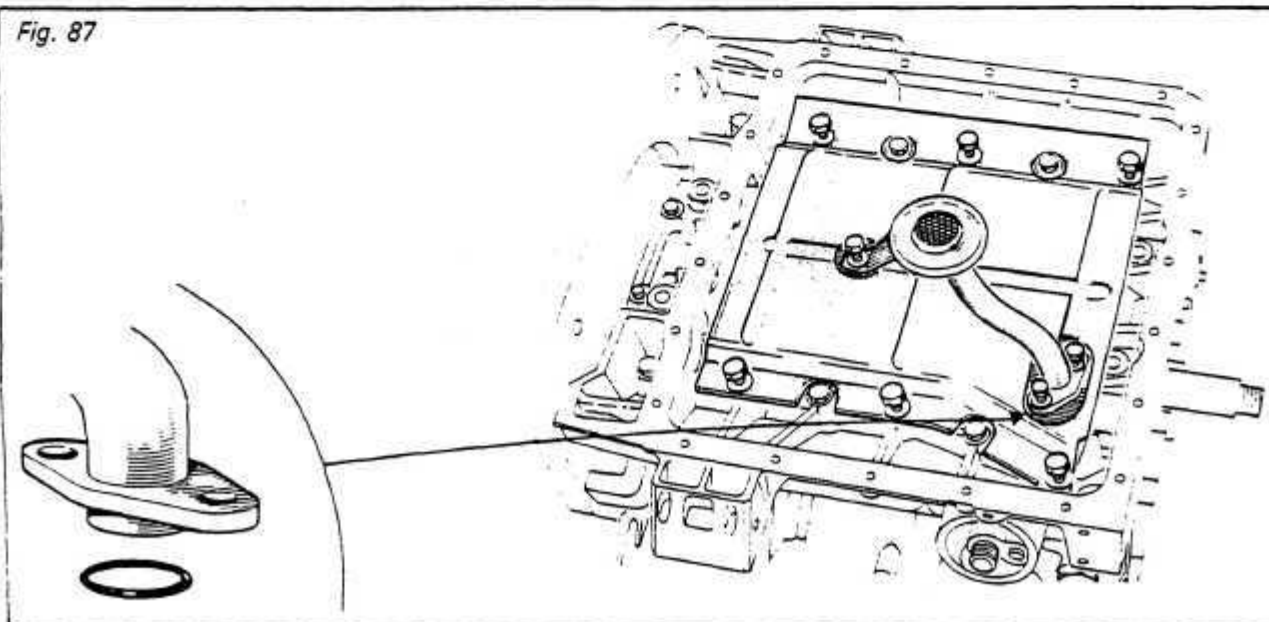


Fig. 85

REAR PLATE

Offer up the rear plate with its paper gasket. It is located laterally by dowel (A). Tighten bottom bolts (1) first followed by the 6 female capscrews. (Fig. 86)

Fig. 87



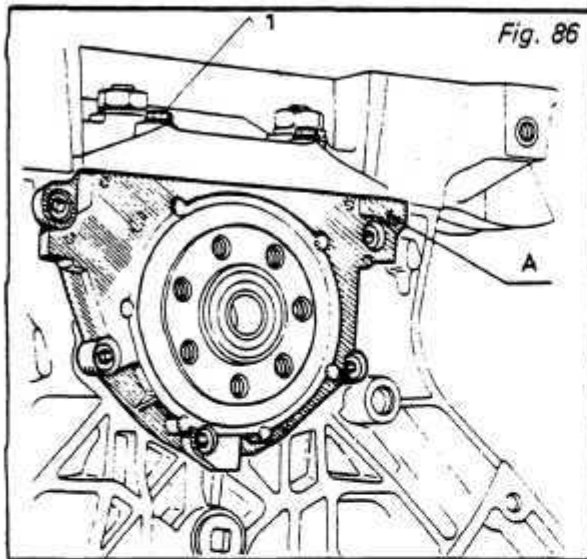


Fig. 86

Refit:

The anti-emulsion plate

The suction pipe fitted with a new "O" ring seal

A new cork gasket and the sump. (Fig. 87)

Turn engine over.

The crankshaft must be positioned as follows in order to set the valve timing.

Keyway vertical

No. 1 piston 15 mm (19/32") down its bore on the compression stroke (BTDC) to avoid the risk of contact with the valves. (Fig. 88)

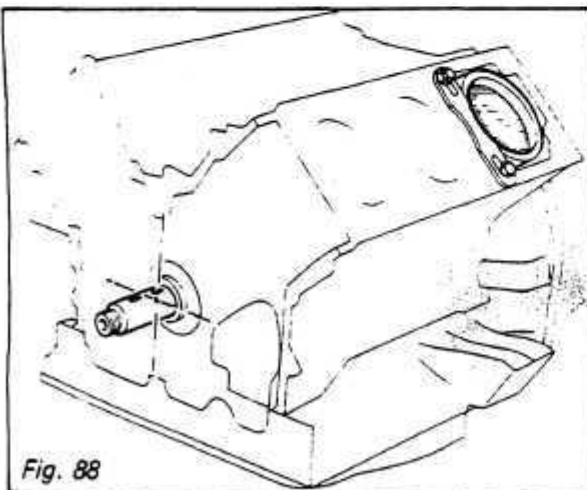


Fig. 88

FITTING CYLINDER HEADS

A—LH cylinder head: insert a pin punch into the side of each cylinder locating roll pin hole to prevent the latter being pushed down when the cylinder head is refitted. (Fig. 89)

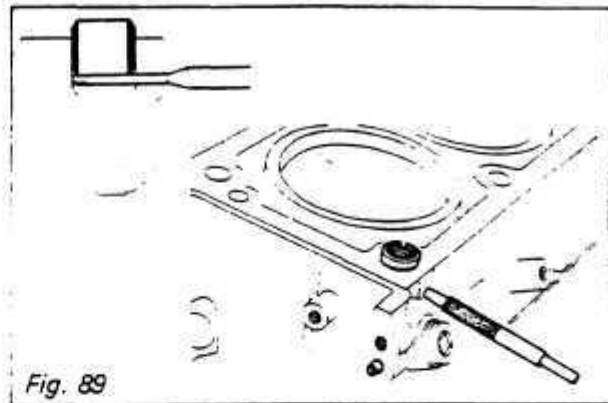


Fig. 89

Insert the roll pins and push them in until they rest on the pin punches.

Remove the liner clamps.

Fit the cylinder head gaskets dry.

Fit the cylinder head.

Line up the LH camshaft so that its slot (E) is positioned as shown. (Fig. 90)

This corresponds to the "on the rock" position of the rocker arms for No. 1 cylinder.

Remove the pin punches. Fit the rocker shaft assembly, taking care to place it the correct way.

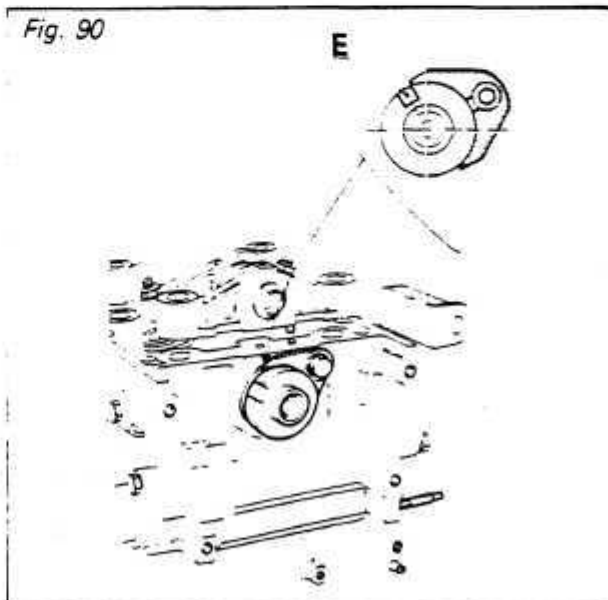


Fig. 90

A—RH cylinder head: carry out the same operation for the RH cylinder head. Line up the RH camshaft so that its slot (F) is positioned as shown. This corresponds to the "on the rock" position of the rocker arms for No. 6 cylinder. Fit the rocker arm assembly, taking care to place it the correct way round. (Fig. 91)

