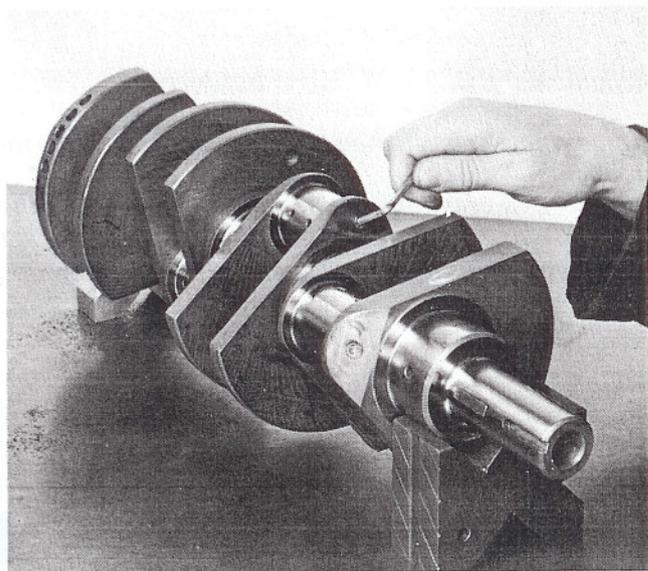
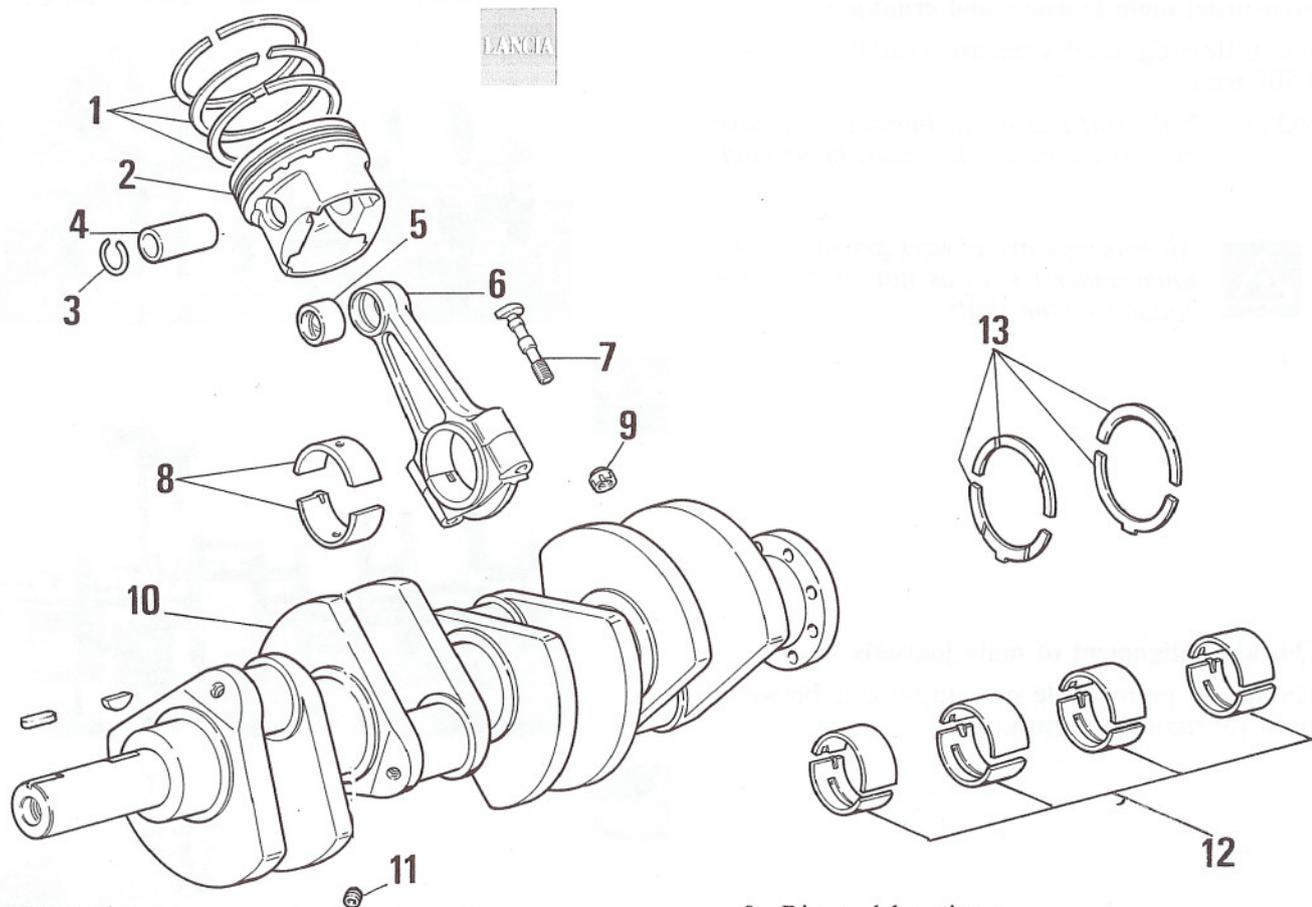


### 10.



Removing-refitting oil plugs

Crankshaft and associated components available as spares



1. Piston rings
2. Piston
3. Gudgeon pin circlips
4. Gudgeon pin
5. Connecting rod bush
6. Connecting rod
7. Bolts fixing con rod caps

8. Big end bearings
9. Nuts fixing con rod caps
10. Crankshfat
11. Plugs for crankshaft oil ducts
12. Crankshaft bearings
13. Thrust washers

## CRANKSHAFT BEARINGS

## Checking crankshaft bearings

**NOTE** *The following undersizes are available for crankshaft bearings: 0,127 – 0,254 mm.*



*Never carry out any adjustments to the half bearings. If there are signs of grooves or traces of seizing, they must be replaced. Ensure the utmost cleanliness when fitting.*

## Fitting crankshaft bearings

**NOTE** *Make sure that each half bearings rests on the entire housing in the engine mounting.*

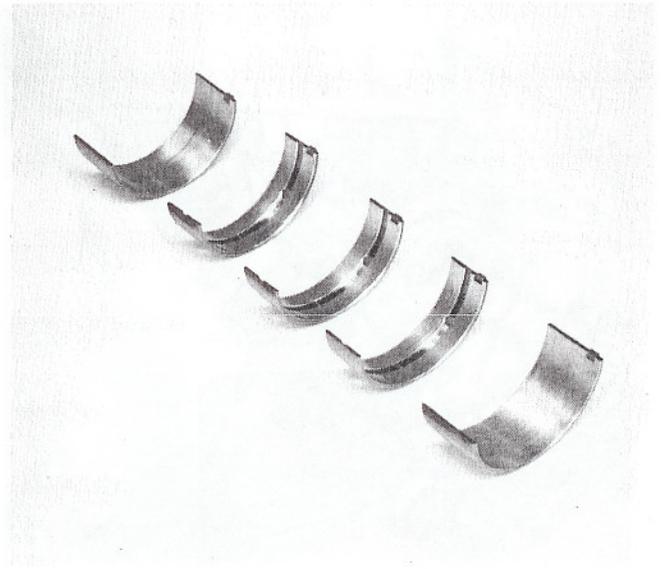


*Carefully clean the external surfaces of the half bearings and the relevant mountings when fitting. The bearings fitted on the front and rear supports do not have splines for the lubrication oil.*

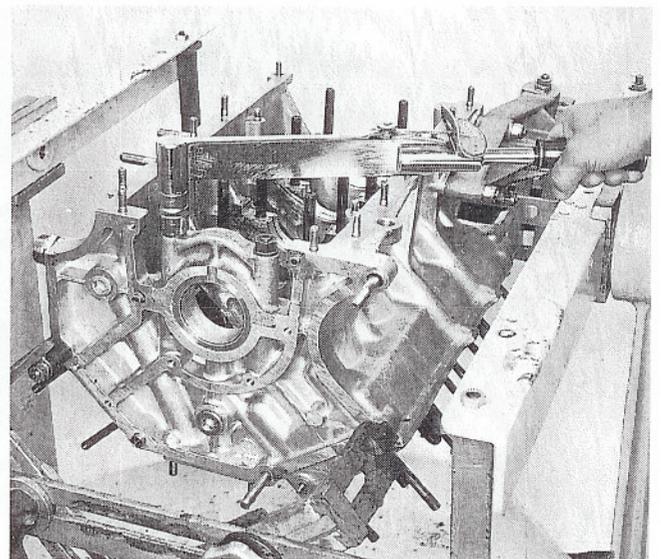
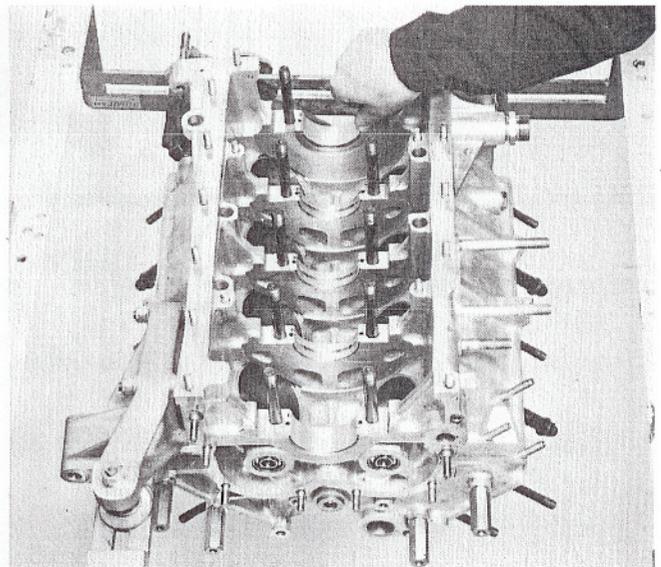
CHECKING CRANKSHAFT BEARING  
PRE-LOADING

**8,8 daNm**

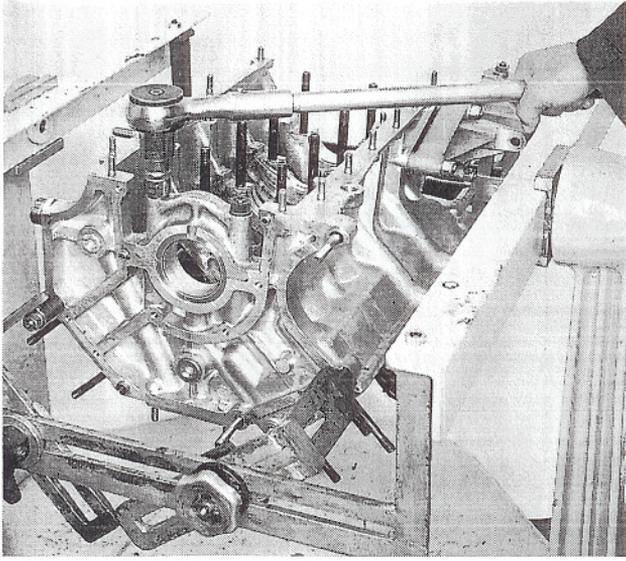
Fit the bearings in the caps and in the crankcase.  
Fit the main bearing caps and tighten to the recommended torque of 8,8 daNm.



