

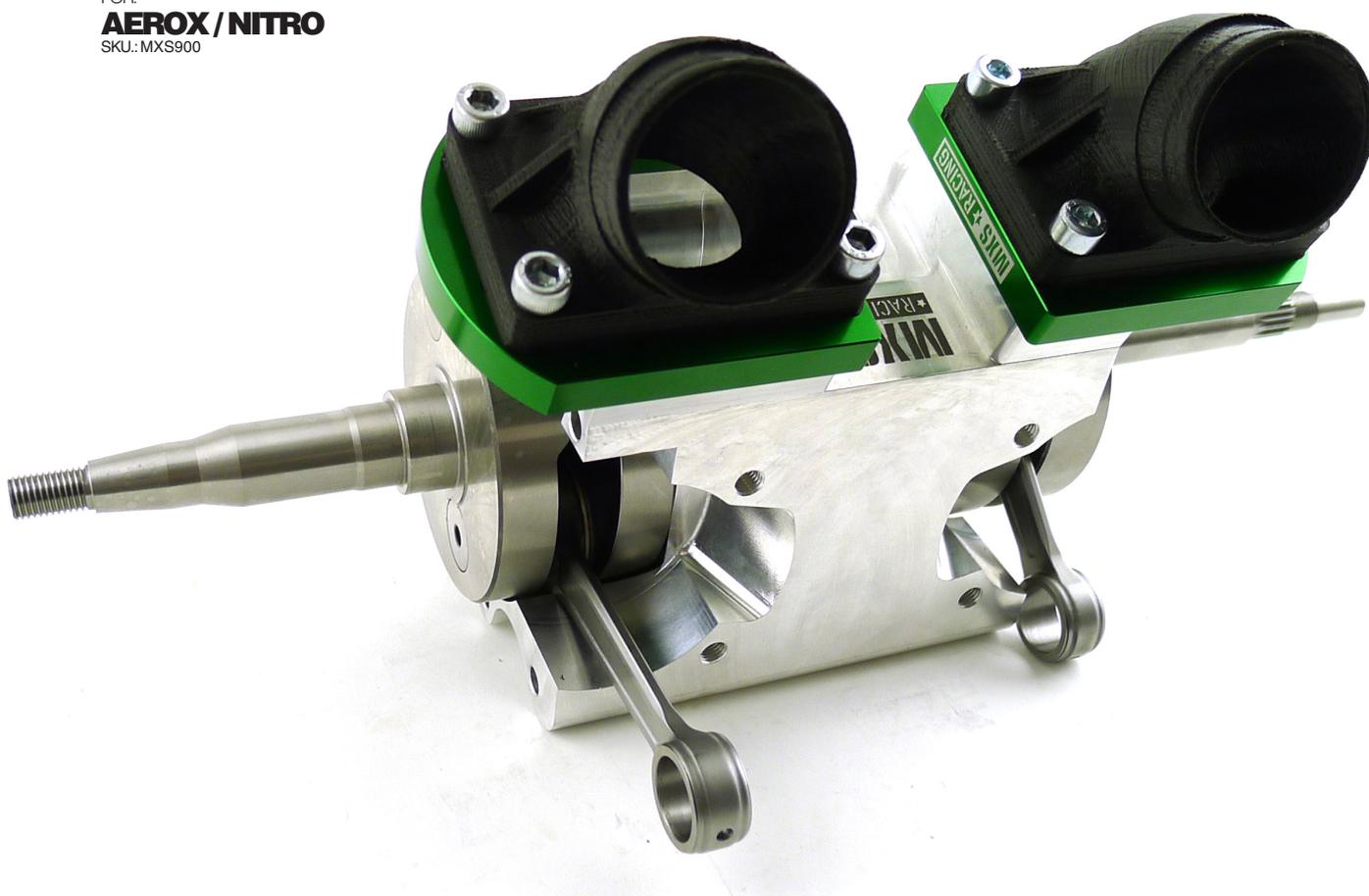
MOUNTING GUIDE

ENG 

XX-MXS-EBAMXS900-1
08/2015

TWIN CYLINDER CRANKCASE

FOR:
AEROX / NITRO
SKU: MXS900



MXS
★ RACING ★

MXS
Custom



Consultez la dernière version de la notice de montage en PDF sur www.mxsracing.com

The latest version of this mounting guide in English is available as a PDF download at www.mxsracing.com

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! ATTENTION !

PLEASE READ THIS MANUAL
THOROUGHLY TO AVOID
SEVERE ENGINE DAMAGE !

