

# NAMURA®

## T E C H N O L O G I E S I N C

### INSTALLATION GUIDE

The following guide is for reference only, some models may vary.

**!** Namura Pistons should be installed to the clearance specifications in the OEM service manual of the given application. However additional bore clearance may be necessary for an engine that has been modified

**!** Do not have the cylinder bored before purchasing your piston. Always have the piston available when boring any cylinder so the clearances can be exact. Double check the clearances before final assembly.

#### Preparation-

1. It is highly recommended you have the official/OEM installation specifications and service manual for the original parts for use during installation.
2. Check that the product is the correct replacement part by comparing to the existing piston
3. Before installation, the size of each individual piston should always be checked. In general pistons should be measured at a 90 degree angle to the wrist pin and at 25% of the piston length from the bottom of the skirt. The piston and cylinder size should result in correct piston to cylinder wall clearance for the specific model.  
However original model specifications should always supersede the table below.
4. Always clean parts thoroughly and use quality installation lube when fitting engine parts. The cylinder(s) should be cleaned thoroughly with a good solvent and some paper towels. Do this until the towel comes out clean and residue free.
5. The air filter box and engine (crankcase and cylinder head) must always be checked for cleanliness before doing any install.
6. Before piston installation, the cylinder condition must always be checked. Check carefully for cracks, exact diameter, roundness, and if they are free of taper.
7. Cast cylinders - finish cylinders with a 220, 280, 300 grit stone  
Plated cylinders - should always be honed or deglazed before installation of the part.  
Silicon carbide and aluminum oxide honing stones of various grits have long been used in power honing machines and portable hones to finish cylinder bores. These types of abrasives are popular with engine builders because of their flexibility and low cost. But in recent years, a growing number of performance engine builders and custom engine builders have started using the same type of honing stones that production engine rebuilders and OEMs use: diamond abrasives.  
It is recommended that you do not use a "ball hone" or "brake hone stones" but a diamond tipped nylon brush or other diamond abrasive to clean the bore, but if necessary for plated cylinders you can use a 500 grit stone to clean the cylinder.

#### Cylinder Clearance-

Namura Pistons are manufactured per OEM specs so in order to confirm the clearance you will need a shop manual to find the clearance for your bike. The chart below gives a general indication of clearance by capacity but If you are unsure and no manual is available please contact Namura Technologies through the website.

#### Typical Piston to Cylinder Wall Clearance

Capacity / Cylinder	2-Stroke 50-250cc	2 Stroke 251cc+	4-stroke 50-124cc	4-stroke 125-249cc	4-Stroke 250cc+
Clearance indication	0.05mm-0.06mm 0.0020"-0.0025"	0.06mm-0.07mm 0.0025"-0.0031"	0.04mm-0.06mm 0.0015"-0.0023"	0.04mm-0.06mm 0.0015"-0.0023"	0.04mm-0.06mm 0.0015"-0.0023"
Recommended hrs of use: competition / normal use	08-10 / 12-15	08-10 / 12-15	15 / 20	15 / 20	15 / 20

\*Additional bore clearance may be necessary for modified engines (aftermarket pipe, ignition mods, or for cast iron bores).

#### Ring Installation:

**2 & 4-Stroke:** Markings always face up. 1R = Top Compression Ring, 2R = Second Compression Ring  
**2-stroke** - Dual rings: The top compression ring will have a silver finish on the outer diameter.  
**4-stroke** - Generally, the top compression ring will have a silver finish around the outer diameter;  
 The middle ring will be all black followed by the bottom "oil" ring made up of one expansion ring and two scraper rings.

8. Although the included piston rings are matched for the specific piston and bore size, the rings on the piston should always be checked for the correct ring end gap specifications. The ring gap should be around 0.4 to 0.5% of the piston diameter and can be measured by placing the ring in the cylinder and using a feeler gauge. Normally it is not necessary to modify the ring gap. The below chart has some general gap specification guidelines.

<b>Typical Ring End Gap:</b>	Single ring from .010 to .025 (0.254-0.635mm)☞
<b>Two ring piston's range from .010 to .035 (0.254-0.635mm)☞</b>	

\* Note: It is not needed to check or modify the ring gap on oil control rings. The ring gap on the second ring should always be larger than the gap in the top compression ring.

10. Install the rings on the piston, starting with the oil control ring (for 4-strokes). Please check for the proper installation of the oil expander ring. Then, if applicable, install the second compression ring and finally the top ring.

\*Pay special attention to the oil ring; the two scraper rings should be staggered 1 inch (25.4mm) from the gap of the expansion ring (one gap to the right of the expansion ring gap, the other to the left of the expansion ring gap) Always install the expansion ring first followed by scraper rings. Be sure to not allow the expansion ring ends to overlap as shown in *Diagram 1*.

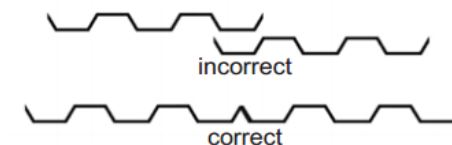


Diagram 1

#### **Pin & Circlip Tips:**

Press pin into piston. Carefully install circlips without bending or distorting them. It is recommended to install the circlips with the opening at a 6 or 12 o'clock position

Important: The arrow or "EX" marking on the top of the piston points to the exhaust side of the piston.

#### **Tips:**

Always use new gaskets for assembly. Namura gaskets are designed to synchronize with Namura Pistons.

There should be no head gasket material extending into the cylinder bore.

Top off engine with OEM recommended oil such as 10W40 for proper run in. Do not use synthetic oils to initially run/break-in the engine.

Only apply synthetic oil after fully breaking-in the engine.

Make sure valve timing & valve clearance is correctly set. Failure to do this can result in severe engine damage.

Before starting the engine, check manually if the engine rotates freely.

#### **Break-In:**

Let the machine warm up properly. When the piston / rings are new, they are not seated into the cylinder yet.

Giving it a decent warm up cycle will prove crucial to prevent any scuffing in its early stages of break in. Take it easy until you've reached your particular machines normal operating temperature. Excessive idling will impede the piston from breaking in properly.

Be sure to visually inspect while idling looking for any leaks, smoke, etc.

Be sure to do at least 2 heat cycles where after your machine reaches operating temperature for 30 minutes to 1 hour

let it cool all the way down and then repeat. This allows any new seals to seat properly. Also don't be afraid to give it throttle,

just don't go full throttle and stay there for extended periods of time. When an engine has a fresh rebuild, the best thing for it is constantly varying cylinder pressure. This is achieved by varying the throttle position, always be on and off the throttle.

Generally you'll want to ride like this for at least the first full tank of gas.

Do not tow or haul with the machine during the break in period or put the engine under any abnormal or excessive loads (hills, mud, rough terrain).

After the break-in be sure to visually inspect everything again (ie. leaks, proper exhaust discharge, etc.).

If it looks ok than the machine should be ready for normal operation.

DISCLAIMER: Due to the operating environment of powersports applications, Namura Technologies Inc., manufacturer, distributor, nor seller makes and warranty of merchantability of any kind for this product for any particular purpose, either expressed or implied. This product is sold "as is" without warranty. Due to the inherently dangerous nature of powersports applications this product is sold without liability on the part of Namura Technologies Inc., manufacturer, distributor, or seller for any special, incidental, or consequential damages for loss of property, equipment, profits or revenue, or losses sustained as the result of injury (including death) to any person or entity. Any dispute arising out of the use of this product must be resolved under the laws of Minnesota within a venue of Dakota Country.