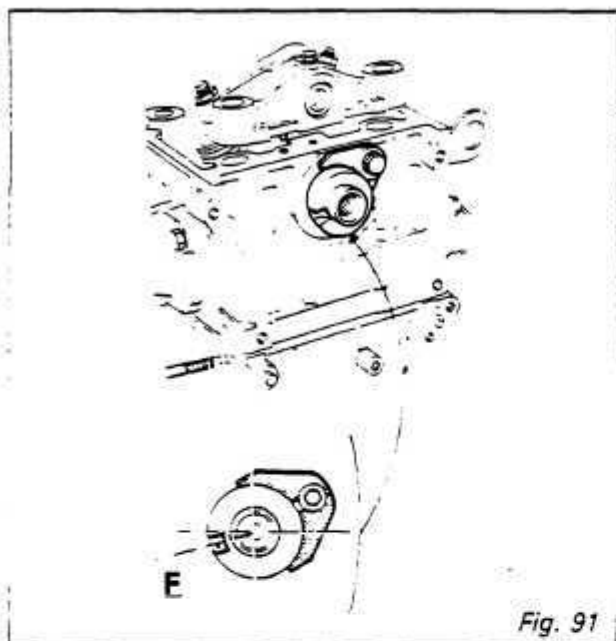


Fig. 91

Lubricate the cylinder head bolts and hand tighten them.

Torque tighten the cylinder heads on both banks.

Refit:

oil pressure switch

tensioner oil filter gauzes

both chain tensioners

the fixed shoes

tensioner blades

timing sprocket key and timing sprocket with timing mark facing outwards. (Fig. 92)

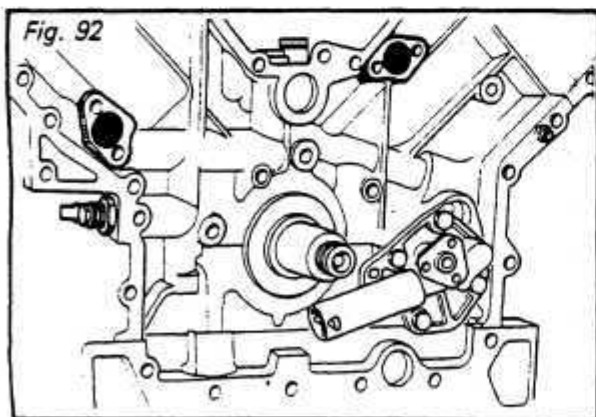


Fig. 92

VALVE TIMING LH SIDE

Turn the crankshaft clockwise so that the keyway centre lies on the centre line of the LH bank of cylinders. (Fig. 93)

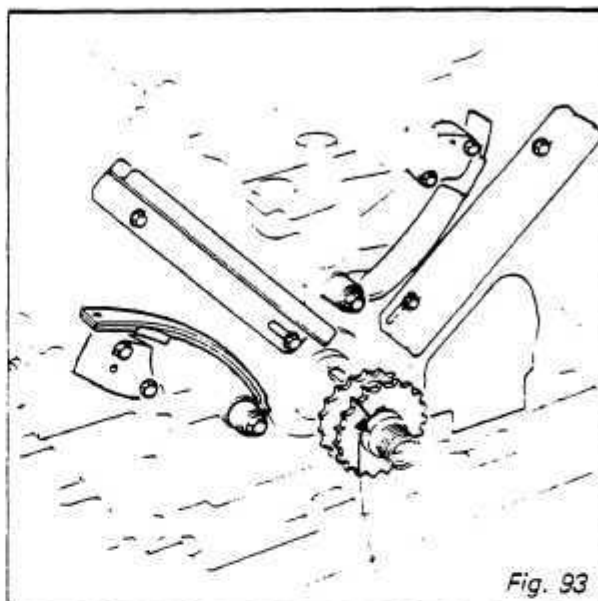


Fig. 93

Fit the timing chain to the LH sprocket, with the dual marking on the chain astride the timing mark on the sprocket.

Now fit the timing chain over the rear set of teeth on the timing double sprocket, with the single marking on the chain in line with the timing mark on the front of the double sprocket. (Fig. 94)

Fit the camshaft sprocket to the camshaft, taking care to ensure that the driving pin enters its slot.

Torque tighten the camshaft sprocket bolt while preventing the crankshaft from turning.

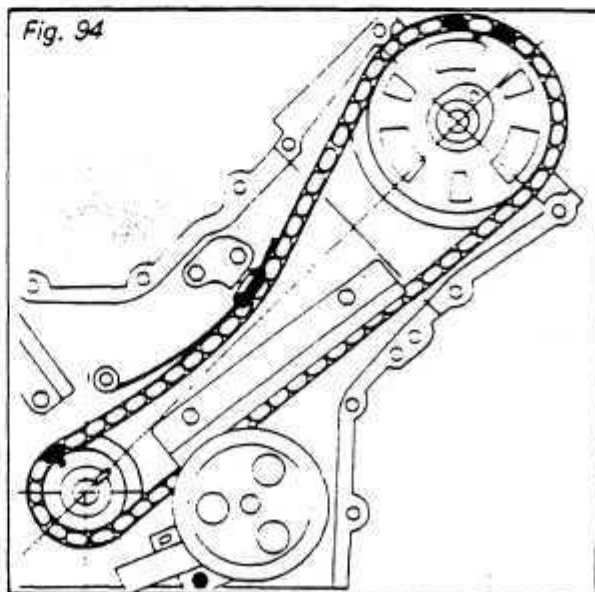
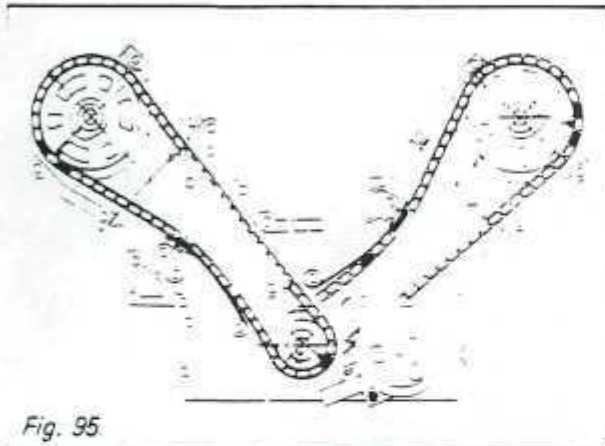


Fig. 94

VALVE TIMING RH

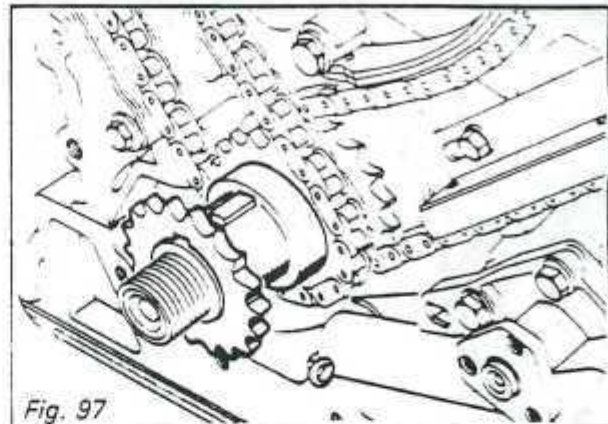
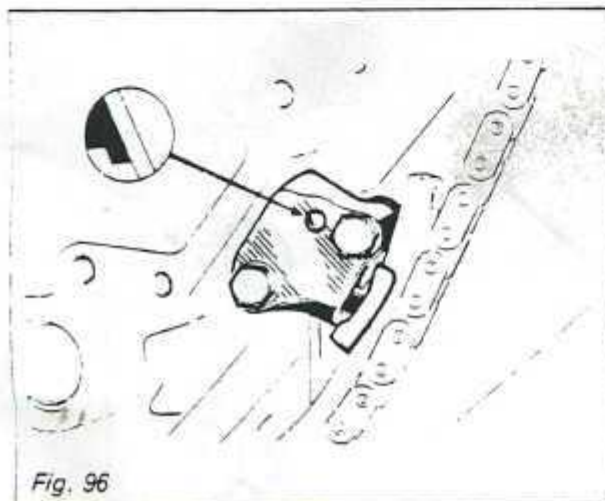
Turn the crankshaft through 150° (the timing mark on the crankshaft sprocket becomes in line with the oil pump cover bottom fixing bolt). (Fig. 95)



Fit the timing chain to the RH sprocket, with the dual marking on the chain astride the timing mark on the sprocket.