GUARANTEE – EXCLUSIONS

The MXS Racing CNC Twin Cylinder Crankcase has a guarantee against all manufacturing defects that are detected before installation. Defects and signs of wear caused by normal use or by external effects (faulty assembly or disassembly, incorrect maintenance, inappropriate use, etc.) or by modifying the product in ways not intended or specified by the vendor are exempt from guarantee. For more information, please contact vendor.

1. INTRODUCTION

We thank you for your trust and confidence by purchasing the MXS Racing CNC Twin Cylinder Crankcase. This installation guide will provide you with all the necessary information for making optimum use of your new engine set-up and for obtaining maximum performance.

1.1 REQUIREMENTS

If you do not have the technical know-how, experience and tools to perform the installation, we recommend contacting a 2-stroke engine expert as to be able to exploit the full potential of your new set-up.

2. CONTENTS BASIC KIT

- Twin Cylinder Crankcase CNC MXS Racing 49mm stroke / 95mm conrod
Sku: MXS900
- Twin Cylinder Crankshaft MXS Racing 49mm stroke / 95mm conrod
Sku: MXS84995/TWIN
- 4 x Crankshaft Bearings
Sku: SKF6005-2RSLTN9/C3VT162 (inside)
Sku: SKF6005TN9/C3 (outside)
- 6 x Stud Bolts 180mm
Sku: EKP-WG99
- 2 x Oil Seals for Crankshaft Viton / Teflon
Sku: P285.0002
- 2 x Intake Spacers Twin Cylinder MXS Racing
Sku: MXS900010
- 2 x Intake Manifolds d = 40mm for Spacers Twin Cylinder MXS
Sku: MXS900011
- 2 x Intake Adapters d = 40mm
Sku: MXS900012
- Installation Guide

3. RECOMMENDED ENGINE CONFIGURATION

- Crankcase Minarelli w/ rear disc brake Yamaha Aerox / MBK Nitro
Sku: OE-ITJ440703209
- Cylinders MXS GP 2 90cc 45mm stroke Yamaha Aerox / MBK Nitro
Sku: MXSGP008
- Reed Valves Bidalot „V-Force 3i“ Honda CR85
Sku: BID13700870
- Carburetors Keihin PWK 35mm (main 170 – pilot 50)
Sku: KH-900102
- Variator Stage6 R/T Oversize Yamaha Aerox / BW's (weights 10 - 12g)
Sku: S6-5616634
- Drive Belt Stage6 R/T for Oversize Variator Yamaha Aerox / BW's
Sku: S6-5916627
- Clutch d = 112mm Stage6 Racing Torque Control MK II
Sku: S6-5016614 (use all weights + put springs at half tension)
- Clutch Bell Stage6 Racing Wing Cooler d = 112mm
Sku: S6-5516609
- Transmission Cover Polini Yamaha Aerox / BW's
Sku: U170.0301
- Primary Transmission 14/42 Malossi
Sku: M6714733
- Secondary Transmission 15/42 Polini
Sku: P202.1346
- Variator Cover Polini Yamaha Aerox / MBK Nitro
Sku: P170.0305 / P170.0303
- Swingarm Polini „Torsen WD“ Yamaha Aerox / MBK Nitro
Sku: P172.0016

All the MXS Racing GP90 Parts are available
in our Onlineshop: www.maxiscoot.com

4. MILLING GUIDE OEM CRANKCASE

4.1 CYLINDER BASE

Crankcase and variator cover should be in very good condition, without any signs of corrosion. It is important to use ALL variator cover bolts to ensure the level of rigidity and stability necessary for this set-up.

4.2 PASSAGE FOR CONNECTING ROD

The original crankcase cylinder base seat has to be bored before use. (ill. 4.2.a)

- Bore: 58.2mm

- Depth: 10mm

Clearance cuts for the passage of the connecting rod have to be milled as well. (ill. 4.2.b)

4.3 CRANKCASE

The MXS CNC twin cylinder crankcase is wider than the original one by 5mm. This requires milling down the sides of the original crankcase (ignition and variator side) by 2.5mm ($\pm 0.05\text{mm}$).

