The XS650 engine uses two springs of different size to prevent valve float or surging.
The chart below shows the basic value characteristics.

VALVE SPRING SPECIFICATION CHART

	OUTER	INNER
Diameter of wire	4.2 mm.	2.9 mm.
Direction of winding	Right Hand	Left Hand
Total Winding	6.25	8.0
Free Length	42.55 mm.	42.0 mm.
Installed Length (Valve Closed)	37 mm.	35.0 mm.
Installed Pressure	17.7 ± 1.25 kgs. (39.02 ± 2.75 lbs.)	10 ± 0.7 kgs. (22.05 ± 1.54 lbs.)
* Compressed Length (Valve Open)	27.5 mm.	25.5 mm.
Compressed Pressure	57.5 ± 4.0 kgs. (126.78 ± 8.82 lbs.)	27.2 ± 1.9 kgs. (59.97 ± 4.19 lbs.)
* Measured without collar. Tolerance: ± 3%		

Piston Clearance

a) Piston-to-bore clearance is the difference between minimum cylinder bore measurement and maximum piston diameter. Standard clearance is .050–.055 mm (.0020"–.0022"). If measurements prove that the clearance equals .10 mm or more, it is excessive, and one of two corrective measures must be taken to bring the clearance back within tolerances.

b) First if cylinder taper is within tolerances, and if the cylinder can be cleaned up by honing, then obtain a larger size standard piston that is large enough to obtain the correct clearance.

c) Secondly bore and hone out the cylinder to the size of a first oversize piston, plus the correct clearance.

d) How to Calculate Standard Size Piston-to-Cylinder Clearance from Stamped Numbers
Nominal piston standard size is 75 mm. The number stamped on the piston crown is the actual size. (The 74 is dropped.)

EXAMPLE:

.954 on crown really means 74.954 mm piston diameter, or .046 mm undersize.

Cylinder standard bore size is marked in large numbers on the very bottom of the cylinder. It equals 75 mm PLUS the amount marked.

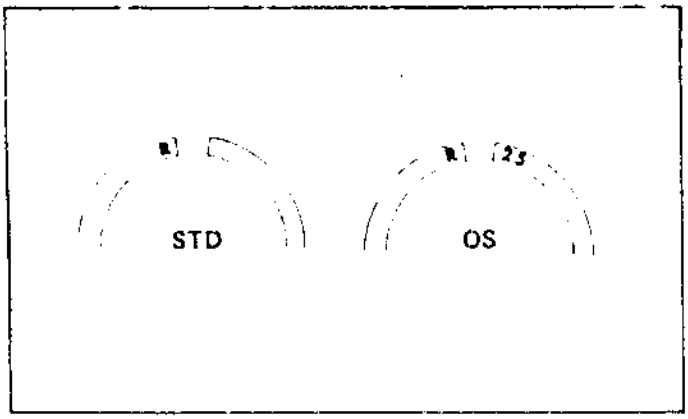
EXAMPLE:

.007 marked on cylinder really means 75.007 mm cylinder bore, or .007 mm oversize.
If the above piston is used with this cylinder, total clearance would be .053 mm (.0021").

EXAMPLE:

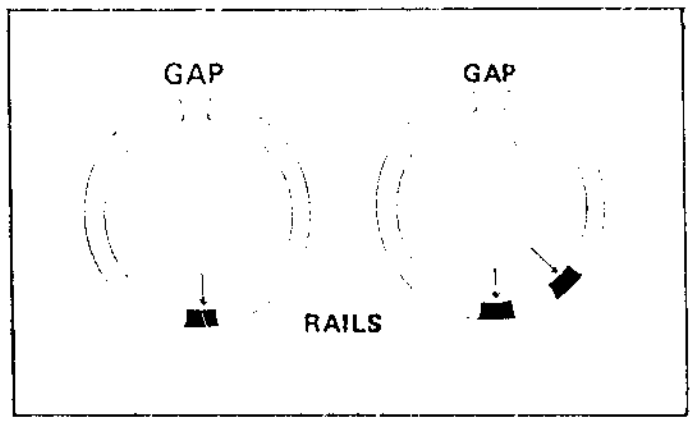
75.007 (Cylinder)
−74.954 (Piston)
.053 (Clearance)

a) The oversize top and middle ring sizes are stamped on top of the ring.



SIZE (mm)		MARK
Standard		None
Oversize	1st	25
	2nd	50
	3rd	75
	4th	100

b) All three pieces of the bottom (oil control) ring are color coded to identify sizes. The color marks are painted on the ring, 180° opposite the end gap (see next page).



SIZE			COLOR	
Standard			Blue	(1 mark)
Oversize	1st	.25 (0.25mm)	Blue	(2 marks)
	2nd	.50 (0.50mm)	Red	(1 mark)
	3rd	.75 (0.75mm)	Red	(2 marks)
	4th	100 (1.0 mm)	Yellow	(1 mark)

	Standard Gap (mm)	Wear Limit
Compression Ring	.2 – .4	.8
Wiper Ring	.2 – .4	.8
Oil Control (Rails)	.3 – .6	1.0