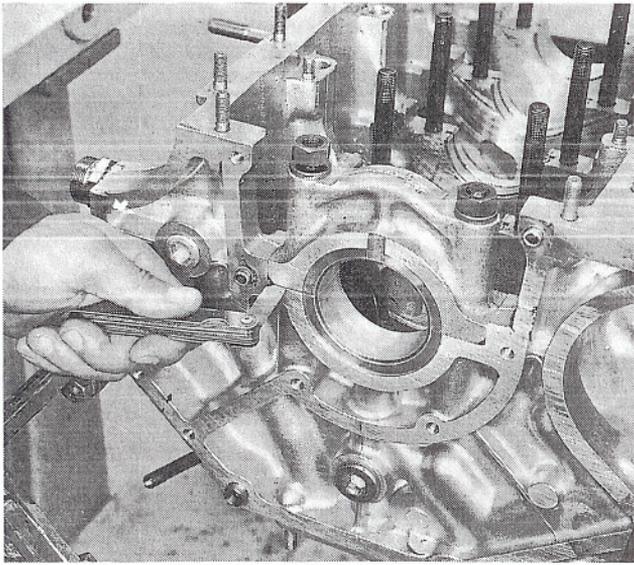
LANCIA



10.



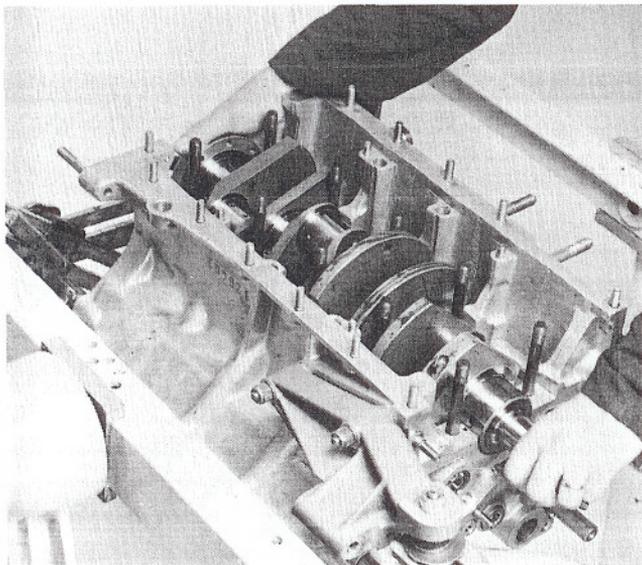
Completely undo one main bearing cap fixing nut.



$\geq 0,05$

Insert the feeler gauge between the edge of the main bearing cap which was previously loosened and check that the cap is raised at least 0,05 mm.

If this is not the case, the fault (due to too large a crankcase housing-bearing cap diameter) should be eliminated by **reaming** the crankshaft seats which should be carried out at specialist workshops.



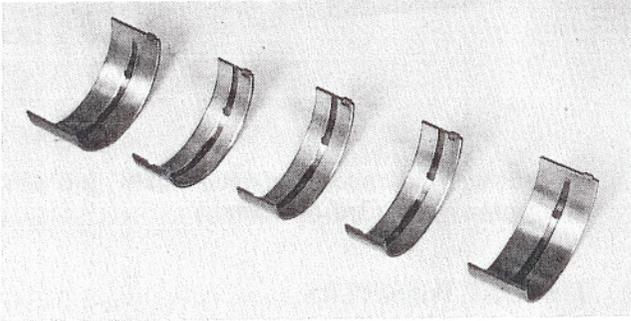
Fitting crankshaft

## MEASURING BEARING CLEARANCE

## Measuring bearing clearance using calibrated wire (1st operation)

The arrow shows the calibrated wire.

**NOTE** Check each bearing separately without removing the shaft during the checking operations.



The bearings fitted on the caps have an oil lubrication spline.

## Bearing caps

These are numbered in order from 1 to 5.

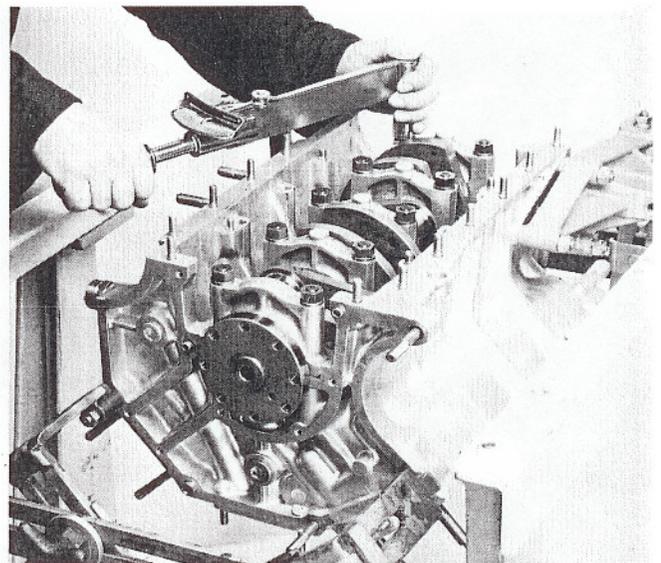
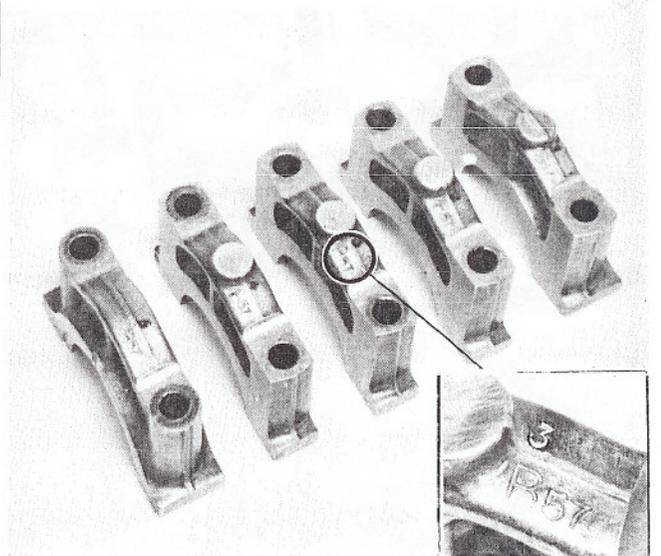
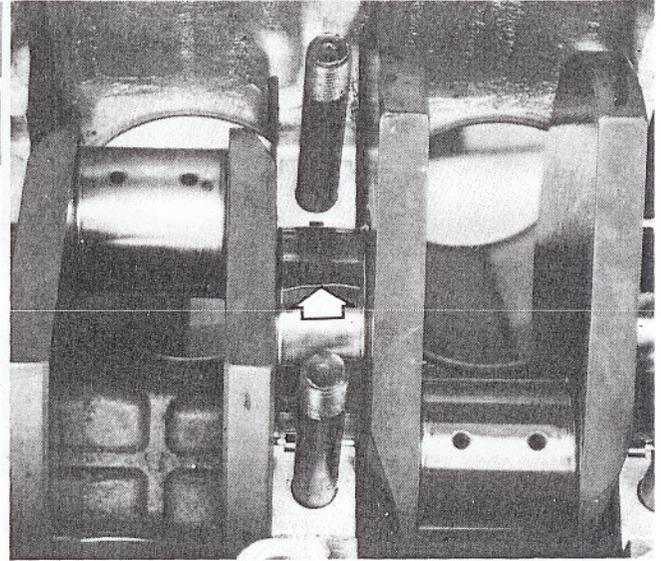
In order to fit them correctly:

- position cap number 1 on the timing side support, turning it in such a way that the number is legible from the flywheel side;
- proceed in the same way for the remaining bearing caps.

