

Duff

Installation of High-Compression and Oversized pistons & liners
in Renault engines

How to install piston-liner kits in Renault engines:

- 904 cc Dauphine kit
- 1150cc R3-R10 kit
- 1300cc R3-R10 kit
- 1150cc R3 Gordini R-1134 kit
- 1300cc - - - - -
- 1300cc - - R-1135 -
- 1440cc - - R-1135 -
- 1600cc R12 GORDINI R-1173 KIT
- 1289cc R5 RNS 100 BHP KIT

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- Liners : should protrude beyond head gasket line as specified by Renault shop manual with liners strongly pushed down on the liner seals which are available in different thicknesses in order to adjust protrusion. *
- Pistons: clearance at skirt is pre-set by manufacturer of kit. If pistons and liners not purchased as a set, clearance should be : Cast pistons : .002 to .003 - Forged Pistons : .004 to .005 -
- Rings: Top ring -chromed - Mark "Top" up - clearance 7 to 8/10 mm (.028 to .031)
Cil ring 6 to 7/10 - (.024 to .028)
(for regimes over 7,500/8,000 rpms, increase clearance, or if no break in period allowed) SCRAPER if not U-Flex type (.012 to .015)
Scraper if U-Flex type - install as is - be careful not to damage it (caterpillar) do not shorten or adjust - ends should bottom against each other.
- Piston pin: must be free enough that you can push it through the piston with one finger, without any effort. In some engines, the pin is stopped with clips, the opening of which should be up. In other engines, there are no clips and the pin is a press-fit in the con rod. Do not to burr the metal when installing pin, which should move freely in piston.
- Alignment of rods, crankshaft, pistons : must be rechecked entirely in engine itself without piston rings before final installation. Never rely on a previous alignment or on an alignment performed outside the engine.
- Tightening of rods and pistons is not recommended, except if fitting rods with special reinforced bolts (see FAM 7/73)

PISTON MARKINGS : Arrow towards Flywheel or towards rotation of engine depending piston manufacturers.

*some racing engines are fitted with copper shims instead of paper, and/or external liner wall flat rubber seals (available from FAM)
Recent Renault engines (since 1975) model #843, #841 with 79mm pistons have no shims, only an O-ring seal (consult manual)

HIGH COMPRESSION RACING PISTONS: Due to their higher domed head, these pistons should never be installed without checking Valve/Piston clearance, which can be ascertained by installing cylinder head without any head gasket and turning engine by hand. If engine gets stuck or encounters excessive resistance, use high spot blue to locate contact points. Also note that, when installing larger than stock valves, you can have contacts between valve edge and liner or/and valve reliefs on piston dome. In some cases, like for installation of 1600cc High Compression Gordini pistons, it is necessary to modify combustion chamber configuration to avoid contacts or excessive compression ratios. We always supply the proper instructions and drawings when selling such pistons or equipment. There are also some application such as for the 845/B competition engine (1861 or 1905cc) where the guide angles have to be modified in order to clear the valves between themselves where special care should be exerted to avoid contacts. The same applies when using cylinder heads which have been ground beyond the manufacturer's authorized limit. However, such heads should be replaced since the design of Renault combustion chambers prohibits their use when more than .020" under (maximum authorized by manufacturer (.012) . Increase in compression ratio in RENAULT engines is achieved by higher domed pistons exclusively. The more the cylinder head will be milled, the more the engine will lose its efficiency and power (up to 25%).

"BRETTLE" Sets - FITTING INSTRUCTIONS

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You have bought a set (B) and we congratulate you for having taken this initiative. If you want that this equipment gives you entire satisfaction, may we advise you to follow up instructions below:

PIN FITTING

CITROEN: All references must be fitted with pins turning on rod; heat pistons (up to about 100°C); lubricate pins and fix them with an appropriate tool.

PEUGEOT: All references (excepted for Ref. 6165 and 6172) must be fitted with pins turning on rod (Ref. 6165 and 6172 must be fitted with pins turning on piston); heat pistons (up to about 100°C); lubricate pins and fix them with an appropriate tool.