Now fit the timing chain over the front set of teeth on the timing double sprocket, with the single marking on the chain in line with the timing mark on the front of the double sprocket. Torque tighten the camshaft sprocket bolt while preventing the crankshaft from turning.

Set both timing chain tensioners by turning the ratchet mechanism clockwise with a screw driver. Do not assist the tensioner to find their operational setting. (Fig. 96)



Position the crankshaft with the keyway uppermost. (Fig. 97)

Refit:

The distance piece for the oil pump drive pinion, The key,

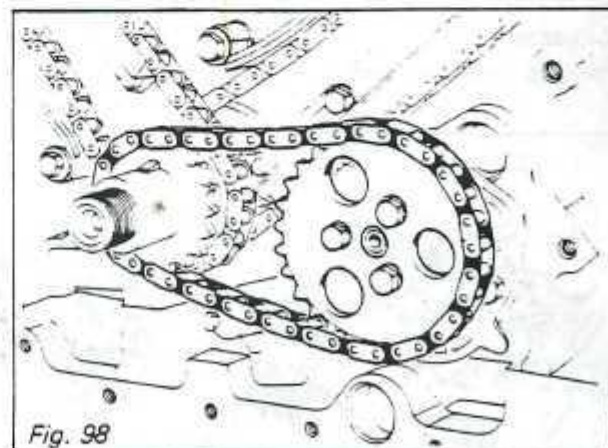
And oil pump drive pinion,

The oil pump drive chain and sprocket, assemble the bolts with loctite and torque tighten them. (Fig. 98)

The timing cover gaskets dry.

The timing cover (located by two dowels)

The fixing bolts (smear the bottom bolts with loctite)

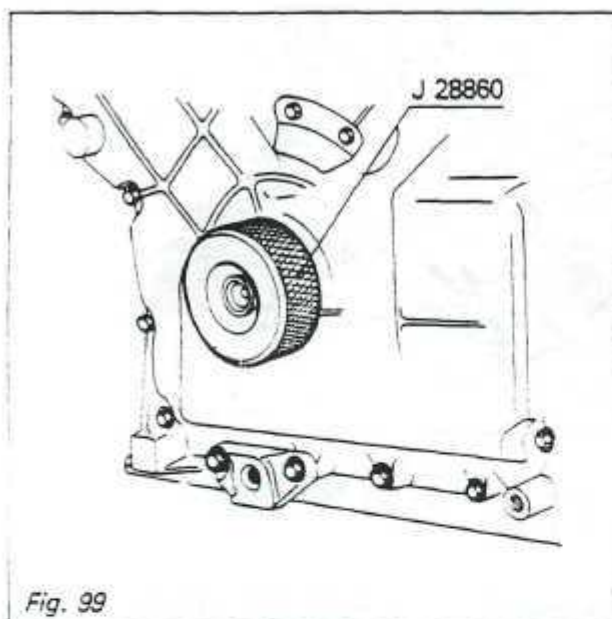


Trim off the gaskets flush with the tops of the cylinder heads.

Refit:

The crankshaft pulley oil seal.

The pulley (oil seal bearing face lubricated). (Fig. 99)



Smear the crankshaft threads with loctite.
Prevent the crankshaft from turning.
Fit and torque tighten nut.

Refit:

The water pump complete with its hoses
(inserting new "O" rings) (Fig. 100)

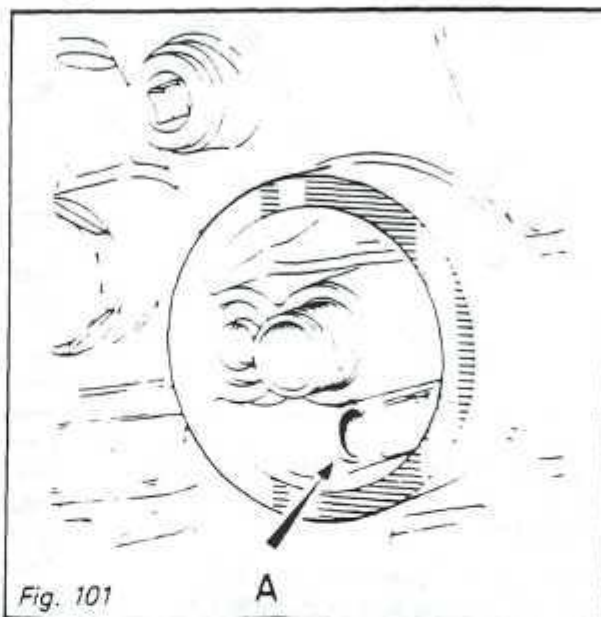
Insulating plates

Rubber seals round inlet tracts

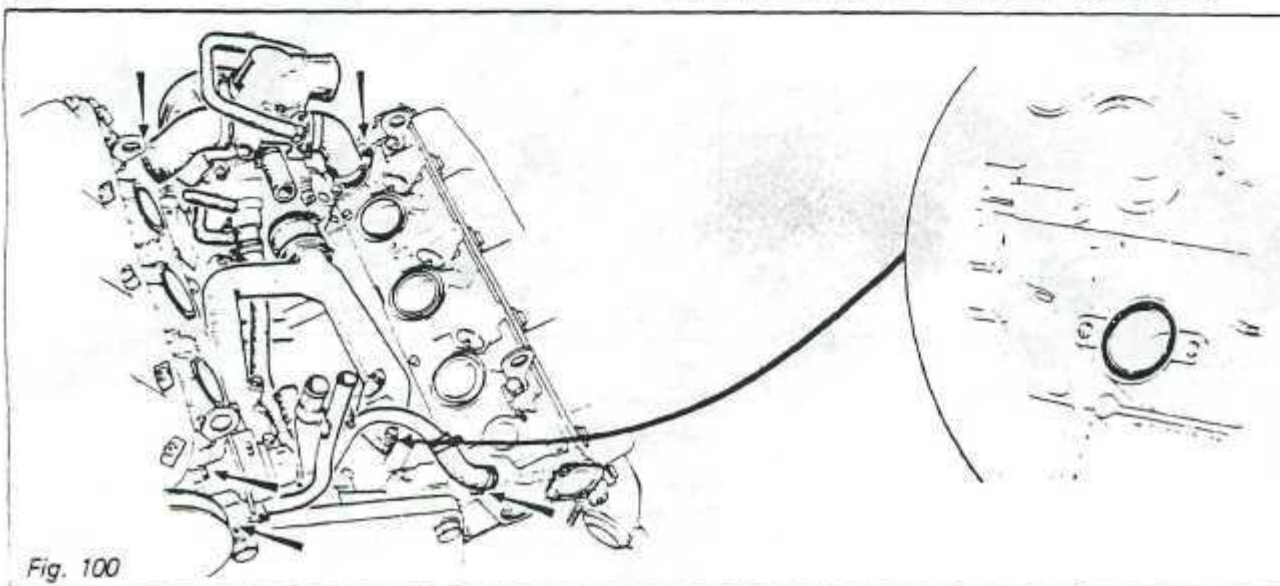
Inlet manifold assembly

Alternator and its drive belt and distributor and
leads

Adjust rocker arm clearances. Fit the rocker
covers and spark plugs.
Remove the engine from the support.
Fit and tighten
the cylinder block drain plugs
and new oil filter (after injecting some oil
through hole (A) to prime oil pump) (Fig. 101)



Fit the main bearing oil seal using tool J28861
Fit the flywheel or converter driving plate.
The final bolts are of the self locking type and
they must be renewed after each dismantling;
smear the threads with loctite.
Refit the dipstick tube smeared with loctite.



Engine

C:07:13

Refit the engine to the vehicle.