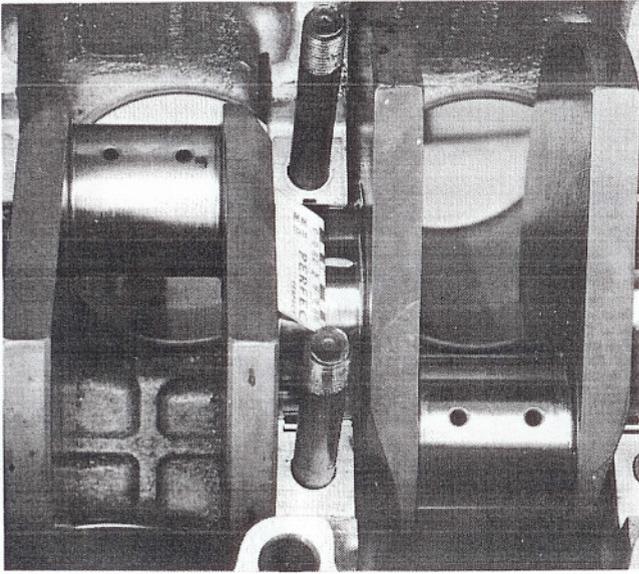
8,8 daNm



Tightening bolts securing main bearing caps to torque (2nd operation)

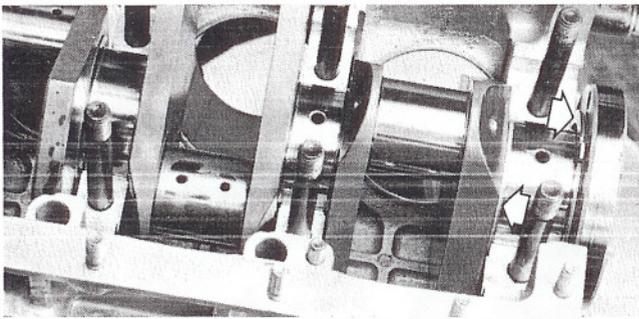


### 10.



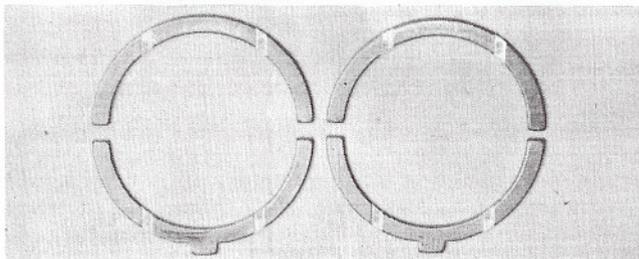
0,006 - 0,038

Measuring clearance between main journals using plastigage (3rd operation)



### THRUST WASHERS

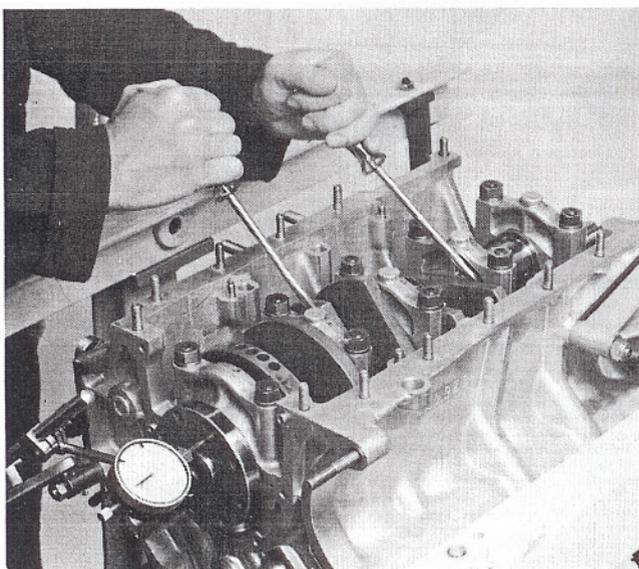
Fitting thrust washers on flywheel side bearing  
Retighten the nuts securing the main bearing caps to torque.



*Refit the thrust washers with the splined surfaces (where the size is marked) facing the crankshaft.*



*The parts concerned with engine oil before fitting.*



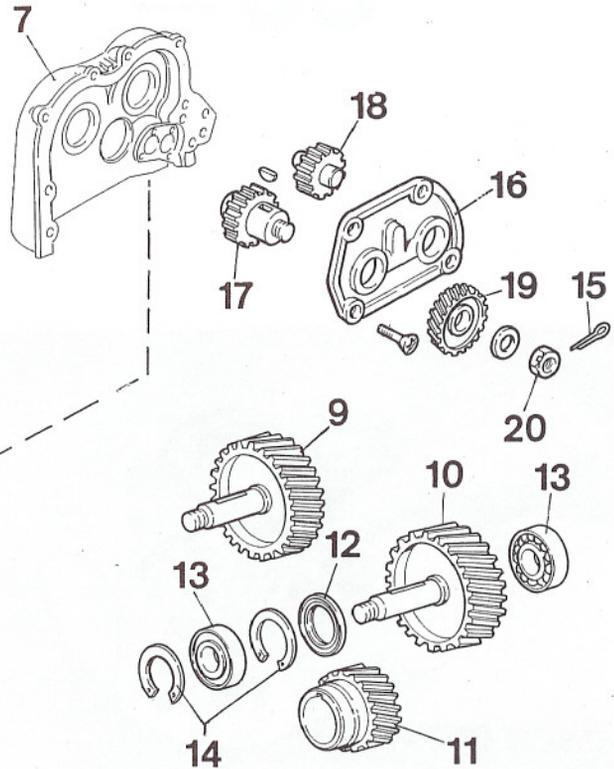
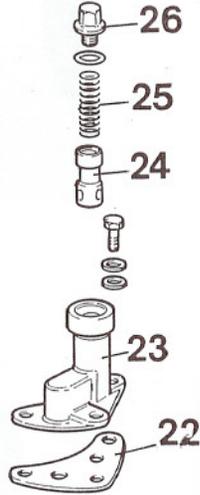
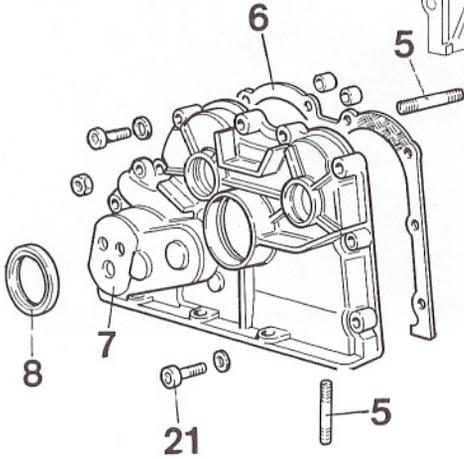
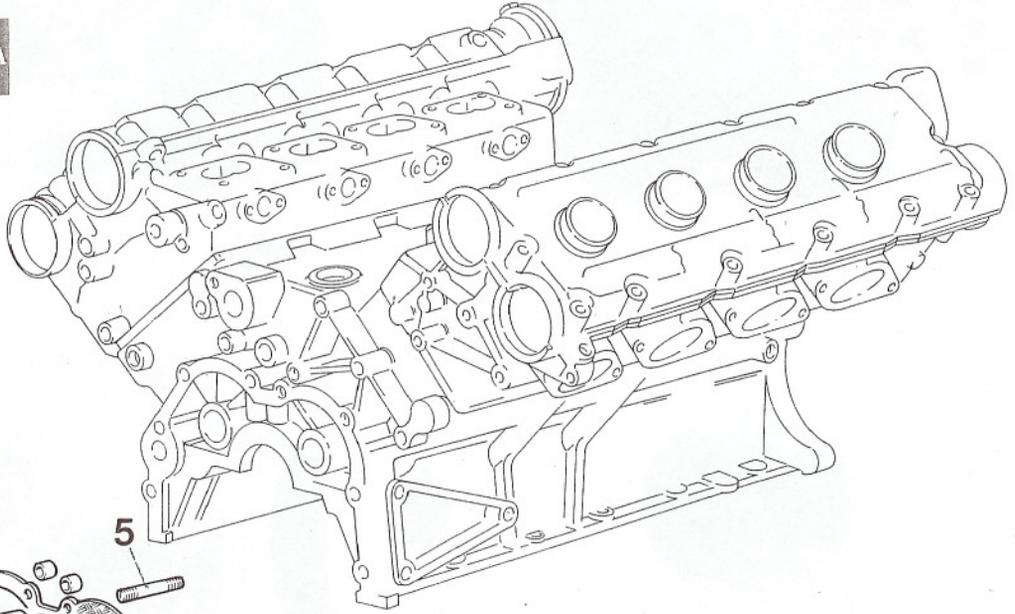
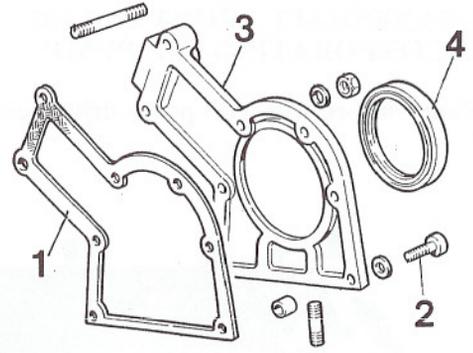
0,100 - 0,289