RENAULT: All the pistons unprovided with a groove of a pin lock (groove for circlips or lock rings) must be fitted with pin turning in the piston. Heat rod (up to about 400°C) and fix pin with an appropriate tool.

CIRCLIPS FITTING

Use round-nose pliers.

Stress in cambering direction and be careful that circlip does not get deformed (which circlip should be well immobilized in his housing after fitting).

We recommend you to use a circlip-plier for the circlips fitting.

PISTON RINGS FITTING

Horizontal engines (Citroën 2 CV, Ami 6, Ami 8, Dyane and GS) are equipped with conical piston rings which have to be fitted in their grooves and in the correct direction: the letter "H" or the indication "Top" which is engraved on the piston rings, should be found on the piston-head, that is to say on the cylinder-head side.

Care: Before fitting a new set on horizontal engines, it is necessary to change valves and to check if valves guides are in good state

"UFLEX TYPE" OIL SCRAPER RINGS FITTING

These rings are pre-adjusted and must be fitted just as it is. Do not shorten them; fit them with a rings collar.

PISTONS FITTING

CITROEN: Ref. 6018, 6029, 6035, 6048, 6049, 6050, 6051, 6055, 6056

Comply with the sign (marked —♦ or ♦) indicating the rotation direction of engine.

Ref. 6034, 6043.

Pistons marked:

AVD: right side front of the car

AVG: left side front of the car.

Ref. 6053, 6054.

Pistons marked AV: front of the car.

FIXING OF PISTONS IN THE CYLINDERS

We suppose that your connecting-rods are well trued up and that you have properly alternated your piston ring joints.

You should then be ready to fix pistons in the cylinders. It is a delicate operation as it determines your engine longevity.

We recommend you to clean cylinders and pistons with petrol (for example), without wiping them; let them dry or dry with compressed air; then lubricate rings and pistons plentifully with clean oil.

CYLINDER-HEADS TIGHTENING

This operation has to be very carefully done. Comply with Manufacturers' standards requirements, and use a dynamometrical spanner.

Do not forget to re-tighten cylinder-heads after a few miles (about 500 kilometers).

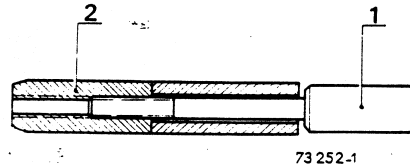
Finally, remember that a well run in engine is the guarantee for a complete satisfaction.



FITTING THE GUDGEON PINS

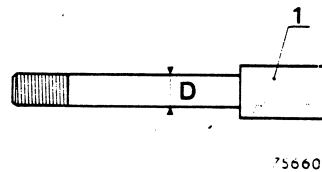
The gudgeon pin bore on the 841-II engine is 12 mm (.472") diameter instead of 13 mm (.512") as on the 821 engine.

The inserting mandrel (1) from the Mot.255 tooling must be modified as per drawing before fitting the gudgeon pins to the pistons.



$$\text{Diameter } D = 11,6 \begin{matrix} +0 \\ -0,1 \end{matrix} \text{ mm } \left(.457 \begin{matrix} +.0 \\ -.004 \end{matrix} \right)$$

This modified mandrel may also be ordered from C.S.S. quoting the Part No. Mot.255-02.



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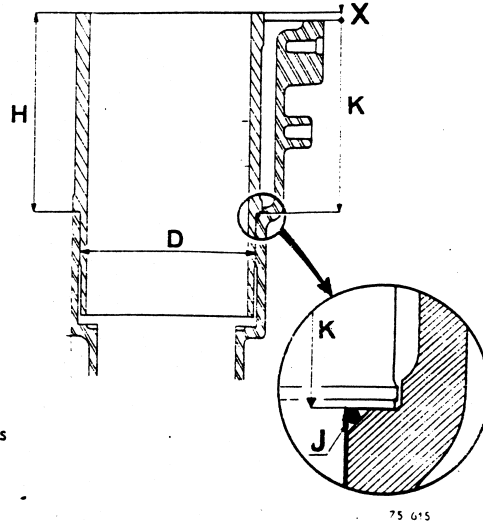
CHECKING LINER PROTRUSION

An increase in the liner bore has led to :
- modification of the liner bottom locating diameter (D) in the cylinder block :
84 mm (3.307") instead of 82,5 mm (3.248")

- fitting of rubber 'O' ring liner base seals (J) instead of Excelnyl seals.
These new seals ensure sealing only.