Fill

The engine with oil

The cooling system

Adjust the controls, ignition and fuel injection.

Then run the engine for 30 minutes. Allow it to cool down for at least two hours, then re-tighten the cylinder heads.

Loosen bolt No. 1 and re-tighten it to 15 lb/ft (20mm). Repeat the above on each bolt in the order shown. (Fig. 102)

Slip graduated disc over the socket before fitting the torque wrench and angular tighten to 115°.

Repeat for each bolt in the order shown.

Adjust valve clearances.

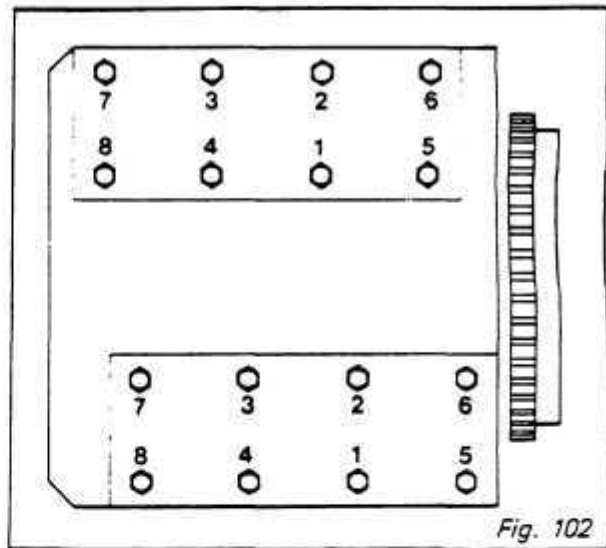
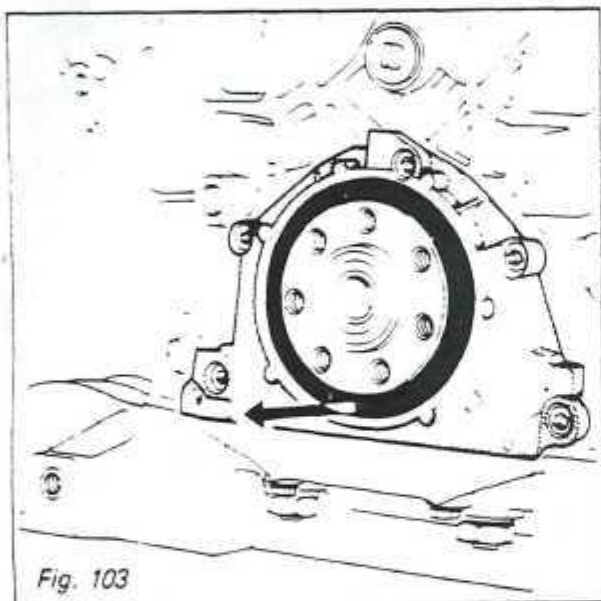


Fig. 102

Main Bearing Oil Seal—Flywheel End—Changing**REMOVING**

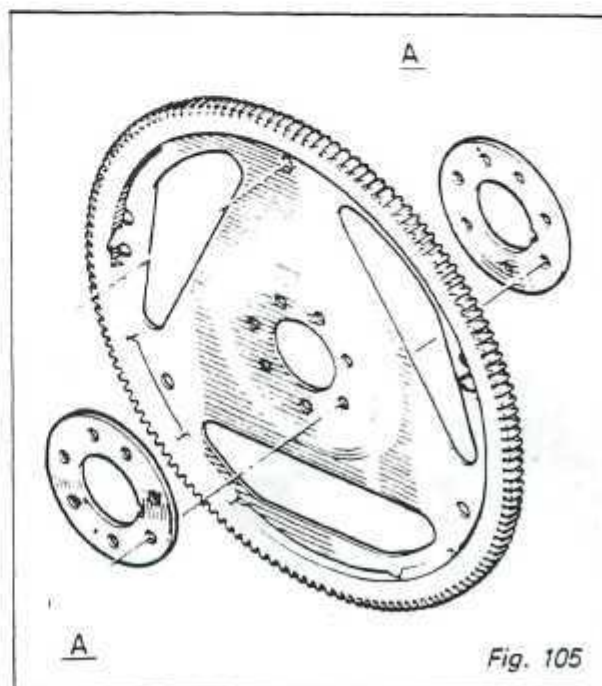
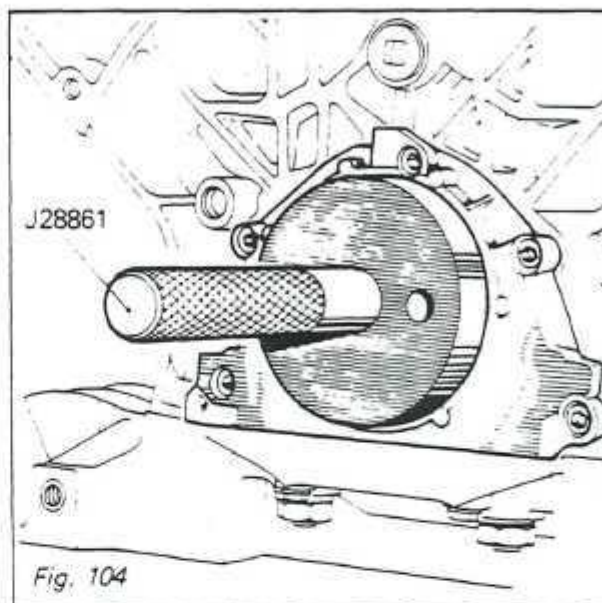
Remove the gearbox or automatic transmission the clutch mechanism and disc if applicable flywheel or convertor driving plate (Fig. 103) Ease the oil seal out with a screw driver. Special points concerning refitting. Lubricate the new oil seal and insert it in the tool. J28861



Take extreme care when fitting as the oil seal lip is delicate. Locate the seal by tapping on the end of the tool. (Fig. 104)

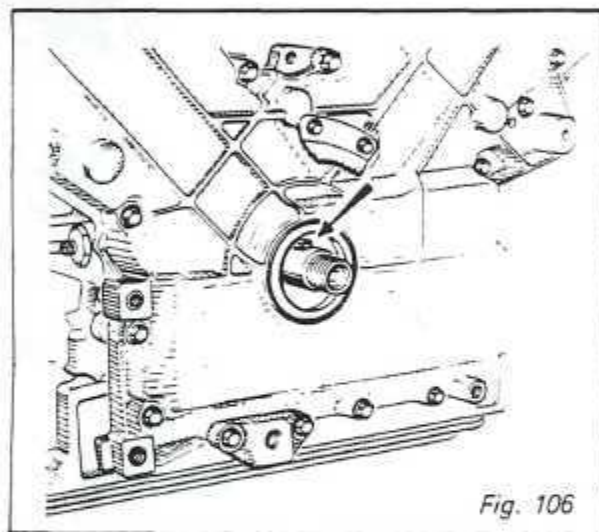
Remove the tool by pulling and turning at the same time. Smear the new bolts for the flywheel or convertor driving plate with loctite. Note: Place one plate (A) on each side of the convertor driving plate. (Fig. 105)

Torque tighten bolts.
Convertor driving plate fixing bolts 50 lb/ft (68 mm).
Flywheel fixing bolts 45 lb/ft (60 mm).



Main Bearing Oil Seal—Timing Gear End—Changing**REMOVING**

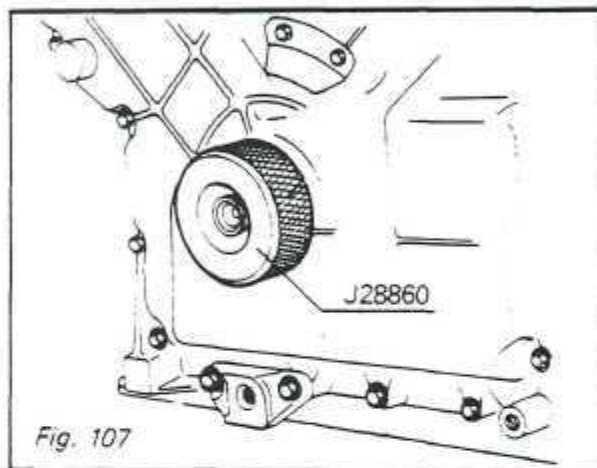
Remove
alternator drive belt
air conditioning drive belt
exhaust muffler
Rotate crankshaft until TDC timing mark on pulley
is straight up. (Fig. 106)



Remove crankshaft pulley nut. Remove pulley.
Extract the old oil seal with a screw driver; do not
mark the oil seal location.

