

DERBI E3 **RF80WR Pack**

ATTENTION / PAY ATTENTION :

For optimum operation of your newly purchased unit, we recommend that you carefully follow the assembly instructions below.

The assembly described below requires very good mechanical knowledge. Leave the assembly to a professional.

For optimum operation of the cylinderkit you just have acquired, we recommend that you follow the installation instructions below.

The assembly described below requires very good mechanical knowledge. Entrust this assembly to a professional.

Crankcase machining : (DOC221)

- Piston passage: It is necessary to machine the crankcases to a diameter of Ø50mm, depth 22mm (in relation to the cylinder parting line), to allow the passage of the front skirt of the piston at bottom dead centre. Do not shorten the piston skirt (see DOC221 - Red zone)
- Piston fitment : It is necessary to machine the crankcases on a diameter 55mm/depth 24.5mm (with regard to the bottom plan of the cylinder), to allow the passage of the front skirt of the piston, at BDC. Do not shorten the skirt (See drawing DOC221 - Red Area)
- Adjusting the transfers: Adjust the transfers on the housings, with the transferring the cylinder, using a base seal to mark out the area of material to be removed.
- Adjust transfers: on the crankcases with the transfers of the cylinder, by manual milling. You can use one of the supplied gaskets to trace the area of material to be removed.

Montage du Bas moteur / Assembly of motor housings :

This thermal unit has been developed with the Racing Factory Course crankshaft 44.9mm E90mm (Ref 121 00 886) . This crankshaft has been balanced to work

with the original DERBI balancing shaft, mounted on the GPR. **It is imperative that it be fitted**, otherwise significant vibrations could lead to the breakage of the assembly and/or the exhaust system.

We strongly advise you to assemble the crankshaft "blank", presenting it only on a ½ crankcase. At this stage, present the piston on the connecting rod, and present the cylinder on the crankcase: Rotate the crankshaft, and make sure that neither the connecting rod nor the piston touches the crankcases.

When fitting the crankshaft, it is imperative to fit new SKF 6204 ETN9 set C3H bearings (Ref 800 00 400) and new lip seals.

This thermal group was developed with the Racing Factory crankshaft, stroke 44.9mm (Ref 121 00 886). This crankshaft was balanced to work with the genuine DERBI countershaft, gone up on the GPR. Its assembly is imperative, under penalty of important vibrations likely to break the whole, and/or exhaust system.

We advise you very deeply, to make a blank assembly of the crankcase, by presenting him only on one half crankcase. At this stage, present the piston on the connecting rod, and present the cylinder on the crankcase: make turn the crankshaft, and make sure that neither the connecting rod nor the piston touch in crankcases.

During the assembly of the crankshaft, it is imperative to go up with new bearings new bearings, type SKF 6204 ETN9 C3H (Ref 800 00 400), and new lip seals.

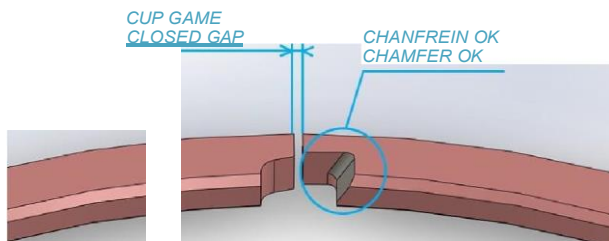
Montage du piston / Mounting the Piston :

- The piston must be mounted in such a way that the ring stop pin is positioned towards the rear, facing the rear transfer. It must be perfectly free in its groove.
- It is imperative to check and adjust, if necessary, the clearance at the segment cut, which must be **at least 0.20mm**.
- The piston must be mounted in such a way that the locking pin of the piston ring is placed towards the rear, facing the rear transfer.
- It is imperative to check, and adjust, if necessary, the closed gap of the piston ring, which must be **0.20mm mini**.