Checking and measuring crankshaft end float

**NOTE** *The thrust washers are available as spares in oversizes of 0,127 - 0,254 mm.*

Crankshaft front and rear cover components available as spares

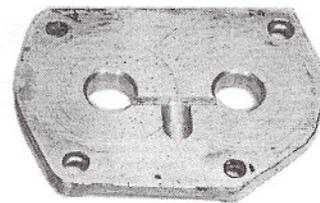
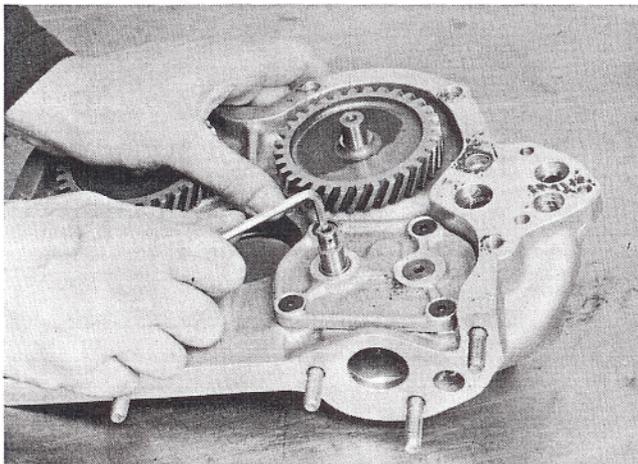
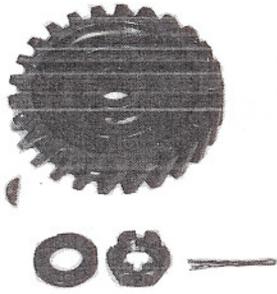
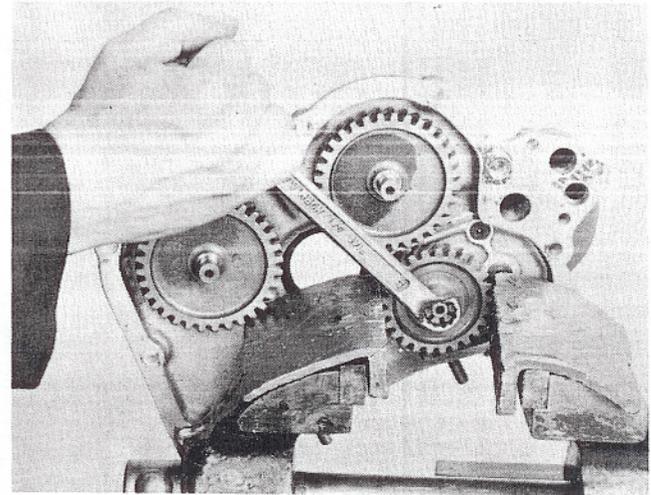
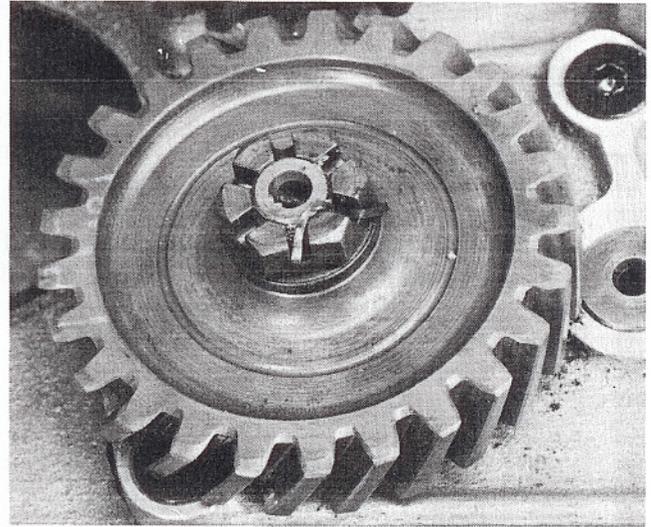
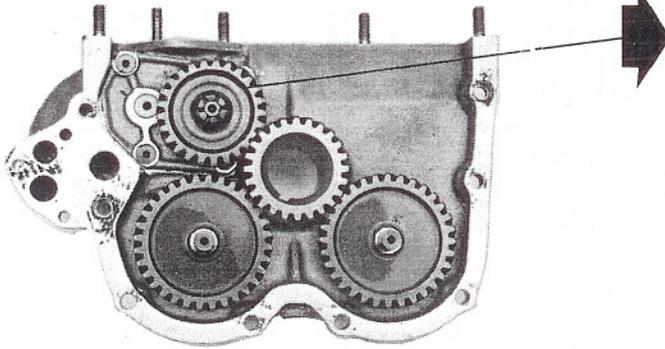
1. Gasket for rear cover - 2. Bolts fixing rear cover - 3. Rear cover - 4. Seal - 5. Studs - 6. Gasket for front cover - 7. Front cover - 8. Seal - 9. Right cylinder head camshaft drive gear - 10. Left cylinder head camshaft drive gear - 11. Oil pump driven gear - 12. Oil pump drive gear - 13. Nut with notches for fitting split pin - 14. Bolts fixing front cover to cylinder block/crankcase - 15. Seal - 16. Casing for oil pressure relief valve - 17. Piston - 18. Spring for oil pressure relief valve - 19. Plug



**10.**

**CRANKSHAFT FRONT COVER  
INCORPORATING OIL PUMP**

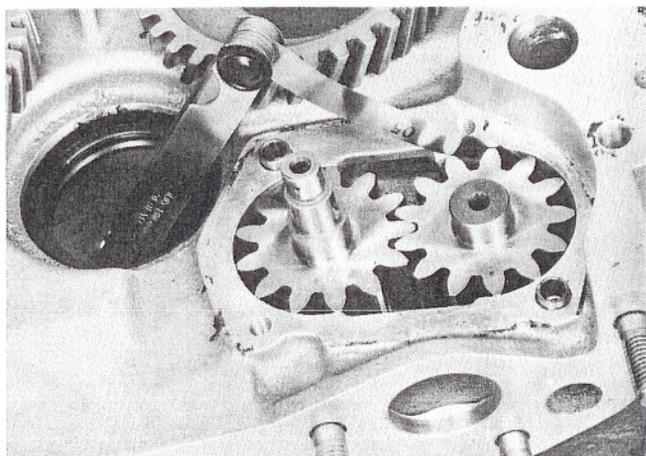
Removing-refitting oil pump drive gear



**Removing-refitting oil pump cover**

*Check that the surfaces of the plate are flat and do not have any grooves or scoring.*

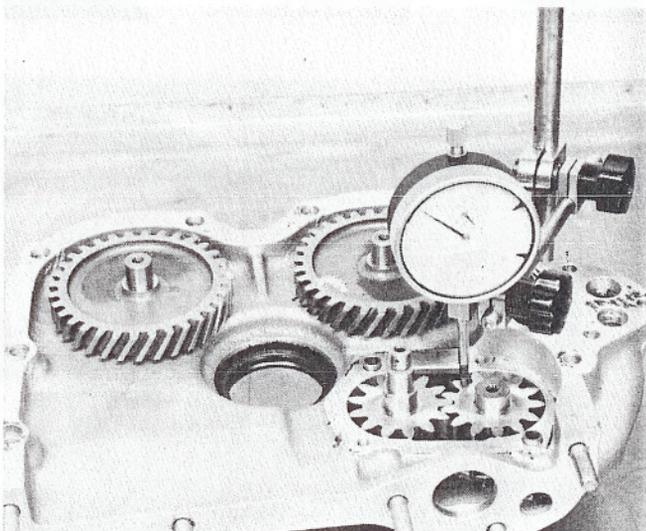
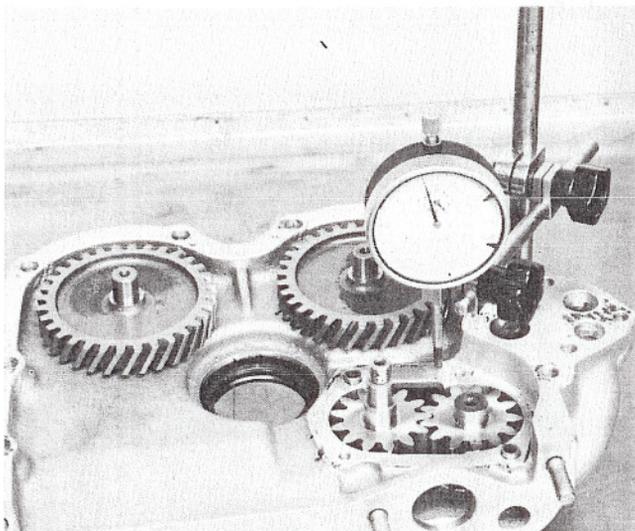
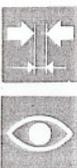
0,090 ÷ 0,141



Checking clearance between external circumference of gears and pump casing using a feeler gauge

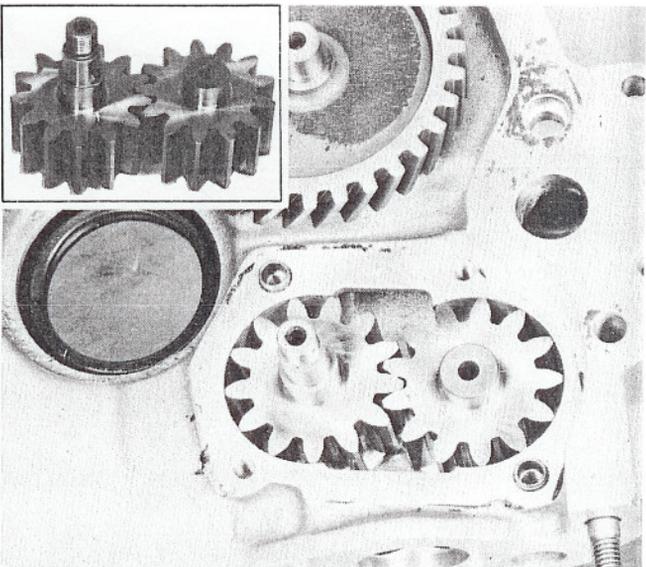
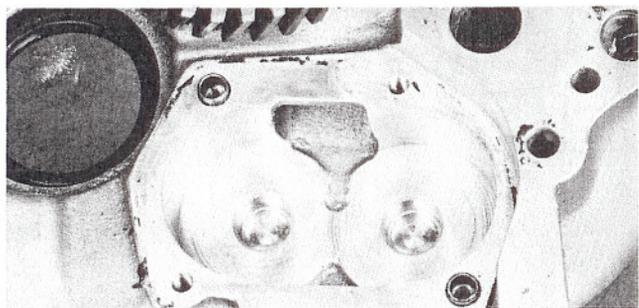
**NOTE** *The clearance should be between 0.090 and 0.141 mm; if this is not the case the pump gears and the front cover have to be replaced.*

0,037 ÷ 0,065



Checking clearance between gears and cover support surface on pump casing

**NOTE** *The clearance should be between 0.037 and 0.065 mm; if this is not the case the pump gears and the front cover have to be replaced.*