REFITTING

Lubricate the new seal, fit it to inserting tool
J28860 — offer up tool and seal, push the tool in
until it contacts the timing cover which locates
the oil seal correctly. (Fig. 107)



Check the oil seal locating on the old pulley. Fit a
new pulley if the old pulley is marked or worn;
make sure it enters the key.

Smear the bolt with 1 or 2 drops of loctite and
torque tighten the nut to 135 lb·ft (183 nm).

Refit
exhaust muffler
alternator drive belt
air conditioning drive belt and tension

Oil Pump—Overhauling

REMOVING

Drain engine oil

Remove

alternator drive belt tensioner

air conditioning drive belt

air conditioning compressor

air filter

and rocker covers

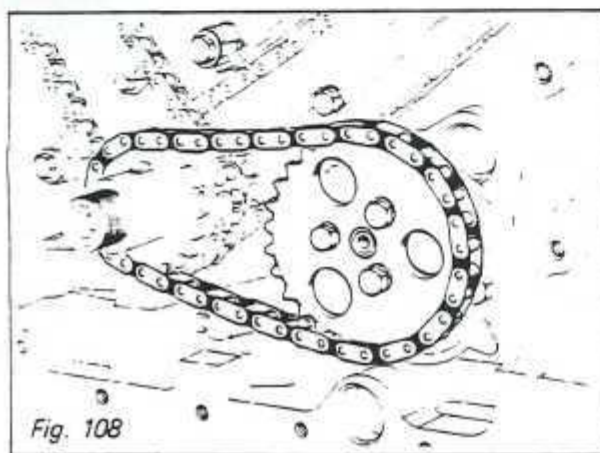


Fig. 108

Remove

exhaust muffler

crankshaft pulley nut

crankshaft pulley

and timing cover

Remove

the sprocket and chain (Fig. 108)

oil pump cover (never unstick the cover by tapping the release valve boss) (A) (Fig. 109)

and driven gear

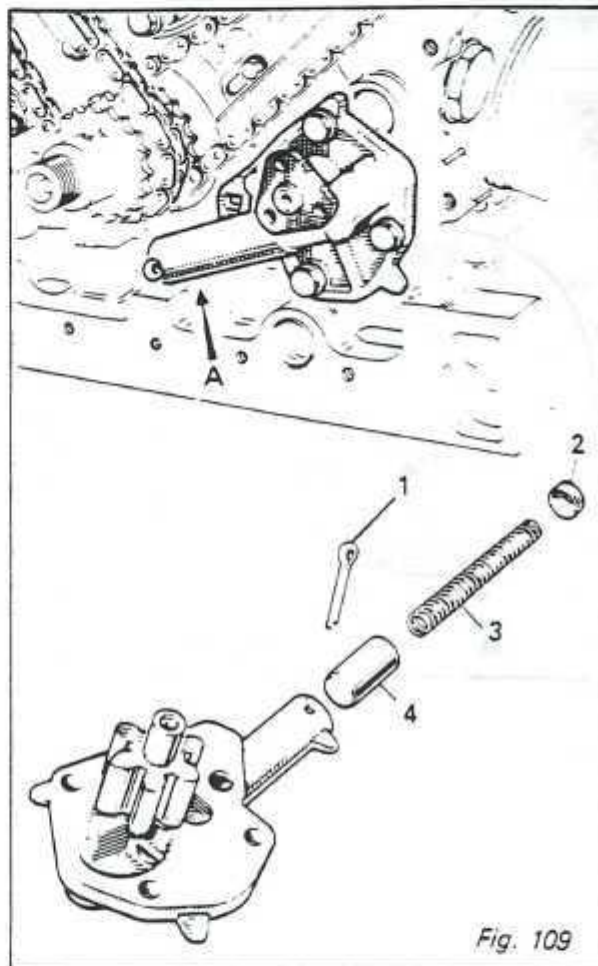


Fig. 109

DISMANTLING

Remove the split pin (1) and take out

the concave spring seat (2)

spring (3)

and release valve plunger (4)

OVERHAULING

Check

condition of components;

and location in cylinder block. (Fig. 110)

The complete oil pump assembly must be changed if any particular part is worn.

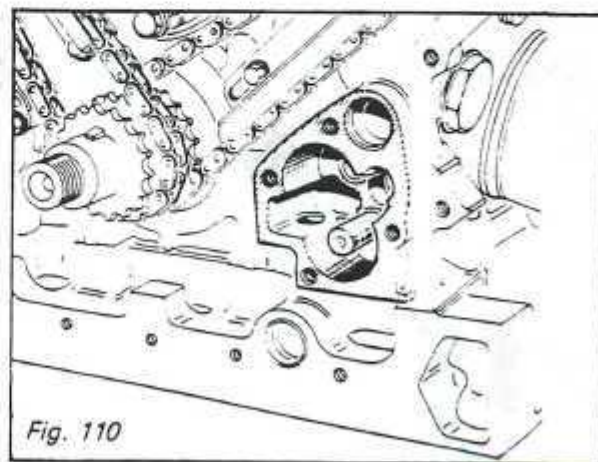
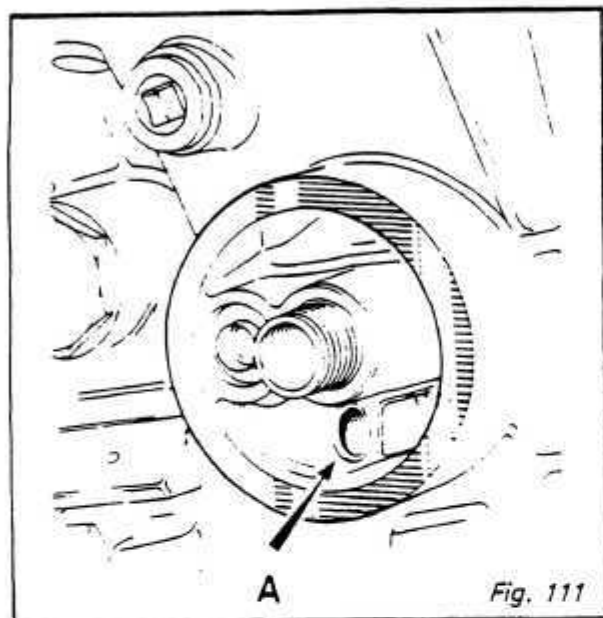


Fig. 110

REFITTING

Check oil pump rotation.

Make sure that the release valve plunger and spring seat are inserted the correct way round.

**SPECIAL POINTS CONCERNING REFITTING**

Fit in position
the drive gear
and oil pump cover; tighten the driving plate bolts
progressively to make sure that pump gears
revolve freely.

Remove the oil filter and inject some engine oil
through hole (A) with an oil can to prime the oil
pumps. (Fig. 111)

Fit the oil pump sprocket bolts and the timing
cover bottom bolts with loctite.

Torque tighten the pulley nut after smearing the
crankshaft threads with loctite.

Refit

alternator drive belt and tension

rocker covers

air conditioning compressor

air conditioning drive belt and tension

exhaust muffler

Fill engine with correct quantity of recommended
oil.

Make all necessary adjustments.