Liner protrusion, therefore, is no longer dependent on the insertion of base seals of various thicknesses between the line locating flange and the cylinder block.

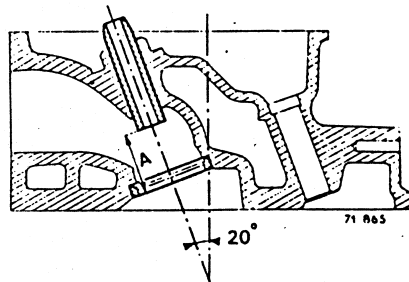
As the liner locates directly on the block, the protrusion is achieved by the respective manufacturing dimensions of the two components concerned :
liner and cylinder block.



697-821-841 FLAT HEAD ENGINE

POSITION OF GUIDES

Position of the valve guide with reference to the valve seat :
A = 29 mm (1.142").



Place the cylinder head on the Mot. 355 block.
 Press out the valve guide using the mandrel (I).

Check whether the valve guide is standard size or whether it has been changed before.

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Standard size		13 mm	(.512")
Repair sizes	1 groove	13,10 mm	(.516")
	2 grooves	13,25 mm	(.522")

Please note that all guides come only in 13,10mm and 13,25mm O.D.

All bronze guides are oversized in length and have to be cut to your engine specs

For high lift camshafts, it might be necessary of further reducing the guides on top of 2mm.

Illustration Only - Drawing not to scale.
Wilmonda RCH Mot 252-01 Made in France

Dimensions: Length: 6.605"

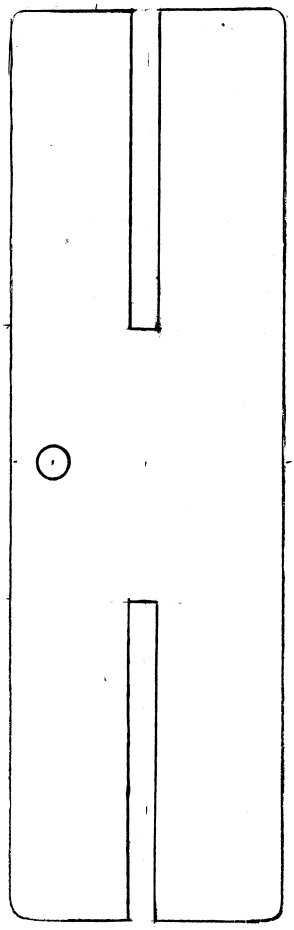
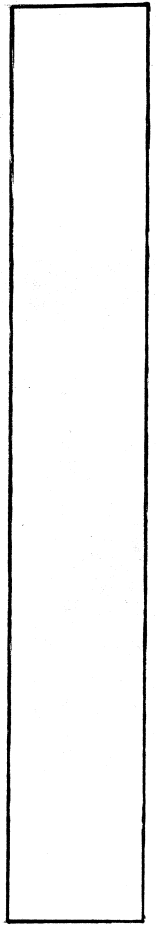
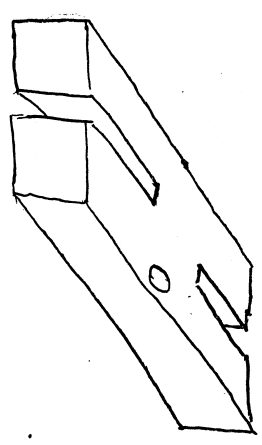
Width: 1.975"

Thickness: .980"

Hole Dia: .312 Hole location: .306 c/ from edge

Slots: Width .350" Length 2.145" 3.3125 c/ from end

Material: Steel



Renault
Lines
Measuring
Block