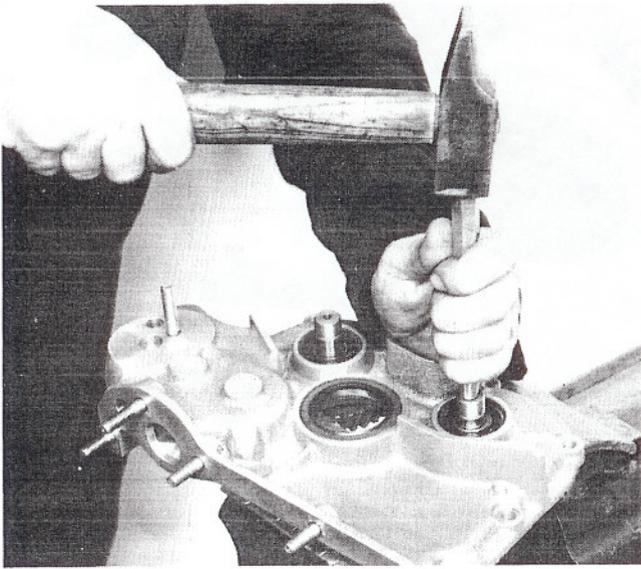
Removing-refitting pump gears

**NOTE** *Check that the surfaces of the pump casing are flat and that there are no grooves or scoring.*



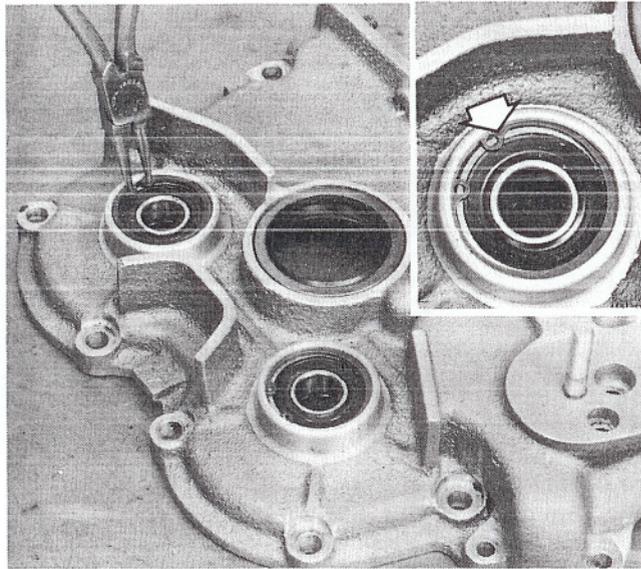
*The parts concerned with engine oil before fitting.*

**10.**



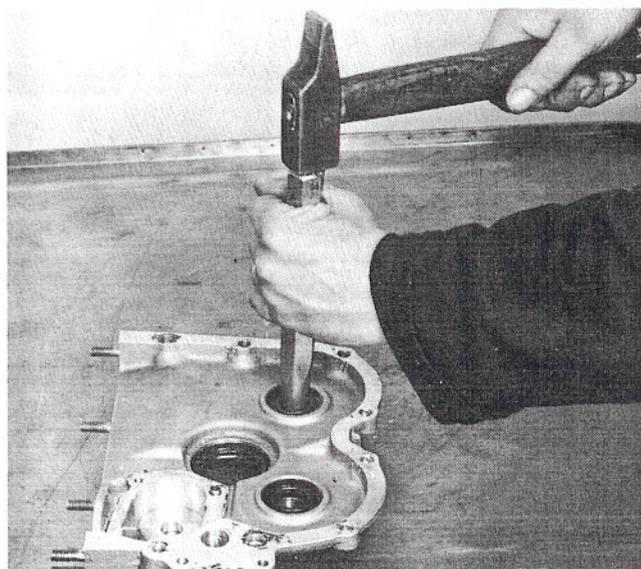
**Removing camshaft drive gears**

The gears are removed using an ordinary steel drift.



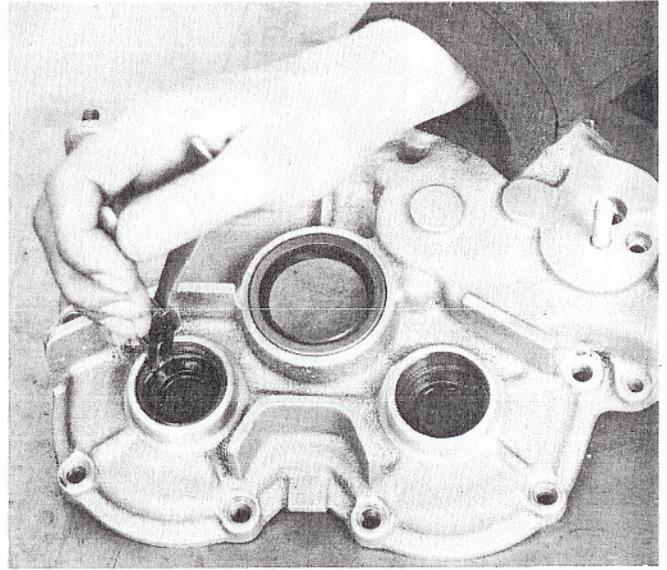
**Removing-refitting upper circlips keeping bearings in place**

The arrow shows the circlip.

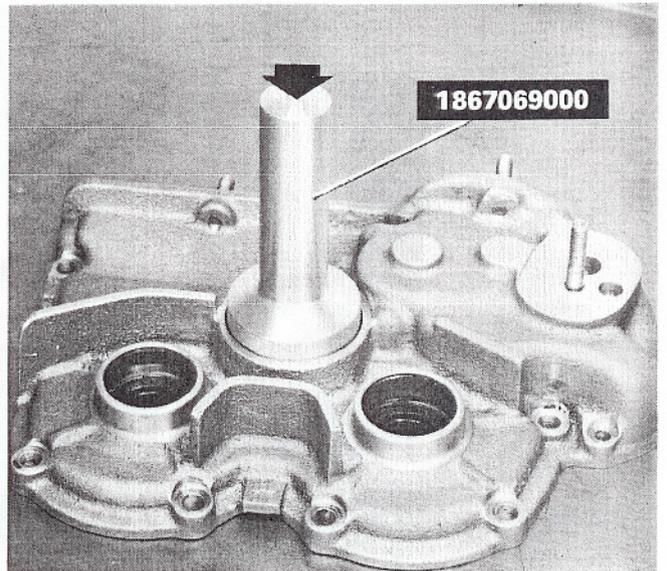


**Removing bearings for camshaft drive gears**

The bearings are removed using an ordinary steel drift.



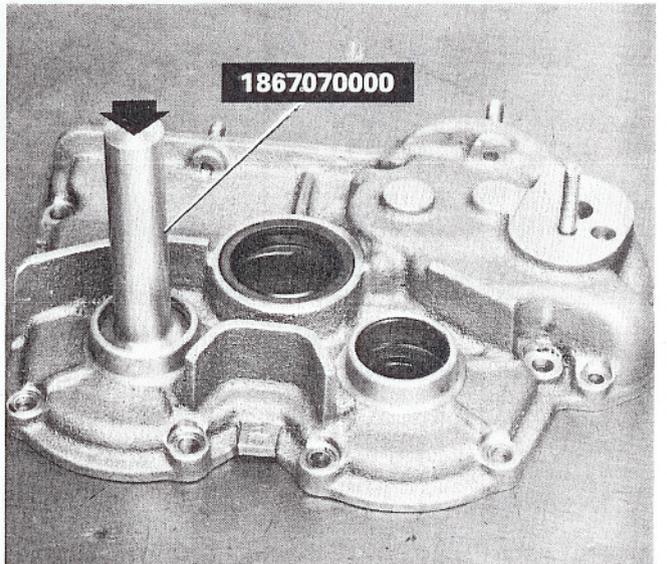
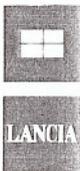
Removing-refitting lower circlips keeping bearings in place



Fitting seal on crankshaft front cover



*Lubricate the seal with engine oil*

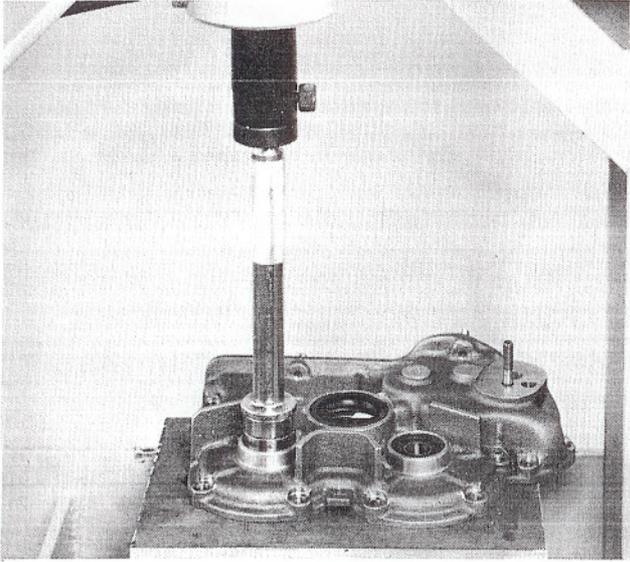


Fitting camshaft drive gears gasket on crankshaft front cover

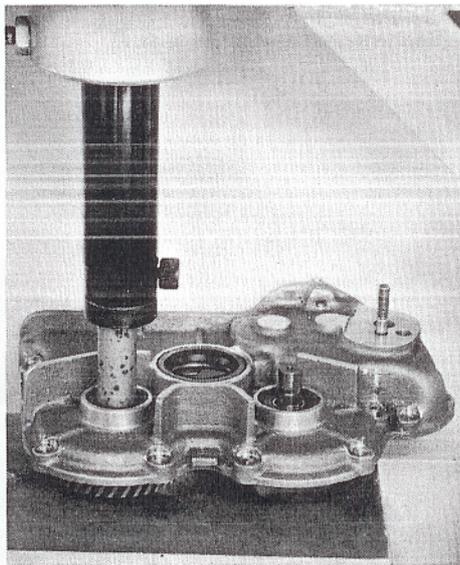
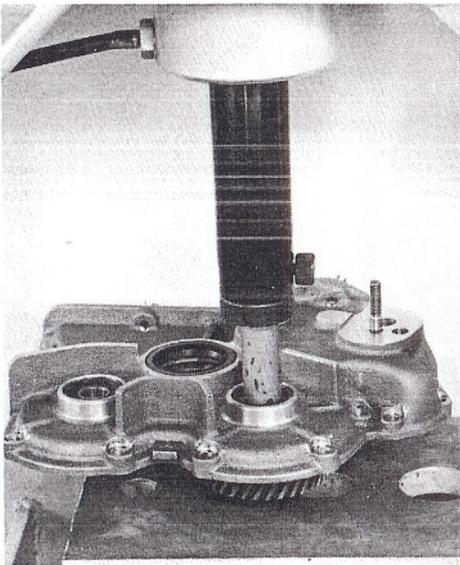