Oil Pressure Checking — Fig. 112

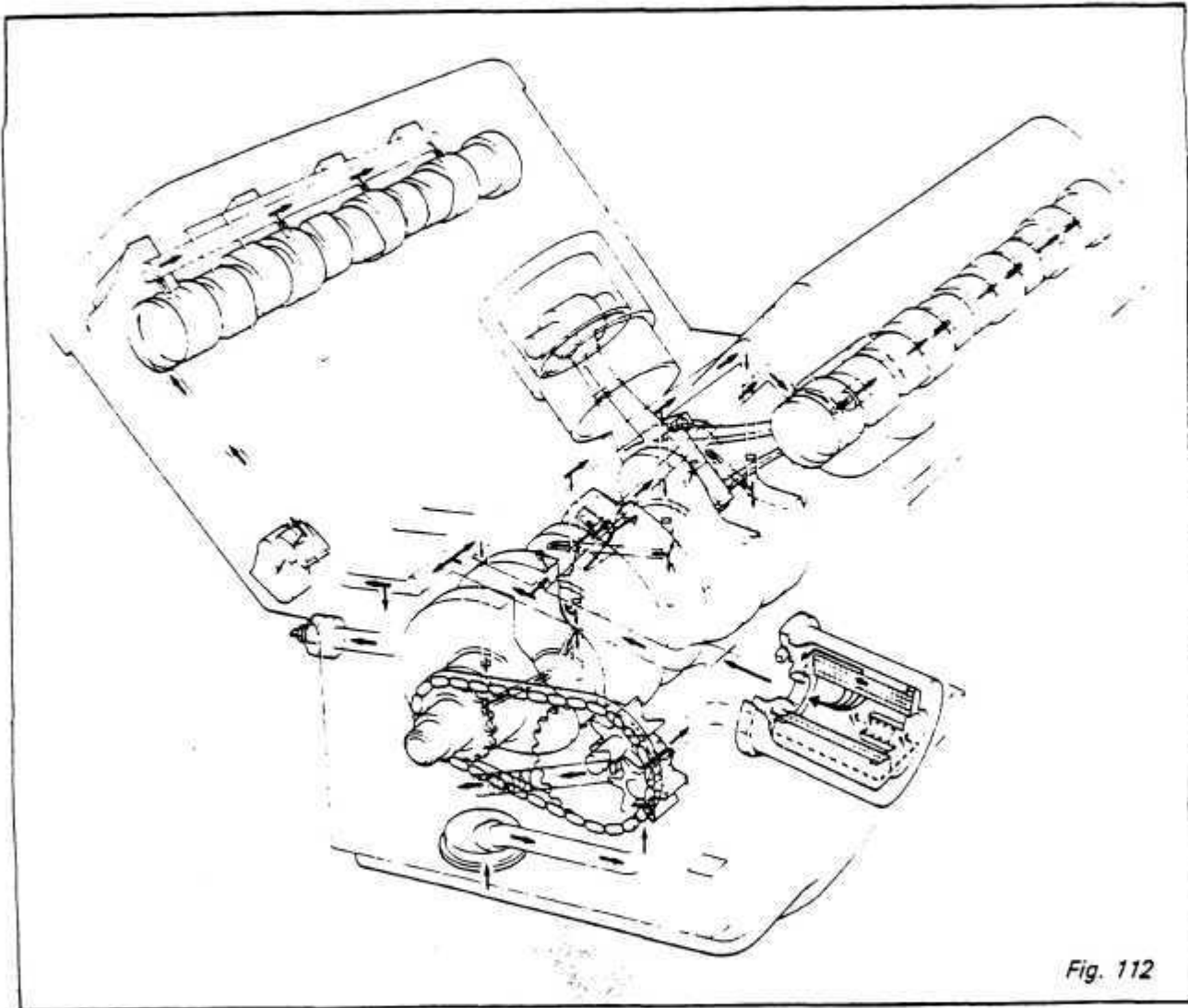
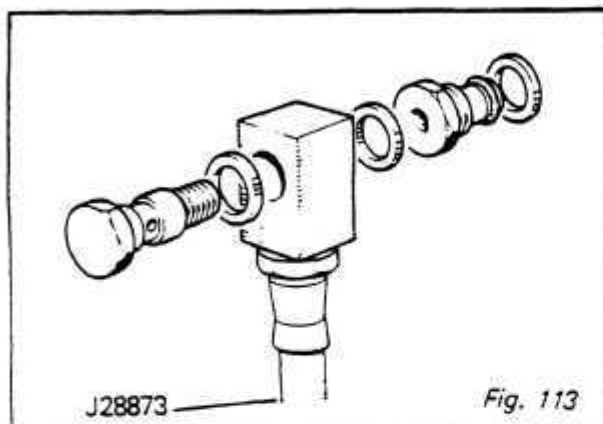


Fig. 112

The engine oil pressure must be checked when the engine is hot (80°C).

The oil pressure is to be checked using tools J28872 and J28873. (Fig. 113 and 114)

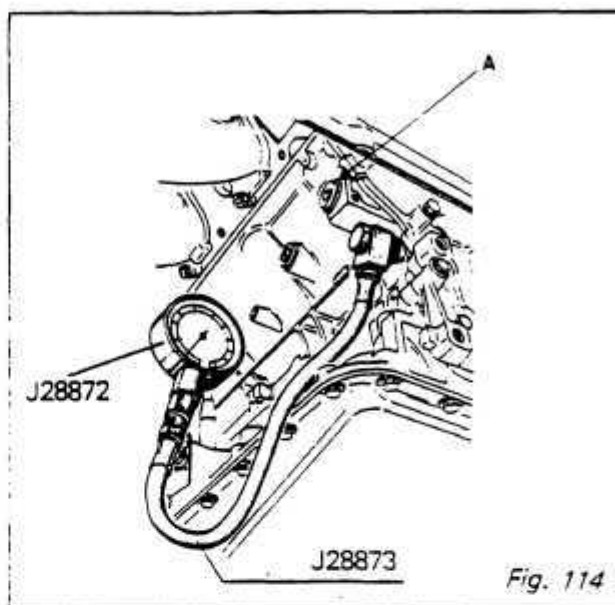


Remove oil pressure sender then connect oil pressure checking gauge.

The oil pressure should be

32 psi (2,0 bars) min at 900 rpm

65 psi (4,4 bars) min at 4000 rpm



Refit

the oil pressure sender using a new copper washer and top up engine oil if required.

Water Pump

REMOVING

Remove
intake manifold
alternator and A/C
drive belts
Loosen hose clamps securing water pump and
heater hoses. (Fig. 115)

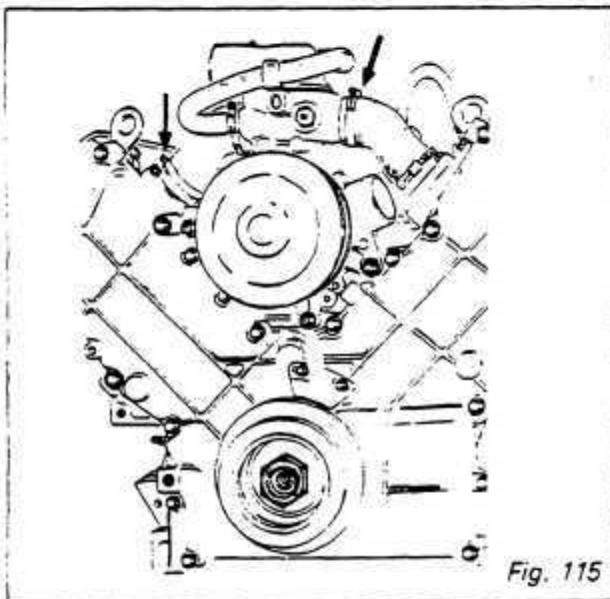


Fig. 115

Remove
coolant temperature switch wire.
water pump mounting bolts.
Remove water pump.

