MX Composites

Instructions for using MX Composites connecting rods

For use in single cylinder 4-stroke motorcycle engines

Content

Introduction

Thank you for purchasing connecting rods from MX Composites!

Connecting rods are one of the most stressed parts in the engine, yet many connecting rod failures are not caused by the connecting rod itself. Many failures are due to sheer human errors; as improper installation, oil starvation, rough handling, overheating or even over cycling. By carefully following the steps in these instructions you can expect your connecting rods to function properly.

The instructions are divided in three sections. The first two sections cover different aspects of the installation process. The last section covers important instructions for the user of the engine equipped with an MX Composites connecting rod, i.e. the rider. Make sure he/she reads it!

Technical support is available by sending an e-mail to support@mxcomposites.com. We will respond within 24 hours during work week days.

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The MX Composites connecting rods are designed for the sole purpose of racing and shall under no circumstances be used on public roads.

Our connecting rods are sold as performance enhancing products without any expressed or implied warranty. You as a buyer/user assume the full responsibility for how it is used. MX Composites AB shall not, under any circumstances, be liable for any special incidental or consequential damages, including but not limited to damages or loss of other equipment.

We guarantee the quality of the manufacturing process and the dimensional sizes. We have no control over customer assembly and modification of the connecting rod in the engine. There are no further guarantees either expressed or implied by MX Composites AB or any of our agents or representatives.

MX Composites AB reserves the right to make product improvements/changes without notice and without incurring liability with respect to similar products previously manufactured.

The MX Composites connecting rods are patent protected.

All our products are sold under the conditions set out in our General Terms and Conditions for Sale of Products (GTC), available at www.mxcomposites.com.

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Connecting rod to crank shaft assembly instructions

Before you assemble the crank shaft

- Check that the connecting rod is free from scratches and other defects
- Check that the connecting rod fits in piston
- Check piston and crank pin tolerances
- Check that the connecting rod fits in crank case and that you have enough room to rotate crank
- Always use new crank pin or one without any scratches or marks

WARNING!
Hard impacts may cause cracks that are not visible to the eye but will limit the fatigue performance and hence the life of the connecting rod. Handle the connecting rods with great care.

Balancing (only for skilled engine builders)

To reduce vibrations and get the best response from your connecting rod you need to lighten the crank shaft counter weights. Easiest way to do this is to use a lathe (machine thru turning).

Since MX Composites connecting rods generally has a thicker stem than the standard connecting rod you need to remove material on the inside of the cranks counter weights to make room for the connecting rod. MX Composites can provide a specific balancing manual for each engine if demanded.

In some cases it is possible to reduce or even exclude the balance shaft/s since vibrations are significantly reduced with MX Composites connecting rods. Make sure that the balance shaft is only used for balancing before removing it. In some cases the balance shaft also has other functions besides balancing.

Radial clearances

Since the connecting rod itself functions as a bearing it is very important to make sure that the clearances are correct. Otherwise you will not have an adequate oil film built up properly and you jeopardise the lifetime of the bearing surfaces. To make sure you have correct clearances you should always measure the piston pin and the crank pin and compare with the following recommendations:

Piston pin within xx.994 - xx.998 (xx=nominal dimension 15, 17, 18 or 19mm)
Crank pin within XX.992 - XX.998 (XX=nominal dimension 29, 31, 32, 33 or 34mm)

Mounting

Clean and pre lubricate every part before assembling the crank shaft. Fill the crank pin with oil to make sure there is no air left inside the crank pin.

Axial clearance

Press the crank shaft webs to correct outer measurement, according to specific engine model.

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Crank shaft to engine assembly instructions

Engine setup recommendations

	250cc engines	450cc engines
Max Piston weight:	200 g	350 g
Max rev:	15000 rpm	12000 rpm

Notice
If you use MX Composites connecting rod you can gain power by changing ignition timing. Find out your own optimal settings in a dyno or on the track.

Lubrication

Make sure that all oil channels are working as they should and that they are clean. Always use clean synthetic oil and fill oil pump/s and channels with oil. Before mounting the crank shaft fill it completely with oil. It is of greatest importance that the oil channel in the crank pin is supplying enough oil to the connecting rod slide bearing immediately at start up. When using slide bearing solution instead of a connecting rod with roller bearing you can remove the jet that chokes the oil flow to the crank shaft (if mounted).

Oil should be changed after 5-10 racing hours depending on use. After oil and filter change make sure you have built up full oil pressure **before starting the engine**.

Alignment

To have the oil film built up correctly it is of greatest importance that the surfaces of the connecting rod slide bearing are aligned to its respective counterpart. The easiest way to verify this is to mount the connecting rod and measure axial clearance at piston pin and crank pin. The connecting rod axial clearance in the piston **must be larger** than between the crank webs. Also make sure that the connecting rod has enough space in the piston during the engine cycle.

After assembly

Before starting the engine, make sure that you build up oil pressure that can supply the bearings with new fresh oil. Do this by applying up to 50 kick-starts with the engine kill-switch pressed, or until the oil system is fully filled. Remove spark plug for easier kicking.

WARNING!
When the engine is cold, the bearing clearance is very tight. Therefore, always let the engine warm up properly in order to achieve the correct bearing clearance before revving the engine.

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User Manual

Before starting the engine the first time of the day always kick-start it several times with engine kill-switch pressed. This is important since MX Composites connecting rods need oil pressure before starting. On motorcycles with an electric starter and no kill-switch, avoid ignition by removing the sparkplug cap.

It is essential, before every cold start, to warm up the engine **on idle speed only** until reaching approx 50°C / 122 Fahrenheit. This is required since the cold clearance of the connecting rod bearing is very tight. The bearing clearance is optimised at working temperature and it is not until the engine has reached this temperature that the bearing oil film can handle loads from high revs.

Recommended interval for oil change is 5-10 racing hours depending on engine usage, oil quality and in what environment the bike is used. Find out your own interval, depending on use.

After each oil change, make sure that there is oil in the oil channels. Do this by applying up to 50 kick-starts with the engine kill-switch pressed, or until you are sure that the oil system is fully filled. Remove spark plug for more effortless kicking.

Maintain other service recommendations on the engine to minimize connecting rod problems.

MX Composites recommends a connecting rod change interval of 10 hours for 250cc engines and 25 hours for 450cc and larger cubic engines. These recommendations are valid for use in world top-tier motocross racing conditions.

We hope you will enjoy our product and that it may lead to many victories!

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