*Lubricate the seal with engine oil*

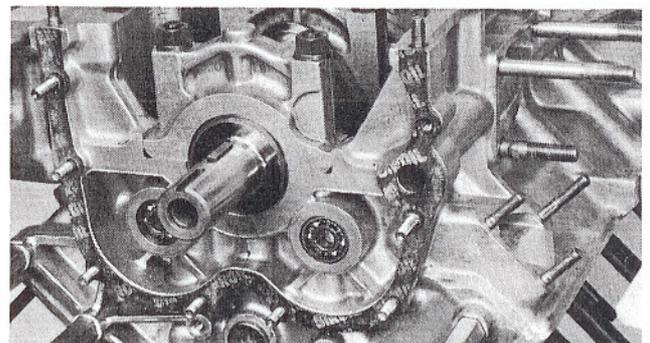
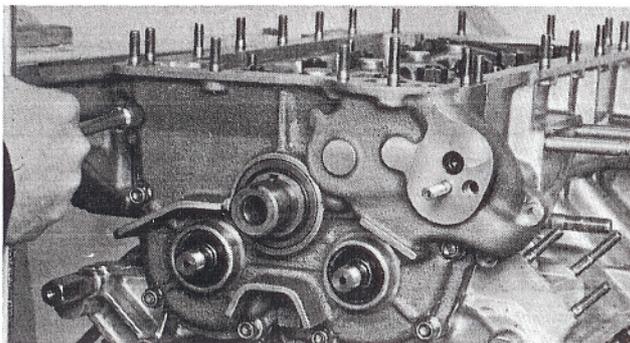
10.



Fitting camshaft drive gear bearings on the press



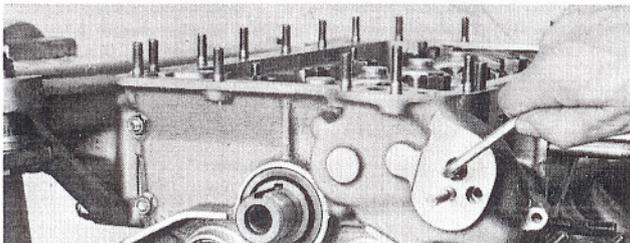
Fitting camshaft drive gears on the press



Fitting gasket and front cover incorporating oil pump

**NOTE** *Line up the front cover plane with the plane of the crankcase oil sump support surface.*

*Slightly grease the gasket support surfaces using lubricant.*

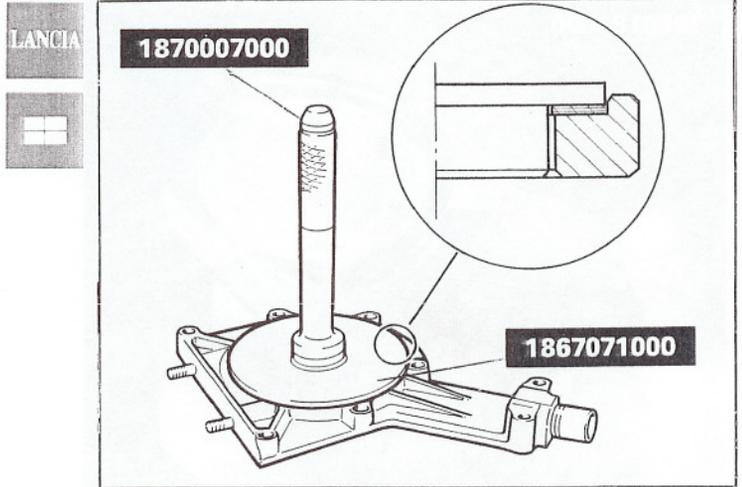


CRANKSHAFT REAR COVER

Fitting gasket on crankshaft rear cover



Lubricate the seal with engine oil.

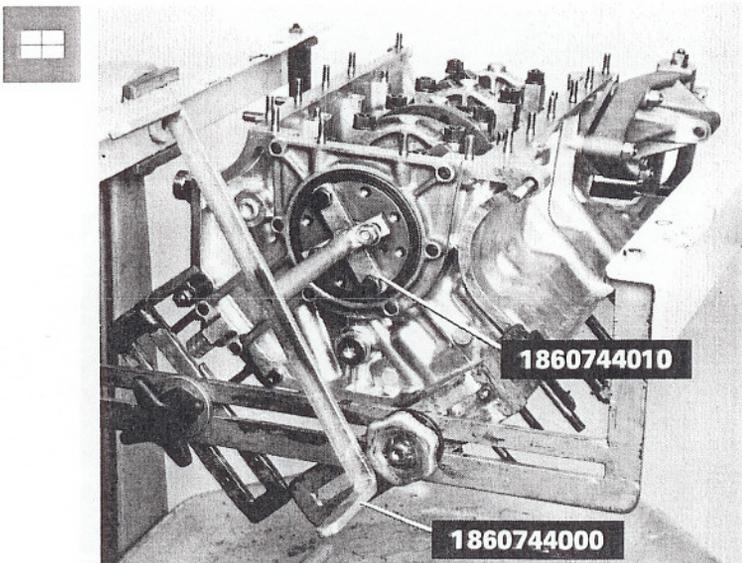
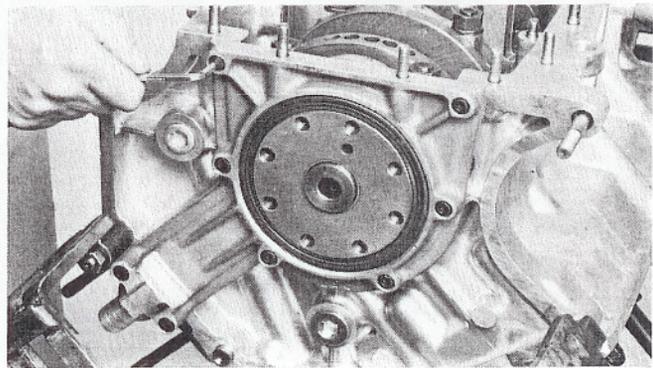
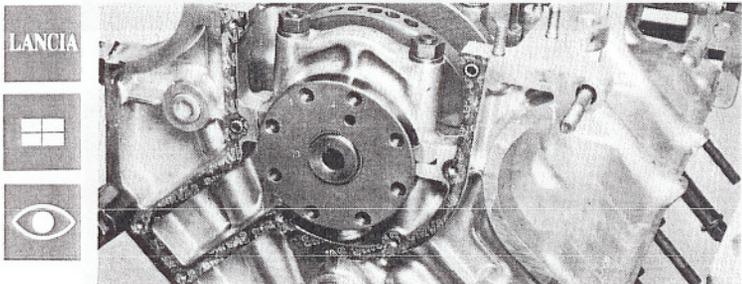


Fitting gasket and crankshaft rear cover

NOTE. Line up the rear cover plane with the plane of the crankcase oil sump support surface.

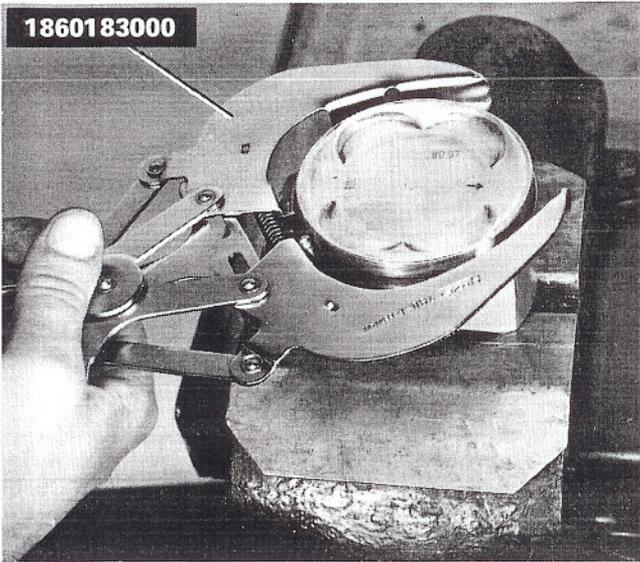


Slightly lubricate the gasket support surfaces with lubricant.



