S.P.I. Piston + Ring Installation Guide for Snowmobile Applications

IMPORTANT This guide is for reference only, some models may vary (refer to the Manufactures Specifications)

If the old piston has failed, determine the cause and remedy the problem before replacing. Seizing on the exhaust side is caused from a lean mixture or air leak. A "four corner" style seizure is caused from insufficient warm up or clearance. A hole in the piston is caused from detonation, a result of advanced timing or poor fuel quality. A broken piston skirt is caused from excess piston to cylinder clearance.

Preparation:

1) Removal: To remove a piston, use a piston pin puller and heat piston if necessary, **WARNING**: do not hit pin with a hammer)

2) Measure the cylinder for clearances and out of roundness, service limit is .003" out of round up to 65mm / .004" out of round over 66mm larger size.

3) Finish Cylinder - Cast iron cylinders- finish cylinders with a 220 or 300 grit stone. Nikasil, Electrofusion, SCNM, & other coated cylinders if necessary can use a 500 grit hone to clean cylinder.

Note: To prevent ring breakage, make sure all port edges are chamfered @30deg. angles with a radius of .9 to 1.4mm

Tips: -If the cylinder is in good condition but has aluminum build up from a seizure, muriatic acid can be used to soften and clean off aluminum during cylinder preparation. Chrome plated rings can be used in cast or nikasil or electrofution bore but cannot be used in chrome bore. (note: Chrome was used in pre early 80's production but seldom after that.)
-Always check that the ring end gap will not be in align with a port. By putting a mark on the top of the piston were the ring locating pins(s) are is a quick and easy way to check.

Installation: IMPORTANT! Check **Piston-To-Cylinder Clearance and Ring End Gap** before assembly. Typical clearance range and end gap are as follows. (Note: ALWAYS refer to manufacturers specifications; clearance and end gap must be set on ANY piston that is installed. If they are not properly set engine failure could occur.)

Bore Size	Air Cooled		Liquid Cooled		Ring End Gap
	(Inch)	(mm)	(Inch)	(mm)	
50-65mm	.003-.004	0.076 - 0.102	.003 -.005	0.076 - 0.127	.010" to .025"
66-70mm	.0035-.0045	0.089 - 0.114	.005 -.006	0.127 - 0.152	.016" to .039"
71mm+up	.005-.006	0.127 - 0.152	.0055 -.0065	0.139 - 0.165	.016" to .039"
Hyperdryve (single or dual ring)	.0116-.002	0.29 - 0.050	.0116 – 0.002	0.29 - 0.050	1st .3MM (.0118") - .4MM .0157") 2nd.4MM (.0157") - .5MM (.0197")

1) Install pistons with arrow facing exhaust or on some Polaris's the arrow will face the magneto side of engine. If wrist pin has a tight interference - heat the piston + oil the pin for ease of assembly.
2) Put a rag under piston and carefully install circlips without bending or distorting them. Be careful they are tight in the circlip groove. Most engine builders like to position pin circlips at 12:00 o'clock or 6:00 o'clock positions.
3) Remove rag and make sure gasket surface's are clean, oil cylinder and install.

Break-in procedure

For the first tank of fuel on oil injected machines, use 50:1 fuel/ 2- stroke oil mixture. On Pre-mix applications use 20:1 fuel/ 2 stroke oil mixture for first tank. Avoid prolonged high RPM operations for the first 5 hours of use.

Ovesize cross-reference: .010" =.25mm, .02"=.50mm, .03"=.75mm, .04"=.1.00mm, .06"=.1.50mm, .08"=.2.00mm