

Setting Clamp Parallelism - Clamps With Superbolt Tensioners

For Uniloy IBS Models 122-3, 135-3S, and 189-3S

Why is Even Tonnage Distribution Important?

A mold that is not clamping parallel will tend to flash on the side that is higher. Picture the clamp at the moment the mold touches on one side. In order for the other side to close, something has to give and with the amount of tonnage on the machine, it does! The side that has the platen set lower will cause one tie bar to carry the tonnage that the other is not. The tie bars bend, the cross arms flex and the whole tie bar/cross arm assembly will shift causing side load on the rods of the hydraulic cylinder(s). As a result, eventual mold damage, tie bar breakage or cylinder failure will occur.

When to Check for Parallelism

- * In between mold changes. An indicator base and indicator should always be readily available. Prior to installing another mold, a quick check is all that is required and should be part of the standard procedure.
- * At least once a year. As part of the annual maintenance program, it should be among the first top ten on the list!
- * Whenever flashing occurs in any area of the parison mold.

How to Check for Parallelism

- 1.) Remove mold and core rods from the area.
- 2.) Close clamp and turn off pump. Follow Lockout/Tag out Procedure's.
- 3.) Stone off the surface of the table and the surface of the upper platen using a flat surface stone and kerosene (preferred).
- 4.) Check the stack height from the surface of the table to the bottom surface of the platen using a machinist combination square. The dimension should be $9.930" + 000"/-.030"$ ($9-29/32" - 9-15/16"$). If this dimension is off by $.040"$ or more go the "How To Adjust for Parallelism" section below.
- 5.) "Gauge Blocks" (see note below) are needed to set the lower cross arm parallel to the table. To install, set each gauge block on either side of the outboard cylinders between the lower cross arm and the underside of table. Make sure gauge blocks are held snug by using a bottle jack under the cross arm.
- 6.) To check, "Left to Right Parallelism" (tie bar to tie bar), set up an indicator base to the underside of the platen. Move the indicator from left to right. Be sure to keep the plunger an equal distance from either side of the platen as much as possible. T.I.R should be less than $.005"$. If readings are greater than $.005"$ go to procedure – "How To Adjust For Parallelism" section below.

Note: Gauge blocks are only needed for the injection clamp. The blow clamp will be set in the full down position. Gauge blocks can be made from two pieces of approx. 1 1/2" x 2 1/2" bar stock. The lengths must be ground as a matched set (within .001"). The following are the preferred lengths:

- * Model 122-3 with 5" stroke Clamps -----21"
- * Model 135 & 189-3S with 5" stroke Clamps-----24"
- * Model 135 & 189-3S with 6" stroke Clamps-----26"
- * Model 135 & 189-3S with 7" stroke Clamps-----28"

How To Adjust For Parallelism

- 1.) Remove mold and core rods from the area.
- 2.) Close clamp and turn off pump. Follow Lockout/Tag out Procedure's.
- 3.) Stone off the surface of the table and the surface of the upper platen using a flat surface stone and kerosene (preferred).
- 4.) First set "Stack Height" from the surface of the table to the bottom surface of the platen using a machinist combination square. The dimension should be 9.930" + 000"/-.030" (9-29/32" – 9-15/16").
- 5.) "Rough Adjustment" is made by first loosening the Superbolt on top of both tie bars only.

To loosen the Superbolt tensioner:

- Step 1: Loosen each jack bolt 1/8 turn following a circular pattern around the tensioner (1 round only). As you move around and get back to the 1st jack bolt, it will be tight again. Do this for all studs on the joint prior to the next step
- Step 2: Repeat a 2nd round as above for all studs, loosening each jack bolt 1/4 turn in a circular pattern.
- Step 3: Continue loosening 1/4 turn for 3rd and successive rounds until all jack bolts are loose.
- Step 4: It is recommended that each jack bolt be removed, cleaned and re-lubricated with the correct Superbolt lubricant (JL-G or JL-M) between each use.

Spin the tensioner off of the washer to allow the lower nut (hex nut or spanner nut) to be adjusted. Tighten or loosen the (hex nut or spanner nut) located under the cross arm to set at clamp opening at 9 29/32"- 9 15/16". Spin both Superbolt tensioners back down on to the washer and tighten snug by hand. If this is for the blow clamp, skip to step 7.

- 6.) Once "Rough Adjustment" is complete, parallelism needs to be set using "Gauge Blocks". To install, set each gauge block on either side of the outboard cylinders between the lower cross arm and the underside of the table. Make sure gauge blocks are held snug by using a bottle jack under the cross arm (crack the upper hydraulic hose to allow movement).
- 7.) To Set "Left to Right Parallelism" (tie bar to tie bar) set up an indicator base to the underside of the platen. Move the indicator from left to right. Be sure to keep the plunger an equal distance from either side of the platen as much as possible. T.I.R should be less than .002". If readings are greater than .002", find the higher of the two sides and lower the high side to within .002".

8.) Tighten both Superbolt tensioners as per the procedure below and check readings again making sure readings have not moved. To tighten the Superbolt tensioner:

To tighten the Superbolt tensioner:

- Step 1: Back off the tensioner slightly from the washer
- Step 2: Tighten only (4) four jack bolts at 90° apart (12:00, 6:00, 9:00, and 3:00) with a torque of 32 ft.-lbs. This will seat the flange. If using an impact, use a reduced setting or slightly pulse the trigger at the full setting.
- Step 3: Torque same 4 jack bolts to 60 ft.-lbs. This will provide a total torque of approximately 10,000 ft.-lbs. on the tie bar.
- Step 4: Torque all jack bolts in a circular pattern at 60 ft.-lbs. Do this for ALL jack bolts (1 round only).
- Step 5: Repeat step 4 until all jack bolts are "stabilized" (less than 10° rotation). This usually requires 2-4 additional passes

9.) To set "Front to Back" parallelism, remove the gauge blocks and the hydraulic jack below, tighten the upper hydraulic hose and close the clamps. Using the indicator base, move the indicator from front to back. Readings should be within .005". Although rare, if necessary, set by loosening the four bolts securing the platen up to the cross arm enough to insert a strip of steel shim. Be sure the shim is at least 1" wide and the entire length of the contact surface of the platen. It may be necessary on some machines to notch the shim for the bolts securing the platen. Secure bolts and check indications. At this point, the total parallelism left to right and front to back should be within .002".

Cylinder Specifications

There have been occasions when the cylinder rod unscrews from the piston in spite of the use of set screws, pins and Loctite. This becomes apparent in the machine in three areas:

- * The mold starts to slam due to the center cylinder not entering the cushion enough.
- * The parisons hit the injection manifold due to the injection clamp not lifting the head enough.
- * The blown bottles hit the upper half of the blow mold due to the blow cylinder not lifting high enough.

The following are the dimensions of the cylinders used in the retracted position. Measurements are taken from the cylinder base to the face of the rod.

Clamp Cylinder Size	Part #	Measurement
4" bore x 5 1/4" stroke	64491-T	13.25"
5" bore x 5 1/4" stroke	1295052	13.75"
4" bore x 7 1/4" stroke	1295062	15.25"
5" bore x 7 1/4" stroke	1295111	15.72"