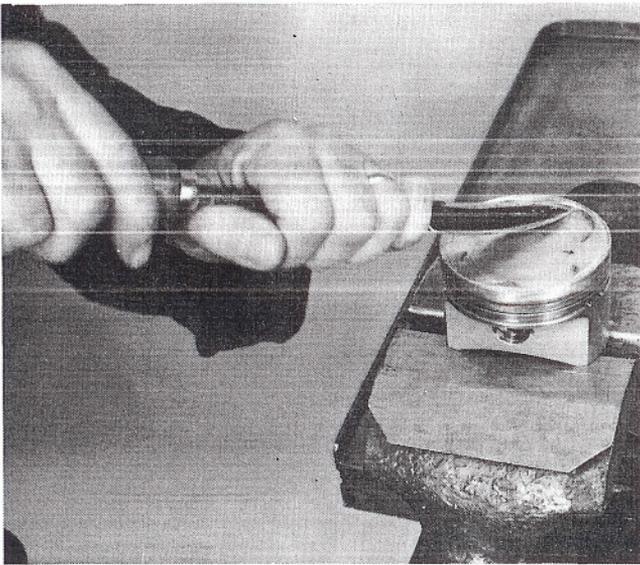
Fitting crank for rotating crankshaft

**10.**

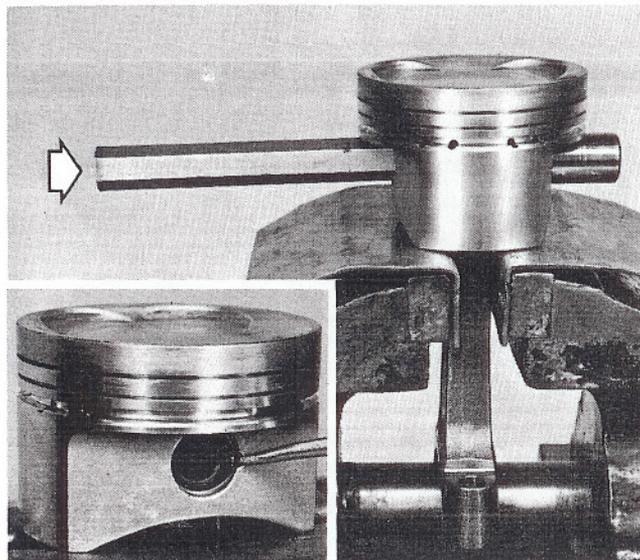


**CONNECTING ROD-PISTON ASSEMBLY**

**Removing piston rings**



**Cleaning piston crown**



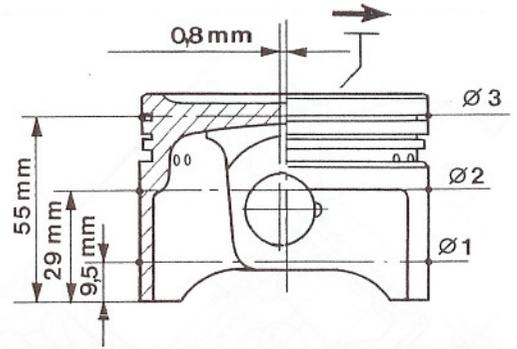
**Removing gudgeon pin circlips**

**Removing gudgeon pin**

The gudgeon pin can be removed using an ordinary steel drift.

**NOTE** *If the components are free from faults they can be reused; care must therefore be taken to mark parts belonging to the same group.*

$\varnothing_1$	verde	80,963 ÷ 80,977	
	rosa	80,953 ÷ 80,967	
$\varnothing_2$	verde	80,933 ÷ 80,947	
	rosa	80,923 ÷ 80,937	
$\varnothing_3$	verde	80,458 ÷ 80,482	
	rosa	80,448 ÷ 80,472	

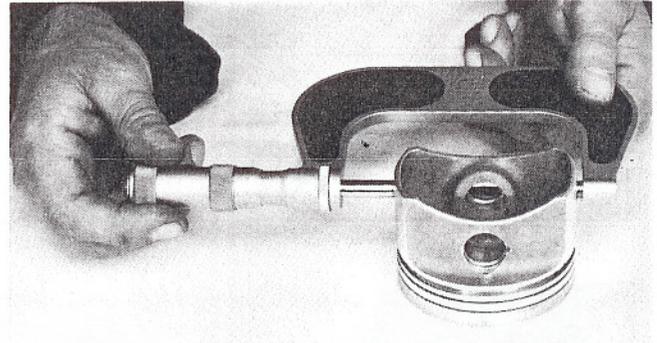


**Measuring piston diameters**



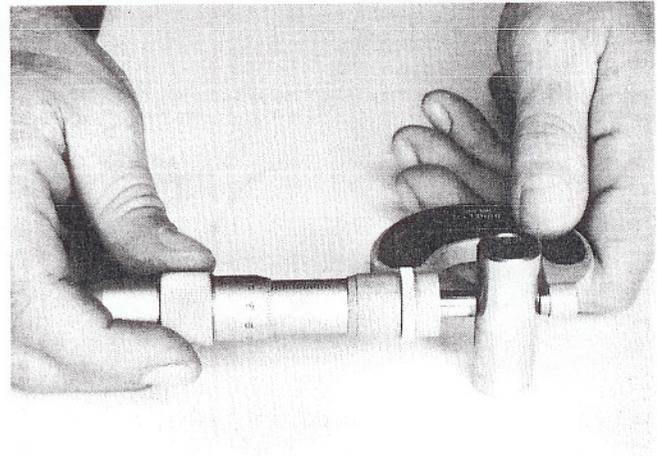
The opening for the gudgeon pin is offset 0.8 mm in relation to the actual piston axis.

**NOTE** There is an arrow stamped on the piston crown which should be facing the same way as the direction of rotation of the engine.  
Before removing pistons for overhauling this reference must be renewed.

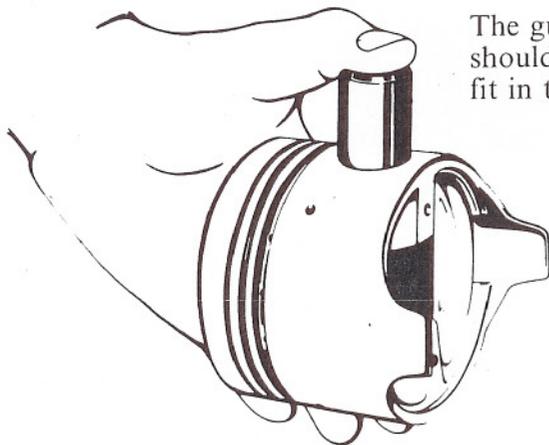


**GUDGEON PINS**

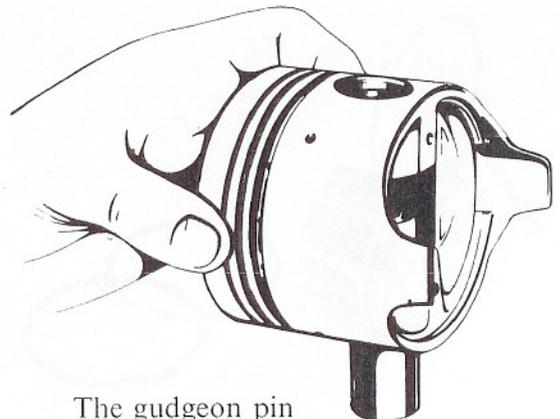
<b>18,494 ÷ 18,500</b>	
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**Measuring gudgeon pin diameter**



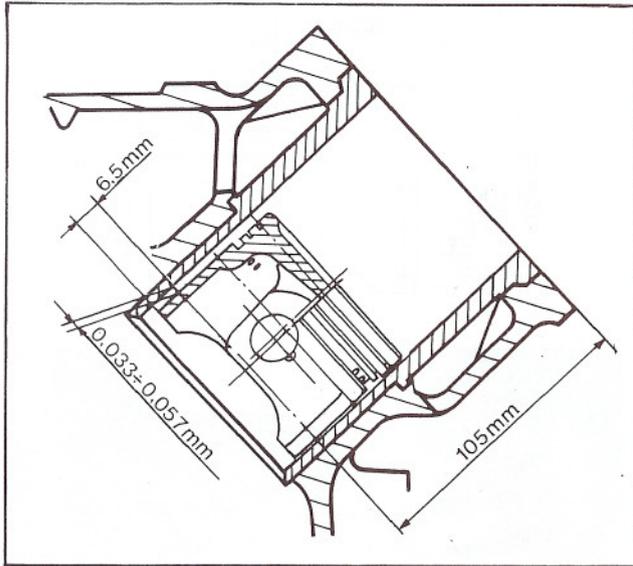
The gudgeon pin should be a push fit in the piston



The gudgeon pin should not come out of the piston

**Conditions for a correct gudgeon pin-piston fit**

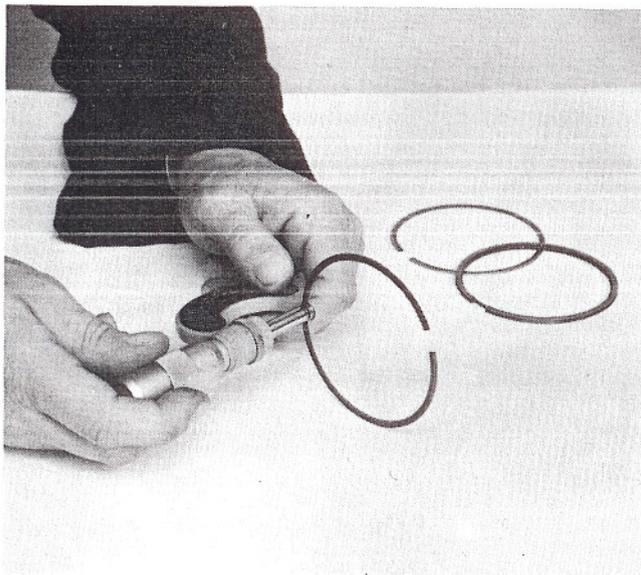
**10.**



$0,033 \div 0,057$

Measured 9.5 mm from the base of the piston and 105 mm from the top of the cylinder bore