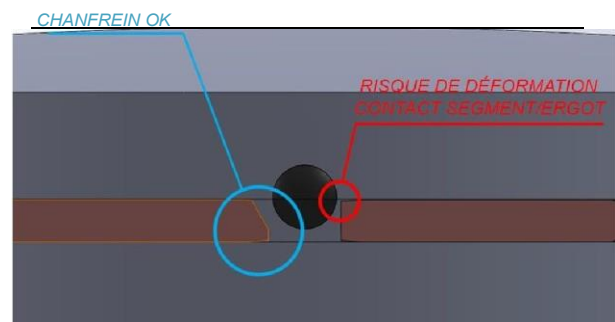
- Performance optimisation: To prevent the segment from jamming in the groove, a small diamond file can be used to make a square section, a chamfer on the bees of the segment, in its upper part (see drawing below)

- Performance optimization: in order to prevent the piston ring from becoming blocked in its groove, it is possible to do a little chamfer on the upper nozzles of the ring, using a small squared diamond file(See drawing below).

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Piston-Cylinder Set :

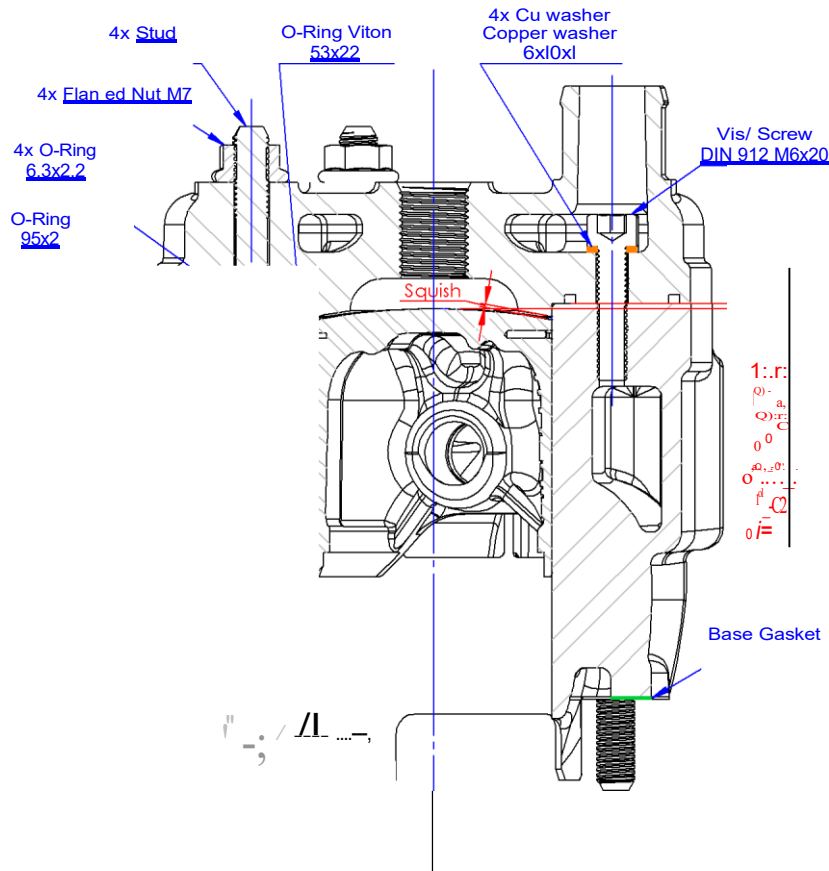
The piston-cylinder clearance must be between **0.055 and 0.065 mm**.

Here, according to the letter or number stamped on the cylinder, is the diameter and reference of the corresponding piston:

The piston-cylinder clearance must be between 0.055 and 0.065 mm.

Here, depending on the letter or number stamped on the cylinder, the diameter and the reference of the corresponding piston :

| Bearing Cylinder | Marking Cylinder | O Piston | Reference Piston |
|---------------------|------------------|----------|------------------|
| 47.595 $0^{+0.010}$ | B | 047.54 | 113 34 668 |
| 47.605 $0^{+0.010}$ | C | 047.55 | 113 35 668 |



Squish - Compression Ratio / Squish - Compression Ratio :

- It is very important to carefully tune your top end engine to the correct squish and compression ratio **for** your application, and the fuel you use.