Perfectly level seating of the crankcase is really important. This 5mm difference is necessary for mounting the 49mm stroke MXS crankshaft with oversized crankwebs. (ill. 4.3)

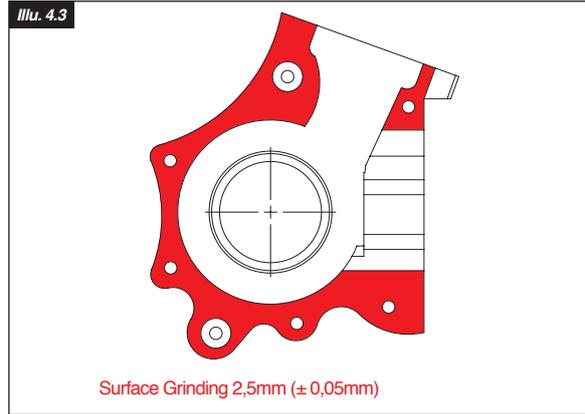
4.4 CRANKSHAFT

Milling for crankshaft webs MXS 49mm stroke.

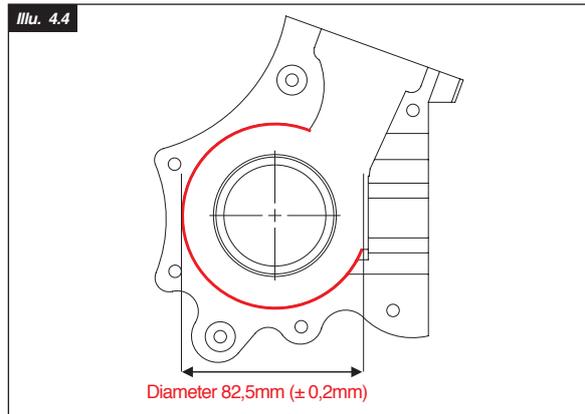
Bore: 82.5mm (ill. 4.4)

4.5 BEARINGS 25MM

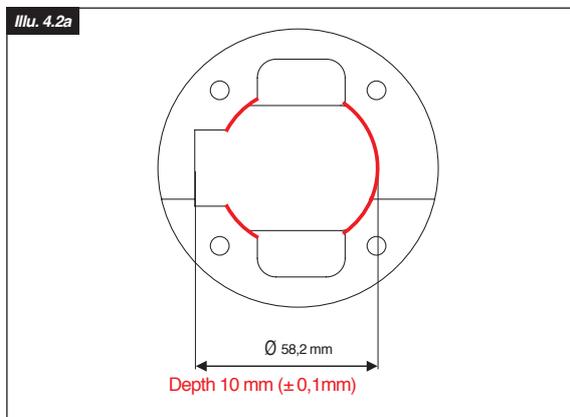
Milling for 25mm bearings. The bearings are a little „slimmer“ to compensate for the larger webs; the original crankcase has to be milled down by 1.5mm ($\pm 0.1\text{mm}$). (ill. 4.5)