Remove
water pump body (Fig. 116)
coolant temperature switch
thermostat cover
and thermostat

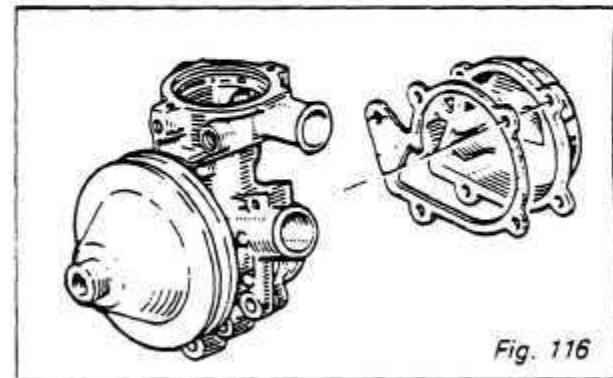


Fig. 116

FITTING

Clean the joint faces before fitting new gaskets.
Fit the thermostat to its cover the right way
round. (Fig. 117)

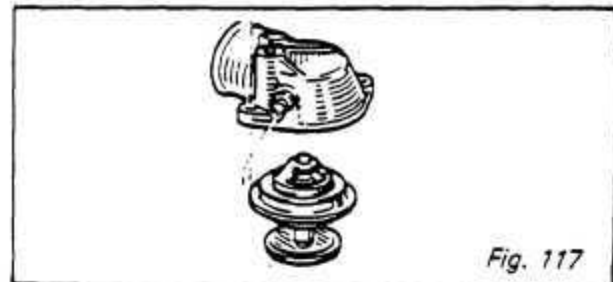


Fig. 117

Check that "O" rings are in position in the inlet
manifold.

Tighten all hose clamps.

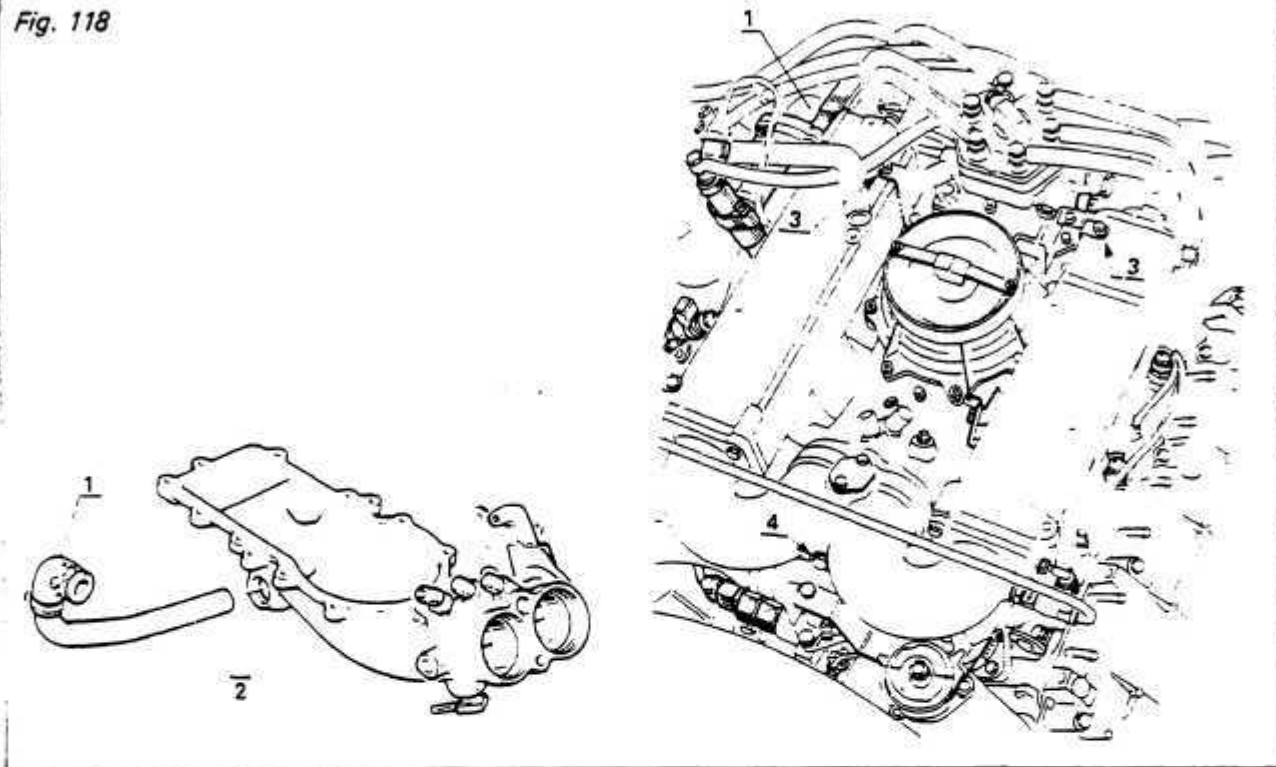
Refit alternator and A/C drive belts and tension.

Refit intake manifold.

Fill the cooling system.

Inlet Air Manifold

Fig. 118



LOWER AIR CASING

REMOVING

Remove air filter assembly. Unscrew the fuel unions on the fuel metering head.

Loosen the hose clip connecting air inlet pipe (1) to the idle speed control. (Fig. 118)

Turn the pipe to free the idle speed control hose and pull to release it from the lower air casing.

The pipe is assembled with an "O" ring (2) in the lower air casing for sealing purposes.

Remove idle speed control. Unscrew the 2 capscrews (3) and bolt (4) holding the lower air casing to the inlet manifold.

Disconnect arm (5) (Fig. 119) from the throttle linkage ball as follows: —

— rotate clip half a turn to free it then slide it along $\frac{3}{8}$ " to unlock the ball.

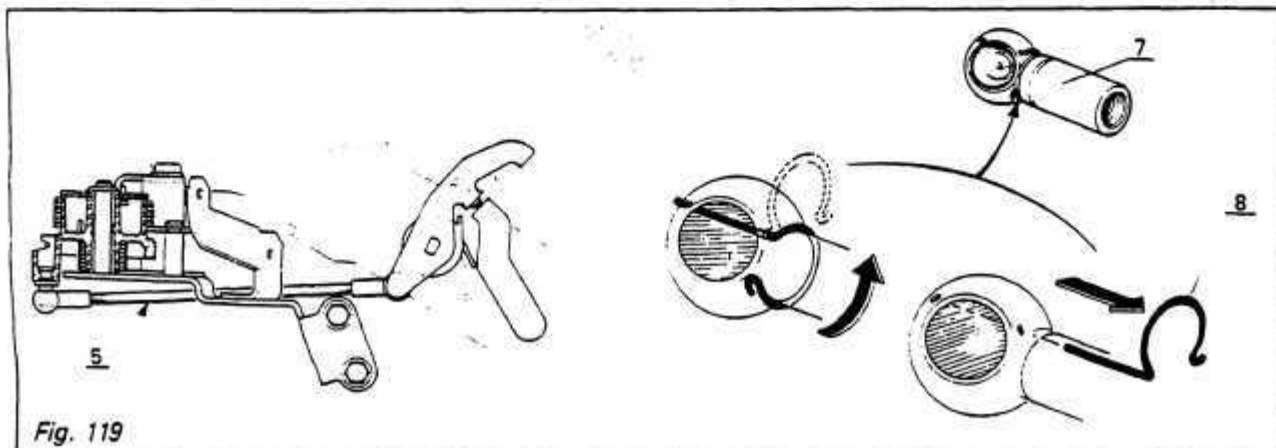


Fig. 119

NOTE: The arm has LH and RH threaded ends to assist adjustment.

The LH threaded end is identified by a groove (7) on the ball joint. Disconnect the HT wires from the distributor.

Free the lower casing rearwards to clear the air intake elbow rings and lift it at the back to pass over the distributor cap. Remove the lower casing and disconnect the vacuum pipes on the distributor.

REFITTING

Change all seals. There is a plastic seal at the elbow end of the air channel and an "O" ring at the lower casing end in the connecting rings.

Connect up the vacuum pipes.

Offer up the casing.

Screw in bolt (4) first to enable capscrews (3) to line up with their holes.

Tighten bolt (4) then capscrews (3). (Fig. 118)

Re-connect

The HT wires to the distributor cap

All fuel unions

The idle speed air pipe, after greasing the "O" ring in the lower casing

The idle speed control

The throttle arm ball joint, locking it correctly with the clip (8) (Fig. 119)

INLET AIR MANIFOLD

REMOVING

Remove lower air casing (see preceding page).