- All values below are for Run use. For all

For other uses, the squish should be decompressed, increasing the squish by at least 0.1mm from the Run value.

- The value of the squish used will depend on the type of fuel used.

- You will be able to adjust your squish, using the different thicknesses of base seal provided.

- It is very important to carefully set the piston height, in order to run with a squish and a compression ratio adapted to your use, and to the fuel that you use.

- All values below are given for sprint races (dragster). For any other use, it is necessary to decompress, increasing the squish to a minimum of 0.1mm relatively to the Sprint Race (dragster) value.

- The value of the squish used will depend on the type of fuel used.

- You can set easily your squish value, using the different thickness of the supplied gaskets.

| Fuel Type Gas Type | Piston Height Dp (mm) | Squish (mm) | Volume de chambre Combustion Chamber Volume (cm)³ |
|---|------------------------------|--------------------|---|
| Unleaded 98 Unleaded Fuel 98 | -1.05 / -1.00 | 0.70/0.75 | 5.50 / 5.60 |
| AVGAS 100 LL Leaded Fuel Octane>100 | -0.95 / -0.90 | 0.60/0.65 | 5.30 / 5.40 |
| Leaded Racing Leaded Octane>110 | -0.85 / -0.80 | 0.50/0.55 | 5.10 / 5.20 |

IMPORTANT:

- Never use unleaded 95 or SP95 E10 petrol (containing ethanol)
- Never use Unleaded SP95 gas (which may contain Ethanol)

Tightening torques :

- M7 Nuts : 1.5m.kg (15N.m)
- Vis M6 / M6 Screws: 1.0m.kg (10N.m)

Performance Optimization:

- Do not shorten the piston skirts under any circumstances: This would lead to a change in the crankshaft balance and thus to vibrations, as well as to high piston wear (piston/rod friction) due to tilting because of poor guidance.
- **Do not touch the oval section of the exhaust outlet.** Changing it to a circular section, for example to connect it to an exhaust flange, would result in a significant drop in performance.
- Install one or more large volume radiators if necessary. The ideal operating temperature should be between 45 and 55°C
- This thermal unit has been developed with the following parts:
 - Racing Factory exhaust system - Ref 150 00 787
 - HONDA CR85 VForce 3i Valve - Ref 137 00 870
 - HONDA CR85 intake manifold
 - Carburettor Type PWK Ø34mm
 - Racing Factory Ref 140 00 382 (7.3mm TDC)