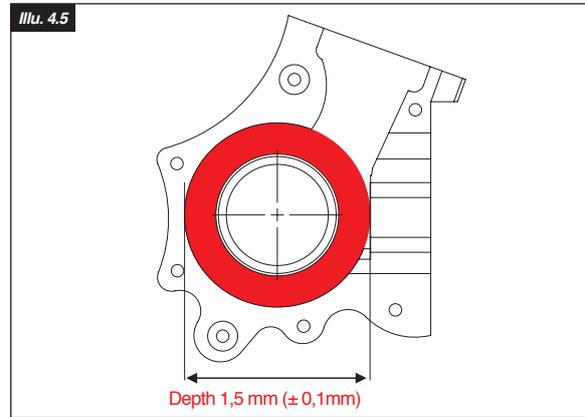
Milling Original Cylinder Base Seat



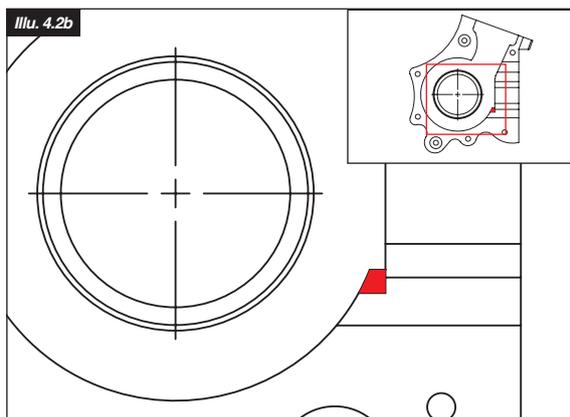
Milling for Crankshaft



Milling Cylinder Base

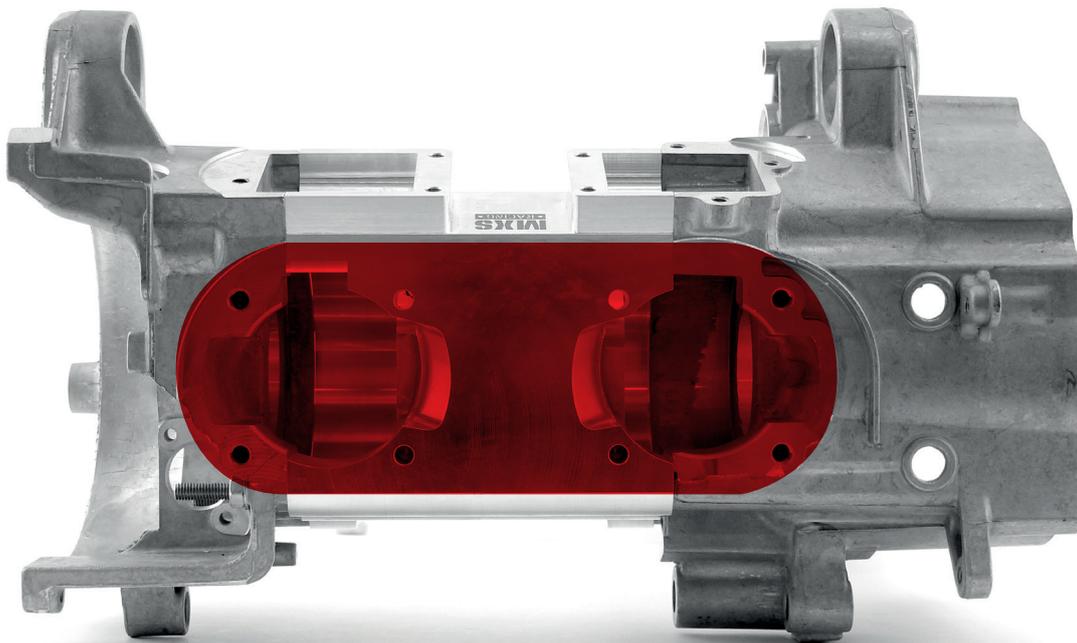


Milling for Bearings 25mm



Milling Passage for Connecting Rod

Illu. 4.6



Make sure that the cylinder contact area is level

4.6 SURFACE GRINDING

Make sure that the cylinder contact area, between the new MXS Racing CNC crankcase and the original Minarelli crankcase, is perfectly level. It is very important that the cylinder bases are placed at the exact same height.

(ill. 4.6)

4.7 KICKSTARTER

In order to obtain maximum stability, the variator-side crankshaft spline is longer and provides the option of adding a bearing inside the variator case. This way torsion rigidity during acceleration is increased. There are two options:

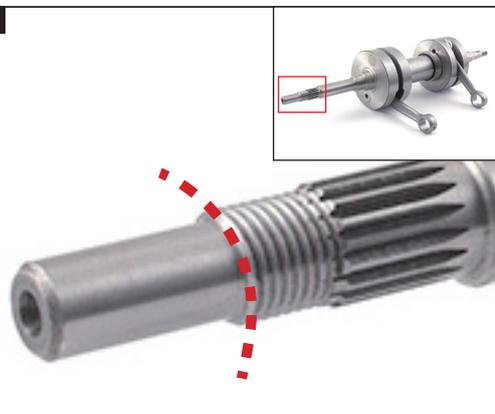
- Cut the end of the spline down to where the threaded part begins; in this case you can keep the kickstarter, and the extra support by the bearing cannot be used. (ill. 4.7.a)

- Heat the variator cover to remove the kickstart pinion gear shaft. Place the additional bearing (sku MXS...). In this case you'll have to use an external starter motor. (ill. 4.7.b)

4.8 OVERSIZE VARIATOR

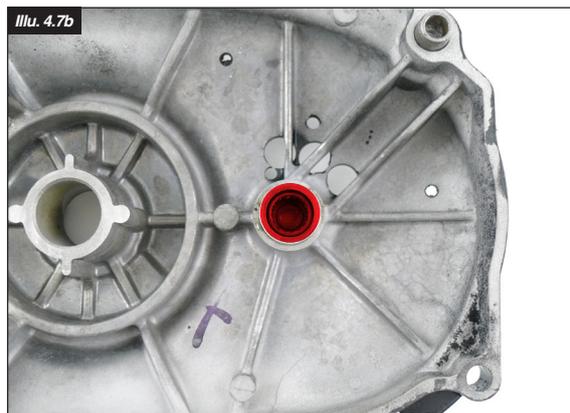
If using an oversize variator, refer to instructions given by variator manufacturer.