Unscrew the 4 manifold bolts (1). (Fig. 120)

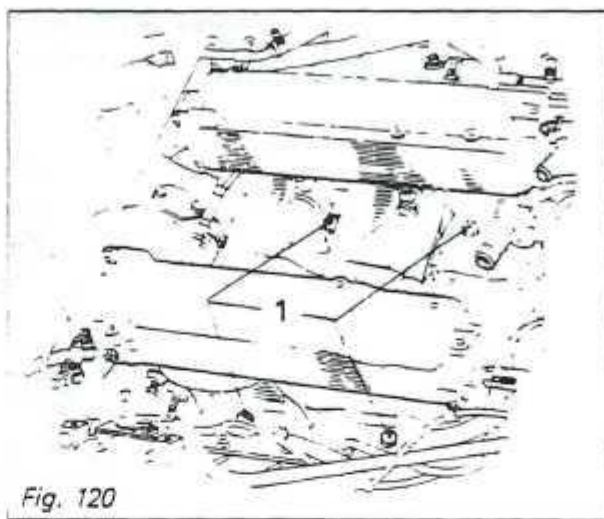


Fig. 120

REFITTING

Note the following

Change all gaskets and seals

Fit inlet sleeves

Reconnect the distributor vacuum pipe

Fit the fuel metering head/air flow meter in place

Remember to pass the control arm under the bracket

Screw the inlet sleeve bolt in a few threads so as to be able to lift up the back of the air flow meter to avoid the distributor cap

Screw in bolt (42) first partly to line up capscrews (41) then tighten first

REFIT

The auxiliary air pipe

The throttle arm

Fuel pipes

Injectors

HT wires

Oil fume rebreathing and vacuum pipes

Connections

Idle speed control

Engine

C:14:01

Radiator

ENGINE COOLING

The vehicle has two (2) electric fans for radiator cooling mounted at the front of the vehicle. These fans are activated when the engine coolant temperature exceeds 97°C (206°F) and deactivated at 91°C (195°F). Operation of these fans is controlled by a temperature switch located on the coolant return pipe in the engine compartment.

The water pump, located at the rear of the engine, is belt driven by the crankshaft pulley. The thermostat is housed in the top of the water pump under the thermostat housing cover. The thermostat housing cover is equipped with an air bleed screw used to purge the air from the coolant system when refilling.

Coolant leaving the engine is directed through a series of pipes and hose couplings along the left side of the vehicle centre tunnel to the radiator. Coolant leaving the radiator is directed through a series of pipes and hose couplings along the right side of the vehicle centre tunnel to the engine.

The coolant expansion tank (fill point) located on the right side of the engine compartment, is connected to the coolant return pipe by a hose.

C:14:02

Engine

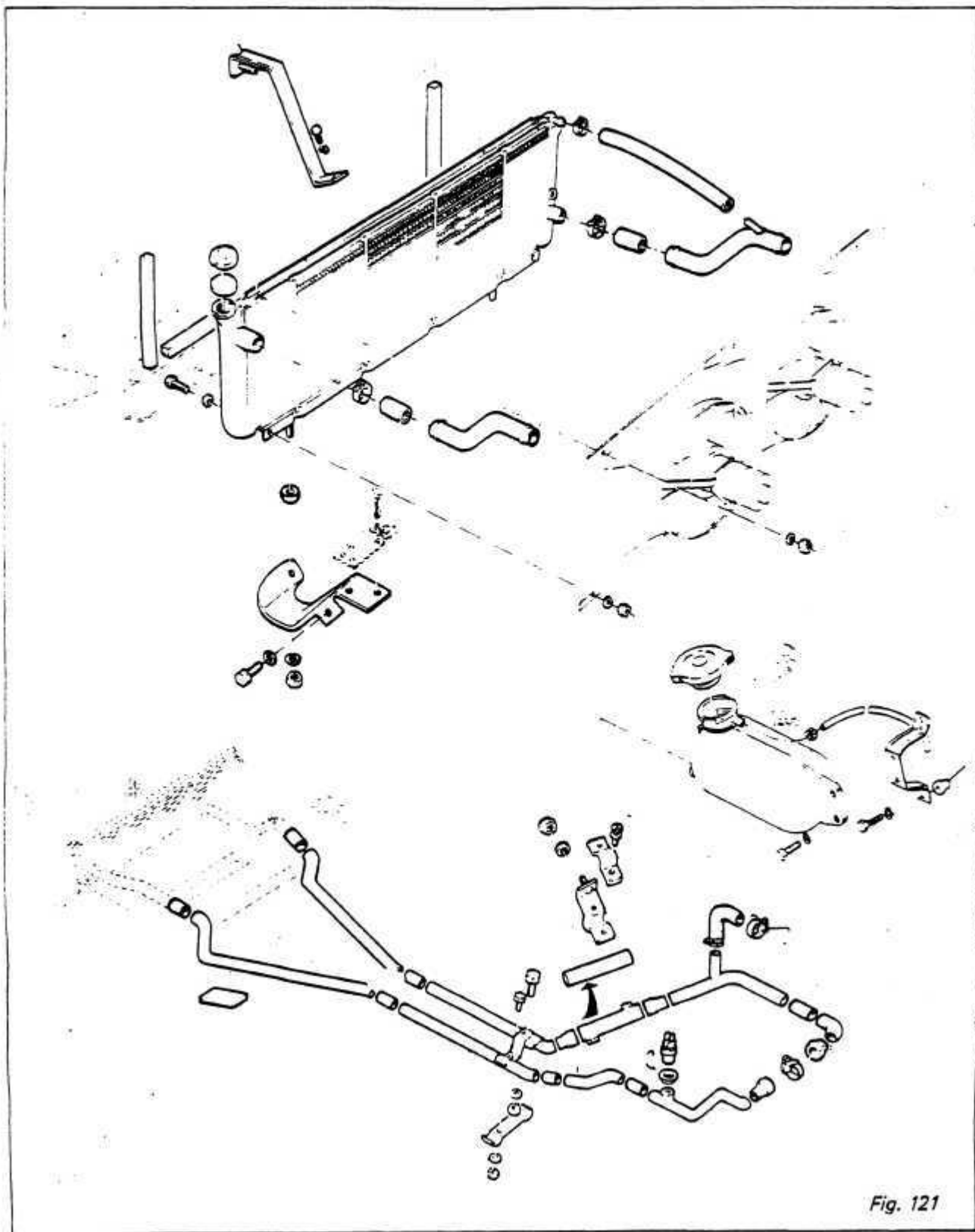


Fig. 121

DMC

Radiator

REMOVING

Release the radiator bottom hose connection and drain coolant, also release the outlet breather pipe connection from the RH top of the radiator.

Release the radiator top hose connection.

Release all screws securing the radiator air duct to the body and spoiler and withdraw duct downwards.

Remove the nuts, washers and rubber mountings securing the radiator to the lower support brackets.

Disconnect both horn leads. Remove three bolts securing each lower support bracket and horn bracket to frame and whilst providing alternative support for the radiator assembly, remove support brackets and horns with brackets.

With radiator assembly supported, remove each bolt securing radiator top support to frame.

Manoeuvre the radiator assembly sufficiently to gain access to and release nut securing each top support strut to radiator assembly. Remove brackets.

From top of radiator remove central nut and bolt securing fan housing to radiator and two nuts securing condenser.

From lower edge of radiator remove three nuts and bolts securing fan housing and two nuts securing condenser.

Ease condenser forwards and disengage mounting studs from radiator downwards between condenser and fan housing and remove.

Provide temporary support for condenser and fan housing.

REFITTING

With the fan housing assembly and condenser supported in position, insert the radiator between and engage the condenser mounting studs in the radiator top and bottom flanges. Fit nuts to all four studs.

Secure fan housing assembly to radiator with a central nut and bolt in the top flange, and three nuts and bolts along the bottom flange.

Secure the radiator top support struts to radiator assembly with nuts.

Ensure foam strip is fitted to underside of body, to about top of radiator assembly.

Raise the radiator assembly into position and secure top struts to frame with two bolts.

Check rubber bushes are fitted to radiator bottom studs before fitting lower support brackets onto studs and securing, with horn brackets, to frame using three bolts each side.

Fit second rubber bush, washer and nut onto each radiator bottom stud. Do not over-tighten nuts.

Connect horn leads. Slide radiator duct into position and secure with screws to body and spoiler.

Refit top hose, bottom hose and outlet breather pipe to radiator.

Refill cooling system with correct coolant mixture.