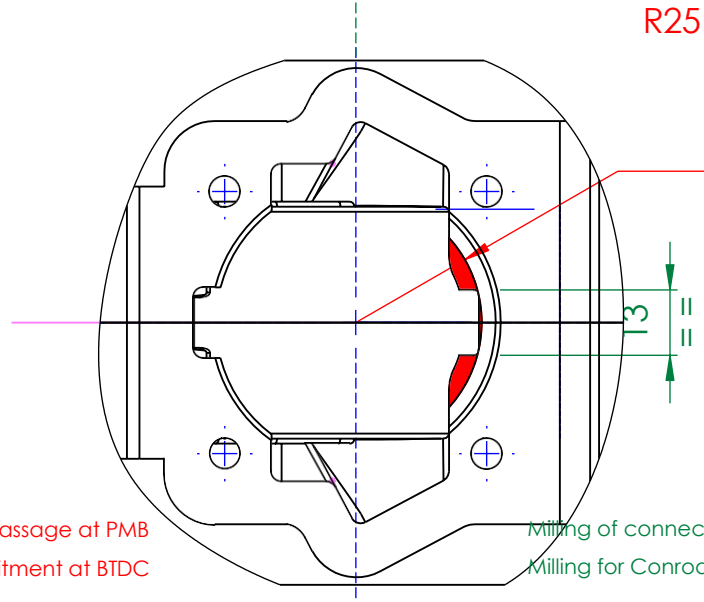
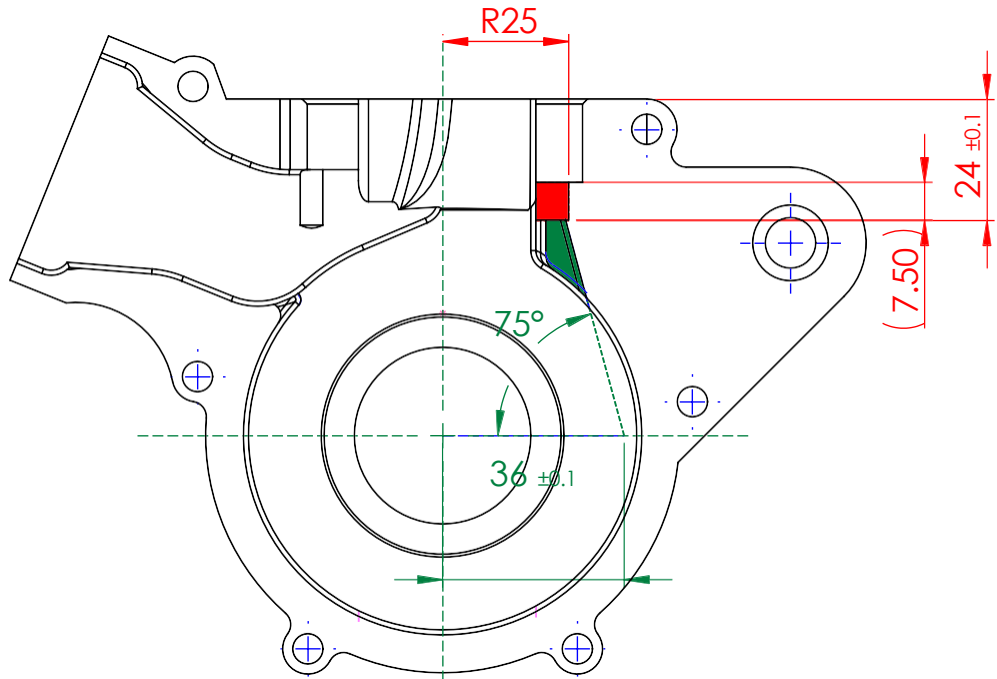
- NGK R6252 E105 spark plug

- Do not shorten the piston skirts in any way: this would cause the crankshaft to be unbalanced and therefore, would cause important vibrations, and a high wear of the piston due to improper guiding.

- **Do not touch the oval section of the exhaust outlet.** Modifying it in a circular section, to connect it to an exhaust flange, for example, would result in a significant decrease in performance.

- If necessary, install one or more large volume radiators. The ideal operating temperature must be between 45 and 55 °C

- This thermal group has been developed with the following parts:
 - Racing Factory Exhaust - Ref 150 00 787
 - Reed Valve VForce 3i HONDA CR85 - Ref 137 00 870
 - Intake manifold HONDA CR85
 - Carburettor Type PWK Ø34mm
 - Racing Factory Ignition Ref 140 00 350 or 140 00 382 (Timing 7.3mm BTDC)
 - Spark plug NGK R6252 E105



Milling of piston passage at PMB
Boring for piston fitment at BTDC

Milling of connecting rod passage (stroke 44.9)
Milling for Conrod fitment (for 44.9 stroke)



| | | | |
|-----------|---------------|-----------|------------|
| Material: | Approved by | J.BIDALOT | 17.11.2022 |
| | Controlled by | A.BIDALOT | 17.11.2022 |
| | Quotation | A.BIDALOT | 17.11.2022 |
| | 2D drawing | A.BIDALOT | 17.11.2022 |
| | 3D design | A.BIDALOT | 17.11.2022 |
| Replaces: | Replaced by: | Name | Date |

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Z.A de Berroueta 64122 URRUGNE FRANCE

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| Ech: 1/1 | DERBI High Engine For RF80WR Thermal Groups MACHINING DERBI ES | Code | Sheet |
| | | Plan Number | |
| A4 | | DOC 221 | 1 / 1 |