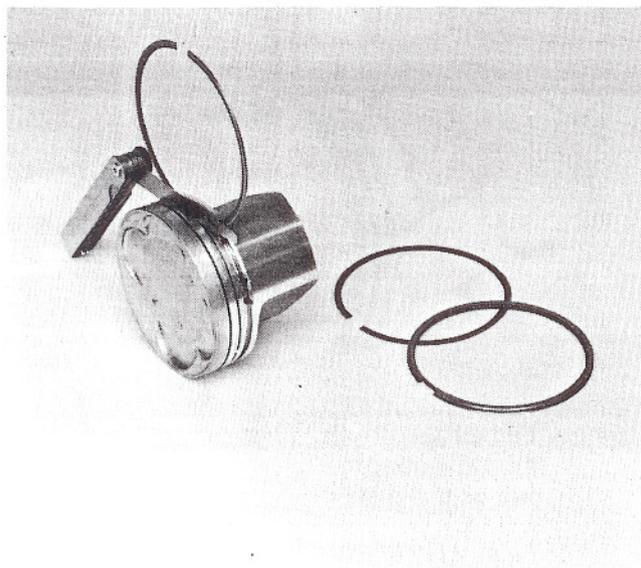
**Checking clearance between piston and cylinder bore**



**PISTON RINGS**

1	$0,975 \div 0,990$
2	$0,975 \div 0,990$
3	$2,978 \div 2,990$

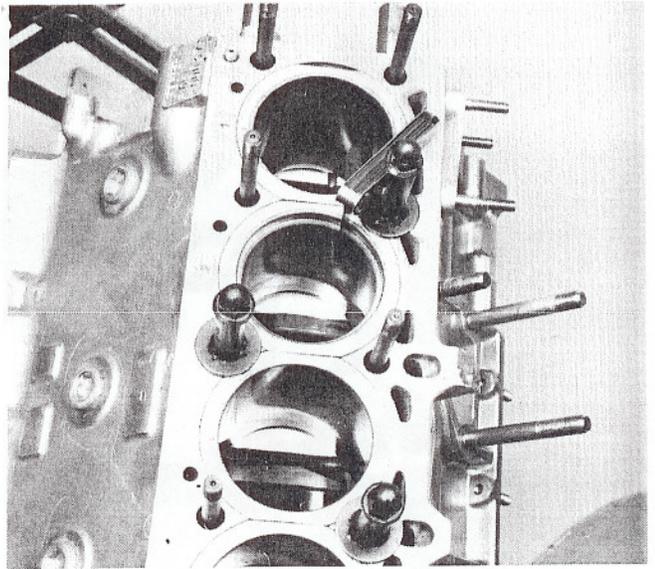
**Measuring thickness of piston rings**



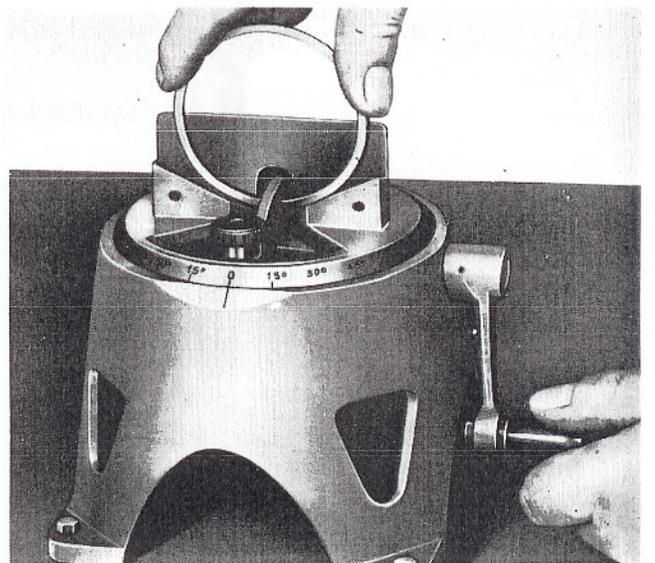
1	$0,030 \div 0,065$
2	$0,030 \div 0,065$
3	$0,015 \div 0,047$

**Checking clearance between piston rings and grooves**

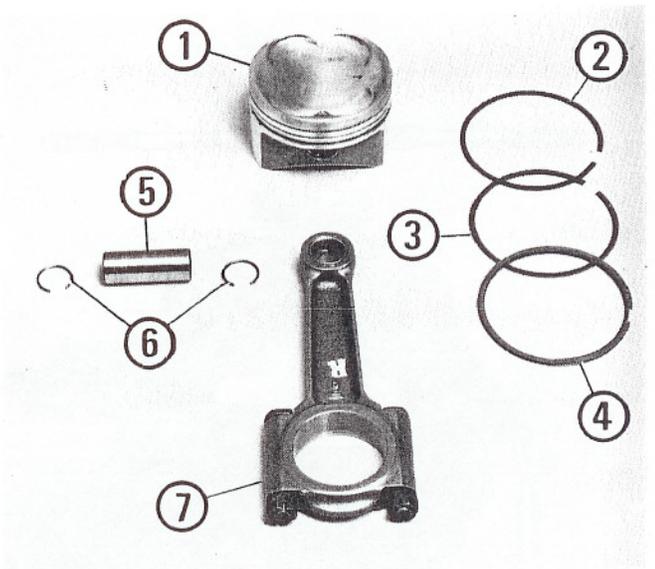
1	0,10 ÷ 0,30
2	0,10 ÷ 0,30
3	0,25 ÷ 0,40



Checking and measuring clearance between edges of piston rings



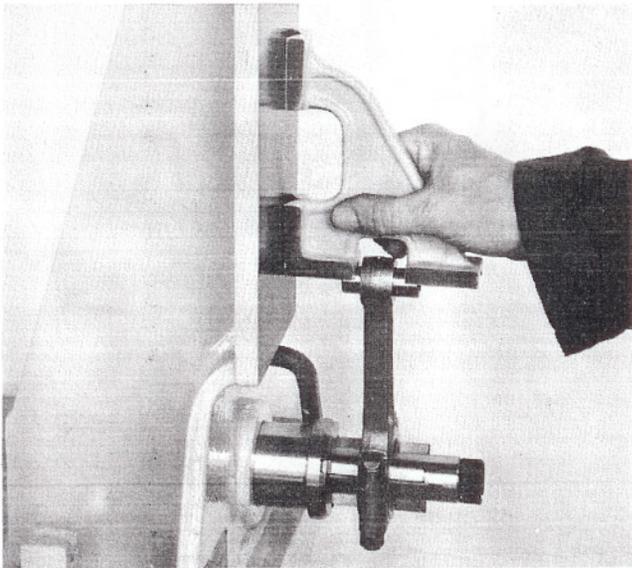
Gapping the piston rings



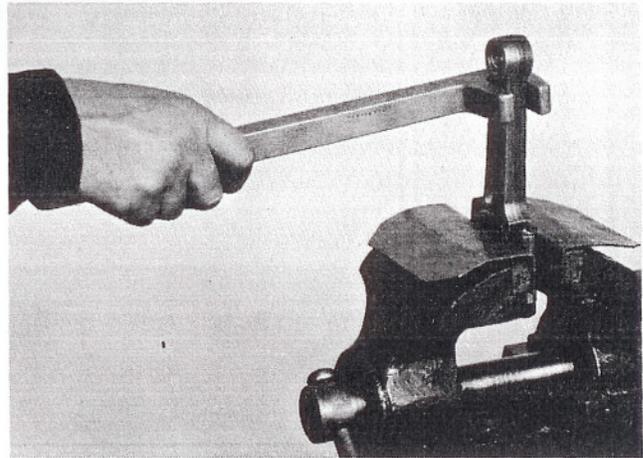
Connecting rod-gudgeon pin-piston assembly

1. Piston
2. 1st groove piston ring
3. 2nd groove piston ring
4. 3rd groove piston ring (oil scraper ring with helical spring)
5. Gudgeon pin
6. Gudgeon pin circlips
7. Complete connecting rod

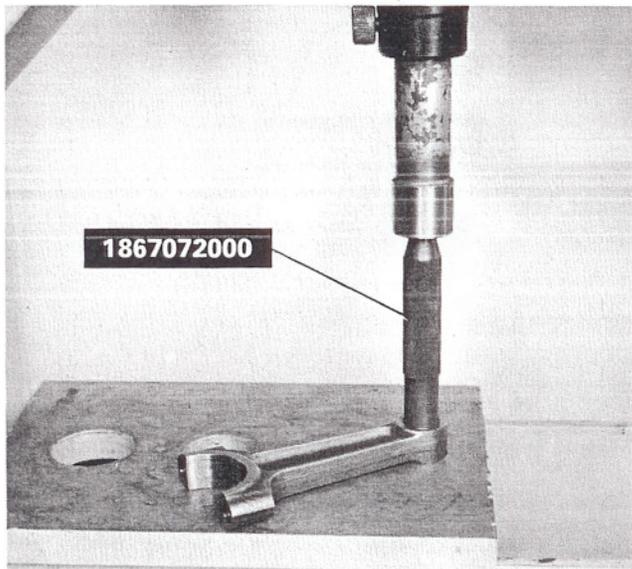
10.



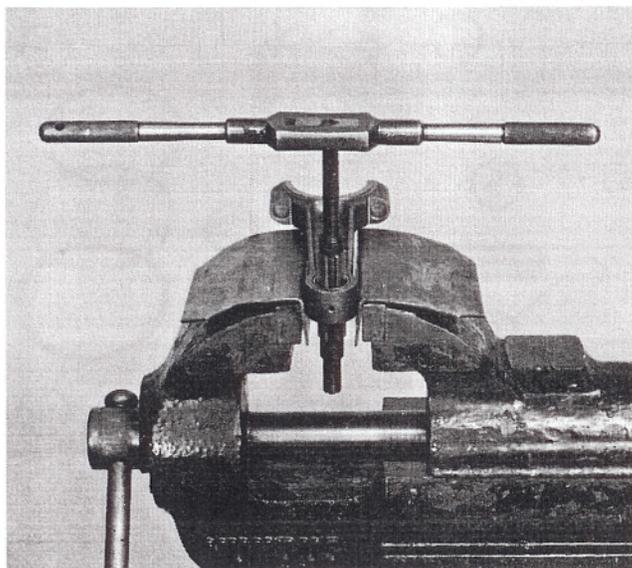
CONNECTING RODS



Connecting rod alignment check and stem straightening



Removing-refitting small end bush



Grinding small end bush