Illu. 4.7a



Keep kickstarter

Illu. 4.7b



Use external starter and increase torsion rigidity

5. Assembly

5.1 MOUNTING CRANKCASE

The actual centrepiece of the MXS Racing crankcase comes pre-assembled, and once all the milling is done, the variator case and ignition can be assembled and mounted. Two SKF bearings (25x47x12mm) are included in the kit, we recommend placing them on the splines in advance.

To do this, heat the variator-side journal with a heat gun. When it is warm enough, insert it into the crankcase; the crankcase has to be mounted with sealing compound to its prepared contact area in advance. Please note that the entire assembly is quite heavy, we recommend blocking the rear part of the variator cover to avoid tipping.

Now do the same on the ignition side of the crankshaft.

Now that the actual assembling is finished, place the 6 stud bolts and fasten them with the 6 nuts.

5.2 MOUNTING CYLINDERS

We strongly recommend using two MXS Racing GP2 cylinders for this twin cylinder set-up. Before installing them, you should mark them as left and right cylinder. Mount the two cylinders using the thickest base gasket; check squish clearance with a 0.7mm solder wire. Measure squish by turning the motor with the kickstarter or the electric starter. Note that the cylinders do not necessarily have the same squish clearance. For optimum performance, you should settle on a 0.55mm squish for both cylinders. Once the squish clearance is properly adjusted, mount the cylinders following the instructions given by the manufacturer.

5.3 IGNITION TIMING

This twin cylinder set-up is a straight-twin engine with 180° crankshaft angle with two power strokes in each revolution. Ignition timing has to be readjusted accordingly. Please check the instructions given by the manufacturer.

5.4 MOUNTING INTAKE

Two intake manifolds and two spacers are included in delivery. Mount them on the twin cylinder case; use appropriate reed valves (Derbi or CR 85). And don't forget to seal the entire intake properly.

Now mount the two carburetors. We recommend adjusting them so their settings are identical (needle height – main jet – pilot jet – power jet – mixture screw – idle screw – float bowl level) so it will be easier to readjust them after the first run.

5.5 MOUNTING VARIATOR

We recommend getting a new variator for this set-up.

We strongly advise against using the original variator as it won't be compatible with the obligatory reinforced primary and secondary transmission (by Polini, Malossi or Top Performances).

5.6 MOUNTING CRANKCASE TO CHASSIS

Now mount the entire assembly to the chassis; make sure that everything is properly fastened.

Connect the crankshaft to the ignition.

Drain and refill the coolant system completely and make sure that the battery is sufficiently charged to run the water pump (refer to #7 below).

Connect switches.

6. RUNNING IN

Before starting the engine make sure that the carburetor main jet is „too big“ so the mixture will be too rich. After start-up, synchronize the carburetors and let the engine idle for approx. 20 minutes. Keep an eye on the temperature while doing so. Then let the engine cool down again for 10 minutes. Restart the engine. You should do this two times minimum. Then open the throttle and readjust carburetors again.

Attention: as a twin cylinder set-up has plenty of torque, you should go easy on the clutch in the beginning.

7. COOLING SYSTEM

7.1 Buy two Y-connectors for the cooling system of this twin cylinder engine available in any hardware store.

7.2 Connect the lower outlet of the radiator to the water pump, then connect the Y-piece. Now both cylinders can be supplied with water through the ports at the cylinder base.

7.3 Connect the two hoses coming out of the cylinder head to the other Y-connector to return the coolant to the upper inlet of the radiator.

7.4 Use the original hose (d = 4mm) to link the 2 drain screws on the cylinder head and fasten it with a hose clamp on each side. Do the same with the second cylinder.

7.5 Refill cooling system with coolant.

7.6 Detach the hose from one of the drain plugs to bleed out excess air. Reconnect the hose as soon as the liquid does not contain bubbles any longer. Do the same with the second cylinder.

The original radiator has to be replaced with a larger, more efficient model capable of keeping an ideal temperature of 50°C (maximum 60°C). It is also possible to join up two radiators to get the same results.

8. FUEL

We strongly recommend using fuel with an octane rating of 98 (minimum). Do not use E10/E85 fuel. We also recommend using very high quality oil such as Castrol A747 or Motul 800GP. Fuel-oil mixing ratio is 2%.

9. MAINTENANCE - TIPS FOR OPTIMIZATION

An engine can only be powerful and reliable when properly taken care of. This is why we recommend to check the condition of piston / piston ring every two hours of operation (approx.). Once the engine is run in it is recommended to measure the cylinder compression with an appropriate gauge. Knowing the initial compression the cylinder starts out with helps in knowing when it becomes too low so the problem can be fixed. You can find all replacement parts for the MXS GP90 cylinder kit in our webshop.